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THE
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A

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OF

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K. S.	KATHLEEN SCHLESINGER. Editor of the *Portfolio of Musical Archaeology*. Author of *The Instruments of the Orchestra*; &c.	**Jew's Harp; Kettledrum;** **Keyboard.**
L.	COUNT LÜTZOW, LITT.D. (Oxon.), D.PH. (Prague), F.R.G.S. Chamberlain of H.M. the Emperor of Austria, King of Bohemia. Hon. Member of the Royal Society of Literature. Member of the Bohemian Academy, &c. Author of *Bohemia, a Historical Sketch*; *The Historians of Bohemia* (Ilchester Lecture, Oxford, 1904); *The Life and Times of John Hus*; &c.	**Jerome of Prague.**
L. F. V.-H.	LEVESON FRANCIS VERNON-HARCOURT, M.A., M.INST.C.E. (1839–1907). Formerly Professor of Civil Engineering at University College, London. Author of *Rivers and Canals*; *Harbours and Docks*; *Civil Engineering as applied in Construction*; &c.	**Jetty.**
L. J. S.	LEONARD JAMES SPENCER, M.A. Assistant in the Department of Mineralogy, British Museum. Formerly Scholar of Sidney Sussex College, Cambridge, and Harkness Scholar. Editor of the *Mineralogical Magazine.*	**Jarosite.**
L. C.	REV. LEWIS CAMPBELL, D.C.L., LL.D. See the biographical article: CAMPBELL, LEWIS.	**Jowett.**
L. D.*	LOUIS DUCHESNE. See the biographical article: DUCHESNE, L. M. O.	**John XIX.;** **Julius I.**
L. V.*	LUIGI VILLARI. Italian Foreign Office (Emigration Department). Formerly Newspaper Correspondent in east of Europe. Italian Vice-Consul in New Orleans, 1906; Philadelphia, 1907; Boston, U.S.A., 1907–1910. Author of *Italian Life in Town and Country*; *Fire and Sword in the Caucasus*; &c.	**Italy:** *History* (E. *and* G.).
M.	LORD MACAULAY. See the biographical article: MACAULAY, BARON.	**Johnson, Samuel.**
M. Br.	MARGARET BRYANT.	**Keats** (*in part*).
M. F.	SIR MICHAEL FOSTER, K.C.B., D.C.L., D.SC., LL.D., F.R.S. See the biographical article: FOSTER, SIR M.	**Kölliker.**
M. M. Bh.	SIR MANCHERJEE MERWANJEE BHOWNAGGREE. Fellow of Bombay University. M.P. for N.E. Bethnal Green, 1895–1906. Author of *History of the Constitution of the East India Company*; &c.	**Jeejeebhoy.**
M. O. B. C.	MAXIMILIAN OTTO BISMARCK CASPARI, M.A. Reader in Ancient History at London University. Lecturer in Greek at Birmingham University, 1905–1908.	**Justin II.**
M. P.*	LEON JACQUES MAXIME PRINET. Formerly Archivist to the French National Archives. Auxiliary of the Institute of France (Academy of Moral and Political Sciences).	**Joinville** (*Family*); **Joyeuse;** **Juge, Boffille de.**
N. M.	NORMAN MCLEAN, M.A. Lecturer in Aramaic, Cambridge University. Fellow and Hebrew Lecturer, Christ's College, Cambridge. Joint-editor of the larger *Cambridge Septuagint.*	**Jacob of Edessa;** **Jacob of Sĕrūgh;** **Joshua the Stylite.**
N. V.	JOSEPH MARIE NOEL VALOIS. Member of Académie des Inscriptions et Belles-Lettres, Paris. Honorary Archivist at the Archives Nationales. Formerly President of the Société de l'Histoire de France and the Société de l'École de Chartes. Author of *La France et le grand schisme d'Occident*; &c.	**John XXIII.**

O. H.*	Otto Hehner, F.I.C., F.C.S. Public Analyst. Formerly President of Society of Public Analysts. Vice-President of Institute of Chemistry of Great Britain and Ireland. Author of works on butter analysis; *Alcohol Tables*; &c.	**Jams and Jellies.**
O. J. R. H.	Osbert John Radcliffe Howarth, M.A. Christ Church, Oxford. Geographical Scholar, 1901. Assistant Secretary of the British Association.	**Java** (*in part*); **Korea** (*in part*).
P. A.	Paul Daniel Alphandéry. Professor of the History of Dogma, École pratique des Hautes Études, Sorbonne, Paris. Author of *Les Idées morales chez les hétérodoxes latines au début du XIII^{e} siècle.*	**Joachim of Floris;** **John XXII.**
P. A. A.	Philip A. Ashworth, M.A., Doc.Juris. New College, Oxford. Barrister-at-Law. Translator of H. R. von Gneist's *History of the English Constitution.*	**Jhering.**
P. A. K.	Prince Peter Alexeivitch Kropotkin. See the biographical article: Kropotkin, P. A.	**Kalmuck; Kaluga;** **Kamchatka; Kara-Kum;** **Kazañ; Kerch; Khingan;** **Khokand; Kiev; Kronstadt;** **Kubañ; Kuen-Lun;** **Kursk; Kutais.**
P. Gi.	Peter Giles, M.A., LL.D., Litt.D. Fellow and Classical Lecturer of Emmanuel College, Cambridge, and University Reader in Comparative Philology. Formerly Secretary of the Cambridge Philological Society. Author of *Manual of Comparative Philology.*	**J.** **K.**
P. G. T.	Peter Guthrie Tait. See the biographical article: Tait, Peter Guthrie.	**Knot.**
P. La.	Philip Lake, M.A., F.G.S. Lecturer on Physical and Regional Geography in Cambridge University. Formerly of the Geological Survey of India. Author of *Monograph of British Cambrian Trilobites.* Translator and Editor of Kayser's *Comparative Geology.*	**Japan:** *Geology.*
P. L. G.	Philip Lyttelton Gell, M.A. Sometime Scholar of Balliol College, Oxford. Secretary to the Clarendon Press, Oxford, 1884–1897. Fellow of King's College, London.	**Khazars** (*in part*).
P. Vi.	Paul Vinogradoff, D.C.L., LL.D. See the biographical article: **Vinogradoff, Paul.**	**Jurisprudence, Comparative.**
R. A.*	Robert Anchel. Archivist to the Département de l'Eure.	**Kersaint.**
R. Ad.	Robert Adamson, LL.D. See the biographical article: Adamson, Robert.	**Kant** (*in part*).
R. A. S. M.	Robert Alexander Stewart Macalister, M.A., F.S.A. St John's College, Cambridge. Director of Excavations for the Palestine Exploration Fund.	**Joppa;** **Kerak.**
R. A. W.	Robert Alexander Wahab, C.B., C.M.G., C.I.E. Colonel, Royal Engineers. Formerly H.M. Commissioner, Aden Boundary Delimitation, and Superintendent, Survey of India. Served with Tirah Expeditionary Force, 1897–1898; Anglo-Russian Boundary Commission, Pamirs, 1895; &c.	**Kuwēt.**
R. F. L.	Rev. Richard Frederick Littledale, M.A., LL.D., D.C.L. (1833–1890). Author of *Religious Communities of Women in the Early Church*; *Catholic Ritual in the Church of England*; *Why Ritualists do not become Roman Catholics.*	**Jesuits** (*in part*).
R. G.	Richard Garnett, LL.D. See the biographical article: Garnett, Richard.	**Krazewski.**
R. H. C.	Rev. Robert Henry Charles, M.A., D.D., D.Litt. (Oxon.). Grinfield Lecturer and Lecturer in Biblical Studies, Oxford and Fellow of Merton College. Fellow of the British Academy. Formerly Senior Moderator of Trinity College, Dublin. Author and Editor of *Book of Enoch*; *Book of Jubilees*; *Assumption of Moses*; *Ascension of Isaiah*; *Testaments of the XII. Patriarchs*; &c.	**Jeremy, Epistle of;** **Jubilees, Book of;** **Judith, The Book of.**
R. I. P.	Reginald Innes Pocock, F.Z.S. Superintendent of the Zoological Gardens, London.	**King-Crab.**
R. J. M.	Ronald John McNeill, M.A. Christ Church, Oxford. Barrister-at-Law. Formerly Editor of the *St James's Gazette*, London.	**Jeffreys, 1st Baron;** **Keith:** *Family.*
R. K. D.	Sir Robert Kennaway Douglas. Formerly Keeper of Oriental Printed Books and MSS. at the British Museum, and Professor of Chinese, King's College, London. Author of *The Language and Literature of China*; &c.	**Jenghiz Khan;** **Julien.**
R. L.*	Richard Lydekker, F.R.S., F.G.S., F.Z.S. Member of the Staff of the Geological Survey of India, 1874–1882. Author of *Catalogue of Fossil Mammals, Reptiles and Birds in the British Museum*; *The Deer of all Lands*; *The Game Animals of Africa*; &c.	**Jerboa;** **Kangaroo** (*in part*).

R. N. B.	Robert Nisbet Bain (d. 1909). Assistant Librarian, British Museum, 1883–1909. Author of *Scandinavia, the Political History of Denmark, Norway and Sweden, 1513–1900*; *The First Romanovs, 1613–1725*; *Slavonic Europe, the Political History of Poland and Russia from 1469 to 1796*; &c.	**Ivan I.-VI.; Jellachich;** **John III. :** *Sobieski*; **Juel, Jens; Juel, Neils;** **Kármán; Kemeny, Baron;** **Kisfaludy; Kollontaj;** **Koniecpolski; Kosciuszko;** **Kurakin, Prince.**
R. Po.	René Poupardin, D. ès L. Secretary of the École des Chartes. Honorary Librarian at the Bibliothèque Nationale, Paris. Author of *Le Royaume de Provence sous les Carolingiens*; *Recueil des chartes de Saint-Germain*; &c.	**John, Duke of Burgundy.**
R. P. S.	R. Phené Spiers, F.S.A., F.R.I.B.A. Formerly Master of the Architectural School, Royal Academy, London. Past President of Architectural Association. Associate and Fellow of King's College, London. Corresponding Member of the Institute of France. Editor of Fergusson's *History of Architecture*. Author of *Architecture: East and West*; &c.	**Jacobean Style.**
R. S. C.	Robert Seymour Conway, M.A., D.Litt. (Cantab.). Professor of Latin and Indo-European Philology in the University of Manchester. Formerly Professor of Latin in University College, Cardiff; and Fellow of Gonville and Caius College, Cambridge. Author of *The Italic Dialects*.	**Italy:** *History* (A.).
S. A. C.	Stanley Arthur Cook, M.A. Lecturer in Hebrew and Syriac, and formerly Fellow, Gonville and Caius College, Cambridge. Editor for Palestine Exploration Fund. Examiner in Hebrew and Aramaic, London University, 1904–1908. Author of *Glossary of Aramaic Inscriptions*; *The Laws of Moses and the Code of Hammurabi*; *Critical Notes on Old Testament History*; *Religion of Ancient Palestine*; &c.	**Jacob; Jehoiakim;** **Jehoram; Jehoshaphat;** **Jehu; Jephthah;** **Jerahmeel; Jeroboam;** **Jews:** *Old Testament History*; **Jezebel; Joab; Joash;** **Joseph:** *Old Testament*; **Joshua; Josiah; Judah;** **Judges, Book of;** **Kabbalah** (*in part*); **Kenites; Kings, Books of.**
St. C.	Viscount St Cyres. See the biographical article: Iddesleigh, 1st Earl of.	**Jansen;** **Jansenism.**
S. N.	Simon Newcomb, D.Sc., D.C.L. See the biographical article: Newcomb, Simon.	**Jupiter:** *Satellites*.
T. As.	Thomas Ashby, M.A., D.Litt. (Oxon.). Director of British School of Archaeology at Rome. Formerly Scholar of Christ Church, Oxford. Craven Fellow, 1897. Conington Prizeman, 1906. Member of the Imperial German Archaeological Institute.	**Italy:** *Geography and Statistics*; *History* (B.); **Ivrea.**
T. A. I.	Thomas Allan Ingram, M.A., LL.D. Trinity College, Dublin.	**Juvenile Offenders** (*in part*).
T. A. J.	Thomas Athol Joyce, M.A. Assistant in Department of Ethnography, British Museum. Hon. Sec., Royal Anthropological Institute.	**Kavirondo.**
T. F. C.	Theodore Freylinghuysen Collier, Ph.D. Assistant Professor of History, Williams College, Williamstown, Mass., U.S.A.	**Julius III.**
T. H.	Thomas Hodgkin, D.C.L., LL.D. See the biographical article: Hodgkin, T.	**Jordanes** (*in part*).
T. H. H.*	Sir Thomas Hungerford Holdich, K.C.M.G., K.C.I.E., D.Sc., F.R.G.S. Colonel in the Royal Engineers. Superintendent Frontier Surveys, India, 1892–1898. Gold Medallist, R.G.S. (London), 1887. H.M. Commissioner for the Perso-Beluch Boundary, 1896. Author of *The Indian Borderland*; *The Gates of India*; &c.	**Kabul; Kalat; Kandahar;** **Kashmir; Khyber Pass;** **Kunar; Kushk.**
T. K.	Thomas Kirkup, M.A., LL.D. Author of *An Inquiry into Socialism*; *Primer of Socialism*; &c.	**Julian** (*in part*).
T. K. C.	Rev. Thomas Kelly Cheyne, D.D. See the biographical article: Cheyne, T. K.	**Jeremiah; Joel** (*in part*); **Jonah.**
Th. N.	Theodor Nöldeke, Ph.D. See the biographical article: Nöldeke, Theodor.	**Koran** (*in part*).
T. Se.	Thomas Seccombe, M.A. Balliol College, Oxford. Lecturer in History, East London and Birkbeck Colleges, University of London. Stanhope Prizeman, Oxford, 1887. Assistant Editor of *Dictionary of National Biography*, 1891–1901. Author of *The Age of Johnson*. Joint-author of *Bookman History of English Literature*; &c.	**Johnson, Samuel.**
T. Wo.	Thomas Woodhouse. Head of the Weaving and Textile Designing Department, Technical College, Dundee.	**Jute.**
T. W. R. D.	Thomas William Rhys Davids, LL.D., Ph.D. Professor of Comparative Religion, Manchester. Professor of Pali and Buddhist Literature, University College, London, 1882–1904. President of the Pali Text Society. Fellow of the British Academy. Secretary and Librarian of Royal Asiatic Society, 1885–1902. Author of *Buddhism*; *Sacred Books of the Buddhists*; *Early Buddhism*; *Buddhist India*; *Dialogues of the Buddha*; &c.	**Jains;** **Jātaka;** **Kanishka.**
W. An.	William Anderson, F.R.C.S. Formerly Chairman of Council of the Japan Society. Author of *The Pictorial Arts of Japan*; *Japanese Wood Engravings*; *Catalogue of Chinese and Japanese Pictures in the British Museum*; &c.	**Japan:** *Art* (*in part*).

W. A. B. C.	Rev. William Augustus Brevoort Coolidge, M.A., F.R.G.S., Ph.D. (Bern). Fellow of Magdalen College, Oxford. Professor of English History, St David's College, Lampeter, 1880–1881. Author of *Guide to Switzerland*; *The Alps in Nature and in History*; &c. Editor of *The Alpine Journal*, 1880–1889.	**Jenatsch, Georg;** **Jungfrau;** **Jura.**
W. A. P.	Walter Alison Phillips, M.A. Formerly Exhibitioner of Merton College and Senior Scholar of St John's College, Oxford. Author of *Modern Europe*; &c.	**Jacobins;** **King; Kriemhild;** **Krüdener, Baroness von.**
W. B.*	William Burton, M.A., F.C.S. Chairman, Joint Committee of Pottery Manufacturers of Great Britain. Author of *English Stoneware and Earthenware*; &c.	**Kashi** (*in part*).
W. Ba.	William Bacher, Ph.D. Professor of Biblical Studies at the Rabbinical Seminary, Buda-Pest.	**Jonah, Rabbi; Kimḥi.**
W. Be.	Sir Walter Besant. See the biographical article: Besant, Sir Walter.	**Jefferies.**
W. F. C.	William Feilden Craies, M.A. Barrister-at-Law, Inner Temple. Lecturer on Criminal Law at King's College, London. Editor of Archbold's *Criminal Pleading*, 23rd ed.	**Jury.**
W. F. D.	William Frederick Denning, F.R.A.S. Gold Medal, R.A.S. President, Liverpool Astronomical Society, 1877–1878. Corresponding Fellow of Royal Astronomical Society of Canada; &c. Author of *Telescopic Work for Starlight Evenings*; *The Great Meteoric Shower*; &c.	**Jupiter.**
W. G.	William Garnett, M.A., D.C.L. Educational Adviser to the London County Council. Formerly Fellow and Lecturer of St John's College, Cambridge. Principal and Professor of Mathematics, Durham College of Science, Newcastle-on-Tyne. Author of *Elementary Dynamics*; &c.	**Kelvin, Lord.**
W. G. S.	William Graham Sumner. See the biographical article: Sumner, William Graham.	**Jackson, Andrew.**
W. H. Be.	William Henry Bennett, M.A., D.D., D.Litt.(Cantab.). Professor of Old Testament Exegesis in New and Hackney Colleges, London. Formerly Fellow of St John's College, Cambridge. Lecturer in Hebrew at Firth College, Sheffield. Author of *Religion of the Post-Exilic Prophets*; &c.	**Japheth.**
W. H. Di.	William Henry Dines, F.R.S. Director of Upper Air Investigation for the English Meteorological Office.	**Kite-flying** (*in part*).
W. H. F.	Sir William H. Flower, LL.D. See the biographical article: Flower, Sir W. H.	**Kangaroo** (*in part*).
W. L. F.	Walter Lynwood Fleming, A.M., Ph.D. Professor of History in Louisiana State University. Author of *Documentary History of Reconstruction*; &c.	**Knights of the Golden Circle;** **Ku Klux Klan.**
W. L.-W.	Sir William Lee-Warner, M.A., K.C.S.I. Member of Council of India. Formerly Secretary in the Political and Secret Department of the India Office. Author of *Life of the Marquis of Dalhousie*; *Memoirs of Field-Marshal Sir Henry Wylie Norman*; &c.	**Jung Bahadur, Sir.**
W. M. R.	William Michael Rossetti. See the biographical article: Rossetti, Dante G.	**Kneller.**
W. M. Ra.	Sir William Mitchell Ramsay, LL.D., D.C.L. See the biographical article, Ramsay, Sir W. M.	**Jupiter** (*in part*).
W. P. J.	William Price James. Barrister-at-Law, Inner Temple. High Bailiff, Cardiff County Court. Author of *Romantic Professions*; &c.	**Kipling, Rudyard.**
W. R. S.	William Robertson Smith, LL.D. See the biographical article: Smith, William Robertson.	**Joel** (*in part*); **Jubilee, Year of** (*in part*).
W. W. F.*	William Warde Fowler, M.A. Fellow of Lincoln College, Oxford. Sub-rector, 1881–1904. Gifford Lecturer, Edinburgh University, 1908. Author of *The City-State of the Greeks and Romans*; *The Roman Festivals of the Republican Period*; &c.	**Juno;** **Jupiter** (*in part*).
W. W. R.*	William Walker Rockwell, Lic.Theol. Assistant Professor of Church History, Union Theological Seminary, New York.	**Jerusalem, Synod of.**
W. Y. S.	William Young Sellar, LL.D. See the biographical article: Sellar, W. Y.	**Juvenal** (*in part*).

PRINCIPAL UNSIGNED ARTICLES

Ivy.
Jamaica.
Janissaries.
Jaundice.
Ju-Jutsu.
Jumping.
Juniper.
Jurisprudence.
Kaffirs.
Kansas.
Kent.
Kentucky.
Kerry.
Ketones.
Kildare.
Kilkenny.
Know Nothing Party.

ENCYCLOPÆDIA BRITANNICA

ELEVENTH EDITION

VOLUME XV

ITALY (*Italia*), the name[1] applied both in ancient and in modern times to the great peninsula that projects from the mass of central Europe far to the south into the Mediterranean Sea, where the island of Sicily may be considered as a continuation of the continental promontory. The portion of the Mediterranean commonly termed the Tyrrhenian Sea forms its limit on the W. and S., and the Adriatic on the E.; while to the N., where it joins the main continent of Europe, it is separated from the adjacent regions by the mighty barrier of the Alps, which sweeps round in a vast semicircle from the head of the Adriatic to the shores of Nice and Monaco.

Boundaries.

Topography.—The land thus circumscribed extends between the parallels of 46° 40′ and 36° 38′ N., and between 6° 30′ and 18° 30′ E. Its greatest length in a straight line along the mainland is from N.W. to S.E., in which direction it measures 708 m. in a direct line from the frontier near Courmayeur to Cape Sta Maria di Leuca, south of Otranto, but the great mountain peninsula of Calabria extends about two degrees farther south to Cape Spartivento in lat. 37° 55′. Its breadth is, owing to its configuration, very irregular. The northern portion, measured from the Alps at the Monte Viso to the mouth of the Po, has a breadth of about 270 m., while the maximum breadth, from the Rocca Chiardonnet near Susa to a peak in the valley of the Isonzo, is 354 m. But the peninsula of Italy, which forms the largest portion of the country, nowhere exceeds 150 m. in breadth, while it does not generally measure more than 100 m. across. Its southern extremity, Calabria, forms a complete peninsula, being united to the mass of Lucania or the Basilicata by an isthmus only 35 m. in width, while that between the gulfs of Sta Eufemia and Squillace, which connects the two portions of the province, does not exceed 20 m. The area of the kingdom of Italy, exclusive of the large islands, is computed at 91,277 sq. m. Though the Alps form throughout the northern boundary of Italy, the exact limits at the extremities of the Alpine chain are not clearly marked. Ancient geographers appear to have generally regarded the remarkable headland which descends from the Maritime Alps to the sea between Nice and Monaco as the limit of Italy in that direction, and in a purely geographical point of view it is probably the best point that could be selected. But Augustus, who was the first to give to Italy a definite political organization, carried the frontier to the river Varus or Var, a few miles west of Nice, and this river continued in modern times to be generally recognized as the boundary between France and Italy. But in 1860 the annexation of Nice and the adjoining territory to France brought the political frontier farther east, to a point between Mentone and Ventimiglia which constitutes no natural limit.

Towards the north-east, the point where the Julian Alps approach close to the seashore (just at the sources of the little stream known in ancient times as the Timavus) would seem to constitute the best natural limit. But by Augustus the frontier was carried farther east so as to include Tergeste (Trieste), and the little river Formio (Risano) was in the first instance chosen as the limit, but this was subsequently transferred to the river Arsia (the Arsa), which flows into the Gulf of Quarnero, so as to include almost all Istria; and the circumstance that the coast of Istria was throughout the middle ages held by the republic of Venice tended to perpetuate this arrangement, so that Istria was generally regarded as belonging to Italy, though certainly not forming any natural portion of that country. Present Italian aspirations are similarly directed.

The only other part of the northern frontier of Italy where the boundary is not clearly marked by nature is Tirol or the valley of the Adige. Here the main chain of the Alps (as marked by the watershed) recedes so far to the north that it has never constituted the frontier. In ancient times the upper valleys of the Adige and its tributaries were inhabited by Raetian tribes and included in the province of Raetia; and the line of demarcation between that province and Italy was purely arbitrary, as it remains to this day. Tridentum or Trent was in the time of Pliny included in the tenth region of Italy or Venetia, but he tells us that the inhabitants were a Raetian tribe. At the present day the frontier between Austria and the kingdom of Italy crosses the Adige about 30 m. below Trent—that city and its territory, which previous to the treaty of Lunéville in 1801 was governed by sovereign archbishops, subject only to the German emperors, being now included in the Austrian empire.

While the Alps thus constitute the northern boundary of Italy, its configuration and internal geography are determined almost entirely by the great chain of the Apennines, which branches off from the Maritime Alps between Nice and Genoa, and, after stretching in an unbroken line from the Gulf of Genoa to the Adriatic, turns more to the south, and is continued throughout

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[1] On the derivation see below, *History*, section A, *ad. init.*

Central and Southern Italy, of which it forms as it were the backbone, until it ends in the southernmost extremity of Calabria at Cape Spartivento. The great spur or promontory projecting towards the east to Brindisi and Otranto has no direct connexion with the central chain.

One chief result of the manner in which the Apennines traverse Italy from the Mediterranean to the Adriatic is the marked division between Northern Italy, including the region north of the Apennines and extending thence to the foot of the Alps, and the central and more southerly portions of the peninsula. No such line of separation exists farther south, and the terms Central and Southern Italy, though in general use among geographers and convenient for descriptive purposes, do not correspond to any natural divisions.

1. *Northern Italy.*—By far the larger portion of Northern Italy is occupied by the basin of the Po, which comprises the whole of the broad plain extending from the foot of the Apennines to that of the Alps, together with the valleys and slopes on both sides of it. From its source in Monte Viso to its outflow into the Adriatic—a distance of more than 220 m. in a direct line—the Po receives all the waters that flow from the Apennines northwards, and all those that descend from the Alps towards the south, Mincio (the outlet of the Lake of Garda) inclusive. The next river to the E. is the Adige, which, after pursuing a parallel course with the Po for a considerable distance, enters the Adriatic by a separate mouth. Farther to the N. and N.E. the various rivers of Venetia fall directly into the Gulf of Venice.

There is no other instance in Europe of a basin of similar extent equally clearly characterized—the perfectly level character of the plain being as striking as the boldness with which the lower slopes of the mountain ranges begin to rise on each side of it. This is most clearly marked on the side of the Apennines, where the great Aemilian Way, which has been the high road from the time of the Romans to our own, preserves an unbroken straight line from Rimini to Piacenza, a distance of more than 150 m., during which the underfalls of the mountains continually approach it on the left, without once crossing the line of road.

The geography of Northern Italy will be best described by following the course of the Po. That river has its origin as a mountain torrent descending from two little dark lakes on the north flank of Monte Viso, at a height of more than 6000 ft. above the sea; and after a course of less than 20 m. it enters the plain at Saluzzo, between which and Turin, a distance of only 30 m., it receives three considerable tributaries—the Chisone on its left bank, bringing down the waters from the valley of Fenestrelle, and the Varaita and Maira on the south, contributing those of two valleys of the Alps immediately south of that of the Po itself. A few miles below Valenza it is joined by the Tanaro, a large stream, which brings with it the united waters of the Stura, the Bormida and several minor rivers.

More important are the rivers that descend from the main chain of the Graian and Pennine Alps and join the Po on its left bank. Of these the Dora (called for distinction's sake Dora Riparia), which unites with the greater river just below Turin, has its source in the Mont Genèvre, and flows past Susa at the foot of the Mont Cenis. Next comes the Stura, which rises in the glaciers of the Roche Melon; then the Orca, flowing through the Val di Locana; and then the Dora Baltea, one of the greatest of all the Alpine tributaries of the Po, which has its source in the glaciers of Mont Blanc, above Courmayeur, and thence descends through the Val d'Aosta for about 70 m. till it enters the plain at Ivrea, and, after flowing about 20 m. more, joins the Po a few miles below Chivasso. This great valley—one of the most considerable on the southern side of the Alps—has attracted special attention, in ancient as well as modern times, from its leading to two of the most frequented passes across the great mountain chain—the Great and the Little St Bernard—the former diverging at Aosta, and crossing the main ridges to the north into the valley of the Rhone, the other following a more westerly direction into Savoy. Below Aosta also the Dora Baltea receives several considerable tributaries, which descend from the glaciers between Mont Blanc and Monte Rosa.

About 25 m. below its confluence with the Dora, the Po receives the Sesia, also a large river, which has its source above Alagna at the southern foot of Monte Rosa, and after flowing by Varallo and Vercelli falls into the Po about 14 m. below the latter city. About 30 m. east of this confluence—in the course of which the Po makes a great bend south to Valenza, and then returns again to the northward—it is joined by the Ticino, a large and rapid river, which brings with it the outflow of Lago Maggiore and all the waters that flow into it. Of these the Ticino itself has its source about 10 m. above Airolo at the foot of the St Gotthard, and after flowing above 36 m. through the Val Leventina to Bellinzona (where it is joined by the Moësa bringing down the waters of the Val Misocco) enters the lake through a marshy plain at Magadino, about 10 m. distant. On the west side of the lake the Toccia or Tosa descends from the pass of the Gries nearly due south to Domodossola, where it receives the waters of the Doveria from the Simplon, and a few miles lower down those of the Val d'Anzasca from the foot of Monte Rosa, and 12 m. farther has its outlet into the lake between Baveno and Pallanza. The Lago Maggiore is also the receptacle of the waters of the Lago di Lugano on the east and the Lago d'Orta on the west.

The next great affluent of the Po, the Adda, forms the outflow of the Lake of Como, and has also its sources in the Alps, above Bormio, whence it flows through the broad and fertile valley of the Valtellina for more than 65 m. till it enters the lake near Colico. The Adda in this part of its course has a direction almost due east to west; but at the point where it reaches the lake, the Liro descends the valley of S. Giacomo, which runs nearly north and south from the pass of the Splügen, thus affording one of the most direct lines of communication across the Alps. The Adda flows out of the lake at its south-eastern extremity at Lecco, and has thence a course through the plain of above 70 m. till it enters the Po between Piacenza and Cremona. It flows by Lodi and Pizzighettone, and receives the waters of the Brembo, descending from the Val Brembana, and the Serio from the Val Seriana above Bergamo. The Oglio, a more considerable stream than either of the last two, rises in the Monte Tonale above Edolo, and descends through the Val Camonica to Lovere, where it expands into a large lake, called Iseo from the town of that name on its southern shore. Issuing thence at its south-west extremity, the Oglio has a long and winding course through the plain before it finally reaches the Po a few miles above Borgoforte. In this lower part it receives the smaller streams of the Mella, which flows by Brescia, and the Chiese, which proceeds from the small Lago d'Idro, between the Lago d'Iseo and that of Garda.

The last of the great tributaries of the Po is the Mincio, which flows from the Lago di Garda, and has a course of about 40 m. from Peschiera, where it issues from the lake at its south-eastern angle, till it joins the Po. About 12 m. above the confluence it passes under the walls of Mantua, and expands into a broad lake-like reach so as entirely to encircle that city. Notwithstanding its extent, the Lago di Garda is not fed by the snows of the high Alps, nor is the stream which enters it at its northern extremity (at Riva) commonly known as the Mincio, though forming the main source of that river, but is termed the Sarca; it rises at the foot of Monte Tonale.

The Adige, formed by the junction of two streams—the Etsch or Adige proper and the Eisak, both of which belong to Tirol rather than to Italy—descends as far as Verona, where it enters the great plain, with a course from north to south nearly parallel to the rivers last described, and would seem likely to discharge its waters into those of the Po, but below Legnago it turns eastward and runs parallel to the Po for about 40 m., entering the Adriatic by an independent mouth about 8 m. from the northern outlet of the greater stream. The waters of the two rivers have, however, been made to communicate by artificial cuts and canals in more than one place.

The Po itself, which is here a very large stream, with an average width of 400 to 600 yds., continues to flow with an undivided mass of waters as far as Sta Maria di Ariano, where it parts into two arms, known as the Po di Maestra and Po di Goro, and these again are subdivided into several other branches, forming a delta above 20 m. in width from north to south. The point of bifurcation, at present about 25 m. from the sea, was formerly much farther inland, more than 10 m. west of Ferrara, where a small arm of the river, still called the Po di Ferrara, branches from the main stream. Previous to the year 1154 this channel was the main stream, and the two small branches into which it subdivides, called the Po di Volano and Po di Primaro, were in early times the two main outlets of the river. The southernmost of these, the Po di Primaro, enters the Adriatic about 12 m. north of Ravenna, so that if these two arms be included, the delta of the Po extends about 36 m. from south to north. The whole course of the river, including its windings, is estimated at about 450 m.

Besides the delta of the Po and the large marshy tracts which it forms, there exist on both sides of it extensive lagoons of salt water, generally separated from the Adriatic by narrow strips of sand or embankments, partly natural and partly artificial, but having openings which admit the influx and efflux of the sea-water, and serve as ports for communication with the mainland. The best known and the most extensive of these lagoons is that in which Venice is situated, which extends from Torcello in the north to Chioggia and Brondolo in the south, a distance of above 40 m.; but they were formerly much more extensive, and afforded a continuous means of internal navigation, by what were called "the Seven Seas" (Septem Maria), from Ravenna to Altinum, a few miles north of Torcello. That city, like Ravenna, originally stood in the midst of a lagoon; and the coast east of it to near Monfalcone, where it meets the mountains, is occupied by similar expanses of water, which are, however, becoming gradually converted into dry land.

The tract adjoining this long line of lagoons is, like the basin of the Po, a broad expanse of perfectly level alluvial plain, extending from the Adige eastwards to the Carnic Alps, where they approach close to the Adriatic between Aquileia and Trieste, and northwards to the foot of the great chain, which here sweeps round in a semicircle from the neighbourhood of Vicenza to that of Aquileia. The space thus included was known in ancient times as Venetia, a name applied in the middle ages to the well-known city; the eastern portion of it became known in the middle ages as the Frioul or Friuli.

Returning to the south of the Po, the tributaries of that river on its right bank below the Tanaro are very inferior in volume and importance to those from the north. Flowing from the Ligurian

Apennines, which never attain the limit of perpetual snow, they generally dwindle in summer into insignificant streams. Beginning from the Tanaro, the principal of them are—(1) the Scrivia, a small but rapid stream flowing from the Apennines at the back of Genoa; (2) the Trebbia, a much larger river, though of the same torrent-like character, which rises near Torriglia within 20 m. of Genoa, flows by Bobbio, and joins the Po a few miles above Piacenza; (3) the Nure, a few miles east of the preceding; (4) the Taro, a more considerable stream; (5) the Parma, flowing by the city of the same name; (6) the Enza; (7) the Secchia, which flows by Modena; (8) the Panaro, a few miles to the east of that city; (9) the Reno, which flows by Bologna, but instead of holding its course till it discharges its waters into the Po, as it did in Roman times, is turned aside by an artificial channel into the Po di Primaro. The other small streams east of this—of which the most considerable are the Solaro, the Santerno, flowing by Imola, the Lamone by Faenza, the Montone by Forlì, all in Roman times tributaries of the Po—have their outlet in like manner into the Po di Primaro, or by artificial mouths into the Adriatic between Ravenna and Rimini. The river Marecchia, which enters the sea immediately north of Rimini, may be considered as the natural limit of Northern Italy. It was adopted by Augustus as the boundary of Gallia Cispadana; the far-famed Rubicon was a trifling stream a few miles farther north, now called Fiumicino. The Savio is the only other stream of any importance which has always flowed directly into the Adriatic from this side of the Tuscan Apennines.

The narrow strip of coast-land between the Maritime Alps, the Apennines and the sea—called in ancient times Liguria, and now known as the Riviera of Genoa—is throughout its extent, from Nice to Genoa on the one side, and from Genoa to Spezia on the other, almost wholly mountainous. It is occupied by the branches and offshoots of the mountain ranges which separate it from the great plain to the north, and send down their lateral ridges close to the water's edge, leaving only in places a few square miles of level plains at the mouths of the rivers and openings of the valleys. The district is by no means devoid of fertility, the steep slopes facing the south enjoying so fine a climate as to render them very favourable for the growth of fruit trees, especially the olive, which is cultivated in terraces to a considerable height up the face of the mountains, while the openings of the valleys are generally occupied by towns or villages, some of which have become favourite winter resorts.

From the proximity of the mountains to the sea none of the rivers in this part of Italy has a long course, and they are generally mere mountain torrents, rapid and swollen in winter and spring, and almost dry in summer. The largest and most important are those which descend from the Maritime Alps between Nice and Albenga. The most considerable of them are—the Roja, which rises in the Col di Tenda and descends to Ventimiglia; the Taggia, between San Remo and Oneglia; and the Centa, which enters the sea at Albenga. The Lavagna, which enters the sea at Chiavari, is the only stream of any importance between Genoa and the Gulf of Spezia. But immediately east of that inlet (a remarkable instance of a deep land-locked gulf with no river flowing into it) the Magra, which descends from Pontremoli down the valley known as the Lunigiana, is a large stream, and brings with it the waters of another considerable stream, the Vara. The Magra (Macra), in ancient times the boundary between Liguria and Etruria, may be considered as constituting on this side the limit of Northern Italy.

The Apennines (*q.v.*), as has been already mentioned, here traverse the whole breadth of Italy, cutting off the peninsula properly so termed from the broader mass of Northern Italy by a continuous barrier of considerable breadth, though of far inferior elevation to that of the Alps. The Ligurian Apennines may be considered as taking their rise in the neighbourhood of Savona, where a pass of very moderate elevation connects them with the Maritime Alps, of which they are in fact only a continuation. From the neighbourhood of Savona to that of Genoa they do not rise to more than 3000 to 4000 ft., and are traversed by passes of less than 2000 ft. As they extend towards the east they increase in elevation; the Monte Bue rises to 5915 ft., while the Monte Cimone, a little farther east, attains 7103 ft. This is the highest point in the northern Apennines, and belongs to a group of summits of nearly equal altitude; the range which is continued thence between Tuscany and what are now known as the Emilian provinces presents a continuous ridge from the mountains at the head of the Val di Mugello (due north of Florence) to the point where they are traversed by the celebrated Furlo Pass. The highest point in this part of the range is the Monte Falterona, above the sources of the Arno, which attains 5410 ft. Throughout this tract the Apennines are generally covered with extensive forests of chestnut, oak and beech; while their upper slopes afford admirable pasturage. Few towns of any importance are found either on their northern or southern declivity, and the former region especially, though occupying a tract of from 30 to 40 m. in width, between the crest of the Apennines and the plain of the Po, is one of the least known and at the same time least interesting portions of Italy.

2. *Central Italy.*—The geography of Central Italy is almost wholly determined by the Apennines, which traverse it in a direction from about north-north-east to south-south-west, almost precisely parallel to that of the coast of the Adriatic from Rimini to Pescara. The line of the highest summits and of the watershed ranges is about 30 to 40 m. from the Adriatic, while about double that distance separates it from the Tyrrhenian Sea on the west. In this part of the range almost all the highest points of the Apennines are found. Beginning from the group called the Alpi della Luna near the sources of the Tiber, which attain 4435 ft., they are continued by the Monte Nerone (5010 ft.), Monte Catria (5590), and Monte Maggio to the Monte Pennino near Nocera (5169 ft.), and thence to the Monte della Sibilla, at the source of the Nar or Nera, which attains 7663 ft. Proceeding thence southwards, we find in succession the Monte Vettore (8128 ft.), the Pizzo di Sevo (7945 ft.), and the two great mountain masses of the Monte Corno, commonly called the Gran Sasso d'Italia, the most lofty of all the Apennines, attaining to a height of 9560 ft., and the Monte della Maiella, its highest summit measuring 9170 ft. Farther south no very lofty summits are found till we come to the group of Monti del Matese, in Samnium (6660 ft.), which according to the division here adopted belongs to Southern Italy. Besides the lofty central masses enumerated there are two other lofty peaks, outliers from the main range, and separated from it by valleys of considerable extent. These are the Monte Terminillo, near Leonessa (7278 ft.), and the Monte Velino near the Lake Fucino, rising to 8192 ft., both of which are covered with snow from November till May. But the Apennines of Central Italy, instead of presenting, like the Alps and the northern Apennines, a definite central ridge, with transverse valleys leading down from it on both sides, in reality constitute a mountain mass of very considerable breadth, composed of a number of minor ranges and groups of mountains, which preserve a generally parallel direction, and are separated by upland valleys, some of them of considerable extent as well as considerable elevation above the sea. Such is the basin of Lake Fucino, situated in the centre of the mass, almost exactly midway between the two seas, at an elevation of 2180 ft. above them; while the upper valley of the Aterno, in which Aquila is situated, is 2380 ft. above the sea. Still more elevated is the valley of the Gizio (a tributary of the Aterno), of which Sulmona is the chief town. This communicates with the upper valley of the Sangro by a level plain called the Piano di Cinque Miglia, at an elevation of 4298 ft., regarded as the most wintry spot in Italy. Nor do the highest summits form a continuous ridge of great altitude for any considerable distance; they are rather a series of groups separated by tracts of very inferior elevation forming natural passes across the range, and broken in some places (as is the case in almost all limestone countries) by the waters from the upland valleys turning suddenly at right angles, and breaking through the mountain ranges which bound them. Thus the Gran Sasso and the Maiella are separated by the deep valley of the Aterno, while the Tronto breaks through the range between Monte Vettore and the Pizzo di Sevo. This constitution of the great mass of the central Apennines has in all ages exercised an important influence upon the character of this portion of Italy, which may be considered as divided by nature into two great regions, a cold and barren upland country, bordered on both sides by rich and fertile tracts, enjoying a warm but temperate climate.

The district west of the Apennines, a region of great beauty and fertility, though inferior in productiveness to Northern Italy, coincides in a general way with the countries familiar to all students of ancient history as Etruria and Latium. Until the union of Italy they were comprised in Tuscany and the southern Papal States. The northern part of Tuscany is indeed occupied to a considerable extent by the underfalls and offshoots of the Apennines, which, besides the slopes and spurs of the main range that constitutes its northern frontier towards the plain of the Po, throw off several outlying ranges or groups. Of these the most remarkable is the group between the valleys of the Serchio and the Magra, commonly known as the mountains of Carrara, from the celebrated marble quarries in the vicinity of that city. Two of the summits of this group, the Pizzo d'Uccello and the Pania della Croce, attain 6155 and 6100 ft. Another lateral range, the Prato Magno, which branches off from the central chain at the Monte Falterona, and separates the upper valley of the Arno from its second basin, rises to 5188 ft.; while a similar branch, called the Alpe di Catenaja, of inferior elevation, divides the upper course of the Arno from that of the Tiber.

The rest of this tract is for the most part a hilly, broken country, of moderate elevation, but Monte Amiata, near Radicofani, an isolated mass of volcanic origin, attains a height of 5650 ft. South of this the country between the frontier of Tuscany and the Tiber is in great part of volcanic origin, forming hills with distinct crater-shaped basins, in several instances occupied by small lakes (the Lake of Bolsena, Lake of Vico and Lake of Bracciano). This volcanic tract extends across the Campagna of Rome, till it rises again in the lofty group of the Alban hills, the highest summit of which, the Monte Cavo, is 3160 ft. above the sea. In this part the Apennines are separated from the sea, distant about 30 m. by the undulating volcanic plain of the Roman Campagna, from which the mountains rise in a wall-like barrier, of which the highest point, the Monte Gennaro, attains 4165 ft. South of Palestrina again, the main mass of the Apennines throws off another lateral mass, known in ancient times as the Volscian mountains (now called the Monti Lepini), separated from the central ranges by the broad valley of the Sacco, a tributary of the Liri (Liris) or Garigliano, and forming a large and rugged mountain mass, nearly 5000 ft. in height, which descends to the sea at Terracina, and between that point and the mouth of the Liri throws out several rugged mountain headlands, which may be considered as constituting the natural boundary between Latium and Campania, and consequently the natural limit of Central Italy. Besides these offshoots of the Apennines there are in this part of Central Italy several detached mountains, rising almost like islands on the seashore, of which the two most remarkable are the Monte Argentaro on the coast of Tuscany near Orbetello (2087 ft.) and the Monte Circello (1771 ft.) at the angle of the Pontine Marshes, by the whole breadth of which it is separated from the Volscian Apennines.

The two valleys of the Arno and the Tiber (Ital. *Tevere*) may be considered as furnishing the key to the geography of all this portion of Italy west of the Apennines. The Arno, which has its source in the Monte Falterona, one of the most elevated summits of the main chain of the Tuscan Apennines, flows nearly south till in the neighbourhood of Arezzo it turns abruptly north-west, and pursues that course as far as Pontassieve, where it again makes a sudden bend to the west, and pursues a westerly course thence to the sea, passing through Florence and Pisa. Its principal tributary is the Sieve, which joins it at Pontassieve, bringing down the waters of the Val di Mugello. The Elsa and the Era, which join it on its left bank, descending from the hills near Siena and Volterra, are inconsiderable streams; and the Serchio, which flows from the territory of Lucca and the Alpi Apuani, and formerly joined the Arno a few miles from its mouth, now enters the sea by a separate channel. The most considerable rivers of Tuscany south of the Arno are the Cecina, which flows through the plain below Volterra, and the Ombrone, which rises in the hills near Siena, and enters the sea about 12 m. below Grosseto.

The Tiber, a much more important river than the Arno, and the largest in Italy with the exception of the Po, rises in the Apennines, about 20 m. east of the source of the Arno, and flows nearly south by Borgo S. Sepolcro and Città di Castello, then between Perugia and Todi to Orte, just below which it receives the Nera. The Nera, which rises in the lofty group of the Monte della Sibilla, is a considerable stream, and brings with it the waters of the Velino (with its tributaries the Turano and the Salto), which joins it a few miles below its celebrated waterfall at Terni. The Teverone or Anio, which enters the Tiber a few miles above Rome, is an inferior stream to the Nera, but brings down a considerable body of water from the mountains above Subiaco. It is a singular fact in the geography of Central Italy that the valleys of the Tiber and Arno are in some measure connected by that of the Chiana, a level and marshy tract, the waters from which flow partly into the Arno and partly into the Tiber.

The eastern declivity of the central Apennines towards the Adriatic is far less interesting and varied than the western. The central range here approaches much nearer to the sea, and hence, with few exceptions, the rivers that flow from it have short courses and are of comparatively little importance. They may be enumerated, proceeding from Rimini southwards: (1) the Foglia; (2) the Metauro, of historical celebrity, and affording access to one of the most frequented passes of the Apennines; (3) the Esino; (4) the Potenza; (5) the Chienti; (6) the Aso; (7) the Tronto; (8) the Vomano; (9) the Aterno; (10) the Sangro; (11) the Trigno, which forms the boundary of the southernmost province of the Abruzzi, and may therefore be taken as the limit of Central Italy.

The whole of this portion of Central Italy is a hilly country, much broken and cut up by the torrents from the mountains, but fertile, especially in fruit-trees, olives and vines; and it has been, both in ancient and modern times, a populous district, containing many small towns though no great cities. Its chief disadvantage is the absence of ports, the coast preserving an almost unbroken straight line, with the single exception of Ancona, the only port worthy of the name on the eastern coast of Central Italy.

3. *Southern Italy.*—The great central mass of the Apennines, which has held its course throughout Central Italy, with a general direction from north-west to south-east, may be considered as continued in the same direction for about 100 m. farther, from the basin-shaped group of the Monti del Matese (which rises to 6660 ft.) to the neighbourhood of Potenza, in the heart of the province of Basilicata, corresponding nearly to the ancient Lucania. The whole of the district known in ancient times as Samnium (a part of which retains the name of Sannio, though officially designated the province of Campobasso) is occupied by an irregular mass of mountains, of much inferior height to those of Central Italy, and broken up into a number of groups, intersected by rivers, which have for the most part a very tortuous course. This mountainous tract, which has an average breadth of from 50 to 60 m., is bounded west by the plain of Campania, now called the Terra di Lavoro, and east by the much broader and more extensive tract of Apulia or Puglia, composed partly of level plains, but for the most part of undulating downs, contrasting strongly with the mountain ranges of the Apennines, which rise abruptly above them. The central mass of the mountains, however, throws out two outlying ranges, the one to the west, which separates the Bay of Naples from that of Salerno, and culminates in the Monte S. Angelo above Castellammare (4720 ft.), while the detached volcanic cone of Vesuvius (nearly 4000 ft.) is isolated from the neighbouring mountains by an intervening strip of plain. On the east side in like manner the Monte Gargano (3465 ft.), a detached limestone mass which projects in a bold spur-like promontory into the Adriatic, forming the only break in the otherwise uniform coast-line of Italy on that sea, though separated from the great body of the Apennines by a considerable interval of low country, may be considered as merely an outlier from the central mass.

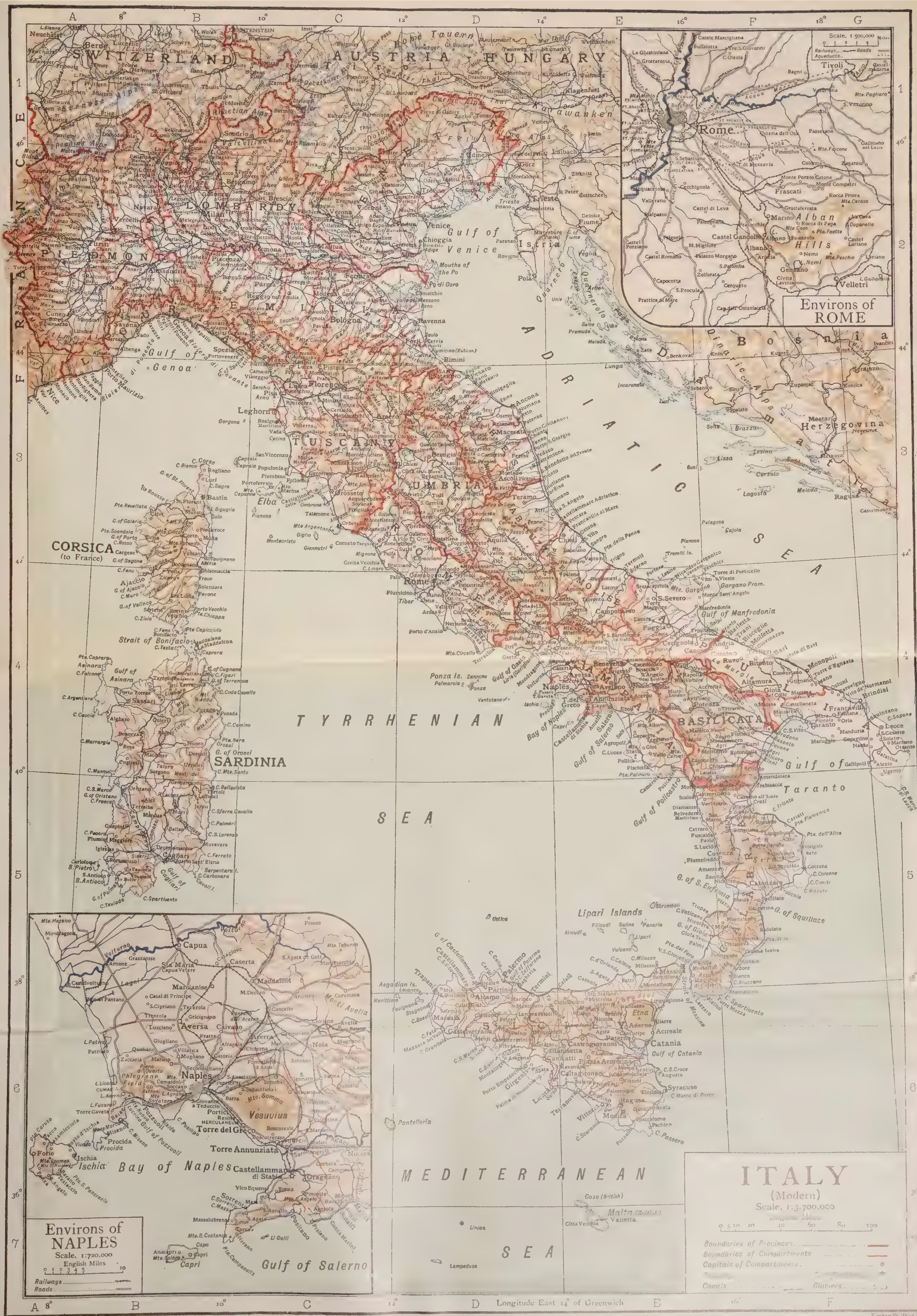
From the neighbourhood of Potenza, the main ridge of the Apennines is continued by the Monti della Maddalena in a direction nearly due south, so that it approaches within a short distance of the Gulf of Policastro, whence it is carried on as far as the Monte Pollino, the last of the lofty summits of the Apennine chain, which exceeds 7000 ft. in height. The range is, however, continued through the province now called Calabria, to the southern extremity or "toe" of Italy, but presents in this part a very much altered character, the broken limestone range which is the true continuation of the chain as far as the neighbourhood of Nicastro and Catanzaro, and keeps close to the west coast, being flanked on the east by a great mass of granitic mountains, rising to about 6000 ft., and covered with vast forests, from which it derives the name of La Sila. A similar mass, separated from the preceding by a low neck of Tertiary hills, fills up the whole of the peninsular extremity of Italy from Squillace to Reggio. Its highest point is called Aspromonte (6420 ft.).

While the rugged and mountainous district of Calabria, extending nearly due south for a distance of more than 150 m., thus derives its character and configuration almost wholly from the range of the Apennines, the long spur-like promontory which projects towards the east to Brindisi and Otranto is merely a continuation of the low tract of Apulia, with a dry calcareous soil of Tertiary origin. The Monte Volture, which rises in the neighbourhood of Melfi and Venosa to 4357 ft., is of volcanic origin, and in great measure detached from the adjoining mass of the Apennines. Eastward from this the ranges of low bare hills called the Murgie of Gravina and Altamura gradually sink into the still more moderate level of those which constitute the peninsular tract between Brindisi and Taranto as far as the Cape of Sta Maria di Leuca, the south-east extremity of Italy. This projecting tract, which may be termed the "heel" or "spur" of Southern Italy, in conjunction with the great promontory of Calabria, forms the deep Gulf of Taranto, about 70 m. in width, and somewhat greater depth, which receives a number of streams from the central mass of the Apennines.

None of the rivers of Southern Italy is of any great importance. The Liri (Liris) or Garigliano, which has its source in the central Apennines above Sora, not far from Lake Fucino, and enters the Gulf of Gaeta about 10 m. east of the city of that name, brings down a considerable body of water; as does also the Volturno, which rises in the mountains between Castel di Sangro and Agnone, flows past Isernia, Venafro and Capua, and enters the sea about 15 m. from the mouth of the Garigliano. About 16 m. above Capua it receives the Calore, which flows by Benevento. The Silarus or Sele enters the Gulf of Salerno a few miles below the ruins of Paestum. Below this the watershed of the Apennines is too near to the sea on that side to allow the formation of any large streams. Hence the rivers that flow in the opposite direction into the Adriatic and the Gulf of Taranto have much longer courses, though all partake of the character of mountain torrents, rushing down with great violence in winter and after storms, but dwindling in the summer into scanty streams, which hold a winding and sluggish course through the great plains of Apulia. Proceeding south from the Trigno, already mentioned as constituting the limit of Central Italy, there are (1) the Biferno and (2) the Fortore, both rising in the mountains of Samnium, and flowing into the Adriatic west of Monte Gargano; (3) the Cervaro, south of the great promontory; and (4) the Ofanto, the Aufidus of Horace, whose description of it is characteristic of almost all the rivers of Southern Italy, of which it may be taken as the typical representative. It rises about 15 m. west of Conza, and only about 25 m. from the Gulf of Salerno, so that it is frequently (though erroneously) described as traversing the whole range of the Apennines. In its lower course it flows near Canosa and traverses the celebrated battlefield of Cannae. (5) The Bradano, which rises near Venosa, almost at the foot of Monte Volture, flows towards the south-east into the Gulf of Taranto, as do the Basento, the Agri and the Sinni, all of which descend from the central chain of the Apennines south of Potenza. The Crati, which flows from Cosenza northwards, and then turns abruptly eastward to enter the same gulf, is the only stream worthy of notice in the rugged peninsula of Calabria; while the arid limestone hills projecting eastwards to Capo di Leuca do not give rise to anything more than a mere streamlet, from the mouth of the Ofanto to the south-eastern extremity of Italy.

Lakes.

The only important lakes are those on or near the north frontier, formed by the expansion of the tributaries of the Po. They have been already noticed in connexion with the rivers by which they are formed, but may be again enumerated in order of succession. They are, proceeding from west to east, (1) the Lago d'Orta, (2) the Lago Maggiore, (3) the Lago di Lugano, (4) the Lago di Como, (5) the Lago d'Iseo, (6) the Lago d'Idro, and (7) the Lago di Garda. Of these the last named is considerably the largest, covering an area of 143 sq. m. It is 32½ m. long by 10 broad; while the Lago Maggiore, notwithstanding its name, though considerably exceeding it in length (37 m.), falls materially below it in superficial extent. They are all of great depth—the Lago Maggiore having an extreme


ITALY
(Modern)
Scale, 1:3,700,000
English Miles
0 5 10 20 40 60 80 100
Boundaries of Provinces
Boundaries of Compartments
Capitals of Compartments
Canals
Glaciers
Longitude East 14° of Greenwich
Environs of ROME
Scale, 1:500,000
Railways
Roads
Aqueducts
Environs of NAPLES
Scale, 1:720,000
English Miles
0 1 2 3 4 5 10
Railways
Roads
SWITZERLAND
AUSTRIA HUNGARY
FRANCE
PIEDMONT
LOMBARDY
EMILIA
LIGURIA
TUSCANY
UMBRIA
ROME
Bosnia
Herzegovina
Dalmatia
Istria
Gulf of Venice
Gulf of Genoa
ADRIATIC SEA
TYRRHENIAN SEA
MEDITERRANEAN SEA
CORSICA
(to France)
Strait of Bonifacio
SARDINIA
BASILICATA
Gulf of Taranto
Gulf of Manfredonia
Gulf of Salerno
Bay of Naples
Lipari Islands
Gulf of Catania
G. of Squillace
G. of S. Eufemia
Malta (British)
Gozo (British)
Rome
Naples
Vesuvius
Etna
Capri
Ischia
Procida
Elba
Ponza Is.
Pantelleria
Lampedusa
Aegadian Is.
A
B
C
D
E
F
G
8°
10°
12°
14°
16°
18°
36°
38°
40°
42°
44°
46°

Emery Walker

depth of 1198 ft., while that of Como attains to 1365 ft. Of a wholly different character is the Lago di Varese, between the Lago Maggiore and that of Lugano, which is a mere shallow expanse of water, surrounded by hills of very moderate elevation. Two other small lakes in the same neighbourhood, as well as those of Erba and Pusiano, between Como and Lecco, are of a similar character.

The lakes of Central Italy, which are comparatively of trifling dimensions, belong to a wholly different class. The most important of these, the Lacus Fucinus of the ancients, now called the Lago di Celano, situated almost exactly in the centre of the peninsula, occupies a basin of considerable extent, surrounded by mountains and without any natural outlet, at an elevation of more than 2000 ft. Its waters have been in great part carried off by an artificial channel, and more than half its surface laid bare. Next in size is the Lago Trasimeno, a broad expanse of shallow waters, about 30 m. in circumference, surrounded by low hills. The neighbouring lake of Chiusi is of similar character, but much smaller dimensions. All the other lakes of Central Italy, which are scattered through the volcanic districts west of the Apennines, are of an entirely different formation, and occupy deep cup-shaped hollows, which have undoubtedly at one time formed the craters of extinct volcanoes. Such is the Lago di Bolsena, near the city of the same name, which is an extensive sheet of water, as well as the much smaller Lago di Vico (the Ciminian lake of ancient writers) and the Lago di Bracciano, nearer Rome, while to the south of Rome the well known lakes of Albano and Nemi have a similar origin.

The only lake properly so called in southern Italy is the Lago del Matese, in the heart of the mountain group of the same name, of small extent. The so-called lakes on the coast of the Adriatic north and south of the promontory of Gargano are brackish lagoons communicating with the sea.

Islands. The three great islands of Sicily, Sardinia and Corsica are closely connected with Italy, both by geographical position and community of language, but they are considered at length in separate articles. Of the smaller islands that lie near the coasts of Italy, the most considerable is that of Elba, off the west coast of central Italy, about 50 m. S. of Leghorn, and separated from the mainland at Piombino by a strait of only about 6 m. in width. North of this, and about midway between Corsica and Tuscany, is the small island of Capraia, steep and rocky, and only 4½ m. long, but with a secure port; Gorgona, about 25 m. farther north, is still smaller, and is a mere rock, inhabited by a few fishermen. South of Elba are the equally insignificant islets of Pianosa and Montecristo, while the more considerable island of Giglio lies much nearer the mainland, immediately opposite the mountain promontory of Monte Argentaro, itself almost an island. The islands farther south in the Tyrrhenian Sea are of an entirely different character. Of these Ischia and Procida, close to the northern headland of the Bay of Naples, are of volcanic origin, as is the case also with the more distant group of the Ponza Islands. These are three in number—Ponza, Palmarola and Zannone; while Ventotene (also of volcanic formation) is about midway between Ponza and Ischia. The island of Capri, on the other hand, opposite the southern promontory of the Bay of Naples, is a precipitous limestone rock. The Aeolian or Lipari Islands, a remarkable volcanic group, belong rather to Sicily than to Italy, though Stromboli, the most easterly of them, is about equidistant from Sicily and from the mainland.

The Italian coast of the Adriatic presents a great contrast to its opposite shores, for while the coast of Dalmatia is bordered by a succession of islands, great and small, the long and uniform coast-line of Italy from Otranto to Rimini presents not a single adjacent island; and the small outlying group of the Tremiti Islands (north of the Monte Gargano and about 15 m. from the mainland) alone breaks the monotony of this part of the Adriatic.

Geology.—The geology of Italy is mainly dependent upon that of the Apennines (*q.v.*). On each side of that great chain are found extensive Tertiary deposits, sometimes, as in Tuscany, the district of Monferrat, &c., forming a broken, hilly country, at others spreading into broad plains or undulating downs, such as the Tavoliere of Puglia, and the tract that forms the spur of Italy from Bari to Otranto.

Besides these, and leaving out of account the islands, the Italian peninsula presents four distinct volcanic districts. In three of them the volcanoes are entirely extinct, while the fourth is still in great activity.

1. The Euganean hills form a small group extending for about 10 m. from the neighbourhood of Padua to Este, and separated from the lower offshoots of the Alps by a portion of the wide plain of Padua. Monte Venda, their highest peak, is 1890 ft. high.

2. The Roman district, the largest of the four, extends from the hills of Albano to the frontier of Tuscany, and from the lower slopes of the Apennines to the Tyrrhenian Sea. It may be divided into three groups: the Monti Albani, the second highest[1] of which, Monte Cavo (3115 ft.), is the ancient Mons Albanus, on the summit of which stood the temple of Jupiter Latialis, where the assemblies of the cities forming the Latin confederation were held; the Monti Cimini, which extend from the valley of the Tiber to the neighbourhood of Civita Vecchia, and attain at their culminating point an elevation of 3454 ft.; and the mountains of Radicofani and Monte Amiata, the latter of which is 5688 ft. high. The lakes of Bolsena (Vulsiniensis), of Bracciano (Sabatinus), of Vico (Ciminus), of Albano (Albanus), of Nemi (Nemorensis), and other smaller lakes belong to this district; while between its south-west extremity and Monte Circello the Pontine Marshes form a broad strip of alluvial soil infested by malaria.

3. The volcanic region of the Terra di Lavoro is separated by the Volscian mountains from the Roman district. It may be also divided into three groups. Of Roccamonfina, at the N.N.W. end of the Campanian Plain, the highest cone, called Montagna di Santa Croce, is 3291 ft. The Phlegraean Fields embrace all the country round Baiae and Pozzuoli and the adjoining islands. Monte Barbaro (Gaurus), north-east of the site of Cumae, Monte San Nicola (Epomeus), 2589 ft. in Ischia, and Camaldoli, 1488 ft., west of Naples, are the highest cones. The lakes Averno (Avernus), Lucrino (Lucrinus), Fusaro (Palus Acherusia), and Agnano are within this group, which has shown activity in historical times. A stream of lava issued in 1198 from the crater of the Solfatara, which still continues to exhale steam and noxious gases; the Lava dell' Arso came out of the N.E. flank of Monte Epomeo in 1302; and Monte Nuovo, north-west of Pozzuoli (455 ft.), was thrown up in three days in September 1538. Since its first historical eruption in A.D. 79, Vesuvius or Somma, which forms the third group, has been in constant activity. The Punta del Nasone, the highest point of Somma, is 3714 ft. high, while the Punta del Palo, the highest point of the brim of the crater of Vesuvius, varies materially with successive eruptions from 3856 to 4275 ft.

4. The Apulian volcanic formation consists of the great mass of Monte Volture, which rises at the west end of the plains of Apulia, on the frontier of Basilicata, and is surrounded by the Apennines on its south-west and north-west sides. Its highest peak, the Pizzuto di Melfi, attains an elevation of 4365 ft. Within the widest crater there are the two small lakes of Monticchio and San Michele. In connexion with the volcanic districts we may mention *Le Mofete*, the pools of Ampsanctus, in a wooded valley S.E. of Frigento, in the province of Avellino, Campania (Virgil, *Aeneid*, vii. 563-571). The largest is not more than 160 ft. in circumference, and 7 ft. deep.

The whole of the great plain of Lombardy is covered by Pleistocene and recent deposits. It is a great depression—the continuation of the Adriatic Sea—filled up by deposits brought down by the rivers from the mountains. The depression was probably formed during the later stages of the growth of the Alps.

Climate and Vegetation.—The geographical position of Italy, extending from about 46° to 38° N., renders it one of the hottest countries in Europe. But the effect of its southern latitude is tempered by its peninsular character, bounded as it is on both sides by seas of considerable extent, as well as by the great range of the Alps with its snows and glaciers to the north. There are thus irregular variations of climate. Great differences also exist with regard to climate between northern and southern Italy, due in great part to other circumstances as well as to differences of latitude. Thus the great plain of northern Italy is chilled by the cold winds from the Alps, while the damp warm winds from the Mediterranean are to a great extent intercepted by the Ligurian Apennines. Hence this part of the country has a cold winter climate, so that while the mean summer temperature of Milan is higher than that of Sassari, and equal to that of Naples, and the extremes reached at Milan and Bologna are a good deal higher than those of Naples, the mean winter temperature of Turin is actually lower than that of Copenhagen. The lowest recorded winter temperature at Turin is 5° Fahr. Throughout the region north of the Apennines no plants will thrive which cannot stand occasional severe frosts in winter, so that not only oranges and lemons but even the olive tree cannot be grown, except in specially favoured situations. But the strip of coast between the Apennines and the sea, known as the Riviera of Genoa, is not only extremely favourable to the growth of olives, but produces oranges and lemons in abundance, while even the aloe, the cactus and the palm flourish in many places.

Central Italy also presents striking differences of climate and temperature according to the greater or less proximity to the mountains. Thus the greater part of Tuscany, and the provinces thence to Rome, enjoy a mild winter climate, and are well adapted to the growth of mulberries and olives as well as vines, but it is not till after passing Terracina, in proceeding along the western coast towards the south, that the vegetation of southern Italy develops in its full luxuriance. Even in the central parts of Tuscany, however, the climate is very much affected by the neighbouring mountains, and the increasing elevation of the Apennines as they proceed south produces a corresponding effect upon the temperature. But it is when we reach the central range of the Apennines that we find the coldest districts of Italy. In all the upland valleys of the Abruzzi snow begins to fall early in November, and heavy storms occur often as late as May; whole communities are shut out for months from any intercourse with their neighbours, and some villages are so long buried in snow that regular passages are made between the different houses for the sake of communication among the inhabitants. The district from the south-east of Lake Fucino to the Piano di Cinque Miglia, enclosing the upper basin of the Sangro and the small lake of Scanno, is the coldest and most bleak part of Italy south of the Alps. Heavy falls of snow in June are not uncommon, and only for a short time towards the end of July are the nights totally exempt from light frosts. Yet less than 40 m. E. of this district, and even more to the north, the olive, the fig-tree and the orange thrive luxuriantly on the shores of the Adriatic from Ortona to Vasto. In the same way, whilst in the plains and hills round Naples snow is rarely seen, and never remains long, and the thermometer seldom descends to the freezing-point, 20 m. E. from it in the fertile valley of Avellino, of no great elevation, but encircled by high mountains, light frosts are not uncommon as late as June; and 18 m. farther east, in the elevated region of San Angelo dei Lombardi and Bisaccia, the inhabitants are always warmly clad, and vines grow with difficulty and only in sheltered places. Still farther south-east, Potenza has almost the coldest climate in Italy, and certainly the lowest summer temperatures. But nowhere are these contrasts so striking as in Calabria. The shores, especially on the Tyrrhenian Sea, present almost a continued grove of olive, orange, lemon and citron trees, which attain a size unknown in the north of Italy. The sugar-cane flourishes, the cotton-plant ripens to perfection, date-trees are seen in the gardens, the rocks are clothed with the prickly-pear or Indian fig, the enclosures of the fields are formed by aloes and sometimes pomegranates, the liquorice-root grows wild, and the mastic, the myrtle and many varieties of oleander and cistus form the underwood of the natural forests of arbutus and evergreen oak. If we turn inland but 5 or 6 m. from the shore, and often even less, the scene changes. High districts covered with oaks and chestnuts succeed to this almost tropical vegetation; a little higher up and we reach the elevated regions of the Pollino and the Sila, covered with firs and pines, and affording rich pastures even in the midst of summer, when heavy dews and light frosts succeed each other in July and August, and snow begins to appear at the end of September or early in October. Along the shores of the Adriatic, which are exposed to the north-east winds, blowing coldly from over the Albanian mountains, delicate plants do not thrive so well in general as under the same latitude along the shores of the Tyrrhenian Sea.

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[1] The actually highest point is the Maschio delle Faete (3137 ft.). (See ALBANUS MONS.)

Southern Italy indeed has in general a very different climate from the northern portion of the kingdom; and, though large tracts are still occupied by rugged mountains of sufficient elevation to retain the snow for a considerable part of the year, the districts adjoining the sea enjoy a climate similar to that of Greece and the southern provinces of Spain. Unfortunately several of these fertile tracts suffer severely from malaria (*q.v.*), and especially the great plain adjoining the Gulf of Tarentum, which in the early ages of history was surrounded by a girdle of Greek cities—some of which attained to almost unexampled prosperity—has for centuries past been given up to almost complete desolation.[1]

It is remarkable that, of the vegetable productions of Italy, many which are at the present day among the first to attract the attention of the visitor are of comparatively late introduction, and were unknown in ancient times. The olive indeed in all ages clothed the hills of a large part of the country; but the orange and lemon, are a late importation from the East, while the cactus or Indian fig and the aloe, both of them so conspicuous on the shores of southern Italy, as well as of the Riviera of Genoa, are of Mexican origin, and consequently could not have been introduced earlier than the 16th century. The same remark applies to the maize or Indian corn. Many botanists are even of opinion that the sweet chestnut, which now constitutes so large a part of the forests that clothe the sides both of the Alps and the Apennines, and in some districts supplies the chief food of the inhabitants, is not originally of Italian growth; it is certain that it had not attained in ancient times to anything like the extension and importance which it now possesses. The eucalyptus is of quite modern introduction; it has been extensively planted in malarious districts. The characteristic cypress, ilex and stone-pine, however, are native trees, the last-named flourishing especially near the coast. The proportion of evergreens is large, and has a marked effect on the landscape in winter.

Fauna.—The chamois, bouquetin and marmot are found only in the Alps, not at all in the Apennines. In the latter the bear was found in Roman times, and there are said to be still a few remaining. Wolves are more numerous, though only in the mountainous districts; the flocks are protected against them by large white sheep-dogs, who have some wolf blood in them. Wild boars are also found in mountainous and forest districts. Foxes are common in the neighbourhood of Rome. The sea mammals include the common dolphin (*Delphinus delphis*). The birds are similar to those of central Europe; in the mountains vultures, eagles, buzzards, kites, falcons and hawks are found. Partridges, woodcock, snipe, &c., are among the game birds; but all kinds of small birds are also shot for food, and their number is thus kept down, while many members of the migratory species are caught by traps in the foothills on the south side of the Alps, especially near the Lake of Como, on their passage. Large numbers of quails are shot in the spring. Among reptiles, the various kinds of lizard are noticeable. There are several varieties of snakes, of which three species (all vipers) are poisonous. Of sea-fish there are many varieties, the tunny, the sardine and the anchovy being commercially the most important. Some of the other edible fish, such as the palombo, are not found in northern waters. Small cuttlefish are in common use as an article of diet. Tortoiseshell, an important article of commerce, is derived from the *Thalassochelys caretta*, a sea turtle. Of freshwater fish the trout of the mountain streams and the eels of the coast lagoons may be mentioned. The tarantula spider and the scorpion are found in the south of Italy. The aquarium of the zoological station at Naples contains the finest collection in the world of marine animals, showing the wonderful variety of the different species of fish, molluscs, crustacea, &c., found in the Mediterranean. (E. H. B.; T. As.)

Population.—The following table indicates the areas of the several provinces (sixty-nine in number), and the population of each according to the censuses of the 31st of December 1881 and the 9th of February 1901. (The larger divisions or compartments in which the provinces are grouped are not officially recognized.)

Provinces and Compartments.	Area in sq. m.	Population.	
		1881.	1901.
Alessandria	1950	729,710	825,745
Cuneo	2882	635,400	670,504
Novara	2553	675,926	763,830
Turin	3955	1,029,214	1,147,414
Piedmont	11,340	3,070,250	3,407,493
Genoa	1582	760,122	931,156
Porto Maurizio	455	132,251	144,604
Liguria	2037	892,373	1,075,760
Bergamo	1098	390,775	467,549
Brescia	1845	471,568	541,765
Como	1091	515,050	594,304
Cremona	695	302,097	329,471
Mantua	912	295,728	315,448
Milan	1223	1,114,991	1,450,214
Pavia	1290	469,831	504,382
Sondrio	1232	120,534	130,966
Lombardy	9386	3,680,574	4,334,099
Belluno	1293	174,140	214,803
Padua	823	397,762	444,360
Rovigo	685	217,700	222,057
Treviso	960	375,704	416,945
Udine	2541	501,745	614,720
Venice	934	356,708	399,823
Verona	1188	394,065	427,018
Vicenza	1052	396,349	453,621
Venetia	9476	2,814,173	3,193,347
Bologna	1448	464,879	529,619
Ferrara	1012	230,807	270,558
Forlì	725	251,110	283,996
Modena	987	279,254	323,598
Parma	1250	267,306	303,694
Piacenza	954	226,758	250,491
Ravenna	715	218,359	234,656
Reggio (Emilia)	876	244,959	281,085
Emilia	7967	2,183,432	2,477,697
Arezzo	1273	238,744	275,588
Florence	2265	790,776	945,324
Grosseto	1738	114,295	137,795
Leghorn	133	121,612	121,137
Lucca	558	284,484	329,986
Massa and Carrara	687	169,469	202,749
Pisa	1179	283,563	319,854
Siena	1471	205,926	233,874
Tuscany	9304	2,208,869	2,566,307
Ancona	762	267,338	308,346
Ascoli Piceno	796	209,185	251,829
Macerata	1087	239,713	269,505
Pesaro and Urbino	1118	223,043	259,083
Marches	3763	939,279	1,088,763
Perugia—Umbria	3748	572,060	675,352
Rome—Lazio	4663	903,472	1,142,526

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[1] On the influence of malaria on the population of Early Italy see W. H. S. Jones in *Annals of Archaeology and Anthropology*, ii. 97 sqq. (Liverpool, 1909).

Provinces and Compartments.	Area in sq. m.	Population.	
		1881.	1901.
Aquila degli Abruzzi (Abruzzo Ulteriore II.)	2484	353,027	436,367
Campobasso (Molise)	1691	365,434	389,976
Chieti (Abruzzo Citeriore)	1138	343,948	387,604
Teramo (Abruzzo Ulteriore I.)	1067	254,806	312,188
Abruzzi and Molise	6380	1,317,215	1,526,135
Avellino (Principato Ulteriore)	1172	392,619	421,766
Benevento	818	238,425	265,460
Caserta (Terra di Lavoro)	2033	714,131	805,345
Naples	350	1,001,245	1,141,788
Salerno (Principato Citeriore)	1916	550,157	585,132
Campania	6289	2,896,577	3,219,491
Bari delle Puglie (Terra di Bari)	2065	679,499	837,683
Foggia (Capitanata)	2688	356,267	421,115
Lecce (Terra di Otranto)	2623	553,298	705,382
Apulia	7376	1,589,064	1,964,180
Potenza (Basilicata)	3845	524,504	491,558
Catanzaro (Calabria Ulteriore II.)	2030	433,975	498,791
Cosenza (Calabria Citeriore)	2568	451,185	503,329
Reggio di Calabria (Calabria Ulteriore I.)	1221	372,723	437,209
Calabria	5819	1,257,883	1,439,329
Caltanisetta	1263	266,379	329,449
Catania	1917	563,457	703,598
Girgenti	1172	312,487	380,666
Messina	1246	460,924	550,895
Palermo	1948	699,151	796,151
Syracuse	1442	341,526	433,796
Trapani	948	283,977	373,569
Sicily	9936	2,927,901	3,568,124
Cagliari	5204	420,635	486,767
Sassari	4090	261,367	309,026
Sardinia	9294	682,002	795,793
Kingdom of Italy	110,623	28,459,628	32,965,504

The number of foreigners in Italy in 1901 was 61,606, of whom 37,762 were domiciled within the kingdom.

The population given in the foregoing table is the resident or "legal" population, which is also given for the individual towns. This is 490,251 higher than the actual population, 32,475,253, ascertained by the census of the 10th of February 1901; the difference is due to temporary absences from their residences of certain individuals on military service, &c., who probably were counted twice, and also to the fact that 469,020 individuals were returned as absent from Italy, while only 61,606 foreigners were in Italy at the date of the census. The kingdom is divided into 69 provinces, 284 regions, of which 197 are classed as *circondarii* and 87 as districts (the latter belonging to the province of Mantua and the 8 provinces of Venetia), 1806 administrative divisions (*mandamenti*) and 8262 communes. These were the figures at the date of the census. In 1906 there were 1805 *mandamenti* and 8290 communes, and 4 boroughs in Sardinia not connected with communes. The *mandamenti* or administrative divisions no longer correspond to the judicial divisions (*mandamenti giudiziarii*) which in November 1891 were reduced from 1806 to 1535 by a law which provided that judicial reform should not modify existing administrative and electoral divisions. The principal elective local administrative bodies are the provincial and the communal councils. The franchise is somewhat wider than the parliamentary. Both bodies are elected for six years, one-half being renewed every three years. The provincial council elects a provincial commission and the communal council a municipal council from among its own members; these smaller bodies carry on the business of the larger while they are not sitting. The syndic of each commune is elected by ballot by the communal council from among its own members.

The actual (not the resident or "legal") population of Italy since 1770 is approximately given in the following table (the first census of the kingdom as a whole was taken in 1871):—

1770	14,689,317	1861	25,016,801
1800	17,237,421	1871	26,801,154
1825	19,726,977	1881	28,459,628
1848	23,617,153	1901	32,475,253

The average density increased from 257·21 per sq. m. in 1881 to 293·28 in 1901. In Venetia, Emilia, the Marches, Umbria and Tuscany the proportion of concentrated population is only from 40 to 55%; in Piedmont, Liguria and Lombardy the proportion rises to from 70 to 76%; in southern Italy, Sicily and Sardinia it attains a maximum of from 76 to 93%.

The population of towns over 100,000 is given in the following table according to the estimates for 1906. The population of the town itself is distinguished from that of its commune, which often includes a considerable portion of the surrounding country.

	Town.	Commune.
Bologna	105,153	160,423
Catania	135,548	159,210
Florence	201,183	226,559
Genoa	255,294	267,248
Messina	108,514	165,007
Milan	560,613	..
Naples	491,614	585,289
Palermo	264,036	323,747
Rome	403,282	516,580
Turin	277,121	361,720
Venice	146,940	169,563

The population of the different parts of Italy differs in character and dialect; and there is little community of sentiment between them. The modes of life and standards of comfort and morality in north Italy and in Calabria are widely different; the former being far in front of the latter. Much, however, is effected towards unification, by compulsory military service, it being the principle that no man shall serve within the military district to which he belongs. In almost all parts the idea of personal loyalty (*e.g.* between master and servant) retains an almost feudal strength. The inhabitants of the north—the Piedmontese, Lombards and Genoese especially—have suffered less than those of the rest of the peninsula from foreign domination and from the admixture of inferior racial elements, and the cold winter climate prevents the heat of summer from being enervating. They, and also the inhabitants of central Italy, are more industrious than the inhabitants of the southern provinces, who have by no means recovered from centuries of misgovernment and oppression, and are naturally more hot-blooded and excitable, but less stable, capable of organization or trustworthy. The southerners are apathetic except when roused, and socialist doctrines find their chief adherents in the north. The Sicilians and Sardinians have something of Spanish dignity, but the former are one of the most mixed and the latter probably one of the purest races of the Italian kingdom. Physical characteristics differ widely; but as a whole the Italian is somewhat short of stature, with dark or black hair and eyes, often good looking. Both sexes reach maturity early. Mortality is decreasing, but if we may judge from the physical conditions of the recruits the physique of the nation shows little or no improvement. Much of this lack of progress is attributed to the heavy manual (especially agricultural) work undertaken by women and children. The women especially age rapidly, largely owing to this cause (E. Nathan, *Vent' anni di vita italiana attraverso all' annuario*, 169 sqq.).

Births, Marriages, Deaths.—Birth and marriage rates vary considerably, being highest in the centre and south (Umbria, the Marches, Apulia, Abruzzi and Molise, and Calabria) and lowest in the north (Piedmont, Liguria and Venetia), and in Sardinia. The death-rate is highest in Apulia, in the Abruzzi and Molise, and in Sardinia, and lowest in the north, especially in Venetia and Piedmont.

Taking the statistics for the whole kingdom, the annual marriage-rate for the years 1876–1880 was 7·53 per 1000; in 1881–1885 it rose to 8·06; in 1886–1890 it was 7·77; in 1891–1895 it was 7·41, and in 1896–1900 it had gone down to 7·14 (a figure largely produced by the abnormally low rate of 6·88 in 1898), and in 1902 was 7·23. Divorce is forbidden by the Roman Catholic Church, and only 839 judicial separations were obtained from the courts in 1902, more than half of the demands made having been abandoned. Of the whole population in 1901, 57·5% were unmarried, 36·0% married, and 6·5% widowers or widows. The illegitimate births show a decrease, having been 6·95 per 100 births in 1872 and 5·72 in 1902, with a rise, however, in the intermediate period as high as 7·76 in 1883. The birth-rate shows a corresponding decrease from 38·10 per 1000 in 1881 to 33·29 in 1902. The male births have since 1872 been about 3% (3·14 in 1872–1875 and 2·72 in 1896–1900) in excess of the female births, which is rather more than compensated for by the greater male mortality, the excess being 2·64 in 1872–1875 and having increased to 4·08 in 1896–1900. (The calculations are made in both cases on the total of births and deaths of both sexes.) The result is that, while in 1871 there was an excess of 143,370 males over females in the total population, in 1881 the excess was only 71,138, and in 1901 there were 169,684 more females than males. The death-rate (excluding still-born children) was, in 1872, 30·78 per 1000, and has since steadily decreased—less rapidly between 1886–1890 than during other years; in 1902 it was only 22·15 and in 1899 was as low as 21·89. The excess of births over deaths shows considerable variations—owing to a very low birth-rate, it was only 3·12 per 1000 in 1880, but has averaged 11·05 per 1000 from 1896 to 1900, reaching 11·98 in 1899 and 11·14 in 1902. For the four years 1899–1902 24·66 % died under the age of one year, 9·41 between one and two years. The average expectation of life at birth for the same period was 52 years and 11 months, 62 years and 2 months at the age of three years, 52 years at the age of fifteen, 44 years at the age of twenty-four, 30 years at the age of forty; while the average period of life, which was 35 years 3 months per individual in 1882, was 43 years per individual in 1901. This shows a considerable improvement, largely, but not entirely, in the diminution of infant mortality; the expectation of life at birth in 1882, it is true, was only 33 years and 6 months, and at three years of age 56 years 1 month; but the increase, both in the expectation of life and in its average duration, goes all through the different ages.

Occupations.—In the census of 1901 the population over nine years of age (both male and female) was divided as follows as regards the main professions:—

	Total.	Males.	Females.
Agricultural (including hunting and fishing)	9,666,467	6,466,165	3,200,302
Industrial	4,505,736	3,017,393	1,488,343
Commerce and transport (public and private services)	1,003,888	885,070	118,818
Domestic service, &c. . .	574,855	171,875	402,980
Professional classes, administration, &c.	1,304,347	855,217	449,130
Defence	204,012	204,012	. .
Religion	129,893	89,329	40,564

Emigration.—The movement of emigration may be divided into two currents, temporary and permanent—the former going chiefly towards neighbouring European countries and to North Africa, and consisting of manual labourers, the latter towards trans-oceanic countries, principally Brazil, Argentina and the United States. These emigrants remain abroad for several years, even when they do not definitively establish themselves there. They are composed principally of peasants, unskilled workmen and other manual labourers. There was a tendency towards increased emigration during the last quarter of the 19th century. The principal causes are the growth of population, and the over-supply of and low rates of remuneration for manual labour in various Italian provinces. Emigration has, however, recently assumed such proportions as to lead to scarcity of labour and rise of wages in Italy itself. Italians form about half of the total emigrants to America.

Year.	Temporary Emigration.		Permanent Emigration.	
	Total No. of Emigrants.	Per every 100,000 of Population.	Total No. of Emigrants.	Per every 100,000 of Population.
1881	94,225	333	41,607	147
1891	118,111	389	175,520	578
1901	281,668	865	251,577	772

The increased figures may, to a minor extent, be due to better registration, in consequence of the law of 1901.

From the next table will be seen the direction of emigration in the years specified:—

	1900.	1901.	1902.	1903.	1904.	1905.
Europe	181,047	244,298	236,066	215,943	209,942	266,982
N. Africa	5,417	9,499	11,771	9,452	14,709	11,910
U.S. and Canada . .	89,400	124,636	196,723	200,383	173,537	322,627
Mexico (Central America)	2,069	997	766	1,311	1,828	2,044
South America . . .	74,168	152,543	85,097	78,699	74,209	111,943
Asia and Oceania . .	691	1,272	1,086	2,168	2,966	2,715
Total	352,792	533,245	531,509	507,956	477,191	718,221

The figures for 1905 show that the total of 718,221 emigrants was made up, as regards numbers, mainly by individuals from Venetia, Sicily, Campania, Piedmont, Calabria and the Abruzzi; while the percentage was highest in Calabria (4·44), the Abruzzi, Venetia, Basilicata, the Marches, Sicily (2·86), Campania, Piedmont (2·02). Tuscany gives 1·20, Latium 1·14 %, Apulia only 1·02, while Sardinia with 0·34 % occupies an exceptional position. The figure for Sicily, which was 106,000 in 1905, reached 127,000 in 1906 (3·5 %), and of these about three-fourths would be adults; in the meantime, however, the population increases so fast that even in 1905 there was a net increase in Sicily of 20,000 souls; so that in three years 220,000 workers were replaced by 320,000 infants.

The phenomenon of emigration in Sicily cannot altogether be explained by low wages, which have risen, though prices have done the same. It has been defined as apparently "a kind of collective madness."

Agriculture.—Accurate statistics with regard to the area occupied in different forms of cultivation are difficult to obtain, both on account of their varied and piecemeal character and from the lack of a complete cadastral survey. A complete survey was ordered by the law of the 1st of March 1886, but many years must elapse before its completion. The law, however, enabled provinces most heavily burdened by land tax to accelerate their portion of the survey, and to profit by the reassessment of the tax on the new basis. An idea of the effects of the survey may be gathered from the fact that the assessments in the four provinces of Mantua, Ancona, Cremona and Milan, which formerly amounted to a total of £1,454,696, are now £2,788,080, an increase of 91 %. Of the total area of Italy, 70,793,000 acres, 71 % are classed as "productive." The unproductive area comprises 16 % of the total area (this includes 4 % occupied by lagoons or marshes, and 1·75 % of the total area susceptible of *bonificazione* or improvement by drainage. Between 1882 and 1902 over £4,000,000 was spent on this by the government). The uncultivated area is 13 %. This includes 3·50 % of the total susceptible of cultivation.

The cultivated area may be divided into five agrarian regions or zones, named after the variety of tree culture which flourishes in them. (1) Proceeding from south to north, the first zone is that of the *agrumi* (oranges, lemons and similar fruits). It comprises a great part of Sicily. In Sardinia it extends along the southern and western coasts. It predominates along the Ligurian Riviera from Bordighera to Spezia, and on the Adriatic, near San Benedetto del Tronto and Gargano, and, crossing the Italian shore of the Ionian Sea, prevails in some regions of Calabria, and terminates around the gulfs of Salerno, Sorrento and Naples. (2) The region of *olives* comprises the internal Sicilian valleys and part of the mountain slopes; in Sardinia, the valleys near the coast on the S.E., S.W. and N.W.; on the mainland it extends from Liguria and from the southern extremities of the Romagna to Cape Santa Maria di Leuca in Apulia, and to Cape Spartivento in Calabria. Some districts of the olive region are near the lakes of upper Italy and in Venetia, and the territories of Verona, Vicenza, Treviso and Friuli. (3) The *vine* region begins on the sunny slopes of the Alpine spurs and in those Alpine valleys open towards the south, extending over the plains of Lombardy and Emilia. In Sardinia it covers the mountain slopes to a considerable height, and in Sicily covers the sides of the Madonie range, reaching a level above 3000 ft. on the southern slope of Etna. The Calabrian Alps, the less rocky sides of the Apulian Murgie and the whole length of the Apennines are covered at different heights, according to their situation. The hills of Tuscany, and of Monferrato in Piedmont, produce the most celebrated Italian vintages. (4) The region of *chestnuts* extends from the valleys to the high plateaus of the Alps, along the northern slopes of the Apennines in Liguria, Modena, Tuscany, Romagna, Umbria, the Marches and along the southern Apennines to the Calabrian and Sicilian ranges, as well as to the mountains of Sardinia. (5) The *wooded* region covers the Alps and Apennines above the chestnut level. The woods consist chiefly of pine and hazel upon the Apennines, and upon the Calabrian, Sicilian and Sardinian mountains of oak, ilex, hornbeam and similar trees.

Between these regions of tree culture lie zones of different herbaceous culture, cereals, vegetables and textile plants. The style of cultivation varies according to the nature of the ground, terraces supported by stone walls being much used in mountainous districts. Cereal cultivation occupies the foremost place in area and quantity though it has been on the decline since 1903, still representing, however, an advance on previous years. Wheat is the most important crop and is widely distributed. In 1905 12,734,491 acres, or about 18 % of the total area, produced 151,696,571 bushels of wheat, a yield of only 12 bushels per acre. The importation has, however, enormously increased since 1882—from 164,600 to 1,126,368 tons; while the extent of land devoted to corn cultivation has slightly decreased. Next in importance to wheat comes maize, occupying about 7 % of the total area of the country, and cultivated almost everywhere as an alternative crop. The production of maize in 1905 reached about 96,250,000 bushels, a slight increase on the average. The production of maize is, however, insufficient, and 208,719 tons were imported in 1902—about double the amount imported in 1882.

Rice is cultivated in low-lying, moist lands, where spring and summer temperatures are high. The Po valley and the valleys of Emilia and the Romagna are best adapted for rice, but the area is diminishing on account of the competition of foreign rice and of the impoverishment of the soil by too intense cultivation. The area is about 0·5 % of the total of Italy. The area under rye is about 0·5 % of the total, of which about two-thirds lie in the Alpine and about one-third in the Apennine zone. The barley zone is geographically extensive but embraces not more than 1 % of the total area, of which half is situated in Sardinia and Sicily. Oats, cultivated in the Roman and Tuscan maremma and in Apulia, are used almost exclusively for horses and cattle. The area of oats cultivation is 1·5 % of the total area. The other cereals, millet and *panico sorgo* (*Panicum italicum*), have lost much of their importance in consequence of the introduction of maize and rice. Millet, however, is still cultivated in the north of Italy, and is used as bread for agricultural labourers, and as forage when mixed with buckwheat (*Sorghum saccaratum*). The manufacture of macaroni and similar foodstuff is a characteristic Italian industry. It is extensively distributed, but especially flourishes in the Neapolitan provinces. The exportation of "cornflour pastes" sank, however, from 7100 tons to 350 between 1882 and 1902.

The cultivation of green forage is extensive and is divided into the categories of temporary and perennial. The temporary includes vetches, pulse, lupine, clover and trifolium; and the perennial, meadow-trefoil, lupinella, sulla (*Hedysarum coronarium*), lucerne and darnel. The natural grass meadows are extensive, and hay is grown all over the country, but especially in the Po valley. Pasture occupies about 30 % of the total area of the country, of which Alpine pastures occupy 1·25 %. Seed-bearing vegetables are comparatively scarce. The principal are: white beans, largely consumed by the working classes; lentils, much less cultivated than beans; and green peas, largely consumed in Italy, and exported as a spring vegetable. Chick-pease are extensively cultivated in the southern provinces. Horse beans are grown, especially in the south and in the larger islands; lupines are also grown for fodder.

Among tuberous vegetables the potato comes first. The area occupied is about 0·7 % of the whole of the country. Turnips are grown principally in the central provinces as an alternative crop to wheat. They yield as much as 12 tons per acre. Beetroot (*Beta vulgaris*) is used as fodder, and yields about 10 tons per acre. Sugar beet is extensively grown to supply the sugar factories. In 1898–1899 there were only four sugar factories, with an output of 5972 tons; in 1905 there were thirty-three, with an output of 93,916 tons.

Market gardening is carried on both near towns and villages, where products find ready sale, and along the great railways, on account of transport facilities. Rome is an exception to the former rule and imports garden produce largely from the neighbourhood of Naples and from Sardinia.

Among the chief industrial plants is tobacco, which grows wherever suitable soil exists. Since tobacco is a government monopoly, its cultivation is subject to official concessions and prescriptions. Experiments hitherto made show that the cultivation of Oriental tobacco may profitably be extended in Italy. The yield for 1901 was 5528 tons, but a large increase took place subsequently, eleven million new plants having been added in southern Italy in 1905.

The chief textile plants are hemp, flax and cotton. Hemp is largely cultivated in the provinces of Turin, Ferrara, Bologna, Forlì, Ascoli Piceno and Caserta. Bologna hemp is specially valued. Flax covers about 160,000 acres, with a product, in fibre, amounting to about 20,000 tons. Cotton (*Gossypium herbaceum*), which at the beginning of the 19th century, at the time of the Continental blockade, and again during the American War of Secession, was largely cultivated, is now grown only in parts of Sicily and in a few southern provinces. Sumach, liquorice and madder are also grown in the south.

The vine is cultivated throughout the length and breadth of Italy, but while in some of the districts of the south and centre it occupies from 10 to 20 % of the cultivated area, in some of the northern provinces, such as Sondrio, Belluno, Grosseto, &c., the average is only about 1 or 2 %. The methods of cultivation are varied; but the planting of the vines by themselves in long rows of insignificant bushes is the exception. In Lombardy, Emilia, Romagna, Tuscany, the Marches, Umbria and the southern provinces, they are trained to trees which are either left in their natural state or subjected to pruning and pollarding. In Campania the vines are allowed to climb freely to the tops of the poplars. In the rest of Italy the elm and the maple are the trees mainly employed as supports. Artificial props of several kinds—wires, cane work, trellis work, &c.—are also in use in many districts (in the neighbourhood of Rome canes are almost exclusively employed), and in some the plant is permitted to trail along the ground. The vintage takes place, according to locality and climate, from the beginning of September to the beginning of November. The vine has been attacked by the *Oidium Tuckeri*, the *Phylloxera vastatrix* and the *Peronospora viticola*, which in rapid succession wrought great havoc in Italian vineyards. American vines, are, however, immune and have been largely adopted. The production of wine in the vintage of 1907, which was extraordinarily abundant all over the country, was estimated at 1232 million gallons (56 million hectolitres), the average for 1901–1903 being some 352 million gallons less; of this the probable home consumption was estimated at rather over half, while a considerable amount remained over from 1906. The exportation in 1902 only reached about 45 million gallons (and even that is double the average), while an equally abundant vintage in France and Spain rendered the exportation of the balance of 1907 impossible, and fiscal regulations rendered the distillation of the superfluous amount difficult. The quality, too, owing to bad weather at the time of vintage, was not good; Italian wine, indeed, never is sufficiently good to compete with the best wines of other countries, especially France (though there is more opening for Italian wines of the Bordeaux and Burgundy type); nor will many kinds of it stand keeping, partly owing to their natural qualities and partly to the insufficient care devoted to their preparation. There has been some improvement, however, while some of the heavier white wines, noticeably the Marsala of Sicily, have excellent keeping qualities. The area cultivated as vineyards has increased enormously, from about 4,940,000 acres to 9,880,000 acres, or about 14 % of the total area of the country. Over-production seems thus to be a considerable danger, and improvement of quality is rather to be sought after. This has been encouraged by government prizes since 1904.

Next to cereals and the vine the most important object of cultivation is the olive. In Sicily and the provinces of Reggio, Catanzaro, Cosenza and Lecce this tree flourishes without shelter; as far north as Rome, Aquila and Teramo it requires only the slightest protection; in the rest of the peninsula it runs the risk of damage by frost every ten years or so. The proportion of ground under olives is from 20 to 36 % at Porto Maurizio, and in Reggio, Lecce, Bari, Chieti and Leghorn it averages from 10 to 19 %. Throughout Piedmont, Lombardy, Venetia and the greater part of Emilia, the tree is of little importance. In the olive there is great variety of kinds, and the methods of cultivation differ greatly in different districts; in Bari, Chieti and Lecce, for instance, there are regular woods of nothing but olive-trees, while in middle Italy there are olive-orchards with the interspaces occupied by crops of various kinds. The Tuscan oils from Lucca, Calci and Buti are considered the best in the world; those of Bari, Umbria and western Liguria rank next. The wood of the olive is also used for the manufacture of small articles. The olive-growing area occupies about 3·5 % of the total area of the country, and the crop in 1905 produced about 75,000,000 gallons of oil. The falling off of the crop, especially in 1899, was due to bad seasons and to insects, notably the *Cycloconium oleoginum*, and the *Dacus oleae*, or oil-fly, which have ravaged the olive-yards, and it is noticeable that lately good and bad seasons seem to alternate; between 1900 and 1905 the crops were alternately one half of, and equal to, that of the latter year. With the development of agricultural knowledge, notable improvements have been effected in the manufacture of oil. The steam mills give the best results. The export trade, however, is decreasing considerably, while the home consumption is increasing. In 1901, 1985 imperial tuns of oil were shipped from Gallipoli for abroad—two-thirds to the United Kingdom, one-third to Russia—and 666 to Italian ports; while in 1904 the figures were reversed, 1633 tuns going to Italian ports, and only 945 tuns to foreign ports. The other principal port of shipping is Gioia Tauro, 30 m. N.N.E. of Reggio Calabria. A certain amount of linseed-oil is made in Lombardy, Sicily, Apulia and Calabria; colza in Piedmont, Lombardy, Venetia and Emilia; and castor-oil in Venetia and Sicily. The product is principally used for industrial purposes, and partly in the preparation of food, but the amount is decreasing.

The cultivation of oranges, lemons and their congeners (collectively designated in Italian by the term *agrumi*) is of comparatively modern date, the introduction of the *Citrus Bigaradia* being probably due to the Arabs. Sicily is the chief centre of cultivation—the area occupied by lemon and orange orchards in the province of Palermo alone having increased from 11,525 acres in 1854 to 54,340 in 1874. Reggio Calabria, Catanzaro, Cosenza, Lecce, Salerno, Naples and Caserta are the continental provinces which come next after Sicily. In Sardinia the cultivation is extensive, but receives little attention. Both crude and concentrated lime-juice is exported, and essential oils are extracted from the rind of the *agrumi*, more particularly from that of the lemon and the bergamot. In northern and central Italy, except in the province of Brescia, the *agrumi* are almost non-existent. The trees are planted on irrigated soil and the fruit gathered between November and August. Considerable trade is done in *agro di limone* or lemon extract, which forms the basis of citric acid. Extraction is extensively carried on in the provinces of Messina and Palermo.

Among other fruit trees, apple-trees have special importance. Almonds are widely cultivated in Sicily, Sardinia and the southern provinces; walnut trees throughout the peninsula, their wood being more important than their fruit; hazel nuts, figs, prickly pears (used in the south and the islands for hedges, their fruit being a minor consideration), peaches, pears, locust beans and pistachio nuts are among the other fruits. The mulberry-tree (*Morus alba*), whose leaves serve as food for silkworms, is cultivated in every region, considerable progress having been made in its cultivation and in the rearing of silkworms since 1850. Silkworm-rearing establishments of importance now exist in the Marches, Umbria, in the Abruzzi, Tuscany, Piedmont and Venetia. The chief silk-producing provinces are Lombardy, Venetia and Piedmont. During the period 1900–1904 the average annual production of silk cocoons was 53,500 tons, and of silk 5200 tons.

The great variety in physical and social conditions throughout the peninsula gives corresponding variety to the methods of agriculture. In the rotation of crops there is an amazing diversity—shifts of two years, three years, four years, six years, and in many cases whatever order strikes the fancy of the farmer. The fields of Tuscany for the most part bear wheat one year and maize the next, in perpetual interchanges, relieved to some extent by green crops. A similar method prevails in the Abruzzi, and in the provinces of Salerno, Benevento and Avellino. In Lombardy a six-year shift is common: either wheat, clover, maize, rice, rice, rice (the last year manured with lupines) or maize, wheat followed by clover, clover, clover ploughed in, and rice, rice and rice manured with lupines. The Emilian region is one where regular rotations are best observed—a common shift being grain, maize, clover, beans and vetches, &c., grain, which has the disadvantage of the grain crops succeeding each other. In the province of Naples, Caserta, &c., the method of fallows is widely adopted, the ground often being left in this state for fifteen or twenty years; and in some parts of Sicily there is a regular interchange of fallow and crop year by year. The following scheme indicates a common Sicilian method of a type which has many varieties: fallow, grain, grain, pasture, pasture—other two divisions of the area following the same order, but beginning respectively with the two years of grain and the two of pasture.

Woods and forests.

Woods and forests play an important part, especially in regard to the consistency of the soil and to the character of the water-courses. The chestnut is of great value for its wood and its fruit, an article of popular consumption. Good timber is furnished by the oak and beech, and pine and fir forests of the Alps and Apennines. Notwithstanding the efforts of the government to unify and co-ordinate the forest laws previously existing in the various states, deforestation has continued in many regions. This has been due to speculation, to the unrestricted pasturage of goats, to the rights which many communes have over the forests, and to some extent to excessive taxation, which led the proprietors to cut and sell the trees and then abandon the ground to the Treasury. The results are—a lack of water-supply and of water-power, the streams becoming mere torrents for a short period and perfectly dry for the rest of the year; lack of a sufficient supply of timber; the denudation of the soil on the hills, and, where the valleys below have insufficient drainage, the formation of swamps. If the available water-power of Italy, already very considerable, be harnessed, converted into electric power (which is already being done in some districts), and further increased by reafforestation, the effect upon the industries of Italy will be incalculable, and the importation of coal will be very materially diminished. The area of forest is about 14·3% of the total, and of the chestnut-woods 1·5 more; and its products in 1886 were valued at £3,520,000 (not including chestnuts). A quantity of it is really brushwood, used for the manufacture of charcoal and for fuel, coal being little used except for manufacturing purposes. Forest nurseries have also been founded.

Live stock.

According to an approximate calculation the number of head of live stock in Italy in 1890 was 16,620,000, thus divided:—horses, 720,000; asses, 1,000,000; mules, 300,000; cattle, 5,000,000; sheep, 6,000,000; goats, 1,800,000; swine, 1,800,000.

The breed of cattle most widely distributed is that known as the Podolian, usually with white or grey coat and enormous horns. Of the numerous sub-varieties, the finest is said to be that of the Val di Chiana, where the animals are stall-fed all the year round; next is ranked the so-called Valle Tiberina type. Wilder varieties roam in vast herds over the Tuscan and Roman *maremmas*, and the corresponding districts in Apulia and other regions. In the Alpine districts there is a stock distinct from the Podolian, generally called *razza montanina*. These animals are much smaller in stature and more regular in form than the Podolians; they are mainly kept for dairy purposes. Another stock, with no close allies nearer than the south of France, is found in the plain of Racconigi and Carmagnola; the mouse-coloured Swiss breed occurs in the neighbourhood of Milan; the Tirolese breed stretches south to Padua and Modena; and a red-coated breed named of Reggio or Friuli is familiar both in what were the duchies of Parma and Modena, and in the provinces of Udine and Treviso. In Sicily the so-called Modica race is of note; and in Sardinia there is a distinct stock which seldom exceeds the weight of 700 ℔. Buffaloes are kept in several districts, more particularly of southern Italy.

Enormous flocks are possessed by professional sheep-farmers, who pasture them in the mountains in the summer, and bring them down to the plains in the winter. At Saluzzo in Piedmont there is a stock with hanging ears, arched face and tall stature, kept for its dairy qualities; and in the Biellese the merino breed is maintained by some of the larger proprietors. In the upper valleys of the Alps there are many local varieties, one of which at Ossola is like the Scottish blackface. Liguria is not much adapted for sheep-farming on a large scale; but a number of small flocks come down to the plain of Tuscany in the winter. With the exception of a few sub-Alpine districts near Bergamo and Brescia, the great Lombard plain is decidedly unpastoral. The Bergamo sheep is the largest breed in the country; that of Cadore and Belluno approaches it in size. In the Venetian districts the farmers often have small stationary flocks. Throughout the Roman province, and Umbria, Apulia, the Abruzzi, Basilicata and Calabria, is found in its full development a remarkable system of pastoral migration with the change of seasons which has been in existence from the most ancient times, and has attracted attention as much by its picturesqueness as by its industrial importance (see APULIA). Merino sheep have been acclimatized in the Abruzzi, Capitanata and Basilicata. The number of sheep, however, is on the decrease. Similarly, the number of goats, which are reared only in hilly regions, is decreasing, especially on account of the existing forest laws, as they are the chief enemies of young plantations. Horse-breeding is on the increase. The state helps to improve the breeds by placing choice stallions at the disposal of private breeders at a low tariff. The exportation is, however, unimportant, while the importation is largely on the increase, 46,463 horses having been imported in 1902. Cattle-breeding varies with the different regions. In upper Italy cattle are principally reared in pens and stalls; in central Italy cattle are allowed to run half wild, the stall system being little practised; in the south and in the islands cattle are kept in the open air, few shelters being provided. The erection of shelters, however, is encouraged by the state. Swine are extensively reared in many provinces. Fowls are kept on all farms and, though methods are still antiquated, trade in fowls and eggs is rapidly increasing.

In 1905 Italy exported 32,786 and imported 17,766 head of cattle; exported 33,574 and imported 6551 sheep; exported 95,995 and imported 1604 swine. The former two show a very large decrease and the latter a large increase on the export figures for 1882. The export of agricultural products shows a large increase.

The north of Italy has long been known for its great dairy districts. Parmesan cheese, otherwise called Lodigiano (from Lodi) or *grana*, was presented to King Louis XII. as early as 1509. Parmesan is not confined to the province from which it derives its name; it is manufactured in all that part of Emilia in the neighbourhood of the Po, and in the provinces of Brescia, Bergamo, Pavia, Novara and Alessandria. Gorgonzola, which takes its name from a town in the province, has become general throughout the whole of Lombardy, in the eastern parts of the "ancient provinces," and in the province of Cuneo. The cheese known as the *cacio-cavallo* is produced in regions extending from 37° to 43° N. lat. Gruyère, extensively manufactured in Switzerland and France, is also produced in Italy in the Alpine regions and in Sicily. With the exception of Parmesan, Gorgonzola, La Fontina and Gruyère, most of the Italian cheese is consumed in the locality of its production. Co-operative dairy farms are numerous in north Italy, and though only about half as many as in 1889 (114 in 1902) are better organized. Modern methods have been introduced.

Drainage, &c.

The drainage of marshes and marshy lands has considerably extended. A law passed on the 22nd of March 1900 gave a special impulse to this form of enterprise by fixing the ratio of expenditure incumbent respectively upon the State, the provinces, the communes, and the owners or other private individuals directly interested.

Agrarian economics.

The Italian Federation of Agrarian Unions has greatly contributed to agricultural progress. Government travelling teachers of agriculture, and fixed schools of viticulture, also do good work. Some unions annually purchase large quantities of merchandise for their members, especially chemical manures. The importation of machinery amounted to over 5000 tons in 1901.

Income from land has diminished on the whole. The chief diminution has taken place in the south in regard to oranges and lemons, cereals and (for some provinces) vines. Since 1895, however, the heavy import corn duty has caused a slight rise in the income from corn lands. The principal reasons for the general decrease are the fall in prices through foreign competition and the closing of certain markets, the diseases of plants and the increased outlay required to combat them, and the growth of State and local taxation. One of the great evils of Italian agricultural taxation is its lack of elasticity and of adaptation to local conditions. Taxes are not sufficiently proportioned to what the land may reasonably be expected to produce, nor sufficient allowance made for the exceptional conditions of a southern climate, in which a few hours' bad weather may destroy a whole crop. The Italian agriculturist has come to look (and often in vain) for action on a large scale from the state, for irrigation, drainage of uncultivated low-lying land, which may be made fertile, river regulation, &c.; while to the small proprietor the state often appears only as a hard and inconsiderate tax-gatherer.

The relations between owners and tillers of the soil are still regulated by the ancient forms of agrarian contract, which have remained almost untouched by social and political changes. The possibility of reforming these contracts in some parts of the kingdom has been studied, in the hope of bringing them into closer harmony with the needs of rational cultivation and the exigencies of social justice.

Peasant proprietorship is most common in Lombardy and Piedmont, but it is also found elsewhere. Large farms are found in certain of the more open districts; but in Italy generally, and especially in Sardinia, the land is very much subdivided. The following forms of contract are most usual in the several regions: In Piedmont the *mezzadria* (*métayage*), the *terzieria*, the *colonia parziaria*, the *boaria*, the *schiavenza* and the *affitto*, or lease, are most usual. Under *mezzadria* the contract generally lasts three years. Products are usually divided in equal proportions between the owner and the tiller. The owner pays the taxes, defrays the cost of preparing the ground, and provides the necessary implements. Stock usually belongs to the owner, and, even if kept on the half-and-half system, is usually bought by him. The peasant, or *mezzadro*, provides labour. Under *terzieria* the owner furnishes stock, implements and seed, and the tiller retains only one-third of the principal products. In the *colonia parziaria* the peasant executes all the agricultural work, in return for which he is housed rent-free, and receives one-sixth of the corn, one-third of the maize and has a small money wage. This contract is usually renewed from year to year. The *boaria* is widely diffused in its two forms of *cascina fatta* and *paghe*. In the former case a peasant family undertakes all the necessary work in return for payment in money or kind, which varies according to the crop; in the latter the money wages and the payment in kind are fixed beforehand. *Schiavenza*, either simple or with a share in the crops, is a form of contract similar to the *boaria*, but applied principally to large holdings. The wages are lower than under the *boaria*. In the *affitto*, or lease, the proprietor furnishes seed and the implements. Rent varies according to the quality of the soil.

In Lombardy, besides the *mezzadria*, the lease is common, but the *terzieria* is rare. The lessee, or farmer, tills the soil at his own risk; usually he provides live stock, implements and capital, and has no right to compensation for ordinary improvements, nor for extraordinary improvements effected without the landlord's consent. He is obliged to give a guarantee for the fulfilment of his engagements. In some places he pays an annual tribute in grapes, corn and other produce. In some of the Lombard *mezzadria* contracts taxes are paid by the cultivator.

In Venetia it is more common than elsewhere in Italy for owners to till their own soil. The prevalent forms of contract are the *mezzadria* and the lease. In Liguria, also, *mezzadria* and lease are the chief forms of contract.

In Emilia both *mezzadria* and lease tenure are widely diffused in the provinces of Ferrara, Reggio and Parma; but other special forms of contract exist, known as the *famiglio da spesa*, *boaria*, *braccianti obbligati* and *braccianti disobbligati*. In the *famiglio da spesa* the tiller receives a small wage and a proportion of certain products. The *boaria* is of two kinds. If the tiller receives as much as 45 lire per month, supplemented by other wages in kind, it is said to be *boaria a salario*; if the principal part of his remuneration is in kind, his contract is called *boaria a spesa*.

In the Marches, Umbria and Tuscany, *mezzadria* prevails in its purest form. Profits and losses, both in regard to produce and stock, are equally divided. In some places, however, the landlord takes two-thirds of the olives and the whole of the grapes and the mulberry leaves. Leasehold exists in the province of Grosseto alone. In Latium leasehold and farming by landlords prevail, but cases of *mezzadria* and of "improvement farms" exist. In the *agro Romano*, or zone immediately around Rome, land is as a rule left for pasturage. It needs, therefore, merely supervision by guardians and mounted overseers, or *butteri*, who are housed and receive wages. Large landlords are usually represented by *ministri*, or factors, who direct agricultural operations and manage the estates, but the estate is often let to a middleman, or *mercante di campagna*. Wherever corn is cultivated, leasehold predominates. Much of the work is done by companies of peasants, who come down from the mountainous districts when required, permanent residence not being possible owing to the malaria. Near Velletri and Frosinone "improvement farms" prevail. A piece of uncultivated land is made over to a peasant for from 20 to 29 years. Vines and olives are usually planted, the landlord paying the taxes and receiving one-third of the produce. At the end of the contract the landlord either cultivates his land himself or leases it, repaying to the improver part of the expenditure incurred by him. This repayment sometimes consists of half the estimated value of the standing crops.

In the Abruzzi and in Apulia leasehold is predominant. Usually leases last from three to six years. In the provinces of Foggia and Lecce long leases (up to twenty-nine years) are granted, but in them it is explicitly declared that they do not imply *enfiteusi* (perpetual leasehold), nor any other form of contract equivalent to co-proprietorship. *Mezzadria* is rarely resorted to. On some small holdings, however, it exists with contracts lasting from two to six years. Special contracts, known as *colonie immovibili* and *colonie temporanee* are applied to the *latifondi* or huge estates, the owners of which receive half the produce, except that of the vines, olive-trees and woods, which he leases separately. "Improvement contracts" also exist. They consist of long leases, under which the landlord shares the costs of improvements and builds farm-houses; also leases of orange and lemon gardens, two-thirds of the produce of which go to the landlord, while the farmer contributes half the cost of farming besides the labour. Leasehold, varying from four to six years for arable land and from six to eighteen years for forest-land, prevails also in Campania, Basilicata and Calabria. The *estaglio*, or rent, is often paid in kind, and is equivalent to half the produce of good land and one-third of the produce of bad land. "Improvement contracts" are granted for uncultivated bush districts, where one fourth of the produce goes to the landlord, and for plantations of fig-trees, olive-trees and vines, half of the produce of which belongs to the landlord, who at the end of ten years reimburses the tenant for a part of the improvements effected. Other forms of contract are the *piccola mezzadria*, or sub-letting by tenants to under-tenants, on the half-and-half system; *enfiteusi*, or perpetual leases at low rents—a form which has almost died out; and *mezzadria* (in the provinces of Caserta and Benevento).

In Sicily leasehold prevails under special conditions. In pure leasehold the landlord demands at least six months' rent as guarantee, and the forfeiture of any fortuitous advantages. Under the *gabella* lease the contract lasts twenty-nine years, the lessee being obliged to make improvements, but being sometimes exempted from rent during the first years. *Inquilinaggio* is a form of lease by which the landlord, and sometimes the tenant, makes over to tenant or sub-tenant the sowing of corn. There are various categories of *inquilinaggio*, according as rent is paid in money or in kind. Under *mezzadria* or *metateria* the landlord divides the produce with the farmer in various proportions. The farmer provides all labour. *Latifondi* farms are very numerous in Sicily. The landlord lets his land to two or more persons jointly, who undertake to restore it to him in good condition with one-third of it "*interrozzito*," that is, fallow, so as to be cultivated the following year according to triennial rotation. These lessees are usually speculators, who divide and sub-let the estate. The sub-tenants in their turn let a part of their land to peasants in *mezzadria*, thus creating a system disastrous both for agriculture and the peasants. At harvest-time the produce is placed in the barns of the lessor, who first deducts 25% as premium, then 16% for *battiteria* (the difference between corn before and after winnowing), then deducts a proportion for rent and subsidies, so that the portion retained by the actual tiller of the soil is extremely meagre. In bad years the tiller, moreover, gives up seed corn before beginning harvest.

In Sardinia landlord-farming and leasehold prevail. In the few cases of *mezzadria* the Tuscan system is followed.

Mines.—The number of mines increased from 589 in 1881 to 1580 in 1902. The output in 1881 was worth about £2,800,000, but by 1895 had decreased to £1,800,000, chiefly on account of the fall in the price of sulphur. It afterwards rose, and was worth more than £3,640,000 in 1899, falling again to £3,118,600 in 1902 owing to severe American competition in sulphur (see SICILY). The chief minerals are sulphur, in the production of which Italy holds one of the first places, iron, zinc, lead; these, and, to a smaller extent, copper of an inferior quality, manganese and antimony, are successfully mined. The bulk of the sulphur mines are in Sicily, while the majority of the lead and zinc mines are in Sardinia; much of the lead smelting is done at Pertusola, near Genoa, the company formed for this purpose having acquired many of the Sardinian mines. Iron is mainly mined in Elba. Quicksilver and tin are found (the latter in small quantities) in Tuscany. Boracic acid is chiefly found near Volterra, where there is also a little rock salt, but the main supply is obtained by evaporation. The output of stone from quarries is greatly diminished (from 12,500,000 tons, worth £1,920,000, in 1890, to 8,000,000 tons, worth £1,400,000, in 1899), a circumstance probably attributable to the slackening of building enterprise in many cities, and to the decrease in the demand for stone for railway, maritime and river embankment works. The value of the output had, however, by 1902 risen to £1,600,000, representing a tonnage of about 10,000,000. There is good travertine below Tivoli and elsewhere in Italy; the finest granite is found at Baveno. Lava is much used for paving-stones in the neighbourhood of volcanic districts, where pozzolana (for cement) and pumice stone are also important. Much of Italy contains Pliocene clay, which is good for pottery and brickmaking. Mineral springs are very numerous, and of great variety.

Fisheries.—The number of boats and smacks engaged in the fisheries has considerably increased. In 1881 the total number was 15,914, with a tonnage of 49,103. In 1902 there were 23,098 boats, manned by 101,720 men, and the total catch was valued at just over half a million sterling—according to the government figures, which are certainly below the truth. The value has, however, undoubtedly diminished, though the number of boats and crews increases. Most of the fishing boats, properly so called, start from the Adriatic coast, the coral boats from the western Mediterranean coast, and the sponge boats from the western Mediterranean and Sicilian coasts. Fishing and trawling are carried on chiefly off the Italian (especially Ligurian, Austrian and Tunisian coasts; coral is found principally near Sardinia and Sicily, and sponges almost exclusively off Sicily and Tunisia in the neighbourhood of Sfax. For sponge fishing no accurate statistics are available before 1896; in that year 75 tons of sponges were secured, but there has been considerable diminution since, only 31 tons being obtained in 1902. A considerable proportion was obtained by foreign boats. The island of Lampedusa may be considered its centre. Coral fishing, which fell off between 1889 and 1892 on account of the temporary closing of the Sciacca coral reefs has greatly decreased since 1884, when the fisheries produced 643 tons, whereas in 1902 they only produced 225 tons. The value of the product has, however, proportionately increased, so that the sum realized was little less, while less than half the number of men was employed. Sardinian coral commands from £3 to £4 per kilogramme (2·204 lb), and is much more valuable than the Sicilian coral. The Sciacca reefs were again closed for three winters by a decree of 1904. The fishing is largely carried on by boats from Torre del Greco, in the Gulf of Naples, where the best coral beds are now exhausted. In 1879 4000 men were employed; in 1902 only just over 1000. In 1902 there were 48 tunny fisheries, employing 3006 men, and 5116 tons of fish worth £80,000 were caught. The main fisheries are in Sardinia, Sicily and Elba. Anchovy and sardine fishing (the products of which are reckoned among the general total) are also of considerable importance, especially along the Ligurian and Tuscan coasts. The lagoon fisheries are also of great importance, more especially those of Comacchio, the lagoon of Orbetello and the Mare Piccolo at Taranto &c The deep-sea fishing boats in 1902 numbered 1368, with a total tonnage of 16,149; 100 of these were coral-fishing boats and 111 sponge-fishing boats.

Industrial Progress.—The industrial progress of Italy has been great since 1880. Many articles formerly imported are now made at home, and some Italian manufactures have begun to compete in foreign markets. Italy has only unimportant lignite and anthracite mines, but water power is abundant and has been largely applied to industry, especially in generating electricity. The electric power required for the tramways and the illumination of Rome is entirely supplied by turbines situated at Tivoli, and this is the case elsewhere, and the harnessing of this water-power is capable of very considerable extension. A sign of industrial development is to be found in the growing number of manufacturing companies, both Italian and foreign.

Mechanical industries.

The chief development has taken place in mechanical industries, though it has also been marked in metallurgy. Sulphur mining supplies large industries of sulphur-refining and grinding, in spite of American competition. Very little pig iron is made, most of the iron ore being exported, and iron manufactured consists of old iron resmelted. For steel-making foreign pig iron is chiefly used. The manufacture of steel rails, carried on first at Terni and afterwards at Savona, began in Italy in 1886. Tin has been manufactured since 1892. Lead, antimony, mercury and copper are also produced. The total salt production in 1902 was 458,497 tons, of which 248,215 were produced in the government salt factories and the rest in the free salt-works of Sicily. Great progress has been made in the manufacture of machinery; locomotives, railway carriages, electric tram-cars, &c., and machinery of all kinds, are now largely made in Italy itself, especially in the north and in the neighbourhood of Naples. At Turin the manufacture of motor-cars has attained great importance and the F.I.A.T. (Fabbrica Italiana Automobili Torino) factory employs 2000 workmen, while eight others employ 2780 amongst them.

Textiles.

The textile industries, some of which are of ancient date, are among those that have most rapidly developed. Handlooms and small spinning establishments have, in the silk industry, given place to large establishments with steam looms. The production of raw silk at least tripled itself between 1875 and 1900, and the value of the silks woven in Italy, estimated in 1890 to be £2,200,000, is now, on account of the development of the export trade, calculated to be almost £4,000,000. Lombardy (especially Como, Milan and Bergamo), Piedmont and Venetia are the chief silk-producing regions. There are several public assay offices in Italy for silk; the first in the world was established in Turin in 1750. The cotton industry has also rapidly developed. Home products not only supply the Italian market in increasing degree, but find their way into foreign markets. While importation of raw cotton increases importations of cotton thread and of cotton stuffs have rapidly decreased. The value of the annual produce of the various branches of the cotton industry, which in 1885 was calculated to be £7,200,000, was in 1900, notwithstanding the fall in prices, about £12,000,000. The industry is chiefly developed in Lombardy, Piedmont and Liguria; to some extent also in Campania, Venetia and Tuscany, and to a less extent in Lazio (Rome), Apulia, Emilia, the Marches, Umbria, the Abruzzi and Sicily. A government weaving school was established in Naples in 1906. As in the case of cotton, Italian woollen fabrics are conquering the home market in increasing degree. The industry centres chiefly in Piedmont (province of Novara), Venetia (province of Vicenza), Tuscany (Florence), Lombardy (Brescia), Campania (Caserta), Genoa, Umbria, the Marches and Rome. To some extent the industry also exists in Emilia, Calabria, Basilicata, the Abruzzi, Sardinia and Sicily. It has, however, a comparatively small export trade.

The other textile industries (flax, jute, &c.) have made notable progress. The jute industry is concentrated in a few large factories, which from 1887 onwards have more than supplied the home market, and have begun considerably to export.

Chemicals.

Chemical industries show an output worth £2,640,000 in 1902 as against £1,040,000 in 1893. The chief products are sulphuric acid; sulphate of copper, employed chiefly as a preventive of certain maladies of the vine; carbonate of lead, hyperphosphates and chemical manures; calcium carbide; explosive powder; dynamite and other explosives. Pharmaceutical industries, as distinguished from those above mentioned, have kept pace with the general development of Italian activity. The principal product is quinine, the manufacture of which has acquired great importance, owing to its use as a specific against malaria. Milan and Genoa are the principal centres, and also the government military pharmaceutical factory at Turin. Other industries of a semi-chemical character are candle-, soap-, glue-, and perfume-making, and the preparation of india-rubber. The last named has succeeded, by means of the large establishments at Milan in supplying not only the whole Italian market but an export trade.

The match-making industry is subject to special fiscal conditions. In 1902–1903 there were 219 match factories scattered throughout Italy, but especially in Piedmont, Lombardy and Venetia. The number has been reduced to less than half since 1897 by the suppression of smaller factories, while the production has increased from 47,690 millions to 59,741 millions.

The beetroot-sugar industry has attained considerable proportions in Umbria, the Marches, Lazio, Venetia and Piedmont since 1890. In 1898–1899, 5972 tons were produced, while in 1905 the figure had risen to 93,916. The rise of the industry has been favoured by protective tariffs and by a system of excise which allows a considerable premium to manufacturers.

Alcohol has undergone various oscillations, according to the legislation governing distilleries. In 1871 only 20 hectolitres were produced, but in 1881 the output was 318,000 hectolitres, the maximum hitherto attained. Since then special laws have hampered development, some provinces, as for instance Sardinia, being allowed to manufacture for their own consumption but not for export. In other parts the industry is subjected to an almost prohibitive excise-duty. The average production is about 180,000 hectolitres per annum. The greatest quantity is produced in Lombardy, Piedmont, Venetia and Tuscany. The quantity of beer is about the same, the greater part of the beer drunk being imported from Germany, while the production of artificial mineral waters has somewhat decreased. There is a considerable trade (not very large for export, however) in natural mineral waters, which are often excellent.

Paper-making is highly developed in the provinces of Novara, Caserta, Milan, Vicenza, Turin, Como, Lucca, Ancona, Genoa, Brescia, Cuneo, Macerata and Salerno. The hand-made paper of Fabriano is especially good.

Furniture-making in different styles is carried on all over Italy, especially as a result of the establishment of industrial schools. Each region produces a special type, Venetia turning out imitations of 16th- and 17th-century styles, Tuscany the 15th-century or cinquecento style, and the Neapolitan provinces the Pompeian style. Furniture and cabinet-making in great factories are carried on particularly in Lombardy and Piedmont. Bent-wood factories have been established in Venetia and Liguria.

A characteristic Italian industry is that of straw-plaiting for hat-making, which is carried on principally in Tuscany, in the district of Fermo, in the Alpine villages of the province of Vicenza, and in some communes of the province of Messina. The plaiting is done by country women, while the hats are made up in factories. Both plaits and hats are largely exported.

Tobacco is entirely a government monopoly; the total amount manufactured in 1902–1903 was 16,599 tons—a fairly constant figure.

The finest glass is made in Tuscany and Venetia; Venetian glass is often coloured and of artistic form.

Artistic industries.

In the various ceramic arts Italy was once unrivalled, but the ancient tradition for a long time lost its primeval impulse. The works at Vinovo, which had fame in the 18th century, came to an untimely end in 1820; those of Castelli (in the Abruzzi), which have been revived, were supplanted by Charles III.'s establishment at Capodimonte, 1750, which after producing articles of surprising execution was closed before the end of the century. The first place now belongs to the Della Doccia works at Florence. Founded in 1735 by the marquis Carlo Ginori, they maintained a reputation of the very highest kind down to about 1860; but since then they have not kept pace with their younger rivals in other lands. They still, however, are commercially successful. Other cities where the ceramic industries keep their ground are Pesaro, Gubbio, Faenza (whose name long ago became the distinctive term for the finer kind of potter's work in France, *faïence*), Savona and Albissola, Turin, Mondovi, Cuneo, Castellamonte, Milan, Brescia, Sassuolo, Imola, Rimini, Perugia, Castelli, &c. In all these the older styles, by which these places became famous in the 16th–18th centuries, have been revived. It is estimated that the total production of the finer wares amounts on the average to £400,000 per annum. The ruder branches of the art—the making of tiles and common wares—are pretty generally diffused.

The jeweller's art received large encouragement in a country which had so many independent courts; but nowhere has it attained a fuller development than at Rome. A vast variety of trinkets—in coral, glass, lava, &c.—is exported from Italy, or carried away by the annual host of tourists. The copying of the paintings of the old masters is becoming an art industry of no small mercantile importance in some of the larger cities.

The production of mosaics is an industry still carried on with much success in Italy, which indeed ranks exceedingly high in the department. The great works of the Vatican are especially famous (more than 17,000 distinct tints are employed in their productions), and there are many other establishments in Rome. The Florentine mosaics are perhaps better known abroad; they are composed of larger pieces than the Roman. Those of the Venetian artists are remarkable for the boldness of their colouring. There is a tendency towards the fostering of feminine home industries—lace-making, linen-weaving, &c.

Condition of the Working Classes.—The condition of the numerous agricultural labourers (who constitute one-third of the population) is, except in some regions, hard, and in places absolutely miserable. Much light was thrown upon their position by the agricultural inquiry (*inchiesta agraria*) completed in 1884. The large numbers of emigrants, who are drawn chiefly from the rural classes, furnish another proof of poverty. The terms of agrarian contracts and leases (except in districts where *mezzadria* prevails in its essential form), are in many regions disadvantageous to the labourers, who suffer from the obligation to provide guarantees for payment of rent, for repayment of seed corn and for the division of products.

Malaria.

It was only at the close of the 19th century that the true cause of malaria—the conveyance of the infection by the bite of the *Anopheles claviger*—was discovered. This mosquito does not as a rule enter the large towns; but low-lying coast districts and ill-drained plains are especially subject to it. Much has been done in keeping out the insects by fine wire netting placed on the windows and the doors of houses, especially in the railwaymen's cottages. In 1902 the state took up the sale of quinine at a low price, manufacturing it at the central military pharmaceutical laboratory at Turin. Statistics show the difference produced by this measure.

Financial Year.	Pounds of quinine sold.	Deaths by Malaria.
1901–1902	..	13,358
1902–1903	4,932	9,908
1903–1904	15,915	8,513
1904–1905	30,956	8,501
1905–1906	41,166	7,838
1906–1907	45,591	4,875

The profit made by the state, which is entirely devoted to a special fund for means against malaria, amounted in these five years to £41,759. It has been established that two 3-grain pastilles a day are a sufficient prophylactic; and the proprietors of malarious estates and contractors for public works in malarious districts are bound by law to provide sufficient quinine for their workmen, death for want of this precaution coming under the provisions of the workmen's compensation act. Much has also been, though much remains to be, done in the way of *bonificamento*, *i.e.* proper drainage and improvement of the (generally fertile) low-lying and hitherto malarious plains.

In Venetia the lives of the small proprietors and of the salaried peasants are often extremely miserable. There and in Lombardy the disease known as *pellagra* is most widely diffused. The disease is due to poisoning by micro-organisms produced by deteriorated maize, and can be combated by care in ripening, drying and storing the maize. The most recent statistics show the disease to be diminishing. Whereas in 1881 there were 104,067 (16·29 per 1000) peasants afflicted by the disease, in 1899 there were only 72,603 (10·30 per 1000) peasants, with a maximum of 39,882 (34·32 per 1000) peasants in Venetia, and 19,557 (12·90 per 1000) peasants in Lombardy. The decrease of the disease is a direct result of the efforts made to combat it, in the form of special hospitals or *pellagrosari*, economic kitchens, rural bakeries and maize-drying establishments. A bill for the better prevention of pellagra was introduced in the spring of 1902. The deaths from it dropped in that year to 2376, from 3054 in the previous year and 3788 in 1900.

In Liguria, on account of the comparative rarity of large estates, agricultural labourers are in a better condition. Men earn between 1s. 3d. and 2s. 1d. a day, and women from 5d. to 8d. In Emilia the day labourers, known as *disobbligati*, earn, on the contrary, low wages, out of which they have to provide for shelter and to lay by something against unemployment. Their condition is miserable. In Tuscany, however, the prevalence of *mezzadria*, properly so called, has raised the labourers' position. Yet in some Tuscan provinces, as, for instance, that of Grosseto, where malaria rages, labourers are organized in gangs under "corporals," who undertake harvest work. They are poverty-stricken, and easily fall victims to fever. In the Abruzzi and in Apulia both regular and irregular workmen are engaged by the year. The *curatori* or *curatoli* (factors) receive £40 a year, with a slight interest in the profits; the stockmen hardly earn in money and kind £13; the muleteers and underworkmen get between £5 to £8, plus firewood, bread and oil; irregular workmen have even lower wages, with a daily distribution of bread, salt and oil. In Campania and Calabria the *curatoli* and *massari* earn, in money and kind, about £12 a year; cowmen, shepherds and muleteers about £10; irregular workmen are paid from 8½d. to 1s. 8d. per day, but only find employment, on an average, 230 days in the year. The condition of Sicilian labourers is also miserable. The huge extent of the *latifondi*, or large estates, often results in their being left in the hands of speculators, who exploit both workmen and farmers with such usury that the latter are often compelled, at the end of a scanty year, to hand over their crops to the usurers before harvest. In Sardinia wage-earners are paid 10d. a day, with free shelter and an allotment for private cultivation. Irregular adult workmen earn between 10d. and 1s. 3d., and boys from 6d. to 10d. a day. Woodcutters and vine-waterers, however, sometimes earn as much as 3s. a day.

The peasants somewhat rarely use animal food—this is most largely used in Sardinia and least in Sicily—bread and polenta or macaroni and vegetables being the staple diet. Wine is the prevailing drink.

The condition of the workmen employed in manufactures has improved during recent years. Wages are higher, the cost of the prime necessaries of life is, as a rule, lower, though taxation on some of them is still enormous; so that the remuneration of work has improved. Taking into account the variations in wages and in the price of wheat, it may be calculated that the number of hours of work requisite to earn a sum equal to the price of a cwt. of wheat fell from 183 in 1871 to 73 in 1894. In 1898 it was 105, on account of the rise in the price of wheat, and since then up till 1902 it oscillated between 105 and 95.

Wages have risen from 22·6 centimes per hour (on an average) to 26·3 centimes, but not in all industries. In the mining and woollen industries they have fallen, but have increased in mechanical, chemical, silk and cotton industries. Wages vary greatly in different parts of Italy, according to the cost of the necessaries of life, the degree of development of working-class needs and the state of working-class organization, which in some places has succeeded in increasing the rates of pay. Women are, as a rule, paid less than men, and though their wages have also increased, the rise has been slighter than in the case of men. In some trades, for instance the silk trade, women earn little more than 10d. a day, and, for some classes of work, as little as 7d. and 4½d. The general improvement in sanitation has led to a corresponding improvement in the condition of the working classes, though much still remains to be done, especially in the south. On the other hand, it is generally the case that even in the most unpromising inn the bedding is clean.

Strikes.

The number of industrial strikes has risen from year to year, although, on account of the large number of persons involved in some of them, the rise in the number of strikers has not always corresponded to the number of strikes. During the years 1900 and 1901 strikes were increasingly numerous, chiefly on account of the growth of Socialist and working-class organizations.

The greatest proportion of strikes takes place in northern Italy, especially Lombardy and Piedmont, where manufacturing industries are most developed. Textile, building and mining industries show the highest percentage of strikes, since they give employment to large numbers of men concentrated in single localities. Agricultural strikes, though less frequent than those in manufacturing industries, have special importance in Italy. They are most common in the north and centre, a circumstance which shows them to be promoted less by the more backward and more ignorant peasants than by the better-educated labourers of Lombardy and Emilia, among whom Socialist organizations are widespread. Since 1901 there have been, more than once, general strikes at Milan and elsewhere, and one in the autumn of 1905 caused great inconvenience throughout the country, and led to no effective result.

Although in some industrial centres the working-class movement has assumed an importance equal to that of other countries, there is no general working-class organization comparable to the English trade unions. Mutual benefit and co-operative societies serve the purpose of working-class defence or offence against the employers. In 1893, after many vicissitudes, the Italian Socialist Labour Party was founded, and has now become the Italian Socialist Party, in which the majority of Italian workmen enrol themselves. Printers and hat-makers, however, possess trade societies. In 1899 an agitation began for the organization of "Chambers of Labour," intended to look after the technical education of workmen and to form commissions of arbitration in case of strikes. They act also as employment bureaux, and are often centres of political propaganda. At present such "chambers" exist in many Italian cities, while "leagues of improvement," or of "resistance," are rapidly spreading in the country districts. In many cases the action of these organizations has proved, at least temporarily, advantageous to the working classes.

Labour legislation is backward in Italy, on account of the late development of manufacturing industry and of working-class organization. On the 17th of April 1898 a species of Employers' Liability Act compelled employers of more than five workmen in certain industries to insure their employees against accidents.

On the 17th of July 1898 a national fund for the insurance of workmen against illness and old age was founded by law on the principle of optional registration. In addition to an initial endowment by the state, part of the annual income of the fund is furnished in various forms by the state (principally by making over a proportion of the profits of the Post Office Savings Bank), and part by the premiums of the workmen. The minimum annual premium is six lire for an annuity of one lira per day at the age of sixty, and insurance against sickness. The low level of wages in many trades and the jealousies of the "Chambers of Labour" and other working-class organizations impede rapid development.

A law came into operation in February 1908, according to which a weekly day of rest (with few exceptions) was established on Sunday in every case in which it was possible, and otherwise upon some other day of the week.

The French institution of *Prudhommes* was introduced into Italy in 1893, under the name of *Collegi di Probiviri*. The institution has not attained great vogue. Most of the colleges deal with matters affecting textile and mechanical industries. Each "college" is founded by royal decree, and consists of a president, with not fewer than ten and not more than twenty members. A conciliation bureau and a jury are elected to deal with disputes concerning wages, hours of work, labour contracts, &c., and have power to settle the disputes, without appeal, whenever the amounts involved do not exceed £8.

Provident institutions.

Provident institutions have considerably developed in Italy under the forms of savings banks, assurance companies and mutual benefit societies. Besides the Post Office Savings Bank and the ordinary savings banks, many co-operative credit societies and ordinary credit banks receive deposits of savings.

The greatest number of savings banks exists in Lombardy; Piedmont and Venetia come next. Campania holds the first place in the south, most of the savings of that region being deposited in the provident institutions of Naples. In Liguria and Sardinia the habit of thrift is less developed. Assurance societies in Italy are subject to the general dispositions of the commercial code regarding commercial companies. Mutual benefit societies have increased rapidly, both because their advantages have been appreciated, and because, until recently, the state had taken no steps directly to insure workmen against illness. The present Italian mutual benefit societies resemble the ancient beneficent corporations, of which in some respects they may be considered a continuation. The societies require government recognition if they wish to enjoy legal rights. The state (law of the 15th of April 1896) imposed this condition in order to determine exactly the aims of the societies, and, while allowing them to give help to their sick, old or feeble members, or aid the families of deceased members, to forbid them to pay old-age pensions, lest they assumed burdens beyond their financial strength. Nevertheless, the majority of societies have not sought recognition, being suspicious of fiscal state intervention.

Co-operation.

Co-operation, for the various purposes of credit, distribution, production and labour, has attained great development in Italy. Credit co-operation is represented by a special type of association known as People's Banks (*Banche Popolari*). They are not, as a rule, supported by workmen or peasants, but rather by small tradespeople, manufacturers and farmers. They perform a useful function in protecting their clients from the cruel usury which prevails, especially in the south. A recent form of co-operative credit banks are the *Casse Rurali* or rural banks, on the Raffeisen system, which lend money to peasants and small proprietors out of capital obtained on credit or by gift. These loans are made on personal security, but the members of the bank do not contribute any quota of the capital, though their liability is unlimited in case of loss. They are especially widespread in Lombardy and Venetia.

Distributive co-operation is confined almost entirely to Piedmont, Liguria, Lombardy, Venetia, Emilia and Tuscany, and is practically unknown in Basilicata, the Abruzzi and Sardinia.

Co-operative dairies are numerous. They have, however, much decreased in number since 1889. More numerous are the agricultural and viticultural co-operative societies, which have largely increased in number. They are to be found mainly in the fertile plains of north Italy, where they enjoy considerable success, removing the cause of labour troubles and strikes, and providing for cultivation on a sufficiently large scale. The richest, however, of the co-operative societies, though few in number, are those for the production of electricity, for textile industries and for ceramic and glass manufactures.

Co-operation in general is most widely diffused, in proportion to population, in central Italy; less so in northern Italy, and much less so in the south and the islands. It thus appears that co-operation flourishes most in the districts in which the *mezzadria* system has been prevalent.

Railways.—The first railway in Italy, a line 16 m. long from Naples to Castellammare, was opened in 1840. By 1881 there were some 5500 m. open, in 1891 some 8000 m., while in 1901 the total length was 9317 m. In July 1905 all the principal lines, which had been constructed by the state, but had been since 1885 let out to three companies (Mediterranean, Adriatic, Sicilian), were taken over by the state; their length amounted in 1901 to 6147 m., and in 1907 to 8422 m. The minor lines (many of them narrow gauge) remain in the hands of private companies. The total length, including the Sardinian railways, was 10,368 m. in 1907. The state, in taking over the railways, did not exercise sufficient care to see that the lines and the rolling stock were kept up to a proper state of efficiency and adequacy for the work they had to perform; while the step itself was taken somewhat hastily. The result was that for the first two years of state administration the service was distinctly bad, and the lack of goods trucks at the ports was especially felt. A capital expenditure of £4,000,000 annually was decided on to bring the lines up to the necessary state of efficiency to be able to cope with the rapidly increasing traffic. It was estimated in 1906 that this would have to be maintained for a period of ten years, with a further total expenditure of £14,000,000 on new lines.

Comparing the state of things in 1901 with that of 1881, for the whole country, we find the passenger and goods traffic almost doubled (except the cattle traffic), the capital expenditure almost doubled, the working expenses per mile almost imperceptibly increased, and the gross receipts per mile slightly lower. The *personnel* had increased from 70,568 to 108,690. The construction of numerous unremunerative lines, and the free granting of concessions to government and other employees (and also of cheap tickets on special occasions for congresses, &c., in various towns, without strict inquiry into the qualifications of the claimants) will account for the failure to realize a higher profit. The fares (in slow trains, with the addition of 10% for expenses) are: 1st class, 1·85d.; 2nd, 1·3d.; 3rd, 0·725d. per mile. There are, however, considerable reductions for distances over 93 m., on a scale increasing in proportion to the distance.

The taking over of the main lines by the state has of course produced a considerable change in the financial situation of the railways. The state incurred in this connexion a liability of some £20,000,000, of which about £16,000,000 represented the rolling stock. The state has considerably improved the engines and passenger carriages. The capital value of the whole of the lines, rolling stock, &c., for 1908–1909 was calculated approximately at £244,161,400, and the profits at £5,295,019, or 2·2%.

Milan is the most important railway centre in the country, and is followed by Turin, Genoa, Verona, Bologna, Rome, Naples. Lombardy and Piedmont are much better provided with railways in proportion to their area than any other parts of Italy; next come Venetia, Emilia and the immediate environs of Naples.

The northern frontier is crossed by the railway from Turin to Ventimiglia by the Col di Tenda, the Mont Cenis line from Turin to Modane (the tunnel is 7 m. in length), the Simplon line (tunnel 11 m. in length) from Domodossola to Brigue, the St Gotthard from Milan to Chiasso (the tunnel is entirely in Swiss territory), the Brenner from Verona to Trent, the line from Udine to Tarvis and the line from Venice to Triest by the Adriatic coast. Besides these international lines the most important are those from Milan to Turin (via Vercelli and via Alessandria), to Genoa via Tortona, to Bologna via Parma and Modena, to Verona, and the shorter lines to the district of the lakes of Lombardy; from Turin to Genoa via Savona and via Alessandria; from Genoa to Savona and Ventimiglia along the Riviera, and along the south-west coast of Italy, via Sarzana (whence a line runs to Parma) to Pisa (whence lines run to Pistoia and Florence) and Rome; from Verona to Modena, and to Venice via Padua; from Bologna to Padua, to Rimini (and thence along the north-east coast via Ancona, Castellammare Adriatico and Foggia to Brindisi and Otranto), and to Florence and Rome; from Rome to Ancona, to Castellammare Adriatico and to Naples; from Naples to Foggia, via Metaponto (with a junction for Reggio di Calabria), to Brindisi and to Reggio di Calabria. (For the Sicilian and Sardinian lines, see SICILY and SARDINIA.) The speed of the trains is not high, nor are the runs without stoppage long as a rule. One of the fastest runs is from Rome to Orte, 52·40 m. in 69 min., or 45·40 m. per hour, but this is a double line with little traffic. The low speed reduces the potentiality of the lines. The insufficiency of rolling stock, and especially of goods wagons, is mainly caused by delays in "handling" traffic consequent on this or other causes, among which may be mentioned the great length of the single lines south of Rome. It is thus a matter of difficulty to provide trucks for a sudden emergency, *e.g.* the vintage season; and in 1905–1907 complaints were many, while the seaports were continually short of trucks. This led to deficiencies in the supply of coal to the manufacturing centres, and to some diversion elsewhere of shipping.

Steam and Electric Tramways.—Tramways with mechanical traction have developed rapidly. Between 1875, when the first line was opened, and 1901, the length of the lines grew to 1890 m. of steam and 270 m. of electric tramways. These lines exist principally in Lombardy (especially in the province of Milan), in Piedmont, especially in the province of Turin, and in other regions of northern and central Italy. In the south they are rare, on account partly of the mountainous character of the country, and partly of the scarcity of traffic. All the important towns of Italy are provided with internal electric tramways, mostly with overhead wires.

Carriage-roads have been greatly extended in modern times, although their ratio to area varies in different localities. In north Italy there are 1480 yds. of road per sq. m.; in central Italy 993; in southern Italy 405; in Sardinia 596, and in Sicily only 244. They are as a rule well kept up in north and central Italy, less so in the south, where, especially in Calabria, many villages are inaccessible by road and have only footpaths leading to them. By the act of 1903 the state contributes half and the province a quarter of the cost of roads connecting communes with the nearest railway stations or landing places.

Inland Navigation.—Navigable canals had in 1886 a total length of about 655 m.; they are principally situated in Piedmont, Lombardy and Venetia, and are thus practically confined to the Po basin. Canals lead from Milan to the Ticino, Adda and Po. The Po is itself navigable from Turin downwards, but through its delta it is so sandy that canals are preferred, the Po di Volano and the Po di Primaro on the right, and the Canale Bianco on the left. The total length of navigable rivers is 967 m.

Posts, Telegraphs and Telephones.—The number of post offices (including *collettorie*, or collecting offices, which are rapidly being eliminated) increased from 2200 in 1862 to 4823 in 1881, 6700 in 1891 and 8817 in 1904. In spite of a large increase in the number of letters and post cards (*i.e.* nearly 10 per inhabitant per annum in 1904, as against 5·65 in 1888) the average is considerably below that of most other European countries. The number of state telegraph offices was 4603, of other offices (railway and tramway stations, which accept private telegrams for transmission) 1930. The telephone system is considerably developed; in 1904, 92 urban and 66 inter-urban systems existed. They were installed by private companies, but have been taken over by the state. International communication between Rome and Paris, and Italy and Switzerland also exists. The parcel post and money order services have largely increased since 1887–1888, the number of parcels having almost doubled (those for abroad are more than trebled), while the number of money orders issued is trebled and their value doubled (about £40,000,000). The value of the foreign orders paid in Italy increased from £1,280,000 to £2,356,000—owing to the increase of emigration and of the savings sent home by emigrants.

At the end of 1907 Italy was among the few countries that had not adopted the reduction of postage sanctioned at the Postal Union congress, held in Rome in 1906, by which the rates became 2½d. for the first oz., and 1½d. per oz. afterwards. The internal rate is 15c. (1½d.) per ½ oz.; post-cards 10c. (1d.), reply 15c. On the other hand, letters within the postal district are only 5c. (½d.) per ½ oz. Printed matter is 2c. (⅕d.) per 50 grammes (1⅔ oz.). The regulations provide that if there is a greater weight of correspondence (including book-packets) than 1¼ ℔ for any individual by any one delivery, notice shall be given him that it is lying at the post office, he being then obliged to arrange for fetching it. Letters insured for a fixed sum are not delivered under any circumstances.

Money order cards are very convenient and cheap (up to 10 lire [8s.] for 10c. [1d.]), as they need not be enclosed in a letter, while a short private message can be written on them. Owing to the comparatively small amount of letters, it is found possible to have a travelling post office on all principal trains (while almost every train has a travelling sorter, for whom a compartment is reserved) without a late fee being exacted in either case. In the principal towns letters may be posted in special boxes at the head office just before the departure of any given mail train, and are conveyed direct to the travelling post office. Another convenient arrangement is the provision of letter-boxes on electric tramcars in some cities.

Mercantile Marine.—Between the years 1881 and 1905 the number of ships entered and cleared at Italian ports decreased slightly (219,598 in 1881 and 208,737 in 1905), while their aggregate tonnage increased (32,070,704 in 1881 and 80,782,030 in 1905). In the movement of shipping, trade with foreign countries prevails (especially as regards arrivals) over trade between Italian ports. Most of the merchandise and passengers bound for and hailing from foreign ports sail under foreign flags. Similarly, foreign vessels prevail over Italian vessels in regard to goods embarked. European countries absorb the greater part of Italian sea-borne trade, whereas most of the passenger traffic goes to North and South America. The substitution of steamships for sailing vessels has brought about a diminution in the number of vessels belonging to the Italian mercantile marine, whether employed in the coasting trade, the fisheries or in traffic on the high seas. Thus:—

Year.	Total No. of Ships.	Steamships.		Sailing Vessels.	
		Number.	Tonnage (Net).	Number.	Tonnage (Net).
1881	7815	176	93,698	7,639	895,359
1905	5596	513	462,259	5,083	570,355

Among the steamers the increase has chiefly taken place in vessels of more than 1000 tons displacement, but the number of large sailing vessels has also increased. The most important Italian ports are (in order): Genoa, Naples, Palermo, Leghorn, Messina, Venice, Catania.

Foreign Trade.—Italian trade with foreign countries (imports and exports) during the quinquennium 1872–1876 averaged £94,000,000 a year; in the quinquennium 1893–1897 it fell to £88,960,000 a year. In 1898, however, the total rose to £104,680,000, but the increase was principally due to the extra importation of corn in that year. In 1899 it was nearly £120,000,000. Since 1899 there has been a steady increase both in imports and exports. Thus:—

Year.	Trade with Foreign Countries in £1000 (exclusive of Precious Metals).[1]			
	Totals.	Imports.	Exports.	Excess of Imports over Exports.
1871	81,966	38,548	43,418	–4,870
1881	96,208	49,587	46,621	2,966
1891	80,135	45,063	35,072	9,991
1900	121,538	68,009	53,529	14,480
1904	140,437	76,549	63,888	12,661

[1] No account has here been taken of fluctuations of exchange.

The great extension of Italian coast-line is thought by some to be not really a source of strength to the Italian mercantile marine, as few of the ports have a large enough hinterland to provide them with traffic, and in this hinterland (except in the basin of the Po) there are no canals or navigable rivers. Another source of weakness is the fact that Italy is a country of transit and the Italian mercantile marine has to enter into competition with the ships of other countries, which call there in passing. A third difficulty is the comparatively small tonnage and volume of Italian exports relatively to the imports, the former in 1907 being about one-fourth of the latter, and greatly out of proportion to the relative value; while a fourth is the lack of facilities for handling goods, especially in the smaller ports.

The total imports for the first six months of 1907 amounted to £57,840,000, an increase of £7,520,000 as compared with the corresponding period of 1906. The exports for the corresponding period amounted to £35,840,000, a diminution of £1,520,000 as compared with the corresponding period of 1906. The diminution was due to a smaller exportation of raw silk and oil. The countries with which this trade is mainly carried on are: (imports) United Kingdom, Germany, United States, France, Russia and India; (exports) Switzerland, United States, Germany, France, United Kingdom and Argentina.

The most important imports are minerals, including coal and metals (both in pig and wrought); silks, raw, spun and woven; stone, potter's earths, earthenware and glass; corn, flour and farinaceous products; cotton, raw, spun and woven; and live stock. The principal exports are silk and cotton tissues, live stock, wines, spirits and oils; corn, flour, macaroni and similar products; and minerals, chiefly sulphur. Before the tariff reform of 1887 manufactured articles, alimentary products and raw materials for manufacture held the principal places in the imports. In the exports, alimentary products came first, while raw materials for manufacture and manufactured articles were of little account. The transformation of Italy from a purely agricultural into a largely industrial country is shown by the circumstance that trade in raw stuffs, semi-manufactured and manufactured materials, now preponderates over that in alimentary products and wholly-manufactured articles, both the importation of raw materials and the exportation of manufactured articles having increased. The balance of Italian trade has undergone frequent fluctuations. The large predominance of imports over exports after 1884 was a result of the falling off of the export trade in live stock, olive oil and wine, on account of the closing of the French market, while the importation of corn from Russia and the Balkan States increased considerably. In 1894 the excess of imports over exports fell to £2,720,000, but by 1898 it had grown to £8,391,000, in consequence chiefly of the increased importation of coal, raw cotton and cotton thread, pig and cast iron, old iron, grease and oil-seeds for use in Italian industries. In 1899 the excess of imports over exports fell to £3,006,000; but since then it has never been less than £12,000,000.

Education.—Public instruction in Italy is regulated by the state, which maintains public schools of every grade, and requires that other public schools shall conform to the rules of the state schools. No private person may open a school without state authorization. Schools may be classed thus:—

1. Elementary, of two grades, of the lower of which there must legally be at least one for boys and one for girls in each commune; while the upper grade elementary school is required in communes having normal and secondary schools or over 4000 inhabitants. In both the instruction is free They are maintained by the communes, sometimes with state help.

The age limit is six to nine years for the lower grade, and up to twelve for the higher grade, attendance being obligatory at the latter also where it exists. 2. Secondary instruction (i.) classical in the *ginnasi* and *licei*, the latter leading to the universities; (ii.) technical. 3. Higher education—universities, higher institutes and special schools.

Of the secondary and higher educatory methods, in the normal schools and licei the state provides for the payment of the staff and for scientific material, and often largely supports the ginnasi and technical schools, which should by law be supported by the communes. The universities are maintained by the state and by their own ancient resources; while the higher special schools are maintained conjointly by the state, the province, the commune and (sometimes) the local chamber of commerce.

The number of persons unable to read and write has gradually decreased, both absolutely and in proportion to the number of inhabitants. The census of 1871 gave 73 % of illiterates, that of 1881, 67 %, and that of 1901, 56 %, *i.e.* 51·8 for males and 60·8 for females. In Piedmont there were 17·7 % of illiterates above six years (the lowest) and in Calabria 78·7 % (the highest), the figures for the whole country being 48·5. As might be expected, progress has been most rapid wherever education, at the moment of national unification, was most widely diffused. For instance, the number of bridegrooms unable to write their names in 1872 was in the province of Turin 26 %, and in the Calabrian province of Cosenza 90 %; in 1899 the percentage in the province of Turin had fallen to 5 %, while in that of Cosenza it was still 76 %. Infant asylums (where the first rudiments of instruction are imparted to children between two and a half and six years of age) and elementary schools have increased in number. There has been a corresponding increase in the number of scholars. Thus:—

Year.	Infant Asylums (Public and Private).		Daily Elementary Schools (Public and Private).	
	Number of Asylums.	Number of Scholars.	Number of Schoolrooms.	Number of Scholars.
1885–86	2083	240,365	53,628	2,252,898
1890–91	2296	278,204	57,077	2,418,692
1901–02	3314	355,594	61,777	2,733,349

The teachers in 1901–1902 numbered 65,739 (exclusive of 576 non-teaching directors and 322 teachers of special subjects) or about 41·5 scholars per teacher.

The rate of increase in the public state-supported schools has been much greater than in the private schools. School buildings have been improved and the qualifications of teachers raised. Nevertheless, many schools are still defective, both from a hygienic and a teaching point of view; while the economic position of the elementary teachers, who in Italy depend upon the communal administrations and not upon the state, is still in many parts of the country extremely low.

The law of 1877 rendering education compulsory for children between six and nine years of age has been the principal cause of the spread of elementary education. The law is, however, imperfectly enforced for financial reasons. In 1901–1902 only 65 % out of the whole number of children between six and nine years of age were registered in the lower standards of the elementary and private schools. The evening schools have to some extent helped to spread education. Their number and that of their scholars have, however, decreased since the withdrawal of state subsidies. In 1871–1872 there were 375,947 scholars at the evening schools and 154,585 at the holiday schools, while in 1900–1901 these numbers had fallen to 94,510 and 35,460 respectively. These are, however, the only institutions in which a decrease is shown, and by the law of 1906 5000 of these institutions are to be provided in the communes where the proportion of illiterates is highest. In 1895 they numbered 4245, with 138,181 scholars. Regimental schools impart elementary education to illiterate soldiers. Whereas the levy of 1894 showed 40 % of the recruits to be completely illiterate, only 27 % were illiterate when the levy was discharged in 1897. Private institutions and working-class associations have striven to improve the intellectual conditions of the working classes. Popular universities have lately attained considerable development. The number of institutes devoted to secondary education remained almost unchanged between 1880–1881 and 1895–1896. In some places the number has even been diminished by the suppression of private educational institutes. But the number of scholars has considerably increased, and shows a ratio superior to the general increase of the population. The greatest increase has taken place in technical education, where it has been much more rapid than in classical education. There are three higher commercial schools, with academic rank, at Venice, Genoa and Bari, and eleven secondary commercial schools; and technical and commercial schools for women at Florence and Milan. The number of agricultural schools has also grown, although the total is relatively small when compared with population. The attendance at the various classes of secondary schools in 1882 and 1902 is shown by the following table:—

	1882.	1902.	No. of Schools.
Ginnasi—			
Government	13,875	24,081	192
On an equal footing with government schools	6,417	7,208	76
Not on such a footing	22,609	24,850[1]	442
Total . . .	42,811	56,139	710
Technical schools—			
Government	7,510	30,411	188
On an equal footing	8,653	12,055	101
Not on such a footing	8,670	3,623[1]	106[1]
Total . . .	24,833	46,089	395
Licei—			
Government	6,623	10,983	121
On an equal footing	1,167	1,955	33
Not on such a footing	4,600	4,962[1]	187
Total . . .	12,390	17,900	341
Technical institutes—			
Government	5,555	9,654	54
On an equal footing	1,684	1,898	18
Not on such a footing.	619	378[1]	7
Total . . .	7,858	11,930	79
Nautical institutes—			
Government	758	1,878	18
On an equal footing	69	38	1
Not on such a footing	13	29[1]	1
Total . . .	816	1,945	20

[1] 1896.

The schools which do not obtain equality with government schools are either some of those conducted by religious orders, or else those in which a sufficient standard is not reached. The total number of such schools was, in 1896, 742 with 33,813 pupils.

The pupils of the secondary schools reach a maximum of 6·60 per 1000 in Liguria and 5·92 in Latium, and a minimum of 2·30 in the Abruzzi, 2·27 in Calabria and 1·65 in Basilicata.

For the boarding schools, or *convitti*, there are only incomplete reports except for the institutions directly dependent on the ministry of public instruction, which are comparatively few. The rest are largely directed by religious institutions. In 1895–1896 there were 919 convitti for boys, with 59,066 pupils, of which 40, with 3814 pupils, were dependent on the ministry (in 1901–1902 there were 43 of these with 4036 pupils); and 1456 for girls, with 49,367 pupils, of which only 8, with about 600 pupils, were dependent on the ministry.

The *scuole normali* or training schools (117 in number, of which 75 were government institutions) for teachers had 1329 male students in 1901–1902, showing hardly any increase, while the female students increased from 8005 in 1882–1883 to 22,316 in 1895–1896, but decreased to 19,044 in 1901–1902, owing to the admission of women to telegraph and telephone work. The female secondary schools in 1881–1882 numbered 77, of which 7 were government institutions, with 3569 pupils; in 1901–1902 there were 233 schools (9 governmental) with 9347 pupils.

The total attendance of students in the various faculties at the different universities and higher institutes is as follows:—

	1882.	1902.
Law	4,801	8,385
Philosophy and letters . . .	419	1,703
Medicine and surgery . . .	4,428	9,055
Professional diploma, pharmacy .	798	3,290
Mathematics and natural science .	1,364	3,500
Engineering	982	1,293
Agriculture	145	507
Commerce	128	167
Total .	13,065	27,900

Thus a large all-round increase in secondary and higher education is shown—satisfactory in many respects, but showing that more young men devote themselves to the learned professions (especially to the law) than the economic condition of the country will justify. There are 21 universities—Bologna, Cagliari, Camerino, Catania, Ferrara, Genoa, Macerata, Messina, Modena, Naples, Padua, Palermo, Parma, Pavia, Perugia, Pisa, Rome, Sassari, Siena, Turin, Urbino, of which Camerino, Ferrara, Perugia and Urbino are not state institutions; university courses are also given at Aquila, Bari and Catanzaro. Of these the most frequented in 1904–1905 were: Naples (4745), Turin (3451), Rome (2630), Bologna (1711), Pavia (1559), Padua (1364), Genoa (1276), and the least frequented, Cagliari (254), Siena (235) and Sassari (200). The professors are ordinary and extraordinary, and free professors (*liberi docenti*), corresponding to the German *Privatdozenten*, are also allowed to be attached to the universities.

The institutions which co-operate with the universities are the special schools for engineers at Turin, Naples, Rome and Bologna (and others attached to some of the universities), the higher technical institute at Milan, the higher veterinary schools of Milan, Naples and Turin, the institute for higher studies at Florence (*Istituto di studi superiori, pratici e di perfezionamento*), the literary and scientific academy of Milan, the higher institutes for the training of female teachers at Florence and Rome, the Institute of Social Studies at Florence, the higher commercial schools at Venice, Bari and Genoa, the commercial university founded by L. Bocconi at Milan in 1902, the higher naval school at Genoa, the higher schools of agriculture at Milan and Portici, the experimental institute at Perugia, the school of forestry at Vallambrosa, the industrial museum at Turin. The special secondary institutions, distinct from those already reckoned under the universities and allied schools, include an Oriental institute at Naples with 243 pupils; 34 schools of agriculture with (1904–1905) 1925 students; 2 schools of mining (at Caltanisetta and Iglesias) with (1904–1905) 83 students; 308 industrial and commercial schools with (1903–1904) 46,411 students; 174 schools of design and moulding with (1898) 12,556 students; 13 government fine art institutes (1904–1905) with 2778 students and 13 non-government with 1662 students; 5 government institutes of music with 1026 students, and 51 non-government with 4109 pupils (1904–1905). Almost all of these show a considerable increase.

Libraries are numerous in Italy, those even of small cities being often rich in manuscripts and valuable works. Statistics collected in 1893–1894 and 1896 revealed the existence of 1831 libraries, either private (but open to the public) or completely public. The public libraries have been enormously increased since 1870 by the incorporation of the treasures of suppressed monastic institutions. The richest in manuscripts is that of the Vatican, especially since the purchase of the Barberini Library in 1902; it now contains over 34,000 MSS. The Vatican archives are also of great importance. Most large towns contain important state or communal archives, in which a considerable amount of research is being done by local investigators; the various societies for local history (*Società di Storia Patria*) do very good work and issue valuable publications; the treasures which the archives contain are by no means exhausted. Libraries and archives are under the superintendence of the Ministry of Public Instruction. A separate department of this ministry under a director-general has the charge of antiquities and fine arts, making archaeological excavations and supervising those undertaken by private persons (permission to foreigners, even to foreign schools, to excavate in Italy is rarely granted), and maintaining the numerous state museums and picture galleries. The exportation of works of art and antiquities from Italy without leave of the ministry is forbidden (though it has in the past been sometimes evaded). An inventory of those subjects, the exportation of which can in no case be permitted, has been prepared; and the ministry has at its disposal a fund of £200,000 for the purchase of important works of art of all kinds.

Charities.—In Italy there is no legal right in the poor to be supported by the parish or commune, nor any obligation on the commune to relieve the poor—except in the case of forsaken children and the sick poor. Public charity is exercised through the permanent charitable foundations (*opere pie*), which are, however, very unequally distributed in the different provinces. The districts of Italy which show between 1881 and 1903 the greatest increase of new institutions, or of gifts to old ones, are Lombardy, Piedmont, Liguria, while Sardinia, Calabria and Basilicata stand lowest, Latium standing comparatively low.

The patrimony of Italian charitable institutions is considerable and is constantly increasing. In 1880 the number of charitable institutions (exclusive of public pawnshops, or *Monti di Pietà*, and other institutions which combine operations of credit with charity) was approximately 22,000, with an aggregate patrimony of nearly £80,000,000. The revenue was about £3,600,000; after deduction of taxes, interest on debts, expenses of management, &c., £2,080,000. Adding to this £1,240,000 of communal and provincial subsidies, the product of the labour of inmates, temporary subscriptions, &c., the net revenue available for charity was, during 1880, £3,860,000. Of this sum £260,000 was spent for religious purposes. Between 1881 and 1905 the bequests to existing institutions and sums left for the endowment of new institutions amounted to about £16,604,600.

Charitable institutions take, as a rule, the two forms of outdoor and indoor relief and attendance. The indoor institutions are the more important in regard to endowment, and consist of hospitals for the infirm (a number of these are situated at the seaside); of hospitals for chronic and incurable diseases; of orphan asylums; of poorhouses and shelters for beggars; of infant asylums or institutes for the first education of children under six years of age; of lunatic asylums; of homes for the deaf and dumb; and of institutes for the blind. The outdoor charitable institutions include those which distribute help in money or food; those which supply medicine and medical help; those which aid mothers unable to rear their own children; those which subsidize orphans and foundlings; those which subsidize educational institutes; and those which supply marriage portions. Between 1881 and 1898 the chief increases took place in the endowments of hospitals; orphan asylums; infant asylums; poorhouses; almshouses; voluntary workhouses; and institutes for the blind. The least creditably administered of these are the asylums for abandoned infants; in 1887, of a total of 23,913, 53·77% died; while during the years 1893–1896 (no later statistics are available) of 117,970 51·72% died. The average mortality under one year for the whole of Italy in 1893–1896 was only 16·66%.

Italian charity legislation was reformed by the laws of 1862 and 1890, which attempted to provide efficacious protection for endowments, and to ensure the application of the income to the purposes for which it was intended. The law considers as "charitable institutions" (*opere pie*) all poorhouses, almshouses and institutes which partly or wholly give help to able-bodied or infirm paupers, or seek to improve their moral and economic condition; and also the *Congregazioni di carità* (municipal charity boards existing in every commune, and composed of members elected by the municipal council), which administer funds destined for the poor in general. All charitable institutions were under the protection of provincial administrative junta, existing in every province, and empowered to control the management of charitable endowments. The supreme control was vested in the minister of the Interior. The law of 1890 also empowers every citizen to appeal to the tribunals on behalf of the poor, for whose benefit a given charitable institution may have been intended. A more recent law provides for the formation of a central body, with provincial commissions under it. Its effect, however, has been comparatively small.

Public pawnshops or *Monti di pietà* numbered 555 in 1896, with a net patrimony of £2,879,625. In that year their income, including revenue from capital, was £416,385, and their expenditure £300,232. The amount lent on security was £4,153,229.

The *Monti frumentarii* or co-operative corn deposits, which lend seed corn to farmers, and are repaid after harvest with interest in kind, numbered 1615 in 1894, and possessed a patrimony of £240,000.

In addition to the regular charitable institutions, the communal and provincial authorities exercise charity, the former (in 1899) to the extent of £1,827,166 and the latter to the extent of £919,832 per annum. Part of these sums is given to hospitals, and part spent directly by the communal and provincial authorities. Of the sum spent by the communes, about $\frac{1}{2}$ goes for the sanitary service (doctors, midwives, vaccination), $\frac{1}{8}$ for the maintenance of foundlings, $\frac{1}{10}$ for the support of the sick in hospitals, and $\frac{1}{22}$ for sheltering the aged and needy. Of the sum spent by the provincial authorities, over half goes to lunatic asylums and over a quarter to the maintenance of foundling hospitals.

Religion.—The great majority of Italians—97·12%—are Roman Catholics. Besides the ordinary Latin rite, several others are recognized. The Armenians of Venice maintain their traditional characteristics. The Albanians of the southern provinces still employ the Greek rite and the Greek language in their public worship, and their priests, like those of the Greek Church, are allowed to marry. Certain peculiarities introduced by St Ambrose distinguish the ritual of Milan from that of the general church. Up to 1871 the island of Sicily was, according to the bull of Urban II., ecclesiastically dependent on the king, and exempt from the canonical power of the pope.

Though the territorial authority of the papal see was practically abolished in 1870, the fact that Rome is the seat of the administrative centre of the vast organization of the church is not without significance to the nation. In the same city in which the administrative functions of the body politic are centralized there still exists the court of the spiritual potentate which in 1879 consisted of 1821 persons. Protestants number some 65,000, of whom half are Italian and half foreign. Of the former 22,500 are Waldensians. The number of Jews was returned as 36,000, but is certainly higher. There are, besides, in Italy some 2500 members of the Greek Orthodox Church. There were in 1901 20,707 parishes in Italy, 68,444 secular clergy and 48,043 regulars (monks, lay brothers and nuns). The size of parishes varies from province to province, Sicily having larger parishes in virtue of the old Sicilian church laws, and Naples, and some parts of central Italy, having the smallest. The Italian parishes had in 1901 a total gross revenue, including assignments from the public worship endowment fund, of £1,280,000 or an average of £63 per parish; 51% of this gross sum consists of revenue from glebe lands.

The kingdom is divided into 264 sees and ten abbeys, or prelatures *nullius dioceseos*. The dioceses are as follows:—

A. 6 suburbicarian sees—Ostia and Velletri, Porto and Sta Rufina, Albano, Frascati, Palestrina, Sabina—all held by cardinal bishops.

B. 74 sees immediately subject to the Holy See, of which 12 are archiepiscopal and 61 episcopal.

C. 37 ecclesiastical provinces, each under a metropolitan, composed of 148 suffragan dioceses. Their position is indicated in the following table:—

Metropolitans.	*Suffragans.*
Acerenza-Matera	Anglona-Tursi, Tricarico, Venosa.
Bari	Conversano, Ruvo-Bitonto.
Benevento	S. Agata de' Goti, Alife, Ariano, Ascoli Satriano Cerignola, Avellino, Bojano, Bovino, Larino, Lucera, S. Severo, Telese (Cerreto), Termoli.
Bologna	Faenza, Imola.
Brindisi and Ostuni	No suffragan.
Cagliari	Galtelli-Nuoro, Iglesias, Ogliastra.
Capua	Caiazzo, Calvi-Teano, Caserta, Isernia-Venafro, Sessa.
Chieti and Vasto	No suffragan.
Conza and Campagna	S. Angelo de' Lombardi-Bisaccia, Lacedonia, Muro Lucano.
Fermo	Macerata-Tolentino, Montalto, Ripatransone, S. Severino.
Florence	Borgo S. Sepolcro, Colle di Val d'Elsa, Fiesole, S. Miniato, Modigliana, Pistoia-Prato.
Genoa	Albenga, Bobbio, Chiavari, Savona-Noli, Tortona, Ventimiglia.
Lanciano and Ortona	No suffragan.
Manfredonia and Viesti	No suffragan.
Messina	Lipari, Nicosia, Patti.
Milan	Bergamo, Brescia, Como, Crema, Cremona, Lodi, Mantua, Pavia.
Modena	Carpi, Guastalla, Massa-Carrara, Reggio.
Monreale	Caltanisetta, Girgenti.
Naples	Acerra, Ischia, Nola, Pozzuoli.
Oristano	Ales-Terralba.
Otranto	Gallipoli, Lecce, Ugento.
Palermo	Cefalù, Mazzara, Trapani.
Pisa	Leghorn, Pescia, Pontremoli, Volterra.
Ravenna	Bertinoro, Cervia, Cesena, Comacchio, Forlì, Rimini, Sarsina.
Reggio Calabria	Bova, Cassano, Catanzaro, Cotrone, Gerace, Nicastro, Oppido, Nicotera-Tropea, Squillace.
Salerno	Acerno, Capaccio-Vallo, Diano, Marsico-Nuovo and Potenza, Nocera dei Pagani, Nusco, Policastro.
Sassari	Alghero, Ampurias and Tempio, Bisarhio, Bosa.
S. Severino	Cariati.
Siena	Chiusi-Pienza, Grosseto, Massa Marittima, Sovana-Pitigliano.
Syracuse	Caltagirone, Noto, Piazza-Armerina.
Sorrento	Castellammare.
Taranto	Castellaneta, Oria.
Trani-Nazareth-Barletta, Bisceglie	Andria.
Turin	Acqui, Alba, Aosta, Asti, Cuneo, Fossano, Ivrea, Mondovi, Pinerolo, Saluzzo, Susa.
Urbino	S. Angelo in Vado-Urbania, Cagli-Pergola, Fossombrone, Montefeltro, Pesaro, Sinigaglia.
Venice (patriarch)	Adria, Belluno-Feltre, Ceneda (Vittorio), Chioggia, Concordia-Portogruaro, Padua, Treviso, Verona, Vicenza.
Vercelli	Alessandria della Paglia, Biella, Casale, Monferrato, Novara, Vigevano.

Twelve archbishops and sixty-one bishops are independent of all metropolitan supervision, and hold directly of the Holy See. The archbishops are those of Amalfi, Aquila, Camerino and Treia, Catania, Cosenza, Ferrara, Gaeta, Lucca, Perugia, Rossano, Spoleto, and Udine, and the bishops those of Acireale, Acquapendente, Alatri, Amelia, Anagni, Ancona-Umana, Aquino-Sora-Pontecorvo, Arezzo, Ascoli, Assisi, Aversa, Bagnorea, Borgo San Donnino, Cava-Sarno, Città di Castello, Città della Pieve, Cività Castellana-Orte-Gallese, Corneto-Civita Vecchia, Cortona, Fabriano-Matelica, Fano, Ferentino Foggia, Foligno, Gravina-Montepeloso, Gubbio, Jesi, Luni-Sarzana and Bragnato, S. Marco-Bisignano, Marsi (Pescina), Melfi-Rapolla Mileto, Molfetta-Terlizzi-Giovennazzo, Monopoli, Montalcino, Montefiascone, Montepulciano, Nardo, Narni, Nocera in Umbria, Norcia, Orvieto, Osimo-Cingoli, Parma, Penne-Atri, Piacenza, Poggio Mirteto, Recanati-Loreto, Rieti, Segni, Sutri-Nepi, Teramo, Terni, Terracina-Piperno-Sezze, Tivoli, Todi, Trivento, Troia, Valva-Sulmona, Veroli, Viterbo-Toscanella. Excluding the diocese of Rome and suburbicarian sees, each see has an average area of 430 sq. m. and a population of 121,285 souls. The largest sees exist in Venetia and Lombardy, and the smallest in the provinces of Naples, Leghorn, Forlì, Ancona, Pesaro, Urbino, Caserta, Avellino and Ascoli. The Italian sees (exclusive of Rome and of the suburbicarian sees) have a total annual revenue of £206,000 equal to an average of £800 per see. The richest is that of Girgenti, with £6304, and the poorest that of Porto Maurizio, with only £246. In each diocese is a seminary or diocesan school.

Religious Foundations.

In 1855 an act was passed in the Sardinian states for the disestablishment of all houses of the religious orders not engaged in preaching, teaching or the care of the sick, of all chapters of collegiate churches not having a cure of souls or existing in towns of less than 20,000 inhabitants, and of all private benefices for which no service was paid by the holders. The property and money thus obtained were used to form an ecclesiastical fund (*Cassa Ecclesiastica*) distinct from the finances of the state. This act resulted in the suppression of 274 monasteries with 3733 friars, of 61 nunneries with 1756 nuns and of 2722 chapters and benefices. In 1860 and 1861 the royal commissioners (even before the constitution of the new kingdom of Italy had been formally declared) issued decrees by which there were abolished—(1) in Umbria, 197 monasteries and 102 convents with 1809 male and 2393 female associates, and 836 chapters or benefices; (2) in the Marches, 292 monasteries and 127 convents with 2950 male and 2728 female associates; (3) in the Neapolitan provinces, 747 monasteries and 275 convents with 8787 male and 7493 female associates. There were thus disestablished in seven or eight years 2075 houses of the regular clergy occupied by 31,649 persons; and the confiscated property yielded a revenue of £398,298. And at the same time there had been suppressed 11,889 chapters and benefices of the secular clergy, which yielded an annual income of £199,149. The value of the capital thus potentially freed was estimated at £12,000,000; though hitherto the ecclesiastical possessions in Lombardy, Emilia, Tuscany and Sicily had been untouched. As yet the Cassa Ecclesiastica had no right to dispose of the property thus entrusted to it; but in 1862 an act was passed by which it transferred all its real property to the national domain, and was credited with a corresponding amount by the exchequer. The property could now be disposed of like the other property of the domain; and except in Sicily, where the system of emphyteusis was adopted, the church lands began to be sold by auction. To encourage the poorer classes of the people to become landholders, it was decided that the lots offered for sale should be small, and that the purchaser should be allowed to pay by five or ten yearly instalments. By a new act in 1866 the process of secularization was extended to the whole kingdom. All the members of the suppressed communities received full exercise of all the ordinary political and civil rights of laymen; and annuities were granted to all those who had taken permanent religious vows prior to the 18th of January 1864. To priests and choristers, for example, of the proprietary or endowed orders were assigned £24 per annum if they were upwards of sixty years of age, £16 if upwards of 40, and £14, 8s. if younger. The Cassa Ecclesiastica was abolished, and in its stead was instituted a *Fondo pel Culto*, or public worship fund. From the general confiscation were exempted the buildings actually used for public worship, as episcopal residences or seminaries, &c., or which had been appropriated to the use of schools, poorhouses, hospitals, &c.; as well as the buildings, appurtenances, and movable property of the abbeys of Monte Casino, Della Cava dei Tirreni, San Martino della Scala, Monreale, Certosa near Pavia, and other establishments of the same kind of importance as architectural or historical monuments. An annuity equal to the ascertained revenue of the suppressed institutions was placed to the credit of the fund in the government 5% consols. A fourth of this sum was to be handed to the communes to be employed on works of beneficence or education as soon as a surplus was obtained from that part of the annuity assigned for the payment of monastic pensions; and in Sicily, 209 communes entered on their privileges as soon as the patrimony was liquidated. Another act in 1867 decreed the suppression of certain foundations which had escaped the action of previous measures, put an extraordinary tax of 30% on the whole of the patrimony of the church, and granted the government the right of issuing 5% bonds sufficient to bring into the treasury £16,000,000, which were to be accepted at their nominal value as purchase money for the alienated property. The public worship endowment fund has relieved the state exchequer of the cost of public worship; has gradually furnished to the poorer parish priests an addition to their stipends, raising them to £32 per annum, with the prospect of further raising them to £40; and has contributed to the outlay incurred by the communes for religious purposes. The monastic buildings required for public purposes have been made over to the communal and provincial authorities, while the same authorities have been entrusted with the administration of the ecclesiastical revenues previously set apart for charity and education, and objects of art and historical interest have been consigned to public libraries and museums. By these laws the reception of novices was forbidden in the existing conventual establishments the extinction of which had been decreed, and all new foundations were forbidden, except those engaged in instruction and the care of the sick. But the laws have not been rigorously enforced of late years; and the ecclesiastical possessions seized by the state were thrown on the market simultaneously, and so realized very low prices, being often bought up by wealthy religious institutions. The large number of these institutions was increased when these bodies were expelled from France.

On the 30th of June 1903 the patrimony of the endowment fund amounted to £17,339,040, of which only £264,289 were represented by buildings still occupied by monks or nuns. The rest was made up of capital and interest. The liabilities of the fund (capitalized) amounted to £10,668,105, of which monastic pensions represented a rapidly diminishing sum of £2,564,930. The chief items of annual expenditure drawn from the fund are the supplementary stipends to priests and the pensions to members of suppressed religious houses. The number of persons in receipt of monastic pensions on the 30th of June 1899 was 13,255; but while this item of expenditure will disappear by the deaths of those entitled to pensions, the supplementary stipends and contributions are gradually increasing. The following table shows the course of the two main categories of the fund from 1876 to 1902–1903:—

	1876.	1885–1886.	1898–1899.	1902–1903.
Monastic pensions, liquidation of religious property and provision of shelter for nuns	£749,172	£491,339	£220,479	£165,144
Supplementary stipends to bishops and parochial clergy, assignments to Sardinian clergy and expenditure for education and charitable purposes . .	142,912	128,521	210,020	347,940

Roman Charitable and Religious Fund.—The law of the 19th of June 1873 contained special provisions, in conformity with the character of Rome as the seat of the papacy, and with the situation created by the Law of Guarantees. According to the census of 1871 there were in the city and province of Rome 474 monastic establishments (311 for monks, 163 for nuns), occupied by 4326 monks and 3825 nuns, and possessing a gross revenue of 4,780,891 lire. Of these, 126 monasteries and 90 convents were situated in the city, 51 monasteries and 22 convents in the "suburbicariates." The law of 1873 created a special charitable and religious fund of the city, while it left untouched 23 monasteries and 49 convents which had either the character of private institutions or were supported by foreign funds. New parishes were created, old parishes were improved, the property of the suppressed religious corporations was assigned to charitable and educational institutions and to hospitals, while property having no special application was used to form a charitable and religious fund. On the 30th of June 1903 the balance-sheet of this fund showed a credit amounting to £1,796,120 and a debit of £460,819. Expenditure for the year 1902–1903 was £889,858 and revenue £818,674.

Constitution and Government.—The Vatican palace itself (with St Peter's), the Lateran palace, and the papal villa at Castel Gandolfo have secured to them the privilege of extraterritoriality by the law of 1871. The small republic of San Marino is the only other enclave in Italian territory. Italy is a constitutional monarchy, in which the executive power belongs exclusively to the sovereign, while the legislative power is shared by him with the parliament. He holds supreme command by land and sea, appoints ministers and officials, promulgates the laws, coins money, bestows honours, has the right of pardoning, and summons and dissolves the parliament. Treaties with foreign powers, however, must have the consent of parliament. The sovereign is irresponsible, the ministers, the signature of one of whom is required to give validity to royal decrees, being responsible. Parliament consists of two chambers, the senate and the Chamber of Deputies, which are nominally on an equal footing, though practically the elective chamber is the more important. The senate consists of princes of the blood who have attained their majority, and of an unlimited number of senators above forty years of age, who are qualified under any one of twenty-one specified categories—by having either held high office, or attained celebrity in science, literature, &c. In 1908 there were 318 senators exclusive of five members of the royal family. Nomination is by the king for life. Besides its legislative functions, the senate is the highest court of justice in the case of political offences or the impeachment of ministers. The deputies to the lower house are 508 in number, *i.e.* one to every 64,893 of the population, and all the constituencies are single-member constituencies. The party system is not really strong. The suffrage is extended to all citizens over twenty-one years of age who can read and write and have either attained a certain standard of elementary education or are qualified by paying a rent which varies from £6 in communes of 2500 inhabitants to £16 in communes of 150,000 inhabitants, or, if peasant farmers, 16s. of rent; or by being sharers in the profits of farms on which not less than £3, 4s. of direct (including provincial) taxation is paid; or by paying not less than £16 in direct (including provincial) taxation. Others, *e.g.* members of the professional classes, are qualified to vote by their position. The number of electors (2,541,327) at the general election in 1904 was 29% of the male population over twenty-one years of age, and 7·6% of the total population—exclusive of those temporarily disfranchised on account of military service; and of these 62·7% voted. No candidate can be returned unless he obtains more than half the votes given and more than one-sixth of the total number on the register; otherwise a second ballot must be held. Nor can he be returned under the age of thirty, and he must be qualified as an elector. All salaried government officials (except ministers, under-secretaries of state and other high functionaries, and officers in the army or navy), and ecclesiastics, are disqualified for election. Senators and deputies receive no salary but have free passes on railways throughout Italy and on certain lines of steamers. Parliaments are quinquennial, but the king may dissolve the Chamber of Deputies at any time, being bound, however, to convoke a new chamber within four months. The executive must call parliament together annually. Each of the chambers has the right of introducing new bills, as has also the government; but all money bills must originate in the Chamber of Deputies. The consent of both chambers and the assent of the king is necessary to their being passed. Ministers may attend the debates of either house but can only vote in that of which they are members. The sittings of both houses are public, and an absolute majority of the members must be present to make a sitting valid. The ministers are eleven in number and have salaries of about £1000 each; the presidency of the council of ministers (created in 1889) may be held by itself or (as is usual) in conjunction with any other portfolio. The ministries are: interior (under whom are the prefects of the several provinces), foreign affairs, treasury (separated from finance in 1889), finance, public works, justice and ecclesiastical affairs, war, marine, public instruction, commerce, industry and agriculture, posts and telegraphs (separated from public works in 1889). Each minister is aided by an under-secretary of state at a salary of £500. There is a council of state with advisory functions, which can also decide certain questions of administration, especially applications from local authorities and conflicts between ministries, and a court of accounts, which has the right of examining all details of state expenditure. In every country the bureaucracy is abused, with more or less reason, for unprogressiveness, timidity and "red-tape," and Italy is no exception to the rule. The officials are not well paid, and are certainly numerous; while the manifold checks and counter-checks have by no means always been sufficient to prevent dishonesty.

Titles of Honour.—The former existence of so many separate sovereignties and "fountains of honour" gave rise to a great many hereditary titles of nobility. Besides many hundreds of princes, dukes, marquesses, counts, barons and viscounts, there are a large number of persons of "patrician" rank, persons with a right to the designation *nobile* or *signori*, and certain hereditary knights or baronets. In the "Golden Book of the Capitol" (*Libro d'oro del Campidoglio*) are inscribed 321 patrician families, and of these 28 have the title of prince and 8 that of duke, while the others are marquesses, counts or simple patricians. For the Italian orders of knighthood see KNIGHTHOOD AND CHIVALRY: *Orders of Knighthood*. The king's [illegible] is duke of Aosta, his son is prince of Piedmont and his cousin is duke of Genoa.

Justice.—The judiciary system of Italy is mainly framed on the French model. Italy has courts of cassation at Rome, Naples, Palermo, Turin, Florence, 20 appeal court districts, 162 tribunal districts and 1535 *mandamenti*, each with its own magistracy (*pretore*). In 12 of the principal towns there are also *pretori* who have exclusively penal jurisdiction. For minor civil cases involving sums up to 100 lire (£4), justices *conciliatori* have also jurisdiction, while they may act as arbitrators up to any amount by consent. The Roman court of cassation is the highest, and in both penal and civil matters has a right to decide questions of law and disputes between the lower judicial authorities, and it is the only one which has jurisdiction in penal cases, while sharing with the others the right to review civil cases.

The *pretori* have penal jurisdiction concerning all misdemeanours (*contravvenzioni*) or offences (*delitti*) punishable by imprisonment not exceeding three months or by fine not exceeding 1000 lire (£40). The penal tribunals have jurisdiction in cases involving imprisonment up to ten years or a fine exceeding £40, while the assize courts, with a jury, deal with offences involving imprisonment for life or over ten years, and have exclusive jurisdiction (except that the senate is on occasion a high court of justice) over all political offences. Appeal may be made from the sentences of the *pretori* to the tribunals, and from the tribunals to the courts of appeal; from the assize courts there is no appeal except on a point of form, which appeal goes to the court of cassation at Rome. This court has the supreme power in all questions of legality of a sentence, jurisdiction or competency.

The penal code was unified and reformed in 1890. A reform of late years is the conditional sentence, corresponding to the English "being bound over to appear for judgment if called upon," applied to [illegible] cases in 1907. In civil matters there is appeal from the justice *conciliatore* to the *pretore* (who has jurisdiction up to a sum of 1500 lire=£60), from the *pretore* to the civil tribunal, from the civil tribunal to the court of appeal, and from the court of appeal to the court of cassation.

The judges of all kinds are very poorly paid. Even the first president of the Rome court of cassation only receives £600 a year.

The number of civil proceedings vary considerably from province to province. Lombardy, with 28 lawsuits per 1000 inhabitants, holds the lowest place; Emilia comes next with 31 per 1000; Tuscany has 32, Venetia 33, Calabria 114, Rome 145, Apulia 173, and Sardinia 300 per 1000. The high amount in Sardinia is chiefly due to cases within the competence of the conciliation offices. The number of penal proceedings, especially those within the competence of *pretori*, has also increased, chiefly on account of the frequency of minor contraventions of the act referring to [illegible]. The ratio of criminal proceedings to population is, as a rule, much higher in the south than in the north.

A regulation, dated February 1891, established three classes of prisons: judiciary prisons, for persons awaiting examination or persons sentenced to arrest, detention or seclusion for less than six months; penal establishments of various kinds (*ergastoli*, *case di reclusione*, *detenzione* or *custodia*), for criminals condemned to long terms of imprisonment; and reformatories, for criminals under age and vagabonds. Capital punishment was abolished in 1890, penal servitude for life being substituted. This generally implies solitary confinement of the most rigorous nature, and, as little is done to occupy the mind, the criminal not infrequently becomes insane. Certain types of dangerous individuals are relegated after serving a sentence in the ordinary penal prisons, and by administrative, not by judicial, process to forced residence (*domicilio coatto*) [illegible]. These establishments are generally unsatisfactory, being mostly situated on small islands where it is often difficult to find work for the *coatti*, who are free by day, being only confined at night. They receive a small and barely sufficient allowance for food [illegible] a day, which they are at liberty to supplement by work if they can find it or care to do it.

Notwithstanding the introduction of new prisons and the transformation of old ones, the number of cells for solitary confinement is still insufficient for a complete application of the penal system established by the code of 1890, and the moral effect of the association of the prisoners is not good, though the system of solitary confinement as practised in Italy is little better. The total number of prisoners, including minors and inhabitants of enforced residences, which from 76,066 (2·64 per 1000 inhabitants) on the 31st of December 1871 rose to a maximum of 80,792 on the 31st of December 1879 (2·83 per 1000), decreased to a minimum of 69,624 in 1896 (2·34 per 1000), and on the 31st of December 1898 rose again to 75,470 (2·30 per 1000), of whom 7191, less than one-tenth, were women. The increase of the figures regarding women is to be noticed throughout. On the 31st of December 1909 it had decreased to [illegible] of which [illegible] were women. Of these, 31,219 were in lock-ups, 25,145 in penal establishments, 1837 minors in government and 2647 in private reformatories, and 3071 (males) were inmates of forced residences.

Crime.—Statistics of offences, including *contravvenzioni* or breaches of by-laws and regulations, exhibit a considerable increase per 100,000 inhabitants since 1887, and only a slight diminution on the figures of 1897. The figure was 1793·25 per 100,000 in 1887, 2084·20 in 1892, 2546·49 in 1897, 2497·90 in 1902. The increase is partly covered by *contravvenzioni*, but almost every class of penal offence shows a rise except homicide, and even in that the diminution is slow (5418 in 1880, 3906 in 1887, 4408 in 1892, 4005 in 1897, 3202 in 1902), and Italy remains, owing to the frequent use of the knife, the European country in which it is most frequent. Libels, insults, &c., resistance to public authority, offences against good customs, thefts and frauds, have increased; assaults are nearly stationary. There is also an increase in juvenile delinquency. From 1890 to 1902 the actual number rose by one-third (from [illegible] to [illegible]), the proportion to the rest of those sentenced from one-fifth to one-fourth, while in 1906 the actual number rose to [illegible], being a considerable proportionate rise also. In Naples the Camorra and in Sicily the Mafia are secret societies whose power of resistance to authority is still not inconsiderable.

Procedure, both civil and criminal, is somewhat slow, and the preliminary proceedings before the *juge d'instruction* occupy much time; and recent murder trials, by the large number of witnesses called (including experts) and the lengthy speeches of counsel, have been dragged out to an unconscionable length. In this, as in the intervention of the presiding judge, the French system has been adopted; and it is said (e.g. by Nathan, *Vent'anni di vita italiana*, p. 321) that the efforts of the *juge d'instruction* are, as a rule, in fact, though not in law, largely directed to prove that the accused is guilty. In 1906 of [illegible] persons accused of penal offences, [illegible] were acquitted during the period of the instruction, [illegible] by the courts, [illegible] condemned and the rest acquitted in some other way. This shows that charges, often involving preliminary imprisonment, are brought against an excessive proportion of persons who either are not or cannot be proved to be guilty. The courts of appeal and cassation, too, often have more than they can do: in the year 1907 the court of cassation at Rome decided [illegible] appeals on points of law in penal cases, while no fewer than [illegible] remained to be decided.

As in most civilized countries, the number of suicides in Italy has increased from year to year.

The Italian suicide rate of 63·6 per 1,000,000 is, however, lower than those of Denmark, Switzerland, Germany and France, while it approximates to that of England. The Italian rate is highest in the more enlightened and industrial north, and lowest in the south. Emilia gives a maximum rate of 10·28 per 100,000, while that of Liguria and Lazio is little lower. The minimum of 1·27 is found in the Basilicata, though Calabria gives only 2·35. About 20% of the total are women, and there is an increase of nearly 3% since 1882 in the proportion of suicides under twenty years of age.

Army.—The Italian army grew out of the old Piedmontese army with which in the main the unification of Italy was brought about. This unification meant for the army the absorption of contingents from all parts of Italy and presenting serious differences in physical and moral aptitudes, political opinions and education. Moreover the strategic geography of the country required the greater part of the army to be stationed permanently within reach of the north-eastern and north-western frontiers. These conditions made a territorial system of recruiting or organization, as understood in Germany, practically impossible. To secure fairly uniform efficiency in the various corps, and also as a means of unifying Italy, Piedmontese, Umbrians and Neapolitans are mixed in the same corps and sleep in the same barrack room. But on leaving the colours the men disperse to their homes, and thus a regiment has, on mobilization, to draw largely on the nearest reservists, irrespective of the corps to which they belong. The remedy for this condition of affairs is sought in a most elaborate and artificial system of transferring officers and men from one unit to another at stated intervals in peace-time, but this is no more than a palliative, and there are other difficulties of almost equal importance to be surmounted. Thus in Italy the universal service system, though probably the best organization both for the army and the nation, works with a maximum of friction. "Army Reform," therefore, has been very much in the forefront of late years, owing to the estrangement of Austria (which power can mobilize much more rapidly), but financial difficulties have hitherto stood in the way of any radical and far-reaching reforms, and even the proposals of the Commission of 1907, referred to below, have only been partially accepted.

The law of 1875 therefore still regulates the principles of military service in Italy, though an important modification was made in 1907–1908. By this law every man liable and accepted for service served for eight or nine years in the *Active Army* and its *Reserve* (of which three to five were spent with the colours), four or five in the *Mobile Militia*, and the rest of the service period of nineteen years in the *Territorial Militia*. Under present regulations the term of liability is divided into nine years in the *Active Army* and *Reserve* (three or two years with the colours) four in the *Mobile Militia* and six in the *Territorial Militia*. But these figures do not represent the actual service of every able-bodied Italian. Like almost all "Universal Service" countries Italy only drafts a small proportion of the available recruits into the army.

The following table shows the operation of the law of 1875, with the figures of 1871 for comparison:—

	30th Sept.		30th June	
	1871	1881	1898	1901
Officers[1]	14,070	22,482	30,739	30,716
Men	521,896	1,533,552	2,821,567	3,330,202
Active Army & Reserve	530,054	731,126	845,160	734,401
Mobile Militia		298,724	445,335	320,177
Territorial Militia		825,470	1,553,734	2,275,831

[1] Including officers on special service or in the reserve.

Thus, on the 30th of September 1871 the various categories of the army included only 2% of the population, but on the 30th of June 1898 they included 10%. But in 1901 the strength of the active army and reserve shows a marked diminution, which became accentuated in the year following. The table below indicates that up to 1907 the army, though always below its nominal strength, never absorbed more than a quarter of the available contingent.

	1902.	1903	1904	1906
Liable	441,171	453,640	476,800	475,737
Physically unfit	91,176	96,095	114,770	122,550
Struck off	12,270	13,186	13,430	15,222
Failed to appear	33,034	34,711	36,246	46,296
Put back for re-examination	106,835	108,018	107,173	122,205
Assigned to Territorial Militia and excused peace service	62,252	60,016	84,136	87,032
Assigned to active army	102,904	102,141	97,132	87,468
Joined active army	88,000	86,448	81,351	80,930

The serious condition of recruiting was quickly noticed, and the tabulation of each year's results was followed by a new draft law, but no solution was achieved until a special commission assembled. The inquiries made by this body revealed an unsatisfactory condition in the national defences, traceable in the main to financial exigencies, and as regards recruiting a new law was brought into force in 1907–1908.

One specially difficult point concerned the effectives of the peace-strength army. Hitherto the actual time of training had been less than the nominal. The recruits due to join in November were not incorporated till the following March, and thus in the winter months Italy was defenceless. The army is always maintained at a low peace effective (about one-quarter of war establishment) and even this was reduced, by the absence of the recruits, until there were often only 15 rank and file with a company, whose war strength is about 230. Even in the summer and autumn a large proportion of the army consisted of men with but a few months' service—a highly dangerous state of things considering the peculiar mobilization conditions of the country. Further—and this case no legislation can cover—the contingent, and (what is more serious) the reserves, are being steadily weakened by emigration. The increase in the numbers rejected as unfit is accounted for by the fact that if only a small proportion of the contingent can be taken for service, the medical standard of acceptance is high.

The new recruiting scheme of 1907 re-established three categories of recruits,[1] the 2nd category corresponding practically to the German *Ersatz-Reserve*. The men classed in it have to train for six months, and then are called up in the later summer to make up the gap above mentioned. The new terms of service for the other categories have been already stated. In consequence of the lack of sanction funds, some financial trouble arose for the training and service of the new 2nd category for short training, which increases were concurrent with the heavy contingents of 1907 and 1908. These changes threw a considerable strain on the finances, but the imminence of the danger caused their acceptance.

The peace strength under the new scheme is nominally 300,000, but actually (average throughout the year) about 240,000. The army is organized in 12 army corps (each of 2 divisions), 6 of which are quartered on the plain of Lombardy and Venetia and on the frontiers, and 2 more in northern Central Italy. Their headquarters are: I. Turin. II. Alessandria. III. Milan. IV. Genoa. V. Verona. VI. Bologna. VII. Ancona. VIII. Florence. IX. Rome. X. Naples. XI. Bari. XII. Palermo. Sardinian division Cagliari. In addition there are 22 "Alpini" battalions and 15 mountain batteries stationed on the Alpine frontiers.

The war strength was estimated in 1901 as, *Active Army* (incl. Reserve) 750,000, *Mobile Militia* 320,000, *Territorial Militia* 2,300,000 (more than half of the last-named untrained). These figures are, with a fractional increase in the Regular Army, applicable to-day. When the 1907 scheme takes full effect, however, the Active Army and the Mobile Militia will each be augmented by about one-third. In 1915 the field army should, including officers and permanent *cadres*, be about 1,012,000 strong. The Mobile Militia will not, however, at that date have felt the effects of the scheme, and the Territorial Militia (setting the drain of emigration against the increased population) will probably remain at about the same figure as in 1901.

The army consists of 96 three-battalion regiments of infantry of the line and 12 of *bersaglieri* (riflemen), each of the latter having a cyclist company (Bersaglieri cyclist battalions are being (1909) provisionally formed); 26 regiments of cavalry, of which 10 are lancers, each of 6 squadrons; 24 regiments of artillery, each of 8 batteries;[2] 1 regiment of horse artillery of 6 batteries; 1 of mountain artillery of 12 batteries, and 3 independent mountain batteries. The armament of the infantry is the Männlicher-Carcano magazine rifle of 1891. The field and horse artillery was in 1909 in process of rearmament with a Krupp quick-firer. The garrison artillery consists of 3 coast and 3 fortress regiments, with a total of 72 companies. There are 4 regiments (11 battalions) of engineers. The *carabinieri* or gendarmerie, some 26,500 in number, are part of the standing army; they are recruited from selected volunteers from the army. In 1902 the special corps in Eritrea numbered about 4700 of all ranks, including nearly 4000 natives.

Ordinary and extraordinary military expenditure for the financial year 1898–1899 amounted to nearly £10,000,000, an increase of £4,000,000 as compared with 1871. The Army Committee decided that from the 1st of July 1901 until the 30th of June 1907 Italian military expenditure proper should not exceed the maximum of £9,560,000 per annum fixed by the Army Bill of May 1897, and that military pensions should not exceed £1,440,000. Italian military expenditure was thus until 1907 £11,000,000 per annum. In 1908 the ordinary and extraordinary expenditure was £10,000,000. The demands of the Commission were only partly complied with, but a large special grant was voted amounting to at least £1,000,000 per annum for the next seven years. The amount spent is slight compared with the military expenditure of other countries.

The Alpine frontier is fortified strongly, although the condition of the works was in many cases considered unsatisfactory by the 1907 Commission. The fortresses in the basin of the Po chiefly belong to the era of divided Italy and are now out of date; the chief coast fortresses are Vado, Genoa, Spezia, Monte Argentaro, Gaeta, Straits of Messina, Taranto, Maddalena. Rome is protected by a circle of forts from a *coup de main* from the sea, the coast, only 12 m. off, being flat and deserted.

Navy.—For purposes of naval organization the Italian coast is divided into three maritime departments, with headquarters at Spezia, Naples and Venice; and into two *comandi militari*, with headquarters at Taranto and at the island of Maddalena. The *personnel* of the navy consists of the following corps: (1) General staff; (2) naval engineers, chiefly employed in building and repairing war vessels; (3) sanitary corps; (4) commissariat corps, for supplies and account-keeping; (5) crews.

The *matériel* of the Italian navy has been completely transformed, especially in virtue of the bill of the 31st of March 1875. Old types of vessels have been sold or demolished, and replaced by newer types.

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[1] The 2nd category of the 1875 law had practically ceased to exist.

[2] This may be reduced, in consequence of the adoption of the new Q.F. gun, 1 to 6.

In March 1907 the Italian navy contained, excluding ships of no fighting value:—

	Effective.	Completing.	Projected.
Modern battleships .	4	4	3
Old battleships .	10	..	..
Armoured cruisers	0	2	..
Protected cruisers .	14	..	..
Torpedo gunboats	13	..	..
Destroyers	13	4	10
Modern torpedo boats	34	..	15
Submarines . .	1	4	2

The four modern ships—the "Vittorio Emanuele" class, laid down in 1897—have a tonnage of 12,625, two 12-in. and twelve 8-in. guns, an I.H.P. of 19,000, and a designed speed of 22 knots, being intended to avoid any battleship and to carry enough guns to destroy any cruiser.

The *personnel* on active service consisted of 1799 officers and 25,000 men, the former being doubled and the latter trebled since 1882.

Naval expenditure has enormously increased since 1871, the total for 1871 having been about £900,000, and the total for 1905–1906 over £5,100,000. Violent fluctuations have, however, taken place from year to year, according to the state of Italian finances. To permit the steady execution of a normal programme of shipbuilding, the Italian Chamber, in May 1901, adopted a resolution limiting naval expenditure, inclusive of naval pensions and of premiums on mercantile shipbuilding, to the sum of £4,840,000 for the following six years, *i.e.* from 1st July 1901 until 30th June 1907. This sum consists of £4,240,000 of naval expenditure proper, £220,000 for naval pensions and £380,000 for premiums upon mercantile shipbuilding. During the financial year ending on the 30th of June 1901 these figures were slightly exceeded.

Finance.—The volume of the Italian budget has considerably increased as regards both income and expenditure. The income of £60,741,418 in 1881 rose in 1899–1900 to £69,917,126; while the expenditure increased from £58,705,929 in 1881 to £69,708,706 in 1899–1900, an increase of £9,175,708 in income and £11,002,777 in expenditure, while there has been a still further increase since, the figures for 1905–1906 showing (excluding items which figure on both sides of the account) an increase of £8,766,995 in income and £5,434,560 in expenditure over 1899–1900. These figures include not only the categories of "income and expenditure" proper, but also those known as "movement of capital," "railway constructions" and "*partite di giro*," which do not constitute real income and expenditure.[1] Considering only income and expenditure proper, the approximate totals are:—

Financial Year.	Revenue.	Expenditure.	Surpluses or Deficits.
1882	£52,064,800	£51,904,800	£+ 160,000
1885–1886	56,364,000	57,304,400	− 940,400
1890–1891	61,600,000	64,601,600	−3,001,600
1895–1896	65,344,000	67,962,800	−2,618,800
1898–1899	66,352,800	65,046,400	+1,306,400
1899–1900	66,860,800	65,323,600	+1,537,200
1900–1901	68,829,200	66,094,400	+2,734,800
1905–1906	77,684,200	75,143,300	+2,540,900

The financial year 1862 closed with a deficit of more than £16,000,000, which increased in 1866 to £28,840,000 on account of the preparations for the war against Austria. Excepting the increases of deficit in 1868 and 1870, the annual deficits tended thenceforward to decrease, until in 1875 equilibrium between expenditure and revenue was attained, and was maintained until 1881. Advantage was taken of the equilibrium to abolish certain imposts, amongst them the grist tax, which prior to its gradual repeal produced more than £3,200,000 a year. From 1885–1886 onwards, outlay on public works, military and colonial expenditure, and especially the commercial and financial crises, contributed to produce annual deficits; but owing to drastic reforms introduced in 1894–1895 and to careful management the year 1898–1899 marked a return of surpluses (nearly £1,306,400).

The revenue in the Italian financial year 1905–1906 (July 1, 1905 to June 30, 1906) was £102,486,108, and the expenditure £99,945,253, or, subtracting the *partite di giro*, £99,684,121 and £97,143,266, leaving a surplus of £2,540,855.[2] The surplus was made up by contributions from every branch of the effective revenue, except the "contributions and repayments from local authorities." The railways showed an increase of £351,685; registration transfer and succession, £205,500; direct taxation, £42,130 (mainly from income tax, which more than made up for the remission of the house tax in the districts of Calabria visited by the earthquake of 1905); customs and excise, £1,030,742; government monopolies, £291,027; posts, £41,310; telegraphs, £23,364; telephones, £65,771. Of the surplus £1,000,000 was allocated to the improvement of posts, telegraphs and telephones; £1,000,000 to public works (£720,000 for harbour improvement and £280,000 for internal navigation); £200,000 to the navy (£132,000 for a second dry dock at Taranto and £68,000 for coal purchase); and £200,000 as a nucleus of a fund for the purchase of valuable works of art which are in danger of exportation.

Taxation.

The state therefore draws its principal revenues from the imposts, the taxes and the monopolies. According to the Italian tributary system, "imposts," properly so called are those upon land, buildings and personal estate. The impost upon land is based upon the cadastral survey independently of the vicissitudes of harvests. In 1869 the main quota to the impost was increased by one-tenth, in addition to the extra two-tenths previously imposed in 1866. Subsequently, it was decided to repeal these additional tenths, the first being abolished in 1886 and the rest in 1887. On account of the inequalities still existing in the cadastral survey, in spite of the law of 1886 (see *Agriculture*, above), great differences are found in the land tax assessments in various parts of Italy. Land is not so heavily burdened by the government quota as by the additional centimes imposed by the provincial and communal authorities. On an average Italian landowners pay nearly 25% of their revenues from land in government and local land tax. The buildings impost has been assessed since 1866 upon the basis of 12·50% of "taxable revenue." Taxable revenue corresponds to two-thirds of actual income from factories and to three-fourths of actual income from houses; it is ascertained by the agents of the financial administration. In 1869, however, a third additional tenth was added to the previously existing additional two-tenths, and, unlike the tenths of the land tax, they have not been abolished. At present the main quota with the additional three-tenths amounts to 16·25% of taxable income. The imposts on incomes from personal estate (*ricchezza mobile*) were introduced in 1866; it applies to incomes derived from investments, industry or personal enterprise, but not to landed revenues. It is proportional, and is collected by deduction from salaries and pensions paid to servants of the state, where it is assessed on three-eighths of the income, and from interest on consolidated stock, where it is assessed on the whole amount; and by register in the cases of private individuals, who pay on three-fourths of their income, professional men, capitalists or manufacturers, who pay on one-half or nine-twentieths of their income. From 1871 to 1894 it was assessed at 13·20% of taxable income, this quota being formed of 12% main quota and 1·20% as an additional tenth. In 1894 the quota, including the additional tenth, was raised to the uniform level of 20%. One-tenth of the tax is paid to the communes as compensation for revenues made over to the state.

Taxes proper are divided into (*a*) taxes on business transactions and (*b*) taxes on articles of consumption. The former apply principally to successions, stamps, registrations, mortgages, &c.; the latter to distilleries, breweries, explosives, native sugar and matches, though the customs revenue and octrois upon articles of general consumption, such as corn, wine, spirits, meat, flour, petroleum, butter, tea, coffee and sugar, may be considered as belonging to this class. The monopolies are those of salt, tobacco and the lottery.

Since 1880, while income from the salt and lotto monopolies has remained almost stationary, and that from land tax and octroi has diminished, revenue derived from all other sources has notably increased, especially that from the income tax on personal estate, and the customs, the yield from which has been nearly doubled.

It will be seen that the revenue is swollen by a large number of taxes which can only be justified by necessity; the reduction and, still more, the readjustment of taxation (which now largely falls on articles of primary necessity) is urgently needed. The government in presenting the estimates for 1907–1908 proposed to set aside a sum of nearly £800,000 every year for this express purpose. It must be remembered that the sums realized by the octroi go in the main to the various communes. It is only in Rome and Naples that the octroi is collected directly by the government, which pays over a certain proportion to the respective communes.

The external taxation is not only strongly protectionist, but is applied to goods which cannot be made in Italy; hardly anything comes in duty free, even such articles as second-hand furniture paying duty, unless within six months of the date at which the importer has declared domicile in Italy. The application, too, is somewhat rigorous, *e.g.* the tax on electric light is applied to foreign ships generating their own electricity while lying in Italian ports.

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[1] "Movement of capital" consists, as regards "income," of the proceeds of the sale of buildings, Church or Crown lands, old prisons, barracks, &c., or of moneys derived from sale of consolidated stock. Thus "income" really signifies diminution of patrimony or increase of debt. In regard to "expenditure," "movement of capital" refers to extinction of debt by amortization or otherwise, to purchases of buildings or to advances made by the state. Thus "expenditure" really represents a patrimonial improvement, a creation of credit or a decrease of indebtedness. The items referring to "railway construction" represent, on the one hand, repayments made to the exchequer by the communes and provinces of money disbursed on their account by the State Treasury; and, on the other, the cost of new railways incurred by the Treasury. The items of the "*partite di giro*" are inscribed both on the credit and debit sides of the budget, and have merely a figurative value.

[2] Financial operations (mainly in connexion with railway purchase) figure on each side of the account for about £22,000,000.

The annual consumption per inhabitant of certain kinds of food and drink has considerably increased, *e.g.* grain from 270 ℔ per head in 1884–1885 to 321 ℔ in 1901–1902 (maize remains almost stationary at 158 ℔); wine from 73 to 125 litres per head; oil from 12 to 13 ℔ per head (sugar is almost stationary at 7¼ ℔ per head, and coffee at about 1 ℔); salt from 14 to 16 ℔ per head. Tobacco slightly diminished in weight at a little over 1 ℔ per head, while the gross receipts are considerably increased—by over 2¼ millions sterling since 1884–1885—showing that the quality consumed is much better. The annual expenditure on tobacco was 5s. per inhabitant in 1902–1903, and is increasing.

The annual surpluses are largely accounted for by the heavy taxation on almost everything imported into the country,[1] and by the monopolies on tobacco and on salt; and are as a rule spent, and well spent, in other ways. Thus, that of 1907–1908 was devoted mainly to raising the salaries of government officials and university professors; even then the maximum for both (in the former class, for an under-secretary of state) was only £500 per annum. The case is frequent, too, in which a project is sanctioned by law, but is then not carried into execution, or only partly so, owing to the lack of funds. Additional stamp duties and taxes were imposed in 1909 to meet the expenditure necessitated by the disastrous earthquake at the end of 1908.

The way in which the taxes press on the poor may be shown by the number of small proprietors sold up owing to inability to pay the land and other taxes. In 1882 the number of landed proprietors was 14·52% of the population, in 1902 only 12·66, with an actual diminution of some 30,000. Had the percentage of 1882 been kept up there would have been in 1902 600,000 more proprietors than there were. Between 1884 and 1902 no fewer than 220,616 sales were effected for failure to pay taxes, while, from 1886 to 1902, 79,208 expropriations were effected for other debts not due to the state. In 1884 there were 20,422 sales, of which 35·28% were for debts of 4s. or less, and 51·95 for debts between 4s. and £2; in 1902 there were 4857 sales, but only 11·01% for debts under 4s. (the treasury having given up proceeding in cases where the property is a tiny piece of ground, sometimes hardly capable of cultivation), and 55·69% for debts between 4s. and £2. The expropriations deal as a rule with properties of higher value; of these there were 3217 in 1886, 5993 in 1892 (a period of agricultural depression), 3910 in 1902. About 22% of them are for debts under £40, about 49% from £40 to £200, about 26% from £200 to £2000.

Of the expenditure a large amount is absorbed by interest on debt. Debt has continually increased with the development of the state.

Expenditure. The sum paid in interest on debt amounted to £17,640,000 in 1871, £19,440,000 in 1881, £25,600,000 in 1891–1892 and £27,560,000 in 1899–1900; but had been reduced to £23,100,409 by the 30th of June 1906. The public debt at that date was composed as follows:—

Part I.—*Funded Debt.*

	Amount.
Grand Livre—	
Consolidated 5 %	£316,141,802
" 3 %	6,404,335
" 4½ % net	28,872,511
" 4 % "	7,875,592
" 3½ % "	37,689,880
Total	£396,984,120
Debts to be transferred to the Grand Livre	60,868
Perpetual annuity to the Holy See	2,580,000
Perpetual debts (Modena, Sicily, Naples)	2,591,807
Total	£402,216,795

Part II.—*Unfunded Debt.*

Debts separately inscribed in the Grand Livre	10,042,027
Various railway obligations, redeemable, &c.	56,375,351
Sicilian indemnities	195,348
Capital value of annual payment to South Austrian Company	37,102,908
Long date Treasury warrants, law of July 7, 1901	1,416,200
Railway certificates (3·65% net), Art. 6 of law, June 25, 1905, No. 261	14,220,000
Total	£119,351,834
Part I.	£402,216,795
Grand Total	£521,568,629

The debt per head of population was, in 1905, £14, 16s. 3d., and the interest 13s. 5d.

In July 1906 the 5% gross (4% net), and 4% net rente were successfully converted into 3¾% stock (to be reduced to 3½% after five years), to a total amount of £324,017,393. The [illegible] for reimbursement at par represented a sum of only £187,588 and the market value of the stock was hardly affected; while the saving to the Treasury was to be £800,000 per annum for the first five years and about double the amount afterwards.

Currency.—The *lira* (plural *lire*) of 100 *centesimi* (centimes) is equal in value to the French franc. The total coinage (exclusive of Eritrean currency) from the 1st of January 1862 to the end of 1907 was 1,104,667,116 lire (exclusive of recoinage), divided as follows: gold, 427,516,970 lire; silver, 570,097,025 lire; nickel, 23,417,000 lire; bronze, 83,636,121 lire. The forced paper currency, instituted in 1866, was abolished in 1881, in which year were dissolved the Union of Banks of Issue created in 1874 to furnish to the state treasury a milliard of lire in notes, guaranteed collectively by the banks. Part of the Union notes were redeemed, part replaced by 10 lire and 5 lire state notes, payable at sight in metallic legal tender by certain state banks. Nevertheless the law of 1881 did not succeed in maintaining the value of the state notes at a par with the metallic currency, and from 1885 onwards there reappeared a gold premium, which during 1899 and 1900 remained at about 7%, but subsequently fell to about 3% and has since 1902 practically disappeared. The paper circulation to the debit of the state and the paper currency issued by the authorized state banks is shown below:—

Date.		Direct Liability of State.		[illegible]	[illegible]
		State Notes.	[illegible][1]		
		Lire.	Lire.	Lire.	Lire.
31st December	1881	[illegible]	..	[illegible]	[illegible]
"	[illegible]	[illegible]	..	[illegible]	[illegible]
"	[illegible]	[illegible]	.	[illegible]	[illegible]
"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
"	1899	[illegible]	[illegible]	[illegible]	[illegible]
"	1905	[illegible]	[illegible]	[illegible]	[illegible]

[1] These ceased to have legal currency at the end of 1901; they were notes of 1 and 2 lire.

Banks.—Until 1893 the juridical status of the Banks of Issue was regulated by the laws of the 30th of April 1874 on paper currency and of the 7th of April 1881 on the abolition of forced currency. At that time four limited companies were authorized to issue bank notes, namely, the National Bank, the National Bank of Tuscany, the Roman Bank and the Tuscan Credit Bank; and two banking corporations, the Bank of Naples and the Bank of Sicily. In 1893 the Roman Bank was put into liquidation, and the other three limited companies were fused, so as to create the Bank of Italy, the privilege of issuing bank notes being thenceforward confined to the Bank of Italy, the Bank of Naples and the Bank of Sicily. The gold reserve in the possession of the Banca d'Italia on September 30th 1907 amounted to £32,240,984, and the silver reserve to £4,767,861; the foreign treasury bonds, &c. amounted to £3,324,074, making the total reserve £40,332,919; while the circulation amounted to £54,612,234. The figures were on the 31st of December 1906:

	Paper Circulation.	Reserve.
Banca d'Italia	£47,504,352	[illegible]
Banca di Napoli	13,893,152	[illegible]
Banca di Sicilia	2,813,692	[illegible]
Total	£64,211,196	[illegible]

This is considerably in excess of the circulation, £40,404,000, fixed by royal decree of 1900; but the issue of additional notes was allowed, provided they were entirely covered by a metallic reserve, whereas up to the fixed limit a 40% reserve only was necessary. These notes are of 50, 100, 500 and 1000 lire; while the state issues notes for 5, 10 and 25 lire, the currency of these at the end of October 1906 being £17,546,967; with a total guarantee of £15,636,000 held against them. They were in January 1908 equal in value to the metallic currency of gold and silver.

The price of Italian consolidated 5% (gross, 4% net, allowing for the 20% income tax) stock, which is the security most largely negotiated abroad, and used in settling differences between large financial institutions, has steadily risen during recent years. After being depressed between 1885 and 1894, the prices in Italy and abroad reached, in 1899, on the Rome Stock Exchange, the average of 100·83 and of 94·8 on the Paris Bourse. By the end of 1901 the price of Italian stock on the Paris Bourse had, however, risen to par or thereabouts. The average price of Italian 4% in 1905 was 105·29; since the conversion to 3¾% net (to be further reduced to 3½ in five more years), the price has been about 103·5. Rates of exchange, or, in other words the gold premium, favoured Italy during the years immediately following the abolition of the forced currency in 1881. In 1885, however, rates tended to rise, and though they fell in 1886 they subsequently increased to such an extent as to reach 110% at the end of August 1894. For the next four years they continued low, but rose again in 1898 and 1899. In 1900 the maximum rate was 107·32, and the minimum 105·40, but in 1901 rates fell considerably, and were at par in 1902–1909.

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[1] For example, wheat, the price of which was in 1902 26 lire per cwt., pays a tax of 7½ lire; sugar pays four times its wholesale value in tax; coffee twice its wholesale value.

There are in Italy six clearing houses, namely, the ancient one at Leghorn, and those of Genoa, Milan, Rome, Florence and Turin, founded since 1882.

The number of ordinary banks, which diminished between 1889 and 1894, increased in the following years, and was 158 in 1898. At the same time the capital employed in banking decreased by nearly one-half, namely, from about £12,360,000 in 1880 to about £6,520,000 in 1898. This decrease was due to the liquidation of a number of large and small banks, amongst others the Bank of Genoa, the General Bank, and the Società di Credito Mobiliare Italiano of Rome, and the Genoa Discount Bank—establishments which alone represented £4,840,000 of paid-up capital. Ordinary credit operations are also carried on by the co-operative credit societies, of which there are some 700.

Agrarian Credit Banks.

Certain banks make a special business of lending money to owners of land or buildings (*credito fondiario*). Loans are repayable by instalments, and are guaranteed by first mortgages not greater in amount than half the value of the hypothecated property. The banks may buy up mortgages and advance money on current account on the security of land or buildings. The development of the large cities has induced these banks to turn their attention rather to building enterprise than to mortgages on rural property. The value of their land certificates or *cartelle fondiarie* (representing capital in circulation) rose from £10,420,000 in 1881 to £15,560,000 in 1886, and to £30,720,000 in 1891, but fell to £29,320,000 in 1896, to £27,360,000 in 1898, and to £24,360,000 in 1907; the amount of money lent increased from £10,440,000 in 1881 to £15,600,000 in 1886, and £30,800,000 in 1891, but fell to £29,320,000 in 1896, to £27,360,000 in 1899, and to £21,720,000 in 1907. The diminution was due to the law of the 10th of April 1893 upon the banks of issue, by which they were obliged to liquidate the loan and mortgage business they had previously carried on.

Various laws have been passed to facilitate agrarian credit. The law of the 23rd of January 1887 (still in force) extended the dispositions of the Civil Code with regard to "privileges,"[1] and established special "privileges" in regard to harvested produce, produce stored in barns and farm buildings, and in regard to agricultural implements. Loans on mortgage may also be granted to landowners and agricultural unions, with a view to the introduction of agricultural improvements. These loans are regulated by special disposition, and are guaranteed by a share of the increased value of the land after the improvements have been carried out. Agrarian credit banks may, with the permission of the government, issue *cartelle agrarie*, or agrarian bonds, repayable by instalments and bearing interest.

Internal Administration.—It was not till 1865 that the administrative unity of Italy was realized. Up to that year some of the regions of the kingdom, such as Tuscany, continued to have a kind of autonomy; but by the laws of the 20th of March the whole country was divided into 69 provinces and 8545 communes. The extent to which communal independence had been maintained in Italy through all the centuries of its political disintegration was strongly in its favour. The syndic (*sindaco*) or chief magistrate of the commune was appointed by the king for three years, and he was assisted by a "municipal junta."

Local government was modified by the law of the 10th of February 1889 and by posterior enactments. The syndics (or mayors) are now elected by a secret ballot of the communal council, though they are still government officials. In the provincial administrations the functions of the prefects have been curtailed. Each province has a prefect, responsible to and appointed by the Ministry of the Interior, while each of the regions (called variously *circondarii* and *distretti*) has its sub-prefect. Whereas the prefect was formerly *ex-officio* president of the provincial deputation or executive committee of the provincial council, his duties under the present law are reduced to mere participation in the management of provincial affairs, the president of the provincial deputation being chosen among and elected by the members of the deputation. The most important change introduced by the new law has been the creation in every province of a provincial administrative junta entrusted with the supervision of communal administrations, a function previously discharged by the provincial deputation. Each provincial administrative junta is composed, in part, of government nominees, and in larger part of elective elements, elected by the provincial council for four years, half of whom require to be elected every two years. The acts of communal administration requiring the sanction of the provincial administrative junta are chiefly financial. Both communal councils and prefects may appeal to the government against the decision of the provincial administrative juntas, the government being guided by the opinion of the Council of State. Besides possessing competence in regard to local government elections, which previously came within the jurisdiction of the provincial deputations, the provincial administrative juntas discharge magisterial functions in administrative affairs, and deal with appeals presented by private persons against acts of the communal and provincial administrations. The juntas are in this respect organs of the administrative jurisprudence created in Italy by the law of the 1st of May 1890, in order to provide juridical protection for those rights and interests outside the competence of the ordinary tribunals. The provincial council only meets once a year in ordinary session.

The former qualifications for electorship in local government elections have been modified, and it is now sufficient to pay five lire annually in direct taxes, five lire of certain communal taxes, or a certain rental (which varies according to the population of a commune), instead of being obliged to pay, as previously, at least five lire annually of direct taxes to the state. In consequence of this change the number of local electors increased by more than one-third between 1887–1889; it decreased, however, as a result of an extraordinary revision of the registers in 1894. The period for which both communal and provincial councils are elected is six years, one-half being renewed every three years.

The ratio of local electors to population is in Piedmont 79%, but in Sicily less than 45%. The ratio of voters to qualified electors tends to increase; it is highest in Campania, Basilicata and in the south generally; the lowest percentages are given by Emilia and Liguria.

Local finance.

Local finance is regulated by the communal and provincial law of May 1898, which instituted provincial administrative juntas, empowered to examine and sanction the acts of the communal financial administrations. The sanction of the provincial administrative junta is necessary for sales or purchases of property, alterations of rates (although in case of increase the junta can only act upon request of ratepayers paying an aggregate of one-twentieth of the local direct taxation), and expenditure affecting the communal budget for more than five years. The provincial administrative junta is, moreover, empowered to order "obligatory" expenditure, such as the upkeep of roads, sanitary works, lighting, police (*i.e.* the so-called "guardie di pubblica sicurezza," the "carabinieri" being really a military force; only the largest towns maintain a municipal police force), charities, education, &c., in case such expenditure is neglected by the communal authorities. The cost of fire brigades, infant asylums, evening and holiday schools, is classed as "optional" expenditure. Communal revenues are drawn from the proceeds of communal property, interest upon capital, taxes and local dues. The most important of the local dues is the gate tax, or *dazio di consumo*, which may be either a surtax upon commodities (such as alcoholic drinks or meat), having already paid customs duty at the frontier, in which case the local surtax may not exceed 50% of the frontier duty, or an exclusively communal duty limited to 10% on flour, bread and farinaceous products,[2] and to 20% upon other commodities. The taxes thus vary considerably in different towns.

In addition, the communes have a right to levy a surtax not exceeding 50% of the quota levied by the state upon lands and buildings; a family tax, or *fuocatico*, upon the total incomes of families, which, for fiscal purposes, are divided into various categories; a tax based upon the rent-value of houses, and other taxes upon cattle, horses, dogs, carriages and servants; also on licences for shopkeepers, hotel and restaurant keepers, &c.; on the slaughter of animals, stamp duties, one-half of the tax on bicycles, &c. Occasional sources of interest are found in the sale of communal property, the realization of communal credits, and the contraction of debt.

The provincial administrations are entrusted with the management of the affairs of the provinces in general, as distinguished from those of the communes. Their expenditure is likewise classed as "obligatory" and "optional." The former category comprises the maintenance of provincial roads, bridges and watercourse embankments; secondary education, whenever this is not provided for by private institutions or by the state (elementary education being maintained by the communes), and the maintenance of foundlings and pauper lunatics. "Optional" expenditure includes the cost of services of general public interest, though not strictly indispensable. Provincial revenues are drawn from provincial property, school taxes, tolls and surtaxes on land and buildings. The provincial surtaxes may not exceed 50% of the quotas levied by the state. In 1897 the total provincial revenue was £3,732,253, of which £3,460,000 was obtained from the surtax upon lands and buildings. Expenditure amounted to £3,768,888, of which the principal items were £760,000 for roads and bridges, £520,000 for lunatic asylums, £240,000 for foundling hospitals, £320,000 for interest on debt and £200,000 for police. Like communal revenue, provincial revenue has considerably increased since 1880, principally on account of the increase in the land and building surtax.

The Italian local authorities, communes and provinces alike, have considerably increased their indebtedness since 1882. The ratio of communal and provincial debt per inhabitant has grown from 30·79 lire (£1, 4s. 7½d.) to 43·70 lire (£1, 14s. 11d.), an increase due in great part to the need for improved buildings, hygienic reforms and education, but also attributable in part to the manner in which the finances of many communes are administered. The total was in 1900, £49,496,193 for the communes and £6,908,022 for the provinces. The former total is more than double and the latter more than treble the sum in 1873, while there is an increase of 62% in the former and 26% in the latter over the totals for 1882.

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[1] "Privileges" assure to creditors priority of claim in case of foreclosure for debt or mortgage. Prior to the law of the 23rd of January 1887 harvested produce and agricultural implements were legally exempt from "privilege."

[2] At the beginning of 1902 the Italian parliament sanctioned a bill providing for the abolition of municipal duties on bread and farinaceous products within three years of the promulgation of the bill on 1st July 1902.

See *Annuario statistico italiano* (not, however, issued regularly each year) for general statistics; and other official publications; W. Deecke, *Italy; a Popular Account of the Country, its People and its Institutions* (translated by H. A. Nesbitt, London, 1904); B. King and T. Okey, *Italy to-day* (London, 1901); E. Nathan, *Vent' Anni di vita italiana attraverso all' Annuario* (Rome, 1906); G. Strafforello, *Geografia dell' Italia* (Turin, 1890–1902). (T. As.)

History

The difficulty of Italian history lies in the fact that until modern times the Italians have had no political unity, no independence, no organized existence as a nation. Split up into numerous and mutually hostile communities, they never, through the fourteen centuries which have elapsed since the end of the old Western empire, shook off the yoke of foreigners completely; they never until lately learned to merge their local and conflicting interests in the common good of undivided Italy. Their history is therefore not the history of a single people, centralizing and absorbing its constituent elements by a process of continued evolution, but of a group of cognate populations, exemplifying divers types of constitutional developments.

The early history of Italy will be found under Rome and allied headings. The following account is therefore mainly concerned with the periods succeeding A.D. 476, when Romulus Augustulus was deposed by Odoacer. Prefixed to this are two sections dealing respectively with (A) the ethnographical and philological divisions of ancient Italy, and (B) the unification of the country under Augustus, the growth of the road system and so forth. The subsequent history is divided into five periods: (C) From 476 to 1796; (D) From 1796 to 1814; (E) From 1815 to 1870; (F) From 1870 to 1902; (G) From 1902 to 1910.

A. Ancient Languages and Peoples

The ethnography of ancient Italy is a very complicated and difficult subject, and notwithstanding the researches of modern scholars is still involved in some obscurity. The great beauty and fertility of the country, as well as the charm of its climate, undoubtedly attracted, even in early ages, successive swarms of invaders from the north, who sometimes drove out the previous occupants of the most favoured districts, at others reduced them to a state of serfdom, or settled down in the midst of them, until the two races gradually coalesced. Ancient writers are agreed as to the composite character of the population of Italy, and the diversity of races that were found within the limits of the peninsula. But unfortunately the traditions they have transmitted to us are often various and conflicting, while the only safe test of the affinities of nations, derived from the comparison of their languages, is to a great extent inapplicable, from the fact that the idioms that prevailed in Italy in and before the 5th century B.C. are preserved, if at all, only in a few scanty and fragmentary inscriptions, though from that date onwards we have now a very fair record of many of them (see, *e.g.* Latin Language, Osca Lingua, Iguvium, Volsci, Etruria: section *Language*, and below). These materials, imperfect as they are, when combined with the notices derived from ancient writers and the evidence of archaeological excavations, may be considered as having furnished some results of reasonable certainty.

It must be observed that the name "Italians" was at one time confined to the Oenotrians; indeed, according to Antiochus of Syracuse (*apud* Dion. Hal. *Ant. Rom.* ii. 1), the name of Italy was first still more limited, being applied only to the southern portion of the Bruttium peninsula (now known as Calabria). But in the time of that historian, as well as of Thucydides, the names of Oenotria and Italia, which appear to have been at that period regarded as synonymous, had been extended to include the shore of the Tarentine Gulf as far as Metapontum and from thence across to the gulfs of Laus and Posidonia on the Tyrrhenian Sea. It thus still comprised only the two provinces subsequently known as Lucania and Bruttium (see references *s.v.* "Italia" in R. S. Conway's *Italic Dialects*, p. 5). The name seems to be a Graecized form of an Italic *Vitelia*, from the stem *vitlo-*, "calf" (Lat. *vitulus*, Gr. ἰταλός), and perhaps to have meant "calf-land," "grazing-land"; but the origin is more certain than the meaning; the calf may be one of the many animals connected with Italian tribes (see Hirpini, Samnites).

Taking the term Italy to comprise the whole peninsula with the northern region as far as the Alps, we must first distinguish the tribe or tribes which spoke Indo-European languages from those who did not. To the latter category it is now possible to refer with certainty only the Etruscans (for the chronology and limits of their occupation of Italian soil see Etruria: section *Language*). Of all the other tribes that inhabited Italy down to the classical period, of whose speech there is any record (whether explicit or in the form of names and glosses), it is impossible to maintain that any one does not belong to the Indo-European group. Putting aside the Etruscan, and also the different Greek dialects of the Greek colonies, like Cumae, Neapolis, Tarentum, and proceeding from the south to the north, the different languages or dialects, of whose separate existence at some time between, say, 600 and 200 B.C., we can be sure, may be enumerated as follows: (1) Sicel, (2) South Oscan and Oscan, (3) Messapian, (4) North Oscan, (5) Volscian, (6) East Italic or "Sabellic," (7) Latinian, (8) Sabine, (9) Iguvine or "Umbrian," (10) Gallic, (11) Ligurian and (12) Venetic.

Between several of these dialects it is probable that closer affinities exist. (1) It is probable, though not very clearly demonstrated, that Venetic, East Italic and Messapian are connected together and with the ancient dialects spoken in Illyria (*q.v.*), so that these might be provisionally entitled the Adriatic group, to which the language spoken by the Eteocretes of the city of Praesos in Crete down to the 4th century B.C. was perhaps akin. (2) Too little is known of the Sicel language to make clear more than its Indo-European character. But it must be reckoned among the languages of Italy because of the well-supported tradition of the early existence of the Sicels in Latium (see Siculi). Their possible place in the earlier stratum of Indo-European population is discussed under Sabini. How far also the language or languages spoken in Bruttium and at certain points of Lucania, such as Anxia, differed from the Oscan of Samnium and Campania there is not enough evidence to show (see Bruttii). (3) It is doubtful whether there are any actual inscriptions which can be referred with certainty to the language of the Ligures, but some other evidence seems to link them with the *-CO-* peoples, whose early distribution is discussed under Volsci and Liguria. (4) It is difficult to point to any definite evidence by which we may determine the dates of the earliest appearance of Gallic tribes in the north of Italy. No satisfactory collection has been made of the Celtic inscriptions of Cisalpine Gaul, though many are scattered about in different museums. For our present purpose it is important to note that the archaeological stratification in deposits like those of Bologna shows that the Gallic period supervened upon the Etruscan. Until a scientific collection of the local and personal names of this district has been made, and until the archaeological evidence is clearly interpreted, it is impossible to go beyond the region of conjecture as to the tribe or tribes occupying the valley of the Po before the two invasions. It is clear, however, that the Celtic and Etruscan elements together occupied the greater part of the district between the Apennines and the Alps down to its Romanization, which took place gradually in the course of the 2nd century B.C. Their linguistic neighbours were Ligurian in the south and south-west, and the Veneti on the east.

We know from the Roman historians that a large force of Gauls came as far south as Rome in the year 390 B.C., and that some part of this horde settled in what was henceforward known as the *Ager Gallicus*, the easternmost strip of coast in what was later known as Umbria, including the towns of Caesēna, Ravenna and Arīminum. A bilingual inscription (Gallic and Latin) of the 2nd century B.C. was found as far south as Tuder, the modern Todi (*Italic Dialects*, ii. 528; Stokes, *Bezzenberger's Beiträge*, 11, p. 113).

(5) Turning now to the languages which constitute the Italic group in the narrower sense, (*a*) Oscan; (*b*) the dialect of Velitrae, commonly called Volscian; (*c*) Latinian (*i.e.* Latin and its nearest congeners, like Faliscan); and (*d*) Umbrian (or, as it may more safely be called, Iguvine), two principles of classification offer themselves, of which the first is purely linguistic, the second linguistic and topographical. Writers on the ethnology of Italy have been hitherto content with the first, namely, the broad distinction between the dialects which preserved the Indo-European velars (especially the breathed plosive *q*) as velars or back-palatals (gutturals), with or without the addition of a *w*-sound, and the dialects which converted the velars wholly into labials, for example, Latinian *quis* contrasted with Oscan, Volscian and Umbrian *pis* (see further LATIN LANGUAGE).

This distinction, however, takes us but a little way towards an historical grouping of the tribes, since the only Latinian dialects of which, besides Latin, we have inscriptions are Faliscan and Marsian (see FALISCI, MARSI); although the place-names of the Aequi (*q.v.*) suggest that they belong to the same group in this respect. Except, therefore, for a very small and apparently isolated area in the north of Latium and south of Etruria, all the tribes of Italy, though their idioms differed in certain particulars, are left undiscriminated. This presents a strong contrast to the evidence of tradition, which asserts very strongly (1) the identity of the Sabines and Samnites; (2) the conquest of an earlier population by this tribe; and which affords (3) clear evidence of the identity of the Sabines with the ruling class, *i.e.* the patricians, at Rome itself (see SABINI; and ROME. *Early History and Ethnology*).

Some clue to this enigma may perhaps be found in the second principle of classification proposed by the present writer at the Congresso Internationale di Scienze Storiche at Rome (*Atti del Congresso*, ii) in 1903. It was on that occasion pointed out that the ethnica or tribal and oppidan names of communities belonging to the Sabine stock were marked by the use of the suffix *-NO-* as in *Sabini*; and that there was some linguistic evidence that this stratum of population overcame an earlier population, which used, generally, ethnica in *-CO-* or *-TI-* (as in *Marruci*, *Ardeates*, transformed later into *Marrucini*, *Ardeatini*).

The validity of this distinction and its results are discussed under SABINI and VOLSCI, but it is well to state here its chief consequences.

1. Latin will be counted the language of the earlier plebeian stratum of the population of Rome and Latium, probably once spread over a large area of the peninsula, and akin in some degree to the language or languages spoken in north Italy before either the Etruscan or the Gallic invasions began.

2. It would follow, on the other hand, that what is called Oscan represented the language of the invading Sabines (more correctly Safines), whose racial affinities would seem to be of a distinctly more northern cast, and to mark them, like the Dorians or Achaeans in Greece, as an early wave of the invaders who more than once in later history have vitally influenced the fortunes of the tempting southern land into which they forced their way.

3. What is called Volscian, known only from the important inscription of the town of Velitrae, and what is called Umbrian, known from the famous Iguvine Tables with a few other records, would be regarded as Safine dialects, spoken by Safine communities who had become more or less isolated in the midst of the earlier and possibly partly Etruscanized populations, the result being that as early as the 4th century B.C. their language had suffered corruptions which it escaped both in the Samnite mountains and in the independent and self-contained community of Rome.

For fuller details the reader must be referred to the separate articles already mentioned, and to IGUVIUM, PICENUM, OSCA LINGUA, MARSI, AEQUI, SICULI and LIGURIA. Such archaeological evidence as can be connected with the linguistic data will there be discussed.

(R. S. C.)

B. CONSOLIDATION OF ITALY

We have seen that the name of Italy was originally applied only to the southernmost part of the peninsula, and was only gradually extended so as to comprise the central regions, such as Latium and Campania, which were designated by writers as late as Thucydides and Aristotle as in Opicia. The progress of this change cannot be followed in detail, but there can be little doubt that the extension of the Roman arms, and the gradual union of the nations of the peninsula under one dominant power, would contribute to the introduction, or rather would make the necessity felt, for the use of one general appellation. At first, indeed, the term was apparently confined to the regions of the central and southern districts, exclusive of Cisalpine Gaul and the whole tract north of the Apennines, and this continued to be the official or definite signification of the name down to the end of the republic. But the natural limits of Italy are so clearly marked that the name came to be generally employed as a geographical term at a much earlier period. Thus we already find Polybius repeatedly applying it in this wider signification to the whole country, as far as the foot of the Alps; and it is evident from many passages in the Latin writers that this was the familiar use of the term in the days of Cicero and Caesar. The official distinction was, however, still retained. Cisalpine Gaul, including the whole of northern Italy, still constituted a "province," an appellation never applied to Italy itself. As such it was assigned to Julius Caesar, together with Transalpine Gaul, and it was not till he crossed the Rubicon that he entered Italy in the strict sense of the term.

Augustus was the first who gave a definite administrative organization to Italy as a whole, and at the same time gave official sanction to that wider acceptation of the name which had already established itself in familiar usage, and which has continued to prevail ever since.

The division of Italy into eleven regions, instituted by Augustus for administrative purposes, which continued in official use till the reign of Constantine, was based mainly on the territorial divisions previously existing, and preserved with few exceptions the ancient limits.

The first region comprised Latium (in the more extended sense of the term, as including the land of the Volsci, Hernici and Aurunci), together with Campania and the district of the Picentini. It thus extended from the mouth of the Tiber to that of the Silarus (see LATIUM).

The second region included Apulia and Calabria (the name by which the Romans usually designated the district known to the Greeks as Messapia or Iapygia), together with the land of the Hirpini, which had usually been considered as a part of Samnium.

The third region contained Lucania and Bruttium; it was bounded on the west coast by the Silarus, on the east by the Bradanus.

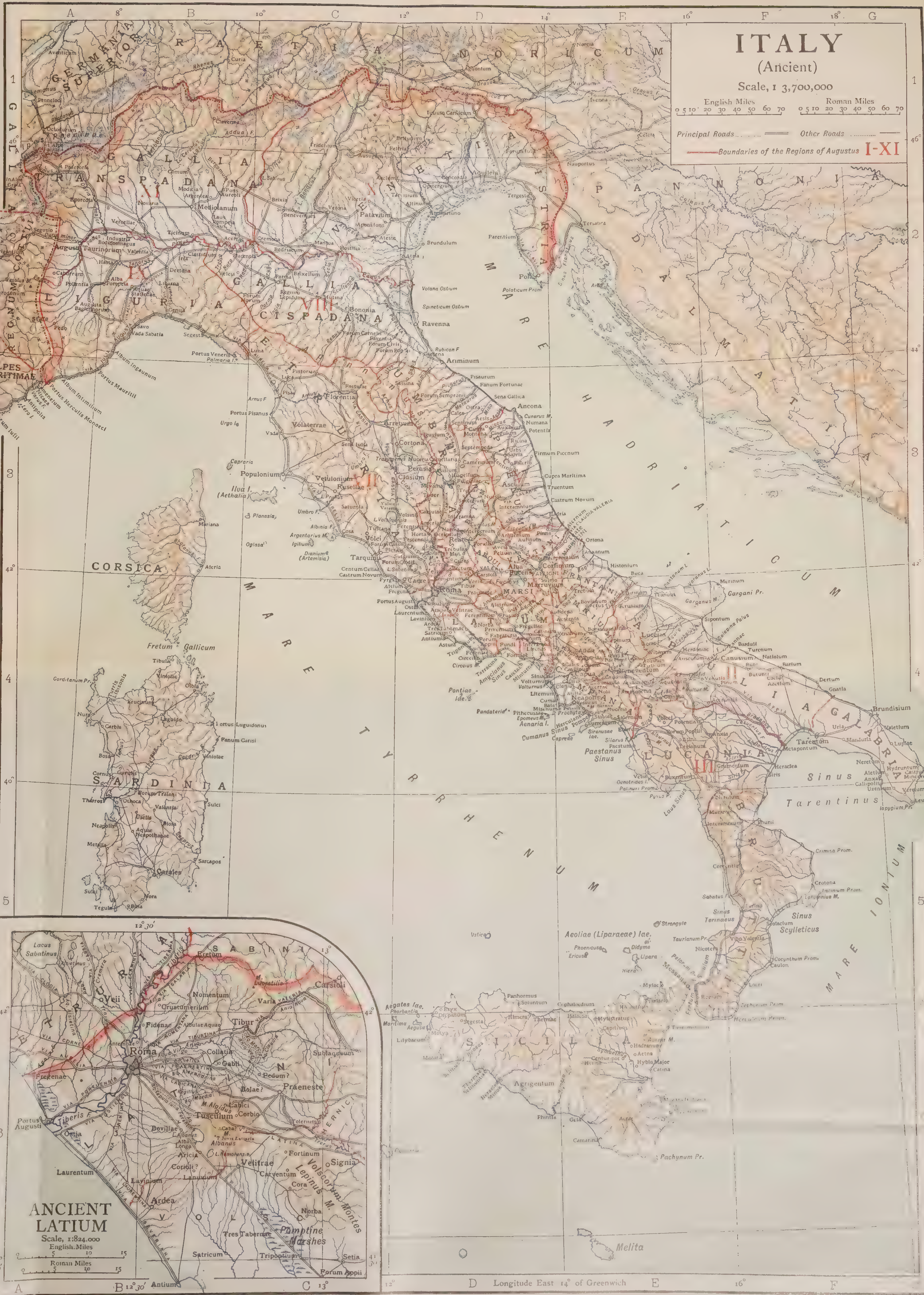
The fourth region comprised all the Samnites (except the Hirpini), together with the Sabines and the cognate tribes of the Frentani, Marrucini, Marsi, Peligni, Vestini and Aequiculi. It was separated from Apulia on the south by the river Tifernus, and from Picenum on the north by the Matrinus.

The fifth region was composed solely of Picenum, extending along the coast of the Adriatic from the mouth of the Matrinus to that of the Aesis, beyond Ancona.

The sixth region was formed by Umbria, in the more extended sense of the term, as including the Ager Gallicus, along the coast of the Adriatic from the Aesis to the Ariminus, and separated from Etruria on the west by the Tiber.

The seventh region consisted of Etruria, which preserved its ancient limits, extending from the Tiber to the Tyrrhenian Sea, and separated from Liguria on the north by the river Macra.

The eighth region, termed Gallia Cispadana, comprised the southern portion of Cisalpine Gaul, and was bounded on the north (as its name implied) by the river Padus or Po, from above Placentia to its mouth. It was separated from Etruria and Umbria by the main chain of the Apennines; and the river


ITALY
(Ancient)
Scale, 1 3,700,000
English Miles
Roman Miles
0 5 10 20 30 40 50 60 70
Principal Roads
Other Roads
Boundaries of the Regions of Augustus I-XI
RAETIA
NORICUM
GERMANIA SUPERIOR
GALLIA
PANNONIA
DALMATIA
ISTRIA
VENETIA
GALLIA TRANSPADANA
GALLIA CISPADANA
LIGURIA
ALPES MARITIMAE
REGNUM COTTII
ETRURIA
UMBRIA
PICENUM
SABINI
LATIUM
CAMPANIA
SAMNIUM
APULIA
CALABRIA
LUCANIA
BRUTTII
SICILIA
CORSICA
SARDINIA
MARE HADRIATICUM
MARE TYRRHENUM
MARE IONIUM
Sinus Tarentinus
Sinus Scylleticus
Paestanus Sinus
Fretum Gallicum
Aeoliae (Liparaeae) Ins.
Melita
Mediolanum
Augusta Taurinorum
Aquileia
Patavium
Ravenna
Bononia
Ariminum
Ancona
Florentia
Roma
Ostia
Capua
Neapolis
Beneventum
Tarentum
Brundisium
Corfinium
Populonium
Pisae
Luna
Genua
Arretium
Perusia
Clusium
Volaterrae
Tarquinii
Ilva I. (Aethalia)
Agrigentum
Pachynum Pr.
Longitude East 14° of Greenwich
ANCIENT LATIUM
Scale, 1:824,000
English Miles
Roman Miles
0 5 10 15
Roma
Veii
Fidenae
Tibur
Praeneste
Tusculum
Gabii
Aricia
Velitrae
Lanuvium
Lavinium
Ardea
Antium
Laurentum
Ostia
Portus Augusti
Fregenae
Nomentum
Signia
Norba
Cora
Setia
Forum Appii
Tres Tabernae
Pomptine Marshes
Volscorum Montes
Lacus Sabatinus
Carsioli
Eretum
Varia
Sublaqueum
HERNICI
VOLSCI
Emery Walker sc.

Ariminus was substituted for the far-famed Rubicon as its limit on the Adriatic.

The ninth region comprised Liguria, extending along the sea-coast from the Varus to the Macra, and inland as far as the river Padus, which constituted its northern boundary from its source in Mount Vesulus to its confluence with the Trebia just above Placentia.

The tenth region included Venetia from the Padus and Adriatic to the Alps, to which was annexed the neighbouring peninsula of Istria, and to the west the territory of the Cenomani, a Gaulish tribe, extending from the Athesis to the Addua, which had previously been regarded as a part of Gallia Cisalpina.

The eleventh region, known as Gallia Transpadana, included all the rest of Cisalpine Gaul from the Padus on the south and the Addua on the east to the foot of the Alps.

The arrangements thus established by Augustus continued almost unchanged till the time of Constantine, and formed the basis of all subsequent administrative divisions until the fall of the Western empire.

Roads.

The mainstay of the Roman military control of Italy first, and of the whole empire afterwards, was the splendid system of roads. As the supremacy of Rome extended itself over Italy, the Roman road system grew step by step, each fresh conquest being marked by the pushing forward of roads through the heart of the newly-won territory, and the establishment of fortresses in connexion with them. It was in Italy that the military value of a network of roads was first appreciated by the Romans, and the lesson stood them in good stead in the provinces. And it was for military reasons that from mere cart-tracks they were developed into permanent highways (T. Ashby, in *Papers of the British School at Rome*, i. 129). From Rome itself roads radiated in all directions. Communications with the south-east were mainly provided by the Via Appia (the "queen of Roman roads," as Statius called it) and the Via Latina, which met close to Casilinum, at the crossing of the Volturnus, 3 m. N.W. of Capua, the second city in Italy in the 3rd century B.C., and the centre of the road system of Campania. Here the Via Appia turned eastward towards Beneventum, while the Via Popilia continued in a south-easterly direction through the Campanian plain and thence southwards through the mountains of Lucania and Bruttii as far as Rhegium. Coast roads of minor importance as means of through communication also existed on both sides of the "toe" of the boot. Other roads ran south from Capua to Cumae, Puteoli (the most important harbour of Campania), and Neapolis, which could also be reached by a coast road from Minturnae on the Via Appia. From Beneventum, another important road centre, the Via Appia itself ran south-east through the mountains past Venusia to Tarentum on the south-west coast of the "heel," and thence across Calabria to Brundusium, while Trajan's correction of it, following an older mule-track, ran north-east through the mountains and then through the lower ground of Apulia, reaching the coast at Barium. Both met at Brundusium, the principal port for the East. From Aequum Tuticum, on the Via Traiana, the Via Herculia ran to the south-east, crossing the older Via Appia, then south to Potentia and so on to join the Via Popilia in the centre of Lucania.

The only highroad of importance which left Rome and ran eastwards, the Via Valeria, was not completed as far as the Adriatic before the time of Claudius; but on the north and north-west started the main highways which communicated with central and northern Italy, and with all that part of the Roman empire which was accessible by land. The Via Salaria, a very ancient road, with its branch, the Via Caecilia, ran north-eastwards to the Adriatic coast and so also did the Via Flaminia, which reached the coast at Fanum Fortunae, and thence followed it to Ariminum. The road along the east coast from Fanum Fortunae down to Barium, which connected the terminations of the Via Salaria and Via Valeria, and of other roads farther south crossing from Campania, had no special name in ancient times, as far as we know. The Via Flaminia was the earliest and most important road to the north; and it was soon extended (in 187 B.C.) by the Via Aemilia running through Bononia as far as Placentia, in an almost absolutely straight line between the plain of the Po and the foot of the Apennines. In the same year a road was constructed over the Apennines from Bononia to Arretium, but it is difficult to suppose that it was not until later that the Via Cassia was made, giving a direct communication between Arretium and Rome. The Via Clodia was an alternative route to the Cassia for the first portion out of Rome, a branch having been built at the same time from Florentia to Lucca and Luna. Along the west coast the Via Aurelia ran up to Pisa and was continued by another Via Aemilia to Genoa. Thence the Via Postumia led to Dertona, Placentia and Cremona, while the Via Aemilia and the Via Julia Augusta continued along the coast into Gallia Narbonensis.

The road system of Cisalpine Gaul was mainly conditioned by the rivers which had to be crossed, and the Alpine passes which had to be approached.

Cremona, on the north bank of the Po, was an important meeting point of roads and Hostilia (Ostiglia) another; so also was Patavium, farther east, and Altinum and Aquileia farther east still. Roads, indeed, were almost as plentiful as railways at the present day in the basin of the Po.

As to the roads leading out of Italy, from Aquileia roads diverged northward into Raetia, eastward to Noricum and Pannonia, and southwards to the Istrian and Dalmatian coasts. Farther west came the roads over the higher Alpine passes—the Brenner from Verona, the Septimer and the Splügen from Clavenna (Chiavenna), the Great and the Little St Bernard from Augusta Praetoria (Aosta), and the Mont Genèvre from Augusta Taurinorum (Turin).

Westward two short but important roads led on each side of the Tiber to the great harbour at its mouth; while the coast of Latium was supplied with a coast road by Septimius Severus. To the south-west the roads were short and of little importance.

On ancient Italian geography in general see articles in Pauly-Wissowa, *Realencyclopädie* (1899, , sqq.); *Corpus inscriptionum Latinarum* (Berlin, 1862 sqq.); G. Strafforello, *Geografia dell' Italia* (Turin, 1890–1892); H. Nissen, *Italische Landeskunde* (Berlin, 1883–1902); also references in articles ROME, LATIUM, &c. (T. As.)

C. FROM 476 to 1796

The year 476 opened a new age for the Italian people. Odoacer, a chief of the Herulians, deposed Romulus, the last Augustus of the West, and placed the peninsula beneath the titular sway of the Byzantine emperors. At Pavia the barbarian conquerors of Italy proclaimed him king, and he received from Zeno the dignity of Roman patrician. Thus began that system of mixed government, Teutonic and Roman, which, in the absence of a national monarch, impressed the institutions of new Italy from the earliest date with dualism. The same revolution vested supreme authority in a non-resident and inefficient autocrat, whose title gave him the right to interfere in Italian affairs, but who lacked the power and will to rule the people for his own or their advantage. Odoacer inaugurated that long series of foreign rulers—Greeks, Franks, Germans, Spaniards and Austrians—who have successively contributed to the misgovernment of Italy from distant seats of empire.

I. *Gothic and Lombard Kingdoms.*—In 488 Theodoric, king of the East Goths, received commission from the Greek emperor, Zeno, to undertake the affairs of Italy. He defeated Odoacer, drove him to Ravenna, besieged him there, and in 493 completed the conquest of the country by murdering the Herulian chief with his own hand. Theodoric respected the Roman institutions which he found in Italy, held the Eternal City sacred, and governed by ministers chosen from the Roman population. He settled at Ravenna, which had been the capital of Italy since the days of Honorius, and which still testifies by its monuments to the Gothic chieftain's Romanizing policy. Those who believe that the Italians would have gained strength by unification in a single monarchy must regret that this Gothic kingdom lacked the elements of stability. The Goths, except in the valley of the Po, resembled an army of occupation rather than a people numerous enough to blend with the Italic stock. Though their rule was favourable to the Romans, they were Arians; and religious differences, combined with the pride and jealousies of a nation accustomed to imperial honours, rendered the inhabitants of Italy eager to throw off their yoke. When, therefore, Justinian undertook the reconquest of Italy, his generals, Belisarius and Narses, were supported by the south. The struggle of the Greeks and the Goths was carried on for fourteen years, between 539 and 553, when Teias, the last Gothic king, was finally defeated in a bloody battle near Vesuvius. At its close the provinces of Italy were placed beneath Greek dukes, controlled by a governor-general, entitled exarch, who ruled in the Byzantine emperor's name at Ravenna.

The Lombards.

This new settlement lasted but a few years. Narses had employed Lombard auxiliaries in his campaigns against the Goths; and when he was recalled by an insulting message from the empress in 565, he is said to have invited this fiercest and rudest of the Teutonic clans to seize the spoils of Italy. Be this as it may, the Lombards, their ranks swelled by the Gepidae, whom they had lately conquered, and by the wrecks of other barbarian tribes, passed southward under their king Alboin in 568. The Herulian invaders had been but a band of adventurers; the Goths were an army; the Lombards, far more formidable, were a nation in movement. Pavia offered stubborn resistance; but after a three years' siege it was taken, and Alboin made it the capital of his new kingdom.

In order to understand the future history of Italy, it is necessary to form a clear conception of the method pursued by the Lombards in their conquest. Penetrating the peninsula, and advancing like a glacier or half-liquid stream of mud, they occupied the valley of the Po, and moved slowly downward through the centre of the country. Numerous as they were compared with their Gothic predecessors, they had not strength or multitude enough to occupy the whole peninsula. Venice, which since the days of Attila had offered an asylum to Roman refugees from the northern cities, was left untouched. So was Genoa with its Riviera. Ravenna, entrenched within her lagoons, remained a Greek city. Rome, protected by invincible prestige, escaped. The sea-coast cities of the south, and the islands, Sicily, Sardinia and Corsica, preserved their independence. Thus the Lombards neither occupied the extremities nor subjugated the brain-centre of the country. The strength of Alboin's kingdom was in the north; his capital, Pavia. As his people pressed southward, they omitted to possess themselves of the coasts; and what was worse for the future of these conquerors, the original impetus of the invasion was checked by the untimely murder of Alboin in 573. After this event, the semi-independent chiefs of the Lombard tribe, who borrowed the title of dukes from their Roman predecessors, seem to have been contented with consolidating their power in the districts each had occupied. The duchies of Spoleto in the centre, and of Benevento in the south, inserted wedge-like into the middle of the peninsula, and enclosing independent Rome, were but loosely united to the kingdom at Pavia. Italy was broken up into districts, each offering points for attack from without, and fostering the seeds of internal revolution. Three separate capitals must be discriminated—Pavia, the seat of the new Lombard kingdom; Ravenna, the garrison city of the Byzantine emperor; and Rome, the rallying point of the old nation, where the successor of St Peter was already beginning to assume that national protectorate which proved so influential in the future.

It is not necessary to write the history of the Lombard kingdom in detail. Suffice it to say that the rule of the Lombards proved at first far more oppressive to the native population, and was less intelligent of their old customs, than that of the Goths had been. Wherever the Lombards had the upper hand, they placed the country under military rule, resembling in its general character what we now know as the feudal system. Though there is reason to suppose that the Roman laws were still administered within the cities, yet the Lombard code was that of the kingdom; and the Lombards being Arians, they added the oppression of religious intolerance to that of martial despotism and barbarous cupidity. The Italians were reduced to the last extremity when Gregory the Great (590–604), having strengthened his position by diplomatic relations with the duchy of Spoleto, and brought about the conversion of the Lombards to orthodoxy, raised the cause of the remaining Roman population throughout Italy. The fruit of his policy, which made of Rome a counterpoise against the effete empire of the Greeks upon the one hand and against the pressure of the feudal kingdom on the other, was seen in the succeeding century. When Leo the Isaurian published his decrees against the worship of images in 726, Gregory II. allied himself with Liudprand, the Lombard king, threw off allegiance to Byzantium, and established the autonomy of Rome. This pope initiated the dangerous policy of playing one hostile force off against another with a view to securing independence. He used the Lombards in his struggle with the Greeks, leaving to his successors the duty of checking these unnatural allies. This was accomplished by calling the Franks in against the Lombards. Liudprand pressed hard, not only upon the Greek dominions of the exarchate, but also upon Rome. His successors, Rachis and Aistolf, attempted to follow the same game of conquest. But the popes, Gregory III., Zachary and Stephen II., determining at any cost to espouse the national cause and to aggrandize their own office, continued to rely upon the Franks. Pippin twice crossed the Alps, and forced Aistolf to relinquish his acquisitions, including Ravenna, Pentapolis, the coast towns of Romagna and some cities in the duchy of Spoleto. These he handed over to the pope of Rome. This donation of Pippin in 756 confirmed the papal see in the protectorate of the Italic party, and conferred upon it sovereign rights. The virtual outcome of the contest carried on by Rome since the year 726 with Byzantium and Pavia was to place the popes in the position held by the Greek exarch, and to confirm the limitation of the Lombard kingdom. We must, however, be cautious to remember that the south of Italy was comparatively unaffected. The dukes of the Greek empire and the Lombard dukes of Benevento, together with a few autonomous commercial cities, still divided Italy below the Campagna of Rome (see LOMBARDS).

Charles the Great and the Carolingians.

II. *Frankish Emperors.*—The Franko-Papal alliance, which conferred a crown on Pippin and sovereign rights upon the see of Rome, held within itself that ideal of mutually supporting papacy and empire which exercised so powerful an influence in medieval history. When Charles the Great (Charlemagne) deposed his father-in-law Desiderius, the last Lombard king, in 774, and when he received the circlet of the empire from Leo III. at Rome in 800, he did but complete and ratify the compact offered to his grandfather, Charles Martel, by Gregory III. The relations between the new emperor and the pope were ill defined; and this proved the source of infinite disasters to Italy and Europe in the sequel. But for the moment each seemed necessary to the other; and that sufficed. Charles took possession of the kingdom of Italy, as limited by Pippin's settlement. The pope was confirmed in his rectorship of the cities ceded by Aistolf, with the further understanding, tacit rather than expressed, that, even as he had wrung these provinces for the Italic people from both Greeks and Lombards, so in the future he might claim the protectorate of such portions of Italy, external to the kingdom, as he should be able to acquire. This, at any rate, seems to be the meaning of that obscure re-settlement of the peninsula which Charles effected. The kingdom of Italy, transmitted on his death by Charles the Great, and afterwards confirmed to his grandson Lothar by the peace of Verdun in 843, stretched from the Alps to Terracina. The duchy of Benevento remained tributary, but independent. The cities of Gaeta and Naples, Sicily and the so-called Theme of Lombardy in South Apulia and Calabria, still recognized the Byzantine emperor. Venice stood aloof, professing a nominal allegiance to the East. The parcels into which the Lombards had divided the peninsula remained thus virtually unaltered, except for the new authority acquired by the see of Rome.

Internally Charles left the affairs of the Italian kingdom much as he found them, except that he appears to have pursued the policy of breaking up the larger fiefs of the Lombards, substituting counts for their dukes, and adding to the privileges of the bishops. We may reckon these measures among the earliest advantages extended to the cities, which still contained the bulk of the old Roman population, and which were destined to intervene with decisive effect two centuries later in Italian history. It should also here be noticed that the changes introduced into the holding of the fiefs, whether by altering their boundaries or substituting Frankish for Lombard vassals, were chief among the causes why the feudal system took no permanent hold in Italy. Feudalism was not at any time a national institution. The hierarchy of dukes and marquises and counts consisted of foreign soldiers imposed on the indigenous inhabitants; and the rapid succession of conquerors, Lombards, Franks and Germans following each other at no long interval, and each endeavouring to weaken the remaining strength of his predecessor, prevented this alien hierarchy from acquiring fixity by permanence of tenure. Among the many miseries inflicted upon Italy by the frequent changes of her northern rulers, this at least may be reckoned a blessing.

Frankish and Italian kings.

The Italians acknowledged eight kings of the house of Charles the Great, ending in Charles the Fat, who was deposed in 888. After them followed ten sovereigns, some of whom have been misnamed Italians by writers too eager to catch at any resemblance of national glory for a people passive in the hands of foreign masters. The truth is that no period in Italian history was less really glorious than that which came to a close in 961 by Berengar II.'s cession of his rights to Otto the Great. It was a period marked in the first place by the conquests of the Saracens, who began to occupy Sicily early in the 9th century, overran Calabria and Apulia, took Bari and threatened Rome. In the second place it was marked by a restoration of the Greeks to power. In 890 they established themselves again at Bari, and ruled the Theme of Lombardy by means of an officer entitled Catapan. In the third place it was marked by a decline of good government in Rome. Early in the 10th century the papacy fell into the hands of a noble family, known eventually as the counts of Tusculum, who almost succeeded in rendering the office hereditary, and in uniting the civil and ecclesiastical functions of the city under a single member of their house. It is not necessary to relate the scandals of Marozia's and Theodora's female reign, the infamies of John XII. or the intrigues which tended to convert Rome into a duchy. The most important fact for the historian of Italy to notice is that during this time the popes abandoned, not only their high duties as chiefs of Christendom, but also their protectorate of Italian liberties. A fourth humiliating episode in this period was the invasion of the Magyar barbarians, who overran the north of Italy, and reduced its fairest provinces to the condition of a wilderness. Anarchy and misery are indeed the main features of that long space of time which elapsed between the death of Charles the Great and the descent of Otto. Through the almost impenetrable darkness and confusion we only discern this much, that Italy was powerless to constitute herself a nation.

The discords which followed on the break-up of the Carolingian power, and the weakness of the so-called Italian emperors, who were unable to control the feudatories (marquises of Ivrea and Tuscany, dukes of Friuli and Spoleto), from whose ranks they sprang, exposed Italy to ever-increasing misrule. The country by this time had become thickly covered over with castles, the seats of greater or lesser nobles, all of whom were eager to detach themselves from strict allegiance to the "Regno." The cities, exposed to pillage by Huns in the north and Saracens in the south, and ravaged on the coast by Norse pirates, asserted their right to enclose themselves with walls, and taught their burghers the use of arms. Within the circuit of their ramparts, the bishops already began to exercise authority in rivalry with the counts, to whom, since the days of Theodoric, had been entrusted the government of the Italian burghs. Agreeably to feudal customs, these nobles, as they grew in power, retired from the town, and built themselves fortresses on points of vantage in the neighbourhood. Thus the titular king of Italy found himself simultaneously at war with those great vassals who had chosen him from their own class, with the turbulent factions of the Roman aristocracy, with unruly bishops in the growing cities and with the multitude of minor counts and barons who occupied the open lands, and who changed sides according to the interests of the moment. The last king of the quasi-Italian succession, Berengar II., marquis of Ivrea (951–961), made a vigorous effort to restore the authority of the regno; and had he succeeded, it is not impossible that now at the last moment Italy might have become an independent nation. But this attempt at unification was reckoned to Berengar for a crime. He only won the hatred of all classes, and was represented by the obscure annalists of that period as an oppressor of the church and a remorseless tyrant. In Italy, divided between feudal nobles and almost hereditary ecclesiastics, of foreign blood and alien sympathies, there was no national feeling. Berengar stood alone against a multitude, unanimous in their intolerance of discipline. His predecessor in the kingdom, Lothar, had left a young and beautiful widow, Adelheid. Berengar imprisoned her upon the Lake of Como, and threatened her with a forced marriage to his son Adalbert. She escaped to the castle of Canossa, where the great count of Tuscany espoused her cause, and appealed in her behalf to Otto the Saxon. The king of Germany descended into Italy, and took Adelheid in marriage. After this episode Berengar was more discredited and impotent than ever. In the extremity of his fortunes he had recourse himself to Otto, making a formal cession of the Italian kingdom, in his own name and that of his son Adalbert, to the Saxon as his overlord. By this slender tie the crown of Italy was joined to that of Germany; and the formal right of the elected king of Germany to be considered king of Italy and emperor may be held to have accrued from this epoch.

Saxon and Franconian emperors.

III. *The German Emperors.*—Berengar gained nothing by his act of obedience to Otto. The great Italian nobles, in their turn, appealed to Germany. Otto entered Lombardy in 961, deposed Berengar, assumed the crown in San Ambrogio at Milan, and in 962 was proclaimed emperor by John XII. at Rome. Henceforward Italy changed masters according as one or other of the German families assumed supremacy beyond the Alps. It is one of the strongest instances furnished by history of the fascination exercised by an idea that the Italians themselves should have grown to glory in this dependence of their nation upon Caesars who had nothing but a name in common with the Roman Imperator of the past.

The first thing we have to notice in this revolution which placed Otto the Great upon the imperial throne is that the Italian kingdom, founded by the Lombards, recognized by the Franks and recently claimed by eminent Italian feudatories, virtually ceased to exist. It was merged in the German kingdom; and, since for the German princes Germany was of necessity their first care, Italy from this time forward began to be left more and more to herself. The central authority of Pavia had always been weak; the regno had proved insufficient to combine the nation. But now even that shadow of union disappeared, and the Italians were abandoned to the slowly working influences which tended to divide them into separate states. The most brilliant period of their chequered history, the period which includes the rise of communes, the exchange of municipal liberty for despotism and the gradual discrimination of the five great powers (Milan, Venice, Florence, the Papacy and the kingdom of Naples), now begins. Among the centrifugal forces which determined the future of the Italian race must be reckoned, first and foremost, the new spirit of municipal independence. We have seen how the cities enclosed themselves with walls, and how the bishops defined their authority against that of the counts. Otto encouraged this revolution by placing the enclosures of the chief burghs beyond the jurisdiction of the counts. Within those precincts the bishops and the citizens were independent of all feudal masters but the emperor. He further broke the power of the great vassals by redivisions of their feuds, and by the creation of new marches which he assigned to his German followers. In this way, owing to the dislocation of the ancient aristocracy, to the enlarged jurisdiction of a power so democratic as the episcopate, and to the increased privileges of the burghs, feudalism received a powerful check in Italy. The Italian people, that people which gave to the world the commerce and the arts of Florence, was not indeed as yet apparent. But the conditions under which it could arise, casting from itself all foreign and feudal trammels, recognizing its true past in ancient Rome, and reconstructing a civility out of the ruins of those glorious memories, were now at last granted. The nobles from this time forward retired into the country and the mountains, fortified themselves in strong places outside the cities, and gave their best attention to fostering the rural population. Within the cities and upon the open lands the Italians, in this and the next century, doubled, trebled and quadrupled their numbers. A race was formed strong enough to keep the empire itself in check, strong enough, except for its own internecine contests, to have formed a nation equal to its happier neighbours.

The recent scandals of the papacy induced Otto to deprive the Romans of their right to elect popes. But when he died in 973, his son Otto II. (married to Theophano of the imperial Byzantine house) and his grandson, Otto III., who descended into Italy in 996, found that the affairs of Rome and of the southern provinces were more than even their imperial powers could cope with. The faction of the counts of Tusculum raised its head from time to time in the Eternal City, and Rome still claimed to be a commonwealth. Otto III.'s untimely death in 1002 introduced new discords. Rome fell once more into the hands of her nobles. The Lombards chose Ardoin, marquis of Ivrea, for king, and Pavia supported his claims against those of Henry of Bavaria, who had been elected in Germany. Milan sided with Henry; and this is perhaps the first eminent instance of cities being reckoned powerful allies in the Italian disputes of sovereigns. It is also the first instance of that bitter feud between the two great capitals of Lombardy, a feud rooted in ancient antipathies between the Roman population of Mediolanum and the Lombard garrison of Alboin's successors, which proved so disastrous to the national cause. Ardoin retired to a monastery, where he died in 1015. Henry nearly destroyed Pavia, was crowned in Rome and died in 1024. After this event Heribert, the archbishop of Milan, invited Conrad, the Franconian king of Germany, into Italy, and crowned him with the iron crown of the kingdom.

Heribert and the Lombard burghs.

The intervention of this man, Heribert, compels us to turn a closer glance upon the cities of North Italy. It is here, at the present epoch and for the next two centuries, that the pith and nerve of the Italian nation must be sought; and among the burghs of Lombardy, Milan, the eldest daughter of ancient Rome, assumes the lead. In Milan we hear for the first time the word *Comune*. In Milan the citizens first form themselves into a *Parlamento*. In Milan the archbishop organizes the hitherto voiceless, defenceless population into a community capable of expressing its needs, and an army ready to maintain its rights. To Heribert is attributed the invention of the *Carroccio*, which played so singular and important a part in the warfare of Italian cities. A huge car drawn by oxen, bearing the standard of the burgh, and carrying an altar with the host, this carroccio, like the ark of the Israelites, formed a rallying point in battle, and reminded the armed artisans that they had a city and a church to fight for. That Heribert's device proved effectual in raising the spirit of his burghers, and consolidating them into a formidable band of warriors, is shown by the fact that it was speedily adopted in all the free cities. It must not, however, be supposed that at this epoch the liberties of the burghs were fully developed. The mass of the people remained unrepresented in the government; and even if the consuls existed in the days of Heribert, they were but humble legal officers, transacting business for their constituents in the courts of the bishop and his viscount. It still needed nearly a century of struggle to render the burghers independent of lordship, with a fully organized commune, self-governed in its several assemblies. While making these reservations, it is at the same time right to observe that certain Italian communities were more advanced upon the path of independence than others. This is specially the case with the maritime ports. Not to mention Venice, which has not yet entered the Italian community, and remains a Greek free city, Genoa and Pisa were rapidly rising into ill-defined autonomy. Their command of fleets gave them incontestable advantages, as when, for instance, Otto II. employed the Pisans in 980 against the Greeks in Lower Italy, and the Pisans and Genoese together attacked the Saracens of Sardinia in 1017. Still, speaking generally, the age of independence for the burghs had only begun when Heribert from Milan undertook the earliest organization of a force that was to become paramount in peace and war.

Rome.

Next to Milan, and from the point of view of general politics even more than Milan, Rome now claims attention. The destinies of Italy depended upon the character which the see of St Peter should assume. Even the liberties of her republics in the north hung on the issue of a contest which in the 11th and 12th centuries shook Europe to its farthest boundaries. So fatally were the internal affairs of that magnificent but unhappy country bound up with concerns which brought the forces of the civilized world into play. Her ancient prestige, her geographical position and the intellectual primacy of her most noble children rendered Italy the battleground of principles that set all Christendom in motion, and by the clash of which she found herself for ever afterwards divided. During the reign of Conrad II., the party of the counts of Tusculum revived in Rome; and Crescentius, claiming the title of consul in the imperial city, sought once more to control the election of the popes. When Henry III., the son of Conrad, entered Italy in 1046, he found three popes in Rome. These he abolished, and, taking the appointment into his own hands, gave German bishops to the see. The policy thus initiated upon the precedent laid down by Otto the Great was a remedy for pressing evils. It saved Rome from becoming a duchy in the hands of the Tusculum house. But it neither raised the prestige of the papacy, nor could it satisfy the Italians, who rightly regarded the Roman see as theirs. These German popes were short-lived and inefficient. Their appointment, according to notions which defined themselves within the church at this epoch, was simoniacal; and during the long minority of Henry IV., who succeeded his father in 1056, the terrible Tuscan monk, Hildebrand of Soana, forged weapons which he used with deadly effect against the presumption of the empire. The condition of the church seemed desperate, unless it could be purged of crying scandals—of the subjection of the papacy to the great Roman nobles, of its subordination to the German emperor and of its internal demoralization. It was Hildebrand's policy throughout three papacies, during which he controlled the counsels of the Vatican, and before he himself assumed the tiara, to prepare the mind of Italy and Europe for a mighty change. His programme included these three points: (1) the celibacy of the clergy; (2) the abolition of ecclesiastical appointments made by the secular authority; (3) the vesting of the papal election in the hands of the Roman clergy and people, presided over by the curia of cardinals. How Hildebrand paved the way for these reforms during the pontificates of Nicholas II. and Alexander II., how he succeeded in raising the papal office from the depths of degradation and subjection to illimitable sway over the minds of men in Europe, and how his warfare with the empire established on a solid basis the still doubtful independence of the Italian burghs, renewing the long neglected protectorate of the Italian race, and bequeathing to his successors a national policy which had been forgotten by the popes since his great predecessor Gregory II., forms a chapter in European history which must now be interrupted. We have to follow the fortunes of unexpected allies, upon whom in no small measure his success depended.

In order to maintain some thread of continuity through the perplexed and tangled vicissitudes of the Italian race, it has been necessary to disregard those provinces which did not immediately contribute to the formation of its history. For this reason we have left the whole of the south up to the present point unnoticed. Sicily in the hands of the Mussulmans, the Theme of Lombardy abandoned to the weak suzerainty of the Greek catapans, the Lombard duchy of Benevento slowly falling to pieces and the maritime republics of Naples, Gaeta and Amalfi extending their influence by commerce in the Mediterranean, were in effect detached from the Italian regno, beyond the jurisdiction of Rome, included in no parcel of Italy proper. But now the moment had arrived when this vast group of provinces, forming the future kingdom of the Two Sicilies, was about to enter definitely and decisively within the bounds of the Italian community. Some Norman adventurers, on pilgrimage to St Michael's shrine on Monte Gargano, lent their swords in 1017 to the Lombard cities of Apulia against the Greeks. Twelve years later we find the Normans settled at Aversa under their Count Rainulf. From this station as a centre the little band of adventurers, playing the Greeks off against the Lombards, and the Lombards against the Greeks, spread their power in all directions, until they made themselves the most considerable force in southern Italy. William of Hauteville was proclaimed count of Apulia. His half-brother, Robert Wiskard or Guiscard, after defeating the papal troops at Civitella in 1053, received from Leo IX. the investiture of all present and future conquests in Apulia, Calabria and Sicily, which he agreed to hold as fiefs of the Holy See. Nicholas II. ratified this grant, and confirmed the title of count. Having consolidated their possessions on the mainland, the Normans, under Robert Guiscard's brother, the great Count Roger, undertook the conquest of Sicily in 1060. After a prolonged struggle of thirty years, they wrested the whole island from the Saracens; and Roger, dying in 1101, bequeathed to his son Roger a kingdom in Calabria and Sicily second to none in Europe for wealth and magnificence. This, while the elder branch of the Hauteville family still held the title and domains of the Apulian duchy; but in 1127, upon the death of his cousin Duke William, Roger united the whole of the future realm. In 1130 he assumed the style of king of Sicily, inscribing upon his sword the famous hexameter—

Norman conquest of the Two Sicilies.

> "Appulus et Calaber Siculus mihi servit et Afer."

This Norman conquest of the two Sicilies forms the most romantic episode in medieval Italian history. By the consolidation of Apulia, Calabria and Sicily into a powerful kingdom, by checking the growth of the maritime republics and by recognizing the over-lordship of the papal see, the house of Hauteville influenced the destinies of Italy with more effect than any of the princes who had previously dealt with any portion of the peninsula. Their kingdom, though Naples was from time to time separated from Sicily, never quite lost the cohesion they had given it; and all the disturbances of equilibrium in Italy were due in after days to papal manipulation of the rights acquired by Robert Guiscard's act of homage. The southern *regno*, in the hands of the popes, proved an insurmountable obstacle to the unification of Italy, led to French interference in Italian affairs, introduced the Spaniard and maintained in these rich southern provinces the reality of feudal sovereignty long after this alien element had been eliminated from the rest of Italy (see NORMANS; SICILY: *History*).

For the sake of clearness, we have anticipated the course of events by nearly a century. We must now return to the date of Hildebrand's elevation to the papacy in 1073, when he chose the memorable name of Gregory VII. In the next year after his election Hildebrand convened a council, and passed measures enforcing the celibacy of the clergy. In 1075 he caused the investiture of ecclesiastical dignitaries by secular potentates of any degree to be condemned. These two reforms, striking at the most cherished privileges and most deeply-rooted self-indulgences of the aristocratic caste in Europe, inflamed the bitterest hostility. Henry IV., king of Germany, but not crowned emperor, convened a diet in the following year at Worms, where Gregory was deposed and excommunicated. The pope retorted with a counter excommunication, far more formidable, releasing the king's subjects from their oaths of allegiance. War was thus declared between the two chiefs of western Christendom: that war of investitures which out-lasted the lives of both Gregory and Henry, and was not terminated till the year 1122. The dramatic episodes of this struggle are too well known to be enlarged upon. In his single-handed duel with the strength of Germany, Gregory received material assistance from the Countess Matilda of Tuscany. She was the last heiress of the great house of Canossa, whose fiefs stretched from Mantua across Lombardy, passed the Apennines, included the Tuscan plains, and embraced a portion of the duchy of Spoleto. It was in her castle of Canossa that Henry IV. performed his three days' penance in the winter of 1077, and there she made the cession of her vast domains to the church. This cession, renewed after the death of Gregory to his successors, conferred upon the popes indefinite rights, of which they afterwards availed themselves in the consolidation of their temporal power. Matilda died in the year 1115. Gregory had passed before her from the scene of his contest, an exile at Salerno, whither Robert Guiscard carried him in 1084 from the anarchy of rebellious Rome. With unbroken spirit, though the objects of his life were unattained, though Italy and Europe had been thrown into confusion, and the issue of the conflict was still doubtful, Gregory expired in 1085 with these words on his lips: "I loved justice, I hated iniquity, therefore in banishment I die."

War of investitures.

The greatest of the popes thus breathed his last; but the new spirit he had communicated to the papacy was not destined to expire with him. Gregory's immediate successors, Victor III., Urban II. and Paschal II., carried on his struggle with Henry IV. and his imperial antipopes, encouraging the emperor's son to rebel against him, and stirring up Europe for the first crusade. When Henry IV. died, his own son's prisoner, in 1106, Henry V. crossed the Alps, entered Rome, wrung the imperial coronation from Paschal II. and compelled the pope to grant his claims on the investitures. Scarcely had he returned to Germany when the Lateran disavowed all that the pope had done, on the score that it had been extorted by force. France sided with the church. Germany rejected the bull of investiture. A new descent into Italy, a new seizure of Rome, proved of no avail. The emperor's real weakness was in Germany, where his subjects openly expressed their discontent. He at last abandoned the contest which had distracted Europe. By the concordat of Worms, 1122, the emperor surrendered the right of investiture by ring and staff, and granted the right of election to the clergy. The popes were henceforth to be chosen by the cardinals, the bishops by the chapters subject to the pope's approval. On the other hand the pope ceded to the emperor the right of investiture by the sceptre. But the main issue of the struggle was not in these details of ecclesiastical government; principles had been at stake far deeper and more widely reaching. The respective relations of pope and emperor, as defined in the compact between Charles the Great and Leo III., were brought in question, and the two chief potentates of Christendom, no longer tacitly concordant, stood against each other as irreconcilable rivals. Upon this point, though the battle seemed to be a drawn one, the popes were really victors. They remained independent of the emperor, but the emperor had still to seek the crown at their hands. The pretensions of Otto the Great and Henry III. to make popes were gone for ever (see PAPACY; INVESTITURES).

IV. *Age of the Communes*.—The real gainers, however, by the war of investitures were the Italians. In the first place, from this time forward, owing to the election of popes by the Roman curia, the Holy See remained in the hands of Italians, and this, though it was by no means an unmixed good, was a great glory to the nation. In the next place, the antagonism of the popes to the emperors, which became hereditary in the Holy College, forced the former to assume the protectorate of the national cause. But by far the greatest profit the Italians reaped was the emancipation of their

Rise of free cities.

burghs. During the forty-seven years' war, when pope and emperor were respectively bidding for their alliance, and offering concessions to secure their support, the communes grew in self-reliance, strength and liberty. As the bishops had helped to free them from subservience to their feudal masters, so the war of investitures relieved them of dependence on their bishops. The age of real autonomy, signalized by the supremacy of consuls in the cities, had arrived.

In the republics, as we begin to know them after the war of investitures, government was carried on by officers called consuls, varying in number according to custom and according to the division of the town into districts. These magistrates, as we have already seen, were originally appointed to control and protect the humbler classes. But, in proportion as the people gained more power in the field the consuls rose into importance, superseded the bishops and began to represent the city in transactions with its neighbours. Popes and emperors who needed the assistance of a city, had to seek it from the consuls, and thus these officers gradually converted an obscure and indefinite authority into what resembles the presidency of a commonwealth. They were supported by a deliberative assembly, called *credenza*, chosen from the more distinguished citizens. In addition to this privy council, we find a *gran consiglio*, consisting of the burghers who had established the right to interfere immediately in public affairs, and a still larger assembly called *parlamento*, which included the whole adult population. Though the institutions of the communes varied in different localities, this is the type to which they all approximated. It will be perceived that the type was rather oligarchical than strictly democratic. Between the parlamento and the consuls with their privy council, or credenza, was interposed the gran consiglio of privileged burghers. These formed the aristocracy of the town, who by their wealth and birth held its affairs within their custody. There is good reason to believe that, when the term *popolo* occurs, it refers to this body and not to the whole mass of the population. The *comune* included the entire city—bishop, consuls, oligarchy, councils, handicraftsmen, proletariate. The *popolo* was the governing or upper class. It was almost inevitable in the transition from feudalism to democracy that this intermediate ground should be traversed; and the peculiar Italian phrases, *primo popolo*, *secondo popolo*, *terzo popolo*, and so forth, indicate successive changes, whereby the oligarchy passed from one stage to another in its progress toward absorption in democracy or tyranny.

Under their consuls the Italian burghs rose to a great height of prosperity and splendour. Pisa built her Duomo. Milan undertook the irrigation works which enriched the soil of Lombardy for ever. Massive walls, substantial edifices, commodious seaports, good roads, were the benefits conferred by this new government on Italy. It is also to be noticed that the people now began to be conscious of their past. They recognized the fact that their blood was Latin as distinguished from Teutonic, and that they must look to ancient Rome for those memories which constitute a people's nationality. At this epoch the study of Roman law received a new impulse, and this is the real meaning of the legend that Pisa, glorious through her consuls, brought the pandects in a single codex from Amalfi. The very name consul, no less than the Romanizing character of the best architecture of the time, points to the same revival of antiquity.

Republic in Rome.

The rise of the Lombard communes produced a sympathetic revolution in Rome, which deserves to be mentioned in this place. A monk, named Arnold of Brescia, animated with the spirit of the Milanese, stirred up the Romans to shake off the temporal sway of their bishop. He attempted, in fact, upon a grand scale what was being slowly and quietly effected in the northern cities. Rome, ever mindful of her unique past, listened to Arnold's preaching. A senate was established, and the republic was proclaimed. The title of patrician was revived and offered to Conrad, king of Italy, but not crowned emperor. Conrad refused it, and the Romans conferred it upon one of their own nobles. Though these institutions borrowed high-sounding titles from antiquity, they were in reality imitations of the Lombard civic system. The patrician stood for the consuls. The senate, composed of nobles, represented the credenza and the gran consiglio. The pope was unable to check this revolution, which is now chiefly interesting as further proof of the insurgence of the Latin as against the feudal elements in Italy at this period (see ROME: *History*).

Municipal wars.

Though the communes gained so much by the war of investitures, the division of the country between the pope's and emperor's parties was no small price to pay for independence. It inflicted upon Italy the ineradicable curse of party-warfare, setting city against city, house against house, and rendering concordant action for a national end impossible. No sooner had the compromise of the investitures been concluded than it was manifest that the burghers of the new enfranchised communes were resolved to turn their arms against each other. We seek in vain an obvious motive for each separate quarrel. All we know for certain is that, at this epoch, Rome attempts to ruin Tivoli, and Venice Pisa; Milan fights with Cremona, Cremona with Crema, Pavia with Verona, Verona with Padua, Piacenza with Parma, Modena and Reggio with Bologna, Bologna and Faenza with Ravenna and Imola, Florence and Pisa with Lucca and Siena, and so on through the whole list of cities. The nearer the neighbours, the more rancorous and internecine is the strife; and, as in all cases where animosity is deadly and no grave local causes of dispute are apparent, we are bound to conclude that some deeply-seated permanent uneasiness goaded these fast growing communities into rivalry. Italy was, in fact, too small for her children. As the towns expanded, they perceived that they must mutually exclude each other. They fought for bare existence, for primacy in commerce, for the command of seaports, for the keys of mountain passes, for rivers, roads and all the avenues of wealth and plenty. The pope's cause and the emperor's cause were of comparatively little moment to Italian burghers; and the names of Guelph and Ghibelline, which before long began to be heard in every street, on every market-place, had no meaning for them. These watchwords are said to have arisen in Germany during the disputed succession of the empire between 1135 and 1152, when the Welfs of Bavaria opposed the Swabian princes of Waiblingen origin. But in Italy, although they were severally identified with the papal and imperial parties, they really served as symbols for jealousies which altered in complexion from time to time and place to place, expressing more than antagonistic political principles, and involving differences vital enough to split the social fabric to its foundation.

Swabian emperors.

Under the imperial rule of Lothar the Saxon (1125–1137) and Conrad the Swabian (1138–1152), these civil wars increased in violence owing to the absence of authority. Neither Lothar nor Conrad was strong at home; the former had no influence in Italy, and the latter never entered Italy at all. But when Conrad died, the electors chose his nephew Frederick, surnamed Barbarossa, who united the rival honours of Welf and Waiblingen, to succeed him; and it was soon obvious that the empire had a master powerful of brain and firm of will. Frederick immediately determined to reassert the imperial rights in his southern provinces, and to check the warfare of the Lombard burghs. When he first crossed the Alps in 1154, Lombardy was, roughly speaking, divided between two parties, the one headed by Pavia professing loyalty to the empire, the other headed by Milan ready to oppose its claims. The municipal animosities of the last quarter of a century gave substance to these factions; yet neither the imperial nor the anti-imperial party had any real community of interest with Frederick. He came to supersede self-government by consuls, to deprive the cities of the privilege of making war on their own account and to extort his regalian rights of forage, food and lodging for his armies. It was only the habit of interurban jealousy which prevented the communes from at once combining to resist demands which threatened their liberty of action, and would leave them passive at the pleasure of a foreign master. The diet was opened at Roncaglia near Piacenza, where Frederick

Frederick Barbarossa and the Lombard cities.

listened to the complaints of Como and Lodi against Milan, of Pavia against Tortona and of the marquis of Montferrat against Asti and Chieri. The plaintiffs in each case were imperialists; and Frederick's first action was to redress their supposed grievances. He laid waste Chieri, Asti and Tortona, then took the Lombard crown at Pavia, and, reserving Milan for a future day, passed southward to Rome. Outside the gates of Rome he was met by a deputation from the senate he had come to supersede, who addressed him in words memorable for expressing the republican spirit of new Italy face to face with autocratic feudalism: " Thou wast a stranger, I have made thee a citizen "; it is Rome who speaks: " Thou camest as an alien from beyond the Alps, I have conferred on thee the principality." Moved only to scorn and indignation by the rhetoric of these presumptuous enthusiasts, Frederick marched into the Leonine city, and took the imperial crown from the hands of Adrian IV. In return for this compliance, the emperor delivered over to the pope his troublesome rival Arnold of Brescia, who was burned alive by Nicholas Breakspear, the only English successor of St Peter. The gates of Rome itself were shut against Frederick; and even on this first occasion his good understanding with Adrian began to suffer. The points of dispute between them related mainly to Matilda's bequest, and to the kingdom of Sicily, which the pope had rendered independent of the empire by renewing its investiture in the name of the Holy See. In truth, the papacy and the empire had become irreconcilable. Each claimed illimitable authority, and neither was content to abide within such limits as would have secured a mutual tolerance. Having obtained his coronation, Frederick withdrew to Germany, while Milan prepared herself against the storm which threatened. In the ensuing struggle with the empire, that great city rose to the altitude of patriotic heroism. By their sufferings no less than by their deeds of daring, her citizens showed themselves to be sublime, devoted and disinterested, winning the purest laurels which give lustre to Italian story. Almost in Frederick's presence, they rebuilt Tortona, punished Pavia, Lodi, Cremona and the marquis of Montferrat. Then they fortified the Adda and Ticino, and waited for the emperor's next descent. He came in 1158 with a large army, overran Lombardy, raised his imperial allies, and sat down before the walls of Milan. Famine forced the burghers to partial obedience, and Frederick held a victorious diet at Roncaglia. Here the jurists of Bologna appeared, armed with their new lore of Roman law, and expounded Justinian's code in the interests of the German empire. It was now seen how the absolutist doctrines of autocracy developed in Justinian's age at Byzantium would bear fruits in the development of an imperial idea, which was destined to be the fatal mirage of medieval Italy. Frederick placed judges of his own appointment, with the title of podestà, in all the Lombard communes; and this stretch of his authority, while it exacerbated his foes, forced even his friends to join their ranks against him. The war, meanwhile, dragged on. Crema yielded after an heroic siege in 1160, and was abandoned to the cruelty of its fierce rival Cremona. Milan was invested in 1161, starved into capitulation after nine months' resistance, and given up to total destruction by the Italian imperialists of Frederick's army, so stained and tarnished with the vindictive passions of municipal rivalry was even this, the one great glorious strife of Italian annals. Having ruined his rebellious city, but not tamed her spirit, Frederick withdrew across the Alps. But, in the interval between his second and third visit, a league was formed against him in north-eastern Lombardy. Verona, Vicenza, Padua, Treviso, Venice entered into a compact to defend their liberties; and when he came again in 1163 with a brilliant staff of German knights, the imperial cities refused to join his standards. This was the first and ominous sign of a coming change.

Meanwhile the election of Alexander III. to the papacy in 1159 added a powerful ally to the republican party. Opposed by an anti-pope whom the emperor favoured, Alexander found it was his truest policy to rely for support upon the anti-imperialist communes. They in return gladly accepted a champion who lent them the prestige and influence of the church. When Frederick once more crossed the Alps in 1166, he advanced on Rome, and besieged Alexander in the Coliseum. But the affairs of Lombardy left him no leisure to persecute a recalcitrant pontiff. In April 1167 a new league was formed between Cremona, Bergamo, Brescia, Mantua and Ferrara. In December of the same year this league allied itself with the elder Veronese league, and received the addition of Milan, Lodi, Piacenza, Parma, Modena and Bologna. The famous league of Lombard cities, styled Concordia in its acts of settlement, was now established. Novara, Vercelli, Asti and Tortona swelled its ranks; only Pavia and Montferrat remained imperialist between the Alps and Apennines. Frederick fled for his life by the Mont Cenis, and in 1168 the town of Alessandria was erected to keep Pavia and the marquisate in check. In the emperor's absence, Ravenna, Rimini, Imola and Forli joined the league, which now called itself the " Society of Venice, Lombardy, the March, Romagna and Alessandria." For the fifth time, in 1174, Frederick entered his rebellious dominions. The fortress town of Alessandria stopped his progress with those mud walls contemptuously named " of straw," while the forces of the league assembled at Modena and obliged him to raise the siege. In the spring of 1176 Frederick threatened Milan. His army found itself a little to the north of the town near the village of Legnano, when the troops of the city, assisted only by a few allies from Piacenza, Verona, Brescia, Novara and Vercelli, met and overwhelmed it. The victory was complete. Frederick escaped alone to Pavia, whence he opened negotiations with Alexander. In consequence of these transactions, he was suffered to betake himself unharmed to Venice. Here, as upon neutral ground, the emperor met the pope, and a truce for six years was concluded with the Lombard burghs. Looking back from the vantage-ground of history upon the issue of this long struggle, we are struck with the small results which satisfied the Lombard communes. They had humbled and utterly defeated their foreign lord. They had proved their strength in combination. Yet neither the acts by which their league was ratified nor the terms negotiated for them by their patron Alexander evince the smallest desire of what we now understand as national independence. The name of Italy is never mentioned. The supremacy of the emperor is not called in question. The conception of a permanent confederation, bound together in offensive and defensive alliance for common objects, has not occurred to these hard fighters and stubborn asserters of their civic privileges. All they claim is municipal autonomy; the right to manage their own affairs within the city walls, to fight their battles as they choose, and to follow their several ends unchecked. It is vain to lament that, when they might have now established Italian independence upon a secure basis, they chose local and municipal privileges. Their mutual jealousies, combined with the prestige of the empire, and possibly with the selfishness of the pope, who had secured his own position, and was not likely to foster a national spirit that would have threatened the ecclesiastical supremacy, deprived the Italians of the only great opportunity they ever had of forming themselves into a powerful nation.

Lombard League.

Peace of Constance.

When the truce expired in 1183, a permanent peace was ratified at Constance. The intervening years had been spent by the Lombards, not in consolidating their union, but in attempting to secure special privileges for their several cities. Alessandria della Paglia, glorious by her resistance to the emperor in 1174, had even changed her name to Cesarea! The signatories of the peace of Constance were divided between leaguers and imperialists. On the one side we find Vercelli, Novara, Milan, Lodi, Bergamo, Brescia, Mantua, Verona, Vicenza, Padua, Treviso, Bologna, Faenza, Modena, Reggio, Parma, Piacenza; on the other, Pavia, Genoa, Alba, Cremona, Como, Tortona, Asti, Cesarea. Venice, who had not yet entered the Italian community, is conspicuous by her absence. According to the terms of this treaty, the communes were confirmed in their right of self-government by consuls, and their right of warfare. The emperor retained the supreme courts of appeal within the cities, and his claim for sustenance at their expense when he came into Italy.

War of cities against nobles.

The privileges confirmed to the Lombard cities by the peace of Constance were extended to Tuscany, where Florence, having ruined Fiesole, had begun her career of freedom and prosperity. The next great chapter in the history of Italian evolution is the war of the burghs against the nobles. The consular cities were everywhere surrounded by castles; and, though the feudal lords had been weakened by the events of the preceding centuries, they continued to be formidable enemies. It was, for instance, necessary to the well-being of the towns that they should possess territory round their walls, and this had to be wrested from the nobles. We cannot linger over the details of this warfare. It must suffice to say that, partly by mortgaging their property to rich burghers, partly by entering the service of the cities as *condottieri* (mercenary leaders), partly by espousing the cause of one town against another, and partly by forced submission after the siege of their strong places, the counts were gradually brought into connexion of dependence on the communes. These, in their turn, forced the nobles to leave their castles, and to reside for at least a portion of each year within the walls. By these measures the counts became citizens, the rural population ceased to rank as serfs, and the Italo-Roman population of the towns absorbed into itself the remnants of Franks, Germans and other foreign stocks. It would be impossible to exaggerate the importance of this revolution, which ended by destroying the last vestige of feudality, and prepared that common Italian people which afterwards distinguished itself by the creation of European culture. But, like all the vicissitudes, of the Italian race, while it was a decided step forward in one direction, it introduced a new source of discord. The associated nobles proved ill neighbours to the peaceable citizens. They fortified their houses, retained their military habits, defied the consuls, and carried on feuds in the streets and squares. The war against the castles became a war against the palaces; and the system of government by consuls proved inefficient to control the clashing elements within the state. This led to the establishment of podestàs, who represented a compromise between two radically hostile parties in the city, and whose business it was to arbitrate and keep the peace between them. Invariably a foreigner, elected for a year with power of life and death and control of the armed force, but subject to a strict account at the expiration of his office, the podestà might be compared to a dictator invested with limited authority. His title was derived from that of Frederick Barbarossa's judges; but he had no dependence on the empire. The citizens chose him, and voluntarily submitted to his rule. The podestà marks an essentially transitional state in civic government, and his intervention paved the way for despotism.

Innocent III.

The thirty years which elapsed between Frederick Barbarossa's death in 1190 and the coronation of his grandson Frederick II. in 1220 form one of the most momentous epochs in Italian history. Barbarossa, perceiving the advantage that would accrue to his house if he could join the crown of Sicily to that of Germany, and thus deprive the popes of their allies in Lower Italy, procured the marriage of his son Henry VI. to Constance, daughter of King Roger, and heiress of the Hauteville dynasty. When William II., the last monarch of the Norman race, died, Henry VI. claimed that kingdom in his wife's right, and was recognized in 1194. Three years afterwards he died, leaving a son, Frederick, to the care of Constance, who in her turn died in 1198, bequeathing the young prince, already crowned king of Germany, to the guardianship of Innocent III. It was bold policy to confide Frederick to his greatest enemy and rival; but the pope honourably discharged his duty, until his ward outgrew the years of tutelage, and became a fair mark for ecclesiastical hostility. Frederick's long minority was occupied by Innocent's pontificate. Among the principal events of that reign must be reckoned the foundation of the two orders, Franciscan and Dominican, who were destined to form a militia for the holy see in conflict with the empire and the heretics of Lombardy. A second great event was the fourth crusade, undertaken in 1198, which established the naval and commercial supremacy of the Italians in the Mediterranean. The Venetians, who contracted for the transport of the crusaders, and whose blind doge Dandolo was first to land in Constantinople, received one-half and one-fourth of the divided Greek empire for their spoils. The Venetian ascendancy in the Levant dates from this epoch; for, though the republic had no power to occupy all the domains ceded to it, Candia was taken, together with several small islands and stations on the mainland. The formation of a Latin empire in the East increased the pope's prestige; while at home it was his policy to organize Countess Matilda's heritage by the formation of Guelph leagues, over which he presided. This is the meaning of the three leagues, in the March, in the duchy of Spoleto and in Tuscany, which now combined the chief cities of the papal territory into allies of the holy see. From the Tuscan league Pisa, consistently Ghibelline, stood aloof. Rome itself again at this epoch established a republic, with which Innocent would not or could not interfere. The thirteen districts in their council nominated four *caporioni*, who acted in concert with a *senator*, appointed, like the podestà of other cities, for supreme judicial functions. Meanwhile the Guelph and Ghibelline factions were beginning to divide Italy into minute parcels. Not only did commune range itself against commune under the two rival flags, but party rose up against party within the city walls. The introduction of the factions into Florence in 1215, owing to a private quarrel between the Buondelmonti, Amidei and Donati, is a celebrated instance of what was happening in every burgh.

Frederick II. Emperor.

Frederick II. was left without a rival for the imperial throne in 1218 by the death of Otto IV., and on the 22nd of November 1220, Honorius III., Innocent's successor, crowned him in Rome. It was impossible for any section of the Italians to mistake the gravity of his access to power. In his single person he combined the prestige of empire with the crowns of Italy, Sicily, Sardinia, Germany and Burgundy; and in 1225, by marriage with Yolande de Brienne, he added that of Jerusalem. There was no prince greater or more formidable in the habitable globe. The communes, no less than the popes, felt that they must prepare themselves for contest to the death with a power which threatened their existence. Already in 1218, the Guelphs of Lombardy had resuscitated their old league, and had been defeated by the Ghibellines in a battle near Ghibello. Italy seemed to lie prostrate before the emperor, who commanded her for the first time from the south as well as from the north. In 1227 Frederick, who had promised to lead a crusade, was excommunicated by Gregory IX. because he was obliged by illness to defer his undertaking; and thus the spiritual power declared war upon its rival. The Guelph towns of Lombardy again raised their levies. Frederick enlisted his Saracen troops at Nocera and Luceria, and appointed the terrible Ezzelino da Romano his vicar in the Marches of Verona to quell their insurrection. It was 1236, however, before he was able to take the field himself against the Lombards. Having established Ezzelino in Verona, Vicenza and Padua, he defeated the Milanese and their allies at Cortenuova in 1237, and sent their carroccio as a trophy of his victory to Rome. Gregory IX. feared lest the Guelph party would be ruined by this check. He therefore made alliance with Venice and Genoa, fulminated a new excommunication against Frederick, and convoked a council at Rome to ratify his ban in 1241. The Genoese undertook to bring the French bishops to this council. Their fleet was attacked at Meloria by the Pisans, and utterly defeated. The French prelates went in silver chains to prison in the Ghibelline capital of Tuscany. So far Frederick had been successful at all points. In 1243 a new pope, Innocent IV., was elected, who prosecuted the war with still bitterer spirit. Forced to fly to France, he there, at Lyons, in 1245, convened a council, which enforced his condemnation of the emperor. Frederick's subjects were freed from their allegiance, and he was declared dethroned and deprived of all rights. Five times king and emperor as he was, Frederick, placed under the ban of the church, led henceforth a doomed existence. The mendicant monks stirred up the populace to acts of fanatical enmity. To plot against him, to attempt his life by poison or the sword, was accounted virtuous. His secretary, Piero delle Vigne, was wrongly suspected of conspiring. The crimes of his vicar Ezzelino, who laid whole provinces waste and murdered men by thousands in his Paduan prisons, increased the horror with which he was regarded. Parma revolted from him, and he spent months in 1247–1248 vainly trying to reduce this one time faithful city. The only gleam of success which shone on his ill fortune was the revolution which placed Florence in the hands of the Ghibellines in 1248. Next year Bologna rose against him, defeated his troops and took his son Enzio, king of Sardinia, prisoner at Fossalta. Hunted to the ground and broken-hearted, Frederick expired at the end of 1250 in his Apulian castle of Fiorentino. It is difficult to judge his career with fairness. The only prince who could, with any probability of success, have established the German rule in Italy, his ruin proved the impossibility of that long-cherished scheme. The nation had outgrown dependence upon foreigners, and after his death no German emperor interfered with anything but miserable failure in Italian affairs. Yet from many points of view it might be regretted that Frederick was not suffered to rule Italy. By birth and breeding an Italian, highly gifted and widely cultivated, liberal in his opinions, a patron of literature, a founder of universities, he anticipated the spirit of the Renaissance. At his court Italian started into being as a language. His laws were wise. He was capable of giving to Italy a large and noble culture. But the commanding greatness of his position proved his ruin. Emperor and king of Sicily, he was the natural enemy of popes, who could not tolerate so overwhelming a rival.

Papal war against Frederick's successors.

After Frederick's death, the popes carried on their war for eighteen years against his descendants. The cause of his son Conrad was sustained in Lower Italy by Manfred, one of Frederick's many natural children; and, when Conrad died in 1254, Manfred still acted as vicegerent for the Swabians, who were now represented by a boy Conradin. Innocent IV. and Alexander IV. continued to make head against the Ghibelline party. The most dramatic incident in this struggle was the crusade preached against Ezzelino. This tyrant had made himself justly odious; and when he was hunted to death in 1259, the triumph was less for the Guelph cause than for humanity outraged by the iniquities of such a monster. The battle between Guelph and Ghibelline raged with unintermitting fury. While the former faction gained in Lombardy by the massacre of Ezzelino, the latter revived in Tuscany after the battle of Montaperti, which in 1260 placed Florence at the discretion of the Ghibellines. Manfred, now called king of Sicily, headed the Ghibellines, and there was no strong counterpoise against him. In this necessity Urban IV. and Clement IV. invited Charles of Anjou to enter Italy and take the Guelph command. They made him senator of Rome and vicar of Tuscany, and promised him the investiture of the regno provided he stipulated that it should not be held in combination with the empire. Charles accepted these terms, and was welcomed by the Guelph party as their chief throughout Italy. He defeated Manfred in a battle at Grandella near Benevento in 1266. Manfred was killed; and, when Conradin, a lad of sixteen, descended from Germany to make good his claims to the kingdom, he too was defeated at Tagliacozzo in 1267. Less lucky than his uncle, Conradin escaped with his life, to die upon a scaffold at Naples. His glove was carried to his cousin Constance, wife of Peter of Aragon, the last of the great Norman-Swabian family. Enzio died in his prison four years later. The popes had been successful; but they had purchased their bloody victory at a great cost. This first invitation to French princes brought with it incalculable evils.

Charles of Anjou, supported by Rome, and recognized as chief in Tuscany, was by far the most formidable of the Italian potentates. In his turn he now excited the jealousy of the popes, who began, though cautiously, to cast their weight into the Ghibelline scale. Gregory initiated the policy of establishing an equilibrium between the parties, which was carried out by his successor Nicholas III. Charles was forced to resign the senatorship of Rome and the signoria of Lombardy and Tuscany. In 1282 he received a more decided check, when Sicily rose against him in the famous rebellion of the Vespers. He lost the island, which gave itself to Aragon; and thus the kingdom of Sicily was severed from that of Naples, the dynasty in the one being Spanish and Ghibelline, in the other French and Guelph. Meanwhile a new emperor had been elected, the prudent Rudolf of Habsburg, who abstained from interference with Italy, and who confirmed the territorial pretensions of the popes by solemn charter in 1278. Henceforth Emilia, Romagna, the March of Ancona, the patrimony of St Peter and the Campagna of Rome held of the Holy See, and not of the empire. The imperial chancery, without inquiring closely into the deeds furnished by the papal curia, made a deed of gift, which placed the pope in the position of a temporal sovereign. While Nicholas III. thus bettered the position of the church in Italy, the Guelph party grew stronger than ever, through the crushing defeat of the Pisans by the Genoese at Meloria in 1284. Pisa, who had ruined Amalfi, was now ruined by Genoa. She never held her head so high again after this victory, which sent her best and bravest citizens to die in the Ligurian dungeons. The Mediterranean was left to be fought for by Genoa and Venice, while Guelph Florence grew still more powerful in Tuscany. Not long after the battle of Meloria Charles of Anjou died, and was succeeded by his son Charles II. of Naples, who played no prominent part in Italian affairs. The Guelph party was held together with a less tight hand even in cities so consistent as Florence. Here in the year 1300 new factions, subdividing the old Guelphs and Ghibellines under the names of Neri and Bianchi, had acquired such force that Boniface VIII., a violently Guelph pope, called in Charles of Valois to pacify the republic and undertake the charge of Italian affairs. Boniface was a passionate and unwise man. After quarrelling with the French king, Philip le Bel, he fell into the hands of the Colonna family at Anagni, and died, either of the violence he there received or of mortification, in October 1303.

Civil Wars of Guelphs and Ghibellines.

Translation of the Papacy to Avignon.

After the short papacy of Benedict XI. a Frenchman, Clement V., was elected, and the seat of the papacy was transferred to Avignon. Thus began that Babylonian exile of the popes which placed them in subjection to the French crown and ruined their prestige in Italy. Lasting seventy years, and joining on to the sixty years of the Great Schism, this enfeeblement of the papal authority, coinciding as it did with the practical elimination of the empire from Italian affairs, gave a long period of comparative independence to the nation. Nor must it be forgotten that this exile was due to the policy which induced the pontiffs, in their detestation of Ghibellinism, to rely successively upon the houses of Anjou and of Valois. This policy it was which justified Dante's fierce epigram—the *puttaneggiar co regi*.

The period we have briefly traversed was immortalized by Dante in an epic which from one point of view might be called the poem of the Guelphs and Ghibellines. From the foregoing bare narration of events it is impossible to estimate the importance of these parties, or to understand their bearing on subsequent Italian history We are therefore forced to pause awhile, and probe beneath the surface. The civil wars may be regarded as a continuation of the previous municipal struggle, intensified by recent hostilities between the burghers and the nobles. The quarrels of the church and empire lend pretexts and furnish war-cries; but the real question at issue is not the supremacy of pope or emperor. The conflict is a social one, between civic and feudal institutions, between commercial and military interests, between progress and conservatism. Guelph democracy and industry idealize the pope. The banner of the church waves above the camp of those who aim at positive prosperity and republican equality. Ghibelline aristocracy and immobility idealize the emperor. The prestige of the empire, based upon Roman law and feudal tradition, attracts imaginative patriots and systematic thinkers. The two ideals are counterposed and mutually exclusive. No city calls itself either Guelph or Ghibelline till it has expelled one-half of its inhabitants; for each party is resolved to constitute the state according to its own conception, and the affirmation of the one programme is the negation of the other. The Ghibelline honestly believes that the Guelphs will reduce society to chaos. The Guelph is persuaded that the Ghibellines will annihilate freedom and strangle commerce. The struggle is waged by two sets of men who equally love their city, but who would fain rule it upon diametrically opposite principles, and who fight to the death for its possession. This contradiction enters into the minutest details of life—armorial bearings, clothes, habits at table, symbolize and accentuate the difference. Meanwhile each party forms its own organization of chiefs, finance-officers and registrars at home, and sends ambassadors to foreign cities of the same complexion. A network of party policy embraces and dominates the burghs of Italy, bringing the most distant centres into relation, and by the very division of the country augmenting the sense of nationality. The Italians learn through their discords at this epoch that they form one community. The victory in the conflict practically falls to the hitherto unenfranchised plebeians. The elder noble families die out or lose their preponderance. In some cities, as notably in Florence after the date 1292, it becomes criminal to be *scioperato*, or unemployed in industry. New houses rise into importance; a new commercial aristocracy is formed. Burghers of all denominations are enrolled in one or other of the arts or gilds, and these trading companies furnish the material from which the government or signoria of the city is composed. Plebeian handicrafts assert their right to be represented on an equality with learned professions and wealthy corporations. The ancient classes are confounded and obliterated in a population more homogeneous, more adapted for democracy and despotism.

New constitution of the free cities.

In addition to the parliament and the councils which have been already enumerated, we now find a *council of the party* established within the city. This body tends to become a little state within the state, and, by controlling the victorious majority, disposes of the government as it thinks best. The consuls are merged in *ancients* or *priors*, chosen from the arts. A new magistrate, the *gonfalonier of justice*, appears in some of the Guelph cities, with the special duty of keeping the insolence of the nobility in check. Meanwhile the podestà still subsists; but he is no longer equal to the task of maintaining an equilibrium of forces. He sinks more and more into a judge, loses more and more the character of dictator. His ancient place is now occupied by a new functionary, no longer acting as arbiter, but concentrating the forces of the triumphant party. The *captain of the people*, acting as head of the ascendant Guelphs or Ghibellines, undertakes the responsibility of proscriptions, decides on questions of policy, forms alliances, declares war. Like all officers created to meet an emergency, the limitations to his power are ill-defined, and he is often little better than an autocrat.

Origin of Tyrannies.

V. *Age of the Despots.*—Thus the Italians, during the heat of the civil wars, were ostensibly divided between partisans of the empire and partisans of the church. After the death of Frederick II. their affairs were managed by Manfred and by Charles of Anjou, the supreme captains of the parties, under whose orders acted the captains of the people in each city. The contest being carried on by warfare, it followed that these captains in the burghs were chosen on account of military skill; and, since the nobles were men of arms by profession, members of ancient houses took the lead again in towns where they had been absorbed into the bourgeoisie. In this way, after the downfall of the Ezzelini of Romano, the Della Scala dynasty arose in Verona, and the Carraresi in Padua. The Estensi made themselves lords of Ferrara; the Torriani headed the Guelphs of Milan. At Ravenna we find the Polenta family, at Rimini the Malatestas, at Parma the Rossi, at Piacenza the Scotti, at Faenza the Manfredi. There is not a burgh of northern Italy but can trace the rise of a dynastic house to the vicissitudes of this period. In Tuscany, where the Guelph party was very strongly organized, and the commercial constitution of Florence kept the nobility in check, the communes remained as yet free from hereditary masters. Yet generals from time to time arose, the Conte Ugolino della Gheradesca at Pisa, Uguccione della Faggiuola at Lucca, the Conte Guido di Montefeltro at Florence, who threatened the liberties of Tuscan cities with military despotism.

Left to themselves by absentee emperors and exiled popes, the Italians pursued their own course of development unchecked. After the commencement of the 14th century, the civil wars decreased in fury, and at the same time it was perceived that their effect had been to confirm tyrants in their grasp upon free cities. Growing up out of the captain of the people or signore of the commune, the tyrant annihilated both parties for his own profit and for the peace of the state. He used the dictatorial powers with which he was invested to place himself above the law, resuming in his person the state-machinery which had preceded him. In him, for the first time, the city attained self-consciousness; the blindly working forces of previous revolutions were combined in the will of a ruler. The tyrant's general policy was to favour the multitude at the expense of his own caste. He won favour by these means, and completed the levelling down of classes, which had been proceeding ever since the emergence of the communes.

Decline of civil wars. Advent of the bourgeoisie.

In 1309 Robert, grandson of Charles, the first Angevine sovereign, succeeded to the throne of Naples, and became the leader of the Guelphs in Italy. In the next year Henry VII. of Luxembourg crossed the Alps soon after his election to the empire, and raised the hopes of the Ghibellines. Dante from his mountain solitudes passionately called upon him to play the part of a Messiah. But it was now impossible for any German to control the "Garden of the Empire." Italy had entered on a new phase of her existence, and the great poet's *De monarchia* represented a dream of the past which could not be realized. Henry established imperial vicars in the Lombard towns, confirming the tyrants, but gaining nothing for the empire in exchange for the titles he conferred. After receiving the crown in Rome, he died at Buonconvento, a little walled town south of Siena, on his backward journey in 1313. The profits of his inroad were reaped by despots, who used the Ghibelline prestige for the consolidation of their own power. It is from this epoch that the supremacy of the Visconti, hitherto the unsuccessful rivals of the Guelphic Torriani for the signory of Milan, dates. The Scaligers in Verona and the Carraresi in Padua were strengthened; and in Tuscany Castruccio Castracane, Uguccione's successor at Lucca, became formidable. In 1325 he defeated the Florentines at Alto Pascio, and carried home their carroccio as a trophy of his victory over the Guelphs. Louis of Bavaria, the next emperor, made a similar excursion in the year 1327, with even greater loss of imperial prestige. He deposed Galeazzo Visconti on his downward journey, and offered Milan for a sum of money to his son Azzo upon his return. Castruccio Castracane was nominated by him duke of Lucca; and this is the first instance of a dynastic title conferred upon an Italian adventurer by the emperor. Castruccio dominated Tuscany, where the Guelph cause, in the weakness of King Robert, languished. But the adventurer's death in 1328 saved the stronghold of republican institutions, and Florence breathed freely for a while again. Can Grande della Scala's death in the next year inflicted on the Lombard Ghibellines a loss hardly inferior to that of Castruccio's on their Tuscan allies. Equally contemptible in its political results and void of historical interest was the brief visit of John of Bohemia, son of Henry VII., whom the Ghibellines next invited to assume their leadership. He sold a few privileges, conferred a few titles, and recrossed the Alps in 1333. It is clear that at this time the fury of the civil wars was spent. In spite of repeated efforts on the part of the Ghibellines, in spite of King Robert's supine incapacity, the imperialists gained no permanent advantage. The Italians were tired of fighting, and the leaders of both factions looked exclusively to their own interests. Each city which had been the cradle of freedom thankfully accepted a master, to quench the conflagration of party strife, encourage trade, and make the handicraftsmen comfortable. Even the Florentines in 1342 submitted for a few months to the despotism of the duke of Athens. They conferred the signory upon him for life; and, had he not mismanaged matters, he might have held the city in his grasp. Italy was settling down and turning her attention to home comforts, arts and literature. Boccaccio, the contented bourgeois, succeeded to Dante, the fierce aristocrat.

The most marked proof of the change which came over Italy towards the middle of the 14th century is furnished by the companies of adventure. It was with their own militia that the burghers won freedom in the war of independence, subdued the nobles, and fought the battles of the parties. But from this time forward they laid down their arms, and played the game of warfare by the aid of mercenaries. Ecclesiastical overlords, interfering from a distance in Italian politics; prosperous republics, with plenty of money to spend but no leisure or inclination for camp-life; cautious tyrants, glad of every pretext to emasculate their subjects, and courting popularity by exchanging conscription for taxation—all combined to favour the new system. Mercenary troops are said to have been first levied from disbanded Germans, together with Breton and English adventurers, whom the Visconti and Castruccio took into their pay. They soon appeared under their own captains, who hired them out to the highest bidder, or marched them on marauding expeditions up and down the less protected districts. The names of some of these earliest captains of adventure, Fra Moriale, Count Lando and Duke Werner, who styled himself the "Enemy of God and Mercy," have been preserved to us. As the companies grew in size and improved their discipline, it was seen by the Italian nobles that this kind of service offered a good career for men of spirit, who had learned the use of arms. To leave so powerful and profitable a calling in the hands of foreigners seemed both dangerous and uneconomical. Therefore, after the middle of the century, this profession fell into the hands of natives. The first Italian who formed an exclusively Italian company was Alberico da Barbiano, a nobleman of Romagna, and founder of the Milanese house of Belgiojoso. In his school the great condottieri Braccio da Montone and Sforza Attendolo were formed; and henceforth the battles of Italy were fought by Italian generals commanding native troops. This was better in some respects than if the mercenaries had been foreigners. Yet it must not be forgotten that the new companies of adventure, who decided Italian affairs for the next century, were in no sense patriotic. They sold themselves for money, irrespective of the cause which they upheld; and, while changing masters, they had no care for any interests but their own. The name condottiero, derived from *condotta*, a paid contract to supply so many fighting men in serviceable order, sufficiently indicates the nature of the business. In the hands of able captains, like Francesco Sforza or Piccinino, these mercenary troops became moving despotisms, draining the country of its wealth, and always eager to fasten and found tyrannies upon the provinces they had been summoned to defend. Their generals substituted heavy-armed cavalry for the old militia, and introduced systems of campaigning which reduced the art of war to a game of skill. Battles became all but bloodless; diplomacy and tactics superseded feats of arms and hard blows in pitched fields. In this way the Italians lost their military vigour, and wars were waged by despots from their cabinets, who pulled the strings of puppet captains in their pay. Nor were the people only enfeebled for resistance to a real foe; the whole political spirit of the race was demoralized. The purely selfish bond between condottieri and their employers, whether princes or republics, involved intrigues and treachery, checks and counterchecks, secret terror on the one hand and treasonable practice on the other, which ended by making statecraft in Italy synonymous with perfidy.

Change in type of despotism.

It must further be noticed that the rise of mercenaries was synchronous with a change in the nature of Italian despotism. The tyrants, as we have already seen, established themselves as captains of the people, vicars of the empire, vicars for the church, leaders of the Guelph and Ghibelline parties. They were accepted by a population eager for repose, who had merged old class distinctions in the conflicts of preceding centuries. They rested in large measure on the favour of the multitude, and pursued a policy of sacrificing to their interests the nobles. It was natural that these self-made princes should seek to secure the peace which they had promised in their cities, by freeing the people from military service and disarming the aristocracy. As their tenure of power grew firmer, they advanced dynastic claims, assumed titles, and took the style of petty sovereigns. Their government became paternal; and, though there was no limit to their cruelty when stung by terror, they used the purse rather than the sword, bribery at home and treasonable intrigue abroad in preference to coercive measures or open war. Thus was elaborated the type of despot which attained completeness in Gian Galeazzo Visconti and Lorenzo de' Medici. No longer a tyrant of Ezzelino's stamp, he reigned by intelligence and terrorism masked beneath a smile. He substituted cunning and corruption for violence. The lesser people tolerated him because he extended the power of their city and made it beautiful with public buildings. The bourgeoisie, protected in their trade, found it convenient to support him. The nobles, turned into courtiers, placemen, diplomatists and men of affairs, ended by preferring his authority to the alternative of democratic institutions. A lethargy of well-being, broken only by the pinch of taxation for war-costs, or by outbursts of frantic ferocity and lust in the less calculating tyrants, descended on the population of cities which had boasted of their freedom. Only Florence and Venice, at the close of the period upon which we are now entering, maintained their republican independence. And Venice was ruled by a close oligarchy; Florence was passing from the hands of her oligarchs into the power of the Medicean merchants.

Discrimination of the five great powers.

Between the year 1305, when Clement V. settled at Avignon, and the year 1447, when Nicholas V. re-established the papacy upon a solid basis at Rome, the Italians approximated more nearly to self-government than at any other epoch of their history. The conditions which have been described, of despotism, mercenary warfare and bourgeois prosperity, determined the character of this epoch, which was also the period when the great achievements of the Renaissance were prepared. At the end of this century and a half, five principal powers divided the peninsula; and their confederated action during the next forty-five years (1447–1492) secured for Italy a season of peace and brilliant prosperity. These five powers were the kingdom of Naples, the duchy of Milan, the republic of Florence, the republic of Venice and the papacy. The subsequent events of Italian history will be rendered most intelligible if at this point we trace the development of these five constituents of Italian greatness separately.

The Two Sicilies.

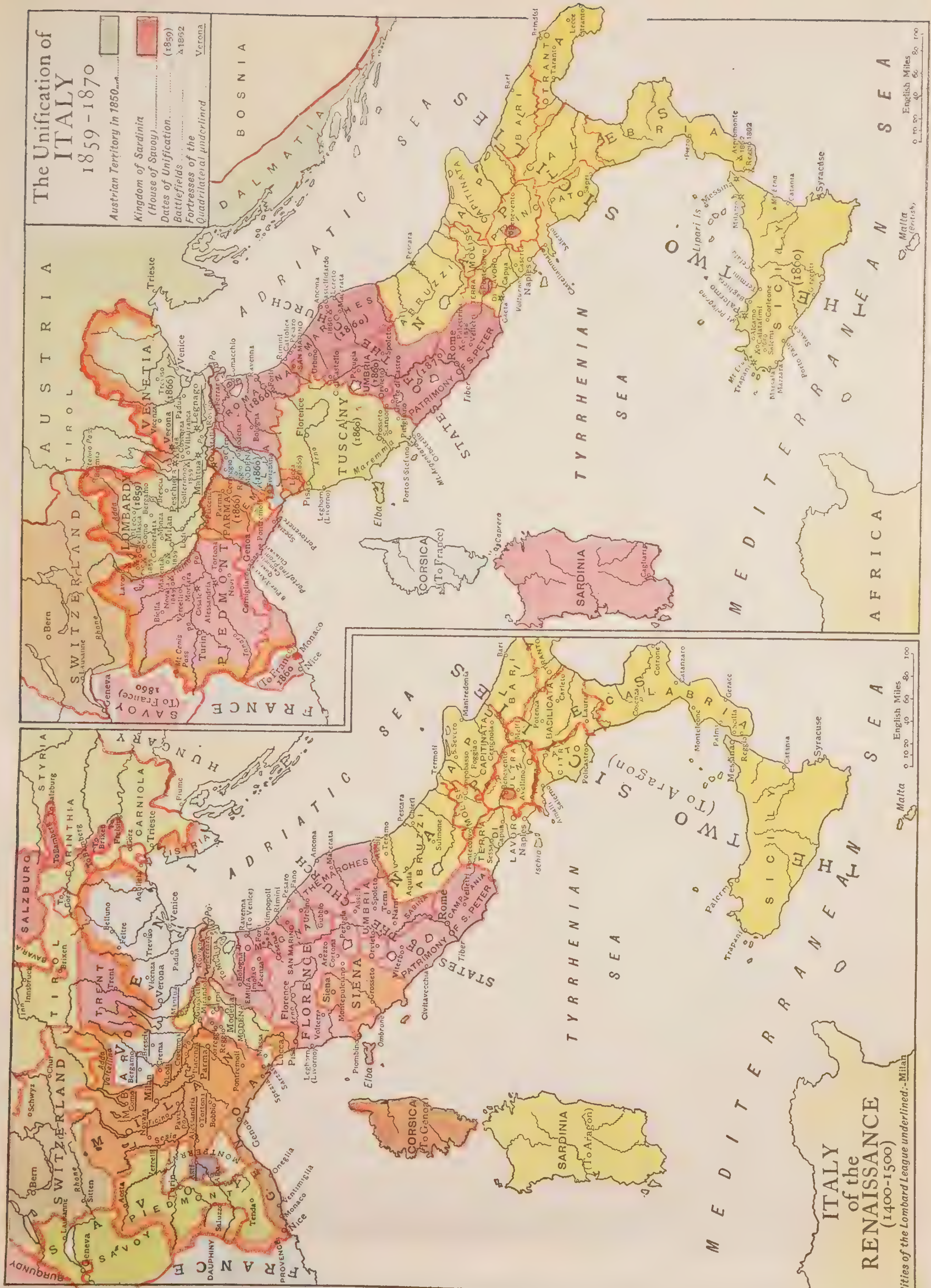
When Robert of Anjou died in 1343, he was succeeded by his grand-daughter Joan, the childless wife of four successive husbands, Andrew of Hungary, Louis of Taranto, James of Aragon and Otto of Brunswick. Charles of Durazzo, the last male scion of the Angevine house in Lower Italy, murdered Joan in 1382, and held the kingdom for five years. Dying in 1387, he transmitted Naples to his son Ladislaus, who had no children, and was followed in 1414 by his sister Joan II. She too, though twice married, died without issue, having at one time adopted Louis III. of Provence and his brother René, at another Alfonso V. of Aragon, who inherited the crown of Sicily. After her death in February 1435 the kingdom was fought for between René of Anjou and Alfonso, surnamed the Magnanimous. René found supporters among the Italian princes, especially the Milanese Visconti, who helped him to assert his claims with arms. During the war of succession which ensued, Alfonso was taken prisoner by the Genoese fleet in August 1435, and was sent a prisoner to Filippo Maria at Milan. Here he pleaded his own cause so powerfully, and proved so incontestably the advantage which might ensue to the Visconti from his alliance, if he held the regno, that he obtained his release and recognition as king. From the end of the year 1435

Alfonso reigned alone and undisturbed in Lower Italy, combining for the first time since the year 1282 the crowns of Sicily and Naples. The former he held by inheritance, together with that of Aragon. The latter he considered to be his by conquest. Therefore, when he died in 1458, he bequeathed Naples to his natural son Ferdinand, while Sicily and Aragon passed together to his brother John, and so on to Ferdinand the Catholic. The twenty-three years of Alfonso's reign were the most prosperous and splendid period of South Italian history. He became an Italian in taste and sympathy, entering with enthusiasm into the humanistic ardour of the earlier Renaissance, encouraging men of letters at his court, administering his kingdom on the principles of an enlightened despotism, and lending his authority to establish that equilibrium in the peninsula upon which the politicians of his age believed, not without reason, that Italian independence might be secured.

Duchy of Milan.

The last member of the Visconti family of whom we had occasion to speak was Azzo, who bought the city in 1328 from Louis of Bavaria. His uncle Lucchino succeeded, but was murdered in 1349 by a wife against whose life he had been plotting. Lucchino's brother John, archbishop of Milan, now assumed the lordship of the city, and extended the power of the Visconti over Genoa and the whole of north Italy, with the exception of Piedmont, Verona, Mantua, Ferrara and Venice. The greatness of the family dates from the reign of this masterful prelate. He died in 1354, and his heritage was divided between three members of his house, Matteo, Bernabò and Galeazzo. In the next year Matteo, being judged incompetent to rule, was assassinated by order of his brothers, who made an equal partition of their subject cities—Bernabò residing in Milan, Galeazzo in Pavia. Galeazzo was the wealthiest and most magnificent Italian of his epoch. He married his daughter Violante to our duke of Clarence, and his son Gian Galeazzo to a daughter of King John of France. When he died in 1378, this son resolved to reunite the domains of the Visconti; and, with this object in view, he plotted and executed the murder of his uncle Bernabò. Gian Galeazzo thus became by one stroke the most formidable of Italian despots. Immured in his castle at Pavia, accumulating wealth by systematic taxation and methodical economy, he organized the mercenary troops who eagerly took service under so good a paymaster; and, by directing their operations from his cabinet, he threatened the whole of Italy with conquest. The last scions of the Della Scala family still reigned in Verona, the last Carraresi in Padua; the Estensi were powerful in Ferrara, the Gonzaghi in Mantua. Gian Galeazzo, partly by force and partly by intrigue, discredited these minor despots, pushed his dominion to the very verge of Venice, and, having subjected Lombardy to his sway, proceeded to attack Tuscany. Pisa and Perugia were threatened with extinction, and Florence dreaded the advance of the Visconti arms, when the plague suddenly cut short his career of treachery and conquest in the year 1402. Seven years before his death Gian Galeazzo bought the title of duke of Milan and count of Pavia from the emperor Wenceslaus, and there is no doubt that he was aiming at the sovereignty of Italy. But no sooner was he dead than the essential weakness of an artificial state, built up by cunning and perfidious policy, with the aid of bought troops, dignified by no dynastic title, and consolidated by no sense of loyalty, became apparent. Gian Galeazzo's duchy was a masterpiece of mechanical contrivance, the creation of a scheming intellect and lawless will. When the mind which had planned it was withdrawn, it fell to pieces, and the very hands which had been used to build it helped to scatter its fragments. The Visconti's own generals, Facino Cane, Pandolfo Malatesta, Jacopo dal Verme, Gabrino Fondulo, Ottobon Terzo, seized upon the tyranny of several Lombard cities. In others the petty tyrants whom the Visconti had uprooted reappeared. The Estensi recovered their grasp upon Ferrara, and the Gonzaghi upon Mantua. Venice strengthened herself between the Adriatic and the Alps. Florence reassumed her Tuscan hegemony. Other communes which still preserved the shadow of independence, like Perugia and Bologna, began once more to dream of republican freedom under their own leading families. Meanwhile Gian Galeazzo had left two sons, Giovanni Maria and Filippo Maria. Giovanni, a monster of cruelty and lust, was assassinated by some Milanese nobles in 1412; and now Filippo set about rebuilding his father's duchy. Herein he was aided by the troops of Facino Cane, who, dying opportunely at this period, left considerable wealth, a well-trained band of mercenaries, and a widow, Beatrice di Tenda. Filippo married and then beheaded Beatrice after a mock trial for adultery, having used her money and her influence in reuniting several subject cities to the crown of Milan. He subsequently spent a long, suspicious, secret and incomprehensible career in the attempt to piece together Gian Galeazzo's Lombard state, and to carry out his schemes of Italian conquest. In this endeavour he met with vigorous opponents. Venice and Florence, strong in the strength of their resentful oligarchies, offered a determined resistance; nor was Filippo equal in ability to his father. His infernal cunning often defeated its own aims, checkmating him at the point of achievement by suggestions of duplicity or terror. In the course of Filippo's wars with Florence and Venice, the greatest generals of this age were formed—Francesco Carmagnola, who was beheaded between the columns at Venice in 1432; Niccolò Piccinino, who died at Milan in 1444; and Francesco Sforza, who survived to seize his master's heritage in 1450. Son of Attendolo Sforza, this Francesco received the hand of Filippo's natural daughter, Bianca, as a reward for past service and a pledge of future support. When the Visconti dynasty ended by the duke's death in 1447, he pretended to espouse the cause of the Milanese republic, which was then re-established; but he played his cards so subtly as to make himself, by the help of Cosimo de' Medici in Florence, duke *de facto* if not *de jure*. Francesco Sforza was the only condottiero among many aspiring to be tyrants who planted themselves firmly on a throne of first-rate importance. Once seated in the duchy of Milan, he displayed rare qualities as a ruler; for he not only entered into the spirit of the age, which required humanity and culture from a despot, but he also knew how to curb his desire for territory. The conception of confederated Italy found in him a vigorous supporter. Thus the limitation of the Milanese duchy under Filippo Maria Visconti, and its consolidation under Francesco Sforza, were equally effectual in preparing the balance of power to which Italian politics now tended.

This balance could not have been established without the concurrent aid of Florence. After the expulsion of the duke of Athens in 1343, and the great plague of 1348, the Florentine proletariate rose up against the merchant princes. This insurgence of the artisans, in a republic which had been remodelled upon economical principles by Giano della Bella's constitution of 1292, reached a climax in 1378, when the Ciompi rebellion placed the city for a few years in the hands of the Lesser Arts. The revolution was but temporary, and was rather a symptom of democratic tendencies in the state than the sign of any capacity for government on the part of the working classes. The necessities of war and foreign affairs soon placed Florence in the power of an oligarchy headed by the great Albizzi family. They fought the battles of the republic with success against the Visconti, and widely extended the Florentine domain over the Tuscan cities. During their season of ascendancy Pisa was enslaved, and Florence gained the access to the sea. But throughout this period a powerful opposition was gathering strength. It was led by the Medici, who sided with the common people, and increased their political importance by the accumulation and wise employment of vast commercial wealth. In 1433 the Albizzi and the Medici came to open strife. Cosimo de' Medici, the chief of the opposition, was exiled to Venice. In the next year he returned, assumed the presidency of the democratic party, and by a system of corruption and popularity-hunting, combined with the patronage of arts and letters, established himself as the real but unacknowledged dictator of the commonwealth. Cosimo abandoned the policy of his predecessors. Instead of opposing Francesco Sforza in Milan, he lent him his prestige and influence, foreseeing that the dynastic future of his own family and the pacification of Italy might be secured by a balance of power in



AUSTRIA
TIROL
SWITZERLAND
FRANCE
BOSNIA
DALMATIA
VENETIA (1866)
LOMBARDY (1859)
PIEDMONT
PARMA (1860)
MODENA (1860)
TUSCANY (1860)
ROMAGNA (1860)
MARCHES (1860)
UMBRIA (1860)
PATRIMONY OF S. PETER (1870)
STATES OF THE CHURCH
NAPLES
TWO SICILIES
SICILY (1860)
SARDINIA
CORSICA (To France)
SAVOY (To France) 1860
Nice (To France) 1860
ADRIATIC SEA
TYRRHENIAN SEA
MEDITERRANEAN SEA
AFRICA
Malta (British)
Turin
Milan
Venice
Verona
Mantua
Peschiera
Legnago
Trieste
Genoa
Florence
Rome
Naples
Palermo
Messina
Syracuse
Magenta
Solferino
Custozza
Novara
Aspromonte 1862
Caprera
Elba
Lipari Is.
English Miles 0 10 20 40 60 80 100
ITALY of the RENAISSANCE
SALZBURG
CARINTHIA
CARNIOLA
STYRIA
HUNGARY
ISTRIA
TRENT
VENICE
MILAN
MONTFERRAT
SAVOY
GENOA
FLORENCE
SIENA
STATES OF THE CHURCH
THE MARCHES
UMBRIA
PATRIMONY OF S. PETER
SABINA
CAMPANIA
ABRUZZI
MOLISE
TERRA DI LAVORO
CAPITINATA
TERRA DI BARI
BASILICATA
PRINCIPATO ULTRA
PRINCIPATO CITRA
CALABRIA
TERRA D'OTRANTO
TWO SICILIES (To Aragon)
SICILY
SARDINIA (To Aragon)
CORSICA (To Genoa)
PROVENCE
DAUPHINY
BURGUNDY
BAVARIA
Innsbruck
Brixen
Trent
Bern
Geneva
Lausanne
Aosta
Turin
Asti
Alessandria
Tortona
Pavia
Milan
Como
Bergamo
Brescia
Cremona
Lodi
Crema
Piacenza
Parma
Reggio
Modena
Mantua
Verona
Vicenza
Padua
Treviso
Ferrara
Bologna
Ravenna (To Venice)
Lucca
Pisa
Florence
Arezzo
Siena
Perugia
Ancona
Rome
Naples
Bari
Palermo
Messina
English Miles 0 10 20 40 60 80 100

The Unification of ITALY 1859-1870

Austrian Territory in 1850 ▨
Kingdom of Sardinia (House of Savoy) ▨
Dates of Unification (1859)
Battlefields ✕1862
Fortresses of the Quadrilateral underlined Verona

ITALY of the RENAISSANCE (1400-1500)

Cities of the Lombard League underlined:- Milan

Emery Walker sc.

which Florence should rank on equal terms with Milan and Naples.

Venice.

The republic of Venice differed essentially from any other state in Italy; and her history was so separate that, up to this point, it would have been needless to interrupt the narrative by tracing it. Venice, however, in the 14th century took her place at last as an Italian power on an equality at least with the very greatest. The constitution of the commonwealth had slowly matured itself through a series of revolutions, which confirmed and defined a type of singular stability. During the earlier days of the republic the doge had been a prince elected by the people, and answerable only to the popular assemblies. In 1032 he was obliged to act in concert with a senate, called *pregadi*; and in 1172 the grand council, which became the real sovereign of the state, was formed. The several steps whereby the members of the grand council succeeded in eliminating the people from a share in the government, and reducing the doge to the position of their ornamental representative, cannot here be described. It must suffice to say that these changes culminated in 1297, when an act was passed for closing the grand council, or in other words for confining it to a fixed number of privileged families, in whom the government was henceforth vested by hereditary right. This ratification of the oligarchical principle, together with the establishment in 1311 of the Council of Ten, completed that famous constitution which endured till the extinction of the republic in 1797. Meanwhile, throughout the middle ages, it had been the policy of Venice to refrain from conquests on the Italian mainland, and to confine her energies to commerce in the East. The first entry of any moment made by the Venetians into strictly Italian affairs was in 1336, when the republics of Florence and St Mark allied themselves against Mastino della Scala, and the latter took possession of Treviso. After this, for thirty years, between 1352 and 1381, Venice and Genoa contested the supremacy of the Mediterranean. Pisa's maritime power having been extinguished in the battle of Meloria (1284), the two surviving republics had no rivals. They fought their duel out upon the Bosporus, off Sardinia, and in the Morea, with various success. From the first great encounter, in 1355, Venice retired well-nigh exhausted, and Genoa was so crippled that she placed herself under the protection of the Visconti. The second and decisive battle was fought upon the Adriatic. The Genoese fleet under Luciano Doria defeated the Venetians off Pola in 1379, and sailed without opposition to Chioggia, which was stormed and taken. Thus the Venetians found themselves blockaded in their own lagoons. Meanwhile a fleet was raised for their relief by Carlo Zeno in the Levant, and the admiral Vittore Pisani, who had been imprisoned after the defeat at Pola, was released to lead their forlorn hope from the city side. The Genoese in their turn were now blockaded in Chioggia, and forced by famine to surrender. The losses of men and money which the war of Chioggia, as it was called, entailed, though they did not immediately depress the spirit of the Genoese republic, signed her naval ruin. During this second struggle to the death with Genoa, the Venetians had been also at strife with the Carraresi of Padua and the Scaligers of Verona. In 1406, after the extinction of these princely houses they added Verona, Vicenza and Padua to the territories they claimed on *terra firma*. Their career of conquest, and their new policy of forming Italian alliances and entering into the management of Italian affairs were confirmed by the long dogeship of Francesco Foscari (1423–1457), who must rank with Alfonso, Cosimo de' Medici, Francesco Sforza and Nicholas V., as a joint-founder of confederated Italy. When Constantinople fell in 1453, the old ties between Venice and the Eastern empire were broken, and she now entered on a wholly new phase of her history. Ranking as one of the five Italian powers, she was also destined to defend Western Christendom against the encroachments of the Turk in Europe. (See VENICE: *History*.)

The Papacy.

By their settlement in Avignon, the popes relinquished their protectorate of Italian liberties, and lost their position as Italian potentates. Rienzi's revolution in Rome (1347–1354), and his establishment of a republic upon a fantastic basis, half classical, half feudal, proved the temper of the times; while the rise of dynastic families in the cities of the church, claiming the title of papal vicars, but acting in their own interests, weakened the authority of the Holy See. The predatory expeditions of Bertrand du Poiet and Robert of Geneva were as ineffective as the descents of the emperors; and, though the cardinal Albornoz conquered Romagna and the March in 1364, the legates who resided in those districts were not long able to hold them against their despots. At last Gregory XI. returned to Rome; and Urban VI., elected in 1378, put a final end to the Avignonian exile. Still the Great Schism, which now distracted Western Christendom, so enfeebled the papacy, and kept the Roman pontiffs so engaged in ecclesiastical disputes, that they had neither power nor leisure to occupy themselves seriously with their temporal affairs. The threatening presence of the two princely houses of Orsini and Colonna, alike dangerous as friends or foes, rendered Rome an unsafe residence. Even when the schism was nominally terminated in 1415 by the council of Constance, the next two popes held but a precarious grasp upon their Italian domains. Martin V. (1417–1431) resided principally at Florence. Eugenius IV. (1431–1447) followed his example. And what Martin managed to regain Eugenius lost. At the same time, the change which had now come over Italian politics, the desire on all sides for a settlement, and the growing conviction that a federation was necessary, proved advantageous to the popes as sovereigns. They gradually entered into the spirit of their age, assumed the style of despots and made use of the humanistic movement, then at its height, to place themselves in a new relation to Italy. The election of Nicholas V. in 1447 determined this revolution in the papacy, and opened a period of temporal splendour, which ended with the establishment of the popes as sovereigns. Thomas of Sarzana was a distinguished humanist. Humbly born, he had been tutor in the house of the Albizzi, and afterwards librarian of the Medici at Florence, where he imbibed the politics together with the culture of the Renaissance. Soon after assuming the tiara, he found himself without a rival in the church; for the schism ended by Felix V.'s resignation in 1449. Nicholas fixed his residence in Rome, which he began to rebuild and to fortify, determining to render the Eternal City once more a capital worthy of its high place in Europe. The Romans were flattered; and, though his reign was disturbed by republican conspiracy, Nicholas V. was able before his death in 1455 to secure the modern status of the pontiff as a splendid patron and a wealthy temporal potentate.

Confederated Italy.

Italy was now for a brief space independent. The humanistic movement had created a common culture, a common language and sense of common nationality. The five great powers, with their satellites—dukes of Savoy and Urbino, marquesses of Ferrara and Mantua, republics of Bologna, Perugia, Siena—were constituted. All political institutions tended toward despotism. The Medici became yearly more indispensable to Florence, the Bentivogli more autocratic in Bologna, the Baglioni in Perugia; and even Siena was ruled by the Petrucci. But this despotism was of a mild type. The princes were Italians; they shared the common enthusiasms of the nation for art, learning, literature and science; they studied how to mask their tyranny with arts agreeable to the multitude. When Italy had reached this point, Constantinople was taken by the Turks. On all sides it was felt that the Italian alliance must be tightened; and one of the last, best acts of Nicholas V.'s pontificate was the appeal in 1453 to the five great powers in federation. As regards their common opposition to the Turk, this appeal led to nothing; but it marked the growth of a new Italian consciousness.

Between 1453 and 1492 Italy continued to be prosperous and tranquil. Nearly all wars during this period were undertaken either to check the growing power of Venice or to further the ambition of the papacy. Having become despots, the popes sought to establish their relatives in principalities. The word nepotism acquired new significance in the reigns of Sixtus IV. and Innocent VIII. Though the country was convulsed by no great struggle, these forty years witnessed a truly appalling increase of political crime. To be a prince was tantamount to being the mark of secret conspiracy and assassination. Among the most noteworthy examples of such attempts may be mentioned the revolt of the barons against Ferdinand I. of Naples (1464), the murder of Galeazzo Maria Sforza at Milan (1476) and the plot of the Pazzi to destroy the Medici (1478). After Cosimo de' Medici's death in 1464, the presidency of the Florentine republic passed to his son Piero, who left it in 1469 to his sons Lorenzo and Giuliano. These youths assumed the style of princes, and it was against their lives that the Pazzi, with the sanction of Sixtus IV., aimed their blow. Giuliano was murdered, Lorenzo escaped, to tighten his grasp upon the city, which now loved him and was proud of him. During the following fourteen years of his brilliant career he made himself absolute master of Florence, and so modified her institutions that the Medici were henceforth necessary to the state. Apprehending the importance of Italian federation, Lorenzo, by his personal tact and prudent leadership of the republic, secured peace and a common intelligence between the five powers. His own family was fortified by the marriage of his daughter to a son of Innocent VIII., which procured his son Giovanni's elevation to the cardinalate, and involved two Medicean papacies and the future dependence of Florence upon Rome.

Invasion of Charles VIII.

VI. *Age of Invasions.*—The year 1492 opened a new age for Italy. In this year Lorenzo died, and was succeeded by his son, the vain and weak Piero; France passed beneath the personal control of the inexperienced Charles VIII.; the fall of Granada freed Spain from her embarrassments; Columbus discovered America, destroying the commercial supremacy of Venice; last, but not least, Roderigo Borgia assumed the tiara with the famous title of Alexander VI. In this year the short-lived federation of the five powers was shaken, and Italy was once more drawn into the vortex of European affairs. The events which led to this disaster may be briefly told. After Galeazzo Maria's assassination, his crown passed to a boy, Gian Galeazzo, who was in due course married to a grand-daughter of Ferdinand I. of Naples. But the government of Milan remained in the hands of this youth's uncle, Lodovico, surnamed Il Moro. Lodovico resolved to become duke of Milan. The king of Naples was his natural enemy, and he had cause to suspect that Piero de' Medici might abandon his alliance. Feeling himself alone, with no right to the title he was bent on seizing, he had recourse to Charles VIII. of France, whom he urged to make good his claim to the kingdom of Naples. This claim, it may be said in passing, rested on the will of King René of Anjou. After some hesitation, Charles agreed to invade Italy. He crossed the Alps in 1495, passed through Lombardy, entered Tuscany, freed Pisa from the yoke of Florence, witnessed the expulsion of the Medici, marched to Naples and was crowned there—all this without striking a blow. Meanwhile Lodovico procured his nephew's death, and raised a league against the French in Lombardy. Charles hurried back from Naples, and narrowly escaped destruction at Fornovo in the passes of the Apennines. He made good his retreat, however, and returned to France in 1495. Little remained to him of his light acquisitions; but he had convulsed Italy by this invasion, destroyed her equilibrium, exposed her military weakness and political disunion, and revealed her wealth to greedy and more powerful nations.

Louis XII.

The princes of the house of Aragon, now represented by Frederick, a son of Ferdinand I., returned to Naples. Florence made herself a republic, adopting a form of constitution analogous to that of Venice. At this crisis she was ruled by the monk Girolamo Savonarola, who inspired the people with a thirst for freedom, preached the necessity of reformation, and placed himself in direct antagonism to Rome. After a short but eventful career, the influence of which was long effective, he lost his hold upon the citizens. Alexander VI. procured a mock trial, and his enemies burned him upon the Piazza in 1498. In this year Louis XII. succeeded Charles VIII. upon the throne of France. As duke of Orleans he had certain claims to Milan through his grandmother Valentina, daughter of Gian Galeazzo, the first duke. They were not valid, for the investiture of the duchy had been granted only to male heirs. But they served as a sufficient pretext, and in 1499 Louis entered and subdued the Milanese. Lodovico escaped to Germany, returned the next year, was betrayed by his Swiss mercenaries and sent to die at Loches in France. In 1500 Louis made the blunder of calling Ferdinand the Catholic to help him in the conquest of Naples. By a treaty signed at Granada, the French and Spanish kings were to divide the spoil. The conquest was easy; but, when it came to a partition, Ferdinand played his ally false. He made himself supreme over the Two Sicilies, which he now reunited under a single crown. Three years later, unlessoned by this experience, Louis signed the treaty of Blois (1504), whereby he invited the emperor Maximilian to aid him in the subjugation of Venice. No policy could have been less far-sighted; for Charles V., joint heir to Austria, Burgundy, Castile and Aragon, the future overwhelming rival of France, was already born.

The stage was now prepared, and all the actors who were destined to accomplish the ruin of Italy trod it with their armies. Spain, France, Germany, with their Swiss auxiliaries, had been summoned upon various pretexts to partake her provinces. Then, too late, patriots like Machiavelli perceived the suicidal self-indulgence of the past, which, by substituting mercenary troops for national militias, left the Italians at the absolute discretion of their neighbours. Whatever parts the Italians themselves played in the succeeding quarter of a century, the game was in the hands of French, Spanish and German invaders. Meanwhile, no scheme for combination against common foes arose in the peninsula. Each petty potentate strove for his own private advantage in the confusion; and at this epoch the chief gains accrued to the papacy. Aided by his terrible son, Cesare Borgia, Alexander VI. chastised the Roman nobles, subdued Romagna and the March, threatened Tuscany, and seemed to be upon the point of creating a Central Italian state in favour of his progeny, when he died suddenly in 1503. His conquests reverted to the Holy See. Julius II., his bitterest enemy and powerful successor, continued Alexander's policy, but no longer in the interest of his own relatives. It became the nobler ambition of Julius to aggrandize the church, and to reassume the protectorate of the Italian people. With this object, he secured Emilia, carried his victorious arms against Ferrara, and curbed the tyranny of the Baglioni in Perugia. Julius II. played a perilous game; but the stakes were high, and he fancied himself strong enough to guide the tempest he evoked. Quarrelling with the Venetians in 1508, he combined the forces of all Europe by the league of Cambray against them; and, when he had succeeded in his first purpose of humbling them even to the dust, he turned round in 1510, uttered his famous resolve to expel the barbarians from Italy, and pitted the Spaniards against the French. It was with the Swiss that he hoped to effect this revolution; but the Swiss, now interfering for the first time as principals in Italian affairs, were incapable of more than adding to the already maddening distractions of the people. Formed for mercenary warfare, they proved a perilous instrument in the hands of those who used them, and were hardly less injurious to their friends than to their foes. In 1512 the battle of Ravenna between the French troops and the allies of Julius—Spaniards, Venetians and Swiss—was fought. Gaston de Foix bought a doubtful victory dearly with his death; and the allies, though beaten on the banks of the Ronco, immediately afterwards expelled the French from Lombardy. Yet Julius II. had failed, as might have been foreseen. He only exchanged one set of foreign masters for another, and taught a new barbarian race how pleasant were the plains of Italy. As a consequence of the battle of Ravenna, the Medici returned in 1512 to Florence.

When Leo X. was elected in 1513, Rome and Florence rejoiced; but Italy had no repose. Louis XII. had lost the game, and the Spaniards were triumphant. But new actors appeared upon the scene, and the same old struggle was resumed with fiercer energy. By the victory of Marignano in 1515 Francis I., having now succeeded to the throne of France, regained the Milanese, and broke the power of the Swiss, who held it for Massimiliano Sforza, the titular duke. Leo for a while relied on Francis; for the vast power of Charles V., who succeeded to the empire in 1519, as in 1516 he had succeeded to the crowns of Spain and Lower Italy, threatened the whole of Europe. It was Leo's nature, however, to be inconstant. In 1521 he changed sides, allied himself to Charles, and died after hearing that the imperial troops had again expelled the French from Milan. During the next four years the Franco-Spanish war dragged on in Lombardy until the decisive battle of Pavia in 1525, when Francis was taken prisoner, and Italy lay open to the Spanish armies. Meanwhile Leo X. had been followed by Adrian VI., and Adrian by Clement VII., of the house of Medici, who had long ruled Florence. In the reign of this pope Francis was released from his prison in Madrid (1526), and Clement hoped that he might still be used in the Italian interest as a counterpoise to Charles. It is impossible in this place to follow the tangled intrigues of that period. The year 1527 was signalized by the famous sack of Rome. An army of mixed German and Spanish troops, pretending to act for the emperor, but which may rather be regarded as a vast marauding party, entered Italy under their leader Frundsberg. After his death, the Constable de Bourbon took command of them; they marched slowly down, aided by the marquis of Ferrara, and unopposed by the duke of Urbino, reached Rome, and took it by assault. The constable was killed in the first onslaught; Clement was imprisoned in the castle of St Angelo; Rome was abandoned to the rage of 30,000 ruffians. As an immediate result of this catastrophe, Florence shook off the Medici, and established a republic. But Clement, having made peace with the emperor, turned the remnants of the army which had sacked Rome against his native city. After a desperate resistance, Florence fell in 1530. Alessandro de' Medici was placed there with the title of duke of Cività di Penna; and, on his murder in 1537, Cosimo de' Medici, of the younger branch of the ruling house, was made duke. Acting as lieutenant for the Spaniards, he subsequently (1555) subdued Siena, and bequeathed to his descendants the grand-duchy of Tuscany.

Settlement of Italy by Spain.

VII. *Spanish-Austrian Ascendancy.*—It was high time, after the sack of Rome in 1527, that Charles V. should undertake Italian affairs. The country was exposed to anarchy, of which this had been the last and most disgraceful example. The Turks were threatening western Europe, and Luther was inflaming Germany. By the treaty of Barcelona in 1529 the pope and emperor made terms. By that of Cambray in the same year France relinquished Italy to Spain. Charles then entered the port of Genoa, and on the 5th of November met Clement VII. at Bologna. He there received the imperial crown, and summoned the Italian princes for a settlement of all disputed claims. Francesco Sforza, the last and childless heir of the ducal house, was left in Milan till his death, which happened in 1535. The republic of Venice was respected in her liberties and Lombard territories. The Este family received a confirmation of their duchy of Modena and Reggio, and were invested in their fief of Ferrara by the pope. The marquessate of Mantua was made a duchy; and Florence was secured, as we have seen, to the Medici. The great gainer by this settlement was the papacy, which held the most substantial Italian province, together with a prestige that raised it far above all rivalry. The rest of Italy, however parcelled, henceforth became but a dependence upon Spain. Charles V., it must be remembered, achieved his conquest and confirmed his authority far less as emperor than as the heir of Castile and Aragon. A Spanish viceroy in Milan and another in Naples, supported by Rome and by the minor princes who followed the policy dictated to them from Madrid, were sufficient to preserve the whole peninsula in a state of somnolent inglorious servitude.

From 1530 until 1796, that is, for a period of nearly three centuries, the Italians had no history of their own. Their annals are filled with records of dynastic changes and redistributions of territory, consequent upon treaties signed by foreign powers, in the settlement of quarrels which no wise concerned the people. Italy only too often became the theatre of desolating and distracting wars. But these wars were fought for the most part by alien armies; the points at issue were decided beyond the Alps; the gains accrued to royal families whose names were unpronounceable by southern tongues. The affairs of Europe during the years when Habsburg and Bourbon fought their domestic battles with the blood of noble races may teach grave lessons to all thoughtful men of our days, but none bitterer, none fraught with more insulting recollections, than to the Italian people, who were haggled over like dumb driven cattle in the mart of chaffering kings. We cannot wholly acquit the Italians of their share of blame. When they might have won national independence, after their warfare with the Swabian emperors, they let the golden opportunity slip. Pampered with commercial prosperity, eaten to the core with inter-urban rivalries, they submitted to despots, renounced the use of arms, and offered themselves in the hour of need, defenceless and disunited to the shock of puissant nations. That they had created modern civilization for Europe availed them nothing. Italy, intellectually first among the peoples, was now politically and practically last; and nothing to her historian is more heartrending than to watch the gradual extinction of her spirit in this age of slavery.

Pontificate of Paul III.

In 1534 Alessandro Farnese, who owed his elevation to his sister Giulia, one of Alexander VI.'s mistresses, took the tiara with the title of Paul III. It was his ambition to create a duchy for his family; and with this object he gave Parma and Piacenza to his son Pier Luigi. After much wrangling between the French and Spanish parties, the duchy was confirmed in 1586 to Ottaviano Farnese and his son Alessandro, better known as Philip II.'s general, the prince of Parma. Alessandro's descendants reigned in Parma and Piacenza till the year 1731. Paul III.'s pontificate was further marked by important changes in the church, all of which confirmed the spiritual autocracy of Rome. In 1540 this pope approved of Loyola's foundation, and secured the powerful militia of the Jesuit order. The Inquisition was established with almost unlimited powers in Italy, and the press was placed under its jurisdiction. Thus free thought received a check, by which not only ecclesiastical but political tyrants knew how to profit. Henceforth it was impossible to publish or to utter a word which might offend the despots of church or state; and the Italians had to amuse their leisure with the polite triflings of academics. In 1545 a council was opened at Trent for the reformation of church discipline and the promulgation of orthodox doctrine. The decrees of this council defined Roman Catholicism against the Reformation; and, while failing to regenerate morality, they enforced a hypocritical observance of public decency. Italy to outer view put forth blossoms of hectic and hysterical piety, though at the core her clergy and her aristocracy were more corrupt than ever.

Reign of Philip II.

In 1556 Philip II., by the abdication of his father Charles V., became king of Spain. He already wore the crown of the Two Sicilies, and ruled the duchy of Milan. In the next year Ferdinand, brother of Charles, was elected emperor. The French, meanwhile, had not entirely abandoned their claims on Italy. Gian Pietro Caraffa, who was made pope in 1555 with the name of Paul IV., endeavoured to revive the ancient papal policy of leaning upon France. He encouraged the duke of Guise to undertake the conquest of Naples, as Charles of Anjou had been summoned by his predecessors. But such schemes were now obsolete and anachronistic. They led to a languid lingering Italian campaign, which was settled far beyond the Alps by Philip's victories over the French at St Quentin and Gravelines. The peace of Câteau Cambresis, signed in 1559, left the Spanish monarch undisputed lord of Italy. Of free commonwealths there now survived only Venice, which, together with Spain, achieved for Europe the victory of Lepanto in 1573; Genoa, which, after the ineffectual Fieschi revolution in 1547, abode beneath the rule of the great Doria family, and held a feeble sway in Corsica; and the two insignificant republics of Lucca and San Marino.

The future hope of Italy, however, was growing in a remote and hitherto neglected corner. Emmanuel Philibert, duke of Savoy, represented the oldest and not the least illustrious reigning house in Europe, and his descendants were destined to achieve for Italy the independence which no other power or prince had given her since the fall of ancient Rome. (See SAVOY, HOUSE OF.)

When Emmanuel Philibert succeeded to his father Charles III. in 1553, he was a duke without a duchy. But the princes of the house of Savoy were a race of warriors; and what Emmanuel Philibert lost as sovereign he regained as captain of adventure in the service of his cousin Philip II. The treaty of Câteau Cambresis in 1559, and the evacuation of the Piedmontese cities held by French and Spanish troops in 1574, restored his state. By removing the capital from Chambéry to Turin, he completed the transformation of the dukes of Savoy from Burgundian into Italian sovereigns. They still owned Savoy beyond the Alps, the plains of Bresse, and the maritime province of Nice.

Emmanuel Philibert was succeeded by his son Charles Emmanuel I., who married Catherine, a daughter of Philip II. He seized the first opportunity of annexing Saluzzo, which had been lost to Savoy in the last two reigns, and renewed the disastrous policy of his grandfather Charles III. by invading Geneva and threatening Provence. Henry IV. of France forced him in 1601 to relinquish Bresse and his Burgundian possessions. In return he was allowed to keep Saluzzo. All hopes of conquest on the transalpine side were now quenched; but the keys of Italy had been given to the dukes of Savoy; and their attention was still further concentrated upon Lombard conquests. Charles Emmanuel now attempted the acquisition of Montferrat, which was soon to become vacant by the death of Francesco Gonzaga, who held it together with Mantua. In order to secure this territory, he went to war with Philip III. of Spain, and allied himself with Venice and the Grisons to expel the Spaniards from the Valtelline. When the male line of the Gonzaga family expired in 1627, Charles, duke of Nevers, claimed Mantua and Montferrat in right of his wife, the only daughter of the last duke. Charles Emmanuel was now checkmated by France, as he had formerly been by Spain. The total gains of all his strenuous endeavours amounted to the acquisition of a few places on the borders of Montferrat.

Extinction of old ducal families.

Not only the Gonzagas, but several other ancient ducal families, died out about the date which we have reached. The legitimate line of the Estensi ended in 1597 by the death of Alfonso II., the last duke of Ferrara. He left his domains to a natural relative, Cesare d'Este, who would in earlier days have inherited without dispute, for bastardy had been no bar on more than one occasion in the Este pedigree. Urban VIII., however, put in a claim to Ferrara, which, it will be remembered, had been recognized a papal fief in 1530. Cesare d'Este had to content himself with Modena and Reggio, where his descendants reigned as dukes till 1794. Under the same pontiff, the Holy See absorbed the duchy of Urbino on the death of Francesco Maria II., the last representative of Montefeltro and Della Rovere. The popes were now masters of a fine and compact territory, embracing no inconsiderable portion of Countess Matilda's legacy, in addition to Pippin's donation, and the patrimony of St Peter. Meanwhile Spanish fanaticism, the suppression of the Huguenots in France and the Catholic policy of Austria combined to strengthen their authority as pontiffs. Urban's predecessor, Paul V., advanced so far as to extend his spiritual jurisdiction over Venice, which, up to the date of his election (1605), had resisted all encroachments of the Holy See. Venice offered the single instance in Italy of a national church. The republic managed the tithes, and the clergy acknowledged no chief above their own patriarch. Paul V. now forced the Venetians to admit his ecclesiastical supremacy; but they refused to readmit the Jesuits, who had been expelled in 1606. This, if we do not count the proclamation of James I. of England (1604), was the earliest instance of the order's banishment from a state where it had proved disloyal to the commonwealth.

Decline of Venice and Spain.

Venice rapidly declined throughout the 17th century. The loss of trade consequent upon the closing of Egypt and the Levant, together with the discovery of America and the sea-route to the Indies, had dried up her chief source of wealth. Prolonged warfare with the Ottomans, who forced her to abandon Candia in 1669, as they had robbed her of Cyprus in 1570, still further crippled her resources. Yet she kept the Adriatic free of pirates, notably by suppressing the sea-robbers called Uscocchi (1601–1617), maintained herself in the Ionian Islands, and in 1684 added one more to the series of victorious episodes which render her annals so romantic. In that year Francesco Morosini, upon whose tomb we still may read the title Peloponnesiacus, wrested the whole of the Morea from the Turks. But after his death in 1715 the republic relaxed her hold upon his conquests. The Venetian nobles abandoned themselves to indolence and vice. Many of them fell into the slough of pauperism, and were saved from starvation by public doles. Though the signory still made a brave show upon occasions of parade, it was clear that the state was rotten to the core, and sinking into the decrepitude of dotage. The Spanish monarchy at the same epoch dwindled with apparently less reason. Philip's Austrian successors reduced it to the rank of a secondary European power. This decline of vigour was felt, with the customary effects of discord and bad government, in Lower Italy. The revolt of Masaniello in Naples (1647), followed by rebellions at Palermo and Messina, which placed Sicily for a while in the hands of Louis XIV. (1676–1678) were symptoms of progressive anarchy. The population, ground down by preposterous taxes, ill-used as only the subjects of Spaniards, Turks or Bourbons are handled, rose in blind exasperation against their oppressors. It is impossible to attach political importance to these revolutions; nor did they bring the people any appreciable good. The destinies of Italy were decided in the cabinets and on the battlefields of northern Europe. A Bourbon at Versailles, a Habsburg at Vienna, or a thick-lipped Lorrainer, with a stroke of his pen, wrote off province against province, regarding not the populations who had bled for him or thrown themselves upon his mercy.

Wars of Succession.

This inglorious and passive chapter of Italian history is continued to the date of the French Revolution with the records of three dynastic wars, the war of the Spanish succession, the war of the Polish succession, the war of the Austrian succession, followed by three European treaties, which brought them respectively to diplomatic terminations. Italy, handled and rehandled, settled and resettled, upon each of these occasions, changed masters without caring or knowing what befell the principals in any one of the disputes. Humiliating to human nature in general as are the annals of the 18th-century campaigns in Europe, there is no point of view from which they appear in a light so tragi-comic as from that afforded by Italian history. The system of setting nations by the ears with the view of settling the quarrels of a few reigning houses was reduced to absurdity when the people, as in these cases, came to be partitioned and exchanged without the assertion or negation of a single principle affecting their interests or rousing their emotions.

Spanish Succession.

In 1700 Charles II. died, and with him ended the Austrian family in Spain. Louis XIV. claimed the throne for Philip, duke of Anjou. Charles, archduke of Austria, opposed him. The dispute was fought out in Flanders; but Lombardy felt the shock, as usual, of the French and Austrian dynasties. The French armies were more than once defeated by Prince Eugene of Savoy, who drove them out of Italy in 1707. Therefore, in the peace of Utrecht (1713), the services of the house of Savoy had to be duly recognized. Victor Amadeus II. received Sicily with the title of king. Montferrat and Alessandria were added to his northern provinces, and his state was recognized as independent. Charles of Austria, now emperor, took Milan, Mantua, Naples and Sardinia for his portion of the Italian spoil. Philip founded the Bourbon line of Spanish kings, renouncing in Italy all that his Habsburg predecessors had gained. Discontented with this diminution of the Spanish heritage, Philip V. married Elisabetta Farnese, heiress to the last duke of Parma, in 1714. He hoped to secure this duchy for his son, Don Carlos; and Elisabetta further brought with her a claim to the grand-duchy of Tuscany, which would soon become vacant by the death of Gian Gastone de' Medici. After this marriage Philip broke the peace of Europe by invading Sardinia. The Quadruple Alliance was formed, and the new king of Sicily was punished for his supposed adherence to Philip V. by the forced exchange of Sicily for the island of Sardinia. It was thus that in 1720 the house of Savoy assumed the regal title which it bore until the declaration of the Italian kingdom in the last century. Victor Amadeus II.'s reign was of great importance in the history of his state. Though a despot, as all monarchs were obliged to be at that date, he reigned with prudence, probity and zeal for the welfare of his subjects. He took public education out of the hands of the Jesuits, which, for the future development of manliness in his dominions, was a measure of incalculable value. The duchy of Savoy in his days became a kingdom, and Sardinia, though it seemed a poor exchange for Sicily, was a far less perilous possession than the larger and wealthier island would have been. In 1730 Victor Amadeus abdicated in favour of his son Charles Emmanuel III. Repenting of this step, he subsequently attempted to regain Turin, but was imprisoned in the castle of Rivoli, where he ended his days in 1732.

Polish Succession.

The War of the Polish Succession which now disturbed Europe is only important in Italian history because the treaty of Vienna in 1738 settled the disputed affairs of the duchies of Parma and Tuscany. The duke Antonio Farnese died in 1731; the grand-duke Gian Gastone de' Medici died in 1737. In the duchy of Parma Don Carlos had already been proclaimed. But he was now transferred to the Two Sicilies, while Francis of Lorraine, the husband of Maria Theresa, took Tuscany and Parma. Milan and Mantua remained in the hands of the Austrians. On this occasion Charles Emmanuel acquired Tortona and Novara.

Austrian Succession.

Worse complications ensued for the Italians when the emperor Charles VI., father of Maria Theresa, died in 1740. The three branches of the Bourbon house, ruling in France, Spain and the Sicilies, joined with Prussia, Bavaria and the kingdom of Sardinia to despoil Maria Theresa of her heritage. Lombardy was made the seat of war; and here the king of Sardinia acted as in some sense the arbiter of the situation. After war broke out, he changed sides and supported the Habsburg-Lorraine party. At first, in 1745, the Sardinians were defeated by the French and Spanish troops. But Francis of Lorraine, elected emperor in that year, sent an army to the king's support, which in 1746 obtained a signal victory over the Bourbons at Piacenza. Charles Emmanuel now threatened Genoa. The Austrian soldiers already held the town. But the citizens expelled them, and the republic kept her independence. In 1748 the treaty of Aix-la-Chapelle, which put an end to the War of the Austrian Succession, once more redivided Italy. Parma, Piacenza and Guastalla were formed into a duchy for Don Philip, brother of Charles III. of the Two Sicilies, and son of Philip V. of Spain. Charles III. was confirmed in his kingdom of the Two Sicilies. The Austrians kept Milan and Tuscany. The duchy of Modena was placed under the protection of the French. So was Genoa, which in 1755, after Paoli's insurrection against the misgovernment of the republic, ceded her old domain of Corsica to France.

Forty-four years' peace.

From the date of this settlement until 1792, Italy enjoyed a period of repose and internal amelioration under her numerous paternal despots. It became the fashion during these forty-four years of peace to encourage the industrial population and to experimentalize in economical reforms. The Austrian government in Lombardy under Maria Theresa was characterized by improved agriculture, regular administration, order, reformed taxation and increased education. A considerable amount of local autonomy was allowed, and dependence on Vienna was very slight and not irksome. The nobles and the clergy were rich and influential, but kept in order by the civil power. There was no feeling of nationality, but the people were prosperous, enjoyed profound peace and were placidly content with the existing order of things. On the death of Maria Theresa in 1780, the emperor Joseph II. instituted much wider reforms. Feudal privileges were done away with, clerical influence diminished and many monasteries and convents suppressed, the criminal law rendered more humane and torture abolished largely as a result of G. Beccaria's famous pamphlet *Dei delitti e delle pene*. At the same time Joseph's administration was more arbitrary, and local autonomy was to some extent curtailed. His anti-clerical laws produced some ill-feeling among the more devout part of the population. On the whole the Austrian rule in pre-revolutionary days was beneficial and far from oppressive, and helped Lombardy to recover from the ill-effects of the Spanish domination. It did little for the moral education of the people, but the same criticism applies more or less to all the European governments of the day. The emperor Francis I. ruled the grand-duchy of Tuscany by lieutenants until his death in 1765, when it was given, as an independent state, to his second son, Peter Leopold. The reign of this duke was long remembered as a period of internal prosperity, wise legislation and important public enterprise. Leopold, among other useful works, drained the Val di Chiana, and restored those fertile upland plains to agriculture. In 1790 he succeeded to the empire, and left Tuscany to his son Ferdinand. The kingdom of Sardinia was administered upon similar principles, but with less of geniality. Charles Emmanuel made his will law, and erased the remnants of free institutions from his state. At the same time he wisely followed his father's policy with regard to education and the church. This is perhaps the best that can be said of a king who incarnated the stolid absolutism of the period. From this date, however, we are able to trace the revival of independent thought among the Italians. The European ferment of ideas which preceded the French Revolution expressed itself in men like Alfieri, the fierce denouncer of tyrants, Beccaria, the philosopher of criminal jurisprudence, Volta, the physicist, and numerous political economists of Tuscany. Moved partly by external influences and partly by a slow internal reawakening, the people was preparing for the efforts of the 19th century. The papacy, during this period, had to reconsider the question of the Jesuits, who made themselves universally odious, not only in Italy, but also in France and Spain. In the pontificate of Clement XIII. they ruled the Vatican, and almost succeeded in embroiling the pope with the concerted Bourbon potentates of Europe. His successor, Clement XIV. suppressed the order altogether by a brief of 1773. (J. A. S.)

D. ITALY IN THE NAPOLEONIC PERIOD, 1796–1814

The campaign of 1796 which led to the awakening of the Italian people to a new consciousness of unity and strength is detailed in the article NAPOLEONIC CAMPAIGNS. Here we can attempt only a general survey of the events, political, civic and social, which heralded the *Risorgimento* in its first phase. It is desirable in the first place to realize the condition of Italy at the time when the irruption of the French and the expulsion of the Austrians opened up a new political vista for that oppressed and divided people.

Influence of the French Revolution.

For many generations Italy had been bandied to and fro between the Habsburgs and the Bourbons The decline of French influence at the close of the reign of Louis XIV. left the Habsburgs and the Spanish Bourbons without serious rivals. The former possessed the rich duchies of Milan (including Mantua) and Tuscany; while through a marriage alliance with the house of Este of Modena (the Archduke Ferdinand had married the heiress of Modena) its influence over that duchy was supreme. It also had a few fiefs in Piedmont and in Genoese territory. By marrying her daughter, Maria Amelia, to the young duke of Parma, and another daughter, Maria Carolina, to Ferdinand of Naples, Maria Theresa consolidated Habsburg influence in the north and south of the peninsula. The Spanish Bourbons held Naples and Sicily, as well as the duchy of Parma.

Bonaparte in Italy.

Of the nominally independent states the chief were the kingdom of Sardinia, ruled over by the house of Savoy, and comprising Piedmont, the isle of Sardinia and nominally Savoy and Nice, though the two provinces last named had virtually been lost to the monarchy since the campaign of 1793. Equally extensive, but less important in the political sphere, were the Papal States and Venetia, the former torpid under the obscurantist rule of pope and cardinals, the latter enervated by luxury and the policy of unmanly complaisance long pursued by doge and council. The ancient rival of Venice, Genoa, was likewise far gone in decline. The small states, Lucca and San Marino, completed the map of Italy. The worst governed part of the peninsula was the south, where feudalism lay heavily on the cultivators and corruption pervaded all ranks. Milan and Piedmont were comparatively well governed; but repugnance to Austrian rule in the former case, and the contagion of French Jacobinical opinions in the latter, brought those populations into increasing hostility to the rulers. The democratic propaganda, which was permeating all the large towns of the peninsula, then led to the formation of numerous and powerful clubs and secret societies; and the throne of Victor Amadeus III., of the house of Savoy, soon began to totter under the blows delivered by the French troops at the mountain barriers of his kingdom and under the insidious assaults of the friends of liberty at Turin. Plotting was rife at Milan, as also at Bologna, where the memory of old liberties predisposed men to cast off clerical rule and led to the first rising on behalf of Italian liberty in the year 1794. At Palermo the Sicilians struggled hard to establish a republic in place of the odious government of an alien dynasty. The anathemas of the pope, the bravery of Piedmontese and Austrians, and the subsidies of Great Britain failed to keep the league of Italian princes against France intact. The grand-duke of Tuscany was the first of the European sovereigns who made peace with, and recognized the French republic, early in 1795. The first fortnight of Napoleon's campaign of 1796 detached Sardinia from alliance with Austria and England. The enthusiasm of the Italians for the young Corsican "liberator" greatly helped his progress. Two months later Ferdinand of Naples sought for an armistice, the central duchies were easily overrun, and, early in 1797, Pope Pius VI. was fain to sign terms of peace with Bonaparte at Tolentino, practically ceding the northern part of his states, known as the Legations. The surrender of the last Habsburg stronghold, Mantua, on the 2nd of February 1797 left the field clear for the erection of new political institutions.

The Cispadane Republic.

Already the men of Reggio, Modena and Bologna had declared for a democratic policy, in which feudalism and clerical rule should have no place, and in which manhood suffrage, together with other rights promised by Bonaparte to the men of Milan in May 1796, should form the basis of a new order of things. In taking this step the Modenese and Romagnols had the encouragement of Bonaparte, despite the orders which the French directory sent to him in a contrary sense. The result was the formation of an assembly at Modena which abolished feudal dues and customs, declared for manhood suffrage and established the Cispadane Republic (October 1796).

The close of Bonaparte's victorious campaign against the Archduke Charles in 1797 enabled him to mature those designs respecting Venice which are detailed in the article NAPOLEON. On a far higher level was his conduct towards the Milanese. While the French directory saw in that province little more than a district which might be plundered and bargained for, Bonaparte, though by no means remiss in the exaction of gold and of artistic treasures, was laying the foundation of a friendly republic. During his sojourn at the castle of Montebello or Mombello, near Milan, he commissioned several of the leading men of northern Italy to draw up a project of constitution and list of reforms for that province. Meanwhile he took care to curb the excesses of the Italian Jacobins and to encourage the Moderates, who were favourable to the French connexion as promising a guarantee against Austrian domination and internal anarchy. He summed up his conduct in the letter of the 8th of May 1797 to the French directory, "I cool the hot heads here and warm the cool ones."

The Cisalpine Republic.

The Transpadane Republic, or, as it was soon called, the Cisalpine Republic, began its organized life on the 9th of July 1797, with a brilliant festival at Milan. The constitution was modelled on that of the French directory, and, lest there should be a majority of clerical or Jacobinical deputies, the French Republic through its general, Bonaparte, nominated and appointed the first deputies and administrators of the new government. In the same month it was joined by the Cispadane Republic; and the terms of the treaty of Campo Formio (October 17, 1797), while fatal to the political life of Venice, awarded to this now considerable state the Venetian territories west of the river Adige. A month later, under the pretence of stilling the civil strifes in the Valtelline, Bonaparte absorbed that Swiss district in the Cisalpine Republic, which thus included all the lands between Como and Verona on the north, and Rimini on the south.

End of the Venetian Republic.

Early in the year 1798 the Austrians, in pursuance of the scheme of partition agreed on at Campo Formio, entered Venice and brought to an end its era of independence which had lasted some 1100 years. Venice with its mainland territories east of the Adige, inclusive of Istria and Dalmatia, went to the Habsburgs, while the Venetian isles of the Adriatic (the Ionian Isles) and the Venetian fleet went to strengthen France for that eastern expedition on which Bonaparte had already set his heart. Venice not only paid the costs of the war to the two chief belligerents, but her naval resources also helped to launch the young general on his career of eastern adventure. Her former rival, Genoa, had also been compelled, in June 1797, to bow before the young conqueror, and had undergone at his hands a remodelling on the lines already followed at Milan. The new Genoese republic, French in all but name, was renamed the Ligurian Republic.

French occupation of Rome.

Before he set sail for Egypt, the French had taken possession of Rome. Already masters of the papal fortress of Ancona, they began openly to challenge the pope's authority at the Eternal City itself. Joseph Bonaparte, then French envoy to the Vatican, encouraged democratic manifestations; and one of them, at the close of 1797, led to a scuffle in which a French general, Duphot, was killed. The French directory at once ordered its general, Berthier, to march to Rome: the Roman democrats proclaimed a republic on the 15th of February 1798, and on their invitation Berthier and his troops marched in. The pope, Pius VI., was forthwith haled away to Siena and a year later to Valence in the south of France, where he died. Thus fell the temporal power. The "liberators" of Rome thereupon proceeded to plunder the city in a way which brought shame on their cause and disgrace (perhaps not wholly deserved) on the general left in command, Masséna.

Naples.

The Parthenopaean Republic.

These events brought revolution to the gates of the kingdom of Naples, the worst-governed part of Italy, where the boorish king, Ferdinand IV. (*il rè lazzarone*, he was termed), and his whimsical consort, Maria Carolina, scarcely held in check the discontent of their own subjects. A British fleet under Nelson, sent into the Mediterranean in May 1798 primarily for their defence, checkmated the designs of Bonaparte in Egypt, and then, returning to Naples, encouraged that court to adopt a spirited policy. It is now known that the influence of Nelson and of the British ambassador, Sir William Hamilton, and Lady Hamilton precipitated the rupture between Naples and France. The results were disastrous. The Neapolitan troops at first occupied Rome, but, being badly handled by their leader, the Austrian general, Mack, they were soon scattered in flight; and the Republican troops under General Championnet, after crushing the stubborn resistance of the lazzaroni, made their way into Naples and proclaimed the Parthenopaean Republic (January 23, 1799). The Neapolitan Democrats chose five of their leading men to be directors, and tithes and feudal dues and customs were abolished. Much good work was done by the Republicans during their brief tenure of power, but it soon came to an end owing to the course of events which favoured a reaction against France. The directors of Paris, not content with overrunning and plundering Switzerland, had outraged German sentiment in many ways. Further, at the close of 1798 they virtually compelled the young king of Sardinia, Charles Emmanuel IV., to abdicate at Turin. He retired to the island of Sardinia, while the French despoiled Piedmont, thereby adding fuel to the resentment rapidly growing against them in every part of Europe.

Suvarov in Italy.

The outcome of it all was the War of the Second Coalition, in which Russia, Austria, Great Britain, Naples and some secondary states of Germany took part. The incursion of an Austro-Russian army, led by that strange but magnetic being, Suvarov, decided the campaign in northern Italy. The French, poorly handled by Schérer and Sérurier, were everywhere beaten, especially at Magnano (April 5) and Cassano (April 27). Milan and Turin fell before the allies, and Moreau, who took over the command, had much difficulty in making his way to the Genoese coast-line. There he awaited the arrival of Macdonald with the army of Naples. That general, Championnet's successor, had been compelled by these reverses and by the threatening pressure of Nelson's fleet to evacuate Naples and central Italy. In many parts the peasants and townsfolk, enraged by the licence of the French, hung on his flank and rear. The republics set up by the French at Naples, Rome and Milan collapsed as soon as the French troops retired; and a reaction in favour of clerical and Austrian influence set in with great violence. For the events which then occurred at Naples, so compromising to the reputation of Nelson, see NELSON and NAPLES. Sir William Hamilton was subsequently recalled in a manner closely resembling a disgrace, and his place was taken by Paget, who behaved with more dignity and tact.

Meanwhile Macdonald, after struggling through central Italy, had defeated an Austrian force at Modena (June 12, 1799), but Suvarov was able by swift movements utterly to overthrow him at the Trebbia (June 17–19). The wreck of his force drifted away helplessly towards Genoa. A month later the ambitious young general, Joubert, who took over Moreau's command and rallied part of Macdonald's following, was utterly routed by the Austro-Russian army at Novi (August 15) with the loss of 12,000 men. Joubert perished in the battle. The growing friction between Austria and Russia led to the transference of Suvarov and his Russians to Switzerland, with results which were to be fatal to the allies in that quarter. But in Italy the Austrian successes continued. Melas defeated Championnet near Coni on the 4th of November; and a little later the French garrisons at Ancona and Coni surrendered. The tricolour, which floated triumphantly over all the strongholds of Italy early in the year, at its close waved only over Genoa, where Masséna prepared for a stubborn defence. Nice and Savoy also seemed at the mercy of the invaders. Everywhere the old order of things was restored. The death of the aged Pope Pius VI. at Valence (August 29, 1799) deprived the French of whatever advantage they had hoped to gain by dragging him into exile; on the 24th of March 1800 the conclave, assembled for greater security on the island of San Giorgio at Venice, elected a new pontiff, Pius VII.

Campaign of Marengo.

Such was the position of affairs when Bonaparte returned from Egypt and landed at Fréjus. The contrast presented by his triumphs, whether real or imaginary, to the reverses sustained by the armies of the French directory, was fatal to that body and to popular institutions in France. After the *coup d'état* of Brumaire (November 1799) he, as First Consul, began to organize an expedition against the Austrians (Russia having now retired from the coalition), in northern Italy. The campaign culminating at Marengo was the result. By that triumph (due to Desaix and Kellermann rather than directly to him), Bonaparte consolidated his own position in France and again laid Italy at his feet. The Austrian general, Melas, signed an armistice whereby he was to retire with his army beyond the river Mincio. Ten days earlier, namely on the 4th of June, Masséna had been compelled by hunger to capitulate at Genoa; but the success at Marengo, followed up by that of Macdonald in north Italy, and Moreau at Hohenlinden (December 2, 1800), brought the emperor Francis to sue for peace which was finally concluded at Lunéville on the 9th of February 1801. The Cisalpine and Ligurian Republics (reconstituted soon after Marengo) were recognized by Austria on condition that they were independent of France. The rule of Pius VII. over the Papal States was admitted; and Italian affairs were arranged much as they were at Campo Formio: Modena and Tuscany now reverted to French control, their former rulers being promised compensation in Germany. Naples, easily worsted by the French, under Miollis, left the British alliance, and made peace by the treaty of Florence (March 1801), agreeing to withdraw her troops from the Papal States, to cede Piombino and the Presidii (in Tuscany) to France and to close her ports to British ships and commerce. King Ferdinand also had to accept a French garrison at Taranto, and other points in the south.

Treaty of Lunéville.

Napoleon's reorganization of Italy.

Other changes took place in that year, all of them in favour of France. By complex and secret bargaining with the court of Madrid, Bonaparte procured the cession to France of Louisiana, in North America, and Parma; while the duke of Parma (husband of an infanta of Spain) was promoted by him to the duchy of Tuscany, now renamed the kingdom of Etruria. Piedmont was declared to be a military division at the disposal of France (April 21, 1801); and on the 21st of September 1802, Bonaparte, then First Consul for life, issued a decree for its definitive incorporation in the French Republic. About that time, too, Elba fell into the hands of Napoleon. Piedmont was organized in six departments on the model of those of France, and a number of French veterans were settled by Napoleon in and near the fortress of Alessandria. Besides copying the Roman habit of planting military colonies, the First Consul imitated the old conquerors of the world by extending and completing the road-system of his outlying districts, especially at those important passes, the Mont Cenis and Simplon. He greatly improved the rough track over the Simplon Pass, so that, when finished in 1807, it was practicable for artillery. Milan was the terminus of the road, and the construction of the Foro Buonaparte and the completion of the cathedral added dignity to the Lombard capital. The Corniche road was improved; and public works in various parts of Piedmont, and the Cisalpine and Ligurian Republics attested the foresight and wisdom of the great organizer of industry and quickener of human energies. The universities of Pavia and Bologna were reopened and made great progress in this time of peace and growing prosperity. Somewhat later the Pavia canal was begun in order to connect Lake Como with the Adriatic for barge-traffic.

The personal nature of the tie binding Italy to France was illustrated by a curious incident of the winter of 1802–1803. Bonaparte, now First Consul for life, felt strong enough to impose his will on the Cisalpine Republic and to set at defiance one of the stipulations of the treaty of Lunéville. On the pretext of consolidating that republic, he invited 450 of its leading men to come to Lyons to a *consulta*. In reality he and his agents had already provided for the passing of proposals which were agreeable to him. The deputies having been dazzled by fêtes and reviews, Talleyrand and Marescalchi, ministers of foreign affairs at Paris and Milan, plied them with hints as to the course to be followed by the *consulta*; and, despite the rage of the more democratic of their number, everything corresponded to the wishes of the First Consul. It remained to find a chief. Very many were in favour of Count Melzi, a Lombard noble, who had been chief of the executive at Milan; but again Talleyrand and French agents set to work on behalf of their master, with the result that he was elected president for ten years. He accepted that office because, as he frankly informed the deputies, he had found no one who "for his services rendered to his country, his authority with the people and his separation from party has deserved such an office." Melzi was elected vice-president with merely honorary functions. The constitution comprised a *consulta* charged with executive duties, a legislative body of 150 members and a court charged with the maintenance of the fundamental laws. These three bodies were to be chosen by three electoral colleges consisting of (*a*) landed proprietors, (*b*) learned men and clerics, (*c*) merchants and traders, holding their sessions biennially at Milan, Bologna and Brescia respectively. In practice the *consulta* could override the legislature; and, as the *consulta* was little more than the organ of the president, the whole constitution may be pronounced as autocratic as that of France after the changes brought about by Bonaparte in August 1802. Finally we must note that the Cisalpine now took the name of the Italian Republic, and that by a concordat with the pope, Bonaparte regulated its relations to the Holy See in a manner analogous to that adopted in the famous French concordat promulgated at Easter 1802 (see CONCORDAT). It remains to add that the Ligurian Republic and that of Lucca remodelled their constitutions in a way somewhat similar to that of the Cisalpine.

Kingdom of Italy.

Bonaparte's ascendancy did not pass unchallenged. Many of the Italians retained their enthusiasm for democracy and national independence. In 1803 movements in these directions took place at Rimini, Brescia and Bologna; but they were sharply repressed, and most Italians came to acquiesce in the Napoleonic supremacy as inevitable and indeed beneficial. The complete disregard shown by Napoleon for one of the chief conditions of the treaty of Lunéville (February 1801)—that stipulating for the independence of the Ligurian and Cisalpine Republics—became more and more apparent every year. Alike in political and commercial affairs they were for all practical purposes dependencies of France. Finally, after the proclamation of the French empire (May 18, 1804) Napoleon proposed to place his brother Joseph over the Italian state, which now took the title of kingdom of Italy. On Joseph declining, Napoleon finally decided to accept the crown which Melzi, Marescalchi, Serbelloni and others begged him to assume. Accordingly, on the 26th of May 1805, in the cathedral at Milan, he crowned himself with the iron crown of the old Lombard kings, using the traditional formula, "God gave it me: let him beware who touches it." On the 7th of June he appointed his step-son, Eugène Beauharnais, to be viceroy. Eugène soon found that his chief duty was to enforce the will of Napoleon. The legislature at Milan having ventured to alter some details of taxation, Eugène received the following rule of conduct from his step-father: "Your system of government is simple: the emperor wills it to be thus." Republicanism was now everywhere discouraged. The little republic of Lucca, along with Piombino, was now awarded as a principality by the emperor to Elisa Bonaparte and her husband, Bacciocchi.

In June 1805 there came a last and intolerable affront to the emperors of Austria and Russia, who at that very time were seeking to put bounds to Napoleon's ambition and to redress the balance of power. The French emperor, at the supposed request of the doge of Genoa, declared the Ligurian Republic to be an integral part of the French empire. This defiance to the sovereigns of Russia and Austria rekindled the flames of war. The third coalition was formed between Great Britain, Russia and Austria, Naples soon joining its ranks.

For the chief events of the ensuing campaigns see NAPOLEONIC CAMPAIGNS. While Masséna pursued the Austrians into their own lands at the close of 1805, Italian forces under Eugène and Gouvion St Cyr (*q.v.*) held their ground against allied forces landed at Naples. After Austerlitz (December 2, 1805) Austria made peace by the treaty of Pressburg, ceding to the kingdom of Italy her part of Venetia along with the provinces of Istria and Dalmatia. Napoleon then turned fiercely against Maria Carolina of Naples upbraiding her with her "perfidy." He sent Joseph Bonaparte and Masséna southwards with a strong column, compelled the Anglo-Russian forces to evacuate Naples, and occupied the south of the peninsula with little opposition except at the fortress of Gaeta. The Bourbon court sailed away to Palermo, where it remained for eight years under the protection afforded by the British fleet and a British army of occupation. On the 15th of February 1806 Joseph Bonaparte entered Naples in triumph, his troops capturing there two hundred pieces of cannon. Gaeta, however, held out stoutly against the French. Sir Sidney Smith with a British squadron captured Capri (February 1806), and the peasants of the Abruzzi and Calabria soon began to give trouble. Worst of all was the arrival of a small British force in Calabria under Sir John Stuart, which beat off with heavy loss an attack imprudently delivered by General Réynier on level ground near the village of Maida (July 4). The steady volleys of Kempt's light infantry were fatal to the French, who fell back in disorder under a bayonet charge of the victors, with the loss of some 2700 men. Calabria now rose in revolt against King Joseph, and the peasants dealt out savage reprisals to the French troops. On the 18th of July, however, Gaeta surrendered to Masséna, and that marshal, now moving rapidly southwards, extricated Réynier, crushed the Bourbon rising in Calabria with great barbarity, and compelled the British force to re-embark for Sicily. At Palermo Queen Maria Carolina continued to make vehement but futile efforts for the overthrow of King Joseph.

Joseph Bonaparte in Naples.

It is more important to observe that under Joseph and his ministers or advisers, including the Frenchmen Roederer, Dumas, Miot de Melito and the Corsican Saliceti, great progress was made in abolishing feudal laws and customs, in reforming the judicial procedure and criminal laws on the model of the *Code Napoléon*, and in attempting the beginnings of elementary education. More questionable was Joseph's policy in closing and confiscating the property of 213 of the richer monasteries of the land. The monks were pensioned off, but though the confiscated property helped to fill the empty coffers of the state, the measure aroused widespread alarm and resentment among that superstitious people.

The peace of Tilsit (July 7, 1807) enabled Napoleon to press on his projects for securing the command of the Mediterranean, thenceforth a fundamental axiom of his policy. Consequently, in the autumn of 1807 he urged on Joseph the adoption of vigorous measures for the capture of Sicily. Already, in the negotiations with England during the summer of 1806, the emperor had shown his sense of the extreme importance of gaining possession of that island, which indeed caused the breakdown of the peace proposals then being considered; and now he ordered French squadrons into the Mediterranean in order to secure Corfu and Sicily. His plans respecting Corfu succeeded. That island and some of the adjacent isles fell into the hands of the French (some of them were captured by British troops in 1809–10); but Sicily remained unassailable. Capri, however, fell to the French on the 18th of October 1808, shortly after the arrival at Naples of the new king, Murat.

Murat King of Naples.

This ambitious marshal, brother-in-law of Napoleon, foiled in his hope of gaining the crown of Spain, received that of Naples in the summer of 1808, Joseph Bonaparte being moved from Naples to Madrid. This arrangement pleased neither of the relatives of the emperor; but his will now was law on the continent. Joseph left Naples on the 23rd of May 1808; but it was not until the 6th of September that Joachim Murat made his entry. A fortnight later his consort Caroline arrived, and soon showed a vigour and restlessness of spirit which frequently clashed with the dictates of her brother, the emperor and the showy, unsteady policy of her consort. The Spanish national rising of 1808 and thereafter the Peninsular War diverted Napoleon's attention from the affairs of south Italy. In June 1809, during his campaign against Austria, Sir John Stuart with an Anglo-Sicilian force sailed northwards, captured Ischia and threw Murat into great alarm; but on the news of the Austrian defeat at Wagram, Stuart sailed back again.

It is now time to turn to the affairs of central Italy. Early in 1808 Napoleon proceeded with plans which he had secretly concerted after the treaty of Tilsit for transferring the infanta

Central Italy.

of Spain who, after the death of her consort, reigned at Florence on behalf of her young son, Charles Louis, from her kingdom of Etruria to the little principality of Entre Douro e Minho which he proposed to carve out from the north of Portugal. Etruria reverted to the French empire, but the Spanish princess and her son did not receive the promised indemnity. Elisa Bonaparte and her husband, Bacciocchi, rulers of Lucca and Piombino, became the heads of the administration in Tuscany, Elisa showing decided governing capacity.

Napoleon and the Papacy.

Annexation of the Papal States.

The last part of the peninsula to undergo the Gallicizing influence was the papal dominion. For some time past the relations between Napoleon and the pope, Pius VII., had been severely strained, chiefly because the emperor insisted on controlling the church, both in France and in the kingdom of Italy, in a way inconsistent with the traditions of the Vatican, but also because the pontiff refused to grant the divorce between Jerome Bonaparte and the former Miss Patterson on which Napoleon early in the year 1806 laid so much stress. These and other disputes led the emperor, as successor of Charlemagne, to treat the pope in a very high-handed way. "Your Holiness (he wrote) is sovereign of Rome, but I am its emperor"; and he threatened to annul the presumed "donation" of Rome by Charlemagne, unless the pope yielded implicit obedience to him in all temporal affairs. He further exploited the Charlemagne tradition for the benefit of the continental system, that great engine of commercial war by which he hoped to assure the ruin of England. This aim prompted the annexation of Tuscany, and his intervention in the affairs of the Papal States. To this the pope assented under pressure from Napoleon; but the latter soon found other pretexts for intervention, and in February 1808 a French column under Miollis occupied Rome, and deposed the papal authorities. Against this violence Pius VII. protested in vain. Napoleon sought to push matters to an extreme, and on the 2nd of April he adopted the rigorous measure of annexing to the kingdom of Italy the papal provinces of Ancona, Urbino, Macerata and Camerina. This measure, which seemed to the pious an act of sacrilege, and to Italian patriots an outrage on the only independent sovereign of the peninsula, sufficed for the present. The outbreak of war in Spain, followed by the rupture with Austria in the spring of 1809, distracted the attention of the emperor. But after the occupation of Vienna the conqueror dated from that capital on the 17th of May 1809 a decree virtually annexing Rome and the *Patrimonium Petri* to the French empire. Here again he cited the action of Charlemagne, his "august predecessor," who had merely given "certain domains to the bishops of Rome as fiefs, though Rome did not thereby cease to be part of his empire."

In reply the pope prepared a bull of excommunication against those who should infringe the prerogatives of the Holy See in this matter. Thereupon the French general, Miollis, who still occupied Rome, caused the pope to be arrested and carried him away northwards into Tuscany, thence to Savona; finally he was taken, at Napoleon's orders, to Fontainebleau. Thus, a second time, fell the temporal power of the papacy. By an imperial decree of the 17th of February 1810, Rome and the neighbouring districts, including Spoleto, became part of the French empire. Rome thenceforth figured as its second city, and entered upon a new life under the administration of French officials. The Roman territory was divided into two departments—the Tiber and Trasimenus; the *Code Napoléon* was introduced, public works were set on foot and great advance was made in the material sphere. Nevertheless the harshness with which the emperor treated the Roman clergy and suppressed the monasteries caused deep resentment to the orthodox.

Character of Napoleon's rule.

Collapse of Napoleon's rule.

There is no need to detail the fortunes of the Napoleonic states in Italy. One and all they underwent the influences emanating from Paris; and in respect to civil administration, law, judicial procedure, education and public works, they all experienced great benefits, the results of which never wholly disappeared. On the other hand, they suffered from the rigorous measures of the continental system, which seriously crippled trade at the ports and were not compensated by the increased facilities for trade with France which Napoleon opened up. The drain of men to supply his armies in Germany, Spain and Russia was also a serious loss. A powerful Italian corps marched under Eugène Beauharnais to Moscow, and distinguished itself at Malo-Jaroslavitz, as also during the horrors of the retreat in the closing weeks of 1812. It is said that out of 27,000 Italians who entered Russia with Eugène, only 333 saw their country again. That campaign marked the beginning of the end for the Napoleonic domination in Italy as elsewhere. Murat, left in command of the Grand Army at Vilna, abandoned his charge and in the next year made overtures to the allies who coalesced against Napoleon. For his vacillations at this time and his final fate, see MURAT. Here it must suffice to say that the uncertainty caused by his policy in 1813–1814 had no small share in embarrassing Napoleon and in precipitating the downfall of his power in Italy. Eugène Beauharnais, viceroy of the kingdom of Italy, showed both constancy and courage; but after the battle of Leipzig (October 16–19, 1813) his power crumbled away under the assaults of the now victorious Austrians. By an arrangement with Bavaria, they were able to march through Tirol and down the valley of the Adige in force, and overpowered the troops of Eugène whose position was fatally compromised by the defection of Murat and the dissensions among the Italians. Very many of them, distrusting both of these kings, sought to act independently in favour of an Italian republic. Lord William Bentinck with an Anglo-Sicilian force landed at Leghorn on the 8th of March 1814, and issued a proclamation to the Italians bidding them rise against Napoleon in the interests of their own freedom. A little later he gained possession of Genoa. Amidst these schisms the defence of Italy collapsed. On the 16th of April 1814 Eugène, on hearing of Napoleon's overthrow at Paris, signed an armistice at Mantua by which he was enabled to send away the French troops beyond the Alps and entrust himself to the consideration of the allies. The Austrians, under General Bellegarde, entered Milan without resistance; and this event precluded the restoration of the old political order.

The arrangements made by the allies in accordance with the treaty of Paris (June 12, 1814) and the Final Act of the congress of Vienna (June 9, 1815), imposed on Italy boundaries which, roughly speaking, corresponded to those of the pre-Napoleonic era. To the kingdom of Sardinia, now reconstituted under Victor Emmanuel I., France ceded its old provinces, Savoy and Nice; and the allies, especially Great Britain and Austria, insisted on the addition to that monarchy of the territories of the former republic of Genoa, in respect of which the king took the title of duke of Genoa, in order to strengthen it for the duty of acting as a buffer state between France and the smaller states of central Italy. Austria recovered the Milanese, and all the possessions of the old Venetian Republic on the mainland, including Istria and Dalmatia. The Ionian Islands, formerly belonging to Venice, were, by a treaty signed at Paris on the 5th of November 1815, placed under the protection of Great Britain. By an instrument signed on the 24th of April 1815, the Austrian territories in north Italy were erected into the kingdom of Lombardo-Venetia, which, though an integral part of the Austrian empire, was to enjoy a separate administration, the symbol of its separate individuality being the coronation of the emperors with the ancient iron crown of Lombardy ("Proclamation de l'empereur d'Autriche, &c.," April 7, 1815, *State Papers*, ii. 906). Francis IV., son of the archduke Ferdinand of Austria and Maria Beatrice, daughter of Ercole Rinaldo, the last of the Estensi, was reinstated as duke of Modena. Parma and Piacenza were assigned to Marie Louise, daughter of the Austrian emperor and wife of Napoleon, on behalf of her son, the little Napoleon, but by subsequent arrangements (1816–1817) the duchy was to revert at her death to the Bourbons of Parma, then reigning at Lucca. Tuscany was restored to the grand-duke Ferdinand III. of Habsburg-Lorraine. The duchy of Lucca was given to Marie Louise of Bourbon-Parma, who, at the death of Marie Louise of Austria, would return to Parma, when Lucca would be handed over to Tuscany. The pope, Pius VII., who had long been kept under restraint by Napoleon at Fontainebleau, returned to Rome in May 1814, and was recognized by the congress of Vienna (not without some demur on the part of Austria) as the sovereign of all the former possessions of the Holy See. Ferdinand IV. of Naples, not long after the death of his consort, Maria Carolina, in Austria, returned from Sicily to take possession of his dominions on the mainland. He received them back in their entirety at the hands of the powers, who recognized his new title of Ferdinand I. of the Two Sicilies. The rash attempt of Murat in the autumn of 1815, which led to his death at Pizzo in Calabria, enabled the Bourbon dynasty to crush malcontents with all the greater severity. The reaction, which was dull and heavy in the dominions of the pope and of Victor Emmanuel, systematically harsh in the Austrian states of the north, and comparatively mild in Parma and Tuscany, excited the greatest loathing in southern Italy and Sicily, because there it was directed by a dynasty which had aroused feelings of hatred mingled with contempt.

There were special reasons why Sicily should harbour these feelings against the Bourbons. During eight years (1806–1814) the chief places of the island had been garrisoned by British troops; and the commander of the force which upheld the tottering rule of Ferdinand at Palermo naturally had great authority. The British government, which awarded a large annual subsidy to the king and queen at Palermo, claimed to have some control over the administration. Lord William Bentinck finally took over large administrative powers, seeing that Ferdinand, owing to his dulness, and Maria Carolina, owing to her very suspicious intrigues with Napoleon, could never be trusted. The contest between the royal power and that of the Sicilian estates threatened to bring matters to a deadlock, until in 1812, under the impulse of Lord William Bentinck, a constitution modelled largely on that of England was passed by the estates. After the retirement of the British troops in 1814 the constitution lapsed, and the royal authority became once more absolute. But the memory of the benefits conferred by "the English constitution" remained fresh and green amidst the arid waste of repression which followed. It lived on as one of the impalpable but powerful influences which spurred on the Sicilians and the democrats of Naples to the efforts which they put forth in 1821, 1830, 1848 and 1860.

This result, accruing from British intervention, was in some respects similar to that exerted by Napoleon on the Italians of the mainland. The brutalities of Austria's white coats in the north, the unintelligent repression then characteristic of the house of Savoy, the petty spite of the duke of Modena, the medieval obscurantism of pope and cardinals in the middle of the peninsula and the clownish excesses of Ferdinand in the south, could not blot out from the minds of the Italians the recollection of the benefits derived from the just laws, vigorous administration and enlightened aims of the great emperor. The hard but salutary training which they had undergone at his hands had taught them that they were the equals of the northern races both in the council chamber and on the field of battle. It had further revealed to them that truth, which once grasped can never be forgotten, that, despite differences of climate, character and speech, they were in all essentials a nation. (J. Hl. R.)

E. The Risorgimento, 1815–1870

As the result of the Vienna treaties, Austria became the real mistress of Italy. Not only did she govern Lombardy and Venetia directly, but Austrian princes ruled in Modena, Parma and Tuscany; Piacenza, Ferrara and Comacchio had Austrian garrisons; Prince Metternich, the Austrian chancellor, believed that he could always secure the election of an Austrophil pope, and Ferdinand of Naples, reinstated by an Austrian army, had bound himself, by a secret article of the treaty of June 12, 1815, not to introduce methods of government incompatible with those adopted in Austria's Italian possessions. Austria also concluded offensive and defensive alliances with Sardinia, Tuscany and Naples; and Metternich's ambition was to make Austrian predominance over Italy still more absolute, by placing an Austrian archduke on the Sardinian throne.

Reaction in the Italian States.

Victor Emmanuel I., the king of Sardinia, was the only native ruler in the peninsula, and the Savoy dynasty was popular with all classes. But although welcomed with enthusiasm on his return to Turin, he introduced a system of reaction which, if less brutal, was no less uncompromising than that of Austrian archdukes or Bourbon princes. His object was to restore his dominions to the conditions preceding the French occupation. The French system of taxation was maintained because it brought in ampler revenues; but feudalism, the antiquated legislation and bureaucracy were revived, and all the officers and officials still living who had served the state before the Revolution, many of them now in their dotage, were restored to their posts; only nobles were eligible for the higher government appointments; all who had served under the French administration were dismissed or reduced in rank; and in the army beardless scions of the aristocracy were placed over the heads of war-worn veterans who had commanded regiments in Spain and Russia. The influence of a bigoted priesthood was re-established, and "every form of intellectual and moral torment, everything save actual persecution and physical torture that could be inflicted on the 'impure' was inflicted" (Cesare Balbo's *Autobiography*). All this soon provoked discontent among the educated classes. In Genoa the government was particularly unpopular, for the Genoese resented being handed over to their old enemy Piedmont like a flock of sheep. Nevertheless the king strongly disliked the Austrians, and would willingly have seen them driven from Italy.

Austrian rule in Italy.

Reaction in Rome.

Naples.

In Lombardy French rule had ended by making itself unpopular, and even before the fall of Napoleon a national party, called the *Italici puri*, had begun to advocate the independence of Lombardy, or even its union with Sardinia. At first a part of the population were content with Austrian rule, which provided an honest and efficient administration; but the rigid system of centralization which, while allowing the semblance of local autonomy, sent every minute question for settlement to Vienna; the severe police methods; the bureaucracy, in which the best appointments were usually conferred on Germans or Slavs wholly dependent on Vienna, proved galling to the people, and in view of the growing disaffection the country was turned into a vast armed camp. In Modena Duke Francis proved a cruel tyrant. In Parma, on the other hand, there was very little oppression, the French codes were retained, and the council of state was consulted on all legislative matters. Lucca too enjoyed good government, and the peasantry were well cared for and prosperous. In Tuscany the rule of Ferdinand and of his minister Fossombroni was mild and benevolent, but enervating and demoralizing. The Papal States were ruled by a unique system of theocracy, for not only the head of the state but all the more important officials were ecclesiastics, assisted by the Inquisition, the Index and all the paraphernalia of medieval church government. The administration was inefficient and corrupt, the censorship uncompromising, the police ferocious and oppressive, although quite unable to cope with the prevalent anarchy and brigandage; the antiquated pontifical statutes took the place of the French laws, and every vestige of the vigorous old communal independence was swept away. In Naples King Ferdinand retained some of the laws and institutions of Murat's régime, and many of the functionaries of the former government entered his service; but he revived the Bourbon tradition, the odious police system and the censorship; and a degrading religious bigotry, to which the masses were all too much inclined, became the basis of government and social life. The upper classes were still to a large extent inoculated with French ideas, but the common people were either devoted to the dynasty or indifferent. In Sicily, which for centuries had enjoyed a feudal constitution modernized and Anglicized under British auspices in 1812, and where anti-Neapolitan feeling was strong, autonomy was suppressed, the constitution abolished in 1816, and the island, as a reward for its fidelity to the dynasty, converted into a Neapolitan province governed by Neapolitan bureaucrats.

Secret societies. The Carbonari.

To the mass of the people the restoration of the old governments undoubtedly brought a sense of relief, for the terrible drain in men and money caused by Napoleon's wars had caused much discontent, whereas now there was a prospect of peace and rest. But the restored governments in their terror of revolution would not realize that the late régime had wafted a breath of new life over the country and left ineffaceable traces in the way of improved laws, efficient administration, good roads and the sweeping away of old abuses; while the new-born idea of Italian unity, strengthened by a national pride revived on many a stricken field from Madrid to Moscow, was a force to be reckoned with. The oppression and follies of the restored governments made men forget the evils of French rule and remember only its good side. The masses were still more or less indifferent, but among the nobility and the educated middle classes, cut off from all part in free political life, there was developed either the spirit of despair at Italy's moral degradation, as expressed in the writings of Foscolo and Leopardi, or a passion of hatred and revolt, which found its manifestation, in spite of severe laws, in the development of secret societies. The most important of these were the Carbonari lodges, whose objects were the expulsion of the foreigner and the achievement of constitutional freedom (see CARBONARI).

Revolution in Naples, 1820.

When Ferdinand returned to Naples in 1815 he found the kingdom, and especially the army, honeycombed with Carbonarism, to which many noblemen and officers were affiliated; and although the police instituted prosecutions and organized the counter-movement of the *Calderai*, who may be compared to the "Black Hundreds" of modern Russia, the revolutionary spirit continued to grow, but it was not at first anti-dynastic. The granting of the Spanish constitution of 1820 proved the signal for the beginning of the Italian liberationist movement; a military mutiny led by two officers, Silvati and Morelli, and the priest Menichini, broke out at Monteforte, to the cry of "God, the King, and the Constitution!" The troops sent against them commanded by General Guglielmo Pepe, himself a Carbonaro, hesitated to act, and the king, finding that he could not count on the army, granted the constitution (July 13, 1820), and appointed his son Francis regent. The events that followed are described in the article on the history of Naples (*q.v.*). Not only did the constitution, which was modelled on the impossible Spanish constitution of 1812, prove unworkable, but the powers of the Grand Alliance, whose main object was to keep the peace of Europe, felt themselves bound to interfere to prevent the evil precedent of a successful military revolution. The diplomatic developments that led to the intervention of Austria are sketched elsewhere (see EUROPE: *History*); in general the result of the deliberations of the congresses of Troppau and Laibach was to establish, not the general right of intervention claimed in the Troppau Protocol, but the special right of Austria to safeguard her interests in Italy. The defeat of General Pepe by the Austrians at Rieti (March 7, 1821) and the re-establishment of King Ferdinand's autocratic power under the protection of Austrian bayonets were the effective assertion of this principle.

Military revolt in Piedmont.

The movement in Naples had been purely local, for the Neapolitan Carbonari had at that time no thought save of Naples; it was, moreover, a movement of the middle and upper classes in which the masses took little interest. Immediately after the battle of Rieti a Carbonarist mutiny broke out in Piedmont independently of events in the south. Both King Victor Emmanuel and his brother Charles Felix had no sons, and the heir presumptive to the throne was Prince Charles Albert, of the Carignano branch of the house of Savoy. Charles Albert felt a certain interest in Liberal ideas and was always surrounded by young nobles of Carbonarist and anti-Austrian tendencies, and was therefore regarded with suspicion by his royal relatives. Metternich, too, had an instinctive dislike for him, and proposed to exclude him from the succession by marrying one of the king's daughters to Francis of Modena, and getting the Salic law abolished so that the succession would pass to the duke and Austria would thus dominate Piedmont. The Liberal movement had gained ground in Piedmont as in Naples among the younger nobles and officers, and the events of Spain and southern Italy aroused much excitement. In March 1821, Count Santorre di Santarosa and other conspirators informed Charles Albert of a constitutional and anti-Austrian plot, and asked for his help. After a momentary hesitation he informed the king; but at his request no arrests were made, and no precautions were taken. On the 10th of March the garrison of Alessandria mutinied, and its example was followed on the 12th by that of Turin, where the Spanish constitution was demanded, and the black, red and blue flag of the Carbonari paraded the streets. The next day the king abdicated after appointing Charles Albert regent. The latter immediately proclaimed the constitution, but the new king, Charles Felix, who was at Modena at the time, repudiated the regent's acts and exiled him to Tuscany; and, with his consent, an Austrian army invaded Piedmont and crushed the constitutionalists at Novara. Many of the conspirators were condemned to death, but all succeeded in escaping. Charles Felix was most indignant with the ex-regent, but he resented, as an unwarrantable interference, Austria's attempt to have him excluded from the succession at the congress of Verona (1822). Charles Albert's somewhat equivocal conduct also roused the hatred of the Liberals, and for a long time the *esecrato Carignano* was regarded, most unjustly, as a traitor even by many who were not republicans.

Liberalism in Lombardy.

Carbonarism had been introduced into Lombardy by two Romagnols, Count Laderchi and Pietro Maroncelli, but the leader of the movement was Count F. Confalonieri, who was in favour of an Italian federation composed of northern Italy under the house of Savoy, central Italy under the pope, and the kingdom of Naples. There had been some mild plotting against Austria in Milan, and an attempt was made to co-operate with the Piedmontese movement of 1821; already in 1820 Maroncelli and the poet Silvio Pellico had been arrested as Carbonari, and after the movement in Piedmont more arrests were made. The mission of Gaetano Castiglia and Marquis Giorgio Pallavicini to Turin, where they had interviewed Charles Albert, although without any definite result—for Confalonieri had warned the prince that Lombardy was not ready to rise—was accidentally discovered, and Confalonieri was himself arrested. The plot would never have been a menace to Austria but for her treatment of the conspirators. Pellico and Maroncelli were immured in the Spielberg; Confalonieri and two dozen others were condemned to death, their sentences being, however, commuted to imprisonment in that same terrible fortress. The heroism of the prisoners, and Silvio Pellico's account of his imprisonment (*Le mie Prigioni*), did much to enlist the sympathy of Europe for the Italian cause.

The Papal States.

During the next few years order reigned in Italy, save for a few unimportant outbreaks in the Papal States; there was, however, perpetual discontent and agitation, especially in Romagna, where misgovernment was extreme. Under Pius VII. and his minister Cardinal Consalvi oppression had not been very severe, and Metternich's proposal to establish a central inquisitorial tribunal for political offences throughout Italy had been rejected by the papal government. But on the death of Pius in 1823, his successor Leo XII. (Cardinal Della Genga) proved a ferocious reactionary under whom barbarous laws were enacted and torture frequently applied. The secret societies, such as the Carbonari, the Adelfi and the Bersaglieri d'America, which flourished in Romagna, replied to these persecutions by assassinating the more brutal officials ans spies. The events of 1820–1821 increased the agitation in Romagna, and in 1825 large numbers of persons were condemned to death, imprisonment or exile. The society of the Sanfedisti, formed of the dregs of the populace, whose object was to murder every Liberal, was openly protected and encouraged. Leo died

Revolutions of 1830.

in 1829, and the mild, religious Pius VIII. (Cardinal Castiglioni) only reigned until 1830, when Gregory XVI. (Cardinal Cappellari) was elected through Austrian influence, and proved another *zelante.* The July revolution in Paris and the declaration of the new king, Louis Philippe, that France, as a Liberal monarchy, would not only not intervene in the internal affairs of other countries, but would not permit other powers to do so, aroused great hopes among the oppressed peoples, and was the immediate cause of a revolution in Romagna and the Marches. In February 1831 these provinces rose, raised the red, white and green tricolor (which henceforth took the place of the Carbonarist colours as the Italian flag), and shook off the papal yoke with surprising ease.[1] At Parma too there was an outbreak and a demand for the constitution; Marie Louise could not grant it because of her engagements with Austria, and, therefore, abandoned her dominions. In Modena Duke Francis, ambitious of enlarging his territories, coquetted with the Carbonari of Paris, and opened indirect negotiations with Menotti, the revolutionary leader in his state, believing that he might assist him in his plans. Menotti, for his part, conceived the idea of a united Italian state under the duke. A rising was organized for February 1831; but Francis got wind of it, and, repenting of his dangerous dallying with revolution, arrested Menotti and fled to Austrian territory with his prisoner. In his absence the insurrection took place, and Biagio Nardi, having been elected dictator, proclaimed that "Italy is one; the Italian nation one sole nation." But the French king soon abandoned his principle of non-intervention on which the Italian revolutionists had built their hopes; the Austrians intervened unhindered; the old governments were re-established in Parma, Modena and Romagna; and Menotti and many other patriots were hanged. The Austrians evacuated Romagna in July, but another insurrection having broken out immediately afterwards which the papal troops were unable to quell, they returned. This second intervention gave umbrage to France, who by way of a counterpoise sent a force to occupy Ancona. These two foreign occupations, which were almost as displeasing to the pope as to the Liberals, lasted until 1838. The powers, immediately after the revolt, presented a memorandum to Gregory recommending certain moderate reforms, but no attention was paid to it. These various movements proved in the first place that the masses were by no means ripe for revolution, and that the idea of unity, although now advocated by a few revolutionary leaders, was far from being generally accepted even by the Liberals; and, secondly, that, in spite of the indifference of the masses, the despotic governments were unable to hold their own without the assistance of foreign bayonets.

Mazzini and "Young Italy."

On the 27th of April 1831, Charles Albert succeeded Charles Felix on the throne of Piedmont. Shortly afterwards he received a letter from an unknown person, in which he was exhorted with fiery eloquence to place himself at the head of the movement for liberating and uniting Italy and expelling the foreigner, and told that he was free to choose whether he would be "the first of men or the last of Italian tyrants." The author was Giuseppe Mazzini, then a young man of twenty-six years, who, though in theory a republican, was ready to accept the leadership of a prince of the house of Savoy if he would guide the nation to freedom. The only result of his letter, however, was that he was forbidden to re-enter Sardinian territory. Mazzini, who had learned to distrust Carbonarism owing to its lack of a guiding principle and its absurd paraphernalia of ritual and mystery, had conceived the idea of a more serious political association for the emancipation of his country not only from foreign and domestic despotism but from national faults of character; and this idea he had materialized in the organization of a society called the *Giovane Italia* (Young Italy) among the Italian refugees at Marseilles. After the events of 1831 he declared that the liberation of Italy could only be achieved through unity, and his great merit lies in having inspired a large number of Italians with that idea at a time when provincial jealousies and the difficulty of communications maintained separatist feelings. Young Italy spread to all centres of Italian exiles, and by means of literature carried on an active propaganda in Italy itself, where the party came to be called "Ghibellini," as though reviving the traditions of medieval anti-Papalism. Though eventually this activity of the Giovane Italia supplanted that of the older societies, in practice it met with no better success; the two attempts to invade Savoy in the hope of seducing the army from its allegiance failed miserably, and only resulted in a series of barbarous sentences of death and imprisonment which made most Liberals despair of Charles Albert, while they called down much criticism on Mazzini as the organizer of raids in which he himself took no part. He was now forced to leave France, but continued his work of agitation from London. The disorders in Naples and Sicily in 1837 had no connexion with Mazzini, but the forlorn hope of the brothers Bandiera, who in 1844 landed on the Calabrian coast, was the work of the Giovane Italia. The rebels were captured and shot, but the significance of the attempt lies in the fact that it was the first occasion on which north Italians (the Bandieras were Venetians and officers in the Austrian navy) had tried to raise the standard of revolt in the south.

Romagna had continued a prey to anarchy ever since 1831; the government organized armed bands called the Centurioni (descended from the earlier Sanfedisti), to terrorize the Liberals, while the secret societies continued their "propaganda by deeds." It is noteworthy that Romagna was the only part of Italy where the revolutionary movement was accompanied by murder. In 1845 several outbreaks occurred, and a band led by Pietro Renzi captured Rimini, whence a proclamation drawn up by L. C. Farini was issued demanding the reforms advocated by the powers' memorandum of 1831. But the movement collapsed without result, and the leaders fled to Tuscany.

Liberalism and economic development.

Side by side with the Mazzinian propaganda in favour of a united Italian republic, which manifested itself in secret societies, plots and insurrections, there was another Liberal movement based on the education of opinion and on economic development. In Piedmont, in spite of the government's reactionary methods, a large part of the population were genuinely attached to the Savoy dynasty, and the idea of a regeneration of Italy under its auspices began to gain ground. Some writers proclaimed the necessity of building railways, developing agriculture and encouraging industries, before resorting to revolution; while others, like the Tuscan Gino Capponi, inspired by the example of England and France, wished to make the people fit for freedom by means of improved schools, books and periodicals. Vincenzo Gioberti (*q.v.*) published in 1843 his famous treatise *Del primato morale e civile degli Italiani*, a work, which, in striking contrast to the prevailing pessimism of the day, extolled the past greatness and achievements of the Italian people and their present virtues. His political ideal was a federation of all the Italian states under the presidency of the pope, on a basis of Catholicism, but without a constitution. In spite of all its inaccuracies and exaggerations the book served a useful purpose in reviving the self-respect of a despondent people. Another work of a similar kind was *Le Speranze d'Italia* (1844) by the Piedmontese Count Cesare Balbo (*q.v.*). Like Gioberti he advocated a federation of Italian states, but he declared that before this could be achieved Austria must be expelled from Italy and compensation found for her in the Near East by making her a Danubian power—a curious forecast that Italy's liberation would begin with an eastern war. He extolled Charles Albert and appealed to his patriotism; he believed that the church was necessary and the secret societies harmful; representative government was undesirable, but he advocated a consultative assembly. Above all Italian character must be reformed and the nation educated. A third important publication was Massimo d'Azeglio's *Degli ultimi casi di Romagna*, in which the author, another Piedmontese nobleman, exposed papal misgovernment while condemning the secret societies and advocating open resistance and protest. He upheld the papacy in principle, regarded Austria as the great enemy of Italian regeneration, and believed that the means of expelling her were only to be found in Piedmont.

The Italian exiles.

Besides the revolutionists and republicans who promoted conspiracy and insurrection whenever possible, and the moderates or "Neo-Guelphs," as Gioberti's followers were called, we must mention the Italian exiles who were learning the art of war in foreign countries—in Spain, in Greece, in Poland, in South America—and those other exiles who, in Paris or London, eked out a bare subsistence by teaching Italian or by their pen, and laid the foundations of that love of Italy which, especially in England, eventually brought the weight of diplomacy into the scales for Italian freedom. All these forces were equally necessary—the revolutionists to keep up agitation and make government by bayonets impossible; the moderates to curb the impetuosity of the revolutionists and to present a scheme of society that was neither reactionary nor anarchical; the volunteers abroad to gain military experience; and the more peaceful exiles to spread the name of Italy among foreign peoples. All the while a vast amount of revolutionary literature was being printed in Switzerland, France and England, and smuggled into Italy; the poet Giusti satirized the Italian princes, the dramatist G. B. Niccolini blasted tyranny in his tragedies, the novelist Guerrazzi re-evoked the memories of the last struggle for Florentine freedom in *L'Assedio di Firenze*, and Verdi's operas bristled with political *double entendres* which escaped the censor but were understood and applauded by the audience.

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[1] Among the insurgents of Romagna was Louis Napoleon, afterwards emperor of the French.

Election of Pius IX.

On the death of Pope Gregory XVI. in 1846 Austria hoped to secure the election of another zealot; but the Italian cardinals, who did not want an Austrophil, finished the conclave before the arrival of Cardinal Gaysrück, Austria's mouthpiece, and in June elected Giovanni Maria Mastai Ferretti as Pius IX. The new pope, who while bishop of Imole had evinced a certain interest in Liberalism, was a kindly man, of inferior intelligence, who thought that all difficulties could be settled with a little good-will, some reforms and a political amnesty. The amnesty which he granted was the beginning of the immense if short-lived popularity which he was to enjoy. But he did not move so fast in the path of reform as was expected, and agitation continued throughout the papal states.[1] In 1847 some administrative reforms were enacted, the laity were admitted to certain offices, railways were talked about, and political newspapers permitted. In April Pius created a *Consulta*, or consultative assembly, and soon afterwards a council of ministers and a municipality for Rome. Here he would willingly have stopped, but he soon realized that he had hardly begun. Every fresh reform edict was greeted with demonstrations of enthusiasm, but the ominous cry "Viva Pio Nono solo!" signified dissatisfaction with the whole system of government. A lay ministry was now demanded, a constitution, and an Italian federation for war against Austria. Rumours of a reactionary plot by Austria and the Jesuits against Pius, induced him to create a national guard and to appoint Cardinal Ferretti as secretary of state.

Events in Rome produced widespread excitement throughout Europe. Metternich had declared that the one thing which had not entered into his calculations was a Liberal pope, only that was an impossibility; still he was much disturbed by Pius's attitude, and tried to stem the revolutionary tide by frightening the princes. Seizing the agitation in Romagna as a pretext, he had the town of Ferrara occupied by Austrian troops, which provoked the indignation not only of the Liberals but also of the pope, for according to the treaties Austria had the right of occupying the citadel alone. There was great resentment throughout Italy, and in answer to the pope's request Charles Albert declared that he was with him in everything, while from South America Giuseppe Garibaldi wrote to offer his services to His Holiness. Charles Albert, although maintaining his reactionary policy, had introduced administrative reforms, built railways, reorganized the army and developed the resources of the country. He had little sympathy with Liberalism and abhorred revolution, but his hatred of Austria and his resentment at the galling tutelage to which she subjected him had gained strength year by year. Religion was still his dominant passion, and when a pope in Liberal guise appeared on the scene and was bullied by Austria, his two strongest feelings—piety and hatred of Austria—ceased to be incompatible. In 1847 Lord Minto visited the Italian courts to try to induce the recalcitrant despots to mend their ways, so as to avoid revolution and war, the latter being England's especial anxiety; this mission, although not destined to produce much effect, aroused extravagant hopes among the Liberals. Charles Louis, the opera-bouffe duke of Lucca, who had coquetted with Liberalism in the past, now refused to make any concessions to his subjects, and in 1847 sold his duchy to Leopold II. of Tuscany (the successor of Ferdinand III. since 1824) to whom it would have reverted in any case at the death of the duchess of Parma. At the same time Leopold ceded Lunigiana to Parma and Modena in equal parts, an arrangement which provoked the indignation of the inhabitants of the district (especially of those destined to be ruled by Francis V. of Modena, who had succeeded to Francis IV. in 1846), and led to disturbances at Fivizzano. In September 1847, Leopold gave way to the popular agitation for a national guard, in spite of Metternich's threats, and allowed greater freedom of the press; every concession made by the pope was followed by demands for a similar measure in Tuscany.

Revolutionary agitation, 1847.

Ferdinand I. of the Two Sicilies had died in 1825, and was succeeded by Francis I. At the latter's death in 1830 Ferdinand II. succeeded, and although at first he gave promise of proving a wiser ruler, he soon reverted to the traditional Bourbon methods. An ignorant bigot, he concentrated the whole of the executive into his own hands, was surrounded by priests and monks, and served by an army of spies. In 1847 there were unimportant disturbances in various parts of the kingdom, but there was no anti-dynastic outbreak, the jealousy between Naples and Sicily largely contributing to the weakness of the movement. On the 12th of January, however, a revolution, the first of the many throughout Europe that was to make the year 1848 memorable, broke out at Palermo under the leadership of Ruggiero Settimo. The Neapolitan army sent to crush the rising was at first unsuccessful, and the insurgents demanded the constitution of 1812 or complete independence. Disturbances occurred at Naples also, and the king, who could not obtain Austrian help, as the pope refused to allow Austrian troops to pass through his dominions, on the advice of his prime minister, the duke of Serracapriola, granted a constitution, freedom of the press, the national guard, &c. (January 28).

Revolutions of 1848.

The news from Naples strengthened the demand for a constitution in Piedmont. Count Camillo Cavour, then editor of a new and influential paper called *Il Risorgimento*, had advocated it strongly, and monster demonstrations were held every day. The king disliked the idea, but great pressure was brought to bear on him, and finally, on the 4th of March 1848, he granted the charter which was destined to be the constitution of the future Italian kingdom. It provided for a nominated senate and an elective chamber of deputies, the king retaining the right of veto; the press censorship was abolished, and freedom of meeting, of the press and of speech were guaranteed. Balbo was called upon to form the first constitutional ministry. Three days later the grand-duke of Tuscany promised similar liberties, and a charter, prepared by a commission which included Gino Capponi and Bettino Ricasoli, was promulgated on the 17th.

In the Austrian provinces the situation seemed calmer, and the government rejected the moderate proposals of Daniele Manin and N. Tommaseo. A demonstration in favour of Pius IX. on the 3rd of January at Milan was dispersed with unnecessary severity, and martial law was proclaimed the following month. The revolution which broke out on the 8th of March in Vienna itself and the subsequent flight of Metternich (see AUSTRIA-HUNGARY: *History*), led to the granting of feeble concessions to Lombardy and Venetia, which were announced in Milan on the 18th. But it was too late; and in spite of the exhortations of the mayor, Gabrio Casati, and of the republican C. Cattaneo, who believed that a rising against 15,000 Austrian soldiers under Field-Marshal Radetzky was madness, the famous Five Days' revolution began. It was a popular outburst of pent-up hate, unprepared by leaders, although leaders such as Luciano Manara soon arose. Radetzky occupied the citadel and other points of vantage; but in the night barricades sprang up by the hundred and were manned by citizens of all classes, armed with every kind of weapon. The desperate struggle lasted until the 22nd, when the Austrians, having lost 5000 killed and wounded, were forced to evacuate the city. The rest of Lombardy and Venetia now flew to arms, and the Austrian garrisons, except in the Quadrilateral (Verona, Peschiera, Mantua and Legnano) were expelled. In Venice the people, under the leadership of Manin, rose in arms and forced the military and civil governors (Counts Zichy and Palffy) to sign a capitulation on the 22nd of March, after which the republic was proclaimed. At Milan, where there was a division of opinion between the monarchists under Casati and the republicans under Cattaneo, a provisional administration was formed and the question of the form of government postponed for the moment. The duke of Modena and Charles Louis of Parma (Marie Louise was now dead) abandoned their capitals; in both cities provisional governments were set up which subsequently proclaimed annexation to Piedmont. In Rome the pope gave way to popular clamour, granting one concession after another, and on the 8th of February he publicly called down God's blessing on Italy—that Italy hated by the Austrians, whose name it had hitherto been a crime to mention. On the 10th of March he appointed a new ministry, under Cardinal Antonelli, which included several Liberal laymen, such as Marco Minghetti, G. Pasolini, L. C. Farini and Count G. Recchi. On the 11th a constitution drawn up by a commission of cardinals, without the knowledge of the ministry, was promulgated, a constitution which attempted the impossible task of reconciling the pope's temporal power with free institutions. In the meanwhile preparations for war against Austria were being carried on with Pius's sanction.

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[1] In Rome itself a certain Angelo Brunetti, known as Ciceruacchio, a forage merchant of lowly birth and a Carbonaro, exercised great influence over the masses and kept the peace where the authorities would have failed.

First war of Italy against Austria.

There were now three main political tendencies, viz. the union of north Italy under Charles Albert and an alliance with the pope and Naples, a federation of the different states under their present rulers, and a united republic of all Italy. All parties, however, were agreed in favour of war against Austria, for which the peoples forced their unwilling rulers to prepare. But the only state capable of taking the initiative was Piedmont, and the king still hesitated. Then came the news of the Five Days of Milan, which produced the wildest excitement in Turin; unless the army were sent to assist the struggling Lombards at once the dynasty was in jeopardy. Cavour's stirring articles in the *Risorgimento* hastened the king's decision, and on the 23rd of March he declared war (see for the military events ITALIAN WARS, 1848–70). But much precious time had been lost, and even then the army was not ready. Charles Albert could dispose of 90,000 men, including some 30,000 from central Italy, but he took the field with only half his force. He might yet have cut off Radetzky on his retreat, or captured Mantua, which was only held by 300 men. But his delays lost him both chances and enabled Radetzky to receive reinforcements from Austria. The pope, unable to resist the popular demand for war, allowed his army to depart (March 23) under the command of General Durando, with instructions to act in concert with Charles Albert, and he corresponded with the grand-duke of Tuscany and the king of Naples with a view to a military alliance. But at the same time, fearing a schism in the church should he attack Catholic Austria, he forbade his troops to do more than defend the frontier, and in his Encyclical of the 29th of April stated that, as head of the church, he could not declare war, but that he was unable to prevent his subjects from following the example of other Italians. He then requested Charles Albert to take the papal troops under his command, and also wrote to the emperor of Austria asking him voluntarily to relinquish Lombardy and Venetia. Tuscany and Naples had both joined the Italian league; a Tuscan army started for Lombardy on the 30th of April, and 17,000 Neapolitans commanded by Pepe (who had returned after 28 years of exile) went to assist Durando in intercepting the Austrian reinforcements under Nugent. The Piedmontese defeated the enemy at Pastrengo (April 30), but did not profit by the victory. The Neapolitans reached Bologna on the 17th of May, but in the meantime a dispute had broken out at Naples between the king and parliament as to the nature of the royal oath; a cry of treason was raised by a group of factious youngsters, barricades were erected and street fighting ensued (May 15). On the 17th Ferdinand dissolved parliament and recalled the army. On receiving the order to return, Pepe, after hesitating for some time between his oath to the king and his desire to fight for Italy, finally resigned his commission and crossed the Po with a few thousand men, the rest of his force returning south. The effects of this were soon felt. A force of Tuscan volunteers was attacked by a superior body of Austrians at Curtatone and Montanaro and defeated after a gallant resistance on the 27th of May; Charles Albert, after wasting precious time round Peschiera, which capitulated on the 30th of May, defeated Radetzky at Goito. But the withdrawal of the Neapolitans left Durando too weak to intercept Nugent and his 30,000 men; and the latter, although harassed by the inhabitants of Venetia and repulsed at Vicenza, succeeded in joining Radetzky, who was soon further reinforced from Tirol. The whole Austrian army now turned on Vicenza, which after a brave resistance surrendered on the 10th of June. All Venetia except the capital was thus once more occupied by the Austrians. On the 23rd, 24th and 25th of July (first battle of Custozza) the Piedmontese were defeated and forced to retire on Milan with Radetzky's superior force in pursuit. The king was the object of a hostile demonstration in Milan, and although he was ready to defend the city to the last, the town council negotiated a capitulation with Radetzky. The mob, egged on by the republicans, attacked the palace where the king was lodged, and he escaped with difficulty, returning to Piedmont with the remnants of his army. On the 6th of August Radetzky re-entered Milan, and three days later an armistice was concluded between Austria and Piedmont, the latter agreeing to evacuate Lombardy and Venetia. The offer of French assistance, made after the proclamation of the republic in the spring of 1848, had been rejected mainly because France, fearing that the creation of a strong Italian state would be a danger to her, would have demanded the cession of Nice and Savoy, which the king refused to consider.

Daniele Manin and Venice.

Meanwhile, the republic had been proclaimed in Venice; but on the 7th of July the assembly declared in favour of fusion with Piedmont, and Manin, who had been elected president, resigned his powers to the royal commissioners. Soon after Custozza, however, the Austrians blockaded the city on the land side. In Rome the pope's authority weakened day by day, and disorder increased. The Austrian attempt to occupy Bologna was repulsed by the citizens, but unfortunately this success was followed by anarchy and murder, and Farini only with difficulty restored a semblance of order. The Mamiani ministry having failed to achieve anything, Pius summoned Pellegrino Rossi, a learned lawyer who had long been exiled in France, to form a cabinet. On the 15th of November he was assassinated, and as no one was punished for this crime the insolence of the disorderly elements increased, and shots were exchanged with the Swiss Guard. The terrified pope fled in disguise to Gaeta (November 25), and when parliament requested him to return he refused even to receive the deputation. This meant a complete rupture; on the 5th of February 1849 a constituent assembly was summoned, and on the 9th it voted the downfall of the temporal power and proclaimed the republic.

Proclamation of the Roman Republic.

Mazzini hurried to Rome to see his dream realized, and was chosen head of the Triumvirate. On the 18th Pius invited the armed intervention of France, Austria, Naples and Spain to restore his authority. In Tuscany the government drifted from the moderates to the extreme democrats; the Ridolfi ministry was succeeded after Custozza by that of Ricasoli, and the latter by that of Capponi. The lower classes provoked disorders, which were very serious at Leghorn, and were only quelled by Guerrazzi's energy. Capponi resigned in October 1848, and Leopold reluctantly consented to a democratic ministry led by Guerrazzi and Montanelli, the former a very ambitious and unscrupulous man, the latter honest but fantastic. Following the Roman example, a constituent assembly was demanded to vote on union with Rome and eventually with the rest of Italy. The grand-duke, fearing an excommunication from the pope, refused the request, and left Florence for Siena and

S. Stefano; on the 8th of February 1849 the republic was proclaimed, and on the 21st, at the pressing request of the pope and the king of Naples, Leopold went to Gaeta.

Ferdinand did not openly break his constitutional promises until Sicily was reconquered. His troops had captured Messina after a bombardment which earned him the sobriquet of "King Bomba"; Catania and Syracuse fell soon after, hideous atrocities being everywhere committed with his sanction. He now prorogued parliament, adopted stringent measures against the Liberals, and retired to Gaeta, the haven of refuge for deposed despots.

Charles Albert renews the war.

Accession of Victor Emmanuel II.

But so long as Piedmont was not completely crushed none of the princes dared to take decisive measures against their subjects; in spite of Custozza, Charles Albert still had an army, and Austria, with revolutions in Vienna, Hungary and Bohemia on her hands, could not intervene. In Piedmont the Pinelli-Revel ministry, which had continued the negotiations for an alliance with Leopold and the pope, resigned as it could not count on a parliamentary majority, and in December the returned exile Gioberti formed a new ministry. His proposal to reinstate Leopold and the pope with Piedmontese arms, so as to avoid Austrian intervention, was rejected by both potentates, and met with opposition even in Piedmont, which would thereby have forfeited its prestige throughout Italy. Austrian mediation was now imminent, as the Vienna revolution had been crushed, and the new emperor, Francis Joseph, refused to consider any settlement other than on the basis of the treaties of 1815. But Charles Albert, who, whatever his faults, had a generous nature, was determined that so long as he had an army in being he could not abandon the Lombards and the Venetians, whom he had encouraged in their resistance, without one more effort, though he knew full well that he was staking all on a desperate chance. On the 12th of March 1849, he denounced the armistice, and, owing to the want of confidence in Piedmontese strategy after 1848, gave the chief command to the Polish General Chrzanowski. His forces amounted to 80,000 men, including a Lombard corps and some Roman, Tuscan and other volunteers. But the discipline and moral of the army were shaken and its organization faulty. General Ramorino, disobeying his instructions, failed to prevent a corps of Austrians under Lieut. Field-Marshal d'Aspre from seizing Mortara, a fault for which he was afterwards court-martialled and shot, and after some preliminary fighting Radetzky won the decisive battle of Novara (March 23) which broke up the Piedmontese army. The king, who had sought death in vain all day, had to ask terms of Radetzky; the latter demanded a slice of Piedmont and the heir to the throne (Victor Emmanuel) as a hostage, without a reservation for the consent of parliament. Charles Albert, realizing his own failure and thinking that his son might obtain better terms, abdicated and departed at once for Portugal, where he died in a monastery a few months later. Victor Emmanuel went in person to treat with Radetzky on the 24th of March. The Field-Marshal received him most courteously and offered not only to waive the demand for a part of Piedmontese territory, but to enlarge the kingdom, on condition that the constitution should be abolished and the blue Piedmontese flag substituted for the tricolor. But the young king was determined to abide by his father's oath, and had therefore to agree to an Austrian occupation of the territory between the Po, the Ticino and the Sesia, and of half the citadel of Alessandria, until peace should be concluded, the evacuation of all districts occupied by his troops outside Piedmont, the dissolution of his corps of Lombard, Polish and Hungarian volunteers and the withdrawal of his fleet from the Adriatic.

Novara set Austria free to reinstate the Italian despots. Ferdinand at once re-established autocracy in Naples; though the struggle in Sicily did not end until May, when Palermo, after a splendid resistance, capitulated. In Tuscany disorder continued, and although Guerrazzi, who had been appointed dictator, saved the country from complete anarchy, a large part of the population, especially among the peasantry, was still loyal to the grand-duke. After Novara the chief question was how to avoid an Austrian occupation, and owing to the prevailing confusion the town council of Florence took matters into its own hands and declared the grand-duke reinstated, but on a constitutional basis and without foreign help (April 12). Leopold accepted as regards the constitution, but said nothing about foreign intervention. Count Serristori, the grand-ducal commissioner, arrived in Florence on the 4th of May 1849; the national guard was disbanded; and on the 25th, the Austrians under d'Aspre entered Florence.

On the 28th of July Leopold returned to his capital, and while that event was welcomed by a part of the people, the fact that he had come under Austrian protection ended by destroying all loyalty to the dynasty, and consequently contributed not a little to Italian unity.

Garibaldi.

France and the Roman Republic,

In Rome the triumvirate decided to defend the republic to the last. The city was quieter and more orderly than it had ever been before, for Mazzini and Ciceruacchio successfully opposed all class warfare; and in April the defenders received a priceless addition to their strength in the person of Garibaldi, who, on the outbreak of the revolution in 1848, had returned with a few of his followers from his exile in South America, and in April 1849 entered Rome with some 500 men to fight for the republic. At this time France, as a counterpoise to Austrian intervention in other parts of Italy, decided to restore the pope, regardless of the fact that this action would necessitate the crushing of a sister republic. As yet, however, no such intention was publicly avowed. On the 25th of April General Oudinot landed with 8000 men at Civitavecchia, and on the 30th attempted to capture Rome by suprise, but was completely defeated by Garibaldi, who might have driven the French into the sea, had Mazzini allowed him to leave the city. The French republican government, in order to gain time for reinforcements to arrive, sent Ferdinand de Lesseps to pretend to treat with Mazzini, the envoy himself not being a party to this deception. Mazzini refused to allow the French into the city, but while the negotiations were being dragged on Oudinot's force was increased to 35,000 men. At the same time an Austrian army was marching through the Legations, and Neapolitan and Spanish troops were advancing from the south. The Roman army (20,000 men) was commanded by General Rosselli, and included, besides Garibaldi's red-shirted legionaries, volunteers from all parts of Italy, mostly very young men, many of them wealthy and of noble family. The Neapolitans were ignominiously beaten in May and retired to the frontier; on the 1st of June Oudinot declared that he would attack Rome on the 4th, but by beginning operations on the 3rd, when no attack was expected, he captured an important position in the Pamphili gardens.

In spite of this success, however, it was not until the end of the month, and after desperate fighting, that the French penetrated within the walls and the defence ceased (June 29). The Assembly, which had continued in session, was dispersed by the French troops on the 2nd of July, but Mazzini escaped a week later. Garibaldi quitted the city, followed by 4000 of his men, and attempted to join the defenders of Venice. In spite of the fact that he was pursued by the armies of four Powers, he succeeded in reaching San Marino; but his force melted away and, after hiding in the marshes of Ravenna, he fled across the peninsula, assisted by nobles, peasants and priests, to the Tuscan coast, whence he reached Piedmont and eventually America, to await a new call to fight for Italy (see GARIBALDI).

Reduction of Venice by Austria.

After a heroic defence, conducted by Giuseppe Martinengo, Brescia was recaptured in April by the Austrians under Lieut. Field-Marshal von Haynau, the atrocities which followed earning for Haynau the name of "The Hyena of Brescia." In May they seized Bologna, and Ancona in June, restoring order in those towns by the same methods as at Brescia. Venice alone still held out; after Novara the Piedmontese commissioners withdrew and Manin again took charge of the government. The assembly voted: "Venice resists the Austrians at all costs," and the citizens and soldiers, strengthened by the arrival of volunteers from all parts of Italy, including Pepe, who was given the chief command of the defenders, showed the most splendid devotion in their hopeless task. By the end of May the city was blockaded by land and sea, and in July the bombardment began. On the 24th the city, reduced by famine, capitulated on favourable terms. Manin, Pepe and a few others were excluded from the amnesty and went into exile.

Thus were despotism and foreign predominance re-established throughout Italy save in Piedmont. Yet the "terrible year" was by no means all loss. The Italian cause had been crushed, but revolution and war had strengthened the feeling of unity, for Neapolitans had fought for Venice, Lombards for Rome, Piedmontese for all Italy. Piedmont was shown to possess the qualities necessary to constitute the nucleus of a great nation. It was now evident that the federal idea was impossible, for none of the princes except Victor Emmanuel could be trusted, and that unity and freedom could not be achieved under a republic, for nothing could be done without the Piedmontese army, which was royalist to the core. All reasonable men were now convinced that the question of the ultimate form of the Italian government was secondary, and that the national efforts should be concentrated on the task of expelling the Austrians; the form of government could be decided afterwards. Liberals were by no means inclined to despair of accomplishing this task; for hatred of the foreigners, and of the despots restored by their bayonets, had been deepened by the humiliations and cruelties suffered during the war into a passion common to all Italy.

Piedmont after the war.

Cavour.

When the terms of the Austro-Piedmontese armistice were announced in the Chamber at Turin they aroused great indignation, but the king succeeded in convincing the deputies that they were inevitable. The peace negotiations dragged on for several months, involving two changes of ministry, and D'Azeglio became premier. Through Anglo-French mediation Piedmont's war indemnity was reduced from 230,000,000 to 75,000,000 lire, but the question of the amnesty remained. The king declared himself ready to go to war again if those compromised in the Lombard revolution were not freely pardoned, and at last Austria agreed to amnesty all save a very few, and in August the peace terms were agreed upon. The Chamber, however, refused to ratify them, and it was not until the king's eloquent appeal from Moncalieri to his people's loyalty, and after a dissolution and the election of a new parliament, that the treaty was ratified (January 9, 1850). The situation in Piedmont was far from promising, the exchequer was empty, the army disorganized, the country despondent and suspicious of the king. If Piedmont was to be fitted for the part which optimists expected it to play, everything must be built up anew. Legislation had to be entirely reformed, and the bill for abolishing the special jurisdiction for the clergy (*foro ecclesiastico*) and other medieval privileges aroused the bitter opposition of the Vatican as well as of the Piedmontese clericals. This same year (1850) Cavour, who had been in parliament for some time and had in his speech of the 7th of March struck the first note of encouragement after the gloom of Novara, became minister of agriculture, and in 1851 also assumed the portfolio of finance. He ended by dominating the cabinet, but owing to his having negotiated a union of the Right Centre and the Left Centre (the *Connubio*) in the conviction that the country needed the moderate elements of both parties, he quarrelled with D'Azeglio (who, as an uncompromising conservative, failed to see the value of such a move) and resigned. But D'Azeglio was not equal to the situation, and he, too, resigned in November 1852; whereupon the king appointed Cavour prime minister, a position which with short intervals he held until his death.

Austrian rule after 1849.

The Austrians in the period from 1849 to 1859, known as the *decennio della resistenza* (decade of resistance), were made to feel that they were in a conquered country where they could have no social intercourse with the people; for no self-respecting Lombard or Venetian would even speak to an Austrian. Austria, on the other hand, treated her Italian subjects with great severity. The Italian provinces were the most heavily taxed in the whole empire, and much of the money thus levied was spent either for the benefit of other provinces or to pay for the huge army of occupation and the fortresses in Italy. The promise of a constitution for the empire, made in 1849, was never carried out; the government of Lombardo-Venetia was vested in Field-Marshal Radetzky; and although only very few of the revolutionists were excluded from the amnesty, the carrying of arms or the distribution or possession of revolutionary literature was punished with death. Long terms of imprisonment and the bastinado, the latter even inflicted on women, were the penalties for the least expression of anti-Austrian opinion.

The Lombard republicans had been greatly weakened by the events of 1848, but Mazzini still believed that a bold act by a few revolutionists would make the people rise *en masse* and expel the Austrians. A conspiracy, planned with the object, among others, of kidnapping the emperor while on a visit to Venice and forcing him to make concessions, was postponed in consequence of the *coup d'état* by which Louis Napoleon became emperor of the French (1852); but a chance discovery led to a large number of arrests, and the state trials at Mantua, conducted in the most shamelessly inquisitorial manner, resulted in five death sentences, including that of the priest Tazzoli, and many of imprisonment for long terms. Even this did not convince Mazzini of the hopelessness of such attempts, for he was out of touch with Italian public opinion, and he greatly weakened his influence by favouring a crack-brained outbreak at Milan on the 6th of February 1853, which was easily quelled, numbers of the insurgents being executed or imprisoned. Radetzky, not satisfied with this, laid an embargo on the property of many Lombard emigrants who had settled in Piedmont and become naturalized, accusing them of complicity. The Piedmontese government rightly regarded this measure as a violation of the peace treaty of 1850, and Cavour recalled the Piedmontese minister from Vienna, an action which was endorsed by Italian public opinion generally, and won the approval of France and England.

Cavour's ideal for the present was the expulsion of Austria from Italy and the expansion of Piedmont into a north Italian kingdom; and, although he did not yet think of Italian unity as a question of practical policy, he began to foresee it as a future possibility. But in reorganizing the shattered finances of the state and preparing it for its greater destinies, he had to impose heavy taxes, which led to rioting and involved the minister himself in considerable though temporary unpopularity. His ecclesiastical legislation, too, met with bitter opposition from the Church.

Crimean War.

Italy and the Congress of Paris, 1856.

But the question was soon forgotten in the turmoil caused by the Crimean War. Cavour believed that by taking part in the war his country would gain for itself a military status and a place in the councils of the great Powers, and establish claims on Great Britain and France for the realization of its Italian ambitions. One section of public opinion desired to make Piedmont's co-operation subject to definite promises by the Powers; but the latter refused to bind themselves, and both Victor Emmanuel and Cavour realized that, even without such promises, participation would give Piedmont a claim. There was also the danger that Austria might join the allies first and Piedmont be left isolated; but there were also strong arguments on the other side, for while the Radical party saw no obvious reason why Piedmont should fight other people's battles, and therefore opposed the alliance, there was the risk that Austria might join the alliance together with Piedmont, which would have constituted a disastrous situation. Da Bormida, the minister for foreign affairs, resigned rather than agree to the proposal, and other statesmen were equally opposed to it. But after long negotiations the treaty of alliance was signed in January 1855, and while Austria remained neutral, a well-equipped Piedmontese force of 15,000 men, under General La Marmora, sailed for the Crimea. Everything turned out as Cavour had hoped.

The Piedmontese troops distinguished themselves in the field, gaining the sympathies of the French and English; and at the subsequent congress of Paris (1856), where Cavour himself was Sardinian representative, the Italian question was discussed, and the intolerable oppression of the Italian peoples by Austria and the despots ventilated.

Austria at last began to see that a policy of coercion was useless and dangerous, and made tentative efforts at conciliation. Taxation was somewhat reduced, the censorship was made less severe, political amnesties were granted, humaner officials were appointed and the Congregations (a sort of shadowy consultative assembly) were revived. In 1856 the emperor and empress visited their Italian dominions, but were received with icy coldness; the following year, on the retirement of Radetzky at the age of ninety-three, the archduke Maximilian, an able, cultivated and kind-hearted man, was appointed viceroy. He made desperate efforts to conciliate the population, and succeeded with a few of the nobles, who were led to believe in the possibility of an Italian confederation, including Lombardy and Venetia which would be united to Austria by a personal union alone; but the immense majority of all classes rejected these advances, and came to regard union with Piedmont with increasing favour.[1]

Restored governments after 1849.

Persecution of Liberals in Naples.

Meanwhile Francis V. of Modena, restored to his duchy by Austrian bayonets, continued to govern according to the traditions of his house. Charles II. of Parma, after having been reinstated by the Austrians, abdicated in favour of his son Charles III. a drunken libertine and a cruel tyrant (May 1849); the latter was assassinated in 1854, and a regency under his widow, Marie Louise, was instituted during which the government became somewhat more tolerable, although by no means free from political persecution; in 1857 the Austrian troops evacuated the duchy. Leopold of Tuscany suspended the constitution, and in 1852 formally abolished it by order from Vienna; he also concluded a treaty of semi-subjection with Austria and a Concordat with the pope for granting fresh privileges to the Church. His government, however, was not characterized by cruelty like those of his brother despots, and Guerrazzi and the other Liberals of 1849, although tried and sentenced to long terms of imprisonment, were merely exiled. Yet the opposition gained recruits among all the ablest and most respectable Tuscans. In Rome, after the restoration of the temporal power by the French troops, the pope paid no attention to Louis Napoleon's advice to maintain some form of constitution, to grant a general amnesty, and to secularize the administration. He promised, indeed, a consultative council of state, and granted an amnesty from which no less than 25,000 persons were excluded; but on his return to Rome (12th April 1850), after he was quite certain that France had given up all idea of imposing constitutional limitations on him, he re-established his government on the old lines of priestly absolutism, and, devoting himself to religious practices, left political affairs mostly to the astute cardinal Antonelli, who repressed with great severity the political agitation which still continued. At Naples a trifling disturbance in September 1849, led to the arrest of a large number of persons connected with the *Unità Italiana*, a society somewhat similar to the Carbonari. The prisoners included Silvio Spaventa, Luigi Settembrini, Carlo Poerio and many other cultured and worthy citizens. Many condemnations followed, and hundreds of "politicals" were immured in hideous dungeons, a state of things which provoked Gladstone's famous letters to Lord Aberdeen, in which Bourbon rule was branded for all time as "the negation of God erected into a system of government." But oppressive, corrupt and inefficient as it was, the government was not confronted by the uncompromising hostility of the whole people; the ignorant priest-ridden masses were either indifferent or of mildly Bourbon sympathies; the opposition was constituted by the educated middle classes and a part of the nobility. The revolutionary attempts of Bentivegna in Sicily (1856) and of the Mazzinian Carlo Pisacane, who landed at Sapri in Calabria with a few followers in 1857, failed from lack of popular support, and the leaders were killed.

New Unionist movement.

Napoleon III. and Italy.

The decline of Mazzini's influence was accompanied by the rise of a new movement in favour of Italian unity under Victor Emmanuel, inspired by the Milanese marquis Giorgio Pallavicini, who had spent 14 years in the Spielberg, and by Manin, living in exile in Paris, both of them ex-republicans who had become monarchists. The propaganda was organized by the Sicilian La Farina by means of the *Società Nazionale*. All who accepted the motto "Unity, Independence and Victor Emmanuel" were admitted into the society. Many of the republicans and Mazzinians joined it, but Mazzini himself regarded it with no sympathy. In the Austrian provinces and in the duchies it carried all before it, and gained many adherents in the Legations, Rome and Naples, although in the latter regions the autonomist feeling was still strong even among the Liberals. In Piedmont itself it was at first less successful; and Cavour, although he aspired ultimately to a united Italy with Rome as the capital,[2] openly professed no ambition beyond the expulsion of Austria and the formation of a North Italian kingdom. But he gave secret encouragement to the movement, and ended by practically directing its activity through La Farina. The king, too, was in close sympathy with the society's aims, but for the present it was necessary to hide this attitude from the eyes of the Powers, whose sympathy Cavour could only hope to gain by professing hostility to everything that savoured of revolution. Both the king and his minister realized that Piedmont alone, even with the help of the National Society, could not expel Austria from Italy without foreign assistance. Piedmontese finances had been strained to breaking-point to organize an army obviously intended for other than merely defensive purposes. Cavour now set himself to the task of isolating Austria and securing an alliance for her expulsion. A British alliance would have been preferable, but the British government was too much concerned with the preservation of European peace. The emperor Napoleon, almost alone among Frenchmen, had genuine Italian sympathies. But were he to intervene in Italy, the intervention would not only have to be successful; it would have to bring tangible advantages to France. Hence his hesitations and vacillations, which Cavour steadily worked to overcome. Suddenly on the 14th of January 1858 Napoleon's life was attempted by Felice Orsini (*q.v.*) a Mazzinian Romagnol, who believed that Napoleon was the chief obstacle to the success of the revolution in Italy. The attempt failed and its author was caught and executed, but while it appeared at first to destroy Napoleon's Italian sympathies and led to a sharp interchange of notes between Paris and Turin, the emperor was really impressed by the attempt and by Orsini's letter from prison exhorting him to intervene in Italy. He realized how deep the Italian feeling for independence must be, and that a refusal to act now might result in further attempts on his life, as indeed Orsini's letter stated. Consequently negotiations with Cavour were resumed, and a meeting with him was arranged to take place at Plombières (20th and 21st of July 1858). There it was agreed that France should supply 200,000 men and Piedmont 100,000 for the expulsion of the Austrians from Italy, that Piedmont should be expanded into a kingdom of North Italy, that central Italy should form a separate kingdom, on the throne of which the emperor contemplated placing one of his own relatives, and Naples another, possibly under Lucien Murat; the pope, while retaining only the "Patrimony of St Peter" (the Roman province), would be president of the Italian confederation. In exchange for French assistance Piedmont would cede Savoy and perhaps Nice to France; and a marriage between Victor Emmanuel's daughter Clothilde and Jerome Bonaparte, to which Napoleon attached great importance, although not made a definite condition, was also discussed. No written agreement, however, was signed.

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[1] The popular cry of "Viva Verdi!" did not merely express enthusiasm for Italy's most eminent musician, but signified, in initials: "Viva Vittorio Emanuele Re d' Italia!"

[2] La Farina's *Epistolario*, ii. 426.

On the 1st of January 1859, Napoleon astounded the diplomatic world by remarking to Baron Hübner, the Austrian ambassador, at the New Year's reception at the Tuileries, that he regretted that relations between France and Austria were "not so good as they had been"; and at the opening of the Piedmontese parliament on the 10th Victor Emmanuel pronounced the memorable words that he could not be insensible to the cry of pain (*il grido di dolore*) which reached him from all parts of Italy. Yet after these warlike declarations and after the signing of a military convention at Turin, the king agreeing to all the conditions proposed by Napoleon, the latter suddenly became pacific again, and adopted the Russian suggestion that Italian affairs should be settled by a congress. Austria agreed on condition that Piedmont should disarm and should not be admitted to the congress. Lord Malmesbury urged the Sardinian government to yield; but Cavour refused to disarm, or to accept the principle of a congress, unless Piedmont were admitted to it on equal terms with the other Powers. As neither the Sardinian nor the Austrian government seemed disposed to yield, the idea of a congress had to be abandoned. Lord Malmesbury now proposed that all three Powers should disarm simultaneously and that, as suggested by Austria, the precedent of Laibach should be followed and all the Italian states invited to plead their cause at the bar of the Great Powers. To this course Napoleon consented, to the despair of King Victor Emmanuel and Cavour, who saw in this a proof that he wished to back out of his engagement and make war impossible. When war seemed imminent volunteers from all parts of Italy, especially from Lombardy, had come pouring into Piedmont to enrol themselves in the army or in the specially raised volunteer corps (the command of which was given to Garibaldi), and "to go to Piedmont" became a test of patriotism throughout the country. Urged by a peremptory message from Napoleon, Cavour saw the necessity of bowing to the will of Europe, of disbanding the volunteers and reducing the army to a peace footing. The situation, however, was saved by a false move on the part of Austria. At Vienna the war party was in the ascendant; the convention for disarmament had been signed, but so far from its being carried out, the reserves were actually called out on the 12th of April; and on the 23rd, before Cavour's decision was known at Vienna, an Austrian ultimatum reached Turin, summoning Piedmont to disarm within three days on pain of invasion. Cavour was filled with joy at the turn affairs had taken, for Austria now appeared as the aggressor. On the 29th Francis Joseph declared war, and the next day his troops crossed the Ticino, a move which was followed, as Napoleon had stated it would be, by a French declaration of war. The military events of the Italian war of 1859 are described under Italian Wars. The actions of Montebello (May 20), Palestro (May 31) and Melegnano (June 8) and the battles of Magenta (June 4) and Solferino (June 24) all went against the Austrians. Garibaldi's volunteers raised the standard of insurrection and held the field in the region of the Italian lakes. After Solferino the allies prepared to besiege the Quadrilateral. Then Napoleon suddenly drew back, unwilling, for many reasons, to continue the campaign. Firstly, he doubted whether the allies were strong enough to attack the Quadrilateral, for he saw the defects of his own army's organization; secondly, he began to fear intervention by Prussia, whose attitude appeared menacing; thirdly, although really anxious to expel the Austrians from Italy, he did not wish to create a too powerful Italian state at the foot of the Alps, which, besides constituting a potential danger to France, might threaten the pope's temporal power, and Napoleon believed that he could not stand without the clerical vote; fourthly, the war had been declared against the wishes of the great majority of Frenchmen and was even now far from popular. Consequently, to the surprise of all Europe, while the allied forces were drawn up ready for battle, Napoleon, without consulting Victor Emmanuel, sent General Fleury on the 6th of July to Francis Joseph to ask for an armistice, which was agreed to. The king was now informed, and on the 8th Generals Vaillant, Della Rocca and Hess met at Villafranca and arranged an armistice until the 15th of August. But the king and Cavour were terribly upset by this move, which meant peace without Venetia; Cavour hurried to the king's headquarters at Monzambano and in excited, almost disrespectful, language implored him not to agree to peace and to continue the war alone, relying on the Piedmontese army and a general Italian revolution. But Victor Emmanuel on this occasion proved the greater statesman of the two; he understood that, hard as it was, he must content himself with Lombardy for the present, lest all be lost. On the 11th the two emperors met at Villafranca, where they agreed that Lombardy should be ceded to Piedmont, and Venetia retained by Austria but governed by Liberal methods; that the rulers of Tuscany, Parma and Modena, who had been again deposed, should be restored, the Papal States reformed, the Legations given a separate administration and the pope made president of an Italian confederation including Austria as mistress of Venetia. It was a revival of the old impossible federal idea, which would have left Italy divided and dominated by Austria and France. Victor Emmanuel regretfully signed the peace preliminaries, adding, however, *pour ce qui me concerne* (which meant that he made no undertaking with regard to central Italy), and Cavour resigned office.

Italian war of 1859.

Armistice of Villafranca.

The Lombard campaign had produced important effects throughout the rest of Italy. The Sardinian government had formally invited that of Tuscany to participate in the war of liberation, and on the grand-duke rejecting the proposal, moderates and democrats combined to present an ultimatum to Leopold demanding that he should abdicate in favour of his son, grant a constitution and take part in the campaign. On his refusal Florence rose as one man, and he, feeling that he could not rely on his troops, abandoned Tuscany on the 27th of April 1859. A provisional government was formed, led by Ubaldino Peruzzi, and was strengthened on the 8th of May by the inclusion of Baron Bettino Ricasoli, a man of great force of character, who became the real head of the administration, and all through the ensuing critical period aimed unswervingly at Italian unity. Victor Emmanuel, at the request of the people, assumed the protectorate over Tuscany, where he was represented by the Sardinian minister Boncompagni. On the 23rd of May Prince Napoleon, with a French army corps, landed at Leghorn, his avowed object being to threaten the Austrian flank;[1] and in June these troops, together with a Tuscan contingent, departed for Lombardy. In the duchy of Modena an insurrection had broken out, and after Magenta Duke Francis joined the Austrian army in Lombardy, leaving a regency in charge. But on the 14th of June the municipality formed a provisional government and proclaimed annexation to Piedmont; L. C. Farini was chosen dictator, and 4000 Modenese joined the allies. The duchess-regent of Parma also withdrew to Austrian territory, and on the 11th of June annexation to Piedmont was proclaimed. At the same time the Austrians evacuated the Legations and Cardinal Milesi, the papal representative, departed. The municipality of Bologna formed a *Giunta*, to which Romagna and the Marches adhered, and invoked the dictatorship of Victor Emmanuel; at Perugia, too, a provisional government was constituted under F. Guardabassi. But the Marches were soon reoccupied by pontifical troops, and Perugia fell, its capture being followed by an indiscriminate massacre of men, women and children. In July the marquis D'Azeglio arrived at Bologna as royal commissioner.

Unionist movements in Central Italy.

After the meetings at Villafranca Napoleon returned to France. The question of the cession of Nice and Savoy had not been raised; for the emperor had not fulfilled his part of the bargain, that he would drive the Austrians out of Italy, since Venice was yet to be freed. At the same time he was resolutely opposed to the Piedmontese annexations in central Italy. But here Cavour intervened, for he was determined to maintain the annexations, at all costs. Although he had resigned, he remained in office until Rattazzi could form a new ministry; and while officially recalling the royal commissioners according to the preliminaries of Villafranca, he privately encouraged them to remain and organize resistance to the return of the despots, if necessary by force (see Cavour). Farini, who in August was elected dictator of Parma as well as Modena, and Ricasoli, who since, on the withdrawal of the Sardinian commissioner Boncompagni, had become supreme in Tuscany, were now the men who by their energy and determination achieved the annexation of central Italy to Piedmont, in spite of the strenuous opposition of the French emperor and the weakness of many Italian Liberals. In August Marco Minghetti succeeded in forming a military league and a customs union between Tuscany, Romagna and the duchies, and in procuring the adoption of the Piedmontese codes; and envoys were sent to Paris to mollify Napoleon. Constituent assemblies met and voted for unity under Victor Emmanuel, but the king could not openly accept the proposal owing to the emperor's opposition, backed by the presence of French armies in Lombardy; at a word from Napoleon there might have been an Austrian, and perhaps a Franco-Austrian, invasion of central Italy. But to Napoleon's statement that he could not agree to the unification of Italy, as he was bound by his promises to Austria at Villafranca, Victor Emmanuel replied that he himself, after Magenta and Solferino, was bound in honour to link his fate with that of the Italian people; and General Manfredo Fanti was sent by the Turin government to organize the army of the Central League, with Garibaldi under him.

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[1] In reality the emperor was contemplating an Etrurian kingdom with the prince at its head.

Treaty of Zürich.

The terms of the treaty of peace signed at Zürich on the 10th of November were practically identical with those of the preliminaries of Villafranca. It was soon evident, however, that the Italian question was far from being settled. Central Italy refused to be bound by the treaty, and offered the dictatorship to Prince Carignano, who, himself unable to accept owing to Napoleon's opposition, suggested Boncompagni, who was accordingly elected. Napoleon now realized that it would be impossible, without running serious risks, to oppose the movement in favour of unity. He suggested an international congress on the question; inspired a pamphlet, *Le Pape et le Congrès*, which proposed a reduction of the papal territory, and wrote to the pope advising him to cede Romagna in order to obtain better guarantees for the rest of his dominions. The proposed congress fell through, and Napoleon thereupon raised the question of the cession of Nice and Savoy as the price of his consent to the union of the central provinces with the Italian kingdom. In January 1866 the Rattazzi ministry fell, after completing the fusion of Lombardy with Piedmont, and Cavour was again summoned by the king to the head of affairs.

Cavour well knew the unpopularity that would fall upon him by consenting to the cession of Nice, the birthplace of Garibaldi, and Savoy, the cradle of the royal house; but he realized the necessity of the sacrifice, if central Italy was to be won. The negotiations were long drawn out; for Cavour struggled to save Nice and Napoleon was anxious to make conditions, especially as regards Tuscany. At last, on the 24th of March, the treaty was signed whereby the cession was agreed upon, but subject to the vote of the populations concerned and ratification by the Italian parliament. The king having formally accepted the voluntary annexation of the duchies, Tuscany and Romagna, appointed the prince of Carignano viceroy with Ricasoli as governor-general (22nd of March), and was immediately afterwards excommunicated by the pope. On the 2nd of April 1860 the new Italian parliament, including members from central Italy, assembled at Turin. Three weeks later the treaty of Turin ceding Savoy and Nice to France was ratified, though not without much opposition, and Cavour was fiercely reviled for his share in the transaction, especially by Garibaldi, who even contemplated an expedition to Nice, but was induced to desist by the king.

Naples under Francis II.

In May 1859 Ferdinand of Naples was succeeded by his son Francis II., who gave no signs of any intention to change his father's policy, and, in spite of Napoleon's advice, refused to grant a constitution or to enter into an alliance with Sardinia. The result was a revolutionary agitation which in Sicily, stirred up by Mazzini's agents, Rosalino Pilo and Francesco Crispi, culminated, on the 5th of April 1860, in open revolt. An invitation had been sent Garibaldi to put himself at the head of the movement; at first he had refused, but reports of the progress of the insurrection soon determined him to risk all on a bold stroke, and on the 5th of May he embarked at Quarto, near Genoa, with Bixio, the Hungarian Türr and some 1000 picked followers, on two steamers. The preparations for the expedition, openly made, were viewed by Cavour with mixed feelings. With its object he sympathized; yet he could not give official sanction to an armed attack on a friendly power, nor on the other hand could he forbid an action enthusiastically approved by public opinion. He accordingly directed the Sardinian admiral Persano only to arrest the expedition should it touch at a Sardinian port; while in reply to the indignant protests of the continental powers he disclaimed all knowledge of the affair. On the 11th Garibaldi landed at Marsala, without opposition, defeated the Neapolitan forces at Calatafimi on the 15th, and on the 27th entered Palermo in triumph, where he proclaimed himself, in King Victor Emmanuel's name, dictator of Sicily. By the end of July, after the hard-won victory of Milazzo, the whole island, with the exception of the citadel of Messina and a few unimportant ports, was in his hands.

From Cavour's point of view, the situation was now one of extreme anxiety. It was certain that, his work in Sicily done, Garibaldi would turn his attention to the Neapolitan dominions on the mainland; and beyond these lay Umbria and the Marches and—Rome. It was all-important that whatever victories Garibaldi might win should be won for the Italian kingdom, and, above all, that no ill-timed attack on the Papal States should provoke an intervention of the powers. La Farina was accordingly sent to Palermo to urge the immediate annexation of Sicily to Piedmont. But Garibaldi, who wished to keep a free hand, distrusted Cavour and scorned all counsels of expediency, refused to agree; Sicily was the necessary base for his projected invasion of Naples; it would be time enough to announce its union with Piedmont when Victor Emmanuel had been proclaimed king of United Italy in Rome. Foiled by the dictator's stubbornness, Cavour had once more to take to underhand methods; and, while continuing futile negotiations with King Francis, sent his agents into Naples to stir up disaffection and create a sentiment in favour of national unity strong enough, in any event, to force Garibaldi's hand.

Garibaldi in Naples.

On the 8th of August, in spite of the protests and threats of most of the powers, the Garibaldians began to cross the Straits, and in a short time 20,000 of them were on the mainland. The Bourbonists in Calabria, utterly disorganized, broke before the invincible red-shirts, and the 40,000 men defending the Salerno-Avellino line made no better resistance, being eventually ordered to fall back on the Volturno. On the 6th of September King Francis, with his family and several of the ministers, sailed for Gaeta, and the next day Garibaldi entered Naples alone in advance of the army, and was enthusiastically welcomed. He proclaimed himself dictator of the kingdom, with Bertani as secretary of state, but as a proof of his loyalty he consigned the Neapolitan fleet to Persano.

Intervention of Piedmont.

His rapid success, meanwhile, inspired both the French emperor and the government of Turin with misgivings. There was a danger that Garibaldi's *entourage*, composed of ex-Mazzinians, might induce him to proclaim a republic and march on Rome; which would have meant French intervention and the undoing of all Cavour's work. King Victor Emmanuel and Cavour both wrote to Garibaldi urging him not to spoil all by aiming at too much. But Garibaldi poured scorn on all suggestions of compromise; and Cavour saw that the situation could only be saved by the armed participation of Piedmont in the liberation of south Italy.

The situation was, indeed, sufficiently critical. The unrest in Naples had spread into Umbria and the Marches, and the papal troops, under General Lamoricière, were preparing to suppress it. Had they succeeded, the position of the Piedmontese in Romagna would have been imperilled; had they failed, the road would have been open for Garibaldi to march on Rome. In the circumstances, Cavour decided that Piedmont must anticipate Garibaldi, occupy Umbria and the Marches and place Italy between the red-shirts and Rome. His excuse was the pope's refusal to dismiss his foreign levies (September 7). On the 11th of September a Piedmontese army of 35,000 men crossed the frontier at La Cattolica; on the 18th the pontifical army was crushed at Castelfidardo; and when, on the 29th, Ancona fell, Umbria and the Marches were in the power of Piedmont. On the 15th of October King Victor Emmanuel crossed the Neapolitan border at the head of his troops.

It had been a race between Garibaldi and the Piedmontese. “If we do not arrive at the Volturno before Garibaldi reaches La Cattolica,” Cavour had said, “the monarchy is lost, and Italy will remain in the prison-house of the Revolution.”[1] Fortunately for his policy, the red-shirts had encountered a formidable obstacle to their advance in the Neapolitan army entrenched on the Volturno under the guns of Capua. On the 19th of September the Garibaldians began their attack on this position with their usual impetuous valour; but they were repulsed again and again, and it was not till the 2nd of October, after a two days' pitched battle, that they succeeded in carrying the position. The way was now open for the advance of the Piedmontese, who, save at Isernia, encountered practically no resistance. On the 29th Victor Emmanuel and Garibaldi met, and on the 7th of November they entered Naples together. Garibaldi now resigned his authority into the king's hands and, refusing the title and other honours offered to him, retired to his island home of Caprera.[2]

Recognition of the united kingdom of Italy.

Gaeta remained still to be taken. The Piedmontese under Cialdini had begun the siege on the 5th of November, but it was not until the 10th of January 1861, when at the instance of Great Britain Napoleon withdrew his squadron, that the blockade could be made complete. On the 13th of February the fortress surrendered, Francis and his family having departed by sea for papal territory. The citadel of Messina capitulated on the 22nd, and Civitella del Tronto, the last stronghold of Bourbonism, on the 21st of March. On the 18th of February the first Italian parliament met at Turin, and Victor Emmanuel was proclaimed king of Italy. The new kingdom was recognized by Great Britain within a fortnight, by France three months later, and subsequently by other powers. It included the whole peninsula except Venetia and Rome, and these the government and the nation were determined to annex sooner or later.

Problems of the new government. Brigandage.

There were, however, other serious problems calling for immediate attention. The country had to be built up and converted from an agglomeration of scattered medieval principalities into a unified modern nation. The first question which arose was that of brigandage in the south. Brigandage had always existed in the Neapolitan kingdom, largely owing to the poverty of the people; but the evil was now aggravated by the mistake of the new government in dismissing the Bourbon troops, and then calling them out again as recruits. A great many turned brigands rather than serve again, and together with the remaining adherents of Bourbon rule and malefactors of all kinds, were made use of by the ex-king and his *entourage* to harass the Italian administration. Bands of desperadoes were formed, commanded by the most infamous criminals and by foreigners who came to fight in what they were led to believe was an Italian *Vendée*, but which was in reality a campaign of butchery and plunder. Villages were sacked and burnt, men, women and children mutilated, tortured or roasted alive, and women outraged. The authors of these deeds when pursued by troops fled into papal territory, where they were welcomed by the authorities and allowed to refit and raise fresh recruits under the aegis of the Church. The prime organizers of the movement were King Francis's uncle, the count of Trapani, and Mons. de Mérode, a Belgian ecclesiastic who enjoyed immense influence at the Vatican. The task of suppressing brigandage was entrusted to Generals La Marmora and Cialdini; but in spite of extreme severity, justifiable in the circumstances, it took four or five years completely to suppress the movement. Its vitality, indeed, was largely due to the mistakes made by the new administration, conducted as this was by officials ignorant of southern conditions and out of sympathy with a people far more primitive than in any other part of the peninsula. Politically, its sole outcome was to prove the impossibility of allowing the continuance of an independent Roman state in the heart of Italy.

Garibaldi's volunteers.

Another of the government's difficulties was the question of what to do with Garibaldi's volunteers. Fanti, the minister of war, had three armies to incorporate in that of Piedmont, viz. that of central Italy, that of the Bourbons and that of Garibaldi. The first caused no difficulty; the rank and file of the second were mostly disbanded, but a number of the officers were taken into the Italian army; the third offered a more serious problem. Garibaldi demanded that all his officers should be given equivalent rank in the Italian army, and in this he had the support of Fanti. Cavour, on the other hand, while anxious to deal generously with the Garibaldians, recognized the impossibility of such a course, which would not only have offended the conservative spirit of the Piedmontese military caste, which disliked and despised irregular troops, but would almost certainly have introduced into the army an element of indiscipline and disorder.

Death of Cavour.

On the 18th of April the question of the volunteers was discussed in one of the most dramatic sittings of the Italian parliament. Garibaldi, elected member for Naples, denounced Cavour in unmeasured terms for his treatment of the volunteers and for the cession of Nice, accusing him of leading the country to civil war. These charges produced a tremendous uproar, but Bixio by a splendid appeal for concord succeeded in calming the two adversaries. On the 23rd of April they were formally reconciled in the presence of the king, but the scene of the 18th of April hastened Cavour's end. In May the Roman question was discussed in parliament. Cavour had often declared that in the end the capital of Italy must be Rome, for it alone of all Italian cities had an unquestioned claim to moral supremacy, and his views of a free church in a free state were well known. He had negotiated secretly with the pope through unofficial agents, and sketched out a scheme of settlement of the Roman question, which foreshadowed in its main features the law of papal guarantees. But it was not given him to see this problem solved, for his health was broken by the strain of the last few years, during which practically the whole administration of the country was concentrated in his hands. He died after a short illness on the 6th of June 1861, at a moment when Italy had the greatest need of his statesmanship.

Ricasoli Ministry. Financial difficulties.

Rattazzi Ministry.

Ricasoli now became prime minister, Cavour having advised the king to that effect. The financial situation was far from brilliant, for the expenses of the administration of Italy were far larger than the total of those of all the separate states, and everything had to be created or rebuilt. The budget of 1861 showed a deficit of 344,000,000 lire, while the service of the debt was 110,000,000; deficits were met by new loans issued on unfavourable terms (that of July 1861 for 500,000,000 lire cost the government 714,833,000), and government stock fell as low as 36. It was now that the period of reckless finance began which, save for a lucid interval under Sella, was to last until nearly the end of the century. Considering the state of the country and the coming war for Venice, heavy expenditure was inevitable, but good management might have rendered the situation less dangerous. Ricasoli, honest and capable as he was, failed to win popularity; his attitude on the Roman question, which became more uncompromising after the failure of his attempt at conciliation, and his desire to emancipate Italy from French predominance, brought down on him the hostility of Napoleon. He fell in March 1862, and was succeeded by Rattazzi, who being more pliable and intriguing managed at first to please everybody, including Garibaldi. At this time the extremists and even the moderates were full of schemes for liberating Venice and Rome. Garibaldi had a plan, with which the premier was connected, for attacking Austria by raising a revolt in the Balkans and Hungary, and later he contemplated a raid

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[1] N. Bianchi, *Cavour*, p. 118.

[2] He asked for the Neapolitan viceroyalty for life, which the king very wisely refused.

Garibaldi and Rome. Affair of Aspromonte, 1862.

Minghetti Ministry.

into the Trentino; but the government, seeing the danger of such an attempt, arrested several Garibaldians at Sarnico (near Brescia), and in the *émeute* which followed several persons were shot. Garibaldi now became an opponent of the ministry, and in June went to Sicily, where, after taking counsel with his former followers, he decided on an immediate raid on Rome. He summoned his legionaries, and in August crossed over to Calabria with 1000 men. His intentions in the main were still loyal, for he desired to capture Rome for the kingdom; and he did his best to avoid the regulars tardily sent against him. On the 29th of August 1862, however, he encountered a force under Pallavicini at Aspromonte, and, although Garibaldi ordered his men not to fire, some of the raw Sicilian volunteers discharged a few volleys which were returned by the regulars. Garibaldi himself was seriously wounded and taken prisoner. He was shut up in the fortress of Varignano, and after endless discussions as to whether he should be tried or not, the question was settled by an amnesty. The affair made the ministry so unpopular that it was forced to resign. Farini, who succeeded, retired almost at once on account of ill-health, and Minghetti became premier, with Visconti-Venosta as minister for foreign affairs. The financial situation continued to be seriously embarrassing; deficit was piled on deficit, loan upon loan, and the service of the debt rose from 90,000,000 lire in 1860 to 220,000,000 in 1864.

France, Italy and the Roman question.

Capital transferred to Florence, 1865.

La Marmora Ministry.

Negotiations were resumed with Napoleon for the evacuation of Rome by the French troops; but the emperor, though he saw that the temporal power could not for ever be supported by French bayonets, desired some guarantee that the evacuation should not be followed, at all events immediately, by an Italian occupation, lest Catholic opinion should lay the blame for this upon France. Ultimately the two governments concluded a convention on the 15th of September 1864, whereby France agreed to withdraw her troops from Rome so soon as the papal army should be reorganized, or at the outside within two years, Italy undertaking not to attack it nor permit others to do so, and to transfer the capital from Turin to some other city within six months.[1] The change of capital would have the appearance of a definite abandonment of the *Roma capitale* programme, although in reality it was to be merely a *tappa* (stage) on the way. The convention was kept secret, but the last clause leaked out and caused the bitterest feeling among the people of Turin, who would have been resigned to losing the capital provided it were transferred to Rome, but resented the fact that it was to be established in any other city, and that the convention was made without consulting parliament. Demonstrations were held which were repressed with unnecessary violence, and although the change of capital was not unpopular in the rest of Italy, where the *Piemontesismo* of the new régime was beginning to arouse jealousy, the secrecy with which the affair was arranged and the shooting down of the people in Turin raised such a storm of disapproval that the king for the first time used his privilege of dismissing the ministry. Under La Marmora's administration the September convention was ratified, and the capital was transferred to Florence the following year. This affair resulted in an important political change, for the Piedmontese deputies, hitherto the bulwarks of moderate conservatism, now shifted to the Left or constitutional opposition.

Venetian question.

Prusso-Italian Alliance of 1866.

Meanwhile, the Venetian question was becoming more and more acute. Every Italian felt the presence of the Austrians in the lagoons as a national humiliation, and between 1859 and 1866 countless plots were hatched for their expulsion. But, in spite of the sympathy of the king, the attempt to raise armed bands in Venetia had no success, and it became clear that the foreigner could only be driven from the peninsula by regular war. To wage this alone Italy was still too weak, and it was necessary to look round for an ally. Napoleon was sympathetic; he desired to see the Austrians expelled, and the Syllabus of Pius IX., which had stirred up the more aggressive elements among the French clergy against his government, had brought him once more into harmony with the views of Victor Emmanuel; but he dared not brave French public opinion by another war with Austria, nor did Italy desire an alliance which would only have been bought at the price of further cessions. There remained Prussia, which, now that the Danish campaign of 1864 was over, was completing her preparations for the final struggle with Austria for the hegemony of Germany; and Napoleon, who saw in the furthering of Bismarck's plans the surest means of securing his own influence in a divided Europe, willingly lent his aid in negotiating a Prusso-Italian alliance. In the summer of 1865 Bismarck made formal proposals to La Marmora; but the *pourparlers* were interrupted by the conclusion of the convention of Gastein (August 14), to which Austria agreed partly under pressure of the Prusso-Italian *entente*. To Italy the convention seemed like a betrayal; to Napoleon it was a set-back which he tried to retrieve by suggesting to Austria the peaceful cession of Venetia to the Italian kingdom, in order to prevent any danger of its alliance with Prussia. This proposal broke on the refusal of the emperor Francis Joseph to cede Austrian territory except as the result of a struggle; and Napoleon, won over by Bismarck at the famous interview at Biarritz, once more took up the idea of a Prusso-Italian offensive and defensive alliance. This was actually concluded on the 8th of April 1866. Its terms, dictated by a natural suspicion on the part of the Italian government, stipulated that it should only become effective in the event of Prussia declaring war on Austria within three months. Peace was not to be concluded until Italy should have received Venetia, and Prussia an equivalent territory in Germany.

The outbreak of war was postponed by further diplomatic complications. On the 12th of June Napoleon, whose policy throughout had been obscure and contradictory, signed a secret treaty with Austria, under which Venice was to be handed over to him, to be given to Italy in the event of her making a separate peace. La Marmora, however, who believed himself bound in honour to Prussia, refused to enter into a separate arrangement. On the 16th the Prussians began hostilities, and on the 20th Italy declared war.

Ricasoli Ministry.

Battle of Königgrätz.

Victor Emmanuel took the supreme command of the Italian army, and La Marmora resigned the premiership (which was assumed by Ricasoli), to become chief of the staff. La Marmora had three army corps (130,000 men) under his immediate command, to operate on the Mincio, while Cialdini with 80,000 men was to operate on the Po. The Austrian southern army consisting of 95,000 men was commanded by the archduke Albert, with General von John as chief of the staff. On the 23rd of June La Marmora crossed the Mincio, and on the 24th a battle was fought at Custozza, under circumstances highly disadvantageous to the Italians, which after a stubborn contest ended in a crushing Austrian victory. Bad generalship, bad organization and the jealousy between La Marmora and Della Rocca were responsible for this defeat. Custozza might have been afterwards retrieved, for the Italians had plenty of fresh troops besides Cialdini's army; but nothing was done, as both the king and La Marmora believed the situation to be much worse than it actually was. On the 3rd of July the Prussians completely defeated the Austrians at Königgrätz, and on the 5th Austria ceded Venetia to Napoleon, accepting his mediation in favour of peace. The Italian iron-clad fleet commanded by the incapable Persano, after wasting much time at Taranto and Ancona, made an unsuccessful attack on the Dalmatian island of Lissa on the 18th of July, and on the 20th was completely defeated by the Austrian squadron, consisting of wooden ships, but commanded by the capable Admiral Tegethoff.

On the 22nd Prussia, without consulting Italy, made an armistice with Austria, while Italy obtained an eight days' truce on condition of evacuating the Trentino, which had almost entirely

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[1] The counterblast of Pius IX. to this convention was the encyclical *Quanta Cura* of Dec. 8, 1864, followed by the famous *Syllabus*.

Venice united to Italy.

fallen into the hands of Garibaldi and his volunteers. Ricasoli wished to go on with the war, rather than accept Venetia as a gift from France; but the king and La Marmora saw that peace must be made, as the whole Austrian army of 350,000 men was now free to fall on Italy. An armistice was accordingly signed at Cormons on the 12th of August; Austria handed Venetia over to General Leboeuf, representing Napoleon; and on the 3rd of October peace between Austria and Italy was concluded at Vienna. On the 19th Leboeuf handed Venetia over to the Venetian representatives, and at the plebiscite held on the 21st and 22nd, 647,246 votes were returned in favour of union with Italy, only 69 against it. When this result was announced to the king by a deputation from Venice he said: "This is the finest day of my life; Italy is made, but it is not complete." Rome was still wanting.

Revolt in Sicily, 1866.

Rattazzi Ministry.

Garibaldi attacks Rome.

Menabrea Ministry.

Battle of Mentana.

Custozza and Lissa were not Italy's only misfortunes in 1866. There had been considerable discontent in Sicily, where the government had made itself unpopular. The priesthood and the remnants of the Bourbon party fomented an agitation, which in September culminated in an attack on Palermo by 3000 armed insurgents, and in similar outbreaks elsewhere. The revolt was put down owing to the energy of the mayor of Palermo, Marquis A. Di Rudini, and the arrival of reinforcements. The Ricasoli cabinet fell over the law against the religious houses, and was succeeded by that of Rattazzi, who with the support of the Left was apparently more fortunate. The French regular troops were withdrawn from Rome in December 1866; but the pontifical forces were largely recruited in France and commanded by officers of the imperial army, and service under the pope was considered by the French war office as equivalent to service in France. This was a violation of the letter as well as of the spirit of the September convention, and a stronger and more straightforward statesman than Rattazzi would have declared Italy absolved from its provisions. Mazzini now wanted to promote an insurrection in Roman territory, whereas Garibaldi advocated an invasion from without. He delivered a series of violent speeches against the papacy, and made open preparations for a raid, which were not interfered with by the government; but on the 23rd of September 1867 Rattazzi had him suddenly arrested and confined to Caprera. In spite of the vigilance of the warships he escaped on the 14th of October and landed in Tuscany. Armed bands had already entered papal territory, but achieved nothing in particular. Their presence, however, was a sufficient excuse for Napoleon, under pressure of the clerical party, to send another expedition to Rome (26th of October). Rattazzi, after ordering a body of troops to enter papal territory with no definite object, now resigned, and was succeeded by Menabrea. Garibaldi joined the bands on the 23rd, but his ill-armed and ill-disciplined force was very inferior to his volunteers of '49, '60 and '66. On the 24th he captured Monte Rotondo, but did not enter Rome as the expected insurrection had not broken out. On the 29th a French force, under de Failly, arrived, and on the 3rd of November a battle took place at Mentana between 4000 or 5000 redshirts and a somewhat superior force of French and pontificals. The Garibaldians, mowed down by the new French *chassepôt* rifles, fought until their last cartridges were exhausted, and retreated the next day towards the Italian frontier, leaving 800 prisoners.

Lanza Ministry.

The affair of Mentana caused considerable excitement throughout Europe, and the Roman question entered on an acute stage. Napoleon suggested his favourite expedient of a congress, but the proposal broke down owing to Great Britain's refusal to participate; and Rouher, the French premier, declared in the Chamber (5th of December 1867) that France could never permit the Italians to occupy Rome. The attitude of France strengthened that anti-French feeling in Italy which had begun with Villafranca; and Bismarck was not slow to make use of this hostility, with a view to preventing Italy from taking sides with France against Germany in the struggle between the two powers which he saw to be inevitable. At the same time Napoleon was making overtures both to Austria and to Italy, overtures which were favourably received. Victor Emmanuel was sincerely anxious to assist Napoleon, for in spite of Nice and Savoy and Mentana he felt a chivalrous desire to help the man who had fought for Italy. But with the French at Civitavecchia (they had left Rome very soon after Mentana) a war for France was not to be thought of, and Napoleon would not promise more than the literal observance of the September convention. Austria would not join France unless Italy did the same, and she realized that that was impossible unless Napoleon gave way about Rome. Consequently the negotiations were suspended. A scandal concerning the tobacco monopoly led to the fall of Menabrea, who was succeeded in December 1869 by Giovanni Lanza, with Visconti-Venosta at the foreign office and Q. Sella as finance minister. The latter introduced a sounder financial policy, which was maintained until the fall of the Right in 1876. Mazzini, now openly hostile to the monarchy, was seized with a perfect monomania for insurrections, and promoted various small risings, the only effect of which was to show how completely his influence was gone.

Italian occupation of Rome.

In December 1869 the XXI. oecumenical council began its sittings in Rome, and on the 18th of July 1870 proclaimed the infallibility of the pope (see VATICAN COUNCIL). Two days previously Napoleon had declared war on Prussia, and immediately afterwards he withdrew his troops from Civitavecchia; but he persuaded Lanza to promise to abide by the September convention, and it was not until after Wörth and Gravelotte that he offered to give Italy a free hand to occupy Rome. Then it was too late; Victor Emmanuel asked Thiers if he could give his word of honour that with 100,000 Italian troops France could be saved, but Thiers remained silent. Austria replied like Italy: "It is too late." On the 9th of August Italy made a declaration of neutrality, and three weeks later Visconti-Venosta informed the powers that Italy was about to occupy Rome. On the 3rd of September the news of Sédan reached Florence, and with the fall of Napoleon's empire the September convention ceased to have any value. The powers having engaged to abstain from intervention in Italian affairs, Victor Emmanuel addressed a letter to Pius IX. asking him in the name of religion and peace to accept Italian protection instead of the temporal power, to which the pope replied that he would only yield to force. On the 11th of September General Cadorna at the head of 60,000 men entered papal territory. The garrison of Civitavecchia surrendered to Bixio, but the 10,000 men in Rome, mostly French, Belgians, Swiss and Bavarians, under Kanzler, were ready to fight. Cardinal Antonelli would have come to terms, but the pope decided on making a sufficient show of resistance to prove that he was yielding to force. On the 20th the Italians began the attack, and General Mazé de la Roche's division having effected a breach in the Porta Pia, the pope ordered the garrison to cease fire and the Italians poured into the Eternal City followed by thousands of Roman exiles. By noon the whole city on the left of the Tiber was occupied and the garrison laid down their arms; the next day, at the pope's request, the Leonine City on the right bank was also occupied. It had been intended to leave that part of Rome to the pope, but by the earnest desire of the inhabitants it too was included in the Italian kingdom. At the plebiscite there were 133,681 votes for union and 1507 against it. In July 1872 King Victor Emmanuel made his solemn entry into Rome, which was then declared the capital of Italy. Thus, after a struggle of more than half a century, in spite of apparently insuperable obstacles, the liberation and the unity of Italy were accomplished.

BIBLIOGRAPHY.—A vast amount of material on the Risorgimento has been published both in Italy and abroad as well as numerous works of a literary and critical nature. The most detailed Italian history of the period is Carlo Tivaroni's *Storia critica del Risorgimento Italiano* in 9 vols. (Turin, 1888–1897), based on a diligent study of the original authorities and containing a large amount of information; the author is a Mazzinian, which fact should be taken into account, but he generally quotes the opinions of those who disagree with him as well. Another voluminous but less valuable work is F. Bertolini's *Storia d'Italia dal 1814 al 1878*, in 2 parts (Milan, 1880–1881). L. Chiala's *Lettere del Conte di Cavour* (7 vols., Turin, 1883–1887) and D. Zanichelli's *Scritti del Conte di Cavour* (Bologna, 1892) are very important, and so are Prince Metternich's *Mémoires* (7 vols., Paris, 1881). P. Orsi's *L'Italia moderna* (Milan, 1901) should also be mentioned. N. Bianchi's *Storia della diplomazia europea in Italia* (8 vols., Turin, 1865) is an invaluable and thoroughly reliable work. See also Zini's *Storia d' Italia* (4 vols., Milan, 1875); Gualterio's *Gli ultimi rivolgimenti italiani* (4 vols., Florence, 1850) is important for the period from 1831 to 1847, and so also is L. Farina's *Storia d'Italia dal 1815 al 1849* (5 vols., Turin, 1851); W. R. Thayer's *Dawn of Italian Independence* (Boston, 1893) is gushing and not always accurate; C. Cantù's *Dell' indipendenza italiana cronistoria* (Naples, 1872–1877) is reactionary and often unreliable; V. Bersezio, *Il Regno di Vittorio Emanuele II* (8 vols., Turin, 1889, &c.). For English readers Countess E. Martinengo Cesaresco's *Liberation of Italy* (London, 1895) is to be strongly recommended, and is indeed, for accuracy, fairness and synthesis, as well as for charm of style, one of the very best books on the subject in any language; Bolton King's *History of Italian Unity* (2 vols., London, 1899) is bulkier and less satisfactory, but contains a useful bibliography. A succinct account of the chief events of the period will be found in Sir Spencer Walpole's *History of Twenty-Five Years* (London, 1904). See also the *Cambridge Modern History*, vols. x. and xi. (Cambridge, 1907, &c.), where full bibliographies will be found. (L. V.*)

F. HISTORY, 1870–1902

Italian occupation of Rome.

The downfall of the temporal power was hailed throughout Italy with unbounded enthusiasm. Abroad, Catholic countries at first received the tidings with resignation, and Protestant countries with joy. In France, where the Government of National Defence had replaced the Empire, Crémieux, as president of the government delegation at Tours, hastened to offer his congratulations to Italy. The occupation of Rome caused no surprise to the French government, which had been forewarned on 11th September of the Italian intentions. On that occasion Jules Favre had recognized the September convention to be dead, and, while refusing explicitly to denounce it, had admitted that unless Italy went to Rome the city would become a prey to dangerous agitators. At the same time he made it clear that Italy would occupy Rome upon her own responsibility. Agreeably surprised by this attitude on the part of France, Visconti-Venosta lost no time in conveying officially the thanks of Italy to the French government. He doubtless foresaw that the language of Favre and Crémieux would not be endorsed by the French Clericals. Prussia, while satisfied at the fall of the temporal power, seemed to fear lest Italy might recompense the absence of French opposition to the occupation of Rome by armed intervention in favour of France. Bismarck, moreover, was indignant at the connivance of the Italian government in the Garibaldian expedition to Dijon, and was irritated by Visconti-Venosta's plea in the Italian parliament for the integrity of French territory. The course of events in France, however, soon calmed German apprehensions. The advent of Thiers, his attitude towards the petition of French bishops on behalf of the pope, the recall of Senard, the French minister at Florence—who had written to congratulate Victor Emmanuel on the capture of Rome—and the instructions given to his successor, the comte de Choiseul, to absent himself from Italy at the moment of the king's official entry into the new capital (2nd July 1871), together with the haste displayed in appointing a French ambassador to the Holy See, rapidly cooled the cordiality of Franco-Italian relations, and reassured Bismarck on the score of any dangerous intimacy between the two governments.

Attitude of the Vatican.

The friendly attitude of France towards Italy during the period immediately subsequent to the occupation of Rome seemed to cow and to dishearten the Vatican. For a few weeks the relations between the Curia and the Italian authorities were marked by a conciliatory spirit. The secretary-general of the Italian foreign office, Baron Blanc, who had accompanied General Cadorna to Rome, was received almost daily by Cardinal Antonelli, papal secretary of state, in order to settle innumerable questions arising out of the Italian occupation. The royal commissioner for finance, Giacomelli, had, as a precautionary measure, seized the pontifical treasury; but upon being informed by Cardinal Antonelli that among the funds deposited in the treasury were 1,000,000 crowns of Peter's Pence offered by the faithful to the pope in person, the commissioner was authorized by the Italian council of state not only to restore this sum, but also to indemnify the Holy See for moneys expended for the service of the October coupon of the pontifical debt, that debt having been taken over by the Italian state. On the 29th of September Cardinal Antonelli further apprised Baron Blanc that he was about to issue drafts for the monthly payment of the 50,000 crowns inscribed in the pontifical budget for the maintenance of the pope, the Sacred College, the apostolic palaces and the papal guards. The Italian treasury at once honoured all the papal drafts, and thus contributed a first instalment of the 3,225,000 lire per annum afterwards placed by Article 4 of the Law of Guarantees at the disposal of the Holy See. Payments would have been regularly continued had not pressure from the French Clerical party coerced the Vatican into refusing any further instalment.

The Law of Guarantees.

Once in possession of Rome, and guarantor to the Catholic world of the spiritual independence of the pope, the Italian government prepared juridically to regulate its relations to the Holy See. A bill known as the Law of Guarantees was therefore framed and laid before parliament. The measure was an amalgam of Cavour's scheme for a "free church in a free state," of Ricasoli's Free Church Bill, rejected by parliament four years previously, and of the proposals presented to Pius IX. by Count Ponza di San Martino in September 1870. After a debate lasting nearly two months the Law of Guarantees was adopted in secret ballot on the 21st of March 1871 by 185 votes against 106.

It consisted of two parts. The first, containing thirteen articles, recognized (Articles 1 and 2) the person of the pontiff as sacred and intangible, and while providing for free discussion of religious questions, punished insults and outrages against the pope in the same way as insults and outrages against the king. Royal honours were attributed to the pope (Article 3), who was further guaranteed the same precedence as that accorded to him by other Catholic sovereigns, and the right to maintain his Noble and Swiss guards. Article 4 allotted the pontiff an annuity of 3,225,000 lire (£129,000) for the maintenance of the Sacred College, the sacred palaces, the congregations, the Vatican chancery and the diplomatic service. The sacred palaces, museums and libraries were, by Article 5, exempted from all taxation, and the pope was assured perpetual enjoyment of the Vatican and Lateran buildings and gardens, and of the papal villa at Castel Gandolfo. Articles 6 and 7 forbade access of any Italian official or agent to the above-mentioned palaces or to any eventual conclave or oecumenical council without special authorization from the pope, conclave or council. Article 8 prohibited the seizure or examination of any ecclesiastical papers, documents, books or registers of purely spiritual character. Article 9 guaranteed to the pope full freedom for the exercise of his spiritual ministry, and provided for the publication of pontifical announcements on the doors of the Roman churches and basilicas. Article 10 extended immunity to ecclesiastics employed by the Holy See, and bestowed upon foreign ecclesiastics in Rome the personal rights of Italian citizens. By Article 11, diplomatists accredited to the Holy See, and papal diplomatists while in Italy, were placed on the same footing as diplomatists accredited to the Quirinal. Article 12 provided for the transmission free of cost in Italy of all papal telegrams and correspondence both with bishops and foreign governments, and sanctioned the establishment, at the expense of the Italian state, of a papal telegraph office served by papal officials in communication with the Italian postal and telegraph system. Article 13 exempted all ecclesiastical seminaries, academies, colleges and schools for the education of priests in the city of Rome from all interference on the part of the Italian government.

This portion of the law, designed to reassure foreign Catholics, met with little opposition; but the second portion, regulating the relations between state and church in Italy, was sharply criticized by deputies who, like Sella, recognized the ideal of a "free church in a free state" to be an impracticable dream. The second division of the law abolished (Article 14) all restrictions upon the right of meeting of members of the clergy. By Article 15 the government relinquished its rights to apostolic legation in Sicily, and to the appointment of its own nominees to the chief benefices throughout the kingdom. Bishops were further dispensed from swearing fealty to the king, though, except in Rome and suburbs, the choice of bishops was limited to ecclesiastics of Italian nationality. Article 16 abolished the need for royal *exequatur* and *placet* for ecclesiastical publications, but subordinated the enjoyment of temporalities by bishops and priests to the concession of state *exequatur* and *placet*. Article 17 maintained the independence of the ecclesiastical jurisdiction in spiritual and disciplinary matters, but reserved for the state the exclusive right to carry out coercive measures.

On the 12th of July 1871, Articles 268, 269 and 270 of the Italian Penal Code were so modified as to make ecclesiastics liable to imprisonment for periods varying from six months to five years, and to fines from 1000 to 3000 lire, for spoken or written attacks against the laws of the state, or for the fomentation of disorder. An encyclical of Pius IX. to the bishops of the Catholic Church on the 15th of May 1871 repudiated the Law of Guarantees, and summoned Catholic princes to co-operate in restoring the temporal power. Practically, therefore, the law has remained a one-sided enactment, by which Italy considers herself bound, and of which she has always observed the spirit, even though the exigencies of self-defence may have led in some minor respects to non-observance of the letter. The annuity payable to the pope has, for instance, been made subject to quinquennial prescription, so that in the event of tardy recognition of the law the Vatican could at no time claim payment of more than five years' annuity with interest.

For a few months after the occupation of Rome pressing questions incidental to a new change of capital and to the administration of a new domain distracted public attention from the real condition of Italian affairs. The rise of the Tiber and the flooding of Rome in December 1870 (tactfully used by Victor Emmanuel as an opportunity for a first visit to the new capital) illustrated the imperative necessity of reorganizing the drainage of the city and of constructing the Tiber embankment. In spite of pressure from the French government, which desired Italy to maintain Florence as the political and to regard Rome merely as the moral capital of the realm, the government offices and both legislative chambers were transferred in 1871 to the Eternal City. Early in the year the crown prince Humbert with the Princess Margherita took up their residence in the Quirinal Palace, which, in view of the Vatican refusal to deliver up the keys, had to be opened by force. Eight monasteries were expropriated to make room for the chief state departments, pending the construction of more suitable edifices. The growth of Clerical influence in France engendered a belief that Italy would soon have to defend with the sword her newly-won unity, while the tremendous lesson of the Franco-Prussian War convinced the military authorities of the need for thorough military reform. General Ricotti Magnani, minister of war, therefore framed an Army Reform Bill designed to bring the Italian army as nearly as possible up to the Prussian standard. Sella, minister of finance, notwithstanding the sorry plight of the Italian exchequer, readily granted the means for the reform. "We must arm," he said, "since we have overturned the papal throne," and he pointed to France as the quarter from which attack was most likely to come.

Finance.

Though perhaps less desperate than during the previous decade, the condition of Italian finance was precarious indeed. With taxation screwed up to breaking point on personal and real estate, on all forms of commercial and industrial activity, and on salt, flour and other necessaries of life; with a deficit of £8,500,000 for the current year, and the prospect of a further aggregate deficit of £12,000,000 during the next quinquennium, Sella's heroic struggle against national bankruptcy was still far from a successful termination. He chiefly had borne the brunt and won the laurels of the unprecedented fight against deficit in which Italy had been involved since 1862. As finance minister in the Rattazzi cabinet of that year he had been confronted with a public debt of nearly £120,000,000, and with an immediate deficit of nearly £18,000,000. In 1864, as minister in the La Marmora cabinet, he had again to face an excess of expenditure over income amounting to more than £14,600,000. By the seizure and sale of Church lands, by the sale of state railways, by "economy to the bone" and on one supreme occasion by an appeal to taxpayers to advance a year's quota of the land-tax, he had met the most pressing engagements of that troublous period. The king was persuaded to forgo one-fifth of his civil list, ministers and the higher civil servants were required to relinquish a portion of their meagre salaries, but, in spite of all, Sella had found himself in 1865 compelled to propose the most hated of fiscal burdens—a grist tax on cereals. This tax (*macinato*) had long been known in Italy. Vexatious methods of assessment and collection had made it so unpopular that the Italian government in 1859–1860 had thought it expedient to abolish it throughout the realm. Sella hoped by the application of a mechanical meter both to obviate the odium attaching to former methods of collection and to avoid the maintenance of an army of inspectors and tax-gatherers, whose stipends had formerly eaten up most of the proceeds of the impost. Before proposing the reintroduction of the tax, Sella and his friend Ferrara improved and made exhaustive experiments with the meter. The result of their efforts was laid before parliament in one of the most monumental and most painstaking preambles ever prefixed to a bill. Sella, nevertheless, fell before the storm of opposition which his scheme aroused. Scialoja, who succeeded him, was obliged to adopt a similar proposal, but parliament again proved refractory. Ferrara, successor of Scialoja, met a like fate; but Count Cambray-Digny, finance minister in the Menabrea cabinet of 1868–1869, driven to find means to cover a deficit aggravated by the interest on the Venetian debt, succeeded, with Sella's help, in forcing a Grist Tax Bill through parliament, though in a form of which Sella could not entirely approve. When, on the 1st of January 1869, the new tax came into force, nearly half the flour-mills in Italy ceased work. In many districts the government was obliged to open mills on its own account. Inspectors and tax-gatherers did their work under police protection, and in several parts of the country riots had to be suppressed *manu militari*. At first the net revenue from the impost was less than £1,100,000; but under Sella's firm administration (1869–1873), and in consequence of improvements gradually introduced by him, the net return ultimately exceeded £3,200,000. The parliamentary opposition to the impost, which the Left denounced as "the tax on hunger," was largely factitious. Few, except the open partisans of national bankruptcy, doubted its necessity; yet so strong was the current of feeling worked up for party purposes by opponents of the measure, that Sella's achievement in having by its means saved the financial situation of Italy deserves to rank among the most noteworthy performances of modern parliamentary statesmanship.

Under the stress of the appalling financial conditions represented by chronic deficit, crushing taxation, the heavy expenditure necessary for the consolidation of the kingdom, the reform of the army and the interest on the pontifical debt, Sella, on the 11th of December 1871, exposed to parliament the financial situation in all its nakedness. He recognized that considerable improvement had already taken place. Revenue from taxation had risen in a decade from £7,000,000 to £20,200,000; profit on state monopolies had increased from £7,000,000 to £9,400,000; exports had grown to exceed imports; income from the working of telegraphs had tripled itself; railways had been extended from 2200 to 6200 kilometres, and the annual travelling public had augmented from 15,000,000 to 25,000,000 persons. The serious feature of the situation lay less in the income than in the "intangible" expenditure, namely, the vast sums required for interest on the various forms of public debt and for pensions. Within ten years this category of outlay had increased from £8,000,000 to £28,800,000. During the same period the assumption of the Venetian and Roman debts, losses on the issue of loans and the accumulation of annual deficits, had caused public indebtedness to rise from £92,000,000 to £328,000,000, no less than £100,000,000 of the latter sum having been sacrificed in premiums and commissions to bankers and underwriters of loans. By economies and new taxes Sella had reduced the deficit to less than £2,000,000 in 1871, but for 1872 he found himself confronted with a total expenditure of £8,000,000 in excess of revenue. He therefore proposed to make over the treasury service to the state banks, to increase the forced currency, to raise the stamp and registration duties and to impose a new tax on textile fabrics. An optional conversion of sundry internal loans into consolidated stock at a lower rate of interest was calculated to effect considerable saving. The battle over these proposals was long and fierce. But for the tactics of Rattazzi, leader of the Left, who, by basing his opposition on party considerations, impeded the secession of Minghetti and a part of the Right from the ministerial majority, Sella would have been defeated. On the 23rd of March 1872, however, he succeeded in carrying his programme, which not only provided for the pressing needs of the moment, but laid the foundation of the much-needed equilibrium between expenditure and revenue.

Religious Orders Bill.

In the spring of 1873 it became evident that the days of the Lanza-Sella cabinet were numbered. Fear of the advent of a Radical administration under Rattazzi alone prevented the Minghettian Right from revolting against the government. The Left, conscious of its strength, impatiently awaited the moment of accession to power. Sella, the real head of the Lanza cabinet, was worn out by four years' continuous work and disheartened by the perfidious misrepresentation in which Italian politicians, particularly those of the Left, have ever excelled. By sheer force of will he compelled the Chamber early in 1873 to adopt some minor financial reforms, but on the 29th of April found himself in a minority on the question of a credit for a proposed state arsenal at Taranto. Pressure from all sides of the House, however, induced the ministry to retain office until after the debate on the application to Rome and the Papal States of the Religious Orders Bill (originally passed in 1866)—a measure which, with the help of Ricasoli, was carried at the end of May. While leaving intact the general houses of the various confraternities (except that of the Jesuits), the bill abolished the corporate personality of religious orders, handed over their schools and hospitals to civil administrators, placed their churches at the disposal of the secular clergy, and provided pensions for nuns and monks, those who had families being sent to reside with their relatives, and those who by reason of age or bereavement had no home but their monasteries being allowed to end their days in religious houses specially set apart for the purpose. The proceeds of the sale of the suppressed convents and monasteries were partly converted into pensions for monks and nuns, and partly allotted to the municipal charity boards which had undertaken the educational and charitable functions formerly exercised by the religious orders. To the pope was made over £16,000 per annum as a contribution to the expense of maintaining in Rome representatives of foreign orders; the Sacred College, however, rejected this endowment, and summoned all the suppressed confraternities to reconstitute themselves under the ordinary Italian law of association. A few days after the passage of the Religious Orders Bill, the death of Rattazzi (5th June 1873) removed all probability of the immediate advent of the Left. Sella, uncertain of the loyalty of the Right, challenged a vote on the immediate discussion of further financial reforms, and on the 23rd of June was overthrown by a coalition of the Left under Depretis with a part of the Right under Minghetti and the Tuscan Centre under Correnti. The administration which thus fell was unquestionably the most important since the death of Cavour. It had completed national unity, transferred the capital to Rome, overcome the chief obstacles to financial equilibrium, initiated military reform and laid the foundation of the relations between state and church.

Minghetti.

The succeeding Minghetti-Visconti-Venosta cabinet—which held office from the 10th of July 1873 to the 18th of March 1876—continued in essential points the work of the preceding administration. Minghetti's finance, though less clear-sighted and less resolute than that of Sella, was on the whole prudent and beneficial. With the aid of Sella he concluded conventions for the redemption of the chief Italian railways from their French and Austrian proprietors. By dint of expedients he gradually overcame the chronic deficit, and, owing to the normal increase of revenue, ended his term of office with the announcement of a surplus of some £720,000. The question whether this surplus was real or only apparent has been much debated, but there is no reason to doubt its substantial reality. It left out of account a sum of £1,000,000 for railway construction which was covered by credit, but, on the other hand, took no note of £360,000 expended in the redemption of debt. Practically, therefore, the Right, of which the Minghetti cabinet was the last representative administration, left Italian finance with a surplus of £80,000. Outside the all-important domain of finance, the attention of Minghetti and his colleagues was principally absorbed by strife between church and state, army reform and railway redemption. For some time after the occupation of Rome the pope, in order to substantiate the pretence that his spiritual freedom had been diminished, avoided the creation of cardinals and the nomination of bishops. On the 22nd of December 1873, however, he unexpectedly created twelve cardinals, and subsequently proceeded to nominate a number of bishops. Visconti-Venosta, who had retained the portfolio for foreign affairs in the Minghetti cabinet, at once drew the attention of the European powers to this proof of the pope's spiritual freedom and of the imaginary nature of his "imprisonment" in the Vatican. At the same time he assured them that absolute liberty would be guaranteed to the deliberations of a conclave. In relation to the Church in Italy, Minghetti's policy was less perspicacious. He let it be understood that the announcement of the appointment of bishops and the request for the royal *exequatur* might be made to the government impersonally by the congregation of bishops and regulars, by a municipal council or by any other corporate body—a concession of which the bishops were quick to take advantage, but which so irritated Italian political opinion that, in July 1875, the government was compelled to withdraw the temporalities of ecclesiastics who had neglected to apply for the *exequatur*, and to evict sundry bishops who had taken possession of their palaces without authorization from the state. Parliamentary pressure further obliged Bonghi, minister of public instruction, to compel clerical seminaries either to forgo the instruction of lay pupils or to conform to the laws of the state in regard to inspection and examination, an ordinance which gave rise to conflicts between ecclesiastical and lay authorities, and led to the forcible dissolution of the Mantua seminary and to the suppression of the Catholic university in Rome.

Military and naval reform.

More noteworthy than its management of internal affairs were the efforts of the Minghetti cabinet to strengthen and consolidate national defence. Appalled by the weakness, or rather the non-existence, of the navy, Admiral Saint-Bon, with his coadjutor Signor Brin, addressed himself earnestly to the task of recreating the fleet, which had never recovered from the effects of the disaster of Lissa. During his three years of office he laid the foundation upon which Brin was afterwards to build up a new Italian navy. Simultaneously General Ricotti Magnani matured the army reform scheme which he had elaborated under the preceding administration. His bill, adopted by parliament on the 7th of June 1875, still forms the ground plan of the Italian army.

Foreign policy under the Right.

It was fortunate for Italy that during the whole period 1869–1876 the direction of her foreign policy remained in the experienced hands of Visconti-Venosta, a statesman whose trustworthiness, dignity and moderation even political opponents have been compelled to recognize. Diplomatic records fail to substantiate the accusations of lack of initiative and instability of political criterion currently brought against him by contemporaries. As foreign minister of a young state which had attained unity in defiance of the most formidable religious organization in the world and in opposition to the traditional policy of France, it could but be Visconti-Venosta's aim to uphold the dignity of his country while convincing European diplomacy that United Italy was an element of order and progress, and that the spiritual independence of the Roman pontiff had suffered no diminution. Prudence, moreover, counselled avoidance of all action likely to serve the predominant anti-Italian party in France as a pretext for violent intervention in favour of the pope. On the occasion of the Metrical Congress, which met in Paris in 1872, he, however, successfully protested against the recognition of the Vatican delegate, Father Secchi, as a representative of a "state," and obtained from Count de Rémusat, French foreign minister, a formal declaration that the presence of Father Secchi on that occasion could not constitute a diplomatic precedent. The irritation displayed by Bismarck at the Francophil attitude of Italy towards the end of the Franco-German War gave place to a certain show of goodwill when the great chancellor found himself in his turn involved in a struggle against the Vatican and when the policy of Thiers began to strain Franco-Italian relations. Thiers had consistently opposed the emperor Napoleon's pro-Italian policy. In the case of Italy, as in that of Germany, he frankly regretted the constitution of powerful homogeneous states upon the borders of France. Personal pique accentuated this feeling in regard to Italy. The refusal of Victor Emmanuel II. to meet Thiers at the opening of the Mont Cenis tunnel (a refusal not unconnected with offensive language employed at Florence in October 1870 by Thiers during his European tour, and with his instructions to the French minister to remain absent from Victor Emmanuel's official entry into Rome) had wounded the *amour propre* of the French statesman, and had decreased whatever inclination he might otherwise have felt to oppose the French Clerical agitation for the restoration of the temporal power, and for French interference with the Italian Religious Orders Bill. Consequently relations between France and Italy became so strained that in 1873 both the French minister to the Quirinal and the Italian minister to the Republic remained for several months absent from their posts. At this juncture the emperor of Austria invited Victor Emmanuel to visit the Vienna Exhibition, and the Italian government received a confidential intimation that acceptance of the invitation to Vienna would be followed by a further invitation from Berlin. Perceiving the advantage of a visit to the imperial and apostolic court after the Italian occupation of Rome and the suppression of the religious orders, and convinced of the value of more cordial intercourse with the German empire, Visconti-Venosta and Minghetti advised their sovereign to accept both the Austrian and the subsequent German invitations. The visit to Vienna took place on the 17th to the 22nd of September, and that to Berlin on the 22nd to the 26th of September 1873, the Italian monarch being accorded in both courts a most cordial reception, although the contemporaneous publication of La Marmora's famous pamphlet, *More Light on the Events of 1866*, prevented intercourse between the Italian ministers and Bismarck from being entirely confidential. Visconti-Venosta and Minghetti, moreover, wisely resisted the chancellor's pressure to override the Law of Guarantees and to engage in an Italian *Kulturkampf*. Nevertheless the royal journey contributed notably to the establishment of cordial relations between Italy and the central powers, relations which were further strengthened by the visit of the emperor Francis Joseph to Victor Emmanuel at Venice in April 1875, and by that of the German emperor to Milan in October of the same year. Meanwhile Thiers had given place to Marshal Macmahon, who effected a decided improvement in Franco-Italian relations by recalling from Civitavecchia the cruiser "Orénoque," which since 1870 had been stationed in that port at the disposal of the pope in case he should desire to quit Rome. The foreign policy of Visconti-Venosta may be said to have reinforced the international position of Italy without sacrifice of dignity, and without the vacillation and short-sightedness which was to characterize the ensuing administrations of the Left.

The fall of the Right on the 18th of March 1876 was an event destined profoundly and in many respects adversely to affect the course of Italian history. Except at rare and not auspicious intervals, the Right had held office from 1849 to 1876. Its rule was associated in the popular mind with severe administration; hostility to the democratic elements represented by Garibaldi, Crispi, Depretis and Bertani; ruthless imposition and collection of taxes in order to meet the financial engagements forced upon Italy by the vicissitudes of her Risorgimento; strong predilection for Piedmontese, Lombards and Tuscans, and a steady determination, not always scrupulous in its choice of means, to retain executive power and the most important administrative offices of the state for the *consorteria*, or close corporation, of its own adherents. For years the men of the Left had worked to inoculate the electorate with suspicion of Conservative methods and with hatred of the imposts which they nevertheless knew to be indispensable to sound finance. In regard to the grist tax especially, the agitators of the Left had placed their party in a radically false position. Moreover, the redemption of the railways by the state—contracts for which had been signed by Sella in 1875 on behalf of the Minghetti cabinet with Rothschild at Basel and with the Austrian government at Vienna—had been fiercely opposed by the Left, although its members were for the most part convinced of the utility of the operation. When, at the beginning of March 1876, these contracts were submitted to parliament, a group of Tuscan deputies, under Cesare Correnti, joined the opposition, and on the 18th of March took advantage of a chance motion concerning the date of discussion of an interpellation on the grist tax to place the Minghetti cabinet in a minority. Depretis, ex-prodictator of Sicily, and successor of Rattazzi in the leadership of the Left, was entrusted by the king with the formation of a Liberal ministry. Besides the premiership, Depretis assumed the portfolio of finance; Nicotera, an ex-Garibaldian of somewhat tarnished reputation, but a man of energetic and conservative temperament, was placed at the ministry of the interior; public works were entrusted to Zanardelli, a Radical doctrinaire of considerable juridical attainments; General Mezzacapo and Signor Brin replaced General Ricotti Magnani and Admiral Saint-Bon at the war office and ministry of marine; while to Mancini and Coppino, prominent members of the Left, were allotted the portfolios of justice and public instruction. Great difficulty was experienced in finding a foreign minister willing to challenge comparison with Visconti-Venosta. Several diplomatists in active service were approached, but, partly on account of their refusal, and partly from the desire of the Left to avoid giving so important a post to a diplomatist bound by ties of friendship or of interest to the Right, the choice fell upon Melegari, Italian minister at Bern.

First Depretis Cabinet.

The new ministers had long since made monarchical professions of faith, but, up to the moment of taking office, were nevertheless considered to be tinged with an almost revolutionary hue. The king alone appeared to feel no misgiving. His shrewd sense of political expediency and his loyalty to constitutional principles saved him from the error of obstructing the advent and driving into an anti-dynastic attitude politicians who had succeeded in winning popular favour. Indeed, the patriotism and loyalty of the new ministers were above suspicion. Danger lay rather in entrusting men schooled in political conspiracy and in unscrupulous parliamentary opposition with the government of a young state still beset by enemies at home and abroad. As an opposition party the Left had lived upon the facile credit of political promises, but had no well-considered programme nor other discipline nor unity of purpose than that born of the common eagerness of its leaders for office and their common hostility to the Right. Neither Depretis, Nicotera, Crispi, Cairoli nor Zanardelli was disposed permanently to recognize the superiority of any one chief. The dissensions which broke out among them within a few months of the accession of their party to power never afterwards disappeared, except at rare moments when it became necessary to unite in preventing the return of the Conservatives. Considerations such as these could not be expected to appeal to the nation at large, which hailed the advent of the Left as the dawn of an era of unlimited popular sovereignty, diminished administrative pressure, reduction of taxation and general prosperity. The programme of Depretis corresponded only in part to these expectations. Its chief points were extension of the franchise, incompatibility of a parliamentary mandate with an official position, strict enforcement of the rights of the State in regard to the Church, protection of freedom of conscience, maintenance of the military and naval policy inaugurated by the Conservatives, acceptance of the railway redemption contracts, consolidation of the financial equilibrium, abolition of the forced

Programme of the Left.

currency, and, eventually, fiscal reform. The long-promised abolition of the grist tax was not explicitly mentioned, opposition to the railway redemption contracts was transformed into approval, and the vaunted reduction of taxation replaced by lip-service to the Conservative deity of financial equilibrium. The railway redemption contracts were in fact immediately voted by parliament, with a clause pledging the government to legislate in favour of farming out the railways to private companies.

Nicotera, minister of the interior, began his administration of home affairs by a sweeping change in the *personnel* of the prefects, sub-prefects and public prosecutors, but found himself obliged to incur the wrath of his supporters by prohibiting Radical meetings likely to endanger public order, and by enunciating administrative principles which would have befitted an inveterate Conservative. In regard to the Church, he instructed the prefects strictly to prevent infraction of the law against religious orders. At the same time the cabinet, as a whole, brought in a Clerical Abuses Bill, threatening with severe punishment priests guilty of disturbing the peace of families, of opposing the laws of the state, or of fomenting disorder. Depretis, for his part, was compelled to declare impracticable the immediate abolition of the grist tax, and to frame a bill for the increase of revenue, acts which caused the secession of some sixty Radicals and Republicans from the ministerial majority, and gave the signal for an agitation against the premier similar to that which he himself had formerly undertaken against the Right. The first general election under the Left (November 1876) had yielded the cabinet the overwhelming majority of 421 Ministerialists against 87 Conservatives, but the very size of the majority rendered it unmanageable. The Clerical Abuses Bill provoked further dissensions: Nicotera was severely affected by revelations concerning his political past; Zanardelli refused to sanction the construction of a railway in Calabria in which Nicotera was interested; and Depretis saw fit to compensate the supporters of his bill for the increase of revenue by decorating at one stroke sixty ministerial deputies with the Order of the Crown of Italy. A further derogation from the ideal of democratic austerity was committed by adding £80,000 per annum to the king's civil list (14th May 1877) and by burdening the state exchequer with royal household pensions amounting to £20,000 a year. The civil list, which the law of the 10th of August 1862 had fixed at £650,000 a year, but which had been voluntarily reduced by the king to £530,000 in 1864, and to £490,000 in 1867, was thus raised to £570,000 a year. Almost the only respect in which the Left could boast a decided improvement over the administration of the Right was the energy displayed by Nicotera in combating brigandage and the mafia in Calabria and Sicily. Successes achieved in those provinces failed, however, to save Nicotera from the wrath of the Chamber, and on the 14th of December 1877 a cabinet crisis arose over a question concerning the secrecy of telegraphic correspondence. Depretis thereupon reconstructed his administration, excluding Nicotera, Melegari and Zanardelli, placing Crispi at the home office, entrusting Magliani with finance, and himself assuming the direction of foreign affairs.

Foreign policy of the Left.

In regard to foreign affairs, the début of the Left as a governing party was scarcely more satisfactory than its home policy. Since the war of 1866 the Left had advocated an Italo-Prussian alliance in opposition to the Francophil tendencies of the Right. On more than one occasion Bismarck had maintained direct relations with the chiefs of the Left, and had in 1870 worked to prevent a Franco-Italian alliance by encouraging the "party of action" to press for the occupation of Rome. Besides, the Left stood for anti-clericalism and for the retention by the State of means of coercing the Church, in opposition to the men of the Right, who, with the exception of Sella, favoured Cavour's ideal of "a free Church in a free State," and the consequent abandonment of state control over ecclesiastical government. Upon the outbreak of the Prussian *Kulturkampf* the Left had pressed the Right to introduce an Italian counterpart to the Prussian May laws, especially as the attitude of Thiers and the hostility of the French Clericals obviated the need for sparing French susceptibilities. Visconti-Venosta and Minghetti, partly from aversion to a Jacobin policy, and partly from a conviction that Bismarck sooner or later would undertake his *Gang nach Canossa*, regardless of any tacit engagement he might have assumed towards Italy, had wisely declined to be drawn into any infraction of the Law of Guarantees. It was, however, expected that the chiefs of the Left, upon attaining office, would turn resolutely towards Prussia in search of a guarantee against the Clerical menace embodied in the régime of Marshal Macmahon. On the contrary, Depretis and Melegari, both of whom were imbued with French Liberal doctrines, adopted towards the Republic an attitude so deferential as to arouse suspicion in Vienna and Berlin. Depretis recalled Nigra from Paris and replaced him by General Cialdini, whose ardent plea for Italian intervention in favour of France in 1870, and whose comradeship with Marshal Macmahon in 1859, would, it was supposed, render him *persona gratissima* to the French government. This calculation was falsified by events. Incensed by the elevation to the rank of embassies of the Italian legation in Paris and the French legation to the Quirinal, and by the introduction of the Italian bill against clerical abuses, the French Clerical party not only attacked Italy and her representative, General Cialdini, in the Chamber of Deputies, but promoted a monster petition against the Italian bill. Even the *coup d'état* of the 16th of May 1877 (when Macmahon dismissed the Jules Simon cabinet for opposing the Clerical petition) hardly availed to change the attitude of Depretis. As a precaution against an eventual French attempt to restore the temporal power, orders were hurriedly given to complete the defences of Rome, but in other respects the Italian government maintained its subservient attitude. Yet at that moment the adoption of a clear line of policy, in accord with the central powers, might have saved Italy from the loss of prestige entailed by her bearing in regard to the Russo-Turkish War and the Austrian acquisition of Bosnia, and might have prevented the disappointment subsequently occasioned by the outcome of the Congress of Berlin. In the hope of inducing the European powers to "compensate" Italy for the increase of Austrian influence on the Adriatic, Crispi undertook in the autumn of 1877, with the approval of the king, and in spite of the half-disguised opposition of Depretis, a semi-official mission to Paris, Berlin, London and Vienna. The mission appears not to have been an unqualified success, though Crispi afterwards affirmed in the Chamber (4th March 1886) that Depretis might in 1877 "have harnessed fortune to the Italian chariot." Depretis, anxious only to avoid "a policy of adventure," let slip whatever opportunity may have presented itself, and neglected even to deal energetically with the impotent but mischievous Italian agitation for a "rectification" of the Italo-Austrian frontier. He greeted the treaty of San Stefano (3rd March 1878) with undisguised relief, and by the mouth of the king, congratulated Italy (7th March 1878) on having maintained with the powers friendly and cordial relations "free from suspicious precautions," and upon having secured for herself "that most precious of alliances, the alliance of the future"—a phrase of which the empty rhetoric was to be bitterly demonstrated by the Berlin Congress and the French occupation of Tunisia.

Crispi.

The entry of Crispi into the Depretis cabinet (December 1877) placed at the ministry of the interior a strong hand and sure eye at a moment when they were about to become imperatively necessary. Crispi was the only man of truly statesmanlike calibre in the ranks of the Left. Formerly a friend and disciple of Mazzini, with whom he had broken on the question of the monarchical form of government which Crispi believed indispensable to the unification of Italy, he had afterwards been one of Garibaldi's most efficient coadjutors and an active member of the "party of action." Passionate, not always scrupulous in his choice and use of political weapons, intensely patriotic, loyal with a loyalty based rather on reason than sentiment, quick-witted, prompt in action, determined and pertinacious, he possessed in eminent degree many qualities lacking in other

Deaths of Victor Emmanuel II. and Pius IX.

Leo XIII.

Liberal chieftains. Hardly had he assumed office when the unexpected death of Victor Emmanuel II. (9th January 1878) stirred national feeling to an unprecedented depth, and placed the continuity of monarchical institutions in Italy upon trial before Europe. For thirty years Victor Emmanuel had been the centre point of national hopes, the token and embodiment of the struggle for national redemption. He had led the country out of the despondency which followed the defeat of Novara and the abdication of Charles Albert, through all the vicissitudes of national unification to the final triumph at Rome. His disappearance snapped the chief link with the heroic period, and removed from the helm of state a ruler of large heart, great experience and civil courage, at a moment when elements of continuity were needed and vital problems of internal reorganization had still to be faced. Crispi adopted the measures necessary to ensure the tranquil accession of King Humbert with a quick energy which precluded any Radical or Republican demonstrations. His influence decided the choice of the Roman Pantheon as the late monarch's burial-place, in spite of formidable pressure from the Piedmontese, who wished Victor Emmanuel II. to rest with the Sardinian kings at Superga. He also persuaded the new ruler to inaugurate, as King Humbert I., the new dynastical epoch of the kings of Italy, instead of continuing as Humbert IV. the succession of the kings of Sardinia. Before the commotion caused by the death of Victor Emmanuel had passed away, the decease of Pius IX. (7th February 1878) placed further demands upon Crispi's sagacity and promptitude. Like Victor Emmanuel, Pius IX. had been bound up with the history of the Risorgimento, but, unlike him, had represented and embodied the anti-national, reactionary spirit. Ecclesiastically, he had become the instrument of the triumph of Jesuit influence, and had in turn set his seal upon the dogma of the Immaculate Conception, the Syllabus and Papal Infallibility. Yet, in spite of all, his jovial disposition and good-humoured cynicism saved him from unpopularity, and rendered his death an occasion of mourning. Notwithstanding the pontiff's bestowal of the apostolic benediction *in articulo mortis* upon Victor Emmanuel, the attitude of the Vatican had remained so inimical as to make it doubtful whether the conclave would be held in Rome. Crispi, whose strong anti-clerical convictions did not prevent him from regarding the papacy as pre-eminently an Italian institution, was determined both to prove to the Catholic world the practical independence of the government of the Church and to retain for Rome so potent a centre of universal attraction as the presence of the future pope. The Sacred College having decided to hold the conclave abroad, Crispi assured them of absolute freedom if they remained in Rome, or of protection to the frontier should they migrate, but warned them that, once evacuated, the Vatican would be occupied in the name of the Italian government and be lost to the Church as headquarters of the papacy. The cardinals thereupon overruled their former decision, and the conclave was held in Rome, the new pope, Cardinal Pecci, being elected on the 20th of February 1878 without let or hindrance. The Italian government not only prorogued the Chamber during the conclave to prevent unseemly inquiries or demonstrations on the part of deputies, but by means of Mancini, minister of justice, and Cardinal di Pietro, assured the new pope protection during the settlement of his outstanding personal affairs, an assurance of which Leo XIII. on the evening after his election, took full advantage. At the same time the duke of Aosta, commander of the Rome army corps, ordered the troops to render royal honours to the pontiff should he officially appear in the capital. King Humbert addressed to the pope a letter of congratulation upon his election, and received a courteous reply. The improvement thus signalized in the relations between Quirinal and Vatican was further exemplified on the 18th of October 1878, when the Italian government accepted a papal formula with regard to the granting of the royal *exequatur* for bishops, whereby they, upon nomination by the Holy See, recognized state control over, and made application for, the payment of their temporalities.

Cairoli.

The Depretis-Crispi cabinet did not long survive the opening of the new reign. Crispi's position was shaken by a morally plausible but juridically untenable charge of bigamy, while on the 8th of March the election of Cairoli, an opponent of the ministry and head of the extremer section of the Left, to the presidency of the Chamber, induced Depretis to tender his resignation to the new king. Cairoli succeeded in forming an administration, in which his friend Count Corti, Italian ambassador at Constantinople, accepted the portfolio of foreign affairs, Zanardelli the ministry of the interior, and Seismit Doda the ministry of finance. Though the cabinet had no stable majority, it induced the Chamber to sanction a commercial treaty which had been negotiated with France and a general "autonomous" customs tariff. The commercial treaty was, however, rejected by the French Chamber in June 1878, a circumstance necessitating the application of the Italian general tariff, which implied a 10 to 20% increase in the duties on the principal French exports. A highly imaginative financial exposition by Seismit Doda, who announced a surplus of £2,400,000, paved the way for a Grist Tax Reduction Bill, which Cairoli had taken over from the Depretis programme. The Chamber, though convinced of the danger of this reform, the perils of which were incisively demonstrated by Sella, voted by an overwhelming majority for an immediate reduction of the impost by one-fourth, and its complete abolition within four years. Cairoli's premiership was, however, destined to be cut short by an attempt made upon the king's life in November 1878, during a royal visit to Naples, by a miscreant named Passanante. In spite of the courage and presence of mind of Cairoli, who received the dagger thrust intended for the king, public and parliamentary indignation found expression in a vote which compelled the ministry to resign.

Italy and the Berlin Congress.

Irredentism.

Though brief, Cairoli's term of office was momentous in regard to foreign affairs. The treaty of San Stefano had led to the convocation of the Berlin Congress, and though Count Corti was by no means ignorant of the rumours concerning secret agreements between Germany, Austria and Russia, and Germany, Austria and Great Britain, he scarcely seemed alive to the possible effect of such agreements upon Italy. Replying on the 9th of April 1878 to interpellations by Visconti-Venosta and other deputies on the impending Congress of Berlin, he appeared free from apprehension lest Italy, isolated, might find herself face to face with a change of the balance of power in the Mediterranean, and declared that in the event of serious complications Italy would be "too much sought after rather than too much forgotten." The policy of Italy in the congress, he added, would be to support the interests of the young Balkan nations. Wrapped in this optimism, Count Corti proceeded, as first Italian delegate, to Berlin, where he found himself obliged, on the 28th of May, to join reluctantly in sanctioning the Austrian occupation of Bosnia and Herzegovina. On the 8th of July the revelation of the Anglo-Ottoman treaty for the British occupation of Cyprus took the congress by surprise. Italy, who had made the integrity of the Ottoman empire a cardinal point of her Eastern policy, felt this change of the Mediterranean *status quo* the more severely inasmuch as, in order not to strain her relations with France, she had turned a deaf ear to Austrian, Russian and German advice to prepare to occupy Tunisia in agreement with Great Britain. Count Corti had no suspicion that France had adopted a less disinterested attitude towards similar suggestions from Bismarck and Lord Salisbury. He therefore returned from the German capital with "clean" but empty hands, a plight which found marked disfavour in Italian eyes, and stimulated anti-Austrian Irredentism. Ever since Venetia had been ceded by Austria to the emperor Napoleon, and by him to Italy, after the war of 1866, secret revolutionary committees had been formed in the northern Italian provinces to prepare for the "redemption" of Trent and Trieste. For twelve years these committees had remained comparatively inactive, but in 1878 the presence of the ex-Garibaldian Cairoli at the head of the government, and popular dissatisfaction at the spread of Austrian sway on the Adriatic, encouraged them to begin a series of noisy demonstrations. On the evening of the signature at Berlin of the clause sanctioning the Austrian occupation of Bosnia and Herzegovina, an Irredentist riot took place before the Austrian consulate at Venice. The Italian government attached little importance to the occurrence, and believed that a diplomatic expression of regret would suffice to allay Austrian irritation. Austria, indeed, might easily have been persuaded to ignore the Irredentist agitation, had not the equivocal attitude of Cairoli and Zanardelli cast doubt upon the sincerity of their regret. The former at Pavia (15th October 1878), and the latter at Arco (3rd November), declared publicly that Irredentist manifestations could not be prevented under existing laws, but gave no hint of introducing any law to sanction their prevention. "Repression, not prevention" became the official formula, the enunciation of which by Cairoli at Pavia caused Count Corti and two other ministers to resign.

Finance.

The fall of Cairoli, and the formation of a second Depretis cabinet in 1878, brought no substantial change in the attitude of the government towards Irredentism, nor was the position improved by the return of Cairoli to power in the following July. Though aware of Bismarck's hostility towards Italy, of the conclusion of the Austro-German alliance of 1879, and of the undisguised ill-will of France, Italy not only made no attempt to crush an agitation as mischievous as it was futile, but granted a state funeral to General Avezzana, president of the Irredentist League. In Bonghi's mordant phrase, the foreign policy of Italy during this period may be said to have been characterized by "enormous intellectual impotence counterbalanced by equal moral feebleness." Home affairs were scarcely better managed. Parliament had degenerated into a congeries of personal groups, whose members were eager only to overturn cabinets in order to secure power for the leaders and official favours for themselves. Depretis, who had succeeded Cairoli in December 1878, fell in July 1879, after a vote in which Cairoli and Nicotera joined the Conservative opposition. On 12th July Cairoli formed a new administration, only to resign on 24th November, and to reconstruct his cabinet with the help of Depretis. The administration of finance was as chaotic as the condition of parliament. The £2,400,000 surplus announced by Seismit Doda proved to be a myth. Nevertheless Magliani, who succeeded Seismit Doda, had neither the perspicacity nor the courage to resist the abolition of the grist tax. The first vote of the Chamber for the immediate diminution of the tax, and for its total abolition on 1st January 1883, had been opposed by the Senate. A second bill was passed by the Chamber on 18th July 1879, providing for the immediate repeal of the grist tax on minor cereals, and for its total abolition on 1st January 1884. While approving the repeal in regard to minor cereals, the Senate (24th January 1880) again rejected the repeal of the tax on grinding wheat as prejudicial to national finance. After the general election of 1880, however, the Ministerialists, aided by a number of factious Conservatives, passed a third bill repealing the grist tax on wheat (10th July 1880), the repeal to take effect from the 1st of January 1884 onwards. The Senate, in which the partisans of the ministry had been increased by numerous appointments *ad hoc*, finally set the seal of its approval upon the measure. Notwithstanding this prospective loss of revenue, parliament showed great reluctance to vote any new impost, although hardly a year previously it had sanctioned (30th June 1879) Depretis's scheme for spending during the next eighteen years £43,200,000 in building 5000 kilometres of railway, an expenditure not wholly justified by the importance of the lines, and useful principally as a source of electoral sops for the constituents of ministerial deputies. The unsatisfactory financial condition of the Florence, Rome and Naples municipalities necessitated state help, but the Chamber nevertheless proceeded with a light heart (23rd February 1881) to sanction the issue of a foreign loan for £26,000,000, with a view to the abolition of the forced currency, thus adding to the burdens of the exchequer a load which three years later again dragged Italy into the gulf of chronic deficit.

Tunisia.

In no modern country is error or incompetence on the part of administrators more swiftly followed by retribution than in Italy; both at home and abroad she is hemmed in by political and economic conditions which leave little margin for folly, and still less for "mental and moral insufficiency," such as had been displayed by the Left. Nemesis came in the spring of 1881, in the form of the French invasion of Tunisia. Guiccioli, the biographer of Sella, observes that Italian politicians find it especially hard to resist "the temptation of appearing crafty." The men of the Left believed themselves subtle enough to retain the confidence and esteem of all foreign powers while coquetting at home with elements which some of these powers had reason to regard with suspicion. Italy, in constant danger from France, needed good relations with Austria and Germany, but could only attain the goodwill of the former by firm treatment of the revolutionary Irredentist agitation, and of the latter by clear demonstration of Italian will and ability to cope with all anti-monarchical forces. Depretis and Cairoli did neither the one nor the other. Hence, when opportunity offered firmly to establish Italian predominance in the central Mediterranean by an occupation of Tunisia, they found themselves deprived of those confidential relations with the central powers, and even with Great Britain, which might have enabled them to use the opportunity to full advantage. The conduct of Italy in declining the suggestions received from Count Andrássy and General Ignatiev on the eve of the Russo-Turkish War—that Italy should seek compensation in Tunisia for the extension of Austrian sway in the Balkans—and in subsequently rejecting the German suggestion to come to an arrangement with Great Britain for the occupation of Tunisia as compensation for the British occupation of Cyprus, was certainly due to fear lest an attempt on Tunisia should lead to a war with France, for which Italy knew herself to be totally unprepared. This very unpreparedness, however, rendered still less excusable her treatment of the Irredentist agitation, which brought her within a hair's-breadth of a conflict with Austria. Although Cairoli, upon learning of the Anglo-Ottoman convention in regard to Cyprus, had advised Count Corti of the possibility that Great Britain might seek to placate France by conniving at a French occupation of Tunisia, neither he nor Count Corti had any inkling of the verbal arrangement made between Lord Salisbury and Waddington at the instance of Bismarck, that, when convenient, France should occupy Tunisia, an agreement afterwards confirmed (with a reserve as to the eventual attitude of Italy) in despatches exchanged in July and August 1878 between the Quai d'Orsay and Downing Street. Almost up to the moment of the French occupation of Tunisia the Italian government believed that Great Britain, if only out of gratitude for the bearing of Italy in connexion with the Dulcigno demonstration in the autumn of 1880, would prevent French acquisition of the Regency. Ignorant of the assurance conveyed to France by Lord Granville that the Gladstone cabinet would respect the engagements of the Beaconsfield-Salisbury administration, Cairoli, in deference to Italian public opinion, endeavoured to neutralize the activity of the French consul Roustan by the appointment of an equally energetic Italian consul, Macciò. The rivalry between these two officials in Tunisia contributed not a little to strain Franco-Italian relations, but it is doubtful whether France would have precipitated her action had not General Menabrea, Italian ambassador in London, urged his government to purchase the Tunis-Goletta railway from the English company by which it had been constructed. A French attempt to purchase the line was upset in the English courts, and the railway was finally secured by Italy at a price more than eight times its real value. This pertinacity engendered a belief in France that Italy was about to undertake in Tunisia a more aggressive policy than necessary for the protection of her commercial interests. Roustan therefore hastened to extort from the bey concessions calculated to neutralize the advantages which Italy had hoped to secure by the possession of the Tunis-Goletta line, and at the same time the French government prepared at Toulon an expeditionary corps for the occupation of the Regency. In the spring of 1881 the Kroumir tribe was reported to have attacked a French force on the Algerian border, and on the 9th of April Roustan informed the bey of Tunis that France would chastise the assailants. The bey issued futile protests to the powers. On the 26th of April the island of Tabarca was occupied by the French, Bizerta was seized on the 2nd of May, and on the 12th of May the bey signed the treaty of Bardo accepting the French protectorate. France undertook the maintenance of order in the Regency, and assumed the representation of Tunisia in all dealings with other countries.

Italian indignation at the French *coup de main* was the deeper on account of the apparent duplicity of the government of the Republic. On the 11th of May the French foreign minister, Barthélémy Saint Hilaire, had officially assured the Italian ambassador in Paris that France "had no thought of occupying Tunisia or any part of Tunisian territory, beyond some points of the Kroumir country." This assurance, dictated by Jules Ferry to Barthélémy Saint Hilaire in the presence of the Italian ambassador, and by him telegraphed *en clair* to Rome, was considered a binding pledge that France would not materially alter the *status quo* in Tunisia. Documents subsequently published have somewhat attenuated the responsibility of Ferry and Saint Hilaire for this breach of faith, and have shown that the French forces in Tunisia acted upon secret instructions from General Farre, minister of war in the Ferry cabinet, who pursued a policy diametrically opposed to the official declarations made by the premier and the foreign minister. Even had this circumstance been known at the time, it could scarcely have mitigated the intense resentment of the whole Italian nation at an event which was considered tantamount not only to the destruction of Italian aspirations to Tunisia, but to the ruin of the interests of the numerous Italian colony and to a constant menace against the security of the Sicilian and south Italian coasts.

Had the blow thus struck at Italian influence in the Mediterranean induced politicians to sink for a while their personal differences and to unite in presenting a firm front to foreign nations, the crisis in regard to Tunisia might not have been wholly unproductive of good. Unfortunately, on this, as on other critical occasions, deputies proved themselves incapable of common effort to promote general welfare. While excitement over Tunisia was at its height, but before the situation was irretrievably compromised to the disadvantage of Italy, Cairoli had been compelled to resign by a vote of want of confidence in the Chamber. The only politician capable of dealing adequately with the situation was Sella, leader of the Right, and to him the crown appealed. The faction leaders of the Left, though divided by personal jealousies and mutually incompatible ambitions, agreed that the worst evil which could befall Italy would be the return of the Right to power, and conspired to preclude the possibility of a Sella cabinet. An attempt by Depretis to recompose the Cairoli ministry proved fruitless, and after eleven precious days had been lost, King Humbert was obliged, on the 19th of April 1881, to refuse Cairoli's resignation. The conclusion of the treaty of Bardo on the 12th of May, however, compelled Cairoli to sacrifice himself to popular indignation. Again Sella was called upon, but again the dog-in-the-manger policy of Depretis, Cairoli, Nicotera and Baccarini, in conjunction with the intolerant attitude of some extreme Conservatives, proved fatal to his endeavours. Depretis then succeeded in recomposing the Cairoli cabinet without Cairoli, Mancini being placed at the foreign office. Except in regard to an increase of the army estimates, urgently demanded by public opinion, the new ministry had practically no programme. Public opinion was further irritated against France by the massacre of some Italian workmen at Marseilles on the occasion of the return of the French expedition from Tunisia, and Depretis, in response to public feeling, found himself obliged to mobilize a part of the militia for military exercises. In this condition of home and foreign affairs occurred disorders at Rome in connexion with the transfer of the remains of Pius IX. from St Peter's to the basilica of San Lorenzo. Most of the responsibility lay with the Vatican, which had arranged the procession in the way best calculated to irritate Italian feeling, but little excuse can be offered for the failure of the Italian authorities to maintain public order. In conjunction with the occupation of Tunisia, the effect of these disorders was to exhibit Italy as a country powerless to defend its interests abroad or to keep peace at home. The scandal and the pressure of foreign Catholic opinion compelled Depretis to pursue a more energetic policy, and to publish a formal declaration of the intangibility of the Law of Guarantees.

Growth of the Triple Alliance.

Meanwhile a conviction was spreading that the only way of escape from the dangerous isolation of Italy lay in closer agreement with Austria and Germany. Depretis tardily recognized the need for such agreement, if only to remove the "coldness and invincible diffidence" which, by subsequent confession of Mancini, then characterized the attitude of the central powers; but he was opposed to any formal alliance, lest it might arouse French resentment, while the new Franco-Italian treaty was still unconcluded, and the foreign loan for the abolition of the forced currency had still to be floated. He, indeed, was not disposed to concede to public opinion anything beyond an increase of the army, a measure insistently demanded by Garibaldi and the Left. The Right likewise desired to strengthen both army and navy, but advocated cordial relations with Berlin and Vienna as a guarantee against French domineering, and as a pledge that Italy would be vouchsafed time to effect her armaments without disturbing financial equilibrium. The Right also hoped that closer accord with Germany and Austria would compel Italy to conform her home policy more nearly to the principles of order prevailing in those empires. More resolute than Right or Left was the Centre, a small group led by Sidney Sonnino, a young politician of unusual fibre, which sought in the press and in parliament to spread a conviction that the only sound basis for Italian policy would be close alliance with the central powers and a friendly understanding with Great Britain in regard to Mediterranean affairs. The principal Italian public men were divided in opinion on the subject of an alliance. Peruzzi, Lanza and Bonghi pleaded for equal friendship with all powers, and especially with France; Crispi, Minghetti, Cadorna and others, including Blanc, secretary-general to the foreign office, openly favoured a pro-Austrian policy. Austria and Germany, however, scarcely reciprocated these dispositions. The Irredentist agitation had left profound traces at Berlin as well as at Vienna, and had given rise to a distrust of Depretis which nothing had yet occurred to allay. Nor, in view of the comparative weakness of Italian armaments, could eagerness to find an ally be deemed conclusive proof of the value of Italian friendship. Count di Robilant, Italian ambassador at Vienna, warned his government not to yield too readily to pro-Austrian pressure, lest the dignity of Italy be compromised, or her desire for an alliance be granted on onerous terms. Mancini, foreign minister, who was as anxious as Depretis for the conclusion of the Franco-Italian commercial treaty, gladly followed this advice, and limited his efforts to the maintenance of correct diplomatic relations with the central powers. Except in regard to the Roman question, the advantages and disadvantages of an Italian alliance with Austria and Germany counterbalanced each other. A *rapprochement* with France and a continuance of the Irredentist movement could not fail to arouse Austro-German hostility; but, on the other hand, to draw near to the central powers would inevitably accentuate the diffidence of France. In the one hypothesis, as in the other, Italy could count upon the moral support of Great Britain, but could not make of British friendship the keystone of a Continental policy. Apart from resentment against France on account of Tunisia there remained the question of the temporal power of the pope to turn the scale in favour of Austria and Germany. Danger of foreign interference in the relations between Italy and the papacy had never been so great since the Italian occupation of Rome, as when, in the summer of 1881, the disorders during the transfer of the remains of Pius IX. had lent an unwonted ring of plausibility to the papal complaint concerning the "miserable" position of the Holy See. Bismarck at that moment had entered upon his "pilgrimage to Canossa," and was anxious to obtain from the

Vatican the support of German Catholics. What resistance could Italy have offered had the German chancellor, seconded by Austria, and assuredly supported by France, called upon Italy to revise the Law of Guarantees in conformity with Catholic exigencies, or had he taken the initiative of making papal independence the subject of an international conference? Friendship and alliance with Catholic Austria and powerful Germany could alone lay this spectre. This was the only immediate advantage Italy could hope to obtain by drawing nearer the central Powers.

The political conditions of Europe favoured the realization of Italian desires. Growing rivalry between Austria and Russia in the Balkans rendered the continuance of the "League of the Three Emperors" a practical impossibility. The Austro-German alliance of 1879 formally guaranteed the territory of the contracting parties, but Austria could not count upon effectual help from Germany in case of war, since Russian attack upon Austria would certainly have been followed by French attack upon Germany. As in 1869–1870, it therefore became a matter of the highest importance for Austria to retain full disposal of all her troops by assuring herself against Italian aggression. The tsar, Alexander III., under the impression of the assassination of his father, desired, however, the renewal of the *Dreikaiserbund*, both as a guarantee of European peace and as a conservative league against revolutionary parties. The German emperor shared this desire, but Bismarck and the Austrian emperor wished to substitute for the imperial league some more advantageous combination. Hence a tacit understanding between Bismarck and Austria that the latter should profit by Italian resentment against France to draw Italy into the orbit of the Austro-German alliance. For the moment Germany was to hold aloof lest any active initiative on her part should displease the Vatican, of whose help Bismarck stood in need.

At the beginning of August 1881 the Austrian press mooted the idea of a visit from King Humbert to the emperor Francis Joseph. Count di Robilant, anxious that Italy should not seem to beg a smile from the central Powers, advised Mancini to receive with caution the suggestions of the Austrian press. Depretis took occasion to deny, in a form scarcely courteous, the probability of the visit. Robilant's opposition to a precipitate acceptance of the Austrian hint was founded upon fear lest King Humbert at Vienna might be pressed to disavow Irredentist aspirations, and upon a desire to arrange for a visit of the emperor Francis Joseph to Rome in return for King Humbert's visit to Vienna. Seeing the hesitation of the Italian government, the Austrian and German semi-official press redoubled their efforts to bring about the visit. By the end of September the idea had gained such ground in Italy that the visit was practically settled, and on the 7th of October Mancini informed Robilant (who was then in Italy) of the fact. Though he considered such precipitation impolitic, Robilant, finding that confidential information of Italian intentions had already been conveyed to the Austrian government, sought an interview with King Humbert, and on the 17th of October started for Vienna to settle the conditions of the visit. Depretis, fearing to jeopardize the impending conclusion of the Franco-Italian commercial treaty, would have preferred the visit to take the form of an act of personal courtesy between sovereigns. The Austrian government, for its part, desired that the king should be accompanied by Depretis, though not by Mancini, lest the presence of the Italian foreign minister should lend to the occasion too marked a political character. Mancini, unable to brook exclusion, insisted, however, upon accompanying the king. King Humbert with Queen Margherita reached Vienna on the morning of the 27th of October, and stayed at the Hofburg until the 31st of October. The visit was marked by the greatest cordiality, Count Robilant's fears of inopportune pressure with regard to Irredentism proving groundless. Both in Germany and Austria the visit was construed as a preliminary to the adhesion of Italy to the Austro-German alliance. Count Hatzfeldt, on behalf of the German Foreign Office, informed the Italian ambassador in Berlin that whatever was done at Vienna would be regarded as having been done in the German capital. Nor did nascent irritation in France prevent the conclusion of the Franco-Italian commercial treaty, which was signed at Paris on the 3rd of November.

In Italy public opinion as a whole was favourable to the visit, especially as it was not considered an obstacle to the projected increase of the army and navy. Doubts, however, soon sprang up as to its effect upon the minds of Austrian statesmen, since on the 8th of November the language employed by Kállay and Count Andrássy to the Hungarian delegations on the subject of Irredentism was scarcely calculated to soothe Italian susceptibilities. But on 9th November the European situation was suddenly modified by the formation of the Gambetta cabinet, and, in view of the policy of revenge with which Gambetta was supposed to be identified, it became imperative for Bismarck to assure himself that Italy would not be enticed into a Francophil attitude by any concession Gambetta might offer. As usual when dealing with weaker nations, the German chancellor resorted to intimidation. He not only re-established the Prussian legation to the Vatican, suppressed since 1874, and omitted from the imperial message to the Reichstag (17th November 1881) all reference to King Humbert's visit to Vienna, but took occasion on the 29th of November to refer to Italy as a country tottering on the verge of revolution, and opened in the German semi-official press a campaign in favour of an international guarantee for the independence of the papacy. These manœuvres produced their effect upon Italian public opinion. In the long and important debate upon foreign policy in the Italian Chamber of Deputies (6th to 9th December) the fear was repeatedly expressed lest Bismarck should seek to purchase the support of German Catholics by raising the Roman question. Mancini, still unwilling frankly to adhere to the Austro-German alliance, found his policy of "friendship all round" impeded by Gambetta's uncompromising attitude in regard to Tunisia. Bismarck nevertheless continued his press campaign in favour of the temporal power until, reassured by Gambetta's decision to send Roustan back to Tunis to complete as minister the anti-Italian programme begun as consul, he finally instructed his organs to emphasize the common interests of Germany and Italy on the occasion of the opening of the St Gothard tunnel. But the effect of the German press campaign could not be effaced in a day. At the new year's reception of deputies King Humbert aroused enthusiasm by a significant remark that Italy intended to remain "mistress in her own house"; while Mancini addressed to Count de Launay, Italian ambassador in Berlin, a haughty despatch, repudiating the supposition that the pope might (as Bismarckian emissaries had suggested to the Vatican) obtain abroad greater spiritual liberty than in Rome, or that closer relations between Italy and Germany, such as were required by the interests and aspirations of the two countries, could be made in any way contingent upon a modification of Italian freedom of action in regard to home affairs.

The sudden fall of Gambetta (26th January 1882) having removed the fear of immediate European complications, the cabinets of Berlin and Vienna again displayed diffidence towards Italy. So great was Bismarck's distrust of Italian parliamentary instability, his doubts of Italian capacity for offensive warfare and his fear of the Francophil tendencies of Depretis, that for many weeks the Italian ambassador at Berlin was unable to obtain audience of the chancellor. But for the Tunisian question Italy might again have been drawn into the wake of France. Mancini tried to impede the organization of French rule in the Regency by refusing to recognize the treaty of Bardo, yet so careless was Bismarck of Italian susceptibilities that he instructed the German consul at Tunis to recognize French decrees. Partly under the influence of these circumstances, and partly in response to persuasion by Baron Blanc, secretary-general for foreign affairs, Mancini instructed Count di Robilant to open negotiations for an Italo-Austrian alliance—instructions which Robilant neglected until questioned by Count Kalnóky on the subject. The first exchange of ideas between the two Governments proved fruitless, since Kalnóky, somewhat Clerical-minded, was averse from guaranteeing the integrity of all Italian territory, and Mancini was equally unwilling to guarantee to Austria permanent possession of Trent and Trieste. Mancini, moreover, wished the treaty of alliance to provide for reciprocal protection of the chief interests of the contracting Powers, Italy undertaking to second Austria-Hungary in the Balkans, and Austria and Germany pledging themselves to support Italy in Mediterranean questions. Without some such proviso Italy would, in Mancini's opinion, be exposed single-handed to French resentment. At the request of Kalnóky, Mancini defined his proposal in a memorandum, but the illness of himself and Depretis, combined with an untoward discussion in the Italian press on the failure of the Austrian emperor to return in Rome King Humbert's visit to Vienna, caused negotiations to drag. The pope, it transpired, had refused to receive the emperor if he came to Rome on a visit to the Quirinal, and Francis Joseph, though anxious to return King Humbert's visit, was unable to offend the feelings of his Catholic subjects. Meanwhile (11th May 1882) the Italian parliament adopted the new Army Bill, involving a special credit of £5,100,000 for the creation of two new army corps, by which the war footing of the regular army was raised to nearly 850,000 men and the ordinary military estimates to £8,000,000 per annum. Garibaldi, who, since the French occupation of Tunis, had ardently worked for the increase of the army, had thus the satisfaction of seeing his desire realized before his death at Caprera, on the 2nd of June 1882. "In spirit a child, in character a man of classic mould," Garibaldi had remained the nation's idol, an almost legendary hero whose place none could aspire to fill. Gratitude for his achievements and sorrow for his death found expression in universal mourning wherein king and peasant equally joined. Before his death, and almost contemporaneously with the passing of the Army Bill, negotiations for the alliance were renewed. Encouraged from Berlin, Kalnóky agreed to the reciprocal territorial guarantee, but declined reciprocity in support of special interests. Mancini had therefore to be content with a declaration that the allies would act in mutually friendly intelligence. Depretis made some opposition, but finally acquiesced, and the treaty of triple alliance was signed on the 20th of May 1882, five days after the promulgation of the Franco-Italian commercial treaty in Paris. Though partial revelations have been made, the exact tenor of the treaty of triple alliance has never been divulged. It is known to have been concluded for a period of five years, to have pledged the contracting parties to join in resisting attack upon the territory of any one of them, and to have specified the military disposition to be adopted by each in case attack should come either from France, or from Russia, or from both simultaneously. The Italian General Staff is said to have undertaken, in the event of war against France, to operate with two armies on the north-western frontier against the French armée des Alpes, of which the war strength is about 250,000 men. A third Italian army would, if expedient, pass into Germany, to operate against either France or Russia. Austria undertook to guard the Adriatic on land and sea, and to help Germany by checkmating Russia on land. Germany would be sufficiently employed in carrying on war against two fronts. Kalnóky desired that both the terms of the treaty and the fact of its conclusion should remain secret, but Bismarck and Mancini hastened to hint at its existence, the former in the Reichstag on the 12th of June 1882, and the latter in the Italian semi-official press. A revival of Irredentism in connexion with the execution of an Austrian deserter named Oberdank, who after escaping into Italy endeavoured to return to Austria with explosive bombs in his possession, and the cordial references to France made by Depretis at Stradella (8th October 1882), prevented the French government from suspecting the existence of the alliance, or from ceasing to strive after a Franco-Italian understanding. Suspicion was not aroused until March 1883, when Mancini, in defending himself against strictures upon his refusal to co-operate with Great Britain in Egypt, practically revealed the existence of the treaty, thereby irritating France and destroying Depretis's secret hope of finding in the triple alliance the advantage of an Austro-German guarantee without the disadvantage of French enmity. In Italy the revelation of the treaty was hailed with satisfaction except by the Clericals, who were enraged at the blow thus struck at the restoration of the pope's temporal power, and by the Radicals, who feared both the inevitable breach with republican France and the reinforcement of Italian constitutional parties by intimacy with strong monarchical states such as Germany and Austria. These very considerations naturally combined to recommend the fact to constitutionalists, who saw in it, besides the territorial guarantee, the elimination of the danger of foreign interference in the relations between Italy and the Vatican, such as Bismarck had recently threatened and such as France was believed ready to propose.

Death of Garibaldi.

Signature of the Treaty, 1882.

Nevertheless, during its first period (1882–1887) the triple alliance failed to ensure cordiality between the contracting Powers. Mancini exerted himself in a hundred ways to soothe French resentment. He not only refused to join Great Britain in the Egyptian expedition, but agreed to suspend Italian consular jurisdiction in Tunis, and deprecated suspicion of French designs upon Morocco. His efforts were worse than futile. France remained cold, while Bismarck and Kalnóky, distrustful of the Radicalism of Depretis and Mancini, assumed towards their ally an attitude almost hostile. Possibly Germany and Austria may have been influenced by the secret treaty signed between Austria, Germany and Russia on the 21st of March 1884, and ratified during the meeting of the three emperors at Skierniewice in September of that year, by which Bismarck, in return for "honest brokerage" in the Balkans, is understood to have obtained from Austria and Russia a promise of benevolent neutrality in case Germany should be "forced" to make war upon a fourth power—France. Guaranteed thus against Russian attack, Italy became in the eyes of the central powers a negligible quantity, and was treated accordingly. Though kept in the dark as to the Skierniewice arrangement, the Italian government soon discovered from the course of events that the triple alliance had practically lost its object, European peace having been assured without Italian co-operation. Meanwhile France provided Italy with fresh cause for uneasiness by abating her hostility to Germany. Italy in consequence drew nearer to Great Britain, and at the London conference on the Egyptian financial question sided with Great Britain against Austria and Germany. At the same time negotiations took place with Great Britain for an Italian occupation of Massawa, and Mancini, dreaming of a vast Anglo-Italian enterprise against the Mahdi, expatiated in the spring of 1885 upon the glories of an Anglo-Italian alliance, an indiscretion which drew upon him a scarcely-veiled *démenti* from London. Again speaking in the Chamber, Mancini claimed for Italy the principal merit in the conclusion of the triple alliance, but declared that the alliance left Italy full liberty of action in regard to interests outside its scope, "especially as there was no possibility of obtaining protection for such interests from those who by the alliance had not undertaken to protect them." These words, which revealed the absence of any stipulation in regard to the protection of Italian interests in the Mediterranean, created lively dissatisfaction in Italy and corresponding satisfaction in France. They hastened Mancini's downfall (17th June 1885), and prepared the advent of count di Robilant, who three months later succeeded Mancini at the Italian Foreign Office. Robilant, for whom the Skierniewice pact was no secret, followed a firmly independent policy throughout the Bulgarian crisis of 1885–1886, declining to be drawn into any action beyond that required by the treaty of Berlin and the protection of Italian interests in the Balkans. Italy, indeed, came out of the Eastern crisis with enhanced prestige and with her relations to Austria greatly improved. Towards Prince Bismarck Robilant maintained an attitude of dignified independence, and as, in the spring of 1886, the moment for the renewal of the triple alliance drew near, he profited by the development of the Bulgarian crisis and the threatened Franco-Russian understanding to secure from the central powers "something more" than the bare territorial guarantee of the original treaty. This "something more" consisted, at least in part, of the arrangement, with the help of Austria and Germany, of an Anglo-Italian naval understanding having special reference to the Eastern question, but providing for common action by the British and Italian fleets in the Mediterranean in case of war. A vote of the Italian Chamber on the 4th of February 1887, in connexion with the disaster to Italian troops at Dogali, in Abyssinia, brought about the resignation of the Depretis-Robilant cabinet. The crisis dragged for three months, and before its definitive solution by the formation of a Depretis-Crispi ministry, Robilant succeeded (17th March 1887) in renewing the triple alliance on terms more favourable to Italy than those obtained in 1882. Not only did he secure concessions from Austria and Germany corresponding in some degree to the improved state of the Italian army and navy, but, in virtue of the Anglo-Italian understanding, assured the practical adhesion of Great Britain to the European policy of the central powers, a triumph probably greater than any registered by Italian diplomacy since the completion of national unity.

First renewal of the Triple Alliance.

Internal reforms.

The period between May 1881 and July 1887 occupied, in the region of foreign affairs, by the negotiation, conclusion and renewal of the triple alliance, by the Bulgarian crisis and by the dawn of an Italian colonial policy, was marked at home by urgent political and economic problems, and by the parliamentary phenomena known as *trasformismo*. On the 29th of June 1881 the Chamber adopted a Franchise Reform Bill, which increased the electorate from 600,000 to 2,000,000 by lowering the fiscal qualification from 40 to 19·80 lire in direct taxation, and by extending the suffrage to all persons who had passed through the two lower standards of the elementary schools, and practically to all persons able to read and write. The immediate result of the reform was to increase the political influence of large cities where the proportion of illiterate workmen was lower than in the country districts, and to exclude from the franchise numbers of peasants and small proprietors who, though of more conservative temperament and of better economic position than the artizan population of the large towns, were often unable to fulfil the scholarship qualification. On the 12th of April 1883 the forced currency was formally abolished by the resumption of treasury payments in gold with funds obtained through a loan of £14,500,000 issued in London on the 5th of May 1882. Owing to the hostility of the French market, the loan was covered with difficulty, and, though the gold premium fell and commercial exchanges were temporarily facilitated by the resumption of cash payments, it is doubtful whether these advantages made up for the burden of £640,000 additional annual interest thrown upon the exchequer. On the 6th of March 1885 parliament finally sanctioned the conventions by which state railways were farmed out to three private companies—the Mediterranean, Adriatic and Sicilian. The railways redeemed in 1875–1876 had been worked in the interval by the government at a heavy loss. A commission of inquiry reported in favour of private management. The conventions, concluded for a period of sixty years, but terminable by either party after twenty or forty years, retained for the state the possession of the lines (except the southern railway, viz. the line from Bologna to Brindisi belonging to the Società Meridionale to whom the Adriatic lines were now farmed), but sold rolling stock to the companies, arranged various schedules of state subsidy for lines projected or in course of construction, guaranteed interest on the bonds of the companies and arranged for the division of revenue between the companies, the reserve fund and the state. National control of the railways was secured by a proviso that the directors must be of Italian nationality. Depretis and his colleague Genala, minister of public works, experienced great difficulty in securing parliamentary sanction for the conventions, not so much on account of their defective character, as from the opposition of local interests anxious to extort new lines from the government. In fact, the conventions were only voted by a majority of twenty-three votes after the government had undertaken to increase the length of new state-built lines from 1500 to 2500 kilometres. Unfortunately, the calculation of probable railway revenue on which the conventions had been based proved to be enormously exaggerated. For many years the 37½% of the gross revenue (less the cost of maintaining the rolling stock, incumbent on the state) scarcely sufficed to pay the interest on debts incurred for railway construction and on the guaranteed bonds. Gradually the increase of traffic consequent upon the industrial development of Italy decreased the annual losses of the state, but the position of the government in regard to the railways still remained so unsatisfactory as to render the resumption of the whole system by the state on the expiration of the first period of twenty years in 1905 inevitable.

The railway conventions.

Finance.

Intimately bound up with the forced currency, the railway conventions and public works was the financial question in general. From 1876, when equilibrium between expenditure and revenue had first been attained, taxation yielded steady annual surpluses, which in 1881 reached the satisfactory level of £2,120,000. The gradual abolition of the grist tax on minor cereals diminished the surplus in 1882 to £236,000, and in 1883 to £110,000, while the total repeal of the grist tax on wheat, which took effect on the 1st of January 1884, coincided with the opening of a new and disastrous period of deficit. True, the repeal of the grist tax was not the only, nor possibly even the principal, cause of the deficit. The policy of "fiscal transformation" inaugurated by the Left increased revenue from indirect taxation from £17,000,000 in 1876 to more than £24,000,000 in 1887, by substituting heavy corn duties for the grist tax, and by raising the sugar and petroleum duties to unprecedented levels. But partly from lack of firm financial administration, partly through the increase of military and naval expenditure (which in 1887 amounted to £9,000,000 for the army, while special efforts were made to strengthen the navy), and principally through the constant drain of railway construction and public works, the demands upon the exchequer grew largely to exceed the normal increase of revenue, and necessitated the contraction of new debts. In their anxiety to remain in office Depretis and the finance minister, Magliani, never hesitated to mortgage the financial future of their country. No concession could be denied to deputies, or groups of deputies, whose support was indispensable to the life of the cabinet, nor, under such conditions, was it possible to place any effective check upon administrative abuses in which politicians or their electors were interested. Railways, roads and harbours which contractors had undertaken to construct for reasonable amounts were frequently made to cost thrice the original estimates. Minghetti, in a trenchant exposure of the parliamentary condition of Italy during this period, cites a case in which a credit for certain public works was, during a debate in the Chamber, increased by the government from £6,600,000 to £9,000,000 in order to conciliate local political interests. In the spring of 1887 Genala, minister of public works, was taken to task for having sanctioned expenditure of £80,000,000 on railway construction while only £40,000,000 had been included in the estimates. As most of these credits were spread over a series of years, succeeding administrations found their financial liberty of action destroyed, and were obliged to cover deficit by constant issues of consolidated stock. Thus the deficit of £940,000 for the financial year 1885–1886 rose to nearly £2,920,000 in 1887–1888, and in 1888–1889 attained the terrible level of £9,400,000.

Nevertheless, in spite of many and serious shortcomings, the long series of Depretis administrations was marked by the adoption of some useful measures. Besides the realization of the formal programme of the Left, consisting of the repeal of the grist tax, the abolition of the forced currency, the extension of the suffrage and the development of the railway system, Depretis laid the foundation for land tax re-assessment by introducing a new cadastral survey. Unfortunately, the new survey was made largely optional, so that provinces which had reason to hope for a diminution of land tax under a revised assessment hastened to complete their survey, while others, in which the average of the land tax was below a normal assessment, neglected to comply with the provisions of the scheme. An important undertaking, known as the Agricultural Inquiry, brought to light vast quantities of information valuable for future agrarian legislation. The year 1885 saw the introduction and adoption of a measure embodying the principle of employers' liability for accidents to workmen, a principle subsequently extended and more equitably defined in the spring of 1899. An effort to encourage the development of the mercantile marine was made in the same year, and a convention was concluded with the chief lines of passenger steamers to retain their fastest vessels as auxiliaries to the fleet in case of war. Sanitation and public hygiene received a potent impulse from the cholera epidemic of 1884, many of the unhealthiest quarters in Naples and other cities being demolished and rebuilt, with funds chiefly furnished by the state. The movement was strongly supported by King Humbert, whose intrepidity in visiting the most dangerous spots at Busca and Naples while the epidemic was at its height, reassuring the panic-stricken inhabitants by his presence, excited the enthusiasm of his people and the admiration of Europe.

"Trasformismo."

During the accomplishment of these and other reforms the condition of parliament underwent profound change. By degrees the administrations of the Left had ceased to rely solely upon the Liberal sections of the Chamber, and had carried their most important bills with the help of the Right. This process of transformation was not exclusively the work of Depretis, but had been initiated as early as 1873, when a portion of the Right under Minghetti had, by joining the Left, overturned the Lanza-Sella cabinet. In 1876 Minghetti himself had fallen a victim to a similar defection of Conservative deputies. The practical annihilation of the old Right in the elections of 1876 opened a new parliamentary era. Reduced in number to less than one hundred, and radically changed in spirit and composition, the Right gave way, if not to despair, at least to a despondency unsuited to an opposition party. Though on more than one occasion personal rancour against the men of the Moderate Left prevented the Right from following Sella's advice and regaining, by timely coalition with cognate parliamentary elements, a portion of its former influence, the bulk of the party, with singular inconsistency, drew nearer and nearer to the Liberal cabinets. The process was accelerated by Sella's illness and death (14th March 1884), an event which cast profound discouragement over the more thoughtful of the Conservatives and Moderate Liberals, by whom Sella had been regarded as a supreme political reserve, as a statesman whose experienced vigour and patriotic sagacity might have been trusted to lift Italy from any depth of folly or misfortune. By a strange anomaly the Radical measures brought forward by the Left diminished instead of increasing the distance between it and the Conservatives. Numerically insufficient to reject such measures, and lacking the fibre and the cohesion necessary for the pursuance of a far-sighted policy, the Right thought prudent not to employ its strength in uncompromising opposition, but rather, by supporting the government, to endeavour to modify Radical legislation in a Conservative sense. In every case the calculation proved fallacious. Radical measures were passed unmodified, and the Right was compelled sadly to accept the accomplished fact. Thus it was with the abolition of the grist tax, the reform of the suffrage, the railway conventions and many other bills. When, in course of time, the extended suffrage increased the Republican and Extreme Radical elements in the Chamber, and the Liberal "Pentarchy" (composed of Crispi, Cairoli, Nicotera, Zanardelli and Baccarini) assumed an attitude of bitter hostility to Depretis, the Right, obeying the impulse of Minghetti, rallied openly to Depretis, lending him aid without which his prolonged term of office would have been impossible. The result was parliamentary chaos, baptized *trasformismo*. In May 1883 this process received official recognition by the elimination of the Radicals Zanardelli and Baccarini from the Depretis cabinet, while in the course of 1884 a Conservative, Signor Biancheri, was elected to the presidency of the Chamber, and another Conservative, General Ricotti, appointed to the War Office. Though Depretis, at the end of his life in 1887, showed signs of repenting of the confusion thus created, he had established a parliamentary system destined largely to sterilize and vitiate the political life of Italy.

Colonial policy.

Contemporaneously with the vicissitudes of home and foreign policy under the Left there grew up in Italy a marked tendency towards colonial enterprise. The tendency itself dated from 1869, when a congress of the Italian chambers of commerce at Genoa had urged the Lanza cabinet to establish a commercial depôt on the Red Sea. On the 11th of March 1870 an Italian shipper, Signor Rubattino, had bought the bay of Assab, with the neighbouring island of Darmakieh, from Beheran, sultan of Raheita, for £1880, the funds being furnished by the government. The Egyptian government being unwilling to recognize the sovereignty of Beheran over Assab or his right to sell territory to a foreign power, Visconti-Venosta thought it opportune not then to occupy Assab. No further step was taken until, at the end of 1879, Rubattino prepared to establish a commercial station at Assab. The British government made inquiry as to his intentions, and on the 19th of April 1880 received a formal undertaking from Cairoli that Assab would never be fortified nor be made a military establishment. Meanwhile (January 1880) stores and materials were landed, and Assab was permanently occupied. Eighteen months later a party of Italian sailors and explorers under Lieutenant Biglieri and Signor Giulietti were massacred in Egyptian territory. Egypt, however, refused to make thorough inquiry into the massacre, and was only prevented from occupying Raheita and coming into conflict with Italy by the good offices of Lord Granville, who dissuaded the Egyptian government from enforcing its sovereignty. On the 20th of September 1881 Beheran formally accepted Italian protection, and in the following February an Anglo-Italian convention established the Italian title to Assab on condition that Italy should formally recognise the suzerainty of the Porte and of the khedive over the Red Sea coast, and should prevent the transport of arms and munitions of war through the territory of Assab. This convention was never recognized by the Porte nor by the Egyptian government. A month later (10th March 1882) Rubattino made over his establishment to the Italian government, and on the 12th of June the Chamber adopted a bill constituting Assab an Italian crown colony.

The Egyptian Question.

Within four weeks of the adoption of this bill the bombardment of Alexandria by the British fleet (11th July 1882) opened an era destined profoundly to affect the colonial position of Italy. The revolt of Arabi Pasha (September 1881) had led to the meeting of an ambassadorial conference at Constantinople, promoted by Mancini, Italian minister for foreign affairs, in the hope of preventing European intervention in Egypt and the permanent establishment of an Anglo-French condominium to the detriment of Italian influence. At the opening of the conference (23rd June 1882) Italy secured the signature of a self-denying protocol whereby all the great powers undertook to avoid isolated action; but the rapid development of the crisis in Egypt, and the refusal of France to co-operate with Great Britain in the restoration of order, necessitated vigorous action by the latter alone. In view of the French refusal, Lord Granville on the 27th of July invited Italy to join in restoring order in Egypt; but Mancini and Depretis, in spite of the efforts of Crispi, then in London, declined the offer. Financial considerations, lack of proper transports for an expeditionary corps, fear of displeasing France, dislike of a "policy of adventure," misplaced deference towards the ambassadorial conference in Constantinople, and unwillingness to thwart the current of Italian sentiment in favour of the Egyptian "nationalists," were the chief motives of the Italian refusal, which had the effect of somewhat estranging Great Britain and Italy. Anglo-Italian relations, however, regained their normal cordiality two years later, and found expression in the support lent by Italy to the British proposal at the London conference on the Egyptian question (July 1884). About the same time Mancini was informed by the Italian agent in Cairo that Great Britain would be well disposed towards an extension of Italian influence on the Red Sea coast. Having sounded Lord Granville, Mancini received encouragement to seize Beilul and Massawa, in view of the projected restriction of the Egyptian zone of military occupation consequent on the Mahdist rising in the Sudan. Lord Granville further inquired whether Italy would co-operate in pacifying the Sudan, and received an affirmative reply. Italian action was hastened by news that, in December 1884, an exploring party under Signor Bianchi, royal commissioner for Assab, had been massacred in the Aussa (Danakil) country, an event which aroused in Italy a desire to punish the assassins and to obtain satisfaction for the still unpunished massacre of Signor Giulietti and his companions. Partly to satisfy public opinion, partly in order to profit by the favourable disposition of the British government, and partly in the hope of remedying the error committed in 1882 by refusal to co-operate with Great Britain in Egypt, the Italian government in January 1885 despatched an expedition under Admiral Caimi and Colonel Saletta to occupy Massawa and Beilul. The occupation, effected on the 5th of February, was accelerated by fear lest Italy might be forestalled by France or Russia, both of which powers were suspected of desiring to establish themselves firmly on the Red Sea and to exercise a protectorate over Abyssinia. News of the occupation reached Europe simultaneously with the tidings of the fall of Khartum, an event which disappointed Italian hopes of military co-operation with Great Britain in the Sudan. The resignation of the Gladstone-Granville cabinet further precluded the projected Italian occupation of Suakin, and the Italians, wisely refraining from an independent attempt to succour Kassala, then besieged by the Mahdists, bent their efforts to the increase of their zone of occupation around Massawa. The extension of the Italian zone excited the suspicions of John, negus of Abyssinia, whose apprehensions were assiduously fomented by Alula, ras of Tigré, and by French and Greek adventurers. Measures, apparently successful, were taken to reassure the negus, but shortly afterwards protection inopportunely accorded by Italy to enemies of Ras Alula, induced the Abyssinians to enter upon hostilities. In January 1886 Ras Alula raided the village of Wa, to the west of Zula, but towards the end of the year (23rd November) Wa was occupied by the irregular troops of General Gené, who had superseded Colonel Saletta at Massawa. Angered by this step, Ras Alula took prisoners the members of an Italian exploring party commanded by Count Salimbeni, and held them as hostages for the evacuation of Wa. General Gené nevertheless reinforced Wa and pushed forward a detachment to Saati. On the 25th of January 1887 Ras Alula attacked Saati, but was repulsed with loss. On the following day, however, the Abyssinians succeeded in surprising, near the village of Dogali, an Italian force of 524 officers and men under Colonel De Cristoforis, who were convoying provisions to the garrison of Saati. The Abyssinians, 20,000 strong, speedily overwhelmed the small Italian force, which, after exhausting its ammunition, was destroyed where it stood. One man only escaped. Four hundred and seven men and twenty-three officers were killed outright, and one officer and eighty-one men wounded. Dead and wounded alike were horribly mutilated by order of Alula. Fearing a new attack, General Gené withdrew his forces from Saati, Wa and Arafali; but the losses of the Abyssinians at Saati and Dogali had been so heavy as to dissuade Alula from further hostilities.

Disaster of Dogali.

Abyssinia.

In Italy the disaster of Dogali produced consternation, and caused the fall of the Depretis-Robilant cabinet. The Chamber, eager for revenge, voted a credit of £200,000, and sanctioned the despatch of reinforcements. Meanwhile Signor Crispi, who, though averse from colonial adventure, desired to vindicate Italian honour, entered the Depretis cabinet as minister of the interior, and obtained from parliament a new credit of £800,000. In November 1887 a strong expedition under General di San Marzano raised the strength of the Massawa garrison to nearly 20,000 men. The British government, desirous of preventing an Italo-Abyssinian conflict, which could but strengthen the position of the Mahdists, despatched Mr (afterwards Sir) Gerald Portal from Massawa on the 29th of October to mediate with the negus. The mission proved fruitless. Portal returned to Massawa on the 25th of December 1887, and warned the Italians that John was preparing to attack them in the following spring with an army of 100,000 men. On the 28th of March 1888 the negus indeed descended from the Abyssinian high plateau in the direction of Saati, but finding the Italian position too strong to be carried by assault, temporized and opened negotiations for peace. His tactics failed to entice the Italians from their position, and on the 3rd of April sickness among his men compelled John to withdraw the Abyssinian army. The negus next marched against Menelek, king of Shoa, whose neutrality Italy had purchased with 5000 Remington rifles and a supply of ammunition, but found him with 80,000 men too strongly entrenched to be successfully attacked. Tidings of a new Mahdist incursion into Abyssinian territory reaching the negus induced him to postpone the settlement of his quarrel with Menelek until the dervishes had been chastised. Marching towards the Blue Nile, he joined battle with the Mahdists, but on the 10th of March 1889 was killed, in the hour of victory, near Gallabat. His death gave rise to an Abyssinian war of succession between Mangashà, natural son of John, and Menelek, grandson of the Negus Sella-Sellassié. Menelek, by means of Count Antonelli, resident in the Shoa country, requested Italy to execute a diversion in his favour by occupying Asmarà and other points on the high plateau. Antonelli profited by the situation to obtain Menelek's signature to a treaty fixing the frontiers of the Italian colony and defining Italo-Abyssinian relations. The treaty, signed at Ucciali on the 2nd of May 1899, arranged for regular intercourse between Italy and Abyssinia and conceded to Italy a portion of the high plateau, with the positions of Halai, Saganeiti and Asmarà. The main point of the treaty, however, lay in clause 17:—

Treaty of Ucciali.

> "His Majesty the king of kings of Ethiopia *consents* to make use of the government of His Majesty the king of Italy for the treatment of all questions concerning other powers and governments."

Upon this clause Italy founded her claim to a protectorate over Abyssinia. In September 1889 the treaty of Ucciali was ratified in Italy by Menelek's lieutenant, the Ras Makonnen. Makonnen further concluded with the Italian premier, Crispi, a convention whereby Italy recognized Menelek as emperor of Ethiopia, Menelek recognized the Italian colony, and arranged for a special Italo-Abyssinian currency and for a loan. On the 11th of October Italy communicated article 17 of the treaty of Ucciali to the European powers, interpreting it as a valid title to an Italian protectorate over Abyssinia. Russia alone neglected to take note of the communication, and persisted in the hostile attitude she had assumed at the moment of the occupation of Massawa. Meanwhile the Italian mint coined thalers bearing the portrait of King Humbert, with an inscription referring to the Italian protectorate, and on the 1st of January 1890 a royal decree conferred upon the colony the name of "Eritrea."

Operations in Abyssinia.

In the colony itself General Baldissera, who had replaced General Saletta, delayed the movement against Mangashà desired by Menelek. The Italian general would have preferred to wait until his intervention was requested by both pretenders to the Abyssinian throne. Pressed by the home government, he, however, instructed a native ally to occupy the important positions of Keren and Asmarà, and prepared himself to take the offensive against Mangashà and Ras Alula. The latter retreated south of the river Mareb, leaving the whole of the cis-Mareb territory, including the provinces of Hamasen, Agameh, Seraè and Okulè-Kusai, in Italian hands. General Orero, successor of Baldissera, pushed offensive action more vigorously, and on the 26th of January 1890 entered Adowa, a city considerably to the south of the Mareb—an imprudent step which aroused Menelek's suspicions, and had hurriedly to be retraced. Mangashà, seeing further resistance to be useless, submitted to Menelek, who at the end of February ratified at Makallé the additional convention to the treaty of Uccialli, but refused to recognize the Italian occupation of the Mareb. The negus, however, conformed to article 17 of the treaty of Uccialli by requesting Italy to represent Abyssinia at the Brussels anti-slavery conference, an act which strengthened Italian illusions as to Menelek's readiness to submit to their protectorate. Menelek had previously notified the chief European powers of his coronation at Entotto (14th December 1889), but Germany and Great Britain replied that such notification should have been made through the Italian government. Germany, moreover, wounded Menelek's pride by employing merely the title of "highness." The negus took advantage of the incident to protest against the Italian text of article 17, and to contend that the Amharic text contained no equivalent for the word "*consent*," but merely stipulated that Abyssinia "*might*" make use of Italy in her relations with foreign powers. On the 28th of October 1890 Count Antonelli, negotiator of the treaty, was despatched to settle the controversy, but on arriving at Adis Ababa, the new residence of the negus, found agreement impossible either with regard to the frontier or the protectorate. On the 10th of April 1891, Menelek communicated to the powers his views with regard to the Italian frontier, and announced his intention of re-establishing the ancient boundaries of Ethiopia as far as Khartum to the north-west and Victoria Nyanza to the south. Meanwhile the marquis de Rudini, who had succeeded Crispi as Italian premier, had authorized the abandonment of article 17 even before he had heard of the failure of Antonelli's negotiations. Rudini was glad to leave the whole dispute in abeyance and to make with the local ras, or chieftains, of the high plateau an arrangement securing for Italy the cis-Mareb provinces of Seraè and Okulè-Kusai under the rule of an allied native chief named Bath-Agos. Rudini, however, was able to conclude two protocols with Great Britain (March and April 1891) whereby the British government definitely recognized Abyssinia as within the Italian sphere of influence in return for an Italian recognition of British rights in the Upper Nile.

First Crispi Cabinet.

Tosti and conciliation.

Terms of the "Roman Question."

The period 1887–1890 was marked in Italy by great political activity. The entry of Crispi into the Depretis cabinet as minister of the interior (4th April 1887) introduced into the government an element of vigour which had long been lacking. Though sixty-eight years of age, Crispi possessed an activity, a rapidity of decision and an energy in execution with which none of his contemporaries could vie. Within four months the death of Depretis (29th July 1887) opened for Crispi the way to the premiership. Besides assuming the presidency of the council of ministers and retaining the ministry of the interior, Crispi took over the portfolio of foreign affairs which Depretis had held since the resignation of Count di Robilant. One of the first questions with which he had to deal was that of conciliation between Italy and the Vatican. At the end of May the pope, in an allocution to the cardinals, had spoken of Italy in terms of unusual cordiality, and had expressed a wish for peace. A few days later Signor Bonghi, one of the framers of the Law of Guarantees, published in the *Nuova Antologia* a plea for reconciliation on the basis of an amendment to the Law of Guarantees and recognition by the pope of the Italian title to Rome. The chief incident of the movement towards conciliation consisted, however, in the publication of a pamphlet entitled *La Conciliazione* by Father Tosti, a close friend and confidant of the pope, extolling the advantages of peace between Vatican and Quirinal. Tosti's pamphlet was known to represent papal ideas, and Tosti himself was *persona grata* to the Italian government. Reconciliation seemed within sight when suddenly Tosti's pamphlet was placed on the Index, ostensibly on account of a phrase, "The whole of Italy entered Rome by the breach of Porta Pia; the king cannot restore Rome to the pope, since Rome belongs to the Italian people." On the 4th of June 1887 the official Vatican organ, the *Osservatore Romano*, published a letter written by Tosti to the pope conditionally retracting the views expressed in the pamphlet. The letter had been written at the pope's request, on the understanding that it should not be published. On the 15th of June the pope addressed to Cardinal Rampolla del Tindaro, secretary of state, a letter reiterating in uncompromising terms the papal claim to the temporal power, and at the end of July Cardinal Rampolla reformulated the same claim in a circular to the papal nuncios abroad. The dream of conciliation was at an end, but the Tosti incident had served once more to illustrate the true position of the Vatican in regard to Italy. It became clear that neither the influence of the regular clergy, of which the Society of Jesus is the most powerful embodiment, nor that of foreign clerical parties, which largely control the Peter's Pence fund, would ever permit renunciation of the papal claim to temporal power. France, and the French Catholics especially, feared lest conciliation should diminish the reliance of the Vatican upon France, and consequently French hold over the Vatican. The Vatican, for its part, felt its claim to temporal power to be too valuable a pecuniary asset and too efficacious an instrument of church discipline lightly to be thrown away. The legend of an "imprisoned pope," subject to every whim of his gaolers, had never failed to arouse the pity and loosen the purse-strings of the faithful; dangerous innovators and would-be reformers within the church could be compelled to bow before the symbol of the temporal power, and their spirit of submission tested by their readiness to forgo the realization of their aims until the head of the church should be restored to his rightful domain. More important than all was the interest of the Roman curia, composed almost exclusively of Italians, to retain in its own hands the choice of the pontiff and to maintain the predominance of the Italian element and the Italian spirit in the ecclesiastical hierarchy. Conciliation with Italy would expose the pope and his Italian *entourage* to suspicion of being unduly subject to Italian political influence—of being, in a word, more Italian than Catholic. Such a suspicion would inevitably lead to a movement in favour of the internationalization of the curia and of the papacy. In order to avoid this danger it was therefore necessary to refuse all compromise, and, by perpetual reiteration of a claim incompatible with Italian territorial unity, to prove to the church at large that the pope and the curia were more Catholic than Italian. Such rigidity of principle need not be extended to the affairs of everyday contact between the Vatican and the Italian authorities, with regard to which, indeed, a tacit *modus vivendi* was easily attainable. Italy, for her part, could not go back upon the achievements of the Risorgimento by restoring Rome or any portion of Italian territory to the pope. She had hoped by conciliation to arrive at an understanding which should have ranged the church among the conservative and not among the disruptive forces of the country, but she was keenly desirous to retain the papacy as a preponderatingly Italian institution, and was ready to make whatever formal concessions might have appeared necessary to reassure foreign Catholics concerning the reality of the pope's spiritual independence. The failure of the conciliation movement left profound irritation between Vatican and Quirinal, an irritation which, on the Vatican side, found expression in vivacious protests and in threats of leaving Rome; and, on the Italian side, in the deposition of the syndic of Rome for having visited the cardinal-vicar, in the anti-clerical provisions of the new penal code, and in the inauguration (9th June 1889) of a monument to Giordano Bruno on the very site of his martyrdom.

The internal situation inherited by Crispi from Depretis was very unsatisfactory. Extravagant expenditure on railways and public works, loose administration of finance, the cost of colonial enterprise, the growing demands for the army and navy, the impending tariff war with France, and the over-speculation in building and in industrial ventures, which had absorbed all the floating capital of the country, had combined to produce a state of affairs calling for firm and radical treatment. Crispi, burdened by the premiership and by the two most important portfolios in the cabinet, was, however, unable to exercise efficient control over all departments of state. Nevertheless his administration was by no means unfruitful. Zanardelli, minister of justice, secured in June 1888 the adoption of a new penal code; state surveillance was extended to the *opere pie*, or charitable institutions; municipal franchise was reformed by granting what was practically manhood suffrage with residential qualification, provision being made for minority representation; and the central state administration was reformed by a bill fixing the number and functions of the various ministries. The management of finance was scarcely satisfactory, for though Giolitti, who had succeeded Magliani and Perazzi at the treasury, suppressed the former's illusory "pension fund," he lacked the fibre necessary to deal with the enormous deficit of nearly £10,000,000 in 1888–1889, the existence of which both Perazzi and he had recognized. The most successful feature of Crispi's term of office was his strict maintenance of order and the suppression of Radical and Irredentist agitation. So vigorous was his treatment of Irredentism that he dismissed without warning his colleague Seismit Doda, minister of finance, for having failed to protest against Irredentist speeches delivered in his presence at Udine. Firmness such as this secured for him the support of all constitutional elements, and after three years' premiership his position was infinitely stronger than at the outset. The general election of 1890 gave the cabinet an almost unwieldy majority, comprising four-fifths of the Chamber. A lengthy term of office seemed to be opening out before him when, on the 31st of January 1891, Crispi, speaking in a debate upon an unimportant bill, angrily rebuked the Right for its noisy interruptions. The rebuke infuriated the Conservative deputies, who, protesting against Crispi's words in the name of the "sacred memories" of their party, precipitated a division and placed the cabinet in a minority. The incident, whether due to chance or guile, brought about the resignation of Crispi. A few days later he was succeeded in the premiership by the marquis di Rudini, leader of the Right, who formed a coalition cabinet with Nicotera and a part of the Left.

Rudini.

The sudden fall of Crispi wrought a great change in the character of Italian relations with foreign powers. His policy had been characterized by extreme cordiality towards Austria and Germany, by a close understanding with Great Britain in regard to Mediterranean questions, and by an apparent animosity towards France, which at one moment seemed likely to lead to war. Shortly before the fall of the Depretis-Robilant cabinet Count Robilant had announced the intention of Italy to denounce the commercial treaties with France and Austria, which would lapse on the 31st of December 1887, and had intimated his readiness to negotiate new treaties. On the 24th of June 1887, in view of a possible rupture of commercial relations with France, the Depretis-Crispi cabinet introduced a new general tariff. The probability of the conclusion of a new Franco-Italian treaty was small, both on account of the protectionist spirit of France and of French resentment at the renewal of the triple alliance, but even such slight probability vanished after a visit paid to Bismarck by Crispi (October 1887) within three months of his appointment to the premiership. Crispi entertained no a priori animosity towards France, but was strongly convinced that Italy must emancipate herself from the position of political dependence on her powerful neighbour which had vitiated the foreign policy of the Left. So far was he from desiring a rupture with France, that he had subordinated acceptance of the portfolio of the interior in the Depretis cabinet to an assurance that the triple alliance contained no provision for offensive warfare. But his ostentatious visit to Friedrichsruh, and a subsequent speech at Turin, in which, while professing sentiments of friendship and esteem for France, he eulogized the personality of Bismarck, aroused against him a hostility on the part of the French which he was never afterwards able to allay. France was equally careless of Italian susceptibilities, and in April 1888 Goblet made a futile but irritating attempt to enforce at Massawa the Ottoman régime of the capitulations in regard to non-Italian residents. In such circumstances the negotiations for the new commercial treaty could but fail, and though the old treaty was prolonged by special arrangement for two months, differential tariffs were put in force on both sides of the frontier on the 29th of February 1888. The value of French exports into Italy decreased immediately by one-half, while Italian exports to France decreased by nearly two-thirds. At the end of 1889 Crispi abolished the differential duties against French imports and returned to the general Italian tariff, but France declined to follow his lead and maintained her prohibitive dues. Meanwhile the enthusiastic reception accorded to the young German emperor on the occasion of his visit to Rome in October 1888, and the cordiality shown towards King Humbert and Crispi at Berlin in May 1889, increased the tension of Franco-Italian relations; nor was it until after the fall of Prince Bismarck in March 1890 that Crispi adopted towards the Republic a more friendly attitude by sending an Italian squadron to salute President Carnot at Toulon. The chief advantage derived by Italy from Crispi's foreign policy was the increase of confidence in her government on the part of her allies and of Great Britain. On the occasion of the incident raised by Goblet with regard to Massawa, Bismarck made it clear to France that, in case of complications, Italy would not stand alone; and when in February 1888 a strong French fleet appeared to menace the Italian coast, the British Mediterranean squadron demonstrated its readiness to support Italian naval dispositions. Moreover, under Crispi's hand Italy awoke from the apathy of former years and gained consciousness of her place in the world. The conflict with France, the operations in Eritrea, the vigorous interpretation of the triple alliance, the questions of Morocco and Bulgaria, were all used by him as means to stimulate national sentiment. With the instinct of a true statesman, he felt the pulse of the people, divined their need for prestige, and their preference for a government heavy-handed rather than lax. How great had been Crispi's power was seen by contrast with the policy of the Rudini cabinet which succeeded him in February 1891. Crispi's so-called "megalomania" gave place to retrenchment in home affairs and to a deferential attitude towards all foreign powers. The premiership of Rudini was hailed by the Radical leader, Cavallotti, as a pledge of the non-renewal of the triple alliance, against which the Radicals began a vociferous campaign. Their tactics, however, produced a contrary effect, for Rudini, accepting proposals from Berlin, renewed the alliance in June 1891 for a period of twelve years. None of Rudini's public utterances justify the supposition that he assumed office with the intention of allowing the alliance to lapse on its expiry in May 1892; indeed, he frankly declared it to form the basis of his foreign policy. The attitude of several of his colleagues was more equivocal, but though they coquetted with French financiers in the hope of obtaining the support of the Paris Bourse for Italian securities, the precipitate renewal of the alliance destroyed all probability of a close understanding with France. The desire of Rudini to live on the best possible terms with all powers was further evinced in the course of a visit paid to Monza by M. de Giers in October 1891, when the Russian statesman was apprised of the entirely defensive nature of Italian engagements under the triple alliance. At the same time he carried to a successful conclusion negotiations begun by Crispi for the renewal of commercial treaties with Austria and Germany upon terms which to some extent compensated Italy for the reduction of her commerce with France, and concluded with Great Britain conventions for the delimitation of British and Italian spheres of influence in north-east Africa. In home affairs his administration was weak and vacillating, nor did the economies effected in naval and military expenditure and in other departments suffice to strengthen the position of a cabinet which had disappointed the hopes of its supporters. On the 14th of April 1892 dissensions between ministers concerning the financial programme led to a cabinet crisis, and though Rudini succeeded in reconstructing his administration, he was defeated in the Chamber on the 5th of May and obliged to resign. King Humbert, who, from lack of confidence in Rudini, had declined to allow him to dissolve parliament, entrusted Signor Giolitti, a Piedmontese deputy, sometime treasury minister in the Crispi cabinet, with the formation of a ministry of

Second renewal of the Triple Alliance.

Giolitti.

the Left, which contrived to obtain six months' supply on account, and dissolved the Chamber

Bank scandals.

The ensuing general election (November 1892), marked by unprecedented violence and abuse of official pressure upon the electorate, fitly ushered in what proved to be the most unfortunate period of Italian history since the completion of national unity. The influence of Giolitti was based largely upon the favour of a court clique, and especially of Rattazzi, minister of the royal household. Early in 1893 a scandal arose in connexion with the management of state banks, and particularly of the Banca Romana, whose managing director, Tanlongo, had issued £2,500,000 of duplicate bank-notes. Giolitti scarcely improved matters by creating Tanlongo a member of the senate, and by denying in parliament the existence of any mismanagement. The senate, however, manifested the utmost hostility to Tanlongo, whom Giolitti, in consequence of an interpellation in the Chamber, was compelled to arrest. Arrests of other prominent persons followed, and on the 3rd of February the Chamber authorized the prosecution of De Zerbi, a Neapolitan deputy accused of corruption. On the 20th of February De Zerbi suddenly expired. For a time Giolitti successfully opposed inquiry into the conditions of the state banks, but on the 21st of March was compelled to sanction an official investigation by a parliamentary commission composed of seven members. On the 23rd of November the report of the commission was read to the Chamber amid intense excitement. It established that all Italian cabinets since 1880 had grossly neglected the state banks; that the two preceding cabinets had been aware of the irregularities committed by Tanlongo; that Tanlongo had heavily subsidized the press, paying as much as £20,000 for that purpose in 1888 alone; that a number of deputies, including several ex-ministers, had received from him loans of a considerable amount, which they had apparently made no effort to refund; that Giolitti had deceived the Chamber with regard to the state banks, and was open to suspicion of having, after the arrest of Tanlongo, abstracted a number of documents from the latter's papers before placing the remainder in the hands of the judicial authorities. In spite of the gravity of the charges formulated against many prominent men, the report merely "deplored" and "disapproved" of their conduct, without proposing penal proceedings. Fear of extending still farther a scandal which had already attained huge dimensions, and the desire to avoid any further shock to national credit, convinced the commissioners of the expediency of avoiding a long series of prosecutions. The report, however, sealed the fate of the Giolitti cabinet, and on the 24th of November it resigned amid general execration.

Aigues-Mortes massacre.

Apart from the lack of scruple manifested by Giolitti in the bank scandals, he exhibited incompetence in the conduct of foreign and home affairs. On the 16th and 18th of August 1893 a number of Italian workmen were massacred at Aigues-Mortes. The French authorities, under whose eyes the massacre was perpetrated, did nothing to prevent or repress it, and the mayor of Marseilles even refused to admit the wounded Italian workmen to the municipal hospital. These occurrences provoked anti-French demonstrations in many parts of Italy, and revived the chronic Italian rancour against France. The Italian foreign minister, Brin, began by demanding the punishment of the persons guilty of the massacre, but hastened to accept as satisfactory the anodyne measures adopted by the French government. Giolitti removed the prefect of Rome for not having prevented an expression of popular anger, and presented formal excuses to the French consul at Messina for a demonstration against that consulate. In the following December the French tribunal at Angoulême acquitted all the authors of the massacre. At home Giolitti displayed the same weakness. Riots at Naples in August 1893 and symptoms of unrest in Sicily found him, as usual, unprepared and vacillating. The closing of the French market to Sicilian produce, the devastation wrought by the phylloxera and the decrease of the sulphur trade had combined to produce in Sicily a discontent of which Socialist agitators took advantage to organize the workmen of the towns and the peasants of the country into groups known as *fasci*. The movement had no well-defined object. Here and there it was based upon a bastard Socialism, in other places it was made a means of municipal party warfare under the guidance of the local mafia, and in some districts it was simply popular effervescence against the local octrois on bread and flour. As early as January 1893 a conflict had occurred between the police and the populace, in which several men, women and children were killed, an occurrence used by the agitators further to inflame the populace. Instead of maintaining a firm policy, Giolitti allowed the movement to spread until, towards the autumn of 1893, he became alarmed and drafted troops into the island, though in numbers insufficient to restore order. At the moment of his fall the movement assumed the aspect of an insurrection, and during the interval between his resignation (24th November) and the formation of a new Crispi cabinet (10th December) conflicts between the public forces and the rioters were frequent. The return of Crispi to power—a return imposed by public opinion as that of the only man capable of dealing with the desperate situation—marked the turning-point of the crisis. Intimately acquainted with the conditions of his native island, Crispi adopted efficacious remedies. The *fasci* were suppressed, Sicily was filled with troops, the reserves were called out, a state of siege proclaimed, military courts instituted and the whole movement crushed in a few weeks. The chief agitators were either sentenced to heavy terms of imprisonment or were compelled to flee the country. A simultaneous insurrection at Massa-Carrara was crushed with similar vigour. Crispi's methods aroused great outcry in the Radical press, but the severe sentences of the military courts were in time tempered by the Royal prerogative of amnesty.

Insurrection in Sicily.

Financial crisis.

But it was not alone in regard to public order that heroic measures were necessary. The financial situation inspired serious misgivings. While engagements contracted by Depretis in regard to public works had more than neutralized the normal increase of revenue from taxation, the whole credit of the state had been affected by the severe economic and financial crises of the years 1889–1893. The state banks, already hampered by maladministration, were encumbered by huge quantities of real estate which had been taken over as compensation for unredeemed mortgages. Baron Sidney Sonnino, minister of finance in the Crispi cabinet, found a prospective deficit of £7,080,000, and in spite of economies was obliged to face an actual deficit of more than £6,000,000. Drastic measures were necessary to limit expenditure and to provide new sources of revenue. Sonnino applied, and subsequently amended, the Bank Reform Bill passed by the previous Administration (August 10, 1893) for the creation of a supreme state bank, the Bank of Italy, which was entrusted with the liquidation of the insolvent Banca Romana. The new law forbade the state banks to lend money on real estate, limited their powers of discounting bills and securities, and reduced the maximum of their paper currency. In order to diminish the gold premium, which under Giolitti had risen to 16%, forced currency was given to the existing notes of the banks of Italy, Naples and Sicily, while special state notes were issued to meet immediate currency needs. Measures were enforced to prevent Italian holders of consols from sending their coupons abroad to be paid in gold, with the result that, whereas in 1893 £3,240,000 had been paid abroad in gold for the service of the January coupons and only £680,000 in paper in Italy, the same coupon was paid a year later with only £1,360,000 abroad and £2,540,000 at home. Economies for more than £1,000,000, were immediately effected, taxes, calculated to produce £2,440,000, were proposed to be placed upon land, incomes, salt and corn, while the existing income-tax upon consols (fixed at 8% by Cambray-Digny in 1868, and raised to 13·20% by Sella in 1870) was increased to 20% irrespectively of the stockholders' nationality. These proposals met with opposition so fierce as to cause a cabinet crisis, but Sonnino who resigned office as minister of finance, returned to power as minister of the treasury, promulgated some of his proposals by royal decree, and in spite of vehement opposition secured their ratification by the Chamber. The tax upon consols, which, in conjunction with the other severe fiscal measures, was regarded abroad as a pledge that Italy intended at all costs to avoid bankruptcy, caused a rise in Italian stocks. When the Crispi cabinet fell in March 1896 Sonnino had the satisfaction of seeing revenue increased by £3,400,000, expenditure diminished by £2,800,000, the gold premium reduced from 16 to 5%, consolidated stock at 95 instead of 72, and, notwithstanding the expenditure necessitated by the Abyssinian War, financial equilibrium practically restored.

Attacks on Crispi.

While engaged in restoring order and in supporting Sonnino's courageous struggle against bankruptcy, Crispi became the object of fierce attacks from the Radicals, Socialists and anarchists. On the 16th of June an attempt by an anarchist named Lega was made on Crispi's life; on the 24th of June President Carnot was assassinated by the anarchist Caserio; and on the 30th of June an Italian journalist was murdered at Leghorn for a newspaper attack upon anarchism—a series of outrages which led the government to frame and parliament to adopt (11th July) a Public Safety Bill for the prevention of anarchist propaganda and crime. At the end of July the trial of the persons implicated in the Banca Romana scandal revealed the fact that among the documents abstracted by Giolitti from the papers of the bank manager, Tanlongo, were several bearing upon Crispi's political and private life. On the 11th of December Giolitti laid these and other papers before the Chamber, in the hope of ruining Crispi, but upon examination most of them were found to be worthless, and the rest of so private a nature as to be unfit for publication. The effect of the incident was rather to increase detestation of Giolitti than to damage Crispi. The latter, indeed, prosecuted the former for libel and for abuse of his position when premier, but after many vicissitudes, including the flight of Giolitti to Berlin in order to avoid arrest, the Chamber refused authorization for the prosecution, and the matter dropped. A fresh attempt of the same kind was then made against Crispi by the Radical leader Cavallotti, who advanced unproven charges of corruption and embezzlement. These attacks were, however, unavailing to shake Crispi's position, and in the general election of May 1895 his government obtained a majority of nearly 200 votes. Nevertheless public confidence in the efficacy of the parliamentary system and in the honesty of politicians was seriously diminished by these unsavoury occurrences, which, in combination with the acquittal of all the defendants in the Banca Romana trial, and the abandonment of the proceedings against Giolitti, reinforced to an alarming degree the propaganda of the revolutionary parties.

Complications in Eritrea.

The foreign policy of the second Crispi Administration, in which the portfolio of foreign affairs was held by Baron Blanc, was, as before, marked by a cordial interpretation of the triple alliance, and by close accord with Great Britain. In the Armenian question Italy seconded with energy the diplomacy of Austria and Germany, while the Italian fleet joined the British Mediterranean squadron in a demonstration off the Syrian coast. Graver than any foreign question were the complications in Eritrea. Under the arrangement concluded in 1891 by Rudini with native chiefs in regard to the Italo-Abyssinian frontier districts, relations with Abyssinia had remained comparatively satisfactory. Towards the Sudan, however, the Mahdists, who had recovered from a defeat inflicted by an Italian force at Agordat in 1890, resumed operations in December 1893. Colonel Arimondi, commander of the colonial forces in the absence of the military governor, General Baratieri, attacked and routed a dervish force 10,000 strong on the 21st of December. The Italian troops, mostly native levies, numbered only 2200 men. The dervish loss was more than 1000 killed, while the total Italian casualties amounted to less than 250. General Baratieri, upon returning to the colony, decided to execute a *coup de main* against the dervish base at Kassala, both in order to relieve pressure from that quarter and to preclude a combined Abyssinian and dervish attack upon the colony at the end of 1894. The protocol concluded with Great Britain on the 15th of April 1891, already referred to, contained a clause to the effect that, were Kassala occupied by the Italians, the place should be transferred to the Egyptian government as soon as the latter should be in a position to restore order in the Sudan. Concentrating a little army of 2600 men, Baratieri surprised and captured Kassala on the 17th of July 1894, and garrisoned the place with native levies under Italian officers. Meanwhile Menelek, jealous of the extension of Italian influence to a part of northern Somaliland and to the Benadir coast, had, with the support of France and Russia, completed his preparations for asserting his authority as independent ruler of Ethiopia. On the 11th of May 1893 he denounced the treaty of Uccialli, but the Giolitti cabinet, absorbed by the bank scandals, paid no heed to his action. Possibly an adroit repetition in favour of Mangashà and against Menelek of the policy formerly followed in favour of Menelek against the negus John might have consolidated Italian influence in Abyssinia by preventing the ascendancy of any single chieftain. The Italian government, however, neglected this opening, and Mangashà came to terms with Menelek. Consequently the efforts of Crispi and his envoy, Colonel Piano, to conclude a new treaty with Menelek in June 1894 not only proved unsuccessful, but formed a prelude to troubles on the Italo-Abyssinian frontier. Bath-Agos, the native chieftain who ruled the Okulé-Kusai and the cis-Mareb provinces on behalf of Italy, intrigued with Mangashà, ras of the trans-Mareb province of Tigré, and with Menelek, to raise a revolt against Italian rule on the high plateau. In December 1894 the revolt broke out, but Major Toselli with a small force marched rapidly against Bath Agos, whom he routed and killed at Halai. General Baratieri, having reason to suspect the complicity of Mangashà in the revolt, called upon him to furnish troops for a projected Italo-Abyssinian campaign against the Mahdists. Mangashà made no reply, and Baratieri crossing the Mareb advanced to Adowa, but four days later was obliged to return northwards. Mangashà thereupon took the offensive and attempted to occupy the village of Coatit in Okulé-Kusai, but was forestalled and defeated by Baratieri on the 13th of January 1895. Hurriedly retreating to Senafé, hard pressed by the Italians, who shelled Senafé on the evening of the 15th of January, Mangashà was obliged to abandon his camp and provisions to Baratieri, who also secured a quantity of correspondence establishing the complicity of Menelek and Mangashà in the revolt of Bath-Agos.

Conquest of Tigré.

The comparatively facile success achieved by Baratieri against Mangashà seems to have led him to undervalue his enemy, and to forget that Menelek, negus and king of Shoa, had an interest in allowing Mangashà to be crushed, in order that the imperial authority and the superiority of Shoan over Tigrin arms might be the more strikingly asserted. After obtaining the establishment of an apostolic prefecture in Eritrea under the charge of Italian Franciscans, Baratieri expelled from the colony the French Lazarist missionaries for their alleged complicity in the Bath-Agos insurrection, and in March 1895 undertook the conquest of Tigré. Occupying Adigrat and Makallè, he reached Adowa on the 1st of April, and thence pushed forward to Axum, the holy city of Abyssinia. These places were garrisoned, and during the rainy season Baratieri returned to Italy, where he was received with unbounded enthusiasm. Whether he or the Crispi cabinet had any inkling of the enterprise to which they were committed by the occupation of Tigré is more than doubtful. Certainly Baratieri made no adequate preparations to repel an Abyssinian attempt to reconquer the province. Early in September both Mangashà and Menelek showed signs of activity, and on the 20th of September Makonnen, ras of Harrar, who up till then had been regarded as a friend and quasi-ally by Italy, expelled all Italians from his territory and marched with 30,000 men to join the negus. On returning to Eritrea, Baratieri mobilized his native reserves and pushed forward columns under Major Toselli and General Arimondi as far south as Amba Alagi. Mangashà fell back before the Italians, who obtained several minor successes; but on the 6th of December Toselli's column, 2000 strong, which through a misunderstanding continued to hold Amba Alagi, was almost annihilated by the Abyssinian vanguard of 40,000 men. Toselli and all but three officers and 300 men fell at their posts after a desperate resistance. Arimondi, collecting the survivors of the Toselli column, retreated to Makallè and Adigrat. At Makallè, however, he left a small garrison in the fort, which on the 7th of January 1896 was invested by the Abyssinian army. Repeated attempts to capture the fort having failed, Menelek and Makonnen opened negotiations with Baratieri for its capitulation, and on the 21st of January the garrison, under Major Galliano, who had heroically defended the position, were permitted to march out with the honours of war. Meanwhile Baratieri received reinforcements from Italy, but remained undecided as to the best plan of campaign. Thus a month was lost, during which the Abyssinian army advanced to Hausen, a position slightly south of Adowa. The Italian commander attempted to treat with Menelek, but his negotiations merely enabled the Italian envoy, Major Salsa, to ascertain that the Abyssinians were nearly 100,000 strong mostly armed with rifles and well supplied with artillery. The Italians, including camp-followers, numbered less than 25,000 men, a force too small for effective action, but too large to be easily provisioned at 200 m. from its base, in a roadless, mountainous country, almost devoid of water. For a moment Baratieri thought of retreat, especially as the hope of creating a diversion from Zaila towards Harrar had failed in consequence of the British refusal to permit the landing of an Italian force without the consent of France. The defection of a number of native allies (who, however, were attacked and defeated by Colonel Stevani on the 18th of February) rendered the Italian position still more precarious; but Baratieri, unable to make up his mind, continued to manœuvre in the hope of drawing an Abyssinian attack. These futile tactics exasperated the home government, which on the 22nd of February despatched General Baldissera, with strong reinforcements, to supersede Baratieri. On the 25th of February Crispi telegraphed to Baratieri, denouncing his operations as "military phthisis," and urging him to decide upon some strategic plan. Baratieri, anxious probably to obtain some success before the arrival of Baldissera, and alarmed by the rapid diminution of his stores, which precluded further immobility, called a council of war (29th of February) and obtained the approval of the divisional commanders for a plan of attack. During the night the army advanced towards Adowa in three divisions, under Generals Dabormida, Arimondi and Albertone, each division being between 4000 and 5000 strong, and a brigade 5300 strong under General Ellena remaining in reserve. All the divisions, save that of Albertone, consisted chiefly of Italian troops. During the march Albertone's native division mistook the road, and found itself obliged to delay in the Arimondi column by retracing its steps. Marching rapidly, however, Albertone outdistanced the other columns, but, in consequence of allowing his men an hour's rest, arrived upon the scene of action when the Abyssinians, whom it had been hoped to surprise at dawn, were ready to receive the attack. Pressed by overwhelming forces, the Italians, after a violent combat, began to give way. The Dabormida division, unsupported by Albertone, found itself likewise engaged in a separate combat against superior numbers. Similarly the Arimondi brigade was attacked by 30,000 Shoans, and encumbered by the débris of Albertone's troops. Baratieri vainly attempted to push forward the reserve, but the Italians were already overwhelmed, and the battle—or rather, series of distinct engagements—ended in a general rout. The Italian loss is estimated to have been more than 6000, of whom 3125 were whites. Between 3000 and 4000 prisoners were taken by the Abyssinians, including General Albertone, while Generals Arimondi and Dabormida were killed and General Ellena wounded. The Abyssinians lost more than 5000 killed and 8000 wounded. Baratieri, after a futile attempt to direct the retreat, fled in haste and reached Adi-Cajè before the débris of his army. Thence he despatched telegrams to Italy throwing blame for the defeat upon his troops, a proceeding which subsequent evidence proved to be as unjustifiable as it was unsoldierlike. Placed under court-martial for his conduct, Baratieri was acquitted of the charge for having been led to give battle by other than military considerations, but the sentence "deplored that in such difficult circumstances the command should have been given to a general so inferior to the exigencies of the situation."

Battle of Adowa.

In Italy the news of the defeat of Adowa caused deep discouragement and dismay. On the 5th of March the Crispi cabinet resigned before an outburst of indignation which the Opposition had assiduously fomented, and five days later a new cabinet was formed by General Ricotti-Magnani, who, however, made over the premiership to the marquis di Rudini. The latter, though leader of the Right, had long been intriguing with Cavallotti, leader of the Extreme Left, to overthrow Crispi, but without the disaster of Adowa his plan would scarcely have succeeded. The first act of the new cabinet was to confirm instructions given by its predecessor to General Baldissera (who had succeeded General Baratieri on the 2nd of March) to treat for peace with Menelek if he thought desirable. Baldissera opened negotiations with the negus through Major Salsa, and simultaneously reorganized the Italian army. The negotiations having failed, he marched to relieve the beleaguered garrison of Adigrat; but Menelek, discouraged by the heavy losses at Adowa, broke up his camp and returned southwards to Shoa. At the same time Baldissera detached Colonel Stevani with four native battalions to relieve Kassala, then hard pressed by the Mahdists. Kassala was relieved on the 1st of April, and Stevani a few days later severely defeated the dervishes at Jebel Mokram and Tucruff. Returning from Kassala Colonel Stevani rejoined Baldissera, who on the 4th of May relieved Adigrat after a well-executed march. By adroit negotiations with Mangashà the Italian general obtained the release of the Italian prisoners in Tigré, and towards the end of May withdrew his whole force north of the Mareb. Major Nerazzini was then despatched as special envoy to the negus to arrange terms of peace. On the 26th of October Nerazzini succeeded in concluding, at Adis Ababa, a provisional treaty annulling the treaty of Uccialli; recognizing the absolute independence of Ethiopia; postponing for one year the definitive delimitation of the Italo-Abyssinian boundary, but allowing the Italians meanwhile to hold the strong Mareb-Belesa-Muna line; and arranging for the release of the Italian prisoners after ratification of the treaty in exchange for an indemnity of which the amount was to be fixed by the Italian government. The treaty having been duly ratified, and an indemnity of £400,000 paid to Menelek, the Shoan prisoners were released, and Major Nerazzini once more returned to Abyssinia with instructions to secure, if possible, Menelek's assent to the definitive retention of the Mareb-Belesa-Muna line by Italy. Before Nerazzini could reach Adis Ababa, Rudini, in order partially to satisfy the demands of his Radical supporters for the abandonment of the colony, announced in the Chamber the intention of Italy to limit her occupation to the triangular zone between the points Asmarà, Keren and Massawa, and, possibly, to withdraw to Massawa alone. This declaration, of which Menelek was swiftly apprised by French agents, rendered it impossible to Nerazzini to obtain more than a boundary leaving to Italy but a small portion of the high plateau and ceding to Abyssinia the fertile provinces of Seraè and Okulé-Kusai. The fall of the Rudini cabinet in June 1898, however, enabled Signor Ferdinando Martini and Captain Cicco di Cola, who had been appointed respectively civil governor of Eritrea and minister resident at Adis Ababa, to prevent the cession of Seraè and Okulé-Kusai, and to secure the assent of Menelek to Italian retention of the Mareb-Belesa-Muna frontier. Eritrea has now approximately the same extent as before the revolt of Bath-Agos, except in regard (1) to Kassala, which was transferred to the Anglo-Egyptian authorities on the 25th of December 1897, in pursuance of the above-mentioned Anglo-Italian convention; and (2) to slight rectifications of its northern and eastern boundaries by conventions concluded between the Eritrean and the

Abyssinian settlement.

Anglo-Egyptian authorities. Under Signor Ferdinando Martini's able administration (1898–1906) the cost of the colony to Italy was reduced and its trade and agriculture have vastly improved.

While marked in regard to Eritrea by vacillation and undignified readiness to yield to Radical clamour, the policy of the marquis di Rudini was in other respects chiefly characterized by a desire to demolish Crispi and his supporters. Actuated by rancour against Crispi, he, on the 29th of April 1896, authorized the publication of a Green Book on Abyssinian affairs, in which, without the consent of Great Britain, the confidential Anglo-Italian negotiations in regard to the Abyssinian war were disclosed. This publication, which amounted to a gross breach of diplomatic confidence, might have endangered the cordiality of Anglo-Italian relations, had not the esteem of the British government for General Ferrero, Italian ambassador in London, induced it to overlook the incident. Fortunately for Italy, the marquis Visconti Venosta shortly afterwards consented to assume the portfolio of foreign affairs, which had been resigned by Duke Caetani di Sermoneta, and again to place, after an interval of twenty years, his unrivalled experience at the service of his country. In September 1896 he succeeded in concluding with France a treaty with regard to Tunisia in place of the old Italo-Tunisian treaty, denounced by the French Government a year previously. During the Greco-Turkish War of 1897 Visconti Venosta laboured to maintain the European concert, joined Great Britain in preserving Greece from the worst consequences of her folly, and lent moral and material aid in establishing an autonomous government in Crete. At the same time he mitigated the Francophil tendencies of some of his colleagues, accompanied King Humbert and Queen Margherita on their visit to Homburg in September 1897, and, by loyal observance of the spirit of the triple alliance, retained for Italy the confidence of her allies without forfeiting the goodwill of France.

The home administration of the Rudini cabinet compared unfavourably with that of foreign affairs. Bound by a secret understanding with the Radical leader Cavallotti, an able but unscrupulous demagogue, Rudini was compelled to bow to Radical exigencies. He threw all the influence of the government against Crispi, who was charged with complicity in embezzlements perpetrated by Favilla, managing director of the Bologna branch of the Bank of Naples. After being subjected to persecution for nearly two years, Crispi's character was substantially vindicated by the report of a parliamentary commission appointed to inquire into his relations with Favilla. True, the commission proposed and the Chamber adopted a vote of censure upon Crispi's conduct in 1894, when, as premier and minister of the interior, he had borrowed £12,000 from Favilla to replenish the secret service fund, and had subsequently repaid the money as instalments for secret service were in due course furnished by the treasury. Though irregular, his action was to some extent justified by the depletion of the secret service fund under Giolitti and by the abnormal circumstances prevailing in 1893–1894, when he had been obliged to quell the insurrections in Sicily and Massa-Carrara. But the Rudini-Cavallotti alliance was destined to produce other results than those of the campaign against Crispi. Pressed by Cavallotti, Rudini in March 1897 dissolved the Chamber and conducted the general election in such a way as to crush by government pressure the partisans of Crispi, and greatly to strengthen the (Socialist, Republican and Radical) revolutionary parties. More than ever at the mercy of the Radicals and of their revolutionary allies, Rudini continued so to administer public affairs that subversive propaganda and associations obtained unprecedented extension. The effect was seen in May 1898, when, in consequence of a rise in the price of bread, disturbances occurred in southern Italy. The corn duty was reduced to meet the emergency, but the disturbed area extended to Naples, Foggia, Bari, Minervino-Murge, Molfetta and thence along the line of railway which skirts the Adriatic coast. At Faenza, Piacenza, Cremona, Pavia and Milan, where subversive associations were stronger, it assumed the complexion of a political revolt. From the 7th to the 9th of May Milan remained practically in the hands of the mob. A palace was sacked, barricades were erected and for forty-eight hours the troops under General Bava-Beccaris, notwithstanding the employment of artillery, were unable to restore order. In view of these occurrences, Rudini authorized the proclamation of a state of siege at Milan, Florence, Leghorn and Naples, delegating the suppression of disorder to special military commissioners. By these means order was restored, though not without considerable loss of life at Milan and elsewhere. At Milan alone the official returns confessed to eighty killed and several hundred wounded, a total generally considered below the real figures. As in 1894, excessively severe sentences were passed by the military tribunals upon revolutionary leaders and other persons considered to have been implicated in the outbreak, but successive royal amnesties obliterated these condemnations within three years.

Riots of May, 1898.

Pelloux and obstruction.

No Italian administration since the death of Depretis underwent so many metamorphoses as that of the marquis di Rudini. Modified a first time within five months of its formation (July 1896) in connexion with General Ricotti's Army Reform Bill, and again in December 1897, when Zanardelli entered the cabinet, it was reconstructed for a third time at the end of May 1898 upon the question of a Public Safety Bill, but fell for the fourth and last time on the 18th of June 1898, on account of public indignation at the results of Rudini's home policy as exemplified in the May riots. On the 29th of June Rudini was succeeded in the premiership by General Luigi Pelloux, a Savoyard, whose only title to office was the confidence of the king. The Pelloux cabinet possessed no clear programme except in regard to the Public Safety Bill, which it had taken over from its predecessor. Presented to parliament in November 1898, the bill was read a second time in the following spring, but its third reading was violently obstructed by the Socialists, Radicals and Republicans of the Extreme Left. After a series of scenes and scuffles the bill was promulgated by royal decree, the decree being postdated to allow time for the third reading. Again obstruction precluded debate, and on the 22nd of July 1899 the decree automatically acquired force of law, pending the adoption of a bill of indemnity by the Chamber. In February 1900 it was, however, quashed by the supreme court on a point of procedure, and the Public Safety Bill as a whole had again to be presented to the Chamber. In view of the violence of Extremist obstruction, an effort was made to reform the standing orders of the Lower House, but parliamentary feeling ran so high that General Pelloux thought it expedient to appeal to the country. The general election of June 1900 not only failed to reinforce the cabinet, but largely increased the strength of the extreme parties (Radicals, Republicans and Socialists), who in the new Chamber numbered nearly 100 out of a total of 508. General Pelloux therefore resigned, and on the 24th of June a moderate Liberal cabinet was formed by the aged Signor Saracco, president of the senate. Within five weeks of its formation King Humbert was shot by an anarchist assassin named Bresci while leaving an athletic festival at Monza, where his Majesty had distributed the prizes (29th July 1900). The death of the unfortunate monarch, against whom an attempt had previously been made by the anarchist Acciarito (22nd April 1897), caused an outburst of profound sorrow and indignation. Though not a great monarch, King Humbert had, by his unfailing generosity and personal courage, won the esteem and affection of his people. During the cholera epidemic at Naples and Busca in 1884, and the Ischia earthquake of 1885, he, regardless of danger, brought relief and encouragement to sufferers, and rescued many lives. More than £100,000 of his civil list was annually devoted to charitable purposes. Humbert was succeeded by his only son, Victor Emmanuel III. (b. November 11, 1869), a liberal-minded and well-educated prince, who at the time of his father's assassination was returning from a cruise in the eastern Mediterranean. The remains of King Humbert were laid to rest in the Pantheon at Rome beside those of his father, Victor Emmanuel II. (9th August). Two

Death of King Humbert.

Accession of King Victor Emmanuel III.

days later Victor Emmanuel III. swore fidelity to the constitution before the assembled Houses of Parliament and in the presence of his consort, Elena of Montenegro, whom he had married in October 1896.

Foreign affairs.

The later course of Italian foreign policy was marked by many vicissitudes. Admiral Canevaro, who had gained distinction as commander of the international forces in Crete (1896–1898), assumed the direction of foreign affairs in the first period of the Pelloux administration. His diplomacy, though energetic, lacked steadiness. Soon after taking office he completed the negotiations begun by the Rudini administration for a new commercial treaty with France (October 1898), whereby Franco-Italian commercial relations were placed upon a normal footing after a breach which had lasted for more than ten years. By the despatch of a squadron to South America he obtained satisfaction for injuries inflicted thirteen years previously upon an Italian subject by the United States of Colombia. In December 1898 he convoked a diplomatic conference in Rome to discuss secret means for the repression of anarchist propaganda and crime in view of the assassination of the empress of Austria by an Italian anarchist (Luccheni), but it is doubtful whether results of practical value were achieved. The action of the tsar of Russia in convening the Peace Conference at The Hague in May 1900 gave rise to a question as to the right of the Vatican to be officially represented, and Admiral Canevaro, supported by Great Britain and Germany, succeeded in preventing the invitation of a papal delegate. Shortly afterwards his term of office was brought to a close by the failure of an attempt to secure for Italy a coaling station at Sanmen and a sphere of influence in China; but his policy of active participation in Chinese affairs was continued in a modified form by his successor, the Marquis Visconti Venosta, who, entering the reconstructed Pelloux cabinet in May 1899, retained the portfolio of foreign affairs in the ensuing Saracco administration, and secured the despatch of an Italian expedition, 2000 strong, to aid in repressing the Chinese outbreak and in protecting Italian interests in the Far East (July 1900). With characteristic foresight, Visconti Venosta promoted an exchange of views between Italy and France in regard to the Tripolitan hinterland, which the Anglo-French convention of 1899 had placed within the French sphere of influence—a modification of the *status quo ante* considered highly detrimental to Italian aspirations in Tripoli. For this reason the Anglo-French convention had caused profound irritation in Italy, and had tended somewhat to diminish the cordiality of Anglo-Italian relations. Visconti Venosta is believed, however, to have obtained from France a formal declaration that France would not transgress the limits assigned to her influence by the convention. Similarly, in regard to Albania, Visconti Venosta exchanged notes with Austria with a view to the prevention of any misunderstanding through the conflict between Italian and Austrian interests in that part of the Adriatic coast. Upon the fall of the Saracco cabinet (9th February 1901) Visconti Venosta was succeeded at the foreign office by Signor Prinetti, a Lombard manufacturer of strong temperament, but without previous diplomatic experience. The new minister continued in most respects the policy of his predecessor. The outset of his administration was marked by Franco-Italian fêtes at Toulon (10th to 14th April 1901), when the Italian fleet returned a visit paid by the French Mediterranean squadron to Cagliari in April 1899; and by the despatch of three Italian warships to Prevesa to obtain satisfaction for damage done to Italian subjects by Turkish officials.

Zanardelli-Giolitti Cabinet.

The Saracco administration, formed after the obstructionist crisis of 1899–1900 as a cabinet of transition and pacification, was overthrown in February 1901 in consequence of its vacillating conduct towards a dock strike at Genoa. It was succeeded by a Zanardelli cabinet, in which the portfolio of the interior was allotted to Giolitti. Composed mainly of elements drawn from the Left, and dependent for a majority upon the support of the subversive groups of the Extreme Left, the formation of this cabinet gave the signal for a vast working-class movement, during which the Socialist party sought to extend its political influence by means of strikes and the organization of labour leagues among agricultural labourers and artisans. The movement was confined chiefly to the northern and central provinces. During the first six months of 1901 the strikes numbered 600, and involved more than 1,000,000 workmen. (H. W. S.)

G. 1902–1909

Labour troubles.

In 1901–1902 the social economic condition of Italy was a matter of grave concern. The strikes and other economic agitations at this time may be divided roughly into three groups: strikes in industrial centres for higher wages, shorter hours and better labour conditions generally; strikes of agricultural labourers in northern Italy for better contracts with the landlords; disturbances among the south Italian peasantry due to low wages, unemployment (particularly in Apulia), and the claims of the labourers to public land occupied illegally by the landlords, combined with local feuds and the struggle for power of the various influential families. The prime cause in most cases was the unsatisfactory economic condition of the working classes, which they realized all the more vividly for the very improvements that had been made in it, while education and better communications enabled them to organize themselves. Unfortunately these genuine grievances were taken advantage of by the Socialists for their own purposes, and strikes and disorders were sometimes promoted without cause and conciliation impeded by outsiders who acted from motives of personal ambition or profit. Moreover, while many strikes were quite orderly, the turbulent character of a part of the Italian people and their hatred of authority often converted peaceful demands for better conditions into dangerous riots, in which the dregs of the urban population (known as *teppisti* or the *mala vita*) joined.

Whereas in the past the strikes had been purely local and due to local conditions, they now appeared of more general and political character, and the "sympathy" strike came to be a frequent and undesirable addition to the ordinary economic agitation. The most serious movement at this time was that of the railway servants. The agitation had begun some fifteen years before, and the men had at various times demanded better pay and shorter hours, often with success. The next demand was for greater fixity of tenure and more regular promotion, as well as for the recognition by the companies of the railwaymen's union. On the 4th of January 1902, the employees of the Mediterranean railway advanced these demands at a meeting at Turin, and threatened to strike if they were not satisfied. By the beginning of February the agitation had spread all over Italy, and the government was faced by the possibility of a strike which would paralyse the whole economic life of the country. Then the Turin gas men struck, and a general "sympathy" strike broke out in that city in consequence, which resulted in scenes of violence lasting two days. The government called out all the railwaymen who were army reservists, but continued to keep them at their railway work, exercising military discipline over them and thus ensuring the continuance of the service. At the same time it mediated between the companies and the employees, and in June a settlement was formally concluded between the ministers of public works and of the treasury and the directors of the companies concerning the grievances of the employees.

One consequence of the agrarian agitations was the increased use of machinery and the reduction in the number of hands employed, which if it proved advantageous to the landlord and to the few labourers retained, who received higher wages, resulted in an increase of unemployment. The Socialist party, which had grown powerful under a series of weak-kneed administrations, now began to show signs of division; on the one hand there was the revolutionary wing, led by Signor Enrico Ferri, the Mantuan deputy, which advocated a policy of uncompromising class warfare, and on the other the *riformisti*, or moderate Socialists, led by Signor Filippo Turati, deputy for Milan, who adopted a more conciliatory attitude and were ready to ally themselves with other parliamentary parties. Later the division took another aspect, the extreme wing being constituted by the *sindacalisti*, who were opposed to all legislative parliamentary action and favoured only direct revolutionary propaganda by means of the *sindacati* or unions which organized strikes and demonstrations. In March 1902 agrarian strikes organized by the *leghe* broke out in the district of Copparo and Polesine (lower valley of the Po), owing to a dispute about the labour contracts, and in Apulia on account of unemployment. In August there were strikes among the dock labourers of Genoa and the iron workers of Florence; the latter agitation developed into a general strike in that city, which aroused widespread indignation among the orderly part of the population and ended without any definite result. At Como 15,000 textile workers remained on strike for nearly a month, but there were no disorders.

General strike of 1904.

The year 1903, although not free from strikes and minor disturbances, was quieter, but in September 1904 a very serious situation was brought about by a general economic and political agitation. The troubles began with the disturbances at Buggeru in Sardinia and Castelluzzo in Sicily, in both of which places the troops were compelled to use their arms and several persons were killed and wounded; at a demonstration at Sestri Ponente in Liguria to protest against what was called the Buggeru "massacre," four carabineers and eleven rioters were injured. The Monza labour exchange then took the initiative of proclaiming a general strike throughout Italy (September 15th) as a protest against the government for daring to maintain order. The strike spread to nearly all the industrial centres, although in many places it was limited to a few trades. At Milan it was more serious and lasted longer than elsewhere, as the movement was controlled by the anarchists under Arturo Labriola; the hooligans committed many acts of savage violence, especially against those workmen who refused to strike, and much property was wilfully destroyed. At Genoa, which was in the hands of the *teppisti* for a couple of days, three persons were killed and 50 wounded, including 14 policemen, and railway communications were interrupted for a short time. Venice was cut off from the mainland for two days and all the public services were suspended. Riots broke out also in Naples, Florence, Rome and Bologna. The deputies of the Extreme Left, instead of using their influence in favour of pacification, could think of nothing better than to demand an immediate convocation of parliament in order that they might present a bill forbidding the troops and police to use their arms in all conflicts between capital and labour, whatever the provocation might be. This preposterous proposal was of course not even discussed, and the movement caused a strong feeling of reaction against Socialism and of hostility to the government for its weakness; for, however much sympathy there might be with the genuine grievances of the working classes, the September strikes were of a frankly revolutionary character and had been fomented by professional agitators and kept going by the dregs of the people. The mayor of Venice sent a firm and dignified protest to the government for its inaction, and the people of Liguria raised a large subscription in favour of the troops, in recognition of their gallantry and admirable discipline during the troubles.

Unrest of 1905.

Early in 1905 there was a fresh agitation among the railway servants, who were dissatisfied with the clauses concerning the personnel in the bill for the purchase of the lines by the state. They initiated a system of obstruction which hampered and delayed the traffic without altogether suspending it. On the 17th of April a general railway strike was ordered by the union, but owing to the action of the authorities, who for once showed energy, the traffic was carried on. Other disturbances of a serious character occurred among the steelworkers of Terni, at Grammichele in Sicily and at Alessandria. The extreme parties now began to direct especial attention to propaganda in the army, with a view to destroying its cohesion and thus paralysing the action of the government. The campaign was conducted on the lines of the anti-militarist movement in France identified with the name of Hervé. Fortunately, however, this policy was not successful, as military service is less unpopular in Italy than in many other countries; aggressive militarism is quite unknown, and without it anti-militarism can gain no foothold. No serious mutinies have ever occurred in the Italian army, and the only results of the propaganda were occasional meetings of hooligans, where Hervéist sentiments were expressed and applauded, and a few minor disturbances among reservists unexpectedly called back to the colours. In the army itself the *esprit de corps* and the sense of duty and discipline nullified the work of the propagandists.

Strikes in 1907.

In June and July 1907 there were again disturbances among the agricultural labourers of Ferrara and Rovigo, and a widespread strike organized by the *leghe* throughout those provinces caused very serious losses to all concerned. The *leghisti*, moreover, were guilty of much criminal violence; they committed one murder and established a veritable reign of terror, boycotting, beating and wounding numbers of peaceful labourers who would not join the unions, and brutally maltreating solitary policemen and soldiers. The authorities, however, by arresting a number of the more prominent leaders succeeded in restoring order. Almost immediately afterwards an agitation of a still less defensible character broke out in various towns under the guise of anti-clericalism. Certain scandals had come to light in a small convent school at Greco near Milan. This was seized upon as a pretext for violent anti-clerical demonstrations all over Italy and for brutal and unprovoked attacks on unoffending priests; at Spezia a church was set on fire and another dismantled, at Marino Cardinal Merry del Val was attacked by a gang of hooligans, and at Rome the violence of the *teppisti* reached such a pitch as to provoke reaction on the part of all respectable people, and some of the aggressors were very roughly handled. The Socialists and the Freemasons were largely responsible for the agitation, and they filled the country with stories of other priestly and conventual immoralities, nearly all of which, except the original case at Greco, proved to be without foundation. In September 1907 disorders in Apulia over the repartition of communal lands broke out anew, and were particularly serious at Ruvo, Bari, Cerignola and Satriano del Colle. In some cases there was foundation for the labourers' claims, but unfortunately the movement got into the hands of professional agitators and common swindlers, and the leader, a certain Giampetruzzi, who at one time seemed to be a worthy colleague of Marcelin Albert, was afterwards tried and condemned for having cheated his own followers.

In October 1907 there was again a general strike at Milan, which was rendered more serious on account of the action of the railway servants, and extended to other cities; traffic was disorganized over a large part of northern Italy, until the government, being now owner of the railways, dismissed the ringleaders from the service. This had the desired effect, and although the *Sindacato dei ferrovieri* (railway servants' union) threatened a general railway strike if the dismissed men were not reinstated, there was no further trouble. In the spring of 1908 there were agrarian strikes at Parma; the labour contracts had pressed hardly on the peasantry, who had cause for complaint; but while some improvement had been effected in the new contracts, certain unscrupulous demagogues, of whom Alceste De Ambris, representing the "syndacalist" wing of the Socialist party, was the chief, organized a widespread agitation. The landlords on their part organized an agrarian union to defend their interests and enrolled numbers of non-union labourers to carry on the necessary work and save the crops. Conflicts occurred between the strikers and the independent labourers and the police; the trouble spread to the city of Parma, where violent scenes occurred when the labour exchange was occupied by the troops, and many soldiers and policemen, whose behaviour as usual was exemplary throughout, were seriously wounded. The agitation ceased in June with the defeat of the strikers, but not until a vast amount of damage had been done to the crops and all had suffered heavy losses, including the government, whose expenses for the maintenance of public order ran into tens of millions of lire. The failure of the strike caused the Socialists to quarrel among themselves and to accuse each other of dishonesty in the management of party funds; it appeared in fact that the large sums collected throughout Italy on behalf of the strikers had been squandered or appropriated by the "syndacalist" leaders. The spirit of indiscipline had begun to reach the lower classes of state employees, especially the school teachers and the postal and telegraph clerks, and at one time it seemed as though the country were about to face a situation similar to that which arose in France in the spring of 1909. Fortunately, however, the government, by dismissing the ringleader, Dr Campanozzi, in time nipped the agitation in the bud, and it did attempt to redress some of the genuine grievances. Public opinion upheld the government in its attitude, for all persons of common sense realized that the suspension of the public services could not be permitted for a moment in a civilized country.

Internal politics, 1902.

In parliamentary politics the most notable event in 1902 was the presentation of a divorce bill by Signor Zanardelli's government; this was done not because there was any real demand for it, but to please the doctrinaire anti-clericals and freemasons, divorce being regarded not as a social institution but as a weapon against Catholicism. But while the majority of the deputies were nominally in favour of the bill, the parliamentary committee reported against it, and public opinion was so hostile that an anti-divorce petition received 3,500,000 signatures, including not only those of professing Catholics, but of free-thinkers and Jews, who regarded divorce as unsuitable to Italian conditions. The opposition outside parliament was in fact so overwhelming that the ministry decided to drop the bill. The financial situation continued satisfactory; a new loan at 3½% was voted by the Chamber in April 1902, and by June the whole of it had been placed in Italy. In October the rate of exchange was at par, the premium on gold had disappeared, and by the end of the year the budget showed a surplus of sixteen millions.

1903–1905.

In January 1903 Signor Prinetti, the minister for foreign affairs, resigned on account of ill-health, and was succeeded by Admiral Morin, while Admiral Bettolo took the latter's place as minister of marine. The unpopularity of the ministry forced Signor Giolitti, the minister of the interior, to resign (June 1903), and he was followed by Admiral Bettolo, whose administration had been violently attacked by the Socialists; in October Signor Zanardelli, the premier, resigned on account of his health, and the king entrusted the formation of the cabinet to Signor Giolitti. The latter accepted the task, and the new administration included Signor Tittoni, late prefect of Naples, as foreign minister, Signor Luigi Luzzatti, the eminent financier, at the treasury, General Pedotti at the war office, and Admiral Mirabello as minister of marine. Almost immediately after his appointment Signor Tittoni accompanied the king and queen of Italy on a state visit to France and then to England, where various international questions were discussed, and the cordial reception which the royal pair met with in London and at Windsor served to dispel the small cloud which had arisen in the relations of the two countries on account of the Tripoli agreements and the language question in Malta. The premier's programme was not well received by the Chamber, although the treasury minister's financial statement was again satisfactory. The weakness of the government in dealing with the strike riots caused a feeling of profound dissatisfaction, and the so-called "experiment of liberty," conducted with the object of conciliating the extreme parties, proved a dismal failure. In October 1904, after the September strikes, the Chamber was dissolved, and at the general elections in November a ministerial majority was returned, while the deputies of the Extreme Left (Socialists, Republicans and Radicals) were reduced from 107 to 94, and a few mild clericals elected. The municipal elections in several of the larger cities, which had hitherto been regarded as strongholds of socialism, marked an overwhelming triumph for the constitutional parties, notably in Milan, Turin and Genoa, for the strikes had wrought as much harm to the working classes as to the bourgeoisie. In spite of its majority the Giolitti cabinet, realizing that it had lost its hold over the country, resigned in March 1905.

1905–1906.

Signor Fortis then became premier and minister of the interior, Signor Maiorano finance minister and Signor Carcano treasury minister, while Signor Tittoni, Admiral Mirabello and General Pedotti retained the portfolios they had held in the previous administration. The new government was colourless in the extreme, and the premier's programme aroused no enthusiasm in the House, the most important bill presented being that for the purchase of the railways, which was voted in June 1905. But the ministry never had any real hold over the country or parliament, and the dissatisfaction caused by the *modus vivendi* with Spain, which would have wrought much injury to the Italian wine-growers, led to demonstrations and riots, and a hostile vote in the Chamber produced a cabinet crisis (December 17, 1905); Signor Fortis, however, reconstructed the ministry, inducing the marquis di San Giuliano to accept the portfolio of foreign affairs. This last fact was significant, as the new foreign secretary, a Sicilian deputy and a specialist on international politics, had hitherto been one of Signor Sonnino's staunchest adherents; his defection, which was but one of many, showed that the more prominent members of the Sonnino party were tired of waiting in vain for their chief's access to power. Even this cabinet was still-born, and a hostile vote in the Chamber on the 30th of January 1906 brought about its fall.

1906–1909.

Now at last, after waiting so long, Signor Sonnino's hour had struck, and he became premier for the first time. This result was most satisfactory to all the best elements in the country, and great hopes were entertained that the advent of a rigid and honest statesman would usher in a new era of Italian parliamentary life. Unfortunately at the very outset of its career the composition of the new cabinet proved disappointing; for while such men as Count Guicciardini, the minister for foreign affairs, and Signor Luzzatti at the treasury commanded general approval, the choice of Signor Sacchi as minister of justice and of Signor Pantano as minister of agriculture and trade, both of them advanced and militant Radicals, savoured of an unholy compact between the premier and his erstwhile bitter enemies, which boded ill for the success of the administration. For this unfortunate combination Signor Sonnino himself was not altogether to blame; having lost many of his most faithful followers, who, weary of waiting for office, had gone over to the enemy, he had been forced to seek support among men who had professed hostility to the existing order of things and thus to secure at least the neutrality of the Extreme Left and make the public realize that the "reddest" of Socialists, Radicals and Republicans may be tamed and rendered harmless by the offer of cabinet appointments. A similar experiment had been tried in France not without success. Unfortunately in the case of Signor Sonnino public opinion expected too much and did not take to the idea of such a compromise. The new premier's first act was one which cannot be sufficiently praised: he suppressed all subsidies to journalists, and although this resulted in bitter attacks against him in the columns of the "reptile press" it commanded the approval of all right-thinking men. Signor Sonnino realized, however, that his majority was not to be counted on: "The country is with me," he said to a friend, "but the Chamber is against me." In April 1906 an eruption of Mount Etna caused the destruction of several villages and much loss of life and damage to property; in appointing a committee to distribute the relief funds the premier refused to include any of the deputies of the devastated districts among its members, and when asked by them for the reason of this omission, he replied, with a frankness more characteristic of the man than politic, that he knew they would prove more solicitous in the distribution of relief for their own electors than for the real sufferers. A motion presented by the Socialists in the Chamber for the immediate discussion of a bill to prevent "the massacres of the proletariate" having been rejected by an enormous majority, the 28 Socialist deputies resigned their seats; on presenting themselves for re-election their number was reduced to 25. A few days later the ministry, having received an adverse vote on a question of procedure, sent in its resignation (May 17).

The fall of Signor Sonnino, the disappointment caused by the non-fulfilment of the expectations to which his advent to power had given rise throughout Italy and the dearth of influential statesmen, made the return to power of Signor Giolitti inevitable. An appeal to the country might have brought about a different result, but it is said that opposition from the highest quarters rendered this course practically impossible. The change of government brought Signor Tittoni back to the foreign office; Signor Maiorano became treasury minister, General Viganò minister of war, Signor Cocco Ortu, whose chief claim to consideration was the fact of his being a Sardinian (the island had rarely been represented in the cabinet) minister of agriculture, Signor Gianturco of justice, Signor Massimini of finance, Signor Schanzer of posts and telegraphs and Signor Fusinato of education. The new ministry began auspiciously with the conversion of the public debt from 4% to 3¾%, to be eventually reduced to 3½%. This operation had been prepared by Signor Luzzatti under Signor Sonnino's leadership, and although carried out by Signor Maiorano it was Luzzatti who deservedly reaped the honour and glory; the bill was presented, discussed and voted by both Houses on the 29th of June, and by the 7th of July the conversion was completed most successfully, showing on how sound a basis Italian finance was now placed. The surplus for the year amounted to 65,000,000 lire. In November Signor Gianturco died, and Signor Pietro Bertolini took his place as minister of public works; the latter proved perhaps the ablest member of the cabinet, but the acceptance of office under Giolitti of a man who had been one of the most trusted and valuable lieutenants of Signor Sonnino marked a further step in the *dégringolade* of that statesman's party, and was attributed to the fact that Signor Bertolini resented not having had a place in the late Sonnino ministry. General Viganò was succeeded in December by Senator Casana, the first civilian to become minister of war in Italy. He made various reforms which were badly wanted in army administration, but on the whole the experiment of a civilian "War Lord" was not a complete success, and in April 1909 Senator Casana retired and was succeeded by General Spingardi, an appointment which received general approval.

The elections of March 1909 returned a chamber very slightly different from its predecessor. The ministerial majority was over three hundred, and although the Extreme Left was somewhat increased in numbers it was weakened in tone, and many of the newly elected "reds" were hardly more than pale pink.

Church and State.

Meanwhile, the relations between Church and State began to show signs of change. The chief supporters of the claims of the papacy to temporal power were the clericals of France and Austria, but in the former country they had lost all influence, and the situation between the Church and the government was becoming every day more strained. With the rebellion of her "Eldest Daughter," the Roman Church could not continue in her old attitude of uncompromising hostility towards United Italy, and the Vatican began to realize the folly of placing every Italian in the dilemma of being *either* a good Italian *or* a good Catholic, when the majority wished to be both. Outside of Rome relations between the clergy and the authorities were as a rule quite cordial, and in May 1903 Cardinal Sarto, the patriarch of Venice, asked for and obtained an audience with the king when he visited that city, and the meeting which followed was of a very friendly character. In July following Leo XIII. died, and that same Cardinal Sarto became pope under the style of Pius X. The new pontiff, although nominally upholding the claims of the temporal power, in practice attached but little importance to it. At the elections for the local bodies the Catholics had already been permitted to vote, and, availing themselves of the privilege, they gained seats in many municipal councils and obtained the majority in some. At the general parliamentary elections of 1904 a few Catholics had been elected as such, and the encyclical of the 11th of June 1905 on the political organization of the Catholics, practically abolished the *non expedit*. In September of that year a number of religious institutions in the Near East, formerly under the protectorate of the French government, in view of the rupture between Church and State in France, formally asked to be placed under Italian protection, which was granted in January 1907. The situation thus became the very reverse of what it had been in Crispi's time, when the French government, even when anti-clerical, protected the Catholic Church abroad for political purposes, whereas the conflict between Church and State in Italy extended to foreign countries, to the detriment of Italian political interests. A more difficult question was that of religious education in the public elementary schools. Signor Giolitti wished to conciliate the Vatican by facilitating religious education, which was desired by the majority of the parents, but he did not wish to offend the Freemasons and other anti-clericals too much, as they could always give trouble at awkward moments. Consequently the minister of education, Signor Rava, concocted a body of rules which, it was hoped, would satisfy every one: religious instruction was to be maintained as a necessary part of the curriculum, but in communes where the majority of the municipal councillors were opposed to it it might be suppressed; the council in that case must, however, facilitate the teaching of religion to those children whose parents desire it. In practice, however, when the council has suppressed religious instruction no such facilities are given. At the general elections of March 1909, over a score of Clerical deputies were returned, Clericals of a very mild tone who had no thought of the temporal power and were supporters of the monarchy and anti-socialists; where no Clerical candidate was in the field the Catholic voters plumped for the constitutional candidate against all representatives of the Extreme Left. On the other hand, the attitude of the Vatican towards Liberalism within the Church was one of uncompromising reaction, and under the new pope the doctrines of Christian Democracy and Modernism were condemned in no uncertain tone. Don Romolo Murri, the Christian Democratic leader, who exercised much influence over the younger and more progressive clergy, having been severely censured by the Vatican, made formal submission, and declared his intention of retiring from the struggle. But he appeared again on the scene in the general elections of 1909, as a Christian Democratic candidate; he was elected, and alone of the Catholic deputies took his seat in the Chamber on the Extreme Left, where all his neighbours were violent anti-clericals.

Earthquake of December 1908.

At 5 A.M. on the 28th of December 1908, an earthquake of appalling severity shook the whole of southern Calabria and the eastern part of Sicily, completely destroying the cities of Reggio and Messina, the smaller towns of Canitello, Scilla, Villa San Giovanni, Bagnara, Palmi, Melito, Porto Salvo and Santa Eufemia, as well as a large number of villages. In the case of Messina the horror of the situation was heightened by a tidal wave. The catastrophe was the greatest of its kind that has ever occurred in any country; the number of persons killed was approximately 150,000, while the injured were beyond calculation.

Foreign affairs.

The characteristic feature of Italy's foreign relations during this period was the weakening of the bonds of the Triple Alliance and the improved relations with France, while the traditional friendship with England remained unimpaired. Franco-Italian friendship was officially cemented by the visit of King Victor Emmanuel and Queen Elena in October 1903 to Paris where they received a very cordial welcome. The visit was returned in April 1904 when M. Loubet, the French president, came to Rome; this action was strongly resented by the pope, who, like his predecessor since 1870, objected to the presence of foreign Catholic rulers in Rome, and led to the final rupture between France and the Vatican. The Franco-Italian understanding had the effect of raising Italy's credit, and the Italian *rente*, which had been shut out of the French bourses, resumed its place there once more, a fact which contributed to increase its price and to reduce the unfavourable rate of exchange. That agreement also served to clear up the situation in Tripoli; while Italian aspirations towards Tunisia had been ended by the French occupation of that territory, Tripoli and Bengazi were now recognized as coming within the Italian "sphere of influence." The Tripoli hinterland, however, was in danger of being absorbed by other powers having large African interests; the Anglo-French declaration of the 21st of March 1899 in particular seemed likely to interfere with Italian activity.

The Triple Alliance was maintained and renewed as far as paper documents were concerned (in June 1902 it was reconfirmed for 12 years), but public opinion was no longer so favourably disposed towards it. Austria's petty persecutions of her Italian subjects in the *irredente* provinces, her active propaganda incompatible with Italian interests in the Balkans, and the anti-Italian war talk of Austrian military circles, imperilled the relations of the two "allies"; it was remarked, indeed, that the object of the alliance between Austria and Italy was to prevent war between them. Austria had persistently adopted a policy of pin-pricks and aggravating police provocation towards the Italians of the Adriatic Littoral and of the Trentino, while encouraging the Slavonic element in the former and the Germans in the latter. One of the causes of ill-feeling was the university question; the Austrian government had persistently refused to create an Italian university for its Italian subjects, fearing lest it should become a hotbed of "irredentism," the Italian-speaking students being thus obliged to attend the German-Austrian universities. An attempt at compromise resulted in the institution of an Italian law faculty at Innsbruck, but this aroused the violent hostility of the German students and populace, who gave proof of their superior civilization by an unprovoked attack on the Italians in October 1902. Further acts of violence were committed by the Germans in 1903, which led to anti-Austrian demonstrations in Italy. The worst tumults occurred in November 1904, when Italian students and professors were attacked at Innsbruck without provocation; being outnumbered by a hundred to one the Italians were forced to use their revolvers in self-defence, and several persons were wounded on both sides. Anti-Italian demonstrations occurred periodically also at Vienna, while in Dalmatia and Croatia Italian fishermen and workmen (Italian citizens, not natives) were subject to attacks by gangs of half-savage Croats, which led to frequent diplomatic "incidents." A further cause of resentment was Austria's attitude towards the Vatican, inspired by the strong clerical tendencies of the imperial family, and indeed of a large section of the Austrian people. But the most serious point at issue was the Balkan question. Italian public opinion could not view without serious misgivings the active political propaganda which Austria was conducting in Albania. The two governments frequently discussed the situation, but although they had agreed to a self-denying ordinance whereby each bound itself not to occupy any part of Albanian territory, Austria's declarations and promises were hardly borne out by the activity of her agents in the Balkans. Italy, therefore, instituted a counter-propaganda by means of schools and commercial agencies. The Macedonian troubles of 1903 again brought Austria and Italy into conflict. The acceptance by the powers of the Mürzsteg programme and the appointment of Austrian and Russian financial agents in Macedonia was an advantage for Austria and a set-back for Italy; but the latter scored a success in the appointment of General de Giorgis as commander of the international Macedonian gendarmerie; she also obtained, with the support of Great Britain, France and Russia, the assignment of the partly Albanian district of Monastir to the Italian officers of that corps.

In October 1908 came the bombshell of the Austrian annexation of Bosnia, announced to King Victor Emmanuel and to other rulers by autograph letters from the emperor-king. The news caused the most widespread sensation, and public opinion in Italy was greatly agitated at what it regarded as an act of brigandage on the part of Austria, when Signor Tittoni in a speech at Carate Brianza (October 6th) declared that "Italy might await events with serenity, and that these could find her neither unprepared nor isolated." These words were taken to mean that Italy would receive compensation to restore the balance of power upset in Austria's favour. When it was found that there was to be no direct compensation for Italy a storm of indignation was aroused against Austria, and also against Signor Tittoni.

On the 29th of October, however, Austria abandoned her military posts in the sandjak of Novibazar, and the frontier between Austria and Turkey, formerly an uncertain one, which left Austria a half-open back door to the Aegean, was now a distinct line of demarcation. Thus the danger of a "pacific penetration" of Macedonia by Austria became more remote. Austria also gave way on another point, renouncing her right to police the Montenegrin coast and to prevent Montenegro from having warships of its own (paragraphs 5, 6 and 11 of art. 29 of the Berlin Treaty) in a note presented to the Italian foreign office on the 12th of April 1909. Italy had developed some important commercial interests in Montenegro, and anything which strengthened the position of that principality was a guarantee against further Austrian encroachments. The harbour works in the Montenegrin port of Antivari, commenced in March 1905 and completed early in 1909, were an Italian concern, and Italy became a party to the agreement for the Danube-Adriatic Railway (June 2, 1908) together with Russia, France and Servia; Italy was to contribute 35,000,000 lire out of a total capital of 100,000,000, and to be represented by four directors out of twelve. But the whole episode was a warning to Italy, and the result was a national movement for security. Credits for the army and navy were voted almost without a dissentient voice; new battleships were laid down, the strength of the army was increased, and the defences of the exposed eastern border were strengthened. It was clear that so long as Austria, bribed by Germany, could act in a way so opposed to Italian interests in the Balkans, the Triple Alliance was a mockery, and Italy could only meet the situation by being prepared for all contingencies.

BIBLIOGRAPHY.—It is difficult to indicate in a short space the most important sources of general Italian history. Muratori's great collection, the *Rerum Italicarum scriptores.* in combination with his *Dissertationes*, the chronicles and other historical material published by the *Archivio Storico Italiano*, and the works of detached annalists of whom the Villani are the most notable, take first rank. Next we may mention Muratori's *Annali d' Italia*, together with Guicciardini's *Storia d' Italia* and its modern continuation by Carlo Botta. Among the more recent contributions S. de Sismondi's *Républiques italiennes* (Brussels, 1838) and Carlo Troya's *Storia d' Italia nel medio evo* are among the most valuable general works, while the large *Storia Politica d' Italia* by various authors, published at Milan, is also important—F. Bertolini, *I Barbari*; F. Lanzani, *Storia dei comuni italiani dalle origini fino al 1313* (1882); C. Cipolla, *Storia delle Signorie Italiane dal 1313 al 1530* (1881); A. Cosci, *L' Italia durante le preponderanze straniere, 1530–1789* (1875): A. Franchetti, *Storia d' Italia dal 1789 al 1799*; G. de Castro, *Storia d' Italia dal 1789 al 1814* (1881). For the beginnings of Italian history the chief works are T. Hodgkin's *Italy and her Invaders* (Oxford, 1892–1899) and P. Villari's *Le Invasioni barbariche* (Milan, 1900), both based on original research and sound scholarship. The period from 1494 to modern times is dealt with in various volumes of the *Cambridge Modern History*, especially in vol. i., "The Renaissance," which contains valuable bibliographies. Giuseppe Ferrari's *Rivoluzioni d' Italia* (1858) deserves notice as a work of singular vigour, though no great scientific importance, and Cesare Balbo's *Sommario* (Florence, 1856) presents the main outlines of the subject with brevity and clearness. For the period of the French revolution and the Napoleonic wars see F. Lemmi's *Le Origini del risorgimento italiano* (Milan, 1906); E. Bonnal de Ganges, *La Chute d'une république* [*Venise*] (Paris, 1885); D. Carutti, *Storia della corte di Savoia durante la rivoluzione e l' impero francese* (2 vols., Turin, 1892); G. de Castro, *Storia d' Italia dal 1797 al 1814* (Milan, 1881); A. Dufourcq, *Le Régime jacobin en Italie, 1796–1799* (Paris, 1900); A. Franchetti, *Storia d' Italia dal 1789 al 1799* (Milan, 1878); P. Gaffarel, *Bonaparte et les républiques italiennes (1796–1799)* (Paris, 1895); R. M. Johnston, *The Napoleonic Empire in Southern Italy* (2 vols., with full bibliography, London, 1904); E. Ramondini, *L' Italia durante la dominazione francese* (Naples, 1882); E. Ruth, *Geschichte des italienischen Volkes unter der napoleonischen Herrschaft* (Leipzig, 1859). For modern times, see Bolton King's *History of Italian Unity* (1899) and Bolton King and Thomas Okey's *Italy To-day* (1901). With regard to the history of separate provinces it may suffice to notice N. Machiavelli's *Storia fiorentina*, B. Corio's *Storia di Milano*, G. Capponi's *Storia della repubblica di Firenze* (Florence, 1875), P. Villari's *I primi due secoli della storia di Firenze* (Florence, 1905), F. Pagano's *Istoria del regno di Napoli* (Palermo-Naples, 1832, &c.), P. Romanin's *Storia documentata di Venezia* (Venice, 1853), M. Amari's *Musulmani di Sicilia* (1854–1875), F. Gregorovius's *Geschichte der Stadt Rom* (Stuttgart, 1881), A. von Reumont's *Geschichte der Stadt Rom* (Berlin, 1867), L. Cibrario's *Storia della monarchia piemontese* (Turin, 1840), and D. Carutti's

Storia della diplomazia della corte di Savoia (Rome, 1875). The *Archivii storici* and *Deputazioni di storia patria* of the various Italian towns and provinces contain a great deal of valuable material for local history. From the point of view of papal history, L. von Ranke's *History of the Popes* (English edition, London, 1870), M. Creighton's *History of the Papacy* (London, 1897) and L. Pastor's *Geschichte der Päpste* (Freiburg i. B., 1886–1896), should be mentioned. From the point of view of general culture, Jacob Burckhardt's *Cultur der Renaissance in Italien* (Basel, 1860), E. Guinet's *Révolutions d'Italie* (Paris, 1857), and J. A. Symonds's *Renaissance in Italy* (5 vols., London, 1875, &c.) should be consulted. (L. V.*)

ITEM (a Latin adverb meaning "also," "likewise"), originally used adverbially in English at the beginning of each separate head in a list of articles, or each detail in an account book or ledger or in a legal document. The word is thus applied, as a noun, to the various heads in any such enumeration and also to a piece of information or news.

ITHACA (Ἰθάκη), vulgarly Thiaki (Θιάκη), next to Paxo the smallest of the seven Ionian Islands, with an area of about 44 sq. m. It forms an eparchy of the nomos of Cephalonia in the kingdom of Greece, and its population, which was 9873 in 1870, is now about 13,000. The island consists of two mountain masses, connected by a narrow isthmus of hills, and separated by a wide inlet of the sea known as the Gulf of Molo. The northern and greater mass culminates in the heights of Anoi (2650 ft.), and the southern in Hagios Stephanos, or Mount Merovigli (2100 ft.). Vathy (Βαθύ = "deep"), the chief town and port of the island, lies at the northern foot of Mount Stephanos, its whitewashed houses stretching for about a mile round the deep bay in the Gulf of Molo, to which it owes its name. As there are only one or two small stretches of arable land in Ithaca, the inhabitants are dependent on commerce for their grain supply; and olive oil, wine and currants are the principal products obtained by the cultivation of the thin stratum of soil that covers the calcareous rocks. Goats are fed in considerable number on the brushwood pasture of the hills; and hares (in spite of Aristotle's supposed assertion of their absence) are exceptionally abundant. The island is divided into four districts: Vathy, Aeto (or Eagle's Cliff), Anoge (Anoi) or Upland, and Exoge (Exoi) or Outland.

The name has remained attached to the island from the earliest historical times with but little interruption of the tradition; though in Brompton's travels (12th century) and in the old Venetian maps we find it called Fale or Val de Compar, and at a later date it not unfrequently appears as Little Cephalonia. This last name indicates the general character of Ithacan history (if history it can be called) in modern and indeed in ancient times; for the fame of the island is almost solely due to its position in the Homeric story of Odysseus. Ithaca, according to the Homeric epos, was the royal seat and residence of King Odysseus. The island is incidentally described with no small variety of detail, picturesque and topographical; the Homeric localities for which counterparts have been sought are Mount Neritos, Mount Neion, the harbour of Phorcys, the town and palace of Odysseus, the fountain of Arethusa, the cave of the Naiads, the stalls of the swineherd Eumaeus, the orchard of Laertes, the Korax or Raven Cliff and the island Asteris, where the suitors lay in ambush for Telemachus. Among the "identificationists" there are two schools, one placing the town at Polis on the west coast in the northern half of the island (Leake, Gladstone, &c.), and the other at Aeto on the isthmus. The latter site, which was advocated by Sir William Gell (*Topography and Antiquities of Ithaca*, London, 1807), was supported by Dr H. Schliemann, who carried on excavations in 1873 and 1878 (see H. Schliemann, *Ithaque, le Péloponnèse, Troie*, Paris, 1869, also published in German; his letter to *The Times*, 26th of September, 1878; and the author's life prefixed to *Ilios*, London, 1880). But his results were mainly negative. The fact is that no amount of ingenuity can reconcile the descriptions given in the *Odyssey* with the actual topography of this island. Above all, the passage in which the position of Ithaca is described offers great difficulties. "Now Ithaca lies low, farthest up the sea line towards the darkness, but those others face the dawning and the sun." (Butcher and Lang). Such a passage fits very ill an island lying, as Ithaca does, just to the east of Cephalonia. Accordingly Professor W. Dörpfeld has suggested that the Homeric Ithaca is not the island which was called Ithaca by the later Greeks, but must be identified with Leucas (Santa Maura, *q.v.*). He succeeds in fitting the Homeric topography to this latter island, and suggests that the name may have been transferred in consequence of a migration of the inhabitants. There is no doubt that Leucas fits the Homeric descriptions much better than Ithaca; but, on the other hand, many scholars maintain that it is a mistake to treat the imaginary descriptions of a poet as if they were portions of a guide-book, or to look, in the author of the *Odyssey*, for a close familiarity with the geography of the Ionian islands.

See, besides the works already referred to, the separate works on Ithaca by Schreiber (Leipzig, 1829); Rühle von Lilienstern (Berlin, 1832); N. Karavias Grivas (Ἱστορία τῆς νήσου Ἰθάκης) (Athens, 1849); Bowen (London, 1851); and Gandar, (Paris, 1854); Hercher, in *Hermes* (1866); Leake's *Northern Greece*; Mure's *Tour in Greece*; Bursian's *Geogr. von Griechenland*; Gladstone, "The Dominions of Ulysses," in *Macmillan's Magazine* (1877). A history of the discussions will be found in Buchholz, *Die Homerischen Realien* (Leipzig, 1871); Partsch, *Kephallenia und Ithaka* (1890); W. Dörpfeld in *Mélanges Perrot*, pp. 79-93 (1903); P. Goessler, *Leukas-Ithaka* (Stuttgart, 1904). (E. Gr.)

ITHACA, a city and the county-seat of Tompkins county, New York, U.S.A., at the southern end of Cayuga Lake, 60 m. S.W. of Syracuse. Pop. (1890) 11,079, (1900) 13,136, of whom 1310 were foreign-born, (1910 census) 14,802. It is served by the Delaware, Lackawanna & Western and the Lehigh Valley railways and by interurban electric line; and steamboats ply on the lake. Most of the city is in the level valley, from which it spreads up the heights on the south, east and west. The finest residential district is East Hill, particularly Cornell and Cayuga Heights (across Fall Creek from the Cornell campus). Renwick Beach, at the head of the lake, is a pleasure resort. The neighbouring region is one of much beauty, and is frequented by summer tourists. Near the city are many waterfalls, the most notable being Taughannock Falls (9 m. N.), with a fall of 215 ft. Through the city from the east run Fall, Cascadilla and Six Mile Creeks, the first two of which have cut deep gorges and have a number of cascades and waterfalls, the largest, Ithaca Fall in Fall Creek, being 120 ft. high. Six Mile Creek crosses the south side of the city and empties into Cayuga Inlet, which crosses the western and lower districts, often inundated in the spring. The Inlet receives the waters of a number of small streams descending from the south-western hills. Among the attractions in this direction are Buttermilk Falls and ravine, on the outskirts of the city, Lick Brook Falls and glen and Enfield Falls and glen, the last 7 m. distant. Fall Creek furnishes good water-power. The city has various manufactures, including fire-arms, calendar clocks, traction engines, electrical appliances, patent chains, incubators, autophones, artesian well drills, salt, cement, window glass and wallpaper. The value of the factory product increased from $1,500,604 in 1900 to $2,080,002 in 1905, or 38·6%. Ithaca is also a farming centre and coal market, and much fruit is grown in the vicinity. The city is best known as the seat of Cornell University (*q.v.*). It has also the Ezra Cornell Free Library of about 28,000 volumes, the Ithaca Conservatory of Music, the Cascadilla School and the Ithaca High School. Ithaca was settled about 1789, the name being given to it by Simeon De Witt in 1806. It was incorporated as a village in 1821, and was chartered as a city in 1888. At Buttermilk Falls stood the principal village of the Tutelo Indians, Coreorgonel, settled in 1753 and destroyed in 1779 by a detachment of Sullivan's force.

ITINERARIUM (*i.e.* road-book, from Lat. *iter*, road), a term applied to the extant descriptions of the ancient Roman roads and routes of traffic, with the stations and distances. It is usual to distinguish two classes of these, *Itineraria adnotata* or *scripta* and *Itineraria picta*—the former having the character of a book, and the latter being a kind of travelling map. Of the Itineraria Scripta the most important are: (1) *It. Antonini* (see ANTONINI ITINERARIUM), which consists of two parts, the one dealing with roads in Europe, Asia and Africa, and the other with familiar sea-routes—the distances usually being measured from Rome; (2) *It. Hierosolymitanum* or *Burdigalense*, which belongs to the 4th century, and contains the route of a pilgrimage from Bordeaux to Jerusalem and from Heraclea by Rome to Milan (ed. G. Parthey and M. Pinder, 1848, with the *Itinerarium Antonini*); (3) *It. Alexandri*, containing a sketch of the march-route of Alexander the Great, mainly derived from Arrian and prepared for Constantius's expedition in A.D. 340–345 against the Persians (ed. D. Volkmann, 1871). A collected edition of the ancient itineraria, with ten maps, was issued by Fortia d'Urban, *Recueil des itinéraires anciens* (1845). Of the Itineraria Picta only one great example has been preserved. This is the famous *Tabula Peutingeriana*, which, without attending to the shape or relative position of the countries, represents by straight lines and dots of various sizes the roads and towns of the whole Roman world (facsimile published by K. Miller, 1888; see also Map).

ITIUS PORTUS, the name given by Caesar to the chief harbour which he used when embarking for his second expedition to Britain in 54 B.C. (*De bello Gallico*, v. 2). It was certainly near the uplands round Cape Grisnez (*Promuntorium Itium*), but the exact site has been violently disputed ever since the renaissance of learning. Many critics have assumed that Caesar used the same port for his first expedition, but the name does not appear at all in that connexion (*B. G.* iv. 21-23). This fact, coupled with other considerations, makes it probable that the two expeditions started from different places. It is generally agreed that the first embarked at Boulogne. The same view was widely held about the second, but T. Rice Holmes in an article in the *Classical Review* (May 1909) gave strong reasons for preferring Wissant, 4 m. east of Grisnez. The chief reason is that Caesar, having found he could not set sail from the small harbour of Boulogne with even 80 ships simultaneously, decided that he must take another point for the sailing of the "more than 800" ships of the second expedition. Holmes argues that, allowing for change in the foreshore since Caesar's time, 800 specially built ships could have been hauled above the highest spring-tide level, and afterwards launched simultaneously at Wissant, which would therefore have been "commodissimus" (v. 2) or opposed to "brevissimus traiectus" (iv. 21).

See T. R. Holmes in *Classical Review* (May 1909), in which he partially revises the conclusions at which he arrived in his *Ancient Britain* (1907), pp. 552-594; that the first expedition started from Boulogne is accepted, *e.g.* by H. Stuart Jones, in *English Historical Review* (1909), xxiv. 115; other authorities in Holmes's article.

ITO, HIROBUMI, Prince (1841–1909), Japanese statesman, was born in 1841, being the son of Ito Jūzō, and (like his father) began life as a retainer of the lord of Choshu, one of the most powerful nobles of Japan. Choshu, in common with many of his fellow Daimyos, was bitterly opposed to the rule of the shôgun or tycoon, and when this rule resulted in the conclusion of the treaty with Commodore M. C. Perry in 1854, the smouldering discontent broke out into open hostility against both parties to the compact. In these views Ito cordially agreed with his chieftain, and was sent on a secret mission to Yedo to report to his lord on the doings of the government. This visit had the effect of causing Ito to turn his attention seriously to the study of the British and of other military systems. As a result he persuaded Choshu to remodel his army, and to exchange the bows and arrows of his men for guns and rifles. But Ito felt that his knowledge of foreigners, if it was to be thorough, should be sought for in Europe, and with the connivance of Choshu he, in company with Inouye and three other young men of the same rank as himself, determined to risk their lives by committing the then capital offence of visiting a foreign country. With great secrecy they made their way to Nagasaki, where they concluded an arrangement with the agent of Messrs Jardine, Matheson & Co. for passages on board a vessel which was about to sail for Shanghai (1863). At that port the adventurers separated, three of their number taking ship as passengers to London, while Ito and Inouye preferred to work their passages before the mast in the "Pegasus," bound for the same destination. For a year these two friends remained in London studying English methods, but then events occurred in Japan which recalled them to their country. The treaties lately concluded by the shôgun with the foreign powers conceded the right to navigate the strait of Shimonoseki, leading to the Inland Sea. On the northern shores of this strait stretched the feudal state ruled over by Prince Choshu, who refused to recognize the clause opening the strait, and erected batteries on the shore, from which he opened fire on all ships which attempted to force the passage. The shôgun having declared himself unable in the circumstances to give effect to the provision, the treaty powers determined to take the matter into their own hands. Ito, who was better aware than his chief of the disproportion between the fighting powers of Europe and Japan, memorialized the cabinets, begging that hostilities should be suspended until he should have had time to use his influence with Choshu in the interests of peace. With this object Ito hurried back to Japan. But his efforts were futile. Choshu refused to give way, and suffered the consequences of his obstinacy in the destruction of his batteries and in the infliction of a heavy fine. The part played by Ito in these negotiations aroused the animosity of the more reactionary of his fellow-clansmen, who made repeated attempts to assassinate him. On one notable occasion he was pursued by his enemies into a tea-house, where he was concealed by a young lady beneath the floor of her room. Thus began a romantic acquaintance, which ended in the lady becoming the wife of the fugitive. Subsequently (1868) Ito was made governor of Hiogo, and in the course of the following year became vice-minister of finance. In 1871 he accompanied Iwakura on an important mission to Europe, which, though diplomatically a failure, resulted in the enlistment of the services of European authorities on military, naval and educational systems.

After his return to Japan Ito served in several cabinets as head of the bureau of engineering and mines, and in 1886 he accepted office as prime minister, a post which, when he resigned in 1901, he had held four times. In 1882 he was sent on a mission to Europe to study the various forms of constitutional government; on this occasion he attended the coronation of the tsar Alexander III. On his return to Japan he was entrusted with the arduous duty of drafting a constitution. In 1890 he reaped the fruits of his labours, and nine years later he was destined to witness the abrogation of the old treaties, and the substitution in their place of conventions which place Japan on terms of equality with the European states. In all the great reforms in the Land of the Rising Sun Ito played a leading part. It was mainly due to his active interest in military and naval affairs that he was able to meet Li Hung-chang at the end of the Chinese and Japanese War (1895) as the representative of the conquering state, and the conclusion of the Anglo-Japanese Alliance in 1902 testified to his triumphant success in raising Japan to the first rank among civilized powers. As a reward for his conspicuous services in connexion with the Chinese War Ito was made a marquis, and in 1897 he accompanied Prince Arisugawa as a joint representative of the Mikado at the Diamond Jubilee of Queen Victoria. At the close of 1901 he again, though in an unofficial capacity, visited Europe and the United States; and in England he was created a G.C.B. After the Russo-Japanese War (1905) he was appointed resident general in Korea, and in that capacity he was responsible for the steps taken to increase Japanese influence in that country. In September 1907 he was advanced to the rank of prince. He retired from his post in Korea in July 1909, and became president of the privy council in Japan. But on the 26th of October, when on a visit to Harbin, he was shot dead by a Korean assassin.

He is to be distinguished from Admiral Count Yuko Ito (b. 1843), the distinguished naval commander.

ITRI, a town of Campania, Italy, in the province of Caserta, 6 m. by road N.W. of Formia. Pop. (1901) 5797. The town is picturesquely situated 690 ft. above sea-level, in the mountains which the Via Appia traverses between Fondi and Formia.

Interesting remains of the substruction wall supporting the ancient road are preserved in Itri itself; and there are many remains of ancient buildings near it. The brigand Fra Diavolo, the hero of Auber's opera, was a native of Itri, and the place was once noted for brigandage.

ITURBIDE (or YTURBIDE), **AUGUSTIN DE** (1783–1824), emperor of Mexico from May 1822 to March 1823, was born on the 27th of September 1783, at Valladolid, now Morelia, in Mexico, where his father, an Old Spaniard from Pampeluna, had settled with his creole wife. After enjoying a better education than was then usual in Mexico, Iturbide entered the military service, and in 1810 held the post of lieutenant in the provincial regiment of his native city. In that year the insurrection under Hidalgo broke out, and Iturbide, more from policy, it would seem, than from principle, served in the royal army. Possessed of splendid courage and brilliant military talents, which fitted him especially for guerilla warfare, the young creole did signal service, and rapidly rose in military rank. In December 1813 Colonel Iturbide, along with General Llano, dealt a crushing blow to the revolt by defeating Morelos, the successor of Hidalgo, in the battle of Valladolid; and the former followed it up by another decisive victory at Puruaran in January 1814. Next year Don Augustin was appointed to the command of the army of the north and to the governorship of the provinces of Valladolid and Guanajuato, but in 1816 grave charges of extortion and violence were brought against him, which led to his recall. Although the general was acquitted, or at least although the inquiry was dropped, he did not resume his commands, but retired into private life for four years, which, we are told, he spent in a rigid course of penance for his former excesses. In 1820 Apodaca, viceroy of Mexico, received instructions from the Spanish cortes to proclaim the constitution promulgated in Spain in 1812, but although obliged at first to submit to an order by which his power was much curtailed, he secretly cherished the design of reviving the absolute power for Ferdinand VII. in Mexico. Under pretext of putting down the lingering remains of revolt, he levied troops, and, placing Iturbide at their head, instructed him to proclaim the absolute power of the king. Four years of reflection, however, had modified the general's views, and now, led both by personal ambition and by patriotic regard for his country, Iturbide resolved to espouse the cause of national independence. His subsequent proceedings—how he issued the *Plan of Iguala*, on the 24th of February 1821, how by the refusal of the Spanish cortes to ratify the treaty of Cordova, which he had signed with O'Donoju, he was transformed from a mere champion of monarchy into a candidate for the crown, and how, hailed by the soldiers as Emperor Augustin I. on the 18th of May 1822, he was compelled within ten months, by his arrogant neglect of constitutional restraints, to tender his abdication to a congress which he had forcibly dissolved—will be found detailed under MEXICO. Although the congress refused to accept his abdication on the ground that to do so would be to recognize the validity of his election, it permitted the ex-emperor to retire to Leghorn in Italy, while in consideration of his services in 1820 a yearly pension of £5000 was conferred upon him. But Iturbide resolved to make one more bid for power; and in 1824, passing from Leghorn to London, he published a *Statement*, and on the 11th of May set sail for Mexico. The congress immediately issued an act of outlawry against him, forbidding him to set foot on Mexican soil on pain of death. Ignorant of this, the ex-emperor landed in disguise at Soto la Marina on the 14th of July. He was almost immediately recognized and arrested, and on the 19th of July 1824 was shot at Padilla, by order of the state of Tamaulipas, without being permitted an appeal to the general congress. Don Augustin de Iturbide is described by his contemporaries as being of handsome figure and ingratiating manner. His brilliant courage and wonderful success made him the idol of his soldiers, though towards his prisoners he displayed the most cold-blooded cruelty, boasting in one of his despatches of having honoured Good Friday by shooting three hundred excommunicated wretches. Though described as amiable in his private life, he seems in his public career to have been ambitious and unscrupulous, and by his haughty Spanish temper, impatient of all resistance or control, to have forfeited the opportunity of founding a secure imperial dynasty. His grandson Augustin was chosen by the ill-fated emperor Maximilian as his successor.

See *Statement of some of the principal events in the public life of Augustin de Iturbide*, written by himself (Eng. trans., 1824).

ITZA, an American-Indian people of Mayan stock, inhabiting the country around Lake Peten in northern Guatemala. Chichen-Itza, among the most wonderful of the ruined cities of Yucatan, was the capital of the Itzas. Thence, according to their traditions they removed, on the breaking up of the Mayan kingdom in 1420, to an island in the lake where another city was built. Cortes met them in 1525, but they preserved their independence till 1697, when the Spaniards destroyed the city and temples, and a library of sacred books, written in hieroglyphics on bark fibre. The Itzas were one of the eighteen semi-independent Maya states, whose incessant internecine wars at length brought about the dismemberment of the empire of Xibalba and the destruction of Mayan civilization.

ITZEHOE, a town of Germany, in the Prussian province of Schleswig-Holstein, on the Stör, a navigable tributary of the Elbe, 32 m. north-west of Hamburg and 15 m. north of Glückstadt. Pop. (1900) 15,649. The church of St Lawrence, dating from the 12th century, and the building in which the Holstein estates formerly met, are noteworthy. The town has a convent founded in 1256, a high school, a hospital and other benevolent institutions. Itzehoe is a busy commercial place. Its sugar refineries are among the largest in Germany. Ironfounding, shipbuilding and wool-spinning are also carried on, and the manufactures include machinery, tobacco, fishing-nets, chicory, soap, cement and beer. Fishing employs some of the inhabitants, and the markets for cattle and horses are important. A considerable trade is carried on in agricultural products and wood, chiefly with Hamburg and Altona.

Itzehoe is the oldest town in Holstein. Its nucleus was a castle, built in 809 by Egbert, one of Charlemagne's counts, against the Danes. The community which sprang up around it was diversely called Esseveldoburg, Eselsfleth and Ezeho. In 1201 the town was destroyed, but it was restored in 1224. To the new town the Lübeck rights were granted by Adolphus IV. in 1238, and to the old town in 1303. During the Thirty Years' War Itzehoe was twice destroyed by the Swedes, in 1644 and 1657, but was rebuilt on each occasion. It passed to Prussia in 1867, with the duchy of Schleswig-Holstein.

IUKA, the county-seat of Tishomingo county, Mississippi, U.S.A., about 25 m. S.E. of Corinth in the N.E. corner of the state and 8 m. S. of the Tennessee river. Pop. (1900) 882; (1910) 1221. It is served by the Southern railway, and has a considerable trade in cotton and farm products. Its mineral springs make it a health resort. In the American Civil War, a Confederate force under General Sterling Price occupied the town on the 14th of September 1862, driving out a small Union garrison; and on the 19th of September a partial engagement took place between Price and a Federal column commanded by General Rosecrans, in which the Confederate losses were 700 and the Union 790. Price, whose line of retreat was threatened by superior forces under General Grant, withdrew from Iuka on the morning of the 20th of September.

IULUS, in Roman legend: (*a*) the eldest son of Ascanius and grandson of Aeneas, founder of the Julian gens (*gens Iulia*), deprived of his kingdom of Latium by his younger brother Silvius (Dion. Halic. i. 70); (*b*) another name for, or epithet of, Ascanius.

IVAN (JOHN), the name of six grand dukes of Muscovy and tsars of Russia.

IVAN I., called *Kalita*, or Money-Bag (d. 1341), grand duke of Vladimir, was the first *sobiratel*, or "gatherer" of the scattered Russian lands, thereby laying the foundations of the future autocracy as a national institution. This he contrived to do by adopting a policy of complete subserviency to the khan of the Golden Horde, who, in return for a liberal and punctual tribute, permitted him to aggrandize himself at the expense of the lesser grand dukes. Moscow and Tver were the first to fall. The latter Ivan received from the hand of the khan, after devastating it with a host of 50,000 Tatars (1327). When Alexander of Tver fled to the powerful city of Pskov, Ivan, not strong enough to attack Pskov, procured the banishment of Alexander by the aid of the metropolitan, Theognost, who threatened Pskov with an interdict. In 1330 Ivan extended his influence over Rostov by the drastic methods of blackmail and hanging. But Great Novgorod was too strong for him, and twice he threatened that republic in vain. In 1340 Ivan assisted the khan to ravage the domains of Prince Ivan of Smolensk, who had refused to pay the customary tribute to the Horde. Ivan's own domains, at any rate during his reign, remained free from Tatar incursions, and prospered correspondingly, thus attracting immigrants and their wealth from the other surrounding principalities. Ivan was a most careful, not to say niggardly economist, keeping an exact account of every village or piece of plate that his money-bags acquired, whence his nickname. The most important event of his reign was the transference of the metropolitan see from Vladimir to Moscow, which gave Muscovy the pre-eminence over all the other Russian states, and made the metropolitan the ecclesiastical police-superintendent of the grand duke. The Metropolitan Peter built the first stone cathedral of Moscow, and his successor, Theognost, followed suit with three more stone churches. Simultaneously Ivan substituted stone walls for the ancient wooden ones of the Kreml', or citadel, which made Moscow a still safer place of refuge.

See S. M. Solov'ev, *History of Russia* (Rus.), vol. iii. (St Petersburg, 1895); Polezhaev, *The Principality of Moscow in the first half of the 14th Century* (Rus.) (St Petersburg, 1878).

Ivan II. (1326–1359), grand duke of Vladimir, a younger son of Ivan Kalita, was born in 1326. In 1353 he succeeded his elder brother Simeon as grand duke, despite the competition of Prince Constantine of Suzdal, the Khan Hanibek preferring to bestow the *yarluik*, or letter of investiture, upon Ivan rather than upon Constantine. At first the principalities of Suzdal, Ryazan and the republic of Novgorod refused to recognize him as grand duke, and waged war with him till 1354. The authority of the grand duchy sensibly diminished during the reign of Ivan II. The surrounding principalities paid but little attention to Moscow, and Ivan, "a meek, gentle and merciful prince," was ruled to a great extent by the *tuisyatsky*, or chiliarch, Alexis Khvost, and, after his murder by the jealous boyars in 1357, by Bishop Alexis. He died in 1359. Like most of his predecessors, Ivan, by his last will, divided his dominions among his children.

See Dmitry Ilovaisky, *History of Russia* (Rus.), vol. ii. (Moscow, 1876–1894).

Ivan III. (1440–1505), grand duke of Muscovy, son of Vasily (Basil) Vasilievich the Blind, grand duke of Moscow, and Maria Yaroslavovna, was born in 1440. He was co-regent with his father during the latter years of his life and succeeded him in 1462. Ivan tenaciously pursued the unifying policy of his predecessors. Nevertheless, cautious to timidity, like most of the princes of the house of Rurik, he avoided as far as possible any violent collision with his neighbours until all the circumstances were exceptionally favourable, always preferring to attain his ends gradually, circuitously and subterraneously. Muscovy had by this time become a compact and powerful state, whilst her rivals had grown sensibly weaker, a condition of things very favourable to the speculative activity of a statesman of Ivan III.'s peculiar character. His first enterprise was a war with the republic of Novgorod, which, alarmed at the growing dominancy of Muscovy, had placed herself beneath the protection of Casimir IV., king of Poland, an alliance regarded at Moscow as an act of apostasy from orthodoxy. Ivan took the field against Novgorod in 1470, and after his generals had twice defeated the forces of the republic, at Shelona and on the Dvina, during the summer of 1471, the Novgorodians were forced to sue for peace, which they obtained on engaging to abandon for ever the Polish alliance, ceding a considerable portion of their northern colonies, and paying a war indemnity of 15,500 roubles. From henceforth Ivan sought continually a pretext for destroying Novgorod altogether; but though he frequently violated its ancient privileges in minor matters, the attitude of the republic was so wary that his looked-for opportunity did not come till 1477. In that year the ambassadors of Novgorod played into his hands by addressing him in public audience as "Gosudar" (sovereign) instead of "Gospodin" ("Sir") as heretofore. Ivan at once seized upon this as a recognition of his sovereignty, and when the Novgorodians repudiated their ambassadors, he marched against them. Deserted by Casimir IV., and surrounded on every side by the Muscovite armies, which included a Tatar contingent, the republic recognized Ivan as autocrat, and surrendered (January 14, 1478) all her prerogatives and possessions (the latter including the whole of northern Russia from Lapland to the Urals) into his hands. Subsequent revolts (1479–1488) were punished by the removal *en masse* of the richest and most ancient families of Novgorod to Moscow, Vyatka and other central Russian cities. After this, Novgorod, as an independent state, ceased to exist. The rival republic of Pskov owed the continuance of its own political existence to the readiness with which it assisted Ivan against its ancient enemy. The other principalities were virtually absorbed, by conquest, purchase or marriage contract—Yaroslavl in 1463, Rostov in 1474, Tver in 1485.

Ivan's refusal to share his conquests with his brothers, and his subsequent interference with the internal politics of their inherited principalities, involved him in several wars with them, from which, though the princes were assisted by Lithuania, he emerged victorious. Finally, Ivan's new rule of government, formally set forth in his last will to the effect that the domains of all his kinsfolk, after their deaths, should pass directly to the reigning grand duke instead of reverting, as hitherto, to the princes' heirs, put an end once for all to these semi-independent princelets. The further extension of the Muscovite dominion was facilitated by the death of Casimir IV. in 1492, when Poland and Lithuania once more parted company. The throne of Lithuania was now occupied by Casimir's son Alexander, a weak and lethargic prince so incapable of defending his possessions against the persistent attacks of the Muscovites that he attempted to save them by a matrimonial compact, and wedded Helena, Ivan's daughter. But the clear determination of Ivan to appropriate as much of Lithuania as possible at last compelled Alexander in 1499 to take up arms against his father-in-law. The Lithuanians were routed at Vedrosha (July 14, 1500), and in 1503 Alexander was glad to purchase peace by ceding to Ivan Chernigov, Starodub, Novgorod-Syeversk and sixteen other towns.

It was in the reign of Ivan III. that Muscovy rejected the Tatar yoke. In 1480 Ivan refused to pay the customary tribute to the grand Khan Ahmed. When, however, the grand khan marched against him, Ivan's courage began to fail, and only the stern exhortations of the high-spirited bishop of Rostov, Vassian, could induce him to take the field. All through the autumn the Russian and Tatar hosts confronted each other on opposite sides of the Ugra, till the 11th of November, when Ahmed retired into the steppe. In the following year the grand khan, while preparing a second expedition against Moscow, was suddenly attacked, routed and slain by Ivak, the khan of the Nogai Tatars, whereupon the Golden Horde suddenly fell to pieces. In 1487 Ivan reduced the khanate of Kazan (one of the offshoots of the Horde) to the condition of a vassal-state, though in his later years it broke away from his suzerainty. With the other Mahommedan powers, the khan of the Crimea and the sultan of Turkey, Ivan's relations were pacific and even amicable. The Crimean khan, Mengli Girai, helped him against Lithuania and facilitated the opening of diplomatic intercourse between Moscow and Constantinople, where the first Russian embassy appeared in 1495.

The character of the government of Muscovy under Ivan III. changed essentially and took on an autocratic form which it had never had before. This was due not merely to the natural consequence of the hegemony of Moscow over the other Russian lands, but even more to the simultaneous growth of new and exotic principles falling upon a soil already prepared for them. After the fall of Constantinople, orthodox canonists were inclined to regard the Muscovite grand dukes as the successors by the Byzantine emperors. This movement coincided with a change in the family circumstances of Ivan III. After the death of his first consort, Maria of Tver (1467), at the suggestion of Pope Paul II. (1469), who hoped thereby to bind Russia to the holy see, Ivan III. wedded the Catholic Zoe Palaeologa (better known by her orthodox name of Sophia), daughter of Thomas, despot of the Morea, who claimed the throne of Constantinople as the nearest relative of the last Greek emperor. The princess, however, clave to her family traditions, and awoke imperial ideas in the mind of her consort. It was through her influence that the ceremonious etiquette of Constantinople (along with the imperial double-headed eagle and all that it implied) was adopted by the court of Moscow. The grand duke henceforth held aloof from his boyars. The old patriarchal systems of government vanished. The boyars were no longer consulted on affairs of state. The sovereign became sacrosanct, while the boyars were reduced to the level of slaves absolutely dependent on the will of the sovereign. The boyars naturally resented so insulting a revolution, and struggled against it, at first with some success. But the clever Greek lady prevailed in the end, and it was her son Vasily, not Maria of Tver's son, Demetrius, who was ultimately crowned co-regent with his father (April 14, 1502). It was in the reign of Ivan III. that the first Russian "Law Book," or code, was compiled by the scribe Gusev. Ivan did his utmost to promote civilization in his realm, and with that object invited many foreign masters and artificers to settle in Muscovy, the most noted of whom was the Italian Ridolfo di Fioravante, nicknamed Aristotle because of his extraordinary knowledge, who built the cathedrals of the Assumption (Uspenski) and of Saint Michael or the Holy Archangels in the Kreml.

See P. Pierling, *Mariage d'un tsar au Vatican, Ivan III et Sophie Paléologue* (Paris, 1891); E. I. Kashprovsky, *The Struggle of Ivan III. with Sigismund I.* (Rus.) (Nizhni, 1899); S. M. Solov'ev, *History of Russia* (Rus.), vol. v. (St Petersburg, 1895).

Ivan IV., called "the Terrible" (1530–1584), tsar of Muscovy, was the son of Vasily [Basil] III. Ivanovich, grand duke of Muscovy, by his second wife, Helena Glinska. Born on the 25th of August 1530, he was proclaimed grand duke on the death of his father (1533), and took the government into his own hands in 1544, being then fourteen years old. Ivan IV. was in every respect precocious; but from the first there was what we should now call a neurotic strain in his character. His father died when he was three, his mother when he was only seven, and he grew up in a brutal and degrading environment where he learnt to hold human life and human dignity in contempt. He was maltreated by the leading boyars whom successive revolutions placed at the head of affairs, and hence he conceived an inextinguishable hatred of their whole order and a corresponding fondness for the merchant class, their natural enemies. At a very early age he entertained an exalted idea of his own divine authority, and his studies were largely devoted to searching in the Scriptures and the Slavonic chronicles for sanctions and precedents for the exercise and development of his right divine. He first asserted his power by literally throwing to the dogs the last of his boyar tyrants, and shortly afterwards announced his intention of assuming the title of tsar, a title which his father and grandfather had coveted but never dared to assume publicly. On the 16th of January 1547, he was crowned the first Russian tsar by the metropolitan of Moscow; on the 3rd of February in the same year he selected as his wife from among the virgins gathered from all parts of Russia for his inspection, Anastasia Zakharina-Koshkina, the scion of an ancient and noble family better known by its later name of Romanov.

Hitherto, by his own showing, the private life of the young tsar had been unspeakably abominable, but his sensitive conscience (he was naturally religious) induced him, in 1550, to summon a *Zemsky Sobor* or national assembly, the first of its kind, to which he made a curious public confession of the sins of his youth, and at the same time promised that the realm of Russia (for whose dilapidation he blamed the boyar regents) should henceforth be governed justly and mercifully. In 1551 the tsar submitted to a synod of prelates a hundred questions as to the best mode of remedying existing evils, for which reason the decrees of this synod are generally called *stoglav* or *centuria*. The decennium extending from 1550 to 1560 was the good period of Ivan IV.'s reign, when he deliberately broke away from his disreputable past and surrounded himself with good men of lowly origin. It was not only that he hated and distrusted the boyars, but he was already statesman enough to discern that they could not be fitted into the new order of things which he aimed at introducing. Ivan meditated the regeneration of Muscovy, and the only men who could assist him in his task were men who could look steadily forward to the future because they had no past to look back upon, men who would unflinchingly obey their sovereign because they owed their whole political significance to him alone. The chief of these men of good-will were Alexis Adashev and the monk Sylvester, men of so obscure an origin that almost every detail of their lives is conjectural, but both of them, morally, the best Muscovites of their day. Their influence upon the young tsar was profoundly beneficial, and the period of their administration coincides with the most glorious period of Ivan's reign—the period of the conquest of Kazan and Astrakhan.

In the course of 1551 one of the factions of Kazan offered the whole khanate to the young tsar, and on the 20th of August 1552 he stood before its walls with an army of 150,000 men and 50 guns. The siege was long and costly; the army suffered severely; and only the tenacity of the tsar kept it in camp for six weeks. But on the 2nd of October the fortress, which had been heroically defended, was taken by assault. The conquest of Kazan was an epoch-making event in the history of eastern Europe. It was not only the first territorial conquest from the Tatars, before whom Muscovy had humbled herself for generations; at Kazan Asia, in the name of Mahomet, had fought behind its last trench against Christian Europe marshalled beneath the banner of the tsar of Muscovy. For the first time the Volga became a Russian river. Nothing could now retard the natural advance of the young Russian state towards the east and the south-east. In 1554 Astrakhan fell almost without a blow By 1560 all the Finnic and Tatar tribes between the Oka and the Kama had become Russian subjects. Ivan was also the first tsar who dared to attack the Crimea. In 1555 he sent Ivan Sheremetev against Perekop, and Sheremetev routed the Tatars in a great two days' battle at Sudbishenska. Some of Ivan's advisers, including both Sylvester and Adashev, now advised him to make an end of the Crimean khanate, as he had already made an end of the khanates of Kazan and Astrakhan. But Ivan, wiser in his generation, knew that the thing was impossible, in view of the immense distance to be traversed, and the predominance of the Grand Turk from whom it would have to be wrested. It was upon Livonia that his eyes were fixed, which was comparatively near at hand and promised him a seaboard and direct communication with western Europe. Ivan IV., like Peter I. after him, clearly recognized the necessity of raising Muscovy to the level of her neighbours. He proposed to do so by promoting a wholesale immigration into his tsardom of master-workmen and skilled artificers. But all his neighbours, apprehensive of the consequences of a civilized Muscovy, combined to thwart him. Charles V. even went so far as to disperse 123 skilled Germans whom Ivan's agent had collected and brought to Lübeck for shipment to a Baltic port. After this, Ivan was obliged to help himself as best he could. His opportunity seemed to have come when, in the middle of the 16th century, the Order of the Sword broke up, and the possession of Livonia was fiercely contested between Sweden, Poland and Denmark. Ivan intervened in 1558 and quickly captured Narva, Dorpat and a dozen smaller fortresses; then, in 1560, Livonia placed herself beneath the protection of Poland, and King Sigismund II. warned Ivan off the premises.

By this time, Ivan had entered upon the second and evil portion of his reign. As early as 1553 he had ceased to trust

Sylvester and Adashev, owing to their extraordinary backwardness in supporting the claims of his infant son to the throne while he himself lay at the point of death. The ambiguous and ungrateful conduct of the tsar's intimate friends and protégés on this occasion has never been satisfactorily explained, and he had good reason to resent it. Nevertheless, on his recovery, much to his credit, he overlooked it, and they continued to direct affairs for six years longer. Then the dispute about the Crimea arose, and Ivan became convinced that they were mediocre politicians as well as untrustworthy friends. In 1560 both of them disappeared from the scene, Sylvester into a monastery at his own request, while Adashev died the same year, in honourable exile as a general in Livonia. The death of his deeply beloved consort Anastasia and his son Demetrius, and the desertion of his one bosom friend Prince Kurbsky, about the same time, seem to have infuriated Ivan against God and man. During the next ten years (1560–1570) terrible and horrible things happened in the realm of Muscovy. The tsar himself lived in an atmosphere of apprehension, imagining that every man's hand was against him. On the 3rd of December 1564 he quitted Moscow with his whole family. On the 3rd of January 1565 he declared in an open letter addressed to the metropolitan his intention to abdicate. The common people, whom he had always favoured at the expense of the boyars, thereupon implored him to come back on his own terms. He consented to do so, but entrenched himself within a peculiar institution, the *oprichina* or "separate estate." Certain towns and districts all over Russia were separated from the rest of the realm, and their revenues were assigned to the maintenance of the tsar's new court and household, which was to consist of 1000 carefully selected boyars and lower dignitaries, with their families and suites, in the midst of whom Ivan henceforth lived exclusively. The *oprichina* was no constitutional innovation. The *duma*, or council, still attended to all the details of the administration; the old boyars still retained their ancient offices and dignities. The only difference was that the tsar had cut himself off from them, and they were not even to communicate with him except on extraordinary and exceptional occasions. The *oprichniki*, as being the exclusive favourites of the tsar, naturally, in their own interests, hardened the tsar's heart against all outsiders, and trampled with impunity upon every one beyond the charmed circle. Their first and most notable victim was Philip, the saintly metropolitan of Moscow, who was strangled for condemning the *oprichina* as an unchristian institution, and refusing to bless the tsar (1569). Ivan had stopped at Tver, to murder St Philip, while on his way to destroy the second wealthiest city in his tsardom—Great Novgorod. A delator of infamous character, one Peter, had accused the authorities of the city to the tsar of conspiracy; Ivan, without even confronting the Novgorodians with their accuser, proceeded at the end of 1569 to punish them. After ravaging the land, his own land, like a wild beast, he entered the city on the 8th of January 1570, and for the next five weeks, systematically and deliberately, day after day, massacred batches of every class of the population. Every monastery, church, manor-house, warehouse and farm within a circuit of 100 m. was then wrecked, plundered and left roofless, all goods were pillaged, all cattle destroyed. Not till the 13th of February were the miserable remnants of the population permitted to rebuild their houses and cultivate their fields once more.

An intermittent and desultory war, with Sweden and Poland simultaneously, for the possession of Livonia and Esthonia, went on from 1560 to 1582. Ivan's generals (he himself rarely took the field) were generally successful at first, and bore down their enemies by sheer numbers, capturing scores of fortresses and towns. But in the end the superior military efficiency of the Swedes and Poles invariably prevailed. Ivan was also unfortunate in having for his chief antagonist Stephen Báthory, one of the greatest captains of the age. Thus all his strenuous efforts, all his enormous sacrifices, came to nothing. The West was too strong for him. By the peace of Zapoli (January 15th, 1582) he surrendered Livonia with Polotsk to Báthory, and by the truce of Ilyusa he at the same time abandoned Ingria to the Swedes. The Baltic seaboard was lost to Muscovy for another century and a half. In his latter years Ivan cultivated friendly relations with England, in the hope of securing some share in the benefits of civilization from the friendship of Queen Elizabeth, one of whose ladies, Mary Hastings, he wished to marry, though his fifth wife, Martha Nagaya, was still alive. Towards the end of his life Ivan was partially consoled for his failure in the west by the unexpected acquisition of the kingdom of Siberia in the east, which was first subdued by the Cossack hetman Ermak or Yermak in 1581.

In November 1580 Ivan in a fit of ungovernable fury at some contradiction or reproach, struck his eldest surviving son Ivan, a prince of rare promise, whom he passionately loved, a blow which proved fatal. In an agony of remorse, he would now have abdicated "as being unworthy to reign longer"; but his trembling boyars, fearing some dark ruse, refused to obey any one but himself. Three years later, on the 18th of March 1584, while playing at chess, he suddenly fell backwards in his chair and was removed to his bed in a dying condition. At the last moment he assumed the hood of the strictest order of hermits, and died as the monk Jonah.

Ivan IV. was undoubtedly a man of great natural ability. His political foresight was extraordinary. He anticipated the ideals of Peter the Great, and only failed in realizing them because his material resources were inadequate. But admiration of his talents must not blind us to his moral worthlessness, nor is it right to cast the blame for his excesses on the brutal and vicious society in which he lived. The same society which produced his infamous favourites also produced St Philip of Moscow, and by refusing to listen to St Philip Ivan sank below even the not very lofty moral standard of his own age. He certainly left Muscovite society worse than he found it, and so prepared the way for the horrors of "the Great Anarchy." Personally, Ivan was tall and well-made, with high shoulders and a broad chest. His eyes were small and restless, his nose hooked, he had a beard and moustaches of imposing length. His face had a sinister, troubled expression; but an enigmatical smile played perpetually around his lips. He was the best educated and the hardest worked man of his age. His memory was astonishing, his energy indefatigable. As far as possible he saw to everything personally, and never sent away a petitioner of the lower orders.

See S. M. Solov'ev, *History of Russia* (Rus.) vol. v. (St Petersburg, 1895); A. Brückner, *Geschichte Russlands bis zum Ende des 18ten Jahrhunderts* (Gotha, 1896); E. Tikhomirov, *The first Tsar of Moscovy, Ivan IV.* (Rus.) (Moscow, 1888); L. G. T. Tidander, *Kriget mellan Sverige och Ryssland åren 1555–1557* (Vesterås, 1888); P. Pierling, *Un Arbitrage pontifical au XVI^{e} siècle entre la Pologne et la Russie* (Bruxelles, 1890); V. V. Novodvorsky, *The Struggle for Livonia, 1570–1582* (Rus.) (St Petersburg, 1904); K. Waliszewski, *Ivan le terrible* (Paris, 1904); R. N. Bain, *Slavonic Europe*, ch. 5 (Cambridge, 1907).

Ivan V.[1] (1666–1696), tsar of Russia, was the son of Tsar Alexius Mikhailovich and his first consort Miloslavzkoya. Physically and mentally deficient, Ivan was the mere tool of the party in Muscovy who would have kept the children of the tsar Alexis, by his second consort Natalia Naruishkina, from the throne. In 1682 the party of progress, headed by Artamon Matvyeev and the tsaritsa Natalia, passed Ivan over and placed his half-brother, the vigorous and promising little tsarevich Peter, on the throne. On the 23rd of May, however, the Naruishkin faction was overthrown by the *stryeltsi* (musketeers), secretly worked upon by Ivan's half-sister Sophia, and Ivan was associated as tsar with Peter. Three days later he was proclaimed "first tsar," in order still further to depress the Naruishkins, and place the government in the hands of Sophia exclusively. In 1689 the name of Ivan was used as a pretext by Sophia in her attempt to oust Peter from the throne altogether. Ivan was made to distribute beakers of wine to his sister's adherents with his own hands, but subsequently, beneath the influence of his uncle Prozorovsky, he openly declared that "even for his sister's sake, he would quarrel no longer with his dear brother." During the reign of his colleague Peter, Ivan V. took no part whatever in affairs, but devoted himself "to incessant prayer and rigorous fasting." On the 9th of January 1684 he married Praskovia Saltuikova, who bore him five daughters, one of whom, Anne, ultimately ascended the Russian throne. In his last years Ivan was a paralytic. He died on the 29th of January 1696.

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[1] Ivan V., if we count from the first grand duke of that name, as most Russian historians do; Ivan II., if, with the minority, we reckon from Ivan the Terrible as the first Russian tsar.

See R. Nisbet Bain, *The First Romanovs* (London, 1905); M. P. Pogodin, *The First Seventeen Years of the Life of Peter the Great* (Rus.) (Moscow, 1875).

Ivan VI. (1740–1764), emperor of Russia, was the son of Prince Antony Ulrich of Brunswick, and the princess Anna Leopoldovna of Mecklenburg, and great-nephew of the empress Anne, who adopted him and declared him her successor on the 5th of October 1740, when he was only eight weeks old. On the death of Anne (October 17th) he was proclaimed emperor, and on the following day Ernest Johann Biren, duke of Courland, was appointed regent. On the fall of Biren (November 8th), the regency passed to the baby tsar's mother, though the government was in the hands of the capable vice-chancellor, Andrei Osterman. A little more than twelve months later, a *coup d'état* placed the tsesarevna Elizabeth on the throne (December 6, 1741), and Ivan and his family were imprisoned in the fortress of Dünamünde (Ust Dvinsk) (December 13, 1742) after a preliminary detention at Riga, from whence the new empress had at first decided to send them home to Brunswick. In June 1744 they were transferred to Kholmogory on the White Sea, where Ivan, isolated from his family, and seeing nobody but his gaoler, remained for the next twelve years. Rumours of his confinement at Kholmogory having leaked out, he was secretly transferred to the fortress of Schlüsselburg (1756), where he was still more rigorously guarded, the very commandant of the fortress not knowing who "a certain arrestant" committed to his care really was. On the accession of Peter III. the condition of the unfortunate prisoner seemed about to be ameliorated, for the kind-hearted emperor visited and sympathized with him; but Peter himself was overthrown a few weeks later. In the instructions sent to Ivan's guardian, Prince Churmtyev, the latter was ordered to chain up his charge, and even scourge him should he become refractory. On the accession of Catherine still more stringent orders were sent to the officer in charge of "the nameless one." If any attempt were made from outside to release him, the prisoner was to be put to death; in no circumstances was he to be delivered alive into any one's hands, even if his deliverers produced the empress's own sign-manual authorizing his release. By this time, twenty years of solitary confinement had disturbed Ivan's mental equilibrium, though he does not seem to have been actually insane. Nevertheless, despite the mystery surrounding him, he was well aware of his imperial origin, and always called himself *gosudar* (sovereign). Though instructions had been given to keep him ignorant, he had been taught his letters and could read his Bible. Nor could his residence at Schlüsselburg remain concealed for ever, and its discovery was the cause of his ruin. A sub-lieutenant of the garrison, Vasily Mirovich, found out all about him, and formed a plan for freeing and proclaiming him emperor. At midnight on the 5th of July 1764, Mirovich won over some of the garrison, arrested the commandant, Berednikov, and demanded the delivery of Ivan, who there and then was murdered by his gaolers in obedience to the secret instructions already in their possession.

See R. Nisbet Bain, *The Pupils of Peter the Great* (London, 1897); M. Semevsky, *Ivan VI. Antonovich* (Rus.) (St Petersburg, 1866); A. Brückner, *The Emperor Ivan VI. and his Family* (Rus.) (Moscow, 1874); V. A. Bilbasov, *Geschichte Catherine II.* (vol. ii., Berlin, 1891–1893). (R. N. B.)

IVANGOROD, a fortified town of Russian Poland, in the government of Lublin, 64 m. by rail S.E. from Warsaw, at the confluence of the Wieprz with the Vistula. It is defended by nine forts on the right bank of the Vistula and by three on the left bank, and, with Warsaw, Novo-Georgievsk and Brest-Litovsk, forms the Polish "quadrilateral."

IVANOVO-VOZNESENSK, a town of middle Russia, in the government of Vladimir, 86 m. by rail N. of the town of Vladimir. Pop. (1887) 22,000; (1900) 64,628. It consists of what were originally two villages—Ivanovo, dating from the 16th century, and Voznesensk, of much more recent date—united into a town in 1861. Of best note among the public buildings are the cathedral, and the church of the Intercession of the Virgin, formerly associated with an important monastery founded in 1579 and abandoned in 1754. One of the colleges of the town contains a public library. Linen-weaving was introduced in 1751, and in 1776 the manufacture of chintzes was brought from Schlüsselburg. The town has cotton factories, calico print-works, iron-works and chemical works.

IVARR BEINLAUSI (d. 873), son of Ragnar Lothbrok, the great Viking chieftain, is known in English and Continental annals as Inuaer, Ingwar or Hingwar. He was one of the Danish leaders in the Sheppey expedition of 855 and was perhaps present at the siege of York in 867. The chief incident in his life was his share in the martyrdom of St Edmund in 870. He seems to have been the leader of the Danes on that occasion, and by this act he probably gained the epithet "crudelissimus" by which he is usually described. It is probable that he is to be identified with Imhar, king of the Norsemen of all Ireland and Britain, who was active in Ireland between the years 852 and 873, the year of his death.

IVIZA, Ibiza or Iviça, an island in the Mediterranean Sea, belonging to Spain, and forming part of the archipelago known as the Balearic Islands (*q.v.*). Pop. (1900) 23,524; area 228 sq. m. Iviza lies 50 m. S.W. of Majorca and about 60 m. from Cape San Martin on the coast of Spain. Its greatest length from north-east to south-west is about 25 m. and its greatest breadth about 13 m. The coast is indented by numerous small bays, the principal of which are those of San Antonio on the north-west, and of Iviza on the south-east. Of all the Balearic group, Iviza is the most varied in its scenery and the most fruitful. The hilly parts which culminate in the Pico de Atalayasa (1560 ft.), are richly wooded. The climate is for the most part mild and agreeable, though the hot winds from the African coast are sometimes troublesome. Oil, corn and fruits (of which the most important are the fig, prickly pear, almond and carob-bean) are the principal products; hemp and flax are also grown, but the inhabitants are rather indolent, and their modes of culture are very primitive. There are numerous salt-pans along the coast, which were formerly worked by the Spanish government. Fruit, salt, charcoal, lead and stockings of native manufacture are exported. The imports are rice, flour, sugar, woollen goods and cotton. The capital of the island, and, indeed, the only town of much importance—for the population is remarkably scattered—is Iviza or La Ciudad (6527), a fortified town on the south-east coast, consisting of a lower and upper portion, and possessing a good harbour, a 13th-century Gothic collegiate church and an ancient castle. Iviza was the see of a bishop from 1782 to 1851.

South of Iviza lies the smaller and more irregular island of Formentera (pop., 1900, 2243; area, 37 sq. m.), which is said to derive its name from the production of wheat. With Iviza it agrees both in general appearance and in the character of its products, but it is altogether destitute of streams. Goats and sheep are found in the mountains, and the coasts are greatly frequented by flamingoes. Iviza and Formentera are the principal islands of the lesser or western Balearic group, formerly known as the Pityusae or Pine Islands.

IVORY, SIR JAMES (1765–1842), Scottish mathematician, was born in Dundee in 1765. In 1779 he entered the university of St Andrews, distinguishing himself especially in mathematics. He then studied theology; but, after two sessions at St Andrews and one at Edinburgh, he abandoned all idea of the church, and in 1786 he became an assistant-teacher of mathematics and natural philosoghy in a newly established academy at Dundee. Three years later he became partner in and manager of a flax-spinning company at Douglastown in Forfarshire, still, however, prosecuting in moments of leisure his favourite studies. He was essentially a self-trained mathematician, and was not only deeply versed in ancient and modern geometry, but also had a full knowledge of the analytical methods and discoveries of the continental mathematicians. His earliest memoir, dealing with an analytical expression for the rectification of the ellipse, is published in the *Transactions of the Royal Society of Edinburgh* (1796); and this and his later papers on "Cubic Equations" (1799) and "Kepler's Problem" (1802) evince great facility in the handling of algebraic formulae. In 1804 after the dissolution of the flax-spinning company of which he was manager, he obtained one of the mathematical chairs in the Royal Military College at Marlow (afterwards removed to Sandhurst); and till the year 1816, when failing health obliged him to resign, he discharged his professional duties with remarkable success. During this period he published in the *Philosophical Transactions* several important memoirs, which earned for him the Copley medal in 1814 and ensured his election as a Fellow of the Royal Society in 1815. Of special importance in the history of attractions is the first of these earlier memoirs (*Phil. Trans.*, 1809), in which the problem of the attraction of a homogeneous ellipsoid upon an external point is reduced to the simpler case of the attraction of another but related ellipsoid upon a corresponding point interior to it. This theorem is known as Ivory's theorem. His later papers in the *Philosophical Transactions* treat of astronomical refractions, of planetary perturbations, of equilibrium of fluid masses, &c. For his investigations in the first named of these he received a royal medal in 1826 and again in 1839. In 1831, on the recommendation of Lord Brougham, King William IV. granted him a pension of £300 per annum, and conferred on him the Hanoverian Guelphic order of knighthood. Besides being directly connected with the chief scientific societies of his own country, the Royal Society of Edinburgh, the Royal Irish Academy, &c., he was corresponding member of the Royal Academy of Sciences both of Paris and Berlin, and of the Royal Society of Göttingen. He died at London on the 21st of September 1842.

A list of his works is given in the *Catalogue of Scientific Papers of the Royal Society of London.*

IVORY (Fr. *ivoire*, Lat. *ebur*), strictly speaking a term confined to the material represented by the tusk of the elephant, and for commercial purposes almost entirely to that of the male elephant. In Africa both the male and female elephant produce good-sized tusks; in the Indian variety the female is much less bountifully provided, and in Ceylon perhaps not more than 1% of either sex have any tusks at all. Ivory is in substance very dense, the pores close and compact and filled with a gelatinous solution which contributes to the beautiful polish which may be given to it and makes it easy to work. It may be placed between bone and horn; more fibrous than bone and therefore less easily torn or splintered. For a scientific definition it would be difficult to find a better one than that given by Sir Richard Owen. He says: [1] "The name ivory is now restricted to that modification of dentine or tooth substance which in transverse sections or fractures shows lines of different colours, or striae, proceeding in the arc of a circle and forming by their decussations minute curvilinear lozenge-shaped spaces." These spaces are formed by an immense number of exceedingly minute tubes placed very close together, radiating outwards in all directions. It is to this arrangement of structure that ivory owes its fine grain and almost perfect elasticity, and the peculiar marking resembling the engine-turning on the case of a watch, by which many people are guided in distinguishing it from celluloid or other imitations. Elephants' tusks are the upper incisor teeth of the animal, which, starting in earliest youth from a semi-solid vascular pulp, grow during the whole of its existence, gathering phosphates and other earthy matters and becoming hardened as in the formation of teeth generally. The tusk is built up in layers, the inside layer being the last produced. A large proportion is embedded in the bone sockets of the skull, and is hollow for some distance up in a conical form, the hollow becoming less and less as it is prolonged into a narrow channel which runs along as a thread or as it is sometimes called, nerve, towards the point of the tooth. The outer layer, or bark, is enamel of similar density to the central part. Besides the elephant's tooth or tusk we recognize as ivory, for commercial purposes, the teeth of the hippopotamus, walrus, narwhal, cachalot or sperm-whale and of some animals of the wild boar class, such as the warthog of South Africa. Practically, however, amongst these the hippo and walrus tusks are the only ones of importance for large work, though boars' tusks come to the sale-rooms in considerable quantities from India and Africa.

Generally speaking, the supply of ivory imported into Europe comes from Africa; some is Asiatic, but much that is shipped from India is really African, coming by way of Zanzibar and Mozambique to Bombay. A certain amount is furnished by the vast stores of remains of prehistoric animals still existing throughout Russia, principally in Siberia in the neighbourhood of the Lena and other rivers discharging into the Arctic Ocean. The mammoth and mastodon seem at one time to have been common over the whole surface of the globe. In England tusks have been recently dug up—for instance at Dungeness—as long as 12 ft. and weighing 200 lb. The Siberian deposits have been worked for now nearly two centuries. The store appears to be as inexhaustible as a coalfield. Some think that a day may come when the spread of civilization may cause the utter disappearance of the elephant in Africa, and that it will be to these deposits that we may have to turn as the only source of animal ivory. Of late years in England the use of mammoth ivory has shown signs of decline. Practically none passed through the London sale-rooms during 1903–1906. Before that, parcels of 10 to 20 tons were not uncommon. Not all of it is good; perhaps about half of what comes to England is so, the rest rotten; specimens, however, are found as perfect and in as fine condition as if recently killed, instead of having lain hidden and preserved for thousands of years in the icy ground. There is a considerable literature (see Shooting) on the subject of big-game hunting, which includes that of the elephant, hippopotamus and smaller tusk-bearing animals. Elephants until comparatively recent times roamed over the whole of Africa from the northern deserts to the Cape of Good Hope. They are still abundant in Central Africa and Uganda, but civilization has gradually driven them farther and farther into the wilds and impenetrable forests of the interior.

The quality of ivory varies according to the districts whence it is obtained, the soft variety of the eastern parts of the continent being the most esteemed. When in perfect condition African ivory should be if recently cut of a warm, transparent, mellow tint, with as little as possible appearance of grain or mottling. Asiatic ivory is of a denser white, more open in texture and softer to work. But it is apt to turn yellow sooner, and is not so easy to polish. Unlike bone, ivory requires no preparation, but is fit for immediate working. That from the neighbourhood of Cameroon is very good, then ranks the ivory from Loango, Congo, Gabun and Ambriz; next the Gold Coast, Sierra Leone and Cape Coast Castle. That of French Sudan is nearly always "ringy," and some of the Ambriz variety also. We may call Zanzibar and Mozambique varieties soft; Angola and Ambriz all hard. Ambriz ivory was at one time much esteemed, but there is comparatively little now. Siam ivory is rarely if ever soft. Abyssinian has its soft side, but Egypt is practically the only place where both descriptions are largely distributed. A drawback to Abyssinian ivory is a prevalence of a rather thick bark. Egyptian is liable to be cracked, from the extreme variations of temperature; more so formerly than now, since better methods of packing and transit are used. Ivory is extremely sensitive to sudden extremes of temperature; for this reason billiard balls should be kept where the temperature is fairly equable.

The market terms by which descriptions of ivory are distinguished are liable to mislead. They refer to ports of shipment rather than to places of origin. For instance, "Malta" ivory is a well-understood term, yet there are no ivory producing animals in that island.

Tusks should be regular and tapering in shape, not very curved or twisted, for economy in cutting; the coat fine, thin, clear and transparent. The substance of ivory is so elastic and flexible that excellent riding-whips have been cut longitudinally from whole tusks. The size to which tusks grow and are brought to market depends on race rather than on size of elephants. The latter run largest in equatorial Africa. Asiatic bull elephant tusks seldom exceed 50 ℔ in weight, though lengths of 9 ft. and up to 150 ℔ weight are not entirely unknown. Record lengths for African tusks are the one presented to George V., when prince of Wales, on his marriage (1893), measuring 8 ft. 7½ in. and weighing 165 ℔, and the pair of tusks which were brought to the Zanzibar market by natives in 1898, weighing together over 450 ℔. One of the latter is now in the Natural History Museum at South Kensington; the other is in Messrs Rodgers & Co.'s collection at Sheffield. For length the longest known are those belonging to Messrs Rowland Ward, Piccadilly, which measure 11 ft. and 11 ft. 5 in. respectively, with a combined weight of 293 ℔. Osteodentine, resulting from the effects of injuries from spearheads or bullets, is sometimes found in tusks. This formation, resembling stalactites, grows with the tusk, the bullets or iron remaining embedded without trace of their entry.

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[1] Lecture before the Society of Arts (1856).

The most important commercial distinction of the qualities of ivory is that of the *hard* and *soft* varieties. The terms are difficult to define exactly. Generally speaking, hard or bright ivory is distinctly harder to cut with the saw or other tools. It is, as it were, glassy and transparent. Soft contains more moisture, stands differences of climate and temperature better, and does not crack so easily. The expert is guided by the shape of the tooth, by the colour and quality of the bark or skin, and by the transparency when cut, or even before, as at the point of the tooth. Roughly, a line might be drawn almost centrally down the map of Africa, on the west of which the hard quality prevails, on the east the soft. In choosing ivory for example for knife-handles—people rather like to see a pretty grain, strongly marked; but the finest quality in the hard variety, which is generally used for them, is the closest and freest from grain. The curved or canine teeth of the hippopotamus are valuable and come in considerable quantities to the European markets. Owen describes this variety as "an extremely dense, compact kind of dentine, partially defended on the outside by a thin layer of enamel as hard as porcelain; so hard as to strike fire with steel." By reason of this hardness it is not at all liked by the turner and ivory workers, and before being touched by them the enamel has to be removed by acid, or sometimes by heating and sudden cooling, when it can be scaled off. The texture is slightly curdled, mottled or damasked. Hippo ivory was at one time largely used for artificial teeth, but now mostly for umbrella and stick-handles; whole (in their natural form) for fancy door-handles and the like. In the trade the term is not "riverhorse" but "seahorse teeth." Walrus ivory is less dense and coarser than hippo, but of fine quality—what there is of it, for the oval centre which has more the character of coarse bone unfortunately extends a long way up. At one time a large supply came to the market, but of late years there has been an increasing scarcity, the animals having been almost exterminated by the ruthless persecution to which they have been subjected in their principal haunts in the northern seas. It is little esteemed now, though our ancestors thought highly of it. Comparatively large slabs are to be found in medieval sculpture of the 11th and 12th centuries, and the grips of most oriental swords, ancient and modern, are made from it. The ivory from the single tusk or horn of the narwhal is not of much commercial value except as an ornament or curiosity. Some horns attain a length of 8 to 10 ft., 4 in. thick at the base. It is dense in substance and of a fair colour, but owing to the central cavity there is little of it fit for anything larger than napkin-rings.

Ivory in Commerce, and its Industrial Applications.—Almost the whole of the importation of ivory to Europe was until recent years confined to London, the principal distributing mart of the world. But the opening up of the Congo trade has placed the port of Antwerp in a position which has equalled and, for a time, may surpass that of London. Other important markets are Liverpool and Hamburg; and Germany, France and Portugal have colonial possessions in Africa, from which it is imported. America is a considerable importer for its own requirements. From the German Cameroon alone, according to Schilling, there were exported during the ten years ending 1905, 452,100 kilos of ivory. Mr Buxton estimates the amount of ivory imported into the United Kingdom at about 500 tons. If we give the same to Antwerp we have from these two ports alone no less than 1000 tons a year to be provided. Allowing a weight so high as 30 ℔ per pair of tusks (which is far too high, perhaps twice too high) we should have here alone between thirty and forty thousand elephants to account for. It is true that every pair of tusks that comes to the market represents a dead elephant, but not necessarily by any means a slain or even a recently killed one, as is popularly supposed and unfortunately too often repeated. By far the greater proportion is the result of stores accumulated by natives, a good part coming from animals which have died a natural death. Not 20% is *live* ivory or recently killed; the remainder is known in the trade as *dead* ivory.

In 1827 the principal London ivory importers imported 3000 cwt. in 1850, 8000 cwt. The highest price up to 1855 was £55 per cwt. At the July sales in 1905 a record price was reached for billiard-ball teeth of £167 per cwt. The total imports into the United Kingdom were, according to Board of Trade returns, in 1890, 14,349 cwt.; in 1895, 10,911 cwt.; in 1900, 9889 cwt.; in 1904, 9045 cwt.

From Messrs Hale & Son's (ivory brokers, 10 Fenchurch Avenue) Ivory Report of the second quarterly sales in London, April 1906, it appears that the following were offered:—

	Tons.
From Zanzibar, Bombay, Mozambique and Siam	17
Egyptian	19¼
West Coast African	11
Lisbon	1
Abyssinian	6¾
	55
Sea horse (hippopotamus teeth)	1¾
Walrus	¼
Waste ivory	10¼
	67¼

Hard ivory was scarce. West Coast African was principally of the Gabun description, and some of very fine quality. There was very little inquiry for walrus. The highest prices ranged as follows: Soft East Coast tusks (Zanzibar, Mozambique, Bombay and Siam), 102 to 143 ℔. each £66, 10s. to £75, 10s. per cwt. Billiard-ball scrivelloes, £104 per cwt. Cut points for billiard-balls (3⅛ in. to 2⅜ to 3 in.) £114 to £151 per cwt. Seahorse (for best), 3s. 6d. to 4s. 1d. per ℔. Boars' tusks, 6d. to 7d. per ℔.

Quantities of ivory offered to Public auction (from Messrs Hale & Son's Reports).

	1903.	1904.	1905.
	Tons.	Tons.	Tons.
Zanzibar, Bombay, Mozambique and Siam	81	75	76
Egyptian	49¾	72¾	81¾
Abyssinian	22¾	9¾	23¼
West Coast African	46¾	39½	41½
Lisbon	3	3	1¾
	203¼	200	224¼
Seahorse teeth and Boars' tusks	7	9¾	7¼
	210¼	209¾	231½

Fluctuations in prices of ivory at the London Sale-Room (from Messrs Hale & Son's Charts, which show the prices at each quarterly sale from 1870).

	1870.	1880.	1890.	1900.	1905.
Billiard Ball pieces	£55	£90	£112	£68	£167
Averages—					
Hard Egyptian 36 to 50 ℔.	30	38	50	29	48
Soft East Indian 50 to 70 ℔.	67	55	88	57	72
West Coast African 50 to 70 ℔.	36	57	65	48	61
Hard East African 50 to 70 ℔.	37	49	64	48	61

In October 1889 soft East Indian fetched an average of £82 per cwt., but in several instances higher prices were realized, and one lot reached £88 per cwt. At the Liverpool April sales 1906 about 7¼ tons were offered from Gabun, Angola, and Cameroon (from the last $5\frac{3}{4}$ tons). To the port of Antwerp the imports were 6830 cwt. in 1904 and 6570 cwt. in 1905; of which 5310 cwt. and 4890 cwt. respectively were from the Congo State.

The leading London sales are held quarterly in Mincing Lane, a very interesting and wonderful display of tusks and ivory of all kinds being laid out previously for inspection in the great warehouses known as the "Ivory Floor" in the London docks. The quarterly Liverpool sales follow the London ones, with a short interval.

The important part which ivory plays in the industrial arts not only for decorative, but also for domestic applications is hardly sufficiently recognized. Nothing is wasted of this valuable product. Hundreds of sacks full of cuttings and shavings, and scraps returned by manufacturers after they have used what they require for their particular trade, come to the mart. The dust is used for polishing, and in the preparation of Indian ink, and even for food in the form of ivory jelly. The scraps come in for inlaying and for the numberless purposes in which ivory is used for small domestic and decorative objects. India, which has been called the backbone of the trade, takes enormous quantities of the rings left in the turning of billiard-balls, which serve as women's bangles, or for making small toys and models, and in other characteristic Indian work. Without endeavouring to enumerate all the applications, a glance may be cast at the most important of those which consume the largest quantity. Chief among these is the manufacture of billiard-balls, of cutlery handles, of piano-keys and of brushware and toilet articles. Billiard-balls demand the highest quality of ivory; for the best balls the soft description is employed, though recently, through the competition of bonzoline and similar substitutes, the hard has been more used in order that the weight may be assimilated to that of the artificial kind. Therefore the most valuable tusks of all are those adapted for the billiard-ball trade. The term used is "scrivelloes," and is applied to teeth proper for the purpose, weighing not over about 7 lb. The division of the tusk into smaller pieces for subsequent manufacture, in order to avoid waste, is a matter of importance.

The accompanying diagrams (figs. 1 and 2) show the method; the cuts are made radiating from an imaginary centre of the curve of the tusk. In after processes the various trades have their own particular methods for making the most of the material. In making a billiard-ball of the English size the first thing to be done is to rough out, from the cylindrical section, a sphere about $2\frac{1}{8}$ in. in diameter, which will eventually be $2\,{}^{1}/_{16}$ or sometimes for professional players a little larger. One hemisphere—as shown in the diagrams (fig. 2)—is first turned, and the resulting ring detached with a parting tool. The diameter is accurately taken and the subsequent removals taken off in other directions. The ball is then fixed in a wooden chuck, the half cylinder reversed, and the operation repeated for the other hemisphere. It is now left five years to season and then turned dead true. The rounder and straighter the tusk selected for ball-making the better. Evidently, if the tusk is oval and the ball the size of the least diameter, its sides which come nearer to the bark or rind will be coarser and of a different density from those portions further removed from this outer skin. The matching of billiard-balls is important, for extreme accuracy in weight is essential. It is usual to bleach them, as the purchaser—or at any rate the distributing intermediary—likes to have them of a dead white. But this is a mistake, for bleaching with chemicals takes out the gelatine to some extent, alters the quality and affects the density; it also makes them more liable to crack, and they are not nearly so nice-looking. Billiard-balls should be bought in summer time when the temperature is most equable, and gently used till the winter season. On an average three balls of fine quality are got out of a tooth. The stock of more than one great manufacturer surpasses at times 30,000 in number. But although ball teeth rose in 1905 to £167 a cwt., the price of billiard-balls was the same in 1905 as it was in 1885. Roughly speaking, there are about twelve different qualities and prices of billiard-balls, and eight of pyramid-and pool-balls, the latter ranging from half a guinea to two guineas each.

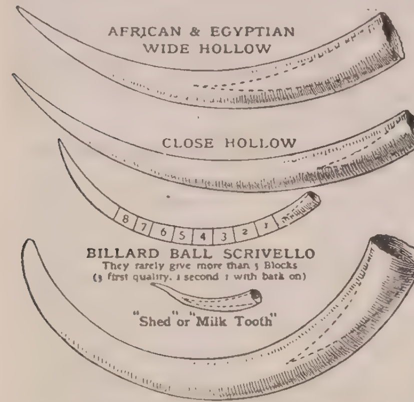


FIG. 1.

The ivory for piano-keys is delivered to the trade in the shape of what are known as heads and tails, the former for the parts which come under the fingers, the latter for that running up between the black keys. The two are joined afterwards on the keyboard with extreme accuracy. Piano-keys are bleached, but organists for some reason or other prefer unbleached keys. The soft variety is mostly used for high-class work and preferably of the Egyptian type.

The great centres of the ivory industry for the ordinary objects of common domestic use are in England, for cutlery handles Sheffield, for billiard-balls and piano-keys London. For cutlery a large firm such as Rodgers & Sons uses an average of some twenty tons of ivory annually, mostly of the hard variety. But for billiard-balls and piano-keys America is now a large producer, and a considerable quantity is made in France and Germany. Brush backs are almost wholly in English hands. Dieppe has long been famous for the numberless little ornaments and useful articles such as statuettes, crucifixes, little book-covers, paper-cutters, combs, serviette-rings and *articles de Paris* generally. And St Claude in the Jura, and Geislingen in Würtemberg, and Erbach in Hesse, Germany, are amongst the most important centres of the industry. India and China supply the multitude of toys, models, chess and draughtsmen, puzzles, workbox fittings and other curiosities.

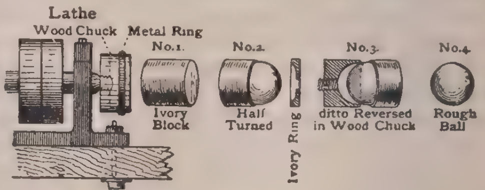


FIG. 2.

Vegetable Ivory, &c.—Some allusion may be made to vegetable ivory and artificial substitutes. The plants yielding the vegetable ivory of commerce represent two or more species of an anomalous genus of palms, and are known to botanists as *Phytelephas*. They are natives of tropical South America, occurring chiefly on the banks of the river Magdalena, Colombia, always found in damp localities, not only, however, on the lower coast region as in Darien, but also at a considerable elevation above the sea. They are mostly found in separate groves, not mixed with other trees or shrubs. The plant is severally known as the "tagua" by the Indians on the banks of the Magdalena, as the "anta" on the coast of Darien, and as the "pullipunta" and "homero" in Peru. It is stemless or short-stemmed, and crowned with from twelve to twenty very long pinnatifid leaves. The plants are dioecious, the males forming higher, more erect and robust trunks than the females. The male inflorescence is in the form of a simple fleshy cylindrical spadix covered with flowers; the female flowers are also in a single spadix, which, however, is shorter than in the male. The fruit consists of a conglomerated head composed of six or seven drupes, each containing from six to nine seeds, and the whole being enclosed in a walled woody covering forming altogether a globular head as large as that of a man. A single plant sometimes bears at the same time from six to eight of these large heads of fruit, each weighing from 20 to 25 lb. In its very young state the seed contains a clear insipid fluid, which travellers take advantage of to allay thirst. As it gets older this fluid becomes milky and of a sweet taste, and it gradually continues to change both in taste and consistence until it becomes so hard as to make it valuable as a substitute for animal ivory. In their young and fresh state the fruits are eaten with avidity by bears, hogs and other animals. The seeds, or nuts as they are usually called when fully ripe and hard, are used by the American Indians for making small ornamental articles and toys. They are imported into Britain in considerable quantities, frequently under the name of "Côrozo" nuts, a name by which the fruits of some species of *Attalea* (another palm with hard ivory-like seeds) are known in Central America—their uses being chiefly for small articles of turnery. Of vegetable ivory Great Britain imported in 1904 1200 tons, of which about 400 tons were re-exported, principally to Germany. It is mainly and largely used for coat buttons.

Many artificial compounds have, from time to time, been tried as substitutes for ivory; amongst them potatoes treated with sulphuric acid. Celluloid is familiar to us nowadays. In the form of bonzoline, into which it is said to enter, it is used largely for billiard balls; and a new French substitute—a caseine made from milk, called gallalith—has begun to be much used for piano keys in the cheaper sorts of instrument. Odontolite is mammoth ivory, which through lapse of time and from surroundings becomes converted into a substance known as fossil or blue ivory, and is used occasionally in jewelry as turquoise, which it very much resembles. It results from the tusks of antediluvian mammoths buried in the earth for thousands of years, during which time under certain conditions the ivory becomes slowly penetrated with the metallic salts which give it the peculiar vivid blue colour of turquoise.

Ivory Sculpture and the Decorative Arts.—The use of ivory as a material peculiarly adapted for sculpture and decoration has been universal in the history of civilization. The earliest examples which have come down to us take us back to prehistoric times, when, so far as our knowledge goes, civilization as we understand it had attained no higher degree than that of the dwellers in caves, or of the most primitive races. Throughout succeeding ages there is continued evidence that no other substance—except perhaps wood, of which we have even fewer ancient examples—has been so consistently connected with man's art-craftsmanship. It is hardly too much to say that to follow properly the history of ivory sculpture involves the study of the whole world's art in all ages. It will take us back to the most remote antiquity, for we have examples of the earliest dynasties of Egypt and Assyria. Nor is there entire default when we come to the periods of the highest civilization of Greece and Rome. It has held an honoured place in all ages for the adornment of the palaces of the great, not only in sculpture proper but in the rich inlay of panelling, of furniture, chariots and other costly articles. The Bible teems with references to its beauty and value. And when, in the days of Pheidias, Greek sculpture had reached the highest perfection, we learn from ancient writers that colossal statues were constructed—notably the "Zeus of Olympia" and the "Athena of the Parthenon." The faces, hands and other exposed portions of these figures were of ivory, and the question, therefore, of the method of production of such extremely large slabs as perhaps were used has been often debated. A similar difficulty arises with regard to other pieces of considerable size, found, for example, amongst consular diptychs. It has been conjectured that some means of softening and moulding ivory was known to the ancients, but as a matter of fact though it may be softened it cannot be again restored to its original condition. If up to the 4th century we are unable to point to a large number of examples of sculpture in ivory, from that date onwards the chain is unbroken, and during the five or six hundred years of unrest and strife from the decline of the Roman empire in the 5th century to the dawn of the Gothic revival of art in the 11th or 12th, ivory sculpture alone of the sculptural arts carries on the preservation of types and traditions of classic times in central Europe. Most important indeed is the rôle which existing examples of ivory carving play in the history of the last two centuries of the consulates of the Western and Eastern empires. Though the evidences of decadence in art may be marked, the close of that period brings us down to the end of the reign of Justinian (527–563). Two centuries later the iconoclastic persecutions in the Eastern empire drive westward and compel to settle there numerous colonies of monks and artificers. Throughout the Carlovingian period, the examples of ivory sculpture which we possess in not inconsiderable quantity are of extreme importance in the history of the early development of Byzantine art in Europe. And when the Western world of art arose from its torpor, freed itself from Byzantine shackles and traditions, and began to think for itself, it is to the sculptures in ivory of the Gothic art of the 13th and 14th centuries that we turn with admiration of their exquisite beauty of expression. Up to about the 14th century the influence of the church was everywhere predominant in all matters relating to art. In ivories, as in mosaics, enamels or miniature painting it would be difficult to find a dozen examples, from the age of Constantine onwards, other than sacred ones or of sacred symbolism. But as the period of the Renaissance approached, the influence of romantic literature began to assert itself, and a feeling and style similar to those which are characteristic of the charming series of religious art in ivory, so touchingly conceived and executed, meet us in many objects in ivory destined for ordinary domestic uses and ornament. Mirror cases, caskets for jewelry or toilet purposes, combs, the decoration of arms, or of saddlery or of weapons of the chase, are carved and chased with scenes of real life or illustrations of the romances, which bring home to us in a vivid manner details of the manners and customs, amusements, dresses and domestic life of the times. With the Renaissance and a return to classical ideas, joined with a love of display and of gorgeous magnificence, art in ivory takes a secondary place. There is a want of simplicity and of originality. It is the period of the commencement of decadence. Then comes the period nicknamed *rococo*, which persisted so long. Ivory carving follows the vulgar fashion, is content with copying or adapting, and until the revival in our own times is, except in rare instances, no longer to be classed as a fine art. It becomes a trade and is in the hands of the mechanic of the workshop. In this necessarily brief and condensed sketch we have been concerned mainly with ivory carving in Europe. It will be necessary to give also, presently, some indications enabling the inquirer to follow the history—or at least to put him on the track of it—not only in the different countries of the West but also in India, China and Japan.

Prehistoric Ivory Carvings.—These are the result of investigations made about the middle of the 19th century in the cave dwellings of the Dordogne in France and also of the lake dwellings of Switzerland. As records they are unique in the history of art. Further than this our wonderment is excited at finding these engravings or sculptures in the round, these chiselled examples of the art of the uncultivated savage, conceived and executed with a feeling of delicacy and restraint which the most modern artist might envy. Who they were who executed them must be left to the palaeontologist and geologist to decide. We can only be certain that they were contemporary with the period when the mammoth and the reindeer still roved freely in southern France. The most important examples are the sketch of the mammoth (see PAINTING, Plate I.), on a slab of ivory now in the museum of the Jardin des Plantes, the head and shoulders of an ibex carved in the round on a piece of reindeer horn, and the figure of a woman (instances of representations of the human form are most rare) naked and wearing a necklace and bracelet. Many of the originals are in the museum at St Germain-en-Laye, and casts of a considerable number are in the British Museum.

Ancient Assyrian, Egyptian, Greek and Roman Ivories.—We know from ancient writers that the Egyptians were skilled in ivory carving and that they procured ivory in large quantities from Ethiopia. The Louvre possesses examples of a kind of flat castanets or clappers, in the form of the curve of the tusks themselves, engraved in outline, beautifully modelled hands

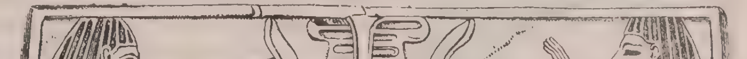
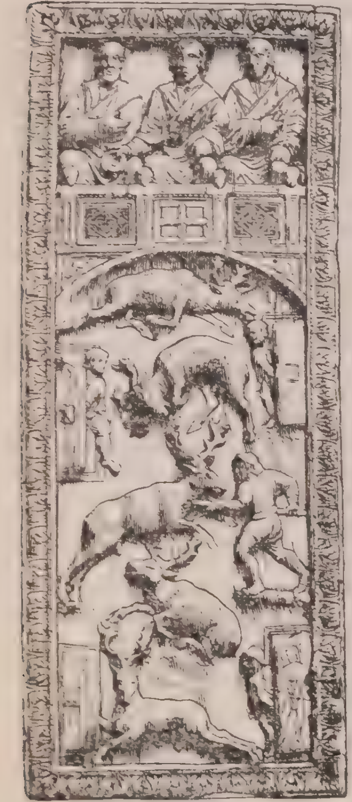


FIG. 3.—Panel with Cartouche, Nineveh.

forming the tapering points; and large quantities of small objects, including a box of plain form and simple decoration identified from the inscribed praenomen as the fifth dynasty, about 4000 B.C. The British Museum and the museum at Cairo are also comparatively rich. But no other collection in the world contains such an interesting collection of ancient Assyrian ivories as that in the British Museum. Those exhibited number some fifty important pieces, and many other fragments are, on account of their fragility or state of decay, stowed away. The collection is the result of the excavations by Layard about 1840 on the supposed site of Nineveh opposite the modern city of Mosul. When found they were so decomposed from the lapse of time as scarcely to bear touching or the contact of the external air. Layard hit upon the ingenious plan of boiling in a solution of gelatine and thus restoring to them the animal matter which had dried up in the course of centuries. Later, the explorations of Flinders Petrie and others at Abydos brought to light a considerable number of sculptured fragments which may be even two thousand years older than those of Nineveh. They have been exhibited in London and since distributed amongst various museums at home and abroad.

Consular and Official and Private Diptychs.—About fifty of the remarkable plaques called "consular diptychs," of the time of the three last centuries of the consulates of the Roman and Greek empire have been preserved. They range in date from perhaps mid-fourth to mid-sixth centuries, and as with two or three exceptions the dates are certain it would be difficult to overestimate their historic or intrinsic value. The earliest of absolutely certain date is the diptych of Aosta (A.D. 408), the first after the recognition of Christianity; or, if the Monza diptych represents, as some think, the Consul Stilicon, then we may refer back six years earlier. At any rate the edict of Theodosius in A.D. 384, concerning the restriction of the use of ivory to the diptychs of the regular consuls, is evidence that the custom must have been long established. According to some authorities the beautiful leaf of diptych in the Liverpool Museum (fig. 4) is a consular one and to be ascribed to Marcus Julius Philippus (A.D. 248). Similarly the Gherardesca leaf in the British Museum may be accepted as of the Consul Marcus Aurelius (A.D. 308). But the whole question of the half dozen earliest examples is conjectural. With a few notable exceptions they show decadence in art. Amongst the finest may be cited the leaf with the combats with stags at Liverpool, the diptych of Probianus at Berlin and the two leaves, one of Anastasius, the other of Orestes, in the Victoria and Albert Museum. The literature concerning these diptychs is voluminous, from the time of the erudite treatise by Gori published in 1759 to the present day. The latest of certain date is that of Basilius, consul of the East in 541, the last of the consuls. The diptychs of private individuals or of officials number about sixteen, and in the case of the private ones have a far greater artistic value. Of these the Victoria and Albert Museum possesses the most beautiful leaf of perhaps the finest example of ancient ivory sculpture which has come down to us, diptychon Meleretense, representing a Bacchante (fig. 5). The other half, which is much injured, is in the Cluny Museum. Other important pieces are the Aesculapius and Hygeia at Liverpool, the Hippolytus and Phaedra at Brescia, the Barberini in the Bargello and at Vienna and the Rufius Probianus at Berlin. Besides the diptychs ancient Greek and Roman ivories before the recognition of Christianity are comparatively small in number and are mostly in the great museums of the Vatican, Naples, the British Museum, the Louvre and the Cluny Museum. Amongst them are the statuette of Penthea, perhaps of the 3rd century (Cluny), a large head of a woman (museum of Vienna) and the Bellerophon (British Museum), nor must those of the Roman occupation in England and other countries be forgotten. Notable instances are the plaque and ivory mask found at Caerleon. Others are now in the Guildhall and British Museums, and most continental European museums have examples connected with their own history.



From photo by W. A. Mansell & Co.

FIG. 4.—Leaf of diptych showing combats with stags; in the Liverpool Museum.

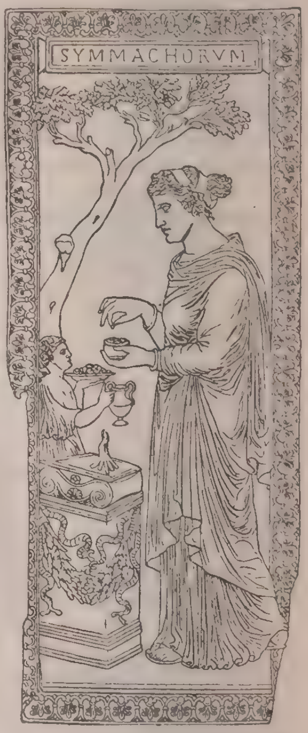


FIG. 5.—Leaf of Roman diptych, representing a Bacchante; in the Victoria and Albert Museum.

Early Christian and Early Byzantine Ivories.—The few examples we possess of Christian ivories previous to the time of Constantine are not of great importance from the point of view of the history of art. But after that date the ivories which we may ascribe to the centuries from the end of the 4th to at least the end of the 9th become of considerable interest, on account of their connexion with the development of Byzantine art in western Europe. With regard to exact origins and dates opinions are largely divergent. In great part they are due to the carrying on of traditions and styles by which the makers of the sarcophagi were inspired, and the difficulties of ascription are increased when in addition to the primitive elements the influence of Byzantine systems introduced many new ideas derived from many extraneous sources. The questions involved are of no small archaeological, iconographical and artistic importance, but it must be admitted that we are reduced to conjecture in many cases, and compelled to theorize. And it would seem to be impossible to be more precise as to dates than within a margin of sometimes three centuries. Then, again, we are met by the question how far these ivories are connected with Byzantine art; whether they were made in the West by immigrant Greeks, or indigenous works, or purely imported productions. Some German critics have endeavoured to construct a system of schools, and to form definite groups, assigning them to Rome, Ravenna, Milan and Monza. Not only so, but they claim to be precise in dating even to a certain decade of a century. But it is certainly more than doubtful whether there is sufficient evidence on which to found such assumptions. It is at least probable that a considerable number of the ivories whose dates are given by such a number of critics so wide a range as from the 4th to the 10th century are nothing more than the work of the monks of the numerous monasteries founded throughout the Carlovingian empire, copying and adapting from whatever came into their hands. Many of them were Greek immigrants exiled at the time of the iconoclastic persecutions. To these must be added the Celtic and Anglo-Saxon missionaries, who brought with them and disseminated their own national feeling and technique. We have to take into account also the relations which existed not only with Constantinople but also with the great governing provinces of Syria and Egypt. Where all our information is so vague, and in the face of so much conflicting opinion amongst authorities, it is not unreasonable to hold with regard to very many of these ivories that instead of assigning them to the age of Justinian or even the preceding century we ought rather to postpone their dating from one to perhaps three centuries later and to admit that we cannot be precise even within these limits. It would be impossible to follow here the whole of the arguments relating to this most important period of the development of ivory sculpture or to mention a tithe of the examples which illustrate it. Amongst the most striking the earliest is the very celebrated leaf of a diptych in the British Museum representing an archangel (fig. 6). It is generally admitted that we have no ivory of the 5th or 6th centuries or in fact of any early medieval period which can compare with it in excellence of design and workmanship. There is no record (it is believed) from whence the museum obtained the ivory. There are at least plausible grounds for surmising that it is identical with the "Angelus longus eburneus" of a book-cover among the books brought to England by St Augustine which is mentioned in a list of things belonging to Christchurch, Canterbury (see Dart, *App.* p. xviii.). The dating of the four Passion plaques, also in the British Museum, varies from the 5th to the 7th century. But although most recent authorities accept the earlier date, the present writer holds strongly that they are not anterior to, at earliest, the 7th century. Even then they will remain, with the exception of the Monza oil flask and perhaps the St Sabina doors, the earliest known representation of the crucifixion. The ivory vase, with cover, in the British Museum, appears to possess defined elements of the farther East, due perhaps to the relations between Syria and Christian India or Ceylon. Other important early Christian ivories are the series of pyxes, the diptych in the treasury of St Ambrogio at Milan, the chair of Maximian at Ravenna (most important as a type piece), the panel with the "Ascension" in the Bavarian National Museum, the Brescia casket, the "Lorsch" bookcovers of the Vatican and Victoria and Albert Museum, the Bodleian and other bookcovers, the St Paul diptych in the Bargello at Florence and the "Annunciation" plaque in the Trivulzio collection. So far as unquestionably oriental specimens of Byzantine art are concerned they are few in number, but we have in the famous Harbaville triptych in the Louvre a super-excellent example.

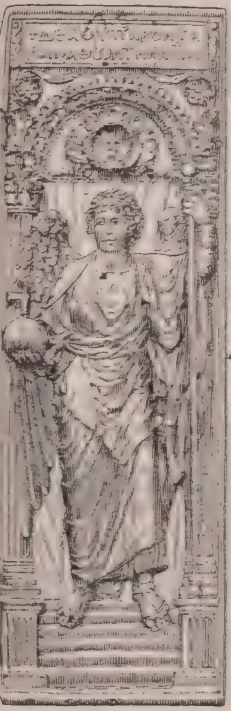

From photo by W. A. Mansell & Co.

FIG. 6.—Leaf of Diptych, representing Archangel; in the British Museum.

Gothic Ivories.—The most generally charming period of ivory sculpture is unquestionably that which, coincident with the Gothic revival in art, marked the beginning of a great and lasting change. The formalism imposed by Byzantine traditions gave place to a brighter, more delicate and tenderer conception. This golden age of the ivory carver—at its best in the 14th century—was still in evidence during the 15th, and although there is the beginning of a transition in style in the 15th century, the period of neglect and decadence which set in about the beginning of the 16th hardly reached the acute stage until well on into the 17th. To review the various developments both of religious art which reigned almost alone until the 14th century, or of the secular side as exemplified in the delightful mirror cases and caskets carved with subjects from the romantic stories which were so popular, would be impossible here. Almost every great museum and famous private collection abounds in examples of the well-known diptychs and triptychs and little portable oratories of this period. Some, as in a famous panel in the British Museum, are marvels of minute workmanship, others of delicate openwork and tracery. Others, again, are remarkable for the wonderful way in which, in the compass of a few inches, whole histories and episodes of the scriptural narratives are expressed in the most vivid and telling manner. Charming above all are the statuettes of the Virgin and Child which French and Flemish art, especially, have handed down to us. Of these the Victoria and Albert Museum possesses a representative collection. Another series of interest is that of the croziers or pastoral staves, the development of which the student of ivories will be careful to study in connexion with the earlier ones and the tau-headed staves. In addition there are shrines, reliquaries, bookcovers, liturgical combs, portable altars, pyxes, holy water buckets and sprinklers, *flabella* or liturgical fans, rosaries, *memento mori*, paxes, small figures and groups, and almost every conceivable adjunct of the sanctuary or the private oratory. It is to French or Flemish art that the greater number and the most beautiful must be referred. At the same time—to take one example only—the diptych and triptych of Bishop Grandison in the British Museum—we have evidence that English ivory carvers were capable of rare excellence of design and workmanship. Nor can crucifixes be forgotten, though they are of extreme rarity before the 17th century. A most beautiful 13th-century figure for one—though only a fragment—is in the Victoria and Albert Museum. Amongst secular objects of this period, besides the mirror cases (fig. 7) and caskets, there are hunting horns (the earlier ones probably oriental, or more or less faithfully copied from oriental models), chess and draughtsmen (especially the curious set from the isle of Lewis), combs, marriage coffers (at one period remarkable Italian ones of bone), memorandum tablets, seals, the pommels and cantles of saddles and a

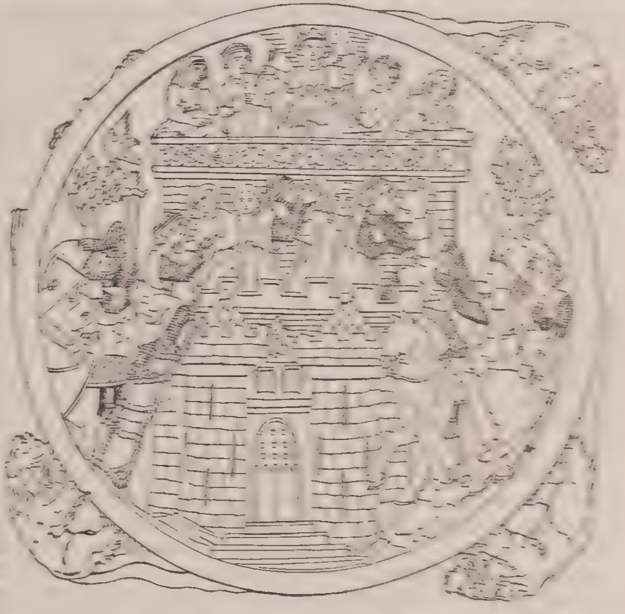


FIG. 7.—Mirror Case, illustrating the Storming of the Castle of Love; in the Victoria and Albert Museum.

unique harp now in the Louvre. The above enumeration will alone suffice to show that the inquirer must be referred for details to the numerous works which treat of medieval ivory sculpture.

Ivory Sculpture from the 16th to the 19th Century.—Compared with the wealth of ivory carving of the two preceding centuries, the 15th, and especially the 16th, centuries are singularly poor in really fine work. But before we arrive at the period of real decadence we shall come across such things as the knife of Diana of Poitiers in the Louvre, the sceptre of Louis XIII., the Rothschild hunting horn, many Italian powder horns, the German Psyche in the Louvre, or the "Young Girl and Death" in the Munich Museum, in which there is undoubtedly originality and talent of the first order. The practice of ivory carving became extremely popular throughout the 17th and 18th centuries, especially in the Netherlands and in Germany, and the amount of ivory consumed must have been very great. But, with rare exceptions, and these for the most part Flemish, it is art of an inferior kind, which seems to have been abandoned to second-rate sculptors and the artisans of the workshop. There is little originality, the rococo styles run riot, and we seem to be condemned to wade through an interminable series of gods and goddesses, bacchanalians and satyrs, pseudo-classical copies from the antique and imitations of the schools of Rubens. As a matter of fact few great museums, except the German ones, care to include in their collections examples of these periods. Some exceptions are made in the case of Flemish sculptors of such talent as François Duquesnoy (Fiammingo), Gerard van Obstal or Lucas Fayd'herbe. In a lesser degree, in Germany, Christoph Angermair, Leonhard Kern, Bernhard Strauss, Elhafen, Kruger and Rauchmiller; and, in France, Jean Guillermin, David le Marchand and Jean Cavalier. Crucifixes were turned out in enormous numbers, some of not inconsiderable merit, but, for the most part, they represent anatomical exercises varying but slightly from a pattern of which a celebrated one atributed to Faistenberger may be taken as a type. Tankards abound, and some, notably the one in the Jones collection, than which perhaps no finer example exists, are also of a high standard. Duquesnoy's work is well illustrated by the charming series of six plaques in the Victoria and Albert Museum known as the "Fiammingo boys." Amongst the crowd of objects in ivory of all descriptions of the early 18th century, the many examples of the curious implements known as *rappoirs*, or tobacco graters, should be noticed. It may perhaps be necessary to add that although the character of art in ivory in these periods is not of the highest, the subject is not one entirely unworthy of attention and study, and there are a certain number of remarkable and even admirable examples.

Ivory Sculpture of Spain, Portugal, India, China and Japan.—Generally speaking, with regard to Spain and Portugal, there is little reason to do otherwise than confine our attention to a certain class of important Moorish or Hispano-Moresque ivories of the time of the Arab occupation of the Peninsula, from the 8th to the 15th centuries. Some fine examples are in the Victoria and Albert Museum. Of Portuguese work there is little except the hybrid productions of Goa and the Portuguese settlements in the East. Some mention must be made also of the remarkable examples of mixed Portuguese and savage art from Benin, now in the British Museum. Of Indian ivory carving the India Museum at Kensington supplies a very large and varied collection which has no equal elsewhere. But there is little older than the 17th century, nor can it be said that Indian art in ivory can occupy a very high place in the history of the art. What we know of Chinese carving in ivory is confined to those examples which are turned out for the European market, and can hardly be considered as appealing very strongly to cultivated tastes. A brief reference to the well-known delightful *netsukés* and the characteristic inlaid work must suffice here for the ivories of Japan (see JAPAN: *Art*).

Ivory Sculpture in the 19th Century and of the Present Day.—Few people are aware of the extent to which modern ivory sculpture is practised by distinguished artists. Year by year, however, a certain amount is exhibited in the Royal Academy and in most foreign salons, but in England the works—necessarily not very numerous—are soon absorbed in private collections. On the European continent, on the contrary, in such galleries as the Belgian state collections or the Luxembourg, examples are frequently acquired and exhibited. In Belgium the acquisition of the Congo and the considerable import of ivory therefrom gave encouragement to a definite revival of the art. Important exhibitions have been held in Belgium, and a notable one in Paris in 1904. Though ivory carving is as expensive as marble sculpture, all sculptors delight in following it, and the material entails no special knowledge or training. Of 19th-century artists there were in France amongst the best known, besides numerous minor workers of Dieppe and St Claude, Augustin Moreau, Vautier, Soitoux, Belleteste, Meugniot, Pradier, Triqueti and Gerôme; and in the first decade of the 20th century, besides such distinguished names in the first rank as Jean Dampt and Théodore Rivière, there were Vever, Gardet, Caron, Barrias, Allouard, Ferrary and many others. Nor must the decorative work of René Lalique be omitted. No less than forty Belgian sculptors exhibited work in ivory at the Brussels exhibition of 1887. The list included artists of such distinction as J. Dillens, Constantin Meunier, van der Stappen, Khnopff, P. Wolfers, Samuel and Paul de Vigne, and amongst contemporary Belgian sculptors are also van Beurden, G. Devreese, Vincotte, de Tombay and Lagae. In England the most notable work includes the "Lamia" of George Frampton, the "St Elizabeth" of Alfred Gilbert, the "Mors Janua Vitae" of Harry Bates, the "Launcelot" of W. Reynolds-Stephens and the use of ivory in the applied arts by Lynn Jenkins, A. G. Walker, Alexander Fisher and others.

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On the consular diptychs, see H. F. Clinton, *Fasti Romani* (1845–1850); A. Gori, *Thesaurus veterum diptychorum* (1759); C. Lenormant, *Trésor de numismatique et de glyptique* (1834–1846); F. Pulszky, *Catalogue of the Féjérváry Ivories* (1856).

On the artistic interest generally, see also C. Alabaster, *Catalogue of Chinese Objects in the South Kensington Museum*; Sir R. Alcock, *Art and Art Industries in Japan* (1878); Barraud et Martin, *Le Bâton pastoral* (1856); Bouchot, *Les Reliures d'art à la Bibliothèque Nationale*; Bretagne, *Sur les peignes liturgiques*; H. Cole, *Indian Art at Delhi* (1904); R. Garrucci, *Storia dell' arte Christiana* (1881); A. Jacquemart, *Histoire du mobilier* (1876); J. Labarte, *Histoire des arts industriels* (1864); C. Lind, *Über den Krummstab* (1863); Sir F. Madden, "Lewis Chessmen" (in *Archaeologia*, vol. xxiv. 1832); W. Maskell, *Ivories, Ancient and Medieval in the South Kensington Museum* (1872); A. Michel, *Histoire de l'art*; E. Molinier, *Histoire générale des arts* (1896); E. Oldfield, *Catalogue of Fictile Ivories sold by the Arundel Society* (1855); A. H. Pitt Rivers, *Antique Works of Art from Benin* (1900); A. C. Quatremère de Quincy, *Le Jupiter Olympien* (1815); Charles Scherer, *Elfenbeinplastik seit der Renaissance* (1903); E. du Sommerard, *Les Arts au moyen âge* (1838–1846); G. Stephens, *Runic Caskets* (1866–1868); A. Venturi, *Storia dell' arte Italiana* (1901); Sir G. Watt, *Indian Art at Delhi* (1904); J. O. Westwood, *Fictile Ivories in the South Kensington Museum* (1876). Sir M. D. Wyatt, *Notices of Sculpture in Ivory* (1856). (A. ML.)

IVORY COAST (*Côte d'Ivoire*), a French West African colony, bounded S. by the Gulf of Guinea, W. by Liberia and French Guinea, N. by the colony of Upper Senegal and Niger, E. by the Gold Coast. Its area is approximately 120,000 sq. m., and its population possibly 2,000,000, of whom some 600 are Europeans. Official estimates (1908) placed the native population as low as 980,000.

Physical Features.—The coast-line extends from 7° 30′ to 3° 7′ W. and has a length of 380 m. It forms an arc of a circle of which the convexity turns slightly to the north; neither bay nor promontory breaks the regularity of its outline. The shore is low, bordered in its eastern half with lagoons, and difficult of access on account of the submarine bar of sand which stretches along nearly the whole of the coast, and also because of the heavy surf caused by the great Atlantic billows. The principal lagoons going W. to E. are those of Grand Lahou, Grand Bassam or Ebrié and Assini. The coast plains extend inland about 40 m. Beyond the ground rises in steep slopes to a general level of over 1000 ft., the plateau being traversed in several directions by hills rising 2000 ft. and over, and cut by valleys with a general south-eastern trend. In the north-east, in the district of Kong (q.v.), the country becomes mountainous, Mt. Komonos attaining a height of 4757 ft. In the north-west, by the Liberian frontier, the mountains in the Gon region rise over 6000 ft. Starting from the Liberian frontier, the chief rivers are the Cavalla (or Kavalli), the San Pedro, the Sassandra (340 m. long), the Bandama (225 m.), formed by the White and the Red Bandama, the Komoe (360 m.) and the Bia. All these streams are interrupted by rapids as they descend from the highlands to the plain and are unnavigable by steamers save for a few miles from their mouths. The rivers named all drain to the Gulf of Guinea; the rivers in the extreme north of the colony belong to the Niger system, being affluents of the Bani or Mahel Balevel branch of that river. The watershed runs roughly from 9° N. in the west to 10° N. in the east and is marked by a line of hills rising about 650 ft. above the level of the plateau. The climate is in general very hot and unhealthy, the rainfall being very heavy. In some parts of the plateau healthier conditions prevail. The fauna and flora are similar to those of the Gold Coast and Liberia. Primeval forest extends from the coast plains to about 8° N., covering nearly 50,000 sq. m.

Inhabitants.—The coast districts are inhabited by Negro tribes allied on the one hand to the Krumen (*q.v.*) and on the other to the people of Ashanti (*q.v.*). The Assinis are of Ashanti origin, and chiefly of the Ochin and Agni tribes. Farther west are found the "Jack-Jacks" and the "Kwa-Kwas," sobriquets given respectively to the Aradian and Avikom by the early European traders. The Kwa-Kwa are said to be so called because their salutation "resembles the cry of a duck." In the interior the Negro strain predominates but with an admixture of Hamitic or Berber blood. The tribes represented include Jamans, Wongaras and Mandingos (*q.v.*), some of whom are Moslems. The Mandingos have intermarried largely with the Bambara or Sienuf, an agricultural people of more than average intelligence widely spread over the country, of which they are considered to be the indigenous race. The Bambara themselves are perhaps only a distinct branch of the original Mandingo stock. The Baulé, who occupy the central part of the colony, are of Agni-Ashanti origin. The bulk of the inhabitants are fetish worshippers. On the northern confines of the great forest belt live races of cannibals, whose existence was first made known by Captain d'Ollone in 1899. In general the coast tribes are peaceful. They have the reputation of being neither industrious nor intelligent. The traders are chiefly Fanti, Sierra Leonians, Senegalese and Mandingos.

Towns.—The chief towns on the coast are Grand and Little Bassam, Jackville and Assini in the east and Grand Lahou, Sassandra and Tabu in the west. Grand and Little Bassam are built on the strip of sand which separates the Grand Bassam or Ebrié lagoon from the sea. This lagoon forms a commodious harbour, once the bar has been crossed. Grand Bassam is situated at the point where the lagoon and the river Komoe enter the sea and there is a minimum depth of 12 ft. of water over the bar. The town (pop. 5000, including about 100 Europeans) is the seat of the customs administration and of the judicial department, and is the largest centre for the trade of the colony. A wharf equipped with cranes extends beyond the surf line and the town is served by a light railway. It is notoriously unhealthy; yellow fever is endemic. Little Bassam, renamed by the French Port Bouet, possesses an advantage over the other ports on the coast, as at this point there is no bar. The sea floor is here rent by a chasm known as the "Bottomless Pit," the waters having a depth of 65 ft. Abijean (Abidjan), on the north side of the lagoon opposite Port Bouet, is the starting-point of a railway to the oil and rubber regions. The half-mile of foreshore separating the port from the lagoon was in 1904–1907 pierced by a canal, but the canal silted up as soon as cut, and in 1908 the French decided to make Grand Bassam the chief port of the colony. Assini is an important centre for the rubber trade of Ashanti. On the northern shore of the Bassam lagoon, and 10 m. from Grand Bassam, is the capital of the colony, the native name Adjame having been changed into Bingerville in honour of Captain L. G. Binger (see below). The town is built on a hill and is fairly healthy.

In the interior are several towns, though none of any size numerically. The best known are [illegible], Kong and Bona, entrepôts for the trade of the middle Niger, and Bontuku, on the caravan route to Sokoto and the meeting-place of the merchants from Kong and Timbuktu engaged in the kola-nut trade with Ashanti and the Gold Coast. Bontuku is peopled largely by Wongara and Hausa, and most of the inhabitants, who number some 3000, are Moslems. The town, which was founded in the 15th century or earlier, is walled, contains various mosques and generally presents the appearance of an eastern city.

Agriculture and Trade.—The natives cultivate maize, plantains, bananas, pineapples, limes, pepper, cotton, &c., and live easily on the products of their gardens, with occasional help from fishing and hunting. They also weave cloth, make pottery and smelt iron. Europeans introduced the cultivation of coffee, which gives good results. The forests are rich in palm-tree products, rubber and mahogany, which constitute the chief articles of export. The rubber goes almost exclusively to England, as does also the mahogany. The palm-oil and palm kernels are sent almost entirely to France. The value of the external trade of the colony exceeded £1,000,000 for the first time in 1904. About 50% of the trade is with Great Britain. The export of ivory, for which the country was formerly famous, has almost ceased, the elephants being largely driven out of the colony. Cotton goods, by far the most important of the imports, come almost entirely from Great Britain. Gold is found and many native villages have small "placer" mines. In 1901 the government of the colony began the granting of mining concessions, in which British capital was largely invested. There are many ancient mines in the country, disused since the close of the 18th century, if not earlier.

Communications.—The railway from Little Bassam serves the east central part of the colony and runs to Katiola, in Kong, a total distance of 250 m. The line is of metre gauge. The cutting of two canals, whereby communication is effected by lagoon between Assini and Grand Lahou via Bassam, followed the construction of the railway. Grand and Little Bassam are in regular communication by steamer with Bordeaux, Marseilles, Liverpool, Antwerp and Hamburg. Grand Bassam is connected with Europe by submarine cable via Dakar. Telegraph lines connect the coast with all the principal stations in the interior, with the Gold Coast, and with the other French colonies in West Africa.

Administration, &c.—The colony is under the general superintendence of the government general of French West Africa. At the head of the local administration is a lieutenant-governor, who is assisted by a council on which nominated unofficial members have seats. To a large extent the native forms of government are maintained under European administrators responsible for the preservation of order, the colony for this purpose being divided into a number of "circles" each with its local government. The colony has a separate budget and is self-supporting. Revenue is derived chiefly from customs receipts and a capitation tax of frs. 2.50 (2s.), instituted in 1901 and levied on all persons over ten years old. The budget for 1906 balanced at £120,400.

History.—The Ivory Coast is stated to have been visited by Dieppe merchants in the 14th century, and was made known by the Portuguese discoveries towards the end of the 15th century. It was thereafter frequented by traders for ivory, slaves and other commodities. There was a French settlement at Assini, 1700–1704, and a French factory was maintained at Grand Bassam from 1700 to 1707. In the early part of the 19th century several French traders had established themselves along the coast. In 1830 Admiral (then Commandant) Bouët-Willaumez (1808–1871) began a series of surveys and expeditions which yielded valuable results. In 1842 he obtained from the native chiefs cessions of territory at Assini and Grand Bassam to France and the towns named were occupied in 1843. From that time French influence gradually extended along the coast, but no attempt was made to penetrate inland. As one result of the Franco-Prussian War, France in 1872 withdrew her garrisons, handing over the care of the establishments to a merchant named Verdier, to whom an annual subsidy of £800 was paid. This merchant sent an agent into the interior who made friendly treaties between France and some of the native chiefs. In 1883, in view of the claims of other European powers to territory in Africa, France again took over the actual administration of Assini and Bassam. Between 1887 and 1889 Captain Binger (an officer of marine infantry, and subsequently director of the African department at the colonial ministry) traversed the whole region between the coast and the Niger, visited Bontuku and the Kong country, and signed protectorate treaties with the chiefs. The kingdom of Jaman, it may be mentioned, was for a few months included in the Gold Coast hinterland. In January 1889 a British mission sent by the governor of the Gold Coast concluded a treaty with the king of Jaman at Bontuku, placing his dominions under British protection.

The king had, however, previously concluded treaties of "commerce and friendship" with the French, and by the Anglo-French agreement of August 1889 Jaman, with Bontuku, was recognized as French territory. In 1892 Captain Binger made further explorations in the interior of the Ivory Coast, and in 1893 he was appointed the first governor of the colony on its erection into an administration distinct from that of Senegal. Among other famous explorers who helped to make known the hinterland was Colonel (then Captain) Marchand. It was to the zone between the Kong states and the hinterland of Liberia that Samory (see SENEGAL) fled for refuge before he was taken prisoner (1898), and for a short time he was master of Kong. The boundary of the colony on the west was settled by Franco-Liberian agreements of 1892 and subsequent dates; that on the east by the Anglo-French agreements of 1893 and 1898. The northern boundary was fixed in 1899 on the division of the middle Niger territories (up to that date officially called the French Sudan) among the other French West African colonies. The systematic development of the colony, the opening up of the hinterland and the exploitation of its economic resources date from the appointment of Captain Binger as governor, a post he held for over three years. The work he began has been carried on zealously and effectively by subsequent governors, who have succeeded in winning the co-operation of the natives.

In the older books of travel are often found the alternative names for this region, Tooth Coast (*Côte des Dents*) or Kwa-Kwa Coast, and, less frequently, the Coast of the Five and Six Stripes (alluding to a kind of cotton fabric in favour with the natives). The term Côte des Dents continued in general use in France until the closing years of the 19th century.

See *Dix ans à la Côte d'Ivoire* (Paris, 1906) by F. J. Clozel, governor of the colony, and *Notre colonie de la Côte d'Ivoire* (Paris, 1903) by R. Villamur and Richaud. These two volumes deal with the history, geography, zoology and economic condition of the Ivory Coast. *La Côte d'Ivoire* by Michellet and Clement describes the administrative and land systems, &c. Another volume also called *La Côte d'Ivoire* (Paris, 1908) is an official monograph on the colony. For ethnology consult *Coutumes indigènes de la Côte d'Ivoire* (Paris, 1902) by F. J. Clozel and R. Villamur, and *Les Coutumes Agni*, by R. Villamur and Delafosse. Of books of travel see *Du Niger au Golfe de Guinée par Kong* (Paris, 1892) by L. G. Binger, and *Mission Hostains-d'Ollone 1898–1900* (Paris, 1901) by Captain d'Ollone. A *Carte de la Côte d'Ivoire* by A. Meunier, on the scale of 1 : 500,000 (6 sheets), was published in Paris, 1905. Annual reports on the colony are published by the French colonial and the British foreign offices.

IVREA (anc. *Eporedia*), a town and episcopal see of Piedmont, Italy, in the province of Turin, from which it is 38 m. N.N.E. by rail and 27 m. direct, situated 770 ft. above sea-level, on the Dora Baltea at the point where it leaves the mountains. Pop. (1901) 6047 (town), 11,696 (commune). The cathedral was built between 973 and 1005; the gallery round the back of the apse and the crypt have plain cubical capitals of this period. The two *campanili* flanking the apse at each end of the side aisle are the oldest example of this architectural arrangement. The isolated tower, which is all that remains of the ancient abbey of S. Stefano, is slightly later. The hill above the town is crowned by the imposing Castello delle Quattro Torri, built in 1358, and now a prison. One of the four towers was destroyed by lightning in 1676. A tramway runs to Santhià.

The ancient Eporedia, standing at the junction of the roads from Augusta Taurinorum and Vercellae, at the point where the road to Augusta Praetoria enters the narrow valley of the Duria (Dora Baltea), was a military position of considerable importance belonging to the Salassi who inhabited the whole upper valley of the Duria. The importance of the gold-mines of the district led to its seizure by the Romans in 143 B.C. The centre of the mining industry seems to have been Victumulae (see TICINUM), until in 100 B.C. a colony of Roman citizens was founded at Eporedia itself; but the prosperity of this was only assured when the Salassi were finally defeated in 25 B.C. and Augusta Praetoria founded. There are remains of a theatre of the time of the Antonines and the Ponte Vecchio rests on Roman foundations.

In the middle ages Ivrea was the capital of a Lombard duchy, and later of a marquisate; both Berengar II. (950) and Arduin (1002) became kings of Italy for a short period. Later it submitted to the marquises of Monferrato, and in the middle of the 14th century passed to the house of Savoy. (T. As.)

IVRY-SUR-SEINE, a town of northern France, in the department of Seine, near the left bank of the Seine, less than 1 m. S.S.E. of the fortifications of Paris. Pop. (1906) 30,532. Ivry has a large hospital for incurables. It manufactures organs, earthenware, wall-paper and rubber, and has engineering works, breweries, and oil-works, its trade being facilitated by a port on the Seine. The town is dominated by a fort of the older line of defence of Paris.

IVY (A.S. *ifig*, Ger. *Epheu*, perhaps connected with *apium*, *ἄπιον*), the collective designation of certain species and varieties of *Hedera*, a member of the natural order Araliaceae.

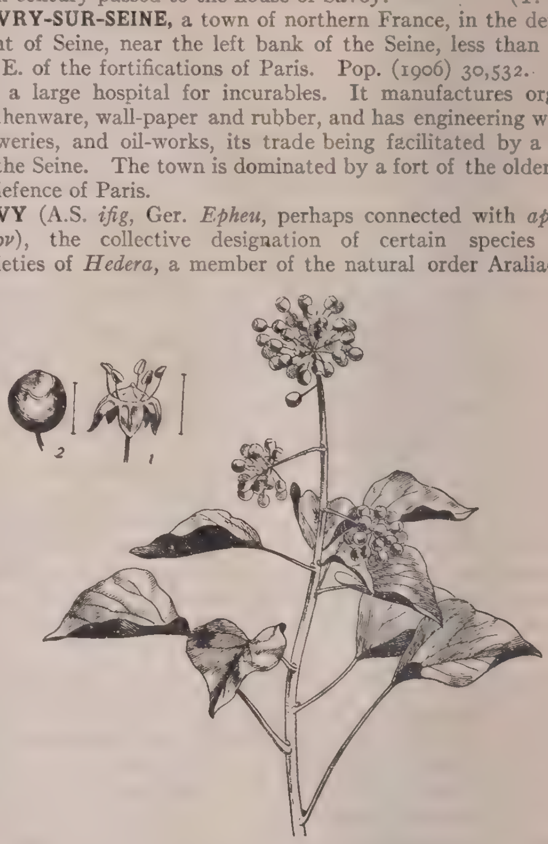


FIG. 1.—Ivy (*Hedera Helix*) fruiting branch.
1. Flower. 2. Fruit.

There are fifty species of ivy recorded in modern books, but they may be reduced to two, or at the most, three. The European ivy, *Hedera Helix* (fig. 1), is a plant subject to infinite variety in the forms and colours of its leaves, but the tendency of which is always to a three- to five-lobed form when climbing and a regular ovate form of leaf when producing flower and fruit. The African ivy, *H. canariensis*, often regarded as a variety of *H. Helix* and known as the Irish ivy, is a native of North Africa and the adjacent islands. It is the common large-leaved climbing ivy, and also varies, but in a less degree than *H. Helix*, from which its leaves differ in their larger size, rich deep green colour, and a prevailing tendency to a five-lobed outline. When in fruit the leaves are usually three-lobed, but they are sometimes entire and broadly ovate. The Asiatic ivy, *H. colchica* (fig. 2), now considered to be a form of *H. Helix*, has ovate, obscurely three-lobed leaves of a coriaceous texture and a deep green colour; in the tree or fruiting form the leaves are narrower than in the climbing form, and without any trace of lobes. Distinctive characters are also to be found in the appendages of the pedicels and calyx, *H. Helix* having six-rayed stellate hairs, *H. canariensis* fifteen-rayed hairs and *H. colchica* yellowish two-lobed scales.

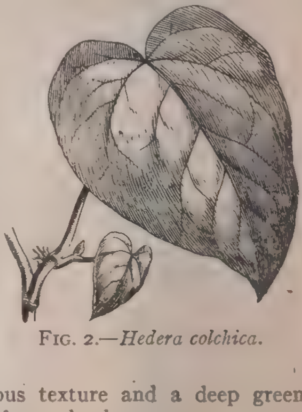


FIG. 2.—*Hedera colchica.*

The Australian ivy, *H. australiana*, is a small glabrous shrub with pinnate leaves. It is a native of Queensland, and is practically unknown in cultivation.

It is of the utmost importance to note the difference of characters of the same species of ivy in its two conditions of climbing and fruiting. The first stage of growth, which we will suppose to be from the seed, is essentially scandent, and the leaves are lobed more or less. This stage is accompanied with a plentiful production of the claspers or modified roots by means of which the plant becomes attached and obtains support. When it has reached the summit of the tree or tower, the stems, being no longer able to maintain a perpendicular attitude, fall over and become horizontal or pendent. Coincidently with this change they cease to produce claspers, and the leaves are strikingly modified in form, being now narrower and less lobed than on the ascending stems. In due time this tree-like growth produces terminal umbels of greenish flowers, which have the parts in fives, with the styles united into a very short one. These flowers are succeeded by smooth black or yellow berries, containing two to five seeds. The yellow-berried ivy is met with in northern India and in Italy, but in northern Europe it is known only as a curiosity of the garden, where, if sufficiently sheltered and nourished, it becomes an exceedingly beautiful and fruitful tree.

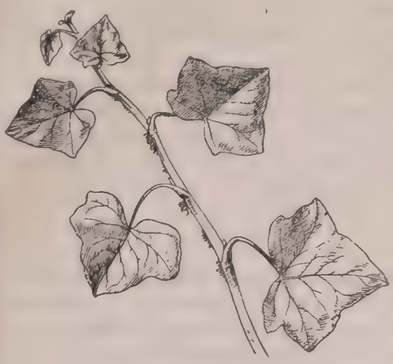


FIG. 3.—Climbing Shoot of Ivy.

It is stated in books that some forms of sylvestral ivy never flower, but a negative declaration of this kind is valueless. Sylvestral ivies of great age may be found in woods on the western coasts of Britain that have apparently never flowered, but this is probably to be explained by their inability to surmount the trees supporting them, for until the plant can spread its branches horizontally in full daylight, the flowering or tree-like growth is never formed.

A question of great practical importance arises out of the relation of the plant to its means of support. A moderate growth of ivy is not injurious to trees; still the tendency is from the first inimical to the prosperity of the tree, and at a certain stage it becomes deadly. Therefore the growth of ivy on trees should be kept within reasonable bounds, more especially in the case of trees that are of special value for their beauty, history, or the quality of their timber. In regard to buildings clothed with ivy, there is nothing to be feared so long as the plant does not penetrate the substance of the wall by means of any fissure. Should it thrust its way in, the natural and continuous expansion of its several parts will necessarily hasten the decay of the edifice. But a fair growth of ivy on sound walls that afford no entrance beyond the superficial attachment of the claspers is, without any exception whatever, beneficial. It promotes dryness and warmth, reduces to a minimum the corrosive action of the atmosphere, and is altogether as conservative as it is beautiful.

The economical uses of the ivy are not of great importance. The leaves are eaten greedily by horses, deer, cattle and sheep, and in times of scarcity have proved useful. The flowers afford a good supply of honey to bees; and, as they appear in autumn, they occasionally make amends for the shortcomings of the season. The berries are eaten by wood pigeons, blackbirds and thrushes. From all parts of the plant a balsamic bitter may be obtained, and this in the form of *hederic acid* is the only preparation of ivy known to chemists.

In the garden the uses of the ivy are innumerable, and the least known though not the least valuable of them is the cultivation of the plant as a bush or tree, the fruiting growth being selected for this purpose. The variegated tree forms of *H. Helix*, with leaves of creamy white, golden green or rich deep orange yellow, soon prove handsome miniature trees, that thrive almost as well in smoky town gardens as in the pure air of the country, and that no ordinary winter will injure in the least. The tree-form of the Asiatic ivy (*H. colchica*) is scarcely to be equalled in beauty of leafage by any evergreen shrub known to English gardens, and, although in the course of a few years it will attain to a stature of 5 or 6 ft., it is but rarely we meet with it, or indeed with tree ivies of any kind, but little attention having been given to this subject until recent years. The scandent forms are more generally appreciated, and are now much employed in the formation of marginal lines, screens and trained pyramids, as well as for clothing walls. A very striking example of the capabilities of the commonest ivies, when treated artistically as garden plants, may be seen in the Zoological Gardens of Amsterdam, where several paddocks are enclosed with wreaths, garlands and bands of ivy in a most picturesque manner.

About sixty varieties known in gardens are figured and described in *The Ivy, a Monograph*, by Shirley Hibberd (1872). To cultivate these is an extremely simple matter, as they will thrive in a poor soil and endure a considerable depth of shade, so that they may with advantage be planted under trees. The common Irish ivy is often to be seen clothing the ground beneath large yew trees where grass would not live, and it is occasionally planted in graveyards in London to form an imitation of grass turf, for which purpose it is admirably suited.

The ivy, like the holly, is a scarce plant on the American continent. In the northern United States and British America the winters are not more severe than the ivy can endure, but the summers are too hot and dry, and the requirements of the plant have not often obtained attention. In districts where native ferns abound the ivy will be found to thrive, and the varieties of *Hedera Helix* should have the preference. But in the drier districts ivies might often be planted on the north side of buildings, and, if encouraged with water and careful training for three or four years, would then grow rapidly and train themselves. A strong light is detrimental to the growth of ivy, but this enhances its value, for we have no hardy plants that may be compared with it for variety and beauty that will endure shade with equal patience.

The North American poison ivy (poison oak), *Rhus Toxicodendron* (nat. order Anacardiaceae), is a climber with pinnately compound leaves, which are very attractive in their autumn colour but poisonous to the touch to some persons, while others can handle the plant without injury. The effects are redness and violent itching followed by fever and a vesicular eruption.

The ground ivy, *Nepeta Glechoma* (nat. order Labiatae), is a small creeping plant with rounded crenate leaves and small blue-purple flowers, occurring in hedges and thickets.

IWAKURA, TOMOMI, PRINCE (1835–1883), Japanese statesman, was born in Kiōto. He was one of the court nobles (*kuge*) of Japan, and he traced his descent to the emperor Murakami (A.D. 947–967). A man of profound ability and singular force of character, he acted a leading part in the complications preceding the fall of the Tokugawa *shōgunate*, and was obliged to fly from Kiōto accompanied by his coadjutor, Prince Sanjō. They took refuge with the *Daimyō* of Chōshū, and, while there, established relations which contributed greatly to the ultimate union of the two great fiefs, Satsuma and Chōshū, for the work of the Restoration. From 1867 until the day of his death Iwakura was one of the most prominent figures on the political stage. In 1871 he proceeded to America and Europe at the head of an imposing embassy of some fifty persons, the object being to explain to foreign governments the actual conditions existing in Japan, and to pave the way for negotiating new treaties consistent with her sovereign rights. Little success attended the mission. Returning to Japan in 1873, Iwakura found the cabinet divided as to the manner of dealing with Korea's insulting attitude. He advocated peace, and his influence carried the day, thus removing a difficulty which, though apparently of minor dimensions, might have changed the whole course of Japan's modern history.

IXION, in Greek legend, son of Phlegyas, king of the Lapithae in Thessaly (or of Ares), and husband of Dia. According to custom he promised his father-in-law, Deïoneus, a handsome bridal present, but treacherously murdered him when he claimed the fulfilment of the promise. As a punishment, Ixion was seized with madness, until Zeus purified him of his crime and admitted him as a guest to Olympus. Ixion abused his pardon by trying to seduce Hera; but the goddess substituted for herself a cloud, by which he became the father of the Centaurs. Zeus bound him on a fiery wheel, which rolls unceasingly through the air or (according to the later version) in the underworld (Pindar, *Pythia*, ii. 21; Ovid, *Metam.* iv. 461; Virgil, *Aeneid*, vi. 601). Ixion is generally taken to represent the eternally moving sun. Another explanation connects the story with the practice (among certain peoples of central Europe) of carrying a blazing, revolving wheel through fields which needed the heat of the sun, the legend being invented to explain the custom and subsequently adopted by the Greeks (see Mannhardt, *Wald- und Feldkulte*, ii. 1905, p. 83). In view of the fact that the oak was the sun-god's tree and that the mistletoe grew upon it, it is suggested by A. B. Cook (*Class. Rev.* xvii. 420) that *Ἰξίων* is derived from *ἰξός* (mistletoe), the sun's fire being regarded as an emanation from the mistletoe. Ixion himself is probably a by-form of Zeus (Usener in *Rhein. Mus.* liii. 345).

"The Myth of Ixion" (by C. Smith, in *Classical Review*, June 1895) deals with the subject of a red-figure cantharus in the British Museum.

IXTACCIHUATL, or Iztaccihuatl ("white woman"), a lofty mountain of volcanic origin, 10 m. N. of Popocatepetl and about 40 m. S.S.E of the city of Mexico, forming part of the short spur called the Sierra Nevada. According to Angelo Heilprin (1853–1907) its elevation is 16,960 ft.; other authorities make it much less. Its apparent height is dwarfed somewhat by its elongated summit and the large area covered. It has three summits of different heights standing on a north and south line, the central one being the largest and highest and all three rising above the permanent snow-line. As seen from the city of Mexico the three summits have the appearance of a shrouded human figure, hence the poetic Aztec appellation of "white woman" and the unsentimental Spanish designation "*La mujer gorda.*" The ascent is difficult and perilous, and is rarely accomplished.

Heilprin says that the mountain is largely composed of trachytic rocks and that it is older than Popocatepetl. It has no crater and no trace of lingering volcanic heat. It is surmised that its crater, if it ever had one, has been filled in and its cone worn away by erosion through long periods of time.

IYRCAE, an ancient nation on the north-east trade route described by Herodotus (iv. 22) beyond the Thyssagetae, somewhere about the upper basins of the Tobol and the Irtysh. They were distinguished by their mode of hunting, climbing a tree to survey their game, and then pursuing it with trained horses and dogs. They were almost certainly the ancestors of the modern Magyars, also called Jugra.

The reading *Τῦρκαι* is an anachronism, and when Pliny (*N.H.* vi. 19) and Mela (i. 116) speak of Tyrcae it is also probably due to a false correction. (E. H. M.)

IZBARTA, or Sparta [anc. *Baris*], the chief town of the Hamid-abad sanjak of the Konia vilayet, in Asia Minor, well situated on the edge of a fertile plain at the foot of Aghlasun Dagh. It was once the capital of the Emirate of Hamid. It suffered severely from the earthquake of the 16th–17th of January 1889. It is a prosperous place with an enlightened Greek element in its population (hence the numerous families called "Spartali" in Levantine towns); and it is, in fact, the chief inland colony of Hellenism in Anatolia. Pop. 20,000 (Moslems 13,000, Christians 7000). The new Aidin railway extends from Dineir to Izbarta via Buldur.

IZHEVSK, a town of Russia, in the government of Vyatka, 140 m. S.W. of Perm and 22 m. W. from the Kama, on the Izh river. Pop. (1897) 21,500. It has one of the principal steel and rifle works of the Russian crown, started in 1807. The making of sporting guns is an active industry.

IZMAIL, or Ismail, a town of Russia, in the government of Bessarabia, on the left bank of the Kilia branch of the Danube, 35 m. below Reni railway station. Pop. (1866) 31,779, (1900) 33,607, comprising Great and Little Russians, Bulgarians, Jews and Gipsies. There are flour-mills and a trade in cereals, wool, tallow and hides. Originally a Turkish fortified post, Izmail had by the end of the 18th century grown into a place of 30,000 inhabitants. It was occupied by the Russians in 1770, and twenty years later its capture was one of the brilliant achievements of the Russian general, Count A. V. Suvarov. On that occasion the garrison was 40,000 strong, and the assault cost the assailants 10,000 and the defenders 30,000 men. The victory was the theme of one of the Russian poet G. R. Derzhavin's odes. In 1809 the town was again captured by the Russians; and, when in 1812 it was assigned to them by the Bucharest peace, they chose it as the central station for their Danube fleet. It was about this time that the town of Tuchkov, with which it was later (1830) incorporated, grew up outside of the fortifications. These were dismantled in accordance with the treaty of Paris (1856), by which Izmail was made over to Rumania. The town was again transferred to Russia by the peace of Berlin (1878).

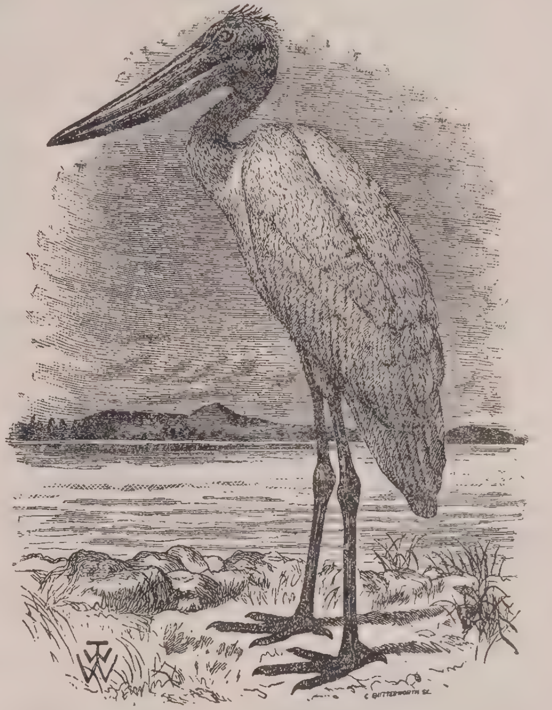
IZU-NO-SHICHI-TŌ, the seven (*shichi*) islands (*to*) of Izu, included in the empire of Japan. They stretch in a southerly direction from a point near the mouth of Tokyo Bay, and lie between 33° and 34° 48′ N. and between 139° and 140° E. Their names, beginning from the north, are Izu-no-Oshima, To-shima, Nii-shima, Kozu-shima, Miyake-shima and Hachijo-shima. There are some islets in their immediate vicinity. Izu-no-Oshima, an island 10 m. long and 5½ m. wide, is 15 m. from the nearest point of the Izu promontory. It is known to western cartographers as Vries Island, a name derived from that of Captain Martin Gerritsz de Vries, a Dutch navigator, who is supposed to have discovered the island in 1643. But the group was known to the Japanese from a remote period, and used as convict settlements certainly from the 12th century and probably from a still earlier era. Hachijo, the most southerly, is often erroneously written "Fatsisio" on English charts. Izu-no-Oshima is remarkable for its smoking volcano, Mihara-yama (2461 ft.), a conspicuous object to all ships bound for Yokohama. Three others of the islands—Nii-shima, Kozu-shima and Miyake-shima—have active volcanoes. Those on Nii-shima and Kozu-shima are of inconsiderable size, but that on Miyake-shima, namely, Oyama, rises to a height of 2707 ft. The most southerly island, Hachijo-shima, has a still higher peak, Dsubo-take (2838 ft.), but it does not emit any smoke.

J A letter of the alphabet which, as far as form is concerned, is only a modification of the Latin I and dates back with a separate value only to the 15th century. It was first used as a special form of initial I, the ordinary form being kept for use in other positions. As, however, in many cases initial *i* had the consonantal value of the English *y* in *iugum* (yoke), &c., the symbol came to be used for the value of *y*, a value which it still retains in German: *Ja! jung*, &c. Initially it is pronounced in English as an affricate *dzh*. The great majority of English words beginning with *j* are (1) of foreign (mostly French) origin, as "jaundice," "judge"; (2) imitative of sound, like "jar" (the verb); or (3) influenced by analogy, like "jaw" (influenced by *chaw*, according to Skeat). In early French *g* when palatalized by *e* or *i* sounds became confused with consonantal *i* (*y*), and both passed into the sound of *j* which is still preserved in English. A similar sound-change takes place in other languages, *e.g.* Lithuanian, where the resulting sound is spelt *dž*. Modern French and also Provençal and Portuguese have changed *j*=*dzh* into *ž* (*zh*). The sound initially is sometimes represented in English by *g*: *gem*, *gaol* as well as *jail*. At the end of modern English words the same sound is represented by *-dge* as in *judge*, French *juge*. In this position, however, the sound occurs also in genuine English words like *bridge*, *sedge*, *singe*, but this is true only for the southern dialects on which the literary language is founded. In the northern dialects the pronunciation as *brig*, *seg*, *sing* still survives. (P. Gi.)

JA'ALIN (from *Jā'al*, to settle, *i.e.* "the squatters"), an African tribe of Semitic stock. They formerly occupied the country on both banks of the Nile from Khartum to Abu Hamed. They claim to be of the Koreish tribe and even trace descent from Abbas, uncle of the prophet. They are of Arab origin, but now of very mixed blood. According to their own tradition they emigrated to Nubia in the 12th century. They were at one time subject to the Funj kings, but their position was in a measure independent. At the Egyptian invasion in 1820 they were the most powerful of Arab tribes in the Nile valley. They submitted at first, but in 1822 rebelled and massacred the Egyptian garrison at Shendi. The revolt was mercilessly suppressed, and the Jā'alin were thenceforward looked on with suspicion. They were almost the first of the northern tribes to join the mahdi in 1884, and it was their position to the north of Khartum which made communication with General Gordon so difficult. The Jā'alin are now a semi-nomad agricultural people. Many are employed in Khartum as servants, scribes and watchmen. They are a proud religious people, formerly notorious as cruel slave dealers. J. L. Burckhardt says the true Jā'alin from the eastern desert is exactly like the Bedouin of eastern Arabia.

See *The Anglo-Egyptian Sudan*, edited by Count Gleichen (London, 1905).

JABIRU, according to Marcgrave the Brazilian name of a bird, subsequently called by Linnaeus *Mycteria americana*, one of the largest of the storks, *Ciconiidae*, which occurs from Mexico southwards to the territory of the Argentine Republic. It stands between 4 and 5 ft. in height, and is conspicuous for its massive bill, slightly upturned, and its entirely white plumage; but the head and neck are bare and black, except for about the lower third part of the latter, which is bright red in the living bird. Very nearly allied to *Mycteria*, and also commonly called jabirus, are the birds of the genera *Xenorhynchus* and *Ephippiorhynchus*—the former containing one or (in the opinion of some) two species, *X. australis* and *X. indicus*, and the latter one only, *E. senegalensis*. These belong to the countries indicated by their names, and differ chiefly by their feathered head and neck, while the last is sometimes termed the saddle-billed stork from the very singular shape of its beak. Somewhat more distantly related are the gigantic birds known to Europeans in India and elsewhere as adjutant birds, belonging to the genus *Leptoptilus*, distinguished by their sad-coloured plumage, their black scabrous head, and their enormous tawny pouch, which depends occasionally some 16 in. or more in length from the lower part of the neck, and seems to be connected with the respiratory and not, as commonly believed, with the digestive system. In many parts of India *L. dubius*, the largest of these birds, the *hargila* as Hindus call it, is a most efficient scavenger, sailing aloft at a vast height and descending on the discovery of offal, though frogs and fishes also form part of its diet. It familiarly enters the large towns, in many of which an account of its services it is strictly protected from injury, and, having satisfied its appetite, seeks the repose it has earned, sitting with its feet extended in front in a most grotesque attitude. A second and smaller species, *L. javanicus*, has a more southern and eastern range; while a third, *L. crumenifer*, of African origin, and often known as the marabou-stork, gives its name to the beautifully soft feathers so called, which are the under-tail-coverts; the "marabout" feathers of the plume-trade are mostly supplied by other birds, the term being apparently applied to any downy feathers. (A. N.)


C BUTTERWORTH SC.

Jabiru.

JABLOCHKOV, PAUL (1847–1894), Russian electrical engineer and inventor, was born at Serdobsk, in the government of Saratov, on the 14th of September 1847, and educated at St Petersburg. In 1871 he was appointed director of the telegraph lines between Moscow and Kursk, but in 1875 he resigned his position in order to devote himself to his researches on electric lighting by arc lamps, which he had already taken up. In 1876 he settled in Paris, and towards the end of the year brought out his famous "candles," known by his name, which consisted of two carbon parallel rods, separated by a non-conducting partition; alternating currents were employed, and the candle was operated by a high-resistance carbon match connecting the tips of the rods, a true arc forming between the parallel carbons when this burnt off, and the separators volatilizing as the carbons burnt away. For a few years his system of electric lighting was widely adopted, but it was gradually superseded (see LIGHTING: *Electric*) and is no longer in use. Jablochkov made various other electrical inventions, but he died in poverty, having returned to Russia on the 19th of March 1894.

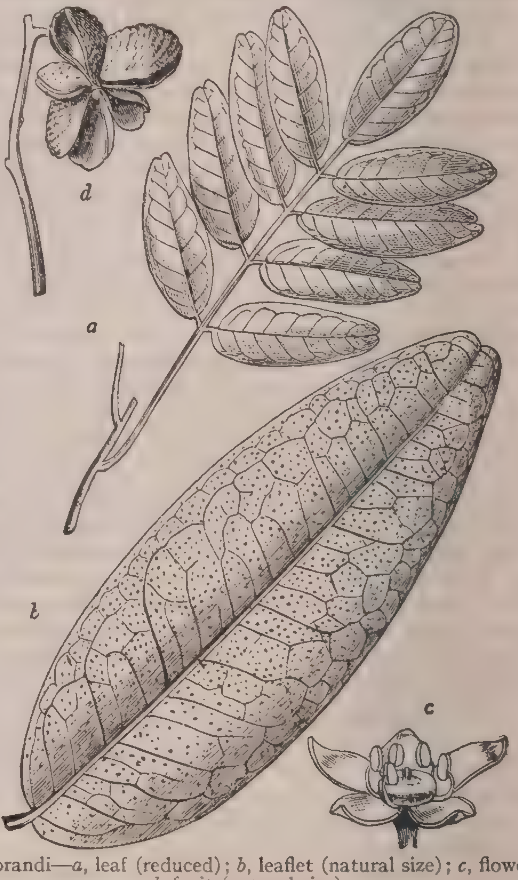
JABLONSKI, DANIEL ERNST (1660–1741), German theologian, was born at Nassenhuben, near Danzig, on the 20th of November 1660. His father was a minister of the Moravian Church, who had taken the name of Peter Figulus on his baptism; the son, however, preferred the Bohemian family name of Jablonski. His maternal grandfather, Johann Amos Comenius (d. 1670), was a bishop of the Moravian Church. Having studied at Frankfort-on-the-Oder and at Oxford, Jablonski entered upon his career as a preacher at Magdeburg in 1683, and then from 1686 to 1691 he was the head of the Moravian college at Lissa, a position which had been filled by his grandfather. Still retaining his connexion with the Moravians, he was appointed court preacher at Königsberg in 1691 by the elector of Brandenburg, Frederick III., and here, entering upon a career of great activity, he soon became a person of influence in court circles. In 1693 he was transferred to Berlin as court preacher, and in 1699 he was consecrated a bishop of the Moravian Church. At Berlin Jablonski worked hard to bring about a union between the followers of Luther and those of Calvin; the courts of Berlin, Hanover, Brunswick and Gotha were interested in his scheme, and his principal helper was the philosopher Leibnitz. His idea appears to have been to form a general union between the German, the English and the Swiss Protestants, and thus to establish *una eademque sancta catholica et apostolica eademque evangelica et reformata ecclesia.* For some years negotiations were carried on with a view to attaining this end, but eventually it was found impossible to surmount the many difficulties in the way; Jablonski and Leibnitz, however, did not cease to believe in the possibility of accomplishing their purpose. Jablonski's next plan was to reform the Church of Prussia by introducing into it the episcopate, and also the liturgy of the English Church, but here again he was unsuccessful. As a scholar Jablonski brought out a Hebrew edition of the Old Testament, and translated Bentley's *A Confutation of Atheism* into Latin (1696). He had some share in founding the Berlin Academy of Sciences, of which he was president in 1733, and he received a degree from the university of Oxford. He died on the 25th of May 1741.

Jablonski's son, Paul Ernst Jablonski (1693–1757), was professor of theology and philosophy at the university of Frankfort-on-the-Oder.

Editions of the letters which passed between Jablonski and Leibnitz, relative to the proposed union, were published at Leipzig in 1747 and at Dorpat in 1899.

JABORANDI, a name given in a generic manner in Brazil and South America generally to a number of different plants, all of which possess more or less marked sialogogue and sudorific properties. In the year 1875 a drug was introduced under the above name to the notice of medical men in France by Dr Coutinho of Pernambuco, its botanical source being then unknown. *Pilocarpus pennatifolius*, a member of the natural order Rutaceae, the plant from which it is obtained, is a slightly branched shrub about 10 ft. high, growing in Paraguay and the eastern provinces of Brazil. The leaves, which are placed alternately on the stem, are often $1\frac{1}{2}$ ft. long, and consist of from two to five pairs of opposite leaflets, the terminal one having a longer pedicel than the others. The leaflets are oval, lanceolate, entire and obtuse, with the apex often slightly indented, from 3 to 4 in. long and 1 to $1\frac{1}{2}$ in. broad in the middle. When held up to the light they may be observed to have scattered all over them numerous pellucid dots or receptacles of secretion immersed in the substance of the leaf. The leaves in size and texture bear some resemblance to those of the cherry-laurel (*Prunus laurocerasus*), but are less polished on the upper surface. The flowers, which are produced in spring and early summer, are borne on a raceme, 6 or 8 in. long, and the fruit consists of five carpels, of which not more than two or three usually arrive at maturity. The leaves are the part of the plant usually imported, although occasionally the stems and roots are attached to them. The active principle for which the name *pilocarpine*, suggested by Holmes, was ultimately adopted, was discovered almost simultaneously by Hardy in France and Gerrard in England, but was first obtained in a pure state by Petit of Paris. It is a liquid alkaloid, slightly soluble in water, and very soluble in alcohol, ether and chloroform. It strongly rotates the plane of polarization to the right, and forms crystalline salts of which the nitrate is that chiefly used in medicine. The nitrate and phosphate are insoluble in ether, chloroform and benzol, while the hydrochlorate and hydrobromate dissolve both in these menstrua and in water and alcohol; the sulphate and acetate being deliquescent are not employed medicinally. The formula of the alkaloid is $C_{11}H_{16}N_2O_2$.

Certain other alkaloids are present in the leaves. They have been named *jaborine, jaboridine and pilocarpidine.* The first of these is the most important and constant. It is possibly derived from pilocarpine, and has the formula $C_{22}H_{32}N_4O_4$. Jaborine resembles atropine pharmacologically, and is therefore antagonistic to pilocarpine. The various preparations of jaborandi leaves are therefore undesirable for therapeutic purposes, and only the nitrate of pilocarpine itself should be used. This is a white crystalline powder, soluble in the ratio of about one part in ten of cold water. The dose is $\frac{1}{20}$–$\frac{1}{2}$ grain by the mouth, and up to one-third of a grain hypodermically, in which fashion it is usually given.



Jaborandi—*a*, leaf (reduced); *b*, leaflet (natural size); *c*, flower; *d*, fruit (natural size).

The action of this powerful alkaloid closely resembles that of physostigmine, but whereas the latter is specially active in influencing the heart, the eye and the spinal cord, pilocarpine exerts its greatest power on the secretions. It has no external action. When taken by the mouth the drug is rapidly absorbed and stimulates the secretions of the entire alimentary tract, though not of the liver. The action on the salivary glands is the most marked and the best understood. The great flow of saliva is due to an action of the drug, after absorption, on the terminations of the chorda tympani, sympathetic and other nerves of salivary secretion. The gland cells themselves are unaffected. The nerves are so violently excited that direct stimulation of them by electricity adds nothing to the rate of salivary flow. The action is antagonized by atropine, which paralyses the nerve terminals. About $\frac{1}{100}$th of a grain of atropine antagonizes half a grain of pilocarpine. The circulation is depressed by the drug, the pulse being slowed and the blood pressure falling. The cardiac action is due to stimulation of the vagus, but the dilatation of the blood-vessels does not appear to be due to a specific action upon them. The drug does not kill by its action on the heart. Its dangerous action is upon the bronchial secretion, which is greatly increased. Pilocarpine is not only the most powerful sialogogue but also the most powerful diaphoretic known. One dose may cause the flow of nearly a pint of sweat in an hour. The action is due, as in the case of the salivation, to stimulation of the terminals of the sudorific nerves. According to K. Binz there is also in both cases an action on the medullary centres for these secretions. Just as the saliva is a true secretion containing a high proportion of ptyalin and salts, and is not a mere transudation of water, so the perspiration is found to contain a high ratio of urea and chlorides. The great diaphoresis and the depression of the circulation usually cause a fall in temperature of about 2° F. The drug is excreted unchanged in the urine. It is a mild diuretic. When given internally or applied locally to the eye it powerfully stimulates the terminals of the oculomotor nerves in the iris and ciliary muscle, causing extreme contraction of the pupil and spasm of accommodation. The tension of the eyeball is at first raised but afterwards lowered.

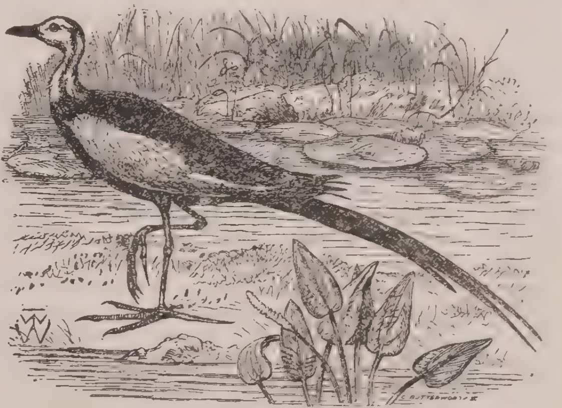
The chief therapeutic use of the drug is as a diaphoretic in chronic Bright's disease. It is also used to aid the growth of the hair—in which it is sometimes successful; in cases of inordinate thirst, when one-tenth of a grain with a little bismuth held in the mouth may be of much value; in cases of lead and mercury poisoning, where it aids the elimination of the poison in the secretions; as a galactagogue; and in cases of atropine poisoning (though here it is of doubtful value).

JACA, a city of northern Spain, in the province of Huesca, 114 m. by rail N. by W. of Saragossa, on the left bank of the river Aragon, and among the southern slopes of the Pyrenees, 2380 ft. above the sea. Pop. (1900), 4934. Jaca is an episcopal see, and was formerly the capital of the Aragonese county of Sobrarbe. Its massive Gothic cathedral dates at least from the 11th century, and possibly from the 9th. The city derives some importance from its position on the ancient frontier road from Saragossa to Pau. In August 1904 the French and Spanish governments agreed to supplement this trade-route by building a railway from Oloron in the Basses Pyrénées to Jaca. Various frontier defence works were constructed in the neighbourhood at the close of the 19th century.

The origin of the city is unknown. The Jaccetani (Ἰακκητανοί) are mentioned as one of the most celebrated of the numerous small tribes inhabiting the basin of the Ebro by Strabo, who adds that their territory was the theatre of the wars which took place in the 1st century B.C. between Sertorius and Pompey. They are probably identical with the Lacetani of Livy (xxi. 60, 61) and Caesar (*B.C.* i. 60). Early in the 8th century Jaca fell into the possession of the Moors, by whose writers it is referred to under the name of Dyaka as one of the chief places in the province of Sarkosta (Saragossa). The date of its reconquest is uncertain, but it must have been before the time of Ramiro I. of Aragon (1035–1063), who gave it the title of "city," and in 1063 held within its walls a council, which, inasmuch as the people were called in to sanction its decrees, is regarded as of great importance in the history of the parliamentary institutions of the Peninsula. In 1705 Jaca supported King Philip V. from whom, in consequence, it received the title of *muy noble, muy leal y vencedora*, "most noble, most loyal and victorious." During the Peninsular War it surrendered to the French in 1809, and was recaptured in 1814.

JACAMAR, a word formed by Brisson from *Jacameri*, the Brazilian name of a bird, as given by Marcgrave, and since adopted in most European tongues for the species to which it was first applied and others allied to it, forming the family *Galbulidae*[1] of ornithologists, the precise position of which is uncertain, since the best authorities differ. All will agree that the jacamars belong to the great heterogeneous group called by Nitzsch Picariae, but further into detail it is hardly safe to go. The *Galbulidae* have zygodactylous or pair-toed feet, like the *Cuculidae*, *Bucconidae* and *Picidae*, they also resemble both the latter in laying glossy white eggs, but in this respect they bear the same resemblance to the *Momotidae*, *Alcedinidae*, *Meropidae* and some other groups, to which affinity has been claimed for them. In the opinion of Sclater (*A Monograph of the Jacamars and Puff-birds*) the jacamars form two groups—one consisting of the single genus and species *Jacamerops aureus* (*J. grandis* of most authors), and the other including all the rest, viz. *Urogalba* with two species, *Galbula* with nine, *Brachygalba* with five, and *Jacamaralcyon* and *Galbalcyrhynchus* with one each. They are all rather small birds, the largest known being little over 10 in. in length, with long and sharply pointed bills, and the plumage more or less resplendent with golden or bronze reflections, but at the same time comparatively soft. *Jacamaralcyon tridactyla* differs from all the rest in possessing but three toes (as its name indicates), on each foot, the hallux being deficient. With the exception of *Galbula melanogenia*, which is found also in Central America and southern Mexico, all the jacamars inhabit the tropical portions of South America eastward of the Andes, *Galbula ruficauda*, however, extending its range to the islands of Trinidad and Tobago.[2] Very little is known of the habits of any of the species. They are seen sitting motionless on trees, sometimes solitarily, at other times in companies, whence they suddenly dart off at any passing insect, catch it on the wing, and return to their perch. Of their nidification almost nothing has been recorded, but the species occurring in Tobago is said by Kirk to make its nest in marl-banks, digging a hole about an inch and a half in diameter and some 18 in. deep. (A. N.)

JAÇANÁ, the Brazilian name, according to Marcgrave, of certain birds, since found to have some allies in other parts of the world, which are also very generally called by the same appellation. They have been most frequently classed with the water-hens or rails (*Rallidae*), but are now recognized by many systematists as forming a separate family, *Parridae*,[3] whose leaning seems to be rather towards the *Limicolae*, as apparently first suggested by Blyth, a view which is supported by the osteological observations of Parker (*Proc. Zool. Society*, 1863, p. 513), though denied by A. Milne-Edwards (*Ois. foss. de la France*, ii. p. 110). The most obvious characteristic of this group of birds is the extraordinary length of their toes and claws, whereby they are enabled to walk with ease over water-lilies and other aquatic plants growing in rivers and lakes. The family has been divided into four genera—of which *Parra*, as now restricted, inhabits South America; *Metopidius*, hardly differing from it, has representatives in Africa, Madagascar and the Indian region; *Hydralector*, also very nearly allied to *Parra*, belongs to the



Pheasant-tailed Jaçaná.

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[1] *Galbula* was first applied to Marcgrave's bird by Moehring. It is another form of *Galgulus*, and seems to have been one of the many names of the golden oriole. See ICTERUS.

[2] The singular appearance, recorded by Canon Tristram (*Zoologist*, p. 3906), of a bird of this species in Lincolnshire seems to require notice. No instance seems to be known of any jacamar having been kept in confinement or brought to this country alive; but expert aviculturists are often not communicative, and many importations of rare birds have doubtless passed unrecorded.

[3] The classic *Parra* is by some authors thought to have been the golden oriole (see ICTERUS), while others suppose it was a jay or pie. The word seems to have been imported into ornithology by Aldrovandus, but the reason which prompted Linnaeus to apply it, as he seems first to have done, to a bird of this group, cannot be satisfactorily stated.

northern portion of the Australian region; and *Hydrophasianus*, the most extravagant form of the whole, is found in India, Ceylon and China. In habits the jaçanás have much in common with the water-hens, but that fact is insufficient to warrant the affinity asserted to exist between the two groups; for in their osteological structure there is much difference, and the resemblance seems to be only that of analogy. The *Parridae* lay very peculiar eggs of a rich olive-brown colour, in most cases closely marked with dark lines, thus presenting an appearance by which they may be readily known from those of any other birds, though an approach to it is occasionally to be noticed in those of certain *Limicolae*, and especially of certain *Charadriidae*. (A. N.)

JACINI, STEFANO, Count (1827–1891), Italian statesman and economist, was descended from an old and wealthy Lombard family. He studied in Switzerland, at Milan, and in German universities. During the period of the Austrian restoration in Lombardy (1849–1859) he devoted himself to literary and economic studies. For his work on *La Proprietà fondiaria in Lombardia* (Milan, 1856) he received a prize from the Milanese *Società d'incoraggiamento di scienze e lettere* and was made a member of the Istituto Lombardo. In another work, *Sulle condizioni economiche della Valtellina* (Milan, 1858, translated into English by W. E. Gladstone), he exposed the evils of Austrian rule, and he drew up a report on the general conditions of Lombardy and Venetia for Cavour. He was minister of Public Works under Cavour in 1860–1861, in 1864 under La Marmora, and down to 1867 under Ricasoli. In 1866 he presented a bill favouring Italy's participation in the construction of the St Gotthard tunnel. He was instrumental in bringing about the alliance with Prussia for the war of 1866 against Austria, and in the organization of the Italian railways. From 1881 to 1886 he was president of the commission to inquire into the agricultural conditions of Italy, and edited the voluminous report on the subject. He was created senator in 1870, and given the title of count in 1880. He died in 1891.

L. Carpi's *Risorgimento italiano*, vol. iv. (Milan, 1888), contains a short sketch of Jacini's life.

JACK, a word with a great variety of meanings and applications, all traceable to the common use of the word as a by-name of a man. The question has been much discussed whether "Jack" as a name is an adaptation of Fr. *Jacques*, *i.e.* James, from Lat. *Jacobus*, Gr. Ἰάκωβος, or whether it is a direct pet formation from John, which is its earliest and universal use in English. In the *History of the Monastery of St Augustine* at Canterbury, 1414, Jack is given as a form of John—*Mos est Saxonum . . . verba et nomina transformare . . . . ut . . . pro Johanne Jankin sive Jacke* (see E. W. B. Nicholson, *The Pedigree of Jack and other Allied Names*, 1892). "Jack" was early used as a general term for any man of the common people, especially in combination with the woman's name Jill or Gill, as in the nursery rhyme. The *New English Dictionary* quotes from the *Coventry Mysteries*, 1450: "And I wole kepe the feet this tyde Thow ther come both Iakke and Gylle." Familiar examples of this generic application of the name are Jack or Jack Tar for a sailor, which seems to date from the 17th century, and such compound uses as cheap-jack and steeple-jack, or such expressions as "jack in office," "jack of all trades," &c. It is a further extension of this that gives the name to the knave in a pack of cards, and also to various animals, as jackdaw, jack-snipe, jack-rabbit (a species of large prairie-hare); it is also used as a general name for pike.

The many applications of the word "jack" to mechanical devices and other objects follow two lines of reference, one to objects somewhat smaller than the ordinary, the other to appliances which take the place of direct manual labour or assist or save it. Of the first class may be noticed the use of the term for the small object bowl in the game of bowls or for jack rafters, those rafters in a building shorter than the main rafters, especially the end rafters in a hipped roof. The use of jack as the name for a particular form of ship's flag probably arose thus, for it is always a smaller flag than the ensign. The jack is flown on a staff on the bowsprit of a vessel. In the British navy the jack is a small Union flag. (The Union flag should not be styled a Union Jack except when it is flown as a jack.) The jack of other nations is usually the canton of the ensign, as in the German and the United States navies, or else is a smaller form of the national ensign, as in France. (See Flag.)

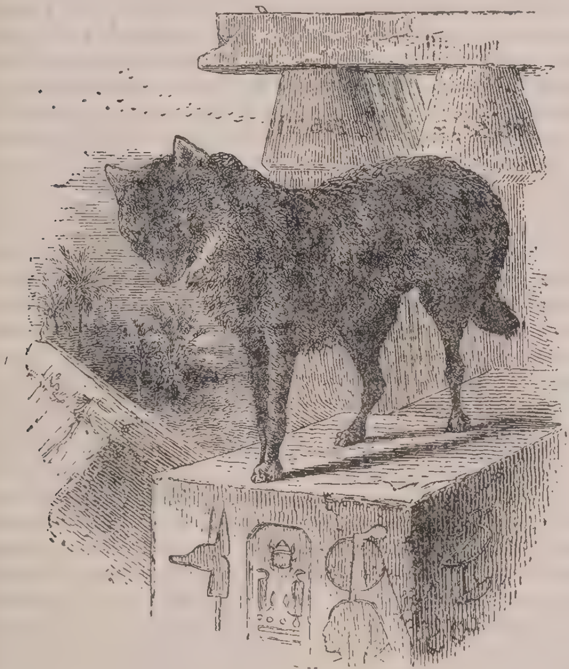
The more common use of "jack" is for various mechanical and other devices originally used as substitutes for men or boys. Thus the origin of the boot-jack and the meat-jack is explained in Isaac Watts's *Logic*, 1724: "So foot boys, who had frequently the common name of Jack given them, were kept to turn the spit or pull off their masters' boots, but when instruments were invented for both these services, they were both called jacks." The *New English Dictionary* finds a transitional sense in the use of the name "jack" for mechanical figures which strike the hours on a bell of a clock. Such a figure in the clock of St Lawrence Church at Reading is called a jack in the parish accounts for 1498–1499. There are many different applications of "jack," to certain levers and other parts of textile machinery, to metal plugs used for connecting lines in a telephone exchange, to wooden uprights connecting the levers of the keys with the strings in the harpsichord and virginal, to a framework forming a seat or staging which can be fixed outside a window for cleaning or painting purposes, and to many devices containing a roller or winch, as in a jack towel, a long towel hung on a roller. The principal mechanical application of the word, however, is to a machine for raising weights from below. A jack chain, so called from its use in meat-jacks, is one in which the links, formed each in a figure of eight, are set in planes at right angles to each other, so that they are seen alternately flat or edgeways.

In most European languages the word "jack" in various forms appears for a short upper outer garment, particularly in the shape of a sleeveless (quilted) leather jerkin, sometimes with plates or rings of iron sewn to it. It was the common coat of defence of the infantry of the middle ages. The word in this case is of French origin and was an adaptation of the common name *Jacques*, as being a garment worn by the common people. In French the word is *jaque*, and it appears in Italian as *giaco*, or *giacco*, in Dutch *jak*, Swedish *jacka* and German *Jacke*, still the ordinary name for a short coat, as is the English jacket, from the diminutive French *jaquette*. It was probably from some resemblance to the leather coat that the well-known leather vessels for holding liquor or for drinking were known as jacks or black jacks. These drinking vessels, which are often of great size, were not described as black jacks till the 16th century, though known as jacks much earlier. Among the important specimens that have survived to this day is one with the initials and crown of Charles I. and the date, 1646, which came from Kensington Palace and is now in the British Museum; one each at Queen's College and New College, Oxford; two at Winchester College; one at Eton College; and six at the Chelsea Hospital. Many specimens are painted with shields of arms, initials and other devices; they are very seldom mounted in silver, though spurious specimens with silver medallions of Cromwell and other prominent personages exist. At the end of the 17th century a smaller jack of a different form, like an ordinary drinking mug with a tapering cylindrical body, often mounted in silver, came into vogue in a limited degree. The black jack is a distinct type of drinking vessel from the leather botel and the bombard. The jack-boot, the heavy riding boot with long flap covering the knee and part of the thigh, and worn by troopers first during the 17th century, was so called probably from association with the leather jack or jerkin. The jack-boot is still worn by the Household Cavalry, and the name is applied to a high riding boot reaching to the knee as distinguished from the riding boot with tops, used in full hunting-kit or by grooms or coachmen.

Jack, sometimes spelled jak, is the common name for the fruit of the tree *Artiocarpus integrifolia*, found in the East Indies. The word is an adaptation of the Portuguese *jaca* from the Malay name *chakka*. (See Bread Fruit.)

The word "jackanapes," now used as an opprobrious term for a swaggering person with impertinent ways and affected airs and graces, has a disputed and curious history. According to the *New English Dictionary* it first appears in 1450 in reference to William de la Pole, duke of Suffolk (*Political Poems*, "Rolls Series," II. 224), "Jack Napys with his clogge hath tiede Talbot oure gentille dogge." Suffolk's badge was a clog and chain, such as was often used for an ape kept in captivity, and he is alluded to (ibid. 222) as "Ape clogge." Jack Napes, Jack o' Napes, Jackanapes, was a common name for a tame ape from the 16th century, and it seems more likely that the word is a fanciful name for a monkey than that it is due to the nickname of Suffolk.

JACKAL (Turk. *chakāl*), a name properly restricted to *Canis aureus*, a wolf-like wild member of the dog family inhabiting eastern Europe and southern Asia, but extended to include a number of allied species. Jackals resemble wolves and dogs in their dentition, the round eye-pupils, the period of gestation, and to a large extent also in habits. The European species grows to a height of 15 in. at the shoulders, and to a length of about 2 ft., exclusive of its bushy tail. Typically the fur is greyish-yellow, darker on the back and lighter beneath. The range of the common jackal (*C. aureus*) extends from Dalmatia to India, the species being represented by several local races. In Senegal this species is replaced by *C. anthus*, while in Egypt occurs the much larger *C. lupaster*, commonly known as the Egyptian wolf. Nearly allied to the last is the so-called Indian wolf (*C. pallipes*). Other African species are the black-backed jackal (*C. mesomelas*), the variegated jackal (*C. variegatus*), and the dusky jackal (*C. adustus*). Jackals are nocturnal animals, concealing themselves until dusk in woody jungles and other natural lurking places, and then sallying forth in packs, which sometimes number two hundred individuals, and visiting farmyards, villages and towns in search of food. This consists for the most part of the smaller mammals and poultry; although the association in packs enables these marauders to hunt down antelopes and sheep. When unable to obtain living prey, they feed on carrion and refuse of all kinds, and are thus useful in removing putrescent matter from the streets. They are also fond of grapes and other fruits, and are thus the pests of the vineyard as well as the poultry-yard. The cry of the jackal is even more appalling than that of the hyena, a shriek from one member of a pack being the signal for a general chorus of screams, which is kept up during the greater part of the night. In India these animals are hunted with foxhounds or greyhounds, and from their cunning and pluck afford excellent sport. Jackals are readily tamed; and domesticated individuals are said, when called by their masters, to wag their tails, crouch and throw themselves on the ground, and otherwise behave in a dog-like fashion. The jackal, like the fox, has an offensive odour, due to the secretion of a gland at the base of the tail.



Egyptian Jackal (*Canis lupaster*).

JACKDAW, or simply DAW (Old Low German, *Daha*; Dutch, *Kaauw*), one of the smallest species of the genus *Corvus* (see CROW), and a very well known inhabitant of Europe, the *C. monedula* of ornithologists. In some of its habits it much resembles its congener the rook, with which it constantly associates during a great part of the year; but, while the rook only exceptionally places its nest elsewhere than on the boughs of trees and open to the sky, the daw almost invariably chooses holes, whether in rocks, hollow trees, rabbit-burrows or buildings. Nearly every church-tower and castle, ruined or not, is more or less numerously occupied by daws. Chimneys frequently give them the accommodation they desire, much to the annoyance of the householder, who finds the funnel choked by the quantity of sticks brought together by the birds, since their industry in collecting materials for their nests is as marvellous as it often is futile. In some cases the stack of loose sticks piled up by daws in a belfry or tower has been known to form a structure 10 or 12 ft. in height, and hence this species may be accounted one of the greatest nest-builders in the world. The style of architecture practised by the daw thus brings it more than the rook into contact with man, and its familiarity is increased by the boldness of its disposition which, though tempered by discreet cunning, is hardly surpassed among birds. Its small size, in comparison with most of its congeners, alone incapacitates it from inflicting the serious injuries of which some of them are often the authors, yet its pilferings are not to be denied, though on the whole its services to the agriculturist are great, for in the destruction of injurious insects it is hardly inferior to the rook, and it has the useful habit of ridding sheep, on whose backs it may be frequently seen perched, of some of their parasites.

The daw displays the glossy black plumage so characteristic of the true crows, varied only by the hoary grey of the ear-coverts, and of the nape and sides of the neck, which is the mark of the adult; but examples from the east of Europe and western Asia have these parts much lighter, passing into a silvery white, and hence have been deemed by some authorities to constitute a distinct species (*C. collaris*, Drumm.). Further to the eastward occurs the *C. dauuricus* of Pallas, which has not only the collar broader and of a pure white, but much of the lower parts of the body white also. Japan and northern China are inhabited also by a form resembling that of western Europe, but wanting the grey nape of the latter. This is the *C. neglectus* of Professor Schlegel, and is said by Dresser, on the authority of Swinhoe, to interbreed frequently with *C. dauuricus*. These are all the birds that seem entitled to be considered daws, though Dr Bowdler Sharpe (*Cat. B. Brit. Museum*, iii. 24) associates with them (under the little-deserved separate generic distinction *Coloeus*) the fish-crow of North America, which appears both in structure and in habits to be a true crow. (A. N.)

JACKSON, ANDREW (1767–1845), seventh president of the United States, was born on the 15th of March 1767, at the Waxhaw or Warsaw settlement, in Union county, North Carolina, or in Lancaster county, South Carolina, whither his parents had immigrated from Carrickfergus, Ireland, in 1765. He played a slight part in the War of Independence, and was taken prisoner in 1781, his treatment resulting in a lifelong dislike of Great Britain. He studied law at Salisbury, North Carolina, was admitted to the bar there in 1787, and began to practise at McLeansville, Guilford county, North Carolina, where for a time he was a constable and deputy-sheriff. In 1788, having been appointed prosecuting attorney of the western district of North Carolina (now the state of Tennessee), he removed to Nashville, the seat of justice of the district. In 1791 he married Mrs Rachel Robards (*née* Donelson), having heard that her husband had obtained a divorce through the legislature of Virginia. The legislative act, however, had only authorized the courts to determine whether or not there were sufficient grounds for a divorce and to grant or withhold it accordingly. It was more than two years before the divorce was actually granted, and only on the basis of the fact that Jackson and Mrs Robards were then living together. On receiving this information, Jackson had the marriage ceremony performed a second time.

In 1796 Jackson assisted in framing the constitution of Tennessee. From December 1796 to March 1797 he represented that state in the Federal House of Representatives, where he distinguished himself as an irreconcilable opponent of President Washington, and was one of the twelve representatives who voted against the address to him by the House. In 1797 he was elected a United States senator; but he resigned in the following year. He was judge of the supreme court of Tennessee from 1798 to 1804. In 1804–1805 he contracted a friendship with Aaron Burr; and at the latter's trial in 1807 Jackson was one of his conspicuous champions. Up to the time of his nomination for the presidency, the biographer of Jackson finds nothing to record but military exploits in which he displayed perseverance, energy and skill of a very high order, and a succession of personal acts in which he showed himself ignorant, violent, perverse, quarrelsome and astonishingly indiscreet. His combative disposition led him into numerous personal difficulties. In 1795 he fought a duel with Colonel Waitstill Avery (1745–1821), an opposing counsel, over some angry words uttered in a court room; but both, it appears, intentionally fired wild. In 1806 in another duel, after a long and bitter quarrel, he killed Charles Dickinson, and Jackson himself received a wound from which he never fully recovered. In 1813 he exchanged shots with Thomas Hart Benton and his brother Jesse in a Nashville tavern, and received a second wound. Jackson and Thomas Hart Benton were later reconciled.

In 1813–1814, as major-general of militia, he commanded in the campaign against the Creek Indians in Georgia and Alabama, defeated them (at Talladega, on the 9th of November 1813, and at Tohopeka, on the 29th of March 1814), and thus first attracted public notice by his talents. In May 1814 he was commissioned as major-general in the regular army to serve against the British; in November he captured Pensacola, Florida, then owned by Spain, but used by the British as a base of operations; and on the 8th of January 1815 he inflicted a severe defeat on the enemy before New Orleans, the contestants being unaware that a treaty of peace had already been signed. During his stay in New Orleans he proclaimed martial law, and carried out his measures with unrelenting sternness, banishing from the town a judge who attempted resistance. When civil law was restored, Jackson was fined $1000 for contempt of court; in 1844 Congress ordered the fine with interest ($2700) to be repaid. In 1818 Jackson received the command against the Seminoles. His conduct in following them up into the Spanish territory of Florida, in seizing Pensacola, and in arresting and executing two British subjects, Alexander Arbuthnot and Robert Ambrister, gave rise to much hostile comment in the cabinet and in Congress; but the negotiations for the purchase of Florida put an end to the diplomatic difficulty. In 1821 Jackson was military governor of the territory of Florida, and there again he came into collision with the civil authority. From this, as from previous troubles, John Quincy Adams, then secretary of state, extricated him.

In July 1822 the general assembly of Tennessee nominated Jackson for president; and in 1823 he was elected to the United States Senate, from which he resigned in 1825. The rival candidates for the office of president in the campaign of 1824 were Jackson, John Quincy Adams, W. H. Crawford and Henry Clay. Jackson obtained the largest number of votes (99) in the electoral college (Adams receiving 84, Crawford 41 and Clay 37); but no one had an absolute majority, and it thus became the duty of the House of Representatives to choose one of the three candidates—Adams, Jackson and Crawford—who had received the greatest numbers of electoral votes. At the election by the house (February 9, 1825) Adams was chosen, receiving the votes of 13 states, while Jackson received the votes of 7 and Crawford the votes of 4. Jackson, however, was recognized by the abler politicians as the coming man. Martin Van Buren and others, going into opposition under his banner, waged from the first a relentless and factious war on the administration. Van Buren was the most adroit politician of his time; and Jackson was in the hands of very astute men, who advised and controlled him. He was easy to lead when his mind was in solution; and he gave his confidence freely where he had once placed it. He was not suspicious, but if he withdrew his confidence he was implacable. When his mind crystallized on a notion that had a personal significance to himself, that notion became a hard fact that filled his field of vision. When he was told that he had been cheated in the matter of the presidency,[1] he was sure of it, although those who told him were by no means so.

There was great significance in the election of Jackson in 1828. A new generation was growing up under new economic and social conditions. They felt great confidence in themselves and great independence. They despised tradition and Old World ways and notions; and they accepted the Jeffersonian dogmas, not only as maxims, but as social forces—the causes of the material prosperity of the country. By this generation, therefore, Jackson was recognized as a man after their own heart. They liked him because he was vigorous, brusque, uncouth, relentless, straightforward and open. They made him president in 1828, and he fulfilled all their expectations. He had 178 votes in the electoral college against 83 given for Adams. Though the work of redistribution of offices began almost at his inauguration, it is yet an incorrect account of the matter to say that Jackson corrupted the civil service. His administration is rather the date at which a system of democracy, organized by the use of patronage, was introduced into the federal arena by Van Buren. It was at this time that the Democratic or Republican party divided, largely along personal lines, into Jacksonian Democrats and National Republicans, the latter led by such men as Henry Clay and J. Q. Adams. The administration itself had two factions in it from the first, the faction of Van Buren, the secretary of state in 1829–1831, and that of Calhoun, vice-president in 1829–1832. The refusal of the wives of the cabinet and of Mrs Calhoun to accord social recognition to Mrs J. H. Eaton brought about a rupture, and in April 1831 the whole cabinet was reorganized. Van Buren, a widower, sided with the president in this affair and grew in his favour. Jackson in the meantime had learned that Calhoun as secretary of war had wished to censure him for his actions during the Seminole war in Florida in 1818, and henceforth he regarded the South Carolina statesman as his enemy. The result was that Jackson transferred to Van Buren his support for succession in the presidency. The relations between Jackson and his cabinet were unlike those existing under his predecessors. Having a military point of view, he was inclined to look upon the cabinet members as inferior officers, and when in need of advice he usually consulted a group of personal friends, who came to be called the "Kitchen Cabinet." The principal members of this clique were William B. Lewis (1784–1866), Amos Kendall and Duff Green, the last named being editor of the *United States Telegraph*, the organ of the administration.

In 1832 Jackson was re-elected by a large majority (219 electoral votes to 49) over Henry Clay, his chief opponent. The battle raged mainly around the re-charter of the Bank of the United States. It is probable that Jackson's advisers in 1828 had told him, though erroneously, that the bank had worked against him, and then were not able to control him. The first message of his first presidency had contained a severe reflection on the bank; and in the very height of this second campaign (July 1832) he vetoed the re-charter, which had been passed in the session of 1831–1832. Jackson interpreted his re-election as an approval by the people of his war on the bank, and he pushed it with energy. In September 1833 he ordered the public deposits in the bank to be transferred to selected local banks, and entered upon the "experiment" whether these could not act as fiscal agents for the government, and whether the desire to get the deposits would not induce the local banks to adopt sound rules of currency. During the next session the Senate passed a resolution condemning his conduct. Jackson protested, and after a hard struggle, in which Jackson's friends were led by Senator Thomas Hart Benton, the resolution was ordered to be expunged from the record, on the 16th of January 1837.

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[1] The charge was freely made then and afterwards (though, it is now believed, without justification) that Clay had supported Adams and by influencing his followers in the house had been instrumental in securing his election, as the result of a bargain by which Adams had agreed to pay him for his support by appointing him secretary of state.

In 1832, when the state of South Carolina attempted to "nullify" the tariff laws, Jackson at once took steps to enforce the authority of the federal government, ordering two war vessels to Charleston and placing troops within convenient distance. He also issued a proclamation warning the people of South Carolina against the consequences of their conduct. In the troubles between Georgia and the Cherokee Indians, however, he took a different stand. Shortly after his first election Georgia passed an act extending over the Cherokee country the civil laws of the state. This was contrary to the rights of the Cherokees under a federal treaty, and the Supreme Court consequently declared the act void (1832). Jackson, however, having the frontiersman's contempt for the Indian, refused to enforce the decision of the court (see NULLIFICATION; GEORGIA: *History*).

Jackson was very successful in collecting old claims against various European nations for spoliations inflicted under Napoleon's continental system, especially the French spoliation claims, with reference to which he acted with aggressiveness and firmness. Aiming at a currency to consist largely of specie, he caused the payment of these claims to be received and imported in specie as far as possible; and in 1836 he ordered land-agents to receive for land nothing but specie. About the same time a law passed Congress for distributing among the states some $35,000,000 balance belonging to the United States, the public debt having all been paid. The eighty banks of deposit in which it was lying had regarded this sum almost as a permanent loan, and had inflated credit on the basis of it. The necessary calling in of their loans in order to meet the drafts in favour of the states, combining with the breach of the overstrained credit between America and Europe and the decline in the price of cotton, brought about a crash which prostrated the whole financial, industrial and commercial system of the country for six or seven years. The crash came just as Jackson was leaving office; the whole burden fell on his successor, Van Buren.

In the 18th century the influences at work in the American colonies developed democratic notions. In fact, the circumstances were those which create equality of wealth and condition, as far as civilized men ever can be equal. The War of Independence was attended by a grand outburst of political dogmatism of the democratic type. A class of men were produced who believed in very broad dogmas of popular power and rights. There were a few rich men, but they were almost ashamed to differ from their neighbours and, in some known cases, they affected democracy in order to win popularity. After the 19th century began the class of rich men rapidly increased. In the first years of the century a little clique at Philadelphia became alarmed at the increase of the "money power," and at the growing perils to democracy. They attacked with some violence, but little skill, the first Bank of the United States, and they prevented its re-charter. The most permanent interest of the history of the United States is the picture it offers of a primitive democratic society transformed by prosperity and the acquisition of capital into a great republican commonwealth. The denunciations of the "money power" and the reiteration of democratic dogmas deserve earnest attention. They show the development of classes or parties in the old undifferentiated mass. Jackson came upon the political stage just when a wealthy class first existed. It was an industrial and commercial class greatly interested in the tariff, and deeply interested also in the then current forms of issue banking. The southern planters also were rich, but were agriculturists and remained philosophical Democrats. Jackson was a man of low birth, uneducated, prejudiced, and marked by strong personal feeling in all his beliefs and disbeliefs. He showed, in his military work and in his early political doings, great lack of discipline. The proposal to make him president won his assent and awakened his ambition. In anything which he undertook he always wanted to carry his point almost regardless of incidental effects on himself or others. He soon became completely engaged in the effort to be made president. The men nearest to him understood his character and played on it. It was suggested to him that the money power was against him. That meant that, to the educated or cultivated class of that day, he did not seem to be in the class from which a president should be chosen. He took the idea that the Bank of the United States was leading the money power against him, and that he was the champion of the masses of democracy and of the common people. The opposite party, led by Clay, Adams, Biddle, &c., had schemes for banks and tariffs, enterprises which were open to severe criticism. The political struggle was very intense and there were two good sides to it. Men like Thomas H. Benton, Edward Livingston, Amos Kendall, and the southern statesmen, found material for strong attacks on the Whigs. The great mass of voters felt the issue as Jackson's managers stated it. That meant that the masses recognized Jackson as their champion. Therefore, Jackson's personality and name became a power on the side opposed to banks, corporations and other forms of the new growing power of capital. That Jackson was a typical man of his generation is certain. He represents the spirit and temper of the free American of that day, and it was a part of his way of thinking and acting that he put his whole life and interest into the conflict. He accomplished two things of great importance in the history: he crushed excessive state-rights and established the contrary doctrine in fact and in the political orthodoxy of the democrats; he destroyed the great bank. The subsequent history of the bank left it without an apologist, and prejudiced the whole later judgment about it. The way in which Jackson accomplished these things was such that it cost the country ten years of the severest liquidation, and left conflicting traditions of public policy in the Democratic party. After he left Washington, Jackson fell into discord with his most intimate old friends, and turned his interest to the cause of slavery, which he thought to be attacked and in danger.

Jackson is the only president of whom it may be said that he went out of office far more popular than he was when he entered. When he went into office he had no political opinions, only some popular notions. He left his party strong, perfectly organized and enthusiastic on a platform of low expenditure, payment of the debt, no expenditure for public improvement or for glory or display in any form and low taxes. His name still remained a spell to conjure with, and the politicians sought to obtain the assistance of his approval for their schemes; but in general his last years were quiet and uneventful. He died at his residence, "The Hermitage," near Nashville, Tennessee, on the 8th of June 1845.

BIBLIOGRAPHY.—Of the early biographies, that by J. H. Eaton (Philadelphia, 1824) is a history of Jackson's early military exploits, written for political purposes. Amos Kendall's *Life* (New York, 1843) is incomplete, extending only to 1814. James Parton's elaborate work (3 vols., New York, 1860) is still useful. Parton prepared a shorter biography for the "Great Commanders Series" (New York, 1893), which emphasizes Jackson's military career. W. G. Sumner's *Andrew Jackson* in the "American Statesmen Series" (Boston, 1882; revised, 1899) combines the leading facts of Jackson's life with a history of his times. W. G. Brown wrote an appreciative sketch (Boston, 1900) for the "Riverside Biographical Series." Of more recent works the most elaborate are the *History of Andrew Jackson*, by A. C. Buell (New York, 1904), marred by numerous errors, and the *Life and Times of Andrew Jackson*, by A. S. Colyar (Nashville, 1904). Charles H. Peck's *The Jacksonian Epoch* (New York, 1899) is an account of national politics from 1815 to 1840, in which the antagonism of Jackson and Clay is emphasized. (W. G. S.)

JACKSON, CYRIL (1746–1819), dean of Christ Church, Oxford, was born in Yorkshire, and educated at Westminster and Oxford. In 1771 he was chosen to be sub-preceptor to the two eldest sons of George III., but in 1776 he was dismissed, probably through some household intrigues. He then took orders, and was appointed in 1779 to the preachership at Lincoln's Inn and to a canonry at Christ Church, Oxford. In 1783 he was elected dean of Christ Church. His devotion to the college led him to decline the bishopric of Oxford in 1799 and the primacy of Ireland in 1800. He took a leading part in framing the statute which, in 1802, launched the system of public examinations at Oxford, but otherwise he was not prominent in university affairs. On his resignation in 1809 he settled at Felpham, in Sussex, where he remained till his death.

JACKSON, FREDERICK GEORGE (1860–), British Arctic explorer, was educated at Denstone College and Edinburgh University. His first voyage in Arctic waters was on a whaling-cruise in 1886–1887, and in 1893 he made a sledge-journey of 3000 miles across the frozen *tundra* of Siberia lying between the Ob and the Pechora. His narrative of this journey was published under the title of *The Great Frozen Land* (1895). On his return, he was given the command of the Jackson-Harmsworth Arctic expediton (1894–1897), which had for its objective the general exploration of Franz Josef Land. In recognition of his services he received a knighthood of the first class of the Danish Royal Order of St Olaf in 1898, and was awarded the gold medal of the Paris Geographical Society in 1899. His account of the expedition was published under the title of *A Thousand Days in the Arctic* (1899). He served in South Africa during the Boer War, and obtained the rank of captain. His travels also include a journey across the Australian deserts.

JACKSON, HELEN MARIA (1831–1885), American poet and novelist, who wrote under the intials of "H. H." (Helen Hunt), was born in Amherst, Massachusetts, on the 18th of October 1831, the daughter of Nathan Welby Fiske (1798–1847), who was a professor in Amherst College. In October 1852 she married Lieutenant Edward Bissell Hunt (1822–1863), of the U.S. corps of engineers. In 1870 she published a little volume of meditative *Verses*, which was praised by Emerson in the preface to his *Parnassus* (1874). In 1875 she married William S. Jackson, a banker, of Colorado Springs. She became a prolific writer of prose and verse, including juvenile tales, books of travel, household hints and novels, of which the best is *Ramona* (1884), a defence of the Indian character. In 1883, as a special commissioner with Abbot Kinney (b. 1850), she investigated the condition and needs of the Mission Indians in California. *A Century of Dishonor* (1881) was an arraignment of the treatment of the Indians by the United States. She died on the 12th of August 1885 in San Francisco.

In addition to her publications referred to above, *Mercy Philbrick's Choice* (1876), *Hetty's Strange History* (1877), *Zeph* (1886), and *Sonnets and Lyrics* (1886) may be mentioned.

JACKSON, MASON (*c.* 1820–1903), British engraver, was born at Berwick-on-Tweed about 1820, and was trained as a wood engraver by his brother, John Jackson, the author of a history of this art. In the middle of the 19th century he made a considerable reputation by his engravings for the Art Union of London, and for Knight's *Shakespeare* and other standard books; and in 1860 he was appointed art editor of the *Illustrated London News*, a post which he held for thirty years. He wrote a history of the rise and progress of illustrated journalism. He died in December 1903.

JACKSON, THOMAS (1579–1640), president of Corpus Christi College, Oxford, and dean of Peterborough, was born at Witton-le-Wear, Durham, and educated at Oxford. He became a probationer fellow of Corpus in 1606, and was soon afterwards elected vice-president. In 1623 he was presented to the living of St Nicholas, Newcastle, and about 1625 to the living of Winston, Durham. Five years later he was appointed president of Corpus, and in 1632 the king presented him to the living of Witney, Oxfordshire. He was made a prebendary of Winchester in 1635, and was dean of Peterborough in 1635–1639. Although originally a Calvinist, he became in later life an Arminian.

His chief work was a series of commentaries on the Apostles' Creed, the first complete edition being entitled *The Works of Thomas Jackson, D.D.* (London, 1673). The commentaries were, however, originally published in 1613–1657, as twelve books with different titles, the first being *The Eternal Truth of Scriptures* (London, 1613).

JACKSON, THOMAS JONATHAN (1824–1863), known as "Stonewall Jackson," American general, was born at Clarksburg, Virginia (now West Viginia), on the 21st of January 1824, and was descended from an Ulster family. At an early age he was left a penniless orphan, and his education was acquired in a small country school until he procured, mainly by his own energy, a nomination to the Military Academy. Lack of social graces and the deficiencies of his early education impeded him at first, but "in the end 'Old Jack,' as he was always called, with his desperate earnestness, his unflinching straightforwardness, and his high sense of honour, came to be regarded with something like affection." Such qualities he displayed not less amongst the light-hearted cadets than afterwards at the head of troops in battle. After graduating he took part, as second lieutenant in the 1st U.S. Artillery, in the Mexican War. At Vera Cruz he won the rank of first lieutenant, and for gallant conduct at Contreras and Chapultepec respectively he was brevetted captain and major, a rank which he attained with less than one year's service. During his stay in the city of Mexico his thoughts were seriously directed towards religion, and, eventually entering the Presbyterian communion, he ruled every subsequent action of his life by his faith. In 1851 he applied for and obtained a professorship at the Virginia military institute, Lexington; and here, except for a short visit to Europe, he remained for ten years, teaching natural science, the theory of gunnery and battalion drill. Though he was not a good teacher, his influence both on his pupils and on those few intimate friends for whom alone he relaxed the gravity of his manner was profound, and, little as he was known to the white inhabitants of Lexington, he was revered by the slaves, to whom he showed uniform kindness, and for whose moral instruction he worked unceasingly. As to the great question at issue in 1861, Major Jackson's ruling motive was devotion to his state, and when Virginia seceded, on the 17th of April, and the Lexington cadets were ordered to Richmond, Jackson went thither in command of the corps. His intimate friend, Governor Letcher, appreciating his gifts, sent him as a colonel of infantry to Harper's Ferry, where the first collision with the Union forces was hourly expected. In June he received the command of a brigade, and in July promotion to the rank of brigadier-general. He had well employed the short time at his disposal for training his men, and on the first field of Bull Run they won for themselves and their brigadier, by their rigid steadiness at the critical moment of the battle, the historic name of "Stonewall."

After the battle of Bull Run Jackson spent some time in the further training of his brigade which, to his infinite regret, he was compelled to leave behind him when, in October, he was assigned as a major-general to command in the Shenandoah Valley. His army had to be formed out of local troops, and few modern weapons were available, but the Valley regiments retained the impress of Jackson's training till the days of Cedar Creek. Discipline was not acquired at once, however, and the first ventures of the force were not very successful. At Kernstown, indeed, Jackson was tactically defeated by the Federals under Shields (March 23, 1862). But the Stonewall brigade had been sent to its old leader in November, and by the time that the famous Valley Campaign (see SHENANDOAH VALLEY CAMPAIGNS) began, the forces under Jackson's command had acquired cohesion and power of manœuvre. On the 8th of May 1862 was fought the combat of McDowell, won by Jackson against the leading troops of Frémont's command from West Virginia. Three weeks later the forces under Banks were being driven over the Potomac at Harper's Ferry, and Jackson was master of the Valley. Every other plan of campaign in Virginia was at once subordinated to the scheme of "trapping Jackson." But the Confederates, marching swiftly up the Valley, slipped between the converging columns of Frémont from the west and

McDowell from the east, and concluded a most daring campaign by the victorious actions of Cross Keys and Port Republic (8th and 9th of June). While the forces of the North were still scattered, Jackson secretly left the Valley to take a decisive part in Lee's campaign before Richmond. In the "Seven Days" Jackson was frequently at fault, but his driving energy bore no small part in securing the defeat of McClellan's advance on Richmond. Here he passed for the first time under the direct orders of Robert Lee, and the rest of his career was spent in command of the II. corps of the Army of Northern Virginia. As Lee's chief and most trusted subordinate he was throughout charged with the execution of the more delicate and difficult operations of his commander's hazardous strategy. After his victory over Banks at Cedar Mountain, near Culpeper, Virginia, Jackson led the daring march round the flank of General Pope's army, which against all theoretical rules ended in the great victory of second Bull Run. In the Maryland campaign Lieut.-General Jackson was again detached from the main army. Eleven thousand Federals, surrounded in Harper's Ferry, were forced to surrender, and Jackson rejoined Lee just in time to oppose McClellan's advance. At the Antietam his corps bore the brunt of the battle, which was one of the most stubborn of modern warfare. At Fredericksburg his wing of Lee's line of battle was heavily engaged, and his last battle, before Chancellorsville, in the thickets of the Wilderness, was his greatest triumph. By one of his swift and secret flank marches he placed his corps on the flank of the enemy, and on the 2nd of May flung them against the Federal XI. corps, which was utterly routed. At the close of a day of victory he was reconnoitring the hostile positions when suddenly the Confederate outposts opened fire upon his staff, whom they mistook in the dark and tangled forest for Federal cavalry. Jackson fell wounded, and on the 10th of May he died at Guinea's station. He was buried, according to his own wish, at Lexington, where a statue and a memorial hall commemorate his connexion with the place; and on the spot where he was mortally wounded stands a plain granite pillar. The first contribution towards the bronze statue at Richmond was made by the negro Baptist congregation for which Jackson had laboured so earnestly in his Lexington years. He was twice married, first to Eleanor (d. 1854), daughter of George Junkin, president of Washington College, Virginia, and secondly in 1857 to Mary Anna Morrison, daughter of a North Carolina clergyman.

That Jackson's death, at a critical moment of the fortunes of the Confederacy, was an irreparable loss was disputed by no one. Lee said that he had lost his right arm, and, good soldiers as were the other generals, not one amongst them was comparable to Jackson, whose name was dreaded in the North like that of Lee himself. His military character was the enlargement of his personal character—"desperate earnestness, unflinching straightforwardness," and absolute, almost fatalist, trust in the guidance of providence. At the head of his troops, who idolized him, he was a Cromwell, adding to the zeal of a fanatic and the energy of the born leader the special military skill and trained soldierly spirit which the English commander had to gain by experience. His Christianity was conspicuous, even amongst deeply religious men like Lee and Stuart, and penetrated every part of his character and conduct.

See lives by R. L. Dabney (New York, 1883), J. E. Cooke (New York, 1866), M. A. Jackson (General Jackson's widow) (New York, 1892); and especially G. F. R. Henderson, *Stonewall Jackson* (London, 1898), and H. A. White, *Stonewall Jackson* (Philadelphia, 1909).

JACKSON, WILLIAM (1730–1803), English musician, was born at Exeter on the 29th of May 1730. His father, a grocer, bestowed a liberal education upon him, but, on account of the lad's strong predilection for music, was induced to place him under the care of John Silvester, the organist of Exeter Cathedral, with whom he remained about two years. In 1748 he went to London, and studied under John Travers, organist of the king's chapel. Returning to Exeter, he settled there as a teacher and composer, and in 1777 was appointed subchanter, organist, lay-vicar and master of the choristers of the cathedral. In 1755 he published his first work, *Twelve Songs*, which became at once highly popular. His next publication, *Six Sonatas for the Harpsichord*, was a failure. His third work, *Six Elegies for three voices, preceded by an Invocation, with an Accompaniment*, placed him among the first composers of his day. His fourth work was another set of *Twelve Songs*, now very scarce; and his fifth work was again a set of *Twelve Songs*, all of which are now forgotten. He next published *Twelve Hymns*, with some good remarks upon that style of composition, although his precepts were better than his practice. A set of *Twelve Songs* followed, containing some good compositions. Next came an *Ode to Fancy*, the words by Dr Warton. *Twelve Canzonets for two voices* formed his ninth work; and one of them—"Time has not thinned my Flowing Hair"—long held a place at public and private concerts. His tenth work was *Eight Sonatas for the Harpsichord*, some of which were novel and pleasing. He composed three dramatic pieces,—*Lycidas* (1767), *The Lord of the Manor*, to General Burgoyne's words (1780), and *The Metamorphoses*, a comic opera produced at Drury Lane in 1783, which did not succeed. In the second of these dramatic works, two airs—"Encompassed in an Angel's Form" and "When first this Humble Roof I knew"—were great favourites. His church music was published after his death by James Paddon (1820); most of it is poor, but "Jackson in F" was for many years popular. In 1782 he published *Thirty Letters on Various Subjects*, in which he severely attacked canons, and described William Bird's *Non nobis Domine* as containing passages not to be endured. But his anger and contempt were most strongly expressed against catches of all kinds, which he denounced as barbarous. In 1791 he put forth a pamphlet, *Observations on the Present State of Music in London*, in which he found fault with everything and everybody. He published in 1798 *The Four Ages, together with Essays on Various Subjects*,—a work which gives a favourable idea of his character and of his literary acquirements. Jackson also cultivated a taste for landscape painting, and imitated, not unsuccessfully, the style of his friend Gainsborough. He died on the 5th of July 1803.

JACKSON, a city and the county-seat of Jackson county, Michigan, U.S.A., on both sides of the Grand River, 76 m. W. of Detroit. Pop. (1890), 20,798; (1900), 25,180, of whom 3843 were foreign-born (1004 German, 941 English Canadian); (1910 census) 31,433. It is served by the Michigan Central, the Lake Shore & Michigan Southern, the Grand Trunk and the Cincinnati Northern railways, and by inter-urban electric lines. It is the seat of the state prison (established 1839). Coal is mined in the vicinity; the city has a large trade with the surrounding agricultural district (whose distinctive product is beans); the Michigan Central railway has car and machine shops here; and the city has many manufacturing establishments. The total factory product in 1904 was valued at $8,348,125, an increase of 24·4% over that of 1900. The municipality owns and operates its water-works. The place was formerly a favourite camping ground of the Indians, and was settled by whites in 1829. In 1830 it was laid out as a town, selected for the county-seat, and named Jacksonburg in honour of Andrew Jackson; the present name was adopted in 1838. Jackson was incorporated as a village in 1843, and in 1857 was chartered as a city. It was at a convention held at Jackson on the 6th of July 1854 that the Republican party was first organized and so named by a representative state body.

JACKSON, a city and the county-seat of Hinds county, Mississippi, U.S.A., and the capital of the state, on the W. bank of the Pearl River, about 40 m. E. of Vicksburg and 185 m. N. of New Orleans, Louisiana. Pop. (1890), 5920; (1900), 7816, of whom 4447 were negroes. According to the Federal census taken in 1910 the population had increased to 21,262. Jackson is served by the Illinois Central, the Alabama & Vicksburg, the Gulf & Ship Island, New Orleans Great Northern, and the Yazoo & Mississippi Valley railways, and during the winter by small freight and passenger steamboats on the Pearl River. In Jackson is the state library, with more than 80,000 volumes. The new state capitol was finished in 1903. The old state capitol, dating from 1839, is of considerable interest; in it were held the secession convention (1861), the "Black and Tan Convention" (1868), and the constitutional convention of 1890, and in it Jefferson Davis made his last speech (1884). Jackson is the seat of Millsaps College, chartered in 1890 and opened in 1892 (under the control of the Methodist Episcopal Church, South), and having, in 1907–1908, 12 instructors and 297 students; of Belhaven College (non-sectarian, 1894), for girls; and of Jackson College (founded in 1877 at Natchez by the American Baptist Home Mission Society; in 1883 removed to Jackson), for negroes, which had 356 students in 1907–1908. The city is a market for cotton and farm products, and has a number of manufactories. In 1821 the site was designated as the seat of the state government, and early in the following year the town, named in honour of Andrew Jackson, was laid out. The legislature first met here in December 1822. It was not until 1840 that it was chartered as a city. During the Civil War Jackson was in the theatre of active campaigning. On the 14th of May 1863 Johnston who then held the city, was attacked on both sides by Sherman and McPherson with two corps of Grant's army, which, after a sharp engagement, drove the Confederates from the town. After the fall of Vicksburg Johnston concentrated his forces at Jackson, which had been evacuated by the Federal troops, and prepared to make a stand behind the intrenchments. On the 9th of July Sherman began an investment of the place, and during the succeeding week a sharp bombardment was carried on. In the night of the 16th Johnston, taking advantage of a lull in the firing, withdrew suddenly from the city. Sherman's army entered on the 17th and remained five days, burning a considerable part of the city and ravaging the surrounding country.

JACKSON, a city and the county-seat of Madison county, Tennessee, U.S.A., situated on the Forked Deer river, about 85 m. N.E. of Memphis. Pop. (1890), 10,039; (1900), 14,511, of whom 6108 were negroes; (1910 census), 15,779. It is served by the Mobile & Ohio, the Nashville, Chattanooga & St Louis and the Illinois Central railways. The state supreme court holds its sessions here for the western district of Tennessee. The city is the seat of Union University (co-educational), chartered in 1875 as Southwestern Baptist University, and conducted under that name at Jackson until 1907, when the present name was adopted. In 1907–1908 the university had 17 instructors and 280 students. At Jackson, also, are St Mary's Academy (Roman Catholic); the Memphis Conference Female Institute (Methodist Episcopal, South, 1843), and Lane College (for negroes), under the control of the Colored Methodist Episcopal Church. Jackson is an important cotton market, and is a shipping point for the farm products and fruits of the surrounding country. It has also numerous manufactures and railway shops. The total value of the factory product in 1905 was $2,317,715. The municipality owns and operates the electric-lighting plant and the water-works. There is in the city an electro-chalybeate well with therapeutic properties. Jackson was settled about 1820, incorporated as a town in 1823, chartered as a city in 1854, and in 1907 received a new charter by which the sale of intoxicating liquors is forever prohibited. After General Grant's advance into Tennessee in 1862 Jackson was fortified and became an important base of operations for the Federal army, Grant himself establishing his headquarters here in October.

JACKSONVILLE, a city and the county-seat of Duval county, Florida, U.S.A., in the N.E. part of the state, on the left bank of the St John's River, 14 m. from the Atlantic Ocean as the crow flies and about 27 m. by water. Pop. (1890), 17,201; (1900), 28,429, of whom 16,236 were negroes and 1166 foreign-born; (1910 census) 57,699; the city being the largest in the state. It is served by the Southern, the Atlantic Coast Line, the Seaboard Air Line, the Georgia Southern & Florida and the Florida East Coast railways, and by several steamship lines.[1] It is the largest railway centre in the state, and is popularly known as the Gate City of Florida. In appearance Jacksonville is very attractive. It has many handsome buildings, and its residential streets are shaded with live-oaks, water oaks and bitter-orange trees. Jacksonville is the seat of two schools for negroes, the Florida Baptist Academy and Cookman Institute (1872; Methodist Episcopal). Many winter visitors are annually attracted by the excellent climate, the mean temperature for the winter months being about 55° F. Among the places of interest in the vicinity is the large Florida ostrich farm. There are numerous municipal and other parks. The city owns and operates its electric-lighting plant and its water-works system. The capital invested in manufacturing increased from $1,857,844 in 1900 to $4,837,281 in 1905, or 160·4%, and the value of the factory product rose from $1,798,607 in 1900 to $5,340,264 in 1905, or 196·9%. Jacksonville is the most important distributing centre in Florida, and is a port of entry. In 1909 its foreign imports were valued at $513,439; its foreign exports at $2,507,373.

The site of Jacksonville was called Cow Ford (a version of the Indian name, Wacca Pilatka), from the excellent ford of the St John's River, over which went the King's Road, a highway built by the English from St Augustine to the Georgia line. The first settlement was made in 1816. In 1822 a town was laid out here and was named in honour of General Andrew Jackson; in 1833 Jacksonville was incorporated. During the Civil War the city was thrice occupied by Federal troops. In 1888 there was an epidemic of yellow fever. On the 3rd of May 1901 a fire destroyed nearly 150 blocks of buildings, constituting nearly the whole of the business part of the city, the total loss being more than $15,000,000; but within two years new buildings greater in number than those destroyed were constructed, and up to December 1909 about 9000 building permits had been granted.

JACKSONVILLE, a city and the county-seat of Morgan county, Illinois, U.S.A., on Mauvaiseterre Creek, about 33 m. W. of Springfield. Pop. (1890), 12,935; (1900), 15,078, of whom 1497 were foreign-born; (1910 census), 15,326. It is served by the Chicago, Burlington & Quincy, the Chicago & Alton, the Chicago, Peoria & St Louis and the Wabash railways. It is the seat of several educational and philanthropic institutions. Illinois College (Presbyterian), founded in 1829 through the efforts of the Rev. John Millot Ellis (1793–1855), a missionary of the American Home Missionary Society and of the so-called Yale Band (seven Yale graduates devoted to higher education in the Middle West), is one of the oldest colleges in the Central States of the United States. The Jacksonville Female Academy (1830) and the Illinois Conservatory of Music (1871) were absorbed in 1903 by Illinois College, which then became co-educational. The college embraces, besides the collegiate department, Whipple Academy (a preparatory department), the Illinois Conservatory of Music and a School of Art, and in 1908–1909 had 21 instructors and 173 students. The Rev. Edward Beecher was the first president of the college (from 1830 to 1844), and among its prominent graduates have been Richard Yates, jun., the Rev. Thomas K. Beecher, Newton Bateman (1822–1897), superintendent of public instruction of Illinois from 1865 to 1875 and president of Knox College in 1875–1893, Bishop Theodore N. Morrison (b. 1850), Protestant Episcopal Bishop of Iowa after 1898, and William J. Bryan. The Illinois Woman's College (Methodist Episcopal; chartered in 1847 as the Illinois Conference Female Academy) received its present name in 1899. The State Central Hospital for the Insane (opened in 1851), the State School for the deaf (established in 1839, opened in 1845, and the first charitable institution of the state) and the State School for the Blind (1849) are also in Jacksonville. Morgan Lake and Duncan Park are pleasure resorts. The total value of the factory product in 1905 was $1,981,582, an increase of 17·7% since 1900. Jacksonville was laid out in 1825 as the county-seat of Morgan county, was named probably in honour of Andrew Jackson, and was incorporated as a town in 1840, chartered as a city in 1867, and re-chartered in 1887. The majority of the early settlers came from the southern and border states, principally from Missouri and Kentucky; but subsequently there was a large immigration of New England and Eastern people, and these elements were stronger in the population of Jacksonville than in any other city of southern Illinois. The city was a station of the "Underground Railroad."

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[1] Shoals in the river and sand rock at its mouth long prevented the development of an extensive water trade, but in 1896 the United States Government made an appropriation (supplemented in 1902, 1903 and 1904) for deepening, for a width of 300 ft., the channel connecting the city and the ocean to 24 ft., and on the bar 27 ft. (mean low water), and by 1909 the work had been completed; further dredging to a 24 ft. depth between the navigable channel and pierhead lines was authorized in 1907 and completed by 1910.

JACOB (Hebrew *yă'ăqōb*, derived, according to Gen. xxv. 26, xxvii. 36, from a root meaning "to seize the heel" or "supplant"), son of Isaac and Rebekah in the Biblical narrative, and the father of the twelve tribes of Israel. Jacob and his twin brother Esau are the eponyms of the Israelites and Edomites. It was said of them that they would be two nations, and that the elder would serve the younger. Esau was born first, but lost his superiority by relinquishing his birthright, and Jacob by an act of deceit gained the paternal blessing intended for Esau (Gen. xxvii., J and E).[1] The popular view regarding Israel and Edom is expressed when the story makes Jacob a tent-dweller, and Esau a hunter, a man of the field. But whilst Esau married among the Canaanite "daughters of the land" (P in xxvi. 34; xxviii. 8 seq.), Jacob was sent, or (according to a variant tradition) fled from Beer-sheba, to take a wife from among his Syrian kinsfolk at Haran. On the way he received a revelation at Bethel ("house of God") promising to him and to his descendants the whole extent of the land. The beautiful story of Jacob's fortunes at Haran is among the best examples of Hebrew narrative: how he served seven years for Rachel, "and they seemed a few days for the love he had to her," and was tricked by receiving the elder sister Leah, and how he served yet another seven years, and at last won his love. The patriarch's increasing wealth caused him to incur the jealousy of his father-in-law, Laban, and he was forced to flee in secret with his family. They were overtaken at Gilead,[2] whose name (interpreted "heap of witness") is explained by the covenant into which Jacob and Laban entered (xxxi. 47 sqq.). Passing Mahanaim ("camps"), where he saw the camps of God, Jacob sent to Esau with friendly overtures. At the Jabbok he wrestled with a divine being and prevailed (cf. Hos. xii. 3 sqq.), hence he called the place Peniel or Penuel ("the face of God"), and received the new name Israel. He then effected an unexpected reconciliation with Esau, passed to Succoth, where he built "booths" for his cattle (hence its name), and reached Shechem. Here he purchased ground from the clan Hamor (cf. Judg. ix. 28), and erected an altar to "God (El) the God of Israel." This was the scene of the rape of Dinah and of the attack of Simeon and Levi which led to their ruin (xxxiv.; see Dan, Levites, Simeon). Thence Jacob went down south to Bethel, where he received a divine revelation (P), similar to that recorded by the earlier narrator (J), and was called Israel (xxxv. 9–13, 15). Here Deborah, Rebekah's nurse, died, on the way to Ephrath. Rachel died in giving birth to Benjamin (*q.v.*), and further south Reuben was guilty of a grave offence (cf. xlix. 4). According to P, Jacob came to Hebron, and it was at this juncture that Jacob and Esau separated (a second time) and the latter removed to Mount Seir (xxxvi. 6 sqq.; cf. the parallel in xiii. 5 sqq.). Compelled by circumstances, described with much fullness and vividness, Jacob ultimately migrated to Egypt, receiving on the way the promise that God would make of him a great nation, which should come again out of Egypt (see Joseph). After an interview with the Pharaoh (recorded only by P, xlvii. 5–11), he dwelt with his sons in the land of Goshen, and as his death drew near pronounced a formal benediction upon the two sons of Joseph (Manasseh and Ephraim), intentionally exalting the younger. Then he summoned all the "sons" to gather round his bed, and told them "what shall befall in the latter days" (xlix.). He died at the age of 147 (so P), and permission was given to carry his body to Canaan to be buried.

These narratives are full of much valuable evidence regarding marriage customs, pastoral life and duties, popular beliefs and traditions, and are evidently typical of what was currently retailed. Their historical value has been variously estimated. The *name* existed long before the traditional date of Jacob, and the Egyptian phonetic equivalent of Jacob-el (cf. Isra-el, Ishma-el) appears to be the name of a district of central Palestine (or possibly east of Jordon) about 1500 B.C. But the stories in their present form are very much later. The close relation between Jacob and Aramaeans confirms the view that some of the tribes of Israel were partly of Aramaean origin; his entrance into Palestine from beyond the Jordan is parallel to Joshua's invasion at the head of the Israelites; and his previous journey from the south finds independent support in traditions of another distinct movement from this quarter. Consequently, it would appear that these extremely elevated and richly developed narratives of Jacob-Israel embody, among a number of other features, a recollection of two distinct traditions of migration which became fused among the Israelites. See further Genesis; Jews. (S. A. C.)

JACOB, JOHN (1812–1858), Indian soldier and administrator, was born on the 11th of January 1812, educated at Addiscombe, and entered the Bombay artillery in 1828. He served in the first Afghan War under Sir John Keane, and afterwards led his regiment with distinction at the battles of Meeanee, Shahdadpur, and Umarkot; but it is as commandant of the Sind Horse and political superintendent of Upper Sind that he was chiefly famous. He was the pacificator of the Sind frontier, reducing the tribes to quietude as much by his commanding personality as by his ubiquitous military measures. In 1853 he foretold the Indian Mutiny, saying: "There is more danger to our Indian empire from the state of the Bengal army, from the feeling which there exists between the native and the European, and thence spreads throughout the length and breadth of the land, than from all other causes combined. Let government look to this; it is a serious and most important truth"; but he was only rebuked by Lord Dalhousie for his pains. He was a friend of Sir Charles Napier and Sir James Outram, and resembled them in his outspoken criticisms and independence of authority. He died at the early age of 46 of brain fever, brought on by excessive heat and overwork. The town of Jacobabad, which has the reputation of being the hottest place in India, is named after him.

See A. I. Shand, *General John Jacob* (1900).

JACOB BEN ASHER (1280–1340), codifier of Jewish law, was born in Germany and died in Toledo. A son of Asher ben Yeḥiel (*q.v.*), Jacob helped to re-introduce the older elaborate method of legal casuistry which had been overthrown by Maimonides (*q.v.*). The Asheri family suffered great privations but remained faithful in their devotion to the Talmud. Jacob ben Asher is known as the Ba'al ha-ṭurim (literally "Master of the Rows") from his chief work, the four *Ṭurim* or Rows (the title is derived from the four *Ṭurim* or rows of jewels in the High Priest's breastplate). In this work Jacob ben Asher codified Rabbinic law on ethics and ritual, and it remained a standard work of reference until it was edited with a commentary by Joseph Qaro, who afterwards simplified the code into the more popular *Shulḥan Aruch*. Jacob also wrote two commentaries on the Pentateuch.

See Graetz, *History of the Jews* (Eng. trans.), vol. iv. ch. iii.; Weiss, *Dor dor we-dorashav*, v. 118–123. (I. A.)

JACOB OF EDESSA, who ranks with Barhebraeus as the most distinguished for scholarship among Syriac writers,[3] was born at 'Ēn-dēbḫā in the province of Antioch, probably about A.D. 640. From the trustworthy account of his life by Barhebraeus (*Chron. Eccles.* i. 289) we learn that he studied first at the famous monastery of Ken-neshrē (on the left bank of the Euphrates, opposite Jerābis) and afterwards at Alexandria, which had of course been for some time in the hands of the Moslems.[1] On his return he was appointed bishop of Edessa by his friend Athanasius II. (of Balad), probably in 684,[2] but held this office only for three or four years, as the clergy withstood his strict enforcement of the Church canons and he was not supported by Julian, the successor of Athanasius in the patriarchate. Accordingly, having in anger publicly burnt a copy of the canons in front of Julian's residence, Jacob retired to the monastery of Kaisūm near Samosāta, and from there to the monastery of Eusebhōnā,[3] where for eleven years he taught the Psalms and the reading of the Scriptures in Greek. But towards the close of this period he again encountered opposition, this time from monks "who hated the Greeks," and so proceeded to the great convent of Tell ʿAddā or Teleda (? modern Tellādi, N.W. of Aleppo), where he spent nine years in revising and emending the Peshitta version of the Old Testament by the help of the various Greek versions. He was finally recalled to the bishopric of Edessa in 708, but died four months later, on the 5th of June.

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[1] For the symbols J, E, P, as regards the sources of the book of Genesis, see Genesis; Bible: *Old Test. Criticism*.

[2] Since it is some 300 m. from Haran to Gilead it is probable that Laban's home, only seven days' journey distant, was nearer Gilead than the current tradition allows (Gen. xxxi. 22 sqq.).

[3] "In the literature of his country Jacob holds much the same place as Jerome among the Latin fathers" (Wright, *Short Hist. of Syr. Lit.* p. 143).

In doctrine Jacob was undoubtedly Monophysite.[4] Of the very large number of his works, which are mostly in prose, not many have as yet been published, but much information may be gathered from Assemani's *Bibliotheca Orientalis* and Wright's *Catalogue of Syriac MSS. in the British Museum.* (1) Of the Syriac Old Testament Jacob produced what Wright calls "a curious eclectic or patchwork text," of which five volumes survive in Europe (Wright's *Catalogue* 38). It was "the last attempt at a revision of the Old Testament in the Monophysite Church." Jacob was also the chief founder of the Syriac Massorah among the Monophysites, which produced such MSS. as the one (Vat. cliii.) described by Wiseman in *Horae syriacae*, part iii. (2) Jacob was the author both of commentaries and of scholia on the sacred books; of these specimens are given by Assemani and Wright. They were largely quoted by later commentators, who often refer to Jacob as "the interpreter of the Scriptures." With the commentaries may be mentioned his *Hexahemeron*, or treatise on the six days of creation, MSS. of which exist at Leiden and at Lyons. It was his latest work, and being left incomplete was finished by his friend George the bishop of the Arabs. Among apocrypha, the *History of the Rechabites* composed by Zosimus was translated from Greek into Syriac by Jacob (Wright's *Catalogue* 1128, and Nau in *Revue sémitique* vi. 263, vii. 54, 136). (3) Mention has been made above of Jacob's zeal on behalf of ecclesiastical canons. In his letter to the priest Addai we possess a collection of canons from his pen, given in the form of answers to Addai's questions. These were edited by Lagarde in *Reliquiae juris eccl. syriace*, pp. 117 sqq. and Lamy in *Dissert.* pp. 98 sqq. Additional canons were given in Wright's *Notulae syriacae.* The whole have been translated and expounded by Kayser, *Die Canones Jacobs von Edessa* (Leipzig, 1886). (4) Jacob made many contributions to Syriac liturgy, both original and translated (Wright, *Short Hist.* p. 145 seq.). (5) To philosophical literature his chief original contribution was his *Enchiridion*, a tract on philosophical terms (Wright's *Catalogue* 984). The translations of works of Aristotle which have been attributed to him are probably by other hands (Wright, *Short Hist.* p. 149; Duval, *Littérature syriaque*, pp. 255, 258). The treatise *De causa omnium causarum*, which was the work of a bishop of Edessa, was formerly attributed to Jacob; but the publication of the whole by Kayser [5] has made it clear that the treatise is of much later date. (6) An important historical work by Jacob—a *Chronicle* in continuation of that of Eusebius—has unfortunately perished all except a few leaves. Of these a full account is given in Wright's *Catalogue* 1062. (7) Jacob's fame among his countrymen rests most of all on his labours as a grammarian. In his letter to George, bishop of Sĕrūgh, on Syriac orthography (published by Phillips in London 1869, and by Martin in Paris the same year) he sets forth the importance of fidelity by scribes in the copying of minutiae of spelling. In his grammar [6] (of which only some fragments remain), while expressing his sense of the disadvantage under which Syriac labours through its alphabet containing only consonants, he declined to introduce a general system of vowel-signs, lest the change should contribute to the neglect and loss of the older books written without vowels. At the same time he invented, by adaptation of the Greek vowels, such a system of signs as might serve for purposes of grammatical exposition, and elaborated the rules by which certain consonants serve to indicate vowels. He also systematized and extended the use of diacritical points. It is still a moot question how far Jacob is to be regarded as the author of the five vowel-signs derived from Greek which soon after came into use among the Jacobites.[7] In any case he made the most important contribution to Syriac grammar down to the time of Barhebraeus. (8) As a translator Jacob's greatest achievement was his Syriac version of the *Homiliae cathedrales* of Severus, the monophysite patriarch of Antioch (512–518, 535–536). This important collection is now in part known to us by E. W. Brooks's edition and translation of the 6th book of selected epistles of Severus, according to another Syriac version made by Athanasius of Nisibis in 669. (9) A large number of letters by Jacob to various correspondents have been found in various MSS Besides those on the canon law to Addai, and on grammar to George of Sĕrūgh referred to above, there are others dealing with doctrine, liturgy, &c. A few are in verse.

Jacob impresses the modern reader mainly as an *educator* of his countrymen, and particularly of the clergy. His writings lack the fervid rhetoric and graceful style of such authors as Isaac of Antioch, Jacob of Sĕrūgh and Philoxenus of Mabbōg. But judged by the standard of his time he shows the qualities of a truly scientific theologian and scholar. (N. M.)

JACOB OF JÜTERBOGK (*c.* 1381–1465), monk and theologian. Benedict Stolzenhagen, known in religion as Jacob, was born at Jüterbogk in Brandenburg of poor peasant stock. He became a Cistercian at the monastery of Paradiz in Poland, and was sent by the abbot to the university of Cracow, where he became master in philosophy and doctor of theology. He returned to his monastery, of which he became abbot. In 1441, however, discontented with the absence of strict discipline in his community, he obtained the leave of the papal legate at the council of Basel to transfer himself to the Carthusians, entering the monastery of Salvatorberg near Erfurt, of which he became prior. He lectured on theology at the university of Erfurt, of which he was rector in 1455. He died on the 30th of April 1465.

Jacob's main preoccupation was the reform of monastic life, the grave disorders of which he deplored, and to this end he wrote his *Petitiones religiosorum pro reformatione sui status.* Another work, *De negligentia praelatorum*, was directed against the neglect of their duties by the higher clergy, and he addressed a petition for the reform of the church (*Advisamentum pro reformatione ecclesiae*) to Pope Nicholas V. This having no effect, he issued the most outspoken of his works, *De septem ecclesiae statibus*, in which he reviewed the work of the reforming councils of his time, and, without touching the question of doctrine, championed a drastic reform of life and practice of the church on the lines laid down at Constance and Basel.

His principal works are collected in Walch, *Monimenta med. aev.* i. and ii. (1757, 1771), and Engelbert Klüpfel, *Vetus bibliotheca eccles.* (Freiburg-im-Breisgau, 1780).

JACOB OF SĔRŪGH, one of the best Syriac authors, named by one of his biographers "the flute of the Holy Spirit and the harp of the believing church," was born in 451 at Kurtam, a village on the Euphrates to the west of Ḥarrān, and was probably educated at Edessa. At an early age he attracted the attention of his countrymen by his piety and his literary gifts, and entered on the composition of the long series of metrical homilies on religious themes which formed the great work of his life. Having been ordained to the priesthood, he became periodeutes or episcopal visitor of Ḥaurā, in Sĕrūgh, not far from his birthplace. His tenure of this office extended over a time of great trouble to the Christian population of Mesopotamia, due to the fierce war carried on by Kavadh II. of Persia within the Roman borders. When on the 10th of January 503 Amid was captured by the Persians after a three months' siege and all its citizens put to the sword or carried captive, a panic seized the whole district, and the Christian inhabitants of many neighbouring cities planned to leave their homes and flee to the west of the Euphrates. They were recalled to a more courageous frame of mind by the letters of Jacob.[1] In 519, at the age of 68, Jacob was made bishop of Baṭnān, another town in the district of Sĕrūgh, but only lived till November 521.

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[1] Merx infers that the fact of Jacob's going to Alexandria as a student tells against the view that the Arabs burned the great library (*Hist. artis gramm. apud Syros*, p. 35). On this question cf. Krehl in *Atti del iv. congr. internaz. degli Orientalisti* (Florence, 1880), pp. 433 sqq.

[2] Pseudo-Dionysius of Tell-Mahrē says 677; but Athanasius was patriarch only 684–687.

[3] According to Merx (*op. cit.* p. 43) this may be the celebrated convent of Eusebius near Apamea.

[4] Assemani tried hard to prove him orthodox (*B.O.* i. 470 sqq.) but changed his opinion on reading his biography by Barhebraeus (ib. ii. 337). See especially Lamy, *Dissert. de Syrorum fide*, pp. 206 sqq.

[5] Text at Leipzig 1889 (*Das Buch der Erkenntniss der Wahrheit oder der Ursache aller Ursachen*): translation (posthumously) at Strassburg 1893.

[6] The surviving fragments were published by Wright (London, 1871) and by Merx, *op. cit.* p. 73 sqq. of Syriac text.

[7] An affirmative answer is given by Wiseman (*Horae syr.* pp. 181–8) and Wright (*Catalogue* 1168; *Fragm. of the Syriac Grammar of Jacob of Edessa*, preface; *Short Hist.* p. 151 seq.). But Martin (in *Jour. As.* May–June 1869, pp. 456 sqq.), Duval (*Grammaire syriaque*, p. 71) and Merx (*op. cit.* p. 50) are of the opposite opinion. The date of the introduction of the seven Nestorian vowel-signs is also uncertain.

From the various extant accounts of Jacob's life and from the number of his known works, we gather that his literary activity was unceasing. According to Barhebraeus (*Chron. Eccles.* i. 191) he employed 70 amanuenses and wrote in all 760 metrical homilies, besides expositions, letters and hymns of different sorts. Of his merits as a writer and poet we are now well able to judge from P. Bedjan's excellent edition of selected metrical homilies, of which four volumes have already appeared (Paris 1905–1908), containing 146 pieces.[2] They are written throughout in dodecasyllabic metre, and those published deal mainly with biblical themes, though there are also poems on such subjects as the deaths of Christian martyrs, the fall of the idols, the council of Nicaea, &c.[3] Of Jacob's prose works, which are not nearly so numerous, the most interesting are his letters, which throw light upon some of the events of his time and reveal his attachment to the Monophysite doctrine which was then struggling for supremacy in the Syrian churches, and particularly at Edessa, over the opposite teaching of Nestorius.[4] (N. M.)

JACOBA, or JACQUELINE (1401–1436), countess of Holland, was the only daughter and heiress of William, duke of Bavaria and count of Holland, Zeeland and Hainaut. She was married as a child to John, duke of Touraine, second son of Charles VI., king of France, who on the death of his elder brother Louis became dauphin. John of Touraine died in April 1417, and two months afterwards Jacoba lost her father. Acknowledged as sovereign in Holland and Zeeland, Jacoba was opposed by her uncle John of Bavaria, bishop of Liége. She had the support of the Hook faction in Holland. Meanwhile she had been married in 1418 by her uncle, John the Fearless, duke of Burgundy, to her cousin John IV., duke of Brabant. By the mediation of John the Fearless, a treaty of partition was concluded in 1419 between Jacoba and John of Bavaria; but it was merely a truce, and the contest between uncle and niece soon began again and continued with varying success. In 1420 Jacoba fled to England; and there, declaring that her marriage with John of Brabant was illegal, she contracted a marriage with Humphrey, duke of Gloucester, in 1422. Two years later Jacoba, with Humphrey, invaded Holland, where she was now opposed by her former husband, John of Brabant, John of Bavaria having died of poison. In 1425 Humphrey deserted his wife, who found herself obliged to seek refuge with her cousin, Philip V., duke of Burgundy, to whom she had to submit, and she was imprisoned in the castle of Ghent. John of Brabant now mortgaged the two counties of Holland and Zeeland to Philip, who assumed their protectorate. Jacoba, however, escaped from prison in disguise, and for three years struggled gallantly to maintain herself in Holland against the united efforts of Philip of Burgundy and John of Brabant, and met at first with success. The death of the weak John of Brabant (April 1427) freed the countess from her quondam husband; but nevertheless the pope pronounced Jacoba's marriage with Humphrey illegal, and Philip, putting out his full strength, broke down all opposition. By a treaty, made in July 1428, Jacoba was left nominally countess, but Philip was to administer the government of Holland, Zeeland and Hainaut, and was declared heir in case Jacoba should die without children. Two years later Philip mortgaged Holland and Zeeland to the Borselen family, of which Francis, lord of Borselen, was the head. Jacoba now made her last effort. In 1432 she secretly married Francis of Borselen, and endeavoured to foment a rising in Holland against the Burgundian rule. Philip invaded the country, however, and threw Borselen into prison. Only on condition that Jacoba abdicated her three countships in his favour would he allow her liberty and recognize her marriage with Borselen. She submitted in April 1432, retained her title of duchess in Bavaria, and lived on her husband's estates in retirement. She died on the 9th of October 1436, leaving no children.

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JACOBABAD, a town of British India, the administrative headquarters of the Upper Sind frontier district in Bombay; with a station on the Quetta branch of the North-Western railway, 37 m. from the junction at Ruk, on the main line. Pop. (1901), 10,787. It is famous as having consistently the highest temperature in India. During the month of June the thermometer ranges between 120° and 127° F. The town was founded on the site of the village of Khangarh in 1847 by General John Jacob, for many years commandant of the Sind Horse, who died here in 1858. It has cantonments for a cavalry regiment, with accommodation for caravans from Central Asia. It is watered by two canals. An annual horse show is held in January.

JACOBEAN STYLE, the name given to the second phase of the early Renaissance architecture in England, following the Elizabethan style. Although the term is generally employed of the style which prevailed in England during the first quarter of the 17th century, its peculiar decadent detail will be found nearly twenty years earlier at Wollaton Hall, Nottinghamshire, and in Oxford and Cambridge examples exist up to 1660, notwithstanding the introduction of the purer Italian style by Inigo Jones in 1619 at Whitehall. Already during Queen Elizabeth's reign reproductions of the classic orders had found their way into English architecture, based frequently upon John Shute's *The First and Chief Grounds of Architecture*, published in 1563, with two other editions in 1579 and 1584. In 1577, three years before the commencement of Wollaton Hall, a copybook of the orders was brought out in Antwerp by Jan Vredeman de Vries. Though nominally based on the description of the orders by Vitruvius, the author indulged freely not only in his rendering of them, but in suggestions of his own, showing how the orders might be employed in various buildings. Those suggestions were of a most decadent type, so that even the author deemed it advisable to publish a letter from a canon of the Church, stating that there was nothing in his architectural designs which was contrary to religion. It is to publications of this kind that Jacobean architecture owes the perversion of its forms and the introduction of strap work and pierced crestings, which appear for the first time at Wollaton (1580); at Bramshill, Hampshire (1607–1612), and in Holland House, Kensington (1624), it receives its fullest development. (R. P. S.)

JACOBI, FRIEDRICH HEINRICH (1743–1819), German philosopher, was born at Düsseldorf on the 25th of January 1743. The second son of a wealthy sugar merchant near Düsseldorf, he was educated for a commercial career. Of a retiring, meditative disposition, Jacobi associated himself at Geneva mainly with the literary and scientific circle of which the most prominent member was Lesage. He studied closely the works of Charles Bonnet, and the political ideas of Rousseau and Voltaire. In 1763 he was called back to Düsseldorf, and in the following year he married and took over the management of his father's business. After a short period he gave up his commercial career, and in 1770 became a member of the council for the duchies of Jülich and Berg, in which capacity he distinguished himself by his ability in financial affairs, and his zeal in social reform. Jacobi kept up his interest in literary and philosophic matters by an extensive correspondence, and his mansion at Pempelfort, near Düsseldorf, was the centre of a distinguished literary circle. With C. M. Wieland he helped to found a new literary journal, *Der Teutsche Mercur*, in which some of his earliest writings, mainly on practical or economic subjects, were published. Here too appeared in part the first of his philosophic works, *Edward Allwills Briefsammlung* (1776), a combination of romance and speculation. This was followed in 1779 by *Woldemar*, a philosophic novel, of very imperfect structure, but full of genial ideas, and giving the most complete picture of Jacobi's method of philosophizing. In 1779 he visited Munich as member of the privy council, but after a short stay there differences with his colleagues and with the authorities of Bavaria drove him back to Pempelfort. A few unimportant tracts on questions of theoretical politics were followed in 1785 by the work which first brought Jacobi into prominence as a philosopher. A conversation which he had held with Lessing in 1780, in which Lessing avowed that he knew no philosophy, in the true sense of that word, save Spinozism, led him to a protracted study of Spinoza's works. The *Briefe über die Lehre Spinozas* (1785; 2nd ed., much enlarged and with important *Appendices*, 1789) expressed sharply and clearly Jacobi's strenuous objection to a dogmatic system in philosophy, and drew upon him the vigorous enmity of the Berlin clique, led by Moses Mendelssohn. Jacobi was ridiculed as endeavouring to reintroduce into philosophy the antiquated notion of unreasoning belief, was denounced as an enemy of reason, as a pietist, and as in all probability a Jesuit in disguise, and was especially attacked for his use of the ambiguous term "belief." Jacobi's next important work, *David Hume über den Glauben, oder Idealismus und Realismus* (1787), was an attempt to show not only that the term *Glaube* had been used by the most eminent writers to denote what he had employed it for in the *Letters on Spinoza*, but that the nature of the cognition of facts as opposed to the construction of inferences could not be otherwise expressed. In this writing, and especially in the *Appendix*, Jacobi came into contact with the critical philosophy, and subjected the Kantian view of knowledge to searching examination.

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[1] See the contemporary *Chronicle* called that of Joshua the Stylite, chap. 54.

[2] Assemani (*Bibl. Orient.* i. 305–339) enumerates 231 which he had seen in MSS.

[3] Some other historical poems M. Bedjan has not seen fit to publish, on account of their unreliable and legendary character (vol. i. p. ix. of preface).

[4] A full list of the older editions of works by Jacob is given by Wright in *Short History of Syriac Literature*, pp. 68–72.

The outbreak of the war with the French republic induced Jacobi in 1793 to leave his home near Düsseldorf, and for nearly ten years he resided in Holstein. While there he became intimately acquainted with Reinhold (in whose *Beiträge*, pt. iii., 1801, his important work *Über das Unternehmen des Kriticismus, die Vernunft zu Verstande zu bringen* was first published), and with Matthias Claudius, the editor of the *Wandsbecker Bote*. During the same period the excitement caused by the accusation of atheism brought against Fichte at Jena led to the publication of Jacobi's *Letter to Fichte* (1799), in which he made more precise the relation of his own philosophic principles to theology. Soon after his return to Germany, Jacobi received a call to Munich in connexion with the new academy of sciences just founded there. The loss of a considerable portion of his fortune induced him to accept this offer; he settled in Munich in 1804, and in 1807 became president of the academy. In 1811 appeared his last philosophic work, directed against Schelling specially (*Von den göttlichen Dingen und ihrer Offenbarung*), the first part of which, a review of the *Wandsbecker Bote*, had been written in 1798. A bitter reply from Schelling was left without answer by Jacobi, but gave rise to an animated controversy in which Fries and Baader took prominent part. In 1812 Jacobi retired from the office of president, and began to prepare a collected edition of his works. He died before this was completed, on the 10th of March 1819. The edition of his writings was continued by his friend F. Köppen, and was completed in 1825. The works fill six volumes, of which the fourth is in three parts. To the second is prefixed an introduction by Jacobi, which is at the same time an introduction to his philosophy. The fourth volume has also an important preface.

The philosophy of Jacobi is essentially unsystematic. A certain fundamental view which underlies all his thinking is brought to bear in succession upon those systematic doctrines which appear to stand most sharply in contradiction to it, and any positive philosophic results are given only occasionally. The leading idea of the whole is that of the complete separation between understanding and apprehension of real fact. For Jacobi understanding, or the logical faculty, is purely formal or elaborative, and its results never transcend the given material supplied to it. From the basis of immediate experience or perception thought proceeds by comparison and abstraction, establishing connexions among facts, but remaining in its nature mediate and finite. The principle of reason and consequent, the necessity of thinking each given fact of perception as conditioned, impels understanding towards an endless series of identical propositions, the records of successive comparisons and abstractions. The province of the understanding is therefore strictly the region of the conditioned; to it the world must present itself as a mechanism. If, then, there is objective truth at all, the existence of real facts must be made known to us otherwise than through the logical faculty of thought; and, as the regress from conclusion to premises must depend upon something not itself capable of logical grounding, mediate thought implies the consciousness of immediate truth. Philosophy therefore must resign the hopeless ideal of a systematic (*i.e.* intelligible) explanation of things, and must content itself with the examination of the facts of consciousness. It is a mere prejudice of philosophic thinkers, a prejudice which has descended from Aristotle, that mediate or demonstrated cognition is superior in cogency and value to the immediate perception of truths or facts.

As Jacobi starts with the doctrine that thought is partial and limited, applicable only to connect facts, but incapable of explaining their existence, it is evident that for him any demonstrative system of metaphysic which should attempt to subject all existence to the principle of logical ground must be repulsive. Now in modern philosophy the first and greatest demonstrative system of metaphysic is that of Spinoza, and it lay in the nature of things that upon Spinoza's system Jacobi should first direct his criticism. A summary of the results of his examination is thus presented (*Werke*, i. 216–223): (1) Spinozism is atheism; (2) the Kabbalistic philosophy, in so far as it is philosophy, is nothing but undeveloped or confused Spinozism; (3) the philosophy of Leibnitz and Wolff is not less fatalistic than that of Spinoza, and carries a resolute thinker to the very principles of Spinoza; (4) every demonstrative method ends in fatalism; (5) we can demonstrate only similarities (agreements, truths conditionally necessary), proceeding always in identical propositions; every proof presupposes something already proved, the principle of which is immediately given (*Offenbarung*, revelation, is the term here employed by Jacobi, as by many later writers, *e.g.* Lotze, to denote the peculiar character of an immediate, unproved truth); (6) the keystone (*Element*) of all human knowledge and activity is belief (*Glaube*). Of these propositions only the first and fourth require further notice. Jacobi, accepting the law of reason and consequent as the fundamental rule of demonstrative reasoning, and as the rule explicitly followed by Spinoza, points out that, if we proceed by applying this principle so as to recede from particular and qualified facts to the more general and abstract conditions, we land ourselves, not in the notion of an active, intelligent creator of the system of things, but in the notion of an all-comprehensive, indeterminate *Nature*, devoid of will or intelligence. Our unconditioned is either a pure *abstraction*, or else the impossible notion of a completed system of conditions. In either case the result is atheism, and this result is necessary if the demonstrative method, the method of understanding, is regarded as the only possible means of knowledge. Moreover, the same method inevitably lands in fatalism. For, if the action of the human will is to be made intelligible to understanding, it must be thought as a conditioned phenomenon, having its sufficient ground in preceding circumstances, and, in ultimate abstraction, as the outflow from nature which is the sum of conditions. But this is the fatalist conception, and any philosophy which accepts the law of reason and consequent as the essence of understanding is fatalistic. Thus for the scientific understanding there can be no God and no liberty. It is impossible that there should be a God, for if so he would of necessity be finite. But a finite God, a God that is *known*, is no God. It is impossible that there should be liberty, for if so the mechanical order of phenomena, by means of which they are comprehensible, would be disturbed, and we should have an unintelligible world, coupled with the requirement that it shall be understood. Cognition, then, in the strict sense, occupies the middle place between sense perception, which is belief in matters of sense, and reason, which is belief in supersensuous fact.

The best introduction to Jacobi's philosophy is the preface to the second volume of the *Works*, and Appendix 7 to the *Letters on Spinoza's Theory*. See also J. Kuhn, *Jacobi und die Philosophie seiner Zeit* (1834); F. Deycks, *F. H. Jacobi im Verhältnis zu seinen Zeitgenossen* (1848); H. Düntzer, *Freundesbilder aus Goethes Leben* (1853); E. Zirngiebl, *F. H. Jacobis Leben, Dichten, und Denken*, 1867; F. Harms, *Über die Lehre von F. H. Jacobi* (1876). Jacobi's *Auserlesener Briefwechsel* has been edited by F. Roth in 2 vols. (1825–1827).

JACOBI, JOHANN GEORG (1740–1814), German poet, elder brother of the philosopher, F. H. Jacobi (1743–1819), was born at Düsseldorf on the 2nd of September 1740. He studied theology at Göttingen and jurisprudence at Helmstedt, and was appointed, in 1766, professor of philosophy in Halle. In this year he made the acquaintance of J. W. L. ("Vater") Gleim, who, attracted by the young poet's *Poetische Versuche* (1764), became his warm friend, and a lively literary correspondence ensued between Gleim in Halberstadt and Jacobi in Halle. In order to have Jacobi near him, Gleim succeeded in procuring for him a prebendal stall at the cathedral of Halberstadt in 1769, and here Jacobi issued a number of anacreontic lyrics and sonnets. He tired, however, of the lighter muse, and in 1774, to Gleim's grief, left Halberstadt, and for two years (1774–1776) edited at Düsseldorf the *Iris*, a quarterly for women readers. Meanwhile, he wrote many charming lyrics, distinguished by exquisite taste and true poetical feeling. In 1784 he became professor of literature at the university of Freiburg im Breisgau, a post which he held until his death there on the 4th of January 1814. In addition to the earlier *Iris*, to which Goethe, his brother F. H. Jacobi, Gleim and other poets contributed, he published, from 1803–1813, another periodical, also called *Iris*, in which Klopstock, Herder, Jean Paul, Voss and the brothers Stollberg also collaborated.

Jacobi's *Sämmtliche Werke* were published in 1774 (Halberstadt, 3 vols.). Other editions appeared at Zürich in 1807–1813 and 1825. See *Ungedruckte Briefe von und an Johann Georg Jacobi* (Strassburg, 1874); biographical notice by Daniel Jacoby in *Allg. Deutsche Biographie*; Longo, *Laurence Sterne und Johann Georg Jacobi* (Vienna, 1898); and *Leben J. G. Jacobis, von einem seiner Freunde* (1822).

JACOBI, KARL GUSTAV JACOB (1804–1851), German mathematician, was born at Potsdam, of Jewish parentage, on the 10th of December 1804. He studied at Berlin University, where he obtained the degree of doctor of philosophy in 1825, his thesis being an analytical discussion of the theory of fractions. In 1827 he became extraordinary and in 1829 ordinary professor of mathematics at Königsberg, and this chair he filled till 1842, when he visited Italy for a few months to recruit his health. On his return he removed to Berlin, where he lived as a royal pensioner till his death, which occurred on the 18th of February 1851.

His investigations in elliptic functions, the theory of which he established upon quite a new basis, and more particularly his development of the theta-function, as given in his great treatise *Fundamenta nova theoriae functionum ellipticarum* (Königsberg, 1829), and in later papers in *Crelle's Journal*, constitute his grandest analytical discoveries. Second in importance only to these are his researches in differential equations, notably the theory of the last multiplier, which is fully treated in his *Vorlesungen über Dynamik*, edited by R. F. A. Clebsch (Berlin, 1866). It was in analytical development that Jacobi's peculiar power mainly lay, and he made many important contributions of this kind to other departments of mathematics, as a glance at the long list of papers that were published by him in *Crelle's Journal* and elsewhere from 1826 onwards will sufficiently indicate. He was one of the early founders of the theory of determinants; in particular, he invented the functional determinant formed of the n^2 differential coefficients of n given functions of n independent variables, which now bears his name (Jacobian), and which has played an important part in many analytical investigations (see ALGEBRAIC FORMS). Valuable also are his papers on Abelian transcendents, and his investigations in the theory of numbers, in which latter department he mainly supplements the labours of K. F. Gauss. The planetary theory and other particular dynamical problems likewise occupied his attention from time to time. He left a vast store of manuscript, portions of which have been published at intervals in *Crelle's Journal*. His other works include *Commentatio de transformatione integralis duplicis indefiniti in formam simpliciorem* (1832), *Canon arithmeticus* (1839), and *Opuscula mathematica* (1846–1857). His *Gesammelte Werke* (1881–1891) were published by the Berlin Academy.

See Lejeune-Dirichlet, "Gedächtnisrede auf Jacobi" in the *Abhandlungen der Berliner Akademie* (1852).

JACOBINS, THE, the most famous of the political clubs of the French Revolution. It had its origin in the Club Breton, which was established at Versailles shortly after the opening of the States General in 1789. It was at first composed exclusively of deputies from Brittany, but was soon joined by others from various parts of France, and counted among its early members Mirabeau, Sieyès, Barnave, Pétion, the Abbé Grégoire, Charles and Alexandre Lameth, Robespierre, the duc d'Aiguillon, and La Revellière-Lépeaux. At this time its meetings were secret and little is known of what took place at them. After the émeute of the 5th and 6th of October the club, still entirely composed of deputies, followed the National Assembly to Paris, where it rented the refectory of the monastery of the Jacobins in the Rue St Honoré, near the seat of the Assembly. The name "Jacobins," given in France to the Dominicans, because their first house in Paris was in the Rue St Jacques, was first applied to the club in ridicule by its enemies. The title assumed by the club itself, after the promulgation of the constitution of 1791, was *Société des amis de la constitution séants aux Jacobins à Paris*, which was changed on the 21st of September 1792, after the fall of the monarchy, to *Société des Jacobins, amis de la liberté et de l'égalité*. It occupied successively the refectory, the library, and the chapel of the monastery.

Once transferred to Paris, the club underwent rapid modifications. The first step was its expansion by the admission as members or associates of others besides deputies; Arthur Young was so admitted on the 18th of January 1790. On the 8th of February the society was formally constituted on this broader basis by the adoption of the rules drawn up by Barnave, which were issued with the signature of the duc d'Aiguillon, the president. The objects of the club were defined as (1) to discuss in advance questions to be decided by the National Assembly; (2) to work for the establishment and strengthening of the constitution in accordance with the spirit of the preamble (*i.e.* of respect for legally constituted authority and the rights of man); (3) to correspond with other societies of the same kind which should be formed in the realm. At the same time the rules of order and forms of election were settled, and the constitution of the club determined. There were to be a president, elected every month, four secretaries, a treasurer, and committees elected to superintend elections and presentations, the correspondence, and the administration of the club. Any member who by word or action showed that his principles were contrary to the constitution and the rights of man was to be expelled, a rule which later on facilitated the "purification" of the society by the expulsion of its more moderate elements. By the 7th article the club decided to admit as associates similar societies in other parts of France and to maintain with them a regular correspondence.

This last provision was of far-reaching importance. By the 10th of August 1790 there were already one hundred and fifty-two affiliated clubs; the attempts at counter-revolution led to a great increase of their number in the spring of 1791, and by the close of the year the Jacobins had a network of branches all over France. It was this widespread yet highly centralized organization that gave to the Jacobin Club its formidable power.

At the outset the Jacobin Club was not distinguished by extreme political views. The somewhat high subscription confined its membership to men of substance, and to the last it was—so far as the central society in Paris was concerned—composed almost entirely of professional men, such as Robespierre, or well-to-do *bourgeois*, like Santerre. From the first, however, other elements were present. Besides Louis Philippe, duc de Chartres (afterwards king of the French), liberal aristocrats of the type of the duc d'Aiguillon, the prince de Broglie, or the vicomte de Noailles, and the *bourgeois* who formed the mass of the members, the club contained such figures as "Père" Michel Gérard, a peasant proprietor from Tuel-en-Montgermont, in Brittany, whose rough common sense was admired as the oracle of popular wisdom, and whose countryman's waistcoat and plaited hair were later on to become the model for the Jacobin fashion.[1] The provincial branches were from the first far more democratic, though in these too the leadership was usually in the hands of members of the educated or propertied classes. Up to the very eve of the republic, the club ostensibly supported the monarchy; it took no part in the petition of the 17th of July 1790 for the king's dethronement; nor had it any official share even in the insurrections of the 20th of June and the 10th of August 1792; it only formally recognized the republic on the 21st of September. But the character and extent of the club's influence cannot be gauged by its official acts alone, and long before it emerged as the principal focus of the Terror, its character had been profoundly changed by the secession of its more moderate elements, some to found the Club of 1789, some in 1791—among them Barnave, the Lameths, Duport and Bailly—

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[1] "When I first sat among you I heard so many beautiful speeches that I might have believed myself in heaven, had there not been so many lawyers present." Instead of practical questions "we have become involved in a *galimatias* of Rights of Man of which I understand mighty little but that it is worth nothing." *Motion du Père Gérard* in the Jacobins of the 27th of April 1790 (Aulard i. 63).

to found the club of the Feuillants scoffed at by their former friends as the *club monarchique*. The main cause of this change was the admission of the public to the sittings of the club, which began on the 14th of October 1791. The result is described in a report of the Department of Paris on "the state of the empire," presented on the 12th of June 1792, at the request of Roland, the minister of the interior, and signed by the duc de La Rochefoucauld, which ascribes to the Jacobins all the woes of the state. "There exists," it runs, "in the midst of the capital committed to our care a public pulpit of defamation, where citizens of every age and both sexes are admitted day by day to listen to a criminal propaganda. . . . This establishment, situated in the former house of the Jacobins, calls itself a society; but it has less the aspect of a private society than that of a public spectacle: vast tribunes are thrown open for the audience; all the sittings are advertised to the public for fixed days and hours, and the speeches made are printed in a special journal and lavishly distributed."[1] In this society—the report continues—murder is counselled or applauded, all authorities are calumniated and all the organs of the law bespattered with abuse; as to its power, it exercises "by its influence, its affiliations and its correspondence a veritable ministerial authority, without title and without responsibility, while leaving to the legal and responsible authorities only the shadow of power" (Schmidt, *Tableaux* i. 78, &c.).

The constituency to which the club was henceforth responsible, and from which it derived its power, was in fact the *peuple bête* of Paris; the *sans-culottes*—decayed lackeys, cosmopolitan ne'er-do-weels, and starving workpeople—who crowded its tribunes. To this audience, and not primarily to the members of the club, the speeches of the orators were addressed and by its verdict they were judged. In the earlier stages of the Revolution the mob had been satisfied with the fine platitudes of the *philosophes* and the vague promise of a political millennium; but as the chaos in the body politic grew, and with it the appalling material misery, it began to clamour for the blood of the "traitors" in office by whose corrupt machinations the millennium was delayed, and only those orators were listened to who pandered to its suspicions. Hence the elimination of the moderate elements from the club; hence the ascendancy of Marat, and finally of Robespierre, the secret of whose power was that they really shared the suspicions of the populace, to which they gave a voice and which they did not shrink from translating into action. After the fall of the monarchy Robespierre was in effect the Jacobin Club; for to the tribunes he was the oracle of political wisdom, and by his standard all others were judged.[2] With his fall the Jacobins too came to an end.

Not the least singular thing about the Jacobins is the very slender material basis on which their overwhelming power rested. France groaned under their tyranny, which was compared to that of the Inquisition, with its system of espionage and denunciations which no one was too illustrious or too humble to escape. Yet it was reckoned by competent observers that, at the height of the Terror, the Jacobins could not command a force of more than 3000 men in Paris. But the secret of their strength was that, in the midst of the general disorganization, they alone were organized. The police agent Dutard, in a report to the minister Garat (April 30, 1793), describing an episode in the Palais Égalité (Royal), adds: "Why did a dozen Jacobins strike terror into two or three hundred aristocrats? It is that the former have a rallying-point and that the latter have none." When the *jeunesse dorée* did at last organize themselves, they had little difficulty in flogging the Jacobins out of the cafés into comparative silence. Long before this the Girondin government had been urged to meet organization by organization, force by force; and it is clear from the daily reports of the police agents that even a moderate display of energy would have saved the National Convention from the humiliation of being dominated by a club, and the French Revolution from the blot of the Terror. But though the Girondins were fully conscious of the evil, they were too timid, or too convinced of the ultimate triumph of their own persuasive eloquence, to act. In the session of the 30th of April 1793 a proposal was made to move the Convention to Versailles out of reach of the Jacobins, and Buzot declared that it was "impossible to remain in Paris" so long as "this abominable haunt" should exist; but the motion was not carried, and the Girondins remained to become the victims of the Jacobins.

Meanwhile other political clubs could only survive so long as they were content to be the shadows of the powerful organization of the Rue St Honoré. The Feuillants had been suppressed on the 18th of August 1792. The turn of the Cordeliers came so soon as its leaders showed signs of revolting against Jacobin supremacy, and no more startling proof of this ascendancy could be found than the ease with which Hébert and his fellows were condemned and the readiness with which the Cordeliers, after a feeble attempt at protest, acquiesced in the verdict. It is idle to speculate on what might have happened had this ascendancy been overthrown by the action of a strong government. No strong government existed, nor, in the actual conditions of the country, could exist on the lines laid down by the constitution. France was menaced by civil war within, and by a coalition of hostile powers without; the discipline of the Terror was perhaps necessary if she was to be welded into a united force capable of resisting this double peril; and the revolutionary leaders saw in the Jacobin organization the only instrument by which this discipline could be made effective. This is the apology usually put forward for the Jacobins by republican writers of later times; they were, it is said (and of some of them it is certainly true), no mere doctrinaires and visionary sectaries, but practical and far-seeing politicians, who realized that "desperate ills need desperate remedies," and, by having the courage of their convictions, saved the gains of the Revolution for France.

The Jacobin Club was closed after the fall of Robespierre on the 9th of Thermidor of the year III., and some of its members were executed. An attempt was made to re-open the club, which was joined by many of the enemies of the Thermidorians, but on the 21st of Brumaire, year III. (Nov. 11, 1794), it was definitively closed. Its members and their sympathizers were scattered among the cafés, where a ruthless war of sticks and chairs was waged against them by the young "aristocrats" known as the *jeunesse dorée*. Nevertheless the "Jacobins" survived, in a somewhat subterranean fashion, emerging again in the club of the Panthéon, founded on the 25th of November 1795, and suppressed in the following February (see Babeuf; François Noel). The last attempt to reorganize them was the foundation of the *Réunion d'amis de l'égalité et de la liberté*, in July 1799, which had its headquarters in the *Salle du Manège* of the Tuileries, and was thus known as the *Club du Manège*. It was patronized by Barras, and some two hundred and fifty members of the two councils of the legislature were enrolled as members, including many notable ex-Jacobins. It published a newspaper called the *Journal des Libres*, proclaimed the apotheosis of Robespierre and Babeuf, and attacked the Directory as a *royauté pentarchique*. But public opinion was now preponderatingly moderate or royalist, and the club was violently attacked in the press and in the streets, the suspicions of the government were aroused; it had to change its meeting-place from the Tuileries to the church of the Jacobins (Temple of Peace) in the Rue du Bac, and in August it was suppressed, after barely a month's existence. Its members revenged themselves on the Directory by supporting Napoleon Bonaparte.

Long before the suppression of the Jacobin Club the name of "Jacobins" had been popularly applied to all promulgators of extreme revolutionary opinions. In this sense the word passed beyond the borders of France and long survived the Revolution. Canning's paper, *The Anti-Jacobin*, directed against the English Radicals, consecrated its use in England; and in the correspondence of Metternich and other leaders of the repressive policy which followed the second fall of Napoleon, "Jacobin" is the term commonly applied to anyone with Liberal tendencies, even to so august a personage as the emperor Alexander I. of Russia.

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[1] *i.e. Journal des débats et de la correspondance de la Société*, &c. For the various newspapers published under the auspices of the Jacobins see Aulard i. p. cx., &c.

[2] In the published reports only the speeches of members are given, not the interruptions from the tribunes. But see the report (May 18, 1793) of Dutard to Garat on a meeting of the Jacobins (Schmidt, *Tableaux* ii. 242).

The most important source of information for the history of the Jacobins is F. A. Aulard's *La société des Jacobins, Recueil de documents* (6 vols., Paris, 1889, &c.), where a critical bibliography will be found. This collection does not contain all the printed sources—notably the official Journal of the Club is omitted—but these sources, when not included, are indicated. The documents published are furnished with valuable explanatory notes. See also W. A. Schmidt, *Tableaux de la révolution française* (3 vols., Leipzig, 1867–1870), notably for the reports of the secret police, which throw much light on the actual working of the Jacobin propaganda. (W. A. P.)

JACOBITE CHURCH. The name of "Jacobites" is first found in a synodal decree of Nicaea A.D. 787, and was invented by hostile Greeks for the Syrian Monophysite Church as founded, or rather restored, by Jacob or James Baradaeus, who was ordained its bishop A.D. 541 or 543. The Monophysites, who like the Greeks knew themselves simply as the Orthodox, were grievously persecuted by the emperor Justinian and the graecizing patriarchs of Antioch, because they rejected the decrees of the council of Chalcedon, in which they—not without good reason—saw nothing but a thinly veiled relapse into those opinions of Nestorius which the previous council of Ephesus had condemned. James was born a little before A.D. 500 at Tella or Tela, 55 m. east of Edessa, of a priestly family, and entered the convent of Phesilta on Mount Isla. About 528 he went with a fellow-monk Sergius to Constantinople to plead the cause of his co-religionists with the empress Theodora, and livid there fifteen years. Justinian during those years imprisoned, deprived or exiled most of the recalcitrant clergy of Syria, Mesopotamia, Cilicia, Cappadocia, and the adjacent regions. Once ordained bishop of Edessa, with the connivance of Theodora, James, disguised as a ragged beggar (whence his name Baradaeus, Syriac *Burdĕānā*, Arabic *al-Barādiā*), traversed these regions preaching, teaching and ordaining new clergy to the number, it is said, of 80,000. His later years were embittered by squabbles with his own clergy, and he died in 578. His work, however, endured, and in the middle ages the Jacobite hierarchy numbered 150 archbishops and bishops under a patriarch and his *maphrian*. About the year 728 six Jacobite bishops present at the council of Manazgert established communion with the Armenians, who equally rejected Chalcedon; they were sent by the patriarch of Antioch, and among them were the metropolitan of Urha (Edessa) and the bishops of Qarhan, Gardman, Nferkert and Amasia. How long this union lasted is not known. In 1842, when the Rev. G. P. Badger visited the chief Jacobite centres, their numbers in all Turkey had dwindled to about 100,000 souls, owing to vast secessions to Rome. At Aleppo at that date only ten families out of several hundred remained true to their old faith, and something like the same proportion at Damascus and Bagdad. Badger testifies that the Syrian proselytes to Rome were superior to their Jacobite brethren, having established schools, rebuilt their churches, increased their clergy, and, above all, having learned to live with each other on terms of peace and charity. As late as 1850 there were 150 villages of them in the Jebel Toor to the north-east of Mardin, 50 in the district of Urfah and Gawar, and a few in the neighbourhoods of Diarbekr, Mosul and Damascus. From about 1860, the seceders to Rome were able, thanks to French consular protection, to seize the majority of the Jacobite churches in Turkey; and this injustice has contributed much to the present degradation and impoverishment of the Jacobites.

They used leavened bread in the Eucharist mixed with salt and oil, and like other Monophysites add to the *Trisagion* the words "Who wast crucified for our sake." They venerate pictures or images, and make the sign of the cross with one finger to show that Christ had but one nature. Deacons, as in Armenia, marry before taking priests' orders. Their patriarch is styled of Antioch, but seldom comes west of Mardin. His *maphrian* (fertilizer) since 1089 has lived at Mosul and ordains the bishops. Monkery is common among them, but there are no nuns. Next to the Roman Uniats (whom they term *Rassen* or Venal) they most hate the Nestorian Syrians of Persia. In 1882, at the instance of the British government, the Turks began to recognize them as a separate organization.

See M. Klein, *Jacobus Baradaeus* (Leiden, 1882); Assemani, *Bibl. Or.* ii. 62–69, 326 and 331; G. P. Badger, *The Nestorians* (London, 1852); Rubens Duval, *La litérature syriaque* (Paris, 1899); G. Krüger, *Monophysitische Streitigkeiten* (Jena, 1884); Silbernagel, *Verfassung der Kirchen des Orients* (Landshut, 1865); and G. Wright, *History of Syriac Literature* (London, 1894). (F. C. C.)

JACOBITES (from Lat. *Jacobus*, James), the name given after the revolution of 1688 to the adherents, first of the exiled English king James II., then of his descendants, and after the extinction of the latter in 1807, of the descendants of Charles I., *i.e.* of the exiled house of Stuart.

The history of the Jacobites, culminating in the risings of 1715 and 1745, is part of the general history of England (*q.v.*), and especially of Scotland (*q.v.*), in which country they were comparatively more numerous and more active, while there was also a large number of Jacobites in Ireland. They were recruited largely, but not solely, from among the Roman Catholics, and the Protestants among them were often identical with the Non-Jurors. Owing to a variety of causes Jacobitism began to lose ground after the accession of George I. and the suppression of the revolt of 1715; and the total failure of the rising of 1745 may be said to mark its end as a serious political force. In 1765 Horace Walpole said that "Jacobitism, the concealed mother of the latter (*i.e.* Toryism), was extinct," but as a sentiment it remained for some time longer, and may even be said to exist to-day. In 1750, during a strike of coal workers at Elswick, James III. was proclaimed king; in 1780 certain persons walked out of the Roman Catholic Church at Hexham when George III. was prayed for; and as late as 1784 a Jacobite rising was talked about. Northumberland was thus a Jacobite stronghold; and in Manchester, where in 1777 according to an American observer Jacobitism "is openly professed," a Jacobite rendezvous known as "John Shaw's Club" lasted from 1735 to 1892. North Wales was another Jacobite centre. The "Cycle of the White Rose"—the white rose being the badge of the Stuarts—composed of members of the principal Welsh families around Wrexham, including the Williams-Wynns of Wynnstay, lasted from 1710 until some time between 1850 and 1860. Jacobite traditions also lingered among the great families of the Scottish Highlands; the last person to suffer death as a Jacobite was Archibald Cameron, a son of Cameron of Lochiel, who was executed in 1753. Dr Johnson's Jacobite sympathies are well known, and on the death of Victor Emmanuel I., the ex-king of Sardinia, in 1824, Lord Liverpool wrote to Canning saying "there are those who think that the ex-king was the lawful king of Great Britain." Until the accession of King Edward VII. finger-bowls were not placed upon the royal dinner-table, because in former times those who secretly sympathized with the Jacobites were in the habit of drinking to the king *over the water*. The romantic side of Jacobitism was stimulated by Sir Walter Scott's *Waverley*, and many Jacobite poems were written during the 19th century.

The chief collections of Jacobite poems are: Charles Mackay's *Jacobite Songs and Ballads of Scotland, 1688–1746, with Appendix of Modern Jacobite Songs* (1861); G. S. Macquoid's *Jacobite Songs and Ballads* (1888); and *English Jacobite Ballads*, edited by A. B. Grosart from the Towneley manuscripts (1877).

Upon the death of Henry Stuart, Cardinal York, the last of James II.'s descendants, in 1807, the rightful occupant of the British throne according to legitimist principles was to be found among the descendants of Henrietta, daughter of Charles I., who married Philip I., duke of Orleans. Henrietta's daughter, Anne Marie (1669–1728), became the wife of Victor Amadeus II., duke of Savoy, afterwards king of Sardinia; her son was King Charles Emmanuel III., and her grandson Victor Amadeus III. The latter's son, King Victor Emmanuel I., left no sons, and his eldest daughter, Marie Beatrice, married Francis IV., duke of Modena, whose son Ferdinand (d. 1849) left an only daughter, Marie Thérèse (b. 1849). This lady, the wife of Prince Louis of Bavaria, was in 1910 the senior member of the Stuart family, and according to the legitimists the rightful sovereign of Great Britain and Ireland.

Table showing the succession to the crown of Great Britain and Ireland according to Jacobite principles.

Charles I. (1600–1649)
Henrietta (1644–1670) =
Philip I., duke of Orleans (1640–1701)
Anne Marie (1669–1728) =
Victor Amadeus II., king of Sardinia (1666–1732)
Charles Emmanuel III.
king of Sardinia (1701–1773)
Victor Amadeus III.
king of Sardinia (1726–1796)
Victor Emmanuel I.
king of Sardinia (1759–1824)
Marie Beatrice (*c.* 1780–1840) =
Francis IV., duke of Modena (1779–1846)
Ferdinand (1821–1849)
Marie Thérèse (b. 1849) =
Louis, prince of Bavaria (b. 1845)

Rupert, prince of Bavaria (b. 1869)	Charles (b. 1874)	Francis (b. 1875)
Luitpold (b. 1901)	Albert (b. 1905)	Rudolph (b. 1909)

Among the modern Jacobite, or legitimist, societies perhaps the most important is the "Order of the White Rose," which has a branch in Canada and the United States. The order holds that sovereign authority is of divine sanction, and that the execution of Charles I. and the revolution of 1688 were national crimes; it exists to study the history of the Stuarts, to oppose all democratic tendencies, and in general to maintain the theory that kingship is independent of all parliamentary authority and popular approval. The order, which was instituted in 1886, was responsible for the Stuart exhibition of 1889, and has a newspaper, the *Royalist*. Among other societies with similar objects in view are the "Thames Valley Legitimist Club" and the "Legitimist Jacobite League of Great Britain and Ireland."

See *Historical Papers relating to the Jacobite Period*, edited by J. Allardyce (Aberdeen, 1895–1896); James Hogg, *The Jacobite Relics of Scotland* (Edinburgh, 1819–1821); and F. W. Head, *The Fallen Stuarts* (Cambridge, 1901). The marquis de Ruvigny has compiled *The Jacobite Peerage* (Edinburgh, 1904), a work which purports to give a list of all the titles and honours conferred by the kings of the exiled House of Stuart. (A. W. H.*)

JACOBS, CHRISTIAN FRIEDRICH WILHELM (1764–1847), German classical scholar, was born at Gotha on the 6th of October 1764. After studying philology and theology at Jena and Göttingen, in 1785 he became teacher in the gymnasium of his native town, and in 1802 was appointed to an office in the public library. In 1807 he became classical tutor in the lyceum of Munich, but, disgusted at the attacks made upon him by the old Bavarian Catholic party, who resented the introduction of "north German" teachers, he returned to Gotha in 1810 to take charge of the library and the numismatic cabinet. He remained in Gotha till his death on the 30th of March 1847. Jacobs was an extremely successful teacher; he took great interest in the affairs of his country, and was a publicist of no mean order. But his great work was an edition of the Greek Anthology, with copious notes, in 13 volumes (1798–1814), supplemented by a revised text from the Codex Palatinus (1814–1817). He published also notes on Horace, Stobaeus, Euripides, Athenaeus and the *Iliaca* of Tzetzes; translations of Aelian (*History of Animals*); many of the Greek romances; Philostratus; poetical versions of much of the Greek Anthology; miscellaneous essays on classical subjects; and some very successful school books. His translation of the political speeches of Demosthenes was undertaken with the express purpose of rousing his country against Napoleon, whom he regarded as a second Philip of Macedon.

See E. F. Wüstemann, *Friderici Jacobsii laudatio* (Gotha, 1848); C. Bursian, *Geschichte der classischen Philologie in Deutschland*; and the appreciative article by C. Regel in *Allgemeine deutsche Biographie*.

JACOBS CAVERN, a cavern in latitude 36° 35′ N., 2 m. E. of Pineville, McDonald county, Missouri, named after its discoverer, E. H. Jacobs, of Bentonville, Arkansas. It was scientifically explored by him, in company with Professors Charles Peabody and Warren K. Moorehead, in 1903. The results were published in that year by Jacobs in the *Benton County Sun*; by C. N. Gould in *Science*, July 31, 1903; by Peabody in the *Am. Anthropologist*, Sept. 1903; and in the *Am. Journ. Archaeology*, 1904; and by Peabody and Moorehead, 1904, as *Bulletin I.* of the Dept. of Archaeology in Phillips Academy, Andover, Mass., in the museum of which are exhibits, maps and photographs.

Jacobs Cavern is one of the smaller caves, hardly more than a rock-shelter, and is entirely in the "St Joe Limestone" of the sub-carboniferous age. Its roof is a single flat stratum of limestone; its walls are well marked by lines of stratification; dripstone also partly covers the walls, fills a deep fissure at the end of the cave, and spreads over the floor, where it mingles with an ancient bed of ashes, forming an ash-breccia (mostly firm and solid) that encloses fragments of sandstone, flint spalls, flint implements, charcoal and bones. Underneath is the true floor of the cave, a mass of homogeneous yellow clay, one metre in thickness. It holds scattered fragments of limestone, and is itself the result of limestone degeneration. The length of the opening is over 21 metres; its depth 14 metres, and the height of roof above the undisturbed ash deposit varied from 1 m. 20 cm. to 2 m. 60 cm. The bone recess at the end was from 50 cm. to 80 cm. in height. The stratum of ashes was from 50 cm. to 1 m. 50 cm. thick.

The ash surface was staked off into square metres, and the substance carefully removed in order. Each stalactite, stalagmite and pilaster was measured, numbered, and removed in sections. Six human skeletons were found buried in the ashes. Seven-tenths of a cubic metre of animal bones were found: deer, bear, wolf, raccoon, opossum, beaver, buffalo, elk, turkey, woodchuck, tortoise and hog; all contemporary with man's occupancy. Three stone metates, one stone axe, one celt and fifteen hammer-stones were found. Jacobs Cavern was peculiarly rich in flint knives and projectile points. The sum total amounts to 419 objects, besides hundreds of fragments, cores, spalls and rejects, retained for study and comparison. Considerable numbers of bone or horn awls were found in the ashes, as well as fragments of pottery, but no "ceremonial" objects.

The rude type of the implements, the absence of fine pottery, and the peculiarities of the human remains, indicate a race of occupants more ancient than the "mound-builders." The deepest implement observed was buried 50 cm. under the stalagmitic surface. Dr. Hovey has proved that the rate of stalagmitic growth in Wyandotte Cave, Indiana, is .0254 cm. annually; and if that was the rate in Jacobs Cavern, 1968 years would have been needed for the embedding of that implement. Polished rocks outside the cavern and pictographs in the vicinity indicate the work of a prehistoric race earlier than the Osage Indians, who were the historic owners previous to the advent of the white man. (H. C. H.)

JACOBSEN, JENS PETER (1847–1885), Danish imaginative writer, was born at Thisted in Jutland, on the 7th of April 1847; he was the eldest of the five children of a prosperous merchant. He became a student at the university of Copenhagen in 1868. As a boy he showed a remarkable turn for science, particularly for botany. In 1870, although he was secretly writing verses already, Jacobsen definitely adopted botany as a profession. He was sent by a scientific body in Copenhagen to report on the flora of the islands of Anholt and Læsö. About this time the discoveries of Darwin began to exercise a fascination over him, and finding them little understood in Denmark, he translated into Danish *The Origin of Species* and *The Descent of Man*. In the autumn of 1872, while collecting plants in a morass near Ordrup, he contracted pulmonary disease. His illness, which cut him off from scientific investigation, drove him to literature. He met the famous critic, Dr Georg Brandes, who was struck by his powers of expression, and under his influence, in the spring of 1873, Jacobsen began his great historical romance of *Marie Grubbe.* His method of composition was painful and elaborate, and his work was not ready for publication until the close of 1876. In 1879 he was too ill to write at all; but in 1880 an improvement came, and he finished his second novel, *Niels Lyhne.* In 1882 he published a volume of six short stories, most of them written a few years earlier, called, from the first of them, *Mogens.* After this he wrote no more, but lingered on in his mother's house at Thisted until the 30th of April 1885. In 1886 his posthumous fragments were collected. It was early recognized that Jacobsen was the greatest artist in prose that Denmark has produced. He has been compared with Flaubert, with De Quincey, with Pater; but these parallelisms merely express a sense of the intense individuality of his style, and of his untiring pursuit of beauty in colour, form and melody. Although he wrote so little, and crossed the living stage so hurriedly, his influence in the North has been far-reaching. It may be said that no one in Denmark or Norway has tried to write prose carefully since 1880 whose efforts have not been in some degree modified by the example of Jacobsen's laborious art.

His *Samlede Skrifter* appeared in two volumes in 1888; in 1899 his letters (*Breve*) were edited by Edvard Brandes. In 1896 an English translation of part of the former was published under the title of *Siren Voices: Niels Lyhne*, by Miss E. F. L. Robertson. (E. G.)

JACOB'S WELL, the scene of the conversation between Jesus and the "woman of Samaria" narrated in the Fourth Gospel, is described as being in the neighbourhood of an otherwise unmentioned "city called Sychar." From the time of Eusebius this city has been identified with Sychem or Shechem (modern Nablus), and the well is still in existence 1½ m. E. of the town, at the foot of Mt Gerizim. It is beneath one of the ruined arches of a church mentioned by Jerome, and is reached by a few rough steps. When Robinson visited it in 1838 it was 105 ft. deep, but it is now much shallower and often dry.

For a discussion of Sychar as distinct from Shechem see T. K. Cheyne, art. "Sychar," in *Ency. Bibl.*, col. 4830. It is possible that Sychar should be placed at Tulūl Balātā, a mound about ½ m. W. of the well (*Palestine Exploration Fund Statement*, 1907, p. 92 seq.); when that village fell into ruin the name may have migrated to 'Askar, a village on the lower slopes of Mt Ebal about 1¾ m. E.N.E. from Nablus and ½ m. N. from Jacob's Well. It may be noted that the difficulty is not with the location of the well, but with the identification of Sychar.

JACOBUS DE VORAGINE (*c.* 1230–*c.* 1298), Italian chronicler, archbishop of Genoa, was born at the little village of Varazze, near Genoa, about the year 1230. He entered the order of the friars preachers of St Dominic in 1244, and besides preaching with success in many parts of Italy, taught in the schools of his own fraternity. He was provincial of Lombardy from 1267 till 1286, when he was removed at the meeting of the order in Paris. He also represented his own province at the councils of Lucca (1288) and Ferrara (1290). On the last occasion he was one of the four delegates charged with signifying Nicholas IV.'s desire for the deposition of Munio de Zamora, who had been master of the order from 1285, and was deprived of his office by a papal bull dated the 12th of April 1291. In 1288 Nicholas empowered him to absolve the people of Genoa for their offence in aiding the Sicilians against Charles II. Early in 1292 the same pope, himself a Franciscan, summoned Jacobus to Rome, intending to consecrate him archbishop of Genoa with his own hands. He reached Rome on Palm Sunday (March 30), only to find his patron ill of a deadly sickness, from which he died on Good Friday (April 4). The cardinals, however, "propter honorem Communis Januae," determined to carry out this consecration on the Sunday after Easter. He was a good bishop, and especially distinguished himself by his efforts to appease the civil discords of Genoa. He died in 1298 or 1299, and was buried in the Dominican church at Genoa. A story, mentioned by the chronicler Echard as unworthy of credit, makes Boniface VIII., on the first day of Lent, cast the ashes in the archbishop's eyes instead of on his head, with the words, "Remember that thou art a Ghibelline, and with thy fellow Ghibellines wilt return to naught."

Jacobus de Voragine left a list of his own works. Speaking of himself in his *Chronicon januense*, he says, "While he was in his order, and after he had been made archbishop, he wrote many works. For he compiled the legends of the saints (*Legendae sanctorum*) in one volume, adding many things from the *Historia tripartita et scholastica*, and from the chronicles of many writers." The other writings he claims are two anonymous volumes of "Sermons concerning all the Saints" whose yearly feasts the church celebrates. Of these volumes, he adds, one is very diffuse, but the other short and concise. Then follow *Sermones de omnibus evangeliis dominicalibus* for every Sunday in the year; *Sermones de omnibus evangeliis, i.e.* a book of discourses on all the Gospels, from Ash Wednesday to the Tuesday after Easter; and a treatise called "*Marialis*, qui totus est de B. Maria compositus," consisting of about 160 discourses on the attributes, titles, &c., of the Virgin Mary. In the same work the archbishop claims to have written his *Chronicon januense* in the second year of his pontificate (1293), but it extends to 1296 or 1297. To this list Echard adds several other works, such as a defence of the Dominicans, printed at Venice in 1504, and a *Summa virtutum et vitiorum Guillelmi Peraldi*, a Dominican who died about 1250. Jacobus is also said by Sixtus of Siena (*Biblioth. Sacra*, lib. ix.) to have translated the Old and New Testaments into his own tongue. "But," adds Echard, "if he did so, the version lies so closely hid that there is no recollection of it," and it may be added that it is highly improbable that the man who compiled the Golden Legend ever conceived the necessity of having the Scriptures in the vernacular.

His two chief works are the *Chronicon januense* and the *Golden Legend* or *Lombardica hystoria.* The former is partly printed in Muratori (*Scriptores Rer. Ital.* ix. 6). It is divided into twelve parts. The first four deal with the mythical history of Genoa from the time of its founder, Janus, the first king of Italy, and its enlarger, a second Janus "citizen of Troy", till its conversion to Christianity "about twenty-five years after the passion of Christ." Part v. professes to treat of the beginning, the growth and the perfection of the city; but of the first period the writer candidly confesses he knows nothing except by hearsay. The second period includes the Genoese crusading exploits in the East, and extends to their victory over the Pisans (*c.* 1130), while the third reaches down to the days of the author's archbishopric. The sixth part deals with the constitution of the city, the seventh and eighth with the duties of rulers and citizens, the ninth with those of domestic life. The tenth gives the ecclesiastical history of Genoa from the time of its first known bishop, St Valentine, "whom we believe to have lived about 530 A.D.," till 1133, when the city was raised to archiepiscopal rank. The eleventh contains the lives of all the bishops in order, and includes the chief events during their pontificates; the twelfth deals in the same way with the archbishops, not forgetting the writer himself.

The *Golden Legend*, one of the most popular religious works of the middle ages, is a collection of the legendary lives of the greater saints of the medieval church. The preface divides the ecclesiastical year into four periods corresponding to the various epochs of the world's history, a time of deviation, of renovation, of reconciliation and of pilgrimage. The book itself, however, falls into five sections:—(*a*) from Advent to Christmas (*cc.* 1–5); (*b*) from Christmas to Septuagesima (6–30); (*c*) from Septuagesima to Easter (31–53); (*d*) from Easter Day to the octave of Pentecost (54–76); (*e*) from the octave of Pentecost to Advent (77–180). The saints' lives are full of puerile legend, and in not a few cases contain accounts of 13th-century miracles wrought at special places, particularly with reference to the Dominicans. The last chapter but one (181), "De Sancto Pelagio Papa," contains a kind of history of the world from the middle of the 6th century; while the last (182) is a somewhat allegorical disquisition, "De Dedicatione Ecclesiae."

The *Golden Legend* was translated into French by Jean Belet de Vigny in the 14th century. It was also one of the earliest books to issue from the press. A Latin edition is assigned to about 1469; and a dated one was published at Lyons in 1473. Many other Latin editions were printed before the end of the century. A French translation by Master John Bataillier is dated 1476; Jean de Vigny's appeared at Paris, 1488; an Italian one by Nic. Manerbi (? Venice, 1475); a Bohemian one at Pilsen, 1475–1479, and at Prague, 1495; Caxton's English versions, 1483, 1487 and 1493; and a German one in 1489. Several 15th-century editions of the *Sermons* are also known, and the *Mariale* was printed at Venice in 1497 and at Paris in 1503.

For bibliography see Potthast, *Bibliotheca hist. med. aev.* (Berlin, 1896), p. 634; U. Chevalier, *Répertoire des sources hist. Bio.-bibl.* (Paris, 1905), *s.v.* "Jacques de Voragine."

JACOTOT, JOSEPH (1770–1840), French educationist, author of the method of "emancipation intellectuelle," was born at Dijon on the 4th of March 1770. He was educated at the university of Dijon, where in his nineteenth year he was chosen professor of Latin, after which he studied law, became advocate, and at the same time devoted a large amount of his attention to mathematics. In 1788 he organized a federation of the youth of Dijon for the defence of the principles of the Revolution; and in 1792, with the rank of captain, he set out to take part in the campaign of Belgium, where he conducted himself with bravery and distinction. After for some time filling the office of secretary of the "commission d'organisation du mouvement des armées," he in 1794 became deputy of the director of the Polytechnic school, and on the institution of the central schools at Dijon he was appointed to the chair of the "method of sciences," where he made his first experiments in that mode of tuition which he afterwards developed more fully. On the central schools being replaced by other educational institutions, Jacotot occupied successively the chairs of mathematics and of Roman law until the overthrow of the empire. In 1815 he was elected a representative to the chamber of deputies; but after the second restoration he found it necessary to quit his native land, and, having taken up his residence at Brussels, he was in 1818 nominated by the Government teacher of the French language at the university of Louvain, where he perfected into a system the educational principles which he had already practised with success in France. His method was not only adopted in several institutions in Belgium, but also met with some approval in France, England, Germany and Russia. It was based on three principles: (1) all men have equal intelligence; (2) every man has received from God the faculty of being able to instruct himself; (3) everything is in everything. As regards (1) he maintained that it is only in the will to use their intelligence that men differ; and his own process, depending on (3), was to give any one learning a language for the first time a short passage of a few lines, and to encourage the pupil to study, first the words, then the letters, then the grammar, then the meaning, until a single paragraph became the occasion for learning an entire literature. After the revolution of 1830 Jacotot returned to France, and he died at Paris on the 30th of July 1840.

His system was described by him in *Enseignement universel, langue maternelle*, Louvain and Dijon, 1823—which passed through several editions—and in various other works; and he also advocated his views in the *Journal de l'émancipation intellectuelle*. For a complete list of his works and fuller details regarding his career, see *Biographie de J. Jacotot*, by Achille Guillard (Paris, 1860).

JACQUARD, JOSEPH MARIE (1752–1834), French inventor, was born at Lyons on the 7th of July 1752. On the death of his father, who was a working weaver, he inherited two looms, with which he started business on his own account. He did not, however, prosper, and was at last forced to become a lime-burner at Bresse, while his wife supported herself at Lyons by plaiting straw. In 1793 he took part in the unsuccessful defence of Lyons against the troops of the Convention; but afterwards served in their ranks on the Rhône and Loire. After seeing some active service, in which his young son was shot down at his side, he again returned to Lyons. There he obtained a situation in a factory, and employed his spare time in constructing his improved loom, of which he had conceived the idea several years previously. In 1801 he exhibited his invention at the industrial exhibition at Paris; and in 1803 he was summoned to Paris and attached to the Conservatoire des Arts et Métiers. A loom by Jacques de Vaucanson (1709–1782), deposited there, suggested various improvements in his own, which he gradually perfected to its final state. Although his invention was fiercely opposed by the silk-weavers, who feared that its introduction, owing to the saving of labour, would deprive them of their livelihood, its advantages secured its general adoption, and by 1812 there were 11,000 Jacquard looms in use in France. The loom was declared public property in 1806, and Jacquard was rewarded with a pension and a royalty on each machine. He died at Oullins (Rhône) on the 7th of August 1834, and six years later a statue was erected to him at Lyons (see WEAVING).

JACQUERIE, THE, an insurrection of the French peasantry which broke out in the Île de France and about Beauvais at the end of May 1358. The hardships endured by the peasants in the Hundred Years' War and their hatred for the nobles who oppressed them were the principal causes which led to the rising, though the immediate occasion was an affray which took place on the 28th of May at the village of Saint-Leu between "brigands" (militia infantry armoured in brigandines) and countryfolk. The latter having got the upper hand united with the inhabitants of the neighbouring villages and placed Guillaume Karle at their head. They destroyed numerous châteaux in the valleys of the Oise, the Brêche and the Thérain, where they subjected the whole countryside to fire and sword, committing the most terrible atrocities. Charles the Bad, king of Navarre, crushed the rebellion at the battle of Mello on the 10th of June, and the nobles then took violent reprisals upon the peasants, massacring them in great numbers.

See Simeon Luce, *Histoire de la Jacquerie* (Paris, 1859 and 1895). (J. V.*)

JACTITATION (from Lat. *jactitare*, to throw out publicly), in English law, the maliciously boasting or giving out by one party that he or she is married to the other. In such a case, in order to prevent the common reputation of their marriage that might ensue, the procedure is by suit of jactitation of marriage, in which the petitioner alleges that the respondent boasts that he or she is married to the petitioner, and prays a declaration of nullity and a decree putting the respondent to perpetual silence thereafter. Previously to 1857 such a proceeding took place only in the ecclesiastical courts, but by express terms of the Matrimonial Causes Act of that year it can now be brought in the probate, divorce and admiralty division of the High Court. To the suit there are three defences: (1) denial of the boasting; (2) the truth of the representations; (3) allegation (by way of estoppel) that the petitioner acquiesced in the boasting of the respondent. In *Thompson* v. *Rourke*, 1893, Prob. 70, the court of appeal laid down that the court will not make a decree in a jactitation suit in favour of a petitioner who has at any time acquiesced in the assertion of the respondent that they were actually married. Jactitation of marriage is a suit that is very rare.

JADE, or JAHDE, a deep bay and estuary of the North Sea, belonging to the grand-duchy of Oldenburg, Germany. The bay, which was for the most part made by storm-floods in the 13th and 16th centuries, measures 70 sq. m., and has communication with the open sea by a fairway, a mile and a half wide, which never freezes, and with the tide gives access to the largest vessels. On the west side of the entrance to the bay is the Prussian naval port of Wilhelmshaven. A tiny stream, about 14 m. long, also known as the Jade, enters the head of the bay.

JADE, a name commonly applied to certain ornamental stones, mostly of a green colour, belonging to at least two distinct species, one termed nephrite and the other jadeite. Whilst the term jade is popularly used in this sense, it is now usually restricted by mineralogists to nephrite. The word jade[1] is derived (through Fr. *le jade* for *l'ejade*) from Span. *ijada* (Lat. *ilia*), the loins, this mineral having been known to the Spanish conquerors of Mexico and Peru under the name of *piedra de ijada* or *yjada* (colic stone). The reputed value of the stone in renal diseases is also suggested by the term nephrite (so named by A. G. Werner from Gr. *νεφρός*, kidney), and by its old name *lapis nephriticus*.

Jade, in its wide and popular sense, has always been highly prized by the Chinese, who not only believe in its medicinal value but regard it as the symbol of virtue. It is known, with other ornamental stones, under the name of *yu* or *yu-chi* (yu-stone). According to Professor H. A. Giles, it occupies in China the highest place as a jewel, and is revered as "the quintessence of heaven and earth." Notwithstanding its toughness or tenacity, due to a dense fibrous structure, it is wrought into complicated forms and elaborately carved. On many prehistoric sites in Europe, as in the Swiss lake-dwellings, celts and other carved objects both in nephrite and in jadeite have not infrequently been found; and as no kind of jade had until recent years been discovered *in situ* in any European locality it was held, especially by Professor L. H. Fischer, of Freiburg im Breisgau, Baden, that either the raw material or the worked objects must have been brought by some of the early inhabitants from a jade locality probably in the East, or were obtained by barter, thus suggesting a very early trade-route to the Orient. Exceptional interest, therefore, attached to the discovery of jade in Europe, nephrite having been found in Silesia, and jadeite or a similar rock in the Alps, whilst pebbles of jade have been obtained from many localities in Austria and north Germany, in the latter case probably derived from Sweden. It is, therefore, no longer necessary to assign the old jade implements to an exotic origin. Dr A. B. Meyer, of Dresden, always maintained that the European jade objects were indigenous, and his views have become generally accepted. Now that the mineral characters of jade are better understood, and its identification less uncertain, it may possibly be found with altered peridotites, or with amphibolites, among the old crystalline schists of many localities.

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[1] The English use of the word for a worthless, ill-tempered horse, a "screw," also applied as a term of reproach to a woman, has been referred doubtfully to the same Spanish source as the O. Sp. *ijadear*, meaning to pant, of a broken-winded horse.

Nephrite, or true jade, may be regarded as a finely fibrous or compact variety of amphibole, referred either to actinolite or to tremolite, according as its colour inclines to green or white. Chemically it is a calcium-magnesium silicate, $CaMg_3(SiO_3)_4$. The fibres are either more or less parallel or irregularly felted together, rendering the stone excessively tough; yet its hardness is not great, being only about 6 or 6·5. The mineral sometimes tends to become schistose, breaking with a splintery fracture, or its structure may be horny. The specific gravity varies from 2·9 to 3·18, and is of determinative value, since jadeite is much denser. The colour of jade presents various shades of green, yellow and grey, and the mineral when polished has a rather greasy lustre. Professor F. W. Clarke found the colours due to compounds of iron, manganese and chromium. One of the most famous localities for nephrite is on the west side of the South Island of New Zealand, where it occurs as nodules and veins in serpentine and talcose rocks, but is generally found as boulders. It was known to the Maoris as *pounamu*, or "green stone," and was highly prized, being worked with great labour into various objects, especially the club-like implement known as the *mere*, or *pattoo-pattoo*, and the breast ornament called *hei-tiki*. The New Zealand jade, called by old writers "green talc of the Maoris," is now worked in Europe as an ornamental stone. The green jade-like stone known in New Zealand as *tangiwai* is bowenite, a translucent serpentine with enclosures of magnesite. The mode of occurrence of the nephrite and bowenite of New Zealand has been described by A. M. Finlayson (*Quart. Jour. Geol. Soc.*, 1909, p. 351). It appears that the Maoris distinguished six varieties of jade. Difference of colour seems due to variations in the proportion of ferrous silicate in the mineral. According to Finlayson, the New Zealand nephrite results from the chemical alteration of serpentine, olivine or pyroxene, whereby a fibrous amphibole is formed, which becomes converted by intense pressure and movement into the dense nephrite.

Nephrite occurs also in New Caledonia, and perhaps in some of the other Pacific islands, but many of the New Caledonian implements reputed to be of jade are really made of serpentine. From its use as a material for axe-heads, jade is often known in Germany as *Beilstein* ("axe-stone"). A fibrous variety, of specific gravity 3·18, found in New Caledonia, and perhaps in the Marquesas, was distinguished by A. Damour under the name of "oceanic jade."

Much of the nephrite used by the Chinese has been obtained from quarries in the Kuen-lun mountains, on the sides of the Kara-kash valley, in Turkestan. The mineral, generally of pale colour, occurs in nests and veins running through hornblende-schists and gneissose rocks, and it is notable that when first quarried it is comparatively soft. It appears to have a wide distribution in the mountains, and has been worked from very ancient times in Khotan. Nephrite is said to occur also in the Pamir region, and pebbles are found in the beds of many streams. In Turkestan, jade is known as *yashm* or *yeshm*, a word which appears in Arabic as *yeshb*, perhaps cognate with ἴασπις or jasper. The "jasper" of the ancients may have included jade. Nephrite is said to have been discovered in 1891 in the Nan-shan mountains in the Chinese province of Kan-suh, where it is worked. The great centre of Chinese jade-working is at Peking, and formerly the industry was active at Su-chow Fu. Siberia has yielded very fine specimens of dark green nephrite, notably from the neighbourhood of the Alibert graphite mine, near Batugol, Lake Baikal. The jade seems to occur as a rock in part of the Sajan mountain system. New deposits in Siberia were opened up to supply material for the tomb of the tsar Alexander III. A gigantic monolith exists at the tomb of Tamerlane at Samarkand. The occurrence of the Siberian jade has been described by Professor L. von Jaczewski.

Jade implements are widely distributed in Alaska and British Columbia, being found in Indian graves, in old shell-heaps and on the sites of deserted villages. Dr G. M. Dawson, arguing from the discovery of some boulders of jade in the Fraser river valley, held that they were not obtained by barter from Siberia, but were of native origin; and the locality was afterwards discovered by Lieut. G. M. Stoney. It is known as the Jade Mountains, and is situated north of Kowak river, about 150 miles from its mouth. The study of a large collection of jade implements by Professor F. W. Clarke and Dr G. P. Merrill proved that the Alaskan jade is true nephrite, not to be distinguished from that of New Zealand.

Jadeite is a mineral species established by A. Damour in 1863, differing markedly from nephrite in that its relation lies with the pyroxenes rather than with the amphiboles. It is an aluminium sodium silicate, $NaAl(SiO_3)_2$, related to spodumene. S. L. Penfield showed, by measurement, that jadeite is monoclinic. Its colour is commonly very pale, and white jadeite, which is the purest variety, is known as "camphor jade." In many cases the mineral shows bright patches of apple-green or emerald-green, due to the presence of chromium. Jadeite is much more fusible than nephrite, and is rather harder (6·5 to 7), but its most readily determined character is found in its higher specific gravity, which ranges from 3·20 to 3·41. Some jadeite seems to be a metamorphosed igneous rock.

The Burmese jade, discovered by a Yunnan trader in the 13th century, is mostly jadeite. The quarries, described by Dr F. Noetling, are situated on the Uru river, about 120 m. from Mogaung, where the jadeite occurs in serpentine, and is partly extracted by fire-setting. It is also found as boulders in alluvium, and when these occur in a bed of laterite they acquire a red colour, which imparts to them peculiar value. According to Dr W. G. Bleeck, who visited the jade country of Upper Burma after Noetling, jadeite occurs at three localities in the Kachin Hills—Tawmaw, Hweka and Mamon. The jadeite is known as *chauk-sen*, and is sent either to China or to Mandalay, by way of Bhamo, whence Bhamo has come erroneously to be regarded as a locality for jade. Jadeite occurs in association with the nephrite of Turkestan, and possibly in some other Asiatic localities. In certain cases nephrite is formed by the alteration of jadeite, as shown by Professor J. P. Iddings. The Chinese *feits'ui*, sometimes called "imperial jade," is a beautiful green stone, which seems generally to be jadeite, but it is said that in some cases it may be chrysoprase. It is named from its resemblance in colour to the plumage of the kingfisher. The resonant character of jade has led to its occasional use as a musical stone.

In Mexico, in Central America and in the northern part of South America, objects of jadeite are common. The Kunz votive adze from Oaxaca, in Mexico, is now in the American Museum of Natural History, New York. At the time of the Spanish conquest of Mexico amulets of green stone were highly venerated, and it is believed that jadeite was one of the stones prized under the name of *chalchihuitl*. Probably turquoise was another stone included under this name, and indeed any green stone capable of being polished, such as the Amazon stone, now recognized as a green feldspar, may have been numbered among the Aztec amulets. Dr Kunz suggests that the chalchihuitl was jadeite in southern Mexico and Central America, and turquoise in northern Mexico and New Mexico. He thinks that Mexican jadeite may yet be discovered in places (*Gems and Precious Stones of Mexico*, by G. F. Kunz: Mexico, 1907).

Chloromelanite is Damour's name for a dense, dark mineral which has been regarded as a kind of jade, and was used for the manufacture of celts found in the dolmens of France and in certain Swiss lake-dwellings. It is a mineral of spinach-green or dark-green colour, having a specific gravity of 3·4, or even as high as 3·65, and may be regarded as a variety of jadeite rich in iron. Chloromelanite occurs in the Cyclops Mountains in New Guinea, and is used for hatchets or agricultural implements, whilst the sago-clubs of the island are usually of serpentine. Sillimanite, or fibrolite, is a mineral which, like chloromelanite, was used by the Neolithic occupants of western Europe, and is sometimes mistaken for a pale kind of jade. It is an aluminium silicate, of specific gravity about 3·2, distinguished by its infusibility. The *jade tenace* of J. R. Haüy, discovered by H. B. de Saussure in the Swiss Alps, is now known as saussurite. Among other substances sometimes taken for jade may be mentioned prehnite, a hydrous calcium-aluminium silicate, which when polished much resembles certain kinds of jade. Pectolite has been used, like jade, in Alaska. A variety of vesuvianite (idocrase) from California, described by Dr. G. F. Kunz as californite, was at first mistaken for jade. The name jadeolite has been given by Kunz to a green chromiferous syenite from the jadeite mines of Burma. The mineral called bowenite, at one time supposed to be jade, is a hard and tough variety of serpentine. Some of the common Chinese ornaments imitating jade are carved in steatite or serpentine, while others are merely glass. The *pâte de riz* is a fine white glass. The so-called "pink jade" is mostly quartz, artificially coloured, and "black jade," though sometimes mentioned, has no existence.

An exhaustive description of jade will be found in a sumptuous work, entitled *Investigations and Studies in Jade* (New York, 1906). This work, edited by Dr G. F. Kunz, was prepared in illustration of the famous jade collection made by Heber Reginald Bishop, and presented by him to the Metropolitan Museum of Art, New York. The work, which is in two folio volumes, superbly illustrated, was printed privately, and after 100 copies had been struck off on American hand-made paper, the type was distributed and the material used for the illustrations was destroyed. The second volume is a catalogue of the collection, which comprises 900 specimens arranged in three classes: mineralogical, archaeological and artistic. The important section on Chinese jade was contributed by Dr S. W. Bushell, who also translated for the work a discourse on jade—*Yü-shuo* by T'ang Jung-tso, of Peking. Reference should also be made to Heinrich Fischer's *Nephrit und Jadeit* (2nd ed., Stuttgart, 1880), a work which at the date of its publication was almost exhaustive. (F. W. R.*)

JAEN, an inland province of southern Spain, formed in 1833 of districts belonging to Andalusia; bounded on the N. by Ciudad Real and Albacete, E. by Albacete and Granada, S. by Granada, and W. by Cordova. Pop. (1900), 474,490; area, 5848 sq. m. Jaen comprises the upper basin of the river Guadalquivir, which traverses the central districts from east to west, and is enclosed on the north, south and east by mountain ranges, while on the west it is entered by the great Andalusian plain. The Sierra Morena, which divides Andalusia from New Castile, extends along the northern half of the province, its most prominent ridges being the Loma de Chiclana and the Loma de Ubeda; the Sierras de Segura, in the east, derive their name from the river Segura, which rises just within the border; and between the last-named watershed, its continuation the Sierra del Pozo, and the parallel Sierra de Cazorla, is the source of the Guadalquivir. The loftiest summits in the province are those of the Sierra Magina (7103 ft.) farther west and south. Apart from the Guadalquivir the only large rivers are its right-hand tributaries the Jándula and Guadalimar, its left-hand tributary the Guadiana Menor, and the Segura, which flows east and south to the Mediterranean.

In a region which varies so markedly in the altitude of its surface, the climate is naturally unequal; and, while the bleak, wind-swept highlands are only available as sheep-walks, the well-watered and fertile valleys favour the cultivation of the vine, the olive and all kinds of cereals. The mineral wealth of Jaen has been known since Roman times, and mining is an important industry, with its centre at Linares. Over 400 lead mines were worked in 1903; small quantities of iron, copper and salt are also obtained. There is some trade in sawn timber and cloth; esparto fabrics, alcohol and oil are manufactured. The roads, partly owing to the development of mining, are more numerous and better kept than in most Spanish provinces. Railway communication is also very complete in the western districts, as the main line Madrid-Cordova-Seville passes through them and is joined south of Linares by two important railways—from Algeciras and Malaga on the south-west, and from Almeria on the south-east. The eastern half of Jaen is inaccessible by rail. In the western half are Jaen, the capital (pop. (1900), 26,434), with Andujar (16,302), Baeza (14,379), Bailen (7420), Linares (38,245), Martos (17,078) and Ubeda (19,913). Other towns of more than 7000 inhabitants are Alcalá la Real, Alcaudete, Arjona, La Carolina and Porcuna, in the west; and Cazorla, Quesada, Torredonjimeno, Villacarillo and Villanueva del Arzobispo, in the east.

JAEN, the capital of the Spanish province of Jaen, on the Linares-Puente Genil railway, 1500 ft. above the sea. Pop. (1900), 26,434. Jaen is finely situated on the well-wooded northern slopes of the Jabalcuz Mountains, overlooking the picturesque valleys of the Jaen and Guadalbullon rivers, which flow north into the Guadalquivir. The hillside upon which the narrow and irregular city streets rise in terraces is fortified with Moorish walls and a Moorish citadel. Jaen is an episcopal see. Its cathedral was founded in 1532; and, although it remained unfinished until late in the 18th century, its main characteristics are those of the Renaissance period. The city contains many churches and convents, a library, art galleries, theatres, barracks and hospitals. Its manufactures include leather, soap, alcohol and linen; and it was formerly celebrated for its silk. There are hot mineral springs in the mountains, 2 m. south.

The identification of Jaen with the Roman Aurinx, which has sometimes been suggested, is extremely questionable. After the Moorish conquest Jaen was an important commercial centre, under the name of Jayyan; and ultimately became capital of a petty kingdom, which was brought to an end only in 1246 by Ferdinand III. of Castille, who transferred hither the bishopric of Baeza in 1248. Ferdinand IV. died at Jaen in 1312. In 1712 the city suffered severely from an earthquake.

JAFARABAD, a state of India, in the Kathiawar agency of Bombay, forming part of the territory of the nawab of Janjira; area, 42 sq. m.; pop. (1901), 12,097; estimated revenue, £4000. The town of Jafarabad (pop. 6038), situated on the estuary of a river, carries on a large coasting trade.

JAFFNA, a town of Ceylon, at the northern extremity of the island. The fort was described by Sir J. Emerson Tennent as "the most perfect little military work in Ceylon—a pentagon built of blocks of white coral." The European part of the town bears the Dutch stamp more distinctly than any other town in the island; and there still exists a Dutch Presbyterian church. Several of the church buildings date from the time of the Portuguese. In 1901 Jaffna had a population of 33,879, while in the district or peninsula of the same name there were 300,851 persons, nearly all Tamils, the only Europeans being the civil servants and a few planters. Coco-nut planting has not been successful of recent years. The natives grow palmyras freely, and have a trade in the fibre of this palm. They also grow and export tobacco, but not enough rice for their own requirements. A steamer calls weekly, and there is considerable trade. The railway extension from Kurunegala due north to Jaffna and the coast was commenced in 1900. Jaffna is the seat of a government agent and district judge, and criminal sessions of the supreme court are regularly held. Jaffna, or, as the natives call it, Yalpannan, was occupied by the Tamils about 204 B.C., and there continued to be Tamil rajahs of Jaffna till 1617, when the Portuguese took possession of the place. As early as 1544 the missionaries under Francis Xavier had made converts in this part of Ceylon, and after the conquest the Portuguese maintained their proselytizing zeal. They had a Jesuit college, a Franciscan and a Dominican monastery. The Dutch drove out the Portuguese in 1658. The Church of England Missionary Society began its work in Jaffna in 1818, and the American Missionary Society in 1822.

JÄGER, GUSTAV (1832–), German naturalist and hygienist, was born at Bürg in Württemberg on the 23rd of June 1832. After studying medicine at Tübingen he became a teacher of zoology at Vienna. In 1868 he was appointed professor of zoology at the academy of Hohenheim, and subsequently he became teacher of zoology and anthropology at Stuttgart polytechnic and professor of physiology at the veterinary school. In 1884 he abandoned teaching and started practice as a physician in Stuttgart. He wrote various works on biological subjects, including *Die Darwinsche Theorie und ihre Stellung zu Moral und Religion* (1869), *Lehrbuch der allgemeinen Zoologie* (1871–1878), and *Die Entdeckung der Seele* (1878). In 1876 he suggested an hypothesis in explanation of heredity, resembling the germ-plasm theory subsequently elaborated by August Weismann, to the effect that the germinal protoplasm retains its specific properties from generation to generation, dividing in each reproduction into an ontogenetic portion, out of which the individual is built up, and a phylogenetic portion, which is reserved to form the reproductive material of the mature offspring. In *Die Normalkleidung als Gesundheitsschutz* (1880) he advocated the system of clothing associated with his name, objecting especially to the use of any kind of vegetable fibre for clothes.

JÄGERNDORF (Czech, *Krnov*), a town of Austria, in Silesia, 18 m. N.W. of Troppau by rail. Pop. (1900), 14,675, mostly German. It is situated on the Oppa and possesses a château belonging to Prince Liechtenstein, who holds extensive estates in the district. Jägerndorf has large manufactories of cloth, woollens, linen and machines, and carries on an active trade. On the neighbouring hill of Burgberg (1420 ft.) are a church, much visited as a place of pilgrimage, and the ruins of the seat of the former princes of Jägerndorf. The claim of Prussia to the principality of Jägerndorf was the occasion of the first Silesian war (1740–1742), but in the partition, which followed, Austria retained the larger portion of it. Jägerndorf suffered severely during the Thirty Years' War, and was the scene of engagements between the Prussians and Austrians in May 1745 and in January 1779.

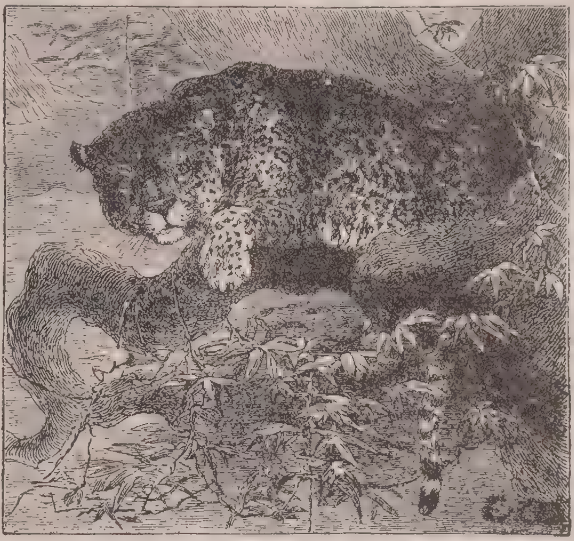
JAGERSFONTEIN, a town in the Orange Free State, 50 m. N.W. by rail of Springfontein on the trunk line from Cape Town to Pretoria. Pop. (1904), 5657—1293 whites and 4364 coloured persons. Jagersfontein, which occupies a pleasant situation on the open veld about 4500 ft. above the sea, owes its existence to the valuable diamond mine discovered here in 1870. The first diamond, a stone of 50 carats, was found in August of that year, and digging immediately began. The discovery a few weeks later of the much richer mines at Bultfontein and Du Toits Pan, followed by the great finds at De Beers and Colesberg Kop (Kimberley) caused Jagersfontein to be neglected for several years. Up to 1887 the claims in the mine were held by a large number of individuals, but coincident with the efforts to amalgamate the interest in the Kimberley mines a similar movement took place at Jagersfontein, and by 1893 all the claims became the property of one company, which has a working arrangement with the De Beers corporation. The mine, which is worked on the open system and has a depth of 450 ft., yields stones of very fine quality, but the annual output does not exceed in value £500,000. In 1909 a shaft 950 ft. deep was sunk with a view to working the mine on the underground system. Among the famous stones found in the mine are the "Excelsior" (weighing 971 carats, and larger than any previously discovered) and the "Jubilee" (see DIAMOND). The town was created a municipality in 1904.

Fourteen miles east of Jagersfontein is Boomplaats, the site of the battle fought in 1848 between the Boers under A. W. Pretorius and the British under Sir Harry Smith (see ORANGE FREE STATE: *History*).

JAGO, RICHARD (1715–1781), English poet, third son of Richard Jago, rector of Beaudesert, Warwickshire, was born in 1715. He went up to University College, Oxford, in 1732, and took his degree in 1736. He was ordained to the curacy of Snitterfield, Warwickshire, in 1737, and became rector in 1754; and, although he subsequently received other preferments, Snitterfield remained his favourite residence. He died there on the 8th of May 1781. He was twice married. Jago's best-known poem, *The Blackbirds*, was first printed in Hawkesworth's *Adventurer* (No. 37, March 13, 1753), and was generally attributed to Gilbert West, but Jago published it in his own name, with other poems, in R. Dodsley's *Collection of Poems* (vol. iv., 1755). In 1767 appeared a topographical poem, *Edge Hill, or the Rural Prospect delineated and moralized*; two separate sermons were published in 1755; and in 1768 *Labour and Genius, a Fable.* Shortly before his death Jago revised his poems, and they were published in 1784 by his friend, John Scott Hylton, as *Poems Moral and Descriptive.*

See a notice prefixed to the edition of 1784; A. Chalmers, *English Poets* (vol. xvii., 1810); F. L. Colvile, *Warwickshire Worthies* (1870); some biographical notes are to be found in the letters of Shenstone to Jago printed in vol. iii. of Shenstone's *Works* (1769).

JAGUAR (*Felis onca*), the largest species of the *Felidae* found on the American continent, where it ranges from Texas through Central and South America to Patagonia. In the countries which bound its northern limit it is not frequently met with, but in South America it is quite common, and Don Felix de Azara states that when the Spaniards first settled in the district between Montevideo and Santa Fé, as many as two thousand were killed yearly. The jaguar is usually found singly (sometimes in pairs), and preys upon such quadrupeds as the horse, tapir, capybara, dogs or cattle. It often feeds on fresh-water turtles; sometimes following the reptiles into the water to effect a capture, it inserts a paw between the shells and drags out the body of the turtle by means of its sharp claws. Occasionally after having tasted human flesh, the jaguar becomes a confirmed man-eater. The cry of this great cat, which is heard at night, and most frequently during the pairing season, is deep and hoarse in tone, and consists of the sound *pu, pu,* often repeated. The female brings forth from two to four cubs towards the close of the year, which are able to follow their mother in about fifteen days after birth. The ground colour of the jaguar varies greatly, ranging from white to black, the rosette markings in the extremes being but faintly visible. The general or typical coloration is, however, a rich tan upon the head, neck, body, outside of legs, and tail near the root. The upper part of the head and sides of the face are thickly marked with small black spots, and the rest of body is covered with rosettes, formed of rings of black spots, with a black spot in the centre, and ranged lengthwise along the body in five to seven rows on each side. These black rings are heaviest along the back. The lips, throat, breast and belly, the inside of the legs and the lower sides of tail are pure white, marked with irregular spots of black, those on the breast being long bars and on the belly and inside of legs large blotches. The tail has large black spots near the root, some with light centres, and from about midway of its length to the tip it is ringed with black. The ears are black behind, with a large buff spot near the tip. The nose and upper lip are light rufous brown. The size varies, the total length of a very large specimen measuring 6 ft. 9 in.; the average length, however, is about 4 ft. from the nose to root of tail. In form the jaguar is thick-set; it does not stand high upon its legs; and in comparison with the leopard is heavily built; but its movements are very rapid, and it is fully as agile as its more graceful relative. The skull resembles that of the lion and tiger, but is much broader in proportion to its length, and may be identified by the presence of a tubercle on the inner edge of the orbit. The species has been divided into a number of local forms, regarded by some American naturalists as distinct species, but preferably ranked as sub-species or races.



The Jaguar (*Felis onca*).

JAGUARONDI, or YAGUARONDI (*Felis jaguarondi*), a South American wild cat, found in Brazil, Paraguay and Guiana, ranging to north-eastern Mexico. This relatively small cat, uniformly coloured, is generally of some shade of brownish-grey, but in some individuals the fur has a rufous coat, while in others grey predominates. These cats are said by Don Felix de Azara to keep to cover, without venturing into open places. They attack tame poultry and also young fawns. The names jaguarondi and eyra are applied indifferently to this species and *Felis eyra*.

JAHANABAD, a town of British India in Gaya district, Bengal, situated on a branch of the East Indian railway. Pop. (1901), 7018. It was once a flourishing trading town, and in 1760 it formed one of the eight branches of the East India Company's central factory at Patna. Since the introduction of Manchester goods, the trade of the town in cotton cloth has almost entirely ceased; but large numbers of the Jolaha or Mahommedan weaver caste live in the neighbourhood.

JAHANGIR, or JEHANGIR (1569–1627), Mogul emperor of Delhi, succeeded his father Akbar the Great in 1605. His name was Salim, but he assumed the title of Jahangir, "Conqueror of the World," on his accession. It was in his reign that Sir Thomas Roe came as ambassador of James I., on behalf of the

English company. He was a dissolute ruler, much addicted to drunkenness, and his reign is chiefly notable for the influence enjoyed by his wife Nur Jahan, "the Light of the World." At first she influenced Jahangir for good, but surrounding herself with her relatives she aroused the jealousy of the imperial princes; and Jahangir died in 1627 in the midst of a rebellion headed by his son, Khurram or Shah Jahan, and his greatest general, Mahabat Khan. The tomb of Jahangir is situated in the gardens of Shahdera on the outskirts of Lahore.

JĀḤIẒ (ABŪ ʿUTHMĀN ʿAMR IBN BAHR UL-JĀḤIẒ; *i.e.* "the man the pupils of whose eyes are prominent") (d. 869), Arabian writer. He spent his life and devoted himself in Basra chiefly to the study of polite literature. A Muʿtazilite in his religious beliefs, he developed a system of his own and founded a sect named after him. He was favoured by Ibn uz-Zaiyāt, the vizier of the caliph Wāthiq.

His work, the *Kitāb ul-Bayān wat-Tabyīn*, a discursive treatise on rhetoric, has been published in two volumes at Cairo (1895). The *Kitāb ul-Mahāsin wal-Addād* was edited by G. van Vloten as *Le Livre des beautés et des antithèses* (Leiden, 1898); the *Kitāb ul-Bu-halā. Le Livre des avares*, ed. by the same (Leiden, 1900); two other smaller works, the *Excellences of the Turks* and the *Superiority in Glory of the Blacks over the Whites*, also prepared by the same. The *Kitāb ul-Ḥayawān*, or "Book of Animals," a philological and literary, not a scientific, work, was published at Cairo (1906).

(G. W. T.)

JAHN, FRIEDRICH LUDWIG (1778–1852), German pedagogue and patriot, commonly called *Turnvater* ("Father of Gymnastics"), was born in Lanz on the 11th of August 1778. He studied theology and philology from 1796 to 1802 at Halle, Göttingen and Greifswald. After Jena he joined the Prussian army. In 1809 he went to Berlin, where he became a teacher at the Gymnasium zum Grauen as well as at the Plamann School. Brooding upon the humiliation of his native land by Napoleon, he conceived the idea of restoring the spirits of his countrymen by the development of their physical and moral powers through the practice of gymnastics. The first *Turnplatz*, or open-air gymnasium, was opened by him at Berlin in 1811, and the movement spread rapidly, the young gymnasts being taught to regard themselves as members of a kind of gild for the emancipation of their fatherland. This patriotic spirit was nourished in no small degree by the writings of Jahn. Early in 1813 he took an active part at Breslau in the formation of the famous corps of Lützow, a battalion of which he commanded, though during the same period he was often employed in secret service. After the war he returned to Berlin, where he was appointed state teacher of gymnastics. As such he was a leader in the formation of the student *Burschenschaften* (patriotic fraternities) in Jena.

A man of democratic nature, rugged, honest, eccentric and outspoken, Jahn often came into collision with the reactionary spirit of the time, and this conflict resulted in 1819 in the closing of the *Turnplatz* and the arrest of Jahn himself. Kept in semi-confinement at the fortress of Kolberg until 1824, he was then sentenced to imprisonment for two years; but this sentence was reversed in 1825, though he was forbidden to live within ten miles of Berlin. He therefore took up his residence at Freyburg on the Unstrut, where he remained until his death, with the exception of a short period in 1828, when he was exiled to Cölleda on a charge of sedition. In 1840 he was decorated by the Prussian government with the Iron Cross for bravery in the wars against Napoleon. In the spring of 1848 he was elected by the district of Naumburg to the German National Parliament. Jahn died on the 15th of October 1852 in Freyburg, where a monument was erected in his honour in 1859.

Among his works are the following: *Bereicherung des hochdeutschen Sprachschatzes* (Leipzig, 1806), *Deutsches Volksthum* (Lübeck, 1810), *Runenblätter* (Frankfort, 1814), *Neue Runenblätter* (Naumburg, 1828), *Merke zum deutschen Volksthum* (Hildburghausen, 1833), and *Selbstvertheidigung* (Vindication) (Leipzig, 1863). A complete edition of his works appeared at Hof in 1884–1887. See the biography by Schultheiss (Berlin, 1894), and *Jahn als Erzieher*, by Friedrich (Munich, 1895).

JAHN, JOHANN (1750–1816), German Orientalist, was born at Tasswitz, Moravia, on the 18th of June 1750. He studied philosophy at Olmütz, and in 1772 began his theological studies at the Premonstratensian convent of Bruck, near Znaim. Having been ordained in 1775, he for a short time held a cure at Mislitz, but was soon recalled to Bruck as professor of Oriental languages and Biblical hermeneutics. On the suppression of the convent by Joseph II. in 1784, Jahn took up similar work at Olmütz, and in 1789 he was transferred to Vienna as professor of Oriental languages, biblical archaeology and dogmatics. In 1792 he published his *Einleitung ins Alte Testament* (2 vols.), which soon brought him into trouble; the cardinal-archbishop of Vienna laid a complaint against him for having departed from the traditional teaching of the Church, *e.g.* by asserting Job, Jonah, Tobit and Judith to be didactic poems, and the cases of demoniacal possession in the New Testament to be cases of dangerous disease. An ecclesiastical commission reported that the views themselves were not necessarily heretical, but that Jahn had erred in showing too little consideration for the views of German Catholic theologians in coming into conflict with his bishop, and in raising difficult problems by which the unlearned might be led astray. He was accordingly advised to modify his expressions in future. Although he appears honestly to have accepted this judgment, the hostility of his opponents did not cease until at last (1806) he was compelled to accept a canonry at St Stephen's, Vienna, which involved the resignation of his chair. This step had been preceded by the condemnation of his *Introductio in libros sacros veteris foederis in compendium redacta*, published in 1804, and also of his *Archaeologia biblica in compendium redacta* (1805). The only work of importance, outside the region of mere philology, afterwards published by him, was the *Enchiridion Hermeneuticae* (1812). He died on the 16th of August 1816.

Besides the works already mentioned, he published *Hebräische Sprachlehre für Anfänger* (1792); *Aramäische od. Chaldäische u. Syrische Sprachlehre für Anfänger* (1793); *Arabische Sprachlehre* (1796); *Elementarbuch der hebr. Sprache* (1799); *Chaldäische Chrestomathie* (1800); *Arabische Chrestomathie* (1802); *Lexicon arabico-latinum chrestomathiae accommodatum* (1802); an edition of the Hebrew Bible (1806); *Grammatica linguae hebraicae* (1809); a critical commentary on the Messianic passages of the Old Testament (*Vaticinia prophetarum de Jesu Messia*, 1815). In 1821 a collection of *Nachträge* appeared, containing six dissertations on Biblical subjects. The English translation of the *Archaeologia* by T. C. Upham (1840) has passed through several editions.

JAHN, OTTO (1813–1869), German archaeologist, philologist, and writer on art and music, was born at Kiel on the 16th of June 1813. After the completion of his university studies at Kiel, Leipzig and Berlin, he travelled for three years in France and Italy; in 1839 he became privatdocent at Kiel, and in 1842 professor-extraordinary of archaeology and philology at Greifswald (ordinary professor 1845). In 1847 he accepted the chair of archaeology at Leipzig, of which he was deprived in 1851 for having taken part in the political movements of 1848–1849. In 1855 he was appointed professor of the science of antiquity, and director of the academical art museum at Bonn, and in 1867 he was called to succeed E. Gerhard at Berlin. He died at Göttingen, on the 9th of September 1869.

The following are the most important of his works: 1. Archaeological: *Palamedes* (1836); *Telephos u. Troilos* (1841); *Die Gemälde des Polygnot* (1841); *Pentheus u. die Mänaden* (1841); *Paris u. Oinone* (1844); *Die hellenische Kunst* (1846); *Peitho, die Göttin der Überredung* (1847); *Über einige Darstellungen des Paris-Urteils* (1849); *Die Ficoronische Cista* (1852); *Pausaniae descriptio arcis Athenarum* (3rd ed., 1901); *Darstellungen griechischer Dichter auf Vasenbildern* (1861). 2. Philological: Critical editions of Juvenal, Persius and Sulpicia (3rd ed. by F. Bücheler, 1893); Censorinus (1845); Florus (1852); Cicero's *Brutus* (4th ed., 1877); and *Orator* (3rd ed., 1869); the *Periochae* of Livy (1853); the *Psyche et Cupido* of Apuleius (3rd ed., 1884; 5th ed., 1905); Longinus (1867; 3rd ed. by J. Vahlen, 1905). 3. Biographical and aesthetic: *Ueber Mendelssohn's Paulus* (1842); *Biographie Mozarts*, a work of extraordinary labour, and of great importance for the history of music (3rd ed. by H. Disters, 1889–1891; Eng. trans. by P. D. Townsend, 1891); *Ludwig Uhland* (1863); *Gesammelte Aufsätze über Musik* (1866); *Biographische Aufsätze* (1866). His *Griechische Bilderchroniken* was published after his death, by his nephew A. Michaelis, who has written an exhaustive biography in *Allgemeine Deutsche Biographie*, xiii.; see also J. Vahlen, *Otto Jahn* (1870); C. Bursian, *Geschichte der classischen Philologie in Deutschland*.

JAHRUM, a town and district of Persia in the province of Fars, S.E. of Shiraz and S.W. of Darab. The district has thirty-three villages and is famous for its celebrated *shâhân* dates, which are exported in great quantities; it also produces much tobacco and fruit. The water supply is scanty, and most of the irrigation is by water drawn from wells. The town of Jahrum, situated about 90 m. S.E. of Shiraz, is surrounded by a mud-wall 3 m. in circuit which was constructed in 1834. It has a population of about 15,000, one half living inside and the other half outside the walls. It is the market for the produce of the surrounding districts, has six caravanserais and a post office.

JAINS, the most numerous and influential sect of heretics, or nonconformists to the Brahmanical system of Hinduism, in India. They are found in every province of upper Hindustan, in the cities along the Ganges and in Calcutta. But they are more numerous to the west—in Mewar, Gujarat, and in the upper part of the Malabar coast—and are also scattered throughout the whole of the southern peninsula. They are mostly traders, and live in the towns; and the wealth of many of their community gives them a social importance greater than would result from their mere numbers. In the Indian census of 1901 they are returned as being 1,334,140 in number. Their magnificent series of temples and shrines on Mount Abu, one of the seven wonders of India, is perhaps the most striking outward sign of their wealth and importance.

The Jains are the last direct representatives on the continent of India of those schools of thought which grew out of the active philosophical speculation and earnest spirit of religious inquiry that prevailed in the valley of the Ganges during the 5th and 6th centuries before the Christian era. For many centuries Jainism was so overshadowed by that stupendous movement, born at the same time and in the same place, which we call Buddhism, that it remained almost unnoticed by the side of its powerful rival. But when Buddhism, whose widely open doors had absorbed the mass of the community, became thereby corrupted from its pristine purity and gradually died away, the smaller school of the Jains, less diametrically opposed to the victorious orthodox creed of the Brahmans, survived, and in some degree took its place.

Jainism purports to be the system of belief promulgated by Vaddhamāna, better known by his epithet of Mahā-vīra (the great hero), who was a contemporary of Gotama, the Buddha. But the Jains, like the Buddhists, believe that the same system had previously been proclaimed through countless ages by each one of a succession of earlier teachers. The Jains count twenty-four such prophets, whom they call Jinas, or Tīrthankaras, that is, conquerors or leaders of schools of thought. It is from this word Jina that the modern name Jainas, meaning followers of the Jina, or of the Jinas, is derived. This legend of the twenty-four Jinas contains a germ of truth. Mahā-vīra was not an originator; he merely carried on, with but slight changes, a system which existed before his time, and which probably owes its most distinguishing features to a teacher named Pārṣwa, who ranks in the succession of Jinas as the predecessor of Mahā-vīra. Pārṣwa is said, in the Jain chronology, to have been born two hundred years before Mahā-vīra (that is, about 760 B.C.); but the only conclusion that it is safe to draw from this statement is that Pārṣwa was considerably earlier in point of time than Mahā-vīra. Very little reliance can be placed upon the details reported in the Jain books concerning the previous Jinas in the list of the twenty-four Tīrthankaras. The curious will find in them many reminiscences of Hindu and Buddhist legend; and the antiquary must notice the distinctive symbols assigned to each, in order to recognize the statues of the different Jinas, otherwise identical, in the different Jain temples.

The Jains are divided into two great parties—the *Digambaras*, or Sky-clad Ones, and the *Svetāmbaras*, or the White-robed Ones. The latter have only as yet been traced, and that doubtfully, as far back as the 5th century after Christ; the former are almost certainly the same as the Niganṭhas, who are referred to in numerous passages of the Buddhist Pāli Piṭakas, and must therefore be at least as old as the 6th century B.C. In many of these passages the Niganṭhas are mentioned as contemporaneous with the Buddha; and details enough are given concerning their leader Niganṭha Nāta-putta (that is, the Niganṭha of the Jñātṛika clan) to enable us to identify him, without any doubt, as the same person as the Vaddhamāna Mahā-vīra of the Jain books. This remarkable confirmation, from the scriptures of a rival religion, of the Jain tradition is conclusive as to the date of Mahā-vīra. The Niganṭhas are referred to in one of Asoka's edicts (*Corpus Inscriptionum*, Plate xx.). Unfortunately the account of the teachings of Niganṭha Nāta-putta given in the Buddhist scriptures are, like those of the Buddha's teachings given in the Brahmanical literature, very meagre.

Jain Literature.—The Jain scriptures themselves, though based on earlier traditions, are not older in their present form than the 5th century of our era. The most distinctively sacred books are called the forty-five Āgamas, consisting of eleven Angas, twelve Upangas, ten Pakiṇṇakas, six Chedas, four Mūla-sūtras and two other books. Devaddhi Gaṇin, who occupies among the Jains a position very similar to that occupied among the Buddhists by Buddhaghosa, collected the then existing traditions and teachings of the sect into these forty-five Āgamas. Like the Buddhist scriptures, the earlier Jain books are written in a dialect of their own, the so-called Jaina Prākrit; and it was not till between A.D. 1000 and 1100 that the Jains adopted Sanskrit as their literary language. Considerable progress has been made in the publication and elucidation of these original authorities. But a great deal remains yet to be done. The oldest books now in the possession of the modern Jains purport to go back, not to the foundation of the existing order in the 6th century B.C., but only to the time of Bhadrabahu, three centuries later. The whole of the still older literature, on which the revision then made was based, the so-called *Pūrvas*, have been lost. And the existing canonical books, while preserving a great deal that was probably derived from them, contain much later material. The problem remains to sort out the older from the later, to distinguish between the earlier form of the faith and its subsequent developments, and to collect the numerous data for the general, social, industrial, religious and political history of India. Professor Weber gave a fairly full and carefully-drawn-up analysis of the whole of the more ancient books in the second part of the second volume of his *Catalogue of the Sanskrit MSS. at Berlin*, published in 1888, and in vols. xvi. and xvii. of his *Indische Studien*. An English translation of these last was published first in the *Indian Antiquary*, and then separately at Bombay, 1893. Professor Bhandarkar gave an account of the contents of many later works in his *Report on the Search for Sanskrit MSS.*, Bombay, 1883. Only a small beginning has been made in editing and translating these works. The best *précis* of a long book can necessarily only deal with the more important features in it. And in the choice of what should be included the *précis*-writer will often omit the points some subsequent investigator may most especially want. All the older works ought therefore to be edited and translated in full and properly indexed. The Jains themselves have now printed in Bombay a complete edition of their sacred books. But the critical value of this edition and of other editions of separate texts printed elsewhere in India leaves much to be desired. Professor Jacobi has edited and translated the *Kalpa Sūtra*, containing a life of the founder of the Jain order; but this can scarcely be older than the 5th century of our era. He has also edited and translated the *Āyāranya Sutta* of the Svetambara Jains. The text, published by the Pali Text Society, is of 140 pages octavo. The first part of it, about 50 pages, is a very old document on the Jain views as to conduct, and the remainder consists of appendices, added at different times, on the same subject. The older part may go back as early as the 3rd century B.C., and it sets out more especially the Jain doctrine of *tapas* or self-mortification, in contradistinction to the Buddhist view, which condemned asceticism. The rules of conduct in this book are for members of the order. Dr Rudolf Hoernle edited and translated an ancient work on the rules of conduct for laymen, the *Uvāsaga Dasāo*.[1] Professor Leumann edited another of the older works, the *Aupapātika Sūtra*, and a fourth, entitled the *Dasa-vaikālika Sūtra*, both of them published by the German Oriental Society. Professor Jacobi translated two more, the *Uttarādhyāyana* and the *Sūtra Kritānga*.[2] Finally Dr Barnett has translated two others in vol. xvii. of the *Oriental Translation Fund* (new series, London, 1907). Thus about one-fiftieth part of these interesting and valuable old records is now accessible to the European scholar. The sect of the Svetambaras has preserved the oldest literatures. Dr Hoernle has treated of the early history of the sect in the *Proceedings of the Asiatic Society of Bengal* for 1898. Several scholars—notably Bhagvanlāl Indrajī, Mr Lewis Rice and Hofrath Bühler[1]—have treated of the remarkable archaeological discoveries lately made. These confirm the older records in many details, and show that the Jains, in the centuries before the Christian era, were a wealthy and important body in widely separated parts of India.

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[1] Published in the *Bibliotheca Indica*, Calcutta, 1888.

[2] These two, and the other two mentioned above, form vols. i. and ii. of his *Jaina Sutras*, published in the *Sacred Books of the East* (1884, 1895).

Jainism.—The most distinguishing outward peculiarity of Mahā-vīra and of his earliest followers was their practice of going quite naked, whence the term *Digambara.* Against this custom, Gotama, the Buddha, especially warned his followers; and it is referred to in the well-known Greek phrase, *Gymnosophist,* used already by Megasthenes, which applies very aptly to the Niganṭhas. Even the earliest name Niganṭha, which means "free from bonds," may not be without allusions to this curious belief in the sanctity of nakedness, though it also alluded to freedom from the bonds of sin and of transmigration. The statues of the Jinas in the Jain temples, some of which are of enormous size, are still always quite naked; but the Jains themselves have abandoned the practice, the Digambaras being sky-clad at meal-time only, and the Svetāmbaras being always completely clothed. And even among the Digambaras it is only the recluses or *Yatis,* men devoted to a religious life, who carry out this practice. The Jain laity—the *Srāvakas,* or disciples—do not adopt it.

The Jain views of life were, in the most important and essential respects, the exact reverse of the Buddhist views. The two orders, Buddhist and Jain, were not only, and from the first, independent, but directly opposed the one to the other. In philosophy the Jains are the most thorough-going supporters of the old animistic position. Nearly everything, according to them, has a soul within its outward visible shape—not only men and animals, but also all plants, and even particles of earth, and of water (when it is cold), and fire and wind. The Buddhist theory, as is well known, is put together without the hypothesis of "soul" at all. The word the Jains use for soul is *jīva,* which means life; and there is much analogy between many of the expressions they use and the view that the ultimate cells and atoms are all, in a more or less modified sense, alive. They regard good and evil and space as ultimate substances which come into direct contact with the minute souls in everything. And their best-known position in regard to the points most discussed in philosophy is *Syād-vāda,* the doctrine that you may say "Yes" and at the same time "No" to everything. You can affirm the eternity of the world, for instance, from one point of view, and at the same time deny it from another; or, at different times and in different connexions, you may one day affirm it and another day deny it. This position both leads to vagueness of thought and explains why Jainism has had so little influence over other schools of philosophy in India. On the other hand, the Jains are as determined in their views of asceticism (*tapas*) as they were compromising in their views of philosophy. Any injury done to the "souls" being one of the worst of iniquities, the good monk should not wash his clothes (indeed, the most austere will reject clothes altogether), nor even wash his teeth, for fear of injuring living things. "Subdue the body, chastise thyself, weaken thyself, just as fire consumes dry wood." It was by suppressing, through such self-torture, the influence on his soul of all sensations that the Jain could obtain salvation. It is related of the founder himself, the Mahā-vīra, that after twelve years' penance he thus obtained Nirvāna (Jacobi, *Jaina Sūtras,* i. 201) before he entered upon his career as a teacher. And through the rest of his life, till he died at Pāvā, shortly before the Buddha, he followed the same habit of continual self-mortification. The Buddha, on the other hand, obtained Nirvāna in his 35th year, under the Bo tree, after he had abandoned penance; and through the rest of his life he spoke of penance as quite useless from his point of view.

There is no manual of Jainism as yet published, but there is a great deal of information on various points in the introductions to the works referred to above. Professor Jacobi, who is the best authority on the history of this sect, thus sums up the distinction between the Mahā-vīra and the Buddha: "Mahā-vīra was rather of the ordinary class of religious men in India. He may be allowed a talent for religious matters, but he possessed not the genius which Buddha undoubtedly had. . . . The Buddha's philosophy forms a system based on a few fundamental ideas, whilst that of Mahā-vīra scarcely forms a system, but is merely a sum of opinions (*pannattis*) on various subjects, no fundamental ideas being there to uphold the mass of metaphysical matter. Besides this. . . it is the ethical element that gives to the Buddhist writings their superiority over those of the Jains. Mahā-vīra treated ethics as corollary and subordinate to his metaphysics, with which he was chiefly concerned."

ADDITIONAL AUTHORITIES.—Bhadrabāhu's *Kalpa Sūtra,* the recognized and popular manual of the Svetāmbara Jains, edited with English introduction by Professor Jacobi (Leipzig, 1879); Hemacandra's "Yoga S'āstram," edited by Windisch, in the *Zeitschrift der deutschen morg. Ges.* for 1874; "Zwei Jaina Stotra," edited in the *Indische Studien,* vol. xv.; *Ein Fragment der Bhagavatī,* by Professor Weber; *Mémoires de l'Académie de Berlin* (1866); *Nirayāvaliya Sutta,* edited by Dr Warren, with Dutch introduction (Amsterdam, 1879); *Over de godsdienstige en wijsgeerige Begrippen der Jainas,* by Dr Warren (his doctor-dissertation, Zwolle, 1875); *Beiträge zur Grammatik des Jaina-prākrit,* by Dr Edward Müller (Berlin, 1876); Colebrooke's *Essays,* vol. ii. Mr J. Burgess has an exhaustive account of the Jain Cave Temples (none older than the 7th century) in Fergusson and Burgess's *Cave Temples in India* (London, 1880).

See also Hopkins' *Religions of India* (London, 1896), pp. 280–96, and J. G. Bühler *On the Indian Sect of the Jainas,* edited by J. Burgess (London, 1904). (T. W. R. D.)

JAIPUR, or JEYPORE, a city and native state of India in the Rajputana agency. The city is a prosperous place of comparatively recent date. It derives its name from the famous Maharaja Jai Singh II., who founded it in 1728. It is built of pink stucco in imitation of sandstone, and is remarkable for the width and regularity of its streets. It is the only city in India that is laid out in rectangular blocks, and it is divided by cross streets into six equal portions. The main streets are 111 ft. wide and are paved, while the city is lighted by gas. The regularity of plan, and the straight streets with the houses all built after the same pattern, deprive Jaipur of the charm of the East, while the painted mud walls of the houses give it the meretricious air of stage scenery. The huge palace of the maharaja stands in the centre of the city. Another noteworthy building is Jai Singh's observatory. The chief industries are in metals and marble, which are fostered by a school of art, founded in 1868. There is also a wealthy and enterprising community of native bankers. The city has three colleges and several hospitals. Pop. (1901), 160,167. The ancient capital of Jaipur was Amber.

The STATE OF JAIPUR, which takes its name from the city, has a total area of 15,579 sq. m. Pop. (1901), 2, 658, 666, showing a decrease of 6 % in the decade. The estimated revenue is £430,000, and the tribute £27,000. The centre of the state is a sandy and barren plain 1,600 ft. above sea-level, bounded on the E. by ranges of hills running north and south. On the N. and W. it is bounded by a broken chain of hills, an offshoot of the Aravalli mountains, beyond which lies the sandy desert of Rajputana. The soil is generally sandy. The hills are more or less covered with jungle trees, of no value except for fuel. Towards the S. and E. the soil becomes more fertile. Salt is largely manufactured and exported from the Sambhar lake, which is worked by the government of India under an arrangement with the states of Jaipur and Jodhpur. It yields salt of a very high quality. The state is traversed by the Rajputana railway, with branches to Agra and Delhi.

The maharaja of Jaipur belongs to the Kachwaha clan of Rajputs, claiming descent from Rama, king of Ajodhya. The state is said to have been founded about 1128 by Dhula Rai, from Gwalior, who with his Kachwahas is said to have absorbed or driven out the petty chiefs. The Jaipur house furnished to the Moguls some of their most distinguished generals. Among them were Man Singh, who fought in Orissa and Assam; Jai

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[1] The *Hatthi Gumphā* and three other inscriptions at Cuttack (Leyden, 1885); *Sravana Belgola* inscriptions (Bangalore, 1889); *Vienna Oriental Journal,* vols. ii.–v.; *Epigraphia Indica,* vols. i–vii.

Singh, commonly known by his imperial title of Mirza Raja, whose name appears in all the wars of Aurangzeb in the Deccan; and Jai Singh II., or Sawai Jai Singh, the famous mathematician and astronomer, and the founder of Jaipur city. Towards the end of the 18th century the Jats of Bharatpur and the chief of Alwar each annexed a portion of the territory of Jaipur. By the end of the century the state was in great confusion, distracted by internal broils and impoverished by the exactions of the Mahrattas. The disputes between the chiefs of Jaipur and Jodhpur had brought both states to the verge of ruin, and Amir Khan with the Pindaris was exhausting the country. By a treaty in 1818 the protection of the British was extended to Jaipur and an annual tribute fixed. In 1835 there was a serious disturbance in the city, after which the British government took measures to insist upon order and to reform the administration as well as to support its effective action; and the state has gradually become well-governed and prosperous. During the Mutiny of 1857 the maharaja assisted the British in every way that lay in his power. Maharaja Madho Singh, G.C.S.I., G.C.V.O., was born in 1861, and succeeded in 1882. He is distinguished for his enlightened administration and his patronage of art. He was one of the princes who visited England at the time of King Edward's coronation in 1902. It was he who started and endowed with a donation of 15 lakhs, afterwards increased to 20 lakhs, of rupees (£133,000) the "Indian People's Famine Fund." The Jaipur imperial service transport corps saw service in the Chitral and Tirah campaigns.

JAISALMER, or JEYSULMERE, a town and native state of India in the Rajputana agency. The town stands on a ridge of yellowish sandstone, crowned by a fort, which contains the palace and several ornate Jain temples. Many of the houses and temples are finely sculptured. Pop. (1901), 7137. The area of the state is 16,062 sq. m. In 1901 the population was 73,370, showing a decrease of 37% in ten years, as a consequence of famine. The estimated revenue is about £6000; there is no tribute. Jaisalmer is almost entirely a sandy waste, forming a part of the great Indian desert. The general aspect of the country is that of an interminable sea of sandhills, of all shapes and sizes, some rising to a height of 150 ft. Those in the west are covered with *phog* bushes, those in the east with tufts of long grass. Water is scarce, and generally brackish; the average depth of the wells is said to be about 250 ft. There are no perennial streams, and only one small river, the Kakni, which, after flowing a distance of 28 m., spreads over a large surface of flat ground, and forms a lake or *jhil* called the Bhuj-Jhil. The climate is dry and healthy. Throughout Jaisalmer only rain-crops, such as *bajra*, *joar*, *moth*, *til*, &c., are grown; spring crops of wheat, barley, &c., are very rare. Owing to the scant rainfall, irrigation is almost unknown.

The main part of the population lead a wandering life, grazing their flocks and herds. Large herds of camels, horned cattle, sheep and goats are kept. The principal trade is in wool, *ghi*, camels, cattle and sheep. The chief imports are grain, sugar, foreign cloth, piece-goods, &c. Education is at a low ebb. Jain priests are the chief schoolmasters, and their teaching is elementary. The ruler of Jaisalmer is styled *maharawal*. The state suffered from famine in 1897, 1900 and other years, to such an extent that it has had to incur a heavy debt for extraordinary expenditure. There are no railways.

The majority of the inhabitants are Bhatti Rajputs, who take their name from an ancestor named Bhatti, renowned as a warrior when the tribe were located in the Punjab. Shortly after this the clan was driven southwards, and found a refuge in the Indian desert, which was thenceforth its home. Deorāj, a famous prince of the Bhatti family, is esteemed the real founder of the present Jaisalmer dynasty, and with him the title of *rāwal* commenced. In 1156 Jāisal, the sixth in succession from Deorāj, founded the fort and city of Jaisalmer, and made it his capital. In 1294 the Bhattis so enraged the emperor Alā-ud-dín that his army captured and sacked the fort and city of Jaisalmer, so that for some time it was quite deserted. After this there is nothing to record till the time of Rāwal Sabal Singh, whose reign marks an epoch in Bhatti history in that he acknowledged the supremacy of the Mogul emperor Shāh Jahān. The Jaisalmer princes had now arrived at the height of their power, but from this time till the accession of Rāwal Mulrāj in 1762 the fortunes of the state rapidly declined, and most of its outlying provinces were lost. In 1818 Mulrāj entered into political relations with the British. Maharawal Salivahan, born in 1887, succeeded to the chiefship in 1891.

JAJCE (pronounced *Yaïtse*), a town of Bosnia, situated on the Pliva and Vrbas rivers, and at the terminus of a branch railway from Serajevo, 62 m. S.E. Pop. (1895), about 4000. Jajce occupies a conical hill, overlooking one of the finest waterfalls in Europe, where the Pliva rushes down into the Vrbas, 100 ft. below. The 14th century citadel which crowns this hill is said to have been built for Hrvoje, duke of Spalato, on the model of the Castel del' Uovo at Naples; but the resemblance is very slight, and although both *jajce* and *uovo* signify "an egg," the town probably derives its name from the shape of the hill. The ruined church of St Luke, said by legend to be the Evangelist's burial place, has a fine Italian belfry, and dates from the 15th century. Jezero, 5 m. W. of Jajce, contains the Turkish fort of Djöl-Hissar, or "the Lake-Fort." In this neighbourhood a line of waterfalls and meres, formed by the Pliva, stretches for several miles, enclosed by steep rocks and forest-clad mountains. The power supplied by the main fall, at Jajce, is used for industrial purposes, but the beauty of the town remains unimpaired.

From 1463 to 1528 Jajce was the principal outwork of eastern Christendom against the Turks. Venice contributed money for its defence, and Hungary provided armies; while the pope entreated all Christian monarchs to avert its fall. In 1463 Mahomet II. had seized more than 75 Bosnian fortresses, including Jajce itself; and the last independent king of Bosnia, Stephen Tomašević, had been beheaded, or, according to one tradition, flayed alive, before the walls of Jajce, on a spot still called *Kraljeva Polje*, the "King's Field." His coffin and skeleton are still displayed in St Luke's Church. The Hungarians, under King Matthias I., came to the rescue, and reconquered the greater part of Bosnia during the same year; and, although Mahomet returned in 1464, he was again defeated at Jajce, and compelled to flee before another Hungarian advance. In 1467 Hungarian *bans*, or military governors, were appointed to rule in north-west Bosnia, and in 1472 Matthias appointed Nicolaus Ujlaki king of the country, with Jajce for his capital. This kingdom lasted, in fact, for 59 years; but, after the death of Ujlaki, in 1492, its rulers only bore the title of *ban*, and of *vojvod*. In 1500 the Turks, under Bajazet II., were crushed at Jajce by the Hungarians under John Corvinus; and several other attacks were repelled between 1520 and 1526. But in 1526 the Hungarian power was destroyed at Mohács; and in 1528 Jajce was forced to surrender.

See Bräss, "Jajce, die alte Königstadt Bosniens," in *Deutsche geog. Blätter*, pp. 71–85 (Bremen, 1899).

JĀJPUR, or JAJPORE, a town of British India, in Cuttack district, Bengal, situated on the right bank of the Baitarani river. Pop. (1901), 12,111. It was the capital of Orissa under the Kesari dynasty until the 11th century, when it was superseded by Cuttack. In Jājpur are numerous ruins of temples, sculptures, &c., and a large and beautiful sun pillar.

JAKOB, LUDWIG HEINRICH VON (1759–1827), German economist, was born at Wettin on the 26th of February 1759. In 1777 he entered the university of Halle. In 1780 he was appointed teacher at the gymnasium, and in 1791 professor of philosophy at the university. The suppression of the university of Halle having been decreed by Napoleon, Jakob betook himself to Russia, where in 1807 he was appointed professor of political economy at Kharkoff, and in 1809 a member of the government commission to inquire into the finances of the empire. In the following year he became president of the commission for the revision of criminal law, and he at the same time obtained an important office in the finance department, with the rank of counsellor of state; but in 1816 he returned to Halle to occupy the chair of political economy. He died at Lauchstädt on the 22nd of July 1827.

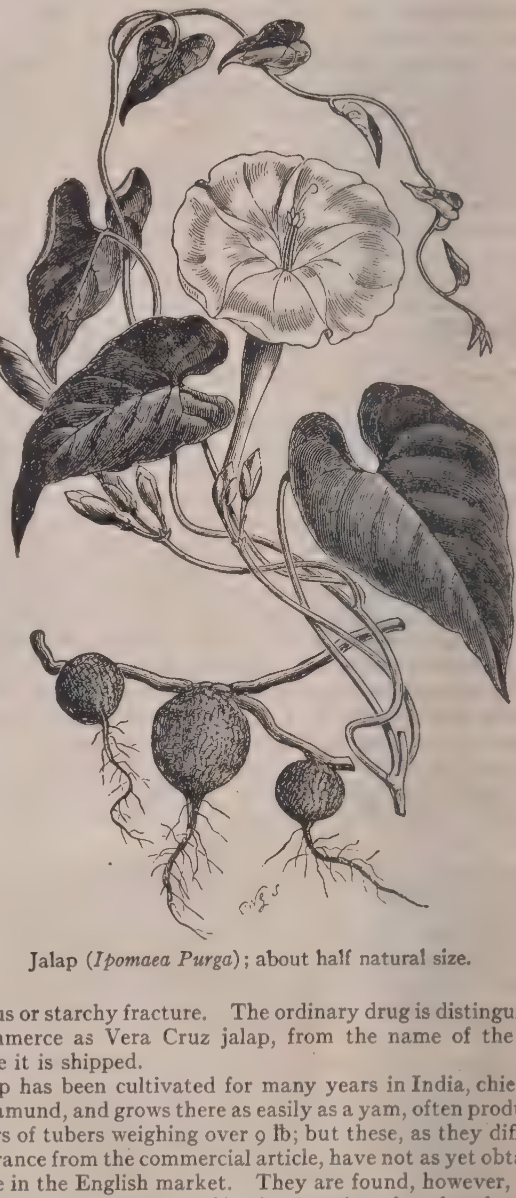
Shortly after his first appointment to a professorship in Halle Jakob had begun to turn his attention rather to the practical than the speculative side of philosophy, and in 1805 he published at Halle *Lehrbuch der Nationalökonomie*, in which he was the first to advocate in Germany the necessity of a distinct science dealing specially with the subject of national wealth. His principal other works are *Grundriss der allgemeinen Logik* (Halle, 1788); *Grundsätze der Polizeigesetzgebung und Polizeianstalten* (Leipzig, 1809); *Einleitung in das Studium der Staatswissenschaften* (Halle, 1819); *Entwurf eines Criminalgesetzbuchs für das russische Reich* (Halle, 1818) and *Staatsfinanzwissenschaft* (2 vols., Halle, 1821).

JAKOVA (also written DIAKOVA, GYAKOVO and GJAKOVICA), a town of Albania, European Turkey, in the vilayet of Kossovo; on the river Erenik, a right-hand tributary of the White Drin. Pop. (1905) about 12,000. Jakova is the chief town of the Alpine region which extends from the Montenegrin frontier to the Drin and White Drin. This region has never been thoroughly explored, or brought under effective Turkish rule, on account of the inaccessible character of its mountains and forests, and the lawlessness of its inhabitants—a group of two Roman Catholic and three Moslem tribes, known collectively as the Malsia Jakovs, whose official representative resides in Jakova.

JAKUNS, an aboriginal race of the Malay Peninsula. They have become much mixed with other tribes, and are found throughout the south of the peninsula and along the coasts. The purest types are straight-haired, exhibit marked Mongolian characteristics and are closely related to the Malays. They are probably a branch of the Pre-Malays, the "savage Malays" of A. R. Wallace. They are divided into two groups: (1) Jakuns of the jungle, (2) Jakuns of the sea or Orang Laut. The latter set of tribes now comprise the remnants of the pirates or "sea-gipsies" of the Malaccan straits. The Jakuns, who must be studied in conjunction with the other aboriginal peoples of the Malay Peninsula, the Semangs and the Sakais, are not so dwarfish as those. The head is round; the skin varies from olive-brown to dark copper; the face is flat and the lower jaw square. The nose is thick and short, with wide, open nostrils. The cheekbones are high and well marked. The hair has a blue-black tint, eyes are black and the beard is scanty. The Jakuns live a wild forest life, and in general habits much resemble the Sakai, being but little in advance of the latter in social conditions except where they come into close contact with the Malay peoples.

JALALABAD, or JELLALABAD, a town and province of Afghanistan. The town lies at a height of 1950 ft. in a plain on the south side of the Kabul river, 96 m. from Kabul and 76 from Peshawar. Estimated pop., 4000. Between it and Peshawar intervenes the Khyber Pass, and between it and Kabul the passes of Jagdalak, Khurd Kabul, &c. The site was chosen by the emperor Baber, and he laid out some gardens here; but the town itself was built by his grandson Akbar in A.D. 1560. It resembles the city of Kabul on a smaller scale, and has one central bazaar, the streets generally being very narrow. The most notable episode in the history of the place is the famous defence by Sir Robert Sale during the first Afghan war, when he held the town from November 1841 to April 1842. On its evacuation in 1842 General Pollock destroyed the defences, but they were rebuilt in 1878. The town is now fortified, surrounded by a high wall with bastions and loopholes. The province of Jalalabad is about 80 m. in length by 35 in width, and includes the large district of Laghman north of the Kabul river, as well as that on the south called Ningrahar. The climate of Jalalabad is similar to that of Peshawar. As a strategical centre Jalalabad is one of the most important positions in Afghanistan, for it dominates the entrances to the Laghman and the Kunar valleys; commanding routes to Chitral or India north of the Khyber, as well as the Kabul-Peshawar road.

JALAP, a cathartic drug consisting of the tuberous roots of *Ipomaea Purga*, a convolvulaceous plant growing on the eastern declivities of the Mexican Andes at an elevation of 5000 to 8000 ft. above the level of the sea, more especially about the neighbourhood of Chiconquiaco, and near San Salvador on the eastern slope of the Cofre de Perote. Jalap has been known in Europe since the beginning of the 17th century, and derives its name from the city of Jalapa in Mexico, near which it grows, but its botanical source was not accurately determined until 1829, when Dr. J. R. Coxe of Philadelphia published a description and coloured figure taken from living plants sent him two years previously from Mexico. The jalap plant has slender herbaceous twining stems, with alternately placed heart-shaped pointed leaves and salver-shaped deep purplish-pink flowers. The underground stems are slender and creeping; their vertical roots enlarge and form turnip-shaped tubers. The roots are dug up in Mexico throughout the year, and are suspended to dry in a net over the hearth of the Indians' huts, and hence acquire a smoky odour. The large tubers are often gashed to cause them to dry more quickly. In their form they vary from spindle-shaped to ovoid or globular, and in size from a pigeon's egg to a man's fist. Externally they are brown and marked with small transverse paler scars, and internally they present a dirty white resinous or starchy fracture. The ordinary drug is distinguished in commerce as Vera Cruz jalap, from the name of the port whence it is shipped.



Jalap (*Ipomaea Purga*); about half natural size.

Jalap has been cultivated for many years in India, chiefly at Ootacamund, and grows there as easily as a yam, often producing clusters of tubers weighing over 9 lb; but these, as they differ in appearance from the commercial article, have not as yet obtained a place in the English market. They are found, however, to be rich in resin, containing 18%. In Jamaica also the plant has been grown, at first amongst the cinchona trees, but more recently in new ground, as it was found to exhaust the soil.

Besides Mexican or Vera Cruz jalap, a drug called Tampico jalap has been imported for some years in considerable quantity. It has a much more shrivelled appearance and paler colour than ordinary jalap, and lacks the small transverse scars present in the true drug. This kind of jalap, the Purga de Sierra Gorda of the Mexicans, was traced by Hanbury to *Ipomaea simulans.*

It grows in Mexico along the mountain range of the Sierra Gorda in the neighbourhood of San Luis de la Paz, from which district it is carried down to Tampico, whence it is exported. A third variety of jalap known as woody jalap, male jalap, or Orizaba root, or by the Mexicans as Purgo macho, is derived from *Ipomaea orizabensis*, a plant of Orizaba. The root occurs in fibrous pieces, which are usually rectangular blocks of irregular shape, 2 in. or more in diameter, and are evidently portions of a large root. It is only occasionally met with in commerce.

The dose of jalap is from five to twenty grains, the British Pharmacopeia directing that it must contain from 9 to 11 % of the resin, which is given in doses of two to five grains. One preparation of this drug is in common use, the *Pulvis Jalapae Compositus*, which consists of 5 parts of jalap, 9 of cream of tartar, and 1 of ginger. The dose is from 20 grains to a drachm. It is best given in the maximum dose which causes the minimum of irritation.

The chief constituents of jalap resin are two glucosides—*convolvulin* and *jalapin*—sugar, starch and gum. Convolvulin constitutes nearly 20 % of the resin. It is insoluble in ether, and is more active than jalapin. It is not used separately in medicine. Jalapin is present in about the same proportions. It dissolves readily in ether, and has a soft resinous consistence. It may be given in half-grain doses. It is the active principle of the allied drug *scammony*. According to Mayer, the formula of convolvulin is $C_{34}H_{50}O_{16}$, and that of jalapin $C_{31}H_{50}O_{16}$.

Jalap is a typical hydragogue purgative, causing the excretion of more fluid than scammony, but producing less stimulation of the muscular wall of the bowel. For both reasons it is preferable to scammony. It was shown by Professor Rutherford at Edinburgh to be a powerful secretory cholagogue, an action possessed by few hydragogue purgatives. The stimulation of the liver is said to depend upon the solution of the resin by the intestinal secretion. The drug is largely employed in cases of Bright's disease and dropsy from any cause, being especially useful when the liver shares in the general venous congestion. It is not much used in ordinary constipation.

JALAPA, Xalapa, or Halapa, a city of the state of Vera Cruz, Mexico, 70 m. by rail N.W. of the port of Vera Cruz. Pop. (1900), 20,388. It is picturesquely situated on the slopes of the sierra which separates the central plateau from the *tierra caliente* of the Gulf Coast, at an elevation of 4300 ft., and with the Cofre de Perote behind it rising to a height of 13,419 ft. Its climate is cool and healthy and the town is frequented in the hot season by the wealthier residents of Vera Cruz. The city is well built, in the old Spanish style. Among its public buildings are a fine old church, a Franciscan convent founded by Cortez in 1556, and three hospitals, one of which, that of San Juan de Dios, dates from colonial times. The neighbouring valleys and slopes are fertile, and in the forests of this region is found the plant (jalap), which takes its name from the place. Jalapa was for a time the capital of the state, but its political and commercial importance has declined since the opening of the railway between Vera Cruz and the city of Mexico. It manufactures pottery and leather.

JALAUN, a town and district of British India, in the Allahabad division of the United Provinces. Pop. of town (1901), 8573. Formerly it was the residence of a Mahratta governor, but never the headquarters of the district, which are at Orai.

The District of Jalaun has an area of 1477 sq. m. It lies entirely within the level plain of Bundelkhand, north of the hill country, and is almost surrounded by the Jumna and its tributaries the Betwa and Pahuj. The central region thus enclosed is a dead level of cultivated land, almost destitute of trees, and sparsely dotted with villages. The southern portion presents almost one unbroken sheet of cultivation. The boundary rivers form the only interesting feature in Jalaun. The river Non flows through the centre of the district, which it drains by innumerable small ravines instead of watering. Jalaun has suffered much from the noxious *kans* grass, owing to the spread of which many villages have been abandoned and their lands thrown out of cultivation. Pop. (1901), 399,726, showing an increase of 1%. The two largest towns are Kunch (15,888), and Kalpi (10,139). The district is traversed by the line of the Indian Midland railway from Jhansi to Cawnpore. A small part of it is watered by the Betwa canal. Grain, oil-seeds, cotton and *ghi* are exported.

In early times Jalaun seems to have been the home of two Rajput clans, the Chandels in the east and the Kachwahas in the west. The town of Kalpi on the Jumna was conquered for the princes of Ghor as early as 1196. Early in the 14th century the Bundelas occupied the greater part of Jalaun, and even succeeded in holding the fortified post of Kalpi. That important possession was soon recovered by the Mussulmans, and passed under the sway of the Mogul emperors. Akbar's governors at Kalpi maintained a nominal authority over the surrounding district; and the Bundela chiefs were in a state of chronic revolt, which culminated in the war of independence under Chhatar Sal. On the outbreak of his rebellion in 1671 he occupied a large province to the south of the Jumna. Setting out from this basis, and assisted by the Mahrattas, he reduced the whole of Bundelkhand. On his death he bequeathed one-third of his dominions to his Mahratta allies, who before long succeeded in annexing the whole of Bundelkhand. Under Mahratta rule the country was a prey to constant anarchy and intestine strife. To this period must be traced the origin of the poverty and desolation which are still conspicuous throughout the district. In 1806 Kalpi was made over to the British, and in 1840, on the death of Nana Gobind Ras, his possessions lapsed to them also. Various interchanges of territory took place, and in 1856 the present boundaries were substantially settled. Jalaun had a bad reputation during the Mutiny. When the news of the rising at Cawnpore reached Kalpi, the men of the 53rd native infantry deserted their officers, and in June the Jhansi mutineers reached the district, and began their murder of Europeans. The inhabitants everywhere revelled in the licence of plunder and murder which the Mutiny had spread through all Bundelkhand, and it was not till September 1858 that the rebels were finally defeated.

JALISCO, Xalisco, or Guadalajara, a Pacific coast state of Mexico, of very irregular shape, bounded, beginning on the N., by the territory of Tepic and the states of Durango, Zacatecas, Aguas Calientes, Guanajuato, Michoacán, and Colima. Pop. (1900), 1,153,891. Area, 31,846 sq. m. Jalisco is traversed from N.N.W. to S.S.E. by the Sierra Madre, locally known as the Sierra de Nayarit and Sierra de Jalisco, which divides the state into a low heavily forested coastal plain and a high plateau region, part of the great Anáhuac table-land, with an average elevation of about 5000 ft., broken by spurs and flanking ranges of moderate height. The sierra region is largely volcanic and earthquakes are frequent; in the S. are the active volcanoes of Colima (12,750 ft.) and the Nevado de Colima (14,363) ft.). The *tierra caliente* zone of the coast is tropical, humid, and unfavourable to Europeans, while the inland plateaus vary from subtropical to temperate and are generally drier and healthful. The greater part of the state is drained by the Rio Grande de Lerma (called the Santiago on its lower course) and its tributaries, chief of which is the Rio Verde. Lakes are numerous; the largest are the Chapala, about 80 m. long by 10 to 35 m. wide, which is considered one of the most beautiful inland sheets of water in Mexico, the Sayula and the Magdalena, noted for their abundance of fish. The agricultural products of Jalisco include Indian corn, wheat and beans on the uplands, and sugar-cane, cotton, rice, indigo and tobacco in the warmer districts. Rubber and palm oil are natural forest products of the coastal zone. Stock-raising is an important occupation in some of the more elevated districts. The mineral resources include silver, gold, cinnabar, copper, bismuth, and various precious stones. There are reduction works of the old-fashioned type and some manufactures, including cotton and woollen goods, pottery, refined sugar and leather. The commercial activities of the state contribute much to its prosperity. There is a large percentage of Indians and mestizos in the population. The capital is Guadalajara, and other important towns with their populations in 1900 (unless otherwise stated) are: Zapotlanejo (20,275), 21 m. E. by N. of Guadalajara; Ciudad Guzmán (17,374 in 1895), 60 m. N.E. of Colima; Lagos (14,716 in 1895), a mining town 100 m. E.N.E. of Guadalajara on the Mexican Central railway; Tamazula (8783 in 1895); Sayula (7883); Autlán (7715); Teocaltiche (8881); Ameca (7212 in 1895), in a fertile agricultural region on the western slopes of the sierras; Cocula (7090 in 1895); and Zacoalco (6516). Jalisco was first invaded by the Spaniards about 1526 and was soon afterwards conquered by Nuño de Guzman. It once formed part of the *reyno* of Nueva Galicia, which also included Aguas Calientes and Zacatecas. In 1889 its area was much reduced by a subdivision of its coastal zone, which was set apart as the territory of Tepic.

JALNA, or Jaulna, a town in Hyderabad state, India, on the Godavari branch of the Nizam's railway, and 210 m. N.E. of Bombay. Pop. (1901), 20,270. Until 1903 it was a cantonment of the Hyderabad contingent, originally established in 1827. Its gardens produce fruit, which is largely exported. On the opposite bank of the river Kundlika is the trading town of Kadirabad; pop. (1901), 11,159.

JALPAIGURI, or Julpigoree, a town and district of British India, in the Rajshahi division of Eastern Bengal and Assam. The town is on the right bank of the river Tista, with a station on the Eastern Bengal railway about 300 m. due N. of Calcutta. Pop. (1901), 9708. It is the headquarters of the commissioner of the division.

The District of Jalpaiguri (organized in 1869) occupies an irregularly shaped tract south of Darjeeling and Bhutan and north of the state of Kuch Behar. It includes the Western Dwars, annexed from Bhutan after the war of 1864–1865. Area, 2,962 sq. m. Pop. (1901), 787,380, an increase of 16% in the decade. The district is divided into a "regulation" tract, lying towards the south-west, and a strip of country, about 22 m. in width, running along the foot of the Himalayas, and known as the Western Dwars. The former is a continuous expanse of level paddy fields, only broken by groves of bamboos, palms, and fruit-trees. The frontier towards Bhutan is formed by the Sinchula mountain range, some peaks of which attain an elevation of 6000 ft. It is thickly wooded from base to summit. The principal rivers, proceeding from west to east, are the Mahananda, Karatoya, Tista, Jaldhaka, Duduya, Mujnai, Tursa, Kaljani, Raidak, and Sankos. The most important is the Tista, which forms a valuable means of water communication. Lime is quarried in the lower Bhutan hills. The Western Dwars are the principal centre of tea cultivation in Eastern Bengal. The other portion of the district produces jute. Jalpaiguri is traversed by the main line of the Eastern Bengal railway to Darjeeling. It is also served by the Bengal Dwars railway.

JAMAICA, the largest island in the British West Indies. It lies about 80 m. S. of the eastern extremity of Cuba, between 17° 43′ and 18° 32′ N. and 76° 10′ and 78° 20′ W., is 144 m. long, 50 m. in extreme breadth, and has an area of 4207 sq. m. The coast-line has the form of a turtle, the mountain ridges representing the back. A mountainous backbone runs through the island from E. to W., throwing off a number of subsidiary ridges, mostly in a north-westerly or south-easterly direction. In the east this range is more distinctly marked, forming the Blue Mountains, with cloud-capped peaks and numerous bifurcating branches. They trend W. by N., and are crossed by five passes at altitudes varying from 3000 to 4000 ft. They culminate in Blue Mountain Peak (7360 ft.), after which the heights gradually decrease until the range is merged into the hills of the western plateau. Two-thirds of the island are occupied by this limestone plateau, a region of great beauty broken by innumerable hills, valleys and sink-holes, and covered with luxuriant vegetation. The uplands usually terminate in steep slopes or bluffs, separated from the sea, in most cases, by a strip of level land. On the south coast, especially, the plains are often large, the Liguanea plain, on which Kingston stands, having an area of 200 sq. m. Upwards of a hundred rivers and streams find their way to the sea, besides the numerous tributaries which issue from every ravine in the mountains. These streams for the most part are not navigable, and in times of flood they become devastating torrents. In the parish of Portland, the Rio Grande receives all the smaller tributaries from the west. In St Thomas in the east the main range is drained by the Plantain Garden river, the tributaries of which form deep ravines and narrow gorges. The valley of the Plantain Garden expands into a picturesque and fertile plain. The Black river flows through a level country, and is navigable by small craft for about 30 m. The Salt river and the Cabaritta, also in the south, are navigable by barges. Other rivers of the south are the Rio Cobre (on which are irrigation works for the sugar and fruit plantations), the Yallahs and the Rio Minho; in the north are the Martha Brae, the White river, the Great Spanish river, and the Rio Grande. Vestiges of intermittent volcanic action occur, and there are several medicinal springs. Jamaica has 16 harbours, the chief of which are Port Morant, Kingston, Old Harbour, Montego Bay, Falmouth, St Ann's Bay, Port Maria and Port Antonio.

Geology.—The greater part of Jamaica is covered by Tertiary deposits, but in the Blue Mountain and some of the other ranges the older rocks rise to the surface. The foundation of the island is formed by a series of stratified shales and conglomerates, with tuffs and other volcanic rocks and occasional bands of marine limestone. The limestones contain Upper Cretaceous fossils, and the whole series has been strongly folded. Upon this foundation rests unconformably a series of marls and limestones of Eocene and early Oligocene age. Some of the limestones are made of Foraminifera, together with Radiolaria, and indicate a subsidence to abyssal depths. Nevertheless, the higher peaks of the island still remained above the sea. Towards the middle of the Oligocene period, mountain folding took place on an extensive scale, and the island was raised far above its present level and was probably connected with the rest of the Greater Antilles and perhaps with the mainland also. At the same time plutonic rocks of various kinds were intruded into the deposits already formed, and in some cases produced considerable metamorphism. During the Miocene and Pliocene periods the island again sank, but never to the depths which it reached in the Eocene period. The deposits formed were shallow-water conglomerates, marls and limestones, with mollusca, brachiopoda, corals, &c. Finally, a series of successive elevations of small amount, less than 500 ft. in the aggregate, raised the island to its present level. The terraces which mark the successive stages in this elevation are well shown in Montego Bay and elsewhere. The remarkable depressions of the Cockpit country and the closed basin of the Hector river are similar in origin to swallow-holes, and were formed by the solution of a limestone layer resting upon insoluble rocks. The island produces a great variety of marbles, porphyrites, granite and ochres. Traces of gold have been found associated with some of the oxidized copper ores (blue and green carbonates) in the Clarendon mines. Copper ores are widely diffused but are very expensive to work; as are the lead and cobalt which are also found. Manganese iron ores and a form of arsenic occur.

Climate.—The climate is one of the island's chief attractions. Near the coast it is warm and humid, but that of the uplands is delightfully mild and equable. At Kingston the temperature ranges from 70·7° to 87·8° F., and this is generally the average of all the low-lying coast land. At Cinchona, 4907 ft. above the sea, it varies from 57·5° to 68·5°. The vapours from the rivers and the ocean produce in the upper regions clouds saturated with moisture which induce vegetation belonging to a colder climate. During the rainy seasons there is such an accumulation of these vapours as to cause a general coolness and occasion sudden heavy showers, and sometimes destructive floods. The rainy seasons, in May and October, last for about three weeks, although, as a rule no month is quite without rain. The fall varies greatly; while the annual average for the island is 66·3 in., at Kingston it is 32·6 in., at Cinchona 105·5 in., and at some places in the north-east it exceeds 200 in. The climate of the Santa Cruz Mountains is extremely favourable to sufferers from tubercular and rheumatic diseases. Excepting near morasses and lagoons, the island is very healthy, and yellow fever, once prevalent, now rarely occurs. In the early part of the 19th century, hurricanes often devastated Jamaica, but now, though they pass to the N.E. and S.W. with comparative frequency, they rarely strike the island itself.

Flora.—The flora is remarkable, showing types from North, Central, and South America, with a few European forms, besides the common plants found everywhere in the tropics. Of flowering plants there are 2180 distinct species, and of ferns 450 species, several of both being indigenous. The largeness of these numbers may be to some extent accounted for by differences of altitude, temperature and humidity. There are many beautiful flowers, such as the aloe, the yucca, the datura the mountain pride and the *Victoria regia*; and the cactus tribe is well represented. The Sensitive Plant grows in pastures, and orchids in the woods. There are forest trees fit for every purpose; including the ballata, rosewood, satinwood, mahogany, lignum vitae, lancewood and ebony. The logwood and fustic are exported for dyeing. There are also the Jamaica cedar, and the silk cotton tree (*Ceiba Bombax*). Pimento (peculiar to Jamaica) is indigenous, and furnishes the allspice. The bamboo, coffee and cocoa are well known. Several species of palm abound,—the macaw, the fan palm, screw palm, and palmetto royal. There are plantations of coco-nut palm. The other noticeable trees and plants are the mango, the breadfruit tree, the papaw, the lacebark tree, and the guava. The *Palma Christi*, from which castor oil is made, is a very abundant annual. English vegetables grow in the hills, and the plains produce plantains, cocoa, yams, cassava, ochra, beans, pease, ginger and arrowroot. Maize and guinea-corn are cultivated, and the guinea-grass, accidentally introduced in 1750, is very valuable for horses and cattle,—so much so that pen-keeping or cattle farming is a highly profitable occupation. Among the principal fruits are the orange, shaddock, lime, grape or cluster fruit, pine-apple, mango, banana, grapes, melons, avocado pear, breadfruit, and tamarind.

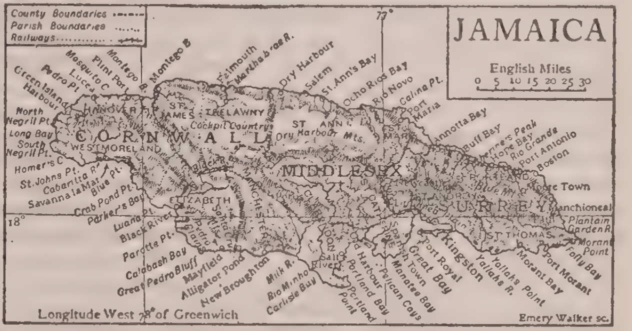
Fauna.—There are fourteen sorts of *lampyridae* or fireflies, besides the *elateridae* or lantern beetles. There are no venomous serpents, but numerous harmless snakes and lizards exist. The land-crab is considered a table delicacy, and the land-turtle also is eaten. The scorpion and centipede, though poisonous, are not very dangerous. Ants, sandflies and mosquitoes swarm in the lowlands. There are twenty different song-birds, and forty-three varieties of birds are presumed to be peculiar to the island. The sea and the rivers swarm with fish. Turtles abound, and the seal, the manatee and the crocodile are sometimes found. The coral reefs, with their varied polyps and anemones, the numerous alcyonarians and diverse coral-dwelling animals are readily accessible to the student, and the island is also celebrated for the number of species of its land-shells.

People.—The population of the island was estimated in 1905 at 806,690. Jamaica is rich in traces of its former Arawâk inhabitants. Aboriginal petaloid celts and other implements, flattened skulls and vessels are common, and images are sometimes found in the large limestone caverns of the island. The present inhabitants, of whom only 2% are white, include Maroons, the descendants of the slaves of the Spaniards who fled into the interior when the island was captured by the British; descendants of imported African slaves; mixed race of British and African blood; coolies from India; a few Chinese, and the British officials and white settlers. The Maroons live by themselves and are few in number, while the half-castes enter into trade and sometimes into the professions. The number of white inhabitants other than British is very small. A negro peasant population is encouraged, with a view to its being a support to the industries of the island; but, in many cases a field negro will not work for his employer more than four days a week. He may till his own plot of ground on one of the other days or not, as the spirit moves him, but four days' work a week will keep him easily. He has little or no care for the future. He has probably squatted on someone's land, and has no rent to pay. Clothes he need hardly buy, fuel he needs only for cooking, and food is ready to his hand for the picking. Unfortunately a widespread indulgence in predial larceny is a great hindrance to agriculture as well as to moral progress. But that habits of thrift are being inculcated is shown by the steady increase in the accounts in the government savings banks. That gross superstition is still prevalent is shown by the cases of *obeah* or witchcraft that come before the courts from time to time. Another indication of the status of the negro may be found in the fact that more than 60% of the births are illegitimate, a percentage that shows an unfortunate tendency to increase rather than diminish.

The capital, Kingston, stands on the south-east coast, and near it is the town of Port Royal. Spanish Town (pop. 5019), the former capital, is in the parish of St Catherine, Middlesex, 11¾ m. by rail west of Kingston. Since the removal of the seat of government to Kingston, the town has gradually sunk in importance. In the cathedral many of the governors of the island are buried. A marble statue of Rodney commemorates his victory over the count de Grasse off Dominica in 1782. Montego Bay (pop. 4803), on the north-west coast, is the second town on the island, and is also a favourite bathing resort. Port Antonio (1784) lies between two secure harbours on the north-east, and owes its prosperity mainly to the development of the trade in fruit, for which it is the chief place of shipment.

Industries.—Agricultural enterprise falls into two classes—planting and pen-keeping, *i.e.* the breeding of horses, mules, cattle and sheep. The chief products are bananas, oranges, coffee, sugar, rum, logwood, cocoa, pimento, ginger, coco-nuts, limes, nutmegs, pineapples, tobacco, grape-fruit and mangoes. There is a board of agriculture, with an experimental station at Hope; there is also an agricultural society with 26 branches throughout the colony. Bee-keeping is a growing industry, especially among the peasants. The land as a rule is divided into small holdings, the vast majority consisting of five acres and less. The manufactures are few. In addition to the sugar and coffee estates and cigar factories, there are tanneries, distilleries, breweries, electric light and gas works, ironfoundries, potteries and factories for the production of coco-nut oil, essential oils, ice, matches and mineral waters. There is an important establishment at Spanish Town for the production of logwood extract. The exports, more than half of which go to the United States, mostly comprise fruit, sugar and rum. The United States also contributes the majority of the imports. More than half the revenue of the colony is derived from import duties, the remainder is furnished by excise, stamps and licences. With the exception of that of the parish boards, there is no direct taxation.

Communications.—In 1900 an Imperial Direct West India Line of steamers was started by Elder, Dempster & Co., to encourage the fruit trade with England; it had a subsidy of £40,000, contributed jointly by the Imperial and Jamaican governments. Two steamers go round the island once a week, calling at the principal ports, the circuit occupying about 120 hours. A number of sailing "droghers" also ply from port to port. Jamaica has a number of good roads and bridle paths; the main roads, controlled by the public works department, encircle the island, with several branches from north to south. The parochial roads are maintained by the parish boards. A railway traverses the island from Kingston in the south-east to Montego Bay in the north-west, and also branches to Port Antonio and to Ewarton. Jamaica is included in the Postal Union and in the Imperial penny post, and there is a weekly mail service to and from England by the Royal Mail Line, but mails are also carried by other companies. The island is connected by cable with the United States via Cuba, and with Halifax, Nova Scotia via Bermuda.


JAMAICA
County Boundaries
Parish Boundaries
Railways
English Miles
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18°
Longitude West 78° of Greenwich
Emery Walker sc.
CORNWALL
MIDDLESEX
SURREY
HANOVER
ST JAMES
TRELAWNY
ST ANN
WESTMORELAND
ELIZABETH
MANCHESTER
CLARENDON
ST CATHERINE
ST MARY
PORTLAND
ST ANDREW
ST THOMAS
Cockpit Country
Dry Harbour Mts.
Blue Mts.
Green Island Harbour
Pedro Pt.
Lucea
Mosquito C.
Plint Pt.
Montego Pt.
Montego B.
Falmouth
Martha brae R.
Dry Harbour
Salem
St. Ann's Bay
Ocho Rios Bay
Rio Novo
Galina Pt.
Port Maria
Annotta Bay
Buff Bay
St. Margaret's Bay
Hope Bay
Rio Grande
Port Antonio
Boston
Moore Town
Manchioneal
Plantain Garden R.
Morant Point
Folly Bay
Port Morant
Morant Bay
Yallahs Point
Yallahs R.
Kingston
Port Royal
Great Bay
Spanish Town
Manatee Bay
Pelican Cays
Old Harbour
Portland Bay
Portland Point
Salt River
Carlisle Bay
Rio Minho
Milk R.
New Broughton
Alligator Pond
Mayfield
Great Pedro Bluff
Calabash Bay
Parottee Pt.
Black River
Luana Pt.
Parker's Bay
Crab Pond Pt.
Savanna la Mar
Blue Pt.
Cabarita R.
St. Johns Pt.
Homer's C.
South Negril Pt.
Long Bay
North Negril Pt.
Black R.
Santa Cruz Mts.
Pedro Plains

There is a government savings bank at Kingston with branches throughout the island, and there are also branches of the Colonial Bank of London and the Bank of Nova Scotia. The coins in circulation are British gold and silver, but not bronze, instead of which local nickel is used. United States gold passes as currency. English weights and measures are used.

Administration, &c.—The island is divided into three counties, Surrey in the east, Middlesex in the centre, and Cornwall in the west, and each of these is subdivided into five parishes. The parish is the unit of local government, and has jurisdiction over roads, markets, sanitation, poor relief and waterworks. The management is vested in a parish board, the members of which are elected. The chairman or custos is appointed by the governor. The island is administered by a governor, who bears the old Spanish title of captain-general, assisted by a legislative council of five *ex officio* members, not more than ten nominated members, and fourteen members elected on a limited suffrage. There is also a privy council of three *ex officio* and not more than eight nominated members. There is an Imperial garrison of about 2000 officers and men, with headquarters at Newcastle, consisting of Royal Engineers, Royal Artillery, infantry and four companies of the West India Regiment. There is a naval station at Port Royal, and the entrance to its harbour is strongly fortified. In addition there is a militia of infantry and artillery, about 800 strong.

Previous to 1870 the Church of England was established in Jamaica, but in that year a disestablishment act was passed which provided for gradual disendowment. It is still the most numerous body, and is presided over by the bishop of Jamaica, who is also archbishop of the West Indies. The Baptists, Wesleyans, Presbyterians, Moravians and Roman Catholics are all represented; there is a Jewish synagogue at Kingston, and the Salvation Army has a branch on the island. The Church of England maintains many schools, a theological college, a deaconesses' home and an orphanage. The Baptists have a theological college; and the Roman Catholics support a training college for teachers, two industrial schools and two orphanages. Elementary education is in private hands, but fostered, since 1867, by government grants; it is free but not compulsory, although the governor has the right to compel the attendance of all children from 6 to 14 years of age in such towns and districts as he may designate. The teachers in these schools are for the most part trained in the government-aided training colleges of the various denominations. For higher education there are the University College and high school at Hope near Kingston, Potsdam School in St Elizabeth, the Mico School and Wolmer's Free School in Kingston, founded (for boys and girls) in 1729, the Montego Bay secondary school, and numerous other endowed and self-supporting establishments. The Cambridge Local Examinations have been held regularly since 1882.

History.—Jamaica was discovered by Columbus on the 3rd of May 1494. Though he called it Santiago, it has always been known by its Indian name Jaymaca, "the island of springs," modernized in form and pronunciation into Jamaica. Excepting that in 1505 Columbus once put in for shelter, the island remained unvisited until 1509, when Diego, the discoverer's son, sent Don Juan d'Esquivel to take possession, and thenceforward it passed under Spanish rule. Sant' Iago de la Vega, or Spanish Town, which remained the capital of the island until 1872, was founded in 1523. Sir Anthony Shirley, a British admiral, attacked the island in 1596, and plundered and burned the capital, but did not follow up his victory. Upon his retirement the Spaniards restored their capital and were unmolested until 1635, when the island was again raided by the British under Colonel Jackson. The period of the Spanish occupation is mainly memorable for the annihilation of the gentle and peaceful Arawâk Indian inhabitants; Don Pedro d'Esquivel was one of their cruellest oppressors. The whole island was divided among eight noble Spanish families, who discouraged immigration to such an extent that when Jamaica was taken by the British the white and slave population together did not exceed 3000. Under the vigorous foreign policy of Cromwell an attempt was made to crush the Spanish power in the West Indies, and an expedition under Admirals Penn and Venables succeeded in capturing and holding Jamaica in 1655. The Spanish were entirely expelled in 1658. Their slaves then took to the mountains, and down to the end of the 18th century the disaffection of these Maroons, as they were called, caused constant trouble. Jamaica continued to be governed by military authority until 1661, when Colonel D'Oyley was appointed captain-general and governor-in-chief with an executive council, and a constitution was introduced resembling that of England. He was succeeded in the next year by Lord Windsor, under whom a legislative council was established. Jamaica soon became the chief resort of the buccaneers, who not infrequently united the characters of merchant or planter with that of pirate or privateer. By the Treaty of Madrid, 1670, the British title to the island was recognized, and the buccaneers were suppressed. The Royal African Company was formed in 1672 with a monopoly of the slave trade, and from this time Jamaica was one of the greatest slave marts in the world. The sugar-industry was introduced about this period, the first pot of sugar being sent to London in 1673. An attempt was made in 1678 to saddle the island with a yearly tribute to the Crown and to restrict the free legislature. The privileges of the legislative assembly, however, were restored in 1682; but not till 46 years later was the question of revenue settled by a compromise by which Jamaica undertook to settle £8000 (an amount afterwards commuted to £6000) per annum on the Crown, provided that English statute laws were made binding in Jamaica.

During these years of political struggle the colony was thrice afflicted by nature. A great earthquake occurred in 1692, when the chief part of the town of Port Royal, built on a shelving bank of sand, slipped into the sea. Two dreadful hurricanes devastated the island in 1712 and 1722, the second of which did so much damage that the seat of commerce had to be transferred from Port Royal to Kingston.

The only prominent event in the history of the island during the later years of the 18th century, was the threatened invasion by the French and Spanish in 1782, but Jamaica was saved by the victory of Rodney and Hood off Dominica. The last attempt at invasion was made in 1806, when the French were defeated by Admiral Duckworth. When the slave trade was abolished the island was at the zenith of its prosperity; sugar, coffee, cocoa, pimento, ginger and indigo were being produced in large quantities, and it was the dépôt of a very lucrative trade with the Spanish main. The anti-slavery agitation in Great Britain found its echo in the island, and in 1832 the negroes revolted, believing that emancipation had been granted. They killed a number of whites and destroyed a large amount of valuable property. Two years later the Emancipation Act was passed, and, subject to a short term of apprenticeship, the slaves were free. Emancipation left the planters in a pitiable condition financially. The British government awarded them conpensation at the rate of £19 per slave, the market value of slaves at the time being £35, but most of this compensation went into the hands of the planters' creditors. They were left with overworked estates, a poor market and a scarcity of labour. Nor was this the end of their misfortunes. During the slavery times the British government had protected the planter by imposing a heavy differential duty on foreign sugar; but on the introduction of free trade the price of sugar fell by one-half and reduced the profits of the already impoverished planter. Many estates, already heavily mortgaged, were abandoned, and the trade of the island was at a standstill. Differences between the executive, the legislature, and the home government, as to the means of retrenching the public expenditure, created much bitterness. Although some slight improvement marked the administration of Sir Charles Metcalfe and the earl of Elgin, when coolie immigration was introduced to supply the scarcity and irregularity of labour and the railway was opened, the improvement was not permanent. In 1865 Edward John Eyre became governor. Financial affairs were at their lowest ebb and the colonial treasury showed a deficit of £80,000. To meet this difficulty new taxes were imposed and discontent was rife among the negroes. Dr Underhill, the secretary of a Baptist organization known as the British Union, wrote to the colonial secretary in London, pointing out the state of affairs. This letter became public in Jamaica, and in the opinion of the governor added in no small measure to the popular excitement. On the 11th of October 1865 the negroes rose at Morant Bay and murdered the custos and most of the white inhabitants. The slight encounter which followed filled the island with terror, and there is no doubt that many excesses were committed on both sides. The assembly passed an act by which martial law was proclaimed, and the legislature passed an act abrogating the constitution.

The action of Governor Eyre, though generally approved throughout the West Indies, caused much controversy in England, and he was recalled. A prosecution was instituted against him, resulting in an elaborate exposition of martial law by Chief Justice Cockburn, but the jury threw out the bill and Eyre was discharged. He was succeeded in the government of Jamaica by Sir Henry Storks, and under the crown colony system of government the state of the island made slow but steady progress. In 1868 the first fruit shipment took place from Port Antonio, the immigration of coolies was revived, and cinchona planting was introduced. The method of government was changed in 1884, when a new constitution, slightly modified in 1895, was granted to the island.

In the afternoon of the 14th of January 1907 a terrible earthquake visited Kingston. Almost every building in the capital and in Port Royal, and many in St Andrews, were destroyed or seriously injured. The loss of life was variously estimated, but probably exceeded one thousand. Among those killed was

Sir James Fergusson, 6th baronet (b. 1832). The principal shock was followed by many more of slighter intensity during the ensuing fortnight and later. On the 17th of January assistance was brought by three American war-ships under Rear-Admiral Davis, who however withdrew them on the 19th, owing to a misunderstanding with the governor of the island, Sir Alexander Swettenham, on the subject of the landing of marines from the vessels with a view to preserving order. The incident caused considerable sensation, and led to Sir A. Swettenham's resignation in the following March, Sir Sydney Olivier, K.C.M.G., being appointed governor. Order was speedily restored; but the destructive effect of the earthquake was a severe check to the prosperity of the island.

See Bryan Edwards, *History of the West Indies* (London, 1809, and appendix, 1819); P. H. Gosse, *Journal of a Naturalist in Jamaica* (London, 1851) and *Birds of Jamaica* (1847); *Jamaica Handbook* (London, annual); Bacon and Aaron, *New Jamaica* (1890); W. P. Livingstone, *Black Jamaica* (London, 1900), F. Cundall, *Bibliotheca Jamaicensis* (Kingston, 1895), and *Studies in Jamaica History* (1900); W. J. Gardner, *History of Jamaica* (New York, 1909). For geology, see R. T. Hill, "The Geology and Physical Geography of Jamaica," *Bull. Mus. Com. Zool. Harvard*, xxxiv. (1899).

JAMAICA, formerly a village of Queens county, Long Island, New York, U.S.A., but after the 1st of January 1898 a part of the borough of Queens, New York City. Pop. (1890) 5361. It is served by the Long Island railroad, the lines of which from Brooklyn and Manhattan meet here and then separate to serve the different regions of the island.[1] King's Park (about 10 acres) comprises the estate of John Alsop King (1788–1867), governor of New York in 1857–1859, from whose heirs in 1897 the land was purchased by the village trustees. In South Jamaica there is a race track, at which meetings are held in the spring and autumn. The headquarters of the Queens Borough Department of Public Works and Police are in the Jamaica town-hall, and Jamaica is the seat of a city training school for teachers (until 1905 one of the New York State normal schools). For two guns, a coat, and a quantity of powder and lead, several New Englanders obtained from the Indians a deed for a tract of land here in September 1655. In March 1657 they received permission from Governor Stuyvesant to found a town, which was chartered in 1660 and was named Rustdorp by Stuyvesant, but the English called it Jamaica; it was rechartered in 1666, 1686 and 1788. The village was incorporated in 1814 and reincorporated in 1855. In 1665 it was made the seat of justice of the north riding; in 1683–1788 it was the shire town of Queens county. With Hempstead, Gravesend, Newtown and Flushing, also towns of New England origin and type, Jamaica was early disaffected towards the provincial government of New York. In 1669 these towns complained that they had no representation in a popular assembly, and in 1670 they protested against taxation without representation. The founders of Jamaica were mostly Presbyterians, and they organized one of the first Presbyterian churches in America. At the beginning of the War of Independence Jamaica was under the control of Loyalists; after the defeat of the Americans in the battle of Long Island (27th August 1776) it was occupied by the British; and until the end of the war it was the headquarters of General Oliver Delancey, who had command of all Long Island.

JAMB (from Fr. *jambe*, leg), in architecture, the side-post or lining of a doorway or other aperture. The jambs of a window outside the frame are called "reveals." Small shafts to doors and windows with caps and bases are known as "jamb-shafts"; when in the inside arris of the jamb of a window they are sometimes called "scoinsons."

JAMES (a variant of the name Jacob, Heb. יַעֲקֹב, one who holds by the heel, outwitter, through O. Fr. *James*, another form of *Jacques*, *Jaques*, from Low Lat. *Jacobus*; cf. Ital. *Jacopo* [Jacob], *Giacomo* [James], Prov. *Jacme*, Cat. *Jaume*, Cast. *Jaime*), a masculine proper name popular in Christian countries as having been that of two of Christ's apostles. It has been borne by many sovereigns and other princes, the most important of whom are noticed below, after the heading devoted to the characters in the New Testament, in the following order: (1) kings of England and Scotland, (2) other kings in the alphabetical order of their countries, (3) the "Old Pretender." The article on the Epistle of James in the New Testament follows after the remaining biographical articles in which James is a surname.

JAMES (Gr. Ἰάκωβος, the Heb. *Ya'akob* or Jacob), the name of several persons mentioned in the New Testament.

1. JAMES, the son of Zebedee. He was among the first who were called to be Christ's immediate followers (Mark i. 19 seq.; Matt. iv. 21 seq., and perhaps Luke v. 10), and afterwards obtained an honoured place in the apostolic band, his name twice occupying the second place after Peter's in the lists (Mark iii. 17; Acts i. 13), while on at least three notable occasions he was, along with Peter and his brother John, specially chosen by Jesus to be with him (Mark v. 37; Matt. xvii. i, xxvi. 37). This same prominence may have contributed partly to the title "Boanerges" or "sons of thunder" which, according to Mark iii. 17, Jesus himself gave to the two brothers. But its most natural interpretation is to be found in the impetuous disposition which would have called down fire from heaven on the offending Samaritan villagers (Luke ix. 54), and afterwards found expression, though in a different way, in the ambitious request to occupy the places of honour in Christ's kingdom (Mark x. 35 seq.). James is included among those who after the ascension waited at Jerusalem (Acts i. 13) for the descent of the Holy Ghost on the day of Pentecost. And though on this occasion only his name is mentioned, he must have been a zealous and prominent member of the Christian community, to judge from the fact that when a victim had to be chosen from among the apostles, who should be sacrificed to the animosity of the Jews, it was on James that the blow fell first. The brief notice is given in Acts xii. 1, 2. Eusebius (*Hist. Eccl.* ii. 9) has preserved for us from Clement of Alexandria the additional information that the accuser of the apostle "beholding his confession and moved thereby, confessed that he too was a Christian. So they were both led away to execution together; and on the road the accuser asked James for forgiveness. Gazing on him for a little while, he said, 'Peace be with thee,' and kissed him. And then both were beheaded together."

The later, and wholly untrustworthy, legends which tell of the apostle's preaching in Spain, and of the translation of his body to Santiago de Compostela, are to be found in the *Acta Sanctorum* (July 25), vi. 1–124; see also Mrs Jameson's *Sacred and Legendary Art*, i. 230–241.

2. JAMES, the son of Alphaeus. He also was one of the apostles, and is mentioned in all the four lists (Matt. x. 3; Mark iii. 18; Luke vi. 15; Acts i. 13) by this name. We know nothing further regarding him, unless we believe him to be the same as James "the little."

3. JAMES, the little. He is described as the son of a Mary (Matt. xxvii. 56; Mark xv. 40), who was in all probability the wife of Clopas (John xix. 25). And on the ground that Clopas is another form of the name Alphaeus, this James has been thought by some to be the same as 2. But the evidence of the Syriac versions, which render Alphaeus by *Chalphai*, while Clopas is simply transliterated *Kleopha*, makes it extremely improbable that the two names are to be identified. And as we have no better ground for finding in Clopas the Cleopas of Luke xxiv. 18, we must be content to admit that James the little is again an almost wholly unknown personality, and has no connexion with any of the other Jameses mentioned in the New Testament.

4. JAMES, the father of Judas. There can be no doubt that in the mention of "Judas of James" in Luke vi. 16 the ellipsis should be supplied by "the son" and not as in the A.V. by "the brother" (cf. Luke iii. 1, vi. 14; Acts xii. 2, where the word

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[1] In June 1908 the subway lines of the interborough system of New York City were extended to the Flatbush (Brooklyn) station of the Long Island railroad, thus bringing Jamaica into direct connexion with Manhattan borough by way of the East river tunnel, completed in the same year.

ἀδελφός is inserted). This Judas, known as Thaddaeus by Matthew and Mark, afterwards became one of the apostles, and is expressly distinguished by St John from the traitor as "not Iscariot" (John xiv. 22).

5. JAMES, the Lord's brother. In Matt. xiii. 55 and Mark vi. 3 we read of a certain James as, along with Joses and Judas and Simon, a "brother" of the Lord. The exact nature of the relationship there implied has been the subject of much discussion. Jerome's view (*de vir. ill.* 2), that the "brothers" were in reality cousins, "sons of Mary the sister of the Lord's mother," rests on too many unproved assumptions to be entitled to much weight, and may be said to have been finally disposed of by Bishop Lightfoot in his essay on "The Brothers of the Lord" (*Galatians*, pp. 252 sqq., *Dissertations on the Apostolic Age*, pp. 1 sqq.). Even however if we understand the word "brethren" in its natural sense, it may be applied either to the sons of Joseph by a former wife, in which case they would be the step-brothers of Jesus, or to sons born to Joseph and Mary after the birth of Jesus. The former of these views, generally known as the *Epiphanian* view from its most zealous advocate in the 4th century, can claim for its support the preponderating voice of tradition (see the catena of references given by Lightfoot, *loc. cit.*, who himself inclines to this view). On the other hand the *Helvidian* theory as propounded by Helvidius, and apparently accepted by Tertullian (cf. *adv. Marc.* iv. 29), which makes James a brother of the Lord, as truly as Mary was his mother, undoubtedly seems more in keeping with the direct statements of the Gospels, and also with the after history of the brothers in the Church (see W. Patrick, *James the Brother of the Lord*, 1906, p. 5). In any case, whatever the exact nature of James's antecedents, there can be no question as to the important place which he occupied in the early Church. Converted to a full belief in the living Lord, perhaps through the special revelation that was granted to him (1 Cor. xv. 7), he became the recognized head of the Church at Jerusalem (Acts xii. 17, xv. 13, xxi. 18), and is called by St Paul (Gal. ii. 9), along with Peter and John, a "pillar" of the Christian community. He was traditionally the author of the epistle in the New Testament which bears his name (see JAMES, EPISTLE OF). From the New Testament we learn no more of the history of James the Lord's brother, but Eusebius (*Hist. Eccl.* ii. 23) has preserved for us from Hegesippus the earliest ecclesiastical traditions concerning him. By that authority he is described as having been a Nazarite, and on account of his eminent righteousness called "Just" and "Oblias." So great was his influence with the people that he was appealed to by the scribes and Pharisees for a true and (as they hoped) unfavourable judgment about the Messiahship of Christ. Placed, to give the greater publicity to his words, on a pinnacle of the temple, he, when solemnly appealed to, made confession of his faith, and was at once thrown down and murdered. This happened immediately before the siege. Josephus (*Antiq.* xx. 9, 1) tells that it was by order of Ananus the high priest, in the interval between the death of Festus and the arrival of his successor Albinus, that James was put to death; and his narrative gives the idea of some sort of judicial examination, for he says that along with some others James was brought before an assembly of judges, by whom they were condemned and delivered to be stoned. Josephus is also cited by Eusebius (*Hist. Eccl.* ii, 23) to the effect that the miseries of the siege were due to divine vengeance for the murder of James. Later writers describe James as an ἐπίσκοπος (Clem. Al. *apud* Eus. *Hist. Ecc.* ii. 1) and even as an ἐπίσκοπος ἐπισκόπων (Clem. *Hom.*, *ad init.*). According to Eusebius (*Hist. Eccl.* vii. 19) his episcopal chair was still shown at Jerusalem at the time when Eusebius wrote.

BIBLIOGRAPHY.—In addition to the relevant literature cited above, see the articles under the heading "James" in Hastings's *Dictionary of the Bible* (Mayor) and *Dictionary of Christ and the Gospels* (Fulford), and in the *Encycl. Biblica* (O. Cone); also the introductions to the Commentaries on the Epistle of James by Mayor and Knowling. Zahn has an elaborate essay on *Brüder und Vettern Jesu* ("The Brothers and Cousins of Jesus") in the *Forschungen zur Geschichte des neutestamentlichen Kanons*, vi. 2 (Leipzig, 1900).

(G. MI.)

JAMES I. (1566–1625), king of Great Britain and Ireland, formerly king of Scotland as James VI., was the only child of Mary Queen of Scots, and her second husband, Henry Stewart Lord Darnley. He was born in the castle of Edinburgh on the 19th of June 1566, and was proclaimed king of Scotland on the 24th of July 1567, upon the forced abdication of his mother. Until 1578 he was treated as being incapable of taking any real part in public affairs, and was kept in the castle of Stirling for safety's sake amid the confused fighting of the early years of his minority.

The young king was a very weakly boy. It is said that he could not stand without support until he was seven, and although he lived until he was nearly sixty, he was never a strong man. In after life he was a constant and even a reckless rider, but the weakness in his legs was never quite cured. During a great part of his life he found it necessary to be tied to the saddle. When on one occasion in 1621 his horse threw him into the New River near his palace of Theobalds in the neighbourhood of London, he had a very narrow escape of being drowned; yet he continued to ride as before. At all times he preferred to lean on the shoulder of an attendant when walking. This feebleness of body, which had no doubt a large share in causing certain corresponding deficiencies of character, was attributed to the agitations and the violent efforts forced on his mother by the murder of her secretary Rizzio when she was in the sixth month of her pregnancy. The fact that James was a bold rider, in spite of this serious disqualification for athletic exercise, should be borne in mind when he is accused of having been a coward.

The circumstances surrounding him in boyhood were not favourable to the development of his character. His immediate guardian or foster-father, the earl of Mar, was indeed an honourable man, and the countess, who had charge of the nursing of the king, discharged her duty so as to win his lasting confidence. James afterwards entrusted her with the care of his eldest son, Henry. When the earl died in 1572 his place was well filled by his brother, Sir Alexander Erskine. The king's education was placed under the care of George Buchanan, assisted by Peter Young, and two other tutors. Buchanan, who did not spare the rod, and the other teachers, who had more reverence for the royal person, gave the boy a sound training in languages. The English envoy, Sir Henry Killigrew, who saw him in 1574, testified to his proficiency in translating from and into Latin and French. As it was very desirable that he should be trained a Protestant king, he was well instructed in theology. The exceptionally scholastic quality of his education helped to give him a taste for learning, but also tended to make him a pedant.

James was only twelve when the earl of Morton was driven from the regency, and for some time after he can have been no more than a puppet in the hands of intriguers and party leaders. When, for instance, in 1582 he was seized by the faction of nobles who carried out the so-called raid of Ruthven, which was in fact a kidnapping enterprise carried out in the interest of the Protestant party, he cried like a child. One of the conspirators, the master of Glamis, Sir Thomas Lyon, told him that it was better "bairns should greet [children should cry] than bearded men." It was not indeed till 1583, when he broke away from his captors, that James began to govern in reality.

For the history of his reign reference may be made to the articles on the histories of England and Scotland. James's work as a ruler can be divided, without violating any sound rule of criticism, into black and white—into the part which was a failure and a preparation for future disaster, and the part which was solid achievement, honourable to himself and profitable to his people. His native kingdom of Scotland had the benefit of the second. Between 1583 and 1603 he reduced the anarchical baronage of Scotland to obedience, and replaced the subdivision of sovereignty and consequent confusion, which had been the very essence of feudalism, by a strong centralized royal authority. In fact he did in Scotland the work which had been done by the Tudors in England, by Louis XI. in France, and by Ferdinand and Isabella in Spain. It was the work of all the strong rulers of the Renaissance. But James not only brought his disobedient and intriguing barons to order—that was a comparatively easy achievement and might well have been performed by more than one of his predecessors, had their lives been prolonged—he also quelled the attempts of the Protestants to found what Hallam has well defined as a "Presbyterian Hildebrandism." He enforced the superiority of the state over the church. Both before his accession to the throne of England (1603) and afterwards he took an intelligent interest in the prosperity of his Scottish kingdom, and did much for the pacification of the Hebrides, for the enforcement of order on the Borders, and for the development of industry. That he did so much although the crown was poor (largely it must be confessed because he made profuse gifts of the secularized church lands), and although the armed force at his disposal was so small that to the very end he was exposed to the attacks of would-be kidnappers (as in the case of the Gowrie conspiracy of 1600), is proof positive that he was neither the mere poltroon nor the mere learned fool he has often been called.

James's methods of achieving ends in themselves honourable and profitable were indeed of a kind which has made posterity unjust to his real merits. The circumstances in which he passed his youth developed in him a natural tendency to craft. He boasted indeed of his "king-craft" and probably believed that he owed it to his studies. But it was in reality the resource of the weak, the art of playing off one possible enemy against another by trickery, and so deceiving all. The marquis de Fontenay, the French ambassador, who saw him in the early part of his reign, speaks of him as cowed by the violence about him. It is certain that James was most unscrupulous in making promises which he never meant to keep, and the terror in which he passed his youth sufficiently explains his preference for guile. He would make promises to everybody, as when he wrote to the pope in 1584 more than hinting that he would be a good Roman Catholic if helped in his need. His very natural desire to escape from the poverty and insecurity of Scotland to the opulent English throne not only kept him busy in intrigues to placate the Roman Catholics or anybody else who could help or hinder him, but led him to behave basely in regard to the execution of his mother in 1587. He blustered to give himself an air of courage, but took good care to do nothing to offend Elizabeth. When the time came for fulfilling his promises and half-promises, he was not able, even if he had been willing, to keep his word to everybody. The methods which had helped him to success in Scotland did him harm in England, where his reign prepared the way for the great civil war. In his southern kingdom his failure was in fact complete. Although England accepted him as the alternative to civil war, and although he was received and surrounded with fulsome flattery, he did not win the respect of his English subjects. His undignified personal appearance was against him, and so were his garrulity, his Scottish accent, his slovenliness and his toleration of disorders in his court, but, above all, his favour for handsome male favourites, whom he loaded with gifts and caressed with demonstrations of affection which laid him open to vile suspicions. In ecclesiastical matters he offended many, who contrasted his severity and rudeness to the Puritan divines at the Hampton Court conference (1604) with his politeness to the Roman Catholics, whom he, however, worried by fits and starts. In a country where the authority of the state had been firmly established and the problem was how to keep it from degenerating into the mere instrument of a king's passions, his insistence on the doctrine of divine right aroused distrust and hostility. In itself, and in its origin, the doctrine was nothing more than a necessary assertion of the independence of the state in face of the "Hildebrandism" of Rome and Geneva alike. But when Englishmen were told that the king alone had indefeasible rights, and that all the privileges of subjects were revocable gifts, they were roused to hostility. His weaknesses cast suspicion on his best-meant schemes. His favour for his countrymen helped to defeat his wise wish to bring about a full union between England and Scotland. His profusion, which had been bad in the poverty of Scotland and was boundless amid the wealth of England, kept him necessitous, and drove him to shifts. Posterity can give him credit for his desire to forward religious peace in Europe, but his Protestant subjects were simply frightened when he sought a matrimonial alliance with Spain. Sagacious men among his contemporaries could not see the consistency of a king who married his daughter Elizabeth to the elector palatine, a leader of the German Protestants, and also sought to marry his son to an infanta of Spain. The king's subservience to Spain was indeed almost besotted. He could not see her real weakness, and he allowed himself to be befooled by the ministers of Philip III. and Philip IV. The end of his scheming was that he was dragged into a needless war with Spain by his son Charles and his favourite George Villiers, duke of Buckingham, just before his death on the 5th of March 1625 at his favourite residence, Theobalds.

James married in 1589 Anne, second daughter of Frederick II., king of Denmark. His voyage to meet his bride, whose ship had been driven into a Norwegian port by bad weather, is the only episode of a romantic character in the life of this very prosaic member of a poetic family. By this wife James had three children who survived infancy: Henry Frederick, prince of Wales, who died in 1612; Charles, the future king; and Elizabeth, wife of the elector palatine, Frederick V.

Not the least of James's many ambitions was the desire to excel as an author. He left a body of writings which, though of mediocre quality as literature, entitle him to a unique place among English kings since Alfred for width of intellectual interest and literary faculty. His efforts were inspired by his preceptor George Buchanan, whose memory he cherished in later years. His first work was in verse, *Essayes of a Prentise in the Divine Art of Poesie* (Edin. Vautrollier, 1584), containing fifteen sonnets, "Ane Metaphoricall invention of a tragedie called Phoenix," a short poem "Of Time," translations from Du Bartas, Lucan and the Book of Psalms ("out of Tremellius"), and a prose tract entitled "Ane short treatise, containing some Reulis and Cautelis to be observit and eschewit in Scottis Poesie." The volume is introduced by commendatory sonnets, including one by Alexander Montgomerie. The chief interest of the book lies in the "Treatise" and the prefatory sonnets "To the Reader" and "Sonnet decifring the perfyte poete." There is little originality in this youthful production. It has been surmised that it was compiled from the exercises written when the author was Buchanan's pupil at Stirling, and that it was directly suggested by his preceptor's *De Prosodia* and his annotations on Vives. On the other hand, it shows intimate acquaintance with the critical reflections of Ronsard and Du Bellay, and of Gascoigne in his *Notes of Instruction* (1575). In 1591 James published *Poeticall Exercises at Vacant Houres*, including a translation of the *Furies* of Du Bartas, his own *Lepanto*, and Du Bartas's version of it, *La Lepanthe*. His *Daemonologie*, a prose treatise denouncing witchcraft and exhorting the civil power to the strongest measures of suppression, appeared in 1599. In the same year he printed the first edition (seven copies) of his *Basilikon Doron*, strongly Protestant in tone. A French edition, specially translated for presentation to the pope, has a disingenuous preface explaining that certain phrases (*e.g.* "papistical doctrine") are omitted, because of the difficulty of rendering them in a foreign tongue. The original edition was, however, translated by order of the suspicious pope, and was immediately placed on the Index. Shortly after going to England James produced his famous *Counterblaste to Tobacco* (London, 1604), in which he forsakes his Scots tongue for Southern English. The volume was published anonymously. James's prose works (including his speeches) were collected and edited (folio, 1616) by James Montagu, bishop of Winchester, and were translated into Latin by the same hand in a companion folio, in 1619 (also Frankfort, 1689). A tract, entitled "The True Law of Free Monarchies," appeared in 1603; "An Apology for the Oath of Allegiance" in 1607; and a "*Déclaration du Roy Jacques I. . . . pour le droit des Rois*" in 1615. In 1588 and 1589 James issued two small volumes of *Meditations* on some verses of (*a*) Revelations and (*b*) 1 Chronicles. Other two "meditations" were printed posthumously.

See T. F. Henderson, *James I. and VI.* (London, 1904); P. Hume Brown, *History of Scotland*, vol. ii. (Edinburgh and Cambridge, 1902); and Andrew Lang, *History of Scotland*, vol. ii. (Edinburgh, 1902) and *James VI. and the Gowrie Mystery* (London, 1902); *The Register of the Privy Council of Scotland* (Edinburgh, 1877, &c.), vols. ii. to xiii.; S. R. Gardiner, *History of England 1603–1642* (London, 1883–1884). A comprehensive bibliography will be found in the *Cambridge Modern Hist.* iii. 847 (Cambridge, 1904).

For James's literary work, see Edward Arber's reprint of the *Essayes* and *Counterblaste* ("English Reprints," 1869, &c.); R. S. Rait's *Lusus Regius* (1900); G. Gregory Smith's *Elizabethan Critical Essays* (1904), vol. i., where the *Treatise* is edited for the first time; A. O. Meyer's "Clemens VIII. und Jacob I. von England" in *Quellen und Forschungen* (Preuss. Hist. Inst.), VII. ii., for an account of the issues of the *Basilikon Doron*; P. Hume Brown's *George Buchanan* (1890), pp. 250–261, for a sketch of James's association with Buchanan.

JAMES II. (1633–1701), king of Great Britain and Ireland, second surviving son of Charles I. and Henrietta Maria, was born at St James's on the 15th of October 1633, and created duke of York in January 1643. During the Civil War James was taken prisoner by Fairfax (1646), but contrived to escape to Holland in 1648. Subsequently he served in the French army under Turenne, and in the Spanish under Condé, and was applauded by both commanders for his brilliant personal courage. Returning to England with Charles II. in 1660 he was appointed lord high admiral and warden of the Cinque Ports. Pepys, who was secretary to the navy, has recorded the patient industry and unflinching probity of his naval administration. His victory over the Dutch in 1665, and his drawn battle with De Ruyter in 1672, show that he was a good naval commander as well as an excellent administrator. These achievements won him a reputation for high courage, which, until the close of 1688, was amply deserved. His private record was not as good as his public. In December 1660 he admitted to having contracted, under discreditable circumstances, a secret marriage with Anne Hyde (1637–1671), daughter of Lord Clarendon, in the previous September. Both before and after the marriage he seems to have been a libertine as unblushing though not so fastidious as Charles himself. In 1672 he made a public avowal of his conversion to Roman Catholicism. Charles II. had opposed this project, but in 1673 allowed him to marry the Catholic Mary of Modena as his second wife. Both houses of parliament, who viewed this union with abhorrence, now passed the Test Act, forbidding Catholics to hold office. In consequence of this James was forced to resign his posts. It was in vain that he married his daughter Mary to the Protestant prince of Orange in 1677. Anti-Catholic feeling ran so high that, after the discovery of the Popish Plot, he found it wiser to retire to Brussels (1679), while Shaftesbury and the Whigs planned to exclude him from the succession. He was lord high commissioner of Scotland (1680–1682), where he occupied himself in a severe persecution of the Covenanters. In 1684 Charles, having triumphed over the Exclusionists, restored James to the office of high admiral by use of his dispensing power.

James ascended the throne on the 16th of February 1685. The nation showed its loyalty by its firm adherence to him during the rebellions of Argyll in Scotland and Monmouth in England (1685). The savage reprisals on their suppression, in especial the "Bloody Assizes" of Jeffreys, produced a revulsion of public feeling. James had promised to defend the existing Church and government, but the people now became suspicious. James was not a mere tyrant and bigot, as the popular imagination speedily assumed him to be. He was rather a mediocre but not altogether obtuse man, who mistook tributary streams for the main currents of national thought. Thus he greatly underrated the strength of the Establishment, and preposterously exaggerated that of Dissent and Catholicism. He perceived that opinion was seriously divided in the Established Church, and thought that a vigorous policy would soon prove effective. Hence he publicly celebrated Mass, prohibited preaching against Catholicism, and showed exceptional favour to renegades from the Establishment. By undue pressure he secured a decision of the judges, in the test case of *Godden* v. *Hale* (1687), by which he was allowed to dispense Catholics from the Test Act. Catholics were now admitted to the chief offices in the army, and to some important posts in the state, in virtue of the dispensing power of James. The judges had been intimidated or corrupted, and the royal promise to protect the Establishment violated. The army had been increased to 20,000 men and encamped at Hounslow Heath to overawe the capital. Public alarm was speedily manifested and suspicion to a high degree awakened. In 1687 James made a bid for the support of the Dissenters by advocating a system of joint toleration for Catholics and Dissenters. In April 1687 he published a Declaration of Indulgence—exempting Catholics and Dissenters from penal statutes. He followed up this measure by dissolving parliament and attacking the universities. By an unscrupulous use of the dispensing power he introduced Dissenters and Catholics into all departments of state and into the municipal corporations, which were remodelled in their interests. Then in April 1688 he took the suicidal step of issuing a proclamation to force the clergy and bishops to read the Declaration in their pulpits, and thus personally advocate a measure they detested. Seven bishops refused, were indicted by James for libel, but acquitted amid the indescribable enthusiasm of the populace. Protestant nobles of England, enraged at the tolerant policy of James, had been in negotiation with William of Orange since 1687. The trial of the seven bishops, and the birth of a son to James, now induced them to send William a definite invitation (June 30, 1688). James remained in a fool's paradise till the last, and only awakened to his danger when William landed at Torbay (November 5, 1688) and swept all before him. James pretended to treat, and in the midst of the negotiations fled to France. He was intercepted at Faversham and brought back, but the politic prince of Orange allowed him to escape a second time (December 23, 1688).

At the end of 1688 James seemed to have lost his old courage. After his defeat at the Boyne (July 1, 1690) he speedily departed from Ireland, where he had so conducted himself that his English followers had been ashamed of his incapacity, while French officers had derided him. His proclamations and policy towards England during these years show unmistakable traces of the same incompetence. On the 17th of May 1692 he saw the French fleet destroyed before his very eyes off Cape La Hogue. He was aware of, though not an open advocate of the "Assassination Plot," which was directed against William. By its revelation and failure (February 10, 1696) the third and last serious attempt of James for his restoration failed. He refused in the same year to accept the French influence in favour of his candidature to the Polish throne, on the ground that it would exclude him from the English. Henceforward he neglected politics, and Louis of France ceased to consider him as a political factor. A mysterious conversion had been effected in him by an austere Cistercian abbot. The world saw with astonishment this vicious, rough, coarse-fibred man of the world transformed into an austere penitent, who worked miracles of healing. Surrounded by this odour of sanctity, which greatly edified the faithful, James lived at St Germain until his death on the 17th of September 1701.

The political ineptitude of James is clear; he often showed firmness when conciliation was needful, and weakness when resolution alone could have saved the day. Moreover, though he mismanaged almost every political problem with which he personally dealt, he was singularly tactless and impatient of advice. But in general political morality he was not below his age, and in his advocacy of toleration decidedly above it. He was more honest and sincere than Charles II., more genuinely patriotic in his foreign policy, and more consistent in his religious attitude. That his brother retained the throne while James lost it is an ironical demonstration that a more pitiless fate awaits the ruler whose faults are of the intellect, than one whose faults are of the heart.

By Anne Hyde James had eight children, of whom two only, Mary and Anne, both queens of England, survived their father. By Mary of Modena he had seven children, among them being James Francis Edward (the Old Pretender) and Louisa Maria Theresa, who died at St Germain in 1712. By one mistress, Arabella Churchill (1648–1730), he had two sons, James, duke of Berwick, and Henry (1673–1702), titular duke of Albemarle and grand prior of France, and a daughter, Henrietta (1667–1730), who married Sir Henry Waldegrave, afterwards Baron Waldegrave; and by another, Catherine Sedley, countess of Dorchester (1657–1717), a daughter, Catherine (d. 1743), who married James Annesley, 5th earl of Anglesey, and afterwards John Sheffield, duke of Buckingham and Normanby.

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JAMES I. (1394–1437), king of Scotland and poet, the son of King Robert III., was born at Dunfermline in July 1394. After the death of his mother, Annabella Drummond of Stobhall, in 1402, he was placed under the care of Henry Wardlaw (d. 1440), who became bishop of St Andrews in 1403, but soon his father resolved to send him to France. Robert doubtless decided upon this course owing to the fact that in 1402 his elder son, David, duke of Rothesay, had met his death in a mysterious fashion, being probably murdered by his uncle, Robert, duke of Albany, who, as the king was an invalid, was virtually the ruler of Scotland. On the way to France, however, James fell into the hands of some English sailors and was sent to Henry IV., who refused to admit him to ransom. The chronicler Thomas Walsingham, says that James's imprisonment began in 1406, while the future king himself places it in 1404; February 1406 is probably the correct date. On the death of Robert III. in April 1406 James became nominally king of Scotland, but he remained a captive in England, the government being conducted by his uncle, Robert of Albany, who showed no anxiety to procure his nephew's release. Dying in 1420, Albany was succeeded as regent by his son, Murdoch. At first James was confined in the Tower of London, but in June 1407 he was removed to the castle at Nottingham, whence about a month later he was taken to Evesham. His education was continued by capable tutors, and he not only attained excellence in all manly sports, but became perhaps more cultured than any other prince of his age. In person he was short and stout, but well-proportioned and very strong. His agility was not less remarkable than his strength; he excelled in all athletic feats which demanded suppleness of limb and quickness of eye. As regards his intellectual attainments he is reported to have been acquainted with philosophy, and it is evident from his subsequent career that he had studied jurisprudence; moreover, besides being proficient in vocal and instrumental music, he cultivated the art of poetry with much success. When Henry V. became king in March 1413, James was again imprisoned in the Tower of London, but soon afterwards he was taken to Windsor and was treated with great consideration by the English king. In 1420, with the intention of detaching the Scottish auxiliaries from the French standard, he was sent to take part in Henry's campaign in France; this move failed in its immediate object and he returned to England after Henry's death in 1422. About this time negotiations for the release of James were begun in earnest, and in September 1423 a treaty was signed at York, the Scottish nation undertaking to pay a ransom of 60,000 marks "for his maintenance in England." By the terms of the treaty James was to wed a noble English lady, and on the 12th of February 1424 he was married at Southwark to Jane, daughter of John Beaufort, earl of Somerset, a lady to whom he was faithful through life. Ten thousand marks of his ransom were remitted as Jane's dowry, and in April 1424 James and his bride entered Scotland.

With the reign of James I., whose coronation took place at Scone on the 21st of May 1424, constitutional sovereignty may be said to begin in Scotland. By the introduction of a system of statute law, modelled to some extent on that of England, and by the additional importance assigned to parliament, the leaven was prepared which was to work towards the destruction of the indefinite authority of the king and of the unbridled licence of the nobles. During the parliament held at Perth in March 1425 James arrested Murdoch, duke of Albany, and his son, Alexander; together with Albany's eldest son, Walter, and Duncan, earl of Lennox, who had been seized previously; they were sentenced to death, and the four were executed at Stirling. In a parliament held at Inverness in 1427 the king arrested many turbulent northern chiefs, and his whole policy was directed towards crushing the power of the nobles. In this he was very successful. Expeditions reduced the Highlands to order; earldom after earldom was forfeited; but this vigour aroused the desire for revenge, and at length cost James his life. Having been warned that he would never again cross the Forth, the king went to reside in Perth just before Christmas 1436. Among those whom he had angered was Sir Robert Graham (d. 1437), who had been banished by his orders. Instigated by the king's uncle, Walter Stewart, earl of Atholl (d. 1437), and aided by the royal chamberlain, Sir Robert Stewart, and by a band of Highlanders, Graham burst into the presence of James on the night of the 20th of February 1437 and stabbed the king to death. Graham and Atholl were afterwards tortured and executed. James had two sons: Alexander, who died young, and James II., who succeeded to the throne; and six daughters, among them being Margaret, the queen of Louis XI. of France. His widow, Jane, married Sir James Stewart, the "black knight of Lorne," and died on the 15th of July 1445.

During the latter part of James's reign difficulties arose between Scotland and England and also between Scotland and the papacy. Part of the king's ransom was still owing to England; other causes of discord between the two nations existed, and in 1436 these culminated in a short war. In ecclesiastical matters James showed himself merciless towards heretics, but his desire to reform the Scottish Church and to make it less dependent on Rome brought him into collision with Popes Martin V. and Eugenius IV.

James was the author of two poems, the *Kingis Quair* and *Good Counsel* (a short piece of three stanzas). The *Song of Absence*, *Peblis to the Play* and *Christis Kirk on the Greene* have been ascribed to him without evidence. *The Kingis Quair* (preserved in the Selden MS. B. 24 in the Bodleian) is an allegorical poem of the *cours d'amour* type, written in seven-lined Chaucerian stanzas and extending to 1379 lines. It was composed during James's captivity in England and celebrates his courtship of Lady Jane Beaufort. Though in many respects a Chaucerian *pastiche*, it not rarely equals its model in verbal and metrical felicity. Its language is an artificial blend of northern and southern (Chaucerian) forms, of the type shown in *Lancelot of the Laik* and the *Quair of Jelusy*.

Bibliography.—The contemporary authorities for the reign of James I. are Andrew of Wyntoun, *The Orygynale Cronykil of Scotland*, edited by D. Laing (Edinburgh, 1872–1879); and Walter Bower's continuation of John of Fordun's *Scotichronicon*, edited by T. Hearne (Oxford, 1722). See also J. Pinkerton, *History of Scotland* (1797); A. Lang, *History of Scotland*, vol. i. (1900); and G. Burnett, *Introduction* to the *Exchequer Rolls of Scotland* (Edinburgh, 1878–1901). *The Kingis Quair* was first printed in the *Poetical Remains of James the First*, edited by William Tytler (1783). Later editions are Morison's reprint (Perth, 1786); J. Sibbald's, in his *Chronicle of Scottish Poetry* (1802, vol. i.); Thomson's in 1815 and 1824; G. Chalmers's, in his *Poetic Remains of some of the Scottish Kings* (1824); Rogers's *Poetical Remains of King James the First* (1873); Skeat's edition published by the Scottish Text Society (1884). An attempt has been made to dispute James's authorship of the poem, but the arguments elaborated by J. T. T. Brown (*The Authorship of the Kingis Quair*, Glasgow, 1896) have been convincingly answered by Jusserand in his *Jacques I^{er} d'Écosse fut-il poète ? Étude sur l'authenticité du cahier du roi* (Paris, 1897, reprinted from the *Revue historique*, vol. lxiv.). See also the full correspondence in the *Athenaeum* (July-Aug. 1896 and Dec. 1899); W. A. Neilson, *Origins and Sources of the Court of Love* (Boston, 1899) pp. 152 &c., 235 &c.; and Gregory Smith, *Transition Period* (1900), pp. 40, 41.

JAMES II. (1430–1460), king of Scotland, the only surviving son of James I. and his wife, Jane, daughter of John Beaufort, earl of Somerset, was born on the 16th of October 1430. Crowned king at Holyrood in March 1437, shortly after the murder of his father, he was at first under the guardianship of his mother, while Archibald, 5th earl of Douglas, was regent of the kingdom, and considerable power was possessed by Sir Alexander Livingstone and Sir William Crichton (d. 1454). When about 1439 Queen Jane was married to Sir James Stewart, the knight of Lorne, Livingstone obtained the custody of the young king, whose minority was marked by fierce hostility between the Douglases and the Crichtons, with Livingstone first on one side and then on the other. About 1443 the royal cause was espoused by William, 8th earl of Douglas, who attacked Crichton in the king's name, and civil war lasted until about 1446. In July 1449 James was married to Mary (d. 1463), daughter of Arnold, duke of Gelderland, and undertook the government himself; and almost immediately Livingstone was arrested, but Douglas retained the royal favour for a few months more. In 1452, however, this powerful earl was invited to Stirling by the king, and, charged with treachery, was stabbed by James and then killed by the attendants. Civil war broke out at once between James and the Douglases, whose lands were ravaged; but after the Scots parliament had exonerated the king, James, the new earl of Douglas, made his submission. Early in 1455 this struggle was renewed. Marching against the rebels James gained several victories, after which Douglas was attainted and his lands forfeited. Fortified by this success and assured of the support of the parliament and of the great nobles, James, acting as an absolute king, could view without alarm the war which had broken out with England. After two expeditions across the borders, a truce was made in July 1457, and the king employed the period of peace in strengthening his authority in the Highlands. During the Wars of the Roses he showed his sympathy with the Lancastrian party after the defeat of Henry VI. at Northampton by attacking the English possessions to the south of Scotland. It was while conducting the siege of Roxburgh Castle that James was killed, through the bursting of a cannon, on the 3rd of August 1460. He left three sons, his successor, James III., Alexander Stewart, duke of Albany, and John Stewart, earl of Mar (d. 1479); and two daughters. James, who is sometimes called "Fiery Face," was a vigorous and popular prince, and, although not a scholar like his father, showed interest in education. His reign is a period of some importance in the legislative history of Scotland, as measures were passed with regard to the tenure of land, the reformation of the coinage, and the protection of the poor, while the organization for the administration of justice was greatly improved.

JAMES III. (1451–1488), king of Scotland, eldest son of James II., was born on the 10th of July 1451. Becoming king in 1460 he was crowned at Kelso. After the death of his mother in 1463, and of her principal supporter, James Kennedy, bishop of St Andrews, two years later, the person of the young king, and with it the chief authority in the kingdom, were seized by Sir Alexander Boyd and his brother Lord Boyd, while the latter's son, Thomas, was created earl of Arran and married to the king's sister, Mary. In July 1469 James himself was married to Margaret (d. 1486), daughter of Christian I., king of Denmark and Norway, but before the wedding the Boyds had lost their power. Having undertaken the government in person, the king received the submission of the powerful earl of Ross, and strengthened his authority in other ways. But his preference for a sedentary and not for an active life and his increasing attachment to favourites of humble birth diminished his popularity, and he had some differences with his parliament. About 1479, probably with reason both suspicious and jealous, James arrested his brothers, Alexander, duke of Albany, and John, earl of Mar; Mar met his death in a mysterious fashion at Craigmillar, but Albany escaped to France and then visited England, where in 1482 Edward IV. recognized him as king of Scotland by the gift of the king of England. War broke out with England, but James, made a prisoner by his nobles, was unable to prevent Albany and his ally, Richard, duke of Gloucester (afterwards Richard III.), from taking Berwick and marching to Edinburgh. Peace with Albany followed, but soon afterwards the duke was again in communication with Edward, and was condemned by the parliament after the death of the English king in April 1483. Albany's death in France in 1485 did not end the king's troubles. His policy of living at peace with England and of arranging marriages between the members of the royal families of the two countries did not commend itself to the turbulent section of his nobles; his artistic tastes and lavish expenditure added to the discontent, and a rebellion broke out. Fleeing into the north of his kingdom James collected an army and came to terms with his foes; but the rebels, having seized the person of the king's eldest son, afterwards James IV., renewed the struggle. The rival armies met at the Sauchieburn near Bannockburn, and James soon fled. Reaching Beaton's Mill he revealed his identity, and, according to the popular story, was killed on the 11th of June 1488 by a soldier in the guise of a priest who had been called in to shrive him. He left three sons—his successor, James IV.; James Stewart, duke of Ross, afterwards archbishop of St Andrews, and John Stewart, earl of Mar. James was a cultured prince with a taste for music and architecture, but was a weak and incapable king. His character is thus described by a chronicler: "He was ane man that loved solitude, and desired nevir to hear of warre, bot delighted more in musick and policie and building nor he did in the government of the realme."

JAMES IV. (1473–1513), king of Scotland, eldest son of James III., was born on the 17th of March 1473. He was nominally the leader of the rebels who defeated the troops of James III. at the Sauchieburn in June 1488, and became king when his father was killed. As he adopted an entirely different policy with the nobles from that of his father, and, moreover, showed great affability towards the lower class of his subjects, among whom he delighted to wander incognito, few if any of the kings of Scotland have won such general popularity, or passed a reign so untroubled by intestine strife. Crowned at Scone a few days after his accession, James began at once to take an active part in the business of government. A slight insurrection was easily suppressed, and a plot formed by some nobles to hand him over to the English king, Henry VII., came to nothing. In spite of this proceeding Henry wished to live at peace with his northern neighbour, and soon contemplated marrying his daughter to James, but the Scottish king was not equally pacific. When, in 1495, Perkin Warbeck, pretending to be the duke of York, Edward IV.'s younger son, came to Scotland, James bestowed upon him both an income and a bride, and prepared to invade England in his interests. For various reasons the war was confined to a few border forays. After Warbeck left Scotland in 1497, the Spanish ambassador negotiated a peace, and in 1502 a marriage was definitely arranged between James and Henry's daughter Margaret (1489–1541). The wedding took place at Holyrood in August 1503, and it was this union which led to the accession of the Stewart dynasty to the English throne.

About the same time James crushed a rebellion in the western isles, into which he had previously led expeditions, and parliament took measures to strengthen the royal authority therein. At this date too, or a little earlier, the king of Scotland began to treat as an equal with the powerful princes of Europe, Maximilian I., Louis XII. and others; sending assistance to his uncle Hans, king of Denmark, and receiving special marks of favour from Pope Julius II., anxious to obtain his support. But his position was weakened when Henry VIII. followed Henry VII. on the English throne in 1509. Causes of quarrel already existed, and other causes, both public and private, soon arose between the two kings; sea-fights took place between their ships, while war was brought nearer by the treaty of alliance which James concluded with Louis XII. in 1512. Henry made a vain effort to prevent, or to postpone, the outbreak of hostilities; but urged on by his French ally and his queen, James declared for war, in spite of the counsels of some of his advisers, and (it is said) of the warning of an apparition. Gathering a large and well-armed force, he took Norham and other castles in August 1513, spending some time at Ford Castle, where, according to report, he was engaged in an amorous intrigue with the wife of its owner. Then he moved out to fight the advancing English army under Thomas Howard, earl of Surrey. The battle, which took place at Flodden, or more correctly, at the foot of Brankston Hill, on Friday the 9th of September 1513, is among the most famous and disastrous, if not among the most momentous, in the history of Scotland. Having led his troops from their position of vantage, the king himself was killed while fighting on foot, together with nearly all his nobles; there was no foundation for the rumour that he had escaped from the carnage. He left one legitimate child, his successor James V., but as his gallantries were numerous he had many illegitimate children, among them (by Marion Boyd) Alexander Stewart, archbishop of St Andrews and chancellor of Scotland, who was killed at Flodden, and (by Janet Kennedy) James Stewart, earl of Moray (d. 1544). One of his other mistresses was Margaret Drummond (d. 1501).

James appears to have been a brave and generous man, and a wise and energetic king. According to one account, he was possessed of considerable learning; during his reign the Scottish court attained some degree of refinement, and Scotland counted in European politics as she had never done before. Literature flourished under the royal patronage, education was encouraged, and the material condition of the country improved enormously. Prominent both as an administrator and as a lawgiver, the king by his vigorous rule did much to destroy the tendencies to independence which existed in the Highlands and Islands; but, on the other hand, his rash conduct at Flodden brought much misery upon his kingdom. He was specially interested in his navy. The tournaments which took place under his auspices were worthy of the best days of chivalry in France and England. James shared to the full in the superstitions of the age which was quickly passing away. He is said to have worn an iron belt as penance for his share in his father's death; and by his frequent visits to shrines, and his benefactions to religious foundations, he won a reputation for piety.

JAMES V. (1512–1542), king of Scotland, son of James IV., was born at Linlithgow on the 10th of April 1512, and became king when his father was killed at Flodden in 1513. The regency was at first vested in his mother, but after Queen Margaret's second marriage, with Archibald Douglas, 6th earl of Angus, in August 1514, it was transferred by the estates to John Stewart, duke of Albany. Henceforward the minority of James was disturbed by constant quarrels between a faction, generally favourable to England, under Angus, and the partisans of France under Albany; while the queen-mother and the nobles struggled to gain and to regain possession of the king's person. The English had not followed up their victory at Flodden, although there were as usual forays on the borders, but Henry VIII. was watching affairs in Scotland with an observant eye, and other European sovereigns were not indifferent to the possibility of a Scotch alliance. In 1524, when Albany had retired to France, the parliament declared that James was fit to govern, but that he must be advised by his mother and a council. This "erection" of James as king was mainly due to the efforts of Henry VIII. In 1526 Angus obtained control of the king, and kept him in close confinement until 1528, when James, escaping from Edinburgh to Stirling, put vigorous measures in execution against the earl, and compelled him to flee to England. In 1529 and 1530 the king made a strong effort to suppress his turbulent vassals in the south of Scotland; and after several raids and counter-raids negotiations for peace with England were begun, and in May 1534 a treaty was signed. At this time, as on previous occasions, Henry VIII. wished James to marry his daughter Mary, while other ladies had been suggested by the emperor Charles V.; but the Scottish king, preferring a French bride, visited France, and in January 1537 was married at Paris to Madeleine, daughter of King Francis I. Madeleine died soon after her arrival in Scotland, and in 1538 James made a much more important marriage, being united to Mary (1515–1560), daughter of Claude, duke of Guise, and widow of Louis of Orleans, duke of Longueville. It was this connexion, probably, which finally induced James to forsake his vacillating foreign policy, and to range himself definitely among the enemies of England. In 1536 he had refused to meet Henry VIII. at York, and in the following year had received the gift of a cap and sword from Pope Paul III., thus renouncing the friendship of his uncle. Two plots to murder the king were now discovered, and James also foiled the attempts of Henry VIII. to kidnap him. Although in 1540 the English king made another attempt to win the support, or at least the neutrality, of James for his religious policy, the relations between the two countries became very unfriendly, and in 1542 Henry sent an army to invade Scotland. James was not slow to make reprisals, but his nobles were angry or indifferent, and on the 25th of November 1542 his forces were easily scattered at the rout of Solway Moss. This blow preyed upon the king's mind, and on the 14th of December he died at Falkland, having just heard of the birth of his daughter. His two sons had died in infancy, and his successor was his only legitimate child, Mary. He left several bastards, among them James Stewart, earl of Murray (the regent Murray), Lord John Stewart (1531–1563) prior of Coldingham, and Lord Robert Stewart, earl of Orkney (d. 1592).

Although possessing a weak constitution, which was further impaired by his irregular manner of life, James showed great vigour and independence as a sovereign, both in withstanding the machinations of his uncle, Henry VIII., and in opposing the influence of the nobles. The persecutions to which heretics were exposed during this reign were due mainly to the excessive influence exercised by the ecclesiastics, especially by David Beaton, archbishop of St Andrews. The king's habit of mingling with the peasantry secured for him a large amount of popularity, and probably led many to ascribe to him the authorship of poems describing scenes in peasant life, *Christis Kirk on the Grene*, *The Gaberlunzie Man* and *The Jolly Beggar*. There is no proof that he was the author of any of these poems, but from expressions in the poems of Sir David Lindsay, who was on terms of intimacy with him, it appears that occasionally he wrote verses.

JAMES I., the Conqueror (1208–1276), king of Aragon, son of Peter II., king of Aragon, and of Mary of Montpellier, whose mother was Eudoxia Comnena, daughter of the emperor Manuel, was born at Montpellier on the 2nd of February 1208. His father, a man of immoral life, was with difficulty persuaded to cohabit with his wife. He endeavoured to repudiate her, and she fled to Rome, where she died in April 1213. Peter, whose possessions in Provence entangled him in the wars between the Albigenses and Simon of Montfort, endeavoured to placate the northern crusaders by arranging a marriage between his son James and Simon's daughter. In 1211 the boy was entrusted to Montfort's care to be educated, but the aggressions of the crusaders on the princes of the south forced Peter to take up arms against them, and he was slain at Muret on the 12th of September 1213. Montfort would willingly have used James as a means of extending his own power. The Aragonese and Catalans, however, appealed to the pope, who forced Montfort to surrender him in May or June 1214. James was now entrusted to the care of Guillen de Monredon, the head of the Templars in Spain and Provence. The kingdom was given over to confusion till in 1216 the Templars and some of the more loyal nobles brought the young king to Saragossa. At the age of thirteen he was married to Leonora, daughter of Alphonso VIII. of Castile, whom he divorced later on the ground of consanguinity. A son born of the marriage, Alphonso, was recognized as legitimate, but died before his father, childless. It was only by slow steps that the royal authority was asserted, but the young king, who was of gigantic stature and immense strength, was also astute and patient. By 1228 he had so far brought his vassals to obedience, that he was able to undertake the conquest of the Balearic Islands, which he achieved within four years. At the same time he endeavoured to bring about a union of Aragon with Navarre, by a contract of mutual adoption between himself and the Navarrese king, Sancho, who was old enough to be his grandfather. The scheme broke down, and James abstained from a policy of conquest. He wisely turned to the more feasible course of extending his dominions at the expense of the decadent

Mahommedan princes of Valencia. On the 28th of September 1238 the town of Valencia surrendered, and the whole territory was conquered in the ensuing years. Like all the princes of his house, James took part in the politics of southern France. He endeavoured to form a southern state on both sides of the Pyrenees, which should counterbalance the power of France north of the Loire. Here also his policy failed against physical, social and political obstacles. As in the case of Navarre, he was too wise to launch into perilous adventures. By the Treaty of Corbeil, with Louis IX., signed the 11th of May 1258, he frankly withdrew from conflict with the French king, and contented himself with the recognition of his position, and the surrender of antiquated French claims to the overlordship of Catalonia. During the remaining twenty years of his life, James was much concerned in warring with the Moors in Murcia, not on his own account, but on behalf of his son-in-law Alphonso the Wise of Castile. As a legislator and organizer he occupies a high place among the Spanish kings. He would probably have been more successful but for the confusion caused by the disputes in his own household. James, though orthodox and pious, had an ample share of moral laxity. After repudiating Leonora of Castile he married Yolande (in Spanish Violante) daughter of Andrew II. of Hungary, who had a considerable influence over him. But she could not prevent him from continuing a long series of intrigues. The favour he showed his bastards led to protest from the nobles, and to conflicts between his sons legitimate and illegitimate. When one of the latter, Fernan Sanchez, who had behaved with gross ingratitude and treason to his father, was slain by the legitimate son Pedro, the old king recorded his grim satisfaction. At the close of his life King James divided his states between his sons by Yolande of Hungary, Pedro and James, leaving the Spanish possessions on the mainland to the first, the Balearic Islands and the lordship of Montpellier to the second—a division which inevitably produced fratricidal conflicts. The king fell very ill at Alcira, and resigned his crown, intending to retire to the monastery of Poblet, but died at Valencia on the 27th of July 1276.

King James was the author of a chronicle of his own life, written or dictated apparently at different times, which is a very fine example of autobiographical literature. A translation into English by J. Forster, with notes by Don Pascual de Gayangos, was published in London in 1883. See also *James I. of Aragon*, by F. Darwin Swift (Clarendon Press, 1894), in which are many references to authorities.

JAMES II. (*c.* 1260–1327), king of Aragon, grandson of James I., and son of Peter III. by his marriage with Constance, daughter of Manfred of Beneventum, was left in 1285 as king of Sicily by his father. In 1291, on the death of his elder brother, Alphonso, to whom Aragon had fallen, he resigned Sicily and endeavoured to arrange the quarrel between his own family and the Angevine House, by marriage with Blanca, daughter of Charles of Anjou, king of Naples.

JAMES II. (1243–1311), king of Majorca, inherited the Balearic Islands from his father James I. of Aragon. He was engaged in constant conflict with his brother Pedro III. of Aragon, and in alliance with the French king against his own kin.

JAMES III. (1315–1349), king of Majorca, grandson of James II., was driven out of his little state and finally murdered by his cousin Pedro IV. of Aragon, who definitely reannexed the Balearic Islands to the crown.

JAMES (JAMES FRANCIS EDWARD STUART) (1688–1766), prince of Wales, known to the Jacobites as James III. and to the Hanoverian party as the Old Pretender, the son and heir of James II. of England, was born in St James's Palace, London, on the 10th of June 1688. The scandalous story that he was a supposititious child, started and spread abroad by interested politicians at the time of his birth, has been completely disproved, and most contemporary writers allude to his striking family likeness to the Royal Stuarts. Shortly before the flight of the king to Sheerness, the infant prince together with his mother was sent to France, and afterwards he continued to reside with his father at the court of St Germain. On the death of his father, on the 16th of September 1701, he was immediately proclaimed king by Louis XIV. of France, but a fantastic attempt to perform a similar ceremony in London so roused the anger of the populace that the mock pursuivants barely escaped with their lives. A bill of attainder against him received the royal assent a few days before the death of William III. in 1702, and the Princess Anne, half-sister of the Pretender, succeeded William on the throne. An influential party still, however, continued to adhere to the Jacobite cause; but an expedition from Dunkirk planned in favour of James in the spring of 1708 failed of success, although the French ships under the comte de Fourbin, with James himself on board, reached the Firth of Forth in safety. At the Peace of Utrecht James withdrew from French territory to Bar-le-Duc in Lorraine. A rebellion in the Highlands of Scotland was inaugurated in September 1715 by the raising of the standard on the braes of Mar, and by the solemn proclamation of James Stuart, "the chevalier of St George," in the midst of the assembled clans, but its progress was arrested in November by the indecisive battle of Sheriffmuir and by the surrender at Preston. Unaware of the gloomy nature of his prospects, the chevalier landed in December 1715 at Peterhead, and advanced as far south as Scone, accompanied by a small force under the earl of Mar; but on learning of the approach of the duke of Argyll, he retreated to Montrose, where the Highlanders dispersed to the mountains, and he embarked again for France. A Spanish expedition sent out in his behalf in 1719, under the direction of Alberoni, was scattered by a tempest, only two frigates reaching the appointed rendezvous in the island of Lewis.

In 1718 James had become affianced to the young princess Maria Clementina Sobieski, grand-daughter of the warrior king of Poland, John Sobieski. The intended marriage was forbidden by the emperor, who in consequence kept the princess and her mother in honourable confinement at Innsbruck in Tirol. An attempt to abduct the princess by means of a ruse contrived by a zealous Jacobite gentleman, Charles Wogan, proved successful; Clementina reached Italy in safety, and she and James were ultimately married at Montefiascone on the 1st of September 1719. James and Clementina were now invited to reside in Rome at the special request of Pope Clement XI., who openly acknowledged their titles of British King and Queen, gave them a papal guard of troops, presented them with a villa at Albano and a palace (the Palazzo Muti in the Piazza dei Santi Apostoli) in the city, and also made them an annual allowance of 12,000 crowns out of the papal treasury. At the Palazzo Muti, which remained the chief centre of Jacobite intriguing, were born James's two sons, Charles Edward (the Young Pretender) and Henry Benedict Stuart. James's married life proved turbulent and unhappy, a circumstance that was principally due to the hot temper and jealous nature of Clementina, who soon after Henry's birth in 1725 left her husband and spent over two years in a Roman convent. At length a reconciliation was effected, which Clementina did not long survive, for she died at the early age of 32 in February 1735. Full regal honours were paid to the Stuart queen at her funeral, and the splendid but tasteless monument by Pietro Bracchi (1700–1773) in St Peter's was erected to her memory by order of Pope Benedict XIV.

His wife's death seems to have affected James's health and spirits greatly, and he now began to grow feeble and indifferent, so that the political adherents of the Stuarts were gradually led to fix their hopes upon the two young princes rather than upon their father. Travellers to Rome at this period note that James appeared seldom in public, and that much of his time was given up to religious exercises; he was *dévot à l'excès*, so Charles de Brosses, an unprejudiced Frenchman, informs us. It was with great reluctance that James allowed his elder son to leave Italy for France in 1744; nevertheless in the following year, he permitted Henry to follow his brother's example, but with the news of Culloden he evidently came to regard his cause as definitely lost. The estrangement from his elder and favourite son, which arose over Henry's adoption of an ecclesiastical career, so embittered his last years that he sank into a moping invalid and rarely left his chamber. With the crushing failure of the

"Forty-five" and his quarrel with his heir, the once-dreaded James soon became a mere cipher in British politics, and his death at Rome on the 2nd of January 1766 passed almost unnoticed in London. He was buried with regal pomp in St Peter's, where Canova's famous monument, erected by Pius VII. in 1819, commemorates him and his two sons. As to James's personal character, there is abundant evidence to show that he was grave, high-principled, industrious, abstemious and dignified, and that the unflattering portrait drawn of him by Thackeray in *Esmond* is utterly at variance with historical facts. Although a fervent Roman Catholic, he was far more reasonable and liberal in his religious views than his father, as many extant letters testify.

See Earl Stanhope, *History of England and Decline of the Last Stuarts* (1853); *Calendar of the Stuart Papers at Windsor Castle*; J. H. Jesse, *Memories of the Pretenders and their Adherents* (1845); Dr John Doran, *"Mann" and Manners at the Court of Florence* (1876); *Relazione della morte di Giacomo III., Rè d'Inghilterra*; and Charles de Brosses, *Lettres sur l'Italie* (1885). (H. M. V.)

JAMES, DAVID (1839–1893), English actor, was born in London, his real name being Belasco. He began his stage career at an early age, and after 1863 gradually made his way in humorous parts. His creation, in 1875, of the part of Perkyn Middlewick in *Our Boys* made him famous as a comedian, the performance obtaining for the piece a then unprecedented run from the 16th of January 1875 till the 18th of April 1879. In 1885 he had another notable success as Blueskin in *Little Jack Sheppard* at the Gaiety Theatre, his principal associates being Fred Leslie and Nellie Farren. His song in this burlesque, "Botany Bay," became widely popular. In the part of John Dory in *Wild Oats* he again made a great hit at the Criterion Theatre in 1886; and among his other most successful impersonations were Simon Ingot in *David Garrick*, Tweedie in *Tweedie's Rights*, Macclesfield in *The Guv'nor*, and Eccles in *Caste*. His unctuous humour and unfailing spirits made him a great favourite with the public. He died on the 2nd of October 1893.

JAMES, GEORGE PAYNE RAINSFORD (1799–1860), English novelist, son of Pinkstan James, physician, was born in George Street, Hanover Square, London, on the 9th of August 1799. He was educated at a private school at Putney, and afterwards in France. He began to write early, and had, according to his own account, composed the stories afterwards published as *A String of Pearls* before he was seventeen. As a contributor to newspapers and magazines, he came under the notice of Washington Irving, who encouraged him to produce his *Life of Edward the Black Prince* (1822). *Richelieu* was finished in 1825, and was well thought of by Sir Walter Scott (who apparently saw it in manuscript), but was not brought out till 1829. Perhaps Irving and Scott, from their natural amiability, were rather dangerous advisers for a writer so inclined by nature to abundant production as James. But he took up historical romance writing at a lucky moment. Scott had firmly established the popularity of the style, and James in England, like Dumas in France, reaped the reward of their master's labours as well as of their own. For thirty years the author of *Richelieu* continued to pour out novels of the same kind though of varying merit. His works in prose fiction, verse narrative, and history of an easy kind are said to number over a hundred, most of them being three-volume novels of the usual length. Sixty-seven are catalogued in the British Museum. The best examples of his style are perhaps *Richelieu* (1829); *Philip Augustus* (1831); *Henry Masterton*, probably the best of all (1832); *Mary of Burgundy* (1833); *Darnley* (1839); *Corse de Léon* (1841); *The Smuggler* (1845). His poetry does not require special mention, nor does his history, though for a short time during the reign of William IV. he held the office of historiographer royal. After writing copiously for about twenty years, James in 1850 went to America as British Consul for Massachusetts. He was consul at Richmond, Virginia, from 1852 to 1856, when he was appointed to a similar post at Venice, where he died on the 9th of June 1860.

James has been compared to Dumas, and the comparison holds good in respect of kind, though by no means in respect of merit. Both had a certain gift of separating from the picturesque parts of history what could without much difficulty be worked up into picturesque fiction, and both were possessed of a ready pen. Here, however, the likeness ends. Of purely literary talent James had little. His plots are poor, his descriptions weak, his dialogue often below even a fair average, and he was deplorably prone to repeat himself. The "two cavaliers" who in one form or another open most of his books have passed into a proverb, and Thackeray's good-natured but fatal parody of *Barbazure* is likely to outlast *Richelieu* and *Darnley* by many a year. Nevertheless, though James cannot be allowed any very high rank among novelists, he had a genuine narrative gift, and, though his very best books fall far below *Les trois mousquetaires* and *La reine Margot*, there is a certain even level of interest to be found in all of them. James never resorted to illegitimate methods to attract readers, and deserves such credit as may be due to a purveyor of amusement who never caters for the less creditable tastes of his guests.

His best novels were published in a revised form in 21 volumes (1844–1849).

JAMES, HENRY (1843–), American author, was born in New York on the 15th of April 1843. His father was Henry James (1811–1882), a theological writer of great originality, from whom both he and his brother Professor William James derived their psychological subtlety and their idiomatic, picturesque English. Most of Henry's boyhood was spent in Europe, where he studied under tutors in England, France and Switzerland. In 1860 he returned to America, and began reading law at Harvard, only to find speedily that literature, not law, was what he most cared for. His earliest short tale, "The Story of a Year," appeared in 1865, in the *Atlantic Monthly*, and frequent stories and sketches followed. In 1869 he again went to Europe, where he subsequently made his home, for the most part living in London, or at Rye in Sussex. Among his specially noteworthy works are the following: *Watch and Ward* (1871); *Roderick Hudson* (1875); *The American* (1877); *Daisy Miller* (1878); *French Poets and Novelists* (1878); *A Life of Hawthorne* (1879); *The Portrait of a Lady* (1881); *Portraits of Places* (1884); *The Bostonians* (1886); *Partial Portraits* (1888); *The Tragic Muse* (1890); *Essays in London* (1893); *The Two Magics* (1898); *The Awkward Age* (1898); *The Wings of the Dove* (1902); *The Ambassadors* (1903); *The Golden Bowl* (1904); *English Hours* (1905); *The American Scene* (1907); *The High Bid* (1909); *Italian Hours* (1909).

As a novelist, Henry James is a modern of the moderns both in subject matter and in method. He is entirely loyal to contemporary life and reverentially exact in his transcription of the phase. His characters are for the most part people of the world who conceive of life as a fine art and have the leisure to carry out their theories. Rarely are they at close quarters with any ugly practical task. They are subtle and complex with the subtlety and the complexity that come from conscious preoccupation with themselves. They are specialists in conduct and past masters in casuistry, and are full of variations and shadows of turning. Moreover, they are finely expressive of *milieu*; each belongs unmistakably to his class and his race; each is true to inherited moral traditions and delicately illustrative of some social code. To reveal the power and the tragedy of life through so many minutely limiting and apparently artificial conditions, and by means of characters who are somewhat self-conscious and are apt to make of life only a pleasant pastime, might well seem an impossible task. Yet it is precisely in this that Henry James is pre-eminently successful. The essentially human is what he really cares for, however much he may at times seem preoccupied with the *technique* of his art or with the mask of conventions through which he makes the essentially human reveal itself. Nor has "the vista of the spiritual been denied him." No more poignant spiritual tragedy has been recounted in recent fiction than the story of Isabel Archer in *The Portrait of a Lady*. His method, too, is as modern as his subject matter. He early fell in love with the "point of view," and the good and the bad qualities of his work all follow from this literary passion. He is a very sensitive impressionist, with a technique that can fix the most elusive phase of character and render the most baffling surface. The skill is unending with which he places his characters in such relations and under such lights that they flash out in due succession their continuously varying facets. At times he may seem to forget that a character is something incalculably more than the sum of all its phases; and then his characters tend to have their existence, as Positivists expect to have their immortality, simply and solely in the minds of other people. But when his method is at its best, the delicate phases of character that he transcribes coalesce perfectly into clearly defined and suggestive images of living, acting men and women. Doubtless, there is a certain initiation necessary for the enjoyment of Mr James. He presupposes a cosmopolitan outlook, a certain interest in art and in social artifice, and no little abstract curiosity about the workings of the human mechanism. But for speculative readers, for readers who care for art in life as well as for life in art, and for readers above all who want to encounter and comprehend a great variety of very modern and finely modulated characters, Mr James holds a place of his own, unrivalled as an interpreter of the world of to-day.

For a list of the short stories of Mr Henry James, collections of them in volume form, and other works, see bibliographies by F. A. King, in *The Novels of Henry James*, by Elisabeth L. Cary (New York and London, 1905), and by Le Roy Phillips, *A Bibliography of the Writings of Henry James* (Boston, Mass., 1906). In 1909 an *édition de luxe* of Henry James's novels was published in 24 volumes.

JAMES, JOHN ANGELL (1785–1859), English Nonconformist divine, was born at Blandford, Dorsetshire, on the 6th of June 1785. At the close of his seven years' apprenticeship to a linendraper at Poole he decided to become a preacher, and in 1802 he went to David Bogue's training institution at Gosport. A year and a half later, on a visit to Birmingham, his preaching was so highly esteemed by the congregation of Carr's Lane Independent chapel that they invited him to exercise his ministry amongst them; he settled there in 1805, and was ordained in May 1806. For several years his success as a preacher was comparatively small; but he jumped into popularity about 1814, and began to attract large crowds wherever he officiated. At the same time his religious writings, the best known of which are *The Anxious Inquirer* and *An Earnest Ministry*, acquired a wide circulation. James was a typical Congregational preacher of the early 19th century, massive and elaborate rather than original. His preaching displayed little or nothing of Calvinism, the earlier severity of which had been modified in Birmingham by Edward Williams, one of his predecessors. He was one of the founders of the Evangelical Alliance and of the Congregational Union of England and Wales. Municipal interests appealed strongly to him, and he was also for many years chairman of Spring Hill (afterwards Mansfield) College. He died at Birmingham on the 1st of October 1859.

A collected edition of James's works appeared in 1860–1864. See *A Review of the Life and Character of J. Angell James* (1860), by J. Campbell, and *Life and Letters of J. A. James* (1861), edited by his successor, R. W. Dale, who also contributed a sketch of his predecessor to *Pulpit Memorials* (1878).

JAMES, THOMAS (*c.* 1573–1629), English librarian, was born at Newport, Isle of Wight. He was educated at Winchester and New College, Oxford, and became a fellow of New College in 1593. His wide knowledge of books, together with his skill in deciphering manuscripts and detecting literary forgeries, secured him in 1602 the post of librarian to the library founded in that year by Sir Thomas Bodley at Oxford. At the same time he was made rector of St Aldate's, Oxford. In 1605 he compiled a classified catalogue of the books in the Bodleian Library, but in 1620 substituted for it an alphabetical catalogue. The arrangement in 1610, whereby the Stationers' Company undertook to supply the Bodleian Library with every book published, was James's suggestion. Ill health compelled him to resign his post in 1620, and he died at Oxford in August 1629.

JAMES, WILLIAM (d. 1827), English naval historian, author of the *Naval History of Great Britain from the Declaration of War by France in 1793 to the Accession of George IV.*, practised as a proctor in the admiralty court of Jamaica between 1801 and 1813. He was in the United States when the war of 1812 broke out, and was detained as a prisoner, but escaped to Halifax. His literary career began by letters to the *Naval Chronicle* over the signature of "Boxer." In 1816 he published *An Inquiry into the Merits of the Principal Naval Actions between Great Britain and the United States.* In this pamphlet, which James reprinted in 1817, enlarged and with a new title, his object was to prove that the American frigates were stronger than their British opponents nominally of the same class. In 1819 he began his *Naval History*, which appeared in five volumes (1822–1824), and was reprinted in six volumes (1826). It is a monument of painstaking accuracy in all such matters as dates, names, tonnage, armament and movements of ships, though no attempt is ever made to show the connexion between the various movements. James died on the 28th of May 1827 in London, leaving a widow who received a civil list pension of £100.

An edition of the *Naval History* in six volumes, with additions and notes by Capt. F. Chamier, was published in 1837, and a further one in 1886. An edition epitomized by R. O'Byrne appeared in 1888, and an *Index* by C. G. Toogood was issued by the Navy Records Society in 1895.

JAMES, WILLIAM (1842–1910), American philosopher, son of the Swedenborgian theologian Henry James, and brother of the novelist Henry James, was born on the 11th of January 1842 at New York City. He graduated M.D. at Harvard in 1870. Two years after he was appointed a lecturer at Harvard in anatomy and physiology, and later in psychology and philosophy. Subsequently he became assistant professor of philosophy (1880–1885), professor (1885–1889), professor of psychology (1889–1897) and professor of philosophy (1897–1907). In 1899–1901 he delivered the Gifford lectures on natural religion at the university of Edinburgh, and in 1908 the Hibbert lectures at Manchester College, Oxford. With the appearance of his *Principles of Psychology* (2 vols., 1890), James at once stepped into the front rank of psychologists as a leader of the physical school, a position which he maintained not only by the brilliance of his analogies but also by the freshness and unconventionality of his style. In metaphysics he upheld the idealist position from the empirical standpoint. Beside the *Principles of Psychology*, which appeared in a shorter form in 1892 (*Psychology*), his chief works are: *The Will to Believe* (1897); *Human Immortality* (Boston, 1898); *Talks to Teachers* (1899); *The Varieties of Religious Experience* (New York, 1902); *Pragmatism—a New Name for some Old Ways of Thinking* (1907); *A Pluralistic Universe* (1909; Hibbert lectures), in which, though he still attacked the hypothesis of absolutism, he admitted it as a legitimate alternative. He received honorary degrees from Padua (1893), Princeton (1896), Edinburgh (1902), Harvard (1905). He died on the 27th of August 1910.

JAMES OF HEREFORD, HENRY JAMES, 1st Baron (1828–), English lawyer and statesman, son of P. T. James, surgeon, was born at Hereford on the 30th of October 1828, and educated at Cheltenham College. A prizeman of the Inner Temple, he was called to the bar in 1852 and joined the Oxford circuit, where he soon came into prominence. In 1867 he was made "postman" of the court of exchequer, and in 1869 became a Q.C. At the general election of 1868 he obtained a seat in parliament for Taunton as a Liberal, by the unseating of Mr Serjeant Cox on a scrutiny in March 1869, and he kept the seat till 1885, when he was returned for Bury. He attracted attention in parliament by his speeches in 1872 in the debates on the Judicature Act. In 1873 (September) he was made solicitor-general, and in November attorney-general, and knighted; and when Gladstone returned to power in 1880 he resumed his office. He was responsible for carrying the Corrupt Practices Act of 1883. On Gladstone's conversion to Home Rule, Sir Henry James parted from him and became one of the most influential of the Liberal Unionists: Gladstone had offered him the lord chancellorship in 1886, but he declined it; and the knowledge of the sacrifice he had made in refusing to follow his old chief in his new departure lent great weight to his advocacy of the Unionist cause in the country. He was one of the leading counsel for *The Times* before the Parnell Commission, and from 1892 to 1895 was attorney-general to the prince of Wales. From 1895 to 1902 he was a member of the Unionist ministry as chancellor for the duchy of Lancaster, and in 1895 he was made a peer as Baron James of Hereford. In later years he was a prominent opponent of the Tariff Reform movement, adhering to the section of Free Trade Unionists.

JAMES, EPISTLE OF, a book of the New Testament. The superscription (Jas. i. 1) ascribes it to that pre-eminent "pillar" (Gal. ii. 9) of the original mother church who later came to be regarded in certain quarters as the "bishop of bishops" (Epist. of James to Clement, *ap. Clem. Hom.* Superscription). As such he appears in a position to address an encyclical to "the twelve tribes of the dispersion"; for the context (i. 18, v. 7 seq.) and literary relation (cf. 1 Pet. i. 1, 3, 23–25) prove this to be a figure for the entire new people of God, without the distinction of carnal birth, as Paul had described "the Israel of God" (Gal. vi. 16), spiritually begotten, like Isaac, by the word received in faith (Gal. iii. 28 seq., iv. 28; Rom. ix. 6–9, iv. 16–18). This idea of the spiritually begotten Israel becomes current after 1 Pet., as appears in John i. 11–13, iii. 3–8; Barn. iv. 6, xiii. 13; 2 Clem. ii. 2, &c.

The interpretation which takes the expression "the twelve tribes" literally, and conceives the brother of the Lord as sending an epistle written in the Greek language throughout the Christian world, but as addressing Jewish Christians only (so *e.g.* Sieffert, *s.v.* "Jacobus im N.T." in Hauck, *Realencykl.* ed. 1900, vol. viii.), assumes not only such divisive interference as Paul might justly resent (cf. Gal. ii. 1–10), but involves a strange idea of conditions. Were worldliness, tongue religion, moral indifference, the distinctive marks of the Jewish element? Surely the rebukes of James apply to conditions of the whole Church and not sporadic Jewish-Christian conventicles in the Greek-speaking world, if any such existed.

It is at least an open question whether the superscription (connected with that of Jude) be not a later conjecture prefixed by some compiler of the catholic epistles, but of the late date implied in our interpretation of ver. 1 there should be small dispute. Whatever the currency in classical circles of the epistle as a literary form, it is irrational to put first in the development of Christian literature a general epistle, couched in fluent, even rhetorical, Greek, and afterwards the Pauline letters, which both as to origin and subsequent circulation were a product of urgent conditions. The order consonant with history is (1) Paul's "letters" to "the churches of" a province (Gal. i. 2; 2 Cor. i. 1); (2) the address to "the elect of the dispersion" in a group of the Pauline provinces (1 Pet. i. 1); (3) the address to "the twelve tribes of the dispersion" everywhere (Jas. i. 1; cf. Rev. vii. 2–4). James, like 1 John, is a homily, even more lacking than 1 John in every epistolary feature, not even supplied with the customary epistolary farewell. The superscription, if original, compels us to treat the whole writing as not only late but pseudonymous. If prefixed by conjecture, to secure recognition and authority for the book, even this was at first a failure. The earliest trace of any recognition of it is in Origen (A.D. 230) who refers to it as "said to be from James" (φερομέγη ἡ Ἰακώβου Ἐπιστολή), seeming thus to regard ver. 1 as superscription rather than part of the text. Eusebius (A.D. 325) classifies it among the disputed books, declaring that it is regarded as spurious, and that not many of the ancients have mentioned it. Even Jerome (A.D. 390), though personally he accepted it, admits that it was "said to have been published by another in the name of James." The Syrian canon of the Peshitta was the first to admit it.

Modern criticism naturally made the superscription its starting-point, endeavouring first to explain the contents of the writing on this theory of authorship, but generally reaching the conclusion that the two do not agree. Conservatives as a rule avoid the implication of a direct polemic against Paul in ii. 14–26, which would lay open the author to the bitter accusations launched against the interlopers of 2 Cor. x.–xiii., by dating before the Judaistic controversy. Other critics regard the very language alone as fatal to such a theory of date, authorship and circle addressed. The contents, ignoring the conflict of Jew and Gentile, complaining of worldiness and tongue-religion (cf. 1 John iii. 17 seq. with James ii. 14–16) suggest a much later date than the death of James (A.D. 62–66). They also require a different character in the author, if not also a different circle of readers from those addressed in i. 1.

The prevalent conditions seem to be those of the Greek church of the post-apostolic period, characterized by worldiness of life, profession without practice, and a contentious garrulity of teaching (1 John iii. 3–10, 18; 1 Tim. i. 6 seq., vi. 3–10; 2 Tim. iii. 1–5, iv. 3 seq.). The author meets these with the weapons commanded for the purpose in 1 Tim. vi. 3, but quite in the spirit of one of the "wise men" of the Hebrew wisdom literature. His gospel is completely denationalized, humanitarian; but, while equally universalistic, is quite unsympathetic towards the doctrine and the mysticism of Paul. He has nothing whatever to say of the incarnation, life, example, suffering or resurrection of Jesus, and does not interest himself in the doctrines of Christ's person, which were hotly debated up to this time. The absence of all mention of Christ (with the single exception of ii. 1, where there is reason to think the words ἡμῶν Ἰησοῦ Χριστοῦ interpolated) has even led to the theory, ably but unconvincingly maintained by Spitta, that the writing is a mere recast of a Jewish moralistic writing like the *Two Ways*. The thoughts are loosely strung together: yet the following seems to be the general framework on which the New Testament preacher has collected his material.

1. The problem of evil (i. 1–19a). Outward trials are for our development through aid of divinely given "wisdom" (2–11). Inward (moral) trials are not to be imputed to God, the author of all good, whose purpose is the moral good of his creation (12–19a; cf. 1 John i. 5).

2. The righteousness God intends is defined in the eternal moral law. It is a product of deeds, not words (i. 19b–27).

3. The "royal law" of love is violated by discrimination against the poor (ii. 1–13); and by professions of faith barren of good works (14–26).

4. The true spirit of wisdom appears not in aspiring to teach, but in goodness and meekness of life (ch. iii.). Strife and self-exaltation are fruits of a different spirit, to be resisted and overcome by humble prayer for more grace (iv. 1–10).

5. God's judgment is at hand. The thought condemns censoriousness (iv. 11 et seq.), presumptuous treatment of life (13–17), and the tyranny of the rich (v. 1–6). It encourages the believer to patient endurance to the end without murmuring or imprecations (7–12). It impels the church to diligence in its work of worship, care and prayer (13–18), and in the reclamation of the erring (19–20).

The use made by James of earlier material is as important for determining the *terminus a quo* of its own date as the use of it by later writers for the *terminus ad quem*. Acquaintance with the evangelic tradition is apparent. It is conceived, however, more in the Matthaean sense of "commandments to be observed" (Matt. xxviii. 20) than the Pauline, Markan and Johannine of the drama of the incarnation and redemption. There is no traceable literary contact with the synoptic gospels. Acquaintance, however, with some of the Pauline epistles "must be regarded as incontestably established" (O. Cone, *Ency. Bibl.* ii. 2323). Besides scattered reminiscences of Romans, 1 Corinthians and Galatians, enumerated in the article referred to, the section devoted to a refutation of the doctrine of "justification by faith apart from works" undeniably presupposes the Pauline terminology. Had the author been consciously opposing the great apostle to the Gentiles he would probably have treated the subject less superficially. What he really opposes is the same ultra-Pauline moral laxity which Paul himself had found occasion to rebuke among would-be adherents in Corinth (1 Cor. vi. 12; viii. 1–3, 11, 12; x. 23 seq., 32 seq.) and which appears still more marked in the pastoral epistles and 1 John. In rebuking it James unconsciously retracts the misapplied Pauline principle itself. To suppose that the technical terminology of Paul, including even his classic example of the faith of Abraham, could be employed here independently of Rom. ii. 21–23, iii. 28, iv. 1; Gal. ii. 16, iii. 6, is to pass a judgment which in every other field of literary criticism would be at once repudiated. To imagine it current in pre-Pauline Judaism is to misconceive the spirit of the synagogue.[1] To make James the coiner and Paul the borrower not only throws back James to a date incompatible with the other phenomena, but implies a literary polemic tactlessly waged by Paul against the head of the Jerusalem church. Acquaintance with Hebrews is only slightly less probable, for James ii. 25 adds an explication of the case of Rahab also, cited in Heb. xi. 31 along with Abraham as an example of justification by faith only, to his correction of the Pauline scriptural argument. The question whether James is dependent on 1 Peter or conversely is still actively disputed. As regards the superscription the relation has been defined above. Dependence on Revelation (A.D. 95) is probable (cf. i. 12 and ii. 5 with Rev. ii. 9, 10 and v. 9 with Rev. iii. 20), but the contacts with Clement of Rome (A.D. 95–120) indicate the reverse relation. James iv. 6 and v. 20 = 1 Clem. xlix. 5 and xxx. 2; but as both passages are also found in 1 Peter (iv. 8, v. 5), the latter may be the common source. Clement's further development of the cases of Abraham and Rahab, however, adding as it does to the demonstration of James from Scripture of their justification "by works and not by faith only," that the particular good work which "wrought with the faith" of Abraham and Rahab to their justification was "hospitality" (1 Clem. x.–xii.) seems plainly to presuppose James. Priority is more difficult to establish in the case of Hermas (A.D. 120–140), where the contacts are undisputed (cf. James iv. 7, 12 with Mand. xii. 5, 6; Sim. ix. 23).[1]

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[1] Nothing adduced by Lightfoot (*Comm. on Gal.* Exc. "The faith of Abraham") justifies the unsupported and improbable assertion that the quotation James ii. 21 seq. "was probably in common use among the Jews to prove that orthodoxy of doctrine sufficed for salvation" (Mayor, *s.v.* "James, Epistle of" in Hasting's *Dict. Bible*, p. 546).

The date (A.D. 95–120) implied by the literary contacts of James of course precludes authorship by the Lord's brother, though this does not necessarily prove the superscription later still. The question whether the writing as a whole is pseudonymous, or only the superscription a mistaken conjecture by the scribe of Jude 1 is of secondary importance. A date about 100–120 for the substance of the writing is accepted by the majority of modern scholars and throws real light upon the author's endeavour. Pfleiderer in pointing out the similarities of James and the *Shepherd* of Hermas declares it to be "certain that both writings presuppose like historical circumstances, and, from a similar point of view, direct their admonitions to their contemporaries, among whom a lax worldly-mindedness and unfruitful theological wrangling threatened to destroy the religious life."[2] Holtzmann has characterized this as "the right visual angle" for the judgment of the book. Questions as to the obligation of Mosaism and the relations of Jew and Gentile have utterly disappeared below the horizon. Neither the attachment to the religious forms of Judaism, which we are informed was characteristic of James, nor that personal relation to the Lord which gave him his supreme distinction are indicated by so much as a single word. Instead of being written in Aramaic, as it would almost necessarily be if antecedent to the Pauline epistles, or even in the Semitic style characteristic of the older and more Palestinian elements of the New Testament we have a Greek even more fluent than Paul's and metaphors and allusions (i. 17, iii. 1–12) of a type more like Greek rhetoric than anything else in the New Testament. Were we to judge by the contacts with Hebrews, Clement of Rome and Hermas and the similarity of situation evidenced in the last-named, Rome would seem the most natural place of origin. The history of the epistle's reception into the canon is not opposed to this; for, once it was attributed to James, Syria would be more likely to take it up, while the West, more sceptical, if not better informed as to its origin, held back; just as happened in the case of Hebrews.

It is the author's conception of the nature of the gospel which mainly gives us pause in following this pretty general disposition of modern scholarship. With all the phenomena of vocabulary and style which seem to justify such conceptions as von Soden's that c. iii. and iv. 11–v. 6 represent excerpts respectively from the essay of an Alexandrian scribe, and a triple fragment of Jewish apocalypse, the analysis above given will be found the exponent of a real logical sequence. We might almost admit a resemblance in form to the general literary type which Spitta adduces. The term "wisdom" in particular is used in the special and technical sense of the "wise men" of Hebrew literature (Matt. xxiii. 34), the sense of "the wisdom of the just" of Luke i. 17. True, the mystical sense given to the term in one of the sources of Luke, by Paul and some of the Church fathers, is not present. While the gospel is pre-eminently the divine gift of "wisdom," "wisdom" is not personified, but conceived primarily as a system of humanitarian ethics, i. 21–25, and only secondarily as a spiritual effluence, imparting the regenerate disposition, the "mind that was in Christ Jesus," iii. 13–18. And yet for James as well as for Paul Christ is "the wisdom of God." The difference in conception of the term is similar to that between Ecclesiasticus and the Wisdom of Solomon. Our author, like Paul, expects the hearers of the word to be "a kind of first-fruits to God of his creation." (i. 18 cf. 1 Pet. i. 23), and bids them depend upon the gift of grace (i. 5, iv. 5 seq.), but for the evils of the world he has no remedy but the patient endurance of the Christian philosopher (i. 2–18). For the faithlessness (διψυχία i. 6–8; cf. *Didache* and Hermas), worldliness (ii. 1–13) and hollow profession (ii. 14–26) of the church life of his time, with its "theological wrangling" (iii. 1–12), his remedy is again the God-given, peaceable spirit of the Christian philosopher (iii. 13–18), which is the antithesis of the spirit of self-seeking and censoriousness (iv. 1–12), and which appreciates the pettiness of earthly life with its sordid gains and its unjust distribution of wealth (iv. 13–v. 6). This attitude of the Christian stoic will maintain the individual in his patient waiting for the expected "coming of the Lord" (v. 7–11); while the church sustains its official functions of healing and prayer, and reclamation of the erring (v. 13–20).[3] For this conception of the gospel and of the officially organized church, our nearest analogy is in Matthew, or rather in the blocks of precepts of the Lord which after subtraction of the Markan narrative framework are found to underlie our first gospel. It may be mere coincidence that the material in Matthew as well as in the *Didache* seems to be arranged in five divisions, beginning with a commendation of the right way, and ending with warnings of the judgment, while the logical analysis of James yields something similar; but of the affinity of spirit there can be no doubt.

The type of ethical thought exemplified in James has been called Ebionite (Hilgenfeld). It is clearly manifest in the humanitarianism of Luke also. But with the possible exception of the prohibition of oaths there is nothing which ought to suggest the epithet. The strong sense of social wrongs, the impatience with tongue-religion, the utter ignoring of ceremonialism, the reflection on the value and significance of "life," are distinctive simply of the "wisdom" writers. Like these our author holds himself so far aloof from current debate of ceremonial or doctrine as to escape our principal standards of measurement regarding place and time. Certain general considerations, however, are fairly decisive. The prolonged effort, mainly of English scholarship, to vindicate the superscription, even on the condition of assuming priority to the Pauline epistles, grows only increasingly hopeless with increasing knowledge of conditions, linguistic and other, in that early period. The moralistic conception of the gospel as a "law of liberty," the very phrase recalling the expression of Barn. ii., "the new law of Christ, which is without the yoke of constraint," the conception of the church as primarily an ethical society, its functions already officially distributed, suggest the period of the *Didache*, Barnabas and Clement of Rome. Independently of the literary contacts we should judge the period to be about A.D. 100–120. The connexions with the Pauline epistles are conclusive for a date later than the death of James; those with Clement and Hermas are perhaps sufficient to date it as prior to the former, and suggest Rome as the place of origin. The connexions with wisdom-literature favour somewhat the Hellenistic culture of Syria, as represented for example at Antioch.

The most important commentaries on the epistle are those of Matt. Schneckenburger (1832), K. G. W. Theile (1833), J. Kern (1838), G. H. Ewald (1870), C. F. D. Erdmann (1881), H. v. Soden (1898), J. B. Mayor (1892) and W. Patrick (1906). The pre-Pauline date is championed by B. Weiss (*Introd.*), W. Beyschlag (Meyer's *Commentary*), Th. Zahn (*Introd.*), J. B. Mayor and W. Patrick. J. V. Bartlet (*Ap. Age*, pp. 217–250) pleads for it, and the view is still common among English interpreters. F. K. Zimmer (*Z. w. Th.*, 1893) showed the priority of Paul, with many others. A. Hilgenfeld (*Einl.*)

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[1] On the contacts in general see Moffat, *Hist. N.T.*^{2} p. 578, on relation to Clem. R. see Bacon, "Doctrine of Faith in Hebrews, James and Clement of Rome," in *Jour. of Bib. Lit.*, 1900, pp. 12–21.

[2] *Das Urchristenthum*, 868, quoted by Cone, *loc. cit.*

[3] The logical relation of v. 12 to the context is problematical. Perhaps it may be accounted for by the order of the compend of Christian ethics the writer was following. Cf. Matt. v. 34–37 in relation to Matt. v. 12 (cf. ver. 10) and vi. 19 sqq. (cf. ver. 2, and iv. 13 seq.). The non-charismatic conception of healing, no longer the "gift" of some layman in the community (1 Cor. xii. 9 seq.) but a function of "the elders" (1 Tim. iv. 14), is another indication of comparatively late date.

and A. C. McGiffert (*Ap. Age*) place it in the period of Domitian; Baur (*Ch. History*), Schwegler (*Nachap. Zeitalt.*), Zeller, Volkmar (*Z. w. Th.*), Hausrath (*Ap. Age*), H. J. Holtzmann (*Einl.*), Jülicher (*Einl.*), Usteri (*St. u. Kr.*, 1889), W. Brückner (*Chron.*), H. v. Soden (*Hand-comm.*) and A. Harnack (*Chron.*) under Hadrian. A convenient synopsis of results will be found in J. Moffat, *Historical New Test.*^{2} (pp. 576–581), and in the articles *s.v.* "James" in *Encycl. Bibl.* and the Bible Dictionaries. (B. W. B.)

JAMESON, ANNA BROWNELL (1794–1860), British writer, was born in Dublin on the 17th of May 1794. Her father, Denis Brownell Murphy (d. 1842), a miniature and enamel painter, removed to England in 1798 with his family, and eventually settled at Hanwell, near London. At sixteen years of age Anna became governess in the family of the marquis of Winchester. In 1821 she was engaged to Robert Jameson. The engagement was broken off, and Anna Murphy accompanied a young pupil to Italy, writing in a fictitious character a narrative of what she saw and did. This diary she gave to a bookseller on condition of receiving a guitar if he secured any profits. Colburn ultimately published it as *The Diary of an Ennuyée* (1826), which attracted much attention. The author was governess to the children of Mr Littleton, afterwards Lord Hatherton, from 1821 to 1825, when she married Robert Jameson. The marriage proved unhappy; when, in 1829, Jameson was appointed puisne judge in the island of Dominica the couple separated without regret, and Mrs Jameson visited the Continent again with her father.

The first work which displayed her powers of original thought was her *Characteristics of Women* (1832). These analyses of Shakespeare's heroines are remarkable for delicacy of critical insight and fineness of literary touch. They are the result of a penetrating but essentially feminine mind, applied to the study of individuals of its own sex, detecting characteristics and defining differences not perceived by the ordinary critic and entirely overlooked by the general reader. German literature and art had aroused much interest in England, and Mrs Jameson paid her first visit to Germany in 1833. The conglomerations of hard lines, cold colours and pedantic subjects which decorated Munich under the patronage of King Louis of Bavaria, were new to the world, and Mrs Jameson's enthusiasm first gave them an English reputation.

In 1836 Mrs Jameson was summoned to Canada by her husband, who had been appointed chancellor of the province of Toronto. He failed to meet her at New York, and she was left to make her way alone at the worst season of the year to Toronto. After six months' experiment she felt it useless to prolong a life far from all ties of family happiness and opportunities of usefulness. Before leaving, she undertook a journey to the depths of the Indian settlements in Canada; she explored Lake Huron, and saw much of emigrant and Indian life unknown to travellers, which she afterwards embodied in her *Winter Studies and Summer Rambles*. She returned to England in 1838. At this period Mrs Jameson began making careful notes of the chief private art collections in and near London. The result appeared in her *Companion to the Private Galleries* (1842), followed in the same year by the *Handbook to the Public Galleries*. She edited the *Memoirs of the Early Italian Painters* in 1845. In the same year she visited her friend Ottilie von Goethe. Her friendship with Lady Byron dates from about this time and lasted for some seven years; it was brought to an end apparently through Lady Byron's unreasonable temper. A volume of essays published in 1846 contains one of Mrs Jameson's best pieces of work, *The House of Titian*. In 1847 she went to Italy with her niece and subsequent biographer (*Memoirs*, 1878), Geraldine Bate (Mrs Macpherson), to collect materials for the work on which her reputation rests—her series of *Sacred and Legendary Art*. The time was ripe for such contributions to the traveller's library. The *Acta Sanctorum* and the *Book of the Golden Legend* had had their readers, but no one had ever pointed out the connexion between these tales and the works of Christian art. The way to these studies had been pointed out in the preface to Kugler's *Handbook of Italian Painting* by Sir Charles Eastlake, who had intended pursuing the subject himself. Eventually he made over to Mrs Jameson the materials and references he had collected. She recognized the extent of the ground before her as a mingled sphere of poetry, history, devotion and art. She infected her readers with her own enthusiastic admiration; and, in spite of her slight technical and historical equipment, Mrs. Jameson produced a book which thoroughly deserved its great success.

She also took a keen interest in questions affecting the education, occupations and maintenance of her own sex. Her early essay on *The Relative Social Position of Mothers and Governesses* was the work of one who knew both sides; and in no respect does she more clearly prove the falseness of the position she describes than in the certainty with which she predicts its eventual reform. To her we owe the first popular enunciation of the principle of male and female co-operation in works of mercy and education. In her later years she took up a succession of subjects all bearing on the same principles of active benevolence and the best ways of carrying them into practice. Sisters of charity, hospitals, penitentiaries, prisons and workhouses all claimed her interest—all more or less included under those definitions of "the communion of love and communion of labour" which are inseparably connected with her memory. To the clear and temperate forms in which she brought the results of her convictions before her friends in the shape of private lectures—published as *Sisters of Charity* (1855) and *The Communion of Labour* (1856)—may be traced the source whence later reformers and philanthropists took counsel and courage.

Mrs Jameson died on the 17th of March 1860. She left the last of her *Sacred and Legendary Art* series in preparation. It was completed, under the title of *The History of Our Lord in Art*, by Lady Eastlake.

JAMESON (or JAMESONE), **GEORGE** (*c.* 1587–1644), Scottish portrait-painter, was born at Aberdeen, where his father was architect and a member of the guild. After studying painting under Rubens at Antwerp, with Vandyck as a fellow pupil, he returned in 1620 to Aberdeen, where he was married in 1624 and remained at least until 1630, after which he took up his residence in Edinburgh. He was employed by the magistrates of Edinburgh to copy several portraits of the Scottish kings for presentation to Charles I. on his first visit to Scotland in 1633, and the king rewarded him with a diamond ring from his own finger. This circumstance at once established Jameson's fame, and he soon found constant employment in painting the portraits of the Scottish nobility and gentry. He also painted a portrait of Charles, which he declined to sell to the magistrates of Aberdeen for the price they offered. He died at Edinburgh in 1644.

JAMESON, LEANDER STARR (1853–), British colonial statesman, son of R. W. Jameson, a writer to the signet in Edinburgh, was born at Edinburgh in 1853, and was educated for the medical profession at University College Hospital, London (M.R.C.S. 1875; M.D. 1877). After acting as house physician, house surgeon and demonstrator of anatomy, and showing promise of a successful professional career in London, his health broke down from overwork in 1878, and he went out to South Africa and settled down in practice at Kimberley. There he rapidly acquired a great reputation as a medical man, and, besides numbering President Kruger and the Matabele chief Lobengula among his patients, came much into contact with Cecil Rhodes. In 1888 his influence with Lobengula was successfully exerted to induce that chieftain to grant the concessions to the agents of Rhodes which led to the formation of the British South Africa Company; and when the company proceeded to open up Mashonaland, Jameson abandoned his medical practice and joined the pioneer expedition of 1890. From this time his fortunes were bound up with Rhodes's schemes in the north. Immediately after the pioneer column had occupied Mashonaland, Jameson, with F. C. Selous and A. R. Colquhoun, went east to Manicaland and was instrumental in securing the greater part of that country, to which Portugal was laying claim, for the Chartered Company. In 1891 Jameson succeeded Colquhoun as administrator of Rhodesia. The events connected with his vigorous administration and the wars with the Matabele are narrated under RHODESIA. At the end of 1894 "Dr Jim" (as he was familiarly called) came to England and was fêted on all sides; he was made a C.B., and returned to Africa in the spring of 1895 with enhanced prestige. On the last day of that year the world was startled to learn that Jameson, with a force of 600 men, had made a raid into the Transvaal from Mafeking in support of a projected rising in Johannesburg, which had been connived at by Rhodes at the Cape (see RHODES and TRANSVAAL). Jameson's force was compelled to surrender at Doornkop, receiving a guarantee that the lives of all would be spared; he and his officers were sent to Pretoria, and, after a short delay, during which time sections of the Boer populace clamoured for the execution of Jameson, President Kruger on the surrender of Johannesburg (January 7) handed them over to the British government for punishment. They were tried in London under the Foreign Enlistment Act in May 1896, and Dr Jameson was sentenced to fifteen months' inprisonment at Holloway. He served a year in prison, and was then released on account of ill health. He still retained the affections of the white population of Rhodesia, and subsequently returned there in an unofficial capacity. He was the constant companion of Rhodes on his journeys up to the end of his life, and when Rhodes died in May 1902 Jameson was left one of the executors of his will. In 1903 Jameson came forward as the leader of the Progressive (British) party in Cape Colony; and that party being victorious at the general election in January-February 1904, Jameson formed an administration in which he took the post of prime minister. He had to face a serious economic crisis and strenuously promoted the development of the agricultural and pastoral resources of the colony. He also passed a much needed Redistribution Act, and in the session of 1906 passed an Amnesty Act restoring the rebel voters to the franchise. Jameson, as prime minister of Cape Colony, attended the Colonial conference held in London in 1907. In September of that year the Cape parliament was dissolved, and as the elections for the legislative council went in favour of the Bond, Jameson resigned office, 31st of January 1908 (see CAPE COLONY: *History*). In 1908 he was chosen one of the delegates from Cape Colony to the intercolonial convention for the closer union of the South African states, and he took a prominent part in settling the terms on which union was effected in 1909. It was at Jameson's suggestion that the Orange River Colony was renamed Orange Free State Province.

JAMESON, ROBERT (1774–1854), Scottish naturalist and mineralogist, was born at Leith on the 11th of July 1774. He became assistant to a surgeon in his native town; but, having studied natural history under Dr John Walker in 1792 and 1793, he felt that his true province lay in that science. He went in 1800 to Freiberg to study for nearly two years under Werner, and spent two more in continental travel. In 1804 he succeeded Dr Walker as regius professor of natural history in Edinburgh university, and became perhaps the first eminent exponent in Great Britain of the Wernerian geological system; but when he found that theory untenable, he frankly announced his conversion to the views of Hutton. As a teacher, Jameson was remarkable for his power of imparting enthusiasm to his students, and from his class-room there radiated an influence which gave a marked impetus to the study of geology in Britain. His energy also, by means of government aid, private donation and personal outlay, amassed a great part of the splendid collection which now occupies the natural history department of the Royal Scottish Museum in Edinburgh. In 1819 Jameson, with Sir David Brewster, started the *Edinburgh Philosophical Journal*, which after the tenth volume remained under his sole conduct till his death, which took place in Edinburgh on the 19th of April 1854. His bust now stands in the hall of the Edinburgh University library.

Jameson was the author of *Outline of the Mineralogy of the Shetland Islands and of the Island of Arran* (1798), incorporated with *Mineralogy of the Scottish Isles* (1800); *Mineralogical Description of Scotland*, vol. i. pt. 1. (Dumfries, 1805); this was to have been the first of a series embracing all Scotland; *System of Mineralogy* (3 vols., 1804–1808; 3rd ed., 1820); *Elements of Geognosy* (1809); *Mineralogical Travels through the Hebrides, Orkney and Shetland Islands* (2 vols., 1813); and *Manual of Mineralogy* (1821); besides a number of occasional papers, of which a list will be found in the *Edinburgh New Philosophical Journal* for July 1854, along with a portrait and biographical sketch of the author.

JAMESTOWN, a city and the county-seat of Stutsman county, North Dakota, U.S.A., on the James River, about 93 m. W. of Fargo. Pop. (1900), 2853, of whom 587 were foreign-born; (1905) 5093; (1910) 4358. Jamestown is served by the Northern Pacific railway, of which it is a division headquarters. At Jamestown is St John's Academy, a school for girls, conducted by the Sisters of St Joseph. The state hospital for the insane is just beyond the city limits. The city is the commercial centre of a prosperous farming and stock-raising region in the James River valley, and has grain-elevators and flour-mills. Jamestown was first settled in 1873, near Fort Seward, a U.S. military post established in 1872 and abandoned in 1877, and was chartered as a city in 1883.

JAMESTOWN, a city of Chautauqua county, New York, U.S.A., at the S. outlet of Chautauqua Lake, 68 m. S. by W. of Buffalo. Pop. (1900), 22,892, of whom 7270 were foreign-born, mostly Swedish; (1910 census) 31,297. It is served by the Erie and the Jamestown, Chautauqua & Lake Erie railways, by electric lines extending along Lake Chautauqua to Lake Erie on the N. and to Warren, Pennsylvania, on the S., and by summer steamboat lines on Lake Chautauqua. Jamestown is situated among the hills of Chautauqua county, and is a popular summer resort. There is a free public library. A supply of natural gas (from Pennsylvania) and a fine water-power combine to render Jamestown a manufacturing centre of considerable importance. In 1905 the value of its factory products was $10,349,752, an increase of 33·9% since 1900. The city owns and operates its electric-lighting plant and its water-supply system, the water, of exceptional purity, being obtained from artesian wells 4 m. distant. Jamestown was settled in 1810, was incorporated in 1827, and was chartered as a city in 1886. The city was named in honour of James Prendergast, an early settler.

JAMESTOWN, a former village in what is now James City county, Virginia, U.S.A., on Jamestown Island, in the James River, about 40 m. above Norfolk. It was here that the first permanent English settlement in America was founded on the 13th of May 1607, that representative government was inaugurated on the American Continent in 1619, and that negro servitude was introduced into the original thirteen colonies, also in 1619. In Jamestown was the first Anglican church built in America. The settlement was in a low marshy district which proved to be unhealthy; it was accidentally burned in January 1608, was almost completely destroyed by Nathaniel Bacon in September 1676, the state house and other buildings were again burned in 1698, and after the removal of the seat of government of Virginia from Jamestown to the Middle Plantations (now Williamsburg) in 1699 the village fell rapidly into decay. Its population had never been large: it was about 490 in 1609, and 183 in 1623; the mortality was always very heavy. By the middle of the 19th century the peninsula on which Jamestown had been situated had become an island, and by 1900 the James River had worn away the shore but had hardly touched the territory of the "New Towne" (1619), immediately E. of the first settlement; almost the only visible remains, however, were the tower of the brick church and a few gravestones. In 1900 the association for the preservation of Virginia antiquities, to which the site was deeded in 1893, induced the United States government to build a wall to prevent the further encroachment of the river; the foundations of several of the old buildings have since been uncovered, many interesting relics have been found, and in 1907 there were erected a brick church (which is as far as possible a reproduction of the fourth one built in 1639–1647), a marble shaft marking the site of the first settlement, another shaft commemorating the first house of burgesses, a bronze monument to the memory of Captain John Smith, and another monument to the memory of Pocahontas. At the head of

Jamestown peninsula Cornwallis, in July 1781, attempted to trick the Americans under Lafayette and General Anthony Wayne by displaying a few men on the peninsula and concealing the principal part of his army on the mainland; but when Wayne discovered the trap he made first a vigorous charge, and then a retreat to Lafayette's line. Early in the Civil War the Confederates regarded the site (then an island) as of such strategic importance that (near the brick church tower and probably near the site of the first fortifications by the original settlers) they erected heavy earthworks upon it for defence. (For additional details concerning the early history of Jamestown, see Virginia: *History*.)

The founding at Jamestown of the first permanent English-speaking settlement in America was celebrated in 1907 by the Jamestown tercentennial exposition, held on grounds at Sewell's Point on the shore of Hampton Roads. About twenty foreign nations, the federal government, and most of the states of the union took part in the exposition.

See L. G. Tyler, *The Cradle of the Republic: Jamestown and James River* (Richmond, 2nd ed., 1906); Mrs R. A. Pryor, *The Birth of the Nation: Jamestown, 1607* (New York, 1907); and particularly S. H. Yonge, *The Site of Old "James Towne," 1607–1698* (Richmond, 1904), embodying the results of the topographical investigations of the engineer in charge of the river-wall built in 1900–1901.

JĀMĪ (Nūr-ed-din ʽAbd-ur-raḥman Ibn Aḥmad) (1414–1492), Persian poet and mystic, was born at Jām in Khorasan, whence the name by which he is usually known. In his poems he mystically utilizes the connexion of the name with the same word meaning "wine-cup." He was the last great classic poet of Persia, and a pronounced mystic of the Sūfic philosophy. His three *diwans* (1479–1491) contain his lyrical poems and odes; among his prose writings the chief is his *Bahāristān* ("Spring-garden") (1487); and his collection of romantic poems, *Haft Aurang* ("Seven Thrones"), contains the *Salāmān wa Absāl* and his *Yūsuf wa Zalīkha* (Joseph and Potiphar's wife).

On Jāmī's life and works see V. von Rosenzweig, *Biographische Notizen über Mewlana Abdurrahman Dschami* (Vienna, 1840); Gore Ouseley, *Biographical Notices of Persian Poets* (1846); W. N. Lees, *A Biographical Sketch of the Mystic Philosopher and Poet Jami* (Calcutta, 1859); E. Beauvois *s.v.* Djami in *Nouvelle Biographie générale*; and H. Ethé in Geiger and Kuhn's *Grundriss der iranischen Philologie*, ii. There are English translations of the *Bahāristān* by E. Rehatsek (Benares, 1887) and Sorabji Fardunji (Bombay, 1899); of *Salāmān wa Absāl* by Edward FitzGerald (1856, with a notice of Jāmī's life); of *Yūsuf wa Zalīkha* by R. T. H. Griffith (1882) and A. Rogers (1892); also selections in English by F. Hadland Davis, *The Persian Mystics: Jāmī* (1908). (See also Persia: *Literature*.)

JAMIESON, JOHN (1759–1838), Scottish lexicographer, son of a minister, was born in Glasgow, on the 3rd of March 1759. He was educated at Glasgow University, and subsequently attended classes in Edinburgh. After six years' theological study, Jamieson was licensed to preach in 1789 and became pastor of an Anti-burgher congregation in Forfar; and in 1797 he was called to the Anti-burgher church in Nicolson Street, Edinburgh. The union of the Burgher and Anti-burgher sections of the Secession Church in 1820 was largely due to his exertions. He retired from the ministry in 1830 and died in Edinburgh on the 12th of July 1838.

Jamieson's name stands at the head of a tolerably long list of works in the *Bibliotheca britannica*; but by far his most important book is the laborious and erudite compilation, best described by its own title-page: *An Etymological Dictionary of the Scottish Language; illustrating the words in their different significations by examples from Ancient and Modern Writers; shewing their Affinity to those of other Languages, and especially the Northern; explaining many terms which though now obsolete in England were formerly common to both countries; and elucidating National Rites, Customs and Institutions in their Analogy to those of other nations; to which is prefixed a Dissertation on the Origin of the Scottish Language.* This appeared in 2 vols., 4to, at Edinburgh in 1808, followed in 1825 by a *Supplement*, in 2 vols., 4to, in which he was assisted by scholars in all parts of the country. A revised edition by Longmuir and Donaldson was issued in 1879–1887.

JAMIESON, ROBERT (*c.* 1780-1844), Scottish antiquary, was born in Morayshire. In 1806 he published a collection of *Popular Ballads and Songs from Tradition, Manuscript and Scarce Editions.* Two pleasing lyrics of his own were included. Scott, through whose assistance he received a government post at Edinburgh, held Jamieson in high esteem and pointed out his skill in discovering the connexion between Scandinavian and Scottish legends. Jamieson's work preserved much oral tradition which might otherwise have been lost. He was associated with Henry Weber and Scott in *Illustrations of Northern Antiquities* (1814). He died on the 24th of September 1844.

JAMKHANDI, a native state of India, in the Deccan division of Bombay, ranking as one of the southern Mahratta Jagirs. Area, 524 sq. m. Pop. (1901), 105,357; estimated revenue, £37,000; tribute, £1300. The chief is a Brahman of the Patwardhan family. Cotton, wheat and millet are produced, and cotton and silk cloth are manufactured, though not exported. The town of Jamkhandi, the capital, is situated 68 m. E. of Kolhapur. Pop. (1901), 13,029.

JAMMU, or Jummoo, the capital of the state of Jammu and Kashmir in Northern India, on the river Tavi (Ta-wi), a tributary of the Chenab. Pop. (1901), 36,130. The town and palace stand upon the right bank of the river; the fort overhangs the left bank at an elevation of 150 ft. above the stream. The lofty whitened walls of the palace and citadel present a striking appearance from the surrounding country. Extensive pleasure grounds and ruins of great size attest the former prosperity of the city when it was the seat of a Rajput dynasty whose dominions extended into the plains and included the modern district of Sialkot. It was afterwards conquered by the Sikhs, and formed part of Ranjit Singh's dominions. After his death it was acquired by Gulab Singh as the nucleus of his dominions, to which the British added Kashmir in 1846. It is connected with Sialkot in the Punjab by a railway 16 m. long. In 1898 the town was devastated by a fire, which destroyed most of the public offices.

The state of Jammu proper, as opposed to Kashmir, consists of a submontane tract, forming the upper basin of the Chenab. Pop. (1901), 1,521,307, showing an increase of 5% in the decade. A land settlement has recently been introduced under British supervision.

JAMNIA (Ἰαμνία or Ἰαμνεία), the Greek form of the Hebrew name Jabneel—*i.e.* "God causeth to build" (Josh. xv. 11)—or Jabneh (2 Chron. xxvi. 6), the modern Arabic Yebna, a town of Palestine, on the border between Dan and Judah, situated 13 m. S. of Jaffa, and 4 m. E. of the seashore. The modern village stands on an isolated sandy hillock, surrounded by gardens with olives to the north and sand-dunes to the west. It contains a small crusaders' church, now a mosque. Jamnia belonged to the Philistines, and Uzziah of Judah is said to have taken it (2 Chron. xxvi. 6). In Maccabean times Joseph and Azarias attacked it unsuccessfully (1 Macc. v. 55–62; 2 Macc. xii. 8 seq. is untrustworthy). Alexander Jannaeus subdued it, and under Pompey it became Roman. It changed hands several times, is mentioned by Strabo (xvi. 2) as being once very populous, and in the Jewish war was taken by Vespasian. The population was mainly Jewish (Philo, *Leg. ad Gaium*, § 30), and the town is principally famous as having been the seat of the Sanhedrin and the religious centre of Judaism from A.D. 70 to 135. It sent a bishop to Nicaea in 325. In 1144 a crusaders' fortress was built on the hill, which is often mentioned under the name Ibelin. There was also a Jabneel in Lower Galilee (Josh. xix. 33), called later Caphar Yama, the present village Yemma, 8 m. S. of Tiberias; and another fortress in Upper Galilee was named Jamnia (Josephus, *Vita*, 37). Attempts have been made to unify these two Galilean sites, but without success.

JAMRUD, a fort and cantonment in India, just beyond the border of Peshawar district, North-West Frontier Province, situated at the mouth of the Khyber Pass, 10½ m. W. of Peshawar city, with which it is connected by a branch railway. It was occupied by Hari Singh, Ranjit Singh's commander in 1836; but in April 1837 Dost Mahommed sent a body of Afghans to attack it. The Sikhs gained a doubtful victory, with the loss of their general. During the military operations of 1878–79 Jamrud became a place of considerable importance as the frontier outpost on British territory towards Afghanistan, and it was also the base of operations for a portion of the Tirah campaign in 1897–1898. It is the headquarters of the Khyber Rifles, and the collecting station for the Khyber tolls. Pop. (1901), 1848.

JAMS AND JELLIES. In the article Food Preservation it is pointed out that concentrated sugar solution inhibits the growth of organisms and has, therefore, a preservative action. The preparation of jams and jellies is based upon that fact. All fresh and succulent fruit contains a large percentage of water, amounting to at least four-fifths of the whole, and a comparatively small proportion of sugar, not exceeding as a rule from 10 to 15%. Such fruit is naturally liable to decomposition unless the greater proportion of the water is removed or the percentage of sugar is greatly increased. The jams and jellies of commerce are fruit preserves containing so much added sugar that the total amount of sugar forms about two-thirds of the weight of the articles. All ordinary edible fruit can be and is made into jam. The fruit is sometimes pulped and stoned, sometimes used whole and unbroken; oranges are sliced or shredded. For the preparation of jellies only certain fruit is suitable, namely such as contains a peculiar material which on boiling becomes dissolved and on cooling solidifies with the formation of a gelatinous mass. This material, often called *pectin*, occurs mainly in comparatively acid fruit like gooseberries, currants and apples, and is almost absent from strawberries and raspberries. It is chemically a member of the group of carbohydrates, is closely allied with vegetable gums abundantly formed by certain sea-weeds and mosses (agar-agar and Iceland moss), and is probably a mixture of various pentoses. Pentoses are devoid of food-value, but, like animal gelatine, with which they are in no way related, can form vehicles for food material. Some degree of gelatinization is aimed at also in jams; hence to such fruits as have no gelatinizing power an addition of apple or gooseberry juice, or even of Iceland moss or agar-agar, is made. Animal gelatin is very rarely used.

The art of jam and jelly making was formerly domestic, but has become a very large branch of manufacture. For the production of a thoroughly satisfactory conserve the boiling-down must be carried out very rapidly, so that the natural colour of the fruit shall be little affected. Considerable experience is required to stop at the right point; too short boiling leaves an excess of water, leading to fermentation, while over-concentration promotes crystallization of the sugar. The manufactured product is on that account, as a rule, more uniform and bright than the domestic article. The finish of the boiling is mostly judged by rule of thumb, but in some scientifically conducted factories careful thermometric observation is employed. Formerly jams and jellies consisted of nothing but fruit and sugar; now starch-glucose is frequently used by manufacturers as an ingredient. This permits of the production of a slightly more aqueous and gelatinous product, alleged also to be devoid of crystallizing power, as compared with the home-made article. The addition of starch-glucose is not held to be an adulteration. Aniline colours are very frequently used by manufacturers to enhance the colour, and the effect of an excess of water is sought to be counteracted by the addition of some salicylic acid or other preservative. There has long been, and still exists to some extent, a popular prejudice in favour of sugar obtained from the sugar-cane as compared with that of the sugar-beet. This prejudice is absolutely baseless, and enormous quantities of beet-sugar are used in the boiling of jam. Adulteration in the gross sense, such as a substantial addition of coarse pulp, like that of turnips or mangolds, very rarely occurs; but the pulp of apple and other cheap fruit is often admixed without notice to the purchaser. The use of colouring matters and preservatives is discussed at length in the article Adulteration. (O. H.*)

JANESVILLE, a city and the county-seat of Rock County, Wisconsin, U.S.A., situated on both sides of the Rock river, 70 m. S.W. of Milwaukee and 90 m. N.W. of Chicago. Pop. (1900), 13,185, of whom 2409 were foreign-born; (1910 census), 13,894. It is served by the Chicago & North-Western and the Chicago, Milwaukee & St Paul railways, and by electric lines connecting with Madison and Beloit, Wis., and Rockford, Illinois. The Rock river is not commercially navigable at this point, but furnishes valuable water-power for manufacturing purposes. The city is picturesquely situated on bluffs above the river. Janesville is the centre of the tobacco trade of the state, and has various manufactures. The total value of the city's factory product in 1905 was $3,846,038, an increase of 20·8 % since 1900. Its public buildings include a city hall, court house, post office, city hospital and a public library. It is the seat of a school for the blind, opened as a private institution in 1849 and taken over by the state in 1850, the first charitable institution controlled by the state, ranking as one of the most successful of its kind in the United States. The first settlement was made here about 1834. Janesville was named in honour of Henry F. Janes, an early settler, and was chartered as a city in 1853.

JANET, PAUL (1823–1899), French philosophical writer, was born in Paris on the 30th of April 1823. He was professor of moral philosophy at Bourges (1845–1848) and Strassburg (1848–1857), and of logic at the lycée Louis-le-Grand, Paris (1857–1864). In 1864 he was appointed to the chair of philosophy at the Sorbonne, and elected a member of the academy of the moral and political sciences. He wrote a large number of books and articles upon philosophy, politics and ethics, on idealistic lines: *La Famille*, *Histoire de la philosophie dans l'antiquité et dans le temps moderne*, *Histoire de la science politique*, *Philosophie de la Révolution Française*, &c. They are not characterized by much originality of thought. In philosophy he was a follower of Victor Cousin, and through him of Hegel. His principal work in this line, *Théorie de la morale*, is little more than a somewhat patronizing reproduction of Kant. He died in October 1899.

JANGIPUR, or Jahangirpur, a town of British India, in Murshidabad district, Bengal, situated on the Bhagirathi. Pop. (1901), 10,921. The town is said to have been founded by the Mogul emperor Jahangir. During the early years of British rule it was an important centre of the silk trade, and the site of one of the East India Company's commercial residencies. Jangipur is now best known as the toll station for registering all the traffic on the Bhagirathi. The number of boats registered annually is about 10,000.

JANIN, JULES GABRIEL (1804–1874), French critic, was born at St Étienne (Loire) on the 16th of February 1804, and died near Paris on the 19th of June 1874. His father was a lawyer, and he was well educated, first at St Étienne, and then at the lycée Louis-le-Grand in Paris. He betook himself to journalism very early, and worked on the *Figaro*, the *Quotidienne*, &c., until in 1830 he became dramatic critic of the *Journal des Débats*. Long before this, however, he had made a considerable literary reputation, for which indeed his strange novel *L'Âne mort et la femme guillotinée* (1829) would have sufficed. *La Confession* (1830), which followed, was less remarkable in substance but even more so in style; and in *Barnave* (1831) he attacked the Orleans family. From the day, however, when Janin became the theatrical critic of the *Débats*, though he continued to write books indefatigably, he was to most Frenchmen a dramatic critic and nothing more. He was outrageously inconsistent, and judged things from no general point of view whatsoever, though his judgment was usually good-natured. Few journalists have ever been masters of a more attractive fashion of saying the first thing that came into their heads. After many years of *feuilleton* writing he collected some of his articles in the work called *Histoire de la littérature dramatique en France* (1853–1858), which by no means deserves its title. In 1865 he made his first attempt upon the Academy, but was not successful till five years later. Meanwhile he had not been content with his *feuilletons*, written persistently about all manner of things. No one was more in request with the Paris publishers for prefaces, letterpress to illustrated books and such trifles. He travelled (picking up in one of his journeys a curious windfall, a country house at Lucca, in a lottery), and wrote accounts of his travels; he wrote numerous tales and novels, and composed many other works, of which by far the best is the *Fin d'un monde et du neveu de Rameau* (1861), in which, under the guise of a sequel to Diderot's masterpiece, he showed his great familiarity with the late 18th century. He married in 1841; his wife had money, and he was always in easy circumstances. In the early part of his career he had many quarrels, notably one with Félix Pyat (1810–1889), whom he prosecuted successfully for defamation of character. For the most part his work is mere improvisation, and has few elements of vitality except a light and vivid style. His *Œuvres choisies* (12 vols., 1875–1878) were edited by A. de la Fitzelière.

A study on Janin with a bibliography was published by A. Piédagnel in 1874. See also Sainte-Beuve, *Causeries du lundi*, ii. and v., and Gustave Planche, *Portraits littéraires*.

JANISSARIES (corrupted from Turkish *yeni chêri*, new troops), an organized military force constituting until 1826 the standing army of the Ottoman empire. At the outset of her history Turkey possessed no standing army. All Moslems capable of bearing arms served as a kind of volunteer yeomanry known as *akinjis*; they were summoned by public criers, or, if the occasion required it, by secret messengers. It was under Orkhan that a regular paid army was first organized: the soldiers were known as *yaya* or *piyadê*. The result was unsatisfactory, as the Turcomans, from whom these troops were recruited, were unaccustomed to fight on foot or to submit to military discipline. Accordingly in 1330, on the advice of Chendéréli Kara Khalil, the system known as *devshurmé* or forced levy, was adopted, whereby a certain number of Christian youths (at first 1000) were every year taken from their parents and, after undergoing a period of apprenticeship, were enrolled as *yeni chêri* or new troops. The venerable saint Haji Bektash, founder of the Bektashi dervishes, blessed the corps and promised them victory; he remained ever after the patron saint of the janissaries.

At first the corps was exclusively recruited by the forced levy of Christian children, for which purpose the officer known as *tournaji-bashi*, or head-keeper of the cranes, made periodical tours in the provinces. The fixed organization of the corps dates only from Mahommed II., and its regulations were subsequently modified by Suleiman I. In early days all Christians were enrolled indiscriminately; later those from Albania, Bosnia and Bulgaria were preferred. The recruits while serving their apprenticeship were instructed in the principles of the faith by *khojas*, but according to D'Ohsson (vii. 327) they were not obliged to become Moslems.

The entire corps, commanded by the aga of the janissaries, was known as the *ojak* (hearth); it was divided into *ortas* or units of varying numbers; the *oda* (room) was the name given to the barracks in which the janissaries were lodged. There were, after the reorganization of Suleiman I., 196 ortas of three classes, viz. the *jemaat*, comprising 101 ortas, the *beuluk*, 61 ortas, and the *sekban*, or *seimen*, 34 ortas; to these must be added 34 ortas of *ajami* or apprentices. The strength of the orta varied greatly, sometimes being as low as 100, sometimes rising considerably beyond its nominal war strength of 500. The distinction between the different classes seems to have been principally in name; in theory the jemaat, or *yaya beiler*, were specially charged with the duty of frontier-guards; the *beuluks* had the privilege of serving as the sultan's guards and of keeping the sacred banner in their custody.

Until the accession of Murad III. (1574) the total effective of the janissaries, including the ajami or apprentices, did not exceed 20,000. In 1582 irregularities in the mode of admission to the ranks began. Soon parents themselves begged to have their children enrolled, so great were the privileges attaching to the corps; later the privilege of enlistment was restricted to the children or relatives of former janissaries; eventually the regulations were much relaxed, and any person was admitted, only negroes being excluded. In 1591 the ojak numbered 48,688 men. Under Ibrahim (1640–1648) it was reduced by Kara Mustafa to 17,000; but it soon rose again, and at the accession of Mahommed IV. (1648), the accession-bakshish was distributed to 50,000 janissaries. During the war of 1683–1698 the rules for admission were suspended, 30,000 recruits being received at one time, and the effective of the corps rising to 70,000; about 1805 it numbered more than 112,000; it went on increasing until the destruction of the janissaries, when it reached 135,000. It would perhaps be more correct to say that these are the numbers figuring on the pay-sheets, and that they doubtless largely exceed the total of the men actually serving in the ranks.

Promotion to the rank of warrant officer was obtained by long or distinguished service; it was by seniority up to the rank of *odabashi*, but odabashis were promoted to the rank of *chorbaji* (commander of an orta) solely by selection. Janissaries advanced in their own orta, which they left only to assume the command of another. Ortas remained permanently stationed in the fortress towns in which they were in garrison, being displaced in time of peace only when some violent animosity broke out between two companies. There were usually 12 in garrison at Belgrade, 14 at Khotin, 16 at Widdin, 20 at Bagdad, &c. The commander was frequently changed. A new chorbaji was usually appointed to the command of an orta stationed at a frontier post; he was then transferred elsewhere, so that in course of time he passed through different provinces.

In time of peace the janissary received no pay. At first his war pay was limited to one aspre per diem, but it was eventually raised to a minimum of three aspres, while veterans received as much as 29 aspres, and retired officers from 30 to 120. The aga received 24,000 piastres per annum; the ordinary pay of a commander was 120 aspres per diem. The aga and several of his subordinates received a percentage of the pay and allowance of the troops; they also inherited the property of deceased janissaries. Moreover, the officers profited largely by retaining the names of dead or fictitious janissaries on the pay-rolls. Rations of mutton, bread and candles were furnished by the government, the supply of rice, butter and vegetables being at the charge of the commandant. The rations would have been entirely inadequate if the janissaries had not been allowed, contrary to the regulations, to pursue different callings, such as those of baker, butcher, glazier, boatman, &c. At first the janissaries bore no other distinctive mark save the white felt cap. Soon the red cap with gold embroidery was substituted. Later a uniform was introduced, of which the distinctive mark was less the colour than the cut of the coat and the shape of the head-dress and turban. The only distinction in the costume of commanding officers was in the colour of their boots, those of the beuluks being red while the others were yellow; subordinate officers wore black boots.

The fundamental laws of the janissaries, which were very early infringed, were as follows: implicit obedience to their officers; perfect accord and union among themselves; abstinence from luxury, extravagance and practices unseemly for a soldier and a brave man; observance of the rules of Haji Bektash and of the religious law; exclusion from the ranks of all save those properly levied; special rules for the infliction of the death-penalty; promotion to be by seniority; janissaries to be admonished or punished by their own officers only; the infirm and unfit to be pensioned; janissaries were not to let their beards grow, not to marry, nor to leave their barracks, nor to engage in trade; but were to spend their time in drill and in practising the arts of war.

In time of peace the state supplied no arms, and the janissaries on service in the capital were armed only with clubs; they were forbidden to carry any arm save a cutlass, the only exception being at the frontier-posts. In time of war the janissaries provided their own arms, and these might be any which took their fancy. However, they were induced by rivalry to procure the best obtainable and to keep them in perfect order. The banner of the janissaries was of white silk on which verses from the Koran were embroidered in gold. This banner was planted beside the aga's tent in camp, with four other flags in red cases, and his three horse-tails. Each orta had its flag, half-red and half-yellow, placed before the tent of its commander. Each orta had two or three great caldrons used for boiling the soup and pilaw; these were under the guard of subordinate officers. A particular superstition attached to them: if they were lost in battle all the officers were disgraced, and the orta was no longer allowed to parade with its caldrons in public ceremonies. The janissaries were stationed in most of the guard-houses of Constantinople and other large towns. No sentries were on duty, but patrols were sent out two or three times a day. It was customary for the sultan or the grand vizier to bestow largess on an orta which they might visit.

The janissaries conducted themselves with extreme violence and brutality towards civilians. They extorted money from them on every possible pretext: thus, it was their duty to sweep the streets in the immediate vicinity of their barracks, but they forced the civilians, especially if rayas, to perform this task or to pay a bribe. They were themselves subject to severe corporal punishments; if these were to take place publicly the ojak was first asked for its consent.

At first a source of strength to Turkey as being the only well-organized and disciplined force in the country, the janissaries soon became its bane, thanks to their lawlessness and exactions. One frequent means of exhibiting their discontent was to set fire to Constantinople; 140 such fires are said to have been caused during the 28 years of Ahmed III.'s reign. The janissaries were at all times distinguished for their want of respect towards the sultans; their outbreaks were never due to a real desire for reforms of abuses or of misgovernment, but were solely caused to obtain the downfall of some obnoxious minister.

The first recorded revolt of the janissaries is in 1443, on the occasion of the second accession of Mahommed II., when they broke into rebellion at Adrianople. A similar revolt happened at his death, when Bayazid II. was forced to yield to their demands and thus the custom of the accession-bakshish was established; at the end of his reign it was the janissaries who forced Bayazid to summon Prince Selim and to hand over the reins of power to him. During the Persian campaign of Selim I. they mutinied more than once. Under Osman II. their disorders reached their greatest height and led to the dethronement and murder of the sultan. It would be tedious to recall all their acts of insubordination. Throughout Turkish history they were made use of as instruments by unscrupulous and ambitious statesmen, and in the 17th century they had become a praetorian guard in the worst sense of the word. Sultan Selim III. in despair endeavoured to organize a properly drilled and disciplined force, under the name of *nizam-i-jedid*, to take their place; for some time the janissaries regarded this attempt in sullen silence; a curious detail is that Napoleon's ambassador Sebastiani strongly dissuaded the sultan from taking this step. Again serving as tools, the janissaries dethroned Selim III. and obtained the abolition of the nizam-i-jedid. But after the successful revolution of Bairakdar Pasha of Widdin the new troops were re-established and drilled: the resentment of the janissaries rose to such a height that they attacked the grand vizier's house, and after destroying it marched against the sultan's palace. They were repulsed by cannon, losing 600 men in the affair (1806). But such was the excitement and alarm caused at Constantinople that the nizam-i-jedid, or *sekbans* as they were now called, had to be suppressed. During the next 20 years the insolence and turbulence of the janissaries knew no bounds. Sultan Mahmud II., powerfully impressed by their violence and lawlessness at his accession, and with the example of Mehemet Ali's method of suppressing the Mamlukes before his eyes, determined to rid the state of this scourge; long biding his time, in 1825 he decided to form a corps of regular drilled troops known as *eshkenjis*. A *fetva* was obtained from the Sheikh-ul-Islam to the effect that it was the duty of Moslems to acquire military science. The imperial decree announcing the formation of the new troops was promulgated at a grand council, and the high dignitaries present (including certain of the principal officers of the janissaries who concurred) undertook to comply with its provisions. But the janissaries rose in revolt, and on the 10th of June 1826, began to collect on the Et Meidan square at Constantinople: at midnight they attacked the house of the aga of janissaries, and, finding he had made good his escape, proceeded to overturn the caldrons of as many ortas as they could find, thus forcing the troops of those ortas to join the insurrection. Then they pillaged and robbed throughout the town. Meanwhile the government was collecting its forces: the ulema, consulted by the sultan, gave the following fetva: "If unjust and violent men attack their brethren, fight against the aggressors and send them before their natural judge!" On this the sacred standard of the prophet was unfurled, and war was formally declared against these disturbers of order. Cannon were brought against the Et Meidan, which was surrounded by troops. Ibrahim Aga, known as Kara Jehennum, the commander of the artillery, made a last appeal to the janissaries to surrender; they refused, and fire was opened upon them. Such as escaped were shot down as they fled; the barracks where many found refuge were burnt; those who were taken prisoner were brought before the grand vizier and hanged. Before many days were over the corps had ceased to exist, and the janissaries, the glory of Turkey's early days and the scourge of the country for the last two centuries, had passed for ever from the page of her history.

See M. d'Ohsson, *Tableaux de l'empire ottoman* (Paris, 1787–1820); Ahmed Vefyk, *Lehjé-i-osmanié* (Constantinople, 1290–1874); A. Djévad Bey, *État militaire ottoman* (Constantinople, 1885).

JANIUAY, a town of the province of Iloilo, Panay, Philippine Islands, on the Suague river, about 20 m. W.N.W. of Iloilo, the capital. Pop. (1903), 27,399, including Lambúnao (6661) annexed to Janiuay in 1903. The town commands delightful views of mountain and valley scenery. An excellent road connects it with Pototan, about 10 m. E. The surrounding country is hilly but fertile and well cultivated, producing rice, sugar, tobacco, vegetables (for the Iloilo market), hemp and Indian corn. The women weave and sell beautiful fabrics of pina, silk, cotton and abaca. The language is Panay-Visayan. Janiuay was founded in 1578; it was first established in the mountains and was subsequently removed to its present site.

JANJIRA, a native state of India, in the Konkan division of Bombay, situated along the coast among the spurs of the Western Ghats, 40 m. S. of Bombay city. Area, 324 sq. m. Pop. (1901), 85,414, showing an increase of 4% in the decade. The estimated revenue is about £37,000; there is no tribute. The chief, whose title is Nawab Sahib, is by descent a Sidi or Abyssinian Mahommedan; and his ancestors were for many generations admirals of the Mahommedan rulers of the Deccan. The state, popularly known as Habsan (=Abyssinian), did not come under direct subordination to the British until 1870. It supplies sailors and fishermen, and also firewood, to Bombay, with which it is in regular communication by steamer.

The Nawab of Janjira is also chief of the state of JAFARABAD (*q.v.*).

JAN MAYEN, an arctic island between Greenland and the north of Norway, about 71° N. 8° W. It is 34 m. long and 9 in greatest breadth, and is divided into two parts by a narrow isthmus. The island is of volcanic formation and mountainous, the highest summit being Beerenberg in the north (8350 ft.). Volcanic eruptions have been observed. Glaciers are fully developed. Henry Hudson discovered the island in 1607 and called it Hudson's Tutches or Touches. Thereafter it was several times observed by navigators who successively claimed its discovery and renamed it. Thus, in 1611 or the following year whalers from Hull named it Trinity Island; in 1612 Jean Vrolicq, a French whaler, called it Île de Richelieu; and in 1614 Joris Carolus named one of its promontories Jan Meys Hoek after the captain of one of his ships. The present name of the island is derived from this, the claim of its discovery by a Dutch navigator, Jan Mayen, in 1611, being unsupportable. The island is not permanently inhabited, but has been frequently visited by explorers, sealers and whalers; and an Austrian station for scientific observations was maintained here for a year in 1882–1883. During this period a mean temperature of 27·8° F. was recorded.

JANSEN, CORNELIUS (1585–1638), bishop of Ypres, and father of the religious revival known as Jansenism, was born of humble Catholic parentage at Accoy in the province of Utrecht on the 28th of October 1585. In 1602 he entered the university of Louvain, then in the throes of a violent conflict between the Jesuit, or scholastic, party and the followers of Michael Baius, who swore by St Augustine. Jansen ended by attaching himself strongly to the latter party, and presently made a momentous friendship with a like-minded fellow-student, Du Vergier de Hauranne, afterwards abbot of Saint Cyran. After taking his degree he went to Paris, partly to recruit his health by a change of scene, partly to study Greek. Eventually he joined Du Vergier at his country home near Bayonne, and spent some years teaching at the bishop's college. All his spare time was spent in studying the early Fathers with Du Vergier, and laying plans for a reformation of the Church. In 1616 he returned to Louvain, to take charge of the college of St Pulcheria, a hostel for Dutch students of theology. Pupils found him a somewhat choleric and exacting master and academic society a great recluse. However, he took an active part in the university's resistance to the Jesuits; for these had established a theological school of their own in Louvain, which was proving a formidable rival to the official faculty of divinity. In the hope of repressing their encroachments, Jansen was sent twice to Madrid, in 1624 and 1626; the second time he narrowly escaped the Inquisition. He warmly supported the Catholic missionary bishop of Holland, Rovenius, in his contests with the Jesuits, who were trying to evangelize that country without regard to the bishop's wishes. He also crossed swords more than once with the Dutch Presbyterian champion, Voetius, still remembered for his attacks on Descartes. Antipathy to the Jesuits brought Jansen no nearer Protestantism; on the contrary, he yearned to beat these by their own weapons, chiefly by showing them that Catholics could interpret the Bible in a manner quite as mystical and pietistic as theirs. This became the great object of his lectures, when he was appointed regius professor of scriptural interpretation at Louvain in 1630. Still more was it the object of his *Augustinus*, a bulky treatise on the theology of St Augustine, barely finished at the time of his death. Preparing it had been his chief occupation ever since he went back to Louvain. But Jansen, as he said, did not mean to be a school-pedant all his life; and there were moments when he dreamed political dreams. He looked forward to a time when Belgium should throw off the Spanish yoke and become an independent Catholic republic on the model of Protestant Holland. These ideas became known to his Spanish rulers, and to assuage them he wrote a philippic called the *Mars gallicus* (1635), a violent attack on French ambitions generally, and on Richelieu's indifference to international Catholic interests in particular. The *Mars gallicus* did not do much to help Jansen's friends in France, but it more than appeased the wrath of Madrid with Jansen himself; in 1636 he was appointed bishop of Ypres. Within two years he was cut off by a sudden illness on the 6th of May 1638; the *Augustinus*, the book of his life, was published posthumously in 1640.

Full details as to Jansen's career will be found in Reuchlin's *Geschichte von Port Royal* (Hamburg, 1839), vol. i. See also *Jansénius* by the Abbés Callawaert and Nols (Louvain, 1893). (St C.)

JANSENISM, the religious principles laid down by Cornelius Jansen in his *Augustinus*. This was simply a digest of the teaching of St Augustine, drawn up with a special eye to the needs of the 17th century. In Jansen's opinion the church was suffering from three evils. The official scholastic theology was anything but evangelical. Having set out to embody the mysteries of faith in human language, it had fallen a victim to the excellence of its own methods; language proved too strong for mystery. Theology sank into a branch of dialectic; whatever would not fit in with a logical formula was cast aside as useless. But average human nature does not take kindly to a syllogism, and theology had ceased to have any appreciable influence on popular religion. Simple souls found their spiritual pasture in little mincing "devotions"; while robuster minds built up for themselves a natural moralistic religion, quite as close to Epictetus as to Christianity. All these three evils were attacked by Jansen. As against the theologians, he urged that in a spiritual religion experience, not reason, must be our guide. As against the stoical self-sufficiency of the moralists, he dwelt on the helplessness of man and his dependence on his maker. As against the ceremonialists, he maintained that no amount of church-going will save a man, unless the love of God is in him. But this capacity for love no one can give himself. If he is born without the religious instinct, he can only receive it by going through a process of "conversion." And whether God converts this man or that depends on his good pleasure. Thus Jansen's theories of conversion melt into predestination; although, in doing so, they somewhat modify its grimness. Even for the worst miscreant there is hope—for who can say but that God may yet think fit to convert him? Jansen's thoughts went back every moment to his two spiritual heroes, St Augustine and St Paul, each of whom had been "the chief of sinners."

Such doctrines have a marked analogy to those of Calvin; but in many ways Jansen differed widely from the Protestants. He vehemently rejected their doctrine of justification by faith; conversion might be instantaneous, but it was only the beginning of a long and gradual process of justification. Secondly, although the one thing necessary in religion was a personal relation of the human soul to its maker, Jansen held that that relation was only possible in and through the Roman Church. Herein he was following Augustine, who had managed to couple together a high theory of church authority and sacramental grace with a strongly personal religion. But the circumstances of the 17th century were not those of the 5th; and Jansen landed his followers in an inextricable confusion. What were they to do, when the outward church said one thing, and the inward voice said another? Some time went by, however, before the two authorities came into open conflict. Jansen's ideas were popularized in France by his friend Du Vergier, abbot of St Cyran; and he dwelt mainly on the practical side of the matter—on the necessity of conversion and love of God, as the basis of the religious life. This brought him into conflict with the Jesuits, whom he accused of giving absolution much too easily, without any serious inquiry into the dispositions of their penitent. His views are expounded at length by his disciple, Antoine Arnauld, in a book on *Frequent Communion* (1643). This book was the first manifestation of Jansenism to the general public in France, and raised a violent storm. But many divines supported Arnauld; and no official action was taken against his party till 1649. In that year the Paris University condemned five propositions from Jansen's *Augustinus*, all relative to predestination. This censure, backed by the signatures of eighty-five bishops, was sent up to Rome for endorsement; and in 1653 Pope Innocent X. declared all five propositions heretical.

This decree placed the Jansenists between two fires; for although the five propositions only represented one side of Jansen's teaching, it was recognized by both parties that the whole question was to be fought out on this issue. Under the leadership of Arnauld, who came of a great family of lawyers, the Jansenists accordingly took refuge in a series of legal tactics. Firstly, they denied that Jansen had meant the propositions in the sense condemned. Alexander VII. replied (1656) that his predecessor had condemned them in the sense intended by their author. Arnauld retorted that the church might be infallible in abstract questions of theology; but as to what was passing through an author's mind it knew no more than any one else. However, the French government supported the pope. In 1656 Arnauld was deprived of his degree, in spite of Pascal's *Provincial Letters* (1656–1657), begun in an attempt to save him (see Pascal; Casuistry). In 1661 a formulary, or solemn renunciation of Jansen, was imposed on all his suspected followers; those who would not sign it went into hiding, or to the Bastille. Peace was only restored under Clement IX. in 1669.

This peace was treated by Jansenist writers as a triumph; really it was the beginning of their downfall. They had set out to reform the Church of Rome; they ended by having to fight hard for a doubtful foothold within it. Even that foothold soon gave way. Louis XIV. was a fanatic for uniformity, civil and religious; the last thing he was likely to tolerate was a handful of eccentric recluses, who believed themselves to be in special touch with Heaven, and therefore might at any moment set their conscience up against the law. During the lifetime of his cousin, Madame de Longueville, the great protectress of the Jansenists, Louis stayed his hand; on her death (1679) the reign of severity began. That summer Arnauld, who had spent the greater part of his life in hiding, was forced to leave France for good.

Six years later he was joined in exile by Pasquier Quesnel who succeeded him as leader of the party. Long before his flight from France Quesnel had published a devotional commentary—*Réflexions morales sur le Nouveau Testament*—which had gone through many editions without exciting official suspicion. But in 1695 Louis Antoine de Noailles, bishop of Châlons, was made archbishop of Paris. He was known to be very hostile to the Jesuits, and at Châlons had more than once expressed official approval of Quesnel's *Réflexions*. So the Jesuit party determined to wreck archbishop and book at the same time. The Jansenists played into their hands by suddenly raising (1701) in the Paris divinity school the question whether it was necessary to accept the condemnation of Jansen with interior assent, or whether a "respectful silence" was enough. Very soon ecclesiastical France was in a blaze. In 1703 Louis XIV. wrote to Pope Clement XI., proposing that they should take joint action to make an end of Jansenism for ever. Clement replied in 1705 with a bull condemning respectful silence. This measure only whetted Louis's appetite. He was growing old and increasingly superstitious; the affairs of his realm were going from bad to worse; he became frenziedly anxious to propitiate the wrath of his maker by making war on the enemies of the Church. In 1711 he asked the pope for a second, and still stronger bull, that would tear up Jansenism by the roots. The pope's choice of a book to condemn fell on Quesnel's *Réflexions*; in 1713 appeared the bull *Unigenitus*, anathematizing no less than one-hundred-and-one of its propositions. Indeed, in his zeal against the Jansenists the pope condemned various practices in no way peculiar to their party; thus, for instance, many orthodox Catholics were exasperated at the heavy blow he dealt at popular Bible reading. Hence the bull met with much opposition from Archbishop de Noailles and others who did not call themselves Jansenists. In the midst of the conflict Louis XIV. died (September 1715); but the freethinking duke of Orleans, who succeeded him as regent, continued after some wavering to support the bull. Thereupon four bishops appealed against it to a general council; and the country became divided into "appellants" and "acceptants" (1717). The regent's disreputable minister, Cardinal Dubois, patched up an abortive truce in 1720, but the appellants promptly "re-appealed" against it. During the next ten years, however, they were slowly crushed, and in 1730 the *Unigenitus* was proclaimed part and parcel of the law of France. This led to a great quarrel with the judges, who were intensely Gallican in spirit (see GALLICANISM), and had always regarded the *Unigenitus* as a triumph of ultramontanism. The quarrel dragged indefinitely on through the 18th century, though the questions at issue were really constitutional and political rather than religious.

Meanwhile the most ardent Jansenists had followed Quesnel to Holland. Here they met with a warm welcome from the Dutch Catholic body, which had always been in close sympathy with Jansenism, although without regarding itself as formally pledged to the *Augustinus*. But it had broken loose from Rome in 1702, and was now organizing itself into an independent church (see UTRECHT). The Jansenists who remained in France had meanwhile fallen on evil days. Persecution usually begets hysteria in its victims; and the more extravagant members of the party were far advanced on the road which leads to apocalyptic prophecy and "speaking with tongues." About 1728 the "miracles of St Médard" became the talk of Paris. This was the cemetery where was buried François de Pâris, a young Jansenist deacon of singularly holy life, and a perfervid opponent of the *Unigenitus*. All sorts of miraculous cures were believed to have been worked at his tomb, until the government closed the cemetery in 1732. This gave rise to the famous epigram:

De par le roi, défense à Dieu
De faire miracle en ce lieu.

On the miracles soon followed the rise of the so-called Convulsionaries. These worked themselves up, mainly by the use of frightful self-tortures, into a state of frenzy, in which they prophesied and cured diseases. They were eventually disowned by the more reputable Jansenists, and were severely repressed by the police. But in 1772 they were still important enough for Diderot to enter the field against them. Meanwhile genuine Jansenism survived in many country parsonages and convents, and led to frequent quarrels with the authorities. Only one of its latter-day disciples, however, rose to real eminence; this was the Abbé Henri Grégoire, who played a considerable part in the French Revolution. A few small Jansenist congregations still survive in France; and others have been started in connexion with the Old Catholic Church in Holland.

LITERATURE.—For the 17th century see the *Port Royal* of Sainte-Beuve (5th ed., Paris, 1888) in six volumes. See also H. Reuchlin, *Geschichte von Port Royal* (2 vols., Hamburg, 1839–1844), and C. Beard, *Port Royal* (2 vols., London, 1861). No satisfactory Roman Catholic history of the subject exists, though reference may be made to Count Joseph de Maistre's *De l'église gallicane* (last ed., Lyons, 1881). On the Jansenism of the 18th century no single work exists, though much information will be found in the *Gallican Church* of Canon Jervis (2 vols., London, 1872). For a series of excellent sketches see also Seche, *Les Derniers Jansénistes* (3 vols., Paris, 1891). A more detailed list of books bearing on the subject will be found in the 5th volume of the *Cambridge Modern History*; and J. Paquier's *Le Jansénisme* (Paris, 1909) may also be consulted.
(ST C.)

JANSSEN, or JANSEN (sometimes JOHNSON), **CORNELIUS** (1593–1664), Flemish painter, was apparently born in London, and baptized on the 14th of October 1593. There seems no reason to suppose, as was formerly stated, that he was born at Amsterdam. He worked in England from 1618 to 1643, and afterwards retired to Holland, working at Middelburg, Amsterdam, The Hague and Utrecht, and dying at one of the last two places about 1664. In England he was patronized by James I. and the court, and under Charles I. he continued to paint the numerous portraits which adorn many English mansions and collections. Janssen's pictures, chiefly portraits, are distinguished by clear colouring, delicate touch, good taste and careful finish. He generally painted upon panel, and often worked on a small scale, sometimes producing replicas of his larger works. A characteristic of his style is the very dark background, which throws the carnations of his portraits into rounded relief. In all probability his earliest portrait (1618) was that of John Milton as a boy of ten.

JANSSEN, JOHANNES (1829–1891), German historian, was born at Xanten on the 10th of April 1829, and was educated as a Roman Catholic at Münster, Louvain, Bonn and Berlin, afterwards becoming a teacher of history at Frankfort-on-the-Main. He was ordained priest in 1860; became a member of the Prussian Chamber of Deputies in 1875; and in 1880 was made domestic prelate to the pope and apostolic pronotary. He died at Frankfort on the 24th of December 1891. Janssen was a stout champion of the Ultramontane party in the Roman Catholic Church. His great work is his *Geschichte des deutschen Volkes seit dem Ausgang des Mittelalters* (8 vols., Freiburg, 1878–1894). In this book he shows himself very hostile to the Reformation, and attempts to prove that the Protestants were responsible for the general unrest in Germany during the 16th and 17th centuries. The author's partisanship led to some controversy, and Janssen wrote *An meine Kritiker* (Freiburg, 1882) and *Ein zweites Wort an meine Kritiker* (Freiburg, 1883) in reply to the *Janssens Geschichte des deutschen Volkes* (Munich, 1883) of M. Lenz, and other criticisms.

The *Geschichte*, which has passed through numerous editions, has been continued and improved by Ludwig Pastor, and the greater part of it has been translated into English by M. A. Mitchell and A. M.

Christie (London, 1896, fol.). Of his other works perhaps the most important are: the editing of *Frankfurts Reichskorrespondenz, 1376–1519* (Freiburg, 1863–1872); and of the *Leben, Briefe und kleinere Schriften* of his friend J. F. Böhmer (Leipzig, 1868); a monograph, *Schiller als Historiker* (Freiburg, 1863); and *Zeit- und Lebensbilder* (Freiburg, 1875).

See L. Pastor, *Johannes Janssen* (Freiburg, 1893); F. Meister, *Erinnerung an Johannes Janssen* (Frankfort, 1896); Schwann, *Johannes Janssen und die Geschichte der deutschen Reformation* (Munich, 1892).

JANSSEN, PIERRE JULES CÉSAR (1824–1907), French astronomer, was born in Paris on the 22nd of February 1824, and studied mathematics and physics at the faculty of sciences. He taught at the lycée Charlemagne in 1853, and in the school of architecture 1865–1871, but his energies were mainly devoted to various scientific missions entrusted to him. Thus in 1857 he went to Peru in order to determine the magnetic equator; in 1861–1862 and 1864, he studied telluric absorption in the solar spectrum in Italy and Switzerland; in 1867 he carried out optical and magnetic experiments at the Azores; he successfully observed both transits of Venus, that of 1874 in Japan, that of 1882 at Oran in Algeria; and he took part in a long series of solar eclipse-expeditions, *e.g.* to Trani (1867), Guntoor (1868), Algiers (1870), Siam (1875), the Caroline Islands (1883), and to Alcosebre in Spain (1905). To see the eclipse of 1870 he escaped from besieged Paris in a balloon. At the great Indian eclipse of 1868 he demonstrated the gaseous nature of the red prominences, and devised a method of observing them under ordinary daylight conditions. One main purpose of his spectroscopic inquiries was to answer the question whether the sun contains oxygen or not. An indispensable preliminary was the virtual elimination of oxygen-absorption in the earth's atmosphere, and his bold project of establishing an observatory on the top of Mont Blanc was prompted by a perception of the advantages to be gained by reducing the thickness of air through which observations have to be made. This observatory, the foundations of which were fixed in the snow that appears to cover the summit to a depth of ten metres, was built in September 1893, and Janssen, in spite of his sixty-nine years, made the ascent and spent four days taking observations. In 1875 he was appointed director of the new astrophysical observatory established by the French government at Meudon, and set on foot there in 1876 the remarkable series of solar photographs collected in his great *Atlas de photographies solaires* (1904). The first volume of the *Annales de l'observatoire de Meudon* was published by him in 1896. He died at Paris on the 23rd of December 1907.

See A. M. Clerke, *Hist. of Astr. during the 19th Century* (1903); H. Macpherson, *Astronomers of To-Day* (1905).

JANSSENS (or Jansens), **VICTOR HONORIUS** (1664–1739), Flemish painter, was born at Brussels. After seven years in the studio of an obscure painter named Volders, he spent four years in the household of the duke of Holstein. The next eleven years Janssens passed in Rome, where he took eager advantage of all the aids to artistic study, and formed an intimacy with Tempesta, in whose landscapes he frequently inserted figures. Rising into popularity, he painted a large number of cabinet historical scenes; but, on his return to Brussels, the claims of his increasing family restricted him almost entirely to the larger and more lucrative size of picture, of which very many of the churches and palaces of the Netherlands contain examples. In 1718 Janssens was invited to Vienna, where he stayed three years, and was made painter to the emperor. The statement that he visited England is based only upon the fact that certain fashionable interiors of the time in that country have been attributed to him. Janssen's colouring was good, his touch delicate and his taste refined.

JANSSENS (or Jansens) **VAN NUYSSEN, ABRAHAM** (1567–1632), Flemish painter, was born at Antwerp in 1567. He studied under Jan Snellinck, was a "master" in 1602, and in 1607 was dean of the master-painters. Till the appearance of Rubens he was considered perhaps the best historical painter of his time. The styles of the two artists are not unlike. In correctness of drawing Janssens excelled his great contemporary; in bold composition and in treatment of the nude he equalled him; but in faculty of colour and in general freedom of disposition and touch he fell far short. A master of chiaroscuro, he gratified his taste for strong contrasts of light and shade in his torchlights and similar effects. Good examples of this master are to be seen in the Antwerp museum and the Vienna gallery. The stories of his jealousy of Rubens and of his dissolute life are quite unfounded. He died at Antwerp in 1632.

JANUARIUS, ST, or San Gennaro, the patron saint of Naples. According to the legend, he was bishop of Benevento, and flourished towards the close of the 3rd century. On the outbreak of the persecution by Diocletian and Maximian, he was taken to Nola and brought before Timotheus, governor of Campania, on account of his profession of the Christian religion. After various assaults upon his constancy, he was sentenced to be cast into the fiery furnace, through which he passed wholly unharmed. On the following day, along with a number of fellow martyrs, he was exposed to the fury of wild beasts, which, however, laid themselves down in tame submission at his feet. Timotheus, again pronouncing sentence of death, was struck with blindness, but immediately healed by the powerful intercession of the saint, a miracle which converted nearly five thousand men on the spot. The ungrateful judge, only roused to further fury by these occurrences, caused the execution of Januarius by the sword to be forthwith carried out. The body was ultimately removed by the inhabitants of Naples to that city, where the relic became very famous for its miracles, especially in counteracting the more dangerous eruptions of Vesuvius. Whatever the difficulties raised by his *Acta*, the cult of St Januarius, bishop and martyr, is attested historically at Naples as early as the 5th century (*Biblioth. hagiog. latina*, No. 6558). Two phials preserved in the cathedral are believed to contain the blood of the martyr. The relic is shown twice a year—in May and September. On these occasions the substance contained in the phial liquefies, and the Neapolitans see in this phenomenon a supernatural manifestation. The "miracle of St Januarius" did not occur before the middle of the 15th century.

A great number of saints of the name of Januarius are mentioned in the martyrologies. The best-known are the Roman martyr (festival, the 10th of July), whose epitaph was written by Pope Damasus (De Rossi, *Bullettino*, p. 17, 1863), and the martyr of Cordova, who forms along with Faustus and Martialis the group designated by Prudentius (*Peristephanon*, iv. 20) by the name of *tres coronae*. The festival of these martyrs is celebrated on the 13th of October.

See *Acta sanctorum*, September, vi. 761–891; G. Scherillo, *Esame di un codice greco pubblicato nel tomo secondo della bibliotheca casinensis* (Naples, 1876); G. Taglialatela, *Memorie storico-critiche del culto del sangue di S. Gennaro* (Naples, 1893), which contains many facts, but little criticism; G. Albini, *Sulla mobilità dei liquidi viscosi non omogenei* (*Società reale di Napoli, Rendiconti*, 2nd series, vol. iv., 1890); *Acta sanctorum*, October, vi. 187–193. (H. De.)

JANUARY, the first month in the modern calendar, consisting of thirty-one days. The name (Lat. *Januarius*) is derived from the two-faced Roman god Janus, to whom the month was dedicated. As doorkeeper of heaven, as looking both into the past and the future, and as being essentially the deity who busied himself with the beginnings of all enterprises, he was appropriately made guardian of the fortunes of the new year. The consecration of the month took place by an offering of meal, salt, frankincense and wine, each of which was new. The Anglo-Saxons called January *Wulfmonath*, in allusion to the fact that hunger then made the wolves bold enough to come into the villages. The principal festivals of the month are: New Year's Day; Feast of the Circumcision; Epiphany; Twelfth-Day; and Conversion of St Paul (see Calendar).

JANUS, in Roman mythology one of the principal Italian deities. The name is generally explained as the masculine form of Diana (Jana), and Janus as originally a god of light and day, who gradually became the god of the beginning and origin of all things. According to some, however, he is simply the god of doorways (*januae*) and in this connexion is the patron of all entrances and beginnings. According to Mommsen, he was "the spirit of opening," and the double-head was connected with the gate that opened both ways. Others, attributing to him an Etruscan origin, regard him as the god of the vault of heaven, which the Etruscan arch is supposed to resemble. The rationalists explained him as an old king of Latium, who built a citadel for himself on the Janiculum. It was believed that his worship, which was said to have existed as a local cult before the foundation of Rome, was introduced there by Romulus, and that a temple was dedicated to him by Numa. This temple, in reality only an arch or gateway (*Janus geminus*) facing east and west, stood at the north-east end of the forum. It was open during war and closed during peace (Livy i. 19); it was shut only four times before the Christian era. A possible explanation is, that it was considered a bad omen to shut the city gates while the citizens were outside fighting for the state; it was necessary that they should have free access to the city, whether they returned victorious or defeated. Similarly, the door of a private house was kept open while the members of the family were away, but when all were at home it was closed to keep out intruders. There was also a temple of Janus near the theatre of Marcellus, in the forum olitorium, erected by Gaius Duilius (Tacitus, *Ann.* ii. 49), if not earlier.

The beginning of the day (hence his epithet Matutinus), of the month, and of the year (January) was sacred to Janus; on the 9th of January the festival called Agonia was celebrated in his honour. He was invoked before any other god at the beginning of any important undertaking; his priest was the Rex Sacrorum, the representative of the ancient king in his capacity as religious head of the state. All gateways, housedoors and entrances generally, were under his protection; he was the inventor of agriculture (hence Consivius, "he who sows or plants"), of civil laws, of the coining of money and of religious worship. He was worshipped on the Janiculum as the protector of trade and shipping; his head is found on the *as*, together with the prow of a ship. He is usually represented on the earliest coins with two bearded faces, looking in opposite directions; in the time of Hadrian the number of faces is increased to four. In his capacity as porter or doorkeeper he holds a staff in his right hand, and a key (or keys) in his left; as such he is called Patulcius (opener) and Clusius (closer). His titles Curiatius, Patricius, Quirinus originate in his worship in the gentes, the curiae and the state, and have no reference to any special functions or characteristics. In late times, he is both bearded and unbearded; in place of the staff and keys, the fingers of his right hand show the number 300 (CCC.), those of his left the number of the remaining days of the year (LXV.). According to A. B. Cook (*Classical Review*, xviii. 367), Janus is only another form of Jupiter, the name under which he was worshipped by the pre-Latin (aboriginal) inhabitants of Rome; after their conquest by the Italians, Janus and Jana took their place as independent divinities by the side of the Italian Jupiter and Juno. He considers it probable that the three-headed Janus was a triple oak-god worshipped in the form of two vertical beams and a cross-bar (such as the *tigillum sororium*, for which see Horatii); hence also the door, consisting of two lintels and side-posts, was sacred to Janus. The three-headed type may have been the original, from which the two-headed and four-headed types were developed. J. G. Frazer (*The Early History of the Kingship*, pp. 214, 285), who also identifies Janus with Jupiter, is of opinion that Janus was not originally a doorkeeper, but that the door was called after him, not vice versa. *Janua* may be an adjective, *janua foris* meaning a door with a symbol of Janus close by the chief entrance, to serve as a protection for the house; then *janua* alone came to mean a door generally, with or without the symbol of Janus. The double head may have been due to the desire to make the god look both ways for greater protection. By J. Rhys (*Hibbert Lectures*, 1886, pp. 82, 94) Janus is identified with the three-faced (sometimes three-headed) Celtic god Cernunnus, a chthonian divinity, compared by Rhys with the Teutonic Heimdal, the warder of the gods of the under-world; like Janus, Cernunnus and Heimdal were considered to be the *fons et origo* of all things.

See S. Linde, *De Jano summo romanorum deo* (Lund, 1891); J. S. Speÿer, "Le Dieu romain Janus," in *Revue de l'histoire des religions* (xxvi., 1892); G. Wissowa, *Religion und Kultus der Römer* (1902); W. Deecke, *Etruskische Forschungen*, vol. ii.; W. Warde Fowler, *The Roman Festivals of the Period of the Republic* (1899), pp. 282–290; articles in W. H. Roscher's *Lexikon der Mythologie* and Daremberg and Saglio's *Dictionnaire des Antiquités*; J. Toutain, *Études de Mythologie* (1909). On other *jani* (arched passages) in Rome, frequented by business men and money changers, see O. Richter, *Topographie der Stadt Rom* (1901). (J. H. F.)

JAORA, a native state of Central India, in the Malwa agency. It consists of two isolated tracts, between Ratlam and Neemuch. Area, with the dependencies of Piplauda and Pant Piplauda, 568 sq. m. Pop. (1901), 84,202. The estimated revenue is £57,000; tribute, £9000. The chief, whose title is nawab, is a Mahommedan of Afghan descent. The state was confirmed by the British government in 1818 by the Treaty of Mandsaur. Nawab Mahommed Ismail, who died in 1895, was an honorary major in the British army. His son, Iftikhar Ali Khan, a minor at his accession, was educated in the Daly College at Indore, with a British officer for his tutor, and received powers of administration in 1906. The chief crops are millets, cotton, maize and poppy. The last supplies a large part of the Malwa opium of commerce. The town of Jaora is on the Rajputana-Malwa railway, 20 m. N. of Ratlam. Pop. (1901), 23,854. It is well laid out, with many good modern buildings, and has a high school and dispensary. To celebrate Queen Victoria's Diamond Jubilee, the Victoria Institute and a zenana dispensary were opened in 1898.

JAPAN, an empire of eastern Asia, and one of the great powers of the world. The following article is divided for convenience into ten sections:—I. Geography; II. The People; III. Language and Literature; IV. Art; V. Economic Conditions; VI. Government and Administration; VII. Religion; VIII. Foreign Intercourse; IX. Domestic History; X. The Claim of Japan.

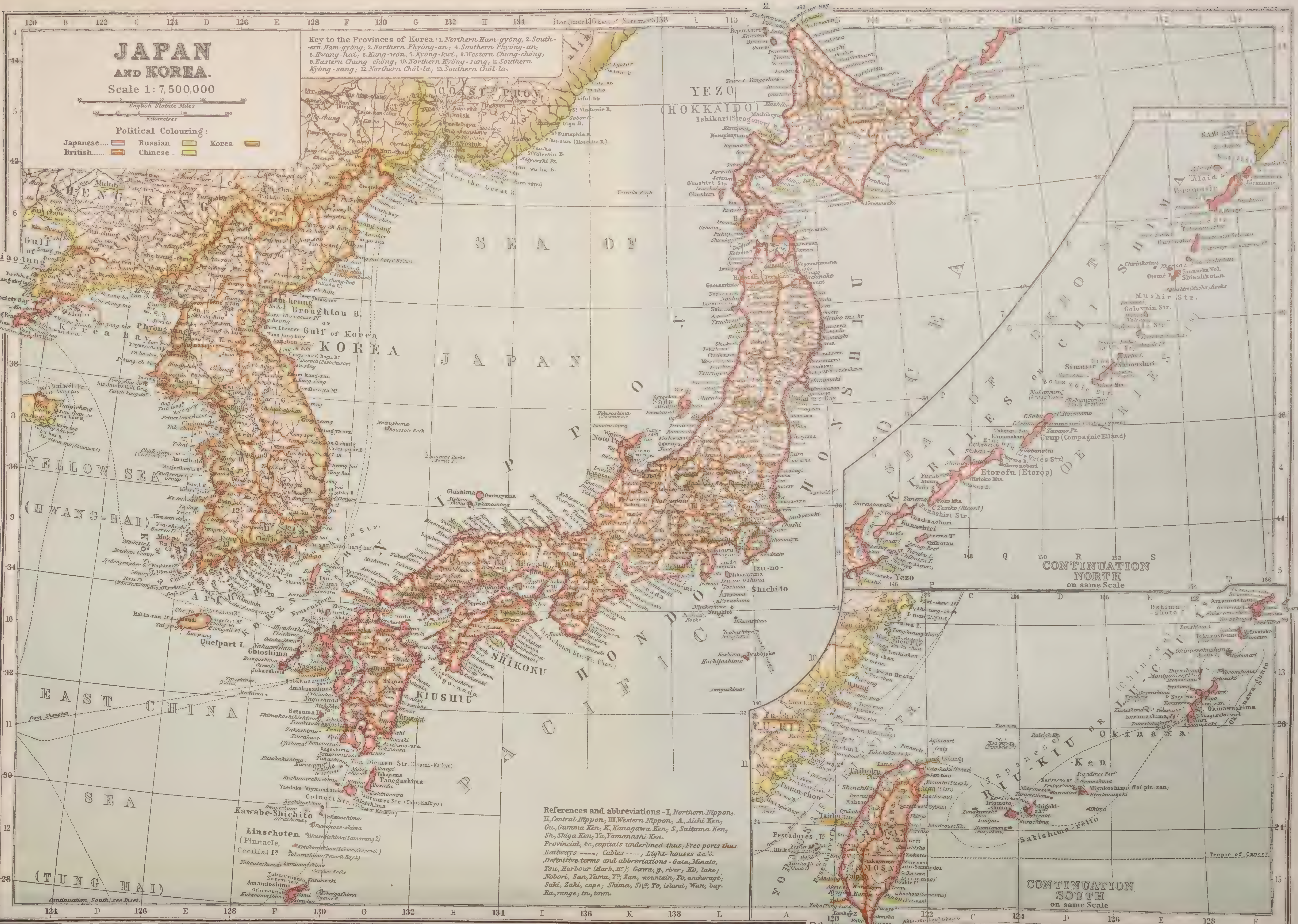
I.—Geography

Position and Extent.

The continent of Asia stretches two arms into the Pacific Ocean, Kamchatka in the north and Malacca in the south, between which lies a long cluster of islands constituting the Japanese empire, which covers 37° 14′ of longitude and 29° 11′ of latitude. On the extreme north are the Kuriles (called by the Japanese *Chishima*, or the "myriad isles"), which extend to 156° 32′ E. and to 50° 56′ N.; on the extreme south is Formosa (called by the Japanese *Taiwan*), which extends to 122° 6′ E., and to 21° 45′ N. There are six large islands, namely Sakhalin (called by the Japanese *Karafuto*); Yezo or Ezo (which with the Kuriles is designated *Hokkaidō*, or the north-sea district); Nippon (the "origin of the sun"), which is the main island; Shikoku (the "four provinces"), which lies on the east of Nippon; Kiūshiū or Kyushu (the "nine provinces"), which lies on the south of Nippon, and Formosa, which forms the most southerly link of the chain. Formosa and the Pescadores were ceded to Japan by China after the war of 1894–1895, and the southern half of Sakhalin—the part south of 50° N.—was added to Japan by cession from Russia in 1905. Korea, annexed in August 1910, is separately noticed.

Coast-line.—The following table shows the numbers, the lengths of coast-line, and the areas of the various groups of islands, only those being indicated that have a coast-line of at least 1 *ri* (2½ m.), or that, though smaller, are inhabited; except in the case of Formosa and the Pescadores, where the whole numbers are given:—

	Number.	Length of coast in miles.	Area in square miles.
Nippon	1	4,765·03	99,373·57
Isles adjacent to Nippon	167	1,275·09	470·30
Shikoku	1	1,100·85	6,461·39
Isles adjacent to Shikoku	75	548·12	175·40
Kiūshiū	1	2,101·28	13,778·68
Isles adjacent to Kiūshiū	150	2,405·06	1,821·85



JAPAN AND KOREA.

Scale 1: 7,500,000

English Statute Miles
Kilometres
Political Colouring:
Japanese
British
Russian
Chinese
Korea
Key to the Provinces of Korea: 1. Northern Ham-gyöng; 2. Southern Ham-gyöng; 3. Northern Phyöng-an; 4. Southern Phyöng-an; 5. Hwang-hai; 6. Kang-wön; 7. Kyöng-kwi; 8. Western Chung-chöng; 9. Eastern Chung-chöng; 10. Northern Kyöng-sang; 11. Southern Kyöng-sang; 12. Northern Chöl-la; 13. Southern Chöl-la.
References and abbreviations - I, Northern Nippon; II, Central Nippon; III, Western Nippon; A., Aichi Ken; Gu., Gumma Ken; K., Kanagawa Ken; S., Saitama Ken; Sh., Shiga Ken; Ya, Yamanashi Ken.
Provincial, &c., capitals underlined thus; Free ports thus.
Railways ——; Cables ----; Light-houses &c.
Definitive terms and abbreviations - Gata, Minato, Tsu, Harbour (Harb., Hr.); Gawa, g., river; Ko, lake; Nobori, San, Yama, Ya., Zan, mountain; Po, anchorage; Saki, Zaki, cape; Shima, Sha., To, island; Wan, bay. Ra., range; tn., town.
Longitude East of Greenwich
SEA OF JAPAN
YELLOW SEA (HWANG-HAI)
EAST CHINA SEA (TUNG HAI)
PACIFIC OCEAN
KOREA
SHENG-KING
COAST PROV.
YEZO (HOKKAIDO)
HONDO
SHIKOKU
KIUSHIU
NIPPON
Gulf of Korea
Broughton B.
Korea Bay
Liao-tung
Quelpart I.
Gotoshima
Tsushima
Vladivostok
Peter the Great B.
Izu-no-Shichi-to
Kawabe-Shichito
Linschoten (Pinnacle, Cecilia) Is.
Continuation South, see Inset.
CONTINUATION NORTH on same Scale
KURILES or CHISHIMA
SEA OF OKHOTSK
Kamchatka
Etorofu (Etorop)
Urup
Simusir
Kunashiri
CONTINUATION SOUTH on same Scale
FORMOSA
TAI-WAN
RIU-KIU or LIU-CHIU
Okinawa Ken
Sakishima-retto
Pescadores Is.
FU-KIEN
Tropic of Cancer

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	Number.	Length of coast in miles.	Area in square miles.
Yezo	1	1,423·32	30,148·41
Isles adjacent to Yezo	13	110·24	30·51
Sakhalin (Karafuto)	1	Unsurveyed	12,487·64
Sado	1	130·05	335·92
Okishima	1	182·27	130·40
Isles adjacent to Okishima	1	3·09	0·06
Awaji	1	94·43	217·83
Isles adjacent to Awaji	1	5·32	0·83
Iki	1	86·47	50·96
Isles adjacent to Iki	1	4·41	0·47
Tsushima	1	409·23	261·72
Isles adjacent to Tsushima	5	118·80	4·58
Riūkiū (or Luchu) Islands	55	768·74	935·18
Kuriles (Chishima)	31	1,496·23	6,159·42
Bonin (Ogasawara Islands)	20	174·65	26·82
Taiwan (Formosa)	1	731·31	13,429·31
Isles adjacent to Formosa	7	128·32	Not surveyed
Pescadores (Hoko-tō)	12	98·67	85·50
Totals	549	18,160·98	173,786·75

If the various smaller islands be included, a total of over 3000 is reached, but there has not been any absolutely accurate enumeration.

It will be observed that the coast-line is very long in proportion to the area, the ratio being 1 m. of coast to every 9·5 m. of area. The Pacific Ocean, which washes the eastern shores, moulds their outline into much greater diversity than does the Sea of Japan which washes the western shores. Thus the Pacific sea-board measures 10,562 m. against 2887 m. for that of the Japan Sea. In depth of water, too, the advantage is on the Pacific side. There the bottom slopes very abruptly, descending precipitously at a point not far from the north-east coast of the main island, where soundings have shown 4655 fathoms. This, the deepest sea-bed in the world, is called the Tuscarora Deep, after the name of the United States' man-of-war which made the survey. The configuration seems to point to a colossal crater under the ocean, and many of the earthquakes which visit Japan appear to have their origin in this submarine region. On the other hand, the average depth of the Japan Sea is only 1200 fathoms, and its maximum depth is 3200. The east coast, from Cape Shiriya (Shiriyazaki) in the north to Cape Inuboye (Inuboesaki) near Tōkyō Bay, though abounding in small indentations, has only two large bays, those of Sendai and Matsushima; but southward from Tōkyō Bay to Cape Satta (Satanomisaki) in Kiūshiū there are many capacious inlets which offer excellent anchorage, as the Gulf of Sagami (Sagaminada), the Bays of Suruga (Surugawan), Ise (Isenumi) and Osaka, the Kii Channel, the Gulf of Tosa (Tosonada), &c. Opening into both the Pacific and the Sea of Japan and separating Shikoku and Kiūshiū from the main island as well as from each other, is the celebrated Inland Sea, one of the most picturesque sheets of water in the world. Its surface measures 1325 sq. m.; it has a length of 255 m. and a maximum width of 56 m.; its coast-lines aggregate 700 m.; its depth is nowhere more than 65 fathoms, and it is studded with islands which present scenery of the most diverse and beautiful character. There are four narrow avenues connecting this remarkable body of water with the Pacific and the Japan Sea; that on the west, called Shimonoseki Strait, has a width of 3000 yds., that on the south, known as Hayamoto Strait, is 8 m. across; and the two on the north, Yura and Naruto Straits, measure 3000 and 1500 yds. respectively. It need scarcely be said that these restricted approaches give little access to the storms which disturb the seas outside. More broken into bays and inlets than any other part of the coast is the western shore of Kiūshiū. Here three promontories—Nomo, Shimabara and Kizaki—enclose a large bay having on its shores Nagasaki, the great naval port of Sasebo, and other anchorages. On the south of Kiūshiū the Bay of Kagoshima has historical interest, and on the west are the bays of Ariakeno-ura and Yatsushiro. To the north of Nagasaki are the bays of Hakata, Karatsu and Imari. Between this coast and the southern extremity of the Korean peninsula are situated the islands of Iki and Tsushima, the latter being only 30 m. distant from the peninsula. Passing farther north, the shoreline of the main island along the Japan Sea is found to be comparatively straight and monotonous, there being only one noteworthy indentation, that of Wakasa-wan, where are situated the naval port of Maizuru and the harbour of Tsuruga, the Japanese point of communication with the Vladivostok terminus of the Trans-Asian railway. From this harbour to Osaka Japan's waist measures only 77 m., and as the great lake of Biwa and some minor sheets of water break the interval, a canal may be dug to join the Pacific and the Sea of Japan. Yezo is not rich in anchorages. Uchiura (Volcano Bay), Nemuro (Walfisch) Bay and Ishikari Bay are the only remarkable inlets. As for Formosa, the peculiarity of its outline is that the eastern coast falls precipitously into deep water, while the western slopes slowly to shelving bottoms and shoals. The Pescadores Islands afford the best anchorage in this part of Japan.

Mountains.—The Japanese islands are traversed from north to south by a range of mountains which sends out various lateral branches. Lofty summits are separated by comparatively low passes, which lie at the level of crystalline rocks and schists constituting the original uplands upon which the summits have been piled by volcanic action. The scenery among the mountains is generally soft. Climatic agencies have smoothed and modified everything rugged or abrupt, until an impression of gentle undulation rather than of grandeur is suggested. Nowhere is the region of eternal snow reached, and masses of foliage enhance the gentle aspect of the scenery and glorify it in autumn with tints of striking brilliancy. Mountain alternates with valley, so that not more than one-eighth of the country's entire area is cultivable.

Fuji.

The king of Japanese mountains is Fuji-yama or Fuji-san (peerless mount), of which the highest point (Ken-ga-mine) is 12,395 ft. above sea-level. The remarkable grace of this mountain's curve—an inverted catenary—makes it one of the most beautiful in the world, and has obtained for it a prominent place in Japanese decorative art. Great streams of lava flowed from the crater in ancient times. The course of one is still visible to a distance of 15 m. from the summit, but the rest are covered, for the most part, with deep deposits of ashes and scoriae. On the south Fuji slopes unbroken to the sea, but on the other three sides the plain from which it rises is surrounded by mountains, among which, on the north and west, a series of most picturesque lakes has been formed in consequence of the rivers having been dammed by ashes ejected from Fuji's crater. To a height of some 1500 ft. the slopes of the mountain are cultivated; a grassy moorland stretches up the next 2500 ft.; then follows a forest, the upper edge of which climbs to an altitude of nearly 8000 ft., and finally there is a wide area of ashes and scoriae. There is entire absence of the Alpine plants found abundantly on the summits of other high mountains in Japan, a fact due, doubtless, to the comparatively recent activity of the volcano. The ascent of Fuji presents no difficulties. A traveller can reach the usual point of departure, Gotemba, by rail from Yokohama, and thence the ascent and descent may be made in one day by a pedestrian.

The Japanese Alps.

The provinces of Hida and Etchiu are bounded on the east by a chain of mountains including, or having in their immediate vicinity, the highest peaks in Japan after Fuji. Six of these summits rise to a height of 9000 ft. or upwards, and constitute the most imposing assemblage of mountains in the country. The ridge runs due north and south through 60 to 70 m., and has a width of 5 to 10 m. It is mostly of granite, only two of the mountains—Norikura and Tateyama—showing clear traces of volcanic origin. Its lower flanks are clothed with forests of beech, conifers and oak. Farther south, in the same range, stands Ontake (10,450 ft.), the second highest mountain in Japan proper (as distinguished from Formosa); and other remarkable though not so lofty peaks mark the same regions. This grand group of mountains has been well called the "Alps of Japan," and a good account of them may be found in *The Japanese Alps* (1896) by the Rev. W. Weston. On the summit of Ontake are eight large and several small craters, and there also may be seen displays of trance and "divine possession," such as are described by Mr Percival Lowell in *Occult Japan* (1895).

The Nikko Mountains.

Even more picturesque, though less lofty, than the Alps of Japan, are the Nikko mountains, enclosing the mausolea of the two greatest of the Tokugawa *shōguns*. The highest of these are Shirane-san (7422 ft.), Nantai-san (8169 ft.), Nyohô-zan (8100 ft.), and Omanago (7546 ft.). They are clothed with magnificent vegetation, and everywhere they echo the voices of waterfalls and rivulets.

Mountains of the North.

In the north of the main island there are no peaks of remarkable height. The best known are Chiokai-zan, called "Akita-Fuji" (the Fuji of the Akita province), a volcano 7077 ft. high, which was active as late as 1861; Ganju-san (6791 ft.), called also "Nambu-Fuji" or Iwate-zan, remarkable for the beauty of its logarithmic curves; Iwaki-san (5230 ft.), known as Tsugaru-Fuji, and said by some to be even more imposing than Fuji itself; and the twin mountains Gassan (6447 ft.) and Haguro-san (5600 ft.). A little farther south, enclosing the fertile plain of Aizu (Aizu-taira, as it is called) several important peaks are found, among them being Iide-san (6332 ft.); Azuma-yama (7733 ft.), which, after a long interval of quiescence, has given many evidences of volcanic activity during recent years; Nasu-dake (6296 ft.), an active volcano; and Bandai-san (6037 ft.). A terrible interest attaches to the last-named mountain, for, after having remained quiet so long as to lull the inhabitants of the neighbouring district into complete security, it suddenly burst into fierce activity on the 15th of July 1888, discharging a vast avalanche of earth and rock, which dashed down its slopes like an inundation, burying four hamlets, partially destroying seven villages, killing 461 people and devastating an area of 27 sq. m.

Mountains of Kōzuke, Kai and Shinano.

In the province of Kōzuke, which belongs to the central part of the main island, the noteworthy mountains are Asama-yama (8136 ft.), one of the best known and most violently active volcanoes of Japan; Akagi-san, a circular range of peaks surrounding the basin of an old crater and rising to a height of 6210 ft.; the Haruna group, celebrated for scenic beauties, and Myogi-san, a cluster of pinnacles which, though not rising higher than 3880 ft., offer scenery which dispels the delusion that nature as represented in the classical pictures (*bunjingwa*) of China and Japan exists only in the artist's imagination. Farther south, in the province of Kai (Kōshiu), and separating two great rivers, the Fuji-kawa and the Tenriu-gawa, there lies a range of hills with peaks second only to those of the Japanese Alps spoken of above. The principal elevations in this range are Shirane-san—with three summits, Nōdori (9970 ft.), Ai-no-take (10,200 ft.) and Kaigane (10,330 ft.)—and Hōōzan (9550 ft.). It will be observed that all the highest mountains of Japan form a species of belt across the widest part of the main island, beginning on the west with the Alps of Etchiu, Hida and Shinano, and ending on the east with Fuji-yama. In all the regions of the main island southward of this belt the only mountains of conspicuous altitude are Omine (6169 ft.) and Odai-gaharazan (5540 ft.) in Yamato and Daisen or Oyama (5951 ft.) in Hōki.

Mountains of Shikoku. The island of Shikoku has no mountains of notable magnitude. The highest is Ishizuchi-zan (7727 ft.), but there are several peaks varying from 3000 to 6000 ft.

Mountains of Kiūshiū. Kiūshiū, though abounding in mountain chains, independent or connected, is not remarkable for lofty peaks. In the neighbourhood of Nagasaki, over the celebrated solfataras of Unzen-take (called also Onsen) stands an extinct volcano, whose summit, Fugen-dake, is 4865 ft. high. More notable is Aso-take, some 20 m. from Kumamoto; for, though the highest of its five peaks has an altitude of only 5545 ft., it boasts the largest crater in the world, with walls nearly 2000 ft. high and a basin from 10 to 14 m. in diameter. Aso-take is still an active volcano, but its eruptions during recent years have been confined to ashes and dust. Only two other mountains in Kiūshiū need be mentioned—a volcano (3743 ft.) on the island Sakura-jima, in the extreme south; and Kirishima-yama (5538 ft.), on the boundary of Hiūga, a mountain specially sacred in Japanese eyes, because on its eastern peak (Takachiho-dake) the god Ninigi descended as the forerunner of the first Japanese sovereign, Jimmu.

Among the mountains of Japan there are three volcanic ranges, namely, that of the Kuriles, that of Fuji, and that of Kirishima.

Volcanoes. Fuji is the most remarkable volcanic peak. The Japanese regard it as a sacred mountain, and numbers of pilgrims make the ascent in midsummer. From 500 to 600 ft. is supposed to be the depth of the crater. There are neither sulphuric exhalations nor escapes of steam at present, and it would seem that this great volcano is permanently extinct. But experience in other parts of Japan shows that a long quiescent crater may at any moment burst into disastrous activity. Within the period of Japan's written history several eruptions are recorded the last having been in 1707, when the whole summit burst into flame, rocks were shattered, ashes fell to a depth of several inches even in Yedo (Tōkyō), 60 m. distant, and the crater poured forth streams of lava. Among still active volcanoes the following are the best known:—

Name of Volcano. Height in feet.	Remarks.
Tarumai (Yezo) 2969.	Forms southern wall of a large ancient crater now occupied by a lake (Shikotsu). A little steam still issues from several smaller cones on the summit of the ridge, as well as from one, called Eniwa, on the northern side.
Noboribetsu (Yezo) 1148.	In a state of continuous activity, with frequent detonations and rumblings. The crater is divided by a wooded rock-wall. The northern part is occupied by a steaming lake, while the southern part contains numerous solfataras and boiling springs.
Komagatake (Yezo) 3822.	The ancient crater-wall, with a lofty pinnacle on the western side, contains a low new cone with numerous steaming rifts and vents. In a serious eruption in 1856 the S.E. flank of the mountain and the country side in that direction were denuded of trees.
Esan 2067.	A volcano-promontory at the Pacific end of the Tsugaru Strait: a finely formed cone surrounded on three sides by the sea, the crater breached on the land side. The central vent displays considerable activity, while the rocky walls are stained with red, yellow and white deposits from numerous minor vents.
Agatsuma (Iwaki) 5230.	Erupted in 1903 and killed two geologists.
Bandai-san (Iwashiro) 6037.	Erupted in 1888 after a long period of quiescence. The outbreak was preceded by an earthquake of some severity, after which about 20 explosions took place. A huge avalanche of earth and rocks buried the Nagase Valley with its villages and inhabitants, and devastated an area of over 27 sq. m. The number of lives lost was 461; four hamlets were completely entombed with their inhabitants and cattle; seven villages were partially wrecked; forests were levelled or the trees entirely denuded of bark; rivers were blocked up, and lakes were formed. The lip of the fracture is now marked by a line of steaming vents.
Azuma-yama (Fukushima) 7733.	Long considered extinct, but has erupted several times since 1893, the last explosion having been in 1900, when 82 sulphur-diggers were killed or injured; ashes were thrown to a distance of 5 m., accumulating in places to a depth of 5 ft.; and a crater 300 ft. in diameter, and as many in depth, was formed on the E. side of the mountain. This crater is still active. The summit-crater is occupied by a beautiful lake. On the Fukushima (E.) side of the volcano rises a large parasitic cone, extinct.
Nasu (Tochigi) 6296.	Has both a summit and a lateral crater, which are apparently connected and perpetually emitting steam. At or about the main vents are numerous solfataras. The whole of the upper part of the cone consists of grey highly acidic lava. At the base is a thermal spring, where baths have existed since the 7th century.
Shirane (Nikko) 7422.	The only remaining active vent of the once highly volcanic Nikko district. Eruption in 1889.
Shirane (Kai) 10,330.	Eruption in 1905, when the main crater was enlarged to a length of 3000 ft. It is divided into three parts, separated by walls, and each containing a lake, of which the middle one emits steam and the two others are cold. The central lake, during the periods of eruption (which are frequent), displays a geyser-like activity. These lakes contain free sulphuric acid, mixed with iron and alum.
Unzen (Hizen) 4865.	A triple-peaked volcano in the solfatara stage, extinct at the summit, but displaying considerable activity at its base in the form of numerous fumaroles and boiling sulphur springs.
Aso-take (Higo) 5545.	Remarkable for the largest crater in the world. It measures 10 m. by 15, and rises almost symmetrically to a height of about 2000 ft., with only one break through which the river Shira flows. The centre is occupied by a mass of peaks, on the W. flank of which lies the modern active crater. Two of the five compartments into which it is divided by walls of deeply striated volcanic ash are constantly emitting steam, while a new vent displaying great activity has been opened at the base of the cone on the south side. Eruptions have been recorded since the earliest days of Japanese history. In 1884 the ejected dust and ashes devastated farmlands through large areas. An outbreak in 1894 produced numerous rifts in the inner walls from which steam and smoke have issued ever since.
Kaimon (Kagoshima Bay) 3041.	One of the most beautiful volcanoes of Japan, known as the Satsuma-Fuji. The symmetry of the cone is marred by a convexity on the seaward (S.) side. This volcano is all but extinct.
Sakura-jima (Kagoshima Bay) 3743.	An island-volcano, with several parasitic cones (extinct), on the N. and E. sides. At the summit are two deep craters, the southern of which emits steam. Grass grows, however, to the very edges of the crater. The island is celebrated for thermal springs, oranges and *daikon* (radishes), which sometimes grow to a weight of 70 lb.
Kiri-shima (Kagoshima Bay) 5538.	A volcanic range of which Takachiho, the only active cone, forms the terminal (S.E.) peak. The crater, situated on the S.W. side of the volcano, lies some 500 ft. below the summit-peak. It is of remarkably regular formation, and the floor is pierced by a number of huge fumaroles whence issue immense volumes of steam.
Izuno Oshima (Vries Island) (Izu) 2461.	The volcano on this island is called Mihara. There is a double crater, the outer being almost complete. The diameter of the outer crater, within which rises the modern cone to a height of 500 ft. above

Izuno Oshima (Vries Island) (Izu) 2461—(*cont.*).	the surrounding floor, is about 2 m.; while the present crater, which displays incessant activity, has itself a diameter of ¼ m.
Asama (Ise) 8136.	The largest active volcano in Japan. An eruption in 1783, with a deluge of lava, destroyed an extensive forest and overwhelmed several villages. The present cone is the third, portions of two concentric crater rings remaining. The present crater is remarkable for the absolute perpendicularity of its walls, and has an immense depth —from 600 to 800 ft. It is circular, ¾ m. in circumference, with sides honeycombed and burned to a red hue.

Some of the above information is based upon Mr. C. E. Bruce-Mitford's valuable work (see *Geog. Jour.*, Feb. 1908, &c.).

Earthquakes.—Japan is subject to marked displays of seismic violence. One steadily exercised influence is constantly at work, for the shores bordering the Pacific Ocean are slowly though appreciably rising, while on the side of the Japan Sea a corresponding subsidence is taking place. Japan also experiences a vast number of petty vibrations not perceptible without the aid of delicate instruments. But of earthquakes proper, large or small, she has an exceptional abundance. Thus in the thirteen years ending in 1897—that is to say, the first period when really scientific apparatus for recording purposes was available—she was visited by no fewer than 17,750 shocks, being an average of something over 3½ daily. The frequency of these phenomena is in some degree a source of security, for the minor vibrations are believed to exercise a binding effect by removing weak cleavages. Nevertheless the annals show that during the three centuries before 1897 there were 108 earthquakes sufficiently disastrous to merit historical mention. If the calculation be carried farther back—as has been done by the seismic disaster investigation committee of Japan, a body of scientists constantly engaged in studying these phenomena under government auspices,—it is found that, since the country's history began to be written in the 8th century A.D., there have been 2006 major disturbances; but inasmuch as 1489 of these occurred before the beginning of the Tokugawa administration (early in the 17th century, and therefore in an era when methods of recording were comparatively defective), exact details are naturally lacking. The story, so far as it is known, may be gathered from the following table:—

Date A.D.	Region.	Houses destroyed.	Deaths.
684	Southern part of Tosa	—	— (1)
869	Mutsu	—	— (2)
1361	Kiōto	—	—
1498	Tōkaidō	—	2,000 (3)
1569	Bungo	—	700
1596	Kiōto	—	2,000
1605 (31/1)	Pacific Coast	—	5,000
1611 (27/9)	Aizu	—	3,700
1614 (2/12)	Pacific Coast (N.E.)	—	1,700
1662 (16/6)	Kiōto	5,500	500
1666 (2/2)	Echigo	—	1,500
1694 (19/2)	Ugo	2,760	390
1703 (30/12)	Tōkyō	20,162	5,233
1707 (28/10)	Pacific Coast of Kiūshiū and Shikoku	29,000	4,900
1751 (20/5)	Echigo	9,100	1,700
1766 (8/3)	Hirosaki	7,500	1,335
1792 (10/2)	Hizen and Higo	12,000	15,000
1828 (18/2)	Echigo	11,750	1,443
1844 (8/5)	Echigo	34,000	12,000
1854 (6/7)	Yamato, Iga, Ise	5,000	2,400
1854 (23/12)	Tōkaidō (Shikoku)	60,000	3,000
1855 (11/11)	Yedo (Tōkyō)	50,000	6,700
1891 (28/10)	Mino, Owari	222,501	7,273
1894 (22/10)	Shōnai	8,403	726
1896 (15/6)	Sanriku	13,073	27,122
1896 (31/8)	Ugo, Rikuchu	8,996	209
1906 (12/2)	Formosa	5,556	1,228

(1) An area of over 1,200,000 acres swallowed up by the sea.
(2) Tidal wave killed thousands of people.
(3) Hamana lagoon formed.

In the capital (Tōkyō) the average yearly number of shocks throughout the 26 years ending in 1906 was 96, exclusive of minor vibrations, but during the 50 years then ending there were only two severe shocks (1884 and 1894), and they were not directly responsible for any damage to life or limb. The Pacific coast of the Japanese islands is more liable than the western shore to shocks disturbing a wide area. Apparent proof has been obtained that the shocks occurring in the Pacific districts originate at the bottom of the sea—the Tuscarora Deep is supposed to be the centre of seismic activity —and they are accompanied in most cases by tidal waves. It would seem that of late years Tajima, Hida, Kōzuke and some other regions in central Japan have enjoyed the greatest immunity, while Musashi (in which province Tōkyō is situated) and Sagami have been most subject to disturbance.

Plains.—Japan, though very mountainous, has many extensive plains. The northern island—Yezo—contains seven, and there are as many more in the main and southern islands, to say nothing of flat lands of minor dimensions. The principal are given in the following table:—

Name.		Situation.	Area.	Remarks.
Tokachi	plain	Yezo.	744,000 acres.	—
Ishikari	,,	do.	480,000 ,,	—
Kushiro	,,	do.	1,229,000 ,,	—
Nemuro	,,	do.	320,000 ,,	—
Kitami	,,	do.	230,000 ,,	—
Hidaka	,,	do.	200,000 ,,	—
Teshio	,,	do.	180,000 ,,	—
Echigo	,,	Main Island.	Unascertained.	—
Sendai	,,	do.	do.	—
Kwanto	,,	do.	do.	In this plain lie the capital, Tōkyō, and the town of Yokohama. It supports about 6 millions of people.
Mino-Owari	,,	do.	do.	Has 1½ million inhabitants.
Kinai	,,	do.	do.	Has the cities of Osaka, Kiōto and Kobe, and 2½ million people.
Tsukushi	,,	Kiūshiū.	do.	The chief coalfield of Japan.

Rivers.—Japan is abundantly watered. Probably no country in the world possesses a closer network of streams, supplemented by canals and lakes. But the quantity of water carried seawards varies within wide limits; for whereas, during the rainy season in summer and while the snows of winter are melting in spring, great volumes of water sweep down from the mountains, these broad rivers dwindle at other times to petty rivulets trickling among a waste of pebbles and boulders. Nor are there any long rivers, and all are so broken by shallows and rapids that navigation is generally impossible except by means of flat-bottomed boats drawing only a few inches. The chief rivers are given in the following table:—

	Length in miles.	Source.	Mouth.
Ishikari-gawa	275	Ishikari-dake	Otaru.
Shinano-gawa	215	Kimpu-san	Niigata.
Teshio-gawa	192	Teshio-take	Sea of Japan.
Tone-gawa	177	Monju-zan, Kōzuke	Choshi (Shimosa).
Mogami-gawa	151	Dainichi-dake (Uzen).	Sakata.
Yoshino-gawa	149	Yahazu-yama (Tosa).	Tokushima (Awa).
Kitakami-gawa	146	Nakayama-dake (Rikuchiu)	Ishinomaki (Rikuzen).
Tenriu-gawa	136	Suwako (Shinano)	Tōtōmi Bay.
Go-gawa or Iwamegawa	122	Maruse-yama (Bingo)	Iwami Bay.
Abukuma-gawa	122	Asahi-take (Iwashiro)	Matsushima Bay.
Tokachi-gawa	120	Tokachi-dake	Tokachi Bay.
Sendai-gawa	112	Kunimi-zan (Hiuga)	Kumizaki (Satsuma).
Oi-gawa	112	Shirane-san (Kai).	Suruga Bay.
Kiso-gawa	112	Kiso-zan (Shinano)	Bay of Isenumi.
Ara-kawa	104	Chichibu-yama	Tōkyō Bay.
Naga-gawa	102	Nasu-yama (Shimotsuke)	Naka-no-minato (Huachi).

Lakes and Waterfalls.—Japan has many lakes, remarkable for the beauty of their scenery rather than for their extent. Some are contained in alluvial depressions in the river valleys; others have been formed by volcanic eruptions, the ejecta damming the rivers until exits were found over cliffs or through gorges. Some of these lakes have become favourite summer resorts for foreigners. To that category belong especially the lakes of Hakone, of Chiuzenji, of Shōji, of Inawashiro, and of Biwa. Among these the highest is Lake Chiuzenji, which is 4375 ft. above sea-level, has a maximum depth of 93 fathoms, and empties itself at one end over a fall (Kegon) 250 ft. high. The Shōji lakes lie at a height of 3160 ft., and their neighbourhood abounds in scenic charms. Lake Hakone is at a height of 2428 ft.; Inawashiro, at a height of 1920 ft. and Biwa at a height of 328 ft. The Japanese associate Lake Biwa (Omi) with eight views of special loveliness (*Omi-no-hakkei*). Lake Suwa, in Shinano, which is emptied by the Tenriu-gawa, has a height of 2624 ft. In the vicinity of many of these mountain lakes thermal springs, with remarkable curative properties, are to be found. (F. By.)

Geology.—It is a popular belief that the islands of Japan consist for the most part of volcanic rocks. But although this conception might reasonably be suggested by the presence of many active and extinct volcanoes, Professor J. Milne has pointed out that it is literally true of the Kuriles alone, partially true for the northern half of the Main Island and for Kiūshiū, and quite incorrect as applied to the southern half of the Main Island and to Shikoku. This authority sums up the geology of Japan briefly and succinctly as follows (in *Things Japanese*, by Professor Chamberlain): "The backbone of the country consists of primitive gneiss and schists. Amongst the latter, in Shikoku, there is an extremely interesting rock consisting largely of piedmontite. Overlying these amongst the Palaeozoic rocks, we meet in many parts of Japan with slates and other rocks possibly of Cambrian or Silurian age. Trilobites have been discovered in Rikuzen. Carboniferous rocks are represented by mountain masses of *Fusulina* and other limestones. There is also amongst the Palaeozoic group an interesting series of red slates containing Radiolaria. Mesozoic rocks are represented by slates containing *Ammonites* and *Monotis*, evidently of Triassic age, rocks containing *Ammonites Bucklandi* of Liassic age, a series of beds rich in plants of Jurassic age, and beds of Cretaceous age containing *Trigonia* and many other fossils. The Cainozoic or Tertiary system forms a fringe round the coasts of many portions of the empire. It chiefly consists of stratified volcanic tuffs rich in coal, lignite, fossilized plants and an invertebrate fauna. Diatomaceous earth exists at several places in Yezo. In the alluvium which covers all, the remains have been discovered of several species of elephant, which, according to Dr Edmund Naumann, are of Indian origin. The most common eruptive rock is andesite. Such rocks as basalt, diorite and trachyte are comparatively rare. Quartz porphyry, quartzless porphyry, and granite are largely developed." Drs von Richthofen and Rein discuss the subject in greater detail. They have pointed out that in the mountain system of Japan there are three main lines. One runs from S.W. to N.E.; another from S.S.W. to N.N.E., and the third is meridional. These they call respectively the "southern schist range," the "northern schist range," and the "snow range," the last consisting mainly of old crystalline massive rocks. The rocks predominating in Japan fall also into three groups. They are, first, plutonic rocks, especially granite; secondly, volcanic rocks, chiefly trachyte and dolerite; and thirdly, palaeozoic schists. On the other hand, limestone and sandstone, especially of the Mesozoic strata, are strikingly deficient. The strike of the old crystalline rocks follows, in general, the main direction of the islands (S.W. to N.E.). They are often overlain by schists and quartzites, or broken through by volcanic masses. "The basis of the islands consist of granite, syenite, diorite, diabase and related kinds of rock, porphyry appearing comparatively seldom. Now the granite, continuing for long distances, forms the prevailing rock; then, again, it forms the foundation for thick strata of schist and sandstone, itself only appearing in valleys of erosion and river boulders, in rocky projections on the coasts or in the ridges of the mountains. . . . In the composition of many mountains in Hondo (the main island) granite plays a prominent part. . . . It appears to form the central mass which crops up in hundreds of places towards the coast and in the interior. Old schists, free from fossils and rich in quartz, overlie it in parallel chains through the whole length of the peninsula, especially in the central and highest ridges, and bear the ores of Chū-goku (the central provinces), principally copper pyrites and magnetic pyrites. These schist ridges rich in quartz show, to a depth of 20 metres, considerable disintegration. The resulting pebble and quartz-sand is very unproductive, and supports chiefly a poor underwood and crippled pines with widely spreading roots which seek their nourishment afar. In the province of Settsu granite everywhere predominates, which may be observed also in the railway cuttings between Hiōgo and Osaka, as well as in the temples and walls of these towns. The waterfalls near Kobe descend over granite walls and the *mikageishi* (stone of Mikage), famous throughout Japan, is granite from Settsu. . . . In the hill country on the borders of Ise, Owari, Mikawa and Tōtōmi, on the one side, and Omi, Mino and Shinano, on the other, granite frequently forms dark grey and much disintegrated rock-projections above schist and diluvial quartz pebbles. The feldspar of a splendid pegmatite and its products of disintegration on the borders of Owari, Mino and Mikawa form the raw material of the very extensive ceramic industry of this district, with its chief place, Seto. Of granite are chiefly formed the meridional mountains of Shinano. Granite, diorite and other plutonic rocks hem in the winding upper valleys of the Kisogawa, the Saigawa (Shinano river) and many other rivers of this province, their clear water running over granite. Also in the hills bordering on the plain of Kwanto these old crystalline rocks are widely spread. Farther northwards they give way again, as in the south, to schists and eruptive rocks. Yet even here granite may be traced in many places. Of course it is not always a pure granite; even hablit and granite-porphyry are found here and there. Thus, for instance, near Nikkō in the upper valley of the Daiya-gawa, and in several other places in the neighbouring mountains, a granite-porphyry appears with large, pale, flesh-coloured crystals of orthoclase, dull triclinic felspar, quartz and hornblende." "From the mine of Ichinokawa in Shikoku come the wonderful crystals of antimonite, which form such conspicuous objects in the mineralogical cabinets of Europe." (Rein's *Japan* and Milne in *Things Japanese*.) The above conditions suggest the presence of tertiary formations, yet only the younger groups of that formation appear to be developed. Nor is there any sign of moraines, glacier-scorings or other traces of the ice-age.

The oldest beds which have yielded fossils in any abundance belong to the Carboniferous System. The Trias proper is represented by truly marine deposits, while the Rhaetic beds contain plant remains. The Jurassic and Cretaceous beds are also in part marine and in part terrestrial. During the whole of the Mesozoic era Japan appears to have lain on or near the margin of the Asiatic continent, and the marine deposits are confined for the most part to the eastern side of the islands.

The igneous rocks occur at several geological horizons, but the great volcanic eruptions did not begin until the Tertiary period. The existing volcanoes belong to four separate arcs or chains. On the south is the arc of the Luchu islands, which penetrates into Kiū Shiū. In the centre there is the arc of the Izu-no-Shichito islands, which is continued into Hondo along the Fossa Magna. In North Hondo the great Bandai arc forms the axis of the island and stretches into Yezo (Hokkaidō). Finally in the east of Yezo rise the most westerly volcanoes of the Kurile chain. The lavas and ashes ejected by these volcanoes consist of liparite, dacite, andesite and basalt.

Structurally Japan is divided into two regions by a depression (the "Fossa Magna" of Naumann) which stretches across the island of Hondo from Shimoda to Nagano. The depression is marked by a line of volcanoes, including Fuji, and is in part buried beneath the products of their eruptions. It is supposed to be due to a great fault along its western margin. South and west of the Fossa Magna the beds are thrown into folds which run approximately parallel to the general direction of the coast, and two zones may be recognized—an outer, consisting of Palaeozoic and Mesozoic beds, and an inner, consisting of Archaean and Palaeozoic rocks, with granitic intrusions. Nearly along the boundary between the two zones lie the inland seas of south Japan. Towards the Fossa Magna the folds bend northwards.

North and east of the Fossa Magna the structure is concealed, to a very large extent, by the outpourings of the volcanoes which form so marked a feature in the northern part of Hondo. But the foundation on which the volcanoes rest is exposed along the east coast of Hondo (in the Kwanto, Abukuma and Kitakami hills), and also in the island of Yezo. This foundation consists of Archean, Palaeozoic and Mesozoic beds folded together, the direction of the folds being N. by W. to S. by E., that is to say, slightly oblique to the general direction of this part of the island. Towards the Fossa Magna the folds bend sharply round until they are nearly parallel to the Fossa itself. (P. La.)

Secular Movement

It has been abundantly demonstrated by careful observations that the east coasts of Japan are slowly rising. This phenomenon was first noticed in the case of the plain on which stands the capital, Tōkyō. Maps of sufficiently trustworthy accuracy show that in the 11th century Tōkyō Bay penetrated much more deeply in a northern direction than it does now; the point where the city's main river (Sumida or Arakawa) enters the sea was considerably to the north of its present position, and low-lying districts, to-day thickly populated, were under water. Edmund Naumann was the discoverer of these facts, and his attention was first drawn to them by learning that an edible sea-weed, which flourishes only in salt water, is called *Asakusa-nori*, from the place (Asakusa) of its original provenance, which now lies some 3 m. inland. Similar phenomena were found in Sakhalin by Schmidt and on the north-east coast of the main island by Rein, and there can be little doubt that they exist at other places also. Naumann has concluded that "formerly Tōkyō Bay stretched further over the whole level country of Shimosa and Hitachi and northwards as far as the plain of Kwantō extends;" that "the mountain country of Kasusa-Awa emerged from it an island, and that a current ran in a north-westerly direction between this island and the northern mountain margin of the present plain toward the north-east into the open ocean."

Mineral Springs.—The presence of so many active volcanoes is partially compensated by a wealth of mineral springs. Since many of these thermal springs possess great medicinal value, Japan may become one of the world's favourite health-resorts. There are more than a hundred spas, some hot, some cold, which, being easily accessible and highly efficacious, are largely visited by the Japanese. The most noteworthy are as follows:—

Name of Spa.	Prefecture.	Quality.	Temp., F°.
Arima	Hiogo	Salt	100
Asama	Nagano	Pure	111—127
Asamushi	Aomori	Salt	134—168
Atami	Shizuoka	do.	131—226
Beppu	Oita	Carbonic Acid	109—132
Bessho	Nagano	Pure or Sulphurous	108—113
Dogo	Ehime	Pure	70—110
Hakone	Kanagawa	Pure, Salt or Sulphurous	98—168
Higashi-yama	Fukushima	Pure or Salt	117—144
Ikao	Gumma	Salt	111—127
Isobe	do.	do.	Cold
Kusatsu	do.	Sulphurous	127—148

Name of Spa.	Prefecture.	Quality.	Temp., F°.
Nasu	Tochigi	Sulphurous	162—172
Noboribetsu	Ishikari	do.	125
Shibu	Nagano	Salt	98—115
Chiuzenji	Shizuoka	Carbonate of Soda and Sulphur	114—185
Takarazuka	Hiogo	Carbonic Acid	Cold
Ureshino	Saga	do.	230
Unzen	Nagasaki	Sulphurous	158—204
Wagura	Ishikawa	Salt	180
Yamashiro	do.	do.	165
Yunoshima	Hiogo	do.	104—134

Climate.—The large extension of the Japanese islands in a northerly and southerly direction causes great varieties of climate. General characteristics are hot and humid though short summers, and long, cold and clear winters. The equatorial currents produce conditions differing from those existing at corresponding latitudes on the neighbouring continent. In Kiūshiū, Shikoku and the southern half of the main island, the months of July and August alone are marked by oppressive heat at the sea-level, while in elevated districts a cool and even bracing temperature may always be found, though the direct rays of the sun retain distressing power. Winter in these districts does not last more than two months, from the end of December to the beginning of March; for although the latter month is not free from frost and even snow, the balminess of spring makes itself plainly perceptible. In the northern half of the main island, in Yezo and in the Kuriles, the cold is severe during the winter, which lasts for at least four months, and snow falls sometimes to great depths. Whereas in Tōkyō the number of frosty nights during a year does not average much over 60, the corresponding number in Sapporo on the north-west of Yezo is 145. But the variation of the thermometer in winter and summer being considerable—as much as 72° F. in Tōkyō—the climate proves somewhat trying to persons of weak constitution. On the other hand, the mean daily variation is in general less than that in other countries having the same latitude: it is greatest in January, when it reaches 18° F., and least in July, when it barely exceeds 9° F. The monthly variation is very great in March, when it usually reaches 43° F.

Meteorology.

During the first 40 years of the *Meiji* era numerous meteorological stations were established. Reports are constantly forwarded by telegraph to the central observatory in Tōkyō, which issues daily statements of the climatic conditions during the previous twenty-four hours, as well as forecasts for the next twenty-four. The whole country is divided into districts for meteorological purposes, and storm-warnings are issued when necessary. At the most important stations observations are taken every hour; at the less important, six observations daily; and at the least important, three observations. From the record of three decades the following yearly averages of temperature are obtained:—

	F°.
Taihoku (in Formosa)	71
Nagasaki (Kiūshiū)	60
Kōbe (Main Island)	59
Osaka (Main Island)	59
Okayama (Main Island)	58
Nagoya (Main Island)	58
Sakai (Main Island)	58
Tōkyō (Capital)	57
Kiōto (Main Island)	57
Niigata (Main Island)	55
Ishinomaki (Main Island)	52
Aomori (Main Island)	50
Sapporo (Yezo)	44

The following table affords data for comparing the climates of Peking, Shanghai, Hakodate, Tōkyō and San Francisco:—

	Longitude.	Latitude.	Mean Temp., F°.
Peking	116° 29′ E.	39° 57′ N.	53
Shanghai	121° 20′ E.	31° 12′ N.	59
Hakodate	140° 45′ E.	41° 46′ N.	47
Tōkyō	138° 47′ E.	35° 41′ N.	57
San Francisco	122° 25′ E.	37° 48′ N.	56

	Hottest Month.	Mean Temp. of Hottest Month.
Peking	July	80
Shanghai	do.	84
Hakodate	August	71
Tōkyō	do.	79
San Francisco	September	63

	Coldest Month.	Mean Temp. of Coldest Month.
Peking.	January	22
Shanghai	do.	26
Hakodate	do.	28
Tōkyō	do.	36
San Francisco	do.	49

Rainfall.

There are three wet seasons in Japan: the first, from the middle of April to the beginning of May; the second, from the middle of June to the beginning of July; and the third, from early in September to early in October. The dog days (*doyō*) are from the middle of July till the second half of August. September is the wettest month; January the driest. During the four months from November to February inclusive only about 18% of the whole rain for the year falls. In the district on the east of the main island the snowfall is insignificant, seldom attaining a depth of more than four or five inches and generally melting in a few days, while bright, sunny skies are usual. But in the mountainous provinces of the interior and in those along the western coast, deep snow covers the ground throughout the whole winter, and the sky is usually wrapped in a veil of clouds. These differences are due to the action of the north-westerly wind that blows over Japan from Siberia. The intervening sea being comparatively warm, this wind arrives at Japan having its temperature increased and carrying moisture which it deposits as snow on the western faces of the Japanese mountains. Crossing the mountains and descending their eastern slopes, the wind becomes less saturated and warmer, so that the formation of clouds ceases. Japan is emphatically a wet country so far as quantity of rainfall is concerned, the average for the whole country being 1570 mm. per annum. Still there are about four sunny days for every three on which rain or snow falls, the actual figures being 150 days of snow or rain and 215 days of sunshine.

Wind.

During the cold season, which begins in October and ends in April, northerly and westerly winds prevail throughout Japan. They come from the adjacent continent of Asia, and they develop considerable strength owing to the fact that there is an average difference of some 22 mm. between the atmospheric pressure (750 mm.) in the Pacific and that (772 mm.) in the Japanese islands. But during the warm season, from May to September, these conditions of atmospheric pressure are reversed, that in the Pacific rising to 767 mm. and that in Japan falling to 750 mm. Hence throughout this season the prevailing winds are light breezes from the west and south. A comparison of the force habitually developed by the wind in various parts of the islands shows that at Suttsu in Yezo the average strength is 9 metres per second, while Izuhara in the island Tsu-shima, Kumamoto in Kiūshiū and Gifu in the east centre of the main island stand at the bottom of the list with an average wind velocity of only 2 metres. A calamitous atmospheric feature is the periodical arrival of storms called "typhoons" (Japanese *tai-fu* or "great wind"). These have their origin, for the most part, in the China Sea, especially in the vicinity of Luzon. Their season is from June to October, but they occur in other months also, and they develop a velocity of 5 to 75 m. an hour. The meteorological record for ten years ended 1905 shows a total of 120 typhoons, being an average of 12 annually. September had 14 of these phenomena, March 11 and April 10, leaving 85 for the remaining 9 months. But only 65 out of the whole number developed disastrous force. It is particularly unfortunate that September should be the season of greatest typhoon frequency, for the earlier varieties of rice flower in that month and a heavy storm does much damage. Thus, in 1902—by no means an abnormal year—statistics show the following disasters owing to typhoons: casualties to human life, 3639; ships and boats lost, 3244; buildings destroyed wholly or partially, 695,062; land inundated, 1,071,575 acres; roads destroyed, 1236 m.; bridges washed away, 13,685; embankments broken, 705 m.; crops damaged, 8,712,655 bushels. The total loss, including cost of repairs, was estimated at nearly 3 millions sterling, which may be regarded as an annual average.

Flora.—The flora of Japan has been carefully studied by many scientific men from Siebold downwards. Foreigners visiting Japan are immediately struck by the affection of the people for flowers, trees and natural beauties of every kind. In actual wealth of blossom or dimensions of forest trees the Japanese islands cannot claim any special distinction. The spectacles most admired by all classes are the tints of the foliage in autumn and the glory of flowering trees in the spring. In beauty and variety of pattern and colour the autumnal tints are unsurpassed. The colours pass from deep brown through purple to yellow and white, thrown into relief by the dark green of non-deciduous shrubs and trees. Oaks and wild prunus, wild vines and sumachs, various kinds of maple, the *dōdan* (*Enkianthus Japonicus* Hook.)—a wonderful bush which in autumn develops a hue of ruddy red—birches and other trees, all add multitudinous colours to the brilliancy of a spectacle which is further enriched by masses of feathery bamboo. The one defect is lack of green sward. The grass used for Japanese lawns loses its verdure in autumn and remains from November to March a greyish-brown blot upon the scene. Spring is supposed to begin in February when, according to the old calendar, the new year sets in, but the only flowers then in bloom are the *camellia japonica* and some kinds of daphne. The former—called by the Japanese *tsubaki*—may often be seen glowing fiery red amid snow, but the pink (*otome tsubaki*), white (*shiro-tsubaki*) and variegated (*shibori-no-tsubaki*) kinds do not bloom until March or April. Neither the camellia nor the daphne is regarded as a refined flower: their manner of shedding their blossoms is too unsightly. Queen of spring flowers is the plum (*ume*). The tree lends itself with peculiar readiness to the skilful manipulation of the gardener, and is by him trained into shapes of remarkable grace. Its pure white or rose-red blossoms, heralding the first approach of genial weather, are regarded with special favour and are accounted the symbol of unassuming hardihood. The cherry (*sakura*) is even more esteemed. It will not suffer any training, nor does it, like the plum, improve by pruning, but the sunshine that attends its brief period of bloom in April, the magnificence of its flower-laden boughs and the picturesque flutter of its falling petals, inspired an ancient poet to liken it to the "soul of Yamato" (Japan), and it has ever since been thus regarded. The wild peach (*momo*) blooms at the same time, but attracts little attention. All these trees—the plum, the cherry and the peach—bear no fruit worthy of the name, nor do they excel their Occidental representatives in wealth of blossom, but the admiring affection they inspire in Japan is unique. Scarcely has the cherry season passed when that of the wistaria (*fuji*) comes, followed by the azalea (*tsutsuji*) and the iris (*shōbu*), the last being almost contemporaneous with the peony (*botan*), which is regarded by many Japanese as the king of flowers and is cultivated assiduously. A species of weeping maple (*shidare-momiji*) dresses itself in peachy-red foliage and is trained into many picturesque shapes, though not without detriment to its longevity. Summer sees the lotus (*renge*) convert wide expanses of lake and river into sheets of white and red blossoms; a comparatively flowerless interval ensues until, in October and November, the chrysanthemum arrives to furnish an excuse for fashionable gatherings. With the exception of the dog-days and the dead of winter, there is no season when flowers cease to be an object of attention to the Japanese, nor does any class fail to participate in the sentiment. There is similar enthusiasm in the matter of gardens. From the 10th century onwards the art of landscape gardening steadily grew into a science, with esoteric as well as exoteric aspects, and with a special vocabulary. The underlying principle is to reproduce nature's scenic beauties, all the features being drawn to scale, so that however restricted the space, there shall be no violation of proportion. Thus the artificial lakes and hills, the stones forming rockeries or simulating solitary crags, the trees and even the bushes are all selected or manipulated so as to fall congruously into the general scheme. If, on the one hand, huge stones are transported hundreds of miles from sea-shore or river-bed where, in the lapse of long centuries, waves and cataracts have hammered them into strange shapes, and if the harmonizing of their various colours and the adjustment of their forms to environment are studied with profound subtlety, so the training and tending of the trees and shrubs that keep them company require much taste and much toil. Thus the red pine (*aka-matsu* or *pinus densiflora*), which is the favourite garden tree, has to be subjected twice a year to a process of spray-dressing which involves the careful removal of every weak or aged needle. One tree occupies the whole time of a gardener for about ten days. The details are endless, the results delightful. But it has to be clearly understood that there is here no mention of a flower-garden in the Occidental sense of the term. Flowers are cultivated, but for their own sakes, not as a feature of the landscape garden. If they are present, it is only as an incident. This of course does not apply to shrubs which blossom at their seasons and fall always into the general scheme of the landscape. Forests of cherry-trees, plum-trees, magnolia trees, or *hiyaku-jikkō* (*Lagerstroemia indica*), banks of azalea, clumps of hydrangea, groups of camellia—such have their permanent places and their foliage adds notes of colour when their flowers have fallen. But chrysanthemums, peonies, roses and so forth, are treated as special shows, and are removed or hidden when out of bloom. There is another remarkable feature of the Japanese gardener's art. He dwarfs trees so that they remain measurable only by inches after their age has reached scores, even hundreds, of years, and the proportions of leaf, branch and stem are preserved with fidelity. The pots in which these wonders of patient skill are grown have to be themselves fine specimens of the keramist's craft, and as much as £200 is sometimes paid for a notably well trained tree.

There exists among many foreign observers an impression that Japan is comparatively poor in wild-flowers; an impression probably due to the fact that there are no flowery meadows or lanes. Besides, the flowers are curiously wanting in fragrance. Almost the only notable exceptions are the *mokusei* (*Osmanthus fragrans*), the daphne and the magnolia. Missing the perfume-laden air of the Occident, a visitor is prone to infer paucity of blossoms. But if some familiar European flowers are absent, they are replaced by others strange to Western eyes—a wealth of *lespedeza* and *Indigo-fera*; a vast variety of lilies; graceful grasses like the eulalia and the *ominameshi* (*Patrina scabiosaefolia*); the richly-hued *Pyrus japonica*; azaleas, diervillas and deutzias; the *kikyo* (*Platycodon grandiflorum*), the *gibōshi* (*Funkia ovata*), and many another. The same is true of Japanese forests. It has been well said that "to enumerate the constituents and inhabitants of the Japanese mountain-forests would be to name at least half the entire flora."

According to Franchet and Savatier Japan possesses:—

	Families.	Genera.	Species.
Dicotyledonous plants	121	795	1934
Monocotyledonous plants . . .	28	202	613
Higher Cryptogamous plants . .	5	38	196
Vascular plants	154	1035	2743

The investigations of Japanese botanists are adding constantly to the above number, and it is not likely that finality will be reached for some time. According to a comparison made by A. Gray with regard to the numbers of genera and species respectively represented in the forest trees of four regions of the northern hemisphere, the following is the case:—

Atlantic Forest-region of N. America .	66 genera and 155 species.
Pacific Forest-region of N. America .	31 genera and 78 species.
Japan and Manchuria Forest-region .	66 genera and 168 species.
Forests of Europe	33 genera and 85 species.

While there can be no doubt that the luxuriance of Japan's flora is due to rich soil, to high temperature and to rainfall not only plentiful but well distributed over the whole year, the wealth and variety of her trees and shrubs must be largely the result of immigration. Japan has four insular chains which link her to the neighbouring continent. On the south, the Riūkiū Islands bring her within reach of Formosa and the Malayan archipelago; on the west, Oki, Iki, and Tsushima bridge the sea between her and Korea; on the north-west Sakhalin connects her with the Amur region; and on the north, the Kuriles form an almost continuous route to Kamchatka. By these paths the germs of Asiatic plants were carried over to join the endemic flora of the country, and all found suitable homes amid greatly varying conditions of climate and physiography.

Fauna.—Japan is an exception to the general rule that continents are richer in fauna than are their neighbouring islands. It has been said with truth that "an industrious collector of beetles, butterflies, neuroptera, &c., finds a greater number of species in a circuit of some miles near Tōkyō than are exhibited by the whole British Isles."

Of mammals 50 species have been identified and catalogued. Neither the lion nor the tiger is found. The true Carnivora are three only, the bear, the dog and the marten. Three species of bears are scientifically recognized, but one of them, the ice-bear (*Ursus maritimus*), is only an accidental visitor, carried down by the Arctic current. In the main island the black bear (*kuma, Ursus japonicus*) alone has its habitation, but the island of Yezo has the great brown bear (called *shi-guma, oki-kuma* or *aka-kuma*), the "grisly" of North America. The bear does not attract much popular interest in Japan. Tradition centres rather upon the fox (*kitsune*) and the badger (*mujina*), which are credited with supernatural powers, the former being worshipped as the messenger of the harvest god, while the latter is regarded as a mischievous rollicker. Next to these comes the monkey (*saru*), which dwells equally among the snows of the north and in the mountainous regions of the south. *Saru* enters into the composition of many place-names, an evidence of the people's familiarity with the animal. There are ten species of bat (*komori*) and seven of insect-eaters, and prominent in this class are the mole (*mugura*) and the hedgehog (*hari-nezumi*). Among the martens there is a weasel (*itachi*), which, though useful as a rat-killer, has the evil repute of being responsible for sudden and mysterious injuries to human beings; there is a river-otter (*kawauso*), and there is a sea-otter (*rakko*) which inhabits the northern seas and is highly valued for its beautiful pelt. The rodents are represented by an abundance of rats, with comparatively few mice, and by the ordinary squirrel, to which the people give the name of tree-rat (*ki-nezumi*), as well as the flying squirrel, known as the *momo-dori* (peach-bird) in the north, where it hides from the light in hollow tree-trunks, and in the south as the *ban-tori* (or bird of evening). There are no rabbits, but hares (*usagi*) are to be found in very varying numbers, and those of one species put on a white coat during winter. The wild boar (*shishi* or *ii-no-shishi*) does not differ appreciably from its European congener. Its flesh is much relished, and for some unexplained reason is called by its vendors "mountain-whale" (*yama-kujira*). A very beautiful stag (*shika*), with eight-branched antlers, inhabits the remote woodlands, and there are five species of antelope (*kamo-shika*) which are found in the highest and least accessible parts of the mountains. Domestic animals have for representatives the horse (*uma*), a small beast with little beauty of form though possessing much hardihood and endurance; the ox (*ushi*), mainly a beast of burden or draught; the pig (*buta*), very occasionally; the dog (*inu*), an unsightly and useless brute; the cat (*neko*), with a stump in lieu of a tail; barndoor fowl (*niwa-tori*), ducks (*ahiro*) and pigeons (*hato*). The turkey (*shichimencho*) and the goose (*gachō*) have been introduced but are little appreciated as yet.

Although so-called singing birds exist in tolerable numbers, those worthy of the name of songster are few. Eminently first is a species of nightingale (*uguisu*), which, though smaller than its congener of the West, is gifted with exquisitely modulated flute-like notes of considerable range. The *uguisu* is a dainty bird in the matter of temperature. After May it retires from the low-lying regions and gradually ascends to higher altitudes as midsummer approaches. A variety of the cuckoo called *hototogisu* (*Cuculus poliocephalus*) in imitation of the sound of its voice, is heard as an accompaniment of the *uguisu*, and there are also three other species, the *kakkōdori* (*Cuculus canorus*), the *tsutsu-dori* (*C. himalayanus*), and the *masuhakari*, or *juichi* (*C. hyperythrus*). To these the lark, *hibari* (*Alauda japonica*), joins its voice, and the cooing of the pigeon (*hato*) is supplemented by the twittering of the ubiquitous sparrow (*suzume*), while over all are heard the raucous caw of the raven (*karasu*) and the harsh scream of the kite (*tombi*), between which and the raven there is perpetual feud. The falcon (*taka*), always an honoured bird in Japan, where from time immemorial hawking has been an aristocratic pastime, is common enough, and so is the sparrow-hawk (*hai-taka*), but the eagle (*washi*) affects solitude. Two English ornithologists, Blakiston and Pryer, are the recognized authorities on the birds of Japan, and in a contribution to the *Transactions of the Asiatic Society of Japan* (vol. x.) they have enumerated 359 species. Starlings (*muku-dori*) are numerous, and so are the wagtail (*sekirei*), the swallow (*tsubame*) the martin (*ten*), the woodchat (*mozu*) and the jay (*kakesu* or *kashi-dori*), but the magpie (*tōgarasu*), though common in China, is rare in Japan. Blackbirds and thrushes are not found, nor any species of parrot, but on the other hand, we have the hoopoe (*yatsugashira*), the red-breast (*komadori*), the bluebird (*ruri*), the wren (*miso-sazai*), the golden-crested wren (*itadaki*), the golden-eagle (*inu-washi*), the finch (*hiwa*), the longtailed rosefinch (*benimashiko*), the ouzel—brown (*akahara*), dusky (*tsugumi*) and water (*kawa-garasu*)—the kingfisher (*kawasemi*), the crake (*kuina*) and the tomtit (*kara*). Among game-birds there are the quail (*uzura*), the heathcock (*ezo-rachō*), the ptarmigan (*ezo-raichō* or *ezo-yama-dori*), the woodcock (*hodo-shigi*), the snipe (*ta-shigi*)—with two special species, the solitary snipe (*yama-shigi*) and the painted snipe (*tama-shigi*)—and the pheasant (*kiji*). Of the last there are two species, the *kiji* proper, a bird presenting no remarkable features, and the copper pheasant, a magnificent bird with plumage of dazzling beauty. Conspicuous above all others, not only for grace of form but also for the immemorial attention paid to them by Japanese artists, are the crane (*tsuru*) and the heron (*sagi*). Of the crane there are seven species, the stateliest and most beautiful being the *Grus japonensis* (*tanchō* or *tanchō-suru*), which stands some 5 ft. high and has pure white plumage with a red crown, black tail-feathers and black upper neck. It is a sacred bird, and it shares with the tortoise the honour of being an emblem of longevity. The other species are the demoiselle crane (*anewa-zuru*), the black crane (*kuro-zuru* or *nezumi-zuru*, i.e. *Grus cinerea*), the *Grus leucauchen* (*mana-zuru*), the *Grus monachus* (*nabe-suru*), and the white crane (*shiro-zuru*). The Japanese include in this category the stork (*kōzuru*), but it may be said to have disappeared from the island. The heron (*sagi*) constitutes a charming feature in a Japanese landscape, especially the silver heron (*shira-sagi*), which displays its brilliant white plumage in the rice-fields from spring to early autumn. The night-heron (*goi-sagi*) is very common. Besides these waders there are plover (*chidori*); golden (*muna-guro* or *ai-guro*); gray (*daizen*); ringed (*shiro-chidori*); spur-winged (*keri*) and Harting's sand-plover (*ikaru-chidori*); sand-pipers—green (*ashiro-shigi*) and spoon-billed (*hera-shigi*)—and water-hens (*ban*). Among swimming birds the most numerous are the gull (*kamome*), of which many varieties are found; the cormorant (*u*)—which is trained by the Japanese for fishing purposes—and multitudinous flocks of wild-geese (*gan*) and wild-ducks (*kamo*), from the beautiful mandarin-duck (*oshi-dori*), emblem of conjugal fidelity, to teal (*kogamo*) and widgeon (*hidori-gamo*) of several species. Great preserves of wild-duck and teal used to be a frequent feature in the parks attached to the feudal castles of old Japan, when a peculiar method of netting the birds or striking them with falcons was a favourite aristocratic pastime. A few of such preserves still exist, and it is noticeable that in the Palace-moats of Tōkyō all kinds of water-birds, attracted by the absolute immunity they enjoy there, assemble in countless numbers at the approach of winter and remain until the following spring, wholly indifferent to the close proximity of the city.

Of reptiles Japan has only 30 species, and among them is included the marine turtle (*umi-game*) which can scarcely be said to frequent her waters, since it is seen only at rare intervals on the southern coast. This is even truer of the larger species (the *shōgakubo*, i.e. *Chelonia cephalo*). Both are highly valued for the sake of the shell, which has always been a favourite material for ladies' combs and hairpins. By carefully selecting certain portions and welding them together in a perfectly flawless mass, a pure amber-coloured object is obtained at heavy cost. Of the fresh-water tortoise there are two kinds, the *suppon* (*Trionyx japonica*) and the *kame-no-ko* (*Emys vulgaris japonica*). The latter is one of the Japanese emblems of longevity. It is often depicted with a flowing tail, which appendix attests close observation of nature; for the *mino-game*, as it is called, represents a tortoise to which, in the course of many scores of years, confervae have attached themselves so as to form an appendage of long green locks as the creature swims about. Sea-snakes occasionally make their way to Japan, being carried thither by the Black Current (Kuro Shiwo) and the monsoon, but they must be regarded as merely fortuitous visitors. There are 10 species of land-snakes (*hebi*), among which one only (the *mamushi*, or *Trigonocephalus Blomhoffi*) is venomous. The others for the most part frequent the rice-fields and live upon frogs. The largest is the *aodaisho* (*Elaphis virgatus*), which sometimes attains a length of 5 ft., but is quite harmless. Lizards (*tokage*), frogs (*kawazu* or *kaeru*), toads (*ebogayeru*) and newts (*imori*) are plentiful, and much curiosity attaches to a giant salamander (*sansho-uwo*, called also *hazekai* and other names according to localities), which reaches to a length of 5 ft., and (according to Rein) is closely related to the *Andrias Scheuchzeri* of the Oeningen strata.

The seas surrounding the Japanese islands may be called a resort of fishes, for, in addition to numerous species which abide there permanently, there are migatory kinds, coming and going with the monsoons and with the great ocean streams that set to and from the shores. In winter, for example, when the northern monsoon begins to blow, numbers of denizens of the Sea of Okhotsk swim southward to the more genial waters of north Japan; and in summer the Indian Ocean and the Malayan archipelago send to her southern coasts a crowd of emigrants which turn homeward again at the approach of winter. It thus falls out that in spite of the enormous quantity of fish consumed as food or used as fertilizers year after year by the Japanese, the seas remain as richly stocked as ever. Nine orders of fishes have been distinguished as the piscifauna of Japanese waters. They may be found carefully catalogued with all their included species in Rein's *Japan*, and highly interesting researches by Japanese physiographists are recorded in the Journal of the College of Science of the Imperial University of Tōkyō. Briefly, the chief fish of Japan are the bream (*tai*), the perch (*suzuki*), the mullet (*bora*), the rock-fish (*hatatate*), the grunter (*oni-o-koze*), the mackerel (*saba*), the sword-fish (*tachi-uwo*); the wrasse (*kusabi*), the haddock (*tara*), the flounder (*karei*), and its congeners the sole (*hirame*) and the turbot (*ishi-garei*), the shad (*namazu*), the salmon (*shake*), the *masu*, the carp (*koi*), the *funa*, the gold fish (*kingyo*), the gold carp (*higoi*), the loach (*dojo*), the herring (*nishin*), the *iwashi* (*Clupea melanosticta*), the eel (*unagi*), the conger eel (*anago*), the coffer-fish (*hako-uwo*), the *fugu* (*Tetrodon*), the *ai* (*Plecoglossus altivelis*), the sayori (*Hemiramphus sayori*), the shark (same), the dogfish (*manuka-zame*), the ray (*e*), the sturgeon (*chō-zame*) and the *maguro* (*Thynnus sibi*).

The insect life of Japan broadly corresponds with that of temperate regions in Europe. But there are also a number of tropical species, notably among butterflies and beetles. The latter—for which the generic term in Japan is *mushi* or *kaichū*—include some beautiful species, from the "jewel beetle" (*tama-mushi*), the "gold beetle" (*kogane-mushi*) and the *Chrysochroa fulgidissima*, which glow and sparkle with the brilliancy of gold and precious stones, to the jet black *Melanauster chinensis*, which seems to have been fashioned out of lacquer spotted with white. There is also a giant nasicornous beetle. Among butterflies (*chōchō*) Rein gives prominence to the broad-winged kind (*Papilio*), which recall tropical brilliancy. One (*Papilio macilentus*) is peculiar to Japan. Many others seem to be practically identical with European species. That is especially true of the moths (*yachō*), 100 species of which have been identified with English types. There are seven large silk-moths, of which two only (*Bombyx mori* and *Antheraea yama-mai*) are employed in producing silk. Fishing lines are manufactured from the cocoons of the *genjiki-mushi* (*Caligula japonica*), which is one of the commonest moths in the islands. Wasps, bees and hornets, generically known as *hachi*, differ little from their European types, except that they are somewhat larger and more sluggish. The gad-fly (*abu*), the house-fly (*hai*), the mosquito (*ka*), the flea (*nomi*) and occasionally the bed-bug (called by the Japanese *kara-mushi* because it is believed to be imported from China), are all fully represented, and the dragon-fly (*tombō*) presents itself in immense numbers at certain seasons. Grasshoppers (*batta*) are abundant, and one kind (*inago*), which frequent the rice-fields when the cereal is ripening, are caught and fried in oil as an article of food. On the moors in late summer the mantis (*kama-kiri-mushi*) is commonly met with, and the cricket (*kūrogi*) and the cockroach abound. Particularly obtrusive is the cicada (*semi*), of which there are many species. Its strident voice is heard most loudly at times of great heat, when the song of the birds is hushed. The dragon-fly and the cicada afford ceaseless entertainment to the Japanese boy. He catches them by means of a rod smeared with bird-lime, and then tying a fine string under their wings, he flies them at its end. Spiders abound, from a giant species to one of the minutest dimensions, and the tree-bug is always ready to make a destructive lodgment in any sickly tree-stem. The scorpion (*sasori*) exists but is not poisonous.

Japanese rivers and lakes are the habitation of several—seven or eight—species of freshwater crab (*kani*), which live in holes on the shore and emerge in the day-time, often moving to considerable distances from their homes. Shrimps (*kawa-ebi*) also are found in the rivers and rice-fields. These shrimps as well as a large species of crab—*mokusō-gani*—serve the people as an article of food, but the small crabs which live in holes have no recognized *raison d' être*. In Japan, as elsewhere, the principal crustacea are found in the sea. Flocks of *lupa* and other species swim in the wake of the tropical fishes which move towards Japan at certain seasons. Naturally these migratory crabs are not limited to Japanese waters. Milne Edwards has identified ten species which occur in Australian seas also, and Rein mentions, as belonging to the same category, the "helmet-crab" or "horse-shoe crab" (*kabuto-gani*; *Limulus longispina* Hoeven). Very remarkable is the giant *Taka-ashi*—long legs (*Macrocheirus Kaempferi*), which has legs 1⅓ metres long and is found in the seas of Japan and the Malay archipelago. There is no lobster on the coasts of Japan, but there are various species of cray-fish (*Palinurus* and *Scyllarus*) the principal of which, under the names of *ise-ebi* (*Palinurus japonicus*) and *kuruma-ebi* (*Penaeus canaliculatus*) are greatly prized as an article of diet.

Already in 1882, Dunker in his *Index Molluscorum Maris Japonici* enumerated nearly 1200 species of marine molluscs found in the

Japanese archipelago, and several others have since then been added to the list. As for the land and fresh-water molluscs, some 200 of which are known, they are mainly kindred with those of China and Siberia, tropical and Indian forms being exceptional. There are 57 species of *Helix* (*maimaitsuburi*, *dedemushi*, *katatsumuri* or *kwagyū*) and 25 of *Clausilia* (*kiseru-gai* or pipe-snail), including the two largest snails in Japan, namely the *Cl. Martensi* and the *Cl. Yokohamensis*, which attain to a length of 58 mm. and 44 mm. respectively. The mussel (*i-no-kai*) is well represented by the species *numa-gai* (marsh-mussel), *karasu-gai* (raven-mussel), *kamisori-gai* (razor-mussel), *shijimi-no-kai* (*Corbicula*), of which there are nine species, &c. Unlike the land-molluscs, the great majority of Japanese sea-molluscs are akin to those of the Indian Ocean and the Malay archipelago. Some of them extend westward as far as the Red Sea. The best known and most frequent forms are the *asari* (*Tapes philippinarum*), the *hamaguri* (*Meretrix lusoria*), the *baka* (*Mactra sulcataria*), the *aka-gai* (*Scapharca inflata*), the *kaki* (oyster), the *awabi* (*Haliotis japonica*), the *sazae* (*Turbo cornutus*), the *hora-gai* (*Tritonium tritonius*), &c. Among the cephalopods several are of great value as articles of food, *e.g.* the *surume* (*Onychotheuthis Banksii*), the *tako* (octopus), the *shidako* (Eledone), the *ika* (Sepia) and the *tako-fune* (Argonauta).

Greeff enumerates, as denizens of Japanese seas, 26 kinds of sea-urchins (*gaze* or *uni*) and 12 of starfish (*hitode* or *tako-no-makura*). These, like the mollusca, indicate the influence of the Kuro Shiwo and the south-west monsoon, for they have close affinity with species found in the Indian and Pacific Oceans. For edible purposes the most valuable of the Japanese echinoderms is the sea-slug or *bêche de mer* (*namako*), which is greatly appreciated and forms an important staple of export to China. Rein writes: "Very remarkable in connexion with the starfishes is the occurrence of *Asterias rubens* on the Japanese coast. This creature displays an almost unexampled frequency and extent of distribution in the whole North Sea, in the western parts of the Baltic, near the Faroe Islands, Iceland, Greenland and the English coasts, so that it may be regarded as a characteristic North Sea echinoderm form. Towards the south this starfish disappears, it seems, completely; for it is not yet known with certainty to exist either in the Mediterranean or in the southern parts of the Atlantic Ocean. In others also *Asterias rubens* is not known—and then it suddenly reappears in Japan. *Archaster typicus* has a pretty wide distribution over the Indian Ocean; other *Asteridae* of Japan, on the other hand, appear to be confined to its shores."

Japan is not rich in corals and sponges. Her most interesting contributions are crust-corals (*Gorgonidae*, *Corallium*, *Isis*, &c.), and especially flint-sponges, called by the Japanese *hoshi-gai* and known as "glass-coral" (*Hyalonema sieboldi*). These last have not been found anywhere except at the entrance of the Bay of Tōkyō at a depth of some 200 fathoms.

II.—THE PEOPLE

Population.—The population was as follows on the 31st of December 1907:—

Population.	Males.	Females.	Totals.	Population per sq. m.
Japan proper . .	24,601 658	24,172,627	48,774,285	330
Formosa (Taiwan)	1,640,778	1,476,137	3,116,915	224
Sakhalin . . .	7,175	3,631	10,806	0·1
Totals . .	26,249,611	25,652,395	51,902,006	

The following table shows the rate of increase in the four quadrennial periods between 1891 and 1907 in Japan proper:—

Year.	Males.	Females.	Totals.	Average increase per cent.	Population per sq. m.
1891 . .	20,563,416	20,155,261	40,718,677	1·09	272
1895 . .	21,345,750	20,904,870	42,270,620	1·09	286
1899 . .	22,330,112	21,930,540	44,260,652	1·14	299
1903 . .	23,601,640	23,131,236	46,732,876	1.54	316
1907 . .	24,601,658	24,172,627	48,774,285	1·13	330

The population of Formosa (Taiwan) during the ten-year period 1898–1907 grew as follows:—

Year.	Males.	Females.	Totals.	Average increase per cent.	Population per sq. m.
1898 . .	1,307,428	1,157,539	2,464,967	—	182
1902 . .	1,513,280	1,312,067	2,825,347	2·70	209
1907 . .	1,640,778	1,476,137	3,116,915	2·37	224

According to quasi-historical records, the population of the empire in the year A.D. 610 was 4,988,842, and in 736 it had grown to 8,631,770. It is impossible to say how much reliance may be placed on these figures, but from the 18th century, when the name of every subject had to be inscribed on the roll of a temple as a measure against his adoption of Christianity, a tolerably trustworthy census could always be taken. The returns thus obtained show that from the year 1723 until 1846 the population remained almost stationary, the figure in the former year being 26,065,422, and that in the latter year 26,907,625. There had, indeed, been five periods of declining population in that interval of 124 years, namely, the periods 1738–1744, 1759–1762, 1773–1774, 1791–1792, and 1844–1846. But after 1872, when the census showed a total of 33,110,825, the population grew steadily, its increment between 1872 and 1898 inclusive, a period of 27 years, being 10,649,990. Such a rate of increase invests the question of subsistence with great importance. In former times the area of land under cultivation increased in a marked degree. Returns prepared at the beginning of the 10th century showed 2½ million acres under crops, whereas the figure in 1834 was over 8 million acres. But the development of means of subsistence has been outstripped by the growth of population in recent years. Thus, during the period between 1899 and 1907 the population received an increment of 11·6% whereas the food-producing area increased by only 4·4%. This discrepancy caused anxiety at one time, but large fields suitable for colonization have been opened in Sakhalin, Korea, Manchuria and Formosa, so that the problem of subsistence has ceased to be troublesome. The birth-rate, taking the average of the decennial period ended 1907, is 3·05% of the population, and the death-rate is 2·05. Males exceed females in the ratio of 2% approximately. But this rule does not hold after the age of 65, where for every 100 females only 83 males are found. The Japanese are of low stature as compared with the inhabitants of Western Europe: about 16% of the adult males are below 5 ft. But there are evidences of steady improvement in this respect. Thus, during the period of ten years between 1893 and 1902, it was found that the percentage of recruits of 5 ft. 5 in. and upward grew from 10·09 to 12·67, the rate of increase having been remarkably steady; and the percentage of those under 5 ft. declined from 20·21 to 16·20.

Towns.—There are in Japan 23 towns having a population of over 50,000, and there are 76 having a population of over 20,000. The larger towns, their populations and the growth of the latter during the five-year period commencing with 1898 were as follow:—

URBAN POPULATIONS

	1898.	1903.
Tōkyō	1,440,121	1,795,128
Osaka	821,235	988,200
Kiōto	353,139	379,404
Nagoya	244,145	284,829
Kobe	215,780	283,839
Yokohama	193,762	324,776
Hiroshima	122,306	113,545
Nagasaki	107,422	151,727
Kanazawa	83,595	97,548
Sendai	83,325	93,773
Hakodate	78,040	84,746
Fukuoka	66,190	70,107
Wakayama	63,667	67,908
Tokushima	61,501	62,998
Kumamoto	61,463	55,277
Toyama	59,558	86,276
Okayama	58,025	80,140
Otaru	56,961	79,746
Kagoshima	53,481	58,384
Niigata	53,366	58,821
Sakai	50,203	——
Sapporo	——	55,304
Kure	——	62,825
Sasebo	——	52,607

The growth of Kure and Sasebo is attributable to the fact that they have become the sites of large ship-building yards, the property of the state.

The number of houses in Japan at the end of 1903, when the census was last taken, was 8,725,544, the average number of inmates in each house being thus 5·5.

Physical Characteristics.—The best authorities are agreed that the Japanese people do not differ physically from their Korean and Chinese neighbours as much as the inhabitants of northern Europe differ from those of southern Europe. It is true that the Japanese are shorter in stature than either the Chinese or the Koreans. Thus the average height of the Japanese male is only 5 ft. 3½ in., and that of the female 4 ft. 10½ in., whereas in the case of the Koreans and the northern Chinese the corresponding figures for males are 5 ft. 5¾ in. and 5 ft. 7 in. respectively. Yet in other physical characteristics the Japanese, the Koreans and the Chinese resemble each other so closely that, under similar conditions as to costume and coiffure, no appreciable difference is apparent. Thus since it has become the fashion for Chinese students to flock to the schools and colleges of Japan, there adopting, as do their Japanese fellow-students, Occidental garments and methods of hairdressing, the distinction of nationality ceases to be perceptible. The most exhaustive anthropological study of the Japanese has been made by Dr E. Baelz (emeritus professor of medicine in the Imperial University of Tōkyō), who enumerates the following sub-divisions of the race inhabiting the Japanese islands. The first and most important is the Manchu-Korean type; that is to say, the type which prevails in north China and in Korea. This is seen specially among the upper classes in Japan. Its characteristics are exceptional tallness combined with slenderness and elegance of figure; a face somewhat long, without any special prominence of the cheekbones but having more or less oblique eyes; an aquiline nose; a slightly receding chin; largish upper teeth; a long neck; a narrow chest; a long trunk, and delicately shaped, small hands with long, slender fingers. The most plausible hypothesis is that men of this type are descendants of Korean colonists who, in prehistoric times, settled in the province of Izumo, on the west coast of Japan, having made their way thither from the Korean peninsula by the island of Oki, being carried by the cold current which flows along the eastern coast of Korea. The second type is the Mongol. It is not very frequently found in Japan, perhaps because, under favourable social conditions, it tends to pass into the Manchu-Korean type. Its representative has a broad face, with prominent cheek-bones, oblique eyes, a nose more or less flat and a wide mouth. The figure is strongly and squarely built, but this last characteristic can scarcely be called typical. There is no satisfactory theory as to the route by which the Mongols reached Japan, but it is scarcely possible to doubt that they found their way thither at one time. More important than either of these types as an element of the Japanese nation is the Malay. Small in stature, with a well-knit frame, the cheekbones prominent, the face generally round, the nose and neck short, a marked tendency to prognathism, the chest broad and well developed, the trunk long, the hands small and delicate—this Malay type is found in nearly all the islands along the east coast of the Asiatic continent as well as in southern China and in the extreme south-west of Korean peninsula. Carried northward by the warm current known as the Kuro Shiwo, the Malays seem to have landed in Kiūshiū—the most southerly of the main Japanese islands—whence they ultimately pushed northward and conquered their Manchu-Korean predecessors, the Izumo colonists. None of the above three, however, can be regarded as the earliest settlers in Japan. Before them all was a tribe of immigrants who appear to have crossed from north-eastern Asia at an epoch when the sea had not yet dug broad channels between the continent and the adjacent islands. These people—the Ainu—are usually spoken of as the aborigines of Japan. They once occupied the whole country, but were gradually driven northward by the Manchu-Koreans and the Malays, until only a mere handful of them survived in the northern island of Yezo. Like the Malay and the Mongol types they are short and thickly built, but unlike either they have prominent brows, bushy locks, round deep-set eyes, long divergent lashes, straight noses and much hair on the face and the body. In short, the Ainu suggest much closer affinity with Europeans than does any other of the types that go to make up the population of Japan. It is not to be supposed, however, that these traces of different elements indicate any lack of homogeneity in the Japanese race. Amalgamation has been completely effected in the course of long centuries, and even the Ainu, though the small surviving remnant of them now live apart, have left a trace upon their conquerors.

The typical Japanese of the present day has certain marked physical peculiarities. In the first place, the ratio of the height of his head to the length of his body is greater than it is in Europeans. The Englishman's head is often one-eighth of the length of his body or even less, and in continental Europeans, as a rule, the ratio does not amount to one-seventh; but in the Japanese it exceeds the latter figure. In all nations men of short stature have relatively large heads, but in the case of the Japanese there appears to be some racial reason for the phenomenon. Another striking feature is shortness of legs relatively to length of trunk. In northern Europeans the leg is usually much more than one-half of the body's length, but in Japanese the ratio is one-half or even less; so that whereas the Japanese, when seated, looks almost as tall as a European, there may be a great difference between their statures when both are standing. This special feature has been attributed to the Japanese habit of kneeling instead of sitting, but investigation shows that it is equally marked in the working classes who pass most of their time standing. In Europe the same physical traits—relative length of head and shortness of legs—distinguish the central race (Alpine) from the Teutonic, and seem to indicate an affinity between the former and the Mongols. It is in the face, however, that we find specially distinctive traits, namely, in the eyes, the eyelashes, the cheekbones and the beard. Not that the eyeball itself differs from that of an Occidental. The difference consists in the fact that "the socket of the eye is comparatively small and shallow, and the osseous ridges at the brows being little marked, the eye is less deeply set than in the European. In fact, seen in profile, forehead and upper lip often form an unbroken line." Then, again, the shape of the eye, as modelled by the lids, shows a striking peculiarity. For whereas the open eye is almost invariably horizontal in the European, it is often oblique in the Japanese on account of the higher level of the upper corner. "But even apart from obliqueness, the shape of the corners is peculiar in the Mongolian eye. The inner corner is partly or entirely covered by a fold of the upper lid continuing more or less into the lower lid. This fold often covers also the whole free rim of the upper lid, so that the insertion of the eyelashes is hidden" and the opening between the lids is so narrowed as to disappear altogether at the moment of laughter. As for the eye-lashes, not only are they comparatively short and sparse, but also they converge instead of diverging, so that whereas in a European the free ends of the lashes are further distant from each other than their roots, in a Japanese they are nearer together. Prominence of cheekbones is another special feature, but it is much commoner in the lower than in the upper classes, where elongated faces may almost be said to be the rule. Finally, there is marked paucity of hair on the face of the average Japanese—apart from the Ainu—and what hair there is is nearly always straight. It is not to be supposed, however, that because the Japanese is short of stature and often finely moulded, he lacks either strength or endurance. On the contrary, he possesses both in a marked degree, and his deftness of finger is not less remarkable than the suppleness and activity of his body.

Moral Characteristics.—The most prominent trait of Japanese disposition is gaiety of heart. Emphatically of a laughter-loving nature, the Japanese passes through the world with a smile on his lips. The petty ills of life do not disturb his equanimity. He takes them as part of the day's work, and though he sometimes grumbles, rarely, if ever, does he repine. Exceptional to this general rule, however, is a mood of pessimism which sometimes overtakes youths on the threshold of manhood. Finding the problem of life insolvable, they abandon the attempt to solve it and take refuge in the grave. It seems as though there were always a number of young men hovering on the brink of such suicidal despair. An example alone is needed finally to destroy the equilibrium. Some one throws himself over a cataract or leaps into the crater of a volcano, and immediately a score or two follow. Apparently the more picturesquely awful the manner of the demise, the greater its attractive force. The thing is not a product of insanity, as the term is usually interpreted; letters always left behind by the victims prove them to have been in full possession of their reasoning faculties up to the last moment. Some observers lay the blame at the door of Buddhism, a creed which promotes pessimism by begetting the anchorite, the ascetic and the shuddering believer in seven hells. But Buddhism did not formerly produce such incidents, and, for the rest, the faith of Shaka has little sway over the student mind in Japan. The phenomenon is modern: it is not an outcome of Japanese nature nor yet of Buddhist teaching, but is due to the stress of endeavouring to reach the standards of Western acquirement with grievously inadequate equipment, opportunities and resources. In order to support himself and pay his academic fees many a Japanese has to fall into the ranks of the physical labourer during a part of each day or night. Ill-nourished, over-worked and, it may be, disappointed, he finds the struggle intolerable and so passes out into the darkness. But he is not a normal type. The normal type is light-hearted and buoyant. One naturally expects to find, and one does find, that this moral sunshine is associated with good temper. The Japanese is exceptionally serene. Irascibility is regarded as permissible in sickly children only: grown people are supposed to be superior to displays of impatience. But there is a limit of imperturbability, and when that limit is reached, the subsequent passion is desperately vehement. It has been said that these traits go to make the Japanese soldier what he is. The hardships of a campaign cause him little suffering since he never frets over them, but the hour of combat finds him forgetful of everything save victory. In the case of the military class—and prior to the Restoration of 1867 the term "military class" was synonymous with "educated class"—this spirit of stoicism was built up by precept on a solid basis of heredity. The *samurai* (soldier) learned that his first characteristic must be to suppress all outward displays of emotion. Pain, pleasure, passion and peril must all find him unperturbed. The supreme test, satisfied so frequently as to be commonplace, was a shocking form of suicide performed with a placid mien. This capacity, coupled with readiness to sacrifice life at any moment on the altar of country, fief or honour, made a remarkably heroic character. On the other hand, some observers hold that the education of this stoicism was effected at the cost of the feelings it sought to conceal. In support of that theory it is pointed out that the average Japanese, man or woman, will recount a death or some other calamity in his own family with a perfectly calm, if not a smiling, face. Probably there is a measure of truth in the criticism. Feelings cannot be habitually hidden without being more or less blunted. But here another Japanese trait presents itself—politeness. There is no more polite nation in the world than the Japanese. Whether in real courtesy of heart they excel Occidentals may be open to doubt, but in all the forms of comity they are unrivalled. Now one of the cardinal rules of politeness is to avoid burdening a stranger with the weight of one's own woes. Therefore a mother, passing from the chamber which has just witnessed her paroxysms of grief, will describe calmly to a stranger—especially a foreigner—the death of her only child. The same suppression of emotional display in public is observed in all the affairs of life. Youths and maidens maintain towards each other a demeanour of reserve and even indifference, from which it has been confidently affirmed that love does not exist in Japan. The truth is that in no other country do so many dual suicides occur—suicides of a man and woman who, unable to be united in this world, go to a union beyond the grave. It is true, nevertheless, that love as a prelude to marriage finds only a small place in Japanese ethics. Marriages in the great majority of cases are arranged with little reference to the feelings of the parties concerned. It might be supposed that conjugal fidelity must suffer from such a custom. It does suffer seriously in the case of the husband, but emphatically not in the case of the wife. Even though she be cognisant—as she often is—of her husband's extra-marital relations, she abates nothing of the duty which she has been taught to regard as the first canon of female ethics. From many points of view, indeed, there is no more beautiful type of character than that of the Japanese woman. She is entirely unselfish; exquisitely modest without being anything of a prude; abounding in intelligence which is never obscured by egoism; patient in the hour of suffering; strong in time of affliction; a faithful wife; a loving mother; a good daughter; and capable, as history shows, of heroism rivalling that of the stronger sex. As to the question of sexual virtue and morality in Japan, grounds for a conclusive verdict are hard to find. In the interests of hygiene prostitution is licensed, and that fact is by many critics construed as proof of tolerance. But licensing is associated with strict segregation; and it results that the great cities are conspicuously free from evidences of vice, and that the streets may be traversed by women at all hours of the day and night with perfect impunity and without fear of encountering offensive spectacles. The ratio of marriages is approximately 8·46 per thousand units of the population, and the ratio of divorces is 1·36 per thousand. There are thus about 16 divorces for every hundred marriages. Divorces take place chiefly among the lower orders, who frequently treat marriage merely as a test of a couple's suitability to be helpmates in the struggles of life. If experience develops incompatibility of temper or some other mutually repellent characteristic, separation follows as a matter of course. On the other hand, divorces among persons of the upper classes are comparatively rare, and divorces on account of a wife's unfaithfulness are almost unknown.

Concerning the virtues of truth and probity, extremely conflicting opinions have been expressed. The Japanese *samurai* always prided himself on having "no second word." He never drew his sword without using it; he never gave his word without keeping it. Yet it may be doubted whether the value attached in Japan to the abstract quality, truth, is as high as the value attached to it in England, or whether the consciousness of having told a falsehood weighs as heavily on the heart. Much depends upon the motive. Whatever may be said of the upper class, it is probably true that the average Japanese will not sacrifice expediency on the altar of truth. He will be veracious only so long as the consequences are not seriously injurious. Perhaps no more can be affirmed of any nation. The "white lie" of the Anglo-Saxon and the *hōben no uso* of the Japanese are twins. In the matter of probity, however, it is possible to speak with more assurance. There is undoubtedly in the lower ranks of Japanese tradesmen a comparatively large fringe of persons whose standard of commercial morality is defective. They are descendants of feudal days when the mercantile element, being counted as the dregs of the population, lost its self-respect. Against this blemish—which is in process of gradual correction—the fact has to be set that the better class of merchants, the whole of the artisans and the labouring classes in general, obey canons of probity fully on a level with the best to be found elsewhere. For the rest, frugality, industry and patience characterize all the bread-winners; courage and burning patriotism are attributes of the whole nation.

There are five qualities possessed by the Japanese in a marked degree. The first is frugality. From time immemorial the great mass of the people have lived in absolute ignorance of luxury in any form and in the perpetual presence of a necessity to economize. Amid these circumstances there has emerged capacity to make a little go a long way and to be content with the most meagre fare. The second quality is endurance. It is born of causes cognate with those which have begotten frugality. The average Japanese may be said to live without artificial heat; his paper doors admit the light but do not exclude the cold. His brazier barely suffices to warm his hands and his face. Equally is he a stranger to methods of artificial cooling. He takes the frost that winter inflicts and the fever that summer brings as unavoidable visitors. The third quality is obedience; the offspring of eight centuries passed under the shadow of military autocracy. Whatever he is authoritatively bidden to do, that the Japanese will do. The fourth quality is altruism. In the upper classes the welfare of the family has been set above the interests of each member. The fifth quality is a genius for detail. Probably this is the outcome of an extraordinarily elaborate system of social etiquette. Each generation has added something to the canons of its predecessor, and for every ten points preserved not more than one has been discarded. An instinctive respect for minutiae has thus been inculcated, and has gradually extended to all the affairs of life. That this accuracy may sometimes degenerate into triviality, and that such absorption in trifles may occasionally hide the broad horizon, is conceivable.

But the only hitherto apparent evidence of such defects is an excessive clinging to the letter of the law; a marked reluctance to exercise discretion; and that, perhaps, is attributable rather to the habit of obedience. Certainly the Japanese have proved themselves capable of great things, and their achievements seem to have been helped rather than retarded by their attention to detail.

III.—LANGUAGE AND LITERATURE

Language.—Since the year 1820, when Klaproth concluded that the Japanese language had sprung from the Ural-Altaic stock, philologists have busied themselves in tracing its affinities. If the theories hitherto held with regard to the origin of the Japanese people be correct, close relationship should exist between the Japanese and the Korean tongues, and possibly between the Japanese and the Chinese. Aston devoted much study to the former question, but although he proved that in construction the two have a striking similarity, he could not find any corresponding likeness in their vocabularies. As far back as the beginning of the Christian era the Japanese and the Koreans could not hold intercourse without the aid of interpreters. If then the languages of Korea and Japan had a common stock, they must have branched off from it at a date exceedingly remote. As for the languages of Japan and China, they have remained essentially different throughout some twenty centuries in spite of the fact that Japan adopted Chinese calligraphy and assimilated Chinese literature. Mr K. Hirai has done much to establish his theory that Japanese and Aryan had a common parent. But nothing has yet been substantiated. Meanwhile an inquirer is confronted by the strange fact that of three neighbouring countries between which frequent communication existed, one (China) never deviated from an ideographic script; another (Korea) invented an alphabet, and the third (Japan) devised a syllabary. Antiquaries have sought to show that Japan possessed some form of script before her first contact with either Korea or China. But such traces of prehistoric letters as are supposed to have been found seem to be corruptions of the Korean alphabet rather than independent symbols. It is commonly believed that the two Japanese syllabaries—which, though distinct in form, have identical sounds—were invented by Kukai (790) and Kibi Daijin (760) respectively. But the evidence of old documents seems to show that these syllabaries had a gradual evolution and that neither was the outcome of a single scholar's inventive genius.

The sequence of events appears to have been this:—Japan's earliest contact with an oversea people was with the Koreans, and she made some tentative efforts to adapt their alphabet to the expression of her own language. Traces of these efforts survived, and inspired the idea that the art of writing was practised by the Japanese before the opening of intercourse with their continental neighbours. Korea, however, had neither a literary nor an ethical message to deliver, and thus her script failed to attract much attention. Very different was the case when China presented her noble code of Confucian philosophy and the literature embodying it. The Japanese then recognized a lofty civilization and placed themselves as pupils at its feet, learning its script and deciphering its books. Their veneration extended to ideographs. At first they adapted them frankly to their own tongue. For example, the ideographs signifying *rice* or *metal* or *water* in Chinese were used to convey the same ideas in Japanese. Each ideograph thus came to have two sounds, one Japanese, the other Chinese—*e.g.* the ideograph for *rice* had for Japanese sound *kome* and for Chinese sound *bei.* Nor was this the whole story. There were two epochs in Japan's study of the Chinese language: first, the epoch when she received Confucianism through Korea; and, secondly, the epoch when she began to study Buddhism direct from China. Whether the sounds that came by Korea were corrupt, or whether the interval separating these epochs had sufficed to produce a sensible difference of pronunciation in China itself, it would seem that the students of Buddhism who flocked from Japan to the Middle Kingdom during the Sui era (A.D. 589–619) insisted on the accuracy of the pronunciation acquired there, although it diverged perceptibly from the pronunciation already recognized in Japan. Thus, in fine, each word came to have three sounds—two Chinese, known as the *kan* and the *go*, and one Japanese, known as the *kun*. For example:—

"KAN" SOUND.	"GO" SOUND.	JAPANESE SOUND.	MEANING.
Sei	*Jo*	*Koe*	Voice
Nen	*Zen*	*Toshi*	Year
Jinkan	*Ningen*	*Hito no aida*	Human being.

As to which of the first two methods of pronunciation had chronological precedence, the weight of opinion is that the *kan* came later than the *go.* Evidently this triplication of sounds had many disadvantages, but, on the other hand, the whole Chinese language may be said to have been grafted on the Japanese. Chinese has the widest capacity of any tongue ever invented. It consists of thousands of monosyllabic roots, each having a definite meaning. These monosyllables may be used singly or combined, two, three or four at a time, so that the resulting combinations convey almost any conceivable shades of meaning. Take, for example, the word "electricity." The very idea conveyed was wholly novel in Japan. But scholars were immediately able to construct the following:—

Lightning.	*Den.*	
Exhalation.	*Ki*	
Electricity.	*Denki.*	
Telegram.	*Dempō.*	*Hō* = tidings.
Electric light.	*Dentō.*	*Tō* = lamp.
Negative electricity.	*Indenki.*	*In* = the negative principle.
Positive electricity.	*Yodenki.*	*Yo* = the positive principle.
Thermo-electricity.	*Netsudenki.*	*Netsu* = heat.
Dynamic-electricity.	*Ryūdo-denki.*	*Ryūdo* = fluid.
Telephone.	*Denwa.*	*Wa* = conversation.

Every branch of learning can thus be equipped with a vocabulary. Potent, however, as such a vehicle is for expressing thought, its ideographic script constitutes a great obstacle to general acquisition, and the Japanese soon applied themselves to minimizing the difficulty by substituting a phonetic system. Analysis showed that all the required sounds could be conveyed with 47 syllables, and having selected the ideographs that corresponded to those sounds, they reduced them, first, to forms called *hiragana*, and, secondly, to still more simplified forms called *katakana.*

Such, in brief, is the story of the Japanese language. When we come to dissect it, we find several striking characteristics. First, the construction is unlike that of any European tongue: all qualifiers precede the words they qualify, except prepositions which become postpositions. Thus instead of saying "the house of Mr Smith is in that street," a Japanese says "Smith Mr of house that street in is." Then there is no relative pronoun, and the resulting complication seems great to an English-speaking person, as the following illustration will show:—

JAPANESE.	ENGLISH.
Zenaku wo saiban suru tame no Virtue vice-judging sake of *mochiitaru yūitsu no hyojun wa* used unique standard *jiai no kōi tada* benevolence of conduct only *kore nomi.* this alone.	The unique standard which is used for judging virtue or vice is benevolent conduct solely.

It will be observed that in the above sentence there are two untranslated words, *wo* and *wa*. These belong to a group of four auxiliary particles called *te ni wo ha* (or *wa*), which serve to mark the cases of nouns, *te* (or *de*) being the sign of the instrumental ablative; *ni* that of the dative; *wo* that of the objective, and *wa* that of the nominative. These exist in the Korean language also, but not in any other tongue. There are also polite and ordinary forms of expression, often so different as to constitute distinct languages; and there are a number of honorifics which frequently discharge the duty of pronouns. Another marked peculiarity is that active agency is never attributed to neuter nouns. A Japanese does not say "the poison killed him" but "he died on account of the poison;" nor does he say "the war has caused commodities to appreciate," but "commodities have appreciated in consequence of the war." That the language loses much force owing to this limitation cannot be denied: metaphor and allegory are almost completely banished.

The difficulties that confront an Occidental who attempts to learn Japanese are enormous. There are three languages to be acquired: first, the ordinary colloquial; second, the polite colloquial; and, third, the written. The ordinary colloquial differs materially from its polite form, and both are as unlike the written form as modern Italian is unlike ancient Latin. "Add to this," writes Professor B. H. Chamberlain, "the necessity of committing to memory two syllabaries, one of which has many variant forms, and at least two or three thousand Chinese ideographs, in forms standard and cursive —ideographs, too, most of which are susceptible of three or four different readings according to circumstance,—add, further, that all these kinds of written symbols are apt to be encountered pell mell on the same page, and the task of mastering Japanese becomes almost Herculean." In view of all this there is a strong movement in favour of romanizing the Japanese script: that is to say, abolishing the ideograph and adopting in its place the Roman alphabet. But while every one appreciates the magnitude of the relief that would thus be afforded, there has as yet been little substantial progress. A language which has been adapted from its infancy to ideographic transmission cannot easily be fitted to phonetic uses.

Dictionaries.—F. Brinkley, *An Unabridged Japanese-English Dictionary* (Tōkyō, 1896); Y. Shimada, *English-Japanese Dictionary*, (Tōkyō, 1897); *Webster's Dictionary, trans. into Japanese*, (Tōkyō, 1899); J. H. Gubbins, *Dictionary of Chinese-Japanese Words* (3 vols., London, 1889); J. C. Hepburn, *Japanese-English and English-Japanese Dictionary* (London, 1903); E. M. Satow and I. Masakata, *English-Japanese Dictionary* (London, 1904).

Literature.—From the neighbouring continent the Japanese derived the art of transmitting ideas to paper. But as to the date of that acquisition there is doubt. An authenticated work compiled A.D. 720 speaks of historiographers having been appointed to collect local records for the first time in 403, from which it is to be inferred that such officials had already existed at the court. There is also a tradition that some kind of general history was compiled in 620 but destroyed by fire in 645. At all events, the earliest book now extant dates from 712. Its origin is described in its preface. When the emperor Temmu (673–686) ascended the throne, he found that there did not exist any revised collection of the fragmentary annals of the chief families. He therefore caused these annals to be collated. There happened to be among the court ladies one Hiyeda no Are, who was gifted with an extraordinary memory. Measures were taken to instruct her in the genuine traditions and the old language of former ages, the intention being to have the whole ultimately dictated to a competent scribe. But the emperor died before the project could be consummated, and for twenty-five years Are's memory remained the sole depository of the collected annals. Then, under the auspices of the empress Gemmyō, the original plan was carried out in 712, Yasumaro being the scribe. The work that resulted is known as the *Kojiki* (*Record of Ancient Matters*). It has been accurately translated by Professor B. H. Chamberlain (*Transactions of the Asiatic Society of Japan*, vol. x.), who, in a preface justly regarded by students of Japan as an exegetical classic, makes the pertinent comment: "Taking the word Altaïc in its usual acceptation, viz. as the generic name of all the languages belonging to the Manchu, Mongolian, Turkish and Finnish groups, not only the archaic, but the classical, literature of Japan carries us back several centuries beyond the earliest extant documents of any other Altaïc tongue." By the term "archaic" is to be understood the pure Japanese language of earliest times, and by the term "classical" the quasi-Chinese language which came into use for literary purposes when Japan appropriated the civilization of her great neighbours. The *Kojiki* is written in the archaic form: that is to say, the language is the language of old Japan, the script, although ideographic, is used phonetically only, and the case-indicators are represented by Chinese characters having the same sounds. It is a species of saga, setting forth not only the heavenly beginnings of the Japanese race, but also the story of creation, the succession of the various sovereigns and the salient events of their reigns, the whole interspersed with songs, many of which may be attributed to the 6th century, while some doubtless date from the fourth or even the third. This *Kojiki* marks the parting of the ways. Already by the time of its compilation the influence of Chinese civilization and Chinese literature had prevailed so greatly in Japan that the next authentic work, composed only eight years later, was completely Chinese in style and embodied Chinese traditions and Chinese philosophical doctrines, not distinguishing them from their Japanese context. This volume was called the *Nihongi* (*Chronicles of Japan*). It may be said to have wholly supplanted its predecessor in popular favour, for the classic style—that is to say, the Chinese—had now come to be regarded as the only erudite script. The *Chronicles* re-traversed much of the ground already gone over by the *Record*, preserving many of the songs in occasionally changed form, omitting some portions, supplementing others, and imparting to the whole such an exotic character as almost to disqualify the work for a place in Japanese literature. Yet this was the style which thenceforth prevailed among the litterati of Japan. "Standard Chinese soon became easier to understand than archaic Japanese, as the former alone was taught in the schools, and the native language changed rapidly during the century or two that followed the diffusion of the foreign tongue and civilization" (CHAMBERLAIN). The neglect into which the *Kojiki* fell lasted until the 17th century. Almost simultaneously with its appearance in type (1644) and its consequent accessibility, there arose a galaxy of scholars under whose influence the archaic style and the ancient Japanese traditions entered a period of renaissance. The story of this period and of its products has been admirably told by Sir Ernest Satow ("Revival of Pure Shintō," *Proceedings of the Asiatic Society of Japan*, vol. iii.), whose essay, together with Professor Chamberlain's *Kojiki*, the same author's introduction to *The Classical Poetry of the Japanese*, and Mr W. G. Aston's *Nihongi*, are essential to every student of Japanese literature. To understand this 17th century renaissance, knowledge of one fact is necessary, namely, that about the year A.D. 810, a celebrated Buddhist priest, Kūkai, who had spent several years studying in China, compounded out of Buddhism, Confucianism and Shintō a system of doctrine called *Ryōbu Shintō* (Dual Shintō), the prominent tenet of which was that the Shintō deities were merely transmigrations of Buddhist divinities. By this device Japanese conservatism was effectually conciliated, and Buddhism became in fact the creed of the nation, its positive and practical precepts entirely eclipsing the agnostic intuitionalism of Shintō. Against this hybrid faith several Japanese scholars arrayed themselves in the 17th and 18th centuries, the greatest of them being Mabuchi and Motoori. The latter's *magnum opus*, *Kojikiden* (*Exposition of the Record of Ancient Matters*), declared by Chamberlain to be "perhaps the most admirable work of which Japanese erudition can boast," consists of 44 large volumes, devoted to elucidating the *Kojiki* and resuscitating the Shintō cult as it existed in the earliest days. This great work of reconstruction was only one feature of the literary activity which marked the 17th and 18th centuries, when, under Tokugawa rule, the blessing of long-unknown peace came to the nation. Iyeyasu himself devoted the last years of his life to collecting ancient manuscripts. In his country retreat at Shizuoka he formed one of the richest libraries ever brought together in Japan, and by will he bequeathed the Japanese section of it to his eighth son, the feudal chief of Owari, and the Chinese section to his ninth son, the prince of Kishū, with the result that under the former feudatory's auspices two works of considerable merit were produced treating of ancient ceremonials and supplementing the *Nihongi*. Much more memorable, however, was a library formed by Iyeyasu's grandson the feudal chief of Mito (1662–1700), who not only collected a vast quantity of books hitherto scattered among Shintō and Buddhist monasteries and private houses, but also employed a number of scholars to compile a history unprecedented in magnitude, the *Dai-Nihon-shi*. It consisted of 240 volumes, and it became at once the standard in its own branch of literature. Still more comprehensive was a book emanating from the same source and treating of court ceremonials. It ran to more than 500 volumes, and the emperor honoured the work by bestowing on it the title *Reigi Ruiten* (*Rules of Ceremonials*). These compilations together with the *Nihon Gwaishi* (*History of Japan Outside the Court*), written by Rai Sanyo and published in 1827, constituted the chief sources of historical knowledge before the Meiji era. Rai Sanyo devoted twenty years to the preparation of his 22 volumes and took his materials from 259 Japanese and Chinese works. But neither he nor his predecessors recognized in history anything more than a vehicle for recording the mere sequence of events and their relations, together with some account of the personages concerned. Their volumes make profoundly dry reading. Vicarious interest, however, attaches to the productions of the Mito School on account of the political influence they exercised in rehabilitating the nation's respect for the throne by unveiling the picture of an epoch prior to the usurpations of military feudalism. The struggles of the great rival clans, replete with episodes of the most tragic and stirring character, inspired quasi-historical narrations of a more popular character, which often took the form of illuminated scrolls. But it was not until the Meiji era that history, in the modern sense of the term, began to be written. During recent times many students have turned their attention to this branch of literature. Works of wide scope and clear insight have been produced, and the Historiographers' section in the Imperial University of Tōkyō has been for several years engaged in collecting and collating materials for a history which will probably rank with anything of the kind in existence.

Poetry.

In their poetry above everything the Japanese have remained impervious to alien influences. It owes this conservation to its prosody. Without rhyme, without variety of metre, without elasticity of dimensions, it is also without known counterpart. To alter it in any way would be to deprive it of all distinguishing characteristics. At some remote date a Japanese maker of songs seems to have discovered that a peculiar and very fascinating rhythm is produced by lines containing 5 syllables and 7 syllables alternately. That is Japanese poetry (*uta* or *tanka*). There are generally five lines: the first and third consisting of 5 syllables, the second, fourth and fifth of 7, making a total of 31 in all. The number of lines is not compulsory: sometimes they may reach to thirty, forty or even more, but the alternation of 5 and 7 syllables is compulsory. The most attenuated form of all is the *hokku* (or *haikai*) which consists of only three lines, namely, 17 syllables. Necessarily the ideas embodied in such a narrow vehicle must be fragmentary. Thus it results that Japanese poems are, for the most part, impressionist; they suggest a great deal more than they actually express. Here is an example:—

Momiji-ha wo
Kaze ni makasete
Miru yori mo
Hakanaki mono wa
Inochi nari keri

More fleeting than the glint of
withered leaf wind-blown, the
thing called life.

There is no English metre with this peculiar cadence.

It is not to be inferred that the writers of Japan, enamoured as they were of Chinese ideographs and Chinese style, deliberately excluded everything Chinese from the realm of poetry. On the contrary, many of them took pleasure in composing versicles to which Chinese words were admitted and which showed something of the "parallelism" peculiar to Chinese poetry, since the first ideograph of the last line was required to be identical with the final ideograph. But rhyme was not attempted, and the syllabic metre of Japan was preserved, the alternation of 5 and 7 being, however, dispensed with. Such couplets were called *shi* to distinguish them from the pure Japanese *uta* or *tanka*. The two greatest masters of Japanese poetry were Hitomaro and Akahito, both of the early 8th century, and next to them stands Tsurayuki, who flourished at the beginning of the 10th century, and is not supposed to have transmitted his mantle to any successor. The choicest productions of the former two with those of many other poets were brought together in 756 and embodied in a book called the *Manyōshū* (*Collection of a Myriad Leaves*). The volume remained unique until the beginning of the 10th century, when (A.D. 905) Tsurayuki and three coadjutors compiled the *Kokinshū* (*Collection of Odes Ancient and Modern*), the first of twenty-one similar anthologies between the 11th and the 15th centuries, which constitute the *Niju-ichi Dai-shū* (*Anthologies of the One-and-Twenty Reigns*). If to these we add the *Hyaku-ninshū* (*Hundred Odes by a Hundred Poets*) brought together by Teika Kyō in the 13th century, we have all the classics of Japanese poetry. For the composition of the *uta* gradually deteriorated from the end of the 9th century, when a game called *uta-awase* became a fashionable pastime, and aristocratic men and women tried to string together versicles of 31 syllables, careful of the form and careless of the thought. The *uta-awase*, in its later developments, may not unjustly be compared to the Occidental game of *bouts-rimés*. The poetry of the nation remained immovable in the ancient groove until very modern times, when, either by direct access to the originals or through the medium of very defective translations, the nation became acquainted with the masters of Occidental song. A small coterie of authors, headed by Professor Toyama, then attempted to revolutionize Japanese poetry by recasting it on European lines. But the project failed signally, and indeed it may well be doubted whether the Japanese language can be adapted to such uses.

Influence of Women in Japanese Literature.

It was under the auspices of an empress (Suiko) that the first historical manuscript is said to have been compiled in 620. It was under the auspices of an empress (Gemmyō) that the *Record of Ancient Matters* was transcribed (712) from the lips of a court lady. And it was under the auspices of an empress that the *Chronicles of Japan* were composed (720). To women, indeed, from the 8th century onwards may be said to have been entrusted the guardianship of the pure Japanese language, the classical, or Chinese, form being adopted by men. The distinction continued throughout the ages. To this day the spoken language of Japanese women is appreciably simpler and softer than that of the men, and to this day while the educated woman uses the hiragana syllabary in writing, eschews Chinese words and rarely pens an ideograph, the educated man employs the ideograph entirely, and translates his thoughts as far as possible into the mispronounced Chinese words without recourse to which it would be impossible for him to discuss any scientific subject, or even to refer to the details of his daily business. Japan was thus enriched with two works of very high merit, the *Genji Monogatari* (c. 1004) and the *Makura no Zōshi* (about the same date). The former, by Murasaki no Shikibu—probably a pseudonym—was the first novel composed in Japan. Before her time there had been many monogatari (narratives), but all consisted of short stories of a fairy or quasi-historical, whereas Murasaki did for Japan what Fielding and Richardson did for England. Her work was a prose epic of real life, the ideal narrative form. Her language is pure and natural, her sentences are refined and ornate, and, as Mr Aston well says, her "story flows on easily from one scene of real life to another, giving us a varied and minutely detailed picture of life and society in Kioto, such as we possess for no other country at the same period." The *Makura no Zōshi* (*Pillow Sketches*), like the *Genji Monogatari*, was by a noble lady—Sei Shōnagon—but it is simply a record of daily events and fugitive thoughts, though not in the form of a diary. The book is one of the most natural and unaffected compositions ever written. Undesignedly it conveys a wonderfully realistic picture of aristocratic life and social ethics in Kiōto at the beginning of the 11th century. "If we compare it with anything that Europe has to show at this period, it must be admitted that it is indeed a remarkable work. What a revelation it would be if we had the court life of Alfred's or Canute's reign depicted to us in a similar way?"

The Dark Age.

The period from the early part of the 14th century to the opening of the 17th is generally regarded as the dark age of Japanese literature. The constant wars of the time left their impress upon everything. To them is due the fact that the two principal works compiled during this epoch were, one political, the other quasi-historical. In the former, *Jinkōshōtō-ki* (*History of the True Succession of the Divine Monarchs*), Kitabatake Chikafusa (1340) undertook to prove that of the two sovereigns then disputing for supremacy in Japan, Go-Daigo was the rightful monarch; in the latter, *Taihei-ki* (*History of Great Peace*), Kojima (1370) devoted his pages to describing the events of contemporaneous history. Neither work can be said to possess signal literary merit, but both had memorable consequences. For the *Jinkōshōtō-ki*, by its strong advocacy of the mikado's administrative rights as against the usurpations of military feudalism, may be said to have sowed the seeds of Japan's modern polity; and the *Taihei-ki*, by its erudite diction, skilful rhetoric, simplification of old grammatical constructions and copious interpolation of Chinese words, furnished a model for many imitators and laid the foundations of Japan's 19th-century style. The *Taihei-ki* produced another notable effect; it inspired public readers who soon developed into historical *raconteurs*; a class of professionals who are almost as much in vogue to-day as they were 500 years ago. Belonging to about the same period as the *Jinkōshōtō-ki*, another classic occupies a leading place in Japanese esteem. It is the *Tsure-zure-gusa* (*Materials for Dispelling Ennui*), by Kenkō-bōshi, described by Mr Aston as "one of the most delightful oases in Japanese literature: a collection of short sketches, anecdotes and essays on all imaginable subjects, something in the manner of Selden's *Table Talk*."

The Drama.

The so-called dark age of Japanese literature was not entirely unproductive: it gave the drama (*Nō*) to Japan. Tradition ascribes the origin of the drama to a religious dance of a pantomimic character, called *Kagura* and associated with Shintō ceremonials. The Nō, however, owed its development mainly to Buddhist influence. During the medieval era of internecine strife the Buddhist priests were the sole depositaries of literary talent, and seeing that, from the close of the 14th century, the Shintō mime (Kagura) was largely employed by the military class to invoke or acknowledge the assistance of the gods, the monks of Buddha set themselves to compose librettos for this mime, and the performance, thus modified, received the name of Nō. Briefly speaking, the Nō was a dance of the most stately character, adapted to the incidents of dramas "which embrace within their scope a world of legendary lore, of quaint fancies and of religious sentiment." Their motives were chiefly confined to such themes as the law of retribution to which all human beings are subjected, the transitoriness of life and the advisability of shaking off from one's feet the dust of this sinful world. But some were of a purely martial nature. This difference is probably explained by the fact that the idea of thus modifying the Kagura had its origin in musical recitations from the semi-romantic semi-historical narratives of the 14th century. Such recitations were given by itinerant Bonzes, and it is easy to understand the connexion between them and the Nō. Very soon the Nō came to occupy in the estimation of the military class a position similar to that held by the *tanka* as a literary pursuit, and the *gagaku* as a musical, in the Imperial court. All the great aristocrats not only patronized the Nō but were themselves ready to take part in it. Costumes of the utmost magnificence were worn, and the chiselling of masks for the use of the performers occupied scores of artists and ranked as a high glyptic accomplishment. There are 335 classical dramas of this kind in a compendium called the *Yōkyoku Tsūge*, and many of them are inseparably connected with the names of Kwanami Kiyotsugu (1406) and his son Motokiyo (1455), who are counted the fathers of the art. For a moment, when the tide of Western civilization swept over Japan, the Nō seemed likely to be permanently submerged. But the renaissance of nationalism (*kokusui hozon*) saved the venerable drama, and owing to the exertions of Prince Iwakura, the artist Hōshō Kurō and Umewaka Minoru, it stands as high as ever in popular favour. Concerning the five schools into which the Nō is divided, their characteristics and their differences—these are matters of interest to the initiated alone.

The Farce.

The Japanese are essentially a laughter-loving people. They are highly susceptible of tragic emotions, but they turn gladly to the brighter phases of life. Hence a need was soon felt of something to dispel the pessimism of the Nō, and that something took the form of comedies played in the interludes of the Nō and called *Kyōgen* (mad words). The Kyōgen needs no elaborate description: it is a pure farce, never immodest or vulgar.

The Theatre.

The classic drama Nō and its companion the Kyōgen had two children, the *Jōruri* and the *Kabuki*. They were born at the close of the 16th century and they owed their origin to the growing influence of the commercial class, who asserted a right to be amused but were excluded from enjoyment of the aristocratic Nō and the Kyōgen. The Jōruri is a dramatic ballad, sung or recited to the accompaniment of the *samisen* and in unison with the movements of puppets. It came into existence in Kiōto and was thence transferred to Yedo (Tōkyō), where the greatest of Japanese playwrights, Chikamatsu Monzaemon (1653–1724), and a musician of exceptional talent, Takemoto Gidayū, collaborated to render this puppet drama a highly popular entertainment. It flourished for nearly 200 years in Yedo, and is still occasionally performed in Osaka. Like the Nō the Jōruri dealt always with sombre themes, and was supplemented by the Kabuki (farce). This last owed its inception to a priestess who, having abandoned her holy vocation at the call of love, espoused dancing as a means of livelihood and trained a number of girls for the purpose. The law presently interdicted these female comedians (*onna-kabuki*) in the interests of public morality, and they were succeeded by "boy comedians" (*wakashu-kabuki*) who simulated women's ways and were vetoed in their turn, giving place to *yaro-kabuki* (comedians with queues). Gradually the Kabuki developed the features of a genuine theatre; the actor and the playwright were discriminated, and, the performances taking the form of domestic drama (*Wagoto* and *Sewamono*) or historical drama (*Aragoto* or *Jidaimono*), actors of perpetual fame sprang up, as Sakata Tōjūrō and Ichikawa Danjinrō (1660–1704). Mimetic posture-dances (*Shosagoto*) were always introduced as interludes; past and present indiscriminately contributed to the playwright's subjects; realism was carried to extremes; a revolving stage and all mechanical accessories were supplied; female parts were invariably taken by males, who attained almost incredible skill in these simulations; a chorus—relic of the Nō—chanted expositions of profound sentiments or thrilling incidents; and histrionic talent of the very highest order was often displayed. But the *Kabuki-za* and its *yakusha* (actors) remained always a plebeian institution. No *samurai* frequented the former or associated with the latter. With the introduction of Western civilization in modern times, however, the theatre ceased to be tabooed by the aristocracy. Men and women of all ranks began to visit it; the emperor himself consented (1887) to witness a performance by the great stars of the stage at the private residence of Marquis Inouye; a dramatic reform association was organized by a number of prominent noblemen and scholars; drastic efforts were made to purge the old historical dramas of anachronisms and inconsistencies, and at length a theatre (the *Yuraku-za*) was built on purely European lines, where instead of sitting from morning to night witnessing one long-drawn-out drama with interludes of whole farces, a visitor may devote only a few evening-hours to the pastime. The Shosagoto has not been abolished, nor is there any reason why it should be. It has graces and beauties of its own. There remains to be noted the incursion of amateurs into the histrionic realm. In former times the actor's profession was absolutely exclusive in Japan. Children were trained to wear their fathers' mantles, and the idea that a non-professional could tread the hallowed ground of the stage did not enter any imagination. But with the advent of the new regimen in Meiji days there arose a desire for social plays depicting the life of the modern generation, and as these "croppy dramas" (*zampatsu-mono*)—so called in allusion to the European method of cutting the hair close—were not included in the repertoire of the orthodox theatre, amateur troupes (known as *sōshi-yakusha*) were organized to fill the void. Even Shakespeare has been played by these amateurs, and the abundant wit of the Japanese is on the way to enrich the stage with modern farces of unquestionable merit.

Literature of the Tokugawa Era.

The Tokugawa era (1603–1867), which popularized the drama, had other memorable effects upon Japanese literature. Yedo, the shōgun's capital, displaced Kiōto as the centre of literary activity. Its population of more than a million, including all sorts and conditions of men—notably wealthy merchants and mechanics—constituted a new audience to which authors had to address themselves; and an unparalleled development of mental activity necessitated wholesale drafts upon the Chinese vocabulary. To this may be attributed the appearance of a group of men known as *kangakusha* (Chinese scholars). The most celebrated among them were: Fujiwara Seikwa (1560–1619), who introduced his countrymen to the philosophy of Chu-Hi; Hayashi Rasan (1583–1657), who wrote 170 treatises on scholastic and moral subjects; Kaibara Ekken (1630–1714), teacher of a fine system of ethics; Arai Hakuseki (1657–1725), historian, philosopher, statesman and financier: and Muro Kiusō, the second great exponent of Chu-Hi's philosophy. "Japan owes a profound debt of gratitude to the *kangakusha* of that time. For their day and country they were emphatically the salt of earth." But naturally not all were believers in the same philosophy. The fervour of the followers of Chu-Hi (the orthodox school) could not fail to provoke opposition. Thus some arose who declared allegiance to the idealistic intuitionalism of Wang Yang-ming, and others advocated direct study of the works of Confucius and Mencius. Connected with this rejection of Chu-Hi were such eminent names as those of Itō Junsai (1627–1718), Itō Tōgai (1617–1736), Ogyu Sōrai (1666–1728) and Dazai Shuntai (1679–1747). These Chinese scholars made no secret of their contempt for Buddhism, and in their turn they were held in aversion by the Buddhists and the Japanese scholars (*wagakusha*), so that the second half of the 18th century was a time of perpetual wrangling and controversy. The worshippers at the shrine of Chinese philosophy evoked a reactionary spirit of nationalism, just as the excessive worship of Occidental civilization was destined to do in the 19th century.

Apart from philosophical researches and the development of the drama, as above related, the Tokugawa era is remarkable for folk-lore, moral discourses, fiction and a peculiar form of poetry. This last does not demand much attention. Its principal variety is the *haikai*, which is nothing more than a *tanka* shorn of its concluding fourteen syllables, and therefore virtually identical with the *hokku*, already described. The name of Bashō is immemorially associated with this kind of lilliputian versicle, which reached the extreme of impressionism. A more important addition to Japanese literature was made in the 17th century in the form of children's tales (*Otogibanashi*). They are charmingly simple and graceful, and they have been rendered into English again and again since the beginning of the Meiji era. But whether they are to be regarded as genuine folk-lore or merely as a branch of the fiction of the age when they first appeared in book form, remains uncertain. Of fiction proper there was an abundance. The pioneer of this kind of literature is considered to have been Saikaku (1641–1693), who wrote sketches of every-day life as he saw it, short tales of some merit and novels which deal with the most disreputable phases of human existence. His notable successors in the same line were two men of Kiōto, named Jishō (1675–1745) and Kiseki (1666–1716). They had their own publishing house, and its name *Hachimonji-ya* (figure-of-eight store) came to be indelibly associated with this kind of literature. But these men did little more than pave the way for the true romantic novel, which first took shape under the hand of Santō Kyōden (1761–1816), and culminated in the works of Bakin, Tanehiko, Samba, Ikku, Shunsui and their successors. Of nearly all the books in this class it may be said that they deal largely in sensationalism and pornography, though it does not follow that their language is either coarse or licentious. The life of the virtuous Japanese woman being essentially uneventful, these romancists not unnaturally sought their female types among dancing-girls and courtesans. The books were profusely illustrated with wood-cuts and chromoxylographs from pictures of the *ukiyoe* masters, who, like the playwright, the actor and the romancer, ministered to the pleasure of the "man in the street." Brief mention must also be made of two other kinds of books belonging to this epoch; namely, the *Shingaku-sho* (ethical essays) and the *Jitsuroku-mono* (true records). The latter were often little more than historical novels founded on facts; and the former, though nominally intended to engraft the doctrines of Buddhism and Shintō upon the philosophy of China, were really of rationalistic tendency.

The Meiji Era.

Although the incursions made into Chinese philosophy and the revival of Japanese traditions during the Tokugawa Epoch contributed materially to the overthrow of feudalism and the restoration of the Throne's administrative power, the immediate tendency of the last two events was to divert the nation's attention wholly from the study of either Confucianism or the *Record of Ancient Matters*. A universal thirst set in for Occidental science and literature, so that students occupied themselves everywhere with readers and grammars modelled on European lines rather than with the Analects or the *Kojiki*. English at once became the language of learning. Thus the three colleges which formed the nucleus of the Imperial University of Tōkyō were presided over by a graduate of Michigan College (Professor Toyama), a member of the English bar (Professor Hōzumi) and a graduate of Cambridge (Baron Kikuchi). If Japan was eminently fortunate in the men who directed her political career at that time, she was equally favoured in those that presided over her literary culture. Fukuzawa Yukichi, founder of the Keiō Gijuku, now one of Japan's four universities, did more than any of his contemporaries by writing and speaking to spread a knowledge of the West, its ways and its thoughts, and Nakamura Keiu laboured in the same cause by translating Smiles's *Self-help* and Mill's *Representative Government*. A universal geography (by Uchida Masao); a history of nations (by Mitsukuri Rinshō); a translation of *Chambers's Encyclopaedia* by the department of education; Japanese renderings of Herbert Spencer and of Guizot and Buckle—all these made their appearance during the first fourteen years of the epoch. The influence of politics may be strongly traced in the literature of that time, for the first romances produced by the new school were all of a political character: *Keikoku Bidan* (*Model for Statesmen*, with Epaminondas for hero) by Yano Fumio;

Setchūbai (*Plum-blossoms in snow*) and *Kwakwan-ō* (*Nightingale Among Flowers*) by Suyehiro. This idea of subserving literature to political ends is said to have been suggested by Nakae Tokusuke's translation of Rousseau's *Contrat social*. The year 1882 saw *Julius Caesar* in a Japanese dress. The translator was Tsubouchi Shōyō, one of the greatest writers of the Meiji era. His *Shōsetsu Shinsui* (*Essentials of a Novel*) was an eloquent plea for realism as contrasted with the artificiality of the characters depicted by Bakin, and his own works illustrative of this theory took the public by storm. He also brought out the first literary periodical published in Japan, namely, the *Waseda Bungaku*, so called because Tsubouchi was professor of literature in the Waseda University, an institution founded by Count Okuma, whose name cannot be omitted from any history of Meiji literature, not as an author but as a patron. As illustrating the rapid development of familiarity with foreign authors, a Japanese retrospect of the Meiji era notes that whereas Macaulay's *Essays* were in the curriculum of the Imperial University in 1881–1882, they were studied, five or six years later, in secondary schools, and pupils of the latter were able to read with understanding the works of Goldsmith, Tennyson and Thackeray. Up to Tsubouchi's time the Meiji literature was all in the literary language, but there was then formed a society calling itself *Kenyūsha*, some of whose associates—as Bimyōsai—used the colloquial language in their works, while others—as Kōyō, Rōhan, &c.—went back to the classical diction of the Genroku era (1655–1703). Rōhan is one of the most renowned of Japan's modern authors, and some of his historical romances have had wide vogue. Meanwhile the business of translating went on apace. Great numbers of European and American authors were rendered into Japanese—Calderon, Lytton, Disraeli, Byron, Shakespeare, Milton, Turgueniev, Carlyle, Daudet, Emerson, Hugo, Heine, De Quincey, Dickens, Körner, Goethe—their name is legion and their influence upon Japanese literature is conspicuous. In 1888 a special course of German literature was inaugurated at the Imperial University, and with it is associated the name of Mori Ogai, Japan's most faithful interpreter of German thought and speech. Virtually every literary magnate of the Occident has found one or more interpreters in modern Japan. Accurate reviewers of the era have divided it into periods of two or three years each, according to the various groups of foreign authors that were in vogue, and every year sees a large addition to the number of Japanese who study the masterpieces of Western literature in the original.

Newspapers and Periodicals.

Newspapers, as the term is understood in the West, did not exist in old Japan, though block-printed leaflets were occasionally issued to describe some specially stirring event. Yet the Japanese were not entirely unacquainted with journalism. During the last decades of the factory at Deshima the Dutch traders made it a yearly custom to submit to the governor of Nagasaki selected extracts from newspapers arriving from Batavia, and these extracts, having been translated into Japanese, were forwarded to the court in Yedo together with their originals. To such compilations the name of *Oranda fusetsu-sho* (*Dutch Reports*) was given. Immediately after the conclusion of the first treaty in 1857, the Yedo authorities instructed the office for studying foreign books (*Bunsho torishirabe-dokoro*) to translate excerpts from European and American journals. Occasionally these translations were copied for circulation among officials, but the bulk of the people knew nothing of them. Thus the first real newspaper did not see the light until 1861, when a Yedo publisher brought out the *Batavia News*, a compilation of items from foreign newspapers, printed on Japanese paper from wooden blocks. Entirely devoid of local interest, this journal did not survive for more than a few months. It was followed, in 1864, by the *Shimbun-shi* (*News*), which was published in Yokohama, with Kishida Ginkō for editor and John Hiko for sub-editor. The latter had been cast away, many years previously, on the coast of the United States and had become a naturalized American citizen. He retained a knowledge of spoken Japanese, but the ideographic script was a sealed book to him, and his editorial part was limited to oral translations from American journals which the editor committed to writing. The *Shimbun-shi* essayed to collect domestic news as well as foreign. It was published twice a month and might possibly have created a demand for its wares had not the editor and sub-editor left for America after the issue of the 10th number. The example, however, had now been set. During the three years that separated the death of the *Shimbun-shi* from the birth of the Meiji era (October 1867) no less than ten quasi-journals made their appearance. They were in fact nothing better than inferior magazines, printed from wood-blocks, issued weekly or monthly, and giving little evidence of enterprise or intellect, though connected with them were the names of men destined to become famous in the world of literature, as Fukuchi Genichiro, Tsūji Shinji (afterwards Baron Tsūji) and Suzuki Yuichi. These publications attracted little interest and exercised no influence. Journalism was regarded as a mere pastime. The first evidence of its potentialities was furnished by the *Kōko Shimbun* (*The World*) under the editorship of Fukuchi Genichiro and Sasano Dempei. To many Japanese observers it seemed that the restoration of 1867 had merely transferred the administrative authority from the Tokugawa Shōgun to the clans of Satsuma and Chōshū. The *Kōko Shimbun* severely attacked the two clans as specious usurpers. It was not in the mood of Japanese officialdom at that time to brook such assaults. The *Kōko Shimbun* was suppressed; Fukuchi was thrust into prison, and all journals or periodicals except those having official sanction were vetoed. At the beginning of 1868 only two newspapers remained in the field. Very soon, however, the enlightened makers of modern Japan appreciated the importance of journalism, and in 1871 the *Shimbun Zasshi* (*News Periodical*) was started under the auspices of the illustrious Kido. Shortly afterwards there appeared in Yokohama—whence it was subsequently transferred to Tōkyō—the *Mainichi Shimbun* (*Daily News*), the first veritable daily and also the first journal printed with movable types and foreign presses. Its editors were Numa Morikage, Shimada Saburo and Koizuka Ryū, all destined to become celebrated not only in the field of journalism but also in that of politics. It has often been said of the Japanese that they are slow in forming a decision but very quick to act upon it. This was illustrated in the case of journalism. In 1870 the country possessed only two quasi-journals, both under official auspices. In 1875 it possessed over 100 periodicals and daily newspapers. The most conspicuous were the *Nichi Nichi Shimbun* (*Daily News*), the *Yūbin Hōchi* (*Postal Intelligence*), the *Chōya Shimbun* (*Government and People News*), the *Akebono Shimbun* (*The Dawn*), and the *Mainichi Shimbun* (*Daily News*). These were called "the five great journals." The *Nichi Nichi Shimbun* had an editor of conspicuous literary ability in Fukuchi Genichirō, and the *Hōchi Shimbun*, its chief rival, received assistance from such men as Yano Fumio, Fujita Makichi, Inukai Ki and Minoura Katsundo. Japan had not yet any political parties, but the ferment that preceded their birth was abroad. The newspaper press being almost entirely in the hands of men whose interests suggested wider opening of the door to official preferment, nearly all editorial pens were directed against the government. So strenuous did this campaign become that, in 1875, a press law was enacted empowering the minister of home affairs and the police to suspend or suppress a journal and to fine or imprison its editor without public trial. Many suffered under this law, but the ultimate effect was to invest the press with new popularity, and very soon the newspapers conceived a device which effectually protected their literary staff, for they employed "dummy editors" whose sole function was to go to prison in lieu of the true editor.

Japanese journalistic writing in these early years of Meiji was marred by extreme and pedantic classicism. There had not yet been any real escape from the tradition which assigned the crown of scholarship to whatever author drew most largely upon the resources of the Chinese language and learning. The example set by the Imperial court, and still set by it, did not tend to correct this style. The sovereign, whether speaking by rescript or by ordinance, never addressed the bulk of his subjects. His words were taken from sources so classical as to be intelligible to only the highly educated minority. The newspapers sacrificed their audience to their erudition and preferred classicism to circulation. Their columns were thus a sealed book to the whole of the lower middle classes and to the entire female population. The *Yomiuri Shimbun* (*Buy and Read News*) was the first to break away from this pernicious fashion. Established in 1875, it adopted a style midway between the classical and the colloquial, and it appended the syllabic characters to each ideograph, so that its columns became intelligible to every reader of ordinary education. It was followed by the *Yeiri Shimbun* (*Pictorial Newspaper*), the first to insert illustrations and to publish *feuilleton* romances. Both of these journals devoted space to social news, a radical departure from the austere restrictions observed by their aristocratic contemporaries.

Era of Political Parties.

The year 1881 saw the nation divided into political parties and within measured distance of constitutional government. Thenceforth the great majority of the newspapers and periodicals ranged themselves under the flag of this or that party. An era of embittered polemics ensued. The journals, while fighting continuously against each other's principles, agreed in attacking the ministry, and the latter found it necessary to establish organs of its own which preached the German system of state autocracy. Editors seemed to be incapable of rising above the dead level of political strife, and their utterances were not relieved even by a semblance of fairness. Readers turned away in disgust, and journal after journal passed out of existence. The situation was saved by a newspaper which from the outset of its career obeyed the best canons of journalism. Born in 1882, the *Jiji Shimpō* (*Times*) enjoyed the immense advantage of having its policy controlled by one of the greatest thinkers of modern Japan, Fukuzawa Yukichi. Its basic principle was liberty of the individual, liberty of the family and liberty of the nation; it was always found on the side of broad-minded justice, and it derived its materials from economic, social and scientific sources. Other newspapers of greatly improved character followed the *Jiji Shimpō*, especially notable among them being the *Kokumin Shimbun*.

Commercial Journalism.

In the meanwhile Osaka, always pioneer in matters of commercial enterprise, had set the example of applying the force of capital to journalistic development. Tōkyō journals were all on a literary or political basis, but the *Osaka Asahi Shimbun* (*Osaka Rising Sun News*) was purely a business undertaking. Its proprietor, Maruyama Ryūhei, spared no expense to obtain news from all quarters of the world, and for the first time the Japanese public learned what stores of information may be found in the columns of a really enterprising journal. Very soon the *Asahi* had a keen competitor in the *Osaka Mainichi Shimbun* (*Osaka Daily News*) and these papers ultimately crushed all rivals in Osaka. In 1888 Maruyama established another *Asahi* in Tōkyō, and thither he was quickly followed by his Osaka rival, which in Tōkyō took the name of *Mainichi Dempō* (*Daily Telegraph*). These two newspapers now stand alone as purveyors of copious telegraphic news, and in the next rank, not greatly lower, comes the *Jiji Shimpō*.

With the opening of the diet in 1890, politics again obtruded themselves into newspaper columns, but as practical living issues now occupied attention, readers were no longer wearied by the abstract homilies of former days. Moreover, freedom of the press was at length secured. Already (1887) the government had voluntarily made a great step in advance by divesting itself of the right to imprison or fine editors by executive order. But it reserved the power of suppressing or suspending a newspaper, and against that reservation a majority of the lower house voted, session after session, only to see the bill rejected by the peers, who shared the government's opinion that to grant a larger measure of liberty would certainly encourage licence. Not until 1897 was this opposition fully overcome. A new law, passed by both houses and confirmed by the emperor, took from the executive all power over journals, except in cases of lèse majesté, and nothing now remains of the former arbitrary system except that any periodical having a political complexion is required to deposit security varying from 175 to 1000 *yen*. The result has falsified all sinister forebodings. A much more moderate tone pervades the writings of the press since restrictions were entirely removed, and although there are now 1775 journals and periodicals published throughout the empire, with a total annual circulation of some 700 million copies, intemperance of language, such as in former times would have provoked official interference, is practically unknown to-day. Moreover, the best Japanese editors have caught with remarkable aptitude the spirit of modern journalism. But a few years ago they used to compile laborious essays, in which the inspiration was drawn from Occidental text-books, and the alien character of the source was hidden under a veneer of Chinese aphorisms. To-day they write terse, succinct, closely-reasoned articles, seldom diffuse, often witty; and generally free from extravagance of thought or diction. Incidentally they are hastening the assimilation of the written and the spoken languages (*genbun itchi*) which may possibly prelude a still greater reform, abolition of the ideographic script. Yet, with few exceptions, the profession of journalism is not remunerative. Very low rates of subscription, and almost prohibitory charges for advertising, are chiefly to blame.[1] The vicissitudes of the enterprise may be gathered from the fact that, whereas 2767 journals and periodicals were started between 1889 and 1894 (inclusive), no less than 2465 ceased publishing. The largest circulation recorded in 1908 was about 150,000 copies daily, and the honour of attaining that exceptional figure belonged to the *Osaka Asahi Shimbun*. (F. By.)

IV.—JAPANESE ART

Pictorial Art.

Painting and Engraving.—In Japanese art the impressionist element is predominant. Pictures, as the term is understood in Europe, can scarcely be said to have existed at any time in Japan. The artist did not depict emotion: he depicted the subjects that produce emotion. Therefore he took his motives from nature rather than from history; or, if he borrowed from the latter, what he selected was a scene, not the pains or the passions of its actors. Moreover, he never exhausted his subject, but was always careful to leave a wide margin for the imagination of the spectator. This latter consideration sometimes impelled him to represent things which, to European eyes, seem trivial or insignificant, but which really convey hints of deep significance. In short, Japanese pictures are like Japanese poetry: they do not supply thought but only awaken it. Often their methods show conventionalism, but it is conventionalism so perfect and free in its allurements that nature seems to suggest both the motive and the treatment. Thus though neither botanically nor ornithologically correct, their flowers and their birds show a truth to nature, and a habit of minute observation in the artist, which cannot be too much admired. Every blade of grass, each leaf and feather, has been the object of loving and patient study.

It has been rashly assumed by some writers that the Japanese do not study from nature. All their work is an emphatic protest against this supposition. It can in fact be shown conclusively that the Japanese have derived all their fundamental ideas of symmetry, so different from ours, from a close study of nature and her processes in the attainment of endless variety. A special feature of their art is that, while often closely and minutely imitating natural objects, such as birds, flowers and fishes, the especial objects of their predilection and study, they frequently combine the facts of external nature with a conventional mode of treatment better suited to their purpose. During the long apprenticeship that educated Japanese serve to acquire the power of writing with the brush the complicated characters borrowed from Chinese, they unconsciously cultivate the habit of minute observation and the power of accurate imitation, and with these the delicacy of touch and freedom of hand which only long practice can give. A hair's-breadth deviation in a line is fatal to good calligraphy, both among the Chinese and the Japanese. When they come to use the pencil in drawing, they already possess accuracy of eye and free command of the brush. Whether a Japanese art-worker sets himself to copy what he sees before him or to give play to his fancy in combining what he has seen with some ideal in his mind, the result shows perfect facility of execution and easy grace in all the lines.

The beauties of the human form never appealed to the Japanese artist. Associating the nude solely with the performance of menial tasks, he deemed it worse than a solecism to transfer such subjects to his canvas, and thus a wide field of motive was closed to him. On the other hand, the draped figure received admirable treatment from his brush, and the naturalistic school of the 17th, 18th and 19th centuries reached a high level of skill in depicting men, women and children in motion. Nor has there ever been a Japanese Landseer. Sosen's monkeys and badgers constitute the one possible exception, but the horses, oxen, deer, tigers, dogs, bears, foxes and even cats of the best Japanese artists were ill drawn and badly modelled. In the field of landscape the Japanese painter fully reached the eminence on which his great Chinese masters stood. He did not obey the laws of linear perspective as they are formulated in the Occident, nor did he show cast shadows, but his aerial perspective and his foreshortening left nothing to be desired. It has been suggested that he deliberately eschewed chiaroscuro because his pictures, destined invariably to hang in an alcove, were required to be equally effective from every aspect and had also to form part of a decorative scheme. But the more credible explanation is that he merely followed Chinese example in this matter, as he did also in linear perspective, accepting without question the curious canon that lines converge as they approach the spectator.

Decorative Art.

It is in the realm of decorative art that the world has chiefly benefited by contact with Japan. Her influence is second only to that of Greece. Most Japanese decorative designs consist of natural objects, treated sometimes in a more or less conventional manner, but always distinguished by delicacy of touch, graceful freedom of conception and delightfully harmonized tints. Perhaps the admiration which the Japanese artist has won in this field is due not more to his wealth of fancy and skilful adaptation of natural forms, than to his individuality of character in treating his subjects. There is complete absence of uniformity and monotony. Repetition without any variation is abhorrent to every Japanese. He will not tolerate the stagnation and tedium of a dull uniformity by mechanical reproduction. His temperament will not let him endure the labour of always producing the same pattern. Hence the repetition of two articles exactly like each other, and, generally, the division of any space into equal parts are instinctively avoided, as nature avoids the production of any two plants, or even any two leaves of the same tree, which in all points shall be exactly alike.

The application of this principle in the same free spirit is the secret of much of the originality and the excellence of the decorative art of Japan. Her artists and artisans alike aim at symmetry, not by an equal division of parts, as we do, but rather by a certain balance of corresponding parts, each different from the other, and not numerically even, with an effect of variety and freedom from formality. They seek it, in fact, as nature attains the same end. If we take for instance the skins of animals that

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[1] The highest rate of subscription to a daily journal is twelve shillings per annum, and the usual charge for advertisement is from 7d. to one shilling per line of 22 ideographs (about nine words).

JAPAN

PAINTING

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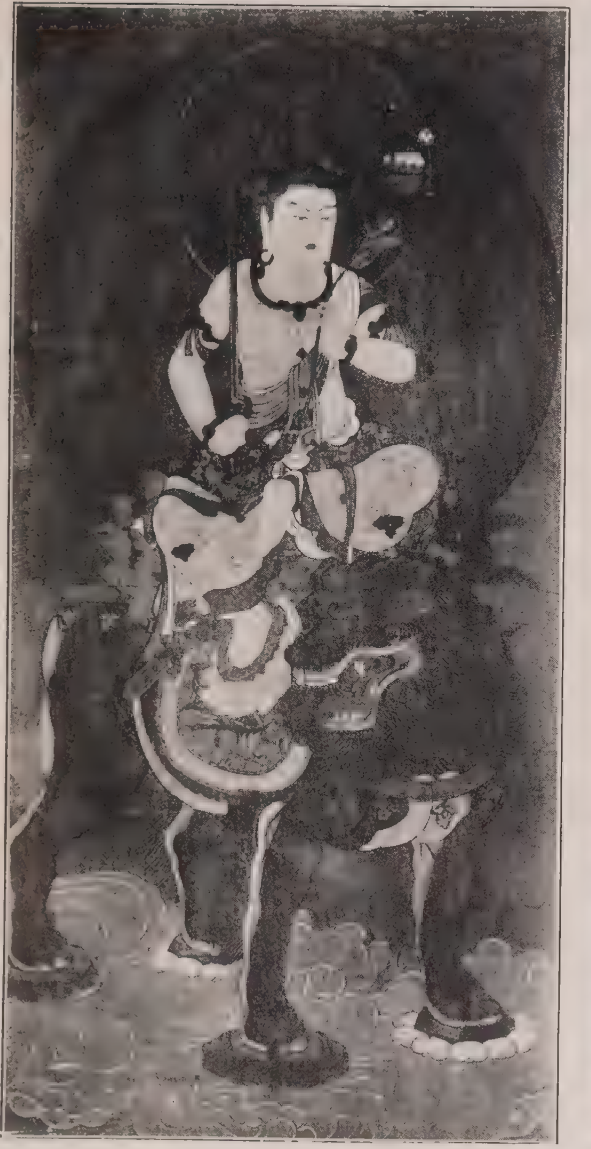

FIG. 1.—MANJUSRI, DEITY OF WISDOM. Kosé School (13th century).

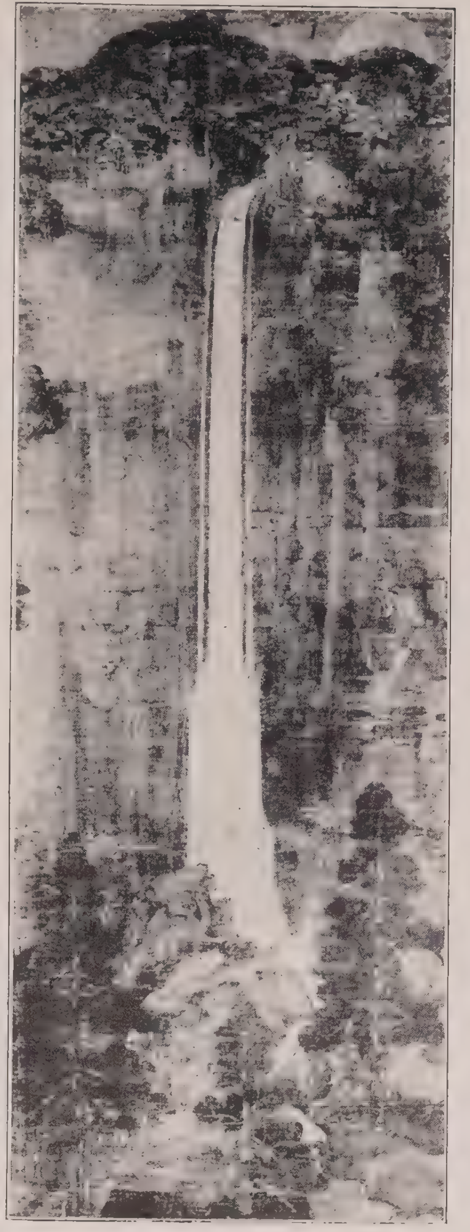

FIG. 2.—WATERFALL OF NACHI. Attributed to Kanaoka (9th century).

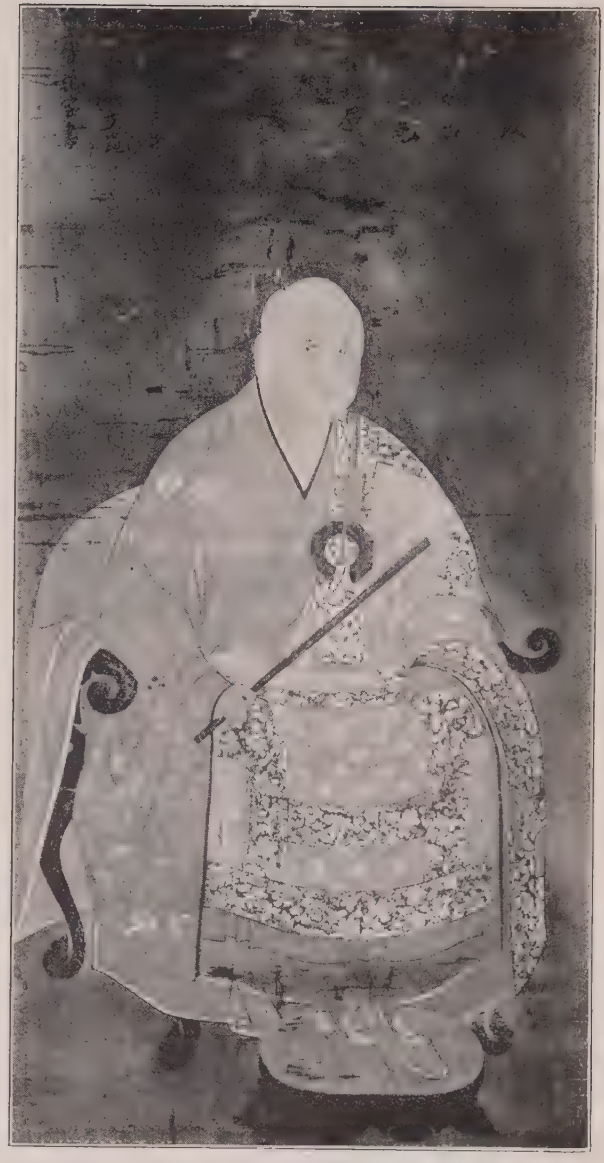

FIG. 3.—PORTRAIT OF THE PRIEST DAITO-KOKUSHI. Tosa School (14th century).

JAPAN

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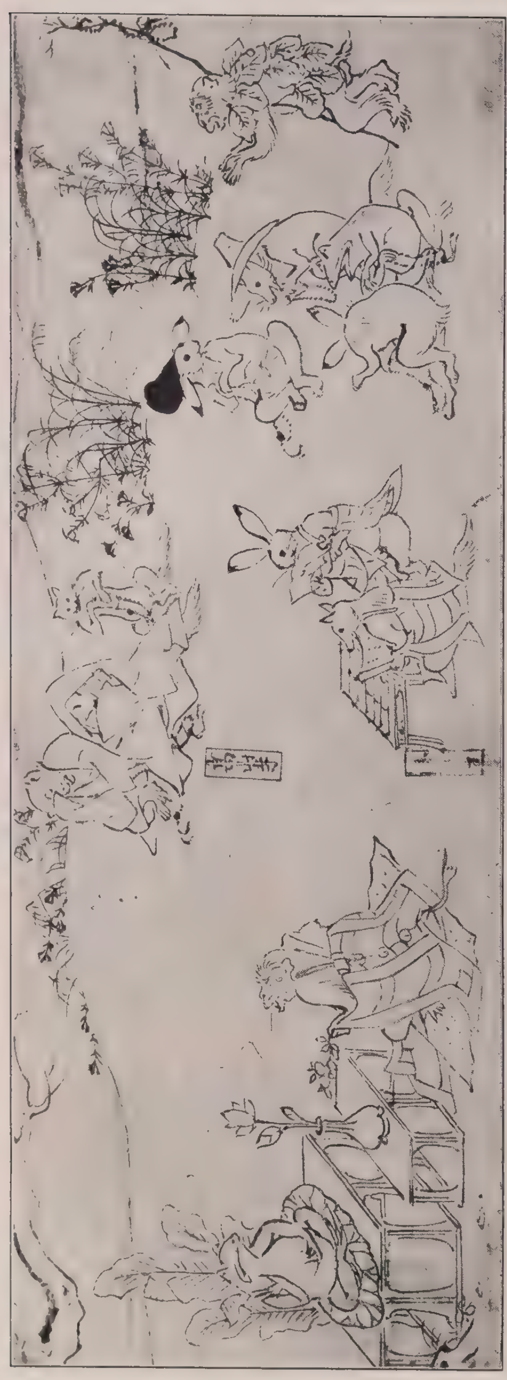

FIG. 4.—PRIESTS CARICATURED BY ANIMALS. By Toba Sojo (1053–1140).

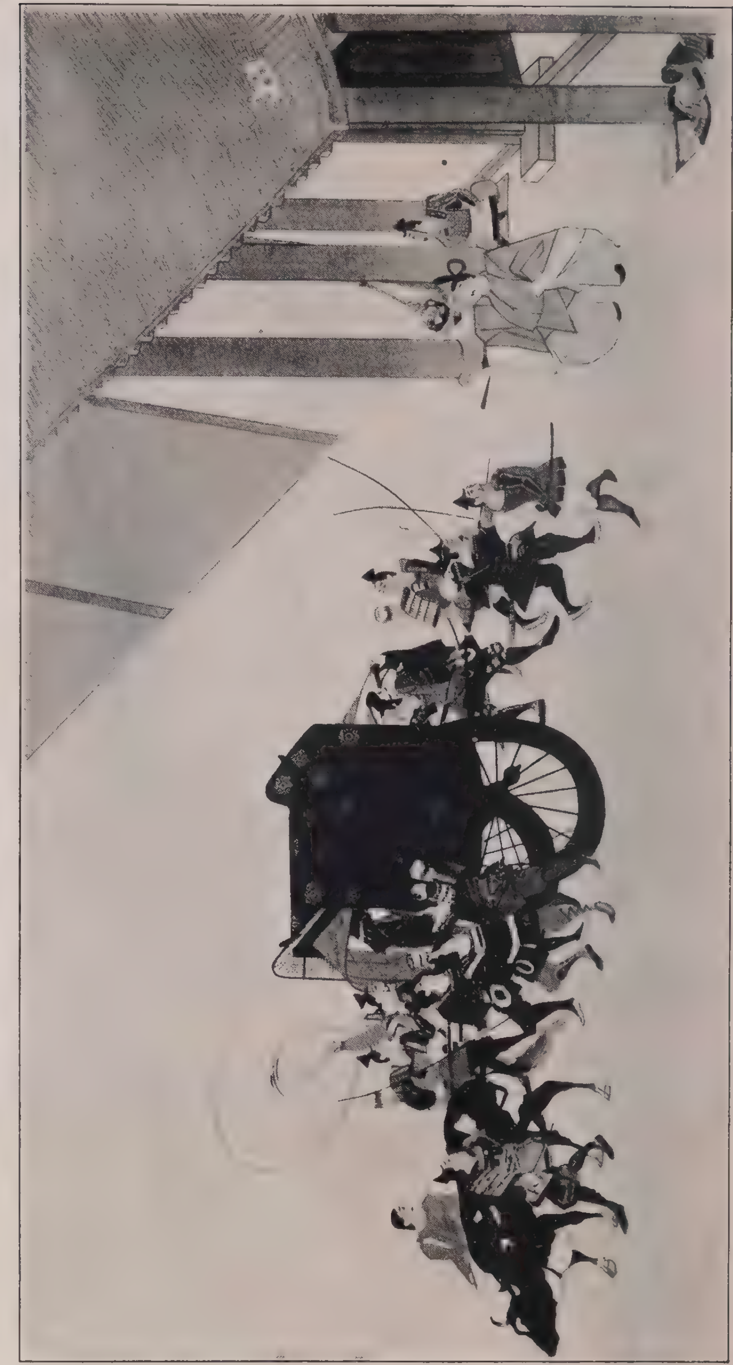

FIG. 5.—ESCAPE OF THE EMPEROR DISGUISED AS A WOMAN. Scene from the Civil War. By Keion (13th century).

are striped or spotted, we have the best possible illustration of nature's methods in this direction. Examining the tiger or the leopard, in all the beauty of their symmetrical adornment, we do not see in any one example an exact repetition of the same stripes or spots on each side of the mesial line. They seem to be alike, and yet are all different. The line of division along the spine, it will be observed, is not perfectly continuous or defined, but in part suggested; and each radiating stripe on either side is full of variety in size, direction, and to some extent in colour and depth of shade. Thus nature works, and so, following in her footsteps, works the Japanese artist. The same law prevailing in all nature's creation, in the plumage of birds, the painting of butterflies' wings, the marking of shells, and in all the infinite variety and beauty of the floral kingdom, the lesson is constantly renewed to the observant eye. Among flowers the orchids, with all their fantastic extravagance and mimic imitations of birds and insects, are especially prolific in examples of symmetrical effects without any repetition of similar parts or divisions into even numbers.

The orchids may be taken as offering fair types of the Japanese artist's ideal in all art work. And thus, close student of nature's processes, methods, and effects as the Japanese art workman is, he ever seeks to produce humble replicas from his only art master. Thus he proceeds in all his decorative work, avoiding studiously the exact repetition of any lines and spaces, and all diametrical divisions, or, if these be forced upon him by the shape of the object, exercising the utmost ingenuity to disguise the fact, and train away the eye from observing the weak point, as nature does in like circumstances. Thus if a lacquer box in the form of a parallelogram is the object, Japanese artists will not divide it in two equal parts by a perpendicular line, but by a diagonal, as offering a more pleasing line and division. If the box be round, they will seek to lead the eye away from the naked regularity of the circle by a pattern distracting attention, as, for example, by a zigzag breaking the circular outline, and supported by other ornaments. A similar feeling is shown by them as colourists, and, though sometimes eccentric and daring in their contrasts, they never produce discords in their chromatic scale. They have undoubtedly a fine sense of colour, and a similarly delicate and subtle feeling for harmonious blending of brilliant and sober hues. As a rule they prefer a quiet and refined style, using full but low-toned colours. They know the value of bright colours, however, and how best to utilize them, both supporting and contrasting them with their secondaries and complementaries.

Division into Periods.

The development of Japanese painting may be divided into the following six periods, each signalized by a wave of progress. (1) From the middle of the 6th to the middle of the 9th century: the naturalization of Chinese and Chino-Buddhist art. (2) From the middle of the 9th to the middle of the 15th century: the establishment of great native schools under Kosé no Kanaoka and his descendants and followers, the pure Chinese school gradually falling into neglect. (3) From the middle of the 15th to the latter part of the 17th century: the revival of the Chinese style. (4) From the latter part of the 17th to the latter part of the 18th century: the establishment of a popular school. (5) From the latter part of the 18th to the latter part of the 19th century: the foundation of a naturalistic school, and the first introduction of European influence into Japanese painting; the acme and decline of the popular school. (6) From about 1875 to the present time: a period of transition.

First Period.

Tradition refers to the advent of a Chinese artist named Nanriu, invited to Japan in the 5th century as a painter of the Imperial banners, but of the labours and influence of this man and of his descendants we have no record. The real beginnings of the study of painting and sculpture in their higher branches must be dated from the introduction of Buddhism from China in the middle of the 6th century, and for three centuries after this event there is evidence that the practice of the arts was carried on mainly by or under the instruction of Korean and Chinese immigrants.

The paintings of which we have any mention were almost limited to representations of Buddhist masters of the Tang dynasty (618–905), notably Wu Tao-zu (8th century), of whose genius romantic stories are related. The oldest existing work of this period is a mural decoration in the hall of the temple of Horyū-ji, Nara, attributed to a Korean priest named Donchô, who lived in Japan in the 6th century; and this painting, in spite of the destructive effects of time and exposure, shows traces of the same power of line, colour and composition that stamps the best of the later examples of Buddhist art.

Second Period.

The native artist who crested the first great wave of Japanese painting was a court noble named Kosé no Kanaoka, living under the patronage of the emperor Seiwa (850–859) and his successors down to about the end of the 9th century, in the midst of a period of peace and culture. Of his own work few, if any, examples have reached us; and those attributed with more or less probability to his hand are all representations of Buddhist divinities, showing a somewhat formal and conventional design, with a masterly calligraphic touch and perfect harmony of colouring. Tradition credits him with an especial genius for the delineation of animals and landscape, and commemorates his skill by a curious anecdote of a painted horse which left its frame to ravage the fields, and was reduced to pictorial stability only by the sacrifice of its eyes. He left a line of descendants extending far into the 15th century, all famous for Buddhist pictures, and some engaged in establishing a native style, the *Wa-gwa-ryū*.

At the end of the 9th century there were two exotic styles of painting, Chinese and Buddhist, and the beginning of a native style founded upon these. All three were practised by the same artists, and it was not until a later period that each became the badge of a school.

Chinese Style.

The Chinese style (*Kara-ryū*), the fundamental essence of all Japanese art, has a fairly distinct history, dating back to the introduction of Buddhism into China (A. D. 62), and it is said to have been chiefly from the works of Wu Tao-zu, the master of the 8th century, that Kanaoka drew his inspiration. This early Chinese manner, which lasted in the parent country down to the end of the 13th century, was characterized by a virile grace of line, a grave dignity of composition, striking simplicity of technique, and a strong but incomplete naturalistic ideal. The colouring, harmonious but subdued in tone, held a place altogether secondary to that of the outline, and was frequently omitted altogether, even in the most famous works. Shadows and reflections were ignored, and perspective, approximately correct for landscape distances, was isometrical for near objects, while the introduction of a symbolic sun or moon lent the sole distinction between a day and a night scene. The art was one of imperfect evolution, but for thirteen centuries it was the only living pictorial art in the world, and the Chinese deserve the honour of having created landscape painting. The materials used were water-colours, brushes, usually of deer-hair, and a surface of unsized paper, translucid silk or wooden panel. The chief motives were landscapes of a peculiarly wild and romantic type, animal life, trees and flowers, and figure compositions drawn from Chinese and Buddhist history and Taoist legend; and these, together with the grand aims and strange shortcomings of its principles and the limited range of its methods, were adopted almost without change by Japan. It was a noble art, but unfortunately the rivalry of the Buddhist and later native styles permitted it to fall into comparative neglect, and it was left for a few of the faithful, the most famous of whom was a priest of the 14th century named Kawo, to preserve it from inanition till the great Chinese renaissance that lent its stamp to the next period. The reputed founder of Japanese caricature may also be added to the list. He was a priest named Kakuyū, but better known as the abbot of Toba, who lived in the 12th century. An accomplished artist in the Chinese manner, he amused himself and his friends by burlesque sketches, marked by a grace and humour that his imitators never equalled. Later, the motive of the Toba pictures, as such caricatures were called, tended to degenerate, and the elegant figures of Kakuyū were replaced by scrawls that often substituted indecency and ugliness for art and wit. Some of the old masters of the Yamato school were, however, admirable in their rendering of the burlesque, and in modern times Kyōsai, the last of the Hokusai school, outdid all his predecessors in the riotous originality of his weird and comic fancies. A new phase of the art now lives in the pages of the newspaper press.

Buddhist Style.

The Buddhist style was probably even more ancient than the Chinese, for the scheme of colouring distinctive of the Buddhist picture was almost certainly of Indian origin; brilliant and decorative, and heightened by a lavish use of gold. it was essential to the effect of a picture destined for the dim light of the Buddhist temple. The style was applied only to the representations of sacred personages and scenes, and as the traditional forms and attributes of the Brahmanic and Buddhist divinities were mutable only within narrow limits, the subjects seldom afforded scope for originality of design or observation of nature. The principal Buddhist painters down to the 14th century were members of the Kosé, Takuma and Kasuga lines, the first descended from Kanaoka, the second from Takuma Taméuji (ending 10th century), and the third from Fujiwara no Motomitsu (11th century). The last and greatest master of the school was a priest named Meicho, better known as Chō Densu, the Japanese Fra Angelico. It is to him that Japan owes the possession of some of the most stately and most original works in her art, sublime in conception, line and colour, and deeply instinct with the religious spirit. He died in 1427, at the age of seventy-six, in the seclusion of the temple where he had passed the whole of his days.

Native Style.

The native style, *Yamato* or *Wa-gwa-ryū*, was an adaptation of Chinese art canons to motives drawn from the court life, poetry and stories of old Japan. It was undoubtedly practised by the Kose line, and perhaps by their predecessors, but it did not take shape as a school until the beginning of the 11th century under Fujiwara no Motomitsu, who was a pupil of Kose no Kinmochi; it then became known as *Yamato-ryū*, a title which two centuries later was changed to that of *Tosa*, on the occasion of one of its masters, Fujiwara no Tsunetaka, assuming that appellation as a family name. The Yamato-Tosa artists painted in all styles, but that which was the speciality of the school, to be found in nearly all the historical rolls bequeathed to us by their leaders, was a lightly-touched outline filled in with flat and bright body-colours, in which verdigris-green played a great part. The originality of the motive did not prevent the adoption of all the Chinese conventions, and of some new ones of the artist's own. The curious expedient of spiriting away the roof of any building of which the artist wished to show the interior was one of the most remarkable of these. Amongst the foremost names of the school are those of Montómitsu (11th century), Nobuzane (13th century), Tsunetaka (13th century), Mitsunobu (15th and 16th centuries), his son Mitsushige, and Mitsuōki (17th century). The struggle between the Taira and Minamoto clans for the power that had long been practically abandoned by the Imperial line lasted through the 11th and the greater part of the 12th centuries, ending only with the rise of Yoritomo to the shōgunate in 1185. These internecine disturbances had been unfavourable to any new departure in art, except in matters appertaining to arms and armour, and the strife between two puppet emperors for a shadow of authority in the 14th century brought another distracting element. It was not until the triumph of the northern dynasty was achieved through the prowess of an interested champion of the Ashikaga clan that the culture of ancient Japan revived. The palace of the Ashikaga shōguns then replaced the Imperial court as the centre of patronage of art and literature and established a new era in art history.

Third Period.

Towards the close of the Ashikaga shōgunate painting entered on a new phase. Talented representatives of the Kose, Takuma and Tosa lines maintained the reputation of the native and Buddhist schools, and the long-neglected Chinese school was destined to undergo a vigorous revival. The initiation of the new movement is attributed to a priest named Jôsetsu, who lived in the early part of the 15th century, and of whom little else is known. It is not even certain whether he was of Chinese or Japanese birth; he is, however, believed by some authorities to have been the teacher of three great artists—Shūbun, Sesshū and Kano Masanobu—who became the leaders of three schools: Shūbun, that of the pure Chinese art of the Sung and Yuan dynasties (10th and 13th centuries); Sesshū, that of a modified school bearing his name; and Masanobu, of the great Kano school, which has reached to the present day. The qualities of the new Chinese schools were essentially those of the older dynasties: breadth, simplicity, a daringly calligraphic play of brush that strongly recalled the accomplishments of the famous scribes, and a colouring that varied between sparing washes of flat local tints and a strength and brilliancy of decorative effort that rivalled even that of the Buddhist pictures. The motives remained almost identical with those of the Chinese masters, and so imbued with the foreign spirit were many of the Japanese disciples that it is said they found it difficult to avoid introducing Chinese accessories even into pictures of native scenery.

Sesshū (1421–1507) was a priest who visited China and studied painting there for several years, at length returning in 1469, disappointed with the living Chinese artists, and resolved to strike out a style of his own, based upon that of the old masters. He was the boldest and most original of Japanese landscape artists, leaving powerful and poetic records of the scenery of his own land as well as that of China, and trusting more to the sure and sweeping stroke of the brush than to colour. Shūbun was an artist of little less power, but he followed more closely his exemplars, the Chinese masters of the 12th and 13th centuries; while Kano Masanobū (1424–1520), trained in the love of Chinese art, departed little from the canons he had learned from Jōsetsu or Oguri Sōtan. It was left to his more famous son, Motonobu, to establish the school which bears the family name. Kano Motonobu (1477–1559) was one of the greatest Japanese painters, an eclectic of genius, who excelled in every style and every branch of his art. His variety was inexhaustible, and he remains to this day a model whom the most distinguished artists are proud to imitate. The names of the celebrated members of this long line are too many to quote here, but the most accomplished of his descendants was Tanyū, who died in 1674, at the age of seventy-three. The close of this long period brought a new style of art, that of the Kōrin school. Ogata Kōrin (1653–1716) is claimed by both the Tosa and Kano schools, but his work bears more resemblance to that of an erratic offshoot of the Kano line named Sōtatsu than to the typical work of the academies. He was an artist of eccentric originality, who achieved wonders in bold decorative effects in spite of a studied contempt for detail. As a lacquer painter he left a strong mark upon the work of his contemporaries and successors. His brother and pupil, Kenzan, adopted his style, and left a reputation as a decorator of pottery hardly less brilliant than Kōrin's in that of lacquer; and a later follower, Hōitsu (1762–1828), greatly excelled the master in delicacy and refinement, although inferior to him in vigour and invention. Down to the end of this era painting was entirely in the hands of a patrician caste—courtiers, priests, feudal nobles and their military retainers, all men of high education and gentle birth, living in a polished circle. It was practised more as a phase of aesthetic culture than with any utilitarian views. It was a labour of loving service, untouched by the spirit of material gain, conferring upon the work of the older masters a dignity and poetic feeling which we vainly seek in much of the later work. Unhappily, but almost inevitably, over-culture led to a gradual falling-off from the old virility. The strength of Meichō, Sesshū, Motonobu and Tanyū gave place to a more or less slavish imitation of the old Japanese painters and their Chinese exemplars, till the heirs to the splendid traditions of the great masters preserved little more than their conventions and shortcomings. It was time for a new departure, but there seemed to be no sufficient strength left within the charmed circle of the orthodox schools, and the new movement was fated to come from the masses, whose voice had hitherto been silent in the art world.

Fourth Period: Popular School.

A new era in art began in the latter half of the 17th century with the establishment of a popular school under an embroiderer's draughtsman named Hishigawa Moronobu (*c.* 1646–1713). Perhaps no great change is ever entirely a novelty. The old painters of the Yamato-Tosa line had frequently shown something of the daily life around them, and one of the later scions of the school, named Iwasa Matahei, had even made a speciality of this class of motive; but so little is known of Matahei and his work that even his period is a matter of dispute, and the few pictures attributed to his pencil are open to question on grounds of authenticity. He probably worked some two generations before the time of Moronobu, but there is no reason to believe that his labours had any material share in determining the creation and trend of the new school.

Moronobu was a consummate artist, with all the delicacy and calligraphic force of the best of the Tosa masters, whom he undoubtedly strove to emulate in style; and his pictures are not only the most beautiful but also the most trustworthy records of the life of his time. It was not to his paintings, however, that he owed his greatest influence, but to the powerful impulse he gave to the illustration of books and broadsides by wood-engravings. It is true that illustrated books were known as early as 1608, if not before, but they were few and unattractive, and did little to inaugurate the great stream of *ehon*, or picture books, that were to take so large a share in the education of his own class. It is to Moronobu that Japan owes the popularization of artistic wood-engravings, for nothing before his series of xylographic albums approached his best work in strength and beauty, and nothing since has surpassed it. Later there came abundant aid to the cause of popular art, partly from pupils of the Kano and Tosa schools, but mainly from the artisan class. Most of these artists were designers for books and broadsides by calling, painters only on occasion, but a few of them did nothing for the engravers. Throughout the whole of this period, embracing about a hundred years, there still continued to work, altogether apart from the men who were making the success of popular art, a large number of able painters of the Kano, Tosa and Chinese schools, who multiplied pictures that had every merit except that of originality. These men, living in the past, paid little attention to the great popular movement, which seemed to be quite outside their social and artistic sphere and scarcely worthy of cultured criticism. It was in the middle of the 18th century that the decorative, but relatively feeble, Chinese art of the later Ming period found favour in Japan and a clever exponent in a painter named Ryūrikyō It must be regarded as a sad decadence from the old Chinese ideals, which was further hastened, from about 1765, by the popularity of the southern Chinese style. This was a weak affectation that found its chief votaries amongst literary men ambitious of an easily earned artistic reputation. The principal Japanese supporter of this school was Taigadō (1722–1775), but the volume of copies of his sketches, *Taigadō sansui juseki*, published about 1870, is one of the least attractive albums ever printed in Japan.

Fifth Period; Naturalistic School.

The fifth period was introduced by a movement as momentous as that which stamped its predecessor—the foundation of a naturalistic school under a group of men outside the orthodox academical circles. The naturalistic principle was by no means a new one; some of the old Chinese masters were naturalistic in a broad and noble manner, and their Japanese followers could be admirably and minutely accurate when they pleased; but too many of the latter were content to construct their pictures out of fragmentary reminiscences of ancient Chinese masterpieces, not presuming to see a rock, a tree, an ox, or a human figure, except through Chinese spectacles. It was a farmer's son named Okyō, trained in his youth to paint in the Chinese manner, who was first bold enough to adopt as a canon what his predecessors had only admitted under rare exceptions, the principle of an exact imitation of nature. Unfortunately, even he had not all the courage of his creed, and while he would paint a bird or a fish with perfect realism, he no more dared to trust his eyes in larger motives than did the most devout follower of Shūbun or Motonobu. He was essentially a painter of the classical schools, with the speciality of elaborate reproduction of detail in certain sections of animal life, but fortunately this partial concession to truth, emphasized as it was by a rare sense of beauty, did large service.

Okyō rose into notice about 1775, and a number of pupils flocked to his studio in Shijō Street, Kiōto (whence Shijō school). Amongst these the most famous were Goshun (1742–1811), who is sometimes regarded as one of the founders of the school; Sosen (1757–1821), an animal painter of remarkable power, but especially celebrated for pictures of monkey life; Shūhō, the younger brother of the last, also an animal painter; Rōsetsu (1755–1799), the best landscape painter of his school; Keibun, a younger brother of Goshun, and some later followers of scarcely less fame, notably Hoyen, a pupil of Keibun; Tessan, an adopted son of Sosen; Ippō and Yōsai (1788–1878), well known for a remarkable set of volumes, the *Zenken kojitsu*, containing a long series of portraits of ancient Japanese celebrities. Ozui and Ojyu, the sons of Okyō, painted in the style of their father, but failed to attain great eminence. Lastly, amongst the associates of the Shijō master was the celebrated Ganku (1798–1837), who developed a special style of his own, and is sometimes regarded as the founder of a distinct school. He was, however, greatly influenced by Okyō's example, and his sons, Gantai, Ganryo, and Gantoku or Renzan, drifted into a manner almost indistinguishable from that of the Shijō school.

European School.

It remains only to allude to the European school, if school it can be called, founded by Kokan and Denkichi, two contemporaries of Okyō. These artists, at first educated in one of the native schools, obtained from a Hollander in Nagasaki some training in the methods and principles of European painting, and left a few oil paintings in which the laws of light and shade and perspective were correctly observed. They were not, however, of sufficient capacity to render the adopted manner more than a subject of curiosity, except to a few followers who have reached down to the present generation. It is possible that the essays in perspective found in the pictures of Hokusai, Hiroshige, and some of the popular artists of the 19th century, were suggested by Kokan's drawings and writings.

Sixth Period.

The sixth period began about 1875, when an Italian artist was engaged by the government as a professor of painting in the Engineering College at Tōkyō. Since that time some distinguished European artists have visited Japan, and several Japanese students have made a pilgrimage to Europe to see for themselves what lessons may be gained from Western art. These students, confronted by a strong reaction in favour of pure Japanese art, have fought manfully to win public sympathy, and though their success is not yet crowned, it is not impossible that an Occidental school may ultimately be established. Thus far the great obstacle has been that pictures painted in accordance with Western canons are not suited to Japanese interiors and do not appeal to the taste of the most renowned Japanese connoisseurs. Somewhat more successful has been an attempt—inaugurated by Hashimoto Gahō and Kawabata Gyokusho—to combine the art of the West with that of Japan by adding to the latter the chiaroscuro and the linear perspective of the former. If the disciples of this school could shake off the Sesshū tradition of strong outlines and adopt the Kano Motonobu revelation of modelling by mass only, their work would stand on a high place. But they, too, receive little encouragement. The tendency of the time is conservative in art matters.

A series of magnificent publications has popularized art and its best products in a manner such as could never have been anticipated. The *Kokka*, a monthly magazine richly and beautifully illustrated and edited by Japanese students, has reached its 223rd number; the *Shimbi Daikan*, a colossal album containing chromoxylographic facsimiles of celebrated examples in every branch of art, has been completed in 20 volumes; the masterpieces of Kōrin and Motonobu have been reproduced in similar albums; the masterpieces of the *Ukiyo-e* are in process of publication, and it seems certain that the Japanese nation will ultimately be educated to such a knowledge of its own art as will make for permanent appreciation. Meanwhile the intrepid group of painters in oil plod along unflinchingly, having formed themselves into an association (the *hakuba-kai*) which gives periodical exhibitions, and there are, in Tōkyō and Kiōto, well-organized and flourishing art schools which receive a substantial measure of state aid, as well as a private academy founded by Okakura with a band of seceders from the hybrid fashions of the Gahō system. Altogether the nation seems to be growing more and more convinced that its art future should not wander far from the lines of the past. (W. An.; F. By.)

Engraving.

Although a little engraving on copper has been practised in Japan of late years, it is of no artistic value, and the only branch of the art which calls for recognition is the cutting of wood-blocks for use either with colours or without. This, however, is of supreme importance, and as its technique differs in most respects from the European practice, it demands a somewhat detailed description.

The wood used is generally that of the cherry-tree, *sakura*, which has a grain of peculiar evenness and hardness. It is worked plankwise to a surface parallel with the grain, and not across it. A design is drawn by the artist, to whom the whole credit of the production generally belongs, with a brush on thin paper, which is then pasted face downwards on the block. The engraver, who is very rarely the designer, then cuts the outlines into the block with a knife, afterwards removing the superfluous wood with gouges and chisels. Great skill is shown in this operation, which achieves perhaps the finest facsimile reproduction of drawings ever known without the aid of photographic processes. A peculiar but highly artistic device is that of gradually rounding off the surfaces where necessary, in order to obtain in printing a soft and graduated mass of colour which does not terminate too abruptly. In printing with colours a separate block is made in this manner for each tint, the first containing as a rule the mere lines of the composition, and the others providing for the masses of tint to be applied. In all printing the paper is laid on the upper surface of the block, and the impression rubbed off with a circular pad, composed of twisted cord within a covering of paper cloth and bamboo-leaf, and called the *baren*. In colour-printing, the colours, which are much the same as those in use in Europe, are mixed, with rice-paste as a medium, on the block for each operation, and the power of regulating the result given by this custom to an intelligent craftsman (who, again, is neither the artist nor the engraver) was productive in the best period of very beautiful and artistic effects, such as could never have been obtained by any mechanical device. A wonderfully accurate register, or successive superposition of each block, is got mainly by the skill of the printer, who is assisted only by a mark defining one corner and another mark showing the opposite side limit.

The origins of this method of colour-printing are obscure. It has been practised to some extent in China and Korea, but there is no evidence of its antiquity in these countries. It appears to be one of the few indigenous arts of Japan. But before accepting this conclusion as final, one must not lose sight of the fact that the so-called chiaroscuro engraving was at the height of its use in Italy at the same time that embassies from the Christians in Japan visited Rome, and that it is thus possible that the suggestion at least may have been derived from Europe. The fact that no traces of it have been discovered in Japan would be easily accounted for, when it is remembered that the examples taken home would almost certainly have been religious pictures, would have been preserved in well-known and accessible places, and would thus have been entirely destroyed in the terrible and minute extermination of Christianity by Hideyoshi at the beginning of the 17th century. Japanese tradition ascribes the invention of colour-printing to Idzumiya Gonshirō, who, about the end of the 17th century, first made use of a second block to apply a tint of red (*beni*) to his prints. Sir Ernest Satow states more definitely that "Sakakibara attributes its origin to the year 1695, when portraits of the actor Ichikawa Danjiuro, coloured by this process, were sold in the streets of Yedo for five cash apiece." The credit of the invention is also given to Torii Kiyonobu, who worked at about this time, and, indeed, is said to have made the prints above mentioned. But authentic examples of his work now remaining, printed in three colours, seem to show a technique too complete for an origin quite so recent. However, he is the first artist of importance to have produced the broadsheets—for many years chiefly portraits of notable actors, historical characters and famous courtesans—which are the leading and characteristic use to which the art was applied. Pupils, the chief of whom were Kiyomasa, Kiyotsume, Kiyomitsu, Kiyonaga and Kiyomine, carried on his tradition until the end of the 18th century, the three earlier using but few colours, while the works of the two last named show a technical mastery of all the capabilities of the process.

The next artist of importance is Suzuki Harunobu (worked *c.* 1760–1780), to whom the Japanese sometimes ascribe the invention of the process, probably on the grounds of an improvement in his technique, and the fact that he seems to have been one of the first of the colour-print makers to attain great popularity. Katsukawa Shunshō (d. 1792) must next be mentioned, not only for the beauty of his own work, but because he was the first master of Hokusai; then Yeishi (worked *c.* 1781–1800), the founder of the Hosoda school; Utamaro (1754–1806), whose prints of beautiful women were collected by Dutchmen while he was still alive, and have had in our own day a vogue greater, perhaps, than those of any other of his fellows; and Toyokuni I. (1768–1825), who especially devoted himself to broadsheet portraits of actors and dramatic scenes. The greatest of all the artists of the popular school was, however, Hokusai (1760–1849). His most famous series of broadsheets is the *Thirty-six Views of Mount Fuji* (1823–1829), which, in spite of the conventional title, includes at least forty-six. His work is catalogued in detail by E. de Goncourt. At the beginning of the 19th century the process was technically at its greatest height, and in the hands of the great landscape artist, Hiroshige I., as well as the pupils of Toyokuni I.—Kunisada and Kuniyoshi—and those of Hokusai, it at first kept up an excellent level. But an undue increase in the number of blocks used, combined with the inferiority of the imported colours and carelessness or loss of skill in printing, brought about a rapid decline soon after 1840. This continued until the old traditions were well-nigh exhausted, but since 1880 there has been a distinct revival. The prints of the present day are cut with great skill, and the designs are excellent, though both these branches seem to lack the vigour of conception and breadth of execution of the older masters. The colours now used are almost invariably of cheap German origin, and though they have a certain prettiness—ephemeral, it is to be feared—they again can not compare with the old native productions. Among workers in this style, Yoshitoshi (d. *c.* 1898) was perhaps the best. Living artists in 1908 included Toshihide, Miyagawa Shuntei, Yoshiu Chikanobu—one of the elder generation—Tomisuka Yeishu, Toshikata and Gekko. Formerly the colour-print artist was of mean extraction and low social position, but he now has some recognition at the hands of the professors of more esteemed branches of art. This change is doubtless due in part to Occidental appreciation of the products of his art, which were formerly held in little honour by his own countrymen, the place assigned to them being scarcely higher than that accorded to magazine illustrations in Europe and America. But it is also largely due to his displays of unsurpassed skill in preparing xylographs for the beautiful art publications issued by the *Shimbi Shōin* and the *Kokka* company. These xylographs prove that the Japanese art-artisan of the present day was not surpassed by the greatest of his predecessors in this line. (E. F. S.; F. BY.)

Book Illustration.

The history of the illustrated book in Japan may be said to begin with the *Ise monogatari*, a romance first published in the 10th century, of which an edition adorned with woodcuts appeared in 1608. In the course of the 17th century many other works of the same nature were issued, including some in which the cuts were roughly coloured by hand; but the execution of these is not as good as contemporary European work. The date of the first use of colour-printing in Japanese book illustration is uncertain. In 1667 a collection of designs for *kimono* (garments) appeared, in which inks of several colours were made use of; but these were only employed in turn for single printings, and in no case were two of them used on the same print. It is certain, however, that the mere use of coloured inks must soon have suggested the combination of two or more of them, and it is probable that examples of this will be discovered much earlier in date than those known at present.

About the year 1680 Hishigawa Moronobu achieved a great popularity for woodcut illustration, and laid the foundations of the splendid school which followed. The names of the engravers who cut his designs are not known, and in fact the reputation of these craftsmen is curiously subordinated to that of the designers in all Japanese work of the kind. With Moronobu must be associated Okumura Masanobu, a little later perhaps in date, whose work is also of considerable value. During the ensuing thirty years numerous illustrated books appeared, including the earliest yet known which are illustrated by colour-printing. Nishikawa Sukenobu (1671–1751) illustrated a very large number of books, many of which were not published until after his death. With him may be associated Ichiō Shumboku (d. *c.* 1773) and Tsukioka Tange (1717–1786), the latter of whom made the drawings for many of the *meishō* or guide-books which form so interesting and distinctive a branch of Japanese illustration. The work of Tachibana Morikuni (1670–1748) is also of great importance. The books illustrated by the men of this school were mainly collections of useful information, guide-books, romances and historical and religious compilations; but much of the best of their work is to be found in the collections of pictorial designs, very often taken from Chinese sources, which were produced for the use of workers in lacquer, pottery and similar crafts. These, both for design and for skill of cutting, hold their own with the best work of European wood-cutting of any period. The development of the art of Japanese colour-printing naturally had its effect on book-illustration, and the later years of the 18th and the earlier of the 19th century saw a vast increase of books illustrated by this process. The subjects also now include a new series of landscapes and views drawn as seen by the designers, and not reproductions of the work of other men; and also sketches of scenes and characters of every-day life and of the folk-lore in which Japan is so rich. Among the artists of this period, as of all others in Japan, Hokusai (1760–1849) is absolutely pre-eminent. His greatest production in book-illustration was the *Mangwa*, a collection of sketches which cover the whole ground of Japanese life and legend, art and handicraft. It consists of fifteen volumes, which appeared at intervals from 1812 to 1875, twelve being published during his life and the others from material left by him. Among his many other works may be mentioned the *Azuma Asobi* (*Walks round Yedo*, 1799). Of his pupils, Hokkei (1780–1856) and Kyōsai were the greatest. Most of the artists, whose main work was the designing of broadsheets, produced elaborately illustrated books; and this series includes specimens of printing in colours from wood-blocks, which for technique have never been excelled. Among them should be mentioned Shunshō (*Seirō bijin awase kagami*, 1776); Utamaro (*Seirō nenjyū gyoji*, 1804); Toyokuni I. (*Yakusha kono teikishiwa*, 1801); as well as Harunobu Yeishi (*Onna sanjyu rokkasen*, 1798), Kitao Masanobu and Tachibana Minko, each of whom produced beautiful work of the same nature. In the period next following, the chief artists were Keisai Yeisen (*Keisai so-gwa*, 1832) and Kikuchi Yōsai (*Zenken kojitsu*), the latter of whom ranks perhaps as highly as any of the artists who confined their work to black and white. The books produced in the period 1880–1908 in Japan are still of high technical excellence. The colours are, unfortunately, of cheap European manufacture; and the design, although quite characteristic and often beautiful, is as a rule merely pretty. The engraving is as good as ever. Among the book-illustrators of our own generation must be again mentioned Kyōsai; Kōno Bairei (d. 1895), whose books of birds—the *Bairei hyakucho gwafu* (1881 and 1884) and *Yūaka-no-tsuki* (1889)—are unequalled of their kind; Imao Keinen, who also issued a beautiful set of illustrations of birds and flowers (*Keinen kwachō gwafu*), engraved by Tanaka Jirokichi and printed by Miki Nisaburō (1891–1892); and Watanabe Seitei, whose studies of similar subjects have appeared in *Seitei kwachō gwafu* (1890–1891) and the *Bijutsu sekai* (1894), engraved by Gotō Tokujirō. Mention should also be made of several charming series of fairy tales, of which that published in English by the *Kobunsha* in Tōkyō in 1885 is perhaps the best. In their adaptation of modern processes of illustration the Japanese are entirely abreast of Western nations, the chromo-lithographs and other reproductions in the *Kokka*, a periodical record of Japanese works of art (begun in 1889), in the superb albums of the *Shimbi Shōin*, and in the publications of Ogawa being of quite a high order of merit. (E. F. S.; F. BY.)

Sculpture and Carving.—Sculpture in wood and metal is of

PAINTING

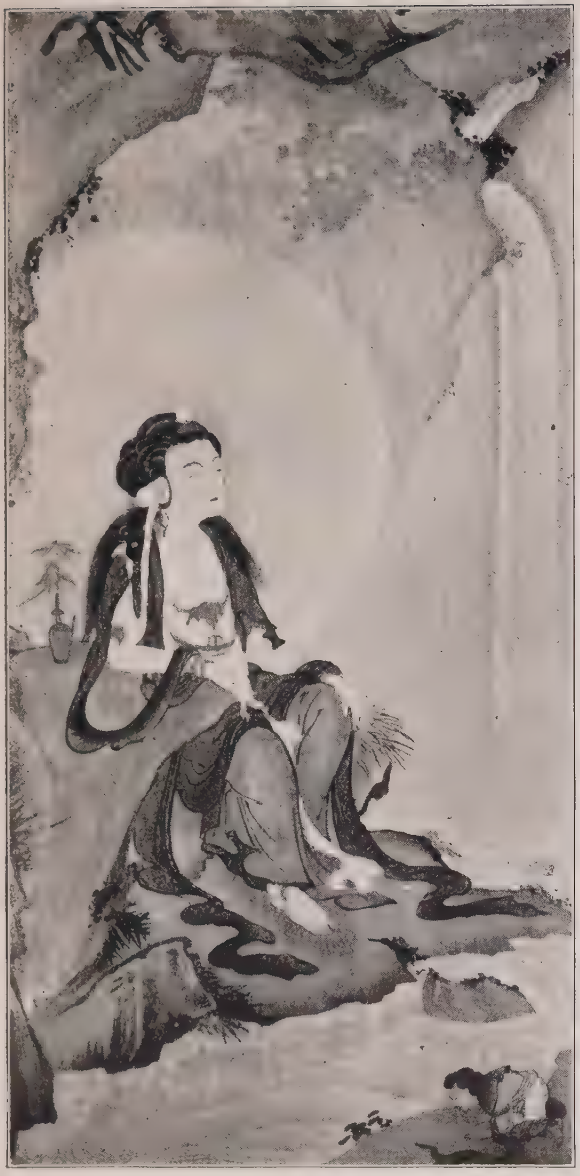

FIG. 6.—KWANNON, GODDESS OF MERCY. By Mincho or Cho Densu (1352–1431).

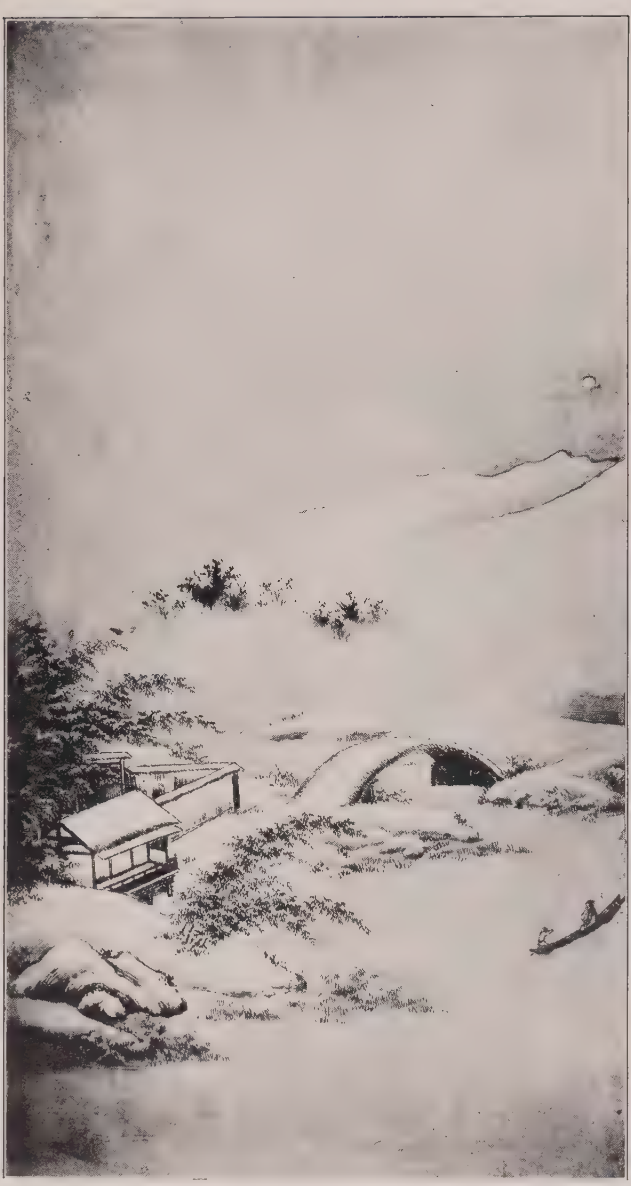

FIG. 7.—LANDSCAPE IN SNOW. By Kano Motonobu (1476–1559).

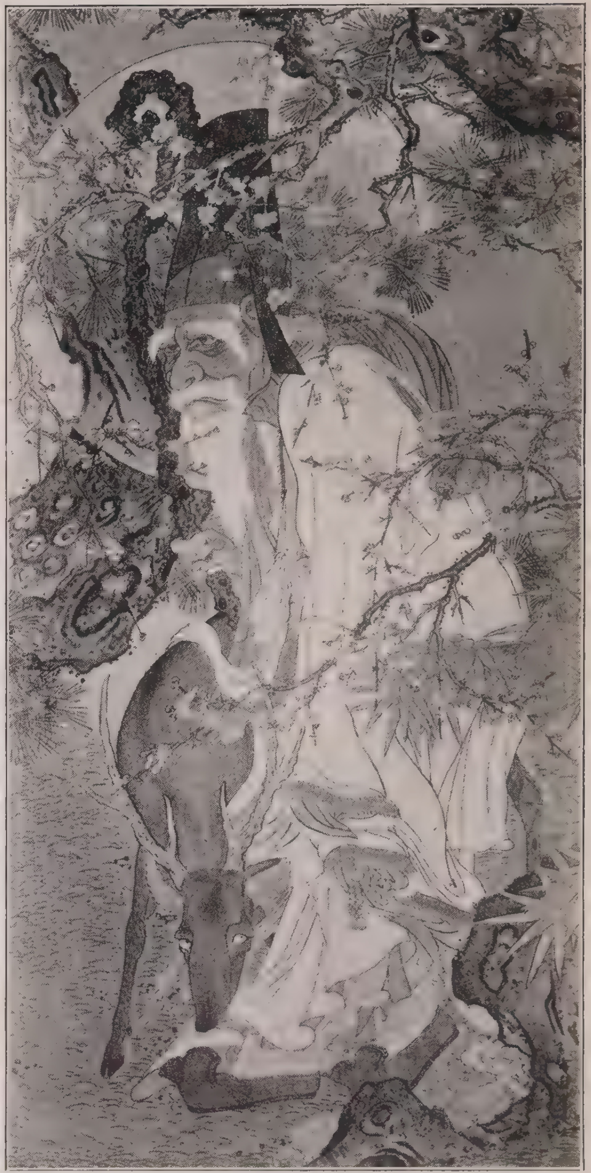

FIG. 8.—JUROJIN. By Sesshiu (1420–1506).

Plate IV.

JAPAN

PAINTING

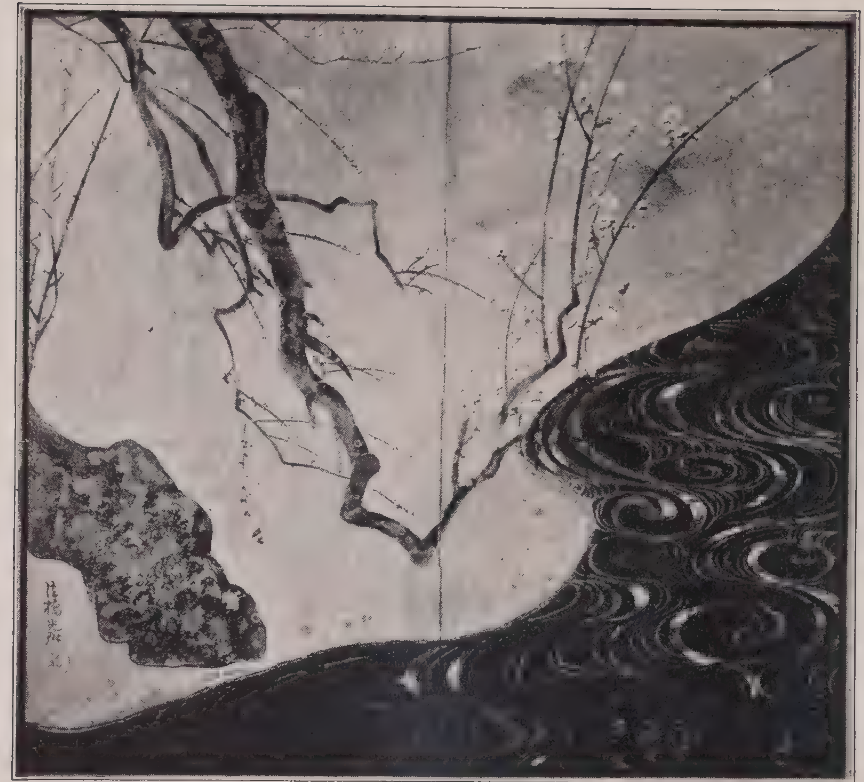

Fig. 9.—PLUM TREES AND STREAM—SCREEN ON GOLD GROUND. By Korin (1661–1716).

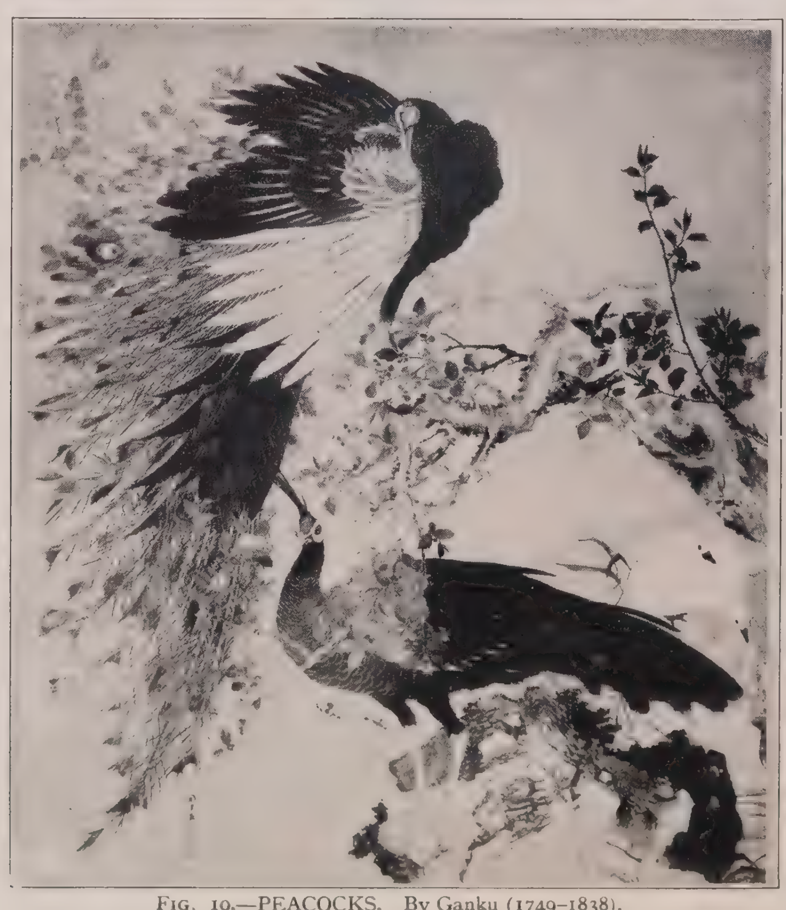

Fig. 10.—PEACOCKS. By Ganku (1749–1838).

Historical Sketch.

ancient date in Japan. Its antiquity is not, indeed, comparable to that of ancient Egypt or Greece, but no country besides Japan can boast a living and highly developed art that has numbered upwards of twelve centuries of unbroken and brilliant productiveness. Setting aside rude prehistoric essays in stone and metal, which have special interest for the antiquary, we have examples of sculpture in wood and metal, magnificent in conception and technique, dating from the earliest periods of what we may term historical Japan; that is, from near the beginning of the great Buddhist propaganda under the emperor Kimmei (540–571) and the princely hierarch, Shōtoku Taishi (573–621). Stone has never been in favour in Japan as a material for the higher expression of the sculptor's art.

First Period.

The first historical period of glyptic art in Japan reaches from the end of the 6th to the end of the 12th century, culminating in the work of the great Nara sculptors, Unkei and his pupil Kwaikei. Happily, there are still preserved in the great temples of Japan, chiefly in the ancient capital of Nara, many noble relics of this period.

The place of honour may perhaps be conferred upon sculptures in wood, representing the Indian Buddhists, Asangha and Vasabandhu, preserved in the Golden Hall of Kofuku-ji, Nara. These are attributed to a Kamakura sculptor of the 8th or 9th century, and in simple and realistic dignity of pose and grand lines of composition are worthy of comparison with the works of ancient Greece. With these may be named the demon lantern-bearers, so perfect in the grotesque treatment of the diabolical heads and the accurate anatomical forms of the sturdy body and limbs; the colossal temple guardians of the great gate of Tōdai-ji, by Unkei and Kwaikei (11th century), somewhat conventionalized, but still bearing evidence of direct study from nature, and inspired with intense energy of action; and the smaller but more accurately modelled temple guardians in the Saikondo, Nara, which almost compare with the "fighting gladiator" in their realization of menacing strength. The "goddess of art" of Akishino-dera, Nara, attributed to the 8th century, is the most graceful and least conventional of female sculptures in Japan, but infinitely remote from the feminine conception of the Greeks. The wooden portrait of Vimalakirtti, attributed to Unkei, at Kofuku-ji, has some of the qualities of the images of the two Indian Buddhists. The sculptures attributed to Jōchō, the founder of the Nara school, although powerful in pose and masterly in execution, lack the truth of observation seen in some of the earlier and later masterpieces.

The most perfect of the ancient bronzes is the great image of Bhaicha-djyaguru in the temple of Yakushi-ji, Nara, attributed to a Korean monk of the 7th century, named Giōgi. The bronze image of the same divinity at Hōryū-ji, said to have been cast at the beginning of the 7th century by Tori Busshi, the grandson of a Chinese immigrant, is of good technical quality, but much inferior in design to the former. The colossal Nara Daibutsu (Vairocana) at Tōdai-ji, cast in 749 by a workman of Korean descent, is the largest of the great bronzes in Japan, but ranks far below the Yakushi-ji image in artistic qualities. The present head, however, is a later substitute for the original, which was destroyed by fire.

The great Nara school of sculpture in wood was founded in the early part of the 11th century by a sculptor of Imperial descent named Jōchō, who is said to have modelled his style upon that of the Chinese wood-carvers of the Tang dynasty; his traditions were maintained by descendants and followers down to the beginning of the 13th century. All the artists of this period were men of aristocratic rank and origin, and were held distinct from the carpenter-architects of the imposing temples which were to contain their works.

Sacred images were not the only specimens of glyptic art produced in these six centuries; reliquaries, bells, vases, incense-burners, candlesticks, lanterns, decorated arms and armour, and many other objects, showing no less mastery of design and execution, have reached us. Gold and silver had been applied to the adornment of helmets and breastplates from the 7th century, but it was in the 12th century that the decoration reached the high degree of elaboration shown us in the armour of the Japanese Bayard, Yoshitsunē, which is still preserved at Kasuga, Nara.

Wooden masks employed in the ancient theatrical performances were made from the 7th century, and offer a distinct and often grotesque phase of wood-carving. Several families of experts have been associated with this class of sculpture, and their designs have been carefully preserved and imitated down to the present day.

Second Period.

The second period in Japanese glyptic art extends from the beginning of the 13th to the early part of the 17th century. The great struggle between the Taira and Minamoto clans had ended, but the militant spirit was still strong, and brought work for the artists who made and ornamented arms and armour. The Miyōchins, a line that claimed ancestry from the 7th century, were at the head of their calling, and their work in iron breastplates and helmets, chiefly in *repoussé*, is still unrivalled. It was not until the latter half of the 15th century that there came into vogue the elaborate decoration of the sword, a fashion that was to last four hundred years.

The metal guard (*tsuba*), made of iron or precious alloy, was adorned with engraved designs, often inlaid with gold and silver. The free end of the hilt was crowned with a metallic cap or pommel (*kashira*), the other extremity next the tsuba was embraced by an oval ring (*fuchi*), and in the middle was affixed on each side a special ornament called the *menuki*, all adapted in material and workmanship to harmonize with the guard. The *kodzuka*, or handle of a little knife implanted into the sheath of the short sword or dagger, was also of metal and engraved with like care. The founder of the first great line of tsuba and menuki artists was Gotō Yūjō (1440–1512), a friend of the painter Kano Motonobu, whose designs he adopted. Many families of sword artists sprang up at a later period, furnishing treasures for the collector even down to the present day, and their labours reached a level of technical mastery and refined artistic judgment almost without parallel in the art industries of Europe. Buddhist sculpture was by no means neglected during this period, but there are few works that call for special notice. The most noteworthy effort was the casting by Ono Goroyémon in 1252 of the well-known bronze image, the Kamakura Daibutsu.

Third Period.

The third period includes the 17th, 18th and the greater part of the 19th centuries. It was the era of the artisan artist. The makers of Buddhist images and of sword ornaments carried on their work with undiminished industry and success, and some famous schools of the latter arose during this period. The Buddhist sculptors, however, tended to grow more conventional and the metal-workers more naturalistic as the 18th century began to wane. It was in connexion with architecture that the great artisan movement began. The initiator was Hidari Jingoro (1594–1652), at first a simple carpenter, afterwards one of the most famous sculptors in the land of great artists. The gorgeous decoration of the mausoleum of Iyeyasu at Nikkō, and of the gateway of the Nishi Hongwan temple at Kiōto, are the most striking instances of his handiwork or direction.

The pillars, architraves, ceilings, panels, and almost every available part of the structure, are covered with arabesques and sculptured figures of dragons, lions, tigers, birds, flowers, and even pictorial compositions with landscapes and figures, deeply carved in solid or open work—the wood sometimes plain, sometimes overlaid with pigment and gilding, as in the panelled ceiling of the chapel of Iyeyasu in Tōkyō. The designs for these decorations, like those of the sword ornaments, were adopted from the great schools of painting, but the invention of the sculptor was by no means idle. From this time the temple carvers, although still attached to the carpenters' guild, took a place apart from the rest of their craft, and the genius of Hidari Jingoro secured for one important section of the artisan world a recognition like that which Hishigawa Moronobu, the painter and book-illustrator, afterwards won for another.

A little later arose another art industry, also emanating from the masses. The use of tobacco, which became prevalent in the 17th century, necessitated the pouch. In order to suspend this from the girdle there was employed a kind of button or toggle—the *netsuke*. The metallic bowl and mouthpiece of the pipe offered a tempting surface for embellishment, as well as the clasp of the pouch; and the netsuke, being made of wood, ivory or other material susceptible of carving, also gave occasion for art and ingenuity.

The engravers of pipes, pouch clasps, and the metallic discs (*kagami-buta*) attached to certain netsuke, sprang from the same class and were not less original. They worked, too, with a skill little inferior to that of the Gotōs, Naras, and other aristocratic sculptors of sword ornaments, and often with a refinement which their relative disadvantages in education and associations render especially remarkable. The netsuke and the pipe, with all that pertained to it, were for the commoners what the sword-hilt and guard were for the gentry. Neither class cared to bestow jewels upon their persons, but neither spared thought or expense in the embellishment of the object they most loved. The final manifestation of popular glyptic art was the *okimono*, an ornament pure and simple, in which utility was altogether secondary in intention to decorative effect. Its manufacture as a special branch of art work dates from the rise of the naturalistic school of painting and the great expansion of the popular school under the Katsugawa, but the okimono formed an occasional amusement of the older glyptic artists. Some of the most exquisite and most ingenious of these earlier productions, such as the magnificent iron eagle in the South Kensington Museum, the wonderful articulated models of crayfish, dragons, serpents, birds, that are found in many European collections, came from the studios of the Miyōchins; but these were the play of giants, and were not made as articles of commerce. The new artisan makers of the okimono struck out a line for themselves, one influenced more by the naturalistic and popular schools than by the classical art, and the quails of Kamejo, the tortoises of Seimin, the dragons of Tōun and Tōryū, and in recent years the falcons and the peacocks of Suzuki Chokichi, are the joy of the European collector. The best of these are exquisite in workmanship, graceful in design, often strikingly original in conception, and usually naturalistic in ideal. They constitute a phase of art in which Japan has few rivals.

The present generation is more systematically commercial in its glyptic produce than any previous age. Millions of commercial articles in metal-work, wood and ivory flood the European markets, and may be bought in any street in Europe at a small price, but they offer a variety of design and an excellence of workmanship which place them almost beyond Western competition. Above all this, however, the Japanese sculptor is a force in art. He is nearly as thorough as his forefathers, and maintains the same love of all things beautiful; and if he cannot show any epoch-making novelty, he is at any rate doing his best to support unsurpassed the decorative traditions of the past.

Sword-making Families.

History has been eminently careful to preserve the names and records of the men who chiselled sword furniture. The sword being regarded as the soul of the samurai, every one who contributed to its manufacture, whether as forger of the blade or sculptor of the furniture, was held in high repute. The Gotō family worked steadily during 14 generations, and its 19th century representative—Gotō Ichijō—will always be remembered as one of the family's greatest experts. But there were many others whose productions fully equalled and often excelled the best efforts of the Gotō. The following list gives the names and periods of the most renowned families:—

(It should be noted that the division by centuries indicates the time of a family's origin. In a great majority of cases the representatives of each generation worked on through succeeding centuries).

15th and 16th Centuries.

Miyōchin; Gotō; Umetada; Muneta; Aoki; Sōami; Nakai.

17th Century.

Kuwamura; Mizuno; Koichi; Nagayoshi;
Kuninaga; Yoshishige; Katsugi; Tsuji;
Muneyoshi; Tadahira; Shōami; Hosono;
Yokoya; Nara; Okada; Okamoto; Kinai; Akao;
Yoshioka; Hirata; Nomura; Wakabayashi; Inouye;
Yasui; Chiyo; Kaneko; Uemura; Iwamoto.

18th Century.

Gorobei; Shōemon; Kikugawa; Yasuyama; Noda; Tamagawa; Fujita; Kikuoka; Kizaemon; Hamano; Ōmori; Okamoto; Kashiwaya; Kusakari; Shichibei; Itō.

19th Century.

Natsuo; Ishiguro; Yanagawa; Honjo; Tanaka; Okano; Kawarabayashi; Oda; and many masters of the Ōmori, Hamano and Iwamoto families, as well as the five experts, Shuraku, Temmin, Ryūmin, Minjō and Minkoku. (W. An.; F. By.)

Japanese Point of View.

There is a radical difference between the points of view of the Japanese and the Western connoisseur in estimating the merits of sculpture in metal. The quality of the chiselling is the first feature to which the Japanese directs his attention; the decorative design is the prime object of the Occidental's attention. With very rare exceptions, the decorative motives of Japanese sword furniture were always supplied by painters. Hence it is that the Japanese connoisseur draws a clear distinction between the decorative design and its technical execution, crediting the former to the pictorial artist and the latter to the sculptor. He detects in the stroke of a chisel and the lines of a graving tool subjective beauties which appear to be hidden from the great majority of Western dilettanti. He estimates the rank of a specimen by the quality of the chisel-work. The Japanese *kinzoku-shi* (metal sculptor) uses thirty-six principal classes of chisel, each with its distinctive name, and as most of these classes comprise from five to ten sub-varieties, his cutting and graving tools aggregate about two hundred and fifty.

The Field for Sculptured Decoration.

Scarcely less important in Japanese eyes than the chiselling of the decorative design itself is the preparation of the field to which it is applied. There used to be a strict canon with reference to this in former times. *Namako* (fish-roe) grounds were essential for the mountings of swords worn on ceremonial occasions, the *ishime* (stone-pitting) or *jimigaki* (polished) styles being considered less aristocratic.

Namako is obtained by punching the whole surface—except the portion carrying the decorative design—into a texture of microscopic dots. The first makers of namako did not aim at regularity in the distribution of these dots; they were content to produce the effect of millet-seed sifted haphazard over the surface. But from the 15th century the punching of the dots in rigidly straight lines came to be considered essential, and the difficulty involved was so great that namako-making took its place among the highest technical achievements of the sculptor. When it is remembered that the punching tool was guided solely by the hand and eye, and that three or more blows of the mallet had to be struck for every dot, some conception may be formed of the patience and accuracy needed to produce these tiny protuberances in perfectly straight lines, at exactly equal intervals and of absolutely uniform size. Namako disposed in straight parallel lines originally ranked at the head of this kind of work. But a new kind was introduced in the 16th century. It was obtained by punching the dots in intersecting lines, so arranged that the dots fell uniformly into diamond-shaped groups of five each. This is called *go-no-me-namako*, because of its resemblance to the disposition of chequers in the Japanese game of *go*. A century later, the *daimyō namako* was invented, in which lines of dots alternated with lines of polished ground. *Ishime* may be briefly described as diapering. There is scarcely any limit to the ingenuity and skill of the Japanese expert in diapering a metal surface. It is not possible to enumerate here even the principal styles of ishime, but mention may be made of the *zara-maki* (broad-cast), in which the surface is finely but irregularly pitted after the manner of the face of a stone; the *nashi-ji* (pear-ground), in which we have a surface like the rind of a pear; the *hari-ishime* (needle ishime), where the indentations are so minute that they seem to have been made with the point of a needle; the *gama-ishime*, which is intended to imitate the skin of a toad; the *tsuya-ishime*, produced with a chisel sharpened so that its traces have a lustrous appearance; the *ore-kuchi* (broken-tool), a peculiar kind obtained with a jagged tool; and the *gozamé*, which resembles the plaited surface of a fine straw mat.

Patina.

Great importance has always been attached by Japanese experts to the patina of metal used for artistic chiselling. It was mainly for the sake of their patina that value attached to the remarkable alloys *shakudo* (3 parts of gold to 97 of copper) and *shibuichi* (1 part of silver to 3 of copper). Neither metal, when it emerges from the furnace, has any beauty, shakudo being simply dark-coloured copper and shibuichi pale gun-metal. But after proper treatment[1] the former develops a glossy black patina with violet sheen, and the latter shows beautiful shades of grey with silvery lustre. Both these compounds afford delicate, unobtrusive and effective grounds for inlaying with gold, silver and other metals, as well as for sculpture, whether incised or in relief. Copper, too, by patina-producing treatment, is made to show not merely a rich golden sheen with pleasing limpidity, but also red of various hues, from deep coral to light vermilion, several shades of grey, and browns of numerous tones from dead-leaf to chocolate. Even greater value has always been set upon the patina of iron, and many secret recipes were preserved in artist families for producing the fine, satin-like texture so much admired by all connoisseurs.

Methods of Chiselling.

In Japan, as in Europe, three varieties of relief carving are distinguished—*alto* (*taka-bori*), *mezzo* (*chūniku-bori*) and *basso* (*usuniku-bori*). In the opinion of the Japanese expert, these styles hold the same respective rank as that occupied by the three kinds of ideographic script in caligraphy. High relief carving corresponds to the *kaisho*, or most classical form of writing; medium relief to the *gyōsho*, or semi-cursive style; and low relief to the *sōsho* or grass character. With regard to incised chiselling, the commonest form is *kebori* (hair-carving), which may be called engraving, the lines being of uniform thickness and depth. Very beautiful results are obtained by the kebori method, but incomparably the finest work in the incised class is that known as *kata-kiri-bori*. In this kind of chiselling the Japanese artist can claim to be unique as well as unrivalled. Evidently the idea of the great Yokoya experts, the originators of the style, was to break away from the somewhat formal monotony of ordinary engraving, where each line performs exactly the same function, and to convert the chisel into an artist's brush instead of using it as a common cutting tool. They succeeded admirably. In the kata-kiri-bori every line has its proper value in the pictorial design, and strength and directness become cardinal elements in the strokes of the burin just as they do in the brush-work of the picture-painter. The same fundamental rule applied, too, whether the field of the decoration was silk, paper or metal. The artist's tool, be it brush or burin, must perform its task by one effort. There must be no appearance of subsequent deepening, or extending, or re-cutting or finishing. Kata-kiri-bori by a great expert is a delight. One is lost in astonishment at the nervous yet perfectly regulated force and the unerring fidelity of every trace of the chisel. Another variety of carving much affected by artists of the 17th century, and now largely used, is called *shishi-ai-bori* or *niku-ai-bori*. In this style the surface of the design is not raised above the general plane of the field, but an effect of projection is obtained either by recessing the whole space immediately surrounding the design, or by enclosing the latter in a scarped frame. Yet another and very favourite method, giving beautiful results, is to model the design on both faces of the metal so as to give a sculpture in the round. The fashion is always accompanied by chiselling *à jour* (*sukashi-bori*), so that the sculptured portions stand out in their entirety.

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[1] It is first boiled in a lye obtained by lixiviating wood ashes; it is next polished with charcoal powder; then immersed in plum vinegar and salt; then washed with weak lye and placed in a tub of water to remove all traces of alkali, the final step being to digest in a boiling solution of copper sulphate, verdigris and water.

Inlaying.

Inlaying with gold or silver was among the early forms of decoration in Japan. The skill developed in modern times is at least equal to anything which the past can show, and the results produced are much more imposing. There are two principal kinds of inlaying: the first called *hon-zōgan* (true inlaying), the second *nunome-zōgan* (linen-mesh inlaying). As to the former, the Japanese method does not differ from that seen in the beautiful iron censers and vases inlaid with gold which the Chinese produced from the *Süen-tē* era (1426–1436). In the surface of the metal the workman cuts grooves wider at the base than at the top, and then hammers into them gold or silver wire. Such a process presents no remarkable features, except that it has been carried by the Japanese to an extraordinary degree of elaborateness. The nunome-zōgan is more interesting. Suppose, for example, that the artist desires to produce an inlaid diaper. His first business is to chisel the surface in lines forming the basic pattern of the design. Thus, for a diamond-petal diaper the chisel is carried across the face of the metal horizontally, tracing a number of parallel bands divided at fixed intervals by ribs which are obtained by merely straightening the chisel and striking it a heavy blow. The same process is then repeated in another direction, so that the new bands cross the old at an angle adapted to the nature of the design. Several independent chisellings may be necessary before the lines of the diaper emerge clearly, but throughout the whole operation no measurement of any kind is taken, the artist being guided entirely by his hand and eye. The metal is then heated, not to redness, but sufficiently to develop a certain degree of softness, and the workman, taking a very thin sheet of gold (or silver), hammers portions of it into the salient points of the design. In ordinary cases this is the sixth process. The seventh is to hammer gold into the outlines of the diaper; the eighth, to hammer it into the pattern filling the spaces between the lines, and the ninth and tenth to complete the details. Of course the more intricate the design the more numerous the processes. It is scarcely possible to imagine a higher effort of hand and eye than this *nunome-zōgan* displays, for while intricacy and elaborateness are carried to the very extreme, absolute mechanical accuracy is obtained. Sometimes in the same design we see gold of three different hues, obtained by varying the alloy. A third kind of inlaying, peculiar to Japan, is *sumi-zōgan* (ink-inlaying), so called because the inlaid design gives the impression of having been painted with Indian ink beneath the transparent surface of the metal. The difference between this process and ordinary inlaying is that for *sumi-zōgan* the design to be inlaid is fully chiselled out of an independent block of metal with sides sloping so as to be broader at the base than at the top. The object which is to receive the decoration is then channelled in dimensions corresponding to those of the design block, and the latter having been fixed in the channels, the surface is ground and polished until an intimate union is obtained between the inlaid design and the metal forming its field. Very beautiful effects are thus produced, for the design seems to have grown up to the surface of the metal field rather than to have been planted in it. Shibuichi inlaid with shakudo used to be the commonest combination of metals in this class of decoration, and the objects usually depicted were bamboos, crows, wild-fowl under the moon, peony sprays and so forth.

Wood-grained Grounds.

A variety of decoration much practised by early experts, and carried to a high degree of excellence in modern times, is *mokume-ji* (wood-grained ground). The process in this case is to take a thin plate of metal and beat it into another plate of similar metal, so that the two, though welded together, retain their separate forms. The mass, while still hot, is coated with *hena-tsuchi* (a kind of marl) and rolled in straw ash, in which state it is roasted over a charcoal fire raised to glowing heat with the bellows. The clay having been removed, another plate of the same metal is beaten in, and the same process is repeated. This is done several times, the number depending on the quality of graining that the expert desires to produce. The manifold plate is then heavily punched from one side, so that the opposite face protrudes in broken blisters, which are then hammered down until each becomes a centre of wave propagation. In fine work the apex of the blister is ground off before the final hammering. Iron was the metal used exclusively for work of this kind down to the 16th century, but various metals began thenceforth to be combined. Perhaps the choicest variety is gold graining in a shakudo field. By repeated hammering and polishing the expert obtains such control of the wood-grain pattern that its sinuosities and eddies seem to have developed symmetry without losing anything of their fantastic grace. There are other methods of producing *mokume-ji*.

Modern and Ancient Skill.

It has been frequently asserted by Western critics that the year (1876) which witnessed the abolition of sword-wearing in Japan, witnessed also the end of her artistic metal-work. That is a great mistake. The art has merely developed new phases in modern times. Not only are its masters as skilled now as they were in the days of the Gotō, the Nara, the Yokoya and the Yanagawa celebrities, but also their productions must be called greater in many respects and more interesting than those of their renowned predecessors. They no longer devote themselves to the manufacture of sword ornaments, but work rather at vases, censers, statuettes, plaques, boxes and other objects of a serviceable or ornamental nature. All the processes described above are practised by them with full success, and they have added others quite as remarkable.

Of these, one of the most interesting is called *kiribame* (insertion). The decorative design having been completely chiselled in the round, is then fixed in a field of a different metal, in which a design of exactly similar outline has been cut out. The result is that the picture has no blank reverse. For example, on the surface of a shibuichi box-lid we see the backs of a flock of geese chiselled in silver, and when the lid is opened, their breasts and the under-sides of their pinions appear. The difficulty of such work is plain. Microscopic accuracy has to be attained in cutting out the space for the insertion of the design, and while the latter must be soldered firmly in its place, not the slightest trace of solder or the least sign of junction must be discernible between the metal of the inserted picture and that of the field in which it is inserted. Suzuki Gensuke is the inventor of this method. He belongs to a class of experts called *uchimono-shi* (hammerers) who perform preparatory work for glyptic artists in metal. The skill of these men is often wonderful. Using the hammer only, some of them can beat out an intricate shape as truly and delicately as a sculptor could carve it with his chisels. Ōhori Masatoshi, an uchimono-shi of Aizu (d. 1897), made a silver cake-box in the form of a sixteen-petalled chrysanthemum. The shapes of the body and lid corresponded so intimately that, whereas the lid could be slipped on easily and smoothly without any attempt to adjust its curves to those of the body, it always fitted so closely that the box could be lifted by grasping the lid only. Another feat of his was to apply a lining of silver to a shakudo box by shaping and hammering only, the fit being so perfect that the lining clung like paper to every part of the box. Suzuki Gensuke and Hirata Sōkō are scarcely less expert. The latter once exhibited in Tōkyō a silver game-cock with soft plumage and surface modelling of the most delicate character. It had been made by means of the hammer only. Suzuki's kiribame process is not to be confounded with the *kiribame-zōgan* (inserted inlaying) of Tōyoda Kokō, also a modern artist. The gist of the latter method is that a design chiselled *à jour* has its outlines veneered with other metal which serves to emphasize them. Thus, having pierced a spray of flowers in a thin sheet of shibuichi, the artist fits a slender rim of gold, silver or shakudo to the petals, leaves and stalks, so that an effect is produced of transparent blossoms outlined in gold, silver or purple. Another modern achievement—also due to Suzuki Gensuke—is *maze-gane* (mixed metals). It is a singular conception, and the results obtained depend largely on chance. Shibuichi and shakudo are melted separately, and when they have cooled just enough not to mingle too intimately, they are cast into a bar which is subsequently beaten flat. The plate thus obtained shows accidental clouding, or massing of dark tones, and these patches are taken as the basis of a pictorial design to which final character is given by inlaying with gold and silver, and by katā-kiri sculpture. Such pictures partake largely of the impressionist character, but they attain much beauty in the hands of the Japanese artist with his extensive *répertoire* of suggestive symbols. A process resembling maze-gane, but less fortuitous, is *shibuichi-dōshi* (combined shibuichi), which involves beating together two kinds of shibuichi and then adding a third variety, after which the details of the picture are worked in as in the case of maze-gane. The charm of these methods is that certain parts of the decorative design seem to float, not on the surface of the metal, but actually within it, an admirable effect of depth and atmosphere being thus produced. Mention must also be made of an extraordinarily elaborate and troublesome process invented by Kajima Ippu, a great artist of the present day. It is called *togi-dashi-zōgan* (ground-out inlaying). In this exquisite and ingenious kind of work the design appears to be growing up from the depths of the metal, and a delightful impression of atmosphere and water is obtained. All these processes, as well as that of *repoussé*, in which the Japanese have excelled from a remote period, are now practised with the greatest skill in Tōkyō, Kiōto, Osaka and Kanazawa. At the art exhibitions held twice a year in the principal cities there may be seen specimens of statuettes, alcove ornaments, and household utensils which show that the Japanese worker in metals stands more indisputably than ever at the head of the world's artists in that field. The Occident does not yet appear to have full realized the existence of such talent in Japan; partly perhaps because its displays in former times were limited chiefly to sword-furniture, possessing little interest for the average European or American; and partly because the Japanese have not yet learned to adapt their skill to foreign requirements. They confine themselves at present to decorating plaques, boxes and cases for cigars or cigarettes, and an occasional tea or coffee service; but the whole domain of salvers, dessert-services, race-cups and so on remains virtually unexplored. Only within the past few years have stores been established in the foreign settlements for the sale of silver utensils, and already the workmanship on these objects displays palpable signs of the deterioration which all branches of Japanese art have undergone in the attempt to cater for foreign taste. In a general sense the European or American connoisseur is much less exacting than the Japanese. Broad effects of richness and splendour captivate the former, whereas the latter looks for delicacy of finish, accuracy of detail and, above all, evidences of artistic competence. It is nothing to a Japanese that a vase should be covered with profuse decoration of flowers and foliage: he requires that every blossom and every leaf shall be instinct with vitality, and the comparative costliness of fine workmanship does not influence his choice. But if the Japanese sculptor adopted such standards in working for foreign patrons, his market would be reduced to very narrow dimensions. He therefore adapts himself to his circumstances, and, using the mould rather than the chisel, produces specimens which show tawdry handsomeness and are attractively cheap. It must be admitted, however, that even though foreign appreciative faculty were sufficiently educated, the Japanese artist in metals would still labour under the great difficulty of devising shapes to take the place of those which Europe and America have learned to consider classical.

Bronze Casting.

Bronze is called by the Japanese *kara-kane*, a term signifying "Chinese metal" and showing clearly the source from which knowledge of the alloy was obtained. It is a copper-lead-tin compound, the proportions of its constituents varying from 72 to 88 % of copper, from 4 to 20 % of lead and from 2 to 8 % of tin. There are also present small quantities of arsenic and antimony, and zinc is found generally as a mere trace, but sometimes reaching to 6 %. Gold is supposed to have found a place in ancient bronzes, but its presence has never been detected by analysis, and of silver not more than 2 % seems to have been admitted at any time. Mr W. Gowland has shown that, whatever may have been the practice of Japanese bronze makers in ancient and medieval eras, their successors in later days deliberately introduced arsenic and antimony into the compound in order to harden the bronze without impairing its fusibility, so that it might take a sharper impression of the mould. Japanese bronze is well suited for castings, not only because of its low melting-point, great fluidity and capacity for taking sharp impressions, but also because it has a particularly smooth surface and readily develops a fine patina. One variety deserves special mention. It is a golden yellow bronze, called *sentoku*—this being the Japanese pronunciation of *Suen-tē*, the era of the Ming dynasty of China when this compound was invented. Copper, tin, lead and zinc, mixed in various proportions by different experts, are the ingredients, and the beautiful golden hues and glossy texture of the surface are obtained by patina-producing processes, in which branch of metal-work the Japanese show altogether unique skill.

From the time when they began to cast bronze statues, Japanese experts understood how to employ a hollow, removable core round which the metal was run in a skin just thick enough for strength without waste of material; and they also understood the use of wax for modelling purposes. In ordinary circumstances, a casting thus obtained took the form of a shell without any break of continuity. But for very large castings the process had to be modified. The great image of Lochana Buddha at Nara, for example, would measure 138 ft. in height were it standing erect, and its weight is about 550 tons. The colossal Amida at Kamakura has a height only 3 ft. less. It would have been scarcely possible to cast such statues in one piece *in situ*, or, if cast elsewhere, to transport them and elevate them on their pedestals. The plan pursued was to build them up gradually in their places by casting segment after segment. Thus, for the Nara Dai-butsu, the mould was constructed in a series of steps ascending 12 in. at a time, until the head and neck were reached, which, of course, had to be cast in one shell, 12 ft. high.

The term "parlour bronzes" serves to designate objects for domestic use, as flower-vases, incense-burners and alcove ornaments. Bronze-casters began to turn their attention to these objects about the middle of the 17th century. The art of casting bronze reached its culmination in the hands of a group of great experts—Seimin, Tōun, Masatune, Teijō, Sōmin, Keisai, Takusai, Gido, Zenryūsai and Hotokusai—who flourished during the second half of the 18th century and the first half of the 19th. Many brilliant specimens of these men's work survive, their general features being that the motives are naturalistic, that the quality of the metal is exceptionally fine, that in addition to beautifully clear casting obtained by highly skilled use of the *cera-perduta* process, the chisel was employed to impart delicacy and finish to the design, and that modelling in high relief is most successfully introduced. But it is a mistake to assert, as many have asserted, that after the era of the above ten masters—the latest of whom, Sōmin, ceased to work in 1871—no bronzes comparable with theirs were cast. Between 1875 and 1879 some of the finest bronzes ever produced in Japan were turned out by a group of experts working under the business name of Sanseisha. Started by two brothers, Oshima Katsujiro (art-name Jōun) and Oshima Yasutaro (art-name Shōkaku), this association secured the services of a number of skilled chisellers of sword-furniture, who had lost their occupation by the abandonment of sword-wearing. Nothing could surpass the delicacy of the works executed at the Sanseisha's atelier in Tōkyō, but unfortunately such productions were above the standard of the customers for whom they were intended. Foreign buyers, who alone stood in the market at that time, failed to distinguish the fine and costly bronzes of Jōun, Shōkaku and their colleagues from cheap imitations which soon began to compete with them, so that ultimately the Sanseisha had to be closed. This page in the modern history of Japan's bronzes needs little alteration to be true of her applied art in general. Foreign demand has shown so little discrimination that experts, finding it impossible to obtain adequate remuneration for first-class work, have been obliged to abandon the field altogether, or to lower their standard to the level of general appreciation, or by forgery to cater for the perverted taste which attaches unreasoning value to age. Jōun has produced, and is thoroughly capable of producing, bronzes at least equal to the best of Seimin's masterpieces, yet he has often been induced to put Seimin's name on objects for the sake of attracting buyers who attach more value to cachet than to quality. If to the names of Jōun and his brilliant pupil Ryūki we add those of Suzuki Chōkichi, Okazaki Sessei, Hasegawa Kumazō, Kanaya Gorosaburō and Jomi Eisuke, we have a group of modern bronze-casters who unquestionably surpass the ten experts beginning with Seimin and ending with Sōmin. Okazaki Sessei has successfully achieved the casting of huge panels carrying designs in high relief; and whether there is question of patina or of workmanship, Jōmi Eisuke has never been surpassed.

Occidental influence has been felt, of course, in the field of modern bronze-casting. At a school of art officially established in Tōkyō in 1873 under the direction of Italian teachers—a school which owed its signal failure partly to the incompetence and intemperate behaviour of some of its foreign professors, and partly to a strong renaissance of pure Japanese classicism—one of the few accomplishments successfully taught was that of modelling in plaster and chiselling in marble after Occidental methods. Marble statues are out of place in the wooden buildings as well as in the parks of Japan, and even plaster busts or groups, though less incongruous perhaps, have not yet found favour. Hence the skill undoubtedly possessed by several graduates of the defunct art school has to be devoted chiefly to a subordinate purpose, namely, the fashioning of models for metal-casters. To this combination of modellers in European style and metal-workers of such force as Suzuki and Okazaki, Japan owes various memorial bronzes and effigies which are gradually finding a place in her parks, her museums, her shrines or her private houses. There is here little departure from the well-trodden paths of Europe. Studies in drapery, prancing steeds, ideal poses, heads with fragments of torsos attached (in extreme violation of true art), crouching beasts of prey—all the stereotyped styles are reproduced. The imitation is excellent.

Carving in Wood and Ivory.

Among the artists of early times it is often difficult to distinguish between the carver of wood and the caster of bronze. The latter sometimes made his own models in wax, sometimes chiselled them in wood, and sometimes had recourse to a specialist in wood-carving. The group of splendid sculptors in wood that graced the 11th, 12th and 13th centuries left names never to be forgotten, but undoubtedly many other artists of scarcely less force regarded bronze-casting as their principal business. Thus the story of wood-carving is very difficult to trace. Even in the field of architectural

SCULPTURE

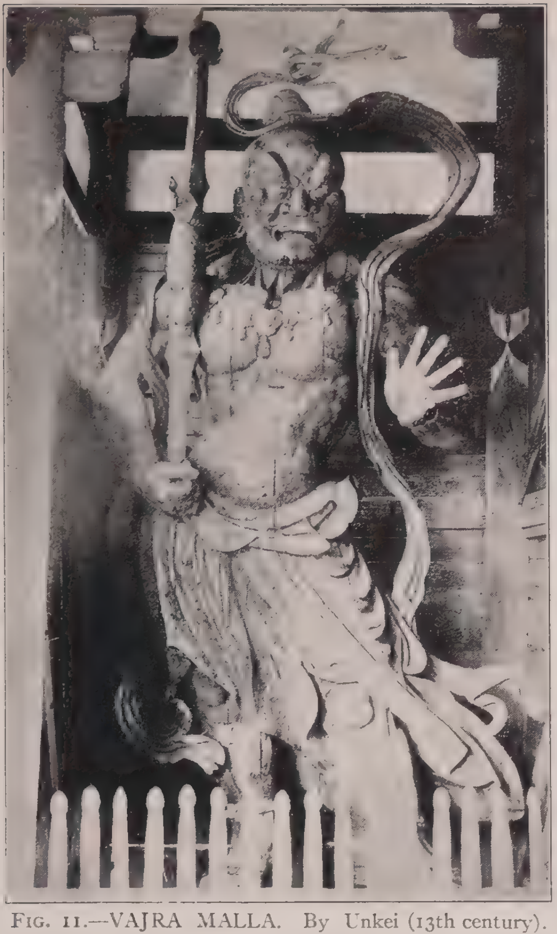


FIG. 11.—VAJRA MALLA. By Unkei (13th century).

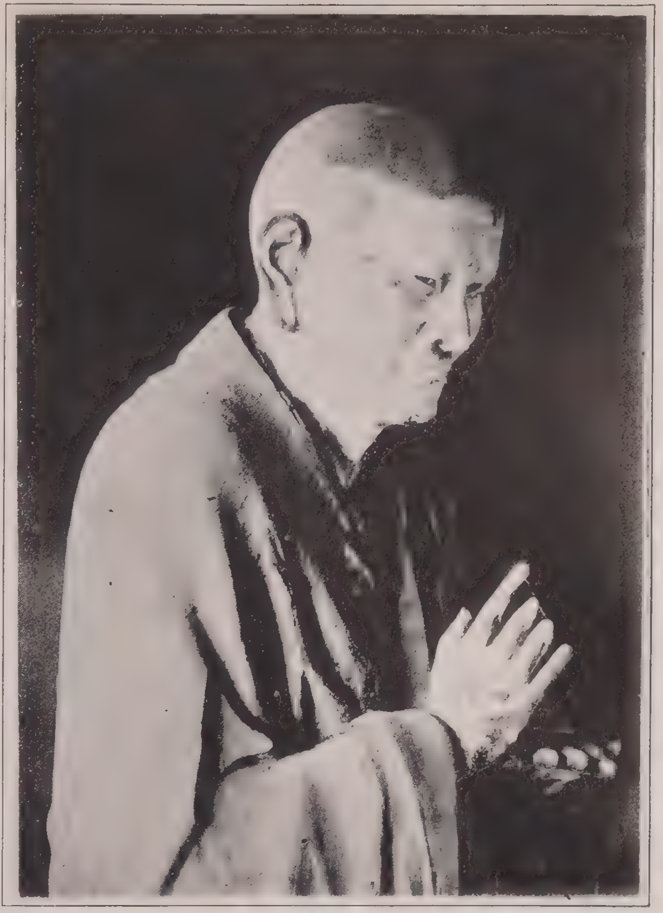


FIG. 12.—STATUE OF ASANGA (12th century, artist unknown).

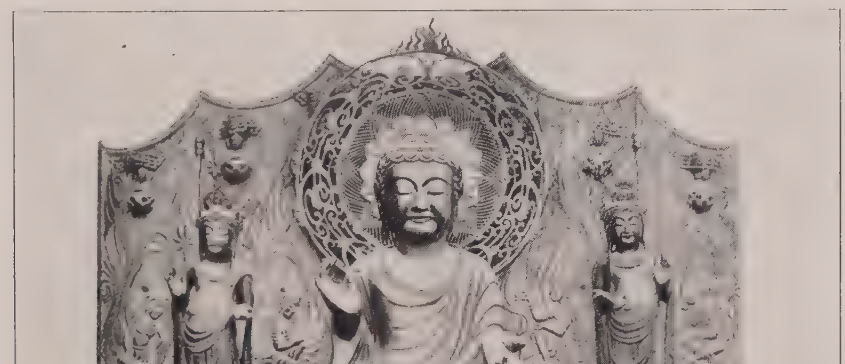
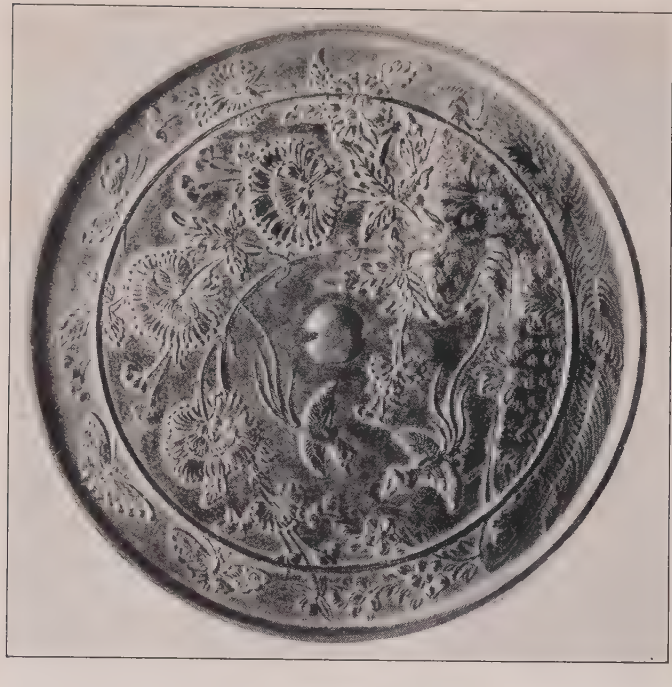


FIG. 13.—STATUES OF BUDDHA AMI'TABHA AND TWO BODHISATTVAS (7th century).

PLATE VI.

JAPAN

METAL WORK AND LACQUER



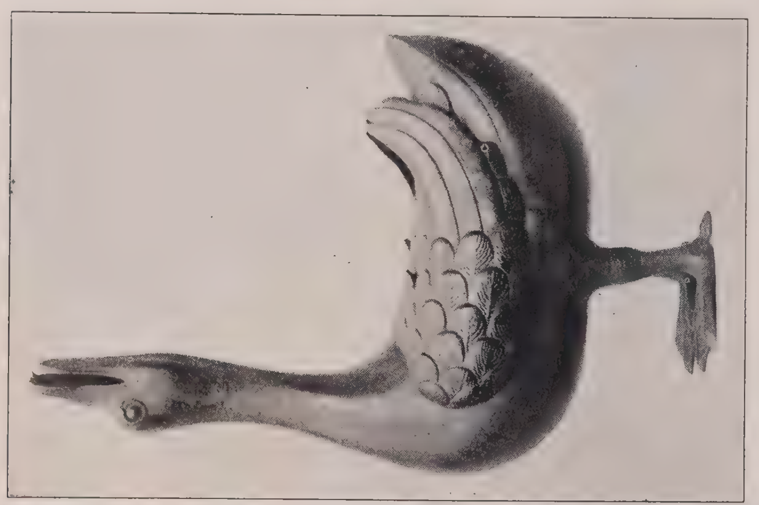


FIG. 15.—BRONZE DUCK INCENSE BURNER (15th century). British Museum.

FIG. 16.—BRONZE MIRROR (12th to 13th century).

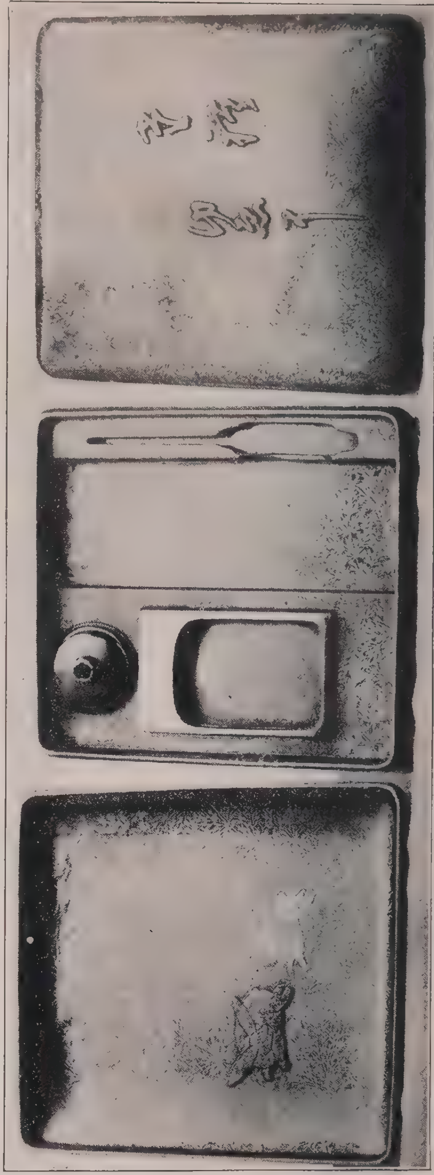


FIG. 17.—INKSTONE BOX IN LACQUER. By Koyetsu (1557–1637).

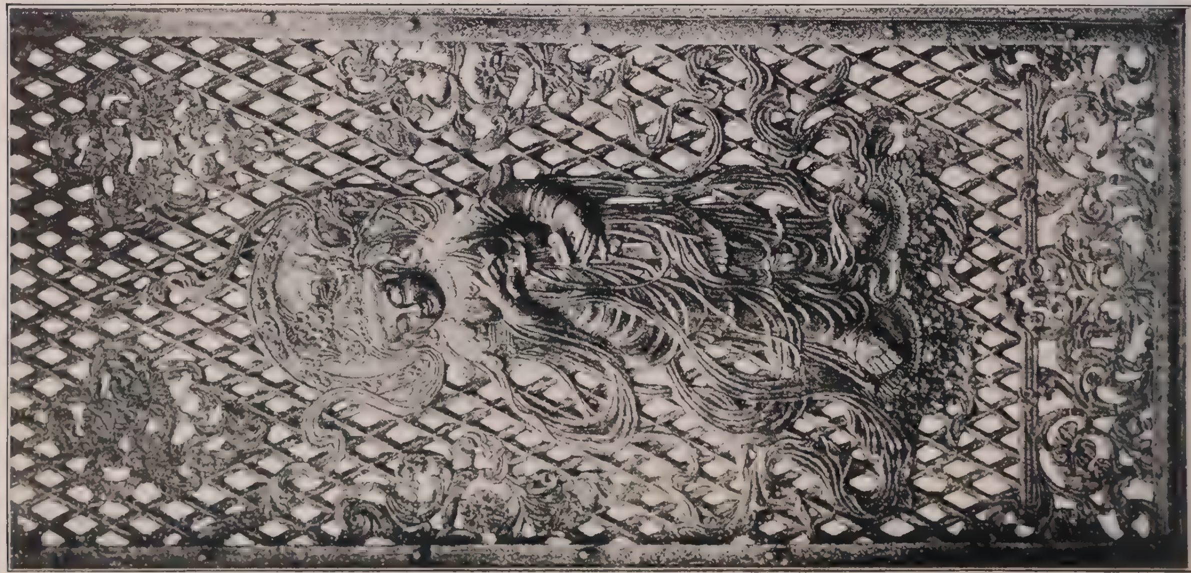


FIG. 14.—DOOR OF BRONZE LANTERN IN THE TODAI TEMPLE (8th century).

decoration for interiors, tradition tells us scarcely anything about the masters who carved such magnificent works as those seen in the Kiōto temples, the Tokugawa mausolea, and some of the old castles. There are, however, no modern developments of such work to be noted. The ability of former times exists and is exercised in the old way, though the field for its employment has been greatly narrowed.

Netsuke Carvers.

When Japanese sculpture in wood or ivory is spoken of, the first idea that presents itself is connected with the netsuke, which, of all the art objects found in Japan, is perhaps the most essentially Japanese. If Japan had given us nothing but the netsuke, we should still have no difficulty in differentiating the bright versatility of her national genius from the comparatively sombre, mechanic and unimaginative temperament of the Chinese. But the netsuke may now be said to be a thing of the past. The *inro* (medicine-box), which it mainly served to fix in the girdle, has been driven out of fashion by the new civilization imported from the West, and artists who would have carved netsuke in former times now devote their chisels to statuettes and alcove ornaments. It is not to be inferred, however, though it is a favourite assertion of collectors, that no good netsuke have been made in modern times. That theory is based upon the fact that after the opening of the country to foreign intercourse in 1857, hundreds of inferior specimens of netsuke were chiselled by inexpert hands, purchased wholesale by treaty-port merchants, and sent to New York, London and Paris, where, though they brought profit to the exporter, they also disgusted the connoisseur and soon earned discredit for their whole class. But in fact the glyptic artists of Tōkyō, Osaka and Kiōto, though they now devote their chisels chiefly to works of more importance than the netsuke, are in no sense inferior to their predecessors of feudal days, and many beautiful netsuke bearing their signatures are in existence. As for the modern ivory statuette or alcove ornament, of which great numbers are now carved for the foreign market, it certainly stands on a plane much higher than the netsuke, since anatomical defects which escape notice in the latter owing to its diminutive size, become obtrusive in the former.

The Realistic Departure.

One of the most remarkable developments of figure sculpture in modern Japan was due to Matsumoto Kisaburo (1830–1869). He carved human figures with as much accuracy as though they were destined for purposes of surgical demonstration. Considering that this man had neither art education nor anatomical instruction, and that he never enjoyed an opportunity of studying from a model in a studio, his achievements were remarkable. He and the craftsmen of the school he established completely refute the theory that the anatomical solecisms commonly seen in the works of Japanese sculptors are due to faulty observation. Without scientific training of any kind Matsumoto and his followers produced works in which the eye of science cannot detect any error. But it is impossible to admit within the circle of high-art productions these wooden figures of everyday men and women, unrelieved by any subjective element, and owing their merit entirely to the fidelity with which their contours are shaped, their muscles modelled, and their anatomical proportions preserved. They have not even the attraction of being cleanly sculptured in wood, but are covered with thinly lacquered muslin, which, though doubtless a good preservative, accentuates their puppet-like character. Nevertheless, Matsumoto's figures marked an epoch in Japanese wood sculpture. Their vivid realism appealed strongly to the taste of the average foreigner. A considerable school of carvers soon began to work in the Matsumoto style, and hundreds of their productions have gone to Europe and America, finding no market in Japan.

The Semi-foreign School.

Midway between the Matsumoto school and the pure style approved by the native taste in former times stand a number of wood-carvers headed by Takamura Kōun, who occupies in the field of sculpture much the same place as that held by Hashimoto Gaho in the realm of painting. Kōun carves figures in the round which not only display great power of chisel and breadth of style, but also tell a story not necessarily drawn from the motives of the classical school. This departure from established canons must be traced to the influence of the short-lived academy of Italian art established by the Japanese government early in the Meiji era. In the forefront of the new movement are to be found men like Yoneharu Unkai and Shinkai Taketarō; the former chiselled a figure of Jenner for the Medical Association of Japan when they celebrated the centenary of the great physician, and the latter has carved life-size effigies of two Imperial princes who lost their lives in the war with China (1894–95). The artists of the Kōun school, however, do much work which appeals to emotions in general rather than to individual memories. Thus Arakawa Reiun, one of Kōun's most brilliant pupils, has exhibited a figure of a swordsman in the act of driving home a furious thrust. The weapon is not shown. Reiun sculptured simply a man poised on the toes of one foot, the other foot raised, the arm extended, and the body straining forward in strong yet elastic muscular effort. A more imaginative work by the same artist is a figure of a farmer who has just shot an eagle that swooped upon his grandson. The old man holds his bow still raised. Some of the eagle's feathers, blown to his side, suggest the death of the bird; at his feet lies the corpse of the little boy, and the horror, grief and anger that such a tragedy would inspire are depicted with striking realism in the farmer's face. Such work has very close affinities with Occidental conceptions. The chief distinguishing feature is that the glyptic character is preserved at the expense of surface finish. The undisguised touches of the chisel tell a story of technical force and directness which could not be suggested by perfectly smooth surfaces. To subordinate process to result is the European canon; to show the former without marring the latter is the Japanese ideal. Many of Kōun's sculptures appear unfinished to eyes trained in Occidental galleries, whereas the Japanese connoisseur detects evidence of a technical feat in their seeming roughness.

Private Dwellings.

Architecture.—From the evidence of ancient records it appears that before the 5th century the Japanese resided in houses of a very rude character. The sovereign's palace itself was merely a wooden hut. Its pillars were thrust into the ground and the whole framework—consisting of posts, beams, rafters, door-posts and window-frames—was tied together with cords made by twisting the long fibrous stems of climbing plants. The roof was thatched, and perhaps had a gable at each end with a hole to allow the smoke of the wood fire to escape. Wooden doors swung on a kind of hook; the windows were mere holes in the walls. Rugs of skins or rush matting were used for sitting on, and the whole was surrounded with a palisade. In the middle of the 5th century two-storeyed houses seem to have been built, but the evidence on the subject is slender. In the 8th century, however, when the court was moved to Nara, the influence of Chinese civilization made itself felt. Architects, turners, tile-makers, decorative artists and sculptors, coming from China and from Korea, erected grand temples for the worship of Buddha enshrining images of much beauty and adorned with paintings and carvings of considerable merit. The plan of the city itself was taken from that of the Chinese metropolis. A broad central avenue led straight to the palace, and on either side of it ran four parallel streets, crossed at right angles by smaller thoroughfares. During this century the first sumptuary edict ordered that the dwellings of all high officials and opulent civilians should have tiled roofs and be coloured red, the latter injunction being evidently intended to stop the use of logs carrying their bark. Tiles thenceforth became the orthodox covering for a roof, but vermilion, being regarded as a religious colour, found no favour in private dwellings. In the 9th century, after the capital had been established at Kiōto, the palace of the sovereigns and the mansions of ministers and nobles were built on a scale of unprecedented grandeur. It is true that all the structures of the time had the defect of a box-like appearance. Massive, towering roofs, which impart an air of stateliness even to a wooden building and yet, by their graceful curves, avoid any suggestion of ponderosity, were still confined to Buddhist edifices. The architect of private dwellings attached more importance to satin-surfaced boards and careful joinery than to any appearance of strength or solidity.

Except for the number of buildings composing it, the palace had little to distinguish it from a nobleman's mansion. The latter consisted of a principal hall, where the master of the house lived, ate and slept, and of three suites of chambers, disposed on the north, the east and the west of the principal hall. In the northern suite the lady of the house dwelt, the eastern and western suites being allotted to other members of the family. Corridors joined the principal hall to the subordinate edifices, for as yet the idea had not been conceived of having more than one chamber under the same roof. The principal hall was usually 42 ft. square. Its centre was occupied by a "parent chamber," 30 ft. square, around which ran an ambulatory and a veranda, each 6 ft. wide. The parent chamber and the ambulatory were ceiled, sometimes with interlacing strips of bark or broad laths, so as to produce a plaited effect; sometimes with plain boards. The veranda had no ceiling. Sliding doors, a characteristic feature of modern Japanese houses, had not yet come into use, and no means were provided for closing the veranda, but the ambulatory was surrounded by a wall of latticed timber or plain boards, the lower half of which could be removed altogether, whereas the upper half, suspended from hooks, could be swung upward and outward. Privacy was obtained by blinds of split bamboo, and the parent chamber was separated from the ambulatory by similar bamboo blinds with silk cords for raising or lowering them, or by curtains. The thick rectangular mats of uniform size which, fitting together so as to present a level unbroken surface, cover the floor of all modern Japanese houses, were not yet in use: floors were boarded, having only a limited space matted. This form of mansion underwent little modification until the 12th century, when the introduction of the Zen sect of Buddhism with its contemplative practice called for greater privacy. Interiors were then divided into smaller rooms by means of sliding doors covered with thin rice-paper, which permitted the passage of light while obstructing vision; the hanging lattices were replaced by wooden doors which could be slid along a groove so as to be removable in the daytime, and an alcove was added in the principal chamber for a sacred picture or Buddhist image to serve as an object of contemplation for a devotee while practising the rite of abstraction. Thus the main features of the Japanese dwelling-house were evolved, and little change took place subsequently, except that the brush of the painter was freely used for decorating partitions, and in aristocratic mansions unlimited care was exercised in the choice of rare woods.

Buddhist Temple Architecture.

The Buddhist temple underwent little change at Japanese hands except in the matter of decoration. Such as it was in outline when first erected in accordance with Chinese models, such it virtually remained, though in later times all the resources of the sculptor and the painter were employed to beautify it externally and internally.

> "The building, sometimes of huge dimensions, is invariably surrounded by a raised gallery, reached by a flight of steps in the centre of the approach front, the balustrade of which is a continuation of the gallery railing. This gallery is sometimes supported upon a deep system of bracketing, corbelled out from the feet of the main pillars. Within this raised gallery, which is sheltered by the oversailing eaves, there is, in the larger temples, a columned loggia passing round the two sides and the front of the building, or, in some cases, placed on the façade only. The ceilings of the loggias are generally sloping, with richly carved roof-timbers showing below at intervals; and quaintly carved braces connect the outer pillars with the main posts of the building. Some temples are to be seen in which the ceiling of the loggia is boarded flat and decorated with large paintings of dragons in black and gold. The intercolumniation is regulated by a standard of about six or seven feet, and the general result of the treatment of columns, wall-posts, &c., is that the whole mural space, not filled in with doors or windows, is divided into regular oblong panels, which sometimes receive plaster, sometimes boarding and sometimes rich framework and carving or painted panels. Diagonal bracing or strutting is nowhere to be found, and in many cases mortises and other joints are such as very materially to weaken the timbers at their points of connexion. It would seem that only the immense weight of the roofs and their heavy projections prevent a collapse of some of these structures in high winds. The principal façade of the temple is filled in one, two or three compartments with hinged doors, variously ornamented and folding outwards, sometimes in double folds. From these doorways, generally left open, the interior light is principally obtained, windows, as the term is generally understood, being rare. An elaborate cornice of wooden bracketing crowns the walls, forming one of the principal ornaments of the building. The whole disposition of pillars, posts, brackets and rafters is harmonically arranged according to some measure of the standard of length. A very important feature of the façade is the portico or porch-way, which covers the principal steps and is generally formed by producing the central portion of the main roof over the steps and supporting such projection upon isolated wooden pillars braced together near the top with horizontal ties, carved, moulded and otherwise fantastically decorated. Above these ties are the cornice brackets and beams, corresponding in general design to the cornice of the walls, and the intermediate space is filled with open carvings of dragons or other characteristic designs. The forms of roof are various, but mostly they commence in a steep slope at the top, gradually flattening towards the eaves so as to produce a slightly concave appearance, this concavity being rendered more emphatic by the tilt which is given to the eaves at the four corners. The appearance of the ends of the roof is half hip, half gable. Heavy ribs of tile-cresting with large terminals are carried along the ridge and the slope of the gable. The result of the whole is very picturesque, and has the advantage of looking equally satisfactory from any point of view. The interior arrangement of wall columns, horizontal beams and cornice bracketing corresponds with that on the outside. The ceiling is invariably boarded and subdivided by ribs into small rectangular coffers. Sometimes painting is introduced into these panels and lacquer and metal clasps are added to the ribs. When the temple is of very large dimensions an interior peristyle of pillars is introduced to assist in supporting the roof, and in such cases each pillar carries profuse bracketing corresponding to that of the cornice. The construction of the framework of the Japanese roof is such that the weights all act vertically; there is no thrust on the outer walls, and every available point of the interior is used as a means of support.
>
> "The floor is partly boarded and partly matted. The shrines, altars and oblatory tables are placed at the back in the centre, and there are often other secondary shrines at the sides. In temples of the best class the floor of the gallery and of the central portion of the main building from entrance to altar are richly lacquered; in those of inferior class they are merely polished by continued rubbing."—(J. Conder, in the *Proceedings of the Royal Institute of British Architects.*)

Shintō Architecture.

None of the magnificence of the Buddhist temple belongs to the Shintō shrine. In the case of the latter conservatism has been absolute from time immemorial. The shrines of Ise, which may be called the Mecca of Shintō devotees, are believed to present to-day precisely the appearance they presented in 478, when they were moved thither in obedience to a revelation from the Sun-goddess. It has been the custom to rebuild them every twentieth year, alternately on each of two sites set apart for the purpose, the features of the old edifice being reproduced in the new with scrupulous accuracy.

They are enlarged replicas of the primeval wooden hut described above, having rafters with their upper ends crossed; thatched or shingled roof; boarded floors, and logs laid on the roof-ridge at right angles for the purpose of binding the ridge and the rafters firmly together. A thatched roof is imperative in the orthodox shrine, but in modern days tiles or sheets of copper are sometimes substituted. At Ise, however, no such novelties are tolerated. The avenue of approach generally passes under a structure called *torii*. Originally designed as a perch for fowls which sang to the deities at daybreak, this torii subsequently came to be erroneously regarded as a gateway characteristic of the Shintō shrine. It consists of two thick trunks placed upright, their upper ends mortised into a horizontal log which projects beyond them at either side. The structure derives some grace from its extreme simplicity.

Textile Fabrics and Embroidery.—In no branch of applied art does the decorative genius of Japan show more attractive results than in that of textile fabrics, and in none has there been more conspicuous progress during recent years. Her woven and embroidered stuffs have always been beautiful; but in former times few pieces of size and splendour were produced, if we except the curtains used for draping festival cars and the hangings of temples. Tapestry, as it is employed in Europe, was not thought of, nor indeed could the small hand-looms of the period be easily adapted to such work. All that has been changed, however. Arras of large dimensions, showing remarkable workmanship and grand combinations of colours, is now manufactured in Kiōto, the product of years of patient toil on the part of weaver and designer alike. Kawashima of Kiōto has acquired high reputation for work of this kind. He inaugurated the new departure a few years ago by copying a Gobelin, but it may safely be asserted that no Gobelin will bear comparison with the pieces now produced in Japan.

The most approved fashion of weaving is called *tsuzure-ori* (linked-weaving); that is to say, the cross threads are laid in with the fingers and pushed into their places with a comb by hand, very little machinery being used. The threads extend only to the outlines of each figure, and it follows that every part of the pattern has a rim of minute holes like pierced lines separating postage stamps in a sheet, the effect being that the design seems to hang suspended in the ground—linked into it, as the Japanese term implies.[1] A specimen of this nature recently manufactured by Kawashima's weavers measured 20 ft. by 13, and represented the annual festival at the Nikkō mausolea. The chief shrine was shown, as were also the gate and the long flight of stone steps leading up to it, several other buildings, the groves of cryptomeria that surround the mausolea, and the festival procession. All the architectural and decorative details, all the carvings and colours, all the accessories—everything was wrought in silk, and each of the 1500 figures forming the procession wore exactly appropriate costume. Even this wealth of detail, remarkable as it was, seemed less surprising than the fact that the weaver had succeeded in producing the effect of atmosphere and aerial perspective. Through the graceful cryptomerias distant mountains and the still more distant sky could be seen, and between the buildings in the foreground and those in the middle distance atmosphere appeared to be perceptible. Two years of incessant labour with relays of artisans working steadily throughout the twenty-four hours were required to finish this piece. Naturally such specimens are not produced in large numbers. Next in decorative importance to tsuzure-ori stands *yūzen birôdo*, commonly known among English-speaking people as cut velvet. Dyeing by the *yūzen* process is an innovation of modern times. The design is painted on the fabric, after which the latter is steamed, and the picture is ultimately fixed by methods which are kept secret. The soft silk known as *habutaye* is a favourite ground for such work, but silk crape also is largely employed. No other method permits the decorator to achieve such fidelity and such boldness of draughtsmanship. The difference between the results of the ordinary and the yūzen processes of dyeing is, in fact, the difference between a stencilled sketch and a finished picture. In the case of cut velvet, the yūzen process is supplemented as follows: The cutter, who works at an ordinary wooden bench, has no tool except a small sharp chisel with a V-shaped point. This chisel is passed into an iron pencil having at the end guards, between which the point of the chisel projects, so that it is impossible for the user to cut beyond a certain depth. When the velvet comes to him, it already carries a coloured picture permanently fixed by the yūzen process, but the wires have not been withdrawn. It is, in fact, velvet that has passed through all the usual stages of manufacture except the cutting of the thread along each wire and the withdrawal of the wires. The cutting artist lays the piece of unfinished velvet on his bench, and proceeds to carve into the pattern with his chisel, just as though he were shading the lines of the design with a steel pencil. When the pattern is lightly traced, he uses his knife delicately; when the lines are strong and the shadows heavy, he makes the point pierce deeply. In short, the little chisel becomes in his fingers a painter's brush, and when it is remembered that, the basis upon which he works being simply a thread of silk, his hand must be trained to such delicacy of muscular effort as to be capable of arresting the edge of the knife at varying depths within the diameter of the tiny filament, the difficulty of the achievement will be understood. Of course it is to be noted that the edge of the cutting tool is never allowed to trespass upon a line which the exigencies of the design require to be solid. The veining of a cherry petal, for example, the tessellation of a carp's scales, the serration of a leaf's edge—all these lines remain intact, spared by the cutter's tool, while the leaf itself, or the petal, or the scales of the fish, have the threads forming them cut so as to show the velvet nap and to appear in soft, low relief. In one variety of this fabric, a slip of gold foil is laid under each wire, and left in position after the wire is withdrawn, the cutting tool being then used with freedom in some parts of the design, so that the gold gleams through the severed thread, producing a rich and suggestive effect. Velvet, however, is not capable of being made the basis for pictures so elaborate and microscopically accurate as those produced by the yūzen process on silk crape or habutaye. The rich-toned, soft plumage of birds or the magnificent blending of colours in a bunch of peonies or chrysanthemums cannot be obtained with absolute fidelity on the ribbed surface of velvet.

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[1] This method is some 300 years old. It is by no means a modern invention, as some writers have asserted.

Embroidery. The embroiderer's craft has been followed for centuries in Japan with eminent success, but whereas it formerly ranked with dyeing and weaving, it has now come to be regarded as an art. Formerly the embroiderer was content to produce a pattern with his needle, now he paints a picture. So perfectly does the modern Japanese embroiderer elaborate his scheme of values that all the essential elements of pictorial effects—chiaroscuro, aerial perspective and atmosphere are present in his work. Thus a graceful and realistic school has replaced the comparatively stiff and conventional style of former times.

Further, an improvement of a technical character was recently made, which has the effect of adding greatly to the durability of these embroideries. Owing to the use of paper among the threads of the embroidery and sizing in the preparation of the stuff forming the ground, every operation of folding used to cause perceptible injury to a piece, so that after a few years it acquired a crumpled and dingy appearance. But by the new method embroiderers now succeed in producing fabrics which defy all destructive influences—except, of course, dirt and decay.

Early Period. *Ceramics.*—All research proves that up to the 12th century of the Christian era the ceramic ware produced in Japan was of a very rude character. The interest attaching to it is historical rather than technical. Pottery was certainly manufactured from an early date, and there is evidence that kilns existed in some fifteen provinces in the 10th century. But although the use of the potter's wheel had long been understood, the objects produced were simple utensils to contain offerings of rice, fruit and fish at the austere ceremonials of the Shintō faith, jars for storing seeds, and vessels for common domestic use. In the 13th century, however, the introduction of tea from China, together with vessels for infusing and serving it, revealed to the Japanese a new conception of ceramic possibilities, for the potters of the Middle Kingdom had then (Sung dynasty) fully entered the road which was destined to carry them ultimately to a high pinnacle of their craft. It had long been customary in Japan to send students to China for the purpose of studying philosophy and religion, and she now (1223) sent a potter, Kato Shirozaemon, who, on his return, opened a kiln at Seto in the province of Owari, and began to produce little jars for preserving tea and cups for drinking it. These were conspicuously superior to anything previously manufactured. Kato is regarded as the father of Japanese ceramics. But the ware produced by him and his successors at the Seto kilns, or by their contemporaries in other parts of the country, had no valid claim to decorative excellence. Nearly three centuries elapsed before a radically upward movement took place, and on this occasion also the inspiration came from China. In 1520 a potter named Gorodayu Goshonzui (known to posterity as Shonzui) made his way to Fuchow and thence to King-te-chen, where, after five years' study, he acquired the art of manufacturing porcelain, as distinguished from pottery, together with the art of applying decoration in blue under the glaze. He established his kiln at Arita in Hizen, and the event marked the opening of the second epoch of Japanese ceramics. Yet the new departure then made did not lead far. The existence of porcelain clay in Hizen was not discovered for many years, and Shonzui's pieces being made entirely with kaolin imported from China, their manufacture ceased after his death, though knowledge of the processes learned by him survived and was used in the production of greatly inferior wares. The third clearly differentiated epoch was inaugurated by the discovery of true kaolin at Izumi-yama in Hizen, the discoverer being one of the Korean potters who came to Japan in the train of Hideyoshi's generals returning from the invasion of Korea, and the date of the discovery being about 1605. Thus much premised, it becomes possible to speak in detail of the various wares for which Japan became famous.

The principal kinds of ware are Hizen, Kiōto, Satsuma, Kutani, Owari, Bizen, Takatori, Banko, Izumo and Yatsushiro.

Hizen. There are three chief varieties of Hizen ware, namely, (1) the enamelled porcelain of Arita—the "old Japan" of European collectors; (2) the enamelled porcelain of Nabeshima; and (3) the blue and white, or plain white, porcelain of Hirado. The earliest manufacture of porcelain—as distinguished from pottery—began in the opening years of the 16th century, but its materials were exotic. Genuine Japanese porcelain dates from about a century later. The decoration was confined to blue under the glaze, and as an object of art the ware possessed no special merit. Not until the year 1620 do we find any evidence of the style for which Arita porcelain afterwards became famous, namely, decoration with vitrifiable enamels. The first efforts in this direction were comparatively crude; but before the middle of the 17th century, two experts—Goroshichi and Kakiemon—carried the art to a point of considerable excellence. From that time forward the Arita factories turned out large quantities of porcelain profusely decorated with blue under the glaze and coloured enamels over it. Many pieces were exported by the Dutch, and some also were specially manufactured to their order. Specimens of the latter are still preserved in European collections, where they are classed as genuine examples of Japanese ceramic art, though beyond question their style of decoration was greatly influenced by Dutch interference. The porcelains of Arita were carried to the neighbouring town of Imari for sale and shipment. Hence the ware came to be known to Japanese and foreigners alike as *Imari-yaki* (*yaki* = anything baked; hence ware).

Nabeshima. The Nabeshima porcelain—so called because of its production at private factories under the special patronage of Nabeshima Naoshige, feudal chief of Hizen—was produced at Okawachiyama. It differed from Imari-yaki in the milky whiteness and softness of its glaze, the comparative sparseness of its enamelled decoration, and the relegation of blue *sous couverte* to an entirely secondary place. This is undoubtedly the finest jewelled porcelain in Japan; the best examples leave nothing to be desired. The factory's period of excellence began about the year 1680, and culminated at the close of the 18th century.

Hirado. The Hirado porcelain—so called because it enjoyed the special patronage of Matsuura, feudal chief of Hirado—was produced at Mikawa-uchi-yama, but did not attain excellence until the middle of the 18th century, from which time until about 1830 specimens of rare beauty were produced. They were decorated with blue under the glaze, but some were pure white with exquisitely chiselled designs incised or in relief. The production was always scanty, and, owing to official prohibitions, the ware did not find its way into the general market.

Kiōto.

The history of Kiōto ware—which, being for the most part faience, belongs to an entirely different category from the Hizen porcelains spoken of above—is the history of individual ceramists rather than of special manufactures. Speaking broadly, however, four different varieties are usually distinguished. They are *raku-yaki*, *awata-yaki*, *iwakura-yaki* and *kiyomizu-yaki*.

Raku.

Raku-yaki is essentially the domestic faience of Japan; for, being entirely hand-made and fired at a very low temperature, its manufacture offers few difficulties, and has consequently been carried on by amateurs in their own homes at various places throughout the country. The raku-yaki of Kiōto is the parent of all the rest. It was first produced by a Korean who emigrated to Japan in the early part of the 16th century. But the term *raku-yaki* did not come into use until the close of the century, when Chōjiro (artistic name, Chōryū) received from Hideyoshi (the Taikō) a seal bearing the ideograph *raku*, with which he thenceforth stamped his productions. Thirteen generations of the same family carried on the work, each using a stamp with the same ideograph, its calligraphy, however, differing sufficiently to be identified by connoisseurs. The faience is thick and clumsy, having soft, brittle and very light *pâte*. The staple type has black glaze showing little lustre, and in choice varieties this is curiously speckled and pitted with red. Salmon-coloured, red, yellow and white glazes are also found, and in late specimens gilding was added. The raku faience owed much of its popularity to the patronage of the tea clubs. The nature of its paste and glaze adapted it for the infusion of powdered tea, and its homely character suited the austere canons of the tea ceremonies.

Awata.

Awata-yaki is the best known among the ceramic productions of Kiōto. There is evidence to show that the art of decoration with enamels over the glaze reached Kiōto from Hizen in the middle of the 17th century. Just at that time there flourished in the Western capital a potter of remarkable ability, called Nomura Seisuke. He immediately utilized the new method, and produced many beautiful examples of jewelled faience, having close, hard *pâte*, yellowish-white, or brownish-white, glaze covered with a network of fine crackle, and sparse decoration in pure full-bodied colours—red, green, gold and silver. He worked chiefly at Awata, and thus brought that factory into prominence. Nomura Seisuke, or Ninsei as he is commonly called, was one of Japan's greatest ceramists. Genuine examples of his faience have always been highly prized, and numerous imitations were subsequently produced, all stamped with the ideograph Ninsei. After Ninsei's time, the most renowned ceramists of the Awata factories were Kenzan (1688–1740); Ebisei, a contemporary of Kenzan; Dōhachi (1751–1763), who subsequently moved to Kiyōmizu-zaka, another part of Kiōto, the faience of which constitutes the Kiyōmizu-yaki mentioned above; Kinkōzan (1745–1760); Hōzan (1690–1721); Taizan (1760–1800); Bizan (1810–1838); and Tanzan, who was still living in 1909. It must be noted that several of these names, as Kenzan, Dōhachi, Kinkōzan, Hōzan and Taizan, were not limited to one artist. They are family names, and though the dates we have given indicate the eras of the most noted ceramists in each family, amateurs must not draw any chronological conclusion from the mere fact that a specimen bears such and such a name.

Iwakura.

The origin of the Iwakura-yaki is somewhat obscure, and its history, at an early date, becomes confused with that of the Awata yaki, from which, indeed, it does not materially differ.

Kiyōmizu.

In the term Kiyōmizu-yaki may be included roughly all the faience of Kiōto, with the exception of the three varieties described above. The distinction between Kiyōmizu, Awata and Iwakura is primarily local. They are parts of the same city, and if their names have been used to designate particular classes of pottery, it is not because the technical or decorative features of each class distinguish it from the other two, but chiefly for the purpose of identifying the place of production. On the slopes called Kiyōmizu-zaka and Gojō-zaka lived a number of ceramists, all following virtually the same models with variations due to individual genius. The principal Kiyōmizu artists were: Ebisei, who moved from Awata to Gojō-zaka in 1688; Eisen and Rokubei, pupils of Ebisei; Mokubei, a pupil of Eisen, but more celebrated than his master; Shūhei (1790–1810), Kentei (1752–1820), and Zengoro Hozen, generally known as Eiraku (1790–1850). Eisen was the first to manufacture porcelain (as distinguished from faience) in Kiōto, and this branch of the art was carried to a high standard of excellence by Eiraku, whose speciality was a rich coral-red glaze with finely executed decoration in gold. The latter ceramist excelled also in the production of purple, green and yellow glazes, which he combined with admirable skill and taste. Some choice ware of the latter type was manufactured by him in Kishū, by order of the feudal chief of that province. It is known as *Kairaku-yen-yaki* (ware of the Kairaku park).

Satsuma.

No phrase is commoner in the mouths of Western collectors than "Old Satsuma"; no ware is rarer in Western collections. Nine hundred and ninety-nine pieces out of every thousand that do duty as genuine examples of this prince of faiences are simply examples of the skill of modern forgers. In point of fact, the production of faience decorated with gold and coloured enamels may be said to have commenced at the beginning of the 19th century in Satsuma. Some writers maintain that it did actually commence then, and that nothing of the kind had existed there previously. Setting aside, however, the strong improbability that a style of decoration so widely practised and so highly esteemed could have remained unknown during a century and a half to experts working for one of the most puissant chieftains in Japan, we have the evidence of trustworthy traditions and written records that enamelled faience was made by the potters at Tatsumonji—the principal factory of Satsuma-ware in early days—as far back as the year 1676. Mitsuhisa, then feudal lord of Satsuma, was a munificent patron of art. He summoned to his fief the painter Tangen—a pupil of the renowned Tanyū, who died in 1674—and employed him to paint faience or to furnish designs for the ceramists of Tatsumonji. The ware produced under these circumstances is still known by the name of Satsuma Tangen. But the number of specimens was small. Destined chiefly for private use or for presents, their decoration was delicate rather than rich, the colour chiefly employed being brown, or reddish brown, under the glaze, and the decoration over the glaze being sparse and chaste. Not until the close of the 18th century or the beginning of the 19th did the more profuse fashion of enamelled decoration come to be largely employed. It was introduced by two potters who had visited Kiōto, and there observed the ornate methods so well illustrated in the wares of Awata and Kiyōmizu. At the same time a strong impetus was given to the production of faience at Tadeno—then the chief factory in Satsuma—owing to the patronage of Shimazu Tamanobu, lord of the province. To this increase in production and to the more elaborate application of vitrifiable enamels may be attributed the erroneous idea that Satsuma faience decorated with gold and coloured enamels had its origin at the close of the 18th century. For all the purposes of the ordinary collector it may be said to have commenced then, and to have come to an end about 1800; but for the purposes of the historian we must look farther back.

The ceramic art in Satsuma owed much to the aid of a number of Korean experts who settled there after the return of the Japanese forces from Korea. One of these men, Boku Heii, discovered (1603) clay fitted for the manufacture of white *craquelé* faience. This was the subsequently celebrated *Satsuma-yaki*. But in Boku's time, and indeed as long as the factories flourished, many other kinds of faience were produced, the principal having rich black or *flambé* glazes, while a few were green or yellow monochromes. One curious variety, called *same-yaki*, had glaze chagrined like the skin of a shark. Most of the finest pieces of enamelled faience were the work of artists at the Tadeno factory, while the best specimens of other kinds were by the artists of Tatsumonji.

Kutani.

The porcelain of Kutani is among those best known to Western collectors, though good specimens of the old ware have always been scarce. Its manufacture dates from the close of the 17th century, when the feudal chief of Kaga took the industry under his patronage. There were two principal varieties of the ware: *ao-Kutani*, so called because of a green (*ao*) enamel of great brilliancy and beauty which was largely used in its decoration, and Kutani with painted and enamelled *pâte* varying from hard porcelain to pottery. Many of the pieces are distinguished by a peculiar creamy whiteness of glaze, suggesting the idea that they were intended to imitate the soft-paste wares of China. The enamels are used to delineate decorative subjects and are applied in masses, the principal colours being green, yellow and soft Prussian blue, all brilliant and transparent, with the exception of the last which is nearly opaque. In many cases we find large portions of the surface completely covered with green or yellow enamel overlying black diapers or scroll patterns. The second variety of Kutani ware may often be mistaken for "old Japan" (*i.e.* Imari porcelain). The most characteristic examples of it are distinguishable, however, by the preponderating presence of a peculiar russet red, differing essentially from the full-bodied and comparatively brilliant colour of the Arita pottery. Moreover, the workmen of Kaga did not follow the Arita precedent of massing blue under the glaze. In the great majority of cases they did not use blue at all in this position, and when they did, its place was essentially subordinate. They also employed silver freely for decorative purposes, whereas we rarely find it thus used on "old Japan" porcelain.

About the time (1843) of the ao-Kutani revival, a potter called Iida Hachiroemon introduced a style of decoration which subsequently came to be regarded as typical of all Kaga procelains. Taking the Eiraku porcelains of Kiōto as models, Hachiroemon employed red grounds with designs traced on them in gold. The style was not absolutely new in Kaga. We find similar decoration on old and choice examples of Kutani-yaki. But the character of the old red differs essentially from that of the modern manufacture—the former being a soft, subdued colour, more like a bloom than an enamel; the latter a glossy and comparatively crude pigment. In Hachiroemon's time and during the twenty years following the date of his innovation, many beautiful examples of elaborately decorated Kutani porcelain were produced. The richness, profusion and microscopic accuracy of their decoration could scarcely have been surpassed; but, with very rare exceptions, their lack of delicacy of technique disqualifies them to rank as fine porcelains.

JAPAN
LACQUER

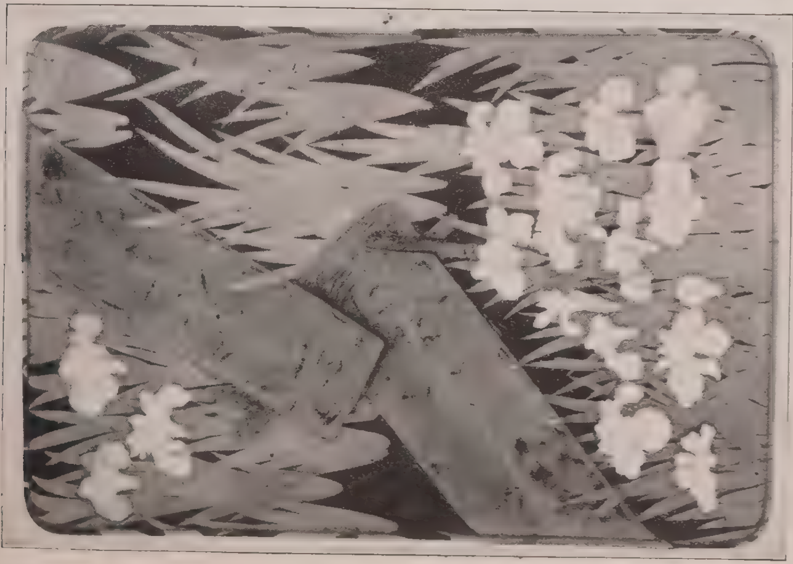

Fig. 18.—LID OF BOX. By Korin.

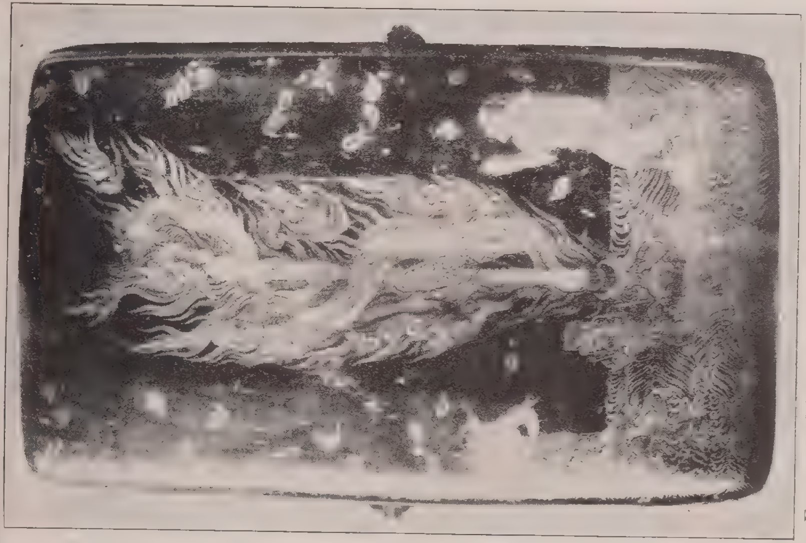

Fig. 19.—CASE FOR HEAD OF A SKAKUJO.

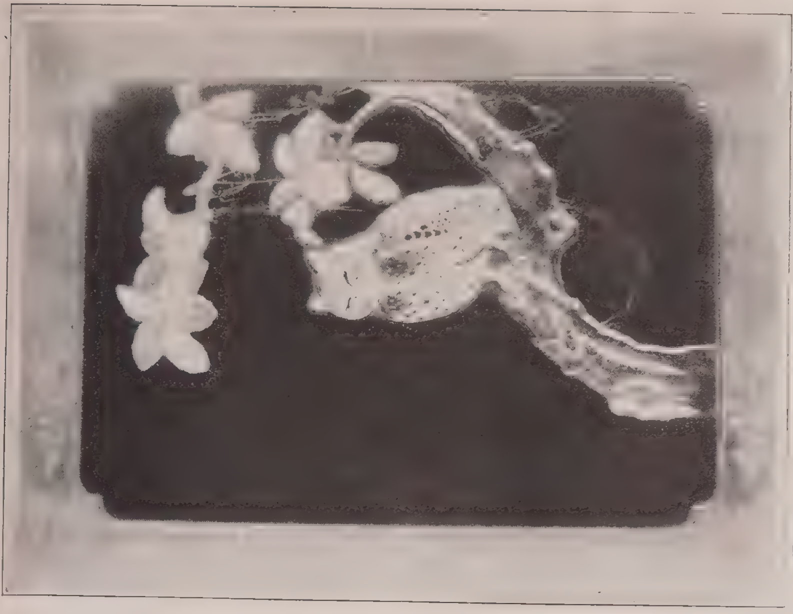

Fig. 20.—OWL ON A BRANCH. By Ritsuo.

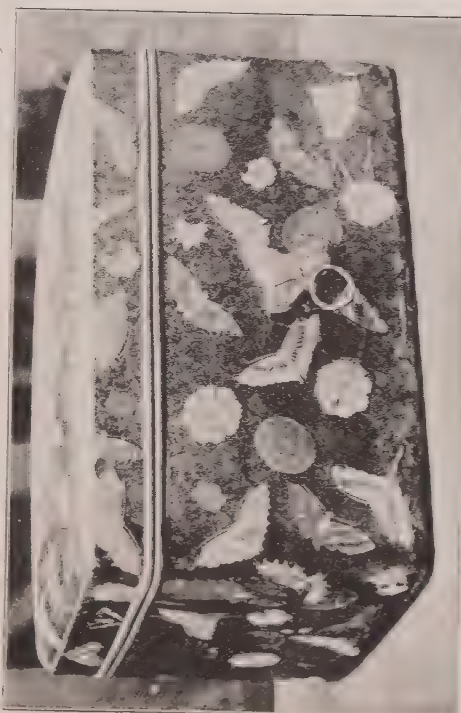

Fig. 21.—BOX WITH BUTTERFLIES AND FLOWERS IN GOLD (12th century).

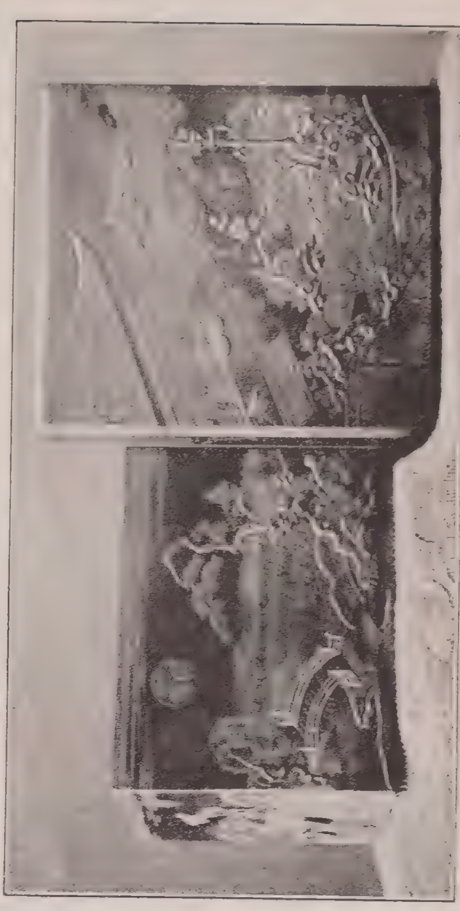

Fig. 22.—LACQUERED BOXES. By Kōami (1598-1651).

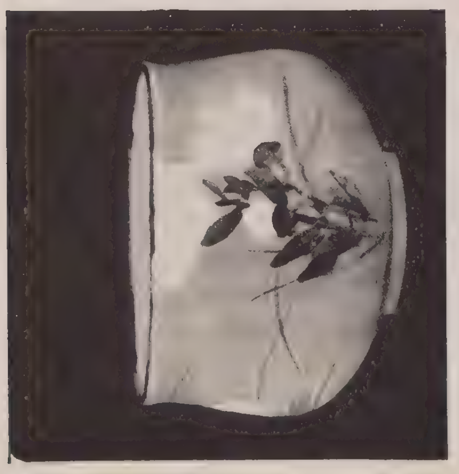

FIG. 23.—TEA BOWL. By Kenzan.

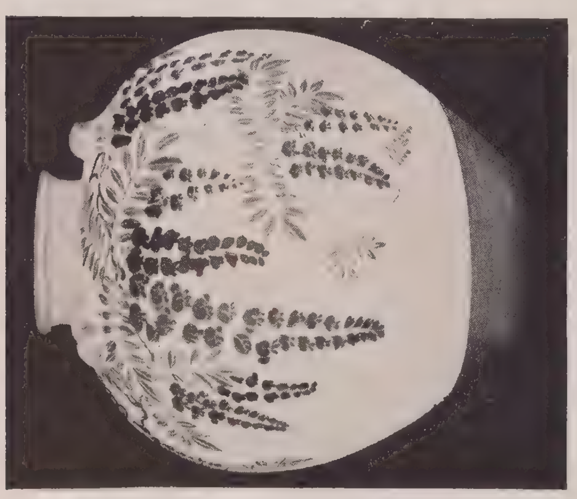

FIG. 24.—TEA JAR. By Ninsei.

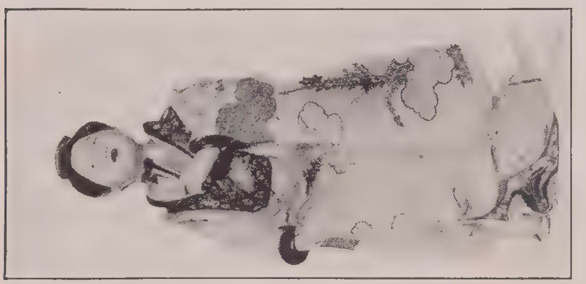

FIG. 25.—FIGURE. By Kakiemon. Arita porcelain.

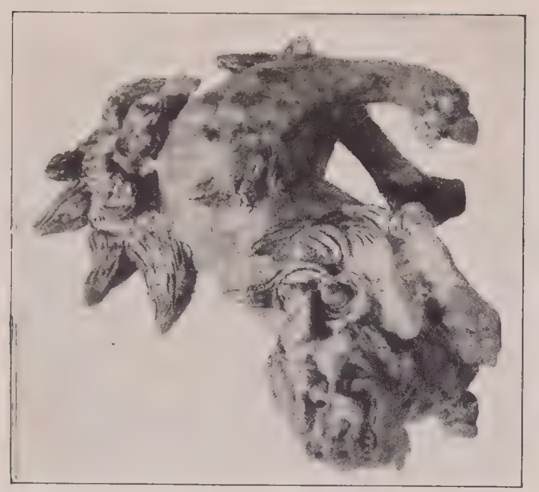

FIG. 26.—LION. By Chojiro Raku.

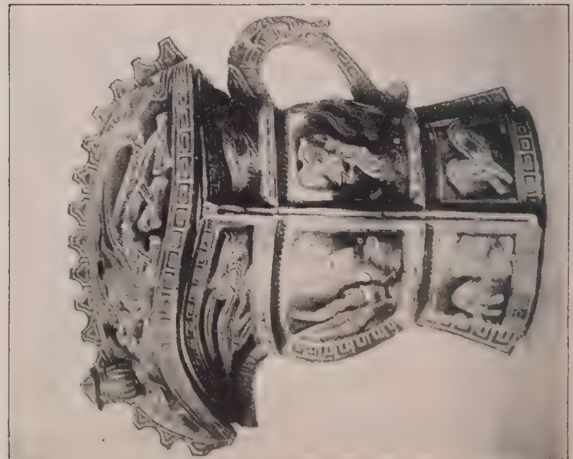

FIG. 27.—CENSER, WITH KOCHI GLAZE. By Eisen.

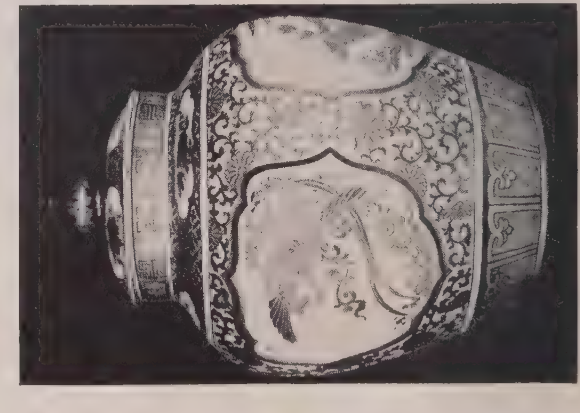

FIG. 28.—TEA JAR. By Ninsei.

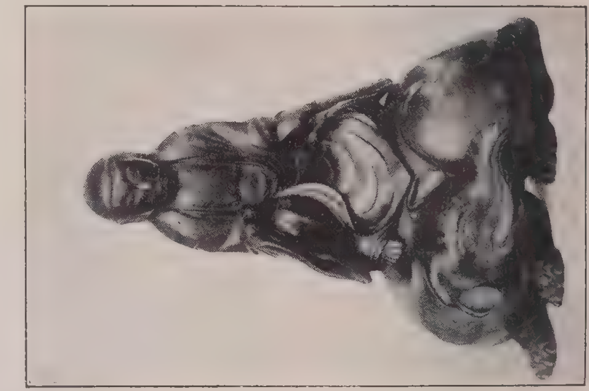

FIG. 29.—BIZEN WARE. Samantabhadra

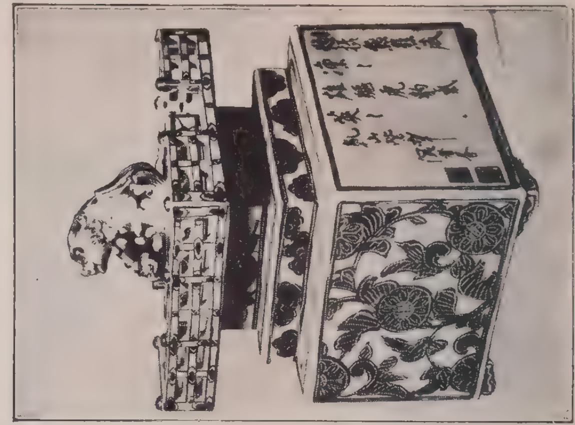

Fig. 30.—CENSER. By Kenzan.

Owari.

It was at the little village of Seto, some five miles from Nagoya, the chief town of the province of Owari, or Bishū, that the celebrated Kato Shirozaemon made the first Japanese faience worthy to be considered a technical success. Shirozaemon produced dainty little tea-jars, ewers and other *cha-no-yu* utensils. These, being no longer stoved in an inverted position, as had been the habit before Shirozaemon's time, were not disfigured by the bare, blistered lips of their predecessors. Their *pâte* was close and well-manufactured pottery, varying in colour from dark brown to russet, and covered with thick, lustrous glazes—black, amber-brown, chocolate and yellowish grey. These glazes were not monochromatic: they showed differences of tint, and sometimes marked varieties of colour; as when chocolate-brown passed into amber, or black was relieved by streaks and clouds of grey and dead-leaf red. This ware came to be known as *Tōshiro-yaki*, a term obtained by combining the second syllable of Katō with the two first of Shirozaemon. A genuine example of it is at present worth many times its weight in gold to Japanese dilettanti, though in foreign eyes it is little more than interesting. Shirozaemon was succeeded at the kiln by three generations of his family, each representative retaining the name of Tōshiro, and each distinguishing himself by the excellence of his work. Thenceforth Seto became the headquarters of the manufacture of *cha-no-yu* utensils, and many of the tiny pieces turned out there deserve high admiration, their technique being perfect, and their mahogany, russet-brown, amber and buff glazes showing wonderful lustre and richness. Seto, in fact, acquired such a widespread reputation for its ceramic productions that the term *seto-mono* (Seto article) came to be used generally for all pottery and porcelain, just as "China" is in the West. Seto has now ceased to be a pottery-producing centre, and has become the chief porcelain manufactory of Japan. The porcelain industry was inaugurated in 1807 by Tamikichi, a local ceramist, who had visited Hizen and spent three years there studying the necessary processes. Owari abounds in porcelain stone; but it does not occur in constant or particularly simple forms, and as the potters have not yet learned to treat their materials scientifically, their work is often marred by unforeseen difficulties. For many years after Tamikichi's processes had begun to be practised, the only decoration employed was blue under the glaze. Sometimes Chinese cobalt was used, sometimes Japanese, and sometimes a mixture of both. To Kawamoto Hansuke, who flourished about 1830–1845, belongs the credit of having turned out the richest and most attractive ware of this class. But, speaking generally, Japanese blues do not rank on the same decorative level with those of China. At Arita, although pieces were occasionally turned out of which the colour could not be surpassed in purity and brilliancy, the general character of the blue *sous couverte* was either thin or dull. At Hirado the ceramists affected a lighter and more delicate tone than that of the Chinese, and, in order to obtain it, subjected the choice pigment of the Middle Kingdom to refining processes of great severity. The Hirado blue, therefore, belongs to a special aesthetic category. But at Owari the experts were content with an inferior colour, and their blue-and-white porcelains never enjoyed a distinguished reputation, though occasionally we find a specimen of great merit.

Decoration with vitrifiable enamels over the glaze, though it began to be practised at Owari about the year 1840, never became a speciality of the place. Nowadays, indeed, numerous examples of porcelains decorated in this manner are classed among Owari products. But they receive their decoration, almost without exception, in Tōkyō or Yokohama, where a large number of artists, called *e-tsuke-shi*, devote themselves entirely to porcelain-painting. These men seldom use vitrifiable enamels, pigments being much more tractable and less costly. The dominant feature of the designs is pictorial. They are frankly adapted to Western taste. Indeed, of this porcelain it may be said that, from the monster pieces of blue-and-white manufactured at Seto—vases six feet high and garden pillar-lamps half as tall again do not dismay the Bishū ceramist—to tiny coffee-cups decorated in Tōkyō, with their delicate miniatures of birds, flowers, insects, fishes and so forth, everything indicates the death of the old severe aestheticism. To such a depth of debasement had the ceramic art fallen in Owari, that before the happy renaissance of the past ten years, Nagoya discredited itself by employing porcelain as a base for cloisonné enamelling. Many products of this vitiated industry have found their way into the collections of foreigners.

Bizen.

Pottery was produced at several hamlets in Bizen as far back as the 14th century, but ware worthy of artistic notice did not make its appearance until the close of the 16th century, when the Taikō himself paid a visit to the factory at Imbe. Thenceforth utensils for the use of the tea clubs began to be manufactured. This *Bizen-yaki* was red stoneware, with thin diaphanous glaze. Made of exceedingly refractory clay, it underwent stoving for more than three weeks, and was consequently remarkable for its hardness and metallic timbre. Some fifty years later, the character of the choicest Bizen-yaki underwent a marked change. It became slate-coloured or bluish-brown faience, with *pâte* as fine as pipe-clay, but very hard. In the *ao-Bizen* (blue Bizen), as well as in the red variety, figures of mythical beings and animals, birds, fishes and other natural objects, were modelled with a degree of plastic ability that can scarcely be spoken of in too high terms. Representative specimens are truly admirable—every line, every contour faithful. The production was very limited, and good pieces soon ceased to be procurable except at long intervals and heavy expense. The Bizen-yaki familiar to Western collectors is comparatively coarse brown or reddish brown, stoneware, modelled rudely, though sometimes redeemed by touches of the genius never entirely absent from the work of the Japanese artisan-artist. Easy to be confounded with it is another ware of the same type manufactured at Shidoro in the province of Tōtōmi.

Takatori.

The Japanese potters could never vie with the Chinese in the production of glazes: the wonderful monochromes and polychromes of the Middle Kingdom had no peers anywhere. In Japan they were most closely approached by the faience of Takatori in the province of Chikuzen. In its early days the ceramic industry of this province owed something to the assistance of Korean experts who settled there after the expedition of 1592. But its chief development took place under the direction of Igarashi Jizaemon, an amateur ceramist, who, happening to visit Chikuzen about 1620, was taken under the protection of the chief of the fief and munificently treated. Taking the renowned *yao-pien-yao*, or "transmutation ware" of China as a model, the Takatori potters endeavoured, by skilful mixing of colouring materials, to reproduce the wonderful effects of oxidization seen in the Chinese ware. They did not, indeed, achieve their ideal, but they did succeed in producing some exquisitely lustrous glazes of the *flambé* type, rich transparent brown passing into claret colour, with flecks or streaks of white and clouds of "iron dust." The *pâte* of this faience was of the finest description, and the technique in every respect faultless. Unfortunately, the best experts confined themselves to working for the tea clubs, and consequently produced only insignificant pieces, as tea-jars, cups and little ewers. During the 18th century, a departure was made from these strict canons. From this period date most of the specimens best known outside Japan—cleverly modelled figures of mythological beings and animals covered with lustrous variegated glazes, the general colours being grey or buff, with tints of green, chocolate, brown and sometimes blue.

Awaji.

A ware of which considerable quantities have found their way westward of late years in the *Awaji-yaki*, so called from the island of Awaji where it is manufactured in the village of Iga. It was first produced between the years 1830 and 1840 by one Kajū Mimpei, a man of considerable private means who devoted himself to the ceramic art out of pure enthusiasm. His story is full of interest, but it must suffice here to note the results of his enterprise. Directing his efforts at first to reproducing the deep green and straw-yellow glazes of China, he had exhausted almost his entire resources before success came, and even then the public was slow to recognize the merits of his ware. Nevertheless he persevered, and in 1838 we find him producing not only green and yellow monochromes, but also greyish white and mirror-black glazes of high excellence. So thoroughly had he now mastered the management of glazes that he could combine yellow, green, white and claret colour in regular patches to imitate tortoise-shell. Many of his pieces have designs incised or in relief, and others are skilfully decorated with gold and silver. Awaji-yaki, or *Mimpei-yaki* as it is often called, is generally porcelain, but we occasionally find specimens which may readily be mistaken for Awata faience.

Banko.

Banko faience is a universal favourite with foreign collectors. The type generally known to them is exceedingly light ware, for the most part made of light grey, unglazed clay, and having hand-modelled decoration in relief. But there are numerous varieties. Chocolate or dove-coloured grounds with delicate diapers in gold and *engobe*; brown or black faience with white, yellow and pink designs incised or in relief; pottery curiously and deftly marbled by combinations of various coloured clays—these and many other kinds are to be found, all, however, presenting one common feature, namely, skilful finger-moulding and a slight roughening of the surface as though it had received the impression of coarse linen or crape before baking. This modern *banko-yaki* is produced chiefly at Yokkaichi in the province of Ise. It is entirely different from the original banko-ware made in Kuwana, in the same province, by Numanami Gozaemon at the close of the 18th century. Gozaemon was an imitator. He took for his models the raku faience of Kiōto, the masterpieces of Ninsei and Kenzan, the rococo wares of Korea, the enamelled porcelain of China, and the blue-and-white ware of Delft. He did not found a school, simply because he had nothing new to teach, and the fact that a modern ware goes by the same name as his productions is simply because his seal—the inscription on which (*banko*, everlasting) suggested the name of the ware—subsequently (1830) fell into the hands of one Mori Yūsetsu, who applied it to his own ware. Mori Yūsetsu, however, had more originality than Numanami. He conceived the idea of shaping his pieces by putting the mould inside and pressing the clay with the hand into the matrix. The consequence was that his wares received the design on the inner as well as the outer surface, and were moreover thumb-marked—essential characteristics of the banko-yaki now so popular.

Izumo.

Among a multitude of other Japanese wares, space allows us to mention only two, those of Izumo and Yatsushiro. The chief of the former is faience, having light grey, close *pâte* and yellow or straw-coloured glaze, with or without crackle, to which is applied decoration in gold and green enamel. Another variety has chocolate glaze, clouded with amber and flecked with gold dust. The former faience had its origin at the close of the 17th century, the latter at the close of the 18th; but the *Izumo-yaki* now procurable is a modern production.

Yatsushiro.

The Yatsushiro faience is a production of the province of Higo, where a number of Korean potters settled at the close of the 17th century. It is the only Japanese ware in which the characteristics of a Korean original are unmistakably preserved. Its diaphanous, pearl-grey glaze, uniform, lustrous and finely crackled, overlying encaustic decoration in white slip, the fineness of its warm reddish *pâte*, and the general excellence of its technique, have always commanded admiration. It is produced now in considerable quantities, but the modern ware falls far short of its predecessor.

Many examples of the above varieties deserve the enthusiastic admiration they have received, yet they unquestionably belong to a lower rank of ceramic achievements than the choice productions of Chinese kilns. The potters of the Middle Kingdom, from the early eras of the Ming dynasty down to the latest years of the 18th century, stood absolutely without rivals as makers of porcelain. Their technical ability was incomparable—though in grace of decorative conception they yielded the palm to the Japanese—and the representative specimens they bequeathed to posterity remained, until quite recently, far beyond the imitative capacity of European or Asiatic experts. As for faience and pottery, however, the Chinese despised them in all forms, with one notable exception, the *yi-hsing-yao*, known in the Occident as *boccaro*. Even the *yi-hsing-yao*, too, owed much of its popularity to special utility. It was essentially the ware of the tea-drinker. If in the best specimens exquisite modelling, wonderful accuracy of finish and *pâtes* of interesting tints are found, such pieces are, none the less, stamped prominently with the character of utensils rather than with that of works of art. In short, the artistic output of Chinese kilns in their palmiest days was, not faience or pottery, but porcelain, whether of soft or hard paste. Japan, on the contrary, owes her ceramic distinction in the main to her faience. A great deal has been said by enthusiastic writers about the *famille chrysanthemo-pêonienne* of Imari and the *genre Kakiemon* of Nabeshima, but these porcelains, beautiful as they undoubtedly are, cannot be placed on the same level with the *kwan-yao* and *famille rose* of the Chinese experts. The Imari ware, even though its thick biscuit and generally ungraceful shapes be omitted from the account, shows no enamels that can rival the exquisitely soft, broken tints of the *famille rose;* and the *Kakiemon* porcelain, for all its rich though chaste contrasts, lacks the delicate transmitted tints of the shell-like *kwan-yao*. So, too, the blue-and-white porcelain of Hirado, though assisted by exceptional tenderness of *sous-pâte* colour, by milk-white glaze, by great beauty of decorative design, and often by an admirable use of the modelling or graving tool, represents a ceramic achievement palpably below the soft paste *kai-pien-yao* of King-te-chen. It is a curious and interesting fact that this last product of Chinese skill remained unknown in Japan down to very recent days. In the eyes of a Chinese connoisseur, no blue-and-white porcelain worthy of consideration exists, or ever has existed, except the *kai-pien-yao*, with its imponderable *pâte*, its wax-like surface, and its rich, glowing blue, entirely free from superficiality or garishness and broken into a thousand tints by the microscopic crackle of the glaze. The Japanese, although they obtained from their neighbour almost everything of value she had to give them, did not know this wonderful ware, and their ignorance is in itself sufficient to prove their ceramic inferiority. There remains, too, a wide domain in which the Chinese developed high skill, whereas the Japanese can scarcely be said to have entered it at all; namely, the domain of monochromes and polychromes, striking every note of colour from the richest to the most delicate; the domain of *truité* and *flambé* glazes, of *yō-pien-yao* (transmutation ware), and of egg-shell with incised or translucid decoration. In all that region of achievement the Chinese potters stood alone and seemingly unapproachable. The Japanese, on the contrary, made a specialty of faience, and in that particular line they reached a high standard of excellence. No faience produced either in China or any other Oriental country can dispute the palm with really representative specimens of Satsuma ware. Not without full reason have Western connoisseurs lavished panegyrics upon that exquisite production. The faience of the Kiōto artists never reached quite to the level of the Satsuma in quality of *pâte* and glowing mellowness of decoration; their materials were slightly inferior. But their skill as decorators was as great as its range was wide, and they produced a multitude of masterpieces on which alone Japan's ceramic fame might safely be rested.

Change of Style after the Restoration.

When the mediatization of the fiefs, in 1871, terminated the local patronage hitherto extended so munificently to artists, the Japanese ceramists gradually learned that they must thenceforth depend chiefly upon the markets of Europe and America. They had to appeal, in short, to an entirely new public, and how to secure its approval was to them a perplexing problem. Having little to guide them, they often interpreted Western taste incorrectly, and impaired their own reputation in a corresponding degree. Thus, in the early years of the Meiji era, there was a period of complete prostitution. No new skill was developed, and what remained of the old was expended chiefly upon the manufacture of meretricious objects, disfigured by excess of decoration and not relieved by any excellence of technique. In spite of their artistic defects, these specimens were exported in considerable numbers by merchants in the foreign settlements, and their first cost being very low, they found a not unremunerative market. But as European and American collectors became better acquainted with the capacities of the pre-Meiji potters, the great inferiority of these new specimens was recognized, and the prices commanded by the old wares gradually appreciated. What then happened was very natural: imitations of the old wares were produced, and having been sufficiently disfigured by staining and other processes calculated to lend an air of rust and age, they were sold to ignorant persons, who laboured under the singular yet common hallucination that the points to be looked for in specimens from early kilns were, not technical excellence, decorative tastefulness and richness of colour, but dinginess, imperfections and dirt; persons who imagined, in short, that defects which they would condemn at once in new porcelains ought to be regarded as merits in old. Of course a trade of that kind, based on deception, could not have permanent success. One of the imitators of "old Satsuma" was among the first to perceive that a new line must be struck out. Yet the earliest results of his awakened perception helped to demonstrate still further the depraved spirit that had come over Japanese art. For he applied himself to manufacture wares having a close affinity with the shocking monstrosities used for sepulchral purposes in ancient Apulia, where fragments of dissected satyrs, busts of nymphs or halves of horses were considered graceful excrescences for the adornment of an amphora or a pithos. This *Makuzu* faience, produced by the now justly celebrated Miyagawa Shōzan of Ota (near Yokohama), survives in the form of vases and pots having birds, reptiles, flowers, crustacea and so forth plastered over the surface—specimens that disgrace the period of their manufacture, and represent probably the worst aberration of Japanese ceramic conception.

Adoption of Chinese Models.

A production so degraded as the early Makuzu faience could not possibly have a lengthy vogue. Miyagawa soon began to cast about for a better inspiration, and found it in the monochromes and polychromes of the Chinese *Kang-hsi* and *Yung-cheng* kilns. The extraordinary value attaching to the incomparable red glazes of China, not only in the country of their origin but also in the United States, where collectors showed a fine instinct in this matter, seems to have suggested to Miyagawa the idea of imitation. He took for model the rich and delicate "liquid-dawn" monochrome, and succeeded in producing some specimens of considerable merit. Thenceforth his example was largely followed, and it may now be said that the tendency of many of the best Japanese ceramists is to copy Chinese *chefs-d'œuvre*. To find them thus renewing their reputation by reverting to Chinese models, is not only another tribute to the perennial supremacy of Chinese porcelains, but also a fresh illustration of the eclectic genius of Japanese art. All the products of this new effort are porcelains proper. Seven kilns are devoted, wholly or in part, to the new wares: belonging to Miyagawa Shōzan of Ota, Seifū Yōhei of Kiōto, Takemoto Hayata and Katō Tomojiro of Tōkyō, Higuchi Haruzane of Hirado, Shida Yasukyo of Kaga and Kato Masukichi of Seto.

Seifū of Kiōto.

Among the seven ceramists here enumerated, Seifū of Kiōto probably enjoys the highest reputation. If we except the ware of Satsuma, it may be said that nearly all the fine faience of Japan was manufactured formerly in Kiōto. Nomura Ninsei, in the middle of the 17th century, inaugurated a long era of beautiful productions with his cream-like "fish-roe" *craquelé* glazes, carrying rich decoration of clear and brilliant vitrifiable enamels. It was he who gave their first really artistic impulse to the kilns of Awata, Mizoro and Iwakura, whence so many delightful specimens of faience issued almost without interruption until the middle of the 19th century and continue to issue to-day. The three Kenzan, of whom the third died in 1820; Ebisei; the four Dōhachi, of whom the fourth was still alive in 1909; the Kagiya family, manufacturers of the celebrated Kinkōzan ware; Hōzan, whose imitations of Delft faience and his *pâte-sur-pâte* pieces with fern-scroll decoration remain incomparable; Taizan Yōhei, whose ninth descendant of the same name now produces fine specimens of Awata ware for foreign markets; Tanzan Yōshitaro and his son Rokuro, to whose credit stands a new departure in the form of faience having *pâte-sur-pâte* decoration of lace patterns, diapers and archaic designs executed in low relief with admirable skill and minuteness; the two Bizan, renowned for their representations of richly apparelled figures as decorative motives; Rokubei, who studied painting under Maruyama Ōkyō and followed the naturalistic style of that great artist; Mokubei, the first really expert manufacturer of translucid porcelain in Kiōto; Shūhei, Kintei, and above all, Zengoro Hōzen, the celebrated potter of Eiraku wares—these names and many others give to Kiōto ceramics an eminence as well as an individuality which few other wares of Japan can boast. Nor is it to be supposed that the ancient capital now lacks great potters. Okamura Yasutaro, commonly called Shōzan, produces specimens which only a very acute connoisseur can distinguish from the work of Nomura Ninsei; Tanzan Rokuro's half-tint enamels and soft creamy glazes would have stood high in any epoch; Taizan Yōhei produces Awata faience not inferior to that of former days; Kagiya Sōbei worthily supports the reputation of the Kinkōzan ware; Kawamoto Eijiro has made to the order of a well-known Kiōto firm many specimens now figuring in foreign collections as old masterpieces; and Itō Tōzan succeeds in decorating faience with seven colours *sous couverte* (black, green, blue, russet-red, tea-brown, purple and peach), a feat never before accomplished. It is therefore an error to assert that Kiōto has no longer a title to be called a great ceramic centre. Seifū Yōhei, however, has the special faculty of manufacturing monochromatic and jewelled porcelain and faience, which differ essentially from the traditional Kiōto types, their models being taken directly from China. But a sharp distinction has to be drawn between the method of Seifū and that of the other six ceramists mentioned above as following Chinese fashions. It is this, that whereas the latter produce their chromatic effects by mixing the colouring matter with the glaze, Seifū paints the biscuit with a pigment over which he runs a translucid colourless glaze. The Kiōto artist's process is much easier than that of his rivals, and although his monochromes are often of most pleasing delicacy and fine tone, they do not belong to the same category of technical excellence as the wares they imitate. From this judgment must be excepted, however, his ivory-white and *céladon* wares, as well as his porcelains decorated with blue, or blue and red *sous couverte*, and with vitrifiable enamels over the glaze. In these five varieties he is emphatically great. It cannot be said, indeed, that his *céladon* shows the velvety richness of surface and tenderness of colour that distinguished the old *Kuang-yao* and *Lungchuan-yao* of China, or that he has ever essayed the moss-edged crackle of the beautiful *Ko-yao*. But his *céladon* certainly equals the more modern Chinese examples from the *Kang-hsi* and *Yung-cheng* kilns. As for his ivory-white, it distinctly surpasses the Chinese Ming *Chen-yao* in every quality except an indescribable intimacy of glaze and *pâte* which probably can never be obtained by either Japanese or European methods.

Miyagawa Shōzan.

Miyagawa Shōzan, or Makuzu, as he is generally called, has never followed Seifū's example in descending from the difficult manipulation of coloured glazes to the comparatively simple process of painted biscuit. This comment does not refer to the use of blue and red *sous couverte*. In that class of beautiful ware the application of pigment to the unglazed *pâte* is inevitable, and both Seifū and Miyagawa, working on the same lines as their Chinese predecessors, produce porcelains that almost rank with choice Kang-hsi specimens, though they have not yet mastered the processes sufficiently to employ them in the manufacture of large imposing pieces or wares of moderate price. But in the matter of true monochromatic and polychromatic glazes, to Shōzan belongs the credit of having inaugurated Chinese fashions, and if he has never fully succeeded in achieving *lang-yao* (sang-de-bœuf), *chi-hung* (liquid-dawn red), *chiang-tou-hung* (bean-blossom red, the "peach-blow" of American collectors), or above all *pin-kwo-tsing* (apple-green with red bloom), his efforts to imitate them have resulted in some very interesting pieces.

Tōkyō Ceramists.

Takemoto and Katō of Tōkyō entered the field subsequently to Shōzan, but followed the same models approximately. Takemoto, however, has made a speciality of black glazes, his aim being to rival the *Sung Chien-yao*, with its glaze of mirror-black or raven's-wing green, and its leveret fur streaking or russet-moss dappling, the prince of all wares in the estimation of the Japanese tea-clubs. Like Shōzan, he is still very far from his original, but, also like Shōzan, he produces highly meritorious pieces in his efforts to reach an ideal that will probably continue to elude him for ever. Of Katō there is not much to be said. He has not succeeded in winning great distinction, but he manufactures some very delicate monochromes, fully deserving to be classed among prominent evidences of the new departure. Tōkyō was never a centre of ceramic production. Even during the 300 years of its conspicuous prosperity as the administrative capital of the Tokugawa shōguns, it had no noted factories, doubtless owing to the absence of any suitable potter's clay in the immediate vicinity. Its only notable production of a ceramic character was the work of Miura Kenya (1830–1843), who followed the methods of the celebrated Haritsu (1688–1704) of Kiōto in decorating plain or lacquered wood with mosaics of raku faience having coloured glazes. Kenya was also a skilled modeller of figures, and his factory in the Imado suburb obtained a considerable reputation for work of that nature. He was succeeded by Tozawa Benshi, an old man of over seventy in 1909, who, using clay from Owari or Hizen, has turned out many porcelain statuettes of great beauty. But although the capital of Japan formerly played only an insignificant part in Japanese ceramics, modern Tōkyō has an important school of artist-artisans. Every year large quantities of porcelain and faience are sent from the provinces to the capital to receive surface decoration, and in wealth of design as well as carefulness of execution the results are praiseworthy. But of the pigments employed nothing very laudatory could be said until very recent times. They were generally crude, of impure tone, and without depth or brilliancy. Now, however, they have lost these defects and entered a period of considerable excellence. Figure-subjects constitute the chief feature of the designs. A majority of the artists are content to copy old pictures of Buddha's sixteen disciples, the seven gods of happiness, and other similar assemblages of mythical or historical personages, not only because such work offers large opportunity for the use of striking colours and the production of meretricious effects, dear to the eye of the average Western householder and tourist, but also because a complicated design, as compared with a simple one, has the advantage of hiding the technical imperfections of the ware. Of late there have happily appeared some decorators who prefer to choose their subjects from the natural field in which their great predecessors excelled, and there is reason to hope that this more congenial and more pleasing style will supplant its modern usurper. The best known factory in Tōkyō for decorative purposes is the Hyōchi-en. It was established in the Fukagawa suburb in 1875, with the immediate object of preparing specimens for the first Tōkyō exhibition held at that time. Its founders obtained a measure of official aid, and were able to secure the services of some good artists, among whom may be mentioned Obanawa and Shimauchi. The porcelains of Owari and Arita naturally received most attention at the hands of the Hyōchi-en decorators, but there was scarcely one of the principal wares of Japan upon which they did not try their skill, and if a piece of monochromatic Minton or Sèvres came in their way, they undertook to improve it by the addition of designs copied from old masters or suggested by modern taste. The cachet of the Fukagawa atelier was indiscriminately applied to all such pieces, and has probably proved a source of confusion to collectors. Many other factories for decoration were established from time to time in Tōkyō. Of these some still exist; others, ceasing to be profitable, have been abandoned. On the whole, the industry may now be said to have assumed a domestic character. In a house, presenting no distinctive features whatsoever, one finds the decorator with a cupboard full of bowls and vases of glazed biscuit, which he adorns, piece by piece, using the simplest conceivable apparatus and a meagre supply of pigments. Sometimes he fixes the decoration himself, employing for that purpose a small kiln which stands in his back garden; sometimes he entrusts this part of the work to a factory. As in the case of everything Japanese, there is no pretence, no useless expenditure about the process. Yet it is plain that this school of Tōkyō decorators, though often choosing their subjects badly, have contributed much to the progress of the ceramic art during the past few years. Little by little there has been developed a degree of skill which compares not unfavourably with the work of the old masters. Table services of Owari porcelain — the ware itself excellently manipulated and of almost egg-shell fineness—are now decorated with floral scrolls, landscapes, insects, birds, figure-subjects and all sorts of designs, chaste, elaborate or quaint; and these services, representing so much artistic labour and originality, are sold for prices that bear no due ratio to the skill required in their manufacture.

There is only one reservation to be made in speaking of the modern decorative industry of Japan under its better aspects. In Tōkyō, Kiōto, Yokohama and Kobe—in all of which places decorating ateliers (*etsuke-dokoro*), similar to those of Tōkyō, have been established in modern times—the artists use chiefly pigments, seldom venturing to employ vitrifiable enamels. That the results achieved with these different materials are not comparable is a fact which every connoisseur must admit. The glossy surface of a porcelain glaze is ill fitted for rendering artistic effects with ordinary colours. The proper field for the application of these is the biscuit, in which position the covering glaze serves at once to soften and to preserve the pigment. It can scarcely be doubted that the true instincts of the ceramist will ultimately counsel him to confine his decoration over the glaze to vitrifiable enamels, with which the Chinese and Japanese potters of former times obtained such brilliant results. But to employ enamels successfully is an achievement demanding special training and materials not easy to procure or to prepare. The Tōkyō decorators are not likely, therefore, to change their present methods immediately.

An impetus was given to ceramic decoration by the efforts of a new school, which owed its origin to Dr G. Wagener, an eminent German expert formerly in the service of the Japanese government. Dr Wagener conceived the idea of developing the art of decoration under the glaze, as applied to faience. Faience thus decorated has always been exceptional in Japan. Rare specimens were produced in Satsuma and Kiōto, the colour employed being chiefly blue, though brown and black were used in very exceptional instances. The difficulty of obtaining clear, rich tints was nearly prohibitive, and though success, when achieved, seemed to justify the effort, this class of ware never received much attention in Japan. By careful selection and preparation of *pâte*, glaze and pigments, Dr Wagener proved not only that the manufacture was reasonably feasible, but also that decoration thus applied to pottery possesses unique delicacy and softness. Ware manufactured by his direction at the Tōkyō school of technique (*shokkô gakkô*), under the name of *asahi-yaki*, ranks among the interesting productions of modern Japan. The decorative colour chiefly employed is chocolate brown, which harmonizes excellently with the glaze. But the ware has never found favour in Japanese eyes, an element of unpleasant garishness being imparted to it by the vitreous appearance of the glaze, which is manufactured according to European methods. The modern faience of Ito Tōzan of Kiōto, decorated with colour under the glaze, is incomparably more artistic than the Tōkyō *asahi-yaki*, from which, nevertheless, the Kiōto master doubtless borrowed some ideas. The decorative industry in Tōkyō owed much also to the kōshō-kaisha, an institution started by Wakai and Matsuo in 1873, with official assistance. Owing to the intelligent patronage of this company, and the impetus given to the ceramic trade by its enterprise, the style of the Tōkyō *etsuke* was much improved and the field of their industry extended. It must be acknowledged, however, that the Tōkyō artists often devote their skill to purposes of forgery, and that their imitations, especially of old Satsuma-yaki, are sometimes franked by dealers whose standing should forbid such frauds. In this context it may be mentioned that, of late years, decoration of a remarkably microscopic character has been successfully practised in Kiōto, Osaka and Kobe, its originator being Meisan of Osaka. Before dismissing the subject of modern Tōkyō ceramics, it may be added that Katō Tomatarō, mentioned above in connexion with the manufacture of special glazes, has also been very successful in producing porcelains decorated with blue *sous couverte* at his factory in the Koishikawa suburb.

Modern Wares of Hirado.

Higuchi of Hirado is to be classed with ceramists of the new school on account of one ware only, namely, porcelain having translucid decoration, the so-called "grains of rice" of American collectors, designated *hotaru-de* (firefly style) in Japan. That, however, is an achievement of no small consequence, especially since it had never previously been essayed outside China. The Hirado expert has not yet attained technical skill equal to that of the Chinese. He cannot, like them, cover the greater part of a specimen's surface with a lacework of transparent decoration, exciting wonder that *pâte* deprived so greatly of continuity could have been manipulated without accident. But his artistic instincts are higher than those of the Chinese, and there is reasonable hope that in time he may excel their best works. In other respects the Hirado factories do not produce wares nearly so beautiful as those manufactured there between 1759 and 1840, when the *Hirado-yaki* stood at the head of all Japanese porcelain on account of its pure, close-grained *pâte*, its lustrous milk-white glaze, and the soft clear blue of its carefully executed decoration.

Ware of Owari.

The Owari potters were slow to follow the lead of Miyagawa Shōzan and Seifū Yōhei. At the industrial exhibition in Kiōto (1895) the first results of their efforts were shown, attracting attention at once. In medieval times Owari was celebrated for faience glazes of various colours, much affected by the tea-clubs, but its staple manufacture from the beginning of the 19th century was porcelain decorated with blue under the glaze, the best specimens of which did not approach their Chinese prototypes in fineness of *pâte*, purity of glaze or richness of colour. During the first twenty-five years of the Meiji era the Owari potters sought to compensate the technical and artistic defects of their pieces by giving them magnificent dimensions; but at the Tōkyō industrial exhibition (1891) they were able to contribute some specimens showing decorative, plastic and graving skill of no mean order. Previously to that time, one of the Seto experts, Katō Gosuke, had developed remarkable ability in the manufacture of *céladon*, though in that field he was subsequently distanced by Seifū of Kiōto. Only lately did Owari feel the influence of the new movement towards Chinese types. Its potters took *flambé* glazes for models, and their pieces possessed an air of novelty that attracted connoisseurs. But the style was not calculated to win general popularity, and the manufacturing processes were too easy to occupy the attention of great potters. On a far higher level stood egg-shell porcelain, remarkable examples of which were sent from Seto to the Kiōto industrial exhibition of 1895. Chinese potters of the Yung-lo era (1403–1414) enriched their country with a quantity of ware to which the name of *totai-ki* (bodiless utensil) was given on account of its wonderfully attenuated *pâte*. The finest specimens of this porcelain had incised decoration, sparingly employed but adding much to the beauty of the piece. In subsequent eras the potters of King-te-chen did not fail to continue this remarkable manufacture, but its only Japanese representative was a porcelain distinctly inferior in more than one respect, namely, the egg-shell utensils of Hizen and Hirado, some of which had finely woven basket-cases to protect their extreme fragility. The Seto experts, however, are now making bowls, cups and vases that rank nearly as high as the celebrated Yung-lo totai-ki. In purity of tone and velvet-like gloss of surface there is distinct inferiority on the side of the Japanese ware, but in thinness of *pâte* it supports comparison, and in profusion and beauty of incised decoration it excels its Chinese original.

Ware of Kaga.

Latest of all to acknowledge the impulse of the new departure have been the potters of Kaga. For many years their ware enjoyed the credit, or discredit, of being the most lavishly decorated porcelain in Japan. It is known to Western collectors as a product blazing with red and gold, a very degenerate offspring of the Chinese Ming type, which Hozen of Kiōto reproduced so beautifully at the beginning of the 19th century under the name of *eiraku-yaki*. Undoubtedly the best specimens of this *kinran-de* (brocade) porcelain of Kaga merit praise and admiration; but, on the whole, ware so gaudy could not long hold a high place in public esteem. The Kaga potters ultimately appreciated that defect. They still manufacture quantities of tea and coffee sets, and dinner or dessert services of red-and-gold porcelain for foreign markets; but about 1885 some of them made zealous and patient efforts to revert to the processes that won so much fame for the old Kutani-yaki, with its grand combinations of rich, lustrous, soft-toned glazes. The attempt was never entirely successful, but its results restored something of the Kaga kilns' reputation. Since 1895, again, a totally new departure has been made by Morishita Hachizaemon, a ceramic expert, in conjunction with Shida Yasukyo, president of the Kaga products joint stock company (*Kaga bussan kabushiki kaisha*) and teacher in the Kaga industrial school. The line chosen by these ceramists is purely Chinese. Their great aim seems to be the production of the exquisite Chinese monochromes known as *u-kwo-tien-tsing* (blue of the sky after rain) and *yueh-peh* (*clair-de-lune*). But they also devote much attention to porcelains decorated with blue or red *sous couverte*. Their work shows much promise, but like all fine specimens of the Sino-Japanese school, the prices are too high to attract wide custom.

Summary.

The sum of the matter is that the modern Japanese ceramist, after many efforts to cater for the taste of the Occident, evidently concludes that his best hope consists in devoting all his technical and artistic resources to reproducing the celebrated wares of China. In explanation of the fact that he did not essay this route in former times, it may be noted, first, that he had only a limited acquaintance with the wares in question; secondly, that Japanese connoisseurs never attached any value to their countrymen's imitation of Chinese porcelains so long as the originals were obtainable; thirdly, that the ceramic art of China not having fallen into its present state of decadence, the idea of competing with it did not occur to outsiders; and fourthly, that Europe and America had not developed their present keen appreciation of Chinese masterpieces. Yet it is remarkable that China, at the close of the 19th century, should have again furnished models to Japanese eclecticism.

Lacquer.—Japan derived the art of lacquering from China (probably about the beginning of the 6th century), but she ultimately carried it far beyond Chinese conception. At first her experts confined themselves to plain black lacquer. From the early part of the 8th century they began to ornament it with dust of gold or mother-of-pearl, and throughout the Heian epoch (9th to 12th century) they added pictorial designs, though of a formal character, the chief motives being floral subjects, arabesques and scrolls. All this work was in the style known as *hira-makie* (flat decoration); that is to say, having the decorative design in the same plane as the ground. In the days of the great dilettante Yoshimasa (1449–1490), lacquer experts devised a new style, *taka-makie*, or decoration in relief, which immensely augmented the beauty of the ware, and constituted a feature altogether special to Japan. Thus when, at the close of the 16th century, the Taikō inaugurated the fashion of lavishing all the resources of applied art on the interior decoration of castles and temples, the services of the lacquerer were employed to an extent hitherto unknown, and there resulted some magnificent work on friezes, coffered ceilings, door panels, altar-pieces and cenotaphs. This new departure reached its climax in the Tokugawa mausolea of Yedo and Nikkō, which are enriched by the possession of the most splendid applications of lacquer decoration the world has ever seen, nor is it likely that anything of comparable beauty and grandeur will be again produced in the same line. Japanese connoisseurs indicate the end of the 17th century as the golden period of the art, and so deeply rooted is this belief that whenever a date has to be assigned to any specimen of exceptionally fine quality, it is unhesitatingly referred to the time of Joken-in (Tsunayoshi).

Among the many skilled artists who have practised this beautiful craft since the first on record, Kiyohara Norisuye (*c.* 1169), may be mentioned Kōyetsu (1558–1637) and his pupils, who are especially noted for their *inro* (medicine-cases worn as part of the costume); Kajikawa Kinjirō (*c.* 1680), the founder of the great Kajikawa family, which continued up to the 19th century; and Koma Kyūhaku (d. 1715), whose pupils and descendants maintained his traditions for a period of equal length. Of individual artists, perhaps the most notable is Ogata Kōrin (d. 1716), whose skill was equally great in the arts of painting and pottery. He was the eldest son of an artist named Ogato Sōken, and studied the styles of the Kanō and Tosa schools successively. Among the artists who influenced him were Kanō Tsunenobu, Nomura Sōtatsu and Kōyetsu. His lacquer-ware is distinguished for a bold and at times almost eccentric impressionism, and his use of inlay is strongly characteristic. Ritsuō (1663–1747), a pupil and contemporary of Kōrin, and like him a potter and painter also, was another lacquerer of great skill. Then followed Hanzan, the two Shiome, Yamamoto Shunshō and his pupils, Yamada Jōka and Kwanshōsai Tōyō (late 18th century). In the beginning of the 19th century worked Shōkwasai, who frequently collaborated with the metal-worker Shibayama, encrusting his lacquer with small decorations in metal by the latter.

Modern Work.

No important new developments have taken place during modern times in Japan's lacquer manufacture. Her artists follow the old ways faithfully; and indeed it is not easy to see how they could do better. On the other hand, there has not been any deterioration; all the skill of former days is still active. The contrary has been repeatedly affirmed by foreign critics, but no one really familiar with modern productions can entertain such a view. Lacquer-making, however, being essentially an art and not a mere handicraft, has its eras of great masters and its seasons of inferior execution. Men of the calibre of Kōyetsu Kōrin, Ritsuō, Kajikawa and Mitsutoshi must be rare in any age, and the epoch when they flourished is justly remembered with enthusiasm. But the Meiji era has had its Zeshin, and it had in 1909 Shirayama Fukumatsu, Kawanabe Itchō, Ogāwa Shōmin, Uematsu Hōmin, Shibayama Sōichi, Morishita Morihachi and other lesser experts, all masters in designing and execution. Zeshin, shortly before he died, indicated Shirayama Fukumatsu as the man upon whom his mantle should descend, and that the judgment of this really great craftsman was correct cannot be denied by any one who has seen the works of Shirayama. He excels in his representations of landscapes and waterscapes, and has succeeded in transferring to gold-lacquer panels tender and delicate pictures of nature's softest moods—pictures that show balance, richness, harmony and a fine sense of decorative proportion. Kawanabe Itchō is celebrated for his representations of flowers and foliage, and Morishita Morihachi and Asano Saburo (of Kaga) are admirable in all styles, but especially, perhaps, in the charming variety called *togi-dashi* (ground down), which is pre-eminent for its satin-like texture and for the atmosphere of dreamy softness that pervades the decoration. The togi-dashi design, when finely executed, seems to hang suspended in the velvety lacquer or to float under its silky surface. The magnificent sheen and richness of the pure *kin-makie* (gold lacquer) are wanting, but in their place we have inimitable tenderness and delicacy.

New Development.

The only branch of the lacquerer's art that can be said to have shown any marked development in the Meiji era is that in which parts of the decorative scheme consist of objects in gold, silver, shakudo, shibuichi, iron, or, above all, ivory or mother-of pearl. It might indeed be inferred, from some of the essays published in Europe on the subject of Japan's ornamental arts, that this application of ivory and mother-of-pearl holds a place of paramount importance. Such is not the case. Cabinets, fire-screens, plaques and boxes resplendent with gold lacquer grounds carrying elaborate and profuse decoration of ivory and mother-of-pearl [1] are not objects that appeal to Japanese taste. They belong essentially to the catalogue of articles called into existence to meet the demand of the foreign market, being, in fact, an attempt to adapt the lacquerer's art to decorative furniture for European houses. On the whole it is a successful attempt. The plumage of gorgeously-hued birds, the blossoms of flowers (especially the hydrangea), the folds of thick brocade, microscopic diapers and arabesques, are built up with tiny fragments of iridescent shell, in combination with silver-foil, gold-lacquer and coloured bone, the whole producing a rich and sparkling effect. In fine specimens the workmanship is extraordinarily minute, and every fragment of metal, shell, ivory or bone, used to construct the decorative scheme, is imbedded firmly in its place. But in a majority of cases the work of building is done by means of paste and glue only, so that the result lacks durability. The employment of mother-of-pearl to ornament lacquer grounds dates from a period as remote as the 8th century, but its use as a material for constructing decorative designs began in the 17th century, and was due to an expert called Shibayama, whose descendant, Shibayama Sōichi, has in recent years been associated with the same work in Tōkyō.

Processes.

In the manufacture of Japanese lacquer there are three processes. The first is the extraction and preparation of the lac; the second, its application; and the third, the decoration of the lacquered surface. The lac, when taken from an incision in the trunk of the *Rhus vernicifera* (*urushi-no-ki*), contains approximately 70% of lac acid, 4% of gum arabic, 2% of albumen, and 24% of water. It is strained, deprived of its moisture, and receives an admixture of gamboge, cinnabar, acetous protoxide or some other colouring matter. The object to be lacquered, which is generally made of thin white pine, is subjected to singularly thorough and painstaking treatment, one of the processes being to cover it with a layer of Japanese paper or thin hempen cloth, which is fixed by means of a pulp of rice-paste and lacquer. In this way the danger of warping is averted, and exudations from the wooden surface are prevented from reaching the overlaid coats of lacquer. Numerous operations of luting, sizing, lacquering, polishing, drying, rubbing down, and so on, are performed by the *nurimono-shi*, until, after many days' treatment, the object emerges with a smooth, lustre-like dark-grey or coloured surface, and is ready to pass into the hands of the *makie-shi*, or decorator. The latter is an artist; those who have performed the preliminary operations are merely skilled artisans. The makie-shi may be said to paint a picture on the surface of the already lacquered object. He takes for subject a landscape, a seascape, a battle-scene, flowers, foliage, birds, fishes, insects—in short, anything. This he sketches in outline with a paste of white lead, and then, having filled in the details with gold and colours, he superposes a coat of translucid lacquer, which is finally subjected to careful polishing. If parts of the design are to be in relief, they are built up with a putty of black lacquer, white lead, camphor and lamp-black. In all fine lacquers gold predominates so largely that the general impression conveyed by the object is one of glow and richness. It is also an inviolable rule that every part must show beautiful and highly finished work, whether it be an external or an internal part. The makie-shi ranks almost as high as the pictorial artist in Japanese esteem. He frequently signs his works, and a great number of names have been thus handed down during the past two centuries.

Cloisonné Enamel.—Cloisonné enamel is essentially of modern development in Japan. The process was known at an early period, and was employed for the purpose of subsidiary decoration from the close of the 16th century, but not until the 19th century did Japanese experts begin to manufacture the objects known in Europe as "enamels;" that is to say, vases, plaques, censers, bowls, and so forth, having their surface covered with vitrified pastes applied either in the *champlevé* or the *cloisonné* style. It is necessary to insist upon this fact, because it has been stated with apparent authority that numerous specimens which began to be exported from 1865 were the outcome of industry commencing in the 16th century and reaching its point of culmination at the beginning of the 18th. There is not the slenderest ground for such a theory. The work began in 1838, and Kaji Tsunekichi of Owari was its originator. During 20 years previously to the reopening of the country in 1858, cloisonné enamelling was practised in the manner now understood by the term; when foreign merchants began to settle in Yokohama, several experts were working skilfully in Owari after the methods of Kaji Tsunekichi. Up to that time there had been little demand for enamels of large dimensions, but when the foreign market called for vases, censers, plaques and such things, no difficulty was found in supplying them. Thus, about the year 1865, there commenced an export of enamels which had no prototypes in Japan, being destined frankly for European and American collectors. From a technical point of view these specimens had much to recommend them. The base, usually of copper, was as thin as cardboard; the cloisons, exceedingly fine and delicate, were laid on with care and accuracy; the colours were even, and the designs showed artistic judgment. Two faults, however, marred the work—first, the shapes were clumsy and unpleasing, being copied from bronzes whose solidity justified forms unsuited to thin enamelled vessels; secondly, the colours, sombre and somewhat impure, lacked the glow and mellowness that give decorative superiority to the technically inferior Chinese enamels of the later Ming and early Tsing eras. Very soon, however, the artisans of Nagoya (Owari), Yokohama and Tōkyō—where the art had been taken up—found that faithful and fine workmanship did not pay. The foreign merchant desired many and cheap specimens for export, rather than few and costly. There followed then a period of gradual decline, and the enamels exported to Europe showed so much inferiority that they were supposed to be the products of a widely different era and of different makers. The industry was threatened with extinction, and would certainly have dwindled to insignificant dimensions had not a few earnest artists, working in the face of many difficulties and discouragements, succeeded in striking out new lines and establishing new standards for excellence.

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[1] Obtained from the shell of the *Halictis*.

New Schools.

Three clearly differentiated schools now (1875) came into existence. One, headed by Namikawa Yasuyuki of Kiōto, took for its objects the utmost delicacy and perfection of technique, richness of decoration, purity of design and harmony of colour. The thin clumsily-shaped vases of the Kaji school, with their uniformly distributed decoration of diapers, scrolls and arabesques in comparatively dull colours, ceased altogether to be produced, their place being taken by graceful specimens, technically flawless, and carrying designs not only free from stiffness, but also executed in colours at once rich and soft. This school may be subdivided, Kiōto representing one branch, Nagoya, Tōkyō and Yokohama the other. In the products of the Kiōto branch the decoration generally covered the whole surface of the piece; in the products of the other branch the artist aimed rather at pictorial effect, placing the design in a monochromatic field of low tone. It is plain that such a method as the latter implies great command of coloured pastes, and, indeed, no feature of the manufacture is more conspicuous than the progress made during the period 1880–1900 in compounding and firing vitrifiable enamels. Many excellent examples of cloisonné enamel have been produced by each branch of this school. There has been nothing like them in any other country, and they stand at an immeasurable distance above the works of the early Owari school represented by Kaji Tsunekichi and his pupils and colleagues.

Cloisonless Enamels.

The second of the modern schools is headed by Namikawa Sosuke of Tōkyō. It is an easily traced outgrowth of the second branch of the first school just described, for one can readily understand that from placing the decorative design in a monochromatic field of low tone, which is essentially a pictorial method, development would proceed in the direction of concealing the mechanics of the art in order to enhance the pictorial effect. Thus arose the so-called "cloisonless enamels" (*musenjippō*). They are not always without cloisons. The design is generally framed at the outset with a ribbon of thin metal, precisely after the manner of ordinary cloisonné ware. But as the work proceeds the cloisons are hidden—unless their presence is necessary to give emphasis to the design—and the final result is a picture in vitrified enamels.

Monochromatic Enamels.

The characteristic productions of the third among the modern schools are monochromatic and translucid enamels. All students of the ceramic art know that the monochrome porcelains of China owe their beauty to the fact that the colour is in the glaze, not under it. The ceramist finds no difficulty in applying a uniform coat of pigment to porcelain biscuit, and covering the whole with a diaphanous glaze. The colour is fixed and the glaze set by secondary firing at a lower temperature than that necessary for hardening the *pâte*. Such porcelains, however, lack the velvet-like softness and depth of tone so justly prized in the genuine monochrome, where the glaze itself contains the colouring matter, *pâte* and glaze being fired simultaneously at the same high temperature. It is apparent that a vitrified enamel may be made to perform, in part at any rate, the function of a porcelain glaze. Acting upon that theory, the experts of Tōkyō and Nagoya have produced many very beautiful specimens of monochrome enamel—yellow (canary or straw), *rose du Barry*, liquid-dawn, red, aubergine purple, green (grass or leaf), dove-grey and lapis lazuli blue. The pieces do not quite reach the level of Chinese monochrome porcelains, but their inferiority is not marked. The artist's great difficulty is to hide the metal base completely. A monochrome loses much of its attractiveness when the colour merges into a metal rim, or when the interior of a vase is covered with crude unpolished paste. But to spread and fix the enamel so that neither at the rim nor in the interior shall there be any break of continuity, or any indication that the base is copper, not porcelain, demands quite exceptional skill.

Translucid Enamel.

The translucid enamels of the modern school are generally associated with decorative bases. In other words, a suitable design is chiselled in the metal base so as to be visible through the diaphanous enamel. Very beautiful effects of broken and softened lights, combined with depth and delicacy of colour, are thus obtained. But the decorative designs which lend themselves to such a purpose are not numerous. A gold base deeply chiselled in wave-diaper and overrun with a paste of aubergine purple is the most pleasing. A still higher achievement is to apply to the chiselled base designs executed in coloured enamels, finally covering the whole with translucid paste. Admirable results are thus produced; as when, through a medium of cerulean blue, bright goldfish and blue-backed carp appear swimming in silvery waves, or brilliantly plumaged birds seem to soar among fleecy clouds. The artists of this school show also much skill in using enamels for the purposes of subordinate decoration—suspending enamelled butterflies, birds or floral sprays, among the reticulations of a silver vase chiselled *à jour*; or filling with translucid enamels parts of a decorative scheme sculptured in iron, silver, gold or shakudo.

V.—Economic Conditions

Roads and Posts in Early Times.

Communications.—From the conditions actually existing in the 8th century after the Christian era the first compilers of Japanese history inferred the conditions which might have existed in the 7th century before that era. One of their inferences was that, in the early days, communication was by water only, and that not until 549 B.C. did the most populous region of the empire—the west coast—come into possession of public roads. Six hundred years later, the local satraps are represented as having received instructions to build regular highways, and in the 3rd century the massing of troops for an over-sea expedition invested roads with new value. Nothing is yet heard, however, about posts. These evidences of civilization did not make their appearance until the first great era of Japanese reform, the Taika period (645–650), when stations were established along the principal highways, provision was made of post-horses, and a system of bells and checks was devised for distinguishing official carriers. In those days ordinary travellers were required to carry passports, nor had they any share in the benefits of the official organization, which was entirely under the control of the minister of war. Great difficulties attended the movements of private persons. Even the task of transmitting to the central government provincial taxes paid in kind had to be discharged by specially organized parties, and this journey from the north-eastern districts to the capital generally occupied three months. At the close of the 7th century the emperor Mommu is said to have enacted a law that wealthy persons living near the highways must supply rice to travellers, and in 745 an empress (Koken) directed that a stock of medical necessaries must be kept at the postal stations. Among the benevolent acts attributed to renowned Buddhist priests posterity specially remembers their efforts to encourage the building of roads and bridges. The great emperor Kwammu (782–806) was constrained to devote a space of five years to the reorganization of the whole system of post-stations. Owing to the anarchy which prevailed during the 10th, 11th and 12th centuries, facilities of communication disappeared almost entirely, even for men of rank a long journey involved danger of starvation or fatal exposure, and the pains and perils of travel became a household word among the people.

Yoritomo, the founder of feudalism at the close of the 12th century, was too great a statesman to underestimate the value of roads and posts. The highway between his stronghold, Kamakura, and the imperial city, Kiōto, began in his time to develop features which ultimately entitled it to be called one of the finest roads in the world. But after Yoritomo's death the land became once more an armed camp, in which the rival barons discouraged travel beyond the limits of their own domains. Not until the Tokugawa family obtained military control of the whole empire (1603), and, fixing its capital at Yedo, required the feudal chiefs to reside there every second year, did the problem of roads and post-stations force itself once more on official attention. Regulations were now strictly enforced, fixing the number of horses and carriers available at each station, the loads to be carried by them and their charges, as well as the transport services that each feudal chief was entitled to demand and the fees he had to pay in return. Tolerable hostelries now came into existence, but they furnished only shelter, fuel and the coarsest kind of food. By degrees, however, the progresses of the feudal chiefs to and from Yedo, which at first were simple and economical, developed features of competitive magnificence, and the importance of good roads and suitable accommodation received increased attention. This found expression in practice in 1663. A system more elaborate than anything antecedent was then introduced under the name of "flying transport." Three kinds of couriers operated. The first class were in the direct employment of the shōgunate. They carried official messages between Yedo and Osaka—a distance of 348 miles—in four days by means of a well organized system of relays. The second class maintained communications between the fiefs and the Tokugawa court as well as their own families in Yedo, for in the alternate years of a feudatory's compulsory residence in that city his family had to live there. The third class were maintained by a syndicate of 13 merchants as a private enterprise for transmitting letters between the three great cities of Kiōto, Osaka and Yedo and intervening places. This syndicate did not undertake to deliver a letter direct to an addressee. The method pursued was to expose letters and parcels at fixed places in the vicinity of their destination, leaving the addressees to discover for themselves that such things had arrived. Imperfect as this system was, it represented a great advance from the conditions in medieval times.

The Tōkaidō.

The Nakasendō.

The Oshūkaidō.

The nation does not seem to have appreciated the deficiencies of the syndicate's service, supplemented as it was by a network of waterways which greatly increased the facilities for transport. After the cessation of civil wars under the sway of the Tokugawa, the building and improvement of roads went on steadily. It is not too much to say, indeed, that when Japan opened her doors to foreigners in the middle of the 19th century, she possessed a system of roads some of which bore striking testimony to her medieval greatness. The most remarkable was the Tōkaidō (eastern-sea way), so called because it ran eastward along the coast from Kiōto. This great highway, 345 m. long, connected Osaka and Kiōto with Yedo. The date of its construction is not recorded, but it certainly underwent signal improvement in the 12th and 13th centuries, and during the two and a half centuries of Tokugawa sway in Yedo. A wide, well-made and well-kept avenue, it was lined throughout the greater part of its length by giant pine-trees, rendering it the most picturesque highway in the world. Iyeyasu, the founder of the Tokugawa dynasty of shōguns, directed that his body should be interred at Nikkō, a place of exceptional beauty, consecrated eight hundred years previously. This meant an extension of the Tōkaidō (under a different name) nearly a hundred miles northward, for the magnificent shrines erected then at Nikkō and the periodical ceremonies thenceforth performed there demanded a correspondingly fine avenue of approach. The original Tōkaidō was taken for model, and Yedo and Nikkō were joined by a highway flanked by rows of cryptomeria. Second only to the Tōkaidō is the Nakasendō (mid-mountain road), which also was constructed to join Kiōto with Yedo, but follows an inland course through the provinces of Yamashiro, Omi, Mino, Shinshū, Kōtzuke and Musashi. Its length is 340 m., and though not flanked by trees or possessing so good a bed as the Tōkaidō, it is nevertheless a sufficiently remarkable highway. A third road, the Oshūkaidō runs northward from Yedo (now Tōkyō) to Aomori on the extreme north of the main island, a distance of 445 m., and several lesser highways give access to other regions.

Modern Superintendence of Roads.

The question of road superintendence received early attention from the government of the restoration. At a general assembly of local prefects held at Tōkyō in June 1875 it was decided to classify the different roads throughout the empire, and to determine the several sources from which the sums necessary for their maintenance and repair should be drawn. After several days' discussion all roads were eventually ranged under one or other of the following heads:—

- I. National roads, consisting of—
    - Class 1. Roads leading from Tōkyō to the various treaty ports.
    - Class 2. Roads leading from Tōkyō to the ancestral shrines in the province of Isē, and also to the cities or to military stations.
    - Class 3. Roads leading from Tōkyō to the prefectural offices, and those forming the lines of connexion between cities and military stations.
- II. Prefectural roads, consisting of—
    - Class 1. Roads connecting different prefectures, or leading from military stations to their outposts.
    - Class 2. Roads connecting the head offices of cities and prefectures with their branch offices.
    - Class 3. Roads connecting noted localities with the chief town of such neighbourhoods, or leading to seaports convenient of access.
- III. Village roads, consisting of—
    - Class 1. Roads passing through several localities in succession, or merely leading from one locality to another.
    - Class 2. Roads specially constructed for the convenience of irrigation, pasturage, mines, factories, &c., in accordance with measures determined by the people of the locality.
    - Class 3. Roads constructed for the benefit of Shintō shrines, Buddhist temples, or to facilitate the cultivation of rice-fields and arable land.

Of the above three headings, it was decided that all national roads should be maintained at the national expense, the regulations for their up-keep being entrusted to the care of the prefectures along the line of route, and the cost incurred being paid from the Imperial treasury. Prefectural roads are maintained by a joint contribution from the government and from the particular prefecture, each paying one-half of the sum needed. Village roads, being for the convenience of local districts alone, are maintained at the expense of such districts under the general supervision of the corresponding prefecture. The width of national roads was determined at 42 ft. for class 1, 36 ft. for class 2, and 30 ft. for class 3; the prefectural roads were to be from 24 to 30 ft., and the dimensions of the village roads were optional, according to the necessity of the case.

Vehicles.

The Jinrikisha.

The vehicles chiefly employed in ante-Meiji days were ox-carriages, *norimono*, *kago* and carts drawn by hand. Ox-carriages were used only by people of the highest rank. They were often constructed of rich lacquer; the curtains suspended in front were of the finest bamboo workmanship, with thick cords and tassels of plaited silk, and the draught animal, an ox of handsome proportions, was brilliantly caparisoned. The care and expense lavished upon these highly ornate structures would have been deemed extravagant even in medieval Europe. They have passed entirely out of use, and are now to be seen in museums only, but the type still exists in China. The norimono resembled a miniature house slung by its roof-ridge from a massive pole which projected at either end sufficiently to admit the shoulders of a carrier. It, too, was frequently of very ornamental nature and served to carry aristocrats or officials of high position. The kago was the humblest of all conveyances recognized as usable by the upper classes. It was an open palanquin, V-shaped in cross section, slung from a pole which rested on the shoulders of two bearers. Extraordinary skill and endurance were shown by the men who carried the norimono and the kago, but none the less these vehicles were both profoundly uncomfortable. They have now been relegated to the warehouses of undertakers, where they serve as bearers for folks too poor to employ catafalques, their place on the roads and in the streets having been completely taken by the *jinrikisha*, a two-wheeled vehicle pulled by one or two men who think nothing of running 20 m. at the rate of 6 m. an hour. The jinrikisha was devised by a Japanese in 1870, and since then it has come into use throughout the whole of Asia eastward of the Suez Canal. Luggage, of course, could not be carried by norimono or kago. It was necessary to have recourse to packmen, packhorses or baggage-carts drawn by men or horses. All these still exist and are as useful as ever within certain limits. In the cities and towns horses used as beasts of burden are now shod with iron, but in rural or mountainous districts straw shoes are substituted, a device which enables the animals to traverse rocky or precipitous roads with safety.

Railways.—It is easy to understand that an enterprise like railway construction, requiring a great outlay of capital with returns long delayed, did not at first commend itself to the Japanese, who were almost entirely ignorant of co-operation as a factor of business organization. Moreover, long habituated to snail-like modes of travel, the people did not rapidly appreciate the celerity of the locomotive. Neither the ox-cart, the norimono, nor the kago covered a daily distance of over 20 m. on the average, and the packhorse was even slower. Amid such conditions the idea of railways would have been slow to germinate had not a catastrophe furnished some impetus. In 1869 a rice-famine occurred in the southern island, Kiūshiū, and while the cereal was procurable abundantly in the northern provinces, people in the south perished of hunger owing to lack of transport facilities. Sir Harry Parkes, British representative in Tōkyō, seized this occasion to urge the construction of railways. Ito and Okuma, then influential members of the government, at once recognized the wisdom of his advice. Arrangements were made for a loan of a million sterling in London on the security of the customs revenue, and English engineers were engaged to lay a line between Tōkyō and Yokohama (18 m.). Vehement voices of opposition were at once raised in private and official circles alike, all persons engaged in transport business imagined themselves threatened with ruin, and conservative patriots detected loss of national independence in a foreign loan. So fierce was the antagonism that the military authorities refused to permit operations of survey in the southern suburb of Tōkyō, and the road had to be laid on an embankment constructed in the sea. Ito and Okuma, however, never flinched, and they were ably supported by Marquis M. Inouye and M. Mayejima. The latter published, in 1870, the first Japanese work on railways, advocating the building of lines from Tōkyō to Kiōto and Osaka; the former, appointed superintendent of the lines, held that post for 30 years, and is justly spoken of as "the father of Japanese railways."

September 1872 saw the first official opening of a railway (the Tōkyō-Yokohama line) in Japan, the ceremony being performed by the emperor himself, a measure which effectually silenced all further opposition. Eight years from the time of turning the first sod saw 71 m. of road open to traffic, the northern section being that between Tōkyō and Yokohama, and the southern that between Kiōto and Kobe. A period of interruption now ensued, owing to domestic troubles and foreign complications, and when, in 1878, the government was able to devote attention once again to railway problems, it found the treasury empty. Then for the first time a public works loan was floated in the home market, and about £300,000 of the total thus obtained passed into the hands of the railway bureau, which at once undertook the building of a road from Kiōto to the shore of Lake Biwa, a work memorable as the first line built in Japan without foreign assistance.[1] During all this time private enterprise had remained wholly inactive in the matter of railways, and it became a matter of importance to rouse the people from this apathetic attitude. For the ordinary process of organizing a joint-stock company and raising share-capital the nation was not yet prepared. But shortly after the abolition of feudalism there had come into the possession of the former feudatories state loan-bonds amounting to some 18 millions sterling, which represented the sum granted by the treasury in commutation of the revenues formerly accruing to these men from their fiefs. Already events had shown that the feudatories, quite devoid of business experience, were not unlikely to dispose of these bonds and devote the proceeds to unsound enterprises. Prince Iwakura, one of the leaders of the Meiji statesmen, persuaded the feudatories to employ a part of the bonds as capital for railway construction, and thus the first private railway company was formed in Japan under the name *Nippon tetsudo kaisha* (Japan railway company), the treasury guaranteeing 8% on the paid-up capital for a period of 15 years. Some time elapsed before this example found followers, but ultimately a programme was elaborated and carried out having for its basis a grand trunk line extending the whole length of the main island from Aomori on the north to Shimonoseki on the south, a distance of 1153 m.; and a continuation of the same line throughout the length of the southern island of Kiūshiū, from Moji on the north—which lies on the opposite side of the strait from Shimonoseki—to Kagoshima on the south, a distance of 232¾ m.; as well as a line from Moji to Nagasaki, a distance of 163½ m. Of this main road the state undertook to build the central section (376 m.), between Tōkyō and Kōbe (via Kiōto); the Japan railway company undertook the portion (457 m.) northward of Tōkyō to Aomori; the Sanyō railway company undertook the portion (320 m.) southward of Tōkyō to Shimonoseki; and the Kiūshiū railway company undertook the lines in Kiūshiū. The whole line is now in operation. The first project was to carry the Tōkyō-Kiōto line through the interior of the island so as to secure it against enterprises on the part of a maritime enemy. Such engineering difficulties presented themselves, however, that the coast route was ultimately chosen, and though the line through the interior was subsequently constructed, strategical considerations were not allowed completely to govern its direction.

When this building of railways began in Japan, much discussion was taking place in England and India as to the relative advantages of the wide and narrow gauges, and so strongly did the arguments in favour of the latter appeal to the English advisers of the Japanese government that the metre gauge was chosen. Some fitful efforts made in later years to change the system proved unsuccessful. The lines are single, for the most part; and as the embankments, the cuttings, the culverts and the bridge-piers have not been constructed for a double line, any change now would be very costly. The average speed of passenger trains in Japan is 18 m. an hour, the corresponding figure over the metre-gauge roads in India being 16 m., and the figure for English parliamentary trains from 19 to 28 m. British engineers surveyed the routes for the first lines and superintended the work of construction, but within a few years the Japanese were able to dispense with foreign aid altogether, both in building and operating their railways. They also construct carriages, wagons and locomotives, and they may therefore be said to have become entirely independent in the matter of railways, for a government iron-foundry at Wakamatsu in Kiūshiū is able to manufacture steel rails.

The total length of lines open for traffic at the end of March 1906 was 4746 m., 1470 m. having been built by the state and 3276 by private companies; the former at a cost of 16 millions sterling for construction and equipment, and the latter at a cost of 25 millions. Thus the expenditure by the state averaged £10,884 per mile, and that by private companies, £7631. This difference is explained by the facts that the state lines having been the pioneers, portions of them were built before experience had indicated cheap methods; that a very large and costly foreign staff was employed on these roads in the early days, whereas no such item appeared in the accounts of private lines; that extensive works for the building of locomotives and rolling stock are connected with the government's roads, and that it fell to the lot of the state to undertake lines in districts presenting exceptional engineering difficulties, such districts being naturally avoided by private companies. The gross earnings of all the lines during the fiscal year 1905–1906 were 7 millions sterling, approximately, and the gross expenses (including the payment of interest on loans and debentures) were under 3½ millions, so that there remained a net profit of 3½ millions, being at the rate of a little over 8½% on the invested capital. The facts that the outlays averaged less than 47% of the gross income, and that accidents and irregularities are not numerous, prove that Japanese management in this kind of enterprise is efficient.

Nationalization of Private Railways

When the fiscal year 1906–1907 opened, the number of private companies was no less than 36, owning and operating 3276 m. of railway. To say that this represented an average of 91 m. per company is to convey an over-favourable idea, for, as a matter of fact, 15 of the companies averaged less than 24 m. Anything like efficient co-operation was impossible in such circumstances, and constant complaints were heard about delays in transit and undue expense. The defects of divided ownership had long suggested the expediency of nationalization, but not until 1906 could the diet be induced to give its consent. On March 31 of that year, a railway nationalization law was promulgated. It enacted that, within a period of 10 years from 1906 to 1915, the state should purchase the 17 principal private roads, which had a length of 2812 m., and whose cost of construction and equipment had been 23½ millions sterling. The original scheme included 15 other railways, with an aggregate mileage of only 353 m.; but these were eliminated as being lines of local interest only. The actual purchase price of the 17 lines was calculated at 43 millions sterling (about double their cost price), on the following basis: (*a*) An amount equal to 20 times the sum obtained by multiplying the cost of construction at the date of purchase by the average ratio of the profit to the cost of construction during the six business terms of the company from the second half-year of 1902 to the first half-year of 1905. (*b*) The amount of the actual cost of stored articles converted according to current prices thereof into public loan-bonds at face value, except in the case of articles which had been purchased with borrowed money. The government agreed to hand over the purchase money within 5 years from the date of the acquisition of the lines, in public loan-bonds bearing 5% interest calculated at their face value; the bonds to be redeemed out of the net profits accruing from the purchased railways. It was calculated that this redemption would be effected in a period of 32 years, after which the annual profit accruing to the state from the lines would be 5½ millions sterling. But the nationalization scheme, though apparently the only effective method of linking together and co-ordinating an excessively subdivided system of lines, has proved a source of considerable financial embarrassment. For when the state constituted itself virtually the sole owner of railways, it necessarily assumed responsibility for extending them so that they should suffice to meet the wants of a nation numbering some 50 millions. Such extension could be effected only by borrowing money. Now the government was pledged by the diet in 1907 to an expenditure of 11½ millions (spread over 8 years) for extending the old state system of roads, and an expenditure of 6¼ millions (spread over 12 years) for improving them. But from the beginning of that year, a period of extreme commercial and financial depression set in, and the treasury had to postpone all recourse to loans for whatever purpose, so that railway progress was completely checked in the field alike of the original and the acquired state lines. Moreover, all securities underwent such sharp depreciation that, on the one hand, the government hesitated to hand over the bonds representing the purchase-price of the railways, lest such an addition to the volume of stocks should cause further depreciation, and, on the other, the former owners of the nationalized lines found the character of their bargain greatly changed. In these circumstances the government decided to take a strong step, namely, to place the whole of the railways owned by it—the original state lines as well as those nationalized—in an account independent of the regular budget, and to devote their entire profits to works of extension and improvement, supplementing the amount with loans from the treasury when necessary.

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[1] In 1877 there were 120 English engineers, drivers and foremen in the service of the railway bureau. Three years later only three advisers remained.

South Manchuria Railway.

In the sequel of the war of 1904–5 Japan, with China's consent, acquired from Russia the lease of the portion of the South-Manchuria railway (see MANCHURIA) between Kwang-cheng-tsze (Chang-chun) on the north and Tairen (Dalny), Port Arthur and Niuchwang on the south—a total length of 470 m. At the close of 1906 this road was handed over to a joint-stock company with a capital of 20 millions sterling, the government contributing 10 millions in the form of the road and its associated properties; the public subscribing 2 millions, and the company being entitled to issue debentures to the extent of 8 millions, the principal and interest of these debentures being officially guaranteed. Four millions' worth of debentures were issued in London in 1907 and 4 millions in 1908. This company's programme is not limited to operating the railway. It also works coal-fields at Yentai and Fushun; has a line of steamers plying between Tairen and Shanghai; and engages in enterprises of electricity, warehousing and the management of houses and lands within zones 50 *li* (17 m.) wide on either side of the line. The government guarantees 6% interest on the capital paid up by the general public.

Electric Railways.

Not until 1905 did Japan come into possession of an electric railway. It was a short line of 8 m., built in Kiōto for the purposes of a domestic exhibition held in that city. Thenceforth this class of enterprise grew steadily in favour, so that, in 1907, there were 16 companies with an aggregate capital of 8 millions sterling, having 165 m. open to traffic and 77 m. under construction. Fifteen other companies with an aggregate capital of 3 millions had also obtained charters. The principal of these is the Tōkyō railway company, with a subscribed capital of 6 millions (3½ paid up), 90½ m. of line open and 149 m. under construction. In 1907 it carried 153 million passengers, and its net earnings were £300,000.

Maritime Communications.

The traditional story of prehistoric Japan indicates that the first recorded emperor was an over-sea invader, whose followers must therefore have possessed some knowledge of ship-building and navigation. But in what kind of craft they sailed and how they handled them, there is nothing to show clearly. Nine centuries later, but still 500 years before the era of surviving written annals, an empress is said to have invaded Korea, embarking her forces at Kobe (then called Takekura) in 500 vessels. In the middle of the 6th century we read of a general named Abe-no-hirafu who led a flotilla up the Amur river to the invasion of Manchuria (then called Shukushin). All these things show that the Japanese of the earliest era navigated the high sea with some skill, and at later dates down to medieval times they are found occasionally sending forces to Korea and constantly visiting China in vessels which seem to have experienced no difficulty in making the voyage. The 16th century was a period of maritime activity so marked that, had not artificial checks been applied, the Japanese, in all probability, would have obtained partial command of Far-Eastern waters. They invaded Korea; their corsairs harried the coasts of China; two hundred of their vessels, sailing under authority of the Taikō's vermilion seal, visited Siam, Luzon, Cochin China and Annam, and they built ships in European style which crossed the Pacific to Acapulco. But this spirit of adventure was chilled at the close of the 16th century and early in the 17th, when events connected with the propagation of Christianity taught the Japanese to believe that national safety could not be secured without international isolation. In 1638 the ports were closed to all foreign ships except those flying the flag of Holland or of China, and a strictly enforced edict forbade the building of any vessel having a capacity of more than 500 *koku* (150 tons) or constructed for purposes of ocean navigation. Thenceforth, with rare exceptions, Japanese craft confined themselves to the coastwise trade. Ocean-going enterprise ceased altogether.

Things remained thus until the middle of the 19th century, when a growing knowledge of the conditions existing in the West warned the Tokugawa administration that continued isolation would be suicidal. In 1853 the law prohibiting the construction of sea-going ships was revoked and the Yedo government built at Uraga a sailing vessel of European type aptly called the "Phoenix" ("Howo Maru"). Just 243 years had elapsed since the founder of the Tokugawa dynasty constructed Japan's first ship after a foreign model, with the aid of an English pilot, Will Adams. In 1853 Commodore M. C. Perry made his appearance, and thenceforth everything conspired to push Japan along the new path. The Dutch, who had been proximately responsible for the adoption of the seclusion policy in the 17th century, now took a prominent part in promoting a liberal view. They sent to the Tokugawa a present of a man-of-war and urged the vital necessity of equipping the country with a navy. Then followed the establishment of a naval college at Tsukiji in Yedo, the building of iron-works at Nagasaki, and the construction at Yokosuka of a dockyard destined to become one of the greatest enterprises of its kind in the East. This last undertaking bore witness to the patriotism of the Tokugawa rulers, for they resolutely carried it to completion during the throes of a revolution which involved the downfall of their dynasty. Their encouragement of maritime enterprise had borne fruit, for when, in 1867, they restored the administration to the Imperial court, 44 ocean-going ships were found among their possessions and 94 were in the hands of the feudatories, a steamer and 20 sailing vessels having been constructed in Japan and the rest purchased abroad.

If the Tokugawa had been energetic in this respect, the new government was still more so. It caused the various maritime carriers to amalgamate into one association called the *Nippon-koku yubin jokisen kaisha* (Mail SS. Company of Japan), to which were transferred, free of charge, the steamers, previously the property of the Tokugawa or the feudatories, and a substantial subsidy was granted by the state. This, the first steamship company ever organized in Japan, remained in existence only four years. Defective management and incapacity to compete with foreign-owned vessels plying between the open ports caused its downfall (1875). Already, however, an independent company had appeared upon the scene. Organized and controlled by a man (Iwasaki Yataro) of exceptional enterprise and business faculty, this *mitsubishi kaisha* (three lozenge company, so called from the design on its flag), working with steamers chartered from the former feudatory of Tosa, to which clan Iwasaki belonged, proved a success from the outset, and grew with each vicissitude of the state. For when (1874) the Meiji government's first complications with a foreign country necessitated the despatch of a military expedition to Formosa, the administration had to purchase 63 foreign steamers for transport purposes, and these were subsequently transferred to the mitsubishi company together with all the vessels (17) hitherto in the possession of the Mail SS. Company, the Treasury further granting to the mitsubishi a subsidy of £50,000 annually. Shortly afterwards it was decided to purchase a service maintained by the Pacific Mail SS. Company with 4 steamers between Yokohama and Shanghai, and money for the purpose having been lent by the state to the mitsubishi, Japan's first line of steamers to a foreign country was firmly established, just 20 years after the law interdicting the construction of ocean-going vessels had been rescinded.

The next memorable event in this chapter of history occurred in 1877, when the Satsuma clan, eminently the most powerful and most warlike among all the former feudatories, took the field in open rebellion. For a time the fate of the government hung in the balance, and only by a flanking movement over-sea was the rebellion crushed. This strategy compelled the purchase of 10 foreign steamers, and these too were subsequently handed over to the mitsubishi company, which, in 1880, found itself possessed of 32 ships aggregating 25,600 tons, whereas all the other vessels of foreign type in the country totalled only 27 with a tonnage of 6500. It had now become apparent that the country could not hope to meet emergencies which might at any moment arise, especially in connexion with Korean affairs, unless the development of the mercantile marine proceeded more rapidly. Therefore in 1881 the formation of a new company was officially promoted. It had the name of the *kyōdō unyu kaisha* (Union Transport Company); its capital was about a million sterling; it received a large subsidy from the state, and its chief purpose was to provide vessels for military uses and as commerce-carriers. Japan had now definitely embraced the policy of entrusting to private companies rather than to the state the duty of acquiring a fleet of vessels capable of serving as transports or auxiliary cruisers in time of war. But there was now seen the curious spectacle of two companies (the Mitsubishi and the Union Transport) competing in the same waters and both subsidized by the treasury. After this had gone on for four years, the two companies were amalgamated (1885) into the *Nippon yusen kaisha* (Japan Mail SS. Company) with a capital of £1,100,000 and an annual subsidy of £88,000, fixed on the basis of 8% of the capital. Another company had come into existence a few months earlier. Its fleet consisted of 100 small steamers, totalling 10,000 tons, which had hitherto been competing in the Inland Sea.

Japan now possessed a substantial mercantile marine, the rate of whose development is indicated by the following figures:—

Year.	Steamers.		Sailing Vessels.		Totals.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.
1870	35	15,498	11	2,454	46	17,952
1892	642	122,300	780	46,065	1,422	168,365

Nevertheless, only 23% of the exports and imports was transported in Japanese bottoms in 1892, whereas foreign steamers took 77%. This discrepancy was one of the subjects discussed in the first session of the diet, but a bill presented by the government for encouraging navigation failed to obtain parliamentary consent, and in 1893 the Japan Mail SS. Company, without waiting for state assistance, opened a regular service to Bombay mainly for the purpose of carrying raw cotton from India to supply the spinning industry which had now assumed great importance in Japan. Thus the rising sun flag flew for the first time outside Far-Eastern waters. Almost immediately after the establishment of this line, Japan had to engage in war with China, which entailed the despatch of some two hundred thousand men to the neighbouring continent and their maintenance there for more than a year. All the country's available shipping resources did not suffice for this task. Additional vessels had to be purchased or chartered, and thus, by the beginning of 1896, the mercantile marine of Japan had grown to 899 steamers of 373,588 tons, while the sailing vessels had diminished to 644 of 44,000 tons.

In 1897 there occurred an event destined to exercise a potent influence on the fortunes not only of Japan herself but also of her mercantile marine. No sooner had she exchanged with China ratifications of a treaty of peace which seemed to prelude a long period of tranquillity, than Russia, Germany and France ordered her to restore all the continental territory ceded to her by China. Japan then recognized that her hope of peace was delusive, and that she must be prepared to engage in a struggle incomparably more serious than the one from which she had just emerged. Determined that when the crucial moment came she should not be found without ample means for transporting her armies, the government, under the leadership of Prince Ito and with the consent of the diet, enacted, in March 1896 laws liberally encouraging ship-building and navigation. Under the navigation law "any Japanese subject or any commercial company whose partners or shareholders were all Japanese subjects, engaged in carrying passengers and cargo between Japan and foreign countries or between foreign ports, in their own vessels, which must be of at least 1000 tons and registered in the shipping list of the Empire, became entitled to subsidies proportionate to the distance run and the tonnage of the vessels"; and under the ship-building law, bounties were granted for the construction of iron or steel vessels of not less than 700 tons gross by any Japanese subject or any commercial company whose partners and shareholders were all Japanese. The effect of this legislation was marked. In the period of six years ended 1902, no less than 835 vessels of 455,000 tons were added to the mercantile marine, and the treasury found itself paying encouragement money which totalled six hundred thousand pounds annually. Ship-building underwent remarkable development. Thus, while in 1870 only 2 steamers aggregating 57 tons had been constructed in Japanese yards, 53 steamers totalling 5380 tons and 193 sailing vessels of 17,873 tons were launched in 1900. By the year 1907 Japan had 216 private ship yards and 42 private docks,[1] and while the government yards were able to build first-class line-of-battle ships of the largest size, the private docks were turning out steamers of 9000 tons burden. When war broke out with Russia in 1904, Japan had 567,000 tons of steam shipping, but that stupendous struggle obliged her to materially augment even this great total. In operations connected with the war she lost 71,000 tons, but on the other hand, she built 27,000 tons at home and bought 177,000 abroad, so that the net increase to her mercantile fleet of steamers was 133,000 tons. The following table shows the growth of her marine during the ten years ending 1907:—

Year.	Steamers.		Sailing Vessels.		Totals.	
	Number.	Gross Tonnage.	Number.	Gross Tonnage.	Number.	Gross Tonnage.
1898	1130	477,430	1914	170,194	3044	648,324
1899	1221	510,007	3322	286,923	4543	467,930
1900	1329	543,365	3850	320,572	5179	863,937
1901	1395	583,532	4026	336,528	5471	920,060
1902	1441	610,445	3907	336,154	5348	946,600
1903	1570	663,220	3934	328,953	5504	992,173
1904	1815	798,240	3940	329,125	5755	1,127,365
1905	1988	939,749	4132	336,571	6170	1,276,320
1906	2103	1,041,569	4547	353,356	6700	1,395,925
1907	2139	1,115,880	4728	365,559	6867	1,481,439

With regard to the development of ship-building in Japanese yards the following figures convey information:—

NUMBERS OF VESSELS BUILT IN JAPAN AND NUMBERS PURCHASED ABROAD

Year.	Built in Japan.		Purchased abroad.	
	Steamers.	Sailing Vessels.	Steamers.	Sailing Vessels.
1898	479	1301	194	9
1899	554	2771	199	12
1900	653	3302	206	7
1901	754	3559	215	6
1902	813	3585	220	6
1903	855	5304	233	8
1904	947	3324	277	8
1905	1028	3508	357	11
1906	1100	3859	387	11
1907	1150	4033	419	12

In the building of iron and steel ships the Japanese are obliged to import much of the material used, but a large steel-foundry has been established under government auspices at Wakamatsu in Kiūshiū, that position having been chosen on account of comparative proximity to the Taiya iron mine in China, where the greater part of the iron ore used for the foundry is procured.

Seamen.

Simultaneously with the growth of the mercantile marine there has been a marked development in the number of licensed mariners; that is to say, seamen registered by the government as having passed the examination prescribed by law. In 1876 there were only 4 Japanese subjects who satisfied that definition as against 74 duly qualified foreigners holding responsible positions. In 1895 the numbers were 4135 Japanese and 835 foreigners, and ten years later the corresponding figures were 16,886 and 349 respectively. In 1904 the ordinary seamen of the mercantile marine totalled 202,710.

Education of Mariners.

There are in Japan various institutions where the theory and practice of navigation are taught. The principal of these is the *Tōkyō shōsen gakkō* (Tōkyō mercantile marine college, established in 1875), where some 600 of the men now serving as officers and engineers have graduated. Well equipped colleges exist also in seven other places, all having been established with official co-operation. Mention must be made of a mariners' assistance association (*kaiin ekizai-kai*, established in 1800) which acts as a kind of agency for supplying mariners to ship-owners, and of a distressed mariners' relief association (*suinan kyūsai-kai*) which has succoured about a hundred thousand seamen since its establishment in 1899.

Maritime Administration.

The duty of overseeing all matters relating to the maritime carrying trade devolves on the department of state for communications, and is delegated by the latter to one of its bureaus (the *Kwansen-kyoku*, or ships superintendence bureau), which, again, is divided into three sections: one for inspecting vessels, one for examining mariners, and one for the general control of all shipping in Japanese waters. For the better discharge of its duties this bureau parcels out the empire into 4 districts, having their headquarters at Tōkyō, Osaka, Nagasaki and Hakodate; and these four districts are in turn subdivided into 18 sections, each having an office of marine affairs (*kwaiji-kyoku*).

Competition between Japanese and Foreign Ships.

Competition between Japanese and foreign ships in the carriage of the country's over-sea trade soon began to assume appreciable dimensions. Thus, whereas in 1891 the portion carried in Japanese bottoms was only 1½ millions sterling against 12½ millions carried by foreign vessels, the corresponding figures in 1902 were 20½ millions against 32¼ millions. In other words, Japanese steamers carried only 11% of the total trade in 1891, but their share rose to 39% in 1902. The prospect suggested by this record caused some uneasiness, which was not allayed by observing that while the tonnage of Japanese vessels in Chinese ports was only 2%

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[1] The largest is the mitsubishi at Nagasaki. It has a length of 722 ft. Next stands the kawasaki at Kobe, and in the third place is the uraga.

in 1896 as compared with foreign vessels, the former figure grew to 16% in 1902; while in Korean ports Japanese steamers almost monopolized the carrying trade, leaving only 18% to their foreign rivals, and even in Hong-Kong the tonnage of Japanese ships increased from 3% in 1896 to 13% in 1900. In 1898 Japan stood eleventh on the list of the thirteen principal maritime countries of the world, but in 1907 she rose to the fifth place. Her principal company, the Nippon yusen kaisha, though established as lately as 1885, now ranks ninth in point of tonnage among the 21 leading maritime companies of the world. This company was able to supply 55 out of a total fleet of 207 transports furnished by all the steamship companies of Japan for military and naval purposes during the war with Russia in 1904-5. It may be noted in conclusion that the development of Japan's steam-shipping during the five decades ended 1907 was as follows:—

	Tons.
At the end of 1868	17,952
At the end of 1878	63,468
At the end of 1888	197,365
At the end of 1898	648,324
At the end of 1907	1,115,880

Open Ports. There are 33 ports in Japan open as places of call for foreign steamers. Their names with the dates of their opening are as follow:—

Name.	Date of Opening.	Situation.
Yokohama	1859	Main Island.
Kobe	1868	do.
Niigata	1867	do.
Osaka	1899	do.
Yokkaichi	do.	do.
Shimonoseki	do.	do.
Itozaki	do.	do.
Taketoyo	do.	do.
Shimizu	do.	do.
Tsuruga	do.	do.
Nanao	do.	do.
Fushiki	do.	do.
Sakai	do.	do.
Hamada	do.	do.
Miyazu	do.	do.
Aomori	1906	do.
Nagasaki	1859	Kiūshiū.
Moji	1899	do.
Hakata	do.	do.
Karatsu	do.	do.
Kuchinotsu	do.	do.
Misumi	do.	do.
Suminoye	1906	do.
Izuhara	1899	Tsushima.
Sasuna	do.	do.
Shikami	do.	do.
Nafa	do.	Riūkiū.
Otaru	do.	Yezo.
Kushiro	do.	do.
Mororan	do.	do.
Hakodate	1865	do.
Kelung	1899	Formosa.
Tamsui	do.	do.
Takow	do.	do.
Anping	do.	do.

Emigration.—Characteristic of the Japanese is a spirit of adventure: they readily emigrate to foreign countries if any inducement offers. A strong disposition to exclude them has displayed itself in the United States of America, in Australasia and in British Columbia, and it is evident that, since one nation cannot force its society on another at the point of the sword, this anti-Asiatic prejudice will have to be respected, though it has its origin in nothing more respectable than the jealousy of the labouring classes. One result is an increase in the number of Japanese emigrating to Korea, Manchuria and S. America. The following table shows the numbers residing at various places outside Japan in 1904 and 1906 respectively:—

Place.	Number in 1904.	Number in 1906.
China	9,417	27,126
Korea	31,093	100,000
Manchuria	—	43,823
Hong-Kong	600	756
Singapore	1,292	1,428
British India	413	530
Europe	183	697
United States of America	33,849	130,228
Canada	3,838	5,088
Mexico	456	1,294
S. America	1,496	2,500
Philippines	2,652	2,185
Hawaii	65,008	64,319
Australasia	71,129	3,274

Foreign Residents.—The number of foreigners residing in Japan and their nationalities in 1889, 1899 and 1906, respectively, were as follow:—

	1889.	1899.	1906.
Americans	899	1,296	1,650
British	1,701	2,013	2,155
Russians	63	134	211
French	335	463	540
Portuguese	108	158	165
Germans	550	532	670
Chinese	4,975	6,372	12,425
Koreans	8	188	254

There are also small numbers of Dutch, Peruvians, Belgians, Swiss, Italians, Danes, Swedes, Austrians, Hungarians, &c. This slow growth of the foreign residents is remarkable when contrasted with the fact that the volume of the country's foreign trade, which constitutes their main business, grew in the same period from 13½ millions sterling to 92 millions.

Posts and Telegraphs.—The government of the Restoration did not wait for the complete abolition of feudalism before organizing a new system of posts in accordance with modern needs. At first, letters only were carried, but before the close of 1871 the service was extended so as to include newspapers, printed matter, books and commercial samples, while the area was extended so as to embrace all important towns between Hakodate in the northern island of Yezo and Nagasaki in the southern island of Kiūshiū. Two years later this field was closed to private enterprise, the state assuming sole charge of the business. A few years later saw Japan in possession of an organization comparable in every respect with the systems existing in Europe. In 1892 a foreign service was added. Whereas in 1871 the number of post-offices throughout the empire was only 179, it had grown to 6449 in 1907, while the mail matter sent during the latter year totalled 1254 millions (including 15 millions of parcels), and 67,000 persons were engaged in handling it. Japan labours under special difficulties for postal purposes, owing to the great number of islands included in the empire, the exceptionally mountainous nature of the country, and the wide areas covered by the cities in proportion to the number of their inhabitants. It is not surprising to find, therefore, that the means of distribution are varied. The state derives a net revenue of 5 million *yen* approximately from its postal service. It need scarcely be added that the system of postal money-orders was developed *pari passu* with that of ordinary correspondence, but in this context one interesting fact may be noted, namely, that while Japan sends abroad only some £25,000 annually to foreign countries through the post, she receives over £450,000 from her over-sea emigrants.

Postal Savings Banks. Japan at the time of the Restoration (1867) was not entirely without experience which prepared her for the postal money-order system. Some 600 years ago the idea of the bill of exchange was born in the little town of Totsugawa (Yamato province), though it did not obtain much development before the establishment of the Tokugawa shōgunate in the 17th century. The feudal chiefs, having then to transmit large sums to Yedo for the purposes of their compulsory residence there, availed themselves of bills of exchange, and the shōgun's government, which received considerable amounts in Osaka, selected ten brokers to whom the duty of effecting the transfer of these funds was entrusted. Subsequently the 10 chosen brokers were permitted to extend their services to the general public, and a recent Japanese historian notes that Osaka thus became the birthplace of banking business in Japan. Postal money-orders were therefore easily appreciated at the time of their introduction in 1875. This was not true of the postal savings bank, however, an institution which came into existence in the same year. It was altogether a novel idea that the public at large, especially the lower sections of it, should entrust their savings to the government for safe keeping, especially as the minimum and maximum deposited at one time were fixed at such petty sums as 10 *sen* (2¼d.) and 50 *sen* (1s.), respectively. Indeed, in the circumstances, the fact that £1500 was deposited in the first year must be regarded as notable. Subsequently deposits were taken in postage stamps, and arrangements were effected for enabling depositors to pay money to distant creditors through the bank by merely stating the destination and the amount of the nearest post office. In 1908 the number of depositors in the post office savings bank was 8217, and their deposits exceeded 10 millions sterling. Thirty per cent. of the depositors belonged to the agricultural classes, 13 to the commercial and only 6 to the industrial.

Telegraphs.

Rapid communication by means of beacons was not unknown in ancient Japan, but code-signalling by the aid of flags was not introduced until the 17th century and was probably suggested by observing the practice of foreign merchantmen. Its use, however, was peculiar. The central office stood at Osaka, between which city and many of the principal provincial towns rudely constructed towers were placed at long distances, and from one to another of these intelligence as to the market price of rice was flashed by flag-shaking, the signals being read with telescopes. The Japanese saw a telegraph for the first time in 1854, when Commodore Perry presented a set of apparatus to the shōgun, and four years later the feudal chief of Satsuma (Shimazu Nariakira) caused wires to be erected within the enclosure of his castle. The true value of electric telegraphy was first demonstrated to the Japanese in connexion with an insurrection in 1877, under the leadership of Saigo, the favourite of this same Shimazu Nariakira. Before that time, however, a line of telegraph had been put up between Tōkyō and Yokohama (18 m.) and a code of regulations had been enacted. Sudden introduction to such a mysterious product of foreign science created superstitious dread in the minds of a few of the lower orders, and occasional attempts were made at the outset to wreck the wires. In 1886 the postal and telegraph offices were amalgamated and both systems underwent large development. Whereas the length of wires at the end of the fourth year after the introduction of the system was only 53 m., and the number of messages 20,000, these figures had grown in 1907 to 95,623 and 25 millions, respectively. Several cables are included in these latter figures, the longest being that to Formosa (1229 m.). Wireless telegraphy began to come into general use in 1908, when several vessels belonging to the principal steamship companies were equipped with the apparatus. It had already been employed for some years by the army and navy, especially during the war with Russia, when the latter service installed a new system, the joint invention of Captain Tonami of the navy, Professor S. Kimura of the naval college and Mr M. Matsushiro of the department of communications. The telegraph service in Japan barely pays the cost of operating and maintenance.

Telephones.

The introduction of the telephone into Japan took place in 1877, but it served official purposes solely during 13 years, and even when (1890) it was placed at the disposal of the general public its utilities found at first few appreciators. But this apathy soon yielded to a mood of eager employment, and the resources of the government (which monopolized the enterprise) proved inadequate to satisfy public demand. Automatic telephones were ultimately set up at many places in the principal towns and along the most frequented highways. The longest distance covered was from Tōkyō to Osaka (348 m.). In 1907 Japan had 140,440 m. of telephone wires, 262 exchanges, 159 automatic telephones, and the approximate number of messages sent was 160 millions. The telephone service pays a net revenue of about £100,000 annually.

Agriculture.—The gross area of land in Japan—excluding Formosa and Sakhalin—is 89,167,880 acres, of which 53,487,022 acres represent the property of the crown, the state and the communes, the rest (35,680,868 acres) being owned by private persons. Of the grand total the arable lands represent 15,301,297 acres. With regard to the immense expanse remaining unproductive, experts calculate that if all lands inclined at less than 15° be considered cultivable, an area of 10,684,517 acres remains to be reclaimed, though whether the result would repay the cost is a question hitherto unanswered. The cultivated lands are thus classified, namely, wet fields (called also paddy fields or rice lands), 6,871,437 acres; dry fields (or upland farms), 5,741,745 acres, and others, 2,688,115 acres.

Rice.

Paddy fields are to be seen in every valley or dell where farming is practicable; they are divided into square, oblong or triangular plots by grass-grown ridges a few inches in height and on an average a foot in breadth—the rice being planted in the soft mud thus enclosed. Narrow pathways intersect these rice-valleys at intervals, and rivulets (generally flowing between low banks covered with clumps of bamboo) feed ditches cut for purposes of irrigation. The fields are generally kept under water to a depth of a few inches while the crops are young, but are drained immediately before harvesting. They are then dug up, and again flooded before the second crop is planted out. The rising grounds which skirt the rice-land are tilled by the hoe, and produce Indian corn, millet and edible roots. The well-wooded slopes supply the peasants with timber and firewood. Thirty-six per cent. of the rice-fields yield two crops yearly. The seed is sown in small beds, and the seedlings are planted out in the fields after attaining the height of about 4 in. The finest rice is produced in the fertile plains watered by the Tonegawa in the province of Shimōsa, but the grain of Kaga and of the two central provinces of Settsu and Harima is also very good.

Sake.

Not only does rice form the chief food of the Japanese but also the national beverage, called sake, is brewed from it. In colour the best sake resembles very pale sherry; the taste is rather acid. None but the finest grain is used in its manufacture. Of sake there are many varieties, from the best quality down to *shiro-zake* or "white sake," and the turbid sort, drunk only in the poorer districts, known as *nigori-zake*; there is also a sweet sort, called *mirin*.

The various cereal and other crops cultivated in Japan, the areas devoted to them and the annual production are shown in the following table:—

	1898. Acres.	1902. Acres.	1906. Acres.
Rice	7,044,060	7,117,990	7,246,982
Barley	1,649,240	1,613,270	1,674,595
Rye	1,703,410	1,688,635	1,752,095
Wheat	1,164,020	1,210,435	1,107,967
Millet	693,812	652,492	594,280
Beans	1,503,395	1,488,600	1,478,345
Buckwheat	450,100	414,375	402,575
Rape-seed	377,070	392,612	352,807
Potatoes	92,297	105,350	140,197
Sweet Potatoes	668,130	693,427	717,620
Cotton	100,720	51,750	24,165
Hemp	62,970	42,227	34,845
Indigo (leaf)	122,180	92,982	40,910
	1903.	1905.	1906.
Sugar Cane	41,750	43,308	45,087

It is observable that no marked increase is taking place in the area under cultivation, and that the business of growing cotton, hemp and indigo is gradually diminishing, these staples being supplied from abroad. In Germany and Italy the annual additions made to the arable area average 8% whereas in Japan the figure is only 5%. Moreover, of the latter amount the rate for paddy fields is only 3·3% against 7·9% in the case of upland farms. This means that the population is rapidly outgrowing its supply of home-produced rice, the great food-stuff of the nation, and the price of that cereal consequently shows a steady tendency to appreciate. Thus whereas the market value was 5s. 5d. per bushel in 1901, it rose to 6s. 9d. in 1906.

Silk and Tea.

Scarcely less important to Japan than the cereals she raises are her silk and tea, both of which find markets abroad. Her production of the latter staple does not show any sign of marked development, for though tea is almost as essential an article of diet in Japan as rice, its foreign consumers are practically limited to the United States and their demand does not increase. The figures for the 10-year period ended 1906 are as follow:—

	Area under cultivation (acres).	Tea produced (℔ av.).
1897	147,230	70,063,076
1901	122,120	57,975,486
1906	126,125	58,279,286

Sericulture, on the contrary, shows steady development year by year. The demand of European and American markets has very elastic limits, and if Japanese growers are content with moderate, but still substantial, gains they can find an almost unrestricted sale in the West. The development from 1886 to 1906 was as follows:—

	Raw silk produced yearly (℔).
Average from 1886 to 1889	8,739,273
1895	19,087,310
1900	20,705,644
1905	21,630,829
1906	24,215,324

The chief silk-producing prefectures in Japan, according to the order of production, are Nagano, Gumma, Yamanashi, Fukushima, Aichi and Saitama. At the close of 1906 there were 3843 filatures throughout the country, and the number of families engaged in sericulture was 397,885.

Lacquer, vegetable wax and tobacco are also important staples of production. The figures for the ten-year period, 1897 to 1906, are as follow:—

	Lacquer (lb).	Vegetable wax (lb).	Tobacco (lb).
1897	344,267	25,850,790	110,572,925
1906	668,266	39,714,661	101,718,592

While the quantity of certain products increases, the number of filatures and factories diminishes, the inference being that industries are coming to be conducted on a larger scale than was formerly the case. Thus in sericulture the filatures diminished from 4723 in 1897 to 3843 in 1906; the number of lacquer factories from 1637 to 1123 at the same dates, and the number of wax factories from 2619 to 1929.

Agricultural Improvements.

It is generally said that whereas more than 60% of Japan's entire population is engaged in agriculture, she remains far behind the progressive nations of Europe in the application of scientific principles to farming. Nevertheless if we take for unit the average value of the yield per hectare in Italy, we obtain the following figures:—

	Yield per hectare
Italy	100
India	51
Germany	121
France	122
Egypt	153
Japan	213

In the realm of agriculture, as in all departments of modern Japan's material development, abundant traces are found of official activity. Thus, in the year 1900, the government enacted laws designed to correct the excessive subdivision of farmers' holdings; to utilize unproductive areas lying between cultivated fields; to straighten roads; to facilitate irrigation; to promote the use of machinery; to make known the value of artificial fertilizers; to conserve streams and to prevent inundations. Further, in order to furnish capital for the purposes of farming, 46 agricultural and commercial banks—one in each prefecture—were established with a central institution called the hypothec bank which assists them to collect funds. A Hokkaidō colonial bank and subsequently a bank of Formosa were also organized, and a law was framed to encourage the formation of co-operative societies which should develop a system of credit, assist the business of sale and purchase and concentrate small capitals. Experimental stations were another official creation. Their functions were to carry on investigations relating to seeds, diseases of cereals, insect pests, stock-breeding, the use of implements, the manufacture of agricultural products and cognate matters. Encouragement by grants in aid was also given to the establishment of similar experimental farms by private persons in the various prefectures, and such farms are now to be found everywhere. This official initiative, with equally successful results, extended to the domain of sericulture and tea-growing. There are two state sericultural training institutions where not only the rearing of silk-worms and the management of filatures are taught, but also experiments are made; and these institutions, like the state agricultural stations, have served as models for institutes on the same lines under private auspices. A silk-conditioning house at Yokohama; experimental tea-farms; laws to prevent and remove diseases of plants, cereals, silkworms and cattle, and regulations to check dishonesty in the matter of fertilizers, complete the record of official efforts in the realm of agriculture during the Meiji era.

Stock-breeding.

One of the problems of modern Japan is the supply of cattle. With a rapidly growing taste for beef—which, in former days, was not an article of diet—there is a slow but steady diminution in the stock of cattle. Thus while the number of the latter in 1897 was 1,214,163, out of which total 158,504 were slaughtered, the corresponding figures in 1906 were 1,190,373 and 167,458, respectively. The stock of sheep (3500 in 1906) increases slowly, and the stocks of goats (58,694 in 1897 and 74,750 in 1906) and swine (206,217 in 1897 and 284,708 in 1906) grow with somewhat greater rapidity, but mutton and pork do not suit Japanese taste, and goats are kept mainly for the sake of their milk. The government has done much towards the improvement of cattle and horses by importing bulls and sires, but, on the whole, the mixed breed is not a success, and the war with Russia in 1904–5 having clearly disclosed a pressing need of heavier horses for artillery and cavalry purposes, large importations of Australian, American and European cattle are now made, and the organization of race-clubs has been encouraged throughout the country.

Forests.—Forests occupy an area of 55 millions of acres, or 60% of the total superficies of Japan, and one-third of that expanse, namely, 18 million acres, approximately, is the property of the state. It cannot be said that any very practical attempt has yet been made to develop this source of wealth. The receipts from forests stood at only 13 million *yen* in the budget for 1907–1908, and even that figure compares favourably with the revenue of only 3 millions derived from the same source in the fiscal year 1904–1905. This failure to utilize a valuable asset is chiefly due to defective communications, but the demand for timber has already begun to increase. In 1907 a revised forestry law was promulgated, according to which the administration is competent to prevent the destruction of forests and to cause the planting of plains and waste-lands, or the re-planting of denuded areas. A plan was also elaborated for systematically turning the state forests to valuable account, while, at the same time, providing for their conservation.

Fisheries.—From ancient times the Japanese have been great fishermen. The seas that encircle their many-coasted islands teem with fish and aquatic products, which have always constituted an essential article of diet. Early in the 18th century, the Tokugawa administration, in pursuance of a policy of isolation, interdicted the construction of ocean-going ships, and the people's enterprise in the matter of deep-sea fishing suffered a severe check. But shortly after the Restoration in 1867, not only was this veto rescinded, but also the government, organizing a marine bureau and a marine products examination office, took vigorous measures to promote pelagic industry. Then followed the formation of the marine products association under the presidency of an imperial prince. Fishery training schools were the next step; then periodical exhibitions of fishery and marine products; then the introduction and improvement of fishing implements; and then by rapid strides the area of operations widened until Japanese fishing boats of improved types came to be seen in Australasia, in Canada, in the seas of Sakhalin, the Maritime Province, Korea and China; in the waters of Kamchatka and in the Sea of Okhotsk. No less than 9000 fishermen with 2000 boats capture yearly about £300,000 worth of fish in Korean waters; at least 8000 find a plentiful livelihood off the coasts of Sakhalin and Siberia, and 200 Japanese boats engage in the salmon-fishing of the Fraser River. In 1893, the total value of Japanese marine products and fish captured did not exceed 1¼ millions sterling, whereas in 1906 the figure had grown to 5½ millions, to which must be added 3½ millions of manufactured marine products. Fourteen kinds of fish represent more than 50% of the whole catch, namely, (in the order of their importance) bonito (*katsuo*), sardines (*iwashi*), pagrus (*tai*), cuttle-fish and squid (*tako* and *ika*), mackerel (*saba*), yellow tail (*buri*), tunny-fish (*maguro*), prawns (*ebi*), sole (*karei*), grey mullet (*bora*), eels (*unagi*), salmon (*shake*), sea-ear (*awabi*) and carp (*koi*). Altogether 700 kinds of aquatic products are known in Japan, and 400 of them constitute articles of diet. Among manufactured aquatic products the chief are (in the order of their importance) dried bonito, fish guano, dried cuttle-fish, dried and boiled sardines, dried herring and dried prawns. The export of marine products amounted to £900,000 in 1906 against £400,000 ten years previously; China is the chief market. As for imports, they were insignificant at the beginning of the Meiji era, but by degrees a demand was created for salted fish, dried sardines (for fertilizing), edible sea-weed, canned fish and turtle-shell, so that whereas the total imports were only £1600 in 1868, they grew to over £400,000 in 1906.

Minerals.—Crystalline schists form the axis of Japan. They run in a general direction from south-west to north-east, with chains starting east and west from Shikoku. On these schists rocks of every age are superimposed, and amid these somewhat complicated geological conditions numerous minerals occur. Precious stones, however, are not found, though crystals of quartz and antimony as well as good specimens of topaz and agate are not infrequent.

Gold.

Gold occurs in quartz veins among schists, paleozoic or volcanic rocks and in placers. The quantity obtained is not large, but it shows tolerably steady development, and may possibly be much increased by more generous use of capital and larger recourse to modern methods.

Silver.

The value of the silver mined is approximately equal to that of the gold. It is found chiefly in volcanic rocks (especially tuff), in the form of sulphide, and it is usually associated with gold, copper, lead or zinc.

Copper.

Much more important in Japan's economics than either of the precious metals is copper. Veins often showing a thickness of from 70 to 80 ft., though of poor quality (2 to 8%), are found bedded in crystalline schists or paleozoic sedimentary rocks, but the richest (10 to 30%) occur in tuff and other volcanic rocks.

Iron.

There have not yet been found any evidences that Japan is rich in iron ores. Her largest known deposit (magnetite) occurs at Kamaishi in Iwate prefecture, but the quantity of pig-iron produced from the ore mined there does not exceed 37,000 tons annually, and Japan is obliged to import from the neighbouring continent the greater part of the iron needed by her for ship-building and armaments.

Coal.

Considerable deposits of coal exist, both anthracite and bituminous. The former, found chiefly at Amakusa, is not greatly inferior to the Cardiff mineral; and the latter—obtained in abundance in Kiūshiū and Yezo—is a brown coal of good medium quality. Altogether there are 29 coal-fields now actually worked in Japan, and she obtained an important addition to her sources of supply in the sequel to the war with Russia, when the Fushun mines near Mukden, Manchuria, were transferred to her. During the 10 years ending in 1906, the market value of the coal mined in Japan grew from less than 2 millions sterling to over 6 millions.

Petroleum.

Petroleum also has of late sprung into prominence on the list of her mineral products. The oil-bearing strata—which occur mainly in tertiary rocks—extend from Yezo to Formosa, but the principal are in Echigo, which yields the greater part of the petroleum now obtained, the Yezo and Formosa wells being still little exploited. The quantity of petroleum obtained in Japan in 1897 was 9 million gallons, whereas the quantity obtained in 1906 was 55 millions.

Japanese mining enterprise was more than trebled during the decade 1897 to 1906, for the value of the minerals taken out in the former year was only 3½ millions sterling, whereas the corresponding figure for 1906 was 11 millions. The earliest mention of gold-mining in Japan takes us back to the year A.D. 696, and by the 16th century the country had acquired the reputation of being rich in gold. During the days of her medieval intercourse with the outer world, her stores of the precious metals were largely reduced, for between the years 1602 and 1766, Holland, Spain, Portugal and China took from her 313,800 ℔ (troy) of gold and 11,230,000 ℔ of silver.

Copper occupied a scarcely less important place in Old Japan. From a period long anterior to historic times this metal was employed to manufacture mirrors and swords, and the introduction of Buddhism in the 6th century was quickly followed by the casting of sacred images, many of which still survive. Finding in the 18th century that her foreign intercourse not only had largely denuded her of gold and silver, but also threatened to denude her of copper, Japan set a limit (3415 tons) to the yearly export of the latter metal. After the resumption of administrative power by the emperor in 1867, attention was quickly directed to the question of mineral resources; several Western experts were employed to conduct surveys and introduce Occidental mining methods, and ten of the most important mines were worked under the direct auspices of the state in order to serve as object lessons. Subsequently these mines were all transferred to private hands, and the government now retains possession of only a few iron and coal mines whose products are needed for dockyard and arsenal purposes. The following table shows the recent progress and present condition of mining industry in Japan:—

	GOLD		SILVER		COPPER		LEAD	
	Quantity. oz.	Value. £	Quantity. oz.	Value. £	Quantity. Tons.	Value. £	Quantity. Tons.	Value. £
1897 . .	34,553	136,834	1,809,805	208,200	19,722	869,266	746	10,343
1901 . .	82,517	330,076	1,824,842	211,682	26,495	1,625,244	1,744	24,640
1906 . .	90,842	363,715	2,623,212	243,914	37,254	3,007,992	2,721	49,690

	IRON		COAL		PETROLEUM		SULPHUR	
	Quantity. Tons.	Value. £	Quantity. Tons.	Value. £	Quantity. Gallons.	Value. £	Quantity. Tons.	Value. £
1897 . .	35,178	103,559	5,229,662	1,899,592	9,248,800	44,389	13,138	33,588
1901 . .	46,456	123,701	9,025,325	3,060,931	39,351,960	227,841	16,007	38,612
1906 . .	85,203	268,911	12,980,103	6,314,400	55,135,880	314,550	27,406	61,386

	ANTIMONY		MANGANESE		OTHERS	
	Quantity. Tons.	Value. £	Quantity. Tons.	Value. £	Value. £	Total Values. £
1897 . .	1,133	27,362	13,175	8,758	3,863	3,345,662
1901 . .	529	13,481	15,738	10,846	3,450	5,670,508
1906 . .	293	22,862	12,322	51,365	41,338	10,839,783

The number of mine employees in 1907 was 190,000, in round numbers; the number of mining companies, 189; and the aggregate paid-up capital, 10 millions sterling.

Industries.—In the beginning of the Meiji era Japan was practically without any manufacturing industries, as the term is understood in the Occident, and she had not so much as one joint-stock company. At the end of 1906, her joint-stock companies and partnerships totalled 9329, their paid up capital exceeded 100 millions sterling, and their reserves totalled 26 millions. It is not to be inferred, however, from the absence of manufacturing organizations 50 years ago that such pursuits were deliberately eschewed or despised in Japan. On the contrary, at the very dawn of the historical epoch we find that sections of the people took their names from the work carried on by them, and that specimens of expert industry were preserved in the sovereign's palace side by side with the imperial insignia. Further, skilled artisans from the neighbouring continent always found a welcome in Japan, and when Korea was successfully invaded in early times, one of the uses which the victors made of their conquest was to import Korean weavers and dyers. Subsequently the advent of Buddhism, with its demand for images, temples, gorgeous vestments and rich paraphernalia, gave a marked impulse to the development of artistic industry, which at the outset took its models from China, India and Greece, but gradually, while assimilating many of the best features of the continental schools, subjected them to such great modifications in accordance with Japanese genius that they ceased to retain more than a trace of their originals. From the 9th century luxurious habits prevailed in Kiōto under the sway of the Fujiwara regents, and the imperial city's munificent patronage drew to its precincts a crowd of artisans. But these were not industrials, in the Western sense of the term, and, further, their organization was essentially domestic, each family selecting its own pursuit and following it from generation to generation without co-operation or partnership with any outsider. The establishment of military feudalism in the 12th century brought a reaction from the effeminate luxury of the metropolis, and during nearly 300 years no industry enjoyed large popularity except that of the armourer and the sword-smith. No sooner, however, did the prowess of Oda Nobunaga and, above all, of Hideyoshi, the taikō, bring within sight a cessation of civil war and the unification of the country, than the taste for beautiful objects and artistic utensils recovered vitality. By degrees there grew up among the feudal barons a keen rivalry in art industry, and the shōgun's court in Yedo set a standard which the feudatories constantly strove to attain. Ultimately, in the days immediately antecedent to its fall, the shōgun's administration sought to induce a more logical system by encouraging local manufacturers to supply local needs only, leaving to Kiōto and Yedo the duty of catering to general wants.

But before this reform had approached maturity, the second advent of Western nations introduced to Japan the products of an industrial civilization centuries in advance of her own from the point of view of utility, though nowise superior in the application of art. Immediately the nation became alive to the necessity of correcting its own inferiority in this respect. But the people being entirely without models for organization, without financial machinery and without the idea of joint stock enterprise, the government had to choose between entering the field as an instructor, and leaving the nation to struggle along an arduous and expensive way to tardy development. There could be no question as to which course would conduce more to the general advantage, and thus, in days immediately subsequent to the resumption of administrative power by the emperor, the spectacle was seen of official excursions into the domains of silk-reeling, cement-making, cotton and silk spinning, brick-burning, printing and book-binding, soap-boiling, type-casting and ceramic decoration, to say nothing of their establishing colleges and schools where all branches of applied science were taught. Domestic exhibitions also were organized, and specimens of the country's products and manufactures were sent under government auspices to exhibitions abroad. On the other hand, the effect of this new departure along Western lines could not but be injurious to the old domestic industries of the country, especially to those which owed their existence to tastes and traditions now regarded as obsolete. Here again the government came to the rescue by establishing a firm whose functions were to familiarize foreign markets with the products of Japanese artisans, and to instruct the latter in adaptations likely to appeal to Occidental taste. Steps were also taken for training women as artisans, and the government printing bureau set the example of employing female labour, an innovation which soon developed large dimensions. In short, the authorities applied themselves to educate an industrial disposition throughout the country, and as soon as success seemed to be in sight, they gradually transferred from official to private direction the various model enterprises, retaining only such as were required to supply the needs of the state.

The result of all this effort was that whereas, in the beginning of the Meiji era, Japan had virtually no industries worthy of the name, she possessed in 1896—that is to say, after an interval of 25 years of effort—no less than 4595 industrial and commercial companies, joint stock or partnership, with a paid-up capital of 40 millions sterling. Her development during the decade ending in 1906 is shown in the following table:—

	Number of companies.	Paid-up capital (millions sterling).	Reserves (millions sterling).
1897	6,113	53	6
1901	8,602	83	12
1906	9,329	107	26

What effect this development exercised upon the country's over-sea trade may be inferred from the fact that, whereas the manufactured goods exported in 1870 were nil, their value in 1901 was 8 millions sterling, and in 1906 the figure rose to over 20 millions. In the following table are given some facts relating to the principal industries in which foreign markets are interested:—

COTTON YARNS

	Spindles.	Operatives.		Quantity produced.	Remarks.
		Male.	Female.		
				lb	This is a wholly new industry in Japan. It had no existence before the Meiji era.
1897	768,328	9,933	35,059	216,913,196	
1901	1,181,762	13,481	49,540	274,861,380	
1906	1,425,406	13,032	59,281	383,359,113	

WOVEN GOODS

	Looms.	Operatives.		Market value of products.	Remarks.
		Male.	Female.		
				Millions sterling.	It is observable that a decrease in the number of operatives is concurrent with an increase of production.
1897	947,134	54,119	987,110	19	
1901	719,550	43,172	747,946	24	
1906	736,828	40,886	751,605	36	

MATCHES

	Families engaged.	Operatives.		Quantity produced.	Value.	Remarks.
		Male.	Female.			
				Gross.	£	This is an altogether new industry. Japanese matches now hold the leading place in all Far-Eastern markets.
1897	269	21,447	26,277	24,038,960	654,849	
1901	261	5,656	16,504	32,901,319	926,689	
1906	250	5,468	18,721	54,802,293	1,551,698	

FOREIGN PAPER (as distinguished from Japanese)

	Factories.	Operatives.		Quantity produced.	Value.	Remarks.
		Male.	Female.			
				lb	£	Had not Japanese factories been established all this paper must have been imported.
1897	9	164	109	46,256,649	300,662	
1901	13	2 635	1,397	113,348,340	714,094	
1906	22	3 774	1,778	218,022,434	1,415,778	

In the field of what may be called minor manufactures—as ceramic wares, lacquers, straw-plaits, &c.—there has been corresponding growth, for the value of these productions increased from 1¼ millions sterling in 1897 to 3½ millions in 1906. But as these manufactures do not enter into competition with foreign goods in either Eastern or Western markets, they are interesting only as showing the development of Japan's producing power. They contribute nothing to the solution of the problem whether Japanese industries are destined ultimately to drive their foreign rivals from the markets of Asia, if not to compete injuriously with them even in Europe and America. Japan seems to have one great advantage over Occidental countries: she possesses an abundance of dexterous and exceptionally cheap labour. It has been said, indeed, that this latter advantage is not likely to be permanent, since the wages of labour and the cost of living are fast increasing. The average cost of labour doubled in the interval between 1895 and 1906, but, on the other hand, the number of manufacturing organizations doubled in the same time, while the amount of their paid-up capital nearly trebled. As to the necessaries of life, if those specially affected by government monopolies be excluded, the rate of appreciation between 1900 and 1906 averaged about 30%, and it thus appears that the cost of living is not increasing with the same rapidity as the remuneration earned by labour. The manufacturing progress of the nation seems, therefore, to have a bright future, the only serious impediment being deficient capital. There is abundance of coal, and steps have been taken on a large scale to utilize the many excellent opportunities which the country offers for developing electricity by water-power.

Silk-weaving.

The fact that Japan's exports of raw silk amount to more than 12 millions sterling, while she sends over-sea only 3½ millions' worth of silk fabrics, suggests some marked inferiority on the part of her weavers. But the true explanation seems to be that her distance from the Occident handicaps her in catering for the changing fashions of the West. There cannot be any doubt that the skill of Japanese weavers was at one time eminent. The sun goddess herself, the predominant figure in the Japanese pantheon, is said to have practised weaving; the names of four varieties of woven fabrics were known in prehistoric times; the 3rd century of the Christian era saw the arrival of a Korean maker of cloth; after him came an influx of Chinese who were distributed throughout the country to improve the arts of sericulture and silk-weaving; a sovereign (Yuriaku) of the 5th century employed 92 groups of naturalized Chinese for similar purposes; in 421 the same emperor issued a decree encouraging the culture of mulberry trees and calling for taxes on silk and cotton; the manufacture of textiles was directly supervised by the consort of this sovereign; in 645 a bureau of weaving was established; many other evidences are conclusive as to the great antiquity of the art of silk and cotton weaving in Japan.

The coming of Buddhism in the 6th century contributed not a little to the development of the art, since not only did the priests require for their own vestments and for the decoration of temples silken fabrics of more and more gorgeous description, but also these holy men themselves, careful always to keep touch with the continental developments of their faith, made frequent voyages to China, whence they brought back to Japan a knowledge of whatever technical or artistic improvements the Middle Kingdom could show. When Kiōto became the permanent metropolis of the empire, at the close of the 8th century, a bureau was established for weaving brocades and rich silk stuffs to be used in the palace. This preluded an era of some three centuries of steadily developing luxury in Kiōto; an era when an essential part of every aristocratic mansion's furniture was a collection of magnificent silk robes for use in the sumptuous *Nō*. Then, in the 15th century came the "Tea Ceremonial," when the brocade mountings of a picture or the wrapper of a tiny tea-jar possessed an almost incredible value, and such skill was attained by weavers and dyers that even fragments of the fabrics produced by them command extravagant prices to-day. Kiōto always remained, and still remains, the chief producing centre, and to such a degree has the science of colour been developed there that no less than 4000 varieties of tint are distinguished. The sense of colour, indeed, seems to have been a special endowment of the Japanese people from the earliest times, and some of the combinations handed down from medieval times are treasured as incomparable examples. During the long era of peace under the Tokugawa administration the costumes of men and women showed an increasing tendency to richness and beauty. This culminated in the Genroku epoch (1688–1760), and the aristocracy of the present day delight in viewing histrionic performances where the costumes of that age and of its rival, the Momoyama (end of the 16th century) are reproduced.

It would be possible to draw up a formidable catalogue of the various kinds of silk fabrics manufactured in Japan before the opening of the Meiji era, and the signal ability of her weavers has derived a new impulse from contact with the Occident. Machinery has been largely introduced, and though the products of hand-looms still enjoy the reputation of greater durability, there has unquestionably been a marked development of producing power. Japanese looms now turn out about 17 millions sterling of silk textiles, of which less than 4 millions go abroad. Nor is increased quantity alone to be noted, for at the factory of Kawashima in Kiōto Gobelins are produced such as have never been rivalled elsewhere.

Commerce in Tokugawa Times.—The conditions existing in Japan during the two hundred and fifty years prefatory to the modern opening of the country were unfavourable to the development alike of national and of international trade. As to the former, the system of feudal government exercised a crippling influence, for each feudal chief endeavoured to check the exit of any kind of property from his fief, and free interchange of commodities was thus prevented so effectually that cases are recorded of one feudatory's subjects dying of starvation while those of an adjoining fief enjoyed abundance. International commerce, on the other hand, lay under the veto of the central government, which punished with death anyone attempting to hold intercourse with foreigners. Thus the fiefs practised a policy of mutual seclusion at home, and united to maintain a policy of general seclusion abroad. Yet it was under the feudal system that the most signal development of Japanese trade took place, and since the processes of that development have much historical interest they invite close attention.

As the bulk of a feudal chief's income was paid in rice, arrangements had to be made for sending the grain to market and transmitting its proceeds. This was effected originally by establishing in Osaka stores (*kura-yashiki*), under the charge of samurai, who received the rice, sold it to merchants in that city and remitted the proceeds by official carriers. But from the middle of the 17th century these stores were placed in the charge of tradesmen to whom was given the name of *kake-ya* (agent). They disposed of the products entrusted to them by a fief and held the money, sending it by monthly instalments to an appointed place, rendering yearly accounts and receiving commission at the rate of from 2 to 4%. They had no special licence, but they were honourably regarded and often distinguished by an official title or an hereditary pension. In fact a kake-ya, of such standing as the Mitsui and the Konoike families, was, in effect, a banker charged with the finances of several fiefs. In Osaka the method of sale was uniform. Tenders were invited, and these having been opened in the presence of all the store officials and kake-ya, the successful tenderers had to deposit bargain-money, paying the remainder within ten days, and thereafter becoming entitled to take delivery of the rice in whole or by instalments within a certain time, no fee being charged for storage. A similar system existed in Yedo, the shōgun's capital. Out of the custom of deferred delivery developed the establishment of exchanges where advances were made against sale certificates, and purely speculative transactions came into vogue. There followed an experience common enough in the West at one time: public opinion rebelled against these transactions in margins on the ground that they tended to enhance the price of rice. Several of the brokers were arrested and brought to trial; marginal dealings were thenceforth forbidden, and a system of licences was inaugurated in Yedo, the number of licensed dealers[1] being restricted to 108.

The system of organized trading companies had its origin in the 12th century, when, the number of merchants admitted within the confines of Yedo being restricted, it became necessary for those not obtaining that privilege to establish some mode of co-operation, and there resulted the formation of companies with representatives stationed in the feudal capital and share-holding members in the provinces. The Ashikaga shōguns developed this restriction by selling to the highest bidder the exclusive right of engaging in a particular trade, and the Tokugawa administration had recourse to the same practice. But whereas the monopolies instituted by the Ashikaga had for sole object the enrichment of the exchequer, the Tokugawa regarded it chiefly as a means of obtaining worthy representatives in each branch of trade. The first licences were issued in Yedo to keepers of bath-houses in the middle of the 17th century. As the city grew in dimensions these licences increased in value, so that pawnbrokers willingly accepted them in pledge for loans. Subsequently almanack-sellers were obliged to take out licences, and the system was afterwards extended to money-changers.

It was to the fishmongers, however, that the advantages of commercial organization first presented themselves vividly. The greatest fish-market in Japan is at Nihon-bashi in Tōkyō (formerly Yedo). It had its origin in the needs of the Tokugawa court. When Iyeyasu (founder of the Tokugawa dynasty) entered Yedo in 1590, his train was followed by some fishermen of Settsu, to whom he granted the privilege of plying their trade in the adjacent seas, on condition that they furnished a supply of their best fish for the use of the garrison. The remainder they offered for sale at Nihon-bashi. Early in the 17th century one Sukegoro of Yamato province (hence called Yamato-ya) went to Yedo and organized the fishmongers into a great gild. Nothing is recorded about this man's antecedents, though his mercantile genius entitles him to historical notice. He contracted for the sale of all the fish obtained in the neighbouring seas, advanced money to the fishermen on the security of their catch, constructed preserves for keeping the fish alive until they were exposed in the market, and enrolled all the dealers in a confederation which ultimately consisted of 391 wholesale merchants and 246 brokers. The main purpose of Sukegoro's system was to prevent the consumer from dealing direct with the producer. Thus in return for the pecuniary accommodation granted to fishermen to buy boats and nets they were required to give every fish they caught to the wholesale merchant from whom they had received the advance; and the latter, on his side, had to sell in the open market at prices fixed by the confederation. A somewhat similar system applied to vegetables, though in this case the monopoly was never so close.

It will be observed that this federation of fishmongers approximated closely to a trust, as the term is now understood; that is to say, an association of merchants engaged in the same branch of trade and pledged to observe certain rules in the conduct of their business as well as to adhere to fixed rates. The idea was extended to nearly every trade, 10 monster confederations being organized in Yedo and 24 in Osaka. These received official recognition, and contributed a sum to the exchequer under the euphonious name of "benefit money," amounting to nearly £20,000 annually. They attained a high state of prosperity, the whole of the cities' supplies passing through their hands.[2] No member of a confederation was permitted to dispose of his licence except to a near relative, and if anyone not on the roll of a confederation engaged in the same business he became liable to punishment at the hands of the officials. In spite of the limits thus imposed on the transfer of licences, one of these documents commanded from £80 to £6,400, and in the beginning of the 19th century the confederations, or gilds, had increased to 68 in Yedo, comprising 1195 merchants. The gild system extended to maritime enterprise also. In the beginning of the 17th century a merchant of Sakai (near Osaka) established a junk service between Osaka and Yedo, but this kind of business did not attain any considerable development until the close of that century, when 10 gilds of Yedo and 24 of Osaka combined to organize a marine-transport company for the purpose of conveying their own merchandise. Here also the principle of monopoly was strictly observed, no goods being shipped for unaffiliated merchants. This carrying trade rapidly assumed large dimensions. The number of junks entering Yedo rose to over 1500 yearly. They raced from port to port, just as tea-clippers from China to Europe used to race in recent times, and troubles incidental to their rivalry became so serious that it was found necessary to enact stringent rules. Each junk-master had to subscribe a written oath that he would comply strictly with the regulations and observe the sequence of sailing as determined by lot. The junks had to call *en route* at Uraga for the purpose of undergoing official examination. The order of their arrival there was duly registered, and the master making the best record throughout the year received a present in money as well as a complimentary garment, and became the shippers' favourite next season.

Operations relating to the currency also were brought under the control of gilds. The business of money-changing seems to have been taken up as a profession from the beginning of the 15th century, but it was then in the hands of pedlars who carried strings of copper cash which they exchanged for gold or silver coins, then in rare circulation, or for parcels of gold dust. From the early part of the 17th century exchanges were opened in Yedo, and in 1718 the men engaged in this business formed a gild after the fashion of the time. Six hundred of these received licences, and no unlicensed person was permitted to purchase the avocation. Four representatives of the chief exchange met daily and fixed the ratio between gold and silver, the figure being then communicated to the various exchanges and to the shōgun's officials. As for the prices of gold or silver in terms of copper or bank-notes, 24 representatives of the exchanges met every evening, and, in the presence of an official censor, settled the figure for the following day and recorded the amount of transactions during the past 24 hours, full information on these points being at once sent to the city governors and the street elders.

The exchanges in their ultimate form approximated very closely to the Occidental idea of banks. They not only bought gold, silver and copper coins, but they also received money on deposit, made loans and issued vouchers which played a very important part in commercial transactions. The voucher seems to have come into existence in Japan in the 14th century. It originated in the Yoshino market of Yamato province, where the hilly nature of the district rendered the carriage of copper money so arduous that rich merchants began to substitute written receipts and engagements which quickly became current. Among these documents there was a "joint voucher" (*kumiai-fuda*), signed by several persons, any one of whom might be held responsible for its redemption. This had large vogue, but it did not obtain official recognition until 1636, when the third Tokugawa shōgun selected 30 substantial merchants and divided them into 3 gilds, each authorized to issue vouchers, provided that a certain sum was deposited by way of security. Such vouchers were obviously a form of bank-note. Their circulation by the exchange came about in a similar manner. During many years the treasure of the shōgun and of the feudal chiefs was carried to Yedo by pack-horses and coolies of the regular postal service. But the costliness of such a method led to the selection in 1691 of 10 exchange agents who were appointed bankers to the Tokugawa government and were required to furnish money within 30 days of the date of an order drawn on them. These agents went by the name of the "ten-men gild." Subsequently the firm of Mitsui was added, but it enjoyed the special privilege of being allowed 150 days to collect a specified amount. The gild received moneys on account of the Tokugawa or the feudal chiefs at provincial centres, and then made its own arrangements for cashing the cheques drawn upon it by the shōgun or the daimyō in Yedo. If coin happened to be immediately available, it was employed to cash the cheques; otherwise the vouchers of the gild served instead. It was in Osaka, however, that the functions of the exchanges acquired fullest development. That city has exhibited, in all eras, a remarkable aptitude for trade. Its merchants, as already shown, were not only entrusted with the duty of selling the rice and other products of the surrounding fiefs, but also they became depositories of the proceeds, which they paid out on account of the owners in whatever sums the latter desired. Such an evidence of official confidence greatly strengthened their credit, and they received further encouragement from the second Tokugawa shōgun (1605–1623) and from Ishimaru Sadatsugu, governor of the city in 1661. He fostered wholesale transactions, sought to introduce a large element of credit into commerce by instituting a system of credit sales; took measures to promote the circulation of cheques; inaugurated market sales of gold and silver and appointed ten chiefs of exchange who were empowered to oversee the business of money-exchanging in general. These ten received exemption from municipal taxation and were permitted to wear swords. Under them were 22 exchanges forming a gild, whose members agreed to honour one another's vouchers and mutually to facilitate business. Gradually they elaborated a regular system of banking, so that, in the middle of the 18th century, they issued various descriptions of paper-orders for fixed sums payable at certain places within fixed periods; deposit notes redeemable on the demand of an indicated person or his order; bills of exchange drawn by *A* upon *B* in favour of *C* (a common form for use in monthly or annual settlements); promissory notes to be paid at a future time, or cheques payable at sight, for goods purchased; and storage orders engaging to deliver goods on account of which earnest money had been paid. These last, much employed in transactions relating to rice and sugar, were generally valid for a period of 3 years and 3 months, were signed by a confederation of exchanges or merchants on joint responsibility, and guaranteed the delivery of the indicated merchandise independently of all accidents. They passed current as readily as coin, and advances could always be obtained against them from pawnbrokers.

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[1] They were called *fuda-sashi* (ticket-holders), a term derived from the fact that rice-vouchers were usually held in a split bamboo which was thrust into a pile of rice-bags to indicate their buyer.

[2] In 1725, when the population of Yedo was about three-quarters of a million, the merchandise that entered the city was 861,893 bags of rice; 795,856 casks of sake; 132,892 casks of soy (fish-sauce); 18,209,987 bundles of fire-wood; 809,790 bags of charcoal; 90,811 tubs of oil; 1,670,850 bags of salt and 3,613,500 pieces of cotton cloth.

All these documents, indicating a well-developed system of credit, were duly protected by law, severe penalties being inflicted for any failure to implement the pledges they embodied. The merchants of Yedo and Osaka, working on the system of trusts here described, gradually acquired great wealth and fell into habits of marked luxury. It is recorded that they did not hesitate to pay £5 for the first bonito of the season and £11 for the first egg-fruit. Naturally the spectacle of such extravagance excited popular discontent. Men began to grumble against the so-called "official merchants" who, under government auspices, monopolized every branch of trade; and this feeling grew almost uncontrollable in 1836, when rice rose to an unprecedented price owing to crop failure. Men loudly ascribed that state of affairs to regrating on the part of the wholesale companies, and murmurs similar to those raised at the close of the 19th century in America against the trust system began to reach the ears of the authorities perpetually. The celebrated Fujita Toko of Mito took up the question. He argued that the monopoly system, since it included Osaka, exposed the Yedo market to all the vicissitudes of the former city, which had then lost much of its old prosperity.

Finally, in 1841, the shōgun's chief minister, Mizuno Echizen-no-Kami, withdrew all trading licences, dissolved the gilds and proclaimed that every person should thenceforth be free to engage in any commerce without let or hindrance. This recklessly drastic measure, vividly illustrating the arbitrariness of feudal officialdom, not only included the commercial gilds, the shipping gilds, the exchange gilds and the land transport gilds, but was also carried to the length of forbidding any company to confine itself to wholesale dealings. The authorities further declared that in times of scarcity wholesale transactions must be abandoned altogether and retail business alone carried on, their purpose being to bring retail and wholesale prices to the same level. The custom of advancing money to fishermen or to producers in the provincial districts was interdicted; even the fuda-sashi might no longer ply their calling, and neither bath-house keepers nor hairdressers were allowed to combine for the purpose of adopting uniform rates of charges. But this ill-judged interference produced evils greater than those it was intended to remedy. The gilds had not really been exacting. Their organization had reduced the cost of distribution, and they had provided facilities of transport which brought produce within quick and cheap reach of central markets.

Ten years' experience showed that a modified form of the old system would conduce to public interests. The gilds were re-established, licence fees, however, being abolished, and no limit set to the number of firms in a gild. Things remained thus until the beginning of the Meiji era (1867), when the gilds shared the cataclysm that overtook all the country's old institutions.

Japanese commercial and industrial life presents another feature which seems to suggest special aptitude for combination. In mercantile or manufacturing families, while the eldest son always succeeded to his father's business, not only the younger sons but also the apprentices and employees, after they had served faithfully for a number of years, expected to be set up as branch houses under the auspices of the principal family, receiving a place of business, a certain amount of capital and the privilege of using the original house-name. Many an old-established firm thus came to have a plexus of branches all serving to extend its business and strengthen its credit, so that the group held a commanding position in the business world. It will be apparent from the above that commercial transactions on a large scale in pre-Meiji days were practically limited to the two great cities of Yedo and Osaka, the people in the provincial fiefs having no direct association with the gild system, confining themselves, for the most part, to domestic industries on a small scale, and not being allowed to extend their business beyond the boundaries of the fief to which they belonged.

Foreign Commerce during the Meiji Era.—If Japan's industrial development in modern times has been remarkable, the same may be said even more emphatically about the development of her over-sea commerce. This was checked at first not only by the unpopularity attaching to all intercourse with outside nations, but also by embarrassments resulting from the difference between the silver price of gold in Japan and its silver price in Europe, the precious metals being connected in Japan by a ratio of 1 to 8, and in Europe by a ratio of 1 to 15. This latter fact was the cause of a sudden and violent appreciation of values; for the government, seeing the country threatened with loss of all its gold, tried to avert the catastrophe by altering and reducing the weights of the silver coins without altering their denominations, and a corresponding difference exhibited itself, as a matter of course, in the silver quotations of commodities. Another difficulty was the attitude of officialdom. During several centuries Japan's over-sea trade had been under the control of officialdom, to whose coffers it contributed a substantial revenue. But when the foreign exporter entered the field under the conditions created by the new system, he diverted to his own pocket the handsome profit previously accruing to the government; and since the latter could not easily become reconciled to this loss of revenue, or wean itself from its traditional habit of interference in affairs of foreign commerce, and since the foreigner, on his side, not only desired secrecy in order to prevent competition, but was also tormented by inveterate suspicions of Oriental espionage, not a little friction occurred from time to time. Thus the scanty records of that early epoch suggest that trade was beset with great difficulties, and that the foreigner had to contend against most adverse circumstances, though in truth his gains amounted to 40 or 50%.

Tea and Silk.

The chief staples of the early trade were tea and silk. It happened that just before Japan's raw silk became available for export, the production of that article in France and Italy had been largely curtailed owing to a novel disease of the silkworm. Thus, when the first bales of Japanese silk appeared in London, and when it was found to possess qualities entitling it to the highest rank, a keen demand sprang up. Japanese green tea also, differing radically in flavour and bouquet from the black tea of China, appealed quickly to American taste, so that by the year 1907 Japan found herself selling to foreign countries tea to the extent of 1¼ millions sterling, and raw silk to the extent of 12¼ millions. This remarkable development is typical of the general history of Japan's foreign trade in modern times. Omitting the first decade and a half, the statistics for which are imperfect, the volume of the trade grew from 5 millions sterling in 1873—3 shillings per head of the population—to 93 millions in 1907—or 38 shillings per head. It was not a uniform growth. The period of 35 years divides itself conspicuously into two eras: the first, of 15 years (1873–1887), during which the development was from 5 millions to 9·7 millions, a ratio of 1 to 2, approximately; the second, of 20 years (1887–1907), during which the development was from 9·7 millions to 93 millions, a ratio of 1 to 10.

That a commerce which scarcely doubled itself in the first fifteen years should have grown nearly tenfold in the next twenty is a fact inviting attention. There are two principal causes: one general, the other special. The general cause was that several years necessarily elapsed before the nation's material condition began to respond perceptibly to the improvements effected by the Meiji government in matters of administration, taxation and transport facilities. Fiscal burdens had been reduced and security of life and property obtained, but railway building and road-making, harbour construction, the growth of posts, telegraphs, exchanges and banks, and the development of a mercantile marine did not exercise a sensible influence on the nation's prosperity until 1884 or 1885. From that time the country entered a period of steadily growing prosperity, and from that time private enterprise may be said to have finally started upon a career of independent activity. The special cause which, from 1885, contributed to a marked growth of trade was the resumption of specie payments. Up to that time the treasury's fiat notes had suffered such marked fluctuations of specie value that sound or successful commerce became very difficult. Against the importing merchant the currency trouble worked with double potency. Not only did the gold with which he purchased goods appreciate constantly in terms of the silver for which he sold them, but the silver itself appreciated sharply and rapidly in terms of the fiat notes paid by Japanese consumers. Cursory reflection may suggest that these factors should have stimulated exports as much as they depressed imports. But such was not altogether the case in practice. For the exporter's transactions were hampered by the possibility that a delay of a week or even a day might increase the purchasing power of his silver in Japanese markets by bringing about a further depreciation of paper, so that he worked timidly and hesitatingly, dividing his operations as minutely as possible in order to take advantage of the downward tendency of the fiat notes. Not till this element of pernicious disturbance was removed did the trade recover a healthy tone and grow so lustily as to tread closely on the heels of the foreign commerce of China, with her 300 million inhabitants and long-established international relations.

The Foreign Middleman.

Japan's trade with the outer world was built up chiefly by the energy and enterprise of the foreign middleman. He acted the part of an almost ideal agent. As an exporter, his command of cheap capital, his experience, his knowledge of foreign markets, and his connexions enabled him to secure sales such as must have been beyond reach of the Japanese working independently. Moreover, he paid to native consumers ready cash for their staples, taking upon his own shoulders all the risks of finding markets abroad. As an importer, he enjoyed, in centres of supply, credit which the Japanese lacked, and he offered to native consumers foreign produce brought to their doors with a minimum of responsibility on their part. Finally, whether as exporters or importers, foreign middlemen always competed with each other so keenly that their Japanese clients obtained the best possible terms from them. Yet the ambition of the Japanese to oust them cannot be regarded as unnatural. Every nation must desire to carry on its own commerce independently of alien assistance; and moreover, the foreign middleman's residence during many years within Japanese territory, but without the pale of Japanese sovereignty, invested him with an aggressive character which the anti-Oriental exclusiveness of certain Occidental nations helped to accentuate. Thus from the point of view of the average Japanese there are several reasons for wishing to dispense with alien middlemen, and it is plain that these reasons are operative; for whereas, in 1888, native merchants carried on only 12% of the country's over-sea trade without the intervention of the foreign middlemen, their share rose to 35% in 1899 and has since been slowly increasing.

Balance of Trade.

Analysis of Japan's foreign trade during the Meiji era shows that during the 35-year period ending in 1907, imports exceeded exports in 21 years and exports exceeded imports in 14 years. This does not suggest a very badly balanced trade. But closer examination accentuates the difference, for when the figures are added, it is found that the excesses of exports aggregated only 11 millions sterling, whereas the excesses of imports totalled 71 millions, there being thus a so-called "unfavourable balance" of 60 millions over all. The movements of specie do not throw much light upon this subject, for they are complicated by large imports of gold resulting from war indemnities and foreign loans. Undoubtedly the balance is materially redressed by the expenditures of the foreign communities in the former settlements, of foreign tourists visiting Japan and of foreign vessels engaged in the carrying trade, as well as by the earnings of Japanese vessels and the interest on investments made by foreigners. Nevertheless there remains an appreciable margin against Japan, and it is probably to be accounted for by the consideration that she is still engaged equipping herself for the industrial career evidently lying before her.

Trade with Various Countries.

The manner in which Japan's over-sea trade was divided in 1907 among the seven foreign countries principally engaged in it may be seen from the following table:—

	Exports to £ (millions).	Imports from £ (millions).	Total £ (millions).
United States	13½	8½	22
China	8¾	6¼	15
Great Britain	2¼	11¾	14
British India	1⅓	7⅔	9
Germany	1⅛	4⅞	6
France	4⅓	⅔	5
Korea	3⅓	1⅔	5

Among the 33 open ports of Japan, the first place belongs to Yokohama in the matter of foreign trade, and Kobe ranks second. The former far outstrips the latter in exports, but the case is reversed when imports are considered. As to the percentages of the whole trade standing to the credit of the five principal ports, the following figures may be consulted:—Yokohama, 40%; Kobe, 35·6; Osaka, 10; Moji, 5; and Nagasaki, 2.

VI.—Government, Administration, &c.

Emperor and Princes.—At the head of the Japanese State stands the emperor, generally spoken of by foreigners as the *mikado* (honourable gate[1]), a title comparable with sublime porte and by his own subjects as *tenshi* (son of heaven) or *tennō* (heavenly king). The emperor Mutou Hito (*q.v.*) was the 121st of his line, according to Japanese history, which reckons from 660 B.C., when Jimmu ascended the throne. But as written records do not carry us back farther than A.D. 712, the reigns and periods of the very early monarchs are more or less apocryphal. Still the fact remains that Japan has been ruled by an unbroken dynasty ever since the dawn of her history, in which respect she is unique among all the nations in the world. There are four families of princes of the blood, from any one of which a successor to the throne may be taken in default of a direct heir: Princes Arisugawa, Fushimi, Kanin and Higashi Fushimi. These families are all direct descendants of emperors, and their heads have the title of *shinnō* (prince of the blood), whereas the other imperial princes, of whom there are ten, have only the second syllable of *shinnō* (pronounced *wō* when separated from *shin*). Second and younger sons of a *shinnō* are all *wō*, and eldest sons lose the title *shin* and become *wō* from the fifth generation.

The Peerage.—In former times there were no Japanese titles of nobility, as the term is understood in the Occident. Nobles there were, however, namely, *kuge*, or court nobles, descendants of younger sons of emperors, and *daimyō* (great name), some of whom could trace their lineage to mikados; but all owed their exalted position as feudal chiefs to military prowess. The Meiji restoration of 1867 led to the abolition of the *daimyōs* as feudal chiefs, and they, together with the kuge, were merged into one class called *kwazoku* (flower families), a term corresponding to aristocracy, all inferior persons being *heimin* (ordinary folk). In 1884, however, the five Chinese titles of *ki* (prince), *kō* (marquis), *haku* (count), *shi* (viscount) and *dan* (baron) were introduced, and patents were not only granted to the ancient nobility but also conferred on men who had rendered conspicuous public service. The titles are all hereditary, but they descend to the firstborn only, younger children having no distinguishing appellation. The first list in 1884 showed 11 princes, 24 marquises, 76 counts, 324 viscounts and 74 barons. After the war with China (1894–95) the total grew to 716, and the war with

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[1] Some derive this term from *mika*, an ancient Japanese term for "great," and *to*, "place."

Russia (1904–5) increased the number to 912, namely, 15 princes, 39 marquises, 100 counts, 376 viscounts and 382 barons.

Household Department.—The Imperial household department is completely differentiated from the administration of state affairs. It includes bureaux of treasury, forests, peerage and hunting, as well as boards of ceremonies and chamberlains, officials of the empress's household and officials of the crown prince's household. The annual allowance made to the throne is £300,000, and the Imperial estate comprises some 12,000 acres of building land, 3,850,000 acres of forests, and 300,000 acres of miscellaneous lands, the whole valued at some 19 millions sterling, but probably not yielding an income of more than £200,000 yearly. Further, the household owns about 3 millions sterling (face value) of bonds and shares, from which a revenue of some £250,000 is derived, so that the whole income amounts to three-quarters of a million sterling, approximately. Out of this the households of the crown prince and all the Imperial princes are supported; allowances are granted at the time of conferring titles of nobility; a long list of charities receive liberal contributions, and considerable sums are paid to encourage art and education. The emperor himself is probably one of the most frugal sovereigns that ever occupied a throne.

Departments of State.—There are nine departments of state presided over by ministers—foreign affairs, home affairs, finance, war, navy, justice, education, agriculture and commerce, communications. These ministers form the cabinet, which is presided over by the minister president of state, so that its members number ten in all. Ministers of state are appointed by the emperor and are responsible to him alone. But between the cabinet and the crown stand a small body of men, the survivors of those by whose genius modern Japan was raised to her present high position among the nations. They are known as "elder statesmen" (*genrō*). Their proved ability constitutes an invaluable asset, and in the solution of serious problems their voice may be said to be final. At the end of 1909 four of these renowned statesmen remained—Prince Yamagata, Marquises Inouye and Matsukata and Count Okumá. There is also a privy council, which consists of a variable number of distinguished men—in 1909 there were 29, the president being Field-Marshal Prince Yamagata. Their duty is to debate and advise upon all matters referred to them by the emperor, who sometimes attends their meetings in person.

Civil Officials.—The total number of civil officials was 137,819 in 1906. It had been only 68,876 in 1898, from which time it grew regularly year by year. The salaries and allowances paid out of the treasury every year on account of the civil service are 4 millions sterling, approximately, and the annual emoluments of the principal officials are as follow:—Prime minister, £960; minister of a department, £600; ambassador, £500, with allowances varying from £2200 to £3000; president of privy council, £500; resident-general in Seoul, £600; governor-general of Formosa, £600; vice-minister, £400; minister plenipotentiary, £400, with allowances from £1000 to £1700; governor of prefecture, £300 to £360; judge of the court of cassation, £200 to £500; other judges, £60 to £400; professor of imperial university, from £80 to £160, with allowances from £40 to £120; privy councillor, £400; director of a bureau, £300; &c.

Legislature.—The first Japanese Diet was convoked the 29th of November, 1890. There are two chambers, a house of peers (*kizoku-in*) and a house of representatives (*shugi-in*). Each is invested with the same legislative power.

The upper chamber consists of four classes of members. They are, first, hereditary members, namely, princes and marquises, who are entitled to sit when they reach the age of 25; secondly, counts, viscounts and barons, elected—after they have attained their 25th year—by their respective orders in the maximum ratio of one member to every five peers; thirdly, men of education or distinguished service who are nominated by the emperor; and, fourthly, representatives of the highest tax-payers, elected, one for each prefecture, by their own class. The minimum age limit for non-titled members is 30, and it is provided that their total number must not exceed that of the titled members. The house was composed in 1909 of 14 princes of the blood, 15 princes, 39 marquises, 17 counts, 69 viscounts, 56 barons, 124 Imperial nominees, and 45 representatives of the highest tax-payers—that is to say, 210 titled members and 169 non-titled.

The lower house consists of elected members only. Originally the property qualification was fixed at a minimum annual payment of 30s. in direct taxes (*i.e.* taxes imposed by the central government), but in 1900 the law of election was amended, and the property qualification for electors is now a payment of £1 in direct taxes, while for candidates no qualification is required either as to property or as to locality. Members are of two kinds, namely, those returned by incorporated cities and those returned by prefectures. In each case the ratio is one member for every 130,000 electors, and the electoral district is the city or prefecture.

Voting is by ballot, one man one vote, and a general election must take place once in 4 years for the house of representatives, and once in 7 years for the house of peers. The house of representatives, however, is liable to be dissolved by order of the sovereign as a disciplinary measure, in which event a general election must be held within 5 months from the date of dissolution, whereas the house of peers is not liable to any such treatment. Otherwise the two houses enjoy equal rights and privileges, except that the budget must first be submitted to the representatives. Each member receives a salary of £200; the president receives £500, and the vice-president £300. The presidents are nominated by the sovereign from three names submitted by each house, but the appointment of a vice-president is within the independent right of each chamber. The lower house consists of 379 members, of whom 75 are returned by the urban population and 304 by the rural. Under the original property qualification the number of franchise-holders was only 453,474, or 11·5 to every 1000 of the nation, but it is now 1,676,007, or 15·77 to every 1000. By the constitution which created the diet freedom of conscience, of speech and of public meeting, inviolability of domicile and correspondence, security from arrest or punishment except by due process of law, permanence of judicial appointments and all the other essential elements of civil liberty were granted. In the diet full legislative authority is vested: without its consent no tax can be imposed, increased or remitted; nor can any public money be paid out except the salaries of officials, which the sovereign reserves the right to fix at will. In the emperor are vested the prerogatives of declaring war and making peace, of concluding treaties, of appointing and dismissing officials, of approving and promulgating laws, of issuing urgent ordinances to take the temporary place of laws, and of conferring titles of nobility.

Procedure of the Diet.—It could scarcely have been expected that neither tumult nor intemperance would disfigure the proceedings of a diet whose members were entirely without parliamentary experience, but not without grievances to ventilate, wrongs (real or fancied) to avenge, and abuses to redress. On the whole, however, there has been a remarkable absence of anything like disgraceful licence. The politeness, the good temper, and the sense of dignity which characterize the Japanese, generally saved the situation when it threatened to degenerate into a "scene." Foreigners entering the house of representatives in Tōkyō for the first time might easily misinterpret some of its habits. A number distinguishes each member. It is painted in white on a wooden indicator, the latter being fastened by a hinge to the face of the member's desk. When present he sets the indicator standing upright, and lowers it when leaving the house. Permission to speak is not obtained by catching the president's eye, but by calling out the aspirant's number, and as members often emphasize their calls by hammering their desks with the indicators, there are moments of decided din. But, for the rest, orderliness and decorum habitually prevail. Speeches have to be made from a rostrum. There are few displays of oratory or eloquence. The Japanese formulates his views with remarkable facility. He is absolutely free from *gaucherie* or self-consciousness when speaking in public: he can think on his feet. But his mind does not usually busy itself with abstract ideas and subtleties of philosophical or religious thought. Flights of fancy, impassioned bursts of sentiment, appeals to the heart rather than to the reason of an audience, are devices strange to his mental habit. He can be rhetorical, but not eloquent. Among all the speeches hitherto delivered in the Japanese diet it would be difficult to find a passage deserving the latter epithet.

From the first the debates were recorded verbatim. Years before the date fixed for the promulgation of the constitution, a little band of students elaborated a system of stenography and adapted it to the Japanese syllabary. Their labours remained almost without recognition or remuneration until the diet was on the eve of meeting, when it was discovered that a competent staff of shorthand reporters could be organized at an hour's notice. Japan can thus boast that, alone among the countries of the world, she possesses an exact record of the proceedings of her Diet from the moment when the first word was spoken within its walls.

A special feature of the Diet's procedure helps to discourage oratorical displays. Each measure of importance has to be submitted to a committee, and not until the latter's report has been received does serious debate take place. But in ninety-nine cases out of every hundred the committee's report determines the attitude of the house, and speeches are felt to be more or less superfluous. One result of this system is that business is done with a degree of celerity scarcely known in Occidental legislatures. For example, the meetings of the house of representatives during the session 1896–1897 were 32, and the number of hours occupied by the sittings aggregated 116. Yet the result was 55 bills debated and passed, several of them measures of prime importance, such as the gold standard bill, the budget and a statutory tariff law. It must be remembered that although actual sittings of the houses are comparatively few and brief, the committees remain almost constantly at work from morning to evening throughout the twelve weeks of the session's duration.

Divisions of the Empire.—The earliest traditional divisions of Japan into provinces was made by the emperor Seimu (131–190), in whose time the sway of the throne did not extend farther north than a line curving from Sendai Bay, on the north-east coast of the main island, to the vicinity of Niigata (one of the treaty ports), on the north-west coast. The region northward of this line was then occupied by barbarous tribes, of whom the Ainu (still to be found in Yezo) are probably the remaining descendants. The whole country was then divided into thirty-two provinces. In the 3rd century the empress Jingō, on her return from her victorious expedition against Korea, portioned out the empire into five home provinces and seven circuits, in imitation of the Korean system. By the emperor Mommu (696–707) some of the provinces were subdivided so as to increase the whole number to sixty-six, and the boundaries then fixed by him were re-surveyed in the reign of the emperor Shōmu (723–756). The old division is as follows[1]:—

I. The *Go-kinai* or "five home provinces" *i.e.* those lying immediately around Kyōto, the capital, viz.:—

Yamashiro,	also called	Jōshū	Izumi,	also called	*Senshū*
Yamato	,,	Washū	*Settsu*	,,	Sesshū
Kawachi	,,	Kashū			

II. The seven circuits, as follow:—

1. The *Tōkaidō*, or "eastern-sea circuit," which comprised fifteen provinces, viz.:—

Iga	or	Ishū	Kai	or	*Kōshyū*
Isé	,,	*Seishū*	*Sagami*	,,	*Sōshyū*
Shima	,,	Shinshū	Musashi	,,	*Bushyū*
Owari	,,	*Bishū*	Awa	,,	*Bōshū*
Mikawa	,,	*Sanshū*	*Kazusa*	,,	Sōshū
Tōtōmi	,,	*Enshū*	*Shimōsa*	,,	Sōshū
Suruga	,,	*Sunshū*	*Hitachi*	,,	Jōshū
Izu	,,	Dzushū			

2. The *Tōzandō*, or "eastern-mountain circuit," which comprised eight provinces, viz.:—

Ōmi	or	*Gōshū*	Kōzuke	or	*Jōshū*
Mino	,,	Nōshū	Shimotsuke	,,	*Yashū*
Hida	,,	Hishū	Mutsu	,,	*Ōshū*
Shinano	,,	*Shinshū*	*Dewa*	,,	Ushū

3. The *Hokurikudō*, or "northern-land circuit," which comprised seven provinces, viz.:—

Wakasa	or	*Jakushū*	*Etchiu*	or	Esshū
Echizen	,,	Esshū	*Echigo*	,,	Esshū
Kaga	,,	*Kashū*	*Sado* (island)	,,	Sashū
Noto	,,	Nōshū			

4. The *Sanindō*, or "mountain-back circuit," which comprised eight provinces, viz.:—

Tamba	or	Tanshū	*Hōki*	or	Hakushū
Tango	,,	Tanshū	Izumo	,,	*Unshū*
Tajima	,,	Tanshū	Iwami	,,	*Sekishū*
Inaba	,,	*Inshū*	*Oki* (group of islands)		

5. The *Sanyōdō*, or "mountain-front circuit," which comprised eight provinces, viz.:—

Harima	or	*Banshū*	*Bingo*	or	Bishū
Mimasaka	,,	*Sakushū*	Aki	,,	*Geishū*
Bizen	,,	Bishū	*Suwō*	,,	Bōshū
Bitchiu	,,	Bishū	Nagato	,,	*Chōshū*

6. The *Nankaidō*, or "southern-sea circuit," which comprised six provinces, viz.:—

Kii	or	*Kishū*	*Sanuki*	or	Sanshū
Awaji (island)	,,	Tanshū	*Iyo*	,,	Yoshū
Awa	,,	*Ashū*	*Tosa*	,,	*Toshū*

7. The *Saikaidō*, or "western-sea circuit," which comprised nine provinces, viz:—

Chikuzen	or	Chikushū	*Higo*	or	Hishū
Chikugo	,,	Chikushū	*Hiuga*	,,	Nisshū
Buzen	,,	Hōshū	*Osumi*	,,	Gūshū
Bungo	,,	Hōshū	Satsuma	,,	*Sasshū*
Hizen	,,	Hishū			

III. The two islands, viz.:—

1. Tsushima	or	*Taishū*	2. *Iki*	or	Ishū

Upon comparing the above list with a map of Japan, it will be seen that the main island contains the Go-kinai, Tōkaidō, Tōzandō, Hokurikudō, Sanindō, Sanyōdō, and one province (Kishu) of the Nankaidō. Omitting also the island of Awaji, the remaining provinces of the Nankaidō give the name Shikoku (the "four provinces") to the island in which they lie; while Saikaidō coincides exactly with the large island Kiūshiū (the "nine provinces").

In 1868, when the rebellious nobles of Ōshū and Dewa, in the Tōzandō, had submitted to the emperor, those two provinces were subdivided, Dewa into Uzen and Ugo, and Ōshū into Iwaki, Iwashiro, Rikuzen, Rikuchū and Michinoku (usually called Mutsu). This increased the old number of provinces from sixty-six to seventy-one. At the same time there was created a new circuit, called the *Hokkaidō*, or "northern-sea circuit," which comprised the eleven provinces into which the large island of Yezo was then divided (viz. Oshima, Shiribeshi, Ishikari, Teshibo, Kitami, Iburi, Hiaka, Tokachi, Kushiro, and Nemuro) and the Kurile Islands (Chishima).

Another division of the old sixty-six provinces was made by taking as a central point the ancient barrier of Osaka on the frontier of Ōmi and Yamashiro,—the region lying on the east, which consisted of thirty-three provinces, being called *Kwantō*, or "east of the barrier," the remaining thirty-three provinces on the west being styled *Kwansei*, or "west of the barrier." At the present time, however, the term Kwantō is applied to only the eight provinces of Musashi, Sagami, Kōzuke, Shimotsuke, Kazusa, Shimōsa, Awa and Hitachi,—all lying immediately to the east of the old barrier of Hakone, in Sagami.

Chū-goku, or "central provinces," is a name in common use for the Sanindō and Sanyōdō taken together. *Saikoku*, or "western provinces," is another name for Kiūshiū, which in books again is frequently called *Chinsei*.

Local Administrative Divisions.—For purposes of local administration Japan is divided into 3 urban prefectures (*fu*), 43 rural prefectures (*ken*), and 3 special dominions (*chō*), namely Formosa, Hokkaidō and South Sakhalin. Formosa and Sakhalin not having been included in Japan's territories until 1895 and 1905, respectively, are still under the military control of a governor-general, and belong, therefore, to an administrative system different from that prevailing throughout the rest of the country. The prefectures and Hokkaidō are divided again into 638 sub-prefectures (*gun* or *kōri*); 60 towns (*shi*); 125 urban districts (*chō*) and 12,274 rural districts (*son*). The three urban prefectures are Tōkyō, Osaka and Kiōto, and the urban and rural districts are distinguished according to the number of houses they contain. Each prefecture is named after its chief town, with the exception of Okinawa, which is the appellation of a group of islands called also Riūkiū (Luchu). The following table shows the names of the prefectures, their areas, populations, number of sub-prefectures, towns and urban and rural divisions:—

Prefecture.	Area in sq. m.	Population.	Sub-prefectures.	Towns.	Urban Districts.	Rural Districts.
Tōkyō	749·76	1,795,128[2]	8	1	20	157
Kanagawa	927·79	776,642	11	1	19	202
Saitama	1,585·30	1,174,094	9	—	42	343
Chiba	1,943·85	1,273,387	12	—	69	286
Ibaraki	2,235·67	1,131,556	14	1	45	335
Tochigi	2,854·14	788,324	8	1	30	145
Gumma	2,427·21	774,654	11	2	38	169
Nagano	5,088·41	1,237,584	16	1	22	371
Yamanashi	1,727·50	498,539	9	1	7	235
Shizuoka	3,002·76	1,199,805	13	1	38	306
Aichi	1,864·17	1,591,357	19	1	74	592
Miye	2,196·56	495,389	15	2	19	325
Gifu	4,001·84	996,062	18	1	42	299
Shiga	1,540·30	712,024	12	1	12	190
Fukui	1,621·50	633,840	11	1	9	171
Ishikawa	1,611·59	392,905	8	1	16	259
Toyama	1,587·80	785,554	8	2	31	239
The above 17 prefectures form Central Japan.						
Niigata	4,914·55	1,812,289	16	1	47	401
Fukushima	5,042·57	1,057,971	17	1	37	388
Miyagi	3,223·11	835,830	16	1	31	172
Yamagata	3,576·89	829,210	11	2	24	206
Akita	4,493·84	775,077	9	1	42	197

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[1] The names given in italics are those more commonly used. Those in the first column are generally of pure native derivation; those in the second column are composed of the Chinese word *shū*, a "province," added to the Chinese pronunciation of one of the characters with which the native name is written. In a few cases both names are used.

[2] This is not the population of the city proper, but that of the urban prefecture.

Prefecture.	Area in sq. m.	Population.	Sub-prefectures.	Towns.	Urban Districts.	Rural Districts.
Iwate	5,359·17	726,380	13	1	23	217
Aomori	3,617·89	612,171	8	2	9	159
The above 7 prefectures form Northern Japan.						
Kiōto	1,767·43	931,576[1]	18	1	20	260
Osaka	689·69	1,311,909[1]	9	2	13	289
Nara	1,200·46	538,507	10	1	18	142
Wakayama	1,851·29	681,572	7	1	16	215
Hiōgo	3,318·31	1,667,226	25	2	29	403
Okayama	2,509·04	1,132,000	19	1	29	383
Hiroshima	3,103·84	1,436,415	16	3	27	420
Yamaguchi	1,324·34	986,161	11	1	10	215
Shimane	2,597·48	721,448	16	1	14	276
Tottori	1,335·99	418,929	6	1	8	227
The above 10 prefectures form Southern Japan.						
Tokushima	1,616·82	699,398	10	1	2	137
Kagawa	976·46	700,462	7	2	12	166
Ehime	2,033·57	997,481	12	1	18	283
Kochi	2,720·13	616,549	6	1	14	183
The above 4 prefectures form the island of Shikoku.						
Nagasaki	1,401·49	821,323	9	2	15	288
Saga	984·07	621,011	8	1	7	127
Fukuoka	1,894·14	1,362,743	19	4	38	340
Kumamoto	2,774·20	1,151,401	12	1	33	331
Oita	2,400·27	839,485	12	—	28	251
Miyazaki	2,904·54	454,707	8	—	9	91
Kagoshima	3,589·76	1,104,631	12	1	—	380
Okinawa	935·18	469,203	5	2	—	52
The above 8 prefectures form Kiūshiū.						
Hokkaidō	36,328·34	610,155	88	3	19	456

Local Administrative System.—In the system of local administration. full effect is given to the principle of popular representation. Each prefecture (urban or rural), each sub-prefecture, each town and each district (urban or rural) has its local assembly, the number of members being fixed in proportion to the population. There is no superior limit of number in the case of a prefectural assembly, but the inferior limit is 30. For a town assembly, however, the superior limit is 60 and the inferior 30; for a sub-prefectural assembly the corresponding figures are 40 and 15, and for a district assembly, 30 and 8. These bodies are all elective. The property qualification for the franchise in the case of prefectural and sub-prefectural assemblies is an annual payment of direct national taxes to the amount of 3 *yen*; and in the case of town and district assemblies, 2 *yen*; while to be eligible for election to a prefectural assembly a yearly payment of 10 *yen* of direct national taxes is necessary; to a sub-prefectural assembly, 5 *yen*, and to a town or district assembly, 2 *yen*. Under these qualifications the electors aggregate 2,009,745, and those eligible for election total 919,507. In towns and districts franchise-holders are further divided into classes with regard to their payment of local taxes. Thus for town electors there are three classes, differentiated by the following process: On the list of ratepayers the highest are checked off until their aggregate payments are equal to one-third of the total taxes. These persons form the first class. Next below them the persons whose aggregate payments represent one-third of the total amount are checked off to form the second class, and all the remainder form the third class. Each class elects one-third of the members of assembly. In the districts there are only two classes, namely, those whose payments, in order from the highest, aggregate one-half of the total, the remaining names on the list being placed in the second class. Each class elects one-half of the members. This is called the system of *ō-jinushi* (large landowners) and is found to work satisfactorily as a device for conferring representative rights in proportion to property. The franchise is withheld from all salaried local officials, from judicial officials, from ministers of religion, from persons who, not being barristers by profession, assist the people in affairs connected with law courts or official bureaux, and from every individual or member of a company that contracts for the execution of public works or the supply of articles to a local administration, as well as from persons unable to write their own names and the name of the candidate for whom they vote. Members of assembly are not paid. For prefectural and sub-prefectural assemblies the term is four years; for town and district assemblies, six years, with the provision that one-half of the members must be elected every third year. The prefectural assemblies hold one session of 30 days yearly; the sub-prefectural assemblies, one session of not more than 14 days. The town and district assemblies have no fixed session; they are summoned by the mayor or the head-man when their deliberations appear necessary, and they continue in session till their business is concluded.

The chief function of the assemblies is to deal with all questions of local finance. They discuss and vote the yearly budgets; they pass the settled accounts; they fix the local taxes within a maximum limit which bears a certain ratio to the national taxes; they make representations to the minister for home affairs; they deal with the fixed property of the locality; they raise loans, and so on. It is necessary, however, that they should obtain the consent of the minister for home affairs, and sometimes of the minister of finance also, before disturbing any objects of scientific, artistic or historical importance; before contracting loans; before imposing special taxes or passing the normal limits of taxation; before enacting new local regulations or changing the old; before dealing with grants in aid made by the central treasury, &c. The governor of a prefecture, who is appointed by the central administration, is invested with considerable power. He oversees the carrying out of all works undertaken at the public expense; he causes bills to be drafted for discussion by an assembly; he is responsible for the administration of the funds and property of the prefecture; he orders payments and receipts; he directs the machinery for collecting taxes and fees; he summons a prefectural assembly, opens it and closes it, and has competence to suspend its session should such a course seem necessary. Many of the functions performed by the governor with regard to prefectural assemblies are discharged by a head-man (*gun-chô*) in the case of sub-prefectural assemblies. This head-man is a salaried official appointed by the central administration. He convenes, opens and closes the sub-prefectural assembly; he may require it to reconsider any of its financial decisions that seem improper, explaining his reasons for doing so, and should the assembly adhere to its original view, he may refer the matter to the governor of the prefecture. On the other hand, the assembly is competent to appeal to the home minister from the governor's decision. The sub-prefectural head-man may also take upon himself, in case of emergency, any of the functions falling within the competence of the sub-prefectural assembly, provided that he reports the fact to the assembly and seeks its sanction at the earliest possible opportunity. In each district also there is a head-man, but his post is always elective and generally non-salaried. He occupies towards a district assembly the same position that the sub-prefecture head-man holds towards a sub-prefectural assembly. Over the governors stands the minister for home affairs, who discharges general duties of superintendence and sanction, has competence to delete any item of a local budget, and may, with the emperor's consent, order the dissolution of a local assembly, provided that steps are taken to elect and convene another within three months.

The machinery of local administration is completed by councils, of which the governor of a prefecture, the mayor[2] of a town, or the head-man of a sub-prefecture or district, is *ex officio* president, and the councillors are partly elective, partly nominated by the central government. The councils may be said to stand in an executive position towards the local legislatures, namely, the assemblies, for the former give effect to the measures voted by the latter, take their place in case of emergency and consider questions submitted by them. This system of local government has now been in operation since 1885, and has been found to work well. It constitutes a thorough method of political education for the people. In feudal days popular representation had no existence, but a very effective chain of local responsibility was manufactured by dividing the people—apart from the samurai—into groups of five families, which were held jointly liable for any offence committed by one of their members. Thus it cannot be said that the people were altogether unprepared for this new system.

The Ancient System.

The Army.—The Japanese—as distinguished from the aboriginal inhabitants of Japan—having fought their way into the country, are naturally described in their annals as a nation of soldiers. The sovereign is said to have been the commander-in-chief and his captains were known as *o-omi* and *o-muraji*, while the duty of serving in the ranks devolved on all subjects alike. This information is indeed derived from tradition only, since the first written record goes back no further than 712. We are justified, however, in believing that at the close of the 7th century of the Christian era, when the empress Jito sat upon the throne, the social system of the Tang dynasty of China commended itself for adoption; the distinction of civil and military is said to have been then established for the first time, though it probably concerned officials only. Certain officers received definitely military commissions, as generals, brigadiers, captains and so on; a military office (*hyōbu-shō*) was organized, and each important district throughout the empire had its military division (*gundan*). One-third—some say one-fourth—of the nation's able-bodied males constituted the army. Tactically there was a complete organization, from the squad of 5 men to the division of 600 horse and 400 foot. Service was for a defined period, during which taxes were remitted, so that military duties always found men ready to discharge them. Thus the hereditary soldier—afterwards known as the *samurai* or *bushi*—did not yet exist, nor was there any such thing as an exclusive right to carry arms. Weapons of war, the property of the state, were served out when required for fighting or for training purposes.

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[1] This is not the population of the city proper, but that of the urban prefecture.

[2] The mayor of a town (*shichō*) is nominated by the minister for home affairs from three men chosen by the town assembly.

At the close of the 8th century stubborn insurrections on the part of the aborigines gave new importance to the soldier. The conscription list had to be greatly increased, and it came to be a recognized principle that every stalwart man should bear arms, every weakling become a bread-winner. Thus, for the first time, the distinction between "soldier" and "working man"[1] received official recognition, and in consequence of the circumstances attending the distinction a measure of contempt attached to the latter. The next stage of development had its origin in the assumption of high offices of state by great families, who encroached upon the imperial prerogatives, and appropriated as hereditary perquisites posts which should have remained in the gift of the sovereign. The Fujiwara clan, taking all the civil offices, resided in the capital, whereas the military posts fell to the lot of the Taira and the Minamoto, who, settling in the provinces and being thus required to guard and police the outlying districts, found it expedient to surround themselves with men who made soldiering a profession. These latter, in their turn, transmitted their functions to their sons, so that there grew up in the shadow of the great houses a number of military families devoted to maintaining the power and promoting the interests of their masters, from whom they derived their own privileges and emoluments.

From the middle of the 10th century, therefore, the terms *samurai* and *bushi* acquired a special significance, being applied to themselves and their followers by the local magnates, whose power tended more and more to eclipse even that of the throne, and finally, in the 12th century, when the Minamoto brought the whole country under the sway of military organization, the privilege of bearing arms was restricted to the samurai. Thenceforth the military class entered upon a period of administrative and social superiority which lasted, without serious interruption, until the middle of the 19th century. But it is to be observed that the distinction between soldier and civilian, samurai and commoner, was not of ancient existence, nor did it arise from any question of race or caste, victor or vanquished, as is often supposed and stated. It was an outcome wholly of ambitious usurpations, which, relying for success on force of arms, gave practical importance to the soldier, and invested his profession with factitious honour.

Weapons.

The bow was always the chief weapon of the fighting-man in Japan. "War" and "bow-and-arrow" were synonymous terms. Tradition tells how Tametomo shot an arrow through the crest of his brother's helmet, in order to recall the youth's allegiance without injuring him; how Nasuno Michitaka discharged a shaft that severed the stem of a fan swayed by the wind; how Mutsuru, ordered by an emperor to rescue a fish from the talons of an osprey without killing bird or fish, cut off the osprey's feet with a crescent-headed arrow so that the fish dropped into the palace lake and the bird continued its flight; and there are many similar records of Japanese skill with the weapon. Still better authenticated were the feats performed at the "thirty-three-span halls" in Kiōto and Yedo, where the archer had to shoot an arrow through the whole length of a corridor 128 yards long and only 16 ft. high. Wada Daihachi, in the 17th century, succeeded in sending 8133 arrows from end to end of the corridor in 24 consecutive hours, being an average of over 5 shafts per minute; and Masatoki, in 1852, made 5383 successful shots in 20 hours, more than 4 a minute. The lengths of the bow and arrow were determined with reference to the capacity of the archer. In the case of the bow, the unit of measurement was the distance between the tips of the thumb and the little finger with the hand fully stretched. Fifteen of these units gave the length of the bow—the maximum being about 7½ ft. The unit for the arrow was from 12 to 15 hand-breadths, or from 3 ft. to 3¾ ft. Originally the bow was of unvarnished boxwood or *zelkowa*; but subsequently bamboo alone came to be employed. Binding with cord or rattan served to strengthen the bow, and for precision of flight the arrow had three feathers, an eagle's wing being most esteemed for that purpose, and after it, in order, that of the copper pheasant, the crane, the adjutant and the snipe.

Next in importance to the bow came the sword, which is often spoken of as the samurai's chief weapon, though there can be no doubt that during long ages it ranked after the bow. It was a single-edged weapon remarkable for its three exactly similar curves—edge, face-line and back; its almost imperceptibly convexed blade; its admirable tempering; its consummately skilled forging; its razor-like sharpness; its cunning distribution of weight, giving a maximum efficiency of stroke. The 10th century saw this weapon carried to perfection, and it has been inferred that only from that epoch did the samurai begin to esteem his sword as the greatest treasure he possessed, and to rely on it as his best instrument of attack and defence. But it is evident that the evolution of such a blade must have been due to an urgent, long-existing demand, and that the *katana* came as the sequel of innumerable efforts on the part of the sword-smith and generous encouragement on that of the soldier. Many pages of Japanese annals and household traditions are associated with its use. In every age numbers of men devoted their whole lives to acquiring novel skill in swordsmanship. Many of them invented systems of their own, differing from one another in some subtle details unknown to any save the master himself and his favourite pupils. Not merely the method of handling the weapon had to be studied. Associated with sword-play was an art variously known as *shinobi*, *yawara*, and *jujutsu*, names which imply the exertion of muscular force in such a manner as to produce a maximum of effect with a minimum of effort, by directing an adversary's strength so as to become auxiliary to one's own. It was an essential element of the expert's art not only that he should be competent to defend himself with any object that happened to be within reach, but also that without an orthodox weapon he should be capable of inflicting fatal or disabling injury on an assailant. In the many records of great swordsmen instances are related of men seizing a piece of firewood, a brazier-iron, or a druggist's pestle as a weapon of offence, while, on the other side, an umbrella, an iron fan or even a pot-lid served for protection. The samurai had to be prepared for every emergency. Were he caught weaponless by a number of assailants, his art of yawara was supposed to supply him with expedients for emerging unscathed. Nothing counted save the issue. The methods of gaining victory or the circumstances attending defeat were scarcely taken into consideration. The true samurai had to rise superior to all contingencies. Out of this perpetual effort on the part of hundreds of experts to discover and perfect novel developments of swordsmanship, there grew a habit which held its vogue down to modern times, namely, that when a man had mastered one style of sword-play in the school of a teacher, he set himself to study all others, and for that purpose undertook a tour throughout the provinces, challenging every expert, and, in the event of defeat, constituting himself the victor's pupil. The sword exercised a potent influence on the life of the Japanese nation. The distinction of wearing it, the rights that it conferred, the deeds wrought with it, the fame attaching to special skill in its use, the superstitions connected with it, the incredible value set upon a fine blade, the honours bestowed on an expert sword-smith, the traditions that had grown up around celebrated weapons, the profound study needed to be a competent judge of a sword's qualities—all these things conspired to give the katana an importance beyond the limits of ordinary comprehension. A samurai carried at least two swords, a long and a short. Their scabbards of lacquered wood were thrust into his girdle, not slung from it, being fastened in their place by cords of plaited silk. Sometimes he increased the number of swords to three, four or even five, before going into battle, and this array was supplemented by a dagger carried in the bosom. The short sword was not employed in the actual combat. Its use was to cut off an enemy's head after overthrowing him, and it also served a defeated soldier in his last resort—suicide. In general the long sword did not measure more than 3 ft., including the hilt; but some were 5 ft. long, and some 7. Considering that the scabbard, being fastened to the girdle, had no play, the feat of drawing one of these very long swords demanded extraordinary aptitude.

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[1] The term *hyaku-shō*, here translated "working man," means literally "one engaged in any of the various callings" apart from military service. In a later age a further distinction was established between the agriculturist, the artisan, and the trader, and the word *hyaku-shō* then came to carry the signification of "husbandman" only.

Spear and glaive were also ancient Japanese weapons. The oldest form of spear was derived from China. Its handle measured about 6 ft. and its blade 8 in., and it had sickle-shaped horns at the junction of blade and hilt (somewhat resembling a European *ranseur*). This weapon served almost exclusively for guarding palisades and gates. In the 14th century a true lance came into use. Its length varied greatly, and it had a hog-backed blade tempered almost as finely as the sword itself. This, too, was a Chinese type, as was also the glaive. The glaive (*naginata*, long sword) was a scimitar-like blade, some 3 ft. in length, fixed on a slightly longer haft. Originally the warlike monks alone employed this weapon, but from the 12th century it found much favour among military men. Ultimately, however, its use may be said to have been limited to women and priests. The spear, however, formed a useful adjunct of the sword, for whereas the latter could not be used except by troops in very loose formation, the former served for close-order fighting.

Armour.

Japanese armour (*gusoku*) may be broadly described as plate armour, but the essential difference between it and the European type was that, whereas the latter took its shape from the body, the former neither resembled nor was intended to resemble ordinary garments. Hence the only changes that occurred in Japanese armour from generation to generation had their origin in improved methods of construction. In general appearance it differed from the panoply of all other nations, so that, although to its essential parts we may apply with propriety the European terms—helmet, corselet, &c.—individually and in combination these parts were not at all like the originals of those names. Perhaps the easiest way of describing the difference is to say that whereas a European knight seemed to be clad in a suit of metal clothes, a Japanese samurai looked as if he wore protective curtains. The Japanese armour was, in fact, suspended from, rather than fitted to, the person. Only one of its elements found a counterpart in the European suit, namely, a tabard, which, in the case of men of rank, was made of the richest brocade. Iron and leather were the chief materials, and as the laminae were strung together with a vast number of coloured cords—silk or leather—an appearance of considerable brilliancy was produced. Ornamentation did not stop there. Plating and inlaying with gold and silver, and finely wrought decoration in chiselled, inlaid and *repoussé* work were freely applied. On the whole, however, despite the highly artistic character of its ornamentation, the loose, pendulous nature of Japanese armour detracted greatly from its workmanlike aspect, especially when the *horo* was added—a curious appendage in the shape of a curtain of fine transparent silk, which was either stretched in front between the horns of the helmet and the tip of the bow, or worn on the shoulders and back, the purpose in either case being to turn the point of an arrow. A true samurai observed strict rules of etiquette with regard even to the garments worn under his armour, and it was part of his soldierly capacity to be able to bear the great weight of the whole without loss of activity, a feat impossible to any untrained man of modern days. Common soldiers were generally content with a comparatively light helmet and a corselet.

War-horses.

The Japanese never had a war-horse worthy to be so called. The mis-shapen ponies which carried them to battle showed qualities of hardiness and endurance, but were so deficient in stature and massiveness that when mounted by a man in voluminous armour they looked painfully puny. Nothing is known of the early Japanese saddle, but at the beginning of historic times it approximated closely to the Chinese type. Subsequently a purely Japanese shape was designed. It consisted of a wooden frame so constructed that a padded numnah could be fastened to it. Galled backs or withers were unknown with such a saddle: it fitted any horse. The stirrup, originally a simple affair resembling that of China and Europe, afterwards took the form of a shoe-sole with upturned toe. Both stirrups and saddle-frame were often of beautiful workmanship, the former covered with rich gold lacquer, the latter inlaid with gold or silver. In the latter part of the military epoch chain-armour was adopted for the horse, and its head was protected by a monster-faced mask of iron.

Early Strategy and Tactics.

Flags were used in battle as well as on ceremonial occasions. Some were monochrome, as the red and white flags of the Taira and the Minamoto clans in their celebrated struggle during the 12th century; and some were streamers emblazoned with figures of the sun, the moon, a dragon, a tiger and so forth, or with religious legends. Fans with iron ribs were carried by commanding officers, and signals to advance or retreat were given by beating drums and metal gongs and blowing conches. During the military epoch a campaign was opened or a contest preluded by a human sacrifice to the god of war, the victim at this rite of blood (*chi-matsuri*) being generally a prisoner or a condemned criminal. Although ambuscades and surprises played a large part in all strategy, pitched battles were the general rule, and it was essential that notice of an intention to attack should be given by discharging a singing arrow. Thereafter the assaulting army, taking the word from its commander, raised a shout of "Ei! Ei!" to which the other side replied, and the formalities having been thus satisfied, the fight commenced. In early medieval days tactics were of the crudest description. An army consisted of a congeries of little bands, each under the order of a chief who considered himself independent, and instead of subordinating his movements to a general plan, struck a blow wherever he pleased. From time immemorial a romantic value has attached in Japan to the first of anything: the first snow of winter; the first water drawn from the well on New Year's Day; the first blossom of the spring; the first note of the nightingale. So in war the first to ride up to the foe or the wielder of the first spear was held in high honour, and a samurai strove for that distinction as his principal duty. It necessarily resulted, too, not only from the nature of the weapons employed, but also from the immense labour devoted by the true samurai to perfecting himself in their use, that displays of individual prowess were deemed the chief object in a battle. Some tactical formations borrowed from China were familiar in Japan, but their intelligent use and their modification to suit the circumstances of the time were inaugurated only by the great captains of the 15th and 16th centuries. Prior to that epoch a battle resembled a gigantic fencing match. Men fought as individuals, not as units of a tactical formation, and the engagement consisted of a number of personal duels, all in simultaneous progress. It was the samurai's habit to proclaim his name and titles in the presence of the enemy, sometimes adding from his own record or his father's any details that might tend to dispirit his hearers. Then some one advancing to cross weapons with him would perform the same ceremony of self-introduction, and if either found anything to upbraid in the other's antecedents or family history, he did not fail to make loud reference to it, such a device being counted efficacious as a means of disturbing an adversary's *sang-froid*, though the principle underlying the mutual introduction was courtesy. The duellists could reckon on finishing their fight undisturbed, but the victor frequently had to endure the combined assault of a number of the comrades or retainers of the vanquished. Of course a skilled swordsman did not necessarily seek a single combat; he was equally ready to ride into the thick of the fight without discrimination, and a group of common soldiers never hesitated to make a united attack upon a mounted officer if they found him disengaged. But the general feature of a battle was individual contests, and when the fighting had ceased, each samurai proceeded to the tent[1] of the commanding officer and submitted for inspection the heads of those whom he had killed.

Change of Tactics.

The disadvantage of such a mode of fighting was demonstrated for the first time when the Mongols invaded Japan in 1274. The invaders moved in phalanx, guarding themselves with pavises, and covering their advance with a host of archers shooting clouds of poisoned arrows.[2] When a Japanese samurai advanced singly and challenged one of them to combat, they opened their ranks, enclosed the challenger and cut him to pieces. Many Japanese were thus slain, and it was not until they made a concerted movement of attack that they produced any effect upon the enemy. But although the advantage of massing strength seems to have been recognized, the Japanese themselves did not adopt the formation which the Mongols had shown to be so formidable. Individual prowess continued to be the prominent factor in battles down to a comparatively recent period. The great captains Takeda Shingen and Uyesugi Kenshin are supposed to have been Japan's pioneer tacticians. They certainly appreciated the value of a formation in which the action of the individual should be subordinated to the unity of the whole. But when it is remembered that firearms had already been in the hands of the Japanese for several years, and that they had means of acquainting themselves with the tactics of Europe through their intercourse with the Dutch, it is remarkable that the changes attributed to Takeda and Uyesugi were not more drastic. Speaking broadly, what they did was to organize a column with the musqueteers and archers in front; the spearmen and swordsmen in the second line; the cavalry in the third line; the commanding officer in the rear, and the drums and standards in the centre. At close quarters the spear proved a highly effective weapon, and in the days of Hideyoshi (1536–1598) combined flank and front attacks by bands of spearmen became a favourite device. The importance of a strong reserve also received recognition, and in theory, at all events, a tolerably intelligent system of tactics was adopted. But not until the close of the 17th century did the doctrine of strictly disciplined action obtain practical vogue. Yamaga Soko is said to have been the successful inculcator of this principle, and from his time the most approved tactical formation was known as the *Yamagaryū* (Yamaga style), though it showed no other innovation than strict subordination of each unit to the general plan.

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[1] A tent was simply a space enclosed with strips of cloth or silk, on which was emblazoned the crest of the commander. It had no covering.

[2] The Japanese never at any time of their history used poisoned arrows; they despised them as depraved and inhuman weapons.

Military Principles.

Although, tactically speaking, the samurai was everything and the system nothing before the second half of the 17th century, and although strategy was chiefly a matter of deception, surprises and ambushes, it must not be supposed that there were no classical principles. The student of European military history searches in vain for the rules and maxims of war so often invoked by glib critics, but the student of Japanese history is more successful. Here, as in virtually every field of things Japanese, retrospect discovers the ubiquitous Chinaman. The treatises of Sung and 'Ng (called in Japan Son and Go) Chinese generals of the third century after Christ, were the classics of Far-Eastern captains through all generations. (See *The Book of War*, tr. E. F. Calthrop, 1908.) Yoshitsunē, in the 12th century, deceived a loving girl to obtain a copy of Sung's work which her father had in his possession, and Yamaga, in the 17th century, when he set himself to compose a book on tactics, derived his materials almost entirely from the two Chinese monographs. These treatises came into the hands of the Japanese in the 8th century, when the celebrated Kibi no Mabi went to study civilization in China, just as his successors of the 19th century went to study a new civilization in Europe and America. Thenceforth Son and Go became household words among Japanese soldiers. Their volumes were to the samurai what the *Mahayana* was to the Buddhist. They were believed to have collected whatever of good had preceded them, and to have forecast whatever of good the future might produce. The character of their strategic methods, somewhat analogous to those of 18th-century Europe, may be gathered from the following:—

> "An army undertaking an offensive campaign must be twice as numerous as the enemy. A force investing a fortress should be numerically ten times the garrison. When the adversary holds high ground, turn his flank; do not deliver a frontal attack. When he has a mountain or a river behind him, cut his lines of communication. If he deliberately assumes a position from which victory is his only escape, hold him there, but do not molest him. If you can surround him, leave one route open for his escape, since desperate men fight fiercely. When you have to cross a river, put your advance-guard and your rear-guard at a distance from the banks. When the enemy has to cross a river, let him get well engaged in the operation before you strike at him. In a march, make celerity your first object. Pass no copse, enter no ravine, nor approach any thicket until your scouts have explored it fully."

Such precepts are multiplied; but when these ancient authors discuss tactical formations, they do not seem to have contemplated anything like rapid, well-ordered changes of mobile, highly trained masses of men from one formation to another, or their quick transfer from point to point of a battlefield. The basis of their tactics is *The Book of Changes*. Here again is encountered the superstition that underlies nearly all Chinese and Japanese institutions: the superstition that took captive even the great mind of Confucius. The positive and the negative principles; the sympathetic and the antipathetic elements; cosmos growing out of chaos; chaos re-absorbing cosmos—on such fancies they founded their tactical system. The result was a phalanx of complicated organization, difficult to manœuvre and liable to be easily thrown into confusion. Yet when Yamaga in the 17th century interpreted these ancient Chinese treatises, he detected in them suggestions for a very shrewd use of the principle of échelon, and applied it to devise formations which combined much of the frontal expansion of the line with the solidity of the column. More than that cannot be said for Japanese tactical genius. The samurai was the best fighting unit in the Orient—probably one of the best fighting units the world ever produced. It was perhaps because of that excellence that his captains remained indifferent tacticians.

Ethics of the Samurai.

In estimating the military capacity of the Japanese, it is essential to know something of the ethical code of the samurai, the *bushido* (way of the warrior) as it was called. A typical example of the rules of conduct prescribed by feudal chieftains is furnished in the code of Kato Kiyomasa, a celebrated general of the 16th century:—

Regulations for Samurai of every Rank; the Highest and Lowest alike.

1. The routine of service must be strictly observed. From 6 a.m. military exercises shall be practised. Archery, gunnery and horsemanship must not be neglected. If any man shows exceptional proficiency he shall receive extra pay.

2. Those that desire recreation may engage in hawking, deer-hunting or wrestling.

3. With regard to dress, garments of cotton or pongee shall be worn. Any man incurring debts owing to extravagance of costume or living shall be considered a law-breaker. If, however, being zealous in the practice of military arts suitable to his rank, he desires to hire instructors, an allowance may be granted to him for that purpose.

4. The staple of diet shall be unhulled rice. At social entertainments one guest for one host is the proper limit. Only when men are assembled for military exercises shall many dine together.

5. It is the duty of every samurai to make himself acquainted with the principles of his craft. Extravagant displays of adornment are forbidden in battle.

6. Dancing or organizing dances is unlawful; it is likely to betray sword-carrying men into acts of violence. Whatever a man does should be done with his heart. Therefore for the soldier military amusements alone are suitable. The penalty for violating this provision is death by suicide.

7. Learning shall be encouraged. Military books must be read. The spirit of loyalty and filial piety must be educated before all things. Poem-composing pastimes are not to be engaged in by samurai. To be addicted to such amusements is to resemble a woman. A man born a samurai should live and die sword in hand. Unless he is thus trained in time of peace, he will be useless in the hour of stress. To be brave and warlike must be his invariable condition.

8. Whosoever finds these rules too severe shall be relieved from service. Should investigation show that any one is so unfortunate as to lack manly qualities, he shall be singled out and dismissed forthwith. The imperative character of these instructions must not be doubted.

The plainly paramount purpose of these rules was to draw a sharp line of demarcation between the samurai and the courtiers living in Kiōto. The dancing, the couplet-composing, the sumptuous living and the fine costumes of the officials frequenting the imperial capital were strictly interdicted by the feudatories. Frugality, fealty and filial piety—these may be called the fundamental virtues of the samurai. Owing to the circumstances out of which his caste had grown, he regarded all bread-winning pursuits with contempt, and despised money. To be swayed in the smallest degree by mercenary motives was despicable in his eyes. Essentially a stoic, he made self-control the ideal of his existence, and practised the courageous endurance of suffering so thoroughly that he could without hesitation inflict on his own body pain of the most horrible description. Nor can the courage of the samurai justly be ascribed to bluntness of moral sensibility resulting from semi-savage conditions of life. From the 8th century onwards the current of existence in Japan set with general steadiness in the direction of artistic refinement and voluptuous luxury, amidst which men could scarcely fail to acquire habits and tastes inconsistent with acts of high courage and great endurance. The samurai's mood was not a product of semi-barbarism, but rather a protest against emasculating civilization. He schooled himself to regard death by his own hand as a normal eventuality. The story of other nations shows epochs when death was welcomed as a relief and deliberately invited as a refuge from the mere weariness of living. But wherever there has been liberty to choose, and leisure to employ, a painless mode of exit from the world, men have invariably selected it. The samurai, however, adopted in *harakiri* (disembowelment) a mode of suicide so painful and so shocking that to school the mind to regard it with indifference and perform it without flinching was a feat not easy to conceive. Assistance was often rendered by a friend who stood ready to decapitate the victim immediately after the stomach had been gashed; but there were innumerable examples of men who consummated the tragedy without aid, especially when the sacrifice of life was by way of protest against the excesses of a feudal chief or the crimes of a ruler, or when some motive for secrecy existed. It must be observed that the suicide of the samurai was never inspired by any doctrine like that of Hegesias. Death did not present itself to him as a legitimate means of escaping from the cares and disappointments of life. Self-destruction had only one consolatory aspect, that it was the soldier's privilege to expiate a crime with his own sword, not under the hand of the executioner. It rested with his feudal chief to determine his guilt, and his peremptory duty was never to question the justice of an order to commit suicide, but to obey without murmur or protest. For the rest, the general motives for suicide were to escape falling into the hands of a victorious enemy, to remonstrate against some official abuse which no ordinary complaint could reach, or, by means of a dying protest, to turn a liege lord from pursuing courses injurious to his reputation and his fortune. This last was the noblest and by no means the most infrequent reason for suicide. Scores of examples are recorded of men who, with everything to make existence desirable, deliberately laid down their lives at the prompting of loyalty. Thus the samurai rose to a remarkable height of moral nobility. He had no assurance that his death might not be wholly fruitless, as indeed it often proved. If the sacrifice achieved its purpose, if it turned a liege lord from evil courses, the samurai could hope that his memory would be honoured. But if the lord resented such a violent and conspicuous mode of reproving his excesses, then the faithful vassal's retribution would be an execrated memory and, perhaps, suffering for his family and relatives. Yet the deed was performed again and again. It remains to be noted that the samurai entertained a high respect for the obligations of truth; "A bushi has no second word," was one of his favourite mottoes. However, a reservation is necessary here. The samurai's doctrine was not truth for truth's sake, but truth for the sake of the spirit of uncompromising manliness on which he based all his code of morality. A pledge or a promise must never be broken, but the duty of veracity did not override the interests or the welfare of others. Generosity to a defeated foe was also one of the tenets of the samurai's ethics. History contains many instances of the exercise of that quality.

Religious Influence.

Something more, however, than a profound conception of duty was needed to nerve the samurai for sacrifices such as he seems to have been always ready to make. It is true that Japanese parents of the military class took pains to familiarize their children of both sexes from very tender years with the idea of self-destruction at any time. But superadded to the force of education and the incentive of tradition there was a transcendental influence. Buddhism supplied it. The tenets of that creed divided themselves, broadly speaking, into two doctrines, salvation by faith and salvation by works, and the chief exponent of the latter principle is the sect which prescribes meditation as the vehicle of enlightenment. Whatever be the mental processes induced by this rite, those who have practised it insist that it leads finally to a state of absorption, in which the mind is flooded by an illumination revealing the universe in a new aspect, absolutely free from all traces of passion, interest or affection, and showing, written across everything in flaming letters, the truth that for him who has found Buddha there is neither birth nor death, growth nor decay. Lifted high above his surroundings, he is prepared to meet every fate with indifference. The attainment of that state seems to have been a fact in the case both of the samurai of the military epoch and of the Japanese soldier to-day.

Abolition of the Samurai.

The policy of seclusion adopted by the Tokugawa administration after the Shimabara insurrection included an order that no samurai should acquire foreign learning. Nevertheless some knowledge could not fail to filter in through the Dutch factory at Deshima, and thus, a few years before the advent of the American ships, Takashima Shūhan, governor of Nagasaki, becoming persuaded of the fate his country must invite if she remained oblivious of the world's progress, memorialized the Yedo government in the sense that, unless Japan improved her weapons of war and reformed her military system, she could not escape humiliation such as had just overtaken China. He obtained small arms and field-guns of modern type from Holland, and, repairing to Yedo with a company of men trained according to the new tactics, he offered an object lesson for the consideration of the conservative officials. They answered by throwing him into prison. But Egawa, one of his retainers, proved a still more zealous reformer, and his foresight being vindicated by the appearance of the American war-vessels in 1853, he won the government's confidence and was entrusted with the work of planning and building forts at Shinagawa and Shimoda. At Egawa's instance rifles and cannon were imported largely from Europe, and their manufacture was commenced in Japan, a powder-mill also being established with machinery obtained from Holland. Finally, in 1862, the shōgun's government adopted the military system of the West, and organized three divisions of all arms, with a total strength of 13,600 officers and men. Disbanded at the fall of the shōgunate in 1867, this force nevertheless served as a model for a similar organization under the imperial government, and in the meanwhile the principal fiefs had not been idle, some—as Satsuma—adopting English tactics, others following France or Germany, and a few choosing Dutch. There appeared upon the stage at this juncture a great figure in the person of Omura Masujiro, a samurai of the Chōshū clan. He established Japan's first military school at Kiōto in 1868; he attempted to substitute for the hereditary soldier conscripts taken from all classes of the people, and he conceived the plan of dividing the whole empire into six military districts. An assassin's dagger removed him on the threshold of these great reforms, but his statue now stands in Tōkyō and his name is spoken with reverence by all his countrymen. In 1870 Yamagata Aritomo (afterwards Field-Marshal Prince Yamagata) and Saigo Tsugumichi (afterwards Field-Marshal Marquis Saigo) returned from a tour of military inspection in Europe, and in 1872 they organized a corps of Imperial guards, taken from the three clans which had been conspicuous in the work of restoring the administrative power to the sovereign, namely, the clans of Satsuma, Chōshū and Tosa. They also established garrisons in Tōkyō, Sendai, Osaka and Kumamoto, thus placing the military authority in the hands of the central government. Reforms followed quickly. In 1872, the *hyōbushō*, an office which controlled all matters relating to war, was replaced by two departments, one of war and one of the navy, and, in 1873, an imperial decree substituted universal conscription for the system of hereditary militarism. Many persons viewed this experiment with deep misgiving. They feared that it would not only alienate the samurai, but also entrust the duty of defending the country to men unfitted by tradition and custom for such a task, namely, the farmers, artisans and tradespeople, who, after centuries of exclusion from the military pale, might be expected to have lost all martial spirit. The government, however, was not deterred by these apprehensions. It argued that since the distinction of samurai and commoner had not originally existed, and since the former was a product simply of accidental conditions, there was no valid reason to doubt the military capacity of the people at large. The justice of this reasoning was put to a conclusive test a few years later. Originally the period of service with the colours was fixed at 3 years, that of service with the first and second reserves being 2 years each. One of the serious difficulties encountered at the outset was that samurai conscripts were too proud to stand in the ranks with common rustics or artisans, and above all to obey the commands of plebeian officers. But patriotism soon overcame this obstacle. The whole country—with the exception of the northern island, Yezo—was parcelled out into six military districts (headquarters Tōkyō, Osaka, Nagoya, Sendai, Hiroshima and Kumamoto) each furnishing a division of all arms and services. There was also from 1876 a guards division in Tōkyō. The total strength on a peace footing was 31,680 of all arms, and on a war footing, 46,350. The defence of Yezo was entrusted to a colonial militia. It may well be supposed that to find competent officers for this army greatly perplexed its organizers. The military school—now in Tōkyō but originally founded by Omura in Kiōto—had to turn out graduates at high pressure, and private soldiers who showed any special aptitude were rapidly promoted to positions of command. French military instructors were engaged, and the work of translating manuals was carried out with all celerity. In 1877, this new army of conscripts had to endure a crucial test: it had to take the field against the Satsuma samurai, the very flower of their class, who in that year openly rebelled against the Tōkyō government. The campaign lasted eight months; as there had not yet been time to form the reserves, the Imperial forces were soon seriously reduced in number by casualties in the field and by disease, the latter claiming many victims owing to defective commissariat. It thus became necessary to have recourse to volunteers, but as these were for the most part samurai, the expectation was that their hereditary instinct of fighting would compensate for lack of training. That expectation was not fulfilled. Serving side by side in the field, the samurai volunteer and the heimin[1] regular were found to differ by precisely the degree of their respective training. The fact was thus finally established that the fighting qualities of the farmer and artisan reached as high a standard as those of the bushi.

Thenceforth the story of the Japanese army is one of steady progress and development. In 1878, the military duties of the empire were divided among three offices: namely, the army department, the general staff and the inspection department, while the six divisions of troops were organized into three army corps.

In 1879, the total period of colour and reserve service became 10 years. In 1883 the period was extended to 12 years, the list of exemptions was abbreviated, and above all substitution was no longer allowed. Great care was devoted to the training of officers; promotion went by merit, and at least ten of the most promising officers were sent abroad every year to study. A comprehensive system of education for the rank and file was organized. Great difficulty was experienced in procuring horses suitable for cavalry, and indeed the Japanese army long remained weak in this arm. In 1886, the whole littoral of the empire was divided into five districts, each with its admiralty and its naval port, and the army being made responsible for coast defence, a battery construction corps was formed. Moreover, an exhaustive scheme was elaborated to secure full co-operation between the army and navy. In 1888 the seven divisions of the army first found themselves prepared to take the field, and, in 1893, a revised system of mobilization was sanctioned, to be put into operation the following year, for the Chino-Japanese War (*q.v.*). At this period the division, mobilized for service in the field, consisted of 12 battalions of infantry, 3 troops of cavalry, 4 batteries of field and 2 of mountain artillery, 2 companies of sappers and train, totalling 18,492 of all arms with 5633 horses. The guards had only 8 battalions and 4 batteries (field). The field army aggregated over 120,000, with 168 field and 72 mountain guns, and the total of all forces, field, garrison and dépôt, was 220,580 of all arms, with 47,220 horses and 294 guns. Owing, however, to various modifications necessitated by circumstances, the numbers actually on duty were over 240,000, with 6495 non-combatant employees and about 100,000 coolies who acted as carriers. The infantry were armed with the Murata single-loader rifle, but the field artillery was inferior, and the only two divisions equipped with magazine rifles and smokeless powder never came into action. The experiences gained in this war bore large fruit. The total term of service with the colours and the reserves was slightly increased; the colonial militia of Yezo (Hokkaidō) was organized as a seventh line division; 5 new divisions were added, bringing the whole number of divisions to 13 (including the guards); a mixed brigade was stationed in Formosa (then newly added to Japan's dominions); a high military council composed of field-marshals was created; the cavalry was brigaded; the garrison artillery was increased; strenuous efforts were made to improve the education of officers and men; and lastly, sanitary arrangements underwent much modification. An arsenal had been established in Tōkyō, in 1868, for the manufacture of small arms and small-arm ammunition; this was followed by an arsenal in Osaka for the manufacture of guns and gun-ammunition; four powder factories were opened, and in later years big-gun factories at Kure and Mororan. Japan was able to make 12-inch guns in 1902, and her capacity for this kind of work was in 1909 second to none. She has her own patterns of rifle and field gun, so that she is independent of foreign aid so far as armaments are concerned. In 1900, she sent a force to North China to assist in the campaign for the relief of the foreign legations in Peking, and on that occasion her troops were able to observe at first hand the qualities and methods of European soldiers. In 1904 took place the great war with Russia (see RUSSO-JAPANESE WAR). After the war important changes were made in the direction of augmenting and improving the armed forces. The number of divisions was increased to 19 (including the guards), of which one division is for service in Korea and one for service in Manchuria. Various technical corps were organized, as well as horse artillery, heavy field artillery and machine-gun units. The field-gun was replaced by a quick-firer manufactured at Osaka, and much attention was given to the question of remounts—for, both in the war with China and in that with Russia, the horsing of the cavalry had been poor. Perhaps the most far-reaching change in all armies of late years is the shortening of the term of service with the colours to 2 years for the infantry, 3 years remaining the rule for other arms. This was adopted by Japan after the war, the infantry period of service with the reserves being extended to 14⅓ years, and of course has the effect of greatly augmenting the potential war strength. As to this, figures are kept secret, nor can any accurate approximation be attempted without danger of error. Rough estimates of Japan's war strength have, however, been made, giving 550,000 as the war strength of the first line army, plus 34,000 for garrisons overseas and 150,000 special reserves (*hojū*); 370,000 second line or *kōbi*, and 110,000 for the fully trained portion of the territorial forces, or *Kokumin-hei*. All these branches can further draw upon half-trained elements to the number of about 800,000 to replace losses. Japan's available strength in the last resort for home defence was recently (1909) stated by the Russian *Novoye Vremya* at 3,000,000. In 20 years, when the present system has produced its full effect, the first line should be 740,000 strong, the second line 780,000, and the third line about 3,850,000 (3,000,000 untrained and 850,000 partly trained). Details can be found in *Journal of the R. United Service Institution*, Dec. 1909–Jan. 1910.

Recruiting.

At 20 years of age every Japanese subject, of whatever status, becomes liable for military service. But the difficulty of making service universal in the case of a growing population is felt here as in Europe, and practically the system has elements of the old-fashioned conscription. The minimum height is 5·2 ft. (artillery and engineers, 5·4 ft.). There are four principal kinds of service, namely, service with the colours (*genyeki*), for two years; service with the first reserves (*yobi*), for 7⅓ years; service with the second reserves (*kōbi*), for 7 years; and service with the territorial troops (*ko kumin-hei*) up to the age of 40. Special reserve (*hojū*) takes up men who, though liable for conscription and medically qualified, have escaped the lot for service with the colours. It consists of two classes, one of men remaining in the category of *hojū* for 7⅓ years, the other for 1⅓ year, before passing into the territorial army. Their purpose is similar to that of special or *ersatz* reserves elsewhere. The first class receives the usual short initial training. Men of the second class, in ordinary circumstances, pass, after their 1⅓ year's inability, to the territorial army untrained. As for the first and second general reserves (*yobi* and *kōbi*), each is called out twice during its full term for short "refresher" courses. After reaching the territorial army a man is relieved from all further training. The total number of youths eligible for conscription each year is about 435,000, but the annual contingent for full service is not much more than 100,000. Conscripts in the active army may be discharged before the expiration of two years if their conduct and aptitude are exceptional.

A youth is exempted if it be clearly established[2] that his family is dependent upon his earnings. Except for permanent deformities men are put back for one year before being finally rejected on medical grounds. Men who have been convicted of crime are disqualified, but those who have been temporarily deprived of civil rights must present themselves for conscription at the termination of their sentence. Educated men may enrol themselves as one-year volunteers instead of drawing lots, this privilege of entry enduring up to the age of 28, after which, service for the full term without drawing lots is imposed. Residence in a foreign country secures exemption up to the age of 32—provided that official permission to go abroad has been obtained. A man returning after the age of 32 is drafted into the territorial army, but if he returns before that age he must volunteer to receive training, otherwise he is taken without lot for service with the colours. The system of volunteering is largely resorted to by persons of the better classes. Any youth who possesses certain educational qualifications is entitled to volunteer for training. If accepted after medical inspection, he serves with the colours for one year, during three months of which time he must live in barracks—unless a special permit be granted by his commanding officer. A volunteer has to contribute to his maintenance and equipment, although youths who cannot afford the full expense, if otherwise qualified, are assisted by the state. At the conclusion of a year's training the volunteer is drafted into the first reserve for 6¼ years, and then into the second reserve for 5 years, so that his total period (12¼ years) of service before passing into the territorial army is the same as that of an ordinary conscript. The main purpose of the one-year voluntariat, as in Germany, is to provide officers for the reserves to territorial troops. Qualified teachers in the public service are only liable to a very short initial training, after which they pass at once into the territorial army. But if a teacher abandons that calling before the age of 28, he becomes liable, without lot,[1] to two years with the colours, unless he adopts the alternative of volunteering.

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[1] The general term for commoners as distinguished from samurai.

[2] The privilege at first led to great abuses. It became a common thing to employ some aged and indigent person, set him up as the head of a "branch family," and give him for adopted son a youth liable to conscription.

Officers.

Officers are obtained in two ways. There are six local preparatory cadet schools (*yonen-gakko*) in various parts of the empire, for boys of from 13 to 15. After 3 years at one of these schools[2] a graduate spends 21 months at the central preparatory school (*chuo-yonen-gakko*), Tōkyō, and if he graduates with sufficient credit at the latter institution, he becomes eligible for admission to the officers' college (*shikan-gakko*) without further test of proficiency. The second method of obtaining officers is by competitive examination for direct admission to the officers' college. In either case the cadet is sent to serve with the colours for 6 to 12 months as a private and non-commissioned officer, before commencing his course at the officers' college. The period of study at the officers' college is one year, and after graduating successfully the cadet serves with troops for 6 months on probation. If at the end of that time he is favourably reported on, he is commissioned as a sub-lieutenant. Young officers of engineers and artillery receive a year's further training at a special college. Officers' ranks are the same as in the British army, but the nomenclature is more simple. The terms, with their English equivalents, are *shōi* (second lieutenant), *chūi* (first lieutenant), *tai* (captain), *shōsa* (major), *chūsa* (lieut.-colonel), *taisa* (colonel), *shōshō* (major-general), *chūjō* (lieut.-general), *taishō* (general), *gensui* (field-marshal). All these except the last apply to the same relative ranks in the navy. Promotion of officers in the junior grades is by seniority or merit, but after the rank of captain all promotion is by merit, and thus many officers never rise higher than captain, in which case retirement is compulsory at the age of 48. Except in the highest ranks, a certain minimum period has to be spent in each rank before promotion to the next.

Soldiers.

There are three grades of privates: upper soldiers (*jōtō-hei*), first-class soldiers (*ittō-sotsu*), and second-class soldiers (*nitō-sotsu*). A private on joining is a second-class soldier. For proficiency and good conduct he is raised to the rank of first-class soldier, and ultimately to that of upper soldier. Non-commissioned officers are obtained from the ranks, or from those who wish to make soldiering a profession, as in European armies. The grades are corporal (*gochō*), sergeant (*gunsō*), sergeant-major (*sōchō*) and special sergeant-major (*tokumu-sōchō*).

The pay of the conscript is, as it is everywhere, a trifle (1s. 10d.–3s. 0½d. per month). The professional non-commissioned officers are better paid, the lowest grade receiving three times as much as an upper soldier. Officers' pay is roughly at about three-quarters of the rates prevailing in Germany, sub-lieutenants receiving about £34, captains £71, colonels £238 per annum, &c. Pensions for officers and non-commissioned officers, according to scale, can be claimed after 11 years' colour service.

The emperor is the commander-in-chief of the army, and theoretically the sole source of military authority, which he exercises through a general staff and a war department, with the assistance of a board of field-marshals (*gensuifu*). The general staff has for chief a field-marshal, and for vice-chief a general or lieutenant-general. It includes besides the usual general staff departments, various survey and topographical officers, and the military college is under its direction. The war department is presided over by a general officer on the active list, who is a member of the cabinet without being necessarily affected by ministerial changes. There are, further, artillery and engineer committees, and a remount bureau. The headquarters of coast defences under general officers are Tōkyō, Yokohama, Shimonoseki and Yura. The whole empire is divided into three military districts—eastern, central and western—each under the command of a general or lieutenant-general. The divisional headquarters are as follows:—Guard Tōkyō, I. Tōkyō, II. Sendai, III. Nagoya, IV. Wakayama, V. Hiroshima, VI. Kumamoto, VII. Asahikawa, VIII. Hirosaki, IX. Kasanava, X. Himeji, XI. Senzui, XII. Kokura, XIII. Takata, XIV. Utsonomia, XV. Fushimi, XVI. Kiōto, XVII. Okayama, XVIII. Kurume. Some of these divisions are permanently on foreign service, but their recruiting areas in Japan are maintained. There are also four cavalry brigades, and a number of unassigned regiments of field and mountain artillery, as well as garrison artillery and army technical troops. The organization of the active army by regiments is 176 infantry regiments of 3 battalions; 27 cavalry regiments; 30 field artillery regiments each of 6 and 3 mountain artillery regiments each of 3 batteries; 6 regiments and 6 battalions of siege, heavy field and fortress artillery; 20 battalions engineers; 19 supply and transport battalions.

Medical Service.

The medical service is exceptionally well organized. It received unstinted praise from European and American experts who observed it closely during the wars of 1900 and 1904–5. The establishment of surgeons to each division is approximately 100, and arrangements complete in every detail are made for all lines of medical assistance. Much help is rendered by the red cross society of Japan, which has an income of 2,000,000 *yen* annually, a fine hospital in Tōkyō, a large nursing staff and two specially built and equipped hospital ships. During the early part of the campaign in Pechili, in 1900, the French column entrusted its wounded to the care of the Japanese.

Supply.

The staple article of commissariat for a Japanese army in the field is *hoshii* (dried rice), of which three days' supply can easily be carried in a bag by the soldier. When required for use the rice, being placed in water, swells to its original bulk, and is eaten with a relish of salted fish, dried sea-weed or pickled plums. The task of provisioning an army on these lines is comparatively simple. The Japanese soldier, though low in stature, is well set up, muscular and hardy. He has great powers of endurance, and manœuvres with remarkable celerity, doing everything at the run, if necessary, and continuing to run without distress for a length of time astonishing to European observers. He is greatly subject, however, to attacks of *kakke* (beri-beri), and if he has recourse to meat diet, which appears to be the best preventive, he will probably lose something of his capacity for prolonged rapid movement. He attacks with apparent indifference to danger, preserves his cheerfulness amid hardships, is splendidly patriotic and has always shown himself thoroughly amenable to discipline.

Military Schools.

Of the many educational and training establishments, the most important is the *rikugun daigakkō*, or army college, where officers, (generally subalterns), are prepared for service in the upper ranks and for staff appointments, the course of study extending over three years. The Toyama school stands next in importance. The courses pursued there are attended chiefly by subaltern officers of dismounted branches, non-commissioned officers also being allowed to take the musketry course. The term of training is five months. Young officers of the scientific branches are instructed at the *hōkōgakkō* (school of artillery and engineers). There are, further, two special schools of gunnery—one for field, the other for garrison artillery, attended chiefly by captains and senior subalterns of the two branches. There is an inspection department of military education, the inspector-general being a lieutenant-general, under whom are fifteen field and general officers, who act as inspectors of the various schools and colleges and of military educational matters in general.

The Japanese officer's pay is small and his mode of life frugal. He lives out of barracks, frequently with his own family. His uniform is plain and inexpensive,[3] and he has no desire to exchange it for mufti. He has no mess expenses, contribution to a band, or luxuries of any kind, and as he is nearly always without private means to supplement his pay, his habits are thoroughly economical. He devotes himself absolutely to his profession, living for nothing else, and since he is strongly imbued with an effective conception of the honour of his cloth, instances of his incurring disgrace by debt or dissipation are exceptional. The samurai may be said to have been revived in the officers of the modern army, who preserve and act up to all the old traditions. The system of promotion has evidently much to do with this good result, for no Japanese officer can hope to rise above the rank of captain unless, by showing himself really zealous and capable, he obtains from his commanding officer the recommendation without which all higher educational opportunities are closed to him. Yet promotion by merit has not degenerated into promotion by favour, and corruption appears to be virtually absent. In the stormiest days of parliamentary warfare, when charges of dishonesty were freely preferred by party politicians against all departments of officialdom, no whisper ever impeached the integrity of army officers.

The training of the troops is thorough and strictly progressive, the responsibility of the company, squadron and battery commanders for the training of their commands, and the latitude granted them in choice of means being, as in Germany, the keystone of the system.

Originally the government engaged French officers to assist in

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[1] Conscription without lot is thus the punishment for all failures to comply with and attempts to evade the military laws.

[2] Sons of officers' widows, or of officers in reduced circumstances, are educated at these schools either free or at reduced charges, but are required to complete the course and to graduate.

[3] Uniform does not vary according to regiments or divisions. There is only one type for the whole of the infantry, one for the cavalry, and so on (see UNIFORMS, NAVAL AND MILITARY). Officers largely obtain their uniforms and equipment, as well as their books and technical literature through the *Kai-ko-sha*, which is a combined officers' club, benefit society and co-operative trading association to which nearly all belong.

Foreign Assistance.

organizing the army and elaborating its system of tactics and strategy, and during several years a military mission of French officers resided in Tōkyō and rendered valuable aid to the Japanese. Afterwards German officers were employed, with Jakob Meckel at their head, and they left a perpetually grateful memory. But ultimately the services of foreigners were dispensed with altogether, and Japan now adopts the plan of sending picked men to complete their studies in Europe. Up to 1904 she followed Germany in military matters almost implicitly, but since then, having the experience of her own great war to guide her, she has, instead of modelling herself on any one foreign system, chosen from each whatever seemed most desirable, and also, in many points, taken the initiative herself.

Military Finance.

When the power of the sword was nominally restored to the Imperial government in 1868, the latter planned to devote one-fourth of the state's ordinary revenue to the army and navy. Had the estimated revenue accrued, this would have given a sum of about 3 millions sterling for the two services. But not until 1871, when the troops of the fiefs were finally disbanded, did the government find itself in a position to include in the annual budgets an adequate appropriation on account of armaments. Thenceforth, from 1872 to 1896, the ordinary expenditures of the army varied from three-quarters of a million sterling to $1\frac{1}{2}$ millions, and the extraordinary outlays ranged from a few thousands of pounds to a quarter of a million. Not once in the whole period of 25 years —if 1877 (the year of the Satsuma rebellion) be excepted—did the state's total expenditures on account of the army exceed $1\frac{1}{2}$ millions sterling, and it redounds to the credit of Japan's financial management that she was able to organize, equip and maintain such a force at such a small cost. In 1896, as shown above, she virtually doubled her army, and a proportionate increase of expenditure ensued, the outlays for maintenance jumping at once from an average of about $1\frac{1}{4}$ millions sterling to $2\frac{1}{4}$ millions, and growing thenceforth with the organization of the new army, until in the year (1903) preceding the outbreak of war with Russia, they reached the figure of 4 millions. Then again, in 1906, six divisions were added, and additional expenses had to be incurred on account of the new over-seas garrisons, so that, in 1909, the ordinary outlays reached a total of 7 millions, or about one-seventh of the ordinary revenue of the state. This takes no account of extraordinary outlays incurred for building forts and barracks, providing new patterns of equipment, &c. In 1909 the latter, owing to the necessity of replacing the weapons used in the Russian War, and in particular the field artillery gun (which was in 1905 only a semi-quickfirer), involved a relatively large outlay.

Early Japanese War-vessels.

The Navy.—The traditions of Japan suggest that the art of navigation was not unfamiliar to the inhabitants of a country consisting of hundreds of islands and abounding in bays and inlets. Some interpreters of her cosmography discover a great ship in the "floating bridge of heaven" from which the divine procreators of the islands commenced their work, and construe in a similar sense other poetically named vehicles of that remote age. But though the seas were certainly traversed by the early invaders of Japan, and though there is plenty of proof that in medieval times the Japanese flag floated over merchantmen which voyaged as far as Siam and India, and over piratical craft which harassed the coasts of Korea and China, it is unquestionable that in the matter of naval architecture Japan fell behind even her next-door neighbours. Thus, when a Mongol fleet came to Kiūshiū in the 13th century, Japan had no vessels capable of contending against the invaders, and when, at the close of the 16th century, a Japanese army was fighting in Korea, repeated defeats of Japan's squadrons by Korean war-junks decided the fate of the campaign on shore as well as on sea. It seems strange that an enterprising nation like the Japanese should not have taken for models the great galleons which visited the Far East in the second half of the 16th century under the flags of Spain, Portugal, Holland and England. With the exception, however, of two ships built by a castaway English pilot to order of Iyeyasu, no effort in that direction appears to have been made, and when an edict vetoing the construction of sea-going vessels was issued in 1636 as part of the Tokugawa policy of isolation, it can scarcely be said to have checked the growth of Japan's navy, for she possessed nothing worthy of the name. It was to the object lesson furnished by the American ships which visited Yedo bay in 1853 and to the urgent counsels of the Dutch that Japan owed the inception of a naval policy. A seamen's training station was opened under Dutch instructors in 1855 at Nagasaki, a building-slip was constructed and an iron factory established at the same place, and shortly afterwards a naval school was organized at Tsukiji in Yedo, a war-ship the "Kwanko Maru"[1]—presented by the Dutch to the shōgun's government—being used for exercising the cadets. To this vessel two others, purchased from the Dutch, were added in 1857 and 1858, and these, with one given by Queen Victoria, formed the nucleus of Japan's navy. In 1860, we find the Pacific crossed for the first time by a Japanese war-ship—the "Kwanrin Maru"—and subsequently some young officers were sent to Holland for instruction in naval science. In fact the Tokugawa statesmen had now thoroughly appreciated the imperative need of a navy. Thus, in spite of domestic unrest which menaced the very existence of the Yedo government, a dock-yard was established and fully equipped, the place chosen as its site being, by a strange coincidence, the village of Yokosuka where Japan's first foreign ship-builder, Will Adams, had lived and died 250 years previously. This dockyard was planned and its construction superintended by a Frenchman, M. Bertin. But although the Dutch had been the first to advise Japan's acquisition of a navy, and although French aid was sought in the case of the important and costly work at Yokosuka, the shōgun's government turned to England for teachers of the art of maritime warfare. Captain Tracey, R.N., and other British officers and warrant-officers were engaged to organize and superintend the school at Tsukiji. They arrived, however, on the eve of the fall of the Tokugawa shōgunate, and as the new administration was not prepared to utilize their services immediately, they returned to England. It is not to be inferred that the Imperial government underrated the importance of organizing a naval force. One of the earliest Imperial rescripts ranked a navy among "the country's most urgent needs" and ordered that it should be "at once placed on a firm foundation." But during the four years immediately subsequent to the restoration, a semi-interregnum existed in military affairs, the power of the sword being partly transferred to the hands of the sovereign and partly retained by the feudal chiefs. Ultimately, not only the vessels which had been in the possession of the shōgunate but also several obtained from Europe by the great feudatories had to be taken over by the Imperial government, which, on reviewing the situation, found itself owner of a motley squadron of 17 war-ships aggregating 13,812 tons displacement, of which two were armoured, one was a composite ship, and the rest were of wood. Steps were now taken to establish and equip a suitable naval college in Tsukiji, and application having been made to the British government for instructors, a second naval mission was sent from England in 1873, consisting of 30 officers and warrant-officers under Commander (afterwards Vice-Admiral Sir) Archibald Douglas. At the very outset occasions for active service afloat presented themselves. In 1868, the year after the fall of the shōgunate, such ships as could be assembled had to be sent to Yezo to attack the main part of the Tokugawa squadron which had raised the flag of revolt and retired to Hakodate under the command of the shōgun's admiral, Enomoto. Then in 1874 the duty of convoying a fleet of transports to Formosa had to be undertaken; and in 1877 sea power played its part in crushing the formidable rebellion in Satsuma. Meanwhile the work of increasing and organizing the navy went on steadily. The first steam war-ship constructed in Japan had been a gun-boat (138 tons) launched in 1866 from a building-yard established at Ishikawajima, an island near the mouth of the Sumida river on which Tōkyō stands. At this yard and at Yokosuka two vessels of 897 tons and 1450 tons, respectively, were launched in 1875 and 1876, and Japan now found herself competent not only to execute all repairs but also to build ships of considerable size. An order was placed in England in 1875, which produced, three years later, the "Fusō," Japan's first ironclad (3717 tons) and the "Kongo" and "Hiei," steel-frame sister-cruisers of 2248 tons. Meanwhile training, practical and theoretical, in seamanship, gunnery, torpedo-practice and naval architecture went on vigorously, and in 1878 the Japanese flag was for the first time seen in European waters, floating over the cruiser "Seiki" (1897 tons) built in Japan and navigated solely by Japanese. The government, constantly solicitous of increasing the fleet, inaugurated, in 1882, a programme of 30 cruisers and 12 torpedo-boats, and in 1886 this was extended, funds being obtained by an issue of naval loan-bonds. But the fleet did not yet include a single battleship. When the diet opened for the first time in 1890, a plan for the construction of two battleships encountered stubborn opposition in the lower house, where the majority attached much less importance to voting money for war-ships than to reducing the land tax. Not until 1892 was this opposition overcome in deference to an order from the throne that thirty thousand pounds sterling should be contributed yearly from the privy purse and that a tithe of all official salaries should be devoted during the same interval to naval needs. Had the house been more prescient, Japan's position at the outbreak of war with China in 1894 would have been very different. She entered the contest with 28 fighting craft, aggregating 57,600 tons, and 24 torpedo-boats, but among them the most powerful was a belted cruiser of 4300 tons. Not one battleship was included, whereas China had two ironclads of nearly 8000 tons each. Under these conditions the result of the naval conflict was awaited with much anxiety in Japan. But the Chinese suffered signal defeats (see CHINO-JAPANESE WAR) off the Yalu and at Wei-hai-wei, and the victors took possession of 17 Chinese craft, including one battleship. The resulting addition to Japan's fighting force was, however, insignificant. But the naval strength of Japan did not depend on prizes. Battleships and cruisers were ordered and launched in Europe one after the other, and when the Russo-Japanese War (*q.v.*) came, the fleet promptly asserted its physical and moral superiority in the surprise of Port Arthur, the battle of the 10th of August 1904, and the crowning victory of Tsushima.

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[1] The term *maru* subsequently became applicable to merchantmen only, war-ships being distinguished as *kan*.

As to the development of the navy from 1903 onwards, it is not possible to detail with absolute accuracy the plans laid down by the admiralty in Tōkyō, but the actual state of the fleet in the year 1909 will be apparent from the figures given below.

Japan's naval strength at the outbreak of the war with Russia in 1904 was:—

	Number.	Displacement. Tons.
Battleships	6	84,652
Armoured cruisers	8	73,982
Other cruisers	44	111,470
Destroyers	19	6,519
Torpedo-boats	80	7,119
Totals	157	283,742

Losses during the war were:—

Battleships	2	27,300
Cruisers (second and smaller classes)	8	18,009
Destroyers	2	705
Torpedo-boats	7	557
Totals	19	46,571

The captured vessels repaired and added to the fleet were:—

Battleships	5	62,524
Cruisers	11	71,276
Destroyers	5	1,740
Totals	21	135,530

The vessels built or purchased after the war and up to the close of 1908 were:—

Battleships	4	71,500
Armoured cruisers	4	56,700
Other cruisers	5	7,000
Destroyers	33	12,573
Torpedo-boats	5	760
Totals	51	148,533

Some of the above have been superannuated, and the serviceable fleet in 1909 was:—

Battleships	13	191,380
Armoured cruisers	12	130,683
Other cruisers, coast-defence ships and gun-boats	47	165,253
Destroyers	55	20,508
Torpedo-boats	77	7,258
Totals	204	515,082

To the foregoing must be added two armoured cruisers—the "Kurama" (14,000) launched at Yokosuka in October 1907, and the "Ibuki" (14,700) launched at Kure in November 1907, but no other battleships or cruisers were laid down in Japan or ordered abroad up to the close of 1908.

Naval Dockyards.

There are four naval dockyards, namely, at Yokosuka, Kure, Sasebo and Maizuru. Twenty-one vessels built at Yokosuka since 1876 included a battleship (19,000 tons) and an armoured cruiser (14,000 tons); seven built at Kure since 1898 included a battleship (19,000 tons) and an armoured cruiser (14,000 tons). The yards at Sasebo and Maizuru had not yet been used in 1909 for constructing large vessels. Two private yards—the Mitsubishi at Nagasaki and Kobe, and the Kawasaki at the latter place—have built several cruisers, gunboats and torpedo craft, and are competent to undertake more important work. Nevertheless in 1909 Japan did not yet possess complete independence in this matter, for she was obliged to have recourse to foreign countries for a part of the steel used in ship-building. Kure manufactures practically all the steel it requires, and there is a government steel-foundry at Wakamatsu on which more than 3 millions sterling had been spent in 1909, but it did not yet keep pace with the country's needs. When this independence has been attained, it is hoped to effect an economy of about 18 % on the outlay for naval construction, owing to the cheapness of manual labour and the disappearance both of the manufacturer's profit and of the expenses of transfer from Europe to Japan.

There are five admiralties—Yokosuka, Kure, Sasebo, Maizuru and Port Arthur; and four naval stations—Takeshiki (in Tsushima), Mekong (in the Pescadores), Ominato and Chinhai (in southern Korea).

Personnel.

The navy is manned partly by conscripts and partly by volunteers. About 5500 are taken every year, and the ratio is, approximately, 55 % of volunteers and 45 % of conscripts. The period of active service is 4 years and that of service with the reserve 7 years. On the average 200 cadets are admitted yearly, of whom 50 are engineers, and in 1906 the personnel of the navy consisted of the following:—

Admirals, combative and non-combative	77
Officers, combative and non-combative, below the rank of admiral	2,867
Warrant officers	9,075
Bluejackets	29,667
Cadets	721
Total	42,407

Naval Education.

The highest educational institution for the navy is the naval staff college, in which there are five courses for officers alone. The gunnery and torpedo schools are attended by officers, and also by selected warrant-officers and bluejackets, who consent to extend their service. There is also a mechanical school for junior engineers, warrant-officers and ordinary artificers.

At the naval cadet academy—originally situated in Tkōyō but now at Etajima near Kure—aspirants for service as naval officers receive a 3 years' academical course and 1 year's training at sea; and, finally, there is a naval engineering college collateral to the naval cadet academy.

Since 1882, foreign instruction has been wholly dispensed with in the Japanese navy; since 1886 she has manufactured her own prismatic powder; since 1891 she has been able to make quick-firing guns and Schwartzkopf torpedoes, and in 1892 one of her officers invented a particularly potent explosive, called (after its inventor) Shimose powder.

The Feudal Period.

Finance.—Under the feudal system of the Tokugawa (1603–1871), all land in Japan was regarded as state property, and parcelled out into 276 fiefs, great and small, which were assigned to as many feudatories. These were empowered to raise revenue for the support of their households, for administrative purposes, and for the maintenance of troops. The basis of taxation varied greatly in different districts, but, at the time of the Restoration in 1867, the general principle was that four-tenths of the gross produce should go to the feudatory, six-tenths to the farmer. In practice this rule was applied to the rice crop only, the assessments for other kinds of produce being levied partly in money and partly in manufactured goods. Forced labour also was exacted, and artisans and tradesmen were subjected to pecuniary levies. The yield of rice in 1867 was about 154 million bushels,[1] of which the market value at prices then ruling was £24,000,000, or

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[1] The reader should be warned that absolute accuracy cannot be claimed for statistics compiled before the Meiji era.

240,000,000 *yen*.[1] Hence the grain tax represented, at the lowest calculation, 96,000,000 *yen*. When the administration reverted to the emperor in 1867 the central treasury was empty, and the funds hitherto employed for governmental purposes in the fiefs continued to be devoted to the support of the feudatories, to the payment of the samurai, and to defraying the expenses of local administration, the central treasury receiving only whatever might remain after these various outlays.

The shōgun himself, whose income amounted to about £3,500,000, did not, on abdicating, hand over to the sovereign either the contents of his treasury or the lands from which he derived his revenues. He contended that funds for the government of the nation as a whole should be levied from the people at large. Not until 1871 did the feudal system cease to exist. The fiefs being then converted into prefectures, their revenues became an asset of the central treasury, less 10 % allotted for the support of the former feudatories.[2]

Paper Money.

But during the interval between 1867 and 1871, the men on whom had devolved the direction of national affairs saw no relief from crippling impecuniosity except an issue of paper money. This was not a novelty in Japan. Paper money had been known to the people since the middle of the 17th century, and in the era of which we are now writing no less than 1694 varieties of notes were in circulation. There were gold notes, silver notes, cash-notes, rice-notes, umbrella-notes, ribbon-notes, lathe-article-notes, and so on through an interminable list, the circulation of each kind being limited to the issuing fief. Many of these notes had almost ceased to have any purchasing power, and nearly all were regarded by the people as evidences of official greed. The first duty of a centralized progressive administration should have been to reform the currency. The political leaders of the time appreciated that duty, but saw themselves compelled by stress of circumstances to adopt the very device which in the hands of the feudal chiefs had produced such deplorable results. The ordinary revenue amounted to only 3,000,000 *yen*, while the extraordinary aggregated 29,000,000, and was derived wholly from issues of paper money or other equally unsound sources.

Land Tax.

Even on the abolition of feudalism in 1871 the situation was not immediately relieved. The land tax, which constituted nine-tenths of the feudal revenues, had been assessed by varying methods and at various rates by the different feudatories, and re-assessment of all the land became a preliminary essential to establishing a uniform system. Such a task, on the basis of accurate surveys, would have involved years of work, whereas the financial needs of the state had to be met immediately. Under the pressure of this imperative necessity a re-assessment was roughly made in two years, and being continued thereafter with greater accuracy, was completed in 1881. This survey, eminently liberal to the agriculturists, assigned a value of 1,200,000,000 *yen* to the whole of the arable land, and the treasury fixed the tax at 3 % of the assessed value of the land, which was about one-half of the real market value. Moreover, the government contemplated a gradual reduction of this already low impost until it should ultimately fall to 1 %. Circumstances prevented the consummation of that purpose. The rate underwent only one reduction of ½ %, and thereafter had to be raised on account of war expenditures. On the whole, however, no class benefited more conspicuously from the change of administration than the peasants, since not only was their burden of taxation light, but also they were converted from mere tenants into actual proprietors. In brief, they acquired the fee-simple of their farms in consideration of paying an annual rent equal to about one sixty-sixth of the market value of the land.

State Revenue.

In 1873, when these changes were effected, the ordinary revenue of the state rose from 24,500,000 *yen* to 70,500,000 *yen*. But seven millions sterling is a small income for a country confronted by such problems as Japan had to solve. She had to build railways; to create an army and a navy; to organize posts, telegraphs, prisons, police and education; to construct roads, improve harbours, light and buoy the coasts; to create a mercantile marine; to start under official auspices numerous industrial enterprises which should serve as object lessons to the people, as well as to lend to private persons large sums in aid of similar projects. Thus, living of necessity beyond its income, the government had recourse to further issues of fiduciary notes, and in proportion as the volume of the latter exceeded actual currency requirements their specie value depreciated.

Banks.

This question of paper currency inaugurates the story of banking; a story on almost every page of which are to be found inscribed the names of Prince Itō, Marquis Inouye, Marquis Matsukata, Count Okuma and Baron Shibusawa, the fathers of their country's economic and financial progress in modern times. The only substitutes for banks in feudal days were a few private firms—"households" would, perhaps, be a more correct expression—which received local taxes in kind, converted them into money, paid the proceeds to the central government or to the feudatories, gave accommodation to officials, did some exchange business, and occasionally extended accommodation to private individuals. They were not banks in the Occidental sense, for they neither collected funds by receiving deposits nor distributed capital by making loans. The various fiefs were so isolated that neither social nor financial intercourse was possible, and moreover the mercantile and manufacturing classes were regarded with some disdain by the gentry. The people had never been familiarized with combinations of capital for productive purposes, and such a thing as a joint-stock company was unknown. In these circumstances, when the administration of state affairs fell into the hands of the men who had made the restoration, they not only lacked the first essential of rule, money, but were also without means of obtaining any, for they could not collect taxes in the fiefs, these being still under the control of the feudal barons; and in the absence of widely organized commerce or finance, no access to funds presented itself. Doubtless the minds of these men were sharpened by the necessities confronting them, yet it speaks eloquently for their discernment that, samurai as they were, without any business training whatever, one of their first essays was to establish organizations which should take charge of the national revenue, encourage industry and promote trade and production by lending money at comparatively low rates of interest. The tentative character of these attempts is evidenced by frequent changes. There was first a business bureau, then a trade bureau, then commercial companies, and then exchange companies, these last being established in the principal cities and at the open ports, their personnel consisting of the three great families—Mitsui, Shimada and Ono—houses of ancient repute, as well as other wealthy merchants in Kiōto, Osaka and elsewhere. These exchange companies were partnerships, though not strictly of the joint-stock kind. They formed the nucleus of banks in Japan, and their functions included, for the first time, the receiving of deposits and the lending of money to merchants and manufacturers. They had power to issue notes, and, at the same time, the government issued notes on its own account. Indeed, in this latter fact is to be found one of the motives for organizing the exchange companies, the idea being that if the state's notes were lent to the companies, the people would become familiarized with the use of such currency, and the companies would find them convenient capital. But this system was essentially unsound: the notes, alike of the treasury and of the companies, though nominally convertible, were not secured by any fixed stock of specie. Four years sufficed to prove the unpracticality of such an arrangement, and in 1872 the exchange companies were swept away, to be succeeded in July 1873 by the establishment of national banks on a system which combined some of the features of English banking with the general bases of American. Each bank had to pay into the treasury 60 % of its capital in government notes. It was credited in return with interest-bearing bonds, which bonds were to be left in the treasury as security for the issue of bank-notes to an equal amount, the banks being required to keep in gold the remaining 40 % of their capital as a fund for converting the notes, which conversion must always be effected on application. The elaborators of this programme were Ito, Inouye, Okuma and Shibusawa. They added a provision designed to prevent the establishment of too small banks, namely, that the capital of each bank must bear a fixed ratio to the population of its place of business. Evidently the main object of the treasury was gradually to replace its own fiat paper with convertible bank-notes. But experience quickly proved that the scheme was unworkable. The treasury notes had been issued in such large volume that sharp depreciation had ensued; gold could not be procured except at a heavy cost, and the balance of foreign trade being against Japan, some 300,000,000 *yen* in specie flowed out of the country between 1872 and 1874.

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[1] The *yen* is a silver coin worth about 2s.: 10 *yen* = £1.

[2] In addition to the above grant, the feudatories were allowed to retain the reserves in their treasuries; thus many of the feudal nobles found themselves possessed of substantial fortunes, a considerable part of which they generally devoted to the support of their former vassals.

It should be noted that at this time foreign trade was still invested with a perilous character in Japanese eyes. In early days, while the Dutch had free access to her ports, they sold her so much and bought so little in return that an immense quantity of the precious metals flowed out of her coffers. Again, when over-sea trade was renewed in modern times, Japan's exceptional financial condition presented to foreigners an opportunity of which they did not fail to take full advantage. For, during her long centuries of seclusion, gold had come to hold to silver in her coinage a ratio of 1 to 8, so that gold cost, in terms of silver, only one-half of what it cost in the West. On the other hand, the treaty gave foreign traders the right to exchange their own silver coins against Japanese, weight for weight, and thus it fell out that the foreigner, going to Japan with a supply of Mexican dollars, could buy with them twice as much gold as they had cost in Mexico. Japan lost very heavily by this system, and its effects accentuated the dread with which her medieval experience had invested foreign commerce. Thus, when the balance of trade swayed heavily in the wrong direction between 1872 and 1874, the fact created undue consternation, and moreover there can be no doubt that the drafters of the bank regulations had over-estimated the quantity of available gold in the country.

All these things made it impossible to keep the bank-notes long in circulation. They were speedily returned for conversion; no deposits came to the aid of the banks, nor did the public make any use of them. Disaster became inevitable. The two great firms of Ono and Shimada, which had stood high in the nation's estimation alike in feudal and in imperial days, closed their doors in 1874; a panic ensued, and the circulation of money ceased almost entirely.

Change of the Banking System.

Evidently the banking system must be changed. The government bowed to necessity. They issued a revised code of banking regulations which substituted treasury notes in the place of specie. Each bank was thenceforth required to invest 80% of its capital in 6% state bonds, and these being lodged with the treasury, the bank became competent to issue an equal quantity of its own notes, forming with the remainder of its capital a reserve of treasury notes for purposes of redemption. This was a complete subversion of the government's original scheme. But no alternative offered. Besides, the situation presented a new feature. The hereditary pensions of the feudatories had been commuted with bonds aggregating 174,000,000 *yen*. Were this large volume of bonds issued at once, their heavy depreciation would be likely to follow, and moreover their holders, unaccustomed to dealing with financial problems, might dispose of the bonds and invest the proceeds in hazardous enterprises. To devise some opportunity for the safe and profitable employment of these bonds seemed, therefore, a pressing necessity, and the newly organized national banks offered such an opportunity. For bond-holders, combining to form a bank, continued to draw from the treasury 6% on their bonds, while they acquired power to issue a corresponding amount of notes which could be lent at profitable rates. The programme worked well. Whereas, up to 1876, only five banks were established under the original regulations, the number under the new rule was 151 in 1879, their aggregate capital having grown in the same interval from 2,000,000 *yen* to 40,000,000 *yen*, and their note issues from less than 1,000,000 to over 34,000,000. Here, then, was a rapidly growing system resting wholly on state credit. Something like a mania for bank-organizing declared itself, and in 1878 the government deemed it necessary to legislate against the establishment of any more national banks, and to limit to 34,000,000 *yen* the aggregate note issues of those already in existence.

It is possible that the conditions which prevailed immediately after the establishment of the national banks might have developed some permanency had not the Satsuma rebellion broken out in 1877. Increased taxation to meet military outlay being impossible in such circumstances, nothing offered except recourse to further note issues. The result was that by 1881, fourteen years after the Restoration, notes whose face value aggregated 164,000,000 *yen* had been put into circulation; the treasury possessed specie amounting to only 8,000,000 *yen*, and 18 paper *yen* could be purchased with 10 silver ones.

Resumption of Specie Payments.

Up to 1881 fitful efforts had been made to strengthen the specie value of fiat paper by throwing quantities of gold and silver upon the market from time to time, and 23,000,000 *yen* had been devoted to the promotion of industries whose products, it was hoped, would go to swell the list of exports, and thus draw specie to the country. But these devices were now finally abandoned, and the government applied itself steadfastly to reducing the volume of the fiduciary currency on the one hand, and accumulating a specie reserve on the other. The steps of the programme were simple. By cutting down administrative expenditure; by transferring certain charges from the treasury to the local communes; by suspending all grants in aid of provincial public works and private enterprises, and by a moderate increase of the tax on alcohol, an annual surplus of revenue, totalling 7,500,000 *yen*, was secured. This was applied to reducing the volume of the notes in circulation. At the same time, it was resolved that all officially conducted industrial and agricultural works should be sold—since their purpose of instruction and example seemed now to have been sufficiently achieved—and the proceeds, together with various securities (aggregating 26,000,000 *yen* in face value) held by the treasury, were applied to the purchase of specie. Had the government entered the market openly as a seller of its own fiduciary notes, its credit must have suffered. There were also ample reasons to doubt whether any available stores of precious metal remained in the country. In obedience to elementary economical laws, the cheap money had steadily driven out the dear, and although the government mint at Osaka, founded in 1871, had struck gold and silver coins worth 80,000,000 *yen* between that date and 1881, the customs returns showed that a great part of this metallic currency had flowed out of the country. In these circumstances Japanese financiers decided that only one course remained: the treasury must play the part of national banker. Produce and manufactures destined for export must be purchased by the state with fiduciary notes, and the metallic proceeds of their sales abroad must be collected and stored in the treasury. This programme required the establishment of consulates in the chief marts of the Occident, and the organization of a great central bank—the present Bank of Japan—as well as of a secondary bank—the present Specie Bank of Yokohama—the former to conduct transactions with native producers and manufacturers, the latter to finance the business of exportation. The outcome of these various arrangements was that, by the middle of 1885, the volume of fiduciary notes had been reduced to 119,000,000 *yen*, their depreciation had fallen to 3%, and the metallic reserve of the treasury had increased to 45,000,000 *yen*. The resumption of specie payments was then announced, and became, in the autumn of that year, an accomplished fact. From the time when this programme began to be effective, Japan entered a period of favourable balance of trade. According to accepted economic theories, the influence of an appreciating currency should be to encourage imports; but the converse was seen in Japan's case, for from 1882 her exports annually exceeded her imports, the maximum excess being reached in 1886, the very year after the resumption of specie payments.

The above facts deserve to figure largely in a retrospect of Japanese finance, not merely because they set forth a fine economic feat, indicating clear insight, good organizing capacity, and courageous energy, but also because volumes of adverse foreign criticism were written in the margin of the story during the course of the incidents it embodies. Now Japan was charged with robbing her own people because she bought their goods with paper money and sold them for specie; again, she was accused of an official conspiracy to ruin the foreign local banks because she purchased exporters' bills on Europe and America at rates that defied ordinary competition; and while some declared that she was plainly without any understanding of her own doings, others predicted that her heroic method of dealing with the problem would paralyze industry, interrupt trade and produce widespread suffering. Undoubtedly, to carry the currency of a nation from a discount of 70 or 80% to par in the course of four years, reducing its volume at the same time from 160 to 119 million *yen*, was a financial enterprise violent and daring almost to rashness. The gentler expedient of a foreign loan would have commended itself to the majority of economists. But it may be here stated, once for all, that until her final adoption of a gold standard in 1897, the foreign money market was practically closed to Japan. Had she borrowed abroad it must have been on a sterling basis. Receiving a fixed sum in silver, she would have had to discharge her debt in rapidly appreciating gold. Twice, indeed, she had recourse to London for small sums, but when she came to cast up her accounts the cost of the accommodation stood out in deterrent proportions. A 9% loan, placed in England in 1868 and paid off in 1889, produced 3,750,000 *yen*, and cost altogether 11,750,000 *yen* in round figures; and a 7% loan, made in 1872 and paid off in 1897, produced 10,750,000 *yen*, and cost 36,000,000 *yen*. These considerations were supplemented by a strong aversion from incurring pecuniary obligations to Western states before the latter had consented to restore Japan's judicial and tariff autonomy. The example of Egypt showed what kind of fate might overtake a semi-independent state falling into the clutches of foreign bond-holders. Japan did not wish to fetter herself with foreign debts while struggling to emerge from the rank of Oriental powers.

Closing of the National Banks.

After the revision of the national bank regulations, semi-official banking enterprise won such favour in public eyes that the government found it necessary to impose limits. This conservative policy proved an incentive to private banks and banking companies, so that, by the year 1883, no less than 1093 banking institutions were in existence throughout Japan with an aggregate capital of 900,000,000 *yen*. But these were entirely lacking in arrangements for combination or for equalizing rates of interest, and to correct such defects, no less than ultimately to constitute the sole note-issuing institution, a central bank (the Bank of Japan) was organized on the model of the Bank of Belgium, with due regard to corresponding institutions in other Western countries and to the conditions existing in Japan. Established in 1882 with a capital of 4,000,000 *yen*, this bank has now a capital of 30 millions, a security reserve of 206 millions, a note-issue of 266 millions, a specie reserve of 160 millions, and loans of 525 millions.

The banking machinery of the country being now complete, in a general sense, steps were taken in 1883 for converting the national banks into ordinary joint-stock concerns and for the redemption of all their note-issues. Each national bank was required to deposit with the treasury the government paper kept in its strong room as security for its own notes, and further to take from its annual profits and hand to the treasury a sum equal to 2½% of its notes in circulation. With these funds the central bank was to purchase state bonds, devoting the interest to redeeming the notes of the national banks. Formed with the object of disturbing the money market as little as possible, this programme encountered two obstacles. The first was that, in view of the Bank of Japan's purchases, the market price of state bonds rose rapidly, so that, whereas official financiers had not expected them to reach par before 1897, they were quoted at a considerable premium in 1886. The second was that the treasury having in 1886 initiated the policy of converting its 6 % bonds into 5 % consols, the former no longer produced interest at the rate estimated for the purposes of the banking scheme. The national banks thus found themselves in an embarrassing situation and began to clamour for a revision of the programme. But the government, seeing compensations for them in other directions, adhered firmly to its scheme. Few problems have caused greater controversy in modern Japan than this question of the ultimate fate of the national banks. Not until 1896 could the diet be induced to pass a bill providing for their dissolution at the close of their charter terms, or their conversion into ordinary joint-stock concerns without any note-issuing power, and not until 1899 did their notes cease to be legal tender. Out of a total of 153 of these banks, 132 continued business as private institutions, and the rest were absorbed or dissolved. Already (1890 and 1893) minute regulations had been enacted bringing all the banks and banking institutions—except the special banks to be presently described—within one system of semi-annual balance-sheets and official auditing, while in the case of savings banks the directors' responsibility was declared unlimited and these banks were required to lodge security with the treasury for the protection of their depositors.

Special Banks.

Just as the ordinary banks were all centred on the Bank of Japan[1] and more or less connected with it, so in 1895, a group of special institutions, called agricultural and commercial banks, were organized and centred on a hypothec bank, the object of this system being to supply cheap capital to farmers and manufacturers on the security of real estate. The hypothec bank had its head office in Tōkyō and was authorized to obtain funds by issuing premium-bearing bonds, while an agricultural and industrial bank was established in each prefecture and received assistance from the hypothec bank. Two years later (1900), an industrial bank—sometimes spoken of as the *crédit mobilier* of Japan—was brought into existence under official auspices, its purpose being to lend money against bonds, debentures and shares, as well as to public corporations. These various institutions, together with clearing houses, bankers' associations, the Hokkaidō colonial bank, the bank of Formosa, savings banks (including a post-office savings bank), and a mint complete the financial machinery of modern Japan.

Review of Banking Development.

Reviewing this chapter of Japan's material development, we find that whereas, at the beginning of the Meiji era (1867), the nation did not possess so much as one banking institution worthy of the name, forty years later it had 2211 banks, with a paid-up capital of £40,000,000, reserves of £12,000,000, and deposits of £147,000,000; and whereas there was not one savings bank in 1867, there were 487 in 1906 with deposits of over £50,000,000. The average yearly dividends of these banks in the ten years ending 1906 varied between 9·1 and 9·9%.

Insurance.

Necessarily the movement of industrial expansion was accompanied by a development of insurance business. The beginnings of this kind of enterprise did not become visible, however, until 1881, and even at that comparatively recent date no Japanese laws had yet been enacted for the control of such operations. The commercial code, published in March 1890, was the earliest legislation which met the need, and from that time the number of insurance companies and the volume of their transactions grew rapidly. In 1897, there were 35 companies with a total paid-up capital of 7,000,000 *yen* and policies aggregating 971,000,000 *yen*, and in 1906 the corresponding figures were 65 companies, 22,000,000 *yen* paid up and policies of 4,149,000,000 *yen*. The premium reserves grew in the same period from 7,000,000 to 108,000,000. The net profits of these companies in 1906 were (in round numbers) 10,000,000 *yen*.

Clearing Houses.

The origin of clearing houses preceded that of insurance companies in Japan by only two years (1879). Osaka set the example, which was quickly followed by Tōkyō, Kobe, Yokohama, Kiōto and Nagoya. In 1898 the bills handled at these institutions amounted to 1,186,000,000 *yen*, and in 1907 to 7,484,000,000 *yen*. Japanese clearing houses are modelled after those of London and New York.

Bourses.

Exchanges existed in Japan as far back as the close of the 17th century. At that time the income of the feudal chiefs consisted almost entirely of rice, and as this was sold to brokers, the latter found it convenient to meet at fixed times and places for conducting their business. Originally their transactions were all for cash, but afterwards they devised time bargains which ultimately developed into a definite form of exchange. The reform of abuses incidental to this system attracted the early attention of the Meiji government, and in 1893 a law was promulgated for the control of exchanges, which then numbered 146. Under this law the minimum share capital of a bourse constituted as a joint-stock company was fixed at 100,000 *yen*, and the whole of its property became liable for failure on the part of its brokers to implement their contracts. There were 51 bourses in 1908.

The Government and Economic Development.

Not less remarkable than this economic development was the large part acted in it by officialdom. There were two reasons for this. One was that a majority of the men gifted with originality and foresight were drawn into the ranks of the administration by the great current of the revolution; the other, that the feudal system had tended to check rather than to encourage material development, since the limits of each fief were also the limits of economical and industrial enterprise. Ideas for combination and co-operation had been confined to a few families, and there was nothing to suggest the organization of companies nor any law to protect them if organized. Thus the opening of the Meiji era found the Japanese nation wholly unqualified for the commercial and manufacturing competition in which it was thenceforth required to engage, and therefore upon those who had brought the country out of its isolation there devolved the responsibility of speedily preparing their fellow countrymen for the new situation. To these leaders banking facilities seemed to be the first need, and steps were accordingly taken in the manner already described. But how to educate men of affairs at a moment's notice? How to replace by a spirit of intelligent progress the ignorance and conservatism of the hitherto despised traders and artisans? When the first bank was organized, its two founders—men who had been urged, nay almost compelled, by officialdom to make the essay—were obliged to raise four-fifths of the capital themselves, the general public not being willing to subscribe more than one-fifth—a petty sum of 500,000 *yen*—and when its staff commenced their duties, they had not the most shadowy conception of what to do. That was a faithful reflection of the condition of the business world at large. If the initiative of the people themselves had been awaited, Japan's career must have been slow indeed.

Only one course offered, namely, that the government itself should organize a number of productive enterprises on modern lines, so that they might serve as schools and also as models. Such, as already noted under *Industries*, was the programme adopted. It provoked much hostile criticism from foreign onlookers, who had learned to decry all official incursions into trade and industry, but had not properly appreciated the special conditions existing in Japan. The end justified the means. At the outset of its administration we find the Meiji government not only forming plans for the circulation of money, building railways and organizing posts and telegraphs, but also establishing dockyards, spinning mills, printing-houses, silk-reeling filatures, paper-making factories and so forth, thus by example encouraging these kinds of enterprise and by legislation providing for their safe prosecution. Yet progress was slow. One by one and at long intervals joint-stock companies came into existence, nor was it until the resumption of specie payments in 1886 that a really effective spirit of enterprise manifested itself among the people. Railways, harbours, mines, spinning, weaving, paper-making, oil-refining, brick-making, leather-tanning, glass-making and other industries attracted eager attention, and whereas the capital subscribed for such works aggregated only 50,000,000 *yen* in 1886, it exceeded 1,000,000,000 *yen* in 1906.

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[1] The Bank of Japan was established as a joint-stock company in 1882. The capital in 1909 was 30,000,000 *yen*. In it alone is vested note-issuing power. There is no limit to its issues against gold or silver coins and bullion, but on other securities (state bonds, treasury bills and other negotiable bonds or commercial paper) its issues are limited to 120 millions, any excess over that figure being subject to a tax of 5 % per annum.

Adoption of the Gold Standard.

When specie payments were resumed in 1885, the notes issued by the Bank of Japan were convertible into silver on demand, the silver standard being thus definitely adopted, a complete reversal of the system inaugurated at the establishment of the national banks on Prince Ito's return from the United States. Japanese financiers believed from the outset in gold monometallism. But, in the first place, the country's stock of gold was soon driven out by her depreciated fiat currency; and, in the second, not only were all other Oriental nations silver-using, but also the Mexican silver dollar had long been the unit of account in Far-Eastern trade. Thus Japan ultimately drifted into silver monometallism, the silver *yen* becoming her unit of currency. So soon, however, as the indemnity that she received from China after the war of 1894–95 had placed her in possession of a stock of gold, she determined to revert to the gold standard. Mechanically speaking, the operation was very easy. Gold having appreciated so that its value in terms of silver had exactly doubled during the first 30 years of the Meiji era, nothing was necessary except to double the denominations of the gold coins in terms of *yen*, leaving the silver subsidiary coins unchanged. Thus the old 5-*yen* gold piece, weighing 2·22221 *momme* of 900 fineness, became a 10-*yen* piece in the new currency, and a new 5-*yen* piece of half the weight was coined. No change whatever was required in the reckonings of the people. The *yen* continued to be their coin of account, with a fixed sterling value of a small fraction over two shillings, and the denominations of the gold coins were doubled. Gold, however, is little seen in Japan; the whole duty of currency is done by notes.

It is not to be supposed that all this economic and financial development was unchequered by periods of depression and severe panic. There were in fact six such seasons: in 1874, 1881, 1889, 1897, 1900 and 1907. But no year throughout the whole period failed to witness an increase in the number of Japan's industrial and commercial companies, and in the amount of capital thus invested.

State Revenue.

To obtain a comprehensive idea of Japan's state finance, the simplest method is to set down the annual revenue at quinquennial periods, commencing with the year 1878–1879, because it was not until 1876 that the system of duly compiled and published budgets came into existence.

Revenue (omitting fractions)

Year.[1]	Ordinary Revenue (millions of *yen*).	Extraordinary Revenue (millions of *yen*).	Total Revenue (millions of *yen*).
1878–9	53	9	62
1883–4	76	7	83
1888–9	74	18	92
1893–4	86	28	114
1898–9	133	87	220
1903–4	224	36	260
1908–9	476	144	620

The most striking feature of the above table is the rapid growth of revenue during the last three periods. So signal was the growth that the revenue may be said to have sextupled in the 15 years ended 1909. This was the result of the two great wars in which Japan was involved, that with China in 1894–95 and that with Russia in 1904–5. The details will be presently shown.

Turning now to the expenditure and pursuing the same plan, we have the following figures:—

Expenditure (omitting fractions)

Year.	Ordinary Expenditures (millions of *yen*).	Extraordinary Expenditures (millions of *yen*).	Total Expenditures (millions of *yen*).
1878–9	56	5	61
1883–4	68	15	83
1888–9	66	15	81
1893–4	64	20	84
1898–9	119	101	220
1903–4	170	80	250
1908–9	427	193	620

It may be here stated that, with three exceptions, the working of the budget showed a surplus in every one of the 41 years between 1867 and 1908.

The sources from which revenue is obtained are as follow:—

Ordinary Revenue

	1894–5.	1898–9.	1903–4.	1908–9.
	millions of *yen*.	millions of *yen*.	millions of *yen*.	millions of *yen*.
Taxes	70·50	96·20	146·10	299·61
Receipts from stamps and Public Undertakings	14·75	33·00	96·87	164·66
Various Receipts	4·58	3·67	8·15	11·48

It appears from the above that during 15 years the weight of taxation increased fourfold. But a correction has to be applied, first, on account of the tax on alcoholic liquors and, secondly, on account of customs dues, neither of which can properly be called general imposts. The former grew from 16 millions in 1894–1895 to 72 millions in 1908–1909, and the latter from $5\frac{1}{4}$ millions to $41\frac{1}{2}$ millions. If these increases be deducted, it is found that taxes, properly so called, grew from 70·5 millions in 1894–1895 to 207·86 millions in 1908–1909, an increase of somewhat less than three-fold. Otherwise stated, the burden per unit of population in 1894–1895 was 3s. 6d., whereas in 1908–1909 it was 8s. 4d. To understand the principle of Japanese taxation and the manner in which the above development took place, it is necessary to glance briefly at the chief taxes separately.

Land Tax.

The land tax is the principal source of revenue. It was originally fixed at 3% of the assessed value of the land, but in 1877 this ratio was reduced to $2\frac{1}{2}$%, on which basis the tax yielded from 37 to 38 million *yen* annually. After the war with China (1894–1895) the government proposed to increase this impost in order to obtain funds for an extensive programme of useful public works and expanded armaments (known subsequently as the "first *post bellum* programme"). By that time the market value of agricultural land had largely appreciated owing to improved communications, and urban land commanded greatly enhanced prices. But the lower house of the diet, considering itself guardian of the farmers' interests, refused to endorse any increase of the tax. Not until 1889 could this resistance be overcome, and then only on condition that the change should not be operative for more than 5 years. The amended rates were 3·3% on rural lands and 5% on urban building sites. Thus altered, the tax produced 46,000,000 *yen*, but at the end of the five-year period it would have reverted to its old figure, had not war with Russia broken out. An increase was then made so that the impost varied from 3% to $17\frac{1}{2}$% according to the class of land, and under this new system the tax yielded 85 millions. Thus the exigencies of two wars had augmented it from 38 millions in 1889 to 85 millions in 1907.

Income Tax.

The income tax was introduced in 1887. It was on a graduated scale, varying from 1% on incomes of not less than 300 *yen*, to 3% on incomes of 30,000 *yen* and upwards. At these rates the tax yielded an insignificant revenue of about 2,000,000 *yen*. In 1899, a revision was effected for the purposes of the first *post bellum* programme. This revision increased the number of classes from five to ten, incomes of 300 *yen* standing at the bottom and incomes of 100,000 *yen* or upwards at the top, the minimum and maximum rates being 1% and $5\frac{1}{2}$%. The tax now produced approximately 8,000,000 *yen*. Finally in 1904, when war broke out with Russia, these rates were again revised, the minimum now becoming 2%, and the maximum 8·2%. Thus revised, the tax yields a revenue of 27,000,000 *yen*.

Business Tax.

The business tax was instituted in 1896, after the war with China, and the rates have remained unchanged. For the purposes of the tax all kinds of business are divided into nine classes, and the tax is levied on the amounts of sales (wholesale and retail), on rental value of buildings, on number of employees and on amount of capital. The yield from the tax grows steadily. It was only 4,500,000 *yen* in 1897, but it figured at 22,000,000 *yen* in the budget for 1908–1909.

Tax on Alcoholic Liquors.

The above three imposts constitute the only direct taxes in Japan. Among indirect taxes the most important is that upon alcoholic liquors. It was inaugurated in 1871; doubled, roughly speaking, in 1878; still further increased thenceforth at intervals of about 3 years, until it is now approximately twenty times as heavy as it was originally. The liquor taxed is mainly sake; the rate is about 50 *sen* (one shilling) per gallon, and the annual yield is 72,000,000 *yen*.

Customs Duties.

In 1859, when Japan re-opened her ports to foreign commerce, the customs dues were fixed on a basis of 10% *ad valorem*, but this was almost immediately changed to a nominal 5% and a real 3%. The customs then yielded a very petty return—not more than three or four million *yen*—and the Japanese government had no discretionary power to alter the rates. Strenuous efforts to change this system were at length successful, and, in 1899, the tariff was divided into two sections, conventional and statutory; the rates in the former being governed by a treaty valid for 12 years; those in the latter being fixed at Japan's will. Things remained thus until the war with Russia compelled a revision of the statutory tariff. Under this system the ratio of the duties to the value of the dutiable goods was about 15·65 %. The customs yield a revenue of about 42,000,000 *yen*.

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[1] The Japanese fiscal year is from April 1 to March 31.

Other Taxes.

In addition to the above there are eleven taxes, some in existence before the war of 1904–5, and some created for the purpose of carrying on the war or to meet the expenses of a *post bellum* programme.

Taxes in existence before 1904–1905:—

Name.	Yield (millions of *yen*).
Tax on soy	4
Tax on sugar	16¼
Mining tax	2
Tax on bourses	2
Tax on issue of bank-notes	1
Tonnage dues	½

Taxes created on account of the war (1904–5) or in its immediate sequel:—

Name.	Yield (millions of *yen*).
Consumption tax on textile fabrics	19½
Tax on dealers in patent medicines	¼
Tax on communications	2⅓
Consumption tax on kerosene	1½
Succession tax	1½

Also, as shown above, the land tax was increased by 39 millions; the income tax by 19 millions; the business tax by 15 millions; and the tax on alcoholic liquors by 15 millions. On the whole, if taxes of general incidence and those of special incidence be lumped together, it appears that the burden swelled from 160,000,000 *yen* before the war to 320,000,000 after it.

State Monopolies and Manufactures.

The government of Japan carries on many manufacturing undertakings for purposes of military and naval equipment, for shipbuilding, for the construction of railway rolling stock, for the manufacture of telegraph and light-house materials, for iron-founding and steel-making, for printing, for paper-making and so forth. There are 48 of these institutions, giving employment to 108,000 male operatives and 23,000 female, together with 63,000 labourers. But the financial results do not appear independently in the general budget. Three other government undertakings, however, constitute important budgetary items: they are, the profits derived from the postal and telegraph services, 39,000,000 *yen*; secondly, from forests, 13,000,000 *yen*; and thirdly, from railways, 37,000,000 *yen*. The government further exercises a monopoly of three important staples, tobacco, salt and camphor. In each case the crude article is produced by private individuals from whom it is taken over at a fair price by the government, and, having been manufactured (if necessary), it is resold by government agents at fixed prices. The tobacco monopoly yields a profit of some 33,000,000 *yen*; the salt monopoly a profit of 12,000,000 yen, and the camphor monopoly a profit of 1,000,000 *yen*. Thus the ordinary revenue of the state consisted in 1908–1909 of:—

	Yen.
Proceeds of taxes	320,000,000
Proceeds of state enterprises (posts and telegraphs, forests and railways)	89,000,000
Proceeds of monopolies	56,000,000
Sundries	11,000,000
Total	476,000,000

The ordinary expenditures of the nine departments of state aggregated—in 1908–1909—427,000,000 *yen*, so that there was a surplus revenue of 49,000,000 *yen*.

Extraordinary Expenditures.

Japanese budgets have long included an extraordinary section, so called because it embodies outlays of a special and terminable character as distinguished from ordinary and perpetually recurring expenditures. The items in this extraordinary section possessed deep interest in the years 1896 and 1907, because they disclosed the special programmes mapped out by Japanese financiers and statesmen after the wars with China and Russia. Both programmes had the same bases—expansion of armaments and development of the country's material resources. After her war with China, Japan received a plain intimation that she must either fight again after a few years or resign herself to a career of insignificance on the confines of the Far East. No other interpretation could be assigned to the action of Russia, Germany and France in requiring her to retrocede the territory which she had acquired by right of conquest. Japan therefore made provision for the doubling of her army and her navy, for the growth of a mercantile marine qualified to supply a sufficiency of troop-ships, and for the development of resources which should lighten the burden of these outlays.

The war with Russia ensued nine years after these preparations had begun, and Japan emerged victorious. It then seemed to the onlooking nations that she would rest from her warlike efforts. On the contrary, just as she had behaved after her war with China, so she now behaved after her war with Russia—made arrangements to double her army and navy and to develop her material resources. The government drafted for the year 1907–1908 a budget with three salient features. First, instead of proceeding to deal in a leisurely manner with the greatly increased national debt, Japan's financiers made dispositions to pay it off completely in the space of 30 years. Secondly, a total outlay of 422,000,000 *yen* was set down for improving and expanding the army and the navy. Thirdly, expenditures aggregating 304,000,000 *yen* were estimated for productive purposes. All these outlays, included in the extraordinary section of the budget, were spread over a series of years commencing in 1907 and ending in 1913, so that the disbursements would reach their maximum in the fiscal year 1908–1909 and would thenceforth decline with growing rapidity. To finance this programme three constant sources of annual revenue were provided, namely, increased taxation, yielding some 30 millions yearly; domestic loans, varying from 30 to 40 millions each year; and surpluses of ordinary revenue amounting to from 45 to 75 millions. There were also some exceptional and temporary assets: such as 100,000,000 *yen* remaining over from the war fund; 50 millions paid by Russia for the maintenance of her officers and soldiers during their imprisonment in Japan; occasional sales of state properties and so forth. But the backbone of the scheme was the continuing revenue detailed above.

The house of representatives unanimously approved this programme. By the bulk of the nation, however, it was regarded with something like consternation, and a very short time sufficed to demonstrate its impracticability. From the beginning of 1907 a cloud of commercial and industrial depression settled down upon Japan, partly because of so colossal a programme of taxes and expenditures, and partly owing to excessive speculation during the year 1906 and to unfavourable financial conditions abroad. To float domestic loans became a hopeless task, and thus one of the three sources of extraordinary revenue ceased to be available. There remained no alternative but to modify the programme, and this was accomplished by extending the original period of years so as correspondingly to reduce the annual outlays. The nation, however, as represented by its leading men of affairs, clamoured for still more drastic measures, and it became evident that the government must study retrenchment, not expansion, eschewing above all things any increase of the country's indebtedness. A change of ministry took place, and the new cabinet drafted a programme on five bases: first, that all expenditures should be brought within the margin of actual visible revenue, loans being wholly abstained from; secondly, that the estimates should not include any anticipated surpluses of yearly revenue; thirdly, that appropriations of at least 50,000,000 *yen* should be annually set aside to form a sinking fund, the whole of the foreign debt being thus extinguished in 27 years; fourthly, that the state railways should be placed in a separate account, all their profits being devoted to extensions and repairs; and fifthly, that the period for completing the *post bellum* programme should be extended from 6 years to 11. This scheme had the effect of restoring confidence in the soundness of the national finances.

National Debt.—When the fiefs were surrendered to the sovereign at the beginning of the Meiji era, it was decided to provide for the feudal nobles and the samurai by the payment of lump sums in commutation, or by handing to them public bonds, the interest on which should constitute a source of income. The result of this transaction was that bonds having a total face value of 191,500,000 *yen* were issued, and ready-money payments were made aggregating 21,250,000 *yen*.[1] This was the foundation of Japan's national debt. Indeed, these public bonds may be said to have represented the bulk of the state's liabilities during the first 25 years of the Meiji period. The government had also to take over the debts of the fiefs, amounting to 41,000,000 *yen*, of which 21,500,000 *yen* were paid with interest-bearing bonds, the remainder with ready money. If to the above figures be added two foreign loans aggregating 16,500,000 *yen* (completely repaid by the year 1897); a loan of 15,000,000 *yen* incurred on account of the Satsuma revolt of 1877, loans of 33,000,000 *yen* for public works, 13,000,000 *yen* for naval construction, and 14,500,000 *yen*[2] in connexion with the fiat currency, we have a total of 305,000,000 *yen*, being the whole national debt of Japan during the first 28 years of her new era under Imperial administration.

The second epoch dates from the war with China in 1894–95. The direct expenditures on account of the war aggregated 200,000,000

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[1] The amounts include the payments made in connexion with what may be called the disestablishment of the Church. There were 29,805 endowed temples and shrines throughout the empire, and their estates aggregated 354,481 acres, together with 1¾ million bushels of rice (representing 2,500,000 *yen*). The government resumed possession of all these lands and revenues at a total cost to the state of a little less than 2,500,000 *yen*, paid out in pensions spread over a period of fourteen years. The measure sounds like wholesale confiscation. But some extenuation is found in the fact that the temples and shrines held their lands and revenues under titles which, being derived from the feudal chiefs, depended for their validity on the maintenance of feudalism.

[2] This sum represents interest-bearing bonds issued in exchange for fiat notes, with the idea of reducing the volume of the latter. It was a tentative measure, and proved of no value.

yen, of which 135,000,000 *yen* were added to the national debt, the remainder being defrayed with accumulations of surplus revenue, with a part of the indemnity received from China, and with voluntary contributions from patriotic subjects. As the immediate sequel of the war, the government elaborated a large programme of armaments and public works. The expenditure for these unproductive purposes, as well as for coast fortifications, dockyards, and so on, came to 314,000,000 *yen*, and the total of the productive expenditures included in the programme was 190,000,000 *yen*—namely, 120 millions for railways, telegraphs and telephones; 20 millions for riparian improvements; 20 millions in aid of industrial and agricultural banks and so forth—the whole programme thus involving an outlay of 504,000,000 *yen*. To meet this large figure, the Chinese indemnity, surpluses of annual revenue and other assets, furnished 300 millions; and it was decided that the remaining 204 millions should be obtained by domestic loans, the programme to be carried completely into operation—with trifling exceptions—by the year 1905. In practice, however, it was found impossible to obtain money at home without paying a high rate of interest. The government, therefore, had recourse to the London market in 1899, raising a loan of £10,000,000 at 4%, and selling the £100 bonds at 90. In 1902, it was not expected that Japan would need any further immediate recourse to foreign borrowing. According to her financiers' forecast at that time, her national indebtedness would reach its maximum, namely, 575,000,000 *yen*, in the year 1903, and would thenceforward diminish steadily. All Japan's domestic loans were by that time placed on a uniform basis. They carried 5% interest, ran for a period of 5 years without redemption, and were then to be redeemed within 50 years at latest. The treasury had power to expedite the operation of redemption according to financial convenience, but the sum expended on amortization each year must receive the previous consent of the diet. Within the limit of that sum redemption was effected either by purchasing the stock of the loans in the open market or by drawing lots to determine the bonds to be paid off. During the first two periods (1867 to 1897) of the Meiji era, owing to the processes of conversion, consolidation, &c., and to the various requirements of the state's progress, twenty-two different kinds of national bonds were issued; they aggregated 673,215,500 *yen*; 269,042,198 *yen* of that total had been paid off at the close of 1897, and the remainder was to be redeemed by 1946, according to these programmes.

But at this point the empire became involved in war with Russia, and the enormous resulting outlays caused a signal change in the financial situation. Before peace was restored in the autumn of 1905, Japan had been obliged to borrow 405,000,000 *yen* at home and 1,054,000,000 abroad, so that she found herself in 1908 with a total debt of 2,276,000,000 *yen*, of which aggregate her domestic indebtedness stood for 1,110,000,000 and her foreign borrowings amounted to 1,166,000,000. This meant that her debt had grown from 561,000,000 *yen* in 1904 to 2,276,000,000 *yen*[1] in 1908; or from 11·3 *yen* to 43·8 *yen* per head of the population. Further, out of the grand total, the sum actually spent on account of war and armaments represented 1,357,000,000 *yen*. The debt carried interest varying from 4 to 5%.

It will be observed that the country's indebtedness grew by 1,700,000,000 *yen*, in round numbers, owing to the war with Russia. This added obligation the government resolved to discharge within the space of 30 years, for which purpose the diet was asked to approve the establishment of a national debt consolidation fund, which should be kept distinct from the general accounts of revenue and expenditure, and specially applied to payment of interest and redemption of principal. The amount of this fund was never to fall below 110,000,000 *yen* annually. Immediately after the war, the diet approved a cabinet proposal for the nationalization of 17 private railways, at a cost of 500,000,000 *yen*, and this brought the state's debts to 2,776,000,000 *yen* in all. The people becoming impatient of this large burden, a scheme was finally adopted in 1908 for appropriating a sum of at least 50,000,000 *yen* annually to the purpose of redemption.

Local Finance.—Between 1878 and 1888 a system of local autonomy in matters of finance was fully established. Under this system the total expenditures of the various corporations in the last year of each quinquennial period commencing from the fiscal year 1889–1890 were as follow:—

Year.	Total Expenditure (millions of *yen*).
1889–1890	22
1893–1894	52
1898–1899	97
1903–1904[2]	158
1907–1908	167

In the same years the total indebtedness of the corporations was:—

Year.	Debts (millions of *yen*).
1890	¾
1894	10
1899	32
1904	65
1907	89[3]

The chief purposes to which the proceeds of these loans were applied are as follow:—

	Millions of *yen*.
Education	5
Sanitation	12
Industries	13
Public works	52

Local corporations are not competent to incur unrestricted indebtedness. The endorsement of the local assembly must be secured; redemption must commence within 3 years after the date of issue and be completed within 30 years; and, except in the case of very small loans, the sanction of the minister of home affairs must be obtained.

Wealth of Japan.—With reference to the wealth of Japan, there is no official census. So far as can be estimated from statistics for the year 1904–1905, the wealth of Japan proper, excluding Formosa, Sakhalin and some rights in Manchuria, amounts to about 19,896,000,000 *yen*, the items of which are as follow:—

	Yen (10 *yen*=£1).
Lands	12,301,000,000
Buildings	2,331,000,000
Furniture and fittings	1,080,000,000
Live stock	109,000,000
Railways, telegraphs and telephones	707,000,000
Shipping	376,000,000
Merchandise	873,000,000
Specie and bullion	310,000,000
Miscellaneous	1,809,000,000
Grand total	19,896,000,000

Early Education.

Education.—There is no room to doubt that the literature and learning of China and Korea were transported to Japan in very ancient times, but tradition is the sole authority for current statements that in the 3rd century a Korean immigrant was appointed historiographer to the Imperial court of Japan and another learned man from the same country introduced the Japanese to the treasures of Chinese literature. About the end of the 6th century the Japanese court began to send civilians and religionists direct to China, there to study Confucianism and Buddhism, and among these travellers there were some who passed as much as 25 or 30 years beyond the sea. The knowledge acquired by these students was crystallized into a body of laws and ordinances based on the administrative and legal systems of the Sui dynasty in China, and in the middle of the 7th century the first Japanese school seems to have been established by the emperor Tenchi, followed some 50 years later by the first university. Nara was the site of the latter, and the subjects of study were ethics, law, history and mathematics.

Not until 794, the date of the transfer of the capital to Kiōto, however, is there any evidence of educational organization on a considerable scale. A university was then opened in the capital, with affiliated colleges; and local schools were built and endowed by noble families, to whose scions admittance was restricted, but for general education one institution only appears to have been provided. In this Kiōto university the curriculum included the Chinese classics, calligraphy, history, law, etiquette, arithmetic and composition; while in the affiliated colleges special subjects were taught, as medicine, herbalism, acupuncture, shampooing, divination, the almanac and languages. Admission was limited to youths of high social grade; the students aggregated some 400, from 13 to 16 years of age; the faculty included professors and teachers, who were known by the same titles (*hakase* and *shi*) as those applied to their successors to-day; and the government supplied food and clothing as well as books. The family schools numbered five, and their patrons were the Wage, the Fujiwara, the Tachibana (one school each) and the Minamoto (two). At the one institution—opened in 828—where youths in general might receive instruction, the course embraced only calligraphy and the precepts of Buddhism and Confucianism.

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[1] In this is included a sum of 110,000,000 *yen* distributed in the form of loan-bonds among the officers and men of the army and navy by way of reward for their services during the war of 1904–5.

[2] When war broke out in 1904 the local administrative districts took steps to reduce their outlays, so that whereas the expenditures totalled 158,000,000 *yen* in 1903–1904, they fell to 122,000,000 and 126,000,000 in 1904–1905 and 1905–1906 respectively. Thereafter however, they expanded once more.

[3] This includes 22¼ millions of loans raised abroad.

Combination of Native and Foreign Element.

The above retrospect suggests that Japan, in those early days, borrowed her educational system and its subjects of study entirely from China. But closer scrutiny shows that the national factor was carefully preserved. The ethics of administration required a combination of two elements, *wakon*, or the soul of Japan, and *kwansai*, or the ability of China; so that, while adopting from Confucianism the doctrine of filial piety, the Japanese grafted on it a spirit of unswerving loyalty and patriotism; and while accepting Buddha's teaching as to three states of existence, they supplemented it by a belief that in the life beyond the grave the duty of guarding his country would devolve on every man. Great academic importance attached to proficiency in literary composition, which demanded close study of the ideographic script, endlessly perplexing in form and infinitely delicate in sense. To be able to compose and indite graceful couplets constituted a passport to high office as well as to the favour of great ladies, for women vied with men in this accomplishment. The early years of the 11th century saw, grouped about the empress Aki, a galaxy of female authors whose writings are still accounted their country's classics—Murasaki no Shikibu, Akazome Emon, Izumi Shikibu, Ise Taiyu and several lesser lights. To the first two Japan owes the *Genji monogatari* and the *Eiga monogatari*, respectively, and from the Imperial court of those remote ages she inherited admirable models of painting, calligraphy, poetry, music, song and dance. But it is to be observed that all this refinement was limited virtually to the noble families residing in Kiōto, and that the first object of education in that era was to fit men for office and for society.

Education in the Middle Ages.

Meanwhile, beyond the precincts of the capital there were rapidly growing to maturity numerous powerful military magnates who despised every form of learning that did not contribute to martial excellence. An illiterate era ensued which reached its climax with the establishment of feudalism at the close of the 12th century. It is recorded that, about that time, only one man out of a force of five thousand could decipher an Imperial mandate addressed to them. Kamakura, then the seat of feudal government, was at first distinguished for absence of all intellectual training, but subsequently the course of political events brought thither from Kiōto a number of court nobles whose erudition and refinement acted as a potent leaven. Buddhism, too, had been from the outset a strong educating influence. Under its auspices the first great public library was established (1270) at the temple Shōmyo-ji in Kanazawa. It is said to have contained practically all the Chinese and Japanese books then existing, and they were open for perusal by every class of reader. To Buddhist priests, also, Japan owed during many years all the machinery she possessed for popular education. They organized schools at the temples scattered about in almost every part of the empire, and at these *tera-koya*, as they were called, lessons in ethics, calligraphy, reading and etiquette were given to the sons of samurai and even to youths of the mercantile and manufacturing classes.

Education in the pre-Meiji Era.

When, at the beginning of the 17th century, administrative supremacy fell into the hands of the Tokugawa, the illustrious founder of that dynasty of shōguns, Iyeyasu, showed himself an earnest promoter of erudition. He employed a number of priests to make copies of Chinese and Japanese books; he patronized men of learning and he endowed schools. It does not appear to have occurred to him, however, that the spread of knowledge was hampered by a restriction which, emanating originally from the Imperial court in Kiōto, forbade any one outside the ranks of the Buddhist priesthood to become a public teacher. To his fifth successor Tsunayoshi (1680–1709) was reserved the honour of abolishing this veto. Tsunayoshi, whatever his faults, was profoundly attached to literature. By his command a pocket edition of the Chinese classics was prepared, and the example he himself set in reading and expounding rare books to audiences of feudatories and their vassals produced something like a mania for erudition, so that feudal chiefs competed in engaging teachers and founding schools. The eighth shōgun, Yoshimunē (1716–1749), was an even more enlightened ruler. He caused a geography to be compiled and an astronomical observatory to be constructed; he revoked the veto on the study of foreign books; he conceived and carried out the idea of imparting moral education through the medium of calligraphy by preparing ethical primers whose precepts were embodied in the head-lines of copy-books, and he encouraged private schools. Iyenari (1787–1838), the eleventh shōgun, and his immediate successor, Iyeyoshi (1838–1853), patronized learning no less ardently, and it was under the auspices of the latter that Japan acquired her five classics, the primers of *True Words*, of *Great Learning*, of *Lesser Learning*, of *Female Ethics* and of *Women's Filial Piety*.

Thus it may be said that the system of education progressed steadily throughout the Tokugawa era. From the days of Tsunayoshi the number of fief schools steadily increased, and as students were admitted free of all charges, a duty of grateful fealty as well as the impulse of interfief competition drew thither the sons of all samurai. Ultimately the number of such schools rose to over 240, and being supported entirely at the expense of the feudal chiefs, they did no little honour to the spirit of the era. From 7 to 15 years of age lads attended as day scholars, being thereafter admitted as boarders, and twice a year examinations were held in the presence of high officials of the fief. There were also several private schools where the curriculum consisted chiefly of moral philosophy, and there were many temple schools, where ethics, calligraphy, arithmetic, etiquette and, sometimes, commercial matters were taught. A prominent feature of the system was the bond of reverential affection uniting teacher and student. Before entering school a boy was conducted by his father or elder brother to the home of his future teacher, and there the visitors, kneeling before the teacher, pledged themselves to obey him in all things and to submit unquestioningly to any discipline he might impose. Thus the teacher came to be regarded as a parent, and the veneration paid to him was embodied in a precept: "Let not a pupil tread within three feet of his teacher's shadow." In the case of the temple schools the priestly instructor had full cognisance of each student's domestic circumstances and was guided by that knowledge in shaping the course of instruction. The universally underlying principle was, "serve the country and be diligent in your respective avocations." Sons of samurai were trained in military arts, and on attaining proficiency many of them travelled about the country, inuring their bodies to every kind of hardship and challenging all experts of local fame.

Unfortunately, however, the policy of national seclusion prevented for a long time all access to the stores of European knowledge. Not until the beginning of the 18th century did any authorized account of the great world of the West pass into the hands of the people. A celebrated scholar (Arai Hakuseki) then compiled two works—*Saiyō kibun* (*Record of Occidental Hearsay*), and *Sairan igen* (*Renderings of Foreign Languages*)—which embodied much information, obtained from Dutch sources, about Europe, its conditions and its customs. But of course the light thus furnished had very restricted influence. It was not extinguished, however. Thenceforth men's interest centred more and more on the astronomical, geographical and medical sciences of the West, though such subjects were not included in academical studies until the renewal of foreign intercourse in modern times. Then (1857), almost immediately, the nation turned to Western learning, as it had turned to Chinese thirteen centuries earlier. The Tokugawa government established in Yedo an institution called *Bansho-shirabe-dokoro* (place for studying foreign books), where Occidental languages were learned and Occidental works translated. Simultaneously a school for acquiring foreign medical art (*Seiyo igaku-sho*) was opened, and, a little later (1862), the *Kaisei-jo* (place of liberal culture), a college for studying European sciences, was added to the list of new institutions. Thus the eve of the Restoration saw the

Japanese people already appreciative of the stores of learning rendered accessible to them by contact with the Occident.

Commercial Education in Tokugawa Times.

Commercial education was comparatively neglected in the schools. Sons of merchants occasionally attended the *tera-koya*, but the instruction they received there had seldom any bearing upon the conduct of trade. Mercantile knowledge had to be acquired by a system of apprenticeship. A boy of 9 or 10 was apprenticed for a period of 8 or 9 years to a merchant, who undertook to support him and teach him a trade. Generally this young apprentice could not even read or write. He passed through all the stages of shop menial, errand boy, petty clerk, salesman and senior clerk, and in the evenings he received instruction from a teacher, who used for textbooks the manual of letter-writing (*Shosoku orai*) and the manual of commerce (*Shōbai orai*). The latter contained much useful information, and a youth thoroughly versed in its contents was competent to discharge responsible duties. When an apprentice, having attained the position of senior clerk, had given proof of practical ability, he was often assisted by his master to start business independently, but under the same firm-name, for which purpose a sum of capital was given to him or a section of his master's customers were assigned.

Education in Modern Japan.

When the government of the Restoration came into power, the emperor solemnly announced that the administration should be conducted on the principle of employing men of capacity wherever they could be found. This amounted to a declaration that in choosing officials scholastic acquirements would thenceforth take precedence of the claims of birth, and thus unprecedented importance was seen to attach to education. But so long as the feudal system survived, even in part, no general scheme of education could be thoroughly enforced, and thus it was not until the conversion of the fiefs into prefectures in 1871 that the government saw itself in a position to take drastic steps. A commission of investigation was sent to Europe and America, and on its return a very elaborate and extensive plan was drawn up in accordance with French models, which the commissioners had found conspicuously complete and symmetrical. This plan subsequently underwent great modifications. It will be sufficient to say that in consideration of the free education hitherto provided by the feudatories in their various fiefs, the government of the restoration resolved not only that the state should henceforth shoulder the main part of this burden, but also that the benefits of the system should be extended equally to all classes of the population, and that the attendance at primary schools should be compulsory. At the outset the sum to be paid by the treasury was fixed at 2,000,000 *yen*, that having been approximately the expenditure incurred by the feudatories. But the financial arrangements suffered many changes from time to time, and finally, in 1877, the cost of maintaining the schools became a charge on the local taxes, the central treasury granting only sums in aid.

Every child, on attaining the age of six, must attend a common elementary school, where, during a six-years' course, instruction is given in morals, reading, arithmetic, the rudiments of technical work, gymnastics and poetry. Year by year the attendance at these schools has increased. Thus, whereas in the year 1900, only 81·67% of the school-age children of both sexes received the prescribed elementary instruction, the figure in 1905 was 94·93%. The desire for instruction used to be keener among boys than among girls, as was natural in view of the difference of inducement; but ultimately this discrepancy disappeared almost completely. Thus, whereas the percentage of girls attending school was 75·90 in 1900, it rose to 91·46 in 1905, and the corresponding figures for boys were 90·55 and 97·10 respectively. The tuition fee paid at a common elementary school in the rural districts must not exceed 5s. yearly, and in the urban districts, 10s.; but in practice it is much smaller, for these elementary schools form part of the communal system, and such portion of their expenses as is not covered by tuition fees, income from school property and miscellaneous sources, must be defrayed out of the proceeds of local taxation. In 1909 there were 18,160 common elementary schools, and also 9105 schools classed as elementary but having sections where, subsequently to the completion of the regular curriculum, a special supplementary course of study might be pursued in agriculture, commerce or industry (needle-work in the case of girls). The time devoted to these special courses is two, three or four years, according to the degree of proficiency contemplated, and the maximum fees are 15d. per month in urban districts and one-half of that amount in rural districts.

There are also 294 kindergartens, with an attendance of 26,000 infants, whose parents pay 3d. per month on the average for each child. In general the kindergartens are connected with elementary schools or with normal schools.

If a child, after graduation at a common elementary school, desires to extend its education, it passes into a common middle school, where training is given for practical pursuits or for admission to higher educational institutions. The ordinary curriculum at a common middle school includes moral philosophy, English language, history, geography, mathematics, natural history, natural philosophy, chemistry, drawing and the Japanese language. Five years are required to graduate, and from the fourth year the student may take up a special technical course as well as the main course; or, in accordance with local requirements, technical subjects may be taught conjointly with the regular curriculum throughout the whole time. The law provides that there must be at least one common middle school in each prefecture. The actual number in 1909 was 216.

Great inducements attract attendance at a common middle school. Not only does the graduation certificate carry considerable weight as a general qualification, but it also entitles a young man to volunteer for one year's service with the colours, thus escaping one of the two years he would have to serve as an ordinary conscript.

The graduate of a common middle school can claim admittance, without examination, to a high school, where he spends three years preparing to pass to a university, or four years studying a special subject, as law, engineering or medicine. By following the course in a high school, a youth obtains exemption from conscription until the age of 28, when one year as a volunteer will free him from all service with the colours. A high-school certificate of graduation entitles its holder to enter a university without examination, and qualifies him for all public posts.

For girls also high schools are provided, the object being to give a general education of higher standard. Candidates for admission must be over 12 years of age, and must have completed the second-year course of a higher elementary school. The regular course of study requires 4 years, and supplementary courses as well as special art courses may be taken.

In addition to the schools already enumerated, which may be said to constitute the machinery of general education, there are special schools, generally private, and technical schools (including a few private), where instruction is given in medicine and surgery, agriculture, commerce, mechanics, applied chemistry, navigation, electrical engineering, art (pictorial and applied), veterinary science, sericulture and various other branches of industry. There are also apprentices' schools, classed under the heading of elementary, where a course of not less than six months, and not more than four years, may be taken in dyeing and weaving, embroidery, the making of artificial flowers, tobacco manufacture, sericulture, reeling silk, pottery, lacquer, woodwork, metal-work or brewing. There are also schools—nearly all supported by private enterprise—for the blind and the dumb.

Normal schools are maintained for the purpose of training teachers, a class of persons not plentiful in Japan, doubtless because of an exceptionally low scale of emoluments, the yearly pay not exceeding £60 and often falling as low as £15.

There are two Imperial universities, one in Tōkyō and one in Kiōto. In 1909 the former had about 220 professors and instructors and 2880 students. Its colleges number six: law, medicine, engineering, literature, science and agriculture. It has a university hall where post-graduate courses are studied, and it publishes a quarterly journal giving accounts of scientific researches, which indicate not only large erudition, but also original talent. The university of Kiōto is a comparatively new institution and has not given any signs of great vitality. In 1909 its colleges numbered four: law, medicine, literature and science; its faculty consisted of about 60 professors with 70 assistants, and its students aggregated about 1100.

Except in the cases specially indicated, all the figures given above are independent of private educational institutions. The system pursued by the state does not tend to encourage private education, for unless a private school brings its curriculum into exact accord with that prescribed for public institutions of corresponding grade, its students are denied the valuable privilege of partial exemption from conscription, as well as other advantages attaching to state recognition. Thus the quality of the instruction being nominally the same, the rate of fees must also be similar, and no margin offers to tempt private enterprise.

Public education in Japan is strictly secular: no religious teaching of any kind is permitted in the schools. There are about 100 libraries. Progress is marked in this branch, the rate of growth having been from 43 to 100 in the five-year period ended 1905. The largest library is the Imperial, in Tōkyō. It had about half a million volumes in 1909, and the daily average of visitors was about 430.

Apart from the universities, the public educational institutions in Japan involve an annual expenditure of 3½ millions sterling, out of which total a little more than half a million is met by students' fees; 2¾ millions are paid by the communes, and the remainder is defrayed from various sources, the central government contributing only some £28,000. It is estimated that public school property—in land, buildings, books, furniture, &c., aggregates 11 millions sterling.

VII.—RELIGION

Shintō.

The primitive religion of Japan is known by the name of Shintō, which signifies "the divine way," but the Japanese maintain that this term is of comparatively modern application. The term Shintō being obviously of Chinese origin, cannot have been used in Japan before she became acquainted with the Chinese language. Now Buddhism did not reach Japan until the 6th century, and a knowledge of the Chinese language had preceded it by only a hundred years. It is therefore reasonable to conclude that the primitive religion of Japan had no name, and that it did not begin to be called Shintō until Buddhism had entered the field. The two creeds remained distinct, though not implacably antagonistic, until the beginning of the 9th century, when they were welded together into a system of doctrine to which the name *Ryōbu-Shintō* (dual Shintō) was given. In this new creed the Shintō deities were regarded as avatars of Buddhist divinities, and thus it may be said that Shintō was absorbed into Buddhism. Probably that would have been the fate of the indigenous creed in any circumstances, for a religion without a theory as to a future state and without any code of moral duties could scarcely hope to survive contact with a faith so well equipped as Buddhism in these respects. But Shintō, though absorbed, was not obliterated. Its beliefs survived; its shrines survived; its festivals survived, and something of its rites survived also.

Shintō, indeed, may be said to be entwined about the roots of Japan's national existence. Its scripture—as the *Kojiki* must be considered—resembles the Bible in that both begin with the cosmogony. But it represents the gods as peopling the newly created earth with their own offspring instead of with human beings expressly made for the purpose. The actual work of creation was done by a male deity, Izanagi, and a female deity, Izanami. From the right eye of the former was born Amaterasu, who became goddess of the sun; from his left eye, the god of the moon; and from his nose, a species of Lucifer. The grandson of the sun goddess was the first sovereign of Japan, and his descendants have ruled the land in unbroken succession ever since, the 121st being on the throne in 1909. Thus it is to Amaterasu (the heaven-illuminating goddess) that the Japanese pay reverence above all other deities, and it is to her shrine at Ise that pilgrims chiefly flock.

The story of creation, as related in the *Kojiki*, is obviously based on a belief that force is indestructible, and that every exercise of it is productive of some permanent result. Thus by the motions of the creative spirit there spring into existence all the elements that go to make up the universe, and these, being of divine origin, are worshipped and propitiated. Their number becomes immense when we add the deified ghosts of ancestors who were descended from the gods and whose names are associated with great deeds. These ancestors are often regarded as the tutelary deities of districts, where they receive special homage and where shrines are erected to them. The method of worship consists in making offerings and in the recital of rituals (*norito*). Twenty-seven of these rituals were reduced to writing and embodied in a work called *Engishiki* (927). Couched in antique language, these liturgies are designed for the dedication of shrines, for propitiating evil, for entreating blessings on the harvest, for purification, for obtaining household security, for bespeaking protection during a journey, and so forth. Nowhere is any reference found to a future state of reward or punishment, to deliverance from evil, to assistance in the path of virtue. One ceremonial only is designed to avert the consequences of sin or crime; namely, the rite of purification, which, by washing with water and by the sacrifice of valuables, removes the pollution resulting from all wrong-doing. Originally performed on behalf of individuals, this *ō-barai* ultimately came to be a semi-annual ceremony for sweeping away the sins of all the people.

Shintō is thus a mixture of ancestor-worship and of nature-worship without any explicit code of morals. It regards human beings as virtuous by nature; assumes that each man's conscience is his best guide; and while believing in a continued existence beyond the grave, entertains no theory as to its pleasures or pains. Those that pass away become disembodied spirits, inhabiting the world of darkness (*yomi-no-yo*) and possessing power to bring sorrow or joy into the lives of their survivors, on which account they are worshipped and propitiated. Purity and simplicity being essential characteristics of the cult, its shrines are built of white wood, absolutely without decorative features of any kind, and fashioned as were the original huts of the first Japanese settlers. There are no graven images—a fact attributed by some critics to ignorance of the glyptic art on the part of the original worshippers—but there is an emblem of the deity, which generally takes the form of a sword, a mirror or a so-called jewel, these being the insignia handed by the sun goddess to her grandson, the first ruler of Japan. This emblem is not exposed to public view: it is enveloped in silk and brocade and enclosed in a box at the back of the shrine. The mirror sometimes prominent is a Buddhist innovation and has nothing to do with the true emblem of the creed.

From the 9th century, when Buddhism absorbed Shintō, the two grew together so intimately that their differentiation seemed hopeless. But in the middle of the 17th century a strong revival of the indigenous faith was effected by the efforts of a group of illustrious scholars and politicians, at whose head stood Mabuchi, Motoori and Hirata. These men applied themselves with great diligence and acumen to reproduce the pure Shintō of the *Kojiki* and to restore it to its old place in the nation's reverence, their political purpose being to educate a spirit of revolt against the feudal system which deprived the emperor of administrative power. The principles thus revived became the basis of the restoration of 1867; Shintō rites and Shintō rituals were re-adopted, and Buddhism fell for a season into comparative disfavour, Shintō being regarded as the national religion. But Buddhism had twined its roots too deeply around the heart of the people to be thus easily torn up. It gradually recovered its old place, though not its old magnificence, for its disestablishment at the hands of the Meiji government robbed it of a large part of its revenues.

Buddhism.

Buddhism entered China at the beginning of the Christian era, but not until the 4th century did it obtain any strong footing. Thence, two centuries later (522), it reached Japan through Korea. The reception extended to it was not encouraging at first. Its images and its brilliant appurtenances might well deter a nation which had never seen an idol nor ever worshipped in a decorated temple. But the ethical teachings and the positive doctrines of the foreign faith presented an attractive contrast to the colourless Shintō. After a struggle, not without bloodshed, Buddhism won its way. It owed much to the active patronage of Shōtoku taishi, prince-regent during the reign of the empress Suiko (593–621). At his command many new temples were built; the country was divided into dioceses under Buddhist prelates; priests were encouraged to teach the arts of road-making and bridge-building, and students were sent to China to investigate the mysteries of the faith at its supposed fountain-head. Between the middle of the 7th century and that of the 8th, six sects were introduced from China, all imperfect and all based on the teachings of the Hinayana system. Up to this time the propagandists of the creed had been chiefly Chinese and Korean teachers. But from the 8th century onwards, when Kiōto became the permanent capital of the empire, Japanese priests of lofty intelligence and profound piety began to repair to China and bring thence modified forms of the doctrines current there. It was thus that Dengyō daishi (*c.* 800) became the founder of the Tendai (heavenly tranquillity) sect and Kōbō daishi (774–834) the apostle of the Shingon (true word). Other sects followed, until the country possessed six principal sects in all with thirty-seven sub-sects. It must be remembered that Buddhism offers an almost limitless field for eclecticism. There is not in the world any literary production of such magnitude as the Chinese scriptures of the Mahayana. "The canon is seven hundred times the amount of the New Testament. Hsüan Tsang's translation of the *Prajna paramita* is twenty-five times as large as the whole Christian Bible."

It is natural that out of such a mass of doctrine different systems should be elaborated. The Buddhism that came to Japan prior to the days of Dengyō daishi was that of the Vaipulya school, which seems to have been accepted in its entirety. But the Tendai doctrines, introduced by Dengyō, Jikaku and other fellow-thinkers, though founded mainly on the *Saddharma pundarika*, were subjected to the process of eclecticism which all foreign institutions undergo at Japanese hands. Dengyō studied it in the monastery of Tientai which "had been founded towards the close of the 6th century of our era on a lofty range of mountains in the province of Chehkiang by the celebrated preacher Chikai" (Lloyd, "Developments of Japanese Buddhism," *Transactions of the Asiatic Society of Japan*, vol. xxii.), and carrying it to Japan he fitted its disciplinary and meditative methods to the foundations of the sects already existing there.

This eclecticism was even more marked in the case of the Shingon (true word) doctrines, taught by Dengyō's illustrious contemporary, Kōbō daishi, who was regarded as the incarnation of Vairocana. He led his countrymen, by a path almost wholly his own, from the comparatively low platform of Hinayana Buddhism, whose sole aim is individual salvation, to the Mahayana doctrine, which teaches its devotee to strive after perfect enlightenment, not for his own sake alone, but also that he may help his fellows and intercede for them. Then followed the Jōdo (Pure Land) sect, introduced in 1153 by a priest, Senku, who is remembered by later generations as Hōnen shōnin. He taught salvation by faith ritualistically expressed. The virtue that saves comes, not from imitation of and conformity to the person and character of the saviour Amida, but from blind trust in his efforts and ceaseless repetition of pious formulae. It is really a religion of despair rather than of hope, and in that respect it reflects the profound sympathy awakened in the bosom of its teacher by the sorrows and sufferings of the troublous times in which he lived.

A favourite pupil of Hōnen shōnin was Shinran (1173–1262). He founded the Jōdo Shinshū (true sect of jōdo), commonly called simply Shinshū and sometimes Monto, which subsequently became the most influential of Japanese sects, with its splendid monasteries, the two Hongwana-ji in Kiōto. The differences between the doctrines of this sect and those of its predecessors were that the former "divested itself of all metaphysics"; knew nothing of a philosophy of religion, dispensed with a multiplicity of acts of devotion and the keeping of many commandments; did not impose any vows of celibacy or any renunciation of the world, and simply made faith in Amida the all in all. In modern days the Shinshū sect has been the most progressive of all Buddhist sects and has freely sent forth its promising priests to study in Europe and America. Its devotees make no use of charms or spells, which are common among the followers of other sects.

Anterior by a few years to that introduction of the Shinshū was the Zen sect, which has three main divisions, the Rinzai (1168), the Sōtō (1223) and the Obaku (1650). This is essentially a contemplative sect. Truth is reached by pure contemplation, and knowledge can be transmitted from heart to heart without the use of words. In that simple form the doctrine was accepted by the Rinzai believers. But the founders of the Sōtō branch—Shōyo taishi and Butsuji zenshi—added scholarship and research to contemplation, and taught that the "highest wisdom and the most perfect enlightenment are attained when all the elements of phenomenal existence are recognized as empty, vain and unreal." This creed played an important part in the development of Bushidō, and its priests have always been distinguished for erudition and indifference to worldly possessions.

Last but not least important among Japanese sects of Buddhism is the Nichiren or Hokke, called after its founder, Nichiren (1222–1282). It was based on the *Saddharma pundarika*, and it taught that there was only one true Buddha—the moon in the heavens—the other Buddhas being like the moon reflected in the waters, transient, shadowy reflections of the Buddha of truth. It is this being who is the source of all phenomenal existence, and in whom all phenomenal existence has its being. The imperfect Buddhism teaches a chain of cause and effect; true Buddhism teaches that the first link in this chain of cause and effect is the Buddha of original enlightenment. When this point has been reached true wisdom has at length been attained. Thus the monotheistic faith of Christianity was virtually reached in one God in whom all creatures "live, move and have their being." It will readily be conceived that these varied doctrines caused dissension and strife among the sects professing them. Sectarian controversies and squabbles were nearly as prominent among Japanese Buddhists as they were among European Christians, but to the credit of Buddhism it has to be recorded that the stake and the rack never found a place among its instruments of self-assertion. On the other hand, during the wars that devastated Japan from the 12th to the end of the 16th century, many of the monasteries became military camps, and the monks, wearing armour and wielding glaives, fought in secular as well as religious causes.

Christianity in Modern Japan.

The story of the first Christian missionaries to Japan is told elsewhere (see § VIII. FOREIGN INTERCOURSE). Their work suffered an interruption for more than 200 years until, in 1858, almost simultaneously with the conclusion of the treaties, a small band of Catholic fathers entered Japan from the Riūkiū islands, where they had carried on their ministrations since 1846. They found that, in the neighbourhood of Nagasaki, there were some small communities where Christian worship was still carried on. It would seem that these communities had not been subjected to any severe official scrutiny. But the arrival of the fathers revived the old question, and the native Christians, or such of them as refused to apostatize, were removed from their homes and sent into banishment. This was the last example of religious intolerance in Japan. At the instance of the foreign representatives in Tōkyō the exiles were set at liberty in 1873, and from that time complete freedom of conscience existed in fact, though it was not declared by law until the promulgation of the constitution in 1889. In 1905 there were 60,000 Roman Catholic converts in Japan forming 360 congregations, with 130 missionaries and 215 teachers, including 145 nuns. These were all European. They were assisted by 32 Japanese priests, 52 Japanese male catechists and 265 female catechists and nurses. Three seminaries for native priests existed, together with 58 schools and orphanages and two lepers' homes. The whole was presided over by an archbishop and three bishops.

The Anglican Church was established in Japan in 1859 by two American clergymen who settled in Nagasaki, and now, in conjunction with the Episcopal Churches of America and Canada, it has missions collectively designated Nihon Sei-Kōkai. There are 6 bishops—2 American and 4 English—with about 60 foreign and 50 Japanese priests and deacons, besides many foreign lay workers of both sexes and Japanese catechists and school teachers. The converts number 11,000. The Protestant missions include Presbyterian (Nihon Kirisuto Kyōkwai), Congregational (Kumiai), Methodist, Baptist and the Salvation Army (Kyusei-gun). The pioneer Protestant mission was founded in 1859 by representatives of the American Presbyterian and Dutch Reformed Churches. To this mission belongs the credit of having published, in 1880, the first complete Japanese version of the New Testament, followed by the Old Testament in 1887. The Presbyterians, representing 7 religious societies, have over a hundred missionaries; 12,400 converts; a number of boarding schools for boys and girls and day schools. The Congregational churches are associated exclusively with the mission of the American board of commissioners for foreign missions. They have about 11,400 converts, and the largest Christian educational institution in Japan, namely, the Dōshisha in Kiōto. The Methodists represent 6 American societies and 1 Canadian. They have 150 missionaries and 10,000 converts, boarding schools, day schools and the most important Christian college in Tōkyō, namely, the Aoyama Gakuin. The Baptists represent 2 American societies, have 60 missionaries, a theological seminary, an academy for boys, boarding schools for girls, day schools and 3500 converts. The Salvation Army, which did not enter Japan until 1895, has organized 15 corps, and publishes ten thousand copies of a fortnightly magazine, the *War Cry* (*Toki no Koe*). Finally, the Society of Friends, the American and London Religious Tract Societies and the Young Men's Christian Association have a number of missions. It will be seen from the above that the missionaries in Japan, in the space of half a century (1858 to 1908), had won 110,000 converts, in round numbers. To these must be added the Greek, or Russian Church, which has a fine cathedral in Tōkyō, a staff of about 40 Japanese priests and deacons and 27,000 converts, the whole presided over by a bishop. Thus the total number of converts [illegible] system. In spite of the numerous sects represented in Japan there has been virtually no sectarian strife, and it must be said of the Japanese converts that they concern themselves scarcely at all about the questions of dogma which divide European Christianity. Their tendency is to combine with the essential precepts of the faith [illegible]. They are disposed even to evolve the creed to their own requirements just as they adapted Buddhism, and this is a tendency which promises to grow.

VIII.—Foreign Intercourse

Foreign Intercourse in Early and Mediaeval Times.—There can be no doubt that commerce was carried on by Japan with China and Korea earlier than the 3rd century of the Christian era. It would appear that from the very outset over-sea trade was regarded as a government monopoly. Foreigners were allowed to travel freely in the interior of the country provided that they submitted their baggage for official inspection and made no purchases of weapons of war, but all imported goods were bought in the first place by official appraisers who subsequently sold them to the people at arbitrarily fixed prices. Greater importance attached to the trade with China under the Ashikaga shōguns (14th, 15th and 16th centuries), who were in constant need of funds to defray the cost of internecine military operations caused by civil disturbances. In this distress they turned to the neighbouring empire as a source from which money might be obtained. The idea seems to have been suggested to the shōgun Takauji by a Buddhist priest, when he undertook the construction of the temple Tenryū-ji. Two ships laden with goods were fitted out, and it was decided that the enterprise should be repeated annually. Within a few years after the establishment of commercial relations between the two empires, an interruption occurred owing partly to the overthrow of the Yuen Mongols by the Chinese Ming, and partly to the activity of Japanese pirates and adventurers who raided the coasts of China. The shōgun Yoshimitsu (1368–1394), however, succeeded in restoring commercial intercourse, though in order to effect his object he consented that goods sent from Japan should bear the character of tribute, and that he himself should receive investiture at the hands of the Chinese emperor's ambassador. The Nanking government granted a certain number of commercial passports, and these were given by the shōgun to Ōuchi, feudal chief of Chō-shū, which had long been the principal port for trade with the neighbouring empire. Private goods formed only a small portion of a vessel's cargo, the bulk consisting of articles which were delivered into the government's stores in China, payment being received in copper cash. It was from this transaction that the shōgun derived a considerable part of his profits, for the articles did not cost him anything, ordinarily being either presents from the great temples and provincial governors or compulsory contributions from the barons of Kiushiu. Alike the gifts of the Chinese government and the goods obtained in China were afterwards distributed among the noble families in Japan at prices fixed by the shōgun's treasurer. Thus, so far as the shōgun was concerned, these enterprises could not fail to be lucrative. They also brought large profits to the Ōuchi family, for, in the absence of competition, the producers and manufacturers of each country found ready sale in the markets of the other. The articles found most saleable in China were swords, fans, screens, lacquer wares, copper and sulphur, and the goods brought back to Japan were brocades and other silk fabrics, ceramic productions, jade and fragrant woods. The Chinese seem at first to have had a just appreciation of the wonderful swords of Japan. At first they were willing to pay the equivalent of 10 guineas for a pair of swords, but by degrees, as the Japanese began to increase the supply, the price fell, and at the beginning of the 16th century all the diplomacy of the Japanese envoys was needed to obtain good figures for the large and constantly growing quantity of goods that they took over by way of supplement to the tribute. Buddhist priests generally enjoyed the distinction of being selected as envoys, for experience showed that their suave methods [illegible] the commercial scruples of the Chinese authorities and secured a fine profit for their master the shōgun. In the middle of the 16th century these tribute-bearing missions came to an end with the fall of the Ōuchi family and the overthrow of the Ashikaga shōguns, and they were never renewed.

With Korea.

Japan's mediaeval commerce with Korea was less ceremonious than that with China. No passports had to be obtained from the Korean government. A trader was sufficiently equipped when he carried a permit from the Sō family, which held the island of Tsushima in fief. Fifty vessels were allowed to pass yearly from ports in Japan to the three Japanese settlements in Korea. Little is recorded about the nature of this trade, but it was rudely interrupted by the Japanese settlers, who, offended at some arbitrary procedure on the part of the local Korean authorities, took up arms (1510) and at first signally routed the Koreans. An army from Seoul turned the tables, and the Japanese were compelled to abandon the three settlements. Subsequently the shōgun's government—which had not been concerned in the struggle—approached Korea with amicable proposals, and it was agreed that the ringleaders of the rioters should be decapitated and their heads sent to Seoul, Japan's compliance with this condition affording, perhaps, a measure of the value she attached to neighbourly friendship. Thenceforth the number of vessels was limited to 25 annually and the settlements were abolished. Some years later the Japanese again resorted to violent acts of self-assertion, and on this occasion, although the offenders were arrested by order of the shōgun Yoshiharu and handed over to Korea for punishment, the Seoul court persisted in declining to restore the system of settlements or to allow the trade to be resumed on its former basis. Fifty years afterwards the Taikō's armies invaded Korea, overrunning it for seven years, and leaving, when they retired in 1598, a country so impoverished that it no longer offered any attraction to commercial enterprise from beyond the sea.

With Occidental Nations.

The Portuguese discovered Japan by accident in 1542 or 1543—the exact date is uncertain. On a voyage to Macao from Siam, a junk carrying three Portuguese was blown from her course and reached Tanegashima, a small island lying south of the province of Satsuma. The Japanese, always hospitable and inquisitive, welcomed the newcomers and showed special curiosity about the arquebuses carried by the Portuguese, fire-arms being then a novelty in Japan and all weapons of war being in great request. Conversation was impossible, of course, but, by tracing ideographs upon the sand, a Chinese member of the crew succeeded in explaining the cause of the junk's arrival. She was then piloted to a more commodious harbour, and the Portuguese sold two arquebuses to the local feudatory, who immediately ordered his armourer to manufacture similar weapons. Very soon the news of the discovery reached all the Portuguese settlements in the East, and at least seven expeditions were fitted out during the next few years to exploit this new market. Their objective points were all in the island of Kiushiu—the principal stage where the drama—ultimately converted into a tragedy—of Christian propagandism and European commercial intercourse was acted in the interval between 1542 and 1637.

Arrival of the Jesuits.

It does not appear that the Jesuits at Macao, Goa or other centres of Portuguese influence in the East took immediate advantage of the discovery of Japan. The pioneer propagandist was Francis Xavier, who landed at Kagoshima on the 15th of August 1549. During the interval of six or seven years that separated this event from the drifting of the junk to Tanegashima, the Portuguese had traded freely in the ports of Kiushiu, and had reported the Japanese capital to be a city of 96,000 houses, therefore larger than Lisbon. Xavier would probably have gone to Japan even though he had not been specially encouraged, for the reports of his countrymen depicted the Japanese as "very desirous of being instructed," and he hoped to find a field more promising than that furnished by "all these Indian nations, barbarous, vicious and without inclination to virtue." There were, however, two special encouragements. One was a request addressed by a feudatory supposed to have been the chief of the

Bungo fief, to the viceroy of the Indies at Goa; the other, an appeal made in person by a Japanese named Yajiro, whom the fathers spoke of as Anjiro, and who subsequently attained celebrity under his baptismal name, Paul of the holy faith. No credible reason is historically assigned for the action of the Japanese feudatory. Probably his curiosity had been excited by accounts which the Portuguese traders gave of the noble devotion of their country's missionaries, and being entirely without bigotry, as nearly all Japanese were at that epoch, he issued the invitation partly out of curiosity and partly from a sincere desire for progress. Anjiro's case was very different. Labouring under stress of repentant zeal, and fearful that his evil acts might entail murderous consequences, he sought an asylum abroad, and was taken away in 1548 by a Portuguese vessel whose master advised him to repair to Malacca for the purpose of confessing to Xavier. This might well have seemed to the Jesuits a providential dispensation, for Anjiro, already able to speak Portuguese, soon mastered it sufficiently to interpret for Xavier and his fellow-missionaries (without which aid they must have remained long helpless in the face of the immense difficulty of the Japanese language), and to this linguistic skill he added extraordinary gifts of intelligence and memory. Xavier, with two Portuguese companions and Anjiro, were excellently received by the feudal chiefs of Satsuma and obtained permission to preach their doctrine in any part of the fief. This permit is not to be construed as an evidence of official sympathy with the foreign creed. Commercial considerations alone were in question. A Japanese feudal chief in that era had sedulously to foster every source of wealth or strength, and as the newly opened trade with the outer world seemed full of golden promise, each feudatory was not less anxious to secure a monopoly of it in the 16th century than the Ashikaga shōguns had been in the 15th. The Satsuma daimyō was led to believe that the presence of the Jesuits in Kagoshima would certainly prelude the advent of trading vessels. But within a few months one of the expected merchantmen sailed to Hirado without touching at Kagoshima, and her example was followed by two others in the following year, so that the Satsuma chief saw himself flouted for the sake of a petty rival, Matsudaira of Hirado. This fact could not fail to provoke his resentment. But there was another influence at work. Buddhism has always been a tolerant religion, eclectic rather than exclusive. Xavier, however, had all the bigoted intolerance of his time. The Buddhist priests in Kagoshima received him with courtesy and listened respectfully to the doctrines he expounded through the mouth of Anjiro. Xavier rejoined with a display of aggressive intolerance which shocked and alienated the Buddhists. They represented to the Satsuma chief that peace and good order were inconsistent with such a display of militant propagandism, and he, already profoundly chagrined by his commercial disappointment, issued in 1550 an edict making it a capital offence for any of his vassals to embrace Christianity. Xavier, or, more correctly speaking, Anjiro, had won 150 converts, who remained without molestation, but Xavier himself took ship for Hirado. There he was received with salvoes of artillery by the Portuguese merchantmen lying in the harbour and with marks of profound respect by the Portuguese traders, a display which induced the local chief to issue orders that courteous attention should be paid to the teaching of the foreign missionaries. In ten days a hundred baptisms took place: another significant index of the mood of the Japanese in the early era of Occidental intercourse: the men in authority always showed a complaisant attitude towards Christianity where trade could be fostered by so doing, and wherever the men in authority showed such an attitude, considerable numbers of the lower orders embraced the foreign faith. Thus, in considering the commercial history of the era, the element of religion constantly thrusts itself into the foreground.

First Visit of Europeans to Kiōto.

Xavier next resolved to visit Kiōto. The first town of importance he reached on the way was Yamaguchi, capital of the Chōshū fief, situated on the northern shore of the Shimonoseki Strait. There the feudal chief, Ouchi, though sufficiently courteous and inquisitive, showed no special cordiality towards humble missionaries unconnected with commerce, and the work of proselytizing made no progress, so that Xavier and his companion, Fernandez, pushed on to Kiōto. The time was mid-winter; the two fathers suffered terrible privations during their journey of two months on foot, and on reaching Kiōto they found a city which had been almost wholly reduced to ruins by internecine war. Necessarily they failed to obtain audience of either emperor or shōgun, at that time the most inaccessible potentates in the world, the Chinese "son of heaven" excepted, and nothing remained but street preaching, a strange resource, seeing that Xavier, constitutionally a bad linguist, had only a most rudimentary acquaintance with the profoundly difficult tongue in which he attempted to expound the mysteries of a novel creed. A fortnight sufficed to convince him that Kiōto was unfruitful soil. He therefore returned to Yamaguchi. But he had now learned a lesson. He saw that propagandism without scrip or staff and without the countenance of those sitting in the seats of power would be futile in Japan. So he obtained from Hirado his canonicals, together with a clock and other novel products of European skill, which, as well as credentials from the viceroy of India, the governor of Malacca and the bishop of Goa, he presented to the Chōshū chief. His prayer for permission to preach Christianity was now readily granted, and Ouchi issued a proclamation announcing his approval of the introduction of the new religion and according perfect liberty to embrace it. Xavier and Fernandez now made many converts. They also gained the valuable knowledge that the road to success in Japan lay in associating themselves with over-sea commerce and its directors, and in thus winning the co-operation of the feudal chiefs.

Christian Propagandists.

Nearly ten years had now elapsed since the first Portuguese landed in Kagoshima, and during that time trade had gone on steadily and prosperously. No attempt was made to find markets in the main island: the Portuguese confined themselves to Kiūshiū for two reasons: one, that having no knowledge of the coasts, they hesitated to risk their ships and their lives in unsurveyed waters; the other, that whereas the main island, almost from end to end, was seething with internecine war, Kiūshiū remained beyond the pale of disturbance and enjoyed comparative tranquillity. At the time of Xavier's second sojourn in Yamaguchi, a Portuguese ship happened to be visiting Bungo, and at its master's suggestion the great missionary proceeded thither, with the intention of returning temporarily to the Indies. At Bungo there was then ruling Otomo, second in power to only the Satsuma chief among the feudatories of Kiūshiū. By him the Jesuit father was received with all honour. Xavier did not now neglect the lesson he had learned in Yamaguchi. He repaired to the Bungo chieftain's court, escorted by nearly the whole of the Portuguese crew, gorgeously bedizened, carrying their arms and with banners flying. Otomo, a young and ambitious ruler, was keenly anxious to attract foreign traders with their rich cargoes and puissant weapons of war. Witnessing the reverence paid to Xavier by the Portuguese traders, he appreciated the importance of gaining the goodwill of the Jesuits, and accordingly not only granted them full freedom to teach and preach, but also enjoined upon his younger brother, who, in the sequel of a sudden rebellion, had succeeded to the lordship of Yamaguchi, the advisability of extending protection to Torres and Fernandez, then sojourning there. After some four months' stay in Bungo, Xavier set sail for Goa in February 1552. Death overtook him in the last month of the same year.

Xavier's departure from Japan marked the conclusion of the first epoch of Christian propagandism. His sojourn in Japan extended to 27 months. In that time he and his coadjutors won about 760 converts. In Satsuma more than a year's labour produced 150 believers. There Xavier had the assistance of Anjiro to expound his doctrines. No language lends itself with greater difficulty than Japanese to the discussion of theological questions. The terms necessary for such a purpose are not current among laymen, and only by special study, which, it need scarcely be said, must be preluded by an accurate acquaintance with the tongue itself, can a man hope to become duly equipped for the task of exposition and dissertation. It is open to grave doubt whether any foreigner has ever attained the requisite proficiency. Leaving Anjiro in Kagoshima to care for the converts made there, Xavier pushed on to Hirado, where he baptized a hundred Japanese in a few days. Now we have it on the authority of Xavier himself that in this Hirado campaign "none of us knew Japanese." How then did they proceed? "By reciting a semi-Japanese volume" (a translation made by Anjiro of a treatise from Xavier's pen) "and by delivering sermons, we brought several over to the Christian cult." Sermons preached in Portuguese or Latin to a Japanese audience on the island of Hirado in the year 1550 can scarcely have attracted intelligent interest. On his first visit to Yamaguchi, Xavier's means of access to the understanding of his hearers was confined to the rudimentary knowledge of Japanese which Fernandez had been able to acquire in 14 months, a period of study which, in modern times, with all the aids now procurable, would not suffice to carry a student beyond the margin of the colloquial. No converts were won. The people of Yamaguchi probably admired the splendid faith and devotion of these over-sea philosophers, but as for their doctrine, it was unintelligible. In Kiōto the same experience was repeated, with an addition of much physical hardship. But when the Jesuits returned to Yamaguchi in the early autumn of 1551, they baptized 500 persons, including several members of the military class. Still Fernandez with his broken Japanese was the only medium for communicating the profound doctrines of Christianity. It must be concluded that the teachings of the missionaries produced much less effect than the attitude of the local chieftain.

Second Period of Christian Propagandism.

Only two missionaries, Torres and Fernandez, remained in Japan after the departure of Xavier, but they were soon joined by three others. These newcomers landed at Kagoshima and found that, in spite of the official veto against the adoption of Christianity, the feudal chief had lost nothing of his desire to foster foreign trade. Two years later, all the Jesuits in Japan were assembled in Bungo. Their only church stood there; and they had also built two hospitals. Local disturbances had compelled them to withdraw from Yamaguchi, not, however, before their violent disputes with the Buddhist priests in that town had induced the feudatory to proscribe the foreign religion, as had previously been done in Kagoshima. From Funai, the chief town of Bungo, the Jesuits began in 1579 to send yearly reports to their Generals in Rome. These reports, known as the *Annual Letters*, comprise some of the most valuable information available about the conditions then existing in Japan. They describe a state of abject poverty among the lower orders; poverty so cruel that the destruction of children by their famishing parents was an everyday occurrence, and in some instances choice had to be made between cannibalism and starvation. Such suffering becomes easily intelligible when the fact is recalled that Japan had been racked by civil war during more than 200 years, each feudal chief fighting for his own hand, to save or to extend his territorial possessions. From these *Annual Letters* it is possible also to gather a tolerably clear idea of the course of events during the years immediately subsequent to Xavier's departure. There was no break in the continuity of the newly inaugurated foreign trade. Portuguese ships visited Hirado as well as Bungo, and in those days their masters and crews not only attended scrupulously to their religious duties, but also showed such profound respect for the missionaries that the Japanese received constant object lessons in the influence wielded over the traders by the Jesuits. Thirty years later, this orderly and reverential demeanour was exchanged for riotous excesses such as had already made the Portuguese sailor a byword in China. But in the early days of intercourse with Japan the crews of the merchant vessels seem to have preached Christianity by their exemplary conduct. Just as Xavier had been induced to visit Bungo by the anxiety of a ship-captain for Christian ministrations, so in 1557 two of the fathers repaired to Hirado in obedience to the solicitations of Portuguese sailors. There the fathers, under the guidance of Vilela, sent brothers to parade the streets ringing bells and chaunting litanies; they organized bands of boys for the same purpose; they caused the converts, and even children, to flagellate themselves at a model of Mount Calvary, and they worked miracles, healing the sick by contact with scourges or with a booklet in which Xavier had written litanies and prayers. It may well be imagined that such doings attracted surprised attention in Japan. They were supplemented by even more striking practices. For a subfeudatory of the Hirado chief, having been converted, showed his zeal by destroying Buddhist temples and throwing down the idols, thus inaugurating a campaign of violence destined to mark the progress of Christianity throughout the greater part of its history in Japan. There followed the overthrowing of a cross in the Christian cemetery, the burning of a temple in the town of Hirado, and a street riot, the sequel being that the Jesuit fathers were compelled to return once more to Bungo. It is essential to follow all these events, for not otherwise can a clear understanding be reached as to the aspects under which Christianity presented itself originally to the Japanese. The Portuguese traders, reverent as was their demeanour towards Christianity, did not allow their commerce to be interrupted by vicissitudes of propagandism. They still repaired to Hirado, and rumours of the wealth-begetting effects of their presence having reached the neighbouring fief of Omura, its chief, Sumitada, made overtures to the Jesuits in Bungo, offering a port free from all dues for ten years, a large tract of land, a residence for the missionaries and other privileges. The Jesuits hastened to take advantage of this proposal, and no sooner did the news reach Hirado than the feudatory of that island repented of having expelled the fathers and invited them to return. But while they hesitated, a Portuguese vessel arrived at Hirado, and the feudal chief declared publicly that no need existed to conciliate the missionaries, since trade went on without them. When this became known in Bungo, Torres hastened to Hirado, was received with extraordinary honours by the crew of the vessel, and at his instance she left the port, her master declaring that "he could not remain in a country where they maltreated those who professed the same religion as himself." Hirado remained a closed port for some years, but ultimately the advent of three merchantmen, which intimated their determination not to put in unless the anti-Christian ban was removed, induced the feudal chief to receive the Jesuits once more. This incident was paralleled a few years later in the island of Amakusa, where a petty feudatory, in order to attract foreign trade, as the missionaries themselves frankly explain, embraced Christianity and ordered all his vassals to follow his example; but when no Portuguese ship appeared, he apostatized, required his subjects to revert to Buddhism and made the missionaries withdraw. In fact, the competition for the patronage of Portuguese traders was so keen that the Hirado feudatory attempted to burn several of their vessels because they frequented the territorial waters of his neighbour and rival, Sumitada. The latter became a most stalwart Christian when his wish was gratified. He set himself to eradicate idolatry throughout his fief with the strong arm, and his fierce intolerance provoked results which ended in the destruction of the Christian town at the newly opened free port. Sumitada, however, quickly reasserted his authority, and five years later (1567), he took a step which had far-reaching consequences, namely, the building of a church at Nagasaki, in order that Portuguese commerce might have a centre and the Christians an assured asylum. Nagasaki was then a little fishing village. In five years it grew to be a town of thirty thousand inhabitants, and Sumitada became one of the richest of the Kiūshiū feudatories. When in 1573 successful conflicts with the neighbouring fiefs brought him an access of territory, he declared that he owed these victories to the influence of the Christian God, and shortly afterwards he publicly proclaimed banishment for all who would not accept the foreign faith. There were then no Jesuits by his side, but immediately two hastened to join him, and "these, accompanied by a strong guard, but yet not without danger of their lives, went round causing the churches of the Gentiles, with their idols, to be thrown to the ground, while three Japanese Christians went preaching the law of God everywhere. Three of us who were in the neighbouring kingdoms all withdrew therefrom to work in this abundant harvest, and in the space of seven months twenty thousand persons were baptized, including the bonzes of about sixty monasteries, except a few who quitted the State." In Bungo, however, where the Jesuits were originally so well received, it is doubtful whether Christian propagandism would not have ended in failure but for an event which occurred in 1576, namely, the conversion of the chieftain's son, a youth of some 16 years. Two years later Otomo himself came over to the Christian faith. He rendered inestimable aid, not merely within his own fief, but also by the influence he exercised on others. His intervention, supported by recourse to arms, obtained for the Jesuits a footing on the island of Amakusa, where one of the feudatories gave his vassals the choice of conversion or exile, and announced to the Buddhist priests that unless they accepted Christianity their property would be confiscated and they themselves banished. Nearly the whole population of the fief did violence to their conscience for the sake of their homes. Christianity was then becoming established in Kiūshiū by methods similar to those of Islam and the inquisition. Another notable illustration is furnished by the story of the Arima fief, adjoining that of Sumitada (Omura), where such resolute means had been adopted to force Christianity upon the vassals. Moreover, the heads of the two fiefs were brothers. Accordingly, at the time of Sumitada's very dramatic conversion, the Jesuits were invited to Arima and encouraged to form settlements at the ports of Kuchinotsu and Shimabara, which thenceforth began to be frequented by Portuguese merchantmen. The fief naturally became involved in the turmoil resulting from Sumitada's iconoclastic methods of propagandism; but, in 1576, the then ruling feudatory, influenced largely by the object lesson of Sumitada's prosperity and puissance, which that chieftain openly ascribed to the tutelary aid of the Christian deity, accepted baptism and became the "Prince Andrew" of missionary records. It is written in those records that "the first thing Prince Andrew did after his baptism was to convert the chief temple of his capital into a church, its revenues being assigned for the maintenance of the building and the support of the missionaries. He then took measures to have the same thing done in the other towns of his fief, and he seconded the preachers of the gospel so well in everything else that he could flatter himself that he soon would not have one single idolater in his states." Thus in the two years that separated his baptism from his death, twenty thousand converts were won in Arima. But his successor was an enemy of the alien creed. He ordered the Jesuits to quit his dominions, required the converts to return to their ancestral faith, and caused "the holy places to be destroyed and the crosses to be thrown down." Nearly one-half of the converts apostatized under this pressure, but others had recourse to a device of proved potency. They threatened to leave Kuchinotsu *en masse*, and as that would have involved the loss of foreign trade, the hostile edict was materially modified. To this same weapon the Christians owed a still more signal victory. For just at that time the great ship from Macao, now an annual visitor, arrived in Japanese waters carrying the visitor-general, Valegnani. She put into Kuchinotsu, and her presence, with its suggested eventualities, gave such satisfaction that the feudatory offered to accept baptism and to sanction its acceptance by his vassals. This did not satisfy Valegnani, a man of profound political sagacity. He saw that the fief was menaced by serious dangers at the hands of its neighbours, and seizing the psychological moment of its extreme peril, he used the secular arm so adroitly that the fief's chance of survival seemed to be limited to the unreserved adoption of Christianity. Thus, in 1580, the chieftain and his wife were baptized; "all the city was made Christian; they burned their idols and destroyed 40 temples, reserving some materials to build churches."

Christian propagandism had now made substantial progress. The *Annual Letter* of 1582 recorded that at the close of 1581, thirty-two years after the landing of Xavier in Japan, there were about 150,000 converts, of whom some 125,000 were in Kiūshiū and the remainder in Yamaguchi, Kiōto and the neighbourhood of the latter city. The Jesuits in the empire then numbered 75, but down to the year 1563 there had never been more than 9, and down to 1577, not more than 18. The harvest was certainly great in proportion to the number of sowers. But it was a harvest mainly of artificial growth; forced by the despotic insistence of feudal chiefs who possessed the power of life and death over their vassals, and were influenced by a desire to attract foreign trade. To the Buddhist priests this movement of Christian propagandism had brought an experience hitherto unknown to them, persecution on account of creed. They had suffered for interfering in politics, but the fierce cruelty of the Christian fanatic now became known for the first time to men themselves conspicuous for tolerance of heresy and receptivity of instruction. They had had no previous experience of humanity in the garb of an Otomo of Bungo, who, in the words of Crasset, "went to the chase of the bonzes as to that of wild beasts, and made it his singular pleasure to exterminate them from his states."

First Japanese Embassy to Europe.

In 1582 the first Japanese envoys sailed from Nagasaki for Europe. The embassy consisted of four youths, the oldest not more than 16, representing the fiefs of Arima, Omura and Bungo. They visited Lisbon, Madrid and Rome, and in all these cities they were received with displays of magnificence such as 16th century Europe delighted to make. That, indeed, had been the motive of Valegnani in organizing the mission: he desired to let the Japanese see with their own eyes how great were the riches and might of Western states.

Second Visit of Jesuits to Kiōto.

In the above statistics of converts at the close of 1581 mention is made of Christians in Kiōto, though we have already seen that the visit by Xavier and Fernandez to that city was wholly barren of results. A second visit, however, made by Vilela in 1559, proved more successful. He carried letters of recommendation from the Bungo chieftain, and the proximate cause of his journey was an invitation from a Buddhist priest in the celebrated monastery of Hiei-zan, who sought information about Christianity. This was before the razing of temples and the overthrow of idols had commenced in Kiūshiū. On arrival at Hiei-zan, Vilela found that the Buddhist prior who had invited him was dead and that only a portion of the old man's authority had descended to his successor. Nevertheless the Jesuit obtained an opportunity to expound his doctrines to a party of bonzes at the monastery. Subsequently, through the good offices of a priest, described as "one of the most respected men in the city," and with the assistance of the Bungo feudatory's letter, Vilela enjoyed the rare honour of being received by the shōgun in Kiōto, who treated him with all consideration and assigned a house for his residence. It may be imagined that, owing such a debt of gratitude to Buddhist priests, Vilela would have behaved towards them and their creed with courtesy. But the Jesuit fathers were proof against all influences calculated to impair their stern sense of duty. Speaking through the mouth of a Japanese convert, Vilela attacked the bonzes in unmeasured terms and denounced their faith. Soon the bonzes, on their side, were seeking the destruction of these uncompromising assailants with insistence inferior only to that which the Jesuits themselves would have shown in similar circumstances. Against these perils Vilela was protected by the goodwill of the shōgun, who had already issued a decree threatening with death any one who injured the missionaries or obstructed their work. In spite of all difficulties and dangers these wonderful missionaries, whose courage, zeal and devotion are beyond all eulogy, toiled on resolutely and even recklessly, and such success attended their efforts that by 1564 many converts had been won and churches had been established in five walled towns within a distance of 50 miles from Kiōto. Among the converts were two Buddhist priests, notoriously hostile at the outset, who had been nominated as official commissioners to investigate and report upon the doctrine of Christianity. The first conversion *en masse* was due to pressure from above. A petty feudatory, Takayama, whose fief lay at Takatsuki in the neighbourhood of the capital, challenged Vilela to a public controversy, the result of which was that the Japanese acknowledged himself vanquished, embraced Christianity and invited his vassals as well as his family to follow his example. This man's son—Takayama Yūsho—proved one of the stanchest supporters of Christianity in all Japan, and has been immortalized by the Jesuits under the name of Don Justo Ucondono. Incidentally this event furnishes an index to the character of the Japanese samurai: he accepted the consequences of defeat as frankly as he dared it. In the same year (1564) the feudatory of Sawa, a brother of Takayama, became a Christian and imposed the faith on all his vassals, just as Sumitada and other feudal chiefs had done in Kiūshiū. But the Kiōto record differs from that of Kiūshiū in one important respect—the former is free from any intrusion of commercial motives.

Nobunaga and the Jesuits.

Kiōto was at that time the scene of sanguinary tumults, which culminated in the murder of the shōgun (1565), and led to the issue of a decree by the emperor proscribing Christianity. In Japanese medieval history this is one of the only two instances of Imperial interference with Christian propagandism. There is evidence that the edict was obtained at the instance of one of the shōgun's assassins and certain Buddhist priests. The Jesuits—their number had been increased to three—were obliged to take refuge in Sakai, now little more than a suburb of Osaka, but at that time a great and wealthy mart, and the only town in Japan which did not acknowledge the sway of any feudal chief. Three years later they were summoned thence to be presented to Oda Nobunaga, one of the greatest captains Japan has ever produced. In the very year of Xavier's landing at Kagoshima, Nobunaga had succeeded to his father's fief, a comparatively petty estate in the province of Owari. In 1568 he was seated in Kiōto, a maker of shōguns and acknowledged ruler of 30 among the 66 provinces of Japan. Had Nobunaga, wielding such immense power, adopted a hostile attitude towards Christianity, the fires lit by the Jesuits in Japan must soon have been extinguished. Nobunaga, however, to great breadth and liberality of view added strong animosity towards Buddhist priests. Many of the great monasteries had become armed camps, their inmates skilled equally in field-attacks and in the defence of ramparts. One sect (the Nichiren), which was specially affected by the samurai, had lent powerful aid to the murderers of the shōgun three years before Nobunaga's victories carried him to Kiōto, and the armed monasteries constituted *imperia in imperio* which assorted ill with his ambition of complete supremacy. He therefore welcomed Christianity for the sake of its opposition to Buddhism, and when Takayama conducted Froez from Sakai to Nobunaga's presence, the reception accorded to the Jesuit was of the most cordial character. Throughout the fourteen years of life that remained to him, Nobunaga continued to be the constant friend of the missionaries in particular and of foreigners visiting Japan in general. He stood between the Jesuits and the Throne when, in reply to an appeal from the Buddhist priests, the emperor, for the second time, issued an anti-Christian decree (1568); he granted a site for a church and residence at Azuchi on Lake Biwa, where his new fortress stood; he addressed to various powerful feudatories letters signifying a desire for the spread of Christianity; he frequently made handsome presents to the fathers, and whenever they visited him he showed a degree of accessibility and graciousness very foreign to his usually haughty and imperious demeanour. The Jesuits themselves said of him: "This man seems to have been chosen by God to open and prepare the way for our faith." Nevertheless they do not appear to have entertained much hope at any time of converting Nobunaga. They must have understood that their doctrines had not made any profound impression on a man who could treat them as this potentate did in 1579, when he plainly showed that political exigencies might at any moment induce him to sacrifice them.[1] His last act, too, proved that sacrilege was of no account in his eyes, for he took steps to have himself apotheosized at Azuchi with the utmost pomp and circumstance. Still nothing can obscure the benefits he heaped upon the propagandists of Christianity.

Hideyoshi and the Christians.

The terrible tumult of domestic war through which Japan passed in the 15th and 16th centuries brought to her service three of the greatest men ever produced in Occident or Orient. They were Oda Nobunaga, Toyotomi Hideyoshi and Tokugawa Iyeyasu. Hideyoshi, as Nobunaga's lieutenant, contributed largely to the building of the latter's fortunes, and, succeeding him in 1582, brought the whole 66 provinces of the empire under his own administrative sway. For the Jesuits now the absorbing question was, what attitude Hideyoshi would assume towards their propagandism. His power was virtually limitless. With a word he could have overthrown the whole edifice created by them at the cost of so much splendid effort and noble devotion. They were very quickly reassured. In this matter Hideyoshi walked in Nobunaga's footsteps. He not only accorded a friendly audience to Father Organtino, who waited on him as representative of the Jesuits, but also he went in person to assign to the company a site for a church and a residence in Osaka, where there was presently to rise the most massive fortress ever built in the East. At that time many Christian converts were serving in high positions, and in 1584 the Jesuits placed it on record that "Hideyoshi was not only not opposed to the things of God, but he even showed that he made much account of them and preferred them to all the sects of the bonzes. . . . He is entrusting to Christians his treasures, his secrets and his fortresses of most importance, and shows himself well pleased that the sons of the great lords about him should adopt our customs and our law." Two years later in Osaka he received with every mark of cordiality and favour a Jesuit mission which had come from Nagasaki seeking audience, and on that occasion his visitor recorded that he spoke of an intention of christianizing one half of Japan. Nor did Hideyoshi confine himself to words. He actually signed a patent licensing the missionaries to preach throughout all Japan, and exempting not only their houses and churches from the billeting of soldiers but also the priests themselves from local burdens. This was in 1586, on the eve of Hideyoshi's greatest military enterprise, the invasion of Kiūshiū and its complete reduction. He carried that difficult campaign to completion by the middle of 1587, and throughout its course he maintained a uniformly friendly demeanour towards the Jesuits. But suddenly, when on the return journey he reached Hakata in the north of the island, his policy underwent a radical metamorphosis. Five questions were by his order propounded to the vice-provincial of the Jesuits: "Why and by what authority he and his fellow-propagandists had constrained Japanese subjects to become Christians? Why they had induced their disciples and their sectaries to overthrow temples? Why they persecuted the bonzes? Why they and other Portuguese ate animals useful to men, such as oxen and cows? Why the vice-provincial allowed merchants of his nation to buy Japanese to make slaves of them in the Indies?" To these queries Coelho, the vice-provincial, made answer that the missionaries had never themselves resorted, or incited, to violence in their propagandism or persecuted bonzes; that if their eating of beef were considered inadvisable, they would give up the practice; and that they were powerless to prevent or restrain the outrages perpetrated by their countrymen. Hideyoshi read the vice-provincial's reply and, without comment, sent him word to retire to Hirado, assemble all his followers there, and quit the country within six months. On the next day (July 25, 1587) the following edict was published:—

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[1] The problem was to induce the co-operation of a feudatory whose castle served for frontier guard to the fief of a powerful chief, his suzerain. The feudatory was a Christian. Nobunaga seized the Jesuits in Kiōto, and threatened to suppress their religion altogether unless they persuaded the feudatory to abandon the cause of his suzerain.

> "Having learned from our faithful councillors that foreign priests have come into our estates, where they preach a law contrary to that of Japan, and that they even had the audacity to destroy temples dedicated to our Kami and Hotoke; although the outrage merits the most extreme punishment, wishing nevertheless to show them mercy, we order them under pain of death to quit Japan within twenty days. During that space no harm or hurt will be done to them. But at the expiration of that term, we order that if any of them be found in our states, they should be seized and punished as the greatest criminals. As for the Portuguese merchants, we permit them to enter our ports, there to continue their accustomed trade, and to remain in our states provided our affairs need this. But we forbid them to bring any foreign priests into the country, under the penalty of the confiscation of their ships and goods."

How are we to account for this apparently rapid change of mood on the part of Hideyoshi? Some historians insist that from the very outset he conceived the resolve of suppressing Christianity and expelling its propagandists, but that he concealed his design pending the subjugation of Kiūshiū, lest, by premature action, he might weaken his hand for that enterprise. This hypothesis rests mainly on conjecture. Its formulators found it easier to believe in a hidden purpose than to attribute to a statesman so shrewd and far-seeing a sudden change of mind. A more reasonable theory is that, shortly before leaving Osaka for Kiūshiū, Hideyoshi began to entertain doubts as to the expediency of tolerating Christian propagandism, and that his doubts were signally strengthened by direct observation of the state of affairs in Kiūshiū. While still in Osaka, he one day remarked publicly that "he feared much that all the virtue of the European priests served only to conceal pernicious designs against the empire." There had been no demolishing of temples or overthrowing of images at Christian instance in the metropolitan provinces. In Kiūshiū, however, very different conditions prevailed. There Christianity may be said to have been preached at the point of the sword. Temples and images had been destroyed wholesale; vassals in thousands had been compelled to embrace the foreign faith; and the missionaries themselves had come to be treated as demi-gods whose nod was worth conciliating at any cost of self-abasement. Brought into direct contact with these evidences of the growth of a new power, temporal as well as spiritual, Hideyoshi may well have reached the conclusion that a choice had to be finally made between his own supremacy and that of the alien creed, if not between the independence of Japan and the yoke of the great Christian states of Europe.

Sequel of the Edict of Banishment.

Hideyoshi gauged the character of the medieval Christians with sufficient accuracy to know that for the sake of their faith they would at any time defy the laws of the island. His estimate received immediate verification, for when the Jesuits, numbering 120, assembled at Hirado and received his order to embark at once they decided that only those should sail whose services were needed in China. The others remained and went about their duties as usual, under the protection of the converted feudatories. Hideyoshi, however, saw reason to wink at this disregard of his authority. At first he showed uncompromising resolution. All the churches in Kiōto, Osaka and Sakai were demolished, while troops were sent to raze the Christian places of worship in Kiūshiū and seize the port of Nagasaki. These troops were munificently dissuaded from their purpose by the Christian feudatories. But Hideyoshi did not protest, and in 1588 he allowed himself to be convinced by a Portuguese envoy that in the absence of missionaries foreign trade must cease, since without the intervention of the fathers peace and good order could not be maintained among the merchants. Rather than suffer the trade to be interrupted Hideyoshi agreed to the coming of priests, and thenceforth, during some years, Christianity not only continued to flourish and grow in Kiūshiū but also found a favourable field of operations in Kiōto itself. Care was taken that Hideyoshi's attention should not be attracted by any salient evidences of what he had called a "diabolical religion," and thus for a time all went well. There is evidence that, like the feudal chiefs in Kiūshiū, Hideyoshi set great store by foreign trade and would even have sacrificed to its maintenance and expansion something of the aversion he had conceived for Christianity. He did indeed make one very large concession. For on being assured that Portuguese traders could not frequent Japan unless they found Christian priests there to minister to them, he consented to sanction the presence of a limited number of Jesuits. The statistics of 1595 show how Christianity fared under even this partial tolerance, for there were then 137 Jesuits in Japan with 300,000 converts, among whom were 17 feudal chiefs, to say nothing of many men of lesser though still considerable note, and even not a few bonzes.

Hideyoshi's Final Attitude towards Christianity.

For ten years after his unlooked-for order of expulsion, Hideyoshi preserved a tolerant mien. But in 1597 his forbearance gave place to a mood of uncompromising severity. The reasons of this second change are very clear, though diverse accounts have been transmitted. Up to 1593 the Portuguese had possessed a monopoly of religious propagandism and over-sea commerce in Japan. The privilege was secured to them by agreement between Spain and Portugal and by a papal bull. But the Spaniards in Manila had long looked with somewhat jealous eyes on this Jesuit reservation, and when news of the disaster of 1587 reached the Philippines, the Dominicans and Franciscans residing there were fired with zeal to enter an arena where the crown of martyrdom seemed to be the least reward within reach. The papal bull, however, demanded obedience, and to overcome that difficulty a ruse was necessary: the governor of Manila agreed to send a party of Franciscans as ambassadors to Hideyoshi. In that guise the friars, being neither traders nor propagandists, considered that they did not violate either the treaty or the bull. It was a technical subterfuge very unworthy of the object contemplated, and the friars supplemented it by swearing to Hideyoshi that the Philippines would submit to his sway. Thus they obtained permission to visit Kiōto, Osaka and Fushimi, but with the explicit proviso that they must not preach. Very soon they had built a church in Kiōto, consecrated it with the utmost pomp, and were preaching sermons and chaunting litanies there in flagrant defiance of Hideyoshi's veto. Presently their number received an access of three friars who came bearing gifts from the governor at Manila, and now they not only established a convent in Osaka, but also seized a Jesuit church in Nagasaki and converted the circumspect worship hitherto conducted there by the fathers into services of the most public character. Officially checked in Nagasaki, they charged the Jesuits in Kiōto with having intrigued to impede them, and they further vaunted the courageous openness of their own ministrations as compared with the clandestine timidity of the methods which wise prudence had induced the Jesuits to adopt. Retribution would have followed quickly had not Hideyoshi's attention been engrossed by an attempt to invade China through Korea. At this stage, however, a memorable incident occurred. Driven out of her course by a storm, a great and richly laden Spanish galleon, bound for Acapulco from Manila, drifted to the coast of Tosa province, and running—or being purposely run—on a sand-bank as she was being towed into port by Japanese boats, broke her back. She carried goods to the value of some 600,000 crowns, and certain officials urged Hideyoshi to confiscate her as derelict, conveying to him at the same time a detailed account of the doings of the Franciscans and their open flouting of his orders. Hideyoshi, much incensed, commanded the arrest of the Franciscans and despatched officers to Tosa to confiscate the "San Felipe." The pilot of the galleon sought to intimidate these officers by showing them on a map of the world the vast extent of Spain's dominions, and being asked how one country had acquired such extended sway, replied: "Our kings begin by sending into the countries they wish to conquer missionaries who induce the people to embrace our religion, and when they have made considerable progress, troops are sent who combine with the new Christians, and then our kings have not much trouble in accomplishing the rest."

The First Execution of Christians.

On learning of this speech Hideyoshi was overcome with fury. He condemned the Franciscans to have their noses and ears cut off, to be promenaded through Kiōto, Osaka and Sakai, and to be crucified at Nagasaki. "I have ordered these foreigners to be treated thus, because they have come from the Philippines to Japan, calling themselves ambassadors, although they were not so; because they have remained here far too long without my permission; because, in defiance of my prohibition, they have built churches, preached their religion and caused disorders." Twenty-six suffered under this sentence—six Franciscans, three Japanese Jesuits and seventeen native Christians, chiefly domestic servants of the Franciscans.[1] They met their fate with noble fortitude. Hideyoshi further issued a special injunction against the adoption of Christianity by a feudal chief; and took steps to give practical effect to his expulsion edict of 1587. The governor of Nagasaki received instructions to send away all the Jesuits, permitting only two or three to remain for the service of the Portuguese merchants. But the Jesuits were not the kind of men who, to escape personal peril, turn their back upon an unaccomplished work of grace. There were 125 of them in Japan at that time. In October 1597 a junk sailed out of Nagasaki harbour, her decks crowded with seeming Jesuits. In reality she carried 11 of the company, the apparent Jesuits being disguised sailors. It is not to be supposed that such a manœuvre could be hidden from the local authorities. They winked at it, until rumour became insistent that Hideyoshi was about to visit Kiūshiū in person, and all Japanese in administrative posts knew how Hideyoshi visited disobedience and how hopeless was any attempt to deceive him. Therefore, early in 1598, really drastic steps were taken. Churches to the number of 137 were demolished in Kiūshiū, seminaries and residences fell, and the governor of Nagasaki assembled there all the fathers of the company for deportation to Macao by the great ship in the following year. But while they waited, Hideyoshi died. It is not on record that the Jesuits openly declared his removal from the earth to have been a special dispensation in their favour. But they pronounced him an execrable tyrant and consigned his "soul to hell for all eternity." Yet no impartial reader of history can pretend to think that a 16th-century Jesuit general in Hideyoshi's place would have shown towards an alien creed and its propagandists even a small measure of the tolerance exercised by the Japanese statesman towards Christianity and the Jesuits.

Foreign Policy of the Tokugawa Rulers.

Hideyoshi's death occurred in 1598. Two years later, his authority as administrative ruler of all Japan had passed into the hands of Iyeyasu, the Tokugawa chief, and thirty-nine years later the Tokugawa potentates had not only exterminated Christianity in Japan but had also condemned their country to a period of international isolation which continued unbroken until 1853, an interval of 214 years. It has been shown that even when they were most incensed against Christianity, Japanese administrators sought to foster and preserve foreign trade. Why then did they close the country's doors to the outside world and suspend a commerce once so much esteemed? To answer that question some retrospect is needed. Certain historians allege that from the outset Iyeyasu shared Hideyoshi's misgivings about the real designs of Christian potentates and Christian propagandists. But that verdict is not supported by facts. The first occasion of the Tokugawa chief's recorded contact with a Christian propagandist was less than three months after Hideyoshi's death. There was then led into his presence a Franciscan, by name Jerome de Jesus, originally a member of the fictitious embassy from Manila. This man's conduct constitutes an example of the invincible zeal and courage inspiring a Christian priest in those days. Barely escaping the doom of crucifixion which overtook his companions, he had been deported from Japan to Manila at a time when death seemed to be the certain penalty of remaining. But no sooner had he been landed at Manila than he took passage in a Chinese junk, and, returning to Nagasaki, made his way secretly from the far south of Japan to the province of Kii. There arrested, he was brought into the presence of Iyeyasu, and his own record of what ensued is given in a letter subsequently sent to Manila:—

> "When the Prince saw me he asked how I had managed to escape the previous persecution. I answered him that at that date God had delivered me in order that I might go to Manila and bring back new colleagues from there—preachers of the divine law—and that I had returned from Manila to encourage the Christians, cherishing the desire to die on the cross in order to go to enjoy eternal glory like my former colleagues. On hearing these words the Emperor began to smile, whether in his quality of a pagan of the sect of Shaka, which teaches that there is no future life, or whether from the thought that I was frightened at having to be put to death. Then, looking at me kindly, he said, 'Be no longer afraid and no longer conceal yourself, and no longer change your habit, for I wish you well; and as for the Christians who every year pass within sight of the Kwantō where my domains are, when they go to Mexico with their ships, I have a keen desire for them to visit the harbours of this island, to refresh themselves there, and to take what they wish, to trade with my vassals and to teach them how to develop silver mines; and that my intentions may be accomplished before my death, I wish you to indicate to me the means to take to realize them.' I answered that it was necessary that Spanish pilots should take the soundings of his harbours, so that ships might not be lost in future as the 'San Felipe' had been, and that he should solicit this service from the governor of the Philippines. The Prince approved of my advice, and accordingly he has sent a Japanese gentleman, a native of Sakai, the bearer of this message. . . . It is essential to oppose no obstacle to the complete liberty offered by the Emperor to the Spaniards and to our holy order, for the preaching of the holy gospel. . . . The same Prince (who is about to visit the Kwantō) invites me to accompany him to make choice of a house, and to visit the harbour which he promises to open to us; his desires in this respect are keener than I can express."

The above version of the Tokugawa chief's mood is confirmed by events, for not only did he allow the contumelious Franciscan to build a church—the first—in Yedo and to celebrate Mass there, but also he sent three embassies to the Philippines, proposing reciprocal freedom of commerce, offering to open ports in the Kwantō and asking for competent naval architects. He never obtained the architects, and though the trade came, its volume was small in comparison with the abundance of friars that accompanied it. There is just a possibility that Iyeyasu saw in these Spanish monks an instrument of counteracting the influence of the Jesuits, for he must have known that the Franciscans opened their mission in Yedo by "declaiming with violence against the fathers of the company of Jesus." In short, the Spanish monks assumed towards the Jesuits in Japan the same intolerant and abusive tone that the Jesuits themselves had previously assumed towards Buddhism.

At that time there appeared upon the scene another factor destined greatly to complicate events. It was a Dutch merchant ship, the "Liefde." Until the Netherlands revolted from Spain, the Dutch had been the principal distributors of all goods arriving at Lisbon from the Far East; but in 1594 Philip II. closed the port of Lisbon to these rebels, and the Dutch met the situation by turning their prows to the Orient to invade the sources of Portuguese commerce. One of the first expeditions despatched for that purpose set out in 1598, and of the five vessels composing it one only was ever heard of again. This was the "Liefde." She reached Japan during the spring of 1600, with only four-and-twenty alive out of her original crew of 110. Towed into the harbour at Funai, the "Liefde" was visited by Jesuits, who, on discovering her nationality, denounced her to the local authorities as a pirate and endeavoured to incense the Japanese against them. The "Liefde" had on board in the capacity of "pilot major" an Englishman, Will Adams of Gillingham in Kent, whom Iyeyasu summoned to Osaka, where there commenced between the rough British sailor and the Tokugawa chief a curiously friendly intercourse which was not interrupted until the death of Adams twenty years later. The Englishman became master ship-builder to the Yedo government; was employed as diplomatic agent when other traders from his own country and from Holland arrived in Japan, received in perpetual gift a substantial estate, and from first to last possessed the implicit confidence of the shōgun. Iyeyasu quickly discerned the man's honesty, perceived that whatever benefits foreign commerce might confer would be increased by encouraging competition among the foreigners, and realized that English and Dutch trade presented the wholesome feature of complete dissociation from religious propagandism. On the other hand, he showed no intolerance to either Spaniards or Portuguese. He issued (1601) two official patents sanctioning the residence of the fathers in Kiōto, Osaka and Nagasaki; he employed Father Rodriguez as interpreter to the court at Yedo; and in 1603 he gave munificent succour to the Jesuits who were reduced to dire straits owing to the capture of the great ship from Macao by the Dutch and the consequent loss of several years' supplies for the mission in Japan.

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[1] The mutilation was confined to the lobe of one ear. Crucifixion, according to the Japanese method, consisted in tying to a cross and piercing the heart with two sharp spears driven from either side. Death was always instantaneous.

It is thus seen that each of the great trio of Japan's 16th-century statesmen—Nobunaga, Hideyoshi and Iyeyasu—adopted at the outset a most tolerant demeanour towards Christianity. The reasons of Hideyoshi's change of mood have been set forth. We have now to examine the reasons that produced a similar metamorphosis in the case of Iyeyasu. Two causes present themselves immediately. The first is that, while tolerating Christianity, Iyeyasu did not approve of it as a creed; the second, that he himself, whether from state policy or genuine piety, strongly encouraged Buddhism. Proof of the former proposition is found in an order issued by him in 1602 to insure the safety of foreign merchantmen entering Japanese ports: it concluded with the reservation, "but we rigorously forbid them" (foreigners coming in such ships) "to promulgate their faith." Proof of the latter is furnished by the facts that he invariably carried about with him a miniature Buddhist image, which he regarded as his tutelary deity, and that he fostered the creed of Shaka as zealously as Oda Nobunaga had suppressed it. There is much difficulty in tracing the exact sequence of events which gradually educated a strong antipathy to the Christian faith in the mind of the Tokugawa chief. He must have been influenced in some degree by the views of his great predecessor, Hideyoshi. But he did not accept those views implicitly. At the end of the 16th century he sent a trusted emissary to Europe for the purpose of directly observing the conditions in the home of Christianity, and this man, the better to achieve his aim, embraced the foreign faith, and studied it from within as well as from without. The story that he had to tell on his return could not fail to shock the ruler of a country where freedom of conscience had existed from time immemorial. It was a story of the inquisition and of the stake; of unlimited aggression in the name of the cross; of the pope's overlordship which entitled him to confiscate the realm of heretical sovereigns; of religious wars and of wellnigh incredible fanaticism. Iyeyasu must have received an evil impression while he listened to his emissary's statements. Under his own eyes, too, were abundant evidences of the spirit of strife that Christian dogma engendered in those times. From the moment when the Franciscans and Dominicans arrived in Japan, a fierce quarrel began between them and the Jesuits; a quarrel which even community of suffering could not compose. Not less repellent was an attempt on the part of the Spaniards to dictate to Iyeyasu the expulsion of all Hollanders from Japan, and on the part of the Jesuits to dictate the expulsion of the Spaniards. The former proposal, couched almost in the form of a demand, was twice formulated, and accompanied on the second occasion by a scarcely less insulting offer, namely, that Spanish men-of-war would be sent to Japan to burn all Dutch ships found in the ports of the empire. If in the face of proposals so contumelious of his sovereign authority Iyeyasu preserved a calm and dignified mien, merely replying that his country was open to all comers, and that, if other nations had quarrels among themselves, they must not take Japan for battle-ground, it is nevertheless unimaginable that he did not strongly resent such interference with his own independent foreign policy, and that he did not interpret it as foreshadowing a disturbance of the realm's peace by sectarian quarrels among Christians. These experiences, predisposing Iyeyasu to dislike Christianity as a creed and to distrust it as a political influence, were soon supplemented by incidents of an immediately determinative character. The first was an act of fraud and forgery committed in the interests of a Christian feudatory by a trusted official, himself a Christian. Thereupon Iyeyasu, conceiving it unsafe that Christians should fill offices at his court, dismissed all those so employed, banished them from Yedo and forbade any feudal chief to harbour them. The second incident was an attempted survey of the coast of Japan by a Spanish mariner and a Franciscan friar. Permission to take this step had been obtained by an envoy from New Spain, but no deep consideration of reasons seems to have preluded the permission on Japan's side, and when the mariner (Sebastian) and the friar (Sotelo) hastened to carry out the project, Iyeyasu asked Will Adams to explain this display of industry. The Englishman replied that such a proceeding would be regarded in Europe as an act of hostility, especially on the part of the Spaniards or Portuguese, whose aggressions were notorious. He added, in reply to further questions, that "the Roman priesthood had been expelled from many parts of Germany, from Sweden, Norway, Denmark, Holland and England, and that although his own country preserved the pure form of the Christian faith from which Spain and Portugal had deviated, yet neither English nor Dutch considered that that fact afforded them any reason to war with, or to annex, States which were not Christian solely for the reason that they were non-Christian." Iyeyasu reposed entire confidence in Adams. Hearing the Englishman's testimony, he is said to have exclaimed, "If the sovereigns of Europe do not tolerate these priests, I do them no wrong if I refuse to tolerate them." Japanese historians add that Iyeyasu discovered a conspiracy on the part of some Japanese Christians to overthrow his government by the aid of foreign troops. It was not a widely ramified plot, but it lent additional importance to the fact that the sympathy of the fathers and their converts was plainly with the only magnate in the empire who continued to dispute the Tokugawa supremacy, Hideyori, the son of Hideyoshi. Nevertheless Iyeyasu shrank from proceeding to extremities in the case of any foreign priest, and this attitude he maintained until his death (1616). Possibly he might have been not less tolerant towards native Christians also had not the Tokugawa authority been openly defied by a Franciscan father—the Sotelo mentioned above—in Yedo itself. Then (1613) the first execution of Japanese converts took place, though the monk himself was released after a short incarceration. At that time, as is still the case even in these more enlightened days, insignificant differences of custom sometimes induced serious misconceptions. A Christian who had violated the secular law was crucified in Nagasaki. Many of his fellow-believers kneeled around his cross and prayed for the peace of his soul. A party of converts were afterwards burned to death in the same place for refusing to apostatize, and their Christian friends crowded to carry off portions of their bodies as holy relics. When these things were reported to Iyeyasu, he said, "Without doubt that must be a diabolic faith which persuades people not only to worship criminals condemned to death for their crimes, but also to honour those who have been burned or cut in pieces by the order of their lord" (feudal chief).

Suppression of Christianity.

The fateful edict ordering that all foreign priests should be collected in Nagasaki preparatory to removal from Japan, that all churches should be demolished, and that the converts should be compelled to abjure Christianity, was issued on the 27th of January 1614. There were then in Japan 122 Jesuits, 14 Franciscans, 9 Dominicans, 4 Augustins and 7 secular priests. Had these men obeyed the orders of the Japanese authorities by leaving the country finally, not one foreigner would have suffered for his faith in Japan, except the 6 Franciscans executed at Nagasaki by order of Hideyoshi in 1597. But suffering and death counted for nothing with the missionaries as against the possibility of winning or keeping even one convert. Forty-seven of them evaded the edict, some by concealing themselves at the time of its issue, the rest by leaving their ships when the latter had passed out of sight of the shore of Japan, and returning by boats to the scene of their former labours. Moreover, in a few months, those that had actually crossed the sea re-crossed it in various disguises, and soon the Japanese government had to consider whether it would suffer its authority to be thus flouted or resort to extreme measures.

During two years immediately following the issue of the anti-Christian decree, the attention of the Tokugawa chief and indeed of all Japan was concentrated on the closing episode of the great struggle which assured to Iyeyasu final supremacy as administrative ruler of the empire. That episode was a terrible battle under the walls of Osaka castle between the adherents of the Tokugawa and the supporters of Hideyori. In this struggle fresh fuel was added to the fire of anti-Christian resentment, for many Christian converts threw in their lot with Hideyori, and in one part of the field the Tokugawa troops found themselves fighting against a foe whose banners were emblazoned with the cross and with images of the Saviour and St James, the patron saint of Spain. But the Christians had protectors. Many of the feudatories showed themselves strongly averse from inflicting the extreme penalty on men and women whose adoption of an alien religion had been partly forced by the feudatories themselves. As for the people at large, their liberal spirit is attested by the fact that five fathers who were in Osaka castle at the time of its capture made their way to distant refuges without encountering any risk of betrayal. During these events the death of Iyeyasu took place (June 1, 1616), and pending the dedication of his mausoleum the anti-Christian crusade was virtually suspended.

In September 1616 a new anti-Christian edict was promulgated by Hidetada, son and successor of Iyeyasu. It pronounced sentence of exile against all Christian priests, including even those whose presence had been sanctioned for ministering to the Portuguese merchants: it forbade the Japanese, under the penalty of being burned alive and of having all their property confiscated, to have any connexion with the ministers of religion or to give them hospitality. It was forbidden to any prince or lord to keep Christians in his service or even on his estates, and the edict was promulgated with more than usual solemnity, though its enforcement was deferred until the next year on account of the obsequies of Iyeyasu. This edict of 1616 differed from that issued by Iyeyasu in 1614, since the latter did not prescribe the death penalty for converts refusing to apostatize. But both agreed in indicating expulsion as the sole manner of dealing with the foreign priests. As for the shōgun and his advisers, it is reasonable to assume that they did not anticipate much necessity for recourse to violence. They must have known that a great majority of the converts had joined the Christian church at the instance or by the command of their local rulers, and nothing can have seemed less likely than that a creed thus lightly embraced would be adhered to in defiance of torture and death. It is moreover morally certain that had the foreign propagandists obeyed the Government's edict and left the country, not one would have been put to death. They suffered because they defied the laws of the land. Some fifty missionaries happened to be in Nagasaki when Hidetada's edict was issued. A number of these were apprehended and deported, but several of them returned almost immediately. This happened under the jurisdiction of Omura, who had been specially charged with the duty of sending away the *bateren* (*padres*). He appears to have concluded that a striking example must be furnished, and he therefore ordered the seizure and decapitation of two fathers, De l' Assumpcion and Machado. The result completely falsified his calculations, and presaged the cruel struggle now destined to begin.

> The bodies, placed in different coffins, were interred in the same grave. Guards were placed over it, but the concourse was immense. The sick were carried to the sepulchre to be restored to health. The Christians found new strength in this martyrdom; the pagans themselves were full of admiration for it. Numerous conversions and numerous returns of apostates took place everywhere.

In the midst of all this, Navarette, the vice-provincial of the Dominicans, and Ayala, the vice-provincial of the Augustins, came out of their retreat, and in full priestly garb started upon an open propaganda. The two fanatics—for so even Charlevoix considers them to have been—were secretly conveyed to the island Takashima and there decapitated, while their coffins were weighted with big stones and sunk in the sea. Even more directly defiant was the attitude of the next martyred priest, an old Franciscan monk, Juan de Santa Martha. He had for three years suffered all the horrors of a medieval Japanese prison, when it was proposed to release him and deport him to New Spain. His answer was that, if released, he would stay in Japan and preach there. He laid his head on the block in August 1618. But from that time until 1622 no other foreign missionary suffered capital punishment in Japan, though many of them arrived in the country and continued their propagandism there. During that interval, also, there occurred another incident eminently calculated to fix upon the Christians still deeper suspicion of political designs. In a Portuguese ship captured by the Dutch a letter was found instigating the Japanese converts to revolt, and promising that, when the number of these disaffected Christians was sufficient, men-of-war would be sent to aid them. Not the least potent of the influences operating against the Christians was that pamphlets were written by apostates attributing the zeal of the foreign propagandists solely to political motives. Yet another indictment of Spanish and Portuguese propagandists was contained in a despatch addressed to Hidetada in 1620 by the admiral in command of the British and Dutch fleet then cruising in Far-Eastern waters. In that document the friars were flatly accused of treacherous practices, and the Japanese ruler was warned against the aggressive designs of Philip of Spain. In the face of all this evidence the Japanese ceased to hesitate, and a time of terror ensued for the fathers and their converts. The measures adopted towards the missionaries gradually increased in severity. In 1617 the first two fathers put to death (De l' Assumpcion and Machado) were beheaded, "not by the common executioner, but by one of the first officers of the prince." Subsequently Navarette and Ayala were decapitated by the executioner. Then, in 1618, Juan de Santa Martha was executed like a common criminal, his body being dismembered and his head exposed. Finally, in 1622, Zuñiga and Flores were burnt alive. The same year was marked by the "great martyrdom" at Nagasaki when 9 foreign priests went to the stake with 19 Japanese converts. The shōgun seems to have been now labouring under vivid fear of a foreign invasion. An emissary sent by him to Europe had returned on the eve of the "great martyrdom" after seven years abroad, and had made a report more than ever unfavourable to Christianity. Therefore Hidetada deemed it necessary to refuse audience to a Philippine embassy in 1624 and to deport all Spaniards from Japan. Further, it was decreed that no Japanese Christian should thenceforth be suffered to go abroad for commerce, and that though non-Christians or men who had apostatized might travel freely, they must not visit the Philippines. Thus ended all intercourse between Japan and Spain. It had continued for 32 years and had engendered a widespread conviction that Christianity was an instrument of Spanish aggression.

Iyemitsu, son of Hidetada, now ruled in Yedo, though Hidetada himself remained the power behind the throne. The year (1623) of the former's accession to power had been marked by the re-issue of anti-Christian decrees, and by the martyrdom of some 500 Christians within the Tokugawa domains, whither the tide of persecution now flowed for the first time. Thenceforth the campaign was continuous. The men most active and most relentless in carrying on the persecution were Mizuno and Takenaka, governors of Nagasaki, and Matsukura, feudatory of Shimabara. By the latter were invented the punishment of throwing converts into the solfataras at Unzen and the torture of the *fosse*, which consisted in suspension by the feet, head downwards, in a pit until blood oozed from the mouth, nose and ears. Many endured this latter torture for days, until death came to their relief, but a few—notably the Jesuit provincial Ferreyra—apostatized. Matsukura and Takenaka were so strongly obsessed by the Spanish menace that they contemplated the conquest of the Philippines in order to deprive the Spaniards of a Far-Eastern base. But timid counsels then prevailed in Yedo, where the spirit of a Nobunaga, a Hideyoshi or an Iyeyasu no longer presided. Of course the measures of repression grew in severity as the fortitude of the Christians became more obdurate. It is not possible to state the exact number of victims. Some historians say that, down to 1635, no fewer than 280,000 were punished, but that figure is probably exaggerated, for the most trustworthy records indicate that the converts never aggregated more than 300,000, and many of these, if not a great majority, having accepted the foreign faith very lightly, doubtless discarded it readily under menace of destruction. Every opportunity was given for apostatizing and for escaping death. Immunity could be secured by pointing out a fellow-convert, and when it is observed that among the seven or eight feudatories who embraced Christianity only two or three died in that faith, we must conclude that not a few cases of recanting occurred among the commoners. Remarkable fortitude, however, is said to have been displayed. If the converts were intrepid their teachers showed no less courage. Again and again the latter defied the Japanese authorities by coming to the country or returning thither after having been deported. Ignoring the orders of the governors of Macao and Manila and even of the king of Spain himself, they arrived, year after year, to be certainly apprehended and sent to the stake after brief periods of propagandism. In 1626 they actually baptized over 3000 converts. Large rewards were paid to anyone denouncing a propagandist, and as for the people, they had to trample upon a picture of Christ in order to prove that they were not Christians.

Meanwhile the feuds between the Dutch, the Spaniards and the Portuguese never ceased. In 1636, the Dutch found on a captured Portuguese vessel a report of the governor of Macao describing a two days' festival which had been held there in honour of Vieyra, the vice-provincial whose martyrdom had just taken place in Japan. This report the Dutch handed to the Japanese authorities "in order that his majesty may see more clearly what great honour the Portuguese pay to those he has forbidden his realm as traitors to the state and to his crown." Probably the accusation added little to the resentment and distrust already harboured by the Japanese against the Portuguese. At all events the Yedo government took no step distinctly hostile to Portuguese laymen until 1637, when an edict was issued forbidding any foreigners to travel in the empire, lest Portuguese with passports bearing Dutch names might enter it. This was the beginning of the end. In the last month of 1637 a rebellion broke out, commonly called the "Christian revolt of Shimabara," which sealed the fate of Japan's foreign intercourse for over 200 years.

The Shimabara Revolt.

The promontory of Shimabara and the island of Amakusa enclose the gulf of Nagasaki on the west. Among all the fiefs in Japan, Shimabara and Amakusa had been the two most thoroughly christianized in the early years of Jesuit propagandism. Hence in later days they were naturally the scene of the severest persecutions. Still the people would probably have suffered in silence had they not been taxed beyond all endurance to supply funds for an extravagant chief who employed savage methods of extortion. Japanese annals, however, relegate the taxation grievance to an altogether secondary place, and attribute the revolt solely to the instigation of five samurai who led a roving life to avoid persecution for their adherence to Christianity. Whichever version be correct, it is certain that the outbreak ultimately attracted all the Christians from the surrounding regions, and was regarded by the authorities as in effect a Christian rising. The Amakusa insurgents passed over to Shimabara, and on the 27th of January 1638 the whole body—numbering, according to some authorities, 20,000 fighting men with 17,000 women and children; according to others, little more than one-half of these figures—took possession of the dilapidated castle of Hara, which stood on a plateau with three sides descending perpendicularly to the sea, a hundred feet beneath, and with a swamp on its fourth front. There the insurgents, who fought under flags with red crosses and whose battle cries were "Jesus," "Maria" and "St Iago," successfully maintained themselves against the repeated assaults of strong forces until the 12th of April, when, their ammunition and their provisions alike exhausted, they were overwhelmed and put to the sword, with the exception of 105 prisoners. During the siege the Dutch were enabled to furnish a vivid proof of enmity to the Christianity of the Spaniards and the Portuguese. For the guns in possession of the besiegers being too light to accomplish anything, Koeckebacker, the factor at Hirado, was invited to send ships carrying heavier metal. He replied with the "de Ryp" of 20 guns, which threw 426 shot into the castle in 15 days. Probably the great bulk of the remaining Japanese Christians perished at the massacre of Hara. Thenceforth there were few martyrs.[1]

Foreign Trade in the 17th Century.

It has been clearly shown that Nobunaga, Hideyoshi and Iyeyasu were all in favour of foreign intercourse and trade, and that the Tokugawa chief, even more than his predecessor Hideyoshi, made strenuous efforts to differentiate between Christianity and commerce, so that the latter might not be involved in the former's fate. In fact the three objects which Iyeyasu desired most earnestly to compass were the development of foreign commerce, the acquisition of a mercantile marine and the exploitation of Japan's mines. He offered the Spaniards, Portuguese, English and Dutch a site for a settlement in Yedo, and had they accepted the offer the country might never have been closed. In his time Japan was virtually a free-trade country. Importers had not to pay any duties. It was expected, however, that they should make presents to the feudatory into whose port they carried their goods, and these presents were often very valuable. Naturally the Tokugawa chief desired to attract such a source of wealth to his own domains. He sent more than one envoy to Manila to urge the opening of commerce direct with the regions about Yedo, and to ask the Spaniards for competent naval architects. Perhaps the truest exposition of his attitude is given in a law enacted in 1602:—

> "If any foreign vessel by stress of weather is obliged to touch at any principality or to put into any harbour of Japan, we order that, whoever these foreigners may be, absolutely nothing whatever that belongs to them or that they may have brought in their ship, shall be taken from them. Likewise we rigorously prohibit the use of any violence in the purchase or the sale of any of the commodities brought by their ship, and if it is not convenient for the merchants of the ship to remain in the port they have entered, they may pass to any other port that may suit them, and therein buy and sell in full freedom. Likewise we order in a general manner that foreigners may freely reside in any part of Japan they choose, but we rigorously forbid them to promulgate their faith."

It was in that mood that he granted (1605) a licence to the Dutch to trade in Japan, his expectation doubtless being that the ships which they promised to send every year would make their dépôt at Uraga or in some other place near Yedo. But things were ordered differently. The first Hollanders that set foot in Japan were the survivors of the wrecked "Liefde." Thrown into prison for a time, they were approached by emissaries from the feudatory of Hirado, who engaged some of them to teach the art of casting guns and the science of gunnery to his vassals, and when two of them were allowed to leave Japan, he furnished them with the means of doing so, at the same time making promises which invested Hirado with attractions as a port of trade, though it was then and always remained an insignificant fishing village. The Dutch possessed precisely the qualifications suited to the situation then existing in Japan: they had commercial potentialities without any religious associations. Fully appreciating that fact, the shrewd feudatory of Hirado laid himself out to entice the Dutchmen to his fief, and he succeeded. Shortly afterwards, an incident occurred which clearly betrayed the strength of the Tokugawa chief's desire to exploit Japan's mines. The governor-general of the Philippines (Don Rodrigo Vivero y Velasco), his ship being cast away on the Japanese coast on a voyage to Acapulco, was received by Iyeyasu, and in response to the latter's request for fifty miners, the Spaniard formulated terms to which Iyeyasu actually agreed: that half the produce of the mines should go to the miners; that the other half should be divided between Iyeyasu and the king of Spain; that the latter might send commissioners to Japan to look after his mining interests, and that these commissioners might be accompanied by priests who would be entitled to have public churches for holding services. This was in 1609, when the Tokugawa chief had again and again imposed the strictest veto on Christian propagandism. There can be little doubt that he understood the concession made to Don Rodrigo in the sense of Hideyoshi's mandate to the Jesuits in Nagasaki, namely, that a sufficient number might remain to minister to the Portuguese traders frequenting the port. Iyeyasu had confidence in himself and in his countrymen. He knew that emergencies could be dealt with when they arose and he sacrificed nothing to timidity. But his courageous policy died with him and the miners did not come. Neither did the Spaniards ever devote any successful efforts to establishing trade with Japan. Their vessels paid fitful visits to Uraga, but the Portuguese continued to monopolize the commerce.

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[1] See *A History of Christianity in Japan* (1910), by Otis Cary.

Opening of Dutch and English Trade.

In 1611 a Dutch merchantman (the "Brach") reached Hirado with a cargo of pepper, cloth, ivory, silk and lead. She carried two envoys, Spex and Segerszoon, and in the very face of a Spanish embassy which had just arrived from Manila expressly for the purpose of "settling the matter regarding the Hollanders," the Dutchmen obtained a liberal patent from Iyeyasu. Twelve years previously, the merchants of London, stimulated generally by the success of the Dutch in trade with the East, and specially by the fact that "these Hollanders had raised the price of pepper against us from 3 shillings per pound to 6 shillings and 8 shillings," organized the East India Company which immediately began to send ships eastward. Of course the news that the Dutch were about to establish a trading station in Japan reached London speedily, and the East India Company lost no time in ordering one of their vessels, the "Clove," under Captain Saris, to proceed to the Far-Eastern islands. She carried a quantity of pepper, and on the voyage she endeavoured to procure some spices at the Moluccas. But the Dutch would not suffer any poaching on their valuable monopoly. The "Clove" entered Hirado on the 11th of June 1613. Saris seems to have been a man self-opinionated, of shallow judgment and suspicious. Though strongly urged by Will Adams to make Uraga the seat of the new trade, though convinced of the excellence of the harbour there, and though instructed as to the great advantage of proximity to the shōgun's capital, he appears to have conceived some distrust of Adams, for he chose Hirado. From Iyeyasu Captain Saris received a most liberal charter, which plainly displayed the mood of the Tokugawa shōgun towards foreign trade:—

1. The ship that has now come for the first time from England over the sea to Japan may carry on trade of all kinds without hindrance. With regard to future visits (of English ships) permission will be given in regard to all matters.

2. With regard to the cargoes of ships, requisition will be made by list according to the requirements of the shōgunate.

3. English ships are free to visit any port in Japan. If disabled by storms they may put into any harbour.

4. Ground in Yedo in the place which they may desire shall be given to the English, and they may erect houses and reside and trade there. They shall be at liberty to return to their country whenever they wish to do so, and to dispose as they like of the houses they have erected.

5. If an Englishman dies in Japan of disease, or any other cause, his effects shall be handed over without fail.

6. Forced sales of cargo, and violence, shall not take place.

7. If one of the English should commit an offence, he should be sentenced by the English General according to the gravity of his offence. (Translated by Professor Riess.)

The terms of the 4th article show that the shōgun expected the English to make Yedo their headquarters. Had Saris done so, he would have been free from all competition, would have had an immense market at his very doors, would have economized the expense of numerous overland journeys to the Tokugawa court, and would have saved the payment of many "considerations." The result of his mistaken choice and subsequent bad management was that, ten years later (1623), the English factory at Hirado had to be closed, having incurred a total loss of about £2000. In condonation of this failure it must be noted that a few months after the death of Iyeyasu, the charter he had granted to Saris underwent serious modification. The original document threw open to the English every port in Japan; the revised document limited them to Hirado. But this restriction may be indirectly traced to the blunder of not accepting a settlement in Yedo and a port at Uraga. For the Tokugawa's foreign policy was largely swayed by an apprehension lest the Kiūshiū feudatories, over whom the authority of Yedo had never been fully established, might, by the presence of foreign traders, come into possession of such a fleet and such an armament as would ultimately enable them to wrest the administration of the empire from Tokugawa hands. Hence the precaution of confining the English and the Dutch to Hirado, the fief of a *daimyō* too petty to become formidable, and to Nagasaki which was an imperial city.[1] But evidently an English factory in Yedo and English ships at Uraga would have strengthened the Tokugawa ruler's hand instead of supplying engines of war to his political foes. It must also be noted that the question of locality had another injurious outcome. It exposed the English—and the Dutch also—to crippling competition at the hands of a company of rich Osaka monopolists, who, as representing an Imperial city and therefore being pledged to the Tokugawa interests, enjoyed Yedo's favour and took full advantage of it. These shrewd traders not only drew a ring round Hirado, but also sent vessels on their own account to Cochin China, Siam, Tonkin, Cambodia and other places, where they obtained many of the staples in which the English and the Dutch dealt. Still the closure of the English factory at Hirado was purely voluntary. From first to last there had been no serious friction between the English and the Japanese. The company's houses and godowns were not sold. These as well as the charter were left in the hands of the daimyō of Hirado, who promised to restore them should the English re-open business in Japan. The company did think of doing so on more than one occasion, but no practical step was taken until the year 1673, when a merchantman, aptly named the "Return," was sent to seek permission. The Japanese, after mature reflection, made answer that as the king of England was married to a Portuguese princess, British subjects could not be permitted to visit Japan. That this reply was suggested by the Dutch is very probable; that it truly reflected the feeling of the Japanese government towards Roman Catholics is certain.

The Last Days of the Portuguese in Japan.

The Spaniards were expelled from Japan in 1624, the Portuguese in 1638. Two years before the latter event, the Yedo government took a signally retrogressive step. They ordained that no Japanese vessel should go abroad; that no Japanese subject should leave the country, and that, if detected attempting to do so, he should be put to death, the vessel that carried him and her crew being seized "to await our pleasure"; that any Japanese resident abroad should be executed if he returned; that the children and descendants of Spaniards together with those who had adopted such children should not be allowed to remain on pain of death; and that no ship of ocean-going dimensions should be built in Japan. Thus not only were the very children of the Christian propagandists driven completely from the land, but the Japanese people also were sentenced to imprisonment within the limits of their islands, and the country was deprived of all hope of acquiring a mercantile marine. The descendants of the Spaniards, banished by the edict, were taken to Macao in two Portuguese galleons. They numbered 287 and the property they carried with them aggregated 6,697,500 florins. But if the Portuguese derived any gratification from this sweeping out of their much-abused rivals, the feeling was destined to be short-lived. Already they were subjected to humiliating restrictions.

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[1] The Imperial cities were Yedo, Kiōto, Osaka and Nagasaki. To this last the English were subsequently admitted. They were also invited to Kagoshima by the Shimazu chieftain, and, had not their experience at Hirado proved so deterrent, they might have established a factory at Kagoshima.

> "From 1623 the galleons and their cargoes were liable to be burnt and their crews executed if any foreign priest was found on board of them. An official of the Japanese government was stationed in Macao for the purpose of inspecting all intending passengers, and of preventing any one that looked at all suspicious from proceeding to Japan. A complete list and personal description of every one on board was drawn up by this officer, a copy of it was handed to the captain and by him it had to be delivered to the authorities who met him at Nagasaki before he was allowed to anchor. If in the subsequent inspection any discrepancy between the list and the persons actually carried by the vessel appeared, it would prove very awkward for the captain. Then in the inspection of the vessel letters were opened, trunks and boxes ransacked, and all crosses, rosaries or objects of religion of any kind had to be thrown overboard. In 1635 Portuguese were forbidden to employ Japanese to carry their umbrellas or their shoes, and only their chief men were allowed to bear arms, while they had to hire fresh servants every year. It was in the following year (1636) that the artificial islet of Deshima was constructed for their special reception, or rather imprisonment. It lay in front of the former Portuguese factory, with which it was connected by a bridge, and henceforth the Portuguese were to be allowed to cross this bridge only twice a year—at their arrival and at their departure. Furthermore, all their cargoes had to be sold at a fixed price during their fifty days' stay to a ring of licensed merchants from the imperial towns."[1]

The imposition of such irksome conditions did not deter the Portuguese, who continued to send merchandise-laden galleons to Nagasaki. But in 1638 the bolt fell. The Shimabara rebellion was directly responsible. Probably the fact of a revolt of Christian converts, in such numbers and fighting with such resolution, would alone have sufficed to induce the weak government in Yedo to get rid of the Portuguese altogether. But the Portuguese were suspected of having instigated the Shimabara insurrection, and the Japanese authorities believed that they had proof of the fact. Hence, in 1638, an edict was issued proclaiming that as, in defiance of the government's order, the Portuguese had continued to bring missionaries to Japan; as they had supplied these missionaries with provisions and other necessaries, and as they had fomented the Shimabara rebellion, thenceforth any Portuguese ship coming to Japan should be burned, together with her cargo, and every one on board of her should be executed. Ample time was allowed before enforcing this edict. Not only were the Portuguese ships then at Nagasaki permitted to close up their commercial transactions and leave the port, but also in the following year when two galleons arrived from Macao, they were merely sent away with a copy of the edict and a stern warning. But the Portuguese could not easily become reconciled to abandon a commerce from which they had derived splendid profits prior to the intrusion of the Spaniards, the Dutch and the English, and from which they might now hope further gains, since, although the Dutch continued to be formidable rivals, the Spaniards had been excluded, the English had withdrawn, and the Japanese, by the suicidal policy of their own rulers, were no longer able to send ships to China. Therefore they took a step which resulted in one of the saddest episodes of the whole story. Four aged men, the most respected citizens of Macao, were despatched (1640) to Nagasaki as ambassadors in a ship carrying no cargo but only rich presents. They bore a petition declaring that for a long time no missionaries had entered Japan from Macao, that the Portuguese had not been in any way connected with the Shimabara revolt, and that interruption of trade would injure Japan as much as Portugal. These envoys arrived at Nagasaki on the 1st of July 1640, and 24 days sufficed to bring from Yedo, whither their petition had been sent, peremptory orders for their execution as well as executioners to carry out the orders. There was no possibility of resistance. The Japanese had removed the ship's rudder, sails, guns and ammunition, and had placed the envoys, their suite and the crews under guard in Deshima. On the 2nd of August they were all summoned to the governor's hall of audience, where, after their protest had been heard that ambassadors should be under the protection of international law, the sentence written in Yedo 13 days previously was read to them. The following morning the Portuguese were offered their lives if they would apostatize. Every one rejected the offer, and being then led out to the martyrs' mount, the heads of the envoys and of 57 of their companions fell. Thirteen were saved to carry the news to Macao. These thirteen, after witnessing the burning of the galleon, were conducted to the governor's residence who gave them this message:—

> "Do not fail to inform the inhabitants of Macao that the Japanese wish to receive from them neither gold nor silver, nor any kind of presents or merchandise; in a word, absolutely nothing which comes from them. You are witnesses that I have caused even the clothes of those who were executed yesterday to be burned. Let them do the same with respect to us if they find occasion to do so; we consent to it without difficulty. Let them think no more of us, just as if we were no longer in the world."

Finally the thirteen were taken to the martyrs' mount where, set up above the heads of the victims, a tablet recounted the story of the embassy and the reasons for the execution, and concluded with the words:—

> "So long as the sun warms the earth, let no Christian be so bold as to come to Japan, and let all know that if King Philip himself, or even the very God of the Christians, or the great Shaka contravene this prohibition, they shall pay for it with their heads."

Had the ministers of the shōgun in Yedo desired to make clear to future ages that to Christianity alone was due the expulsion of Spaniards and Portuguese from Japan and her adoption of the policy of seclusion they could not have placed on record more conclusive testimony. Macao received the news with rejoicing in that its "earthly ambassadors had been made ambassadors of heaven," but it did not abandon all hope of overcoming Japan's obduracy. When Portugal recovered her independence in 1640, the people of Macao requested Lisbon to send an ambassador to Japan, and on the 16th of July 1647 Don Gonzalo de Siqueira arrived in Nagasaki with two vessels. He carried a letter from King John IV., setting forth the severance of all connexion between Portugal and Spain, which countries were now actually at war, and urging that commercial relations should be re-established. The Portuguese, having refused to give up their rudders and arms, soon found themselves menaced by a force of fifty thousand samurai, and were glad to put out of port quietly on the 4th of September. This was the last episode in the medieval history of Portugal's intercourse with Japan.

The Dutch at Deshima.

When (1609) the Dutch contemplated forming a settlement in Japan, Iyeyasu gave them a written promise that "no man should do them any wrong and that he would maintain and defend them as his own subjects." Moreover, the charter granted to them contained a clause providing that, into whatever ports their ships put, they were not to be molested or hindered in any way, but, "on the contrary, must be shown all manner of help, favour and assistance." They might then have chosen any port in Japan for their headquarters, but they had the misfortune to choose Hirado. For many years they had no cause to regret the choice. Their exclusive possession of the Spice Islands and their own enterprise and command of capital gave them the leading place in Japan's over-sea trade. Even when things had changed greatly for the worse and when the English closed their books with a large loss, it is on record that the Dutch were reaping a profit of 76% annually. Their doings at Hirado were not of a purely commercial character. The Anglo-Dutch "fleet of defence" made that port its basis of operations against the Spaniards and the Portuguese. It brought its prizes into Hirado, the profits to be equally divided between the fleet and the factories, Dutch and English, which arrangement involved a sum of a hundred thousand pounds in 1622. But after the death of Iyeyasu there grew up at the Tokugawa court a party which advocated the expulsion of all foreigners on the ground that, though some professed a different form of Christianity from that of the Castilians and Portuguese, it was nevertheless one and the same creed. This policy was not definitely adopted, but it made itself felt in a discourteous reception accorded to the commandant of Fort Zelandia when he visited Tōkyō in 1627. He attempted to retaliate upon the Japanese vessels which put into Zelandia in the following year, but the Japanese managed to seize his person, exact reparation for loss of time and obtain five hostages whom they carried to prison in Japan. The Japanese government of that time was wholly intolerant of any injury done to its subjects by foreigners. When news of the Zelandia affair reached Yedo, orders were immediately issued for the sequestration of certain Dutch vessels and for the suspension of the Hirado factory, which veto was not removed for four years. Commercial arrangements, also, became less favourable. The Dutch, instead of selling their silk—which generally formed the principal staple of import—in the open market, were required to send it to the Osaka gild of licensed merchants at Nagasaki, by which means, Nagasaki and Osaka being Imperial cities, the Yedo government derived advantage from the transaction. An attempt to evade this onerous system provoked a very stern rebuke from Yedo, and shortly afterwards all Japanese subjects were forbidden to act as servants to the Dutch outside the latter's dwellings. The coöperation of the Hollanders in bombarding the castle of Hara during the Shimabara rebellion (1638) gave them some claim on the shōgun's government, but in the same year the Dutch received an imperious warning that the severest penalties would be inflicted if their ships carried priests or any religious objects or books. So profound was the dislike of everything relating to Christianity that the Dutch nearly caused the ruin of their factory and probably their own destruction by inscribing on some newly erected warehouses the date according to the Christian era. The factory happened to be then presided over by Caron, a man of extraordinary penetration. Without a moment's hesitation he set 400 men to pull down the warehouses, thus depriving the Japanese of all pretext for recourse to violence. He was compelled, however, to promise that there should be no observance of the Sabbath hereafter and that time should no longer be reckoned by the Christian era. In a few months, further evidence of Yedo's ill will was furnished. An edict appeared ordering the Dutch to dispose of all their imports during the year of their arrival, without any option of carrying them away should prices be low. They were thus placed at the mercy of the Osaka gild. Further, they were forbidden to slaughter cattle or carry arms, and altogether it seemed as though the situation was to be rendered impossible for them. An envoy despatched from Batavia to remonstrate could not obtain audience of the shōgun, and though he presented, by way of remonstrance, the charter originally granted by Iyeyasu, the reply he received was:—

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[1] *A History of Japan* (Murdoch and Yamagata).

> "His Majesty charges us to inform you that it is of but slight importance to the Empire of Japan whether foreigners come or do not come to trade. But in consideration of the charter granted to them by Iyeyasu, he is pleased to allow the Hollanders to continue their operations, and to leave them their commercial and other privileges, on the condition that they evacuate Hirado and establish themselves with their vessels in the port of Nagasaki."

The Dutch did not at first regard this as a calamity. During their residence of 31 years at Hirado they had enjoyed full freedom, had been on excellent terms with the feudatory and his samurai, and had prospered in their business. But the pettiness of the place and the inconvenience of the anchorage having always been recognized, transfer to Nagasaki promised a splendid harbour and much larger custom. Bitter, therefore, was their disappointment when they found that they were to be imprisoned in Deshima, a quadrangular island whose longest face did not measure 300 yds., and that, so far from living in the town of Nagasaki, they would not be allowed even to enter it. Siebold writes:—

> "A guard at the gate prevented all communications with the city of Nagasaki; no Dutchman without weighty reasons and without the permission of the governor might pass the gate; no Japanese (unless public women) might live in a Dutchman's house. As if this were not enough, even within Deshima itself our state prisoners were keenly watched. No Japanese might speak with them in his own language unless in the presence of a witness (a government spy) or visit them in their houses. The creatures of the governor had the warehouses under key and the Dutch traders ceased to be masters of their property."

There were worse indignities to be endured. No Dutchman might be buried in Japanese soil: the dead had to be committed to the deep. Every Dutch ship, her rudder, guns and ammunition removed and her sails sealed, was subjected to the strictest search. No religious service could be held. No one was suffered to pass from one Dutch ship to another without the governor's permit. Sometimes the officers and men were wantonly cudgelled by petty Japanese officials. They led, in short, a life of extreme abasement. Some relaxation of this extreme severity was afterwards obtained, but at no time of their sojourn in Deshima, a period of 217 years, were the Dutch relieved from irksome and humiliating restraints. Eleven years after their removal thither, the expediency of consulting the national honour by finally abandoning an enterprise so derogatory was gravely discussed, but hopes of improvement supplementing natural reluctance to surrender a monopoly which still brought large gains, induced them to persevere. At that time this Nagasaki over-sea trade was considerable. From 7 to 10 Dutch ships used to enter the port annually, carrying cargo valued at some 80,000 ℔ of silver, the chief staples of import being silk and piece-goods, and the government levying 5% by way of customs dues. But this did not represent the whole of the charges imposed. A rent of 459 ℔ of silver had to be paid each year for the little island of Deshima and the houses standing on it; and, further, every spring, the Hollanders were required to send to Yedo a mission bearing for the shōgun, the heir-apparent and the court officials presents representing an aggregate value of about 550 ℔ of silver. They found their account, nevertheless, in buying gold and copper—especially the latter—for exportation, until the Japanese authorities, becoming alarmed at the great quantity of copper thus carried away, adopted the policy of limiting the number of vessels, as well as their inward and outward cargoes, so that, in 1790, only one ship might enter annually, nor could she carry away more than 350 tons of copper. On the other hand, the formal visits of the captain of the factory to Yedo were reduced to one every fifth year, and the value of the presents carried by him was cut down to one half.

Loss to Japan by adopting the Policy of Exclusion.

Well-informed historians have contended that, by thus segregating herself from contact with the West, Japan's direct losses were small. Certainly it is true that she could not have learned much from European nations in the 17th century. They had little to teach her in the way of religious tolerance; in the way of international morality; in the way of social amenities and etiquette; in the way of artistic conception and execution; or in the way of that notable shibboleth of modern civilization, the open door and equal opportunities. Yet when all this is admitted, there remains the vital fact that Japan was thus shut off from the atmosphere of competition, and that for nearly two centuries and a half she never had an opportunity of warming her intelligence at the fire of international rivalry or deriving inspiration from an exchange of ideas. She stood comparatively still while the world went on, and the interval between her and the leading peoples of the Occident in matters of material civilization had become very wide before she awoke to a sense of its existence. The sequel of this page of her history has been faithfully summarized by a modern writer:—

> "A more complete metamorphosis of a nation's policy could scarcely be conceived. In 1541 we find the Japanese celebrated, or notorious, throughout the whole of the Far East for exploits abroad; we find them known as the 'kings of the sea'; we find them welcoming foreigners with cordiality and opposing no obstacles to foreign commerce or even to the propagandism of foreign creeds; we find them so quick to recognize the benefits of foreign trade and so apt to pursue them that, in the space of a few years, they establish commercial relations with no less than twenty over-sea markets; we find them authorizing the Portuguese, the Dutch and the English to trade at every port in the empire; we find, in short, all the elements requisite for a career of commercial enterprise, ocean-going adventure and industrial liberality. In 1641 everything is reversed. Trade is interdicted to all Western peoples except the Dutch, and

they are confined to a little island 200 yards in length by 80 in width; the least symptom of predilection for any alien creed exposes a Japanese subject to be punished with awful rigour; any attempt to leave the limits of the realm involves decapitation; not a ship large enough to pass beyond the shadow of the coast may be built. However unwelcome the admission, it is apparent that for all these changes Christian propagandism was responsible. The policy of seclusion adopted by Japan in the early part of the 17th century and resolutely pursued until the middle of the 19th, was anti-Christian, not anti-foreign. The fact cannot be too clearly recognized. It is the chief lesson taught by the events outlined above. Throughout the whole of that period of isolation, Occidentals were not known to the Japanese by any of the terms now in common use, as *gwaikoku-jin*, *seiyō-jin*, or *i-jin*, which embody the simple meanings 'foreigner,' 'Westerner' or 'alien': they were popularly called *bateren* (*padres*). Thus completely had foreign intercourse and Christian propagandism become identified in the eyes of the people. And when it is remembered that foreign intercourse, associated with Christianity, had come to be synonymous in Japanese ears with foreign aggression, with the subversal of the mikado's ancient dynasty, and with the loss of the independence of the 'country of the gods,' there is no difficulty in understanding the attitude of the nation's mind towards this question."

Dutch and Russian Influence.

Foreign Intercourse in Modern Times.—From the middle of the 17th century to the beginning of the 19th, Japan succeeded in rigorously enforcing her policy of seclusion. But in the concluding days of this epoch two influences began to disturb her self-sufficiency. One was the gradual infiltration of light from the outer world through the narrow window of the Dutch prison at Deshima; the other, frequent apparitions of Russian vessels on her northern coasts. The former was a slow process. It materialized first in the study of anatomy by a little group of youths who had acquired accidental knowledge of the radical difference between Dutch and Japanese conceptions as to the structure of the human body. The work of these students reads like a page of romance. Without any appreciable knowledge of the Dutch language, they set themselves to decipher a Dutch medical book, obtained at enormous cost, and from this small beginning they passed to a vague but firm conviction that their country had fallen far behind the material and intellectual progress of the Occident. They laboured in secret, for the study of foreign books was then a criminal offence; yet the patriotism of one of their number outweighed his prudence, and he boldly published a brochure advocating the construction of a navy and predicting a descent by the Russians on the northern borders of the empire. Before this prescient man had lain five months in prison, his foresight was verified by events. The Russians simulated at the outset a desire to establish commercial relations by peaceful means. Had the Japanese been better acquainted with the history of nations, they would have known how to interpret the idea of a Russian quest for commercial connexions in the Far East a hundred years ago. But they dealt with the question on its superficial merits, and, after imposing on the tsar's envoys a wearisome delay of several months at Nagasaki, addressed to them a peremptory refusal together with an order to leave that port forthwith. Incensed by such treatment, and by the subsequent imprisonment of a number of their fellow countrymen who had landed on the island of Etorofu in the Kuriles, the Russians resorted to armed reprisals. The Japanese settlements in Sakhalin and Etorofu were raided and burned, other places were menaced and several Japanese vessels were destroyed. The lesson sank deep into the minds of the Yedo officials. They withdrew their veto against the study of foreign books, and they arrived in part at the reluctant conclusion that to offer armed opposition to the coming of foreign ships was a task somewhat beyond Japan's capacity. Japan ceased, however, to attract European attention amid the absorbing interest of the Napoleonic era, and the shōgun's government, misinterpreting this respite, reverted to their old policy of stalwart resistance to foreign intercourse.

American Enterprise.

Meanwhile another power was beginning to establish close contact with Japan. The whaling industry in Russian waters off the coast of Alaska and in the seas of China and Japan had attracted large investments of American capital and was pursued yearly by thousands of American citizens. In one season 86 of these whaling vessels passed within easy sight of Japan's northern island, Yezo, so that the aspect of foreign ships became quite familiar. From time to time American schooners were cast away on Japan's shores. Generally the survivors were treated with tolerable consideration and ultimately sent to Deshima for shipment to Batavia. Japanese sailors, too, driven out of their route by hurricanes and caught in the stream of the "Black Current," were occasionally carried to the Aleutian Islands, to Oregon or California, and in several instances these shipwrecked mariners were taken back to Japan with all kindness by American vessels. On such an errand of mercy the "Morrison" entered Yedo Bay in 1837, proceeding thence to Kagoshima, only to be driven away by cannon shot; and on such an errand the "Manhattan" in 1845 lay for four days at Uraga while her master (Mercater Cooper) collected books and charts. It would seem that his experience induced the Washington government to attempt the opening of Japan. A ninety-gun ship and a sloop were sent on the errand. They anchored off Uraga (July 1846) and Commodore Biddle made due application for trade. But he received a positive refusal, and having been instructed by his government to abstain from any act calculated to excite hostility or distrust, he quietly weighed anchor and sailed away.

Great Britain reappears upon the scene.

In this same year (1846) a French ship touched at the Riukiu (Luchu) archipelago and sought to persuade the islanders that their only security against British aggression was to place themselves under the protection of France. In fact Great Britain was now beginning to interest herself in south China, and more than one warning reached Yedo from Deshima that English war-ships might at any moment visit Japanese waters. The Dutch have been much blamed for thus attempting to prejudice Japan against the Occident, but if the dictates of commercial rivalry, as it was then practised, do not constitute an ample explanation, it should be remembered that England and Holland had recently been enemies, and that the last British vessel,[1] seen at Nagasaki had gone there hoping to capture the annual Dutch trading-ship from Batavia. Deshima's warnings, however, remained unfulfilled, though they doubtless contributed to Japan's feeling of uneasiness. Then, in 1847, the king of Holland himself intervened. He sent to Yedo various books, together with a map of the world and a despatch advising Japan to abandon her policy of isolation. Within a few months (1849) of the receipt of his Dutch majesty's recommendation, an American brig, the "Preble," under Commander J. Glynn, anchored in Nagasaki harbour and threatened to bombard the town unless immediate delivery were made of 18 seamen who, having been wrecked in northern waters, were held by the Japanese preparatory to shipment for Batavia. In 1849 another despatch reached Yedo from the king of Holland announcing that an American fleet might be expected in Japanese waters a year later, and that, unless Japan agreed to enter into friendly commercial relations, war must ensue. Appended to this despatch was an approximate draft of the treaty which would be presented for signature, together with a copy of a memorandum addressed by the Washington government to European nations, justifying the contemplated expedition on the ground that it would inure to the advantage of Japan as well as to that of the Occident.

Commodore Perry.

In 1853, Commodore Perry, with a squadron of four ships-of-war and 560 men, entered Uraga Bay. So formidable a foreign force had not been seen in Japanese waters since the coming of the Mongol Armada. A panic ensued among the people—the same people who, in the days of Hideyoshi or Iyeyasu, would have gone out to encounter these ships with assured confidence of victory. The contrast did not stop there. The shōgun, whose ancestors had administered the country's affairs with absolutely autocratic authority, now summoned a council of the feudatories to consider the situation; and the Imperial court in Kiōto, which never appealed for heaven's aid except in a national emergency such as had never been witnessed since the creation of the shōgunate, now directed that at the seven principal shrines and at all the great temples special prayers should be offered for the safety of the land and for the destruction of the aliens. Thus the appearance of the American squadron awoke in the cause of the country as a whole a spirit of patriotism hitherto confined to feudal interests. The shōgun does not seem to have had any thought of invoking that spirit: his part in raising it was involuntary and his ministers behaved with perplexed vacillation. The infirmity of the Yedo Administration's purpose presented such a strong contrast to the single-minded resolution of the Imperial court that the prestige of the one was largely impaired and that of the other correspondingly enhanced. Perry, however, was without authority to support his proposals by any recourse to violence. The United States government had relied solely on the moral effect of his display of force, and his countrymen had supplied him with a large collection of the products of peaceful progress, from sewing machines to miniature railways. He did not unduly press for a treaty, but after lying at anchor off Uraga during a period of ten days and after transmitting the president's letter to the sovereign of Japan, he steamed away on the 17th of July, announcing his return in the ensuing spring. The conduct of the Japanese subsequently to his departure showed how fully and rapidly they had acquired the conviction that the appliances of their old civilization were powerless to resist the resources of the new. Orders were issued rescinding the long-enforced veto against the construction of sea-going ships; the feudal chiefs were invited to build and arm large vessels; the Dutch were commissioned to furnish a ship of war and to procure from Europe all the best works on modern military science; every one who had acquired any expert knowledge through the medium of Deshima was taken into official favour; forts were built; cannon were cast and troops were drilled. But from all this effort there resulted only fresh evidence of the country's inability to defy foreign insistence, and on the 2nd of December 1853, instructions were issued that if the Americans returned, they were to be dealt with peacefully. The sight of Perry's steam-propelled ships, their powerful guns and all the specimens they carried of western wonders, had practically broken down the barriers of Japan's isolation without any need of treaties or conventions. Perry returned in the following February, and after an interchange of courtesies and formalities extending over six weeks, obtained a treaty pledging Japan to accord kind treatment to shipwrecked sailors; to permit foreign vessels to obtain stores and provisions within her territory, and to allow American ships to anchor in the ports at Shimoda and Hakodate. On this second occasion Perry had 10 ships with crews numbering two thousand, and when he landed to sign the treaty, he was escorted by a guard of honour mustering 500 strong in 27 boats. Much has been written about his judicious display of force and his sagacious tact in dealing with the Japanese, but it may be doubted whether the consequences of his exploit have not invested its methods with extravagant lustre. Standing on the threshold of modern Japan's wonderful career, his figure shines by the reflected light of its surroundings.

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[1] H.M.S. "Phaeton," which entered that port in 1808.

First Treaty of Commerce.

Russia, Holland and England speedily secured for themselves treaties similar to that concluded by Commodore Perry in 1854. But Japan's doors still remained closed to foreign commerce, and it was reserved for another citizen of the great republic to open them. This was Townsend Harris (1803–1878), the first U.S. consul-general in Japan. Arriving in August 1856, he concluded, in June of the following year, a treaty securing to American citizens the privilege of permanent residence at Shimoda and Hakodate, the opening of Nagasaki, the right of consular jurisdiction and certain minor concessions. Still, however, permission for commercial intercourse was withheld, and Harris, convinced that this great goal could not be reached unless he made his way to Yedo and conferred direct with the shōgun's ministers, pressed persistently for leave to do so. Ten months elapsed before he succeeded, and such a display of reluctance on the Japanese side was very unfavourably criticized in the years immediately subsequent. Ignorance of the country's domestic politics inspired the critics. The Yedo administration, already weakened by the growth of a strong public sentiment in favour of abolishing the dual system of government—that of the mikado in Kiōto and that of the shōgun in Yedo—had been still further discredited by its own timid policy as compared with the stalwart mien of the throne towards the question of foreign intercourse. Openly to sanction commercial relations at such a time would have been little short of reckless. The Perry convention and the first Harris convention could be construed, and were purposely construed, as mere acts of benevolence towards strangers; but a commercial treaty would not have lent itself to any such construction, and naturally the shōgun's ministers hesitated to agree to an apparently suicidal step. Harris carried his point, however. He was received by the shōgun in Yedo in November 1857, and on the 29th of July 1858 a treaty was signed in Yedo, engaging that Yokohama should be opened on the 4th of July 1859 and that commerce between the United States and Japan should thereafter be freely carried on there. This treaty was actually concluded by the shōgun's Ministers in defiance of their failure to obtain the sanction of the sovereign in Kiōto. Foreign historians have found much to say about Japanese duplicity in concealing the subordinate position occupied by the Yedo administration towards the Kiōto court. Such condemnation is not consistent with fuller knowledge. The Yedo authorities had power to solve all problems of foreign intercourse without reference to Kiōto. Iyeyasu had not seen any occasion to seek imperial assent when he granted unrestricted liberty of trade to the representatives of the East India Company, nor had Iyemitsu asked for Kiōto's sanction when he issued his decree for the expulsion of all foreigners. If, in the 19th century, Yedo shrank from a responsibility which it had unhesitatingly assumed in the 17th, the cause was to be found, not in the shōgun's simulation of autonomy, but in his desire to associate the throne with a policy which, while recognizing it to be unavoidable, he distrusted his own ability to make the nation accept. But his ministers had promised Harris that the treaty should be signed, and they kept their word, at a risk of which the United States' consul-general had no conception. Throughout these negotiations Harris spared no pains to create in the minds of the Japanese an intelligent conviction that the world could no longer be kept at arm's length, and though it is extremely problematical whether he would have succeeded had not the Japanese themselves already arrived at that very conviction, his patient and lucid expositions coupled with a winning personality undoubtedly produced much impression. He was largely assisted, too, by recent events in China, where the Peihō forts had been captured and the Chinese forced to sign a treaty at Tientsin. Harris warned the Japanese that the British fleet might be expected at any moment in Yedo Bay, and that the best way to avert irksome demands at the hands of the English was to establish a comparatively moderate precedent by yielding to America's proposals.

Effects of the Treaty.

This treaty could not be represented, as previous conventions had been, in the light of a purely benevolent concession. It definitely provided for the trade and residence of foreign merchants, and thus finally terminated Japan's traditional isolation. Moreover, it had been concluded in defiance of the Throne's refusal to sanction anything of the kind. Much excitement resulted. The nation ranged itself into three parties. One comprised the advocates of free intercourse and progressive liberality; another, while insisting that only the most limited privileges should be accorded to aliens, was of two minds as to the advisability of offering armed resistance at once or temporizing so as to gain time for preparation; the third advocated uncompromising seclusion. Once again the shōgun convoked a meeting of the feudal barons, hoping to secure their co-operation. But with hardly an exception they pronounced against yielding. Thus the shōgunate saw itself compelled to adopt a resolutely liberal policy: it issued a decree in that sense, and thenceforth the administrative court at Yedo and the Imperial court in Kiōto stood in unequivocal opposition to each other, the Conservatives ranging themselves on the side of the latter, the Liberals on that of the former. It was a situation full of perplexity to outsiders, and the foreign representatives misinterpreted it. They imagined that the shōgun's ministers sought only to evade their treaty obligations and to render the situation intolerable for foreign residents, whereas in truth the situation threatened to become intolerable for the shōgunate itself. Nevertheless the Yedo officials cannot be entirely acquitted of duplicity. Under pressure of the necessity of self-preservation they effected with Kiōto a compromise which assigned to foreign intercourse a temporary character. The threatened political crisis was thus averted, but the enemies of the dual system of government gained strength daily. One of their devices was to assassinate foreigners in the hope of embroiling the shōgunate with Western powers and thus either forcing its hand or precipitating its downfall. It is not wonderful, perhaps, that foreigners were deceived, especially as they approached the solution of Japanese problems with all the Occidental's habitual suspicion of everything Oriental. Thus when the Yedo government, cognisant that serious dangers menaced the Yokohama settlement, took precautions to guard it, the foreign ministers convinced themselves that a deliberate piece of chicanery was being practised at their expense; that statecraft rather than truth had dictated the representations made to them by the Japanese authorities; and that the alarm of the latter was simulated for the purpose of finding a pretext to curtail the liberty enjoyed by foreigners. Therefore a suggestion that the inmates of the legations should show themselves as little as possible in the streets of the capital, where at any moment a desperado might cut them down, was treated almost as an insult. Then the Japanese authorities saw no recourse except to attach an armed escort to the person of every foreigner when he moved about the city. But even this precaution, which certainly was not adopted out of mere caprice or with any sinister design, excited fresh suspicions. The British representative, in reporting the event to his government, said that the Japanese had taken the opportunity to graft upon the establishment of spies, watchmen and police-officers at the several legations, a mounted escort to accompany the members whenever they moved about.

Attacks upon Foreigners and their Consequences.

Just at this time (1861) the Yedo statesmen, in order to reconcile the divergent views of the two courts, negotiated a marriage between the emperor's sister and the shōgun. But in order to bring the union about, they had to placate the Kiōto Conservatives by a promise to expel foreigners from the country within ten years. When this became known, it strengthened the hands of the reactionaries, and furnished a new weapon to Yedo's enemies, who interpreted the marriage as the beginning of a plot to dethrone the mikado. Murderous attacks upon foreigners became more frequent. Two of these assaults had momentous consequences. Three British subjects attempted to force their way through the *cortège* of the Satsuma feudal chief on the highway between Yokohama and Yedo. One of them was killed and the other two wounded. This outrage was not inspired by the "barbarian-expelling" sentiment: to any Japanese subject violating the rules of etiquette as these Englishmen had violated them, the same fate would have been meted out. Nevertheless, as the Satsuma daimyō refused to surrender his implicated vassals, and as the shōgun's arm was not long enough to reach the most powerful feudatory in Japan, the British government sent a squadron to bombard his capital, Kagoshima. It was not a brilliant exploit in any sense, but its results were invaluable; for the operations of the British ships finally convinced the Satsuma men of their impotence in the face of Western armaments, and converted them into advocates of liberal progress. Three months previously to this bombardment of Kagoshima another puissant feudatory had thrown down the gauntlet. The Chōshū chief, whose batteries commanded the entrance to the inland sea at Shimonoseki, opened fire upon ships flying the flags of the United States, of France and of Holland. In thus acting he obeyed an edict obtained by the extremists from the mikado without the knowledge of the shōgun, which edict fixed the 11th of May 1863 as the date for practically inaugurating the foreigners-expulsion policy. Again the shōgun's administrative competence proved inadequate to exact reparation, and a squadron, composed chiefly of British men-of-war, proceeding to Shimonoseki, demolished Chōshū's forts, destroyed his ships and scattered his samurai. In the face of the Kagoshima bombardment and the Shimonoseki expedition, no Japanese subject could retain any faith in his country's ability to oppose Occidentals by force. Thus the year 1863 was memorable in Japan's history. It saw the "barbarian-expelling" agitation deprived of the emperor's sanction; it saw the two principal clans, Satsuma and Chōshū, convinced of their country's impotence to defy the Occident; it saw the nation almost fully roused to the disintegrating and weakening effects of the feudal system; and it saw the traditional antipathy to foreigners beginning to be exchanged for a desire to study their civilization and to adopt its best features.

Ratification of the Treaties.

The treaty concluded between the shōgun's government and the United States in 1858 was of course followed by similar compacts with the principal European powers. From the outset these states agreed to co-operate for the assertion of their conventional privileges, and they naturally took Great Britain for leader, though such a relation was never openly announced. The treaties, however, continued during several years to lack imperial ratification, and, as time went by, that defect obtruded itself more and more upon the attention of their foreign signatories. The year 1865 saw British interests entrusted to the charge of Sir Harry Parkes, a man of keen insight, indomitable courage and somewhat peremptory methods, learned during a long period of service in China. It happened that the post of Japanese secretary at the British legation in Yedo was then held by a remarkably gifted young Englishman, who, in a comparatively brief interval, had acquired a good working knowledge of the Japanese language, and it happened also that the British legation in Yedo was already—as it has always been ever since—the best equipped institution of its class in Japan. Aided by these facilities and by the researches of Mr Satow (afterwards Sir Ernest Satow) Parkes arrived at the conclusions that the Yedo government was tottering to its fall; that the resumption of administrative authority by the Kiōto court would make for the interests not only of the West but also of Japan; and that the ratification of the treaties by the mikado would elucidate the situation for foreigners while being, at the same time, essential to the validity of the documents. Two other objects also presented themselves, namely, that the import duties fixed by the conventions should be reduced from 15 to 5% *ad valorem*, and that the ports of Hiōgō and Osaka should be opened at once, instead of at the expiration of two years as originally fixed. It was not proposed that these concessions should be entirely gratuitous. When the four-power flotilla destroyed the Shimonoseki batteries and sank the vessels lying there, a fine of three million dollars (some £750,000) had been imposed upon the daimyō of Chōshū by way of ransom for his capital, which lay at the mercy of the invaders. The daimyō of Chōshū, however, was in open rebellion against the shōgun, and as the latter could not collect the debt from the recalcitrant clansmen, while the four powers insisted on being paid by some one, the Yedo treasury was finally compelled to shoulder the obligation. Two out of the three millions were still due, and Parkes conceived the idea of remitting this debt in exchange for the ratification of the treaties, the reduction of the customs tariff from 15 to 5% *ad valorem* and the immediate opening of Hiōgō and Osaka. He took with him to the place of negotiation (Hiōgō) a fleet of British, French and Dutch war-ships, for, while announcing peaceful intentions, he had accustomed himself to think that a display of force should occupy the foreground in all negotiations with Oriental states. This *coup* may be said to have sealed the fate of the shōgunate. For here again was produced in a highly aggravated form the drama which had so greatly startled the nation eight years previously. Perry had come with his war-ships to the portals of Yedo, and now a foreign fleet, twice as strong as Perry's, had anchored at the vestibule of the Imperial city itself. No rational Japanese could suppose that this parade of force was for purely peaceful purposes, or that rejection of the amicable bargain proposed by Great Britain's representative would be followed by the quiet withdrawal of the menacing fleet, whose terrible potentialities had been demonstrated at Kagoshima and Shimonoseki. The seclusionists, whose voices had been nearly silenced, raised them in renewed denunciation of the shōgun's incompetence to guarantee the sacred city of Kiōto against such trespasses, and the emperor, brought once more under the influence of the anti-foreign party, inflicted a heavy disgrace on the shōgun by dismissing and punishing the officials to whom the latter had entrusted the conduct of negotiations at Hiōgō. Such procedure on the part of the throne amounted to withdrawing the administrative commission held by the Tokugawa family since the days of Iyeyasu. The shōgun resigned. But his adversaries not being yet ready to replace him, he was induced to resume office, with, however, fatally damaged prestige. As for the three-power squadron, it steamed away successful. Parkes had come prepared to write off the indemnity in exchange for three concessions. He obtained two of the concessions without remitting a dollar of the debt.

Final Adoption of Western Civilization.

The shōgun did not long survive the humiliation thus inflicted on him. He died in the following year (1866), and was succeeded by Keiki, destined to be the last of the Tokugawa rulers. Nine years previously this same Keiki had been put forward by the seclusionists as candidate for the shōgunate. Yet no sooner did he attain that distinction in 1866 than he remodelled the army on French lines, engaged English officers to organize a navy, sent his brother to the Paris Exhibition, and altered many of the forms and ceremonies of his court so as to bring them into accord with Occidental fashions. The contrast between the politics he represented when a candidate for office in 1857 and the practice he adopted on succeeding to power in 1866 furnished an apt illustration of the change that had come over the spirit of the time. The most bigoted of the exclusionists were now beginning to abandon all idea of expelling foreigners and to think mainly of acquiring the best elements of their civilization. The Japanese are slow to reach a decision but very quick to act upon it when reached. From 1866 onwards the new spirit rapidly permeated the whole nation; progress became the aim of all classes, and the country entered upon a career of intelligent assimilation which, in forty years, won for Japan a universally accorded place in the ranks of the great Occidental powers.

Japan's Claim for Judicial Autonomy.

After the abolition of the shōgunate and the resumption of administrative functions by the Throne, one of the first acts of the newly organized government was to invite the foreign representatives to Kiōto, where they had audience of the mikado. Subsequently a decree was issued, announcing the emperor's resolve to establish amicable relations with foreign countries, and "declaring that any Japanese subject thereafter guilty of violent behaviour towards a foreigner would not only act in opposition to the Imperial command, but would also be guilty of impairing the dignity and good faith of the nation in the eyes of the powers with which his majesty had pledged himself to maintain friendship." From that time the relations between Japan and foreign states grew yearly more amicable; the nation adopted the products of Western civilization with notable thoroughness, and the provisions of the treaties were carefully observed. Those treaties, however, presented one feature which very soon became exceedingly irksome to Japan. They exempted foreigners residing within her borders from the operation of her criminal laws, and secured to them the privilege of being arraigned solely before tribunals of their own nationality. That system had always been considered necessary where the subjects of Christian states visited or sojourned in non-Christian countries, and, for the purpose of giving effect to it, consular courts were established. This necessitated the confinement of foreign residents to settlements in the neighbourhood of the consular courts, since it would have been imprudent to allow foreigners to have free access to districts remote from the only tribunals competent to control them. The Japanese raised no objection to the embodiment of this system in the treaties. They recognized its necessity and even its expediency, for if, on the one hand, it infringed their country's sovereign rights, on the other, it prevented complications which must have ensued had they been entrusted with jurisdiction which they were not prepared to discharge satisfactorily. But the consular courts were not free from defects. A few of the powers organized competent tribunals presided over by judicial experts, but a majority of the treaty states, not having sufficiently large interests at stake, were content to delegate consular duties to merchants, not only deficient in legal training, but also themselves engaged in the very commercial transactions upon which they might at any moment be required to adjudicate in a magisterial capacity. In any circumstances the dual functions of consul and judge could not be discharged without anomaly by the same official, for he was obliged to act as advocate in the preliminary stages of complications about which, in his position as judge, he might ultimately have to deliver an impartial verdict. In practice, however, the system worked with tolerable smoothness, and might have remained long in force had not the patriotism of the Japanese rebelled bitterly against the implication that their country was unfit to exercise one of the fundamental attributes of every sovereign state, judicial autonomy. From the very outset they spared no effort to qualify for the recovery of this attribute. Revision of the country's laws and re-organization of its law courts would necessarily have been an essential feature of the general reforms suggested by contact with the Occident, but the question of consular jurisdiction certainly constituted a special incentive. Expert assistance was obtained from France and Germany; the best features of European jurisprudence were adapted to the conditions and usages of Japan; the law courts were remodelled, and steps were taken to educate a competent judiciary. In criminal law the example of France was chiefly followed; in commercial law that of Germany; and in civil law that of the Occident generally, with due regard to the customs of the country. The jury system was not adopted, collegiate courts being regarded as more conducive to justice, and the order of procedure went from tribunals of first instance to appeal courts and finally to the court of cassation. Schools of law were quickly opened, and a well-equipped bar soon came into existence. Twelve years after the inception of these great works, Japan made formal application for revision of the treaties on the basis of abolishing consular jurisdiction. She had asked for revision in 1871, sending to Europe and America an important embassy to raise the question. But at that time the conditions originally calling for consular jurisdiction had not undergone any change such as would have justified its abolition, and the Japanese government, though very anxious to recover tariff autonomy as well as judicial, shrank from separating the two questions, lest by prematurely solving one the solution of the other might be unduly deferred. Thus the embassy failed, and though the problem attracted great academical interest from the first, it did not re-enter the field of practical politics until 1883. The negotiations were long protracted. Never previously had an Oriental state received at the hands of the Occident recognition such as that now demanded by Japan, and the West naturally felt deep reluctance to try a wholly novel experiment. The United States had set a generous example by concluding a new treaty (1878) on the lines desired by Japan. But its operation was conditional on a similar act of compliance by the other treaty powers. Ill-informed European publicists ridiculed the Washington statesmen's attitude on this occasion, claiming that what had been given with one hand was taken back with the other. The truth is that the conditional provision was inserted at the request of Japan herself, who appreciated her own unpreparedness for the concession. From 1883, however, she was ready to accept full responsibility, and she therefore asked that all foreigners within her borders should thenceforth be subject to her laws and judiciable by her law-courts, supplementing her application by promising that its favourable reception should be followed by the complete opening of the country and the removal of all restrictions hitherto imposed on foreign trade, travel and residence in her realm. "From the first it had been the habit of Occidental peoples to upbraid Japan on account of the barriers opposed by her to full and free foreign intercourse, and she was now able to claim that these barriers were no longer maintained by her desire, but that they existed because of a system which theoretically proclaimed her unfitness for free association with Western nations, and practically made it impossible for her to throw open her territories completely for the ingress of foreigners." She had a strong case, but on the side of the European powers extreme reluctance was manifested to try the unprecedented experiment of placing their people under the jurisdiction of an Oriental country. Still greater was the reluctance of those upon whom the experiment would be tried. Foreigners residing in Japan naturally clung to consular jurisdiction as a privilege of inestimable value. They saw, indeed, that such a system could not be permanently imposed on a country where the conditions justifying it had nominally disappeared. But they saw, also, that the legal and judicial reforms effected by Japan had been crowded into an extraordinarily brief period, and that, as tyros experimenting with alien systems, the Japanese might be betrayed into many errors.

Recognition by the Powers.

The negotiations lasted for eleven years. They were begun in 1883 and a solution was not reached until 1894. Finally European governments conceded the justice of Japan's case, and it was agreed that from July 1899 Japanese tribunals should assume jurisdiction over every person, of whatever nationality, within the confines of Japan, and the whole country should be thrown open to foreigners, all limitations upon trade, travel and residence being removed. Great Britain took the lead in thus releasing Japan from the fetters of the old system. The initiative came from her with special grace, for the system and all its irksome consequences had been originally imposed on Japan by a combination of powers with Great Britain in the van. As a matter of historical sequence the United States dictated the terms of the first treaty providing for consular jurisdiction. But from a very early period the Washington government showed its willingness to remove all limitations of Japan's sovereignty, whereas Europe, headed by Great Britain, whose preponderating interests entitled her to lead, resolutely refused to make any substantial concession. In Japanese eyes, therefore, British conservatism seemed to be the one serious obstacle, and since the British residents in the settlements far outnumbered all other nationalities, and since they alone had newspaper organs to ventilate their grievances—it was certainly fortunate for the popularity of her people in the Far East that Great Britain saw her way finally to set a liberal example. Nearly five years were required to bring the other Occidental powers into line with Great Britain and America. It should be stated, however, that neither reluctance to make the necessary concessions nor want of sympathy with Japan caused the delay. The explanation is, first, that each set of negotiators sought to improve either the terms or the terminology of the treaties already concluded, and, secondly, that the tariff arrangements for the different countries required elaborate discussion.

Reception given to the Revised Treaties.

Until the last of the revised treaties was ratified, voices of protest against revision continued to be vehemently raised by a large section of the foreign community in the settlements. Some were honestly apprehensive as to the issue of the experiment. Others were swayed by racial prejudice. A few had fallen into an insuperable habit of grumbling, or found their account in advocating conservatism under pretence of championing foreign interests; and all were naturally reluctant to forfeit the immunity from taxation hitherto enjoyed. It seemed as though the inauguration of the new system would find the foreign community in a mood which must greatly diminish the chances of a happy result, for where a captious and aggrieved disposition exists, opportunities to discover causes of complaint cannot be wanting. But at the eleventh hour this unfavourable demeanour underwent a marked change. So soon as it became evident that the old system was hopelessly doomed, the sound common sense of the European and American business man asserted itself. The foreign residents let it be seen that they intended to bow cheerfully to the inevitable, and that no obstacles would be willingly placed by them in the path of Japanese jurisdiction. The Japanese, on their side, took some promising steps. An Imperial rescript declared in unequivocal terms that it was the sovereign's policy and desire to abolish all distinctions between natives and foreigners, and that by fully carrying out the friendly purpose of the treaties his people would best consult his wishes, maintain the character of the nation, and promote its prestige. The premier and other ministers of state issued instructions to the effect that the responsibility now devolved on the government, and the duty on the people, of enabling foreigners to reside confidently and contentedly in every part of the country. Even the chief Buddhist prelates addressed to the priests and parishioners in their dioceses injunctions pointing out that, freedom of conscience being now guaranteed by the constitution, men professing alien creeds must be treated as courteously as the followers of Buddhism, and must enjoy the same rights and privileges.

Thus the great change was effected in circumstances of happy augury. Its results were successful on the whole. Foreigners residing in Japan now enjoy immunity of domicile, personal and religious liberty, freedom from official interference, and security of life and property as fully as though they were living in their own countries, and they have gradually learned to look with greatly increased respect upon Japanese law and its administrators.

Anglo-Japanese Alliance.

Next to the revision of the treaties and to the result of the great wars waged by Japan since the resumption of foreign intercourse, the most memorable incident in her modern career was the conclusion, first, of an *entente*, and, secondly, of an offensive and defensive alliance with Great Britain in January 1902 and September 1905, respectively. The *entente* set out by disavowing on the part of each of the contracting parties any aggressive tendency in either China or Korea, the independence of which two countries was explicitly recognized; and went on to declare that Great Britain in China and Japan in China and Korea might take indispensable means to safeguard their interests; while, if such measures involved one of the signatories in war with a third power, the other signatory would not only remain neutral but would also endeavour to prevent other powers from joining in hostilities against its ally, and would come to the assistance of the latter in the event of its being faced by two or more powers. The *entente* further recognized that Japan possessed, in a peculiar degree, political, commercial and industrial interests in Korea. This agreement, equally novel for each of the contracting parties, evidently tended to the benefit of Japan more than to that of Great Britain, inasmuch as the interests in question were vital from the former power's point of view but merely local from the latter's. The inequality was corrected by an offensive and defensive alliance in 1905. For the scope of the agreement was then extended to India and eastern Asia generally, and while the signatories pledged themselves, on the one hand, to preserve the common interests of all powers in China by insuring her integrity and independence as well as the principle of equal opportunities for the commerce and industry of all nations within her borders, they agreed, on the other, to maintain their own territorial rights in eastern Asia and India, and to come to each other's armed assistance in the event of those rights being assailed by any other power or powers. These agreements have, of course, a close relation to the events which accompanied or immediately preceded them, but they also present a vivid and radical contrast between a country which, less than half a century previously, had struggled vehemently to remain secluded from the world, and a country which now allied itself with one of the most liberal and progressive nations for the purposes of a policy extending over the whole of eastern Asia and India. This contrast was accentuated two years later (1907) when France and Russia concluded *ententes* with Japan, recognizing the independence and integrity of the Chinese Empire, as well as the principle of equal opportunity for all nations in that country, and engaging to support each other for assuring peace and security there. Japan thus became a world power in the most unequivocal sense.

War with Korea.

Japan's Foreign Wars and Complications.—The earliest foreign war conducted by Japan is said to have taken place at the beginning of the 3rd century, when the empress Jingō led an army to the conquest of Korea. But as the event is supposed to have happened more than 500 years before the first Japanese record was written, its traditional details cannot be seriously discussed. There is, however, no room to doubt that from time to time in early ages Japanese troops were seen in Korea, though they made no permanent impression on the country. It was reserved for Hideyoshi, the taikō, to make the Korean peninsula the scene of a great over-sea campaign. Hideyoshi, the Napoleon of Japan, having brought the whole empire under his sway as the sequel of many years of incomparable generalship and statecraft, conceived the project of subjugating China. By some historians his motive has been described as a desire to find employment for the immense mob of armed men whom four centuries of almost continuous fighting had called into existence in Japan: he felt that domestic peace could not be permanently restored unless these restless spirits were occupied abroad. But although that object may have reinforced his purpose, his ambition aimed at nothing less than the conquest of China, and he regarded Korea merely as a stepping-stone to that aim. Had Korea consented to be put to such a use, she need not have fought or suffered. The Koreans, however, counted China invincible. They considered that Japan would be shattered by the first contact with the great empire, and therefore although, in the 13th century, they had given the use of their harbours to the Mongol invaders of Japan, they flatly refused in the 16th to allow their territory to be used for a Japanese invasion of China. On the 24th of May 1592 the wave of invasion rolled against Korea's southern coast. Hideyoshi had chosen Nagoya in the province of Hizen as the home-base of his operations. There the sea separating Japan from the Korean peninsula narrows to a strait divided into two channels of almost equal width by the island of Tsushima. To reach this island from the Japanese side was an easy and safe task, but in the 56-mile channel that separated Tsushima from the peninsula an invading flotilla had to run the risk of attack by Korean warships. At Nagoya Hideyoshi assembled an army of over 300,000 men, of whom some 70,000 constituted the first fighting line, 87,000 the second, and the remainder formed a reserve to be subsequently drawn on as occasion demanded. The question of transport presented some difficulty, but it was solved by the simple expedient of ordering every feudatory to furnish two ships for each 100,000 *koku* of his fief's revenue. These were not fighting vessels but mere transports. As for the plan of campaign, it was precisely in accord with modern principles of strategy, and bore witness to the daring genius of Hideyoshi. The van, consisting of three army corps and mustering in all 51,000 men, was to cross rapidly to Fusan, on the south coast of the peninsula, and immediately commence a movement northward towards the capital, Seoul, one corps moving by the eastern coast-road, one by the central route, and one by the western coast-line. Thereafter the other four corps, which formed the first fighting line, together with the corps under the direct orders of the commander-in-chief, Ukida Hideiye, were to cross, for the purpose of effectually subduing the regions through which the van had passed; and, finally, the two remaining corps of the second line were to be transported by sea up the west coast of the peninsula, to form a junction with the van which, by that time, should be preparing to pass into China over the northern boundary of Korea, namely, the Yalu River. For the landing place of these reinforcements the town of Phyong-yang was adopted, being easily accessible by the Taidong River from the coast. In later ages Japanese armies were destined to move twice over these same regions, once to the invasion of China, once to the attack of Russia, and they adopted almost the same strategical plan as that mapped out by Hideyoshi in the year 1592. The forecast was that the Koreans would offer their chief resistance, first, at the capital, Seoul; next at Phyong-yang, and finally at the Yalu, as the approaches to all these places offered positions capable of being utilized to great advantage for defensive purposes.

Landing in Korea and Advance of the Invaders.

On the 24th of May 1592 the first army corps, under the command of Konishi Yukinaga, crossed unmolested to the peninsula; next day the castle of Fusan was carried by storm, which same fate befell, on the 27th, another and stronger fortress lying 3 miles inland and garrisoned by 20,000 picked soldiers. The invaders were irresistible. From the landing-place at Fusan to the gates of Seoul the distance is 267 miles. Konishi's corps covered that interval in 19 days, storming two forts, carrying two positions and fighting one pitched battle *en route*. On the 12th of June the Korean capital was in Japanese hands, and by the 16th four army corps had assembled there, while four others had effected a landing at Fusan. After a rest of 15 days the northward advance was resumed, and July 15th saw Phyong-yang in Japanese possession. The distance of 130 miles from Seoul to the Taidong had been traversed in 18 days, 10 having been occupied in forcing the passage of a river which, if held with moderate resolution and skill, should have stopped the Japanese altogether. At this point, however, the invasion suffered a check owing to a cause which in modern times has received much attention, though in Hideyoshi's days it had been little considered; the Japanese lost the command of the sea.

Fighting at Sea.

The Japanese idea of sea-fighting in those times was to use open boats propelled chiefly by oars. They closed as quickly as possible with the enemy, and then fell on with the trenchant swords which they used so skilfully. Now during the 15th century and part of the 16th the Chinese had been so harassed by Japanese piratical raids that their inventive genius, quickened by suffering, suggested a device for coping with these formidable adversaries. Once allow the Japanese swordsman to come to close quarters and he carried all before him. To keep him at a distance, then, was the great desideratum, and the Chinese compassed this in maritime warfare by completely covering their boats with roofs of solid timber, so that those within were protected against missiles, while loop-holes and ports enabled them to pour bullets and arrows on a foe. The Koreans learned this device from the Chinese and were the first to employ it in actual warfare. Their own history alleges that they improved upon the Chinese model by nailing sheet iron over the roofs and sides of the "turtle-shell" craft and studding the whole surface with *chevaux de frise*, but Japanese annals indicate that in the great majority of cases solid timber alone was used. It seems strange that the Japanese should have been without any clear perception of the immense fighting superiority possessed by such protected war-vessels over small open boats. But certainly they were either ignorant or indifferent. The fleet which they provided to hold the command of Korean waters did not include one vessel of any magnitude: it consisted simply of some hundreds of row-boats manned by 7000 men. Hideyoshi himself was perhaps not without misgivings. Six years previously he had endeavoured to obtain two war-galleons from the Portuguese, and had he succeeded, the history of the Far East might have been radically different. Evidently, however, he committed a blunder which his countrymen in modern times have conspicuously avoided; he drew the sword without having fully investigated his adversary's resources. Just about the time when the van of the Japanese army was entering Seoul, the Korean admiral, Yi Sun-sin, at the head of a fleet of 80 vessels, attacked the Japanese squadron which lay at anchor near the entrance to Fusan harbour, set 26 of the vessels on fire and dispersed the rest. Four other engagements ensued in rapid succession. The last and most important took place shortly after the Japanese troops had seized Phyong-yang. It resulted in the sinking of over 70 Japanese vessels, transports and fighting ships combined, which formed the main part of a flotilla carrying reinforcements by sea to the van of the invading army. This despatch of troops and supplies by water had been a leading feature of Hideyoshi's plan of campaign, and the destruction of the flotilla to which the duty was entrusted may be said to have sealed the fate of the war by isolating the army in Korea from its home base. It is true that Konishi Yukinaga, who commanded the first division, would have continued his northward march from Phyong-yang without delay. He argued that China was wholly unprepared, and that the best hope of ultimate victory lay in not giving her time to collect her forces. But the commander-in-chief, Ukida Hideiye, refused to endorse this plan. He took the view that since the Korean provinces were still offering desperate resistance, supplies could not be drawn from them, neither could the troops engaged in subjugating them be freed for service at the front. Therefore it was essential to await the consummation of the second phase of Hideyoshi's plan, namely, the despatch of reinforcements and munitions by water to Phyong-yang. The reader has seen how that second phase fared. The Japanese commander at Phyong-yang never received any accession of strength. His force suffered constant diminution from casualties, and the question of commissariat became daily more difficult. It is further plain to any reader of history—and Japanese historians themselves admit the fact—that no wise effort was made to conciliate the Korean people. They were treated so harshly that even the humble peasant took up arms, and thus the peninsula, instead of serving as a basis of supplies, had to be garrisoned perpetually by a strong army.

Chinese Intervention.

The Koreans, having suffered for their loyalty to China, naturally looked to her for succour. Again and again appeals were made to Peking, and at length a force of 5000 men, which had been mobilized in the Liaotung peninsula, crossed the Yalu and moved south to Phyong-yang, where the Japanese van had been lying idle for over two months. This was early in October 1592. Memorable as the first encounter between Japanese and Chinese, the incident also illustrated China's supreme confidence in her own ineffable superiority. The whole of the Korean forces had been driven northward throughout the entire length of the peninsula by the Japanese armies, yet Peking considered that 5000 Chinese "braves" would suffice to roll back this tide of invasion. Three thousand of the Chinese were killed and the remainder fled pell-mell across the Yalu. China now began to be seriously alarmed. She collected an army variously estimated at from 51,000 to 200,000 men, and marching it across Manchuria in the dead of winter, hurled it against Phyong-yang during the first week of February 1593. The Japanese garrison did not exceed 20,000, nearly one-half of its original number having been detached to hold a line of forts which guarded the communications with Seoul. Moreover, the Chinese, though their swords were much inferior to the Japanese weapon, possessed great superiority in artillery and cavalry, as well as in the fact that their troopers wore iron mail which defied the keenest blade. Thus, after a severe fight, the Japanese had to evacuate Phyong-yang and fall back upon Seoul. But this one victory alone stands to China's credit. In all subsequent encounters of any magnitude her army suffered heavy defeats, losing on one occasion some 10,000 men, on another 4000, and on a third 39,000. But the presence of her forces and the determined resistance offered by the Koreans effectually saved China from invasion. Indeed, after the evacuation of Seoul, on the 9th of May 1593, Hideyoshi abandoned all idea of carrying the war into Chinese territory, and devoted his attention to obtaining honourable terms of peace, the Japanese troops meanwhile holding a line of forts along the southern coast of Korea. He died before that end had been accomplished. Had he lived a few days longer, he would have learned of a crushing defeat inflicted on the Chinese forces (at Sö-chhön, October 30, 1598), when the Satsuma men under Shimazu Yoshihiro took 38,700 Chinese heads and sent the noses and ears to Japan, where they now lie buried under a tumulus (*mimizuka*, ear-mound) near the temple of Daibutsu in Kiōto. Thereafter the statesmen to whom the regent on his death-bed had entrusted the duty of terminating the struggle and recalling the troops, intimated to the enemy that the evacuation of the peninsula might be obtained if a Korean prince repaired to Japan as envoy, and if some tiger-skins and *ginseng* were sent to Kiōto in token of amity. So ended one of the greatest over-sea campaigns recorded in history. It had lasted 6½ years, had seen 200,000 Japanese troops at one time on Korean soil, and had cost something like a quarter of a million lives.

Contrast between Foreign Relations in Medieval and Modern Times.

From the recall of the Korea expedition in 1598 to the resumption of intercourse with the Occident in modern times, Japan enjoyed uninterrupted peace with foreign nations. Thereafter she had to engage in four wars. It is a striking contrast. During the first eleven centuries of her historical existence she was involved in only one contest abroad; during the next half century she fought four times beyond the sea and was confronted by many complications. Whatever material or moral advantages her association with the West conferred on her, it did not bring peace.

The "Maria Luz" Complication.

The first menacing foreign complication with which the Japanese government of the Meiji era had to deal was connected with the traffic in Chinese labour, an abuse not yet wholly eradicated. In 1872, a Peruvian ship, the "Maria Luz," put into port at Yokohama, carrying 200 contract labourers. One of the unfortunate men succeeded in reaching the shore and made a piteous appeal to the Japanese authorities, who at once seized the vessel and released her freight of slaves, for they were little better. The Japanese had not always been so particular. In the days of early foreign intercourse, before England's attitude towards slavery had established a new code of ethics, Portuguese ships had been permitted to carry away from Hirado, as they did from Macao, cargoes of men and women, doomed to a life of enforced toil if they survived the horrors of the voyage. But modern Japan followed the tenets of modern morality in such matters. Of course the Peruvian government protested, and for a time relations were strained almost to the point of rupture; but it was finally agreed that the question should be submitted to the arbitration of the tsar, who decided in Japan's favour. Japan's attitude in this affair elicited applause, not merely from the point of view of humanity, but also because of the confidence she showed in Occidental justice.

The Sakhalin Complication.

Another complication which occupied the attention of the Tōkyō government from the beginning of the Meiji era was in truth a legacy from the days of feudalism. In those days the island of Yezo, as well as Sakhalin on its north-west and the Kurile group on its north, could scarcely be said to be in effective Japanese occupation. It is true that the feudal chief of Matsumae (now Fuku-yama), the remains of whose castle may still be seen on the coast at the southern extremity of the island of Yezo, exercised nominal jurisdiction; but his functions did not greatly exceed the levying of taxes on the aboriginal inhabitants of Yezo, the Kuriles and southern Sakhalin. Thus from the beginning of the 18th century Russian fishermen began to settle in the Kuriles and Russian ships menaced Sakhalin. There can be no doubt that the first explorers of Sakhalin were Japanese. As early as 1620, some vassals of the feudal chief of Matsumae visited the place and passed a winter there. It was then supposed to be a peninsula forming part of the Asiatic mainland, but in 1806 a daring Japanese traveller, by name Mamiya Rinzo, made his way to Manchuria, voyaged up and down the Amur, and, crossing to Sakhalin, discovered that a narrow strait separated it from the mainland. There still prevails in the minds of many Occidentals a belief that the discovery of Sakhalin's insular character was reserved for Captain Nevelskoy, a Russian, who visited the place in 1849, but in Japan the fact had then been known for 43 years. Muravief, the great Russian empire-builder in East Asia, under whose orders Nevelskoy acted, quickly appreciated the necessity of acquiring Sakhalin, which commands the estuary of the Amur.

After the conclusion of the treaty of Aigun (1857) he visited Japan with a squadron, and required that the strait of La Pérouse, which separates Sakhalin from Yezo, should be regarded as the frontier between Russia and Japan. This would have given the whole of Sakhalin to Russia. Japan refused, and Muravief immediately resorted to the policy he had already pursued with signal success in the Usuri region: he sent emigrants to settle in Sakhalin. Twice the shōgunate attempted to frustrate this process of gradual absorption by proposing a division of the island along the 50th parallel of north latitude, and finally, in 1872, the Meiji government offered to purchase the Russian portion for 2,000,000 dollars (then equivalent to about £400,000). St Petersburg, having by that time discovered the comparative worthlessness of the island as a wealth-earning possession, showed some signs of acquiescence, and possibly an agreement might have been reached had not a leading Japanese statesman—afterwards Count Kuroda—opposed the bargain as disadvantageous to Japan. Finally St Petersburg's perseverance won the day. In 1875 Japan agreed to recognize Russia's title to the whole island on condition that Russia similarly recognized Japan's title to the Kuriles. It was a singular compact. Russia purchased a Japanese property and paid for it with a part of Japan's belongings. These details form a curious preface to the fact that Sakhalin was destined, 30 years later, to be the scene of a Japanese invasion, in the sequel of which it was divided along the 50th parallel as the shōgun's administration had originally proposed.

Military Expedition to Formosa.

The first of Japan's four conflicts was an expedition to Formosa in 1874. Insignificant from a military point of view, this affair derives vicarious interest from its effect upon the relations between China and Japan, and upon the question of the ownership of the Riūkiū islands. These islands, which lie at a little distance south of Japan, had for centuries been regarded as an apanage of the Satsuma fief. The language and customs of their inhabitants showed unmistakable traces of relationship to the Japanese, and the possibility of the islands being included among the dominions of China had probably never occurred to any Japanese statesman. When therefore, in 1873, the crew of a wrecked Riūkiūan junk were barbarously treated by the inhabitants of northern Formosa, the Japanese government unhesitatingly assumed the responsibility of seeking redress for their outrage. Formosa being a part of the Chinese Empire, complaint was duly preferred in Peking. But the Chinese authorities showed such resolute indifference to Japan's representations that the latter finally took the law into her own hands, and sent a small force to punish the Formosan murderers, who, of course, were found quite unable to offer any serious resistance. The Chinese government, now recognizing the fact that its territories had been invaded, lodged a protest which, but for the intervention of the British minister in Peking, might have involved the two empires in war. The final terms of arrangement were that, in consideration of Japan withdrawing her troops from Formosa, China should indemnify her to the extent of the expenses of the expedition. In sending this expedition to Formosa the government sought to placate the Satsuma samurai, who were beginning to show much opposition to certain features of the administrative reforms just inaugurated, and who claimed special interest in the affairs of the Riūkiū islands.

The Riūkiū Complication.

Had Japan needed any confirmation of her belief that the Riūkiū islands belonged to her, the incidents and settlement of the Formosan complication would have constituted conclusive evidence. Thus in 1876 she did not hesitate to extend her newly organized system of prefectural government to Riūkiū, which thenceforth became the Okinawa prefecture, the former ruler of the islands being pensioned, according to the system followed in the case of the feudal chiefs in Japan proper. China at once entered an objection. She claimed that Riūkiū had always been a tributary of her empire, and she was doubtless perfectly sincere in the contention. But China's interpretation of tribute did not seem reducible to a working theory. So long as her own advantage could be promoted, she regarded as a token of vassalage the presents periodically carried to her court from neighbouring states. So soon, however, as there arose any question of discharging a suzerain's duties, she classed these offerings as insignificant interchanges of neighbourly courtesy. It was true that Riūkiū had followed the custom of despatching gift-bearing envoys to China from time to time, just as Japan herself had done, though with less regularity. But it was also true that Riūkiū had been subdued by Satsuma without China stretching out a hand to help her; that for two centuries the islands had been included in the Satsuma fief, and that China, in the sequel to the Formosan affair, had made a practical acknowledgment of Japan's superior title to protect the islanders. Each empire positively asserted its claims; but whereas Japan put hers into practice, China confined herself to remonstrances. Things remained in that state until 1880, when General Grant, visiting the East, suggested the advisability of a compromise. A conference met in Peking, and the plenipotentiaries agreed that the islands should be divided, Japan taking the northern group, China the southern. But on the eve of signature the Chinese plenipotentiary drew back, pleading that he had no authority to conclude an agreement without previously referring it to certain other dignitaries. Japan, sensible that she had been flouted, retired from the discussion and retained the islands, China's share in them being reduced to a grievance.

The Korean Complication.

From the 16th century, when the Korean peninsula was overrun by Japanese troops, its rulers made a habit of sending a present-bearing embassy to Japan to felicitate the accession of each shōgun. But after the fall of the Tokugawa shōgunate, the Korean court desisted from this custom, declared a determination to have no further relations with a country embracing Western civilization, and refused even to receive a Japanese embassy. This conduct caused deep umbrage in Japan. Several prominent politicians cast their votes for war, and undoubtedly the sword would have been drawn had not the leading statesmen felt that a struggle with Korea, involving probably a rupture with China, must fatally check the progress of the administrative reforms then (1873) in their infancy. Two years later, however, the Koreans crowned their defiance by firing on the boats of a Japanese war-vessel engaged in the operation of coast-surveying. No choice now remained except to despatch an armed expedition against the truculent kingdom. But Japan did not want to fight. In this matter she showed herself an apt pupil of Occidental methods such as had been practised against herself in former years. She assembled an imposing force of war-ships and transports, but instead of proceeding to extremities, she employed the squadron—which was by no means so strong as it seemed—to intimidate Korea into signing a treaty of amity and commerce, and opening three ports to foreign trade (1876). That was the beginning of Korea's friendly relations with the outer world, and Japan naturally took credit for the fact that, thus early in her new career, she had become an instrument for extending the principle of universal intercourse opposed so strenuously by herself in the past.

War with China.

From time immemorial China's policy towards the petty states on her frontiers had been to utilize them as buffers for softening the shock of foreign contact, while contriving, at the same time, that her relations with them should involve no inconvenient responsibilities for herself. The aggressive impulses of the outside world were to be checked by an unproclaimed understanding that the territories of these states partook of the inviolability of China, while the states, on their side, must never expect their suzerain to bear the consequences of their acts. This arrangement, depending largely on sentiment and prestige, retained its validity in the atmosphere of Oriental seclusion, but quickly failed to endure the test of modern Occidental practicality. Tongking, Annam, Siam and Burma were withdrawn, one by one, from the fiction of dependence on China and independence towards all other countries. But with regard to Korea, China proved more tenacious. The possession of the peninsula by a foreign power would have threatened the maritime route to the Chinese capital and given easy access to Manchuria, the cradle of the dynasty which ruled China. Therefore Peking statesmen endeavoured to preserve the old-time relations with the little kingdom. But they could never persuade themselves to modify the indirect methods sanctioned by tradition. Instead of boldly declaring Korea a dependency of China, they sought to keep up the romance of ultimate dependency and intermediate sovereignty. Thus in 1876 Korea was suffered to conclude with Japan a treaty of which the first article declared her "an independent state enjoying the same rights as Japan," and subsequently to make with the United States (1882), Great Britain (1883) and other powers, treaties in which her independence was constructively admitted. China, however, did not intend that Korea should exercise the independence thus conventionally recognized. A Chinese resident was placed in Seoul, and a system of steady though covert interference in Korea's affairs was inaugurated. The chief sufferer from these anomalous conditions was Japan. In all her dealings with Korea, in all complications that arose out of her comparatively large trade with the peninsula, in all questions connected with her numerous settlers there, she found herself negotiating with a dependency of China, and with officials who took their orders from the Chinese representative. China had long entertained a rooted apprehension of Japanese aggression in Korea—an apprehension not unwarranted by history—and that distrust tinged all the influence exerted by her agents there. On many occasions Japan was made sensible of the discrimination thus exercised against her. Little by little the consciousness roused her indignation, and although no single instance constituted a ground for strong international protest, the Japanese people gradually acquired a sense of being perpetually baffled, thwarted and humiliated by China's interference in Korean affairs. For thirty years China had treated Japan as a contemptible deserter from the Oriental standard, and had regarded her progressive efforts with openly disdainful aversion; while Japan, on her side, had chafed more and more to furnish some striking evidence of the wisdom of her preference for Western civilization. Even more serious were the consequences of Chinese interference from the point of view of Korean administration. The rulers of the country lost all sense of national responsibility, and gave unrestrained sway to selfish ambition. The functions of the judiciary and of the executive alike came to be discharged by bribery only. Family interests predominated over those of the state. Taxes were imposed in proportion to the greed of local officials. No thought whatever was taken for the welfare of the people or for the development of the country's resources. Personal responsibility was unknown among officials. To be a member of the Min family, to which the queen belonged, was to possess a passport to office and an indemnity against the consequences of abuse of power. From time to time the advocates of progress or the victims of oppression rose in arms. They effected nothing except to recall to the world's recollection the miserable condition into which Korea had fallen. Chinese military aid was always furnished readily for the suppression of these risings, and thus the Min family learned to base its tenure of power on ability to conciliate China and on readiness to obey Chinese dictation, while the people at large fell into the apathetic condition of men who possess neither security of property nor national ambition.

As a matter of state policy the Korean problem caused much anxiety to Japan. Her own security being deeply concerned in preserving Korea from the grasp of a Western power, she could not suffer the little kingdom to drift into a condition of such administrative incompetence and national debility that a strong aggressor might find at any moment a pretext for interference. On two occasions (1882 and 1884) when China's armed intervention was employed in the interests of the Min to suppress movements of reform, the partisans of the victors, regarding Japan as the fountain of progressive tendencies, destroyed her legation in Seoul and compelled its inmates to fly from the city. Japan behaved with forbearance at these crises, but in the consequent negotiations she acquired conventional titles that touched the core of China's alleged suzerainty. In 1882 her right to maintain troops in Seoul for the protection of her legation was admitted; in 1885 she concluded with China a convention by which each power pledged itself not to send troops to Korea without notifying the other.

The Rupture with China.

In the spring of 1894 a serious insurrection broke out in Korea, and the Min family appealed for China's aid. On the 6th of July 2500 Chinese troops embarked at Tientsin and were transported to the peninsula, where they went into camp at Ya-shan (Asan), on the south-west coast, notice of the measure being given by the Chinese government to the Japanese representative at Peking, according to treaty. During the interval immediately preceding these events, Japan had been rendered acutely sensible of China's arbitrary and unfriendly interference in Korea. Twice the efforts of the Japanese government to obtain redress for unlawful and ruinous commercial prohibitions had been thwarted by the Chinese representative in Seoul; and an ultimatum addressed from Tōkyō to the Korean government had elicited from the viceroy Li in Tientsin a thinly veiled threat of Chinese armed opposition. Still more provocative of national indignation was China's procedure with regard to the murder of Kim Ok-kyun, the leader of progress in Korea, who had been for some years a refugee in Japan. Inveigled from Japan to China by a fellow-countryman sent from Seoul to assassinate him, Kim was shot in a Japanese hotel in Shanghai; and China, instead of punishing the murderer, conveyed him in a war-ship of her own to Korea to be publicly honoured. When, therefore, the Korean insurrection of 1894 induced the Min family again to solicit China's armed intervention, the Tōkyō government concluded that, in the interests of Japan's security and of civilization in the Orient, steps must be taken to put an end to the misrule which offered incessant invitations to foreign aggression, and checked Korea's capacity to maintain its own independence. Japan did not claim for herself any rights or interests in the peninsula superior to those possessed there by China. But there was not the remotest probability that China, whose face had been contemptuously set against all the progressive measures adopted by Japan during the preceding twenty-five years, would join in forcing upon a neighbouring kingdom the very reforms she herself despised, were her co-operation invited through ordinary diplomatic channels only. It was necessary to contrive a situation which would not only furnish clear proof of Japan's resolution, but also enable her to pursue her programme independently of Chinese endorsement, should the latter be finally unobtainable. She therefore met China's notice of a despatch of troops with a corresponding notice of her own, and the month of July 1894 found a Chinese force assembled at Asan and a Japanese force occupying positions in the neighbourhood of Seoul. China's motive for sending troops was nominally to quell the Tonghak insurrection, but really to re-affirm her own domination in the peninsula. Japan's motive was to secure such a position as would enable her to insist upon the radically curative treatment of Korea's malady. Up to this point the two empires were strictly within their conventional rights. Each was entitled by treaty to send troops to Korea, provided that notice was given to the other. But China, in giving notice, described Korea as her "tributary state," thus thrusting into the forefront of the discussion a contention which Japan, from conciliatory motives, would have kept out of sight. Once formally advanced, however, the claim had to be challenged. In the treaty of amity and commerce concluded in 1876 between Japan and Korea, the two high contracting parties were explicitly declared to possess the same national status. Japan could not agree that a power which for nearly two decades she had acknowledged and treated as her equal should be openly classed as a tributary of China. She protested, but the Chinese statesmen took no notice of her protest. They continued to apply the disputed appellation to Korea, and they further asserted their assumption of sovereignty in the peninsula by seeking to set limits to the number of troops sent by Japan, as well as to the sphere of their employment. Japan then proposed that the two empires should unite their efforts for the suppression of disturbances in Korea, and for the subsequent improvement of that kingdom's administration, the latter purpose to be pursued by the despatch of a joint commission of investigation. But China refused everything. Ready at all times to interfere by force of arms between the Korean people and the dominant political faction, she declined to interfere in any way for the promotion of reform. She even expressed supercilious surprise that Japan, while asserting Korea's independence, should suggest the idea of peremptorily reforming its administration. In short, for Chinese purposes the Peking statesmen openly declared Korea a tributary state; but for Japanese purposes they insisted that it must be held independent. They believed that their island neighbour aimed at the absorption of Korea into the Japanese empire. Viewed in the light of that suspicion, China's attitude became comprehensible, but her procedure was inconsistent, illogical and unpractical. The Tōkyō cabinet now declared its resolve not to withdraw the Japanese troops without "some understanding that would guarantee the future peace, order, and good government of Korea," and since China still declined to come to such an understanding, Japan undertook the work of reform single-handed.

Outbreak of Hostilities.

The Chinese representative in Seoul threw his whole weight into the scale against the success of these reforms. But the determining cause of rupture was in itself a belligerent operation. China's troops had been sent originally for the purpose of quelling the Tonghak rebellion. But the rebellion having died of inanition before the landing of the troops, their services were not required. Nevertheless China kept them in Korea, her declared reason for doing so being the presence of a Japanese military force. Throughout the subsequent negotiations the Chinese forces lay in an entrenched camp at Asan, while the Japanese occupied Seoul. An attempt on China's part to send reinforcements could be construed only as an unequivocal declaration of resolve to oppose Japan's proceedings by force of arms. Nevertheless China not only despatched troops by sea to strengthen the camp at Asan, but also sent an army overland across Korea's northern frontier. At this stage an act of war occurred. Three Chinese men-of-war, convoying a transport with 1200 men encountered and fired on three Japanese cruisers. One of the Chinese ships was taken; another was so shattered that she had to be beached and abandoned; the third escaped in a dilapidated condition; and the transport, refusing to surrender, was sunk. This happened on the 25th of July 1894, and an open declaration of war was made by each empire six days later.

Remote Origin of the Conflict.

From the moment when Japan applied herself to break away from Oriental traditions, and to remove from her limbs the fetters of Eastern conservatism, it was inevitable that a widening gulf should gradually grow between herself and China. The war of 1894 was really a contest between Japanese progress and Chinese stagnation. To secure Korean immunity from foreign—especially Russian—aggression was of capital importance to both empires. Japan believed that such security could be attained by introducing into Korea the civilization which had contributed so signally to the development of her own strength and resources. China thought that she could guarantee it without any departure from old-fashioned methods, and by the same process of capricious protection which had failed so signally in the cases of Annam, Tongking, Burma and Siam. The issue really at stake was whether Japan should be suffered to act as the Eastern propagandist of Western progress, or whether her efforts in that cause should be held in check by Chinese conservatism.

Events of the War.

The war itself was a succession of triumphs for Japan. Four days after the first naval encounter she sent from Seoul a column of troops who routed the Chinese entrenched at Asan. Many of the fugitives effected their escape to Phyong-yang, a town on the Taidong River, offering excellent facilities for defence, and historically interesting as the place where a Japanese army of invasion had its first encounter with Chinese troops in 1592. There the Chinese assembled a force of 17,000 men, and made leisurely preparations for a decisive contest. Forty days elapsed before the Japanese columns converged upon Phyong-yang, and that interval was utilized by the Chinese to throw up parapets, mount Krupp guns and otherwise strengthen their position. Moreover, they were armed with repeating rifles, whereas the Japanese had only single-loaders, and the ground offered little cover for an attacking force. In such circumstances, the advantages possessed by the defence ought to have been wellnigh insuperable; yet a day's fighting sufficed to carry all the positions, the assailants' casualties amounting to less than 700 and the defenders losing 6000 in killed and wounded. This brilliant victory was the prelude to an equally conspicuous success at sea. For on the 17th of September, the very day after the battle at Phyong-yang, a great naval fight took place near the mouth of the Yalu River, which forms the northern boundary of Korea. Fourteen Chinese warships and six torpedo-boats were returning to home ports after convoying a fleet of transports to the Yalu, when they encountered eleven Japanese men-of-war cruising in the Yellow Sea. Hitherto the Chinese had sedulously avoided a contest at sea. Their fleet included two armoured battleships of over 7000 tons displacement, whereas the biggest vessels on the Japanese side were belted cruisers of only 4000 tons. In the hands of an admiral appreciating the value of sea power, China's naval force would certainly have been led against Japan's maritime communications, for a successful blow struck there must have put an end to the Korean campaign. The Chinese, however, failed to read history. They employed their war-vessels as convoys only, and, when not using them for that purpose, hid them in port. Everything goes to show that they would have avoided the battle off the Yalu had choice been possible, though when forced to fight they fought bravely. Four of their ships were sunk, and the remainder escaped to Wei-hai-wei, the vigour of the Japanese pursuit being greatly impaired by the presence of torpedo-boats in the retreating squadron.

The Yalu victory opened the over-sea route to China. Japan could now strike at Talien, Port Arthur, and Wei-hai-wei, naval stations on the Liaotung and Shantung peninsulas, where powerful permanent fortifications, built after plans prepared by European experts and armed with the best modern weapons, were regarded as almost impregnable. They fell before the assaults of the Japanese troops as easily as the comparatively rude fortifications at Phyong-yang had fallen. The only resistance of a stubborn character was made by the Chinese fleet at Wei-hai-wei; but after the whole squadron of torpedo-craft had been destroyed or captured as they attempted to escape, and after three of the largest vessels had been sunk at their moorings by Japanese torpedoes, and one by gun-fire, the remaining ships surrendered, and their brave commander, Admiral Ting, committed suicide. This ended the war. It had lasted seven and a half months, during which time Japan put into the field five columns, aggregating about 120,000 of all arms. One of these columns marched northward from Seoul, won the battle of Phyong-yang, advanced to the Yalu, forced its way into Manchuria, and moved towards Mukden by Feng-hwang, fighting several minor engagements, and conducting the greater part of its operations amid deep snow in midwinter. The second column diverged westwards from the Yalu, and, marching through southern Manchuria, reached Hai-cheng, whence it advanced to the capture of Niuchwang and Ying-tse-kow. The third landed on the Liaotung peninsula, and, turning southwards, carried Talien and Port Arthur by assault. The fourth moved up the Liaotung peninsula, and, having seized Kaiping, advanced against Ying-tse-kow, where it joined hands with the second column. The fifth crossed from Port Arthur to Wei-hai-wei, and captured the latter. In all these operations the total Japanese casualties were 1005 killed and 4922 wounded—figures which sufficiently indicate the inefficiency of the Chinese fighting. The deaths from disease totalled 16,866, and the total monetary expenditure was £20,000,000 sterling.

Conclusion of Peace.

The Chinese government sent Li Hung-chang, viceroy of Pechili and senior grand secretary of state, and Li Ching-fong, to discuss terms of peace with Japan, the latter being represented by Marquis (afterwards Prince) Itō and Count Mutsu, prime minister and minister for foreign affairs, respectively. A treaty was signed at Shimonoseki on the 17th of April 1895, and subsequently ratified by the sovereigns of the two empires. It declared the absolute independence of Korea; ceded to Japan the part of Manchuria lying south of a line drawn from the mouth of the river Anping to the mouth of the Liao, through Feng-hwang, Hai-cheng and Ying-tse-kow, as well as the islands of Formosa and the Pescadores; pledged China to pay an indemnity of 200,000,000 taels; provided for the occupation of Wei-hai-wei by Japan pending payment of the indemnity; secured some additional commercial privileges, such as the opening of four new places to foreign trade and the right of foreigners to engage in manufacturing enterprises in China, and provided for the conclusion of a treaty of commerce and amity between the two empires, based on the lines of China's treaties with Occidental powers.

Foreign Interference.

No sooner was this agreement ratified than Russia, Germany and France presented a joint note to the Tōkyō government, recommending that the territories ceded to Japan on the mainland of China should not be permanently occupied, as such a proceeding would be detrimental to peace. The recommendation was couched in the usual terms of diplomatic courtesy, but everything indicated that its signatories were prepared to enforce their advice by an appeal to arms. Japan found herself compelled to comply. Exhausted by the Chinese campaign, which had drained her treasury, consumed her supplies of warlike material, and kept her squadrons constantly at sea for eight months, she had no residue of strength to oppose such a coalition. Her resolve was quickly taken. The day that saw the publication of the ratified treaty saw also the issue of an Imperial rescript in which the mikado, avowing his unalterable devotion to the cause of peace, and recognizing that the counsel offered by the European states was prompted by the same sentiment, "yielded to the dictates of magnanimity, and accepted the advice of the three Powers." The Japanese people were shocked by this incident. They could understand the motives influencing Russia and France, for it was evidently natural that the former should desire to exclude warlike and progressive people like the Japanese from territories contiguous to her borders, and it was also natural that France should remain true to her alliance with Russia. But Germany, wholly uninterested in the ownership of Manchuria, and by profession a warm friend of Japan, seemed to have joined in robbing the latter of the fruits of her victory simply for the sake of establishing some shadowy title to Russia's goodwill. It was not known until a later period that the German emperor entertained profound apprehensions about the "yellow peril," an irruption of Oriental hordes into the Occident, and held it a sacred duty to prevent Japan from gaining a position which might enable her to construct an immense military machine out of the countless millions of China.

Chinese Crisis of 1900.

Japan's third expedition over-sea in the Meiji era had its origin in causes which belong to the history of China (*q.v.*). In the second half of 1900 an anti-foreign and anti-dynastic rebellion, breaking out in Shantung, spread to the metropolitan province of Pechili, and resulted in a situation of extreme peril for the foreign communities of Tientsin and Peking. It was impossible for any European power, or for the United States, to organize sufficiently prompt measures of relief. Thus the eyes of the world turned to Japan, whose proximity to the scene of disturbance rendered intervention comparatively easy for her. But Japan hesitated. Knowing now with what suspicion and distrust the development of her resources and the growth of her military strength were regarded by some European peoples, and aware that she had been admitted to the comity of Western nations on sufferance, she shrank, on the one hand, from seeming to grasp at an opportunity for armed display, and, on the other, from the solecism of obtrusiveness in the society of strangers. Not until Europe and America made it quite plain that they needed and desired her aid did she send a division (21,000) men to Pechili. Her troops played a fine part in the subsequent expedition for the relief of Peking, which had to be approached in midsummer under very trying conditions. Fighting side by side with European and American soldiers, and under the eyes of competent military critics, the Japanese acquitted themselves in such a manner as to establish a high military reputation. Further, after the relief of Peking they withdrew a moiety of their forces, and that step, as well as their unequivocal co-operation with Western powers in the subsequent negotiations, helped to show the injustice of the suspicions with which they had been regarded.

War with Russia.

From the time (1895) when Russia, with the co-operation of Germany and France, dictated to Japan a cardinal alteration of the Shimonoseki treaty, Japanese statesmen seem to have concluded that their country must one day cross swords with the great northern power. Not a few European and American publicists shared that view. But the vast majority, arguing that the little Eastern empire would never invite annihilation by such an encounter, believed that sufficient forbearance to avert serious trouble would always be forthcoming on Japan's side. Yet when the geographical and historical situation was carefully considered, little hope of an ultimately peaceful settlement presented itself.

Japan along its western shore, Korea along its southern and eastern, and Russia along the eastern coast of its maritime province, are washed by the Sea of Japan. The communications between the sea and the Pacific Ocean are practically two only. One is on the north-east, namely, Tsugaru Strait; the other is on the south, namely, the channel between the extremity of the Korean peninsula and the Japanese island of the nine provinces. Tsugaru Strait is entirely under Japan's control. It is between her main island and her island of Yezo, and in case of need she can close it with mines. The channel between the southern extremity of Korea and Japan has a width of 102 m. and would therefore be a fine open sea-way were it free from islands. But almost mid-way in this channel lie the twin islands of Tsushima, and the space of 56 m. that separates them from Japan is narrowed by another island, Iki. Tsushima and Iki belong to the Japanese empire. The former has some exceptionally good harbours, constituting a naval base from which the channel on either side could easily be sealed. Thus the avenues from the Pacific Ocean to the Sea of Japan are controlled by the Japanese empire. In other words, access to the Pacific from Korea's eastern and southern coasts and access to the Pacific from Russia's maritime province depend upon Japan's goodwill. So far as Korea was concerned this question mattered little, it being her fate to depend upon the goodwill of Japan in affairs of much greater importance. But with Russia the case was different. Vladivostok, which until recent times was her principal port in the Far East, lies at the southern extremity of the maritime province; that is to say, on the north-western shore of the Japan Sea. It was therefore necessary for Russia that freedom of passage by the Tsushima channel should be secured, and to secure it one of two things was essential, namely, either that she herself should possess a fortified port on the Korean side, or that Japan should be bound neither to acquire such a port nor to impose any restriction upon the navigation of the strait. To put the matter briefly, Russia must either acquire a strong foothold for herself in southern Korea, or contrive that Japan should not acquire one. There was here a strong inducement for Russian aggression in Korea.

Russia's eastward movement through Asia has been strikingly illustrative of her strong craving for free access to southern seas and of the impediments she had experienced in gratifying that wish. An irresistible impulse had driven her oceanward. Checked again and again in her attempts to reach the Mediterranean, she set out on a five-thousand-miles march of conquest right across the vast Asiatic continent towards the Pacific. Eastward of Lake Baikal she found her line of least resistance along the Amur, and when, owing to the restless perseverance of Muravief, she reached the mouth of that great river, the acquisition of Nikolayevsk for a naval basis was her immediate reward. But Nikolayevsk could not possibly satisfy her. Situated in an inhospitable region far away from all the main routes of the world's commerce, it offered itself only as a stepping-stone to further acquisitions. To push southward from this new port became an immediate object to Russia. There lay an obstacle in the way, however; the long strip of sea-coast from the mouth of the Amur to the Korean frontier—an area then called the Usuri region because the Usuri forms its western boundary—belonged to China, and she, having conceded much to Russia in the matter of the Amur, showed no disposition to make further concessions in the matter of the Usuri. In the presence of menaces, however, she agreed that the region should be regarded as common property pending a convenient opportunity for clear delimitation. That opportunity came very soon. Seizing the moment (1860) when China had been beaten to her knees by England and France, Russia secured final cession of the Usuri region, which now became the maritime province of Siberia. Then Russia shifted her naval base on the Pacific from Nikolayevsk to Vladivostok. She gained ten degrees in a southerly direction.

From the mouth of the Amur, where Nikolayevsk is situated, to the southern shore of Korea there rests on the coast of eastern Asia an arch of islands having at its northern point Sakhalin and at its southern Tsushima, the keystone of the arch being the main island of Japan. This arch embraces the Sea of Japan and is washed on its convex side by the Pacific Ocean. Immediately after the transfer of Russia's naval base from Nikolayevsk to Vladivostok, an attempt was made to obtain possession of the southern point of the arch, namely, Tsushima. A Russian man-of-war proceeded thither and quietly began to establish a settlement, which would soon have constituted a title of ownership had not Great Britain interfered. The Russians saw that Vladivostok, acquired at the cost of so much toil, would be comparatively useless unless from the sea on whose shore it was situated an avenue to the Pacific could be opened, and they therefore tried to obtain command of the Tsushima channel. Immediately after reaching the mouth of the Amur the same instinct had led them to begin the colonization of Sakhalin. The axis of this long narrow island is inclined at a very acute angle to the Usuri region, which its northern extremity almost touches, while its southern is separated from Yezo by the strait of La Pérouse. But in Sakhalin the Russians found Japanese subjects. In fact the island was a part of the Japanese empire. Resorting, however, to the Usuri fiction of joint occupation, they succeeded by 1875 in transferring the whole of Sakhalin to Russia's dominion. Further encroachments upon Japanese territory could not be lightly essayed, and the Russians held their hands. They had been trebly checked: checked in trying to push southward along the coast of the mainland; checked in trying to secure an avenue from Vladivostok to the Pacific; and checked in their search for an ice-free port, which definition Vladivostok did not fulfil. Enterprise in the direction of Korea seemed to be the only hope of saving the maritime results of the great Trans-Asian march.

Was Korea within safe range of such enterprises? Everything seemed to answer in the affirmative. Korea had all the qualifications desired by an aggressor. Her people were unprogressive, her resources undeveloped, her self-defensive capacities insignificant, her government corrupt. But she was a tributary of China, and China had begun to show some tenacity in protecting the integrity of her buffer states. Besides, Japan was understood to have pretensions with regard to Korea. On the whole, therefore, the problem of carrying to full fruition the work of Muravief and his lieutenants demanded strength greater than Russia could exercise without some line of communications supplementing the Amur waterway and the long ocean route. Therefore she set about the construction of a railway across Asia.

The Amur being the boundary of Russia's east Asian territory, this railway had to be carried along its northern bank where many engineering and economic obstacles presented themselves. Besides, the river, from an early stage in its course, makes a huge semicircular sweep northward, and a railway following its bank to Vladivostok must make the same détour. If, on the contrary, the road could be carried over the diameter of the semicircle, it would be a straight and therefore shorter line, technically easier and economically better. The diameter, however, passed through Chinese territory, and an excuse for extorting China's permission was not in sight. Russia therefore proceeded to build each end of the road, deferring the construction of the Amur section for the moment. She had not waited long when, in 1894, war broke out between China and Japan, and the latter, completely victorious, demanded as the price of peace the southern littoral of Manchuria from the Korean boundary to the Liaotung peninsula at the entrance to the Gulf of Pechili. This was a crisis in Russia's career. She saw that her maritime extension could never get nearer to the Pacific than Vladivostok were this claim of Japan's established. For the proposed arrangement would place the littoral of Manchuria in Japan's direct occupation and the littoral of Korea in her constructive control, since not only had she fought to rescue Korea from Chinese suzerainty, but also her object in demanding a slice of the Manchurian coast-line was to protect Korea against aggression from the north; that is to say, against aggression from Russia. Muravief's enterprise had carried his country first to the mouth of the Amur and thence southward along the coast to Vladivostok and to Possiet Bay at the north-eastern extremity of Korea. But it had not given to Russia free access to the Pacific, and now she was menaced with a perpetual barrier to that access, since the whole remaining coast of east Asia as far as the Gulf of Pechili was about to pass into Japan's possession or under her domination.

Then Russia took an extraordinary step. She persuaded Germany and France to force Japan out of Manchuria. It is not to be supposed that she frankly exposed her own aggressive designs and asked for assistance to prosecute them. Neither is it to be supposed that France and Germany were so curiously deficient in perspicacity as to overlook those designs. At all events these three great powers served on Japan a notice to quit, and Japan, exhausted by her struggle with China, had no choice but to obey.

The notice was accompanied by an *exposé* of reasons. Its signatories said that Japan's tenure of the Manchurian littoral would menace the security of the Chinese capital, would render the independence of Korea illusory, and would constitute an obstacle to the peace of the Orient.

By way of saving the situation in some slight degree Japan sought from China a guarantee that no portion of Manchuria should thereafter be leased or ceded to a foreign state. But France warned Japan that to press such a demand would offend Russia, and Russia declared that, for her part, she had no intention of trespassing in Manchuria. Japan, had she been in a position to insist on the guarantee, would also have been in a position to disobey the mandate of the three powers. Unable to do either the one or the other, she quietly stepped out of Manchuria, and proceeded to double her army and treble her navy.

As a reward for the assistance nominally rendered to China in this matter, Russia obtained permission in Peking to divert her Trans-Asian railway from the huge bend of the Amur to the straight line through Manchuria. Neither Germany nor France received any immediate recompense. Three years later, by way of indemnity for the murder of two missionaries by a mob, Germany seized a portion of the province of Shantung. Immediately, on the principle that two wrongs make a right, Russia obtained a lease of the Liaotung peninsula, from which she had driven Japan in 1895. This act she followed by extorting from China permission to construct a branch of the Trans-Asian railway through Manchuria from north to south.

Russia's maritime aspirations had now assumed a radically altered phase. Instead of pushing southward from Vladivostok and Possiet Bay along the coast of Korea, she had suddenly leaped the Korean peninsula and found access to the Pacific in Liaotung. Nothing was wanting to establish her as practical mistress of Manchuria except a plausible excuse for garrisoning the place. Such an excuse was furnished by the Boxer rising in 1900. Its conclusion saw her in military occupation of the whole region, and she might easily have made her occupation permanent by prolonging it until peace and order should have been fully restored. But here she fell into an error of judgment. Imagining that the Chinese could be persuaded or intimidated to any concession, she proposed a convention virtually recognizing her title to Manchuria.

Japan watched all these things with profound anxiety. If there were any reality in the dangers which Russia, Germany and France had declared to be incidental to Japanese occupation of a part of Manchuria, the same dangers must be doubly incidental to Russian occupation of the whole of Manchuria—the security of the Chinese capital would be threatened, and an obstacle would be created to the permanent peace of the East. The independence of Korea was an object of supreme solicitude to Japan. Historically she held towards the little state a relation closely resembling that of suzerain, and though of her ancient conquests nothing remained except a settlement at Fusan on the southern coast, her national sentiment would have been deeply wounded by any foreign aggression in the peninsula. It was to establish Korean independence that she waged war with China in 1894; and her annexation of the Manchurian littoral adjacent to the Korean frontier, after the war, was designed to secure that independence, not to menace it as the triple alliance professed to think. But if Russia came into possession of all Manchuria, her subsequent absorption of Korea would be almost inevitable. For the consideration set forth above as to Vladivostok's maritime avenues would then acquire absolute cogency. Manchuria is larger than France and the United Kingdom lumped together. The addition of such an immense area to Russia's east Asiatic dominions, together with its littoral on the Gulf of Pechili and the Yellow Sea, would necessitate a corresponding expansion of her naval forces in the Far East. With the one exception of Port Arthur, however, the Manchurian coast does not offer any convenient naval base. It is only in the splendid harbours of southern Korea that such bases can be found. Moreover, there would be an even stronger motive impelling Russia towards Korea. Neither the Usuri region nor the Manchurian littoral possesses so much as one port qualified to satisfy her perennial longing for free access to the ocean in a temperate zone. Without Korea, then, Russia's east Asian expansion, though it added huge blocks of territory to her dominions, would have been commercially incomplete and strategically defective.

If it be asked why, apart from history and national sentiment, Japan should object to a Russian Korea, the answer is, first, because there would thus be planted almost within cannon-shot of her shores a power of enormous strength and insatiable ambition; secondly, because, whatever voice in Manchuria's destiny Russia derived from her railway, the same voice in Korea's destiny was possessed by Japan as the sole owner of railways in the peninsula; thirdly, that whereas Russia had an altogether insignificant share in the foreign commerce of Korea and scarcely ten bona-fide settlers, Japan did the greater part of the over-sea trade and had tens of thousands of settlers; fourthly, that if Russia's dominions stretched uninterruptedly from the Sea of Okhotsk to the Gulf of Pechili, her ultimate absorption of north China would be as certain as sunrise; and fifthly, that such domination and such absorption would involve the practical closure of all that immense region to Japanese commerce and industry as well as to the commerce and industry of every Western nation except Russia. This last proposition did not rest solely on the fact that to oppose artificial barriers to free competition is Russia's sole hope of utilizing to her own benefit any commercial opportunities brought within her reach. It rested also on the fact that Russia had objected to foreign settlements at the marts recently opened by treaty with China to American and Japanese subjects. Without settlements, trade at those marts would be impossible, and thus Russia had constructively announced that there should be no trade but Russian, if she could prevent it.

Against such dangers Japan would have been justified in adopting any measure of self-protection. She had foreseen them for six years, and had been strengthening herself to avert them. But she wanted peace. She wanted to develop her material resources and to accumulate some measure of wealth, without which she must remain insignificant among the nations. Two pacific devices offered, and she adopted them both. Russia, instead of trusting time to consolidate her tenure of Manchuria, had made the mistake of pragmatically importuning China for a conventional title. If then Peking could be strengthened to resist this demand, some arrangement of a distinctly terminable nature might be made. The United States, Great Britain and Japan, joining hands for that purpose, did succeed in so far stiffening China's backbone that her show of resolution finally induced Russia to sign a treaty pledging herself to withdraw her troops from Manchuria in three instalments, each step of evacuation to be accomplished by a fixed date. That was one of the pacific devices. The other suggested itself in connexion with the new commercial treaties which China had promised to negotiate in the sequel of the Boxer troubles. In these documents clauses provided for the opening of three places in Manchuria to foreign trade. It seemed a reasonable hope that, having secured commercial access to Manchuria by covenant with its sovereign, China, the powers would not allow Russia arbitrarily to restrict their privileges. It seemed also a reasonable hope that Russia, having solemnly promised to evacuate Manchuria at fixed dates, would fulfil her engagement.

The latter hope was signally disappointed. When the time came for evacuation, Russia behaved as though no promise had ever been given. She proposed wholly new conditions, which would have strengthened her grasp of Manchuria instead of loosening it. China being powerless to offer any practical protest, and Japan's interests ranking next in order of importance, the Tōkyō government approached Russia direct. They did not ask for anything that could hurt her pride or injure her position. Appreciating fully the economical status she had acquired in Manchuria by large outlays of capital, they offered to recognize that status, provided that Russia would extend similar recognition to Japan's status in Korea, would promise, in common with Japan, to respect the sovereignty and the territorial integrity of China and Korea, and would be a party to a mutual engagement that all nations should have equal industrial and commercial opportunities in Manchuria and the Korean peninsula. In a word, they invited Russia to subscribe the policy enunciated by the United States and Great Britain, the policy of the open door and of the integrity of the Chinese and Korean empires.

Thus commenced a negotiation which lasted five and a half months. Japan gradually reduced her demands to a minimum. Russia never made the smallest appreciable concession. She refused to listen to Japan for one moment about Manchuria. Eight years previously Japan had been in military possession of Manchuria, and Russia with the assistance of Germany and France had expelled her for reasons which concerned Japan incomparably more than they concerned any of the three powers—the security of the Chinese capital, the independence of Korea, the peace of the East. Now, Russia had the splendid assurance to declare by implication that none of these things concerned Japan at all. The utmost she would admit was Japan's partial right to be heard about Korea. And at the same time she herself commenced in northern Korea a series of aggressions, partly perhaps to show her potentialities, partly by way of counter-irritant. That was not all. Whilst she studiously deferred her answers to Japan's proposals and protracted the negotiations to an extent which was actually contumelious, she hastened to send eastward a big fleet of war-ships and a new army of soldiers. It was impossible for the dullest politician to mistake her purpose. She intended to yield nothing, but to prepare such a parade of force that her obduracy would command submission. The only alternatives for Japan were war or total and permanent effacement in Asia. She chose war, and in fighting it she fought the battle of free and equal opportunities for all without undue encroachment upon the sovereign rights or territorial integrity of China or Korea, against a military dictatorship, a programme of ruthless territorial aggrandizement and a policy of selfish restrictions.

The Results of the War.

The details of the great struggle that ensued are given elsewhere (see Russo-Japanese War). After the battle of Mukden the belligerents found themselves in a position which must either prelude another stupendous effort on both sides or be utilized for the purpose of peace negotiations. At this point the president of the United States of America intervened in the interests of humanity, and on the 9th of June 1905 instructed the United States' representative in Tōkyō to urge that the Japanese government should open direct negotiations with Russia, an exactly corresponding note being simultaneously sent to the Russian government through the United States' representative in St Petersburg. Japan's reply was made on the 10th of June. It intimated frank acquiescence, and Russia lost no time in taking a similar step. Nevertheless two months elapsed before the plenipotentiaries of the belligerents met, on the 10th of August, at Portsmouth, New Hampshire, U.S.A. Russia sent M. (afterwards Count) de Witte and Baron Rosen; Japan, Baron (afterwards Count) Komura, who had held the portfolio of foreign affairs throughout the war, and Mr. (afterwards Baron) Takahira. In entering this conference, Japanese statesmen, as was subsequently known, saw clearly that a great part of the credit accruing to them for their successful conduct of the war would be forfeited in the sequel of the negotiations. For the people of Japan had accustomed themselves to expect that Russia would assuredly recoup the expenses incurred by their country in the contest, whereas the cabinet in Tōkyō understood well that to look for payment of indemnity by a great state whose territory had not been invaded effectively nor its existence menaced must be futile. Nevertheless, diplomacy required that this conviction should be concealed, and thus Russia carried to the conference a belief that the financial phase of the discussion would be crucial, while, at the same time, the Japanese nation reckoned fully on an indemnity of 150 millions sterling. Baron Komura's mandate was, however, that the only radically essential terms were those formulated by Japan prior to the war. She must insist on securing the ends for which she had fought, since she believed them to be indispensable to the peace of the Far East, but she would not demand anything more. The Japanese plenipotentiary, therefore, judged it wise to marshal his terms in the order of their importance, leaving his Russian colleague to imagine, as he probably would, that the converse method had been adopted, and that everything preliminary to the questions of finance and territory was of minor consequence. The negotiations, commencing on the 10th of August, were not concluded until the 5th of September, when a treaty of peace was signed. There had been a moment when the onlooking world believed that unless Russia agreed to ransom the island of Sakhalin by paying to Japan a sum of 120 millions sterling, the conference would be broken off; nor did such an exchange seem unreasonable, for were Russia expelled from the northern part of Sakhalin, which commands the estuary of the Amur River, her position in Siberia would have been compromised. But the statesmen who directed Japan's affairs were not disposed to make any display of earth-hunger. The southern half of Sakhalin had originally belonged to Japan and had passed into Russia's possession by an arrangement which the Japanese nation strongly resented. To recover that portion of the island seemed, therefore, a legitimate ambition. Japan did not contemplate any larger demand, nor did she seriously insist on an indemnity. Therefore the negotiations were never in real danger of failure. The treaty of Portsmouth recognized Japan's "paramount political, military and economic interests" in Korea; provided for the simultaneous evacuation of Manchuria by the contracting parties; transferred to Japan the lease of the Liaotung peninsula held by Russia from China together with the Russian railways south of Kwang-Cheng-tsze and all collateral mining or other privileges; ceded to Japan the southern half of Sakhalin, the 50th parallel of latitude to be the boundary between the two parts; secured fishing rights for Japanese subjects along the coasts of the seas of Japan, Okhotsk and Bering; laid down that the expenses incurred by the Japanese for the maintenance of the Russian prisoners during the war should be reimbursed by Russia, less the outlays made by the latter on account of Japanese prisoners—by which arrangement Japan obtained a payment of some 4 millions sterling—and provided that the contracting parties, while withdrawing their military forces from Manchuria, might maintain guards to protect their respective railways, the number of such guards not to exceed 15 per kilometre of line. There were other important restrictions: first, the contracting parties were to abstain from taking, on the Russo-Korean frontier, any military measures which might menace the security of Russian or Korean territory; secondly, the two powers pledged themselves not to exploit the Manchurian railways for strategic purposes; and thirdly, they promised not to build on Sakhalin or its adjacent islands any fortifications or other similar military works, or to take any military measures which might impede the free navigation of the straits of La Pérouse and the Gulf of Tartary. The above provisions concerned the two contracting parties only. But China's interests also were considered. Thus it was agreed to "restore entirely and completely to her exclusive administration" all portions of Manchuria then in the occupation, or under the control, of Japanese or Russian troops, except the leased territory; that her consent must be obtained for the transfer to Japan of the leases and concessions held by the Russians in Manchuria; that the Russian government would disavow the possession of "any territorial advantages or preferential or exclusive concessions in impairment of Chinese sovereignty or inconsistent with the principle of equal opportunity in Manchuria"; and that Japan and Russia "engaged reciprocally not to obstruct any general measures common to all countries which China might take for the development of the commerce and industry of Manchuria." This distinction between the special interests of the contracting parties and the interests of China herself as well as of foreign nations generally is essential to clear understanding of a situation which subsequently attracted much attention. From the time of the opium war (1857) to the Boxer rising (1900) each of the great Western powers struggled for its own hand in China, and each sought to gain for itself exclusive concessions and privileges with comparatively little regard for the interests of others, and with no regard whatever for China's sovereign rights. The fruits of this period were: permanently ceded territories (Hong-Kong and Macao); leases temporarily establishing foreign sovereignty in various districts (Kiaochow, Wei-hai-wei and Kwang-chow); railway and mining concessions; and the establishment of settlements at open ports where foreign jurisdiction was supreme. But when, in 1900, the Boxer rising forced all the powers into a common camp, they awoke to full appreciation of a principle which had been growing current for the past two or three years, namely, that concerted action on the lines of maintaining China's integrity and securing to all alike equality of opportunity and a similarly open door, was the only feasible method of preventing the partition of the Chinese Empire and averting a clash of rival interests which might have disastrous results. This, of course, did not mean that there was to be any abandonment of special privileges already acquired or any surrender of existing concessions. The arrangement was not to be retrospective in any sense. Vested interests were to be strictly guarded until the lapse of the periods for which they had been granted, or until the maturity of China's competence to be really autonomous. A curious situation was thus created. International professions of respect for China's sovereignty, for the integrity of her empire and for the enforcement of the open door and equal opportunity, coexisted with legacies from an entirely different past. Russia endorsed this new policy, but not unnaturally declined to abate any of the advantages previously enjoyed by her in Manchuria. Those advantages were very substantial. They included a twenty-five years' lease—with provision for renewal—of the Liaotung peninsula, within which area of 1220 sq. m. Chinese troops might not penetrate, whereas Russia would not only exercise full administrative authority, but also take military and naval action of any kind; they included the creation of a neutral territory in the immediate north of the former and still more extensive, which should remain under Chinese administration, but where neither Chinese nor Russian troops might enter, nor might China, without Russia's consent, cede land, open trading marts or grant concessions to any third nationality; and they included the right to build some 1600 m. of railway (which China would have the opportunity of purchasing at cost price in the year 1938 and would be entitled to receive gratis in 1982), as well as the right to hold extensive zones on either side of the railway, to administer these zones in the fullest sense, and to work all mines lying along the lines. Under the Portsmouth treaty these advantages were transferred to Japan by Russia, the railway, however, being divided so that only the portion (521½ m.) to the south of Kwang-Cheng-tsze fell to Japan's share, while the portion (1077 m.) to the north of that place remained in Russia's hands. China's consent to the above transfers and assignments was obtained in a treaty signed at Peking on the 22nd of December 1905. Thus Japan came to hold in Manchuria a position somewhat contradictory. On the one hand, she figured as the champion of the Chinese Empire's integrity and as an exponent of the new principle of equal opportunity and the open door. On the other, she appeared as the legatee of many privileges more or less inconsistent with that principle. But, at the same time, nearly all the great powers of Europe were similarly circumstanced. In their cases also the same incongruity was observable between the newly professed policy and the aftermath of the old practice. It was scarcely to be expected that Japan alone should make a large sacrifice on the altar of a theory to which no other state thought of yielding any retrospective obedience whatever. She did, indeed, furnish a clear proof of deference to the open-door doctrine, for instead of reserving the railway zones to her own exclusive use, as she was fully entitled to do, she sought and obtained from China a pledge to open to foreign trade 16 places within those zones. For the rest, however, the inconsistency between the past and the present, though existing throughout the whole of China, was nowhere so conspicuous as in the three eastern provinces (Manchuria); not because there was any real difference of degree, but because Manchuria had been the scene of the greatest war of modern times; because that war had been fought by Japan in the cause of the new policy, and because the principles of the equally open door and of China's integrity had been the main bases of the Portsmouth treaty, of the Anglo-Japanese alliance, and of the subsequently concluded *ententes* with France and Russia. In short, the world's eyes were fixed on Manchuria and diverted from China proper, so that every act of Japan was subjected to an exceptionally rigorous scrutiny, and the nations behaved as though they expected her to live up to a standard of almost ideal altitude. China's mood, too, greatly complicated the situation. She had the choice between two moderate and natural courses: either to wait quietly until the various concessions granted by her to foreign powers in the evil past should lapse by maturity, or to qualify herself by earnest reforms and industrious development for their earlier recovery. Nominally she adopted the latter course, but in reality she fell into a mood of much impatience. Under the name of a "rights-recovery campaign" her people began to protest vehemently against the continuance of any conditions which impaired her sovereignty, and as this temper coloured her attitude towards the various questions which inevitably grew out of the situation in Manchuria, her relations with Japan became somewhat strained in the early part of 1909.

Japan in Korea after the War with Russia.

Having waged two wars on account of Korea, Japan emerged from the second conflict with the conviction that the policy of maintaining the independence of Korea must be modified, and that since the identity of Korean and Japanese, interests in the Far East and the paramount character of Japanese interests in Korea would not permit Japan to leave Korea to the care of any third power, she must assume the charge herself. Europe and America also recognized that view of the situation, and consented to withdraw their legations from Seoul, thus leaving the control of Korean foreign affairs entirely in the hands of Japan, who further undertook to assume military direction in the event of aggression from without or disturbance from within. But in the matter of internal administration she continued to limit herself to advisory supervision. Thus, though a Japanese resident-general in Seoul, with subordinate residents throughout the provinces, assumed the functions hitherto discharged by foreign representatives and consuls, the Korean government was merely asked to employ Japanese experts in the position of counsellors, the right to accept or reject their counsels being left to their employers. Once again, however, the futility of looking for any real reforms under this optional system was demonstrated. Japan sent her most renowned statesman, Prince Ito, to discharge the duties of resident-general; but even he, in spite of profound patience and tact, found that some less optional methods must be resorted to. Hence on the 24th of July 1907 a new agreement was signed, by which the resident-general acquired initiative as well as consultative competence to enact and enforce laws and ordinances, to appoint and remove Korean officials, and to place capable Japanese subjects in the ranks of the administration. That this constituted a heavy blow to Korea's independence could not be gainsaid. That it was inevitable seemed to be equally obvious. For there existed in Korea nearly all the worst abuses of medieval systems. The administration of justice depended solely on favour or interest. The police contributed by corruption and incompetence to the insecurity of life and property. The troops were a body of useless mercenaries. Offices being allotted by sale, thousands of incapables thronged the ranks of the executive. The emperor's court was crowded by diviners and plotters of all kinds, male and female. The finances of the throne and those of the state were hopelessly confused. There was nothing like an organized judiciary. A witness was in many cases considered *particeps criminis*; torture was commonly employed to obtain evidence, and defendants in civil cases were placed under arrest. Imprisonment meant death or permanent disablement for a man of small means. Flogging so severe as to cripple, if not to kill, was a common punishment; every major offence from robbery upward was capital, and female criminals were frequently executed by administering shockingly painful poisons. The currency was in a state of the utmost confusion. Extreme corruption and extortion were practised in connexion with taxation. Finally, while nothing showed that the average Korean lacked the elementary virtue of patriotism, there had been repeated proofs that the safety and independence of the empire counted for little in the estimates of political intriguers. Japan must either step out of Korea altogether or effect drastic reforms there. She necessarily chose the latter alternative, and the things which she accomplished between the beginning of 1906 and the close of 1908 may be briefly described as the elaboration of a proper system of taxation; the organization of a staff to administer annual budgets; the re-assessment of taxable property; the floating of public loans for productive enterprises; the reform of the currency; the establishment of banks of various kinds, including agricultural and commercial; the creation of associations for putting bank-notes into circulation; the introduction of a warehousing system to supply capital to farmers; the lighting and buoying of the coasts; the provision of posts, telegraphs, roads and railways; the erection of public buildings; the starting of various industrial enterprises (such as printing, brick-making, forestry and coal-mining); the laying out of model farms; the beginning of cotton cultivation; the building and equipping of an industrial training school; the inauguration of sanitary works; the opening of hospitals and medical schools; the organization of an excellent educational system; the construction of waterworks in several towns; the complete remodelling of the central government; the differentiation of the court and the executive, as well as of the administration and the judiciary; the formation of an efficient body of police; the organization of law courts with a majority of Japanese jurists on the bench; the enactment of a new penal code; drastic reforms in the taxation system. In the summer of 1907 the resident-general advised the Throne to disband the standing army as an unserviceable and expensive force. The measure was doubtless desirable, but the docility of the troops had been overrated. Some of them resisted vehemently, and many became the nucleus of an insurrection which lasted in a desultory manner for nearly two years; cost the lives of 21,000 insurgents and 1300 Japanese; and entailed upon Japan an outlay of nearly a million sterling. Altogether Japan was 15 millions sterling out of pocket on Korea's account by the end of 1909. She had also lost the veteran statesman Prince Ito, who was assassinated at Harbin by a Korean fanatic on the 26th of October 1909. Finally an end was put to an anomalous situation by the annexation of Korea to Japan on the 29th of August 1910. (See further KOREA.)

IX.—DOMESTIC HISTORY

Cosmography.—Japanese annals represent the first inhabitant of earth as a direct descendant of the gods. Two books describe the events of the "Divine age." One, compiled in 712, is called the *Kojiki* (*Records of Ancient Matters*); the other, compiled in 720, is called the *Nihongi* (*Chronicles of Japan*). Both describe the processes of creation, but the author of the *Chronicles* drew largely upon Chinese traditions, whereas the compilers of the *Records* appear to have limited themselves to materials which they believed to be native. The *Records*, therefore, have always been regarded as the more trustworthy guide to pure Japanese conceptions. They deal with the creation of Japan only, other countries having been apparently judged unworthy of attention. At the beginning of all things a primordial trinity is represented as existing on the "plain of high heaven." Thereafter, during an indefinite time and by an indefinite process, other deities come into existence, their titles indicating a vague connexion with constructive and fertilizing forces. They are not immortal: it is explicitly stated that they ultimately pass away, and the idea of the cosmographers seems to be that each deity marks a gradual approach to human methods of procreation. Meanwhile the earth is "young and, like floating oil, drifts about after the manner of a jelly-fish." At last there are born two deities, the creator and the creatress, and these receive the mandate of all the heavenly beings to "make, consolidate and give birth to the drifting land." For use in that work a jewelled spear is given to them, and, standing upon the bridge that connects heaven and earth, they thrust downwards with the weapon, stir the brine below and draw up the spear, when from its point fall drops which, accumulating, form the first dry land. Upon this land the two deities descend, and, by ordinary processes, beget the islands of Japan as well as numerous gods representing the forces of nature. But in giving birth to the god of fire the creatress (Izanami) perishes, and the creator (Izanagi) makes his way to the under-world in search of her—an obvious parallel to the tales of Ishtar and Orpheus. With difficulty he returns to earth, and, as he washes himself from the pollution of Hades, there are born from the turbid water a number of evil deities succeeded by a number of good, just as in the Babylonian cosmogony the primordial ocean, Tiamat, brings forth simultaneously gods and imps. Finally, as Izanagi washes his left eye the Goddess of the Sun comes into existence; as he washes his right, the God of the Moon; and as he washes his nose, the God of Force. To these three he assigns, respectively, the dominion of the sun, the dominion of the moon, and the dominion of the ocean. But the god of force (Sosanoo), like Lucifer, rebels against this decree, creates a commotion in heaven, and after having been the cause of the temporary seclusion of the sun goddess and the consequent wrapping of the world in darkness, kills the goddess of food and is permanently banished from heaven by the host of deities. He descends to Izumo on the west of the main island of Japan, and there saves a maiden from an eight-headed serpent. Sosanoo himself passes to the under-world and becomes the deity of Hades, but he invests one of his descendants with the sovereignty of Japan, and the title is established after many curious adventures. To the sun goddess also, whose feud with her fierce brother survives the latter's banishment from heaven, the idea of making her grandson ruler of Japan presents itself. She despatches three embassies to impose her will upon the descendants of Sosanoo, and finally her grandson descends, not, however, in Izumo, where the demi-gods of Sosanoo's race hold sway, but in Hiūga in the southern island of Kiūshiū. This grandson of Amaterasu (the goddess of the sun) is called Ninigi, whose great-grandson figures in Japanese history as the first human sovereign of the country, known during life as Kamu-Yamato-Iware-Biko, and given the name of Jimmu tennō (Jimmu, son of heaven) fourteen centuries after his death. Japanese annalists attribute the accession of Jimmu to the year 660 B.C. Why that date was chosen must remain a matter of conjecture. The *Records of Ancient Matters* has no chronology, but the more pretentious writers of the *Chronicles of Japan*, doubtless in imitation of their Chinese models, considered it necessary to assign a year, a month, and even a day for each event of importance. There is abundant reason, however, to question the accuracy of all Japanese chronology prior to the 5th century. The first date corroborated by external evidence is 461, and Aston, who has made a special study of the subject, concludes that the year 500 may be taken as the time when the chronology of the *Chronicles* begins to be trustworthy. Many Japanese, however, are firm believers in the *Chronicles*, and when assigning the year of the empire they invariably take 660 B.C. for starting-point, so that 1909 of the Gregorian calendar becomes for them 2569.

Prehistoric Period.—Thus, if the most rigid estimate be accepted, the space of 1160 years, from 660 B.C. to A.D. 500, may be called the prehistoric period. During that long interval the annals include 24 sovereigns, the first 17 of whom lived for over a hundred years on the average. It seems reasonable to conclude that the so-called assignment of the sovereignty of Japan to Sosanoo's descendants and the establishment of their kingdom in Izumo represent an invasion of Mongolian immigrants coming from the direction of the Korean peninsula—indeed one of the *Nihongi's* versions of the event actually indicates Korea as the point of departure—and that the subsequent descent of Ninigi on Mount Takachiho in Hiūga indicates the advent of a body of Malayan settlers from the south sea. Jimmu, according to the *Chronicles*, set out from Hiūga in 667 B.C. and was not crowned at his new palace in Yamato until 660. This campaign of seven years is described in some detail, but no satisfactory information is given as to the nature of the craft in which the invader and his troops voyaged, or as to the number of men under his command. The weapons said to have been carried were bows, spears and swords. A supernatural element is imported into the narrative in the form of the three-legged crow of the sun, which Amaterasu sends down to act as guide and messenger for her descendants. Jimmu died at his palace of Kashiwa-bara in 585 B.C., his age being 127 according to the *Chronicles*, and 137 according to the *Records*. He was buried in a kind of tomb called *misasagi*, which seems to have been in use in Japan for some centuries before the Christian era—"a highly specialized form of tumulus, consisting of two mounds, one having a circular, the other a triangular base, which merged into each other, the whole being surrounded by a moat, or sometimes by two concentric moats with a narrow strip of land between. In some, perhaps in most, cases the misasagi contains a large vault of great unhewn stones without mortar. The walls of this vault converge gradually towards the top, which is roofed in by enormous slabs of stone weighing many tons each. The entrance is by means of a gallery roofed with similar stones." Several of these ancient sepulchral mounds have been examined during recent years, and their contents have furnished information of much antiquarian interest, though there is a complete absence of inscriptions. The reigns of the eight sovereigns who succeeded Jimmu were absolutely uneventful. Nothing is set down except the genealogy of each ruler, the place of his residence and his burial, his age and the date of his death. It was then the custom—and it remained so until the 8th century of the Christian era—to change the capital on the accession of each emperor; a habit which effectually prevented the growth of any great metropolis. The reign of the 10th emperor, Sūjin, lasted from 98 to 30 B.C. During his era the land was troubled by pestilence and the people broke out in rebellion; calamities which were supposed to be caused by the spirit of the ancient ruler of Izumo to avenge a want of consideration shown to his descendants by their supplanters. Divination—by a Chinese process—and visions revealed the source of trouble; rites of worship were performed in honour of the ancient ruler, his descendant being entrusted with the duty, and the pestilence ceased. We now hear for the first time of vigorous measures to quell the aboriginal savages, doubtless the Ainu. Four generals are sent out against them in different directions. But the expedition is interrupted by an armed attempt on the part of the emperor's half-brother, who, utilizing the opportunity of the troops' absence from Yamato, marches from Yamashiro at the head of a powerful army to win the crown for himself. In connexion with these incidents, curious evidence is furnished of the place then assigned to woman by the writers of the *Chronicles*. It is a girl who warns one of the emperor's generals of the plot; it is the sovereign's aunt who interprets the warning; and it is Ata, the wife of the rebellious prince, who leads the left wing of his army. Four other noteworthy facts are recorded of this reign: the taking of a census; the imposition of a tax on animals' skins and game to be paid by men, and on textile fabrics by women; the building of boats for coastwise transport, and the digging of dikes and reservoirs for agricultural purposes. All these things rest solely on the testimony of annalists writing eight centuries later than the era they discuss and compiling their narrative mostly from tradition. Careful investigations have been made to ascertain whether the histories of China and Korea corroborate or contradict those of Japan. Without entering into detailed evidence, the inference may be at once stated that the dates given in Japanese early history are just 120 years too remote; an error very likely to occur when using the sexagenary cycle, which constituted the first method of reckoning time in Japan. But although this correction suffices to reconcile some contradictory features of Far-Eastern history, it does not constitute any explanation of the incredible longevity assigned by the *Chronicles* to several Japanese sovereigns, and the conclusion is that when a consecutive record of reigns came to be compiled in the 8th century, many lacunae were found which had to be filled up from the imagination of the compilers. With this parenthesis we may pass rapidly over the events of the next two centuries (29 B.C. to A.D. 200). They are remarkable for vigorous measures to subdue the aboriginal Ainu, who in the southern island of Kiūshiū are called Kuma-so (the names of two tribes) and sometimes earth-spiders (*i.e.* cave-dwellers), while in the north-eastern regions of the main island they are designated Yemishi. Expeditions are led against them in both regions by Prince Yamato-dake, a hero revered by all succeeding generations of Japanese as the type of valour and loyalty. Dying from the effects of hardship and exposure, but declaring with his last breath that loss of life was as nothing compared with the sorrow of seeing his father's face no more, his spirit ascends to heaven as a white bird, and when his son, Chūai, comes to the throne, he causes cranes to be placed in the moat surrounding his palace in memory of his illustrious sire.

The sovereign had partly ceased to follow the example of Jimmu, who led his armies in person. The emperors did not, however, pass a sedentary life. They frequently made progresses throughout their dominions, and on these occasions a not uncommon incident was the addition of some local beauty to the Imperial harem. This licence had a far-reaching effect, since to provide for the sovereign's numerous offspring—the emperor Keikō (71–130) had 80 children—no better way offered than to make grants of land, and thus were laid the foundations of a territorial nobility destined profoundly to influence the course of Japanese history. Woman continues to figure conspicuously in the story. The image of the sun goddess, enshrined in Ise (5 B.C.), is entrusted to the keeping of a princess, as are the mirror, sword and jewel inherited from the sun goddess; a woman (Tachibana) accompanies Prince Yamato-dake in his campaign against the Yemishi, and sacrifices her life to quell a tempest at sea; Saho, consort of Suinin, is the heroine of a most tragic tale in which the conflict between filial piety and conjugal loyalty leads to her self-destruction; and a woman is found ruling over a large district in Kiūshiū when the Emperor Keikō is engaged in his campaign against the aborigines. The reign of Suinin saw the beginning of an art destined to assume extraordinary importance in Japan—the art of wrestling—and the first champion, Nomi no Sukune, is honoured for having suggested that clay figures should take the place of the human sacrifices hitherto offered at the sepulture of Imperial personages. The irrigation works commenced in the time of Sūjin were zealously continued under his two immediate successors, Suinin and Keikō. More than 800 ponds and channels are described as having been constructed under the former's rule. We find evidence also that the sway of the throne had been by this time widely extended, for in 125 a governor-general of 15 provinces is nominated, and two years later, governors (*miyakko*) are appointed in every province and mayors (*inaki*) in every village. The number or names of these local divisions are not given, but it is explained that mountains and rivers were taken as boundaries of provinces, the limits of towns and villages being marked by roads running respectively east and west, north and south.

Invasion of Korea.

An incident is now reached which the Japanese count a landmark in their history, though foreign critics are disposed to regard it as apocryphal. It is the invasion of Korea by a Japanese army under the command of the empress Jingo, in 200. The emperor Chūai, having proceeded to Kiūshiū for the purpose of conducting a campaign against the Kuma-so, is there joined by the empress, who, at the inspiration of a deity, seeks to divert the Imperial arms against Korea. But the emperor refuses to believe in the existence of any such country, and heaven punishes his incredulity with death at the hands of the Kuma-so, according to one account; from the effects of disease, according to another. The calamity is concealed; the Kuma-so are subdued, and the empress, having collected a fleet and raised an army, crosses to the state of Silla (in Korea), where, at the spectacle of her overwhelming strength, the Korean monarch submits without fighting, and swears that until the sun rises in the west, until rivers run towards their sources, and until pebbles ascend to the sky and become stars, he will do homage and send tribute to Japan. His example is followed by the kings of the two other states constituting the Korean peninsula, and the warlike empress returns triumphant. Many supernatural elements embellish the tale, but the features which chiefly discredit it are that it abounds in anachronisms, and that the event, despite its signal importance, is not mentioned in either Chinese or Korean history. It is certain that China then possessed in Korea territory administered by Chinese governors. She must therefore have had cognisance of such an invasion, had it occurred. Moreover, Korean history mentions twenty-five raids made by the Japanese against Silla during the first five centuries of the Christian era, but not one of them can be indentified with Jingo's alleged expedition. There can be no doubt that the early Japanese were an aggressive, enterprising people, and that their nearest over-sea neighbour suffered much from their activity. Nor can there be any reasonable doubt that the Jingo tale contains a large germ of truth, and is at least an echo of the relations that existed between Japan and Korea in the 3rd and 4th centuries. The records of the 69 years comprising

Jingo's reign are in the main an account of intercourse, sometimes peaceful, sometimes stormy, between the neighbouring countries. Only one other episode occupies a prominent place: it is an attempt on the part of Jingo's step-brothers to oppose her return to Yamato and to prevent the accession of her son to the throne. It should be noted here that all such names as Jimmu, Sūjin, Chūai, &c., are posthumous, and were invented in the reign of Kwammu (782–806), the fashion being taken from China and the names themselves being purely Chinese translations of the qualities assigned to the respective monarchs. Thus Jimmu signifies "divine valour"; Sūjin, "deity-honouring"; and Chūai, "sad middle son." The names of these rulers during life were wholly different from their posthumous appellations.

Earliest Notices in Chinese History.

Chinese history, which is incomparably older and more precise than Korean, is by no means silent about Japan. Long notices occur in the later Han and Wei records (25 to 265). The Japanese are spoken of as dwarfs (*Wa*), and their islands, frequently called the queen country, are said to be mountainous, with soil suitable for growing grain, hemp, and the silk-worm mulberry. The climate is so mild that vegetables can be grown in winter and summer; there are neither oxen, horses, tigers, nor leopards; the people understand the art of weaving; the men tattoo their faces and bodies in patterns indicating differences of rank; male attire consists of a single piece of cloth; females wear a gown passed over the head, and tie their hair in a bow; soldiers are armed with spears and shields. and also with bows, from which they discharge arrows tipped with bone or iron; the sovereign resides in Yamato; there are stockaded forts and houses; food is taken with the fingers but is served on bamboo trays and wooden trenchers; foot-gear is not worn; when men of the lower classes meet a man of rank, they leave the road and retire to the grass, squatting or kneeling with both hands on the ground when they address him; intoxicating liquor is much used; the people are long-lived, many reaching the age of 100; women are more numerous than men; there is no theft, and litigation is infrequent; the women are faithful and not jealous; all men of high rank have four or five wives, others two or three; wives and children of law-breakers are confiscated, and for grave crimes the offender's family is extirpated; divination is practised by burning bones; mourning lasts for some ten days and the rites are performed by a "mourning-keeper"; after a funeral the whole family perform ablutions; fishing is much practised, and the fishermen are skilled divers; there are distinctions of rank and some are vassals to others; each province has a market where goods are exchanged; the country is divided into more than 100 provinces, and among its products are white pearls, green jade and cinnabar. These annals go on to say that between 147 and 190 civil war prevailed for several years, and order was finally restored by a female sovereign, who is described as having been old and unmarried; much addicted to magic arts; attended by a thousand females; dwelling in a palace with lofty pavilions surrounded by a stockade and guarded by soldiers; but leading such a secluded life that few saw her face except one man who served her meals and acted as a medium of communication. There can be little question that this queen was the empress Jingo who, according to Japanese annals, came to the throne in the year A.D. 200, and whose every public act had its inception or promotion in some alleged divine interposition. In one point, however, the Chinese historians are certainly incorrect. They represent tattooing as universal in ancient Japan, whereas it was confined to criminals, in whose case it played the part that branding does elsewhere. Centuries later, in feudal days, the habit came to be practised by men of the lower orders whose avocations involved baring the body, but it never acquired vogue among educated people. In other respects these ancient Chinese annals must be credited with remarkable accuracy in their description of Japan and the Japanese. Their account may be advantageously compared with Professor Chamberlain's analysis of the manners and customs of the early Japanese, in the preface to his translation of the *Kojiki*.

"The Japanese of the mythical period, as pictured in the legends preserved by the compiler of the *Records of Ancient Matters*, were a race who had long emerged from the savage stage and had attained to a high level of barbaric skill. The Stone Age was forgotten by them—or nearly so—and the evidence points to their never having passed through a genuine Bronze Age, though the knowledge of bronze was at a later period introduced from the neighbouring continent. They used iron for manufacturing spears, swords and knives of various shapes, and likewise for the more peaceful purpose of making hooks wherewith to angle or to fasten the doors of their huts. Their other warlike and hunting implements (besides traps and gins, which appear to have been used equally for catching beasts and birds and for destroying human enemies) were bows and arrows, spears and elbow-pads—the latter seemingly of skin, while special allusion is made to the fact that the arrows were feathered. Perhaps clubs should be added to the list. Of the bows and arrows, swords and knives, there is perpetual mention, but nowhere do we hear of the tools with which they were manufactured, and there is the same remarkable silence regarding such widely spread domestic implements as the saw and the axe. We hear, however, of the pestle and mortar, of the fire-drill, of the wedge, of the sickle, and of the shuttle used in weaving. Navigation seems to have been in a very elementary state. Indeed the art of sailing was but little practised in Japan even so late as the middle of the 10th century of our era, subsequent to the general diffusion of Chinese civilization, though rowing and punting are often mentioned by the early poets. To what we should call towns or villages very little reference is made anywhere in the *Records* or in that part of the *Chronicles* which contain the account of the so-called Divine Age. But from what we learn incidentally it would seem that the scanty population was chiefly distributed in small hamlets and isolated dwellings along the coast and up the course of the larger streams. Of house-building there is frequent mention. Fences were in use. Rugs of skins and rush-matting were occasionally brought in to sit on, and we even hear once or twice of silk rugs being used for the same purpose by the noble and wealthy. The habits of personal cleanliness which so pleasantly distinguish the modern Japanese from their neighbours, in continental Asia, though less fully developed than at present would seem to have existed in the germ in early times, as we read more than once of bathing in rivers, and are told of bathing women being specially attached to the person of a certain Imperial infant. Lustrations, too, formed part of the religious practices of the race. Latrines are mentioned several times. They would appear to have been situated away from the houses and to have been generally placed over a running stream, whence doubtless the name for latrine in the archaic dialect—*kawaya* (river-house). A peculiar sort of dwelling-place which the two old histories bring prominently under our notice is the so-called parturition house—a one-roomed hut without windows, which a woman was expected to build and retire into for the purpose of being delivered unseen. Castles are not distinctly spoken of until a time which coincides, according to the received chronology, with the first century B.C. We then first meet with the curious term rice-castle, whose precise signification is a matter of dispute among the native commentators, but which, on comparison with Chinese descriptions of the early Japanese, should probably be understood to mean a kind of palisade serving the purpose of a redoubt, behind which the warriors could ensconce themselves. The food of the early Japanese consisted of fish and of the flesh of the wild creatures which fell by the hunter's arrow or were taken in the trapper's snare. Rice is the only cereal of which there is such mention made as to place it beyond a doubt that its cultivation dates back to time immemorial. Beans, millet and barley are indeed named once, together with silkworms, in the account of the Divine Age. But the passage has every aspect of an interpolation in the legend, perhaps not dating back long before the time of the eighth-century compiler. A few unimportant vegetables and fruits, of most of which there is but a single mention, are found. The intoxicating liquor called *sake* was known in Japan during the mythical period, and so were chopsticks for eating food with. Cooking pots and cups and dishes—the latter both of earthenware and of leaves of trees—are also mentioned; but of the use of fire for warming purposes we hear nothing. Tables are named several times, but never in connexion with food: they would seem to have been used exclusively for the purpose of presenting offerings on, and were probably quite small and low—in fact, rather trays than tables, according to European ideas. In the use of clothing and the specialization of garments the early Japanese had reached a high level. We read in the most ancient legends of upper garments, skirts, trowsers, girdles, veils and hats, while both sexes adorned themselves with necklaces, bracelets and head ornaments of stones considered precious—in this respect offering a striking contrast to their descendants in modern times, of whose attire jewelry forms no part. The material of their clothes was hempen cloth and paper—mulberry bark, coloured by being rubbed with madder, and probably with woad and other tinctorial plants. All the garments, so far as we may judge, were woven, sewing being nowhere mentioned. From the great place which the chase occupied in daily life, we are led to suppose that skins also were used to make garments of. There is in the *Records* at least one passage which favours this supposition, and the *Chronicles* in one place mention the straw rain-coat and broad-brimmed hat, which still form the Japanese peasant's effectual protection against the inclemencies of the weather. The tendrils of creeping plants served the purposes of strings, and bound the warrior's sword round his waist. Combs are mentioned, and it is evident that much attention was devoted to the dressing of the hair. The men seem to have bound up their hair in two bunches, one on each side of the head, while the young boys tied theirs in a top-knot, the unmarried girls let their locks hang down over their necks, and the married women dressed theirs after a fashion which apparently combined the two last-named methods. There is no mention in any of the old books of cutting the hair or beard except in token of disgrace; neither do we gather that the sexes, but for the matter of the head-dress, were distinguished by a diversity of apparel and ornamentation. With regard to the precious stones mentioned above as having been used as ornaments for the head, neck and arms, we know from the specimens which have rewarded the labours of archaeological research in Japan that agate, crystal, glass, jade, serpentine and steatite were the most used materials, and carved and pierced cylindrical shapes the commonest forms. The horse—which was ridden, but not driven—the barn-door fowl and the cormorant used for fishing, are the only domesticated creatures mentioned in the earlier traditions, with the doubtful exception of the silkworm. In the later portions of the *Records* and *Chronicles* dogs and cattle are alluded to, but sheep, swine and even cats were apparently not yet introduced."

As the prehistoric era draws to its end the above analyses of Japanese civilization have to be modified. Thus, towards the close of the 3rd century, ship-building made great progress, and instead of the small boats hitherto in use, a vessel 100 ft. long was constructed. Notable above all is the fact that Japan's turbulent relations with Korea were replaced by friendly intercourse, so that she began to receive from her neighbour instruction in the art of writing. The date assigned by the *Chronicles* for this important event is A.D. 285, but it has been proved almost conclusively that Japanese annals relating to this period are in error to the extent of 120 years. Hence the introduction of calligraphy must be placed in 405. Chinese history shows that between 57 and 247 Japan sent four embassies to the courts of the Han and the Wei, and this intercourse cannot have failed to disclose the ideograph. But the knowledge appears to have been confined to a few interpreters, and not until the year 405 were steps taken to extend it, with the aid of a learned Korean, Wang-in. Korea herself began to study Chinese learning only a few years before she undertook to impart it to Japan. We now find a numerous colony of Koreans passing to Japan and settling there; a large number are also carried over as prisoners of war, and the Japanese obtain seamstresses from both of their continental neighbours. One fact, related with much precision, shows that the refinements of life were in an advanced condition: an ice-house is described, and we read that from 374 (? 494) it became the fashion to store ice in this manner for use in the hot months by placing it in water or *sake*. The emperor, Nintoku, to whose time this innovation is attributed, is one of the romantic figures of Japanese history. He commenced his career by refusing to accept the sovereignty from his younger brother, who pressed him earnestly to do so on the ground that the proper order of succession had been disturbed by their father's partiality—though the rights attaching to primogeniture did not receive imperative recognition in early Japan. After three years of this mutual self-effacement, during which the throne remained vacant, the younger brother committed suicide, and Nintoku reluctantly became sovereign. He chose Naniwa (the modern Osaka) for his capital, but he would not take the farmers from their work to finish the building of a palace, and subsequently, inferring from the absence of smoke over the houses of the people that the country was impoverished, he remitted all taxes and suspended forced labour for a term of three years, during which his palace fell into a state of ruin and he himself fared in the coarsest manner. Digging canals, damming rivers, constructing roads and bridges, and establishing granaries occupied his attention when love did not distract it. But in affairs of the heart he was most unhappy. He figures as the sole wearer of the Japanese crown who was defied by his consort; for when he took a concubine in despite of the empress, her jealousy was so bitter that, refusing to be placated by any of his majesty's verses or other overtures, she left the palace altogether; and when he sought to introduce another beauty into the inner chamber, his own half-brother, who carried his proposals, won the girl for himself. One other fact deserves to be remembered in connexion with Nintoku's reign: Ki-no-tsuno, representative of a great family which had filled the highest administrative and military posts under several sovereigns, is mentioned as "the first to commit to writing in detail the productions of the soil in each locality." This was in 353 (probably 473). We shall err little if we date the commencement of Japanese written annals from this time, though no compilation earlier than the *Kojiki* has survived.

Early Historical Period.—With the emperor Richū, who came to the throne A.D. 400, the historical period may be said to commence; for though the chronology of the records is still questionable, the facts are generally accepted as credible. Conspicuous loyalty towards the sovereign was not an attribute of the Japanese Imperial family in early times. Attempts to usurp the throne were not uncommon, though there are very few instances of such essays on the part of a subject. Love or lust played no insignificant part in the drama, and a common method of placating an irate sovereign was to present a beautiful damsel for his delectation. The veto of consanguinity did not receive very strict respect in these matters. Children of the same father might intermarry, but not those of the same mother; a canon which becomes explicable on observing that as wives usually lived apart from their husbands and had the sole custody of their offspring, two or more families often remained to the end unconscious of the fact that they had a common sire. There was a remarkable tendency to organize the nation into groups of persons following the same pursuit or charged with the same functions. A group thus composed was called *be*. The heads of the great families had titles—as *omi*, *muraji*, *miakko*, *wake*, &c.—and affairs of state were administered by the most renowned of these nobles, wholly subject to the sovereign's ultimate will. The provincial districts were ruled by scions of the Imperial family, who appear to have been, on the whole, entirely subservient to the Throne. There were no tribunals of justice: the ordeal of boiling water or heated metal was the sole test of guilt or innocence, apart, of course, from confession, which was often exacted under menace of torture. A celebrated instance of the ordeal of boiling water is recorded in 415, when this device was employed to correct the genealogies of families suspected of falsely claiming descent from emperors or divine beings. The test proved efficacious, for men conscious of forgery refused to undergo the ordeal. Deprivation of rank was the lightest form of punishment; death the commonest, and occasionally the whole family of an offender became serfs of the house against which the offence had been committed or which had been instrumental in disclosing a crime. There are, however, frequent examples of wrong-doing expiated by the voluntary surrender of lands or other property. We find several instances of that extreme type of loyalty which became habitual in later ages—suicide in preference to surviving a deceased lord. On the whole the successive sovereigns of these early times appear to have ruled with clemency and consideration for the people's welfare. But there were two notable exceptions—Yuriaku (457–479) and Muretsu (499–506). The former slew men ruthlessly in fits of passion or resentment, and the latter was the Nero of Japanese history, a man who loved to witness the agony of his fellows and knew no sentiment of mercy or remorse. Yet even Yuriaku did not fail to promote industrial pursuits. Skilled artisans were obtained from Korea, and it is related that, in 462, this monarch induced the empress and the ladies of the palace to plant mulberry trees with their own hands in order to encourage sericulture. Throughout the 5th and 6th centuries many instances are recorded of the acquisition of landed estates by the Throne, and their occasional bestowal upon princes or Imperial consorts, such gifts being frequently accompanied by the assignment of bodies of agriculturists who seem to have accepted the position of serfs. Meanwhile Chinese civilization was gradually becoming known, either by direct contact or through Korea. Several immigrations of Chinese or Korean settlers are on record. No less than 7053 householders of Chinese subjects came, through Korea, in 540, and one of their number received high rank together with the post of director of the Imperial treasury. From these facts, and from a national register showing the derivation of all the principal families in Japan, it is clearly established that a considerable strain of Chinese and Korean blood runs in the veins of many Japanese subjects.

Introduction of Buddhism.

The most signal and far-reaching event of this epoch was the importation of the Buddhist creed, which took place in 552. A Korean monarch acted as propagandist, sending a special envoy with a bronze image of the Buddha and with several volumes of the Sutras. Unfortunately the coming of the foreign faith happened to synchronize with an epidemic of plague, and conservatives at the Imperial court were easily able to attribute this visitation to resentment on the part of the ancestral deities against the invasion of Japan by an alien creed. Thus the spread of Buddhism was checked; but only for a time. Thirty-five years after the coming of the Sutras, the first temple was erected to enshrine a wooden image of the Buddha 16 ft. high. It has often been alleged that the question between the imported and the indigenous cults had to be decided by the sword. The statement is misleading. That the final adoption of Buddhism resulted from a war is true, but its adoption or rejection did not constitute the motive of the combat. A contest for the succession to the throne at the opening of Sujun's reign (588–592) found the partisans of the Indian faith ranged on one side, its opponents on the other, and in a moment of stress the leaders of the former, Soma and Prince Umayado, vowed to erect Buddhist temples should victory rest on their arms. From that time the future of Buddhism was assured. In 588 Korea sent Buddhist relics, Buddhist priests, Buddhist ascetics, architects of Buddhist temples, and casters of Buddhist images. She had already sent men learned in divination, in medicine, and in the calendar. The building of temples began to be fashionable in the closing years of the 6th century, as did also abdication of the world by people of both sexes; and a census taken in 623, during the reign of the empress Suiko (583–628), showed that there were then 46 temples, 816 priests and 569 nuns in the empire. This rapid growth of the alien faith was due mainly to two causes: first, that the empress Suiko, being of the Soga family, naturally favoured a creed which had found its earliest Japanese patron in the great statesman and general, Soga no Umako; secondly, that one of the most illustrious scholars and philosophers ever possessed by Japan, Prince Shōtoku, devoted all his energies to fostering Buddhism.

The adoption of Buddhism meant to the Japanese much more than the acquisition of a practical religion with a code of clearly defined morality in place of the amorphous and jejune cult of Shintō. It meant the introduction of Chinese civilization. Priests and scholars crossed in numbers from China, and men passed over from Japan to study the Sutras at what was then regarded as the fountain-head of Buddhism. There was also a constant stream of immigrants from China and Korea, and the result may be gathered from the fact that a census taken of the Japanese nobility in 814 indicated 382 Korean and Chinese families against only 796 of pure Japanese origin. The records show that in costume and customs a signal advance was made towards refinement. Hair-ornaments of gold or silver chiselled in the form of flowers; caps of sarcenet in twelve special tints, each indicating a different grade; garments of brocade and embroidery with figured thin silks of various colours—all these were worn on ceremonial occasions; the art of painting was introduced; a recorder's office was established; perfumes were largely employed; court picnics to gather medicinal herbs were instituted, princes and princesses attending in brilliant raiment; Chinese music and dancing were introduced; cross bows and catapults were added to the weapons of war; domestic architecture made signal strides in obedience to the examples of Buddhist sacred edifices, which, from the first, showed magnificence of dimension and decoration hitherto unconceived in Japan; the arts of metal-casting and sculpture underwent great improvement; Prince Shōtoku compiled a code, commonly spoken of as the first written laws of Japan, but in reality a collection of maxims evincing a moral spirit of the highest type. In some respects, however, there was no improvement. The succession to the throne still tended to provoke disputes among the Imperial princes; the sword constituted the principal weapon of punishment, and torture the chief judicial device. Now, too, for the first time, a noble family is found seeking to usurp the Imperial authority. The head of the Soga house, Umako, having compassed the murder of the emperor Sujun and placed on the throne his own niece (Suiko), swept away all opposition to the latter's successor, Jomei, and controlled the administration of state affairs throughout two reigns. In all this he was strongly seconded by his son, Iruka, who even surpassed him in contumelious assumption of power and parade of dignity. Iruka was slain in the presence of the empress Kōgyoku by Prince Naka with the assistance of the minister of the interior, Kamako, and it is not surprising to find the empress (Kōgyoku) abdicating immediately afterwards in favour of Kamako's protégé, Prince Karu, who is known in history as Kōtoku. This Kamako, planner and leader of the conspiracy which overthrew the Soga, is remembered by posterity under the name of Kamatari and as the founder of the most illustrious of Japan's noble houses, the Fujiwara. At this time (645), a habit which afterwards contributed materially to the effacement of the Throne's practical authority was inaugurated. Prince Furubito, pressed by his brother, Prince Karu, to assume the sceptre in accordance with his right of primogeniture, made his refusal peremptory by abandoning the world and taking the tonsure. This retirement to a monastery was afterwards dictated to several sovereigns by ministers who found that an active occupant of the throne impeded their own exercise of administrative autocracy. Furubito's recourse to the tonsure proved, however, to be merely a cloak for ambitious designs. Before a year had passed he conspired to usurp the throne and was put to death with his children, his consorts strangling themselves. Suicide to escape the disgrace of defeat had now become a common practice. Another prominent feature of this epoch was the prevalence of superstition. The smallest incidents—the growing of two lotus flowers on one stem; a popular ballad; the reputed song of a sleeping monkey; the condition of the water in a pond; rain without clouds—all these and cognate trifles were regarded as omens, wizards and witches deluded the common people; a strange form of caterpillar was worshipped as the god of the everlasting world, and the peasants impoverished themselves by making sacrifices to it.

First Legislative Epoch.

An interesting epoch is now reached, the first legislative era of early Japanese history. It commenced with the reign of the emperor Kōtoku (645), of whom the *Chronicles* say that he "honoured the religion of Buddha and despised Shintō"; that "he was of gentle disposition; loved men of learning; made no distinction of noble and mean, and continually dispensed beneficent edicts." The customs calling most loudly for reform in his time were abuse of the system of forced labour; corrupt administration of justice; spoliation of the peasant class; assumption of spurious titles to justify oppression; indiscriminate distribution of the families of slaves and serfs; diversion of taxes to the pockets of collectors; formation of great estates, and a general lack of administrative centralization. The first step of reform consisted in ordering the governors of provinces to prepare registers showing the numbers of freemen and serfs within their jurisdiction as well as the area of cultivated land. It was further ordained that the advantages of irrigation should be shared equally with the common people; that no local governor might try and decide criminal cases while in his province; that any one convicted of accepting bribes should be liable to a fine of double the amount as well as to other punishment; that in the Imperial court a box should be placed for receiving petitions and a bell hung to be sounded in the event of delay in answering them or unfairness in dealing with them; that all absorption of land into great estates should cease; that barriers, outposts, guards and post-horses should be provided; that high officials should be dowered with hereditary estates by way of emolument, the largest of such grants being 3000 homesteads; that men of unblemished character and proved capacity should be appointed aldermen for adjudicating criminal matters; that there should be chosen as clerks for governors and vice-governors of provinces men of solid competence "skilled in writing and arithmetic"; that the land should be parcelled out in fixed proportions to every adult unit of the population with right of tenure for a term of six years; that forced labour should be commuted for taxes of silk and cloth; and that for fiscal and administrative purposes households should be organized in groups of five, each group under an elder, and ten groups forming a township, which, again, should be governed by an elder. Incidentally to these reforms many of the evil customs of the time are exposed. Thus provincial governors when they visited the capital were accustomed to travel with great retinues who appear to have constituted a charge on the regions through which they passed. The law now limited the number of a chief governor's attendants to nine, and forbade him to use official houses or to fare at public cost unless journeying on public business. Again, men who had acquired some local distinction, though they did not belong to noble families, took advantage of the absence of historical records or official registers, and, representing themselves as descendants of magnates to whom the charge of public granaries had been entrusted, succeeded in usurping valuable privileges. The office of provincial governor had in many cases become hereditary, and not only were governors largely independent of Imperial control, but also, since every free man carried arms, there had grown up about these officials a population relying largely on the law of force. Kōtoku's reforms sought to institute a system of temporary governors, and directed that all arms and armour should be stored in arsenals built in waste places, except in the case of provinces adjoining lands where unsubdued aborigines (Yemishi) dwelt. Punishments were drastic, and in the case of a man convicted of treason, all his children were executed with him, his wives and consorts committing suicide. From a much earlier age suicide had been freely resorted to as the most honourable exit from pending disgrace, but as yet the samurai's method of disembowelment was not employed, strangulation or cutting the throat being the regular practice. Torture was freely employed and men often died under it. Signal abuses prevailed in regions beyond the immediate range of the central government's observation. It has been shown that from early days the numerous scions of the Imperial family had generally been provided for by grants of provincial estates. Gradually the descendants of these men, and the representatives of great families who held hereditary rank, extended their domains unscrupulously, employing forced labour to reclaim lands, which they let to the peasants, not hesitating to appropriate large slices of public property, and remitting to the central treasury only such fractions of the taxes as they found convenient. So prevalent had the exaction of forced labour become that country-folk, repairing to the capital to seek redress of grievances, were often compelled to remain there for the purpose of carrying out some work in which dignitaries of state were interested. The removal of the capital to a new site on each change of sovereign involved a vast quantity of unproductive toil. It is recorded that in 656, when the empress Saimei occupied the throne, a canal was dug which required the work of 30,000 men and a wall was built which had employed 70,000 men before its completion. The construction of tombs for grandees was another heavy drain on the people's labour. Some of these sepulchres attained enormous dimensions—that of the emperor Ojin (270–310) measures 2312 yds. round the outer moat and is some 60 ft. high; the emperor Nintoku's (313–399) is still larger, and there is a tumulus in Kawachi on the flank of which a good-sized village has been built. Kōtoku's laws provided that the tomb of a prince should not be so large as to require the work of more than 1000 men for seven days, and that the grave of a petty official must be completed by 50 men in one day. Moreover, it was forbidden to bury with the body gold, silver, copper, iron, jewelled shirts, jade armour or silk brocade. It appears that the custom of suicide or sacrifice at the tomb of grandees still survived, and that people sometimes cut off their hair or stabbed their thighs preparatory to declaiming a threnody. All these practices were vetoed. Abuses had grown up even in connexion with the Shintō rite of purgation. This rite required not only the reading of rituals but also the offering of food and fruits. For the sake of these edibles the rite was often harshly enforced, especially in connexion with pollution from contact with corpses; and thus it fell out that when of two brothers, returning from a scene of forced labour, one lay down upon the road and died, the other, dreading the cost of compulsory purgation, refused to take up the body. Many other evil customs came into existence in connexion with this rite, and all were dealt with in the new laws. Not the least important of the reforms then introduced was the organization of the ministry after the model of the Tang dynasty of China. Eight departments of state were created, and several of them received names which are similarly used to this day. Not only the institutions of China were borrowed but also her official costumes. During Kōtoku's reign 19 grades of head-gear were instituted, and in the time of Tenchi (668–671) the number was increased to 26, with corresponding robes. Throughout this era intercourse was frequent with China, and the spread of Buddhism continued steadily. The empress Saimei (655–661), who succeeded Kōtoku, was an earnest patron of the faith. By her command several public expositions of the Sutras were given, and the building of temples went on in many districts, estates being liberally granted for the maintenance of these places of worship.

The Fujiwara Era.—In the *Chronicles of Japan* the year 672 is treated as a kind of interregnum. It was in truth a year of something like anarchy, a great part of it being occupied by a conflict of unparalleled magnitude between Prince Ōtomo (called in history Emperor Kōbun) and Prince Ōama, who emerged victorious and is historically entitled Temmu (673–686). The four centuries that followed are conveniently designated the Fujiwara era, because throughout that long interval affairs of state were controlled by the Fujiwara family, whose daughters were given as consorts to successive sovereigns and whose sons filled all the high administrative posts. It has been related above that Kamako, chief of the Shintō officials, inspired the assassination of the Soga chief, Iruka, and thus defeated the latter's designs upon the throne in the days of the empress Kōgyoku. Kamako, better known to subsequent generations as Kamatari, was thenceforth regarded with unlimited favour by successive sovereigns, and just before his death in 670, the family name of Fujiwara was bestowed on him by the emperor Tenchi. Kamatari himself deserved all the honour he received, but his descendants abused the high trust reposed in them, reduced the sovereign to a mere puppet, and exercised Imperial authority without openly usurping it. Much of this was due to the adoption of Chinese administrative systems, a process which may be said to have commenced during the reign of Kōtoku (645–654) and to have continued almost uninterruptedly until the 11th century. Under these systems the emperor ceased directly to exercise supreme civil or military power: he became merely the source of authority, not its wielder, the civil functions being delegated to a bureaucracy and the military to a soldier class. Possibly had the custom held of transferring the capital to a new site on each change of sovereign, and had the growth of luxurious habits been thus checked, the comparatively simple life of early times might have held the throne and the people in closer contact. But from the beginning of the 8th century a strong tendency to avoid these costly migrations developed itself. In 709 the court took up its residence at Nara, remaining there until 784; ten years after the latter date Kiōto became the permanent metropolis. The capital at Nara—established during the reign of the empress Gemmyō (708–715)—was built on the plan of the Chinese metropolis. It had nine gates and nine avenues, the palace being situated in the northern section and approached by a broad, straight avenue, which divided the city into two perfectly equal halves, all the other streets running parallel to this main avenue or at right angles to it. Seven sovereigns reigned at Heijō (castle of peace), as Nara is historically called, and, during this period of 75 years, seven of the grandest temples ever seen in Japan were erected; a multitude of idols were cast, among them a colossal bronze Daibutsu 53½ ft. high; large temple-bells were founded, and all the best artists and artisans of the era devoted their services to these works. This religious mania reached its acme in the reign of the emperor Shōmu (724–748), a man equally superstitious and addicted to display. In Temmu's time the custom had been introduced of compelling large numbers of persons to enter the Buddhist priesthood with the object of propitiating heaven's aid to heal the illness of an illustrious personage. In Shōmu's day every natural calamity or abnormal phenomenon was regarded as calling for religious services on a large scale, and the great expense involved in all these buildings and ceremonials, supplemented by lavish outlays on court pageants, was severely felt by the nation. The condition of the agricultural class, who were the chief tax-payers, was further aggravated by the operation of the emperor Kōtoku's land system, which rendered tenure so uncertain as to deter improvements. Therefore, in the Nara epoch, the principle of private ownership of land began to be recognized. Attention was also paid to road-making, bridge-building, river control and house construction, a special feature of this last being the use of tiles for roofing purposes in place of the shingles or thatch hitherto employed. In all these steps of progress Buddhist priests took an active part. Costumes were now governed by purely Chinese fashions. This change had been gradually introduced from the time of Kōtoku's legislative measures—generally called the Taikwa reforms after the name of the era (645–650) of their adoption—and was rendered more thorough by supplementary enactments in the period 701–703 while Mommu occupied the throne. Ladies seem by this time to have abandoned the strings of beads worn in early eras round the neck, wrists and ankles. They used ornaments of gold, silver or jade in their hair, but in other respects their habiliments closely resembled those of men, and to make the difference still less conspicuous they straddled their horses when riding. Attempts were made to facilitate travel by establishing stores of grain along the principal highways, but as yet there were no hostelries, and if a wayfarer did not find shelter in the house of a friend, he had to bivouac as best he could. Such a state of affairs in the provinces offered a marked contrast to the luxurious indulgence which had now begun to prevail in the capital. There festivals of various kinds, dancing, verse-composing, flower picnics, archery, polo, football—of a very refined nature—hawking, hunting and gambling absorbed the attention of the aristocracy. Nothing disturbed the serenity of the epoch except a revolt of the northern Yemishi, which was temporarily subdued by a Fujiwara general, for the Fujiwara had not yet laid aside the martial habits of their ancestors. In 794 the Imperial capital was transferred from Nara to Kiōto by order of the emperor Kwammu, one of the greatest of Japanese sovereigns. Education, the organization of the civil service, riparian works, irrigation improvements, the separation of religion from politics, the abolition of sinecure offices, devices for encouraging and assisting agriculture, all received attention from him. But a twenty-two years' campaign against the northern Yemishi; the building of numerous temples; the indulgence of such a passionate love of the chase that he organized 140 hunting excursions during his reign of 25 years; profuse extravagance on the part of the aristocracy in Kiōto and the exactions of provincial nobles, conspired to sink the working classes into greater depths of hardship than ever. Farmers had to borrow money and seed-rice from local officials or Buddhist temples, hypothecating their land as security; thus the temples and the nobles extended their already great estates, whilst the agricultural population gradually fell into a position of practical serfdom.

Rise of the Fujiwara.

Meanwhile the Fujiwara family were steadily developing their influence in Kiōto. Their methods were simple but thoroughly effective. "By progressive exercises of arbitrariness they gradually contrived that the choice of a consort for the sovereign should be legally limited to a daughter of their family, five branches of which were specially designated to that honour through all ages. When a son was born to an emperor, the Fujiwara took the child into one of their palaces, and on his accession to the throne, the particular Fujiwara noble that happened to be his maternal grandfather became regent of the empire. This office of regent, created towards the close of the 9th century, was part of the scheme; for the Fujiwara did not allow the purple to be worn by a sovereign after he had attained his majority, or, if they suffered him to wield the sceptre during a few years of manhood, they compelled him to abdicate so soon as any independent aspirations began to impair his docility; and since for the purposes of administration in these constantly recurring minorities an office more powerful than that of prime minister (dajō daijin) was needed, they created that of regent (kwambaku), making it hereditary in their own family. In fact the history of Japan from the 9th to the 19th century may be described as the history of four families, the Fujiwara, the Taira, the Minamoto and the Tokugawa. The Fujiwara governed through the emperor; the Taira, the Minamoto and the Tokugawa governed in spite of the emperor. The Fujiwara based their power on matrimonial alliances with the Throne; the Taira, the Minamoto and the Tokugawa based theirs on the possession of armed strength which the throne had no competence to control. There another broad line of cleavage is seen. Throughout the Fujiwara era the centre of political gravity remained always in the court. Throughout the era of the Taira, the Minamoto and the Tokugawa the centre of political gravity was transferred to a point outside the court, the headquarters of a military feudalism." The process of transfer was of course gradual. It commenced with the granting of large tracts of tax-free lands to noblemen who had wrested them from the aborigines (Yemishi) or had reclaimed them by means of serf-labour. These tracts lay for the most part in the northern and eastern parts of the main island, at such a distance from the capital that the writ of the central government did not run there; and since such lands could be rented at rates considerably less than the tax levied on farms belonging to the state, the peasants by degrees abandoned the latter and settled on the former, with the result that the revenues of the Throne steadily diminished, while those of the provincial magnates correspondingly increased. Moreover, in the 7th century, at the time of the adoption of Chinese models of administration and organization, the court began to rely for military protection on the services of guards temporarily drafted from the provincial troops, and, during the protracted struggle against the Yemishi in the north and east in the 8th century, the fact that the power of the sword lay with the provinces began to be noted.

The Taira and the Minamoto.

Kiōto remained the source of authority. But with the growth of luxury and effeminacy in the capital the Fujiwara became more and more averse from the hardships of campaigning, and in the 9th and 10th centuries, respectively, the Taira and the Minamoto[1] families came into prominence as military leaders, the field of the Taira operations being the south and west, that of the Minamoto the north and east. Had the court reserved to itself and munificently exercised the privilege of rewarding these services, it might still have retained power and wealth. But by a niggardly and contemptuous policy on the part of Kiōto not only were the Minamoto leaders estranged but also they assumed the right of recompensing their followers with tax-free estates, an example which the Taira leaders quickly followed. By the early years of the 12th century these estates had attracted the great majority of the farming class, whereas the public land was left wild and uncultivated. In a word, the court and the Fujiwara found themselves without revenue, while the coffers of the Taira and the Minamoto were full: the power of the purse and the power of the sword had passed effectually to the two military families. Prominent features of the moral condition of the capital at this era (12th century) were superstition; refinement and effeminacy. A belief was widely held that calamity could not be averted or success insured without recourse to Buddhist priests. Thus, during a reign of only 13 years at the close of the 11th century, the emperor Shirakawa caused 5420 religious pictures to be painted, ordered the casting of 127 statues of Buddha, each 11 ft. high, of 3150 life-sized images and of 2930 smaller idols, and constructed 21 large temples as well as 446,630 religious edifices of various kinds. Side by side with this faith in the supernatural, sexual immorality prevailed widely, never accompanied, however, by immodesty. Literary proficiency ranked as the be-all and end-all of existence. "A man estimated the conjugal qualities of a young lady by her skill in finding scholarly similes and by her perception of the cadence of words. If a woman was so fortunate as to acquire a reputation for learning, she possessed a certificate of universal virtue and amiability." All the pastimes of the Nara epoch were pursued with increased fervour and elaboration in the Heian (Kiōto) era. The building of fine dwelling-houses and the laying out of landscape gardens took place on a considerable scale, though in these respects the ideals of later ages were not yet reached. As to costume, the close-fitting, business-like and comparatively simple dress of the 8th century was exchanged for a much more elaborate style. During the Nara epoch the many-hued hats of China had been abandoned for a sober headgear of silk gauze covered with black lacquer, but in the Heian era this was replaced by an imposing structure glistening with jewels: the sleeves of the tunic grew so long that they hung to the knees when a man's arms were crossed, and the trowsers were made so full and baggy that they resembled a divided skirt. From this era may be said to have commenced the manufacture of the tasteful and gorgeous textile fabrics for which Japan afterwards became famous. "A fop's ideal was to wear several suits, one above the other, disposing them so that their various colours showed in harmoniously contrasting lines at the folds on the bosom and at the edges of the long sleeves. A successful costume created a sensation in court circles. Its wearer became the hero of the hour, and under the pernicious influence of such ambition men began even to powder their faces and rouge their cheeks like women. As for the fair sex, their costume reached the acme of unpracticality and extravagance in this epoch. Long flowing hair was essential, and what with developing the volume and multiplying the number of her robes, and wearing above her trowsers a many-plied train, a grand lady of the time always seemed to be struggling to emerge from a cataract of habiliments." It was fortunate for Japan that circumstances favoured the growth of a military class in this age of her career, for had the conditions existing in Kiōto during the Heian epoch spread throughout the whole country, the penalty never escaped by a demoralized nation must have overtaken her. But by the middle of the 12th century the pernicious influence of the Fujiwara had paled before that of the Taira and the Minamoto, and a question of succession to the throne marshalled the latter two families in opposite camps, thus inaugurating an era of civil war which held the country in the throes of almost continuous battle for 450 years, placed it under the administration of a military feudalism, and educated a nation of warriors. At first the Minamoto were vanquished and driven from the capital, Kiyomori, the Taira chief, being left complete master of the situation. He established his headquarters at Rokuharu, in Kiōto, appropriated the revenues of 30 out of the 66 provinces forming the empire, and filled all the high offices of state with his own relatives or connexions. But he made no radical change in the administrative system, preferring to follow the example of the Fujiwara by keeping the throne in the hands of minors. And he committed the blunder of sparing the lives of two youthful sons of his defeated rival, the Minamoto chief. They were Yoritomo and Yoshitsunē; the latter the greatest strategist Japan ever produced, with perhaps one exception; the former, one of her three greatest statesmen, the founder of military feudalism. By these two men the Taira were so completely overthrown that they never raised their heads again, a sea-fight at Dan-no-ura (1155) giving them the *coup de grâce.* Their supremacy had lasted 22 years.

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[1] The Taira and the Minamoto both traced their descent from imperial princes; the Tokugawa were a branch of the Minamoto.

The Feudal Era.—Yoritomo, acting largely under the advice of an astute counsellor, Oye no Hiromoto, established his seat of power at Kamakura, 300 m. from Kiōto. He saw that, effectively to utilize the strength of the military class, propinquity to the military centres in the provinces was essential. At Kamakura he organized an administrative body similar in mechanism to that of the metropolitan government but studiously differentiated in the matter of nomenclature. As to the country at large, he brought it effectually under the sway of Kamakura by placing the provinces under the direct control of military governors, chosen and appointed by himself. No attempt was made, however, to interfere in any way with the polity in Kiōto: it was left intact, and the nobles about the Throne—*kuge* (courtly houses), as they came to be called in contradistinction to the *buke* (military houses)—were placated by renewal of their property titles. The Buddhist priests, also, who had been treated most harshly during the Taira tenure of power, found their fortunes restored under Kamakura's sway. Subsequently Yoritomo obtained for himself the title of *sei-itai-shōgun* (barbarian-subduing generalissimo), and just as the office of regent (kwambaku) had long been hereditary in the Fujiwara family, so the office of shōgun became thenceforth hereditary in that of the Minamoto. These changes were radical. They signified a complete shifting of the centre of power. During eighteen centuries from the time of Jimmu's invasion—as Japanese historians reckon—the country had been ruled from the south; now the north became supreme, and for a civilian administration a purely military was substituted. But there was no contumely towards the court in Kiōto. Kamakura made a show of seeking Imperial sanction for every one of its acts, and the whole of the military administration was carried on in the name of the emperor by a shōgun who called himself the Imperial deputy. In this respect things changed materially after the death of Yoritomo (1198). Kamakura then became the scene of a drama analogous to that acted in Kiōto from the 10th century.

Rule of the Hōjō.

The Hōjō family, to which belonged Masa, Yoritomo's consort, assumed towards the Kamakura shōgun an attitude similar to that previously assumed by the Fujiwara family towards the emperor in Kiōto. A child, who on state occasions was carried to the council chamber in Masa's arms, served as the nominal repository of the shōgun's power, the functions of administration being discharged in reality by the Hōjō family, whose successive heads took the name of *shikken* (constable). At first care was taken to have the shōgun's office filled by a near relative of Yoritomo; but after the death of that great statesman's two sons and his nephew, the puppet shōguns were taken from the ranks of the Fujiwara or of the Imperial princes, and were deposed so soon as they attempted to assert themselves. What this meant becomes apparent when we note that in the interval of 83 years between 1220 and 1308, there were six shōguns whose ages at the time of appointment ranged from 3 to 16. Whether, if events had not forced their hands, the Hōjō constables would have maintained towards the Throne the reverent demeanour adopted by Yoritomo must remain a matter of conjecture. What actually happened was that the ex-emperor, Go-Toba, made an ill-judged attempt (1221) to break the power of Kamakura. He issued a call to arms which was responded to by some thousands of cenobites and as many soldiers of Taira extraction. In the brief struggle that ensued the Imperial partisans were wholly shattered, and the direct consequences were the dethronement and exile of the reigning emperor, the banishment of his predecessor together with two princes of the blood, and the compulsory adoption of the tonsure by Go-Toba; while the indirect consequence was that the succession to the throne and the tenure of Imperial power fell under the dictation of the Hōjō as they had formerly fallen under the direction of the Fujiwara. Yoshitoki, then head of the Hōjō family, installed his brother, Tokifusa, as military governor of Kiōto, and confiscating about 3000 estates, the property of those who had espoused the Imperial cause, distributed these lands among the adherents of his own family, thus greatly strengthening the basis of the feudal system. "It fared with the Hōjō as it had fared with all the great families that preceded them: their own misrule ultimately wrought their ruin. Their first eight representatives were talented and upright administrators. They took justice, simplicity and truth for guiding principles; they despised luxury and pomp; they never aspired to high official rank; they were content with two provinces for estates, and they sternly repelled the effeminate, depraved customs of Kiōto." Thus the greater part of the 13th century was, on the whole, a golden era for Japan, and the lower orders learned to welcome feudalism. Nevertheless no century furnished more conspicuous illustrations of the peculiarly Japanese system of vicarious government. Children occupied the position of shōgun in Kamakura under authority emanating from children on the throne in Kiōto; and members of the Hōjō family as shikken administered affairs at the mandate of the child shōguns. Through all three stages in the dignities of mikado, shōgun and shikken, the strictly regulated principle of heredity was maintained, according to which no Hōjō shikken could ever become shōgun; no Minamoto or Fujiwara could occupy the throne. At the beginning of the 14th century, however, several causes combined to shake the supremacy of the Hōjō. Under the sway of the ninth shikken (Takatoki), the austere simplicity of life and earnest discharge of executive duties which had distinguished the early chiefs of the family were exchanged for luxury, debauchery and perfunctory government. Thus the management of fiscal affairs fell into the hands of Takasuke, a man of usurious instincts. It had been the wise custom of the Hōjō constables to store grain in seasons of plenty, and distribute it at low prices in times of dearth. There occurred at this epoch a succession of bad harvests, but instead of opening the state granaries with benevolent liberality, Takasuke sold their contents at the highest obtainable rates; and, by way of contrast to the prevailing indigence, the people saw the constable in Kamakura affecting the pomp and extravagance of a sovereign waited upon by 37 mistresses, supporting a band of 2000 dancers, and keeping a pack of 5000 fighting dogs. The throne happened to be then occupied (1319–1338) by an emperor, Go-Daigo, who had reached full maturity before his accession, and was correspondingly averse from acting the puppet part assigned to the sovereigns of his time. Female influence contributed to his impatience. One of his concubines bore a son for whom he sought to obtain nomination as prince imperial, in defiance of an arrangement made by the Hōjō that the succession should pass alternately to the senior and junior branches of the Imperial family. Kamakura refused to entertain Go-Daigo's project, and thenceforth the child's mother importuned her sovereign and lover to overthrow the Hōjō. The *entourage* of the throne in Kiōto at this time was a counterpart of former eras. The Fujiwara, indeed, wielded nothing of their ancient influence. They had been divided by the Hōjō into five branches, each endowed with an equal right to the office of regent, and their strength was thus dissipated in struggling among themselves for the possession of the prize. But what the Fujiwara had done in their days of greatness, what the Taira had done during their brief tenure of power, the Saionji were now doing, namely, aspiring to furnish prime ministers and empresses from their own family solely. They had already given consorts to five emperors in succession, and jealous rivals were watching keenly to attack this clan which threatened to usurp the place long held by the most illustrious family in the land. A petty incident disturbed this state of very tender equilibrium before the plan of the Hōjō's enemies had fully matured, and the emperor presently found himself an exile on the island of Oki. But there now appeared upon the scene three men of great prowess: Kusunoki Masashige, Nitta Yoshisada and Ashikaga Takauji. The first espoused from the outset the cause of the Throne and, though commanding only a small force, held the Hōjō troops in check. The last two were both of Minamoto descent. Their common ancestor was Minamoto Yoshiiye, whose exploits against the northern Yemishi in the second half of the 11th century had so impressed his countrymen that they gave him the title of Hachiman Tarō (first-born of the god of war). Both men took the field originally in the cause of the Hōjō, but at heart they desired to be avenged upon the latter for disloyalty to the Minamoto. Nitta Yoshisada marched suddenly against Kamakura, carried it by storm and committed the city to the flames. Ashikaga Takauji occupied Kiōto, and with the suicide of Takatoki the Hōjō fell finally from rule after 115 years of supremacy (1219–1334). The emperor now returned from exile, and his son, Prince Moriyoshi, having been appointed to the office of shōgun at Kamakura, the restoration of the administrative power to the Throne seemed an accomplished fact.

The Ashikaga Shōguns.

Go-Daigo, however, was not in any sense a wise sovereign. The extermination of the Hōjō placed wide estates at his disposal, but instead of rewarding those who had deserved well of him, he used a great part of them to enrich his favourites, the companions of his dissipation. Ashikaga Takauji sought just such an opportunity. The following year (1335) saw him proclaiming himself shōgun at Kamakura, and after a complicated pageant of incidents, the emperor Go-Daigo was obliged once more to fly from Kiōto. He carried the regalia with him, refused to submit to Takauji, and declined to recognize his usurped title of shōgun. The Ashikaga chief solved the situation by deposing Go-Daigo and placing upon the throne another scion of the imperial family who is known in history as Kōmyō (1336–1348), and who, of course, confirmed Takauji in the office of shōgun. Thus commenced the Ashikaga line of shōguns, and thus commenced also a fifty-six-year period of divided sovereignty, the emperor Go-Daigo and his descendants reigning in Yoshino as the southern court (*nanchō*), and the emperor Kōmyō and his descendants reigning in Kiōto as the northern court (*hokuchō*). It was by the efforts of the shōgun Yoshimitsu, one of the greatest of the Ashikaga potentates, that this quarrel was finally composed, but during its progress the country had fallen into a deplorable condition. "The constitutional powers had become completely disorganized, especially in regions at a distance from the chief towns. The peasant was impoverished, his spirit broken, his hope of better things completely gone. He dreamed away his miserable existence and left the fields untilled. Bands of robbers followed the armies through the interior of the country, and increased the feeling of lawlessness and insecurity. The coast population, especially that of the island of Kiūshiū, had given itself up in a great measure to piracy. Even on the shores of Korea and China these enterprising Japanese corsairs made their appearance." The shōgun Yoshimitsu checked piracy, and there ensued between Japan and China a renewal of cordial intercourse which, upon the part of the shōgun, developed phases plainly suggesting an admission of Chinese suzerainty.

For a brief moment during the sway of Yoshimitsu the country had rest from internecine war, but immediately after his death (1394) the struggle began afresh. Many of the great territorial lords had now grown too puissant to concern themselves about either mikado or shōgun. Each fought for his own hand, thinking only of extending his sway and his territories. By the middle of the 16th century Kiōto was in ruins, and little vitality remained in any trade or industry except those that ministered to the wants of the warrior. Again in the case of the Ashikaga shōguns the political tendency to exercise power vicariously was shown, as it had been shown in the case of the mikados in Kiōto and in the case of the Minamoto in Kamakura. What the regents had been to the emperors and the constables to the Minamoto shōguns, that the wardens (*kwanryō*) were to the Ashikaga shōguns. Therefore, for possession of this office of kwanryō vehement conflicts were waged, and at one time five rival shōguns were used as figure-heads by contending factions. Yoshimitsu had apportioned an ample allowance for the support of the Imperial court, but in the continuous warfare following his death the estates charged with the duty of paying this allowance ceased to return any revenue; the court nobles had to seek shelter and sustenance with one or other of the feudal chiefs in the provinces, and the court itself was reduced to such a state of indigence that when the emperor Go-Tsuchi died (1500).

his corpse lay for forty days awaiting burial, no funds being available for purposes of sepulture.

Alone among the vicissitudes of these troublous times the strength and influence of Buddhism grew steadily. The great monasteries were military strongholds as well as places of worship. When the emperor Kwammu chose Kiōto for his capital, he established on the hill of Hiyei-zan, which lay north-east of the city, a magnificent temple to ward off the evil influences supposed to emanate from that quarter. Twenty years later, Kōbō, the most famous of all Japanese Buddhist saints, founded on Koya-san in Yamato a monastery not less important than that of Hiyei-zan. These and many other temples had large tax-free estates, and for the protection of their property they found it expedient to train and arm the cenobites as soldiers. From that to taking active part in the political struggles of the time was but a short step, especially as the great temples often became refuges of sovereigns and princes who, though nominally forsaking the world, retained all their interest, and even continued to take an active part, in its vicissitudes. It is recorded of the emperor Shirakawa (1073–1086) that the three things which he declared his total inability to control were the waters of the river Kamo, the fall of the dice, and the monks of Buddha. His successors might have confessed equal inability. Kiyōmori, the puissant chief of the Taira family, had fruitlessly essayed to defy the Buddhists; Yoritomo, in the hour of his most signal triumph, thought it wise to placate them. Where these representatives of centralized power found themselves impotent, it may well be supposed that the comparatively petty chieftans who fought each for his own hand in the 15th and 16th centuries were incapable of accomplishing anything. In fact, the task of centralizing the administrative power, and thus restoring peace and order to the distracted empire, seemed, at the middle of the 16th century, a task beyond achievement by human capacity.

Nobunaga, Hideyoshi and Iyeyasu.

But if ever events create the men to deal with them, such was the case in the second half of that century. Three of the greatest captains and statesmen in Japanese history appeared upon the stage simultaneously, and moreover worked in union, an event altogether inconsistent with the nature of the age. They were Oda Nobunaga, Hideyoshi (the *taikō*) and Tokugawa Iyeyasu. Nobunaga belonged to the Taira family and was originally ruler of a small fief in the province of Owari. Iyeyasu, a sub-feudatory of Nobunaga's enemy, the powerful daimyō[1] of Mikawa and two other provinces, was a scion of the Minamoto and therefore eligible for the shōgunate. Hideyoshi was a peasant's son, equally lacking in patrons and in personal attractions. No chance seemed more remote than that such men, above all Hideyoshi, could possibly rise to supreme power. On the other hand, one outcome of the commotion with which the country had seethed for more than four centuries was to give special effect to the principle of natural selection. The fittest alone surviving, the qualities that made for fitness came to take precedence of rank or station, and those qualities were prowess in the battle-field and wisdom in the statesman's closet. "Any plebeian that would prove himself a first-class fighting man was willingly received into the armed *comitatus* which every feudal potentate was eager to attach to himself and his flag." It was thus that Hideyoshi was originally enrolled in the ranks of Nobunaga's retainers.

Nobunaga, succeeding to his small fief in Owari in 1542, added to it six whole provinces within 25 years of continuous endeavour. Being finally invited by the emperor to undertake the pacification of the country, and appealed to by Yoshiaki, the last of the Ashikaga chiefs, to secure for him the shōgunate, he marched into Kiōto at the head of a powerful army (1568), and, having accomplished the latter purpose, was preparing to complete the former when he fell under the sword of a traitor. Throughout his brilliant career he had the invaluable assistance of Hideyoshi, who would have attained immortal fame on any stage in any era. Hideyoshi entered Nobunaga's service as a groom and ended by administering the whole empire. When he accompanied Nobunaga to Kiōto in obedience to the invitation of the mikado, Okimachi, order and tranquillity were quickly restored in the capital and its vicinity. But to extend this blessing to the whole country, four powerful daimyōs as well as the militant monks had still to be dealt with. The monks had from the outset sheltered and succoured Nobunaga's enemies, and one great prelate, Kenryō, hierarch of the Monto sect, whose headquarters were at Osaka, was believed to aspire to the throne itself. In 1571 Nobunaga attacked and gave to the flames the celebrated monastery of Hiyei-zan, established nearly eight centuries previously; and in 1580 he would have similarly served the splendid temple Hongwan-ji in Osaka, had not the mikado sought and obtained grace for it. The task then remained of subduing four powerful daimyōs, three in the south and one in the north-east, who continued to follow the bent of their own warlike ambitions without paying the least attention to either sovereign or shōgun. The task was commenced by sending an army under Hideyoshi against Mōri of Chōshū, whose fief lay on the northern shore of the Shimonoseki strait. This proved to be the last enterprise planned by Nobunaga. On a morning in June 1582 one of the corps intended to reinforce Hideyoshi's army marched out of Kameyama under the command of Akechi Mitsuhide, who either harboured a personal grudge against Nobunaga or was swayed by blind ambition. Mitsuhide suddenly changed the route of his troops, led them to Kiōto, and attacked the temple Honnō-ji where Nobunaga was sojourning all unsuspicious of treachery. Rescue and resistance being alike hopeless, the great soldier committed suicide. Thirteen days later, Hideyoshi, having concluded peace with Mōri of Chōshū, fell upon Mitsuhide's forces and shattered them, Mitsuhide himself being killed by a peasant as he fled from the field.

Hideyoshi.

Nobunaga's removal at once made Hideyoshi the most conspicuous figure in the empire, the only man with any claim to dispute that title being Tokugawa Iyeyasu. These two had hitherto worked in concert. But the question of the succession to Nobunaga's estates threw the country once more into tumult. He left two grown-up sons and a baby grandson, whose father, Nobunaga's first-born, had perished in the holocaust at Honnō-ji. Hideyoshi, not unmindful, it may be assumed, of the privileges of a guardian, espoused the cause of the infant, and wrested from Nobunaga's three other great captains a reluctant endorsement of his choice. Nobutaka, third son of Nobunaga, at once drew the sword, which he presently had to turn against his own person; two years later (1584), his elder brother, Nobuo, took the field under the aegis of Tokugawa Iyeyasu. Hideyoshi and Iyeyasu, now pitted against each other for the first time, were found to be of equal prowess, and being too wise to prolong a useless war, they reverted to their old alliance, subsequently confirming it by a family union, the son of Iyeyasu being adopted by Hideyoshi and the latter's daughter being given in marriage to Iyeyasu. Hideyoshi had now been invested by the mikado with the post of regent, and his position in the capital was omnipotent. He organized in Kiōto a magnificent pageant, in which the principal figures were himself, Iyeyasu, Nobuo and twenty-seven daimyōs. The emperor was present. Hideyoshi sat on the right of the throne, and all the nobles did obeisance to the sovereign. Prior to this event Hideyoshi had conducted against the still defiant daimyōs of Kiūshiū, especially Shimazu of Satsuma, the greatest army ever massed by any Japanese general, and had reduced the island of the nine provinces, not by weight of armament only, but also by a signal exercise of the wise clemency which distinguished him from all the statesmen of his era.

The whole of Japan was now under Hideyoshi's sway except the fiefs in the extreme north and those in the region known as the Kwantō, namely, the eight provinces forming the eastern elbow of the main island. Seven of these provinces were virtually under the sway of Hōjō Ujimasa, fourth representative of a family established in 1476 by a brilliant adventurer of Ise, not related in any way to the great but then extinct house of Kamakura Hōjōs. The daimyōs in the north were comparatively powerless to resist Hideyoshi, but to reach them the Kwantō had to be reduced, and not only was its chief, Ujimasa, a formidable foe, but also the topographical features of the district represented fortifications of immense strength. After various unsuccessful overtures, having for their purpose to induce Ujimasa to visit the capital and pay homage to the emperor, Hideyoshi marched from Kiōto in the spring of 1590 at the head of 170,000 men, his colleagues Nobuo and Iyeyasu having under their orders 80,000 more. The campaign ended as did all Hideyoshi's enterprises, except that he treated his vanquished enemies with unusual severity. During the three months spent investing Odawara, the northern daimyōs surrendered, and thus the autumn of 1590 saw Hideyoshi master of Japan from end to end, and saw Tokugawa Iyeyasu established at Yedo as recognized ruler of the eight provinces of the Kwantō. These two facts should be bracketed together, because Japan's emergence from the deep gloom of long-continued civil strife was due not more to the brilliant qualities of Hideyoshi and Iyeyasu individually than to the fortunate synchronism of their careers, so that the one was able to carry the other's work to completion and permanence. The last eight years of Hideyoshi's life—he died in 1598—were chiefly remarkable for his attempt to invade China through Korea, and for his attitude towards Christianity (see § VIII.: FOREIGN INTERCOURSE).

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[1] Daimyō ("great name") was the title given to a feudal chief.

The Tokugawa Era.—When Hideyoshi died he left a son, Hideyori, then only six years of age, and the problem of this child's future had naturally caused supreme solicitude to the peasant statesman. He finally entrusted the care of the boy and the management of state affairs to five regents, five ministers, and three intermediary councillors. But he placed chief reliance upon Iyeyasu, whom he appointed president of the board of regents. Among the latter was one, Ishida Mitsunari, who to insatiable ambition added an extraordinary faculty for intrigue and great personal magnetism. These qualities he utilized with such success that the dissensions among the daimyōs, which had been temporarily composed by Hideyoshi, broke out again, and the year 1600 saw Japan divided into two camps, one composed of Tokugawa Iyeyasu and his allies, the other of Ishida Mitsunari and his partisans.

Iyeyasu.

The situation of Iyeyasu was eminently perilous. From his position in the east of the country, he found himself menaced by two powerful enemies on the north and on the south, respectively, the former barely contained by a greatly weaker force of his friends, and the latter moving up in seemingly overwhelming strength from Kiōto. He decided to hurl himself upon the southern army without awaiting the result of the conflict in the north. The encounter took place at Sekigahara in the province of Mino on the 21st of October 1600. The army of Iyeyasu had to move to the attack in such a manner that its left flank and its left rear were threatened by divisions of the enemy posted on commanding eminences. But with the leaders of these divisions Iyeyasu had come to an understanding by which they could be trusted to abide so long as victory did not declare against him. Such incidents were naturally common in an era when every man fought for his own hand. The southerners suffered a crushing defeat. The survivors fled pell-mell to Osaka, where in a colossal fortress, built by Hideyoshi, his son, Hideyori, and the latter's mother, Yodo, were sheltered behind ramparts held 80,000 men. Hideyori's cause had been openly put forward by Ishida Mitsunari and his partisans, but Iyeyasu made no immediate attempt to visit the sin upon the head of his deceased benefactor's child. On the contrary, he sent word to the lady Yodo and her little boy that he absolved them of all complicity. The battle of Sekigahara is commonly spoken of as having terminated the civil war which had devastated Japan, with brief intervals, from the latter half of the 12th century to the beginning of the 17th. That is incorrect in view of the fact that Sekigahara was followed by other fighting, especially by the terrible conflict at Osaka in 1615 when Yodo and her son perished. But Sekigahara's importance cannot be over-rated. For had Iyeyasu been finally crushed there, the wave of internecine strife must have rolled again over the empire until providence provided another Hideyoshi and another Iyeyasu to stem it. Sekigahara, therefore, may be truly described as a turning-point in Japan's career and as one of the decisive battles of the world. As for the fact that the Tokugawa leader did not at once proceed to extremities in the case of the boy Hideyori, though the events of the Sekigahara campaign had made it quite plain that such a course would ultimately be inevitable, we have to remember that only two years had elapsed since Hideyoshi was laid in his grave. His memory was still green and the glory of his achievements still enveloped his family. Iyeyasu foresaw that to carry the tragedy to its bitter end at once must have forced into Hideyori's camp many puissant daimyōs whose sense of allegiance would grow less cogent with the lapse of time. When he did lay siege to the Osaka castle in 1615, the power of the Tokugawa was wellnigh shattered against its ramparts; had not the onset been aided by treachery, the stronghold would probably have proved impregnable.

But signal as were the triumphs of the Tokugawa chieftain in the field, what distinguishes him from all his predecessors is the ability he displayed in consolidating his conquests. The immense estates that fell into his hands he parcelled out in such a manner that all important strategical positions were held by daimyōs whose fidelity could be confidently trusted, and every feudatory of doubtful loyalty found his fief within touch of a Tokugawa partisan. This arrangement, supplemented by a system which required all the great daimyōs to have mansions in the shōgun's capital. Yedo, to keep their families there always and to reside there themselves in alternate years, proved so potent a check to disaffection that from 1615, when the castle of Osaka fell, until 1864, when the Chōshū rōnin attacked Kiōto, Japan remained entirely free from civil war.

It is possible to form a clear idea of the ethical and administrative principles by which Iyeyasu and the early Tokugawa chiefs were guided in elaborating the system which gave to Japan an unprecedented era of peace and prosperity. Evidence is furnished not only by the system itself but also by the contents of a document generally called the *Testament of Iyeyasu*, though probably it was not fully compiled until the time of his grandson, Iyemitsu (1623–1650). The great Tokugawa chief, though he munificently patronized Buddhism and though he carried constantly in his bosom a miniature Buddhist image to which he ascribed all his success in the field and his safety in battle, took his ethical code from Confucius. He held that the basis of all legislation and administration should be the five relations of sovereign and subject, parent and child, husband and wife, brother and sister, friend and friend. The family was, in his eyes, the essential foundation of society, to be maintained at all sacrifices. Beyond these broad outlines of moral duty it was not deemed necessary to instruct the people. Therefore out of the hundred chapters forming the *Testament* only 22 contain what can be called legal enactments, while 55 relate to administration and politics; 16 set forth moral maxims and reflections, and the remainder record illustrative episodes in the career of the author. "No distinct line is drawn between law and morals, between the duty of a citizen and the virtues of a member of a family. Substantive law is entirely wanting, just as it was wanting in the so-called constitution of Prince Shōtoku. Custom, as sanctioned by public observance, must be complied with in the civil affairs of life. What required minute exposition was criminal law, the relations of social classes, etiquette, rank, precedence, administration and government.

Society under feudalism had been moulded into three sharply defined groups, namely, first, the Throne and the court nobles (*kuge*); secondly, the military class (*buke* or *samurai*); and thirdly, the common people (*heimin*). These lines of cleavage were emphasized as much as possible by the Tokugawa rulers. The divine origin of the mikado was held to separate him from contact with mundane affairs, and he was therefore strictly secluded in the palace at Kiōto, his main function being to mediate between his heavenly ancestors and his subjects, entrusting to the shōgun and the samurai the duty of transacting all worldly business on behalf

Social distinctions in the Tokugawa Era.

of the state. In obedience to this principle the mikado became a kind of sacrosanct abstraction. No one except his consorts and his chief ministers ever saw his face. In the rare cases when he gave audience to a privileged subject, he sat behind a curtain, and when he went abroad, he rode in a closely shut car drawn by oxen. A revenue of ten thousand *koku* of rice—the equivalent of about as many guineas—was apportioned for his support, and the right was reserved to him of conferring empty titles upon the living and rank upon the dead. His majesty had one wife, the empress (*kōgō*), necessarily taken from one of the five chosen families (*go-sekke*) of the Fujiwara, but he might also have twelve consorts, and if direct issue failed, the succession passed to one of the two princely families of Arisugawa and Fushimi, adoption, however, being possible in the last resort. The *kuge* constituted the court nobility, consisting of 155 families all of whom traced their lineage to ancient mikados; they ranked far above the feudal chiefs, not excepting even the shōgun; filled by right of heredity nearly all the offices at the court, the emoluments attached being, however, a mere pittance; were entirely without the great estates which had belonged to them in ante-feudal times, and lived lives of proud poverty, occupying themselves with the study of literature and the practice of music and art. After the *kuge* and at a long distance below them in theoretical rank came the military families, who, as a class, were called *buke* or *samurai*. They had hereditary revenues, and they filled the administrative posts, these, too, being often hereditary. The third, and by far the most numerous, section of the nation were the commoners (*heimin*). They had no social status; were not allowed to carry swords, and possessed no income except what they could earn with their hands. About 55 in every 1000 units of the nation were samurai, the latter's wives and children being included in this estimate.

Daimyōs.

Under the Hōjō and the Ashikaga shōguns the holders of the great estates changed frequently according to the vicissitudes of those troublesome times, but under the Tokugawa no change took place, and there thus grew up a landed nobility of the most permanent character. Every one of these estates was a feudal kingdom, large or small, with its own usages and its own laws, based on the general principles above indicated and liable to be judged according to those principles by the shōgun's government (*baku-fu*) in Yedo. A daimyō or feudal chief drew from the peasants on his estate the means of subsistence for himself and his retainers. For this purpose the produce of his estate was assessed by the shōgun's officials in *koku* (one *koku* = 180·39 litres, worth about £1), and about one-half of the assessed amount went to the feudatory, the other half to the tillers of the soil. The richest daimyō was Mayeda of Kaga, whose fief was assessed at a little over a million *koku*, his revenue thus being about half a million sterling. Just as an empress had to be taken from one of five families designated to that distinction for all time, so a successor to the shōgunate, failing direct heir, had to be selected from three families (*sanke*), namely, those of the daimyōs of Owari, Kii and Mito, whose first representatives were three sons of Iyeyasu. Out of the total body of 255 daimyōs existing in the year 1862, 141 were specially distinguished as *fudai*, or hereditary vassals of the Tokugawa house, and to 18 of these was strictly limited the perpetual privilege of filling all the high offices in the Yedo administration, while to 4 of them was reserved the special honour of supplying a regent (*go-tairō*) during the minority of the shōgun. Moreover, a *fudai* daimyō was of necessity appointed to the command of the fortress of Nijō in Kiōto as well as of the great castles of Osaka and Fushimi, which Iyeyasu designated the keys of the country. No intermarriage might take place between members of the court nobility and the feudal houses without the consent of Yedo; no daimyō might apply direct to the emperor for an official title, or might put foot within the imperial district of Kiōto without the shōgun's permit, and at all entrances to the region known as the Kwantō there were established guard-houses, where every one, of whatever rank, must submit to be examined, in order to prevent the wives and children of the daimyōs from secretly leaving Yedo for their own provinces. In their journeys to and from Yedo every second year the feudal chiefs had to travel by one of two great highways, the Tōkaidō or the Nakasendō, and as they moved with great retinues, these roads were provided with a number of inns and tea-houses equipped in a sumptuous manner, and having an abundance of female servants. A puissant daimyō's procession often numbered as many as 1000 retainers, and nothing illustrates more forcibly the wide interval that separated the soldier and the plebeian than the fact that at the appearance of the heralds who preceded these progresses all commoners who happened to be abroad had to kneel on the ground with bowed and uncovered heads; all wayside houses had to close the shutters of windows giving on the road, and none might venture to look down from a height on the passing magnate. Any violation of these rules of etiquette exposed the violator to instant death at the hands of the daimyō's retinue. Moreover, the samurai and the heimin lived strictly apart. A feudal chief had a castle which generally occupied a commanding position. It was surrounded by from one to three broad moats, the innermost crowned with a high wall of huge cut stones, its trace arranged so as to give flank defence, which was further provided by pagoda-like towers placed at the salient angles. Inside this wall stood the houses of the high officials on the outskirts of a park surrounding the residence of the daimyō himself, and from the scarps of the moats or in the intervals between them rose houses for the military retainers, barrack-like structures, provided, whenever possible, with small but artistically arranged and carefully tended gardens. All this domain of the military was called *yashiki* in distinction to the *machi* (streets) where the despised commoners had their habitat.

Samurai.

The general body of the samurai received stipends and lived frugally. Their pay was not reckoned in money: it took the form of so many rations of rice delivered from their chief's granaries. A few had landed estates, usually bestowed in recognition of conspicuous merit. They were probably the finest type of hereditary soldiers the world ever produced. Money and all devices for earning it they profoundly despised. The right of wearing a sword was to them the highest conceivable privilege. They counted themselves the guardians of their fiefs' honour and of their country's welfare. At any moment they were prepared cheerfully to sacrifice their lives on the altar of loyalty. Their word, once given, must never be violated. The slightest insult to their honour might not be condoned. Stoicism was a quality which they esteemed next to courage: all outward display of emotion must be suppressed. The sword might never be drawn for a petty cause, but, if once drawn, must never be returned to its scabbard until it had done its duty. Martial exercises occupied much of their attention, but book learning also they esteemed highly. They were profoundly courteous towards each other, profoundly contemptuous towards the commoner, whatever his wealth. Filial piety ranked next to loyalty in their code of ethics. Thus the Confucian maxim, endorsed explicitly in the *Testament of Iyeyasu*, that a man must not live under the same sky with his father's murderer or his brother's slayer, received most literal obedience, and many instances occurred of vendettas pursued in the face of apparently insuperable difficulties and consummated after years of effort. By the standard of modern morality the Japanese samurai would be counted cruel. Holding that death was the natural sequel of defeat and the only certain way of avoiding disgrace, he did not seek quarter himself or think of extending it to an enemy. Yet in his treatment of the latter he loved to display courtesy until the supreme moment when all considerations of mercy were laid aside. It cannot be doubted that the practice of employing torture judicially tended to educate a mood of callousness towards suffering, or that the many idle hours of a military man's life in time of peace encouraged a measure of dissipation. But there does not seem to be any valid ground for concluding that either of these defects was conspicuous in the character of the Japanese samurai. Faithlessness towards women was the greatest fault that can be laid to his door. The samurai lady claimed no privilege of timidity on account of her sex. She knew how to die in the cause of honour just as readily as her husband, her father or her brother died, and conjugal fidelity did not rank as a virtue in her eyes, being regarded as a simple duty. But her husband held marital faith in small esteem and ranked his wife far below his sword. It has to be remembered that when we speak of a samurai's suicide, there is no question of poison, the bullet, drowning or any comparatively painless manner of exit from the world. The invariable method was to cut open the abdomen (*hara-kiri* or *seppuku*) and afterwards, if strength remained, the sword was turned against the throat. To such endurance had the samurai trained himself that he went through this cruel ordeal without flinching in the smallest degree.

Heimin.

The heimin or commoners were divided into three classes—husbandmen, artisans and traders. The farmer, as the nation lived by his labour, was counted the most respectable among the bread-winners, and a cultivator of his own estate might even carry one sword but never two, that privilege being strictly reserved to a samurai. The artisan, too, received much consideration, as is easily understood when we remember that included in his ranks were artists, swordsmiths, armourers, sculptors of sacred images or sword-furniture, ceramists and lacquerers. Many artisans were in the permanent service of feudal chiefs from whom they received fixed salaries. Tradesmen, however, were regarded with disdain and stood lowest of all in the social organization. Too much despised to be even included in that organization were the *eta* (defiled folks) and the *hinin* (outcasts). The exact origin of these latter pariahs is uncertain, but the ancestors of the eta would seem to have been prisoners of war or the enslaved families of criminals. To such people were assigned the defiling duties of tending tombs, disposing of the bodies of the dead, slaughtering animals or tanning hides. The hinin were mendicants. On them devolved the task of removing and burying the corpses of executed criminals. Living in segregated hamlets, forbidden to marry with heimin, still less with samurai, not allowed to eat, drink or associate with persons above their own class, the eta remained under the ban of ostracism from generation to generation, though many of them contrived to amass much wealth. They were governed by their own headmen, and they had three chiefs, one residing in each of the cities of Yedo, Osaka and Kiōto. All these members of the submerged classes were relieved from proscription and admitted to the ranks of the commoners under the enlightened system of Meiji. The 12th of October 1871 saw their enfranchisement, and at that date the census showed 287,111 eta and 695,689 hinin.

Decline and Fall of the Shōgunate.

Naturally, as the unbroken peace of the Tokugawa régime became habitual, the mood of the nation underwent a change. The samurai, no longer required to lead the frugal life of camp or barracks, began to live beyond their incomes. "They found difficulty in meeting the pecuniary engagements of everyday existence, so that money acquired new importance in their eyes, and they gradually forfeited the respect which their traditional disinterestedness had won for them in the past." At the same time the abuses of feudalism were thrown into increased salience. A large body of hereditary soldiers become an anomaly when fighting has passed even out of memory. On the other hand, the agricultural and commercial classes acquired new importance. The enormous sums disbursed every year in Yedo, for the maintenance of the great establishments which the feudal chiefs vied with each other in keeping there, enriched the merchants and traders so greatly that their scale of living underwent radical change. Buddhism was a potent influence, but its ethical restraints were weakened by the conduct of its priests, who themselves often yielded to the temptation of the time. The aristocracy adhered to its refined pastimes—performances of the *No*; tea reunions; poem composing; polo; football; equestrian archery; fencing and gambling—but the commoner, being excluded from all this realm and, at the same time, emerging rapidly from his old position of penury and degradation, began to develop luxurious proclivities and to demand corresponding amusements. Thus the theatre came into existence; the dancing girl and the jester found lucrative employment; a popular school of art was founded and quickly carried to perfection; the *lupanar* assumed unprecedented dimensions; rich and costly costumes acquired wide vogue in despite of sumptuary laws enacted from time to time; wrestling became an important institution, and plutocracy asserted itself in the face of caste distinctions.

Simultaneously with the change of social conditions thus taking place, history repeated itself at the shōgun's court. The substance of administrative power passed into the hands of a minister, its shadow alone remaining to the shōgun. During only two generations were the successors of Iyeyasu able to resist this traditional tendency. The representative of the third—Iyetsuna (1661–1680)—succumbed to the machinations of an ambitious minister, Sakai Takakiyo, and it may be said that from that time the nominal repository of administrative authority in Yedo was generally a species of magnificent recluse, secluded from contact with the outer world and seeing and hearing only through the eyes and ears of the ladies of his household. In this respect the descendants of the great Tokugawa statesman found themselves reduced to a position precisely analogous to that of the emperor in Kiōto. Sovereign and shōgun were alike mere abstractions so far as the practical work of government was concerned. With the great mass of the feudal chiefs things fared similarly. These men who, in the days of Nobunaga, Hideyoshi and Iyeyasu, had directed the policies of their fiefs and led their armies in the field, were gradually transformed, during the long peace of the Tokugawa era, into voluptuous *fainéants* or, at best, thoughtless dilettanti, willing to abandon the direction of their affairs to seneschals and mayors, who, while on the whole their administration was able and loyal, found their account in contriving and perpetuating the effacement of their chiefs. Thus, in effect, the government of the country, taken out of the hands of the shōgun and the feudatories, fell into those of their vassals. There were exceptions, of course, but so rare as to be merely accidental.

Another important factor has to be noted. It has been shown above that Iyeyasu bestowed upon his three sons the rich fiefs of Owari, Kii (Kishū) and Mito, and that these three families exclusively enjoyed the privilege of furnishing an heir to the shōgun should the latter be without direct issue. Mito ought therefore to have been a most unlikely place for the conception and propagation of principles subversive of the shōgun's administrative autocracy. Nevertheless, in the days of the second of the Mito chiefs at the close of the 17th century, there arose in that province a school of thinkers who, revolting against the ascendancy of Chinese literature and of Buddhism, devoted themselves to compiling a history such as should recall the attention of the nation to its own annals and revive its allegiance to Shintō. It would seem that in patronizing the compilation of this great work the Mito chief was swayed by the spirit of pure patriotism and studentship, and that he discerned nothing of the goal to which the new researches must lead the litterati of his fief. "He and they, for the sake of history and without any thought of politics, undertook a retrospect of their country's annals, and their frank analysis furnished conclusive proof that the emperor was the prime source of administrative authority and that its independent exercise by a shōgun must be regarded as a usurpation. They did not attempt to give practical effect to their discoveries; the era was essentially academical. But this galaxy of scholars projected into the future a light which burned with growing force in each succeeding generation and ultimately burst into a flame which consumed feudalism and the shōgunate," fused the nation into one, and restored the governing authority to the emperor. Of course the Mito men were not alone in this matter: many students subsequently trod in their footsteps and many others sought to stem the tendency; but the net result was fatal to faith in the dual system of government. Possibly had nothing occurred to furnish signal proof of the system's practical defects, it might have long survived this theoretical disapproval. But the crisis caused by the advent of foreign ships and by the forceful renewal of foreign intercourse in the 19th century afforded convincing evidence of the shōgunate's incapacity to protect the state's supposed interests and to enforce the traditional policy of isolation which the nation had learned to consider essential to the empire's integrity.

Another important factor made for the fall of the shōgunate. That factor was the traditional disaffection of the two great southern fiefs, Satsuma and Chōshū. When Iyeyasu parcelled out the empire, he deemed it the wisest policy to leave these chieftains in full possession of their large estates. But this measure, construed as an evidence of weakness rather than a token of liberality, neither won the allegiance of the big feudatories nor cooled their ambition. Thus no sooner did the nation divide into two camps over the question of renewed foreign intercourse than men of the above clans, in concert with representatives of certain of the old court nobles, placed themselves at the head of a movement animated by two loudly proclaimed purposes: restoration of the administration to the emperor, and expulsion of aliens. This latter aspiration underwent a radical change when the bombardment of the Satsuma capital, Kagoshima, and the destruction of the Chōshū forts and ships at Shimonoseki proved conclusively to the Satsuma and Chōshū clans that Japan in her unequipped and backward condition could not hope to stand for a moment against the Occident in arms. But the unwelcome discovery was accompanied by a conviction that only a thoroughly united nation might aspire to preserve its independence, and thus the abolition of the dual form of government became more than ever an article of public faith. It is unnecessary to recount the successive incidents which conspired to undermine the shōgun's authority, and to destroy the prestige of the Yedo administration. Both had been reduced to vanishing quantities by the year 1866 when Keiki succeeded to the shōgunate.

Keiki, known historically as Yoshinobu, the last of the shōguns, was a man of matured intellect and high capacities. He had been put forward by the anti-foreign Conservatives for the succession to the shōgunate in 1857 when the complications of foreign intercourse were in their first stage of acuteness. But, like many other intelligent Japanese, he had learned, in the interval between 1857 and 1866, that to keep her doors closed was an impossible task for Japan, and very quickly after taking the reins of office he recognized that national union could never be achieved while power was divided between Kiōto and Yedo. At this juncture there was addressed to him by Yōdō, chief of the great Tosa fief, a memorial setting forth the hopelessness of the position in which the Yedo court now found itself, and urging that, in the interests of good government and in order that the nation's united strength might be available to meet the exigencies of its new career, the administration should be restored to the emperor. Keiki received this memorial in Kiōto. He immediately summoned a council of all the feudatories and high officials then in the Imperial city, announced to them his intention to lay down his office, and, the next day, presented his resignation to the sovereign. This happened on the 14th of October 1867. It must be ranked among the signal events of the world's history, for it signified the voluntary surrender of kingly authority wielded uninterruptedly for nearly three centuries. That the shōgun's resignation was tendered in good faith there can be no doubt, and had it been accepted in the same spirit, the great danger it involved might have been consummated without bloodshed or disorder. But the clansmen of Satsuma and Chōshū were distrustful. One of the shōgun's first acts after assuming office had been to obtain from the throne an edict for imposing penalties on Chōshū, and there was a precedent for suspecting that the renunciation of power by the shōgun might merely prelude its resumption on a firmer basis. Therefore steps were taken to induce the emperor, then a youth of fifteen, to issue a secret rescript to Satsuma and Chōshū, denouncing the shōgun as the nation's enemy and enjoining his destruction. At the same time all officials connected with the Tokugawa or suspected of sympathy with them were expelled from office in Kiōto, and the shōgun's troops were deprived of the custody of the palace gates by methods which verged upon the use of armed force. In the face of such provocation Keiki's earnest efforts to restrain the indignation of his vassals and adherents failed. They marched against Kiōto and were defeated, whereupon Keiki left his castle at Osaka and retired to Yedo, where he subsequently made unconditional surrender to the Imperial army. There is little more to be set down on this page of the history. The Yedo court consented to lay aside its dignities and be stripped of its administrative authority, but all the Tokugawa vassals and adherents did not prove equally placable. There was resistance in the northern provinces, where the Aizu feudatory refused to abandon the Tokugawa cause; there was an attempt to set up a rival candidate for the throne in the person of an Imperial prince who presided over the Uyeno Monastery in Yedo; and there was a wild essay on the part of the admiral of the shōgun's fleet to establish a republic in the island of Yezo. But these were mere ripples on the surface of the broad stream which set towards the peaceful overthrow of the dual system of government and ultimately towards the fall of feudalism itself. That this system, the outcome of five centuries of nearly continuous warfare, was swept away in almost as many weeks with little loss of life or destruction of property constitutes, perhaps, the most striking incident, certainly the most momentous, in the history of the Japanese nation.

The Meiji Era.—It must be remembered that when reference is made to the Japanese nation in connexion with these radical changes, only the nobles and the samurai are indicated—in other words, a section of the population representing about one-sixteenth of the whole. The bulk of the people—the agricultural, the industrial and the mercantile classes—remained outside the sphere of politics, not sharing the anti-foreign prejudice, or taking any serious interest in the great questions of the time. Foreigners often noted with surprise the contrast between the fierce antipathy displayed towards them by certain samurai on the one hand, and the genial, hospitable reception given to them by the common people on the other. History teaches that the latter was the natural disposition of the Japanese, the former a mood educated by special experiences. Further, even the comparatively narrow statement that the restoration of the administrative power to the emperor was the work of the nobles and the samurai must be taken with limitations. A majority of the nobles entertained no idea of any necessity for change. They were either held fast in the vice of Tokugawa authority, or paralyzed by the sensuous seductions of the lives provided for them by the machinations of their retainers, who transferred the administrative authority of the fiefs to their own hands, leaving its shadow only to their lords. It was among the retainers that longings for a new order of things were generated. Some of these men were sincere disciples of progress—a small band of students and deep thinkers who, looking through the narrow Dutch window at Deshima, had caught a glimmering perception of the realities that lay beyond the horizon of their country's prejudices. But the influence of such Liberals was comparatively insignificant. Though they showed remarkable moral courage and tenacity of purpose, the age did not furnish any strong object lesson to enforce their propaganda of progress. The factors chiefly making for change were, first, the ambition of the southern clans to oust the Tokugawa, and, secondly, the samurai's loyal instinct, reinforced by the teachings of his country's history, by the revival of the Shintō cult, by the promptings of national enterprise, and by the object-lessons of foreign intercourse.

Character of the Revolution.

But though essentially imperialistic in its prime purposes, the revolution which involved the fall of the shōgunate, and ultimately of feudalism, may be called democratic with regard to the personnel of those who planned and directed it. They were, for the most part, men without either official rank or social standing. That is a point essential to a clear understanding of the issue. Fifty-five individuals may be said to have planned and carried out the overthrow of the Yedo administration, and only five of them were territorial nobles. Eight, belonging to the court nobility, laboured under the traditional disadvantages of their class, poverty and political insignificance; and the remaining forty-two, the hearts and hands of the movement, may be described as ambitious youths, who sought to make a career for themselves in the first place, and for their country in the second. The average age of the whole did not exceed thirty. There was another element for which any student of Japanese history might have been prepared: the Satsuma samurai aimed originally not merely at overthrowing the Tokugawa but also at obtaining the shōgunate for their own chief. Possibly it would be unjust to say that all the leaders of the great southern clan harboured that idea. But some of them certainly did, and not until they had consented to abandon the project did their union with Chōshū, the other great southern clan, become possible—a union without which the revolution could scarcely have been accomplished. This ambition of the Satsuma clansmen deserves special mention, because it bore remarkable fruit; it may be said to have laid the foundation of constitutional government in Japan. For, in consequence of the distrust engendered by such aspirations, the authors of the Restoration agreed that when the emperor assumed the reins of power, he should solemnly pledge himself to convene a deliberative assembly, to appoint to administrative posts men of intellect and erudition wherever they might be found, and to decide all measures in accordance with public opinion. This promise, referred to frequently in later times as the Imperial oath at the Restoration, came to be accounted the basis of representative institutions, though in reality it was intended solely as a guarantee against the political ascendancy of any one clan.

The Anti-feudal Idea.

At the outset the necessity of abolishing feudalism did not present itself clearly to the leaders of the revolution. Their sole idea was the unification of the nation. But when they came to consider closely the practical side of the problem, they understood how far it would lead them. Evidently that one homogeneous system of law should replace the more or less heterogeneous systems operative in the various fiefs was essential, and such a substitution meant that the feudatories must be deprived of their local autonomy and, incidentally, of their control of local finances. That was a stupendous change. Hitherto each feudal chief had collected the revenues of his fief and had employed them at will, subject to the sole condition of maintaining a body of troops proportionate to his income. He had been, and was still, an autocrat within the limits of his territory. On the other hand, the active authors of the revolution were a small band of men mainly without prestige or territorial influence. It was impossible that they should dictate any measure sensibly impairing the local and fiscal autonomy of the feudatories. No power capable of enforcing such a measure existed at the time. All the great political changes in Japan had formerly been preceded by wars culminating in the accession of some strong clan to supreme authority, whereas in this case there had been a displacement without a substitution—the Tokugawa had been overthrown and no new administrators had been set up in their stead. It was, moreover, certain that an attempt on the part of any one clan to constitute itself executor of the sovereign's mandates would have stirred the other clans to vehement resistance. In short, the leaders of the revolution found themselves pledged to a new theory of government without any machinery for carrying it into effect, or any means of abolishing the old practice. An ingenious exit from this curious dilemma was devised by the young reformers. They induced the feudal chiefs of Satsuma, Chōshū, Tosa and Hizen, the four most powerful clans in the south, publicly to surrender their fiefs to the emperor, praying his majesty to reorganize them and to bring them all under the same system of law. In the case of Shimazu, chief of Satsuma, and Yōdō, chief of Tosa, this act must stand to their credit as a noble sacrifice. To them the exercise of power had been a reality and the effort of surrendering it must have been correspondingly costly. But the chiefs of Chōshū and Hizen obeyed the suggestions of their principal vassals with little, if any, sense of the probable cost of obedience. The same remark applies to all the other feudatories, with exceptions so rare as to emphasize the rule. They had long been accustomed to abandon the management of their affairs to their leading clansmen, and they allowed themselves to follow the same guidance at this crisis. Out of more than 250 feudatories, only 17 hesitated to imitate the example of the four southern fiefs.

Motives of the Reformers.

An explanation of this remarkable incident has been sought by supposing that the samurai of the various clans, when they advised a course so inconsistent with fidelity to the interests of their feudal chiefs, were influenced by motives of personal ambition, imagining that they themselves might find great opportunities under the new régime. Some hope of that kind may fairly be assumed, and was certainly realized, in the case of the leading samurai of the four southern clans which headed the movement. But it is plain that no such expectations can have been generally entertained. The simplest explanation seems to be the true one: a certain course, indicated by the action of the four southern clans, was conceived to be in accord with the spirit of the Restoration, and not to adopt it would have been to shrink publicly from a sacrifice dictated by the principle of loyalty to the Throne—a principle which had acquired supreme sanctity in the eyes of the men of that era. There might have been some uncertainty about the initial step; but so soon as that was taken by the southern clans their example acquired compelling force. History shows that in political crises the Japanese samurai is generally ready to pay deference to certain canons of almost romantic morality. There was a fever of loyalty and of patriotism in the air of the year 1869. Any one hesitating, for obviously selfish reasons, to adopt a precedent such as that offered by the procedure of the great southern clans, would have seemed to forfeit the right of calling himself a samurai. But although the leaders of this remarkable movement now understood that they must contrive the total abolition of feudalism and build up a new administrative edifice on foundations of constitutional monarchy, they appreciated the necessity of advancing slowly towards a goal which still lay beyond the range of their followers' vision. Thus the first steps taken after the surrender of the fiefs were to appoint the feudatories to the position of governors in the districts over which they had previously ruled; to confirm the samurai in the possession of their incomes and official positions; to put an end to the distinction between court nobles and territorial nobles, and to organize in Kiōto a cabinet consisting of the leaders of the restoration. Each new governor received one-tenth of the income of the fief by way of emoluments; the pay of the officials and the samurai, as well as the administrative expenses of the district, was defrayed from the same source, and the residue, if any, was to pass into the treasury of the central government.

Defects of the First Measures.

The defects of this system from a monarchical point of view soon became evident. It did not give the power of either the purse or the sword to the sovereign. The revenues of the administrative districts continued to be collected and disbursed by the former feudatories, who also retained the control of the troops, the right of appointing and dismissing officials, and almost complete local autonomy. A further radical step had to be taken, and the leaders of reform, seeing nothing better than to continue the method of procedure which had thus far proved so successful, contrived, first, that several of the administrative districts should send in petitions offering to surrender their local autonomy and be brought under the direct rule of the central government; secondly, that a number of samurai should apply for permission to lay aside their swords. While the nation was digesting the principles embodied in these petitions, the government made preparations for further measures of reform. The ex-chief of Satsuma, who showed some umbrage because the services of his clan in promoting the restoration had not been more fully recognized, was induced to take high ministerial office, as were also the ex-chiefs of Chōshū and Tosa. Each of the four great clans had now three representatives in the ministry. These clans were further persuaded to send to Tōkyō—whither the emperor had moved his court—contingents of troops to form the nucleus of a national army. Importance attaches to these details because the principle of clan representation, illustrated in the organization of the cabinet of 1871, continued to be approximately observed for many years in forming ministries, and ultimately became a target for the attacks of party politicians.

Adoption of Radical Measures.

On the 29th of August 1871 an Imperial decree announced the abolition of the system of local autonomy, and the removal of the territorial nobles from the posts of governor. The taxes of the former fiefs were to be paid thenceforth into the central treasury; all officials were to be appointed by the Imperial government, and the feudatories, retaining permanently an income of one-tenth of their original revenues, were to make Tōkyō their place of residence. As for the samurai, they remained for the moment in possession of their hereditary pensions. Radical as these changes seem, the disturbance caused by them was not great, since they left the incomes of the military class untouched. Some of the incomes were for life only, but the majority were hereditary, and all had been granted in consideration of their holders devoting themselves to military service. Four hundred thousand men approximately were in receipt of such emoluments, and the total amount annually taken from the taxpayers for this purpose was about £2,000,000. Plainly the nation would have to be relieved of this burden sooner or later. The samurai were essentially an element of the feudal system, and that they should survive the latter's fall would have been incongruous. On the other hand, suddenly and wholly to deprive these men and their families—a total of some two million persons—of the means of subsistence on which they had hitherto relied with absolute confidence, and in return for which they and their forefathers had rendered faithful service, would have been an act of inhumanity. It may easily be conceived that this problem caused extreme perplexity to the administrators of the new Japan. They left it unsolved for the moment, trusting that time and the loyalty of the samurai themselves would suggest some solution. As for the feudal chiefs, who had now been deprived of all official status and reduced to the position of private gentlemen, without even a patent of nobility to distinguish them from ordinary individuals, they did not find anything specially irksome or regrettable in their altered position. No scrutiny had been made into the contents of their treasuries. They were allowed to retain unquestioned possession of all the accumulated funds of their former fiefs, and they also became public creditors for annual allowances equal to one-tenth of their feudal revenues. They had never previously been so pleasantly circumstanced. It is true that they were entirely stripped of all administrative and military authority; but since their possession of such authority had been in most cases merely nominal, they only felt the change as a relief from responsibility.

Treatment of the Samurai.

By degrees public opinion began to declare itself with regard to the samurai. If they were to be absorbed into the bulk of the people and to lose their fixed revenues, some capital must be placed at their disposal to begin the world again. The samurai themselves showed a noble faculty of resignation. They had been a privileged class, but they had purchased their privileges with their blood and by serving as patterns of all the qualities most prized among Japanese national characteristics. The record of their acts and the recognition of the people entitled them to look for munificent treatment at the hands of the government which they had been the means of setting up. Yet none of these considerations blinded them to the painful fact that the time had passed them by; that no place existed for them in the new polity. Many of them voluntarily stepped down into the company of the peasant or the tradesman, and many others signified their willingness to join the ranks of common bread-winners if some aid was given to equip them for such a career. After two years' consideration the government took action. A decree announced, in 1873, that the treasury was prepared to commute the pensions of the samurai at the rate of six years' purchase for hereditary pensions and four years for life pensions—one-half of the commutation to be paid in cash, and one-half in bonds bearing interest at the rate of 8%. It will be seen that a perpetual pension of £10 would be exchanged for a payment of £30 in cash, together with securities giving an income of £2, 8s.; and that a £10 life pensioner received £20 in cash and securities yielding £1, 12s. annually. It is scarcely credible that the samurai should have accepted such an arrangement. Something, perhaps, must be ascribed to their want of business knowledge, but the general explanation is that they made a large sacrifice in the interests of their country. Nothing in all their career as soldiers became them better than their manner of abandoning it. They were told that they might lay aside their swords, and many of them did so, though from time immemorial they had cherished the sword as the mark of a gentleman, the most precious possession of a warrior, and the one outward evidence that distinguished men of their order from common toilers after gain. They saw themselves deprived of their military employment, were invited to surrender more than one-half of the income it brought, and knew that they were unprepared alike by education and by tradition to earn bread in any calling save that of arms. Yet, at the invitation of a government which they had helped to establish, many of them bowed their heads quietly to this sharp reverse of fortune. It was certainly a striking instance of the fortitude and resignation which the creed of the samurai required him to display in the presence of adversity. As yet, however, the government's measures with regard to the samurai were not compulsory. Men laid aside their swords and commuted their pensions at their own option.

Saigō Takamori.

Meanwhile differences of opinion began to occur among the leaders of progress themselves. Coalitions formed for destructive purposes are often found unable to endure the strain of constructive efforts. Such lack of cohesion might easily have been foreseen in the case of the Japanese reformers. Young men without experience of public affairs, or special education to fit them for responsible posts, found the duty suddenly imposed on them not only of devising administrative and fiscal systems universally applicable to a nation hitherto divided into a congeries of semi-independent principalities, but also of shaping the country's demeanour towards novel problems of foreign intercourse and alien civilization. So long as the heat of their assault upon the shōgunate fused them into a homogeneous party they worked together successfully. But when they had to build a brand-new edifice on the ruins of a still vivid past, it was inevitable that their opinions should vary as to the nature of the materials to be employed. In this divergence of views many of the capital incidents of Japan's modern history had their origin. Of the fifty-five men whose united efforts had compassed the fall of the shōgunate, five stood conspicuous above their colleagues. They were Iwakura and Sanjō, court nobles; Saigō and Okubo, samurai of Satsuma, and Kido, a samurai of Chōshū. In the second rank came many men of great gifts, whose youth alone disqualified them for prominence—Itō, the constructive statesman of the Meiji era, who inspired nearly all the important measures of the time, though he did not openly figure as their originator; Inouye, who never lacked a resource or swerved from the dictates of loyalty; Okuma, a politician of subtle, versatile and vigorous intellect; Itagaki, the Rousseau of his era; and a score of others created by the extraordinary circumstances with which they had to deal. But the five first mentioned were the captains, the rest only lieutenants. Among the five, four were sincere reformers —not free, of course, from selfish motives, but truthfully bent upon promoting the interests of their country before all other aims. The fifth, Saigō Takamori, was a man in whom boundless ambition lay concealed under qualities of the noblest and most enduring type. His absolute freedom from every trace of sordidness gave currency to a belief that his aims were of the simplest; the story of his career satisfied the highest canons of the samurai; his massive physique, commanding presence and sunny aspect impressed and attracted even those who had no opportunity of admiring his life of self-sacrificing effort or appreciating the remarkable military talent he possessed. In the first part of his career, the elevation of his clan to supreme power seems to have been his sole motive, but subsequently personal ambition appears to have swayed him. To the consummation of either object the preservation of the military class was essential. By the swords of the samurai alone could a new *imperium in imperio* be carved out. On the other hand, Saigō's colleagues in the ministry saw clearly not only that the samurai were an unwarrantable burden on the nation, but also that their continued existence after the fall of feudalism would be a menace to public peace as well as an anomaly. Therefore they took the steps already described, and followed them by a conscription law, making every adult male liable for military service without regard to his social standing. It is easy to conceive how painfully unwelcome this conscription law proved to the samurai. Many of them were not unwilling to commute their pensions, since their creed had always forbidden them to care for money. Many of them were not unwilling to abandon the habit of carrying swords, since the adoption of foreign costume rendered such a custom incongruous and inconvenient. But very few of them could readily consent to step down from their cherished position as the military class, and relinquish their traditional title to bear the whole responsibility and enjoy the whole honour of fighting their country's battles. They had supposed, not unreasonably, that service in the army and navy would be reserved exclusively for them and their sons, whereas now the commonest rustic, mechanic or tradesman would be equally eligible.

Split among the Reformers.

While the pain of this blow was still fresh there occurred a trouble with Korea. The little state had behaved with insulting contumely, and when Japan's course came to be debated in Tōkyō, a disruption resulted in the ranks of the reformers. Saigō saw in a foreign war the sole remaining chance of achieving his ambition by lawful means. The government's conscription scheme, yet in its infancy, had not produced even the skeleton of an army. If Korea had to be conquered, the samurai must be employed; and their employment would mean, if not their rehabilitation, at least their organization into a force which, under Saigō's leadership, might dictate a new policy. Other members of the cabinet believed that the nation would be disgraced if it tamely endured Korea's insults. Thus several influential voices swelled the clamour for war. But a peace party offered strenuous opposition. Its members saw the collateral issues of the problem, and declared that the country must not think of taking up arms during a period of radical transition. The final discussion took place in the emperor's presence. The advocates of peace understood the national significance of the issue and perceived that they were debating, not merely whether there should be peace or war, but whether the country should halt or advance on its newly adopted path of progress. They prevailed, and four members of the cabinet, including Saigō, resigned. This rupture was destined to have far-reaching consequences. One of the seceders immediately raised the standard of revolt. Among the devices employed by him to win adherents was an attempt to fan into flame the dying embers of the anti-foreign sentiment. The government easily crushed the insurrection. Another seceder was Itagaki Taisuke. The third and most prominent was Saigō, who seems to have concluded from that moment that he must abandon his aims or achieve them by force. He retired to his native province of Satsuma, and applied his whole resources, his great reputation and the devoted loyalty of a number of able followers to organizing and equipping a strong body of samurai. Matters were facilitated for him by the conservatism of the celebrated Shimazu Saburō, former chief of Satsuma, who, though not opposed to foreign intercourse, had been revolted by the wholesale iconoclasm of the time, and by the indiscriminate rejection of Japanese customs in favour of foreign. He protested vehemently against what seemed to him a slavish abandonment of the nation's individuality, and finding his protest fruitless, he set himself to preserve in his own distant province, where the writ of the Yedo government had never run, the fashions, institutions and customs which his former colleagues in the administration were ruthlessly rejecting. Satsuma thus became a centre of conservative influences, among which Saigō and his constantly augmenting band of samurai found a congenial environment. During four years this breach between the central government and the southern clan grew constantly.

Final Abolition of Sword-wearing and Pensions.

In the meanwhile (1876) two extreme measures were adopted by the government: a veto on the wearing of swords, and an edict ordering the compulsory commutation of the pensions and allowances received by the nobles and the samurai. Three years previously the discarding of swords had been declared optional, and a scheme of voluntary commutation had been announced. Many had bowed quietly to the spirit of these enactments. But many still retained their swords and drew their pensions as of old, obstructing, in the former respect, the government's projects for the reorganization of society, and imposing, in the latter, an intolerable burden on the resources of the treasury. The government thought that the time had come, and that its own strength sufficed, to substitute compulsion for persuasion. The financial measure—which was contrived so as to affect the smallest pension-holders least injuriously—evoked no complaint. The samurai remained faithful to the creed which forbade them to be concerned about money. But the veto against sword-wearing overtaxed the patience of the extreme Conservatives. It seemed to them that all the most honoured traditions of their country were being ruthlessly sacrificed on the altar of alien innovations. Armed protests ensued. A few score of samurai, equipping themselves with the hauberks and weapons of old times, fell upon the garrison of a castle, killed or wounded some 300, and then, retiring to an adjacent mountain, died by their own hands. Their example found imitators in two other places, and finally the Satsuma samurai rose in arms under Saigō.

Satsuma Insurrection.

This was an insurrection very different in dimensions and motives from the outbreaks that had preceded it. During four years the preparations of the Satsuma men had been unremitting. They were equipped with rifles and cannon; they numbered some 30,000; they were all of the military class, and in addition to high training in western tactics and in the use of modern arms of precision, they knew how to wield that formidable weapon, the Japanese sword, of which their opponents were for the most part ignorant. Ostensibly their object was to restore the samurai to their old supremacy, and to secure for them all the posts in the army, the navy and the administration. But although they doubtless entertained that intention, it was put forward mainly with the hope of winning the co-operation of the military class throughout the empire. The real purpose of the revolt was to secure the governing power for Satsuma. A bitter struggle ensued. Beginning on the 29th of January 1877, it was brought to a close on the 24th of September by the death, voluntary or in battle, of all the rebel leaders. During that period the number of men engaged on the government's side had been 66,000 and the number on the side of the rebels 40,000, out of which total the killed and wounded aggregated 35,000, or 33% of the whole. Had the government's troops been finally defeated, there can be no doubt that the samurai's exclusive title to man and direct the army and navy would have been re-established, and Japan would have found herself permanently saddled with a military class, heavily burdening her finances, seriously impeding her progress towards constitutional government, and perpetuating all the abuses incidental to a policy in which the power of the sword rests entirely in the hands of one section of the people. The nation scarcely appreciated the great issues that were at stake. It found more interest in the struggle as furnishing a conclusive test of the efficiency of the new military system compared with the old. The army sent to quell the insurrection consisted of recruits drawn indiscriminately from every class of the people. Viewed in the light of history, it was an army of commoners, deficient in the fighting instinct, and traditionally demoralized for all purposes of resistance to the military class. The Satsuma insurgents, on the contrary, represented the flower of the samurai, long trained for this very struggle, and led by men whom the nation regarded as its bravest captains. The result dispelled all doubts about the fighting quality of the people at large.

Concurrently with these events the government diligently endeavoured to equip the country with all the paraphernalia of Occidental civilization. It is easy to understand that the master-minds of the era, who had planned and carried out the Restoration, continued to take the lead in all paths of progress. Their intellectual superiority entitled them to act as guides; they had enjoyed exceptional opportunities of acquiring enlightenment by visits to Europe and America, and the Japanese people had not yet lost the habit of looking to officialdom for every initiative. But the spectacle thus presented to foreign onlookers was not altogether without disquieting suggestions. The government's reforms seemed to outstrip the nation's readiness for them, and the results wore an air of some artificiality and confusion. Englishmen were employed to superintend the building of railways, the erection of telegraphs, the construction of lighthouses and the organization of a navy. To Frenchmen was entrusted the work of recasting the laws and training the army in strategy and tactics. Educational affairs, the organization of a postal service, the improvement of agriculture and the work of colonization were supervised by Americans. The teaching of medical science, the compilation of a commercial code, the elaboration of a system of local government, and ultimately the training of military officers were assigned to Germans. For instruction in sculpture and painting Italians were engaged. Was it possible that so many novelties should be successfully assimilated, or that the nation should adapt itself to systems planned by a motley band of aliens who knew nothing of its character and customs? These questions did not trouble the Japanese nearly so much as they troubled strangers. The truth is that conservatism was not really required to make the great sacrifices suggested by appearances. Among all the innovations of the era the only one that a Japanese could not lay aside at will was the new fashion of dressing the hair. He abandoned the *queue* irrevocably. But for the rest he lived a dual life. During hours of duty he wore a fine uniform, shaped and decorated in foreign style. But so soon as he stepped out of office or off parade, he reverted to his own comfortable and picturesque costume. Handsome houses were built and furnished according to Western models. But each had an annex where alcoves, verandas, matted floors and paper sliding doors continued to do traditional duty. Beefsteaks, beer, "grape-wine," knives and forks came into use on occasion. But rice-bowls and chopsticks held their everyday place as of old. In a word, though the Japanese adopted every convenient and serviceable attribute of foreign civilization, such as railways, steamships, telegraphs, post-offices, banks and machinery of all kinds; though they accepted Occidental sciences, and, to a large extent, Occidental philosophies; though they recognized the superiority of European jurisprudence and set themselves to bring their laws into accord with it, they nevertheless preserved the essentials of their own mode of life and never lost their individuality. A remarkable spirit of liberalism and a fine eclectic instinct were needed for the part they acted, but they did no radical violence to their own traditions, creeds and conventions. There was indeed a certain element of incongruity and even grotesqueness in the nation's doings. Old people cannot fit their feet to new roads without some clumsiness. The Japanese had grown very old in their special paths, and their novel departure was occasionally disfigured by solecisms. The refined taste that guided them unerringly in all the affairs of life as they had been accustomed to live it, seemed to fail them signally when they emerged into an alien atmosphere. They have given their proofs, however. It is now seen that the apparently excessive rapidity of their progress did not overtax their capacities; that they have emerged safely from their destructive era and carried their constructive career within reach of certain success, and that while they have still to develop some of the traits of their new civilization, there is no prospect whatever of its proving ultimately unsuited to them.

Steps of Progress.

After the Satsuma rebellion, nothing disturbed the even tenor of Japan's domestic politics except an attempt on the part of some of her people to force the growth of parliamentary government. It is evident that the united effort made by the fiefs to overthrow the system of dual government and wrest the administrative power from the shōgun could have only one logical outcome: the combined exercise of the recovered power by those who had been instrumental in recovering it. That was the meaning of the oath taken by the emperor at the Restoration, when the youthful sovereign was made to say that wise counsels should be widely sought, and all things determined by public discussion. But the framers of the oath had the samurai alone in view. Into their consideration the common people—farmers, mechanics, tradesmen—did not enter at all, nor had the common people themselves any idea of advancing a claim to be considered. A voice in the administration would have been to them an embarrassing rather than a pleasing privilege. Thus the first deliberative assembly was composed of nobles and samurai only. A mere debating club without any legislative authority, it was permanently dissolved after two sessions. Possibly the problem of a parliament might have been long postponed after that fiasco, had it not found an ardent advocate in Itagaki Taisuke (afterwards Count Itagaki). A Tosa samurai conspicuous as a leader of the restoration movement, Itagaki was among the advocates of recourse to strong measures against Korea in 1873, and his failure to carry his point, supplemented by a belief that a large section of public opinion would have supported him had there been any machinery for appealing to it, gave fresh impetus to his faith in constitutional government. Resigning office on account of the Korean question, he became the nucleus of agitation in favour of a parliamentary system, and under his banner were enrolled not only discontented samurai but also many of the young men who, returning from direct observation of the working of constitutional systems in Europe or America, and failing to obtain official posts in Japan, attributed their failure to the oligarchical form of their country's polity. Thus in the interval betweeen 1873 and 1877 there were two centres of disturbance in Japan: one in Satsuma, where Saigō figured as leader; the other in Tosa, under Itagaki's guidance. When the Satsuma men appealed to arms in 1877, a widespread apprehension prevailed lest the Tosa politicians should throw in their lot with the insurgents. Such a fear had its origin in failure to understand the object of the one side or to appreciate the sincerity of the other. Saigō and his adherents fought to substitute a Satsuma clique for the oligarchy already in power. Itagaki and his followers struggled for constitutional institutions. The two could not have anything in common. There was consequently no coalition. But the Tosa agitators did not neglect to make capital out of the embarrassment caused by the Satsuma rebellion. While the struggle was at its height, they addressed to the government a memorial, charging the administration with oppressive measures to restrain the voice of public opinion, with usurpation of power to the exclusion of the nation at large, and with levelling downwards instead of upwards, since the samurai had been reduced to the rank of commoners, whereas the commoners should have been educated up to the standard of the samurai. This memorial asked for a representative assembly and talked of popular rights. But since the document admitted that the people were uneducated, it is plain that there cannot have been any serious idea of giving them a share in the administration. In fact, the Tosa Liberals were not really contending for popular representation in the full sense of the term. What they wanted was the creation of some machinery for securing to the samurai at large a voice in the management of state affairs. They chafed against the fact that, whereas the efforts and sacrifices demanded by the Restoration had fallen

Development of Representative Government.

equally on the whole military class, the official prizes under the new system were monopolized by a small coterie of men belonging to the four principal clans. It is on record that Itagaki would have been content originally with an assembly consisting half of officials, half of non-official samurai, and not including any popular element whatever.

But the government did not believe that the time had come even for a measure such as the Tosa Liberals advocated. The statesmen in power conceived that the nation must be educated up to constitutional standards, and that the first step should be to provide an official model. Accordingly, in 1874, arrangements were made for periodically convening an assembly of prefectural governors, in order that they might act as channels of communication between the central authorities and the provincial population, and mutually exchange ideas as to the safest and most effective methods of encouraging progress within the limits of their jurisdictions. This was intended to be the embryo of representative institutions. But the governors, being officials appointed by the cabinet, did not bear in any sense the character of popular nominees, nor could it even be said that they reflected the public feeling of the districts they administered, for their habitual and natural tendency was to try, by means of heroic object lessons, to win the people's allegiance to the government's progressive policy, rather than to convince the government of the danger of overstepping the people's capacities.

These conventions of local officials had no legislative power whatever. The foundations of a body for discharging that function were laid in 1875, when a senate (*genro-in*) was organized. It consisted of official nominees, and its duty was to discuss and revise all laws and ordinances prior to their promulgation. It is to be noted, however, that expediency not less than a spirit of progress presided at the creation of the senate. Into its ranks were drafted a number of men for whom no places could be found in the executive, and who, without some official employment, would have been drawn into the current of disaffection. From that point of view the senate soon came to be regarded as a kind of hospital for administrative invalids, but undoubtedly its discharge of quasi-legislative functions proved suggestive, useful and instructive.

Assassination of Okubo.

The second meeting of the provincial governors had just been prorogued when, in the spring of 1878, the great minister, Okubo Toshimitsu, was assassinated. Okubo, uniformly ready to bear the heaviest burden of responsibility in every political complication, had stood prominently before the nation as Saigō's opponent. He fell under the swords of Saigō's sympathizers. They immediately surrendered themselves to justice, having taken previous care to circulate a statement of motives, which showed that they ranked the government's failure to establish representative institutions as a sin scarcely less heinous than its alleged abuses of power. Well-informed followers of Saigō could never have been sincere believers in representative institutions. These men belonged to a province far removed from the scene of Saigō's desperate struggle. But the broad fact that they had sealed with their life-blood an appeal for a political change indicated the existence of a strong public conviction which would derive further strength from their act. The Japanese are essentially a brave people. Throughout the troublous events that preceded and followed the Restoration, it is not possible to point to one man whose obedience to duty or conviction was visibly weakened by prospects of personal peril. Okubo's assassination did not alarm any of his colleagues; but they understood its suggestiveness, and hastened to give effect to a previously formed resolve.

Local Government.

Two months after Okubo's death, an edict announced that elective assemblies should forthwith be established in various prefectures and cities. These assemblies were to consist of members having a high property qualification, elected by voters having one-half of that qualification; the voting to be by signed ballot, and the session to last for one month in the spring of each year. As to their functions, they were to determine the method of levying and spending local taxes, subject to approval by the minister of state for home affairs; to scrutinize the accounts for the previous year, and, if necessary, to present petitions to the central government. Thus the foundations of genuine representative institutions were laid. It is true that legislative power was not vested in the local assemblies, but in all other important respects they discharged parliamentary duties. Their history need not be related at any length. Sometimes they came into violent collision with the governor of the prefecture, and unsightly struggles resulted. The governors were disposed to advocate public works which the people considered extravagant; and further, as years went by, and as political organizations grew stronger, there was found in each assembly a group of men ready to oppose the governor simply because of his official status. But on the whole the system worked well. The local assemblies served as training schools for the future parliament, and their members showed devotion to public duty as well as considerable aptitude for debate.

The Liberal Party.

This was not what Itagaki and his followers wanted. Their purpose was to overthrow the clique of clansmen who, holding the reins of administrative power, monopolized the prizes of officialdom. Towards the consummation of such an aim the local assemblies helped little. Itagaki redoubled his agitation. He organized his fellow-thinkers into an association called *jiyūtō* (Liberals), the first political party in Japan, to whose ranks there very soon gravitated several men who had been in office and resented the loss of it; many that had never been in office and desired to be; and a still greater number who sincerely believed in the principles of political liberty, but had not yet considered the possibility of immediately adapting such principles to Japan's case. It was in the nature of things that an association of this kind, professing such doctrines, should present a picturesque aspect to the public, and that its collisions with the authorities should invite popular sympathy. Nor were collisions infrequent. For the government, arguing that if the nation was not ready for representative institutions, neither was it ready for full freedom of speech or of public meeting, legislated consistently with that theory, and entrusted to the police large powers of conrol over the press and the platform. The exercise of these powers often created situations in which the Liberals were able to pose as victims of official tyranny, so that they grew in popularity and the contagion of political agitation spread.

The Progressist Party.

Three years later (1881) another split occurred in the ranks of the ruling oligarchy. Okuma Shigenobu (afterwards Count Okuma) seceded from the administration, and was followed by a number of able men who had owed their appointments to his patronage, or who, during his tenure of office as minister of finance, had passed under the influence of his powerful personality. If Itagaki be called the Rousseau of Japan, Okuma may be regarded as the Peel. To remarkable financial ability and a lucid, vigorous judgment he added the faculty of placing himself on the crest of any wave which a genuine *aura popularis* had begun to swell. He, too, inscribed on his banner of revolt against the oligarchy the motto "constitutional government," and it might have been expected that his followers would join hands with those of Itagaki, since the avowed political purpose of both was identical. They did nothing of the kind. Okuma organized an independent party, calling themselves Progressists (*shimpotō*), who not only stood aloof from the Liberals but even assumed an attitude hostile to them. This fact is eloquent. It shows that Japan's first political parties were grouped, not about principles, but about persons. Hence an inevitable lack of cohesion among their elements and a constant tendency to break up into caves and coteries. These are the characteristics that render the story of political evolution in Japan so perplexing to a foreign student. He looks for differences of platform and finds none. Just as a true Liberal must be a Progressist, and a true Progressist a Liberal, so, though each may cast his profession of faith in a mould of different phrases, the ultimate shape must be the same. The mainsprings of early political agitation in Japan were personal grievances and a desire to wrest the administrative power from the hands of the statesmen who had held it so long as to overtax the patience of their rivals. He that searches for profound moral or ethical bases will be disappointed. There were no Conservatives. Society was permeated with the spirit of progress. In a comparative sense the epithet "Conservative" might have been applied to the statesmen who proposed to defer parliamentary institutions until the people, as distinguished from the former samurai, had been in some measure prepared for such an innovation. But since these very statesmen were the guiding spirits of the whole Meiji revolution, it was plain that their convictions must be radical, and that, unless they did violence to their record, they must finally lead the country to representative institutions, the logical sequel of their own reforms.

Okubo's assassination had been followed, in 1878, by an edict announcing the establishment of local assemblies. Okuma's secession in 1881 was followed by an edict announcing that a national assembly would be convened in 1891.

Anti-Government Agitation.

The political parties, having now virtually attained their object, might have been expected to desist from further agitation. But they had another task to perform—that of disseminating anti-official prejudices among the future electors. They worked diligently, and they had an undisputed field, for no one was put forward to champion the government's cause. The campaign was not always conducted on lawful lines. There were plots to assassinate ministers; there was an attempt to employ dynamite, and there was a scheme to foment an insurrection in Korea. On the other hand, dispersals of political meetings by order of police inspectors, and suspension or suppression of newspapers by the unchallengeable verdict of a minister for home affairs, were common occurrences. The breach widened steadily. It is true that Okuma rejoined the cabinet for a time in 1887, but he retired again in circumstances that aggravated his party's hostility to officialdom. In short, during the ten years immediately prior to the opening of the first parliament, an anti-government propaganda was incessantly preached from the platform and in the press.

Meanwhile the statesmen in power resolutely pursued their path of progressive reform. They codified the civil and penal laws, remodelling them on Western bases; they brought a vast number of affairs within the scope of minute regulations; they rescued the finances from confusion and restored them to a sound condition; they recast the whole framework of local government; they organized a great national bank, and established a network of subordinate institutions throughout the country; they pushed on the work of railway construction, and successfully enlisted private enterprise in its cause; they steadily extended the postal and telegraphic services; they economized public expenditures so that the state's income always exceeded its outlays; they laid the foundations of a strong mercantile marine; they instituted a system of postal savings-banks; they undertook large schemes of harbour improvement and road-making; they planned and put into operation an extensive programme of riparian improvement; they made civil service appointments depend on competitive examination; they sent numbers of students to Europe and America to complete their studies; and by tactful, persevering diplomacy they gradually introduced a new tone into the empire's relations with foreign powers. Japan's affairs were never better administered.

The Constitution of 1890.

In 1890 the Constitution was promulgated. Imposing ceremonies marked the event. All the nation's notables were summoned to the palace to witness the delivery of the important document by the sovereign to the prime minister; salvos of artillery were fired; the cities were illuminated, and the people kept holiday. Marquis (afterwards Prince) Itō directed the framing of the Constitution. He had visited the Occident for the purpose of investigating the development of parliamentary institutions and studying their practical working. His name is connected with nearly every great work of constructive statesmanship in the history of new Japan, and perhaps the crown of his legislative career was the drafting of the Constitution, to which the Japanese people point proudly as the only charter of the kind voluntarily given by a sovereign to his subjects. In other countries such concessions were always the outcome of long struggles between ruler and ruled. In Japan the emperor freely divested himself of a portion of his prerogatives and transferred them to the people. That view of the case, as may be seen from the story told above, is not untinged with romance; but in a general sense it is true.

Working of the System.

No incident in Japan's modern career seemed more hazardous than this sudden plunge into parliamentary institutions. There had been some preparation. Provincial assemblies had partially familiarized the people with the methods of deliberative bodies. But provincial assemblies were at best petty arenas—places where the making or mending of roads, and the policing and sanitation of villages came up for discussion, and where political parties exercised no legislative function nor found any opportunity to attack the government or to debate problems of national interest. Thus the convening of a diet and the sudden transfer of financial and legislative authority from the throne and its entourage of tried statesmen to the hands of men whose qualifications for public life rested on the verdict of electors, themselves apparently devoid of all light to guide their choice—this sweeping innovation seemed likely to tax severely, if not to overtax completely, the progressive capacities of the nation. What enhanced the interest of the situation was that the oligarchs who held the administrative power had taken no pains to win a following in the political field. Knowing that the opening of the diet would be a veritable letting loose of the dogs of war, an unmuzzling of the agitators whose mouths had hitherto been partly closed by legal restrictions upon free speech, but who would now enjoy complete immunity within the walls of the assembly whatever the nature of their utterances—foreseeing all this, the statesmen of the day nevertheless stood severely aloof from alliances of every kind, and discharged their administrative functions with apparent indifference to the changes that popular representation could not fail to induce. This somewhat inexplicable display of unconcern became partially intelligible when the constitution was promulgated, for it then appeared that the cabinet's tenure of office was to depend solely on the emperor's will; that ministers were to take their mandate from the Throne, not from parliament. This fact was merely an outcome of the theory underlying every part of the Japanese polity. Laws might be redrafted, institutions remodelled, systems recast, but amid all changes and mutations one steady point must be carefully preserved, the Throne. The makers of new Japan understood that so long as the sanctity and inviolability of the imperial prerogatives could be preserved, the nation would be held by a strong anchor from drifting into dangerous waters. They laboured under no misapprehension about the inevitable issue of their work in framing the constitution. They knew very well that party cabinets are an essential outcome of representative institutions, and that to some kind of party cabinet Japan must come. But they regarded the Imperial mandate as a conservative safeguard, pending the organization and education of parties competent to form cabinets. Such parties did not yet exist, and until they came into unequivocal existence, the Restoration statesmen, who had so successfully managed the affairs of the nation during a quarter of a century, resolved that the steady point furnished by the throne must not be abandoned.

On the other hand, the agitators found here a new platform. They had obtained a constitution and a diet, but they had not obtained an instrument for pulling down the "clan" administrators, since these stood secure from attack under the aegis of the sovereign's mandate. They dared not raise their voices against the unfettered exercise of the mikado's prerogative. The nation, loyal to the core, would not have suffered such a protest, nor could the agitators themselves have found heart to formulate it. But they could read their own interpretation into the text of the Constitution, and they could demonstrate practically that a cabinet not acknowledging responsibility to the legislature was virtually impotent for law-making purposes.

The Diet and the Government.

These are the broad outlines of the contest that began in the first session of the Diet and continued for several years. It is unnecessary to speak of the special points of controversy. Just as the political parties had been formed on the lines of persons, not principles, so the opposition in the Diet was directed against men, not measures. The struggle presented varying aspects at different times, but the fundamental question at issue never changed. Obstruction was the weapon of the political parties. They sought to render legislation and finance impossible for any ministry that refused to take its mandate from the majority in the lower house, and they imparted an air of respectability and even patriotism to their destructive campaign by making "anti-clannism" their war-cry, and industriously fostering the idea that the struggle lay between administration guided by public opinion and administration controlled by a clique of clansmen who separated the throne from the nation. Had not the House of Peers stood stanchly by the government throughout this contest, it is possible that the nation might have suffered severely from the rashness of the political parties.

There was something melancholy in the spectacle. The Restoration statesmen were the men who had made Modern Japan; the men who had raised her, in the face of immense obstacles, from the position of an insignificant Oriental state to that of a formidable unit in the comity of nations; the men, finally, who had given to her a constitution and representative institutions. Yet these same men were now fiercely attacked by the arms which they had themselves nerved; were held up to public obloquy as self-seeking usurpers, and were declared to be impeding the people's constitutional route to administrative privileges, when in reality they were only holding the breach until the people should be able to march into the citadel with some show of orderly and competent organization. That there was no corruption, no abuse of position, is not to be pretended; but on the whole the conservatism of the clan statesmen had only one object—to provide that the newly constructed representative machine should not be set working until its parts were duly adjusted and brought into proper gear. On both sides the leaders understood the situation accurately. The heads of the parties, while publicly clamouring for parliamentary cabinets, privately confessed that they were not yet prepared to assume administrative responsibilities;[1] and the so-called "clan statesmen," while refusing before the world to accept the Diet's mandates, admitted within official circles that the question was one of time only. The situation did not undergo any marked change until, the country becoming engaged in war with China (1894–95), domestic squabbles were forgotten in the presence of foreign danger. From that time an era of coalition commenced. Both the political parties joined hands to vote funds for the prosecution of the campaign, and one of them, the Liberals, subsequently gave support to a cabinet under the presidency of Marquis Itō, the purpose of the union being to carry through the diet an extensive scheme of enlarged armaments and public works planned in the sequel of the war. The Progressists, however, remained implacable, continuing their opposition to the thing called bureaucracy quite irrespective of its measures.

Fusion of the Two Parties.

The next phase (1898) was a fusion of the two parties into one large organization which adopted the name "Constitutional Party" (*kensei-tō*). By this union the chief obstacles to parliamentary cabinets were removed. Not only did the Constitutionalists command a large majority in the lower house, but also they possessed a sufficiency of men who, although lacking ministerial experience, might still advance a reasonable title to be entrusted with portfolios. Immediately the emperor, acting on the advice of Marquis Itō, invited Counts Okuma and Itagaki to form a cabinet. It was essentially a trial. The party politicians were required to demonstrate in practice the justice of the claim they had been so long asserting in theory. They had worked in combination for the destructive purpose of pulling down the so-called "clan statesmen"; they had now to show whether they could work in combination for the constructive purposes of administration. Their heads, Counts Okuma and Itagaki, accepted the Imperial mandate, and the nation watched the result. There was no need to wait long. In less than six months these new links snapped under the tension of old enmities, and the coalition split up once more into its original elements. It had demonstrated that the sweets of power, which the "clan statesmen" had been so vehemently accused of coveting, possessed even greater attractions for their accusers. The issue of the experiment was such a palpable fiasco that it effectually rehabilitated the "clan statesmen," and finally proved, what had indeed been long evident to every close observer, that without the assistance of those statesmen no political party could hold office successfully.

Enrolment of the Clan Statesmen in Political Associations.

Thenceforth it became the unique aim of Liberals and Progressists alike to join hands permanently with the men towards whom they had once displayed such implacable hostility. Prince Itō, the leader of the so-called "elder statesmen," received special solicitations, for it was plain that he would bring to any political party an overwhelming access of strength alike in his own person and in the number of friends and disciples certain to follow him. But Prince Itō declined to be absorbed into any existing party, or to adopt the principle of parliamentary cabinets. He would consent to form a new association, but it must consist of men sufficiently disciplined to obey him implicitly, and sufficiently docile to accept their programme from his hand. The Liberals agreed to these terms. They dissolved their party (August 1900) and enrolled themselves in the ranks of a new organization, which did not even call itself a party, its designation being *rikken seiyū-kai* (association of friends of the constitution), and which had for the cardinal plank in its platform a declaration of ministerial irresponsibility to the Diet. A singular page was thus added to the story of Japanese political development; for not merely did the Liberals enlist under the banner of the statesmen whom for twenty years they had fought to overthrow, but they also tacitly consented to erase from their profession of faith its essential article, parliamentary cabinets, and, by resigning that article to the Progressists, created for the first time an opposition with a solid and intelligible platform. Nevertheless the seiyū-kai grew steadily in strength whereas the number of its opponents declined correspondingly. At the general elections in May 1908 the former secured 195 seats, the four sections of the opposition winning only 184. Thus for the first time in Japanese parliamentary history a majority of the lower chamber found themselves marching under the same banner. Moreover, the four sections of the opposition were independently organized and differed nearly as much from one another as they all differed from the seiyū-kai. Their impotence to make head against the solid phalanx of the latter was thus conspicuous, especially during the 1908–1909 session of the Diet. Much talk then began to be heard about the necessity of coalition, and that this talk will materialize eventually cannot be doubted. Reduction of armaments, abolition of taxes specially imposed for belligerent purposes, and the substitution of a strictly constitutional system for the existing bureaucracy—these objects constitute a sufficiently solid platform, and nothing is wanted except that a body of proved administrators should join the opposition in occupying it. There were in 1909 no signs, however, that any such defection from the ranks of officialdom would take place. Deference is paid to public opinions inasmuch as even a seiyū-kai ministry will not remain in office after its popularity has begun to show signs of waning. But no deference is paid to the doctrine of party cabinets. Prince Itō did not continue to lead the seiyū-kai for more than three years. In July 1903 he delegated that function to Marquis Saionji, representative of one of the very oldest families of the court nobility and a personal friend of the emperor, as also was Prince Itō. The Imperial stamp is thus vicariously set upon the principle of political combinations for the better practical conduct of parliamentary business, but that the seiyū-kai, founded by Prince Itō and led by Marquis Saionji, should ever hold office in defiance of the sovereign's mandate is unthinkable. Constitutional institutions in Japan are therefore developing along lines entirely without precedent. The storm and stress of early parliamentary days have given place to comparative calm. During the first twelve sessions of the Diet, extending over 8 years, there were five dissolutions of the lower house. During the next thirteen sessions, extending over 11 years, there were two dissolutions. During the first 8 years of the Diet's existence there were six changes of cabinet; during the next 11 years there were five changes. Another healthy sign was that men of affairs were beginning to realize the importance of parliamentary representation. At first the constituencies were contested almost entirely by professional politicians, barristers and journalists. In 1909 there was a solid body (the *boshin* club) of business men commanding nearly 50 votes in the lower house; and as the upper chamber included 45 representatives of the highest tax-payers, the interests of commerce and industry were intelligently debated. (F. By.)

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[1] Neither the Liberals nor the Progressists had a working majority in the house of representatives, nor could the ranks of either have furnished men qualified to fill all the administrative posts.

X.—The Claim of Japan: by a Japanese Statesman[1]

It has been said that it is impossible for an Occidental to understand the Oriental, and vice versa; but, admitting that the mutual understanding of two different races or peoples is a difficult matter, why should Occidentals and Orientals be thus set in opposition? No doubt, different peoples of Europe understand each other better than they do the Asiatic; but can Asiatic peoples understand each other better than they can Europeans or than the Europeans can understand any of them? Do Japanese understand Persians or even Indians better than English or French? It is true perhaps that Japanese can and do understand the Chinese better than Europeans; but that is due not only to centuries of mutual intercourse, but to the wonderful and peculiar fact that they have adopted the old classical Chinese literature as their own, somewhat in the way, but in a much greater degree, in which the European nations have adopted the old Greek and Latin literatures. What is here contended for is that the mutual understanding of two peoples is not so much a matter of race, but of the knowledge of each other's history, traditions, literature, &c.

The Japanese have, they think, suffered much from the misunderstanding of their motives, feelings and ideas; what they want is to be understood fully and to be known for what they really are, be it good or bad. They desire, above all, not to be lumped as Oriental, but to be known and judged on their own account. In the latter half of the 19th century, in fact up to the Chinese War, it irritated Japanese travelling abroad more than anything else to be taken for Chinese. Then, after the Chinese War, the alarm about Japan leading Eastern Asia to make a general attack upon Europe—the so-called Yellow Peril—seemed so ridiculous to the Japanese that the bad effects of such wild talk were not quite appreciated by them. The aim of the Japanese nation, ever since, at the time of the Restoration (1868), they laid aside definitively all ideas of seclusion and entered into the comity of nations, has been that they should rise above the level of the Eastern peoples to an equality with the Western and should be in the foremost rank of the brotherhood of nations; it was not their ambition at all to be the champion of the East against the West, but rather to beat down the barriers between themselves and the West.

The intense pride of the Japanese in their nationality, their patriotism and loyalty, arise from their history, for what other nation can point to an Imperial family of one unbroken lineage reigning over the land for twenty-five centuries? Is it not a glorious tradition for a nation, that its emperor should be descended directly from that grandson of "the great heaven-illuminating goddess," to whom she said, "This land (Japan) is the region over which my descendants shall be the lords. Do thou, my august child, proceed thither and govern it. Go! *The prosperity of thy dynasty shall be coeval with heaven and earth.*" Thus they call their country the land of *kami* (ancient gods of tradition). With this spirit, in the old days when China held the hegemony of the East, and all neighbouring peoples were regarded as its tributaries, Japan alone, largely no doubt on account of its insular position, held itself quite aloof; it set at defiance the power of Kublai and routed utterly the combined Chinese and Korean fleets with vast forces sent by him to conquer Japan, this being the only occasion that Japan was threatened with a foreign invasion.

With this spirit, as soon as they perceived the superiority of the Western civilization, they set to work to introduce it into their country, just as in the 7th and 8th centuries they had adopted and adapted the Chinese civilization. In 1868, the first year of the era of Meiji, the emperor swore solemnly the memorable oath of five articles, setting forth the policy that was to be and has been followed thereafter by the government. These five articles were:—

1. Deliberative assemblies shall be established and all measures of government shall be decided by public opinion.
2. All classes, high and low, shall unite in vigorously carrying out the plan of government.
3. Officials, civil and military, and all common people shall as far as possible be allowed to fulfil their just desires so that there may not be any discontent among them.
4. *Uncivilized customs of former times shall be broken through*, and everything shall be based upon just and equitable principles of heaven and earth (nature).
5. *Knowledge shall be sought for throughout the world*, so that the welfare of the empire may be promoted.

(Translation due to Prof. N. Hozumi of Tōkyō Imp. Univ.)

It is interesting, as showing the continuity of the policy of the empire, to place side by side with these articles the words of the Imperial rescript issued in 1908, which are as follows:—

"We are convinced that with the rapid and unceasing advance of civilization, the East and West, mutually dependent and helping each other, are bound by common interests. It is our sincere wish to continue to enjoy for ever its benefits in common with other powers by entering into closer and closer relations and strengthening our friendship with them. Now in order to be able to move onward along with the constant progress of the world and to share in the blessings of civilization, it is obvious that we must develop our internal resources; our nation, but recently emerged from an exhausting war, must put forth increased activity in every branch of administration. It therefore behoves our people to endeavour with one mind, from the highest to the lowest, to pursue their callings honestly and earnestly, to be industrious and thrifty, to abide in faith and righteousness, to be simple and warm-hearted, to put away ostentation and vanity and strive after the useful and solid, to avoid idleness and indulgence, and to apply themselves incessantly to strenuous and arduous tasks . . ."

The ambition of the Japanese people has been, as already stated, to be recognized as an equal by the Great Powers. With this object in view, they have spared no efforts to introduce what they considered superior in the Western civilization, although it may perhaps be doubted whether in their eagerness they have always been wise. *They have always resented any discrimination against them as an Asiatic people*, not merely protesting against it, knowing that such would not avail much, but making every endeavour to remove reasons or excuses for it. Formerly there were troops stationed to guard several legations; foreign postal service was not entirely in the hands of the Japanese government for a long time; these and other indignities against the sovereignty of the nation were gradually removed by proving that they were not necessary. Then there was the question of the extra-territorial jurisdiction; an embassy was sent to Europe and America as early as 1871 with a view to the revision of treaties in order to do away with this *imperium in imperio*, that being the date originally fixed for the revision; the embassy, however, failed in its object but was not altogether fruitless, for it was then clearly seen that it would be necessary to revise thoroughly the system of laws and entirely to reorganize the law courts before Occidental nations could be induced to forgo this privilege. These measures were necessary in any case as a consequence of the introduction of the Western methods and ideas, but they were hastened by the fact of their being a necessary preliminary to the revision of treaties. When the new code of laws was brought before the Diet at its first session, and there was a great opposition against it in the House of Peers on account of its many defects and especially of its ignoring many established usages, the chief argument in its favour, or at least one that had a great influence with many who were unacquainted with technical points, was that it was necessary for the revision of treaties and that the defects, if any, could be afterwards amended at leisure. These preparations on the part of the government, however, took a long time, and in the meantime the whole nation, or at least the more intelligent part of it, was chafing impatiently under what was considered a national indignity. The United States, by being the first to agree to its abandonment, although this agreement was rendered nugatory by a conditional clause, added to the stock of goodwill with which the Japanese have always regarded the Americans on account of their attitude towards them. When at last the consummation so long and ardently desired was attained, great was the joy with which it was greeted, for now it was felt that Japan was indeed on terms of equality with Occidental nations. Great Britain, by being the first to conclude the revised treaty—an act due to the remarkable foresight of her statesmen in spite of the opposition of their countrymen in Japan—did much to bring about the cordial feeling of the Japanese towards the British, which made them welcome with such enthusiasm the Anglo-Japanese alliance. The importance of this last as a powerful instrument for the preservation of peace in the extreme East has been, and always will be, appreciated at its full value by the more intelligent and thoughtful among the Japanese; but by the mass of the people it was received with great acclamation, owing partly to the already existing good feeling towards the British, but also in a large measure because it was felt that the fact that Great Britain should leave its "splendid isolation" to enter into this alliance proclaimed in the clearest possible way that Japan had entered on terms of full equality among the brotherhood of nations, and that thenceforth there could be no ground for that discrimination against them as an Asiatic nation which had been so galling to the Japanese people.

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[1] The following expression of the Japanese point of view, by a statesman of the writer's authority and experience, may well supplement the general account of the progress of Japan and its inclusion among the great civilized powers of the world.—(Ed. *E. B.*)

There have been, and there still are being made, many charges against the Japanese government and people. While admitting that some of them may be founded on facts, it is permissible to point out that traits and acts of a few individuals have often been generalized to be the national characteristic or the result of a fixed policy, while in many cases such charges are due to misunderstandings arising from want of thorough knowledge of each other's language, customs, usages, ideas, &c. Take the principle of "the open door," for instance; the Japanese government has been charged in several instances with acting contrary to it. It is natural that where (as in China) competition is very keen between men of different nationalities, individuals should sometimes feel aggrieved and make complaints of unfairness against the government of their competitors; it is also natural that people at home should listen to and believe in those charges made against the Japanese by their countrymen in the East, while unfortunately the Japanese, being so far away and often unaware of them, have not a ready means of vindicating themselves; but subsequent investigations have always shown those charges to be either groundless or due to misunderstandings, and it may be asserted that in no case has the charge been substantiated that the Japanese government has knowingly, deliberately, of *malice prepense* been guilty of breach of faith in violating the principle of "the open door" to which it has solemnly pledged itself. That it has often been accused by the Japanese subjects of weakness *vis-à-vis* foreign powers to the detriment of their interests, is perhaps a good proof of its fairness.

The Japanese have often been charged with looseness of commercial morality. This charge is harder to answer than the last, for it cannot be denied that there have been many instances of dishonesty on the part of Japanese tradesmen or employees; *tu quoque* is never a valid argument, but there are black sheep everywhere, and there were special reasons why foreigners should have come in contact with many such in their dealings with the Japanese. In days before the Restoration, merchants and tradesmen were officially classed as the lowest of four classes, the samurai, the farmers, the artisans and the merchants; practically, however, rich merchants serving as bankers and employers of others were held in high esteem, even by the samurai. Yet it cannot be denied that the position of the last three was low compared with that of the samurai; their education was not so high, and although of course there was the same code of morality for them all, there was no such high standard of honour as was enjoined upon the samurai by the bushidō or "the way of samurai." Now, when foreign trade was first opened, it was naturally not firms with long-established credit and methods that first ventured upon the new field of business—some few that did failed owing to their want of experience—it was rather enterprising and adventurous spirits with little capital or credit who eagerly flocked to the newly opened ports to try their fortune. It was not to be expected that all or most of those should be very scrupulous in their dealings with the foreigners; the majority of those adventurers failed, while a few of the abler men, generally those who believed in and practised honesty as the best policy, succeeded and came to occupy an honourable position as business men. It is also asserted that foreigners, or at least some of them, did not scruple to take unfair advantage of the want of experience on the part of their Japanese customers to impose upon them methods which they would not have followed except in the East; it may be that such methods were necessary or were deemed so in dealing with those adventurers, but it is a fact that it afterwards took a long time and great effort on the part of Japanese traders to break through some usages and customs which were established in earlier days and which they deemed derogatory to their credit or injurious to their interests. Infringement of patent rights and fraudulent imitation of trade-marks have with some truth also been charged against the Japanese; about this it is to be remarked that although the principles of morality cannot change, their applications may be new; patents and trade-marks are something new to the Japanese, and it takes time to teach that their infringement should be regarded with the same moral censure as stealing. The government has done everything to prevent such practices by enacting and enforcing laws against them, and nowadays they are not so common. Be that as it may, such a state of affairs as that mentioned above is now passing away almost entirely; commerce and trade are now regarded as highly honourable professions, merchants and business men occupy the highest social positions, several of them having been lately raised to the peerage, and are as honourable a set of men as can be met anywhere. It is however to be regretted that in introducing Western business methods, it has not been quite possible to exclude some of their evils, such as promotion of swindling companies, tampering with members of legislature, and so forth.

The Japanese have also been considered in some quarters to be a bellicose nation. No sooner was the war with Russia over than they were said to be ready and eager to fight with the United States. This is another misrepresentation arising from want of proper knowledge of Japanese character and feelings. Although it is true that within the quarter of a century preceding 1909 Japan was engaged in two sanguinary wars, not to mention the Boxer affair, in which owing to her proximity to the scene of the disturbances she had to take a prominent part, yet neither of these was of her own seeking; in both cases she had to fight or else submit to become a mere cipher in the world, if indeed she could have preserved her existence as an independent state. The Japanese, far from being a bellicose people, deliberately cut off all intercourse with the outside world in order to avoid international troubles, and remained absolutely secluded from the world and at profound peace within their own territory for two centuries and a half. Besides, the Japanese have always regarded the Americans with a special goodwill, due no doubt to the steady liberal attitude of the American government and people towards Japan and Japanese, and they look upon the idea of war between Japan and the United States as ridiculous.

Restrictions upon Japanese emigrants to the United States and to Australia are irritating to the Japanese, because it is a discrimination against them as belonging to the "yellow" race, whereas it has been their ambition to raise themselves above the level of the Eastern nations to an equality with the Western nations, although they cannot change the colour of their skin. When a Japanese even of the highest rank and standing has to obtain a permit from an American immigrant officer before he can enter American territory, is it not natural that he and his countrymen should resent this discrimination as an indignity? But they have too much good sense to think or even dream of going to war upon such a matter; on the contrary, the Japanese government agreed in 1908 to limit the number of emigrants in order to avoid complications.

It may be repeated that it has ever been the ambition of the Japanese people to take rank with the Great Powers of the world, and to have a voice in the council of nations; they demand that they shall not be discriminated against because of the colour of their skin, but that they shall rather be judged by their deeds. With this aim, they have made great efforts: where charges brought against them have any foundation in fact, they have endeavoured to make reforms; where they are false or due to misunderstandings they have tried to live them down, trusting to time for their vindication. They are willing to be judged by the intelligent and impartial world: a fair field and no favour is what they claim, and think they have a right to claim, from the world. (K.)

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JAPANNING, the art of coating surfaces of metal, wood, &c., with a variety of varnishes, which are dried and hardened on in stoves or hot chambers. These drying processes constitute the main distinguishing features of the art. The trade owes its name to the fact that it is an imitation of the famous lacquering of Japan (see JAPAN: *Art*), which, however, is prepared with entirely different materials and processes, and is in all respects much more brilliant, durable and beautiful than any ordinary japan work. Japanning is done in clear transparent varnishes, in black and in body colours; but black japan is the most characteristic and common style of work. The varnish for black japan consists essentially of pure natural asphaltum with a proportion of gum animé dissolved in linseed oil and thinned with turpentine. In thin layers such a japan has a rich dark brown colour; it only shows a brilliant black in thicker coatings. For fine work, which has to be smoothed and polished, several coats of black are applied in succession, each being separately dried in the stove at a heat which may rise to about 300° F. Body colours consist of a basis of transparent varnish mixed with the special mineral paints of the desired colours or with bronze powders. The transparent varnish used by japanners is a copal varnish which contains less drying oil and more turpentine than is contained in ordinary painters' oil varnish. Japanning produces a brilliant polished surface which is much more durable and less easily affected by heat, moisture or other influences than any ordinary painted and varnished work. It may be regarded as a process intermediate between ordinary painting and enamelling. It is very extensively applied in the finishing of ordinary ironmongery goods and domestic iron-work, deed boxes, clock dials and papier-mâché articles. The process is also applied to blocks of slate for making imitation of black and other marbles for chimneypieces, &c., and in a modified form is employed for preparing enamelled, japan or patent leather.

JAPHETH (יֶפֶת), in the Bible, the youngest son of Noah[1] according to the Priestly Code (*c.* 450 B.C.); but in the earlier tradition[2] the second son, also the "father" of one of the three groups into which the nations of the world are divided.[3] In Gen. ix. 27, Noah pronounces the following blessing on Japheth—

> "God enlarge (Heb. *yapht*) Japheth (Heb. *yepheth*),
> And let him dwell in the tents of Shem;
> And let Canaan be his servant."

This is probably an ancient oracle independent alike of the flood story and the genealogical scheme in Gen. x. Shem is probably Israel; Canaan, of course, the Canaanites; by analogy, Japheth should be some third element of the population of Palestine—the Philistines or the Phoenicians have been suggested. The sense of the second line is doubtful, it may be "let God dwell" or "let Japheth dwell"; on the latter view Japheth appears to be in friendly alliance with Shem. The words might mean that Japheth was an intruding invader, but this is not consonant with the tone of the oracle. Possibly Japheth is only present in Gen. ix. 20-27 through corruption of the text, Japheth may be an accidental repetition of yapht "may he enlarge," misread as a proper name.

In Gen. x. Japheth is the northern and western division of the nations; being perhaps used as a convenient title under which to group the more remote peoples who were not thought of as standing in ethnic or political connexion with Israel or Egypt. Thus of his descendants, Gomer, Magog,[4] Tubal, Meshech, Ashkenaz, Riphath and Togarmah are peoples who are located with more or less certainty in N.E. Asia Minor, Armenia and the lands to the N.E. of the Black Sea; Javan is the Ionians, used loosely for the seafaring peoples of the West, including Tarshish (Tartessus in Spain), Kittim (Cyprus), Rodanim[5] (Rhodes). There is no certain identification of Tiras and Elishah.

The similarity of the name Japheth to the Titan Iapetos of Greek mythology is probably a mere accident. A place Japheth is mentioned in Judith ii. 25, but it is quite unknown.

In addition to commentaries and dictionary articles, see E. Meyer, *Die Israeliten und ihre Nachbarstämme*, pp. 219 sqq. (W. H. BE.)

JAR, a vessel of simple form, made of earthenware, glass, &c., with a spoutless mouth, and usually without handles. The word came into English through Fr. *jarre* or Span. *jarra*, from Arab. *jarrah*, the earthenware vessel of Eastern countries, used to contain water, oil, wine, &c. The simple electrical condenser known as a *Leyden Jar* (*q.v.*) was so called because of the early experiments made in the science of electricity at Leiden. In the sense of a harsh vibrating sound, a sudden shock or vibrating movement, hence dissension, quarrel or petty strife, "jar" is onomatopoeic in origin; it is also seen in the name of the bird night-jar (also known as the goat-sucker). In the expression "on the jar" or "ajar," of a door or window partly open, the word is another form of *chare* or *char*, meaning turn or turning, which survives in charwoman, one who works at a turn, a job and *chore*, a job, spell of work.

JARGON, in its earliest use a term applied to the chirping and twittering of birds, but since the 15th century mainly confined to any language, spoken or written, which is either unintelligible to the user or to the hearer. It is particularly applied by uninstructed hearers or readers to the language full of technical terminology used by scientific, philosophic and other writers. The word is O. Fr., and Cotgrave defines it as "gibridge (gibberish), fustian language." It is cognate with Span. *gerigonza*, and Ital. *gergo*, *gergone*, and probably related to the onomatopoeic O. Fr. *jargouiller*, to chatter. The root is probably seen in Lat. *garrire*, to chatter.

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[1] Gen. v. 32, vi. 10, vii. 13, x. 1; cf. 1 Chron. i. 4.

[2] Gen. ix. 27, x. 2, J. *c.* 850–750 B.C. In ix. 18 Ham is an editorial addition.

[3] Gen. x. 1–5; cf. 1 Chron. i. 5–7. For the significance of the genealogies in Gen. x. see HAM.

[4] See GOMER, GOG.

[5] So we should read with 1 Chron. i. 7 (LXX.) for Dodanim.

JARGOON, or JARGON (occasionally in old writings *jargounce* and *jacounce*), a name applied by modern mineralogists to those zircons which are fine enough to be cut as gem-stones, but are not of the red colour which characterizes the hyacinth or jacinth. The word is related to Arab *zargun* (zircon). Some of the finest jargoons are green, others brown and yellow, whilst some are colourless. The colourless jargoon may be obtained by heating certain coloured stones. When zircon is heated it sometimes changes in colour, or altogether loses it, and at the same time usually increases in density and brilliancy. The so-called Matura diamonds, formerly sent from Matara (or Matura), in Ceylon, were decolorized zircons. The zircon has strong refractive power, and its lustre is almost adamantine, but it lacks the fire of the diamond. The specific gravity of zircon is subject to considerable variation in different varieties; thus Sir A. H. Church found the sp. gr. of a fine leaf-green jargoon to be as low as 3·982, and that of a pure white jargoon as high as 4·705. Jargoon and tourmaline, when cut as gems, are sometimes mistaken for each other, but the sp. gr. is distinctive, since that of tourmaline is only 3 to 3·2. Moreover, in tourmaline the dichroism is strongly marked, whereas in jargoon it is remarkably feeble. The refractive indices of jargoon are much higher than those of tourmaline (see ZIRCON). (F. W. R.*)

JARĪR IBN ʿATĪYYA UL-KHATFĪ (d. 728), Arabian poet, was born in the reign of the caliph ʿAli, was a member of the tribe Kulaib, a part of the Tamīm, and lived in Irak. Of his early life little is known, but he succeeded in winning the favour of Hajjāj, the governor of Irak (see CALIPHATE). Already famous for his verse, he became more widely known by his feud with Farazdaq and Akhtal. Later he went to Damascus and visited the court of Abdalmalik (ʿAbd ul-Malik) and that of his successor, Walīd. From neither of these did he receive a warm welcome. He was, however, more successful with Omar II., and was the only poet received by the pious caliph.

His verse, which, like that of his contemporaries, is largely satire and eulogy, was published in 2 vols. (Cairo, 1896). (G. W. T.)

JARKENT, a town of Russian Central Asia, in the province of Semiryechensk, 70 m. W.N.W. of Kulja and near to the Ili river. Pop. (1897), 16,372.

JARNAC, a town of western France in the department of Charente, on the right bank of the river Charente, and on the railway 23 m. W. of Angoulême, between that city and Cognac. Pop. (1906), 4493. The town is well built; and an avenue, planted with poplar trees, leads to a handsome suspension bridge. The church contains an interesting ogival crypt. There are communal colleges for both sexes. Brandy, wine and wine-casks are made in the town. Jarnac was in 1569 the scene of a battle in which the Catholics defeated the Protestants. A pyramid marks the spot where Louis, Prince de Condé, one of the Protestant generals, was slain. Jarnac gave its name to an old French family, of which the best known member is Gui Chabot, comte de Jarnac (d. *c.* 1575), whose lucky backstroke in his famous duel with Châteigneraie gave rise to the proverbial phrase *coup de jarnac*, signifying an unexpected blow.

JARO, a town of the province of Iloílo, Panay, Philippine Islands, on the Jaro river, 2 m. N.W. of the town of Iloílo, the capital. Pop. (1903), 10,681. It lies on a plain in the midst of a rich agricultural district, has several fine residences, a cathedral, a curious three-tiered tower, a semi-weekly paper and a monthly periodical. Jaro was founded by the Spanish in 1584. From 1903 until February 1908 it was part of the town or municipality of Iloílo.

JAROSITE, a rare mineral species consisting of hydrous potassium and aluminium sulphate, and belonging to the group of isomorphous rhombohedral minerals enumerated below:—

Alunite	K_2	$[Al(OH)_2]_6 (SO_4)_4$
Jarosite	K_2	$[Fe(OH)_2]_6 (SO_4)_4$
Natrojarosite	Na_2	$[Fe(OH)_2]_6 (SO_4)_4$
Plumbojarosite	Pb	$[Fe(OH)_2]_6 (SO_4)_4$

Jarosite usually occurs as drusy incrustations of minute indistinct crystals with a yellowish-brown colour and brilliant lustre. Hardness 3; sp. gr. 3·15. The best specimens, consisting of crystalline crusts on limonite, are from the Jaroso ravine in the Sierra Almagrera, province of Almeria, Spain, from which locality the mineral receives its name. It has been also found, often in association with iron ores, at a few other localities. A variety occurring as concretionary or mulberry-like forms is known as moronolite (from Gr. μῶρον, "mulberry," and λίθος, "stone"); it is found at Monroe in Orange county, New York. The recently discovered species natrojarosite and plumbojarosite occur as yellowish-brown glistening powders consisting wholly of minute crystals, and are from Nevada and New Mexico respectively. (L. J. S.)

JARRAH WOOD (an adaptation of the native name *Jerryhl*), the product of a large tree (*Eucalyptus marginata*) found in south-western Australia, where it is said to cover an area of 14,000 sq. m. The trees grow straight in the stem to a great size, and yield squared timber up to 40 ft. length and 24 in. diameter. The wood is very hard, heavy (sp. gr. 1·010) and close-grained, with a mahogany-red colour, and sometimes sufficient "figure" to render it suitable for cabinet-makers' use. The timber possesses several useful characteristics; and great expectations were at first formed as to its value for shipbuilding and general constructive purposes. These expectations have not, however, been realized, and the exclusive possession of the tree has not proved that source of wealth to western Australia which was at one time expected. Its greatest merit for shipbuilding and marine purposes is due to the fact that it resists, better than any other timber, the attacks of the *Teredo navalis* and other marine borers, and on land it is equally exempt, in tropical countries, from the ravages of white ants. When felled with the sap at its lowest point and well seasoned, the wood stands exposure in the air, earth or sea remarkably well, on which account it is in request for railway sleepers, telegraph poles and piles in the British colonies and India. The wood, however, frequently shows longitudinal blisters, or lacunae, filled with resin, the same as may be observed in spruce fir timber; and it is deficient in fibre, breaking with a short fracture under comparatively moderate pressure. It has been classed at Lloyds for ship-building purposes in line three, table A, of the registry rules.

JARROW, a port and municipal borough in the Jarrow parliamentary division of Durham, England, on the right bank of the Tyne, 6½ m. below Newcastle, and on a branch of the North-Eastern railway. Pop. (1901), 34,295. The parish church of St Paul was founded in 685, and retains portions of pre-Norman work. The central tower is Norman, and there are good Decorated and Perpendicular details in the body of the church. Close by are the scattered ruins of the monastery begun by the pious Biscop in 681, and consecrated with the church by Ceolfrid in 685. Within the walls of this monastery the Venerable Bede spent his life from childhood; and his body was at first buried within the church, whither, until it was removed under Edward the Confessor to Durham, it attracted many pilgrims. The town is wholly industrial, devoted to ship-building, chemical works, paper mills and the neighbouring collieries. It owes its development from a mere pit village very largely to the enterprise of Sir Charles Mark Palmer (*q.v.*). Jarrow Slake, a river bay, 1 m. long by ½ m. broad, contains the Tyne docks of the North-Eastern railway company. A great quantity of coal is shipped. Jarrow was incorporated in 1875, and the corporation consists of a mayor, 6 aldermen and 18 councillors. Area, 783 acres.

JARRY, NICOLAS, one of the best-known 17th century French calligraphers. He was born at Paris about 1620, and was officially employed by Louis XIV. His most famous work is the *Guirlande de Julie* (1641). He died some time before 1674.

JARVIS, JOHN WESLEY (1780–1840), American artist, nephew of the great John Wesley, was born at South Shields, England, and was taken to the United States at the age of five. He was one of the earliest American painters to give serious attention to the study of anatomy. He lived at first in Philadelphia, afterwards establishing himself in New York, where he enjoyed great popularity, though his conviviality and eccentric mode of life affected his work. He visited Baltimore, Charleston and New Orleans, entertaining much and painting portraits of prominent people, particularly in New Orleans, where General Andrew Jackson was one of his sitters. He had for assistants at different times both Sully and Inman. He affected singularity in dress and manners, and his *mots* were the talk of the day. But his work deteriorated, and he died in great poverty in New York City. Examples of his painting are in the collection of the New York Historical Society.

JASHAR, BOOK OF, in Hebrew *Sepher ha-yashar*, a Hebrew composition mentioned as though well-known in Josh. x. 13 and 2 Sam. i. 18. From these two passages it seems to have been a book of songs relating to important events, but no early collection of the kind is now extant, nor is anything known of it. Various speculations have been put forward as to the name: (1) that it means the book of the upright, *i.e.* Israel or distinguished Israelites, the root being the same as in Jeshurun; (2) that Jashar (ישר) is a transposition of shîr (שיר, song); (3) that it should be pointed Yashir (יָשִׁיר, sing; cf. Exod. xv. 1) and was so called after its first word. None of these is very convincing, though support may be found for them all in the versions. The Septuagint favours (1) by its rendering *ἐπὶ βιβλίου τοῦ εὐθοῦς* in Samuel (it omits the words in Joshua); the Vulgate has *in libro justorum* in both places; the Syriac in Samuel has *Ashīr*, which suggests a Hebrew reading *ha-shīr* (the song), and in Joshua it translates "book of praises." The Targum on both passages has "book of the law," an explanation which is followed by the chief Jewish commentators, making the incidents the fulfilment of passages in the Pentateuch. Since it contained the lament of David (2 Sam. i. 18) it cannot have been completed till after his time. If Wellhausen's restoration of 1 Kings viii. 12 be accepted (from Septuagint 1 Kings viii. 53, *ἐν βιβλίῳ τῆς ᾠδῆς*) where the reference is to the building of the Temple, the book must have been growing in the time of Solomon. The attempt of Donaldson[1] to reconstruct it is largely subjective and uncritical.

In later times when it became customary to compose midrashic works under well-known names, a book of Jashar naturally made its appearance. It need hardly be remarked that this has nothing whatever to do with the older book. It is an anonymous elaboration in Hebrew of the early part of the biblical narrative, probably composed in the 12th century. The fact that its legendary material is drawn from Arabic sources, as well as from Talmud, Midrash and later Jewish works, would seem to show that the writer lived in Spain, or, according to others, in south Italy. The first edition appeared at Venice in 1625, and it has been frequently printed since. It was translated into English by (or for) M. M. Noah (New York, 1840). A work called *The Book of . . . Jasher, translated . . . by Alcuin* (1751; 2nd ed., Bristol, 1829), has nothing to do with this or with any Hebrew original, but is a mere fabrication by the printer, Jacob Ilive, who put it forward as the book "mentioned in Holy Scripture."

Bibliography.—M. Heilprin, *Historical Poetry of the Ancient Hebrews* (New York, 1879), i. 128–131; Mercati, "Una congettura sopra il libro del Giusto," in *Studi e Testi* (5, Roma, 1901). On the medieval work see Zunz, *Gottesdienstliche Vorträge der Juden* (Frankfurt a. M., 1892), 2nd ed., p. 162.

JASHPUR, a tributary state of India, in the Central Provinces, having been transferred from Bengal in 1905. The country is divided almost equally into high and low lands. The Uparghat plateau on the east rises 2200 ft. above sea-level, and the hills above it reach their highest point in Ranijula (3527 ft.). The only river of importance is the Ib, in the bed of which diamonds are found, while from time immemorial its sands have been washed for gold. Jashpur iron, smelted by the Kols, is highly prized. Jungles of *sál* forests abound, harbouring elephant, bison and other wild beasts. Jungle products include lac, silk cocoons and beeswax, which are exported. Area 1948 sq. m.; pop. (1901), 132,114; estimated revenue £8000.

JASMIN, JACQUES (1798–1864), Provençal poet, was born at Agen on the 6th of March 1798, his family name being Boé. His father, who was a tailor, had a certain facility for making doggerel verses, which he sang or recited at fairs and such-like popular gatherings; and Jacques, who used generally to accompany him, was thus early familiarized with the part which he afterwards so successfully filled himself. When sixteen years of age he found employment at a hairdresser's shop, and subsequently started a similar business of his own on the Gravier at Agen. In 1825 he published his first volume of *Papillotos* ("Curl Papers"), containing poems in French (a language he used with a certain sense of restraint), and in the familiar Agen *patois*—the popular speech of the working classes—in which he was to achieve all his literary triumphs. Jasmin was the most famous forerunner in Provençal literature (*q.v.*) of Mistral and the *Félibrige*. His influence in rehabilitating, for literary purposes, his native dialect, was particularly exercised in the public recitals of his poems to which he devoted himself. His poetic gift, and his flexible voice and action, fitted him admirably for this double rôle of troubadour and jongleur. In 1835 he recited his "Blind Girl of Castel-Cuillé" at Bordeaux, in 1836 at Toulouse; and he met with an enthusiastic reception in both those important cities. Most of his public recitations were given for benevolent purposes, the proceeds being contributed by him to the restoration of the church of Vergt and other good works. Four successive volumes of *Papillotos* were published during his lifetime, and contained amongst others the following remarkable poems, quoted in order: "The Charivari," "My Recollections" (supplemented after an interval of many years), "The Blind Girl," "Françounetto," "Martha the Simple," and "The Twin Brothers." With the exception of "The Charivari," these are all touching pictures of humble life—in most cases real episodes—carefully elaborated by the poet till the graphic descriptions, full of light and colour, and the admirably varied and melodious verse, seem too spontaneous and easy to have cost an effort. Jasmin was not a prolific writer, and, in spite of his impetuous nature, would work a long time at one poem, striving to realize every feeling he wished to describe, and give it its most lucid and natural expression. A verse from his spirited poem, "The Third of May," written in honour of Henry IV., and published in the first volume of *Papillotos*, is engraved on the base of the statue erected to that king at Nérac. In 1852 Jasmin's works were crowned by the Académie Française, and a pension was awarded him. The medal struck on the occasion bore the inscription: *Au poëte moral et populaire*. His title of "Maistre ès Jeux" is a distinction only conferred by the academy of Toulouse on illustrious writers. Pius IX. sent him the insignia of a knight of St Gregory the Great, and he was made chevalier of the Legion of Honour. He spent the latter years of his life on a small estate which he had bought near Agen and named "Papillotos," and which he describes in *Ma Bigno* ("My Vine"). Though invited to represent his native city, he refused to do so, preferring the pleasures and leisure of a country life, and wisely judging that he was no really eligible candidate for electoral honours. He died on the 4th of October 1864. His last poem, an answer to Renan, was placed between his folded hands in his coffin.

JASMINE, or Jessamine, botanically *Jasminum*, a genus of shrubs or climbers constituting the principal part of the tribe Jasminoideae of the natural order Oleaceae, and comprising about 150 species, of which 40 or more occur in the gardens of Britain. The plants of the genus are mostly natives of the warmer regions of the Old World; there is one South American species. The leaves are pinnate or ternate, or sometimes apparently simple, consisting of one leaflet, articulated to the petiole. The flowers, usually white or yellow, are arranged in terminal or axillary panicles, and have a tubular 5- or 8-cleft calyx, a cylindrical corolla-tube, with a spreading limb, two included stamens and a two-celled ovary.

The name is derived from the Persian *yásmín*. Linnaeus obtained a fancied etymology from *ἴα*, violets, and *ὀσμή*, smell, but the odour of its flowers bears no resemblance to that of the violet. The common white jasmine, *Jasminum officinale*, one of the best known and most highly esteemed of British hardy ligneous climbers, is a native of northern India and Persia, introduced about the middle of the 16th century. In the centre and south of Europe it is thoroughly acclimatized. Although it grows to the height of 12 and sometimes 20 ft., its stem is feeble and requires support; its leaves are opposite, pinnate and dark green, the leaflets are in three pairs, with an odd one, and are pointed, the terminal one larger and with a tapering point. The fragrant white flowers bloom from June to October; and, as they are found chiefly on the young shoots, the plant should only be pruned in the autumn. Varieties with golden and silver-edged leaves and one with double flowers are known.

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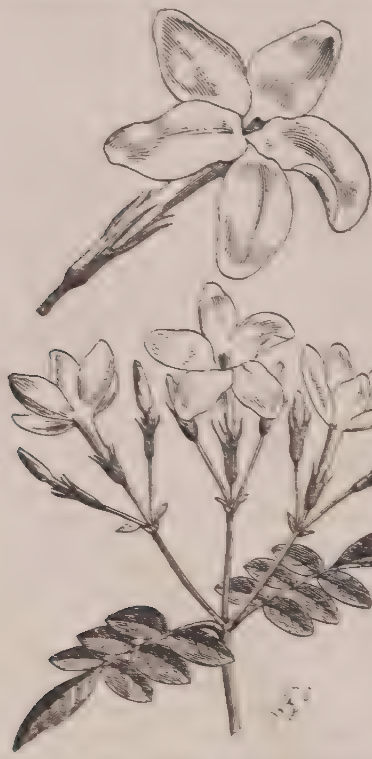
[1] *Jashar: fragmenta archetypa carminum Hebraicorum* (Berlin, 1854). Cf. Perowne's *Remarks* on it (Lond. 1855).

The zambak or Arabian jasmine, *J. Sambac*, is an evergreen white-flowered climber, 6 or 8 ft. high, introduced into Britain in the latter part of the 17th century. Two varieties introduced somewhat later are respectively 3-leaved and double-flowered, and these, as well as that with normal flowers, bloom throughout the greater part of the year. On account of their exquisite fragrance the flowers are highly esteemed in the East, and are frequently referred to by the Persian and Arabian poets. An oil obtained by boiling the leaves is used to anoint the head for complaints of the eye, and an oil obtained from the roots is used medicinally to arrest the secretion of milk. The flowers of one of the double varieties are held sacred to Vishnu, and used as votive offerings in Hindu religious ceremonies. The Spanish, or Catalonian jasmine, *J. grandiflorum*, a native of the north-west Himalaya, and cultivated both in the old and new world, is very like *J. officinale*, but differs in the size of the leaflets; the branches are shorter and stouter, and the flowers very much larger, and reddish underneath. By grafting it on two-year-old plants of *J. officinale*, an erect bush about 3 ft. high is obtained, requiring no supports. In this way it is very extensively cultivated at Cannes and Grasse, in the south of France; the plants are set in rows, fully exposed to the sun; they come into full bearing the second year after grafting; the blossoms, which are very large and intensely fragrant, are produced from July till the end of October, but those of August and September are the most odoriferous.



Jasminum grandiflorum; flower, natural size.

The aroma is extracted by the process known as *enfleurage*, *i.e.* absorption by a fatty body, such as purified lard or olive oil. Square glass trays framed with wood about 3 in. deep are spread over with grease about half an inch thick, in which ridges are made to facilitate absorption, and sprinkled with freshly gathered flowers, which are renewed every morning during the whole time the plant remains in blossom; the trays are piled up in stacks to prevent the evaporation of the aroma; and finally the pomade is scraped off the glass, melted at as low a temperature as possible, and strained. When oil is employed as the absorbent, coarse cotton cloths previously saturated with the finest olive oil are laid on wire-gauze frames, and repeatedly covered in the same manner with fresh flowers; they are then squeezed under a press, yielding what is termed *huile antique au jasmin*. Three pounds of flowers will perfume 1 ℔ of grease—this is exhausted by maceration in 1 pt. of rectified spirit to form the "extract." An essential oil is distilled from jasmine in Tunis and Algeria, but its high price prevents its being used to any extent. The East Indian oil of jasmine is a compound largely contaminated with sandalwood-oil.

The distinguishing characters of *J. odoratissimum*, a native of the Canary Islands and Madeira, consist principally in the alternate, obtuse, ternate and pinnate leaves, the 3-flowered terminal peduncles and the 5-cleft yellow corolla with obtuse segments. The flowers have the advantage of retaining when dry their natural perfume, which is suggestive of a mixture of jasmine, jonquil and orange-blossom. In China *J. paniculatum* is cultivated as an erect shrub, known as *sieu-hing-hwa*; it is valued for its flowers, which are used with those of *J. Sambac*, in the proportion of 10 ℔ of the former to 30 ℔ of the latter, for scenting tea—40 ℔ of the mixture being required for 100 ℔ of tea. *J. angustifolium* is a beautiful evergreen climber 10 to 12 ft. high, found in the Coromandel forests, and introduced into Britain during the present century. Its leaves are of a bright shining green; its large terminal flowers are white with a faint tinge of red, fragrant and blooming throughout the year.

In Cochin China a decoction of the leaves and branches of *J. nervosum* is taken as a blood-purifier; and the bitter leaves of *J. floribundum* (called in Abyssinia *habbez-zelim*) mixed with kousso is considered a powerful anthelmintic, especially for tapeworm; the leaves and branches are added to some fermented liquors to increase their intoxicating quality. In Catalonia and in Turkey the wood of the jasmine is made into long, slender pipe-stems, highly prized by the Moors and Turks. Syrup of jasmine is made by placing in a jar alternate layers of the flowers and sugar, covering the whole with wet cloths and standing it in a cool place; the perfume is absorbed by the sugar, which is converted into a very palatable syrup. The important medicinal plant known in America as the "Carolina jasmine" is not a true jasmine (see GELSEMIUM).

Other hardy species commonly cultivated in gardens are the low or Italian yellow-flowered jasmine, *J. humile*, an East Indian species introduced and now found wild in the south of Europe, an erect shrub 3 or 4 ft. high, with angular branches, alternate and mostly ternate leaves, blossoming from June to September; the common yellow jasmine, *J. fruticans*, a native of southern Europe and the Mediterranean region, a hardy evergreen shrub, 10 to 12 ft. high, with weak, slender stems requiring support, and bearing yellow, odourless flowers from spring to autumn; and *J. nudiflorum* (China), which bears its bright yellow flowers in winter before the leaves appear. It thrives in almost any situation and grows rapidly.

JASON (Ἰάσων), in Greek legend, son of Aeson, king of Iolcus in Thessaly. He was the leader of the Argonautic expedition (see ARGONAUTS). After he returned from it he lived at Corinth with his wife Medea (*q.v.*) for many years. At last he put away Medea, in order to marry Glauce (or Creusa), daughter of the Corinthian king Creon. To avenge herself, Medea presented the new bride with a robe and head-dress, by whose magic properties the wearer was burnt to death, and slew her children by Jason with her own hand. A later story represents Jason as reconciled to Medea (Justin, xlii. 2). His death was said to have been due to suicide through grief, caused by Medea's vengeance (Diod. Sic. iv. 55); or he was crushed by the fall of the poop of the ship "Argo," under which, on the advice of Medea, he had laid himself down to sleep (argument of Euripides' *Medea*). The name (more correctly Iason) means "healer," and Jason is possibly a local hero of Iolcus to whom healing powers were attributed. The ancients regarded him as the oldest navigator, and the patron of navigation. By the moderns he has been variously explained as a solar deity; a god of summer; a god of storm; a god of rain, who carries off the rain-giving cloud (the golden fleece) to refresh the earth after a long period of drought. Some regard the legend as a chthonian myth, Aea (Colchis) being the under-world in the Aeolic religious system from which Jason liberates himself and his betrothed; others, in view of certain resemblances between the story of Jason and that of Cadmus (the ploughing of the field, the sowing of the dragon's teeth, the fight with the Sparti, who are finally set fighting with one another by a stone hurled into their midst), associate both with Demeter the corn-goddess, and refer certain episodes to practices in use at country festivals, *e.g.* the stone throwing, which, like the βαλλητύς at the Eleusinia and the λιθοβολία at

Troezen (Pausanias ii. 30, 4 with Frazer's note) was probably intended to secure a good harvest by driving away the evil spirits of unfruitfulness.

See articles by C. Seeliger in Roscher's *Lexikon der Mythologie* and by F. Durrbach in Daremberg and Saglio's *Dictionnaire des antiquités*; H. D. Müller, *Mythologie der griechischen Stämme* (1861), ii. 328, who explains the name Jason as "wanderer"; W. Mannhardt, *Mythologische Forschungen* (1884), pp. 75, 130; O. Crusius, *Beiträge zur griechischen Mythologie und Religionsgeschichte* (Leipzig, 1886).

Later Versions of the Legend.—Les fais et prouesses du noble et vaillant chevalier Jason was composed in the middle of the 15th century by Raoul Lefèvre on the basis of Benoît's *Roman de Troie*, and presented to Philip of Burgundy, founder of the order of the Golden Fleece. The manners and sentiments of the 15th century are made to harmonize with the classical legends after the fashion of the Italian pre-Raphaelite painters, who equipped Jewish warriors with knightly lance and armour. The story is well told; the digressions are few; and there are many touches of domestic life and natural sympathy, The first edition is believed to have been printed at Bruges in 1474.

Caxton translated the book under the title of *A Boke of the hoole Lyf of Jason*, at the command of the duchess of Burgundy. A Flemish translation appeared at Haarlem in 1495. The Benedictine Bernard de Montfaucon (1655–1741) refers to a MS. by Guido delle Colonne, *Historia Medeae et Jasonis* (unpublished).

The *Histoire de la Thoison d'Or* (Paris, 1516) by Guillaume Fillastre (1400–1473), written about 1440–1450, is an historical compilation dealing with the exploits of the *très chrétiennes maisons* of France, Burgundy and Flanders.

JASON OF CYRENE, a Hellenistic Jew, who lived about 100 B.C. and wrote a history of the times of the Maccabees down to the victory over Nicanor (175–161 B.C.). This work is said to have been in five books and formed the basis of the present 2 Macc. (see ch. ii. 19–32).

JASPER, an opaque compact variety of quartz, variously coloured and often containing argillaceous matter. The colours are usually red, brown, yellow or green, and are due to admixture with compounds of iron, either oxides or silicates. Although the term jasper is now restricted to opaque quartz it is certain that the ancient *jaspis* or ἴασπις was a stone of considerable translucency. The jasper of antiquity was in many cases distinctly green, for it is often compared with the emerald and other green objects. Jasper is referred to in the *Niebelungenlied* as being clear and green. Probably the jasper of the ancients included stones which would now be classed as chalcedony, and the emerald-like jasper may have been akin to our chrysoprase. The Hebrew word *yashefeh* may have designated a green jasper (cf. Assyrian *yashpu*). Professor Flinders Petrie has suggested that the *odem*, the first stone on the High Priest's breastplate, translated "sard," was a red jasper, whilst *tarshish*, the tenth stone, may have been a yellow jasper (Hastings's *Dict. Bible*, 1902).

Many varieties of jasper are recognized. Riband jasper is a form in which the colours are disposed in bands, as in the well-known ornamental stone from Siberia, which shows a regular alternation of dark red and green stripes. Egyptian jasper is a brown jasper, occurring as nodules in the Lybian desert and in the Nile valley, and characterized by a zonal arrangement of light and dark shades of colour. Agate-jasper is a variety intermediate between true jasper and chalcedony. Basanite, lydite, or Lydian stone, is a velvet-black flinty jasper, used as a touchstone for testing the purity of precious metals by their streak. Porcelain jasper is a clay indurated by natural calcination. (F. W. R.*)

JASSY (*Iaşiĭ*), also written Jasii, Jaschi and Yassy, the capital of the department of Jassy, Rumania; situated on the left bank of the river Bahlui, an affluent of the Jijia, about 10 m. W. of the Pruth and the Russian frontier. Pop. (1900), 78,067. Jassy communicates by rail with Galatz on the Danube, Kishinev in Bessarabia, and Czernowitz in Bukowina. The surrounding country is one of uplands and woods, among which rise the monasteries of Cetaţuia, Frumoasa, and Galata with its mineral springs, the water-cure establishment of Rapide and the great seminary of Socola. Jassy itself stands pleasantly amid vineyards and gardens, partly on two hills, partly in the hollow between. Its primitive houses of timber and plaster were mostly swept away after 1860, when brick or stone came into general use, and good streets were cut among the network of narrow, insanitary lanes. Jassy is the seat of the metropolitan of Moldavia, and of a Roman Catholic archbishop. Synagogues and churches abound. The two oldest churches date from the reign of Stephen the Great (1458–1504); perhaps the finest, however, are the 17th-century metropolitan, St Spiridion and Trei Erarchi, the last a curious example of Byzantine art, erected in 1639 or 1640 by Basil the Wolf, and adorned with countless gilded carvings on its outer walls and twin towers.. The St Spiridion Foundation (due to the liberality of Prince Gregory Ghika in 1727, and available for the sick of all countries and creeds) has an annual income of over £80,000, and maintains hospitals and churches in several towns of Moldavia, besides the baths at Slanic in Walachia. The main hospital in Jassy is a large building, and possesses a maternity institution, a midwifery school, a chemical institute, an inoculating establishment, &c. A society of physicians and naturalists has existed in Jassy since the early part of the 19th century, and a number of periodicals are published. Besides the university, founded by Prince Cuza in 1864, with faculties of literature, philosophy, law, science and medicine, there are a military academy and schools of art, music and commerce; a museum, a fine hall and a theatre; the state library, where the chief records of Rumanian history are preserved; an appeal court, a chamber of commerce and several banks. The city is the headquarters of the 4th army corps. It has an active trade in petroleum, salt, metals, timber, cereals, fruit, wine, spirits, preserved meat, textiles, clothing, leather, cardboard and cigarette paper.

The inscription by which the existence of a *Jassiorum municipium* in the time of the Roman Empire is sought to be proved, lies open to grave suspicion; but the city is mentioned as early as the 14th century, and probably does derive its name from the Jassians, or Jazygians, who accompanied the Cumanian invaders. It was often visited by the Moldavian court. About 1564, Prince Alexander Lapusneanu, after whom one of the chief streets is named, chose Jassy for the Moldavian capital, instead of Suceava (now Suczawa, in Bukowina). It was already famous as a centre of culture. Between 1561 and 1563 an excellent school and a Lutheran church were founded by the Greek adventurer, Jacob Basilicus (see Rumania: *History*). In 1643 the first printed book published in Moldavia was issued from a press established by Basil the Wolf. He also founded a school, the first in which the mother-tongue took the place of Greek. Jassy was burned by the Tatars in 1513, by the Turks in 1538, and by the Russians in 1686. By the Peace of Jassy the second Russo-Turkish War was brought to a close in 1792. A Greek insurrection under Ypsilanti in 1821 led to the storming of the city by the Turks in 1822. In 1844 there was a severe conflagration. For the loss caused to the city in 1861 by the removal of the seat of government to Bucharest the constituent assembly voted £148,150, to be paid in ten annual instalments, but no payment was ever made.

JĀTAKA, the technical name, in Buddhist literature, for a story of one or other of the previous births of the Buddha. The word is also used for the name of a collection of 547 of such stories included, by a most fortunate conjuncture of circumstances, in the Buddhist canon. This is the most ancient and the most complete collection of folk-lore now extant in any literature in the world. As it was made at latest in the 3rd century B.C., it can be trusted not to give any of that modern or European colouring which renders suspect much of the folk-lore collected by modern travellers.

Already in the oldest documents, drawn up by the disciples soon after the Buddha's death, he is identified with certain ancient sages of renown. That a religious teacher should claim to be successor of the prophets of old is not uncommon in the history of religions. But the current belief in metempsychosis led, or enabled, the early Buddhists to make a much wider claim. It was not very long before they gradually identified their master with the hero of each of the popular fables and stories of which they were so fond. The process must have been complete by the middle of the 3rd century B.C.; for we find at that date illustrations of the Jātakas in the bas-reliefs on the railing round the Bharahat tope with the titles of the Jātaka stories inscribed above them in the characters of that period.[1] The hero of each story is made into a Bodhisatta; that is, a being who is destined, after a number of subsequent births, to become a Buddha. This rapid development of the Bodhisatta theory is the distinguishing feature in the early history of Buddhism, and was both cause and effect of the simultaneous growth of the Jātaka book. In adopting the folk-lore and fables already current in India, the Buddhists did not change them very much. The stories as preserved to us, are for the most part Indian rather than Buddhist. The ethics they inculcate or suggest are milk for babes; very simple in character and referring almost exclusively to matters common to all schools of thought in India, and indeed elsewhere. Kindness, purity, honesty, generosity, worldly wisdom, perseverance, are the usual virtues praised; the higher ethics of the Path are scarcely mentioned. These stories, popular with all, were especially appreciated by that school of Buddhists that laid stress on the Bodhisatta theory—a school that obtained its chief support, and probably had its origin, in the extreme north-west of India and in the highlands of Asia. That school adopted, from the early centuries of our era, the use of Sanskrit, instead of Pali, as the means of literary expression. It is almost impossible, therefore, that they would have carried the canonical Pali book, voluminous as it is, into Central Asia. Shorter collections of the original stories, written in Sanskrit, were in vogue among them. One such collection, the Jātaka-mālā by Ārya Sūra (6th century), is still extant. Of the existence of another collection, though the Sanskrit original has not yet been found, we have curious evidence. In the 6th century a book of Sanskrit fables was translated into Pahlavi, that is, old Persian (see BIDPAI). In succeeding centuries this work was retranslated into Arabic and Hebrew, thence into Latin and Greek and all the modern languages of Europe. The book bears a close resemblance to the earlier chapters of a late Sanskrit fable book called, from its having five chapters, the *Pancha tantra*, or Pentateuch.

The introduction to the old Jātaka book gives the life of the historical Buddha. That introduction must also have reached Persia by the same route. For in the 8th century St John of Damascus put the story into Greek under the title of *Barlaam and Josaphat*. This story became very popular in the West. It was translated into Latin, into seven European languages, and even into Icelandic and the dialect of the Philippine Islands. Its hero, that is the Buddha, was canonized as a Christian saint; and the 27th of November was officially fixed as the date for his adoration as such.

The book popularly known in Europe as *Aesop's Fables* was not written by Aesop. It was put together in the 14th century at Constantinople by a monk named Planudes, and he drew largely for his stories upon those in the Jātaka book that had reached Europe along various channels. The fables of Babrius and Phaedrus, written respectively in the 1st century before, and in the 1st century after, the Christian era, also contain Jātaka stories known in India in the 4th century B.C. A great deal has been written on this curious question of the migration of fables. But we are still very far from being able to trace the complete history of each story in the Jātaka book, or in any one of the later collections. For India itself the record is most incomplete. We have the original Jātaka book in text and translation. The history of the text of the *Pancha tantra*, about a thousand years later, has been fairly well traced out. But for the intervening centuries scarcely anything has been done. There are illustrations, in the bas-reliefs of the 3rd century B.C., of Jātakas not contained in the Jātaka book. Another collection, the *Cariyâ piṭaka*, of about the same date, has been edited, but not translated. Other collections both in Pali and Sanskrit are known to be extant in MS,; and a large number of Jātaka stories, not included in any formal collection, are mentioned, or told in full, in other works.

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(T. W. R. D.)

JATH, a native state of India, in the Deccan division of Bombay, ranking as one of the southern Mahratta jagirs. With the small state of Daphlapur, which is an integral part of it, it forms the Bijapur Agency, under the collector of Bijapur district. Area, including Daphlapur, 980 sq. m. Pop. (1901), 68,665, showing a decline of 14% in the decade. Estimated revenue £24,000; tribute £700. Agriculture and cattle-breeding are carried on; there are no important manufactures. The chief, whose title is deshmukh, is a Mahratta of the Daphle family. The town of JATH is 92 m. S.E. of Satara. Pop. (1901), 5404.

JÁTIVA (formerly written XATIVA), or SAN FELIPE DE JÁTIVA, a town of eastern Spain, in the province of Valencia, on the right bank of the river Albaida, a tributary of the Júcar, and at the junction of the Valencia-Murcia and Valencia-Albacete railways. Pop. (1900), 12,600. Játiva is built on the margin of a fertile and beautiful plain, and on the southern slopes of the Monte Bernisa, a hill with two peaks, each surmounted by a castle. With its numerous fountains, and spacious avenues shaded with elms or cypresses, the town has a clean and attractive appearance. Its collegiate church, dating from 1414, but rebuilt about a century later in the Renaissance style, was formerly a cathedral, and is the chief among many churches and convents. The town-hall and a church on the castle hill are partly constructed of inscribed Roman masonry, and several houses date from the Moorish occupation. There is a brisk local trade in grain, fruit, wine, oil and rice.

Játiva was the Roman Saetabis, afterwards Valeria Augusta, of Carthaginian or Iberian origin. Pliny (23–79) and Martial (*c.* 40–102) mention the excellence of its linen cloth. Under the Visigoths (*c.* 483–711) it became an episcopal see; but early in the 8th century it was captured by the Moors, under whom it attained great prosperity, and received its present name. It was reconquered by James I. of Aragon (1213–1276). During the 15th and 16th centuries, Játiva was the home of many members of the princely house of Borgia or Borja, who migrated hither from the town of Borja in the province of Saragossa. Alphonso Borgia, afterwards Pope Calixtus III., and Rodrigo Borgia, afterwards Pope Alexander VI., were natives of Játiva, born respectively in 1378 and 1431. The painter Jusepe Ribera was also born here in 1588. Owing to its gallant defence against the troops of the Archduke Charles in the war of the Spanish succession, Játiva received the additional name of San Felipe from Philip V. (1700–1746).

JĀTS, or JUTS, a people of north-western India, who numbered altogether more than 7 millions in 1901. They form a considerable proportion of the population in the Punjab, Rājputana and the adjoining districts of the United Provinces, and are also widely scattered through Sind and Baluchistan. Some writers have identified the Jāts with the ancient Getae, and there is strong reason to believe them a degraded tribe of Rājputs, whose Scythic origin has also been maintained. Hindu legends point to a prehistoric occupation of the Indus valley by this people, and at the time of the Mahommedan conquest of Sind (712) they, with a cognate tribe called Meds, constituted the bulk of the population. They enlisted under the banner of Mahommed bin Kāsim, but at a later date offered a vigorous resistance to the Arab invaders. In 836 they were overthrown by Amran, who imposed on them a tribute of dogs, and used their arms to vanquish the Meds. In 1025, however, they had gathered audacity, not only to invade Mansura, and compel the abjuration of the Mussulman amir, but to attack the victorious army of Mahmūd, laden with the spoil of Somnāth. Chastisement duly ensued: a formidable flotilla, collected at Mūltān, shattered in thousands the comparatively defenceless Jāt boats on the Indus, and annihilated their national pretensions. It is not until the decay of the Mogul Empire that the Jāts again appear in history. One branch of them, settled south of Agra, mainly by bold plundering raids founded two dynasties which still exist at Bharatpur (*q.v.*) and Dholpur (*q.v.*). Another branch, settled north-west of Delhi, who adopted the Sikh religion, ultimately made themselves dominant throughout the Punjab (*q.v.*) under Ranjit Singh, and are now represented in their original home by the Phulkian houses of Patiala (*q.v.*), Jind (*q.v.*) and Nabha (*q.v.*). It is from this latter branch that the Sikh regiments of the Indian army are recruited. The Jāts are mainly agriculturists and cattle breeders. In their settlements on the Ganges and Jumna, extending as far east as Bareilly, they are divided into two great clans, the Dhe and the Hele; while in the Punjab there are said to be one hundred different sections. Their religion varies with locality. In the Punjab they have largely embraced Sikh tenets, while in Sind and Baluchistan they are Mahommedans. In appearance they are not ill-favoured though extremely dark; they have good teeth, and large beards, sometimes stained with indigo. Their inferiority of social position, however, to some extent betrays itself in their aspect, and tends to be perpetuated by their intellectual apathy.

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[1] A complete list of these inscriptions will be found in Rhys Davids's *Buddhist India*, p. 209.

JAUBERT, PIERRE AMÉDÉE ÉMILIEN PROBE (1779–1847), French Orientalist, was born at Aix in Provence on the 3rd of June 1779. He was one of the most distinguished pupils of Silvestre de Sacy, whose funeral *Discours* he pronounced in 1838. Jaubert acted as interpreter to Napoleon in Egypt in 1798–1799, and on his return to Paris held various posts under government. In 1802 he accompanied Sebastiani on his Eastern mission; and in 1804 he was at Constantinople. Next year he was despatched to Persia to arrange an alliance with the shah; but on the way he was seized and imprisoned in a dry cistern for four months by the pasha of Bayazid. The pasha's death freed Jaubert, who successfully accomplished his mission, and rejoined Napoleon at Warsaw in 1807. On the eve of Napoleon's downfall he was appointed chargé d'affaires at Constantinople. The restoration ended his diplomatic career, but in 1818 he undertook a journey with government aid to Tibet, whence he succeeded in introducing into France 400 Kashmir goats. The rest of his life Jaubert spent in study, in writing and in teaching. He became professor of Persian in the collège de France, and director of the école des langues orientales, and in 1830 was elected member of the Académie des Inscriptions. In 1841 he was made a peer of France and councillor of state. He died in Paris on the 28th of January, 1847.

Besides articles in the *Journal asiatique*, he published *Voyage en Arménie et en Perse* (1821; the edition of 1860 has a notice of Jaubert, by M. Sédillot) and *Éléments de la grammaire turque* (1823–1834). See notices in the *Journal asiatique*, Jan. 1847, and the *Journal des débats*, Jan. 30, 1847.

JAUCOURT, ARNAIL FRANÇOIS, Marquis de (1757–1852), French politician, was born on the 14th of November 1757 at Tournon (Seine-et-Marne) of a Protestant family, protected by the prince de Condé, whose regiment he entered. He adopted revolutionary ideas and became colonel of his regiment. In the Assembly, to which he was returned in 1791 by the department of Seine-et-Marne, he voted generally with the minority, and his views being obviously too moderate for his colleagues he resigned in 1792 and was soon after arrested on suspicion of being a reactionary. Mme de Staël procured his release from P. L. Manuel just before the September massacres. He accompanied Talleyrand on his mission to England, returning to France after the execution of Louis XVI. He lived in retirement until the establishment of the Consulate, when he entered the tribunate, of which he was for some time president. In 1803 he entered the senate, and next year became attached to the household of Joseph Bonaparte. Presently his imperialist views cooled, and at the Restoration he became minister of state and a peer of France. At the second Restoration he was for a brief period minister of marine, but held no further office. He devoted himself to the support of the Protestant interest in France. A member of the upper house throughout the reign of Louis Philippe, he was driven into private life by the establishment of the Second Republic, but lived to see the *Coup d'état* and to rally to the government of Louis Napoleon, dying in Paris on the 5th of February 1852.

JAUER, a town of Germany, in the Prussian province of Silesia, 13 m. by rail S. of Leignitz, on the Wüthende Neisse. Pop. (1900), 13,024. St Martin's (Roman Catholic) church dates from 1267–1290, and the Evangelical church from 1655. A new town-hall was erected in 1895–1898. Jauer manufactures leather, carpets, cigars, carriages and gloves, and is specially famous for its sausages. The town was first mentioned in 1242, and was formerly the capital of a principality embracing about 1200 sq. m., now occupied by the circles of Jauer, Bunzlau, Löweberg, Hirschberg and Schönau. From 1392 to 1741 it belonged to the kings of Bohemia, being taken from Maria Theresa by Frederick the Great. Jauer was formerly the prosperous seat of the Silesian linen trade, but the troubles of the Thirty Years' War, in the course of which it was burned down three times, permanently injured this.

See Schönaich, *Die alte Fürstentumshauptstadt Jauer* (Jauer, 1903).

JAUHARĪ (Abu Nasr Ismaʿil ibn Ḥammad ul-Jauhari) (d. 1002 or 1010), Arabian lexicographer, was born at Fārāb on the borders of Turkestan. He studied language in Fārāb and Bagdad, and later among the Arabs of the desert. He then settled in Damghan and afterwards at Nīshapūr, where he died by a fall from the roof of a house. His great work is the *Kitāb us-Ṣaḥāḥ fil-Lugha*, an Arabic dictionary, in which the words are arranged alphabetically according to the last letter of the root. He himself had only partially finished the last recension, but the work was completed by his pupil, Abū Isḥaq Ibrāhīm ibn Ṣāliḥ ul-Warrāq.

An edition was begun by E. Scheidius with a Latin translation, but one part only appeared at Harderwijk (1776). The whole has been published at Tebriz (1854) and at Cairo (1865), and many abridgments and Persian translations have appeared; cf. C. Brockelmann, *Geschichte der arabischen Literatur* (Weimar, 1898), i. 128 seq. (G. W. T.)

JAUNDICE (Fr. *jaunisse*, from *jaune*, yellow), or Icterus (from its resemblance to the colour of the golden oriole, of which Pliny relates that if a jaundiced person looks upon it he recovers but the bird dies), a term in medicine applied to a yellow coloration of the skin and other parts of the body, depending in most instances on some derangement affecting the liver. This yellow colour is due to the presence in the blood of bile or of some of the elements of that secretion. Jaundice, however, must be regarded more as a symptom of some morbid condition previously existing than as a disease *per se*.

Cases with jaundice may be divided into three groups.

1. *Obstructive Jaundice.*—Any obstruction of the passage of bile from the liver into the intestinal canal is sooner or later followed by the appearance of jaundice, which in such circumstances is due to the absorption of bile into the blood. The obstruction is due to one of the following causes: (1) Obstruction by foreign bodies within the bile duct, *e.g.* gallstones or parasites; (2) inflammation of the duodenum or the lining membrane of the duct; (3) stricture or obliteration of the duct; (4) a tumour growing from the duct; (5) pressure on the duct from without, from the liver or other organ, or tumours arising from them. Obstructions from these causes may be partial or complete, and the degree of jaundice will vary accordingly, but it is to be noted that extensive organic disease of the liver may exist without the evidence of obstructive jaundice.

The effect upon the liver of impediments to the outflow of bile such as those above indicated is in the first place an increase in its size, the whole biliary passages and the liver cells being distended with retained bile. This enlargement, however, speedily subsides when the obstruction is removed, but should it persist the liver ultimately shrinks and undergoes atrophy in its whole texture. The bile thus retained is absorbed into the system, and shows itself by the yellow staining seen to a greater or less extent in all the tissues and many of the fluids of the body. The kidneys, which in such circumstances act in some measure vicariously to the liver and excrete a portion of the retained bile, are apt to become affected in their structure by the long continuance of jaundice.

The symptoms of obstructive jaundice necessarily vary according to the nature of the exciting cause, but there generally exists evidence of some morbid condition before the yellow coloration appears. Thus, if the obstruction be due to an impacted gallstone in the common or hepatic duct, there will probably be the symptoms of intense suffering characterizing hepatic colic (see COLIC). In the cases most frequently seen—those, namely, arising from simple catarrh of the bile ducts due to gastro-duodenal irritation spreading through the common duct—the first sign to attract attention is the yellow appearance of the white of the eye, which is speedily followed by a similar colour on the skin over the body generally. The yellow tinge is most distinct where the skin is thin, as on the forehead, breast, elbows, &c. It may be also well seen in the roof of the mouth, but in the lips and gums the colour is not observed till the blood is first pressed from them. The tint varies, being in the milder cases faint, in the more severe a deep saffron yellow, while in extreme degrees of obstruction it may be of dark brown or greenish hue. The colour can scarcely, if at all, be observed in artificial light.

The urine exhibits well marked and characteristic changes in jaundice which exist even before any evidence can be detected on the skin or elsewhere. It is always of dark brown colour resembling porter, but after standing in the air it acquires a greenish tint. Its froth is greenish-yellow, and it stains with this colour any white substance. It contains not only the bile colouring matter but also the bile acids. The former is detected by the play of colours yielded on the addition of nitric acid, the latter by the purple colour, produced by placing a piece of lump sugar in the urine tested, and adding thereto a few drops of strong sulphuric acid.

The contents of the bowels also undergo changes, being characterized chiefly by their pale clay colour, which is in proportion to the amount of hepatic obstruction, and to their consequent want of admixture with bile. For the same reason they contain a large amount of unabsorbed fatty matter, and have an extremely offensive odour.

Constitutional symptoms always attend jaundice with obstruction. The patient becomes languid, drowsy and irritable, and has generally a slow pulse. The appetite is usually but not always diminished, a bitter taste in the mouth is complained of, while flatulent eructations arise from the stomach. Intolerable itching of the skin is a common accompaniment of jaundice, and cutaneous eruptions or boils are occasionally seen. Yellow vision appears to be present in some very rare cases. Should the jaundice depend on advancing organic disease of the liver, such as cancer, the tinge becomes gradually deeper, and the emaciation and debility more marked towards the fatal termination, which in such cases is seldom long postponed. Apart from this, however, jaundice from obstruction may exist for many years, as in those instances where the walls of the bile ducts are thickened from chronic catarrh, but where they are only partially occluded. In the common cases of acute catarrhal jaundice recovery usually takes place in two or three weeks.

The treatment of this form of jaundice bears reference to the cause giving rise to the obstruction. In the ordinary cases of simple catarrhal jaundice, or that following the passing of gallstones, a light nutritious diet (milk, soups, &c., avoiding saccharine and farinaceous substances and alcoholic stimulants), along with counter-irritation applied over the right side and the use of laxatives and cholagogues, will be found to be advantageous. Diaphoretics and diuretics to promote the action of the skin and kidneys are useful in jaundice. In the more chronic forms, besides the remedies above named, the waters of Carlsbad are of special efficacy. In cases other than acute catarrhal, operative interference is often called for, to remove the gallstones, tumour, &c., causing the obstruction.

2. *Toxaemic Jaundice* is observed to occur as a symptom in certain fevers, *e.g.* yellow fever, ague, and in pyaemia also as the effect of certain poisons, such as phosphorus, and the venom of snake-bites. Jaundice of this kind is almost always slight, and neither the urine nor the discharges from the bowels exhibit changes in appearance to such a degree as in the obstructive variety. Grave constitutional symptoms are often present, but they are less to be ascribed to the jaundice than to the disease with which it is associated.

3. *Hereditary Jaundice.*—Under this group there are the jaundice of new-born infants, which varies enormously in severity; the cases in which a slight form of jaundice obtains in several members of the same family, without other symptoms, and which may persist for years; and lastly the group of cases with hypertrophic cirrhosis.

The name ***malignant jaundice*** is sometimes applied to that very fatal form of disease otherwise termed acute yellow atrophy of the liver (see ATROPHY).

JAUNPUR, a city and district of British India, in the Benares division of the United Provinces. The city is on the left bank of the river Gumti, 34 m. N.W. from Benares by rail. Pop. (1901), 42,771. Jaunpur is a very ancient city, the former capital of a Mahommedan kingdom which once extended from Budaun and Etawah to Behar. It abounds in splendid architectural monuments, most of which belong to the period when the rulers of Jaunpur were independent of Delhi. The fort of Feroz Shah is in great part completely ruined, but there remain a fine gateway of the 16th century, a mosque dating from 1376, and the *hammams* or baths of Ibrahim Shah. Among other buildings may be mentioned the Atala Masjid (1408) and the ruined Jinjiri Masjid, mosques built by Ibrahim, the first of which has a great cloistered court and a magnificent façade; the Dariba mosque constructed by two of Ibrahim's governors; the Lal Darwaza erected by the queen of Mahmud; the Jama Masjid (1438–1478) or great mosque of Husain, with court and cloisters, standing on a raised terrace, and in part restored in modern times; and finally the splendid bridge over the Gumti, erected by Munim Khan, Mogul governor in 1569–1573. During the Mutiny of 1857 Jaunpur formed a centre of disaffection. The city has now lost its importance, the only industries surviving being the manufacture of perfumes and papier-mâché articles.

The DISTRICT OF JAUNPUR has an area of 1551 sq. m. It forms part of the wide Gangetic plain, and its surface is accordingly composed of a thick alluvial deposit. The whole country is closely tilled, and no waste lands break the continuous prospect of cultivated fields. It is divided into two unequal parts by the sinuous channel of the Gumti, a tributary of the Ganges, which flows past the city of Jaunpur. Its total course within the district is about 90 m., and it is nowhere fordable. It is crossed by two bridges, one at Jaunpur and the other 2 m. lower down. The Gumti is liable to sudden inundations during the rainy season, owing to the high banks it has piled up at its entrance into the Ganges, which act as dams to prevent the prompt outflow of its flooded waters. These inundations extend to its tributary the Saī. Much damage was thus effected in 1774; but the greatest recorded flood took place in September 1871, when 4000 houses in the city were swept away, besides 9000 more in villages along its banks. The other rivers are the Saī, Barna, Pili and Basohi. Lakes are numerous in the north and south; the largest has a length of 8 m. Pop. (1901), 1,202,920, showing a decrease of 5% in the decade. Sugar-refining is the principal industry. The district is served by the line of the Oudh & Rohilkhand railway from Benares to Fyzabad, and by branches of this and of the Bengal & North-Western systems.

In prehistoric times Jaunpur seems to have formed a portion of the Ajodhya principality, and when it first makes an appearance in authentic history it was subject to the rulers of Benares. With the rest of their dominions it fell under the yoke of the Mussulman invaders in 1194. From that time the district appears to have been ruled by a prince of the Kanauj dynasty, as a tributary of the Mahommedan suzerain. In 1388 Mālik Sarwar Khwāja was sent by Mahommed Tughlak to govern the eastern province. He fixed his residence at Jaunpur, made himself independent of the Delhi court, and assumed the title of Sultan-us-Shark, or "eastern emperor." For nearly a century the Sharki dynasty ruled at Jaunpur, and proved formidable rivals to the sovereigns of Delhi. The last of the dynasty was Sultan Husain, who passed his life in a fierce and chequered struggle for supremacy with Bahlol Lodi, then actual emperor at Delhi. At length, in 1478, Bahlol succeeded in defeating his rival in a series of decisive engagements. He took the city of Jaunpur, but permitted the conquered Husain to reside there, and to complete the building of his great mosque, the Jama Masjid, which now forms the chief ornament of the town. Many other architectural works in the district still bear witness to its greatness under its independent Mussulman rulers. In 1775 the district was made over to the British by the Treaty of Lucknow. From that time nothing occurred which calls for notice till the Mutiny. On the 5th of June 1857, when the news of the Benares revolt reached Jaunpur, the sepoys mutinied. The district continued in a state of complete anarchy till the arrival of the Gurkha force from Azamgarh in September. In November the surrounding country was lost again, and it was not till May 1858 that the last smouldering embers of disaffection were stifled by the repulse of the insurgent leader at the hands of the people themselves.

See A. Führer, *The Shargi Architecture of Jaunpur* (1889).

JAUNTING-CAR, a light two-wheeled carriage for a single horse, in its commonest form with seats for four persons placed back to back, with the foot-boards projecting over the wheels. It is the typical conveyance for persons in Ireland (see Car). The first part of the word is generally taken to be identical with the verb "to jaunt," now only used in the sense of to go on a short pleasure excursion, but in its earliest uses meaning to make a horse caracole or prance, hence to jolt or bump up and down. It would apparently be a variant of "jaunce," of the same meaning, which is supposed to be taken from O. Fr. *jancer*. Skeat takes the origin of jaunt and jaunce to be Scandinavian, and connects them with the Swedish dialect word *ganta*, to romp; and he finds cognate bases in such words as "jump," "high jinks." The word "jaunty," sprightly, especially used of anything done with an easy nonchalant air, is a corruption of "janty," due to confusion with "jaunt." "Janty," often spelt in the 17th and 18th centuries "janté" or "jantee," represents the English pronunciation of Fr. *gentil*, well-bred, neat, spruce.

JAUREGUI, JUAN (1562–1582), a Biscayan by birth, was in 1582 in the service of a Spanish merchant, Gaspar d'Anastro, who was resident at Antwerp. Tempted by the reward of 80,000 ducats offered by Philip II. of Spain for the assassination of William the Silent, prince of Orange, but being himself without courage to undertake the task, d'Anastro, with the help of his cashier Venero, persuaded Jauregui to attempt the murder for the sum of 2877 crowns. On Sunday the 18th of March 1582, as the prince came out of his dining-room Jauregui offered him a petition, and William had no sooner taken it into his hand than Jauregui fired a pistol at his head. The ball pierced the neck below the right ear and passed out at the left jaw-bone; but William ultimately recovered. The assassin was killed on the spot.

JAURÉGUIBERRY, JEAN BERNARD (1815–1887), French admiral, was born at Bayonne on the 26th of August 1815. He entered the navy in 1831, was made a lieutenant in 1845, commander in 1856, and captain in 1860. After serving in the Crimea and in China, and being governor of Senegal, he was promoted to rear-admiral in 1869. He served on land during the second part of the Franco-German War of 1870–71, in the rank of auxiliary general of division. He was present at Coulmiers, Villépion and Loigny-Poupry, in command of a division, and in Chanzy's retreat upon Le Mans and the battle at that place in command of a corps. He was the most distinguished of the many naval officers who did good service in the military operations. On the 9th of December he had been made vice-admiral, and in 1871 he commanded the fleet at Toulon; in 1875 he was a member of the council of admiralty; and in October 1876 he was appointed to command the evolutionary squadron in the Mediterranean. In February 1879 he became minister of the navy in the Waddington cabinet, and on the 27th of May following was elected a senator for life. He was again minister of the navy in the Freycinet cabinet in 1880. A fine example of the fighting French seaman of his time, Jauréguiberry died at Paris on the 21st of October 1887.

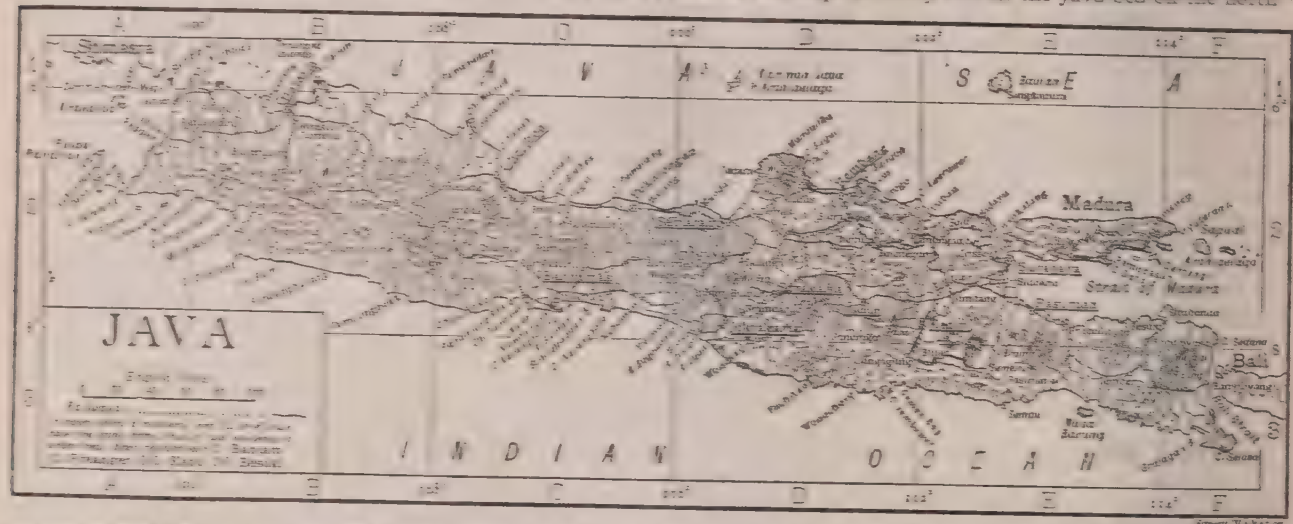
JÁUREGUI Y AGUILAR, JUAN MARTÍNEZ DE (1583–1641), Spanish poet, was baptized at Seville on the 24th of November 1583. In due course he studied at Rome, returning to Spain shortly before 1610 with a double reputation as a painter and a poet. A reference in the preface to the *Novelas exemplares* has been taken to mean that he painted the portrait of Cervantes, who, in the second part of *Don Quixote*, praises the translation of Tasso's *Aminta* published at Rome in 1607. Jáuregui's *Rimas* (1618), a collection of graceful lyrics, is preceded by a controversial preface which attracted much attention on account of its outspoken declaration against *culteranismo*. Through the influence of Olivares, he was appointed groom of the chamber to Philip IV., and gave an elaborate exposition of his artistic doctrines in the *Discurso poético contra el hablar culto y oscuro* (1624), a skilful attack on the new theories, which procured for its author the order of Calatrava. It is plain, however, that the shock of controversy had shaken Jáuregui's convictions, and his poem *Orfeo* (1624) is visibly influenced by Góngora. Jáuregui died at Madrid on the 11th of January 1641, leaving behind him a translation of the *Pharsalia* which was not published till 1684. This rendering reveals Jáuregui as a complete convert to the new school, and it has been argued that, exaggerating the affinities between Lucan and Góngora—both of Cordovan descent—he deliberately translated the thought of the earlier poet into the vocabulary of the later master. This is possible; but it is at least as likely that Jáuregui unconsciously yielded to the current of popular taste, with no other intention than that of conciliating the public of his own day.

JAURÈS, JEAN LÉON (1859–), French Socialist leader, was born at Castres (Tarn) on the 3rd of September 1859. He was educated at the lycée Louis-le-Grand and the école normale supérieure, and took his degree as associate in philosophy in 1881. After teaching philosophy for two years at the lycée of Albi (Tarn), he lectured at the university of Toulouse. He was elected republican deputy for the department of Tarn in 1885. In 1889, after unsuccessfully contesting Castres, he returned to his professional duties at Toulouse, where he took an active interest in municipal affairs, and helped to found the medical faculty of the university. He also prepared two theses for his doctorate in philosophy, *De primis socialismi germanici lineamentis apud Lutherum, Kant, Fichte et Hegel* (1891), and *De la réalité du monde sensible*. In 1902 he gave energetic support to the miners of Carmaux who went out on strike in consequence of the dismissal of a socialist workman, Calvignac; and in the next year he was re-elected to the chamber as deputy for Albi. Although he was defeated at the elections of 1898 and was for four years outside the chamber, his eloquent speeches made him a force in politics as an intellectual champion of socialism. He edited the *Petite République*, and was one of the most energetic defenders of Captain Alfred Dreyfus. He approved of the inclusion of M. Millerand, the socialist, in the Waldeck-Rousseau ministry, though this led to a split with the more revolutionary section led by M. Guesde. In 1902 he was again returned as deputy for Albi, and during the Combes administration his influence secured the coherence of the radical-socialist coalition known as the *bloc*. In 1904 he founded the socialist paper, *L'Humanité*. The French socialist groups held a congress at Rouen in March 1905, which resulted in a new consolidation; the new party, headed by MM. Jaurès and Guesde, ceased to co-operate with the radicals and radical-socialists, and became known as the unified socialists, pledged to advance a collectivist programme. At the general elections of 1906 M. Jaurès was again elected for the Tarn. His ability and vigour were now generally recognized; but the strength of the socialist party, and the practical activity of its leader, still had to reckon with the equally practical and vigorous liberalism of M. Clemenceau. The latter was able to appeal to his countrymen (in a notable speech in the spring of 1906 to rally to a radical programme which had no socialist Utopia in view, and the appearance in him of a strong and practical radical leader had the result of considerably diminishing the effect of the socialist propaganda. M. Jaurès in addition to his daily journalistic activity published *Les preuves (affaire Dreyfus)* (1900); *Action socialiste* (1899); *Études socialistes* (1902), and, with other collaborators, *Histoire socialiste* (1901), &c.

JAVA, one of the larger islands of that portion of the Malay Archipelago which is distinguished as the Sunda Islands. It lies between 105° 12′ 20″ (St Nicholas Point) and 114° 35′ 58″ E. (Cape Sedano) and between 5° 52′ 54″ and 8° 46′ 46″ S. It has a total length of 622 m. from Pepper Bay in the west to Banyuwangi in the east, and an extreme breadth of 121 m. from Cape Bugel in Japara to the coast of Jokjakarta, narrowing towards the middle to about 55 m. Politically and commercially it is important as the seat of the colonial government of the Dutch East Indies, all other parts of the Dutch territory being distinguished as the Outer Possessions (*Buitenbezittingen*). According to the triangulation survey (report published in 1900) the area of Java proper is 47,584 sq. m.; of Madura, the large adjacent and associated island, 1770; and of the smaller islands administratively included with Java and Madura 1200, thus making a total of 50,554 sq. m. The more important of these islands are the following: Pulu Panaitan or Princes Island (*Prinsen-eiland*), 47 sq. m., lies in the Sunda Strait, off the south-western peninsula of the main island, from which it is separated by the Behouden Passage. The Thousand Islands are situated almost due N. of Batavia. Of these five were inhabited in 1900 by about 1080 seafarers from all parts and their descendants. The Karimun Java archipelago, to the north of Samarang, numbers twenty-seven islands with an area of 10 sq. m. and a population of about 800 (having one considerable village on the main island). Bawean[1] (Boyan), 100 m. N. of Surabaya, is a raised volcano with an area of 75 sq. m. and a population of about 30,000. About a third of the men are generally absent as traders or coolies. In Singapore and Sumatra they are known as Boyans. They are devout Mahommedans and many of them make the pilgrimage to Mecca. The Sapudi and Kangean archipelagoes are eastward continuations of Madura. The former, thirteen in all, with an area of 58 sq. m. and 53,000 inhabitants, export cattle, dried fish and trepang; and many of the male population work as day labourers in Java or as lumbermen in Sumbawa, Flores, &c. The main island of the Kangeans has an area of 12 sq. m. (the whole group 25 sq. m.). It is best known for its limestone caves and its buffaloes. Along the south coast the islands are few and small—Klungur or Deli, Tinjil or Tingal, Nusa Kambangan, Sempu and Nusa Barung.

From Sumatra on the W., Java is separated by the Sunda Strait, which at the narrowest is only 14 m. broad, but widens elsewhere to about 50 m. On the E. the strait of Bali, which parts it from the island of that name, is at the northern end not more than 1½ m. across. Through the former strong currents run for the greater part of the day throughout the year outwards from the Java Sea to the Indian Ocean. In the strait of Bali the currents are perhaps even stronger and are extremely irregular. Pilots with local knowledge are absolutely necessary for vessels attempting either passage. In spite of the strength of the currents the Sunda Strait is steadily being diminished in width, and the process if continued must result in a restoration of that junction of Sumatra and Java which according to some authorities formerly existed.[1]

In general terms Java may be described as one of the breakwater islands of the Indian Ocean—part of the mountainous rim (continuous more or less completely with Sumatra) of the partially submerged plateau which lies between the ocean on the S. and the Chinese Sea on the N., and has the massive island of Borneo as its chief subaerial portion. While the waves and currents of the ocean sweep away most of the products of denudation along the south coast or throw a small percentage back in the shape of sandy downs, the Java Sea on the north—not more than 50 fathoms deep—allows them to settle and to form sometimes with extraordinary rapidity broad alluvial tracts.[2]



Emery Walker sc.

It is customary and obvious to divide Java into three divisions, the middle part of the island narrowing into a kind of isthmus, and each of the divisions thus indicated having certain structural characteristics of its own. West Java, which consists of Bantam, Krawang and the Preanger Regencies, has an area of upwards of 16,000 sq. m. In this division the highlands lie for the most part in a compact mass to the south and the lowlands form a continuous tract on the north. The main portion of the uplands consists of the Preanger Mountains, with the plateaus of Bandong, Pekalongan, Tegal, Badong and Garut encircled with volcanic summits. On the borders of the Preanger, Batavia and Bantam are the Halimun Mountains (the Blue Mountains of the older travellers), reaching their greatest altitudes in the volcanic summits of Gedeh and Salak. To the west lie the highlands of Bantam, which extending northward cut off the northern lowlands from the Sunda Strait. Middle Java is the smallest of the three divisions, having an area of not much more than 13,000 sq. m. It comprises Tegal, Pekalongan, Banyumas, Bagelen, Kedu, Jokjakarta, Surakarta, and thus not only takes in the whole of the isthmus but encroaches on the broad eastern portion of the island. In the isthmus mountains are not so closely massed in the south nor the plains so continuous on the north. The watershed culminating in Slamet lies almost midway between the ocean and the Java Sea, and there are somewhat extensive lowlands in the south. In that part of middle Java which physically belongs to eastern Java there is a remarkable series of lowlands stretching almost right across the island from Semarang in the north to Jokjakarta in the south. Eastern Java comprises Rembang, Madiun, Kediri, Surabaya, Pasuruan and Besuki, and has an area of about 17,500 sq. m. In this division lowlands and highlands are intermingled in endless variety except along the south coast, where the watershed-range forms a continuous breakwater from Jokjakarta to Besuki. The volcanic eminences, instead of rising in lines or groups, are isolated.

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[1] It must be observed that Bawean, &c., are mere conventional appendages to Java.

[1] H. B. Guppy (*R. S. G. Soc. Magazine*, 1889) holds that there is no sufficient proof of this connexion, but gives interesting details of the present movements.

[2] See G. F. Tydeman's map of the depths of the sea in the eastern part of the Indian archipelago in M. Weber's *Siboga Expedition*, 1903. The details of the coast forms of the island have been studied by J. F. Snelleman and J. F. Niermeyer in a paper in the Veth *Feestbundel*, utilizing *inter alia* Guppy's observations.

For its area Java is one of the most distinctly volcanic regions of the world. Volcanic forces made it, and volcanic forces have continued to devastate and fertilize it. According to R. D. M. Verbeek about 125 volcanic centres can be distinguished, a number which may be increased or diminished by different methods of classification. It is usual to arrange the volcanoes in the following groups: westernmost Java 11 (all extinct); Preanger 50 (5 active); Cheribon 2 (both extinct); Slamet 2 (1 active); middle Java 16 (2 active); Murio 2 (both extinct); Lavu 2 (extinct); Wilis 2 (extinct); east Java 21 (5 active). The active volcanoes of the present time are Gedeh, Tangkuban, Prahu, Gutar, Papandayan, Galung-gung, Slamet, Sendor, Merapi,[1] Kalut (or Klut), Bromo, Semeru, Lamongan, Raung, but the activity of many of these is trifling, consisting of slight ejections of steam and scoriae.

The plains differ in surface and fertility, according to their geological formation. Built up of alluvium and diluvium, the plains of the north coast-lands in western and middle Java are at their lowest levels, near the mouths of rivers and the sea, in many cases marshy and abounding in lakes and coral remains, but for the rest they are fertile and available for culture. The plains, too, along the south coast of middle Java—of Banyumas and Bagelen—contain many morasses as well as sandy stretches and dunes impeding the outlet of the rivers. They are, nevertheless, available for the cultivation more particularly of rice, and are thickly peopled. In eastern Java, again, the narrow coast plains are to be distinguished from the wider plains lying between the parallel chains of limestone and between the volcanoes. The narrow plains of the north coast are constituted of yellow clay and tuffs containing chalk, washed down by the rivers from the mountain chains and volcanoes. Like the western plains, they, too, are in many cases low and marshy, and fringed with sand and dunes. The plains, on the other hand, at some distance from the sea, or lying in the interior of eastern Java, such as Surakarta, Madiun, Kediri, Pasuruan, Probolinggo and Besuki, owe their formation to the volcanoes at whose bases they lie, occupying levels as high as 1640 ft. down to 328 ft. above the sea, whence they decline to the lower plains of the coast. Lastly, the plains of Lusi, Solo and Brantas, lying between the parallel chains in Japara, Rembang and Surabaya, are in part the product of rivers formerly flowing at a higher level of 30 to 60 or 70 ft., in part the product of the sea, dating from a time when the northern part of the above-named residencies was an island, such as Madura, the mountains of which are the continuation of the north parallel chain, is still.

The considerable rivers of western Java all have their outlets on the north coast, the chief among them being the Chi (Dutch *Tji*) Tarum and the Chi Manuk. They are navigable for native boats and rafts, and are used for the transport of coffee and salt. On the south coast the Chi Tanduwi, on the east of the Preanger, is the only stream available as a waterway, and this only for a few miles above its mouth. In middle Java, also, the rivers discharging at the north coast—the Pamali, Chomal, &c.—are serviceable for the purposes of irrigation and cultivation, but are navigable only near their mouths. The rivers of the south coast—Progo, Serayu, Bogowonto, and Upak, enriched by rills from the volcanoes—serve abundantly to irrigate the plains of Bagelen, Banyumas, &c. Their stony beds, shallows and rapids, and the condition of their mouths lessen, however, their value as waterways. More navigable are the larger rivers of eastern Java. The Solo is navigable for large praus, or native boats, as far up as Surakarta, and above that town for lighter boats, as is also its affluent the Gentung. The canal constructed in 1893 at the lower part of this river, and alterations effected at its mouth, have proved of important service both in irrigating the plain and facilitating the river's outlet into the sea. The Brantas is also navigable in several parts. The smaller rivers of eastern Java are, however, much in the condition of those of western Java. They serve less as waterways than as reservoirs for the irrigation of the fertile plains through which they flow.

The north coast of Java presents everywhere a low strand covered with nipa or mangrove, morasses and fishponds, sandy stretches and low dunes, shifting river-mouths and coast-lines, ports and roads, demanding continual attention and regulation. The south coast is of a different make. The dunes of Banyumas, Bagelen, and Jokjakarta, ranged in three ridges, rising to 50 ft. high, and varying in breadth from 300 to over 1600 ft., liable, moreover, to transformation from tides and the east monsoon, oppose everywhere, also in Preanger and Besuki, a barrier to the discharge of the rivers and the drainage of the coast-lands. They assist the formation of lagoons and morasses. At intervals in the dune coast, running in the direction of the limestone mountains, there tower up steep inaccessible masses of land, showing neither ports nor bays, hollowed out by the sea, rising in perpendicular walls to a height of 160 ft. above sea-level. Sometimes two branches project at right angles from the chain on to the coast, forming a low bay between the capes or ends of the projecting branches, from 1000 to 1600 ft. high. Such a formation occurs frequently along the coast of Besuki, presenting a very irregular coast-line. Of course the north coast is of much greater commercial importance than the south coast.

Geology.—With the exception of a few small patches of schist, supposed to be Cretaceous, the whole island, so far as is known, is covered by deposits of Tertiary and Quaternary age. The ancient "schist formation," which occurs in Sumatra, Borneo, &c., does not rise to the surface anywhere in Java itself, but it is visible in the island of Karimon Java off the north coast. The Cretaceous schists have yielded fossils only at Banjarnegara, where a limestone with Orbitolina is interstratified with them. They are succeeded unconformably by Eocene deposits, consisting of sandstones with coal-seams and limestones containing Nummulites, Alveolina and Orthophragmina; and these beds are as limited in extent as the Cretaceous schists themselves. Sedimentary deposits of Upper Tertiary age are widely spread, covering about 38% of the surface. They consist of breccias, marls and limestones containing numerous fossils, and are for the most part Miocene but probably include a part of the Pliocene also. They were laid down beneath the sea, but have since been folded and elevated to considerable heights. Fluviatile deposits of late Pliocene age have been found in the east of Java, and it was in these that the remarkable anthropoid ape or ape-like man, *Pithecanthropus erectus* of Dubois, was discovered. The Quaternary deposits lie horizontally upon the upturned edges of the Tertiary beds. They are partly marine and partly fluviatile, the marine deposits reaching to a height of some 350 ft. above the sea and thus indicating a considerable elevation of the island in recent times.

The volcanic rocks of Java are of great importance and cover about 28% of the island. The eruptions began in the middle of the Tertiary period, but did not attain their maximum until Quaternary times, and many of the volcanoes are still active. Most of the cones seem to lie along faults parallel to the axis of the island, or on short cross fractures. The lavas and ashes are almost everywhere andesites and basalts, with a little obsidian. Some of the volcanoes, however, have erupted leucite rocks. Similar rocks, together with phonolite, occur in the island of Bavian.[2]

Climate.—Our knowledge of the climate of Batavia, and thus of that of the lowlands of western Java, is almost perfect; but, rainfall excepted, our information as to the climate of Java as a whole is extremely defective. The dominant meteorological facts are simple and obvious: Java lies in the tropics, under an almost vertical sun, and thus has a day of almost uniform length throughout the year.[3] It is also within the perpetual influence of the great atmospheric movements passing between Asia and Australia; and is affected by the neighbourhood of vast expanses of sea and land (Borneo and Sumatra). There are no such maxima of temperature as are recorded from the continents. The highest known at Batavia was 96° F. in 1877 and the lowest 66° in the same year. The mean annual temperature is 79°. The warmest months are May and October, registering 79·5° and 79·46° respectively; the coldest January and February with 77·63° and 77·7° respectively. The daily range is much greater; at one o'clock the thermometer has a mean height of 84°; after two o'clock it declines to about 73° at six o'clock; the greatest daily amplitude is in August and the least in January and February. Eastern Java and the inland plains of middle Java are said to be hotter, but scientific data are few. A very slight degree of elevation above the seaboard plains produces a remarkable difference in the climate, not so much in its mere temperature as in its influence on health. The dwellers in the coast towns are surprised at the invigorating effects of a change to health resorts from 300 to 1200 ft. above sea-level; and at greater elevations it may be uncomfortably cold at night, with chilly mists and occasional frosts. The year is divided into two seasons by the prevailing winds: the rainy season, that of the west monsoon, lasting from November to March, and the dry season, that of the east monsoon, during the rest of the year; the transition from one monsoon to another—the "canting" of the monsoons—being marked by irregularities. On the whole, the east monsoon blows steadily for a longer period than the west. The velocity of the wind is much less than in Europe—not more in the annual mean at Batavia than 3 ft. per second, against 12 to 18 ft. in Europe. The highest velocity ever observed at Batavia was 25 ft. Wind-storms are rare and hardly ever cyclonic. There are as a matter of course a large number of purely local winds, some of them of a very peculiar kind, but few of these have been scientifically dealt with. Thunder-storms are extremely frequent; but the loss of life from lightning is probably diminished by the fact that the palm-trees are excellent conductors. At night the air is almost invariably still. The average rainfall at Batavia is 72·28 in. per annum, of which 51·49 in. are contributed by the west monsoon. The amount varies considerably from year to year: in 1889, 1891 and 1897 there were about 47·24 in.; in 1868 and 1877 nearly 51·17, and in 1872 and 1882 no less than 94·8. There are no long tracts of unbroken rainfall and no long periods of continuous drought. The rainfall is heaviest in January, but it rains only for about one-seventh of the time. Next in order come February, March and December. August, the driest month, has from three to five days of rain, though the amount is usually less than an inch and not more than one and a half inches. The popular description of the rain falling not in drops but streams was proved erroneous by J. Wiesner's careful observations (see *Kais. Akad. d. Wiss. Math. Naturw. Cl.* Bd. xiv., Vienna, 1895), which have been confirmed by A. Woeikof ("Regensintensität und Regendauer in Batavia" in *Z. für Met.*, 1907). The greatest rainfall recorded in an hour (4·5 in.) is enormously exceeded by records even in Europe. From observations taken for the meteorological authorities at a very considerable number of stations, J. H. Boeseken constructed a map in 1900 (*Tijdschr. v. h. Kon. Ned. Aardr. Gen.*, 1900; reproduced in Veth, *Java*, iii. 1903). Among the outstanding facts are the following. The south coasts of both eastern and middle Java have a much heavier rainfall than the north. Majalenka has an annual fall of 175 in. In western Java the maximal district consists of a great ring of mountains from Salak and Gedeh in the west to Galunggung in the east, while the enclosed plateau-region of Chanjur Bandung and Garut are not much different from the sea-board. The whole of middle Java, with the exception of the north coast, has a heavy rainfall. At Chilachap the annual rainfall is 151·43 in., 87·8 in. of which is brought by the south-east monsoon. The great belt which includes the Slamet and the Dieng, and the country on the south coast between Chilachap and Parigi, are maximal. In comparison the whole of eastern Java, with the exception of the mountains from Wilis eastward to Ijen, has a low record which reaches its lowest along the north coast.[1]

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[1] This Merapi must be carefully distinguished from Merapi the Fire Mountain of Sumatra.

[2] R. D. M. Verbeek and R. Fennema, *Description géologique de Java et Madoura* (2 vols. and atlas, Amsterdam, 1896; also published in Dutch)—a summary with map was published by Verbeek in *Peterm. Mitt.* xliv. (1898), 24–33, pl. 3. Also K. Martin, *Die Eintheilung der versteinerungsführenden Sedimente von Java*, Samml. Geol. Reichsmus. Leiden, ser. i., vol. vi. (1899–1902), 135–245.

[3] On the 16th of November the sun rises at 5.32 and sets at 5.57; on the 16th of July it rises at 6.12 and sets at 5.57. The longest day is in December and the shortest in June, while on the other hand the sun is highest in February and October and lowest in June and December.

Fauna.—In respect of its fauna Java differs from Borneo, Sumatra and the Malay Peninsula far more than these differ among themselves; and, at the same time, it shows a close resemblance to the Malay Peninsula, on the one hand, and to the Himalayas on the other. Of the 176 mammals of the whole Indo-Malayan region the greater number occur in Java. Of these 41 are found on the continent of Asia, 8 are common to Java and Borneo, and 6 are common to Java and Sumatra (see M. Weber, *Das Indo-Malay Archipelago und die Geschichte seiner Thierwelt*, Jena, 1902). No genus and only a few species are confined to the island. Of the land-birds only a small proportion are peculiar. The elephant, the tapir, the bear, and various other genera found in the rest of the region are altogether absent. The Javanese rhinoceros (*Rhinoceros sundaicus*; *sarak* in Javanese, *badak* in Sundanese), the largest of the mammals on the island, differs from that of Sumatra in having one horn instead of two. It ranges over the highest mountains, and its regular paths, worn into deep channels, may be traced up the steepest slopes and round the rims of even active volcanoes. Two species of wild swine, *Sus vittatus* and *Sus verrucosus*, are exceedingly abundant, the former in the hot, the latter in the temperate, region; and their depredations are the cause of much loss to the natives, who, however, being Mahommedans, to whom pork is abhorrent, do not hunt them for the sake of their flesh. Not much less than the rhinoceros is the banteng (*Bibos banteng* or *sundaicus*) found in all the uninhabited districts between 2000 and 7000 ft. of elevation. The kidang or muntjak (*Cervulus muntjac*) and the rusa or russa (*Rusa hippelaphus* or *Russa russa*) are the representatives of the deer kind. The former is a delicate little creature occurring singly or in pairs both in the mountains and in the coast districts; the latter lives in herds of fifty to a hundred in the grassy opens, giving excellent sport to the native hunters. Another species (*Russa kuhlii*) exists in Bavian. The kantjil (*Tragulus javanicus*) is a small creature allied to the musk-deer but forming a genus by itself. It lives in the high woods, for the most part singly, seldom in pairs. It is one of the most peculiar of the Javanese mammals. The royal tiger, the same species as that of India, is still common enough to make a tiger-hunt a characteristic Javanese scene. The leopard (*Felis pardus*) is frequent in the warm regions and often ascends to considerable altitudes. Black specimens occasionally occur, but the spots are visible on inspection; and the fact that in the Amsterdam zoological gardens a black leopard had one of its cubs black and the other normally spotted shows that this is only a case of melanism. In the tree-tops the birds find a dangerous enemy in the matjan rembak, or wild cat (*Felis minuta*), about the size of a common cat. The dog tribe is represented by the fox-like adjag (*Cuon* or *Canis sutilans*) which hunts in ferocious packs; and by a wild dog, *Canis tenggeranus*, if this is not now exterminated. The Cheiroptera hold a prominent place in the fauna, the principal genera being *Pteropus*, *Cynonycteris*, *Cynopterus* and *Macroglossus*. Remarkable especially for size is the kalong, or flying fox, *Pteropus edulis*, a fruit-eating bat, which may be seen hanging during the day in black clusters asleep on the trees, and in the evening hastening in long lines to the favourite feeding grounds in the forest. The damage these do to the young coco-nut trees, the maize and the sugar-palms leads the natives to snare and shoot them; and their flesh is a favourite food with Europeans, who prefer to shoot them by night as, if shot by day, they often cling after death to the branches. Smaller kinds of bats are most abundant, perhaps the commonest being *Scotophilus Temminckii*. In certain places they congregate in myriads, like sea-fowl on the cliffs, and their excrement produces extensive guano deposits utilized by the people of Surakarta and Madiun. The creature known to the Europeans as the flying-cat and to the natives as the kubin is the *Galeopithecus volans* or *variagatus*—a sort of transition from the bats to the lemuroids. Of these last Java has several species held in awe by the natives for their supposed power of fascination. The apes are represented by the wou-wou (*Hylobates leuciscus*), the lutung, and kowi (*Semnopithecus maurus* and *pyrrhus*), the surili (*Semnopithecus mitratus*), and the munyuk (*Cercocebus*, or *Macacus*, *cynamolgos*), the most generally distributed of all. From sunrise to sunset the wou-wou makes its presence known, especially in the second zone where it congregates in the trees, by its strange cry, at times harsh and cacophonous, at times weird and pathetic. The lutung or black ape also prefers the temperate region, though it is met with as high as 7000 ft. above the sea and as low as 2000. The *Cercocebus* or grey ape keeps for the most part to the warm coast lands. Rats (including the brown Norway rat, often called *Mus javanicus*, as if it were a native; a great plague); mice in great variety; porcupines (*Acanthion javanicum*); squirrels (five species) and flying squirrels (four species) represent the rodents. A hare, *Lepus nigricollis*, originally from Ceylon, has a very limited habitat; the Insectivora comprise a shrew-mouse (*Rachyura indica*), two species of tupaya and *Hylomys suillus* peculiar to Java and Sumatra. The nearest relation to the bears is *Arctictis binturong*. *Mydaus meliceps* and *Helictis orientalis* represent the badgers. In the upper part of the mountains occurs *Mustela Henrici*, and an otter (*Aonyx leptonyx*) in the streams of the hot zone. The coffee rat (*Paradoxurus hermaphroditus*), a civet cat (*Viverricula indica*), the Javanese ichneumon (*Herpestes javanicus*), and *Priodon gracilis* may also be mentioned.

In 1820, 176 species of birds were known in Java; by 1900 Vorderman and O. Finsch knew 410. Many of these are, of course, rare and occupy a limited habitat far from the haunts of man. Others exist in myriads and are characteristic features in the landscape. Water-fowl of many kinds, ducks, geese, storks, pelicans, &c., give life to sea-shore and lake, river and marsh. Snipe-shooting is a favourtie sport. Common night-birds are the owl (*Strix flammea*) and the goatsucker (*Caprimulgus affinis*). Three species of hornbill, the year-bird of the older travellers (*Buceros plicatus*, *lunatus* and *albirostris*) live in the tall trees of the forest zone. The Javanese peacock is a distinct species (*Pavo muticus* or *spiciferus*), and even exceeds the well-known Indian species in the splendour of its plumage. *Gallus Bankiva* is famous as the reputed parent of all barndoor fowls; *Gallus furcatus* is an exquisitely beautiful bird and can be trained for cock-fighting. Of parrots two species only are known: *Palaeornis Alexandri* or *javanicus* and the pretty little grass-green *Curyllis pusilla*, peculiar to Java. As talkers and mimics they are beaten by the *Gracula javanensis*, a favourite cage-bird with the natives. A cuckoo, *Chrysococcyx basalis*, may be heard in the second zone. The grass-fields are the foraging-grounds of swarms of weaver-birds (*Plocula javanensis* and *Ploccus baya*). They lay nearly as heavy a toll on the rice-fields as the gelatiks (*Munia oryzivora*), which are everywhere the rice-growers' principal foe. Hawks and falcons make both an easy prey. The *Nictuarinas* or honey-birds (eight species) take the place of the humming-bird, which they rival in beauty and diminutiveness, ranging from the lowlands to an altitude of 4000 ft. In the upper regions the birds, like the plants, are more like those of Europe, and some of them—notably the kanchilan (*Hyloterpe Philomela*)—are remarkable for their song. The edible-nest swallow (*Collocalia fuciphaga*) builds in caves in many parts of the island.[2]

As far back as 1859 P. Bleeker credited Java with eleven hundred species of fish; and naturalists are perpetually adding to the number.[3] In splendour and grotesqueness of colouring many kinds, as is well known, look rather like birds than fish. In the neighbourhood of Batavia about three hundred and eighty species are used as food by the natives and the Chinese, who have added to the number by the introduction of the goldfish, which reaches a great size. The sea fish most prized by Europeans is *Lates calcarifer* (a perch). Of more than one hundred species of snakes about twenty-four species

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[1] S. Figei. *Regenwaarnemingen in Nederlandsch Indië* (1902).

[2] See J. C. Konigsberger, "De vogels Java en hunne oeconomische betukenis," *Med. int. s. Lands Plantentuin.*

[3] See especially M. Weber, *Siboga Expedition.*

(including the cobra di capella) are poisonous and these are responsible for the deaths of between one hundred and two hundred persons per annum. Adders and lizards are abundant. Geckos are familiar visitants in the houses of the natives. There are two species of crocodiles.

As in other tropical-rain forest lands the variety and abundance of insects are amazing. At sundown the air becomes resonant for hours with their myriad voices. The *Coleoptera* and the *Lepidoptera* form the glory of all great collections for their size and magnificence. Of butterflies proper five hundred species are known. Of the beetles one of the largest and handsomest is *Chalcosoma atlas.* Among the spiders (a numerously represented order) the most notable is a bird-killing species, *Selene scomia javanensis.* In many parts the island is plagued with ants, termites and mosquitoes. Crops of all kinds are subject to disastrous attacks of creeping and winged foes—many still unidentified (see especially Snellen van Hollenhoven, *Essai d'une faune entomologique de l'Archipel Indo-néerlandais*). Of still lower forms of life the profusion is no less perplexing. Among the worms the *Perichaeta musica* reaches a length of about twenty inches and produces musical sounds. The shell of the *Tridacna gigas* is the largest anywhere known.

Flora.—For the botanist Java is a natural paradise, affording him the means of studying the effects of moisture and heat, of air-currents and altitudes, without the interference of superincumbent arctic conditions. The botanic gardens of Buitenzorg have long been famous for their wealth of material, the ability with which their treasures have been accumulated and displayed, their value in connexion with the economic development of the island and the extensive scientific literature published by their directors.[1] There is a special establishment at Chibodas open to students of all nations for the investigation on the spot of the conditions of the primeval forest. Hardly any similar area in the world has a flora of richer variety than Java. It is estimated that the total number of the species of plants is about 5000; but this is probably under the mark (De Candolle knew of 2605 phanerogamous species), and new genera and species of an unexpected character are from time to time discovered. The lower parts of the island are always in the height of summer. The villages and even the smaller towns are in great measure concealed by the abundant and abiding verdure; and their position in the landscape is to be recognized mainly by their groves, orchards and cultivated fields. The amount and distribution of heat and moisture at the various seasons of the year form the dominant factors in determining the character of the vegetation. Thus trees which are evergreen in west Java are deciduous in the east of the island, some dropping their leaves (*e.g. Tetrameles nudiflora*) at the very time they are in bloom or ripening their fruit. This and other contrasts are graphically described from personal observation by A. F. W. Schimper in his *Pflanzen-Geographie auf physiologischer Grundlage* (Jena, 1898). The abundance of epiphytes, orchids, pitcher-plants, mosses and fungi is a striking result of the prevalent humidity; and many trees and plants indeed, which in drier climates root in the soil, derive sufficient moisture from their stronger neighbours. Of orchids J. J. Smith records 562 species (100 genera), but the flowers of all except about a score are inconspicuous. This last fact is the more remarkable because, taken generally, the Javanese vegetation differs from that of many other tropical countries by being abundantly and often gorgeously floriferous. Many of the loftiest trees crown themselves with blossoms and require no assistance from the climbing plants that seek, as it were, to rival them in their display of colour. Shrubs, too, and herbaceous plants often give brilliant effects in the savannahs, the deserted clearings, the edges of the forest and the sides of the highways. The *lantana*, a verbenaceous alien introduced, it is said, from Jamaica by Lady Raffles, has made itself aggressively conspicuous in many parts of the island, more especially in the Preanger and middle Java, where it occupies areas of hundreds of acres.

The effect of mere altitude in the distribution of the flora was long ago emphasized by Friedrich Junghuhn, the Humboldt of Java, who divided the island into four vertical botanical zones—a division which has generally been accepted by his successors, though, like all such divisions, it is subject to many modifications and exceptions. The forest, or hot zone, extends to a height of 2000 ft. above the sea; the second, that of moderate heat, has its upper limit at about 4500; the third, or cool, zone reaches 7500; and the fourth, or coldest, comprises all that lies beyond. The lowest zone has, of course, the most extensive area; the second is only a fiftieth and the third a five-thousandth of the first; and the fourth is an insignificant remainder. The lowest is the region of the true tropical forest, of rice-fields and sugar-plantations, of coconut palms, cotton, sesamum, cinnamon and tobacco (though this last has a wide altitudinal range). Many parts of the coast (especially on the north) are fringed with mangrove (*Rhizophora mucronata*), &c., and species of *Bruguiera*; the downs have their characteristic flora—convolvulus and *Spinifex squarrosus* catching the eye for very different reasons. Farther inland along the seaboard appear the nipa dwarf palm (*Nipa fruticans*), the *Alsbonia scholaris* (the wood of which is lighter than cork), Cycadacea, tree-ferns, screw pines (*Pandanus*), &c. In west Java the gebang palm (*Corypha gebanga*) grows in clumps and belts not far from but never quite close to the coast; and in east Java a similar position is occupied by the lontar (*Borassus flabelliformis*), valuable for its timber, its sago and its sugar, and in former times for its leaves, which were used as a writing-material. The fresh-water lakes and ponds of this region are richly covered with Utricularia and various kinds of lotus (*Nymphaea lotus, N. stellata, Nelumbium speciosum,* &c.) interspersed with *Pista stratiotes* and other floating plants. Vast prairies are covered with the silvery alang-alang grass broken by bamboo thickets, clusters of trees and shrubs (*Butea frondosa, Emblica officinalis,* &c.) and islands of the taller erigedeh or glagah (*Saccharum spontaneum*). Alang-alang (*Imperata arundinacea*, Cyr. var. Bentham) grows from 1 to 4 ft. in height. It springs up wherever the ground is cleared of trees and is a perfect plague to the cultivator. It cannot hold its own, however, with the ananas, the kratok (*Phaseolus lunatus*) or the lantana; and, in the natural progress of events, the forest resumes its sway except where the natives encourage the young growth of the grass by annually setting the prairies on fire. The true forest, which occupies a great part of this region, changes its character as we proceed from west to east. In west Java it is a dense rain-forest in which the struggle of existence is maintained at high pressure by a host of lofty trees and parasitic plants in bewildering profusion. The preponderance of certain types is remarkable. Thus of the Moraceae there are in Java (and mostly here) seven genera with ninety-five species, eighty-three of which are *Ficus* (see S. H. Koorders and T. Valeton. "Boomsoorten op Java" in *Bijdr. Mede. Dep. Landbower* (1906). These include the so-called waringin, several kinds of figs planted as shade-trees in the parks of the nobles and officials. The Magnoliaceae and Anonaceae are both numerously represented. In middle Java the variety of trees is less, a large area being occupied by teak. In eastern Java the character of the forest is mainly determined by the abundance of the Casuarina or Chimoro (*C. montana* and *C. Junghuhniana*). Another species, *C. equisetifolia*, is planted in west Java as an ornamental tree. These trees are not crowded together and encumbered with the heavy parasitic growths of the rain-forest; but their tall stems are often covered with multitudes of small vermilion fungi. Wherever the local climate has sufficient humidity, the true rain-forest claims its own. The second of Junghuhn's zones is the region of, more especially, tea, cinchona and coffee plantations, of maize and the sugar palm (areng). In the forest the trees are richly clad with ferns and enormous fungi; there is a profusion of underwood (*Pavetta macrophylla Javanica* and *salicifolia*; several species of *Lasianthus, Boehmarias, Strobilanthus,* &c.), of woody lianas and ratans, of tree ferns (especially *Alsophila*). Between the bushes the ground is covered with ferns, lycopods, tradescantias, Bignoniaceae, species of *Aeschynanthus.* Of the lianas the largest is *Plectocomia elongata*; one specimen of which was found to have a length of nearly 790 ft. One of the fungi, *Telephora princeps*, is more than a yard in diameter. The trees are of different species from those of the hot zone even when belonging to the same genus; and new types appear mostly in limited areas. The third zone, which consists mainly of the upper slopes of volcanic mountains, but also comprises several plateaus (the Dieng, parts of the Tengger, the Ijen) is a region of clouds and mists. There are a considerable number of lakes and swamps in several parts of the region, and these have a luxuriant environment of grasses, Cyperaceae, Characeae and similar forms. The taller trees of the region—oaks, chestnuts, various Lauraceae, and four or five species of *Podocarpus*—with some striking exceptions, *Astronia spectabilis,* &c., are less floriferous than those of the lower zones; but the shrubs (*Rhododendron javanicum, Ardisia javanica,* &c.), herbs and parasites more than make up for this defect. There is little cultivation, except in the Tengger, where the natives grow maize, rye and tobacco, and various European vegetables (cabbage, potatoes, &c.), with which they supply the lowland markets. In western Java one of the most striking features of the upper parts of this temperate region is what Schimper calls the "absolute dominion of mosses," associated with the "elfin forest," as he quaintly calls it, a perfect tangle of "low, thick, oblique or even horizontal stems," almost choked to leaflessness by their grey and ghostly burden. Much of the lower vegetation begins to have a European aspect; violets, primulas, thalictrums, ranunculus, vacciniums, equisetums, rhododendrons (*Rhod. retusum*). The *Primula imperialis*, found only on the Pangerango, is a handsome species, prized by specialists. In the fourth or alpine zone occur such distinctly European forms as *Artemisia vulgaris, Plantago major, Solanum nigrum, Stellaria media*; and altogether the alpine flora contains representatives of no fewer than thirty-three families. A characteristic shrub is *Anaphalis javanica*, popularly called the Javanese edelweiss, which "often entirely excludes all other woody plants."[2] The tallest and noblest of all the trees in the island is the rasamala or liquid-ambar (*Altingia excelsa*), which, rising with a straight clean trunk, sometimes 6 ft. in diameter at the base, to a height of 100 to 130 ft., spreads out into a magnificent crown of branches and foliage. When by chance a climbing plant has joined partnership with it, the combination of blossoms at the top is one of the finest colour effects of the forest. The rasamala, however, occurs only in the Preanger and in the neighbouring parts of Bantam and Buitenzorg. Of the other trees that may be classified as timber—from 300 to 400 species—many attain noble proportions. It is sufficient to mention *Calophyllum inophyllum*, which forms fine woods in the south of Bantam, *Mimusops acuminata*, *Irna glabra*, *Dalbergia latifolia* (sun wood, English black-wood) in middle and east Java; the rare but splendid *Pithecolobium Junghuhnianum*; *Schima Noronhae*, *Bischofia javanica*, *Pterospermum javanicum* (greatly prized for ship-building), and the upas-tree. From the economic point of view all these hundreds of trees are of less importance than *Tectona grandis*, the jati or teak, which, almost to the exclusion of all others, occupies about a third of the government forest-lands. It grows best in middle and eastern Java, preferring the comparatively dry and hot climate of the plains and lower hills to a height of about 2000 ft. above the sea, and thriving best in more or less calciferous soils. In June it sheds its leaves and begins to bud again in October. Full-grown trees reach a height of 100 to 150 ft. In 1895 teak (with a very limited quantity of other timber) was felled to the value of about £101,800, and in 1904 the corresponding figure was about £119,935.

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[1] The *Annales de Buitenzorg*, with their *Icones bogorienses*, are universally known; the *Teysmannia* is named after a former director. A history of the gardens was published by Dr Treub, *Festboek van's Lands Plantentuin* (1891).

[2] Bertha Hoola van Nooten published *Fleurs, fruits et feuillages de la flore et de la pomone de l'île de Java* in 1863, but the book is difficult of access. Excellent views of characteristic aspects of the vegetation will be found in Karsten and Schenck, *Vegetationsbilder* (1903).

That an island which has for so long maintained a dense and growing population in its more cultivable regions should have such extensive tracts of primeval or quasi-primeval forest as have been above indicated would be matter of surprise to one who did not consider the simplicity of the life of the Javanese. They require but little fuel; and both their dwellings and their furniture are mostly constructed of bamboo supplemented with a palm or two. They destroy the forest mainly to get room for their rice-fields and pasture for their cattle. In doing this, however, they are often extremely reckless and wasteful; and if it had not been for the unusual humidity of the climate their annual fires would have resulted in widespread conflagrations. As it is, many mountains are now bare which within historic times were forested to the top; but the Dutch government has proved fully alive to the danger of denudation. The state has control of all the woods and forests of the island with the exception of those of the Preanger, the "particular lands," and Madura; and it has long been engaged in replanting with native trees and experimenting with aliens from other parts of the world—*Eucalyptus globulus*, the juar, *Cassia florida* from Sumatra, the surian (*Cedrela febrifuga*), &c. The greatest success has been with cinchona.

Left to itself Java would soon clothe itself again with even a richer natural vegetation than it had when it was first occupied by man. The open space left by the demolition of the fortifications on Nusa Kambangan was in twenty-eight years densely covered by thousands of shrubs and trees of about twenty varieties, many of the latter 80 ft. high. Resident Snijthoff succeeded about the close of the 19th century in re-afforesting a large part of Mount Muriå by the simple expedient of protecting the territory he had to deal with from all encroachments by natives.[1]

Population.—The population of Java (including Madura, &c.) was 30,098,008 in 1905. In 1900 it was 28,746,688; in 1890, 23,912,564; and in 1880, 19,794,505. The natives consist of the Javanese proper, the Sundanese and the Madurese. All three belong to the Malay stock. Between Javanese and Sundanese the distinction is mainly due to the influence of the Hindus on the former and the absence of this on the latter. Between Javanese and Madurese the distinction is rather to be ascribed to difference of natural environment. The Sundanese have best retained the Malay type, both in physique and fashion of life. They occupy the west of the island. The Madurese area, besides the island of Madura and neighbouring isles, includes the eastern part of Java itself. The residencies of Tegal, Pekalongan, Banyumas, Bagelen, Kedu, Semarang, Japara, Surakarta, Jokjakarta, Rembang, Madiun, Kediri and Surabaya have an almost purely Javanese population. The Javanese are the most numerous and civilized of the three peoples.

The colour of the skin in all three cases presents various shades of yellowish-brown; and it is observed that, owing perhaps to the Hindu strain, the Javanese are generally darker than the Sundanese. The eyes are always brown or black, the hair of the head black, long, lank and coarse. Neither breast nor limbs are provided with hair, and there is hardly even the suggestion of a beard. In stature the Sundanese is less than the Javanese proper, being little over 5 ft. in average height, whereas the Javanese is nearly 5½ ft.; at the same time the Sundanese is more stoutly built. The Madurese is as tall as the Javanese, and as stout as the Sundanese. The eye is usually set straight in the head in the Javanese and Madurese; among the Sundanese it is often oblique. The nose is generally flat and small, with wide nostrils, although among the Javanese it not infrequently becomes aquiline. The lips are thick, yet well formed; the teeth are naturally white, but often filed and stained. The cheek-bones are well developed, more particularly with the Madurese. In expressiveness of countenance the Javanese and Madurese are far in advance of the Sundanese. The women are not so well made as the men, and among the lower classes especially soon grow absolutely ugly. In the eyes of the Javanese a golden yellow complexion is the perfection of female beauty. To judge by their early history, the Javanese must have been a warlike and vigorous people, but now they are peaceable, docile, sober, simple and industrious.

One million only out of the twenty-six millions of natives are concentrated in towns, a fact readily explained by their sources of livelihood. The great bulk of the population is distributed over the country in villages usually called by Europeans dessas, from the Low Javanese word *dêså* (High Javanese *dusun*). Every dessa, however small (and those containing from 100 to 1000 families are exceptionally large), forms an independent community; and no sooner does it attain to any considerable size than it sends off a score of families or so to form a new dessa. Each lies in the midst of its own area of cultivation. The general enceinte is formed by an impervious hedge of bamboos 40 to 70 ft. high. Within this lie the houses, each with its own enclosure, which, even when the fields are the communal property, belongs to the individual householder. The capital of a district is only a larger dessa, and that of a regency has the same general type, but includes several kampongs or villages. The bamboo houses in the strictly Javanese districts are always built on the ground; in the Sunda lands they are raised on piles. Some of the well-to-do, however, have stone houses. The principal article of food is rice; a considerable quantity of fish is eaten, but little meat. Family life is usually well ordered. The upper class practise polygamy, but among the common people a man has generally only one wife. The Javanese are nominally Mahommedans, as in former times they were Buddhists and Brahmins; but in reality, not only such exceptional groups as the Kalangs of Surakarta and Jokjakarta and the Baduwis or nomad tribes of Bantam, but the great mass of the people must be considered as believers rather in the primitive animism of their ancestors, for their belief in Islam is overlaid with superstition. As we ascend in the social scale, however, we find the name of Mahommedan more and more applicable; and consequently in spite of the paganism of the populace the influence of the Mahommedan "priests" (this is their official title in Dutch) is widespread and real. Great prestige attaches to the pilgrimage to Mecca, which was made by 5068 persons from Java in 1900. In every considerable town there is a mosque. Christian missionary work is not very widely spread.

Languages.—In spite of Sundanese, Madurese and the intrusive Malay, Javanese has a right to the name. It is a rich and cultivated language which has passed through many stages of development and, under peculiar influences, has become a linguistic complex of an almost unique kind. Though it is customary and convenient to distinguish New Javanese from Kavi or Old Javanese, just as it was customary to distinguish English from Anglo-Saxon, there is no break of historical continuity. Kavi (Basa Kavi, *i.e.* the language of poetry) may be defined as the form spoken and written before the founding of Majapahit; and middle Javanese, still represented by the dialect of Banyumas, north Cheribon, north Krawang and north Bantam, as the form the language assumed under the Majapahit court influence; while New Javanese is the language as it has developed since the fall of that kingdom. Kavi continued to be a literary language long after it had become archaic. It contains more Sanskrit than any other language of the archipelago. New Javanese breaks up into two great varieties, so different that sometimes they are regarded as two distinct languages. The nobility use one form, Kråmå; the common people another, Ngoko, the "thouing" language (cf. Fr. *tutoyant*, Ger. *dutzend*); but each class understands the language of the other class. The aristocrat speaks to the commonalty in the language of the commoner; the commoner speaks to the aristocracy in the language of the aristocrat; and, according to clearly recognized etiquette, every Javanese plays the part of aristocrat or commoner towards those whom he addresses. To speak Ngoko to a superior is to insult him; to speak Krâmå to an equal or inferior is a mark of respect. In this way Dipa Negårå showed his contempt for the Dutch General de Kock. The ordinary Javanese thinks in Ngoko; the children use it to each other, and so on. Between the two forms there is a kind of compromise, the Madya, or middle form of speech, employed by those who stand to each other on equal or friendly footing or by those who feel little constraint of etiquette. For every idea expressed in the language Krâmå has one vocable, the Ngoko another, the two words being sometimes completely different and sometimes differing only in the termination, the beginning or the middle. Thus every Javanese uses, as it were, two or even three languages delicately differentiated from each other. How this state of affairs came about is matter of speculation. Almost certainly the existence side by side of two peoples, speaking each its own tongue, and occupying towards each other the position intellectually and politically of superior and inferior, had much to do with it. But Professor Kern thinks that some influence must also be assigned to *pamela* or *pantang*, word-taboo—certain words being in certain circumstances regarded as of evil omen—a superstition still lingering, *e.g.* even among the Shetland fishermen (see G. A. F. Hazeu, *De taal pantangs*). It has sometimes been asserted that Krâmå contains more Sanskrit words than Ngoko does; but the total number in Krâmå does not exceed 20; and sometimes there is a Sanskrit word in Ngoko which is not in Krâmå. There is a village Krâmå which is not recognized by the educated classes: Krâmå inggil, with a vocabulary of about 300 words, is used in addressing the deity or persons of exalted rank. The Basa Kedaton or court language is a dialect used by all living at court except royalties, who use Ngoko. Among themselves the women of the court employ Krâmå or Madya, but they address the men in Basa Kedaton.[1]

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[1] It is interesting to compare this with the natural "reflorization" of Krakatoa. See Penzig, *Ann. jard. de Buitenzorg*, vol. viii. (1902); and W. Botting in *Nature* (1903).

Literature.—Though a considerable body of Kavi literature is still extant, nothing like a history of it is possible. The date and authorship of most of the works are totally unknown. The first place may be assigned to the *Brata Yuda* (Sansk., *Bharata Yudha*, the conflict of the Bharatas), an epic poem dealing with the struggle between the Pandâwås and the Korâwas for the throne of Ngastina celebrated in parwas 5–10 of the *Mahābhārata.* To the conception, however, of the modern Javanese it is a purely native poem; its kings and heroes find their place in the native history and serve as ancestors to their noble families. (Cohen Stuart published the modern Javanese version with a Dutch translation and notes, *Brâtâ-Joedå*, &c., Samarang, 1877. The Kavi text was lithographed at the Hague by S. Lankhout.) Of greater antiquity probably is the *Ardjunå Wiwåhå* (or marriage festival of Ardjuna), which Professor Kern thinks may be assigned to the first half of the 11th century of the Christian era. The name indicates its *Mahābhārata* origin. (Friederich published the Kavi text from a Bali MS., and *Wiwåhå Djarwa en Brâtå Joedo Kawi*, lithographed facsimiles of two palm-leaf MSS., Batavia, 1878. Djarwa is the name of the poetic diction of modern Javanese.) The oldest poem of which any trace is preserved is probably the mythological *Kåndå* (*i.e.* tradition); the contents are to some extent known from the modern Javanese version. In the literature of modern Javanese there exists a great variety of so-called *babads* or chronicles. It is sufficient to mention the "history" of Baron Sakender, which appears to give an account—often hardly recognizable—of the settlement of Europeans in Java (Cohen Stuart published text and translation, Batavia, 1851; J. Veth gives an analysis of the contents), and the *Babad Tanah Djawi* (the Hague, 1874, 1877), giving the history of the island to 1647 of the Javanese era. Even more numerous are the *wayangs* or puppet-plays which usually take their subjects from the Hindu legends or from those relating to the kingdoms of Majapahit and Pajajaram (see *e.g.* H. C. Humme, *Abiåså, een Javaansche tooneelstuk*, the Hague, 1878). In these plays grotesque figures of gilded leather are moved by the performer, who recites the appropriate speeches and, as occasion demands, plays the part of chorus.

Several Javanese specimens are also known of the beast fable, which plays so important a part in Sanskrit literature (W. Palmer van den Broek, *Javaansche Vertellingen, bevattende de lotgevallen van een kantjil, een reebok*, &c., the Hague, 1878). To the Hindu-Javanese literature there naturally succeeded a Mahommedan-Javanese literature consisting largely of translations or imitations of Arabic originals; it comprises religious romances, moral exhortations and mystical treatises in great variety.[2]

Arts.—In mechanic arts the Javanese are in advance of the other peoples of the archipelago. Of thirty different crafts practised among them, the most important are those of the blacksmith or cutler, the carpenter, the kris-sheath maker, the coppersmith, the goldsmith and the potter. Their skill in the working of the metals is the more noteworthy as they have to import the raw materials. The most esteemed product of the blacksmith's skill is the kris; every man and boy above the age of fourteen wears one at least as part of his ordinary dress, and men of rank two and sometimes four. In the finishing and adornment of the finer weapons no expense is spared; and ancient krises of good workmanship sometimes fetch enormous prices. The Javanese gold and silver work possesses considerable beauty, but there is nothing equal to the filigree of Sumatra; the brass musical instruments are of exceptional excellence. Both bricks and tiles are largely made, as well as a coarse unglazed pottery similar to that of Hindustan; but all the finer wares are imported from China. Cotton spinning, weaving and dyeing are carried on for the most part as purely domestic operations by the women. The usual mode of giving variety of colour is by weaving in stripes with a succession of different coloured yarns, but another mode is to cover with melted wax or damar the part of the cloth not intended to receive the dye. This process is naturally a slow one, and has to be repeated according to the number of colours required. As a consequence the *battiks*, as the cloths thus treated are called, are in request by the wealthier classes. For the most part quiet colours are preferred. To the Javanese of the present day the ancient buildings of the Hindu periods are the work of supernatural power. Except when employed by his European master he seldom builds anything more substantial than a bamboo or timber framework; but in the details of such erections he exhibits both skill and taste. When Europeans first came to the island they found native vessels of large size well entitled to the name of ships; and, though shipbuilding proper is now carried on only under the direction of Europeans, boat-building is a very extensive native industry along the whole of the north coast—the boats sometimes reaching a burden of 50 tons. The only one of the higher arts which the Javanese have carried to any degree of perfection is music; and in regard to the value of their efforts in this direction Europeans differ greatly. The orchestra (*gamelan*) consists of wind, string and percussion instruments, the latter being in preponderancy to the other two. (Details of the instruments will be found in Raffles' *Java*, and a description of a performance in the *Tour du monde*, 1880.)

Chief Towns and Places of Note.—The capital of Java and of the Dutch East India possessions is Batavia (*q.v.*), pop. 115,567. At Meester Cornelis (pop. 33,119), between 6 and 7 m. from Batavia on the railway to Buitenzorg, the battle was fought in 1811 which placed Java in the hands of the British. In the vicinity lies Depok, originally a Christian settlement of freed slaves, but now with about 3000 Mahommedan inhabitants and only 500 Christians. The other chief towns, from west to east through the island, are as follows: Serang (pop. 5600) bears the same relation to Bantam, about 6 m. distant, which New Batavia bears to Old Batavia, its slight elevation of 100 ft. above the sea making it fitter for European occupation. Anjer (Angerlor, Anger) lies 96 m. from Batavia by rail on the coast at the narrowest part of the Sunda Strait; formerly European vessels were wont to call there for fresh provisions and water. Pandeglang (pop. 3644), 787 ft. above sea-level, is known for its hot and cold sulphur springs. About 17 m. west of Batavia lies Tangerang (pop. 13,535), a busy place with about 2800 or 3000 Chinese among its inhabitants. Buitenzorg (*q.v.*) is the country-seat of the governor-general, and its botanic gardens are famous. Krawang, formerly chief town of the residency of that name—the least populous of all—has lost its importance since Purwakerta (pop. 6862) was made the administrative centre. At Wanyasa in the neighbourhood the first tea plantations were attempted on a large scale.

The Preanger regencies—Bandung, Chanjur, Sukabumi, Sumedang, Garut and Tasikmalaya—constitute the most important of all the residencies, though owing to their lack of harbour on the south and the intractable nature of much of their soil they have not shared in the prosperity enjoyed by many other parts of the island. Bandung, the chief town since 1864, lies 2300 ft. above sea-level, 109 m. south of Batavia by rail; it is a well-built and flourishing place (pop. 28,965; Europeans 1522, Chinese 2650) with a handsome resident's house (1867), a large mosque (1867), a school for the sons of native men of rank, the most important quinine factory in the island, and a race-course where in July a good opportunity is afforded of seeing both the life of fashionable and official Java and the customs and costumes of the common people. The district is famous for its waterfalls, one of the most remarkable of which is where the Chi Tarum rushes through a narrow gully to leap down from the Bandung plateau. In the neighbourhood is the great military camp of Chimahi. Chanjur, formerly the chief town, in spite of its loss of administrative position still has a population of 13,599. From Sukabumi (pop. 12,112; 569 Europeans), a pleasant health resort among the hills at an altitude of 1965 ft., tourists are accustomed to visit Wijnkoopers Bay for the sake of the picturesque shore scenery. Chichalengka became after 1870 one of the centres of the coffee industry. Sumedang has only 8013 inhabitants, having declined since the railway took away the highway traffic: it is exceeded both by Garut (10,647) and by Tasikmalaya (9196), but it is a beautiful place well known to sportsmen for its proximity to the Rancha Ekek swamp, where great snipe-shooting matches are held every year. For natural beauty few parts of Java can compare with the plain of Tasikmalaya, itself remarkable, in a country of trees. for its magnificent avenues. N.E. of the Preanger lies the residency of Cheribon[1] (properly Chi Rebon, the shrimp river). The chief town (pop. 24,564) is one of the most important places on the north coast, though the unhealthiness of the site has caused Europeans to settle at Tangkil, 2 m. distant. The church (1842), the regent's residence, and the great prison are among the principal buildings; there are also extensive salt warehouses. The native part of the town is laid out more regularly than is usual, and the Chinese quarter (pop. 3352) has the finest Chinese temple in Java. The palaces of the old sultans of Cheribon are less extensive than those of Surakarta and Jokjakarta. Though the harbour has to be kept open by constant dredging the roadstead is good all the year round. A strange pleasure palace of Sultan Supeh, often described by travellers, lies about 2 m. off near Sunya Raja. Mundu, a village 4 m. south-east of Cheribon, is remarkable as the only spot on the north coast of the island visited by the ikan prut or belly-fish, a species about as large as a cod, caught in thousands and salted by the local fishermen. Indramayu, which lies on both banks of the Chi Manuk about 8 m. from the coast, is mentioned under the name of Dermayo as a port for the rice of the district and the coffee of the Preanger. The coffee trade is extinct but the rice trade is more flourishing than ever, and the town has 13,400 inhabitants, of whom 2200 are Chinese. It might have a great commercial future if money could be found for the works necessary to overcome the disadvantage of its position—the roads being safe only during the east monsoon and the river requiring to be deepened and regulated. Tegal has long been one of the chief towns of Java: commerce, native trade and industry, and fisheries are all well represented and the sugar factories give abundant employment to the inhabitants. The harbour has been the object of various improvements since 1871. The whole district is densely populated (3100 to the sq. m.) and the town proper with its 16,665 inhabitants is surrounded by extensive kampongs (Balapulang, Lebaksiu, &c.). In Pekalongan (pop. 38,211) and Batang (21,286) the most important industry is the production of battiks and stamped cloths; there are also iron-works and sugar factories. The two towns are only some 5 m. apart. The former has a large mosque, a Protestant church, an old fort and a large number of European houses. The Chinese quarters consist of neat stone or brick buildings. Pekalongan smoked ducks are well known. Brebes (13,474) on the Pamali is an important trade centre. Banyumas (5000) is the seat of a resident; it is exceeded by Purwokerto (12,610), Purbalinggo (12,094) and Chilachap (12,000). This last possesses the best harbour on the south coast, and but for malaria would have been an important place. It was chosen as the seat of a great military establishment but had to be abandoned, the fort being blown up in 1893. Semarang (pop. 89,286, of whom 4800 are Europeans and 12,372 Chinese) lies on the Kali Ngaran near the centre of the north coast. Up to 1824 the old European town was surrounded by a wall and ditch. It was almost the exact reproduction of a Dutch town without the slightest accommodation to the exigencies of the climate, the streets narrow and irregular. The modern town is well laid out. Among the more noteworthy buildings of Semarang are the old Prince of Orange fort, the resident's house, the Roman Catholic church, the Protestant church, the mosque, the military hospital. A new impulse to the growth of the town was given by the opening of the railway to Surakarta and Jokjakarta in 1875. As a seaport the place is unfortunately situated. The river has long been silted up; the roadstead is insecure in the west monsoon. After many delays an artificial canal, begun in 1858, became available as a substitute for the river; but further works are necessary. A second great canal to the east, begun in 1896, helps to prevent inundations and thus improve the healthiness of the town. Demak, 13 m. N.E. of Semarang, though situated in a wretched region of swamps and having only 5000 inhabitants, is famous in ancient Javanese history. The mosque, erected by the first sultan of Demak, was rebuilt in 1845; only a small part of the old structure has been preserved, but as a sanctuary it attracts 6000 or 7000 pilgrims annually. To visit Demak seven times has the same ceremonial value as the pilgrimage to Mecca. The tombs of several of the sultans are still extant. Salatiga ("three stones," with allusion to three temples now destroyed) was in early times one of the resting places of ambassadors proceeding to the court of Mataram, and in the European history of Java its name is associated with the peace of 1755 and the capitulation of 1811. It is the seat of a cavalry and artillery camp. Its population, about 10,000, seems to be declining. Ambarawa with its railway station is, on the other hand, rapidly increasing. Its population of 14,745 includes 459 Europeans. About a mile to the N. lies the fortress of Willem I. which Van den Bosch meant to make the centre of the Javanese system of defensive works; the Banyubiru military camp is in the neighbourhood. Kendal (15,000) is a centre of the sugar industry. Kudus (31,000; 4300 Chinese) has grown to be one of the most important inland towns. Its cloth and battik pedlars are known throughout the island and the success of their enterprise is evident in the style of their houses. A good trade is also carried on in cattle, kapok, copra, pottery and all sorts of small wares. The mosque in the old town has interesting remains of Majapahit architecture; and the tomb of Pangeran Kudus is a noted Mahommedan sanctuary. A steam tramway leads northward towards, but does not reach, Japara, which in the 17th century was the chief port of the kingdom of Mataram and retained its commercial importance till the Dutch Company removed its establishment to Semarang. In 1818 Daendels transferred its resident to Pati. Ungaran, 1026 ft. above the sea, was a place of importance as early as the 17th century, and in modern times has become known as a sanatorium. Rembang, a well-built coast town and the seat of a resident, has grown rapidly to have a population of 29,538 with 210 Europeans. Very similar to each other are Surakarta or Solo and Jokjakarta, the chief towns of the quasi-independent states or Vorstenlanden. Surakarta (pop. 109,459; Chinese 5159, Europeans 1913) contains the palace (Kraton, locally called the Bata bumi) of the susuhunan (which the Dutch translated as emperor), the dalem of Prince Mangku Negårå, the residences of the Solo nobles, a small Dutch fort (Vastenburg), a great mosque, an old Dutch settlement, and a Protestant church. Here the susuhunan lives in Oriental pomp and state. To visitors there are few more interesting entertainments than those afforded by the celebration of the 31st of August (the birthday of the queen of the Netherlands) or of the New Year and the Puasa festivals, with their wayungs, ballet-dancers, and so on. Jokjakarta (35 m. S.) has been a great city since Mangku Bumi settled there in 1755. The Kraton has a circuit of 3½ m., and is a little town in itself with the palace proper, the residences of the ladies of the court and kampongs for the hereditary smiths, carpenters, sculptors, masons, payong-makers, musical instrument makers, &c., &c., of his highness. The independent Prince Paku Alam has a palace of his own. As in Surakarta there are an old Dutch town and a fort. The Jogka market is one of the most important of all Java, especially for jewelry. The total population is 72,235 with 1424 Europeans. To the south-east lies Pasar Gedeh, a former capital of Mataram, with tombs of the ancient princes in the Kraton, a favourite residence of wealthy Javanese traders. Surabaya (*q.v.*), on the strait of Madura, is the largest commercial town in Java. Its population increased from 118,000 in 1890 to 146,944 in 1900 (8906 Europeans). To the north lies Grissee or Gresih (25,688 inhabitants) with a fairly good harbour and of special interest in the early European history of Java. Inland is the considerable town of Lamongan (12,485 inhabitants). Fifteen m. S. by rail lies Sidoarjo (10,207; 185 Europeans), the centre of one of the most densely populated districts and important as a railway junction. In the neighbourhood is the populous village of Mojosari. Pasuruan was until modern times one of the chief commercial towns in Java, the staple being sugar. Since the opening of the railway to Surabaya it has greatly declined, and its warehouses and dwelling-houses are largely deserted. The population is 27,152 with 663 Europeans. Probolinggo (called by the natives Banger) is a place of 13,240 inhabitants. The swampy tracts in the vicinity are full of fishponds. The baths of Banyubiru (blue water) to the south have Hindu remains much visited by devotees. Pasirian in the far south of the residency is a considerable market town and the terminus of a branch railway. Besuki, the easternmost of all the residencies, contains several places of some importance; the chief town Bondowoso (8289.); Besuki, about the same size, but with no foreign trade; Jember, a small but rapidly increasing place, and Banyuwangi (17,559). This last was at one time the seat of the resident, now the eastern terminus of the railway system, and is a seaport on the Bali Strait with an important office of the telegraph company controlling communication with Port Darwin and Singapore. It has a very mingled population, besides Javanese and Madurese, Chinese and Arabs, Balinese, Buginese and Europeans. The chief town of Kediri (10,489) is the only residency town in the interior traversed by a navigable river, and is exceeded by Tulungagung; and the residency of Madiun has two considerable centres of population: Madiun (21,168) and Ponorogo (16,765).

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[1] See Walbreken, *De Taalsvorien in het Javaansh*; and G. A. Wilken, *Handboek voor de vergelijkende Volkenkunde van Nederlandsch Indie*, edited by C. M. Pleyte (1893).

[2] See Van den Berg's account of the MSS. of the Batavian Society (the Hague, 1877); and a series of papers by C. Poensen in *Meded. van wege het Ned. Zendelinggenootschap* (1880).

Agriculture.—About 40% of the soil of Java is under cultivation. Bantam and Besuki have each 16% of land under cultivation; Krawang, 21% Preanger, 23%; Rembang, 30%; Japara, 62%; Surabaya, 65%; Kedu, 66%; Samarang, 67%. Proceeding along the south coast from its west end, we find that in Bantam all the land cultivated on its south shore amounts to at most but 5% of that regency; in Preanger and Banyumas, as far as Chilachap, the land under cultivation amounts at a maximum to 20%. East of Surakarta the percentages of land on the south coast under cultivation decline from 30 to 20 and 10. East of the residency of Probolinggo the percentage of land cultivated on the south coast sinks to as low as 2. On the north coast, in Krawang and Rembang, with their morasses and double chains of chalk, there are districts with only 20% and 10% of the soil under cultivation. In the residencies, on the other hand, of Batavia, Cheribon, Tegal, Samarang, Japara, Surabaya and Pasuruan, there are districts having 80% to 90% of soil, and even more, under cultivation.

The agricultural products of Java must be distinguished into those raised by the natives for their own use and those raised for the government and private proprietors. The land assigned to the natives for their own culture and use amounts to about 9,625,000 acres. In western Java the prevailing crop is rice, less prominently cultivated in middle Java, while in eastern Java and Madura other articles of food take the first rank. The Javanese tell strange legends concerning the introduction of rice, and observe various ceremonies in connexion with its planting, paying more regard to them than to the proper cultivation of the cereal. The agricultural produce grown on the lands of the government and private proprietors, comprising an area of about 3½ million acres, consists of sugar, cinchona, coffee, tobacco, tea, indigo, &c. The Javanese possess buffaloes, ordinary cattle, horses, dogs and cats. The buffalo was probably introduced by the Hindus. As in agricultural products, so also in cattle-rearing, western Java is distinguished from middle and eastern Java. The average distribution of buffaloes is 106 per 1000 inhabitants, but it varies considerably in different districts, being greatest in western Java. The fact that rice is the prevailing culture in the west, while in eastern Java other plants constitute the chief produce, explains the larger number of buffaloes found in western Java, these animals being more in requisition in the culture of rice. The ordinary cattle are of mixed race; the Indian zebu having been crossed with the banting and with European cattle of miscellaneous origin. The horses, though small, are of excellent character, and their masters, according to their own ideas, are extremely particular in regard to purity of race. Riding comes naturally to the Javanese; horse-races and tournays have been in vogue among them from early times.

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[1] Cheribon is the form employed by the Dutch: an exception to their usual system, in which Tj- takes the place of the Ch- used in this article.

Coffee is an alien in Java. Specimens brought in 1696 from Cannanore on the Malabar coast perished in an earthquake and floods in 1699; the effective introduction of the precious shrub was due to Hendrik Zwaardekron (see N. P. van den Berg, "Voortbrenging en verbruck van koffie," *Tijdschrift v. Nijverh. en Landb.* 1879; and the article "Koffie" in *Encyc. Ned. Ind.* Wiji kawih is mentioned in a Kavi inscription of A.D. 856, and the bean-broth in David Tappen's list of Javanese beverages, 1667–1682, may have been coffee). The first consignment of coffee (894 ℔) to the Netherlands was made in 1711–1712, but it was not till after 1721 that the yearly exports reached any considerable amount. The aggregate quantity sold in the home market from 1711 to 1791 was 2,036,437 piculs, or on an average about 143 tons per annum; and this probably represented nearly the whole production of the island. By the beginning of the 19th century the annual production was about 7143 tons and after the introduction of the Van den Bosch system of forced culture a further augmentation was effected. The forced culture system was, in 1909, however, of little importance. Official reports show that from 1840 to 1873 the amount ranged from 5226 tons to 7354. During the ten years 1869 to 1878 the average crop of the plantations under state control was 5226 tons, that of the private planters about 810. The government has shown a strange reluctance to surrender the old-fashioned monopoly, but the spirit of private enterprise has slowly gained the day. Though the appearance of the coffee blight (*Hemileia vastatrix*) almost ruined the industry the planters did not give in. An immune variety was introduced from Liberia, and scientific methods of treatment have been adopted in dealing with the plantations. In 1887, a record year, the value of the coffee crop reached £3,083,333, and at its average it was about £1,750,000 between 1886 and 1895. The value was only £1,166,666 in 1896. The greatest difficulties are the uncertainties both of the crop and of its marketable value. The former is well shown in the figures for 1903 to 1905; government 17,900, 3949 and 3511 tons, and private planters 22,395, 15,311 and 21,395 tons. Liberia coffee is still produced in much smaller quantity than Java coffee; the latter on an average of these three years 21,360 tons; the former 7409.

The cultivation of sugar has been long carried on in Java, and since the decline of the coffee plantations it has developed into the leading industry of the island. There are experimental stations at Pasuruan, Pekalongan and elsewhere, where attempts are made to overcome the many diseases to which the cane is subject. Many of the mills are equipped with high-class machinery and produce sugar of excellent colour and grain. In 1853–1857 the average crop was 98,094 tons; in 1869–1873, 170,831, and in 1875–1880, 204,678. By 1899–1900 the average had risen to 787,673 tons; and the crops for 1904 and 1905 were respectively 1,064,935 and 1,028,357 tons. Prices fluctuate, but the value of the harvest of 1905 was estimated at about £15,000,000.

The cultivation of indigo shows a strange vitality. Under the culture system the natives found this the most oppressive of all the state crops. The modern chemist at one time seemed to have killed the industry by his synthetic substitute, but in every year between 1899 and 1904 Java exported between one million and one and a half million pounds of the natural product. Japan and Russia were the largest buyers. As blue is a favourite colour with the Javanese proper a large quantity is used at home.

Tea was first introduced to Java by the Japanese scholar von Siebold in 1826. The culture was undertaken by the state in 1829 with plants from China, but in 1842 they handed it over to contractors, whose attempts to increase their profits by delivering an inferior article ultimately led to the abandonment of the contract system in 1860. In the meantime the basis of a better state of the industry had been laid by the Dutch tea-taster J. J. L. L. Jacobsen of the Nederlandsch Handel Maatschappij, who introduced not only fresh stock, but expert growers from China in 1852–1853. The tea-planters (often taking possession of the abandoned coffee-plantations) have greatly improved the quality of their products. Assam tea was introduced in 1878, and this has rapidly extended its area. The exports increased from 12,110,724 ℔ in 1898 to 25,772,564 in 1905. More than half the total goes to the Netherlands; the United Kingdom ranks next, and, far behind both, Russia.

In 1854 the government introduced the culture of cinchona with free labour, and it had considerable success under F. Junghuhn and his successors, though the varieties grown were of inferior quality. Later seed of the best cinchona was obtained, and under skilful management Java has become the chief producer of quinine in the world. Cacao is produced in the Preanger regencies, Pekalongan, Semarang, Pasuruan, Besuki, Kediri and Surakarta. In 1903, a record year, 1,101,835 piculs (about 6540 tons) were produced. *Broussonetia papyrifera* is grown for the sake of its bark, so well known in Japan (Jap. *kodsu*) as a paper material. The ground-nut (the widely spread *Arachis hypogaea* from South America), locally known as kachang china or tanah, is somewhat extensively grown. The oil is exported to Holland, where it is sold as Delft salad oil. Tapioca has long been cultivated, especially in the Preanger. The industry is mainly in the hands of the Chinese, and the principal foreign purchasers are English biscuit manufacturers. The kapok is a tree from tropical America which, growing freely in any soil, is extensively used throughout Java along the highways as a support for telegraph and telephone wires, and planted as a prop in pepper and cubeb plantations. The silky fibre contained in its long capsuloid fruits is known as cotton wool; and among other uses it serves almost as well as cork for filling life-belts; and the oil from its seed is employed to adulterate ground-nut oil. The quantity of wool exported nearly trebled between 1890 and 1896, in the latter year the total sent to Holland, Australia, Singapore, &c., amounting to 38,586 bales. The rapid exhaustion of the natural supply of india-rubber and gutta-percha began to attract the attention of government in the latter decades of the 19th century. Extensive experiments have been made in the cultivation of *Ficus elastica* (the karet of the natives), *Castilloa elastica*, and *Hevea brasiliensis.* The planting of gutta-percha trees was begun about 1886, and a regular system introduced in the Preanger in 1901. The *Palaquium oblongifolium* plantations at Blavan, Kemutuk and Sewang in Banyumas have also been brought under official control. Java tobacco, amounting to about 35,200,000 ℔ a year, is cultivated almost exclusively in eastern Java. Among other products which are of some importance as articles of export may be mentioned nutmegs, mace, pepper, hides, arrack and copra.

Particular Lands.—At different times down to 1830 the government disposed of its lands in full property to individuals who, acquiring complete control of the inhabitants as well as of the soil, continued down to the 19th century to act as if they were independent of all superior authority. In this way more than 1½ millions of the people were subject not to the state but to "stock companies, absentee landlords and Chinese." According to the *Regeerings Almanak* (1906) these "particular lands," as they are called, were distributed as follows: Bantam 21, Batavia 36, Meester Cornelis 163, Tangerang 80, Buitenzorg 61, Semarang 32, Surabaya 46, Krawang and Demak 3 each, Cheribon 2, and Pekalongan, Kendal and Pasuruan 1 each. In Meester Cornelis no fewer than 297,912 persons were returned in 1905 as living on these lands. Of the 168 estates there are not 20 that grow anything but grass, rice and coconuts. In Buitenzorg (thanks probably to the Botanic Gardens) matters are better: tea, coffee, cinchona and india-rubber appearing amongst the objects of cultivation; and, in general, it must be noted that these estates have often natural difficulties to contend against far beyond their financial strength.

Minerals.—Of all the great islands of the archipelago Java is the poorest in metallic ores. Gold and silver are practically non-existent. Manganese is found in Jokjakarta and various other parts. A concession for working the magnetic iron sands in the neighbourhood of Chilachap was granted in 1904. Coal occurs in thin strata and small pockets in many parts (Bantam, Rembang, Jokjakarta, &c.); and in 1905 a concession was granted to a company to work the coal-beds at Bajah close to the harbour of Wijnkoopers Bay, a port of call of the Koninklijk Paketvaart Maatschappij. The discovery by De Groot in 1863 of petroleum added a most important industry to the list of the resources of Java. The great Dort Petroleum Company, now centred at Amsterdam, was founded in 1887. The production of this company alone rose from 79,179 *kisten* or cases (each 8·14 gall.) in 1891 to 1,642,780 in 1890, and to 1,967,124 in 1905. In 1904 there were no fewer than 36 concessions for petroleum. At the same time there is a larger importation of oil from Sumatra as well as from America and Russia. Sulphur is regularly worked in the Gunong Slamet, G. Sindoro, G. Sumbing, and in the crater of the Tangkuban Prahu as well as in other places in the Preanger regencies and in Pasuruan. Brine-wells exist in various parts. The bledegs (salt-mud wells) of Grobogan in the Solo Valley, Semarang, are best known. They rise from Miocene strata and yield iodine and bromine products as well as common salt. The natives of the district are allowed to extract the salt for their own use, but elsewhere (except in Jokjakarta) the manufacture of salt is a government monopoly and confined to the districts of Sumenep, Panekasan and Sampang in Madura, where from 3000 to 4000 people are hereditarily engaged in extracting salt from sea water, delivering it to the government at the rate of 10 fl. (nearly 17s.) per koyang (3700 lb). The distribution of this salt (rough-grained, greyish and highly hygroscopic) is extremely unsatisfactory. The waste was so great that in 1901 the government paid a prize of about £835 (10,000 fl.) to Karl Boltz von Bolzberg for an improved method of packing. Between 1888 and 1892 the annual amount delivered was 71,405 tons; in the next five years it rose to 89,932; and between 1898 and 1902 sank again to 88,856. The evil effects of this monopoly have been investigated by J. E. de Meyer, "Zout als middel van belasting," *De Ind. Gids.* (1905). The scarcity of salt has led to a great importation of salted fish from Siam (upwards of [illegible]).

Communications.—Roads and railways for the most part follow the fertile plains and table-lands along the coast and between the volcanic areas. The principal railways are the Semarang-Jokjakarta and Batavia-Buitenzorg lines of the Netherlands-Indian railway company, and the Surabaya-Pasuruan, Bangil-Mulang, Sidoarjo-Paren, Kertosono-Tulung Agung, Buitenzorg-Chianjur, Surakarta-Madiun, Pasuruan-Probolinggo, Jokjakarta-Chilachap and other lines of the government. The earliest lines, between Batavia and Buitenzorg and between Semarang and the capitals of the principalities, were built about 1870 by a private company with a state guarantee. Since 1875, when Dr van Goltstein, then a cabinet minister and afterwards Dutch minister in London, had an act passed for the construction of state railways in Java, their progress has become much more rapid. In addition, several private companies have built either light railways or tramways, such as that between Semarang and Joana, and the total length of all lines was 2460 in 1905. There are some 3500 miles of telegraph line, and cables connect Java with Madura, Bali and Sumatra, and Port Darwin in Australia. Material welfare was promoted by the establishment of lines of steamships between Java and the other islands, all belonging to a Royal Packet Company, established in 1888 under a special statute, and virtually possessing a monopoly on account of the government mail contracts.

Administration.—Each village (dessa) forms an independent commune; a group of dessas forms a district, a group of districts a department and a group of departments a residency, of which there are seventeen. At the head of each residency is a resident, with an assistant resident and a controller, all Dutch officials. The officials of the departments and districts are natives appointed by the government; those of the dessa are also natives, elected by the villagers and approved by the resident. In the two sultanates of Surakarta and Jokjakarta the native sultans govern under the supervision of the residents. (For the colonial administration of Netherlands India see Malay Archipelago.)

History.—The origin of the name Java is very doubtful. It is not improbable that it was first applied either to Sumatra or to what was known of the Indian Archipelago—the insular character of the several parts not being at once recognized. Jawa Dwipa, or "land of millet," may have been the original form and have given rise both to the Jaba diu of Ptolemy and to the Je-pho-thi of Fahien, the Chinese pilgrim of the 4th–5th century. The oldest form of the name in Arabic is apparently Zábej. The first epigraphic occurrence of Jawa is in an inscription of 1343. In Marco Polo the name is the common appellation of all the Sunda islands. The Jawa of Ibn Batuta is Sumatra; Java is his Mul Jáwa (*i.e.* possibly "original Java"). Jâwâ is the modern Javanese name (in the court speech Jawi), sometimes with Nusa, "island," or Tanah, "country," prefixed.

It is impossible to extract a rational historical narrative from the earlier *babads* or native chronicles, and even the later are destitute of any satisfactory chronology. The first great era in the history is the ascendancy of the Hindus, and that breaks up into three periods—a period of Buddhism, a period of aggressive Sivaism, and a period of apparent compromise. Of the various Hindu states that were established in the island, that of Majapahit was the most widely dominant down to the end of the 15th century; its tributaries were many, and it even extended its sway into other parts of the archipelago. The second era of Javanese history is the invasion of Islam in the beginning of the 15th century; and the third is the establishment of European and more particularly of Dutch influence and authority in the island. About 1520 the Portuguese entered into commercial relationship with the natives, but at the close of the same century the Dutch began to establish themselves. At the time when the Dutch East India company began to fix its trading factories on the coast towns, the chief native state was Mataram, which had in the 16th century succeeded to the overlordship possessed by the house of Demak—one of the states that rose after the fall of Majapahit. The emperors of Java, as the princes of Mataram are called in the early accounts, had their capital at Kartasura, now an almost deserted place, 6 m. west of Surakarta. At first and for long the company had only forts and little fragments of territory at Jakatra (Batavia), &c.; but in 1705 it obtained definite possession of the Preanger by treaty with Mataram; and in 1745 its authority was extended over the whole north-east coast, from Cheribon to Banyuwangi. In 1755 the kingdom of Mataram was divided into the two states of Surakarta and Jokjakarta, which still retain a shadow of independence. The kingdom of Bantam was finally subjugated in 1808. By the English occupation of the island (1811–1818) the European ascendancy was rather strengthened than weakened; the great Java war (1825–1830), in which Dipâ Negârâ, the last Javanese prince, a clever, bold and unscrupulous leader, struggled to maintain his claim to the whole island, resulted in the complete success of the Dutch. To subdue him and his following, however, taxed all the resources of the Dutch Indian army for a period of five years, and cost it the loss of 15,000 officers and soldiers, besides millions of guilders. Nor did his great influence die with him when his adventurous career came to a close in 1855 at Macassar. Many Javanese, who dream of a restoration of their ancient empire, do not believe even yet that Dipâ Negârâ is dead. They are readily persuaded by fanatical hadjis that their hero will suddenly appear to drive away the Dutch and claim his rightful heritage. Several times there have been political troubles in the native states of central Java, in which Dipâ Negârâ's name was used, notably in 1883, when many rebellious chieftains were exiled. Similar attempts at revolt had been made before, mainly in 1865 and 1870, but none so serious perhaps as that in 1849, in which a son and a brother of Dipâ Negârâ were implicated, aiming to deliver and reinstate him. All such attempts proved as futile there as others in different parts of Java, especially in Bantam, where the trouble of 1850 and 1888 had a religious origin, and in the end they directly contributed to the consolidation of Dutch sway. Being the principal Dutch colony in the Malay Archipelago, Java was the first to benefit from the material change which resulted from the introduction of the Grondwet or Fundamental Law of 1848 in Holland. The main changes were of an economical character, but the political developments were also important. Since 1850 Dutch authority has steadily advanced, principally at the expense of the semi-independent sultanates in central Java, which had been allowed to remain after the capture and exile of Dipâ Negârâ. The power of the sultans of Jokjakarta and Surakarta has diminished; in 1863 Dutch authority was strengthened in the neighbouring island of Madura, and Bantam has lost every vestige of independence. The strengthening of the Dutch power has largely resulted from a more statesmanlike and more generous treatment of the natives, who have been educated to regard the *orang blanda*, or white man, as their protector against the native rulers. Thus, in 1866, passports for natives travelling in Java were abolished by the then governor-general, Dr Sloet van de Beele, who also introduced many reforms, reducing the *corvée* in the government plantations to a minimum, and doing away with the monopoly of fisheries. Six years later a primary education system for the natives, and a penal code, whose liberal provisions seemed framed for Europeans, were introduced.

Antiquities.—Ordinary traces of early human occupation are few in Java. The native bamboo buildings speedily perish. Stone weapons are occasionally found. But remains of the temples and monastic buildings of the Hindu period are numerous and splendid, and are remarkable as representing architecture which reached a high standard without the use of mortar, supporting columns or arches. Chandis (*i.e.* temples, though the word originally meant a depository for the ashes of a saint) are not found in western Java. They exist in two great zones: one in middle Java, one in eastern Java, each with its own distinguishing characteristics, both architectural and religious. The former begins in the Dieng plateau, in the east of Banyumas, and extends into the east of Pekalongan, Kedu and the neighbouring districts of Semarang, northern Jokjakarta, and the western corner of Surakarta. The latter lies mainly in Surabaya, Kediri and Pasuruan. A considerable number of ruins also exist in Probolinggo. Farther east they grow scarce. There is none in Madura. The remains of Macham Putih in Banyuwangi are possibly of non-Hindu origin. In the regency of Kendal (Semarang), to the north of Kedu, the place-names show that temples once existed.[1] Some of them are Sivaite, some Buddhist, some astoundingly composite. None of the Buddhist buildings shows traces of the older Himaryana form of the creed. The greatest of all is a perfect sculptural exposition of the Mahayana doctrine. As to the period during which these temples were erected, authorities are not agreed. Ijzerman assigns the central Java groups to between the 8th and the 10th centuries. The seven-storeyed vihara (monastery) mentioned in the famous Menang-Kabu inscription (Sumatra) as founded by Maharaja Dhiraya Adityadharma in A.D. 656 is by some supposed to be Boro-Budur. A copper plate of 840 refers to Dyeng (Dehyang) as one of the sacred mountains of Java. One thing seems certain, that the temples of the eastern zone are of much more recent origin than most, at least, of the central zone. They are generally distinguished by the characteristics of a decadent and more voluptuous age, and show that the art of the time had become less Indian and more Javanese, with traces of influences derived from the more eastern East. At the same time it must be noted that even in Boro Budur there are non-Indian elements in the decoration, indicating that the Hindu architect employed native artists and to some extent left them a free hand.

In his standard work on *Indian and Eastern Architecture* (London, 1876), James Fergusson asserted that the Javanese temples are in the Chalukyan style. But J. W. Ijzerman in an elaborate paper in the *Album-Kern* contends that the learned historian of architecture was misled by basing his opinion mainly on inaccurate drawings reproduced by Raffles. The Javanese temples, with the solitary exception of Chandi Bima in the Dyeng, are Dravidian and not Chalukyan. The very temples quoted by Fergusson, when more carefully examined, disprove his statement: a fact not without its bearing on the history of the Hindu immigration.

The wonderful scenery of the Dyeng plateau was already, in all probability, an object of superstitious awe to the aboriginal inhabitants of Java; and thus it would catch the attention of the earliest Hindu settlers. The old crater floor is full of traces of human occupation; though, in spite of the tradition of the existence of a considerable town, no sepulchral relics of the inhabitants have been discovered. There still remain five groups of temples—some well preserved, some mere heaps of stone—to prove the devotion their builders bore to Siva, his consort Durga, and Ganesha their son. The Arjuno group, in the middle of the plateau, consists of Chandi Arjuno (with its chapel or priests' residence, Ch. Semar), Ch. Srikahdi, Ch. Puntadeva and Ch. Sembadro, each a simple square chamber with a portico reached by a flight of steps. The second group, Ch. Daravati and Ch. Parakesit, lies to the north-east. The third, now a ruined mound, lies to the east. The fourth, to the north-west, is a group of seven small temples of which Ch. Sanchaki is the most important, with a square ground plan and an octagon roof with a second circular storey. Of the fifth group, in the south, only one temple remains—the Chandi Bima—a small, beautiful and exceptionally interesting building, in "the form of a pyramid, the ribs of which stand out much more prominently than the horizontal lines of the niche-shaped ornaments which rest each on its lotus cushion." How this happens to be the one Chalukyan temple amid hundreds is a problem to be solved. The plateau lies 6500 ft. above the sea, and roads and stairways, locally known as Buddha roads, lead up from the lowlands of Bagelen and Pekalongan. The stairway between Lake Menjur and Lake Chebong alone consisted of 4700 steps. The width of the roadway, however, is only some three or four feet. A remarkable subterranean tunnel still exists, which served to drain the plateau.

Of all the Hindu temples of Java the largest and most magnificent is Boro-Budur, which ranks among the architectural marvels of the world. It lies in the residency of Kedu, a little to the west of the Progo, a considerable stream flowing south to the Indian Ocean. The place is best reached by taking the steam-tram from Magelang or Jokjakarta to the village of Muntilam Passar, where a conveyance may be hired. Strictly speaking, Boro-Budur is not a temple but a hill, rising about 150 ft. above the plain, encased with imposing terraces constructed of hewn lava-blocks and crowded with sculptures. The lowest terrace now above ground forms a square, each side 497 ft. long. About 50 ft. higher there is another terrace of similar shape. Then follow four other terraces of more irregular contour. The structure is crowned by a dome or cupola 52 ft. in diameter surrounded by sixteen smaller bell-shaped cupolas. Regarded as a whole, the main design, to quote Mr Sewell, may be described as "an archaic Indian temple, considerably flattened and consisting of a series of terraces, surmounted by a quasi-stupa capped by a dagoba." It was discovered by the engineer J. W. Ijzerman in 1885 that the basement of the structure had been earthed up before the building was finished, and that the lowest retaining wall was completely concealed by the embankment. The architects had evidently found that their temple was threatened with a destructive subsidence; and, while the sculptors were still busy with the decoration of the lower façades, they had to abandon their work. But the unfinished bas-reliefs were carefully protected by clay and blocks of stone and left in position; and since 1896 they are gradually but systematically being exhumed and photographed by the Dutch archaeologists, who, however, have to proceed with caution, filling up one portion of the embankment before they go on to deal with another. The subjects treated in this lowest enceinte are of the most varied description, forming a picture-gallery of landscapes, scenes of outdoor and domestic life, mingled with mythological and religious designs. Among the genre class appear men shooting birds with blow-pipe or bow and arrow, fishermen with rod or net, a man playing a bagpipe, and so on. It would seem as if the architect had intended gradually to wean the devotees from the things of this world. When once they began to ascend from stage to stage of the temple-hill they were introduced to the realities of religion; and, by the time they reached the dagoba they had passed through a process of instruction and were ready, with enlightened eyes, to enter and behold the image of Buddha, symbolically left imperfect, as beyond the power of human art to realize or portray. From basement to summit the whole hill is a great picture bible of the Mahayana creed.

If the statues and bas-reliefs of Boro-Budur were placed side by side they would extend for 3 m. The eye of the spectator, looking up from the present ground-level, is caught, says Mr Sewell, by the rows of life-size Buddhas that adorn the retaining walls of the several terraces and the cage-like shrines on the circular platforms. All the great figures on the east side represent Akshobhya, the Dhyani Buddha of the East. His right hand is in the Chumisparsa mudra (pose) touching the earth in front of the right knee—"I swear by the earth." All the statues on the south side are Ratnasam Chavu in the varada mudra—the right hand displayed upwards—"I give you all." On the west side the statues represent Amitabha in the dhyana or padinasama mudra, the right hand resting palm upwards on the left, both being on the lap—the attitude of meditation. Those on the north represent Amogasiddhi in the abhaya mudra, the right hand being raised and displayed, palm outwards—"Fear not, all is well."

Other remarkable groups of Hindu temples exist near the village of Prambanan[2] (less correctly Brambanan) in Surakarta, but not far from the borders of Jokjakarta, with a station on the railway between the two chief towns. The village has been named after the temples, Prambanan signifying the place of teachers. The whole ecclesiastical settlement was surrounded by three lines of wall, of which only the inmost is now visible above ground. Between the second and third walls are 157 small temples, and in the central enclosure are the ruins of six larger temples in a double row with two smaller ones at the side. The middle temple of the western row is the main building, full of statues of purely Sivaite character—Siva as Guru or teacher, Siva as Kala or Time the Destroyer, Durga, Ganesha, and so on. But, just as many churches in Christendom are called not after the Christ but after the Virgin, so this is known as Lara (*i.e.* Virgin) Janggrang from the popular name of Durga. In the southern temple of the row is a very fine figure of a four-armed Brahma; in the northern there was a Vishnu with attendant figures. Of the other row the middle temple is again the largest, with Siva, his nandi or bull, and other symbolic sculptures. To the north lies the extraordinary cluster of temples which, though it does not deserve its popular name of Chandi Sewu, the thousand shrines, consists of at least 240 small buildings gathered round a great central temple, richly adorned, though roofless and partially ruined since the earthquake of 1867. Among the more noteworthy figures are those of the huge and ungainly guardians of the temple kneeling at the four main gateways of each of the principal buildings. Colonel Yule pointed out that there are distinct traces of a fine coat of stucco on the exterior and the interior of the buildings, and he compared in this respect "the cave walls of Ellora, the great idols at Bamian, and the Doric order at Selinus." Other temples in the same neighbourhood as Chandi Sewu are Ch. Lumbung, Ch. Kali Bening (Baneng), with a monstrous Kala head as the centre of the design on the southern side, Ch. Kalong and Ch. Plaosan. Tradition assigns these temples to 1266–1296.

Of the temples of the eastern zone the best known is Chandi Jago (or Tumpang), elaborately described in the Archaeological Commission's monograph. According to the *Pararaton*, a native chronicle (published in the *Verhand. v. h. Bat. Gen. v. K. en W.*, 1896), it belongs to the 13th century, containing the tomb of Rangavuni or Vishnuvardhana, who died in 1272–1273. The shrine proper occupies the third of three platforms, the lowest of which forms a square of 45 to 46 ft. each side. The building fronts the west, and is constructed of an andesitic tuff of inferior quality and dark colour. Of distinctly Buddhistic influence there is no trace. The makara (elephant-fish head) is notably absent. The sculptures which run round the base and along the sides of the platforms or terraces are of the most elaborate and varied description—kings on thrones, dwarfs, elephants, supernatural beings, diabolical and grotesque, tree-monsters, palaces, temples, courtyards, lakes, gardens, forests—all are represented. In one place appears a Chinese- or Burmese-looking seven-roofed pagoda; in another, a tall temple strangely split down the centre, with a flight of steps running up the fissure. The inscriptions are in the Devanagari character. In the same neighbourhood are Ch. Singossari, Ch. Kidal, &c. Another of the most beautiful of the eastern temples is Ch. Jabung, mentioned in 1330. It is built of red brick; and its distinctly Javanese origin is suggested by the frequency of the snake-motif still characteristic of modern Javanese art. It may be added that a comparison of the several buildings of the zone affords an interesting study in the development of the pilaster as a decorative rather than structural element.

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[1] See R. Verbeek, "Liget der oudheden van Java," in *Verhand. v. h. Bat. Gen.*, xlvi., and his *Oudreid kundige kaart van Java*. R. Sewell's "Antiquarian notes in Java," in *Journal of the Royal Asiatic Society* (1906), give the best conspectus available for English readers. W. B. Worsfold, *A Visit to Java* (London, 1893), has a good sketch of what was then known, revised by Professor W. Rhys Davids; but whoever wishes full information must refer to Dutch authorities. These are numerous but difficult of access.

[2] The chief authorities on Prambanan are J. W. Ijzerman, *Beschrijving der oudheden nabij de Grens der residenties Soerakarta en Djogjakarta* (Batavia, 1891, with photographs and atlas); and J. Groneman, *Tjandi Parambanan op Midden Java*; see also *Guide à travers l'exposition des Pays-Bas* (The Hague, 1900), No. 174, sqq.

At Panabaram, near Blitar, Kediri, is another group of stone temples and other buildings. The chief temple is remarkable for the richness of its sculptures, which are peculiarly delicate and spirited in their details. The decoration of the mere robes of one of the free-standing stairway-guardians consists of scroll-work, interspersed with birds and animals rendered in a non-Indian style, reminiscent of Chinese or Japanese work. It has been described as one of the most beautiful pieces of sculpture in all the East.

Sculptures from the temples are scattered far and wide throughout Java, and it is one of the greatest difficulties of the archaeologist to determine the origin of many of the most interesting specimens. This, too, is often the case with those that have found their way to the museums of Java and Europe (Batavia, Leiden, Haarlem, Berlin, &c.). Minor relics of the past are to be found alike in the palaces of the nobles and the huts of the highland peasants. Zodiac cups of copper or bronze dating from the 12th or 13th century are in daily use among the Tenggerese. The musical instruments used by the musicians of the native courts are often prized on account of their great antiquity.

As many of the Chinese came from China centuries ago and have not ceased to hold intercourse with their native country, the houses of the wealthier men among them are often rich in ancient specimens of Chinese art. The special exhibition organized by Henri Borel and other enthusiasts showed how much of value in this matter might be brought together in spite of the reluctance of the owners to commit the sacrilege of exposing to public gaze the images of their ancestral gods and heroes. Borel has given exquisite examples of images of Kwan-yin (the Chinese Virgin-Goddess), of Buddhas, of the ghoulish god of literature, of Lie-tai-Peh (the Chinese poet who has gone to live in the planet Venus), &c.; in illustration of his papers in *L'Art flamand et hollandais*, pt. v. (1900), a translation of his monograph published at Batavia.

AUTHORITIES.—Besides the special works quoted *passim*, see Sir Stamford Raffles, *History of Java* (London, 1830); F. Junghuhn, *Java: seine Gestalt, Pflanzendecke, und innere Bauart* (Ger. trans. by J. K. Hasskarl, Leipzig, 1854–1857); P. J. Veth, *Java, Geographisch, ethnologisch, historisch* (2nd ed., Haarlem, 1896–1903), a masterly compendium originally based largely on Junghuhn's descriptions; L. van Deventer, *Geschiedenis der Nederlanders op Java* (2nd ed., Haarlem, 1895); L. W. C. van den Berg, *Le Hadhramout et les colonies arabes dans l'archipel indien* (Batavia, 1886); E. R. Scidmore, *Java, the Garden of the East* (New York, 1898); J. Chailley-Bert, *Java et ses habitants* (Paris, 1900); C. Day, *The Policy and Administration of the Dutch in Java* (London, 1904); E. S. de Klerck, *De Java-Oorlog van* 1825–1830 (Batavia, 1905); *Encyclopaedie v. N. Indië*, art. "Java;" *Guide à travers l'Exposition de Paris* (The Hague, 1900), with articles by specialists on each department of the Dutch colonies, more particularly Java; *Koloniale Verslagen en Regeerings-almanak van N. Indië*, being official publications of the Dutch and Dutch East-Indian Government (see also MALAY ARCHIPELAGO).

(H. A. W.; O. J. R. H.)

JAVELIN, a spear, particularly one light enough to be thrown, a dart. The javelin was often provided with a thong to help in casting (see SPEAR). Javelin-throwing is one of the contests in the athletic section at the international Olympic games. Formerly the sheriff of a county or borough had a body of men armed with javelins, and known as javelin-men, who acted as a bodyguard for the judges when they went on assize. Their duties are now performed by the ordinary police. The word itself is an adaptation of Fr. *javeline*. There are several words in Celtic and Scandinavian languages and in Old English, meaning a spear or dart, that seem to be connected with *javel*, the base form in French; thus Welsh *gaflach*, Irish *gabhla*, O. Norwegian *gaflok*, O. E. *gafeluc*, later in the form *gavelock*, *cf.* O. Norman-Fr. *gavelot*, *javelot*, Ital. *giavelotto*. The origin seems to be Celtic, and the word is cognate with Ir. *gafa*, a hook, fork, gaff; the root is seen in "gable" (*q.v.*), and in the German *Gabel*, fork. The change in meaning from fork, forked end of a spear, to the spear itself is obscure.

JAW (Mid. Eng. *jawe*, *jowe* and *geowe*, O. Eng. *cheowan*, connected with "chaw" and "chew," and in form with "jowl"), in anatomy, the term for the upper maxillary bone, and the mandible or lower maxillary bone of the skull; it is sometimes loosely applied to all the lower front parts of the skull (*q.v.*).

JAWĀLĪQĪ, Abu Manṣūr Mauhūb ul-Jawālīqī (1073–1145), Arabian grammarian, was born at Bagdad, where he studied philology under Tibrīzī and became famous for his handwriting. In his later years he acted as imam to the caliph Moqtafi. His chief work is the *Kitāb ul-Mu'arrab*, or "Explanation of Foreign Words used in Arabic."

The text was edited from an incomplete manuscript by E. Sachau (Leipzig, 1867). Many of the lacunae in this have been supplied from another manuscript by W. Spitta in the *Journal of the German Oriental Society*, xxxiii. 208 sqq. Another work, written as a supplement to the *Durrat ul-Ghawwās* of Harīrī (*q.v.*), has been published as "Le Livre des locutions vicieuses," by H. Derenbourg in *Morgenländische Forschungen* (Leipzig, 1875), pp. 107–166. (G. W. T.)

JAWHAR, a native state of India, in the Konkan division of Bombay, situated among the lower ranges of the western Ghats. Area 310 sq. m. Pop. (1901), 47,538. The estimated revenue is £11,000; there is no tribute. The chief, who is a Koli by caste, traces back his descent to 1343. The leading exports are teak and rice. The principal village is that of Jawhar (pop. 3567).

JAWORÓW, a town in Galicia, Austria, 30 m. W. of Lemberg. Pop. (1900), 10,090. It has a pottery, a brewery, a distillery and some trade in agricultural produce. Not far from it is the watering-place of Szkło with sulphur springs. The town was a favourite residence of John Sobieski, who there received the congratulations of the pope and the Venctian republic on his success against the Turks at Vienna (1683). At Jaworów Peter the Great was betrothed to Catherine I.

JAY, JOHN (1745–1829), American statesman, the descendant of a Huguenot family, and son of Peter Jay, a successful New York merchant, was born in New York City on the 12th of December 1745. On graduating at King's College (now Columbia University) in 1764, Jay entered the office of Benjamin Kissam, an eminent New York lawyer. In 1768 he was admitted to the bar, and rapidly acquired a lucrative practice. In 1774 he married Sarah, youngest daughter of William Livingston, and was thus brought into close relations with one of the most influential families in New York. Like many other able young lawyers, Jay took an active part in the proceedings that resulted in the independence of the United States, identifying himself with the conservative element in the Whig or patriot party. He was sent as a delegate from New York City to the Continental Congress at Philadelphia in September 1774, and though almost the youngest member, was entrusted with drawing up the address to the people of Great Britain. Of the second congress, also, which met at Philadelphia on the 10th of May 1775, Jay was a member; and on its behalf he prepared an address to the people of Canada and an address to the people of Jamaica and Ireland. In April 1776, while still retaining his seat in the Continental Congress, Jay was chosen as a member of the third provincial congress of New York; and his consequent absence from Philadelphia deprived him of the honour of affixing his signature to the Declaration of Independence. As a member of the fourth provincial congress he drafted a resolution by which the delegates of New York in the Continental Congress were authorized to sign the Declaration of Independence. In 1777 he was chairman of the committee of the convention which drafted the first New York state constitution After acting for some time as one of the council of safety (which administered the state government until the new constitution came into effect), he was made chief justice of New York state, in September 1777. A clause in the state constitution prohibited any justice of the Supreme Court from holding any other post save that of delegate to Congress on a "special occasion," but in November 1778 the legislature pronounced the secession of what is now the state of Vermont from the jurisdiction of New Hampshire and New York to be such an occasion, and sent Jay to Congress charged with the duty of securing a settlement of the territorial claims of his state. He took his seat in congress on the 7th of December, and on the 10th was chosen president in succession to Henry Laurens.

On the 27th of September 1779 Jay was appointed minister plenipotentiary to negotiate a treaty between Spain and the United States. He was instructed to endeavour to bring Spain into the treaty already existing between France and the United States by a guarantee that Spain should have the Floridas in case of a successful issue of the war against Great Britain, reserving, however, to the United States the free navigation of the Mississippi. He was also to solicit a subsidy in consideration of the guarantee, and a loan of five million dollars. His task was one of extreme difficulty. Although Spain had joined France in the war against Great Britain, she feared to imperil her own colonial interests by directly encouraging and aiding the former British colonies in their revolt against their mother country, and she had refused to recognize the United States as an independent power. Jay landed at Cadiz on the 22nd of January 1780, but was told that he could not be received in a formally diplomatic character. In May the king's minister, Count de Florida Blanca, intimated to him that the one obstacle to a treaty was the question of the free navigation of the Mississippi, and for months following this interview the policy of the court was clearly one of delay. In February 1781 Congress instructed Jay that he might make concessions regarding the navigation of the Mississippi, if necessary; but further delays were interposed, the news of the surrender of Yorktown arrived, and Jay decided that any sacrifice to obtain a treaty was no longer advisable. His efforts to procure a loan were not much more successful, and he was seriously embarrassed by the action of Congress in drawing bills upon him for large sums. Although by importuning the Spanish minister, and by pledging his personal responsibility, Jay was able to meet some of the bills, he was at last forced to protest others; and the credit of the United States was saved only by a timely subsidy from France.

In 1781 Jay was commissioned to act with Franklin, John Adams, Jefferson and Henry Laurens in negotiating a peace with Great Britain. He arrived in Paris on the 23rd of June 1782, and jointly with Franklin had proceeded far with the negotiations when Adams arrived late in October. The instructions of the American negotiators were as follows:—

> "You are to make the most candid and confidential communications upon all subjects to the ministers of our generous ally, the king of France; to undertake nothing in the negotiations for peace or truce without their knowledge and concurrence; and ultimately to govern yourselves by their advice and opinion, endeavouring in your whole conduct to make them sensible how much we rely on his majesty's influence for effectual support in every thing that may be necessary to the present security, or future prosperity, of the United States of America."

Jay, however, in a letter written to the president of Congress from Spain, had expressed in strong terms his disapproval of such dependence upon France, and, on arriving in Paris, he demanded that Great Britain should treat with his country on an equal footing by first recognizing its independence, although the French minister, Count de Vergennes, contended that an acknowledgment of independence as an effect of the treaty was as much as could reasonably be expected. Finally, owing largely to Jay, who suspected the good faith of France, the American negotiators decided to treat independently with Great Britain. The provisional articles, which were so favourable to the United States as to be a great surprise to the courts of France and Spain, were signed on the 30th of November 1782, and were adopted with no important change as the final treaty on the 3rd of September 1783.

On the 24th of July 1784 Jay landed in New York, where he was presented with the freedom of the city and elected a delegate to Congress. On the 7th of May Congress had already chosen him to be secretary for foreign affairs, and in December Jay resigned his seat in Congress and accepted the secretaryship. He continued to act in this capacity until 1790, when Jefferson became secretary of state under the new constitution. In the question of this constitution Jay had taken a keen interest, and as an advocate of its ratification he wrote over the name "Publius," five (Nos. 2, 3, 4, 5 and 64) of the famous series of papers known collectively as the *Federalist* (see HAMILTON, ALEXANDER). He published anonymously (though without succeeding in concealing the authorship) *An Address to the People of New York*, in vindication of the constitution; and in the state convention at Poughkeepsie he ably seconded Hamilton in securing its ratification by New York. In making his first appointments to federal offices President Washington asked Jay to take his choice; Jay chose that of chief justice of the Supreme Court, and held this position from September 1789 to June 1795. The most famous case that came before him was that of *Chisolm* v. *Georgia*, in which the question was, Can a state be sued by a citizen of another state? Georgia argued that it could not be so sued, on the ground that it was a sovereign state, but Jay decided against Georgia, on the ground that sovereignty in America resided with the people. This decision led to the adoption of the eleventh amendment to the federal constitution, which provides that no suit may be brought in the federal courts against any state by a citizen of another state or by a citizen or subject of any foreign state. In 1792 Jay consented to stand for the governorship of New York State, but a partisan returning-board found the returns of three counties technically defective, and though Jay had received an actual majority of votes, his opponent, George Clinton, was declared elected.

Ever since the War of Independence there had been friction between Great Britain and the United States. To the grievances of the United States, consisting principally of Great Britain's refusal to withdraw its troops from the forts on the north-western frontier, as was required by the peace treaty of 1783, her refusal to make compensation for negroes carried away by the British army at the close of the War of Independence, her restrictions on American commerce, and her refusal to enter into any commercial treaty with the United States, were added, after war broke out between France and Great Britain in 1793, the anti-neutral naval policy according to which British naval vessels were authorized to search American merchantmen and impress American seamen, provisions were treated as contraband of war, and American vessels were seized for no other reason than that they had on board goods which were the property of the enemy or were bound for a port which though not actually blockaded was declared to be blockaded. The anti-British feeling in the House of Representatives became so strong that on the 7th of April 1794 a resolution was introduced to prohibit commercial intercourse between the United States and Great Britain until the north-western posts should be evacuated and Great Britain's anti-neutral naval policy should be abandoned. Thereupon Washington, fearing that war might result, appointed Jay minister extraordinary to Great Britain to negotiate a new treaty, and the Senate confirmed the appointment by a vote of 18 to 8, although the non-intercourse resolution which came from the house a few days later was defeated in the senate only by the casting vote of Vice-President John Adams. Jay landed at Falmouth in June 1794, signed a treaty with Lord Grenville on the 19th of November, and disembarked again at New York on the 28th of May 1795. The treaty, known in history as Jay's Treaty, provided that the north-western posts should be evacuated by the 1st of June 1796, that commissioners should be appointed to settle the north-east and the north-west boundaries, and that the British claims for British debts as well as the American claims for compensation for illegal seizures should be referred to commissioners. More than one-half of the clauses in the treaty related to commerce, and although they contained rather small concessions to the United States, they were about as much as could reasonably have been expected in the circumstances. One clause, the operation of which was limited to two years from the close of the existing war, provided that American vessels not exceeding 70 tons burden might trade with the West Indies, but should carry only American products there and take away to American ports only West Indian products; moreover, the United States was to export in American vessels no molasses, sugar, coffee, cocoa or cotton to any part of the world. Jay consented to this provision under the impression that the articles named were peculiarly the products of the West Indies, not being aware that cotton was rapidly becoming an important export from the southern states. The operation of the other commercial clauses was limited to twelve years. By them the United States was granted limited privileges of trade with the British East Indies; some provisions were made for reciprocal freedom of trade between the United States and the British dominions in Europe; some articles were specified under the head of "contraband of war"; it was agreed that whenever provisions were seized as contraband they should be paid for, and that in cases of the capture of a vessel carrying contraband goods such goods only and not the whole cargo should be seized; it was also agreed that no vessel should be seized merely because it was bound for a blockaded port, unless it attempted to enter the port after receiving notice of the blockade. The treaty was laid before the Senate on the 8th of June 1795, and, with the exception of the clause relating to trade with the West Indies, was ratified on the 24th by a vote of 20 to 10. As yet the public was ignorant of its contents, and although the Senate had enjoined secrecy on its members even after the treaty had been ratified, Senator Mason of Virginia gave out a copy for publication only a few days later. The Republican party, strongly sympathizing with France and strongly disliking Great Britain, had been opposed to Jay's mission, and had denounced Jay as a traitor and guillotined him in effigy when they heard that he was actually negotiating. The publication of the treaty only added to their fury. They filled newspapers with articles denouncing it, wrote virulent pamphlets against it, and burned Jay in effigy. The British flag was insulted. Hamilton was stoned at a public meeting in New York while speaking in defence of the treaty, and Washington was grossly abused for signing it. In the House of Representatives the Republicans endeavoured to prevent the execution of the treaty by refusing the necessary appropriations, and a vote (29th of April, 1795) on a resolution that it ought to be carried into effect stood 49 to 49; but on the next day the opposition was defeated by a vote of 51 to 48. Once in operation, the treaty grew in favour. Two days before landing on his return from the English mission, Jay had been elected governor of New York state; notwithstanding his temporary unpopularity, he was re-elected in April 1798. With the close of this second term of office in 1801, he ended his public career. Although not yet fifty-seven years old, he refused all offers of office and retiring to his estate near Bedford in Westchester county, N.Y., spent the rest of his life in rarely interrupted seclusion. In politics he was throughout inclined toward Conservatism, and after the rise of parties under the federal government he stood with Alexander Hamilton and John Adams as one of the foremost leaders of the Federalist party, as opposed to the Republicans or Democratic-Republicans. From 1821 until 1828 he was president of the American Bible Society. He died on the 17th of May 1829. The purity and integrity of his life are commemorated in a sentence by Daniel Webster: "When the spotless ermine of the judicial robe fell on John Jay, it touched nothing less spotless than itself."

See *The Correspondence and Public Papers of John Jay* (4 vols., New York, 1890–1893), edited by H. P. Johnston; William Jay, *Life of John Jay with Selections from his Correspondence and Miscellaneous Papers* (2 vols., New York, 1833); William Whitelocke, *Life and Times of John Jay* (New York, 1887); and George Pellew, *John Jay* (Boston, 1890), in the "American Statesmen Series."

John Jay's son, WILLIAM JAY (1789–1858), was born in New York City on the 16th of June 1789, graduated from Yale in 1807, and soon afterwards assumed the management of his father's large estate in Westchester county, N.Y. He was actively interested in peace, temperance and anti-slavery movements. He took a prominent part in 1816 in founding the American Bible Society; was a judge of Westchester county from 1818 to 1843, when he was removed from office by the party in power in New York, which hoped, by sacrificing an anti-slavery judge, to gain additional strength in the southern states; joined the American anti-slavery society in 1834, and held several important offices in this organization. In 1840, however, when it began to advocate measures which he deemed too radical, he withdrew his membership, but with his pen he continued his labours on behalf of the slave, urging emancipation in the district of Columbia and the exclusion of slavery from the Territories, though deprecating any attempt to interfere with slavery in the states. He was a member of the American peace society and was its president for several years. His pamphlet, *War and Peace: the Evils of the First with a Plan for Securing the Last*, advocating international arbitration, was published by the English Peace Society in 1842, and is said to have contributed to the promulgation, by the powers signing the Treaty of Paris in 1856, of a protocol expressing the wish that nations, before resorting to arms, should have recourse to the good offices of a friendly power. Among William Jay's other writings, the most important are *The Life of John Jay* (2 vols., 1833) and a *Review of the Causes and Consequences of the Mexican War* (1849). He died at Bedford on the 14th of October 1858.

See Bayard Tuckerman, *William Jay and the Constitutional Movement for the Abolition of Slavery* (New York, 1893).

William Jay's son, JOHN JAY (1817–1894), also took an active part in the anti-slavery movement. He was a prominent member of the free soil party, and was one of the organizers of the Republican party in New York. He was United States minister to Austria-Hungary in 1869–1875, and was a member, and for a time president, of the New York civil service commission appointed by Governor Cleveland in 1883.

JAY, WILLIAM (1769–1853), English Nonconformist divine, was born at Tisbury in Wiltshire on the 6th of May 1769. He adopted his father's trade of stone-mason, but gave it up in 1785 in order to enter the Rev. Cornelius Winter's school at Marlborough. During the three years that Jay spent there, his preaching powers were rapidly developed. Before he was twenty-one he had preached nearly a thousand times, and in 1788 he had for a while occupied Rowland Hill's pulpit in London. Wishing to continue his reading he accepted the humble pastorate of Christian Malford, near Chippenham, where he remained about two years. After one year at Hope chapel, Clifton, he was called to the ministry of Argyle Independent chapel in Bath; and on the 30th of January 1791 he began the work of his life there, attracting hearers of every religious denomination and of every rank, and winning for himself a wide reputation as a brilliant pulpit orator, an earnest religious author, and a friendly counsellor. Sheridan declared him to be the most manly orator he had ever heard. A long and honourable connexion of sixty-two years came to an end in January 1853, and he died on the 27th of December following.

The best-known of Jay's works are his *Morning and Evening Exercises*: *The Christian contemplated*: *The Domestic Minister's Assistant*; and his *Discourses*. He also wrote a *Life of Rev. Cornelius Winter*, and *Memoirs of Rev. John Clarke*. An edition of Jay's *Works* in 12 vols., 8vo, revised by himself, was issued in 1842–1844, and again in 1856. A new edition, in 8 vols., 8vo, was published in 1876. See *Autobiography* (1854); S. Wilson's *Memoir of Jay* (1854); S. Newth in *Pulpit Memorials* (1878).

JAY (Fr. *géai*), a well-known and very beautiful European bird, the *Corvus glandarius* of Linnaeus, the *Garrulus glandarius* of modern ornithologists. To this species are more or less closely allied numerous birds inhabiting the Palaearctic and Indian regions, as well as the greater part of America, but not occurring in the Antilles, in the southern portion of the Neotropical Region, or in the Ethiopian or Australian. All these birds are commonly called jays, and form a group of the crows or *Corvidae*, which may fairly be considered a sub-family, *Garrulinae*. Indeed there are, or have been, systematists who would elevate the jays to the rank of a family *Garrulidae*—a proceeding which seems unnecessary. Some of them have an unquestionable resemblance to the pies, if the group now known by that name can be satisfactorily severed from the true *Corvinae*. In structure the jays are not readily differentiated from the pies; but in habit they are much more arboreal, delighting in thick coverts, seldom appearing in the open, and seeking their food on or under trees. They seem also never to walk or run when on the ground, but always to hop. The body-feathers are commonly loose and soft; and, gaily coloured as are most of the species, in few of them has the plumage the metallic glossiness it generally presents in the pies, while the proverbial beauty of the "jay's wing" is due to the vivid tints of blue—turquoise and cobalt, heightened by bars of jet-black, an indication of the same style of ornament being observable in the greater number of the other forms of the group, and in some predominating over nearly the whole surface. Of the many genera that have been proposed by ornithologists, perhaps about nine may be deemed sufficiently well established.

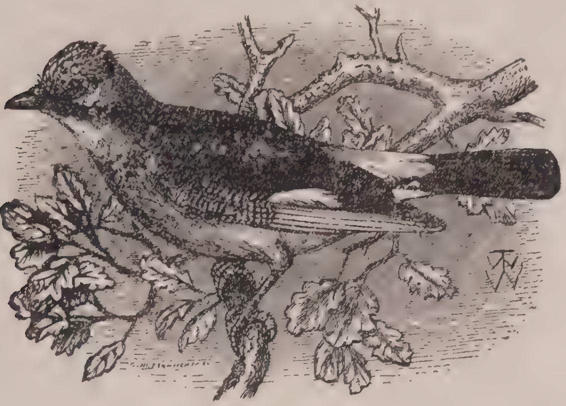

FIG. 1—European Jay.

The ordinary European jay, *Garrulus glandarius* (fig. 1), has suffered so much persecution in the British Islands as to have become in many districts a rare bird. In Ireland it seems now to be indigenous to the southern half of the island only; in England generally, it is far less numerous than formerly; and in Scotland its numbers have decreased with still greater rapidity. There is little doubt that it would have been exterminated but for its stock being supplied in autumn by immigration, and for its shy and wary behaviour, especially at the breeding-season, when it becomes almost wholly mute, and thereby often escapes detection. No truthful man, however much he may love the bird, will gainsay the depredations on fruit and eggs that it at times commits; but the gardeners and gamekeepers of Britain, instead of taking a few simple steps to guard their charge from injury, deliberately adopt methods of wholesale destruction—methods that in the case of this species are only too easy and too effectual—by proffering temptation to trespass which it is not in jay-nature to resist, and accordingly the bird runs great chance of total extirpation. Notwithstanding the war carried on against the jay, its varied cries and active gesticulations show it to be a sprightly bird, and at a distance that renders its beauty-spots invisible, it is yet rendered conspicuous by its cinnamon-coloured body and pure white tail-coverts, which contrast with the deep black and rich chestnut that otherwise mark its plumage, and even the young at once assume a dress closely resembling that of the adult. The nest, generally concealed in a leafy tree or bush, is carefully built, with a lining formed of fine roots neatly interwoven. Herein from four to seven eggs, of a greenish-white closely freckled, so as to seem suffused with light olive, are laid in March or April, and the young on quitting it accompany their parents for some weeks.

Though the common jay of Europe inhabits nearly the whole of this quarter of the globe south of 64° N. lat., its territory in the east of Russia is also occupied by *G. brandti*, a kindred form, which replaces it on the other side of the Ural, and ranges thence across Siberia to Japan; and again on the lower Danube and thence to Constantinople the nearly allied *G. krynicki* (which alone is found in southern Russia, Caucasia and Asia Minor) shares its haunts with it.[1] It also crosses the Mediterranean to Algeria and Morocco; but there, as in southern Spain, it is probably but a winter immigrant. The three forms just named have the widest range of any of the genus. Next to them come *G. atricapillus*, reaching from Syria to Baluchistan, *G. japonicus*, the ordinary jay of southern Japan, and *G. sinensis*, the Chinese bird. Other forms have a much more limited area, as *G. cervicalis*, the local and resident jay of Algeria, *G. hyrcanus*, found on the southern shores of the Caspian Sea, and *G. taevanus*, confined to the island of Formosa. The most aberrant of the true jays is *G. lidthi*, a very rare species, which seems to come from some part of Japan (*vide* Salvadori, *Atti Accad. Torino*, vii. 474), though its exact locality is not known.

Leaving the true jays of the genus *Garrulus*, it is expedient next to consider those of a group named, in 1831, *Perisoreus* by Prince C. L. Bonaparte (*Saggio*, &c., *Anim. Vertebrati*, p. 43) and *Dysornithia* by Swainson (*F. B.-Americana*, ii. 495).[2]

This group contains two species—one the *Lanius infaustus* of Linnaeus and the Siberian jay of English writers, which ranges throughout the pine-forests of the north of Europe and Asia, and the second the *Corvus canadensis* of the same author, or Canada jay, occupying a similar station in America. The so-called Siberian jay is one of the most entertaining birds in the world. Its versatile cries and actions, as seen and heard by those who penetrate the solitude of the northern forests it inhabits, can never be forgotten by one who has had experience of them, any more than the pleasing sight of its rust-coloured tail, which an occasional gleam of sunshine will light up into a brilliancy quite unexpected by those who have only surveyed the bird's otherwise gloomy appearance in the glass-case of a museum. It seems scarcely to know fear, obtruding itself on the notice of any traveller who invades its haunts, and, should he halt, making itself at once a denizen of his bivouac. In confinement it speedily becomes friendly, but suitable food for it is not easily found. Linnaeus seems to have been under a misapprehension when he applied to it the trivial epithet it bears; for by none of his countrymen is it deemed an unlucky bird, but rather the reverse. In fact, no one can listen to the cheery sound of its ordinary calls with any but a hopeful feeling. The Canada jay, or "whisky-jack" (the corruption probably of a Cree name), seems to be of a similar nature, but it presents a still more sombre coloration, its nestling plumage,[3] indeed, being thoroughly corvine in appearance and suggestive of its being a pristine form.

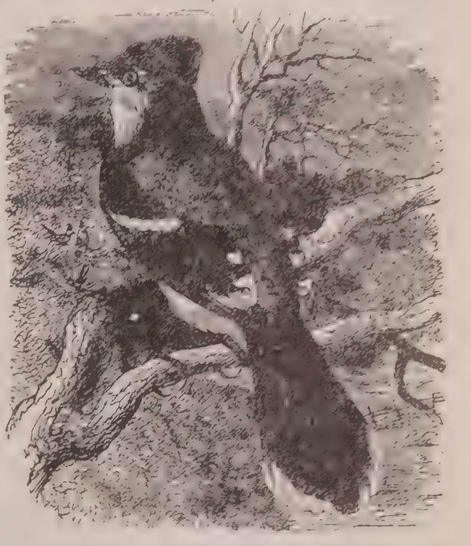

FIG. 2.—American Blue Jay.

As though to make amends for the dull plumage of the species last mentioned, North America offers some of the most brilliantly coloured of the sub-family, and the common blue jay[1] of Canada and the eastern states of the Union, *Cyanurus cristatus* (fig. 2), is one of the most conspicuous birds of the Transatlantic woods. The account of its habits by Alexander Wilson is known to every student of ornithology, and Wilson's followers have had little to do but supplement his history with unimportant details. In this bird and its many allied forms, coloration, though almost confined to various tints of blue, seems to reach its climax, but want of space forbids more particular notice of them, or of the members of the other genera *Cyanocitta*, *Cyanocorax*, *Xanthura*, *Psilorhinus*, and more, which inhabit various parts of the Western continent. It remains, however, to mention the genus *Cissa*, including many beautiful forms belonging to the Indian region, and among them the *C. speciosa* and *C. sinensis*, so often represented in Oriental drawings, though doubts may be expressed whether these birds are not more nearly related to the pies than to the jays. (A. N.)

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[1] Further information will possibly show that these districts are not occupied at the same season of the year by the two forms.

[2] Recent writers have preferred the former name, though it was only used sub-generically by its author, who assigned to it no characters, which the inventor of the latter was careful to do, regarding it at the same time as a genus.

[3] In this it was described and figured (*F. B. Americana*, ii. 296, pl. 55) as a distinct species, *G. brachyrhynchus*.

JEALOUSY (adapted from Fr. *jalousie*, formed from *jaloux*, jealous, Low Lat. *zelosus*, Gr. ζῆλος, ardour, zeal, from the root seen in ζέειν, to boil, ferment; cf. "yeast"), originally a condition of zealous emulation, and hence, in the usual modern sense, of resentment at being (or believing that one is or may be) supplanted or preferred in the love or affection of another, or in the enjoyment of some good regarded as properly one's own. Jealousy is really a form of envy, but implies a feeling of personal claim which in envy or covetousness is wanting. The jealousy of God, as in Exod. xx. 5, "For I, the Lord thy God, am a jealous God," has been defined by Pusey (*Minor Prophets*, 1860) as the attribute "whereby he does not endure the love of his creatures to be transferred from him." "Jealous," by etymology, is however, only another form of "zealous," and the identity is exemplified by such expressions as "I have been very jealous for the Lord God of Hosts" (1 Kings xix. 10). A kind of glass, thick, ribbed and non-transparent, was formerly known as "jealous-glass," and this application is seen in the borrowed French word *jalousie*, a blind or shutter, made of slats of wood, which slope in such a way as to admit air and a certain amount of light, while excluding rain and sun and inspection from without.

JEAN D'ARRAS, a 15th-century *trouvère*, about whose personal history nothing is known, was the collaborator with Antoine du Val and Fouquart de Cambrai in the authorship of a collection of stories entitled *Évangiles de quenouille*. They purport to record the narratives of a group of ladies at their spinning, who relate the current theories on a great variety of subjects. The work dates from the middle of the 15th century and is of considerable value for the light it throws on medieval manners.

There were many editions of this book in the 15th and 16th centuries, one of which was printed by Wynkyn de Worde in English, as *The Gospelles of Dystaves*. A modern edition (Collection Jannet) has a preface by Anatole France.

Another *trouvère*, JEAN D'ARRAS who flourished in the second half of the 14th century, wrote, at the request of John, duke of Berry, a long prose romance entitled *Chronique de la princesse*. It relates with many digressions the antecedents and life of the fairy Mélusine (*q.v.*).

JEAN DE MEUN, or DE MEUNG (*c.* 1250–*c.* 1305), whose original name was Jean Clopinel or Chopinel, was born at Meun-sur-Loire. Tradition asserts that he studied at the university of Paris. At any rate he was, like his contemporary, Rutebeuf, a defender of Guillaume de Saint-Amour and a bitter critic of the mendicant orders. Most of his life seems to have been spent in Paris, where he possessed, in the Rue Saint-Jacques, a house with a tower, court and garden. which was described in 1305 as the house of the late Jean de Meung, and was then bestowed by a certain Adam d'Andely on the Dominicans. Jean de Meun says that in his youth he composed songs that were sung in every public place and school in France. In the enumeration of his own works he places first his continuation of the *Roman de la rose* of Guillaume de Lorris (*q.v.*). The date of this second part is generally fixed between 1268 and 1285 by a reference in the poem to the death of Manfred and Conradin, executed (1268) by order of Charles of Anjou (d. 1285) who is described as the present king of Sicily. M. F. Guillon (*Jean Clopinel*, 1903), however, considering the poem primarily as a political satire, places it in the last five years of the 13th century. Jean de Meun doubtless edited the work of his predecessor, Guillaume de Lorris, before using it as the starting-point of his own vast poem, running to 19,000 lines. The continuation of Jean de Meun is a satire on the monastic orders, on celibacy, on the nobility, the papal see, the excessive pretensions of royalty, and especially on women and marriage. Guillaume had been the servant of love, and the exponent of the laws of "courtoisie"; Jean de Meun added an "art of love," exposing with brutality the vices of women, their arts of deception, and the means by which men may outwit them. Jean de Meun embodied the mocking, sceptical spirit of the *fabliaux*. He did not share in current superstitions, he had no respect for established institutions, and he scorned the conventions of feudalism and romance. His poem shows in the highest degree, in spite of the looseness of its plan, the faculty of keen observation, of lucid reasoning and exposition, and it entitles him to be considered the greatest of French medieval poets. He handled the French language with an ease and precision unknown to his predecessors, and the length of his poem was no bar to its popularity in the 13th and 14th centuries. Part of its vogue was no doubt due to the fact that the author, who had mastered practically all the scientific and literary knowledge of his contemporaries in France, had found room in his poem for a great amount of useful information and for numerous citations from classical authors. The book was attacked by Guillaume de Degulleville in his *Pèlerinage de la vie humaine* (*c.* 1330), long a favourite work both in England and France; by John Gerson, and by Christine de Pisan in her *Épître au dieu d'amour*; but it also found energetic defenders.

Jean de Meun translated in 1284 the treatise, *De re militari*, of Vegetius into French as *Le livre de Vegèce de l'art de chevalerie*[2] (ed. Ulysse Robert, *Soc. des anciens textes fr.*, 1897). He also produced a spirited version, the first in French, of the letters of Abelard and Hèloïse. A 14th-century MS. of this translation in the Bibliothèque Nationale has annotations by Petrarch. His translation of the *De consolatione philosophiae* of Boëtius is preceded by a letter to Philip IV. in which he enumerates his earlier works, two of which are lost—*De spirituelle amitié* from the *De spirituali amicitia* of Aelred of Rievaulx (d. 1166), and the *Livre des merveilles d'Hirlande* from the *Topographia Hibernica*, or *De Mirabilibus Hiberniae* of Giraldus Cambrensis (Giraud de Barry). His last poems are doubtless his *Testament* and *Codicille*. The *Testament* is written in quatrains in monorime, and contains advice to the different classes of the community.

See also Paulin Paris in *Hist. lit. de la France*, xxviii. 391–439, and E. Langlois in *Hist. de la langue et de la lit. française*, ed. L. Petit de Julleville, ii. 125–161 (1896); and editions of the *Roman de la rose* (*q.v.*).

JEANNETTE, a borough of Westmoreland county, Pennsylvania, U.S.A., about 27 m. E. by S. of Pittsburg. Pop. (1890), 3296; (1900), 5865 (1340 foreign-born); (1910), 8077. It is served by the Pennsylvania railroad, and is connected with Pittsburg and Uniontown by electric railway. It is supplied with natural gas and is primarily a manufacturing centre, its principal manufactures being glass, table-ware and rubber goods. Jeannette was founded in 1888, and was incorporated as a borough in 1889.

JEANNIN, PIERRE (1540–1622), French statesman, was born at Autun. A pupil of the great jurist Jacques Cujas at Bourges, he was an advocate at Dijon in 1569 and became councillor and then president of the *parlement* of Burgundy. He opposed in vain the massacre of St Bartholomew in his province. As councillor to the duke of Mayenne he sought to reconcile him with Henry IV. After the victory of Fontaine-Française (1595), Henry took Jeannin into his council and in 1602 named him intendant of finances. He took part in the principal events of the reign, negotiated the treaty of Lyons with the duke of Savoy

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[1] The birds known as blue jays in India and Africa are rollers (*q.v.*).

[2] Jean de Meun's translation formed the basis of a rhymed version (1290) by Jean Priorat of Besançon, *Li abreyance de l'ordre de chevalerie*.

(see Henry IV.), and the defensive alliance between France and the United Netherlands in 1608. As superintendent of finances under Louis XIII., he tried to establish harmony between the king and the queen-mother.

See Berger de Xivrey, *Lettres missives de Henri IV.* (in the *Collection inédite pour l'histoire de France*), t. v. (1850); P(ierre) S(aumaise), *Eloge sur la vie de Pierre Janin* (Dijon, 1623); Sainte-Beuve, *Causeries du lundi*, t. x. (May 1854).

JEBB, JOHN (1736–1786), English divine, was educated at Cambridge, where he was elected fellow of Peterhouse in 1761, having previously been second wrangler. He was a man of independent judgment and warmly supported the movement of 1771 for abolishing university and clerical subscription to the Thirty-nine Articles. In his lectures on the Greek Testament he is said to have expressed Socinian views. In 1775 he resigned his Suffolk church livings, and two years afterwards graduated M.D. at St Andrews. He practised medicine in London and was elected F.R.S. in 1779.

Another John Jebb (1775–1833), bishop of Limerick, is best known as the author of *Sacred Literature* (London, 1820).

JEBB, SIR RICHARD CLAVERHOUSE (1841–1905), English classical scholar, was born at Dundee on the 27th of August 1841. His father was a well-known barrister, and his grandfather a judge. He was educated at Charterhouse and at Trinity College, Cambridge. He won the Porson and Craven scholarships, was senior classic in 1862, and became fellow and tutor of his college in 1863. From 1869 to 1875 he was public orator of the university; professor of Greek at Glasgow from 1875 to 1889, and at Cambridge from 1889 till his death on the 9th of December 1905. In 1891 he was elected member of parliament for Cambridge University; he was knighted in 1900. Jebb was acknowledged to be one of the most brilliant classical scholars of his time, a humanist in the best sense, and his powers of translation from and into the classical languages were unrivalled. A collected volume, *Translations into Greek and Latin*, appeared in 1873 (ed. 1909). He was the recipient of many honorary degrees from European and American universities, and in 1905 was made a member of the Order of Merit. He married in 1874 the widow of General A. J. Slemmer, of the United States army, who survived him.

Jebb was the author of numerous publications, of which the following are the most important: The *Characters* of Theophrastus (1870), text, introduction, English translation and commentary (re-edited by J. E. Sandys, 1909); *The Attic Orators from Antiphon to Isaeus* (2nd ed., 1893), with companion volume, *Selections from the Attic Orators* (2nd ed., 1888); *Bentley* (1882); *Sophocles* (3rd ed., 1893) the seven plays, text, English translation and notes, the promised edition of the fragments being prevented by his death; *Bacchylides* (1905), text, translation, and notes; *Homer* (3rd ed., 1888), an introduction to the *Iliad* and *Odyssey*; *Modern Greece* (1901); *The Growth and Influence of Classical Greek Poetry* (1893). His translation of the *Rhetoric* of Aristotle was published posthumously under the editorship of J. E. Sandys (1909). A selection from his *Essays and Addresses*, and a subsequent volume, *Life and Letters of Sir Richard Claverhouse Jebb* (with critical introduction by A. W. Verrall) were published by his widow in 1907; see also an appreciative notice by J. E. Sandys, *Hist. of Classical Scholarship*, iii. (1908).

JEBEIL (anc. *Gebal-Byblus*), a town of Syria pleasantly situated on a slight eminence near the sea, about 20 m. N. of Beirut. It is surrounded by a wall 1½ m. in circumference, with square towers at the angles, and a castle at the south-east corner. Numerous broken granite columns in the gardens and vineyards that surround the town, with the number of ruined houses within the walls, testify to its former importance. The stele of Jehawmelek, king of Gebal, found here, is one of the most important of Phoenician monuments. The small port is almost choked up with sand and ruins. Pop. 3000, all Moslems.

The inhabitants of the Phoenician Gebal and Greek Byblus were renowned as stonecutters and ship-builders. Arrian (ii. 20.1) represents Enylus, king of Byblus, as joining Alexander with a fleet, after that monarch had captured the city. Philo of Byblus makes it the most ancient city of Phoenicia, founded by Cronus, *i.e.* the Moloch who appears from the stele of Jehawmelek to have been with Baalit the chief deity of the city. According to Plutarch (*Mor.* 357), the ark with the corpse of Osiris was cast ashore at Byblus, and there found by Isis. The orgies of Adonis in the temple of Baalit (Aphrodite Byblia) are described by Lucian, *De Dea Syr.*, cap. vi. The river Adonis is the Nahr al-Ibrahim, which flows near the town. The crusaders, after failing before it in 1099, captured "Giblet" in 1103, but lost it again to Saladin in 1189. Under Mahommedan rule it has gradually decayed. (D. G. H.)

JEBEL (plur. *jibāl*), also written Gebel with hard *g* (plur. *gibāl*), an Arabic word meaning a mountain or a mountain chain. It is frequently used in place-names. The French transliteration of the word is *djebel*. *Jebeli* signifies a mountaineer. The pronunciation with a hard *g* sound is that used in the Egyptian dialect of Arabic.

JEDBURGH, a royal and police burgh and county-town of Roxburghshire, Scotland. Pop. of police burgh (1901), 3136. It is situated on Jed Water, a tributary of the Teviot, 56¼ m. S.E. of Edinburgh by the North British railway, via Roxburgh and St Boswells (49 m. by road), and 10 m. from the border at Catcleuch Shin, a peak of the Cheviots, 1742 ft. high. Of the name Jedburgh there have been many variants, the earliest being Gedwearde (800), Jedwarth (1251), and Geddart (1586), while locally the word is sometimes pronounced Jethart. The town is situated on the left bank of the Jed, the main streets running at right angles from each side of the central market-place. Of the renowned group of Border abbeys—Jedburgh, Melrose, Dryburgh and Kelso—that of Jedburgh is the stateliest. In 1118, according to tradition, but more probably as late as 1138, David, prince of Cumbria, here founded a priory for Augustinian monks from the abbey of St Quentin at Beauvais in France, and in 1147, after he had become king, erected it into an abbey dedicated to the Virgin. Repeatedly damaged in Border warfare, it was ruined in 1544–45 during the English invasion led by Sir Ralph Evers (or Eure). The establishment was suppressed in 1559, the revenues being temporarily annexed to the Crown. After changing owners more than once, the lands were purchased in 1637 by the 3rd earl of Lothian. Latterly five of the bays at the west end had been utilized as the parish church, but in 1873–1875 the 9th marquess of Lothian built a church for the service of the parish, and presented it to the heritors in exchange for the ruined abbey in order to prevent the latter from being injured by modern additions and alterations.

The abbey was built of Old Red sandstone, and belongs mostly to the end of the 12th and the beginning of the 13th centuries. The architecture is mixed, and the abbey is a beautiful example of the Norman and Transition styles. The total length is 235 ft., the nave being 133½ ft. long and 59½ ft. wide. The west front contains a great Norman porch and a fine wheel window. The nave, on each side, has nine pointed arches in the basement storey, nine round arches in the triforium, and thirty-six pointed arches in the clerestory, through which an arcade is carried on both sides. The tower, at the intersection of the nave and transepts, is of unusually massive proportions, being 30 ft. square and fully 100 ft. high; the network baluster round the top is modern. With the exception of the north piers and a small portion of the wall above, which are Norman, the tower dates from the end of the 15th century. The whole of the south transept has perished. The north transept, with early Decorated windows, has been covered in and walled off, and is the burial-ground of the Kerrs of Fernihirst, ancestors of the marquess of Lothian. The earliest tombstone is dated 1524; one of the latest is the recumbent effigy, by G. F. Watts, R.A., of the 8th marquess of Lothian (1832–1870). All that is left of the choir, which contains some very early Norman work, is two bays with three tiers on each side, corresponding to the design of the nave. It is supposed that the aisle, with Decorated window and groined roof, south of the chancel, formed the grammar school (removed from the abbey in 1751) in which Samuel Rutherford (1600–1661), principal of St Mary's College, St Andrews, and James Thomson, author of *The Seasons*, were educated. The door leading from the south aisle into a herbaceous garden, formerly the cloister, is an exquisite copy of one which had become greatly decayed. It was designed by Sir Rowand Anderson, under whose superintendence restoration in the abbey was carried out.

The castle stood on high ground at the south end of the burgh, or "town-head." Erected by David I., it was one of the strongholds ceded to England in 1174, under the treaty of Falaise, for the ransom of William the Lion. It was, however, so often captured by the English that it became a menace rather than a protection, and the townsfolk demolished it in 1409. It had occasionally been used as a royal residence, and was the scene, in November 1285, of the revels held in celebration of the marriage (solemnized in the abbey) of Alexander III. to Joleta, or Yolande, daughter of the count of Dreux. The site was occupied in 1823 by the county prison, now known as the castle, a castellated structure which gradually fell into disuse and was acquired by the corporation in 1890. A house exists in Backgate in which Mary Queen of Scots, resided in 1566, and one in Castlegate which Prince Charles Edward occupied in 1745.

The public buildings include the grammar school (built in 1883 to replace the successor of the school in the abbey), founded by William Turnbull, bishop of Glasgow (d. 1454), the county buildings, the free library and the public hall, which succeeded to the corn exchange destroyed by fire in 1898, a loss that involved the museum and its contents, including the banners captured by the Jethart weavers at Bannockburn and Killiecrankie. The old market cross still exists, and there are two public parks. The chief industry is the manufacture of woollens (blankets, hosiery), but brewing, tanning and iron-founding are carried on, and fruit (especially pears) and garden produce are in repute. Jedburgh was made a royal burgh in the reign of David I., and received a charter from Robert I. and another, in 1566, from Mary Queen of Scots. Sacked and burned time after time during the Border strife, it was inevitable that the townsmen should become keen fighters. Their cry of "Jethart's here!" was heard wherever the fray waxed most fiercely, and the Jethart axe of their invention—a steel axe on a 4-ft. pole—wrought havoc in their hands.

"Jethart or Jeddart justice," according to which a man was hanged first and tried afterwards, seems to have been a hasty generalization from a solitary fact—the summary execution in James VI.'s reign of a gang of rogues at the instance of Sir George Home, but has nevertheless passed into a proverb.

Old Jeddart, 4 m. S. of the present town, the first site of the burgh, is now marked by a few grassy mounds, and of the great Jedburgh forest, only the venerable oaks, the "Capon Tree" and the "King of the Woods" remain. Dunion Hill (1095 ft.), about 2 m. south-west of Jedburgh, commands a fine view of the capital of the county.

JEEJEEBHOY (Jijibhai), **SIR JAMSETJEE** (Jamsetji), Bart. (1783–1859), Indian merchant and philanthropist, was born in Bombay in 1783, of poor but respectable parents, and was left an orphan in early life. At the age of sixteen, with a smattering of mercantile education and a bare pittance, he commenced a series of business travels destined to lead him to fortune and fame. After a preliminary visit to Calcutta, he undertook a voyage to China, then fraught with so much difficulty and risk that it was regarded as a venture betokening considerable enterprise and courage; and he subsequently initiated a systematic trade with that country, being himself the carrier of his merchant wares on his passages to and fro between Bombay and Canton and Shanghai. His second return voyage from China was made in one of the East India Company's fleet, which, under the command of Sir Nathaniel Dance, defeated the French squadron under Admiral Linois (Feb. 15, 1804). On his fourth return voyage from China, the Indiaman in which he sailed was forced to surrender to the French, by whom he was carried as a prisoner to the Cape of Good Hope, then a neutral Dutch possession; and it was only after much delay, and with great difficulty, that he made his way to Calcutta in a Danish ship. Nothing daunted, he undertook yet another voyage to China, which was more successful than any of the previous ones. By this time he had fairly established his reputation as a merchant possessed of the highest spirit of enterprise and considerable wealth, and thenceforward he settled down in Bombay, where he directed his commercial operations on a widely extended scale. By 1836 his firm was large enough to engross the energies of his three sons and other relatives; and he had amassed what at that period of Indian mercantile history was regarded as fabulous wealth. An essentially self-made man, having experienced in early life the miseries of poverty and want, in his days of affluence Jamsetjee Jeejeebhoy developed an active instinct of sympathy with his poorer countrymen, and commenced that career of private and public philanthropy which is his chief title to the admiration of mankind. His liberality was unbounded, and the absorbing occupation of his later life was the alleviation of human distress. To his own community he gave lavishly, but his benevolence was mainly cosmopolitan. Hospitals, schools, homes of charity, pension funds, were founded or endowed by him, while numerous public works in the shape of wells, reservoirs, bridges, causeways, and the like, not only in Bombay, but in other parts of India, were the creation of his bounty. The total of his known benefactions amounted at the time of his death, which took place in 1859, to over £230,000. It was not, however, the amount of his charities so much as the period and circumstances in which they were performed that made his benevolent career worthy of the fame he won. In the first half of the 19th century the various communities of India were much more isolated in their habits and their sympathies than they are now. Jamsetjee Jeejeebhoy's unsectarian philanthropy awakened a common understanding and created a bond between them which has proved not only of domestic value but has had a national and political significance. His services were recognized first in 1842 by the bestowal of a knighthood upon him, and in 1858 by that of a baronetcy. These were the very first distinctions of their kind conferred by Queen Victoria upon a British subject in India.

His title devolved in 1859 on his eldest son Cursetjee, who, by a special Act of the Viceroy's Council in pursuance of a provision in the letters-patent, took the name of Sir Jamsetjee Jeejeebhoy as second baronet. At his death in 1877 his eldest son, Menekjee, became Sir Jamsetjee Jeejeebhoy, the third baronet. Both had the advantage of a good English education, and continued the career of benevolent activity and devoted loyalty to British rule which had signalized the life-work of the founder of the family. They both visited England to do homage to their sovereign; and their public services were recognized by their nomination to the order of the Star of India, as well as by appointment to the Legislative Councils of Calcutta and Bombay.

On the death of the third baronet, the title devolved upon his brother, Cowsajee (1853–1908), who became Sir Jamsetjee Jeejeebhoy, fourth baronet, and the recognized leader of the Parsee community all over the world. He was succeeded by his son Rustomjee (b. 1878), who became Sir Jamsetjee Jeejeebhoy, fifth baronet.

Since their emigration from Persia, the Parsee community had never had a titular chief or head, its communal funds and affairs being managed by a public body, more or less democratic in its constitution, termed the Parsee panchayat. The first Sir Jamsetjee, by the hold that he established on the community, by his charities and public spirit, gradually came to be regarded in the light of its chief; and the recognition which he was the first in India to receive at the hands of the British sovereign finally fixed him and his successors in the baronetcy in the position and title of the official Parsee leader. (M. M. Bh.)

JEFFERIES, RICHARD (1848–1887), English naturalist and author, was born on the 6th of November 1848, at the farmhouse of Coate about 2½ m. from Swindon, on the road to Marlborough. He was sent to school, first at Sydenham and then at Swindon, till the age of fifteen or so, but his actual education was at the hands of his father, who gave him his love for Nature and taught him how to observe. For the faculty of observation, as Jefferies, Gilbert White, and H. D. Thoreau have remarked, several gifts are necessary, including the possession of long sight and quick sight, two things which do not always go together. To them must be joined trained sight and the knowledge of what to expect. The boy's father first showed him what there was to look for in the hedge, in the field, in the trees, and in the sky. This kind of training would in many cases be wasted: to one who can understand it, the book of Nature will by-and-by offer pages which are blurred and illegible to the city-bred lad, and even to the country lad the power of reading them must be maintained by constant practice. To live amid streets or in the working world destroys it. The observer must live alone and always in the country; he must not worry himself about the ways of the world; he must be always, from day to day, watching the infinite changes and variations of Nature. Perhaps, even when the observer can actually read this book of Nature, his power of articulate speech may prove inadequate for the expression of what he sees. But Jefferies, as a boy, was more than an observer of the fields; he was bookish, and read all the books that he could borrow or buy. And presently, as is apt to be the fate of a bookish boy who cannot enter a learned profession, he became a journalist and obtained a post on the local paper. He developed literary ambitions, but for a long time to come was as one beating the air. He tried local history and novels; but his early novels, which were published at his own risk and expense, were, deservedly, failures. In 1872, however, he published a remarkable letter in *The Times*, on "The Wiltshire Labourer," full of original ideas and of facts new to most readers. This was in reality the turning-point in his career. In 1873, after more false starts, Jefferies returned to his true field of work, the life of the country, and began to write for *Fraser's Magazine* on "Farming and Farmers." He had now found himself. The rest of his history is that of continual advance, from close observation becoming daily more and more close, to that intimate communion with Nature with which his later pages are filled. The developments of the later period are throughout touched with the melancholy that belongs to ill-health. For, though in his prose poem called "The Pageant of Summer" the writer seems absolutely revelling in the strength of manhood that belongs to that pageant, yet, in the *Story of My Heart*, written about the same time, we detect the mind that is continually turned to death. He died at Goring, worn out with many ailments, on the 14th of August 1887. The best-known books of Richard Jefferies are: *The Gamekeeper at Home* (1878); *The Story of My Heart* (1883); *Life of the Fields* (1884), containing the best paper he ever wrote, "The Pageant of Summer"; *Amaryllis at the Fair* (1884), in which may be found the portraits of his own people; and *The Open Air*. He stands among the scanty company of men who address a small audience, for whom he read aloud these pages of Nature spoken of above, which only he, and the few like unto him, can decipher.

See Sir Walter Besant, *Eulogy of Richard Jefferies* (1888); H. S. Salt, *Richard Jefferies: a Study* (1894); Edward Thomas, *Richard Jefferies, his Life and Work* (1909). (W. Be.)

JEFFERSON, JOSEPH (1829–1905), American actor, was born in Philadelphia on the 20th of February 1829. He was the third actor of this name in a family of actors and managers, and the most famous of all American comedians. At the age of three he appeared as the boy in Kotzebue's *Pizarro*, and throughout his youth he underwent all the hardships connected with theatrical touring in those early days. After a miscellaneous experience, partly as actor, partly as manager, he won his first pronounced success in 1858 as Asa Trenchard in Tom Taylor's *Our American Cousin* at Laura Keene's theatre in New York. This play was the turning-point of his career, as it was of Sothern's. The naturalness and spontaneity of humour with which he acted the love scenes revealed a spirit in comedy new to his contemporaries, long used to a more artificial convention; and the touch of pathos which the part required revealed no less to the actor an unexpected power in himself. Other early parts were Newman Noggs in *Nicholas Nickleby*, Caleb Plummer in *The Cricket on the Hearth*, Dr Pangloss in *The Heir at Law*, Salem Scudder in *The Octoroon*, and Bob Acres in *The Rivals*, the last being not so much an interpretation of the character as Sheridan sketched it as a creation of the actor's. In 1859 Jefferson made a dramatic version of the story of *Rip Van Winkle* on the basis of older plays, and acted it with success at Washington. The play was given its permanent form by Dion Boucicault in London, where (1865) it ran 170 nights, with Jefferson in the leading part. Jefferson continued to act with undiminished popularity in a limited number of parts in nearly every town in the United States, his Rip Van Winkle, Bob Acres, and Caleb Plummer being the most popular. He was one of the first to establish the travelling combinations which superseded the old system of local stock companies. With the exception of minor parts, such as the First Gravedigger in *Hamlet*, which he played in an "all star combination" headed by Edwin Booth, Jefferson created no new character after 1865; and the success of Rip Van Winkle was so pronounced that he has often been called a one-part actor. If this was a fault, it was the public's, who never wearied of his one masterpiece. Jefferson died on the 23rd of April 1905. No man in his profession was more honoured for his achievements or his character. He was the friend of many of the leading men in American politics, art and literature. He was an ardent fisherman and lover of nature, and devoted to painting. Jefferson was twice married: to an actress, Margaret Clements Lockyer (1832–1861), in 1850, and in 1867 to Sarah Warren, niece of William Warren the actor.

Jefferson's *Autobiography* (New York, 1889) is written with admirable spirit and humour, and its judgments with regard to the art of the actor and of the playwright entitle it to a place beside Cibber's *Apology*. See William Winter, *The Jeffersons* (1881), and *Life of Joseph Jefferson* (1894); Mrs. E. P. Jefferson, *Recollections of Joseph Jefferson* (1909).

JEFFERSON, THOMAS (1743-1826), third president of the United States of America, and the most conspicuous apostle of democracy in America, was born on the 13th of April 1743, at Shadwell, Albemarle county, Virginia. His father, Peter Jefferson (1707-1757), of early Virginian yeoman stock, was a civil engineer and a man of remarkable energy, who became a justice of the peace, a county surveyor and a burgess, served the Crown in inter-colonial boundary surveys, and married into one of the most prominent colonial families, the Randolphs. Albemarle county was then in the frontier wilderness of the Blue Ridge, and was very different, socially, from the lowland counties where a few broad-acred families dominated an open-handed, somewhat luxurious and assertive aristocracy. Unlike his Randolph connexions, Peter Jefferson was a whig and a thorough democrat; from him, and probably, too, from the Albemarle environment, his son came naturally by democratic inclinations.

Jefferson carried with him from the college of William and Mary at Williamsburg, in his twentieth year, a good knowledge of Latin, Greek and French (to which he soon added Spanish, Italian and Anglo-Saxon), and a familiarity with the higher mathematics and natural sciences only possessed, at his age, by men who have a rare natural taste and ability for those studies. He remained an ardent student throughout life, able to give and take in association with the many scholars, American and foreign, whom he numbered among his friends and correspondents. With a liberal Scotsman, Dr William Small, then of the faculty of William and Mary and later a friend of Erasmus Darwin, and George Wythe (1726–1806), a very accomplished scholar and leader of the Virginia bar, Jefferson was an habitual member, while still in college, of a *partie carrée* at the table of Francis Fauquier (*c.* 1720–1768), the accomplished lieutenant-governor of Virginia. Jefferson was an expert violinist, a good singer and dancer, proficient in outdoor sports, and an excellent horseman. Thorough-bred horses always remained to him a necessary luxury. When it is added that Fauquier was a passionate gambler, and that the gentry who gathered every winter at Williamsburg, the seat of government of the province, were ruinously addicted to the same weakness, and that Jefferson had a taste for racing, it does credit to his early strength of character that of his social opportunities he took only the better. He never used tobacco, never played cards, never gambled, and was never party to a personal quarrel.

Soon after leaving college he entered Wythe's law office, and in 1767, after five years of close study, was admitted to the bar. His thorough preparation enabled him to compete from the first with the leading lawyers of the colony, and his success shows that the bar had no rewards that were not fairly within his reach. As an advocate, however, he did not shine; a weakness of voice made continued speaking impossible, and he had neither the ability nor the temperament for oratory. To his legal scholarship and collecting zeal Virginia owed the preservation of a large part of her early statutes. He seems to have lacked interest in litigiousness, which was extraordinarily developed in colonial

Virginia; and he saw and wished to reform the law's abuses. It is probable that he turned, therefore, the more willingly to politics; at any rate, soon after entering public life he abandoned practice (1774).

The death of his father had left him an estate of 1900 acres, the income from which (about £400) gave him the position of an independent country gentleman; and while engaged in the law he had added to his farms after the ambitious Virginia fashion, until, when he married in his thirtieth year, there were 5000 acres all paid for; and almost as much more[1] came to him in 1773 on the death of his father-in-law. On the 1st of January 1772, Jefferson married Martha Wayles Skelton (1749–1782), a childless widow of twenty-three, very handsome, accomplished, and very fond of music. Their married life was exceedingly happy, and Jefferson never remarried after her early death. Of six children born from their union, two daughters alone survived infancy. Jefferson was emotional and very affectionate in his home, and his generous and devoted relations with his children and grandchildren are among the finest features of his character.

Jefferson began his public service as a justice of the peace and parish vestryman; he was chosen a member of the Virginia house of burgesses in 1769 and of every succeeding assembly and convention of the colony until he entered the Continental Congress in 1775. His forceful, facile pen gave him great influence from the first; but though a foremost member of several great deliberative bodies, he can fairly be said never to have made a speech. He hated the "morbid rage of debate" because he believed that men were never convinced by argument, but only by reflection, through reading or unprovocative conversation; and this belief guided him through life. Moreover it is very improbable that he could ever have shone as a public speaker, and to this fact unfriendly critics have attributed, at least in part, his abstention from debate. The house of burgesses of 1769, and its successors in 1773 and 1774, were dissolved by the governor (see VIRGINIA) for their action on the subject of colonial grievances and intercolonial co-operation. Jefferson was prominent in all; was a signer of the Virginia agreement of non-importation and economy (1769); and was elected in 1774 to the first Virginia convention, called to consider the state of the colony and advance intercolonial union. Prevented by illness from attending, Jefferson sent to the convention elaborate resolutions, which he proposed as instructions to the Virginia delegates to the Continental Congress that was to meet at Philadelphia in September. In the direct language of reproach and advice, with no disingenuous loading of the Crown's policy upon its agents, these resolutions attacked the errors of the king, and maintained that "the relation between Great Britain and these colonies was exactly the same as that of England and Scotland after the accession of James and until the Union; and that our emigration to this country gave England no more rights over us than the emigration of the Danes and Saxons gave to the present authorities of their mother country over England." This was cutting at the common root of allegiance, emigration and colonization; but such radicalism was too thorough-going for the immediate end. The resolutions were published, however, as a pamphlet, entitled *A Summary View of the Rights of America*, which was widely circulated. In England, after receiving such modifications—attributed to Burke—as adapted it to the purposes of the opposition, this pamphlet ran through many editions, and procured for its author, as he said, "the honour of having his name inserted in a long list of proscriptions enrolled in a bill of attainder commenced in one of the two houses of parliament, but suppressed in embryo by the hasty course of events." It placed Jefferson among the foremost leaders of revolution, and procured for him the honour of drafting, later, the Declaration of Independence, whose historical portions were, in large part, only a revised transcript of the *Summary View*. In June 1775 he took his seat in the Continental Congress, taking with him fresh credentials of radicalism in the shape of Virginia's answer, which he had drafted, to Lord North's conciliatory propositions. Jefferson soon drafted the reply of Congress to the same propositions. Reappointed to the next Congress, he signalized his service by the authorship of the Declaration of Independence (*q.v.*). Again reappointed, he surrendered his seat, and after refusing a proffered election to serve as a commissioner with Benjamin Franklin and Silas Deane in France, he entered again, in October 1776, the Virginia legislature, where he considered his services most needed.

The local work to which Jefferson attributed such importance was a revision of Virginia's laws. Of the measures proposed to this end he says: "I considered four, passed or reported, as forming a system by which every trace would be eradicated of ancient or future aristocracy, and a foundation laid for a government truly republican"—the repeal of the laws of entail; the abolition of primogeniture and the unequal division of inheritances (Jefferson was himself an eldest son); the guarantee of freedom of conscience and relief of the people from supporting, by taxation, an established church; and a system of general education. The first object was embodied in law in 1776, the second in 1785, the third[2] in 1786 (supplemented 1799, 1801). The last two were parts of a body of codified laws prepared (1776–1779) by Edmund Pendleton,[3] George Wythe, and Jefferson, and principally by Jefferson. Not so fortunate were Jefferson's ambitious schemes of education. District, grammar and classical schools, a free state library and a state college, were all included in his plan. He was the first American statesman to make education by the state a fundamental article of democratic faith. His bill for elementary education he regarded as the most important part of the code, but Virginia had no strong middle class, and the planters would not assume the burden of educating the poor. At this time Jefferson championed the natural right of expatriation, and gradual emancipation of the slaves. His earliest legislative effort, in the five-day session of 1769, had been marked by an effort to secure to masters freedom to manumit their slaves without removing them from the state. It was unsuccessful, and the more radical measure he now favoured was even more impossible of attainment; but a bill he introduced to prohibit the importation of slaves was passed in 1778—the only important change effected in the slave system of the state during the War of Independence. Finally he endeavoured, though unsuccessfully, to secure the introduction of juries into the courts of chancery, and—a generation and more before the fruition of the labours of Romilly and his co-workers in England—aided in securing a humanitarian revision of the penal code,[4] which, though lost by one vote in 1785, was sustained by public sentiment, and was adopted in 1796. Jefferson is of course not entitled to the sole credit for all these services: Wythe, George Mason and James Madison, in particular, were his devoted lieutenants, and—after his departure for France—the principals in the struggle; moreover, an approving public opinion must receive large credit. But Jefferson was throughout the chief inspirer and foremost worker.

In 1779, at almost the gloomiest stage of the war in the southern states, Jefferson succeeded Patrick Henry as the governor of Virginia, being the second to hold that office after the organization of the state government. In his second term (1780–1781) the state was overrun by British expeditions, and Jefferson, a civilian, was blamed for the ineffectual resistance. Though he cannot be said to have been eminently fitted for the task that devolved upon him in such a crisis, most of the criticism of his administration was undoubtedly grossly unjust. His conduct being attacked, he declined renomination for the governorship, but was unanimously returned by Albemarle as a delegate to the state legislature; and on the day previously set for legislative inquiry on a resolution offered by an impulsive critic, he received, by unanimous vote of the house, a declaration of thanks and confidence. He wished however to retire permanently from public life, a wish strengthened by the illness and death of his wife. At this time he composed his *Notes on Virginia*, a semi-statistical work full of humanitarian liberalism. Congress twice offered him an appointment as one of the plenipotentiaries to negotiate peace with England, but, though he accepted the second offer, the business was so far advanced before he could sail that his appointment was recalled. During the following winter (1783) he was again in Congress, and headed the committee appointed to consider the treaty of peace. In the succeeding session his service was marked by a report, from which resulted the present monetary system of the United States (the fundamental idea of its decimal basis being due, however, to Gouverneur Morris); and by the honour of reporting the first definitely formulated plan for the government of the western territories,[1] that embodied in the ordinance of 1784. He was already particularly associated with the great territory north-west of the Ohio; for Virginia had tendered to Congress in 1781, while Jefferson was governor, a cession of her claims to it, and now in 1784 formally transferred the territory by act of Jefferson and his fellow delegates in congress: a consummation for which he had laboured from the beginning. His anti-slavery opinions grew in strength with years (though he was somewhat inconsistent in his attitude on the Missouri question in 1820–1821). Not only justice but patriotism as well pleaded with him the cause of the negroes,[2] for he foresaw the certainty that the race must some day, in some way, be freed, and the dire political dangers involved in the institution of slavery; and could any feasible plan of emancipation have been suggested he would have regarded its cost as a mere bagatelle.

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[1] It was embarrassed with a debt, however, of £3749, which, owing to conditions caused by the War of Independence, he really paid three times to his British creditors (not counting destruction on his estates, of equal amount, ordered by Lord Cornwallis). This greatly reduced his income for a number of years.

[2] The first law of its kind in Christendom, although not the earliest practice of such liberty in America.

[3] George Mason and Thomas L. Lee were members of the commission, but they were not lawyers, and did little actual work on the revision.

[4] Capital punishment was confined to treason and murder; the former was not to be attended by corruption of blood, drawing, or quartering; all other felonies were made punishable by confinement and hard labour, save a few to which was applied, against Jefferson's desire, the principle of retaliation.

From 1784 to 1789 Jefferson was in France, first under an appointment to assist Benjamin Franklin and John Adams in negotiating treaties of commerce with European states, and then as Franklin's successor (1785–1789) as minister to France.[3] In these years he travelled widely in western Europe. Though the commercial principles of the United States were far too liberal for acceptance, as such, by powers holding colonies in America, Jefferson won some specific concessions to American trade. He was exceedingly popular as a minister. The criticism is even to-day current with the uninformed that Jefferson took his manners,[4] morals, "irreligion" and political philosophy from his French residence; and it cannot be wholly ignored. It may therefore be said that there is nothing except unsubstantiated scandal to contradict the conclusion, which various evidence supports, that Jefferson's morals were pure. His religious views and political beliefs will be discussed later. His theories had a deep and broad basis in English whiggism; and though he may well have found at least confirmation of his own ideas in French writers—and notably in Condorcet—he did not read sympathetically the writers commonly named, Rousseau and Montesquieu; besides, his democracy was seasoned, and he was rather a teacher than a student of revolutionary politics when he went to Paris. The *Notes on Virginia* were widely read in Paris, and undoubtedly had some influence in forwarding the dissolution of the doctrines of divine rights and passive obedience among the cultivated classes of France. Jefferson was deeply interested in all the events leading up to the French Revolution, and all his ideas were coloured by his experience of the five seething years passed in Paris. On the 3rd of June 1789 he proposed to the leaders of the third estate a compromise between the king and the nation. In July he received the extraordinary honour of being invited to assist in the deliberations of the committee appointed by the national assembly to draft a constitution. This honour his official position compelled him, of course, to decline; for he sedulously observed official proprieties, and in no way gave offence to the government to which he was accredited.

When Jefferson left France it was with the intention of soon returning; but President Washington tendered him the secretaryship of state in the new federal government, and Jefferson reluctantly accepted. His only essential objection to the constitution—the absence of a bill of rights—was soon met, at least partially, by amendments. Alexander Hamilton (*q.v.*) was secretary of the treasury. These two men, antipodal in temperament and political belief, clashed in irreconcilable hostility, and in the conflict of public sentiment, first on the financial measures of Hamilton, and then on the questions with regard to France and Great Britain, Jefferson's sympathies being predominantly with the former, Hamilton's with the latter, they formed about themselves the two great parties of Democrats and Federalists. The schools of thought for which they stood have since contended for mastery in American politics: Hamilton's gradually strengthened by the necessities of stronger administration, as time gave widening amplitude and increasing weight to the specific powers—and so to Hamilton's great doctrine of the "implied powers"—of the general government of a growing country; Jefferson's rooted in colonial life, and buttressed by the hopes and convictions of democracy.

The most perplexing questions treated by Jefferson as secretary of state arose out of the policy of neutrality adopted by the United States toward France, to whom she was bound by treaties and by a heavy debt of gratitude. Separation from European politics—the doctrine of "America for Americans" that was embodied later in the Monroe declaration—was a tenet cherished by Jefferson as by other leaders (not, however, Hamilton) and by none cherished more firmly, for by nature he was peculiarly opposed to war, and peace was a fundamental part of his politics. However deep, therefore, his French sympathies, he drew the same safe line as did Washington between French politics and American politics,[5] and handled the Genet complications to the satisfaction of even the most partisan Federalists. He expounded, as a very high authority has said, "with remarkable clearness and power the nature and scope of neutral duty," and gave a "classic" statement of the doctrine of recognition.[6]

But the French question had another side in its reaction on American parties.[7] Jefferson did not read excesses in Paris as warnings against democracy, but as warnings against the abuses of monarchy; nor did he regard Bonaparte's *coup d'état* as revealing the weakness of republics, but rather as revealing the danger of standing armies; he did not look on the war of the coalitions against France as one of mere powers, but as one between forms of government; and though the immediate fruits of the Revolution belied his hopes, as they did those of ardent humanitarians the world over, he saw the broad trend of history, which vindicated his faith that a successful reformation of government in France would insure "a general reformation through Europe, and the resurrection to a new life of their people." Each of these statements could be reversed as regards Hamilton. It is the key to an understanding of the times to remember that the War of Independence had disjointed society; and democracy—which Jefferson had proclaimed in the Declaration of Independence, and enthroned in Virginia—after strengthening its rights by the sword, had run to excesses, particularly in the Shays' rebellion, that produced a conservative reaction. To this reaction Hamilton explicitly appealed in the convention of 1787; and of this reaction various features of the constitution, and Hamiltonian federalism generally, were direct fruits. Moreover, independently of special incentives to the alarmist and the man of property, the opinions of many Americans turned again, after the war, into a current of sympathy for England, as naturally as American commerce returned to English ports. Jefferson, however, far from America in these years and unexposed to reactionary influences, came back with undiminished fervour of democracy, and the talk he heard of praise for England, and fearful recoil before even the beginning of the revolution in France, disheartened him, and filled him with suspicion.[1] Hating as he did feudal class institutions and Tudor-Stuart traditions of arbitrary rule,[2] his attitude can be imagined toward Hamilton's oft-avowed partialities—and Jefferson assumed, his intrigues—for British class-government with its eighteenth-century measure of corruption. In short, Hamilton took from recent years the lesson of the evils of lax government; whereas Jefferson clung to the other lesson, which crumbling colonial governments had illustrated, that governments derived their strength (and the Declaration had proclaimed that they derived their just rights) from the will of the governed. Each built his system accordingly: the one on the basis of order, the other on individualism—which led Jefferson to liberty alike in religion and in politics. The two men and the fate of the parties they led are understandable only by regarding one as the leader of reaction, the other as in line with the American tendencies. The educated classes characteristically furnished Federalism with a remarkable body of alarmist leaders; and thus it happened that Jefferson, because, with only a few of his great contemporaries, he had a thorough trust and confidence in the people, became the idol of American democracy.

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[1] This plan applied to the south-western as well as to the north-western territory, and was notable for a provision that slavery should not exist therein after 1800. This provision was defeated in 1784, but was adopted in 1787 for the north-western territory—a step which is very often said to have saved the Union in the Civil War; the south-western territory (out of which were later formed Mississippi, Alabama, &c.) being given over to slavery. Thus the anti-slavery clause of the ordinance of 1784 was not adopted; and it was preceded by unofficial proposals to the same end; yet to it belongs rightly some special honour as blazoning the way for federal control of slavery in the territories, which later proved of such enormous consequence. Jefferson in the first draft of the Ordinance of 1784, suggested the names to be given to the states eventually to be formed out of the territory concerned. For his suggestions he has been much ridiculed. The names are as follows: Illinoia, Michigania, Sylvania, Polypotamia, Assenisipia, Charronesus, Pelisipia, Saratoga, Metropotamia and Washington.

[2] He owned at one time above 150 slaves. His overseers were under contract never to bleed them; but he manumitted only a few at his death.

[3] During this time he assisted in negotiating a treaty of amity and commerce with Prussia (1785) and one with Morocco (1789), and negotiated with France a "convention defining and establishing the functions and privileges of consuls and vice-consuls" (1788).

[4] Patrick Henry humorously declaimed before a popular audience that Jefferson, who favoured French wine and cookery, had "abjured his native victuals."

[5] Jefferson did not sympathize with the temper of his followers who condoned the zealous excesses of Genet, and in general with the "misbehaviour" of the democratic clubs; but, as a student of English liberties, he could not accept Washington's doctrine that for a self-created permanent body to declare "this act unconstitutional, and that act pregnant with mischiefs" was "a stretch of arrogant presumption" which would, if unchecked, "destroy the country."

[6] John Basset Moore, *American Diplomacy* (New York, 1905).

[7] Compare C. D. Hazen, *Contemporary American opinion of the French Revolution* (Johns Hopkins University, Baltimore, 1897).

As Hamilton was somewhat officious and very combative, and Jefferson, although uncontentious, very suspicious and quite independent, both men holding inflexibly to opinions, cabinet harmony became impossible when the two secretaries had formed parties about them and their differences were carried into the newspapers;[3] and Washington abandoned perforce his idea "if parties did exist to reconcile them." Partly from discontent with a position in which he did not feel that he enjoyed the absolute confidence of the president,[4] and partly because of the embarrassed condition of his private affairs, Jefferson repeatedly sought to resign, and finally on the 31st of December 1793, with Washington's reluctant consent, gave up his portfolio and retired to his home at Monticello, near Charlottesville.

Here he remained improving his estate (having refused a foreign mission) until elected vice-president in 1796. Jefferson was never truly happy except in the country. He loved gardening, experimented enthusiastically in varieties and rotations of crops and kept meteorological tables with diligence. For eight years he tabulated with painful accuracy the earliest and latest appearance of thirty-seven vegetables in the Washington market. When abroad he sought out varieties of grasses, trees, rice and olives for American experiment, and after his return from France received yearly for twenty-three years, from his old friend the superintendent of the *Jardin des plantes*, a box of seeds, which he distributed to public and private gardens throughout the United States. Jefferson seems to have been the first discoverer of an exact formula for the construction of mould-boards of least resistance for ploughs. He managed to make practical use of his calculus about his farms, and seems to have been remarkably apt in the practical application of mechanical principles.

In the presidential election of 1796 John Adams, the Federalist candidate, received the largest number of electoral votes, and Jefferson, the Republican candidate, the next largest number, and under the law as it then existed the former became president and the latter vice-president. Jefferson re-entered public life with reluctance, though doubtless with keen enough interest and resolution. He had rightly measured the strength of his followers, and was waiting for the government to "drift into unison" with the republican sense of its constituents, predicting that President Adams would be "overborne" thereby. This prediction was speedily fulfilled. At first the reign of terror and the X. Y. Z. disclosures strengthened the Federalists, until these, mistaking the popular resentment against France for a reaction against democracy—an equivalence in their own minds—passed the alien and sedition laws. In answer to those odious measures Jefferson and Madison prepared and procured the passage of the Kentucky and Virginia resolutions. These resolutions later acquired extraordinary and pernicious prominence in the historical elaboration of the states'-rights doctrine. It is, however, unquestionably true, that as a startling protest against measures "to silence," in Jefferson's words, "by force and not by reason the complaints or criticisms, just or unjust, of our citizens against the conduct of our agents," they served, in this respect, a useful purpose; and as a counterblast against Hamiltonian principles of centralization they were probably, at that moment, very salutary; while even as pieces of constitutional interpretation it is to be remembered that they did not contemplate nullification by any single state, and, moreover, are not to be judged by constitutional principles established later by courts and war. The Federalist party had ruined itself, and it lost the presidential election of 1800. The Republican candidates, Jefferson and Aaron Burr (*q.v.*), receiving equal votes, it devolved upon the House of Representatives, in accordance with the system which then obtained, to make one of the two president, the other vice-president. Party feeling in America has probably never been more dangerously impassioned than in the three years preceding this election; discount as one will the contrary obsessions of men like Fisher Ames, Hamilton and Jefferson, the time was fateful. Unable to induce Burr to avow Federalist principles, influential Federalists, in defiance of the constitution, contemplated the desperate alternative of preventing an election, and appointing an extra-constitutional (Federalist) president *pro tempore*. Better counsels, however, prevailed; Hamilton used his influence in favour of Jefferson as against Burr, and Jefferson became president, entering upon his duties on the 4th of March 1801. Republicans who had affiliated with the Federalists at the time of the X. Y. Z. disclosures returned; very many of the Federalists themselves Jefferson placated and drew over. "Believing," he wrote, "that (excepting the ardent monarchists) all our citizens agreed in ancient whig principles"—or, as he elsewhere expressed it, in "republican forms"—"I thought it advisable to define and declare them, and let them see the ground on which we can rally." This he did in his inaugural, which, though somewhat rhetorical, is a splendid and famous statement of democracy.[1] His conciliatory policy produced a mild schism in his own party, but proved eminently wise, and the state elections of 1801 fulfilled his prophecy of 1791 that the policy of the Federalists would leave them "all head and no body." In 1804 he was re-elected by 162 out of 176 votes.

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[1] It was at this period of his life that Jefferson gave expression to some of the opinions for which he has been most severely criticized and ridiculed. For the Shays' rebellion he felt little abhorrence, and wrote: "A little rebellion now and then is a good thing . . . an observation of this truth should render honest republican governors so mild in their punishment of rebellions as not to discourage them too much. It is a medicine necessary for the sound health of government" (*Writings*, Ford ed., iv. 362–363). Again, "Can history produce an instance of rebellion so honorably conducted? . . . God forbid that we should ever be twenty years without such a rebellion. . . . What signify a few lives lost in a century or two? The tree of liberty must be refreshed from time to time with the blood of patriots and tyrants. It is its natural manure" (Ibid. iv. 467). Again he says: "Societies exist under three forms—(1) without government, as among our Indians; (2) under governments wherein the will of every one has a just influence. . . . (3) under governments of force. . . . It is a problem not clear in my mind that the first condition is not the best." (Ibid. iv. 362.)

[2] He turned law students from Blackstone's toryism to Coke on Littleton; and he would not read Walter Scott, so strong was his aversion to that writer's predilection for class and feudalism.

[3] Hamilton wrote for the papers himself; Jefferson never did. A talented clerk in his department, however, Philip Freneau, set up an anti-administration paper. It was alleged that Jefferson appointed him for the purpose, and encouraged him. Undoubtedly there was nothing in the charge. The Federalist outcry could only have been silenced by removal of Freneau, or by disclaimers or admonitions, which Jefferson did not think it incumbent upon himself—or, since he thought Freneau was doing good, desirable for him—to make.

[4] Contrary to the general belief that Hamilton dominated Washington in the cabinet, there is the president's explicit statement that "there were as many instances" of his deciding against as in favour of the secretary of the treasury.

Jefferson's administrations were distinguished by the simplicity that marked his conduct in private life. He eschewed the pomp and ceremonies, natural inheritances from English origins, that had been an innocent setting to the character of his two noble predecessors. His dress was of "plain cloth" on the day of his inauguration. Instead of driving to the Capitol in a coach and six, he walked without a guard or servant from his lodgings—or, as a rival tradition has it, he rode, and hitched his horse to a neighbouring fence—attended by a crowd of citizens. Instead of opening Congress with a speech to which a formal reply was expected, he sent in a written message by a private hand. He discontinued the practice of sending ministers abroad in public vessels. Between himself and the governors of states he recognized no difference in rank. He would not have his birthday celebrated by state balls. The weekly levée was practically abandoned. Even such titles as "Excellency," "Honourable," "Mr" were distasteful to him. It was formally agreed in cabinet meeting that "when brought together in society, all are perfectly equal, whether foreign or domestic, titled or untitled, in or out of office." Thus diplomatic grades were ignored in social precedence and foreign relations were seriously compromised by dinner-table complications. One minister who appeared in gold lace and dress sword for his first, and regularly appointed, official call on the president, was received—as he insisted with studied purpose—by Jefferson in negligent undress and slippers down at the heel. All this was in part premeditated system[2]—a part of Jefferson's purpose to republicanize the government and public opinion, which was the distinguishing feature of his administration; but it was also simply the nature of the man. In the company he chose by preference, honesty and knowledge were his only tests. He knew absolutely no social distinctions in his willingness to perform services for the deserving. He held up to his daughter as an especial model the family of a poor but gifted mechanic as one wherein she would see "the best examples of rational living." "If it be possible," he said, "to be certainly conscious of anything, I am conscious of feeling no difference between writing to the highest and lowest being on earth."

Jefferson's first administration was marked by a reduction of the army, navy, diplomatic establishment and, to the uttermost, of governmental expenses; some reduction of the civil service, accompanied by a large shifting of offices to Republicans; and, above all, by the Louisiana Purchase (*q.v.*), following which Meriwether Lewis and William Clark, sent by Jefferson, conducted their famous exploring expedition across the continent to the Pacific (see LEWIS, MERIWETHER). Early in his term he carried out a policy he had urged upon the government when minister to France and when vice-president, by dispatching naval forces to coerce Tripoli into a decent respect for the trade of his country—the first in Christendom to gain honourable immunity from tribute or piracy in the Mediterranean. The Louisiana Purchase, although the greatest "inconsistency" of his career, was also an illustration, in corresponding degree, of his essential practicality, and one of the greatest proofs of his statesmanship. It was the crowning achievement of his administration. It is often said that Jefferson established the "spoils system" by his changes in the civil service. He was the innovator, because for the first time there was opportunity for innovation. But mere justice requires attention to the fact that incentive to that innovation, and excuse for it, were found in the absolute one-party monopoly maintained by the Federalists. Moreover, Jefferson's ideals were high; his reasons for changes were in general excellent; he at least so far resisted the great pressure for office—producing by his resistance dissatisfaction within his party—as not to have lowered, apparently, the personnel of the service; and there were no such blots on his administration as President Adams's "midnight judges." Nevertheless, his record here was not clear of blots, showing a few regrettable inconsistencies.[3] Among important but secondary measures of his second administration were the extinguishment of Indian titles, and promotion of Indian emigration to lands beyond the Mississippi; reorganization of the militia; fortification of the seaports; reduction of the public debt; and a simultaneous reduction of taxes. But his second term derives most of its historical interest from the unsuccessful efforts to convict Aaron Burr of treasonable acts in the south-west, and from the efforts made to maintain, without war, the rights of neutrals on the high seas. In his diplomacy with Napoleon and Great Britain Jefferson betrayed a painful incorrigibility of optimism. A national policy of "growling before fighting"—later practised successfully enough by the United States—was not then possible; and one writer has very justly said that what chiefly affects one in the whole matter is the pathos of it—"a philosopher and a friend of peace struggling with a despot of superhuman genius, and a Tory cabinet of superhuman insolence and stolidity" (Trent). It is possible to regard the embargo policy dispassionately as an interesting illustration of Jefferson's love of peace. The idea—a very old one with Jefferson—was not entirely original; in essence it received other attempted applications in the Napoleonic period—and especially in the continental blockade. Jefferson's statesmanship had the limitations of an agrarian outlook. The extreme to which he carried his advocacy of diplomatic isolation, his opposition to the creation of an adequate navy,[4] his estimate of cities as "sores upon the body politic," his prejudice against manufactures, trust in farmers, and political distrust of the artisan class, all reflect them.

When, on the 4th of March 1809, Jefferson retired from the presidency, he had been almost continuously in the public service for forty years. He refused to be re-elected for a third time, though requested by the legislatures of five states to be a candidate; and thus, with Washington's prior example, helped to establish a precedent deemed by him to be of great importance under a democratic government. His influence seemed scarcely lessened in his retirement. Madison and Monroe, his immediate successors—neighbours and devoted friends, whom he had advised in their early education and led in their maturer years—consulted him on all great questions, and there was no break of principles in the twenty-four years of the "Jeffersonian system." Jefferson was one of the greatest political managers his country has known. He had a quick eye for character, was genuinely amiable, uncontentious, tactful, masterful; and it may be assumed from his success that he was wary or shrewd to a degree. It is true, moreover, that, unless tested by a few unchanging principles, his acts were often strikingly inconsistent; and even when so tested, not infrequently remain so in appearance. Full explanations do not remove from some important transactions in his political life an impression of indirectness. But reasonable judgment must find very unjust the stigma of duplicity put upon him by the Federalists. Measured by the records of other men equally successful as political leaders, there seems little of this nature to criticize severely. Jefferson had the full courage of his convictions. Extreme as were his principles, his pertinacity in adhering to them and his independence of expression were quite as extreme. There were philosophic and philanthropic elements in his political faith which will always lead some to class him as a visionary and fanatic; but although he certainly indulged at times in dreams at which one may still smile, he was not, properly speaking, a visionary; nor can he with justice be stigmatized as a fanatic. He felt fervently, was not afraid to risk all on the conclusions to which his heart and his mind led him, declared himself with openness and energy; and he spoke and even wrote his conclusions, how ever bold or abstract, without troubling to detail his reasoning or clip his off-hand speculations. Certain it is that there is much in his utterances for a less robust democracy than his own to cavil at.[1] Soar, however, as he might, he was essentially not a doctrinaire, but an empiricist; his mind was objective. Though he remained, to the end, firm in his belief that there had been an active monarchist party,[2] this obsession did not carry him out of touch with the realities of human nature and of his time. He built with surety on the colonial past, and had a better reasoned view of the actual future than had any of his contemporaries.

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[1] See also Jefferson to E. Gerry, 26th of January 1799 (*Writings*, vii. 325), and to Dupont de Nemours (x. 23). Cf. Hamilton to J. Dayton, 1799 (*Works*, x. 329).

[2] In 1786 he suggested to James Monroe that the society of friends he hoped to gather in Albemarle might, in sumptuary matters, "set a good example" to a country (*i.e.* Virginia) that "needed" it.

[3] See C. R. Fish, *The Civil Service and the Patronage* (Harvard Historical Studies, New York, 1905), ch. 2.

[4] Jefferson's dislike of a navy was due to his desire for an economical administration and for peace. Shortly after his inauguration he expressed a desire to lay up the larger men of war in the eastern branch of the Potomac, where they would require only "one set of plunderers to take care of them." To Thomas Paine he wrote in 1807: "I believe that gunboats are the only *water* defence which can be useful to us and protect us from the ruinous folly of a navy." (*Works*, Ford ed., ix. 137.) The gunboats desired by Jefferson were small, cheap craft equipped with one or two guns and kept on shore under sheds until actually needed, when they were to be launched and manned by a sort of naval militia. A large number of these boats were constructed and they afforded some protection to coasting vessels against privateers, but in bad weather, or when employed against a frigate, they were worse than useless, and Jefferson's "gunboat system" was admittedly a failure.

Events soon appraised the ultra-Federalist judgment of American democracy, so tersely expressed by Fisher Ames as "like death . . . only the dismal passport to a more dismal hereafter"; and, with it, appraised Jefferson's word in his first inaugural for those who, "in the full tide of successful experiment," were ready to abandon a government that had so far kept them "free and firm, on the visionary fear that it might by possibility lack energy to preserve itself." Time soon tested, too, his principle that that government must prove the strongest on earth "where every man . . . would meet invasions of the public order as his own personal concern." He summed up as follows the difference between himself and the Hamiltonian group: "One feared most the ignorance of the people; the other the selfishness of rulers independent of them." Jefferson, in short, had unlimited faith in the honesty of the people; a large faith in their common sense; believed that all is to be won by appealing to the reason of voters; that by education their ignorance can be eliminated; that human nature is indefinitely perfectible; that majorities rule, therefore, not only by virtue of force (which was Locke's ultimate justification of them), but of right.[3] His importance as a maker of modern America can scarcely be overstated, for the ideas he advocated have become the very foundations of American republicanism. His administration ended the possibility, probability or certainty—measure it as one will—of the development of Federalism in the direction of class government; and the party he formed, inspired by the creed he gave it, fixed the democratic future of the nation. And by his own labours he had vindicated his faith in the experiment of self-government.

Jefferson's last years were devoted to the establishment of the university of Virginia at Charlottesville, near his home. He planned the buildings, gathered its faculty—mainly from abroad—and shaped its organization. Practically all the great ideas of aim, administration and curriculum that dominated American universities at the end of the 19th century were anticipated by him. He hoped that the university might be a dominant influence in national culture, but circumstances crippled it. His educational plans had been maturing in his mind since 1776. His financial affairs in these last years gave him grave concern. His fine library of over 10,000 volumes was purchased at a low price by Congress in 1815, and a national contribution ($16,500) just before his death enabled him to die in peace. Though not personally extravagant, his salary, and the small income from his large estates, never sufficed to meet his generous maintenance of his representative position; and after his retirement from public life the numerous visitors to Monticello consumed the remnants of his property. He died on the 4th of July 1826, the fiftieth anniversary of the Declaration of Independence, on the same day as John Adams. He chose for his tomb the epitaph: "Here was buried Thomas Jefferson, author of the Declaration of American Independence, of the statute of Virginia for religious freedom, and father of the university of Virginia."

Jefferson was about 6 ft. in height, large-boned, slim, erect and sinewy. He had angular features, a very ruddy complexion, sandy hair, and hazel-flecked, grey eyes. Age lessened the unattractiveness of his exterior. In later years he was negligent in dress and loose in bearing. There was grace, nevertheless, in his manners; and his frank and earnest address, his quick sympathy (yet he seemed cold to strangers), his vivacious, desultory, informing talk, gave him an engaging charm. Beneath a quiet surface he was fairly aglow with intense convictions and a very emotional temperament. Yet he seems to have acted habitually, in great and little things, on system. His mind, no less trenchant and subtle than Hamilton's, was the most impressible, the most receptive, mind of his time in America. The range of his interests is remarkable. For many years he was president of the American philosophical society. Though it is a biographical tradition that he lacked wit, Molière and *Don Quixote* seem to have been his favourites; and though the utilitarian wholly crowds romanticism out of his writings, he had enough of that quality in youth to prepare to learn Gaelic in order to translate Ossian, and sent to Macpherson for the originals! His interest in art was evidently intellectual. He was singularly sweet-tempered, and shrank from the impassioned political bitterness that raged about him; bore with relative equanimity a flood of coarse and malignant abuse of his motives, morals, religion,[4] personal honesty and decency; cherished very few personal animosities; and better than any of his great antagonists cleared political opposition of ill-blooded personality. In short, his kindness of heart rose above all social, religious or political differences, and nothing destroyed his confidence in men and his sanguine views of life.

AUTHORITIES.—See the editions of Jefferson's *Writings* by H. A. Washington (9 vols., New York, 1853-1854), and—the best—by Paul

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[1] See *e.g.* his letters in 1787 on the Shays' rebellion, and his speculations on the doctrine that one generation may not bind another by paper documents. With the latter may be compared present-day movements like the initiative and referendum, and not a few discussions of national debts. Jefferson's distrust of governments was nothing exceptional for a consistent individualist.

[2] In his last years he carefully sifted and revised his contemporary notes evidencing, as he believed, the existence of such a party, and they remain as his *Ana* (chiefly Hamiltoniana). The only just judgment of these notes is to be obtained by looking at them, and by testing his suspicions with the letters of Hamilton, Ames, Oliver Wolcott, Theodore Sedgwick, George Cabot and the other Hamiltonians. Such a comparison measures also the relative judgment, temper and charity of these writers and Jefferson. It must still remain true, however, that Jefferson's *Ana* present him in a far from engaging light.

[3] "Jefferson, in 1789, wrote some such stuff about the will of majorities, as a New Englander would lose his rank among men of sense to avow."—Fisher Ames (Jan. 1800).

[4] He was classed as a "French infidel" and atheist. His attitude toward religion was in fact deeply reverent and sincere, but he insisted that religion was purely an individual matter, "evidenced, as concerns the world by each one's daily life," and demanded absolute freedom of private judgment. He looked on Unitarianism with much sympathy and desired its growth. "I am a Christian," he wrote in 1823, "in the only sense in which he (Jesus) wished any one to be; sincerely attached to his doctrines in preference to all others; ascribing to himself every human excellence, and believing he never claimed any other."

Leicester Ford (10 vols., New York, 1892–1899); letters in Massachusetts Historical Society, *Collections*, series 7, vol. i.; S. E. Forman, *The Letters and Writings of Thomas Jefferson, including all his Important Utterances on Public Questions* (1900); J. P. Foley, *The Jefferson Cyclopaedia* (New York, 1900); the *Memoir*, *Correspondence*, &c., by T. J. Randolph (4 vols., Charlottesville, Va., 1829); biographies by James Schouler ("Makers of America Series," New York, 1893); John T. Morse ("American Statesmen Series," Boston, 1883), George Tucker (2 vols., Philadelphia, 1837); James Parton (Boston, 1874); and especially that by Henry S. Randall (3 vols., New York, 1853), a monumental work, although marred by some special pleading, and sharing Jefferson's implacable opinions of the "Monocrats." See also Henry Adams, *History of the United States 1801–1817*, vols. 1–4 (New York, 1889–1890); Herbert B. Adams, *Thomas Jefferson and the University of Virginia* (U. S. bureau of education, Washington, 1888); Sarah N. Randolph, *Domestic Life of Thomas Jefferson* (New York, 1871); and an illuminating appreciation by W. P. Trent, in his *Southern Statesmen of the Old Régime* (New York, 1897); that by John Fiske, *Essays, Historical and Literary*, vol. i. (New York, 1902), has slighter merits. (F. S. P.)

JEFFERSON CITY (legally and officially the City of Jefferson), the capital of Missouri, U.S.A., and the county-seat of Cole county, on the Missouri river, near the geographical centre of the state, about 125 m. W. of St Louis. Pop. (1890), 6742; (1900), 9664, of whom 786 were foreign-born and 1822 were negroes; (1910 census), 11,850. It is served by the Missouri Pacific, the Chicago & Alton, and the Missouri, Kansas & Texas railways. Its site is partly in the bottom-lands of the river and partly on the steep banks at an elevation of about 600 ft. above the sea. A steel bridge spans the river. The state capitol, an imposing structure built on a bluff above the river, was built in 1838–1842 and enlarged in 1887–1888; it was first occupied in 1840 by the legislature, which previously had met (after 1837) in the county court house. Other prominent buildings are the United States court house and post office, the state supreme court house, the county court house, the state penitentiary, the state armoury and the executive mansion. The penitentiary is to a large extent self-supporting; in 1903–1904 the earnings were $3493.80 in excess of the costs, but in 1904–1906 the costs exceeded the earnings by $9044. Employment is furnished for the convicts on the pentitentiary premises by incorporated companies. The state law library here is one of the best of the kind in the country, and the city has a public library. In the city is Lincoln Institute, a school for negroes, founded in 1866 by two regiments of negro infantry upon their discharge from the United States army, opened in 1868, taken over by the state in 1879, and having sub-normal, normal, college, industrial and agricultural courses. Coal and limestone are found near the city. In 1905 the total value of the factory product was $3,926,632, an increase of 28·2% since 1900. The original constitution of Missouri prescribed that the capital should be on the Missouri river within 40 m. of the mouth of the Osage, and a commission selected in 1821 the site of Jefferson City, on which a town was laid out in 1822, the name being adopted in honour of Thomas Jefferson. The legislature first met here in 1826; Jefferson City became the county-seat in 1828, and in 1839 was first chartered as a city. The constitutional conventions of 1845 and 1875, and the state convention which issued the call for the National Liberal Republican convention at Cincinnati in 1872, met here, and so for some of its sessions did the state convention of 1861–1863. In June 1861 Jefferson City was occupied by Union forces, and in September–October 1864 it was threatened by Confederate troops under General Sterling Price.

JEFFERSONVILLE, a city and the county-seat of Clark county, Indiana, U.S.A., situated on the N. bank of the Ohio river, opposite Louisville, Kentucky, with which it is connected by several bridges. Pop. (1890), 10,666; (1900), 10,774, of whom 1818 were of negro descent and 615 were foreign-born; (1910 census), 10,412. It is served by the Baltimore & Ohio South-western, the Cleveland, Cincinnati, Chicago & St Louis, and the Pittsburg, Cincinnati, Chicago & St Louis railways, and by three inter-urban electric lines. It is attractively situated on bluffs above the river, which at this point has a descent (known as the falls of the Ohio) of 26 ft. in 2 m. This furnishes good water power for manufacturing purposes both at Jeffersonville and at Louisville. The total value of the factory product in 1905 was $4,526,443, an increase of 20 % since 1900. The Indiana reformatory (formerly the Southern Indiana penitentiary) and a large supply dépôt of the United States army are at Jeffersonville. General George Rogers Clark started (June 24, 1778) on his expedition against Kaskaskia and Vincennes from Corn Island (now completely washed away) opposite what is now Jeffersonville. In 1786 the United States government established Fort Finney (built by Captain Walter Finney), afterwards re-named Fort Steuben, on the site of the present city; but the fort was abandoned in 1791, and the actual beginning of Jeffersonville was in 1802, when a part of the Clark grant (the site of the present city) was transferred by its original owner, Lieut. Isaac Bowman, to three trustees, under whose direction a town was laid out. Jeffersonville was incorporated as a town in 1815, and was chartered as a city in 1839.

JEFFREY, FRANCIS JEFFREY, Lord (1773–1850), Scottish judge and literary critic, son of a depute-clerk in the Court of Session, was born at Edinburgh on the 23rd of October 1773. After attending the high school for six years, he studied at the university of Glasgow from 1787 to May 1789, and at Queen's College, Oxford, from September 1791 to June 1792. He had begun the study of law at Edinburgh before going to Oxford, and now resumed his studies there. He became a member of the speculative society, where he measured himself in debate with Scott, Brougham, Francis Horner, the marquess of Lansdowne, Lord Kinnaird and others. He was admitted to the Scotch bar in December 1794, but, having abandoned the Tory principles in which he had been educated, he found that his Whig politics seriously prejudiced his legal prospects. In consequence of his lack of success at the bar he went to London in 1798 to try his fortune as a journalist, but without success; he also made more than one vain attempt to obtain an office which would have secured him the advantage of a small but fixed salary. His marriage with Catherine Wilson in 1801 made the question of a settled income even more pressing. A project for a new review was brought forward by Sydney Smith in Jeffrey's flat in the presence of H. P. Brougham (afterwards Lord Brougham), Francis Horner and others; and the scheme resulted in the appearance on the 10th of October 1802 of the first number of the *Edinburgh Review.* At the outset the *Review* was not under the charge of any special editor. The first three numbers were, however, practically edited by Sydney Smith, and on his leaving for England the work devolved chiefly on Jeffrey, who, by an arrangement with Constable, the publisher, was eventually appointed editor at a fixed salary. Most of those associated in the undertaking were Whigs; but, although the general bias of the *Review* was towards social and political reforms, it was at first so little of a party organ that for a time it numbered Sir Walter Scott among its contributors; and no distinct emphasis was given to its political leanings until the publication in 1808 of an article by Jeffrey himself on the work of Don Pedro Cevallos on the *French Usurpation of Spain.* This article expressed despair of the success of the British arms in Spain, and Scott at once withdrew his subscription, the *Quarterly* being soon afterwards started in opposition. According to Lord Cockburn the effect of the first number of the *Edinburgh Review* was "electrical." The English reviews were at that time practically publishers' organs, the articles in which were written by hack-writers instructed to praise or blame according to the publishers' interests. Few men of any standing consented to write for them. The *Edinburgh Review*, on the other hand, enlisted a brilliant and independent staff of contributors, guided by the editor, not the publisher. They received sixteen guineas a sheet (sixteen printed pages), increased subsequently to twenty-five guineas in many cases, instead of the two guineas which formed the ordinary London reviewer's fee. Further, the review was not limited to literary criticism. It constituted itself the accredited organ of moderate Whig public opinion. The particular work which provided the starting-point of an article was in many cases merely the occasion for the exposition, always brilliant and incisive, of the author's views on politics, social subjects, ethics or literature. These general principles and the novelty of the method ensured the success of the undertaking even after the original circle of exceptionally able men who founded it had been dispersed. It had a circulation, great for those days, of 12,000 copies. The period of Jeffrey's editorship extended to about twenty-six years, ceasing with the ninety-eighth number, published in June 1829, when he resigned in favour of Macvey Napier.

Jeffrey's own contributions, according to a list which has the sanction of his authority, numbered two hundred, all except six being written before his resignation of the editorship. Jeffrey wrote with great rapidity, at odd moments of leisure and with little special preparation. Great fluency and ease of diction, considerable warmth of imagination and moral sentiment, and a sharp eye to discover any oddity of style or violation of the accepted canons of good taste, made his criticisms pungent and effective. But the essential narrowness and timidity of his general outlook prevented him from detecting and estimating latent forces, either in politics or in matters strictly intellectual and moral; and this lack of understanding and sympathy accounts for his distrust and dislike of the passion and fancy of Shelley and Keats, and for his praise of the half-hearted and elegant romanticism of Rogers and Campbell. (For his treatment of the lake poets see Wordsworth, William.)

A criticism in the fifteenth number of the *Review* on the morality of Moore's poems led in 1806 to a duel between the two authors at Chalk Farm. The proceedings were stopped by the police, and Jeffrey's pistol was found to contain no bullet. The affair led to a warm friendship, however, and Moore contributed to the *Review*, while Jeffrey made ample amends in a later article on *Lalla Rookh* (1817).

Jeffrey's wife had died in 1805, and in 1810 he became acquainted with Charlotte, daughter of Charles Wilkes of New York, and great-niece of John Wilkes. When she returned to America, Jeffrey followed her, and they were married in 1813. Before returning to England they visited several of the chief American cities, and his experience strengthened Jeffrey in the conciliatory policy he had before advocated towards the States. Notwithstanding the increasing success of the *Review*, Jeffrey always continued to look to the bar as the chief field of his ambition. As a matter of fact, his literary reputation helped his professional advancement. His practice extended rapidly in the civil and criminal courts, and he regularly appeared before the general assembly of the Church of Scotland, where his work, though not financially profitable, increased his reputation. As an advocate his sharpness and rapidity of insight gave him a formidable advantage in the detection of the weaknesses of a witness and the vulnerable points of his opponent's case, while he grouped his own arguments with an admirable eye to effect, especially excelling in eloquent closing appeals to a jury. Jeffrey was twice, in 1820 and 1822, elected lord rector of the university of Glasgow. In 1829 he was chosen dean of the faculty of advocates. On the return of the Whigs to power in 1830 he became lord advocate, and entered parliament as member for the Perth burghs. He was unseated, and afterwards returned for Malton, a borough in the interest of Lord Fitzwilliam. After the passing of the Scottish Reform Bill, which he introduced in parliament, he was returned for Edinburgh in December 1832. His parliamentary career, which, though not brilliantly successful, had won him high general esteem, was terminated by his elevation to the judicial bench as Lord Jeffrey in May 1834. In 1842 he was moved to the first division of the Court of Session. On the disruption of the Scottish Church he took the side of the seceders, giving a judicial opinion in their favour, afterwards reversed by the house of lords. He died at Edinburgh on the 26th of January 1850.

Some of his contributions to the *Edinburgh Review* appeared in four volumes in 1844 and 1845. This selection includes the essay on "Beauty" contributed to the *Ency. Brit.* The *Life of Lord Jeffrey, with a Selection from his Correspondence*, by Lord Cockburn, appeared in 1852 in 2 vols. See also the *Selected Correspondence of Macvey Napier* (1877); the sketch of Jeffrey in Carlyle's *Reminiscences*, vol. ii. (1881); and an essay by Lewis E. Gates in *Three Studies in Literature* (New York, 1899).

JEFFREYS, GEORGE JEFFREYS, 1st Baron (1648–1689), lord chancellor of England, son of John Jeffreys, a Welsh country gentleman, was born at Acton Park, his father's seat in Denbighshire, in 1648. His family, though not wealthy, was of good social standing and repute in Wales; his mother, a daughter of Sir Thomas Ireland of Bewsey, Lancashire, was "a very pious good woman." He was educated at Shrewsbury, St Paul's and Westminster schools, at the last of which he was a pupil of Busby, and at Trinity College, Cambridge; but he left the university without taking a degree, and entered the Inner Temple as a student in May 1663. From his childhood Jeffreys displayed exceptional talent, but on coming to London he occupied himself more with the pleasures of conviviality than with serious study of the law. Though he never appears to have fallen into the licentious immorality prevalent at that period, he early became addicted to hard drinking and boisterous company. But as the records of his early years, and indeed of his whole life, are derived almost exclusively from vehemently hostile sources, the numerous anecdotes of his depravity cannot be accepted without a large measure of scepticism. He was a handsome, witty and attractive boon-companion, and in the taverns of the city he made friends among attorneys with practice in the criminal courts. Thus assisted he rose so rapidly in his profession that within three years of his call to the bar in 1668, he was elected common serjeant of the city of London. Such advancement, however, was not to be attained even in the reign of Charles II. solely by the aid of disreputable friendships. Jeffreys had remarkable aptitude for the profession of an advocate—quick intelligence, caustic humour, copious eloquence. His powers of cross-examination were masterly; and if he was insufficiently grounded in legal principles to become a profound lawyer, nothing but greater application was needed in the opinion of so hostile a critic as Lord Campbell, to have made him the rival of Nottingham and Hale. Jeffreys could count on the influence of respectable men of position in the city, such as Sir Robert Clayton and his own namesake Alderman Jeffreys; and he also enjoyed the personal friendship of the virtuous Sir Matthew Hale. In 1667 Jeffreys had married in circumstances which, if improvident, were creditable to his generosity and sense of honour; and his domestic life, so far as is known, was free from the scandal common among his contemporaries. While holding the judicial office of common serjeant, he pursued his practice at the bar. With a view to further preferment he now sought to ingratiate himself with the court party, to which he obtained an introduction possibly through William Chiffinch, the notorious keeper of the king's closet. He at once attached himself to the king's mistress, the duchess of Portsmouth; and as early as 1672 he was employed in confidential business by the court. His influence in the city of London, where opposition to the government of Charles II. was now becoming pronounced, enabled Jeffreys to make himself useful to Danby. In September 1677 he received a knighthood, and his growing favour with the court was further marked by his appointment as solicitor-general to James, duke of York; while the city showed its continued confidence in him by electing him to the post of recorder in October 1678.

In the previous month Titus Oates had made his first revelations of the alleged popish plot, and from this time forward Jeffreys was prominently identified, either as advocate or judge, with the memorable state trials by which the political conflict between the Crown and the people was waged during the remainder of the 17th century. The popish plot, followed by the growing agitation for the exclusion of the duke of York from the succession, widened the breach between the city and the court. Jeffreys threw in his lot with the latter, displaying his zeal by initiating the movement of the "abhorrers" (*q.v.*) against the "petitioners" who were giving voice to the popular demand for the summoning of parliament. He was rewarded with the coveted office of chief justice of Chester on the 30th of April 1680; but when parliament met in October the House of Commons passed a hostile resolution which induced him to resign his recordership, a piece of pusillanimity that drew from the king the remark that Jeffreys was "not parliament-proof." Jeffreys nevertheless received from the city aldermen a substantial token of appreciation for his past services. In 1681 he was created a baronet. In June 1683 the first of the Rye House conspirators were brought to trial. Jeffreys was briefed for the crown in the prosecution of Lord William Howard; and, having been raised to the bench as lord chief justice of the king's bench in September, he presided at the trials of Algernon Sidney in November 1683 and of Sir Thomas Armstrong in the following June. In the autumn of 1684 Jeffreys, who had been active in procuring the surrender of municipal charters to the crown, was called to the cabinet, having previously been sworn of the privy council. In May 1685 he had the satisfaction of passing sentence on Titus Oates for perjury in the plot trials; and about the same time James II. rewarded his zeal with a peerage as Baron Jeffreys of Wem, an honour never before conferred on a chief justice during his tenure of office. Jeffreys had for some time been suffering from stone, which aggravated the irritability of his naturally violent temper; and the malady probably was in some degree the cause of the unmeasured fury he displayed at the trial of Richard Baxter (*q.v.*) for seditious libel—if the unofficial *ex parte* report of the trial, which alone exists, is to be accepted as trustworthy.

In August 1685 Jeffreys opened at Winchester the commission known in history as the "bloody assizes," his conduct of which has branded his name with indelible infamy. The number of persons sentenced to death at these assizes for complicity in the duke of Monmouth's insurrection is uncertain. The official return of those actually executed was 320; many hundreds more were transported and sold into slavery in the West Indies. In all probability the great majority of those condemned were in fact concerned in the rising, but the trials were in many cases a mockery of the administration of justice. Numbers were cajoled into pleading guilty; the case for the prisoners seldom obtained a hearing. The merciless severity of the chief justice did not however exceed the wishes of James II.; for on his return to London Jeffreys received from the king the great seal with the title of lord chancellor. For the next two years he was a strenuous upholder of prerogative, though he was less abjectly pliant than has sometimes been represented. There is no reason to doubt the sincerity of his attachment to the Church of England; for although the king's favour was capricious, Jeffreys never took the easy and certain path to secure it that lay through apostasy; and he even withstood James on occasion, when the latter pushed his Catholic zeal to extremes. Though it is true that he accepted the presidency of the ecclesiastical commission, Burnet's statement that it was Jeffreys who suggested that institution to James is probably incorrect; and he was so far from having instigated the prosecution of the seven bishops in 1688, as has been frequently alleged, that he disapproved of the proceedings and rejoiced secretly at the acquittal. But while he watched with misgiving the king's preferment of Roman Catholics, he made himself the masterful instrument of unconstitutional prerogative in coercing the authorities of Cambridge University, who in 1687 refused to confer degrees on a Benedictine monk, and the fellows of Magdalen College, Oxford, who declined to elect as their president a disreputable nominee of the king.

Being thus conspicuously identified with the most tyrannical measures of James II., Jeffreys found himself in a desperate plight when on the 11th of December 1688 the king fled from the country on the approach to London of William of Orange. The lord chancellor attempted to escape like his master; but in spite of his disguise as a common seaman he was recognized in a tavern at Wapping—possibly, as Roger North relates, by an attorney whom Jeffreys had terrified on some occasion in the court of chancery—and was arrested and conveyed to the Tower. The malady from which he had long suffered had recently made fatal progress, and he died in the Tower on the 18th of April 1689. He was succeeded in the peerage by his son, John (2nd Baron Jeffreys of Wem), who died without male issue in 1702, when the title became extinct.

It is impossible to determine precisely with what justice tradition has made the name of "Judge Jeffreys" a byword of infamy. The Revolution, which brought about his fall, handed over his reputation at the same time to the mercy of his bitterest enemies. They alone have recorded his actions and appraised his motives and character. Even the adherents of the deposed dynasty had no interest in finding excuse for one who served as a convenient scapegoat for the offences of his master. For at least half a century after his death no apology for Lord Jeffreys would have obtained a hearing; and none was attempted. With the exception therefore of what is to be gathered from the reports of the state trials, all knowledge of his conduct rests on testimony tainted by undisguised hostility. Innumerable scurrilous lampoons vilifying the hated instrument of James's tyranny, but without a pretence of historic value, flooded the country at the Revolution; and these, while they fanned the undiscriminating hatred of contemporaries who remembered the judge's severities, and perpetuated that hatred in tradition, have not been sufficiently discounted even by modern historians like Macaulay and Lord Campbell. The name of Jeffreys has therefore been handed down as that of a coarse, ignorant, dissolute, foul-mouthed, inhuman bully, who prostituted the seat of justice. That there was sufficient ground for the execration in which his memory was long held is not to be gainsaid. But the portrait has nevertheless been blackened overmuch. An occasional significant admission in his favour may be gleaned even from the writings of his enemies. Thus Roger North declares that "in matters indifferent," *i.e.* where politics were not concerned, Jeffreys became the seat of justice better than any other that author had seen in his place. Sir J. Jekyll, master of the rolls, told Speaker Onslow that Jeffreys "had great parts and made a great chancellor in the business of his court. In mere private matters he was thought an able and upright judge wherever he sat." His keen sense of humour, allied with a spirit of inveterate mockery and an exuberant command of pungent eloquence, led him to rail and storm at prisoners and witnesses in grossly unseemly fashion. But in this he did not greatly surpass most of his contemporaries on the judicial bench, and it was a failing from which even the dignified and virtuous Hale was not altogether exempt. The intemperance of Jeffreys which shocked North, certainly did not exceed that of Saunders; in violence he was rivalled by Scroggs; though accused of political apostasy, he was not a shameless renegade like Williams; and there is no evidence that in pecuniary matters he was personally venal, or that in licentiousness he followed the example set by Charles II. and most of his courtiers. Some of his actions that have incurred the sternest reprobation of posterity were otherwise estimated by the best of his contemporaries. His trial of Algernon Sidney, described by Macaulay and Lord Campbell as one of the most heinous of his iniquities, was warmly commended by Dr William Lloyd, who was soon afterwards to become a popular idol as one of the illustrious seven bishops (see letter from the bishop of St Asaph in H. B. Irving's *Life of Judge Jeffreys*, p. 184). Nor was the habitual illegality of his procedure on the bench so unquestionable as many writers have assumed. Sir James Stephen inclined to the opinion that no actual abuse of law tainted the trials of the Rye House conspirators, or that of Alice Lisle, the most prominent victim of the "bloody assizes." The conduct of the judges in Russell's trial was, he thinks, "moderate and fair in general"; and the trial of Sidney "much resembled that of Russell." The same high authority pronounces that the trial of Lord Delamere in the House of Lords was conducted by Jeffreys "with propriety and dignity." And if Jeffreys judged political offenders with cruel severity, he also crushed some glaring abuses; conspicuous examples of which were the frauds of attorneys who infested Westminster Hall, and the systematic kidnapping practised by the municipal authorities of Bristol. Moreover, if any value is to be attached to the evidence of physiognomy, the traditional estimate of the character of Jeffreys obtains no confirmation from the refinement of his features and expression as depicted in Kneller's portrait in the National Portrait Gallery of London. But even though the popular notion requires to be thus modified in certain respects, it remains incontestable that Jeffreys was probably on the whole the worst example of a period when the administration of justice in England had sunk to the lowest degradation, and the judicial bench had become the too willing tool of an unconstitutional and unscrupulous executive.

Bibliography.—The chief contemporary authorities for the life of Jeffreys are Bishop Burnet's *History of my own Time* (1724), and see especially the edition " with notes by the Earls of Dartmouth and Hardwick Speaker Onslow and Dean Swift " (Oxford Univ. Press, 1833); Roger North's *Life of the Right Hon. Francis North, Baron of Guildford* (1808) and *Autobiography* (ed. by Augustus Jessopp, 1887); *Ellis Correspondence*, *Verney Papers* (Hist. MSS. Comm.), *Hatton Correspondence* (Camden Soc. pub.); the earl of Ailesbury's *Memoirs*; Evelyn's *Diary*. The only trustworthy information as to the judicial conduct and capacity of Jeffreys is to be found in the reports of the *State Trials*, vols. vii.–xii.; and cf. Sir J. F. Stephen's *History of the Criminal Law of England* (1883). For details of the " bloody assizes," see *Harl. MSS.*, 4689; George Roberts, *The Life, Progresses and Rebellion of James Duke of Monmouth*, vol. ii. (1844); also many pamphlets, lampoons, &c., in the British Museum, as to which see the article on " Sources of History for Monmouth's Rebellion and the Bloody Assizes," by A. L. Humphreys, in *Proceedings of the Somersetshire Archaeological and Natural Hist. Soc.* (1892). Later accounts are by H. W. Woolrych, *Memoirs of the Life of Judge Jeffreys* (1827); Lord Campbell, *The Lives of the Lord Chancellors* (1845), 1st series, vol. iii.; E. Foss, *The Judges of England* (1864), vol. vii.; Henry Roscoe, *Lives of Eminent British Lawyers* (1830); Lord Macaulay, *History of England* (1848; and many subsequent editions). Most of these works, and especially those by Macaulay and Campbell, are uncritical in their hostility to Jeffreys, and are based for the most part on untrustworthy authorities. The best modern work on the subject, though unduly favourable to Jeffreys, is H. B. Irving's *Life of Judge Jeffreys* (1898), the appendix to which contains a full bibliography.

(R. J. M.)

JEHOIACHIN (Heb. " Yah[weh] establisheth "), in the Bible, son of Jehoiakim and king of Judah (2 Kings xxiv. 8 sqq.; 2 Chron, xxxvi. 9 seq.). He came to the throne at the age of eighteen in the midst of the Chaldean invasion of Judah, and is said to have reigned three months. He was compelled to surrender to Nebuchadrezzar and was carried off to Babylon (597 B.C.). This was the First Captivity, and from it Ezekiel (one of the exiles) dates his prophecies. Eight thousand people of the better class (including artisans, &c.) were removed, the Temple was partially despoiled (see Jer. xxvii. 18–20; xxiii.v. 3 seq.),[1] and Jehoiachin's uncle Mattaniah (son of Josiah) was appointed king. Jehoiachin's fate is outlined in Jer. xxii. 20–30 (cf. xxvii. 20). Nearly forty years later, Nebuchadrezzar II. died (562 B.C.) and Evil-Merodach (Amil-Marduk) his successor released the unfortunate captive and gave him precedence over the other subjugated kings who were kept prisoners in Babylon. With this gleam of hope for the unhappy Judaeans both the book of Kings and the prophecies of Jeremiah conclude (2 Kings xxv. 27–30; Jer. lii. 31–34).

See, further, Jeremiah (especially chaps. xxiv., xxvii. seq.), and Jews, § 17.

JEHOIAKIM (Heb. " Yah[weh] raiseth up "), in the Bible, son of Josiah (*q.v.*) and king of Judah (2 Kings xxiii. 34–xxiv. 6). On the defeat of Josiah at Megiddo his younger brother Jehoahaz (or Shallum) was chosen by the Judaeans, but the Egyptian conquerer Necho summoned him to his headquarters at Riblah (south of Hamath on the Orontes) and removed him to Egypt, appointing in his stead Eliakim, whose name (" El[God] raiseth up ") was changed to its better-known synonym, Jehoiakim. For a time Jehoiakim remained under the protection of Necho and paid heavy tribute; but with the rise of the new Chaldean Empire under Nebuchadrezzar II., and the overthrow of Egypt at the battle of Carchemish (605 B.C.) a vital change occurred. After three years of allegiance the king revolted. Invasions followed by Chaldeans, Syrians, Moabites and Ammonites, perhaps the advance troops despatched by the Babylonian king; the power of Egypt was broken and the whole land came into the hands of Nebuchadrezzar. It was at the close of Jehoiakim's reign, apparently just before his death, that the enemy appeared at the gates of Jerusalem, and although he himself " slept with his fathers " his young son was destined to see the first captivity of the land of Judah (597 B.C.). (See Jehoiachin.)

Which " three years " (2 Kings xxiv. 1) are intended is disputed; it is uncertain whether Judah suffered in 605 B.C. (Berossus in Jos. *c. Ap.* i. 19) or was left unharmed (Jos. *Ant.* x. 6. 1); perhaps Nebuchadrezzar made his first inroad against Judah in 602 B.C. because of its intrigue with Egypt (H. Winckler, *Keilinschrift. u. d. alte Test.*, pp. 107 seq.), and the three years of allegiance extends to 599. The chronicler's tradition (2 Chron. xxxvi. 5–8) speaks of Jehoiakim's captivity, apparently confusing him with Jehoiachin. The Septuagint, however, still preserves there the record of his peaceful death, in agreement with the earlier source in 2 Kings, but against the prophecy of Jeremiah (xxii. 18 seq., xxxvi. 30), which is accepted by Jos. *Ant.* x. 6. 3. The different traditions can scarcely be reconciled. Nothing certain is known of the marauding bands sent against Jehoiakim; for Syrians (*Aram*) one would expect Edomites (*Edom*), but see Jer. xxxv. 11; some recensions of the Septuagint even include the " Samaritans "! (For further references to this reign see especially Jeremiah; see also Jews: *History*, § 17.) (S. A. C.)

JEHOL (" hot stream "), or Ch'ēng-tē-fu, a city of China, formerly the seat of the emperor's summer palace, near 118° E. and 41° N., about 140 m. N.E. of Peking, with which it is connected by an excellent road. Pop. (estimate), 10,000. It is a flourishing town, and consists of one great street, about 2 m. long, with smaller streets radiating in all directions. The people are well-to-do and there are some fine shops. The palace, called Pi-shu-shan-chuang, or " mountain lodge for avoiding heat," was built in 1703 on the plan of the palace of Yuen-ming-yuen near Peking. A substantial brick wall 6 m. in circuit encloses several well-wooded heights and extensive gardens, rockeries, pavilions, temples, &c. Jehol was visited by Lord Macartney on his celebrated mission to the emperor K'ienlung in 1793; and it was to Jehol that the emperor Hienfēng retired when the allied armies of England and France occupied Peking in 1860. In the vicinity of Jehol are numerous Lama monasteries and temples, the most remarkable being Potala-su, built on the model of the palace of the grand lama of Tibet at Potala.

JEHORAM, or Joram (Heb. " Yah[weh] is high "), the name of two Biblical characters.

1. The son of Ahab, and king of Israel in succession to his brother Ahaziah.[2] He maintained close relations with Judah, whose king came to his assistance against Moab which had revolted after Ahab's death (2 Kings i. 1; iii.). The king in question is said to have been Jehoshaphat; but, according to Lucian's recension, it was Ahaziah, whilst i. 17 would show that it was Jehoram's namesake (see 2). The result of the campaign appears to have been a defeat for Israel (see on the incidents Edom, Elisha, Moab). The prophetical party were throughout hostile to Jehoram (with his reform iii. 2 contrast x. 27), and the singular account of the war of Benhadad king of Syria against the king of Israel (vi. 24–vii.) shows the feeling against the reigning dynasty. But whether the incidents in which Elisha and the unnamed king of Israel appear originally belonged to the time of Jehoram is very doubtful, and in view of the part which Elisha took in securing the accession of Jehu, it has been urged with much force that they belong to the dynasty of the latter, when the high position of the prophet would be perfectly natural.[3] The briefest account is given of Jehoram's alliance with Ahaziah (son of 2 below) against Hazael of Syria, at Ramoth-Gilead

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[1] 2 Kings xxiv. 13 seq. gives other numbers and a view of the disaster which is more suitable for the Second Captivity. (See Zedekiah.)

[2] 2 Kings i. 17 seq.; see Lucian's reading (cf. Vulg. and Pesh.). Apart from the allusion 1 Kings xxii. 49 (see 2 Chron. xx. 35), and the narrative in 2 Kings i. (see Elijah), nothing is known of this Ahaziah. Notwithstanding his very brief reign (1 Kings xxii. 51; 2 Kings iii. 1), the compiler passes the usual hostile judgment (1 Kings xxii. 52 seq.); see Kings (Books). The chronology in 1 Kings xxii. 51 is difficult; if Lucian's text (twenty-fourth year of Jehoshaphat) is correct, Jehoram 1 and 2 must have come to their respective thrones at almost the same time.

[3] In vii. 6 the hostility of Hittites and Mizraim (*q.v.*) points to a period *after* 842 B.C. (See Jews, § 10 seq.)

(2 Kings viii. 25-29), and the incident—with the wounding of the Israelite king in or about the critical year 842 B.C.—finds a noteworthy parallel in the time of Jehoshaphat and Ahab (1 Kings xxii. 29–36) at the period of the equally momentous events in 854 (see AHAB). See further JEHU.

2. The son of Jehoshaphat and king of Judah. He married Athaliah the daughter of Ahab, and thus was brother-in-law of 1. above, and contemporary with him (2 Kings i. 17). In his days Edom revolted, and this with the mention of Libnah's revolt (2 Kings viii. 20 sqq.) suggests some common action on the part of Philistines and Edomites. The chronicler's account of his life (2 Chron. xxi–xxii. 1) presupposes this, but adds many remarkable details: he began his reign by massacring his brethren (cf. Jehu son of Jehoshaphat, and his bloodshed, 2 Kings ix. seq.); for his wickedness he received a communication from Elijah foretelling his death from disease (cf. Elijah and Ahaziah of Israel, 2 Kings i.); in a great invasion of Philistines and Arabian tribes he lost all his possessions and family, and only Jehoahaz (*i.e.* Ahaziah) was saved.[1] His son Ahaziah reigned only for a year (cf. his namesake of Israel); he is condemned for his Israelite sympathies, and met his end in the general butchery which attended the accession of Jehu (2 Kings viii. 25 sqq.; 2 Chron. xxii. 3 seq., 7; with 2 Kings ix. 27 seq., note the variant tradition in 2 Chron. xxii. 8 seq., and the details which the LXX. (Lucian) appends to 2 Kings x.). (S. A. C.)

JEHOSHAPHAT (Heb. "Yahweh judges"), in the Bible, son of Asa, and king of Judah, in the 9th century B.C. During his period close relations subsisted between Israel and Judah; the two royal houses were connected by marriage (see ATHALIAH; JEHORAM, 2), and undertook joint enterprise in war and commerce. Jehoshaphat aided Ahab in the battle against Benhadad at Ramoth-Gilead in which Ahab was slain (1 Kings xxii.; 2 Chron. xviii.; cf. the parallel incident in 2 Kings viii. 25–29), and trading journeys to Ophir were undertaken by his fleet in conjunction no doubt with Ahab as well as with his son Ahaziah (2 Chron. xx. 35 sqq.; 1 Kings xxii. 47 sqq.). The chronicler's account of his war against Moab, Ammon and Edomite tribes (2 Chron. xx.), must rest ultimately upon a tradition which is presupposed in the earlier source (1 Kings xxii. 47), and the disaster to the ships at Ezion-Geber at the head of the Gulf of Aḳaba preceded, if it was not the introduction to, the great revolt in the days of Jehoshaphat's son Jehoram, where, again, the details in 2 Chron. xxi. must rely in the first instance upon an old source. Apart from what is said of Jehoshaphat's legislative measures (2 Chron. xix. 4 sqq.; cf. the meaning of his name above), an account is preserved of his alliance with Jehoram of Israel against Moab (2 Kings iii.), on which see JEHORAM; MOAB. The "valley of Jehoshaphat" (Joel iii. 12) has been identified by tradition (as old as Eusebius) with the valley between Jerusalem and the mount of Olives. (S. A. C.)

JEHOVAH (YAHWEH[2]), in the Bible, the God of Israel. "Jehovah" is a modern mispronunciation of the Hebrew name, resulting from combining the consonants of that name, *Jhvh*, with the vowels of the word *ădōnāy*, "Lord," which the Jews substituted for the proper name in reading the scriptures. In such cases of substitution the vowels of the word which is to be read are written in the Hebrew text with the consonants of the word which is not to be read. The consonants of the word to be substituted are ordinarily written in the margin; but inasmuch as Adonay was regularly read instead of the ineffable name Jhvh, it was deemed unnecessary to note the fact at every occurrence. When Christian scholars began to study the Old Testament in Hebrew, if they were ignorant of this general rule or regarded the substitution as a piece of Jewish superstition, reading what actually stood in the text, they would inevitably pronounce the name Jĕhōvāh. It is an unprofitable inquiry who first made this blunder; probably many fell into it independently. The statement still commonly repeated that it originated with Petrus Galatinus (1518) is erroneous; Jehova occurs in manuscripts at least as early as the 14th century.

The form Jehovah was used in the 16th century by many authors, both Catholic and Protestant, and in the 17th was zealously defended by Fuller, Gataker, Leusden and others, against the criticisms of such scholars as Drusius, Cappellus and the elder Buxtorf. It appeared in the English Bible in Tyndale's translation of the Pentateuch (1530), and is found in all English Protestant versions of the 16th century except that of Coverdale (1535). In the Authorized Version of 1611 it occurs in Exod. vi. 3; Ps. lxxxiii. 18; Isa. xii. 2; xxvi. 4, beside the compound names Jehovah-jireh, Jehovah-nissi, Jehovah-shalom; elsewhere, in accordance with the usage of the ancient versions, Jhvh is represented by LORD (distinguished by capitals from the title "Lord," Heb. *adonay*). In the Revised Version of 1885 Jehovah is retained in the places in which it stood in the A. V., and is introduced also in Exod. vi. 2, 6, 7, 8; Ps. lxviii. 20; Isa. xlix. 14; Jer. xvi. 21; Hab. iii. 19. The American committee which cooperated in the revision desired to employ the name Jehovah wherever Jhvh occurs in the original, and editions embodying their preferences are printed accordingly.

Several centuries before the Christian era the name Jhvh had ceased to be commonly used by the Jews. Some of the later writers in the Old Testament employ the appellative Elohim, God, prevailingly or exclusively; a collection of Psalms (Ps. xlii.–lxxxiii.) was revised by an editor who changed the Jhvh of the authors into Elohim (see *e.g.* xlv. 7; xlviii. 10; l. 7; li. 14); observe also the frequency of "the Most High," "the God of Heaven," "King of Heaven," in Daniel, and of "Heaven" in First Maccabees. The oldest Greek versions (Septuagint), from the third century B.C., consistently use Κύριος, "Lord," where the Hebrew has Jhvh, corresponding to the substitution of Adonay for Jhvh in reading the original; in books written in Greek in this period (*e.g.* Wisdom, 2 and 3 Maccabees), as in the New Testament, Κύριος takes the place of the name of God. Josephus, who as a priest knew the pronunciation of the name, declares that religion forbids him to divulge it; Philo calls it ineffable, and says that it is lawful for those only whose ears and tongues are purified by wisdom to hear and utter it in a holy place (that is, for priests in the Temple); and in another passage, commenting on Lev. xxiv. 15 seq.: "If any one, I do not say should blaspheme against the Lord of men and gods, but should even dare to utter his name unseasonably, let him expect the penalty of death."[3]

Various motives may have concurred to bring about the suppression of the name. An instinctive feeling that a proper name for God implicitly recognizes the existence of other gods may have had some influence; reverence and the fear lest the holy name should be profaned among the heathen were potent reasons; but probably the most cogent motive was the desire to prevent the abuse of the name in magic. If so, the secrecy had the opposite effect; the name of the god of the Jews was one of the great names in magic, heathen as well as Jewish, and miraculous efficacy was attributed to the mere utterance of it.

In the liturgy of the Temple the name was pronounced in the priestly benediction (Num. vi. 27) after the regular daily sacrifice (in the synagogues a substitute—probably Adonay—was employed);[4] on the Day of Atonement the High Priest uttered the name ten times in his prayers and benediction. In the last generations before the fall of Jerusalem, however, it was pronounced in a low tone so that the sounds were lost in the chant of the priests.[5]

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[1] These details are scarcely the invention of the chronicler; see CHRONICLES, and *Expositor*, Aug. 1906, p. 191.

[2] This form, *Yahweh*, as the correct one, is generally used in the separate articles throughout this work.

[3] See Josephus, *Ant.* ii. 12, 4; Philo, *Vita Mosis*, iii. 11 (ii. §114, ed. Cohn and Wendland); ib. iii. 27 (ii. § 206). The Palestinian authorities more correctly interpreted Lev. xxiv. 15 seq., not of the mere utterance of the name, but of the use of the name of God in blaspheming God.

[4] *Siphrê*, Num. §§ 39, 43; *M. Sotah*, iii. 7; *Sotah*, 38*a*. The tradition that the utterance of the name in the daily benedictions ceased with the death of Simeon the Just, two centuries or more before the Christian era, perhaps arose from a misunderstanding of *Menaḥoth*, 109*b*; in any case it cannot stand against the testimony of older and more authoritative texts.

[5] *Yoma*, 39*b*; *Jer. Yoma*, iii. 7; *Kiddushin*, 71*a*.

After the destruction of the Temple (A.D. 70) the liturgical use of the name ceased, but the tradition was perpetuated in the schools of the rabbis.[1] It was certainly known in Babylonia in the latter part of the 4th century,[2] and not improbably much later. Nor was the knowledge confined to these pious circles; the name continued to be employed by healers, exorcists and magicians, and has been preserved in many places in magical papyri. The vehemence with which the utterance of the name is denounced in the Mishna—"He who pronounces the Name with its own letters has no part in the world to come!"[3]—suggests that this misuse of the name was not uncommon among Jews.

The Samaritans, who otherwise shared the scruples of the Jews about the utterance of the name, seem to have used it in judicial oaths to the scandal of the rabbis.[4]

The early Christian scholars, who inquired what was the true name of the God of the Old Testament, had therefore no great difficulty in getting the information they sought. Clement of Alexandria (d. *c.* 212) says that it was pronounced Ιαουε.[5] Epiphanius (d. 404), who was born in Palestine and spent a considerable part of his life there, gives Ιαβε (one cod. Ιαυε).[6] Theodoret (d. *c.* 457),[7] born in Antioch, writes that the Samaritans pronounced the name Ιαβε (in another passage, Ιαβαι), the Jews Αΐα.[8] The latter is probably not Jhvh but *Ehyeh* (Exod. iii. 14), which the Jews counted among the names of God; there is no reason whatever to imagine that the Samaritans pronounced the name Jhvh differently from the Jews. This direct testimony is supplemented by that of the magical texts, in which Ιαβε ζεβυθ (Jahveh Ṣebāōth), as well as Ιαβα, occurs frequently.[9] In an Ethiopic list of magical names of Jesus, purporting to have been taught by him to his disciples, *Yāwē* is found.[10] Finally, there is evidence from more than one source that the modern Samaritan priests pronounce the name *Yahweh* or *Yahwa.*[11]

There is no reason to impugn the soundness of this substantially consentient testimony to the pronunciation Yahweh or Jahveh, coming as it does through several independent channels. It is confirmed by grammatical considerations. The name Jhvh enters into the composition of many proper names of persons in the Old Testament, either as the initial element, in the form Jeho- or Jo- (as in Jehoram, Joram), or as the final element, in the form *-jahu* or *-jah* (as in Adonijahu, Adonijah). These various forms are perfectly regular if the divine name was Yahweh, and, taken altogether, they cannot be explained on any other hypothesis. Recent scholars, accordingly, with but few exceptions, are agreed that the ancient pronunciation of the name was Yahweh (the first *h* sounded at the end of the syllable).

Genebrardus seems to have been the first to suggest the pronunciation *Iahuê*,[12] but it was not until the 19th century that it became generally accepted.

Jahveh or Yahweh is apparently an example of a common type of Hebrew proper names which have the form of the 3rd pers. sing. of the verb. *e.g.* Jabneh (name of a city), Jābīn, Jamlēk, Jiptāḥ (Jephthah), &c. Most of these really are verbs, the suppressed or implicit subject being *'ēl*, "*numen*, god," or the name of a god; cf. Jabneh and Jabnĕ-ēl, Jiptāḥ and Jiptaḥ-ēl.

The ancient explanations of the name proceed from Exod. iii. 14, 15, where "Yahweh[13] hath sent me" in *v.* 15 corresponds to "Ehyeh hath sent me" in *v.* 14, thus seeming to connect the name Yahweh with the Hebrew verb *hāyāh*, "to become, to be." The Palestinian interpreters found in this the promise that God would be with his people (cf. *v.* 12) in future oppressions as he was in the present distress, or the assertion of his eternity, or eternal constancy; the Alexandrian translation Ἐγώ εἰμι ὁ ὤν . . . Ὁ ὢν ἀπέσταλκέν με πρὸς ὑμᾶς, understands it in the more metaphysical sense of God's absolute being. Both interpretations, "He (who) is (always the same)," and "He (who) is (absolutely, the truly existent)," import into the name all that they profess to find in it; the one, the religious faith in God's unchanging fidelity to his people, the other, a philosophical conception of absolute being which is foreign both to the meaning of the Hebrew verb and to the force of the tense employed. Modern scholars have sometimes found in the name the expression of the aseity[14] of God; sometimes of his reality, in contrast to the imaginary gods of the heathen. Another explanation, which appears first in Jewish authors of the middle ages and has found wide acceptance in recent times, derives the name from the causative of the verb; He (who) causes things to be, gives them being; or calls events into existence, brings them to pass; with many individual modifications of interpretation—creator, life-giver, fulfiller of promises. A serious objection to this theory in every form is that the verb *hāyāh*, "to be," has no causative stem in Hebrew; to express the ideas which these scholars find in the name Yahweh the language employs altogether different verbs.

This assumption that Yahweh is derived from the verb "to be," as seems to be implied in Exod. iii. 14 seq., is not, however, free from difficulty. "To be" in the Hebrew of the Old Testament is not *hāwāh*, as the derivation would require, but *hāyāh*; and we are thus driven to the further assumption that *hāwāh* belongs to an earlier stage of the language, or to some older speech of the forefathers of the Israelites. This hypothesis is not intrinsically improbable—and in Aramaic, a language closely related to Hebrew, "to be" actually is *hăwā*—but it should be noted that in adopting it we admit that, using the name Hebrew in the historical sense, Yahweh is not a Hebrew name. And, inasmuch as nowhere in the Old Testament, outside of Exod. iii., is there the slightest indication that the Israelites connected the name of their God with the idea of "being" in any sense, it may fairly be questioned whether, if the author of Exod. iii. 14 seq., intended to give an etymological interpretation of the name Yahweh,[15] his etymology is any better than many other paronomastic explanations of proper names in the Old Testament, or than, say, the connexion of the name Ἀπόλλων with ἀπολούων, ἀπολύων in Plato's *Cratylus*, or the popular derivation from ἀπόλλυμι.

A root *hāwāh* is represented in Hebrew by the nouns *hōwāh* (Ezek., Isa. xlvii. 11) and *hawwāh* (Ps., Prov., Job) "disaster, calamity, ruin."[16] The primary meaning is probably "sink down, fall," in which sense—common in Arabic—the verb appears in Job xxxvii. 6 (of snow falling to earth). A Catholic commentator of the 16th century, Hieronymus ab Oleastro, seems to have been the first to connect the name "Jehova" with *hōwāh* interpreting it *contritio, sive pernicies* (destruction of the Egyptians and Canaanites); Daumer, adopting the same etymology, took it in a more general sense: Yahweh, as well as Shaddai, meant "Destroyer," and fitly expressed the nature of the terrible god whom he identified with Moloch.

The derivation of Yahweh from *hāwāh* is formally unimpeachable, and is adopted by many recent scholars, who proceed, however, from the primary sense of the root rather than from the specific meaning of the nouns. The name is accordingly interpreted, He (who) falls (baetyl, βαίτυλος, meteorite); or causes (rain or lightning) to fall (storm god); or casts down (his foes, by his thunderbolts). It is obvious that if the derivation be correct, the significance of the name, which in itself denotes only "He falls" or "He fells," must be learned, if at all, from early Israelitish conceptions of the nature of Yahweh rather than from etymology.

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[1] R. Johanan (second half of the 3rd century), *Kiddushin*, 71*a*.

[2] Kiddushin, *l.c.*=*Pesaḥim*, 50*a*.

[3] *M. Sanhedrin*, x. 1; Abba Saul, end of 2nd century.

[4] *Jer. Sanhedrin*, x. 1; R. Mana, 4th century.

[5] *Strom.* v. 6. Variants: Ια ουε, Ια ουαι; cod. L. Ιαου.

[6] *Panarion*, Haer. 40, 5; cf. Lagarde, *Psalter juxta Hebraeos*, 154.

[7] *Quaest.* 15 *in Exod.*; *Fab. haeret. compend.* v. 3, *sub fin.*

[8] Αϊα occurs also in the great magical papyrus of Paris, l. 3020 (Wessely, *Denkschrift. Wien. Akad.*, Phil. Hist. Kl., XXXVI. p. 120), and in the Leiden Papyrus, xvii. 31.

[9] See Deissmann, *Bibelstudien*, 13 sqq.

[10] See Driver, *Studia Biblica*, I. 20.

[11] See Montgomery, *Journal of Biblical Literature*, xxv. (1906), 49–51.

[12] *Chronographia*, Paris, 1567 (ed. Paris, 1600, p. 79 seq.).

[13] This transcription will be used henceforth.

[14] *A-se-itas*, a scholastic Latin expression for the quality of existing by oneself.

[15] The critical difficulties of these verses need not be discussed here. See W. R. Arnold, "The Divine Name in Exodus iii. 14," *Journal of Biblical Literature*, XXIV. (1905), 107–165.

[16] Cf. also *hawwāh*, "desire," Mic. vii. 3; Prov. x. 3.

A more fundamental question is whether the name Yahweh originated among the Israelites or was adopted by them from some other people and speech.[1] The biblical author of the history of the sacred institutions (P) expressly declares that the name Yahweh was unknown to the patriarchs (Exod. vi. 3), and the much older Israelite historian (E) records the first revelation of the name to Moses (Exod. iii. 13–15), apparently following a tradition according to which the Israelites had not been worshippers of Yahweh before the time of Moses, or, as he conceived it, had not worshipped the god of their fathers under that name. The revelation of the name to Moses was made at a mountain sacred to Yahweh (the mountain of God) far to the south of Palestine, in a region where the forefathers of the Israelites had never roamed, and in the territory of other tribes; and long after the settlement in Canaan this region continued to be regarded as the abode of Yahweh (Judg. v. 4; Deut. xxxiii. 2 sqq.; 1 Kings xix. 8 sqq. &c.). Moses is closely connected with the tribes in the vicinity of the holy mountain; according to one account, he married a daughter of the priest of Midian (Exod. ii. 16 sqq.; iii. 1); to this mountain he led the Israelites after their deliverance from Egypt; there his father-in-law met him, and extolling Yahweh as "greater than all the gods," offered (in his capacity as priest of the place?) sacrifices, at which the chief men of the Israelites were his guests; there the religion of Yahweh was revealed through Moses, and the Israelites pledged themselves to serve God according to its prescriptions. It appears, therefore, that in the tradition followed by the Israelite historian the tribes within whose pasture lands the mountain of God stood were worshippers of Yahweh before the time of Moses; and the surmise that the name Yahweh belongs to their speech, rather than to that of Israel, has considerable probability. One of these tribes was Midian, in whose land the mountain of God lay. The Kenites also, with whom another tradition connects Moses, seem to have been worshippers of Yahweh. It is probable that Yahweh was at one time worshipped by various tribes south of Palestine, and that several places in that wide territory (Horeb, Sinai, Kadesh, &c.) were sacred to him; the oldest and most famous of these, the mountain of God, seems to have lain in Arabia, east of the Red Sea. From some of these peoples and at one of these holy places, a group of Israelite tribes adopted the religion of Yahweh, the God who, by the hand of Moses, had delivered them from Egypt.[2]

The tribes of this region probably belonged to some branch of the great Arab stock, and the name Yahweh has, accordingly, been connected with the Arabic *hawā*, "the void" (between heaven and earth), "the atmosphere," or with the verb *hawā*, cognate with Heb. *hāwāh*, "sink, glide down" (through space); *hawwā* "blow" (wind). "He rides through the air, He blows" (Wellhausen), would be a fit name for a god of wind and storm. There is, however, no certain evidence that the Israelites in historical times had any consciousness of the primitive significance of the name.

The attempts to connect the name Yahweh with that of an Indo-European deity (Jehovah-Jove, &c.), or to derive it from Egyptian or Chinese, may be passed over. But one theory which has had considerable currency requires notice, namely, that Yahweh, or Yahu, Yaho,[3] is the name of a god worshipped throughout the whole, or a great part, of the area occupied by the Western Semites. In its earlier form this opinion rested chiefly on certain misinterpreted testimonies in Greek authors about a god ʼΙάω, and was conclusively refuted by Baudissin; recent adherents of the theory build more largely on the occurrence in various parts of this territory of proper names of persons and places which they explain as compounds of Yahu or Yah.[4] The explanation is in most cases simply an assumption of the point at issue; some of the names have been misread; others are undoubtedly the names of Jews. There remain, however, some cases in which it is highly probable that names of non-Israelites are really compounded with Yahweh. The most conspicuous of these is the king of Hamath who in the inscriptions of Sargon (722–705 B.C.) is called Yaubi'di and Ilubi'di (compare Jehoiakim-Eliakim). Azriyau of Jaudi, also, in inscriptions of Tiglath-Pileser (745–728 B.C.), who was formerly supposed to be Azariah (Uzziah) of Judah, is probably a king of the country in northern Syria known to us from the Zenjirli inscriptions as Ja'di.

Friedrich Delitzsch brought into notice three tablets, of the age of the first dynasty of Babylon, in which he read the names of *Ya- a'-ve-ilu*, *Ya-ve-ilu*, and *Ya-ū-um-ilu* ("Yahweh is God"), and which he regarded as conclusive proof that Yahweh was known in Babylonia before 2000 B.C.; he was a god of the Semitic invaders in the second wave of migration, who were, according to Winckler and Delitzsch, of North Semitic stock (Canaanites, in the linguistic sense).[5] We should thus have in the tablets evidence of the worship of Yahweh among the Western Semites at a time long before the rise of Israel. The reading of the names is, however, extremely uncertain, not to say improbable, and the far-reaching inferences drawn from them carry no conviction. In a tablet attributed to the 14th century B.C. which Sellin found in the course of his excavations at Tell Taʽannuk (the Taanach of the O.T.) a name occurs which may be read Aḫi-Yawi (equivalent to Hebrew Ahijah);[6] if the reading be correct, this would show that Yahweh was worshipped in Central Palestine before the Israelite conquest. The reading is, however, only one of several possibilities. The fact that the full form Yahweh appears, whereas in Hebrew proper names only the shorter Yahu and Yah occur, weighs somewhat against the interpretation, as it does against Delitzsch's reading of his tablets.

It would not be at all surprising if, in the great movements of populations and shifting of ascendancy which lie beyond our historical horizon, the worship of Yahweh should have been established in regions remote from those which it occupied in historical times; but nothing which we now know warrants the opinion that his worship was ever general among the Western Semites.

Many attempts have been made to trace the West Semitic Yahu back to Babylonia. Thus Delitzsch formerly derived the name from an Akkadian god, I or Ia; or from the Semitic nominative ending, Yau;[7] but this deity has since disappeared from the pantheon of Assyriologists. The combination of Yah with Ea, one of the great Babylonian gods, seems to have a peculiar fascination for amateurs, by whom it is periodically "discovered." Scholars are now agreed that, so far as Yahu or Yah occurs in Babylonian texts, it is as the name of a foreign god.

Assuming that Yahweh was primitively a nature god, scholars in the 19th century discussed the question over what sphere of nature he originally presided. According to some he was the god of consuming fire; others saw in him the bright sky, or the heaven; still others recognized in him a storm god, a theory with which the derivation of the name from Heb. *hāwāh* or Arab. *hawā* well accords. The association of Yahweh with storm and fire is frequent in the Old Testament; the thunder is the voice of Yahweh, the lightning his arrows, the rainbow his bow. The revelation at Sinai is amid the awe-inspiring phenomena of tempest. Yahweh leads Israel through the desert in a pillar of cloud and fire; he kindles Elijah's altar by lightning, and translates the prophet in a chariot of fire. See also Judg. v. 4 seq.;

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[1] See HEBREW RELIGION.

[2] The divergent Judaean tradition, according to which the forefathers had worshipped Yahweh from time immemorial, may indicate that Judah and the kindred clans had in fact been worshippers of Yahweh before the time of Moses.

[3] The form *Yahu*, or *Yaho*, occurs not only in composition, but by itself; see *Aramaic Papyri discovered at Assuan*, B 4, 6, 11; E 14; J 6. This is doubtless the original of ʼΙάω, frequently found in Greek authors and in magical texts as the name of the God of the Jews.

[4] See a collection and critical estimate of this evidence by Zimmern, *Die Keilinschriften und das Alte Testament*, 465 sqq.

[5] *Babel und Bibel*, 1902. The enormous, and for the most part ephemeral, literature provoked by Delitzsch's lecture cannot be cited here.

[6] *Denkschriften d. Wien. Akad.*, L. iv. p. 115 seq. (1904).

[7] *Wo lag das Paradies?* (1881), pp. 158–166.

Deut. xxxiii. 1; Ps. xviii. 7–15; Hab. iii. 3–6. The cherub upon which he rides when he flies on the wings of the wind (Ps. xviii. 10) is not improbably an ancient mythological personification of the storm cloud, the genius of tempest (cf. Ps. civ. 3). In Ezekiel the throne of Yahweh is borne up on Cherubim, the noise of whose wings is like thunder. Though we may recognize in this poetical imagery the survival of ancient and, if we please, mythical notions, we should err if we inferred that Yahweh was originally a departmental god, presiding specifically over meteorological phenomena, and that this conception of him persisted among the Israelites till very late times. Rather, as the god—or the chief god—of a region and a people, the most sublime and impressive phenomena, the control of the mightiest forces of nature are attributed to him. As the God of Israel Yahweh becomes its leader and champion in war; he is a warrior, mighty in battle; but he is not a god of war in the specific sense.

In the inquiry concerning the nature of Yahweh the name Yahweh Sebaoth (E.V., The Lord of Hosts) has had an important place. The hosts have by some been interpreted of the armies of Israel (see 1 Sam. xvii. 45, and note the association of the name in the Books of Samuel, where it first appears, with the ark, or with war); by others, of the heavenly hosts, the stars conceived as living beings, later, perhaps, the angels as the court of Yahweh and the instruments of his will in nature and history (Ps. lxxxix.); or of the forces of the world in general which do his bidding, cf. the common Greek renderings, Κύριος τῶν δυνάμεων and Κ. παντοκράτωρ, Universal Ruler). It is likely that the name was differently understood in different periods and circles; but in the prophets the hosts are clearly superhuman powers. In many passages the name seems to be only a more solemn substitute for the simple Yahweh, and as such it has probably often been inserted by scribes. Finally, Sebaoth came to be treated as a proper name (cf. Ps. lxxx. 5, 8, 20), and as such is very common in magical texts.

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JEHU, son of Jehoshaphat and grandson of Nimshi, in the Bible, a general of Ahab and Jehoram, and, later, king of Israel. Ahaziah son of Jehoram of Judah and Jehoram brother of Ahaziah of Israel had taken joint action against the Aramaeans of Damascus who were attacking Ramoth-Gilead under Hazael. Jehoram had returned wounded to his palace at Jezreel, whither Ahaziah had come down to visit him. Jehu, meanwhile, remained at the seat of war, and the prophet Elisha sent a messenger to anoint him king. The general at once acknowledged the call, "drove furiously" to Jezreel, and, having slain both kings, proceeded to exterminate the whole of the royal family (2 Kings ix., x.). A similar fate befell the royal princes of Judah (see ATHALIAH), and thus, for a time at least, the new king must have had complete control over the two kingdoms (cf. 2 Chron. xxii. 9). Israelite historians viewed these events as a great religious revolution inspired by Elijah and initiated by Elisha, as the overthrow of the worship of Baal, and as a retribution for the cruel murder of Naboth the Jezreelite (see JEZEBEL). A vivid description is given of the destruction of the prophets of Baal at the temple in Samaria (2 Kings x. 27; contrast iii. 2). While Jehu was supported by the Rechabites in his reforming zeal, a similar revolt against Baalism in Judah is ascribed to the priest Jehoiada (see JOASH). In the tragedies of the period it seems clear that Elisha's interest in both Jehu and the Syrian Hazael (2 Kings viii. 7 sqq.) had some political significance, and in opposition to the "Deuteronomic" the commendation in 2 Kings x. 28 sqq., Hosea's denunciation (i. 4) indicates the judgment which was passed upon Jehu's bloodshed in other circles.

In the course of an expedition against Hazael in 842 Shalmaneser II. of Assyria received tribute of silver and gold from Ya-u-a son of Omri,[1] Tyre and Sidon; another attack followed in 839. For some years after this Assyria was unable to interfere, and war broke out between Damascus and Israel. The Israelite story, which may perhaps be supplemented from Judaean sources (see JOASH), records a great loss of territory on the east of the Jordan (2 Kings x. 32 seq.). Under Jehu's successor Jehoahaz there was continual war with Hazael and his son Ben-hadad, but relief was obtained by his grandson Joash, and the land recovered complete independence under Jeroboam.

Jehu is also the name of a prophet of the time of Baasha and Jehoshaphat (1 Kings xvi.; 2 Chron. xix., xx.). (S. A. C.)

JEKYLL, SIR JOSEPH (1663–1738), English lawyer and master of the rolls, son of John Jekyll, was born in London, and after studying at the Middle Temple was called to the bar in 1687. He rapidly rose to be chief justice of Chester (1697), serjeant-at-law and king's serjeant (1700), and a knight. In 1717 he was made master of the rolls. A Whig in politics, he sat in parliament for various constituencies from 1697 to the end of his life, and took an active part there in debating constitutional questions with much learning, though, according to Lord Hervey (*Mem.* 1, 474), with little "approbation." He was censured by the House of Commons for accepting a brief for the defence of Lord Halifax in a prosecution ordered by the house. He was one of the managers of the impeachment of the Jacobite earl of Wintoun in 1715, and of Harley (Lord Oxford) in 1717. In later years he supported Walpole. He became very unpopular in 1736 for his introduction of the "gin act," taxing the retailing of spirituous liquors, and his house had to be protected from the mob. Pope has an illusion to "Jekyll or some odd Whig, Who never changed his principle or wig" (*Epilogue to the Satires*). Jekyll was also responsible for the Mortmain Act of 1736, which was not superseded till 1888. He died without issue in 1738.

His great-nephew JOSEPH JEKYLL (d. 1837) was a lawyer, politician and wit, who excited a good deal of contemporary satire, and who wrote some *jeux d'esprit* which were well-known in his time. His *Letters of the late Ignatius Sancho, an African*, was published in 1782. In 1894 his correspondence was edited, with a memoir, by the Hon. Algernon Bourke.

JELLACHICH, JOSEF, COUNT (1801–1859), Croatian statesman, was born on the 16th of October 1801 at Pétervárad. He entered the Austrian army (1819), fought against the Bosnians in 1845, was made ban of Croatia, Slavonia and Dalmatia in 1848 on the petition of the Croatians, and was simultaneously raised to the rank of lieutenant-general by the emperor. As ban, Jellachich's policy was directed to preserving the Slav kingdoms for the Habsburg monarchy by identifying himself with the nationalist opposition to Magyar ascendancy, while at the same time discouraging the extreme "Illyrism" advocated by Lodovik Gáj (1809–1872). Though his separatist measures at first brought him into disfavour at the imperial court, their true objective was soon recognized, and, with the triumph of the more violent elements of the Hungarian revolution, he was hailed as the most conspicuous champion of the unity of the empire, and was able to bring about that union of the imperial army with the southern Slavs by which the revolution in Vienna and Budapest was overthrown (see AUSTRIA-HUNGARY: *History*). He began the war of independence in September 1848 by crossing the Drave at the head of 40,000 Croats. After the bloody battle of Buda he concluded a three days' truce with the Hungarians to enable him to assist Prince Windischgrätz to reduce Vienna, and subsequently fought against the Magyars at Schwechát. During the winter campaign of 1848–49 he commanded, under Windischgrätz, the Austrian right wing, capturing Magyar-Ovar and Raab, and defeating the Magyars at Mór. After the recapture of Buda he was made commander-in-chief of the southern army.

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[1] *I.e.* either descendant of, or from the same district as, Omri (see Hogg, *Ency. Bib.* col. 2291). The Assyrian king's sculpture, depicting the embassy and its gifts, is the so-called "black obelisk" now in the British Museum (Nimroud Central Gallery, No. 98; *Guide to Bab. and Ass. Antiq.*, 1900, p. 24 seq., pl. ii.).

At first he gained some successes against Bem (*q.v.*), but on the 14th of July 1849 was routed by the Hungarians at Hegyes and driven behind the Danube. He took no part in the remainder of the war, but returned to Agram to administer Croatia. In 1853 he was appointed commander-in-chief of the army sent against Montenegro, and in 1855 was created a count. He died on the 20th of May 1859. His *Gedichte* were published at Vienna in 1851.

See the anonymous *The Croatian Revolution of the Year* 1848 (Croat.), Agram, 1898. (R. N. B.)

JELLINEK, ADOLF (1821–1893), Jewish preacher and scholar, was born in Moravia. After filling clerical posts in Leipzig, he became *Prediger* (preacher) in Vienna in 1856. He was associated with the promoters of the New Learning within Judaism, and wrote on the history of the Kabbala. His bibliographies (each bearing the Hebrew title *Qontres*) were useful compilations. But his most important work lay in three other directions. (1) *Midrashic.* Jellinek published in the six parts of his *Beth ha-Midrasch* (1853–1878) a large number of smaller *Midrashi*, ancient and medieval homilies and folk-lore records, which have been of much service in the recent revival of interest in Jewish apocalyptic literature. A translation of these collections of Jellinek into German was undertaken by A. Wuensche, under the general title *Aus Israels Lehrhalle.* (2) *Psychological.* Before the study of ethnic psychology had become a science, Jellinek devoted attention to the subject. There is much keen analysis and original investigation in his two essays *Der jüdische Stamm* (1869) and *Der jüdische Stamm in nicht-jüdischen Sprüch-wörtern* (1881–1882). It is to Jellinek that we owe the oft-repeated comparison of the Jewish temperament to that of women in its quickness of perception, versatility and sensibility. (3) *Homiletic.* Jellinek was probably the greatest synagogue orator of the 19th century. He published some 200 sermons, in most of which are displayed unobtrusive learning, fresh application of old sayings, and a high conception of Judaism and its claims. Jellinek was a powerful apologist and an accomplished homilist, at once profound and ingenious.

His son, GEORGE JELLINEK, was appointed professor of international law at Heidelberg in 1891. Another son, MAX HERMANN JELLINEK, was made assistant professor of philology at Vienna in 1892.

A brother of Adolf, HERMANN JELLINEK (b. 1823), was executed at the age of 26 on account of his association with the Hungarian national movement of 1848. One of Hermann Jellinek's best-known works was *Uriel Acosta.* Another brother, MORITZ JELLINEK (1823–1883), was an accomplished economist, and contributed to the Academy of Sciences essays on the price of cereals and on the statistical organization of the country. He founded the Budapest tramway company (1864) and was also president of the corn exchange.

See *Jewish Encyclopedia*, vii. 92–94. For a character sketch of Adolf Jellinek see S. Singer, *Lectures and Addresses* (1908), pp. 88–93; Kohut, *Berühmte israelitische Männer und Frauen.* (I. A.)

JEMAPPES, a town in the province of Hainaut, Belgium, near Mons, famous as the scene of the battle at which Dumouriez, at the head of the French Revolutionary Army, defeated the Austrian army (which was greatly outnumbered) under the duke of Saxe-Teschen and Clerfayt on the 6th of November 1792 (see FRENCH REVOLUTIONARY WARS).

JENA, a university town of Germany, in the grand duchy of Saxe-Weimar, on the left bank of the Saale, 56 m. S.W. from Leipzig by the Grossberigen-Saalfeld and 12 m. S.E. of Weimar by the Weimar-Gera lines of railway. Pop. (1905), 26,355. Its situation in a broad valley environed by limestone hills is somewhat dreary. To the north lies the plateau, descending steeply to the valley, famous as the scene of the battle of Jena. The town is surrounded by promenades occupying the site of the old fortifications; it contains in addition to the medieval market square, many old-fashioned houses and quaint narrow streets. Besides the old university buildings, the most interesting edifices are the 15th-century church of St Michael, with a tower 318 ft. high, containing an altar, beneath which is a doorway leading to a vault, and a bronze statue of Luther, originally destined for his tomb; the university library, in which is preserved a curious figure of a dragon; and the bridge across the Saale, as long as the church steeple is high, the centre arch of which is surmounted by a stone carved head of a malefactor. Across the river is the "mountain," or hill, whence a fine view is obtained of the town and surroundings, and hard by the Fuchs-Turm (Fox tower) celebrated for student orgies, while in the centre of the town is the house of an astronomer, Weigel, with a deep shaft through which the stars can be seen in the day time. Thus the seven marvels of Jena are summed up in the Latin lines:—

> *Ara, caput, draco, mons, pons, vulpecula turris,*
> *Weigeliana domus; septem miracula Jenae.*

There must also be mentioned the university church, the new university buildings, which occupy the site of the ducal palace (Schloss) where Goethe wrote his *Hermann und Dorothea*, the Schwarzer Bär Hotel, where Luther spent the night after his flight from the Wartburg, and four towers and a gateway which now alone mark the position of the ancient walls. The town has of late years become a favourite residential resort and has greatly extended towards the west, where there is a colony of pleasant villas. Its chief prosperity centres, however, in the university. In 1547 the elector John Frederick the Magnanimous of Saxony, while a captive in the hands of the emperor Charles V., conceived the plan of founding a university at Jena, which was accordingly established by his three sons. After having obtained a charter from the emperor Ferdinand I., it was inaugurated on the 2nd of February 1558. It was most numerously attended about the middle of the 18th century; but the most brilliant professoriate was under the duke Charles Augustus, Goethe's patron (1787–1806), when Fichte, Hegel, Schelling, Schlegel and Schiller were on its teaching staff. Founded as a home for the new religious opinions of the 16th century, it has ever been in the forefront of German universities in liberally accepting new ideas. It distances perhaps every other German university in the extent to which it carries out what are popularly regarded as the characteristics of German student-life—duelling and the passion for *Freiheit.* At the end of the 18th and the beginning of the 19th century, the opening of new universities, co-operating with the suspicions of the various German governments as to the democratic opinions which obtained at Jena, militated against the university, which has never regained its former prosperity. In 1905 it was attended by about 1100 students, and its teaching staff (including *privatdocenten*) numbered 112. Amongst its numerous auxiliaries may be mentioned the library, with 200,000 volumes, the observatory, the meteorological institute, the botanical garden, seminaries of theology, philology and education, and well equipped clinical, anatomical and physical institutes. There are also veterinary and agricultural colleges in connexion with the university. The manufactures of Jena are not considerable. The book trade has of late years revived, and there are several printing establishments.

Jena appears to have possessed municipal rights in the 13th century. At the beginning of the 14th century it was in the possession of the margraves of Meissen, from whom it passed in 1423 to the elector of Saxony. Since 1485 it has remained in the Ernestine line of the house of Saxony. In 1662 it fell to Bernhard, youngest son of William duke of Weimar, and became the capital of a small separate duchy. Bernhard's line having become extinct in 1690, Jena was united with Eisenach, and in 1741 reverted with that duchy to Weimar. In more modern times Jena has been made famous by the defeat inflicted in the vicinity, on the 14th of October 1806, by Napoleon upon the Prussian army under the prince of Hohenlohe (see NAPOLEONIC CAMPAIGNS).

See Schreiber and Färber, *Jena von seinem Ursprung bis zur neuesten Zeit* (2nd ed., 1858); Ortloff, *Jena und Umgegend* (3rd ed., 1875); Leonhardt, *Jena als Universität und Stadt* (Jena, 1902); Ritter, *Führer durch Jena und Umgebung* (Jena, 1901); Biedermann, *Die Universität Jena* (Jena, 1858); and the *Urkundenbuch der Stadt Jena*, edited by J. E. A. Martin and O. Devrient (1888–1903).

JENATSCH, GEORG (1596–1639), Swiss political leader, one of the most striking figures in the troubled history of the Grisons in the 17th century, was born at Samaden (capital of the Upper Engadine). He studied at Zürich and Basel, and in 1617 became the Protestant pastor of Scharans (near Thusis). But almost at once he plunged into active politics, taking the side of the Venetian and Protestant party of the Salis family, as against the Spanish and Romanist policy supported by the rival family, that of Planta. He headed the "preachers" who in 1618 tortured to death the arch-priest Rusca, of Sondrio, and outlawed the Plantas. As reprisals, a number of Protestants were massacred at Tirano (1620), in the Valtellina, a very fertile valley, of considerable strategical importance (for through it the Spaniards in Milan could communicate by the Umbrail Pass with the Austrians in Tirol), which then fell into the hands of the Spanish. Jenatsch took part in the murder (1621) of Pompey Planta, the head of the rival party, but later with his friends was compelled to fly the country, giving up his position as a pastor, and henceforth acting solely as a soldier. He helped in the revolt against the Austrians in the Prättigau (1622), and in the invasion of the Valtellina by a French army (1624), but the peace made (1626) between France and Spain left the Valtellina in the hands of the pope, and so destroyed Jenatsch's hopes. Having killed his colonel, Ruinelli, in a duel, Jenatsch had once more to leave his native land, and took service with the Venetians (1629–1630). In 1631 he went to Paris, and actively supported Richelieu's schemes for driving the Spaniards out of the Valtellina, which led to the successful campaign of Rohan (1635), one of whose firmest supporters was Jenatsch. But he soon saw that the French were as unwilling as the Spaniards to restore the Valtellina to the Grisons (which had seized it in 1512). So he became a Romanist (1635), and negotiated secretly with the Spaniards and Austrians. He was the leader of the conspiracy which broke out in 1637, and resulted in the expulsion of Rohan and the French from the Grisons. This treachery on Jenatsch's part did not, however, lead to the freeing of the Valtellina from the Spaniards, and once more he tried to get French support. But on the 24th of January 1639 he was assassinated at Coire by the Plantas; later in the same year the much coveted valley was restored by Spain to the Grisons, which held it till 1797. Jenatsch's career is of general historical importance by reason of the long conflict between France and Spain for the possession of the Valtellina, which forms one of the most bloody episodes in the Thirty Years' War. (W. A. B. C.)

See biography by E. Haffter (Davos, 1894).

JENGHIZ KHAN (1162–1227), Mongol emperor, was born in a tent on the banks of the river Onon. His father Yesukai was absent at the time of his birth, in a campaign against a Tatar chieftain named Temuchin. The fortune of war favoured Yesukai, who having slain his enemy returned to his encampment in triumph. Here he was met by the news that his wife Yulun had given birth to a son. On examining the child he observed in its clenched fist a clot of coagulated blood like a red stone. In the eyes of the superstitious Mongol this circumstance referred to his victory over the Tatar chieftain, and he therefore named the infant Temuchin. The death of Yesukai, which placed Temuchin at the age of thirteen on the Mongol throne, was the signal also for the dispersal of several tribes whose allegiance the old chieftain had retained by his iron rule. When remonstrated with by Temuchin, the rebels replied: "The deepest wells are sometimes dry, and the hardest stone is sometimes broken; why should we cling to thee?" But Yulun was by no means willing to see her son's power melt away; she led those retainers who remained faithful against the deserters, and succeeded in bringing back fully one half to their allegiance. With this doubtful material, Temuchin succeeded in holding his ground against the plots and open hostilities of the neighbouring tribes, more especially of the Naimans, Keraits and Merkits. With one or other of these he maintained an almost unceasing warfare until 1206, when he felt strong enough to proclaim himself the ruler of an empire. He therefore summoned the notables of his kingdom to an assembly on the banks of the Onon, and at their unanimous request adopted the name and title of Jenghiz Khan (Chinese, Chêng-sze, or "perfect warrior"). At this time there remained to him but one open enemy on the Mongolian steppes, Polo the Naiman khan. Against this chief he now led his troops, and in one battle so completely shattered his forces that Kushlek, the successor of Polo, who was left dead upon the field, fled with his ally Toto, the Merkit khan, to the river Irtysh.

Jenghiz Khan now meditated an invasion of the empire of the Kin Tatars, who had wrested northern China from the Sung dynasty. As a first step he invaded western Hia, and, having captured several strongholds, retired in the summer of 1208 to Lung-ting to escape the great heat of the plains. While there news reached him that Toto and Kushlek were preparing for war. In a pitched battle on the river Irtysh he overthrew them completely. Toto was amongst the slain, and Kushlek fled for refuge to the Khitan Tatars. Satisfied with his victory, Jenghiz again directed his forces against Hia. After having defeated the Kin army under the leadership of a son of the sovereign, he captured the Wu-liang-hai Pass in the Great Wall, and penetrated as far as Ning-sia Fu in Kansuh. With unceasing vigour he pushed on his troops, and even established his sway over the province of Liao-tung. Several of the Kin commanders, seeing how persistently victory attended his banners, deserted to him, and garrisons surrendered at his bidding. Having thus secured a firm footing within the Great Wall, he despatched three armies in the autumn of 1213 to overrun the empire. The right wing, under his three sons, Juji, Jagatai and Ogotai, marched towards the south; the left wing, under his brothers Hochar, Kwang-tsin Noyen and Chow-tse-te-po-shi, advanced eastward towards the sea; while Jenghiz and his son Tulē with the centre directed their course in a south-easterly direction. Complete success attended all three expeditions. The right wing advanced as far as Honan, and after having captured upwards of twenty-eight cities rejoined headquarters by the great western road. Hochar made himself master of the country as far as Liao-si; and Jenghiz ceased his triumphal career only when he reached the cliffs of the Shantung promontory. But either because he was weary of the strife, or because it was necessary to revisit his Mongolian empire, he sent an envoy to the Kin emperor in the spring of the following year (1214), saying, "All your possessions in Shantung and the whole country north of the Yellow River are now mine with the solitary exception of Yenking (the modern Peking). By the decree of heaven you are now as weak as I am strong, but I am willing to retire from my conquests; as a condition of my doing so, however, it will be necessary that you distribute largess to my officers and men to appease their fierce hostility." These terms of safety the Kin emperor eagerly accepted, and as a peace offering he presented Jenghiz with a daughter of the late emperor, another princess of the imperial house, 500 youths and maidens, and 3000 horses. No sooner, however, had Jenghiz passed beyond the Great Wall than the Kin emperor, fearing to remain any longer so near the Mongol frontier, moved his court to K'ai-fêng Fu in Honan. This transfer of capital appearing to Jenghiz to indicate a hostile attitude, he once more marched his troops into the doomed empire.

While Jenghiz was thus adding city to city and province to province in China, Kushlek, the fugitive Naiman chief, was not idle. With characteristic treachery he requested permission from his host, the Khitan khan, to collect the fragments of his army which had been scattered by Jenghiz at the battle on the Irtysh, and thus having collected a considerable force he leagued himself with Mahommed, the shah of Khwārizm, against the confiding khan. After a short but decisive campaign the allies remained masters of the position, and the khan was compelled to abdicate the throne in favour of the late guest.

With the power and prestige thus acquired, Kushlek prepared once again to measure swords with the Mongol chief. On receiving the news of his hostile preparations, Jenghiz at once took the field, and in the first battle routed the Naiman troops and made Kushlek a prisoner. His ill-gotten kingdom became an apanage of the Mongol Empire. Jenghiz now held sway up to the Khwārizm frontier. Beyond this he had no immediate desire to go, and he therefore sent envoys to Mahommed, the shah, with presents, saying, "I send thee greeting; I know thy power and the vast extent of thine empire; I regard thee as my most cherished son. On my part thou must know that I have conquered China and all the Turkish nations north of it; thou knowest that my country is a magazine of warriors, a mine of silver, and that I have no need of other lands. I take it that we have an equal interest in encouraging trade between our subjects." This peaceful message was well received by the shah, and in all probability the Mongol armies would never have appeared in Europe but for an unfortunate occurrence. Shortly after the despatch of this first mission Jenghiz sent a party of traders into Transoxiana who were seized and put to death as spies by Inaljuk, the governor of Otrar. As satisfaction for this outrage Jenghiz demanded the extradition of the offending governor. Far from yielding to this summons, however, Mahommed beheaded the chief of the Mongol envoys, and sent the others back without their beards. This insult made war inevitable, and in the spring of 1219 Jenghiz set out from Karakorum on a campaign which was destined to be as startling in its immediate results as its ulterior effects were far-reaching. The invading force was in the first instance divided into two armies: one commanded by Jenghiz's second son Jagatai was directed to march against the Kankalis, the northern defenders of the Khwārizm empire; and the other, led by Juji, his eldest son, advanced by way of Sighnak against Jand (Jend). Against this latter force Mahommed led an army of 400,000 men, who were completely routed, leaving it is said 160,000 dead upon the field. With the remnant of his host Mahommed fled to Samarkand. Meanwhile Jagatai marched down upon the Syr Daria (Jaxartes) by the pass of Taras and invested Otrar, the offending city. After a siege of five months the citadel was taken by assault, and Inaljuk and his followers were put to the sword. The conquerors levelled the walls with the ground, after having given the city over to pillage. At the same time a third army besieged and took Khojent on the Jaxartes; and yet a fourth, led by Jenghiz and his youngest son Tulē, advanced in the direction of Bokhara. Tashkent and Nur surrendered on their approach, and after a short siege Bokhara fell into their hands. On entering the town Jenghiz ascended the steps of the principal mosque, and shouted to his followers, "The hay is cut; give your horses fodder." No second invitation to plunder was needed; the city was sacked, and the inhabitants either escaped beyond the walls or were compelled to submit to infamies which were worse than death. As a final act of vengeance the town was fired, and before the last of the Mongols left the district, the great mosque and certain palaces were the only buildings left to mark the spot where the "centre of science" once stood. From the ruins of Bokhara Jenghiz advanced along the valley of the Sogd to Samarkand, which, weakened by treachery, surrendered to him, as did also Balkh. But in neither case did submission save either the inhabitants from slaughter or the city from pillage. Beyond this point Jenghiz went no farther westward, but sent Tulē, at the head of 70,000 men, to ravage Khorasan, and two flying columns under Chēpē and Sabutai Bahadar to pursue after Mahommed who had taken refuge in Nishapur. Defeated and almost alone, Mahommed fled before his pursuers to the village of Astara on the shore of the Caspian Sea, where he died of an attack of pleurisy, leaving his empire to his son Jelaleddīn (Jalāl ud-din). Meanwhile Tulē carried his arms into the fertile province of Khorasan, and after having captured Nessa by assault appeared before Merv. By an act of atrocious treachery the Mongols gained possession of the city, and, after their manner, sacked and burnt the town. From Merv Tulē marched upon Nishapur, where he met with a most determined resistance. For four days the garrison fought desperately on the walls and in the streets, but at length they were overpowered, and, with the exception of 400 artisans who were sent into Mongolia, every man, woman and child was slain. Herat escaped the fate which had overtaken Merv and Nishapur by opening its gates to the Mongols. At this point of his victorious career Tulē received an order to join Jenghiz before Talikhan in Badakshan, where that chieftain was preparing to renew his pursuit of Jelaleddīn, after a check he had sustained in an engagement fought before Ghazni. As soon as sufficient reinforcements arrived Jenghiz advanced against Jelaleddīn, who had taken up a position on the banks of the Indus. Here the Turks, though far outnumbered, defended their ground with undaunted courage, until, beaten at all points, they fled in confusion. Jelaleddīn, seeing that all was lost, mounted a fresh horse and jumped into the river, which flowed 20 ft. below. With admiring gaze Jenghiz watched the desperate venture of his enemy, and even saw without regret the dripping horseman mount the opposite bank. From the Indus Jenghiz sent in pursuit of Jelaleddīn, who fled to Delhi, but failing to capture the fugitive the Mongols returned to Ghazni after having ravaged the provinces of Lahore, Peshawar and Melikpur. At this moment news reached Jenghiz that the inhabitants of Herat had deposed the governor whom Tulē had appointed over the city, and had placed one of their own choice in his room. To punish this act of rebellion Jenghiz sent an army of 80,000 men against the offending city, which after a siege of six months was taken by assault. For a whole week the Mongols ceased not to kill, burn and destroy, and 1,600,000 persons are said to have been massacred within the walls. Having consummated this act of vengeance, Jenghiz returned to Mongolia by way of Balkh, Bokhara and Samarkand.

Meanwhile Chēpē and Sabutai marched through Azerbeijan, and in the spring of 1222 advanced into Georgia. Here they defeated a combined force of Lesghians, Circassians and Kipchaks, and after taking Astrakhan followed the retreating Kipchaks to the Don. The news of the approach of the mysterious enemy of whose name even they were ignorant was received by the Russian princes at Kiev with dismay. At the instigation, however, of Mitislaf, prince of Galicia, they assembled an opposing force on the Dnieper. Here they received envoys from the Mongol camp, whom they barbarously put to death. "You have killed our envoys," was the answer made by the Mongols; "well, as you wish for war you shall have it. We have done you no harm. God is impartial; He will decide our quarrel." In the first battle, on the river Kaleza, the Russians were utterly routed, and fled before the invaders, who, after ravaging Great Bulgaria retired, gorged with booty, through the country of Saksin, along the river Aktuba, on their way to Mongolia.

In China the same success had attended the Mongol arms as in western Asia. The whole of the country north of the Yellow river, with the exception of one or two cities, was added to the Mongol rule, and, on the death of the Kin emperor Süan Tsung in 1223, the Kin empire virtually ceased to be, and Jenghiz's frontiers thus became conterminous with those of the Sung emperors who held sway over the whole of central and southern China. After his return from Central Asia, Jenghiz once more took the field in western China. While on this campaign the five planets appeared in a certain conjunction, which to the superstitiously minded Mongol chief foretold that evil was awaiting him. With this presentiment strongly impressed upon him he turned his face homewards, and had advanced no farther than the Si-Kiang river in Kansuh when he was seized with an illness of which he died a short time afterwards (1227) at his travelling palace at Ha-lao-tu, on the banks of the river Sale in Mongolia. By the terms of his will Ogotai was appointed his successor, but so essential was it considered to be that his death should remain a secret until Ogotai was proclaimed that, as the funeral procession moved northwards to the great ordu on the banks of the Kerulen, the escort killed every one they met. The body of Jenghiz was then carried successively to the ordus of his several wives, and was finally laid to rest in the valley of Kilien.

Thus ended the career of one of the greatest conquerors the world has ever seen. Born and nurtured as the chief of a petty Mongolian tribe, he lived to see his armies victorious from the China Sea to the banks of the Dnieper; and, though the empire which he created ultimately dwindled away under the hands of his degenerate descendants, leaving not a wrack behind, we have in the presence of the Turks in Europe a consequence of his rule, since it was the advance of his armies which drove their Osmanli ancestors from their original home in northern Asia, and thus led to their invasion of Bithynia under Othman, and finally their advance into Europe under Amurath I.

See Sir H. H. Howorth, *The History of the Mongols*; Sir Robert K. Douglas, *The Life of Jenghiz Khan*. (R. K. D.)

JENKIN, HENRY CHARLES FLEEMING (1833–1885), British engineer, was born near Dungeness on the 25th of March 1833, his father (d. 1885) being a naval commander, and his mother (d. 1885) a novelist of some literary repute, her best books perhaps being *Cousin Stella* (1859) and *Who breaks, pays* (1861). Fleeming Jenkin was educated at first in Scotland, but in 1846 the family went to live abroad, owing to financial straits, and he studied at Genoa University, where he took a first-class degree in physical science. In 1851 he began his engineering career as apprentice in an establishment at Manchester, and subsequently he entered Newall's submarine cable works at Birkenhead. In 1859 he began, in concert with Sir William Thomson (afterwards Lord Kelvin), to work on problems respecting the making and use of cables, and the importance of his researches on the resistance of gutta-percha was at once recognized. From this time he was in constant request in connexion with submarine telegraphy, and he became known also as an inventor. In partnership with Thomson, he made a large income as a consulting telegraph engineer. In 1865 he was elected F.R.S., and was appointed professor of engineering at University College, London. In 1868 he obtained the same professorship at Edinburgh University, and in 1873 he published a textbook of *Magnetism and Electricity*, full of original work. He was author of the article "Bridges" in the ninth edition of this encyclopaedia. His influence among the Edinburgh students was pronounced, and R. L. Stevenson's well-known *Memoir* is a sympathetic tribute to his ability and character. The meteoric charm of his conversation is well described in Stevenson's essay on "Talk and Talkers," under the name of Cockshot. Jenkin's interests were by no means confined to engineering, but extended to the arts and literature; his miscellaneous papers, showing his critical and unconventional views, were issued posthumously in two volumes (1887). In 1882 Jenkin invented an automatic method of electric transport for goods—"telpherage"—but the completion of its details was prevented by his death on the 12th of June 1885. A telpher line on his system was subsequently erected at Glynde in Sussex. He was also well known as a sanitary reformer, and during the last ten years of his life he did much useful work in inculcating more enlightened ideas on the subject both in Edinburgh and other places.

JENKINS, SIR LEOLINE (1623–1685), English lawyer and diplomatist, was the son of a Welsh country gentleman. He was born in 1623 and was educated at Jesus College, Oxford, of which he was elected a fellow at the Restoration in 1660, having been an ardent royalist during the civil war and commonwealth; and in 1661 he became head of the college. In the same year he was made registrar of the consistory court of Westminster; in 1664 deputy judge of the court of arches; about a year later judge of the admiralty court; in 1669 judge of the prerogative court of Canterbury. In these offices Jenkins did enduring work in elucidating and establishing legal principles, especially in relation to international law and admiralty jurisdiction. He was selected to draw up the claim of Charles II. to succeed to the property of his mother, Henrietta Maria, on her death in August 1666, and while in Paris for this purpose he succeeded in defeating the rival claim of the duchess of Orleans, being rewarded by a knighthood on his return. In 1673, on being elected member for Hythe, Jenkins resigned the headship of Jesus College. He was one of the English representatives at the congress of Cologne in 1673, and at the more important congress of Nijmwegen in 1676–1679. He was made a privy councillor in February 1680 and became secretary of state in April of the same year, in which office he was the official leader of the opposition to the Exclusion Bill, though he was by no means a pliant tool in the hands of the court. He resigned office in 1684, and died on the 1st of September 1685. He left most of his property to Jesus College, Oxford, including his books, which he bequeathed to the college library, built by himself; and he left some important manuscripts to All Souls College, where they are preserved. Jenkins left his impress on the law of England in the Statute of Frauds, and the Statute of Distributions, of which he was the principal author, and of which the former profoundly affected the mercantile law of the country, while the latter regulated the inheritance of the personal property of intestates. He was never married.

See William Wynne, *Life of Sir Leoline Jenkins* (2 vols., London, 1724), which contains a number of his diplomatic despatches, letters, speeches and other papers. See also Sir William Temple, *Works*, vol. ii. (4 vols., 1770); Anthony à Wood, *Athenae Oxonienses* (Fasti) edited by P. Bliss (4 vols., London, 1813–1820), and *History and Antiquities of the University of Oxford*, edited by J. Gutch (Oxford, 1792–1796).

JENKINS, ROBERT (*fl.* 1731–1745), English master mariner, is known as the protagonist of the "Jenkins's ear" incident, which, magnified in England by the press and the opposition, became a contributory cause of the war between England and Spain (1739). Bringing home the brig "Rebecca" from the West Indies in 1731, Jenkins was boarded by a Spanish guarda-costa, whose commander rifled the holds and cut off one of his ears. On arriving in England Jenkins stated his grievance to the king, and a report was furnished by the commander-in-chief in the West Indies confirming his account. At first the case created no great stir, but in 1738 he repeated his story with dramatic detail before a committee of the House of Commons, producing what purported to be the ear that had been cut off. Afterwards it was suggested that he might have lost the ear in the pillory.

Jenkins was subsequently given the command of a ship in the East India Company's service, and later became supervisor of the company's affairs at St Helena. In 1741 he was sent from England to that island to investigate charges of corruption brought against the acting governor, and from May 1741 until March 1742 he administered the affairs of the island. Thereafter he resumed his naval career, and is stated in an action with a pirate vessel to have preserved his own vessel and three others under his care (see T. H. Brooke, *History of the Island of St Helena* (London, 2nd ed., 1824), and H. R. Janisch, *Extracts from the St Helena Records*, 1885).

JENKS, JEREMIAH WHIPPLE (1856–), American economist, was born in St Clair, Michigan, on the 2nd of September 1856. He graduated at the university of Michigan in 1878; taught Greek, Latin and German in Mt. Morris College, Illinois; studied in Germany, receiving the degree of Ph.D. from the university of Halle in 1885; taught political science and English literature at Knox College, Galesburg, Ill., in 1886–1889; was professor of political economy and social science at Indiana State University in 1889–1891; and was successively professor of political, municipal and social institutions (1891–1892), professor of political economy and civil and social institutions (1892–1901), and after 1901 professor of political economy and politics at Cornell University. In 1899–1901 he served as an expert agent of the United States industrial commission on investigation of trusts and industrial combinations in the United States and Europe, and contributed to vols. i., viii. and xiii. of this commission's report (1900 and 1901), vol. viii. being a report, written wholly by him, on industrial combinations in Europe. In 1901–1902 he was special commissioner of the United States war department on colonial administration, and wrote a *Report on Certain Economic Questions in the English and Dutch Colonies in the Orient*, published (1902) by the bureau of insular affairs; and in 1903 he was adviser to the Mexican ministry of finance on projected currency changes. In 1903–1904 he was a member of the United States commission on international exchange, in especial charge of the reform of currency in China; in 1905 he was special representative of the United States with the imperial Chinese special mission visiting the United States. In 1907 he became a member of the United States immigration commission. Best known as an expert on "trusts," he has written besides on elections, ballot reform, proportional representation, on education (especially as a training for citizenship), on legislation regarding highways, &c.

His principal published works are *Henry C. Carey als Nationalökonom* (Halle a. S., 1885); *The Trust Problem* (1900; revised 1903); *Great Fortunes* (1906); *Citizenship and the Schools* (1906); and *Principles of Politics* (1909).

JENNÉ, a city of West Africa, formerly the capital of the Songhoi empire, now included in the French colony of Upper Senegal and Niger. Jenné is situated on a marigot or natural canal connecting the Niger and its affluent the Bani or Mahel Balevel, and is within a few miles of the latter stream. It lies 250 m. S.W. of Timbuktu in a straight line. The city is surrounded by channels connected with the Bani but in the dry season it ceases to be an island. On the north is the Moorish quarter; on the north-west, the oldest part of the city, stood the citadel, converted by the French since 1893 into a modern fort. The market-place is midway between the fort and the commercial harbour. The old mosque, partially destroyed in 1830, covered a large area in the south-west portion of the city. It was built on the site of the ancient palace of the Songhoi kings. The architecture of many of the buildings bears a resemblance to Egyptian, the façades of the houses being adorned with great buttresses of pylonic form. There is little trace of the influence of Moorish or Arabian art. The buildings are mostly constructed of clay made into flat long bricks. Massive clay walls surround the city. The inhabitants are great traders and the principal merchants have representatives at Timbuktu and all the chief places on the Niger. The boats built at Jenné are famous throughout the western Sudan.

Jenné is believed to have been founded by the Songhoi in the 8th century, and though it has passed under the dominion of many races it has never been destroyed. Jenné seems to have been at the height of its power from the 12th to the 16th century, when its merchandise was found at every port along the west coast of Africa. From this circumstance it is conjectured that Jenné (Guinea) gave its name to the whole coast (see GUINEA). Subsequently, under the control of Moorish, Tuareg and Fula invaders, the importance of the city greatly declined. With the advent of the French, commerce again began to flourish.

See F. Dubois, *Tombouctou la mystérieuse* (Paris, 1897), in which several chapters are devoted to Jenné; also SONGHOI; TIMBUKTU; and SENEGAL.

JENNER, EDWARD (1749–1823), English physician and discoverer of vaccination, was born at Berkeley, Gloucestershire, on the 17th of May 1749. His father, the Rev. Stephen Jenner, rector of Rockhampton and vicar of Berkeley, came of a family that had been long established in that county, and was possessed of considerable landed property; he died when Edward was only six years old, but his eldest son, the Rev. Stephen Jenner, brought his brother up with paternal care and tenderness. Edward received his early education at Wotton-under-Edge and Cirencester, where he already showed a strong taste for natural history. The medical profession having been selected for him, he began his studies under Daniel Ludlow, a surgeon of Sodbury near Bristol; but in his twenty-first year he proceeded to London, where he became a favourite pupil of John Hunter, in whose house he resided for two years. During this period he was employed by Sir Joseph Banks to arrange and prepare the valuable zoological specimens which he had brought back from Captain Cook's first voyage in 1771. He must have acquitted himself satisfactorily in this task, since he was offered the post of naturalist in the second expedition, but declined it as well as other advantageous offers, preferring rather to practise his profession in his native place, and near his eldest brother, to whom he was much attached. He was the principal founder of a local medical society, to which he contributed several papers of marked ability, in one of which he apparently anticipated later discoveries concerning rheumatic inflammations of the heart. He maintained a correspondence with John Hunter, under whose direction he investigated various points in biology, particularly the hibernation of hedgehogs and habits of the cuckoo; his paper on the latter subject was laid by Hunter before the Royal Society, and appeared in the *Phil. Trans.* for 1788. He also devoted considerable attention to the varied geological character of the district in which he lived, and constructed the first balloon seen in those parts. He was a great favourite in general society, from his agreeable and instructive conversation, and the many accomplishments he possessed. Thus he was a fair musician, both as a part singer and as a performer on the violin and flute, and a very successful writer, after the fashion of that time, of fugitive pieces of verse. In 1788 he married Catherine Kingscote, and in 1792 he obtained the degree of doctor of medicine from St Andrews.

Meanwhile the discovery that is associated with his name had been slowly maturing in his mind. When only an apprentice at Sodbury, his attention had been directed to the relations between cow-pox and small-pox in connexion with a popular belief which he found current in Gloucestershire, as to the antagonism between these two diseases. During his stay in London he appears to have mentioned the thing repeatedly to Hunter, who, being engrossed by other important pursuits, was not so strongly persuaded as Jenner was of its possible importance, yet spoke of it to his friends and in his lectures. After he began practice in Berkeley, Jenner was always accustomed to inquire what his professional brethren thought of it; but he found that, when medical men had noticed the popular report at all, they supposed it to be based on imperfect induction. His first careful investigation of the subject dated from about 1775, and five years elapsed before he had succeeded in clearing away the most perplexing difficulties by which it was surrounded. He first satisfied himself that two different forms of disease had been hitherto confounded under the term cow-pox, only one of which protected against small-pox, and that many of the cases of failure were to be thus accounted for; and his next step was to ascertain that the true cow-pox itself only protects when communicated at a particular stage of the disease. At the same time he came to the conclusion that "the grease" of horses is the same disease as cow-pox and small-pox, each being modified by the organism in which it was developed. For many years, cow-pox being scarce in his county, he had no opportunity of inoculating the disease, and so putting his discovery to the test, but he did all he could in the way of collecting information and communicating what he had ascertained. Thus in 1788 he carried a drawing of the cow-pox, as seen on the hands of a milkmaid, to London, and showed it to Sir E. Home and others, who agreed that it was "an interesting and curious subject." At length, on the 14th of May 1796, he was able to inoculate James Phipps, a boy about eight years old, with matter from cow-pox vesicles on the hand of Sarah Nelmes. On the 1st of the following July the boy was carefully inoculated with variolous matter, but (as Jenner had predicted) no small-pox followed. The discovery was now complete, but Jenner was unable to repeat his experiment until 1798, owing to the disappearance of cow-pox from the dairies. He then repeated his inoculations with the utmost care, and prepared a pamphlet (*Inquiry into the Cause and Effects of the Variolae Vaccinae*) which should announce his discovery to the world. Before publishing it, however, he thought it well to visit London, so as to demonstrate the truth of his assertions to his friends; but he remained in London nearly three months, without being able to find any person who would submit to be vaccinated. Soon after he had returned home, however, Henry Cline, surgeon of St Thomas's Hospital, inoculated some vaccine matter obtained from him over the diseased hip-joint of a child, thinking the counter-irritation might be useful, and found the patient afterwards incapable of acquiring small-pox. In the autumn of the same year, Jenner met with the first opposition to vaccination; and this was the more formidable because it proceeded from J. Ingenhousz, a celebrated physician and man of science. But meanwhile Cline's advocacy of vaccination brought it much more decidedly before the medical profession, of whom the majority were prudent enough to suspend their judgment until they had more ample information. But besides these there were two noisy and troublesome factions, one of which opposed vaccination as a useless and dangerous practice, while the other endangered its success much more by rash and self-seeking advocacy. At the head of the latter was George Pearson, who in November 1798 published a pamphlet speculating upon the subject, before even seeing a case of cow-pox, and afterwards endeavoured, by lecturing on the subject and supplying the virus, to put himself forward as the chief agent in the cause. The matter which he distributed, which had been derived from cows that were found to be infected in London, was found frequently to produce, not the slight disease described by Jenner, but more or less severe eruptions resembling small-pox. Jenner concluded at once that this was due to an accidental contamination of the vaccine with variolous matter, and a visit to London in the spring of 1799 convinced him that this was the case. In the course of this year the practice of vaccination spread over England, being urged principally by non-professional persons of position; and towards its close attempts were made to found institutions for gratuitous vaccination and for supplying lymph to all who might apply for it. Pearson proposed to establish one of these in London, without Jenner's knowledge, in which he offered him the post of honorary corresponding physician! On learning of this scheme to supplant him, and to carry on an institution for public vaccination on principles which he knew to be partly erroneous, Jenner once more visited London early in 1800, when he had influence enough to secure the abandonment of the project. He was afterwards presented to the king, the queen and the prince of Wales, whose encouragement materially aided the spread of vaccination in England. Meanwhile it had made rapid progress in the United States, where it was introduced by Benjamin Waterhouse, then professor of physic at Harvard, and on the continent of Europe, where it was at first diffused by De Carro of Vienna. In consequence of the war between England and France, the discovery was later in reaching Paris; but, its importance once realized, it spread rapidly over France, Spain and Italy.

A few of the incidents connected with its extension may be mentioned. Perhaps the most striking is the expedition which was sent out by the court of Spain in 1803, for the purpose of diffusing cow-pox through all the Spanish possessions in the Old and New Worlds, and which returned in three years, having circumnavigated the globe, and succeeded beyond its utmost expectations. Clergymen in Geneva and Holland urged vaccination upon their parishioners from the pulpit; in Sicily, South America and Naples religious processions were formed for the purpose of receiving it; the anniversary of Jenner's birthday, or of the successful vaccination of James Phipps, was for many years celebrated as a feast in Germany; and the empress of Russia caused the first child operated upon to receive the name of Vaccinov, and to be educated at the public expense. About the close of the year 1801 Jenner's friends in Gloucestershire presented him with a small service of plate as a testimonial of the esteem in which they held his discovery. This was intended merely as a preliminary to the presenting of a petition to parliament for a grant. The petition was presented in 1802, and was referred to a committee, of which the investigations resulted in a report in favour of the grant, and ultimately in a vote of £10,000.

Towards the end of 1802 steps were taken to form a society for the proper spread of vaccination in London, and the Royal Jennerian Society was finally established, Jenner returning to town to preside at the first meeting. This institution began very prosperously, more than twelve thousand persons having been inoculated in the first eighteen months, and with such effect that the deaths from small-pox, which for the latter half of the 18th century had averaged 2018 annually, fell in 1804 to 622. Unfortunately the chief resident inoculator soon set himself up as an authority opposed to Jenner, and this led to such dissensions as caused the society to die out in 1808.

Jenner was led, by the language of the chancellor of the exchequer when his grant was proposed, to attempt practice in London, but after a year's trial he returned to Berkeley. His grant was not paid until 1804, and then, after the deduction of about £1000 for fees, it did little more than pay the expenses attendant upon his discovery. For he was so thoroughly known everywhere as the discoverer of vaccination that, as he himself said, he was "the vaccine clerk of the whole world." At the same time he continued to vaccinate gratuitously all the poor who applied to him on certain days, so that he sometimes had as many as three hundred persons waiting at his door. Meanwhile honours began to shower upon him from abroad: he was elected a member of almost all the chief scientific societies on the continent of Europe, the first being that of Göttingen, where he was proposed by J. F. Blumenbach. But perhaps the most flattering proof of his influence was derived from France. On one occasion, when he was endeavouring to obtain the release of some of the unfortunate Englishmen who had been detained in France on the sudden termination of the Peace of Amiens, Napoleon was about to reject the petition, when Josephine uttered the name of Jenner. The emperor paused and exclaimed: "Ah, we can refuse nothing to that name." Somewhat later he did the same service to Englishmen confined in Mexico and in Austria; and during the latter part of the great war persons before leaving England would sometimes obtain certificates signed by him which served as passports. In his own country his merits were less recognized. His applications on behalf of French prisoners in England were less successful; he never shared in any of the patronage at the disposal of the government, and was even unable to obtain a living for his nephew George.

In 1806 Lord Henry Petty (afterwards the marquess of Lansdowne) became chancellor of the exchequer, and was so convinced of the inadequacy of the former parliamentary grant that he proposed an address to the Crown, praying that the college of physicians should be directed to report upon the success of vaccination. Their report being strongly in its favour, the then chancellor of the exchequer (Spencer Perceval) proposed that a sum of £10,000 without any deductions should be paid to Jenner. The anti-vaccinationists found but one advocate in the House of Commons; and finally the sum was raised to £20,000. Jenner, however, at the same time had the mortification of learning that government did not intend to take any steps towards checking small-pox inoculation, which so persistently kept up that disease. About the same time a subscription for his benefit was begun in India, where his discovery had been gratefully received, but the full amount of this (£7383) only reached him in 1812.

The Royal Jennerian Society having failed, the national vaccine establishment was founded, for the extension of vaccination, in 1808. Jenner spent five months in London for the purpose of organizing it, but was then obliged, by the dangerous illness of one of his sons, to return to Berkeley. He had been appointed director of the institution; but he had no sooner left London than Sir Lucas Pepys, president of the college of physicians, neglected his recommendations, and formed the board out of the officials of that college and the college of surgeons. Jenner at once resigned his post as director, though he continued to give the benefit of his advice whenever it was needed, and this resignation was a bitter mortification to him. In 1810 his eldest son died, and Jenner's grief at his loss, and his incessant labours, materially affected his health. In 1813 the university of Oxford conferred on him the degree of M.D. It was believed that this would lead to his election into the college of physicians, but that learned body decided that he could not be admitted until he had undergone an examination in classics. This Jenner at once refused; to brush up his classics would, he said, "be irksome beyond measure. I would not do it for a diadem. That indeed would be a bauble; I would not do it for John Hunter's museum."

He visited London for the last time in 1814, when he was presented to the Allied Sovereigns and to most of the principal personages who accompanied them. In the next year his wife's death was the signal for him to retire from public life: he never left Berkeley again, except for a day or two, as long as he lived. He found sufficient occupation for the remainder of his life in collecting further evidence on some points connected with his great discovery, and in his engagements as a physician, a naturalist and a magistrate. In 1818 a severe epidemic of small-pox prevailed, and fresh doubts were thrown on the efficacy of vaccination, in part apparently owing to the bad quality of the vaccine lymph employed. This caused Jenner much annoyance, which was relieved by an able defence of the practice, written by Sir Gilbert Blane. But this led him, in 1821, to send a circular letter to most of the medical men in the kingdom inquiring into the effect of other skin diseases in modifying the progress of cow-pox. A year later he published his last work, *On the Influence of Artificial Eruptions in Certain Diseases*; and in 1823 he presented his last paper—"On the Migration of Birds"—to the Royal Society. On the 24th of January 1823 he retired to rest apparently as well as usual, and next morning rose and came down to his library, where he was found insensible on the floor, in a state of apoplexy, and with the right side paralysed. He never rallied, and died on the following morning.

A public subscription was set on foot, shortly after his death, by the medical men of his county, for the purpose of erecting some memorial in his honour, and with much difficulty a sufficient sum was raised to enable a statue to be placed in Gloucester Cathedral. In 1850 another attempt was made to set up a monument to him; this appears to have failed, but at length, in 1858, a statue of him was erected by public subscription in London.

Jenner's life was written by the intimate friend of his later years, Dr John Baron of Gloucester (2 vols., 1827, 1838). See also VACCINATION.

JENNER, SIR WILLIAM, BART. (1815–1898), English physician, was born at Chatham on the 30th of January 1815, and educated at University College, London. He became M.R.C.S. in 1837, and F.R.C.P. in 1852, and in 1844 took the London M.D. In 1847 he began at the London fever hospital investigations into cases of "continued" fever which enabled him finally to make the distinction between typhus and typhoid on which his reputation as a pathologist principally rests. In 1849 he was appointed professor of pathological anatomy at University College, and also assistant physician to University College Hospital, where he afterwards became physician (1854–1876) and consulting physician (1879), besides holding similar appointments at other hospitals. He was also successively Holme professor of clinical medicine and professor of the principles and practice of medicine at University College. He was president of the college of physicians (1881–1888); he was elected F.R.S. in 1864, and received honorary degrees from Oxford, Cambridge and Edinburgh. In 1861 he was appointed physician extraordinary, and in 1862 physician in ordinary, to Queen Victoria, and in 1863 physician in ordinary to the prince of Wales; he attended both the prince consort and the prince of Wales in their attacks of typhoid fever. In 1868 he was created a baronet. As a consultant Sir William Jenner had a great reputation, and he left a large fortune when he died, at Bishop's Waltham, Hants, on the 11th of December 1898, having then retired from practice for eight years owing to failing health.

JENNET, a small Spanish horse; the word is sometimes applied in English to a mule, the offspring of a she-ass and a stallion. Jennet comes, through Fr. *genet*, from Span. *jinete*, a light horseman who rides *à la gineta*, explained as "with his legs tucked up." The name is taken to be a corruption of the Arabic Zenāta, a Berber tribe famed for its cavalry. English and French transferred the word from the rider to his horse, a meaning which the word has only acquired in Spain in modern times.

JENOLAN CAVES, a series of remarkable caverns in Roxburgh county, New South Wales, Australia; 113 m. W. by N. of Sydney, and 36 m. from Tarana, which is served by railway. They are the most celebrated of several similar groups in the limestone of the country; they have not yielded fossils of great interest, but the stalactitic formations, sometimes pure white, are of extraordinary beauty. The caves have been rendered easily accessible to visitors and lighted by electricity.

JENSEN, WILHELM (1837–   ), German author, was born at Heiligenhafen in Holstein on the 15th of February 1837, the son of a local Danish magistrate, who came of old patrician Frisian stock. After attending the classical schools at Kiel and Lübeck, Jensen studied medicine at the universities of Kiel, Würzburg and Breslau. He, however, abandoned the medical profession for that of letters, and after engaging for some years in individual private study proceeded to Munich, where he associated with men of letters. After a residence in Stuttgart (1865–1869), where for a short time he conducted the *Schwäbische Volks-Zeitung*, he became editor in Flensburg of the *Norddeutsche Zeitung*. In 1872 he again returned to Kiel, lived from 1876 to 1888 in Freiburg im Breisgau, and since 1888 has been resident in Munich.

Jensen is perhaps the most fertile of modern German writers of fiction, more than one hundred works having proceeded from his pen; but only comparatively few of them have caught the public taste; such are the novels, *Karin von Schweden* (Berlin, 1878); *Die braune Erica* (Berlin, 1868); and the tale, *Die Pfeifer von Dusenbach, Eine Geschichte aus dem Elsass* (1884). Among others may be mentioned: *Barthenia* (Berlin, 1877); *Götz und Gisela* (Berlin, 1886); *Heimkunft* (Dresden, 1894); *Aus See und Sand* (Dresden, 1897); *Luv und Lee* (Berlin, 1897); and the narratives, *Aus den Tagen der Hansa* (Leipzig, 1885); *Aus stiller Zeit* (Berlin, 1881–1885); and *Heimath* (1901). Jensen also published some tragedies, among which *Dido* (Berlin, 1870) and *Der Kampf für's Reich* (Freiburg im Br., 1884) may be mentioned.

JENYNS, SOAME (1704–1787), English author, was born in London on the 1st of January 1704, and was educated at St John's College, Cambridge. In 1742 he was chosen M.P. for Cambridgeshire, in which his property lay, and he afterwards sat for the borough of Dunwich and the town of Cambridge. From 1755 to 1780 he was one of the commissioners of the board of trade. He died on the 18th of December 1787.

For the measure of literary repute which he enjoyed during his life Jenyns was indebted as much to his wealth and social standing as to his accomplishments and talents, though both were considerable. His poetical works, the *Art of Dancing* (1727) and *Miscellanies* (1770), contain many passages graceful and lively though occasionally verging on licence. The first of his prose works was his *Free Inquiry into the Nature and Origin of Evil* (1756). This essay was severely criticized on its appearance, especially by Samuel Johnson in the *Literary Magazine*. Johnson, in a slashing review—the best paper of the kind he ever wrote—condemned the book as a slight and shallow attempt to solve one of the most difficult of moral problems. Jenyns, a gentle and amiable man in the main, was extremely irritated by his failure. He put forth a second edition of his work, prefaced by a vindication, and tried to take vengeance on Johnson after his death by a sarcastic epitaph.[1] In 1776 Jenyns published his *View of the Internal Evidence of the Christian Religion*. Though at one period of his life he had affected a kind of deistic scepticism, he had now returned to orthodoxy, and there seems no reason to doubt his sincerity, questioned at the time, in defending Christianity on the ground of its total variance with the principles of human reason. The work was deservedly praised in its day for its literary merits, but is so plainly the production of an amateur in theology that as a scientific treatise it is valueless.

A collected edition of the works of Jenyns appeared in 1790, with a biography by Charles Nalson Cole. There are several references to him in Boswell's *Johnson*.

JEOPARDY, a term meaning risk or danger of death, loss or other injury. The word, in Mid. Eng. *juparti*, *jeupartie*, &c., was adapted from O. Fr. *ju*, later *jeu*, and *parti*, even game, in medieval Latin *jocus partitus*. This term was originally used of a problem in chess or of a stage in any other game at which the chances of success or failure are evenly divided between the players. It was thus early transformed to any state of uncertainty.

JEPHSON, ROBERT (1736–1803), British dramatist, was born in Ireland. After serving for some years in the British army, he retired with the rank of captain, and lived in England, where he was the friend of Garrick, Reynolds, Goldsmith, Johnson, Burke, Burney and Charles Townshend. His appointment as master of the horse to the lord-lieutenant of Ireland took him back to Dublin. He published, in the *Mercury* newspaper a series of articles in defence of the lord-lieutenant's administration which were afterwards collected and issued in book form under the title of *The Bachelor, or Speculations of Jeoffry Wagstaffe.* A pension of £300, afterwards doubled, was granted him, and he held his appointment under twelve succeeding viceroys. From 1775 he was engaged in the writing of plays. Among others, his tragedy *Braganza* was successfully performed at Drury Lane in 1775, *Conspiracy* in 1796, *The Law of Lombardy* in 1779, and *The Count of Narbonne* at Covent Garden in 1781. In 1794 he published an heroic poem *Roman Portraits*, and *The Confessions of Jacques Baptiste Couteau*, a satire on the excesses of the French Revolution. He died at Blackrock, near Dublin, on the 31st of May 1803.

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[1] Two lines will suffice:—

Boswell and Thrale, retailers of his wit,
Will tell you how he wrote, and talk'd, and cough'd, and spit.

JEPHTHAH, one of the judges of Israel, in the Bible, was an illegitimate son of Gilead, and, being expelled from his father's house by his lawful brethren, took refuge in the Syrian land of Tob, where he gathered around him a powerful band of homeless men like himself. The Ammonites pressing hard on his countrymen, the elders of Gilead called for his help, which he consented to give on condition that in the event of victory he should be made their head (Judg. xi. 1–xii. 7). His name is best known in history and literature in connexion with his vow, which led to the sacrifice of his daughter on his successful return. The reluctance shown by many writers in accepting the plain sense of the narrative on this point proceeds to a large extent on unwarranted assumptions as to the stage of ethical development which had been reached in Israel in the period of the judges, or at the time when the narrative took shape. The annual lamentation of the women for her death suggests a mythical origin (see ADONIS). Attached to the narrative is an account of a quarrel between Jephthah and the Ephraimites. The latter were defeated, and their retreat was cut off by the Gileadites, who had seized the fords of the Jordan. As the fugitives attempted to cross they were bidden to say "shibbōleth" ("flood" or "ear of corn"), and those who said "sibbōleth" (the Ephraimites apparently being unused to *sh*), were at once put to death. In this way 42,000 of the tribe were killed.[1]

The loose connexion between this and the main narrative, as also the lengthy speech to the children of Ammon (xi. 14–27), which really relates to Moab, has led some writers to infer that two distinct heroes and situations have been combined. See further the commentaries on the Book of Judges (*q.v.*), and Cheyne, *Ency. Bib.*, art. "Jephthah." (S. A. C.)

JERAHMEEL, (Heb. "May God pity"), in the Bible, a clan which with Caleb, the Kenites and others, occupied the southern steppes of Palestine, probably in the district around Arad, about 17 m. S. of Hebron. It was on friendly terms with David during his residence at Ziklag (1 Sam. xxx. 29), and it was apparently in his reign that the various elements of the south were united and were reckoned to Israel. This is expressed in the chronicler's genealogies which make Jerahmeel and Caleb descendants of Judah (see DAVID; JUDAH).

On the names in 1 Chron. ii. see S. A. Cook, *Ency. Bib.*, col. 2363 seq. Peleth (*v.* 33) may be the origin of the Pelethites (2 Sam. viii. 18; xv. 18; xx. 7), and since the name occurs in the revolt of Korah (Num. xvi. 1), it is possible that Jerahmeel, like Caleb and the Kenites, had moved northwards from Kadesh. Samuel (*q.v.*) was of Jerahmeel (1 Sam. i. 1; Septuagint), and the consecutive Jerahmeelite names Nathan and Zabad (1 Chron. ii. 36) have been associated with the prophet and officer (Zabud, 1 Kings iv. 5) of the times of David and Solomon respectively. The association of Samuel and Nathan with this clan, if correct, is a further illustration of the importance of the south for the growth of biblical history (see KENITES and RECHABITES). The *Chronicles of Jerahmeel* (M. Gaster, *Oriental Translation Fund*, 1899) is a late production containing a number of apocryphal Jewish legends of no historical value. (S. A. C.)

JERBA, an island off the coast of North Africa in the Gulf of Gabes, forming part of the regency of Tunisia. It is separated from the mainland by two narrow straits, and save for these channels blocks the entrance to a large bight identified with the Lake Triton of the Romans. The western strait, opening into the Gulf of Gabes, is a mile and a half broad; the eastern strait is wider, but at low water it is possible to cross to the mainland by the Tarik-el-Jemil (road of the camel). The island is irregular in outline, its greatest length and breadth being some 20 m., and its area 425 sq. m. It contains neither rivers nor springs, but is supplied with water by wells and cisterns. It is flat and well wooded with date palms and olive trees. Pop. 35,000 to 40,000, the bulk of the inhabitants being Berbers. Though many of them have adopted Arabic a Berber idiom is commonly spoken. An affinity exists between the Berbers of Jerba and the Beni Mzab. About 3000 Jews live apart in villages of their own, and some 400 Europeans, chiefly Maltese and Greeks, are settled in the island. Jerba has a considerable reputation for the manufacture of the woollen tissues interwoven with silk which are known as burnous stuffs; a market for the sale of sponges is held from November till March; and there is a considerable export trade in olives, dates, figs and other fruits. The capital, trading centre and usual landing-place are at Haumt-es-Suk (market quarter) on the north side of the island (pop. 2500). Here are a medieval fort, built by the Spaniards in 1284, and a modern fort, garrisoned by the French. Gallala, to the south, is noted for the manufacture of a kind of white pottery, much prized. At El Kantara (the bridge) on the eastern strait, and formerly connected with the mainland by a causeway, are extensive ruins of a Roman city—probably those of Meninx, once a flourishing seaport.

Jerba is the Lotophagitis or Lotus-eaters' Island of the Greek and Roman geographers, and is also identified with the Brachion of Scylax. The modern name appears as early as the 4th century in Sextus Aurelius Victor. In the middle ages the possession of Jerba was contested by the Normans of Sicily, the Spaniards and the Turks, the Turks proving victorious. In 1560 after the destruction of the Spanish fleet off the coast of the island by Piali Pasha and the corsair Dragut the Spanish garrison at Haumt-es-Suk was exterminated, and a pyramid, 10 ft. broad at the base and 20 ft. high, was built of their skulls and other bones. In 1848 this pyramid was pulled down at the instance of the Christian community, and the bones were buried in the Catholic cemetery. In general, from the Arab invasion in the 7th century Jerba shared the fortunes of Tunisia.

See H. Barth, *Wanderungen durch die Küstenl. des Mittelmeeres* (Berlin, 1849); and H. von Maltzan, *Reise in Tunis und Tripolis* (Leipzig, 1870).

JERBOA, properly the name of an Arabian and North African jumping rodent mammal, *Jaculus aegyptius* (also known as *Jaculus*, or *Dipus, jaculus*) typifying the family *Jaculidae* (or *Dipodidae*), but in a wider sense applied to most of the representatives of that family, which are widely distributed over the desert and semi-desert tracts of the Old World, although unknown in Africa south of the Sahara. In all the more typical members of the family the three middle metatarsals of the long hind-legs are fused into a cannon-bone; and in the true jerboas of the genus *Jaculus* the two lateral toes, with their supporting metatarsals, are lost, although they are present in the alactagas (*Alactaga*), in which, however, as in certain allied genera, only the three middle toes are functional. As regards the true jerboas, there is a curious resemblance in the structure of their hind-legs to that obtaining among birds. In both groups, for instance, the lower part of the hind-leg is formed by a long, slender cannon-bone, or metatarsus, terminating inferiorly in triple condyles for the three long and sharply clawed toes, the resemblance being increased by the fact that in both cases the small bone of the leg (fibula) is fused with the large one (tibia). It may also be noticed that in mammals and birds which hop on two legs, such as jerboas, kangaroos, thrushes and finches, the proportionate length of the thigh-bone or femur to the tibia and foot (metatarsus and toes) is constant, being 2 to 5; in animals, on the other hand, such as hares, horses and frogs, which use all four feet, the corresponding lengths are 4 to 7. The resemblance between the jerboa's and the bird's skeleton is owing to adaptation to a similar mode of existence. In the young jerboa the proportion of the femur to the rest of the leg is the same as in ordinary running animals. Further, at an early stage of development the fibula is a complete and separate bone, while the three metatarsals, which subsequently fuse together to form the cannon-bone, are likewise separate. In addition to their long hind and short fore limbs, jerboas are mostly characterized by their silky coats—of a fawn colour to harmonize with their desert surroundings—their large eyes, and long tails and ears. As is always the case with large-eared animals, the tympanic bullae of the skull are of unusually large size; the size varying in the different genera according to that of the ears. (For the characteristics of the family and of its more important generic representatives, see RODENTIA.)

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[1] Similarly a Syrian story tells how the Druses came to slay Ibrahim Pasha's troops, and desiring to spare the Syrians ordered the men to say *gamal* (camel). As the Syrians pronounce the *g* soft, and the Egyptians the *g*, hard, the former were easily identified. Other examples from the East will be found in H. C. Kay, *Yaman*, p. 36, and in S. Lane-Poole, *History of Egypt in the Middle Ages*, p. 300. Also, at the Sicilian Vespers (March 13, 1282) the French were made to betray themselves by their pronunciation of *ceci* and *ciceri* (Ital. *c* like *tch*; Fr. *c* like *s*).

In the Egyptian jerboa the length of the body is 8 in., and that of the tail, which is long, cylindrical and covered with short hair terminated by a tuft, 10 in. The five-toed front limbs are extremely short, while the hind pair are six times as long. When about to spring, this jerboa raises its body by means of the hinder extremities, and supports itself at the same time upon its tail, while the fore-feet are so closely pressed to the breast as to be scarcely visible, which doubtless suggested the name *Dipus*, or two-footed. It then leaps into the air and alights upon its four feet, but instantaneously erecting itself, it makes another spring, and so on in such rapid succession as to appear as if rather flying than running. It is a gregarious animal, living in considerable colonies in burrows, which it excavates with its nails and teeth in the sandy soil of Egypt and Arabia. In these it remains during great part of the day, emerging at night in search of the herbs on which it feeds. It is exceedingly shy, and this, together with its extraordinary agility, renders it difficult to capture. The Arabs, however, succeed by closing up all the exits from the burrows with a single exception, by which the rodents are forced to escape, and over which a net is placed for their capture. When confined, they will gnaw through the hardest wood in order to make their escape. The Persian jerboa (*Alactaga indica*) is also a nocturnal burrowing animal, feeding chiefly on grain, which it stores up in underground repositories, closing these when full, and only drawing upon them when the supply of food above ground is exhausted (see also JUMPING MOUSE). (R. L.*)

JERDAN, WILLIAM (1782–1869), Scottish journalist, was born on the 16th of April 1782, at Kelso, Scotland. During the years between 1799 and 1806 he spent short periods in a country lawyer's office, a London West India merchant's counting-house, an Edinburgh solicitor's chambers, and held the position of surgeon's mate on board H.M. guardship "Gladiator" in Portsmouth Harbour, under his uncle, who was surgeon. He went to London in 1806, and became a newspaper reporter. He was in the lobby of the House of Commons on the 11th of May 1812 when Spencer Perceval was shot, and was the first to seize the assassin. By 1812 he had become editor of *The Sun*, a semi-official Tory paper; he occasionally inserted literary articles, then quite an unusual proceeding; but a quarrel with the chief proprietor brought that engagement to a close in 1817. He passed next to the editor's chair of the *Literary Gazette*, which he conducted with success for thirty-four years. Jerdan's position as editor brought him into contact with many distinguished writers. An account of his friends, among whom Canning was a special intimate, is to be found in his *Men I have Known* (1866). When Jerdan retired in 1850 from the editorship of the *Literary Gazette* his pecuniary affairs were far from satisfactory. A testimonial of over £900 was subscribed by his friends; and in 1853 a government pension of 100 guineas was conferred on him by Lord Aberdeen. He published his *Autobiography* in 1852–1853, and died on the 11th of July 1869.

JEREMIAH, in the Bible, the last pre-exilic prophet (*fl.* 626–586 B.C.?), son of Hilkiah.

Early Days of Jeremiah.—There must anciently have existed one or more prose works on Jeremiah and his times, written partly to do honour to the prophet, partly to propagate those views respecting Israel's past with which the name of Jeremiah was associated. Some fragments of this work (or these works) have come down to us; they greatly add to the popularity of the Book of Jeremiah. Strict historical truth we must not ask of them, but they do give us what was believed concerning Jeremiah in the following age, and we must believe that the personality so honoured was an extraordinary one. We have also a number of genuine prophecies which admit us into Jeremiah's inner nature. These are our best authorities, but they are deficient in concrete facts. By birth Jeremiah was a countryman; he came of a priestly family whose estate lay at Anathoth "in the land of Benjamin" (xxxii. 3; cf. i. 1). He came forward as a prophet in the thirteenth year of Josiah (626 B.C.), still young but irresistibly impelled. Unfortunately the account of the call and of the object of the divine caller come to us from a later hand (ch. i.), but we can well believe that the concrete fact which the prophetic call illuminated was an impending blow to the state (i. 13–16; cf. ch. iv.). What the blow exactly was is disputed,[1] but it is certain that Jeremiah saw the gathering storm and anticipated its result, while the statesmen were still wrapped in a false security. Five years later came the reform movement produced by the "finding" of the "book of the law" in the Temple in 621 B.C. (2 Kings xxii. 8), and some critics have gathered from Jer. xi. 1–8 that Jeremiah joined the ranks of those who publicly supported this book in Jerusalem and elsewhere. To others this view appears in itself improbable. How can a man like Jeremiah have advocated any such panacea? He was indeed not at first a complete pessimist, but to be a preacher of Deuteronomy required a sanguine temper which a prophet of the school of Isaiah could not possess. Besides, there is a famous passage (viii. 8, see R.V.) in which Jeremiah delivers a vehement attack upon the "scribes" (or, as we might render, "bookmen") and their "false pen." If, as Wellhausen and Duhm suppose, this refers to Deuteronomy (*i.e.* the original Deuteronomy), the incorrectness of the theory referred to is proved. And even if we think that the phraseology of viii. 8 applies rather to a body of writings than to a single book, yet there is no good ground (xi. 1–8 and xxxiv. 12 being of doubtful origin) for supposing that Jeremiah would have excepted Deuteronomy from his condemnation.

Stages of his Development.—At first our prophet was not altogether a pessimist. He aspired to convince the better minds that the only hope for Israelites, as well as for Israel, lay in "returning" to the true Yahweh, a deity who was no mere national god, and was not to be cajoled by the punctual offering of costly sacrifices. When Jeremiah wrote iv. 1–4 he evidently considered that the judgment could even then be averted. Afterwards he became less hopeful, and it was perhaps a closer acquaintance with the manners of the capital that served to disillusionize him. He began his work at Anathoth, but v. 1–5 (as Duhm points out) seems to come from one who has just now for the first time "run to and fro in the streets of Jerusalem," observing and observed. And what is the result of his expedition? That he cannot find a single just and honest man; that high and low, rich and poor, are all ignorant of the true method of worshipping God ("the way of Yahweh," v. 4). It would seem as if Anathoth were less corrupt than the capital, the moral state of which so shocked Jeremiah. And yet he does not really go beyond the great city-prophet Isaiah who calls the men of Jerusalem "a people of Gomorrah" (i. 10). With all reverence, an historical student has to deduct something from both these statements. It is true that commercial prosperity had put a severe strain on the old morality, and that contact with other peoples, as well as the course of political history, had appeared to lower the position of the God of Israel in relation to other gods. Still, some adherents of the old Israelitish moral and religious standards must have survived, only they were not to be found in the chief places of concourse, but as a rule in coteries which handed on the traditions of Amos and Isaiah in sorrowful retirement.

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[1] Davidson (Hast., *D.B.*, ii. 570 b) mentions two views. (1) The foe might be "a creation of his moral presentiment and assigned to the north as the cloudy region of mystery." (2) The more usual view is that the Scythians (see Herod. i. 76, 103–106; iv. 1) are meant. Neither of these views is satisfactory. The passage v. 15–17 is too definite for (1), and as for (2), the idea of a threatened Scythian invasion lacks a sufficient basis. Those who hold (2) have to suppose that original references to the Scythians were retouched under the impression of Chaldean invasions. Hence Cheyne's theory of a north Arabian invasion from the land of Zaphon = Zibeon (Gen. xxxvi. 2, 14), *i.e.* Ishmael. Cf. N. Schmidt, *Ency. Bib.*, Zibeon, "Scythians," § 8; Cheyne, *Critica Biblica*, part i. (Isaiah and Jeremiah).

Danger of Book Religion.—Probably, too, even in the highest class there were some who had a moral sympathy with Jeremiah; otherwise we can hardly account for the contents of Deuteronomy, at least if the book "found" in the Temple at all resembled the central portion of our Deuteronomy. And the assumption seems to be confirmed by the respectful attitude of certain "elders of the land" in xxvi. 17 sqq., and of the "princes" in xxxvi. 19, 25, towards Jeremiah, which may, at any rate in part, have been due to the recent reform movement. If therefore Jeremiah aimed at Deuteronomy in the severe language of viii.8, he went too far. History shows that book religion has special dangers of its own.[1] Nevertheless the same incorruptible adviser also shows that book religion may be necessary as an educational instrument, and a compromise between the two types of religion is without historical precedent.

Reaction: Opposition to Jeremiah.—This, however, could not as yet be recognized by the friends of prophecy, even though it seemed for a time as if the claims of book religion were rebuffed by facts. The death of the pious king Josiah at Megiddo in 608 B.C. dashed the high hopes of the "book-men," but meant no victory for Jeremiah. Its only result for the majority was a falling back on the earlier popular cultus of the Baals, and on the heathen customs introduced, or reintroduced, by Josiah's grandfather, Manasseh. Would that we possessed the section of the prophet's biography which described his attitude immediately after the news of the battle of Megiddo! Let us, however, be thankful for what we have, and notably for the detailed narratives in chs. xxvi. and xxxvi. The former is dated in the beginning of the reign of Jehoiakim, though Wellhausen suspects that the date is a mistake, and that the real occasion was the death of Josiah. The one clear-sighted patriot saw the full meaning of the tragedy of Megiddo, and for "prophesying against this city"—secured, as men thought, by the Temple (vii. 4)—he was accused by "the priests, the prophets, and all the people" of high treason. But the divinity which hedged a prophet saved him. The "princes," supported by certain "elders" and by "the people" (quick to change their leaders), succeeded in quashing the accusation and setting the prophet free. No king, be it observed, is mentioned. The latter narrative is still more exciting. In the fourth year of Jehoiakim (= the first of Nebuchadrezzar, xxv. 1) Jeremiah was bidden to write down "all the words that Yahweh had spoken to him against Jerusalem (so LXX.), Judah and all the nations from the days of Josiah onwards" (xxxvi. 2). So at least the authors of Jeremiah's biography tell us. They add that in the next year Jeremiah's scribe Baruch read the prophecies of Jeremiah first to the people assembled in the Temple, then to the "princes," and then to the king, who decided his own future policy by burning Baruch's roll in the brazier. We cannot, however, bind ourselves to this tradition. Much more probably the prophecy was virtually a new one (*i.e.* even if some old passages were repeated yet the setting was new), and the burden of the prophecy was "The king of Babylon shall come and destroy this land."[2] We cannot therefore assent to the judgment that "we have, at least as regards [the] oldest portions [of the book] information considerably more specific than is usual in the case of the writings of the prophets."[3]

Fall of the State.—Under Zedekiah the prophet was less fortunate. Such was the tension of feeling that the "princes," who were formerly friendly to Jeremiah, now took up an attitude of decided hostility to him. At last they had him consigned to a miry dungeon, and it was the king who (at the instance of the Cushite Ebed-melech) intervened for his relief, though he remained a prisoner in other quarters till the fall of Jerusalem (586 B.C.). Nebuchadrezzar, who is assumed to have heard of Jeremiah's constant recommendations of submission, gave him the choice either of going to Babylon or of remaining in the country (chs. xxxviii. seq.). He chose the latter and resided with Gedaliah, the native governor, at Mizpah. On the murder of Gedaliah he was carried to Mizraim or Egypt, or perhaps to the land of Mizrim in north Arabia—against his will (chs. xl.–xliii.). How far all this is correct we know not. The graphic style of a narrative is no sufficient proof of its truth. Conceivably enough the story of Jeremiah's journey to Egypt (or Mizrim) may have been imagined to supply a background for the artificial prophecies ascribed to Jeremiah in chs. xlvi.–li. A legend in Jerome and Epiphanius states that he was stoned to death at Daphnae, but the biography, though not averse from horrors, does not mention this.

A Patriot?—Was Jeremiah really a patriot? The question has been variously answered. He was not a Phocion, for he never became the tool of a foreign power. To say with Winckler[4] that he was "a decided adherent of the Chaldean party" is to go beyond the evidence. He did indeed counsel submission, but only because his detachment from party gave him a clearness of vision (cf. xxxviii. 17, 18) which the politicians lacked. How he suffered in his uphill course he has told us himself (xv. 10–21). In after ages the oppressed people saw in his love for Israel and his patient resignation their own realized ideal. "And Onias said, This is the lover of the brethren, he who prayeth much for the people and the holy city, Jeremiah the prophet of God" (2 Macc. xv. 14). And in proportion as the popular belief in Jeremiah rose, fresh prophecies were added to the book (notably those of the new covenant and of the restoration of the people after seventy years) to justify it. Professor N. Schmidt has gone further into the character of this sympathetic prophet, *Ency. Bib.* "Jeremiah," § 5.

Jeremiah's Prophecies.—It has been said above that our best authorities are Jeremiah's own prophecies. Which may these be? Before answering we must again point out (see also ISAIAH) that the records of the pre-exilic prophets came down in a fragmentary form, and that these fragments needed much supplementing to adapt them to the use of post-exilic readers. In Jeremiah, as in Isaiah, we must constantly ask to what age do the phraseology, the ideas and the implied circumstances most naturally point? According to Duhm there are many passages in which metre (see also AMOS) may also be a factor in our critical conclusions. Jeremiah, he thinks, always uses the same metre. Giesebrecht, on the other hand, maintains that there are passages which are certainly Jeremiah's, but which are not in what Duhm calls Jeremiah's metre; Giesebrecht also, himself rather conservative, considers Duhm remarkably free with his emendations. There has also to be considered whether the text of the poetical passages has not often become corrupt, not only from ordinary causes but through the misunderstanding and misreading of north Arabian names on the part of late scribes and editors, the danger to Judah from north Arabia being (it is held) not less in pre-exilic times than the danger from Assyria and Babylonia, so that references to north Arabia are only to be expected. To bring educated readers into touch with critical workers it is needful to acquaint them with these various points, the neglect of any one of which may to some extent injure the results of criticism.

It is a new stage of criticism on which we have entered, so that no single critic can be reckoned as *the* authority on Jeremiah. But since the results of the higher criticism depend on the soundness and thoroughness of the criticism called "lower," and since Duhm has the advantage of being exceptionally free from that exaggerated respect for the letters of the traditional text which has survived the destruction of the old superstitious veneration for the vowel-points, it may be best to give the student his "higher critical" results, dated 1901. Let us premise, however, that the portions mentioned in the 9th edition of the *Ency. Brit.* as having been "entirely or in part denied," to Jeremiah, viz. x. 1–16; xxx.; xxxiii.; l.–li. and lii., are still regarded in their present form as non-Jeremianic. The question which next awaits decision is whether any part of the booklet on foreign nations (xxv., xlvi.-li.) can safely be regarded as Jeremianic. Giesebrecht still asserts the genuineness of xxv. 15-24 (apart from glosses), xlvii. (in the main) and xlix. 7, 8, 10, 11. Against these views see N. Schmidt, *Ency. Bib.*, col. 2384.

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[1] Cf. Ewald, *The Prophets*, Eng. trans., iii. 63, 64.

[2] Cheyne, *Ency. Brit.* (9th ed.), "Jeremiah," suggests after Grätz that the roll simply contained ch. xxv., omitting the most obvious interpolations. Against this view see N. Schmidt, *Ency. Bib.*, "Jeremiah (Book)," § 8, who, however, accepts the negative part of Cheyne's arguments.

[3] Driver, *Introd. to the Lit. of the O.T.* (6), p. 249.

[4] In Helmolt's *Weltgeschichte*, iii. 211.

Let us now listen to Duhm, who analyses the book into six groups of passages. These are (a) i.–xxv., the "words of Jeremiah." (i. 1); (b) xxvi.–xxix., passages from Baruch's biography of Jeremiah; (c) xxx.–xxxi., the book of the future of Israel and Judah; (d) xxxii.–xlv., from Baruch; (e) xlvi.–li., the prophecies "concerning the nations";[1] (f) lii., historical appendix. Upon examining these groups we find that besides a prose letter (ch. xxix.), about sixty poetical pieces may be Jeremiah's. A: Anathoth passages before 621, (a) ii. 2b, 3, 14–28; ii. 29–37; iii. 1–5; iii. 12b, 13, 19, 20; iii. 21–25; iv. 1, 3, 4; these form a cycle. (b) xxxi. 2–6; 15–20; 21, 22; another cycle. (c) iv. 5–8; 11b, 12a, 13, 15–17a; 19–21; 23–26; 29–31; visions and "auditions" of the impending invasion. B: Jerusalem passages. (d) v. 1–6a; 6b–9; 10–17; vi. 1–5; 6b–8; 9–14; 16, 17, 20; 22–26a; 27–30; vii. 28, 29; viii. 4–7a; 8, 9, 13; 14–17; viii. 18–23; ix. 1–8; 9 (short song); 16–18; 19–21; x. 19, 20, 22; reign of Josiah, strong personal element. (e) xxii. 10 (Jehoahaz). xxii. 13–17; probably too xi. 15, 16; xii. 7–12 (Jehoiakim). xxii. 18, 19, perhaps too xxii. 6b, 7; 20–23; and the cycle xiii. 15, 16; 17; 18, 19; 20, 21a, 22–25a, 26, 27 (later, Jehoiakim). xxii. 24; xxii. 28 (Jehoiachin). (f) Later poems. xiv. 2–10; xv. 5–9; xvi. 5–7; xviii. 13–17; xxiii. 9–12; 13–15; xi. 18–20; xv. 10–12; 15–19a, and 20, 21; xvii. 9, 10, 14, 16, 17; xviii. 18–20; xx. 7–11; xx. 14–18; xiv. 17, 18; xvii. 1–4; xxxviii. 24; assigned to the close of Zedekiah's time.

Two Recensions of the Text.—It has often been said that we have virtually two recensions of the text, that represented by the Septuagint and the Massoretic text, and critics have taken different sides, some for one and some for the other. "Recension," however, is a bad term; it implies that the two texts which undeniably exist were the result of revising and editing according to definite critical principles. Such, however, is not the case. It is true that "there are (in the LXX.) many omissions of words, sentences, verses and whole passages, in fact, that altogether about 2700 words are wanting, or the eighth part of the Massoretic text" (Bleek). It may also be admitted that the scribes who produced the Hebrew basis of the Septuagint version, conscious of the unsettled state of the text, did not shrink from what they considered a justifiable simplification. But we must also grant that those from whom the "written" Hebrew text proceeds allowed themselves to fill up and to repeat without any sufficient warrant. In each case in which there is a genuine difference of reading between the two texts, it is for the critic to decide; often, however, he will have to seek to go behind what both the texts present in order to constitute a truer text than either. Here is the great difficulty of the future. We may add to the credit of the Septuagint that the position given to the prophecies on "the nations" (chs. xlvi.–li. in our Bible) in the Septuagint is probably more original than that in the Massoretic text. On this point see especially Schmidt, *Ency. Bib.* "Jeremiah (Book)" §§ 6 and 21; Davidson, Hastings's *Dict. Bible*, ii. 573b–575; Driver, *Introduction* (8th ed.), pp. 269, 270.

The best German commentary is that of Cornill (1905). A skilful translation by Driver, with notes intended for ordinary students (1906) should also be mentioned. (T. K. C.)

JEREMY, EPISTLE OF, an apocryphal book of the Old Testament. This letter purports to have been written by Jeremiah to the exiles who were already in Babylon or on the way thither. The author was a Hellenistic Jew, and not improbably a Jew of Alexandria. His work, which shows little literary skill, was written with a serious practical purpose. He veiled his fierce attack on the idol gods of Egypt by holding up to derision the idolatry of Babylon. The fact that Jeremiah (xxix. 1 sqq.) was known to have written a letter of this nature naturally suggested to a Hellenist, possibly of the 1st century B.C. or earlier, the idea of a second epistolary undertaking, and other passages of Jeremiah's prophecy (x. 1–12; xxix. 4–23) may have determined also its general character and contents.

The writer warned the exiles that they were to remain in captivity for seven generations; that they would there see the worship paid to idols, from all participation in which they were to hold aloof; for that idols were nothing save the work of men's hands, without the powers of speech, hearing or self-preservation. They could not bless their worshippers even in the smallest concerns of life; they were indifferent to moral qualities, and were of less value than the commonest household objects, and finally, "with rare irony, the author compared an idol to a scarecrow (v. 70), impotent to protect, but deluding to the imagination" (MARSHALL).

The date of the epistle is uncertain. It is believed by some scholars to be referred to in 2 Macc. ii. 2, which says that Jeremiah charged the exiles "not to forget the statutes of the Lord, neither to be led astray in their minds when they saw images of gold and silver and the adornment thereof." But the reference is disputed by Fritzsche, Gifford, Shürer and others. The epistle was included in the Greek canon. There was no question of its canonicity till the time of Jerome, who termed it a pseudepigraph.

See Fritzsche, *Handb. zu den Apok.*, 1851; Gifford, in *Speaker's Apoc.* ii. 286–303; Marshall, in Hastings' *Dict. Bible*, ii. 578–579. (R. H. C.)

JERÉZ DE LA FRONTERA (formerly XERES), a town of southern Spain, in the province of Cadiz, near the right bank of the river Guadalete, and on the Seville-Cadiz railway, about 7 m. from the Atlantic coast. Pop. (1900), 63,473. Jeréz is built in the midst of an undulating plain of great fertility. Its whitewashed houses, clean, broad streets, and squares planted with trees extend far beyond the limits formerly enclosed by the Moorish walls, almost entirely demolished. The principal buildings are the 15th-century church of San Miguel, the 17th-century collegiate church with its lofty bell-tower, the 16th-century town-hall, superseded, for official purposes, by a modern edifice, the bull-ring, and many hospitals, charitable institutions and schools, including academies of law, medicine and commerce. But the most characteristic features of Jeréz are the huge *bodegas*, or wine-lodges, for the manufacture and storage of sherry, and the vineyards, covering more than 150,000 acres, which surround it on all sides. The town is an important market for grain, fruit and livestock, but its staple trade is in wine. Sherry is also produced in other districts, but takes its name, formerly written in English as *sherris* or *xeres*, from Jeréz. The demand for sherry diminished very greatly during the last quarter of the 19th century, especially in England, which had been the chief consumer. In 1872 the sherry shipped from Cadiz to Great Britain alone was valued at £2,500,000; in 1902 the total export hardly amounted to one-fifth of this sum. The wine trade, however, still brings a considerable profit, and few towns of southern Spain display greater commercial activity than Jeréz. In the earlier part of the 18th century the neighbourhood suffered severely from yellow fever; but it was rendered comparatively healthy when in 1869 an aqueduct was opened to supply pure water. Strikes and revolutionary disturbances have frequently retarded business in more recent years.

Jeréz has been variously identified with the Roman Municipium Seriense; with Asido, perhaps the original of the Moorish Sherish; and with Hasta Regia, a name which may survive in the designation of La Mesa de Asta, a neighbouring hill. Jeréz was taken from the Moors by Ferdinand III. of Castile (1217–1252); but it was twice recaptured before Alphonso X. finally occupied it in 1264. Towards the close of the 14th century it received the title *de la Frontera*, *i.e.* "of the frontier," common to several towns on the Moorish border.

JERÉZ DE LOS CABALLEROS, a town of south-western Spain, in the province of Badajoz, picturesquely situated on two heights overlooking the river Ardila, a tributary of the Guadiana, 12 m. E. of the Portuguese frontier. Pop. (1900), 10,271. The old town is surrounded by a Moorish wall with six gates; the newer portion is well and regularly built, and planted with numerous orange and other fruit trees. Owing to the lack of railway communication Jeréz is of little commercial importance; its staple trade is in agricultural produce, especially in ham and bacon from the large herds of swine which are reared in the surrounding oak forests. The town is said to have been founded by Alphonso IX. of Leon in 1229; in 1232 it was extended by his son St Ferdinand, who gave it to the knights templar. Hence the name *Jeréz de los Caballeros*, "Jeréz of the knights."

JERICHO (יְרִיחוֹ, יְרֵחוֹ, once יְרִיחֹה, a word of disputed meaning, whether "fragrant" or "moon [-god] city"), an important town in the Jordan valley some 5 m. N. of the Dead Sea. The references to it in the Pentateuch are confined to rough geographical indications of the latitude of the trans-Jordanic camp of the Israelites in Moab before their crossing of the river. This was the first Canaanite city to be attacked and reduced by the victorious Israelites. The story of its conquest is fully narrated in the first seven chapters of Joshua. There must be some little exaggeration in the statement that Jericho was totally destroyed; a hamlet large enough to be enumerated among the towns of Benjamin (Josh. xviii. 21) must have remained; but that it was small is shown by the fact that it was deemed a suitable place for David's ambassadors to retire to after the indignities put upon them by Hanun (2 Sam. x. 5; 1 Chron. xix. 5). Its refortification was due to a Bethelite named Hiel, who endeavoured to avert the curse of Joshua by offering his sons as sacrifices at certain stages of the work (1 Kings xvi. 34). After this event it grew again into importance and became the site of a college of prophets (2 Kings ii. 4 sqq.) for whom Elisha "healed" its poisonous waters. The principal spring in the neighbourhood of Jericho still bears (among the foreign residents) the name of Elisha; the natives call it, Ain es-Sultan, or "Sultan's spring." To Jericho the victorious Israelite marauders magnanimously returned their Judahite captives at the bidding of the prophet Oded (2 Chron. xxviii. 15). Here was fought the last fight between the Babylonians and Zedekiah, wherein the kingdom of Judah came to an end (2 Kings xxv. 5; Jer. xxxix. 5, lii. 8). In the New Testament Jericho is connected with the well-known stories of Bar-Timaeus (Matt. xx. 29; Mark x. 46; Luke xviii. 35) and Zacchaeus (Luke xix. 1) and with the good Samaritan (Luke x. 30).

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[1] li. 59–64a, however, is a specimen of imaginative "Midrashic" history. See Giesebrecht's monograph.

The extra-Biblical history of Jericho is as disastrous as are the records preserved in the Scriptures. Bacchides, the general of the Syrians, captured and fortified it (I. Macc. ix. 50), Aristobulus (Jos. *Ant.* XIV. i. 2) also took it, Pompey (ib. XIV. iv. 1) encamped here on his way to Jerusalem. Before Herod its inhabitants ran away (ib. XIV. xv. 3) as they did before Vespasian (*Wars*, IV. viii. 2). The reason of this lack of warlike quality was no doubt the enervating effect of the great heat of the depression in which the city lies, which has the same effect on the handful of degraded humanity that still occupies the ancient site.

Few places in Palestine are more fertile. It was the city of palm trees of the ancient record of the Israelite invasion preserved in part in Judg. i. 16; and Josephus speaks of its fruitfulness with enthusiasm (*Wars* IV. 8, 3). Even now with every possible hindrance in the way of cultivation it is an important centre of fruit-growing.

The modern er-Rīha is a poor squalid village of, it is estimated, about 300 inhabitants. It is not built exactly on the ancient site. Indeed, the site of Jericho has shifted several times. The mound of Tell es-Sultan, near "Elisha's Fountain," north of the modern village, no doubt covers the Canaanite town. There are two later sites, of Roman or Herodian date, one north, the other west, of this. It was probably the crusaders who established the modern site. An old tower attributed to them is to be seen in the village, and in the surrounding mountains are many remains of early monasticism. Aqueducts, ruined sugar-mills, and other remains of ancient industry abound in the neighbourhood. The whole district is the private property of the sultan of Turkey. In 1907–8 the Canaanite Jericho was excavated under the direction of Prof. Sellin of Vienna.

See "The German Excavations at Jericho," *Pal. Explor. Fund, Quart. Statem.* (1910), pp. 54–68.

JERKIN, a short close-fitting jacket, made usually of leather, and without sleeves, the typical male upper garment of the 16th and 17th centuries. The origin of the word is unknown. The Dutch word *jurk*, a child's frock, often taken as the source, is modern, and represents neither the sound nor the sense of the English word. In architecture the term "jerkin-roofed" is applied, probably with some obscure connexion with the garment, to a particular form of gable end, the gable being cut off half way up the roof and sloping back like a "hipped roof" to the edge.

JEROBOAM (Heb. *yārobʿām*, apparently "Am ['the clan,' here perhaps a divine name] contends"; LXX. *ιεροβοαμ*), the name of two kings in the Bible.

1. The first king of (north) Israel after the disruption (see Solomon). According to the traditions of his early life (1 Kings xi. 26 sqq. and LXX.), he was an Ephraimite who for his ability was placed over the forced levy of Ephraim and Manasseh. Having subsequently incurred Solomon's suspicions he fled to Shishak, king of Egypt, and remained with him until Rehoboam's accession. When the latter came to be made king at Shechem, the old religious centre (see Abimelech), hopes were entertained that a more lenient policy would be introduced. But Rehoboam refused to depart from Solomon's despotic rule, and was tactless enough to send Adoniram, the overseer of the *corvée*. He was stoned to death, and Rehoboam realizing the temper of the people fled to Jerusalem and prepared for war. Jeroboam became the recognized leader of the northern tribes.[1] Conflicts occurred (1 Kings xiv. 30), but no details are preserved except the late story of Rehoboam's son Abijah in 2 Chron. xiii. Jeroboam's chief achievement was the fortification of Shechem (his new capital) and of Penuel in east Jordan. To counteract the influence of Jerusalem he established golden calves at Dan and Bethel, an act which to later ages was as gross a piece of wickedness as his rebellion against the legitimate dynasty of Judah. No notice has survived of Shishak's invasion of Israel (see Rehoboam), and after a reign of twenty-two years Jeroboam was succeeded by Nadab, whose violent death two years later brought the whole house of Jeroboam to an end.

The history of the separation of Judah and Israel in the 10th century B.C. was written from a strong religious standpoint at a date considerably later than the event itself. The visit of Ahijah to Shiloh (xi. 29–39), to announce symbolically the rending of the kingdom, replaces some account of a rebellion in which Jeroboam "lifted up his hand" (*v.* 27) against Solomon. To such an account, not to the incident of Ahijah and the cloak, his flight (*v.* 40) is the natural sequel. The story of Ahijah's prophecy against Jeroboam (ch. xiv.) is not in the original LXX., but another version of the same narrative appears at xii. 24 (LXX.), in which there is no reference to a previous promise to Jeroboam through Ahijah, but the prophet is introduced as a new character. Further, in this version (xii. 24) the incident of the tearing of the cloak is related of Shemaiah and placed at the convention of Shechem. Shemaiah is the prophet who counselled Rehoboam to refrain from war (xii. 21–24); the injunction is opposed to xiv. 30, but appears to be intended to explain Rehoboam's failure to overcome north Israel. (See W. R. Smith, *Old Test. in Jewish Church* (2nd ed.), 117 sqq.; Winckler, *Alte Test. Untersuch.* 12 sqq., and J. Skinner, *Century Bible: Kings*, pp. 443 sqq.)

2. Jeroboam, son of Joash (2) a contemporary of Azariah king of Judah. He was one of the greatest of the kings of Israel. He succeeded in breaking the power of Damascus, which had long been devastating his land, and extended his kingdom from Hamath on the Orontes to the Dead Sea. The brief summary of his achievements preserved in 2 Kings xiv. 23 sqq. may be supplemented by the original writings of Amos and Hosea.[2] There appears to be an allusion in Amos vi. 13 to the recovery of Ashteroth-Karnaim and Lodebar in E. Jordan, and the conquest of Moab (Isa. xv. seq.) is often ascribed to this reign. After a period of prosperity, internal disturbances broke out and the northern kingdom hastened to its fall. Jeroboam was succeeded by his son Zechariah, who after six months was killed at Ibleam (so read in 2 Kings xv. 10; cp. ix. 27, murder of Ahaziah) by Shallum the son of Jabesh—*i.e.* possibly of Jabesh-Gilead—who a month later fell to Menahem (*q.v.*).
(S. A. C.)

See, further, Jews §§ 7, 9 and §§ 12, 13.

JEROME, ST (Hieronymus, in full Eusebius Sophronius Hieronymus) (*c.* 340–420), was born at Strido (modern Strigau ?), a town on the border of Dalmatia fronting Pannonia, destroyed by the Goths in A.D. 377. What is known of Jerome has mostly been recovered from his own writings. He appears to have been born about 340; his parents were Christians, orthodox though living among people mostly Arians and wealthy. He was at first educated at home, Bonosus, a life-long friend, sharing his youthful studies, and was afterwards sent to Rome. Donatus taught him grammar and explained the Latin poets. Victorinus taught him rhetoric. He attended the law-courts, and listened to the Roman advocates pleading in the Forum. He went to the schools of philosophy, and heard lectures on Plato, Diogenes, Clitomachus and Carneades; the conjunction of names show how philosophy had become a dead tradition.

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[1] On the variant traditions in the Hebrew text and the Septuagint, see the commentaries on Kings.

[2] See also Jonah. In 2 Kings xiv. 28, "Hamath, *which had belonged* to Judah" (R.V.) is incorrect; Winckler (*Keilinschrift. u. Alte Test.*, 2nd ed., 262) suspects a reference to Israel's overlordship in Judah; Burney (*Heb. Text of Kings*) reads: "how he fought with Damascus and how he turned away the wrath of Yahweh from Israel"; see also *Ency. Bib.* col. 2406 n. 4, and the commentaries.

His Sundays were spent in the catacombs in discovering graves of the martyrs and deciphering inscriptions. Pope Liberius baptized him in 360; three years later the news of the death of the emperor Julian came to Rome, and Christians felt relieved from a great dread.

When his student days were over Jerome returned to Strido, but did not stay there long. His character was formed. He was a scholar, with a scholar's tastes and cravings for knowledge, easily excited, bent on scholarly discoveries. From Strido he went to Aquileia, where he formed some friendships among the monks of the large monastery, notably with Rufinus, with whom he was destined to quarrel bitterly over the question of Origen's orthodoxy and worth as a commentator; for Jerome was a man who always sacrificed a friend to an opinion, and when he changed sides in a controversy expected his acquaintances to follow him. From Aquileia he went to Gaul (366–370), visiting in turn the principal places in that country, from Narbonne and Toulouse in the south to Treves on the north-east frontier. He stayed some time at Treves studying and observing, and it was there that he first began to think seriously upon sacred things. From Treves he returned to Strido, and from Strido to Aquileia. He settled down to literary work in Aquileia (370–373) and composed there his first original tract, *De muliere septies percussa*, in the form of a letter to his friend Innocentius. Some dispute caused him to leave Aquileia suddenly; and with a few companions, Innocentius, Evagrius, and Heliodorus being among them, he started for a long tour in the East. The epistle to Rufinus (3rd in Vallarsi's enumeration) tells us the route. They went through Thrace, visiting Athens, Bithynia, Galatia, Pontus, Cappadocia and Cilicia, to Antioch, Jerome observing and making notes as they went. He was interested in the theological disputes and schisms in Galatia, in the two languages spoken in Cilicia, &c. At Antioch the party remained some time. Innocentius died of a fever, and Jerome was dangerously ill. This illness induced a spiritual change, and he resolved to renounce whatever kept him back from God. His greatest temptation was the study of the literature of pagan Rome. In a dream Christ reproached him with caring more to be a Ciceronian than a Christian. He disliked the uncouth style of the Scriptures. "O Lord," he prayed, "thou knowest that whenever I have and study secular MSS. I deny thee," and he made a resolve henceforth to devote his scholarship to the Holy Scripture. "David was to be henceforth his Simonides, Pindar and Alcaeus, his Flaccus, Catullus and Severus." Fortified by these resolves he betook himself to a hermit life in the wastes of Chalcis, S.E. from Antioch (373–379). Chalcis was the Thebaid of Syria. Great numbers of monks, each in solitary cell, spent lonely lives, scorched by the sun, ill-clad and scantily fed, pondering on portions of Scripture or copying MSS. to serve as objects of meditation. Jerome at once set himself to such scholarly work as the place afforded. He discovered and copied MSS., and began to study Hebrew. There also he wrote the life of St Paul of Thebes, probably an imaginary tale embodying the facts of the monkish life around him. Just then the Meletian schism, which arose over the relation of the orthodox to Arian bishops and to those baptized by Arians, distressed the church at Antioch (see MELETIUS OF ANTIOCH), and Jerome as usual eagerly joined the fray. Here as elsewhere he had but one rule to guide him in matters of doctrine and discipline—the practice of Rome and the West; for it is singular to see how Jerome, who is daringly original in points of scholarly criticism, was a ruthless partisan in all other matters; and, having discovered what was the Western practice, he set tongue and pen to work with his usual bitterness (*Altercatio luciferiani et orthodoxi*).

At Antioch in 379 he was ordained presbyter. From there he went to Constantinople, where he met with the great Eastern scholar and theologian Gregory of Nazianzus, and with his aid tried to perfect himself in Greek. The result of his studies there was the translation of the *Chronicon* of Eusebius, with a continuation[1] of twenty-eight homilies of Origen on Jeremiah and Ezekiel, and of nine homilies of Origen on the visions of Isaiah.

In 381 Meletius died, and Pope Damasus interfered in the dispute at Antioch, hoping to end it. Jerome was called to Rome in 382 to give help in the matter, and was made secretary during the investigation. His work brought him into intercourse with this great pontiff, who soon saw what he could best do, and how his vast scholarship might be made of use to the church. Damasus suggested to him to revise the "Old Latin" translation of the Bible; and to this task he henceforth devoted his great abilities. At Rome were published the Gospels (with a dedication to Pope Damasus, an explanatory introduction, and the canons of Eusebius), the rest of the New Testament and the version of the Psalms from the Septuagint known as the *Psalterium romanum*, which was followed (*c.* 388) by the *Psalterium gallicanum*, based on the Hexaplar Greek text. These scholarly labours, however, did not take up his whole time, and it was almost impossible for Jerome to be long anywhere without getting into a dispute. He was a zealous defender of that monastic life which was beginning to take such a large place in the church of the 4th century, and he found enthusiastic disciples among the Roman ladies. A number of widows and maidens met together in the house of Marcella to study the Scriptures with him; he taught them Hebrew, and preached the virtues of the celibate life. His arguments and exhortations may be gathered from many of his epistles and from his tract *Adversus Helvidium*, in which he defends the perpetual virginity of Mary against Helvidius, who maintained that she bore children to Joseph. His influence over these ladies alarmed their relatives and excited the suspicions of the regular priesthood and of the populace, but while Pope Damasus lived Jerome remained secure. Damasus died, however, in 384, and was succeeded by Siricius, who did not show much friendship for Jerome. He found it expedient to leave Rome, and set out for the East in 385. His letters (especially Ep. 45) are full of outcries against his enemies and of indignant protestations that he had done nothing unbecoming a Christian, that he had taken no money, nor gifts great nor small, that he had no delight in silken attire, sparkling gems or gold ornaments, that no matron moved him unless by penitence and fasting, &c. His route is given in the third book *In Rufinum*; he went by Rhegium and Cyprus, where he was entertained by Bishop Epiphanius, to Antioch. There he was joined by two wealthy Roman ladies, Paula, a widow, and Eustochium, her daughter, one of Jerome's Hebrew students. They came accompanied by a band of Roman maidens vowed to live a celibate life in a nunnery in Palestine. Accompanied by these ladies Jerome made the tour of Palestine, carefully noting with a scholar's keenness the various places mentioned in Holy Scripture. The results of this journey may be traced in his translation with emendations of the book of Eusebius on the situation and names of Hebrew places, written probably three years afterwards, when he had settled down at Bethlehem. From Palestine Jerome and his companions went to Egypt, remaining some time in Alexandria, and they visited the convents of the Nitrian desert. Jerome's mind was evidently full of anxiety about his translation of the Old Testament, for we find him in his letters recording the conversations he had with learned men about disputed readings and doubtful renderings; the blind Didymus of Alexandria, whom he heard interpreting Hosea, appears to have been most useful. When they returned to Palestine they all settled at Bethlehem, where Paula built four monasteries, three for nuns and one for monks. She was at the head of the nunneries until her death in 404, when Eustochium succeeded her; Jerome presided over the fourth monastery. Here he did most of his literary work and, throwing aside his unfinished plan of a translation from Origen's Hexaplar text, translated the Old Testament directly from the Hebrew, with the aid of Jewish scholars. He mentions a rabbi from Lydda, a rabbi from Tiberias, and above all rabbi Ben Anina, who came to him by night secretly for fear of the Jews. Jerome was not familiar enough with Hebrew to be able to dispense with such assistance, and he makes the synagogue responsible for the accuracy of his version: "Let him who would challenge aught in this translation," he says, "ask the Jews." The result of all this labour was the Latin translation of the Scriptures which, in spite of much opposition from the more conservative party in the church, afterwards became the Vulgate or authorized version; but the Vulgate as we have it now is not exactly Jerome's Vulgate, for it suffered a good deal from changes made under the influence of the older translations; the text became very corrupt during the middle ages, and in particular all the Apocrypha, except Tobit and Judith, which Jerome translated from the Chaldee, were added from the older versions. (See BIBLE: *O.T. Versions.*)

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[1] Cf. Schoene's critical edition (Berlin, 1866, 1875).

Notwithstanding the labour involved in translating the Scriptures, Jerome found time to do a great deal of literary work, and also to indulge in violent controversy. Earlier in life he had a great admiration for Origen, and translated many of his works, and this lasted after he had settled at Bethlehem, for in 389 he translated Origen's homilies on Luke; but he came to change his opinion and wrote violently against two admirers of the great Alexandrian scholar, John, bishop of Jerusalem, and his own former friend Rufinus.

At Bethlehem also he found time to finish *Didymi de spiritu sancto liber*, a translation begun at Rome at the request of Pope Damasus, to denounce the revival of Gnostic heresies by Jovinianus and Vigilantius (*Adv. Jovinianum lib. II.* and *Contra Vigilantium liber*), and to repeat his admiration of the hermit life in his *Vita S. Hilarionis eremitae*, in his *Vita Malchi monachi captivi*, in his translations of the Rule of St Pachomius (the Benedict of Egypt), and in his *S. Pachomii et S. Theodorici epistolae et verba mystica.* He also wrote at Bethlehem *De viris illustribus sive de scriptoribus ecclesiasticis*, a church history in biographies, ending with the life of the author; *De nominibus Hebraicis*, compiled from Philo and Origen; and *De situ et nominibus locorum Hebraicorum.*[1] At the same place, too, he wrote *Quaestiones Hebraicae* on Genesis,[2] and a series of commentaries on Isaiah, Jeremiah, Ezekiel, Daniel, the Twelve Minor Prophets, Matthew and the Epistles of St Paul. About 394 Jerome came to know Augustine, for whom he held a high regard. He engaged in the Pelagian controversy with more than even his usual bitterness (*Dialogi contra pelagianos*); and it is said that the violence of his invective so provoked his opponents that an armed mob attacked the monastery, and that Jerome was forced to flee and to remain in concealment for nearly two years. He returned to Bethlehem in 418, and after a lingering illness died on the 30th of September 420.

Jerome "is one of the few Fathers to whom the title of Saint appears to have been given in recognition of services rendered to the Church rather than for eminent sanctity. He is the great Christian scholar of his age, rather than the profound theologian or the wise guide of souls." His great work was the Vulgate, but his achievements in other fields would have sufficed to distinguish him. His commentaries are valuable because of his knowledge of Greek and Hebrew, his varied interests, and his comparative freedom from allegory. To him we owe the distinction between canonical and apocryphal writings; in the *Prologus Galeatus* prefixed to his version of Samuel and Kings, he says that the church reads the Apocrypha "for the edification of the people, not for confirming the authority of ecclesiastical doctrines." He was a pioneer in the fields of patrology and of biblical archaeology. In controversy he was too fond of mingling personal abuse with legitimate argument, and this weakness mars his letters, which were held in high admiration in the early middle ages, and are valuable for their history of the man and his times. Luther in his *Table Talk* condemns them as dealing only with fasting, meats, virginity, &c. "If he only had insisted upon the works of faith and performed them! But he teaches nothing either about faith, or love, or hope, or the works of faith."

Editions of the complete works: Erasmus (9 vols., Basel, 1516–1520); Mar. Victorius, bishop of Rieti (9 vols., Rome, 1565–1572); F. Calixtus and A. Tribbechovius (12 vols., Frankfort and Leipzig, 1684–1690); J. Martianay (5 vols., incomplete Benedictine ed., Paris, 1693–1706); D. Vallarsi (11 vols., Verona, 1734–1742), the best; Migne, *Patrol. Ser. Lat.* (xxii.–xxix.). The *De viris illust.* was edited by Herding in 1879. A selection is given in translation by W. H. Fremantle, "Select Library of Nicene and Post Nicene Fathers," 2nd series, vol. vi. (New York, 1893). Biographies are prefixed to most of the above editions. See also lives by F. Z. Collombet (Paris and Lyons, 1844); O. Zöckler (Gotha, 1865); E. L. Cutts (London, 1878); C. Martin (London, 1888); P. Largent (Paris, 1898); F. W. Farrar, *Lives of the Fathers*, ii. 150-297 (Edinburgh, 1889). Additional literature is cited in Hauck-Herzog's *Realencyk. für prot. Theol.* viii. 42.

JEROME, JEROME KLAPKA (1859–   ), English author, was born on the 2nd of May 1859. He was educated at the philological school, Marylebone, London; and was by turns clerk, schoolmaster and actor, before he settled down to journalism. He made his reputation as a humorist in 1889 with *Idle Thoughts of an Idle Fellow* and *Three Men in a Boat*, and from 1892 to 1897 he was co-editor of the *Idler* with Robert Barr. At the same time he was also the editor of *To-Day.* A one-act play of his, *Barbara*, was produced at the Globe theatre in 1886, and was followed by many others, among them *Sunset* (1888), *Wood Barrow Farm* (1891), *The Passing of the Third Floor Back* (1907). Among his later books are *Letters to Clorinda* (1898), *The Second Thoughts of an Idle Fellow* (1898), *Three Men on the Bummel* (1900), *Tommy and Co.* (1904), *They and I* (1909).

JEROME OF PRAGUE (d. 1416), an early Bohemian church-reformer and friend of John Hus. Jerome's part in the Hussite movement was formerly much overrated. Very little is known of his early years. He is stated to have belonged to a noble Bohemian family[3] and to have been a few years younger than Hus. After beginning his studies at the university of Prague, where he never attempted to obtain any ecclesiastical office, Jerome proceeded to Oxford in 1398. There he became greatly impressed by the writings of Wycliffe, of whose *Dialogus* and *Trialogus* he made copies. Always inclined to a roving life, he soon proceeded to the university of Paris and afterwards continued his studies at Cologne and Heidelberg, returning to Prague in 1407. In 1403 he is stated to have undertaken a journey to Jerusalem. At Paris his open advocacy of the views of Wycliffe brought him into conflict with John Gerson, chancellor of the university. In Prague Jerome soon attracted attention by his advanced and outspoken opinions. He gave great offence also by exhibiting a portrait of Wycliffe in his room. Jerome was soon on terms of friendship with Hus, and took part in all the controversies of the university. When in 1408 a French embassy arrived at Kutná Hora, the residence of King Wenceslaus of Bohemia, and proposed that the papal schism should be terminated by the refusal of the temporal authorities further to recognize either of the rival popes, Wenceslaus summoned to Kutná Hora the members of the university. The Bohemian *magistri* spoke strongly in favour of the French proposals, while the Germans maintained their allegiance to the Roman pope, Gregory XII. The re-organization of the university was also discussed, and as Wenceslaus for a time favoured the Germans, Hus and Jerome, as leaders of the Bohemians, incurred the anger of the king, who threatened them with death by fire should they oppose his will.

In 1410 Jerome, who had incurred the hostility of the archbishop of Prague by his speeches in favour of Wycliffe's teaching, went to Ofen, where King Sigismund of Hungary resided, and, though a layman, preached before the king denouncing strongly the rapacity and immorality of the clergy. Sigismund shortly afterwards received a letter from the archbishop of Prague containing accusations against Jerome. He was imprisoned by order of the king, but does not appear to have been detained long in Hungary. Appearing at Vienna, he was again brought before the ecclesiastical authorities. He was accused of spreading Wycliffe's doctrines, and his general conduct at Oxford, Paris, Cologne, Prague and Ofen was censured. Jerome vowed that he would not leave Vienna till he had cleared himself from the accusation of heresy. Shortly afterwards he secretly left Vienna, declaring that this promise had been forced on him. He went first to Vöttau in Moravia, and then to Prague. In 1412 the representatives of Pope Gregory XII. publicly offered indulgences for sale at Prague, wishing to raise money for the pope's campaign against King Ladislaus of Naples, an adherent of the antipope of Avignon. Contrary to the wishes of the archbishop of Prague a meeting of the members of the university took place, at which both Hus and Jerome spoke strongly against the sale of indulgences. The fiery eloquence of Jerome, which is noted by all contemporary writers, obtained for him greater success even than that of Hus, particularly among the younger students, who conducted him in triumph to his dwelling-place. Shortly afterwards Jerome proceeded to Poland—it is said on the invitation of King Wladislaus. His courtly manners and his eloquence here also caused him to become very popular, but he again met with strong opposition from the Roman Church. While travelling with the grand-duke Lithold of Lithuania Jerome took part in the religious services of the Greek Orthodox Church.

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[1] Compare the critical edition of these two works in Lagarde's *Onomastica sacra* (Götting. 1870).

[2] See Lagarde's edition appended to his *Genesis Graece* (Leipzig, 1868).

[3] The statement that Jerome's family name was Faulfiss, is founded on a misunderstood passage of Aeneas Sylvius, *Historica Bohemica.* Aeneas Sylvius names as one of the early Bohemian reformers a man "*genere nobilis, ex domo quam Putridi Piscis vocant.*" This was erroneously believed to refer to Jerome.

During his stay in northern Europe Jerome received the news that Hus had been summoned to appear before the council of Constance. He wrote to his friend advising him to do so and adding that he would also proceed there to afford him assistance. Contrary to the advice of Hus he arrived at Constance on the 4th of April 1415. Advised to fly immediately to Bohemia, he succeeded in reaching Hirschau, only 25 m. from the Bohemian frontier. He was here arrested and brought back in chains to Constance, where he was examined by judges appointed by the council. His courage failed him in prison and, to regain his freedom, he renounced the doctrines of Wycliffe and Hus. He declared that Hus had been justly executed and stated in a letter addressed on the 12th of August 1415 to Lacek, lord of Kravář—the only literary document of Jerome that has been preserved—that "the dead man (Hus) had written many false and harmful things." Full confidence was not placed in Jerome's recantation. He claimed to be heard at a general meeting of the council, and this was granted to him. He now again maintained all the theories which he had formerly advocated, and, after a trial that lasted only one day, he was condemned to be burnt as a heretic. The sentence was immediately carried out on the 30th of May 1416, and he met his death with fortitude. As Poggio Bracciolini writes, "none of the Stoics with so constant and brave a soul endured death, which he (Jerome) seemed rather to long for." The eloquence of the Italian humanist has bestowed a not entirely merited aureole on the memory of Jerome of Prague.

See all works dealing with Hus; and indeed all histories of Bohemia contain detailed accounts of the career of Jerome. *The Lives of John Wicliffe, Lord Cobham, John Huss, Jerome of Prague and Žižka* by William Gilpin (London, 1765) still has a certain value. (L.)

JERROLD, DOUGLAS WILLIAM (1803–1857), English dramatist and man of letters, was born in London on the 3rd of January 1803. His father, Samuel Jerrold, actor, was at that time lessee of the little theatre of Wilsby near Cranbrook in Kent, but in 1807 he removed to Sheerness. There, among the bluejackets who swarmed in the port during the war with France, Douglas grew into boyhood. He occasionally took a child's part on the stage, but his father's profession had little attraction for the boy. In December 1813 he joined the guardship "Namur," where he had Jane Austen's brother as captain, and he served as a midshipman until the peace of 1815. He saw nothing of the war save a number of wounded soldiers from Waterloo; but till his dying day there lingered traces of his early passion for the sea. The peace of 1815 ruined Samuel Jerrold; there was no more prize money. On the 1st of January 1816 he removed with his family to London, where the ex-midshipman began the world again as a printer's apprentice, and in 1819 became a compositor in the printing-office of the *Sunday Monitor*. Several short papers and copies of verses by him had already appeared in the sixpenny magazines, and one evening he dropped into the editor's box a criticism of the opera *Der Freischütz*. Next morning he received his own copy to set up, together with a flattering note from the editor, requesting further contributions from the anonymous author. Thenceforward Jerrold was engaged in journalism. In 1821 a comedy that he had composed in his fifteenth year was brought out at Sadler's Wells theatre, under the title *More Frightened than Hurt*. Other pieces followed, and in 1825 he was engaged for a few pounds weekly to produce dramas and farces to the order of Davidge of the Coburg theatre. In the autumn of 1824 the "little Shakespeare in a camlet cloak," as he was called, married Mary Swann; and, while he was engaged with the drama at night, he was steadily pushing his way as a journalist. For a short while he was part proprietor of a small Sunday newspaper. In 1829, through a quarrel with the exacting Davidge, Jerrold left the Coburg; and his three-act melodrama, *Black-eyed Susan; or, All in the Downs*, was brought out by R. W. Elliston at the Surrey theatre. The success of the piece was enormous. With its free gallant sea-flavour, it took the town by storm, and "all London went over the water to see it." Elliston made a fortune by the piece; T. P. Cooke, who played William, made his reputation; Jerrold received about £60 and was engaged as dramatic author at five pounds a week. But his fame as a dramatist was achieved. In 1830 it was proposed that he should adapt something from the French for Drury Lane. "No," was his reply, "I shall come into this theatre as an original dramatist or not at all." *The Bride of Ludgate* (December 8, 1831) was the first of a number of his plays produced at Drury Lane. The other patent houses threw their doors open to him also (the Adelphi had already done so); and in 1836 Jerrold became comanager of the Strand theatre with W. J. Hammond, his brother-in-law. The venture was not successful, and the partnership was dissolved. While it lasted Jerrold wrote his only tragedy, *The Painter of Ghent*, and himself appeared in the title-rôle, without any very marked success. He continued to write sparkling comedies till 1854, the date of his last piece, *The Heart of Gold*.

Meanwhile he had won his way to the pages of numerous periodicals—before 1830 of the second-rate magazines only, but after that to those of more importance. He was a contributor to the *Monthly Magazine*, *Blackwood's*, the *New Monthly*, and the *Athenaeum*. To *Punch*, the publication which of all others is associated with his name, he contributed from its second number in 1841 till within a few days of his death. He founded and edited for some time, though with indifferent success, the *Illuminated Magazine*, *Jerrold's Shilling Magazine*, and *Douglas Jerrold's Weekly Newspaper*; and under his editorship *Lloyd's Weekly Newspaper* rose from almost nonentity to a circulation of 182,000. The history of his later years is little more than a catalogue of his literary productions, interrupted now and again by brief visits to the Continent or to the country. Douglas Jerrold died at his house, Kilburn Priory, in London, on the 8th of June 1857.

Jerrold's figure was small and spare, and in later years bowed almost to deformity. His features were strongly marked and expressive from the thin humorous lips to the keen blue eyes gleaming from beneath the shaggy eyebrows. He was brisk and active, with the careless bluffness of a sailor. Open and sincere, he concealed neither his anger nor his pleasure; to his simple frankness all polite duplicity was distasteful. The cynical side of his nature he kept for his writings; in private life his hand was always open. In politics Jerrold was a Liberal, and he gave eager sympathy to Kossuth, Mazzini and Louis Blanc. In social politics especially he took an eager part; he never tired of declaiming against the horrors of war, the luxury of bishops, and the iniquity of capital punishment.

Douglas Jerrold is now perhaps better known from his reputation as a brilliant wit in conversation than from his writings. As a dramatist he was very popular, though his plays have not kept the stage. He dealt with rather humbler forms of social life than had commonly been represented on the boards. He was one of the first and certainly one of the most successful of those who in defence of the native English drama endeavoured to stem the tide of translation from the French, which threatened early in the 19th century altogether to drown original native talent. His skill in construction and his mastery of epigram and brilliant dialogue are well exemplified in his comedy, *Time Works Wonders* (Haymarket, April 26, 1845). The tales and sketches which form the bulk of Jerrold's collected works vary much in skill and interest; but, although there are evident traces of their having been composed from week to week, they are always marked by keen satirical observation and pungent wit.

Among the best known of his numerous works are: *Men of Character* (1838), including "Job Pippin: The man who couldn't help it," and other sketches of the same kind; *Cakes and Ale* (2 vols., 1842), a collection of short papers and whimsical stories; some more serious novels—*The Story of a Feather* (1844), *The Chronicles of Clovernook* (1846), *A Man made of Money* (1849), and *St Giles and St James* (1851); and various series of papers reprinted from *Punch*—*Punch's Letters to his Son* (1843), *Punch's Complete Letter-writer* (1845), and the famous *Mrs Caudle's Curtain Lectures* (1846).

See W. B. Jerrold, *Life and Remains of Douglas Jerrold* (1859). A collected edition of his writings appeared in 1851–1854, and *The Works of Douglas Jerrold*, with a memoir by his son, W. B. Jerrold, in 1863–1864; but neither is complete. Among the numerous selections from his tales and witticisms are two edited by his grandson, Walter Jerrold, *Bons Mots of Charles Dickens and Douglas Jerrold* (new ed. 1904), and *The Essays of Douglas Jerrold* (1903), illustrated by H. M. Brock. See also *The Wit and Opinions of Douglas Jerrold* (1858), edited by W. B. Jerrold.

His eldest son, WILLIAM BLANCHARD JERROLD (1826–1884), English journalist and author, was born in London on the 23rd of December 1826, and abandoning the artistic career for which he was educated, began newspaper work at an early age there. He was appointed Crystal Palace commissioner to Sweden in 1853, and wrote *A Brage-Beaker with the Swedes* (1854) on his return. In 1855 he was sent to the Paris exhibition as correspondent for several London papers, and from that time he lived much in Paris. In 1857 he succeeded his father as editor of *Lloyd's Weekly Newspaper*, a post which he held for twenty-six years. During the Civil War in America he strongly supported the North, and several of his leading articles were reprinted and placarded in New York by the federal government. He was the founder and president of the English branch of the international literary association for the assimilation of copyright laws. Four of his plays were successfully produced on the London stage, the popular farce *Cool as a Cucumber* (Lyceum 1851) being the best known. His French experiences resulted in a number of books, most important of which is his *Life of Napoleon III.* (1874). He was occupied in writing the biography of Gustave Doré, who had illustrated several of his books, when he died on the 10th of March 1884.

Among his books are *A Story of Social Distinction* (1848), *Life and Remains of Douglas Jerrold* (1859), *Up and Down in the World* (1863), *The Children of Lutetia* (1864), *Cent per Cent* (1871), *At Home in Paris* (1871), *The Best of all Good Company* (1871–1873), and *The Life of George Cruikshank* (1882).

JERRY, a short form of the name Jeremiah, applied to various common objects, and more particularly to a machine for finishing cloth. The expression "jerry-built" is applied to houses built badly and of inferior materials, and run up by a speculative builder. There seems to be no foundation for the assertion that this expression was occasioned by the work of a firm of Liverpool builders named Jerry.

JERSEY, EARLS OF. Sir Edward Villiers (*c.* 1656–1711), son of Sir Edward Villiers (1620–1689), of Richmond, Surrey, was created Baron Villiers and Viscount Villiers in 1691 and earl of Jersey in 1697. His grandfather, Sir Edward Villiers (*c.* 1585–1626), master of the mint and president of Munster, was half-brother of George Villiers, 1st duke of Buckingham, and of Christopher Villiers, 1st earl of Anglesey; his sister was Elizabeth Villiers, the mistress of William III., and afterwards countess of Orkney. Villiers was knight-marshal of the royal household in succession to his father; master of the horse to Queen Mary; and lord chamberlain to William III. and Queen Anne. In 1696 he represented his country at the congress of Ryswick; he was ambassador at the Hague, and after becoming an earl was ambassador in Paris. In 1699 he was made secretary of state for the southern department, and on three occasions he was one of the lords justices of England. In 1704 he was dismissed from office by Anne, and after this event he was concerned in some of the Jacobite schemes. He died on the 25th of August 1711. The 2nd earl was his son William (*c.* 1682–1721), an adherent of the exiled house of Stuart, and the 3rd earl was the latter's son William (d. 1769), who succeeded his kinsman John Fitzgerald (*c.* 1692–1766) as 6th Viscount Grandison. The 3rd earl's son, George Bussy, the 4th earl (1735–1805), held several positions at the court of George III., and on account of his courtly manners was called the "prince of Maccaronies." The 4th earl's son, George, 5th earl of Jersey (1773–1859), one of the most celebrated fox-hunters of his time and a successful owner of racehorses, married Sarah Sophia (1785–1867), daughter of John Fane, 10th earl of Westmorland, and granddaughter of Robert Child, the banker. She inherited her grandfather's great wealth, including his interest in Child's bank, and with her husband took the name of Child-Villiers. Since this time the connexions of the earls of Jersey with Child's bank has been maintained. Victor Albert George Child-Villiers (b. 1845) succeeded his father George Augustus (1808–1859), 6th earl, who had only held the title for three weeks, as 7th earl of Jersey in 1859. This nobleman was governor of New South Wales from 1890 to 1893.

JERSEY, the largest of the Channel Islands, belonging to Great Britain. Its chief town, St Helier, on the south coast of the island, is in 49° 12′ N., 2° 7′ W., 105 m. S. by E. of Portland Bill on the English coast, and 24 m. from the French coast to the east. Jersey is the southernmost of the more important islands of the group. It is of oblong form with a length of 10 m. from east to west and an extreme breadth of 6¼ m. The area is 28,717 acres, or 45 sq. m. Pop. (1901), 52,576.

The island reaches its greatest elevation (nearly 500 ft.) in the north, the land rising sharply from the north coast, and displaying bold and picturesque cliffs towards the sea. The east, south and west coasts consist of a succession of large open bays, shallow and rocky, with marshy or sandy shores separated by rocky headlands. The principal bays are Grève au Lançons, Grève de Lecq, St John's and Bouley Bays on the north coast; St Catherine's and Grouville Bays on the east; St Clement's, St Aubin's and St Brelade's Bays on the south; and St Ouen's Bay, the wide sweep of which occupies nearly the whole of the west coast. The sea in many places has encroached greatly on the land, and sand drifts have been found troublesome, especially on the west coast. The surface of the country is broken by winding valleys having a general direction from north to south, and as they approach the south uniting so as to form small plains. The lofty hedges which bound the small enclosures into which Jersey is divided, the trees and shrubberies which line the roads and cluster round the uplands and in almost every nook of the valleys unutilized for pasturage or tillage, give the island a luxuriant appearance, neutralizing the bare effect of the few sandy plains and sand-covered hills. Fruits and flowers indigenous to warm climates grow freely in the open air. The land, under careful cultivation, is rich and productive, the soil being generally a deep loam, especially in the valleys, but in the west shallow, light and sandy. The subsoil is usually gravel, but in some parts an unfertile clay. Some two-thirds of the total area is under cultivation, great numbers of cattle being pastured, and much market gardening practised. The potato crop is very large. The peasants take advantage of every bit of wall and every isolated nook of ground for growing fruit trees. Grapes are ripened under glass; oranges can be grown in sheltered situations, but the most common fruits are apples, which are used for cider, and pears. A manure of burnt sea-weed (*vraic*) is generally used. The pasturage is very rich, and is much improved by the application of this manure to the surface. The breed of cattle is kept pure by stringent laws against the importation of foreign animals. The milk is used almost exclusively to manufacture butter. The cattle are always housed in winter, but remain out at night from May till October. There was formerly a small black breed of horses peculiar to the island, but horses are now chiefly imported from France or England. Pigs are kept principally for local consumption, and only a few sheep are reared. Fish are not so plentiful as round the shores of Guernsey, but mackerel, turbot, cod, mullet and especially the conger eel are abundant at the Minquiers. There is a large oyster bed between Jersey and France, but partly on account of over-dredging the supply is not so abundant as formerly. There is a great variety of other shell fish. The fisheries, ship-building and boat-building employ many of the inhabitants. Kelp and iodine are manufactured from sea-weed. The principal exports are granite, fruit and vegetables (especially potatoes), butter and cattle; and the chief imports coal and articles of human consumption. Communications with England are maintained principally from Southampton and Weymouth, and there are regular steamship services from Granville and St Malo on the French coast. The Jersey railway runs west from St Helier round St Aubin's Bay to St Aubin, and continues to Corbière at the south-western extremity of the island; and the Jersey eastern railway follows the southern and eastern coasts to Gorey. The island is intersected with a network of good roads.

Jersey is under a distinct and in several respects different form of administrative government from Guernsey and the smaller islands included in the bailiwick of Guernsey. For its peculiar constitution, system of justice, ecclesiastical arrangements and finance, see CHANNEL ISLANDS. There are twelve parishes, namely St Helier, Grouville, St Brelade, St Clement, St John, St Laurence, St Martin, St Mary, St Ouen, St Peter, St Saviour and Trinity. The population of the island nearly doubled between 1821 and 1901, but decreased from 54,518 to 52,576 between 1891 and 1901.

The history of Jersey is treated under CHANNEL ISLANDS. Among objects of antiquarian interest, a cromlech near Mont Orgueil is the finest of several examples. St Brelade's church, probably the oldest in the island, dates from the 12th century; among the later churches St Helier's, of the 14th century, may be mentioned. There are also some very early chapels, considered to date from the 10th century or earlier; among these may be noted the Chapelle-ès-Pêcheurs at St Brelade's, and the picturesque chapel in the grounds of the manor of Rozel. The castle of Mont Orgueil, of which there are considerable remains, is believed to be founded upon the site of a Roman stronghold, and a "Caesar's fort" still forms a part of it.

JERSEY CITY, a city and the county-seat of Hudson county, New Jersey, U.S.A., on a peninsula between the Hudson and Hackensack rivers at the N. and between New York and Newark bays at the S., opposite lower Manhattan Island. Pop. (1890), 163,003; (1900), 206,433, of whom 58,424 were foreign-born (19,314 Irish, 17,375 German, 4642 English, 3832 Italian, 1694 Russian, 1690 Scottish, 1643 Russian Poles, 1445 Austrian) and 3704 were negroes; (1910 census) 267,779. It is the eastern terminus of the Pennsylvania, the Lehigh Valley, the West Shore, the Central of New Jersey, the Baltimore & Ohio, the Northern of New Jersey (operated by the Erie), the Erie, the New York, Susquehanna & Western, and the New Jersey & New York (controlled by the Erie) railways, the first three using the Pennsylvania station; and of the little-used Morris canal. Jersey City is served by several inter-urban electric railways and by the tunnels of the Hudson & Manhattan railroad company to Dey St. and to 33rd St. and 6th Ave., New York City, and it also has docks of several lines of Transatlantic and coast steamers. The city occupies a land area of 14·3 sq. m. and has a water-front of about 12 m. Bergen Hill, a southerly extension of the Palisades, extends longitudinally through it from north to south. At the north end this hill rises on the east side precipitously to a height of nearly 200 ft.; on the west and south sides the slope is gradual. On the crest of the hill is the fine Hudson County Boulevard, about 19 m. long and 100 ft. wide, extending through the city and county from north to south and passing through West Side Park, a splendid county park containing lakes and a 70-acre playground. The water-front, especially on the east side, is given up to manufacturing and shipping establishments. In the hill section are the better residences, most of which are wooden and detached.

The principal buildings are the city hall and the court house. There are nine small city parks with an aggregate area of 39·1 acres. The city has a public library containing (1907) 107,600 volumes and an historical museum. At the corner of Bergen Ave. and Forrest St. is the People's Palace, given in 1904 by Joseph Milbank to the First Congregational church and containing a library and reading-room, a gymnasium, bowling alleys, a billiard-room, a rifle-range, a roof-garden, and an auditorium and theatre; kindergarten classes are held and an employment bureau is maintained. Among the educational institutions are the German American school, Hasbrouck institute, St Aloysius academy (Roman Catholic) and St Peter's college (Roman Catholic); and there are good public schools. Grain is shipped to and from Jersey City in large quantities, and in general the city is an important shipping port; being included, however, in the port of New York, no separate statistics are available. There are large slaughtering establishments, and factories for the refining of sugar and for the manufacture of tobacco goods, soap and perfumery, lead pencils, iron and steel, railway cars, chemicals, rubber goods, silk goods, dressed lumber, and malt liquors. The value of the city's manufactured products increased from $37,376,322 in 1890 to $77,225,116 in 1900, or 106·6%; in 1905 the factory product alone was valued at $75,740,934, an increase of only 3·9 % over the factory product in 1900, this small rate of increase being due very largely to a decline in the value of the products of the sugar and molasses refining industry. The value of the wholesale slaughtering and meat-packing product decreased from $18,551,783 in 1880 and $11,356,511 in 1890 to $6,243,217 in 1900—of this $5,708,763 represented wholesale slaughtering alone; in 1905 the wholesale slaughtering product was valued at $7,568,739.

In 1908 the assessed valuation of the city was $267,039,754. The city is governed by a board of aldermen and a mayor (elected biennially), who appoints most of the officials, the street and water board being the principal exception.

Jersey City when first incorporated was a small sandy peninsula (an island at high tide) known as Paulus Hook, directly opposite the lower end of Manhattan Island. It had been a part of the Dutch patroonship of Pavonia granted to Michael Pauw in 1630. In 1633 the first buildings were erected, and for more than a century the Hook was occupied by a small agricultural and trading community. In 1764 a new post route between New York and Philadelphia passed through what is now the city, and direct ferry communication began with New York. Early in the War of Independence Paulus Hook was fortified by the Americans, but soon after the battle of Long Island they abandoned it, and on the 23rd of September 1776 it was occupied by the British. On the morning of the 19th of August 1779 the British garrison was surprised by Major Henry Lee ("Light Horse Harry"), who with about 500 men took 159 prisoners and lost only 2 killed and 3 wounded, one of the most brilliant exploits during the War of Independence. In 1804 Paulus Hook, containing 117 acres and having about 15 inhabitants, passed into the possession of three enterprising New York lawyers, who laid it out as a town and formed an association for its government, which was incorporated as the "associates of the Jersey company." In 1820 the town was incorporated as the City of Jersey, but it remained a part of the township of Bergen until 1838, when it was reincorporated as a distinct municipality. In 1851 the township of Van Vorst, founded in 1804 between Paulus Hook and Hoboken, was annexed. In 1870 there were two annexations: to the south, the town of Bergen, the county-seat, which was founded in 1660; to the north-west, Hudson City, which had been separated from the township of North Bergen in 1852 and incorporated as a city in 1855. The town of Greenville, to the south, was annexed in 1873.

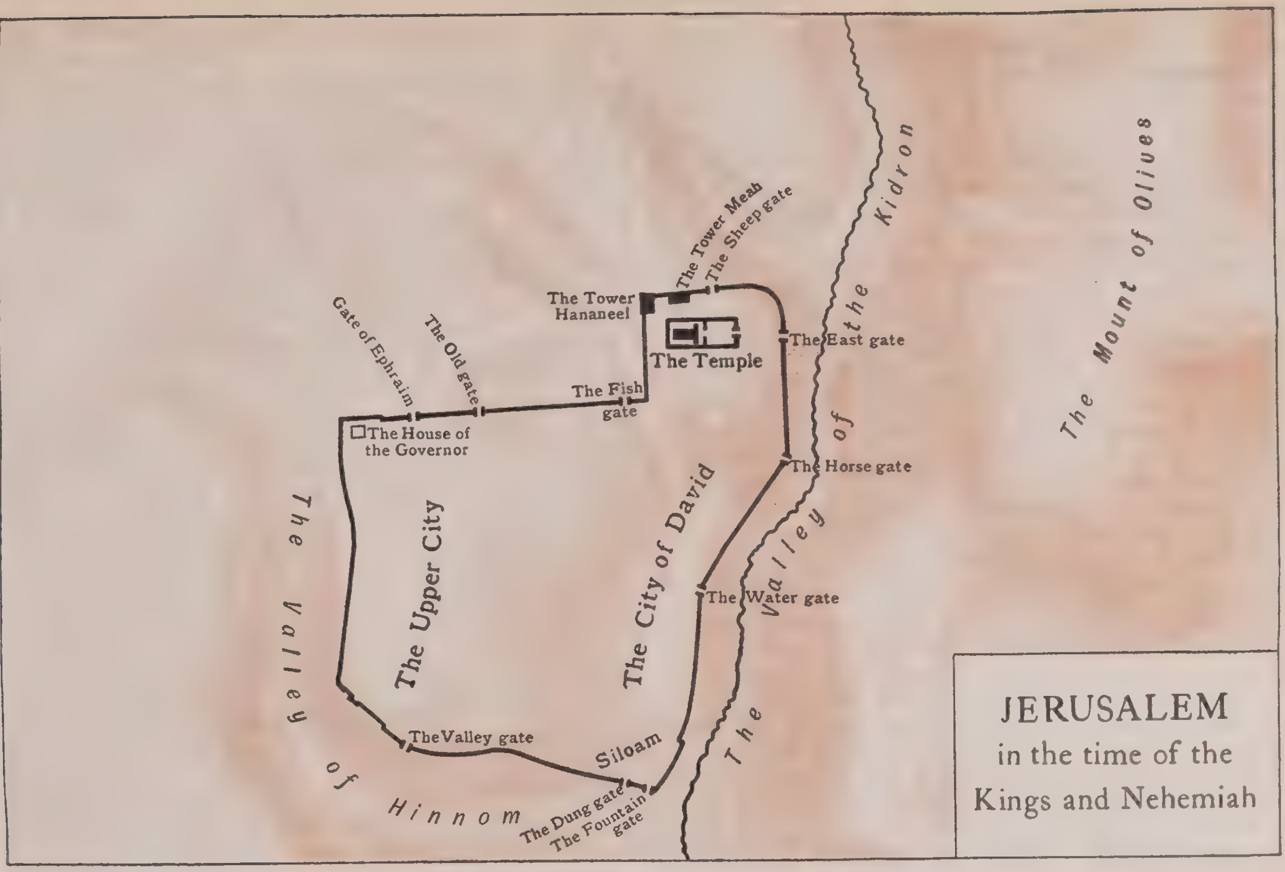
JERUSALEM (Heb. יְרוּשָׁלַםִ, *Yerushalaïm*, pronounced as a dual), the chief city of Palestine. Letters found at Tell el-Amarna in Egypt, written by an early ruler of Jerusalem, show that the name existed under the form *Urusalim*, *i.e.* "City of Salim" or "City of Peace," many years before the Israelites under Joshua entered Canaan. The emperor Hadrian, when he rebuilt the city, changed the name to Aelia Capitolina. The Arabs usually designate Jerusalem by names expressive of holiness, such as Beit el Maḳdis and El Muḳaddis or briefly El Ḳuds, *i.e.* the Sanctuary.

Natural Topography.—Jerusalem is situated in 31° 47′ N. and 35° 15′ E., in the hill country of southern Palestine, close to the watershed, at an average altitude of 2500 ft. above the Mediterranean, and 3800 ft. above the level of the Dead Sea. The city stands on a rocky plateau, which projects southwards from the main line of hills. On the east the valley of the Kidron separates this plateau from the ridge of the Mount of Olives, which is 100 to 200 ft. higher, while the Wadi Er Rababi bounds Jerusalem on the west and south, meeting the Valley of Kidron near the lower pool of Siloam. Both valleys fall rapidly as they approach the point of junction, which lies at a depth of more than 600 ft. below the general valley of the plateau. The latter, which covers an area of about 1000 acres, has at the present time a fairly uniform surface and slopes gradually from the north to the south and east. Originally, however, its formation was very different, as it was intersected by a deep valley, called Tyropoeon by Josephus, which, starting from a point N.W. of the Damascus gate, followed a course first south-east and then west of south, and joined the two main valleys of Kidron and Er Rababi at Siloam. Another shorter valley began near the present Jaffa gate and, taking an easterly direction, joined the Tyropoeon; while a third ravine passed across what is now the northern part of the Haram enclosure and fell into the valley of the Kidron. The exact form of these three interior valleys, which had an important influence on the construction and history of the city, is still imperfectly known, as they are to a great extent obliterated by vast accumulations of rubbish, which has filled them up in some places to a depth of more than 100 ft. Their approximate form was only arrived at by excavations made during the later years of the 19th century. The limited knowledge which we possess of the original features of the ground within the area of the city makes a reconstruction of the topographical history of the latter a difficult task; and, as a natural result, many irreconcilable theories have been suggested. The difficulty is increased by the fact that the geographical descriptions given in the Old Testament, the Apocrypha and the writings of Josephus are very short, and, having been written for those who were acquainted with the places, convey insufficient information to historians of the present day, when the sites are so greatly altered. All that can be done is to form a continuous account in accord with the ancient histories, and with the original formation of the ground, so far as this has been identified by modern exploration. But the progress of exploration and excavation may render this subject to further modification.

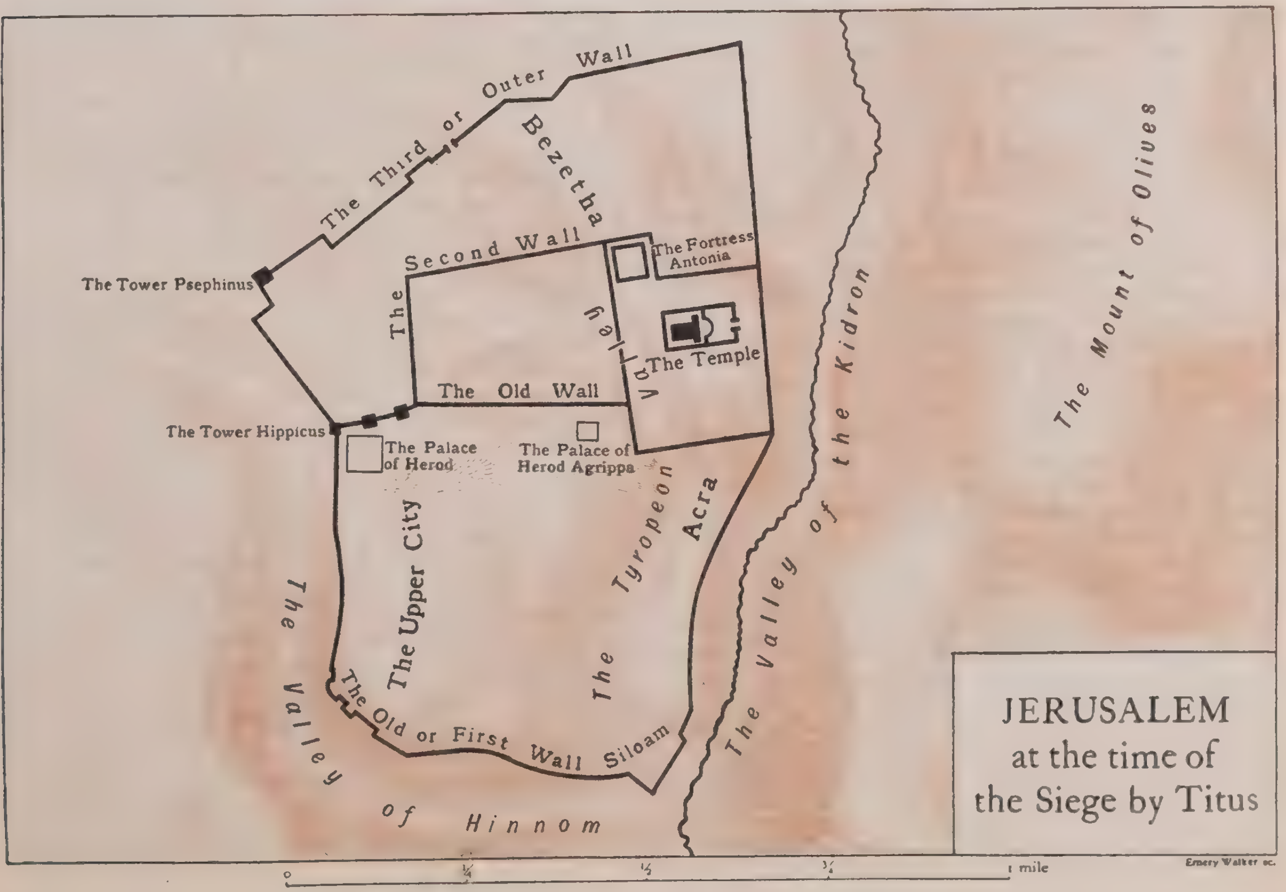
The geological formation of the plateau consists of thin beds of hard silicious chalk, locally called *misse*, which overlie a thick bed of soft white limestone, known by the name of *meleke*. Both descriptions of rock yielded good material for building; while in the soft *meleke* tanks, underground chambers, tombs, &c., were easily excavated. In ancient times a brook flowed down the valley of the Kidron, and it is possible that a stream flowed also through the Tyropoeon valley. The only known spring existing at present within the limits of the city is the "fountain of the Virgin," on the western side of the Kidron valley, but there may have been others which are now concealed by the accumulations of rubbish. Cisterns were also used for the storage of rain water, and aqueducts, of which the remains still exist (see AQUEDUCTS *ad init.*), were constructed for the conveyance of water from a distance. Speaking generally, it is probable that the water supply of Jerusalem in ancient times was better than it is at present.

History.—The early history of Jerusalem is very obscure. The Tell el-Amarna letters show that, long before the invasion by Joshua, it was occupied by the Egyptians, and was probably a stronghold of considerable importance, as it formed a good strategical position in the hill country of southern Palestine. We do not know how the Egyptians were forced to abandon Jerusalem; but, at the time of the Israelite conquest, it was undoubtedly in the hands of the Jebusites, the native inhabitants of the country. The exact position of the Jebusite city is unknown; some authorities locate it on the western hill, now known as Zion; some on the eastern hill, afterwards occupied by the Temple and the city of David; while others consider it was a double settlement, one part being on the western, and the other on the eastern hill, separated from one another by the Tyropoeon valley. The latter view appears to be the most probable, as, according to the Biblical accounts, Jerusalem was partly in Judah and partly in Benjamin, the line of demarcation between the two tribes passing through the city. According to his theory, the part of Jerusalem known as Jebus was situated on the western hill, and the outlying fort of Zion on the eastern hill. The men of Judah and Benjamin did not succeed in getting full possession of the place, and the Jebusites still held it when David became king of Israel. Some years after his accession David succeeded after some difficulty in taking Jerusalem. He established his royal city on the eastern hill close to the site of the Jebusite Zion, while Jebus, the town on the western side of the Tyropoeon valley, became the civil city, of which Joab, David's leading general, was appointed governor. David surrounded the royal city with a wall and built a citadel, probably on the site of the Jebusite fort of Zion, while Joab fortified the western town. North of the city of David, the king, acting under divine guidance, chose a site for the Temple of Jehovah, which was erected with great magnificence by Solomon. The actual site occupied by this building has given rise to much controversy, though all authorities are agreed that it must have stood on some part of the area now known as the Haram. James Fergusson was of opinion that the Temple stood near the south-western corner. As, however, it was proved by the explorations of Sir Charles Warren in 1869–1870 that the Tyropoeon valley passed under this corner, and that the foundations must have been of enormous depth, Fergusson's theory must be regarded as untenable (see also SEPULCHRE, HOLY). On the whole it is most likely that the Temple was erected by Solomon on the same spot as is now occupied by the Dome of the Rock, commonly known as the Mosque of Omar, and, regard being had to the levels of the ground, it is possible that the Holy of Holies, the most sacred chamber of the Temple, stood over the rock which is still regarded with veneration by the Mahommedans. Solomon greatly strengthened the fortifications of Jerusalem, and was probably the builder of the line of defence, called by Josephus the first or old wall, which united the cities on the eastern and western hills. The kingdom reached its highest point of importance during the reign of Solomon, but, shortly after his death, it was broken up by the rebellion of Jeroboam, who founded the separate kingdom of Israel with its capital at Shechem. Two tribes only, Judah and Benjamin, with the descendants of Levi, remained faithful to Rehoboam, the son of Solomon. Jerusalem thus lost much of its importance, especially after it was forced to surrender to Shishak, king of Egypt, who carried off a great part of the riches which had been accumulated by Solomon. The history of Jerusalem during the succeeding three centuries consists for the most part of a succession of wars against the kingdom of Israel, the Moabites and the Syrians. Joash, king of Israel, captured the city from Amaziah, king of Judah, and destroyed part of the fortifications, but these were rebuilt by Uzziah, the son of Amaziah, who did much to restore the city to its original prosperity. In the reign of Hezekiah, the kingdom of Judah became tributary to the Assyrians, who attempted the capture of Jerusalem. Hezekiah improved the defences and arranged for a good water supply, preparatory to the siege by Sennacherib, the Assyrian general. The siege failed and the Assyrians retired. Some years later Syria was again invaded by the Egyptians, who reduced Judah to the position of a tributary state. In the reign of Zedekiah, the last of the line of kings, Jerusalem was captured by Nebuchadrezzar, king of Babylon, who pillaged the city, destroyed the Temple, and ruined the fortifications (see JEWS, § 17). A number of the principal inhabitants were carried captive to Babylon, and Jerusalem was reduced to the position of an insignificant town. Nebuchadrezzar placed in the city a garrison which appears to have been quartered on the western hill, while the eastern hill on which were the Temple and the city of David was left more or less desolate. We have no information regarding Jerusalem during the period of the captivity, but fortunately Nehemiah, who was permitted to return and rebuild the defences about 445 B.C., has given a fairly clear description of the line of the wall which enables us to obtain a good idea of the extent of the city at this period. The Temple had already been partially rebuilt by Zedekiah and his companions, but on a scale far inferior to the magnificent building of King Solomon, and Nehemiah devoted his attention to the reconstruction of the walls. Before beginning the work, he made a preliminary reconnaissance of the fortifications on the south of the town from the Valley Gate, which was near the S.E. corner, to the pool of Siloam and valley of the Kidron. He then allotted the reconstruction of wall and gates to different parties of workmen, and

JERUSALEM


The Tower Meah
The Sheep gate
The Tower Hananeel
The Temple
The East gate
Gate of Ephraim
The Old gate
The Fish gate
The House of the Governor
The Horse gate
The Upper City
The City of David
The Water gate
The Valley gate
Siloam
The Dung gate
The Fountain gate
The Valley of Hinnom
The Valley of the Kidron
The Mount of Olives

JERUSALEM
in the time of the
Kings and Nehemiah


The Third or Outer Wall
Bezetha
The Second Wall
The Fortress Antonia
The Tower Psephinus
The Temple
The Valley
The Old Wall
The Tower Hippicus
The Palace of Herod
The Palace of Herod Agrippa
The Upper City
The Tyropeon
Acra
The Old or First Wall
Siloam
The Valley of Hinnom
The Valley of the Kidron
The Mount of Olives
0
¼
½
¾
1 mile

JERUSALEM
at the time of
the Siege by Titus

Emery Walker sc.

his narrative describes the portion of wall upon which each of these was employed.[1]

It is clear from his account that the lines of fortifications included both the eastern and western hills. North of the Temple enclosure there was a gate, known as the Sheep Gate, which must have opened into the third valley mentioned above, and stood somewhere near what is now the north side of the Haram enclosure, but considerably south of the present north wall of the latter. To the west of the Sheep Gate there were two important towers in the wall, called respectively Meah and Hananeel. The tower Hananeel is specially worthy of notice as it stood N.W. of the Temple and probably formed the basis of the citadel built by Simon Maccabaeus, which again was succeeded by the fortress of Antonia, constructed by Herod the Great, and one of the most important positions at the time of the siege by Titus. At or near the tower Hananeel the wall turned south along the east side of the Tyropoeon valley, and then again westward, crossing the valley at a point probably near the remarkable construction known as Wilson's arch. A gate in the valley, known as the Fish Gate, opened on a road which, leading from the north, went down the Tyropoeon valley to the southern part of the city. Westward of this gate the wall followed the south side of the valley which joined the Tyropoeon from the west as far as the north-western corner of the city at the site of the present Jaffa Gate and the so-called tower of David. In this part of the wall there were apparently two gates facing north, *i.e.* the Old Gate and the Gate of Ephraim, 400 cubits from the corner.[2] At the corner stood the residence of the Babylonian governor, near the site upon which King Herod afterwards built his magnificent palace. From the corner at the governor's house, the wall went in a southerly direction and turned south-east to the Valley Gate, remains of which were discovered by F. J. Bliss and fully described in his *Excavations in Jerusalem in 1894–1897*. From the Valley Gate the wall took an easterly course for a distance of 1000 cubits to the Dung Gate, near which on the east was the Fountain Gate, not far from the lower pool of Siloam. Here was the most southerly point of Jerusalem, and the wall turning hence to the north followed the west side of the valley of the Kidron, enclosing the city of David and the Temple enclosure, and finally turning west at some point near the site of the Golden Gate joined the wall, already described, at the Sheep Gate. Nehemiah mentions a number of places on the eastern hill, including the tomb of David, the positions of which cannot with our present knowledge be fixed with any certainty.

After the restoration of the walls of Jerusalem by Nehemiah, a considerable number of Jews returned to the city, but we know practically nothing of its history for more than a century until, in 332 B.C., Alexander the Great conquered Syria. The gates of Jerusalem were opened to him and he left the Jews in peaceful occupation. But his successors did not act with similar leniency; when the city was captured by Ptolemy I., king of Egypt, twelve years later, the fortifications were partially demolished and apparently not again restored until the period of the high priest Simon II., who repaired the defences and also the Temple buildings. In 168 B.C. Antiochus Epiphanes captured Jerusalem, destroyed the walls, and devastated the Temple, reducing the city to a worse position than it had occupied since the time of the captivity. He built a citadel called the Acra to dominate the town and placed in it a strong garrison of Greeks. The position of the Acra is doubtful, but it appears most probable that it stood on the eastern hill between the Temple and the city of David, both of which it commanded. Some writers place it north of the Temple on the site afterwards occupied by the fortress of Antonia, but such a position is not in accord with the descriptions either in Josephus or in the books of the Maccabees, which are quite consistent with each other. Other writers again have placed the Acra on the eastern side of the hill upon which the church of the Holy Sepulchre now stands, but as this point was probably quite outside the city at the time of Antiochus Epiphanes, and is at too great a distance from the Temple, it can hardly be accepted. But the site which has been already indicated at the N.E. corner of the present Mosque el Aksa meets the accounts of the ancient authorities better than any other. At this point in the Haram enclosure there is an enormous underground cistern, known as the Great Sea, and this may possibly have been the source of water supply for the Greek garrison. The oppression of Antiochus led to a revolt of the Jews under the leadership of the Maccabees, and Judas Maccabaeus succeeded in capturing Jerusalem after severe fighting, but could not get possession of the Acra, which caused much trouble to the Jews, who erected a wall between it and the Temple, and another wall to cut it off from the city. The Greeks held out for a considerable time, but had finally to surrender, probably from want of food, to Simon Maccabaeus, who demolished the Acra and cut down the hill upon which it stood so that it might no longer be higher than the Temple, and that there should be no separation between the latter and the city. Simon then constructed a new citadel, north of the Temple, to take the place of the Acra, and established in Judaea the Asmonean dynasty, which lasted for nearly a century, when the Roman republic began to make its influence felt in Syria. In 65 B.C. Jerusalem was captured by Pompey after a difficult siege. The Asmonean dynasty lasted a few years longer, but finally came to an end when Herod the Great, with the aid of the Romans, took possession of Jerusalem and became the first king of the Idumaean dynasty. Herod again raised the city to the position of an important capital, restoring the fortifications, and rebuilding the Temple from its foundations. He also built the great fortress of Antonia, N.W. of the Temple, on the site of the citadel of the Asmoneans, and constructed a magnificent palace for himself on the western hill, defended by three great towers, which he named Mariamne, Hippicus and Phasaelus. At some period between the time of the Maccabees and of Herod, a second or outer wall had been built outside and north of the first wall, but it is not possible to fix an accurate date to this line of defence, as the references to it in Josephus are obscure. Herod adorned the town with other buildings and constructed a theatre and gymnasium. He doubled the area of the enclosure round the Temple, and there can be little doubt that a great part of the walls of the Haram area date from the time of Herod, while probably the tower of David, which still exists near the Jaffa Gate, is on the same foundation as one of the towers adjoining his palace. Archelaus, Herod's successor, had far less authority than Herod, and the real power of government at Jerusalem was assumed by the Roman procurators, in the time of one of whom, Pontius Pilate, Jesus Christ was condemned to death and crucified outside Jerusalem. The places of his execution and burial are not certainly known (see SEPULCHRE, HOLY).

Herod Agrippa, who succeeded to the kingdom, built a third or outer wall on the north side of Jerusalem in order to enclose and defend the buildings which had gradually been constructed outside the old fortifications. The exact line of this third wall is not known with certainty, but it probably followed approximately the same line as the existing north wall of Jerusalem. Some writers have considered that it extended a considerable distance farther to the north, but of this there is no proof, and no remains have as yet been found which would support the opinion. The wall of Herod Agrippa was planned on a grand scale, but its execution was stopped by the Romans, so that it was not completed at the time of the siege of Jerusalem by Titus. The writings of Josephus give a good idea of the fortifications and buildings of Jerusalem at the time of the siege, and his accurate personal knowledge makes his account worthy of the most careful perusal. He explains clearly how Titus, beginning his attack from the north, captured the third or outer wall, then the second wall, and finally the fortress of Antonia, the Temple, and the upper city. After the capture, Titus ordered the Temple to be demolished and the fortifications to be levelled, with the exception of the three great towers at Herod's palace. It is, however, uncertain how far the order was carried out, and it is probable that the outer walls of the Temple enclosure were left partially standing and that the defences on the west and south of the city were not completely levelled. When Titus and his army withdrew from Jerusalem, the 10th legion was left as a permanent Roman garrison, and a fortified camp for their occupation was established on the western hill. We have no account of the size or position of this camp, but a consideration of the site, and a comparison with other Roman camps in various parts of Europe, make it probable that it occupied an area of about 50 acres, extending over what is now known as the Armenian quarter of the town, and that it was bounded on the north by the old or first wall, on the west also by the old wall, on the south by a line of defence somewhat in the same position as the present south wall where it passes the Zion Gate, and on the east by an entrenchment running north and south parallel to the existing thoroughfare known as David Street. For sixty years the Roman garrison were left in undisturbed occupation, but in 132 the Jews rose in revolt under the leadership of Bar-Cochebas or Barcochba, and took possession of Jerusalem. After a severe struggle, the revolt was suppressed by the Roman general, Julius Severus, and Jerusalem was recaptured and again destroyed. According to some writers, this devastation was even more complete than after the siege by Titus. About 130 the emperor Hadrian decided to rebuild Jerusalem, and make it a Roman colony. The new city was called Aelia Capitolina. The exact size of the city is not known, but it probably extended as far as the present north wall of Jerusalem and included the northern part of the western hill. A temple dedicated to Jupiter Capitolinus was erected on the site of the Temple, and other buildings were constructed, known as the Theatre, the Demosia, the Tetranymphon, the Dodecapylon and the Codra. The Jews were forbidden to reside in the city, but Christians were freely admitted. The history of Jerusalem during the period between the foundation of the city of Aelia by the emperor Hadrian and the accession of Constantine the Great in 306 is obscure, but no important change appears to have been made in the size or fortifications of the city, which continued as a Roman colony. In 326 Constantine, after his conversion to Christianity, issued orders to the bishop Macarius to recover the site of the crucifixion of Jesus Christ, and the tomb in which his body was laid (see SEPULCHRE, HOLY). After the holy sites had been determined, Constantine gave orders for the construction of two magnificent churches, the one over the tomb and the other over the place where the cross was discovered. The present church of the Holy Sepulchre stands on the site upon which one of the churches of Constantine was built, but the second church, the Basilica of the Cross, has completely disappeared. The next important epoch in building construction at Jerusalem was about 460, when the empress Eudocia visited Palestine and expended large sums on the improvement of the city. The walls were repaired by her orders, and the line of fortifications appears to have been extended on the south so as to include the pool of Siloam. A church was built above the pool, probably at the same time, and, after having completely disappeared for many centuries, it was recovered by F. J. Bliss when making his exploration of Jerusalem. The empress also erected a large church in honour of St Stephen north of the Damascus Gate, and is believed to have been buried therein. The site of this church was discovered in 1874, and it has since been rebuilt. In the 6th century the emperor Justinian erected a magnificent basilica at Jerusalem, in honour of the Virgin Mary, and attached to it two hospitals, one for the reception of pilgrims and one for the accommodation of the sick poor. The description given by Procopius does not indicate clearly where this church was situated. A theory frequently put forward is that it stood within the Haram area near the Mosque of el Aksa, but it is more probable that it was on Zion, near the traditional place of the Coenaculum or last supper, where the Mahommedan building known as the tomb of David now stands. In 614 Chosroes II., the king of Persia, captured Jerusalem, devastated many of the buildings, and massacred a great number of the inhabitants. The churches at the Holy Sepulchre were much damaged, but were partially restored by the monk Modestus, who devoted himself with great energy to the work. After a severe struggle the Persians were defeated by the emperor Heraclius, who entered Jerusalem in triumph in 629 bringing with him the holy cross, which had been carried off by Chosroes. At this period the religion of Mahomet was spreading over the east, and in 637 the caliph Omar marched on Jerusalem, which capitulated after a siege of four months. Omar behaved with great moderation, restraining his troops from pillage and leaving the Christians in possession of their churches. A wooden mosque was erected near the site of the Temple, which was replaced by the Mosque of Aksa, built by the amir Abdalmalik (Abd el Malek), who also constructed the Dome of the Rock, known as the Mosque of Omar, in 688. The Mahommedans held Jerusalem until 1099, when it was captured by the crusaders under Godfrey of Bouillon, and became the capital of the Latin Kingdom of Jerusalem (see CRUSADES, vol. viii. p. 401) until 1187, when Saladin reconquered it, and rebuilt the walls. Since that time, except from 1229 to 1239, and from 1243 to 1244, the city has been held by the Mahommedans. It was occupied by the Egyptian sultans until 1517, when the Turks under Selim I. occupied Syria. Selim's successor, Suleiman the Magnificent, restored the fortifications, which since that time have been little altered.

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[1] The sites shown on the plan are tentative, and cannot be regarded as certain; see Nehemiah ii. 12–15, iii. 1–32, xii. 37–39.

[2] See 2 Kings xiv. 13.

Modern Jerusalem.—Jerusalem is the chief town of a sanjak, governed by a *mutessarif*, who reports directly to the Porte. It has the usual executive and town councils, upon which the recognized religious communities, or *millets*, have representatives; and it is garrisoned by infantry of the V. army corps. The city is connected with its port, Jaffa, by a carriage road, 41 m., and by a metre-gauge railway, 54 m., which was completed in 1892, and is worked by a French company. There are also carriage roads to Bethlehem, Hebron and Jericho, and a road to Nablus was in course of construction in 1909. Prior to 1858, when the modern building period commenced, Jerusalem lay wholly within its 16th-century walls, and even as late as 1875 there were few private residences beyond their limits. At present Jerusalem without the walls covers a larger area than that within them. The growth has been chiefly towards the north and north-west; but there are large suburbs on the west, and on the south-west near the railway station on the plain of Rephaim. The village of Siloam has also increased in size, and the western slopes of Olivet are being covered with churches, monasteries and houses. Amongst the most marked features of the change that has taken place since 1875 are the growth of religious and philanthropic establishments; the settlement of Jewish colonies from Bokhara, Yemen and Europe; the migration of Europeans, old Moslem families, and Jews from the city to the suburbs; the increased vegetation, due to the numerous gardens and improved methods of cultivation; the substitution of timber and red tiles for the vaulted stone roofs which were so characteristic of the old city; the striking want of beauty, grandeur, and harmony with their environment exhibited by most of the new buildings; and the introduction of wheeled transport, which, cutting into the soft limestone, has produced mud and dust to an extent previously unknown. To facilitate communication between the city and its suburbs, the Bab ez-Zāhire, or Herod's Gate, and a new gate, near the north-west angle of the walls, have been opened; and a portion of the wall, adjoining the Jaffa Gate, has been thrown down, to allow free access for carriages. Within the city the principal streets have been roughly paved, and iron bars placed across the narrow alleys to prevent the passage of camels. Without the walls carriage roads have been made to the mount of Olives, the railway station, and various parts of the suburbs, but they are kept in bad repair. Little effort has been made to meet the increased sanitary requirements of the larger population and wider inhabited area. There is no municipal water-supply, and the main drain of the city discharges into the lower pool of Siloam, which has become an open cesspit. In several places the débris within the walls is saturated with sewage, and the water of the Fountain of the Virgin, and of many of the old cisterns, is unfit for drinking. Amongst the more important buildings for ecclesiastical and philanthropic purposes erected to the north of the city since 1860 are the Russian cathedral, hospice and hospital; the French hospital of St Louis, and hospice and church of St Augustine; the German schools, orphanages and hospitals; the new hospital and industrial school of the London mission to the Jews; the Abyssinian church; the church and schools of the Church missionary society; the Anglican church, college and bishop's house; the Dominican monastery, seminary and church of St Stephen; the Rothschild hospital and girls' school; and the industrial school and workshops of the Alliance Israélite. On the mount of Olives are the Russian church, tower and hospice, near the chapel of the Ascension; the French Paternoster church; the Carmelite nunnery; and the Russian church of St Mary Magdalene, near Gethsemane. South of the city are the Armenian monastery of Mount Zion and Bishop Gobat's school. On the west side are the institution of the sisters of St Vincent; the Ratisbon school; the Montefiore hospice; the British ophthalmic hospital of the knights of St John; the convent and church of the Clarisses; and the Moravian leper hospital. Within the city walls are the Latin Patriarchal church and residence; the school of the Frères de la Doctrine Chrétienne; the schools and printing house of the Franciscans; the Coptic monastery; the German church of the Redeemer, and hospice; the United Armenian church of the Spasm; the convent and school of the Sœurs de Zion; the Austrian hospice; the Turkish school and museum; the monastery and seminary of the Frères de la Mission Algérienne, with the restored church of St Anne, the church, schools and hospital of the London mission to the Jews; the Armenian seminary and Patriarchal buildings; the Rothschild hospital; and Jewish hospices and synagogues.

The climate is naturally good, but continued neglect of sanitary precautions has made the city unhealthy. During the summer months the heat is tempered by a fresh sea-breeze, and there is usually a sharp fall of temperature at night; but in spring and autumn the east and south-east winds, which blow across the heated depression of the Ghor, are enervating and oppressive. A dry season, which lasts from May to October, is followed by a rainy season, divided into the early winter and latter rains. Snow falls two years out of three, but soon melts. The mean annual temperature is 62·8° F., the maximum 112°, and the minimum 25°. The mean monthly temperature is lowest (47·2°) in February, and highest (76·3°) in August. The mean annual rainfall (1861 to 1899) is 26·06 in. The most unhealthy period is from 1st May to 31st October, when there are, from time to time, outbreaks of typhoid, small-pox, diphtheria and other epidemics. The unhealthiness of the city is chiefly due to want of proper drainage, impure drinking-water, miasma from the disturbed rubbish heaps, and contaminated dust from the uncleansed roads and streets. The only industry is the manufacture of olive-wood and mother-of-pearl goods for sale to pilgrims and for export. The imports (see JOPPA) are chiefly food, clothing and building material. The population in 1905 was about 60,000 (Moslems 7000, Christians 13,000, Jews 40,000). During the pilgrimage season it is increased by about 15,000 travellers and pilgrims.

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JERUSALEM, SYNOD OF (1672). By far the most important of the many synods held at Jerusalem (see Wetzer and Welte, *Kirchenlexikon*, 2nd ed., vi. 1357 sqq.) is that of 1672; and its confession is the most vital statement of faith made in the Greek Church during the past thousand years. It refutes article by article the confession of Cyril Lucaris, which appeared in Latin at Geneva in 1629, and in Greek, with the addition of four "questions," in 1633. Lucaris, who died in 1638 as patriarch of Constantinople, had corresponded with Western scholars and had imbibed Calvinistic views. The great opposition which arose during his lifetime continued after his death, and found classic expression in the highly venerated confession of Petrus Mogilas, metropolitan of Kiev (1643). Though this was intended as a barrier against Calvinistic influences, certain Reformed writers, as well as Roman Catholics, persisted in claiming the support of the Greek Church for sundry of their own positions. Against the Calvinists the synod of 1672 therefore aimed its rejection of unconditional predestination and of justification by faith alone, also its advocacy of what are substantially the Roman doctrines of transubstantiation and of purgatory; the Oriental hostility to Calvinism had been fanned by the Jesuits. Against the Church of Rome, however, there was directed the affirmation that the Holy Ghost proceeds from the Father and not from both Father and Son; this rejection of the *filioque* was not unwelcome to the Turks. Curiously enough, the synod refused to believe that the heretical confession it refuted was actually by a former patriarch of Constantinople; yet the proofs of its genuineness seem to most scholars overwhelming. In negotiations between Anglican and Russian churchmen the confession of Dositheus[1] usually comes to the front.

TEXTS.—The confession of Dositheus, or the eighteen decrees of the Synod of Jerusalem, appeared in 1676 at Paris as *Synodus Bethlehemitica*; a revised text in 1678 as *Synodus Jerosolymitana*; Hardouin, *Acta conciliorum*, vol. xi.; Kimmel, *Monumenta fidei ecclesiae orientalis* (Jena, 1850; critical edition); P. Schaff, *The Creeds of Christendom*, vol. ii. (text after Hardouin and Kimmel, with Latin translation); *The Acts and Decrees of the Synod of Jerusalem translated from the Greek, with notes*, by J. N. W. B. Robertson (London, 1899); J. Michalcescu, *Die Bekenntnisse und die wichtigsten Glaubenszeugnisse der griechisch-orientalischen Kirche* (Leipzig, 1904; Kimmel's text with introductions). LITERATURE.—*The Doctrine of the Russian Church* . . . translated by R. W. Blackmore (Aberdeen, 1845), p. xxv. sqq.; Schaff, i. § 17; Wetzer and Welte, *Kirchenlexikon* (2nd ed.), vi. 1359 seq.; Herzog-Hauck, *Realencyklopädie* (3rd ed.), viii. 703–705; Michalcescu, 123 sqq. (See COUNCILS.) (W. W. R.*)

JESI (anc. *Aesis*), a town and episcopal see of the Marches, Italy, in the province of Ancona, from which it is 17 m. W. by S. by rail, 318 ft. above sea-level. Pop. (1901), 23,285. The place took its ancient name from the river Aesis (mod. Esino), upon the left bank of which it lies. It still retains its picturesque medieval town walls. The Palazzo del Comune is a fine, simple, early Renaissance building (1487–1503) by Francesco di Giorgio Martini; the walls are of brick and the window and door-frames of stone, with severely restrained ornamentation. The courtyard with its loggie was built by Andrea Sansovino in 1519. The library contains some good pictures by Lorenzo Lotto. The castle was built by Baccio Pontelli (1488), designer of the castle at Ostia (1483–1486). Jesi was the birthplace of the emperor Frederic II. (1194), and also of the musical composer, Giovanni Battista Pergolesi (1710–1736). The river Aesis formed the boundary of Italy proper from about 250 B.C. to the time of Sulla (*c.* 82 B.C.); and, in Augustus' division of Italy, that between Umbria (the 6th region) and Picenum (the 5th). The town itself was a colony, of little importance, except, apparently, as a recruiting ground for the Roman army.

JESSE, in the Bible, the father of David (*q.v.*), and as such often regarded as the first in the genealogy of Jesus Christ (cf. Isa. xi. 1, 10). Hence the phrase "tree of Jesse" is applied to a design representing the descent of Jesus from the royal line of David, formerly a favourite ecclesiastical ornament. From a recumbent figure of Jesse springs a tree bearing in its branches the chief figures in the line of descent, and terminating in the figure of Jesus, or of the Virgin and Child. There are remains of such a tree in the church of St Mary at Abergavenny, carved in wood, and supposed to have once stood behind the high altar. Jesse candelabra were also made. At Laon and Amiens there are sculptured Jesses over the central west doorways of the cathedrals. The design was chiefly used in windows. The great east window at Wells and the window at the west end of the nave at Chartres are fine examples. There is a 16th-century Jesse window from Mechlin in St George's, Hanover Square, London. The Jesse window in the choir of Dorchester Abbey, Oxfordshire, is remarkable in that the tree forms the central mullion, and many of the figures are represented as statuettes on the branches of the upper tracery; other figures are in the stained glass; the whole gives a beautiful example of the combination of glass and carved stonework in one design.

JESSE, EDWARD (1780–1868), English writer on natural history, was born on the 14th of January 1780, at Hutton Cranswick, Yorkshire, where his father was vicar of the parish. He became clerk in a government office in 1798, and for a time was secretary to Lord Dartmouth, when president of the Board of Control. In 1812 he was appointed commissioner of hackney coaches, and later he became deputy surveyor-general of the royal parks and palaces. On the abolition of this office he retired on a pension, and he died at Brighton on the 28th of March 1868.

The result of his interest in the habits and characteristics of animals was a series of pleasant and popular books on natural history, the principal of which are *Gleanings in Natural History* (1832–1835); *An Angler's Rambles* (1836); *Anecdotes of Dogs* (1846); and *Lectures on Natural History* (1863). He also edited Izaak Walton's *Compleat Angler*, Gilbert White's *Selborne*, and L. Ritchie's *Windsor Castle*, and wrote a number of handbooks to places of interest, including Windsor and Hampton Court.

JESSE, JOHN HENEAGE (1815–1874), English historian, son of Edward Jesse, was educated at Eton, and afterwards became a clerk in the secretary's department of the admiralty. He died in London on the 7th of July 1874. His poem on Mary Queen of Scots was published about 1831, and was followed by a collection of poems entitled *Tales of the Dead*. He also wrote a drama, *Richard III.*, and a fragmentary poem entitled *London*. None of these ventures achieved any success, but his numerous historical works are written with vivacity and interest, and, in their own style, are an important contribution to the history of England. They include *Memoirs of the Court of England during the Reign of the Stuarts* (1840), *Memoirs of the Court of England from the Revolution of 1688 to the Death of George II.* (1843), *George Selwyn and his Contemporaries* (1843, new ed. 1882), *Memoirs of the Pretenders and their Adherents* (1845), *Memoirs of Richard the Third and his Contemporaries* (1861), and *Memoirs of the Life and Reign of King George the Third* (1867). The titles of these works are sufficiently indicative of their character. They are sketches of the principal personages and of the social details of various periods in the history of England rather than complete and comprehensive historical narratives. In addition to these works Jesse wrote *Literary and Historical Memorials of London* (1847), *London and its Celebrities* (1850), and a new edition of this work as *London: its Celebrated Characters and Remarkable Places* (1871). His *Memoirs of Celebrated Etonians* appeared in 1875.

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[1] Patriarch of Jerusalem (1669–1707), who presided over the synod.

A collected edition containing most of his works in thirty volumes was published in London in 1901.

JESSEL, SIR GEORGE (1824–1883), English judge, was born in London on the 13th of February 1824. He was the son of Zadok Aaron Jessel, a Jewish coral merchant. George Jessel was educated at a school for Jews at Kew, and being prevented by then existing religious disabilities from proceeding to Oxford or Cambridge, went to University College, London. He entered as a student at Lincoln's Inn in 1842, and a year later took his B.A. degree at the university of London, becoming M.A. and gold medallist in mathematics and natural philosophy in 1844. In 1846 he became a fellow of University College, and in 1847 he was called to the bar at Lincoln's Inn. His earnings during his first three years at the bar were 52,346, and 795 guineas, from which it will be seen that his rise to a tolerably large practice was rapid. His work, however, was mainly conveyancing, and for long his income remained almost stationary. By degrees, however, he got more work, and was called within the bar in 1865, becoming a bencher of his Inn in the same year and practising in the Rolls Court. Jessel entered parliament as Liberal member for Dover in 1868, and although neither his intellect nor his oratory was of a class likely to commend itself to his fellow-members, he attracted Gladstone's attention by two learned speeches on the Bankruptcy Bill which was before the house in 1869, with the result that in 1871 he was appointed solicitor-general. His reputation at this time stood high in the chancery courts; on the common law side he was unknown, and on the first occasion upon which he came into the court of Queen's bench to move on behalf of the Crown, there was very nearly a collision between him and the bench. His forceful and direct method of bringing his arguments home to the bench was not modified in his subsequent practice before it. His great powers were fully recognized; his business in addition to that on behalf of the Crown became very large, and his income for three years before he was raised to the bench amounted to nearly £25,000 per annum. In 1873 Jessel succeeded Lord Romilly as master of the rolls. From 1873 to 1881 Jessel sat as a judge of first instance in the rolls court, being also a member of the court of appeal. In November 1874 the first Judicature Act came into effect, and in 1881 the Judicature Act of that year made the master of the rolls the ordinary president of the first court of appeal, relieving him of his duties as a judge of first instance. In the court of appeal Jessel presided almost to the day of his death. For some time before 1883 he suffered from diabetes with chronic disorder of the heart and liver, but struggled against it; on the 16th of March 1883 he sat in court for the last time, and on the 21st of March he died at his residence in London, the immediate cause of death being cardiac syncope.

As a judge of first instance Jessel was a revelation to those accustomed to the proverbial slowness of the chancery courts and of the master of the rolls who preceded him. He disposed of the business before him with rapidity combined with correctness of judgment, and he not only had no arrears himself, but was frequently able to help other judges to clear their lists. His knowledge of law and equity was wide and accurate, and his memory for cases and command of the principles laid down in them extraordinary. In the rolls court he never reserved a judgment, not even in the Epping Forest case (*Commissioners of Sewers* v. *Glasse*, L.R. 19 Eq.; *The Times*, 11th November 1874), in which the evidence and arguments lasted twenty-two days (150 witnesses being examined in court, while the documents went back to the days of King John), and in the court of appeal he did so only twice, and then in deference to the wishes of his colleagues. The second of these two occasions was the case of *Robarts* v. *The Corporation of London* (49 *Law Times* 455; *The Times*, 10th March 1883), and those who may read Jessel's judgment should remember that, reviewing as it does the law and custom on the subject, and the records of the city with regard to the appointment of a remembrancer from the 16th century, together with the facts of the case before the court, it occupied nearly an hour to deliver, but was nevertheless delivered without notes—this, too, on the 9th of March 1883, when the judge who uttered it was within a fortnight of his death. Never during the 19th century was the business of any court performed so rapidly, punctually, and satisfactorily as it was when Jessel presided. He was master of the rolls at a momentous period of legal history. The Judicature Acts, completing the fusion of law and equity, were passed while he was judge of first instance, and were still new to the courts when he died. His knowledge and power of assimilating knowledge of all subjects, his mastery of every branch of law with which he had to concern himself, as well as of equity, together with his willingness to give effect to the new system, caused it to be said when he died that the success of the Judicature Acts would have been impossible without him. His faults as a judge lay in his disposition to be intolerant of those who, not able to follow the rapidity of his judgment, endeavoured to persist in argument after he had made up his mind; but though he was peremptory with the most eminent counsel, young men had no cause to complain of his treatment of them.

Jessel sat on the royal commission for the amendment of the Medical Acts, taking an active part in the preparation of its report. He actively interested himself in the management of London University, of which he was a fellow from 1861, and of which he was elected vice-chancellor in 1880. He was one of the commissioners of patents, and trustee of the British Museum. He was also chairman of the committee of judges which drafted the new rules rendered necessary by the Judicature Acts. He was treasurer of Lincoln's Inn in 1883, and vice-president of the council of legal education. He was also a fellow of the Royal Society. Jessel's career marks an epoch on the bench, owing to the active part taken by him in rendering the Judicature Acts effective, and also because he was the last judge capable of sitting in the House of Commons, a privilege of which he did not avail himself. He was the first Jew who, as solicitor-general, took a share in the executive government of his country, the first Jew who was sworn a regular member of the privy council, and the first Jew who took a seat on the judicial bench of Great Britain; he was also, for many years after being called to the bar, so situated that any one might have driven him from it, because, being a Jew, he was not qualified to be a member of the bar. In person Jessel was a stoutish, square-built man of middle height, with dark hair, somewhat heavy features, a fresh ruddy complexion, and a large mouth. He married in 1856 Amelia, daughter of Joseph Moses, who survived him together with three daughters and two sons, the elder of whom, Charles James (b. 1860), was made a baronet shortly after the death of his distinguished father and in recognition of his services.

See *The Times*, March 23, 1883; E. Manson, *Builders of our Law* (1904).

JESSORE, a town and district of British India, in the Presidency division of Bengal. The town is on the Bhairab river with a railway station 75 m. N.E. of Calcutta. Pop. (1901), 8054

The DISTRICT OF JESSORE has an area of 2925 sq. m. Pop. (1901), 1,813,155, showing a decrease of 4% in the decade. The district forms the central portion of the delta between the Hugli and the united Ganges and Brahmaputra. It is a vast alluvial plain intersected by rivers and watercourses, which in the southern portion spread out into large marshes. The northern part is verdant, with extensive groves of date-palms; villages are numerous and large; and the people are prosperous. In the central portion the population is sparse, the only part suitable for dwellings being the high land on the banks of rivers. The principal rivers are the Madhumati or Haringhata (which forms the eastern boundary of the district), with its tributaries the Nabaganga, Chitra, and Bhairab; the Kumar, Kabadak, Katki, Harihar, Bhadra and Atharabanka. Within the last century the rivers in the interior of Jessore have ceased to be true deltaic rivers; and, whereas the northern portion of the district formerly lay under water for several months every year, it is now reached only by unusual inundations. The tide reaches as far north as the latitude of Jessore town. Jessore is the centre of sugar manufacture from date palms. The exports are sugar, rice, pulse, timber, honey, shells, &c.; the imports are salt, English goods, and cloth. The district is crossed by the Eastern Bengal railway, but the chief means of communication are waterways.

British administration was completely established in the district in 1781, when the governor-general ordered the opening of a court at Murali near Jessore. Before that, however, the fiscal administration had been in the hands of the English, having been transferred to the East India company with that of the rest of Bengal in 1765. The changes in jurisdiction in Jessore have been very numerous. After many transfers and rectifications, the district was in 1863 finally constituted as it at present stands. The rajas of Jessore or Chanchra trace their origin to Bhabeswar Rai, a soldier in the army of Khan-i-Azam, an imperial general, who deprived Raja Pratapaditya, the popular hero of the Sundarbans, of several fiscal divisions, and conferred them on Bhabeswar. But Manohar Rai (1649–1705) is regarded as the principal founder of the family. The estate when he inherited it was of moderate size, but he acquired one *pargana* after another, until, at his death, the property was by far the largest in the neighbourhood.

JESTER, a provider of "jests" or amusements, a buffoon, especially a professional fool at a royal court or in a nobleman's household (see FOOL). The word "jest," from which "jester" is formed, is used from the 16th century for the earlier "gest," Lat. *gesta*, or *res gestae*, things done, from *gerere*, to do, hence deeds, exploits, especially as told in history, and so used of the metrical and prose romances and chronicles of the middle ages. The word became applied to satirical writings and to any long-winded empty tale, and thence to a joke or piece of fun, the current meaning of the word.

JESUATI, a religious order founded by Giovanni Colombini of Siena in 1360. Colombini had been a prosperous merchant and a senator in his native city, but, coming under ecstatic religious influences, abandoned secular affairs and his wife and daughter (after making provision for them), and with a friend of like temperament, Francesco Miani, gave himself to a life of apostolic poverty, penitential discipline, hospital service and public preaching. The name Jesuati was given to Colombini and his disciples from the habit of calling loudly on the name of Jesus at the beginning and end of their ecstatic sermons. The senate banished Colombini from Siena for imparting foolish ideas to the young men of the city, and he continued his mission in Arezzo and other places, only to be honourably recalled home on the outbreak of a devastating pestilence. He went out to meet Urban V. on his return from Avignon to Rome in 1367, and craved his sanction for the new order and a distinctive habit. Before this was granted Colombini had to clear the movement of a suspicion that it was connected with the heretical sect of Fraticelli, and he died on the 31st of July 1367, soon after the papal approval had been given. The guidance of the new order, whose members (all lay brothers) gave themselves entirely to works of mercy, devolved upon Miani. Their rule of life, originally a compound of Benedictine and Franciscan elements, was later modified on Augustinian lines, but traces of the early penitential idea persisted, *e.g.* the wearing of sandals and a daily flagellation. Paul V. in 1606 arranged for a small proportion of clerical members, and later in the 17th century the Jesuati became so secularized that the members were known as the Aquavitae Fathers, and the order was dissolved by Clement IX. in 1668. The female branch of the order, the Jesuati sisters, founded by Caterina Colombini (d. 1387) in Siena, and thence widely dispersed, more consistently maintained the primitive strictness of the society and survived the male branch by 200 years, existing until 1872 in small communities in Italy.

JESUITS, the name generally given to the members of the Society of Jesus, a religious order in the Roman Catholic Church, founded in 1539. This Society may be defined, in its original conception and well-avowed object, as a body of highly trained religious men of various degrees, bound by the three personal vows of poverty, chastity and obedience, together with, in some cases, a special vow to the pope's service, with the object of labouring for the spiritual good of themselves and their neighbours. They are declared to be mendicants and enjoy all the privileges of the other mendicant orders. They are governed and live by constitutions and rules, mostly drawn up by their founder, St Ignatius of Loyola, and approved by the popes. Their proper title is "Clerks Regulars of the Society of Jesus," the word *Societas* being taken as synonymous with the original Spanish term, *Compañia*; perhaps the military term *Cohors* might more fully have expressed the original idea of a band of spiritual soldiers living under martial law and discipline. The ordinary term "Jesuit" was given to the Society by its avowed opponents; it is first found in the writings of Calvin and in the registers of the Parlement of Paris as early as 1552.

Constitution and Character.—The formation of the Society was a masterpiece of genius on the part of a man (see LOYOLA) who was quick to realize the necessity of the moment. Just before Ignatius was experiencing the call to conversion, Luther had begun his revolt against the Roman Church by burning the papal bull of excommunication on the 10th of December 1520. But while Luther's most formidable opponent was thus being prepared in Spain, the actual formation of the Society was not to take place for eighteen years. Its conception seems to have developed very slowly in the mind of Ignatius. It introduced a new idea into the Church. Hitherto all regulars made a point of the choral office in choir. But as Ignatius conceived the Church to be in a state of war, what was desirable in days of peace ceased when the life of the cloister had to be exchanged for the discipline of the camp; so in the sketch of the new society which he laid before Paul III., Ignatius laid down the principle that the obligation of the breviary should be fulfilled privately and separately and not in choir. The other orders, too, were bound by the idea of a constitutional monarchy based on the democratic spirit. Not so with the Society. The founder placed the general for life in an almost uncontrolled position of authority, giving him the faculty of dispensing individuals from the decrees of the highest legislative body, the general congregations. Thus the principle of military obedience was exalted to a degree higher than that existing in the older orders, which preserved to their members certain constitutional rights.

The soldier-mind of Ignatius can be seen throughout the constitutions. Even in the spiritual labours which the Society shares with the other orders, its own ways of dealing with persons and things result from the system of training which succeeds in forming men to a type that is considered desirable. But it must not be thought that in practice the rule of the Society and the high degree of obedience demanded result in mere mechanism. By a system of check and counter check devised in the constitutions the power of local superiors is modified, so that in practice the working is smooth. Ignatius knew that while a high ideal was necessary for every society, his followers were flesh and blood, not machines. He made it clear from the first that the Society was everything and the individual nothing, except so far as he might prove a useful instrument for carrying out the Society's objects. Ignatius said to his secretary Polanco that "in those who offered themselves he looked less to purely natural goodness than to firmness of character and ability for business, for he was of opinion that those who were not fit for public business were not adapted for filling offices in the Society." He further declared that even exceptional qualities and endowments in a candidate were valuable in his eyes only on the condition of their being brought into play, or held in abeyance, strictly at the command of a superior. Hence his teaching on obedience. His letter on this subject, addressed to the Jesuits of Coimbra in 1553, is still one of the standard formularies of the Society, ranking with those other products of his pen, the *Spiritual Exercises* and the *Constitutions*. In this letter Ignatius clothes the general with the powers of a commander-in-chief in time of war, giving him the absolute disposal of all members of the Society in every place and for every purpose. He pushes the claim even further, requiring, besides entire outward submission to command, also the complete identification of the inferior's will with that of the superior. He lays down that the superior is to be obeyed simply as such and as standing in the place of God, without reference to his personal wisdom, piety or discretion; that any obedience which falls short of making the superior's will one's own, in inward affection as well as in outward effect, is lax and imperfect; that going beyond the letter of command, even in things abstractly good and praiseworthy, is disobedience, and that the "sacrifice of the intellect" is the third and highest grade of obedience, well pleasing to God, when the inferior not only wills what the superior wills, but thinks what he thinks, submitting his judgment, so far as it is possible for the will to influence and lead the judgment. This *Letter on Obedience* was written for the guidance and formation of Ignatius's own followers; it was an entirely domestic affair. But when it became known beyond the Society the teaching met with great opposition, especially from members of other orders whose institutes represented the normal days of peace rather than those of war. The letter was condemned by the Inquisitions of Spain and Portugal; and it tasked all the skill and learning of Bellarmine as its apologist, together with the whole influence of the Society, to avert what seemed to be a probable condemnation at Rome.

The teaching of the *Letter* must be understood in the living spirit of the Society. Ignatius himself lays down the rule that an inferior is bound to make all necessary representations to his superior so as to guide him in imposing a precept of obedience. When a superior knows the views of his inferior and still commands, it is because he is aware of other sides of the question which appear of greater importance than those that the inferior has brought forward. Ignatius distinctly excepts the case where obedience in itself would be sinful: "In all things *except sin* I ought to do the will of my superior and not my own." There may be cases where an inferior judges that what is commanded is sinful. What is to be done? Ignatius says: "When it seems to me that I am commanded by my superior to do a thing against which my conscience revolts as sinful and my superior judges otherwise, it is my duty to yield my doubts to him unless I am otherwise constrained by evident reasons. . . . If submissions do not appease my conscience I must impart my doubts to two or three persons of discretion and abide by their decision." From this it is clear that only in *doubtful* cases concerning sin should an inferior try to submit his judgment to that of his superior, who *ex officio* is held to be not only one who would not order what is clearly sinful, but also a competent judge who knows and understands, better than the inferior, the nature and aspect of the command. As the Jesuit obedience is based on the law of God, it is clearly impossible that he should be bound to obey in what is directly opposed to the divine service. A Jesuit lives in obedience all his life, though the yoke is not galling nor always felt. He can accept no dignity or office which will make him independent of the Society; and even if ordered by the pope to accept the cardinalate or the episcopate, he is still bound, if not to obey, yet to listen to the advice of those whom the general deputes to counsel him in important matters.

The Jesuits had to find their principal work in the world and in direct and immediate contact with mankind. To seek spiritual perfection in a retired life of contemplation and prayer did not seem to Ignatius to be the best way of reforming the evils which had brought about the revolt from Rome. He withdrew his followers from this sort of retirement, except as a mere temporary preparation for later activity; he made habitual intercourse with the world a prime duty; and to this end he rigidly suppressed all such external peculiarities of dress or rule as tended to put obstacles in the way of his followers acting freely as emissaries, agents or missionaries in the most various places and circumstances. Another change he introduced even more completely than did the founders of the Friars. The Jesuit has no home: the whole world is his parish. Mobility and cosmopolitanism are of the very essence of the Society. As Ignatius said, the ancient monastic communities were the infantry of the Church, whose duty was to stand firmly in one place on the battlefield; the Jesuits were to be her light horse, capable of going anywhere at a moment's notice, but especially apt and designed for scouting and skirmishing. To carry out this view, it was one of his plans to send foreigners as superiors or officers to the Jesuit houses in each country, requiring of these envoys, however, invariably to use the language of their new place of residence and to study it both in speaking and writing till entire mastery of it had been acquired—thus by degrees making all the parts of his system mutually interchangeable, and so largely increasing the number of persons eligible to fill any given post without reference to locality. But subsequent experience has, in practice, modified this interchange, as far as local government goes, though the central government of the Society is always cosmopolitan.

Next we must consider the machinery by which the Society is constituted and governed so as to make its spirit a living energy and not a mere abstract theory. The Society is distributed into six grades: novices, scholastics, temporal coadjutors (lay brothers), spiritual coadjutors, professed of the three vows, and professed of the four vows. No one can become a postulant for admission to the Society until fourteen years old, unless by special dispensation. The novice is classified according as his destination is the priesthood or lay brotherhood, while a third class of "indifferents" receives such as are reserved for further inquiry before a decision of this kind is made. The novice has first to undergo a strict retreat, practically in solitary confinement, during which he receives from a director the *Spiritual Exercises* and makes a general confession of his whole life; after which the first novitiate of two years' duration begins. In this period of trial the real character of the man is discerned, his weak points are noted and his will is tested. Prayer and the practices of asceticism, as means to an end, are the chief occupations of the novice. He may leave or be dismissed at any time during the two years; but at the end of the period if he is approved and destined for the priesthood, he is advanced to the grade of scholastic and takes the following simple vows in the presence of certain witnesses, but not to any person:—

"Almighty Everlasting God, albeit everyway most unworthy in Thy holy sight, yet relying on Thine infinite kindness and mercy and impelled by the desire of serving Thee, before the Most Holy Virgin Mary and all Thy heavenly host, I, *N.*, vow to Thy divine Majesty Poverty, Chastity and Perpetual Obedience to the Society of Jesus, and promise that I will enter the same Society to live in it perpetually, understanding all things according to the Constitutions of the Society. I humbly pray from Thine immense goodness and clemency, through the Blood of Jesus Christ, that Thou wilt deign to accept this sacrifice in the odour of sweetness; and as Thou hast granted me to desire and to offer this, so wilt Thou bestow abundant grace to fulfil it."

The scholastic then follows the ordinary course of an undergraduate at a university. After passing five years in arts he has, while still keeping up his own studies, to devote five or six years more to teaching the junior classes in various Jesuit schools or colleges. About this period he takes his simple vows in the following terms:—

"I, *N.*, promise to Almighty God, before His Virgin Mother and the whole heavenly host, and to thee, Reverend Father General of the Society of Jesus, holding the place of God, and to thy successors (or to thee, Reverend Father *M.* in place of the General of the Society of Jesus and his successors holding the place of God), Perpetual Poverty, Chastity and Obedience; and according to it a peculiar care in the education of boys, according to the manner expressed in the Apostolic Letter and Constitutions of the said Society."

The lay brothers leave out the clause concerning education. The scholastic does not begin the study of theology until he is twenty-eight or thirty, and then passes through a four or six years' course. Only when he is thirty-four or thirty-six can he be ordained a priest and enter on the grade of a spiritual coadjutor. A lay brother, before he can become a temporal coadjutor for the discharge of domestic duties, must pass ten years before he is admitted to vows. Sometimes after ordination the priest, in the midst of his work, is again called away to a third year's novitiate, called the tertianship, as a preparation for his solemn profession of the three vows. His former vows were simple and the Society was at liberty to dismiss him for any canonical reason. The formula of the famous Jesuit vow is as follows:—

"I, *N.*, promise to Almighty God, before His Virgin Mother and the whole heavenly host, and to all standing by; and to thee, Reverend Father General of the Society of Jesus, holding the place of God, and to thy successors (or to thee, Reverend Father *M.* in place of the General of the Society of Jesus and his successors holding the place of God), Perpetual Poverty, Chastity and Obedience; and according to it a peculiar care in the education of boys according to the form of life contained in the Apostolic Letters of the Society of Jesus and in its Constitutions."

Immediately after the vows the Jesuit adds the following simple vows: (1) that he will never act nor consent that the provisions in the constitutions concerning poverty should be changed; (2) that he will not directly nor indirectly procure election or promotion for himself to any prelacy or dignity in the Society; (3) that he will not accept or consent to his election to any dignity or prelacy outside the Society unless forced thereunto by obedience; (4) that if he knows of others doing these things he will denounce them to the superiors; (5) that if elected to a bishopric he will never refuse to hear such advice as the general may deign to send him and will follow it if he judges it is better than his own opinion. The professed is now eligible to certain offices in the Society, and he may remain as a professed father of the three vows for the rest of his life. The highest class, who constitute the real core of the Society, whence all its chief officers are taken, are the professed of the four vows. This grade can seldom be reached until the candidate is in his forty-fifth year, which involves a probation of thirty-one years in the case of those who have entered on the novitiate at the earliest legal age. The number of these select members is small in comparison with the whole Society; the exact proportion varies from time to time, the present tendency being to increase the number. The vows of this grade are the same as the last formula, with the addition of the following important clause:—

> "Moreover I promise the special obedience to the Sovereign Pontiff concerning missions, as is contained in the same Apostolic Letter and Constitutions."

These various members of the Society are distributed in its novitiate houses, its colleges, its professed houses and its mission residences. The question has been hotly debated whether, in addition to these six grades, there be not a seventh answering in some degree to the tertiaries of the Franciscan and Dominican orders, but secretly affiliated to the Society and acting as its emissaries in various lay positions. This class was styled in France "Jesuits of the short robe," and there is some evidence in support of its actual existence under Louis XV. The Jesuits themselves deny the existence of any such body, and are able to adduce the negative disproof that no provision for it is to be found in their constitutions. On the other hand there are clauses therein which make the creation of such a class perfectly feasible if thought expedient. An admitted instance is the case of Francisco Borgia, who in 1548, while still duke of Gandia, was received into the Society. What has given colour to the idea is that certain persons have made vows of obedience to individual Jesuits; as Thomas Worthington, rector of the Douai seminary, to Father Robert Parsons; Ann Vaux to Fr. Henry Garnet, who told her that he was not indeed allowed to receive her vows, but that she might make them if she wished and then receive his direction. The archaeologist George Oliver of Exeter was, according to Foley's *Records of the English Province*, the last of the secular priests of England who vowed obedience to the Society before its suppression.

The general lives permanently at Rome and holds in his hands the right to appoint, not only to the office of provincial over each of the head districts into which the Society is mapped, but to the offices of each house in particular. There is no standard of electoral right in the Society except in the election of the general himself. By a minute and frequent system of official and private reports he is informed of the doings and progress of every member of the Society and of everything that concerns it throughout the world. Every Jesuit has not only the right but the duty in certain cases of communicating, directly and privately, with his general. While the general thus controls everything, he himself is not exempt from supervision on the part of the Society. A consultative council is imposed upon him by the general congregation, consisting of the assistants of the various nations, a *socius*, or adviser, to warn him of mistakes, and a confessor. These he cannot remove nor select; and he is bound, in certain circumstances, to listen to their advice, although he is not obliged to follow it. Once elected the general may not refuse the office, nor abdicate, nor accept any dignity or office outside of the Society; on the other hand, for certain definite reasons, he may be suspended or even deposed by the authority of the Society, which can thus preserve itself from destruction. No such instance has occurred, although steps were once taken in this direction in the case of a general who had set himself against the current feeling.

It is said that the general of the Jesuits is independent of the pope; and his popular name, "the black pope," has gone to confirm this idea. But it is based on an entirely wrong conception of the two offices. The suppression of the Society by Clement XIV. in 1773 was an object-lesson in the supremacy of the pope. The Society became very numerous and, from time to time, received extraordinary privileges from popes, who were warranted by the necessities of the times in granting them. A great number of influential friends, also, gathered round the fathers who, naturally, sought in every way to retain what had been granted. Popes who thought it well to bring about certain changes, or to withdraw privileges that were found to have passed their intentions or to interfere unduly with the rights of other bodies, often met with loyal resistances against their proposed measures. Resistance up to a certain point is lawful and is not disobedience, for every society has the right of self-preservation. In cases where the popes insisted, in spite of the representations of the Jesuits, their commands were obeyed. Many of the popes were distinctly unfavourable to the Society, while others were as friendly, and often what one pope did against them the next pope withdrew. Whatever was done in times when strong divergence of opinion existed, and whatever may have been the actions of individuals who, even in so highly organized a body as the Society of Jesus, cannot always be successfully controlled by their superiors, yet the ultimate result on the part of the Society has always been obedience to the pope, who authorized, protected and privileged them, and on whom they ultimately depend for their very existence.

Thus constituted, with a skilful union of strictness and freedom, of complex organization with a minimum of friction in working, the Society was admirably devised for its purpose of introducing a new power into the Church and the world. Its immediate services to the Church were great. The Society did much, single-handed, to roll back the tide of Protestant advance when half of Europe, which had not already shaken off its allegiance to the papacy, was threatening to do so. The honours of the reaction belong to the Jesuits, and the reactionary spirit has become their tradition. They had the wisdom to see and to admit, in their correspondence with their superiors, that the real cause of the Reformation was the ignorance, neglect and vicious lives of so many priests. They recognized, as most earnest men did, that the difficulty was in the higher places, and that these could best be touched by indirect methods. At a time when primary or even secondary education had in most places become a mere effete and pedantic adherence to obsolete methods, they were bold enough to innovate, both in system and material. Putting fresh spirit and devotion into the work, they not merely taught and catechized in a new, fresh and attractive manner, besides establishing free schools of good quality, but provided new school books for their pupils which were an enormous advance on those they found in use; so that for nearly three centuries the Jesuits were accounted the best schoolmasters in Europe, as they were, till their forcible suppression in 1901, confessedly the best in France. The Jesuit teachers conciliated the goodwill of their pupils by mingled firmness and gentleness. Although the method of the *Ratio Studiorum* has ceased to be acceptable, yet it played in its time as serious a part in the intellectual development of Europe as did the method of Frederick the Great in modern warfare. Bacon succinctly gives his opinion of the Jesuit teaching in these words: "As for the pedagogical part, the shortest rule would be, Consult the schools of the Jesuits; for nothing better has been put in practice" (*De Augmentis*, vi. 4). In instruction they were excellent; but in education, or formation of character, deficient. Again, when most of the continental clergy had sunk, more or less, into the moral and intellectual slough which is pictured for us in the writings of Erasmus and the *Epistolae obscurorum virorum* (see HUTTEN, ULRICH VON), the Jesuits won back respect for the clerical calling by their personal culture and the unimpeachable purity of their lives. These qualities they have carefully maintained; and probably no large body of men in the world has been so free from the reproach of discreditable members or has kept up, on the whole, an equally high average of intelligence and conduct. As preachers, too, they delivered the pulpit from the bondage of an effete scholasticism and reached at once a clearness and simplicity of treatment such as the English pulpit scarcely begins to exhibit till after the days of Tillotson; while in literature and theology they count a far larger number of respectable writers than any other religious society can boast. It is in the mission field, however, that their achievements have been most remarkable. Whether toiling among the teeming millions in Hindustan and China, labouring amongst the Hurons and Iroquois of North America, governing and civilizing the natives of Brazil and Paraguay in the missions and "reductions," or ministering, at the hourly risk of his life to his fellow-Catholics in England under Elizabeth and the Stuarts, the Jesuit appears alike devoted, indefatigable, cheerful and worthy of hearty admiration and respect.

Nevertheless, two startling and indisputable facts meet the student who pursues the history of the Society. The first is the universal suspicion and hostility it has incurred—not merely from the Protestants whose avowed foe it has been, not yet from the enemies of all clericalism and dogma, but from every Catholic state and nation in the world. Its chief enemies have been those of the household of the Roman Catholic faith. The second fact is the ultimate failure which seems to dog all its most promising schemes and efforts. These two results are to be observed alike in the provinces of morals and politics. The first cause of the opposition indeed redounds to the Jesuits' credit, for it was largely due to their success. Their pulpits rang with a studied eloquence; their churches, sumptuous and attractive, were crowded; and in the confessional their advice was eagerly sought in all kinds of difficulties, for they were the fashionable professors of the art of direction. Full of enthusiasm and zeal, devoted wholly to their Society, they were able to bring in numbers of rich and influential persons to their ranks; for, with a clear understanding of the power of wealth, they became, of set purpose, the apostles of the rich and influential. The Jesuits felt that they were the new men, the men of the time; so with a perfect confidence in themselves they went out to set the Church to rights. It was no wonder that success, so well worked for and so well deserved, failed to win the approval or sympathy of those who found themselves supplanted. Old-fashioned men, to whom the apostles' advice to "do all to the glory of God" seemed sufficient, mistrusted those who professed to go beyond all others and adopted as their motto the famous *Ad majorem Dei gloriam*, "To the greater glory of God." But, besides this, the *esprit de corps* which is necessary for every body of men was, it was held, carried to an excess and made the Jesuits intolerant of any one or anything if not of "ours." The novelties too which they introduced into the conception of the religious life, naturally, were displeasing to the older orders, who felt like old aristocratic families towards a newly rich or purse-proud upstart. The Society, or rather its members, were too aggressive and self-assertive to be welcomed; and a certain characteristic, which soon began to manifest itself in an impatience of episcopal control, showed that the quality of "Jesuitry," usually associated with the Society, was singularly lacking in their dealings with opponents. Their political attitude also alienated many. Many of the Jesuits could not separate religion from politics. To say this is only to assert that they were not clearer-minded than most men of their age. But unfortunately they invariably took the wrong side and allowed themselves to be made the tools of men who saw farther and more clearly than they did. They had their share, direct or indirect, in the embroiling of states, in concocting conspiracies and in kindling wars. They were also responsible by their theoretical teachings in theological schools, where cases were considered and treated in the abstract, for not a few assassinations of the enemies of the cause. Weak minds heard tyrannicide discussed and defended in the abstract; and it was no wonder that, when opportunity served, the train that had been heedlessly laid by speculative professors was fired by rash hands. What professors like Suarez taught in the calm atmosphere of the lecture hall, what writers like Mariana upheld and praised, practical men took as justification for deeds of blood. There is no evidence that any Jesuit took a direct part in political assassinations; however, indirectly, they may have been morally responsible. They were playing with edged tools and often got wounded through their own carelessness. Other grievances were raised by their perpetual meddling in politics, *e.g.* their large share in fanning the flames of political hatred against the Huguenots under the last two Valois kings; their perpetual plotting against England in the reign of Elizabeth; their share in the Thirty Years' War and in the religious miseries of Bohemia; their decisive influence in causing the revocation of the edict of Nantes and the expulsion of the Protestants from France; the ruin of the Stuart cause under James II., and the establishment of the Protestant succession. In a number of cases where the evidence against them is defective, it is at least an unfortunate coincidence that there is always direct proof of some Jesuit having been in communication with the actual agents engaged. They were the stormy petrels of politics. Yet the Jesuits, as a body, should not be made responsible for the doings of men who, in their political intrigues, were going directly against the distinct law of the Society, which in strict terms, and under heavy penalties, forbade them to have anything to do with such matters. The politicians were comparatively few in number, though unfortunately they held high rank; and their disobedience to the rule besmirched the name of the society and destroyed the good work of the other Jesuits who were faithfully carrying out their own proper duties.

A far graver cause for uneasiness was given by the Jesuits' activity in the region of doctrine and morals. Here the charges against them are precise, early, numerous and weighty. Their founder himself was arrested, more than once, by the Inquisition and required to give account of his belief and conduct. But St Ignatius, with all his powerful gifts of intellect, was entirely practical and ethical in his range, and had no turn whatever for speculation, nor desire to discuss, much less to question, any of the received dogmas of the Church. He gives it as a rule of orthodoxy to be ready to say that black is white if the Church says so. He was therefore acquitted on every occasion, and applied each time for a formally attested certificate of his orthodoxy, knowing well that, in default of such documents, the fact of his arrest as a suspected heretic would be more distinctly recollected by opponents than that of his honourable dismissal from custody. His followers, however, have not been so fortunate. On doctrinal questions indeed, though their teaching on grace, especially in the form given to it by Molina (*q.v.*), ran contrary to the accepted teaching on the subject by the Augustinians, Dominicans and other representative schools; yet by their pertinacity they gained for their views a recognized and established position. A special congregation of cardinals and theologians known as *de auxiliis* was summoned by the pope to settle the dispute, for the *odium theologicum* had risen to a desperate height between the representatives of the old and the new theology; but after many years they failed to arrive at any satisfactory conclusion, and the pope, instead of settling the dispute, was only able to impose mutual silence on all opponents. Among those who held out stiffly against the Jesuits on the subject of grace were the Jansenists, who held that they were following the special teaching of St Augustine, known *par excellence* as the doctor of grace. The Jesuits and the Jansenists soon became deadly enemies; and in the ensuing conflict both parties accused each other of flinging scruples to the wind. (See JANSENISM.)

But the accusations against the Jesuit system of moral theology and their action as guides of conduct have had a more serious effect on their reputation. It is undeniable that some of their moral writers were lax in their teaching; and conscience was strained to the snapping point. The Society was trying to make itself all things to all men. Propositions extracted from

Jesuit moral theologians have again and again been condemned by the pope and declared untenable. Many of these can be found in Viva's *Condemned Propositions*. As early as 1554 the Jesuits were censured by the Sorbonne, chiefly at the instance of Eustache de Bellay, bishop of Paris, as being dangerous in matters of faith. Melchor Cano, a Dominican, one of the ablest divines of the 16th century, never ceased to lift up his testimony against them, from their first beginnings till his own death in 1560; and, unmollified by the bribe of the bishopric of the Canaries, which their interest procured for him, he succeeded in banishing them from the university of Salamanca. Carlo Borromeo, to whose original advocacy they owed much, especially in the council of Trent, found himself attacked in his own cathedral pulpit and interfered with in his jurisdiction. He withdrew his protection and expelled them from his colleges and churches; and he was followed in 1604 in this policy by his cousin and successor Cardinal Federigo Borromeo. St Theresa learnt, in after years, to mistrust their methods, although she was grateful to them for much assistance in the first years of her work. The credit of the Society was seriously damaged by the publication, at Cracow, in 1612, of the *Monita Secreta*. This book, which is undoubtedly a forgery, professes to contain the authoritative secret instructions drawn up by the general Acquaviva and given by the superiors of the Society to its various officers and members. A bold caricature of Jesuit methods, the book has been ascribed to John Zaorowsky or to Cambilone and Schloss, all ex-Jesuits, and it is stated to have been discovered in manuscript by Christian of Brunswick in the Jesuit college at Prague. It consists of suggestions and methods for extending the influence of the Jesuits in various ways, for securing a footing in fresh places, for acquiring wealth, for creeping into households and leading silly rich widows captive and so forth, all marked with ambition, craft and unscrupulousness. It had a wide success and popularity, passing through several editions, and even to this day it is used by controversialists as unscrupulous as the original writers. It may, perhaps, represent the actions of some individuals who allowed their zeal to outrun their discretion, but surely no society which exists for good and is marked by so many worthy men could systematically have conducted its operations in such a manner. Later on a formidable assault was made on Jesuit moral theology in the famous *Provincial Letters* of Blaise Pascal (*q.v.*), eighteen in number, issued under the pen-name of Louis de Montalte, from January 1656 to March 1657. Their wit, irony, eloquence and finished style have kept them alive as one of the great French classics—a destiny more fortunate than that of the kindred works by Antoine Arnauld, *Théologie morale des Jésuites*, consisting of extracts from writings of members of the Society, and *Morale pratique des Jésuites*, made up of narratives professing to set forth the manner in which they carried out their own maxims. But, like most controversial writers, the authors were not scrupulous in their quotations, and by giving passages divorced from their contexts often entirely misrepresented their opponents. The immediate reply on the part of the Jesuits, *The Discourses of Cleander and Eudoxus* by Père Daniel, could not compete with Pascal's work in brilliancy, wit or style; moreover, it was unfortunate enough to be put upon the Index of prohibited books in 1701. The reply on behalf of the Society to Pascal's charges of lax morality, apart from mere general denials, is broadly as follows:—

(1) St Ignatius himself, the founder of the Society, had a special aversion from untruthfulness in all its forms, from quibbling, equivocation or even studied obscurity of language, and it would be contrary to the spirit of conformity with his example and institutions for his followers to think and act otherwise. Hence, any who practised equivocation were, so far, unfaithful to the Society. (2) Several of the cases cited by Pascal are mere abstract hypotheses, many of them now obsolete, argued simply as intellectual exercises, but having no practical bearing whatever. (3) Even such as do belong to the sphere of actual life are of the nature of counsel to spiritual physicians, how to deal with exceptional maladies; and were never intended to fix the standard of moral obligation for the general public. (4) The theory that they were intended for this latter purpose and do represent the normal teaching of the Society becomes more untenable in exact proportion as this immorality is insisted on, because it is a matter of notoriety that the Jesuits themselves have been singularly free from personal, as distinguished from corporate, evil repute; and no one pretends that the large number of lay-folk whom they have educated or influenced exhibit greater moral inferiority than others.

The third of these replies is the most cogent as regards Pascal, but the real weakness of his attack lies in that nervous dread of appeal to first principles and their logical result which has been the besetting snare of Gallicanism. Pascal, at his best, has mistaken the part for the whole; he charges to the Society what, at the most, are the doings of individuals; and from these he asserts the degeneration of the body from its original standard; whereas the stronger the life and the more extensive the natural development, side by side will exist marks of degeneration; and a society like the Jesuits has no difficulty in asserting its life independently of such excrescences or, in time, in freeing itself from them.

A charge persistently made against the Society is that it teaches that the end justifies the means. And the words of Busembaum, whose *Medulla theologiae* has gone through more than fifty editions, are quoted in proof. True it is that Busembaum uses these words: *Cui licitus est finis etiam licent media.* But on turning to his work (ed. Paris 1729, p. 584, or Lib. vi. Tract vi. cap. ii., *De sacramentis*, dubium ii.) it will be found that the author is making no universal application of an old legal maxim; but is treating of a particular subject (concerning certain lawful liberties in the marital relation) beyond which his words cannot be forced. The sense in which other Jesuit theologians—*e.g.* Paul Laymann (1575–1635), in his *Theologia moralis* (Munich, 1625), and Ludwig Wagemann (1713–1792), in his *Synopsis theologiae moralis* (Innsbruck, 1762)—quote the axiom is an equally harmless piece of common sense. For instance, if it is lawful to go on a journey by railway it is lawful to take a ticket. No one who put forth that proposition would be thought to mean that it is lawful to defraud the company by stealing a ticket; for the *proviso* is always to be understood, that the means employed should, in themselves, not be bad but good or at least indifferent. So when Wagemann says tersely *Finis determinat probitatem actus* he is clearly referring to acts which in themselves are indifferent, *i.e.* indeterminate. For instance: shooting is an indifferent act, neither good nor bad in itself. The morality of any specified shooting depends upon what is shot, and the circumstances attending that act: shooting a man in self-defence is, as a moral act, on an entirely different plane to shooting a man in murder. It has never been proved, and never can be proved, although the attempt has frequently been made, that the Jesuits ever taught the nefarious proposition ascribed to them, which would be entirely subversive of all morality. Again, the doctrine of probabilism is utterly misunderstood. It is based on an accurate conception of law. Law to bind must be clear and definite; if it be not so, its obligation ceases and liberty of action remains. No probable opinion can stand against a clear and definite law; but when a law is doubtful in its application, in certain circumstances, so is the obligation of obedience: and as a doubtful law is, for practical purposes, no law at all, so it superinduces no obligation. Hence a probable opinion is one, founded on reason and held on serious grounds, that the law does not apply to certain specified cases; and that the law-giver therefore did not intend to bind. It is the principle of equity applied to law. In moral matters a probable opinion, that is one held on no trivial grounds but by unprejudiced and solid thinkers, has no place where the voice of conscience is clear, distinct and formed.

Two causes have been at work to produce the universal failure of the great Society in all its plans and efforts. First stands its lack of really great intellects. It has had its golden age. No society can keep up to its highest level. Nothing can be wider of the truth than the popular conception of the ordinary Jesuit as a being of almost superhuman abilities and universal knowledge. The Society, numbering as it does so many thousands, and with abundant means of devoting men to special branches of study, has, without doubt, produced men of great intelligence and solid learning. The average member, too, on account of his long and systematic training, is always equal and often superior to the average member of any other equally large body, besides being disciplined by a far more perfect drill. But it takes great men to carry out great plans; and of really great men, as the outside world knows and judges, the Society has been markedly barren from almost the first. Apart from its founder and his early companion, St Francis Xavier, there is none who stands in the very first rank. Laynez and Acquaviva were able administrators and politicians; the Bollandists (*q.v.*) were industrious workers and have developed a critical spirit from which much good can be expected; Francisco Suarez, Leonhard Lessius and Cardinal Franzelin were some of the leading Jesuit theologians; Cornelius a Lapide (1567–1637) represents their old school of scriptural studies, while their new German writers are the most advanced of all orthodox higher critics; the French Louis Bourdaloue (*q.v.*), the Italian Paolo Segneri (1624–1694), and the Portuguese Antonio Vieyra (1608–1697) represent their best pulpit orators; while of the many mathematicians and astronomers produced by the Society Angelo Secchi, Ruggiero Giuseppe Boscovich and G.B. Beccaria are conspicuous, and in modern times Stephen Joseph Perry (1833–1889), director of the Stonyhurst College observatory, took a high rank among men of science. Their boldest and most original thinker, Denis Petau, so many years neglected, is now, by inspiring Cardinal Newman's *Essay on the Development of Christian Doctrine*, producing a permanent influence over the current of human thought. The Jesuits have produced no Aquinas, no Anselm, no Bacon, no Richelieu. Men whom they trained, and who broke loose from their teaching, Pascal, Descartes, Voltaire, have powerfully affected the philosophical and religious beliefs of great masses of mankind; but respectable mediocrity is the brand on the long list of Jesuit names in the catalogues of Alegambe and De Backer. This is doubtless due in great measure to the destructive process of scooping out the will of the Jesuit novice, to replace it with that of his superior (as a watchmaker might fit a new movement into a case), and thereby tending, in most cases, to annihilate those subtle qualities of individuality and originality which are essential to genius. Men of the higher stamp will either refuse to submit to the process and leave the Society, or run the danger of coming forth from the mill with their finest qualities pulverized and useless. In accordance with the spirit of its founder, who wished to secure uniformity in the judgment of his followers even in points left open by the Church (" Let us all think the same way, let us all speak in the same manner if possible "), the Society has shown itself to be impatient of those who think or write in a way different from what is current in its ranks.

Nor is this all. The *Ratio Studiorum*, devised by Acquaviva and still obligatory in the colleges of the Society, lays down rules which are incompatible with all breadth and progress in the higher forms of education. True to the anti-speculative and traditional side of the founder's mind, it prescribes that, even where religious topics are not in question, the teacher is not to permit any novel opinions or discussions to be mooted; nor to cite or allow others to cite the opinions of an author not of known repute; nor to teach or suffer to be taught anything contrary to the prevalent opinions of acknowledged doctors current in the schools. Obsolete and false opinions are not to be mentioned at all, even for refutation, nor are objections to received teaching to be dwelt on at any length. The result is that the Jesuit emerges from his schools without any real knowledge of any other method of thought than that which his professors have instilled into him. The professor of Biblical Literature is always to support and defend the Vulgate and can never prefer the marginal readings from the Hebrew and Greek. The Septuagint, as far as it is incorrupt, is to be held not less authentic than the Vulgate. In philosophy Aristotle is always to be followed, and St Thomas Aquinas generally, care being taken to speak respectfully of him even when abandoning his opinions, though now it is customary for the Jesuit teachers to explain him in their own sense. *De vera mente D. Thomas* is no unfamiliar expression in their books. It is not wonderful, under such a method of training, fixed as it has been in minute detail for more than three hundred years, that highly cultivated commonplaces should be the inevitable average result; and that in proportion as Jesuit power has become dominant in Christendom, especially in ecclesiastical circles, the same doom of intellectual sterility and consequent loss of influence with the higher and thoughtful classes, has separated the part from the whole. The initial mistake in the formation of character is that the Jesuits have aimed at educating lay boys in the same manner as they consider advisable for their own novices, for whom obedience and direction is the one thing necessary; whereas for lay people the right use of liberty and initiative are to be desired.

The second cause which has blighted the efforts of the Society is the lesson, too faithfully learnt and practised, of making its corporate interests the first object at all times and in all places. Men were quick to see that Jesuits did not aim at co-operation with the other members of the Church but directly or indirectly at mastery. The most brilliant exception to this rule is found in some of the missions of the Society and notably in that of St Francis Xavier (*q.v.*). But he quitted Europe in 1541 before the new society, especially under Laynez, had hardened into its final mould; and he never returned. His work, so far as can be gathered from contemporary accounts, was not done on true Jesuit lines as they afterwards developed, though the Society has reaped all the credit; and it is even possible that, had he succeeded the founder as general, the institute might not have received that political and self-seeking turn which Laynez, as second general, gave at the critical moment.

It would almost seem that careful selection was made of the men of the greatest piety and enthusiasm, whose unworldliness made them less apt for diplomatic intrigues, to break new ground in the various missions where their success would throw lustre on the Society and their scruples need never come into play. But such men are not to be found easily; and, as they died off, the tendency was to fill their places with more ordinary characters, whose aim was to increase the power and resources of the body. Hence the condescension to heathen rites in Hindustan and China, and the attempted subjugation of the English Catholic clergy. The first successes of the Indian mission were entirely among the lower classes; but when in Madura, in 1606, Robert de Nobili, a nephew of Bellarmine, to win the Brahmins, adopted their dress and mode of life—a step sanctioned by Gregory XV. in 1623 and by Clement XI. in 1707—the fathers who followed his example pushed the new caste-feeling so far as absolutely to refuse the ministrations and sacraments to the pariahs, lest the Brahmin converts should take offence—an attempt which was reported to Rome and was vainly censured by the breves of Innocent X. in 1645, Clement IX. in 1669, Clement XII. in 1734 and 1739, and Benedict XIV. in 1745. The Chinese rites, assailed with equal unsuccess by one pope after another, were not finally put down until 1744 by a bull of Benedict XIV. For Japan, where their side of the story is that best known, we have a remarkable letter, printed by Lucas Wadding in the *Annales minorum*, addressed to Paul V. by Soleto, a Franciscan missionary, who was martyred in 1624, in which he complains to the pope that the Jesuits systematically postponed the spiritual welfare of the native Christians to their own convenience and advantage; while as regards the test of martyrdom, no such result had followed on their teaching, but only on that of the other orders who had undertaken missionary work in Japan. Yet soon many Jesuit martyrs in Japan were to shed a new glory on the Society (see JAPAN: *Foreign Intercourse*). Again, even in Paraguay, the most promising of all Jesuit undertakings, the evidence shows that the fathers, though civilizing the Guarani population just sufficiently to make them useful and docile servants, happier no doubt than they were before or after, stopped there. While the mission was begun on the rational principle of governing races still in their childhood by methods adapted to that stage in their mental development, yet for one hundred and fifty years the " reductions " were conducted in the same manner, and when the hour of trial came the Jesuit civilization fell like a house of cards.

These examples are sufficient to explain the final collapse of so many promising efforts. The individual Jesuit might be, and often was, a hero, saint and martyr, but the system which he was obliged to administer was foredoomed to failure; and the suppression which came in 1773 was the natural result of forces and elements they had set in antagonism without the power of controlling.

The influence of the Society since its restoration in 1814 has not been marked with greater success than in its previous history. It was natural after the restoration that an attempt should be made to pick up again the threads that were dropped; but soon they came to realize the truth of the saying of St Ignatius: " The Society shall adapt itself to the times and not the times to the Society." The political conditions of Europe have completely changed, and constitutionalism is unfavourable to that personal influence which, in former times, the Jesuits were able to bring to bear upon the heads of states. In Europe they confine themselves mainly to educational and ecclesiastical politics, although both Germany and France have followed the example of Portugal and refuse, on political grounds, to allow them to be in these countries. It would appear as though some of the Jesuits had not, even yet, learnt the lesson that meddling with politics has always been their ruin. The main cause of any difficulty that may exist to-day with the Society is that the Jesuits are true to the teaching of that remarkable panegyric, the *Imago primi saeculi Societatis* (probably written by John Tollenarius in 1640), by identifying the Church with their own body, and being intolerant of all who will not share this view. Their power is still large in certain sections of the ecclesiastical world, but in secular affairs it is small. Moreover within the church itself there is a strong and growing feeling that the interests of Catholicism may necessitate a second and final suppression of the Society. Cardinal Manning, a keen observer of times and influences, was wont to say:—“ The work of 1773 was the work of God: and there is another 1773 coming.” But, if this come, it will be due not to the pressure of secular governments, as in the 18th century, but to the action of the Church itself. The very nations which have cast out the Society have shown no disposition to accept its own estimate and identify it with the Church; while the Church itself is not conscious of depending upon the Society. To the Church the Jesuits have been what the Janissaries were to the Ottoman Empire, at first its defenders and its champions, but in the end its taskmasters.

History.—The separate article on Loyola tells of his early years, his conversion, and his first gathering of companions. It was not until November 1537, when all hope of going to the Holy Land was given up, that any outward steps were taken to form these companions into an organized body. It was on the eve of their going to Rome, for the second time, that the fathers met Ignatius at Vicenza and it was determined to adopt a common rule and, at the suggestion of Ignatius, the name of the Company of Jesus. Whatever may have been his private hopes and intentions, it was not until he, Laynez and Faber (Pierre Lefevre), in the name of their companions, were sent to lay their services at the feet of the pope that the history of the Society really begins.

On their arrival at Rome the three Jesuits were favourably received by Paul III., who at once appointed Faber to the chair of scripture and Laynez to that of scholastic theology in the university of the Sapienza. But they encountered much opposition and were even charged with heresy; when this accusation had been disposed of, there were still difficulties in the way of starting any new order. Despite the approval of Cardinal Contarini and the goodwill of the pope (who is said to have exclaimed on perusing the scheme of Ignatius, “ The finger of God is here ”), there was a strong and general feeling that the regular system had broken down and could not be wisely developed farther. Cardinal Guidiccioni, one of the commission of three appointed to examine the draft constitution, was known to advocate the abolition of all existing orders, save four which were to be remodelled and put under strict control. That very year, 1538, a commission of cardinals, including Reginald Pole, Contarini, Sadolet, Caraffa (afterwards Paul IV.), Fregoso and others, had reported that the conventual orders, which they had to deal with, had drifted into such a state that they should all be abolished. Not only so, but, when greater strictness of rule and of enclosure seemed the most needful reforms in communities that had become too secular in tone, the proposal of Ignatius, to make it a first principle that the members of his institute should mix freely in the world and be as little marked off as possible externally from secular clerical life and usages, ran counter to all tradition and prejudice, save that Caraffa’s then recent order of Theatines, which had some analogy with the proposed Society, had taken some steps in the same direction.

Ignatius and his companions, however, had but little doubt of ultimate success, and so bound themselves, on the 15th of April 1539, to obey any superior chosen from amongst their body, and added on the 4th of May certain other rules, the most important of which was a vow of special allegiance to the pope for mission purposes to be taken by all the members of the society. But Guidiccioni, on a careful study of the papers, changed his mind; it is supposed that the cause of this change was in large measure the strong interest in the new scheme exhibited by John III., king of Portugal, who instructed his ambassador to press it on the pope and to ask Ignatius to send some priests of his Society for mission work in Portugal and its Indian possessions. Francis Xavier and Simon Rodriguez were sent to the king in March 1540. Obstacles being cleared away, Paul III., on the 27th of September 1540, issued his bull *Regimini militantis ecclesiae*, by which he confirmed the new Society (the term “ order ” does not belong to it), but limited the members to sixty, a restriction which was removed by the same pope in the bull *Injunctum nobis* of the 14th of March 1543. In the former bull, the pope gives the text of the formula submitted by Ignatius as the scheme of the proposed society, and in it we get the founder’s own ideas: “ . . . This Society, instituted to this special end, namely, to offer spiritual consolation for the advancement of souls in life and Christian doctrine, for the propagation of the faith by public preaching and the ministry of the word of God, spiritual exercises and works of charity and, especially, by the instruction of children and ignorant people in Christianity, and by the spiritual consolation of the faithful in Christ in hearing confessions. . . . ” In this original scheme it is clearly marked out “ that this entire Society and all its members fight for God under the faithful obedience of the most sacred lord, the pope, and the other Roman pontiffs his successors ”; and Ignatius makes particular mention that each member should “ be bound by a special vow,” beyond that formal obligation under which all Christians are of obeying the pope, “ so that whatsoever the present and other Roman pontiffs for the time being shall ordain, pertaining to the advancement of souls and the propagation of the faith, to whatever provinces he shall resolve to send us, we are straightway bound to obey, as far as in us lies, without any tergiversation or excuse, whether he send us among the Turks or to any other unbelievers in being, even to those parts called India, or to any heretics or schismatics or likewise to any believers.” Obedience to the general is enjoined “ in all things pertaining to the institute of the Society . . . and in him they shall acknowledge Christ as though present, and as far as is becoming shall venerate him ”; poverty is enjoined, and this rule affects not only the individual but the common sustentation or care of the Society, except that in the case of colleges revenues are allowed “ to be applied to the wants and necessities of the students ”; and the private recitation of the Office is distinctly mentioned. On the other hand, the perpetuity of the general’s office during his life was no part of the original scheme.

On the 7th of April 1541, Ignatius was unanimously chosen general. His refusal of this post was overruled, so he entered on his office on the 13th of April; and two days after, the newly constituted Society took its formal corporate vows in the basilica of San Paolo *fuori le mura*. Scarcely was the Society launched when its members dispersed in various directions to their new tasks. Alfonso Salmeron and Pasquier-Brouet, as papal delegates, were sent on a secret mission to Ireland to encourage the native clergy and people to resist the religious changes introduced by Henry VIII.; Nicholas Bobadilla went to Naples; Faber, first to the diet of Worms and then to Spain; Laynez and Claude le Jay to Germany, while Ignatius busied himself at Rome in good works and in drawing up the constitutions and completing the *Spiritual Exercises*. Success crowned these first efforts; and the Society began to win golden opinions. The first college was founded at Coimbra in 1542 by John III. of Portugal and put under the rectorship of Rodriguez. It was designed as a training school to feed the Indian mission of which Francis Xavier had already taken the oversight, while a seminary at Goa was the second institution founded outside Rome in connexion with the Society. Both from the original scheme and from the foundation at Coimbra it is clear that the original idea of the colleges was to provide for the education of future Jesuits. In Spain, national pride in the founder aided the Society’s cause almost as much as royal patronage did in Portugal; and the third house was opened in Gandia under the protection of its duke, Francisco Borgia, a grandson of Alexander VI. In Germany, the Jesuits were eagerly welcomed as the only persons able to meet the Lutherans on equal terms. Only in France, among the countries which still were united with the Roman Church, was their advance checked, owing to political distrust of their Spanish origin, together with the hostility of the Sorbonne and the bishop of Paris. However, after many difficulties, they succeeded in getting a footing through the help of Guillaume du Prat, bishop of Clermont (d. 1560), who founded a college for them in 1545 in the town of Billom, besides making over to them his house at Paris, the hôtel de Clermont, which became the nucleus of the afterwards famous college of Louis-le-Grand, while a formal legalization was granted to them by the states-general at Poissy in 1561. In Rome, Paul III.’s favour did not lessen. He bestowed on them the church of St Andrea and conferred at the same time the valuable privilege of making and altering their own statutes; besides the other points, in 1546, which Ignatius had still more at heart, as touching the very essence of his institute, namely, exemption from ecclesiastical offices and dignities and from the task of acting as directors and confessors to convents of women. The former of these measures effectually stopped any drain of the best members away from the society and limited their hopes within its bounds, by putting them more freely at the general’s disposal, especially as it was provided that the final vows could not be annulled, nor could a professed member be dismissed, save by the joint action of the general and the pope. The regulation as to convents seems partly due to a desire to avoid the worry and expenditure of time involved in the discharge of such offices and partly to a conviction that penitents living in enclosure, as all religious persons then were, would be of no effective use to the Society; whereas the founder, against the wishes of several of his companions, laid much stress on the duty of accepting the post of confessor to kings, queens and women of high rank when opportunity presented itself. And the year 1546 is notable in the annals of the Society as that in which it embarked on its great educational career, especially by the annexation of free day-schools to all its colleges.

The council of Trent, in its first period, seemed to increase the reputation of the Society; for the pope chose Laynez, Faber and Salmeron to act as his theologians in that assembly, and in this capacity they had no little influence in framing its decrees. When the council reassembled under Pius IV., Laynez and Salmeron again attended in the same capacity. It is sometimes said that the council formally approved of the Society. This is impossible; for as the Society had received the papal approval, that of the council would have been impertinent as well as unnecessary. St Charles Borromeo wrote to the presiding cardinals, on the 11th of May 1562, saying that, as France was disaffected to the Jesuits whom the pope wished to see established in every country, Pius IV. desired, when the council was occupying itself about regulars, that it should make some honourable mention of the Society in order to recommend it. This was done in the twenty-fifth session (cap. XVI., d.r.) when the decree was passed that at the end of the time of probation novices should either be professed or dismissed; and the words of the council are: "By these things, however, the Synod does not intend to make any innovation or prohibition, so as to hinder the religious order of Clerks of the Society of Jesus from being able to serve God and His Church, in accordance with their pious institute approved of by the Holy Apostolic See."

In 1548 the Society received a valuable recruit in the person of Francisco Borgia, duke of Gandia, afterwards thrice general, while two important events marked 1550—the foundation of the Collegio Romano and a fresh confirmation of the Society by Julius III. The German college, for the children of poor nobles, was founded in 1552; and in the same year Ignatius firmly settled the discipline of the Society by putting down, with promptness and severity, some attempts at independent action on the part of Rodriguez at Coimbra—this being the occasion of the famous letter on obedience; while 1553 saw the despatch of a mission to Abyssinia with one of the fathers as patriarch, and the first rift within the lute when the pope thought that the Spanish Jesuits were taking part with the emperor against the Holy See. Paul IV. (whose election alarmed the Jesuits, for they had not found him very friendly as cardinal) was for a time managed with supreme tact by Ignatius, whom he respected personally. In 1556, the founder died and left the Society consisting of forty-five professed fathers and two thousand ordinary members, distributed over twelve provinces, with more than a hundred colleges and houses.

After the death of the first general there was an interregnum of two years, with Laynez as vicar. During this long period he occupied himself with completing the constitutions by incorporating certain declarations, said to be Ignatian, which explained and sometimes completely altered the meaning of the original text. Laynez was an astute politician and saw the vast capabilities of the Society over a far wider field than the founder contemplated; and he prepared to give it the direction that it has since followed. In some senses, this learned and consummately clever man may be looked upon as the real founder of the Society as history knows it. Having carefully prepared the way, he summoned the general congregation from which he emerged as second general in 1556. As soon as Ignatius had died Paul IV. announced his intention of instituting reforms in the Society, especially in two points: the public recitation of the office in choir and the limitation of the general's office to a term of three years. Despite all the protests and negotiations of Laynez, the pope remained obstinate; and there was nothing but to submit. On the 8th of September 1558, two points were added to the constitutions: that the generalship should be triennial and not perpetual, although after the three years the general might be confirmed; and that the canonical hours should be observed in choir after the manner of the other orders, but with that moderation which should seem expedient to the general. Taking advantage of this last clause, Laynez applied the new law to two houses only, namely, Rome and Lisbon, the other houses contenting themselves with singing vespers on feast days; and as soon as Paul IV. died, Laynez, acting on advice, quietly ignored for the future the orders of the late pope. He also succeeded in increasing further the already enormous powers of the general. Laynez took a leading part in the colloquy of Poissy in 1561 between the Catholics and Huguenots; and obtained a legal footing from the states-general for colleges of the Society in France. He died in 1564, leaving the Society increased to eighteen provinces with a hundred and thirty colleges, and was succeeded by Francisco Borgia. During the third generalate, Pius V. confirmed all the former privileges, and in the amplest form extended to the Society, as being a mendicant institute, all favours that had been or might afterwards be granted to such mendicant bodies. It was a trifling set-off that in 1567 the pope again enjoined the fathers to keep choir and to admit only the professed to priests' orders, especially as Gregory XIII. rescinded both these injunctions in 1573; and indeed, as regards the hours, all that Pius V. was able to obtain was the nominal concession that the breviary should be recited in choir in the professed houses only, and that not of necessity by more than two persons at a time. Everard Mercurian, a Fleming, and a subject of Spain, succeeded Borgia in 1573, being forced on the Society by the pope, in preference to Polanco, Ignatius's secretary and the vicar-general, who was rejected partly as a Spaniard and still more because he was a "New Christian" of Jewish origin and therefore objected to in Spain itself. During his term of office there took place the troubles in Rome concerning the English college and the subsequent Jesuit rule over that institution; and in 1580 the first Jesuit mission, headed by the redoubtable Robert Parsons and the saintly Edmund Campion, set out for England. This mission, on one side, carried on an active propaganda against Elizabeth in favour of Spain; and on the other, among the true missionaries, was marked with devoted zeal and heroism even to the ghastly death of traitors. Claude Acquaviva, the fifth general, held office from 1581 to 1615, a time almost coinciding with the high tide of the successful reaction, chiefly due to the Jesuits. He was an able, strong-willed man, and crushed what was tantamount to a rebellion in Spain. It was during this struggle that Mariana, the historian and the author of the famous *De rege* in which he defends tyrannicide, wrote his treatise *On the Defects in the Government of the Society*. He confessed freely that the Society had faults and that there was a great deal of unrest among the members; and he mentioned among the various points calling for reform the education of the novices and students; the state of the lay brother and the possessions of the Society; the spying system, which he declared to be carried so far that, if the general's archives at Rome should be searched, not one Jesuit's character would be found to escape; the monopoly of the higher offices by a small clique: and the absence of all encouragement and recompense for the best men of the Society.

It was chiefly during the generalship of Acquaviva that the Society began to gain an evil reputation which eclipsed its good report. In France the Jesuits joined, if they did not originate, the league against Henry of Navarre. Absolution was refused by them to those who would not join in the Guise rebellion, and Acquaviva is said to have tried to stop them, but in vain. The assassination of Henry III. in the interests of the league and the wounding of Henry IV. in 1594 by Chastel, a pupil of theirs, revealed the danger that the whole Society was running by the intrigues of a few men. The Jesuits were banished from France in 1594, but were allowed to return by Henry IV. under conditions; as Sully has recorded, the king declared his only motive to be the expediency of not driving them into a corner with possible disastrous results to his life, and because his only hope of tranquillity lay in appeasing them and their powerful friends. In England the political schemings of Parsons were no small factors in the odium which fell on the Society at large; and his determination to capture the English Catholics as an apanage of the Society, to the exclusion of all else, was an object lesson to the rest of Europe of a restless ambition and lust of domination which were to find many imitators. The political turn which was being given by some to the Society, to the detriment of its real spiritual work, evoked the fears of the wiser heads of the body; and in the fifth general congregation held in 1593–1594 it was decreed: "Whereas in these times of difficulty and danger it has happened through the fault of certain individuals, through ambition and intemperate zeal, that our institute has been ill spoken of in divers places and before divers sovereigns . . . . it is severely and strictly forbidden to all members of the Society to interfere in any manner whatever in public affairs even though they be thereto invited; or to deviate from the institute through entreaty, persuasion or any other motive whatever." It would have been well had Acquaviva enforced this decree; but Parsons was allowed to keep on with his work, and other Jesuits in France for many years after directed, to the loss of religion, affairs of state. In 1605 took place in England the Gunpowder Plot, in which Henry Garnet, the superior of the Society in

England, was implicated. That the Jesuits were the instigators of the plot there is no evidence, but they were in close touch with the conspirators, of whose designs Garnet had a general knowledge. There is now no reasonable doubt that he and other Jesuits were legally accessories, and that the condemnation of Garnet as a traitor was substantially just (see GARNET, HENRY).

It was during Acquaviva's generalship that Philip II. of Spain complained bitterly of the Society to Sixtus V., and encouraged him in those plans of reform (even to changing the name) which were only cut short by the pope's death in 1590, and also that the long protracted discussions on grace, wherein the Dominicans contended against the Jesuits, were carried on at Rome with little practical result, by the Congregation *de auxiliis*, which sat from 1598 till 1607. The *Ratio Studiorum* took its shape during this time. The Jesuit influence at Rome was supported by the Spanish ambassador; but when Henry IV. "went to Mass," the balance inclined to the side of France, and the Spanish monopoly became a thing of the past. Acquaviva saw the expulsion of the Jesuits from Venice in 1606 for siding with Paul V. when he placed the republic under interdict, but did not live to see their recall, which took place at the intercession of Louis XIV. in 1657. He also had to banish Parsons from Rome, by order of Clement VIII., who was wearied with the perpetual complaints made against that intriguer. Gregory XIV., by the bull *Ecclesiae Christi* (July 28, 1591), again confirmed the Society, and granted that Jesuits might, for true cause, be expelled from the body without any form of trial or even documentary procedure, besides denouncing excommunications against every one, save the pope or his legates, who directly or indirectly infringed the constitutions of the Society or attempted to bring about any change therein.

Under Vitelleschi, the next general, the Society celebrated its first centenary on the 25th of September 1639, the hundredth anniversary of the verbal approbation given to the scheme by Paul III. During this hundred years the Society had grown to thirty-six provinces, with eight hundred houses containing some fifteen thousand members. In 1640 broke out the great Jansenist controversy, in which the Society took the leading part on one side and finally secured the victory. In this same year, considering themselves ill-used by Olivarez, prime minister of Philip IV. of Spain, the Jesuits powerfully aided the revolution which placed the duke of Braganza on the throne of Portugal; and their services were rewarded for nearly one hundred years with the practical control of ecclesiastical and almost of civil affairs in that kingdom.

The Society also gained ground steadily in France; for, though held in check by Richelieu and little more favoured by Mazarin, yet from the moment that Louis XIV. took the reins, their star was in the ascendant, and Jesuit confessors, the most celebrated of whom were François de La Chaise (*q.v.*) and Michel Le Tellier (1643–1719), guided the policy of the king, not hesitating to take his side in his quarrel with the Holy See, which nearly resulted in a schism, nor to sign the Gallican articles. Their hostility to the Huguenots forced on the revocation of the Edict of Nantes in 1685, and their war against their Jansenist opponents did not cease till the very walls of Port Royal were demolished in 1710, even to the very abbey church itself, and the bodies of the dead taken with every mark of insult from their graves and literally flung to the dogs to devour. But while thus gaining power in one direction, the Society was losing it in another. The Japanese mission had vanished in blood in 1651; and though many Jesuits died with their converts bravely as martyrs for the faith, yet it is impossible to acquit them of a large share in the causes of that overthrow. It was also about this same period that the grave scandal of the Chinese and Malabar rites began to attract attention in Europe, and to make thinking men ask seriously whether the Jesuit missionaries in those parts taught anything which could fairly be called Christianity at all. When it was remembered, too, that they had decided, at a council held at Lima, that it was inexpedient to impose any act of Christian devotion except baptism on the South American converts, without the greatest precautions, on the ground of intellectual difficulties, it is not wonderful that this doubt was not satisfactorily cleared up, notably in face of the charges brought against the Society by Bernardin de Cardonas, bishop of Paraguay, and the saintly Juan de Palafox (*q.v.*), bishop of Angelopolis in Mexico.

But "the terrible power in the universal church, the great riches and the extraordinary prestige" of the Society, which Palafox complained had raised it "above all dignities, laws, councils and apostolic constitutions," carried with them the seeds of rapid and inevitable decay. A succession of devout but incapable generals, after the death of Acquaviva, saw the gradual secularization of tone by the flocking in of recruits of rank and wealth desirous to share in the glories and influence of the Society, but not well adapted to increase them. The general's supremacy received a shock when the eleventh general congregation appointed Oliva as vicar, with the right of succession and powers that practically superseded those of the general Goswin Nickel, whose infirmities, it is said, did not permit him to govern with the necessary application and vigour; and an attempt was made to depose Tirso Gonzalez, the thirteenth general, whose views on probabilism diverged from those favoured by the rest of the Jesuits. Though the political weight of the Society continued to increase in the cabinets of Europe, it was being steadily weakened internally. The Jesuits abandoned the system of free education which had won them so much influence and honour; by attaching themselves exclusively to the interests of courts, they lost favour with the middle and lower classes; and above all, their monopoly of power and patronage in France, with the fatal use they had made of it, drew down the bitterest hostility upon them. It was to their credit, indeed, that the encyclopaedists attacked them as the foremost representatives of Christianity, but they are accountable in no small degree in France, as in England, for alienating the minds of men from the religion for which they professed to work.

But the most fatal part of the policy of the Society was its activity, wealth and importance as a great trading firm with branch houses scattered over the richest countries of the world. Its founder, with a wise instinct, had forbidden the accumulation of wealth; its own constitutions, as revised in the 84th decree of the sixth general congregation, had forbidden all pursuits of a commercial nature, as also had various popes; but nevertheless the trade went on unceasingly, necessarily with the full knowledge of the general, unless it be pleaded that the system of obligatory espionage had completely broken down. The first muttering of the storm which was soon to break was heard in a breve issued in 1741 by Benedict XIV., wherein he denounced the Jesuit offenders as "disobedient, contumacious, captious and reprobate persons," and enacted many stringent regulations for their better government. The first serious attack came from a country where they had been long dominant. In 1753 Spain and Portugal exchanged certain American provinces with each other, which involved a transfer of sovereign rights over Paraguay; but it was also provided that the populations should severally migrate also, that the subjects of each crown might remain the same as before. The inhabitants of the "reductions," whom the Jesuits had trained in the use of European arms and discipline, naturally rose in defence of their homes, and attacked the troops and authorities. Their previous docility and their entire submission to the Jesuits left no possible doubt as to the source of the rebellion, and gave the enemies of the Jesuits a handle against them that was not forgotten. In 1757 Carvalho, marquis of Pombal, prime minister of Joseph I. of Portugal, and an old pupil of the Jesuits at Coimbra, dismissed the three Jesuit chaplains of the king and named three secular priests in their stead. He next complained to Benedict XIV. that the trading operations of the Society hampered the commercial prosperity of the nation, and asked for remedial measures. The pope, who knew the situation, committed a visitation of the Society to Cardinal Saldanha, an intimate friend of Pombal, who issued a severe decree against the Jesuits and ordered the confiscation of all their merchandise. But at this juncture Benedict XIV., the most learned and able pope of the period, was succeeded by a pope strongly in favour of the Jesuits, Clement XIII. Pombal, finding no help from Rome, adopted other means. The king was fired at and wounded on returning from a visit to his mistress on the 3rd of September 1758. The duke of Aveiro and other high personages were tried and executed for conspiracy; while some of the Jesuits, who had undoubtedly been in communication with them, were charged, on doubtful evidence, with complicity in the attempted assassination. Pombal charged the whole Society with the possible guilt of a few, and, unwilling to wait the dubious issue of an application to the pope for licence to try them in the civil courts, whence they were exempt, issued on the 1st of September 1759 a decree ordering the immediate deportation of every Jesuit from Portugal and all its dependencies and their suppression by the bishops in the schools and universities. Those in Portugal were at once shipped, in great misery, to the papal states, and were soon followed by those in the colonies. In France, Madame de Pompadour was their enemy because they had refused her absolution while she remained the king's mistress; but the immediate cause of their ruin was the bankruptcy of Father Lavalette, the Jesuit superior in Martinique, a daring speculator, who failed, after trading for some years, for 2,400,000 francs and brought ruin upon some French commercial houses of note. Lorenzo Ricci, then general of the Society, repudiated the debt, alleging lack of authority on Lavalette's part to pledge the credit of the Society, and he was sued by the creditors. Losing his cause, he appealed to the parlement of Paris, and it, to decide the issue raised by Ricci, required the constitutions of the Jesuits to be produced in evidence, and affirmed the judgment of the courts below. But the publicity given to a document scarcely known till then raised the utmost indignation against the Society. A royal commission, appointed by the duc de Choiseul to examine the constitutions, convoked a private assembly of fifty-one archbishops and bishops under the presidency of Cardinal de Luynes, all of whom except six voted that the unlimited authority of the general was incompatible with the laws of France, and that the appointment of a resident vicar, subject to those laws, was the only solution of the question fair on all sides. Ricci replied with the historical answer, *Sint ut sunt, aut non sint*; and after some further delay, during which much interest was exerted in their favour, the Jesuits were suppressed by an edict in November 1764, but suffered to remain on the footing of secular priests, a grace withdrawn in 1767, when they were expelled from the kingdom. In the very same year, Charles III. of Spain, a monarch known for personal devoutness, convinced, on evidence not now forthcoming, that the Jesuits were plotting against his authority, prepared, through his minister D'Aranda, a decree suppressing the Society in every part of his dominions. Sealed despatches were sent to every Spanish colony, to be opened on the same day, the 2nd of April 1767, when the measure was to take effect in Spain itself, and the expulsion was relentlessly carried out, nearly six thousand priests being deported from Spain alone, and sent to the Italian coast, whence, however, they were repelled by the orders of the pope and Ricci himself, finding a refuge at Corte in Corsica, after some months' suffering in overcrowded vessels at sea. The general's object may probably have been to accentuate the harshness with which the fathers had been treated, and so to increase public sympathy, but the actual result of his policy was blame for the cruelty with which he enhanced their misfortunes, for the poverty of Corsica made even a bare subsistence scarcely procurable for them there. The Bourbon courts of Naples and Parma followed the example of France and Spain; Clement XIII. retorted with a bull launched at the weakest adversary, and declaring the rank and title of the duke of Parma forfeit. The Bourbon sovereigns threatened to make war on the pope in return (France, indeed, seizing on the county of Avignon), and a joint note demanding a retractation, and the abolition of the Jesuits, was presented by the French ambassador at Rome on the 10th of December 1768 in the name of France, Spain and the two Sicilies. The pope, a man of eighty-two, died of apoplexy, brought on by the shock, early in 1769. Cardinal Lorenzo Ganganelli, a conventual Franciscan, was chosen to succeed him, and took the name of Clement XIV. He endeavoured to avert the decision forced upon him, but, as Portugal joined the Bourbon league, and Maria Theresa with her son the emperor Joseph II. ceased to protect the Jesuits, there remained only the petty kingdom of Sardinia in their favour, though the fall of Choiseul in France raised the hopes of the Society for a time. The pope began with some preliminary measures, permitting first the renewal of lawsuits against the Society, which had been suspended by papal authority, and which, indeed, had in no case been ever successful at Rome. He then closed the Collegio Romano, on the plea of its insolvency, seized the houses at Frascati and Tivoli, and broke up the establishments in Bologna and the Legations. Finally on the 21st of July 1773 the famous breve *Dominus ac Redemptor* appeared, suppressing the Society of Jesus. This remarkable document opens by citing a long series of precedents for the suppression of religious orders by the Holy See, amongst which occurs the ill-omened instance of the Templars. It then briefly sketches the objects and history of the Jesuits themselves. It speaks of their defiance of their own constitution, expressly revived by Paul V., forbidding them to meddle in politics; of the great ruin to souls caused by their quarrels with local ordinaries and the other religious orders, their condescension to heathen usages in the East, and the disturbances, resulting in persecutions of the Church, which they had stirred up even in Catholic countries, so that several popes had been obliged to punish them. Seeing then that the Catholic sovereigns had been forced to expel them, that many bishops and other eminent persons demanded their extinction, and that the Society had ceased to fulfil the intention of its institute, the pope declares it necessary for the peace of the Church that it should be suppressed, extinguished, abolished and abrogated for ever, with all its houses, colleges, schools and hospitals; transfers all the authority of its general or officers to the local ordinaries; forbids the reception of any more novices, directing that such as were actually in probation should be dismissed, and declaring that profession in the Society should not serve as a title to holy orders. Priests of the Society are given the option of either joining other orders or remaining as secular clergy, under obedience to the ordinaries, who are empowered to grant or withhold from them licences to hear confessions. Such of the fathers as are engaged in the work of education are permitted to continue, on condition of abstaining from lax and questionable doctrines apt to cause strife and trouble. The question of missions is reserved, and the relaxations granted to the Society in such matters as fasting, reciting the hours and reading heretical books, are withdrawn; while the breve ends with clauses carefully drawn to bar any legal exceptions that might be taken against its full validity and obligation. It has been necessary to cite these heads of the breve because the apologists of the Society allege that no motive influenced the pope save the desire of peace at any price, and that he did not believe in the culpability of the fathers. The categorical charges made in the document rebut this plea. The pope followed up this breve by appointing a congregation of cardinals to take possession of the temporalities of the Society, and armed it with summary powers against all who should attempt to retain or conceal any of the property. He also threw Lorenzo Ricci, the general, into prison, first in the English college and then in the castle of St Angelo, where he died in 1775, under the pontificate of Pius VI., who, though not unfavourable to the Society, and owing his own advancement to it, dared not release him, probably because his continued imprisonment was made a condition by the powers who enjoyed a right of veto in papal elections. In September 1774 Clement XIV. died after much suffering, and the question has been hotly debated ever since whether poison was the cause of his death. But the latest researches have shown that there is no evidence to support the theory of poison. Salicetti, the pope's physician, denied that the body showed signs of poisoning, and Tanucci, Neapolitan ambassador at Rome, who had a large share in procuring the breve of suppression, entirely acquits the Jesuits, while F. Theiner, no friend to the Society, does the like.

At the date of this suppression, the Society had 41 provinces and 22,589 members, of whom 11,295 were priests. Far from submitting to the papal breve, the ex-Jesuits, after some ineffectual attempts at direct resistance, withdrew into the territories of the free-thinking sovereigns of Russia and Prussia, Frederick II. and Catherine II., who became their active friends and protectors; and the fathers alleged as a principle, in so far as their theology is concerned, that no papal bull is binding in a state whose sovereign has not approved and authorized its publication and execution. Russia formed the headquarters of the Society, and two forged breves were speedily circulated, being dated June 9 and June 29, 1774, approving their establishment in Russia, and implying the repeal of the breve of suppression. But these are contradicted by the tenor of five genuine breves issued in September 1774 to the archbishop of Gnesen, and making certain assurances to the ex-Jesuits, on condition of their complete obedience to the injunctions already laid on them. The Jesuits also pleaded a verbal approbation by Pius VI., technically known as an *Oraculum vivae vocis*, but this is invalid for purposes of law unless reduced to writing and duly authenticated.

They elected three Poles successively as generals, taking, however, only the title of vicars, till on the 7th of March 1801 Pius VII. granted them liberty to reconstitute themselves in north Russia, and permitted Kareu, then vicar, to exercise full authority as general. On the 30th of July 1804 a similar breve restored the Jesuits in the Two Sicilies, at the express desire of Ferdinand IV., the pope thus anticipating the further action of 1814, when, by the constitution *Sollicitudo omnium Ecclesiarum*, he revoked the action of Clement XIV., and formally restored the Society to corporate legal existence, yet not only omitted any censure of his predecessor's conduct, but all vindication of the Jesuits from the heavy charges in the breve *Dominus ac Redemptor*. In France, even after their expulsion in 1765, they had maintained a precarious footing in the country under the partial disguise and names of "Fathers of the Faith" or "Clerks of the Sacred Heart," but were obliged by Napoleon I. to retire in 1804. They reappeared under their true name in 1814, and obtained formal licence in 1822, but became the objects of so much hostility that Charles X. deprived them by ordinance of the right of instruction, and obliged all applicants for licences as teachers to make oath that they did not belong to any community unrecognized by the laws. They were dispersed again by the revolution of July 1830, but soon reappeared and, though put to much inconvenience during the latter years of Louis Philippe's reign, notably in 1845, maintained their footing, recovered the right to teach freely after the revolution of 1848, and gradually became the leading educational and ecclesiastical power in France, notably under the Second Empire, till they were once more expelled by the Ferry laws of 1880, though they quietly returned since the execution of those measures. They were again expelled by the Law of Associations of 1901. In Spain they came back with Ferdinand VII., but were expelled at the constitutional rising in 1820, returning in 1823, when the duke of Angoulême's army replaced Ferdinand on his throne; they were driven out once more by Espartero in 1835, and have had no legal position since, though their presence is openly tolerated. In Portugal, ranging themselves on the side of Dom Miguel, they fell with his cause, and were exiled in 1834. There are some to this day in Lisbon under the name of "Fathers of the Faith." Russia, which had been their warmest patron, drove them from St Petersburg and Moscow in 1813, and from the whole empire in 1820, mainly on the plea of attempted proselytizing in the imperial army. Holland drove them out in 1816, and, by giving them thus a valid excuse for aiding the Belgian revolution of 1830, secured them the strong position they have ever since held in Belgium; but they have succeeded in returning to Holland. They were expelled from Switzerland in 1847–1848 for the part they were charged with in exciting the war of the Sonderbund. In south Germany, inclusive of Austria and Bavaria, their annals since their restoration have been uneventful; but in north Germany, owing to the footing Frederick II. had given them in Prussia, they became very powerful, especially in the Rhine provinces, and, gradually moulding the younger generation of clergy after the close of the War of Liberation, succeeded in spreading Ultramontane views amongst them, and so leading up to the difficulties with the civil government which issued in the Falk laws, and their own expulsion by decree of the German parliament (June 19, 1872). Since then many attempts have been made to procure the recall of the Society to the German Empire, but without success, although as individuals they are now allowed in the country. In Great Britain, whither they began to straggle over during the revolutionary troubles at the close of the 18th century, and where, practically unaffected by the clause directed against them in the Emancipation Act of 1829, their chief settlement has been at Stonyhurst in Lancashire, an estate conferred on them by Thomas Weld in 1795, they have been unmolested; but there has been little affinity to the order in the British temperament, and the English province has consequently never risen to numerical or intellectual importance in the Society. In Rome itself, its progress after the restoration was at first slow, and it was not till the reign of Leo XII. (1823–1829) that it recovered its place as the chief educational body there. It advanced steadily under Gregory XVI., and, though it was at first shunned by Pius IX., it secured his entire confidence after his return from Gaeta in 1849, and obtained from him a special breve erecting the staff of its literary journal, the *Civiltà Cattolica*, into a perpetual college under the general of the Jesuits, for the purpose of teaching and propagating the faith in its pages. How, with this pope's support throughout his long reign, the gradual filling of nearly all the sees of Latin Christendom with bishops of their own selection, and their practical capture, directly or indirectly, of the education of the clergy in seminaries, they contrived to stamp out the last remains of independence everywhere, and to crown the Ultramontane triumph with the Vatican Decrees, is matter of familiar knowledge. Leo XIII., while favouring them somewhat, never gave them his full confidence; and by his adhesion to the Thomist philosophy and theology, and his active work for the regeneration and progress of the older orders, he made another suppression possible by destroying much of their prestige. But the usual sequence has been observed under Pius X., who appeared to be greatly in favour of the Society and to rely upon them for many of the measures of his pontificate.

The Society has been ruled by twenty-five generals and four vicars from its foundation to the present day (1910). Of all the various nationalities represented in the Society, neither France, its original cradle, nor England, has ever given it a head, while Spain, Italy, Holland, Belgium, Germany and Poland, were all represented. The numbers of the Society are not accurately known, but are estimated at about 20,000, in all parts of the world; and of these the English, Irish and American Jesuits are under 3000.

The generals of the Jesuits have been as follow:—

1.	Ignatius de Loyola (Spaniard)	1541–1556
2.	Diego Laynez (Spaniard)	1558–1565
3.	Francisco Borgia (Spaniard)	1565–1572
4.	Everard Mercurian (Belgian)	1573–1580
5.	Claudio Acquaviva (Neapolitan)	1581–1615
6.	Mutio Vitelleschi (Roman)	1615–1645
7.	Vincenzio Caraffa (Neapolitan)	1646–1649
8.	Francesco Piccolomini (Florentine)	1649–1651
9.	Alessandro Gottofredi (Roman)	1652
10.	Goswin Nickel (German)	1652–1664
11.	Giovanni Paolo Oliva (Genoese) vicar-general and coadjutor, 1661; general	1664–1681
12.	Charles de Noyelle (Belgian)	1682–1686
13.	Tirso Gonzalez (Spaniard)	1687–1705
14.	Michele Angelo Tamburini (Modenese)	1706–1730
15.	Franz Retz (Bohemian)	1730–1750
16.	Ignazio Visconti (Milanese)	1751–1755
17.	Alessandro Centurioni (Genoese)	1755–1757
18.	Lorenzo Ricci (Florentine)	1758–1775
	a. Stanislaus Czerniewicz (Pole), vicar-general	1782–1785
	b. Gabriel Lienkiewicz (Pole), ,,	1785–1798
	c. Franciscus Xavier Kareu (Pole), (general in Russia, 7th March 1801)	1799–1802
	d. Gabriel Gruber (German)	1802–1805
19.	Thaddaeus Brzozowski (Pole)	1805–1820
20.	Aloysio Fortis (Veronese)	1820–1829
21.	Johannes Roothaan (Dutchman)	1829–1853
22.	Peter Johannes Beckx (Belgian)	1853–1884
23.	Antoine Anderledy (Swiss)	1884–1892
24.	Luis Martin (Spanish)	1892–1906
25.	Francis Xavier Wernz (German)	1906–

The bibliography of Jesuitism is of enormous extent, and it is impracticable to cite more than a few of the most important works. They are as follows: *Institutum Societatis Jesu* (7 vols., Avignon, 1830–1838); Orlandini, *Historia Societatis Jesu* (Antwerp, 1620); *Imago primi saeculi Societatis Jesu* (Antwerp, 1640); Nieremberg, *Vida de San Ignacio de Loyola* (9 vols., fol., Madrid, 1645–1736); Genelli, *Life of St Ignatius of Loyola* (London, 1872); Backer, *Bibliothèque des écrivains de la Compagnie de Jésus* (7 vols., Paris, 1853–1861); Crétineau Joly, *Histoire de la Compagnie de Jésus* (6 vols., Paris, 1844); Guettée, *Histoire des Jésuites* (3 vols., Paris, 1858–1859); Wolff, *Allgemeine Geschichte der Jesuiten* (4 vols., Zurich, 1789–1792); Gioberti, *Il Gesuita moderno* (Lausanne, 1846); F. Parkman, *Pioneers of France in the New World* and *The Jesuits in North America* (Boston, 1868); *Lettres édifiantes et curieuses, écrites des missions étrangères, avec les Annales de la propagation de la foi* (40 vols., Lyons, 1819–1854); Saint-Priest, *Histoire de la chute des Jésuites au XVIII*^{e} *Siècle* (Paris, 1844); Ranke, *Römische Päpste* (3 vols., Berlin, 1838); E. Taunton, *History of the Jesuits in England* (London, 1901); Thomas Hughes, S.J., *History of the Society of Jesus in North America* (London and New York, 1907); R. G. Thwaites, *Jesuit Relations and Allied Documents* (73 vols. Cleveland, 1896–1901).

(R. F. L.; E. Tn.)

JESUP, MORRIS KETCHUM (1830–1908), American banker and philanthropist, was born at Westport, Connecticut, on the 21st of June 1830. In 1842 he went to New York City, where after some experience in business he established a banking house in 1852. In 1856 he organized the banking firm of M. K. Jesup & Company, which after two reorganizations became Cuyler, Morgan & Jesup. He became widely known as a financier, retiring from active business in 1884. He was best known, however, as a munificent patron of scientific research, a large contributor to the needs of education, and a public-spirited citizen of wide interests, who did much for the betterment of social conditions in New York. He contributed largely to the funds for the Arctic expeditions of Commander Robert E. Peary, becoming president of the Peary Arctic Club in 1899. To the American museum of natural history, in New York City, he gave large sums in his lifetime and bequeathed $1,000,000. He was president of the New York chamber of commerce from 1899 until 1907, and was the largest subscriber to its new building. To his native town he gave a fine public library. He died in New York City on the 22nd of January 1908.

JESUS CHRIST. To write a summary account of the life of Christ, though always involving a grave responsibility, was until recent years a comparatively straightforward task; for it was assumed that all that was needed, or could be offered, was a chronological outline based on a harmony of the four canonical Gospels. But to-day history is not satisfied by this simple procedure. Literary criticism has analysed the documents, and has already established some important results; and many questions are still in debate, the answers to which must affect our judgment of the historical value of the existing narratives. It seems therefore consonant alike with prudence and reverence to refrain from attempting to combine afresh into a single picture the materials derivable from the various documents, and to endeavour instead to describe the main contents of the sources from which our knowledge of the Lord Jesus Christ as an historical personage is ultimately drawn, and to observe the picture of Him which each writer in turn has offered to us.

The chief elements of the evidence with which we shall deal are the following:—

1. First, because earliest in point of time, the references to the Lord Jesus Christ in the earliest Epistles of St Paul.
2. The Gospel according to St Mark.
3. A document, no longer extant, which was partially incorporated into the Gospels of St Matthew and St Luke.
4. Further information added by St Matthew's Gospel.
5. Further information added by St Luke's Gospel.
6. The Gospel according to St John.

With regard to traditional sayings or doings of our Lord, which were only written down at a later period, it will suffice to say that those which have any claim to be genuine are very scanty, and that their genuineness has to be tested by their correspondence with the great bulk of information which is derived from the sources already enumerated. The fictitious literature of the second and third centuries, known as the Apocryphal Gospels, offers no direct evidence of any historical value at all: it is chiefly valuable for the contrast which it presents to the grave simplicity of the canonical Gospels, and as showing how incapable a later age was of adding anything to the Gospel history which was not palpably absurd.

1. *Letters of St Paul.*—In the order of chronology we must give the first place to the earliest letters of St Paul. The first piece of Christian literature which has an independent existence and to which we can fix a date is St Paul's first Epistle to the Thessalonians. Lightfoot dates it in 52 or 53; Harnack places it five years earlier. We may say, then, that it was written some twenty years after the Crucifixion. St Paul is not an historian; he is not attempting to describe what Jesus Christ said or did. He is writing a letter to encourage a little Christian society which he, a Jew, had founded in a distant Greek city; and he reminds his readers of many things which he had told them when he was with them. The evidence to be collected from his epistles generally must not detain us here, but we may glance for a moment at this one letter, because it contains what appears to be the first mention of Jesus Christ in the literature of the world. Those who would get a true history cannot afford to neglect their earliest documents. Now the opening sentence of this letter is as follows: "Paul and Silvanus and Timothy to the Church of the Thessalonians in God the Father and the Lord Jesus Christ: Grace to you, and peace." Three men with Greek or Latin names are writing to some kind of assembly in a city of Macedonia. The writers are Jews, to judge by their salutation of "peace," and by their mention of "God the Father," and of the assembly or society as being "in" Him. But what is this new name which is placed side by side with the Divine Name—"in God the Father and the Lord Jesus Christ"? An educated Greek, who knew something (as many at that time did) of the Greek translation of the ancient Hebrew Scriptures, if he had picked up this letter before he had ever heard the name of Jesus Christ, would have been deeply interested in these opening words. He would have known that "Jesus" was the Greek form of Joshua; that "Christ" was the Greek rendering of Messiah, or Anointed, the title of the great King for whom the Jews were looking; he might further have remembered that "the Lord" is the expression which the Greek Old Testament constantly uses instead of the ineffable name of God, which we now call "Jehovah" (*q.v.*). Who, then, he might well ask is this Jesus Christ who is lifted to this unexampled height? For it is plain that Jesus Christ stands in some close relation to "God the Father," and that on the ground of that relation a society has been built up, apparently by Jews, in a Greek city far distant from Palestine. He would learn something as he read on; for the letter makes a passing reference to the foundation of the society, and to the expansion of its influence in other parts of Greece; to the conversion of its members from heathenism, and to the consequent sufferings at the hands of their heathen neighbours. The writers speak of themselves as "apostles," or messengers, of Christ; they refer to similar societies "in Christ Jesus," which they call "churches of God," in Judaea, and they say that these also suffer from the Jews there, who had "killed the Lord Jesus" some time before. But they further speak of Jesus as "raised from the dead," and they refer to the belief which they had led the society to entertain, that He would come again "from heaven to deliver them from the coming wrath." Moreover, they urge them not to grieve for certain members of the society who have already died, saying that, "if we believe that Jesus died and rose again," we may also be assured that "the dead in Christ will rise" and will live for ever with Him. Thus the letter assumes that its readers already have considerable knowledge as to "the Lord Jesus Christ," and as to His relation to "God the Father," a knowledge derived from teaching given in person on a former visit. The purpose of the letter is not to give information as to the past, but to stimulate its readers to perseverance by giving fresh teaching as to the future. Historically it is of great value as showing how widely within twenty or twenty-five years of the Crucifixion a religion which proclaimed developed theological teaching as to "the Lord Jesus Christ" had spread in the Roman Empire. We may draw a further conclusion from this and other letters of St Paul before we go on. St Paul's missionary work must have created a demand. Those who had heard him and read his letters would want to know more than he had told them of the earthly life of the Lord Jesus. They would wish to be able to picture Him to their minds; and especially to understand what could have led to His being put to death by the Romans at the requisition of the Jews. St Paul had not been one of his personal disciples in Galilee or Jerusalem; he had no memories to relate of His miracles and teaching. Some written account of these was an obvious need. And we may be sure that any such narrative concerning One who was so deeply reverenced would be most carefully scrutinized at a time when many were still living whose memories went back to the period of Our Lord's public ministry. One such narrative we now proceed to describe.

2. *St Mark's Gospel.*—The Gospel according to St Mark was written within fifteen years of the first letter of St Paul to the Thessalonians—*i.e.* about 65. It seems designed to meet the requirements of Christians living far away from Palestine. The author was not an eye-witness of what he relates, but he writes with the firm security of a man who has the best authority behind him. The characteristics of his work confirm the early belief that St Mark wrote this Gospel for the Christians of Rome under the guidance of St Peter. It is of the first importance that

we should endeavour to see this book as a whole; to gain the total impression which it makes on the mind; to look at the picture of Jesus Christ which it offers. That picture must inevitably be an incomplete representation of Him; it will need to be supplemented by other pictures which other writers have drawn. But it is important to consider it by itself, as showing us what impress the Master had made on the memory of one disciple who had been almost constantly by His side.

Beginning of Christ's Mission.

The book opens thus: "The beginning of the Gospel of Jesus Christ." This "beginning" is shown to be itself rooted in the past. Hebrew prophets had foretold that God would send a "messenger"; that a voice would be heard saying, "Prepare the way of the Lord." And so, in fact, John came, baptizing in the wilderness and turning the heart of the nation back to God. But John was only a forerunner. He was himself a prophet, and his prophecy was this, "He that is stronger than I am is coming after me." Then, we read, "Jesus came." St Mark introduces Him quite abruptly, just as he had introduced John; for he is writing for those who already know the outlines of the story. "Jesus came from Nazareth of Galilee." He was baptized by John, and as He came out of the water He had a vision of the opened heavens and the Holy Spirit, like a dove, descending upon Him; and He heard a Voice saying, "Thou art My Son, the Beloved: in Thee I am well pleased." He then passed away into the wilderness, where He was tempted by Satan and fed by angels. Then He begins His work; and from the very first we feel that He fulfils John's sign: He is strong. His first words are words of strength; "the time is fulfilled"—that is to say, all the past has been leading up to this great moment; "the kingdom of God is at hand"—that is to say, all your best hopes are on the point of being fulfilled; "repent, and believe the Gospel"—that is to say, turn from your sins and accept the tidings which I bring you. It is but a brief summary of what He must have said; but we feel its strength. He does not hesitate to fix all eyes upon Himself. Then we see Him call two brothers who are fishermen. "Come after Me," He says, "and I will make you fishers of men." They dropped their nets and went after Him, and so did two other brothers, their partners; for they all felt the power of this Master of men: He was strong. He began to teach in the synagogue; they were astonished at His teaching, for he spoke with authority. He was interrupted by a demoniac, but He quelled the evil spirit by a word; He was stronger than the power of evil. When the sun set the Sabbath was at an end, and the people could carry out their sick into the street where He was; and He came forth and healed them all. The demoniacs showed a strange faculty of recognition, and cried that He was "the holy one of God," and "the Christ," but He silenced them at once. The next morning He was gone. He had sought a quiet spot for prayer. Peter, one of those fishermen whom He had called, whose wife's mother had been healed the day before, found Him and tried to bring Him back. "All men are seeking Thee," he pleaded. "Let us go elsewhere" was the quiet reply of one who could not be moved by popular enthusiasm. Once again, we observe, He fulfils John's sign: He is strong. This is our first sight of Jesus Christ. The next shows us that this great strength is united to a most tender sympathy. To touch a leper was forbidden, and the offence involved ceremonial defilement. Yet when a leper declared that Jesus could heal him, if only He would, "He put forth His hand and touched him." The act perfected the leper's faith, and he was healed immediately. But he disobeyed the command to be silent about the matter, and the result was that Jesus could not openly enter into the town, but remained outside in the country. It is the first shadow that falls across His path; His power finds a check in human wilfulness. Presently He is in Capernaum again. He heals a paralysed man, but not until He has come into touch, as we say, with him also, by reaching his deepest need and declaring the forgiveness of his sins. This declaration disturbs the rabbis, who regard it as a blasphemous usurpation of Divine authority. But He claims that "the Son of Man hath authority on earth to forgive sins." The title which He thus adopts must be considered later.

Attitude towards Religious Tradition.

We may note, as we pass on, that He has again, in the exercise of His power and His sympathy, come into conflict with the established religious tradition. This freedom from the trammels of convention appears yet again when he claims as a new disciple a publican, a man whose calling as a tax-gatherer for the Roman government made him odious to every patriotic Jew. Publicans were classed with open sinners; and when Jesus went to this man's house and met a company of his fellows the rabbis were scandalized: "Why eateth your Master with publicans and sinners?" The gentle answer of Jesus showed His sympathy even with those who opposed Him: "The doctor," He said, "must go to the sick." And again, when they challenged His disciples for not observing the regular fasts, He gently reminded them that they themselves relaxed the discipline of fasting for a bridegroom's friends. And He added, in picturesque and pregnant sayings, that an old garment could not bear a new patch, and that old wine-skins could not take new wine. Such language was at once gentle and strong; without condemning the old, it claimed liberty for the new. To what lengths would this liberty go? The sacred badge of the Jews' religion, which marked them off from other men all the world over, was their observance of the Sabbath. It was a national emblem, the test of religion and patriotism. The rabbis had fenced the Sabbath round with minute commands, lest any Jews should even seem to work on the Sabbath day. Thus, plucking and rubbing the ears of corn was counted a form of reaping and threshing. The hungry disciples had so transgressed as they walked through the fields of ripe corn. Jesus defended them by the example of David, who had eaten the shewbread, which only priests might eat, and had given it to his hungry men. Necessity absolves from ritual restrictions. And he went farther, and proclaimed a principle: "The Sabbath was made for man, and not man for the Sabbath, so that the Son of Man is lord even of the Sabbath." For a second time, in justifying His position, He used the expression "the Son of Man." The words might sound to Jewish ears merely as a synonym for "man." For Himself, and possibly for some others, they involved a reference, as appears later, to the "one like to a son of man" in Daniel's prophecy of the coming kingdom. They emphasized His relation to humanity as a whole, in contrast to such narrower titles as "Son of Abraham" or "Son of David." They were fitted to express a wider mission than that of a merely Jewish Messiah: He stood and spoke for mankind. The controversy was renewed when a man with a withered hand appeared in the synagogue on the Sabbath, and the rabbis watched to see whether Jesus would heal him. For the first time, we read that Jesus was angry. They were wilfully blind, and they would rather not see good done than see it done in a way that contradicted their teachings and undermined their influence. After a sharp remonstrance, He healed the man by a mere word. And they went out to make a compact with the followers of the worldly Herod to kill Him, and so to stave off a religious revolution which might easily have been followed by political trouble.

Recapitulation.

Up to this point what have we seen? On the stage of Palestine, an outlying district of the Roman Empire, the home of the Jewish nation, now subject but still fired with the hope of freedom and even of universal domination under the leadership of a divinely anointed King, a new figure has appeared. His appearance has been announced by a reforming prophet, who has summoned the nation to return to its God, and promised that a stronger than himself is to follow. In fulfilment of this promise, who is it that has come? Not a rough prophet in the desert like John, not a leader striking for political freedom, not a pretender aiming at the petty throne of the Herods, not even a great rabbi, building on the patriotic foundation of the Pharisees who had secured the national life by a new devotion to the ancient law. None of these, but, on the contrary, an unknown figure from the remote hills of Galilee, standing on the populous shores of its lake, proclaiming as a message from God that the highest hopes were about to be fulfilled, fastening attention on Himself by speaking with authority and attaching a few followers to His person, exhibiting wonderful powers of healing as a sign that He has come to fulfil all needs, manifesting at the same time an unparalleled sympathy, and setting quietly aside every religious convention which limited the outflow of this sympathy; and as the result of all this arousing the enthusiasm of astonished multitudes and evoking the opposition and even the murderous resentment of the religious guides of the nation. Of His teaching we have heard nothing, except in the occasional sentences by which He justified some of His unexpected actions. No party is formed, no programme is announced, no doctrine is formulated; without assuming the title of Messiah, He offers Himself as the centre of expectation, and seems to invite an unlimited confidence in His person. This, then, in brief summary, is what we have seen: the natural development of an historical situation, a march of events leading rapidly to a climax; an unexampled strength and an unexampled sympathy issuing inevitably in an unexampled liberty; and then the forces of orthodox religion combining with the forces of worldly indifference in order to suppress a dangerous innovator. Yet the writer who in a few pages presents us with so remarkable a representation shows no consciousness at all of artistic treatment. He tells a simple tale in the plainest words: he never stops to offer a comment or to point a moral. The wonder of it all is not in the writing, but in the subject itself. We feel that we have here no skilful composition, but a bare transcript of what occurred. And we feel besides that such a narrative as this is the worthy commencement of an answer to the question with which its readers would have come to it: What was the beginning of the Gospel? How did the Lord Jesus speak and act? and why did He arouse such malignant enmity amongst His own people?

We have followed St Mark's narrative up to the point at which it became clear that conciliatory argument could have no effect upon the Jewish religious leaders. The controversy about the Sabbath had brought their dissatisfaction to a climax. Henceforth Jesus was to them a revolutionary, who must, by any means, be suppressed. After this decisive breach a new period opens. Jesus leaves Capernaum, never again, it would seem, to appear in its synagogue. Henceforward He was to be found, with His disciples, on the shore of the lake, where vast multitudes gathered round Him, drawn not only from Galilee and Judaea, but also from the farther districts north and east of these. He would take refuge from the crowds in a boat, which carried Him from shore to shore; and His healing activity was now at its height. Yet in the midst of this popular enthusiasm He knew that the time had come to prepare for a very different future, and accordingly a fresh departure was made when He selected twelve of His disciples for a more intimate companionship, with a view to a special mission: "He appointed twelve that they might be with Him, and that He might send them forth to preach and to have power to cast out the devils." The excitement and pressure of the crowds was at this time almost overwhelming, and the relatives of Jesus endeavoured to restrain Him; "for they said, He is mad." The scribes from Jerusalem offered a more sinister explanation, saying that He was possessed by the prince of the devils, and that this was why He was able to control all the evil spirits. He answered them first in figurative language, speaking of the certain downfall of a kingdom or a family divided against itself, and of the strong man's house which could not be looted unless the strong man were first bound. Then followed the tremendous warning, that to assign His work to Satan, and so to call good evil, was to blaspheme against the Holy Spirit—the one sin which admitted of no forgiveness. Presently, when He was told that His mother and brethren were calling for Him, He disclaimed their interference by pointing to a new circle of family relationship, consisting of all those who "do the will of God."

Again we find Him teaching by the lake, and the pressure of the multitude is still so great that He sits in a boat while they line the shore. For the first time we are allowed to hear how He taught them. He gives them a parable from nature—the sower's three kinds of failure, compensated by the rich produce of the good soil. At the close He utters the pregnant saying: "He that hath ears to hear let him hear." When His disciples afterwards asked for an explanation, He prefaced it by saying that the inner circle only were intended to understand. The disciples might learn that the message would often prove fruitless, but that nevertheless an abundant harvest would result. For the light was intended to shine, and the hidden was meant to be revealed. Another parable compared the kingdom of God to seed which, when once planted, must inevitably germinate; the process was secret and slow, but the harvest was certain. Again, it was like the tiny mustard-seed which grew out of all proportion to its original size, till the birds could shelter in its great branches. These enigmatic speeches were all that the multitudes got, but the disciples in private were taught their lesson of hope. As we review this teaching it is very remarkable. The world of common things is seen to be a lesson-book of the kingdom of God to those who have eyes to read it. What that kingdom is to be we are not told; we are only taught that its coming is secret, slow and certain. If nature in its ordinary processes was thus seen to be full of significance, the disciples were also to learn that it was under His control. As the boat from which He had been teaching passed to the other side, the tired Teacher slept. A sudden storm terrified the disciples, and they roused Him in alarm. He stilled the storm with a word and rebuked their want of faith. "Who then is this," they whispered with awe, "that even the wind and the sea obey Him?" On the opposite hills a solitary spectator had watched the rise and the lull of the tempest, a fierce demoniac who dwelt among the tombs on the mountain-side. He believed himself to be possessed by a regiment of demons. When Jesus bade them go forth, he begged that they might be allowed to enter into a herd of swine which was hard by. His request was granted, and the swine rushed over a steep place into the lake. It is worth while to note that while most of the cures which Jesus had performed appear to have belonged to this class, this particular case is described as an exceptionally severe one, and the visible effect of the removal of his tormentors may have greatly helped to restore the man's shattered personality.

Christ's Teaching.

We must not attempt to trace in detail the whole of St Mark's story. We have followed it long enough to see its directness and simplicity, to observe the naturalness with which one incident succeeds another, and to watch the gradual manifestation of a personality at once strong and sympathetic, wielding extraordinary powers, which are placed wholly at the service of others, and refusing to be hindered from helping men by the ordinary restrictions of social or religious custom. And we have seen as the consequence of all this the development of an historical situation in which the leaders of current orthodoxy ally themselves with the indifferentism which accepts existing political conditions in order to put down a disturber of the peace. We must now be content with a broader survey of the course of events.

Healing Powers.

Two notable cures were wrought on the western side of the lake—the healing of the woman with the issue and the raising of Jairus's daughter. In each of these cures prominence is given to the requirement and the reward of faith—that is to say, of personal confidence in the Healer: "Thy faith hath made thee whole." "Fear not, only believe." After this Jesus passed away from the enthusiastic crowds by the lake to visit His own Nazareth, and to find there a strange incredulity in regard to one whom the villagers knew as the carpenter. Once more we come across a mysterious limitation of His powers: "He could not do there any miracle," save the cure of a few sick folk; and He marvelled because of their want of faith. The moment had now come when the twelve disciples were to be entrusted with a share of His healing power and with the proclamation of repentance. While they are journeying two and two in various directions St Mark takes occasion to tell us the current conjectures as to who Jesus really was. Some thought him Elijah or one of the ancient prophets returned to earth—a suggestion based on popular tradition; others said He was John the Baptist risen from the dead—the superstition of Herod who had put him to death. When the disciples returned, Jesus took them apart for rest; but the crowds reassembled when they found Him again near the lake, and His yearning compassion for these shepherdless sheep led Him to give them an impressive sign that He had indeed come to supply all human needs. Hitherto His power had gone forth to individuals, but now He fed five thousand men from the scanty stock of five loaves and two fishes. That night He came to His disciples walking upon the waters, and in the period which immediately followed there was once more a great manifestation of healing power.

Opposition of the Scribes.

We have heard nothing for some time of any opposition; but now a fresh conflict arose with certain scribes who had come down from Jerusalem, and who complained that the disciples neglected the ceremonial washing of their hands before meals. Jesus replied with a stern rebuke, addressing the questioners as hypocrites, and exposing the falsity of a system which allowed the breach of fundamental commandments in order that traditional regulations might be observed. He then turned from them to the multitude, and uttered a saying which in effect annulled the Jewish distinction between clean and unclean meats. This was a direct attack on the whole Pharisaic position. The controversy was plainly irreconcilable, and Jesus withdrew to the north, actually passing outside the limits of the Holy Land. He desired to remain unknown, and not to extend His mission to the heathen population, but the extraordinary faith and the modest importunity of a Syrophenician woman induced Him to heal her daughter. Then He returned by a circuitous route to the Sea of Galilee. His return was marked by another miraculous feeding of the multitude, and also by two healing miracles which present unusual features. In both the patient was withdrawn from the multitude and the cure was wrought with the accompaniment of symbolic actions. Moreover, in one case Jesus is described as groaning before He spoke; in the other the cure was at first incomplete; and both of the men were strictly charged to observe silence afterwards. It cannot be a mere coincidence that these are the last cures which St Mark records as performed in Galilee.

Messianic Teaching.

In fact the Galilean ministry is now closed. Jesus retires northwards to Caesarea Philippi, and appears henceforth to devote Himself entirely to the instruction of his disciples, who needed to be prepared for the fatal issue which could not long be delayed. He begins by asking them the popular opinion as to His Person. The suggestions are still the same—John the Baptist, or Elijah, or some other of the prophets. But when He asked their own belief, Peter replied, "Thou art the Christ." He warned them not to make this known; and He proceeded to give them the wholly new teaching that the Son of Man must suffer and be killed, adding that after three days He must rise again. Peter took Him aside and urged Him not to speak so. But He turned to the other disciples and openly rebuked Peter. And then, addressing a yet wider circle, He demanded of those who should follow Him a self-sacrifice like His own. He even used the metaphor of the cross which was carried by the sufferer to the place of execution. Life, he declared, could only be saved by voluntary death. He went on to demand an unswerving loyalty to Himself and His teaching in the face of a threatening world; and then He promised that some of those who were present should not die before they had seen the coming of the kingdom of God. We have had no hint of such teaching as this in the whole of the Galilean ministry. Jesus had stood forth as the strong healer and helper of men; it was bewildering to hear Him speak of dying. He had promised to fulfil men's highest expectations, if only they would not doubt His willingness and power. He had been enthusiastically reverenced by the common people, though suspected and attacked by the religious leaders. He had spoken of "the will of God" as supreme, and had set aside ceremonial traditions. He had announced the nearness of the kingdom of God, but had described it only in parables from nature. He had adopted the vague title of the "Son of Man," but had refrained from proclaiming Himself as the expected Messiah. At last the disciples had expressed their conviction that He was the Christ, and immediately He tells them that He goes to meet humiliation and death as the necessary steps to a resurrection and a coming of the Son of Man in the glory of His Father. It was an amazing announcement and He plainly added that their path like His own lay through death to life. The dark shadows of this picture of the future alone could impress their minds, but a week later three of them were allowed a momentary vision of the light which should overcome the darkness. They saw Jesus transfigured in a radiance of glory: Elijah appeared with Moses, and they talked with Jesus. A cloud came over them, and a Voice, like that of the Baptism, proclaimed "This is My Son, the Beloved: hear ye Him." They were bidden to keep the vision secret till the Son of Man should have risen from the dead. It was in itself a foretaste of resurrection, and the puzzled disciples remembered that the scribes declared that before the resurrection Elijah would appear. Their minds were confused as to what resurrection was meant. Jesus told them that Elijah had in fact come; and He also said that the Scriptures foretold the sufferings of the Son of Man. But the situation was wholly beyond their grasp, and the very language of St Mark at this point seems to reflect the confusion of their minds.

The other disciples, in the meantime, had been vainly endeavouring to cure a peculiarly violent case of demoniacal possession. Jesus Himself cast out the demon, but not before the suffering child had been rendered seemingly lifeless by a final assault. Then they journeyed secretly through Galilee towards Judaea and the eastern side of the Jordan. On the way Jesus reinforced the new lesson of self-renunciation. He offered the little children as the type of those to whom the kingdom of God belonged; and He disappointed a young and wealthy aspirant to His favour, amazing His disciples by saying that the kingdom of God could hardly be entered by the rich; he who forsook all should have all, and more than all; the world's estimates were to be reversed—the first should be last and the last first. They were now journeying towards Jerusalem, and the prediction of the Passion was repeated. James and John, who had witnessed the Transfiguration, and who were confident of the coming glory, asked for the places nearest to their Master, and professed their readiness to share His sufferings. When the other ten were aggrieved Jesus declared that greatness was measured by service, not by rank; and that the Son of Man had come not to be served but to serve, and to give His life to ransom many other lives. As they came up from the Jordan valley and passed through Jericho, an incident occurred which signalized the beginning of the final period. A blind man appealed to Jesus as "the Son of David," and was answered by the restoration of his sight; and when, a little later, Jesus fulfilled an ancient prophecy by mounting an ass and riding into Jerusalem, the multitudes shouted their welcome to the returning "kingdom of David." Hitherto He had not permitted any public recognition of His Messiahship, but now He entered David's city in lowly but significant pomp as David's promised heir.

Entry into Jerusalem.

Two incidents illustrate the spirit of judgment with which He approached the splendid but apostate city. On His arrival He had carefully observed the condition of the Temple, and had retired to sleep outside the city. On the following morning, finding no fruit on a fig-tree in full leaf, He said, "Let no man eat fruit of thee henceforth for ever." It was a parable of impending doom. Then, when He entered the Temple, He swept away with a fiery zeal the merchants and merchandise which had turned God's House into "a robbers' den." The act was at once an assertion of commanding authority and an open condemnation of the religious rulers who had permitted the desecration. Its immediate effect was to make new and powerful enemies; for the chief priests, as well as their rivals the scribes, were now inflamed against Him. At the moment they could do nothing, but the next day they formally demanded whence He derived His right so to act. When they refused to answer His question as to the authority of John the Baptist He in turn refused to tell them His own. But He uttered a parable which more than answered them. The owner of the vineyard, who had sent his servants and last of all his only son, would visit their rejection and murder on the wicked husbandmen. He added a reminder that the stone which the builders refused was, after all, the Divine choice. They were restrained from arresting Him by fear of the people, to whom the meaning of the parable was plain. They therefore sent a joint deputation of Pharisees and Herodians to entrap Him with a question as to the Roman tribute, in answering which He must either lose His influence with the people or else lay Himself open to a charge of treason. When they were baffled, the Sadducees, to whose party the chief priests belonged, sought in vain to pose Him with a problem as to the resurrection of the dead; and after that a more honest scribe confessed the truth of His teaching as to the supremacy of love to God and man over all the sacrificial worship of the Temple, and was told in reply that he was not far from the kingdom of God. Jesus Himself now put a question as to the teaching of the scribes which identified the Messiah with "the Son of David"; and then He denounced those scribes whose pride and extortion and hypocrisy were preparing for them a terrible doom. Before He left the Temple, never to return, one incident gave Him pure satisfaction. His own teaching that all must be given for God was illustrated by the devotion of a poor widow who cast into the treasury the two tiny coins which were all that she had. As He passed out He foretold, in words which corresponded to the doom of the fig-tree, the utter demolition of the imposing but profitless Temple; and presently He opened up to four of His disciples a vision of the future, warning them against false Christs, bidding them expect great sorrows, national and personal, declaring that the gospel must be proclaimed to all the nations, and that after a great tribulation the Son of Man should appear, "coming with the clouds of heaven." The day and the hour none knew, neither the angels nor the Son, but only the Father: it was the duty of all to watch.

Final Scenes.

We now come to the final scenes. The passover was approaching, and plots were being laid for His destruction. He Himself spoke mysteriously of His burial, when a woman poured a vase of costly ointment upon His head. To some this seemed a wasteful act; but He accepted it as a token of the love which gave all that was in its power, and He promised that it should never cease to illustrate His Gospel. Two of the disciples were sent into Jerusalem to prepare the Passover meal. During the meal Jesus declared that He should be betrayed by one of their number. Later in the evening He gave them bread and wine, proclaiming that these were His body and His blood—the tokens of His giving Himself to them, and of a new covenant with God through His death. As they withdrew to the Mount of Olives He foretold their general flight, but promised that when He was risen He would go before them into Galilee. Peter protested faithfulness unto death, but was told that he would deny his Master three times that very night. Then coming to a place called Gethsemane, He bade the disciples wait while He should pray; and taking the three who had been with Him at the Transfiguration He told them to tarry near Him and to watch. He went forward, and fell on the ground, praying that "the cup might be taken away" from Him, but resigning Himself to His Father's will. Presently Judas arrived with a band of armed men, and greeted his Master with a kiss—the signal for His arrest. The disciples fled in panic, after one of them had wounded the high priest's servant. Only a nameless young man tried to follow, but he too fled when hands were laid upon him. Before the high priest Jesus was charged, among other accusations, with threatening to destroy the Temple; but the matter was brought to an issue when He was plainly asked if He were "the Christ, the Son of the Blessed One." He answered that He was, and He predicted that they should see the fulfilment of Daniel's vision of the Son of Man sitting on the right hand of power. Thereupon He was condemned to death for manifest blasphemy, and a scene of cruel mockery followed. Meanwhile Peter in the court below had been sitting with the servants, and in his anxiety to escape recognition had thrice declared that he did not know Jesus. Thus the night passed, and in the morning Jesus was taken to Pilate, for the Jewish council had no power to execute their decree of death. Pilate's question, "Art Thou the King of the Jews?" shows the nature of the accusation which was thought likely to tell with the Roman governor. He had already in bonds one leader of revolution, whose hands were stained with blood—a striking contrast to the calm and silent figure who stood before him. At this moment a crowd came up to ask the fulfilment of his annual act of grace, the pardon of a prisoner at the Passover. Pilate, discerning that it was the envy of the rulers which sought to destroy an inconvenient rival, offered "the King of the Jews" as the prisoner to be released. But the chief priests succeeded in making the people ask for Barabbas and demand the crucifixion of Jesus. Pilate fulfilled his pledge by giving them the man of their choice, and Jesus, whom he had vainly hoped to release on a satisfactory pretext, he now condemned to the shameful punishments of scourging and crucifixion; for the cross, as Jesus had foreseen, was the inevitable fate of a Jewish pretender to sovereignty. The Roman soldiers mocked "the King of the Jews" with a purple robe and a crown of thorns. As they led Him out they forced the cross, which the sufferer commonly carried, upon the shoulders of one Simon of Cyrene, whose sons Alexander and Rufus are here mentioned—probably as being known to St Mark's readers; at any rate, it is interesting to note that, in writing to the Christians at Rome, St Paul a few years earlier had sent a greeting to "Rufus and his mother." Over the cross, which stood between two others, was the condemnatory inscription, "The King of the Jews." This was the Roman designation of Him whom the Jewish rulers tauntingly addressed as "the King of Israel." The same revilers, with a deeper truth than they knew, summed up the mystery of His life and death when they said, "He saved others, Himself He cannot save."

A great darkness shrouded the scene for three hours, and then, in His native Aramaic, Jesus cried in the words of the Psalm, "My God, My God, why has Thou forsaken Me?" One other cry He uttered, and the end came, and at that moment the veil of the Temple was rent from top to bottom—an omen of fearful import to those who had mocked Him, even on the cross, as the destroyer of the Temple, who in three days should build it anew. The disciples of Jesus do not appear as spectators of the end, but only a group of women who had ministered to His needs in Galilee, and had followed Him up to Jerusalem. These women watched His burial, which was performed by a Jewish councillor, to whom Pilate had granted the body after the centurion had certified the reality of the unexpectedly early death. The body was placed in a rock-hewn tomb, and a great stone was rolled against the entrance. Sunset brought on the Jewish sabbath, but the next evening the women brought spices to anoint the body, and at sunrise on the third day they arrived at the tomb, and saw that the stone was rolled away. They entered and found a young man in a white robe, who said, "He is risen, He is not here," and bade them say to His disciples and Peter, "He goeth before you into Galilee; there ye shall see Him, as He said unto you." In terror they fled from the tomb, "and they said nothing to any man, for they feared . . ."

So with a broken sentence the narrative ends. The document is imperfect, owing probably to the accidental loss of its last leaf. In very early times attempts were made to furnish it with a fitting close; but neither of the supplements which we find in manuscripts can be regarded as coming from the original writer. If we ask what must, on grounds of literary probability, have been added before the record was closed, we may content ourselves here with saying that some incident must certainly have been narrated which should have realized the twice-repeated promise that Jesus would be seen by His disciples in Galilee.

3. *Document used by St Matthew and St Luke.*—We pass on now to compare with this narrative of St Mark another very early

document which no longer exists in an independent form, but which can be partially reconstructed from the portions of it which have been embodied in the Gospels of St Matthew and St Luke.

When we review St Mark's narrative as a whole we are struck, first of all, with its directness and simplicity. It moves straightforward upon a well-defined path. It shows us the Lord Jesus entering on the mission predicted by the Baptist without declaring Himself to be the Messiah; attracting the multitudes in Galilee by His healing power and His unbounded sympathy, and at the same time awakening the envy and suspicion of the leaders of religion; training a few disciples till they reach the conviction that He is the Christ, and then, but not till then, admitting them into the secret of His coming sufferings, and preparing them for a mission in which they also must sacrifice themselves; then journeying to Jerusalem to fulfil the destiny which He foresaw, accepting the responsibility of the Messianic title, only to be condemned by the religious authorities as a blasphemer and handed over to the Roman power as a pretender to the Jewish throne. That is the story in its barest outline. It is adequate to its presumed purpose of offering to distant Gentile converts a clear account of their Master's earthly work, and of the causes which led to His rejection by His own people and to His death by Roman crucifixion. The writer makes no comment on the wonderful story which he tells. Allusions to Jewish customs are, indeed, explained as they occur, but apart from this the narrative appears to be a mere transcript of remembered facts. The actors are never characterized; their actions are simply noted down; there is no praise and no blame. To this simplicity and directness of narrative we may in large measure attribute the fact that when two later evangelists desired to give fuller accounts of our Lord's life they both made this early book the basis of their work. In those days there was no sense of unfairness in using up existing materials in order to make a more complete treatise. Accordingly so much of St Mark's Gospel has been taken over word for word in the Gospels of St Luke and St Matthew that, if every copy of it had perished, we could still reconstruct large portions of it by carefully comparing their narratives. They did not hesitate, however, to alter St Mark's language where it seemed to them rough or obscure, for each of them had a distinctive style of his own, and St Luke was a literary artist of a high order. Moreover, though they both accepted the general scheme of St Mark's narrative, each of them was obliged to omit many incidents in order to find room for other material which was at their disposal, by which they were able to supplement the deficiencies of the earlier book. The most conspicuous deficiency was in regard to our Lord's teaching, of which, as we have seen, St Mark had given surprisingly little. Here they were happily in a position to make a very important contribution.

For side by side with St Mark's Gospel there was current in the earliest times another account of the doings and sayings of Jesus Christ. Our knowledge of it to-day is entirely derived from a comparison of the two later evangelists who embodied large portions of it, working it in and out of the general scheme which they derived from St Mark, according as each of them thought most appropriate. St Luke appears to have taken it over in sections for the most part without much modification; but in St Matthew's Gospel its incidents seldom find an independent place; the sayings to which they gave rise are often detached from their context and grouped with sayings of a similar character so as to form considerable discourses, or else they are linked on to sayings which were uttered on other occasions recorded by St Mark. It is probable that many passages of St Luke's Gospel which have no parallel in St Matthew were also derived from this early source; but this is not easily capable of distinct proof; and, therefore, in order to gain a secure conception of the document we must confine ourselves at first to those parts of it which were borrowed by both writers. We shall, however, look to St Luke in the main as preserving for us the more nearly its original form.

We proceed now to give an outline of the contents of this document. To begin with, it contained a fuller account of the teaching of John the Baptist. St Mark tells us only his message of hope; but here we read the severer language with which he called men to repentance. We hear his warning of "the coming wrath": his mighty Successor will baptize with fire; the fruitless tree will be cast into the fire; the chaff will be separated from the wheat and burned with unquenchable fire; the claim to be children of Abraham will not avail, for God can raise up other children to Abraham, if it be from the stones of the desert. Next, we have a narrative of the Temptation, of which St Mark had but recorded the bare fact. It was grounded on the Divine sonship, which we already know was proclaimed at the Baptism. In a threefold vision Jesus is invited to enter upon His inheritance at once; to satisfy His own needs, to accept of earthly dominion, to presume on the Divine protection. The passage stands almost alone as a revelation of inner conflict in a life which outwardly was marked by unusual calm.

The Sermon on the Mount.

Not far from the beginning of the document there stood a remarkable discourse delivered among the hills above the lake. It opens with a startling reversal of the common estimates of happiness and misery. In the light of the coming kingdom it proclaims the blessedness of the poor, the hungry, the sad and the maligned; and the wofulness of the rich, the full, the merry and the popular. It goes on to reverse the ordinary maxims of conduct. Enemies are to be loved, helped, blessed, prayed for. No blow is to be returned; every demand, just or unjust, is to be granted: in short, "as ye desire that men should do to you, do in like manner to them." Then the motive and the model of this conduct are adduced: "Love your enemies . . . . and ye shall be sons of the Highest; for He is kind to the thankless and wicked. Be merciful, as your Father is merciful; and judge not, and ye shall not be judged." We note in passing that this is the first introduction of our Lord's teaching of the fatherhood of God. God is your Father, He says in effect; you will be His sons if like Him you will refuse to make distinctions, loving without looking for a return, sure that in the end love will not be wholly lost. Then follow grave warnings—generous towards others, you must be strict with yourselves; only the good can truly do good; hearers of these words must be doers also, if they would build on the rock and not on the sand. So, with the parable of the two builders, the discourse reached its formal close.

It was followed by the entry of Jesus into Capernaum, where He was asked to heal the servant of a Roman officer. This man's unusual faith, based on his soldierly sense of discipline, surprised the Lord, who declared that it had no equal in Israel itself. Somewhat later messengers arrived from the imprisoned Baptist, who asked if Jesus were indeed "the coming One" of whom he had spoken. Jesus pointed to His acts of healing the sick, raising the dead and proclaiming good news for the poor; thereby suggesting to those who could understand that He fulfilled the ancient prophecy of the Messiah. He then declared the greatness of John in exalted terms, adding, however, that the least in the kingdom of God was John's superior. Then He complained of the unreasonableness of an age which refused John as too austere and Himself as too lax and as being "the friend of publicans and sinners." This narrative clearly presupposes a series of miracles already performed, and also such a conflict with the Pharisees as we have seen recorded by St Mark. Presently we find an offer of discipleship met by the warning that "the Son of Man" is a homeless wanderer; and then the stern refusal of a request for leave to perform a father's funeral rites.

Other Sayings of Jesus.

Close upon these incidents follows a special mission of disciples, introduced by the saying: "The harvest is great, but the labourers are few." The disciples as they journey are to take no provisions, but to throw themselves on the bounty of their hearers; they are to heal the sick and to proclaim the nearness of the kingdom of God. The city that rejects them shall have a less lenient judgment than Sodom; Tyre and Sidon shall be better off than cities like Chorazin and Bethsaida which have seen His miracles;

Capernaum, favoured above all, shall sink to the deepest depth. If words could be sterner than these, they are those which follow: " He that heareth you heareth Me; and he that rejecteth you rejecteth Me; but He that rejecteth Me rejecteth Him that sent Me." This reference to His own personal mission is strikingly expanded in words which He uttered on the return of the disciples. After thanking the Father for revealing to babes what He hides from the wise, He continued in mysterious language: " All things are delivered to Me by My Father; and none knoweth who the Son is but the Father; and who the Father is but the Son, and he to whom the Son chooseth to reveal Him." Happy were the disciples in seeing and hearing what prophets and kings had looked for in vain.

When His disciples, having watched Him at prayer, desired to be taught how to pray, they were bidden to address God as " Father "; to ask first for the hallowing of the Father's name, and the coming of His kingdom; then for their daily food, for the pardon of their sins and for freedom from temptation. It was the prayer of a family—that the sons might be true to the Father, and the Father true to the sons; and they were further encouraged by a parable of the family: " Ask and ye shall receive. . . . Every one that asketh receiveth " : for the heavenly Father will do more, not less, than an earthly father would do for his children. After He had cast out a dumb demon, some said that His power was due to Beelzebub. He accordingly asked them by whom the Jews themselves cast out demons; and He claimed that His power was a sign that the kingdom of God was come. But He warned them that demons cast out once might return in greater force. When they asked for a sign from heaven, He would give them no more than the sign of Jonah, explaining that the repentant Ninevites should condemn the present generation: so, too, should the queen of Sheba; for that which they were now rejecting was more than Jonah and more than Solomon. Yet further warnings were given when a Pharisee invited Him to his table, and expressed surprise that He did not wash His hands before the meal. The cleansing of externals and the tithing of garden-produce, He declares, have usurped the place of judgment and the love of God. Woe is pronounced upon the Pharisees: they are successors to the murderers of the prophets. Then citing from Genesis and 2 Chronicles, the first and last books in the order of the Jewish Bible, He declared that all righteous blood from that of Abel to that of Zachariah should be required of that generation. After this the disciples are encouraged not to fear their murderous opponents. The very sparrows are God's care—much more shall they be; the hairs of their head are all counted. In the end the Son of Man will openly own those who have owned Him before men. For earthly needs no thought is to be taken: the birds and the flowers make no provision for their life and beauty. God will give food and raiment to those who are seeking His kingdom. Earthly goods should be given away in exchange for the imperishable treasures. Suddenly will the Son of Man come: happy the servant whom His Master finds at his appointed task. In brief parables the kingdom of God is likened to a mustard-seed and to leaven. When Jesus is asked if the saved shall be few, He replies that the door is a narrow one. Then, changing His illustration, He says that many shall seek entrance in vain; for the master of the house will refuse to recognize them. But while they are excluded, a multitude from all quarters of the earth shall sit down with Abraham, Isaac and Jacob, and the prophets in the kingdom of God.

His eyes are now fixed on Jerusalem, where, like the prophets, He must die. " Jerusalem, Jerusalem, how often have I desired to gather thy children together, as a bird her brood beneath her wings, but ye refused." " Ye shall not see Me, until ye shall say, Blessed is He that cometh in the name of the Lord." After this we have the healing of a dropsical man on the Sabbath, with a reply to the murmuring Pharisees; and then a parable of the failure of invited guests and the filling of their places from the streets. A few fragmentary passages remain, of which it will be sufficient to cite a word or two to call them to remembrance. There is a warning that he who forsakes not father and mother cannot be a disciple, nor he who does not bear his cross. Savourless salt is fit for nothing. The lost sheep is brought home with a special joy. " Ye cannot serve God and Mammon." Scandals must arise, but woe to him through whom they arise. The Son of Man will come with the suddenness of lightning; the days of Noah and the days of Lot will find a parallel in their blind gaiety and their inevitable disaster. He who seeks to gain his life will lose it. " One shall be taken, and the other left." " Where the carcase is, the vultures will gather." Then, lastly, we have a parable of the servant who failed to employ the money entrusted to him; and a promise that the disciples shall sit on twelve thrones to judge the twelve tribes of Israel. We cannot say by our present method of determination, how this document closed; for in the narratives of the Passion and the Resurrection St Matthew and St Luke only coincide in passages which they have taken from St Mark.

Comparison with St Mark.

Now that we have reconstructed in outline this early account of the Lord Jesus, so far as it has been used by both the later evangelists, we may attempt to compare the picture which it presents to us with that which was offered by St Mark. But in doing so we must remember that we know it only in fragments. There can be little doubt that much more of it is embedded in St Luke's Gospel, and something more also in St Matthew's; but in order to stand on firm ground we have considered thus far only those portions which both of these writers elected to use in composing their later narratives. To go beyond this is a work of delicate discrimination. It can only be effected by a close examination of the style and language of the document, which may enable us in some instances to identify with comparative security certain passages which are found in St Luke, but which St Matthew did not regard as suitable for his purpose. Among these we may venture, quite tentatively, to mention the sermon at Nazareth which opened with a passage from the Book of Isaiah, the raising of the widow's son at Nain, and the parable of the good Samaritan. These are found in St Luke, but not in St Matthew. On the other hand, it is not improbable that the wonderful words which begin, " Come unto Me all ye that labour," were drawn by St Matthew from the same document, though they are not recorded by St Luke. But here we have entered upon a region of less certainty, in which critical scholarship has still much to do; and these passages are mentioned here only as a reminder that the document must have contained more than what St Matthew and St Luke each independently determined to borrow from it. Looking, then, at the portions which we have indicated as having this two-fold testimony, we see that in their fragmentary condition we cannot trace the clear historical development which was so conspicuous a feature of St Mark's Gospel; yet we need not conclude that in its complete form it failed to present an orderly narrative. Next, we see that wherever we are able to observe its method of relating an incident, as in the case of the healing of the centurion's servant, we have the same characteristics of brevity and simplicity which we admired in St Mark. No comment is made by the narrator; he tells his tale in the fewest words and passes on. Again, we note that it supplies just what we feel we most need when we have reached the end of St Mark's story, a fuller account of the teaching which Jesus gave to His disciples and to the people at large. And we see that the substance of that teaching is in complete harmony with the scattered hints that we found in St Mark. If the fatherhood of God stands out clearly, we may remember a passage of St Mark also which speaks of " the Heavenly Father " as forgiving those who forgive. If prayer is encouraged, we may also remember that the same passage of St Mark records the saying: " All things whatsoever ye pray for and ask, believe that ye have received them and ye shall have them." If in one mysterious passage Jesus speaks of " the Father " and " the Son "—terms with which the Gospel of St John has made us familiar—St Mark also in one passage uses the same impressive terms—" the Son " and " the Father." There are, of course, many other parallels with St Mark, and at some points the two documents seem to overlap and to relate the same incidents in somewhat different forms. There is the same use of parables from nature, the same incisiveness of speech and employment of paradox, the same demand to sacrifice all to Him and for His cause, the same importunate claim made by Him on the human soul.

The Element of Warning.

But the contrast between the two writers is even more important for our purpose. No one can read through the passages to which we have pointed without feeling the solemn sternness of the great Teacher, a sternness which can indeed be traced here and there in St Mark, but which does not give its tone to the whole of his picture. Here we see Christ standing forth in solitary grandeur, looking with the eyes of another world on a society which is blindly hastening to its dissolution. It may be that if this document had come down to us in its entirety, we should have gathered from it an exaggerated idea of the severity of our Lord's character. Certain it is that as we read over these fragments we are somewhat startled by the predominance of the element of warning, and by the assertion of rules of conduct which seem almost inconsistent with a normal condition of settled social life. The warning to the nation sounded by the Baptist, that God could raise up a new family for Abraham, is heard again and again in our Lord's teaching. Gentile faith puts Israel to shame. The sons of the kingdom will be left outside, while strangers feast with Abraham. Capernaum shall go to perdition; Jerusalem shall be a desolate ruin. The doom of the nation is pronounced; its fate is imminent; there is no ray of hope for the existing constitution of religion and society. As to individuals within the nation, the despised publicans and sinners will find God's favour before the self-satisfied representatives of the national religion. In such a condition of affairs it is hardly surprising to find that the great and stern Teacher congratulates the poor and has nothing but pity for the rich; that He has no interest at all in comfort or property. If a man asks you for anything, give it him; if he takes it without asking, do not seek to recover it. Nothing material is worth a thought; anxiety is folly; your Father, who feeds His birds and clothes His flowers, will feed and clothe you. Rise to the height of your sonship to God; love your enemies even as God loves His; and if they kill you, God will care for you still; fear them not, fear only Him who loves you all.

Here is a new philosophy of life, offering solid consolation amid the ruin of a world. We have no idea who the disciple may have been who thus seized upon the sadder elements of the teaching of Jesus; but we may well think of him as one of those who were living in Palestine in the dark and threatening years of internecine strife, when the Roman eagles were gathering round their prey, and the first thunder was muttering of the storm which was to leave Jerusalem a heap of stones. At such a moment the warnings of our Lord would claim a large place in a record of His teaching, and the strange comfort which He had offered would be the only hope which it would seem possible to entertain.

The Earlier Narratives.

4. *Additions by the Gospel according to St Matthew.*—We have now examined in turn the two earliest pictures which have been preserved to us of the life of Jesus Christ. The first portrays Him chiefly by a record of His actions, and illustrates His strength, His sympathy, and His freedom from conventional restraints. It shows the disturbing forces of these characteristics, which aroused the envy and apprehension of the leaders of religion. The first bright days of welcome and popularity are soon clouded: the storm begins to lower. More and more the Master devotes Himself to the little circle of His disciples, who are taught that they, as well as He, can only triumph through defeat, succeed by failure, and find their life in giving it away. At length, in fear of religious innovations and pretending that He is a political usurper, the Jews deliver Him up to die on a Roman cross. The last page of the story is torn away, just at the point when it has been declared that He is alive again and about to show Himself to His disciples. The second picture has a somewhat different tone. It is mainly a record of teaching, and the teaching is for the most part stern and paradoxical. It might be described as revolutionary. It is good tidings to the poor: it sets no store on property and material comfort: it pities the wealthy and congratulates the needy. It reverses ordinary judgments and conventional maxims of conduct. It proclaims the downfall of institutions, and compares the present blind security to the days of Noah and of Lot: a few only shall escape the coming overthrow. Yet even in this sterner setting the figure portrayed is unmistakably the same. There is the same strength, the same tender sympathy, the same freedom from convention: there is the same promise to fulfil the highest hopes, the same surrender of life, and the same imperious demand on the lives of others. No thoughtful man who examines and compares these pictures can doubt that they are genuine historical portraits of a figure wholly different from any which had hitherto appeared on the world's stage. They are beyond the power of human invention. They are drawn with a simplicity which is their own guarantee. If we had these, and these only, we should have an adequate explanation of the beginnings of Christianity. There would still be a great gap to be filled before we reached the earliest letters of St Paul; but yet we should know what the Apostle meant when he wrote to "the Church of the Thessalonians in God the Father and the Lord Jesus Christ," and reminded them how they had "turned from idols to serve the living and true God, and to wait for His Son from heaven, whom He raised from the dead, even Jesus who delivereth us from the wrath to come."

If these two narratives served the first needs of Christian believers, it is easy to see that they would presently stimulate further activity in the same direction. For, to begin with, they were obviously incomplete: many incidents and teachings known to the earliest disciples found no place in them; and they contained no account of the life of Jesus Christ before His public ministry, no record of His pedigree, His birth or His childhood. Secondly, their form left much to be desired; for one of them at least was rude in style, sometimes needlessly repetitive and sometimes brief to obscurity. Moreover the very fact that there were two challenged a new and combined work which perhaps should supersede both.

The Gospel of St Matthew.

Accordingly, some years after the fall of Jerusalem—we cannot tell the exact date or the author's name—the book which we call the Gospel according to St Matthew was written to give the Palestinian Christians a full account of Jesus Christ, which should present Him as the promised Messiah, fulfilling the ancient Hebrew prophecies, proclaiming the kingdom of heaven, and founding the Christian society. The writer takes St Mark as his basis, but he incorporates into the story large portions of the teaching which he has found in the other document. He groups his materials with small regard to chronological order; and he fashions out of the many scattered sayings of our Lord continuous discourses, everywhere bringing like to like, with considerable literary art. A wide knowledge of the Old Testament supplies him with a text to illustrate one incident after another; and so deeply is he impressed with the correspondence between the life of Christ and the words of ancient prophecy, that he does not hesitate to introduce his quotations by the formula "that it might be fulfilled which was spoken by the prophet."

His Hebrew instinct leads him to begin with a table of genealogy, artificially constructed in groups of fourteen generations—from Abraham to David, from David to the Captivity, and from the Captivity to the Christ. The royal descent of the Messiah is thus declared, and from the outset His figure is set against the background of the Old Testament. He then proceeds to show that, though His lineage is traced through Joseph's ancestors, He was but the adopted son of Joseph, and he tells the story of the Virgin-birth. The coming of the Child draws Eastern sages to his cradle and fills the court of Herod with suspicious fears. The cruel tyrant kills the babes of Bethlehem, but the Child has been withdrawn by a secret flight into Egypt, whence he presently returns to the family home at Nazareth in Galilee. All this is necessarily fresh material, for the other records had dealt only with the period of public ministry. We have no knowledge of the source from which it was drawn. From the historical standpoint its value must be appraised by the estimate which is formed of the writer's general trustworthiness as a narrator, and by the extent to which the incidents receive confirmation from other quarters. The central fact of the Virgin-birth, as we shall presently see, has high attestation from another early writer.

Discourses and Parables.

The next addition which St Matthew's Gospel makes to our knowledge is of a different kind. It consists of various important sayings of our Lord, which are combined with discourses found in the second document and are worked up into the great utterance which we call the Sermon on the Mount. Such grouping of materials is a feature of this Gospel, and was possibly designed for purposes of public instruction; so that continuous passages might be read aloud in the services of the Church, just as passages from the Old Testament were read in the Jewish synagogues. This motive would account not only for the arrangement of the material, but also for certain changes in the language which seem intended to remove difficulties, and to interpret what is ambiguous or obscure. An example of such interpretation meets us at the outset. The startling saying, "Blessed are ye poor," followed by the woe pronounced upon the rich, might seem like a condemnation of the very principle of property; and when the Christian Church had come to be organized as a society containing rich and poor, the heart of the saying was felt to be more truly and clearly expressed in the words, "Blessed are the poor in spirit." This interpretative process may be traced again and again in this Gospel, which frequently seems to reflect the definite tradition of a settled Church.

Apart from the important parables of the tares, the pearl and the net, the writer adds little to his sources until we come to the remarkable passage in ch. xvi., in which Peter the Rock is declared to be the foundation of the future Church, and is entrusted with the keys of the kingdom of heaven. The function of "binding and loosing," here assigned to him, is in identical terms assigned to the disciples generally in a passage in ch. xviii. in which for the second time we meet with the word "Church"—a word not found elsewhere in the Gospels. There is no sufficient ground for denying that these sayings were uttered by our Lord, but the fact that they were now first placed upon record harmonizes with what has been said already as to the more settled condition of the Christian society which this Gospel appears to reflect.

The parables of the two debtors, the labourers in the vineyard, the two sons, the ten virgins, the sheep and goats, are recorded only by this evangelist. But by way of incident he has almost nothing to add till we come to the closing scenes. The earthquake at the moment of our Lord's death and the subsequent appearance of departed saints are strange traditions unattested by other writers. The same is to be said of the soldiers placed to guard the tomb, and of the story that they had been bribed to say that the sacred body had been stolen while they slept. On the other hand, the appearance of the risen Christ to the women may have been taken from the lost pages of St Mark, being the sequel to the narrative which is broken off abruptly in this Gospel: and it is not improbable that St Mark's Gospel was the source of the great commission to preach and baptize with which St Matthew closes, though the wording of it has probably been modified in accordance with a settled tradition.

The work which the writer of this Gospel thus performed received the immediate sanction of a wide acceptance. It met a definite spiritual need. It presented the Gospel in a suitable form for the edification of the Church; and it confirmed its truth by constant appeals to the Old Testament scriptures, thus manifesting its intimate relation with the past as the outcome of a long preparation and as the fulfilment of a Divine purpose. No Gospel is so frequently quoted by the early post-apostolic writers: none has exercised a greater influence upon Christianity, and consequently upon the history of the world.

Yet from the purely historical point of view its evidential value is not the same as that of St Mark. Its facts for the most part are simply taken over from the earlier evangelist, and the historian must obviously prefer the primary source. Its true importance lies in its attestation of the genuineness of the earlier portraits to which it has so little to add, in its recognition of the relation of Christ to the whole purpose of God as revealed in the Old Testament, and in its interpretation of the Gospel message in its bearing on the living Church of the primitive days.

5. *Additions by St Luke.*—While the needs of Jewish believers were amply met by St Matthew's Gospel, a like service was rendered to Gentile converts by a very different writer. St Luke was a physician who had accompanied St Paul on his missionary journeys. He undertook a history of the beginnings of Christianity, two volumes of which have come down to us, entitled the Gospel and the Acts of the Apostles. His Gospel, like St Matthew's, is founded on St Mark, with the incorporation of large portions of the second document of which we have spoken above. But the way in which the two writers have used the same materials is strikingly different. In St Matthew's Gospel the original sources are frequently blended: the incidents of St Mark are rearranged and often grouped afresh according to subject matter: harsh and ambiguous sentences of both documents are toned down or interpreted. St Luke, on the contrary, chooses between parallel stories of his two sources, preferring neither to duplicate nor to combine: he incorporates St Mark in continuous sections, following him alone for a time, then leaving him entirely, and then returning to introduce a new block of his narrative. He modifies St Mark's style very freely, but he makes less change in the recorded words of our Lord, and he adheres more closely to the original language of the second document.

In his first two chapters he gives an account of the birth and childhood of St John the Baptist and of our Lord Himself, gathered perhaps directly from the traditions of the Holy Family, and written in close imitation of the sacred stories of the Old Testament which were familiar to him in their Greek translation. The whole series of incidents differ from that which we find in St Matthew's Gospel, but there is no direct variance between them. The two narratives are in agreement as to the central fact of the Virgin-birth. St Luke gives a table of genealogy which is irreconcilable with the artificial table of St Matthew's Gospel, and which traces our Lord's ancestry up to Adam, "which was the son of God."

The opening scene of the Galilean ministry is the discourse at Nazareth, in which our Lord claims to fulfil Isaiah's prophecy of the proclamation of good tidings to the poor. The same prophecy is alluded to in His reply to the Baptist's messengers which is incorporated subsequently from the second document. The scene ends with the rejection of Christ by His own townsfolk, as in the parallel story of St Mark which St Luke does not give. It is probable that St Luke found this narrative in the second document, and chose it after his manner in preference to the less instructive story in St Mark. He similarly omits the Marcan account of the call of the fishermen, substituting the story of the miraculous draught. After that he follows St Mark alone, until he introduces after the call of the twelve apostles the sermon which begins with the beatitudes and woes. This is from the second document, which he continues to use, and that without interruption (if we may venture to assign to it the raising of the widow's son at Nain and the anointing by the sinful woman in the Pharisee's house), until he returns to incorporate another section from St Mark.

Characteristic Section of St Luke's Gospel.

This in turn is followed by the most characteristic section of his Gospel (ix. 51–xviii. 14), a long series of incidents wholly independent of St Mark, and introduced as belonging to the period of the final journey from Galilee to Jerusalem. Much of this material is demonstrably derived from the second document; and it is quite possible that the whole of it may come from that source. There are special reasons for thinking so in regard to certain passages, as for example the mission of the seventy disciples and the parable of the good Samaritan, although they are not contained in St Matthew's Gospel.

For the closing scenes at Jerusalem St Luke makes considerable additions to St Mark's narrative: he gives a different account of the Last Supper, and he adds the trial before Herod and the incident of the penitent robber. He appears to have had no information as to the appearance of the risen Lord in Galilee, and he accordingly omits from his reproduction of St Mark's narrative the twice-repeated promise of a meeting with the disciples there. He supplies, however, an account of the appearance to the two disciples at Emmaus and to the whole body of the apostles in Jerusalem.

St Luke's use of his two main sources has preserved the characteristics of both of them. The sternness of certain passages, which has led some critics to imagine that he was an Ebionite, is mainly, if not entirely, due to his faithful reproduction of the language of the second document. The key-note of his Gospel is universality: the mission of the Christ embraces the poor, the weak, the despised, the heretic and the sinful: it is good tidings to all mankind. He tells of the devotion of Mary and Martha, and of the band of women who ministered to our Lord's needs and followed Him to Jerusalem: he tells also of His kindness to more than one sinful woman. Zacchaeus the publican and the grateful Samaritan leper further illustrate this characteristic. Writing as he does for Gentile believers he omits many details which from their strongly Jewish cast might be unintelligible or uninteresting. He also modifies the harshness of St Mark's style, and frequently recasts his language in reference to diseases. From an historical point of view his Gospel is of high value. The proved accuracy of detail elsewhere, as in his narration of events which he witnessed in company with St Paul, enhances our general estimation of his work. A trustworthy observer and a literary artist, the one non-Jewish evangelist has given us—to use M. Renan's words—" the most beautiful book in the world."

6. *Additions by St John.*—We come lastly to consider what addition to our knowledge of Christ's life and work is made by the Fourth Gospel. St Mark's narrative of our Lord's ministry and passion is so simple and straightforward that it satisfies our historical sense. We trace a natural development in it: we seem to see why with such power and such sympathy He necessarily came into conflict with the religious leaders of the people, who were jealous of the influence which He gained and were scandalized by His refusal to be hindered in His mission of mercy by rules and conventions to which they attached the highest importance. The issue is fought out in Galilee, and when our Lord finally journeys to Jerusalem He knows that He goes there to die. The story is so plain and convincing in itself that it gives at first sight an impression of completeness. This impression is confirmed by the Gospels of St Matthew and St Luke, which though they add much fresh material do not disturb the general scheme presented by St Mark. But on reflection we are led to question the sufficiency of the account thus offered to us. Is it probable, we ask, that our Lord should have neglected the sacred custom in accordance with which the pious Jew visited Jerusalem several times each year for the observance of the divinely appointed feasts? It is true that St Mark does not break his narrative of the Galilean ministry to record such visits: but this does not prove that such visits were not made. Again, is it probable that He should have so far neglected Jerusalem as to give it no opportunity of seeing Him and hearing His message until the last week of His life? If the writers of the other two Gospels had no means at their disposal for enlarging the narrow framework of St Mark's narrative by recording definite visits to Jerusalem, at least they preserve to us words from the second document which seem to imply such visits: for how else are we to explain the pathetic complaint, " Jerusalem, Jerusalem, how often would I have gathered thee, as a hen gathereth her chickens under her wings; but ye would not"?

St John's Gospel meets our questionings by a wholly new series of incidents and by an account of a ministry which is concerned mainly not with Galileans but with Judaeans, and which centres in Jerusalem. It is carried on to a large extent concurrently with the Galilean ministry: it is not continuous, but is taken up from feast to feast as our Lord visits the sacred city at the times of its greatest religious activity. It differs in character from the Galilean ministry: for among the simple, unsophisticated folk of Galilee Jesus presents Himself as a healer and helper and teacher, keeping in the background as far as possible His claim to be the Messiah; whereas in Jerusalem His authority is challenged at His first appearance, the element of controversy is never absent, His relation to God is from the outset the vital issue, and consequently His Divine claim is of necessity made explicit. Time after time His life is threatened before the feast is ended, and when the last passover has come we can well understand, what was not made sufficiently clear in the brief Marcan narrative, why Jerusalem proved so fatally hostile to His Messianic claim.

The Purpose of St John's Gospel.

The Fourth Gospel thus offers us a most important supplement to the limited sketch of our Lord's life which we find in the Synoptic Gospels. Yet this was not the purpose which led to its composition. That purpose is plainly stated by the author himself: " These things have been written that ye may believe that Jesus Christ is the Son of God, and that believing ye may have life in His name." His avowed aim is, not to write history, but to produce conviction. He desires to interpret the coming of Jesus Christ into the world, to declare whence and why He came, and to explain how His coming, as light in the midst of darkness, brought a crisis into the lives of all with whom He came in contact. The issue of this crisis in His rejection by the Jews at Jerusalem is the main theme of the book.

St John's prologue prepares us to find that he is not writing for persons who require a succinct narrative of facts, but for those who having such already in familiar use are asking deep questions as to our Lord's mission. It goes back far behind human birth or lines of ancestry. It begins, like the sacred story of creation, " In the beginning." The Book of Genesis had told how all things were called into existence by a Divine utterance: " God said, Let there be . . . and there was." The creative Word had been long personified by Jewish thought, especially in connexion with the prophets to whom "the Word of the Lord" came. " In the beginning," then, St John tells us, the Word was—was with God—yea, was God. He was the medium of creation, the source of its light and its life—especially of that higher life which finds its manifestation in men. So He was in the world, and the world was made by Him, and yet the world knew Him not. At length He came, came to the home which had been prepared for Him, but His own people rejected Him. But such as did receive Him found a new birth, beyond their birth of flesh and blood: they became children of God, were born of God. In order thus to manifest Himself He had undergone a human birth: " the Word was made flesh, and dwelt among us, and we beheld His glory "—the glory, as the evangelist has learned to see, of the Father's only-begotten Son, who has come into the world to reveal to men that God whom "no man hath ever seen." In these opening words we are invited to study the life of Christ from a new point of view, to observe His self-manifestation and its issue. The evangelist looks back across a period of half a century, and writes of Christ not merely as he saw Him in those far-off days, but as he has come by long experience to think and speak of Him. The past is now filled with a glory which could not be so fully perceived at the time, but which, as St John tells, it was the function of the Holy Spirit to reveal to Christ's disciples.

The first name which occurs in this Gospel is that of John the Baptist. He is even introduced into the prologue which sketches in general terms the manifestation of the Divine Word: " There was a man sent from God, whose name was John: he came for witness, to witness to the Light, that through him all might believe." This witness of John holds a position of high importance in this Gospel. His mission is described as running on for a while concurrently with that of our Lord, whereas in the other Gospels we have no record of our Lord's work until John is cast into prison. It is among the disciples of the Baptist on the banks of the Jordan that Jesus finds His first disciples. The Baptist has pointed Him out to them in striking language, which recalls at once the symbolic ritual of the law and the spiritual lessons of the prophets: " Behold, the Lamb of God, which taketh away the sin of the world."

Soon afterwards at Cana of Galilee Jesus gives His first "sign," as the evangelist calls it, in the change of water into wine to supply the deficiency at a marriage feast. This scene has all the happy brightness of the early Galilean ministry which St Mark records. It stands in sharp contrast with the subsequent appearance of Jesus in Jerusalem at the Passover, when His first act is to drive the traders from the Temple courts. In this He seems to be carrying the Baptist's stern mission of purification from the desert into the heart of the sacred city, and so fulfilling, perhaps consciously, the solemn prophecy of Malachi which opens with the words: "Behold, I will send My Messenger, and He shall prepare the way before Me; and the Lord whom ye seek shall suddenly come to His Temple" (Mal. iii. 1–5). This significant action provokes a challenge of His authority, which is answered by a mysterious saying, not understood at the time, but interpreted afterwards as referring to the Resurrection. After this our Lord was visited secretly by a Pharisee named Nicodemus, whose advances were severely met by the words, "Except a man be born again, he cannot see the kingdom of God." When Nicodemus objected that this was to demand a physical impossibility, he was answered that the new birth was "of water and spirit"—words which doubtless contained a reference to the mission of the Baptist and to his prophecy of One who should baptize with the Holy Spirit. Towards the end of this conversation the evangelist passes imperceptibly from reporting the words of the Lord into an interpretation or amplification of them, and in language which recalls the prologue he unfolds the meaning of Christ's mission and indicates the crisis of self-judgment which necessarily accompanies the manifestation of the Light to each individual. When he resumes his narrative the Lord has left Jerusalem, and is found baptizing disciples, in even greater numbers than the Baptist himself. Though Jesus did not personally perform the rite, it is plain once again that in this early period He closely linked His own mission with that of John the Baptist. When men hinted at a rivalry between them, John plainly declared "He must increase, and I must decrease": and the reply of Jesus was to leave Judaea for Galilee.

Away from the atmosphere of contention we find Him manifesting the same broad sympathy and freedom from convention which we have noted in the other Gospels, especially in that of St Luke. He converses with a woman, with a woman moreover who is a Samaritan, and who is of unchaste life. He offers her the "living water" which shall supply all her needs: she readily accepts Him as the expected Messiah, and He receives a welcome from the Samaritans. He passes on to Galilee, where also He is welcomed, and where He performs His second "sign," healing the son of one of Herod's courtiers.

The Ministry at Jerusalem.

But St John's interest does not lie in Galilee, and he soon brings our Lord back to Jerusalem on the occasion of a feast. The Baptist's work is now ended; and, though Jesus still appeals to the testimony of John, the new conflict with the Jewish authorities shows that He is moving now on His own independent and characteristic lines. In cleansing the Temple He had given offence by what might seem an excess of rigour: now, by healing a sick man and bidding him carry his bed on the Sabbath, He offended by His laxity. He answered His accusers by the brief but pregnant sentence: "My Father worketh even until now, and I work." They at once understood that He thus claimed a unique relation to God, and their antagonism became the more intense: "the Jews therefore sought the more to kill Him, because He had not only broken the Sabbath, but had also said that God was His own Father, making Himself equal to God." His first reply is then expanded to cover the whole region of life. The Son beholds the Father at work, and works concurrently, doing nothing of Himself. He does the Father's will. The very principle of life is entrusted to Him. He quickens, and He judges. As Son of Man He judges man.

The next incident is the feeding of the five thousand, which belongs to the Galilean ministry and is recorded by the three other evangelists. St John's purpose in introducing it is not historical but didactic. It is made the occasion of instruction as to the heavenly food, the flesh and blood of Him who came down from heaven. This teaching leads to a conflict with certain Judaeans who seem to have come from Jerusalem, and it proves a severe test even to the faith of disciples.

The feast of tabernacles brings fresh disputes in Jerusalem, and an attempt is made to arrest Jesus. A climax of indignation is reached when a blind man is healed at the pool of Siloam on the sabbath day. At the feast of the dedication a fresh effort at arrest was made, and Jesus then withdrew beyond the Jordan. Here He learned of the sickness of Lazarus, and presently He returned and came to Bethany to raise him from the dead. The excitement produced by this miracle led to yet another attack, destined this time to be successful, on the life of Jesus. The Passover was at hand, and the last supper of our Lord with His disciples on the evening before the Passover lamb was killed is made the occasion of the most inspiring consolations. Our Lord interprets His relation to the disciples by the figure of a tree and its branches—He is the whole of which they are the parts; He promises the mission of the Holy Spirit to continue His work in the world; and He solemnly commends to His Father the disciples whom He is about to leave.

The account of the trial and the crucifixion differs considerably from the accounts given in the other Gospels. St John's narratives are in large part personal memories, and in more than one incident he himself figures as the unnamed disciple "whom Jesus loved." In the Resurrection scenes he also gives incidents in which he has played a part; and the appearances of the risen Lord are not confined either to Jerusalem or to Galilee, but occur in both localities.

If we ask what is the special contribution to history, apart from theology, which St John's Gospel makes, the answer would seem to be this—that beside the Galilean ministry reported by St Mark there was a ministry to "Jews" (Judaeans) in Jerusalem, not continuous, but occasional, taken up from time to time as the great feasts came round; that its teaching was widely different from that which was given to Galileans, and that the situation created was wholly unlike that which arose out of the Galilean ministry. The Galilean ministry opens with enthusiasm, ripening into a popularity which even endangers a satisfactory result. Where opposition manifests itself, it is not native opposition, but comes from religious teachers who are parts of a system which centres in Jerusalem, and who are sometimes expressly noted as having come from Jerusalem. The Jerusalem ministry on the contrary is never welcomed with enthusiasm. It has to do with those who challenge it from the first. There is no atmosphere of simplicity and teachableness which rejoices in the manifestation of power and sympathy and liberty. It is a witness delivered to a hostile audience, whether they will hear or no. Ultimate issues are quickly raised: keen critics see at once the claims which underlie deeds and words, and the claims in consequence become explicit: the relation of the teacher to God Himself is the vital interest. The conflict which thus arose explains what St Mark's succinct narrative had left unexplained—the fatal hostility of Jerusalem. It may have been a part of St John's purpose to give this explanation, and to make other supplements or corrections where earlier narratives appeared to him incomplete or misleading. But he says nothing to indicate this, while on the other hand he distinctly proclaims that his purpose is to produce and confirm conviction of the divine claims of Jesus Christ.

For bibliography see BIBLE; CHRISTIANITY; CHURCH HISTORY; and the articles on the separate Gospels. (J. A. R.)

JET (Fr. *jais*, Ger. *Gagat*), a substance which seems to be a peculiar kind of lignite or anthracite; often cut and polished for ornaments. The word "jet" probably comes, through O. Fr. *jaiet*, from the classical *gagates*, a word which was derived, according to Pliny, from Gagas, in Lycia, where jet, or a similar substance, was originally found. Jet was used in Britain in prehistoric times; many round barrows of the Bronze age have yielded jet beads, buttons, rings, armlets and other ornaments. The abundance of jet in Britain is alluded to by Caius Julius

Solinus (*fl.* 3rd century) and jet ornaments are found with Roman relics in Britain. Probably the supply was obtained from the coast of Yorkshire, especially near Whitby, where nodules of jet were formerly picked up on the shore. Caedmon refers to this jet, and at a later date it was used for rosary beads by the monks of Whitby Abbey.

The Whitby jet occurs in irregular masses, often of lenticular shape, embedded in hard shales known as jet-rock. The jet-rock series belongs to that division of the Upper Lias which is termed the zone of *Ammonites serpentinus.* Microscopic examination of jet occasionally reveals the structure of coniferous wood, which A. C. Seward has shown to be araucarian. Probably masses of wood were brought down by a river, and drifted out to sea, where becoming water-logged they sank, and became gradually buried in a deposit of fine mud, which eventually hardened into shale. Under pressure, perhaps assisted by heat, and with exclusion of air, the wood suffered a peculiar kind of decomposition, probably modified by the presence of salt water, as suggested by Percy E. Spielmann. Scales of fish and other fossils of the jet-rock are frequently impregnated with bituminous products, which may replace the original tissues. Drops of liquid bitumen occur in the cavities of some fossils, whilst inflammable gas is not uncommon in the jet-workings, and petroleum may be detected by its smell. Iron pyrites is often associated with the jet.

Formerly sufficient jet was found in loose pieces on the shore, set free by the disintegration of the cliffs, or washed up from a submarine source. When this supply became insufficient, the rock was attacked by the jet-workers; ultimately the workings took the form of true mines, levels being driven into the shales not only at their outcrop in the cliffs but in some of the inland dales of the Yorkshire moorlands, such as Eskdale. The best jet has a uniform black colour, and is hard, compact and homogeneous in texture, breaking with a conchoidal fracture. It must be tough enough to be readily carved or turned on the lathe, and sufficiently compact in texture to receive a high polish. The final polish was formerly given by means of rouge, which produces a beautiful velvety surface, but rotten-stone and lampblack are often employed instead. The softer kinds, not capable of being freely worked, are known as bastard jet. A soft jet is obtained from the estuarine series of the Lower Oolites of Yorkshire.

Much jet is imported from Spain, but it is generally less hard and lustrous than true Whitby jet. In Spain the chief locality is Villaviciosa, in the province of Asturias. France furnishes jet, especially in the department of the Aude. Much jet, too, occurs in the Lias of Württemberg, and works have been established for its utilization. In the United States jet is known at many localities but is not systematically worked. Pennsylvanian anthracite, however, has been occasionally employed as a substitute. In like manner Scotch cannel coal has been sometimes used at Whitby. Imitations of jet, or substitutes for it, are furnished by vulcanite, glass, black obsidian and black onyx, or stained chalcedony. Jet is sometimes improperly termed black amber, because like amber, though in less degree, it becomes electric by friction.

See P. E. Spielmann, "On the Origin of Jet," *Chemical News* (Dec. 14, 1906); C. Fox-Strangways, "The Jurassic Rocks of Britain, Vol. I. Yorkshire," *Mem. Geol. Surv.* (1892); J. A. Bower, "Whitby Jet and its Manufacture," *Journ. Soc. Arts* (1874, vol. xxii. p. 80).

JETHRO (or JETHER, Exod. iv. 18), the priest of Midian, in the Bible, whose daughter Zipporah became the wife of Moses. He is known as Hobab the son of Reuel the Kenite (Num. x. 29; Judg. iv. 11), and once as Reuel (Exod. ii. 18); and if Zipporah is the wife of Moses referred to in Num. xii. 1, the family could be regarded as Cushite (see CUSH). Jethro was the priest of Yahweh, and resided at the sacred mountain where the deity commissioned Moses to deliver the Israelites from Egypt. Subsequently Jethro came to Moses (probably at Kadesh), a great sacrificial feast was held, and the priest instructed Moses in legislative procedure; Exod. xviii. 27 (see EXODUS) and Num. x. 30 imply that the scene was not Sinai. Jethro was invited to accompany the people into the promised land, and later, we find his clan settling in the south of Judah (Judg. i. 16); see KENITES. The traditions agree in representing the kin of Moses as related to the mixed tribes of the south of Palestine (see EDOM) and in ascribing to the family an important share in the early development of the worship of Yahweh. Cheyne suggests that the names of Hobab and of Jonadab the father of the Rechabites (*q.v.*) were originally identical (*Ency. Bib.* ii. col. 2101).

JETTY. The term jetty, derived from Fr. *jetée*, and therefore signifying something "thrown out," is applied to a variety of structures employed in river, dock and maritime works, which are generally carried out in pairs from river banks, or in continuation of river channels at their outlets into deep water; or out into docks, and outside their entrances; or for forming basins along the sea-coast for ports in tideless seas. The forms and construction of these jetties are as varied as their uses; for though they invariably extend out into water, and serve either for directing a current or for accommodating vessels, they are sometimes formed of high open timber-work, sometimes of low solid projections, and occasionally only differ from breakwaters in their object.

Jetties for regulating Rivers.—Formerly jetties of timber-work were very commonly extended out, opposite one another, from each bank of a river, at intervals, to contract a wide channel, and by concentration of the current to produce a deepening of the central channel; or sometimes mounds of rubble stone, stretching down the foreshore from each bank, served the same purpose. As, however, this system occasioned a greater scour between the ends of the jetties than in the intervening channels, and consequently produced an irregular depth, it has to a great extent been superseded by longitudinal training works, or by dipping cross dikes pointing somewhat upstream (see RIVER ENGINEERING).

Jetties at Docks.—Where docks are given sloping sides, openwork timber jetties are generally carried across the slope, at the ends of which vessels can lie in deep water (fig. 1); or more solid structures are erected over the slope for supporting coal-tips. Pilework jetties are also constructed in the water outside the entrances to docks on each side, so as to form an enlarging trumpet-shaped channel between the entrance, lock or tidal basin and the approach channel, in order to guide vessels in entering or leaving the docks. Solid jetties, moreover, lined with quay walls, are sometimes carried out into a wide dock, at right angles to the line of quays at the side, to enlarge the accommodation; and they also serve, when extended on a large scale from the coast of a tideless sea under shelter of an outlying breakwater, to form the basins in which vessels lie when discharging and taking in cargoes in such a port as Marseilles (see DOCK).

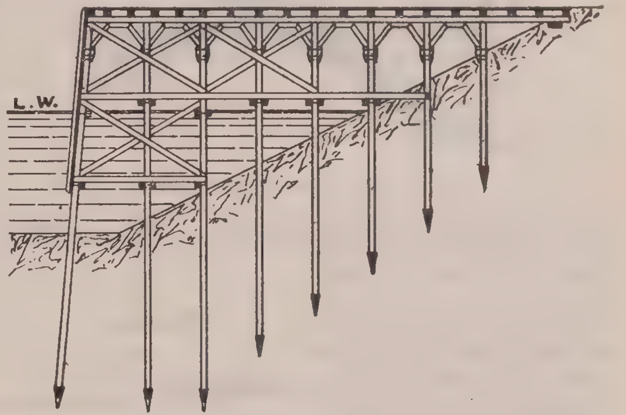

FIG. 1.—Timber Jetty across Dock Slope.

Jetties at Entrances to Jetty Harbours.—The approach channel to some ports situated on sandy coasts is guided and protected across the beach by parallel jetties, made solid up to a little above low water of neap tides, on which open timber-work is erected, provided with a planked platform at the top raised above the highest tides. The channel between the jetties was originally maintained by tidal scour from low-lying areas close to the coast, and subsequently by the current from sluicing basins; but it is now often considerably deepened by sand-pump dredging. It is protected to some extent by the solid portion of the jetties from the inroad of sand from the adjacent beach, and from the levelling action of the waves; whilst the upper open portion serves to indicate the channel, and to guide the vessels if necessary (see HARBOUR). The bottom part of the older jetties, in such long-established jetty ports as Calais, Dunkirk and Ostend, was composed of clay or rubble stone, covered on the top by fascine-work or pitching; but the deepening of the jetty channel by dredging, and the need which arose for its enlargement, led to the reconstruction of the jetties at these ports. The new jetties at Dunkirk were founded in the sandy beach, by the aid of compressed air, at a depth of 22¾ ft. below low water of spring tides; and their solid masonry portion, on a concrete foundation, was raised 5⅜ ft. above low water of neap tides (fig. 2).

Jetties at Lagoon Outlets.—A small tidal rise spreading tidal water over a large expanse of lagoon or inland back-water causes the influx and efflux of the tide to maintain a deep channel through a narrow outlet; but the issuing current on emerging from the outlet, being no longer confined by a bank on each side, becomes dispersed, and owing to the reduction of its scouring force, is no longer able at a moderate distance from the shore effectually to resist the action of the waves and littoral currents tending to form a continuous beach in front of the outlet. Hence a bar is produced which diminishes the available depth in the approach channel. By carrying out a solid jetty over the bar, however, on each side of the outlet, the tidal currents are concentrated in the channel across the bar, and lower it by scour. Thus the available depth of the approach channels to Venice through the Malamocco and Lido outlets from the Venetian lagoon have been deepened several feet over their bars by jetties of rubble stone surmounted by a small superstructure (fig. 3), carried out across the foreshore into deep water on both sides of the channel. Other examples are provided by the long jetties extended into the sea in front of the entrance to Charleston harbour, formerly constructed of fascines, weighted with stone and logs, but subsequently of rubble stone, and by the two converging rubble jetties carried out from each shore of Dublin bay for deepening the approach to Dublin harbour.

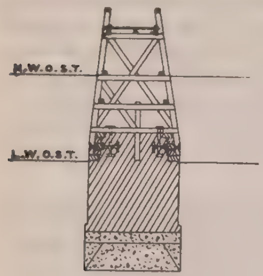

FIG. 2.—Dunkirk East Jetty.

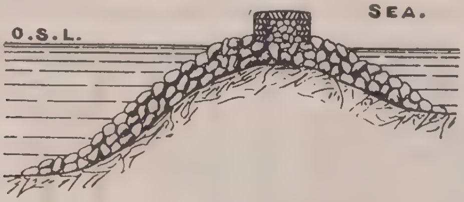

FIG. 3.—Lido Outlet Jetty, Venice.

Jetties at the Outlet of Tideless Rivers.—Jetties have been constructed on each side of the outlet of some of the rivers flowing into the Baltic, with the objects of prolonging the scour of the river and protecting the channel from being shoaled by the littoral drift along the shore. The most interesting application of parallel jetties is in lowering the bar in front of one of the mouths of a deltaic river flowing into a tideless sea, by extending the scour of the river out to the bar by a virtual prolongation of its banks. Jetties prolonging the Sulina branch of the Danube into the Black Sea, and the south pass of the Mississippi into the Gulf of Mexico (fig. 4), formed of rubble stone and concrete blocks, and fascine mattresses weighted with stone and surmounted with large concrete blocks respectively, have enabled the discharge of these rivers to scour away the bars obstructing the access to them; and they have also carried the sediment-bearing waters sufficiently far out to come under the influence of littoral currents, which, by conveying away some of the sediment, postpone the eventual formation of a fresh bar farther out (see RIVER ENGINEERING).

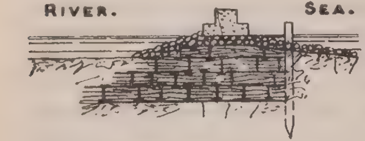

FIG. 4.—Mississippi South Pass Outlet Jetty.

Jetties at the Mouth of Tidal Rivers.—Where a river is narrow near its mouth, and its discharge is generally feeble, the sea is liable on an exposed coast, when the tidal range is small, to block up its outlet during severe storms. The river is thus forced to seek another exit at a weak spot of the beach, which along a low coast may be at some distance off; and this new outlet in its turn may be blocked up, so that the river from time to time shifts the position of its mouth. This inconvenient cycle of changes may be stopped by fixing the outlet of the river at a suitable site, by carrying a jetty on each side of this outlet across the beach, thereby concentrating its discharge in a definite channel and protecting the mouth from being blocked up by littoral drift. This system was long ago applied to the shifting outlet of the river Yare to the south of Yarmouth, and has also been successfully employed for fixing the wandering mouth of the Adur near Shoreham, and of the Adour flowing into the Bay of Biscay below Bayonne. When a new channel was cut across the Hook of Holland to provide a straighter and deeper outlet channel for the river Maas, forming the approach channel to Rotterdam, low, broad, parallel jetties, composed of fascine mattresses weighted with stone (fig. 5), were carried across the foreshore into the sea on either side of the new mouth of the river, to protect the jetty channel from littoral drift, and cause the discharge of the river to maintain it out to deep water (see RIVER ENGINEERING). The channel, also, beyond the outlet of the river Nervion into the Bay of Biscay has been regulated by jetties; and by extending the south-west jetty out for nearly half a mile with a curve concave towards the channel the outlet has not only been protected to some extent from the easterly drift, but the bar in front has been lowered by the scour produced by the discharge of the river following the concave bend of the south-west jetty. As the outer portion of this jetty was exposed to westerly storms from the Bay of Biscay before the outer harbour was constructed, it has been given the form and strength of a breakwater situated in shallow water (fig. 6). (L. F. V.-H.)

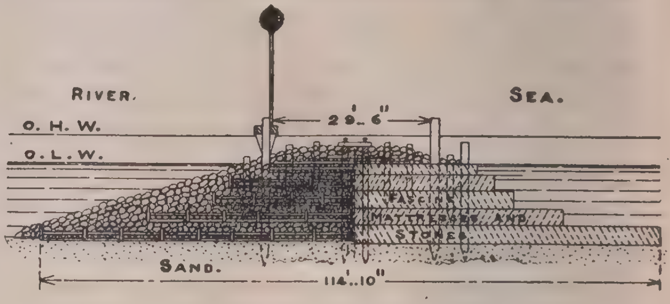

FIG. 5.—River Maas Outlet, North Jetty.

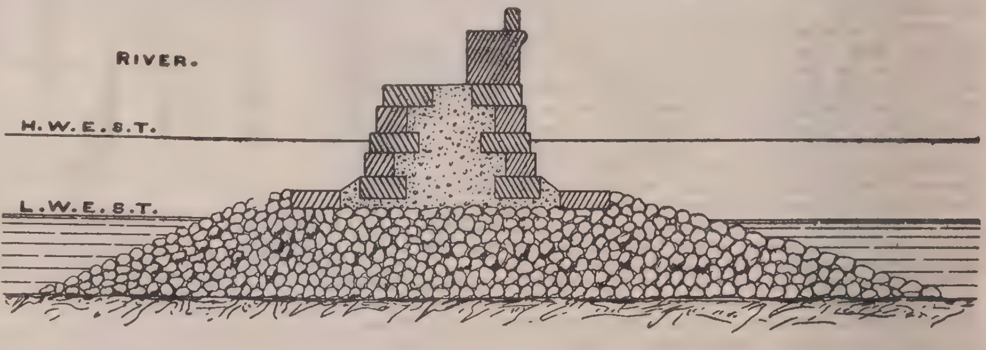

FIG. 6.—River Nervion Outlet, Western Jetty.

JEVER, a town of Germany, in the grand-duchy of Oldenburg, 13 m. by rail N.W. of Wilhelmshaven, and connected with the North Sea by a navigable canal. Pop. (1901), 5486. The chief industries are weaving, spinning, dyeing, brewing and milling; there is also a trade in horses and cattle. The fathers (*Die Getreuen*) of the town used to send an annual birthday present of 101 plovers' eggs to Bismarck, with a dedication in verse.

The castle of Jever was built by Prince Edo Wiemken (d. 1410), the ruler of Jeverland, a populous district which in 1575 came under the rule of the dukes of Oldenburg. In 1603 it passed to the house of Anhalt and was later the property of the empress Catherine II. of Russia, a member of this family. In 1814 it came again into the possession of Oldenburg.

See D. Hohnholz, *Aus Jevers Vorgangenheit* (Jever, 1886); Hagena, *Jeverland bis zum Jahr* 1500 (Oldenburg, 1902); and F. W. Riemann, *Geschichte des Jeverlandes* (Jever, 1896).

JEVEROS (JEBEROS, JIBAROS, JIVAROS or GIVAROS), a tribe of South American Indians on the upper Marañon, Peru, where they wander in the forests. The tribe has many branches and there are frequent tribal wars, but they have always united against a common enemy. Juan de Velasco declares them to be faithful, noble and amiable. They are brave and warlike, and though upon the conquest of Peru they temporarily submitted, a general insurrection in 1599 won them back their liberty. Curious dried human heads, supposed to have been objects of worship, have been found among the Jeveros (see *Ethnol. Soc. Trans.* 1862, W. Bollaert).

JEVONS, WILLIAM STANLEY (1835–1882), English economist and logician, was born at Liverpool on the 1st of September 1835. His father, Thomas Jevons, a man of strong scientific tastes and a writer on legal and economic subjects, was an iron merchant. His mother was the daughter of William Roscoe. At the age of fifteen he was sent to London to attend University College school. He appears at this time to have already formed the belief that important achievements as a thinker were possible to him, and at more than one critical period in his career this belief was the decisive factor in determining his conduct. Towards the end of 1853, after having spent two years at University College, where his favourite subjects were chemistry and botany, he unexpectedly received the offer of the assayership to the new mint in Australia. The idea of leaving England was distasteful, but pecuniary considerations had, in consequence of the failure of his father's firm in 1847, become of vital importance, and he accepted the post. He left England for Sydney in June 1854, and remained there for five years. At the end of that period he resigned his appointment, and in the autumn of 1859 entered again as a student at University College, London, proceeding in due course to the B.A. and M.A. degrees of the university of London. He now gave his principal attention to the moral sciences, but his interest in natural science was by no means exhausted: throughout his life he continued to write occasional papers on scientific subjects, and his intimate knowledge of the physical sciences greatly contributed to the success of his chief logical work, *The Principles of Science.* Not long after taking his M.A. degree Jevons obtained a post as tutor at Owens College, Manchester. In 1866 he was elected professor of logic and mental and moral philosophy and Cobden professor of political economy in Owens college. Next year he married Harriet Ann Taylor, whose father had been the founder and proprietor of the *Manchester Guardian.* Jevons suffered a good deal from ill health and sleeplessness, and found the delivery of lectures covering so wide a range of subjects very burdensome. In 1876 he was glad to exchange the Owens professorship for the professorship of political economy in University College, London. Travelling and music were the principal recreations of his life; but his health continued bad, and he suffered from depression. He found his professorial duties increasingly irksome, and feeling that the pressure of literary work left him no spare energy, he decided in 1880 to resign the post. On the 13th of August 1882 he was drowned whilst bathing near Hastings. Throughout his life he had pursued with devotion and industry the ideals with which he had set out, and his journal and letters display a noble simplicity of disposition and an unswerving honesty of purpose. He was a prolific writer, and at the time of his death he occupied the foremost position in England both as a logician and as an economist. Professor Marshall has said of his work in economics that it "will probably be found to have more constructive force than any, save that of Ricardo, that has been done during the last hundred years." At the time of his death he was engaged upon an economic work that promised to be at least as important as any that he had previously undertaken. It would be difficult to exaggerate the loss which logic and political economy sustained through the accident by which his life was prematurely cut short.

Jevons arrived quite early in his career at the doctrines that constituted his most characteristic and original contributions to economics and logic. The theory of utility, which became the keynote of his general theory of political economy, was practically formulated in a letter written in 1860; and the germ of his logical principles of the substitution of similars may be found in the view which he propounded in another letter written in 1861, that "philosophy would be found to consist solely in pointing out the likeness of things." The theory of utility above referred to, namely, that the degree of utility of a commodity is some continuous mathematical function of the quantity of the commodity available, together with the implied doctrine that economics is essentially a mathematical science, took more definite form in a paper on "A General Mathematical Theory of Political Economy," written for the British Association in 1862. This paper does not appear to have attracted much attention either in 1862 or on its publication four years later in the *Journal of the Statistical Society*; and it was not till 1871, when the *Theory of Political Economy* appeared, that Jevons set forth his doctrines in a fully developed form. It was not till after the publication of this work that Jevons became acquainted with the applications of mathematics to political economy made by earlier writers, notably Antoine Augustin Cournot and H. H. Gossen. The theory of utility was about 1870 being independently developed on somewhat similar lines by Carl Menger in Austria and M.E.L. Walras in Switzerland. As regards the discovery of the connexion between value in exchange and final (or marginal) utility, the priority belongs to Gossen, but this in no way detracts from the great importance of the service which Jevons rendered to English economics by his fresh discovery of the principle, and by the way in which he ultimately forced it into notice. In his reaction from the prevailing view he sometimes expressed himself without due qualification: the declaration, for instance, made at the commencement of the *Theory of Political Economy*, that "value depends entirely upon utility," lent itself to misinterpretation. But a certain exaggeration of emphasis may be pardoned in a writer seeking to attract the attention of an indifferent public. It was not, however, as a theorist dealing with the fundamental data of economic science, but as a brilliant writer on practical economic questions, that Jevons first received general recognition. *A Serious Fall in the Value of Gold* (1863) and *The Coal Question* (1865) placed him in the front rank as a writer on applied economics and statistics; and he would be remembered as one of the leading economists of the 19th century even had his *Theory of Political Economy* never been written. Amongst his economic works may be mentioned *Money and the Mechanism of Exchange* (1875), written in a popular style, and descriptive rather than theoretical, but wonderfully fresh and original in treatment and full of suggestiveness, a *Primer on Political Economy* (1878), *The State in Relation to Labour* (1882), and two works published after his death, namely, *Methods of Social Reform* and *Investigations in Currency and Finance*, containing papers that had appeared separately during his lifetime. The last-named volume contains Jevons's interesting speculations on the connexion between commercial crises and sun-spots. He was engaged at the time of his death upon the preparation of a large treatise on economics and had drawn up a table of contents and completed some chapters and parts of chapters. This fragment was published in 1905 under the title of *The Principles of Economics: a Fragment of a Treatise on the Industrial Mechanism of Society, and other Papers.*

Jevons's work in logic went on *pari passu* with his work in political economy. In 1864 he published a small volume, entitled *Pure Logic; or, the Logic of Quality apart from Quantity*, which was based on Boole's system of logic, but freed from what he considered the false mathematical dress of that system. In the years immediately following he devoted considerable attention to the construction of a logical machine, exhibited before the Royal Society in 1870, by means of which the conclusion derivable from any given set of premisses could be mechanically obtained. In 1866 what he regarded as the great and universal principle of all reasoning dawned upon him; and in 1869 he published a sketch of this fundamental doctrine under the title of *The Substitution of Similars.* He expressed the principle in its simplest form as follows: "Whatever is true of a thing is true of its like," and he worked out in detail its various applications. In the following year appeared the *Elementary Lessons on Logic*, which soon became the most widely read elementary textbook on logic in the English language. In the meantime he was engaged upon a much more important logical treatise, which appeared in 1874 under the title of *The Principles of Science.* In this work Jevons embodied the substance of his earlier works on pure logic and the substitution of similars; he also enunciated and developed the view that induction is simply an inverse employment of deduction; he treated in a luminous manner the general theory of probability, and the relation between probability and induction; and his knowledge of the various natural sciences enabled him throughout to relieve the abstract character of logical doctrine by concrete scientific illustrations, often worked out in great detail. Jevons's general theory of induction was a revival of the theory laid down by Whewell and criticized by Mill; but it was put in a new form, and was free from some of the non-essential adjuncts which rendered Whewell's exposition open to attack. The work as a whole was one of the most notable contributions to logical doctrine that appeared in Great Britain in the 19th century. His *Studies in Deductive Logic*, consisting mainly of exercises and problems for the use of students, was published in 1880. In 1877 and the following years Jevons contributed to the *Contemporary Review* some articles on J. S. Mill, which he had intended to supplement by further articles, and eventually publish in a volume as a criticism of Mill's philosophy. These articles and one other were republished after Jevons's death, together with his earlier logical treatises, in a volume, entitled *Pure Logic, and other Minor Works*. The criticisms on Mill contain much that is ingenious and much that is forcible, but on the whole they cannot be regarded as taking rank with Jevons's other work. His strength lay in his power as an original thinker rather than as a critic; and he will be remembered by his constructive work as logician, economist and statistician.

See *Letters and Journal of W. Stanley Jevons*, edited by his wife (1886). This work contains a bibliography of Jevons's writings. See also LOGIC: *History*. (J. N. K.)

JEW, THE WANDERING, a legendary Jew (see JEWS) doomed to wander till the second coming of Christ because he had taunted Jesus as he passed bearing the cross, saying, "Go on quicker." Jesus is said to have replied, "I go, but thou shalt wait till I return." The legend in this form first appeared in a pamphlet of four leaves alleged to have been printed at Leiden in 1602. This pamphlet relates that Paulus von Eizen (d. 1598), bishop of Schleswig, had met at Hamburg in 1542 a Jew named Ahasuerus (Ahasverus), who declared he was "eternal" and was the same who had been punished in the above-mentioned manner by Jesus at the time of the crucifixion. The pamphlet is supposed to have been written by Chrysostomus Dudulaeus of Westphalia and printed by one Christoff Crutzer, but as no such author or printer is known at this time—the latter name indeed refers directly to the legend—it has been conjectured that the whole story is a myth invented to support the Protestant contention of a continuous witness to the truth of Holy Writ in the person of this "eternal" Jew; he was to form, in his way, a counterpart to the apostolic tradition of the Catholic Church.

The story met with ready acceptance and popularity. Eight editions of the pamphlet appeared in 1602, and the fortieth edition before the end of the following century. It was translated into Dutch and Flemish with almost equal success. The first French edition appeared in 1609, and the story was known in England before 1625, when a parody was produced. Denmark and Sweden followed suit with translations, and the expression "eternal Jew" passed as a current term into Czech. In other words, the story in its usual form spread wherever there was a tincture of Protestantism. In southern Europe little is heard of it in this version, though Rudolph Botoreus, parliamentary advocate of Paris (*Comm. histor.*, 1604), writing in Paris two years after its first appearance, speaks contemptuously of the popular belief in the Wandering Jew in Germany, Spain and Italy.

The popularity of the pamphlet and its translations soon led to reports of the appearance of this mysterious being in almost all parts of the civilized world. Besides the original meeting of the bishop and Ahasuerus in 1542 and others referred back to 1575 in Spain and 1599 at Vienna, the Wandering Jew was stated to have appeared at Prague (1602), at Lübeck (1603), in Bavaria 1604), at Ypres (1623), Brussels (1640), Leipzig (1642), Paris (1644, by the "Turkish Spy"), Stamford (1658), Astrakhan (1672), and Frankenstein (1678). In the next century the Wandering Jew was seen at Munich (1721), Altbach (1766), Brussels (1774), Newcastle (1790, see Brand, *Pop. Antiquities, s.v.*), and on the streets of London between 1818 and 1830 (see *Athenaeum*, 1866, ii. 561). So far as can be ascertained, the latest report of his appearance was in the neighbourhood of Salt Lake City in 1868, when he is said to have made himself known to a Mormon named O'Grady. It is difficult to tell in any one of these cases how far the story is an entire fiction and how far some ingenious impostor took advantage of the existence of the myth.

The reiterated reports of the actual existence of a wandering being, who retained in his memory the details of the crucifixion, show how the idea had fixed itself in popular imagination and found its way into the 19th-century collections of German legends. The two ideas combined in the story of the restless fugitive akin to Cain and wandering for ever are separately represented in the current names given to this figure in different countries. In most Teutonic languages the stress is laid on the perpetual character of his punishment and he is known as the "everlasting," or "eternal" Jew (Ger. "Ewige Jude"). In the lands speaking a Romance tongue, the usual form has reference to the wanderings (Fr. "le Juif errant"). The English form follows the Romance analogy, possibly because derived directly from France. The actual name given to the mysterious Jew varies in the different versions: the original pamphlet calls him Ahasver, and this has been followed in most of the literary versions, though it is difficult to imagine any Jew being called by the name of the typical anti-Semitic king of the Book of Esther. In one of his appearances at Brussels his name is given as Isaac Laquedem, implying an imperfect knowledge of Hebrew in an attempt to represent Isaac "from of old." Alexandre Dumas also made use of this title. In the *Turkish Spy* the Wandering Jew is called Paul Marrane and is supposed to have suffered persecution at the hands of the Inquisition, which was mainly occupied in dealing with the Marranos, *i.e.* the secret Jews of the Iberian peninsula. In the few references to the legend in Spanish writings the Wandering Jew is called Juan Espera en Dios, which gives a more hopeful turn to the legend.

Under other names, a story very similar to that given in the pamphlet of 1602 occurs nearly 400 years earlier on English soil. According to Roger of Wendover in his *Flores historiarum* under the year 1228, an Armenian archbishop, then visiting England, was asked by the monks of St Albans about the well-known Joseph of Arimathaea, who had spoken to Jesus and was said to be still alive. The archbishop claimed to have seen him in Armenia under the name of Carthaphilus or Cartaphilus, who had confessed that he had taunted Jesus in the manner above related. This Carthaphilus had afterwards been baptized by the name of Joseph. Matthew Paris, in repeating the passage from Roger of Wendover, reported that other Armenians had confirmed the story on visiting St Albans in 1252, and regarded it as a great proof of the Christian religion. A similar account is given in the chronicles of Philippe Mouskès (d. 1243). A variant of the same story was known to Guido Bonati, an astronomer quoted by Dante, who calls his hero or villain Butta Deus because he struck Jesus. Under this name he is said to have appeared at Mugello in 1413 and at Bologna in 1415 (in the garb of a Franciscan of the third order).

The source of all these reports of an ever-living witness of the crucifixion is probably Matthew xvi. 28: "There be some of them that stand here which shall in no wise taste of death till they see the Son of Man coming in his kingdom." As the kingdom had not come, it was assumed that there must be persons living who had been present at the crucifixion; the same reasoning is at the root of the Anglo-Israel belief. These words are indeed quoted in the pamphlet of 1602. Again, a legend was based on John xxi. 20 that the beloved disciple would not die before the second coming; while another legend (current in the 16th century) condemned Malchus, whose ear Peter cut off in the garden of Gethsemane (John xvii. 10), to wander perpetually till the second coming. The legend alleges that he had been so condemned for having scoffed at Jesus. These legends and the utterance of Matt. xvi. 28 became "contaminated" by the legend of St Joseph of Arimathaea and the Holy Grail, and took the form given in Roger of Wendover and Matthew Paris. But there is nothing to show the spread of this story among the people before the pamphlet of 1602, and it is difficult to see how this Carthaphilus could have given rise to the legend of the Wandering Jew, since he is not a Jew nor does he wander. The author of 1602 was probably acquainted either directly or indirectly with the story as given by Matthew Paris, since he gives almost the same account. But he gives a new name to his hero and directly connects his fate with Matt. xvi. 28.

Moncure D. Conway (*Ency. Brit.*, 9th ed., xiii. 673) attempted to connect the legend of the Wandering Jew with a whole series of myths relating to never-dying heroes like King Arthur, Frederick Barbarossa, the Seven Sleepers, and Thomas the Rhymer, not to speak of Rip Van Winkle. He goes even farther and connects our legend with mortals visiting earth, as the Yima in Parsism, and the "Ancient of Days" in the Books of Daniel and Enoch, and further connects the legend with the whole medieval tendency to regard the Jew as something uncanny and mysterious. But all these mythological explanations are supererogatory, since the actual legend in question can be definitely traced to the pamphlet of 1602. The same remark applies to the identification with the Mahommedan legend of the "eternal" Chadhir proposed by M. Lidzbarski (*Zeit. f. Assyr.* vii. 116) and I. Friedländer (*Arch. f. Religionswiss.* xiii. 110).

This combination of eternal punishment with restless wandering has attracted the imagination of innumerable writers in almost all European tongues. The Wandering Jew has been regarded as a symbolic figure representing the wanderings and sufferings of his race. The Germans have been especially attracted by the legend, which has been made the subject of poems by Schubart, Schreiber, W. Müller, Lenau, Chamisso, Schlegel, Mosen and Koehler, from which enumeration it will be seen that it was a particularly favourite subject with the Romantic school. They were perhaps influenced by the example of Goethe, who in his *Autobiography* describes, at considerable length, the plan of a poem he had designed on the Wandering Jew. More recently poems have been composed on the subject in German by Adolf Wilbrandt, Fritz Lienhard and others; in English by Robert Buchanan, and in Dutch by H. Heijermans. German novels also exist on the subject, by Franz Horn, Oeklers, Laun and Schucking, tragedies by Klinemann, Haushofer and Zedlitz. Sigismund Heller wrote three cantos on the wanderings of Ahasuerus, while Hans Andersen made of him an "Angel of Doubt." Robert Hamerling even identifies Nero with the Wandering Jew. In France, E. Quinet published a prose epic on the subject in 1833, and Eugène Sue, in his best-known work, *Le Juif errant* (1844), introduces the Wandering Jew in the prologues of its different sections and associates him with the legend of Herodias. In modern times the subject has been made still more popular by Gustave Doré's elaborate designs (1856), containing some of his most striking and imaginative work. Thus, probably, he suggested Grenier's poem on the subject (1857).

In England, besides the ballads in Percy's *Reliques*, William Godwin introduced the idea of an eternal witness of the course of civilization in his *St Leon* (1799), and his son-in-law Shelley introduces Ahasuerus in his *Queen Mab*. It is doubtful how far Swift derived his idea of the immortal Struldbrugs from the notion of the Wandering Jew. George Croly's *Salathiel*, which appeared anonymously in 1828, gave a highly elaborate turn to the legend; this has been re-published under the title *Tarry Thou Till I Come*.

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JEWEL, JOHN (1522–1571), bishop of Salisbury, son of John Jewel of Buden, Devonshire, was born on the 24th of May 1522, and educated under his uncle John Bellamy, rector of Hampton, and other private tutors until his matriculation at Merton college, Oxford, in July 1535. There he was taught by John Parkhurst, afterwards bishop of Norwich; but on the 19th of August 1539 he was elected scholar of Corpus Christi college. He graduated B.A. in 1540, and M.A. in 1545, having been elected fellow of his college in 1542. He made some mark as a teacher at Oxford, and became after 1547 one of the chief disciples of Peter Martyr. He graduated B.D. in 1552, and was made vicar of Sunningwell, and public orator of the university, in which capacity he had to compose a congratulatory epistle to Mary on her accession. In April 1554 he acted as notary to Cranmer and Ridley at their disputation, but in the autumn he signed a series of Catholic articles. He was, nevertheless, suspected, fled to London, and thence to Frankfort, which he reached in March 1555. There he sided with Coxe against Knox, but soon joined Martyr at Strassburg, accompanied him to Zurich, and then paid a visit to Padua.

Under Elizabeth's succession he returned to England, and made earnest efforts to secure what would now be called a low-church settlement of religion. Indeed, his attitude was hardly distinguishable from that of the Elizabethan Puritans, but he gradually modified it under the stress of office and responsibility. He was one of the disputants selected to confute the Romanists at the conference of Westminster after Easter 1559; he was select preacher at St Paul's cross on the 15th of June; and in the autumn was engaged as one of the royal visitors of the western counties. His *congé d'élire* as bishop of Salisbury had been made out on the 27th of July, but he was not consecrated until the 21st of January 1560. He now constituted himself the literary apologist of the Elizabethan settlement. He had on the 26th of November 1559, in a sermon at St Paul's Cross, challenged all comers to prove the Roman case out of the Scriptures, or the councils or Fathers for the first six hundred years after Christ. He repeated his challenge in 1560, and Dr Henry Cole took it up. The chief result was Jewel's *Apologia ecclesiae Anglicanae*, published in 1562, which in Bishop Creighton's words is "the first methodical statement of the position of the Church of England against the Church of Rome, and forms the groundwork of all subsequent controversy." A more formidable antagonist than Cole now entered the lists in the person of Thomas Harding, an Oxford contemporary whom Jewel had deprived of his prebend in Salisbury Cathedral for recusancy. He published an elaborate and bitter *Answer* in 1564, to which Jewel issued a *Reply* in 1565. Harding followed with a *Confutation*, and Jewel with a *Defence*, of the *Apology* in 1566 and 1567; the combatants ranged over the whole field of the Anglo-Roman controversy, and Jewel's theology was officially enjoined upon the Church by Archbishop Bancroft in the reign of James I. Latterly Jewel had been confronted with criticism from a different quarter. The arguments that had weaned him from his Zwinglian simplicity did not satisfy his unpromoted brethren, and Jewel had to refuse admission to a benefice to his friend Laurence Humphrey (*q.v.*), who would not wear a surplice. He was consulted a good deal by the government on such questions as England's attitude towards the council of Trent, and political considerations made him more and more hostile to Puritan demands with which he had previously sympathized. He wrote an attack on Cartwright, which was published after his death by Whitgift. He died on the 23rd of September 1571, and was buried in Salisbury Cathedral, where he had built a library. Hooker, who speaks of Jewel as "the worthiest divine that Christendom hath bred for some hundreds of years," was one of the boys whom Jewel prepared in his house for the university; and his *Ecclesiastical Polity* owes much to Jewel's training.

Jewel's works were published in a folio in 1609 under the direction of Bancroft, who ordered the *Apology* to be placed in churches, in some of which it may still be seen chained to the lectern; other editions appeared at Oxford (1848, 8 vols.) and Cambridge (Parker Soc., 4 vols.). See also Gough's *Index to Parker Soc. Publ.*; Strype's *Works* (General Index); *Acts of the Privy Council*; *Calendars of Domestic and Spanish State Papers*; Dixon's and Frere's *Church Histories*; and *Dictionary of National Biography* (art. by Bishop Creighton). (A. F. P.)

JEWELRY (O. Fr. *jouel*, Fr. *joyau*, perhaps from *joie*, joy; Lat. *gaudium*; retranslated into Low Lat. *jocale*, a toy, from *jocus*, by misapprehension of the origin of the word), a collective term for jewels, or the art connected with them—jewels being personal ornaments, usually made of gems, precious stones, &c., with a setting of precious metal; in a restricted sense it is also common to speak of a gem-stone itself as a jewel, when utilized in this way. Personal ornaments appear to have been among the very first objects on which the invention and ingenuity of man were exercised; and there is no record of any people so rude as not to employ some kind of personal decoration. Natural objects, such as small shells, dried berries, small perforated stones, feathers of variegated colours, were combined by stringing or tying together to ornament the head, neck, arms and legs, the fingers, and even the toes, whilst the cartilages of the nose and ears were frequently perforated for the more ready suspension of suitable ornaments.

Amongst modern Oriental nations we find almost every kind of personal decoration, from the simple caste mark on the forehead of the Hindu to the gorgeous examples of beaten gold and silver work of the various cities and provinces of India. Nor are such decorations mere ornaments without use or meaning. The hook with its corresponding perforation or eye, the clasp, the buckle, the button, grew step by step into a special ornament, according to the rank, means, taste and wants of the wearer, or became an evidence of the dignity of office. Nor was the jewel deemed to have served its purpose with the death of its owner, for it is to the tombs of ancient peoples that we must look for evidence of the early existence of the jeweller's art.

The jewelry of the ancient Egyptians has been preserved for us in their tombs, sometimes in, and sometimes near the sarcophagi which contained the embalmed bodies of the wearers. An amazing series of finds of the intact jewels of five princesses of the XIIth Dynasty (*c.* 2400 B.C.) was the result of the excavations of J. de Morgan at Dāhshur in 1894–1895. The treasure of Princess Hathor-Set contained jewels with the names of Senwosri (Usertesen) II. and III., one of whom was probably her father. The treasure of Princess Merit contained the names of the same two monarchs, and also that of Amenemhē III., to whose family Princess Nebhotp may have belonged. The two remaining princesses were Ita and Khnumit.

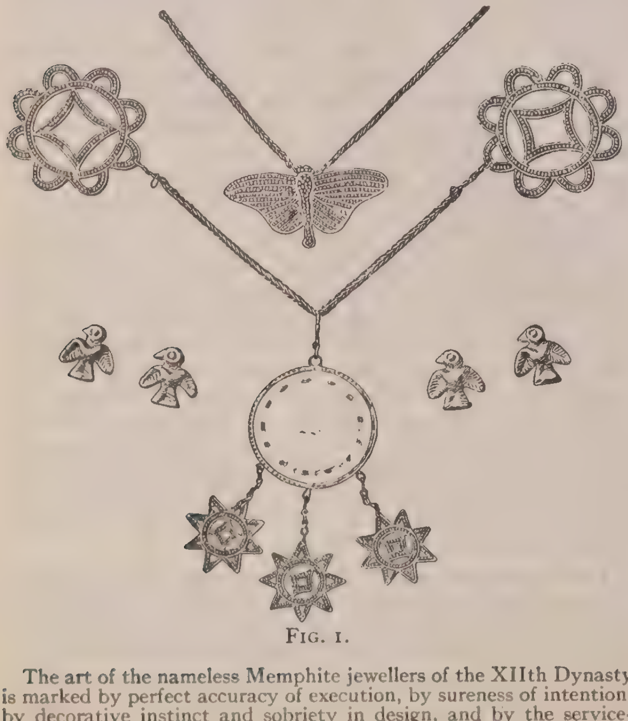


FIG. 1.

The art of the nameless Memphite jewellers of the XIIth Dynasty is marked by perfect accuracy of execution, by sureness of intention, by decorative instinct and sobriety in design, and by the serviceable nature of the jewels for actual wear. All forms of work are represented—including chiselling, soldering, inlaying with coloured stones, moulding and working with twisted wires and filigree. Here also occurs the earliest instance of granulated work, with small grains of gold, soldered on a flat surface (fig. 1). The principal items in this dazzling group are the following: Three gold pectorals (fig. 2 and Plate I. figs. 35, 36) worked *à jour* (with the interstices left open); on the front side they are inlaid with coloured stones, the fine *cloisons* being the only portion of the gold that is visible; on the back, the gold surfaces are most delicately carved, in low relief. Two gold crowns (Plate I. figs. 32, 34), found together, are curiously contrasted in character. The one (fig. 32) is of a formal design, of gold, inlaid (the plume, Plate I. fig 33, was attached to it); the other (fig. 34) has a multitude of star-like flowers, embodied in a filigree of daintily twisted wires. A dagger with inlaid patterns on the handle shows extraordinary perfection of finish.

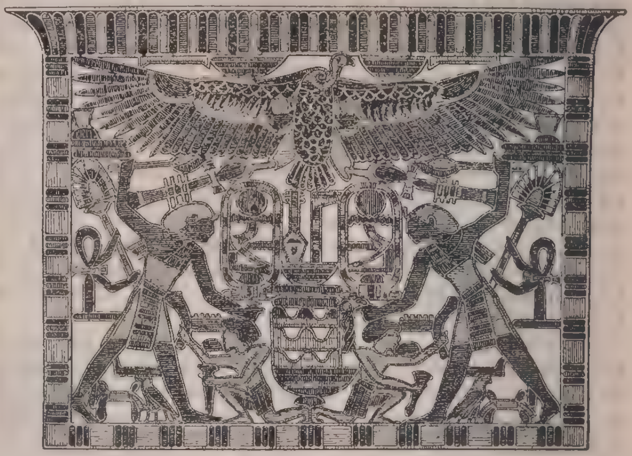


FIG. 2.

Nearly a thousand years later we have another remarkable collection of Egyptian art in the jewelry taken from the coffin of Queen Aah-hotp, discovered in 1859 by Mariette in the entrance to the valley of the tombs of the kings and now preserved in the Cairo museum. Compared with the Dāhshur treasure the jewelry of Aah-hotp is in parts rough and coarse, but none the less it is marked by the ingenuity and mastery of the materials that characterize all the work of the Egyptians. Hammered work, incised and chased work, the evidence of soldering, the combinations of layers of gold plates, together with coloured stones, are all present, and the handicraft is complete in every respect.

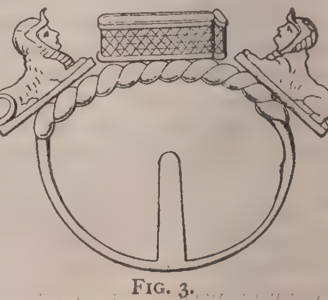


FIG. 3.

A diadem of gold and enamel, found at the back of the head of the mummy of the queen (fig. 3), was fixed in the back hair, showing the cartouche in front. The box holding this cartouche has on the upper surface the titles of the king, "the son of the sun, Aahmes, living for ever and ever," in gold on a ground of lapis lazuli, with a chequered ornament in blue and red pastes, and a sphinx couchant on each side. A necklace with three pendant flies (fig. 4) is entirely of gold, having a hook and loop to fasten it round the neck. Fig. 5 is a gold drop, inlaid with turquoise or blue paste, in the shape of a fig. A gold

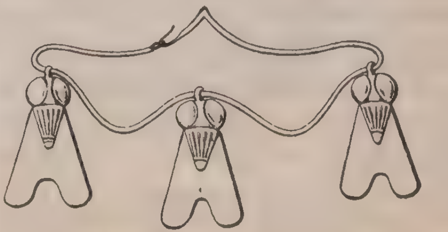


FIG. 4.

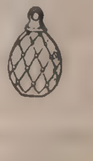


FIG. 5.

chain (fig. 6) is formed of wires closely plaited and very flexible, the ends terminating in the heads of water fowl, and having small rings to secure the collar behind. To the centre is suspended by a small ring a scarabaeus of solid gold inlaid with lapis lazuli. We have an example of a bracelet, similar to those in modern use (fig. 7), and worn by all persons of rank. It is formed of two pieces joined by a hinge, and is decorated with figures in repoussé on a ground inlaid with lapis lazuli.

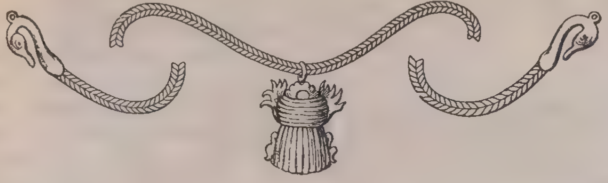


FIG. 6.

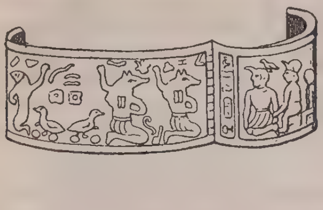


FIG. 7.

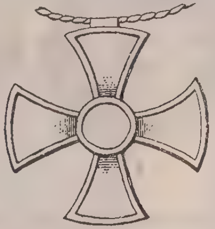


FIG. 8.

That the Assyrians used personal decorations of a very distinct character, and no doubt made of precious materials, is proved by the bas-reliefs from which a considerable collection of jewels could be gathered, such as bracelets, ear-rings and necklaces. Thus, for example, in the British Museum we have representations of Assur-nazir-pal, king of Assyria (*c.* 885–860 B.C.), wearing a cross (fig. 8) very similar to the Maltese cross of modern times. It happens, however, that the excavations have not hitherto been fertile in actual remains of gold work from Assyria. Chance also has so far ordained that the excavations in Crete should not be particularly rich in ornaments of gold. A few isolated objects have been found, such as a duck and other pendants, and also several necklaces with beads of the Argonaut shell-fish pattern. More striking than these is a short bronze sword. The handle has an agate pommel, and is covered with gold plates, engraved with spirited scenes of lions and wild goats (fig. 9, A. J. Evans in *Archaeologia*, 59, 447). In general, however, the gold jewelry of the later Minoan periods is more brilliantly represented by the finds made on the mainland of Greece and at Enkomi in Cyprus. Among the former the gold ornaments found by Heinrich Schliemann in the graves of Mycenae are pre-eminent.

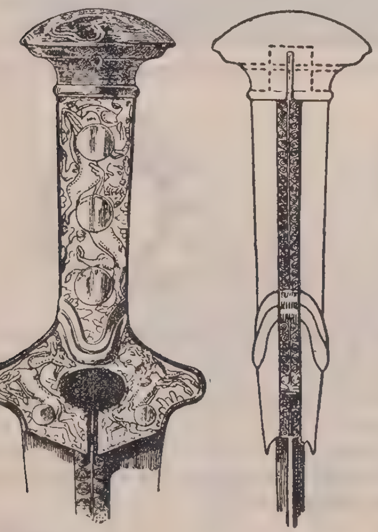


FIG. 9.—From *Archaeologia*, vol. 59, p. 447, by permission of the Society of Antiquaries of London.

The objects found ranged over most of the personal ornaments still in use; necklaces with gold beads and pendants, butterflies (fig. 10), cuttlefish (fig. 11), single and concentric circles, rosettes and leafage, with perforations for attachment to clothing, crosses and stars formed of combined crosses, with crosses in the centre forming spikes—all elaborately ornamented in detail. The spiral forms an incessant decoration from its facile production and repetition by means of twisted gold wire. Grasshoppers or tree crickets in gold repoussé suspended by chains and probably used for the decoration of the hair, and a griffin (fig. 12), having the upper part of the body of an eagle and the lower parts of a lion, with wings decorated with spirals, are among the more remarkable examples of perforated ornaments for attachment to the clothing. There are also perforated ornaments belonging to necklaces, with intaglio engravings of such subjects as a contest of a man and lion, and a duel of two warriors, one of whom stabs his antagonist in the throat. There are also pinheads and brooches formed of two stags lying down (fig. 13), the bodies and necks crossing each other, and the horns meeting symmetrically above the heads, forming a finial. The heads of these ornaments were of gold, with silver blades or pointed pins inserted for use. The bodies of the two stags rest on fronds of the date-palm growing out of the stem which receives the pin. Another remarkable series is composed of figures of women with doves. Some have one dove resting on the head; others have three doves, one on the head and the others resting on arms. The arms in both instances are extended to the elbow, the hands being placed on the breasts. These ornaments are also perforated, and were evidently sewed on the dresses, although there is some evidence that an example with three doves has been fastened with a pin.

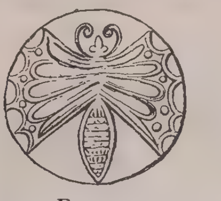


FIG. 10.

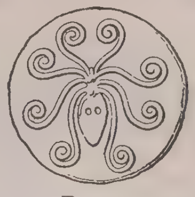


FIG. 11.

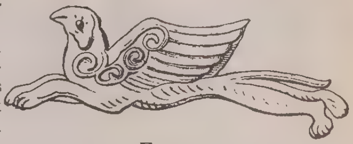


FIG. 12.

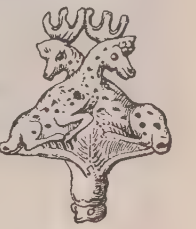


FIG. 13.

An extraordinary diadem was found upon the head of one of the bodies discovered in the same tomb with many objects similar to those noticed above. It is 25 in. in length, covered with shield-like or rosette ornaments in repoussé, the relief being very low but perfectly distinct, and further ornamented by thirty-six large leaves of repoussé gold attached to it. As an example of design and perfection of detail, another smaller diadem found in another tomb may be noted (fig. 14). It is of gold plate, so thick as to require no "piping" at the back to sustain it; but in general the repoussé examples have a piping of copper wire.

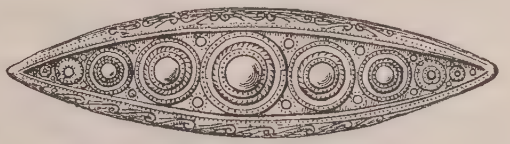


FIG. 14.

The admirable inlaid daggers of the IVth grave at Mycenae are unique in their kind, with their subjects of a lion hunt, of a lion chasing a herd of antelopes, of running lions, of cats hunting wild duck, of inlaid lilies, and of geometric patterns. The subjects are inlaid in gold of various tints, and silver, in bronze plates which are inserted in the flat surfaces of the dagger-blades. In part also the subjects are rendered in relief and gilded. The whole is executed with marvellous precision and vivid representation of motion. To a certain limited extent these daggers are paralleled by a dagger and hatchet found in the treasure of Queen Aah-hotp mentioned above, but in their most characteristic features there is little resemblance. The gold ornaments found by Schliemann at Hissarlik, the supposed site of Troy, divide themselves, generally speaking, into two groups, one being the "great treasure" of diadems, ear-rings, beads, bracelets, &c., which seem the product of a local and uncultured art. The other group, which were found in smaller "treasures," have spirals and rosettes similar to those of Mycenae. The discovery, however, of the gold treasures of the Artemision at Ephesus has brought out points of affinity between the Hissarlik treasures and those of Ephesus, and has made any reasoning difficult, in view of the uncertainties surrounding the Hissarlik finds. The group with

Mycenaean affinities (fig. 15) includes necklaces, brooches, bracelets (*g*), hair-pins (*a*), ear-rings (*c*, *d*, *e*, *f*), with and without pendants, beads and twisted wire drops. The majority of these are ornamented with spirals of twisted wire, or small rosettes, with fragments of stones in the centres. The twisted wire ornaments were evidently portions of necklaces. A circular plaque decorated with a rosette (*h*) is very similar to those found at Mycenae, and a conventionalized eagle (*k*) is characteristic of much of the detail found at that place as well as at Hissarlik. They were all of pure gold, and the wire must have been drawn through a plate of harder metal—probably bronze. The principal ornaments differing from those found at Mycenae are diadems or head fillets of pure hammered gold (*b*) cut into thin plates, attached to rings by double gold wires, and fastened together at the back with thin twisted wire. To these pendants (of which those at the two ends are nearly three times the length of those forming the central portions) are attached small figures, probably of idols. It has been assumed that these were worn across the forehead by women, the long pendants falling on each side of the face.

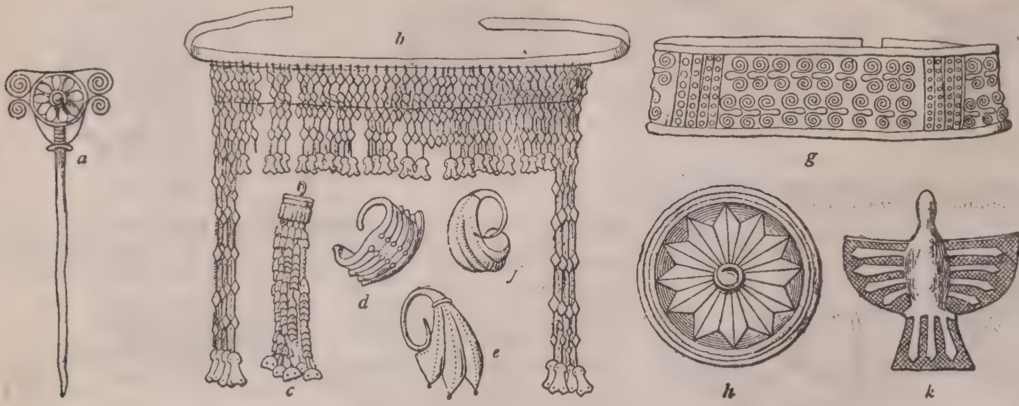


Fig. 15.

The jewelry of the close of the Mycenaean period is best represented by the rich finds of the cemetery of Enkomi near Salamis, in Cyprus. This field was excavated by the British Museum in 1896, and a considerable portion of the finds is now at Bloomsbury. It was rich in all forms of jewelry, but especially in pins, rings and diadems with patterns in relief. In its geometric patterns the art of Enkomi is entirely Mycenaean, but special stress is laid on the mythical forms that were inherited by Greek art, such as the sphinx and the gryphon.

Figs.	37–48	(Plate I.)	are examples of the late Mycenaean treasures from Enkomi.
,,	37, 38	,,	Ear-rings.
,,	39	,,	Diadem, to be tied on the forehead. The impressed figure of a sphinx is repeated twelve times.
,,	40, 41, 46	,,	Ear-rings, originally in bull's head form (fig. 40). Later, the same general form is retained, but decorative patterns (figs. 41, 46) take the place of the bull's head.
,,	42	,,	Pin, probably connected by a chain with a fellow, to be used as a cloak fastening.
,,	43	,,	Pomegranate pendant, with fine granulated work.
,,	44, 45	,,	Pins as No. 42. The heads are of vitreous paste.
,,	46		(See above.)
,,	47	,,	Pendant ornament, in lotus-form, of a pectoral, inlaid with coloured pastes.
,,	48	,,	Small slate cylinder, set in filigree.

Another find of importance was that of a collection of gold ornaments from one of the Greek islands (said to be Aegina) which also found its way to the British Museum. Here we find the themes of archaic Greek art, such as a figure holding up two water-birds, in immediate connexion with Mycenaean gold patterns.

Figs.	49–53	(Plate I.)	are specimens from this treasure.
,,	49	,,	Plate with repoussé ornament for sewing on a dress.
,,	50	,,	Pendant. Figure with two water-birds, on a lotus base, and having serpents issuing from near his middle, modified from Egyptian forms.
Fig.	51	(Plate I.)	Ring, with cut blue glass-pastes in the grooves.
,,	52	,,	Pendant ornament, repoussé, and originally inlaid with pieces of cut glass-paste.
,,	53	,,	Pendant ornament, with dogs and apes, modified from Egyptian forms.

For the beginnings of Greek art proper, the most striking series of personal jewels is the great deposit of ornaments which was found in 1905 by D. G. Hogarth in the soil beneath the central basis of the archaic temple of Artemis of Ephesus. The gold ornaments in question (amounting in all to about 1000 pieces) were mingled with the closely packed earth, and must necessarily, it would seem, have been in the nature of votive offerings, made at the end of the 7th or the beginning of the 6th century B.C. The hoard was rich in pins, brooches, beads and stamped disks of gold. The greater part of the find is at Constantinople, but a portion was assigned to the British Museum, which had undertaken the excavations.

Figs.	54–58	(Plate II.)	Examples of the Ephesus hoard.
,,	54	,,	Electrum pin, with pomegranate head.
,,	55	,,	Hawk ornament.
,,	56	,,	Electrum pin.
,,	57, 58	,,	Electrum ornaments for sewing on drapery.

The cemeteries of Cyprus have yielded a rich harvest of jewelry of Graeco-Phoenician style of the 7th and following centuries B.C. Figs. 16 and 17 are typical examples of a ring and ear-ring from Cyprus.

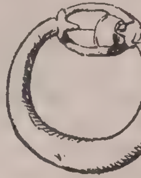


Fig. 16.

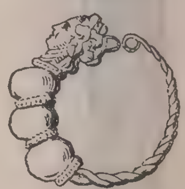


Fig. 17.

Greek, Etruscan and Roman ornaments partake of very similar characteristics. Of course there is variety in design and sometimes in treatment, but it does not rise to any special individuality. Fretwork is a distinguishing feature of all, together with the wave ornament, the guilloche, and the occasional use of the human figure. The workmanship is often of a character which modern gold-workers can only rival with their best skill, and can never surpass.

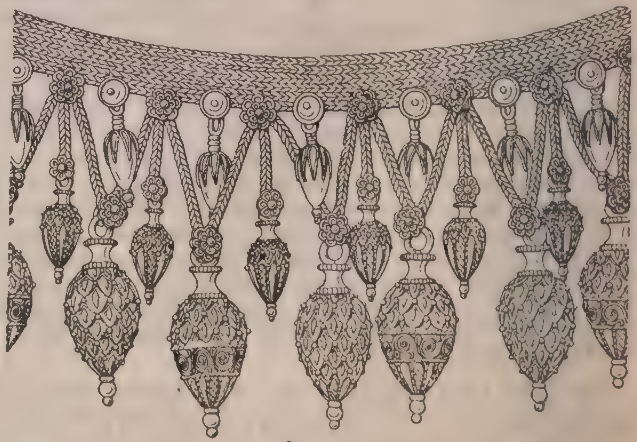
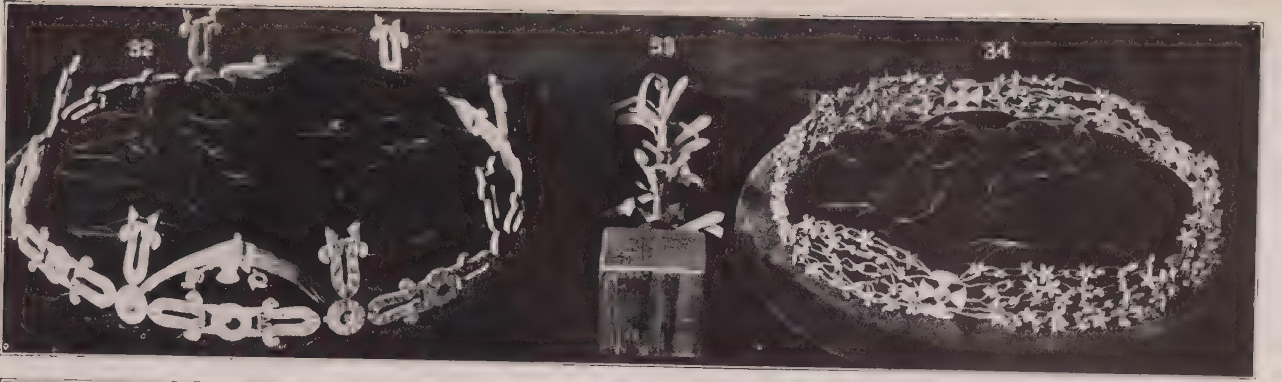
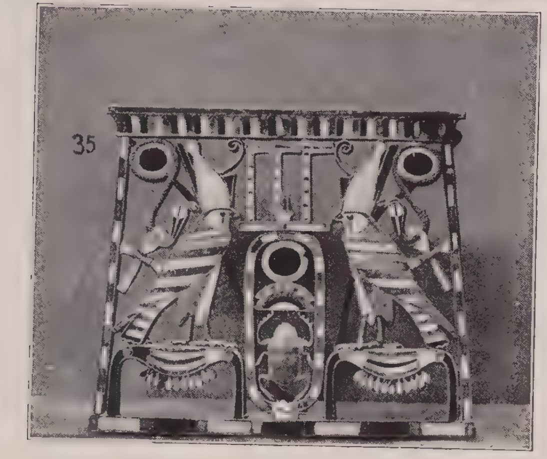
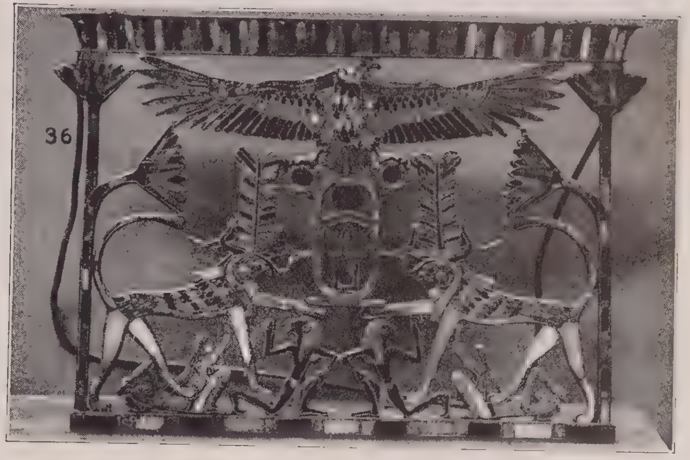


Fig. 18.

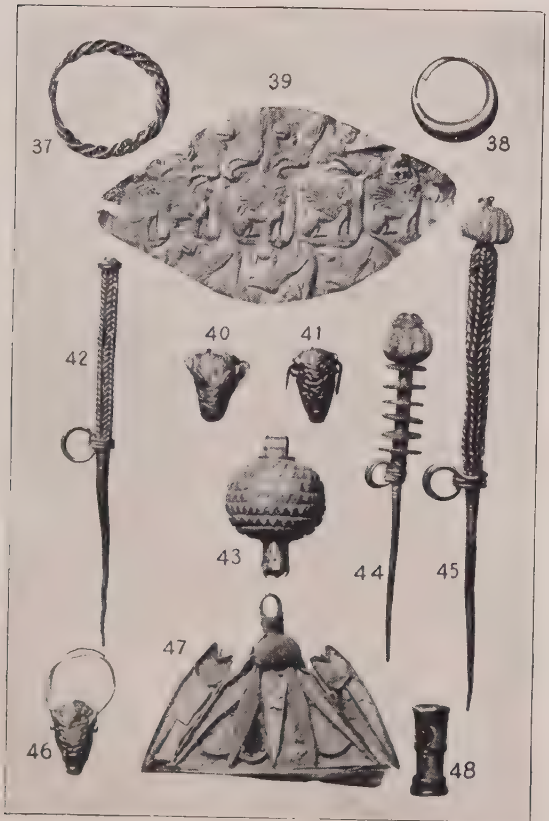
JEWELRY







EARLY EGYPTIAN.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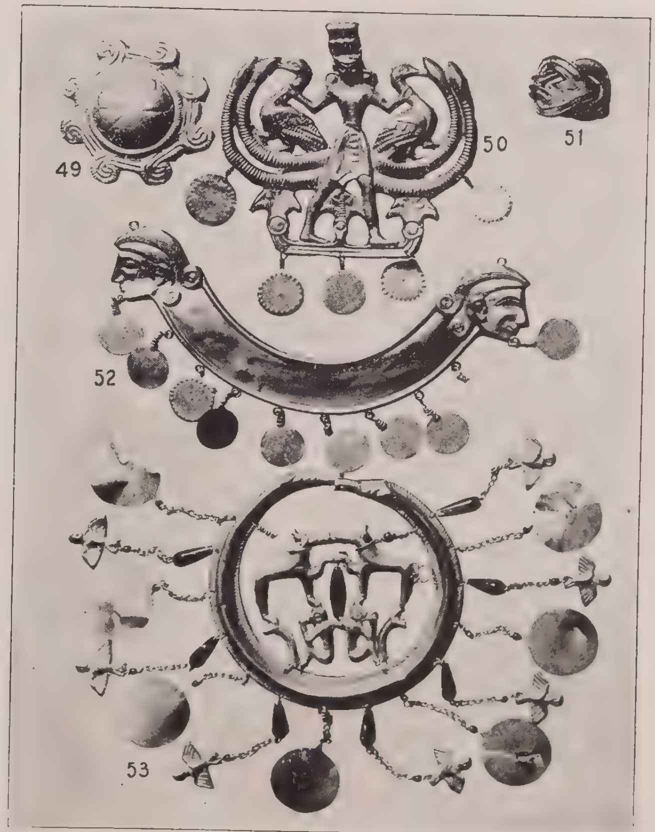
(FROM ENKOMI.)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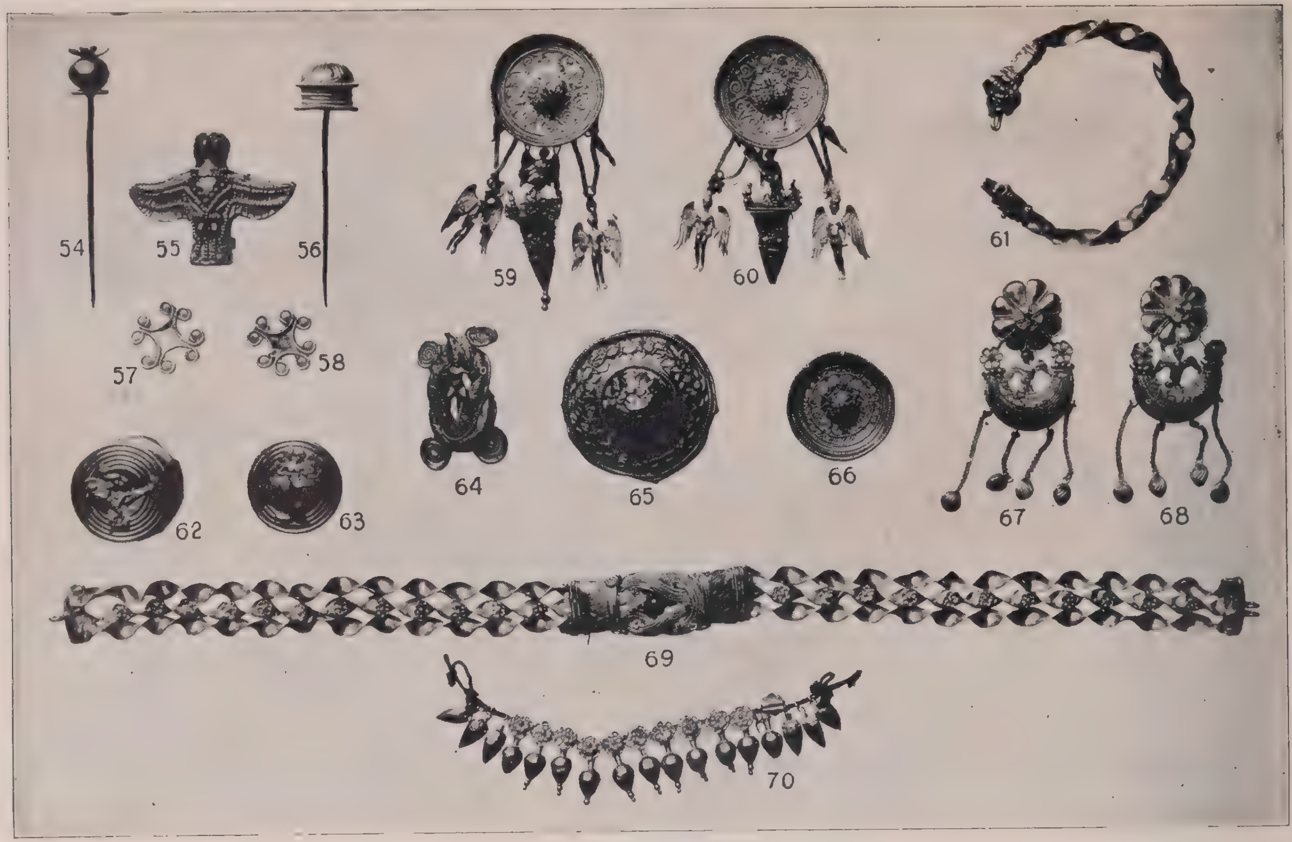
(FROM THE GREEK ISLANDS.)

LATE MYCENAEAN.

PLATE II.

JEWELRY



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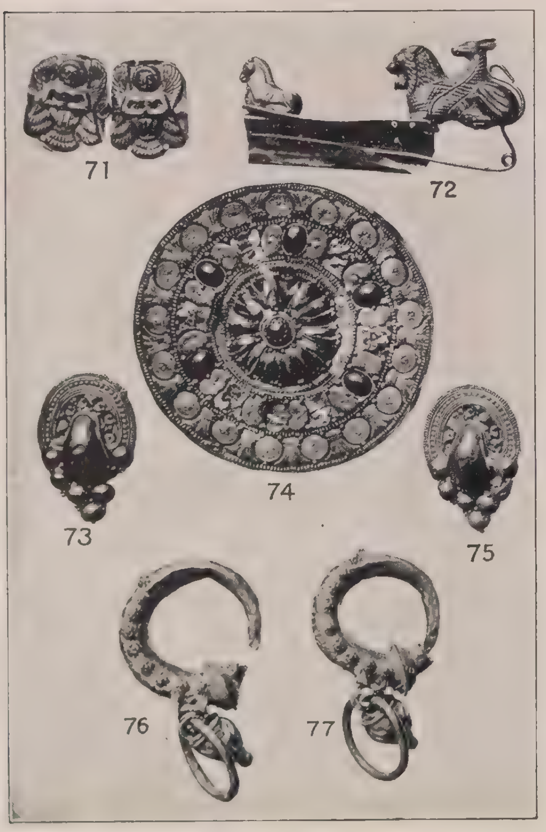
GREEK.



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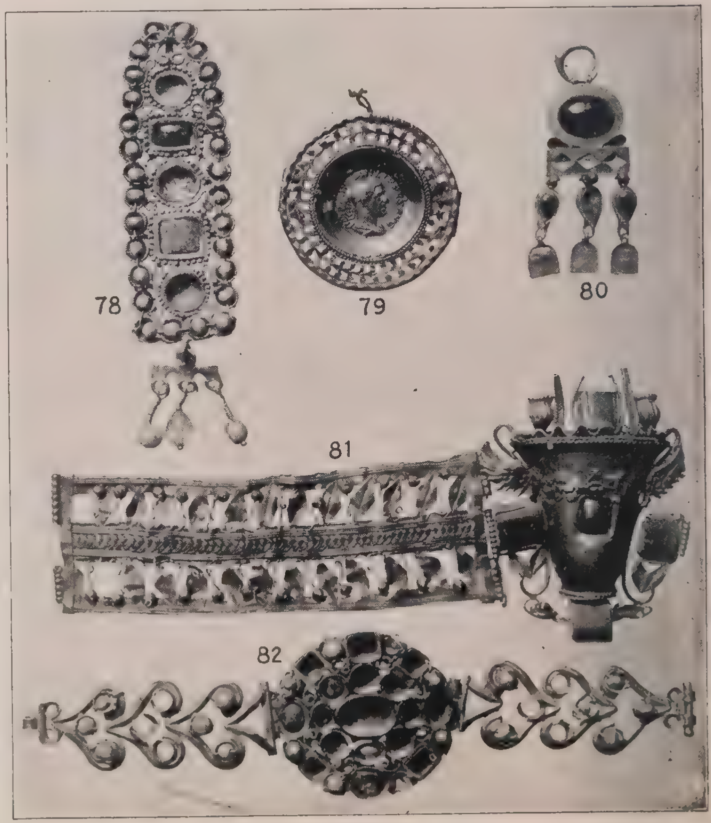
ETRUSCAN.



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ROMAN.

The Greek jewelry of the best period is of extraordinary delicacy and beauty. Fine examples are shown in the British Museum from Melos and elsewhere. Undoubtedly, however, the most brilliant collection of such ornaments is that of the Hermitage, which was derived from the tombs of Kerch and the Crimea. It contains examples of the purest Greek work, together with objects which must have been of local origin, as is shown by the themes which the artist has chosen for his reliefs. Fig. 18 illustrates the jewelry of the Hermitage (see also Ear-Ring).

As further examples of Greek jewelry see the pendant oblong ornament for containing a scroll (fig. 19).

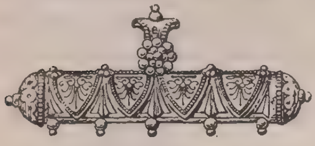
Fig. 19.

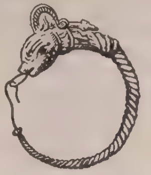
Fig. 20.

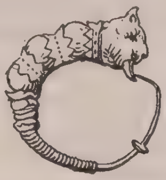
Fig. 21.

The ear-rings (figs. 20, 21) are also characteristic.

Figs. 59–70	(Plate II.)	Examples of fine Greek jewelry, in the British Museum.
„ 59–60	„	Pair of ear-rings, from a grave at Cyme in Aeolis, with filigree work and pendant Erotes.
„ 61	„	Small bracelet.
„ 62–63	„	Small gold reel with repoussé figures of Nereid with helmet of Achilles, and Eros. From Cameiros (Rhodes).
„ 64	„	Filigree ornament (ear-ring?) with Eros in centre. From Syria.
„ 65	„	Medallion ornament with repoussé head of Dionysos and filigree work. (Blacas coll.)
„ 66	„	Stud, with filigree work.
„ 67–68	„	Pair of ear-rings, of gold, with filigree and enamel, from Eretria.
„ 69	„	Diadem, with filigree, and enamel scales, from Tarquinii.
„ 70	„	Necklace pendants.

Etruscan jewlery at its best is not easily distinguished from the Greek, but it tends in its later forms to become florid and diffuse, without precision of design. The granulation of surfaces practised with the highest degree of refinement by the Etruscans was long a puzzle and a problem to the modern jeweller, until Castellani of Rome discovered gold-workers in the Abruzzi to whom the method had descended through many generations. He induced some of these men to go to Naples, and so revived the art, of which he contributed examples to the London Exhibition of 1872 (see Filigree).

Figs. 71–77	(Plate II.)	are well-marked examples of Etruscan work, in the British Museum.
„ 71	„	Pair of sirens, repoussé, forming a hook and eye fastening. From Chiusi (?).
„ 72	„	Early fibula. Horse and chimaera. (Blacas coll.)
„ 74	„	Medallion-shaped fibula, of fine granulated work, with figures of sirens in relief, and set with dark blue pastes. (Bale coll.)
„ 73, 75	„	Pair of late Etruscan ear-rings.
„ 76, 77	„	Pair of late Etruscan ear-rings, in the florid style.

The jewels of the Roman empire are marked by a greater use of large cut stones in combination with the gold, and by larger surfaces of plain and undecorated metal. The adaptation of imperial gold coins to the purposes of the jeweller is also not uncommon.

Figs. 78–82	(Plate II.)	Late Roman imperial jewelry, in the British Museum.
„ 78	„	Large pendant ear-ring, set with stones and pearls. From Tunis, 4th century.
„ 79	„	Pierced-work pendant, set with a coin of the emperor Philip.
„ 80	„	Ear-ring, roughly set with garnets.
„ 81	„	Bracelet, with a winged cornucopia as central ornament, set with plasmas, and with filigree and leaf work.
„ 82	„	Bracelet, roughly set with pearls and stones. From Tunis, 4th century.

With the decay of the Roman empire, and the approach of the barbarian tribes, a new Teutonic style was developed. An important example of this style is the remarkable gold treasure, discovered at Pétrossa in Transylvanian Alps in 1837, and now preserved, as far as it survives, in the museum of Bucharest. A runic inscription shows that it belonged to the Goths. Its style is in part the classical tradition, debased and modified; in part it is a singularly rude and vigorous form of barbaric art. Its chief characteristics are a free use of strongly conventionalized animal forms, such as great bird-shaped fibulae, and an ornamentation consisting of pierced gold work, combined with a free use of stones cut to special shapes, and inlaid either cloisonné-fashion or in a perforated gold plate. This part of the hoard has its affinities in objects found over a wide field from Siberia to Spain. Its rudest and most naturalistic forms occur in the East in uncouth objects from Siberian tombs, whose lineage however has been traced to Persepolis, Assyria and Egypt. In its later and more refined forms the style is known by the name, now somewhat out of favour (except as applied to a limited number of finds), of Merovingian.

The so-called Merovingian jewelry of the 5th century, and the Anglo-Saxon of a later date, have as their distinctive feature thin plates of gold, decorated with thin slabs of garnet, set in walls of gold soldered vertically like the lines of cloisonné enamel, with the addition of very decorative details of filigree work, beading and twisted gold. The typical group are the contents of the tomb of King Childeric (A.D. 481) now in the Bibliothèque Nationale at Paris. In Figs. 22 and 23 we have examples of Anglo-Saxon fibulae, the first being decorated with a species of cloisonné, in which garnets are inserted, while the other is in hammered work in relief. A pendant (fig. 24) is also set with garnets. The buckles (figs. 25, 26, 27) are remarkably characteristic examples, and very elegant in design. A girdle ornament in gold, set with garnets (fig. 28), is an example of Carolingian design of a high class. Another remarkable group of barbaric jewelry, dated by coins as of the beginning of the 7th century, was excavated at Castel Trosino near the Picenian Ascoli, and is attributed to the Lombards. See *Monumenti antichi* (*Accademia dei Lincei*), xii. 145.

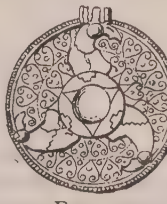
Fig. 22.

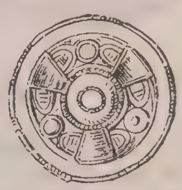
Fig. 23.

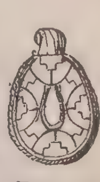
Fig. 24.

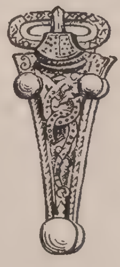
Fig. 25.

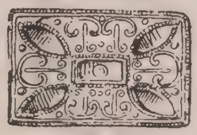
Fig. 26.

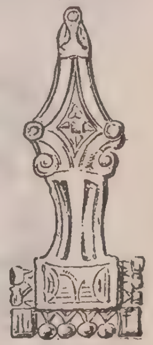
Fig. 27.

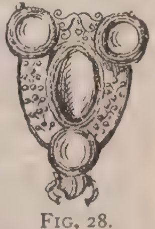
Fig. 28.

We turn now to the Celtic group of jewelled ornaments, which has an equally long and independent line of descent. The characteristic Celtic ornaments are of hammered work with details in repoussé, having fillings-in of vitreous paste, coloured enamels, amber, and in the later examples rock crystal with a smooth rounded surface cut *en cabochon*. The whole group is a special development within the British Isles of the art of the mid-European Early Iron age, which in its turn had been considerably influenced by early Mediterranean culture. In its early stages its special marks are combinations of curves, with peculiar central thickenings which give a quasi-naturalistic effect; a skilful use of inlaid enamels, and the chased line. After the introduction of Christianity, a continuous tradition combined the old system with the interlaced winding scrolls and other new forms of decoration, and so led up to the extreme complexity of early Irish illumination and metal work.

A remarkable group of gold ornaments of the pre-Christian time (probably of the 1st century) was discovered about 1896, in the north-west of Ireland, and acquired by the British Museum. It was subsequently claimed by the Crown as treasure trove, and after litigation was transferred to Dublin (see *Archaeologia*, lv., pl. 22).

Figs. 29 and 30 are illustrations of two brooches of the latest period in this class of work. The first is 13th century; the latter is probably 12th century, and is set with paste, amber and blue.

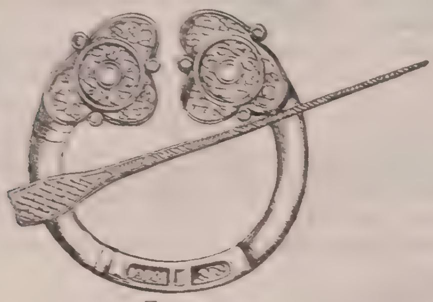

FIG. 29.

Rings are the chief specimens now seen of medieval jewelry from the 10th to the 13th century. They are generally massive and simple. Through the 16th century a variety of changes arose; in the traditions and designs of the *cinquecento* we have plenty of evidence that the workmen used their own designs, and the results culminated in the triumphs of Albert Dürer, Benvenuto Cellini and Hans Holbein. The goldsmiths of the Italian republics must have produced works of surpassing excellence in workmanship, and reaching the highest point in design as applied to handicrafts of any kind. The use of enamels, precious stones, niello work and engraving, in combination with skilful execution of the human figure and animal life, produced effects which modern art in this direction is not likely to approach, still less to rival.

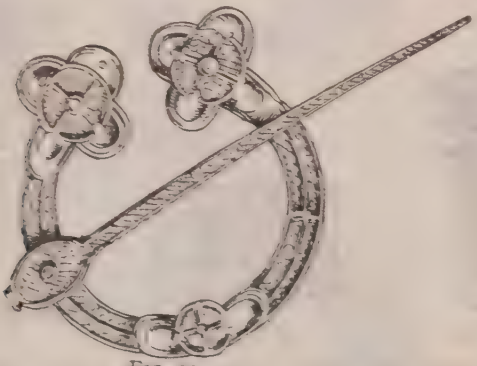

FIG. 30.

In fig. 31 illustrations are given of various characteristic specimens of the Renaissance and later forms of jewelry. A crystal cross set in enamelled gold (*a*) is German work of the 16th century. The pendant reliquary (*b*), enamelled and jewelled, is of 16th century German work, and so probably is the jewel (*c*) of gold set with diamonds and rubies. The Darnley or Lennox jewel (*d*), now in the possession of the king, was made about 1576–1577 for Lady Margaret Douglas, countess of Lennox, the mother of Henry Darnley. It is a pendant golden heart set with a heart-shaped sapphire, richly jewelled and enamelled with emblematic figures and devices. It also has Scottish mottoes around and within it. The ear-ring (*e*) of gold, enamelled, hung with small pearls, is an example of 17th century Russian work, and another (*f*) is Italian, of the same period, being of gold and filigree with enamel, also with pendant pearls. A Spanish ear-ring, of 18th century work (*g*), is a combination of ribbon, cord and filigree in gold; and another (*h*) is Flemish, of probably the same period; it is of gold open work set with diamonds in projecting collets. The old French-Normandy pendant cross and locket (*i*) presents a characteristic example of peasant jewelry; it is of branched open work set with bosses and ridged ornaments of crystal. The ear-ring (*j*) is French of 17th century, also of gold open work set with crystals. A small pendant locket (*k*) is of rock crystal, with the cross of Santiago in gold and translucent crimson enamel; it is 16th or 17th century Spanish work. A pretty ear-ring of gold open scroll work (*m*), set with minute diamonds and three pendant pearls, is Portuguese of 17th century, and another ear-ring (*n*) of gold circular open work, set also with minute diamonds, is Portuguese work of 18th century. These examples fairly illustrate the general features of the most characteristic jewelry of the dates quoted.

During the 17th and 18th centuries we see only a mechanical kind of excellence, the results of the mere tradition of the workshop—the lingering of the power which when wisely directed had done so much and so well, but now simply living on traditional forms, often combined in a most incongruous fashion. Gorgeous effects were aimed at by massing the gold, and introducing stones elaborately cut in themselves or clustered in groups. Thus diamonds were clustered in rosettes and bouquets; rubies, pearls, emeralds and other coloured special stones were brought together for little other purpose than to get them into a given space in conjunction with a certain quantity of gold. The question was not of design in its relation to use as personal decoration, but of the value which could be got into a given space to produce the most striking effect.

The traditions of Oriental design as they had come down through the various periods quoted, were comparatively lost in the wretched results of the *rococo* of Louis XIV. and the inanities of what modern revivalists of the Anglo-Dutch call "Queen Anne." In the London exhibition of 1851, the extravagances of modern jewelry had to stand comparison with the Oriental examples contributed from India. Since then we have learnt more about these works, and have been compelled to acknowledge, in spite of what is sometimes called inferiority of workmanship, how completely the Oriental jeweller understood his work, and with what singular simplicity of method he carried it out. The combinations are always harmonious, the result aimed at is always achieved; and if in attempting to work to European ideas the jeweller failed, this was rather the fault of the forms he had to follow, than due to any want of skill in making the most of a subject in which half the thought and the intended use were foreign to his experience.

A collection of peasant jewelry got together by Castellani for the Paris exhibition of 1867, and now in the Victoria and Albert Museum, illustrates in an admirable manner the traditional jewelry and personal ornaments of a wide range of peoples in Europe. This collection, and the additions made to it since its acquisition by the nation, show the forms in which these objects existed over several generations among the peasantry of France (chiefly Normandy), Spain, Portugal, Holland, Denmark, Germany and Switzerland, and also show how the forms popular in one country are followed and adopted in another, almost invariably because of their perfect adaptation to the purpose for which they were designed.

Apart from these humbler branches of the subject, in the middle of the 19th century the production of jewelry, regarded as a personal art, and not as a commercial and anonymous industry, was almost extinct. Its revival must be associated with the artistic movement which marked the close of that century, and which found emphatic expression in the Paris international exhibition of 1900. For many years before 1895 this industry, though prosperous from the commercial point of view, and always remarkable from that of technical finish, remained stationary as an art. French jewelry rested on its reputation. The traditions were maintained of either the 17th and 18th centuries or the style affected at the close of the second empire—light pierced work and design borrowed from natural flowers. The last type, introduced by Massin, had exercised, indeed, a revolutionary influence on the treatment of jewelry. This clever artist, not less skilful as a craftsman, produced a new *genre* by copying the grace and lightness of living blossoms, thus introducing a perfectly fresh element into the limited variety of traditional style, and by the use of filigree gold work altering its character and giving it greater elegance. Massin still held the first rank in the exhibition of 1878; he had a marked influence on his contemporaries, and his name will be remembered in the history of the goldsmith's art to designate a style and a period. Throughout these years the craft was exclusively devoted to perfection of workmanship. The utmost finish was aimed at in the mounting and setting of gems; jewelry was, in fact, not so much an art as a high-class industry; individual effort and purpose were absent.

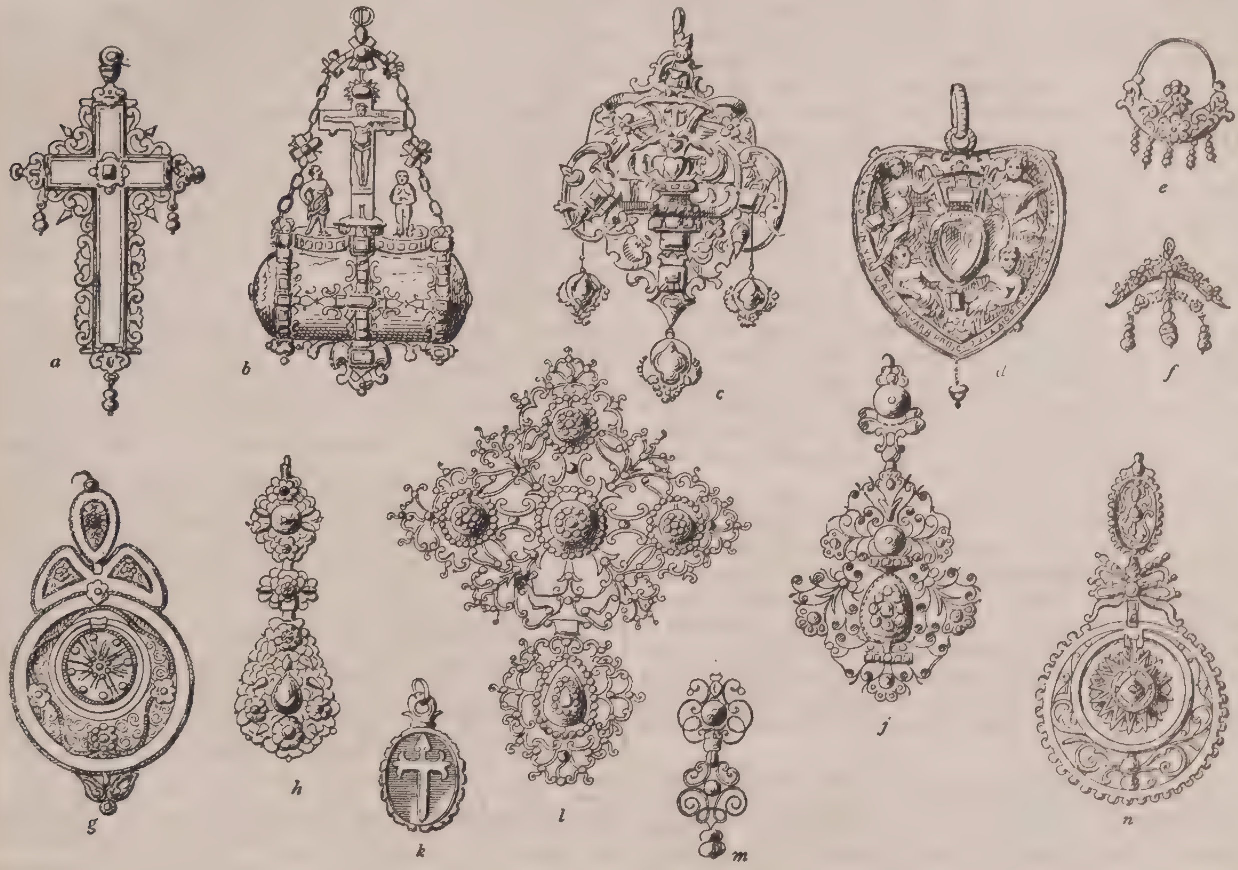

FIG. 31.

Up to that time precious stones had been of such intrinsic value that the jeweller's chief skill lay in displaying these costly stones to the best advantage; the mounting was a secondary consideration. The settings were seldom long preserved in their original condition, but in the case of family jewels were renewed with each generation and each change of fashion, a state of things which could not be favourable to any truly artistic development of taste, since the work was doomed, sooner or later, to destruction. However, the evil led to its own remedy. As soon as diamonds fell in value they lost at the same time their overwhelming prestige, and refined taste could give a preference to trinkets which derived their value and character from artistic design. This revolutionized the jeweller's craft, and revived the simple ornament of gold or silver, which came forward but timidly at first, till, in the Salon of 1895, it burst upon the world in the exhibits of René Lalique, an artist who was further confirmed in his remarkable position by the exhibition of 1900. What specially stamps the works of Lalique is their striking originality. His work may be considered from the point of view of design and from that of execution. As an artist he has completely reconstructed from the foundation the scheme of design which had fed the poverty-stricken imagination of the last generation of goldsmiths. He had recourse to the art of the past, but to the spirit rather than the letter, and to nature for many new elements of design—free double curves, suave or soft; opalescent harmonies of colouring; reminiscences, with quite a new feeling, of Egypt, Chaldea, Greece and the East, or of the art of the Renaissance; and infinite variety of floral forms even of the humblest. He introduces also the female nude in the form of sirens and sphinxes. As a craftsman he has effected a radical change, breaking through old routine, combining all the processes of the goldsmith, the chaser, the enameller and the gem-setter, and freeing himself from the narrow lines in which the art had been confined. He ignores the hierarchy of gems, caring no more on occasion for a diamond than for a flint, since, in his view, no stone, whatever its original estimation, has any value beyond the characteristic expression he lends it as a means to his end. Thus, while he sometimes uses diamonds, rubies, sapphires or emeralds as a background, he will, on the other hand, give a conspicuous position to common stones—carnelian, agate, malachite, jasper, coral, and even materials of no intrinsic value, such as horn. One of his favourite stones is the opal, which lends itself to his arrangements of colour, and which has in consequence become a fashionable stone in French jewelry.

In criticism of the art of Lalique and his school it should be observed that the works of the school are apt to be unsuited to the wear and tear of actual use, and inconveniently eccentric in their details. Moreover, the preciousness of the material is an almost inevitable consideration in the jeweller's craft, and cannot be set at naught by the artist without violating the canons of his art.

The movement which took its rise in France spread in due course to other countries. In England the movement conveniently described as the "arts and crafts movement" affected the design of jewelry. A group of designers has aimed at purging the jeweller's craft of its character of mere gem-mounting in conventional forms (of which the more unimaginative, representing stars, bows, flowers and the like, are varied by such absurdities as insects, birds, animals, figures of men and objects made up simply of stones clustered together). Their work is often excellently and fancifully designed, but it lacks that exquisite perfection of execution achieved by the incomparable craftsmen of France. At the same time English sculptor-decorators—such as Alfred Gilbert, R.A., and George J. Frampton, A.R.A.—have produced objects of a still higher class, but it is usually the work of the goldsmith rather than of the jeweller. Examples may be seen in the badge executed by Gilbert for the president of the Institute of Painters in Water Colours and in the mayoral chain for Preston. Symbolism here enters into the design, which has not only an ornamental but a didactic purpose.

The movement was represented in other countries also. In the United States it was led by L. C. Tiffany, in Belgium by Philippe Wolfers, who occupies in Belgium the position which in France is held by René Lalique. If his design is a little heavier, it is not less beautiful in imagination or less masterly in execution. Graceful, ingenious, fanciful, elegant, fantastic by turns, his objects of jewelry and goldsmithery have a solid claim to be considered *créations d'art*. It has also been felt in Germany, Austria, Russia and Switzerland. It must be admitted that many of the best artists who have devoted themselves to jewelry have been more successful in design than in securing the lightness and strength which are required by the wearer, and which were a characteristic in the works of the Italian craftsmen of the Renaissance. For this reason many of their masterpieces are more beautiful in the case than upon the person.

Modern Jewelry.—So far we have gone over the progress and results of the jeweller's art. We have now to speak of the production of jewelry as a modern art industry, in which large numbers of men and women are employed in the larger cities of Europe. Paris, Vienna, London and Birmingham are the most important centres. An illustration of the manufacture as carried on in London and Birmingham will be sufficient to give an insight into the technique and artistic manipulation of this branch of art industry; but, by way of contrast, it may be interesting to give in the first place a description of the native working jeweller of Hindustan.

He travels very much after the fashion of a tinker in England; his budget contains tools, materials, fire pots, and all the requisites of his handicraft. The gold to be used is generally supplied by the patron or employer, and is frequently in gold coin, which the travelling jeweller undertakes to convert into the ornaments required. He squats down in the corner of a courtyard, or under cover of a veranda, lights his fire, cuts up the gold pieces entrusted to him, hammers, cuts, shapes, drills, solders with the blow-pipe, files, scrapes and burnishes until he has produced the desired effect. If he has stones to set or coloured enamels to introduce, he never seems to make a mistake; his instinct for harmony of colour, like that of his brother craftsman the weaver, is as unerring as that of the bird in the construction of its nest. Whether the materials are common or rich and rare, he invariably does the very best possible with them, according to native ideas of beauty in design and combination. It is only when he is interfered with by European dictation that he ever vulgarizes his art or makes a mistake. The result may appear rude in its finish, but the design and the thought are invariably right. We thus see how a trade in the working of which the "plant" is so simple and wants are so readily met could spread itself, as in years past it did at Clerkenwell and at Birmingham before gigantic factories were invented for producing everything under the sun.

It is impossible to find any date at which the systematic production of jewelry was introduced into England. Probably the Clerkenwell trade dates its origin from the revocation of the edict of Nantes, as the skilled artisans in the jewelry, clock and watch, and trinket trades appear to have been descendants of the emigrant Huguenots. The Birmingham trade would appear to have had its origin in the skill to which the workers in fine steel had attained towards the middle and end of the 18th century, a branch of industry which collapsed after the French Revolution.

Modern jewelry may be classified under three heads: (1) objects in which gems and stones form the principal portions, and in which the work in silver, platinum or gold is really only a means for carrying out the design by fixing the gems or stones in the position arranged by the designer, the metal employed being visible only as a setting; (2) when gold work plays an important part in the development of the design, being itself ornamented by engraving (now rarely used) or enamelling or both, the stones and gems being arranged in subordination to the gold work in such positions as to give a decorative effect to the whole; (3) when gold or other metal is alone used, the design being wrought out by hammering in repoussé, casting, engraving, chasing or by the addition of filigree work (see FILIGREE), or when the surfaces are left absolutely plain but polished and highly finished.

Of course the most ancient and primitive methods are those wholly dependent upon the craft of the workman; but gradually various ingenious processes were invented, by which greater accuracy in the portions to be repeated in a design could be produced with certainty and economy: hence the various methods of stamping used in the production of hand-made jewelry, which are in themselves as much mechanical in relation to the end in view as if the whole object were stamped out at a blow, twisted into its proper position as regards the detail, or the various stamped portions fitted into each other for the mechanical completion of the work. It is therefore rather difficult to draw an absolute line between hand-made and machine-made jewelry, except in extreme cases of hand-made, when everything is worked, so to speak, from the solid, or of machine-made, when the hand has only to give the ornament a few touches of a tool, or fit the parts together if of more than one piece.

The best and most costly hand-made jewelry produced in England, whether as regards gold work, gems, enamelling or engraving, is made in London, and chiefly at Clerkenwell. A design is first made with pencil, sepia or water colour, and when needful with separate enlargement of details, everything in short to make the drawing thoroughly intelligible to the working jeweller. According to the nature and purpose of the design, he cuts out, hammers, files and brings into shape the constructive portions of the work as a basis. Upon this, as each detail is wrought out, he solders, or (more rarely) fixes by rivets, &c., the ornamentation necessary to the effect. The human figure, representations of animal life, leaves, fruit, &c., are modelled in wax, moulded and cast in gold, to be chased up and finished. As the hammering goes on the metal becomes brittle and hard, and then it is passed though the fire to anneal or soften it. In the case of elaborate examples of repoussé, after the general forms are beaten up, the interior is filled with a resinous compound, pitch mixed with fire-brick dust; and this, forming a solid but pliable body underneath the metal, allows of the finished details being wrought out on the front of the design, and being finally completed by chasing. When stones are to be set, or when they form the principal portions of the design, the gold or other metal has to be wrought by hand so as to receive them in little cup-like orifices, these walls of gold enclosing the stone and allowing the edges to be bent over to secure it. Setting is never effected by cement in well-made jewelry. Machine-made settings have in recent years been made, but these are simply cheap imitations of the true hand-made setting. Even strips of gold have been used, serrated at the edges to allow of being easily bent over, for the retention of the stones, true or false.

Great skill and experience are necessary in the proper setting of stones and gems of high value, in order to bring out the greatest amount of brilliancy and colour, and the angle at which a diamond (say) shall be set, in order that the light shall penetrate at the proper point to bring out the "spark" or "flash," is a subject of grave consideration to the setter. Stones set in a haphazard, slovenly manner, however brilliant in themselves, will look commonplace by the side of skilfully set gems of much less fine quality and water. Enamelling (see ENAMEL) has of late years largely taken the place of "paste" or false stones.

Engraving is a simple process in itself, and diversity of effect can be produced by skilful manipulation. An interesting variety in the effect of a single ornament may be produced by the combination of coloured gold of various tints. This colouring is a process requiring skill and experience in the manipulation of the materials according to the quality of the gold and the amount of silver alloy in it. The objects to be coloured are dipped in a boiling mixture of salt, alum and saltpetre. Of general colouring it may be said that the object aimed at is to enhance the appearance of the gold by removing the particles of alloy on the surface, and thus allowing the pure gold only to remain visible to the eye. The process has, however, gone much out of fashion. It is apt to rot the solder, and repairs to gold work can be better finished by electro-gilding.

The application of machinery to the economical production of certain classes of jewelry, not necessarily imitations, but as much "real gold" work, to use a trade phrase, as the best hand-made, has been on the increase for many years. Nearly every kind of gold chain now made is manufactured by machinery, and nothing like the beauty of design or perfection of workmanship could be obtained by hand at, probably, any cost. The question therefore in relation to chains is not the mode of manufacture, but the quality of the metal. Eighteen carat gold is of course preferred by those who wear chains, but this is only gold in the proportion of 18 to 24, pure gold being represented by 24. The gold coin of the realm is 22 carat; that is, it contains one-twelfth of alloy to harden it to stand wear and tear. Thus 18 carat gold has one-fourth of alloy, and so on with lower qualities down to 12, which is in reality only gold by courtesy. It must be remembered that the alloys are made by weight, and as gold is nearly twice as heavy as the metal it is mixed with, it only forms a third of the bulk of a 12 carat mixture.

The application of machinery to the production of personal ornaments in gold and silver can only be economically and successfully carried on when there is a large demand for similar objects, that is to say, objects of precisely the same design and decoration throughout. In machine-made jewelry everything is stereotyped, so to speak, and the only work required for the hand is to fit the parts together—in some instances scarcely that. A design is made, and from it steel dies are sunk for stamping out as rapidly as possible from a plate of rolled metal the portion represented by each die. It is in these steel dies that the skill of the artist die-sinker is manifested. Brooches, ear-rings, pinheads, bracelets, lockets, pendants, &c., are struck out by the gross. This is more especially the case in silver and in plated work—that is, imitation jewelry—the base of which is an alloy, afterwards gilt by electro-plating. With these ornaments imitation stones in paste and glass, pearls, &c., are used, and it is remarkable that of late years some of the best designs, the most simple, appropriate and artistic, have appeared in imitation jewelry. It is only just to those engaged in this manufacture to state distinctly that their work is never sold wholesale for anything else than what it is. The worker in gold only makes gold or real jewelry, and he only makes of a quality well known to his customers. The producer of silver work only manufactures silver ornaments, and so on throughout the whole class of plated goods.

It is the retailer who, if he is unprincipled, takes advantage of the ignorance of the buyer and sells for gold that which is in reality an imitation, and which he bought as such. The imitations of old styles of jewelry which are largely sold in curiosity shops at foreign places of fashionable resort are said to be made in Germany, especially at Munich.

Bibliography.—For the Dāhshur jewels, see J. de Morgan and others; *Fouilles à Dahchour, Mars-Juin 1894* (Vienna, 1895) and *Fouilles à Dahchour en 1894–1895* (Vienna, 1903). For the Aah-hotp jewels, see Mariette, *Album de Musée de Boulaq*, pls. 29–31; Birch, *Facsimiles of the Egyptian Relics discovered in the Tomb of Queen Aah-hotep* (1863). For Cretan excavations, see A. J Evans, in *Annual of the British School at Athens*, Nos. 7 to 11; *Archaeologia*, vol. lix. For excavations at Enkomi, see *Excavations in Cyprus*, by A. S. Murray and others (1900). For Schliemann's excavations, see Schliemann's works; also Schuchhardt, *Schliemann's Excavations*; Perrot & Chipiez, *Histoire de l'Art*, vi. For the Greek Island treasure, see A. J. Evans, *Journal of Hellenic Studies*, xiii. For Ephesus gold treasure, see D. G. Hogarth, *British Museum Excavations at Ephesus*; *The Archaic Artemisia*. For the Hermitage Collection from South Russia, see Gillé, *Antiquités du Bosphore Cimmérien* (reissued by S. Reinach), and the *Comptes rendus* of the Russian Archaeological Commission (St Petersburg). For later jewelry, Pollak, *Goldschmiedearbeit*. For Treasure of Pétrossa, A. Odobesco, *Le Trésor de Pétrossa*. For the European and west Asiatic barbaric jewelry, see O. M. Dalton, in *Archaeologia*, lviii. 237, and the *Treasure of the Oxus* (British Museum, 1905). For the whole history, G. Fontenay, *Les Bijoux anciens et modernes* (Paris [Quantin], 1887). For the recent movement, Léonce Bénédite, "La Bijouterie et la joaillerie, à l'exposition universelle; René Lalique," in the *Revue des arts décoratifs*, 1900 (July, August). (A. H. Sm.)

JEWETT, SARAH ORNE (1849–1909), American novelist, was born in South Berwick, Maine, on the 3rd of September 1849. She was a daughter of the physician Theodore H. Jewett (1815–1878), by whom she was greatly influenced, and whom she has drawn in *A Country Doctor* (1884). She studied at the Berwick Academy, and began her literary career in 1869, when she contributed her first story to the *Atlantic Monthly*. Her best work consists of short stories and sketches, such as those in *The Country of the Pointed Firs* (1896). The People of Maine, with their characteristic speech, manners and traditions, she describes with peculiar charm and realism, often recalling the work of Hawthorne. She died at South Berwick, Maine, on the 24th of June 1909.

Among her publications are: *Deephaven* (1877), a series of sketches; *Old Friends and New* (1879); *Country By-ways* (1881); *A Country Doctor* (1884), a novel; *A Marsh Island* (1885), a novel; *A White Heron and other Stories* (1886); *The King of Folly Island and other People* (1888); *Strangers and Wayfarers* (1890); *A Native of Winby and other Tales* (1893); *The Queen's Twin and other Stories* (1899), and *The Tory Lover* (1901), an historical novel.

JEWS (Heb. *Yĕhūdī*, man of Judah; Gr. Ἰουδαῖοι; Lat. *Judaei*), the general name for the Semitic people which inhabited Palestine from early times, and is known in various connexions as "the Hebrews," "the Jews," and "Israel" (see §5 below). Their history may be divided into three great periods: (1) That covered by the Old Testament to the foundation of Judaism in the Persian age, (2) that of the Greek and Roman domination to the destruction of Jerusalem, and (3) that of the Diaspora or Dispersion to the present day.

I.—Old Testament History

1. *The Land and the People.*—For the first two periods the history of the Jews is mainly that of Palestine. It begins among those peoples which occupied the area lying between the Nile on the one side and the Tigris and the Euphrates on the other. Surrounded by ancient seats of culture in Egypt and Babylonia, by the mysterious deserts of Arabia, and by the highlands of Asia Minor, Palestine, with Syria on the north, was the high road of civilization, trade and warlike enterprise, and the meeting-place of religions. Its small principalities were entirely dominated by the great Powers, whose weakness or acquiescence alone enabled them to rise above dependence or vassalage. The land was traversed by old-established trade routes and possessed important harbours on the Gulf of ʽAkaba and on the Mediterranean coast, the latter exposing it to the influence of the Levantine culture. It was "the physical centre of those movements of history from which the world has grown." The portion of this district abutting upon the Mediterranean may be divided into two main parts:—Syria (from the Taurus to Hermon) and Palestine (southward to the desert bordering upon Egypt). The latter is about 150 m. from north to south (the proverbial "Dan to Beersheba"), with a breadth varying from 25 to 80 m., *i.e.* about 6040 sq. m. This excludes the land east of the Jordan, on which see Palestine.

From time to time streams of migration swept into Palestine and Syria. Semitic tribes wandered northwards from their home in Arabia to seek sustenance in its more fertile fields, to plunder, or to escape the pressure of tribes in the rear. The course leads naturally into either Palestine or Babylonia, and, following the Euphrates, northern Syria is eventually reached. Tribes also moved down from the north: nomads, or offshoots from the powerful states which stretch into Asia Minor. Such frequently recurring movements introduced new blood. Tribes, chiefly of pastoral habits, settled down among others who were so nearly of their own type that a complete amalgamation could be effected, and this without any marked modification of the general characteristics of the earlier inhabitants. It is from such a fusion as this that the ancestors of the Jews were descended, and both the history and the genius of this people can be properly understood only by taking into account the physical features of their land and the characteristics of the Semitic races in general (see Palestine, Semitic Languages).

2. *Society and Religion.*—The similarity uniting the peoples of the East in respect of racial and social characteristics is accompanied by a striking similarity of mental outlook which has survived to modern times. Palestine, in spite of the numerous vicissitudes to which it has been subjected, has not lost its fundamental characteristics. The political changes involved in the Babylonian, Assyrian, Egyptian or Persian conquests surely affected it as little as the subsequent waves of Greek, Roman and other European invasions. Even during the temporary Hellenization in the second great period the character of the people as a whole was untouched by the various external influences which produced so great an effect on the upper classes. When the foreign civilization perished, the old culture once more came to the surface. Hence it is possible, by a comprehensive comparative study of Eastern peoples, in both ancient and modern times, to supplement and illustrate within certain limits our direct knowledge of the early Jewish people, and thus to understand more clearly those characteristics which were

peculiar to them, in relation to those which they shared with other Oriental peoples.

Even before authentic history begins, the elements of religion and society had already crystallized into a solid coherent structure which was to persist without essential modification. Religion was inseparable from ordinary life, and, like that of all peoples who are dependent on the fruits of the earth, was a nature-worship. The tie between deities and worshippers was regarded as physical and entailed mutual obligations. The study of the clan-group as an organization is as instructive here as in other fields. The members of each group lived on terms of equality, the families forming a society of worship the rites of which were conducted by the head. Such groups (each with its local deity) would combine for definite purposes under the impulse of external needs, but owing to inevitable internal jealousies and the incessant feuds among a people averse from discipline and authority, the unions were not necessarily lasting. The elders of these groups possessed some influence, and tended to form an aristocracy, which took the lead in social life, although their authority generally depended merely upon custom. Individual leaders in times of stress acquired a recognized supremacy, and, once a tribe outstripped the rest, the opportunities for continued advance gave further scope to their authority. "The interminable feuds of tribes, conducted on the theory of blood-revenge, . . . can seldom be durably healed without the intervention of a third party who is called in as arbiter, and in this way an impartial and wise power acquires of necessity a great and beneficent influence over all around it" (W. R. Smith). In time, notwithstanding a certain inherent individualism and impatience of control, veritable despotisms arose in the Semitic world, although such organizations were invariably liable to sudden collapse as the old forms of life broke down with changing conditions.[1]

3. *Early History.*[2]—Already in the 15th century B.C. Palestine was inhabited by a settled people whose language, thought and religion were not radically different several hundred years later. Small native princes ruled as vassals of Egypt which, after expelling the Hyksos from its borders, had entered upon a series of conquests as far as the Euphrates. Some centuries previously, however, Babylonia had laid claim to the western states, and the Babylonian (*i.e.* Assyrian) script and language were now used, not merely in the diplomatic correspondence between Egypt and Asia, but also for matters of private and everyday life among the Palestinian princes themselves. To what extent specific Babylonian influence showed itself in other directions is not completely known. Canaan (Palestine and the south Phoenician coast land) and Amor (Lebanon district and beyond) were under the constant supervision of Egypt, and Egyptian officials journeyed round to collect tribute, to attend to complaints, and to assure themselves of the allegiance of the vassals. The Amarna tablets and those more recently found at Taannek (bibl. Taanach), together with the contemporary archaeological evidence (from Lachish, Gezer, Megiddo, Jericho, &c.), represent advanced conditions of life and culture, the precise chronological limits of which cannot be determined with certainty. This age, with its regular maritime intercourse between the Aegean settlements, Phoenicia and the Delta, and with lines of caravans connecting Babylonia, North Syria, Arabia and Egypt, presents a remarkable picture of life and activity, in the centre of which lies Palestine, with here and there Egyptian colonies and some traces of Egyptian cults. The history of this, the "Amarna" age, reveals a state of anarchy in Palestine for which the weakness of Egypt and the downward pressure of north Syrian peoples were responsible. Subdivided into a number of little local principalities, Palestine was suffering both from internal intrigues and from the designs of this northern power. It is now that we find the restless Ḥabiru, a name which is commonly identified with that of the "Hebrews" (*'ibrim*). They offer themselves where necessary to either party, and some at least perhaps belonged to the settled population. The growing prominence of the new northern group of "Hittite" states continued to occupy the energies of Egypt, and when again we have more external light upon Palestinian history, the Hittites (*q.v.*) are found strongly entrenched in the land. But by the end of the first quarter of the 13th century B.C. Egypt had recovered its province (precise boundary uncertain), leaving its rivals in possession of Syria. Towards the close of the 13th century the Egyptian king Merneptah (Mineptah) records a successful campaign in Palestine, and alludes to the defeat of Canaan, Ascalon, Gezer, Yenuam (in Lebanon) and (the people or tribe) Israel.[3] Bodies of aliens from the Levantine coast had previously threatened Egypt and Syria, and at the beginning of the 12th century they formed a coalition on land and sea which taxed all the resources of Rameses III. In the Purasati, apparently the most influential of these peoples, may be recognized the origin of the name "Philistine." The Hittite power became weaker, and the invaders, in spite of defeat, appear to have succeeded in maintaining themselves on the sea coast. External history, however, is very fragmentary just at the age when its evidence would be most welcome. For a time the fate of Syria and Palestine seems to have been no longer controlled by the great powers. When the curtain rises again we enter upon the historical traditions of the Old Testament.

4. *Biblical History.*—For the rest of the first period the Old Testament forms the main source. It contains in fact the history itself in two forms: (*a*) from the creation of man to the fall of Judah (Genesis–2 Kings), which is supplemented and continued further—(*b*) to the foundation of Judaism in the 5th century B.C. (Chronicles—Ezra-Nehemiah). In the light of contemporary monuments, archaeological evidence, the progress of scientific knowledge and the recognized methods of modern historical criticism, the representation of the origin of mankind and of the history of the Jews in the Old Testament can no longer be implicitly accepted. Written by an Oriental people and clothed in an Oriental dress, the Old Testament does not contain objective records, but subjective history written and incorporated for specific purposes. Like many Oriental works it is a compilation, as may be illustrated from a comparison of Chronicles with Samuel–Kings, and the representation of the past in the light of the present (as exemplified in Chronicles) is a frequently recurring phenomenon. The critical examination of the nature and growth of this compilation has removed much that had formerly caused insuperable difficulties and had quite unnecessarily been made an integral or a relevant part of practical religion. On the other hand, criticism has given a deeper meaning to the Old Testament history, and has brought into relief the central truths which really are vital; it may be said to have replaced a divine account of man by man's account of the divine. Scholars are now almost unanimously agreed that the internal features are best explained by the Graf-Wellhausen hypothesis. This involves the view that the historical traditions are mainly due to two characteristic though very complicated recensions, one under the influence of the teaching of Deuteronomy (Joshua to Kings, see § 20), the other, of a more priestly character (akin to Leviticus), of somewhat later date (Genesis to Joshua, with traces in Judges to Kings, see § 23). There are, of course, numerous problems relating to the nature, limits and dates of the two recensions, of the incorporated sources, and of other sources (whether early or late) of independent origin; and here there is naturally room for much divergence of opinion. Older material (often of composite origin) has been used, not so much for the purpose of providing historical information, as with the object of showing the religious significance of past history;

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[1] On the homogeneity of the population, see further, W. R. Smith, *Religion of the Semites* (2nd ed., chaps. i.–iii.); T. Nöldeke, *Sketches from Eastern History*, pp. 1–20 (on "Some Characteristics of the Semitic Race"); and especially E. Meyer, *Gesch. d. Altertums* (2nd ed., i. §§ 330, sqq.). For the relation between the geographical characteristics and the political history, see G. A. Smith, *Historical Geography of the Holy Land.*

[2] For fuller information on this section see PALESTINE: *History*, and the related portions of BABYLONIA AND ASSYRIA, EGYPT, HITTITES, SYRIA.

[3] Or *land* Israel, W. Spiegelberg, *Orient. Lit. Zeit.* xi. (1908), cols. 403–405.

and the series Joshua–Kings is actually included among the "prophets" in Jewish reckoning (see MIDRASH). In general, one may often observe that freedom which is characteristic of early and unscientific historians. Thus one may note the reshaping of older material to agree with later thought, the building up of past periods from the records of other periods, and a frequent loss of perspective. The historical traditions are to be supplemented by the great body of prophetic, legal and poetic literature which reveal contemporary conditions in various internal literary, theological or sociological features. The investigation of their true historical background and of the trustworthiness of their external setting (*e.g.* titles of psalms, dates and headings of prophecies) involves a criticism of the historical traditions themselves, and thus the two major classes of material must be constantly examined both separately and in their bearing on one another. In a word, the study of biblical history, which is dependent in the first instance upon the written sources, demands constant attention to the text (which has had an interesting history) and to the literary features; and it requires a sympathetic acquaintance with Oriental life and thought, both ancient and modern, an appreciation of the necessity of employing the methods of scientific research, and (from the theological side) a reasoned estimate of the dependence of individual religious convictions upon the letter of the Old Testament.[1]

In view of the numerous articles in this work dealing with biblical subjects,[2] the present sketch is limited to the outlines of the traditional history; the religious aspect in its bearing upon biblical theology (which is closely bound up with the traditions) is handled separately under HEBREW RELIGION. The related literature is enormous (see the bibliographies to the special articles); it is indexed annually in *Orientalische Bibliographie* (Berlin), and is usefully summarized in the *Theologische Jahresbericht* (Berlin). On the development of the study of biblical history see C. A. Briggs, *Study of Holy Scripture* (1899), especially ch. xx. The first scientific historical work was by H. Ewald, *Gesch. d. Volkes Israel* (1843; 3rd ed., 1864–1868; Eng. trans., 1869–1883), popularized by Arthur Penrhyn Stanley in his *Hist. of the Jewish Church* (1863–1879). The works of J. Wellhausen (especially *Prolegomena to the Hist. of Israel*, Eng. trans., 1885, also the brilliant article "Israel" in the 9th ed. of the *Ency. Brit.*, 1879) were epoch-making; his position was interpreted to English readers by W. Robertson Smith (*Old Test. in Jewish Church*, 1881, 2nd ed., 1892; *Prophets of Israel*, 1882, 2nd ed. by T. K. Cheyne, 1902). The historical (and related) works of T. K. Cheyne, H. Graetz, H. Guthe, F. C. Kent, A. Kittel, W. H. Kosters, A. Kuenen, C. Piepenbring, and especially B. Stade, although varying greatly in standpoint, are among the most valuable by recent scholars; H. P. Smith's *Old Test. Hist.* ("International Theological Library," Edinburgh, 1903) is in many respects the most serviceable and complete study; a modern and more critical "Ewald" is a desideratum. For the works of numerous other scholars who have furthered Old Testament research in the past it must suffice to refer to the annotated list by J. M. P. Smith, *Books for O.T. Study* (Chicago, 1908).

For the external history, E. Schrader, *Cuneiform Inscr. and the Old Testament* (Eng. trans. by O. C. Whitehouse, 1885–1888) is still helpful; among the less technical works are J. F. McCurdy, *History, Prophecy and the Monuments*; B. Paton, *Syria and Palestine* (1902); G. Maspero, *Hist. ancienne* (6th ed., 1904); A. Jeremias, *Alte Test. im Lichte d. Alten Orients* (2nd ed., 1906); and especially *Altoriental. Texte u. Bilder zum Alten Test.*, ed. by H. Gressman, with A. Ungnad and H. Ranke (1909). The most complete is that of Ed. Meyer, *Gesch. d. Alterthums* (2nd ed., 1907 sqq.). That of Jeremias follows upon the lines of H. Winckler, whose works depart from the somewhat narrow limits of purely "Israelite" histories, emphasize the necessity of observing the characteristics of Oriental thought and policy, and are invaluable for discriminating students. Winckler's own views are condensed in the 3rd edition—a re-writing—of Schrader's work (*Keilinschr. u. d. Alte Testament*, 1903), and, with an instructive account of the history of "ancient nearer Asia," in H. F. Helmolt's *World's History*, iii. 1–252 (1903). All modern histories of any value are necessarily compromises between the biblical traditions and the results of recent investigation, and those studies which appear to depart most widely from the biblical or canonical representation often do greater justice to the evidence as a whole than the slighter or more conservative and apologetic reconstructions.[3] Scientific biblical historical study, nevertheless, is still in a relatively backward condition; and although the labours of scholars since Ewald constitute a distinct epoch, the trend of research points to the recognition of the fact that the purely subjective literary material requires a more historical treatment in the light of our increasing knowledge of external and internal conditions in the old Oriental world. But an inductive and deductive treatment, both comprehensive and in due proportion, does not as yet (1910) exist, and awaits fuller external evidence.[4]

5. *Traditions of Origin.*—The Old Testament preserves the remains of an extensive literature, representing different standpoints, which passed through several hands before it reached its present form. Surrounded by ancient civilizations where writing had long been known, and enjoying, as excavation has proved, a considerable amount of material culture, Palestine could look back upon a lengthy and stirring history which, however, has rarely left its mark upon our records. Whatever ancient sources may have been accessible, whatever trustworthy traditions were in circulation, and whatever a knowledge of the ancient Oriental world might lead one to expect, one is naturally restricted in the first instance to those undated records which have survived in the form which the last editors gave to them. The critical investigation of these records is the indispensable prelude to all serious biblical study, and hasty or sweeping deductions from monumental or archaeological evidence, or versions compiled promiscuously from materials of distinct origin, are alike hazardous. A glimpse at Palestine in the latter half of the second millennium B.C. (§ 3) prepares us for busy scenes and active intercourse, but it is not a history of this kind which the biblical historians themselves transmit. At an age when—on literary-critical grounds—the Old Testament writings were assuming their present form, it was possible to divide the immediately preceding centuries into three distinct periods. (*a*) The first, that of the two rival kingdoms: Israel (Ephraim or Samaria) in the northern half of Palestine, and Judah in the south. Then (*b*) the former lost its independence towards the close of the 8th century B.C., when a number of its inhabitants were carried away; and the latter shared the fate of exile at the beginning of the 6th, but succeeded in making a fresh reconstruction some fifty or sixty years later. Finally (*c*), in the so-called "post-exilic" period, religion and life were reorganized under the influence of a new spirit; relations with Samaria were broken off, and Judaism took its definite character, perhaps about the middle or close of the 5th century. Throughout these vicissitudes there were important political and religious changes which render the study of the composite sources a work of unique difficulty.[5] In addition to this it should be noticed that the term "Jew" (originally *Yehudi*), in spite of its wider application, means properly "man of Judah," *i.e.* of that small district which, with Jerusalem as its capital, became the centre of Judaism. The favourite name "Israel" with all its religious and national associations is somewhat ambiguous in an historical sketch, since, although it is used as opposed to Judah (*a*), it ultimately came to designate the true nucleus of the worshippers of the national god Yahweh as opposed to the Samaritans, the later inhabitants of Israelite territory (*c*). A more general term is "Hebrew" (see HEBREW LANGUAGE), which, whether originally identical with the Ḥabiru or not (§ 3), is used in contrast to foreigners, and this non-committal ethnic

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[1] It is useful to compare the critical study of the Koran (*q.v.*), where, however, the investigation of its various "revelations" is simpler than that of the biblical "prophecies" on account of the greater wealth of independent historical tradition. See also G. B. Gray, *Contemporary Review* (July 1907); A. A. Bevan, *Cambridge Biblical Essays* (ed. Swete, 1909), pp. 1–19.

[2] See primarily BIBLE: *Old Testament*; the articles on the contents and literary structure of the several books; the various biographical, topographical and ethnical articles, and the separate treatment of the more important subjects (*e.g.* LEVITES, PROPHET, SACRIFICE).

[3] On the bearing of external evidence upon the internal biblical records, see especially S. R. Driver's essay in Hogarth's *Authority and Archaeology*; cf. also A. A. Bevan, *Critical Review* (1897), p. 406 sqq., 1898, pp. 131 sqq.); G. B. Gray, *Expositor*, May 1898; W. G. Jordan, *Bib. Crit. and Modern Thought* (1909), pp. 42 sqq.

[4] For the sections which follow the present writer may be permitted to refer to his introductory contributions in the *Expositor* (June, 1906; "The Criticism of the O.T."); the *Jewish Quarterly Review* (July 1905–January 1907 = *Critical Notes on O.T. History*, especially sections vii.–ix.); July and October 1907, April 1908; *Amer. Journ. Theol.* (July 1909, "Simeon and Levi: the Problem of the Old Testament"); and Swete's *Cambridge Bib. Essays*, pp. 54–89 ("The Present Stage of O.T. Research").

deserves preference where precise distinction is unnecessary or impossible.

The traditions which prevailed among the Hebrews concerning their origin belong to a time when Judah and Israel were regarded as a unit. Twelve divisions or tribes, of which Judah was one, held together by a traditional sentiment, were traced back to the sons of Jacob (otherwise known as Israel), the son of Isaac and grandson of Abraham. Their names vary in origin and probably also in point of age, and where they represent fixed territorial limits, the districts so described were in some cases certainly peopled by groups of non-Israelite ancestry. But as tribal names they invited explanation, and of the many characteristic traditions which were doubtless current a number have been preserved, though not in any very early dress. Close relationship was recognized with the Aramaeans, with Edom, Moab and Ammon. This is characteristically expressed when Esau, the ancestor of Edom, is represented as the brother of Jacob, or when Moab and Ammon are the children of Lot, Abraham's nephew (see Genealogy: *Biblical*). Abraham, it was believed, came from Harran (Carrhae), primarily from Babylonia, and Jacob re-enters from Gilead in the north-east with his Aramaean wives and concubines and their families (Benjamin excepted). It is on this occasion that Jacob's name is changed to Israel. These traditions of migration and kinship are in themselves entirely credible, but the detailed accounts of the ancestors Abraham, Isaac and Jacob, as given in Genesis, are inherently doubtful as regards both the internal conditions, which the (late) chronological scheme ascribes to the first half of the second millennium B.C., and the general circumstances of the life of these strangers in a foreign land. From a variety of independent reasons one is forced to conclude that, whatever historical elements they may contain, the stories of this remote past represent the form which tradition had taken in a very much later age.

Opinion is at variance regarding the patriarchal narratives as a whole. To deny their historical character is to reject them as trustworthy accounts of the age to which they are ascribed, and even those scholars who claim that they are essentially historical already go so far as to concede idealization and the possibility or probability of later revision. The failure to apprehend historical method has often led to the fallacious argument that the trustworthiness of individual features justifies our accepting the whole, or that the elimination of unhistorical elements will leave an historical residuum. Here and frequently elsewhere in biblical history it is necessary to allow that a genuine historical tradition may be clothed in an unhistorical dress, but since many diverse motives are often concentrated upon one narrative (*e.g.* Gen. xxxii. 22–32, xxxiv., xxxviii.), the work of internal historical criticism (in view of the scantiness of the evidence) can rarely claim finality. The patriarchal narratives themselves belong to the popular stock of tradition of which only a portion has been preserved. Many of the elements lie outside questions of time and place and are almost immemorial. Some appear written for the first time in the book of Jubilees, in "the Testament of the Twelve Patriarchs" (both perhaps 2nd century B.C.) and in later sources; and although in Genesis the stories are now in a post-exilic setting (a stage earlier than Jubilees), the older portions may well belong to the 7th or 6th cent. This question, however, will rest upon those criteria alone which are of true chronological validity (see further Genesis).

The story of the settlement of the national and tribal ancestors in Palestine is interrupted by an account of the southward movement of Jacob (or Israel) and his sons into a district under the immediate influence of the kings of Egypt. After an interval of uncertain duration we find in Exodus a numerous people subjected to rigorous oppression. No longer individual sons of Jacob or Israel, united tribes were led out by Moses and Aaron; and, after a series of incidents extending over forty years, the "children of Israel" invaded the land in which their ancestors had lived. The traditions embodied in the books Exodus-Joshua are considerably later than the apparent date of the events themselves, and amid the diverse and often conflicting data it is possible to recognize distinct groups due to some extent to distinct historical conditions. The story of the "exodus" is that of the religious birth of "Israel," joined by covenant with the national god Yahweh[1] whose aid in times of peril and need proved his supremacy. In Moses (*q.v.*) was seen the founder of Israel's religion and laws; in Aaron (*q.v.*) the prototype of the Israelite priesthood. Although it is difficult to determine the true historical kernel; two features are most prominent in the narratives which the post-exilic compiler has incorporated: the revelation of Yahweh, and the movement into Palestine. Yahweh had admittedly been the God of Israel's ancestors, but his name was only now made known (Exod. iii. 13 sqq., vi. 2 seq.), and this conception of a new era in Yahweh's relations with the people is associated with the family of Moses and with small groups from the south of Palestine which reappear in religious movements in later history (see Kenites). Amid a great variety of motives the prominence of Kadesh in south Palestine is to be recognized, but it is uncertain what clans or tribes were at Kadesh, and it is possible that traditions, originally confined to those with whom the new conception of Yahweh is connected, were subsequently adopted by others who came to regard themselves as the worshippers of the only true Yahweh. At all events, two quite distinct views seem to underlie the opening books of the Old Testament. The one associates itself with the ancestors of the Hebrews and has an ethnic character. The other, part of the religious history of "Israel," is essentially bound up with the religious genius of the people, and is partly connected with clans from the south of Palestine whose influence appears in later times. Other factors in the literary growth of the present narratives are not excluded (see further § 8, and Exodus, The).[2]

6. *The Monarchy of Israel.*—The book of Joshua continues the fortunes of the "children of Israel" and describes a successful occupation of Palestine by the united tribes. This stands in striking contrast to other records of the partial successes of individual groups (Judg. i.). The former, however, is based upon the account of victories by the Ephraimite Joshua over confederations of petty kings to the south and north of central Palestine, apparently the specific traditions of the people of Ephraim describing from their standpoint the entire conquest of Palestine.[3] The book of Judges represents a period of unrest after the settlement of the people. External oppression and internal rivalries rent the Israelites, and in the religious philosophy of a later (Deuteronomic) age the period is represented as one of alternate apostasy from and of penitent return to the Yahweh of the "exodus." Some vague recollection of known historical events (§ 3 end) might be claimed among the traditions ascribed to the closing centuries of the second millennium, but the view that the prelude to the monarchy was an era when individual leaders "judged" all Israel finds no support in the older narratives, where the heroes of the age (whose correct sequence is uncertain) enjoy only a local fame. The best historical narratives belong to Israel and Gilead; Judah scarcely appears, and in a relatively old poetical account of a great fight of the united tribes against a northern adversary lies outside the writer's horizon or interest (Judg. v., see Deborah). Stories of successful warfare and of temporary leaders (see Abimelech; Ehud; Gideon; Jephthah) form an introduction to the institution of the Israelite monarchy, an epoch of supreme importance in biblical history. The heroic figure who stands at the head is Saul ("asked"), and two accounts of his rise are recorded. (1) The Philistines, a foreign people whose presence in Palestine

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[1] On the name see Jehovah, Tetragrammaton.

[2] The story of Joseph has distinctive internal features of its own, and appears to be from an independent cycle, which has been used to form a connecting link between the Settlement and the Exodus; see also Ed. Meyer, *Die Israeliten u. ihre Nachbarstämme* (1906), pp. 228, 433; B. Luther, ibid. pp. 108 seq., 142 sqq. Neither of the poems in Deut. xxxii. seq. alludes to an escape from Egypt; Israel is merely a desert tribe inspired to settle in Palestine. Apparently even the older accounts of the exodus are not of very great antiquity; according to Jeremiah ii. 2, 7 (cf. Hos. ii. 15) some traditions of the wilderness must have represented Israel in a very favourable light; for the "canonical" view, see Ezekiel xvi., xx., xxiii.

[3] The capture of central Palestine itself is not recorded; according to its own traditions the district had been seized by Jacob (Gen. xlviii. 22; cf. the late form of the tradition in Jubilees xxxiv.). This conception of a conquering hero is entirely distinct from the narratives of the descent of Jacob into Egypt, &c. (see Meyer and Luther, *op. cit.* pp. 110, 227 seq., 415, 433).

has already been noticed, had oppressed Israel (cf. Samson) until a brilliant victory was gained by the prophet Samuel, some account of whose early history is recorded. He himself held supreme sway over all Israel as the last of the "judges" until compelled to accede to the popular demand for a king. The young Saul was chosen by lot and gained unanimous recognition by delivering Jabesh in Gilead from the Ammonites. (2) But other traditions represent the people scattered and in hiding; Israel is groaning under the Philistine yoke, and the unknown Saul is raised up by Yahweh to save his people. This he accomplishes with the help of his son Jonathan. The first account, although now essential to the canonical history, clearly gives a less authentic account of the change from the "judges" to the monarchy, while the second is fragmentary and can hardly be fitted into the present historical thread (see Saul). At all events the first of a series of annalistic notices of the kings of Israel ascribes to Saul conquests over the surrounding peoples to an extent which implies that the district of Judah formed part of his kingdom (1 Sam. xiv. 47 seq). His might is attested also by the fine elegy (2 Sam. i. 19 sqq.) over the death of two great Israelite heroes, Saul and Jonathan, knit together by mutual love, inseparable in life and death, whose unhappy end after a career of success was a national misfortune. Disaster had come upon the north, and the plain of Jezreel saw the total defeat of the king and the rout of his army. The court was hastily removed across the Jordan to Mahanaim, where Saul's son Ishbaal (Ish-bosheth), thanks to his general Abner, recovered some of the lost prestige. In circumstances which are not detailed, the kingdom seems to have regained its strength, and Ishbaal is credited with a reign of two years over Israel and Gilead (2 Sam. ii. 8–10; contrast *v.* 11). But at this point the scanty annals are suspended and the history of the age is given in more popular sources. Both Israel and Judah had their own annals, brief excerpts from which appear in the books of Samuel, Kings and Chronicles, and they are supplemented by fuller narratives of distinct and more popular origin. The writings are the result of a continued literary process, and the Israelite national history has come down to us through Judaean hands, with the result that much of it has been coloured by late Judaean feeling. It is precisely in Saul's time that the account of the Judaean monarchy, or perhaps of the monarchy from the Judaean standpoint, now begins.

7. *The Monarchy of Judah.*—Certain traditions of Judah and Jerusalem appear to have looked back upon a movement from the south, traces of which underlie the present account of the "exodus." The land was full of "sons of Anak," giants who had terrified the scouts sent from Kadesh. Caleb (*q.v.*) alone had distinguished himself by his fearlessness, and the clan Caleb drove them out from Hebron in south Judah (Josh. xv. 14 sqq.; cf. also xi. 21 seq.). David and his followers are found in the south of Hebron, and as they advanced northwards they encountered wondrous heroes between Gath and Jerusalem (2 Sam. xxi. 15 sqq.; xxiii. 8 sqq.). After strenuous fighting the district was cleared, and Jerusalem, taken by the sword, became the capital. History saw in David the head of a lengthy line of kings, the founder of the Judaean monarchy, the psalmist and the priest-king who inaugurated religious institutions now recognized to be of a distinctly later character. As a result of this backward projection of later conceptions, the recovery of the true historical nucleus is difficult. The prominence of Jerusalem, the centre of post-exilic Judaism, necessarily invited reflection. Israelite tradition had ascribed the conquest of Jerusalem, Hebron and other cities of Judah to the Ephraimite Joshua; Judaean tradition, on the other hand, relates the capture of the sacred city from a strange and hostile people (2 Sam. v.). The famous city, within easy reach of the southern desert and central Palestine (to Hebron and to Samaria the distances are about 18 and 35 miles respectively), had already entered into Palestinian history in the "Amarna" age (§ 3). Anathoth, a few miles to the north-east, points to the cult of the goddess Anath, the near-lying Nob has suggested the name of the Babylonian Nebo, and the neighbouring, though unidentified, Beth-Ninib of the Amarna tablets may indicate the worship of a Babylonian war and astral god (cf. the solar name Beth-Shemesh). Such was the religious environment of the ancient city which was destined to become the centre of Judaism. Judaean tradition dated the sanctity of Jerusalem from the installation of the ark, a sacred movable object which symbolized the presence of Yahweh. It is associated with the half-nomad clans in the south of Palestine, or with the wanderings of David and his own priest Abiathar; it is ultimately placed within the newly captured city. Quite another body of tradition associates it with the invasion of all the tribes of Israel from beyond the Jordan (see Ark). To combine the heterogeneous narratives and isolated statements into a consecutive account is impossible; to ignore those which conflict with the now predominating views would be unmethodical. When the narratives describe the life of the young David at the court of the first king of the northern kingdom, when the scenes cover the district which he took with the sword, and when the brave Saul is represented in an unfavourable light, one must allow for the popular tendency to idealize great figures, and for the Judaean origin of the compilation. To David is ascribed the sovereignty over a united people. But the stages in his progress are not clear. After being the popular favourite of Israel in the little district of Benjamin, he was driven away by the jealousy and animosity of Saul. Gradually strengthening his position by alliance with Judaean clans, he became king at Hebron at the time when Israel suffered defeat in the north. His subsequent advance to the kingship over Judah and Israel at Jerusalem is represented as due to the weak condition of Israel, facilitated by the compliance of Abner; partly, also, to the long-expressed wish of the Israelites that their old hero should reign over them. Yet again, Saul had been chosen by Yahweh to free his people from the Philistines; he had been rejected for his sins, and had suffered continuously from this enemy; Israel at his death was left in the unhappy state in which he had found it; it was the Judaean David, the faithful servant of Yahweh, who was now chosen to deliver Israel, and to the last the people gratefully remembered their debt. David accomplished the conquests of Saul but on a grander scale; "Saul hath slain his thousands and David his tens of thousands" is the popular couplet comparing the relative merits of the rival dynasts. A series of campaigns against Edom, Moab, Ammon and the Aramaean states, friendly relations with Hiram of Tyre, and the recognition of his sovereignty by the king of Hamath on the Orontes, combine to portray a monarchy which was the ideal.

But in passing from the books of Samuel, with their many rich and vivid narratives, to the books of Kings, we enter upon another phase of literature; it is a different atmosphere, due to the character of the material and the aims of other compilers (see § 9 beginning). David, the conqueror, was followed by his son Solomon, famous for his wealth, wisdom and piety, above all for the magnificent Temple which he built at Jerusalem. Phoenician artificers were enlisted for the purpose, and with Phoenician sailors successful trading-journeys were regularly undertaken. Commercial intercourse with Asia Minor, Arabia, Tarshish (probably in Spain) and Ophir (*q.v.*) filled his coffers, and his realm extended from the Euphrates to the border of Egypt. Tradition depicts him as a worthy successor to his father, and represents a state of luxury and riches impressive to all who were familiar with the great Oriental courts. The commercial activity of the king and the picture of intercourse and wealth are quite in accordance with what is known of the ancient monarchies, and could already be illustrated from the Amarna age. Judah and Israel dwelt at ease, or held the superior position of military officials, while the earlier inhabitants of the land were put to forced labour. But another side of the picture shows the domestic intrigues which darkened the last days of David. The accession of Solomon had not been without bloodshed, and Judah, together with David's old general Joab and his faithful priest Abiathar, were opposed to the son of a woman who had been the wife of a Hittite warrior. The era of the Temple of Jerusalem starts with a new régime, another captain of the army and another priest. Nevertheless, the enmity of Judah is passed over, and when the kingdom is divided for administrative purposes into twelve districts, which ignore the tribal divisions, the centre of David's early power is exempt from the duty of providing supplies (1 Kings iv.). Yet again, the approach of the divided monarchy is foreshadowed. The employment of Judaeans and Israelites for Solomon's palatial buildings, and the heavy taxation for the upkeep of a court which was the wonder of the world, caused grave internal discontent. External relations, too, were unsatisfactory. The Edomites, who had been almost extirpated by David in the valley of Salt, south of the Dead Sea, were now strong enough to seek revenge; and the powerful kingdom of Damascus, whose foundation is ascribed to this period, began to threaten Israel on the north and north-east. These troubles, we learn, had affected all Solomon's reign, and even Hiram appears to have acquired a portion of Galilee. In the approaching disruption writers saw the punishment for the king's apostasy, and they condemn the sanctuaries in Jerusalem which he erected to the gods of his heathen wives. Nevertheless, these places of cult remained some 300 years until almost the close of the monarchy, when their destruction is attributed to Josiah (§ 16). When at length Solomon died the opportunity was at once seized to request from his son Rehoboam a more generous treatment. The reply is memorable: "My little finger is thicker than my father's loins; my father chastised you with whips, but I will chastise you with scorpions." These words were calculated to inflame a people whom history proves to have been haughty and high-spirited, and the great Israel renounced its union with the small district of Judah. Jeroboam (*q.v.*), once one of Solomon's officers, became king over the north, and thus the history of the divided monarchy begins (about 930 B.C.) with the Israelite power on both sides of the Jordan and with Judah extending southwards from a point a few miles north of Jerusalem.

8. *Problems of the Earliest History.*—Biblical history previous to the separation of Judah and Israel holds a prominent place in current ideas, since over two-fifths of the entire Old Testament deals with these early ages. The historical sources for the crucial period, from the separation to the fall of Jerusalem (586 B.C.), occupy only about one-twelfth, and even of this about one-third is spread over some fifteen years (see below, § 11). From the flourishing days of the later monarchy and onwards, different writers handled the early history of their land from different standpoints. The feeling of national unity between north and south would require historical treatment, the existence of rival monarchies would demand an explanation. But the surviving material is extremely uneven; vital events in these centuries are treated with a slightness in striking contrast to the relatively detailed evidence for the preceding period—evidence, however, which is far from being contemporary. Where the material is fuller, serious discrepancies are found; and where external evidence is fortunately available, the independent character of the biblical history is vividly illustrated. The varied traditions up to this stage cannot be regarded as objective history. It is naturally impossible to treat them from any modern standpoint as fiction; they are honest even where they are most untrustworthy. But the recovery of successive historical nuclei does not furnish a continuous thread, and if one is to be guided by the historical context of events the true background to each nucleus must be sought. The northern kingdom cherished the institution of a monarchy, and in this, as in all great political events, the prophets took part. The precise part these figures play is often idealized and expresses the later views of their prominence. It was only after a bitter experience that the kingship was no longer regarded as a divine gift, and traditions have been revised in order to illustrate the opposition to secular authority. In this and in many other respects the records of the first monarchy have been elaborated and now reveal traces of differing conceptions of the events (see DAN; DAVID; ELI; SAMUEL; SAUL; SOLOMON). The oldest narratives are not in their original contexts, and they contain features which render it questionable whether a very trustworthy recollection of the period was retained. Although the rise of the Hebrew state, at an age when the great powers were quiescent and when such a people as the Philistines is known to have appeared upon the scene, is entirely intelligible, it is not improbable that legends of Saul and David, the heroic founders of the two kingdoms, have been put in a historical setting with the help of later historical tradition. It is at least necessary to distinguish provisionally between a possibly historical framework and narratives which may be of later growth—between the general outlines which only external evidence can test and details which cannot be tested and appear isolated without any cause or devoid of any effect.

Many attempts have been made to present a satisfactory sketch of Israelite history and to do justice to (*a*) the patriarchal narratives, (*b*) the exodus from Egypt and the Israelite invasion, and (*c*) the rise of the monarchy. As regards (*b*), external evidence has already suggested to scholars that there were Israelites in Palestine before the invasion; internal historical criticism is against the view that all the tribes entered under Joshua; and in (*a*) there are traces of an actual settlement in the land, entirely distinct from the cycle of narratives which prepare the way for (*b*). The various reconstructions and compromises by modern apologetic and critical writers alike involve without exception an extremely free treatment of the biblical sources and the rejection of many important and circumstantial data.[1] On the one hand, a sweeping invasion of all the tribes of Israel moved by a common zeal may, like the conquests of Islam, have produced permanent results. According to this view the enervating luxury of Palestinian culture almost destroyed the lofty ideal monotheism inculcated in the desert, and after the fall of the northern tribes (latter part of the 8th cent.) Judah is naturally regarded as the sole heir. But such a conquest, and all that it signifies, conflict both with external evidence (*e.g.* the results of excavation), and with any careful inspection of the narratives themselves. On the other hand, the reconstructions which allow a gradual settlement (perhaps of distinct groups), and an intermingling with the earlier inhabitants, certainly find support in biblical evidence, and they have been ingeniously built up with the help of tribal and other data (*e.g.* Gen. xxxiv., xxxviii.; Judg. i. ix.). But they imply political, sociological and religious developments which do not do justice either to the biblical evidence as a whole or to a comprehensive survey of contemporary conditions.[2] Thus, one of the important questions is the relation between those who had taken part in the exodus and the invasion and those who had not. This inquiry is further complicated by (*c*), where the history of Israel and Judah, as related in Judges and 1 Samuel, has caused endless perplexity. The traditions of the Ephraimite Joshua and of Saul the first king of (north) Israel virtually treat Judah as part of Israel and are related to the underlying representations in (*a*). But the specific independent Judaean standpoint treats the unification of the two divisions as the work of David who leaves the heritage to Solomon. The varied narratives, now due to Judaean editors, preserve distinct points of view, and it is extremely difficult to unravel the threads and to determine their relative position in the history. Finally, the consciousness that the people as a religious body owed everything to the desert clans (*b*) (see § 5) subsequently leaves its mark upon (north) Israelite history (§ 14), but has not the profound significance which it has in the records of Judah and Jerusalem. Without sufficient external and independent evidence wherewith to interpret in the light of history the internal features of the intricate narratives, any reconstruction would naturally be hazardous, and all attempts must invariably be considered in the light of the biblical evidence itself, the date of the Israelite exodus, and the external conditions. Biblical criticism is concerned with a composite (Judaean) history based upon other histories (partly of non-Judaean origin), and the relation between native written sources and external contemporary evidence (monumental and archaeological) distinctly forbids any haphazard selection from accessible sources. The true nature of this relation can be readily observed in other fields (ancient Britain, Greece, Egypt, &c.), where, however, the native documents and sources have not that complexity which characterizes the composite biblical history. (For the period under review, as it appears in the light of existing external evidence, see PALESTINE: *History.*)

9. *The Rival Kingdoms.*—The Palestine of the Hebrews was but part of a great area breathing the same atmosphere, and there was little to distinguish Judah from Israel except when they were distinct political entities. The history of the two kingdoms is contained in Kings and the later and relatively less trustworthy Chronicles, which deals with Judah alone. In the former a separate history of the northern kingdom has been combined with Judaean history by means of synchronisms in accordance with a definite scheme. The 480 years from the foundation of the temple of Jerusalem back to the date of the exodus (1 Kings vi. 1) corresponds to the period forward to the return from the exile (§ 20). This falls into three equal divisions, of which the first ends with Jehoash's temple-reforms and the second with Hezekiah's death. The kingdom of Israel lasts exactly half the time.

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[1] This is especially true of the various ingenious attempts to combine the invasion of the Israelites with the movements of the Ḥabiru in the Amarna period (§ 3).

[2] cf. Winckler, *Keil. u. das Alte Test.* p. 212 seq.; also his "Der alte Orient und die Geschichtsforschung" in *Mitteilungen der Vorderasiat. Gesellschaft* (Berlin, 1906) and *Religionsgeschichtlicher u. gesch. Orient* (Leipzig, 1906); A. Jeremias, *Alte Test.* (p. 464 seq.); B. Baentsch, *Altorient. u. israel. Monotheismus* (pp. 53, 79, 105, &c.); also *Theolog. Lit. Blatt* (1907) No. 19. On the reconstructions of the tribal history, see especially T. K. Cheyne, *Ency. Bib.* art. "Tribes." The most suggestive study of the pre-monarchical narratives is that of E. Meyer and B. Luther (above; see the former's criticisms on the reconstructions, pp. 50, 251 sqq., 422, n. 1 and *passim*).

Of the 240 years from Jeroboam I., 80 elapse before the Syrian wars in Ahab's reign, these cover another 80; the famous king Jeroboam II. reigns 40 years, and 40 years of decline bring the kingdom to an end. These figures speak for themselves, and the present chronology can be accepted only where it is independently proved to be trustworthy (see further W. R. Smith, *Prophets of Israel*, pp. 144–149). Next, the Judaean compiler regularly finds in Israel's troubles the punishment for its schismatic idolatry; nor does he spare Judah, but judges its kings by a standard which agrees with the standpoint of Deuteronomy and is scarcely earlier than the end of the 7th century B.C. (§§ 16, 20). But the history of (north) Israel had naturally its own independent political backgrounds and the literary sources contain the same internal features as the annals and prophetic narratives which are already met with in 1 Samuel. Similarly the thread of the Judaean annals in Kings is also found in 2 Samuel, although the supplementary narratives in Kings are not so rich or varied as the more popular records in the preceding books. The striking differences between Samuel and Kings are due to differences in the writing of the history; independent Israelite records having been incorporated with those of Judah and supplemented (with revision) from the Judaean standpoint (see CHRONICLES; KINGS; SAMUEL).

The Judaean compiler, with his history of the two kingdoms, looks back upon the time when each laid the foundation of its subsequent fortunes. His small kingdom of Judah enjoyed an unbroken dynasty which survived the most serious crises, a temple which grew in splendour and wealth under royal patronage, and a legitimate priesthood which owed its origin to Zadok, the successful rival of David's priest Abiathar. Israel, on the other hand, had signed its death-warrant by the institution of calf-cult, a cult which, however, was scarcely recognized as contrary to the worship of Yahweh before the denunciations of Hosea. The scantiness of political information and the distinctive arrangement of material preclude the attempt to trace the relative position of the two rivals. Judah had natural connexions with Edom and southern Palestine; Israel was more closely associated with Gilead and the Aramaeans of the north. That Israel was the stronger may be suggested by the acquiescence of Judah in the new situation. A diversion was caused by Shishak's invasion, but of this reappearance of Egypt after nearly three centuries of inactivity little is preserved in biblical history. Only the Temple records recall the spoliation of the sanctuary of Jerusalem, and traditions of Jeroboam I. show that Shishak's prominence was well known.[1] Although both kingdoms suffered, common misfortune did not throw them together. On the contrary, the statement that there was continual warfare is supplemented in Chronicles by the story of a victory over Israel by Abijah the son of Rehoboam. Jeroboam's son Nadab perished in a conspiracy whilst besieging the Philistine city of Gibbethon, and Baasha of (north) Israel seized the throne. His reign is noteworthy for the entrance of Damascus into Palestinian politics. Its natural fertility and its commanding position at the meeting-place of trade-routes from every quarter made it a dominant factor until its overthrow. In the absence of its native records its relations with Palestine are not always clear, but it may be supposed that amid varying political changes it was able to play a double game. According to the annals, incessant war prevailed between Baasha and Abijah's successor, Asa. It is understood that the former was in league with Damascus, which had once been hostile to Solomon (1 Kings xi. 24 seq.)—it is not stated upon whom Asa could rely. However, Baasha at length seized Ramah about five miles north of Jerusalem, and the very existence of Judah was threatened. Asa utilized the treasure of the Temple and palace to induce the Syrians to break off their relations with Baasha. These sent troops to harry north Israel, and Baasha was compelled to retire. Asa, it is evident, was too weak to achieve the remarkable victory ascribed to him in 2 Chron. xiv. (see ASA). As for Baasha, his short-lived dynasty resembles that of his predecessors. His son Elah had reigned only two years (like Ishbaal and Nadab) when he was slain in the midst of a drunken carousal by his captain Zimri. Meanwhile the Israelite army was again besieging the Philistines at Gibbethon, and the recurrence of these conflicts points to a critical situation in a Danite locality in which Judah itself (although ignored by the writers), must have been vitally concerned. The army preferred their general Omri, and marching upon Zimri at Tirzah burnt the palace over his head. A fresh rival immediately appeared, the otherwise unknown Tibni, son of Ginath. Israel was divided into two camps, until, on the death of Tibni and his brother Joram, Omri became sole king (c. 887 B.C.). The scanty details of these important events must naturally be contrasted with the comparatively full accounts of earlier Philistine wars and internal conflicts in narratives which date from this or even a later age.

10. *The Dynasty of Omri.*—Omri (*q.v.*), the founder of one of the greatest dynasties of Israel, was contemporary with the revival of Tyre under Ithobaal, and the relationship between the states is seen in the marriage of Omri's son Ahab to Jezebel, the priest-king's daughter. His most notable recorded achievement was the subjugation of Moab and the seizure of part of its territory. The discovery of the inscription of a later king of Moab (*q.v.*) has proved that the east-Jordanic tribes were no uncivilized or barbaric folk; material wealth, a considerable religious and political organization, and the cultivation of letters (as exemplified in the style of the inscription) portray conditions which allow us to form some conception of life in Israel itself. Moreover, Judah (now under Jehoshaphat) enjoyed intimate relations with Israel during Omri's dynasty, and the traditions of intermarriage, and of co-operation in commerce and war, imply what was practically a united Palestine. Alliance with Phoenicia gave the impulse to extended intercourse; trading expeditions were undertaken from the Gulf of Akaba, and Ahab built himself a palace decorated with ivory. The cult of the Baal of Tyre followed Jezebel to the royal city Samaria and even found its way into Jerusalem. This, the natural result of matrimonial and political alliance, already met with under Solomon, receives the usual denunciation. The conflict between Yahweh and Baal and the defeat of the latter are the characteristic notes of the religious history of the period, and they leave their impression upon the records, which are now more abundant. Although little is preserved of Omri's history, the fact that the northern kingdom long continued to be called by the Assyrians after his name is a significant indication of his great reputation. Assyria[2] was now making itself felt in the west for the first time since the days of Tiglath-Pileser I. (*c.* 1100 B.C.), and external sources come to our aid. Assur-nazir-pal III. had exacted tribute from north Syria (*c.* 870 B.C.), and his successor Shalmaneser II., in the course of a series of expeditions, succeeded in gaining the greater part of that land. A defensive coalition was formed in which the kings of Cilicia, Hamath, the Phoenician coast, Damascus and Ammon, the Arabs of the Syrian desert, and "Ahabbu Sirlai" were concerned. In the last, we must recognize the Israelite Ahab. His own contribution of 10,000 men and 12,000 chariots perhaps included levies from Judah and Moab (cf. for the number 1 Kings x. 26). In 854 the allies at least maintained themselves at the battle of Karkar (perhaps Apamea to the north of Hamath). In 849 and 846 other indecisive battles were fought, but the precise constitution of the coalition is not recorded. In 842 Shalmaneser records a campaign against Hazael of Damascus; no coalition is mentioned, although a battle was fought at Sanir (Hermon, Deut. iii. 9), and the cities of Hauran to the south of Damascus were spoiled. Tribute was received from Tyre and Sidon; and Jehu, who was now king of Israel, sent his gifts of gold, silver, &c., to the conqueror. The Assyrian inscription (the so-called "Black Obelisk" now in the British Museum), which records the submission of the petty kings, gives an interesting representation of the humble Israelite emissaries with their long fringed robes and strongly marked physiognomy (see COSTUME, fig. 9). Yet another expedition in 839 would seem to

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[1] 2 Chron. xii. 8, which is independent of the chronicler's artificial treatment of his material, apparently points to some tradition of Egyptian suzerainty.

[2] See for chronology, BABYLONIA AND ASSYRIA, §§ v. and viii.

show that Damascus was neither crushed nor helpless, but thenceforth for a number of years Assyria was fully occupied elsewhere and the west was left to itself. The value of this external evidence for the history of Israel is enhanced by the fact that biblical tradition associates the changes in the thrones of Israel and Damascus with the work of the prophets Elijah and Elisha, but handles the period without a single reference to the Assyrian Empire. Ahab, it seems, had aroused popular resentment by encroaching upon the rights of the people to their landed possessions; had it not been for Jezebel (*q.v.*) the tragedy of Naboth would not have occurred. The worship of Baal of Tyre roused a small circle of zealots, and again the Phoenician marriage was the cause of the evil. We read the history from the point of view of prophets. Elijah of Gilead led the revolt. To one who favoured simplicity of cult the new worship was a desecration of Yahweh, and, braving the anger of the king and queen, he foreshadowed their fate. Hostility towards the dynasty culminated a few years later in a conspiracy which placed on the throne the general Jehu, the son of one Jehoshaphat (or, otherwise, of Nimshi). The work which Elijah began was completed by Elisha, who supported Jehu and the new dynasty. A massacre ensued in which the royal families of Israel and Judah perished. While the extirpation of the cult of Baal was furthered in Israel by Jonadab the Rechabite, it was the "people of the land" who undertook a similar reform in Judah. Jehu (*q.v.*) became king as the champion of the purer worship of Yahweh. The descendants of the detested Phoenician marriage were rooted out, and unless the close intercourse between Israel and Judah had been suddenly broken, it would be supposed that the new king at least laid claim to the south. The events form one of the fundamental problems of biblical history.

11. *Damascus, Israel and Judah.*—The appearance of Assyria in the Mediterranean coast-lands had produced the results which inevitably follow when a great empire comes into contact with minor states. It awakened fresh possibilities—successful combination against a common foe, the sinking of petty rivalries, the chance of gaining favour by a neutrality which was scarcely benevolent. The alliances, counter-alliances and far-reaching political combinations which spring up at every advance of the greater powers are often perplexing in the absence of records of the states concerned. Even the biblical traditions alone do not always represent the same attitude, and our present sources preserve the work of several hands. Hazael of Damascus, Jehu of Israel and Elisha the prophet are the three men of the new age linked together in the words of one writer as though commissioned for like ends (1 Kings xix. 15–17). Hostility to Phoenicia (*i.e.* the Baal of Tyre) is as intelligible as a tendency to look to Aramaean neighbours. Though Elisha sent to anoint Jehu as king, he was none the less on most intimate terms with Bar-hadad (Old. Test. Ben-hadad) of Damascus and recognized Hazael as its future ruler. It is a natural assumption that Damascus could still count upon Israel as an ally in 842; not until the withdrawal of Assyria and the accession of Jehu did the situation change. "In those days Yahweh began to cut short" (or, altering the text, "to be angry with") "Israel." This brief notice heralds the commencement of Hazael's attack upon Israelite territory east of the Jordan (2 Kings x. 32). The origin of the outbreak is uncertain. It has been assumed that Israel had withdrawn from the great coalition, that Jehu sent tribute to Shalmaneser to obtain that monarch's recognition, and that Hazael consequently seized the first opportunity to retaliate. Certain traditions, it is true, indicate that Israel had been at war with the Aramaeans from before 854 to 842, and that Hazael was attacking Gilead at the time when Jehu revolted; but in the midst of these are other traditions of the close and friendly relations between Israel and Damascus! With these perplexing data the position of Judah is inextricably involved.

The special points which have to be noticed in the records for this brief period (1 Kings xvii.–2 Kings xi.) concern both literary and historical criticism.[1] A number of narratives illustrate the work of the prophets, and sometimes purely political records appear to have been used for the purpose (see ELIJAH; ELISHA). If Elijah is the prophet of the fall of Omri's dynasty, Elisha is no less the prophet of Jehu and his successors; and it is extremely probable that his lifework was confined to the dynasty which he inaugurated.[2] In the present narratives, however, the stories in which he possesses influence with king and court are placed before the rise of Jehu, and some of them point to a state of hostility with Damascus before he foresees the atrocities which Hazael will perpetrate. But Ahab's wars with Syria can with difficulty be reconciled with the Assyrian evidence (see AHAB), and the narratives, largely anonymous, agree in a singular manner with what is known of the serious conflicts which, it is said, began in Jehu's time. Moreover, the account of the joint undertaking by Judah (under Jehoshaphat) and Israel against Syria at Ramoth-Gilead at the time of Ahab's death, and again (under Ahaziah) when Jehoram was wounded, shortly before the accession of Jehu, are historical doublets, and they can hardly be harmonized either with the known events of 854 and 842 or with the course of the intervening years. Further, all the traditions point clearly to the very close union of Israel and Judah at this period, a union which is apt to be obscured by the fact that the annalistic summaries of each kingdom are mainly independent. Thus we may contrast the favourable Judaean view of Jehoshaphat with the condemnation passed upon Ahab and Jezebel, whose daughter Athaliah married Jehoram, son of Jehoshaphat. It is noteworthy, also, that an Ahaziah and a Jehoram appear as kings of Israel, and (in the reverse order) of Judah, and somewhat similar incidents recur in the now separate histories of the two kingdoms. The most striking is a great revolt in south Palestine. The alliance between Jehoshaphat and Ahab doubtless continued when the latter was succeeded by his son Ahaziah, and some disaster befell their trading fleet in the Gulf of Akaba (1 Kings xxii. 48 seq.; 2 Chron. xx. 35–37). Next came the revolt of Moab (2 Kings i. 1), and Ahaziah, after the briefest of reigns, was followed by Jehoram, whose Judaean contemporary was Jehoshaphat (ch. iii.), or perhaps rather his own namesake (i. 17). The popular story of Jehoram's campaign against Moab, with which Edom was probably allied (see MOAB), hints at a disastrous ending, and the Judaean annals, in their turn, record the revolt of Edom and the Philistine Libnah (see PHILISTINES), and allude obscurely to a defeat of the Judaean Jehoram (2 Kings viii. 20–22). Further details in 2 Chron. xxi.–xxii. 1 even record an invasion of Philistines and Arabians (? Edomites), an attack upon Jerusalem, the removal of the palace treasures and of all the royal sons with the sole exception of Jehoahaz, *i.e.* Ahaziah (see JEHORAM; JEHOSHAPHAT). Had the two kingdoms been under a single head, these features might find an explanation, but it must be allowed that it is extremely difficult to fit the general situation into our present history, and to determine where the line is to be drawn between trustworthy and untrustworthy details. Moreover, of the various accounts of the massacre of the princes of Judah, the Judaean ascribes it not to Jehu and the reforming party (2 Kings x. 13 seq.) but to Athaliah (*q.v.*). Only the babe Jehoash was saved, and he remained hidden in the Temple adjoining the palace itself. The queen, Athaliah, despite the weak state of Judah after the revolt in Philistia and Edom, actually appears to have maintained herself for six years, until the priests slew her in a conspiracy, overthrew the cult of Baal, and crowned the young child. It is a new source which is here suddenly introduced, belonging apparently to a history of the Temple; it throws no light upon the relations between Judah with its priests and Israel with its prophets, the circumstances of the regency under the priest Jehoiada are ignored, and the Temple reforms occupy the first place in the compiler's interest. The Judaean annals then relate Hazael's advance to Gath; the city was captured and Jerusalem was saved only by using the Temple and palace treasure as a bribe. On the other hand, Chronicles has a different story with a novel prelude. Jehoash, it is said, turned away from Yahweh after the death of Jehoiada and gave heed to the Judaean nobles, "wrath came upon Judah and Jerusalem for their guilt," prophets were sent to bring them back but they turned a deaf ear. The climax of iniquity was the murder of Jehoiada's son Zechariah. Soon after, a small band of Syrians entered Judah, destroyed its princes, and sent the spoil to the king of Damascus; the disaster is regarded as a prompt retribution (2 Chron. xxiv.). The inferiority of Chronicles as a historical source and its varied examples of "tendency-writing" must be set against its possible access to traditions as trustworthy, as those in Kings.¹ In the present instance the Judaean history, varied by Syrian invasion, ends. The position of Judah at this period must be considered (a) from the preceding events [illegible] to the accession of Jehu, and (b) from the situation [illegible] a century later when Jerusalem was visited by Isaiah. The Judaean narratives do not allow us to [illegible] whether [illegible] Jehoash would be friendly or hostile to Israel, or whether Judah [illegible] may have severed the earlier bond of union. If the latter [illegible] the hostility of the Israelite prophets is only to be expected. But it is to be presumed that the prophets came from Israel—the use of [illegible] not excluded—and if, instead of [illegible] the kingdom of Judah, Jehoash bribed Damascus [illegible] with Israel, an alternative [illegible] of the origin of the Aramaean wars may be found.²

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[1] See *Jew. Quart. Rev.* (1908), pp. 597–630. The independent Israelite traditions which here become more numerous have points of contact with those of Saul in 1 Samuel, and the relation is highly suggestive for the study of their growth, as also for the perspective of the various writers.

[2] See W. R. Smith (after Kuenen), *Ency. Bib.*, col. 2670; also W. E. Addis, ib., 1276, the commentaries of Benzinger (p. 130) and Kittel (pp. 153 seq.) on Kings; J. S. Strachan, Hastings's *Dict. Bible*, i. 694; G. A. Smith, *Hist. Geog. of Holy Land*, p. 582; König and Hirsch, *Jew. Ency.* v. 137 seq. ("legend . . . as indifferent to accuracy in dates as it is to definiteness of places and names"); W. R. Harper, *Amos and Hosea*, p. xli. seq. ("the lack of chronological order . . . . the result is to create a wrong impression of Elisha's career"). The bearing of this displacement upon the literary and historical criticism of the narratives has never been worked out.

12. *The Aramaean Wars.*—If the records leave it uncertain (1) whether Jehu like Tyre and Sidon sent tribute to Shalmaneser as a sign of submission or, while severing relations with Hazael, sought the favour of Assyria, and (2) whether Judah only escaped Hazael's vengeance by a timely bribe or, in freeing itself from Israel, had bribed Hazael to create a diversion, it appears that the southern kingdom suffered little in the disastrous wars between Damascus and Israel. There were, indeed, internal troubles, and Jehoash perished in a conspiracy. His son Amaziah had some difficulty in gaining the kingdom and showed unwonted leniency in sparing the children of his father's murderers. This was a departure from the customs of the age, and was perhaps influenced less by generosity than by expediency. Israel, on the other hand, was almost annihilated. The Syrians seized Gilead, swept over into Palestine, and occupied the land. Jehu's son Jehoahaz saw his army made "like the dust in threshing," and the desperate condition of the country recalls the straits in the time of Saul (1 Sam. xiii. 6, 7, 19–22), and the days before the great overthrow of the northern power as described in Judges v. 6–8. The impression left by the horrors of the age is clear from the allusions to the barbarities committed by Damascus and its Ammonite allies upon Gilead (Amos i. 3 sqq.) and in the account of the interview between Elisha and Hazael (2 Kings viii. 12). Several of the situations can be most vividly realized from the narratives of Syrian wars ascribed to the time of Omri's dynasty, even if these did not originally refer to the later period. Under Joash, son of Jehoahaz, the tide turned. Elisha was apparently the champion, and popularly [illegible] when Samaria was visited with the sword. Thrice Joash smote the Syrians—in accordance with the last words of the dying prophet—and Aphek in the Sharon plain, famous in history for Israel's disasters, now witnessed their triumphs. The enemy under Hazael's son Ben-hadad (properly Bar-hadad) was driven out and Joash regained the territory which his father had lost (2 Kings xiii. 25). It may reasonably be supposed that a treaty was concluded (cf. 1 Kings xx. 34). But the peace does not seem to have been popular. The story of the last scene in Elisha's life implies in Joash an easily contented disposition which hindered him from completing his successes. Syria had not been crushed, and the failure to utilize the opportunity was an act of impolitic leniency for which Israel was bound to suffer (2 Kings xiii. 19). Elisha's indignation can be illustrated by the denunciation passed upon an anonymous king by the prophetic party on a similar occasion (1 Kings xx. 35–43).

At this stage it is necessary to notice the fresh invasion of Syria by Hadad-nirari (Adad-nirari), who besieged Mari', king of Damascus, and exacted a heavy tribute (c. 803 B.C.). A diversion of this kind may explain the Israelite successes; the subsequent withdrawal of Assyria may have afforded the occasion for retaliation. Those in Israel who remembered the previous war between Assyria and Damascus would realize the [illegible] power of the latter and would perceive the danger of the short-sighted policy of Joash. It is interesting to find that Hadad-nirari claims tribute from Tyre, Sidon and Beth-omri (Israel), also from Edom and Palastu (Philistia). There are no signs of an alliance (?) such as in the days of Shalmaneser. Ammon is probably included under Damascus; the position of Moab—which had freed itself from Jehoram of Israel—can hardly be determined. But the absence of Judah is surprising. Both Jehoash of Judah and his son Amaziah left behind them a great name, and the latter was comparable only to David (2 Kings xiv. 3). He defeated Edom in the Valley of Salt, and hence it is conceivable that Amaziah's kingdom extended over both Edom and Philistia. A haughty challenge to Joash of Israel gave rise to one of the two fables that are preserved in the Old Testament (Judg. ix. 8 sqq.; see ABIMELECH). It was followed by a battle at Beth-shemesh, the scene would suggest that Philistia also was involved. The result was the rout of Judah, the capture of Amaziah, the destruction of the northern wall of Jerusalem, the sacking of the temple and palace, and the removal of hostages to Samaria (2 Kings xiv. 10 sqq.). Only a few words are preserved, but the details, when carefully weighed, are extremely significant. This momentous event for the southern kingdom was scarcely the outcome of a challenge to a trial of strength; it was rather the sequel to a period of smouldering jealousy and hostility.

The Judaean records have obscured the history since the days of Jehu's dynasty, when Israel and Judah were, as it were, [illegible] were moved by common aims and by a single reforming zeal, and only Israel's vengeance shows the measure of the injuries she had received. That the Judaean compiler has not given fuller information is not surprising; the wonder is that he should have given so much. It is one of those epoch-making turns in the light of which the course of the history of the preceding and following years must be estimated. It is taken, strangely enough, from an Israelite source, but the tone of the whole is quite [illegible]. It needs little reflection to perceive that the position of Jerusalem and Judah was now hardly one of independence, and the following [illegible] in the attempt to [illegible] of Judaean history. So, on the one hand, the year of the disaster sees the death of the Israelite king, and Amaziah survives for fifteen years; while on the other twenty-seven years elapse between the battle and the accession of Jotham, the new king of Judah.¹

The importance of the historical questions regarding relations between Damascus, Israel and Judah is clear. The defeat of Syria by Joash of Israel was not final. The Israelite victories were carried on by Jeroboam II.; he saved Israel from being blotted out, and through his successes "the children of Israel dwelt in their tents as aforetime" (2 Kings xiii. 5, xiv. 26 sqq.). Syria must have resumed warfare with renewed energy, and a state of affairs is presupposed which can be compared with the [illegible] narratives that deal with similar historical situations. In particular, the overthrow of Israel as foreshadowed in 1 Kings xxii. appears an Aramaean invasion (xx. 1 sqq.) after a truce (xxii. 1 sqq.), although this can scarcely be justified by the events which followed the death of Ahab in whose time they are now placed.

For the understanding of these great wars between Syria and Israel, which the traditional chronology spreads over eighty years, for the significance of the crushing defeats and inspiring victories, and for the alternations of despair and hope, a careful study of all the records of relations between Israel and the north is at least instructive, and it is important to remember that, although the present historical sources are scanty and incomplete, some—if not all—of the narratives [illegible] in their present form are probably later than the second half of the 8th century B.C., the period in which these great events fell.²

13. *Political Development.*—Under Jeroboam II. the borders of Israel were restored and in this political revival the prophets again took part.³ The defeat of Ben-hadad by the king of

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¹ Kittel's commentary shows that no a priori distinction can be drawn between "trustworthy" annals of Kings and "untrustworthy" [illegible] of Chronicles. Although the latter also contain new and [illegible], they agree with the former in presenting the same general trend of past history. The "canonical" history in Kings is [illegible] by the Chronicles, but the gulf between them is not so profound as that between the former and the underlying and half-suppressed historical traditions which can still be recognized. [illegible]

² For the former cf. Kings [illegible], Hezekiah and Sennacherib [illegible]; and for the latter, cf. Asa and Baasha (1 Kings xv. 16–20; Asa [illegible]).

¹ It is possible that Hadad-nirari's inscription refers to conditions in the latter part of his reign [illegible] when Judah apparently was no longer independent and when Jeroboam II. was king of Israel. The accession of the former has been placed between [illegible]. It is now known, also, that Ben-hadad and a small coalition were defeated by the king of Hamath, but the bearing of this upon Israelite history is uncertain.

² Cf. generally 1 Sam. iv. and [illegible], 1 Kings xx., xxii., 2 Kings vi. 8–vii. 20; also Judges v. (see DEBORAH).

³ Special mention is made of Jonah, a prophet of Gath-hepher in northern Israel (2 Kings xiv. 25). Nothing is known of [illegible] with the [illegible] of the [illegible] which [illegible] cannot be recovered (see JONAH).

Hamath and the quiescence of Assyria may have encouraged Israelite ambitions, but until more is known of the campaigns of Hadad-nirari and of Shalmaneser III. (against Damascus, 773 B.C.) the situation cannot be safely gauged. Moab was probably tributary; the position of Judah and Edom is involved with the chronological problems. According to the Judaean annals, the "people of Judah" set Azariah (Uzziah) upon his father's throne; and to his long reign of fifty-two years are ascribed conquests over Philistia and Edom, the fortification of Jerusalem and the reorganization of the army. As the relations with Israel are not specified, the sequel to Amaziah's defeat is a matter for conjecture; although, when at the death of Jeroboam Israel hastened to its end amid anarchy and dissension, it is hardly likely that the southern kingdom was unmoved. All that can be recognized from the biblical records, however, is the period of internal prosperity which Israel and Judah enjoyed under Jeroboam and Uzziah (*qq.v.*) respectively.

It is difficult to trace the biblical history century by century as it reaches these last years of bitter conflict and of renewed prosperity. The northern kingdom at the height of its power included Judah, it extended its territory east of the Jordan towards the north and the south, and maintained close relations with Phoenicia and the Aramaean states. It had a national history which left its impress upon the popular imagination, and sundry fragments of tradition reveal the pride which the patriot felt in the past. An original close connexion is felt with the east of the Jordan and with Gilead; stories of invasion and conquest express themselves in varied forms. In so far as internal wealth and luxury presuppose the control of the trade-routes, periodical alliances are implied in which Judah, willingly or unwillingly, was included. But the Judaean records do not allow us to trace its independent history with confidence, and our estimate can scarcely base itself solely upon the accidental fulness or scantiness of political details. In the subsequent disasters of Israel (§ 15) we may perceive the growing supremacy of Judah, and the Assyrian inscriptions clearly indicate the dependence of Judaean politics upon its relations with Edom and Arab tribes on the south-east and with Philistia on the west. Whatever had been the effect of the movement of the Purasati some centuries previously, the Philistines (*i.e.* the people of Philistia) are now found in possession of a mature organization, and the Assyrian evidence is of considerable value for an estimate of the stories of conflict and covenant, of hostility and friendship, which were current in south Palestine. The extension of the term "Judah" (cf. that of "Israel" and "Samaria") is involved with the incorporation of non-Judaean elements. The country for ten miles north of Jerusalem was the exposed and highly debatable district ascribed to the young tribe of Benjamin (the favourite "brother" of both Judah and Joseph; Gen. xxxvii., xxxix. sqq.); the border-line between the rival kingdoms oscillated, and consequently the political position of the smaller and half-desert Judaean state depended upon the attitude of its neighbours. It is possible that tradition is right in supposing that "Judah went down from his brethren" (Gen. xxxviii. 1; cf. Judg. i. 3). Its monarchy traced its origin to Hebron in the south, and its growth is contemporary with a decline in Israel (§ 7). It is at least probable that when Israel was supreme an independent Judah would centre around a more southerly site than Jerusalem. It is naturally uncertain how far the traditions of David can be utilized; but they illustrate Judaean situations when they depict intrigues with Israelite officials, vassalage under Philistia, and friendly relations with Moab, or when they suggest how enmity between Israel and Ammon could be turned to useful account. Tradition, in fact, is concentrated upon the rise of the Judaean dynasty under David, but there are significant periods before the rise of both Jehoash and Uzziah upon which the historical records maintain a perplexing silence.

The Hebrews of Israel and Judah were, political history apart, men of the same general stamp, with the same cult and custom; for the study of religion and social usages, therefore, they can be treated as a single people. The institution of the monarchy was opposed to the simpler local forms of government, and a military régime had distinct disadvantages (cf. 1 Sam. viii. 11–18). The king stood at the head, as the court of final appeal, and upon him and his officers depended the people's welfare. A more intricate social organization caused internal weakness, and Eastern history shows with what rapidity peoples who have become strong by discipline and moderation pass from the height of their glory into extreme corruption and disintegration.[1] This was Israel's fate. Opposition to social abuses and enmity towards religious innovations are regarded as the factors which led to the overthrow of Omri's dynasty by Jehu, and when Israel seemed to be at the height of its glory under Jeroboam II. warning voices again made themselves heard. The two factors are inseparable, for in ancient times no sharp dividing-line was drawn between religious and civic duties: righteousness and equity, religious duty and national custom were one.

Elaborate legal enactments codified in Babylonia by the 20th century B.C. find striking parallels in Hebrew, late Jewish (Talmudic), Syrian and Mahommedan law, or in the unwritten usages of all ages; for even where there were neither written laws nor duly instituted lawgivers, there was no lawlessness, since custom and belief were, and still are, almost inflexible. Various collections are preserved in the Old Testament; they are attributed to the time of Moses the lawgiver, who stands at the beginning of Israelite national and religious history. But many of the laws were quite unsuitable for the circumstances of his age, and the belief that a body of intricate and even contradictory legislation was imposed suddenly upon a people newly emerged from bondage in Egypt raises insurmountable objections, and underestimates the fact that legal usage existed in the earliest stages of society, and therefore in pre-Mosaic times. The more important question is the date of the laws in their present form and content. Collections of laws are found in Deuteronomy and in exilic and post-exilic writings; groups of a relatively earlier type are preserved in Exod. xxxiv. 14–26, xx. 23–xxiii., and (of another stamp) in Lev. xvii.–xxvi. (now in post-exilic form). For a useful conspectus of details, see J. E. Carpenter and G. Harford-Battersby. *The Hexateuch* (vol. i., appendix); C. F. Kent, *Israel's Laws and Legal Enactments* (1907); and in general I. Benzinger, articles "Government," "Family" and "Law and Justice," *Ency. Bib.*, and G. B. Gray, "Law Literature," ib. (the literary growth of legislation). Reference may also be made, for illustrative material, to W. R. Smith, *Kinship and Marriage*, *Religion of the Semites*; to E. Day, *Social Life of the Hebrews*; and, for some comparison of customary usage in the Semitic field, to S. A. Cook, *Laws of Moses and Code of Hammurabi.*

14. *Religion and the Prophets.*—The elements of the thought and religion of the Hebrews do not sever them from their neighbours; similar features of cult are met with elsewhere under different names. Hebrew religious institutions can be understood from the biblical evidence studied in the light of comparative religion; and without going afield to Babylonia, Assyria or Egypt, valuable data are furnished by the cults of Phoenicia, Syria and Arabia, and these in turn can be illustrated from excavation and from modern custom. Every religion has its customary cult and ritual, its recognized times, places and persons for the observance. Worship is simpler at the smaller shrines than at the more famous temples; and, as the rulers are the patrons of the religion and are brought into contact with the religious personnel, the character of the social organization leaves its mark upon those who hold religious and judicial functions alike. The Hebrews shared the paradoxes of Orientals, and religious enthusiasm and ecstasy were prominent features. Seers and prophets of all kinds ranged from those who were consulted for daily mundane affairs to those who revealed the oracles in times of stress, from those who haunted local holy sites to those high in royal favour, from the quiet domestic communities to the austere mountain recluse. Among these were to be found the most sordid opportunism and the most heroic self-effacement, the crassest supernaturalism and—the loftiest conceptions of practical morality. A development of ideals and a growth of spirituality can be traced which render the biblical writings with their series of prophecies a unique

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[1] This is philosophically handled by the Arabian historian Ibn Khaldūn, whose Prolegomena is well worthy of attention; see De Slane, *Not. et extraits*, vols. xix.–xxi., with Von Kremer's criticisms in the *Sitz. d. Kais. Akad.* of Vienna (vol. xciii., 1879); cf. also R. Flint, *History of the Philosophy of History*, i. 157 sqq.

phenomenon.[1] The prophets taught that the national existence of the people was bound up with religious and social conditions; they were in a sense the politicians of the age, and to regard them simply as foretellers of the future is to limit their sphere unduly. They took a keen interest in all the political vicissitudes of the Oriental world. Men of all standards of integrity, they were exposed to external influences, but whether divided among themselves in their adherence to conflicting parties, or isolated in their fierce denunciation of contemporary abuses, they shared alike in the worship of Yahweh whose inspiration they claimed. A recollection of the manifold forms which religious life and thought have taken in Christendom or in Islam, and the passions which are so easily engendered among opposing sects, will prevent a one-sided estimate of the religious standpoints which the writings betray; and to the recognition that they represent lofty ideals it must be added that the great prophets, like all great thinkers, were in advance of their age.

The prophets are thoroughly Oriental figures, and the interpretation of their profound religious experiences requires a particular sympathy which is not inherent in Western minds. Their writings are to be understood in the light of their age and of the conditions which gave birth to them. With few exceptions they are preserved in fragmentary form, with additions and adjustments which were necessary in order to make them applicable to later conditions. When, as often, the great figures have been made the spokesmen of the thought of subsequent generations, the historical criticism of the prophecies becomes one of peculiar difficulty.[2] According to the historical traditions it is precisely in the age of Jeroboam II. and Uzziah that the first of the extant prophecies begin (see AMOS and HOSEA). Here it is enough to observe that the highly advanced doctrines of the distinctive character of Yahweh, as ascribed to the 8th century B.C., presuppose a foundation and development. But the evidence does not allow us to trace the earlier progress of the ideas. Yahwism presents itself under a variety of aspects, and the history of Israel's relations to the God Yahweh (whose name is not necessarily of Israelite origin) can hardly be disentangled amid the complicated threads of the earlier history. The view that the seeds of Yahwism were planted in the young Israelite nation in the days of the "exodus" conflicts with the belief that the worship of Yahweh began in the pre-Mosaic age. Nevertheless, it implies that religion passed into a new stage through the influence of Moses, and to this we find a relatively less complete analogy in the specific north Israelite traditions of the age of Jehu. The change from the dynasty of Omri to that of Jehu has been treated by several hands, and the writers, in their recognition of the introduction of a new tendency, have obscured the fact that the cult of Yahweh had flourished even under such a king as Ahab. While the influence of the great prophets Elijah and Elisha is clearly visible, it is instructive to find that the south, too, has its share in the inauguration of the new era. At Horeb, the mount of God, was located the dramatic theophany which heralded to Elijah the advent of the sword, and Jehu's supporter in his sanguinary measures belongs to the Rechabites, a sect which felt itself to be the true worshipping community of Yahweh and is closely associated with the Kenites, the kin of Moses. It was at the holy well of Kadesh, in the sacred mounts of Sinai and Horeb, and in the field of Edom that the Yahweh of Moses was found, and scattered traces survive of a definite belief in the entrance into Palestine of a movement uncompromisingly devoted to the purer worship of Yahweh. The course of the dynasty of Jehu—the reforms, the disastrous Aramaean wars, and, at length, Yahweh's "arrow of victory"—constituted an epoch in the Israelite history, and it is regarded as such.[3]

The problem of the history of Yahwism depends essentially upon the view adopted as to the date and origin of the biblical details and their validity for the various historical and religious conditions they presuppose. Yahwism is a religion which appears upon a soil saturated with ideas and usages which find their parallel in extra-biblical sources and in neighbouring lands. The problem cannot be approached from modern preconceptions because there was much associated with the worship of Yahweh which only gradually came to be recognized as repugnant, and there was much in earlier ages and in other lands which reflects an elevated and even complex religious philosophy. In the south of the Sinaitic peninsula, remains have been found of an elaborate half-Egyptian, half-Semitic cultus (Petrie, *Researches in Sinai*, xiii.), and not only does Edom possess some reputation for "wisdom," but, where this district is concerned, the old Arabian religion (whose historical connexion with Palestine is still imperfectly known) claims some attention. The characteristic denunciations of corruption and lifeless ritual in the writings of the prophets and the emphasis which is laid upon purity and simplicity of religious life are suggestive of the influence of the nomadic spirit rather than of an internal evolution on Palestinian soil. Desert pastoral life does not necessarily imply any intellectual inferiority, and its religious conceptions, though susceptible of modification, are not artificially moulded through the influence of other civilizations. Nomadic life is recognized by Arabian writers themselves as possessing a relative superiority, and its characteristic purity of manner and its reaction against corruption and luxury are not incompatible with a warlike spirit. If nomadism may be recognized as one of the factors in the growth of Yahwism, there is something to be said for the hypothesis which associates it with the clans connected with the Levites (see E. Meyer, *Israeliten*, pp. 82 sqq.; B. Luther, ib. 138). It is, however, obvious that the influence due to immigrants could be, and doubtless was, exerted at more than one period (see §§ 18, 20; also HEBREW RELIGION; PRIEST).

15. *The Fall of the Israelite Monarchy.*—The prosperity of Israel was its undoing. The disorders that hastened its end find an analogy in the events of the more obscure period after the death of the earlier Jeroboam. Only the briefest details are given. Zechariah was slain after six months by Shallum ben Jabesh in Ibleam; but the usurper fell a month later to Menahem (*q.v.*), who only after much bloodshed established his position. Assyria again appeared upon the scene under Tiglath-pileser IV. (745-728 B.C.).[4] His approach was the signal for the formation of a coalition, which was overthrown in 738. Among those who paid tribute were Raṣun (the biblical Rezin) of Damascus, Menahem of Samaria, the kings of Tyre, Byblos and Hamath and the queen of Aribi (Arabia, the Syrian desert). Israel was once more in league with Damascus and Phoenicia, and the biblical records must be read in the light of political history. Judah was probably holding aloof. Its king, Uzziah, was a leper in his latter days, and his son and regent, Jotham, claims notice for the circumstantial reference (2 Chron. xxvii.; cf. xxvi. 8) to his subjugation of Ammon—the natural allies of Damascus—for three years. Scarcely had Assyria withdrawn before Menahem lost his life in a conspiracy, and Pekah with the help of Gilead made himself king. The new movement was evidently anti-Assyrian, and strenuous endeavours were made to present a united front. It is suggestive to find Judah the centre of attack.[5] Raṣun and Pekah directed their blows from the north, Philistia threatened the west flank, and the Edomites who drove out the Judaeans from Elath (on the Gulf of 'Akaba) were no doubt only taking their part in the concerted action. A more critical situation could scarcely be imagined. The throne of David was then occupied by the young Ahaz, Jotham's son.

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[1] Cf. J. G. Frazer, *Adonis, Attis, Osiris* (1907), p. 67: "Prophecy of the Hebrew type has not been limited to Israel; it is indeed a phenomenon of almost world-wide occurrence; in many lands and in many ages the wild, whirling words of frenzied men and women have been accepted as the utterances of an in-dwelling deity. What does distinguish Hebrew prophecy from all others is that the genius of a few members of the profession wrested this vulgar but powerful instrument from baser uses, and by wielding it in the interest of a high morality rendered a service of incalculable value to humanity. That is indeed the glory of Israel. . . ."

[2] The use which was made in Apocalyptic literature of the traditions of Moses, Isaiah and others finds its analogy within the Old Testament itself; cf. the relation between the present late prophecies of Jonah and the unknown prophet of the time of Jeroboam II. (see § 13, note 5). To condemn re-shaping or adaptation of this nature from a modern Western standpoint is to misunderstand entirely the Oriental mind and Oriental usage.

[3] The condemnation passed upon the impetuous and fiery zeal of the adherents of the new movement (cf. Hos. i. 4), like the remarkable vicissitudes in the traditions of Moses, Aaron and the Levites (*qq.v.*), represents changing situations of real significance, whose true place in the history can with difficulty be recovered.

[4] Formerly thought to be the third of the name.

[5] Perhaps Judah had come to an understanding with Tiglath-pileser (H. M. Haydn, *Journ. Bib. Lit.*, xxviii. 1909, pp. 182-199); see UZZIAH.

In this crisis we meet with Isaiah (*q.v.*), one of the finest of Hebrew prophets. The disorganized state of Egypt and the uncertain allegiance of the desert tribes left Judah without direct aid; on the other hand, opposition to Assyria among the conflicting interests of Palestine and Syria was rarely unanimous. Either in the natural course of events—to preserve the unity of his empire—or influenced by the rich presents of gold and silver with which Ahaz accompanied his appeal for help, Tiglath-pileser intervened with campaigns against Philistia (734 B.C.) and Damascus (733–732). Israel was punished by the ravaging of the northern districts, and the king claims to have carried away the people of "the house of Omri." Pekah was slain and one Hoshea (*q.v.*) was recognized as his successor. Assyrian officers were placed in the land and Judah thus gained its deliverance at the expense of Israel. But the proud Israelites did not remain submissive for long; Damascus had indeed fallen, but neither Philistia nor Edom had yet been crushed.

At this stage a new problem becomes urgent. A number of petty peoples, of whom little definite is known, fringed Palestine from the south of Judah and the Delta to the Syrian desert. They belong to an area which merges itself in the west into Egypt, and Egypt in fact had a hereditary claim upon it. Continued intercourse between Egypt, Gaza and north Arabia is natural in view of the trade-routes which connected them, and on several occasions joint action on the part of Edomites (with allied tribes) and the Philistines is recorded, or may be inferred. The part played by Egypt proper in the ensuing anti-Assyrian combinations is not clearly known; with a number of petty dynasts fomenting discontent and revolt, there was an absence of cohesion in that ancient empire previous to the rise of the Ethiopian dynasty. Consequently the references to "Egypt" (Heb. *Miṣrayim*, Ass. *Muṣri*) sometimes suggest that the geographical term was really extended beyond the bounds of Egypt proper towards those districts where Egyptian influence or domination was or had been recognized (see further Mizraim).

When Israel began to recover its prosperity and regained confidence, its policy halted between obedience to Assyria and reliance upon this ambiguous "Egypt." The situation is illustrated in the writings of Hosea (*q.v.*). When at length Tiglath-pileser died, in 727, the slumbering revolt became general; Israel refused the usual tribute to its overlord, and definitely threw in its lot with "Egypt." In due course Samaria was besieged for three years by Shalmaneser IV. The alliance with So (Seveh, Sibi) of "Egypt," upon whom hopes had been placed, proved futile, and the forebodings of keen-sighted prophets were justified. Although no evidence is at hand, it is probable that Ahaz of Judah rendered service to Assyria by keeping the allies in check; possible, also, that the former enemies of Jerusalem had now been induced to turn against Samaria. The actual capture of the Israelite capital is claimed by Sargon (722), who removed 27,290 of its inhabitants and fifty chariots. Other peoples were introduced, officers were placed in charge, and the usual tribute re-imposed. Another revolt was planned in 720 in which the province of Samaria joined with Hamath and Damascus, with the Phoenician Arpad and Ṣimura, and with Gaza and "Egypt." Two battles, one at Karkar in the north, another at Rapiḥ (Raphia) on the border of Egypt, sufficed to quell the disturbance. The desert peoples who paid tribute on this occasion still continued restless, and in 715 Sargon removed men of Tamūd, Ibādid, Marsiman, Ḥayāpa, "the remote Arabs of the desert," and placed them in the land of Beth-Omri. Sargon's statement is significant for the internal history; but unfortunately the biblical historians take no further interest in the fortunes of the northern kingdom after the fall of Samaria, and see in Judah the sole survivor of the Israelite tribes (see 2 Kings xvii. 7–23). Yet the situation in this neglected district must continue to provoke inquiry.

16. *Judah and Assyria.*—Amid these changes Judah was intimately connected with the south Palestinian peoples (see further Philistines). Ahaz had recognized the sovereignty of Assyria and visited Tiglath-pileser at Damascus. The Temple records describe the innovations he introduced on his return. Under his son Hezekiah there were fresh disturbances in the southern states, and anti-Assyrian intrigues began to take a more definite shape among the Philistine cities. Ashdod openly revolted and found support in Moab, Edom, Judah, and the still ambiguous "Egypt." This step may possibly be connected with the attempt of Marduk (Merodach)-baladan in south Babylonia to form a league against Assyria (cf. 2 Kings xx. 12); at all events Ashdod fell after a three years' siege (711) and for a time there was peace. But with the death of Sargon in 705 there was another great outburst; practically the whole of Palestine and Syria was in arms, and the integrity of Sennacherib's empire was threatened. In both Judah and Philistia the anti-Assyrian party was not without opposition, and those who adhered or favoured adherence to the great power were justified by the result. The inevitable lack of cohesion among the petty states weakened the national cause. At Sennacherib's approach, Ashdod, Ammon, Moab and Edom submitted; Ekron, Ascalon, Lachish and Jerusalem held out strenuously. The southern allies (with "Egypt") were defeated at Eltekeh (Josh. xix. 44). Hezekiah was besieged and compelled to submit (701). The small kings who had remained faithful were rewarded by an extension of their territories, and Ashdod, Ekron and Gaza were enriched at Judah's expense. These events are related in Sennacherib's inscription; the biblical records preserve their own traditions (see Hezekiah). If the impression left upon current thought can be estimated from certain of the utterances of the court-prophet Isaiah and the Judaean countryman Micah (*q.v.*), the light which these throw upon internal conditions must also be used to gauge the real extent of the religious changes ascribed to Hezekiah. A brazen serpent, whose institution was attributed to Moses, had not hitherto been considered out of place in the cult; its destruction was perhaps the king's most notable reform.

In the long reign of his son Manasseh later writers saw the deathblow to the Judaean kingdom. Much is related of his wickedness and enmity to the followers of Yahweh, but few political details have come down. It is uncertain whether Sennacherib invaded Judah again shortly before his death, nevertheless the land was practically under the control of Assyria. Both Esar-haddon (681–668) and Assur-bani-pal (668–*c.* 626) number among their tributaries Tyre, Ammon, Moab, Edom, Ascalon, Gaza and Manasseh himself,[1] and cuneiform dockets unearthed at Gezer suggest the presence of Assyrian garrisons there (and no doubt also elsewhere) to ensure allegiance. The situation was conducive to the spread of foreign customs, and the condemnation passed upon Manasseh thus perhaps becomes more significant. Precisely what form his worship took is a matter of conjecture; but it is possible that the religion must not be judged too strictly from the standpoint of the late compiler, and that Manasseh merely assimilated the older Yahweh-worship to new Assyrian forms.[2] Politics and religion, however, were inseparable, and the supremacy of Assyria meant the supremacy of the Assyrian pantheon.

If Judah was compelled to take part in the Assyrian campaigns against Egypt, Arabia (the Syrian desert) and Tyre, this would only be in accordance with a vassal's duty. But when tradition preserves some recollection of an offence for which Manasseh was taken to Babylon to explain his conduct (2 Chron. xxxiii.), also of the settling of foreign colonists in Samaria by Esar-haddon (Ezra iv. 2), there is just a possibility that Judah made some attempt to gain independence. According to Assur-bani-pal all the western lands were inflamed by the revolt of his brother Samas-sum-ukin. What part Judah took in the Transjordanic disturbances, in which Moab fought invading Arabian tribes on behalf of Assyria, is unknown (see Moab). Manasseh's son Amon fell in a court intrigue and "the people of the land," after avenging the murder, set up in his place the infant Josiah (637). The circumstances imply a regency, but the records are silent upon the outlook. The assumption that the decay of Assyria awoke the national feeling of independence is perhaps justified by those events which made the greatest impression upon the compiler, and an account is given of Josiah's religious reforms, based upon a source apparently identical with that which described the work of Jehoash. In an age when the oppression and corruption of the ruling classes had been such that those who cherished the old worship of Yahweh dared not confide in their most intimate companions (Mic. vii. 5, 6), no social reform was possible; but now the young Josiah, the popular choice, was upon the throne. A roll, it is said, was found in the Temple, its contents struck terror into the hearts of the priests and king, and it led to a solemn covenant before Yahweh to observe the provisions of the law-book which had been so opportunely recovered.

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[1] The fact that these lists are of the kings of the "land Ḥatti" would suggest that the term "Hittite" had been extended to Palestine.

[2] So K. Budde, *Rel. of Israel to Exile*, pp. 165–167. For an attempt to recover the character of the cults, see W. Erbt, *Hebräer* (Leipzig, 1906), pp. 150 sqq.

That the writer (2 Kings xxii. seq.) meant to describe the discovery of Deuteronomy is evident from the events which followed; and this identification of the roll, already made by Jerome, Chrysostom and others, has been substantiated by modern literary criticism since De Wette (1805). (See Deuteronomy; Josiah.) Some very interesting parallels have been cited from Egyptian and Assyrian records where religious texts, said to have been found in temples, or oracles from the distant past, have come to light at the very time when "the days were full."[1] There is, however, no real proof for the traditional antiquity of Deuteronomy. The book forms a very distinctive landmark in the religious history by reason of its attitude to cult and ritual (see Hebrew Religion, § 7). In particular it is aimed against the worship at the numerous minor sanctuaries and inculcates the sole pre-eminence of the one great sanctuary—the Temple of Jerusalem. This centralization involved the removal of the local priests and a modification of ritual and legal observance. The fall of Samaria, Sennacherib's devastation of Judah, and the growth of Jerusalem as the capital, had tended to raise the position of the Temple, although Israel itself, as also Judah, had famous sanctuaries of its own. From the standpoint of the popular religion, the removal of the local altars, like Hezekiah's destruction of the brazen serpent, would be an act of desecration, an iconoclasm which can be partly appreciated from the sentiments of 2 Kings xviii. 22, and partly also from the modern Wahhabite reformation (of the 19th century). But the details and success of the reforms, when viewed in the light of the testimony of contemporary prophets, are uncertain. The book of Deuteronomy crystallizes a doctrine; it is the codification of teaching which presupposes a carefully prepared soil. The account of Josiah's work, like that of Hezekiah, is written by one of the Deuteronomic school: that is to say, the writer describes the promulgation of the teaching under which he lives. It is part of the scheme which runs through the book of Kings, and its apparent object is to show that the Temple planned by David and founded by Solomon ultimately gained its true position as the only sanctuary of Yahweh to which his worshippers should repair. Accordingly, in handling Josiah's successors the writer no longer refers to the high places. But if Josiah carried out the reforms ascribed to him they were of no lasting effect. This is conclusively shown by the writings of Jeremiah (xxv. 3–7, xxxvi. 2 seq.) and Ezekiel. Josiah himself is praised for his justice, but faithless Judah is insincere (Jer. iii. 10), and those who claim to possess Yahweh's law are denounced (viii. 8). If Israel could appear to be better than Judah (iii. 11; Ezek. xvi., xxiii.), the religious revival was a practical failure, and it was not until a century later that the opportunity again came to put any new teaching into effect (§ 20). On the other hand, the book of Deuteronomy has a characteristic social-religious side; its humanity, philanthropy and charity are the distinctive features of its laws, and Josiah's reputation (Jer. xxii. 15 seq.) and the circumstances in which he was chosen king may suggest that he, like Jehoash (2 Kings xi. 17; cf. xxiii. 3), had entered into a reciprocal covenant with a people who, as Micah's writings would indicate, had suffered grievous oppression and misery.[2]

17. *The Fall of the Judaean Monarchy.*—In Josiah's reign a new era was beginning in the history of the world. Assyria was rapidly decaying and Egypt had recovered from the blows of Assur-bani-pal (to which the Hebrew prophet Nahum alludes, iii. 8–10). Psammetichus (Psamtek) I., one of the ablest of Egyptian rulers for many centuries, threw off the Assyrian yoke with the help of troops from Asia Minor and employed these to guard his eastern frontiers at Defneh. He also revived the old trading-connexions between Egypt and Phoenicia. A Chaldean prince, Nabopolassar, set himself up in Babylonia, and Assyria was compelled to invoke the aid of the Aškuza. It was perhaps after this that an inroad of Scythians (*q.v.*) occurred (*c.* 626 B.C.); if it did not actually touch Judah, the advent of the people of the north appears to have caused great alarm (Jer. iv.–vi.: Zephaniah). Bethshean in Samaria has perhaps preserved in its later (though temporary) name Scythopolis an echo of the invasion.[3] Later, Necho, son of Psammetichus, proposed to add to Egypt some of the Assyrian provinces, and marched through Palestine. Josiah at once interposed; it is uncertain whether, in spite of the power of Egypt, he had hopes of extending his kingdom, or whether the famous reformer was, like Manasseh, a vassal of Assyria. The book of Kings gives the standpoint of a later Judaean writer, but Josiah's authority over a much larger area than Judah alone is suggested by xxiii. 19 (part of an addition), and by the references to the border at Riblah in Ezek. vi. 14, xi. 10 seq. He was slain at Megiddo in 608, and Egypt, as in the long-distant past, again held Palestine and Syria. The Judaeans made Jehoahaz (or Shallum) their king, but the Pharaoh banished him to Egypt three months later and appointed his brother Jehoiakim. Shortly afterwards Nineveh fell, and with it the empire which had dominated the fortunes of Palestine for over two centuries (see § 10). Nabonidus (Nabunaid) king of Babylonia (556 B.C.) saw in the disaster the vengeance of the gods for the sacrilege of Sennacherib; the Hebrew prophets, for their part, exulted over Yahweh's far-reaching judgment. The newly formed Chaldean power at once recognized in Necho a dangerous rival and Nabopolassar sent his son Nebuchadrezzar, who overthrew the Egyptian forces at Carchemish (605). The battle was the turning-point of the age, and with it the succession of the new Chaldean or Babylonian kingdom was assured. But the relations between Egypt and Judah were not broken off. The course of events is not clear, but Jehoiakim (*q.v.*) at all events was inclined to rely upon Egypt. He died just as Nebuchadrezzar, seeing his warnings disregarded, was preparing to lay siege to Jerusalem. His young son Jehoiachin surrendered after a three months' reign, with his mother and the court; they were taken away to Babylonia, together with a number of the artisan class (596). Jehoiakim's brother, Mattaniah or Zedekiah, was set in his place under an oath of allegiance, which he broke, preferring Hophra the new king of Egypt. A few years later the second siege took place. It began on the tenth day of the tenth month, January 587. The looked-for intervention of Egypt was unavailing, although a temporary raising of the siege inspired wild hopes. Desertion, pestilence and famine added to the usual horrors of a siege, and at length on the ninth day of the fourth month 586, a breach was made in the walls. Zedekiah fled towards the Jordan valley but was seized and taken to Nebuchadrezzar at Riblah (45 m. south of Hamath). His sons were slain before his eyes, and he himself was blinded and carried off to Babylon after a reign of eleven years. The Babylonian Nebuzaradan was sent to take vengeance upon the rebellious city, and on the seventh day of the fifth month 586 B.C. Jerusalem was destroyed. The Temple, palace and city buildings were burned, the walls broken down, the chief priest Seraiah, the second priest Zephaniah, and other leaders were put to death, and a large body of people was again carried away. The disaster became the great epoch-making event for Jewish history and literature.

Throughout these stormy years the prophet Jeremiah (*q.v.*) had realized that Judah's only hope lay in submission to Babylonia. Stigmatized as a traitor, scorned and even imprisoned, he had not ceased to utter his warnings to deaf ears, although Zedekiah himself was perhaps open to persuasion. Now the penalty had been paid, and the Babylonians, whose policy was less destructive than that of Assyria, contented themselves with appointing as governor a certain Gedaliah. The new centre was Mizpah, a commanding eminence and sanctuary, about 5 m. N.W. of Jerusalem; and here Gedaliah issued an appeal to the people to be loyal to Babylonia and to resume their former peaceful occupations. The land had not been devastated, and many gladly returned from their hiding-places in Moab, Edom and Ammon. But discontented survivors of the royal family under Ishmael intrigued with Baalis, king of Ammon. The plot resulted in the murder of Gedaliah and an unsuccessful attempt to carry off various princesses and officials who had been left in the governor's care. This new confusion and a natural fear of Babylonia's vengeance led many to feel that their only safety lay in flight to Egypt, and, although warned by Jeremiah that even there the sword would find them, they fled south and took refuge in Tahpanhes (Daphnae, *q.v.*), afterwards forming small settlements in other parts of Egypt. But the thread of the history is broken, and apart from an allusion to the favour shown to the captive Jehoiachin (with which the books of Jeremiah and Kings conclude), there is a gap in the records, and subsequent events are viewed from a new standpoint (§ 20).

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[1] See G. Maspero, *Gesch. d. morgenländ. Völker* (1877), p. 446; E. Naville, *Proc. Soc. Bibl. Archaeol.* (1907), pp. 232 sqq., and T. K. Cheyne, *Decline and Fall of Judah* (1908), p. 13, with references. [The genuineness of such discoveries is naturally a matter for historical criticism to decide. Thus the discovery of Numa's laws in Rome (Livy xl. 29), upon which undue weight has sometimes been laid (see Klostermann, *Der Pentateuch* (1906), pp. 155 sqq., was not accepted as genuine by the senate (who had the laws destroyed), and probably not by Pliny himself. Only the later antiquaries clung to the belief in their trustworthiness.—(*Communicated.*)]

[2] Both kings came to the throne after a conspiracy aimed at existing abuses, and other parallels can be found (see Kings).

[3] But see N. Schmidt, *Ency. Bib.*, "Scythians," § 1.

The last few years of the Judaean kingdom present several difficult problems.

(*a*) That there was some fluctuation of tradition is evident in the case of Jehoiakim, with whose quiet end (2 Kings xxiv. 6 [see also LUCIAN]; 2 Chron. xxxvi. 8 [Septuagint]) contrast the fate foreshadowed in Jer. xxii. 18 seq., xxxvi. 30 (cf. Jos. *Ant.* x. 6, 2 seq.). The tradition of his captivity (2 Chron. xxxvi. 6; Dan. i. 2) has apparently confused him with Jehoiachin, and the latter's reign is so brief that some overlapping is conceivable. Moreover, the prophecy in Jer. xxxiv. 5 that Zedekiah would die in peace is not borne out by the history, nor does Josiah's fate agree with the promise in 2 Kings xxii. 20. There is also an evident relation between the pairs: Jehoahaz and Jehoiakim, Jehoiachin and Zedekiah (*e.g.* length of reigns), and the difficulty felt in regard to the second and third is obvious in the attempts of the Jewish historian Josephus to provide a compromise. The contemporary prophecies ascribed to Jeremiah and Ezekiel require careful examination in this connexion, partly as regards their traditional background (especially the headings and setting), and partly for their contents, the details of which sometimes do not admit of a literal interpretation in accordance with our present historical material (cf. Ezek. xix. 3–9, where the two brothers carried off to Egypt and Babylon respectively would seem to be Jehoahaz and his nephew Jehoiachin).

(*b*) Some fluctuation is obvious in the number, dates and extent of the deportations. Jer. lii. 28–30 gives a total of 4600 persons, in contrast to 2 Kings xxiv. 14, 16 (the numbers are not inclusive), and reckons three deportations in the 7th (? 17th), 18th and 23rd years of Nebuchadrezzar. Only the second is specifically said to be from Jerusalem (the remaining are of Judaeans), and the last has been plausibly connected with the murder of Gedaliah, an interval of five years being assumed. For this twenty-third year Josephus (*Ant.* x. 9, 7) gives an invasion of Egypt and an attack upon Ammon, Moab and Palestine (see NEBUCHADREZZAR).

(*c*) That the exile lasted seventy years (? from 586 B.C. to the completion of the second temple) is the view of the canonical history (2 Chron. xxxvi. 21; Jer. xxv. 11, xxix. 10; Zech. i. 12; cf. Tyre, Isa. xxiii. 15), but it is usually reckoned from the first deportation, which was looked upon as of greater significance than the second (Jer. xxiv. xxix.), and it may be a round number. Another difficulty is the interpretation of the 40 years in Ezek. iv. 6 (cf. Egypt, xxix. 11), and the 390 in *v.* 5 (Septuagint 150 or 190; 130 in Jos. x. 9, 7 end). A period of fifty years is allowed by the chronological scheme (1 Kings vi. 1; cf. Jos. *c. Ap.* i. 21), and the late book of Baruch (vi. 3) even speaks of seven generations. Varying chronological schemes may have been current and some weight must be laid upon the remarkable vagueness of the historical information in later writings (see DANIEL).

(*d*) The attitude of the neighbouring peoples constitutes another serious problem (cf. 2 Kings xxiv. 2 and 2 Chron. xxxvi. 5, where Lucian's recension and the Septuagint respectively add the Samaritans!), in view of the circumstances of Gedaliah's appointment (Jer. xl. 11, see above) as contrasted with the frequent prophecies against Ammon, Moab and Edom which *seem* to be contemporary (see EDOM; MOAB).

(*e*) Finally, the recurrence of similar historical situations in Judaean history must be considered. The period under review, with its relations between Judah and Egypt, can be illustrated by prophecies ascribed to a similar situation in the time of Hezekiah. But the destruction of Jerusalem is not quite unique, and somewhat later we meet with indirect evidence for at least one similar disaster upon which the records are silent. There are a number of apparently related passages which, however, on internal grounds, are unsuitable to the present period, and when they show independent signs of a later date (in their present form), there is a very strong probability that they refer to such subsequent disasters. The scantiness of historical tradition makes a final solution impossible, but the study of these years has an important bearing on the history of the later Judaean state, which has been characteristically treated from the standpoint of exiles who returned from Babylonia and regard themselves as the kernel of "Israel." From this point of view, the desire to intensify the denudation of Palestine and the fate of its remnant, and to look to the Babylonian exiles for the future, can probably be recognized in the writings attributed to contemporary prophets.[1]

18. *Internal Conditions and the Exile.*—Many of the exiles accepted their lot and settled down in Babylonia (cf. Jer. xxix. 4–7); Jewish colonies, too, were being founded in Egypt. The agriculturists and herdsmen who had been left in Palestine formed, as always, the staple population, and it is impossible to imagine either Judah or Israel as denuded of its inhabitants. The down-trodden peasants were left in peace to divide the land among them, and new conditions arose as they took over the ownerless estates. But the old continuity was not entirely broken; there was a return to earlier conditions, and life moved more freely in its wonted channels. The fall of the monarchy involved a reversion to a pre-monarchical state. It had scarcely been otherwise in Israel. The Israelites who had been carried off by the Assyrians were also removed from the cult of the land (cf. 1 Sam. xxvi. 19; Ruth i. 15 seq.). It is possible that some had escaped by taking timely refuge among their brethren in Judah; indeed, if national tradition availed, there were doubtless times when Judah cast its eye upon the land with which it had been so intimately connected. It would certainly be unwise to draw a sharp boundary line between the two districts; kings of Judah could be tempted to restore the kingdom of their traditional founder, or Assyria might be complaisant towards a faithful Judaean vassal. The character of the Assyrian domination over Israel must not be misunderstood; the regular payment of tribute and the provision of troops were the main requirements, and the position of the masses underwent little change if an Assyrian governor took the place of an unpopular native ruler. The two sections of the Hebrews who had had so much in common were scarcely severed by a border-line only a few miles to the north of Jerusalem. But Israel after the fall of Samaria is artificially excluded from the Judaean horizon, and lies as a foreign land, although Judah itself had suffered from the intrusion of foreigners in the preceding centuries of war and turmoil, and strangers had settled in her midst, had formed part of the royal guard, or had even served as janissaries (§ 15, end).

Samaria had experienced several changes in its original population,[2] and an instructive story tells how the colonists, in their ignorance of the religion of their new home, incurred the divine wrath. *Cujus regio ejus religio*—settlement upon a new soil involved dependence upon its god, and accordingly priests were sent to instruct the Samaritans in the fear of Yahweh. Thenceforth they continued the worship of the Israelite Yahweh along with their own native cults (2 Kings xvii. 24–28, 33). Their descendants claimed participation in the privileges of the Judaeans (cf. Jer. xli. 5), and must have identified themselves with the old stock (Ezra iv. 2). Whatever recollection they preserved of their origin and of the circumstances of their entry would be retold from a new standpoint; the ethnological traditions would gain a new meaning; the assimilation would in time become complete. In view of subsequent events it would be difficult to find a more interesting subject of inquiry than the internal religious and sociological conditions in Samaria at this age.

To the prophets the religious position was lower in Judah than in Samaria, whose iniquities were less grievous (Jer. iii. 11 seq., xxiii. 11 sqq.; Ezek. xvi. 51). The greater prevalence of heathen elements in Jerusalem, as detailed in the reforms of Josiah or in the writings of the prophets (cf. Ezek. viii.), would at least suggest that the destruction of the state was not entirely a disaster. To this catastrophe may be due the fragmentary character of old Judaean historical traditions. Moreover, the land was purified when it became divorced from the practices of a luxurious court and lost many of its worst inhabitants. In Israel as in Judah the political disasters not only meant a shifting of population, they also brought into prominence the old popular and non-official religion, the character of which is not to be condemned because of the attitude of lofty prophets in advance of their age. When there were sects like the Rechabites (Jer. xxxv.), when the Judaean fields could produce a Micah or a Zephaniah, and when Israel no doubt had men who inherited the spirit of a Hosea, the nature of the underlying conditions can be more justly appreciated. The writings of the prophets were cherished, not only in the unfavourable atmosphere of courts (see Jer. xxxvi., 21 sqq.), but also in the circles of their followers (Isa. viii. 16). In the quiet smaller sanctuaries the old-time beliefs were maintained, and the priests, often perhaps of the older native stock (cf. 2 Kings xvii. 28 and above), were the recognized guardians of the religious cults. The old stories of earlier days encircle places which, though denounced for their corruption, were not regarded as illegitimate, and in the form in which the dim traditions of the past are now preserved they reveal an attempt to purify popular belief and thought. In the domestic circles of prophetic communities the part played by their great heads in history did not suffer in the telling, and it is probable that some part at least of the extant history of the Israelite kingdom passed through the hands of men whose interest lay in the pre-eminence of their seers and their beneficent deeds on behalf of these small communities. This interest and the popular tone of the history may be combined with the fact that the literature does not take us into the midst of that world of activity in which the events unfolded themselves.

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[1] So also one can now compare the estimate taken of the Jews in Egypt in Jer. xliv. with the actual religious conditions which are known to have prevailed later at Elephantine, where a small Jewish colony worshipped Yahu (Yahweh) at their own temple (see E. Sachau, "Drei aram. Papyrusurkunde," in the *Abhandlungen* of the Prussian Academy, Berlin, 1907).

[2] Sargon had removed Babylonians into the land of Hatti (Syria and Palestine), and in 715 B.C. among the colonists were tribes apparently of desert origin (Tamud, Hayapa, &c.); other settlements are ascribed to Esar-haddon and perhaps Assur-bani-pal (Ezra iv. 2, 10). See for the evidence, A. E. Cowley, *Ency. Bib.*, col. 4257; J. A. Montgomery, *The Samaritans*, pp. 46–57 (Philadelphia, 1907).

Although the records preserve complete silence upon the period now under review, it is necessary to free oneself from the narrow outlook of the later Judaean compilers. It is a gratuitous assumption that the history of (north) Israel ceased with the fall of Samaria or that Judah then took over Israelite literature and inherited the old Israelite spirit: the question of the preservation of earlier writings is of historical importance. It is true that the situation in Israel or Samaria continues obscure, but a careful study of literary productions, evidently not earlier than the 7th century B.C., reveals a particular loftiness of conception and a tendency which finds its parallels in Hosea and approximates the peculiar characteristics of the Deuteronomic school of thought. But the history which the Judaean writers have handed down is influenced by the later hostility between Judah and Samaria. The traditional bond between the north and south which nothing could efface (cf. Jos. *Ant.*, xi. 8, 6) has been carried back to the earliest ages; yet the present period, after the age of rival kingdoms, Judah and Israel, and before the foundation of Judaism, is that in which the historical background for the inclusion of Judah among the "sons" of Israel is equally suitable (§§ 5, 20, end). The circumstances favoured a closer alliance between the people of Palestine, and a greater prominence of the old holy places (Hebron, Bethel, Shechem, &c.), of which the ruined Jerusalem would not be one, and the existing condition of Judah and Israel from internal and non-political points of view—not their condition in the pre-monarchical ages—is the more crucial problem in biblical history.[1]

19. *Persian Period.*[2]—The course of events from the middle of the 6th century B.C. to the close of the Persian period is lamentably obscure, although much indirect evidence indicates that this age holds the key to the growth of written biblical history. It was an age of literary activity which manifested itself, not in contemporary historical records—only a few of which have survived—but rather in the special treatment of previously existing sources. The problems are of unusual intricacy and additional light is needed from external evidence. It will be convenient to turn to this first. Scarcely 40 years after the destruction of Jerusalem, a new power appeared in the east in the person of Cyrus the Great. Babylon speedily fell (539 B.C.) and a fresh era opened. To the petty states this meant only a change of masters; they now became part of one of the largest empires of antiquity. The prophets who had marked in the past the advent of Assyrians and Chaldeans now fixed their eyes upon the advance of Cyrus, confident that the fall of Babylon would bring the restoration of their fortunes. Cyrus was hailed as the divinely appointed saviour, the anointed one of Yahweh. The poetic imagery in which the prophets clothed the doom of Babylon, like the romantic account of Herodotus (i. 191), falls short of the simple contemporary account of Cyrus himself. He did not fulfil the detailed predictions, and the events did not reach the ideals of Hebrew writers; but these anticipations may have influenced the form which the Jewish traditions subsequently took. Nevertheless, if Cyrus was not originally a Persian and was not a worshipper of Yahweh (Isa. xli. 25), he was at least tolerant towards subject races and their religions, and the persistent traditions unmistakably point to the honour in which his memory was held. Throughout the Persian supremacy Palestine was necessarily influenced by the course of events in Phoenicia and Egypt (with which intercourse was continual), and some light may thus be indirectly thrown on its otherwise obscure political history. Thus, when Cambyses, the son of Cyrus, made his great expedition against Egypt, with the fleets of Phoenicia and Cyprus and with the camels of the Arabians, it is highly probable that Palestine itself was concerned. Also, the revolt which broke out in the Persian provinces at this juncture may have extended to Palestine; although the usurper Darius encountered his most serious opposition in the north and north-east of his empire. An outburst of Jewish religious feeling is dated in the second year of Darius (520), but whether Judah was making a bold bid for independence or had received special favour for abstaining from the above revolts, external evidence alone can decide. Towards the close of the reign of Darius there was a fresh revolt in Egypt; it was quelled by Xerxes (485–465), who did not imitate the religious tolerance of his predecessors. Artaxerxes I. Longimanus (465–425), attracts attention because the famous Jewish reformers Ezra and Nehemiah flourished under a king of this name. Other revolts occurred in Egypt, and for these and also for the rebellion of the Persian satrap Megabyzos (*c.* 448–447), independent evidence for the position of Judah is needed, since a catastrophe apparently befell the unfortunate state before Nehemiah appears upon the scene. Little is known of the mild and indolent Artaxerxes II. Mnemon (404–359). With the growing weakness of the Persian empire Egypt reasserted its independence for a time. In the reign of Artaxerxes III. Ochus (359–338), Egypt, Phoenicia and Cyprus were in revolt; the rising was quelled without mercy, and the details of the vengeance are valuable for the possible fate of Palestine itself. The Jewish historian Josephus (*Ant.* xi. 7) records the enslavement of the Jews, the pollution of the Temple by a certain Bagoses (see BAGOAS), and a seven years' punishment. Other late sources narrate the destruction of Jericho and a deportation of the Jews to Babylonia and to Hyrcania (on the Caspian Sea). The evidence for the catastrophes under Artaxerxes I. and III. (see ARTAXERXES), exclusively contained in biblical and in external tradition respectively, is of particular importance, since several biblical passages refer to disasters similar to those of 586 but presuppose different conditions and are apparently of later origin.[3] The murder of Artaxerxes III. by

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[1] The growing recognition that the land was not depopulated after 586 is of fundamental significance for the criticism of "exilic" and "post-exilic" history. G. A. Smith thus sums up a discussion of the extent of the deportations: ". . . A large majority of the Jewish people remained on the land. This conclusion may startle us with our generally received notions of the whole nation as exiled. But there are facts which support it" (*Jerusalem*, ii. 268).

[2] On the place of Palestine in Persian history see PERSIA: *History, ancient*, especially § 5 ii.; also ARTAXERXES; CAMBYSES; CYRUS; DARIUS, &c.

[3] The evidence for Artaxerxes III., accepted by Ewald and others (see W. R. Smith, *Old Testament in Jewish Church*, p. 438 seq.; W. Judeich, *Kleinasiat. Stud.*, p. 170; T. K. Cheyne, *Ency. Bib.*, col. 2202; F. C. Kent, *Hist.* [1899], pp. 230 sqq.) has however been questioned by Willrich, *Judaica*, 35–39 (see Cheyne, *Ency. Bib.*, col. 3941). The account of Josephus (above) raises several difficulties, especially the identity of Bagoses. It has been supposed that he has placed the record too late, and that this Bagoses is the Judaean governor who flourished about 408 B.C. (See p. 286, n. 3.)

Bagoses gave a set-back to the revival of the Persian Empire. Under Darius Codomannus (336–330) the advancing Greek power brought matters to a head, and at the battle of Issus in 333 Alexander settled its fate. The overthrow of Tyre and Gaza secured the possession of the coast and the Jewish state entered upon the Greek period. (See § 25.)

During these two centuries the Jews in Palestine had been only one of an aggregate of subject peoples enjoying internal freedom provided in return for a regular tribute. They lived in comparative quietude; although Herodotus knows the Palestinian coast he does not mention the Jews. The earlier Persian kings acknowledged the various religions of the petty peoples; they were also patrons of their temples and would take care to preserve an ancient right of asylum or the privileges of long-established cults.[1] Cyrus on entering Babylon had even restored the gods to the cities to which they belonged.[2] Consequently much interest attaches to the evidence which illustrates the environment of the Jews during this period. Those who had been scattered from Palestine lived in small colonies, sometimes mingling and intermarrying with the natives, sometimes strictly preserving their own individuality. Some took root in the strange lands, and, as later popular stories indicate, evidently reached high positions; others, retaining a more vivid tradition of the land of their fathers, cherished the ideal of a restored Jerusalem. Excavation at Nippur (*q.v.*) in Babylonia has brought to light numerous contract tablets of the 5th century B.C. with Hebrew proper names (Haggai, Hanani, Gedaliah, &c.). Papyri from Elephantine in Upper Egypt, of the same age, proceed from Jewish families who carry on a flourishing business, live among Egyptians and Persians, and take their oaths in courts of law in the name of the god "Yahu," the "God of Heaven," whose temple dated from the last Egyptian kings. Indeed, it was claimed that Cambyses had left the sanctuary unharmed but had destroyed the temples of the Egyptians. In Elephantine, as in Nippur, the legal usages show that similar elements of Babylonio-Assyrian culture prevailed, and the evidence from two such widely separated fields is instructive for conditions in Palestine itself.[3]

20. *The Restoration of Judah.*—The biblical history for the Persian period is contained in a new source—the books of Ezra and Nehemiah, whose standpoint and period are that of Chronicles, with which they are closely joined. After a brief description of the fall of Jerusalem the "seventy years" of the exile are passed over, and we are plunged into a history of the return (2 Chron. xxxvi.; Ezra i.). Although Palestine had not been depopulated, and many of the exiled Jews remained in Persia, the standpoint is that of those who returned from Babylon. Settled in and around Jerusalem, they look upon themselves as the sole community, the true Israel, even as it was believed that once before Israel entered and developed independently in the land of its ancestors. They look back from the age when half-suppressed hostility with Samaria had broken out, and when an exclusive Judaism had been formed. The interest of the writers is as usual in the religious history; they were indifferent to, or perhaps rather ignorant of, the strict order of events. Their narratives can be partially supplemented from other sources (Haggai; Zechariah i.–viii.; Isa. xl.–lxvi.; Malachi), but a consecutive sketch is impossible.[4]

In 561 B.C. the captive Judaean king, Jehoiachin, had received special marks of favour from Nebuchadrezzar's son Amil-marduk. So little is known of this act of recognition that its significance can only be conjectured. A little later Tyre received as its king Merbaal (555–552) who had been fetched from Babylonia. Babylonia was politically unsettled, the representative of the Davidic dynasty had descendants; if Babylon was assured of the allegiance of Judah further acts of clemency may well have followed. But the later recension of Judaean history—our sole source—entirely ignores the elevation of Jehoiachin (2 Kings xxv. 27 sqq.; Jer. lii. 31–34), and proceeds at once to the first year of Cyrus, who proclaims as his divine mission the rebuilding of the Temple (538). The Judaean Sheshbazzar (a corruption of some Babylonian name) brought back the Temple vessels which Nebuchadrezzar had carried away and prepared to undertake the work at the expense of the royal purse. An immense body of exiles is said to have returned at this time to Jerusalem under Zerubbabel, who was of Davidic descent, and the priest Jeshua or Joshua, the grandson of the murdered Seraiah (Ezra i.–iii.; v. 13–vi. 5). When these refused the proffered help of the people of Samaria, men of the same faith as themselves (iv. 2), their troubles began, and the Samaritans retaliated by preventing the rebuilding. The next historical notice is dated in the second year of Darius (520) when two prophets, Haggai and Zechariah, came forward to kindle the Judaeans to new efforts, and in spite of opposition the work went steadily onwards, thanks to the favour of Darius, until the Temple was completed four years later (Ezra v. 2, vi. 13 sqq.). On the other hand, from the independent writings ascribed to these prophets, it appears that no considerable body of exiles could have returned—it is still an event of the future (Zech. ii. 7, vi. 15); little, if anything, had been done to the Temple (Hag. ii. 15); and Zerubbabel is the one to take in hand and complete the great undertaking (Zech. iv. 9). The prophets address themselves to men living in comfortable abodes with olive-fields and vineyards, suffering from bad seasons and agricultural depression, and though the country is unsettled there is no reference to any active opposition on the part of Samaritans. So far from drawing any lesson from the brilliant event in the reign of Cyrus, the prophets imply that Yahweh's wrath is still upon the unfortunate city and that Persia is still the oppressor. Consequently, although small bodies of individuals no doubt came back to Judah from time to time, and some special mark of favour may have been shown by Cyrus, the opinion has gained ground since the early arguments of E. Schrader (*Stud. u. Krit.*, 1867, pp. 460–504), that the compiler's representation of the history is untrustworthy. His main object is to make the new Israel, the post-exilic community at Jerusalem, continuous, as a society, with the old Israel.[5] Greater weight must be laid upon the independent evidence of the prophetical writings, and the objection that Palestine could not have produced the religious fervency of Haggai or Zechariah without an initial impulse from Babylonia begs the question. Unfortunately the internal conditions in the 6th century B.C. can be only indirectly estimated (§ 18), and the political position must remain for the present quite uncertain. In Zerubbabel the people beheld once more a ruler of the Davidic race. The new temple heralded a new future; the mournful fasts commemorative of Jerusalem's disasters would become feasts; Yahweh had left the Temple at the fall of Jerusalem, but had now returned to sanctify it with his presence; the city had purged its iniquity and was fit once more to become the central sanctuary. So Haggai sees in Zerubbabel the representative of the ideal kingdom, the trusted and highly favoured minister who was the signet-ring upon Yahweh's hand (contrast Hag. ii. 24 with Jer. xxii. 23). Zechariah, in his turn, proclaims the overthrow of all difficulties in the path of the new king, who shall rule in glory supported by the priest (Zech. vi.). What political aspirations were revived, what other writers were inspired by these momentous events are questions of inference.

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[1] Thus a decree of Darius I. takes the part of his subjects against the excessive zeal of the official Gadatas, and grants freedom of taxation and exemption from forced labour to those connected with a temple of Apollo in Asia Minor (*Bulletin de correspondance hellénique*, xiii. 529; E. Meyer, *Entstehung des Judenthums*, p. 19 seq.; cf. id. *Forschungen*, ii. 497).

[2] In addition to this, the Egyptian story of the priest Uza-hor at the court of Cambyses and Darius reflects a policy of religious tolerance which illustrates the biblical account of Ezra and Nehemiah (Brugsch, *Gesch. Aeg.* pp. 784 sqq.; see Cheyne, *Jew. Relig. Life after the Exile*, pp. 40–43).

[3] From Têma in north Arabia, also, there is monumental evidence of the 5th century B.C. for Babylonian and Assyrian influence upon the language, cult and art. For Nippur, see *Bab. Exped. of Univ. of Pennsylvania*, series A., vol. ix. (1898), by H. V. Hilprecht; for Elephantine, the Mond papyri, A. H. Sayce and A. E. Cowley, *Aramaic Papyri Discovered at Assuan* (1906), and those cited above (p. 282, n. 1). For the Jewish colonies in general, see H. Guthe, *Ency. Bib.*, art. "Dispersion" (with references); also below, § 25 sqq.

[4] See EZRA AND NEHEMIAH with bibliographical references, also T. K. Cheyne, *Introd. to Isaiah* (1895); *Jew. Religious Life after the Exile* (1898); E. Sellin, *Stud. z. Entstehungsgesch. d. jüd. Gemeinde* (1901); R. H. Kennett in Swete's *Cambridge Biblical Essays* (pp. 92 sqq.); G. Jahn, *Die Bücher Esra u. Nehemja* (1909); and C. C. Torrey, *Ezra Studies* (1910).

[5] There is an obvious effort to preserve the continuity of tradition (*a*) in Ezra ii. which gives a list of families who returned from exile each to its own city, and (*b*) in the return of the holy vessels in the time of Cyrus (contrast 1 Esdras iv. 43 seq.), a view which, in spite of Dan. i. 2, v. 2 seq., conflicts with 2 Kings xxiv. 13 and xxv. 13 (see, however, *v.* 14). That attempts have been made to adjust contradictory representations is suggested by the prophecy ascribed to Jeremiah (xxvii. 16 sqq.) where the restoration of the holy vessels finds no place in the shorter text of the Septuagint (see W. R. Smith, *Old Test. and Jew. Church*, pp. 104 sqq.).

A work which inculcates the dependence of the state upon the purity of its ruler is the unfinished book of Kings with its history of the Davidic dynasty and the Temple. Its ideals culminate in Josiah (§ 16, end), and there is a strong presumption that it is intended to impress upon the new era the lessons drawn from the past. Its treatment of the monarchy is only part of a great and now highly complicated literary undertaking (traceable in the books Joshua to Kings), inspired with the thought and coloured by language characteristic of Deuteronomy (especially the secondary portions), which forms the necessary introduction. Whatever reforms Josiah actually accomplished, the restoration afforded the opportunity of bringing the Deuteronomic teaching into action; though it is more probable that Deuteronomy itself in the main is not much earlier than the second half of the 6th century B.C.[1] It shows a strong nationalist feeling which is not restricted to Judah alone, but comprises a greater Israel from Kadesh in Naphtali in the north to Hebron in the south, and even extends beyond the Jordan. Distinctive non-Judaean features are included, as in the Samaritan liturgical office (Deut. xxvii. 14–26), and the evidence for the conclusion that traditions originally of (north) Israelite interest were taken over and adapted to the later standpoint of Judah and Jerusalem (viz. in the Deuteronomic book of Kings) independently confirms the inferences drawn from Deuteronomy itself. The absence of direct testimony can be partially supplied by later events which presuppose the break-up of no inconsiderable state, and imply relations with Samaria which had been by no means so unfriendly as the historians represent. A common ground for Judaism and Samaritanism is obvious, and it is in this obscure age that it is to be sought. But the curtain is raised for too brief an interval to allow of more than a passing glimpse at the restoration of Judaean fortunes; not until the time of Nehemiah, about 140 years after the fall of Jerusalem, does the historical material become less imperfect.

Upon this blank period before the foundation of Judaism (§§ 21, 23) much light is also thrown by another body of evidence. It has long been recognized that 1 Chron. ii. and iv. represent a Judah composed mainly of groups which had moved up from the south (Hebron) to the vicinity of Jerusalem. It includes Caleb and Jerahmeel, Kenite or Rechabite families, scribes, &c., and these, as "sons" of Hezron, claim some relationship with Gilead. The names point generally to an affinity with south Palestine and north Arabia (Edom, Midian, &c.; see especially the lists in Gen. xxxvi.), and suggest that certain members of a closely related collection of groups had separated from the main body and were ultimately enrolled as Israelites. It is also recognized by many scholars that in the present account of the exodus there are indications of the original prominence of traditions of Kadesh, and also of a journey northwards in which Caleb, Kenites and others took part (§ 5). On these and on other grounds besides, it has long been felt that south Palestine, with its north Arabian connexions, is of real importance in biblical research, and for many years efforts have been made to determine the true significance of the evidence. The usual tendency has been to regard it in the light of the criticism of early Israelite history, which demands some reconstruction (§ 8), and to discern distinct tribal movements previous to the union of Judah and Israel under David. On the other hand, the elaborate theory of T. K. Cheyne involves the view that a history dealing with the south actually underlies our sources and can be recovered by emendation of the text. Against the former is the fact that although certain groups are ultimately found in Judah (Judg. i.), the evidence for the movement—a conquest north of Kadesh, almost at the gate of the promised land—explicitly mentions Israel; and against the latter the evidence again shows that this representation has been deliberately subordinated to the entrance of Israel from beyond the Jordan.[2] In either case the history of separate sections of people may have been extended to Israel as a whole, but there is no evidence for any adequate reconstruction. Yet the presence of distinct representations of the history may be recognized, and since the Judaean compilers of the Old Testament have incorporated non-Judaean sources (*e.g.* the history of the northern monarchy), it is obvious that, apart from indigenous Judaean tradition, the southern groups which were ultimately enrolled in Judah would possess their own stock of oral and written lore. Hence it is noteworthy that the late editor of Judges has given the first place to Othniel, a Kenizzite, and therefore of Edomite affinity, though subsequently reckoned as a Judaean (Judg. i. 13, iii. 9; cf. Gen. xxxvi. 11; 1 Chron. iv. 13). Of Kenite interest is the position of Cain, ancestor of heroes of culture and of the worship of Yahweh (Gen. iv. 17 sqq.). One fragmentary source alludes to a journey to the Midianite or Kenite father-in-law of Moses with the Ark (*q.v.*); another knows of its movements with David and the priest Abiathar (a name closely related to Jether or Jethro; cf. also 1 Chron. iv. 17). Distinctively Calebite are the stories of the eponym who, fearless of the "giants" of Palestine, gained striking divine promises (Num. xiv. 11–24); Caleb's overthrow of the Hebronite giants finds a parallel in David's conflicts before the capture of Jerusalem, and may be associated with the belief that these primitive giants once filled the land (Josh. xi. 21 seq.; see § 7, and DAVID; SAMUEL, BOOKS OF). Calebite, too, are Hebron and its patron Abraham, and both increase in prominence in the patriarchal narratives, where, moreover, an important body of tradition can have emanated only from outside Israel and Judah (see GENESIS). Although Judah was always closely connected with the south, these "southern" features (once clearly more extensive and complete) are found in the Deuteronomic and priestly compilations, and their presence in the historical records can hardly be severed from the prominence of "southern" families in the vicinity of Jerusalem, some time after the fall of Jerusalem. The background in 1 Chron. ii. presupposes the desolation after that disaster, and some traces of these families are found in Nehemiah's time; and while the traditions know of a separation from Edom (viz. stories of Jacob and his "brother" Esau), elsewhere Edom is frequently denounced for unbrotherly conduct in connexion with some disaster which befell Jerusalem, apparently long after 586 B.C. (see § 22).[3] The true inwardness of this movement, its extent and its history, can hardly be recovered at present, but it is noteworthy that the evidence generally involves the Levites, an ecclesiastical body which underwent an extremely intricate development. To a certain extent it would seem that even as Chronicles (*q.v.*) has passed through the hands of one who was keenly interested in the Temple service, so the other historical books have been shaped not only by the late priestly writers (symbolized in literary criticism by P), but also by rather earlier writers, also of priestly sympathies, but of "southern" or half-Edomite affinity. This is independently suggested by the contents and vicissitudes of the purely ecclesiastical traditions.[4]

Recent criticism goes to show that there is a very considerable body of biblical material, more important for its attitude to the history than for its historical accuracy, the true meaning of which cannot as yet be clearly perceived. It raises many serious problems which concentrate upon that age which is of the greatest importance for the biblical and theological student. The perplexing relation between the admittedly late compilations and the actual course of the early history becomes still more intricate when one observes such a feature as the late interest in the Israelite tribes. No doubt there is much that is purely artificial and untrustworthy in the late (post-exilic) representations of these divisions, but it is almost incredible that the historical foundation for their early career is severed from the written sources by centuries of warfare, immigration and other disturbing factors. On the one hand, conservative scholars insist upon the close material relation between the constituent sources; critical scholars, on the other hand, while recognizing much that is relatively untrustworthy, refrain from departing from the general outlines of the canonical history more than is absolutely necessary. Hence the various reconstructions of the earlier history, with all their inherent weaknesses. But historical criticism is faced with the established literary conclusions which, it should be noticed, place the Deuteronomic and priestly compilations posterior to the great changes at and after the fall of the northern monarchy, and, to some extent, contemporary with the equally serious changes in Judah. There were catastrophes detrimental to the preservation of older literary records, and vicissitudes which, if they have not left their mark on contemporary history—which is singularly blank—may be traced on the representations of the past. There are external historical circumstances and internal literary features which unite to show that the application of the literary hypotheses of the Old Testament to the course of Israelite history is still incomplete, and they warn us that the intrinsic value of religious and didactic writings should not depend upon the accuracy of their history.[1] Future research may not be able to solve the problems which arise in the study of the period now under discussion; it is the more necessary, therefore, that all efforts should be tested in the light of purely external evidence (see further § 24; and PALESTINE: *History*).

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[1] The view that Deuteronomy is later than the 7th century has been suggested by M. Vernes, *Nouvelle hypothèse sur la comp. et l'origine du Deut.* (1887); Havet, *Christian. et ses origines* (1878); Horst, in *Rev. de l'hist. des relig.*, 1888; and more recently by E. Day, *Journ. Bib. Lit.* (1902), pp. 202 sqq.; and R. H. Kennett, *Journ. Theol. Stud.* (1906), pp. 486 sqq. The strongest counter-arguments (see W. E. Addis, *Doc. of Hexat.* ii. 2–9) rely upon the historical trustworthiness of 2 Kings xxii. seq. Weighty reasons are brought also by conservative writers against the theory that Deuteronomy dates from or about the age of Josiah, and their objections to the "discovery" of a new law-roll apply equally to the "re-discovery" and promulgation of an old and authentic code.

[2] See, for Cheyne's view, his *Decline and Fall of Judah:-Introduction* (1908). The former tendency has many supporters; see, among recent writers, N. Schmidt, *Hibbert Journal* (1908), pp. 322 sqq.; C.F. Burney, *Journ. Theol. Stud.* (1908), pp. 321 sqq.; O. A. Toffteen, *The Historic Exodus* (1909), pp. 120 sqq.; especially Meyer and Luther, *Die Israeliten*, pp. 442–440, &c. For the early recognition of the evidence in question, see J. Wellhausen, *De gentibus et familiis Judaeis* (Göttingen, 1870); *Prolegomena* (Eng. trans.), pp. 216 sqq., 342 sqq., and 441–443 (from art. "Israel," § 2, *Ency. Brit.* 9th ed.); also A. Kuenen, *Relig. of Israel* (i. 135 seq., 176–182); W. R. Smith, *Prophets of Israel*, pp. 28 seq., 379.

[3] For the prominence of the "southern" element in Judah see E. Meyer, *Entstehung d. Judenthums* (1896), pp. 119, 147, 167, 177, 183 n. 1; *Israeliten*, pp. 352 n. 5, 402, 429 seq.

[4] See § 23 end, and LEVITES. When Edom is renowned for wisdom and a small Judaean family boasts of sages whose names have south Palestinian affinity (1 Chron. ii. 6), and when such names as Korah, Heman, Ethan and Obed-edom, are associated with psalmody, there is no inherent improbability in the conjecture that the "southern" families settled around Jerusalem may have left their mark in other parts of the Old Testament. It is another question whether such literature can be identified (for Cheyne's views, see *Ency. Bib.* "Prophetic Literature," "Psalms," and his recent studies).

21. *Nehemiah and Ezra.*—There is another remarkable gap in the historical traditions between the time of Zerubbabel and the reign of Artaxerxes I. In obscure circumstances the enthusiastic hopes have melted away, the Davidic scion has disappeared, and Jerusalem has been the victim of another disaster. The country is under Persian officials, the nobles and priests form the local government, and the ground is being prepared for the erection of a hierocracy. It is the work of rebuilding and reorganization, of social and of religious reforms, which we encounter in the last pages of biblical history, and in the records of Ezra and Nehemiah we stand in Jerusalem in the very centre of epoch-making events. Nehemiah, the cup-bearer of Artaxerxes at Susa, plunged in grief at the news of the desolation of Jerusalem, obtained permission from the king to rebuild the ruins. Provided with an escort and with the right to obtain supplies of wood for the buildings, he returned to the city of his fathers' sepulchres (the allusion may suggest his royal ancestry). His zeal is represented in a twofold aspect. Having satisfied himself of the extent of the ruins, he aroused the people to the necessity of fortifying and repopulating the city, and a vivid account is given in his name of the many dangers which beset the rebuilding of the walls. Sanballat of Horon, Tobiah the Ammonite, and Gashmu the Arabian (? Edomite) unceasingly opposed him. Tobiah and his son Johanan were related by marriage to Judaean secular and priestly families, and active intrigues resulted, in which nobles and prophets took their part. It was insinuated that Nehemiah had his prophets to proclaim that Judah had again its own king; it was even suggested that he was intending to rebel against Persia! Nehemiah naturally gives us only his version, and the attitude of Haggai and Zechariah to Zerubbabel may illustrate the feeling of his partisans. But Tobiah and Johanan themselves were worshippers of Yahweh (as their names also show), and consequently, with prophets taking different sides and with the Samaritan claims summarily repudiated (Neh. ii. 20; cf. Ezra iv. 3), all the facts cannot be gathered from the narratives. Nevertheless the undaunted Judaean pressed on unmoved by the threatening letters which were sent around, and succeeded in completing the walls within fifty-two days.[2]

In the next place, Nehemiah appears as governor of the small district of Judah and Benjamin. Famine, the avarice of the rich, and the necessity of providing tribute had brought the humbler classes to the lowest straits. Some had mortgaged their houses, fields and vineyards to buy corn; others had borrowed to pay the taxes, and had sold their children to their richer brethren to repay the debt. Nehemiah was faced with old abuses, and vehemently contrasted the harshness of the nobles with the generosity of the exiles who would redeem their poor countrymen from slavery. He himself had always refrained from exacting the usual provision which other governors had claimed; indeed, he had readily entertained over 150 officials and dependants at his table, apart from casual refugees (Neh. v.). We hear something of a twelve-years' governorship and of a second visit, but the evidence does not enable us to determine the sequence (xiii. 6). Neh. v. is placed in the middle of the building of the walls in fifty-two days; the other reforms during the second visit are closely connected with the dedication of the walls and with the events which immediately follow his first arrival when he had come to rebuild the city. Nehemiah also turns his attention to religious abuses. The sabbath, once a festival, had become more strictly observed, and when he found the busy agriculturists and traders (some of them from Tyre) pursuing their usual labours on that day, he pointed to the disasters which had resulted in the past from such profanation, and immediately took measures to put down the evil (Neh. xiii. 18; cf. Jer. xvii. 20 sqq.; Ezek. xx. 13–24; Isa. lvi. 2, 6; lviii. 13). Moreover, the maintenance of the Temple servants called for supervision; the customary allowances had not been paid to the Levites who had come to Jerusalem after the smaller shrines had been put down, and they had now forsaken the city. His last acts were the most conspicuous of all. Some of the Jews had married women of Ashdod, Ammon and Moab, and the impetuous governor indignantly adjured them to desist from a practice which was the historic cause of national sin. Even members of the priestly families had intermarried with Tobiah and Sanballat; the former had his own chamber in the precincts of the Temple, the daughter of the latter was the wife of a son of Joiada the son of the high priest Eliashib. Again Nehemiah's wrath was kindled. Tobiah was cast out, the offending priest expelled, and a general purging followed, in which all the foreign element was removed. With this Nehemiah brings the account of his reforms to a conclusion, and the words "Remember me, O my God, for good" (xiii. 31) are not meaningless. The incidents can be supplemented from Josephus. According to this writer (*Ant.* xi. 7, 2), a certain Manasseh, the brother of Jaddua and grandson of Joiada, refused to divorce his wife, the daughter of Sanballat. For this he was driven out, and, taking refuge with the Samaritans, founded a rival temple and priesthood upon Mt Gerizim, to which repaired other priests and Levites who had been guilty of mixed marriages. There is little doubt that Josephus refers to the same events; but there is considerable confusion in his history of the Persian age, and when he places the schism and the foundation of the new Temple in the time of Alexander the Great (after the obscure disasters of the reign of Artaxerxes III.), it is usually supposed that he is a century too late.[3] At all events, there is now a complete rupture with Samaria, and thus, in the concluding chapter of the last of the historical books of the Old Testament, Judah maintains its claim to the heritage of Israel and rejects the right of the Samaritans to the title[4] (see § 5).

In this separation of the Judaeans from religious and social intercourse with their neighbours, the work of Ezra (*q.v.*) requires notice. The story of this scribe (now combined with the memoirs of Nehemiah) crystallizes the new movement inaugurated after a return of exiles from Babylonia. The age can also be illustrated from Isa. lvi.–lxvi. and Malachi (*q.v.*). There was a poor and weak Jerusalem, its Temple stood in need of renovation, its temple-service was mean, its priests unworthy of their office. On the one side was the grinding poverty of the poor; on the other the abuses of the governors. There were two leading religious parties: one of oppressive formalists, exclusive, strict and ritualistic; the other, more cosmopolitan, extended a freer welcome to strangers, and tolerated the popular elements and the superstitious cults which are vividly depicted (Isa. lxv. seq.). But the former gained the day, and, realizing that the only hope of maintaining a pure worship of Yahweh lay in a forcible isolation from foreign influence, its adherents were prepared to take measures to ensure the religious independence of their assembly. It is related that Ezra, the scribe and priest, returned to Jerusalem with priests and Levites, lay exiles, and a store of vessels for the Temple. He was commissioned to inquire into the religious condition of the land and to disseminate the teaching of the Law to which he had devoted himself (Ezra vii.). On his arrival the people were gathered together, and in due course he read the "book of the Law of Moses" daily for seven days (Neh. viii.). They entered into an agreement to obey its teaching, undertaking in particular to avoid marriages with foreigners (x. 28 sqq.). A special account is given of this reform (Ezra ix. seq.) and the description of Ezra's horror at the prevalence of intermarriage, which threatened to destroy the distinctive character of the community, sufficiently indicates the attitude of the stricter party. The true seed of Israel separated themselves from all foreigners (not, however, without some opposition) and formed an exclusively religious body or "congregation." Dreams of political freedom gave place to hopes of religious independence, and "Israel" became a church, the foundation of which it sought in the desert of Sinai a thousand years before.

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[1] One may recall, in this connexion, Caxton's very interesting prologue to Malory's *Morte d'Arthur* and his remarks on the permanent value of the "histories" of this British hero. [Cf. also Horace, *Ep.* I. ii. and R. Browning, "Development."]

[2] It is noteworthy that Josephus, who has his own representation of the post-exilic age, allows two years and four months for the work (*Ant.* xi. 5, 8).

[3] The papyri from Elephantine (p. 282, n. 1, above) mention as contemporaries the Jerusalem priest Johanan (cf. the son of Joiada and father of Jaddua, Neh. xii. 22), Bagohi (Bagoas), governor of Judah, and Delaiah and Shelemiah sons of Sanballat (408–407 B.C.) They ignore any strained relations between Samaria and Judah, and Delaiah and Bagohi unite in granting permission to the Jewish colony to rebuild their place of worship. If this fixes the date of Sanballat and Nehemiah in the time of the first Artaxerxes, the probability of confusion in the later written sources is enhanced by the recurrence of identical names of kings, priests, &c., in the history.

[4] The Samaritans, for their part, claimed the traditions of their land and called themselves the posterity of Joseph, Ephraim and Manasseh. But they were ready to deny their kinship with the Jews when the latter were in adversity, and could have replied to the tradition that they were foreigners with a *tu quoque* (Josephus, *Ant.* ix. 14, 3; xi. 8, 6; xii. 5, 5) (see SAMARITANS).

22. *Post-exilic History.*—The biblical history for the period in the books of Ezra and Nehemiah is exceptionally obscure, and it is doubtful how far the traditions can be trusted before we reach the reign of Artaxerxes (Ezra vii. sqq., Neh.). The records belonging to this reign represent four different stages: (*a*) The Samaritans reported that the Jews who had returned from the king to Jerusalem were rebuilding the city and completing its walls, an act calculated to endanger the integrity of the province. Artaxerxes accordingly instructed them to stop the work until he should give the necessary decree, and this was done by force (Ezra iv. 7–23, undated; 1 Esdras ii. 16 sqq. mentions a building of the Temple!). (*b*) It was in the 7th year (*i.e.* 458 B.C.) that Ezra returned with a small body of exiles to promulgate the new laws he had brought and to set the Temple service in order.[1] Fortified with remarkable powers, some of which far exceed the known tolerance of Persian kings, he began wide-sweeping marriage reforms; but the record ceases abruptly (vii.–x.). (*c*) In the 20th year (445 B.C.) Nehemiah returned with permission to rebuild the walls, the citadel and the governor's house (Neh. ii. 5, 8; see § 21 above). But (*d*), whilst as governor he accomplishes various needed reforms, there is much confusion in the present narratives, due partly to the resumption of Ezra's labours after an interval of twelve years, and partly to the closely related events of Nehemiah's activity in which room must be found for his twelve-years' governorship and a second visit. The internal literary and historical questions are extremely intricate, and the necessity for some reconstruction is very generally felt (for preliminary details, see EZRA AND NEHEMIAH). The disaster which aroused Nehemiah's grief was scarcely the fall of Jerusalem in 586 B.C., but a more recent one, and it has been conjectured that it followed the work of Ezra (in *b* above). On the other hand, a place can hardly be found for the history of Ezra before the appearance of Nehemiah; he moves in a settled and peaceful community such as Nehemiah had helped to form, his reforms appear to be more mature and schematic than those of Nehemiah; and, whilst Josephus handles the two separately, giving Ezra the priority, many recent scholars incline to place Nehemiah's first visit before the arrival of Ezra.[2] That later tradition should give the pre-eminence to the priestly reforms of Ezra is in every way natural, but it has been found extremely difficult to combine the two in any reconstruction of the period. Next, since there are three distinct sources, for (*a*) above, and for the work of Nehemiah and of Ezra, implicit reliance cannot be placed upon the present sequence of narratives. Thus (*a*), with its allusion to a further decree, forms a plausible prelude to the return of either Ezra (vii. 13) or Nehemiah (i. 3, ii. 3); and if it is surprising that the Samaritans and other opponents, who had previously waited to address Artaxerxes (Ezra iv. 14 sqq., v. 5, 17), should now interfere when Nehemiah was armed with a royal mandate (Neh. ii. 7–9), it is very difficult not to conclude that the royal permits, as now detailed, have been coloured by Jewish patriotism and the history by enmity to Samaria. Finally, the situation in the independent and undated record (*a*) points to a return, a rebuilding (apparently after some previous destruction), and some interference. This agrees substantially with the independent records of Nehemiah, and unless we assume two disasters not widely separated in date —viz. those presupposed in (*a*) and (*c*)—the record in (*a*) may refer to that stage in the history where the other source describes the intrigues of the Samaritans and the letters sent by Tobiah (cf. Tabeel in Ezra iv. 7) to frighten Nehemiah (Neh. vi. 19).[3] Their insinuations that Nehemiah was seeking to be ruler and their representations to Artaxerxes would be enough to alarm the king (cf. Neh. vi. 5–9, 19, and Ezra iv. 15 seq., 20 seq.), and it may possibly be gathered that Nehemiah at once departed to justify himself (Neh. vii. 2, xiii. 4, 6). Nevertheless, since the narratives are no longer in their original form or sequence, it is impossible to trace the successive steps of the sequel; although if the royal favour was endorsed (cf. the account ascribed to the time of Darius, Ezra v. seq.), Nehemiah's position as a reformer would be more secure.

Although there was a stock of tradition for the post-exilic age (cf. Daniel, Esther, 1 Esdras, Josephus), the historical narratives are of the scantiest and vaguest until the time of Artaxerxes, when the account of a return (Ezra iv. 12), which otherwise is quite ignored, appears to have been used for the times of Darius (1 Esdras iv. seq.) and subsequently of Cyrus (Ezra i.–iii.). Moreover, although general opinion identifies our Artaxerxes with the first of that name, certain features suggest that there has been some confusion with the traditions of the time of Artaxerxes II. and III. (§ 19). But the problems are admittedly complicated, and since one is necessarily dependent upon scanty narratives arranged and rearranged by later hands in accordance with their own historical theories, it is difficult to lay stress upon internal evidence which appears to be conclusive for this or that reconstruction.[4] The main facts, however, are clear. Jerusalem had suffered some serious catastrophe before Nehemiah's return; a body of exiles returned, and in spite of interference the work of rebuilding was completed; through their influence the Judaean community underwent reorganization, and separated itself from its so-called heathen neighbours. How many years elapsed from beginning to end can hardly be said. Tradition concentrated upon Ezra and his age many events and changes of fundamental importance. The canonical history has allowed only one great destruction of Jerusalem, and the disaster of 586 B.C. became the type for similar disasters, but how many there were criticism can scarcely decide.[5] Allusions to Judah's sufferings at the hands of Edom, Moab and Ammon often imply conditions which are not applicable to 586. A definite series knows of an invasion and occupation by Edom (*q.v.* end), a people with whom Judah, as the genealogies show, had once been intimately connected. The unfriendliness of the "brother" people, which added so much to the bitterness of Judah, although associated with the events of 586 (so especially 1 Esdras iv. 45), probably belongs to a much later date.[6] The tradition that Edomites burned the Temple and occupied part of Judah (ib. *vv.* 45, 50) is partially confirmed by Ezek. xxxv. 5, 10, xxxvi. 5; Ps. cxxxvii. 7; but the assumption that Darius, as in 1 Esdras, helped the Jews against them can with difficulty be maintained. The interesting conjecture that the second Temple suffered another disaster in the obscure gap which follows the time of Zerubbabel has been urged, after Isa. lxiii. 7–lxiv. 12, by Kuenen (afterwards withdrawn) and by Sellin, and can be independently confirmed. In the records of Nehemiah the ruins of the city are extensive (ii. 8, 17, iii.; cf. Ecclus. xlix. 13), and the tradition that Nehemiah rebuilt this Temple (Jos. *Ant.* xi. 5, 6; 2 Macc. i. 18) is supported (*a*) by the explicit references to the rebuilding of the Temple in the reign of Artaxerxes (1 Esdras ii. 18, not in Ezra iv. 12; but both in a context relating to the history of the Temple), and (*b*) by the otherwise inaccurate statement that the Temple was finished according to the decree of "Cyrus, Darius and Artaxerxes king of Persia" (Ezra vi. 14).

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[1] The statement that the king desired to avoid the divine wrath may possibly have some deeper meaning (*e.g.* some recent revolt, Ezra vii. 23).

[2] It must suffice to refer to the opinions of Bertholet, Buhl, Cheyne, Guthe, Van Hoonacker, Jahn, Kennett, Kent, Kosters, Marquart, Torrey, and Wildeboer.

[3] C. F. Kent, *Israel's Hist. and Biog. Narratives* (1905), p. 358 seq. The objections against this very probable view undervalue Ezra iv. 7–23 and overlook the serious intricacies in the book of Nehemiah.

[4] There are three inquiries: (*a*) the critical value of 1 Esdras, (*b*) the character of the different representations of post-exilic internal and external history, and (*c*) the recovery of the historical facts. To start with the last before considering (*a*) and (*b*) would be futile.

[5] For example, to the sufferings under Artaxerxes III. (§ 19) have been ascribed such passages as Isa. lxiii. 7–lxiv. 12; Ps. xliv., lxxiv., lxxix., lxxx., lxxxiii. (see also LAMENTATIONS). In their present form they are not of the beginning of the 6th century and, if the evidence for Artaxerxes III. proves too doubtful, they may belong to the history preceding Nehemiah's return, provided the internal features do not stand in the way (*e.g.* prior or posterior to the formation of the exclusive Judaean community, &c.). Since the book of Baruch (named after Jeremiah's scribe) is now recognized to be considerably later (probably after the destruction of Jerusalem A.D. 70), it will be seen that the recurrence of similar causes leads to a similarity in the contemporary literary productions (with a reshaping of earlier tradition), the precise date of which depends upon delicate points of detail and not upon the apparently obvious historical elements.

[6] See H. Winckler, *Keil. u. Alte Test.*, 295, and Kennett, *Journ. Theol. Stud.* (1906), p. 487; *Camb. Bib. Essays*, p. 117. The Chaldeans alone destroyed Jerusalem (2 Kings xxv.); Edom was friendly or at least neutral (Jer. xxvii. 3, xl. 11 seq.). The proposal to read "Edomites" for "Syrians" in the list of bands which troubled Jehoiakim (2 Kings xxiv. 2) is not supported by the contemporary reference, Jer. xxxv. 11.

The untrustworthy account of the return in the time of Cyrus (Ezra i. sqq.) or Darius (1 Esdras iv. seq.; probably the older form) is curiously indebted to material which seems to have belonged to the history of the work of Nehemiah (cf. Ezra ii. with Neh. vii.), and the important return in the reign of Artaxerxes (Ezra iv. 12) seems to be connected with other references to some new settlement (Neh. xi. 20, 23, 25, especially xii. 29). The independent testimony of the names in Neh. iii. is against any previous large return from Babylon, and clearly illustrates the strength of the groups of "southern" origin whose presence is only to be expected (p. 285). Moreover, the late compiler of 1 Chronicles distinguishes a Judah composed almost wholly of "southern" groups (1 Chron. ii. and iv.) from a subsequent stage when the first inhabitants of Jerusalem correspond in the main to the new population after Nehemiah had repaired the ruins (1 Chron. ix. and Neh. xi.). Consequently, underlying the canonical form of post-exilic history, one may perhaps recognize some fresh disaster, after the completion of Zerubbabel's temple, when Judah suffered grievously at the hands of its Edomite brethren (in Malachi, date uncertain, vengeance has at last been taken); Nehemiah restored the city, and the traditions of the exiles who returned at this period have been thrown back and focussed upon the work of Zerubbabel. The criticism of the history of Nehemiah, which leads to this conjecture, suggests also that if Nehemiah repulsed the Samaritan claims (ii. 20; cf. Ezra iv. 3, where the building of the Temple is concerned) and refused a compromise (vi.2), it is extremely unlikely that Samaria had hitherto been seriously hostile; see also C. C. Torrey, *Ezra Studies*, pp. 321–333.

Bibilical history ends with the triumph of the Judaean community, the true "Israel," the right to which title is found in the distant past. The Judaean view pervades the present sources, and whilst its David and Solomon ruled over a united land, the separation under Jeroboam is viewed as one of calf-worshipping northern tribes from Jerusalem with its one central temple and the legitimate priesthood of the Zadokites. It is from this narrower standpoint of an exclusive and confined Judah (and Benjamin) that the traditions as incorporated in the late recensions gain fresh force, and in Israel's renunciation of the Judaean yoke the later hostility between the two may be read between the lines. The history in Kings was not finally settled until a very late date, as is evident from the important variations in the Septuagint, and it is especially in the description of the time of Solomon and the disruption that there continued to be considerable fluctuations.[1] The book has no finale and the sudden break may not be accidental. It is replaced by Chronicles, which, confining itself to Judaean history from a later standpoint (after the Persian age), includes new characteristic traditions wherein some recollection of more recent events may be recognized. Thus, the south Judaean or south Palestinian element shows itself in Judaean genealogies and lists; there are circumstantial stories of the rehabilitation of the Temple and the reorganization of cultus; there are fuller traditions of inroads upon Judah by southern peoples and their allies. There is also a more definite subordination of the royal authority to the priesthood (so too in the writings of Ezekiel, *q.v.*); and the stories of punishment inflicted upon kings who dared to contend against the priests (Jehoash, Uzziah) point to a conflict of authority, a hint of which is already found in the reconciliation of Zerubbabel and the priest Joshua in a passage ascribed to Zechariah (ch. vi.).

23. *Post-exilic Judaism.*—With Nehemiah and Ezra we enter upon the era in which a new impulse gave to Jewish life and thought that form which became the characteristic orthodox Judaism. It was not a new religion that took root; older tendencies were diverted into new paths, the existing material was shaped to new ends. Judah was now a religious community whose representative was the high priest of Jerusalem. Instead of sacerdotal kings, there were royal priests, anointed with oil, arrayed with kingly insignia, claiming the usual royal dues in addition to the customary rights of the priests. With his priests and Levites, and with the chiefs and nobles of the Jewish families, the high priest directs this small state, and his death marks an epoch as truly as did that of the monarchs in the past. This hierarchical government, which can find no foundation in the Hebrew monarchy, is the forerunner of the Sanhedrin (*q.v.*); it is an institution which, however inaugurated, set its stamp upon the narratives which have survived. Laws were recast in accordance with the requirements of the time, with the result that, by the side of usages evidently of very great antiquity, details now appear which were previously unknown or wholly unsuitable. The age, which the scanty historical traditions themselves represent as one of supreme importance for the history of the Jews, once seemed devoid of interest, and it is entirely through the laborious scholarship of the 19th century that it now begins to reveal its profound significance. The Graf-Wellhausen hypothesis, that the hierarchical law in its complete form in the Pentateuch stands at the close and not at the beginning of biblical history, that this mature Judaism was the fruit of the 5th century B.C. and not a divinely appointed institution at the exodus (nearly ten centuries previously), has won the recognition of almost all Old Testament scholars. It has been substantiated by numerous subsidiary investigations in diverse departments, from different standpoints, and under various aspects, and can be replaced only by one which shall more adequately explain the literary and historical evidence (see further, p. 289).

The post-exilic priestly spirit represents a tendency which is absent from the Judaean Deuteronomic book of Kings but is fully mature in the later, and to some extent parallel, book of Chronicles (*q.v.*). The "priestly" traditions of the creation and of the patriarchs mark a very distinct advance upon the earlier narratives, and appear in a further developed form in the still later book of Jubilees, or "Little Genesis," where they are used to demonstrate the pre-Mosaic antiquity of the priestly or Levitical institutions. There is also an unmistakable development in the laws; and the priestly legislation, though ahead of both Ezekiel and Deuteronomy, not to mention still earlier usage, not only continues to undergo continual internal modification, but finds a further distinct development, in the way of definition and interpretation, outside the Old Testament—in the Talmud (*q.v.*). Upon the characteristics of the post-exilic priestly writings we need not dwell.[2] Though one may often be repelled by their lifelessness, their lack of spontaneity and the externalization of the ritual, it must be recognized that they placed a strict monotheism upon a legal basis. "It was a necessity that Judaism should incrust itself in this manner; without those hard and ossified forms the preservation of its essential elements would have proved impossible. At a time when all nationalities, and at the same time all bonds of religion and national customs, were beginning to be broken up in the seeming cosmos and real chaos of the Graeco-Roman Empire, the Jews stood out like a rock in the midst of the ocean. When the natural conditions of independent nationality all failed them, they nevertheless artificially maintained it with an energy truly marvellous, and thereby preserved for themselves, and at the same time for the whole world, an eternal good."[3]

If one is apt to acquire too narrow a view of Jewish legalism, the whole experience of subsequent history, through the heroic age of the Maccabees (*q.v.*) and onwards, only proves that the minuteness of ritual procedure could not cramp the heart. Besides, this was only one of the aspects of Jewish literary activity. The work represented in Nehemiah and Ezra, and put into action by the supporters of an exclusive Judaism, certainly won the day, and their hands have left their impress upon the historical traditions. But Yahwism, like Islam, had its sects and tendencies, and the opponents to the stricter ritualism always had followers. Whatever the predominant party might think of foreign marriages, the tradition of the half-Moabite origin of David serves, in the beautiful idyll of Ruth (*q.v.*), to suggest the debt which Judah and Jerusalem owed to one at least of its neighbours. Again, although some may have desired a self-contained community opposed to the heathen neighbours of Jerusalem, the story of Jonah implicitly contends against the attempt of Judaism to close its doors. The conflicting tendencies were incompatible, but Judaism retained the incompatibilities within its limits, and the two tendencies, prophetical and priestly, continue, the former finding its further development in Christianity.[1]

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[1] It is at least a coincidence that the prophet who took the part of Tobiah and Sanballat against Nehemiah (vi. 10 seq.) bears the same name as the one who advised Rehoboam to acquiesce in the disruption (1 Kings xii. 21–24), or announced the divine selection of Jeroboam (ib. *v.* 24, Septuagint only).

[2] See HEBREW RELIGION, § 8 seq., and the relevant portions of the histories of Israel.

[3] J. Wellhausen, art. "Israel," *Ency. Brit.* 9th ed., vol. xiii. p. 419; or his *Prolegomena*, pp. 497 seq.

The Graf-Wellhausen hypothesis (§ 4) does not pretend to be complete in all its details and it is independent of its application to the historical criticism of the Old Testament. No alternative hypothesis prevails, mere desultory criticism of the internal intricacies being quite inadequate. Maintaining that the position of the Pentateuch alone explains the books which follow, conservative writers concede that it is composite, has had some literary history, and has suffered some revision in the post-exilic age. Their concessions continue to become ever more significant, and all that follows from them should be carefully noticed by those who are impressed by their arguments. They identify with Deuteronomy the law-roll which explains the noteworthy reforms of Josiah (§ 16); but since it is naturally admitted that religious conditions had become quite inconsistent with Mosaism, the conservative view implies that the "long-lost" Deuteronomy must have differed profoundly from any known Mosaic writings to which earlier pious kings and prophets had presumably adhered. Similarly, the "book of the Law of Moses," brought from Babylon by Ezra (Ezra vii.; Neh. viii.), clearly contained much of which the people were ignorant, and conservative writers, who oppose the theory that a new Law was then introduced, emphasize (*a*) the previous existence of legislation (to prove that Ezra's book was not entirely a novelty), and (*b*) the gross wickedness in Judah (as illustrated by the prophets) from the time of Josiah to the strenuous efforts of the reformers on behalf of the most fundamental principles of the national religion. This again simply means that the Mosaism of Ezra or Nehemiah must have differed essentially from the priestly teaching prior to their arrival. The arguments of conservative writers involve concessions which, though often overlooked by their readers, are very detrimental to the position they endeavour to support, and the objections they bring against the theory of the introduction of new law-books (under a Josiah or an Ezra) apply with equal force to the promulgation of Mosaic teaching which had been admittedly ignored or forgotten. Their arguments have most weight, however, when they show the hazardous character of reconstructions which rely upon the trustworthiness of the historical narratives. What book Ezra really brought from Babylon is uncertain; the writer, it seems, is merely narrating the introduction of the Law ascribed to Moses, even as a predecessor has recounted the discovery of the Book of the Law, the Deuteronomic code subsequently included in the Pentateuch.

The importance which the biblical writers attach to the return from Babylon in the reign of Artaxerxes forms a starting-point for several interesting inquiries. Thus, in any estimate of the influence of Babylonia upon the Old Testament, it is obviously necessary to ask whether certain features (*a*) are of true Babylonian origin, or (*b*) merely find parallels or analogies in its stores of literature; whether the indebtedness goes back to very early times or to the age of the Assyrian domination or to the exiles who now returned. Again, there were priestly and other families—some originally of "southern" origin—already settled around Jerusalem, and questions inevitably arise concerning their relation to the new-comers and the literary vicissitudes which gave us the Old Testament in its present form. To this age we may ascribe the literature of the Priestly writers (symbolized by P), which differs markedly from the other sources. Yet it is clear from the book of Genesis alone that in the age of Priestly writers and compilers there were other phases of thought. Popular stories with many features of popular religion were current. They could be, and indeed had been made more edifying; but the very noteworthy conservatism of even the last compiler or editor, in contrast to the re-shaping and re-writing of the material in the book of Jubilees, indicates that the Priestly spirit was not that of the whole community. But through the Priestly hands the Old Testament history passed; and their standpoint colours its records. This is especially true of the history of the exilic and post-exilic periods, where the effort is made to preserve the continuity of Israel and the Israelite community (Chronicles–Ezra–Nehemiah). The bitterness aroused by the ardent and to some extent unjust zeal of the reforming element can only be conjectured. The traditions reveal a tendency to legitimate new circumstances. Priesthoods, whose traditions connect them with the south, are subordinated; the ecclesiastical records are re-shaped or re-adjusted; and a picture is presented of hierarchical jealousies and rivalries which (it was thought) were settled once and for all in the days of the exodus from Egypt. Many features gain in significance as the account of the Exodus, the foundation of Israel, is read in the light of the age when, after the advent of a new element from Babylonia, the Pentateuch assumed its present shape; it must suffice to mention the supremacy of the Aaronite priests and the glorification of uncompromising hostility to foreign marriages.[2] The most "unhistorical" tradition has some significance for the development of thought or of history-writing, and thus its internal features are ultimately of historical value. Only from an exhaustive comparison of controlling data can the scattered hints be collected and classified. There is much that is suggestive, for example, in the relation between the "post-exilic" additions to the prophecies and their immediately earlier form; or in the singular prominence of the Judaean family of Perez (its elevation over Zerah, a half-Edomite family, Gen. xxxviii.; its connexion with the Davidic dynasty, Ruth iv.; its position as head of all the Judaean sub-divisions, 1 Chron. ii. 5 sqq.); or in the late insertion of local tradition encircling Jerusalem; or in the perplexing attitude of the histories towards the district of Benjamin and its famous sanctuary of Bethel (only about 10 m. north of Jerusalem). Although these and other phenomena cannot yet be safely placed in a historical frame, the methodical labours of past scholars have shed much light upon the obscurities of the exilic and post-exilic ages, and one must await the more comprehensive study of the two or three centuries which are of the first importance for biblical history and theology.

24. *Old Testament History and External Evidence.*—Thus the Old Testament, the history of the Jews during the first great period, describes the relation of the Hebrews to surrounding peoples, the superiority of Judah over the faithless (north) Israelite tribes, and the reorganization of the Jewish community in and around Jerusalem at the arrival of Ezra with the Book of the Law. The whole gives an impression of unity, which is designed, and is to be expected in a compilation. But closer examination reveals remarkable gaps and irreconcilable historical standpoints. For all serious biblical study, the stages in the growth of the written traditions and the historical circumstances which they imply, must inevitably be carefully considered, and upon the result depends, directly or indirectly, almost every subject of Old Testament investigation. Yet it is impossible to recover with confidence or completeness the development of Hebrew history from the pages of the Old Testament alone. The keen interest taken by the great prophets in the world around them is not prominent in the national records; political history has been subordinated, and the Palestine which modern discovery is revealing is not conspicuous in the didactic narratives. To external evidence one must look, therefore, for that which did not fall within the scope or the horizon of the religious historians. They do not give us the records of the age of the Babylonian monarch Khammurabi (perhaps Amraphel, Gen. xiv.), of the Egyptian conquests in the XVIIIth and following dynasties, or of the period illustrated by the Amarna tablets (§ 3). They treat with almost unique fullness a few years in the middle of the 9th century B.C., but ignore Assyria; yet only the Assyrian inscriptions explain the political situation (§ 10 seq.), and were it not for them the true significance of the 8th–7th centuries could scarcely be realized (§ 15 seq.). It would be erroneous to confuse the extant sources with the historical material which might or must have been accessible, or to assume that the antiquity of the elements of history proves or presupposes the antiquity of the records themselves, or even to deny the presence of some historical kernel merely on account of unhistorical elements or the late dress in which the events are now clothed. External research constantly justifies the cautious attitude which has its logical basis in the internal conflicting character of the written traditions or in their divergence from ascertained facts; at the same time it has clearly shown that the internal study of the Old Testament has its limits. Hence, in the absence of more complete external evidence one is obliged to recognize the limitations of Old Testament historical criticism, even though this recognition means that positive reconstructions are more precarious than negative conclusions.

The naïve impression that each period of history was handled by some more or less contemporary authority is not confirmed by a criticism which confines itself strictly to the literary evidence. An interest in the past is not necessarily confined to any one age, and the critical view that the biblical history has been compiled from relatively late standpoints finds support in the still later treatment of the events—in Chronicles as contrasted with Samuel-Kings or in Jubilees as contrasted with Genesis.[3] It is instructive to observe in Egypt the form which old traditions have taken in Manetho (Maspero, *Rec. de travaux*, xxvii., 1905, l. 22 seq.); cf. also the late story of Rameses II. and the Hittites (J. H. Breasted, *Anc. Rec. of Egypt*, iii. 189 seq.); while in Babylonia one may note the didactic treatment, after the age of Cyrus, of the events of the time of Khammurabi (A. H. Sayce, *Proc. Soc. Biblical Archaeol.*, 1907, pp. 13 sqq.).

The links which unite the traditional heroes with Babylonia (*e.g.* Abraham, Ezra), Mesopotamia (*e.g.* Jacob), Egypt (*e.g.* Joseph,

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[1] An instructive account of Judaism in the early post-exilic age on critical lines (from the Jewish standpoint) is given by C. G. Montefiore, *Hibbert Lectures* (1892), pp. 355 sqq.; cf. also the sketch by I. Abrahams, *Judaism* (1907).

[2] Cf. the story of Phinehas, Num. xxv. 6 sqq.; on Gen. xxxiv., see SIMEON. Apropos of hostility towards Samaria, it is singular that the term of reproach, "Cutheans," applied to the Samaritans is derived from Cutha, the famous seat of the god Nergal, only some 25 m. N.E. of Babylon itself (see above, p. 286, n. 4).

[3] The various tendencies which can be observed in the later pseudepigraphical and apocalyptical writings are of considerable value in any consideration of the development of thought illustrated in the Old Testament itself.

Jeroboam), Midian (*e.g.* Moses, Jethro), &c., like the intimate relationship between Israel and surrounding lands, have a significance in the light of recent research. Israel can no longer be isolated from the politics, culture, folk-lore, thought and religion of western Asia and Egypt. Biblical, or rather Palestinian, thought has been brought into the world of ancient Oriental life, and this life, in spite of the various forms in which it has from time to time been shaped, still rules in the East. This has far-reaching consequences for the traditional attitude to Israelite history and religion. Research is seriously complicated by the growing stores of material, which unfortunately are often utilized without attention to the principles of the various departments of knowledge or aspects of study. The complexity of modern knowledge and the interrelation of its different branches are often insufficiently realized, and that by writers who differ widely in the application of such material as they use to their particular views of the manifold problems of the Old Testament. It has been easy to confuse the study of the Old Testament in its relation to modern religious needs with the technical scientific study of the much edited remains of the literature of a small part of the ancient East. If there was once a tendency to isolate the Old Testament and ignore comparative research, it is now sometimes found possible to exaggerate its general agreement with Oriental history, life and thought. Difficulties have been found in the supernatural or marvellous stories which would be taken as a matter of course by contemporary readers, and efforts are often made to recover historical facts or to adapt the records to modern theology without sufficient attention to the historical data as a whole or to their religious environment. The preliminary preparation for research of any value becomes yearly more exacting.

Many traces of myth, legend and "primitive" thought survive in the Old Testament, and on the most cautious estimate they presuppose a vitality which is not a little astonishing. But they are now softened and often bereft of their earlier significance, and it is this and their divergence from common Oriental thought which make Old Testament thought so profound and unique. The process finds its normal development in later and non-biblical literature; but one can recognize earlier, cruder and less distinctive stages, and, as surely as writings reflect the mentality of an author or of his age, the peculiar characteristics of the extant sources, viewed in the light of a comprehensive survey of Palestinian and surrounding culture, demand a reasonable explanation. The differences between the form of the written history and the conditions which prevailed have impressed themselves variously upon modern writers, and efforts have been made to recover from the Old Testament earlier forms more in accordance with the external evidence. It may be doubted, however, whether the material is sufficient for such restoration or reconstruction.[1] In the Old Testament we have the outcome of specific developments, and the stage at which we see each element of tradition or belief is not always isolated or final (cf. Kings and Chronicles). The early myths, legends and traditions which can be traced differ profoundly from the canonical history, and the gap is wider than that between the latter and the subsequent apocalyptical and pseudepigraphical literature.

Where it is possible to make legitimate and unambiguous comparisons, the ethical and spiritual superiority of Old Testament thought has been convincingly demonstrated, and to the re-shaping and re-writing of the older history and the older traditions the Old Testament owes its permanent value. While the history of the great area between the Nile and the Tigris irresistibly emphasizes the insignificance of Palestine, this land's achievements for humanity grow the more remarkable as research tells more of its environment. Although the light thrown upon ancient conditions of life and thought has destroyed much that sometimes seems vital for the Old Testament, it has brought into relief a more permanent and indisputable appreciation of its significance, and it is gradually dispelling that pseudo-scientific literalism which would fetter the greatest of ancient Oriental writings with an insistence upon the verity of historical facts. Not internal criticism, but the incontestable results of objective observation have shown once and for all that the relationship between the biblical account of the earliest history (Gen. i.–xi.) and its value either as an authentic record (which requires unprejudiced examination) *or* as a religious document (which remains untouched) is typical. If, as seems probable, the continued methodical investigation, which is demanded by the advance of modern knowledge, becomes more drastic in its results, it will recognize ever more clearly that there were certain unique influences in the history of Palestine which cannot be explained by purely historical research. The change from Palestinian polytheism to the pre-eminence of Yahweh and the gradual development of ethical monotheism are *facts* which external evidence continues to emphasize, which biblical criticism must investigate as completely as possible. And if the work of criticism has brought a fuller appreciation of the value of these facts, the debt which is owed to the Jews is enhanced when one proceeds to realize the immense difficulties against which those who transmitted the Old Testament had to contend in the period of Greek domination. The growth of the Old Testament into its present form, and its preservation despite hostile forces, are the two remarkable phenomena which most arrest the attention of the historian; it is for the theologian to interpret their bearing upon the history of religious thought. (S. A. C.)

II.—Greek Domination

25. *Alexander the Great.*—The second great period of the history of the Jews begins with the conquest of Asia by Alexander the Great, disciple of Aristotle, king of Macedon and captain-general of the Greeks. It ends with the destruction of Jerusalem by the armies of the Roman Empire, which was, like Alexander, at once the masterful pupil and the docile patron of Hellenism. The destruction of Jerusalem might be regarded as an event of merely domestic importance; for the Roman cosmopolitan it was only the removal of the titular metropolis of a national and an Oriental religion. But, since a derivative of that religion has come to be a power in the world at large, this event has to be regarded in a different light. The destruction of Jerusalem in A.D. 70 concludes the period of four centuries, during which the Jews as a nation were in contact with the Greeks and exposed to the influence of Hellenism, not wholly of their own will nor yet against it. Whether the master of the provinces, in which there were Jews, be an Alexander, a Ptolemy, a Seleucid or a Roman, the force by which he rules is the force of Greek culture. These four centuries are the Greek period of Jewish history.

The ancient historians, who together cover this period, are strangely indifferent to the importance of the Jews, upon which Josephus is at pains to insist. When Alexander invaded the interior of the Eastern world, which had hitherto remained inviolable, he came as the champion of Hellenism. His death prevented the achievement of his designs; but he had broken down the barrier, he had planted the seed of the Greek's influence in the four quarters of the Persian Empire. His successors, the Diadochi, carried on his work, but Antiochus Epiphanes was the first who deliberately took in hand to deal with the Jews. Daniel (viii. 8) describes the interval between Alexander and Antiochus thus: "The he-goat (the king of Greece) did very greatly: and when he was strong the great horn (Alexander) was broken; and instead of it came up four other ones—four kingdoms shall stand up out of his nation but not with his power. And out of one of them came forth a little horn (Antiochus Epiphanes) which waxed exceeding great towards the south (Egypt) and towards the East (Babylon) and towards the beauteous land (the land of Israel)." The insignificance of the Jewish community in Palestine was their salvation. The reforms of Nehemiah were directed towards the establishment of a religious community at Jerusalem, in which the rigour of the law should be observed. As a part of the Persian Empire the community was obscure and unimportant. But the race whose chief sanctuary it guarded and maintained was the heir of great traditions and ideals. In Egypt, moreover, in Babylon and in Persia individual Jews had responded to the influences of their environment and won the respect of the aliens whom they despised. The law which they cherished as their standard and guide kept them united and conscious of their unity. And the individuals, who acquired power or wisdom among those outside Palestine shed a reflected glory upon the nation and its Temple.

In connexion with Alexander's march through Palestine Josephus gives a tradition of his visit to Jerusalem. In Arrian's narrative of Alexander's exploits, whose fame had already faded before the greater glory of Rome, there is no mention of the visit or the city or the Jews. Only Tyre and Gaza barred the way to Egypt. He took, presumably, the coast-road in order to establish and retain his command of the sea. The rest of Palestine, which is called Coele-Syria, made its submission and furnished supplies. Seven days after the capture of Gaza Alexander was at Pelusium. According to the tradition which Josephus has preserved the high priest refused to transfer his allegiance and Alexander marched against Jerusalem after the capture of Gaza. The high priest dressed in his robes went out to meet him, and at the sight Alexander remembered a dream, in which such a man had appeared to him as the appointed leader of his expedition. So the danger was averted: Alexander offered sacrifice and was shown the prophecy of Daniel, which spoke of him. It is alleged, further, that at this time certain Jews who could not refrain from intermarriage with the heathen set up a temple on Mt Gerizim and became the Samaritan schism (§ 21 above). The combination is certainly artificial and not historical. But it has a value of its own inasmuch as it illustrates the permanent tendencies which mould the history of the Jews. It is true that Alexander was subject to dreams and visited shrines in order to assure himself or his followers of victory. But it is not clear that he had such need of the Jews or such regard for the Temple of Jerusalem that he should turn aside on his way to Egypt for such a purpose.

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[1] Reference may be made to H. Winckler, *Gesch. Israels*, ii. (1900); W. Erbt, *Die Hebräer* (1906); and T. K. Cheyne, *Traditions and Beliefs of Ancient Israel* (1907).

However this may be, Alexander's tutor had been in Asia and had met a Jew there, if his disciple Clearchus of Soli is to be trusted. "The man," Aristotle says, "was by race a Jew out of Coele-Syria. His people are descendants of the Indian philosophers. It is reported that philosophers are called Calani among the Indians and Jews among the Syrians. The Jews take their name from their place of abode, which is called Judaea. The name of their city is very difficult; they call it Hierusaleme. This man, then, having been a guest in many homes and having come down gradually from the highlands to the sea-coast, was Hellenic not only in speech but also in soul. And as we were staying in Asia at the time, the man cast up at the same place and interviewed us and other scholars, making trial of their wisdom. But inasmuch as he had come to be at home with many cultured persons he imparted more than he got." The date of this interview is probably determined by the fact that Aristotle visited his friend Hermias, tyrant of Atarneus, in 347–345 B.C. There is no reason to doubt the probability or even the accuracy of the narrative. Megasthenes also describes the Jews as the philosophers of Syria and couples them with the Brahmins of India. This hellenized Jew who descended from the hills to the coast is a figure typical of the period.

26. *The Ptolemies.*—After the death of Alexander Palestine fell in the end to Ptolemy (301 B.C.) and remained an Egyptian province until 198 B.C. For a century the Jews in Palestine and in Alexandria had no history—or none that Josephus knew. But two individuals exemplify the different attitudes which the nation adopted towards its new environment and its wider opportunities, Joseph the tax-farmer and Jesus the sage.

The wisdom of Jesus ben Sira (Sirach) is contained in the book commonly called *Ecclesiasticus* (*q.v.*). At a time when men were attracted by the wisdom and science of the Greeks, he taught that all wisdom came from Yahweh who had chosen Israel to receive it in trust. He discouraged inquiries into the nature and purpose of things: it was enough for him that Yahweh had created and ruled the universe. If a man had leisure to be wise—and this is not for many—he should study the Scriptures which had come down, and so become a scribe. For the scribe, as for the man at the plough-tail, the Law was the rule of life. All, however much or little preoccupied with worldly business, must fear God, from whom come good things and evil, life, death, poverty and riches. It was not for men to meddle with secrets which are beyond human intelligence. Enough that the individual did his duty in the state of life in which he was set and left behind him a good name at his death. The race survives—"the days of Israel are unnumbered." Every member of the congregation of Israel must labour, as God has appointed, at some handicraft or profession to provide for his home. It is his sacred duty and his private interest to beget children and to train them to take his place. The scholar is apt to pity the smith, the potter, the carpenter and the farmer: with better reason he is apt to condemn the trader who becomes absorbed in greed of gain and so deserts the way of righteousness and fair dealing. As a teacher Jesus gave his own services freely. For the soldier he had no commendation. There were physicians who understood the use of herbs, and must be rewarded when their help was invited. But, whatever means each head of a family adopted to get a livelihood, he must pay the priest's dues. The centre of the life of Israel was the Temple, over which the high priest presided and which was inhabited by Yahweh, the God of Israel. The scribe could train the individual in morals and in manners; but the high priest was the ruler of the nation.

As ruler of the nation the high priest paid its tribute to Egypt, its overlord. But Josephus reports of one Onias that for avarice he withheld it. The sequel shows how a Jew might rise to power in the civil service of the Egyptian Empire and yet remain a hero to some of the Jews—provided that he did not intermarry with a Gentile. For Joseph, the son of Tobiah and nephew of Onias, went to court and secured the taxes of Palestine, when they were put up to auction. As tax-farmer he oppressed the non-Jewish cities and so won the admiration of Josephus.

But while such men went out into the world and brought back wealth of one kind or another to Palestine, other Jews were content to make their homes in foreign parts. At Alexandria in particular Alexander provided for a Jewish colony which soon became Hellenic enough in speech to require a translation of the Law. It is probable that, as in Palestine an Aramaic paraphrase of the Hebrew text was found to be necessary, so in Alexandria the Septuagint grew up gradually, as need arose. The legendary tradition which even Philo accepts gives it a formal nativity, a royal patron and inspired authors. From the text which Philo uses, it is probable that the translation had been transmitted in writing; and his legend probably fixes the date of the commencement of the undertaking for the reign of Ptolemy Lagus.

The apology for the necessary defects of a translation put forward by the translator of *Ecclesiasticus* in his Prologue shows that the work was carried on beyond the limits of the Law. Apparently it was in progress at the time of his coming to Egypt in the reign of Ptolemy Euergetes I. or II. He seems to regard this body of literature as the answer to the charge that the Jews had contributed nothing useful for human life. Once translated into Greek, the Scriptures became a bond of union for the Jews of the dispersion and were at least capable of being used as an instrument for the conversion of the world to Judaism. So far as the latter function is concerned Philo confesses that the Law in his day shared the obscurity of the people, and seems to imply that the proselytes adopted little more than the monotheistic principle and the observance of the Sabbath. According to Juvenal the sons of such proselytes were apt to go farther and to substitute the Jewish Law for the Roman—

Romanas autem soliti contemnere leges;
Judaicum ediscunt et servant ac metuunt ius
Tradidit arcano quodcunque volumine Moyses.

27. *The Seleucids.*—Toward the end of the 3rd century the Palestinian Jews became involved in the struggle between Egypt and Syria. In Jerusalem there were partisans of both the combatants. The more orthodox or conservative Jews preferred the tolerant rule of the Ptolemies: the rest, who chafed at the isolation of the nation, looked to the Seleucids, who inherited Alexander's ideal of a united empire based on a universal adoption of Hellenism. At this point Josephus cites the testimony of Polybius:—"Scopas, the general of Ptolemy, advanced into the highlands and subdued the nation of the Jews in the winter. After the defeat of Scopas, Antiochus gained Batanaea and Samaria and Abila and Gadara, and a little later those of the Jews who live round the Temple called Jerusalem adhered to him." From this it appears that the pro-Syrian faction of the Jews had been strong and active enough to bring an Egyptian army upon them (199–198 B.C.). Josephus adds that an Egyptian garrison was left in Jerusalem. This act of oppression presumably strengthened the Syrian faction of the Jews and led to the transference of the nation's allegiance. The language of Polybius suggests that he was acquainted with other Jewish communities and with the fame of the Temple: in his view they are not an organized state. They were not even a pawn in the game which Antiochus proposed to play with Rome for the possession of Greece and Asia Minor. His defeat left the resources of his kingdom exhausted and its extent diminished; and so the Jews became important to his successors for the sake of their wealth and their position on the frontier. To pay his debt to Rome he was compelled to resort to extraordinary methods of raising money; he actually met his death (187 B.C.) in an attempt to loot the temple of Elymais.

The pro-Syrian faction of the Palestinian Jews found their opportunity in this emergency and informed the governor of Coele-Syria that the treasury in Jerusalem contained untold sums of money. Heliodorus, prime minister of Seleucus Philopator, who succeeded Antiochus, arrived at Jerusalem in his progress through Coele-Syria and Phoenicia and declared the treasure confiscate to the royal exchequer. According to the Jewish legend Heliodorus was attacked when he entered the Temple by a horse with a terrible rider and by two young men. He was scourged and only escaped with his life at the intercession of Onias the high priest, who had pleaded with him vainly that the treasure included the deposits of widows and orphans and also some belonging to Hyrcanus, "a man in very high position." Onias was accused by his enemies of having given the information which led to this outrage and when, relying upon the support of the provincial governor, they proceeded to attempt assassination, he fled to Antioch and appealed to the king.

When Seleucus was assassinated by Heliodorus, Antiochus IV., his brother, who had been chief magistrate at Athens, came back secretly "to seize the kingdom by guile" (Dan. xi. 21 seq.). On his accession he appointed Jesus, the brother of Onias, to the high-priesthood, and sanctioned his proposals for the conversion of Jerusalem into a Greek city. The high priest changed his name to Jason and made a gymnasium near the citadel. The principle of separation was abandoned. The priests deserted the Temple for the palaestra and the young nobles wore the Greek cap. The Jews of Jerusalem were enrolled as citizens of Antioch. Jason sent money for a sacrifice to Heracles at Tyre; and the only recorded opposition to his policy came from his envoys, who pleaded that the money might be applied to naval expenditure. Thus Jason stripped the high-priesthood of its sacred character and did what he could to stamp out Judaism.

Menelaus supplanted Jason, obtaining his appointment from the king by the promise of a larger contribution. In order to secure his position, he contrived the murder of Onias, who had taken sanctuary at Daphne. This outrage, coupled with his appropriation of temple vessels, which he used as bribes, raised against Menelaus the senate and the people of Jerusalem. His brother and deputy was killed in a serious riot, and an accusation was laid against Menelaus before Antiochus. At the inquiry he bought his acquittal from a courtier and his accusers were executed. Antiochus required peace in Jerusalem and probably regarded Onias as the representative of the pro-Egyptian faction, the allies of his enemy.

During his second Egyptian campaign a rumour came that Antiochus was dead, and Jason made a raid upon Jerusalem. Menelaus held the citadel and Jason was unable to establish himself in the city. The people were presumably out of sympathy with hellenizers, whether they belonged to the house of Onias or that of Tobiah. When Antiochus finally evacuated Egypt in obedience to the decree of Rome, he thought that Judaea was in revolt. Though Jason had fled, it was necessary to storm the city; the drastic measures which Menelaus advised seem to indicate that the poorer classes had been roused to defend the Temple from further sacrilege. A massacre took place, and Antiochus braved the anger of Yahweh by entering and pillaging the Temple with impunity. The author of 2 Maccabees infers from his success that the nation had forfeited all right to divine protection for the time (2 Macc. v. 18–20).

The policy which Antiochus thus inaugurated he carried on rigorously and systematically. His whole kingdom was to be unified; Judaism was an eccentricity and as such doomed to extinction. The Temple of Jerusalem was made over to Zeus Olympius: the temple of Gerizim to Zeus Xenius. All the religious rites of Judaism were proscribed and the neighbouring Greek cities were requested to enforce the prohibition upon their Jewish citizens. Jerusalem was occupied by an army which took advantage of the Sabbath and proceeded to suppress its observance. An Athenian came to be the missionary of Hellenism and to direct its ceremonies, which were established by force up and down the country.

28. *The Maccabees.*—Jerusalem and Gerizim were purged and converted to the state religion with some ease. Elsewhere, as there, some conformed and some became martyrs for the faith. And the passive resistance of those who refused to conform at length gave rise to active opposition. "The king's officers who were enforcing the apostasy came into the city of Modein to sacrifice, and many of Israel went over to them, but Mattathias . . . slew a Jew who came to sacrifice and the king's officer and pulled down the altar" (1 Macc. ii. 15 sqq.). Whether led by this Mattathias or not, certain Jews fled into the wilderness and found a leader in Judas Maccabaeus his reputed son, the first of the five Asmonean (Hasmonean) brethren. The warfare which followed was like that which Saul and David waged against the Philistines. Antiochus was occupied with his Parthian campaign and trusted that the Hellenized Jews would maintain their ascendancy with the aid of the provincial troops. In his last illness he wrote to express his confidence in their loyalty. But the rebels collected adherents from the villages; and, when they resolved to violate the sabbath to the extent of resisting attack, they were joined by the company of the Assideans (Hasidim). Such a breach of the sabbath was necessary if the whole Law was to survive at all in Palestine. But the transgression is enough to explain the disfavour into which the Maccabees seem to fall in the judgment of later Judaism, as, in that judgment, it is enough to account for the instability of their dynasty. Unstable as it was, their dynasty was soon established. In the country-side of Judaea, Judaism—and no longer Hellenism—was propagated by force. Apollonius, the commander of the Syrian garrison in Jerusalem, and Seron the commander of the army in Syria, came in turn against Judas and his bands and were defeated. The revolt thus became important enough to engage the attention of the governor of Coele-Syria and Phoenicia, if not of Lysias the regent himself. Nicanor was despatched with a large army to put down the rebels and to pay the tribute due to Rome by selling them as slaves. Judas was at Emmaus; "the men of the citadel" guided a detachment of the Syrian troops to his encampment by night. The rebels escaped in time, but not into the hills, as their enemies surmised. At dawn they made an unexpected attack upon the main body and routed it. Next year (165 B.C.) Lysias himself entered the Idumaean country and laid siege to the fortress of Bethsura. Judas gathered what men he could and joined battle. The siege was raised, more probably in consequence of the death of Antiochus Epiphanes than because Judas had gained any real victory. The proscription of the Jewish religion was withdrawn and the Temple restored to them. But it was Menelaus who was sent by the king "to encourage" (2 Macc. xi. 32) the Jews, and in the official letters no reference is made to Judas. Such hints as these indicate the impossibility of recovering a complete picture of the Jews during the sovereignty of the Greeks, which the Talmudists regard as the dark age, best left in oblivion.

Judas entered Jerusalem, the citadel of which was still occupied by a Syrian garrison, and the Temple was re-dedicated on the 25th of Kislev (164 B.C.). So "the Pious" achieved the object for which presumably they took up arms. The re-establishment of Judaism, which alone of current religions was intolerant of a rival, seems to have excited the jealousy of their neighbours who had embraced the Greek way of life. The hellenizers had not lost all hope of converting the nation and were indisposed to acquiesce in the concordat. Judas and his zealots were thus able to maintain their prominence and gradually to increase their power. At Joppa, for example, the Jewish settlers—two hundred in all—"were invited to go into boats provided in accordance with the common decree of the city." They accepted the invitation and were drowned. Judas avenged them by burning the harbour and the shipping, and set to work to bring into Judaea all such communities of Jews who had kept themselves separate from their heathen neighbours. In this way he became strong enough to deal with the apostates of Judaea.

In 163 Lysias led another expedition against these disturbers of the king's peace and defeated Judas at Bethzachariah. But while the forces were besieging Bethzur and the fortress on Mount Zion, a pretender arose in Antioch, and Lysias was compelled to come to terms—and now with Judas. The Jewish refugees had turned the balance, and so Judas became strategus of Judaea, whilst Menelaus was put to death.

In 162 Demetrius escaped from Rome and got possession of the kingdom of Syria. Jakim, whose name outside religion was Alcimus, waited upon the new king on behalf of the loyal Jews who had hellenized. He himself was qualified to be the legitimate head of a united state, for he was of the tribe of Aaron. Judas and the Asmoneans were usurpers, who owed their title to Lysias. So Alcimus-Jakim was made high priest and Bacchides brought an army to instal him in his office. The Assideans made their submission at once, Judas had won for them religious freedom: but the Temple required a descendant of Aaron for priest and he was come. But his first act was to seize and slay sixty of them: so it was clear to Judas at any rate, if not also to the Assideans who survived, that political independence was necessary if the religion was to be secure. In face of his active opposition Alcimus could not maintain himself without the support of Bacchides and was forced to retire to Antioch. In response to his complaints Nicanor was appointed governor of Judaea with power to treat with Judas. It appears that the two became friends at first, but fresh orders from Antioch made Nicanor guilty of treachery in the eyes of Judas's partisans. Warned by the change of his friend's manner Judas fled. Nicanor threatened to destroy the Temple if the priests would not deliver Judas into his hands. Soon it came to his knowledge that Judas was in Samaria, whither he followed him on a sabbath with Jews pressed into his service. The day was known afterwards as Nicanor's day, for he was found dead on the field (Capharsalama) by the victorious followers of Judas (13th of Adar, March 161 B.C.). After this victory Judas made an alliance with the people of Rome, who had no love for Demetrius his enemy, nor any intention of putting their professions of friendship into practice. Bacchides and Alcimus returned meanwhile into the land of Judah; at Elasa "Judas fell and the rest fled" (1 Macc. ix. 18). Bacchides occupied Judaea and made a chain of forts. Jonathan, who succeeded his brother Judas, was captain of a band of fugitive outlaws. But on the death of Alcimus Bacchides retired and Jonathan with his followers settled down beyond the range of the Syrian garrisons. The Hellenizers still enjoyed the royal favour and Jonathan made no attempt to dispossess them. After an interval of two years they tried to capture him and failed. This failure seems to have convinced Bacchides that it would be well to recognize Jonathan and to secure a balance of parties. In 158 Jonathan began to rule as a judge in Michmash and he destroyed the godless out of Israel—so far, that is, as his power extended. In 153 Alexander Balas withdrew Jonathan from his allegiance to Demetrius by the offer of the high-priesthood. He had already made Jerusalem his capital and fortified the Temple mount: the Syrian garrisons had already been withdrawn with the exception of those of the Akra and Bethzur. In 147 Jonathan repaid his benefactor by destroying the army of the governor of Coele-Syria, who had espoused the cause of Demetrius. The fugitives took sanctuary in the temple of Dagon at Azotus. "But Jonathan burned the temple of Dagon and those who fled into it." After the death of Balas he laid siege to the Akra; and "the apostates, who hated their own nation," appealed to Demetrius. Jonathan was summoned to Antioch, made his peace and apparently relinquished his attempt in return for the addition of three Samaritan districts to his territory. Later, when the people of Antioch rose against the king, Jonathan despatched a force of 3000 men who played a notable part in the merciless suppression of the insurrection. 1 Maccabees credits them with 100,000 victims. Trypho, the regent of Antiochus VI., put even greater political power into the hands of Jonathan and his brother Simon, but finally seized Jonathan on the pretext of a conference. Simon was thus left to consolidate what had been won in Palestine for the Jews and the family whose head he had become. The weakness of the king enabled him to demand and to secure immunity from taxation. The Jewish aristocracy became peers of the Seleucid kingdom. Simon was declared high priest: Rome and Sparta rejoiced in the elevation of their friend and ally. In the hundred and seventieth year (142 B.C.) the yoke of the heathen was taken away from Israel and the people began to date their legal documents "in the first year of Simon the great high priest and commander and leader of the Jews." The popular verdict received official and formal sanction. Simon was declared by the Jews and the priests their governor and high priest for ever, until there should arise a faithful prophet. The garrison of the Akra had been starved by a close blockade into submission, and beyond the boundaries of Judaea "he took Joppa for a haven and made himself master of Gazara and Bethsura."

29. *John Hyrcanus and the Sadducees.*—But in 138 B.C. Antiochus Sidetes entered Seleucia and required the submission of all the petty states, which had taken advantage of the weakness of preceding kings. From Simon he demanded an indemnity of 1000 talents for his oppression and invasion of non-Jewish territory: Simon offered 100 talents. At length Antiochus appeared to enforce his demand in 134. Simon was dead (135 B.C.) and John Hyrcanus had succeeded his father. The Jewish forces were driven back upon Jerusalem and the city was closely invested. At the feast of tabernacles of 132 Hyrcanus requested and Antiochus granted a week's truce. The only hope of the Jews lay in the clemency of their victorious suzerain, and it did not fail them. Some of his advisers urged the demolition of the nation on the ground of their exclusiveness, but he sent a sacrifice and won thereby the name of "Pious." In subsequent negotiations he accepted the disarmament of the besieged and a tribute as conditions of peace, and in response to their entreaty left Jerusalem without a garrison. When he went on his last disastrous campaign, Hyrcanus led a Jewish contingent to join his army, partly perhaps a troop of mercenaries (for Hyrcanus was the first of the Jewish kings to hire mercenaries, with the treasure found in David's tomb). After his death Hyrcanus took advantage of the general confusion to extend Jewish territory with the countenance of Rome. He destroyed the temple of Gerizim and compelled the Idumaeans to submit to circumcision and embrace the laws of the Jews on pain of deportation.

In Jerusalem and in the country, in Alexandria, Egypt and Cyprus, the Jews were prosperous (Jos. *Ant.* xiii. 284). This prosperity and the apparent security of Judaism led to a breach between Hyrcanus and his spiritual directors, the Pharisees. His lineage was (in the opinion of one of them at least) of doubtful purity; and so it was his duty to lay down the high-priesthood and be content to rule the nation. That one man should hold both offices was indeed against the example of Moses, and could only be admitted as a temporary concession to necessity. Hyrcanus could not entertain the proposal that he should resign the sacred office to which he owed much of his authority. The allegation about his mother was false: the Pharisee who retailed it was guilty of no small offence. A Sadducean friend advised Hyrcanus to ask the whole body of the Pharisees to prescribe the penalty. Their leniency, which was notorious, alienated the king or probably furnished him with a pretext for breaking with them. The Pharisees were troublesome counsellors and doubtful allies for an ambitious prince. They were all-powerful with the people, but Hyrcanus with his mercenaries was independent of the people, and the wealthy belonged to the sect of the Sadducees. The suppression of the Pharisaic ordinances and the punishment of those who observed them led to some disturbance. But Hyrcanus "was judged worthy of the three great privileges, the rule of the nation, the high-priestly dignity, and prophecy." This verdict suggests that the Sadducees, with whom he allied himself, had learned to affect some show of Judaism in Judaea. If the poor were ardent nationalists who would not intermingle with the Greeks, the rich had long outgrown and now could humour such prejudices; and the title of their party was capable of recalling at any rate the sound of the national ideal of righteousness, *i.e. Sadaqah.*

The successor of Hyrcanus (d. 105) was Judas Aristobulus, "the friend of the Greeks," who first assumed the title of king. According to Strabo he was a courteous man and in many ways useful to the Jews. His great achievement was the conquest of a part of Ituraea, which he added to Judaea and whose inhabitants he compelled to accept Judaism.

The Sadducean nobility continued in power under his brother and successor Alexander Jannaeus (103–78); and the breach between the king and the mass of the people widened. But Salome Alexandra, his brother's widow, who released him from prison on the death of her husband and married him, was connected with the Pharisees through her brother Simon ben Shetach. If his influence or theirs dictated her policy, there is no evidence of any objection to the union of the secular power with the high-priesthood. The party may have thought that Jannaeus was likely to bring the dynasty to an end. His first action was to besiege Ptolemais. Its citizens appealed to Ptolemy Lathyrus, who had been driven from the throne of Egypt by his mother Cleopatra and was reigning in Cyprus. Alexander raised the siege, made peace with Ptolemy and secretly sent to Cleopatra for help against her son. The result of this double-dealing was that his army was destroyed by Ptolemy, who advanced into Egypt leaving Palestine at the mercy of Cleopatra. But Cleopatra's generals were Jews and by their protests prevented her from annexing it. Being thus freed from fear on the side of Ptolemy, Alexander continued his desultory campaigns across the Jordan and on the coast without any apparent policy and with indifferent success. Finally, when he officiated as high priest at the feast of tabernacles he roused the fury of the people by a derisive breach of the Pharisaic ritual. They cried out that he was unworthy of his office, and pelted him with the citrons which they were carrying as the Law prescribed. Alexander summoned his mercenaries, and 6000 Jews were killed before he set out on his disastrous campaign against an Arabian king. He returned a fugitive to find the nation in armed rebellion. After six years of civil war he appealed to them to state the conditions under which they would lay aside their hostility. They replied by demanding his death and called in the Syrians. But when the Syrians chased him into the mountains, 6000 Jews went over to him and, with their aid, he put down the rebellion. Eight hundred Jews who had held a fortress against him were crucified; 8000 Pharisees fled to Egypt and remained there. Offering an ineffectual resistance to the passage of the Syrian troops, Alexander was driven back by Aretas, king of Arabia, against whom they had marched. His later years brought him small victories over isolated cities.

On his deathbed it is said that Alexander advised his wife to reverse this policy and rely upon the Pharisees. According to the Talmud, he warned her "to fear neither the Pharisees nor their opponents but the hypocrites who do the deed of Zimri and claim the reward of Phinehas:" the warning indicates his justification of his policy in the matter of the crucifixions. In any case the Pharisees were predominant under Alexandra, who became queen (78–69) under her husband's will. Hyrcanus her elder son was only high priest, as the stricter Pharisees required. All the Pharisaic ordinances which Hyrcanus had abolished were reaffirmed as binding. Simon ben Shatach stood beside the queen: the exiles were restored and among them his great colleague Jehudah ben Tabai. The great saying of each of these rabbis is concerned with the duties of a judge; the selection does justice to the importance of the Sanhedrin, which was filled with Pharisees. The legal reforms which they introduced tended for the most part to mercy, but the Talmud refers to one case which is an exception: false witnesses were condemned to suffer the penalty due to their victim, even if he escaped. This ruling may be interpreted as part of a campaign directed against the counsellors of Alexander or as an instance of their general principle that intention is equivalent to commission in the eye of the Law. The queen interposed to prevent the execution of those who had counselled the crucifixion of the rebels and permitted them to withdraw with her younger son Aristobulus to the fortresses outside Jerusalem. Against their natural desire for revenge may be set the fact that the Pharisees did much to improve the status of women among the Jews.

On the death of Alexandra (69 B.C.) Aristobulus disputed the succession of Hyrcanus. When their forces met at Jericho, Hyrcanus, finding that the bulk of his following deserted to Aristobulus, fled with those who remained to the tower Antonia and seized Aristobulus's wife and children as hostages for his own safety. Having this advantage, he was able to abdicate in favour of Aristobulus and to retire into private life. But he was not able to save his friends, who were also the enemies of the reigning king. In fear of reprisals Antipas (or Antipater), the Idumaean, his counsellor, played on the fears of Hyrcanus and persuaded him to buy the aid of the Nabataean Arabs with promises. Aristobulus could not withstand the army of Aretas: he was driven back upon Jerusalem and there besieged. The Jews deserted to the victorious Hyrcanus: only the priests remained loyal to their accepted king; many fled to Egypt.

30. *The Romans and the Idumaeans.*—At this point the power of Rome appeared upon the scene in the person of M. Aemilius Scaurus (stepson of Sulla) who had been sent into Syria by Pompey (65 B.C.). Both brothers appealed to this new tribunal and Aristobulus bought a verdict in his favour. The siege was raised. Aretas retired from Judaea; and Aristobulus pursued the retreating army. But, when Pompey himself arrived at Damascus, Antipater, who pulled the strings and exploited the claims of Hyrcanus, realized that Rome and not the Arabs, who were cowed by the threats of Scaurus, was the ruler of the East. To Rome, therefore, he must pay his court. Others shared this conviction: Strabo speaks of embassies from Egypt and Judaea bearing presents—one deposited in the temple of Jupiter Capitolinus bore the inscription of Alexander, the king of the Jews. From Judaea there were three embassies pleading, for Aristobulus, for Hyrcanus, and for the nation, who would have no king at all but their God.

Pompey deferred his decision until he should have inquired into the state of the Nabataeans, who had shown themselves to be capable of dominating the Jews in the absence of the Roman army. In the interval Aristobulus provoked him by his display of a certain impatience. The people had no responsible head, of whom Rome could take cognisance: so Pompey decided in favour of Hyrcanus and humoured the people by recognizing him, not as king, but as high priest. Antipater remained secure, in power if not in place. The Roman supremacy was established: the Jews were once more one of the subject states of Syria, now a Roman province. Their national aspirations had received a contemptuous acknowledgment, when their Temple had been desecrated by the entry of a foreign conqueror.

Aristobulus himself had less resolution than his partisans. When he repented of his attempted resistance and treated with Pompey for peace, his followers threw themselves into Jerusalem, and, when the faction of Hyrcanus resolved to open the gates, into the Temple. There they held out for three months, succumbing finally because in obedience to the Law (as interpreted since the time of Antiochus Epiphanes) they would only defend themselves from actual assault upon the sabbath day. The Romans profited by this inaction to push on the siege-works, without provoking resistance by actual assaults until the very end. Pompey finally took the stronghold by choosing the day of the fast, when the Jews abstain from all work, that is the sabbath (Strabo). Dio Cassius calls it the day of Cronos. On this bloody sabbath the priests showed a devotion to their worship which matched the inaction of the fighting men. Though they saw the enemy advancing upon them sword in hand they remained at worship untroubled and were slaughtered as they poured libation and burned incense, for they put their own safety second to the service of God. And there were Jews among the murderers of the 12,000 Jews who fell.

The Jews of Palestine thus became once more a subject state, stripped of their conquests and confined to their own borders. Aristobulus and his children were conveyed to Rome to grace their conqueror's triumphal procession. But his son Alexander escaped during the journey, gathered some force, and overran Judaea. The Pharisees decided that they could not take action on either side, since the elder son of Alexandra was directed by the Idumaean Antipater; and the people had an affection for such Asmonean princes as dared to challenge the Roman domination of their ancestral kingdom. The civil war was renewed; but Aulus Gabinius, the proconsul, soon crushed the pretender and set up an aristocracy in Judaea with Hyrcanus as guardian of the Temple. The country was divided into five districts with five synods; and Josephus asserts that the people welcomed the change from the monarchy. In spite of this, Aristobulus (56 B.C.) and Alexander (55 B.C.) found loyalists to follow them in their successive raids. But Antipater found supplies for the army of Gabinius, who, despite Egyptian and Parthian distractions, restored order according to the will of Antipater. M. Crassus, who succeeded him, plundered the Temple of its gold and the treasure (54 B.C.) which the Jews of the dispersion had contributed for its maintenance. It is said that Eleazar, the priest who guarded the treasure, offered Crassus the golden beam as ransom for the whole, knowing, what no one else knew, that it was mainly composed of wood. So Crassus departed to

Parthia and died. When the Parthians, elated by their victory over Crassus (53 B.C.) advanced upon Syria, Cassius opposed them. Some of the Jews, presumably the partisans of Aristobulus, were ready to co-operate with the Parthians. At any rate Antipater was ready to aid Cassius with advice; Taricheae was taken and 30,000 Jews were sold into slavery (51 B.C.). In spite of this vigorous coercion Cassius came to terms with Alexander, before he returned to the Euphrates to hold it against the Parthians.

Two years later Julius Caesar made himself master of Rome and despatched the captive Aristobulus with two legions to win Judaea (49 B.C.). But Pompey's partisans were beforehand with him: he was taken off by poison and got not so much as a burial in his fatherland. At the same time his son Alexander was beheaded at Antioch by Pompey's order as an enemy of Rome. After the defeat and death of Pompey (48 B.C.) Antipater transferred his allegiance to Caesar and demonstrated its value during Caesar's Egyptian campaign. He carried with him the Arabs and the princes of Syria, and through Hyrcanus he was able to transform the hostility of the Egyptian Jews into active friendliness. These services, which incidentally illustrate the solidarity and unity of the Jewish nation and the respect of the communities of the dispersion for the metropolis, were recognized and rewarded. Before his assassination in 44 B.C. Julius Caesar had confirmed Hyrcanus in the high-priesthood and added the title of ethnarch. Antipater had been made a Roman citizen and procurator of the reunited Judaea. Further, as confederates of the senate and people of Rome, the Jews had received accession of territory, including the port of Joppa and, with other material privileges, the right of observing their religious customs not only in Palestine but also in Alexandria and elsewhere. Idumaean or Philistine of Ascalon, Antipater had displayed the capacity of his adoptive or adopted nation for his own profit and theirs. And when Caesar died Suetonius notes that he was mourned by foreign nations, especially by the Jews (*Caes.* 84).

In the midst of all this civil strife the Pharisees and all who were preoccupied with religion found it almost impossible to discern what they should do to please God. The people whom they directed were called out to fight, at the bidding of an alien, for this and that foreigner who seemed most powerful and most likely to succeed. In Palestine few could command leisure for meditation; as for opportunities of effective intervention in affairs, they had none, it would seem, once Alexander was dead.

There is a story of a priest named Onias preserved both by Josephus and in the Talmud, which throws some light upon the indecision of the religious in the period just reviewed. When Aretas intervened in the interest of Hyrcanus and defeated Aristobulus, the usurper of his brother's inheritance, the people accepted the verdict of battle, sided with the victor's client, and joined in the siege of Jerusalem. The most reputable of the Jews fled to Egypt; but Onias, a righteous man and dear to God, who had hidden himself, was discovered by the besiegers. He had a name for power in prayer; for once in a drought he prayed for rain and God had heard his prayer. His captors now required of him that he should put a curse upon Aristobulus and his faction. On compulsion he stood in their midst and said: "O God, king of the universe, since these who stand with me are thy people and the besieged are thy priests, I pray thee that thou hearken not to those against these, nor accomplish what these entreat against those." So he prayed—and the wicked Jews stoned him.

Unrighteous Jews were in the ascendant. There were only Asmonean princes, degenerate and barely titular sons of Levi, to serve as judges of Israel—and they were at feud and both relied upon foreign aid. The righteous could only flee or hide, and so wait dreaming of the mercy of God past and to come. As yet our authorities do not permit us to follow them to Egypt with any certainty, but the *Psalms of Solomon* express the mind of one who survived to see Pompey the Great brought low. Although Pompey had spared the temple treasure, he was the embodiment of the power of Rome, which was not always so considerately exercised. And so the psalmist exults in his death and dishonour (Ps. ii.): he prayed that the pride of the dragon might be humbled and God shewed him the dead body lying upon the waves—and there was none to bury it. As one of those who fear the Lord in truth and in patience, he looks forward to the punishment of all sinners who oppress the righteous and profane the sanctuary. For the sins of the rulers God had rejected his people; but the remnant could not but inherit the promises, which belong to the chosen people. For the Lord is faithful unto those who walk in the righteousness of his commandments (xiv. 1): in the exercise of their freewill and with God's help they will attain salvation. As God's servant, Pompey destroyed their rulers and every wise councillor: soon the righteous and sinless king of David's house shall reign over them and over all the nations (xvii.).

31. *Herod the Great.*—After the departure of Caesar, Antipater warned the adherents of Hyrcanus against taking part in any revolutionary attempts, and his son Herod, who, in spite of his youth, had been appointed governor of Galilee, dealt summarily with Hezekiah, the robber captain who was overrunning the adjacent part of Syria. The gratitude of the Syrians brought him to the knowledge of Sextus Caesar the governor of Syria; but his action inspired the chief men of the Jews with apprehension. Complaint was made to Hyrcanus that Herod had violated the law which prohibited the execution of even an evil man, unless he had been first condemned to death by the Sanhedrin. At the same time the mothers of the murdered men came to the Temple to demand vengeance. So Herod was summoned to stand his trial. He came in answer to the summons—but attended by a bodyguard and protected by the word of Sextus. Of all the Sanhedrin only Sameas "a righteous man and therefore superior to fear" dared to speak. Being a Pharisee he faced the facts of Herod's power and warned the tribunal of the event, just as later he counselled the people to receive him, saying that for their sins they could not escape him. Herod put his own profit above the Law, acting after his kind, and he also was God's instrument. The effect of the speech was to goad the Sanhedrin into condemning Herod: Hyrcanus postponed their decision and persuaded him to flee. Sextus Caesar made him lieutenant-governor of Coele Syria, and only his father restrained him from returning to wreak his revenge upon Hyrcanus.

It is to be remembered that, in this and all narratives of the life of Herod, Josephus was dependent upon the history of Herod's client, Nicolaus of Damascus, and was himself a supporter of law and order. The action of the Sanhedrin and the presence of the women suppliants in the Temple suggest, if they do not prove, that this Hezekiah who harassed the Syrians was a Jewish patriot, who could not acquiesce and wait with Sameas.

Malichus also, the murderer or reputed murderer of Antipater, appears to have been a partisan of Hyrcanus, who had a zeal for Judaism. When Cassius demanded a tribute of 700 talents from Palestine, Antipater set Herod, Phasael and this Malichus, his enemy, to collect it. Herod thought it imprudent to secure the favour of Rome by the sufferings of others. But some cities defaulted, and they were apparently among those assigned to Malichus. If he had been lenient for their sakes or in the hope of damaging Antipater, he was disappointed; for Cassius sold four cities into slavery and Hyrcanus made up the deficit. Soon after this (43 B.C.) Malichus succeeded, it is said, in poisoning Antipater as he dined with Hyrcanus, and was assassinated by Herod's bravoes.

After the departure of Cassius, Antipater being dead, there was confusion in Judaea. Antigonus, the son of Aristobulus, made a raid and was with difficulty repulsed by Herod. The prince of Tyre occupied part of Galilee. When Antony assumed the dominion of the East after the defeat of Cassius at Philippi, an embassy of the Jews, amongst other embassies, approached him in Bithynia and accused the sons of Antipater as usurpers of the power which rightly belonged to Hyrcanus. Another approached him at Antioch. But Hyrcanus was well content to forgo the title to political power, which he could not exercise in practice, and Antony had been a friend of Antipater. So Herod and Phasael continued to be virtually kings of the Jews: Antony's court required large remittances and Palestine was not exempt.

In 40 B.C. Antony was absent in Egypt or Italy; and the Parthians swept down upon Syria with Antigonus in their train. Hyrcanus and Phasael were trapped: Herod fled by way of Egypt to Rome. Hyrcanus, who was Antigonus' only rival, was mutilated and carried to Parthia. So he could no more be high priest, and his life was spared only at the intercession of the Parthian Jews, who had a regard for the Asmonean prince. Thus Antigonus succeeded his uncle as "King Antigonus" in the Greek and "Mattathiah the high priest" in the Hebrew by grace of the Parthians.

The senate of Rome under the influence of Antony and Octavian ratified the claims of Herod, and after some delay lent him the armed force necessary to make them good. In the hope of healing the breach, which his success could only aggravate, and for love, he took to wife Mariamne, grandniece of Hyrcanus. Galilee was pacified, Jerusalem taken and Antigonus beheaded by the Romans. From this point to the end of the period the Jews were dependents of Rome, free to attend to their own affairs, so long as they paid taxes to the subordinate rulers, Herodian or Roman, whom they detested equally. If some from time to time dared to hope for political independence their futility was demonstrated. One by one the descendants of the Asmoneans were removed. The national hope was relegated to an indefinite future and to another sphere. At any rate the Jews were free to worship their God and to study his law: their religion was recognized by the state and indeed established.

This development of Judaism was eminently to the mind of the rulers; and Herod did much to encourage it. More and more it became identified with the synagogue, in which the Law was expounded: more and more it became a matter for the individual and his private life. This was so even in Palestine—the land which the Jews hoped to possess—and in Jerusalem itself, the holy city, in which the Temple stood. Herod had put down Jewish rebels and Herod appointed the high priests. In his appointments he was careful to avoid or to suppress any person who, being popular, might legitimize a rebellion by heading it. The Pharisees, who regarded his rule as an inevitable penalty for the sins of the people, he encouraged. Pollio the Pharisee and Sameas his disciple were in special honour with him, Josephus says, when he re-entered Jerusalem and put to death the leaders of the faction of Antigonus. How well their teaching served his purpose is shown by the sayings of two rabbis who, if not identical with these Pharisees, belong to their period and their party. Shemaiah said, "Love work and hate lordship and make not thyself known to the government." Abtalion said, "Ye wise, be guarded in your words: perchance ye may incur the debt of exile." Precepts such as these could hardly fail to effect some modification of the reckless zeal of the Galileans in the pupils of the synagogue. Many if not all of the professed rabbis had travelled outside Palestine: some were even members of the dispersion, like Hillel the Babylonian, who with Shammai forms the second of the pairs. Through them the experience of the dispersion was brought to bear upon the Palestinian Jews. Herod's nominees were not the men to extend the prestige of the high-priesthood at the expense of these rabbis: even in Jerusalem the synagogue became of more importance than the Temple. Hillel also inculcated the duty of making converts to Judaism. He said, "Be of the disciples of Aaron, loving peace, and pursuing peace, loving mankind and bringing them nigh to the Law." But even he reckoned the books of Daniel and Esther as canonical, and these were dangerous food for men who did not realize the full power of Rome.

So long as Herod lived there was no insurrection. Formally he was an orthodox Jew and set his face against intermarriage with the uncircumcised. He was also ready and able to protect the Jews of the dispersion. But that ability was largely due to his whole-hearted Hellenism, which was shown by the Greek cities which he founded in Palestine and the buildings he erected in Jerusalem. In its material embodiments Greek civilization became as much a part of Jewish life in Palestine as it was in Alexandria or Antioch; and herein the rabbis could not follow him.

When all the Jewish people swore to be loyal to Caesar and the king's policy, the Pharisees—above 6000—refused to swear. The king imposed a fine upon them, and the wife of Pheroras—Herod's brother—paid it on their behalf. In return for her kindness, being entrusted with foreknowledge by the visitation of God, they prophesied that God had decreed an end of rule for Herod and his line and that the sovereignty devolved upon her and Pheroras and their children.

From the sequel it appears that the prophecy was uttered by one Pharisee only, and that it was in no way endorsed by the party. When it came to the ears of the king he slew the most responsible of the Pharisees and every member of his household who accepted what the Pharisee said. An explanation of this unwarrantable generalization may be found in the fact that the incident is derived from a source which was unfavourable to the Pharisees: they are described as a Jewish section of men who pretend to set great store by the exactitude of the ancestral tradition and the laws in which the deity delights—as dominant over women-folk—and as sudden and quick in quarrel.

Towards the end of Herod's life two rabbis attempted to uphold by physical force the cardinal dogma of Judaism, which prohibited the use of images. Their action is intelligible enough. Herod was stricken with an incurable disease. He had sinned against the Law; and at last God had punished him. At last the law-abiding Jews might and must assert the majesty of the outraged Law. The most conspicuous of the many symbols and signs of his transgression was the golden eagle which he had placed over the great gate of the Temple; its destruction was the obvious means to adopt for the quickening and assertion of Jewish principles.

By their labours in the education of the youth of the nation, these rabbis, Judas and Matthias, had endeared themselves to the populace and had gained influence over their disciples. A report that Herod was dead co-operated with their exhortations to send the iconoclasts to their appointed work. And so they went to earn the rewards of their practical piety from the Law. If they died, death was inevitable, the rabbis said, and no better death would they ever find. Moreover, their children and kindred would benefit by the good name and fame belonging to those who died for the Law. Such is the account which Josephus gives in the *Antiquities*; in the *Jewish War* he represents the rabbis and their disciples as looking forward to greater happiness for themselves after such a death. But Herod was not dead yet, and the instigators and the agents of this sacrilege were burned alive.

32. *The Settlement of Augustus.*—On the death of Herod in 4 B.C. Archelaus kept open house for mourners as the Jewish custom, which reduced many Jews to beggary, prescribed. The people petitioned for the punishment of those who were responsible for the execution of Matthias and his associates and for the removal of the high priest. Archelaus temporized; the loyalty of the people no longer constituted a valid title to the throne; his succession must first be sanctioned by Augustus. Before he departed to Rome on this errand, which was itself an insult to the nation, there were riots in Jerusalem at the Passover which he needed all his soldiery to put down. When he presented himself before the emperor—apart from rival claimants of his own family—there was an embassy from the Jewish people who prayed to be rid of a monarchy and rulers such as Herod. As part of the Roman province of Syria and under its governors they would prove that they were not really disaffected and rebellious. During the absence of Archelaus, who would—the Jews feared—prove his legitimacy by emulating his father's ferocity, and to whom their ambassadors preferred Antipas, the Jews of Palestine gave the lie to their protestations of loyalty and peaceableness. At the Passover the pilgrims attacked the Roman troops. After hard fighting the procurator, whose cruelty provoked the attack, captured the Temple and robbed the treasury. On this the insurgents were joined by some of Herod's army and besieged the Romans in Herod's palace. Elsewhere the occasion tempted many to play at being king—Judas, son of Hezekiah, in Galilee; Simon, one of the king's slaves, in Peraea. Most notable of all perhaps was the shepherd Athronges, who assumed the pomp of royalty and employed his four brothers as captains and satraps in the war which he waged upon Romans and king's men alike—not even Jews escaped him unless they brought him contributions.

Order was restored by Varus the governor of Syria in a campaign which Josephus describes as the most important war between that of Pompey and that of Vespasian.

At length Augustus summoned the representatives of the nation and Nicholaus of Damascus, who spoke for Archelaus, to plead before him in the temple of Apollo. Augustus apportioned Herod's dominions among his sons in accordance with the provisions of his latest will. Archelaus received the lion's share: for ten years he was ethnarch of Idumaea, Judaea and Samaria, with a yearly revenue of 600 talents. Antipas became tetrarch of Galilee and Peraea, with a revenue of 200 talents. Philip, who had been left in charge of Palestine pending the decision and had won the respect of Varus, became tetrarch of Batanaea, Trachonitis and Auranitis, with 100 talents. His subjects included only a sprinkling of Jews. Up to his death (A.D. 34) he did nothing to forfeit the favour of Rome. His coins bore the heads of Augustus and Tiberius, and his government was worthy of the best Roman traditions—he succeeded where proconsuls had failed. His capital was Caesarea Philippi, where Pan had been worshipped from ancient times, and where Augustus had a temple built by Herod the Great.

33. *Archelaus.*—Augustus had counselled Archelaus to deal gently with his subjects. But there was an outstanding feud between him and them; and his first act as ethnarch was to remove the high priest on the ground of his sympathy with the rebels. In violation of the Law he married a brother's widow, who had already borne children, and in general he showed himself so fierce and tyrannical that the Jews joined with the Samaritans to accuse him before the emperor. Archelaus was summoned to Rome and banished to Gaul; his territory was entrusted to a series of procurators (A.D. 6–41), among whom was an apostate Jew, but none with any pretension even to a semi-legitimate authority. Each procurator represented not David but Caesar. The Sanhedrin had its police and powers to safeguard the Jewish religion; but the procurator had the appointment of the high priests, and no capital sentence could be executed without his sanction.

34. *The Procurators.*—So the Jews of Judaea obtained the settlement for which they had pleaded at the death of Herod; and some of them began to regret it at once. The first procurator Coponius was accompanied by P. Sulpicius Quirinius, legate of Syria, who came to organize the new Roman province. As a necessary preliminary a census (A.D. 6–7) was taken after the Roman method, which did not conform to the Jewish Law. The people were affronted, but for the most part acquiesced, under the influence of Joazar the high priest. But Judas the Galilean, with a Pharisee named Sadduc (Sadduk), endeavoured to incite them to rebellion in the name of religion. The result of this alliance between a revolutionary and a Pharisee was the formation of the party of Zealots, whose influence—according to Josephus—brought about the great revolt and so led to the destruction of Jerusalem in 70. So far as this influence extended, the Jewish community was threatened with the danger of suicide, and the distinction drawn by Josephus between the Pharisees and the Zealots is a valid one. Not all Pharisees were prepared to take such action, in order that Israel might "tread on the neck of the eagle" (as is said in *The Assumption of Moses*). So long as the Law was not deliberately outraged and so long as the worship was established, most of the religious leaders of the Jews were content to wait.

It seems that the Zealots made more headway in Galilee than in Judaea—so much so that the terms Galilean and Zealot are practically interchangeable. In Galilee the Jews predominated over the heathen and their ruler Herod Antipas had some sort of claim upon their allegiance. His marriage with the daughter of the Arabian king Aretas (which was at any rate in accordance with the general policy of Augustus) seems to have preserved his territory from the incursions of her people, so long as he remained faithful to her. He conciliated his subjects by his deference to the observances of Judaism, and—the case is probably typical of his policy—he joined in protesting, when Pilate set up a votive shield in the palace of Herod within the sacred city. He seems to have served Tiberius as an official scrutineer of the imperial officials and he commemorated his devotion by the foundation of the city of Tiberias. But he repudiated the daughter of Aretas in order to marry Herodias and so set the Arabians against him. Disaster overtook his forces (A.D. 36) and Tiberius, his patron, died before the Roman power was brought in full strength to his aid. Caligula was not predisposed to favour the favourites of Tiberius; and Antipas, having petitioned him for the title of king at the instigation of Herodias, was banished from his tetrarchy and (apparently) was put to death in 39.

Antipas is chiefly known to history in connexion with John the Baptist, who reproached him publicly for his marriage with Herodias. According to the earliest authority, he seems to have imprisoned John to save him from the vengeance of Herodias. But—whatever his motive—Antipas certainly consented to John's death. If the Fourth Gospel is to be trusted, John had already recognized and acclaimed Jesus of Nazareth as the Messiah for whom the Jews were looking. By common consent of Christendom, John was the forerunner of the founder of the Christian Church. It was, therefore, during the reign of Antipas, and partly if not wholly within his territory, that the Gospel was first preached by the rabbi or prophet whom Christendom came to regard as the one true Christ, the Messiah of the Jews. Josephus' history of the Jews contains accounts of John the Baptist and Jesus, the authenticity of which has been called in question for plausible but not entirely convincing reasons. However this may be, the Jews who believed Jesus to be the Christ play no great part in the history of the Jews before 70, as we know it. Many religious teachers and many revolutionaries were crucified within this period; and the early Christians were outwardly distinguished from other Jews only by their scrupulous observance of religious duties.

The crucifixion of Jesus was sanctioned by Pontius Pilate, who was procurator of Judaea A.D. 26–36. Of the Jews under his predecessors little enough is known. Speaking generally, they seem to have avoided giving offence to their subjects. But Pilate so conducted affairs as to attract the attention not only of Josephus but also of Philo, who represents for us the Jewish community of Alexandria. Pilate inaugurated his term of office by ordering his troops to enter Jerusalem at night and to take their standards with them. There were standards and standards in the Roman armies: those which bore the image of the emperor, and therefore constituted a breach of the Jewish Law, had hitherto been kept aloof from the holy city. On learning of this, the Jews repaired to Caesarea and besought Pilate to remove these offensive images. Pilate refused; and, when they persisted in their petition for six days, he surrounded them with soldiers and threatened them with instant death. They protested that they would rather die than dare to transgress the wisdom of the laws; and Pilate yielded. But he proceeded to expend the temple treasure upon an aqueduct for Jerusalem; and some of the Jews regarded the devotion of sacred money to the service of man as a desecration. Pilate came up to Jerusalem and dispersed the petitioners by means of disguised soldiers armed with clubs. So the revolt was put down, but the excessive zeal of the soldiers and Pilate's obstinate adherence to his policy widened the breach between Rome and the stricter Jews. But the death of Sejanus in 31 set Tiberius free from prejudice against the Jews; and, when Pilate put up the votive shields in Herod's palace at Jerusalem, the four sons of Herod came forward in defence of Jewish principles and he was ordered to remove them. In 35 he dispersed a number of Samaritans, who had assembled near Mt Gerizim at the bidding of an impostor, in order to see the temple vessels buried there by Moses. Complaint was made to Vitellius, then legate of Syria, and Pilate was sent to Rome to answer for his shedding of innocent blood. At the passover of 36 Vitellius came to Jerusalem and pacified the Jews by two concessions: he remitted the taxes on fruit sold in the city, and he restored to their custody the high priest's vestments, which Herod Archelaus and the Romans had kept in the tower Antonia. The vestments had been stored there since the time of the first high priest named Hyrcanus, and Herod had taken them over along with the tower, thinking that his possession of them would deter the Jews from rebellion against his rule. At the same time Vitellius vindicated the Roman supremacy by degrading Caiaphas from the high-priesthood, and appointing a son of Annas in his place. The motive for this change does not appear, and we are equally ignorant of the cause which prompted his transference of the priesthood from his nominee to another son of Annas in 37. But it is quite clear that Vitellius was concerned to reconcile the Jews to the authority of Rome. When he marched against Aretas, his army with their standards did not enter Judaea at all; but he himself went up to Jerusalem for the feast and, on receipt of the news that Tiberius was dead, administered to the Jews the oath of allegiance to Caligula.

35. *Caligula and Agrippa I.*— The accession of Caligula (A.D. 37–41) was hailed by his subjects generally as the beginning of the Golden Age. The Jews in particular had a friend at court. Agrippa, the grandson of Herod the Great, was an avowed partisan of the new emperor and had paid penalty for a premature avowal of his preference. But Caligula's favour, though lavished upon Agrippa, was not available for pious Jews. His foible was omnipotence, and he aped the gods of Greece in turn. In the provinces and even in Italy his subjects were ready to acknowledge his divinity—with the sole exception of the Jews. So we learn something of the Palestinian Jews and more of the Jewish community in Alexandria. The great world (as we know it) took small note of Judaism even when Jews converted its women to their faith; but now the Jews as a nation refused to bow before the present god of the civilized world. The new Catholicism was promulgated by authority and accepted with deference. Only the Jews protested: they had a notion of the deity which Caligula at all events did not fulfil.

The people of Alexandria seized the opportunity for an attack upon the Jews. Images of Caligula were set up in the synagogues, an edict deprived the Jews of their rights as citizens, and finally the governor authorized the mob to sack the Jewish quarter, as if it had been a conquered city (38). Jewesses were forced to eat pork and the elders were scourged in the theatre. But Agrippa had influence with the emperor and secured the degradation of the governor. The people and the Jews remained in a state of civil war, until each side sent an embassy (40) to wait upon the emperor. The Jewish embassy was headed by Philo, who has described its fortunes in a tract dealing with the divine punishment of the persecutors. Their opponents also had secured a friend at court and seem to have prevented any effective measure of redress. While the matter was still pending, news arrived that the emperor had commanded Publius Petronius, the governor of Syria, to set up his statue in the temple of Jerusalem. On the intervention of Agrippa the order was countermanded, and the assassination of the emperor (41) effectually stopped the desecration.

36. *Claudius and the Procurators.*—Claudius, the new emperor, restored the civic rights of the Alexandrian Jews and made Agrippa I. king over all the territories of Herod the Great. So there was once more a king of Judaea, and a king who observed the tradition of the Pharisees and protected the Jewish religion. There is a tradition in the Talmud which illustrates his popularity. As he was reading the Law at the feast of tabernacles he burst into tears at the words "Thou mayest not set a stranger over thee which is not thy brother"; and the people cried out, "Fear not, Agrippa; thou art our brother." The fact that he began to build a wall round Jerusalem may be taken as further proof of his patriotism. But the fact that he summoned five vassal-kings of the empire to a conference at Tiberias suggests rather a policy of self-aggrandisement. Both projects were prohibited by the emperor on the intervention of the legate. In 44 he died. The Christian records treat his death as an act of divine vengeance upon the persecutor of the Christian Church. The Jews prayed for his recovery and lamented him. The Gentile soldiers exulted in the downfall of his dynasty, which they signalized after their own fashion. Claudius intended that Agrippa's young son should succeed to the kingdom; but he was overruled by his advisers, and Judaea was taken over once more by Roman procurators. The success of Agrippa's brief reign had revived the hopes of the Jewish nationalists, and concessions only retarded the inevitable insurrection.

Cuspius Fadus, the first of these procurators, purged the land of bandits. He also attempted to regain for the Romans the custody of the high priest's vestments; but the Jews appealed to the emperor against the revival of this advertisement of their servitude. The emperor granted the petition, which indeed the procurator had permitted them to make, and further transferred the nomination of the high priest and the supervision of the temple from the procurator to Agrippa's brother, Herod of Chalcis. But these concessions did not satisfy the hopes of the people. During the government of Fadus, Theudas, who claimed to be a prophet and whom Josephus describes as a wizard, persuaded a large number to take up their possessions and follow him to the Jordan, saying that he would cleave the river asunder with a word of command and so provide them with an easy crossing. A squadron of cavalry despatched by Fadus took them alive, cut off the head of Theudas and brought it to Jerusalem.

Under the second procurator Tiberius Alexander, an apostate Jew of Alexandria, nephew of Philo, the Jews suffered from a great famine and were relieved by the queen of Adiabene, a proselyte to Judaism, who purchased corn from Egypt. The famine was perhaps interpreted by the Zealots as a punishment for their acquiescence in the rule of an apostate. At any rate Alexander crucified two sons of Simon the Galilean, who had headed a revolt in the time of the census. They had presumably followed the example of their father.

Under Ventidius Cumanus (48–52) the mutual hatred of Jews and Romans, Samaritans and Jews, found vent in insults and bloodshed. At the passover, on the fourth day of the feast, a soldier mounting guard at the porches of the Temple provoked an uproar, which ended in a massacre, by indecent exposure of his person. Some of the rebels intercepted a slave of the emperor on the high-road near the city and robbed him of his possessions. Troops were sent to pacify the country, and in one village a soldier found a copy of Moses' laws and tore it up in public with jeers and blasphemies. At this the Jews flocked to Caesarea, and were only restrained from a second outbreak by the execution of the soldier. Finally, the Samaritans attacked certain Galileans who were (as the custom was) travelling through Samaria to Jerusalem for the passover. Cumanus was bribed and refused to avenge the death of the Jews who were killed. So the Galileans with some of the lower classes of "the Jews" allied themselves with a "robber" and burned some of the Samaritan villages. Cumanus armed the Samaritans, and, with them and his own troops, defeated these Jewish marauders. The leading men of Jerusalem prevailed upon the rebels who survived the defeat to disperse. But the quarrel was referred first to the legate of Syria and then to the emperor. The emperor was still disposed to conciliate the Jews; and, at the instance of Agrippa, son of Agrippa I., Cumanus was banished.

37. *Felix and the Revolutionaries.*— Under Antonius Felix (52–60) the revolutionary movement grew and spread. The country, Josephus says, was full of "robbers" and "wizards." The high priest was murdered in the Temple by pilgrims who carried daggers under their cloaks. Wizards and impostors persuaded the multitude to follow them into the desert, and an Egyptian, claiming to be a prophet, led his followers to the Mount of Olives to see the walls of Jerusalem fall at his command. Such deceivers, according to Josephus, did no less than the murderers to destroy the happiness of the city. Their hands were cleaner but their thoughts were more impious, for they pretended to divine inspiration.

Felix the procurator—a king, as Tacitus says, in power and in mind a slave—tried in vain to put down the revolutionaries. The "chief-robber" Eleazar, who had plundered the country for twenty years, was caught and sent to Rome; countless robbers of less note were crucified. But this severity cemented the alliance of religious fanatics with the physical-force party and induced the ordinary citizens to join them, in spite of the punishments which they received when captured. Agrippa II. received a kingdom—first Chalcis, and then the tetrarchies of Philip and Lysanias—but, though he had the oversight of the Temple and the nomination of the high priest, and enjoyed a reputation for knowledge of Jewish customs and questions, he was unable to check the growing power of the Zealots. His sister Drusilla had broken the Law by her marriage with Felix; and his own notorious relations with his sister Berenice, and his coins which bore the images of the emperors, were an open affront to the conscience of Judaism. When Felix was recalled by Nero in 60 the nation was divided against itself, the Gentiles within its gates were watching for their opportunity, and the chief priests robbed the lower priests with a high hand.

In Caesarea there had been for some time trouble between the Jewish and the Syrian inhabitants. The Jews claimed that the city was theirs, because King Herod had founded it. The Syrians admitted the fact, but insisted that it was a city for Greeks, as its temples and statues proved. Their rivalry led to street-fighting: the Jews had the advantage in respect of wealth and bodily strength, but the Greek party had the assistance of the soldiers who were stationed there. On one occasion Felix sent troops against the victorious Jews; but neither this nor the scourge and the prison, to which the leaders of both factions had been consigned, deterred them. The quarrel was therefore referred to the emperor Nero, who finally gave his decision in favour of the Syrians or Greeks. The result of this decision was that the synagogue at Caesarea was insulted on a Sabbath and the Jews left the city taking their books of the Law with them. So—Josephus says—the war began in the twelfth year of the reign of Nero (A.D. 66).

38. *Festus, Albinus and Florus.*—Meanwhile the procurators who succeeded Felix—Porcius Festus (60–62), Albinus (62–64) and Gessius Florus (64–66)—had in their several ways brought the bulk of the nation into line with the more violent of the Jews of Caesarea. Festus found Judaea infested with robbers and the sicarii, who mingled with the crowds at the feasts and stabbed their enemies with the daggers (*sicae*) from which their name was derived. He also had to deal with a wizard, who deceived many by promising them salvation and release from evils, if they would follow him into the desert. His attempts to crush all such disturbers of the peace were cut short by his death in his second year of office.

In the interval which elapsed before the arrival of Albinus, Ananus son of Annas was made high priest by Agrippa. With the apparent intention of restoring order in Jerusalem, he assembled the Sanhedrin, and being, as a Sadducee, cruel in the matter of penalties, secured the condemnation of certain law-breakers to death by stoning. For this he was deposed by Agrippa. Albinus fostered and turned to his profit the struggles of priests with priests and of Zealots with their enemies. The general release of prisoners, with which he celebrated his impending recall, is typical of his policy. Meanwhile Agrippa gave the Levites the right to wear the linen robe of the priests and sanctioned the use of the temple treasure to provide work—the paving of the city with white stones—for the workmen who had finished the Temple (64) and now stood idle. But everything pointed to the destruction of the city, which one Jesus had prophesied at the feast of tabernacles in 62. The Zealots' zeal for the Law and the Temple was flouted by their pro-Roman king.

By comparison with Florus, Albinus was, in the opinion of Josephus, a benefactor. When the news of the troubles at Caesarea reached Jerusalem, it became known also that Florus had seized seventeen talents of the temple treasure (66). At this the patience of the Jews was exhausted. The sacrilege, as they considered it, may have been an attempt to recover arrears of tribute; but they were convinced that Florus was providing for himself and not for Caesar. The revolutionaries went about among the excited people with baskets, begging coppers for their destitute and miserable governor. Stung by this insult, he neglected the fire of war which had been lighted at Caesarea, and hastened to Jerusalem. His soldiers sacked the upper city and killed 630 persons—men, women and children. Berenice, who was fulfilling a Nazarite vow, interposed in vain. Florus actually dared to scourge and crucify Jews who belonged to the Roman order of knights. For the moment the Jews were cowed, and next day they went submissively to greet the troops coming from Caesarea. Their greetings were unanswered, and they cried out against Florus. On this the soldiers drew their swords and drove the people into the city; but, once inside the city, the people stood at bay and succeeded in establishing themselves upon the temple-hill. Florus withdrew with all his troops, except one cohort, to Caesarea. The Jews laid complaint against him, and he complained against the Jews before the governor of Syria, Cestius Gallus, who sent an officer to inquire into the matter. Agrippa, who had hurried from Alexandria, entered Jerusalem with the governor's emissary. So long as he counselled submission to the overwhelming power of Rome the people complied, but when he spoke of obedience to Florus he was compelled to fly. The rulers, who desired peace, and upon whom Florus had laid the duty of restoring peace, asked him for troops; but the civil war ended in their complete discomfiture. The rebels abode by their decision to stop the daily sacrifice for the emperor; Agrippa's troops capitulated and marched out unhurt; and the Romans, who surrendered on the same condition and laid down their arms, were massacred. As if to emphasize the spirit and purpose of the rebellion, one and only one of the Roman soldiers was spared, because he promised to become a Jew even to the extent of circumcision.

39. *Josephus and the Zealots.*—Simultaneously with this massacre the citizens of Caesarea slaughtered the Jews who still remained there; and throughout Syria Jews effected—and suffered—reprisals. At length the governor of Syria approached the centre of the disturbance in Jerusalem, but retreated after burning down a suburb. In the course of his retreat he was attacked by the Jews and fled to Antioch, leaving them his engines of war. Some prominent Jews fled from Jerusalem—as from a sinking ship—to join him and carried the news to the emperor. The rest of the pro-Roman party were forced or persuaded to join the rebels and prepared for war on a grander scale. Generals were selected by the Sanhedrin from the aristocracy, who had tried to keep the peace and still hoped to make terms with Rome. Ananus the high priest, their leader, remained in command at Jerusalem; Galilee, where the first attack was to be expected, was entrusted to Josephus, the historian of the war. The revolutionary leaders, who had already taken the field, were superseded.

Josephus set himself to make an army of the inhabitants of Galilee, many of whom had no wish to fight, and to strengthen the strongholds. His organization of local government and his efforts to maintain law and order brought him into collision with the Zealots and especially with John of Giscala, one of their leaders. The people, whom he had tried to conciliate, were roused against him; John sent assassins and finally procured an order from Jerusalem for his recall. In spite of all this Josephus held his ground and by force or craft put down those who resisted his authority.

In the spring of 67 Vespasian, who had been appointed by Nero to crush the rebellion, advanced from his winter quarters at Antioch. The inhabitants of Sepphoris—whom Josephus had judged to be so eager for the war that he left them to build their wall for themselves—received a Roman garrison at their own request. Joined by Titus, Vespasian advanced into Galilee with three legions and the auxiliary troops supplied by Agrippa and other petty kings. Before his advance the army of Josephus fled. Josephus with a few stalwarts took refuge in Tiberias, and sent a letter to Jerusalem asking that he should be relieved of his command or supplied with an adequate force to continue the war. Hearing that Vespasian was preparing to besiege Jotapata, a strong fortress in the hills, which was held by other fugitives, Josephus entered it just before the road approaching it was made passable for the Roman horse and foot. A deserter announced his arrival to Vespasian, who rejoiced (Josephus says) that the cleverest of his enemies had thus voluntarily imprisoned himself. After some six weeks' siege the place was stormed, and its exhausted garrison were killed or enslaved. Josephus, whose pretences had postponed the final assault, hid in a cave with forty men. His companions refused to permit him to surrender and were resolved to die. At his suggestion they cast lots, and the first man was killed by the second and so on, until all were dead except Josephus and (perhaps) one other. So Josephus saved them from the sin of suicide and gave himself up to the Romans. He had prophesied that the place would be taken—as it was—on the forty-seventh day, and now he prophesied that both Vespasian and his son Titus would reign over all mankind. The prophecy saved his life, though many desired his death, and the rumour of it produced general mourning in Jerusalem. By the end of the year (67) Galilee was in the hands of Vespasian, and John of Giscala had fled. Agrippa celebrated the conquest at Caesarea Philippi with festivities which lasted twenty days.

In accordance with ancient custom Jerusalem welcomed the fugitive Zealots. The result was civil war and famine. Ananus incited the people against these robbers, who arrested, imprisoned and murdered prominent friends of Rome, and arrogated to themselves the right of selecting the high priest by lot. The Zealots took refuge in the Temple and summoned the Idumaeans to their aid. Under cover of a storm, they opened the city-gates to their allies and proceeded to murder Ananus the high priest, and, against the verdict of a formal tribunal, Zacharias the son of Baruch in the midst of the Temple. The Idumaeans left, but John of Giscala remained master of Jerusalem.

40. *The Fall of Jerusalem.*—Vespasian left the rivals to consume one another and occupied his army with the subjugation of the country. When he had isolated the capital and was preparing to besiege it, the news of Nero's death reached him at Caesarea. For a year (June 68–June 69) he held his hand and watched events, until the robber-bands of Simon Bar-Giora (son of the proselyte) required his attention. But, before Vespasian took action to stop his raids, Simon had been invited to Jerusalem in the hope that he would act as a counterpoise to the tyrant John. And so, when Vespasian was proclaimed emperor in fulfilment of Josephus' prophecy, and deputed the command to Titus, there were three rivals at war in Jerusalem—Eleazar, Simon and John. The temple sacrifices were still offered and worshippers were admitted; but John's catapults were busy, and priest and worshippers at the altar were killed, because Eleazar's party occupied the inner courts of the Temple. A few days before the passover of 70 Titus advanced upon Jerusalem, but the civil war went on. When Eleazar opened the temple-gates to admit those who wished to worship God, John of Giscala introduced some of his own men, fully armed under their garments, and so got possession of the Temple. Titus pressed the attack, and the two factions joined hands at last to repel it. In spite of their desperate sallies, Jerusalem was surrounded by a wall, and its people, whose numbers were increased by those who had come up for the passover, were hemmed in to starve. The famine affected all alike—the populace, who desired peace, and the Zealots, who were determined to fight to the end. At last John of Giscala portioned out the sacred wine and oil, saying that they who fought for the Temple might fearlessly use its stores for their sustenance. Steadily the Romans forced their way through wall after wall, until the Jews were driven back to the Temple and the daily sacrifices came to an end on the 17th of July for lack of men. Once more Josephus appealed in vain to John and his followers to cease from desecrating and endangering the Temple. The siege proceeded and the temple-gates were burned. According to Josephus, Titus decided to spare the Temple, but—whether this was so or not—on the 10th of August it was fired by a soldier after a sortie of the Jews had been repelled. The legions set up their standards in the temple-court and hailed Titus as imperator.

Some of the Zealots escaped with John and Simon to the upper city and held it for another month. But Titus had already earned the triumph which he celebrated at Rome in 71. The Jews, wherever they might be, continued to pay the temple-tax; but now it was devoted to Jupiter Capitolinus. The Romans had taken their holy place, and the Law was all that was left to them.

41. *From* A.D. 70 *to* A.D. 135.—The destruction of the Temple carried with it the destruction of the priesthood and all its power. The priests existed to offer sacrifices, and by the Law no sacrifice could be offered except at the Temple of Jerusalem. Thenceforward the remnant of the Jews who survived the fiery ordeal formed a church rather than a nation or a state, and the Pharisees exercised an unchallenged supremacy. With the Temple and its Sadducean high priests perished the Sanhedrin in which the Sadducees had competed with the Pharisees for predominance. The Sicarii or Zealots who had appealed to the arm of flesh were exterminated. Only the teachers of the Law survived to direct the nation and to teach those who remained loyal Jews, how they should render to Caesar what belonged to Caesar, and to God what belonged to God. Here and there hot-headed Zealots rose up to repeat the errors and the disasters of their predecessors. But their fate only served to deepen the impression already stamped upon the general mind of the nation. The Temple was gone, but they had the Law. Already the Jews of the Dispersion had learned to supplement the Temple by the synagogue, and even the Jews of Jerusalem had not been free to spend their lives in the worship of the Temple. There were still, as always, rites which were independent of the place and of the priest; there had been a time when the Temple did not exist. So Judaism survived once more the destruction of its central sanctuary.

When Jerusalem was taken, the Sicarii still continued to hold three strongholds: one—Masada—for three years. But the commander of Masada realized at length that there was no hope of escaping captivity except by death, and urged his comrades to anticipate their fate. Each man slew his wife and children; ten men were selected by lot to slay the rest; one man slew the nine executioners, fired the palace and fell upon his sword. When the place was stormed the garrison consisted of two old women and five children who had concealed themselves in caves. So Vespasian obtained possession of Palestine—the country which Nero had given him—and for a time it was purged of revolutionaries. Early Christian writers assert that he proceeded to search out and to execute all descendants of David who might conceivably come forward as claimants of the vacant throne.

In Egypt and in Cyrene fugitive Zealots endeavoured to continue their rebellion against the emperor, but there also with disastrous results. The doors of the Temple in Egypt were closed, and its sacrifices which had been offered for 243 years were prohibited. Soon afterwards this temple also was destroyed. Apart from these local outbreaks, the Jews throughout the empire remained loyal citizens and were not molested. The general hope of the nation was not necessarily bound up with the house of David, and its realization was not incompatible with the yoke of Rome. They still looked for a true prophet, and meanwhile they had their rabbis.

Under Johanan ben Zaccai (*q.v.*) the Pharisees established themselves at Jamnia. A new Sanhedrin was formed there under the presidency of a ruler, who received yearly dues from all Jewish communities. The scribes through the synagogues preserved the national spirit and directed it towards the religious life which was prescribed by Scripture. The traditions of the elders were tested and gradually harmonized in their essentials. The canon of Scripture was decided in accordance with the touchstone of the Pentateuch. Israel had retired to their tents to study their Bible.

Under Vespasian and Titus the Jews enjoyed freedom of conscience and equal political rights with non-Jewish subjects of Rome. But Domitian, according to pagan historians, bore hardly on them. The temple-tax was strictly exacted; Jews who lived the Jewish life without openly confessing their religion and Jews who concealed their nationality were brought before the magistrates. Proselytes to Judaism were condemned either to death or to forfeiture of their property. Indeed it would seem that Domitian instituted a persecution of the Jews, to which Nerva his successor put an end. Towards the end of Trajan's reign (114–117) the Jews of Egypt and Cyrene rose against their Greek neighbours and set up a king. The rebellion spread to Cyprus; and when Trajan advanced from Mesopotamia into Parthia the Jews of Mesopotamia revolted. The massacres they perpetrated were avenged in kind and all the insurrections were quelled when Hadrian succeeded Trajan.

In 132 the Jews of Palestine rebelled again. Hadrian had forbidden circumcision as illegal mutilation: he had also replaced Jerusalem by a city of his own, Aelia Capitolina, and the temple of Yahweh by a temple of Jupiter. Apart from these bitter provocations—the prohibition of the sign of the covenant and the desecration of the sacred place—the Jews had a leader who was recognized as Messiah by the rabbi Aqiba. Though the majority of the rabbis looked for no such deliverer and refused to admit his claims, Barcochebas (*q.v.*) drew the people after him to struggle for their national independence. For three years and a half he held his own and issued coins in the name of Simon, which commemorate the liberation of Jerusalem. Some attempt was apparently made to rebuild the Temple; and the Jews of the Dispersion, who had perhaps been won over by Aqiba, supported the rebellion. Indeed even Gentiles helped them, so that the whole world (Dio Cassius says) was stirred. Hadrian sent his best generals against the rebels, and at length they were driven from Jerusalem to Bethar (135). The Jews were forbidden to enter the new city of Jerusalem on pain of death.

Bibliography.—The most comprehensive of modern books dealing with the period is Emil Schürer, *Geschichte des Jüdischen Volkes im Zeitalter Jesu Christi* (3 vols., Leipzig, 1901 foll.). Exception has been taken to a certain lack of sympathy with the Jews, especially the rabbis, which has been detected in the author. But at least the book remains an indispensable storehouse of references to ancient and modern authorities. An earlier edition was translated into English under the title *History of the Jewish People* (Edinburgh, 1890, 1891). Of shorter histories, D. A. Schlatter's *Geschichte Israel's von Alexander dem Grossen bis Hadrian* (2nd ed., 1906) is perhaps the least dependent upon Schürer and attempts more than others to interpret the fragmentary evidence available. Dr R. H. Charles has done much by his editions to restore to their proper prominence in connexion with Jewish history the *Testaments of the Twelve Patriarchs*, *The Book of Jubilees*, *Enoch*, &c. But Schürer gives a complete bibliography to which it must suffice to refer. For the Sanhedrin see Synedrium. (J. H. A. H.)

III.—From the Dispersion to Modern Times

42. *The Later Empire.*—With the failure in 135 of the attempt led by Barcochebas to free Judaea from Roman domination a new era begins in the history of the Jews. The direct consequence of the failure was the annihilation of political nationality. Large numbers fell in the actual fighting. Dio Cassius puts the total at the incredible figure of 580,000, besides the incalculable number who succumbed to famine, disease and fire (Dio-Xiphilin lxix. 11–15). Jerusalem was rebuilt by Hadrian, orders to this effect being given during the emperor's first journey through Syria in 130, the date of his foundations at Gaza, Tiberias and Petra (Reinach, *Textes relatifs au Judaïsme*, p. 198). The new city was named Aelia Capitolina, and on the site of the temple of Jehovah there arose another temple dedicated to Jupiter. To Eusebius the erection of a temple of Venus over the sepulchre of Christ was an act of mockery against the Christian religion. Rome had been roused to unwonted fury, and the truculence of the rebels was matched by the cruelty of their masters. The holy city was barred against the Jews; they were excluded, under pain of death, from approaching within view of the walls. Hadrian's policy in this respect was matched later on by the edict of the caliph Omar (*c.* 638), who, like his Roman prototype, prevented the Jews from settling in the capital of their ancient country. The death of Hadrian and the accession of Antoninus Pius (138), however, gave the dispersed people of Palestine a breathing-space. Roman law was by no means intolerant to the Jews. Under the constitution of Caracalla (198–217) all inhabitants of the Roman empire enjoyed the civil rights of the *Cives Romani* (Scherer, *Die Rechtsverhältnisse der Juden*, p. 10).

Moreover, a spiritual revival mitigated the crushing effects of material ruin. The synagogue had become a firmly established institution, and the personal and social life of the masses had come under the control of communal law. The dialectic of the school proved stronger to preserve than the edge of the sword to destroy. Pharisaic Judaism, put to the severest test to which a religious system has ever been subject, showed itself able to control and idealize life in all its phases. Whatever question may be possible as to the force or character of Pharisaism in the time of Christ, there can be no doubt that it became both all-pervading and ennobling among the successors of Aqiba (*q.v.*), himself one of the martyrs to Hadrian's severity. Little more than half a century after the overthrow of the Jewish nationality, the Mishnah was practically completed, and by this code of rabbinic law—and law is here a term which includes the social, moral and religious as well as the ritual and legal phases of human activity—the Jewish people were organized into a community, living more or less autonomously under the Sanhedrin or Synedrium (*q.v.*) and its officials.

Judah the prince, the patriarch or *nāsī* who edited the Mishnah, died early in the 3rd century. With him the importance of the Palestinian patriarchate attained its zenith. Gamaliel II. of Jamnia (Jabne Yebneh) had been raised to this dignity a century before, and, as members of the house of Hillel and thus descendants of David, the patriarchs enjoyed almost royal authority. Their functions were political rather than religious, though their influence was by no means purely secular. They were often on terms of intimate friendship with the emperors, who scarcely interfered with their jurisdiction. As late as Theodosius I. (379–395) the internal affairs of the Jews were formally committed to the patriarchs, and Honorius (404) authorized the collection of the patriarch's tax (*aurum coronarium*), by which a revenue was raised from the Jews of the diaspora. Under Theodosius II. (408–450) the patriarchate was finally abolished after a régime of three centuries and a half (Graetz, *History of the Jews*, Eng. trans. vol. ii. ch. xxii.), though ironically enough the last holder of the office had been for a time elevated by the emperor to the rank of prefect. The real turning-point had been reached earlier, when Christianity became the state religion under Constantine I. in 312.

Religion under the Christian emperors became a significant source of discrimination in legal status, and non-conformity might reach so far as to produce complete loss of rights. The laws concerning the Jews had a repressive and preventive object: the repression of Judaism and the prevention of inroads of Jewish influences into the state religion. The Jews were thrust into a position of isolation, and the Code of Theodosius and other authorities characterize the Jews as a lower order of depraved beings (*inferiores* and *perversi*), their community as a godless, dangerous sect (*secta nefaria, feralis*), their religion a superstition, their assemblies for religious worship a blasphemy (*sacrilegi coetus*) and a contagion (Scherer, *op. cit.* pp. 11–12). Yet Judaism under Roman Christian law was a lawful religion (*religio licita*), Valentinian I. (364–375) forbade the quartering of soldiers in the synagogues, Theodosius I. prohibited interference with the synagogue worship ("Judaeorum sectam nulla lege prohibitam satis constat"), and in 412 a special edict of protection was issued. But the admission of Christians into the Jewish fold was punished by confiscation of goods (357), the erection of new synagogues was arrested by Theodosius II. (439) under penalty of a heavy fine, Jews were forbidden to hold Christian slaves under pain of death (423). A similar penalty attached to intermarriage between Jews and Christians, and an attempt was made to nullify all Jewish marriages which were not celebrated in accordance with Roman law. But Justinian (527–565) was the first to interfere directly in the religious institutions of the Jewish people. In 553 he interdicted the use of the Talmud (which had then not long been completed), and the Byzantine emperors of the 8th and 9th centuries passed even more intolerant regulations. As regards civil law, Jews were at first allowed to settle disputes between Jew and Jew before their own courts, but Justinian denied to them and to heretics the right to appear as witnesses in the public courts against orthodox Christians. To Constantine V. (911–959) goes back the Jewish form of oath which in its later development required the Jew to gird himself with thorns; stand in water; and, holding the scroll of the Torah in his hand, invoke upon his person the leprosy of Naaman, the curse of Eli and the fate of Korah's sons should he perjure himself. This was the original of all the medieval forms of oath *more judaico*, which still prevailed in many European lands till the 19th century, and are even now maintained by some of the Rumanian courts. Jews were by the law of Honorius excluded from the army, from public offices and dignities (418), from acting as advocates (425); only the curial offices were open to them. Justinian gave the finishing touch by proclaiming in 537 the Jews absolutely ineligible for any honour whatsoever ("honore fruantur nullo").

43. *Judaism in Babylonia.*—The Jews themselves were during this period engaged in building up a system of isolation on their own side, but they treated Roman law with greater hospitality than it meted out to them. The Talmud shows the influence of that law in many points, and may justly be compared to it as a monument of codification based on great principles. The Palestinian Talmud was completed in the 4th century, but the better known and more influential version was compiled in Babylonia about 500. The land which, a millennium before, had been a prison for the Jewish exiles was now their asylum of refuge. For a long time it formed their second fatherland. Here, far more than on Palestinian soil, was built the enduring edifice of rabbinism. The population of the southern part of Mesopotamia—the strip of land enclosed between the Tigris and the Euphrates—was, according to Graetz, mainly Jewish; while the district extending for about 79 m. on the east of the Euphrates, from Nehardea in the north to Sura in the south, became a new Palestine with Nehardea for its Jerusalem. The Babylonian Jews were practically independent, and the exilarch (*resh-galutha*) or prince of the captivity was an official who ruled the community as a vassal of the Persian throne. The exilarch claimed, like the Palestinian patriarch, descent from the royal house of David, and exercised most of the functions of

government. Babylonia had risen into supreme importance for Jewish life at about the time when the Mishnah was completed. The great rabbinic academies at Sura and Nehardea, the former of which retained something of its dominant rôle till the 11th century, had been founded, Sura by Abba Arika (*q.v.*) (*c.* 219), but Nehardea, the more ancient seat of the two, famous in the 3rd century for its association with Abba Arika's renowned contemporary Samuel, lost its Jewish importance in the age of Mahomet.

To Samuel of Nehardea (*q.v.*) belongs the honour of formulating the principle which made it possible for Jews to live under alien laws. Jeremiah had admonished his exiled brothers: "Seek ye the peace of the city whither I have caused you to be carried away captives, and pray unto the Lord for it: for in the peace thereof shall ye have peace" (Jer. xxix. 7). It was now necessary to go farther, and the rabbis proclaimed a principle which was as influential with the synagogue as "Give unto Caesar that which is Caesar's" became with the Church. "The law of the government is law" (*Baba Qama* 113 b.), said Samuel, and ever since it has been a religious duty for the Jews to obey and accommodate themselves as far as possible to the laws of the country in which they are settled or reside. In 259 Odenathus, the Palmyrene adventurer whose memory has been eclipsed by that of his wife Zenobia, laid Nehardea waste for the time being, and in its neighbourhood arose the academy of Pumbedita (Pombeditha) which became a new focus for the intellectual life of Israel in Babylonia. These academies were organized on both scholastic and popular lines; their constitution was democratic. An outstanding feature was the *Kallah* assemblage twice a year (in Elul at the close of the summer, and in Adar at the end of the winter), when there were gathered together vast numbers of outside students of the most heterogeneous character as regards both age and attainments. Questions received from various quarters were discussed and the final decision of the *Kallah* was signed by the *Resh-Kallah* or president of the general assembly, who was only second in rank to the *Resh-Metibta*, or president of the scholastic sessions. Thus the Babylonian academies combined the functions of specialist law-schools, universities and popular parliaments. They were a unique product of rabbinism; and the authors of the system were also the compilers of its literary expression, the Talmud.

44. *Judaism in Islam.*—Another force now appears on the scene. The new religion inaugurated by Mahomet differed in its theory from the Roman Catholic Church. The Church, it is true, in council after council, passed decisions unfriendly to the Jews. From the synod at Elvira in the 4th century this process began, and it was continued in the West-Gothic Church legislation, in the Lateran councils (especially the fourth in 1215), and in the council of Trent (1563). The anti-social tendency of these councils expressed itself in the infliction of the badge, in the compulsory domicile of Jews within ghettos, and in the erection of formidable barriers against all intercourse between church and synagogue. The protective instinct was responsible for much of this interference with the natural impulse of men of various creeds towards mutual esteem and forbearance. The church, it was conceived, needed defence against the synagogue at all hazards, and the fear that the latter would influence and dominate the former was never absent from the minds of medieval ecclesiastics. But though this defensive zeal led to active persecution, still in theory Judaism was a tolerated religion wherever the Church had sway, and many papal bulls of a friendly character were issued throughout the middle ages (Scherer, p. 32 seq.).

Islam, on the other hand, had no theoretic place in its scheme for tolerated religions; its principle was fundamentally intolerant. Where the mosque was erected, there was no room for church or synagogue. The caliph Omar initiated in the 7th century a code which required Christians and Jews to wear peculiar dress, denied them the right to hold state offices or to possess land, inflicted a poll-tax on them, and while forbidding them to enter mosques, refused them the permission to build new places of worship for themselves. Again and again these ordinances were repeated in subsequent ages, and intolerance for infidels is still a distinct feature of Mahommedan law. But Islam has often shown itself milder in fact than in theory, for its laws were made to be broken. The medieval Jews on the whole lived, under the crescent, a fuller and freer life than was possible to them under the cross. Mahommedan Babylonia (Persia) was the home of the gaonate (see GAON), the central authority of religious Judaism, whose power transcended that of the secular exilarchate, for it influenced the synagogue far and wide, while the exilarchate was local. The gaonate enjoyed a practical tolerance remarkable when contrasted with the letter of Islamic law. And as the Bagdad caliphate tended to become more and more supreme in Islam, so the gaonate too shared in this increased influence. Not even the Qaraite schism was able to break the power of the geonim. But the dispersion of the Jews was proceeding in directions which carried masses from the Asiatic inland to the Mediterranean coasts and to Europe.

45. *In Medieval Europe: Spain.*—This dispersion of the Jews had begun in the Hellenistic period, but it was after the Barcochebas war that it assumed great dimensions in Europe. There were Jews in the Byzantine empire, in Rome, in France and Spain at very early periods, but it is with the Arab conquest of Spain that the Jews of Europe began to rival in culture and importance their brethren of the Persian gaonate. Before this date the Jews had been learning the rôle they afterwards filled, that of the chief promoters of international commerce. Already under Charlemagne this development is noticeable; in his generous treatment of the Jews this Christian emperor stood in marked contrast to his contemporary the caliph Harun al-Rashid, who persecuted Jews and Christians with equal vigour. But by the 10th century Judaism had received from Islam something more than persecution. It caught the contagion of poetry, philosophy and science.[1] The schismatic Qaraites initiated or rather necessitated a new Hebrew philology, which later on produced Qimḥi, the gaon Saadiah founded a Jewish philosophy, the statesman Ḥasdai introduced a new Jewish culture—and all this under Mahommedan rule. It is in Spain that above all the new spirit manifested itself. The distinctive feature of the Spanish-Jewish culture was its comprehensiveness. Literature and affairs, science and statecraft, poetry and medicine, these various expressions of human nature and activity were so harmoniously balanced that they might be found in the possession of one and the same individual. The Jews of Spain attained to high places in the service of the state from the time of the Moorish conquest in 711. From Ḥasdai ibn Shaprut in the 10th century and Samuel the nagid in the 11th the line of Jewish scholar-statesmen continued till we reach Isaac Abrabanel in 1492, the date of the expulsion of the Jews from Spain. This last-named event synchronized with the discovery of America; Columbus being accompanied by at least one Jewish navigator. While the Spanish period of Jewish history was thus brilliant from the point of view of public service, it was equally notable on the literary side. Hebrew religious poetry was revived for synagogue hymnology, and, partly in imitation of Arabian models, a secular Hebrew poetry was developed in metre and rhyme. The new Hebrew *Piyut* found its first important exponent in Kalir, who was not a Spaniard. But it is to Spain that we must look for the best of the medieval poets of the synagogue, greatest among them being Ibn Gabirol and Halevi. So, too, the greatest Jew of the middle ages, Maimonides, was a Spaniard. In him culminates the Jewish expression of the Spanish-Moorish culture; his writings had an influence on European scholasticism and contributed significant elements to the philosophy of Spinoza. But the reconquest of Andalusia by the Christians associated towards the end of the 15th century with the establishment of the Inquisition, introduced a spirit of intolerance which led to the expulsion of the Jews and Moors. The consequences of this blow were momentous; it may be said to inaugurate the ghetto period. In Spain Jewish life had participated in the general life, but the expulsion—while it dispersed

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[1] On the writers mentioned below see articles *s.v.*

the Spanish Jews in Poland, Turkey, Italy and France, and thus in the end contributed to the Jewish emancipation at the French Revolution—for the time drove the Jews within their own confines and barred them from the outside world.[1]

46. *In France, Germany, England, Italy.*—In the meantime Jewish life had been elsewhere subjected to other influences which produced a result at once narrower and deeper. Under Charlemagne, the Jews, who had begun to settle in Gaul in the time of Caesar, were more than tolerated. They were allowed to hold land and were encouraged to become—what their ubiquity qualified them to be—the merchant princes of Europe. The reign of Louis the Pious (814–840) was, as Graetz puts it, "a golden era for the Jews of his kingdom, such as they had never enjoyed, and were destined never again to enjoy in Europe"—prior, that is, to the age of Mendelssohn. In Germany at the same period the feudal system debarred the Jews from holding land, and though there was as yet no material persecution they suffered moral injury by being driven exclusively into finance and trade. Nor was there any widening of the general horizon such as was witnessed in Spain. The Jewries of France and Germany were thus thrown upon their own cultural resources. They rose to the occasion. In Mainz there settled in the 10th century Gershom, the "light of the exile," who, about 1000, published his ordinance forbidding polygamy in Jewish law as it had long been forbidden in Jewish practice. This ordinance may be regarded as the beginning of the Synodal government of Judaism, which was a marked feature of medieval life in the synagogues of northern and central Europe from the 12th century. Soon after Gershom's death, Rashi (1040–1106) founded at Troyes a new school of learning. If Maimonides represented Judaism on its rational side, Rashi was the expression of its traditions.

French Judaism was thus in a sense more human if less humane than the Spanish variety; the latter produced thinkers, statesmen, poets and scientists; the former, men with whom the Talmud was a passion, men of robuster because of more naïve and concentrated piety. In Spain and North Africa persecution created that strange and significant phenomenon Maranism or crypto-Judaism, a public acceptance of Islam or Christianity combined with a private fidelity to the rites of Judaism. But in England, France and Germany persecution altogether failed to shake the courage of the Jews, and martyrdom was borne in preference to ostensible apostasy. The crusades subjected the Jews to this ordeal. The evil was wrought, not by the regular armies of the cross who were inspired by noble ideals, but by the undisciplined mobs which, for the sake of plunder, associated themselves with the genuine enthusiasts. In 1096 massacres of Jews occurred in many cities of the Rhineland. During the second crusade (1145–1147) Bernard of Clairvaux heroically protested against similar inhumanities. The third crusade, famous for the participation of Richard I., was the occasion for bloody riots in England, especially in York, where 150 Jews immolated themselves to escape baptism. Economically and socially the crusades had disastrous effects upon the Jews (see J. Jacobs, *Jewish Encyclopedia*, iv. 379). Socially they suffered by the outburst of religious animosity. One of the worst forms taken by this ill-will was the oft-revived myth of ritual murder (*q.v.*), and later on when the Black Death devastated Europe (1348–1349) the Jews were the victims of an odious charge of well-poisoning. Economically the results were also injurious. "Before the crusades the Jews had practically a monopoly of trade in Eastern products, but the closer connexion between Europe and the East brought about by the crusades raised up a class of merchant traders among the Christians, and from this time onwards restrictions on the sale of goods by Jews became frequent" (*op. cit.*). After the second crusade the German Jews fell into the class of *servi camerae*, which at first only implied that they enjoyed the immunity of imperial servants, but afterwards made of them slaves and pariahs. At the personal whim of rulers, whether royal or of lower rank, the Jews were expelled from states and principalities and were reduced to a condition of precarious uncertainty as to what the morrow might bring forth. Pope Innocent III. gave strong impetus to the repression of the Jews, especially by ordaining the wearing of a badge. Popular animosity was kindled by the enforced participation of the Jews in public disputations. In 1306 Philip IV. expelled the Jews from France, nine years later Louis X. recalled them for a period of twelve years. Such vicissitudes were the ordinary lot of the Jews for several centuries, and it was their own inner life—the pure life of the home, the idealism of the synagogue, and the belief in ultimate Messianic redemption—that saved them from utter demoralization and despair. Curiously enough in Italy—and particularly in Rome—the external conditions were better. The popes themselves, within their own immediate jurisdiction, were often far more tolerant than their bulls issued for foreign communities, and Torquemada was less an expression than a distortion of the papal policy. In the early 14th century, the age of Dante, the new spirit of the Renaissance made Italian rulers the patrons of art and literature, and the Jews to some extent shared in this gracious change. Robert of Aragon—vicar-general of the papal states—in particular encouraged the Jews and supported them in their literary and scientific ambitions. Small coteries of Jewish minor poets and philosophers were formed, and men like Kalonymos and Immanuel—Dante's friend—shared the versatility and culture of Italy. But in Germany there was no echo of this brighter note. Persecution was elevated into a system, a poll-tax was exacted, and the rabble was allowed (notably in 1336–1337) to give full vent to its fury. Following on this came the Black Death with its terrible consequences in Germany; even in Poland, where the Jews had previously enjoyed considerable rights, extensive massacres took place.

In effect the Jews became outlaws, but their presence being often financially necessary, certain officials were permitted to "hold Jews," who were liable to all forms of arbitrary treatment on the side of their "owners." The Jews had been among the first to appreciate the commercial advantages of permitting the loan of money on interest, but it was the policy of the Church that drove the Jews into money-lending as a characteristic trade. Restrictions on their occupations were everywhere common, and as the Church forbade Christians to engage in usury, this was the only trade open to the Jews. The excessive demands made upon the Jews forbade a fair rate of interest. "The Jews were unwilling sponges by means of which a large part of the subjects' wealth found its way into the royal exchequer" (Abrahams, *Jewish Life in the Middle Ages*, ch. xii.). Hence, though this procedure made the Jews intensely obnoxious to the peoples, they became all the more necessary to the rulers. A favourite form of tolerance was to grant a permit to the Jews to remain in the state for a limited term of years; their continuance beyond the specified time was illegal and they were therefore subject to sudden banishment. Thus a second expulsion of the Jews of France occurred in 1394. Early in the 15th century John Hus—under the inspiration of Wycliffe—initiated at Prague the revolt against the Roman Catholic Church. The Jews suffered in the persecution that followed, and in 1420 all the Austrian Jews were thrown into prison. Martin V. published a favourable bull, but it was ineffectual. The darkest days were nigh. Pope Eugenius (1442) issued a fiercely intolerant missive; the Franciscan John of Capistrano moved the masses to activity by his eloquent denunciations; even Casimir IV. revoked the privileges of the Jews in Poland, when the Turkish capture of Constantinople (1453) offered a new asylum for the hunted Jews of Europe. But in Europe itself the catastrophe was not arrested. The Inquisition in Spain led to the expulsion of the Jews (1492), and this event involved not only the latter but the whole of the Jewish people. "The Jews everywhere felt as if the temple had again been destroyed" (Graetz). Nevertheless, the result was not all evil. If fugitives are for the next half-century to be met with in all parts of Europe, yet, especially in the Levant, there grew up thriving Jewish communities often founded by Spanish refugees. Such incidents as the rise of Joseph Nasi (*q.v.*) to high position under the Turkish government as duke of Naxos mark the coming change. The reformation as such had no favourable influence on Jewish fortunes in Christian Europe, though the championship of the cause of toleration by Reuchlin had considerable value. But the age of the ghetto (*q.v.*) had set in too firmly for immediate amelioration to be possible. It is to Holland and to the 17th century that we must turn for the first real steps towards Jewish emancipation.

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[1] For the importance of the Portuguese Jews, see PORTUGAL: *History*.

47. *Period of Emancipation.*—The ghetto, which had prevailed more or less rigorously for a long period, was not formally prescribed by the papacy until the beginning of the 16th century. The same century was not ended before the prospect of liberty dawned on the Jews. Holland from the moment that it joined the union of Utrecht (1579) deliberately set its face against religious persecution (*Jewish Encyclopedia*, i. 537). Maranos, fleeing to the Netherlands, were welcomed; the immigrants were wealthy, enterprising and cultured. Many Jews, who had been compelled to conceal their faith, now came into the open. By the middle of the 17th century the Jews of Holland had become of such importance that Charles II. of England (then in exile) entered into negotiations with the Amsterdam Jews (1656). In that same year the Amsterdam community was faced by a serious problem in connexion with Spinoza. They brought themselves into notoriety by excommunicating the philosopher—an act of weak self-defence on the part of men who had themselves but recently been admitted to the country, and were timorous of the suspicion that they shared Spinoza's then execrated views. It is more than a mere coincidence that this step was taken during the absence in England of one of the ablest and most notable of the Amsterdam rabbis. At the time, Menasseh ben Israel (*q.v.*) was in London, on a mission to Cromwell. The Jews had been expelled from England by Edward I., after a sojourn in the country of rather more than two centuries, during which they had been the licensed and oppressed money-lenders of the realm, and had—through the special exchequer of the Jews—been used by the sovereign as a means of extorting a revenue from his subjects. In the 17th century a considerable number of Jews had made a home in the English colonies, where from the first they enjoyed practically equal rights with the Christian settlers. Cromwell, upon the inconclusive termination of the conference summoned in 1655 at Whitehall to consider the Jewish question, tacitly assented to the return of the Jews to this country, and at the restoration his action was confirmed. The English Jews "gradually substituted for the personal protection of the crown, the sympathy and confidence of the nation" (L. Wolf, *Menasseh ben Israel's Mission to Cromwell*, p. lxxv.). The city of London was the first to be converted to the new attitude. "The wealth they brought into the country, and their fruitful commercial activity, especially in the colonial trade, soon revealed them as an indispensable element of the prosperity of the city. As early as 1668, Sir Josiah Child, the millionaire governor of the East India company, pleaded for their naturalization on the score of their commercial utility. For the same reason the city found itself compelled at first to connive at their illegal representation on 'Change, and then to violate its own rules by permitting them to act as brokers without previously taking up the freedom. At this period they controlled more of the foreign and colonial trade than all the other alien merchants in London put together. The momentum of their commercial enterprise and stalwart patriotism proved irresistible. From the exchange to the city council chamber, thence to the aldermanic court, and eventually to the mayoralty itself, were inevitable stages of an emancipation to which their large interests in the city and their high character entitled them. Finally the city of London—not only as the converted champion of religious liberty but as the convinced apologist of the Jews—sent Baron Lionel de Rothschild to knock at the door of the unconverted House of Commons as parliamentary representative of the first city in the world" (Wolf, *loc. cit.*).

The pioneers of this emancipation in Holland and England were Sephardic (or Spanish) Jews—descendants of the Spanish exiles. In the meantime the Ashkenazic (or German) Jews had been working out their own salvation. The chief effects of the change were not felt till the 18th century. In England emancipation was of democratic origin and concerned itself with practical questions. On the Continent, the movement was more aristocratic and theoretical; it was part of the intellectual renaissance which found its most striking expression in the principles of the French Revolution. Throughout Europe the 18th century was less an era of stagnation than of transition. The condition of the European Jews seems, on a superficial examination, abject enough. But, excluded though they were from most trades and occupations, confined to special quarters of the city, disabled from sharing most of the amenities of life, the Jews nevertheless were gradually making their escape from the ghetto and from the moral degeneration which it had caused. Some ghettos (as in Moravia) were actually not founded till the 18th century, but the careful observer can perceive clearly that at that period the ghetto was a doomed institution. In the "dark ages" Jews enjoyed neither rights nor privileges; in the 18th century they were still without rights but they had privileges. A grotesque feature of the time in Germany and Austria was the class of court Jews, such as the Oppenheims, the personal favourites of rulers and mostly their victims when their usefulness had ended. These men often rendered great services to their fellow-Jews, and one of the results was the growth in Jewish society of an aristocracy of wealth, where previously there had been an aristocracy of learning. Even more important was another privileged class—that of the *Schutz-Jude* (protected Jew). Where there were no rights, privileges had to be bought. While the court Jews were the favourites of kings, the protected Jews were the protégés of town councils. Corruption is the frequent concomitant of privilege, and thus the town councils often connived for a price at the presence in their midst of Jews whose admission was illegal. Many Jews found it possible to evade laws of domicile by residing in one place and trading in another. Nor could they be effectually excluded from the fairs, the great markets of the 18th century. The Sephardic Jews in all these respects occupied a superior position, and they merited the partiality shown to them. Their personal dignity and the vast range of their colonial enterprises were in striking contrast to the retail traffic of the Ashkenazim and their degenerate bearing and speech. Peddling had been forced on the latter by the action of the gilds which were still powerful in the 18th century on the Continent. Another cause may be sought in the Cossack assaults on the Jews at an earlier period. Crowds of wanderers were to be met on every road; Germany, Holland and Italy were full of Jews who, pack on shoulder, were seeking a precarious livelihood at a time when peddling was neither lucrative nor safe.

But underneath all this were signs of a great change. The 18th century has a goodly tale of Jewish artists in metal-work, makers of pottery, and (wherever the gilds permitted it) artisans and wholesale manufacturers of many important commodities. The last attempts at exclusion were irritating enough; but they differed from the earlier persecution. Such strange enactments as the *Familianten-Gesetz*, which prohibited more than one member of a family from marrying, broke up families by forcing the men to emigrate. In 1781 Dohm pointed to the fact that a Jewish father could seldom hope to enjoy the happiness of living with his children. In that very year, however, Joseph II. initiated in Austria a new era for the Jews. This Austrian reformation was so typical of other changes elsewhere, and so expressive of the previous disabilities of the Jews, that, even in this rapid summary, space must be spared for some of the details supplied by Graetz. "By this new departure (19th of October 1781) the Jews were permitted to learn handicrafts, arts and sciences, and with certain restrictions to devote themselves to agriculture. The doors of the universities and academies, hitherto closed to them, were thrown open. . . . An ordinance of November 2 enjoined that the Jews were everywhere considered fellow-men, and all excesses against them were to be avoided. The Leibzoll (body-tax) was also abolished, in addition to the special law-taxes, the passport duty, the night-duty and all similiar imposts which had stamped the Jews as outcast, for they were now (Dec. 19) to have equal rights with the Christian inhabitants." The Jews were not, indeed, granted complete citizenship, and their residence and public worship in Vienna and other Austrian cities were circumscribed and even penalized. "But Joseph II. annulled a number of vexatious, restrictive regulations, such as the compulsory wearing of beards, the prohibition against going out in the forenoon on Sundays or holidays, or frequenting public pleasure resorts. The emperor even permitted Jewish wholesale merchants, notables and their sons, to wear swords (January 2, 1782), and especially insisted that Christians should behave in a friendly manner towards Jews."

48. *The Mendelssohn Movement.*—This notable beginning to the removal of "the ignominy of a thousand years" was causally connected with the career of Moses Mendelssohn (1729–1786; *q.v.*). He found on both sides an unreadiness for approximation: the Jews had sunk into apathy and degeneration, the Christians were still moved by hereditary antipathy. The failure of the hopes entertained of Sabbatai Zebi (*q.v.*) had plunged the Jewries of the world into despair. This Smyrnan pretender not only proclaimed himself Messiah (*c.* 1650) but he was accepted in that rôle by vast numbers of his brethren. At the moment when Spinoza was publishing a system which is still a dominating note of modern philosophy, this other son of Israel was capturing the very heart of Jewry. His miracles were reported and eagerly believed everywhere; "from Poland, Hamburg and Amsterdam treasures poured into his court; in the Levant young men and maidens prophesied before him; the Persian Jews refused to till the fields. 'We shall pay no more taxes,' they said, 'our Messiah is come.'" The expectation that he would lead Israel in triumph to the Holy Land was doomed to end in disappointment. Sabbatai lacked one quality without which enthusiasm is ineffective; he failed to believe in himself. At the critical moment he embraced Islam to escape death, and though he was still believed in by many—it was not Sabbatai himself but a phantom resemblance that had assumed the turban!—his meteoric career did but colour the sky of the Jews with deeper blackness. Despite all this, one must not fall into the easy error of exaggerating the degeneration into which the Jewries of the world fell from the middle of the 17th till the middle of the 18th century. For Judaism had organized itself; the *Shulḥan aruch* of Joseph Qaro (*q.v.*), printed in 1564 within a decade of its completion, though not accepted without demur, was nevertheless widely admitted as the code of Jewish life. If in more recent times progress in Judaism has implied more or less of revolt against the rigors and fetters of Qaro's code, yet for 250 years it was a powerful safeguard against demoralization and stagnation. No community living in full accordance with that code could fail to reach a high moral and intellectual level.

It is truer to say that on the whole the Jews began at this period to abandon as hopeless the attempt to find a place for themselves in the general life of their country. Perhaps they even ceased to desire it. Their children were taught without any regard to outside conditions, they spoke and wrote a jargon, and their whole training, both by what it included and by what it excluded, tended to produce isolation from their neighbours. Moses Mendelssohn, both by his career and by his propaganda, for ever put an end to these conditions; he more than any other man. Born in the ghetto of Dessau, he was not of the ghetto. At the age of fourteen he found his way to Berlin, where Frederick the Great, inspired by the spirit of Voltaire, held the maxim that "to oppress the Jews never brought prosperity to any government." Mendelssohn became a warm friend of Lessing, the hero of whose drama *Nathan the Wise* was drawn from the Dessau Jew. Mendelssohn's *Phaedo*, on the immortality of the soul, brought the author into immediate fame, and the simple home of the "Jewish Plato" was sought by many of the leaders of Gentile society in Berlin. Mendelssohn's translation of the Pentateuch into German with a new commentary by himself and others introduced the Jews to more modern ways of thinking. Two results emanated from Mendelssohn's work. A new school of scientific study of Judaism emerged, to be dignified by the names of Leopold Zunz (*q.v.*), H. Graetz (*q.v.*) and many others. On the other hand Mendelssohn by his pragmatic conception of religion (specially in his *Jerusalem*) weakened the belief of certain minds in the absolute truth of Judaism, and thus his own grandchildren (including the famous musician Felix Mendelssohn-Bartholdy) as well as later Heine, Börne, Gans and Neander, embraced Christianity. Within Judaism itself two parties were formed, the Liberals and the Conservatives, and as time went on these tendencies definitely organized themselves. Holdheim (*q.v.*) and Geiger (*q.v.*) led the reform movement in Germany and at the present day the effects of the movement are widely felt in America on the Liberal side and on the opposite side in the work of the neo-orthodox school founded by S. R. Hirsch (*q.v.*). Modern seminaries were established first in Breslau by Zacharias Fränkel (*q.v.*) and later in other cities. Brilliant results accrued from all this participation in the general life of Germany. Jews, engaged in all the professions and pursuits of the age, came to the front in many branches of public life, claiming such names as Riesser (d. 1863) and Lasker in politics, Auerbach in literature, Rubinstein and Joachim in music, Traube in medicine, and Lazarus in psychology. Especially famous have been the Jewish linguists, pre-eminent among them Theodor Benfey (1809–1881), the pioneer of modern comparative philology; and the Greek scholar and critic Jakob Bernays (1824–1881).

49. *Effect of the French Revolution.*—In close relation to the German progress in Mendelssohn's age, events had been progressing in France, where the Revolution did much to improve the Jewish condition, thanks largely to the influence of Mirabeau. In 1807 Napoleon convoked a Jewish assembly in Paris. Though the decisions of this body had no binding force on the Jews generally, yet in some important particulars its decrees represent principles widely adopted by the Jewish community. They proclaim the acceptance of the spirit of Mendelssohn's reconciliation of the Jews to modern life. They assert the citizenship and patriotism of Jews, their determination to accommodate themselves to the present as far as they could while retaining loyalty to the past. They declare their readiness to adapt the law of the synagogue to the law of the land, as for instance in the question of marriage and divorce. No Jew, they decided, may perform the ceremony of marriage unless civil formalities have been fulfilled; and divorce is allowed to the Jews only if and so far as it is confirmatory of a legal divorce pronounced by the civil law of the land. The French assembly did not succeed in obtaining formal assent to these decisions (except from Frankfort and Holland), but they gained the practical adhesion of the majority of Western and American Jews. Napoleon, after the report of the assembly, established the consistorial system which remained in force, with its central consistory in the capital, until the recent separation of church and state. Many French Jews acquired fame, among them the ministers Crémieux (1796–1879), Fould, Gondchaux and Raynal; the archaeologists and philologians Oppert, Halévy, Munk, the Derenbourgs, Darmesteters and Reinachs; the musicians Halévy, Waldteufel and Meyerbeer; the authors and dramatists Catulle Mendès and A. d'Ennery, and many others, among them several distinguished occupants of civil and military offices.

50. *Modern Italy.*—Similar developments occurred in other countries, though it becomes impossible to treat the history of the Jews, from this time onwards, in general outline. We must direct our attention to the most important countries in such detail as space permits. And first as to Italy, where the Jews in a special degree have identified themselves with the national life. The revolutions of 1848, which greatly affected the position of the Jews in several parts of Europe, brought considerable gain to the Jews of Italy. During the war against Austria in the year named, Isaac Pesaro Marogonato was finance minister in Venice. Previously to this date the Jews were still confined to the ghetto, but in 1859, in the Italy united under Victor

Emanuel II., the Jews obtained complete rights, a privilege which was extended also to Rome itself in 1870. The Italian Jews devoted themselves with ardour to the service of the state. Isaac Artom was Cavour's secretary, L' Olper a counsellor of Mazzini. "The names of the Jewish soldiers who died in the cause of Italian liberty were placed along with those of their Christian fellow soldiers on the monuments erected in their honour" (*Jewish Encyclopedia*, vii. 10). More recently men like Wollemberg, Ottolenghi and Luzzatti rose to high positions as ministers of state. Most noted of recent Jewish scholars in Italy was S. D. Luzzatto (*q.v.*).

51. *Austria.*—From Italy we may turn to the country which so much influenced Italian politics, Austria, which had founded the system of "Court Jews" in 1518, had expelled the Jews from Vienna as late as 1670, when the synagogue of that city was converted into a church. But economic laws are often too strong for civil vagaries or sectarian fanaticism, and as the commerce of Austria suffered by the absence of the Jews, it was impossible to exclude the latter from the fairs in the provinces of from the markets of the capital. As has been pointed out above, certain protected Jews were permitted to reside in places where the expulsion of the Jews had been decreed. But Maria Theresa (1740–1780) was distinguished for her enmity to the Jews, and in 1744 made a futile attempt to secure their expulsion from Bohemia. "In 1760 she issued an order that all unbearded Jews should wear a yellow badge on their left arm" (*Jewish Encyclopedia*, ii. 330). The most petty limitations of Jewish commercial activity continued; thus at about this period the community of Prague, in a petition, "complain that they are not permitted to buy victuals in the market before a certain hour, vegetables not before 9 and cattle not before 11 o'clock; to buy fish is sometimes altogether prohibited; Jewish druggists are not permitted to buy victuals at the same time with Christians" (*op. cit.*). So, too, with taxation. It was exorbitant and vexatious. To pay for rendering inoperative the banishment edict of 1744, the Jews were taxed 3,000,000 florins annually for ten years. In the same year it was decreed that the Jews should pay "a special tax of 40,000 florins for the right to import their citrons for the feast of booths." Nevertheless, Joseph II. (1780–1790) inaugurated a new era for the Jews of his empire. Soon after his accession he abolished the distinctive Jewish dress, abrogated the poll-tax, admitted the Jews to military service and their children to the public schools, and in general opened the era of emancipation by the *Toleranzpatent* of 1782. This enlightened policy was not continued by the successors of Joseph II. Under Francis II. (1792–1835) economic and social restrictions were numerous. Agriculture was again barred; indeed the Vienna congress of 1815 practically restored the old discriminations against the Jews. As time went on, a more progressive policy intervened, the special form of Jewish oath was abolished in 1846, and in 1848, as a result of the revolutionary movement in which Jews played an active part, legislation took a more liberal turn. Francis Joseph I. ascended the throne in that year, and though the constitution of 1849 recognized the principle of religious liberty, an era of reaction supervened, especially when "the concordat of 1855 delivered Austria altogether into the hands of the clericals." But the day of medieval intolerance had passed, and in 1867 the new constitution "abolished all disabilities on the ground of religious differences," though anti-Semitic manipulation of the law by administrative authority has led to many instances of intolerance. Many Jews have been members of the Reichsrath, some have risen to the rank of general in the army, and Austrian Jews have contributed their quota to learning, the arts and literature. Löw, Jellinek, Kaufmann, as scholars in the Jewish field; as poets and novelists, Kompert, Franzos, L. A. Frankl; the pianist Moscheles, the dramatist Mosenthal, and the actor Sonnenthal, the mathematician Spitzer and the chess-player Steinitz are some of the most prominent names. The law of 1890 makes it "compulsory for every Jew to be a member of the congregation of the district in which he resides, and so gives to every congregation the right to tax the individual members" (*op. cit.*). A similar obligation prevails in parts of Germany. A Jew can avoid the communal tax only by formally declaring himself as outside the Jewish community. The Jews of Hungary shared with their brethren in Austria the same alternations of expulsion and recall. By the law "De Judaeis" passed by the Diet in 1791 the Jews were accorded protection, but half a century passed before their tolerated condition was regularized. The "toleration-tax" was abolished in 1846. During the revolutionary outbreak of 1848, the Jews suffered severely in Hungary, but as many as 20,000 Jews are said to have joined the army. Kossuth succeeded in granting them temporary emancipation, but the suppression of the War of Independence led to an era of royal autocracy which, while it advanced Jewish culture by enforcing the establishment of modern schools, retarded the obtaining of civic and political rights. As in Austria, so in Hungary, these rights were granted by the constitution of 1867. But one step remained. The Hungarian Jews did not consider themselves fully emancipated until the Synagogue was "duly recognized as one of the legally acknowledged religions of the country." This recognition was granted by the law of 1895–1896. In the words of Büchler (*Jewish Encyclopedia*, vi. 503): "Since their emancipation the Jews have taken an active part in the political, industrial, scientific and artistic life of Hungary. In all these fields they have achieved prominence. They have also founded great religious institutions. Their progress has not been arrested even by anti-Semitism, which first developed in 1883 at the time of the Tisza-Eslar accusation of ritual murder."

52. *Other European Countries.*—According to M. Caimi the present Jewish communities of Greece are divisible into five groups: (1) Arta (Epirus); (2) Chalcis (Euboea); (3) Athens (Attica); (4) Volo, Larissa and Trikala (Thessaly); and (5) Corfu and Zante (Ionian Islands). The Greek constitution admits no religious disabilities, but anti-Semitic riots in Corfu and Zante in 1891 caused much distress and emigration. In Spain there has been of late a more liberal attitude towards the Jews, and there is a small congregation (without a public synagogue) in Madrid. In 1858 the edict of expulsion was repealed. Portugal, on the other hand, having abolished the Inquisition in 1821, has since 1826 allowed Jews freedom of religion, and there are synagogues in Lisbon and Faro. In Holland the Jews were admitted to political liberty in 1796. At present more than half of the Dutch Jews are concentrated in Amsterdam, being largely engaged in the diamond and tobacco trades. Among famous names of recent times foremost stands that of the artist Josef Israels. In 1675 was consecrated in Amsterdam the synagogue which is still the most noted Jewish edifice in Europe. Belgium granted full freedom to the Jews in 1815, and the community has since 1808 been organized on the state consistorial system, which till recently also prevailed in France. It was not till 1874 that full religious equality was granted to the Jews of Switzerland. But there has been considerable interference (ostensibly on humanitarian grounds) with the Jewish method of slaughtering animals for food (*Sheḥitah*) and the method was prohibited by a referendum in 1893. In the same year a similar enactment was passed in Saxony, and the subject is a favourite one with anti-Semites, who have enlisted on their side some scientific authorities, though the bulk of expert opinion is in favor of *Sheḥitah* (see Dembo, *Das Schlachten*, 1894). In Sweden the Jews have all the rights which are open to non-Lutherans; they cannot become members of the council of state. In Norway there is a small Jewish settlement (especially in Christiania) who are engaged in industrial pursuits and enjoy complete liberty. Denmark has for long been distinguished for its liberal policy towards the Jews. Since 1814 the latter have been eligible as magistrates, and in 1849 full equality was formally ratified. Many Copenhagen Jews achieved distinction as manufacturers, merchants and bankers, and among famous Jewish men of letters may be specially named Georg Brandes.

The story of the Jews in Russia and Rumania remains a black spot on the European record. In Russia the Jews are more numerous and more harshly treated than in any other part of the world. In the remotest past Jews were settled in much of the territory now included in Russia, but they are still treated as aliens. They are restricted to the pale of settlement which was first established in 1791. The pale now includes fifteen governments, and under the May laws of 1892 the congestion of the Jewish population, the denial of free movement, and the exclusion from the general rights of citizens were rendered more oppressive than ever before. The right to leave the pale is indeed granted to merchants of the first gild, to those possessed of certain educational diplomas, to veteran soldiers and to certain classes of skilled artisans. But these concessions are unfavourably interpreted and much extortion results. Despite a huge emigration of Jews from Russia, the congestion within the pale is the cause of terrible destitution and misery. Fierce massacres occurred in Nizhniy-Novgorod in 1882, and in Kishinev in 1903. Many other pogroms have occurred, and the condition of the Jews has been reduced to one of abject poverty and despair. Much was hoped from the duma, but this body has proved bitterly opposed to the Jewish claim for liberty. Yet in spite of these disabilities there are amongst the Russian Jews many enterprising contractors, skilful doctors, and successful lawyers and scientists. In Rumania, despite the Berlin Treaty, the Jews are treated as aliens, and but a small number have been naturalized. They are excluded from most of the professions and are hampered in every direction.

53. *Oriental Countries.*—In the Orient the condition of the Jews has been much improved by the activity of Western organizations, of which something is said in a later paragraph. Modern schools have been set up in many places, and Palestine has been the scene of a notable educational and agricultural revival, while technical schools—such as the agricultural college near Jaffa and the schools of the alliance and the more recent Bezalel in Jerusalem—have been established. Turkey has always on the whole tolerated the Jews, and much is hoped from the new régime. In Morocco the Jews, who until late in the 19th century were often persecuted, are still confined to a *mellah* (separate quarter), but at the coast-towns there are prosperous Jewish communities mostly engaged in commerce. In other parts of the same continent, in Egypt and in South Africa, many Jews have settled, participating in all industrial and financial pursuits. Recently a mission has been sent to the Falashas of Abyssinia, and much interest has been felt in such outlying branches of the Jewish people as the Black Jews of Cochin and the Bene Israel community of Bombay. In Persia Jews are often the victims of popular outbursts as well as of official extortion, but there are fairly prosperous communities at Bushire, Isfahan, Teheran and Kashan (in Shiraz they are in low estate). The recent advent of constitutional government may improve the condition of the Jews.

54. *The United Kingdom.*—The general course of Jewish history in England has been indicated above. The Jews came to England at least as early as the Norman Conquest; they were expelled from Bury St Edmunds in 1190, after the massacres at the coronation of Richard I.; they were required to wear badges in 1218. At the end of the 12th century was established the "exchequer of the Jews," which chiefly dealt with suits concerning money-lending, and arranged a "continual flow of money from the Jews to the royal treasury," and a so-called "parliament of the Jews" was summoned in 1241; in 1275 was enacted the statute *de Judaismo* which, among other things, permitted the Jews to hold land. But this concession was illusory, and as the statute prevented Jews from engaging in finance—the only occupation which had been open to them—it was a prelude to their expulsion in 1290. There were few Jews in England from that date till the Commonwealth, but Jews settled in the American colonies earlier in the 17th century, and rendered considerable services in the advancement of English commerce. The Whitehall conference of 1655 marks a change in the status of the Jews in England itself, for though no definite results emerged it was clearly defined by the judges that there was no legal obstacle to the return of the Jews. Charles II. in 1664 continued Cromwell's tolerant policy. No serious attempt towards the emancipation of the Jews was made till the Naturalization Act of 1753, which was, however, immediately repealed. Jews no longer attached to the Synagogue, such as the Herschels and Disraelis, attained to fame. In 1830 the first Jewish emancipation bill was brought in by Robert Grant, but it was not till the legislation of 1858–1860 that Jews obtained full parliamentary rights. In other directions progress was more rapid. The office of sheriff was thrown open to Jews in 1835 (Moses Montefiore, sheriff of London was knighted in 1837); Sir I. L. Goldsmid was made a baronet in 1841, Baron Lionel de Rothschild was elected to Parliament in 1847 (though he was unable to take his seat), Alderman (Sir David) Salomons became lord mayor of London in 1855 and Francis Goldsmid was made a Q.C. in 1858. In 1873 Sir George Jessel was made a judge, and Lord Rothschild took his seat in the House of Lords as the first Jewish peer in 1886. A fair proportion of Jews have been elected to the House of Commons, and Mr Herbert Samuel rose to cabinet rank in 1909. Sir Matthew Nathan has been governor of Hong-Kong and Natal, and among Jewish statesmen in the colonies Sir Julius Vogel and V. L. Solomon have been prime ministers (HYAMSON: *A History of the Jews in England*, p. 342). It is unnecessary to remark that in the British colonies the Jews everywhere enjoy full citizenship. In fact, the colonies emancipated the Jews earlier than did the mother country. Jews were settled in Canada from the time of Wolfe, and a congregation was founded at Montreal in 1768, and since 1832 Jews have been entitled to sit in the Canadian parliament. There are some thriving Jewish agricultural colonies in the same dominion. In Australia the Jews from the first were welcomed on perfectly equal terms. The oldest congregation is that of Sydney (1817); the Melbourne community dates from 1844. Reverting to incidents in England itself, in 1870 the abolition of university tests removed all restrictions on Jews at Oxford and Cambridge, and both universities have since elected Jews to professorships and other posts of honour. The communal organization of English Jewry is somewhat inchoate. In 1841 an independent reform congregation was founded, and the Spanish and Portuguese Jews have always maintained their separate existence with a Ḥaham as the ecclesiastical head. In 1870 was founded the United Synagogue, which is a metropolitan organization, and the same remark applies to the more recent Federation of Synagogues. The chief rabbi, who is the ecclesiastical head of the United Synagogue, has also a certain amount of authority over the provincial and colonial Jewries, but this is nominal rather than real. The provincial Jewries, however, participate in the election of the chief rabbi. At the end of 1909 was held the first conference of Jewish ministers in London, and from this is expected some more systematic organization of scattered communities. Anglo-Jewry is rich, however, in charitable, educational and literary institutions; chief among these respectively may be named the Jewish board of guardians (1859), the Jews' college (1855), and the Jewish historical society (1893). Besides the distinctions already noted, English Jews have risen to note in theology (C. G. Montefiore), in literature (Israel Zangwill and Alfred Sutro), in art (S. Hart, R.A., and S. J. Solomon, R.A.) in music (Julius Benedict and Frederick Hymen Cowen). More than 1000 English and colonial Jews participated as active combatants in the South African War. The immigration of Jews from Russia was mainly responsible for the ineffective yet oppressive Aliens Act of 1905. (Full accounts of Anglo-Jewish institutions are given in the *Jewish Year-Book* published annually since 1895.)

55. *The American Continent.*—Closely parallel with the progress of the Jews in England has been their steady advancement in America. Jews made their way to America early in the 16th century, settling in Brazil prior to the Dutch occupation. Under Dutch rule they enjoyed full civil rights. In Mexico and Peru they fell under the ban of the Inquisition. In Surinam the Jews were treated as British subjects; in Barbadoes, Jamaica and New York they are found as early as the first half of the 17th century. During the War of Independence the Jews of America took a prominent part on both sides, for under the British rule many had risen to wealth and high social position. After the Declaration of Independence, Jews are found all over America, where they

have long enjoyed complete emancipation, and have enormously increased in numbers, owing particularly to immigration from Russia. The American Jews bore their share in the Civil War (7038 Jews were in the two armies), and have always identified themselves closely with national movements such as the emancipation of Cuba. They have attained to high rank in all branches of the public service, and have shown most splendid instances of far-sighted and generous philanthropy. Within the Synagogue the reform movement began in 1825, and soon won many successes, the central conference of American rabbis and Union College (1875) at Cincinnati being the instruments of this progress. At the present time orthodox Judaism is also again acquiring its due position and the Jewish theological seminary of America was founded for this purpose. In 1908 an organization, inclusive of various religious sections, was founded under the description "the Jewish community of New York." There have been four Jewish members of the United States senate, and about 30 of the national House of Representatives. Besides filling many diplomatic offices, a Jew (O. S. Straus) has been a member of the cabinet. Many Jews have filled professorial chairs at the universities, others have been judges, and in art, literature (there is a notable Jewish publication society), industry and commerce have rendered considerable services to national culture and prosperity. American universities have owed much to Jewish generosity, a foremost benefactor of these (as of many other American institutions) being Jacob Schiff. Such institutions as the Gratz and Dropsie colleges are further indications of the splendid activity of American Jews in the educational field. The Jews of America have also taken a foremost place in the succour of their oppressed brethren in Russia and other parts of the world. (Full accounts of American Jewish institutions are given in the *American Jewish Year-Book*, published annually since 1899.)

56. *Anti-Semitism.*—It is saddening to be compelled to close this record with the statement that the progress of the European Jews received a serious check by the rise of modern anti-Semitism in the last quarter of the 19th century. While in Russia this took the form of actual massacre, in Germany and Austria it assumed the shape of social and civic ostracism. In Germany Jews are still rarely admitted to the rank of officers in the army, university posts are very difficult of access, Judaism and its doctrines are denounced in medieval language, and a tone of hostility prevails in many public utterances. In Austria, as in Germany, anti-Semitism is a factor in the parliamentary elections. The legend of ritual murder (*q.v.*) has been revived, and every obstacle is placed in the way of the free intercourse of Jews with their Christian fellow-citizens. In France Edouard Adolphe Drumont led the way to a similar animosity, and the popular fury was fanned by the Dreyfus case. It is generally felt, however, that this recrudescence of anti-Semitism is a passing phase in the history of culture (see ANTI-SEMITISM).

57. *The Zionist Movement.*—The Zionist movement (see ZIONISM), founded in 1895 by Theodor Herzl (*q.v.*) was in a sense the outcome of anti-Semitism. Its object was the foundation of a Jewish state in Palestine, but though it aroused much interest it failed to attract the majority of the emancipated Jews, and the movement has of late been transforming itself into a mere effort at colonization. Most Jews not only confidently believe that their own future lies in progressive development *within* the various nationalities of the world, but they also hope that a similar consummation is in store for the as yet unemancipated branches of Israel. Hence the Jews are in no sense internationally organized. The influence of the happier communities has been exercised on behalf of those in a worse position by individuals such as Sir Moses Montefiore (*q.v.*) rather than by societies or leagues. From time to time incidents arise which appeal to the Jewish sympathies everywhere and joint action ensues. Such incidents were the Damascus charge of ritual murder (1840), the forcible baptism of the Italian child Mortara (1858), and the Russian pogroms at various dates. But all attempts at an international union of Jews, even in view of such emergencies as these, have failed. Each country has its own local organization for dealing with Jewish questions. In France the Alliance Israélite (founded in 1860), in England the Anglo-Jewish Association (founded in 1871), in Germany the Hilfsverein der deutschen Juden, and in Austria the Israelitische Allianz zu Wien (founded 1872), in America the American Jewish Committee (founded 1906), and similar organizations in other countries deal only incidentally with political affairs. They are concerned mainly with the education of Jews in the Orient, and the establishment of colonies and technical institutions. Baron Hirsch (*q.v.*) founded the Jewish colonial association, which has undertaken vast colonizing and educational enterprises, especially in Argentina, and more recently the Jewish territorial organization has been started to found a home for the oppressed Jews of Russia. All these institutions are performing a great regenerative work, and the tribulations and disappointments of the last decades of the 19th century were not all loss. The gain consisted in the rousing of the Jewish consciousness to more virile efforts towards a double end, to succour the persecuted and ennoble the ideals of the emancipated.

58. *Statistics.*—Owing to the absence of a religious census in several important countries, the Jewish population of the world can only be given by inferential estimate. The following approximate figures are taken from the *American Jewish Year-Book* for 1909–1910 and are based on similar estimates in the English *Jewish Year-Book*, the *Jewish Encyclopedia*, Nossig's *Jüdische Statistik* and the *Reports* of the Alliance Israélite Universelle According to these estimates the total Jewish population of the world in the year named was approximately 11,500,000. Of this total there were in the British Empire about 380,000 Jews (British Isles 240,000, London accounts for 150,000 of these; Canada and British Columbia 60,000; India 18,000; South Africa 40,000). The largest Jewish populations were those of Russia (5,215,000), Austria-Hungary (2,084,000), United States of America (1,777,000), Germany (607,000, of whom 409,000 were in Prussia), Turkey (463,000, of whom some 78,000 resided in Palestine), Rumania (250,000), Morocco (109,000) and Holland (106,000). Others of the more important totals are: France 95,000 (besides Algeria 63,000 and Tunis 62,000); Italy 52,000; Persia 49,000; Egypt 39,000; Bulgaria 36,000; Argentine Republic 30,000; Tripoli 19,000; Turkestan and Afghanistan 14,000; Switzerland and Belgium each 12,000; Mexico 9000; Greece 8000; Servia 6000; Sweden and Cuba each 4000; Denmark 3500; Brazil and Abyssinia (Falashas) each 3000; Spain and Portugal 2500; China and Japan 2000. There are also Jews in Curaçoa, Surinam, Luxemburg, Norway, Peru, Crete and Venezuela; but in none of these does the Jewish population much exceed 1000.

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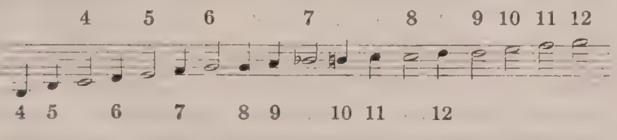
JEWSBURY, GERALDINE ENDSOR (1812–1880), English writer, daughter of Thomas Jewsbury, a Manchester merchant, was born in 1812 at Measham, Derbyshire. Her first novel, *Zoe: the History of Two Lives*, was published in 1845, and was followed by *The Half Sisters* (1848), *Marian Withers* (1851), *Constance Herbert* (1855), *The Sorrows of Gentility* (1856), *Right or Wrong* (1859). In 1850 she was invited by Charles Dickens to write for *Household Words;* for many years she was a frequent contributor to the *Athenaeum* and other journals and magazines. It is, however, mainly on account of her friendship with Thomas Carlyle and his wife that her name is remembered. Carlyle described her, after their first meeting in 1841, as "one of the most interesting young women I have seen for years; clear delicate sense and courage looking out of her small sylph-like figure." From this time till Mrs Carlyle's death in 1866, Geraldine Jewsbury was the most intimate of her friends. The selections from Geraldine Jewsbury's letters to Jane Welsh Carlyle (1892, ed. Mrs Alexander Ireland) prove how confidential were the relations between the two women for a quarter of a century. In 1854 Miss Jewsbury removed from Manchester to London to be near her friend. To her Carlyle turned for sympathy when his wife died; and at his request she wrote down some "biographical anecdotes" of Mrs Carlyle's childhood and early married life. Carlyle's comment was that "few or none of these narratives are correct in details, but there is a certain mythical truth in all or most of them;" and he added, "the Geraldine accounts of her (Mrs Carlyle's) childhood are substantially correct." He accepted them as the groundwork for his own essay on "Jane Welsh Carlyle," with which they were therefore incorporated by Froude when editing Carlyle's *Reminiscences*. Miss Jewsbury was consulted by Froude when he was preparing Carlyle's biography, and her recollection of her friend's confidences confirmed the suspicion that Carlyle had on one occasion used physical violence towards his wife. Miss Jewsbury further informed Froude that the secret of the domestic troubles of the Carlyles lay in the fact that Carlyle had been "one of those persons who ought never to have married," and that Mrs Carlyle had at one time contemplated having her marriage legally annulled (see *My Relations with Carlyle*, by James Anthony Froude, 1903). The endeavour has been made to discredit Miss Jewsbury in relation to this matter, but there seems to be no sufficient ground for doubting that she accurately repeated what she had learnt from Mrs Carlyle's own lips. Miss Jewsbury died in London on the 23rd of September 1880.

JEW'S EARS, the popular name of a fungus, known botanically as *Hirneola auricula-judae*, so called from its shape, which somewhat resembles a human ear. It is very thin, flexible, flesh-coloured to dark brown, and one to three inches broad. It is common on branches of elder, which it often kills, and is also found on elm, willow, oak and other trees. It was formerly prescribed as a remedy for dropsy.

JEW'S HARP, or JEW'S TRUMP (Fr. *guimbarde*, O. Fr. *trompe*, *gronde*; Ger. *Mundharmonica*, *Maultrommel*, *Brummeisen*; Ital. *scaccia-pensieri* or *spassa-pensiero*), a small musical instrument of percussion, known for centuries all over Europe. "Jew's trump" is the older name, and "trump" is still used in parts of Great Britain. Attempts have been made to derive "Jew's" from "jaws" or Fr. *jeu*, but, though there is no apparent reason for associating the instrument with the Jews, it is certain that "Jew's" is the original form (see the *New English Dictionary* and C. B. Mount in *Notes and Queries* (Oct. 23, 1897, p. 322). The instrument consists of a slender tongue of steel riveted at one end to the base of a pear-shaped steel loop; the other end of the tongue, left free and passing out between the two branches of the frame, terminates in a sharp bend at right angles, to enable the player to depress it by an elastic blow and thus set it vibrating while firmly pressing the branches of the frame against his teeth. The vibrations of the steel tongue produce a compound sound composed of a fundamental and its harmonics. By using the cavity of the mouth as a resonator, each harmonic in succession can be isolated and reinforced, giving the instrument the compass shown. The lower harmonics of the series cannot be obtained, owing to the limited capacity of the resonating cavity. The black notes on the stave show the scale which may be produced by using two harps, one tuned a fourth above the other. The player on the Jew's harp, in order to isolate the harmonics, frames his mouth as though intending to pronounce the various vowels. At the beginning of the 19th century, when much energy and ingenuity were being expended in all countries upon the invention of new musical instruments, the *Maultrommel*, re-christened *Mundharmonica* (the most rational of all its names), attracted attention in Germany. Heinrich Scheibler devised an ingenious holder with a handle, to contain five Jew's harps, all tuned to different notes; by holding one in each hand, a large compass, with duplicate notes, became available; he called this complex Jew's harp *Aura*[1] and with it played themes with variations, marches, Scotch reels, &c. Other virtuosi, such as Eulenstein, a native of Würtemberg, achieved the same result by placing the variously tuned Jew's harps upon the table in front of him, taking them up and setting them down as required. Eulenstein created a sensation in London in 1827 by playing on no fewer than sixteen Jew's harps. In 1828 Sir Charles Wheatstone published an essay on the technique of the instrument in the *Quarterly Journal of Science*. (K. S.)



JEZEBEL (Heb. *ī-zebel*, perhaps an artificial form to suggest "un-exalted," a divine name or its equivalent would naturally be expected instead of the first syllable), wife of Ahab, king of Israel (1 Kings xvi. 31), and mother of Athaliah, in the Bible. Her father Eth-baal (Ithobal, Jos., *contra Ap.* i. 18) was king of Tyre and priest of the goddess Astarte. He had usurped the throne and was the first important Phoenician king after Hiram (see PHOENICIA). Jezebel, a true daughter of a priest of Astarte, showed herself hostile to the worship of Yahweh, and to his prophets, whom she relentlessly pursued (1 Kings xviii. 4–13; see ELIJAH). She is represented as a woman of virile character, and became notorious for the part she took in the matter of Naboth's vineyard. When the Jezreelite[2] sheikh refused to sell the family inheritance to the king, Jezebel treacherously caused him to be arrested on a charge of treason, and with the help of false witnesses he was found guilty and condemned to death. For this the prophet Elijah pronounced a solemn curse upon Ahab and Jezebel, which was fulfilled when Jehu, who was anointed king at Elisha's instigation, killed the son Jehoram, massacred all the family, and had Jezebel destroyed (1 Kings xxi.; 2 Kings ix. 11–28). What is told of her comes from sources written under the influence of strong religious bias; among the exaggerations must be reckoned 1 Kings xviii. 13, which is inconsistent with xix. 18 and xxii. 6. A literal interpretation of the reference to Jezebel's idolatry (2 Kings ix. 22) has made her name a byword for a false prophetess in Rev. ii. 20. Her name is often used in modern English as a synonym for an abandoned woman or one who paints her face. (S. A. C.)

JEZREEL (Heb. "God sows"), the capital of the Israelite monarchy under Ahab, and the scene of stirring Biblical events (1 Sam. xxix. 1; 1 Kings xxi.; 2 Kings ix. 21–37). The name was also applied to the great plain (Esdraelon) dominated by the city ("valley of Jezreel," Josh. xvii. 16, &c.). The site has never been lost, and the present village *Zercīn* retains the name radically unchanged. In Greek (*e.g.* Judith) the name appears under the form 'Εσδραηλά; it is *Stradela* in the *Bordeaux Pilgrim*, and to the Crusaders the place was known as *Parvum Gerinum*. The modern stone village stands on a bare rocky knoll, 500 ft. above the broad northern valley, at the north extremity of a long ledge, terminating in steep cliffs, forming part of the chain of Mt Gilboa. The buildings are modern, but some scanty remains of rock-hewn wine presses and a few scattered sarcophagi mark the antiquity of the site. The view over the plains is fine and extensive. It is vain now to look for Ahab's palace or Naboth's vineyard. The fountain mentioned in 1 Sam. xxix. 1 is perhaps the fine spring *'Ain el Meiyyita*, north of the village, a shallow pool of good water full of small fish, rising between black basalt boulders: or more probably the copious *'Ain Jalūd*.

A second city named Jezreel lay in the hill country of Judah, somewhere near Hebron (Josh. xv. 56). This was the native place of David's wife Abinoam (1 Sam. xxv. 43).

See, for an excellent description of the scenery and history of the Israelite Jezreel, G. A. Smith, *Hist. Geog.* xix.

JHABUA, a native state of Central India, in the Bhopawar agency. Area, with the dependency of Rutanmal, 1336 sq. m.

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[1] See *Allg. musik. Ztg.* (Leipzig, 1816), p. 506, and *Beilage* 5, where the construction of the instruments is described and illustrated and the system of notation shown in various pieces of music.

[2] According to another tradition Naboth lived at Samaria (xxi. 1 [LXX.], 18 seq.; cf. xxii. 38). A similar confusion regarding the king's home appears in 2 Kings x. 11 compared with *vv.* 1, 17.

Pop. (1901), 80,889. More than half the inhabitants belong to the aboriginal Bhils. Estimated revenue, £7000; tribute, £1000. Manganese and opium are exported. The chief, whose title is raja, is a Rajput of the Rathor clan, descended from a branch of the Jodhpur family. Raja Udai Singh was invested in 1898 with the powers of administration.

The town of Jhabua (pop. 3354) stands on the bank of a lake, and is surrounded by a mud wall. A dispensary and a guest-house were constructed to commemorate Queen Victoria's Diamond Jubilee in 1897.

JHALAWAR, a native state of India, in the Rajputana agency, pop. (1901), 90,175; estimated revenue, £26,000; tribute, £2000. Area, 810 sq. m. The ruling family of Jhalawar belongs to the Jhala clan of Rajputs, and their ancestors were petty chiefs of Halwad in the district of Jhalawar, in Kathiawar. About 1709 one of the younger sons of the head of the clan left his country with his son to try his fortunes at Delhi. At Kotah he left his son Madhu Singh, who soon became a favourite with the maharaja, and received from him an important post, which became hereditary. On the death of one of the Kotah rajas (1771), the country was left to the charge of Zalim Singh, a descendant of Madhu Singh. From that time Zalim Singh was the real ruler of Kotah. He brought it to a wonderful state of prosperity, and under his administration, which lasted over forty-five years, the Kotah territory was respected by all parties. In 1838 it was resolved, with the consent of the chief of Kotah, to dismember the state, and to create the new principality of Jhalawar as a separate provision for the descendants of Zalim Singh. The districts then severed from Kotah were considered to represent one-third (£120,000) of the income of Kotah; by treaty they acknowledged the supremacy of the British, and agreed to pay an annual tribute of £8000. Madan Singh received the title of maharaja rana, and was placed on the same footing as the other chiefs in Rajputana. He died in 1845. An adopted son of his successor took the name of Zalim Singh in 1875 on becoming chief of Jhalawar. He was a minor and was not invested with governing powers till 1884. Owing to his maladministration, his relations with the British government became strained, and he was finally deposed in 1896, "on account of persistent misgovernment and proved unfitness for the powers of a ruling chief." He went to live at Benares, on a pension of £2000; and the administration was placed in the hands of the British resident. After much consideration, the government resolved in 1897 to break up the state, restoring the greater part to Kotah, but forming the two districts of Shahabad and the Chaumahla into a new state, which came into existence in 1899, and of which Kunwar Bhawani Singh, a descendant of the original Zalim Singh, was appointed chief.

The chief town is Patan, or Jhalrapatan (pop. 7955), founded close to an old site by Zalim Singh in 1796, by the side of an artificial lake. It is the centre of trade, the chief exports of the state being opium, oil-seeds and cotton. The palace is at the cantonment or chhaoni, 4 m. north. The ancient site near the town was occupied by the city of Chandrawati, said to have been destroyed in the time of Aurangzeb. The finest feature of its remains is the temple of Sitaleswar Mahadeva (*c.* 600).

JHANG, a town and district of British India, in the Multan division of the Punjab. The town, which forms one municipality with the newer and now more important quarter of Maghiana, is about 3 m. from the right bank of the river Chenab. Founded by Mal Khan, a Sial chieftain, in 1462, it long formed the capital of a Mahommedan state. Pop. (1901), 24,382. Maghiana has manufactures of leather, soap and metal ware.

The District of Jhang extends along both sides of the Chenab, including its confluences with the Jhelum and the Ravi. Area, 3726 sq. m. Pop. (1901), 378,695, showing an apparent decrease of 13 % in the decade, due to the creation of the district of Lyallpur in 1904. But actually the population increased by 132 % on the old area, owing to the opening of the Chenab canal and the colonization of the tract irrigated by it. Within Jhang many thousands of acres of government waste have been allotted to colonists, who are reported to be flourishing. A branch of the North-Western railway enters the district in this quarter, extending throughout its entire length. The Southern Jech Doab railway serves the south. The principal industries are the ginning, pressing and weaving of cotton.

Jhang contains the ruins of Shorkot, identified with one of the towns taken by Alexander. In modern times the history of Jhang centres in the famous clan of Sials, who exercised an extensive sway over a large tract between Shahpur and Multan, with little dependence on the imperial court at Delhi, until they finally fell before the all-absorbing power of Ranjit Singh. The Sials of Jhang are Mahommedans of Rajput descent, whose ancestor, Rai Shankar of Daranagar, emigrated early in the 13th century from the Gangetic Doab. In the beginning of the 19th century Maharaja Ranjit Singh invaded Jhang, and captured the Sial chieftain's territory. The latter recovered a small portion afterwards, which he was allowed to retain on payment of a yearly tribute. In 1847, after the establishment of the British agency at Lahore, the district came under the charge of the British government; and in 1848 Ismail Khan, the Sial leader, rendered important services against the rebel chiefs, for which he received a pension. During the Mutiny of 1857 the Sial leader again proved his loyalty by serving in person on the British side. His pension was afterwards increased, and he obtained the title of khan bahadur, with a small *jagir* for life.

JHANSI, a city and district of British India, in the Allahabad division of the United Provinces. The city is the centre of the Indian Midland railway system, whence four lines diverge to Agra, Cawnpore, Allahabad and Bhopal. Pop. (1901), 55,724. A stone fort crowns a neighbouring rock. Formerly the capital of a Mahratta principality, which lapsed to the British in 1853, it was during the Mutiny the scene of disaffection and massacre. It was then made over to Gwalior, but has been taken back in exchange for other territory. Even when the city was within Gwalior, the civil headquarters and the cantonment were at Jhansi Naoabad, under its walls. Jhansi is the principal centre for the agricultural trade of the district, but its manufactures are small.

The District of Jhansi was enlarged in 1891 by the incorporation of the former district of Lalitpur, which extends farther into the hill country, almost entirely surrounded by native states. Combined area, 3628 sq. m. Pop. (1901), 616,759 showing a decrease of 10 % in the decade, due to the results of famine. The main line and branches of the Indian Midland railway serve the district, which forms a portion of the hill country of Bundelkhand, sloping down from the outliers of the Vindhyan range on the south to the tributaries of the Jumna on the north. The extreme south is composed of parallel rows of long and narrow-ridged hills. Through the intervening valleys the rivers flow down impetuously over ledges of granite or quartz. North of the hilly region, the rocky granite chains gradually lose themselves in clusters of smaller hills. The northern portion consists of the level plain of Bundelkhand, distinguished for its deep black soil, known as *mar*, and admirably adapted for the cultivation of cotton. The district is intersected or bounded by three principal rivers—the Pahuj, Betwa and Dhasan. The district is much cut up, and portions of it are insulated by the surrounding native states. The principal crops are millets, cotton, oil-seeds, pulses, wheat, gram and barley. The destructive *kans* grass has proved as great a pest here as elsewhere in Bundelkhand. Jhansi is especially exposed to blights, droughts, floods, hailstorms, epidemics, and their natural consequence—famine.

Nothing is known with certainty as to the history of this district before the period of Chandel rule, about the 11th century of our era. To this epoch must be referred the artificial reservoirs and architectural remains of the hilly region. The Chandels were succeeded by their servants the Khangars, who built the fort of Karar, lying just outside the British border. About the 14th century the Bundelas poured down upon the plains, and gradually spread themselves over the whole region which now bears their name. The Mahommedan governors were constantly making irruptions into the Bundela country; and in

1732 Chhatar Sal, the Bundela chieftain, called in the aid of the Mahrattas. They came to his assistance with their accustomed promptitude, and were rewarded on the raja's death in 1734, by the bequest of one-third of his dominions. Their general founded the city of Jhansi, and peopled it with inhabitants from Orchha state. In 1806 British protection was promised to the Mahratta chief, and in 1817 the peshwa ceded to the East India Company all his rights over Bundelkhand. In 1853 the raja died childless, and his territories lapsed to the British. The Jhansi state and the Jalaun and Chanderi districts were then formed into a superintendency. The widow of the raja considered herself aggrieved because she was not allowed to adopt an heir, and because the slaughter of cattle was permitted in the Jhansi territory. Reports were spread which excited the religious prejudices of the Hindus. The events of 1857 accordingly found Jhansi ripe for mutiny. In June a few men of the 12th native infantry seized the fort containing the treasure and magazine, and massacred the European officers of the garrison. Everywhere the usual anarchic quarrels rose among the rebels, and the country was plundered mercilessly. The rani put herself at the head of the rebels, and died bravely in battle. It was not till November 1858, after a series of sharp contests with various guerilla leaders, that the work of reorganization was fairly set on foot.

JHELUM, or JEHLAM (*Hydaspes* of the Greeks), a river of northern India. It is the most westerly of the "five rivers" of the Punjab. It rises in the north-east of the Kashmir state, flows through the city of Srinagar and the Wular lake, issues through the Pir Panjal range by the narrow pass of Baramula, and enters British territory in the Jhelum district. Thence it flows through the plains of the Punjab, forming the boundary between the Jech Doab and the Sind Sagar Doab, and finally joins the Chenab at Timmu after a course of 450 miles. The Jhelum colony, in the Shahpur district of the Punjab, formed on the example of the Chenab colony in 1901, is designed to contain a total irrigable area of 1,130,000 acres. The Jhelum canal is a smaller work than the Chenab canal, but its silt is noted for its fertilizing qualities. Both projects have brought great prosperity to the cultivators.

JHELUM, or JEHLAM, a town and district of British India, in the Rawalpindi division of the Punjab. The town is situated on the right bank of the river Jhelum, here crossed by a bridge of the North-Western railway, 103 m. N. of Lahore. Pop. (1901), 14,951. It is a modern town with river and railway trade (principally in timber from Kashmir), boat-building and cantonments for a cavalry and four infantry regiments.

The DISTRICT OF JHELUM stretches from the river Jhelum almost to the Indus. Area, 2813 sq. m. Pop. (1901), 501,424, showing a decrease of 2% in the decade. Salt is quarried at the Mayo mine in the Salt Range. There are two coal-mines, the only ones worked in the province, from which the North-Western railway obtains part of its supply of coal. The chief centre of the salt trade is Pind Dadan Khan (pop. 13,770). The district is crossed by the main line of the North-Western railway, and also traversed along the south by a branch line. The river Jhelum is navigable throughout the district, which forms the south-eastern portion of a rugged Himalayan spur, extending between the Indus and Jhelum to the borders of the Sind Sagar Doab. Its scenery is very picturesque, although not of so wild a character as the mountain region of Rawalpindi to the north, and is lighted up in places by smiling patches of cultivated valley. The backbone of the district is formed by the Salt Range, a treble line of parallel hills running in three long forks from east to west throughout its whole breadth. The range rises in bold precipices, broken by gorges, clothed with brushwood and traversed by streams which are at first pure, but soon become impregnated with the saline matter over which they pass. Between the line of hills lies a picturesque table-land, in which the beautiful little lake of Kallar Kahar nestles amongst the minor ridges. North of the Salt Range, the country extends upwards in an elevated plateau, diversified by countless ravines and fissures, until it loses itself in tangled masses of Rawalpindi mountains. In this rugged tract cultivation is rare and difficult, the soil being choked with saline matter. At the foot of the Salt Range, however, a small strip of level soil lies along the banks of the Jhelum, and is thickly dotted with prosperous villages. The drainage of the district is determined by a low central watershed running north and south at right angles to the Salt Range. The waters of the western portion find their way into the Sohan, and finally into the Indus; those of the opposite slope collect themselves into small torrents, and empty themselves into the Jhelum.

The history of the district dates back to the semi-mythical period of the *Mahābhārata*. Hindu tradition represents the Salt Range as the refuge of the five Pandava brethren during the period of their exile, and every salient point in its scenery is connected with some legend of the national heroes. Modern research has fixed the site of the conflict between Alexander and Porus as within Jhelum district, although the exact point at which Alexander effected the passage of the Jhelum (or Hydaspes) is disputed. After this event, we have little information with regard to the condition of the district until the Mahommedan conquest brought back literature and history to Upper India. The Janjuahs and Jats, who now hold the Salt Range and its northern plateau respectively, appear to have been the earliest inhabitants. The Ghakkars seem to represent an early wave of conquest from the east, and they still inhabit the whole eastern slope of the district; while the Awans, who now cluster in the western plain, are apparently later invaders from the opposite quarter. The Ghakkars were the dominant race at the period of the first Mahommedan incursions, and long continued to retain their independence. During the flourishing period of the Mogul dynasty, the Ghakkar chieftains were prosperous and loyal vassals of the house of Baber; but after the collapse of the Delhi Empire Jhelum fell, like its neighbours, under the sway of the Sikhs. In 1765 Gujar Singh defeated the last independent Ghakkar prince, and reduced the wild mountaineers to subjection. His son succeeded to his dominions, until 1810, when he fell before the irresistible power of Ranjit Singh. In 1849 the district passed, with the rest of the Sikh territories, into the hands of the British.

JHERING, RUDOLF VON (1818–1892), German jurist, was born on the 22nd of August 1818 at Aurich in East Friesland, where his father practised as a lawyer. Young Jhering entered the university of Heidelberg in 1836 and, after the fashion of German students, visited successively Göttingen and Berlin. G. F. Puchta, the author of *Geschichte des Rechts bei dem römischen Volke*, alone of all his teachers appears to have gained his admiration and influenced the bent of his mind. After graduating *doctor juris*, Jhering established himself in 1844 at Berlin as *privatdocent* for Roman law, and delivered public lectures on the *Geist des römischen Rechts*, the theme which may be said to have constituted his life's work. In 1845 he became an ordinary professor at Basel, in 1846 at Rostock, in 1849 at Kiel, and in 1851 at Giessen. Upon all these seats of learning he left his mark; beyond any other of his contemporaries he animated the dry bones of Roman law. The German juristic world was still under the dominating influence of the Savigny cult, and the older school looked askance at the daring of the young professor, who essayed to adapt the old to new exigencies and to build up a system of natural jurisprudence. This is the keynote of his famous work, *Geist des römischen Rechts auf den verschiedenen Stufen seiner Entwickelung* (1852–1865), which for originality of conception and lucidity of scientific reasoning placed its author in the forefront of modern Roman jurists. It is no exaggeration to say that in the second half of the 19th century the reputation of Jhering was as high as that of Savigny in the first. Their methods were almost diametrically opposed. Savigny and his school represented the conservative, historical tendency. In Jhering the philosophical conception of jurisprudence, as a science to be utilized for the further advancement of the moral and social interests of mankind, was predominant. In 1868 Jhering accepted the chair of Roman Law at Vienna, where his lecture-room was crowded, not only with regular students but with men of all professions and even of the highest ranks in the official world. He became one of the lions of society, the Austrian emperor conferring upon him in 1872 a title of hereditary nobility. But to a mind constituted like his, the social functions of the Austrian metropolis became wearisome, and he gladly exchanged its brilliant circles for the repose of Göttingen, where he became professor in 1872. In this year he had read at Vienna before an admiring audience a lecture, published under the title of *Der Kampf um's Recht* (1872; Eng. trans., *Battle for Right*, 1884). Its success was extraordinary. Within two years it attained twelve editions, and it has been translated into twenty-six languages. This was followed a few years later by *Der Zweck im Recht* (2 vols., 1877–1883). In these two works is clearly seen Jhering's individuality. The *Kampf um's Recht* shows the firmness of his character, the strength of his sense of justice, and his juristic method and logic: "to assert his rights is the duty that every responsible person owes to himself." In the *Zweck im Recht* is perceived the bent of the author's intellect. But perhaps the happiest combination of all his distinctive characteristics is to be found in his *Jurisprudenz des täglichen Lebens* (1870; Eng. trans., 1904). A great feature of his lectures was his so-called *Praktika*, problems in Roman law, and a collection of these with hints for solution was published as early as 1847 under the title *Civilrechtsfälle ohne Entscheidungen.* In Göttingen he continued to work until his death on the 17th of September 1892. A short time previously he had been the centre of a devoted crowd of friends and former pupils, assembled at Wilhelmshöhe near Cassel to celebrate the jubilee of his doctorate. Almost all countries were worthily represented, and this pilgrimage affords an excellent illustration of the extraordinary fascination and enduring influence that Jhering commanded. In appearance he was of middle stature, his face clean-shaven and of classical mould, lit up with vivacity and beaming with good nature. He was perhaps seen at his best when dispensing hospitality in his own house. With him died the best beloved and the most talented of Roman-law professors of modern times. It was said of him by Professor Adolf Merkel in a memorial address, *R. v. Jhering* (1893), that he belonged to the happy class of persons to whom Goethe's lines are applicable: "Was ich in der Jugend gewünscht, das habe ich im Alter die Fülle," and this may justly be said of him, though he did not live to complete his *Geist des römischen Rechts* and his *Rechtsgeschichte*. For this work the span of a single life would have been insufficient, but what he has left to the world is a monument of vigorous intellectual power and stamps Jhering as an original thinker and unrivalled exponent (in his peculiar interpretation) of the spirit of Roman law.

Among others of his works, all of them characteristic of the author and sparkling with wit, may be mentioned the following: *Beiträge zur Lehre von Besitz*, first published in the *Jahrbücher für die Dogmatik des heutigen römischen und deutschen Privat-rechts*, and then separately; *Der Besitzwille*, and an article entitled "Besitz" in the *Handwörterbuch der Staatswissenschaften* (1891), which aroused at the time much controversy, particularly on account of the opposition manifested to Savigny's conception of the subject. See also *Scherz und Ernst in der Jurisprudenz* (1885); *Das Schuldmoment im römischen Privat-recht* (1867); *Das Trinkgeld* (1882); and among the papers he left behind him his *Vorgeschichte der Indoeuropäer*, a fragment, has been published by v. Ehrenberg (1894). See for an account of his life also M. de Jonge, *Rudolf v. Jhering* (1888); and A. Merkel, *Rudolf von Jhering* (1893). (P. A. A.)

JIBITOS, a tribe of South American Indians, first met with by the Franciscans in 1676 in the forest near the Huallaga river, in the Peruvian province of Loreto. After their conversion they settled in villages on the western bank of the river.

JIBUTI (Djibouti), the chief port and capital of French Somaliland, in 11° 35′ N., 43° 10′ E. Jibuti is situated at the entrance to and on the southern shore of the Gulf of Tajura about 150 m. S.W. of Aden. The town is built on a horseshoe-shaped peninsula partly consisting of mud flats, which are spanned by causeways. The chief buildings are the governor's palace, customs-house, post office, and the terminal station of the railway to Abyssinia. The houses in the European quarter are built of stone, are flat-roofed and provided with verandas. There is a good water supply, drawn from a reservoir about 2½ m. distant. The harbour is land-locked and capacious. Ocean steamers are able to enter it at all states of wind and tide. Adjoining the mainland is the native town, consisting mostly of roughly made wooden houses with well thatched roofs. In it is held a large market, chiefly for the disposal of live stock, camels, cattle, &c. The port is a regular calling-place and also a coaling station for the steamers of the Messageries Maritimes, and there is a local service to Aden. Trade is confined to coaling passing ships and to importing goods for and exporting goods from southern Abyssinia via Harrar, there being no local industries. (For statistics see Somaliland, French.) The inhabitants are of many races—Somali, Danakil, Gallas, Armenians, Jews, Arabs, Indians, besides Greeks, Italians, French and other Europeans. The population, which in 1900 when the railway was building was about 15,000, had fallen in 1907 to some 5000 or 6000, including 300 Europeans.

Jibuti was founded by the French in 1888 in consequence of its superiority to Obok both in respect to harbour accommodation and in nearness to Harrar. It has been the seat of the governor of the colony since May 1896. Order is maintained by a purely native police force. The port is not fortified.

JICARILLA, a tribe of North American Indians of Athapascan stock. Their former range was in New Mexico, about the headwaters of the Rio Grande and the Pecos, and they are now settled in a reservation on the northern border of New Mexico. Originally a scourge of the district, they are now subdued, but remain uncivilized. They number some 800 and are steadily decreasing. The name is said to be from the Spanish *jicara*, a basket tray, in reference to their excellent basket-work.

JIDDA (also written Jeddah, Djiddah, Djeddeh), a town in Arabia on the Red Sea coast in 21° 28′ N. and 39° 10′ E. It is of importance mainly as the principal landing place of pilgrims to Mecca, from which it is about 46 m. distant. It is situated in a low sandy plain backed by a range of hills 10 m. to the east, with higher mountains behind. The town extends along the beach for about a mile, and is enclosed by a wall with towers at intervals, the seaward angles being commanded by two forts, in the northern of which are the prison and other public buildings. There are three gates, the Medina gate on the north, the Mecca gate on the east, and the Yemen gate (rarely opened) on the south; there are also three small posterns on the west side, the centre one leading to the quay. In front of the Mecca gate is a rambling suburb with shops, coffee houses, and an open market place; before the Medina gate are the Turkish barracks, and beyond them the holy place of Jidda, the tomb of "our mother Eve," surrounded by the principal cemetery.

The tomb is a walled enclosure said to represent the dimensions of the body, about 200 paces long and 15 ft. broad. At the head is a small erection where gifts are deposited, and rather more than half-way down a whitewashed dome encloses a small dark chapel within which is the black stone known as *El Surrah*, the navel. The grave of Eve is mentioned by Edrisi, but except the black stone nothing bears any aspect of antiquity (see Burton's *Pilgrimage*, vol. ii.).

The sea face is the best part of the town; the houses there are lofty and well built of the rough coral that crops out all along the shore. The streets are narrow and winding. There are two mosques of considerable size and a number of smaller ones. The outer suburbs are merely collections of brushwood huts. The bazaars are well supplied with food-stuffs imported by sea, and fruit and vegetables from Taif and Wadi Fatima. The water supply is limited and brackish; there are, however, two sweet wells and a spring 7½ m. from the town, and most of the houses have cisterns for storing rain-water. The climate is hot and damp, but fever is not so prevalent as at Mecca. The harbour though inconvenient of access is well protected by coral reefs; there are, however, no wharves or other dock facilities and cargo is landed in small Arab boats, *sambuks*.

The governor is a Turkish kaimakam under the vali of Hejaz, and there is a large Turkish garrison; the sharif of Mecca, however, through his agent at Jidda exercises an authority practically superior to that of the sultan's officials. Consulates are maintained by Great Britain, France, Austria, Russia, Holland, Belgium and Persia. The permanent population is estimated at 20,000, of which less than half are Arabs, and of these a large number are foreigners from Yemen and Hadramut, the remainder are negroes and Somali with a few Indian and Greek traders.

Jidda is said to have been founded by Persian merchants in the caliphate of Othman, but its great commercial prosperity dates from the beginning of the 15th century when it became the centre of trade between Egypt and India. Down to the time of Burckhardt (1815) the Suez ships went no farther than Jidda, where they were met by Indian vessels. The introduction of steamers deprived Jidda of its place as an emporium, not only for Indian goods but for the products of the Red Sea, which formerly were collected here, but are now largely exported direct by steamer from Hodeda, Suakin, Jibuti and Aden. At the same time it gave a great impulse to the pilgrim traffic which is now regarded as the annual harvest of Jidda. The average number of pilgrims arriving by sea exceeds 50,000, and in 1903–1904 the total came to 74,600. The changed status of the port is shown in its trade returns, for while its exports decreased from £250,000 in 1880 to £25,000 in 1904, its imports in the latter year amounted to over £1,400,000. The adverse balance of trade is paid by a very large export of specie, collected from the pilgrims during their stay in the country.

JIG, a brisk lively dance, the quick and irregular steps of which have varied at different times and in the various countries in which it has been danced (see DANCE). The music of the "jig," or such as is written in its rhythm, is in various times and has been used frequently to finish a suite, *e.g.* by Bach and Handel. The word has usually been derived from or connected with Fr. *gigue*, Ital. *giga*, Ger. *Geige*, a fiddle. The French and Italian words are now chiefly used of the dance or dance rhythm, and in this sense have been taken by etymologists as adapted from the English "jig," which may have been originally an onomatopoeic word. The idea of jumping, jerking movement has given rise to many applications of "jig" and its derivative "jigger" to mechanical and other devices, such as the machine used for separating the heavier metal-bearing portions from the lighter parts in ore-dressing, or a tackle consisting of a double and single block and fall, &c. The word "jigger," a corruption of the West Indian *chigoe*, is also used as the name of a species of flea, the *Sarcopsylla penetrans*, which burrows and lays its eggs in the human foot, generally under the toe nails, and causes great swelling and irritation (see FLEA).

JIHAD (also written JEHAD, JAHAD, DJEHAD), an Arabic word of which the literal meaning is an effort or a contest. It is used to designate the religious duty inculcated in the Koran on the followers of Mahomet to wage war upon those who do not accept the doctrines of Islam. This duty is laid down in five suras—all of these suras belonging to the period after Mahomet had established his power. Conquered peoples who will neither embrace Islam nor pay a poll-tax (*jizya*) are to be put to the sword. (See further MAHOMMEDAN INSTITUTIONS.) By Mahommedan commentators the commands in the Koran are not interpreted as a general injunction on all Moslems constantly to make war on the infidels. It is generally supposed that the order for a general war can only be given by the caliph (an office now claimed by the sultans of Turkey). Mahommedans who do not acknowledge the spiritual authority of the Ottoman sultan, such as the Persians and Moors, look to their own rulers for the proclamation of a jihad; there has been in fact no universal warfare by Moslems on unbelievers since the early days of Mahommedanism. Jihads are generally proclaimed by all persons who claim to be mahdis, *e.g.* Mahommed Aḥmad (the Sudanese mahdi) proclaimed a jihad in 1882. In the belief of Moslems every one of their number slain in a jihad is taken straight to paradise.

JIMENES (or XIMENES) **DE CISNEROS, FRANCISCO** (1436–1517), Spanish cardinal and statesman, was born in 1436 at Torrelaguna in Castile, of good but poor family. He studied at Alcalá de Henares and afterwards at Salamanca; and in 1459, having entered holy orders, he went to Rome. Returning to Spain in 1465, he brought with him an "expective" letter from the pope, in virtue of which he took possession of the archpriestship of Uzeda in the diocese of Toledo in 1473. Carillo, archbishop of Toledo, opposed him, and on his obstinate refusal to give way threw him into prison. For six years Jimenes held out, and at length in 1480 Carillo restored him to his benefice. This Jimenes exchanged almost at once for a chaplaincy at Siguenza, under Cardinal Mendoza, bishop of Siguenza, who shortly appointed him vicar-general of his diocese. In that position Jimenes won golden opinions from ecclesiastic and layman; and he seemed to be on the sure road to distinction among the secular clergy, when he abruptly resolved to become a monk. Throwing up all his benefices, and changing his baptismal name Gonzales for that of Francisco, he entered the Franciscan monastery of San Juan de los Reyes, recently founded by Ferdinand and Isabella at Toledo. Not content with the ordinary severities of the noviciate, he added voluntary austerities. He slept on the bare ground, wore a hair-shirt, doubled his fasts, and scourged himself with much fervour; indeed throughout his whole life, even when at the acme of his greatness, his private life was most rigorously ascetic. The report of his sanctity brought crowds to confess to him; but from them he retired to the lonely monastery of Our Lady of Castañar; and he even built with his own hands a rude hut in the neighbouring woods, in which he lived at times as an anchorite. He was afterwards guardian of a monastery at Salzeda. Meanwhile Mendoza (now archbishop of Toledo) had not forgotten him; and in 1492 he recommended him to Isabella as her confessor. The queen sent for Jimenes, was pleased with him, and to his great reluctance forced the office upon him. The post was politically important, for Isabella submitted to the judgment of her father-confessor not only her private affairs but also matters of state. Jimenes's severe sanctity soon won him considerable influence over Isabella; and thus it was that he first emerged into political life. In 1494 the queen's confessor was appointed provincial of the order of St Francis, and at once set about reducing the laxity of the conventual to the strictness of the observantine Franciscans. Intense opposition was continued even after Jimenes became archbishop of Toledo. The general of the order himself came from Rome to interfere with the archbishop's measures of reform, but the stern inflexibility of Jimenes, backed by the influence of the queen, subdued every obstacle. Cardinal Mendoza had died in 1495, and Isabella had secretly procured a papal bull nominating her confessor to his diocese of Toledo, the richest and most powerful in Spain, second perhaps to no other dignity of the Roman Church save the papacy. Long and sincerely Jimenes strove to evade the honour; but his *nolo episcopari* was after six months overcome by a second bull ordering him to accept consecration. With the primacy of Spain was associated the lofty dignity of high chancellor of Castile; but Jimenes still maintained his lowly life; and, although a message from Rome required him to live in a style befitting his rank, the outward pomp only concealed his private asceticism. In 1499 Jimenes accompanied the court to Granada, and there eagerly joined the mild and pious Archbishop Talavera in his efforts to convert the Moors. Talavera had begun with gentle measures, but Jimenes preferred to proceed by haranguing the *fakihs*, or doctors of religion, and loading them with gifts. Outwardly the latter method was successful; in two months the converts were so numerous that they had to be baptized by aspersion. The indignation of the unconverted Moors swelled into open revolt. Jimenes was besieged in his house, and the utmost difficulty was found in quieting the city. Baptism or exile was offered to the Moors as a punishment for rebellion. The majority accepted baptism; and Isabella, who had been momentarily annoyed at her archbishop's imprudence, was satisfied that he had done good service to Christianity.

On the 24th of November 1504 Isabella died. Ferdinand at once resigned the title of king of Castile in favour of his daughter Joan and her husband the archduke Philip, assuming instead that of regent. Philip was keenly jealous of Ferdinand's pretensions to the regency; and it required all the tact of Jimenes to bring about a friendly interview between the princes. Ferdinand finally retired from Castile; and, though Jimenes remained, his political weight was less than before. The sudden death of Philip in September 1506 quite overset the already tottering intellect of his wife; his son and heir Charles was still a child; and Ferdinand was at Naples. The nobles of Castile, mutually jealous, agreed to entrust affairs to the archbishop of Toledo, who, moved more by patriotic regard for his country's welfare than by special friendship for Ferdinand, strove to establish the final influence of that king in Castile. Ferdinand did not return till August 1507; and he brought a cardinal's hat for Jimenes. Shortly afterwards the new cardinal of Spain was appointed grand inquisitor-general for Castile and Leon.

The next great event in the cardinal's life was the expedition against the Moorish city of Oran in the north of Africa, in which his religious zeal was supported by the prospect of the political and material gain that would accrue to Spain from the possession of such a station. A preliminary expedition, equipped, like that which followed, at the expense of Jimenes, captured the port of Mers-el-Kebir in 1505; and in 1509 a strong force, accompanied by the cardinal in person, set sail for Africa, and in one day the wealthy city was taken by storm. Though the army remained to make fresh conquests, Jimenes returned to Spain, and occupied himself with the administration of his diocese, and in endeavouring to recover from the regent the expenses of his Oran expedition. On the 28th of January 1516 Ferdinand died, leaving Jimenes as regent of Castile for Charles (afterwards Charles V.), then a youth of sixteen in the Netherlands. Though Jimenes at once took firm hold of the reins of government, and ruled in a determined and even autocratic manner, the haughty and turbulent Castilian nobility and the jealous intriguing Flemish councillors of Charles combined to render his position peculiarly difficult; while the evils consequent upon the unlimited demands of Charles for money threw much undeserved odium upon the regent. In violation of the laws, Jimenes acceded to Charles's desire to be proclaimed king; he secured the person of Charles's younger brother Ferdinand; he fixed the seat of the cortes at Madrid; and he established a standing army by drilling the citizens of the great towns. Immediately on Ferdinand's death, Adrian, dean of Louvain, afterwards pope, produced a commission from Charles appointing him regent. Jimenes admitted him to a nominal equality, but took care that neither he nor the subsequent commissioners of Charles ever had any real share of power. In September 1517 Charles landed in the province of Asturias, and Jimenes hastened to meet him. On the way, however, he fell ill, not without a suspicion of poison. While thus feeble, he received a letter from Charles coldly thanking him for his services, and giving him leave to retire to his diocese. A few hours after this virtual dismissal, which some, however, say the cardinal never saw, Francisco Jimenes died at Roa, on the 8th of November 1517.

Jimenes was a bold and determined statesman. Sternly and inflexibly, with a confidence that became at times overbearing, he carried through what he had decided to be right, with as little regard for the convenience of others as for his own. In the midst of a corrupt clergy his morals were irreproachable. He was liberal to all, and founded and maintained very many benevolent institutions in his diocese. His whole time was devoted either to the state or to religion; his only recreation was in theological or scholastic discussion. Perhaps one of the most noteworthy points about the cardinal is the advanced period of life at which he entered upon the stage where he was to play such leading parts. Whether his abrupt change from the secular to the regular clergy was the fervid outcome of religious enthusiasm or the far-seeing move of a wily schemer has been disputed; but the constant austerity of his life, his unvarying superiority to small personal aims, are arguments for the former alternative that are not to be met by merely pointing to the actual honours and power he at last attained.

In 1500 was founded, and in 1508 was opened, the university of Alcalá de Henares, which, fostered by Cardinal Jimenes, at whose sole expense it was raised, attained a great pitch of outward magnificence and internal worth. At one time 7000 students met within its walls. In 1836 the university was removed to Madrid, and the costly buildings were left vacant. In the hopes of supplanting the romances generally found in the hands of the young, Jimenes caused to be published religious treatises by himself and others. He revived also the Mozarabic liturgy, and endowed a chapel at Toledo, in which it was to be used. But his most famous literary service was the printing at Alcalá (in Latin *Complutum*) of the Complutensian Polyglott, the first edition of the Christian Scriptures in the original text. In this work, on which he is said to have expended half a million of ducats, the cardinal was aided by the celebrated Stunica (D. Lopez de Zuñiga), the Greek scholar Nuñez de Guzman (Pincianus), the Hebraist Vergara, and the humanist Nebrija, by a Cretan Greek Demetrius Ducas, and by three Jewish converts, of whom Zamora edited the Targum to the Pentateuch. The other Targums are not included. In the Old Testament Jerome's version stands between the Greek and Hebrew. The synagogue and the Eastern church, as the preface expresses it, are set like the thieves on this side and on that, with Jesus (that is, the Roman Church) in the midst. The text occupies five volumes, and a sixth contains a Hebrew lexicon, &c. The work commenced in 1502. The New Testament was finished in January 1514, and the whole in April 1517. It was dedicated to Leo X., and was reprinted in 1572 by the Antwerp firm of Plantin, after revision by Benito Arias Montano at the expense of Philip II. The second edition is known as the *Biblia Regia* or *Filipina*.

The work by Alvaro Gomez de Castro, *De Rebus Gestis Francisci Ximenii* (folio, 1659, Alcalá), is the quarry whence have come the materials for biographies of Jimenes—in Spanish by Robles (1604) and Quintanilla (1633); in French by Baudier (1635), Marsollier (1684), Flèchier (1694) and Richard (1704); in German by Hefele (1844, translated into English by Canon Dalton, 1860) and Havemann (1848); and in English by Barrett (1813). See also Prescott's *Ferdinand and Isabella; Revue des Deux Mondes* (May 1841) and *Mém. de l'Acad. d'hist. de Madrid*, vol. iv.

JIND, a native state of India, within the Punjab. It ranks as one of the Cis-Sutlej states, which came under British influence in 1809. The territory consists of three isolated tracts, amid British districts. Total area, 1332 sq. m. Pop. (1901), 282,003, showing a decrease of 1% in the decade. Estimated gross revenue £109,000; there is no tribute. Grain and cotton are exported, and there are manufactures of gold and silver ornaments, leather and wooden wares and cloth. The chief, whose title is raja, is a Sikh of the Sidhu Jat clan and of the Phulkian family. The principality was founded in 1763, and the chief was recognized by the Mogul emperor in 1768. The dynasty has always been famous for its loyalty to the British, especially during the Mutiny, which has been rewarded with accessions of territory. In 1857 the raja of Jind was actually the first man, European or native, who took the field against the mutineers; and his contingent collected supplies in advance for the British troops marching upon Delhi, besides rendering excellent service during the siege. Raja Ranbir Singh succeeded as a minor in 1887, and was granted full powers in 1899. During the Tirah expedition of 1897–98 the Jind imperial service infantry specially distinguished themselves. The town of Jind, the former capital, has a station on the Southern Punjab railway, 80 m. N.W. of Delhi. Pop. (1901), 8047. The present capital and residence of the raja since 1827 is Sangrur; pop. (1901), 11,852.

JINGO, a legendary empress of Japan, wife of Chūai, the 14th mikado (191–200). On her husband's death she assumed the government, and fitted out an army for the invasion of Korea (see JAPAN, § 9). She returned to Japan completely victorious after three years' absence. Subsequently her son Ojen Tenno, afterwards 15th mikado, was born, and later was canonized as Hachiman, god of war. The empress Jingo ruled over Japan till 270. She is still worshipped.

As regards the English oath, usually "By Jingo," or "By the living Jingo," the derivation is doubtful. The identification with the name of Gingulph or Gengulphus, a Burgundian saint who was martyred on the 11th of May 760, was a joke on the part of R. H. Barham, author of the *Ingoldsby Legends*. Some explain the word as a corruption of Jainko, the Basque name for God. It has also been derived from the Persian *jang* (war), St Jingo being the equivalent of the Latin god of war, Mars; and is even explained as a corruption of "Jesus, Son of God," Je-n-go. In support of the Basque derivation it is alleged that the oath was first common in Wales, to aid in the conquest of which Edward I. imported a number of Basque mercenaries. The phrase does not, however, appear in literature before the 17th century, first as conjurer's jargon. Motteux, in his "Rabelais," is the first to use "by jingo," translating *par dieu*. The political use of the word as indicating an aggressive patriotism (Jingoes and Jingoism) originated in 1877 during the weeks of national excitement preluding the despatch of the British Mediterranean squadron to Gallipoli, thus frustrating Russian designs on Constantinople. While the public were on the tiptoe of expectation as to what policy the government would pursue, a bellicose music-hall song with the refrain "We don't want to fight, but by Jingo if we do," &c., was produced in London by a singer known as "the great MacDermott," and instantly became very popular. Thus the war-party came to be called Jingoes, and Jingoism has ever since been the term applied to those who advocate a national policy of arrogance and pugnacity.

For a discussion of the etymology of Jingo see *Notes and Queries*, (August 25, 1894), 8th series, p. 149.

JINN (Djinn), the name of a class of spirits (*genii*) in Arabian mythology. They are the offspring of fire, but in their form and the propagation of their kind they resemble human beings. They are ruled by a race of kings named "Suleyman," one of whom is considered to have built the pyramids. Their central home is the mountain Kāf, and they manifest themselves to men under both animal and mortal form and become invisible at will. There are good and evil jinn, and these in each case reach the extremes of beauty and ugliness.

JIREČEK, JOSEF (1825–1888), Czech scholar, was born at Vysoké Mýto in Bohemia on the 9th of October 1825. He entered the Prague bureau of education in 1850, and became minister of the department in the Hohenwart cabinet in 1871. His efforts to secure equal educational privileges for the Slav nationalities in the Austrian dominions brought him into disfavour with the German element. He became a member of the Bohemian Landtag in 1878, and of the Austrian Reichsrat in 1879. His merits as a scholar were recognized in 1875 by his election as president of the royal Bohemian academy of sciences. He died in Prague on the 25th of November 1888.

With Hermenegild Jireček he defended in 1862 the genuineness of the Königinhof MS. discovered by Wenceslaus Hanka. He published in the Czech language an anthology of Czech literature (3 vols., 1858–1861), a biographical dictionary of Czech writers (2 vols., 1875–1876), a Czech hymnology, editions of Blahoslaw's Czech grammar and of some Czech classics, and of the works of his father-in-law Pavel Josef Šafařik (1795–1861).

His brother **Hermenegild Jireček**, Ritter von Samakow (1827–), Bohemian jurisconsult, who was born at Vysoké Mýto on the 13th of April 1827, was also an official in the education department.

Among his important works on Slavonic law were *Codex juris bohemici* (11 parts, 1867–1892), and a *Collection of Slav Folk-Law* (Czech, 1880), *Slav Law in Bohemia and Moravia down to the 14th Century* (Czech, 3 vols. 1863–1873).

Jireček, Konstantin Josef (1854–), son of Josef, taught history at Prague. He entered the Bulgarian service in 1879, and in 1881 became minister of education at Sofia. In 1884 he became professor of universal history in Czech at Prague, and in 1893 professor of Slavonic antiquities at Vienna.

The bulk of Konstantin's writings deal with the history of the southern Slavs and their literature. They include a *History of the Bulgars* (Czech and German, 1876), *The Principality of Bulgaria* (1891), *Travels in Bulgaria* (Czech, 1888), &c.

JIZAKH, a town of Russian Central Asia, in the province of Samarkand, on the Transcaspian railway, 71 m. N.E. of the city of Samarkand. Pop. (1897), 16,041. As a fortified post of Bokhara it was captured by the Russians in 1866.

JOAB (Heb. "Yah[weh] is a father"), in the Bible, the son of Zeruiah, David's sister (1 Chron. ii. 16). His brothers were Asahel and Abishai. All three were renowned warriors and played a prominent part in David's history. Abishai on one occasion saved the king's life from a Philistine giant (2 Sam. xxi. 17), and Joab as warrior and statesman was directly responsible for much of David's success. Joab won his spurs, according to one account, by capturing Jerusalem (1 Chron. xi. 4–9); with Abishai and Ittai of Gath he led a small army against the Israelites who had rebelled under Absalom (2 Sam. xviii. 2); and he superintended the campaign against Ammon and Edom (2 Sam. xi. 1, xii. 26; 1 Kings xi. 15). He showed his sturdy character by urging the king after the death of Absalom to place his duty to his people before his grief for the loss of his favourite son (2 Sam. xix. 1–8), and by protesting against David's proposal to number the people, an innovation which may have been regarded as an infringement of their liberties (2 Sam. xxiv.; 1 Chron. xxi. 6).

The hostility of the "sons of Zeruiah" towards the tribe of Benjamin is characteristically contrasted with David's own generosity towards Saul's fallen house. Abishai proposed to kill Saul when David surprised him asleep (1 Sam. xxvi. 8), and was anxious to slay Shimei when he cursed the king (2 Sam. xvi. 9). But David was resigned to the will of Yahweh and refused to entertain the suggestions. After Asahel met his death at the hands of Abner, Joab expostulated with David for not taking revenge upon the guilty one, and indeed the king might be considered bound in honour to take up his nephew's cause. But when Joab himself killed Abner, David's imprecation against him and his brother Abishai showed that he dissociated himself from the act of vengeance, although it brought him nearer to the throne of all Israel (2 Sam. iii.). Fear of a possible rival may have influenced Joab, and this at all events led him to slay Amasa of Judah (2 Sam. xx. 4–13). The two deeds are similar, and the impression left by them is expressed in David's last charges to Solomon (1 Kings ii.). But here Joab had taken the side of Adonijah against Solomon, and was put to death by Benaiah at Solomon's command, and it is possible that the charges are the fruit of a later tradition to remove all possible blame from Solomon (*q.v.*). It is singular that Joab is not blamed for killing Absalom, but it would indeed be strange if the man who helped to reconcile father and son (2 Sam. xiv.) should have perpetrated so cruel an act in direct opposition to the king's wishes (xviii. 5, 10–16). A certain animus against Joab's family thus seems to underlie some of the popular narratives of the life of David (*q.v.*). (S. A. C.)

JOACHIM OF FLORIS (*c.* 1145–1202), so named from the monastery of San Giovanni in Fiore, of which he was abbot, Italian mystic theologian, was born at Celico, near Cosenza, in Calabria. He was of noble birth and was brought up at the court of Duke Roger of Apulia. At an early age he went to visit the holy places. After seeing his comrades decimated by the plague at Constantinople he resolved to change his mode of life, and, on his return to Italy, after a rigorous pilgrimage and a period of ascetic retreat, became a monk in the Cistercian abbey of Casamari. In August 1177 we know that he was abbot of the monastery of Corazzo, near Martirano. In 1183 he went to the court of Pope Lucius III. at Veroli, and in 1185 visited Urban III. at Verona. There is extant a letter of Pope Clement III., dated the 8th of June 1188, in which Clement alludes to two of Joachim's works, the *Concordia* and the *Expositio in Apocalypsin*, and urges him to continue them. Joachim, however, was unable to continue his abbatial functions in the midst of his labours in prophetic exegesis, and, moreover, his asceticism accommodated itself but ill with the somewhat lax discipline of Corazzo. He accordingly retired into the solitudes of Pietralata, and subsequently founded with some companions under a rule of his own creation the abbey of San Giovanni in Fiore, on Monte Nero, in the *massif* of La Sila. The pope and the emperor befriended this foundation; Frederick II. and his wife Constance made important donations to it, and promoted the spread of offshoots of the parent house; while Innocent III., on the 21st of January 1204, approved the "ordo Florensis" and the "institutio" which its founder had bestowed upon it. Joachim died in 1202, probably on the 20th of March.

Of the many prophetic and polemical works that were attributed to Joachim in the 13th and following centuries, only those enumerated in his will can be regarded as absolutely authentic. These are the *Concordia novi et veteris Testamenti* (first printed at Venice in 1519), the *Expositio in Apocalypsin* (Venice, 1527), the *Psalterium decem chordarum* (Venice, 1527), together with some "libelli" against the Jews or the adversaries of the Christian faith. It is very probable that these "libelli" are the writings entitled *Concordia Evangeliorum*, *Contra Judaeos*, *De articulis fidei*, *Confessio fidei* and *De unitate Trinitatis*. The last is perhaps the work which was condemned by the Lateran council in 1215 as containing an erroneous criticism of the Trinitarian theory of Peter Lombard. This council, though condemning the book, refrained from condemning the author, and approved the order of Floris. Nevertheless, the monks continued to be subjected to insults as followers of a heretic, until they obtained from Honorius III. in 1220 a bull formally recognizing Joachim as orthodox and forbidding anyone to injure his disciples.

It is impossible to enumerate here all the works attributed to Joachim. Some served their avowed object with great success, being powerful instruments in the anti-papal polemic and sustaining the revolted Franciscans in their hope of an approaching triumph. Among the most widely circulated were the commentaries on Jeremiah, Isaiah and Ezekiel, the *Vaticinia pontificum* and the *De oneribus ecclesiae*. Of his authentic works the doctrinal essential is very simple. Joachim divides the history of humanity, past, present and future, into three periods, which, in his *Expositio in Apocalypsin* (bk. i. ch. 5), he defines as the age of the Law, or of the Father; the age of the Gospel, or of the Son; and the age of the Spirit, which will bring the ages to an end. Before each of these ages there is a period of incubation, or initiation: the first age begins with Abraham, but the period of initiation with the first man Adam. The initiation period of the third age begins with St Benedict, while the actual age of the Spirit is not to begin until 1260, the Church—*mulier amicta sole* (Rev. xii. 1)—remaining hidden in the wilderness 1260 days. We cannot here enter into the infinite details of the other subdivisions imagined by Joachim, or into his system of perpetual concordances between the New and the Old Testaments, which, according to him, furnish the prefiguration of the third age. Far more interesting as explaining the diffusion and the religious and social importance of his doctrine is his conception of the second and third ages. The first age was the age of the Letter, the second was intermediary between the Letter and the Spirit, and the third was to be the age of the Spirit. The age of the Son is the period of study and wisdom, the period of striving towards mystic knowledge. In the age of the Father all that was necessary was obedience; in the age of the Son reading is enjoined; but the age of the Spirit was to be devoted to prayer and song. The third is the age of the *plena spiritus libertas*, the age of contemplation, the monastic age *par excellence*, the age of a monachism wholly directed towards ecstasy, more Oriental than Benedictine. Joachim does not conceal his sympathies with the ideal of Basilian monachism. In his opinion—which is, in form at least, perfectly orthodox—the church of Peter will be, not abolished, but purified; actually, the hierarchy effaces itself in the third age before the order of the monks, the *viri spirituales*. The entire world will become a vast monastery in that day, which will be the resting-season, the sabbath of humanity. In various passages in Joachim's writings the clerical hierarchy is represented by Rachel and the contemplative order by her son Joseph, and Rachel is destined to efface herself before her son. Similarly, the teaching of Christ and the Apostles on the sacraments is considered, implicitly and explicitly, as transitory, as representing that passage from the *significantia* to the *significata* which Joachim signalizes at every stage of his demonstration. Joachim was not disturbed during his lifetime. In 1200 he submitted all his writings to the judgment of the Holy See, and unreservedly affirmed his orthodoxy; the Lateran council, which condemned his criticism of Peter Lombard, made no allusion to his eschatological temerities; and the bull of 1220 was a formal certificate of his orthodoxy.

The Joachimite ideas soon spread into Italy and France, and especially after a division had been produced in the Franciscan order. The rigorists, who soon became known as "Spirituals," represented St Francis as the initiator of Joachim's third age. Certain convents became centres of Joachimism. Around the hermit of Hyères, Hugh of Digne, was formed a group of Franciscans who expected from the advent of the third age the triumph of their ascetic ideas. The Joachimites even obtained a majority in the general chapter of 1247, and elected John of Parma, one of their number, general of the order. Pope Alexander IV., however, compelled John of Parma to renounce his dignity, and the Joachimite opposition became more and more vehement. Pseudo-Joachimite treatises sprang up on every hand, and, finally, in 1254, there appeared in Paris the *Liber introductorius ad Evangelium aeternum*, the work of a Spiritual Franciscan, Gherardo da Borgo San Donnino. This book was published with, and as an introduction to, the three principal works of Joachim, in which the Spirituals had made some interpolations.[1] Gherardo, however, did not say, as has been supposed, that Joachim's books were the new gospel, but merely that the Calabrian abbot had supplied the key to Holy Writ, and that with the help of that *intelligentia mystica* it would be possible to extract from the Old and New Testaments the eternal meaning, the gospel according to the Spirit, a gospel which would never be written; as for this eternal sense, it had been entrusted to an order set apart, to the Franciscan order announced by Joachim, and in this order the ideal of the third age was realized. These affirmations provoked very keen protests in the ecclesiastical world. The secular masters of the university of Paris denounced the work to Pope Innocent IV., and the bishop of Paris sent it to the pope. It was Innocent's successor, Alexander IV., who appointed a commission to examine it; and as a result of this commission, which sat at Anagni, the destruction of the *Liber introductorius* was ordered by a papal breve dated the 23rd of October 1255. In 1260 a council held at Arles condemned Joachim's writings and his supporters, who were very numerous in that region. The Joachimite ideas were equally persistent among the Spirituals, and acquired new strength with the publication of the commentary on the Apocalypse. This book, probably published after the death of its author and probably interpolated by his disciples, contains, besides Joachimite principles, an affirmation even clearer than that of Gherardo da Borgo of the elect character of the Franciscan order, as well as extremely violent attacks on the papacy. The Joachimite literature is extremely vast. From the 14th century to the middle of the 16th, Ubertin of Casale (in his *Arbor Vitae crucifixae*), Bartholomew of Pisa (author of the *Liber Conformitatum*), the Calabrian hermit Telesphorus, John of La Rochetaillade, Seraphin of Fermo, Johannes Annius of Viterbo, Coelius Pannonius, and a host of other writers, repeated or complicated *ad infinitum* the exegesis of Abbot Joachim. A treatise entitled *De ultima aetate ecclesiae*, which appeared in 1356, has been attributed to Wycliffe, but is undoubtedly from the pen of an anonymous Joachimite Franciscan. The heterodox movements in Italy in the 13th and 14th centuries, such as those of the Segarellists, Dolcinists, and Fraticelli of every description, were penetrated with Joachimism; while such independent spirits as Roger Bacon, Arnaldus de Villa Nova and Bernard Délicieux often comforted themselves with the thought of the era of justice and peace promised by Joachim. Dante held Joachim in great reverence, and has placed him in Paradise (*Par.*, xii. 140–141).

See *Acta Sanctorum, Boll.* (May), vii. 94–112; W. Preger in *Abhandl. der kgl. Akad. der Wissenschaften*, hist. sect., vol. xii., pt. 3 (Munich, 1874); idem, *Gesch. d. deutschen Mystik im Mittelalter*, vol. i. (Leipzig, 1874); E. Renan, "Joachim de Flore et l'Évangile éternel" in *Nouvelles études d'histoire religieuse* (Paris, 1884); F. Tocco, *L'Eresia nel medio evo* (Florence, 1884); H. Denifle, "Das Evangelium aeternum und die Commission zu Anagni" in *Archiv für Literatur- und Kirchengesch. des Mittelalters*, vol. i.; Paul Fournier, "Joachim de Flore, ses doctrines, son influence" in *Revue des questions historiques*, t. i. (1900); H. C. Lea, *History of the Inquisition of the Middle Ages*, vol. iii. ch. i. (London, 1888); F. Ehrle's article "Joachim" in Wetzer and Welte's *Kirchenlexikon*. On Joachimism see E. Gebhardt, "Recherches nouvelles sur l'histoire du Joachimisme" in *Revue historique*, vol. xxxi. (1886); H. Haupt, "Zur Gesch. des Joachimismus" in *Briegers Zeitschrift für Kirchengesch.*, vol. vii. (1885). (P. A.)

JOACHIM I. (1484–1535), surnamed Nestor, elector of Brandenburg, elder son of John Cicero, elector of Brandenburg, was born on the 21st of February 1484. He received an excellent education, became elector of Brandenburg on his father's death in January 1499, and soon afterwards married Elizabeth, daughter of John, king of Denmark. He took some part in the political complications of the Scandinavian kingdoms, but the early years of his reign were mainly spent in the administration of his electorate, where by stern and cruel measures he succeeded in restoring some degree of order (see BRANDENBURG). He also improved the administration of justice, aided the development of commerce, and was a friend to the towns. On the approach of the imperial election of 1519, Joachim's vote was eagerly solicited by the partisans of Francis I., king of France, and by those of Charles, afterwards the emperor Charles V. Having treated with, and received lavish promises from, both parties, he appears to have hoped for the dignity for himself; but when the election came he turned to the winning side and voted for Charles. In spite of this step, however, the relations between the emperor and the elector were not friendly, and during the next few years Joachim was frequently in communication with the enemies of Charles. Joachim is best known as a pugnacious adherent of Catholic orthodoxy. He was one of the princes who urged upon the emperor the necessity of enforcing the Edict of Worms, and at several diets was prominent among the enemies of the Reformers. He was among those who met at Dessau in July 1525, and was a member of the league established at Halle in November 1533. But his wife adopted the reformed faith, and in 1528 fled for safety to Saxony; and he had the mortification of seeing these doctrines also favoured by other members of his family. Joachim, who was a patron of learning, established the university of Frankfort-on-the-Oder in 1506. He died at Stendal on the 11th of July 1535.

See T. von Buttler, *Der Kampf Joachims I. von Brandenburg gegen den Adel* (1889); J. G. Droysen, *Geschichte der Preussischen Politik* (1855–1886).

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[1] Preger is the only writer who has maintained that the three books in their primitive form date from 1254.

JOACHIM II. (1505–1571), surnamed Hector, elector of Brandenburg, the elder son of Joachim I., elector of Brandenburg, was born on the 13th of January 1505. Having passed some time at the court of the emperor Maximilian I., he married in 1524 a daughter of George, duke of Saxony. In 1532 he led a contingent of the imperial army on a campaign against the Turks; and soon afterwards, having lost his first wife, married Hedwig, daughter of Sigismund I., king of Poland. He became elector of Brandenburg on his father's death in July 1535, and undertook the government of the old and middle marks, while the new mark passed to his brother John. Joachim took a prominent part in imperial politics as an advocate of peace, though with a due regard for the interests of the house of Habsburg. He attempted to make peace between the Protestants and the emperor Charles V. at Frankfort in 1539, and subsequently at other places; but in 1542 he led the German forces on an unsuccessful campaign against the Turks. When the war broke out between Charles and the league of Schmalkalden in 1546 the elector at first remained neutral; but he afterwards sent some troops to serve under the emperor. With Maurice, elector of Saxony, he persuaded Philip, landgrave of Hesse, to surrender to Charles after the imperial victory at Mühlberg in April 1547, and pledged his word that the landgrave would be pardoned. But, although he felt aggrieved when the emperor declined to be bound by this promise, he refused to join Maurice in his attack on Charles. He supported the *Interim*, which was issued from Augsburg in May 1548, and took part in the negotiations that resulted in the treaty of Passau (1552), and the religious peace of Augsburg (1555). In domestic politics he sought to consolidate and strengthen the power of his house by treaties with neighbouring princes, and succeeded in secularizing the bishoprics of Brandenburg, Havelberg and Lebus. Although brought up as a strict adherent of the older religion, he showed signs of wavering soon after his accession, and in 1539 allowed free entrance to the reformed teaching in the electorate. He took the communion himself in both kinds, and established a new ecclesiastical organization in Brandenburg, but retained much of the ceremonial of the Church of Rome. His position was not unlike that of Henry VIII. in England, and may be partly explained by a desire to replenish his impoverished exchequer with the wealth of the Church (see BRANDENBURG). After the peace of Augsburg the elector mainly confined his attention to Brandenburg, where he showed a keener desire to further the principles of the Reformation. By his luxurious habits and his lavish expenditure on public buildings he piled up a great accumulation of debt, which was partly discharged by the estates of the land in return for important concessions. He cast covetous eyes upon the archbishopric of Magdeburg and the bishopric of Halberstadt, both of which he secured for his son Frederick in 1551. When Frederick died in the following year, the elector's son Sigismund obtained the two sees; and on Sigismund's death in 1566 Magdeburg was secured by his nephew, Joachim Frederick, afterwards elector of Brandenburg. Joachim, who was a prince of generous and cultured tastes, died at Köpenick on the 3rd of January 1571, and was succeeded by his son, John George. In 1880 a statue was erected to his memory at Spandau.

See Steinmüller, *Einführung der Reformation in die Kurmark Brandenburg durch Joachim II.* (1903); S. Isaacsohn, "Die Finanzen Joachims II." in the *Zeitschrift für Preussische Geschichte und Landeskunde* (1864–1883); J. G. Droysen, *Geschichte der Preussischen Politik* (1855–1886).

JOACHIM, JOSEPH (1831–1907), German violinist and composer, was born at Kittsee, near Pressburg, on the 28th of June 1831, the son of Jewish parents. His family moved to Budapest when he was two years old, and he studied there under Serwaczynski, who brought him out at a concert when he was only eight years old. Afterwards he learnt from the elder Hellmesberger and Joseph Böhm in Vienna, the latter instructing him in the management of the bow. In 1843 he went to Leipzig to enter the newly founded conservatorium. Mendelssohn, after testing his musical powers, pronounced that the regular training of a music school was not needed, but recommended that he should receive a thorough general education in music from Ferdinand David and Moritz Hauptmann. In 1844 he visited England, and made his first appearance at Drury Lane Theatre, where his playing of Ernst's fantasia on *Otello* made a great sensation; he also played Beethoven's concerto at a Philharmonic concert conducted by Mendelssohn. In 1847–1849 and 1852 he revisited England, and after the foundation of the popular concerts in 1859, up to 1899, he played there regularly in the latter part of the season. On Liszt's invitation he accepted the post of *Konzertmeister* at Weimar, and was there from 1850 to 1853. This brought Joachim into close contact with the advanced school of German musicians, headed by Liszt; and he was strongly tempted to give his allegiance to what was beginning to be called the "music of the future"; but his artistic convictions forced him to separate himself from the movement, and the tact and good taste he displayed in the difficult moment of explaining his position to Liszt afford one of the finest illustrations of his character.

His acceptance of a similar post at Hanover brought him into a different atmosphere, and his playing at the Düsseldorf festival of 1853 procured him the intimate friendship of Robert Schumann. His introduction of the young Brahms to Schumann is a famous incident of this time. Schumann and Brahms collaborated with Albert Dietrich in a joint sonata for violin and piano, as a welcome on his arrival in Düsseldorf. At Hanover he was *königlicher Konzertdirektor* from 1853 to 1868, when he made Berlin his home. He married in 1863 the mezzo soprano singer, Amalie Weiss, who died in 1899. In 1869 Joachim was appointed head of the newly founded *königliche Hochschule für Musik* in Berlin. The famous "Joachim quartet" was started in the *Sing-Akademie* in the following year. Of his later life, continually occupied with public performances, there is little to say except that he remained, even in a period which saw the rise of numerous violinists of the finest technique, the acknowledged master of all. He died on the 15th of August 1907.

Besides the consummate manual skill which helped to make him famous in his youth, Joachim was gifted with the power of interpreting the greatest music in absolute perfection: while Bach, Mozart, Beethoven and Brahms were masters, whose works he played with a degree of insight that has never been approached, he was no less supreme in the music of Mendelssohn and Schumann; in short, the whole of the classical repertory has become identified with his playing. No survey of Joachim's artistic career would be complete which omitted mention of his absolute freedom from tricks or mannerism, his dignified bearing, and his unselfish character. His devotion to the highest ideals, combined with a certain austerity and massivity of style, brought against him an accusation of coldness from admirers of a more effusive temperament. But the answer to this is given by the depth and variety of expression which his mastery of the resources of his instrument put at his command. His biographer (1898), Andreas Moser, expressed his essential characteristic in the words, "He plays the violin, not for its own sake, but in the service of an ideal."

As a composer Joachim did but little in his later years, and the works of his earlier life never attained the public success which, in the opinion of many, they deserve (see MUSIC). They undoubtedly have a certain austerity of character which does not appeal to every hearer, but they are full of beauty of a grave and dignified kind; and in such things as his "Hungarian concerto" for his own instrument the utmost degree of difficulty is combined with great charm of melodic treatment. The "romance" in B flat for violin and the variations for violin and orchestra are among his finest things, and the noble overture in memory of Kleist, as well as the scena for mezzo soprano from Schiller's *Demetrius*, show a wonderful degree of skill in orchestration as well as originality of thought. Joachim's place in musical history as a composer can only be properly appreciated in the light of his intimate relations with Brahms, with whom he studiously refrained from putting himself into independent rivalry, and to whose work as a composer he gave the co-operation of one who might himself have ranked as a master.

There are admirable portraits of Joachim by G. F. Watts (1866) and by J. S. Sargent (1904), the latter presented to him on the 16th of May 1904, at the celebration of the sixtieth anniversary of his first appearance in England.

JOAN, a mythical female pope, who is usually placed between Leo IV. (847–855) and Benedict III. (855–858). One account has it that she was born in England, another in Germany of English parents. After an education at Cologne, she fell in love with a Benedictine monk and fled with him to Athens disguised as a man. On his death she went to Rome under the alias of Joannes Anglicus (John of England), and entered the priesthood, eventually receiving a cardinal's hat. She was elected pope under the title of John VIII., and died in childbirth during a papal procession.

A French Dominican, Steven of Bourbon (d. *c.* 1261) gives the legend in his *Seven Gifts of the Holy Spirit.* He is believed to have derived it from an earlier writer. More than a hundred authors between the 13th and 17th centuries gave circulation to the myth. Its explosion was first seriously undertaken by David Blondel, a French Calvinist, in his *Éclaircissement de la question si une femme a été assise au siège papal de Rome* (1647); and *De Joanna Papissa* (1657). The refutation was completed by Johann Dollinger in his *Papstfabeln des Mittelalters* (1863; Eng. trans. 1872).

JOAN OF ARC, more properly JEANNETON DARC, afterwards known in France as JEANNE D'ARC[1] (1411–1431), the "Maid of Orleans," was born between 1410 and 1412, the daughter of Jacques Darc, peasant proprietor, of Domremy, a small village in the Vosges, partly in Champagne and partly in Lorraine, and of his wife Isabeau, of the village of Vouthon, who from having made a pilgrimage to Rome had received the usual surname of Romée. Although her parents were in easy circumstances, Joan never learned to read or write, and received her sole religious instruction from her mother, who taught her to recite the Pater Noster, Ave Maria, and Credo. She sometimes guarded her father's flocks, but at her trial in 1431 she strongly resented being referred to as a shepherd girl. In all household work she was specially proficient, her skill in the use of the needle not being excelled (she said) by that of any matron even of Rouen. In her childhood she was noted for her abounding physical energy; but her vivacity, so far from being tainted by any coarse or unfeminine trait, was the direct outcome of an abnormally sensitive nervous temperament. Towards her parents her conduct was uniformly exemplary, and the charm of her unselfish kindness made her a favourite in the village. As she grew to womanhood she became inclined to silence, and spent much of her time in solitude and prayer. She repelled all attempts of the young men of her acquaintance to win her favour; and while active in the performance of her duties, and apparently finding her life quite congenial, inwardly she was engrossed with thoughts reaching far beyond the circle of her daily concerns.

At this time, through the alliance and support of Philip of Burgundy, the English had extended their conquest over the whole of France north of the Loire in addition to their possession of Guienne; and while the infant Henry VI. of England had in 1422 been proclaimed king of France at his father's grave at St Denis, Charles the dauphin (still uncrowned) was forced to watch the slow dismemberment of his kingdom. Isabella, the dauphin's mother, had favoured Henry V. of England, the husband of her daughter Catherine; and under Charles VI. a visionary named Marie d'Avignon declared that France was being ruined by a woman and would be restored by an armed virgin from the marches of Lorraine. To what extent this idea worked in Joan's mind is doubtful. In Geoffrey of Monmouth's tract, *De prophetiis Merlini*, there is a reference to an ancient prophecy of the enchanter Merlin concerning a virgin *ex nemore canuto*, and it appears that this *nemus canutum* had been identified in folk-lore with the oak wood of Domremy. Joan's knowledge of the prophecy does not, however, appear till 1429; and already before that, from 1424, according to her account at her trial, she had become imbued with a sense of having a mission to free France from the English. She heard the voices of St Michael, St Catherine and St Margaret urging her on. In May 1428 she tried to obtain from Robert de Baudricourt, governor of Vaucouleurs, an introduction to the dauphin, saying that God would send him aid, but she was rebuffed. When, however, in September the English (under the earl of Salisbury) invested Orleans, the key to the south of France, she renewed her efforts with Baudricourt, her mission being to relieve Orleans and crown the dauphin at Reims. By persistent importunity, the effect of which was increased by the simplicity of her demeanour and her calm assurance of success, she at last prevailed on the governor to grant her request; and in February 1429, accompanied by six men-at-arms, she set out on her perilous journey to the court of the dauphin at Chinon. At first Charles refused to see her, but popular feeling in her favour induced his advisers to persuade him after three days to grant her an interview. She is said to have persuaded him of the divine character of her commission by discovering him though disguised in the crowd of his courtiers, and by reassuring him regarding his secret doubts as to his legitimacy. And Charles was impressed by her knowledge of a secret prayer, which (he told Dunois) could only be known to God and himself. Accordingly, after a commission of doctors had reported that they had found in her nothing of evil or contrary to the Catholic faith, and a council of matrons had reported on her chastity, she was permitted to set forth with an army of 4000 or 5000 men designed for the relief of Orleans. At the head of the army she rode clothed in a coat of mail, armed with an ancient sword, said to be that with which Charles Martel had vanquished the Saracens, the hiding-place of which, under the altar of the parish church of the village of Ste Catherine de Fierbois, the "voices" had revealed to her; she carried a white standard of her own design embroidered with lilies, and having on the one side the image of God seated on the clouds and holding the world in His hand, and on the other a representation of the Annunciation. Joan succeeded in entering Orleans on the 29th of April 1429, and through the vigorous and unremitting sallies of the French the English gradually became so discouraged that on the 8th of May they raised the siege. It is admitted that her extraordinary pluck and sense of leadership were responsible for this result. In a single week (June 12 to 19), by the capture of Jargeau and Beaugency, followed by the great victory of Patay, where Talbot was taken prisoner, the English were driven beyond the Loire. With some difficulty the dauphin was then persuaded to set out towards Reims, which he entered with an army of 12,000 men on the 16th of July, Troyes having yielded on the way. On the following day, holding the sacred banner, Joan stood beside Charles at his coronation in the cathedral.

The king then entered into negotiations with a view to detaching Burgundy from the English cause. Joan, at his importunity, remained with the army, but the king played her false when she attempted the capture of Paris; and after a failure on the 8th of September, when Joan was wounded,[2] his troops were disbanded. Joan went into Normandy to assist the duke of Alençon, but in December returned to the court, and on the 29th she and her family were ennobled with the surname of du Lis. Unconsoled by such honours, she rode away from the court in March, to assist in the defence of Compiègne against the duke of Burgundy; and on the 24th of May she led an unsuccessful sortie against the besiegers, when she was surrounded and taken prisoner. Charles, partly perhaps on account of his natural indolence, partly on account of the intrigues at the court, made no effort to effect her ransom, and never showed any sign of interest in her fate. By means of negotiations instigated and prosecuted with great perseverance by the university of Paris and the Inquisition, and through the persistent scheming of Pierre Cauchon, the bishop of Beauvais—a Burgundian partisan, who, chased from his own see, hoped to obtain the archbishopric of Rouen—she was sold in November by John of Luxemburg and Burgundy to the English, who on the 3rd of January 1431, at the instance of the university of Paris, delivered her over to the Inquisition for trial. After a public examination, begun on the 9th of January and lasting six days, and another conducted in the prison, she was, on the 20th of March, publicly accused as a heretic and witch, and, being in the end found guilty, she made her submission at the scaffold on the 24th of May, and received pardon. She was still, however, the prisoner of the English, and, having been induced by those who had her in charge to resume her male clothes, she was on this account judged to have relapsed, was sentenced to death, and burned at the stake on the streets of Rouen on the 30th of May 1431. In 1436 an impostor appeared, professing to be Joan of Arc escaped from the flames, who succeeded in inducing many people to believe in her statement, but afterwards confessed her imposture. The sentence passed on Joan of Arc was revoked by the pope on the 7th of July 1456, and since then it has been the custom of Catholic writers to uphold the reality of her divine inspiration.

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[1] In the act of ennoblement the name is spelt Day, due probably to the peculiar pronunciation. It has been disputed whether the name was written originally d'Arc or Darc. It is beyond doubt that the father of Joan was not of noble origin, but Bouteiller suggests that at that period the apostrophe did not indicate nobility. Her mother, it may be noted, is called "de Vouthon."

[2] The Porte St Honoré where Joan was wounded stood where the Comédie Française now stands.

During the latter part of the 19th century a popular cult of the Maid of Orleans sprang up in France, being greatly stimulated by the clerical party, which desired to advertise, in the person of this national heroine, the intimate union between patriotism and the Catholic faith, and for this purpose ardently desired her enrolment among the Saints. On the 27th of January 1894 solemn approval was given by Pope Leo XIII., and in February 1903 a formal proposal was entered for her canonization. The Feast of the Epiphany (Jan. 6), 1904 was made the occasion for a public declaration by Pope Pius X. that she was entitled to the designation Venerable. On the 13th of December 1908 the decree of beatification was published in the Consistory Hall of the Vatican.

As an historical figure, it is impossible to dogmatize concerning the personality of Joan of Arc. The modern clerical view has to some extent provoked what appears, in Anatole France's learned account, ably presented as it is, to be a retaliation, in regarding her as a clerical tool in her own day. But her character was in any case exceptional. She undoubtedly nerved the French at a critical time, and inspired an army of laggards and pillagers with a fanatical enthusiasm, comparable with that of Cromwell's Puritans. Moreover, as regards her genuine military qualities we have the testimony of Dunois and d'Alençon; and Captain Marin, in his *Jeanne d'Arc, tacticien et stratégiste* (1891), takes a high view of her achievements. The nobility of her purpose and the genuineness of her belief in her mission, combined with her purity of character and simple patriotism, stand clear. As to her "supranormal" faculties, a matter concerning which belief largely depends on the point of view, it is to be remarked that Quicherat, a freethinker wholly devoid of clerical influences, admits them (*Aperçus nouveaux*, 1850), saying that the evidence is as good as for any facts in her history. See also A. Lang on "the voices" in *Proc. Soc. Psychical Research*, vol. xi.

Authorities.—For bibliography see *Le Livre d'or de Jeanne d'Arc* (1894), and A. Molinier, *Sources de l'histoire de France* (1904). Until the 19th century the history of Joan of Arc was almost entirely neglected; Voltaire's scurrilous satire *La Pucelle*, while indicative of the attitude of his time, may be compared with the very fair praises in the *Encyclopédie*. The first attempt at a study of the sources was that of L'Averdy in 1790, published in the third volume of *Mémoires* of the Academy of Inscriptions, which served as the base for all lives until J. Quicherat's great work, *Le Procès de Jeanne d'Arc* (1841–1849), a collection of the texts so full and so vivid that they reveal the character and life of the heroine with great distinctness. Michelet's sketch of her work in his *Histoire de France*, one of the best sections of the history, is hardly more vivid than these sources, upon which all the later biographies (notably that of H. A. Wallon, 1860) are based. See also A. Marty, *L'Histoire de Jeanne d'Arc d'après des documents originaux*, with introduction by M. Sepet (1907); P. H. Dunand, *Jeanne d'Arc et l'église* (1908); and especially Andrew Lang, *The Maid of France* (1908). The *Vie de Jeanne d'Arc*, by Anatole France (2 vols., 1908), is brilliant and erudite, but in some respects open to charges of inaccuracy and prejudice in its handling of the sources (see the criticism by Andrew Lang in *The Times*, Lit. Suppl., May 28, 1908). The attempt to establish the reality of the "revelations" and consequently to obtain the canonization of Joan of Arc led the Catholic party in France to publish lives (such as Sepet's, 1869) in support of their claims. Excellent works worth special mention are: Siméon Luce, *Jeanne d'Arc à Domremy*; L. Jarry, *L'Armée anglaise au siège d'Orleans* (1892); J. J. Bourassé, *Miracles de Madame Sainte Kathérine de Fierbois* (1858, trans. by A. Lang); Boucher de Molandon and A. de Beaucorps, *L'Armée anglaise vaincue par Jeanne d'Arc* (1892); R. P. Agroles, S.J., *La Vraie Jeanne d'Arc*. For the "false Pucelle" see A. Lang's article in his *Valet's Tragedy* (1903). Of the numerous dramas and poems of which Joan of Arc has been the subject, mention can only be made of *Die Jungfrau von Orleans* of Schiller, and of the *Joan of Arc* of Southey. A drama in verse by Jules Barbier was set to music by C. Gounod (1873). (J. T. S.*; H. Ch.)

JOANES (or Juanes), **VICENTE** (1506–1579), head of the Valencian school of painters, and often called "the Spanish Raphael," was born at Fuente de la Higuera in the province of Valencia in 1506. He is said to have studied his art for some time in Rome, with which school his affinities are closest, but the greater part of his professional life was spent in the city of Valencia, where most of the extant examples of his work are now to be found. All relate to religious subjects, and are characterized by dignity of conception, accuracy of drawing, truth and beauty of colour, and minuteness of finish. He died at Bocairente (near Jativa) while engaged upon an altarpiece in the church there, on the 21st of December 1579.

JOANNA (1479–1555), called the Mad (*la Loca*), queen of Castile and mother of the emperor Charles V., was the second daughter of Ferdinand and Isabella, king and queen of Spain, and was born at Toledo on the 6th of November 1479. Her youngest sister was Catherine of Aragon, the first wife of Henry VIII. In 1496 at Lille she was married to the archduke Philip the Handsome, son of the German King Maximilian I., and at Ghent, in February 1500, she gave birth to the future emperor. The death of her only brother John, of her eldest sister Isabella, queen of Portugal, and then of the latter's infant son Miguel, made Joanna heiress of the Spanish kingdoms, and in 1502 the cortes of Castile and of Aragon recognized her and her husband as their future sovereigns. Soon after this Joanna's reason began to give way. She mourned in an extravagant fashion for her absent husband, whom at length she joined in Flanders; in this country her passionate jealousy, although justified by Philip's conduct, led to deplorable scenes. In November 1504 her mother's death left Joanna queen of Castile, but as she was obviously incapable of ruling, the duties of government were undertaken by her father, and then for a short time by her husband. The queen was with Philip when he was wrecked on the English coast and became the guest of Henry VII. at Windsor; soon after this event, in September 1506, he died and Joanna's mind became completely deranged, it being almost impossible to get her away from the dead body of her husband. The remaining years of her miserable existence were spent at Tordesillas, where she died on the 11th of April 1555. In spite of her afflictions the queen was sought in marriage by Henry VII. just before his death. Nominally Joanna remained queen of Castile until her death, her name being joined with that of Charles in all public documents, but of necessity she took no part in the business of state. In addition to Charles she had a son Ferdinand, afterwards the emperor Ferdinand I., and four daughters, among them being Maria (1505–1558), wife of Louis II., king of Hungary, afterwards governor-general of the Netherlands.

See R. Villa, *La Reina doña Juana la Loca* (Madrid, 1892); Rösler, *Johanna die Wahnsinnige* (Vienna, 1890); W. H. Prescott, *Hist. of Ferdinand and Isabella* (1854); and H. Tighe, *A Queen of Unrest* (1907).

JOANNA I. (*c.* 1327–1382), queen of Naples, was the daughter of Charles duke of Calabria (d. 1328), and became sovereign of Naples in succession to her grandfather King Robert in 1343. Her first husband was Andrew, son of Charles Robert, king of Hungary, who like the queen herself was a member of the house of Anjou. In 1345 Andrew was assassinated at Aversa, possibly with his wife's connivance, and at once Joanna married Louis, son of Philip prince of Taranto. King Louis of Hungary then came to Naples to avenge his brother's death, and the queen took refuge in Provence—which came under her rule at the same time as Naples—purchasing pardon from Pope Clement VI. by selling to him the town of Avignon, then part of her dominions. Having returned to Naples in 1352 after the departure of Louis, Joanna lost her second husband in 1362, and married James, king of

Majorca (d. 1375), and later Otto of Brunswick, prince of Taranto. The queen had no sons, and as both her daughters were dead she made Louis I. duke of Anjou, brother of Charles V. of France, her heir. This proceeding so angered Charles, duke of Durazzo, who regarded himself as the future king of Naples, that he seized the city. Joanna was captured and was put to death at Aversa on the 22nd of May 1382. The queen was a woman of intellectual tastes, and was acquainted with some of the poets and scholars of her time, including Petrarch and Boccaccio.

See Crivelli, *Della prima e della seconda Giovanna, regine di Napoli* (1832); G. Battaglia, *Giovanna I., regina di Napoli* (1835); W. St C. Baddeley, *Queen Joanna I. of Naples* (1893); Scarpetta, *Giovanna I. di Napoli* (1903); and Francesca M. Steele, *The Beautiful Queen Joanna I. of Naples* (1910).

JOANNA II. (1371–1435), queen of Naples, was descended from Charles II. of Anjou through his son John of Durazzo. She had been married to William, son of Leopold III. of Austria, and at the death of her brother King Ladislaus in 1414 she succeeded to the Neapolitan crown. Her life had always been very dissolute, and although now a widow of forty-five, she chose as her lover Pandolfo Alopo, a youth of twenty-six, whom she made seneschal of the kingdom. He and the constable Muzio Attendolo Sforza completely dominated her, and the turbulent barons wished to provide her with a husband who would be strong enough to break her favourites yet not make himself king. The choice fell on James of Bourbon, a relative of the king of France, and the marriage took place in 1415. But James at once declared himself king, had Alopo killed and Sforza imprisoned, and kept his wife in a state of semi-confinement; this led to a counter-agitation on the part of the barons, who forced James to liberate Sforza, renounce his kingship, and eventually to quit the country. The queen now sent Sforza to re-establish her authority in Rome, whence the Neapolitans had been expelled after the death of Ladislaus; Sforza entered the city and obliged the *condottiere* Braccio da Montone, who was defending it in the pope's name, to depart (1416). But when Oddo Colonna was elected pope as Martin V., he allied himself with Joanna, who promised to give up Rome, while Sforza returned to Naples. The latter found, however, that he had lost all influence with the queen, who was completely dominated by her new lover Giovanni (Sergianni) Caracciolo. Hoping to re-establish his position and crush Caracciolo, Sforza favoured the pretensions of Louis III. of Anjou, who wished to obtain the succession of Naples at Joanna's death, a course which met with the approval of the pope. Joanna refused to adopt Louis owing to the influence of Caracciolo, who hated Sforza; she appealed for help instead to Alphonso of Aragon, promising to make him her heir. War broke out between Joanna and the Aragonese on one side and Louis and Sforza, supported by the pope, on the other. After much fighting by land and sea, Alphonso entered Naples, and in 1422 peace was made. But dissensions broke out between the Aragonese and Catalans and the Neapolitans, and Alphonso had Caracciolo arrested; whereupon Joanna, fearing for her own safety, invoked the aid of Sforza, who with difficulty carried her off to Aversa. There she was joined by Louis whom she adopted as her successor instead of the ungrateful Alphonso. Sforza was accidentally drowned, but when Alphonso returned to Spain, leaving only a small force in Naples, the Angevins with the help of a Genoese fleet recaptured the city. For a few years there was peace in the kingdom, but in 1432 Caracciolo, having quarrelled with the queen, was seized and murdered by his enemies. Internal disorders broke out, and Gian Antonio Orsini, prince of Taranto, led a revolt against Joanna in Apulia; Louis of Anjou died while conducting a campaign against the rebels (1434), and Joanna herself died on the 11th of February 1435, after having appointed his son René her successor. Weak, foolish and dissolute, she made her reign one long scandal, which reduced the kingdom to the lowest depths of degradation. Her perpetual intrigues and her political incapacity made Naples a prey to anarchy and foreign invasions, destroying all sense of patriotism and loyalty both in the barons and the people.

Authorities.—A. von Platen, *Storia del reame di Napoli dal 1414 al 1423* (1864). C. Cipolla, *Storia della signoria Italiana* (1881), where the original authorities are quoted. (See also Naples; Sforza.)

JOASH, or Jehoash (Heb. "Yahweh is strong, *or* hath given"), the name of two kings of Palestine in the Bible.

1. Son of Ahaziah (see Jehoram, 2) and king of Judah. He obtained the throne by means of a revolt in which Athaliah (*q.v.*) perished, and his accession was marked by a solemn covenant, and by the overthrow of the temple of Baal and of its priest Mattan(-Baal). In this the priest Jehoiada (who must have continued to act as regent) took the leading part. The account of Joash's reign is not from a contemporary source (2 Kings xi. 4–xii. 16), and 2 Chronicles adds several new details, including a tradition of a conflict between the king and priests after the death of Jehoiada (xxii. 11; xxiv. 3, 15 sqq.).[1] At an unstated period, the Aramaeans under Hazael captured Gath, and Jerusalem only escaped by buying off the enemy (2 Kings xii. 17 sqq.). This may perhaps be associated with the Aramaean attacks upon Israel (2 below), but the tradition recorded in 2 Chron. xxiv. 23 seq. differs widely and cannot be wholly rejected. The king perished in a conspiracy, the origin of which is not clear; it may have been for his attack upon the priests, it was scarcely for the course he took to save Jerusalem. He was succeeded by his son Amaziah, whose moderation in avenging his father's death receives special mention. After defeating the Edomites, Amaziah turned his attention to Israel.

2. Son of Jehoahaz and king of Israel. Like his grandfather Jehu, he enjoyed the favour of the prophet Elisha, who promised him a triple defeat of the Aramaeans at Aphek (2 Kings xiii. 14 sqq. 22–25). The cities which had been taken from his father by Hazael the father of Ben-hadad were recovered (cf. 1 Kings xx. 34, time of Ahab) and the relief gained by Israel from the previous blows of Syria prepared the way for its speedy extension of power. When challenged by Amaziah of Judah, Joash uttered the famous fable of the thistle and cedar (for another example see Judg. ix. 8–15; see also Abimelech), and a battle was fought at Beth-shemesh, in which Israel was completely successful. An obscure statement in 2 Chron. xxv. 13 would show that this was not the only conflict; at all events, Amaziah was captured, the fortifications of Jerusalem were partially destroyed, the treasures of the Temple and palace were looted, and hostages were carried away to Samaria. According to one statement, Amaziah survived the disaster fifteen years, and lost his life in a conspiracy; but there is a gap in the history of Judah which the narratives do not enable us to fill (1 Kings xv. 1; see xiv. 17, 23). See further Uzziah; Jeroboam (2); and Jews.

(S. A. C.)

JOB. The book of Job (Heb. אִיּוֹב *'Iyyob*, Gr. Ἰώβ), in the Bible, the most splendid creation of Hebrew poetry, is so called from the name of the man whose history and afflictions and sayings form the theme of it.

Contents.—As it now lies before us it consists of five parts. 1. The prologue, in prose, chr. i.–ii., describes in rapid and dramatic steps the history of this man, his prosperity and greatness corresponding to his godliness; then how his life is drawn in under the operation of the sifting providence of God, through the suspicion suggested by the Satan, the minister of this aspect of God's providence, that his godliness is selfish and only the natural return for unexampled prosperity, and the insinuation that if stripped of his prosperity he will curse God to His face. These suspicions bring down two severe calamities on Job, one depriving him of children and possessions alike, and the other throwing the man himself under a painful malady. In spite of these afflictions Job retains his integrity and ascribes no wrong to God. Then is described the advent of Job's three friends—Eliphaz the Temanite, Bildad the Shuhite, and Zophar the Naamathite—who, having heard of Job's calamities, come to condole with him. 2. The body of the book, in poetry, ch. iii.–xxxi., contains a series of speeches in which the problem of Job's afflictions and the relation of external evil to the righteousness of God and the conduct of men are brilliantly discussed. This part, after Job's passionate outburst in ch. iii., is divided into three cycles, each containing six speeches, one by each of the friends, and three by Job, one in reply to each of theirs (ch. iv.–xiv.; xv.–xxi.; xxii.–xxxi.). although in the last cycle the third speaker Zophar fails to answer (unless his answer is to be found in ch. xxvii.). Job, having driven his opponents from the field, carries his reply through a series of discourses in which he dwells in pathetic words upon his early prosperity, contrasting with it his present humiliation, and ends with a solemn repudiation of all the offences that might be suggested against him, and a challenge to God to appear and put His hand to the charge which He had against him and for which He afflicted him. 3. Elihu, the representative of a younger generation, who has been a silent observer of the debate, intervenes to express his dissatisfaction with the manner in which both Job and his friends conducted the cause, and offers what is in some respects a new solution of the question (xxxii.–xxxvii.). 4. In answer to Job's repeated demands that God would appear and solve the riddle of his life, the Lord answers Job out of the whirlwind. The divine speaker does not condescend to refer to Job's individual problem, but in a series of ironical interrogations asks him, as he thinks himself capable of fathoming all things, to expound the mysteries of the origin and subsistence of the world, the phenomena of the atmosphere, the instincts of the creatures that inhabit the desert, and, as he judges God's conduct of the world amiss, invites him to seize the reins, gird himself with the thunder and quell the rebellious forces of evil in the universe (xxxviii.–xlii. 6). Job is humbled and abashed, lays his hand upon his mouth, and repents his hasty words in dust and ashes. No solution of his problem is vouchsafed; but God Himself effects that which neither the man's own thoughts of God nor the representations of the friends could accomplish: he had heard of him with the hearing of the ear without effect, but now his eye sees Him. This is the profoundest religious deep in the book. 5. The epilogue, in prose, xlii. 7–17, describes Job's restoration to a prosperity double that of his former estate, his family felicity and long life.

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[1] That the murder of Zechariah the son of Jehoiada (2 Chron. *l.c.*) is referred to in Matt. xxiii. 35, Luke xi. 51 is commonly held; but see Cheyne, *Ency. Bib.* col. 5373.

Design.—With the exception of the episode of Elihu, the connexion of which with the original form of the poem may be doubtful, all five parts of the book are essential elements of the work as it came from the hand of the first author, although some parts of the second and fourth divisions may have been expanded by later writers. The idea of the composition is to be derived not from any single element of the book, but from the teaching and movement of the whole piece. Job is unquestionably the hero of the work, and in his ideas and his history combined we may assume that we find the author himself speaking and teaching. The discussion between Job and his friends of the problem of suffering occupies two-thirds of the book, or, if the space occupied by Elihu be not considered, nearly three-fourths, and in the direction which the author causes this discussion to take we may see revealed the main didactic purpose of the book. When the three friends, the representatives of former theories of providence, are reduced to silence, we may be certain that it was the author's purpose to discredit the ideas which they represent. Job himself offers no positive contribution to the doctrine of evil; his position is negative, merely antagonistic to that of the friends. But this negative position victoriously maintained by him has the effect of clearing the ground, and the author himself supplies in the prologue the positive truth, when he communicates the real explanation of his hero's calamities, and teaches that they were a trial of his righteousness. It was therefore the author's main purpose in his work to widen men's views of the providence of God and set before them a new view of suffering. This purpose, however, was in all probability subordinate to some wider practical design. No Hebrew writer is merely a poet or a thinker. He is always a teacher. He has men before him in their relations to God,[1] and usually not men in their individual relations, but members of the family of Israel, the people of God. It is consequently scarcely to be doubted that the book has a national scope. The author considered his new truth regarding the meaning of affliction as of national interest, and as the truth then needful for the heart of his people. But the teaching of the book is only half its contents. It contains also a history—deep and inexplicable affliction, a great moral struggle, and a victory. The author meant his new truth to inspire new conduct, new faith, and new hopes. In Job's sufferings, undeserved and inexplicable to him, yet capable of an explanation most consistent with the goodness and faithfulness of God, and casting honour upon his faithful servants; in his despair bordering on unbelief, at last overcome; and in the happy issue of his afflictions—in all this Israel may see itself, and from the sight take courage, and forecast its own history. Job, however, is not to be considered Israel, the righteous servant of the Lord, under a feigned name; he is no mere parable (though such a view is found as early as the Talmud); he and his history have both elements of reality in them. It is these elements of reality common to him with Israel in affliction, common even to him with humanity as a whole, confined within the straitened limits set by its own ignorance, wounded to death by the mysterious sorrows of life, tortured by the uncertainty whether its cry finds an entrance into God's ear, alarmed and paralysed by the irreconcilable discrepancies which it seems to discover between its necessary thoughts of Him and its experience of Him in His providence, and faint with longing that it might come into His place, and behold him, not girt with His majesty, but in human form, as one looketh upon his fellow—it is these elements of truth that make the history of Job instructive to Israel in the times of affliction when it was set before them, and to men of all races in all ages. It would probably be a mistake, however, to imagine that the author consciously stepped outside the limits of his nation and assumed a human position antagonistic to it. The chords he touches vibrate through all humanity—but this is because Israel is the religious kernel of humanity, and because from Israel's heart the deepest religious music of mankind is heard, whether of pathos or of joy.

Two threads requiring to be followed, therefore, run through the book—one the discussion of the problem of evil between Job and his friends, and the other the varying attitude of Job's mind towards God, the first being subordinate to the second. Both Job and his friends advance to the discussion of his sufferings and of the problem of evil, ignorant of the true cause of his calamities—Job strong in his sense of innocence, and the friends armed with their theory of the righteousness of God, who giveth to every man according to his works. With fine psychological instinct the poet lets Job altogether lose his self-control first when his three friends came to visit him. His bereavements and his malady he bore with a steady courage, and his wife's direct instigations to godlessness he repelled with severity and resignation. But when his equals and the old associates of his happiness came to see him, and when he read in their looks and in their seven days' silence the depth of his own misery, his self-command deserted him, and he broke out into a cry of despair, cursing his day and crying for death (iii.). Job had somewhat misinterpreted the demeanour of his friends. It was not all pity that it expressed. Along with their pity they had also brought their theology, and they trusted to heal Job's malady with this. Till a few days before, Job would have agreed with them on the sovereign virtues of this remedy. But he had learned through a higher teaching, the events of God's providence, that it was no longer a specific in his case. His violent impatience, however, under his afflictions and his covert attacks upon the divine rectitude only served to confirm the view of his sufferings which their theory of evil had already suggested to his friends. And thus commences the high debate which continues through twenty-nine chapters.

The three friends of Job came to the consideration of his history with the principle that calamity is the result of evil-doing, as prosperity is the reward of righteousness. Suffering is not an accident or a spontaneous growth of the soil; man is born unto trouble as the sparks fly upwards; there is in human life a tendency to do evil which draws down upon men the chastisement of God (v. 6). The principle is thus enunciated by Eliphaz, from whom the other speakers take their cue: where there is suffering there has been sin in the sufferer. Not suffering in itself, but the effect of it on the sufferer is what gives insight into his true character. Suffering is not always punitive; it is sometimes disciplinary, designed to wean the good man from his sin. If he sees in his suffering the monition of God and turns from his evil, his future shall be rich in peace and happiness, and his latter estate more prosperous than his first. If he murmurs or resists, he can only perish under the multiplying chastisements which his impenitence will provoke. Now this principle is far from being a peculiar crotchet of the friends; its truth is undeniable, though they erred in supposing that it would cover the wide providence of God. The principle is the fundamental idea of moral government, the expression of the natural conscience, a principle common more or less to all peoples, though perhaps more prominent in the Semitic mind, because all religious ideas are more prominent and simple there—not suggested to Israel first by the law, but found and adopted by the law, though it may be sharpened by it. It is the fundamental principle of prophecy no less than of the law, and, if possible, of the wisdom of philosophy of the Hebrews more than of either. Speculation among the Hebrews had a simpler task before it than it had in the West or in the farther East. The Greek philosopher began his operations upon the sum of things; he threw the universe into his crucible at once. His object was to effect some analysis of it, so that he could call one element cause and another effect. Or, to vary the figure, his endeavour was to pursue the streams of tendency which he could observe till he reached at last the central spring which sent them all forth. God, a single cause and explanation, was the object of his search. But to the Hebrew of the later time this was already found. The analysis resulting in the distinction of God and the world had been effected for him so long ago that the history and circumstances of the process had been forgotten, and only the unchallengeable result remained. His philosophy was not a quest of God whom he did not know, but a recognition on all hands of God whom he knew. The great primary idea to his mind was that of God, a Being wholly just, doing all. And the world was little more than the phenomena that revealed the mind and the presence and the operations of God. Consequently the nature of God as known to him and the course of events formed a perfect equation. The idea of what God was in Himself was in complete harmony with His manifestation of Himself in providence, in the events of individual human lives, and in the history of nations. The philosophy of the wise did not go behind the origin of sin, or referred it to the freedom of man; but, sin existing, and God being in immediate personal contact with the world, every event was a direct expression of His moral will and energy; calamity fell on wickedness, and success attended right-doing. This view of the moral harmony between the nature of God and the events of providence in the fortunes of men and nations is the view of the Hebrew wisdom in its oldest form, during what might be called the period of principles, to which belong Prov. x. seq.; and this is the position maintained by Job's three friends. And the significance of the book of Job in the history of Hebrew thought arises in that it marks the point when such a view was definitely overcome, closing the long period when this principle was merely subjected to questionings, and makes a new positive addition to the doctrine of evil.

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[1] Exceptions must be made in the cases of Esther and the Song of Songs, which do not mention God, and the original writer in Ecclesiastes who is a philosopher.

Job agreed that afflictions came directly from the hand of God, and also that God afflicted those whom He held guilty of sins. But his conscience denied the imputation of guilt, whether insinuated by his friends or implied in God's chastisement of him. Hence he was driven to conclude that God was unjust. The position of Job appeared to his friends nothing else but impiety; while theirs was to him mere falsehood and the special pleading of sycophants on behalf of God because He was the stronger. Within these two iron walls the debate moves, making little progress, but with much brilliancy, if not of argument, of illustration. A certain advance indeed is perceptible. In the first series of speeches (iv.–xiv.), the key-note of which is struck by Eliphaz, the oldest and most considerate of the three, the position is that affliction is caused by sin, and is chastisement designed for the sinner's good; and the moral is that Job should recognize it and use it for the purpose for which it was sent. In the second (xv.–xxi.) the terrible fate of the sinner is emphasized, and those brilliant pictures of a restored future, thrown in by all the speakers in the first series, are absent. Job's demeanour under the consolations offered him afforded little hope of his repentance. In the third series (xxii. seq.) the friends cast off all disguise, and openly charge Job with a course of evil life. That their armoury was now exhausted is shown by the brevity of the second speaker, and the failure of the third (at least in the present text) to answer in any form. In reply Job disdains for a time to touch what he well knew lay under all their exhortations; he laments with touching pathos the defection of his friends, who were like the winter torrents looked for in vain by the perishing caravan in the summer heat; he meets with bitter scorn their constant cry that God will not cast off the righteous man, by asking: How can one be righteous with God? what can human weakness, however innocent, do against infinite might and subtlety? they are righteous whom an omnipotent and perverse will thinks fit to consider so; he falls into a hopeless wail over the universal misery of man, who has a weary campaign of life appointed him; then, rising up in the strength of his conscience, he upbraids the Almighty with His misuse of His power and His indiscriminate tyranny—righteous and innocent He destroys alike—and challenges Him to lay aside His majesty and meet His creature as a man, and then he would not fear Him. Even in the second series Job can hardly bring himself to face the personal issue raised by the friends. His relations to God absorb him almost wholly—his pitiable isolation, the indignities showered on his once honoured head, the loathsome spectacle of his body; abandoned by all, he turns for pity from God to men and from men to God. Only in the third series of debates does he put out his hand and grasp firmly the theory of his friends, and their "defences of mud" fall to dust in his hands. Instead of that roseate moral order on which they are never weary of insisting, he finds only disorder and moral confusion. When he thinks of it, trembling takes hold of him. It is not the righteous but the wicked that live, grow old, yea, wax mighty in strength, that send forth their children like a flock and establish them in their sight. Before the logic of facts the theory of the friends goes down; and with this negative result, which the author skilfully reaches through the debate, has to be combined his own positive doctrine of the uses of adversity advanced in the prologue.

To a modern reader it appears strange that both parties were so entangled in the meshes of their preconceptions regarding God as to be unable to break through the broader views. The friends, while maintaining that injustice on the part of God is inconceivable, might have given due weight to the persistent testimony of Job's conscience as that behind which it is impossible to go, and found refuge in the reflection that there might be something inexplicable in the ways of God, and that affliction might have some other meaning than to punish the sinner or even to wean him from his sin. And Job, while maintaining his innocence from overt sins, might have confessed that there was such sinfulness in every human life as was sufficient to account for the severest chastisement from heaven, or at least he might have stopped short of charging God foolishly. Such a position would certainly be taken up by an afflicted saint now, and such an explanation of his sufferings would suggest itself to the sufferer, even though it might be in truth a false explanation. Perhaps here, where an artistic fault might seem to be committed, the art of the writer, or his truth to nature, and the extraordinary freedom with which he moves among his materials, as well as the power and individuality of his dramatic creations, are most remarkable. The rôle which the author reserved for himself was to teach the truth on the question in dispute, and he accomplishes this by allowing his performers to push their false principles to their proper extreme. There is nothing about which men are usually so sure as the character of God. They are ever ready to take Him in their own hand, to interpret His providence in their own sense, to say what things are consistent or not with His character and word, and beat down the opposing consciences of other men by His so-called authority, which is nothing but their own. The friends of Job were religious Orientals, men to whom God was a being in immediate contact with the world and life, to whom the idea of second causes was unknown, on whom science had not yet begun to dawn, nor the conception of a divine scheme pursuing a distant end by complicated means, in which the individual's interest may suffer for the larger good. The broad sympathies of the author and his sense of the truth lying in the theory of the friends are seen in the scope which he allows them, in the richness of the thought and the splendid luxuriance of the imagery—drawn from the immemorial moral consent of mankind, the testimony of the living conscience, and the observation of life—with which he makes them clothe their views. He remembered the elements of truth in the theory from which he was departing, that it was a national heritage, which he himself perhaps had been constrained not without a struggle to abandon; and, while showing its insufficiency, he sets it forth in its most brilliant form.

The extravagance of Job's assertions was occasioned greatly by the extreme position of his friends, which left no room for his conscious innocence along with the rectitude of God. Again, the poet's purpose, as the prologue shows, was to teach that afflictions may fall on a man out of all connexion with any offence of his own, and merely as the trial of his righteousness; and hence he allows Job, as by a true instinct of the nature of his sufferings, to repudiate all connexion between them and sin in himself. And further, the terrible conflict into which the suspicions of the Satan brought Job could not be exhibited without pushing him to the verge of ungodliness. These are all elements of the poet's art; but art and nature are one. In ancient Hebrew life the sense of sin was less deep than it is now. In the desert, too, men speak boldly of God. Nothing is more false than to judge the poet's creation from our later point of view, and construct a theory of the book according to a more developed sense of sin and a deeper reverence for God than belonged to antiquity. In complete contradiction to the testimony of the book itself, some critics, as Hengstenberg and Budde, have assumed that Job's spiritual pride was the cause of his afflictions, that this was the root of bitterness in him which must be killed down ere he could become a true saint. The fundamental position of the book is that Job was already a true saint; this is testified by God Himself, is the radical idea of the author in the prologue, and the very hypothesis of the drama. We might be ready to think that Job's afflictions did not befall him out of all connexion with his own condition of mind, and we might be disposed to find a vindication of God's ways in this. There is no evidence that such an idea was shared by the author of the book. It is remarkable that the attitude which we imagine it would have been so easy for Job to assume, namely, while holding fast his integrity, to fall back upon the inexplicableness of providence, of which there are such imposing descriptions in his speeches, is just the attitude which is taken up in ch. xxviii. It is far from certain, however, that this chapter is an integral part of the original book.

The other line running through the book, the varying attitude of Job's mind towards God, exhibits dramatic action and tragic interest of the highest kind, though the movement is internal. That the exhibition of this struggle in Job's mind was a main point in the author's purpose is seen from the fact that at the end of each of his great trials he notes that Job sinned not, nor ascribed wrong to God (i. 22; ii. 10), and from the effect which the divine voice from the whirlwind is made to produce upon him (xl. 3). In the first cycle of debate (iv.–xiv.) Job's mind reaches the deepest limit of estrangement. There he not merely charges God with injustice, but, unable to reconcile His former goodness with His present enmity, he regards the latter as the true expression of God's attitude towards His creatures, and the former, comprising all his infinite creative skill in weaving the delicate organism of human nature and the rich endowments of His providence, only as the means of exercising His mad and immoral cruelty in the time to come. When the Semitic skin of Job is scratched, we find a modern pessimist beneath. Others in later days have brought the keen sensibility of the human frame and the torture which it endures together, and asked with Job to whom at last all this has to be referred. Towards the end of the cycle a star of heavenly light seems to rise on the horizon; the thought seizes the sufferer's mind that man might have another life, that God's anger pursuing him to the grave might be sated, and that He might call him out of it to Himself again (xiv. 13). This idea of a resurrection, unfamiliar to Job at first, is one which he is allowed to reach out of the necessities of the moral complications around him, but from the author's manner of using the idea we may judge that it was familiar to himself. In the second cycle the thought of a future reconciliation with God is more firmly grasped. That satisfaction or at least composure which, when we observe calamities that we cannot morally account for, we reach by considering that providence is a great scheme moving according to general laws, and that it does not always truly reflect the relation of God to the individual, Job reached in the only way possible to a Semitic mind. He drew a distinction between an outer God whom events obey, pursuing him in His anger, and an inner God whose heart was with him, who was aware of his innocence; and he appeals from God to God, and beseeches God to pledge Himself that he shall receive justice from God (xvi. 19; xvii. 3). And so high at last does this consciousness that God is at one with him rise that he avows his assurance that He will yet appear to do him justice before men, and that he shall see Him with his own eyes, no more estranged but on his side, and for this moment he faints with longing (xix. 25 seq.).[1]

After this expression of faith Job's mind remains calm, though he ends by firmly charging God with perverting his right, and demanding to know the cause of his afflictions (xxvii. 2 seq.; xxxi. 35, where render: "Oh, that I had the indictment which mine adversary has written!"). In answer to this demand the Divine voice answers Job out of the tempest: "Who is this that darkeneth counsel by words without knowledge?" The word "counsel" intimates to Job that God does not act without a design, large and beyond the comprehension of man; and to impress this is the purpose of the Divine speeches. The speaker does not enter into Job's particular cause; there is not a word tending to unravel his riddle; his mind is drawn away to the wisdom and majesty of God Himself. His own words and those of his friends are but re-echoed, but it is God Himself who now utters them. Job is in immediate nearness to the majesty of heaven, wise, unfathomable, ironical over the littleness of man, and he is abased; God Himself effects what neither the man's own thoughts of God nor the representations of his friends could accomplish, though by the same means. The religious insight of the writer sounds here the profoundest deeps of truth.

Integrity.—Doubts whether particular portions of the present book belonged to the original form of it have been raised by many. M. L. De Wette expressed himself as follows: "It appears to us that the present book of Job has not all flowed from one pen. As many books of the Old Testament have been several times written over, so has this also" (Ersch and Gruber, *Ency.*, sect. ii. vol. viii.). The judgment formed by De Wette has been adhered to more or less by most of those who have studied the book. Questions regarding the unity of such books as this are difficult to settle; there is not unanimity among scholars regarding the idea of the book, and consequently they differ as to what parts are in harmony or conflict with unity; and it is dangerous to apply modern ideas of literary composition and artistic unity to the works of antiquity and of the East. The problem raised in the book of Job has certainly received frequent treatment in the Old Testament; and there is no likelihood that all efforts in this direction have been preserved to us. It is probable that the book of Job was but a great effort amidst or after many smaller. It is scarcely to be supposed that one with such poetic and literary power as the author of chap. iii.–xxxi., xxxviii.–xli. would embody the work of any other writer in his own. If there be elements in the book which must be pronounced foreign, they have been inserted in the work of the author by a later hand. It is not unlikely that our present book may, in addition to the great work of the original author, contain some fragments of the thoughts of other religious minds upon the same question, and that these, instead of being loosely appended, have been fitted into the mechanism of the first work. Some of these fragments may have originated at first quite independently of our book, while others may be expansions and insertions that never existed separately. At the same time it is scarcely safe to throw out any portion of the book merely because it seems to us out of harmony with the unity of the main part of the poem, or unless several distinct lines of consideration conspire to point it out as an extraneous element.

The arguments against the originality of the prologue—as, that it is written in prose, that the name Yahweh appears in it, that sacrifice is referred to, and that there are inconsistencies between it and the body of the book—are of little weight. There must have been some introduction to the poem explaining the circumstances of Job, otherwise the poetical dispute would have been unintelligible, for it is improbable that the story of Job was so familiar that a poem in which he and his friends figured as they do here would have been understood. And there is no trace of any other prologue or introduction having ever existed. The prologue, too, is an essential element of the work, containing the author's positive contribution to the doctrine of suffering, for which the discussion in the poem prepares the way. The intermixture of prose and poetry is common in Oriental works containing similar discussions; the reference to sacrifice is to primitive not to Mosaic sacrifice; and the author, while using the name Yahweh freely himself, puts the patriarchal Divine names into the mouth of Job and his friends because he regards them as belonging to the patriarchal age and to a country outside of Israel. That the observance of this rule had a certain awkwardness for the writer appears perhaps from his allowing the name Yahweh to slip in once or twice (xii. 9, cf. xxviii. 28) in familiar phrases in the body of the poem. The discrepancies, such as Job's references to his children as still alive (xix. 17, the interpretation is doubtful), and to his servants, are trivial, and even if real imply nothing in a book admittedly poetical and not historical. The objections to the epilogue are equally unimportant—as that the Satan is not mentioned in it, and that Job's restoration is in conflict with the main idea of the poem—that earthly felicity does not follow righteousness. The epilogue confirms the teaching of the poem when it gives the divine sanction to Job's doctrine regarding God in opposition to that of the friends (xlii. 7). And it is certainly not the intention of the poem to teach that earthly felicity does not follow righteousness; its purpose is to correct the exclusiveness with which the friends of Job maintained that principle. The Satan is introduced in the prologue, exercising his function as minister of God in heaven; but it is to misinterpret wholly the doctrine of evil in the Old Testament to assign to the Satan any such personal importance or independence of power as that he should be called before the curtain to receive the hisses that accompany his own discomfiture. The Satan, though he here appears with the beginnings of a malevolent will of his own, is but the instrument of the sifting providence of God. His work was to try; that done he disappears, his personality being too slight to have any place in the result.

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[1] This remarkable passage reads thus: "*But I know that my redeemer liveth, and afterwards he shall arise upon the dust, and after my skin*, even *this* body, *is destroyed, without my flesh shall I see God; whom I shall see for myself, and mine eyes shall behold, and not as a stranger; my reins within me are consumed* with longing." The redeemer who liveth and shall arise or stand upon the earth is God whom he shall see with his own eyes, on his side. The course of exegesis was greatly influenced by the translation of Jerome, who, departing from the Itala, rendered: "In novissimo die de terra surrecturus sum . . . et rursum circumdabor pelle mea et in carne mea videbo deum meum." The only point now in question is whether: (*a*) Job looks for this manifestation of God to him while he is still alive, or (*b*) after death, and therefore in the sense of a spiritual vision and union with God in another life; that is, whether the words "destroyed" and "without my flesh" are to be taken relatively only, of the extremest effects of his disease upon him, or literally, of the separation of the body in death. A third view which assumes that the words rendered "without my flesh," which run literally, "out of my flesh," mean *looking* out from my flesh, that is, clothed with a new body, and finds the idea of resurrection repeated, perhaps imports more into the language than it will fairly bear. In favour of (*b*) may be adduced the persistent refusal of Job throughout to entertain the idea of a restoration in this life; the word "afterwards"; and perhaps the analogy of other passages where the same situation appears, as Ps. xlix. and lxxiii., although the actual dénouement of the tragedy supports (*a*). The difference between the two senses is not important, when the Old Testament view of immortality is considered. To the Hebrew the life beyond was not what it is to us, a freedom from sin and sorrow and admission to an immediate divine fellowship not attainable here. To him the life beyond was at best a prolongation of the life here; all he desired was that his fellowship with God here should not be interrupted in death, and that Sheol, the place into which deceased persons descended and where they remained, cut off from all life with God, might be overleapt. On this account the theory of Ewald, which throws the centre of gravity of the book into this passage in ch. xix., considering its purpose to be to teach that the riddles of this life shall be solved and its inequalities corrected in a future life, appears one-sided. The point of the passage does not lie in any distinction which it draws between this life and a future life; it lies in the assurance which Job expresses that God, who even now knows his innocence, will vindicate it in the future, and that, though estranged now, He will at last take him to His heart.

Much graver are the suspicions that attach to the speeches of Elihu. Most of those who have studied the book carefully hold that this part does not belong to the original cast, but has been introduced at a considerably later time. The piece is one of the most interesting parts of the book; both the person and the thoughts of Elihu are marked by a strong individuality. This individuality has indeed been very diversely estimated. The ancients for the most part passed a very severe judgment on Elihu: he is a buffoon, a boastful youth whose shallow intermeddling is only to be explained by the fewness of his years, the incarnation of folly, or even the Satan himself gone a-mumming. Some moderns on the other hand have regarded him as the incarnation of the voice of God or even of God himself. The main objections to the connexion of the episode of Elihu with the original book are: that the prologue and epilogue know nothing of him; that on the cause of Job's afflictions he occupies virtually the same position as the friends; that his speeches destroy the dramatic effect of the divine manifestation by introducing a lengthened break between Job's challenge and the answer of God; that the language and style of the piece are marked by an excessive mannerism, too great to have been created by the author of the rest of the poem; that the allusions to the rest of the book are so minute as to betray a reader rather than a hearer; and that the views regarding sin, and especially the scandal given to the author by the irreverence of Job, indicate a religious advance which marks a later age. The position taken by Elihu is almost that of a critic of the book. Regarding the origin of afflictions he is at one with the friends, although he dwells more on the general sinfulness of man than on actual sins, and his reprobation of Job's position is even greater than theirs. His anger was kindled against Job because he made himself righteous before God, and against his friends because they found no answer to Job. His whole object is to refute Job's charge of injustice against God. What is novel in Elihu, therefore, is not his position but his arguments. These do not lack cogency, but betray a kind of thought different from that of the friends. Injustice in God, he argues, can only arise from selfishness in Him; but the very existence of creation implies unselfish love on God's part, for if He thought only of Himself, He would cease actively to uphold creation, and it would fall into death. Again, without justice mere earthly rule is impossible; how then is injustice conceivable in Him who rules over all? It is probable that the original author found his three interlocutors a sufficient medium for expression, and that this new speaker is the creation of another. To a devout and thoughtful reader of the original book, belonging perhaps to a more reverential age, it appeared that the language and bearing of Job had scarcely been sufficiently reprobated by the original speakers, and that the religious reason, apart from any theophany, could suggest arguments sufficient to condemn such demeanour on the part of any man. (For an able though hardly convincing argument for the originality of the discourses of Elihu see Budde's *Commentary*.)

It is more difficult to come to a decision in regard to some other portions of the book, particularly ch. xxvii. 7–xxviii. In the latter part of ch. xxvii. Job seems to go over to the camp of his opponents, and expresses sentiments in complete contradiction to his former views. Hence some have thought the passage to be the missing speech of Zophar. Others, as Hitzig, believe that Job is parodying the ideas of the friends; while others, like Ewald, consider that he is recanting his former excesses, and making such a modification as to express correctly his views on evil. None of these opinions is quite satisfactory, though the last probably expresses the view with which the passage was introduced, whether it be original or not. The meaning of ch. xxviii. can only be that "Wisdom," that is, a theoretical comprehension of providence, is unattainable by man, whose only wisdom is the fear of the Lord or practical piety. But to bring Job to the feeling of this truth was just the purpose of the theophany and the divine speeches; and, if Job had reached it already through his own reflection, the theophany becomes an irrelevancy. It is difficult, therefore, to find a place for these two chapters in the original work. The hymn on Wisdom is a most exquisite poem, which probably originated separately, and was brought into our book with a purpose similar to that which suggested the speeches of Elihu. Objections have also been raised to the descriptions of leviathan and behemoth (ch. xl. 15–xli.). Regarding these it may be enough to say that in meaning these passages are in perfect harmony with other parts of the Divine words, although there is a breadth and detail in the style unlike the sharp, short, ironical touches otherwise characteristic of this part of the poem. (Other longer passages, the originality of which has been called into question, are: xvii. 8 seq.; xxi. 16–18; xxii. 17 seq.; xxiii. 8 seq.; xxiv. 9, 18–24; xxvi. 5–14. On these see the commentaries.)

Date.—The age of such a book as Job, dealing only with principles and having no direct references to historical events can be fixed only approximately. Any conclusion can be reached only by an induction founded on matters which do not afford perfect certainty, such as the comparative development of certain moral ideas in different ages, the pressing claims of certain problems for solution at particular epochs of the history of Israel, and points of contact with other writings of which the age may with some certainty be determined. The Jewish tradition that the book is Mosaic, and the idea that it is a production of the desert, written in another tongue and translated into Hebrew, want even a shadow of probability. The book is a genuine outcome of the religious life and thought of Israel, the product of a religious knowledge and experience that were possible among no other people. That the author lays the scene of the poem outside his own nation and in the patriarchal age is a proceeding common to him with other dramatic writers, who find freer play for their principles in a region removed from the present, where they are not hampered by the obtrusive forms of actual life, but are free to mould occurrences into the moral form that their ideas require.

It is the opinion of some scholars, *e.g.* Delitzsch, that the book belongs to the age of Solomon. It cannot be earlier than this age, for Job (vii. 17) travesties the ideas of Ps. viii. in a manner which shows that this hymn was well known. To infer the date from a comparison of literary coincidences and allusions is however a very delicate operation. For, first, owing to the unity of thought and language which prevades the Old Testament, in which, regarded merely as a national literature, it differs from all other national literatures, we are apt to be deceived, and to take mere similarities for literary allusions and quotations; and, secondly, even when we are sure that there is dependence, it is often uncommonly difficult to decide which is the original source. The reference to Job in Ezek. xiv. 14 is not to our book, but to the man (a legendary figure) who was afterwards made the hero of it. The affinities on the other hand between Job and Isa. xl.–lv. are very close. The date, however, of this part of Isaiah is uncertain, though it cannot have received its final form, if it be composite, long before the return. Between Job iii. and Jer. xx. 14 seq. there is, again, certainly literary connexion. But the judgment of different minds differs on the question which passage is dependent on the other. The language of Jeremiah, however, has a natural pathos and genuineness of feeling in it, somewhat in contrast with the elaborate poetical finish of Job's words, which might suggest the originality of the former.

The tendency among recent scholars is to put the book of Job not earlier than the 5th century B.C. There are good reasons for putting it in the 4th century. It stands at the beginning of the era of Jewish philosophical inquiry—its affinities are with Proverbs, Ecclesiasticus, Ecclesiastes, and the Wisdom of Solomon, a body of writings that belongs to the latest period of pre-Christian Jewish literary development (see WISDOM LITERATURE). Its points of connexion with Isa. xl.–lv. relate only to the problem of the suffering of the righteous, and that it is later than the Isaiah passage appears from the fact that this latter is national and ritual in scope, while Job is universal and ethical.

The book of Job is not literal history, though it reposes on historical tradition. To this tradition belong probably the name of Job and his country, and the names of his three friends, and perhaps also many other details impossible to specify particularly. The view that the book is entirely a literary creation with no basis in historical tradition is as old as the Talmud (*Baba Bathra*, xv. 1), in which a rabbi is cited who says: Job was not, and was not created, but is an allegory. This view is supported by Hengstenberg and others. But pure poetical creations on so extensive a scale are not probable in the East and at so early an age.

Author.—The author of the book is wholly unknown. The religious life of Israel was at certain periods very intense, and at those times the spiritual energy of the nation expressed itself almost impersonally, through men who forgot themselves and were speedily forgotten in name by others. Hitzig conjectures that the author was a native of the north on account of the free criticism of providence which he allows himself. Others, on account of some affinities with the prophet Amos, infer that he belonged to the south of Judah, and this is supposed to account for his intimate acquaintance with the desert. Ewald considers that he belonged to the exile in Egypt, on account of his minute acquaintance with that country. But all these conjectures localize an author whose knowledge was not confined to any locality, who was a true child of the East and familiar with life and nature in every country there, who was at the same time a true Israelite and felt that the earth was the Lord's and the fullness thereof, and whose sympathies and thought took in all God's works.

LITERATURE.—Commentaries by Ewald (1854); Renan (1859); Delitzsch (1864); Zöckler in Lange's *Bibelwerk* (1872); F. C. Cook in *Speaker's Comm.* (1880); A. B. Davidson in *Cambridge Bible* (1884); Dillmann (1891); K. Budde (1896); Duhm (1897). See also Hoekstra, "Job de Knecht van Jehovah" in *Theol. Tijdschr.* (1871), and, in reply, A. Kuenen, "Job en de leidende Knecht van Jahveh," ibid. (1873); C. H. H. Wright in *Bib. Essays* (1886); G. G. Bradley, *Lects. on Job* (2nd ed., 1888); Cheyne, *Job and Solomon* (1887); Dawson, *Wisd. Lit.* (1893); D. B. Macdonald, "The Original Form of the Legend of Job" in *Journ. Bib. Lit.* (1895); E. Hatch, *Essays in Bib. Gk.* (1889); A. Dillmann, in *Trans. of Roy. Pruss. Acad.* (1890). (A. B. D., C. H. T.*)

JOBST, or JODOCUS (*c.* 1350–1411), margrave of Moravia, was a son of John Henry of Luxemburg, margrave of Moravia, and grandson of John, the blind king of Bohemia. He became margrave of Moravia on his father's death in 1375, and his clever and unscrupulous character enabled him to amass a considerable amount of wealth, while his ambition led him into constant quarrels with his brother Procop, his cousins, the German king Wenceslaus and Sigismund, margrave of Brandenburg, and others. By taking advantage of their difficulties he won considerable power, and the record of his life is one of warfare and treachery, followed by broken promises and transitory reconciliations. In 1385 and 1388 he purchased Brandenburg from Sigismund, and the duchy of Luxemburg from Wenceslaus; and in 1397 he also became possessed of upper and lower Lusatia. For some time he had entertained hopes of the German throne and had negotiated with Wenceslaus and others to this end. When, however, King Rupert died in 1410 he maintained at first that there was no vacancy, as Wenceslaus, who had been deposed in 1400, was still king; but changing his attitude, he was chosen German king at Frankfort on the 1st of October 1410 in opposition to Sigismund, who had been elected a few days previously. Jobst however was never crowned, and his death on the 17th of January 1411 prevented hostilities between the rival kings.

See F. M. Pelzel, *Lebensgeschichte des römischen und böhmischen Königs Wenceslaus* (1788–1790); J. Heidemann, *Die Mark Brandenburg unter Jobst von Mähren* (1881); J. Aschbach, *Geschichte Kaiser Sigmunds* (1838–1845); F. Palacky, *Geschichte von Böhmen*, iii. (1864–1874); and T. Lindner, *Geschichte des Deutschen Reiches vom Ende des 14 Jahrhunderts bis zur Reformation*, i. (1875–1880).

JOB'S TEARS, in botany, the popular name for *Coix Lachryma-Jobi*, a species of grass, of the tribe *maydeae*, which also includes the maize (see GRASSES). The seeds, or properly fruits, are contained singly in a stony involucre or bract, which does not open until the enclosed seed germinates. The young involucre surrounds the female flower and the stalk supporting the spike of male flowers, and when ripe has the appearance of bluish-white porcelain. Being shaped somewhat like a large drop of fluid, the form has suggested the name. The fruits are esculent, but the involucres are the part chiefly used, for making necklaces and other ornaments. The plant is a native of India, but is now widely spread throughout the tropical zone. It grows in marshy places; and is cultivated in China, the fruit having a supposed value as a diuretic and anti-phthisic. It was cultivated by John Gerard, author of the famous *Herball*, at the end of the 16th century as a tender annual.

JOCASTA, or IOCASTA (’Ιοκάστη; in Homer, ’Επικάστη), in Greek legend, wife of Laïus, mother (afterwards wife) of Oedipus (*q.v.*), daughter of Menoeceus, sister (or daughter) of Creon. According to Homer (*Od.* xi. 271) and Sophocles (*Oed. Tyr.* 1241), on learning that Oedipus was her son she immediately hanged herself; but in Euripides (*Phoenissae*, 1455) she stabs herself over the bodies of her sons Eteocles and Polynices, who had slain each other in single combat before the walls of Thebes.

JOCKEY, a professional rider of race-horses, now the current usage (see HORSE-RACING). The word is by origin a diminutive of "Jock," the Northern or Scots colloquial equivalent of the name "John" (cf. JACK). A familiar instance of the use of the word as a name is in "Jockey of Norfolk" in Shakespeare's *Richard III.* v. 3, 304. In the 16th and 17th centuries the word was applied to horse-dealers, postilions, itinerant minstrels and vagabonds, and thus frequently bore the meaning of a cunning trickster, a "sharp," whence "to jockey," to outwit, or "do" a person out of something. The current usage is found in John Evelyn's *Diary*, 1670, when it was clearly well known. George Borrow's attempt to derive the word from the gipsy *chukni*, a heavy whip used by horse-dealing gipsies, has no foundation.

JODELLE, ÉTIENNE, seigneur de Limodin (1532–1573), French dramatist and poet, was born in Paris of a noble family. He attached himself to the poetic circle of the Pléiade (see DAURAT) and proceeded to apply the principles of the reformers to dramatic composition. Jodelle aimed at creating a classical drama that should be in every respect different from the moralities and *soties* that then occupied the French stage. His first play, *Cléopâtre captive*, was represented before the court at Reims in 1552. Jodelle himself took the title rôle, and the cast included his friends Remy Belleau and Jean de la Péruse. In honour of the play's success the friends organized a little fête at Arcueil when a goat garlanded with flowers was led in procession and presented to the author—a ceremony exaggerated by the enemies of the Ronsardists into a renewal of the pagan rites of the worship of Bacchus. Jodelle wrote two other plays. *Eugène*, a comedy satirizing the superior clergy, had less success than it deserved. Its preface poured scorn on Jodelle's predecessors in comedy, but in reality his own methods are not so very different from theirs. *Didon se sacrifiant*, a tragedy which follows Virgil's narrative, appears never to have been represented. Jodelle died in poverty in July 1573. His works were collected the year after his death by Charles de la Mothe. They include a quantity of miscellaneous verse dating chiefly from Jodelle's youth. The intrinsic value of his tragedies is small. *Cléopâtre* is lyric rather than dramatic. Throughout the five acts of the piece nothing actually happens. The death of Antony is announced by his ghost in the first act; the story of Cleopatra's suicide is related, but not represented, in the fifth. Each act is terminated by a chorus which moralizes on such subjects as the inconstancy of fortune and the judgments of heaven on human pride. But the play was the starting-point of French classical tragedy, and was soon followed by the *Médée* (1553) of Jean de la Péruse and the *Aman* (1561) of André de Rivaudeau. Jodelle was a rapid worker, but idle and fond of dissipation. His friend Ronsard said that his published poems gave no adequate idea of his powers.

Jodelle's works are collected (1868) in the *Pléiade française* of Charles Marty-Laveaux. The prefatory notice gives full information of the sources of Jodelle's biography, and La Mothe's criticism is reprinted in its entirety.

JODHPUR, or MARWAR, a native state of India, in the Rajputana agency. Area, 34,963 sq. m. Pop. (1901), 1,935.565, showing a decrease of 23% in the decade, due to the results of famine. Estimated revenue, £373,600; tribute, £14,000. The general aspect of the country is that of a sandy plain, divided into two unequal parts by the river Lūni, and dotted with picturesque conical hills, attaining in places an elevation of 3000 ft. The river Lūni is the principal feature in the physical aspects of Jodhpur. One of its head-streams rises in the sacred lake of Pushkar in Ajmere, and the main river flows through Jodhpur in a south-westerly direction till it is finally lost in the marshy ground at the head of the Runn of Cutch. It is fed by numerous tributaries and occasionally overflows its banks, fine crops of wheat and barley being grown on the saturated soil. Its water is, as a rule, saline or brackish, but comparatively sweet water is obtained from wells sunk at a distance of 20 or 30 yds. from the river bank. The famous salt-lake of Sambhar is situated on the borders of Jodhpur and Jaipur, and two smaller lakes of the same description lie within the limits of the state, from which large quantities of salt are extracted. Marble is mined in the north of the state and along the south-east border.

The population consists of Rathor Rājputs (who form the ruling class), Brāhmans, Charans, Bhāts, Mahajans or traders, and Jāts. The Charans, a sacred race, hold large religious grants of land, and enjoy peculiar immunities as traders in local produce. The Bhāts are by profession genealogists, but also engage in trade. Mārwāri traders are an enterprising class to be found throughout the length and breadth of India.

The principal crops are millets and pulses, but wheat and barley are largely produced in the fertile tract watered by the Lūni river. The manufactures comprise leather boxes and brass utensils; and turbans and scarfs and a description of embroidered silk knotted thread are specialities of the country.

The Mahārājā belongs to the Rathor clan of Rājputs. The family chronicles relate that after the downfall of the Rathor dynasty of Kanauj in 1194, Sivajī, the grandson of Jāi Chānd, the last king of Kanauj, entered Mārwār on a pilgrimage to Dwarka, and on halting at the town of Pāli he and his followers settled there to protect the Brāhman community from the constant raids of marauding bands. The Rathor chief thus laid the foundation of the state, but it was not till the time of Rāo Chānda, the tenth in succession from Sivajī, that Mārwār was actually conquered. His grandson Jodha founded the city of Jodhpur, which he made his capital. In 1561 the country was invaded by Akbar, and the chief was forced to submit, and to send his son as a mark of homage to take service under the Mogul emperor. When this son Udāi Singh succeeded to the chiefship, he gave his sister Jodhbāi in marriage to Akbar, and was rewarded by the restoration of most of his former possessions. Udāi Singh's son, Gaj Singh, held high service under Akbar, and conducted successful expeditions in Gujarat and the Deccan. The bigoted and intolerant Aurangzeb invaded Mārwār in 1679, plundered Jodhpur, sacked all the large towns, and commanded the conversion of the Rathors to Mahommedanism. This cemented all the Rājput clans into a bond of union, and a triple alliance was formed by the three states of Jodhpur, Udāipur and Jaipur, to throw off the Mahommedan yoke. One of the conditions of this alliance was that the chiefs of Jodhpur and Jaipur should regain the privilege of marriage with the Udāipur family, which they had forfeited by contracting alliances with the Mogul emperors, on the understanding that the offspring of Udāipur princesses should succeed to the state in preference to all other children. The quarrels arising from this stipulation lasted through many generations, and led to the invitation of Mahratta help from the rival aspirants to power, and finally to the subjection of all the Rājput states to the Mahrattās. Jodhpur was conquered by Sindhia, who levied a tribute of £60,000, and took from it the fort and town of Ajmere. Internecine disputes and succession wars disturbed the peace of the early years of the century, until in January 1818 Jodhpur was taken under British protection. In 1839 the misgovernment of the rājā led to an insurrection which compelled the interference of the British. In 1843, the chief having died without a son, and without having adopted an heir, the nobles and state officials were left to select a successor from the nearest of kin. Their choice fell upon Rājā Takht Sinh, chief of Ahmednagar. This chief, who did good service during the Mutiny, died in 1873. Mahārājā Jaswant Singh, who died in 1896, was a very enlightened ruler. His brother, Sir Pertab Singh (*q.v.*), conducted the administration until his nephew, Sardar Singh, came of age in 1898. The imperial service cavalry formed part of the reserve brigade during the Tirah campaign.

The state maintains a railway running to Bikanir, and there is also a branch railway into Sind. Gold, silver and copper money is coined. The state emblems are a *jhar* or sprig of seven branches and a *khanda* or sword. Jodhpur practically escaped the plague, but it suffered more severely than any other part of Rajputana from the famine of 1899–1900. In February 1900 more than 110,000 persons were in receipt of famine relief.

The city of Jodhpur is 64 m. by rail N.W. of Mārwār junction, on the Rajputana railway. Pop. (1901), 60,437. It was built by Rāo Jodha in 1459, and from that time has been the seat of government. It is surrounded by a strong wall nearly 6 m. in extent, with seventy gates. The fort, which stands on an isolated rock, contains the mahārājā's palace, a large and handsome building, completely covering the crest of the hill on which it stands, and overlooking the city, which lies several hundred feet below. The city contains palaces of the mahārājā, and town residences of the *thākurs* or nobles, besides numerous fine temples and tanks. Building stone is plentiful and close at hand, and the architecture is solid and handsome. Three miles north of Jodhpur are the ruins of Mandor, the site of the ancient capital of the Parihar princes of Mārwār, before its conquest by the Rathors. Mills for grinding flour and crushing grain have been constructed for the imperial service troops. The Jaswant college is affiliated to the B.A. standard of the Allahabad university. To the Hewson hospital a wing for eye diseases was added in 1898, and the Jaswant hospital for women is under an English lady doctor.

JOEL. The second book among the minor prophets in the Bible is entitled *The word of Yahweh that came to Joel the son of Pethuel*, or, as the Septuagint, Latin, Syriac and other versions read, *Bethuel*. Nothing is recorded as to the date or occasion of the prophecy. Most Hebrew prophecies contain pointed references to the foreign politics and social relations of the nation at the time. In the book of Joel there are only scanty allusions to Phoenicians, Philistines, Egypt and Edom, couched in terms applicable to very different ages, while the prophet's own people are exhorted to repentance without specific reference to any of those national sins of which other prophets speak. The occasion of the prophecy, described with great force of rhetoric, is no known historical event, but a plague of locusts, perhaps repeated in successive seasons; and even here there are features in the description which have led many expositors to seek an allegorical interpretation. The most remarkable part of the book is the eschatological picture with which it closes; and the way in which the plague of locusts appears to be taken as foreshadowing the final judgment—the great day or assize of Yahweh, in which Israel's enemies are destroyed—is so unique as greatly to complicate the exegetical problem. It is not therefore surprising that the most various views are still held as to the date and meaning of the book. Allegorists and literalists still contend over the first and still more over the second chapter, and, while the largest number of recent interpreters accept Credner's view that the prophecy was written in the reign of Joash of Judah (835–796 B.C.?), a powerful school of critics (including A. B. Davidson) follow the view suggested by Vatke (*Bib. Theol.* p. 462 seq.), and reckon Joel among the post-exile prophets. Other scholars give yet other dates: see the particulars in the elaborate work of Merx. The followers of Credner are literalists; the opposite school of moderns includes some literalists (as Duhm), while others (like Hilgenfeld, and in a modified sense Merx) adopt the old allegorical interpretation which treats the locusts as a figure for the enemies of Jerusalem.

There are cogent reasons for placing Joel either earlier or later than the great series of prophets extending from the time when Amos first proclaimed the approach of the Assyrian down to the Babylonian exile. In Joel the enemies of Israel are the nations collectively, and among those specified by name neither Assyria nor Chaldaea finds a place. This circumstance might, if it stood alone, be explained by placing Joel with Zephaniah in the brief interval between the decline of the empire of Nineveh and the advance of the Babylonians. But it is further obvious that Joel has no part in the internal struggle between spiritual Yahweh-worship and idolatry which occupied all the prophets from Amos to the captivity. He presupposes a nation of Yahweh-worshippers, whose religion has its centre in the temple and priesthood of Zion, which is indeed conscious of sin, and needs forgiveness and an outpouring of the Spirit, but is not visibly divided, as the kingdom of Judah was between the adherents of spiritual prophecy and a party whose national worship of Yahweh involved for them no fundamental separation from the surrounding nations. The book, therefore, must have been written before the ethico-spiritual and the popular conceptions of Yahweh came into conscious antagonism, or else after the fall of the state and the restoration of the community of Jerusalem to religious rather than political existence had decided the contest in favour of the prophets, and of the Law in which their teaching was ultimately crystallized.

The considerations which have given currency to an early date for Joel are of various kinds. The absence of all mention of one great oppressing world-power seems most natural before the westward march of Assyria involved Israel in the general politics of Asia. The purity of the style is also urged, and a comparison of Amos i. 2, Joel iii. 16 (Heb. iv. 16), and Amos ix. 13, Joel iii. 18 (iv. 18), has been taken as proving that Amos knew our book. The last argument might be inverted with much greater probability, and numerous points of contact between Joel and other parts of the Old Testament (*e.g.* Joel ii. 2, Exod. x. 14; Joel ii. 3, Ezek. xxxvi. 35; Joel iii. 10, Mic. iv. 3) make it not incredible that the purity of his style—which is rather elegant than original and strongly marked—is in large measure the fruit of literary culture. The absence of allusion to a hostile or oppressing empire may be fairly taken in connexion with the fact that the prophecy gives no indication of political life at Jerusalem. When the whole people is mustered in ch. i., the elders or sheikhs of the municipality and the priests of the temple are the most prominent figures. The king is not mentioned—which on Credner's view is explained by assuming that the plague fell in the minority of Joash, when the priest Jehoiada held the reins of power—and the princes, councillors and warriors necessary to an independent state, and so often referred to by the prophets before the exile, are altogether lacking. The nation has only a municipal organization with a priestly aristocracy, precisely the state of things that prevailed under the Persian empire. That the Persians do not appear as enemies of Yahweh and his people is perfectly natural. They were hard masters but not invaders, and under them the enemies of the Jews were their neighbours, just as appears in Joel.[1] Those, however, who place our prophet in the minority of King Joash draw a special argument from the mention of Phoenicians, Philistines and Edomites (iii. 4 seq., 19), pointing to the revolt of Edom under Joram (2 Kings viii. 20) and the incursion of the Philistines in the same reign (2 Chron. xxi. 16, xxii. 1). These were recent events in the time of Joash, and in like manner the Phoenician slave trade in Jewish children is carried back to an early date by the reference in Amos i. 9. This argument is rather specious than sound. Edom's hostility to Judah was incessant, but the feud reached its full intensity only after the time of Deuteronomy (xxiii. 7), when the Edomites joined the Chaldaeans, drew profit from the overthrow of the Jews, whose land they partly occupied, and exercised barbarous cruelty towards the fugitives of Jerusalem (Obad. *passim*; Mal. i. 2 seq.; Isa. lxiii.). The offence of shedding innocent blood charged on them by Joel is natural after these events, but hardly so in connexion with the revolt against Joram.

As regards the Philistines, it is impossible to lay much weight on the statement of Chronicles, unsupported as it is by the older history, and in Joel the Philistines plainly stand in one category with the Phoenicians, as slave dealers, not as armed foes. Gaza in fact was a slave emporium as early as the time of Amos (i. 6), and continued so till Roman times.

Thus, if any inference as to date can be drawn from ch. iii., it must rest on special features of the trade in slaves, which was always an important part of the commerce of the Levant. In the time of Amos the slaves collected by Philistines and Tyrians were sold *en masse* to Edom, and presumably went to Egypt or Arabia. Joel complains that they were sold to the Grecians (Javan, Ionians).[2] It is probable that some Hebrew and Syrian slaves were exported to the Mediterranean coasts from a very early date, and Isa. xi. 11 already speaks of Israelites captive in these districts as well as in Egypt, Ethiopia and the East. But the traffic in this direction hardly became extensive till a later date. In Deut. xxviii. 68, Egypt is still the chief goal of the maritime slave trade, and in Ezek. xxvii. 13 Javan exports slaves to Tyre, not conversely. Thus the allusion to Javan in Joel better suits a later date, when Syrian slaves were in special request in Greece.[3] And the name of Javan is not found in any part of the Old Testament certainly older than Ezekiel. In Joel it seems to stand as a general representative of the distant countries reached by the Mediterranean (in contrast with the southern Arabians, *Sabaeans*, ch. iii. 8), the farthest nation reached by the fleets of the Red Sea. This is precisely the geographical standpoint of the post-exile author of Gen. x. 4, where (assuming that Elishah = Carthage and Tarshish = Tartessus) Javan includes Carthage and Tartessus.

Finally, the allusion to Egypt in Joel iii. 19 must on Credner's theory be explained of the invasion of Shishak a century before Joash. From this time down to the last period of the Hebrew monarchy Egypt was not the enemy of Judah.

If the arguments chiefly relied on for an early date are so precarious or can even be turned against their inventors, there are others of an unambiguous kind which make for a date in the Persian period. It appears from ch. iii. 1, 2, that Joel wrote after the exile. The phrase "to bring again the captivity" would not alone suffice to prove this, for it is used in a wide sense, and perhaps means rather to "reverse the calamity,"[4] but the dispersion of Israel among the nations, and the allotment of the Holy Land to new occupants, cannot fairly be referred to any calamity less than that of the captivity. With this the whole standpoint of the prophecy agrees. To Joel Judah and the people of Yahweh are synonyms; northern Israel has disappeared. Now it is true that those who take their view of the history from Chronicles, where the kingdom of Ephraim is always treated as a sect outside the true religion, can reconcile this fact with an early date. But in ancient times it was not so; and under Joash, the contemporary of Elisha, such a limitation of the people of Yahweh is wholly inconceivable. The earliest prophetic books have a quite different standpoint; otherwise indeed the books of northern prophets and historians could never have been admitted into the Jewish canon. Again, the significant fact that there is no mention of a king and princes, but only of sheikhs and priests, has a force not to be invalidated by the ingenious reference of the book to the time of Joash's minority and the supposed regency of Jehoiada.[5] And the assumption that there was a period before the prophetic conflicts of the 8th century B.C. when spiritual prophecy had unchallenged sway, when there was no gross idolatry or superstition, when the priests of Jerusalem, acting in accord with prophets like Joel, held the same place as heads of a pure worship which they occupied after the exile (cf. Ewald, *Propheten*, i. 89), is not consistent with history. It rests on the old theory of the antiquity of the Levitical legislation, so that in fact all who place that legislation later than Ezekiel are agreed that the book of Joel is also late. In this connexion one point deserves special notice. The religious significance of the plague of drought and locusts is expressed in ch. i. 9 in the observation that the daily meat and drink offering are cut off, and the token of new blessing is the restoration of this service, ch. ii. 14. In other words, the daily offering is the continual symbol of gracious intercourse between Yahweh and his people and the main office of religion. This conception, which finds its parallel in Dan. viii. 11, xi. 31, xii. 11, is quite in accordance with the later law. But under the monarchy the daily oblation was the king's private offering, and not till Ezra's reformation did it become the affair of the community and the central act of national worship (Neh. x. 33 seq.).[6] That Joel wrote not only after the exile but after the work of Ezra and Nehemiah may be viewed as confirmed by the allusions to the walls of Jerusalem in ch. ii. 7, 9. Such is the historical basis which we seem to be able to lay for the study of the exegetical problems of the book.

The style of Joel is clear (which hardly favours an early date), and his language presents peculiarities which are evidences of a late origin. But the structure of the book, the symbolism and the connexion of the prophet's thoughts have given rise to much controversy. It seems safest to start from the fact that the prophecy is divided into two well-marked sections by ch. ii. 18, 19a. According to the Massoretic vocalization, which is in harmony with the most ancient exegetical tradition as contained in the LXX, these words are historical: "Then the Lord was jealous, . . . and answered and said unto his people, Behold," &c. Such is the natural meaning of the words as pointed.

Thus the book falls into two parts. In the first the prophet speaks in his own name, addressing himself to the people in a lively description of a present calamity caused by a terrible plague of locusts which threatens the entire destruction of the country, and appears to be the vehicle of a final consuming judgment (the day of Yahweh). There is no hope save in repentance and prayer; and in ch. ii. 12 the prophet, speaking now for the first time in Yahweh's name, calls the people to a solemn fast at the sanctuary, and invites the intercession of the priests. The calamity is described in the strongest colours of Hebrew hyperbole, and it seems arbitrary to seek too literal an interpretation of details, *e.g.* to lay weight on the four names of locusts, or to take ch. i. 20 of a conflagration produced by drought, when it appears from ii. 3 that the ravages of the locusts themselves are compared to those of fire. But when due allowance is made for

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[1] In the A.V. of ii. 17 it appears that subjection to a foreign power is not a present fact but a thing feared. But the parallelism and v. 19 justify the rendering in margin of R.V. "use a byword against them."

[2] The hypothesis of an Arabian Javan, applied to Joel iii. 6 by Credner, Hitzig, and others, may be viewed as exploded (see Stade, "Das Volk Javan," 1880, reprinted in his *Akad. Reden u. Abhandlungen*, 1899, pp. 123–142). The question, however, has to be re-examined; later interpreters, *e.g.* the LXX translators, may have misunderstood. The text of the passages has to be critically treated anew. See Cheyne, *Traditions and Beliefs of Ancient Israel* (on Gen. x. 2).

[3] Compare Movers, *Phönizisches Alterthum*, iii. i. 70 seq.

[4] See Ewald on Jer. xlviii. 47, Kuenen, *Theol. Tijdschrift* (1873), p. 519; Schwally, *Z.A.T.W.*, viii. 200, and Briggs on Ps. xiv. 7.

[5] Stade not unreasonably questions whether 2 Kings xii. 1–3 implies the paramount political influence of Jehoiada.

[6] See Wellhausen, *Geschichte Israels*, p. 78 seq.; *Prolegomena zur Gesch. Israels* (1883), p. 82 seq.

Eastern rhetoric, there is no occasion to seek in this section anything else than literal locusts. Nay, the allegorical interpretation, which takes the locusts to be hostile invaders, breaks through the laws of all reasonable writing; for the poetical hyperbole which compares the invading swarms to an army (ii. 4 seq.) would be inconceivably lame if a literal army was already concealed under the figure of the locusts. Nor could the prophet so far forget himself in his allegory as to speak of a victorious host as entering the conquered city like a thief (ii. 9). The second part of the book is Yahweh's answer to the people's prayer. The answer begins with a promise of deliverance from famine, and of fruitful seasons compensating for the ravages of the locusts. In the new prosperity of the land the union of Yahweh and his people shall be sealed anew, and so the Lord will proceed to pour down further and higher blessings. The aspiration of Moses (Num. xi. 29) and the hope of earlier prophets (Isa. xxxii. 15, lix. 21; Jer. xxxi. 33) shall be fully realized in the outpouring of the Spirit on all the Jews and even upon their servants (Isa. lxi. 5 with lvi. 6, 7); and then the great day of judgment, which had seemed to overshadow Jerusalem in the now averted plague, shall draw near with awful tokens of blood and fire and darkness. But the terrors of that day are not for the Jews but for their enemies. The worshippers of Yahweh on Zion shall be delivered (cf. Obad. *v.* 17, whose words Joel expressly quotes in ch. ii. 32), and it is their heathen enemies, assembled before Jerusalem to war against Yahweh, who shall be mowed down in the valley of Jehoshaphat ("Yahweh judgeth") by no human arm, but by heavenly warriors. Thus definitively freed from the profane foot of the stranger (Isa. lii. 1), Jerusalem shall abide a holy city for ever. The fertility of the land shall be such as was long ago predicted in Amos ix. 13, and streams issuing from the Temple, as Ezekiel had described in his picture of the restored Jerusalem (Ezek. xlvii.), shall fertilize the barren Wādi of Acacias. Egypt and Edom, on the other hand, shall be desolate, because they have shed the blood of Yahweh's innocents. Compare the similar predictions against Edom, Isa. xxxiv. 9 seq. (Mal. i. 3), and against Egypt, Isa. xix. 5 seq., Ezek. xxix. Joel's eschatological picture appears indeed to be largely a combination of elements from older unfulfilled prophecies. Its central feature, the assembling of the nations to judgment, is already found in Zeph. iii. 8, and in Ezekiel's prophecy concerning Gog and Magog, where the wonders of fire and blood named in Joel ii. 30 are also mentioned (Ezek. xxxviii. 22). The other physical features of the great day, the darkening of the lights of heaven, are a standing figure of the prophets from Amos v. 6, viii. 9, downwards. It is characteristic of the prophetic eschatology that images suggested by one prophet are adopted by his successors, and gradually become part of the permanent scenery of the last times; and it is a proof of the late date of Joel that almost his whole picture is made up of such features. In this respect there is a close parallelism, extending to minor details, between Joel and the last chapters of Zechariah.

That Joel's delineation of the final deliverance and glory attaches itself directly to the deliverance of the nation from a present calamity is quite in the manner of the so-called prophetic perspective. But the fact that the calamity which bulks so largely is natural and not political is characteristic of the post-exile period. Other prophets of the same age speak much of dearth and failure of crops, which in Palestine then as now were aggravated by bad government, and were far more serious to a small and isolated community than they could ever have been to the old kingdom. It was indeed by no means impossible that Jerusalem might have been altogether undone by the famine caused by the locusts; and so the conception of these visitants as the destroying army, executing Yahweh's final judgment, is really much more natural than appears to us at first sight, and does not need to be explained away by allegory. The chief argument relied upon by those who still find allegory at least in ch. ii. is the expression *haṣṣephōnī*, "the northerner"[1] [if this rendering is correct], in ii. 20. In view of the other points of affinity between Joel and Ezekiel, this word inevitably suggests Gog and Magog, and it is difficult to see how a swarm of locusts could receive such a name, or if they came from the north could perish, as the verse puts it, in the desert between the Mediterranean and the Dead Sea. The verse remains a *crux interpretum*, and no exegesis hitherto given can be deemed thoroughly satisfactory; but the interpretation of the whole book must not be made to hinge on a single word in a verse which might be altogether removed without affecting the general course of the prophet's argument.

The whole verse is perhaps the addition of an allegorizing glossator. The prediction in *v.* 19, that the seasons shall henceforth be fruitful, is given after Yahweh has shown his zeal and pity for Israel, not of course by mere words, but by acts, as appears in verses 20, 21, where the verbs are properly perfects recording that Yahweh hath already done great things, and that vegetation has already revived. In other words, the mercy already experienced in the removal of the plague is taken as a pledge of future grace not to stop short till all God's old promises are fulfilled. In this context *v.* 20 is out of place. Observe also that in *v.* 25 the locusts are spoken of in the plain language of chap. i.

See the separate commentaries on Joel by Credner (1831), Wünsche (1872), Merx (1879). The last-named gives an elaborate history of interpretation from the Septuagint down to Calvin, and appends the Ethiopic text edited by Dillmann. Nowack and Marti should also be consulted (see their respective series of commentaries); also G. A. Smith, in *The Book of the Twelve Prophets*, vol. i. (1896), and S. R. Driver, *Joel and Amos* (1897). On the language of Joel, see Holzinger, *Z. A. T. W.* (1889), pp. 89–131. Of older commentaries the most valuable is Pocock's (Oxford, 1691). Bochart's *Hierozoïcon* may also be consulted. (W. R. S.; T. K. C.)

JOEL, MANUEL (1826–1890), Jewish philosopher and preacher. After teaching for several years at the Breslau rabbinical seminary, founded by Z. Frankel, he became the successor of Abraham Geiger in the rabbinate of Breslau. He made important contributions to the history of the school of Aqiba (*q.v.*) as well as to the history of Jewish philosophy, his essays on Ibn Gabirol and Maimonides being of permanent worth. But his most influential work was connected with the relations between Jewish philosophy and the medieval scholasticism. He showed how Albertus Magnus derived some of his ideas from Maimonides and how Spinoza was indebted to the same writer, as well as to Hasdai Crescas. These essays were collected in two volumes of *Beiträge zur Geschichte der Philosophie* (1876), while another two volumes of *Blicke in die Religionsgeschichte* (1880–1883) threw much light on the development of religious thought in the early centuries of the Christian era. Equally renowned were Joel's pulpit addresses. Though he was no orator, his appeal to the reason was effective, and in their published form his three volumes of *Predigten* (issued posthumously) have found many readers. (I. A.)

JOFFRIN, JULES FRANÇOIS ALEXANDRE (1846–1890), French politician, was born at Troyes on the 16th of March 1846. He served in the Franco-German War, was involved in the Commune, and spent eleven years in England as a political exile. He attached himself to the "possibilist" group of the socialist party, the section opposed to the root-and-branch measures of Jules Guesde. He became a member of the municipal council of Paris in 1882, and vice-president in 1888–1889. Violently attacked by the Boulangist organs, *L'Intransigeant* and *La France*, he won a suit against them for libel, and in 1889 he contested the 18th arrondissement of Paris with General Boulanger, who obtained a majority of over 2000 votes, but was declared ineligible. Joffrin was only admitted to the Chamber after a heated discussion, and continued to be attacked by the nationalists. He died in Paris on the 17th of September 1890.

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[1] It has been suggested that *Ṣāphon*, which is often rather troublesome if rendered "the north," may be a weakened form of *ṣib'ōn*, a current popular corruption of *shimo'n* = Ishmael. In Ezek. xxxviii. 15 it is distinctly said that Gog is to come from the recesses of Ṣāphōn. "Meshech" and "Tubal" are no hindrance to this view, if the names of the so-called "sons of Japheth" are critically examined. For they, too, as well as Ṣāphōn, can be plausibly shown to represent regions of North Arabia. See Cheyne, *Traditions and Beliefs of Anc. Israel*, on Gen. x. 2–4.

JOGUES, ISAAC (1607–1646), French missionary in North America, was born at Orleans on the 10th of January 1607. He entered the Society of Jesus at Rouen in 1624, and in 1636 was ordained and sent, by his own wish, to the Huron mission. In 1639 he went among the Tobacco Nation, and in 1641 journeyed to Sault Sainte Marie, where he preached to the Algonquins. Returning from an expedition to Three Rivers he was captured by Mohawks, who tortured him and kept him as a slave until the summer of 1643, when, aided by some Dutchmen, he escaped to the manor of Rensselaerwyck and thence to New Amsterdam. After a brief visit to France, where he was treated with high honour, he returned to the Mohawk country in May 1646 and ratified a treaty between that tribe and the Canadian government. Working among them as the founder of the Mission of the Martyrs, he incurred their enmity, was tortured as a sorcerer, and finally killed at Ossernenon, near Auriesville, N.Y.

See Parkman, *The Jesuits in North America* (1898).

JOḤANAN BEN ZACCAI, Palestinian rabbi, contemporary of the Apostles. He was a disciple of Hillel (*q.v.*), and after the destruction of the Temple of Jerusalem by Titus was the main instrument in the preservation of the Jewish religion. During the last decades of the Temple Joḥanan was a member of the Sanhedrin and a skilled controversialist against the Sadducees. He is also reported to have been head of a great school in the capital. In the war with Rome he belonged to the peace party, and finding that the Zealots were resolved on carrying their revolt to its inevitable sequel, Joḥanan had himself conveyed out of Jerusalem in a coffin. In the Roman camp the rabbi was courteously received, and Vespasian (whose future elevation to the imperial dignity Joḥanan, like Josephus, is said to have foretold) agreed to grant him any boon he desired. Joḥanan obtained permission to found a college at Jamnia (Jabneh), which became the centre of Jewish culture. It practically exercised the judicial functions of the Sanhedrin (see JEWS, § 40 *ad fin.*). That chief literary expression of Pharisaism, the Mishnah, was the outcome of the work begun at Jamnia. Joḥanan solaced his disciples on the fall of the Temple by the double thought that charity could replace sacrifice, and that a life devoted to the religious law could form a fitting continuation of the old theocratic state. "Joḥanan felt the fall of his people more deeply than anyone else, but—and in this lies his historical importance—he did more than any one else to prepare the way for Israel to rise again" (Bacher).

See Graetz, *History of the Jews* (Eng. trans.), vol. ii. ch. xiii.; Weiss, *Dor dor ve-doreshav*, ii. 36; Bacher, *Die Agada der Tannaiten*, vol. i. ch. iii. (I. A.)

JOHANNESBURG, a city of the Transvaal and the centre of the Rand gold-mining industry. It is the most populous city and the commercial capital of South Africa. It is built on the southern slopes of the Witwatersrand in 26° 11′ S. 28° 2′ E., at an elevation of 5764 ft. above the sea. The distances by rail from Johannesburg to the following seaports are: Lourenço Marques, 364 m.; Durban, 483 m.; East London, 659 m.; Port Elizabeth, 714 m.; Cape Town, 957 m. Pretoria is, by rail, 46 m. N. by E.

The town lies immediately north of the central part of the main gold reef. The streets run in straight lines east and west or north and south. The chief open spaces are Market Square in the west and Government Square in the south of the town. Park railway station lies north of the business quarter, and farther north are the Wanderers' athletic sports ground and Joubert's Park. The chief business streets, such as Commissioner Street, Market Street, President Street and Pritchard Street, run east and west. In these thoroughfares and in several of the streets which intersect them are the offices of the mining companies, the banks, clubs, newspaper offices, hotels and shops, the majority being handsome stone or brick buildings, while the survival of some wooden shanties and corrugated iron buildings recalls the early character of the town.

Chief Buildings, &c.—In the centre of Market Square are the market buildings, and at its east end the post and telegraph offices, a handsome block of buildings with a façade 200 ft. long and a tower 106 ft. high. The square itself, a quarter of a mile long, is the largest in South Africa. The offices of the Witwatersrand chamber of mines face the market buildings. The stock exchange is in Marshall Square. The telephone exchange is in the centre of the city, in Von Brandis Square. The law courts are in the centre of Government Square. The Transvaal university college is in Plein Square, a little south of Park station. In the vicinity is St Mary's (Anglican) parish hall (1905–1907), the first portion of a large building planned to take the place of "Old" St Mary's Church, the "mother" church of the Rand, built in 1887. The chief Jewish synagogue is in the same neighbourhood. In Kerk Street, on the outskirts of central Johannesburg, is the Roman Catholic Church of the Immaculate Conception, the headquarters of the vicar apostolic of the Transvaal. North of Joubert's Park is the general hospital, and beyond, near the crest of the hills, commanding the town and the road to Pretoria, is a fort built by the Boer government and now used as a gaol. On the hills, some 3 m. E.N.E. of the town, is the observatory, built in 1903. Johannesburg has several theatres and buildings adapted for public meetings. There is a race-course 2 m. south of the town under the control of the Johannesburg Turf Club.

The Suburbs.—North, east and west of the city proper are suburbs, laid out on the same rectangular plan. The most fashionable are to the east and north—Jeppestown, Belgravia, Doornfontein, the Berea, Hillbrow, Parktown, Yeoville and Bellevue. Braamfontein (with a large cemetery) lies north-west and Fordsburg due west of the city. At Fordsburg are the gas and electric light and power works, and north of Doornfontein there is a large reservoir. There are also on the Rand, and dependent on the gold-mining, three towns possessing separate municipalities—Germiston and Boksburg (*q.v.*), respectively 9 m. and 15 m. E. of Johannesburg, and Krugersdorp (*q.v.*), 21 m. W.

The Mines and other Industries.—South, east and west of the city are the gold mines, indicated by tall chimneys, battery houses and the compounds of the labourers. The bare veld is dotted with these unsightly buildings for a distance of over fifty miles. The mines are worked on the most scientific lines. Characteristic of the Rand is the fine white dust arising from the crushing of the ore, and, close to the batteries, the incessant din caused by the stamps employed in that operation. The compounds in general, especially those originally made for Chinese labourers, are well built, comfortable, and fulfil every hygienic requirement. Besides the buildings, the compounds include wide stretches of veld. To enter and remain in the district, Kaffirs require a monthly pass for which the employer pays 2s. (For details of gold-mining, see GOLD.) A railway traverses the Rand, going westward past Krugersdorp to Klerksdorp and thence to Kimberley, and eastward past Springs to Delagoa Bay. From Springs, 25 m. E. of Johannesburg, is obtained much of the coal used in the Rand mines.

The mines within the municipal area produce nearly half the total gold output of the Transvaal. The other industries of Johannesburg include brewing, printing and bookbinding, timber sawing, flour milling, iron and brass founding, brick making and the manufacture of tobacco.

Health, Education and Social Conditions.—The elevation of Johannesburg makes it, despite its nearness to the tropics, a healthy place for European habitation. Built on open undulating ground, the town is, however, subject to frequent dust storms and to considerable variations in the temperature. The nights in winter are frosty and snow falls occasionally. The average day temperature in winter is 53° F., in summer 75°; the average annual rainfall is 28 in. The death-rate among white inhabitants averages about 17 per thousand. The principal causes of death, both among the white and coloured inhabitants, are diseases of the lungs—including miners' phthisis and pneumonia—diarrhoea, dysentery and enteric. The death-rate among young children is very high.

Education is provided in primary and secondary schools maintained by the state. In the primary schools education is free but not compulsory. The Transvaal university college, founded in 1904 as the technical institute (the change of title being made in 1906), provides full courses in science, mining, engineering and law. In 1906 Alfred Beit (*q.v.*) bequeathed £200,000 towards the cost of erecting and equipping university buildings.

In its social life Johannesburg differs widely from Cape Town and Durban. The white population is not only far larger but more cosmopolitan, less stationary and more dependent on a single industry; it has few links with the past, and both city and citizens bear the marks of youth. The cost of living is much higher than in London or New York. House rent, provisions, clothing, are all very dear, and more than counterbalance the lowness of rates. The customary unit of expenditure is the threepenny-bit or "tickey."

Sanitary and other Services.—There is an ample supply of water to the town and mines, under a water board representing all the Rand municipalities and the mining companies. A water-borne sewerage system began to be introduced in 1906. The general illuminant is electricity, and both electrical and gas services are owned by the municipality. The tramway service, opened in 1891, was taken over by the municipality in 1904. Up to 1906 the trams were horse-drawn; in that year electric cars began running. Rickshaws are also a favourite means of conveyance. The police force is controlled by the government.

Area, Government and Rateable Value.—The city proper covers about 6 sq. m. The municipal boundary extends in every direction some 5 m. from Market Square, encloses about 82 sq. m. and includes several of the largest mines. The local government is carried on by an elected municipal council, the franchise being restricted to white British subjects (men and women) who rent or own property of a certain value. In 1908 the rateable value of the municipality was £36,466,644, the rate 2¼d. in the £, and the town debt £5,500,000.

Population.—In 1887 the population was about 3000. By the beginning of 1890 it had increased to over 25,000. A census taken in July 1896 showed a population within a radius of 3 m. from Market Square of 102,078, of whom 50,907 were whites. At the census of April 1904 the inhabitants of the city proper numbered 99,022, the population within the municipal area being 155,642, of whom 83,363 were whites. Of the white inhabitants, 35% were of British origin, 51,629 were males, and 31,734 females. Of persons aged sixteen or over, the number of males was almost double the number of females. The coloured population included about 7000 British Indians—chiefly small traders. A municipal census taken in August 1908 gave the following result: whites 95,162; natives and coloured 78,781; Asiatics 6780—total 180,687.

History.—Johannesburg owes its existence to the discovery of gold in the Witwatersrand reefs. The town, named after Johannes Rissik, then surveyor-general of the Transvaal, was founded in September 1886, the first buildings being erected on the part of the reef where are now the Ferreira and Wemmer mines. These buildings were found to cover valuable ore, and in December following the Boer government marked out the site of the city proper, and possession of the plots was given to purchasers on the 1st of January 1887. The exploitation of the mines led to a rapid development of the town during the next three years. The year 1890 was one of great depression following the exhaustion of the surface ore, but the provision of better machinery and cheaper coal led to a revival in 1891. By 1892 the leading mines had proved their dividend-earning capacity, and in 1895 there was a great "boom" in the shares of the mining companies. The linking of the town to the seaports by railways during 1892–1895 gave considerable impetus to the gold-mining industry. Material prosperity was accompanied, however, by political, educational and other disadvantages, and the desire of the Johannesburgers—most of whom were foreigners or "Uitlanders"—to remedy the grievances under which they suffered led, in January 1896, to an abortive rising against the Boer government (see TRANSVAAL: *History*). One result of this movement was a slight advance in municipal self-government. Since 1887 the management of the town had been entrusted to a nominated sanitary board, under the chairmanship of the mining commissioner appointed by the South African Republic. In 1890 elected members had been admitted to this board, but at the end of 1897 an elective *stadsraad* (town council) was constituted, though its functions were strictly limited. There was a great development in the mining industry during 1897–1898 and 1899, the value of the gold extracted in 1898 exceeding £15,000,000, but the political situation grew worse, and in September 1899, owing to the imminence of war between the Transvaal and Great Britain, the majority of the Uitlanders fled from the city. Between October 1899, when war broke out, and the 31st of May 1900, when the city was taken by the British, the Boer government worked certain mines for their own benefit. After a period of military administration and of government by a nominated town council, an ordinance was passed in June 1903 providing for elective municipal councils, and in December following the first election to the new council took place. In 1905 the town was divided into wards. In that year the number of municipal voters was 23,338. In 1909 the proportional representation system was adopted in the election of town councillors.

During 1901–1903, while the war was still in progress or but recently concluded, the gold output was comparatively slight. The difficulty in obtaining sufficient labour for the mines led to a successful agitation for the importation of coolies from China (see TRANSVAAL: *History*). During 1904–1906 over 50,000 coolies were brought to the mines, a greatly increased output being the result, the value of the gold extracted in 1905 exceeding £20,000,000. Notwithstanding the increased production of gold, Johannesburg during 1905–1907 passed through a period of severe commercial depression, the result in part of the unsettled political situation. In June 1907 the repatriation of the Chinese coolies began; it was completed in February 1910.

An excellent compilation, entitled *Johannesburg Statistics*, dealing with almost every phase of the city's life, is issued monthly (since January 1905) by the town council. See also the *Post Office Directory, Transvaal* (Johannesburg, annually), which contains specially prepared maps, and the annual reports of the Johannesburg chamber of commerce. For the political history of Johannesburg, see the bibliography under TRANSVAAL.

JOHANNISBERG, a village of Germany, in the Prussian province of Hesse-Nassau, in the Rheingau, on the right bank of the Rhine, 6 m. S. of Rüdesheim by railway. The place is mainly celebrated for the beautiful Schloss which crowns a hill overlooking the Rhine valley, and is surrounded by vineyards yielding the famous Johannisberger wine. The Schloss, built in 1757–1759 by the abbots of Fulda on the site of a Benedictine monastery founded in 1090, was bestowed, in 1807, by Napoleon upon Marshal Kellermann. In 1814 it was given by Francis, emperor of Austria, to Prince Metternich, in whose family it still remains.

JOHN (Heb. יוחנן, *Yōḥānān*, "Yahweh has been gracious," Gr. 'Ιωάννης, Lat. *Joannes*, Ital. *Giovanni*, Span. *Juan*, Port. *João*, Fr. *Jean*, Ger. *Johannes*, *Johann* [abbr. *Hans*], Gael. *Ian*, Pol. and Czech *Jan*, Hung. *János*), a masculine proper name common in all Christian countries, its popularity being due to its having been borne by the "Beloved Disciple" of Christ, St John the Evangelist, and by the forerunner of Christ, St John the Baptist. It has been the name of twenty-two popes—the style of Popes John XXII. and XXIII. being due to an error in the number assumed by John XXI. (*q.v.*)—and of many sovereigns, princes, &c. The order followed in the biographical notices below is as follows: (1) the Apostle, (2) the Baptist, (3) popes, (4) Roman emperors, (5) kings; John of England first, the rest in the alphabetical order of their countries, (6) other sovereign princes, (7) non-sovereign princes, (8) saints, (9) theologians, chroniclers, &c. Those princes who are known by a name in addition to John (John Albert, &c.) will be found after the article JOHN, GOSPEL OF.

JOHN, THE APOSTLE, in the Bible, was the son of Zebedee, a Galilean fisherman, and Salome. It is probable that he was born at Bethsaida, where along with his brother James he followed his father's occupation. The family appears to have been in easy circumstances; at least we find that Zebedee employed hired servants, and that Salome was among those women who contributed to the maintenance of Jesus (Mark i. 20, xv. 40, 41, xvi. 1). John's "call" to follow our Lord occurred simultaneously with that addressed to his brother, and shortly after that addressed to the brothers Andrew and Simon Peter (Mark i. 19, 20). John speedily took his place among the twelve apostles, sharing with James the title of Boanerges ("sons of thunder," perhaps strictly "sons of anger," *i.e.* men readily angered), and became a member of that inner circle to which, in addition to his brother, Peter alone belonged (Mark v. 37, ix. 2, xiv. 33). John appears throughout the synoptic record as a zealous, fiery Jew-Christian. It is he who indignantly complains to Jesus, "We saw one casting out devils in Thy name, and he followeth not us," and tells Him, "We forbade him" for that reason (Mark ix. 38); and who with his brother, when a Samaritan village will not receive Jesus, asks Him, "Wilt thou that we command fire to come down from heaven and consume them?" (Luke ix. 54). The book of Acts confirms this tradition. After the departure of Jesus, John appears as present in Jerusalem with Peter and the other apostles (i. 13); is next to Peter the most prominent among those who bear testimony to the fact of the resurrection (iii. 12–26, iv. 13, 19–22); and is sent with Peter to Samaria, to confirm the newly converted Christians there (viii. 14, 25). St Paul tells us similarly that when, on his second visit to Jerusalem, "James," the Lord's brother, "and Cephas and John, who were considered pillars, perceived the grace that was given unto me, they gave to me and Barnabas the right hand of fellowship, that we should go unto the heathen, and they unto the circumcision" (Gal. ii. 9). John thus belonged in 46–47 to the Jewish-Christian school; but we do not know whether to the stricter group of James or to the milder group of Peter (ibid. ii. 11–14).

The subsequent history of the apostle is obscure. Polycrates, bishop of Ephesus (in Euseb., *H. E.* iii. 31; v. 24), attests in 196 that John "who lay on the bosom of the Lord rests at Ephesus"; but previously in this very sentence he has declared that "Philip one of the twelve apostles rests in Hierapolis," although Eusebius (doubtless rightly) identifies this Philip not with the apostle but with the deacon-evangelist of Acts xxi. 8. Polycrates also declares that John was a priest wearing the πέταλον (gold plate) that distinguished the high-priestly mitre. Irenaeus in various passages of his works, 181–191, holds a similar tradition. He says that John lived up to the time of Trajan and published his gospel in Ephesus, and identifies the apostle with John the disciple of the Lord, who wrote the Apocalypse under Domitian, whom Irenaeus's teacher Polycarp had known personally and of whom Polycarp had much to tell. These traditions are accepted and enlarged by later authors, Tertullian adding that John was banished to Patmos after he had miraculously survived the punishment of immersion in burning oil. As it is evident that legend was busy with John as early as the time of Polycrates, the real worth of these traditions requires to be tested by examination of their ultimate source. This inquiry has been pressed upon scholars since the apostolic authorship of the Apocalypse or of the Fourth Gospel, or of both these works, has been disputed. (See JOHN, GOSPEL OF, and REVELATION, BOOK OF.) The question has not been strictly one between advanced and conservative criticism, for the Tübingen school recognized the Apocalypse as apostolic, and found in it a confirmation of John's residence in Ephesus. On the other hand, Lützelberger (1840), Th. Keim (*Jesus v. Naz.*, vol. i., 1867), J. H. Scholten (1872), H. J. Holtzmann (esp. in *Einl. in d. N. T.*, 3rd ed., 1902), and other recent writers, wholly reject the tradition. It has had able defenders in Steitz (*Stud. u. Krit.*, 1868), Hilgenfeld (*Einl.*, 1875) and Lightfoot (*Essays on Supernatural Religion*, collected 1889). W. Sanday (*Criticism of Fourth Gospel*, 1905) makes passing admissions eloquent as to the strength of the negative position; whilst amongst Roman Catholic scholars, A. Loisy (*Le 4me. Ev.*, 1903) stands with Holtzmann, and Th. Calmes (*Ev. selon S. Jean*, 1904, 1906) and L. Duchesne (*Hist. anc. de l'Egl.*, 1906) exhibit, with papal approbation, the inconclusiveness of the conservative arguments.

The opponents of the tradition lay weight on the absence of positive evidence before the latter part of the 2nd century, especially in Papias and in the epistles of Ignatius and of Irenaeus's authority, Polycarp. They find it necessary to assume that Irenaeus mistook Polycarp; but this is not a difficult task, since already Eusebius (*c.* 310–313) is compelled to point out that Papias testifies to two Johns, the Apostle and a presbyter, and that Irenaeus is mistaken in identifying those two Johns, and in holding that Papias had seen John the Apostle (*H.E.* iii. 39, 5, 2). Irenaeus tells us, doubtless correctly, that Papias was "the companion of Polycarp": this fact alone would suffice, given his two mistakes concerning Papias, to make Irenaeus decide that Polycarp had seen John the Apostle. The chronicler George the Monk (Hamartolus) in the 9th century, and an epitome dating from the 7th or 8th century but probably based on the *Chronicle* of Philip of Side (*c.* 430), declare, on the authority of the second book of Papias, that John the Zebedean was killed by Jews (presumably in 60–70). Adolf Harnack, *Chron. d. altchr. Litt.* (1897), pp. 656–680), rejects the assertion; but the number of scholars who accept it as correct is distinctly on the increase. (F. v. H.)

JOHN THE BAPTIST, in the Bible, the "forerunner" of Jesus Christ in the Gospel story. By his preaching and teaching he evidently made a great impression upon his contemporaries (cf. Josephus, *Ant.* xviii., § 5). According to the birth-narrative embodied in Luke i. and ii., he was born in "a city of Judah" in "the hill country" (possibly Hebron [1]) of priestly parentage. His father Zacharias was a priest "of the course of Abijah," and his mother Elizabeth, who was also of priestly descent, was related to Mary, the mother of Jesus, whose senior John was by six months. This narrative of the Baptist's birth seems to embody some very primitive features, Hebraic and Palestinian in character, and possibly at one time independent of the Christian tradition. In the apocryphal gospels John is sometimes made the subject of special miraculous experiences (*e.g.* in the *Protevangelium Jacobi*, ch. xxii., where Elizabeth fleeing from Herod's assassins cried: "Mount of God, receive a mother with her child," and suddenly the mountain was divided and received her).

In his 30th year (15th year of the emperor Tiberius, ? A.D. 25–26) John began his public life in the "wilderness of Judaea," the wild district that lies between the Kedron and the Dead Sea, and particularly in the neighbourhood of the Jordan, where multitudes were attracted by his eloquence. The central theme of his preaching was, according to the Synoptic Gospels, the nearness of the coming of the Messianic kingdom, and the consequent urgency for preparation by repentance. John was evidently convinced that he himself had received the divine commission to bring to a close and complete the prophetic period, by inaugurating the Messianic age. He identified himself with the "voice" of Isa. xl. 3. Noteworthy features of his preaching were its original and prophetic character, and its high ethical tone, as shown *e.g.* in its anti-Pharisaic denunciation of trust in mere racial privilege (Matt. iii. 9). Herein also lay, probably, the true import of the baptism which he administered to those who accepted his message and confessed their sins. It was an act symbolizing moral purification (cf. Ezek. xxxvi. 25; Zech. xiii. 1) by way of preparation for the coming "kingdom of heaven," and implied that the Jew so baptized no longer rested in his privileged position as a child of Abraham. John's appearance, costume and habits of life, together with the tone of his preaching, all suggest the prophetic character. He was popularly regarded as a prophet, more especially as a second Elijah. His preaching awoke a great popular response, particularly among the masses of the people, "the people of the land." He had disciples who fasted (Mark ii. 18, &c.), who visited him regularly in prison (Matt. xi. 2, xiv. 12), and to whom he taught special forms of prayer (Luke v. 33, xi. 1). Some of these afterwards became followers of Christ (John i. 37). John's activity indeed had far-reaching effects. It profoundly influenced the Messianic movement depicted in the Gospels. The preaching of Jesus shows traces of this, and the Fourth Gospel (as well as the Synoptists) displays a marked interest in connecting the Johannine movement with the beginnings of Christianity. The fact that after the lapse of a quarter of a century there were Christians in Ephesus who accepted John's baptism (Acts xviii. 25, xix. 3) is highly significant. This influence also persisted in later times. Christ's estimate of John (Matt. xi. 7 seq.) was a very high one. He also pointedly alludes to John's work and the people's relation to it, in many sayings and parables (sometimes in a tone of irony). The duration of John's ministry cannot be determined with certainty: it terminated in his imprisonment in the fortress of Machaerus, to which he had been committed by Herod Antipas, whose incestuous marriage with Herodias, the Baptist had sternly rebuked. His execution cannot with safety be placed later than A.D. 28.

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[1] There is no reason to suppose that Jutta is intended by the πόλις Ἰούδα of Luke i. 39: the tradition which makes 'Ain Karim, near Jerusalem, the birthplace of the Baptist only dates from the crusading period.

In the church calendar this event is commemorated on the 29th of August. According to tradition he was buried at Samaria (Theodoret, *H.E.* iii. 3). (G. H. Bo.)

JOHN I., pope from 523 to 526, was a Tuscan by birth, and was consecrated pope on the death of Hormisdas. In 525 he was sent by Theodoric at the head of an embassy to Constantinople to obtain from the emperor Justin toleration for the Arians; but he succeeded so imperfectly in his mission that Theodoric on his return, suspecting that he had acted only half-heartedly, threw him into prison, where he shortly afterwards died, Felix IV. succeeding him. He was enrolled among the martyrs, his day being May 27.

JOHN II., pope from 533 to 535, also named Mercurius, was elevated to the papal chair on the death of Boniface II. During his pontificate a decree against simony was engraven on marble and placed before the altar of St Peter's. At the instance of the emperor Justinian he adopted the proposition *unus de Trinitate passus est in carne* as a test of the orthodoxy of certain Scythian monks accused of Nestorian tendencies. He was succeeded by Agapetus I.

JOHN III., pope from 561 to 574, successor to Pelagius, was descended from a noble Roman family. He is said to have been successful in preventing an invasion of Italy by the recall of the deposed exarch Narses, but the Lombards still continued their incursions, and, especially during the pontificate of his successor Benedict I., inflicted great miseries on the province.

JOHN IV., pope from 640 to 642, was a Dalmatian by birth, and succeeded Severinus after the papal chair had been vacant four months. While he adhered to the repudiation of the Monothelitic doctrine by Severinus, he endeavoured to explain away the connexion of Honorius I. with the heresy. His successor was Theodorus I.

JOHN V., pope from 685 to 686, was a Syrian by birth, and on account of his knowledge of Greek had in 680 been named papal legate to the sixth ecumenical council at Constantinople. He was the successor of Benedict II., and after a pontificate of little more than a year, passed chiefly in bed, was followed by Conon.

JOHN VI., pope from 701 to 705, was a native of Greece, and succeeded to the papal chair two months after the death of Sergius I. He assisted the exarch Theophylact, who had been sent into Italy by the emperor Justinian II., and prevented him from using violence against the Romans. Partly by persuasion and partly by means of a bribe, John succeeded in inducing Gisulf, duke of Benevento, to withdraw from the territories of the empire.

JOHN VII., pope from 705 to 707, successor of John VI., was also of Greek nationality. He seems to have acceded to the request of the emperor Justinian II. that he should give his sanction to the decrees of the Quinisext or Trullan council of 692. There are several monuments of John in the church of St Maria Antiqua at the foot of the Palatine hill; others were formerly in the chapel of the Virgin, built by him in the basilica of St Peter. He was succeeded by Sisinnius.

JOHN VIII., pope from 872 to 882, successor of Adrian II., was a Roman by birth. His chief aim during his pontificate was to defend the Roman state and the authority of the Holy See at Rome from the Saracens, and from the nascent feudalism which was represented outside by the dukes of Spoleto and the marquises of Tuscany and within by a party of Roman nobles. Events, however, were so fatally opposed to his designs that no sooner did one of his schemes begin to realize itself in fact than it was shattered by an unlooked-for chance. To obtain an influential alliance against his enemies, he agreed in 875, after death had deprived him of his natural protector, the emperor Louis II., to bestow the imperial crown on Charles the Bald; but that monarch was too much occupied in France to grant him much effectual aid, and about the time of the death of Charles he found it necessary to come to terms with the Saracens, who were only prevented from entering Rome by the promise of an annual tribute. Carloman, the opponent of Charles's son Louis, soon after invaded northern Italy, and, securing the support of the bishops and counts, demanded from the pope the imperial crown. John attempted to temporize, but Lambert, duke of Spoleto, a partisan of Carloman, whom sickness had recalled to Germany, entered Rome in 878 with an overwhelming force, and for thirty days virtually held John a prisoner in St Peter's. Lambert was, however, unsuccessful in winning any concession from the pope, who after his withdrawal carried out a previous purpose of going to France. There he presided at the council of Troyes, which promulgated a ban of excommunication against the supporters of Carloman—amongst others Adalbert of Tuscany, Lambert of Spoleto, and Formosus, bishop of Porto, who was afterwards elevated to the papal chair. In 879 John returned to Italy accompanied by Boso, duke of Provence, whom he adopted as his son, and made an unsuccessful attempt to get recognized as king of Italy. In the same year he was compelled to give a promise of his sanction to the claims of Charles the Fat, who received from him the imperial crown in 881. Before this, in order to secure the aid of the Greek emperor against the Saracens, he had agreed to sanction the restoration of Photius to the see of Constantinople, and had withdrawn his consent on finding that he reaped from the concession no substantial benefit. Charles the Fat, partly from unwillingness, partly from natural inability, gave him also no effectual aid, and the last years of John VIII. were spent chiefly in hurling vain anathemas against his various political enemies. According to the annalist of Fulda, he was murdered by members of his household. His successor was Marinus.

JOHN IX., pope from 898 to 900, not only confirmed the judgment of his predecessor Theodore II. in granting Christian burial to Formosus, but at a council held at Ravenna decreed that the records of the synod which had condemned him should be burned. Finding, however, that it was advisable to cement the ties between the empire and the papacy, John gave unhesitating support to Lambert in preference to Arnulf, and also induced the council to determine that henceforth the consecration of the popes should take place only in the presence of the imperial legates. The sudden death of Lambert shattered the hopes which this alliance seemed to promise. John was succeeded by Benedict IV.

JOHN X., pope from 914 to 928, was deacon at Bologna when he attracted the attention of Theodora, the wife of Theophylact, the most powerful noble in Rome, through whose influence he was elevated first to the see of Bologna and then to the archbishopric of Ravenna. In direct opposition to a decree of council, he was also at the instigation of Theodora promoted to the papal chair as the successor of Lando. Like John IX. he endeavoured to secure himself against his temporal enemies through a close alliance with Theophylact and Alberic, marquis of Camerino, then governor of the duchy of Spoleto. In December 915 he granted the imperial crown to Berengar, and with the assistance of the forces of all the princes of the Italian peninsula he took the field in person against the Saracens, over whom he gained a great victory on the banks of the Garigliano. The defeat and death of Berengar through the combination of the Italian princes, again frustrated the hopes of a united Italy, and after witnessing several years of anarchy and confusion John perished through the intrigues of Marozia, daughter of Theodora. His successor was Leo VI.

JOHN XI., pope from 931 to 935, was the son of Marozia and the reputed son of Sergius III. Through the influence of his mother he was chosen to succeed Stephen VII. at the early age of twenty-one. He was the mere exponent of the purposes of his mother, until her son Alberic succeeded in 933 in overthrowing their authority. The pope was kept a virtual prisoner in the Lateran, where he is said to have died in 935, in which year Leo VII. was consecrated his successor.

JOHN XII., pope from 955 to 964, was the son of Alberic, whom he succeeded as patrician of Rome in 954, being then only sixteen years of age. His original name was Octavian, but when he assumed the papal tiara as successor to Agapetus II., he adopted the apostolic name of John, the first example, it is said, of the custom of altering the surname in connexion with elevation to the papal chair. As a temporal ruler John was devoid of the vigour and firmness of his father, and his union of the papal office—which through his scandalous private life he made a byword of reproach—with his civil dignities proved a source of weakness rather than of strength. In order to protect himself against the intrigues in Rome and the power of Berengar II. of Italy, he called to his aid Otto the Great of Germany, to whom he granted the imperial crown in 962. Even before Otto left Rome the pope had, however, repented of his recognition of a power which threatened altogether to overshadow his authority, and had begun to conspire against the new emperor. His intrigues were discovered by Otto, who, after he had defeated and taken prisoner Berengar, returned to Rome and summoned a council which deposed John, who was in hiding in the mountains of Campania, and elected Leo VIII. in his stead. An attempt at an insurrection was made by the inhabitants of Rome even before Otto left the city, and on his departure John returned at the head of a formidable company of friends and retainers, and caused Leo to seek safety in immediate flight. Otto determined to make an effort in support of Leo, but before he reached the city John had died, in what manner is uncertain, and Benedict V. had mounted the papal chair.

JOHN XIII., pope from 965 to 972, was descended from a noble Roman family, and at the time of his election as successor to Leo VIII. was bishop of Narni. He had been somewhat inconsistent in his relations with his predecessor Leo, but his election was confirmed by the emperor Otto, and his submissive attitude towards the imperial power was so distasteful to the Romans that they expelled him from the city. On account of the threatening procedure of Otto, they permitted him shortly afterwards to return, upon which, with the sanction of Otto, he took savage vengeance on those who had formerly opposed him. Shortly after holding a council along with the emperor at Ravenna in 967, he gave the imperial crown to Otto II. at Rome in assurance of his succession to his father; and in 972 he also crowned Theophano as empress immediately before her marriage. On his death in the same year he was followed by Benedict VI.

JOHN XIV., pope from 983 to 984, successor to Benedict VII., was born at Pavia, and before his elevation to the papal chair was imperial chancellor of Otto II. Otto died shortly after his election, when Boniface VII., on the strength of the popular feeling against the new pope, returned from Constantinople and placed John in prison, where he died either by starvation or poison.

JOHN XV., pope from 985 to 996, generally recognized as the successor of Boniface VII., the pope John who was said to have ruled for four months after John XIV., being now omitted by the best authorities. John XV. was the son of Leo, a Roman presbyter. At the time he mounted the papal chair Crescentius was patrician of Rome, but, although his influence was on this account very much hampered, the presence of the empress Theophano in Rome from 989 to 991 restrained also the ambition of Crescentius. On her departure the pope, whose venality and nepotism had made him very unpopular with the citizens, died of fever before the arrival of Otto III., who elevated his own kinsman Bruno to the papal dignity under the name of Gregory V.

JOHN XVI., pope or antipope from 997 to 998, was a Calabrian Greek by birth, and a favourite of the empress Theophano, from whom he had received the bishopric of Placentia. His original name was Philagathus. In 995 he was sent by Otto III. on an embassy to Constantinople to negotiate a marriage with a Greek princess. On his way back he either accidentally or at the special request of Crescentius visited Rome. A little before this Gregory V., at the end of 996, had been compelled to flee from the city; and the wily and ambitious Greek had now no scruple in accepting the papal tiara from the hands of Crescentius. The arrival of Otto at Rome in the spring of 998 put a sudden end to the teacherous compact. John sought safety in flight, but was discovered in his place of hiding and brought back to Rome, where after enduring cruel and ignominious tortures he was immured in a dungeon.

JOHN XVII., whose original name was Sicco, succeeded Silvester II. as pope in June 1003, but died less than five months afterwards.

JOHN XVIII., pope from 1003 to 1009, was, during his whole pontificate, the mere creature of the patrician John Crescentius, and ultimately he abdicated and retired to a monastery, where he died shortly afterwards. His successor was Sergius IV.

JOHN XIX., pope from 1024 to 1033, succeeded his brother Benedict VIII., both being members of the powerful house of Tusculum. He merely took orders to enable him to ascend the papal chair, having previously been a consul and senator. He displayed his freedom from ecclesiastical prejudices, if also his utter ignorance of ecclesiastical history, by agreeing, on the payment of a large bribe, to grant to the patriarch of Constantinople the title of an ecumenical bishop, but the general indignation which the proposal excited throughout the church compelled him almost immediately to withdraw from his agreement. On the death of the emperor Henry II. in 1024 he gave his support to Conrad II., who along with his consort was crowned with great pomp at St Peter's in Easter of 1027. John died in 1033, in the full possession of his dignities. A successor was found for him in his nephew Benedict IX., a boy of only twelve years of age. (L. D.*)

JOHN XXI. (Pedro Giuliano-Rebulo), pope from the 8th of September 1276 to the 20th of May 1277 (should be named John XX., but there is an error in the reckoning through the insertion of an antipope), a native of Portugal, educated for the church, became archdeacon and then archbishop of Braga, and so ingratiated himself with Gregory X. at the council of Lyons (1274) that he was taken to Rome as cardinal-bishop of Frascati, and succeeded Gregory after an interregnum of twenty days. As pope he excommunicated Alphonso III. of Portugal for interfering with episcopal elections and sent legates to the Great Khan. He was devoted to secular science, and his small affection for the monks awakened the distrust of a large portion of the clergy. His life was brought to a premature close through the fall of the roof in the palace he had built at Viterbo. His successor was Nicholas III.

John XXI. has been identified since the 14th century, most probably correctly, with Petrus Hispanus, a celebrated Portuguese physician and philosopher, author of several medical works—notably the curious *Liber de oculo*, trans. into German and well edited by A. M. Berger (Munich, 1899), and of a popular textbook in logic, the *Summulae logicales*. John XXI. is constantly referred to as a magician by ignorant chroniclers.

See *Les Registres de Grégoire X. et Jean XXI.*, published by J. Guiraud and E. Cadier in *Bibliothèque des écoles françaises d'Athènes et de Rome* (Paris, 1898); A. Potthast, *Regesta pontif. Roman.*, vol. 2 (Berlin, 1875); F. Gregorovius, *Rome in the Middle Ages*, vol. v., trans. by Mrs G. W. Hamilton (London, 1900–1902); R. Stapper, *Papst Johann XXI.* (Münster, 1898); J. T. Köhler, *Vollständige Nachricht von Papst Johann XXI.* (Göttingen, 1760). (C. H. Ha.)

JOHN XXII., pope from 1316 to 1334, was born at Cahors, France, in 1249. His original name was Jacques Duèse, and he came either of a family of petty nobility or else of well-to-do middle-class parents, and was not, as has been popularly supposed, the son of a shoemaker. He began his education with the Dominicans at Cahors, subsequently studied law at Montpellier, and law and medicine in Paris, and finally taught at Cahors and Toulouse. At Toulouse he became intimate with the bishop Louis, son of Charles II., king of Naples. In 1300 he was elevated to the episcopal see of Fréjus by Pope Boniface VIII. at the instance of the king of Naples, and in 1308 was made chancellor of Naples by Charles, retaining this office under Charles's successor, Robert of Anjou. In 1310 Pope Clement V. summoned Jacques to Avignon and instructed him to advise upon the affair of the Templars and also upon the question of condemning the memory of Boniface VIII. Jacques decided on the legality of suppressing the order of the Templars, holding that the pope would be serving the best interests of the church by pronouncing its suppression; but he rejected the condemnation of Boniface as a sacrilegious affront to the church and a monstrous abuse of the lay power. On the 23rd of December 1312 Clement appointed him cardinal-bishop of Porto, and it was while cardinal of Porto that he was elected pope, on the 7th of August 1316. Clement had died in April 1314, but the cardinals assembled at Carpentras were unable to agree as to his successor. As the two-thirds majority requisite for an election could not be obtained, the cardinals separated, and it was not until the 28th of June 1316 that they reassembled in the cloister of the Dominicans at Lyons, and then only in deference to the pressure exerted upon them by Philip V. of France. After deliberating for more than a month they elected Robert of Anjou's candidate, Jacques Duèse, who was crowned on the 5th of September, and on the 2nd of October arrived at Avignon, where he remained for the rest of his life.

More jurist than theologian, John defended the rights of the papacy with rigorous zeal and as rigorous logic. For the restoration of the papacy to its old independence, which had been so gravely compromised under his immediate predecessors, and for the execution of the vast enterprises which the papacy deemed useful for its prestige and for Christendom, considerable sums were required; and to raise the necessary money John burdened Christian Europe with new taxes and a complicated fiscal system, which was fraught with serious consequences. For his personal use, however, he retained but a very small fraction of the sums thus acquired, and at his death his private fortune amounted to scarce a million florins. The essentially practical character of his administration has led many historians to tax him with avarice, but later research on the fiscal system of the papacy of the period, particularly the joint work of Samaran and Mollat, enables us very sensibly to modify the severe judgment passed on John by Gregorovius and others.

John's pontificate was continually disturbed by his conflict with Louis of Bavaria and by the theological revolt of the Spiritual Franciscans. In October 1314 Louis of Bavaria and Frederick of Austria had each been elected German king by the divided electors. Louis was gradually recognized by the whole of Germany, especially after his victory at Mühldorf (1322), and gained numerous adherents in Italy, where he supported the Visconti, who had been condemned as heretics by the pope. John affected to ignore the successes of Louis, and on the 8th of October 1323 forbade his recognition as king of the Romans. After demanding a respite, Louis abruptly appealed at Nuremberg from the future sentence of the pope to a general council (December 8, 1323). The conflict then assumed a grave doctrinal character. The doctrine of the rights of the lay monarchy sustained by Occam and John of Paris, by Marsilius of Padua, John of Jandun and Leopold of Bamberg, was affirmed by the jurists and theologians, penetrated into the parlements and the universities, and was combated by the upholders of papal absolutism, such as Alvaro Pelayo and Alonzo Trionfo. Excommunicated on the 21st of March 1324, Louis retorted by appealing for a second time to a general council, which was held on the 22nd of May 1324, and accused John of being an enemy to the peace and the law, stigmatizing him as a heretic on the ground that he opposed the principle of evangelical poverty as professed by the strict Franciscans. From this moment Louis appeared in the character of the natural ally and even the protector of the Spirituals against the persecution of the pope. On the 11th of July 1324 the pope laid under an interdict the places where Louis or his adherents resided, but this bull had no effect in Germany. Equally futile was John's declaration (April 3, 1327) that Louis had forfeited his crown and abetted heresy by granting protection to Marsilius of Padua. Having reconciled himself with Frederick of Austria, Louis penetrated into Italy and seized Rome on the 7th of January 1328, with the help of the Roman Ghibellines led by Sciarra Colonna. After installing himself in the Vatican, Louis got himself crowned by the deputies of the Roman people; instituted proceedings for the deposition of John, whom the Roman people, displeased by the spectacle of the papacy abandoning Rome, declared to have forfeited the pontificate (April 18, 1328); and finally caused a Minorite friar, Pietro Rainalucci da Corvara, to be elected pope under the name of Nicholas V. John preached a platonic crusade against Louis, who burned the pope's effigy at Pisa and in Amelia. Soon, however, Louis felt his power waning, and quitted Rome and Italy (1329). Incapable of independent action, the antipope was abandoned by the Romans and handed over to John, who forced him to make a solemn submission with a halter round his neck (August 15, 1330). Nicholas was condemned to perpetual imprisonment, and died in obscurity at Avignon; while the Roman people submitted to King Robert, who governed the church through his vicars. In 1317, in execution of a bull of Clement V., the royal vicariate in Italy had been conferred by John on Robert of Anjou, and this appointment was renewed in 1322 and 1324, with threats of excommunication against any one who should seize the vicariate of Italy without the authorization of the pope. One of John's last acts was his decision to separate Italy from the Empire, but this bull was of no avail and fell into oblivion. After his death, however, the interdict was not removed from Germany, and the resistance of Louis and his theologians continued.

A violent manifestation of this resistance took place in connexion with the accusation of heresy brought against the pope. On the third Sunday in Advent 1329, and afterwards in public consistory, John had preached that the souls of those who have died in a state of grace go into Abraham's bosom, *sub altari Dei*, and do not enjoy the beatific vision (*visio facie ad faciem*) of the Lord until after the Last Judgment and the Resurrection; and he had even instructed a Minorite friar, Gauthier of Dijon, to collect the passages in the Fathers which were in favour of this doctrine. On the 27th of December 1331 a Dominican, Thomas of England, preached against this doctrine at Avignon itself and was thrown into prison. When news of this affair had reached Paris, the pope sent the general of the Minorites, Gerard Odonis, accompanied by a Dominican, to sustain his doctrine in that city, but King Philip VI., perhaps at the instigation of the refugee Spirituals in Paris, referred the question to the faculty of theology, which, on the 2nd of January 1333, declared that the souls of the blessed were elevated to the beatific vision immediately after death; the faculty, nevertheless, were of opinion that the pope should have propounded his erroneous doctrine only "*recitando*," and not "*determinando, asserendo, seu etiam opinando*." The king notified this decision to the pope, who assembled his consistory in November 1333, and gave a haughty reply. The theologians in Louis's following who were opposed to papal absolutism already spoke of "the new heretic, Jacques de Cahors," and reiterated with increasing insistency their demands for the convocation of a general council to try the pope. John appears to have retracted shortly before his death, which occurred on the 4th of December 1334.[1]

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[1] On the 29th of January 1336 Pope Benedict XII. pronounced a long judgment on this point of doctrine, a judgment which he declared had been included by John in a bull which death had prevented him from sealing.

John had kindled very keen animosity, not only among the upholders of the independence of the lay power, but also among the upholders of absolute religious poverty, the exalted Franciscans. Clement V., at the council of Vienne, had attempted to bring back the Spirituals to the common rule by concessions; John, on the other hand, in the bull *Quorundam exigit* (April 13, 1317), adopted an uncompromising and absolute attitude, and by the bull *Gloriosam ecclesiam* (January 23, 1318) condemned the protests which had been raised against the bull *Quorundam* by a group of seventy-four Spirituals and conveyed to Avignon by the monk Bernard Délicieux. Shortly afterwards four Spirituals were burned at Marseilles. These were immediately hailed as martyrs, and in the eyes of the exalted Franciscans at Naples and in Sicily and the south of France the pope was regarded as antichrist. In the bull *Sancta Romana et universa ecclesia* (December 28, 1318) John definitively excommunicated them and condemned their principal book, the *Postil* (commentary) on the Apocalypse (February 8, 1326). The bull *Quia nonnunquam* (March 26, 1322) defined the derogations from the rule punished by the pope, and the bull *Cum inter nonnullos* (November 12, 1323) condemned the proposition which had been admitted at the general chapter of the Franciscans held at Perugia in 1322, according to which Christ and the Apostles were represented as possessing no property, either personal or common. The minister general, Michael of Cesena, though opposed to the exaggerations of the Spirituals, joined with them in protesting against the condemnation of the fundamental principle of evangelical poverty, and the agitation gradually gained ground. The pope, by the bull *Quia quorundam* (November 10, 1324), cited Michael to appear at Avignon at the same time as Occam and Bonagratia. All three fled to the court of Louis of Bavaria (May 26, 1328), while the majority of the Franciscans made submission and elected a general entirely devoted to the pope. But the resistance, aided by Louis and merged as it now was in the cause sustained by Marsilius of Padua and John of Jandun, became daily bolder. Treatises on poverty appeared on every side; the party of Occam clamoured with increasing imperiousness for the condemnation of John by a general council; and the Spirituals, confounded in the persecution with the Beghards and with Fraticelli of every description, maintained themselves in the south of France in spite of the reign of terror instituted in that region by the Inquisition.

See M. Souchon, *Die Papstwahlen von Bonifaz VIII. bis Urban VI.* (Brunswick, 1888); Abbé Albe, *Autour de Jean XXII.* (Rome, 1904); K. Müller, *Der Kampf Ludwigs des Bayern mit der Curie* (Tübingen, 1879 seq.); W. Preger, "Mémoires sur la lutte entre Jean XXII. et Louis de Bavière" in *Abhandl. der bayr. Akad.*, hist. sec., xv., xvi., xvii.; S. Riezler, *Die litterar. Widersacher der Päpste zur Zeit Ludwigs des Baiers* (Leipzig, 1874); F. Ehrle, "Die Spiritualen" in *Archiv für Litteratur- und Kirchengeschichte des Mittelalters* (vols. i. and ii.); C. Samaran and G. Mollat, *La Fiscalité pontificale en France au xiv^e siècle* (Paris, 1905); A. Coulon and G. Mollat, *Lettres secrètes et curiales de Jean XXII. se rapportant à la France* (Paris, 1899, seq.). (P. A.)

JOHN XXIII. (Baldassare Cossa), pope, or rather anti-pope from 1410 to 1415, was born of a good Neapolitan family, and began by leading the life of a corsair before entering the service of the Church under the pontificate of Boniface IX. His abilities, which were mainly of an administrative and military order, were soon rewarded by the cardinal's hat and the legation of Bologna. On the 29th of June 1408 he and seven of his colleagues broke away from Gregory XII., and together with six cardinals of the obedience of Avignon, who had in like manner separated from Benedict XIII., they agreed to aim at the assembling of a general council, setting aside the two rival pontiffs, an expedient which they considered would put an end to the great schism of the Western Church, but which resulted in the election of yet a third pope. This act was none the less decisive for Baldassare Cossa's future. Alexander V., the first pope elected at Pisa, was not perhaps, as has been maintained, merely a man of straw put forward by the ambitious cardinal of Bologna; but he reigned only ten months, and on his death, which happened rather suddenly on the 4th of May 1410, Baldassare Cossa succeeded him. Whether the latter had bought his electors by money and promises, or owed his success to his dominant position in Bologna, and to the support of Florence and of Louis II. of Anjou, he seems to have received the unanimous vote of all the seventeen cardinals gathered together at Bologna (May 17). He took the name of John XXIII., and France, England, and part of Italy and Germany recognized him as head of the Catholic church.

The struggle in which he and Louis II. of Anjou engaged with Ladislaus of Durazzo, king of Sicily, and Gregory XII.'s chief protector in Italy, at first went in John's favour. After the brilliant victory of Roccasecca (May 19, 1411) he had the satisfaction of dragging the standards of Pope Gregory and King Ladislaus through the streets of Rome. But the dispersion of Louis of Anjou's troops and his carelessness, together with the lack of success which attended the preaching of a crusade in Germany, France and England, finally decided John XXIII. to abandon the French claimant to the throne of Sicily; he recognized Ladislaus, his former enemy, as king of Naples, and Ladislaus did not fail to salute John XXIII. as pope, abandoning Gregory XII. (June 15, 1412). This was a fatal step: John XXIII. was trusting in a dishonest and insatiable prince; he would have acted more wisely in remaining the ally of the weak but loyal Louis of Anjou. However, it seemed desirable that the reforms announced by the council of Pisa, which the popes set up by this synod seemed in no hurry to carry into effect, should be further discussed in the new council which it had been agreed should be summoned about the spring of 1412. But John was anxious that this council should be held in Rome, a city where he alone was master; the few prelates and ambassadors who very slowly gathered there held only a small number of sessions, in which John again condemned the writings of Wycliffe. John was attacked by the representatives of the various nations and reprimanded even for his private conduct, but endeavoured to extricate himself from this uncomfortable position by gratifying their desires, if not by reforming abuses. It is, however, only fair to add that he took various half-measures and gave many promises which, if they had been put into execution, would have confirmed or completed the reforms inaugurated at Pisa. But on the 3rd of Mrach 1413 John adjourned the council of Rome till December, without even fixing the place where the next session should be held. It was held at Constance in Germany, and John could only have resigned himself to accepting such an uncertain meeting-place because he was forced by distress, isolation and fear to turn towards the head of the empire. Less than a year after the treaty concluded with Ladislaus of Durazzo, the latter forced his way into Rome (June 8, 1413), which he sacked, expelling John, to whom even the Florentines did not dare to throw open their gates for fear of the king of Sicily. Sigismund, king of the Romans, not only extorted, it is said, a sum of 50,000 florins from the pontiff in his extremity, but insisted upon his summoning the council at Constance (December 9). It was in vain that, on the death of Ladislaus, which took place unexpectedly (August 6, 1414), John was inspired with the idea of breaking his compact with Sigismund and returning to Rome, at the same time appealing to Louis of Anjou. It was too late. The cardinals forced him towards Germany by the most direct road, without allowing him to go by way of Avignon as he had projected, in order to make plans with the princes of France.

On the 5th of November 1414 John opened the council of Constance, where, on Christmas Day, he received the homage of the head of the empire, but where his lack of prestige, the defection of his allies, the fury of his adversaries, and the general sense of the necessity for union soon showed only too clearly how small was the chance of his retaining the tiara. He had to take a solemn oath to abdicate if his two rivals would do the same, and this concession, which was not very sincere, gained him for the last time the honour of seeing Sigismund prostrate at his feet (March 2, 1415). But on the night of the 20th–21st of March, having donned the garments of a layman, with a cross-bow slung at his side, he succeeded in making his escape from Constance, accompanied only by a single servant, and took refuge first in the castle of Schaffhausen, then in that of Laufenburg, then at Freiburg-im-Breisgau, and finally at Brisach, whence he hoped to reach Alsace, and doubtless ultimately Avignon, under the protection of an escort sent by the duke of Burgundy. The news of the pope's escape was received at Constance with an extraordinary outburst of rage, and led to the subversive decrees of the 4th and 5th sessions, which proclaimed the superiority of the council over the pope. Duke Frederick of Austria had hitherto sheltered John's flight; but, laid under the ban of the empire, attacked by powerful armies, and feeling that he was courting ruin, he preferred to give up the pontiff who had trusted to him. John was brought back to Freiburg (April 27), and there in vain attempted to appease the wrath which he had aroused by more or less vague promises of resignation. His trial, however, was already beginning. The three cardinals whom he charged with his defence hastily declined this compromising task. Seventy-four charges were drawn up, only twenty of which were set aside after the witnesses had been heard. The accusation of having poisoned Alexander V. and his doctor at Bologna was not maintained. But enough deeds of immorality, tyranny, ambition and simony were found proved to justify the severest judgment. He was suspended from his functions as pope on the 14th of May 1415, and deposed on the following 29th of May.

However irregular this sentence may have been from the canonical point of view (for the accusers do not seem to have actually proved the crime of heresy, which was necessary, according to most scholars of the period, to justify the deposition of a sovereign pontiff), the condemned pope was not long in confirming it. Baldassare Cossa, now as humble and resigned as he had before been energetic and tenacious, on his transference to the castle of Rudolfzell admitted the wrong which he had done by his flight, refused to bring forward anything in his defence, acquiesced entirely in the judgment of the council which he declared to be infallible, and finally, as an extreme precaution, ratified *motu proprio* the sentence of deposition, declaring that he freely and willingly renounced any rights which he might still have in the papacy. This fact has subsequently been often quoted against those who have appealed to the events of 1415 to maintain that a council can depose a pope who is *scandalizator ecclesiae*.

Cossa kept his word never to appeal against the sentence which stripped him of the pontificate. He was held prisoner for three years in Germany, but in the end bought his liberty from the count palatine. He used this liberty only to go to Florence, in 1419, and throw himself on the mercy of the legitimate pope. Martin V. appointed him cardinal-bishop of Tusculum, a dignity which Cossa only enjoyed for a few months. He died on the 22nd of December 1419, and all visitors to the Baptistery at Florence may admire, under its high baldacchino, the sombre figure sculptured by Donatello of the dethroned pontiff, who had at least the merit of bowing his head under his chastisement, and of contributing by his passive resignation to the extinction of the series of popes which sprang from the council of Pisa. (N.V.)

JOHN I. (925–976), surnamed Tzimisces, East Roman emperor, was born of a distinguished Cappadocian family. After helping his uncle Nicephorus Phocas (*q.v.*) to obtain the throne and to restore the empire's eastern provinces he was deprived of his command by an intrigue, upon which he retaliated by conspiring with Nicephorus' wife Theophania to assassinate him. Elected ruler in his stead, John proceeded to justify his usurpation by the energy with which he repelled the foreign invaders of the empire. In a series of campaigns against the newly established Russian power (970–973) he drove the enemy out of Thrace, crossed Mt Haemus and besieged the fortress of Dorystolon on the Danube. In several hard-fought battles he broke the strength of the Russians so completely that they left him master of eastern Bulgaria. He further secured his northern frontier by transplanting to Thrace some colonies of Paulicians whom he suspected of sympathising with their Saracen neighbours in the east. In 974 he turned against the Abassid empire and easily recovered the inland parts of Syria and the middle reaches of the Euphrates. He died suddenly in 976 on his return from his second campaign against the Saracens. John's surname was apparently derived from the Armenian *tshemshkik* (red boot).

See E. Gibbon, *The Decline and Fall of the Roman Empire*, vol. vi. (ed. Bury, 1896); G. Finlay, *History of Greece*, ii. 334–360 (ed. 1877); G. Schlumberger, *L'Épopée Byzantine*, i. 1–326 (1896).

JOHN II. (1088–1143), surnamed Comnenus and also Kalojoannes (John the Good), East Roman emperor, was the eldest son of the East Roman emperor Alexius, whom he succeeded in 1118. On account of his mild and just reign he has been called the Byzantine Marcus Aurelius. By the personal purity of his character he effected a notable improvement in the manners of his age, but he displayed little vigour in internal administration or in extirpating the long-standing corruptions of the government. Nor did his various successes against the Hungarians, Servians and Seljuk Turks, whom he pressed hard in Asia Minor and proposed to expel from Jerusalem, add much to the stability of his empire. He was accidentally killed during a wild-boar hunt on Mt Taurus, on the 8th of April 1143.

See E. Gibbon, *The Decline and Fall of the Roman Empire*, v. 228 seq. (ed. Bury, 1896).

JOHN III. (1193–1254), surnamed Vatatzes and also Ducas, East Roman emperor, earned for himself such distinction as a soldier that in 1222 he was chosen to succeed his father-in-law Theodore I. Lascaris. He reorganized the remnant of the East Roman empire, and by his administrative skill made it the strongest and richest principality in the Levant. Having secured his eastern frontier by an agreement with the Turks, he set himself to recover the European possessions of his predecessors. While his fleet harassed the Latins in the Aegean Sea and extended his realm to Rhodes, his army, reinforced by Frankish mercenaries, defeated the Latin emperor's forces in the open field. Though unsuccessful in a siege of Constantinople, which he undertook in concert with the Bulgarians (1235), he obtained supremacy over the despotats of Thessalonica and Epirus. The ultimate recovery of Constantinople by the Rhomaic emperors is chiefly due to his exertions.

See E. Gibbon, *The Decline and Fall of the Roman Empire*, vi. 431–462 (ed. Bury, 1896); G. Finlay, *History of Greece*, iii. 196–320 (ed. 1877); A. Meliarakes, *Ἱστορία τοῦ Βασιλείου τῆς Νικαίας καὶ τοῦ Δεσποτάτου τῆς Ἠπείρου*, pp. 155–421 (1898).

JOHN IV. (*c.* 1250–*c.* 1300), surnamed Lascaris, East Roman emperor, son of Theodore II. His father dying in 1258, Michael Palaeologus conspired shortly after to make himself regent, and in 1261 dethroned and blinded the boy monarch, and imprisoned him in a remote castle, where he died a long time after.

See E. Gibbon, *The Decline and Fall of the Roman Empire*, vi. 459–466 (ed. Bury, 1896); A. Meliarakes, *Ἱστορία τοῦ Βασιλείου τῆς Νικαίας* (Athens, 1898), pp. 491–528.

JOHN V. or **VI.** (1332–1391), surnamed Palaeologus, East Roman emperor, was the son of Andronicus III., whom he succeeded in 1341. At first he shared his sovereignty with his father's friend John Cantacuzene, and after a quarrel with the latter was practically superseded by him for a number of years (1347–1355). His reign was marked by the gradual dissolution of the imperial power through the rebellion of his son Andronicus and by the encroachments of the Ottomans, to whom in 1381 John acknowledged himself tributary, after a vain attempt to secure the help of the popes by submitting to the supremacy of the Roman Church.

See E. Gibbon, *The Decline and Fall of the Roman Empire*, vi. 495 seq., vii. 38 seq. (ed. Bury, 1896); E. Pears, *The Destruction of the Greek Empire*, pp. 70–96 (1903).

JOHN VI. or **V.** (*c.* 1292–1383), surnamed Cantacuzene, East Roman emperor, was born at Constantinople. Connected with the house of Palaeologus on his mother's side, on the accession of Andronicus III. (1328) he was entrusted with the supreme administration of affairs. On the death of the emperor in 1341, Cantacuzene was left regent, and guardian of his son John Palaeologus, who was but nine years of age. Being suspected by the empress and opposed by a powerful party at court, he rebelled, and got himself crowned emperor at Didymoteichos in Thrace, while John Palaeologus and his supporters maintained themselves at Constantinople. The civil war which ensued lasted six years, during which the rival parties called in the aid of the Servians and Turks, and engaged mercenaries of every description. It was only by the aid of the Turks, with whom he made a disgraceful bargain, that Cantacuzene brought the war to a termination favourable to himself. In 1347 he entered Constantinople in triumph, and forced his opponents to an arrangement by which he became joint emperor with John Palaeologus and sole administrator during the minority of his colleague. During this period, the empire, already broken up and reduced to the narrowest limits, was assailed on every side. There were wars with the Genoese, who had a colony at Galata and had money transactions with the court; and with the Servians, who were at that time establishing an extensive empire on the north-western frontiers; and there was a hazardous alliance with the Turks, who made their first permanent settlement in Europe, at Callipolis in Thrace, towards the end of the reign (1354). Cantacuzene was far too ready to invoke the aid of foreigners in his European quarrels; and as he had no money to pay them, this gave them a ready pretext for seizing upon a European town. The financial burdens imposed by him had long been displeasing to his subjects, and a strong party had always favoured John Palaeologus. Hence, when the latter entered Constantinople at the end of 1354, his success was easy. Cantacuzene retired to a monastery (where he assumed the name of Joasaph Christodulus)and occupied himself in literary labours. He died in the Peloponnese and was buried by his sons at Mysithra in Laconia. His *History* in four books deals with the years 1320–1356. Really an apologia for his own actions, it needs to be read with caution; fortunately it can be supplemented and corrected by the work of a contemporary, Nicephorus Gregoras. It possesses the merit of being well arranged and homogeneous, the incidents being grouped round the chief actor in the person of the author, but the information is defective on matters with which he is not directly concerned.

Cantacuzene was also the author of a commentary on the first five books of Aristotle's *Ethics*, and of several controversial theological treatises, one of which (*Against Mohammedanism*) is printed in Migne (*Patrologia Graeca*, cliv.). *History*, ed. pr. by J. Pontanus (1603); in Bonn, *Corpus scriptorum hist. Byz.*, by J. Schopen (1828–1832) and Migne, cliii., cliv. See also Val Parisot, *Cantacuzène, homme d'état et historien* (1845); E. Gibbon, *Decline and Fall*, ch. lxiii.; and C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897).

JOHN VI. or **VII.** (1390–1448), surnamed Palaeologus, East Roman emperor, son of Manuel II., succeeded to the throne in 1425. To secure protection against the Turks he visited the pope and consented to the union of the Greek and Roman churches, which was ratified at Florence in 1439. The union failed of its purpose, but by his prudent conduct towards the Ottomans he succeeded in holding possession of Constantinople, and in 1432 withstood a siege by Sultan Murad I.

See TURKEY: *History*; and also E. Gibbon, *The Decline and Fall of the Roman Empire*, vi. 97–107 (ed. Bury, 1896); E. Pears, *The Destruction of the Greek Empire*, pp. 115–130 (1903).

JOHN (1167–1216), king of England, the youngest son of Henry II. by Eleanor of Aquitaine, was born at Oxford on the 24th of December 1167. He was given at an early age the nickname of Lackland because, unlike his elder brothers, he received no apanage in the continental provinces. But his future was a subject of anxious thought to Henry II. When only five years old John was betrothed (1173) to the heiress of Maurienne and Savoy, a principality which, as dominating the chief routes from France and Burgundy to Italy, enjoyed a consequence out of all proportion to its area. Later, when this plan had fallen through, he was endowed with castles, revenues and lands on both sides of the channel; the vacant earldom of Cornwall was reserved for him (1175); he was betrothed to Isabella the heiress of the earldom of Gloucester (1176); and he was granted the lordship of Ireland with the homage of the Anglo-Irish baronage (1177). Henry II. even provoked a civil war by attempting to transfer the duchy of Aquitaine from the hands of Richard Cœur de Lion to those of John (1183). In spite of the incapacity which he displayed in this war, John was sent a little later to govern Ireland (1185); but he returned in a few months covered with disgrace, having alienated the loyal chiefs by his childish insolence and entirely failed to defend the settlers from the hostile septs. Remaining henceforth at his father's side he was treated with the utmost indulgence. But he joined with his brother Richard and the French king Philip Augustus in the great conspiracy of 1189, and the discovery of his treason broke the heart of the old king (see HENRY II.).

Richard on his accession confirmed John's existing possessions; married him to Isabella of Gloucester; and gave him, besides other grants, the entire revenues of six English shires; but excluded him from any share in the regency which was appointed to govern England during the third crusade; and only allowed him to live in the kingdom because urged to this concession by their mother. Soon after the king's departure for the Holy Land it became known that he had designated his nephew, the young Arthur of Brittany, as his successor. John at once began to intrigue against the regents with the aim of securing England for himself. He picked a quarrel with the unpopular chancellor William Longchamp (*q.v.*), and succeeded, by the help of the barons and the Londoners, in expelling this minister, whose chief fault was that of fidelity to the absent Richard. Not being permitted to succeed Longchamp as the head of the administration, John next turned to Philip Augustus for help. A bargain was struck; and when Richard was captured by Leopold, duke of Austria (December 1192), the allies endeavoured to prevent his release, and planned a partition of his dominions. They were, however, unable to win either English or Norman support and their schemes collapsed with Richard's return (March 1194). He magnanimously pardoned his brother, and they lived on not unfriendly terms for the next five years. On his deathbed Richard, reversing his former arrangements, caused his barons to swear fealty to John (1199), although the hereditary claim of Arthur was by the law of primogeniture undoubtedly superior.

England and Normandy, after some hesitation, recognized John's title; the attempt of Anjou and Brittany to assert the rights of Arthur ended disastrously by the capture of the young prince at Mirebeau in Poitou (1202). But there was no part of his dominions in which John inspired personal devotion. Originally accepted as a political necessity, he soon came to be detested by the people as a tyrant and despised by the nobles for his cowardice and sloth. He inherited great difficulties—the feud with France, the dissensions of the continental provinces, the growing indifference of England to foreign conquests, the discontent of all his subjects with a strict executive and severe taxation. But he cannot be acquitted of personal responsibility for his misfortunes. Astute in small matters, he had no breadth of view or foresight; his policy was continually warped by his passions or caprices; he flaunted vices of the most sordid kind with a cynical indifference to public opinion, and shocked an age which was far from tender-hearted by his ferocity to vanquished enemies. He treated his most respectable supporters with base ingratitude, reserved his favour for unscrupulous adventurers, and gave a free rein to the licence of his mercenaries. While possessing considerable gifts of mind and a latent fund of energy, he seldom acted or reflected until the favourable moment had passed. Each of his great humiliations followed as the natural result of crimes or blunders. By his divorce from Isabella of Gloucester he offended the English baronage (1200); by his marriage with Isabella of Angoulême, the betrothed of Hugh of Lusignan, he gave an opportunity to the discontented Poitevins for invoking French assistance and to Philip Augustus for pronouncing against him a sentence of forfeiture. The murder of Arthur (1203) ruined his cause in Normandy and Anjou; the story that the court of the peers of France condemned him for the murder is a fable, but no legal process was needed to convince men of his guilt. In the later quarrel with Innocent III. (1207–1213; see LANGTON, Stephen) he prejudiced his case by proposing a worthless favourite for the primacy and by plundering those of the clergy who bowed to the pope's sentences. Threatened with the desertion of his barons he drove all whom he suspected to desperation by his terrible severity towards the Braose family (1210); and by his continued misgovernment irrevocably estranged the lower classes. When submission to Rome had somewhat improved his position he squandered his last resources in a new and unsuccessful war with France (1214), and enraged the feudal classes by new claims for military service and scutages. The barons were consequently able to exact, in Magna Carta (June 1215), much more than the redress of legitimate grievances; and the people allowed the crown to be placed under the control of an oligarchical committee. When once the sovereign power had been thus divided, the natural consequence was civil war and the intervention of the French king, who had long watched for some such opportunity. John's struggle against the barons and Prince Louis (1216), afterwards King Louis VIII., was the most creditable episode of his career. But the calamitous situation of England at the moment of his death, on the 19th of October 1216, was in the main his work; and while he lived a national reaction in favour of the dynasty was out of the question.

John's second wife, Isabella of Angoulême (d. 1246), who married her former lover, Hugh of Lusignan, after the English king's death, bore the king two sons, Henry III. and Richard, earl of Cornwall; and three daughters, Joan (1210–1238), wife of Alexander II., king of Scotland, Isabella (d. 1241), wife of the emperor Frederick II., and Eleanor (d. 1274), wife of William Marshal, earl of Pembroke, and then of Simon de Montfort, earl of Leicester. John had also two illegitimate sons, Richard and Oliver, and a daughter, Joan or Joanna, who married Llewelyn I. ab Iorwerth, prince of North Wales, and who died in 1236 or 1237.

Authorities.—The chief chronicles for the reign are Gervase of Canterbury's *Gesta regum*, Ralf of Coggeshall's *Chronicon*, Walter of Coventry's *Memoriale*, Roger of Wendover's *Flores historiarum*, the Annals of Burton, Dunstaple and Margan—all these in the Rolls Series. The French chronicle of the so-called "Anonyme de Béthune" (Bouquet, *Recueil des historiens des Gaules et de la France*, vol. xxiv.), the *Histoire des ducs de Normandie et des rois d'Angleterre* (ed. F. Michel, Paris, 1840) and the metrical biography of William the Marshal (*Histoire de Guillaume le Maréchal*, ed. Paul Meyer, 3 vols., Paris, 1891, &c.) throw valuable light on certain episodes. H. S. Sweetman's *Calendar of Documents relating to Ireland*, vol. i. (Rolls Series); W.H. Bliss's *Calendar of Entries in the Papal Registers*, vol. i. (Rolls Series); Potthast's *Regesta pontificum*, vol. i. (Berlin, 1874); Sir T. D. Hardy's *Rotuli litterarum clausarum* (Rec. Commission, 1835) and *Rotuli litterarum patentium* (Rec. Commission, 1835) and L. Delisle's *Catalogue des actes de Philippe Auguste* (Paris, 1856) are the most important guides to the documents. Of modern works W. Stubbs's *Constitutional history*, vol. i. (Oxford, 1897); the same writer's preface to *Walter of Coventry*, vol. ii. (Rolls Series); Miss K. Norgate's *John Lackland* (London, 1902); C. Petit-Dutaillis' *Étude sur la vie et le règne de Louis VIII.* (Paris, 1894) and W. S. McKechnie's *Magna Carta* (Glasgow, 1905) are among the most useful. (H. W. C. D.)

JOHN I. (1350–1395), king of Aragon, was the son of Peter IV. and his third wife Eleanor of Sicily. He was born on the 27th of December 1350, and died by a fall from his horse, like his namesake, cousin and contemporary of Castile. He was a man of insignificant character, with a taste for artificial verse.

JOHN II. (1397–1479), king of Aragon, son of Ferdinand I. and of his wife Eleanor of Albuquerque, born on the 29th of June 1397, was one of the most stirring and most unscrupulous kings of the 15th century. In his youth he was one of the *infantes* (princes) of Aragon who took part in the dissensions of Castile during the minority and reign of John II. Till middle life he was also lieutenant-general in Aragon for his brother and predecessor Alphonso V., whose reign was mainly spent in Italy. In his old age he was engaged in incessant conflicts with his Aragonese and Catalan subjects, with Louis XI. of France, and in preparing the way for the marriage of his son Ferdinand with Isabella of Castile, which brought about the union of the crowns. His troubles with his subjects were closely connected with the tragic dissensions in his own family. John was first married to Blanche of Navarre, of the house of Evreux. By right of Blanche he became king of Navarre, and on her death in 1441 he was left in possession of the kingdom for his life. But a son Charles, called, as heir of Navarre, prince of Viana, had been born of the marriage. John from the first regarded his son with jealousy, which after his second marriage with Joan Henriquez, and under her influence, grew into absolute hatred. He endeavoured to deprive his son of his constitutional right to act as lieutenant-general of Aragon during his father's absence. The cause of the son was taken up by the Aragonese, and the king's attempt to join his second wife in the lieutenant-generalship was set aside. There followed a long conflict, with alternations of success and defeat, which was not terminated till the death of the prince of Viana, perhaps by poison given him by his stepmother, in 1461. The Catalans, who had adopted the cause of Charles and who had grievances of their own, called in a succession of foreign pretenders. In conflict with these the last years of King John were spent. He was forced to pawn Rousillon, his possession on the north-east of the Pyrenees, to Louis XI., who refused to part with it. In his old age he was blinded by cataract, but recovered his eyesight by the operation of couching. The Catalan revolt was pacified in 1472, but John had war, in which he was generally unfortunate, with his neighbour the French king till his death on the 20th of January 1479. He was succeeded by Ferdinand, his son by his second marriage, who was already associated with his wife Isabella as joint sovereign of Castile.

For the history, see Rivadeneyra, "Cronicas de los reyes de Castilla," *Biblioteca de autores españoles*, vols. lxvi, lxviii (Madrid, 1845, &c.); G. Zurita, *Anales de Aragon* (Saragossa, 1610). The reign of John II. of Aragon is largely dealt with in W. H. Prescott's *History of the Reign of Ferdinand and Isabella* (1854).

JOHN (1296–1346), king of Bohemia, was a son of the emperor Henry VII. by his wife Margaret, daughter of John I., duke of Brabant, and was a member of the family of Luxemburg. Born on the 10th of August 1296, he became count of Luxemburg in 1309, and about the same time was offered the crown of Bohemia, which, after the death of Wenceslas III., the last king of the Premyslides dynasty in 1306, had passed to Henry, duke of Carinthia, under whose weak rule the country was in a very disturbed condition. The emperor accepted this offer on behalf of his son, who married Elizabeth (d. 1330), a sister of Wenceslas, and after Henry's departure for Italy, John was crowned king of Bohemia at Prague in February 1311. Henry of Carinthia was driven from the land, where a certain measure of order was restored, and Moravia was again united with Bohemia. As imperial vicar John represented his father at the diet of Nuremberg in January 1313, and was leading an army to his assistance in Italy when he heard of the emperor's death, which took place in August 1313. John was now a candidate for the imperial throne; but, on account of his youth, his claim was not regarded seriously, and he was persuaded to give his support to Louis, duke of Upper Bavaria, afterwards the emperor Louis the Bavarian. At Esslingen and elsewhere he aided Louis in his struggle with Frederick the Fair, duke of Austria, who also claimed the Empire; but his time was mainly passed in quelling disturbances in Bohemia, where his German followers were greatly disliked and where he himself soon became unpopular, especially among the nobles; or in Luxemburg, the borders of which county he was constantly and successfully striving to extend. Restless, adventurous and warlike, John had soon tired of governing his kingdom, and even discussed exchanging it with the emperor Louis for the Palatinate; and while Bohemia was again relapsing into a state of anarchy, her king was winning fame as a warrior in almost every part of Europe. He fought against the citizens of Metz and against his kinsman, John III., duke of Brabant; he led the knights of the Teutonic Order against the heathen in Lithuania and Pomerania and promised Pope John XXII. to head a crusade; and claiming to be king of Poland he attacked the Poles and brought Silesia under his rule. He obtained Tirol by marrying his son, John Henry, to Margaret Maultasch, the heiress of the county, assisted the emperor to defeat and capture Frederick the Fair at the battle of Mühldorf in 1322, and was alternately at peace and at war with the dukes of Austria and with his former foe, Henry of Carinthia. He was a frequent and welcome visitor to France, in which country he had a personal and hereditary interest; and on several occasions his prowess was serviceable to his brother-in-law King Charles IV., and to Charles's successor Philip VI., whose son John, afterwards King John II., married a daughter of the Bohemian king. Soon after the battle of Mühldorf, the relations between John and the emperor became somewhat strained, partly owing to the king's growing friendship with the Papacy and with France, and partly owing to territorial disputes. An agreement, however, was concluded, and John undertook his invasion of Italy, which was perhaps the most dazzling of his exploits. Invited by the citizens of Brescia, he crossed the Alps with a meagre following in 1331, quickly received the homage of many of the cities of northern Italy, and soon found himself the ruler of a great part of the peninsula. But his soldiers were few and his enemies were many, and a second invasion of Italy in 1333 was followed by the dissipation of his dreams of making himself king of Lombardy and Tuscany, and even of supplanting Louis on the imperial throne. The fresh trouble between king and emperor, caused by this enterprise, was intensified by a quarrel over the lands left by Henry of Carinthia, and still later by the interference of Louis in Tirol; and with bewildering rapidity John was allying himself with the kings of Hungary and Poland, fighting against the emperor and his Austrian allies, defending Bohemia, governing Luxemburg, visiting France and negotiating with the pope. About 1340 the king was overtaken by blindness, but he continued to lead an active life, successfully resisting the attacks of Louis and his allies, and campaigning in Lithuania. In 1346 he made a decisive move against the emperor. Acting in union with Pope Clement VI. he secured the formal deposition of Louis and the election of his own son Charles, margrave of Moravia, as German king, or king of the Romans, in July 1346. Then journeying to help Philip of France against the English, he fought at the battle of Crécy, where his heroic death on the 26th of August 1346 was a fitting conclusion to his adventurous life.

John was a chivalrous and romantic personage, who enjoyed a great reputation for valour both before and after his death; but as a ruler he was careless and extravagant, interested only in his kingdom when seeking relief from his constant pecuniary embarrassments. After the death of his first wife, who bore him two sons, Charles, afterwards the emperor Charles IV., and John Henry (d. 1375), and who had been separated from her husband for some years, the king married Beatrice (d. 1383), daughter of Louis I., duke of Bourbon, by whom he had a son, Wenceslas (d. 1383). According to Camden the crest or badge of three ostrich feathers, with the motto *Ich dien*, borne by the prince of Wales was originally that of John of Bohemia and was first assumed by Edward the Black Prince after the battle of Crécy. There is no proof, however, that this badge was ever worn by John—it certainly was not his crest—and its origin must be sought elsewhere.

See J. Schötter, *Johann, Graf von Luxemburg und König von Böhmen* (Luxemburg, 1865); F. von Weech, *Kaiser Ludwig der Bayer und König Johann von Böhmen* (Munich, 1860), and U. Chevalier, *Répertoire des sources historiques*, tome v. (Paris, 1905).

JOHN I. (1358–1390), king of Castile, was the son of Henry II., and of his wife Joan, daughter of John Manuel of Villena, head of a younger branch of the royal house of Castile. In the beginning of his reign he had to contend with the hostility of John of Gaunt, who claimed the crown by right of his wife Constance, daughter of Peter the Cruel. The king of Castile finally bought off the claim of his English competitor by arranging a marriage between his son Henry and Catherine, daughter of John of Gaunt, in 1387. Before this date he had been engaged in hostilities with Portugal which was in alliance with John of Gaunt. His first quarrel with Portugal was settled by his marriage, in 1382, with Beatrix, daughter of the Portuguese king Ferdinand. On the death of his father-in-law in 1383, John endeavoured to enforce the claims of his wife, Ferdinand's only child, to the crown of Portugal. He was resisted by the national sentiment of the people, and was utterly defeated at the battle of Aljubarrota, on the 14th of August 1385. King John was killed at Alcalá on the 9th of October 1390 by the fall of his horse, while he was riding in a *fantasia* with some of the light horsemen known as the *farfanes*, who were mounted and equipped in the Arab style.

JOHN II. (1405–1454), king of Castile, was born on the 6th of March 1405, the son of Henry III. of Castile and of his wife Catherine, daughter of John of Gaunt. He succeeded his father on the 25th of December 1406 at the age of a year and ten months. It was one of the many misfortunes of Castile that the long reign of John II.—forty-nine years—should have been granted to one of the most incapable of her kings. John was amiable, weak and dependent on those about him. He had no taste except for ornament, and no serious interest except in amusements, verse-making, hunting and tournaments. He was entirely under the influence of his favourite, Alvaro de Luna, till his second wife, Isabella of Portugal, obtained control of his feeble will. At her instigation he threw over his faithful and able favourite, a meanness which is said to have caused him well-deserved remorse. He died on the 20th of July 1454 at Valladolid. By his second marriage he was the father of Isabella "the Catholic."

JOHN I. (b. and d. 1316), king of France, son of Louis X. and Clemence, daughter of Charles Martel, who claimed to be king of Hungary, was born, after his father's death, on the 15th of November 1316, and only lived seven days. His uncle, afterwards Philip V. has been accused of having caused his death, or of having substituted a dead child in his place; but nothing was ever proved. An impostor calling himself John I., appeared in Provence, in the reign of John II., but he was captured and died in prison.

JOHN II. (1319–1364), surnamed the Good, king of France, son of Philip VI. and Jeanne of Burgundy, succeeded his father in 1350. At the age of 13 he married Bona of Luxemburg, daughter of John, king of Bohemia. His early exploits against the English were failures and revealed in the young prince both avarice and stubborn persistence in projects obviously ill-advised. It was especially the latter quality which brought about his ruin. His first act upon becoming king was to order the execution of the constable, Raoul de Brienne. The reasons for this are unknown, but from the secrecy with which it was carried out and the readiness with which the honour was transferred to the king's close friend Charles of La Cesda, it has been attributed to the influence and ambition of the latter. John surrounded himself with evil counsellors, Simon de Buci, Robert de Lorris, Nicolas Braque, men of low origin who robbed the treasury and oppressed the people, while the king gave himself up to tournaments and festivities. In imitation of the English order of the Garter, he established the knightly order of the Star, and celebrated its festivals with great display. Raids of the Black Prince in Languedoc led to the states-general of 1355, which readily voted money, but sanctioned the right of resistance against all kinds of pillage —a distinct commentary on the incompetence of the king. In September 1356 John gathered the flower of his chivalry and attacked the Black Prince at Poitiers. The utter defeat of the French was made the more humiliating by the capture of their king, who had bravely led the third line of battle. Taken to England to await ransom, John was at first installed in the Savoy Palace, then at Windsor, Hertford, Somerton, and at last in the Tower. He was granted royal state with his captive companions, made a guest at tournaments, and supplied with luxuries imported by him from France. The treaty of Brétigny (1360), which fixed his ransom at 3,000,000 crowns, enabled him to return to France, but although he married his daughter Isabella to Gian Galeazzo Visconti of Milan, for a gift of 600,000 golden crowns, imposed a heavy feudal "aid" on merchandise, and various other taxes, John was unable to pay more than 400,000 crowns to Edward III. His son Louis of Anjou, who had been left as hostage, escaped from Calais in the summer of 1363, and John, far in arrears in the payments of the ransom, surrendered himself again "to maintain his royal honour which his son had sullied." He landed in England in January 1364 and was received with great honour, lodged again in the Savoy, and was a frequent guest of Edward at Westminster. He died on the 8th of April, and the body was sent back to France with royal honours.

See Froissart's *Chronicles*; Duc d'Aumale, *Notes et documents relatifs à Jean, roi de France, et à sa captivité* (1856); A. Coville, in Lavisse's *Histoire de France*, vol. iv., and authorities cited there.

JOHN (Zapolya) (1487–1540), king of Hungary, was the son of the palatine Stephen Zapolya and the princess Hedwig of Teschen, and was born at the castle of Szepesvár. He began his public career at the famous Rákos diet of 1505, when, on his motion, the assembly decided that after the death of the reigning king, Wladislaus II., no foreign prince should be elected king of Hungary. Henceforth he became the national candidate for the throne, which his family had long coveted. As far back as 1491 his mother had proposed to the sick king that his daughter Anne should be committed to her care in order, subsequently, to be married to her son; but Wladislaus frustrated this project by contracting a matrimonial alliance with the Habsburgs. In 1510 Zapolya sued in person for the hand of the Princess Anne in vain, and his appointment to the voivody of Transylvania (1511) was with the evident intention of removing him far from court. In 1513, after a successful raid in Turkish territory, he hastened to Buda at the head of 1000 horsemen and renewed his suit, which was again rejected. In 1514 he stamped out the dangerous peasant rising under Dozsa (*q.v.*) and the infernal torments by means of which the rebel leader was slowly done to death were the invention of Zapolya. With the gentry, whose hideous oppression had moved the peasantry to revolt, he was now more than ever popular, and, on the death of Wladislaus II., the second diet of Rákos (1516) appointed him the governor of the infant king Louis II. He now aimed at the dignity of palatine also, but the council of state and the court party combined against him and appointed István Báthory instead (1519). The strife of factions now burnt more fiercely than ever at the very time when the pressure of the Turk demanded the combination of all the national forces against a common danger. It was entirely due to the dilatoriness and dissensions of Zapolya and Báthory that the great fortress of Belgrade was captured in 1521, a loss which really sealed the fate of Hungary. In 1522 the diet would have appointed both Zapolya and Báthory captains-general of the realm, but the court set Zapolya aside and chose Báthory only. At the diets of Hátvan and Rákos in 1522, Zapolya placed himself at the head of a confederation to depose the palatine and the other great officers of state, but the attempt failed. In the following year, however, the revolutionary Hátvan diet drove out all the members of the council of state and made István Verböczy, the great jurist, and a friend of Zapolya, palatine. In the midst of this hopeless anarchy, Suleiman I., the Magnificent, invaded Hungary with a countless army, and the young king perished on the field of Mohács in a vain attempt to stay his progress, the contradictory orders of Louis II. preventing Zapolya from arriving in time to turn the fortunes of the day. The court party accused him of deliberate treachery on this occasion; but the charge must be pronounced groundless. His younger brother George was killed at Mohács, where he was second commander-in-chief. Zapolya was elected king of Hungary at the subsequent diet of Tokaj (Oct. 14), the election was confirmed by the diet of Székesfehérvár (10th of November), and he was crowned on the following day with the holy crown.

A struggle with the rival candidate, the German king Ferdinand I., at once ensued (see Hungary: *History*) and it was only with the aid of the Turks that king John was able to exhaust his opponent and compel him to come to terms. Finally, in 1538, by the compact of Nagyvárad, Ferdinand recognized John as king of Hungary, but secured the right of succession on his death. Nevertheless John broke the compact by bequeathing the kingdom to his infant son John Sigismund under Turkish protection. John was the last national king of Hungary. His merit, as a statesman, lies in his stout vindication of the national independence, though without the assistance of his great minister György Utiesenovich, better known as "Frater George" (Cardinal Martinuzzi *q.v.*), this would have been impossible. Indirectly he contributed to the subsequent conquest of Hungary by admitting the Turk as a friend.

See Vilmos Fraknoi, *Ungarn vor der Schlacht bei Mohács* (Budapest, 1886); L. Kupelwieser, *Die Kämpfe Ungarns mit den Osmanen bis zur Schlacht bei Mohács* (Vienna, 1895); Ignacz Acsády, *History of the Hungarian Realm*, vol. i. (Hung.) (Budapest, 1902–1904).

JOHN OF BRIENNE (*c.* 1148–1237), king of Jerusalem and Latin emperor of Constantinople, was a man of sixty years of age before he began to play any considerable part in history. Destined originally for the Church, he had preferred to become a knight, and in forty years of tournaments and fights he had won himself a considerable reputation, when in 1208 envoys came from the Holy Land to ask Philip Augustus, king of France, to select one of his barons as husband to the heiress, and ruler of the kingdom, of Jerusalem. Philip selected John of Brienne, and promised to support him in his new dignity. In 1210 John married the heiress Mary (daughter of Isabella and Conrad of Montferrat), assuming the title of king in right of his wife. In 1211, after some desultory operations, he concluded a six years' truce with Malik-el-Adil; in 1212 he lost his wife, who left him a daughter, Isabella; soon afterwards he married an Armenian princess. In the fifth crusade (1218–1221) he was a prominent figure. The legate Pelagius, however, claimed the command; and, insisting on the advance from Damietta, in spite of the warnings of King John, he refused to accept the favourable terms of the sultan, as the king advised, until it was too late. After the failure of the crusade, King John came to the West to obtain help for his kingdom. In 1223 he met Honorius III. and the emperor Frederick II. at Ferentino, where, in order that he might be connected more closely with the Holy Land, Frederick was betrothed to John's daughter Isabella, now heiress of the kingdom. After the meeting at Ferentino, John went to France and England, finding little consolation; and thence he travelled to Compostella, where he married a new wife, Berengaria of Castile. After a visit to Germany he returned to Rome (1225). Here he received a demand from Frederick II. (who had now married Isabella) that he should abandon his title and dignity of king, which—so Frederick claimed—had passed to himself along with the heiress of the kingdom. John was now a septuagenarian "king in exile," but he was still vigorous enough to revenge himself on Frederick, by commanding the papal troops which attacked southern Italy during the emperor's absence on the sixth crusade (1228–1229). In 1229 John, now eighty years of age, was invited by the barons of the Latin empire of Constantinople to become emperor, on condition that Baldwin of Courtenay should marry his second daughter and succeed him. For nine years he ruled in Constantinople, and in 1235, with a few troops, he repelled a great siege of the city by Vataces of Nicaea and Azen of Bulgaria. After this last feat of arms, which has perhaps been exaggerated by the Latin chroniclers, who compare him to Hector and the Maccabees, John died in the habit of a Franciscan friar. An aged paladin, somewhat uxorious and always penniless, he was a typical knight errant, whose wanderings led him all over Europe, and planted him successively on the thrones of Jerusalem and Constantinople.

The story of John's career must be sought partly in histories of the kingdom of Jerusalem and of the Latin Empire of the East, partly in monographs. Among these, of which R. Röhricht gives a list (*Geschichte des Königreichs Jerusalem*, p. 699, n. 3), see especially that of E. de Montcarmet, *Un chevalier du temps passé* (Limoges, 1876 and 1881).

JOHN III. (Sobieski) (1624–1696), king of Poland, was the eldest son of James Sobieski, castellan of Cracow, and Theofila Danillowiczowna, grand-daughter of the great Hetman Zolkiewski. After being educated at Cracow, he made the grand tour with his brother Mark and returned to Poland in 1648. He served against Chmielnicki and the Cossacks and was present at the battles of Beresteczko (1651) and Batoka (1652), but was one of the first to desert his unhappy country when invaded by the Swedes in 1654, and actually assisted them to conquer the Prussian provinces in 1655. He returned to his lawful allegiance in the following year and assisted Czarniecki in his difficult task of expelling Charles X. of Sweden from the central Polish provinces. For his subsequent services to King John Casimir, especially in the Ukraine against the Tatars and Cossacks, he received the grand bâton of the crown, or commandership-in-chief (1668). He had already (1665) succeeded Czarniecki as acting commander-in-chief. Sobieski had well earned these distinctions by his extraordinary military capacity, but he was now to exhibit a less pleasing side of his character. He was in fact a typical representative of the unscrupulous self-seeking Polish magnates of the 17th century who were always ready to sacrifice everything, their country included, to their own private ambition. At the election diet of 1669 he accepted large bribes from Louis XIV. to support one of the French candidates; after the election of Michael Wisniowiecki (June 19, 1669) he openly conspired, again in the French interest, against his lawful sovereign, and that too at the very time when the Turk was ravaging the southern frontier of the republic. Michael was the feeblest monarch the Poles could have placed upon the throne, and Sobieski deliberately attempted to make government of any kind impossible. He formed a league with the primate Prazmowski and other traitors to dethrone the king; when (1670) the plot was discovered and participation in it repudiated by Louis XIV., the traitors sought the help of the elector of Brandenburg against their own justly indignant countrymen. Two years later the same traitors again conspired against the king, at the very time when the Turks had defeated Sobieski's unsupported lieutenant, Luzecki, at Czertwertyworska and captured the fortress of Kamieniec (Kamenetz-Podolskiy), the key of south-eastern Poland, while Lemberg was only saved by the valour of Elias Lancki. The unhappy king did the only thing possible in the circumstances. He summoned the *tuszenia pospolite*, or national armed assembly; but it failed to assemble in time, whereupon Michael was constrained to sign the disgraceful peace of Buczacz (Oct. 17, 1672) whereby Poland ceded to the Porte the whole of the Ukraine with Podolia and Kamieniec. Aroused to duty by a series of disasters for which he himself was primarily responsible, Sobieski now hastened to the frontier, and won four victories in ten days. But he could not recover Kamieniec, and when the *tuszenia pospolite* met at Golenba and ordered an inquiry into the conduct of Sobieski and his accomplices he frustrated all their efforts by summoning a counter confederation to meet at Szczebrzeszyn. Powerless to oppose a rebel who was at the same time commander-in-chief, both the king and the diet had to give way, and a compromise was come to whereby the peace of Buczacz was repudiated and Sobieski was given a chance of rehabilitating himself, which he did by his brilliant victory over an immense Turkish host at Khotin (Nov. 10, 1673). The same day King Michael died and Sobieski, determined to secure the throne for himself, hastened to the capital, though Tatar bands were swarming over the frontier and the whole situation was acutely perilous. Appearing at the elective diet of 1674 at the head of 6000 veterans he overawed every other competitor, and despite the persistent opposition of the Lithuanians was elected king on the 21st of May. By this time, however, the state of things in the Ukraine was so alarming that the new king had to hasten to the front. Assisted by French diplomacy at the Porte (Louis XIV. desiring to employ Poland against Austria), and his own skilful negotiations with the Tatar khan, John III. now tried to follow the example of Wladislaus IV. by leaving the guardianship of the Ukraine entirely in the hands of the Cossacks, while he assembled as many regulars and militiamen as possible at Lemberg, whence he might hasten with adequate forces to defend whichever of the provinces of the Republic might be in most danger. But the appeal of the king was like the voice of one crying in the wilderness, and not one gentleman in a hundred hastened to the assistance of the fatherland. Even at the end of August Sobieski had but 3000 men at his disposal to oppose to 60,000 Turks. Only his superb strategy and the heroic devotion of his lieutenants—notably the converted Jew, Jan Samuel Chrzanowski, who held the Ottoman army at bay for eleven days behind the walls of Trembowla—enabled the king to remove "the pagan yoke from our shoulders"; and he returned to be crowned at Cracow on the 14th of February 1676. In October 1676, in his entrenched camp at Zaravno, he with 13,000 men withstood 80,000 Turks for three weeks, and recovered by special treaty two-thirds of the Ukraine, but without Kamieniec (treaty of Zaravno, Oct. 16, 1676).

Having now secured peace abroad Sobieski was desirous of strengthening Poland at home by establishing absolute monarchy; but Louis XIV. looked coldly on the project, and from this time forth the old familiar relations between the republic and the French monarchy were strained to breaking point, though the final rupture did not come till 1682 on the arrival of the Austrian minister, Zerowski, at Warsaw. After resisting every attempt of the French court to draw him into the anti-Habsburg league, Sobieski signed the famous treaty of alliance with the emperor Leopold against the Turks (March 31, 1683), which was the prelude to the most glorious episode of his life, the relief of Vienna and the liberation of Hungary from the Ottoman yoke. The epoch-making victory of the 12th of September 1683 was ultimately decided by the charge of the Polish cavalry led by Sobieski in person. Unfortunately Poland profited little or nothing by this great triumph, and now that she had broken the back of the enemy she was left to fight the common enemy in the Ukraine with whatever assistance she could obtain from the unwilling and unready Muscovites. The last twelve years of the reign of John III. were a period of unmitigated humiliation and disaster. He now reaped to the full the harvest of treason and rebellion which he himself had sown so abundantly during the first forty years of his life. A treasonable senate secretly plotting his dethronement, a mutinous diet rejecting the most necessary reforms for fear of "absolutism," ungrateful allies who profited exclusively by his victories —these were his inseparable companions during the remainder of his life. Nay, at last his evil destiny pursued him to the battlefield and his own home. His last campaign (in 1690) was an utter failure, and the last years of his life were embittered by the violence and the intrigues of his dotingly beloved wife, Marya Kazimiera d'Arquien, by whom he had three sons, James, Alexander and Constantine. He died on the 17th of June 1696, a disillusioned and broken-hearted old man.

See Tadeusz Korzon, *Fortunes and Misfortunes of John Sobieski* (Pol.) (Cracow, 1898); E. H. R. Tatham, *John Sobieski* (Oxford, 1881); Kazimierz Waliszewski, *Archives of French Foreign Affairs, 1674–1696*, v. (Cracow, 1881); Ludwik Piotr Leliwa, *John Sobieski and His Times* (Pol.) (Cracow, 1882–1885); Kazimierz Waliszewski, *Marysienka Queen of Poland* (London, 1898); Georg Rieder, *Johann Sobieski in Wien* (Vienna, 1882). (R. N. B.)

JOHN I. (1357–1433), king of Portugal, the natural son of Pedro I. (*el Justicieiro*), was born at Lisbon on the 22nd of April 1357, and in 1364 was created grand-master of Aviz. On the death of his lawful brother Ferdinand I., without male issue, in October 1383, strenuous efforts were made to secure the succession for Beatrice, the only child of Ferdinand I., who as heiress-apparent had been married to John I. of Castile (Spain), but the popular voice declared against an arrangement by which Portugal would virtually have become a Spanish province, and John was after violent tumults proclaimed protector and regent in the following December. In April 1385 he was unanimously chosen king by the estates of the realm at Coimbra. The king of Castile invaded Portugal, but his army was compelled by pestilence to withdraw, and subsequently by the decisive battle of Aljubarrota (Aug. 14, 1385) the stability of John's throne was permanently secured. Hostilities continued intermittently until John of Castile died, without leaving issue by Beatrice, in 1390. Meanwhile the king of Portugal went on consolidating the power of the crown at home and the influence of the nation abroad. In 1415 Ceuta was taken from the Moors by his sons who had been born to him by his wife Philippa, daughter of John, duke of Lancaster; specially distinguished in the siege was Prince Henry (*q.v.*) afterwards generally known as "the Navigator." John I., sometimes surnamed "the Great," and sometimes "father of his country," died on the

11th of August 1433, in the forty-eighth year of a reign which had been characterized by great prudence, ability and success; he was succeeded by his son Edward or Duarte, so named out of compliment to Edward III. of England.

See J. P. Oliveira Martins, *Os filhos de D. João I.* and *A vida de Nun' Alvares* (Lisbon, 2nd ed. 1894).

JOHN II. (1455–1495), the Perfect, king of Portugal, succeeded his father, Alphonso V., in August 1481. His first business was to curtail the overgrown power of his aristocracy; noteworthy incidents in the contest were the execution (1483) of the duke of Braganza for correspondence with Castile, and the murder, by the king's own hand, of the youthful duke of Viseu for conspiracy. This reign was signalized by Bartholomeu Diaz's discovery of the Cape of Good Hope in 1488. Maritime rivalry led to disputes between Portugal and Castile until their claims were adjusted by the famous treaty of Tordesillas (June 7, 1494). John II. died, without leaving male issue, in October 1495, and was succeeded by his brother-in-law Emmanuel (Manoel) I.

See J. P. Oliveira Martins, *O principe perfeito* (Lisbon, 1895).

JOHN III. (1502–1557), king of Portugal, was born at Lisbon, on the 6th of June 1502, and ascended the throne as successor of his father Emmanuel I. in December 1521. In 1524 he married Catherine, sister to the Emperor Charles V., who shortly afterwards married the infanta Isabella, John's sister. Succeeding to the crown at a time when Portugal was at the height of its political power, and Lisbon in a position of commercial importance previously unknown, John III., unfortunately for his dominions, became subservient to the clerical party among his subjects, with disastrous consequences to the commercial and social prosperity of his kingdom. He died of apoplexy on the 6th of June 1557, and was succeeded by his grandson Sebastian, then a child of only three years.

JOHN IV. (1603–1656), the Fortunate, king of Portugal, was born at Villaviciosa in March 1603, succeeded to the dukedom of Braganza in 1630, and married Luisa de Guzman, eldest daughter of the duke of Medina Sidonia, in 1633. By the unanimous voice of the people he was raised to the throne of Portugal (of which he was held to be the legitimate heir) at the revolution effected in December 1640 against the Spanish king, Philip IV. His accession led to a protracted war with Spain, which only ended with the recognition of Portuguese independence in a subsequent reign (1668). He died on the 6th of November 1656, and was succeeded by his son Alphonso VI.

JOHN V. (1689–1750), king of Portugal, was born at Lisbon on the 22nd of October 1689, and succeeded his father Pedro II. in December 1706, being proclaimed on the 1st of January 1707. One of his first acts was to intimate his adherence to the Grand Alliance, which his father had joined in 1703. Accordingly his general Das Minas, along with Lord Galway, advanced into Castile, but sustained the defeat of Almanza (April 14). In October 1708 he married Maria Anna, daughter of Leopold I., thus strengthening the alliance with Austria; the series of unsuccessful campaigns which ensued ultimately terminated in a favourable peace with France in 1713 and with Spain in 1715. The rest of his long reign was characterized by royal subservience to the clergy, the kingdom being administered by ecclesiastical persons and for ecclesiastical objects to an extent that gave him the best of rights to the title "Most Faithful King," bestowed upon him and his successors by a bull of Pope Benedict XIV. in 1748. John V. died on the 31st of July 1750, and was succeeded by his son Joseph.

JOHN VI. (1769–1826), king of Portugal, was born at Lisbon on the 13th of May 1769, and received the title of prince of Brazil in 1788. In 1792 he assumed the reins of government in name of his mother Queen Mary I., who had become insane. He had been brought up in an ecclesiastical atmosphere, and, being naturally of a somewhat weak and helpless character, was but ill adapted for the responsibilities he was thus called on to undertake. In 1799 he assumed the title of regent, which he retained until his mother's death in 1816. (For the political history of his regency, see PORTUGAL.) In 1816 he was recognized as king of Portugal but he continued to reside in Brazil; the consequent spread of dissatisfaction resulted in the peaceful revolution of 1820, and the proclamation of a constitutional government, to which he swore fidelity on his return to Portugal in 1822. In the same year, and again in 1823, he had to suppress a rebellion led by his son Dom Miguel, whom he ultimately was compelled to banish in 1824. He died at Lisbon on the 26th of March 1826, and was succeeded by Pedro IV.

JOHN (1801–1873), king of Saxony, son of Prince Maximilian of Saxony and his wife Caroline of Parma (d. 1804), was born at Dresden on the 12th of December 1801. As a boy he took a keen interest in literature and art (also in history, law, and political science), and studied with the greatest ardour classical and German literature (Herder, Schiller, Goethe). He soon began to compose poetry himself, and drew great inspiration from a journey in Italy (1821–1822), the pleasure of which was however darkened by the death of his brother Clemens. In Pavia the prince met with Biagioli's edition of Dante, and this gave rise to his lifelong and fruitful studies of Dante. The first part of his German translation of Dante was published in 1828, and in 1833 appeared the complete work, with a valuable commentary, which met with a great success. Several new editions appeared under his constant supervision, and he collected a complete library of works on Dante.

On his return from Italy he was betrothed to Princess Amalia of Bavaria, daughter of King Maximilian Joseph. He thus became the brother-in-law of Frederick William IV., king of Prussia, with whom he had a deep and lasting friendship. His wife Amalia died on the 8th of November 1877, having borne him nine children, two of whom, Albert and George, later became kings of Saxony.

On his return to Dresden, John was called in 1822 to the privy board of finance (*Geheimes Finanzkollegium*) and in 1825 became its vice-president. Under the leadership of the president, Freiherr von Manteuffel, he acquired a thorough knowledge of administration and of political economy, and laid the foundations of that conservatism which he retained throughout life. These new activities did not, however, interrupt his literary and artistic studies. He came into still closer relations with politics and government after his entry into the privy council in 1830. During the revolution in Saxony he helped in the pacification of the country, became commandant of the new national guard, the political tendencies of which he tried to check, and took an exceptionally active part in the organization of the constitution of the 4th of September 1831 and especially in the deliberations of the upper chamber, where he worked with unflagging energy and great ability. Following the example of his father, he taught his children in person, and had a great influence on their education. On the 12th of August 1845, during a stay at Leipzig, the prince was the object of hostile public demonstrations, the people holding him to be the head of an alleged ultramontane party at court, and the revolution of 1848 compelled him to interrupt his activities in the upper chamber. Immediately after the suppression of the revolution he resumed his place and took part chiefly in the discussion of legal questions. He was also interested in the amalgamation of the German historical and archaeological societies. On the death of his brother Frederick Augustus II., John became, on the 9th of August 1854, king of Saxony. As king he soon won great popularity owing to his simplicity, graciousness and increasingly evident knowledge of affairs. In his policy as regards the German confederation he was entirely on the side of Austria. Though not opposed to a reform of the federal constitution, he held that its maintenance under the presidency of Austria was essential. This view he supported at the assembly of princes at Frankfort in August and September 1863. He was unable to uphold his views against Prussia, and in the war of 1866 fought on the side of Austria. It was with difficulty that, on the conclusion of peace, Austrian diplomacy succeeded in enabling the king to retain his crown. After 1866 King John gradually became reconciled to the new state of affairs. He entered the North German confederation, and in the war of 1870–71 with France his troops fought with conspicuous courage. He died at Dresden on the 29th of October 1873.

See J. Petzholdt, "Zur Litteratur des Königs Johann," *Neuer Anzeiger für Bibliographie* (1858, 1859, 1871, 1873, 1874); "Aphorismen über unsern König J.," *Bote von Geising* (1866–1869); *Das Büchlein vom König Johann* (Leipzig, 1867); H. v. Treitschke, *Preussische Jahrbücher* 23 (1869); A. Reumont, "Elogio di Giovanni, Rè di Sassonia," *Dagli Atti della Accademia della Crusca* (Florence, 1874); J. P. von Winterstein, *Johann, König von Sachsen* (Dresden, 1878), and in *Allgemeine Deutsche Biographie* (1881); H. Ermisch, *Die Wettiner und die Landesgeschichte* (Leipzig, 1902); O. Kaemmel, *Sächsische Geschichte* (Leipzig, 1899, Sammlung Göschen). (J. Hn.)

JOHN I. (d. 1294), duke of Brabant and Lorraine, surnamed the Victorious, one of the most gifted and chivalrous princes of his time, was the second son of Duke Henry III. and Aleidis of Burgundy. In 1267 his elder brother Henry, being infirm of mind and body, was deposed in his favour. In 1271 John married Margaret, daughter of Louis IX. of France, and on her death in childbirth he took as his second wife (1273) Margaret of Flanders, daughter of Guy de Dampierre. His sister Marie was espoused in 1275 to Philip III. (the Bold) of France, and during the reign of Philip and his son Philip IV. there were close relations of friendship and alliance between Brabant and France. In 1285 John accompanied Philip III. in his expedition against Peter III., king of Aragon, but the duchy of Limburg was the scene of his chief activity and greatest successes. After the death of Waleran IV. in 1279 the succession to this duchy was disputed. His heiress, Ermengarde, had married Reinald I. count of Gelderland. She died childless, but her husband continued to rule in Limburg, although his rights were disputed by Count Adolph of Berg, nephew to Waleran IV. (see Limburg). Not being strong enough to eject his rival, Adolph sold his rights to John of Brabant, and hostilities broke out in 1283. Harassed by desultory warfare and endless negotiations, and seeing no prospect of holding his own against the powerful duke of Brabant, Reinald made over his rights to Henry III. count of Luxemburg, who was a descendant of Waleran III. of Limburg. Henry III. was sustained by the archbishop of Cologne and other allies, as well as by Reinald of Gelderland. The duke of Brabant at once invaded the Rhineland and laid siege to the castle of Woeringen near Bonn. Here he was attacked by the forces of the confederacy on the 5th of June 1288. After a bloody struggle John of Brabant, though at the head of far inferior numbers, was completely victorious. Limburg was henceforth attached to the duchy of Brabant. John consolidated his conquest by giving his daughter in marriage to Henry of Luxemburg (1291). John the Victorious was a perfect model of a feudal prince in the days of chivalry, brave, adventurous, excelling in every form of active exercise, fond of display, generous in temper. He delighted in tournaments, and was always eager personally to take part in jousts. On the 3rd of May 1294, on the occasion of some marriage festivities at Bar, he was wounded in the arm in an encounter by Pierre de Bausner, and died from the effects of the hurt.

Bibliography.—H. Barlandus, *Rerum gestarum a Brabantiae ducibus historia usque in annum 1526* (Louvain, 1566); G. C. van der Berghe, *Jean le Victorieux, duc de Brabant* (1259–1294), (Louvain, 1857); K. F. Stallaert, *Gesch. v. Jan I. van Braband en zijne tijdvak* (Brussels, 1861); A. Wauters, *Le Duc Jean I^{er} et le Brabant sous le règne de ce prince* (Brussels, 1859).

JOHN, or Hans (1513–1571), margrave of Brandenburg-Cüstrin, was the younger son of Joachim I., elector of Brandenburg, and was born at Tangermünde on the 3rd of August 1513. In spite of the *dispositio Achillea* which decreed the indivisibility of the electorate, John inherited the new mark of Brandenburg on his father's death in July 1535. He had been brought up as a strict Catholic, but soon wavered in his allegiance, and in 1538 ranged himself definitely on the side of the Reformers. About the same time he joined the league of Schmalkalden; but before the war broke out between the league and the emperor Charles V. the promises of the emperor had won him over to the imperial side. After the conclusion of the war, the relations between John and Charles became somewhat strained. The margrave opposed the *Interim*, issued from Augsburg in May 1548; and he was the leader of the princes who formed a league for the defence of the Lutheran doctrines in February 1550. The alliance of these princes, however, with Henry II., king of France, does not appear to have commended itself to him and after some differences of opinion with Maurice, elector of Saxony, he returned to the emperor's side. His remaining years were mainly spent in the new mark, which he ruled carefully and economically. He added to its extent by the purchase of Beeskow and Storkow, and fortified the towns of Cüstrin and Peitz. He died at Cüstrin on the 13th of January 1571. His wife Catherine was a daughter of Henry II., duke of Brunswick, and as he left no sons the new mark passed on his death to his nephew John George, elector of Brandenburg.

See Berg, *Beiträge zur Geschichte des Markgrafen Johann von Küstrin* (Landsberg, 1903).

JOHN (1371–1419), called the Fearless (*Sans Peur*), duke of Burgundy, son of Philip the Bold, duke of Burgundy, and Margaret of Flanders, was born at Dijon on the 28th of May 1371. On the death of his maternal grandfather in 1384 he received the title of count of Nevers, which he bore until his father's death. Though originally destined to be the husband of Catherine, sister of Charles VI. of France, he married in 1385 Margaret, daughter of Duke Albert of Bavaria, an alliance which consolidated his position in the Netherlands. In the spring of 1396 he took arms for Hungary against the Turks and on the 28th of September was taken prisoner by the Sultan Bayezid I. at the bloody battle of Nicopolis, where he earned his surname of "the Fearless." He did not recover his liberty until 1397, and then only by paying an enormous ransom. He succeeded his father in 1404, and immediately found himself in conflict with Louis of Orleans, the young brother of Charles VI. The history of the following years is filled with the struggles between these two princes and with their attempts to seize the authority in the name of the demented king. John endeavoured to strengthen his position by marrying his daughter Margaret to the dauphin Louis, and by betrothing his son Philip to a daughter of Charles VI. Like his father, he looked for support to the popular party, to the tradesmen, particularly the powerful gild of the butchers, and also to the university of Paris. In 1405 he opposed in the royal council a scheme of taxation proposed by the duke of Orleans, which was nevertheless adopted. Louis retaliated by refusing to sanction the duke of Burgundy's projected expedition against Calais, whereupon John quitted the court in chagrin on the pretext of taking up his mother's heritage. He was, however, called back to the council to find that the duke of Orleans and the queen had carried off the dauphin. John succeeded in bringing back the dauphin to Paris, and open war seemed imminent between the two princes. But an arrangement was effected in October 1405, and in 1406 John was made by royal decree guardian of the dauphin and the king's children.

The struggle, however, soon revived with increased force. Hostilities had been resumed with England; the duke of Orleans had squandered the money raised for John's expedition against Calais; and the two rivals broke out into open threats. On the 20th of November 1407 their uncle, the duke of Berry, brought about a solemn reconciliation, but three days later Louis was assassinated by John's orders in the Rue Barbette, Paris. John at first sought to conceal his share in the murder, but ultimately decided to confess to his uncles, and abruptly left Paris. His vassals, however, showed themselves determined to support him in his struggle against the avengers of the duke of Orleans. The court decided to negotiate, and called upon the duke to return. John entered Paris in triumph, and instructed the Franciscan theologian Jean Petit (d. 1411) to pronounce an apology for the murder. But he was soon called back to his estates by a rising of the people of Liége against his brother-in-law, the bishop of that town. The queen and the Orleans party took every advantage of his absence and had Petit's discourse solemnly refuted. John's victory over the Liégeois at Hasbain on the 23rd of September 1408, enabled him to return to Paris, where he was reinstated in his ancient privileges. By the peace of Chartres (March 9, 1409) the king absolved him from the crime, and Valentina Visconti, the widow of the murdered duke, and her children pledged themselves to a reconciliation; while an edict of the 27th of December 1409 gave John the guardianship of the dauphin. Nevertheless, a new league was formed against the duke of Burgundy in the following year, principally at the instance of Bernard, count of Armagnac, from whom the party opposed to the Burgundians took its name. The peace of Bicêtre (Nov. 2, 1410) prevented the outbreak of hostilities, inasmuch as the parties were enjoined by its terms to return to their estates; but in 1411, in consequence of ravages committed by the Armagnacs in the environs of Paris, the duke of Burgundy was called back to Paris. He relied more than ever on the support of the popular party, which then obtained the reforming *Ordonnance Cabochienne* (so called from Simon Caboche, a prominent member of the gild of the butchers). But the bloodthirsty excesses of the populace brought a change. John was forced to withdraw to Burgundy (August 1413), and the university of Paris and John Gerson once more censured Petit's propositions, which, but for the lavish bribes of money and wines offered by John to the prelates, would have been solemnly condemned at the council of Constance. John's attitude was undecided; he negotiated with the court and also with the English, who had just renewed hostilities with France. Although he talked of helping his sovereign, his troops took no part in the battle of Agincourt (1415), where, however, two of his brothers, Anthony, duke of Brabant, and Philip, count of Nevers, fell fighting for France.

In 1417 John made an attack on Paris, which failed through his loitering at Lagny;[1] but on the 30th of May 1418 a traitor, one Perrinet Leclerc, opened the gates of Paris to the Burgundian captain, Villiers de l'Isle Adam. The dauphin, afterwards King Charles VI., fled from the town, and John betook himself to the king, who promised to forget the past. John, however, did nothing to prevent the surrender of Rouen, which had been besieged by the English, and on which the fate of the kingdom seemed to depend; and the town was taken in 1419. The dauphin then decided on a reconciliation, and on the 11th of July the two princes swore peace on the bridge of Pouilly, near Melun. On the ground that peace was not sufficiently assured by the Pouilly meeting, a fresh interview was proposed by the dauphin and took place on the 10th of September 1419 on the bridge of Montereau, when the duke of Burgundy was felled with an axe by Tanneguy du Chastel, one of the dauphin's companions, and done to death by the other members of the dauphin's escort. His body was first buried at Montereau and afterwards removed to the Chartreuse of Dijon and placed in a magnificent tomb sculptured by Juan de la Huerta; the tomb was afterwards transferred to the museum in the *hôtel de ville*.

By his wife, Margaret of Bavaria, he had one son, Philip the Good, who succeeded him; and seven daughters—Margaret, who married in 1404 Louis, son of Charles VI., and in 1423 Arthur, earl of Richmond and afterwards duke of Brittany; Mary, wife of Adolph of Cleves; Catherine, promised in 1410 to a son of Louis of Anjou; Isabella, wife of Olivier de Châtillon, count of Penthièvre; Joanna, who died young; Anne, who married John, duke of Bedford, in 1423; and Agnes, who married Charles I., duke of Bourbon, in 1425.

See A. G. P. Baron de Barante, *Histoire des ducs de Bourgogne*, (Brussels, 1835–1836); B. Zeller, *Louis de France et Jean sans Peur* (Paris, 1886); and E. Petit, *Itinéraire de Philippe le Hardi et de Jean sans Peur* (Paris, 1888). (R. Po.)

JOHN (1468–1532), called the Steadfast, elector of Saxony, fourth son of the elector Ernest, was born on the 30th of June 1468. In 1486, when his eldest brother became elector as Frederick III., John received a part of the paternal inheritance and afterwards assisted his kinsman, the German king Maximilian I., in several campaigns. He was an early adherent of Luther, and, becoming elector of Saxony by his brother's death in May 1525, was soon prominent among the Reformers. Having assisted to suppress the rising led by Thomas Munzer in 1525, he helped Philip, landgrave of Hesse, to found the league of Gotha, formed in 1526 for the protection of the Reformers. He was active at the diet of Spires in 1526, and the "recess" of this diet gave him an opportunity to reform the church in Saxony, where a plan for divine service was drawn up by Luther. The assertions of Otto von Pack that a league had been formed against the elector and his friends induced John to ally himself again with Philip of Hesse in March 1528, but he restrained Philip from making an immediate attack upon their opponents. He signed the protest against the "recess" of the diet of Spires in 1529, being thus one of the original Protestants, and was actively hostile to Charles V. at the diet of Augsburg in 1530. Having signed the confession of Augsburg, he was alone among the electors in objecting to the election of Ferdinand, afterwards the emperor Ferdinand I., as king of the Romans. He was among the first members of the league of Schmalkalden, assented to the religious peace of Nuremberg in 1532, and died at Schweidnitz on the 16th of August 1532. John was twice married and left two sons and two daughters. His elder son, John Frederick, succeeded him as elector, and his younger son was John Ernest (d. 1553). He rendered great services to the Protestant cause in its infancy, but as a Lutheran resolutely refused to come to any understanding with other opponents of the older faith.

See J. Becker, *Kurfürst Johann von Sachsen und seine Beziehungen zu Luther* (Leipzig, 1890); J. Janssen, *History of the German People* (English translation), vol. v. (London, 1903); L. von Ranke, *Deutsche Geschichte im Zeitalter der Reformation* (Leipzig, 1882).

JOHN, DON (1545–1578), of Austria, was the natural son of the emperor Charles V. by Barbara Blomberg, the daughter of an opulent citizen of Regensburg. He was born in that free imperial city on the 24th of February 1545, the anniversary of his father's birth and coronation and of the battle of Pavia, and was at first confided under the name of Geronimo to foster parents of humble birth, living at a village near Madrid; but in 1554 he was transferred to the charge of Madalena da Ulloa, the wife of Don Luis de Quijada, and was brought up in ignorance of his parentage at Quijada's castle of Villagarcia not far from Valladolid. Charles V. in a codicil of his will recognized Geronimo as his son, and recommended him to the care of his successor. In September 1559 Philip II. of Spain publicly recognized the boy as a member of the royal family, and he was known at court as Don Juan de Austria. For three years he was educated at Alcalá, and had as school companions his nephews, the infante Don Carlos and Alexander Farnese, prince of Parma. With Don Carlos his relations were especially friendly. It had been Philip's intention that Don John should become a monk, but he showed a strong inclination for a soldier's career and the king yielded. In 1568 Don John was appointed to the command of a squadron of 33 galleys, and his first operations were against the Algerian pirates. His next services were (1569–70) against the rebel Moriscos in Granada. In 1571 a nobler field of action was opened to him. The conquest of Cyprus by the Turks had led the Christian powers of the Mediterranean to fear for the safety of the Adriatic. A league between Spain and Venice was effected by the efforts of Pope Pius V. to resist the Turkish advance to the west, and Don John was named admiral in chief of the combined fleets. At the head of 208 galleys, 6 galleasses and a number of smaller craft, Don John encountered the Turkish fleet at Lepanto on the 7th of October 1571, and gained a complete victory. Only forty Turkish vessels effected their escape, and it was computed that 35,000 of their men were slain or captured while 15,000 Christian galley slaves were released. Unfortunately, through divisions and jealousies between the allies, the fruits of one of the most decisive naval victories in history were to a great extent lost.

This great triumph aroused Don John's ambition and filled his imagination with schemes of personal aggrandizement. He thought of erecting first a principality in Albania and the Morea, and then a kingdom in Tunis. But the conclusion by Venice of a separate peace with the sultan put an end to the league, and though Don John captured Tunis in 1573, it was again speedily lost. The schemes of Don John found no support in Philip II., who refused to entertain them, and even withheld from his half-brother the title of infante of Spain. At last, however, he was appointed (1576) governor-general of the Netherlands, in succession to Luis de Requesens. The administration of the latter had not been successful, the revolt headed by the prince of Orange had spread, and at the time of Don John's nomination the Pacification of Ghent appeared to have united the whole of the seventeen provinces of the Netherlands in determined opposition to Spanish rule and the policy of Philip II. The magic of Don John's name, and the great qualities of which he had given proof, were to recover what had been lost. He was, however, now brought into contact with an adversary of a very different calibre from himself. This was William of Orange, whose influence was now supreme throughout the Netherlands. The Pacification of Ghent, which was really a treaty between Holland and Zeeland and the other provinces for the defence of their common interests against Spanish oppression, had been followed by an agreement between the southern provinces, known as the Union of Brussels, which, though maintaining the Catholic religion and the king's authority, aimed at the expulsion of the Spanish soldiery and officials from the Netherlands. Confronted by the refusal of the states general to accept him as governor unless he assented to the conditions of the Pacification of Ghent, swore to maintain the rights and privileges of the provinces, and to employ only Netherlanders in his service, Don John, after some months of fruitless negotiations, saw himself compelled to give way. At Huey on the 12th of February 1577 he signed a treaty, known as the "Perpetual Edict," in which he complied with these terms. On the 1st of May he made his entry into Brussels, but he found himself governor-general only in name, and the prince of Orange master of the situation. In July he suddenly betook himself to Namur and withdrew his concessions. William of Orange forthwith took up his residence at Brussels, and gave his support to the archduke Matthias, afterwards emperor, whom the states-general accepted as their sovereign. Meanwhile Philip had sent large reinforcements to Don John under the leadership of his cousin Alexander Farnese. At the head of a powerful force Don John now suddenly attacked the patriot army at Gemblours, where, chiefly by the skill and daring of Farnese, a complete victory was gained on the 31st of January 1578. He could not, however, follow up his success for lack of funds, and was compelled to remain inactive all the summer, chafing with impatience at the cold indifference with which his appeals for the sinews of war were treated by Philip. His health gave way, he was attacked with fever, and on the 1st of October 1578, at the early age of 33, Don John died, heartbroken at the failure of all his soaring ambitions, and at the repeated proofs that he had received of the king his brother's jealousy and neglect.

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[1] This incident earned for him among the Parisians the contemptuous nickname of "John of Lagny, who does not hurry."

See Sir W. Stirling Maxwell, *Don John of Austria 1547–1575* (1883) and the bibliography under PHILIP II. OF SPAIN.

JOHN, DON (1629–1679), of Austria, the younger, recognized as the natural son of Philip IV., king of Spain, his mother, Maria Calderon, or Calderona, being an actress. Scandal accused her of a prodigality of favours which must have rendered the paternity of Don John very dubious. He was, however, recognized by the king, received a princely education at Ocaña, and was amply endowed with commanderies in the military orders, and other forms of income. Don John was sent in 1647 to Naples—then in the throes of the popular rising first led by Masaniello—with a squadron and a military force, to support the viceroy. The restoration of royal authority was due rather to the exhaustion of the insurgents and the follies of their French leader, the duke of Guise, than to the forces of Don John. He was next sent as viceroy to Sicily, whence he was recalled in 1651 to complete the pacification of Catalonia, which had been in revolt since 1640. The excesses of the French, whom the Catalans had called in, had produced a reaction, and Don John had not much more to do than to preside over the final siege of Barcelona and the convention which terminated the revolt in October 1652. On both occasions he had played the peacemaker, and this sympathetic part, combined with his own pleasant manners and handsome person with bright eyes and abundant raven-black hair—a complete contrast to the fair complexions of the Habsburgs—made him a popular favourite. In 1656 he was sent to command in Flanders, in combination with the prince of Condé, then in revolt against his own sovereign. At the storming of the French camp at Valenciennes in 1656, Don John displayed brilliant personal courage at the head of a cavalry charge. When, however, he took a part in the leadership of the army at the Dunes in the battle fought against Turenne and the British forces sent over by Cromwell in 1658, he was completely beaten, in spite of the efforts of Condé, whose advice he neglected, and of the hard fighting of English Royalist exiles. During 1661 and 1662 he commanded against the Portuguese in Estremadura. The Spanish troops were ill-appointed, irregularly paid and untrustworthy, but they were superior in numbers and some successes were gained. If Don John had not suffered from the indolence which Clarendon, who knew him, considered his chief defect, the Portuguese would have been hard pressed. The greater part of the south of Portugal was overrun, but in 1663 the Portuguese were reinforced by a body of English troops, and were put under the command of the Huguenot Schomberg. By him Don John was completely beaten at Estremos. Even now he might not have lost the confidence of his father, if Queen Mariana, mother of the sickly infante Carlos, the only surviving legitimate son of the king, had not regarded the bastard with distrust and dislike. Don John was removed from command and sent to his commandery at Consuegra. After the death of Philip IV. in 1665 Don John became the recognized leader of the opposition to the government of Philip's widow, the queen regent. She and her favourite, the German Jesuit Nithard, seized and put to death one of his most trusted servants, Don José Malladas. Don John, in return, put himself at the head of a rising of Aragon and Catalonia, which led to the expulsion of Nithard on the 25th of February 1669. Don John was, however, forced to content himself with the viceroyalty of Aragon. In 1677, the queen mother having aroused universal opposition by her shameless favour for Fernando de Valenzuela, Don John was able to drive her from court, and establish himself as prime minister. Great hopes were entertained of his administration, but it proved disappointing and short. Don John died on the 17th of September 1679.

The career of Don John can be followed in J. C. Dunlop's *Memoirs of Spain 1621–1700* (Edin. 1834).

JOHN OF BEVERLEY, ST (d. 721), English bishop, is said to have been born of noble parents at Harpham, in the east riding of Yorkshire. He received his education at Canterbury under Archbishop Theodore, the statement that he was educated at Oxford being of course untrue. He was for a time a member of the Whitby community, under St Hilda, and in 687 he was consecrated bishop of Hexham and in 705 was promoted to the bishopric of York. He resigned the latter see in 718, and retired to a monastery which he had founded at Beverley, where he died on the 7th of May 721. He was canonized in 1037, and his feast is celebrated annually in the Roman Church on the 7th of May. Many miracles of healing are ascribed to John, whose pupils were numerous and devoted to him. He was celebrated for his scholarship as well as for his virtues.

The following works are ascribed to John by J. Bale: *Pro Luca exponendo* (an exposition of Luke); *Homiliae in Evangelia; Epistolae ad Herebaldum, Audenam, et Bertinum*; and *Epistolae ad Hyldam abbatissam*. See life by Folcard, based on Bede, in *Acta SS. Bolland.*; and J. Raine's *Fasti eboracenses* (1863).

JOHN OF THE CROSS, ST (1542–1591), Spanish mystic, was born at Ontiveros (Old Castile) on the 24th of June 1542. He became a professed Carmelite in 1564, and was ordained priest at Salamanca in 1567. He met with much opposition in his efforts to introduce the reforms proposed by St Theresa, and was more than once imprisoned. His real name was Juan de Yepez y Álvarez; in religion he was known as Juan de San Matias till 1568, when he adopted the name of Juan de la Cruz.

Broken by persecution, he was sent to the monastery of Ubeda, where he died in 1591; his *Obras espirituales* were published posthumously in 1618. He was beatified in 1674 and canonized on the 27th of December 1726. The lofty symbolism of his prose is frequently obscure, but his lyrical verses are distinguished for their rapturous ecstasy and beauty of expression.

Some of his poems have been translated with great success by Arthur Symons in *Images of Good and Evil*; the most convenient edition of his works, which have been frequently reprinted, is that contained in vol. xvi. of the *Biblioteca de autores españoles*.

JOHN OF ASIA (or of Ephesus), a leader of the Monophysite Syriac-speaking Church in the 6th century, and one of the earliest and most important of Syriac historians. Born at Āmid (Diarbekr) about 505, he was there ordained as a deacon in 529: but in 534 we find him in Palestine, and in 535 he passed to Constantinople. The cause of his leaving Āmid was probably either the great pestilence which broke out there in 534 or the furious persecution directed against the Monophysites by Ephraim (patriarch of Antioch 529–544) and Abraham (bishop of Āmid *c.* 520–541). In Constantinople he seems to have early won the notice of Justinian, one of the main objects of whose policy was the consolidation of Eastern Christianity as a bulwark against the heathen power of Persia. John is said by Barhebraeus (*Chron. eccl.* i. 195) to have succeeded Anthimus as Monophysite bishop of Constantinople, but this is probably a mistake.[1] Anyhow he enjoyed the emperor's favour until the death of the latter in 565 and (as he himself tells us) was entrusted with the administration of the entire revenues of the Monophysite Church. He was also sent, with the rank of bishop, on a mission for the conversion of such heathen as remained in Asia Minor, and informs us that the number of those whom he baptized amounted to 70,000. He also built a large monastery at Tralles on the hills skirting the valley of the Meander, and more than 90 other monasteries. Of the mission to the Nubians which he promoted, though he did not himself visit their country, an interesting account is given in the 4th book of the 3rd part of his *History*.[2] In 546 the emperor entrusted him with the task of rooting out the secret practice of idolatry in Constantinople and its neighbourhood. But his fortunes changed soon after the accession of Justin II. About 571 Paul of Asia, the orthodox or Chalcedonian patriarch, began (with the sanction of the emperor) a rigorous persecution of the Monophysite Church leaders, and John was among those who suffered most. He gives us a detailed account of his sufferings in prison, his loss of civil rights, &c., in the third part of his *History*. The latest events recorded are of the date 585, and the author cannot have lived much longer; but of the circumstances of his death nothing is known.

John's main work was his *Ecclesiastical History*, which covered more than six centuries, from the time of Julius Caesar to 585. It was composed in three parts, each containing six books. The first part seems to have wholly perished. The second, which extended from Theodosius II. to the 6th or 7th year of Justin II., was (as F. Nau has recently proved)[3] reproduced in full or almost in full, in John's own words, in the third part of the *Chronicle* which was till lately attributed to the patriarch Dionysius Telmaharensis, but is really the work of an unknown compiler. Of this second division of John's *History*, in which he had probably incorporated the so-called *Chronicle* of Joshua the Stylite, considerable portions are found in the British Museum MSS. Add. 14647 and 14650, and these have been published in the second volume of Land's *Anecdota Syriaca*. But the whole is more completely presented in the Vatican MS. (clxii.), which contains the third part of the *Chronicle* of pseudo-Dionysius. The third part of John's history, which is a detailed account of the ecclesiastical events which happened in 571–585, as well as of some earlier occurrences, survives in a fairly complete state in Add. 14640, a British Museum MS. of the 7th century. It forms a contemporary record of great value to the historian. Its somewhat disordered state, the want of chronological arrangement, and the occasional repetition of accounts of the same events are due, as the author himself informs us (ii. 50), to the work being almost entirely composed during the times of persecution. The same cause may account for the somewhat slovenly Syriac style. The writer claims to have treated his subject impartially, and though written from the narrow point of view of one to whom Monophysite "orthodoxy" was all-important, it is evidently a faithful reproduction of events as they occurred. This third part was edited by Cureton (Oxford, 1853), and was translated into English by R. Payne-Smith (Oxford, 1860) and into German by J. M. Schönfelder (Munich, 1862).

John's other known work was a series of *Biographies of Eastern Saints*, compiled about 569. These have been edited by Land in *Anecdota Syriaca*, ii. 1–288, and translated into Latin by Douwen and Land (Amsterdam, 1889). An interesting estimate of John as an ecclesiastic and author was given by the Abbé Duchesne in a memoir read before the five French Academies on the 25th of October 1892.

JOHN OF DAMASCUS (Johannes Damascenus) (d. before 754), an eminent theologian of the Eastern Church, derives his surname from Damascus, where he was born about the close of the 7th century. His Arabic name was Mansur (the victor), and he received the epithet Chrysorrhoas (gold-pouring) on account of his eloquence. The principal account of his life is contained in a narrative of the 10th century, much of which is obviously legendary. His father Sergius was a Christian, but notwithstanding held a high office under the Saracen caliph, in which he was succeeded by his son. John is said to have owed his education in philosophy, mathematics and theology to an Italian monk named Cosmas, whom Sergius had redeemed from a band of captive slaves. About the year 730 he wrote several treatises in defence of image-worship, which the emperor, Leo the Isaurian, was making strenuous efforts to suppress.

Various pieces of evidence go to show that it was shortly after this date that he resolved to forsake the world, divided his fortune among his friends and the poor, and betook himself to the monastery of St Sabas, near Jerusalem, where he spent the rest of his life. After the customary probation he was ordained priest by the patriarch of Jerusalem. In his last years he travelled through Syria contending against the iconoclasts, and in the same cause he visited Constantinople at the imminent risk of his life during the reign of Constantine Copronymus. With him the "mysteries," the entire ritual, are an integral part of the Orthodox system, and all dogma culminates in image-worship. The date of his death is uncertain; it is probably about 752. John Damascenus is a saint both in the Greek and in the Latin Churches, his festival being observed in the former on the 29th of November and on the 4th of December, and in the latter on the 6th of May.

The works of Damascenus give him a foremost place among the theologians of the early Eastern Church, and, according to Dorner, he "remains in later times the highest authority in the theological literature of the Greeks." This is not because he is an original thinker but because he compiled into systematic form the scattered teaching of his theological predecessors. Several treatises attributed to him are probably spurious, but his undoubted works are numerous and embrace a wide range. The most important contains three parts under the general title Πηγὴ γνώσεως ("The Fountain of Knowledge"). The first part, entitled Κεφάλαια φιλοσοφικά, is an exposition and application of theology of Aristotle's *Dialectic*. The second, entitled Περὶ αἱρέσεων ("Of Heresies"), is a reproduction of the earlier work of Epiphanius, with a continuation giving an account of the heresies that arose after the time of that writer. The third part, entitled Ἔκδοσις ἀκριβὴς τῆς ὀρθοδόξου πίστεως ("An Accurate Exposition of the Orthodox Faith"), is much the most important, containing as it does a complete system of theology founded on the teaching of the fathers and church councils, from the 4th to the 7th century. It thus embodies the finished result of the theological thought of the early Greek Church. Through a Latin translation made by Burgundio of Pisa in the 12th century, it was well known to Peter Lombard and Aquinas, and in this way it influenced the scholastic theology of the West. Another well-known work is the *Sacra parallela*, a collection of biblical passages followed by illustrations drawn from other scriptural sources and from the fathers. There is much merit in his hymns and "canons" one of the latter is very familiar as the hymn "The Day of Resurrection, Earth tell it out abroad." John of Damascus has sometimes been called the "Father of Scholasticism," and the "Lombard of the Greeks," but these epithets are appropriate only in a limited sense.

The Christological position of John may be summed up in the following description:[4] "He tries to secure the unity of the two natures by relegating to the divine Logos the formative and controlling agency. It is not a human individual that the Logos assumes, nor is it humanity, or human nature in general. It is rather a potential human individual, a nature not yet developed into a person or hypostasis. The hypostasis through which this takes place is the personal Logos through whose union with this potential man, in the womb of Mary, the potential man acquires a concrete reality, an individual existence. He has, therefore, no hypostasis of himself but only in and through the Logos. It is denied that he is *non-hypostatic* (ἀνυπόστατος); it is affirmed that he is *en-hypostatic* (ἐνυπόστατος). Two natures may form a unity, as the body and soul in man. So man, both soul and body, is brought into unity with the Logos; there being then one hypostasis for both natures." There is an interchange of the divine and human attributes, a communication of the former which deifies the receptive and passive human nature. In Christ the human will has become the organ of the divine will. Thus while John is an adherent of Chalcedon and a dyothelite, the drift of his teaching is in the monophysite direction. "The Chalcedonian *Definition* is victorious, but Apollinaris is not overcome"; what John gives with the one hand he takes away with the other. On the question of the Atonement he regards the death of Christ as a sacrifice offered to God and not a ransom paid to the devil.

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[1] See Land, *Joannes Bischof von Ephesos*, pp. 57 seq.

[2] Cf. Land's Appendix (*op. cit.* 172–193).

[3] See *Bulletin critique*, 15th June and 25th Aug. 1896, and 25th Jan. 1897; *Journal asiatique*, 9th series, vol. viii. (1896) pp. 346 sqq. and vol. ix. (1897) p. 529; also *Revue de l'Orient chrétien*, *Suppl. trimestriel* (1897), pp. 41–54, 455–493; and compare Nöldeke in *Vienna Oriental Journal* (1896), pp. 160 sqq. The facts are briefly stated in Duval's *Littérature syriaque*, p. 192. A full analysis of this second part of John's history has been given by M. Nau,

[4] G. P. Fisher, *Hist. of Chr. Doctrine*, 159 seq. More fully in R. L. Ottley, *The Doctrine of the Incarnation*, ii. 138–146.

Literature.—The *Life* of John of Damascus was written by John, patriarch of Jerusalem in the 10th century (Migne, *Patrol. Graec.*, xciv. 429–489). The works were edited by Le Quien (2 vols., fol., Paris, 1712) and form vols. 94 to 96 in Migne's Greek series. A monograph by J. Langen was published in 1879. A. Harnack's *History of Dogma* is very full (see especially vols. iii. and iv.; on the image-worship controversy, iv. 322 seq.), and so are the similar works of F. Loofs-Seeberg and A. Dorner. See also O. Bardenhewer's *Patrologie*, and other literature cited in F. Kattenbusch's excellent article in Hauck-Herzog, *Realencyklopädie*, vol. ix.

JOHN OF HEXHAM (*c.* 1160–1209), English chronicler, is known to us merely as the author of a work called the *Historia XXV. annorum*, which continues the *Historia regum* of Simeon of Durham and contains an account of English events 1130–1153. From the title, as given in the only manuscript, we learn John's name and the fact that he was prior of Hexham. It must have been between 1160 and 1209 that he held this position; but the date at which he lived and wrote cannot be more accurately determined. Up to the year 1139 he follows closely the history written by his predecessor, Prior Richard; thenceforward he is an independent though not a very valuable authority. He is best informed as to the events of the north country; his want of care, when he ventures farther afield, may be illustrated by the fact that he places in 1145 King Stephen's siege of Oxford, which really occurred in 1142. Even for northern affairs his chronology is faulty; from 1140 onwards his dates are uniformly one year too late. Prior Richard is not the only author to whom John is indebted; he incorporates in the annal of 1138 two other narratives of the battle of the Standard, one in verse by the monk Serlo, another in prose by Abbot Ailred of Rievaux; and also a poem, by a Glasgow clerk, on the death of Sumerled of the Isles.

The one manuscript of John's chronicle is a 13th century copy; MS. C. C. C. Cambridge, cxxxix. 8. The best edition is that of T. Arnold in *Symeonis monachi opera*, vol. ii. (Rolls Series, 1885). There is an English translation in J. Stevenson's *Church Historians of England*, vol. iv. (London, 1856). (H. W. C. D.)

JOHN OF IRELAND (Johannis de Irlandia), (*fl.* 1480), Scottish writer, perhaps of Lowland origin, was resident for thirty years in Paris and later a professor of theology. He was confessor to James IV. and also to Louis XI. of France, and was rector of Yarrow (de Foresta) when he completed, at Edinburgh, the work on which rests his sole claim as a vernacular writer. This book, preserved in MS. in the Advocates' Library, Edinburgh (MS. 18, 2, 8), and labelled "Johannis de Irlandia opera theologica," is a treatise in Scots on the wisdom and discipline necessary to a prince, especially intended for the use of the young James IV. The book is the earliest extant example of original Scots prose. It was still in MS. in 1910, but an edition was promised by the Scottish Text Society. In this book John refers to two other vernacular writings, one "of the commandementis and uthir thingis pretenand to the salvacioune of man," the other, "of the tabill of confessioune." No traces of these have been discovered. The author's name appears on the registers of the university of Paris and on the rolls of the Scottish parliaments, and he is referred to by the Scottish historians, Leslie and Dempster.

See the notices in John Lyden's Introduction to his edition of the *Complaynt of Scotlande* (1801), pp. 85 seq.; *The Scottish Antiquary*, xiii. 111–115 and xv. 1–14. Annotated extracts are given in Gregory Smith's *Specimens of Middle Scots* (1902).

JOHN OF RAVENNA. Two distinct persons of this name, formerly confused and identified with a third (anonymous) Ravennese in Petrarch's letters, lived at the end of the 14th and the beginning of the 15th century.

1. A young Ravennese born about 1347, who in 1364 went to live with Petrarch as secretary. In 1367 he set out to see the world and make a name for himself, returned in a state of destitution, but, growing restless again, left his employer for good in 1368. He is not mentioned again in Petrarch's correspondence, unless a letter "to a certain wanderer" (*vago cuidam*), congratulating him on his arrival at Rome in 1373, is addressed to him.

2. Son of Conversanus (Conversinus, Convertinus). He is first heard of (Nov. 17, 1368) as appointed to the professorship of rhetoric at Florence, where he had for some time held the post of notary at the courts of justice. This differentiates him from (1). He entered (*c.* 1370) the service of the ducal house of Padua, the Carraras, in which he continued at least until 1404, although the whole of that period was not spent in Padua. From 1375 to 1379 he was a schoolmaster at Belluno, and was dismissed as too good for his post and not adapted for teaching boys. On the 22nd of March 1382, he was appointed professor of rhetoric at Padua. During the struggle between the Carraras and Viscontis, he spent five years at Udine (1387–1392). From 1395–1404 he was chancellor of Francis of Carrara, and is heard of for the last time in 1406 as living at Venice. His history of the Carraras, a tasteless production in barbarous Latin, says little for his literary capacity; but as a teacher he enjoyed a great reputation, amongst his pupils being Vittorino da Feltre and Guarino of Verona.

3. Malpaghini (De Malpaghinis), the most important. Born about 1356, he was a pupil of Petrarch from a very early age to 1374. On the 19th of September 1397 he was appointed professor of rhetoric and eloquence at Florence. On the 9th of June 1412, on the re-opening of the studio, which had been shut from 1405 to 1411 owing to the plague, his appointment was renewed for five years, before the expiration of which period he died (May 1417). Although Malpaghini left nothing behind him, he did much to encourage the study of Latin; among his pupils was Poggio Bracciolini.

The local documents and other authorities on the subject will be found in E. T. Klette, *Beiträge zur Geschichte und Litteratur der italienischen Gelehrtenrenaissance*, vol. i. (1888); see also G. Voigt, *Die Wiederbelebung des klassischen Altertums*, who, however, identifies (1) and (2).

JOHN OF SALISBURY (*c.* 1115–1180), English author, diplomatist and bishop, was born at Salisbury between the years 1115 and 1120. Beyond the fact that he was of Saxon, not of Norman race, and applies to himself the cognomen of *Parvus*, "short," or "small," few details are known regarding his early life; but from his own statements it is gathered that he crossed to France about 1136, and began regular studies in Paris under Abelard, who had there for a brief period re-opened his famous school on Mont St Geneviève. After Abelard's retirement, John carried on his studies under Alberich of Reims and Robert of Melun. From 1138 to 1140 he studied grammar and the classics under William of Conches and Richard l'Evêque, the disciples of Bernard of Chartres, though it is still a matter of controversy whether it was in Chartres or not (cf. A. Clerval, *Les Écoles de Chartres au moyen âge*, 1895). Bernard's teaching was distinguished partly by its pronounced Platonic tendency, partly by the stress laid upon literary study of the greater Latin writers; and the influence of the latter feature is noticeable in all John of Salisbury's works. About 1140 he was at Paris studying theology under Gilbert de la Porrée, then under Robert Pullus and Simon of Poissy. In 1148 he resided at

Moûtiers la Celle in the diocese of Troyes, with his friend Peter of Celle. He was present at the council of Reims, presided over by Pope Eugenius III., and was probably presented by Bernard of Clairvaux to Theobald, archbishop of Canterbury, at whose court he settled, probably about 1150. Appointed secretary to Theobald, he was frequently sent on missions to the papal see. During this time he composed his greatest works, published almost certainly in 1159, the *Policraticus, sive de nugis curialium et de vestigiis philosophorum* and the *Metalogicus*, writings invaluable as storehouses of information regarding the matter and form of scholastic education, and remarkable for their cultivated style and humanist tendency. After the death of Theobald in 1161, John continued as secretary to Thomas Becket, and took an active part in the long disputes between that primate and his sovereign, Henry II. His letters throw light on the constitutional struggle then agitating the English world. With Becket he withdrew to France during the king's displeasure; he returned with him in 1170, and was present at his assassination. In the following years, during which he continued in an influential situation in Canterbury, but at what precise date is unknown, he drew up the *Life of Thomas Becket*. In 1176 he was made bishop of Chartres, where he passed the remainder of his life. In 1179 he took an active part in the council of the Lateran. He died at or near Chartres on the 25th of October 1180.

John's writings enable us to understand with much completeness the literary and scientific position of the 12th century. His views imply a cultivated intelligence well versed in practical affairs, opposing to the extremes of both nominalism and realism a practical common sense. His doctrine is a kind of utilitarianism, with a strong leaning on the speculative side to the modified literary scepticism of Cicero, for whom he had unbounded admiration. He was a humanist before the Renaissance, surpassing all other representatives of the school of Chartres in his knowledge of the Latin classics, as in the purity of his style, which was evidently moulded on that of Cicero. Of Greek writers he appears to have known nothing at first hand, and very little in translations. The *Timaeus* of Plato in the Latin version of Chalcidius was known to him as to his contemporaries and predecessors, and probably he had access to translations of the *Phaedo* and *Meno*. Of Aristotle he possessed the whole of the *Organon* in Latin; he is, indeed, the first of the medieval writers of note to whom the whole was known. Of other Aristotelian writings he appears to have known nothing.

The collected editions of the works are by J. A. Giles (5 vols., Oxford, 1848), and by Migne, in the *Patrologiae cursus*, vol. 199: neither accurate. The *Policraticus* was edited with notes and introductions by C. C. I. Webb, *Ioannis Saresberiensis episcopi Carnotensis Policratici* (Oxford, 1909), 2 vols. The most complete study of John of Salisbury is the monograph by C. Schaarschmidt, *Johannes Sarisberiensis nach Leben und Studien, Schriften und Philosophie*, 1862, which is a model of accurate and complete workmanship. See also the article in the *Dict. Nat. Biog.*

JOHN (1290–*c.* 1320), surnamed the Parricide, and called also John of Swabia, was a son of Rudolph II. count of Habsburg and Agnes daughter of Ottakar II. king of Bohemia, and consequently a grandson of the German king Rudolph I. Having passed his early days at the Bohemian court, when he came of age he demanded a portion of the family estates from his uncle, the German king Albert I. His wishes were not gratified, and with three companions he formed a plan to murder the king. On the 1st of May 1308 Albert in crossing the river Reuss at Windisch became separated from his attendants, and was at once attacked and killed by the four conspirators. John escaped the vengeance of Albert's sons, and was afterwards found in a monastery at Pisa, where in 1313 he is said to have been visited by the emperor Henry VII., who had placed him under the ban. From this time he vanishes from history. The character of John is used by Schiller in his play *Wilhelm Tell*.

JOHN, THE EPISTLES OF. The so-called epistles of John, in the Bible, are not epistles in the strict sense of the term, for the first is a homily, and encyclical or pastoral (as has been recognized since the days of Bretschneider and Michaelis), while the other two are brief notes or letters. Nor are they John's, if John means the son of Zebedee. The latter conclusion depends upon the particular hypothesis adopted with regard to the general Johannine problem, yet even when it is held that John the apostle (*q.v.*) survived to old age in Ephesus, the second and third epistles may be fairly ascribed (with Erasmus, Grotius, Credner, Bretschneider, Reuss, &c.) to John the presbyter[1], as several circles in the early church held ("Opinio a plerisque tradita," Jerome: *De vir. ill.* 18). An apostle indeed might call himself a presbyter (cf. 1 Pet. v. 1). But these notes imply no apostolic claim on the part of the author, and, although their author is anonymous, the likelihood is that their composition by the great Asiatic presbyter John led afterwards to their incorporation in the "instrumentum" of John the apostle's writings, when the prestige of the latter had obscured the former. All hypotheses as to their pseudonymity or composition by different hands may be dismissed. They would never have floated down the stream of tradition except on the support of some primitive authority. If this was not connected with John the apostle the only feasible alternative is to think of John the presbyter, for Papias refers to the latter in precisely this fashion (Euseb. *H.E.* iii. 39, 15; καὶ τοῦτο ὁ π. ἔλεγε).

The period of all three lies somewhere within the last decade of the 1st century and the first decade of the 2nd. No evidence is available to determine in what precise order they were written, but it will be convenient to take the two smaller notes before the larger. The so-called Second Epistle of John is one of the excommunicating notes occasionally despatched by early Christian leaders to a community (cf. 2 Cor. v. 9). The presbyter or elder warns a Christian community, figuratively addressed as "the elect lady" (cf. 13 with 1 Pet. i. 1; v, 13; also the plural of 6, 8, 10 and 13), against some itinerant (cf. *Didache* xi. 1–2, teachers who were promulgating advanced Docetic views (7) upon the person of Christ. The note is merely designed to serve (12) until the writer arrives in person. He sends greetings to his correspondents from some community in which he is residing at present (13), and with which they had evidently some connexion.

The note was familiar to Irenaeus[2] who twice (i. 16, 3, iii. 16, 8) cites 10–11, once quoting it from the first epistle by mistake, but no tradition has preserved the name of the community in question, and all opinions on the matter are guess-work. The reference to "all who know the truth" (ver. 1) is, of course, to be taken relatively (cf. Rev. ii. 23); it does not necessarily imply a centre like Antioch or Rome (Chapman). Whiston thought of Philadelphia, and probably it must have been one of the Asiatic churches.

The so-called Third Epistle of John belongs to the ἐπίστολαι συστάτικαι (2 Cor. iii. 1) of the early church, like Rom. xvi. It is a private note addressed by the presbyter to a certain Gaius, a member of the same community or house-church (9) as that to which 2 John is written. A local errorist, Diotrephes (9–10) had repudiated the authority of the writer and his party, threatening even to excommunicate Gaius and others from the church (cf. Abbott's *Diatessarica*, § 2258). With this opponent the writer promises (10) to deal sharply in person before very long. Meantime (14) he despatches the present note, in hearty appreciation of his correspondent's attitude and character.

The allusion in 9 (ἔγραψα) refers in all likelihood to the "second" epistle (so Ewald, Wolf, Salmon, &c.). In order to avoid the suggestion that it implied a lost epistle, ἂν was inserted at an early stage in the textual history of the note. If ἐκκλήσιας could be read in 12, Demetrius would be a presbyter; in any case, he is not to be identified with Demas (Chapman), nor is there any reason to suppose (with Harnack)[1] that the note of 9 was written to, and suppressed by, him. What the presbyter is afraid of is not so much that his note would not be read (Ewald, Harnack), as that it would not be acted upon.

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[1] So Selwyn, *Christian Prophets* (pp. 133–145), Harnack, Heinrici (*Das Urchristenthum*, 1902, pp. 129 seq.), and von Soden (*History of Early Christian Literature*, pp. 445–446), after Renan (*L'Église chrétienne*, pp. 78 seq.). Von Dobschütz (*Christian Life in the Primitive Church*, pp. 218 seq.) and R. Knopf (*Das nachapost. Zeitalter*, 1905, pp. 32 seq., &c.) are among the most recent critics who ascribe all three epistles to the presbyter.

[2] On the early allusions to these brief notes, cf. Gregory: *The Canon and Text of the New Testament* (1907), pp. 131, 190 seq., Westcott's *Canon of the New Testament*, pp. 218 seq., 355, 357, 366, &c., and Leipoldt's *Geschichte d. neut. Kanons* (1907), i. pp. 66 seq., 78 seq., 99 seq., 151 seq., 192 seq., 232 seq.

These notes, written originally on small sheets of papyrus, reveal the anonymous presbyter travelling (so Clem. Alex. *Quis dives salv.* xlii.) in his circuit or diocese of churches, and writing occasional pastoral letters, in which he speaks not only in his own name but in that of a coterie of like-minded Christians.[2] It is otherwise with the brochure or manifesto known as the "first epistle." This was written neither at the request of its readers nor to meet any definite local emergency, but on the initiative of its author (i. 4) who was evidently concerned about the effect produced upon the Church in general by certain contemporary phases of semi-gnostic teaching. The polemic is directed against a dualism which developed theoretically into docetic views of Christ's person (ii. 22, iv. 2, &c.), and practically into libertinism (ii. 4, &c.).[3] It is natural to think, primarily, of the churches in Asia Minor as the circle addressed, but all indications of date or place are absent, except those which may be inferred from its inner connexion with the Fourth Gospel.

The plan of the brochure is unstudied and unpremeditated, resembling a series of variations upon one or two favourite themes rather than a carefully constructed melody. Fellowship (*κοινωνία*) with God and man is its dominant note. After defining the essence of Christian *κοινωνία* (i. 1–3),[4] the writer passes on to its conditions (i. 5–ii. 17), under the antithesis of light and darkness. These conditions are twofold: (*a*) a sense of sin, which leads Christians to a sense of forgiveness[5] through Jesus Christ, (*b*) and obedience to the supreme law of brotherly love (cf. Ignat. *Ad Smyrn.* 6). If these conditions are unfulfilled, moral darkness is the issue, a darkness which spells ruin to the soul. This prompts the writer to explain the dangers of *κοινωνία* (ii. 18–29), under the antithesis of truth and falsehood, the immediate peril being a novel heretical view of the person of Christ. The characteristics of the fellowship are then developed (iii. 1–12), as sinlessness and brotherly love, under the antithesis of children of God (cf. ii. 29, "born of Him") and children of the devil. This brotherly love bulks so largely in the writer's mind that he proceeds to enlarge upon its main elements of confidence towards God (iii. 13–24), moral discernment (iv. 1–6), and assurance of union with God (iv. 7–21), all these being bound up with a true faith in Jesus as the Christ (v. 1–12).[6] A brief epilogue gives what is for the most part a summary (v. 13–21) of the leading ideas of the homily.[7]

Disjointed as the cause of the argument may seem, a close scrutiny of the context often reveals a subtle connexion between paragraphs which at first sight appear unlinked. Thus the idea of the *κόσμος* passing away (ii. 17) suggests the following sentences upon the nearness of the *παρούσια* (ii. 18 seq.), whose signs are carefully noted in order to reassure believers, and whose moral demands are underlined (ii. 28, iii. 3). Within this paragraph[8] even the abrupt mention of the *χρίσμα* has its genetical place (ii. 20). The heretical *ἀντίχριστοι*, it is implied, have no *χρίσμα* from God; Christians have (note the emphasis on *ὑμεῖς*), owing to their union with the true *Χρίστος*. Again, the genetic relation of iii. 4 seq. to what precedes becomes evident when we consider that the norm of Christian purity (iii. 3) is the keeping of the divine commandments, or conduct resembling Christ's on earth (iii. 3–ii. 4–6), so that the Gnostic[9] breach of this law not only puts a man out of touch with Christ (iii. 6 seq.), but defeats the very end of Christ's work, *i.e.* the abolition of sin (iii. 8). Thus iii. 7–10 resumes and completes the idea of ii. 29; the Gnostic is shown to be out of touch with the righteous God, partly because he will not share the brotherly love which is the expression of the righteousness, and partly because his claims to sinlessness render God's righteous forgiveness (i. 9) superfluous. Similarly the mention of the Spirit (iii. 24) opens naturally into a discussion of the decisive test for the false claims of the heretics or gnostic *illuminati* to spiritual powers and gifts (iv. 1 seq.); and, as this test of the genuine Spirit of God is the confession of Jesus Christ as really human and incarnate, the writer, on returning (in iv. 17 seq.) to his cardinal idea of brotherly love, expresses it in view of the incarnate Son (iv. 9), whose mission furnishes the proof of God's love as well as the example and the energy of man's (iv. 10 seq.). The same conception of the real humanity of Jesus Christ as essential to faith's being and well-being is worked out in the following paragraph (v. 1–12), while the allusion to eternal life (v. 11–12) leads to the closing recapitulation (v. 13–21) of the homily's leading ideas under this special category.

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[1] In his ingenious study (*Texte und Untersuchungen*, xv. 3), whose main contention is adopted by von Dobschütz and Knopf. On this view (for criticism see Belser in the *Tübing. Quartalschrift*, 1897, pp. 150 seq., Krüger in *Zeitschrift für die wiss. Theologie*, 1898, pp. 307–311, and Hilgenfeld: ibid. 316–320), Diotrephes was voicing a successful protest of the local monarchical bishops against the older itinerant authorities (cf. Schmiedel, *Ency. Bib.*, 3146–3147). As Wilamowitz-Moellendorf (*Hermes*, 1898, pp. 529 seq.) points out, there is a close connexion between ver. 11 and ver. 10. The same writer argues that, as the substitution of *ἀγαπήτος* for *φίλτατος* (ver. 1) "ist Schönrednerei und nicht vom besten Geschmacke," the writer adds *ὃν ἐγὼ ἀγαπῶ ἐν ἀληθείᾳ*.

[2] This is the force of the *ἡμεῖς* in 3 John 9–10 (cf. 1 John iv. 6, 14) "The truth" (3 John 3–5) seems to mean a life answering to the apostolic standard thus enforced and exemplified.

[3] Several of these traits were reproduced in the teaching of Cerinthus, others may have been directly Jewish or Jewish Christian. The opposition to the Messianic rôle of Jesus had varied adherents. The denial of the Virgin-birth, which also formed part of the system of Cerinthus, was met by anticipation in the stories of Matthew and Luke, which pushed back the reception of the spirit from the baptism to the birth, but the Johannine school evidently preferred to answer this heresy by developing the theory of the Logos, with its implicate of pre-existence.

[4] On the vexed question whether the language of this paragraph is purely spiritual or includes a realistic reference, cf. G. E. Findlay (*Expositor*, 1893, pp. 97 seq.), and Dr E. A. Abbott's recent study in *Diatessarica*, §§ 1615–1620. The writer is controverting the Docetic heresy, and at the same time keeping up the line of communications with the apostolic base.

[5] The universal range (ii. 2) ascribed to the redeeming work of Christ is directed against Gnostic dualism and the Ebionitic narrowing of salvation to Israel; only *ἡμεῖς* here denotes Christians in general, not Jewish Christians. On the answer to the Gnostic pride of perfectionism (i. 8), cf. Epict. iv. 12, 19. The emphasis on "you all" (ii. 20) hints at the Gnostic aristocratic system of degrees among believers, which naturally tended to break up brotherly love (cf. 1 Cor. viii. 1 seq.). The Gnostics also held that a spiritual seed cf. iii. 9) was implanted in man, as the germ of his higher development into the divine life; for the Valentinian idea cf. Iren. *Adv. Haer.* i. 64, and Tertull. *De anima*, 11 [haeretici] "nescio quod spiritale semen infulciunt animae"). Cf. the general discussions by Häring in *Theologische Abhandlungen C. von Weizsäcker gewidmet* (1892), pp. 188 seq., and Zahn in *Wanderungen durch Schrift u. Geschichte* (1892), pp. 3–74.

[6] Cf. Denney, *The Death of Christ* (1902), pp. 269–281. The polemical reference to Cerinthus is specially clear at this point. The death of Jesus was not that of a phantom, nor was his ministry from the baptism to the crucifixion that of a heavenly aeon which suffered nothing: such is the writer's contention. "In every case the historical is asserted, but care is taken that it shall not be materialized: a primacy is given to the spiritual. . . . Except through the historical, there is no Christianity at all, but neither is there any Christianity till the historical has been spiritually comprehended." The well-known interpolation of the three heavenly witnesses (v. 7) has now been proved by Karl Künstle (*Das Comma Johanneum*, 1905) to have originally come from the pen of the 4th century Spaniard, Priscillian, who himself denied all distinctions of person in the Godhead.

[7] On the "sin to death" (v. 16) cf. Jubilees xxi. 22, xxvi. 34 with Karl's *Johann. Studien* (1898), i. 97 seq. and M. Goguel's *La Notion johannique de l'esprit* (1902), pp. 147–153, for the general theology of the epistle. The conceptions of light and life are best handled by Grill in his *Untersuchungen über die Entstehung des vierten Evgliums* (1902), pp. 301 seq., 312 seq.

[8] In Preuschen's *Zeitschrift für die neutest. Wissenschaft* (1907), pp. 1–8, von Dobschütz tries to show that the present text of ii. 28–iii. 12 indicates a revision or rearrangement of an earlier text. Cludius (*Uransichten des Christentums*, Altona, 1808) had already conjectured that a Gnostic editor must have worked over a Jewish Christian document.

[9] Dr Alois Wurm's attempt (*Die Irrlehrer im ersten Johannesbriefe*, 1903) to read the references to errorists solely in the light of Jewish Christianity ignores or underrates several of the data. He is supported on the whole by Clemen, in Preuschen's *Zeitschrift* (1905), pp. 271–281. There is certainly an anti-Jewish touch, *e.g.* in the claim of iii. 1 (note the emphatic *ἡμῖν*), when one recollects the saying of Aqiba (Aboth iii. 12) and Philo's remark, *καὶ γὰρ εἰ μήπω ἱκανοι θεοῦ παῖδες νομίζεσθαι γεγόναμεν, ἀλλά τοι τῆς ἀειδοῦς εἰκόνος αὐτοῦ, λόγου τοῦ ἱερωτάτου· θεοῦ γὰρ εἰκὼν λόγος ὁ πρεσβύτατος* (*De conf. ling.* 28). But the antithesis of John and Cerinthus, unlike that of Paul and Cerinthus (Epiph. *Haer.* xxviii.), is too well based in the tradition of the early Church to be dismissed as a later dogmatic reflection, and the internal evidence of this manifesto corroborates it clearly.

The curious idea, mentioned by Augustine (*Quaest. evang.* ii. 39), that the writing was addressed *ad Parthos*, has been literally taken by several Latin fathers and later writers (*e.g.* Grotius, Paulus, Hammond), but this title probably was a corruption of *ad sparsos* (Wetstein, Wegschneider) or of *πρὸς παρθένους* (Whiston: the Christians addressed as virgin, *i.e.* free from heresy), if not of *παρθένος*, as applied in early tradition to John the apostle. The circle for which the homily was meant was probably, in the first instance, that of the Fourth Gospel, but it is impossible to determine whether the epistle preceded or followed the larger treatise. The division of opinion on this point (cf. J. Moffat, *Historical New Testament*, 1901, p. 534) is serious, but the evidence for either position is purely subjective. There are sufficient peculiarities of style and conception[1] to justify provisionally some hesitation on the matter of the authorship. The epistle may have been written by a different author, or, from a more popular standpoint, by the author of the gospel, possibly (as some critics hold) by the author of John xxi. But *res lubrica, opinio incerta*.

It is unsafe to lay much stress upon the apparent reminiscence of iv. 2-3 (or of 2 John 7) in Polycarp, *ad Phil.* 7 reading ἐληλυθότα instead of ἐληλυθέναι), though, if a literary filiation is assumed, the probability is that Polycarp is quoting from the epistle, not vice versa (as Volkmar contends, in his *Ursprung d. unseren Evglien* 47 seq.). But Papias is said by Eusebius (*H. E.* iii. 39) to have used ἡ Ἰωάννου προτέρα (= ἡ Ἰωάννου πρώτη, v. 8?), *i.e.* the anonymous tract, which, by the time of Eusebius, had come to be known as 1 John, and we have no reason to suspect or reject this statement, particularly as Justin Martyr, another Asiatic writer, furnishes clear echoes of the epistle (*Dial.* 123). The tract must have been in circulation throughout Asia Minor at any rate before the end of the first quarter of the 2nd century.[2] The *terminus a quo* is approximately the period of the Fourth Gospel's composition, but there is no valid evidence to indicate the priority of either, even upon the hypothesis that both came from the same pen. The aim of each is too special to warrant the conclusion that the epistle was intended to accompany or to introduce the gospel.

Literature.—The most adequate modern editions of the three epistles are by Westcott (3rd ed., 1892), H. J. Holtzmann (*Hand-Commentar zum N. T.*, 3rd ed., 1908), B. Weiss (in Meyer, 6th ed., 1900), Baljon (1904) and J. E. Belser (Freiburg im Breisgau, 1906). Briefer English notes are furnished by W. Alexander (*Speaker's Commentary*, 1881), W. H. Bennett (*Century Bible*, 1901) and H. P. Forbes (*Internat. Handbooks to New Testament*, vol. iv. 1907), while Plummer has a concise edition of the Greek text (in *The Cambridge Greek Testament*, 1886). Huther's edition (in Meyer, 1880) has been translated into English (Edinburgh, 1882), like Rothe's (1878) invaluable commentary on the first epistle (cf. *Expository Times*, vols. iii. v.). Otto Baumgarten's popular edition in *Die Schriften des N.T.* (1907) is, like that of Forbes, written from practically the same standpoint as Holtzmann's. The earlier commentaries of Alford (2nd ed., 1862), C. A. Wolf (2nd ed., 1885), Ewald (*Die Joh. Briefe übersetzt und erklaert*, Göttingen, 1861–1862), and Lücke (3rd ed., revised by Bertheau, 1856) still repay the reader, and among previous editions those of W. Whiston (*Comm. on St John's Three Catholic Epistles*, 1719) and de Wette (1837, &c.) contain material of real exegetical interest. Special editions of the first epistle have been published by John Cotton (London, 1655), Neander (1851; Eng. trans. New York, 1853), E. Haupt (1869; Eng. trans. 1879), Lias (1887) and C. Watson (1891, expository) among others. Special studies by F. H. Kern (*De epistolae Joh. consilio*, Tübingen, 1830), Erdmann (*Primae Joh. epistolae argumentum, nexus et consilium*, Berlin, 1855), C. E. Luthardt (De *primae Joannis epistolae compositione*, 1860), J. Stockmeyer (*Die Structur des ersten Joh. Briefes*, Basel, 1873) and, most elaborately, by H. J. Holtzmann (*Jahrb. für protest. Theologie*, 1881, pp. 690 seq.; 1882, pp. 128 seq., 316 seq., 460 seq.). To the monographs already noted in the course of this article may be added the essays by Wiesinger (*Studien und Kritiken*, 1899, pp. 575 seq.) and Wohlenberg ("Glossen zum ersten Johannisbrief," *Neue Kirchliche Zeitschrift*, 1902, pp. 233 seq., 632 seq.). On 2 John there are special commentaries and studies by Ritmeier (*De electa domina*, 1706), C. A. Kriegele (*De κυρία Johannis*, 1758), Carpzov (*Theolog. exegetica*, pp. 105–208), H. G. B. Müller (*Comment. in secundam epistolam Joannis*, 1783), C. Klug (*De authentia*, &c., 1823), J. Rendel Harris (*Expositor*, 6th series, 1901, pp. 194 seq.), W. M. Ramsay (ibid., pp. 354 seq.) and Gibbins (ibid., 1902, pp. 228–236), while, in addition to Hermann's *Comment. in Joan. ep. III.* (1778), P. L. Gachon (*Authenticité de la deuxième et troisième épîtres de Jean*, 1851), Poggel (*Der zweite und dritte Briefe d. Apostel Johannis*, 1896), and Chapman (*Journal of Theological Studies*, 1904, "The Historical Setting of the Second and the Third Epistles of St John"), have discussed both of the minor epistles together. General studies of all three are furnished by H. J. Holtzmann in Schenkel's *Bibel-Lexicon*, iii. 342–352, Sabatier (*Encyclop. des sciences religieuses*, vii. 177 seq.), S. Cox (*The Private Letters of St Paul and St John*, 1867), Farrar (*Early Days of Christianity*, chs. xxxi., xxxiv. seq.), Gloag (*Introduction to Catholic Epistles*, 1887, pp. 256–350), S. D. F. Salmond in Hasting's *Dict. Bible* (vol. ii), G. H. Gilbert (*The First Interpreters of Jesus*, 1901, pp. 301–332), and V. Bartlet (*The Apostolic Age*, 1900, pp. 418 seq.; from a more advanced critical position by Cone (*The Gospel and its Earliest Interpretations*, 1893, pp. 320–327), P. W. Schmiedel (*Ency. Bib.*, 2556–2562, also in a pamphlet, *Evangelium, Briefe, und Offenbarung des Johannes*, 1906; Eng. trans. 1908), J. Réville (*Le Quatrième Evangile*, 1901, pp. 49 seq.) and Pfleiderer (*Das Urchristentum*, 2nd ed., 1902, pp. 390 seq.). The problem of the epistles is discussed incidentally by many writers on the Fourth Gospel, as well as by writers on New Testament introduction like Zahn, Jacquier, Barth and Belser, on the Conservative side, and Hilgenfeld, Jülicher and von Soden on the Liberal. On the older Syriac version of 2 and 3 John, see Gwynn's article in *Hermathena* (1890), pp. 281 seq. On the general reception of the three epistles in the early Church, Zahn's paragraphs (in his *Geschichte d. N. T. Kanons*, i. 209 seq., 374 seq., 905 seq.; ii. 48 seq., 88 seq.) are the most adequate. (J. Mt.)

JOHN, GOSPEL OF ST, the fourth and latest of the Gospels, in the Bible, and, next to that of St Mark, the shortest. The present article will first describe its general structure and more obvious contents; compare it with the Synoptic Gospels; and draw out its leading characteristics and final object. It will then apply the tests thus gained to the narratives special to this Gospel; and point out the book's special difficulties and limits, and its abiding appeal and greatness. And it will finally consider the questions of its origin and authorship.

Analysis of Contents.—The book's chief break is at xiii. 1, the solemn introduction to the feet-washing: all up to here reports Jesus' signs and apologetic or polemical discourses to the outer world; hence onwards it pictures the manifestation of His glory to the inner circle of His disciples. These two parts contain three sections each.

1. (i.) Introduces the whole work (i. 1–ii. 11). (*a*) The prologue, i. 1–18. The Logos existed before creation and time; was with the very God and was God; and all things were made through Him. For in this Logos is Life, and this Life is a Light which, though shining in darkness, cannot be suppressed by it. This true Light became flesh and tabernacled amongst us; and we beheld His glory, as of an Only-Begotten from the Father, full of grace and truth. John the Baptist testified concerning Him, the Logos-Light and Logos-Life incarnate; but this Logos alone, who is in the bosom of the Father, hath declared the very God. (*b*) The four days' work (i. 19–51). On the first three days John declares that he is not the Christ, proclaims Jesus to be the Christ, and sends his own disciples away to Jesus. On the fourth day, Jesus Himself calls Philip and Nathanael. (*c*) The seventh day's first manifestation of the Incarnate Light's glory (ii. 1–11); Jesus at Cana turns water into wine.

(ii.) Records the manifestations of the Light's and Life's glory and power to friend and foe (ii. 22–vi. 71). (*d*) Solemn inauguration of the Messianic ministry (ii. 12–iii. 21): cleansing of the Temple and prophecy of His resurrection; discourse to Nicodemus on baptismal regeneration. (*e*) Three scenes in Judea, Samaria, Galilee respectively (iii. 32–iv. 54): the Baptist's second testimony; Jesus' discourse with the woman at the well concerning the spiritual, universal character of the new religion; and cure of the ruler's son, the reward of faith in the simple word of Jesus. (*f*) Manifestation of Jesus as the vivifying Life-Logos and its contradiction in Judea, v.: the paralytic's cure. (*g*) Manifestation of Jesus as the heaven-descended living Bread and its contradiction in Galilee, vi.: multiplication of the loaves; walking on the waters; and His discourse on the holy Eucharist.

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[1] "The style is not flowing and articulated; the sentences come like minute-guns, as they would drop from a natural Hebrew. The writer moves, indeed, amidst that order of religious ideas which meets us in the Fourth Gospel, and which was that of the Greek world wherein he found himself. He moves amongst these new ideas, however, not with the practised felicity of the evangelist, but with something of helplessness, although the depth and serene beauty of his spirit give to all he says an infinite impressiveness and charm" (M. Arnold; *God and the Bible*, ch. vi.).

[2] By the end of the 2nd century it appears to have been fairly well-known, to judge from Origen, Irenaeus (iii. 16, 8), and Clement of Alexandria (*Stran.* ii. 15, 66). In the Muratorian canon, which mentions two epistles of John, it seems to be reckoned (cf. Kuhn, *Das Murat. Fragment*, pp. 58 f.) as an appendix or sequel to the Fourth Gospel. The apparent traces of its use in Ignatius (cf. *Smyrn.* vi. 2 = 1 John iii. 17; *Smyrn.* vii = 1 John iii. 14, and *Eph.* xviii. = 1 John v. 6) seem too insecure, of themselves, to warrant any hypothesis of filiation.

(iii.) Acute conflict between the New Light and the old darkness (vii.–xii). (*h*) Self-manifestation of the Logos-Light in the Temple (vii. 1–x. 39). Journey to the feast of tabernacles; invitation to the soul athirst to come to Him (the fountain of Life) and drink, and proclamation of Himself as the Light of the world; cure of the man born blind; allegory of the good shepherd. The allegory continued at the feast of the dedication. They strive to stone or to take Him. (*i*) The Logos-Life brings Lazarus to life; effects of the act (x. 40–xii. 50). Jesus withdraws beyond Jordan, and then comes to Bethany, His friend Lazarus being buried three days; proclaims Himself the Resurrection and the Life; and calls Lazarus back to life. Some who saw it report the act to the Pharisees; the Sanhedrim meets, Caiaphas declares that one man must die for the people, and henceforward they ceaselessly plan His death. Jesus withdraws to the Judaean desert, but soon returns, six days before Passover, to Bethany; Mary anoints Him, a crowd comes to see Him and Lazarus, and the hierarchs then plan the killing of Lazarus also. Next morning He rides into Jerusalem on an ass's colt. Certain Greeks desire to see Him: He declares the hour of His glorification to have come: "Now My soul is troubled. . . . Father, save Me from this hour. But for this have I come unto this hour: Father, glorify Thy Name." A voice answers, "I have glorified it and will glorify it again": some think that an angel spoke; but Jesus explains that this voice was not for His sake but for theirs. When lifted up from earth, He will draw all men to Himself; they are to believe in Him, the Light. The writer's concluding reflection: the small success of Jesus' activity among the Jews. Once again He cries: "I am come a Light into the world, that whoso believeth in Me should not abide in darkness."

2. The Logos-Christ's manifestation of His life and love to His disciples, during the last supper, the passion, the risen life (xiii.–xx).

(iv.) The Last Supper (xiii.–xvii.) (*j*) Solemn washing of the disciples' feet; the beloved disciple; designates the traitor; Judas goes forth, it is night (xiii. 1–30). (*k*) Last discourses, first series (xiii. 31–xiv. 31): the new commandment, the other helper; "Arise, let us go hence." Second series (xv. 1–xvi. 33): allegory of the true vine; "Greater love than this hath no man, that he lay down his life for his friend"; the world's hatred; the spirit of truth shall lead them into all truth; "I came forth from the Father and am come into the world, again I leave the world and go to the Father"; "Be of good cheer, I have overcome the world." (*l*) The high-priestly prayer (xvii). "Father, glorify Thy Son . . . with the glory which I had with Thee before the world was . . . that to as many as Thou hast given Him, He should give eternal life." "I pray for them, I pray not for the world. I pray also for them that shall believe in Me through their word, that they may be all one, as Thou Father art in Me, and I in Thee."

(v.) The Passion (xviii. xix.). (*m*) In the garden: the Roman soldiers come to apprehend Him, fall back upon the ground at His declaration "I am He." Peter and Malchus. (*n*) Before Annas at night and Caiaphas at dawn; Peter's denials (xviii. 12–27). (*o*) Before Pilate (xviii. 28–40). Jesus declares, "My kingdom is not of this world. I have come into the world that I may bear witness to the truth: everyone that is of the truth, heareth My voice"; Pilate asks sceptically "What is truth?" and the crowd prefers Barabbas. (*p*) The true king presented to the people as a mock-king; His rejection by the Jews and abandonment to them (xix. 1–16). (*q*) Jesus carries His cross to Golgotha, and is crucified there between two others; the cross's title and Pilate's refusal to alter it (xix. 17–22). (*r*) The soldiers cast lots upon His garments and seamless tunic; His mother with two faithful women and the beloved disciple at the cross's foot; His commendation of His mother and the disciple to each other; His last two sayings in deliberate accomplishment of scripture "I thirst," "It is accomplished." He gives up the spirit; His bones remain unbroken; and from His spear-lanced side blood and water issue (xix. 23–37). (*s*) The two nobles, Joseph of Arimathaea and Nicodemus, bind the dead body in a winding sheet with one hundred pounds of precious spices, and place it in a new monument in a near garden, since the sabbath is at hand.

(vi.) The risen Jesus, Lord and God (xx.). (*t*) At early dawn on the first day of the week, Mary Magdalen, finding the stone rolled away from the monument, runs to tell Peter and the beloved disciple that the Lord's body has been removed. Peter and the other disciple run to the grave; the latter, arriving first, enters only after Peter has gone in and noted the empty grave-clothes—enters and believes. After their departure, Mary sees two angels where His body had lain and turning away beholds Jesus standing, yet recognizes Him only when He addresses her. He bids her "Do not touch Me, for I have not yet ascended"; but to tell His brethren "I ascend to My Father and to your Father, to My God and to your God." And she does so. (*u*) Second apparition (xx. 19–23). Later on the same day, the doors being shut, Jesus appears amongst His disciples, shows them His (pierced) hands and side, and solemnly commissions and endows them for the apostolate by the words, "As the Father hath sent Me, so I send you," and by breathing upon them saying "Receive the Holy Spirit: whose sins ye remit, they are remitted to them; whose sins ye retain, they are retained." (*v*) Third apparition and culminating saying; conclusion of entire book (xx. 24–31). Thomas, who had been absent, doubts the resurrection; Jesus comes and submits to the doubter's tests. Thomas exclaims, "My Lord and my God"; but Jesus declares "Blessed are they that have not seen and yet have believed." "Now Jesus," concludes the writer, "did many other signs, . . . but these are written, that ye may believe that Jesus is the Christ, the Son of God, and that believing ye may have life in His name."

The above analysis is rough, since even distantly placed sections, indeed the two parts themselves, are interrelated by delicate complex references on and back. And it omits the account of the adulteress (vii. 53–viii. 11): (a valuable report of an actual occurrence which probably belonged to some primitive document otherwise incorporated by the Synoptists), because it is quite un-Johannine in vocabulary, style and character, intercepts the Gospel's thread wherever placed, and is absent from its best MSS. It also omits xxi. This chapter's first two stages contain an important early historical document of Synoptic type: Jesus' apparition to seven disciples by the Lake of Galilee and the miraculous draught of fishes; and Peter's threefold confession and Jesus' threefold commission to him. And its third stage, Jesus' prophecies to Peter and to the beloved disciple concerning their future, and the declaration "This is the disciple who testifies to these things and who has written them, and we know that his testimony is true," is doubtless written by the redactor of the previous two stages. This writer imitates, but is different from, the great author of the first twenty chapters.

Comparison with the Synoptists.—The following are the most obvious differences between the original book and the Synoptists. John has a metaphysical prologue; Matthew and Luke have historical prologues; and Mark is without any prologue. The earthly scene is here Judea, indeed Jerusalem, with but five breaks (vi. 1–vii. 10) is the only long one; whilst over two-thirds of each Synoptist deal with Galilee or Samaria. The ministry here lasts about three and a half years (it begins some months before the first Passover, ii. 13; the feast of v. 1 is probably a second; the third occurs vi. 4; and on the fourth, xi. 55, He dies): whilst the Synoptists have but the one Passover of His death, after barely a year of ministry. Here Jesus' teaching contains no parables and but three allegories, the Synoptists present it as parabolic through and through. Here not one exorcism occurs; in the Synoptists the exorcisms are as prominent as the cures and the preaching. John has, besides the passion, seven accounts in common with the Synoptists: the Baptist and Jesus, (i. 19–34); cleansing of the Temple (ii. 13–16); cure of the centurion's (ruler's) servant (son) (iv. 46–54); multiplication of the loaves (vi. 1–13); walking upon the water (vi. 16–21); anointing at Bethany, (xii. 1–8); entry into Jerusalem (xii. 12–16): all unique occurrences. In the first, John describes how the Baptist, on Jesus' approach, cries "Behold the Lamb of God, which taketh away the sins of the world"; and how he says "I saw the spirit descending upon Him, and I bore witness that this is the Son of God." But the Synoptists, especially Mark, give the slow steps in even the apostles' realization of Jesus' Messianic character; only at Caesarea Philippi Simon alone, for the first time, clearly discerns it, Jesus declaring that His Father has revealed it to Him, and yet Simon is still scandalized at the thought of a suffering Messiah (Mark viii. 28–34). Only some two weeks before the end is He proclaimed Messiah at Jericho (x. 46–48); then in Jerusalem, five days before dying for this upon the cross (xi. 1–10, xv. 37). As to the Baptist, in all three Synoptists, he baptizes Jesus, and in Mark i. 10, 11 it is Jesus who sees the Spirit descending upon Himself on His emerging from beneath the water, and it is to Himself that God's voice is addressed; in John, Jesus' baptism is ignored, only the Spirit remains hovering above Him, as a sign for the Baptist's instruction. And in Matt. xi. 2–6, the Baptist, several months after the Jordan scene, sends from his prison to ascertain if Jesus is indeed the Messiah; in John, the Baptist remains at large so as again (iii. 22–36) to proclaim Jesus' heavenly provenance. The cleansing of the Temple occurs in the Synoptists four days before His death, and instantly determines the hierarchs to seek His destruction (Mark xi. 15–18); John puts it three years back, as an appropriate frontispiece to His complete claims and work.

The passion-narratives reveal the following main differences. John omits, at the last supper, its central point, the great historic act of the holy eucharist, carefully given by the Synoptists and St Paul, having provided a highly doctrinal equivalent in the discourse on the living bread, here spoken by Jesus in Capernaum over a year before the passion (vi. 4), the day after the multiplication of the loaves. This transference is doubtless connected with the change in the relations between the time of the Passover meal and that of His death: in the Synoptists, the Thursday evening's supper is a true Passover meal, the lamb had been slain that afternoon and Jesus dies some twenty-four hours later; in John, the supper is not a Passover-meal, the Passover is celebrated on Friday, and Jesus, proclaimed here from the first, the Lamb of God, dies whilst the paschal lambs, His prototypes, are being slain. The scene in the garden is without the agony of Gethsemane; a faint echo of this historic anguish appears in the scene with the Greeks four days earlier, and even that peaceful appeal to, and answer of, the Father occurs only for His followers’ sakes. In the garden Jesus here Himself goes forth to meet His captors, and these fall back upon the ground, on His revealing Himself as Jesus of Nazareth. The long scenes with Pilate culminate in the great sayings concerning His kingdom not being of this world and the object of this His coming being to bear witness to the truth, thus explaining how, though affirming kingship (Mark xv. 2) He could be innocent. In John He does not declare Himself Messiah before the Jewish Sanhedrin (Mark xiv. 61) but declares Himself supermundane regal witness to the truth before the Roman governor. The scene on Calvary differs as follows: In the Synoptists the soldiers divide His garments among them, casting lots (Mark xv. 24); in John they make four parts of them and cast lots concerning His seamless tunic, thus fulfilling the text, “They divided My garments among them and upon My vesture they cast lots”: the parallelism of Hebrew poetry, which twice describes one fact, being taken as witnessing to two, and the tunic doubtless symbolizing the unity of the Church, as in Philo the high priest’s seamless robe symbolizes the indivisible unity of the universe, expressive of the Logos (*De ebrietate*, xxi.). In the Synoptists, of His followers only women—the careful, seemingly exhaustive lists do not include His mother—remain, looking on “from afar” (Mark xv. 40); in John His mother stands with the two other Marys and the beloved disciple beneath the cross, and “from that hour the disciple took her unto his own (house),” while in the older literature His mother does not appear in Jerusalem till just before Pentecost, and with “His brethren” (Acts i. 14). And John alone tells how the bones of the dead body remained unbroken, fulfilling the ordinance as to the paschal lamb (Exod. xii. 46) and how blood and water flow from His spear-pierced side: thus the Lamb “taketh away the sins of the world” by shedding His blood which “cleanseth us from every sin”; and “He cometh by water and blood,” historically at His baptism and crucifixion, and mystically to each faithful soul in baptism and the eucharist. The story of the risen Christ (xx.) shows dependence on and contrast to the Synoptic accounts. Its two halves have each a negative and a positive scene. The empty grave (1–10) and the apparition to the Magdalen (11–18) together correspond to the message brought by the women (Matt. xxviii. 1–10); and the apparition to the ten joyously believing apostles (19–23) and then to the sadly doubting Thomas (24–29) together correspond to Luke xxiv. 36–43, where the eleven apostles jointly receive one visit from the risen One, and both doubt and believe, mourn and rejoice.

The Johannine discourses reveal differences from the Synoptists so profound as to be admitted by all. Here Jesus, the Baptist and the writer speak so much alike that it is sometimes impossible to say where each speaker begins and ends: *e.g.* in iii. 27–30, 31–36. The speeches dwell upon Jesus’ person and work, as we shall find, with a didactic directness, philosophical terminology and denunciatory exclusiveness unmatched in the Synoptist sayings. “This is eternal life, that they may know Thee the only true God and Jesus Christ whom Thou hast sent” (xvii. 3), is part of the high-priestly prayer; yet Père Calmes, with the papal censor’s approbation, says, “It seems to us impossible not to admit that we have here dogmatic developments explicable rather by the evangelist’s habits of mind than by the actual words of Jesus.” “I have told you of earthly things and you believe not; how shall ye believe if I tell you of heavenly things?” (iii. 12), and “Ye are from beneath, I am from above” (viii. 23), give us a Plato-(Philo-) like upper, “true” world, and a lower, delusive world. “Ye shall die in your sins” (viii. 21); “ye are from your father the devil” (viii. 44); “I am the door of the sheep, all they that came before Me are thieves and robbers,” (x. 7, 8); “they have no excuse for their sin” (xv. 22)—contrast strongly with the yearning over Jerusalem: “The blood of Abel the just” and “the blood of Zacharias son of Barachias” (Matt. xxiii. 35–37; and “Father, forgive them; for they know not what they do” Luke xxiii. 34). And whilst the Synoptist speeches and actions stand in loose and natural relation to each other, the Johannine deeds so closely illustrate the sayings that each set everywhere supplements the other: the history itself here tends to become one long allegory. So with the woman at the well and “the living water”; the multiplication of the loaves and “the living Bread”; “I am the Light of the world” and the blind man’s cure; “I am the Resurrection and the Life” and the raising of Lazarus; indeed even with the Temple-cleansing and the prophecy as to His resurrection, Nicodemus’s night visit and “men loved the darkness rather than the light,” the cure of the inoperative paralytic and “My Father and I work hitherto,” the walking phantom-like upon the waters (John vi. 15–21; Mark vi. 49), and the declaration concerning the eucharist, “the spirit it is that quickeneth” (John vi. 63). Only some sixteen Synoptic sayings reappear here; but we are given some great new sayings full of the Synoptic spirit.

Characteristics and Object.—The book’s character results from the continuous operation of four great tendencies. There is everywhere a readiness to handle traditional, largely historical, materials with a sovereign freedom, controlled and limited by doctrinal convictions and devotional experiences alone. There is everywhere the mystic’s deep love for double, even treble meanings: *e.g.* the “again” in iii. 2, means, literally, “from the beginning,” to be physically born again; morally, to become as a little child; mystically, “from heaven, God,” to be spiritually renewed. “Judgment” (κρίσις), in the popular sense, condemnation, a future act; in the mystical sense, discrimination, a present fact. There is everywhere the influence of certain central ideas, partly identical with, but largely developments of, those less reflectively operative in the Synoptists. Thus six great terms are characteristic of, or even special to, this Gospel. “The Only-Begotten” is most nearly reached by St Paul’s term “His own Son.” The “Word,” or “Logos,” is a term derived from Heracleitus of Ephesus and the Stoics, through the Alexandrian Jew Philo, but conceived here throughout as definitely personal. “The Light of the World” the Jesus-Logos here proclaims Himself to be; in the Synoptists He only declares His disciples to be such. “The Paraclete,” as in Philo, is a “helper,” “intercessor”; but in Philo he is the intelligible universe, whilst here He is a self-conscious Spirit. “Truth,” “the truth,” “to know,” have here a prominence and significance far beyond their Synoptic or even their Pauline use. And above all stand the uses of “Life,” “Eternal Life.” The living ever-working Father (vi. 57; v. 17) has a Logos in whom is Life (i. 4), an ever-working Son (v. 17), who declares Himself “the living Bread,” “the Resurrection and the Life,” “the Way, the Truth and the Life” (vi. 51; xi. 25; xiv. 16): so that Father and Son quicken whom they will (v. 21); the Father’s commandment is life everlasting, and Jesus’ words are spirit and life (xii. 50; vi. 63, 68). The term, already Synoptic, takes over here most of the connotations of the “Kingdom of God,” the standing Synoptic expression, which appears here only in iii. 3–5; xviii. 36. Note that the term “the Logos” is peculiar to the Apocalypse (xix. 13), and the prologue here; but that, as Light and Life, the Logos-conception is present throughout the book. And thus there is everywhere a striving to contemplate history *sub specie aeternitatis* and to englobe the successiveness of man in the simultaneity of God.

Narratives Peculiar to John.—Of his seven great symbolical, doctrinally interpreted “signs,” John shares three, the cure of the ruler’s son, the multiplication of the loaves, the walking on the waters, with the Synoptists: yet here the first is transformed almost beyond recognition; and the two others only typify and prepare the eucharistic discourse. Of the four purely Johannine signs, two—the cures of the paralytic (v. 1–16), and of the man born blind (ix. 1–34)—are, admittedly, profoundly symbolical. In the first case, the man’s physical and spiritual lethargy are closely interconnected and strongly contrasted with the ever-active God and His Logos. In the second case there is also the closest parallel between physical blindness cured, and spiritual darkness dispelled, by the Logos-Light as described in the accompanying discourse. Both narratives are doubtless based upon actual occurrences—the cures narrated in Mark ii., iii., viii., x. and scenes witnessed by the writer in later times; yet here they do but picture our Lord’s spiritual work in the human soul achieved throughout Christian history. We cannot well claim more than these three kinds of reality for the first and the last signs, the miracle at Cana and the resurrection of Lazarus.

For the marriage-feast sign yields throughout an allegorical meaning. Water stands in this Gospel for what is still but symbol; thus the water-pots serve here the external Jewish ablutions—old bottles which the “new wine” of the Gospel is to burst (Mark ii. 22). Wine is the blood of the new covenant, and He will drink the fruit of the vine new in the Kingdom of God (Mark xiv. 23–25); the vineyard where He Himself is the true Vine (Mark xii. 1; John xv. 1). And “the kingdom of heaven is like to a marriage-feast” (Matt. xxii. 2); Jesus is the Bridegroom (Mark ii. 19); “the marriage of the Lamb has come” (Rev. xix. 7). “They have no wine”: the hopelessness of the old conditions is announced here by the true Israel, the Messiah’s spiritual mother, the same “woman” who in Rev. xii. 2, 5 “brought forth a man-child who was to rule all nations.” Cardinal Newman admits that the latter woman “represents the church, this is the real or direct sense”; yet as her man-child is certainly the Messiah, this church must be the faithful Jewish church. Thus also the "woman" at the wedding and beneath the cross stands primarily for the faithful Old Testament community, corresponding to the beloved disciple, the typical New Testament follower of her Son, the Messiah: in each case the devotional accommodation to His earthly mother is equally ancient and legitimate. He answers her "My hour is not yet come," *i.e.* in the symbolic story, the moment for working the miracle; in the symbolized reality, the hour of His death, condition for the spirit's advent; and "what is there between Me and thee?" *i.e.* "My motives spring no more from the old religion," words devoid of difficulty, if spoken thus by the Eternal Logos to the passing Jewish church. The transformation is soon afterwards accomplished, but in symbol only; the "hour" of the full sense is still over three years off. Already Philo says "the Logos is the master of the spiritual drinking-feast," and "let Melchisedeck"—the Logos—"in lieu of water offer wine to souls and inebriate them" (*De somn.* ii. 37; *Legg. all.* iii. 26). But in John this symbolism figures a great historic fact, the joyous freshness of Jesus' ministerial beginnings, as indicated in the sayings of the Bridegroom and of the new wine, a freshness typical of Jesus' ceaseless renovation of souls.

The raising of Lazarus, in appearance a massive, definitely localized historical fact, requires a similar interpretation, unless we would, in favour of the direct historicity of a story peculiar to a profoundly allegorical treatise, ruin the historical trustworthiness of the largely historical Synoptists in precisely their most complete and verisimilar part. For especially in Mark, the passing through Jericho, the entry into Jerusalem, the Temple-cleansing and its immediate effect upon the hierarchs, their next day's interrogatory, "By what authority doest thou these things?" *i.e.* the cleansing (x. 46–xi. 33), are all closely interdependent and lead at once to His discussions with His Jerusalem opponents (xii. xiii.), and to the anointing, last supper, and passion (xiv. xv). John's last and greatest symbolic sign replaces those historic motives, since here it is the raising of Lazarus which determines the hierarchs to kill Jesus (xi. 46–52), and occasions the crowds which accompany and meet Him on His entry (xii. 9–19). The intrinsic improbabilities of the narrative, if taken as direct history, are also great: Jesus' deliberate delay of two days to secure His friend's dying, and His rejoicing at the death, since thus He can revivify His friend and bring His disciples to believe in Himself as the Life; His deliberate weeping over the death which He has thus let happen, yet His anger at the similar tears of Lazarus's other friends; and His praying, as He tells the Father in the prayer itself, simply to edify the bystanders: all point to a doctrinal allegory. Indeed the climax of the whole account is already reached in Jesus' great saying: "I am the Resurrection and the Life; he that believeth in Me . . . shall not die for ever," and in Martha's answer: "I believe that Thou art the Christ, the Son of God, who hast come into the world" (xi. 26, 27); the sign which follows is but the pictorial representation of this abiding truth. The materials for the allegory will have been certain Old Testament narratives, but especially the Synoptic accounts of Jesus' raisings of Jairus's daughter and of the widow's son (Mark v.; (Luke vii.). Mary and Martha are admittedly identical with the sisters in Luke x. 38–42; and already some Greek fathers connect the Lazarus of this allegory with the Lazarus of the parable (Luke xvi. 19–31). In the parable Lazarus returns not to earth, since Abraham foresees that the rich man's brethren would disbelieve even if one rose from the dead; in the corresponding allegory, Lazarus does actually return to life, and the Jews believe so little as to determine upon killing the very Life Himself.

Special Difficulties and Special Greatness.—The difficulties, limitations and temporary means special to the book are closely connected with its ready appeal and abiding power; let us take both sets of things together, in three couples of interrelated price and gift.

The book's method and form are pervadingly allegorical; its instinct and aim are profoundly mystical. Now from Philo to Origen we have a long Hellenistic, Jewish and Christian application of that all-embracing allegorism, where one thing stands for another and where no factual details resist resolution into a symbol of religious ideas and forces. Thus Philo had, in his life of Moses, allegorized the Pentateuchal narratives so as to represent him as mediator, saviour, intercessor of his people, the one great organ of revelation, and the soul's guide from the false lower world into the upper true one. The Fourth Gospel is the noblest instance of this kind of literature, of which the truth depends not on the factual accuracy of the symbolizing appearances but on the truth of the ideas and experiences thus symbolized. And Origen is still full of spontaneous sympathy with its pervading allegorism. But this method has lost its attraction; the Synoptists, with their rarer and slighter pragmatic rearrangements and their greater closeness to our Lord's actual words, deeds, experiences, environment, now come home to us as indefinitely richer in content and stimulative appeal. Yet mysticism persists, as the intuitive and emotional apprehension of the most specifically religious of all truths, viz. the already full, operative existence of eternal beauty, truth and goodness, of infinite Personality and Spirit independently of our action, and not, as in ethics, the simple possibility and obligation for ourselves to produce such-like things. And of this elemental mode of apprehension and root-truth, the Johannine Gospel is the greatest literary document and incentive extant: its ultimate aim and deepest content retain all their potency.

The book contains an intellectualist, static, determinist, abstractive trend. In Luke x. 25–28, eternal life depends upon loving God and man; here it consists in knowing the one true God and Christ whom He has sent. In the Synoptists, Jesus "grows in favour with God and man," passes through true human experiences and trials, prays alone on the mountain-side, and dies with a cry of desolation; here the Logos' watchword is "I am," He has deliberately to stir up emotion in Himself, never prays for Himself, and in the garden and on the cross shows but power and self-possession. Here we find "ye cannot hear, cannot believe, because ye are not from God, not of My sheep" (viii. 47, x. 26); "the world cannot receive the spirit of truth" (xiv. 17). Yet the ethical current appears here also strongly: "he who doeth the truth, cometh to the light" (iii. 21), "if you love Me, keep My commandments" (xiv. 15). Libertarianism is here: "the light came, but men loved the darkness better than the light," "ye will not come to Me" (iii. 19, v. 40); hence the appeal "abide in Me"—the branch can cease to be in Him the Vine (xv. 4, 2). Indeed even those first currents stand here for the deepest religious truths, the prevenience of God and man's affinity to Him. "Not we loved God (first), but He (first) loved us"; "let us love Him, because He first loved us" (1 John iv. 10, 19); "no man can come to Me, unless the Father draw him" (vi. 44), a drawing which effects a hunger and thirst for Christ and God (iv. 14, vi. 35). Thus man's spirit, ever largely but potential, can respond actively to the historic Jesus, because already touched and made hungry by the all-actual Spirit-God who made that soul akin unto Himself.

The book has an outer protective shell of acutely polemical and exclusive moods and insistences, whilst certain splendid Synoptic breadths and reconciliations are nowhere reached; but this is primarily because it is fighting, more consciously than they, for that inalienable ideal of all deepest religion, unity, even external and corporate, amongst all believers. The "Pneumatic" Gospel comes thus specially to emphasize certain central historical facts; and, the most explicitly institutional and sacramental of the four, to proclaim the most universalistic and developmental of all Biblical sayings. Here indeed Jesus will not pray for the world (xvii. 9); "ye shall die in your sins," He insists to His opponents (viii. 44, 24); it is the Jews generally who appear throughout as such; nowhere is there a word as to forgiving our enemies; and the commandment of love is designated by Jesus as His, as new, and as binding the disciples to "love one another" within the community to which He gives His "example" (xv. 12, xiii. 34, 15). In the Synoptists, the disciples' intolerance is rebuked (Mark ix. 38–41); Jesus' opposition is everywhere restricted to the Pharisees and the worldly Sadducees; He ever longs for the conversion of Jerusalem; the great double commandment of love is proclaimed as already formulated in the Mosaic law (Mark xii. 28–34); the neighbour to be thus loved and served is simply any and every suffering fellow-man; and the pattern for such perfect love is found in a schismatical Samaritan (Luke x. 25–37). Yet the deepest strain here is more serenely universalist even than St Paul, for here Jesus says: "God so loved the world, that He gave His only begotten Son, that whosoever believeth in Him should . . . have everlasting life" (iii. 16). True, the great prologue passage (i. 9) probably reads "He was the true Light coming into the world, that enlighteneth every man," so that the writer would everywhere concentrate his mind upon the grace attendant upon explicit knowledge of the incarnate, historic Christ. Yet Christian orthodoxy, which itself has, all but uniformly, understood this passage of the spiritual radiation throughout the world of the Word before His incarnation, has been aided towards such breadth as to the past by the Johannine outlook into the future. For, in contrast to the earliest Synoptic tradition, where the full Christian truth and its first form remain undistinguished, and where its earthly future appears restricted to that generation, in John the Eternal Life conception largely absorbs the attention away from all successiveness; Jesus' earthly life does not limit the religion's assimilation of further truth and experience: "I have many things to tell you, but you cannot bear them now," "the Father will give you another Helper, the spirit of truth, who will abide with you for ever" (xvi. 12, xiv. 15). This universalism is not simply spiritual; the external element, presupposed in the Synoptists as that of the Jewish church within which Jesus' earthly life was spent, is here that of the now separate Christian community: He has other sheep not of this fold—them also He must bring, there will be one fold, one shepherd; and His seamless tunic, and Peter's net which, holding every kind of fish, is not rent, are symbols of this visible unity. Ministerial gradations exist in this church; Jesus begins the feet-washing with Peter, who alone speaks and is spoken to; the beloved disciple outruns Peter to Jesus' monument, yet waits to go in till Peter has done so first; and in the appendix the treble pastoral commission is to Peter alone: a Petrine pre-eminence which but echoes the Synoptists. And sacramentalism informs the great discourses concerning rebirth by water and the spirit, and feeding on the Living Bread, Jesus' flesh and blood, and the narrative of the issue of blood and water from the dead Jesus' side. Indeed so severe a stress is laid upon the explicitly Christian life and its specific means, that orthodoxy itself interprets the rebirth by water and spirit, and the eating the flesh and drinking the blood to which entrance into the Kingdom and possession of interior life are here exclusively attached, as often represented by a simple sincere desire and will for spiritual purification and a keen hunger and thirst for God's aid, together with such cultual acts as such souls can know or find, even without any knowledge of the Christian rites. Thus there is many "a pedagogue to Christ," and the Christian visible means and expressions are the culmination and measure of what, in various degrees and forms, accompanies every sincerely striving soul throughout all human history.

Origin and Authorship.—The question as to the book's origin has lost its poignancy through the ever-increasing recognition of the book's intrinsic character. Thus the recent defenders of the apostolic authorship, the Unitarian James Drummond (1903), the Anglican William Sanday (1905), the Roman Catholic Theodore Calmes (1904), can tell us, the first, that "the evangelist did not aim at an illustrative picture of what was most characteristic of Jesus"; the second, that "the author sank into his own consciousness and at last brought to light what he found there"; the third, that "the Gospel contains an entire theological system," "history is seen through the intervening dogmatic development," "the Samaritan woman is . . . a personification," "the behaviour of the Greeks is entirely natural in such a book." We thus get at cross-purposes with this powerful, profound work. Only some such position as Abbé Loisy's critical summing up (1903) brings out its specific greatness. "What the author was, his book, in spite of himself, tells us to some extent: a Christian of Judeo-Alexandrine formation; a believer without, apparently, any personal reminiscence of what had actually been the life, preaching and death of Jesus; a theologian far removed from every historical preoccupation, though he retains certain principal facts of tradition without which Christianity would evaporate into pure ideas; and a seer who has lived the Gospel which he propounds." "To find his book beautiful and true, we need but take it as it is and understand it." "The church, which has never discussed the literary problem of this Gospel, in nowise erred as to its worth."

Several traditional positions have indeed been approximately maintained or reconquered against the critics. As to the Gospel's date, critics have returned from 160–170 (Baur), 150 (Zeller), 130 (Keim), to 110–115 (Renan) and 80–110 (Harnack): since Irenaeus says its author lived into the times of Trajan (90–117), a date somewhere about 105 would satisfy tradition. As to the place, the critics accept proconsular Asia with practical unanimity, thus endorsing Irenaeus's declaration that the Gospel was published in Ephesus. As to the author's antecedents, critics have ceased to hold that he could not have been a Jew-Christian (so Bretschneider, 1820), and admit (so Schmiedel, (1901) that he must have been by birth a Jew of the Dispersion, or the son of Christian parents who had been such Jews. And as to the vivid accuracy of many of his topographical and social details, the predominant critical verdict now is that he betrays an eye-witness's knowledge of the country between Sichem and Jordan and as to Jerusalem; he will have visited these places, say in 90, or may have lived in Jerusalem shortly before its fall. But the reasons against the author being John the Zebedean or any other eyewitness of Jesus' earthly life have accumulated to a practical demonstration.

As to the external evidence for the book's early date, we must remember that the Epistle to the Hebrews and the Book of Revelation, though admittedly earlier, are of the same school, and, with the great Pauline Epistles, show many preformations of Johannine phrases and ideas. Other slighter prolusions will have circulated in that Philonian centre Ephesus, before the great Gospel englobed and superseded them. Hence the precariousness of the proofs derived from more or less close parallels to Johannine passages in the apostolic fathers. Justin Martyr (163–167) certainly uses the Gospel; but his conception of Jesus' life is so strictly Synoptic that he can hardly have accepted it as from an apostolic eyewitness. Papias of Hierapolis, in his *Exposition of the Lord's Sayings* (145–160) appears nowhere to have mentioned it, and clearly distinguishes between "what Andrew, Peter, . . . John or Matthew or any other of the Lord's disciples spoke," and "what Aristion and the presbyter John, the Lord's disciples, say." Thus Papias, as Eusebius about 314 insists, knew two Johns, and the apostle was to him a far-away figure; indeed early medieval chroniclers recount that Papias "in the second book of the Lord's sayings" asserted that both the sons of Zebedee were "slain by Jews," so that the apostle John would have died before 70. Irenaeus's testimony is the earliest and admittedly the strongest we possess for the Zebedean authorship; yet, as Calmes admits, "it cannot be considered decisive." In his work against the Heresies and in his letter to Florinus, about 185–191, he tells how he had himself known Bishop Polycarp of Smyrna, and how Polycarp "used to recount his familiar intercourse with John and the others who had seen the Lord"; and explicitly identifies this John with the Zebedean and the evangelist. But Irenaeus was at most fifteen when thus frequenting Polycarp; writes thirty-five to fifty years later in Lyons, admitting that he noted down nothing at the time; and, since his mistaken description of Papias as "a hearer of John" the Zebedean was certainly reached by mistaking the presbyter for the apostle, his additional words "and a companion of Polycarp" point to this same mistaken identification having also operated in his mind with regard to Polycarp. In any case, the very real and important presbyter is completely unknown to Irenaeus, and his conclusion as to the book's authorship resulted apparently from a comparison of its contents with Polycarp's teaching. If the presbyter wrote Revelation and was Polycarp's master, such a mistake could easily arise. Certainly Polycrates, bishop of Ephesus, made a precisely similar mistake when about 190 he described the Philip "who rests in Hierapolis" as "one of the twelve apostles," since Eusebius rightly identifies this Philip with the deacon of Acts xxi. A positive testimony for the critical conclusion is derived from the existence of a group of Asia Minor Christians who about 165 rejected the Gospel as not by John but by Cerinthus. The attribution is doubtless mistaken. But could Christians sufficiently numerous to deserve a long discussion by St Epiphanius in 374–377, who upheld the Synoptists, stoutly opposed the Gnostics and Montanists, and had escaped every special designation till the bishop nicknamed them the "Alogoi" (irrational rejectors of the Logos-Gospel), dare, in such a time and country, to hold such views, had the apostolic origin been incontestable? Surely not. The Alexandrian Clement, Tertullian, Origen, Eusebius, Jerome and Augustine only tell of the Zebedean what is traceable to stories told by Papias of others, to passages of Revelation and the Gospel, or to the assured fact of the long-lived Asian presbyter.

As to the internal evidence, if the Gospel typifies various imperfect or sinful attitudes in Nicodemus, the Samaritan woman and Thomas; if even the mother appears to symbolize faithful Israel: then, profoundly spiritual and forward-looking as it is, a type of the perfect disciple, not all unlike Clement's perfect "Gnostic," could hardly be omitted by it; and the precise details of this figure may well be only ideally, mystically true. The original work nowhere identifies this disciple with any particular historic figure. "He who saw" the lance-thrust "hath borne witness, and his witness is true," is asserted (xix. 35) of the disciple. Yet "to see" is said also of intuitive faith, "whoso hath seen Me, hath seen the Father" (xiv. 9); and "true" appears also in "the true Light," "the true Bread from heaven," as characterizing the realities of the upper, alone fully true world, and equals "heavenly" (iii. 12); thus a "true witness" testifies to some heavenly reality, and appeals to the reader's "pneumatic," *i.e.* allegorical, understanding.

Only in the appendix do we find any deliberate identification with a particular historic person: "this is the disciple who witnessed to and who wrote these things" (24) refers doubtless to the whole previous work and to "the disciple whom Jesus loved," identified here with an unnamed historic personage whose recent death had created a shock, evidently because he was the last of that apostolic generation which had so keenly expected the second coming (18–23). This man was so great that the writer strives to win his authority for this Gospel; and yet this man was not John the Zebedean, else why, now he is dead and gone, not proclaim the fact? If the dead man was John the presbyter—if this John had in youth just seen Jesus and the Zebedean, and in extreme old age had still seen and approved the Gospel—to attribute this Gospel to him, as is done here, would not violate the literary ethics of those times. Thus the heathen philosopher Iamblichus (d. *c.* 330) declares: "this was admirable" amongst the Neo-Pythagoreans "that they ascribed everything to Pythagoras; but few of them acknowledge their own works as their own" (*de Pythag. vita*, 198). And as to Christians, Tertullian about 210 tells how the presbyter who, in proconsular Asia, had "composed the *Acts of Paul and Thecla*" was convicted and deposed, for how could it be credible that Paul should confer upon women the power to "teach and baptize" as these *Acts* averred? The attribution as such, then, was not condemned.

The facts of the problem would all appear covered by the hypothesis that John the presbyter, the eleven being all dead, wrote the book of Revelation (its more ancient Christian portions) say in 69, and died at Ephesus say in 100; that the author of the Gospel wrote the first draft, here, say in 97; that this book, expanded by him, first circulated within a select Ephesian Christian circle; and that the Ephesian church officials added to it the appendix and published it in 110–120. But however different or more complicated may have been the actual origins, three points remain certain. The real situation that confronts us is not an unbroken tradition of apostolic eye-witnesses, incapable of re-statement with any hope of ecclesiastical acceptance, except by another apostolic eye-witness. On one side indeed there was the record, underlying the Synoptists, of at least two eye-witnesses, and the necessity of its preservation and transmission; but on the other side a profound double change had come over the Christian outlook and requirements. St Paul's heroic labours (30–64) had gradually gained full recognition and separate organization for the universalist strain in our Lord's teaching; and he who had never seen the earthly Jesus, but only the heavenly Christ, could even declare that Christ "though from the Jewish fathers according to the flesh" had died, "so that henceforth, even if we have known Christ according to the flesh, now we no further know Him thus," "the Lord is the Spirit," and "where the Spirit of the Lord is, there is liberty." And the Jewish church, within which Christianity had first lived and moved, ceased to have a visible centre. Thus a super-spatial and super-temporal interpretation of that first markedly Jewish setting and apprehension of the Christian truth became as necessary as the attachment to the original contingencies. The Fourth Gospel, inexplicable without St Paul and the fall of Jerusalem, is fully understandable with them. The attribution of the book to an eye-witness nowhere resolves, it everywhere increases, the real difficulties; and by insisting upon having history in the same degree and way in John as in the Synoptists, we cease to get it sufficiently anywhere at all. And the Fourth Gospel's true greatness lies well within the range of this its special character. In character it is profoundly "pneumatic"; Paul's super-earthly Spirit-Christ here breathes and speaks, and invites a corresponding spiritual comprehension. And its greatness appears in its inexhaustibly deep teachings concerning Christ's sheep and fold; the Father's drawing of souls to Christ; the dependence of knowledge as to Christ's doctrine upon the doing of God's will; the fulfilling of the commandment of love, as the test of true discipleship; eternal life, begun even here and now; and God a Spirit, to be served in spirit and in truth.

BIBLIOGRAPHY.—See also the independent discussion, under REVELATION, BOOK OF, of the authorship of that work. Among the immense literature of the subject, the following books will be found especially instructive by the classically trained reader: Origen's commentary, finished (only to John xiii. 33) in 235–237 (best ed. by Preuschen, 1903). St Augustine's *Tractatus in Joannis Ev. et Ep.*, about 416. The Spanish Jesuit Juan Maldonatus' Latin commentary, published 1596 (critical reprint, edited by Raich, 1874), a pathfinder on many obscure points, is still a model for tenacious penetration of Johannine ideas. Bretschneider's short *Probabilia de Evangelii . . . Joannis Apostoli indole et origine* (1820), the first systematic assault on the traditional attribution, remains unrefuted in its main contention. The best summing up and ripest fruit of the critical labour since then are Professor H. J. Holtzmann's *Handkommentar* (2nd ed., 1893) and the respective sections in his *Einleitung in d. N. T.* (3rd ed., 1892) and his *Lehrbuch der N. T. Theologie* (1897), vol. 2. Professor C. E. Luthardt's *St John, Author of the Fourth Gospel* (Eng. trans., with admirable bibliography by C. R. Gregory, 1875), still remains the best conservative statement. Among the few critically satisfactory French books, Abbé Loisy's *Le Quatrième évangile* (1903) stands pre-eminent for delicate psychological analysis and continuous sense of the book's closely knit unity; whilst Père Th. Calmes' *Évangile selon S. Jean* (1904) indicates how numerous are the admissions as to the book's character and the evidences for its authorship, made by intelligent Roman Catholic apologists with Rome's explicit approbation. In England a considerably less docile conservatism has been predominant. Bp Lightfoot's *Essays on . . . Supernatural Religion* (1874–1877; collected 1889) are often masterly conservative interpretations of the external evidence; but they leave this evidence still inconclusive, and the formidable contrary internal evidence remains practically untouched. Much the same applies to Bp Westcott's *Gospel according to St John* (1882), devotionally so attractive, and in textual criticism excellent. Dr James Drummond's *Inquiry into the Character and Authorship of the Fourth Gospel* (1903) does not, by its valuable survey of the external evidence, succeed in giving credibility to the eyewitness origin of such a book as this is admitted to be. Professor W. Sanday's slighter *Criticism of the Fourth Gospel* (1905) is in a similar position. Professor P. W. Schmiedel's article "John s. of Zebedee" in the *Ency. Bib.* (1901) is the work of a German of the advanced left. Dr E. A. Abbott's laborious *From Letter to Spirit* (1903), *Joannine Vocabulary* (1904) and *Grammar* (1906) overflow with statistical details and ever acute, often fanciful, conjecture. Professor F. C. Burkitt's *The Gospel History* (1906) vigorously sketches the book's dominant characteristics and true function. E. F. Scott's *The Fourth Gospel* (1906) gives a lucid, critical and religiously tempered account of the Gospel's ideas, aims, affinities, difficulties and abiding significance. (F. v. H.)

JOHN ALBERT (1459–1501), king of Poland, third son of Casimir IV. king of Poland and Elizabeth of Austria. As crown prince he distinguished himself by his brilliant victory over the Tatars at Kopersztyn in 1487. He succeeded his father in 1492. The loss of revenue consequent upon the secession of Lithuania placed John Albert at the mercy of the Polish Sejmiki or local diets, where the *szlachta*, or country gentry, made their subsidies dependent upon the king's subservience. Primarily a warrior with a strong taste for heroic adventure, John Albert desired to pose as the champion of Christendom against the Turks. Circumstances seemed, moreover, to favour him. In his brother Wladislaus, who as king of Hungary and Bohemia possessed a dominant influence in Central Europe, he found a counterpoise to the machinations of the emperor Maximilian, who in 1492 had concluded an alliance against him with Ivan III. of Muscovy, while, as suzerain of Moldavia, John Albert was favourably situated for attacking the Turks. At the conference of Leutschau in 1494 the details of the expedition were arranged between the kings of Poland and Hungary and the elector Frederick of Brandenburg, with the co-operation of Stephen, hospodar of Moldavia, who had appealed to John Albert for assistance. In the course of 1496 John Albert with great difficulty collected an army of 80,000 men in Poland, but the crusade was deflected from its proper course by the sudden invasion of Galicia by the hospodar, who apparently—for the whole subject is still very obscure—had been misled by reports from Hungary that John Albert was bent upon placing his younger brother Sigismund on the throne of Moldavia. Be that as it may, the Poles entered Moldavia not as friends, but as foes, and, after the abortive siege of Suczawa, were compelled to retreat through the Bukowina to Sniatyn, harassed all the way by the forces of the hospodar. The insubordination of the *szlachta* seems to have been one cause of this disgraceful collapse, for John Albert confiscated hundreds of their estates after his return; in spite of which, to the end of his life he retained his extraordinary popularity. When the new grand master of the Teutonic order, Frederic of Saxony, refused to render homage to the Polish crown, John Albert compelled him to do so. His intention of still further humiliating the Teutonic order was frustrated by his sudden death in 1501. A valiant soldier and a man of much enlightenment, John Albert was a poor politician, recklessly sacrificing the future to the present.

See V. Czerny, *The Reigns of John Albert and Alexander Jagiello* (Pol.) (Cracow, 1882).

JOHN ANGELUS (d. 1244), emperor of Thessalonica. In 1232 he received the throne from his father Theodore, who, after a period of exile, had re-established his authority, but owing to his loss of eyesight resolved to make John the nominal sovereign. His reign is chiefly marked by the aggressions of the rival emperor of Nicaea, John Vatatzes, who laid siege to Thessalonica in 1243 and only withdrew upon John Angelus consenting to exchange the title "emperor" for the subordinate one of "despot."

See G. Finlay, *History of Greece*, vol. iii. (1877).

JOHN FREDERICK I. (1503–1554), called the Magnanimous, elector of Saxony, was the elder son of the elector, John the Steadfast, and belonged to the Ernestine branch of the Wettin family. Born at Torgau on the 30th of June 1503 and educated as a Lutheran, he took some part in imperial politics and in the business of the league of Schmalkalden before he became elector by his father's death in August 1532. His lands comprised the western part of Saxony, and included Thuringia, but in 1542 Coburg was surrendered to form an apanage for his brother, John Ernest (d. 1553). John Frederick, who was an ardent Lutheran and had a high regard for Luther, continued the religious policy of his father. In 1534 he assisted to make peace between the German king Ferdinand I. and Ulrich, duke of Württemberg, but his general attitude was one of vacillation between the emperor and his own impetuous colleague in the league of Schmalkalden, Philip, landgrave of Hesse. He was often at variance with Philip, whose bigamy he disliked, and his belief in the pacific intentions of Charles V. and his loyalty to the Empire prevented him from pursuing any definite policy for the defence of Protestantism. In 1541 his kinsman Maurice became duke of Saxony, and cast covetous eyes upon the electoral dignity. A cause of quarrel soon arose. In 1541 John Frederick forced Nicholas Amsdorf into the see of Naumburg in spite of the chapter, who had elected a Roman Catholic, Julius von Pflug; and about the same time he seized Wurzen, the property of the bishop of Meissen, whose see was under the joint protection of electoral and ducal Saxony. Maurice took up arms, and war was only averted by the efforts of Philip of Hesse and Luther. In 1542 the elector assisted to drive Henry, duke of Brunswick-Wolfenbüttel, from his duchy, but in spite of this his relations with Charles V. at the diet of Spires in 1544 were very amicable. This was, however, only a lull in the storm, and the emperor soon began to make preparations for attacking the league of Schmalkalden, and especially John Frederick and Philip of Hesse. The support, or at least the neutrality, of Maurice was won by the hope of the electoral dignity, and in July 1546 war broke out between Charles and the league. In September John Frederick was placed under the imperial ban, and in November Maurice invaded the electorate. Hastening from southern Germany the elector drove Maurice from the land, took his ally, Albert Alcibiades, prince of Bayreuth, prisoner at Rochlitz, and overran ducal Saxony. His progress, however, was checked by the advance of Charles V. Notwithstanding his valour he was wounded and taken prisoner at Mühlberg on the 24th of April 1547, and was condemned to death in order to induce Wittenberg to surrender. The sentence was not carried out, but by the capitulation of Wittenberg (May 1547) he renounced the electoral dignity and a part of his lands in favour of Maurice, steadfastly refusing however to make any concessions on religious matters, and remained in captivity until May 1552, when he returned to the Thuringian lands which his sons had been allowed to retain, his return being hailed with wild enthusiasm. During his imprisonment he had refused to accept the *Interim*, issued from Augsburg in May 1548, and had urged his sons to make no peace with Maurice. After his release the emperor had restored his dignities to him, and his assumption of the electoral arms and title prevented any arrangement with Maurice. However, after the death of this prince in July 1553, a treaty was made at Naumburg in February 1554 with his successor Augustus. John Frederick consented to the transfer of the electoral dignity, but retained for himself the title of "born elector," and received some lands and a sum of money. He was thus the last Ernestine elector of Saxony. He died at Weimar on the 3rd of March 1554, having had three sons by his wife, Sibylla (d. 1554), daughter of John III., duke of Cleves, whom he had married in 1527, and was succeeded by his eldest son, John Frederick. The elector was a great hunter and a hard drinker, whose brave and dignified bearing in a time of misfortune won for him his surname of Magnanimous, and drew eulogies from Roger Ascham and Melanchthon. He founded the university of Jena and was a benefactor to that of Leipzig.

See Mentz, *Johann Friedrich der Grossmütige* (Jena, 1903); Rogge, *Johann Friedrich der Grossmütige* (Halle, 1902) and L. von Ranke, *Deutsche Geschichte im Zeitalter der Reformation* (Leipzig, 1882).

JOHN FREDERICK (1529–1595), called *der Mittlere*, duke of Saxony, was the eldest son of John Frederick, who had been deprived of the Saxon electorate by the emperor Charles V. in 1547. Born at Torgau on the 8th of January 1529, he received a good education, and when his father was imprisoned in 1547 undertook the government of the remnant of electoral Saxony which the emperor allowed the Ernestine branch of the Wettin family to keep. Released in 1552 John Frederick the elder died two years later, and his three sons ruled Ernestine Saxony together until 1557, when John Frederick was made sole ruler. This arrangement lasted until 1565, when John Frederick shared his lands with his surviving brother, John William (1530–1573), retaining for himself Gotha and Weimar. The duke was a strong, even a fanatical, Lutheran, but his religious views were gradually subordinated to the one idea of regaining the electoral dignity then held by Augustus I. To attain this end he lent a willing ear to the schemes of Wilhelm von Grumbach, who came to his court about 1557 and offered to regain the electoral dignity and even to acquire the Empire for his patron. In spite of repeated warnings from the emperor Ferdinand I., John Frederick continued to protect Grumbach, and in 1566 his obstinacy caused him to be placed under the imperial ban. Its execution was entrusted to Augustus who, aided by the duke's brother, John William, marched against Gotha with a strong force. In consequence of a mutiny the town surrendered in April 1567, and John Frederick was delivered to the emperor Maximilian II. He was imprisoned in Vienna, his lands were given to his brother, and he remained in captivity until his death at Steyer on the 6th of May 1595. These years were mainly occupied with studying theology and in correspondence. John Frederick married firstly Agnes (d. 1555) daughter of Philip, landgrave of Hesse, and widow of Maurice, elector of Saxony, and secondly Elizabeth (d. 1594) daughter of Frederick III., elector palatine of the Rhine, by whom he left two sons, John Casimir (1564–1633) and John Ernest (1566–1638). Elizabeth shared her husband's imprisonment for twenty-two years.

See A. Beck, *Johann Friedrich der Mittlere, Herzog zu Sachsen* (Vienna, 1858); and F. Ortloff, *Geschichte der Grumbachischen Händel* (Jena, 1868–1870).

JOHN GEORGE I. (1585–1656), elector of Saxony, second son of the elector Christian I., was born on the 5th of March 1585, succeeding to the electorate in June 1611 on the death of his elder brother, Christian II. The geographical position of electoral Saxony hardly less than her high standing among the German Protestants gave her ruler much importance during the Thirty Years' War. At the beginning of his reign, however, the new elector took up a somewhat detached position. His personal allegiance to Lutheranism was sound, but he liked neither the growing strength of Brandenburg nor the increasing prestige of the Palatinate; the adherence of the other branches of the Saxon ruling house to Protestantism seemed to him to suggest that the head of electoral Saxony should throw his weight into the other scale, and he was prepared to favour the advances of the Habsburgs and the Roman Catholic party. Thus he was easily induced to vote for the election of Ferdinand, archduke of Styria, as emperor in August 1619, an action which nullified the anticipated opposition of the Protestant electors. The new emperor secured the help of John George for the impending campaign in Bohemia by promising that he should be undisturbed in his possession of certain ecclesiastical lands. Carrying out his share of the bargain by occupying Silesia and Lusatia, where he displayed much clemency, the Saxon elector had thus some part in driving Frederick V., elector palatine of the Rhine, from Bohemia and in crushing Protestantism in that country, the crown of which he himself had previously refused. Gradually, however, he was made uneasy by the obvious trend of the imperial policy towards the annihilation of Protestantism, and by a dread lest the ecclesiastical lands should be taken from him; and the issue of the edict of restitution in March 1629 put the coping-stone to his fears. Still, although clamouring vainly for the exemption of the electorate from the area covered by the edict, John George took no decided measures to break his alliance with the emperor. He did, indeed, in February 1631 call a meeting of Protestant princes at Leipzig, but in spite of the appeals of the preacher Matthias Hoë von Hohenegg (1580–1645) he contented himself with a formal protest. Meanwhile Gustavus Adolphus had landed in Germany, and the elector had refused to allow him to cross the Elbe at Wittenberg, thus hindering his attempt to relieve Magdeburg. But John George's reluctance to join the Protestants disappeared when the imperial troops under Tilly began to ravage Saxony, and in September 1631 he concluded an alliance with the Swedish king. The Saxon troops were present at the battle of Breitenfeld, but were routed by the imperialists, the elector himself seeking safety in flight. Nevertheless he soon took the offensive. Marching into Bohemia the Saxons occupied Prague, but John George soon began to negotiate for peace and consequently his soldiers offered little resistance to Wallenstein, who drove them back into Saxony. However, for the present the efforts of Gustavus Adolphus prevented the elector from deserting him, but the position was changed by the death of the king at Lützen in 1632, and the refusal of Saxony to join the Protestant league under Swedish leadership. Still letting his troops fight in a desultory fashion against the imperialists, John George again negotiated for peace, and in May 1635 he concluded the important treaty of Prague with Ferdinand II. His reward was Lusatia and certain other additions of territory; the retention by his son Augustus of the archbishopric of Magdeburg; and some concessions with regard to the edict of restitution. Almost at once he declared war upon the Swedes, but in October 1636 he was beaten at Wittstock; and Saxony, ravaged impartially by both sides, was soon in a deplorable condition. At length in September 1645 the elector was compelled to agree to a truce with the Swedes, who, however, retained Leipzig; and as far as Saxony was concerned this ended the Thirty Years' War. After the peace of Westphalia, which with regard to Saxony did little more than confirm the treaty of Prague, John George died on the 8th of October 1656. Although not without political acumen, he was not a great ruler; his character appears to have been harsh and unlovely, and he was addicted to drink. He was twice married, and in addition to his successor John George II. he left three sons, Augustus (1614–1680), Christian (d. 1691) and Maurice (d. 1681) who were all endowed with lands in Saxony, and who founded cadet branches of the Saxon house.

JOHN GEORGE II. (1613–1680), elector of Saxony, was born on the 31st of May 1613. In 1657, just after his accession, he made an arrangement with his three brothers with the object of preventing disputes over their separate territories, and in 1664 he entered into friendly relations with Louis XIV. He received money from the French king, but the existence of a strong anti-French party in Saxony induced him occasionally to respond to the overtures of the emperor Leopold I. The elector's primary interests were not in politics, but in music and art. He adorned Dresden, which under him became the musical centre of Germany; welcoming foreign musicians and others he gathered around him a large and splendid court, and his capital was the constant scene of musical and other festivals. His enormous expenditure compelled him in 1661 to grant greater control over monetary matters to the estates, a step which laid the foundation of the later system of finance in Saxony. John George died at Freiberg on the 22nd of August 1680.

JOHN GEORGE III. (1647–1691), elector of Saxony, the only son of John George II., was born on the 20th of June 1647. He forsook the vacillating foreign policy of his father and in June 1683 joined an alliance against France. Having raised the first standing army in the electorate he helped to drive the Turks from Vienna in September 1680, leading his men with great gallantry; but disgusted with the attitude of the emperor Leopold I. after the victory, he returned at once to Saxony. However, he sent aid to Leopold in 1685. When Louis XIV.'s armies invaded Germany in September 1688 John George was one of the first to take up arms against the French, and after sharing in the capture of Mainz he was appointed commander-in-chief of the imperial forces. He had not, however, met with any notable success when he died at Tübingen on the 12th of September 1691. Like his father, he was very fond of music, but he appears to have been less extravagant than John George II. His wife was Anna Sophia, daughter of Frederick III. king of

Denmark, and both his sons, John George and Frederick Augustus, became electors of Saxony, the latter also becoming king of Poland as Augustus II.

JOHN GEORGE IV. (1668–1694), elector of Saxony, was born on the 18th of October 1668. At the beginning of his reign his chief adviser was Hans Adam von Schöning (1641–1696), who counselled a union between Saxony and Brandenburg and a more independent attitude towards the emperor. In accordance with this advice certain proposals were put before Leopold I. to which he refused to agree; and consequently the Saxon troops withdrew from the imperial army, a proceeding which led the chagrined emperor to seize and imprison Schöning in July 1692. Although John George was unable to procure his minister's release, Leopold managed to allay the elector's anger, and early in 1693 the Saxon soldiers rejoined the imperialists. This elector is chiefly celebrated for his passion for Magdalene Sibylle von Neidschütz (d. 1694), created in 1693 countess of Rochlitz, whom on his accession he publicly established as his mistress. John George left no legitimate issue when he died on the 27th of April 1694.

JOHN[1] MAURICE OF NASSAU (1604–1679), surnamed the Brazilian, was the son of John the Younger, count of Nassau-Siegen-Dillenburg, and the grandson of John, the elder brother of William the Silent and the chief author of the Union of Utrecht. He distinguished himself in the campaigns of his cousin, the stadtholder Frederick Henry of Orange, and was by him recommended to the directors of the Dutch West India company in 1636 to be governor-general of the new dominion in Brazil recently conquered by the company. He landed at the Recife, the port of Pernambuco, and the chief stronghold of the Dutch, in January 1637. By a series of successful expeditions he gradually extended the Dutch possessions from Sergipe on the south to S. Luis de Maranham in the north. He likewise conquered the Portuguese possessions of St George del Mina and St Thomas on the west coast of Africa. With the assistance of the famous architect, Pieter Post of Haarlem, he transformed the Recife by building a new town adorned with splendid public edifices and gardens, which was called after his name Mauritstad. By his statesmanlike policy he brought the colony into a most flourishing condition and succeeded even in reconciling the Portuguese settlers to submit quietly to Dutch rule. His large schemes and lavish expenditure alarmed however the parsimonious directors of the West India company, but John Maurice refused to retain his post unless he was given a free hand, and he returned to Europe in July 1644. He was shortly afterwards appointed by Frederick Henry to the command of the cavalry in the States army, and he took part in the campaigns of 1645 and 1646. When the war was ended by the peace of Münster in January 1648, he accepted from the elector of Brandenburg the post of governor of Cleves, Mark and Ravensberg, and later also of Minden. His success in the Rhineland was as great as it had been in Brazil, and he proved himself a most able and wise ruler. At the end of 1652 he was appointed head of the order of St John and made a prince of the Empire. In 1664 he came back to Holland; when the war broke out with England supported by an invasion from the bishop of Münster, he was appointed commander-in-chief of the Dutch forces on land. Though hampered in his command by the restrictions of the states-general, he repelled the invasion, and the bishop, Christoph von Galen, was forced to conclude peace. His campaigning was not yet at an end, for in 1673 he was appointed by the stadtholder William III. to command the forces in Friesland and Groningen, and to defend the eastern frontier of the Provinces. In 1675 his health compelled him to give up active military service, and he spent his last years in his beloved Cleves, where he died on the 20th of December 1679. The house which he built at the Hague, named after him the Maurits-huis, now contains the splendid collections of pictures so well known to all admirers of Dutch art.

BIBLIOGRAPHY.—Caspar Barlaeus, *Rerum per octennium in Brasilia et alibi nuper gestarum historia, sub praefectura illustrissimi comitis J. Mauritii Nassoviae* (Amsterdam, 1647); L. Driessen, *Leben des Fürsten Johann Moritz von Nassau* (Berlin, 1849); D. Veegens, *Leven van Jaan Maurits, Graaf van Nassau-Siegen* (Haarlem, 1840).

JOHN O' GROAT'S HOUSE, a spot on the north coast of Caithness, Scotland, 14 m. N. of Wick and 1¾ m. W. of Duncansby Head. It is the mythical site of an octagonal house said to have been erected early in the 16th century by one John Groot, a Dutchman who had migrated to the north of Scotland by permission of James IV. According to the legend, other members of the Groot family followed John, and acquired lands around Duncansby. When there were eight Groot families, disputes began to arise as to precedence at annual feasts. These squabbles John Groot is said to have settled by building an octagonal house which had eight entrances and eight tables, so that the head of each family could enter by his own door and sit at the head of his own table. Being but a few miles south of Dunnet Head, John o' Groat's is a colloquial term for the most northerly point of Scotland. The site of the traditional building is marked by an outline traced in turf. Descendants of the Groot family, now Groat, still live in the neighbourhood. The cowry-shell, *Cypraea europaea*, is locally known as "John o' Groat's bucky."

JOHNS HOPKINS UNIVERSITY, an American educational institution at Baltimore, Maryland, U.S.A. Its trustees, chosen by Johns Hopkins (1794–1873), a successful Baltimore merchant, were incorporated on the 24th of August 1867 under a general act "for the promotion of education in the state of Maryland." But nothing was actually done until after the death of Johns Hopkins (Dec. 24, 1873), when his fortune of $7,000,000 was equally divided between the projected university and a hospital, also to bear his name, and intended to be an auxiliary to the medical school of the university. The trustees of the university consulted with many prominent educationists, notably Charles W. Eliot of Harvard, Andrew D. White of Cornell, and James B. Angell of the university of Michigan; on the 30th of December 1874 they elected Daniel Coit Gilman (*q.v.*) president. The university was formally opened on the 3rd of October 1876, when an address was delivered by T. H. Huxley. The first year was largely given up to consultation among the newly chosen professors, among whom were—in Greek, B. L. Gildersleeve; in mathematics, J. J. Sylvester; in chemistry, Ira Remsen; in biology, Henry Newell Martin (1848–1896); in zoology, William Keith Brooks (1848–1908); and in physics, Henry Augustus Rowland (1848–1901). Prominent among later teachers were Arthur Cayley in mathematics, the Semitic scholar Paul Haupt (b. 1858), Granville Stanley Hall in psychology, Maurice Bloomfield in Sanskrit and comparative philology, James Rendel Harris in Biblical philology, James Wilson Bright in English philology, Herbert B. Adams in history, and Richard T. Ely (b. 1854) in economics. The university at once became a pioneer in the United States in teaching by means of seminary courses and laboratories, and it has been eminently successful in encouraging research, in scientific production, and in preparing its students to become instructors in other colleges and universities. It includes a college in which each of five parallel courses leads to the degree of Bachelor of Arts, but its reputation has been established chiefly by its other two departments, the graduate school and the medical school. The graduate school offers courses in philosophy and psychology, physics, chemistry and biology, historical and economic science, language and literature, and confers the degree of Doctor of Philosophy after at least three years' residence. From its foundation the university had novel features and a liberal administration. Twenty annual fellowships of $500 each were opened to the graduates of any college. Petrography and laboratory psychology were among the new sciences fostered by the new university. Such eminent outsiders were secured for brief residence and lecture courses as J. R. Lowell, F. J. Child, Simon Newcomb, H. E. von Holst, F. A. Walker, William James, Sidney Lanier, James Bryce, E. A. Freeman, W. W. Goodwin, and Alfred Russel Wallace. President Gilman gave up his presidential duties on the 1st of

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[1] This name is usually written Joan, the form used by the man himself in his signature—see the facsimile in Netscher's *Les Hollandais en Brésil*.

September 1901, Ira Remsen[1] succeeding him in the office. The medical department, inaugurated in 1893, is closely affiliated with the excellently equipped Johns Hopkins Hospital (opened in 1889), and is actually a graduate school, as it admits only students holding the bachelor's degree or its equivalent. The degree of Doctor of Medicine is conferred after four years of successful study, and advanced courses are offered. The department's greatest teachers have been William Osler (b. 1849) and William Henry Welch (b. 1850).

The buildings of the university were in 1901 an unpretentious group on crowded ground near the business centre of the city. In 1902 a new site was secured, containing about 125 acres amid pleasant surroundings in the northern suburbs, and new buildings were designed in accordance with a plan formed with a view to secure harmony and symmetry. In 1907 the library contained more than 133,000 bound volumes. Among the numerous publications issued by the university press are: *American Journal of Mathematics*, *Studies in Historical and Political Science*, *Reprint of Economic Tracts*, *American Journal of Philology*, *Contributions to Assyriology and Semitic Philology*, *Modern Language Notes*, *American Chemical Journal*, *American Journal of Insanity*, *Terrestrial Magnetism and Atmospheric Electricity*, *Reports of the Maryland Geological Survey*, and *Reports of the Maryland Weather Service*. The institution is maintained chiefly with the proceeds of the endowment fund. It also receives aid from the state, and charges tuition fees. Its government is entrusted to a board of trustees, while the direction of affairs of a strictly academic nature is delegated to an academic council and to department boards. In 1907–1908 the regular faculty numbered 175, and there was an enrolment of 683 students, of whom 518 were in post-graduate courses.

On the history of the university see Daniel C. Gilman, *The Launching of a University* (New York, 1906), and the annual reports of the president.

JOHNSON, ANDREW (1808–1875), seventeenth president of the United States, was born at Raleigh, North Carolina, on the 29th of December 1808. His parents were poor, and his father died when Andrew was four years old. At the age of ten he was apprenticed to a tailor, his spare hours being spent in acquiring the rudiments of an education. He learned to read from a book which contained selected orations of great British and American statesmen. The young tailor went to Laurens Court House, South Carolina, in 1824, to work at his trade, but returned to Raleigh in 1826 and soon afterward removed to Greeneville in the eastern part of Tennessee. He married during the same year Eliza McCardle (1810–1876), much his superior by birth and education, who taught him the common school branches of learning and was of great assistance in his later career. In East Tennessee most of the people were small farmers, while West Tennessee was a land of great slave plantations. Johnson began in politics to oppose the aristocratic element and became the spokesman and champion of the poorer and labouring classes. In 1828 he was elected an alderman of Greeneville and in 1830–1834 was mayor. In 1834, in the Tennessee constitutional convention he endeavoured to limit the influence of the slaveholders by basing representation in the state legislature on the white population alone. In 1835–1837 and 1839–1841 Johnson was a Democratic member of the state House of Representatives, and in 1841–1843 of the state Senate; in both houses he uniformly upheld the cause of the "common people," and, in addition, opposed legislation for "internal improvements." He soon was recognized as the political champion of East Tennessee. Though his favourite leaders became Whigs, Johnson remained a Democrat, and in 1840 canvassed the state for Van Buren for president.

In 1843 he was elected to the national House of Representatives and there remained for ten years until his district was gerrymandered by the Whigs and he lost his seat. But he at once offered himself as a candidate for governor and was elected and re-elected, and was then sent to the United States Senate, serving from 1857 to 1862. As governor (1853–1857) he proved to be able and non-partisan. He championed popular education and recommended the homestead policy to the national government, and from his sympathy with the working classes and his oft-avowed pride in his former calling he became known as the "mechanic governor." In Congress he proved to be a tireless advocate of the claims of the poorer whites and an opponent of the aristocracy. He favoured the annexation of Texas, supported the Polk administration on the issues of the Mexican War and the Oregon boundary controversy, and though voting for the admission of free California demanded national protection for slavery. He also advocated the homestead law and low tariffs, opposed the policy of "internal improvements," and was a zealous worker for budget economies. Though opposed to a monopoly of political power in the South by the great slaveholders, he deprecated anti-slavery agitation (even favouring denial of the right of petition on that subject) as threatening abolition or the dissolution of the Union, and went with his sectional leaders so far as to demand freedom of choice for the Territories, and protection for slavery where it existed—this even so late as 1860. He supported in 1860 the ultra-Democratic ticket of Breckinridge and Lane, but he did not identify the election of Lincoln with the ruin of the South, though he thought the North should give renewed guarantees to slavery. But he followed Jackson rather than Calhoun, and above everything else set his love of the Union, though believing the South to be grievously wronged. He was the only Southern member of Congress who opposed secession and refused to "go with his state" when it withdrew from the Union in 1861. In the judgment of a leading opponent (O. P. Morton) "perhaps no man in Congress exerted the same influence on the public sentiment of the North at the beginning of the war" as Johnson. During the war he suffered much for his loyalty to the Union. In March 1862 Lincoln made him military governor of the part of Tennessee captured from the Confederates, and after two years of autocratic rule (with much danger to himself) he succeeded in organizing a Union government for the state. In 1864, to secure the votes of the war Democrats and to please the border states that had remained in the Union, Johnson was nominated for vice-president on the ticket with Lincoln.

A month after the inauguration the murder of Lincoln left him president, with the great problem to solve of reconstruction of the Union. All his past career and utterances seemed to indicate that he would favour the harshest measures toward ex-Confederates, hence his acceptability to the most radical republicans. But, whether because he drew a distinction between the treason of individuals and of states, or was influenced by Seward, or simply, once in responsible position, separated Republican party politics from the question of constitutional interpretation, at least he speedily showed that he would be influenced by no acrimony, and adopted the lenient reconstruction policy of Lincoln. In this he had for some time the cordial support of his cabinet. During the summer of 1865 he set up provisional civil governments in all the seceded states except Texas, and within a few months all those states were reorganized and applying for readmission to the Union. The radical congress (Republican by a large majority) sharply opposed this plan of restoration, as they had opposed Lincoln's plan: first, because the members of Congress from the Southern States (when readmitted) would almost certainly vote with the Democrats; secondly, because relatively few of the Confederates were punished; and thirdly, because the newly organized Southern States did not give political rights to the negroes. The question of the status of the negro proved the crux of the issue. Johnson was opposed to general or immediate negro suffrage. A bitter contest began in Feb. 1866, between the president and the Congress, which refused to admit representatives from the South and during 1866 passed over his veto a number of important measures, such as the Freedmen's Bureau Act and the Civil Rights Act, and submitted to the States the Fourteenth Amendment to the Constitution. Johnson took a prominent and undignified part in the congressional campaign of 1866, in which his policies were voted down by the North. In 1867 Congress threw aside his work of restoration and proceeded with its own plan, the main features of which were the disfranchisement of ex-Confederates and the enfranchisement of negroes. On the 2nd of March 1867 Congress passed over the president's veto the Tenure of Office Act, prohibiting the president from dismissing from office without the consent of the Senate any officer appointed by and with the advice and consent of that body, and in addition a section was inserted in the army appropriation bill of this session designed to subordinate the president to the Senate and the general-in-chief of the army in military matters. The president was thus deprived of practically all power. Stanton and other members of his cabinet and General Grant became hostile to him, the president attempted to remove Stanton without regard to the Tenure of Office Act, and, finally, to get rid of the president, Congress in 1868 (February–May) made an attempt to impeach and remove him, his disregard of the Tenure of Office Act being the principal charge against him. The charges[1] were in part quite trivial, and the evidence was ridiculously inadequate for the graver charges. A two-thirds majority was necessary for conviction; and the votes being 35 to 19 (7 Republicans and 12 Democrats voting in his favour on the crucial clauses) he was acquitted. The misguided animus of the impeachment as a piece of partisan politics was soon very generally admitted; and the importance of its failure, in securing the continued power and independence of the presidential element in the constitutional system, can hardly be over-estimated. The rest of his term as president was comparatively quiet and uneventful. In 1869 he retired into private life in Tennessee, and after several unsuccessful efforts was elected to the United States Senate, free of party trammels, in 1875, but died at Carter's Station, Tenn., on the 31st of July 1875. The only speech he made was a skilful and temperate arraignment of President Grant's policy towards the South.

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[1] Ira Remsen was born in New York City on the 10th of February 1846, graduated at the college of the City of New York in 1865, studied at the New York college of physicians and surgeons and at the university of Göttingen, was professor of chemistry at Williams College in 1872–1876, and in 1876 became professor of chemistry at Johns Hopkins University. He published many textbooks of chemistry, organic and inorganic, which were republished in England and were translated abroad. In 1879 he founded the *American Chemical Journal.*

President Johnson's leading political principles were a reverence of Andrew Jackson, unlimited confidence in the people, and an intense veneration for the constitution. Throughout his life he remained in some respects a "backwoodsman." He lacked the finish of systematic education. But his whole career sufficiently proves him to have been a man of extraordinary qualities. He did not rise above untoward circumstances by favour, nor—until after his election as senator—by fortunate and fortuitous connexion with great events, but by strength of native talents, persistent purpose, and an iron will. He had strong, rugged powers, was a close reasoner and a forcible speaker. Unfortunately his extemporaneous speeches were commonplace, in very bad taste, fervently intemperate and denunciatory; and though this was probably due largely to temperament and habits of stump-speaking formed in early life, it was attributed by his enemies to drink. Resorting to stimulants after illness, his marked excess in this respect on the occasion of his inauguration as vice-president undoubtedly did him harm with the public. Faults of personality were his great handicap. Though approachable and not without kindliness of manner, he seemed hard and inflexible; and while president, physical pain and domestic anxieties, added to the struggles of public life, combined to accentuate a naturally somewhat severe temperament. A lifelong Southern Democrat, he was forced to lead (nominally at least) a party of Northern Republicans, with whom he had no bond of sympathy save a common opposition to secession; and his ardent, aggressive convictions and character, above all his complete lack of tact, unfitted him to deal successfully with the passionate partisanship of Congress. The absolute integrity and unflinching courage that marked his career were always ungrudgingly admitted by his greatest enemies.

See L. Foster, *The Life and Speeches of Andrew Johnson* (1866); D. M. De Witt, *The Impeachment and Trial of Andrew Johnson* (1903); C. E. Chadsey, *The Struggle between President Johnson and Congress over Reconstruction* (1896); and W. A. Dunning, *Essays on the Civil War and Reconstruction* (1898). Also see W. A. Dunning's paper "More Light on Andrew Johnson" (in the *American Historical Review*, April 1906), in which apparently conclusive evidence is presented to prove that Johnson's first inaugural, a notable state paper, was written by the historian George Bancroft.

JOHNSON, BENJAMIN (*c.* 1665–1742), English actor, was first a scene painter, then acted in the provinces, and appeared in London in 1695 at Drury Lane after Betterton's defection. He was the original Captain Driver in *Oronooko* (1696), Captain Fireball in Farquhar's *Sir Harry Wildair* (1701), Sable in Steele's *Funeral* (1702), &c.; as the First Gravedigger in *Hamlet* and in several characters in the plays of Ben Jonson he was particularly good. He succeeded, also, to Thomas Doggett's rôles.

JOHNSON, EASTMAN (1824–1906), American artist, was born at Lovell, Maine, on the 29th of July 1824. He studied at Düsseldorf, Paris, Rome and The Hague, the last city being his home for four years. In 1860 he was elected to the National Academy of Design, New York. A distinguished portrait and genre painter, he made distinctively American themes his own, depicting the negro, fisherfolk and farm life with unusual interest. Such pictures as "Old Kentucky Home" (1867), "Husking Bee" (1876), "Cranberry Harvest, Nantucket" (1880), and his portrait group "The Funding Bill" (1881) achieved a national reputation. Among his sitters were many prominent men, including Daniel Webster; Presidents Hayes, Arthur, Cleveland and Harrison; William M. Evarts, Charles J. Folger; Emerson, Longfellow, Hawthorne, James McCosh, Noah Porter and Sir Edward Archbald. He died in New York City on the 5th of April 1906.

JOHNSON, REVERDY (1796–1876), American political leader and jurist, was born at Annapolis, Maryland, on the 21st of May 1796. His father, John Johnson (1770–1824), was a distinguished lawyer, who served in both houses of the Maryland General Assembly, as attorney-general of the state (1806–1811), as a judge of the court of appeals (1811–1821), and as a chancellor of his state (1821–1824). Reverdy graduated from St John's college in 1812. He then studied law in his father's office, was admitted to the bar in 1815 and began to practise in Upper Marlborough,

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[1] The charges centred in the president's removal of Secretary Stanton, his *ad interim* appointment of Lorenzo Thomas, his campaign speeches in 1866, and the relation of these three things to the Tenure of Office Act. Of the eleven charges of impeachment the first was that Stanton's removal was contrary to the Tenure of Office Act; the second, that the appointment of Thomas was a violation of the same law; the third, that the appointment violated the Constitution; the fourth, that Johnson conspired with Thomas "to hinder and prevent Edwin M. Stanton ... from holding ... office of secretary for the department of war"; the fifth, that Johnson had conspired with Thomas to "prevent and hinder the execution" of the Tenure of Office Act; the sixth, that he had conspired with Thomas "to seize, take and possess the property of the United States in the department of war," in violation of the Tenure of Office Act; the seventh, that this action was "a high misdemeanour"; the eighth, that the appointment of Thomas was "with intent unlawfully to control the disbursements of the moneys appropriated for the military service and for the department of war"; the ninth, that he had instructed Major-General Emory, in command of the department of Washington, that an act of 1867 appropriating money for the army was unconstitutional; the tenth, that his speeches in 1866 constituted "a high misdemeanour in office"; and the eleventh, the "omnibus" article, that he had committed high misdemeanours in saying that the 39th Congress was not an authorized Congress, that its legislation was not binding upon him, and that it was incapable of proposing amendments. The actual trial began on the 30th of March (from the 5th of March it was adjourned to the 23rd, and on the 24th of March to the 30th). On the 16th of May, after sessions in which the Senate repeatedly reversed the rulings of the chief justice as to the admission of evidence, in which the president's counsel showed that their case was excellently prepared and the prosecuting counsel appealed in general to political passions rather than to judicial impartiality, the eleventh article was voted on and impeachment failed by a single vote (35 to 19; 7 republicans and 12 democrats voting "Not guilty") of the necessary two-thirds. After ten days' interval, during which B. F. Butler of the prosecuting counsel attempted to prove that corruption had been practised on some of those voting "Not guilty," on the 26th of May a vote was taken on the second and third articles with the same result as on the eleventh article. There was no vote on the other articles.

Prince George's county. In 1817 he removed to Baltimore, where he became the professional associate of Luther Martin, William Pinkney and Roger B. Taney; with Thomas Harris he reported the decisions of the court of appeals in *Harris and Johnson's Reports* (1820–1827); and in 1818 he was appointed chief commissioner of insolvent debtors. From 1821 to 1825 he was a state senator; from 1825 to 1845 he devoted himself to his practice; from 1845 to 1849, as a Whig, he was a member of the United States Senate; and from March 1849 to July 1850 he was attorney-general of the United States. In 1856 he became identified with the conservative wing of the Democratic party, and four years later supported Stephen A. Douglas for the presidency. In 1861 he was a delegate from Maryland to the peace convention at Washington; in 1861–1862 he was a member of the Maryland House of Delegates. After the capture of New Orleans he was commissioned by Lincoln to revise the decisions of the military commandant, General B. F. Butler, in regard to foreign governments, and reversed all those decisions to the entire satisfaction of the administration. In 1863 he again took his seat in the United States Senate. In 1868 he was appointed minister to Great Britain and soon after his arrival in England negotiated the Johnson-Clarendon treaty for the settlement of disputes arising out of the Civil War; this, however, the Senate refused to ratify, and he returned home on the accession of General U. S. Grant to the presidency. Again resuming his practice he was engaged by the government in the prosecution of Ku-Klux cases. He died on the 10th of February 1876 at Annapolis. He repudiated the doctrine of secession, and pleaded for compromise and conciliation. Opposed to the Reconstruction measures, he voted for them on the ground that it was better to accept than reject them, since they were probably the best that could be obtained. As a lawyer he was engaged during his later years in most of the especially important cases in the Supreme Court of the United States and in the courts of Maryland.

JOHNSON, RICHARD (1573–1659?), English romance writer, was baptized in London on the 24th of May 1573. His most famous romance is *The Famous Historie of the Seaven Champions of Christendom* (1596?). The success of this book was so great that the author added a second and a third part in 1608 and 1616. His other stories include: *The Nine Worthies of London* (1592); *The Pleasant Walks of Moorefields* (1607); *The Pleasant Conceites of Old Hobson* (1607), the hero being a well-known haberdasher in the Poultry; *The Most Pleasant History of Tom a Lincolne* (1607); *A Remembrance of . . . Robert Earle of Salisbury* (1612); *Looke on Me, London* (1613); *The History of Tom Thumbe* (1621). *The Crown Garland of Golden Roses . . . set forth in Many Pleasant new Songs and Sonnets* (1612) was reprinted for the Percy Society (1842 and 1845).

JOHNSON, RICHARD MENTOR (1781–1850), ninth vice-president of the United States, was born at Bryant's Station, Kentucky, on the 17th of October 1781. He was admitted to the bar in 1800, and became prominent as a lawyer and Democratic politician, serving in the Federal House of Representatives and in the Senate for many years. From 1837 to 1841 he was vice-president of the United States, to which position he was elected over Francis Granger, by the Senate, none of the four candidates for the vice-presidency having received a majority of the electoral votes. The opposition to Johnson within the party greatly increased during his term, and the Democratic national convention of 1840 adopted the unprecedented course of refusing to nominate anyone for the vice-presidency. In the ensuing election Johnson received most of the Democratic electoral votes, but was defeated by the Whig candidate, John Tyler. He died in Frankfort, Kentucky, on the 19th of November 1850.

JOHNSON, SAMUEL (1709-1784), English writer and lexicographer, was the son of Michael Johnson (1656-1731), bookseller and magistrate of Lichfield, who married in 1706 Sarah Ford (1669–1759). Michael's abilities and attainments seem to have been considerable. He was so well acquainted with the contents of the volumes which he exposed for sale that the country rectors of Staffordshire and Worcestershire thought him an oracle on points of learning. Between him and the clergy, indeed, there was a strong religious and political sympathy. He was a zealous churchman, and, though he had qualified himself for municipal office by taking the oaths to the sovereigns in possession, was to the last a Jacobite in heart. The social position of Samuel's paternal grandfather, William Johnson, remains obscure; his mother was the daughter of Cornelius Ford, "a little Warwickshire Gent."

At a house (now the Johnson Museum) in the Market Square, Lichfield, Samuel Johnson was born on the 18th of September 1709 and baptized on the same day at St Mary's, Lichfield. In the child the physical, intellectual and moral peculiarities which afterwards distinguished the man were plainly discernible: great muscular strength accompanied by much awkwardness and many infirmities; great quickness of parts, with a morbid propensity to sloth and procrastination; a kind and generous heart, with a gloomy and irritable temper. He had inherited from his ancestors a scrofulous taint, and his parents were weak enough to believe that the royal touch would cure him. In his third year he was taken up to London, inspected by the court surgeon, prayed over by the court chaplains and stroked and presented with a piece of gold by Queen Anne. Her hand was applied in vain. The boy's features, which were originally noble and not irregular, were distorted by his malady. His cheeks were deeply scarred. He lost for a time the sight of one eye; and he saw but very imperfectly with the other. But the force of his mind overcame every impediment. Indolent as he was, he acquired knowledge with such ease and rapidity that at every school (such as those at Lichfield and Stourbridge) to which he was sent he was soon the best scholar. From sixteen to eighteen he resided at home, and was left to his own devices. He learned much at this time, though his studies were without guidance and without plan. He ransacked his father's shelves, dipped into a multitude of books, read what was interesting, and passed over what was dull An ordinary lad would have acquired little or no useful knowledge in such a way; but much that was dull to ordinary lads was interesting to Samuel. He read little Greek; for his proficiency in that language was not such that he could take much pleasure in the masters of Attic poetry and eloquence. But he had left school a good Latinist, and he soon acquired an extensive knowledge of Latin literature. He was peculiarly attracted by the works of the great restorers of learning. Once, while searching for some apples, he found a huge folio volume of Petrarch's works. The name excited his curiosity, and he eagerly devoured hundreds of pages. Indeed, the diction and versification of his own Latin compositions show that he had paid at least as much attention to modern copies from the antique as to the original models.

While he was thus irregularly educating himself, his family was sinking into hopeless poverty. Old Michael Johnson was much better qualified to pore over books, and to talk about them, than to trade in them. His business declined; his debts increased; it was with difficulty that the daily expenses of his household were defrayed. It was out of his power to support his son at either university; but a wealthy neighbour offered assistance; and, in reliance on promises which proved to be of very little value, Samuel was entered at Pembroke College, Oxford. When the young scholar presented himself to the rulers of that society, they were amazed not more by his ungainly figure and eccentric manners than by the quantity of extensive and curious information which he had picked up during many months of desultory but not unprofitable study. On the first day of his residence he surprised his teachers by quoting Macrobius; and one of the most learned among them declared that he had never known a freshman of equal attainments.

At Oxford Johnson resided barely over two years, possibly less. He was poor, even to raggedness; and his appearance excited a mirth and a pity which were equally intolerable to his haughty spirit. He was driven from the quadrangle of Christ Church by the sneering looks which the members of that aristocratical society cast at the holes in his shoes. Some charitable person placed a new pair at his door; but he spurned them away in a fury. Distress made him, not servile, but reckless and ungovernable. No opulent gentleman commoner, panting for one-and-twenty, could have treated the academical authorities with more gross disrespect. The needy scholar was generally to be seen under the gate of Pembroke, a gate now adorned with his effigy, haranguing a circle of lads, over whom, in spite of his tattered gown and dirty linen, his wit and audacity gave him an undisputed ascendancy. In every mutiny against the discipline of the college he was the ringleader. Much was pardoned, however, to a youth so highly distinguished by abilities and acquirements. He had early made himself known by turning Pope's "Messiah" into Latin verse. The style and rhythm, indeed, were not exactly Virgilian; but the translation found many admirers, and was read with pleasure by Pope himself.

The time drew near at which Johnson would, in the ordinary course of things, have become a Bachelor of Arts; but he was at the end of his resources. Those promises of support on which he had relied had not been kept. His family could do nothing for him. His debts to Oxford tradesmen were small indeed, yet larger than he could pay. In the autumn of 1731 he was under the necessity of quitting the university without a degree. In the following winter his father died. The old man left but a pittance; and of that pittance almost the whole was appropriated to the support of his widow. The property to which Samuel succeeded amounted to no more than twenty pounds.

His life, during the thirty years which followed, was one hard struggle with poverty. The misery of that struggle needed no aggravation, but was aggravated by the sufferings of an unsound body and an unsound mind. Before the young man left the university, his hereditary malady had broken forth in a singularly cruel form. He had become an incurable hypochondriac. He said long after that he had been mad all his life, or at least not perfectly sane; and, in truth, eccentricities less strange than his have often been thought ground sufficient for absolving felons and for setting aside wills. His grimaces, his gestures, his mutterings, sometimes diverted and sometimes terrified people who did not know him. At a dinner table he would, in a fit of absence, stoop down and twitch off a lady's shoe. He would amaze a drawing-room by suddenly ejaculating a clause of the Lord's Prayer. He would conceive an unintelligible aversion to a particular alley, and perform a great circuit rather than see the hateful place. He would set his heart on touching every post in the streets through which he walked. If by any chance he missed a post, he would go back a hundred yards and repair the omission. Under the influence of his disease, his senses became morbidly torpid, and his imagination morbidly active. At one time he would stand poring on the town clock without being able to tell the hour. At another he would distinctly hear his mother, who was many miles off, calling him by his name. But this was not the worst. A deep melancholy took possession of him, and gave a dark tinge to all his views of human nature and of human destiny. Such wretchedness as he endured has driven many men to shoot themselves or drown themselves. But he was under no temptation to commit suicide. He was sick of life; but he was afraid of death; and he shuddered at every sight or sound which reminded him of the inevitable hour. In religion he found but little comfort during his long and frequent fits of dejection; for his religion partook of his own character. The light from heaven shone on him indeed, but not in a direct line, or with its own pure splendour. The rays had to struggle through a disturbing medium; they reached him refracted, dulled and discoloured by the thick gloom which had settled on his soul, and, though they might be sufficiently clear to guide him, were too dim to cheer him.

With such infirmities of body and of mind, he was left, at two-and-twenty, to fight his way through the world. He remained during about five years in the midland counties. At Lichfield, his birthplace and his early home, he had inherited some friends and acquired others. He was kindly noticed by Henry Hervey, a gay officer of noble family, who happened to be quartered there. Gilbert Walmesley, registrar of the ecclesiastical court of the diocese, a man of distinguished parts, learning and knowledge of the world, did himself honour by patronizing the young adventurer, whose repulsive person, unpolished manners and squalid garb moved many of the petty aristocracy of the neighbourhood to laughter or disgust. At Lichfield, however, Johnson could find no way of earning a livelihood. He became usher of a grammar school in Leicestershire; he resided as a humble companion in the house of a country gentleman; but a life of dependence was insupportable to his haughty spirit. He repaired to Birmingham, and there earned a few guineas by literary drudgery. In that town he printed a translation, little noticed at the time, and long forgotten, of a Latin book about Abyssinia. He then put forth proposals for publishing by subscription the poems of Politian, with notes containing a history of modern Latin verse; but subscriptions did not come in, and the volume never appeared.

While leading this vagrant and miserable life, Johnson fell in love. The object of his passion was Mrs Elizabeth Porter (1688–1752), widow of Harry Porter (d. 1734), whose daughter Lucy was born only six years after Johnson himself. To ordinary spectators the lady appeared to be a short, fat, coarse woman, painted half an inch thick, dressed in gaudy colours, and fond of exhibiting provincial airs and graces which were not exactly those of the Queensberrys and Lepels. To Johnson, however, whose passions were strong, whose eyesight was too weak to distinguish rouge from natural bloom, and who had seldom or never been in the same room with a woman of real fashion, his Tetty, as he called her, was the most beautiful, graceful and accomplished of her sex. That his admiration was unfeigned cannot be doubted; she had, however, a jointure of £600 and perhaps a little more; she came of a good family, and her son Jervis (d. 1763) commanded H.M.S. "Hercules." The marriage, in spite of occasional wranglings, proved happier than might have been expected. The lover continued to be under the illusions of the wedding-day (July 9, 1735) till the lady died in her sixty-fourth year. On her monument at Bromley he placed an inscription extolling the charms of her person and of her manners; and when, long after her decease, he had occasion to mention her, he exclaimed with a tenderness half ludicrous, half pathetic, "Pretty creature!"

His marriage made it necessary for him to exert himself more strenuously than he had hitherto done. He took a house at Edial near Lichfield and advertised for pupils. But eighteen months passed away, and only three pupils came to his academy. The "faces" that Johnson habitually made (probably nervous contortions due to his disorder) may well have alarmed parents. Good scholar though he was, these twitchings had lost him usherships in 1735 and 1736. David Garrick, who was one of the pupils, used, many years later, to throw the best company of London into convulsions of laughter by mimicking the master and his lady.

At length Johnson, in the twenty-eighth year of his age, determined to seek his fortune in London as a literary adventurer. He set out with a few guineas, three acts of his tragedy of *Irene* in manuscript, and two or three letters of introduction from his friend Walmesley. Never since literature became a calling in England had it been a less gainful calling than at the time when Johnson took up his residence in London. In the preceding generation a writer of eminent merit was sure to be munificently rewarded by the Government. The least that he could expect was a pension or a sinecure place; and, if he showed any aptitude for politics, he might hope to be a member of parliament, a lord of the treasury, an ambassador, a secretary of state. But literature had ceased to flourish under the patronage of the great, and had not yet begun to flourish under the patronage of the public. One man of letters, indeed, Pope, had acquired by his pen what was then considered as a handsome fortune, and lived on a footing of equality with nobles and ministers of state. But this was a solitary exception. Even an author whose reputation was established, and whose works were popular—such an author as Thomson, whose *Seasons* was in every library, such an author as Fielding, whose *Pasquin* had had a greater run than any drama since *The Beggar's Opera*—was sometimes glad to obtain, by pawning his best coat, the means of dining on tripe at a cookshop underground, where he could wipe his hands, after his greasy meal, on the back of a Newfoundland dog. It is easy, therefore, to imagine what humiliations and privations must have awaited the novice who had still to earn a name. One of the publishers to whom Johnson applied for employment measured with a scornful eye that athletic though uncouth frame, and exclaimed, "You had better get a porter's knot and carry trunks." Nor was the advice bad, for a porter was likely to be as plentifully fed, and as comfortably lodged, as a poet.

Some time appears to have elapsed before Johnson was able to form any literary connexion from which he could expect more than bread for the day which was passing over him. He never forgot the generosity with which Hervey, who was now residing in London, relieved his wants during this time of trial. "Harry Hervey," said Johnson many years later, "was a vicious man; but he was very kind to me. If you call a dog Hervey, I shall love him." At Hervey's table Johnson sometimes enjoyed feasts which were made more agreeable by contrast. But in general he dined, and thought that he dined well, on sixpennyworth of meat and a pennyworth of bread at an alehouse near Drury Lane.

The effect of the privations and sufferings which he endured at this time was discernible to the last in his temper and his deportment. His manners had never been courtly. They now became almost savage. Being frequently under the necessity of wearing shabby coats and dirty shirts, he became a confirmed sloven. Being often very hungry when he sat down to his meals, he contracted a habit of eating with ravenous greediness. Even to the end of his life, and even at the tables of the great, the sight of food affected him as it affects wild beasts and birds of prey. His taste in cookery, formed in subterranean ordinaries and *à la mode* beef shops, was far from delicate. Whenever he was so fortunate as to have near him a hare that had been kept too long, or a meat pie made with rancid butter, he gorged himself with such violence that his veins swelled and the moisture broke out on his forehead. The affronts which his poverty emboldened stupid and low-minded men to offer to him would have broken a mean spirit into sycophancy, but made him rude even to ferocity. Unhappily the insolence which, while it was defensive, was pardonable, and in some sense respectable, accompanied him into societies where he was treated with courtesy and kindness. He was repeatedly provoked into striking those who had taken liberties with him. All the sufferers, however, were wise enough to abstain from talking about their beatings, except Osborne, the most rapacious and brutal of booksellers, who proclaimed everywhere that he had been knocked down by the huge fellow whom he had hired to puff the Harleian Library.

About a year after Johnson had begun to reside in London he was fortunate enough to obtain regular employment from Edward Cave (*q. v.*) on the *Gentleman's Magazine*. That periodical, just entering on the ninth year of its long existence, was the only one in the kingdom which then had what would now be called a large circulation. Johnson was engaged to write the speeches in the "Reports of the Debates of the Senate of Lilliput" (see REPORTING), under which thin disguise the proceedings of parliament were published. He was generally furnished with notes, meagre indeed and inaccurate, of what had been said; but sometimes he had to find arguments and eloquence both for the ministry and for the opposition. He was himself a Tory, not from rational conviction—for his serious opinion was that one form of government was just as good or as bad as another—but from mere passion, such as inflamed the Capulets against the Montagues, or the Blues of the Roman circus against the Greens. In his infancy he had heard so much talk about the villainies of the Whigs, and the dangers of the Church, that he had become a furious partisan when he could scarcely speak. Before he was three he had insisted on being taken to hear Sacheverel preach at Lichfield Cathedral, and had listened to the sermon with as much respect and probably with as much intelligence, as any Staffordshire squire in the congregation. The work which had been begun in the nursery had been completed by the university. Oxford, when Johnson resided there, was the most Jacobitical place in England; and Pembroke was one of the most Jacobitical colleges in Oxford. The prejudices which he brought up to London were scarcely less absurd than those of his own Tom Tempest. Charles II. and James II. were two of the best kings that ever reigned. Laud was a prodigy of parts and learning over whose tomb Art and Genius still continued to weep. Hampden deserved no more honourable name than that of the "zealot of rebellion." Even the ship-money Johnson would not pronounce to have been an unconstitutional impost. Under a government which allowed to the people an unprecedented liberty of speech and action, he fancied that he was a slave. He hated Dissenters and stock-jobbers, the excise and the army, septennial parliaments, and Continental connexions. He long had an aversion to the Scots, an aversion of which he could not remember the commencement, but which, he owned, had probably originated in his abhorrence of the conduct of the nation during the Great Rebellion. It is easy to guess in what manner debates on great party questions were likely to be reported by a man whose judgment was so much disordered by party spirit. A show of fairness was indeed necessary to the prosperity of the *Magazine*. But Johnson long afterwards owned that, though he had saved appearances, he had taken care that the Whig dogs should not have the best of it; and, in fact, every passage which has lived, every passage which bears the marks of his higher faculties, is put into the mouth of some member of the opposition.

A few weeks after Johnson had entered on these obscure labours, he published a work which at once placed him high among the writers of his age. It is probable that what he had suffered during his first year in London had often reminded him of some parts of the satire in which Juvenal had described the misery and degradation of a needy man of letters, lodged among the pigeons' nests in the tottering garrets which overhung the streets of Rome. Pope's admirable imitations of Horace's *Satires* and *Epistles* had recently appeared, were in every hand, and were by many readers thought superior to the originals. What Pope had done for Horace, Johnson aspired to do for Juvenal.

Johnson's *London* appeared without his name in May 1738. He received only ten guineas for this stately and vigorous poem; but the sale was rapid and the success complete. A second edition was required within a week. Those small critics who are always desirous to lower established reputations ran about proclaiming that the anonymous satirist was superior to Pope in Pope's own peculiar department of literature. It ought to be remembered, to the honour of Pope, that he joined heartily in the applause with which the appearance of a rival genius was welcomed. He made inquiries about the author of *London*. Such a man, he said, could not long be concealed. The name was soon discovered; and Pope, with great kindness, exerted himself to obtain an academical degree and the mastership of a grammar school for the poor young poet. The attempt failed, and Johnson remained a bookseller's hack.

It does not appear that these two men, the most eminent writer of the generation which was going out, and the most eminent writer of the generation which was coming in, ever saw each other. They lived in very different circles, one surrounded by dukes and earls, the other by starving pamphleteers and index-makers. Among Johnson's associates at this time may be mentioned Boyse, who, when his shirts were pledged, scrawled Latin verses sitting up in bed with his arms through two holes in his blanket, who composed very respectable sacred poetry when he was sober, and who was at last run over by a hackney coach when he was drunk; Hoole, surnamed the metaphysical tailor, who, instead of attending to his measures, used to trace geometrical diagrams on the board where he sat cross-legged; and the penitent impostor, George Psalmanazar, who, after poring all day, in a humble lodging, on the folios of Jewish rabbis and Christian fathers, indulged himself at night with literary and theological conversation at an alehouse in the City. But the most remarkable of the persons with whom at this time Johnson consorted was Richard Savage, an earl's son, a shoemaker's apprentice, who had seen life in all its forms, who had feasted among blue ribands in St James's Square, and had lain with fifty pounds weight of irons on his legs in the condemned ward of Newgate. This man had, after many vicissitudes of fortune, sunk at last into abject and hopeless poverty. His pen had failed him. His patrons had been taken away by death, or estranged by the riotous profusion with which he squandered their bounty, and the ungrateful insolence with which he rejected their advice. He now lived by begging. He dined on venison and champagne whenever he had been so fortunate as to borrow a guinea. If his questing had been unsuccessful, he appeased the rage of hunger with some scraps of broken meat, and lay down to rest under the piazza of Covent Garden in warm weather, and, in cold weather, as near as he could get to the furnace of a glass house. Yet in his misery he was still an agreeable companion. He had an inexhaustible store of anecdotes about that gay and brilliant world from which he was now an outcast. He had observed the great men of both parties in hours of careless relaxation, had seen the leaders of opposition without the mask of patriotism, and had heard the prime minister roar with laughter and tell stories not over-decent. During some months Savage lived in the closest familiarity with Johnson; and then the friends parted, not without tears. Johnson remained in London to drudge for Cave. Savage went to the west of England, lived there as he had lived everywhere, and in 1743 died, penniless and heartbroken, in Bristol Gaol.

Soon after his death, while the public curiosity was strongly excited about his extraordinary character and his not less extraordinary adventures, a life of him appeared widely different from the catchpenny lives of eminent men which were then a staple article of manufacture in Grub Street. The style was indeed deficient in ease and variety; and the writer was evidently too partial to the Latin element of our language. But the little work, with all its faults, was a masterpiece. No finer specimen of literary biography existed in any language, living or dead; and a discerning critic might have confidently predicted that the author was destined to be the founder of a new school of English eloquence.

The *Life of Savage* was anonymous; but it was well known in literary circles that Johnson was the writer. During the three years which followed, he produced no important work; but he was not, and indeed could not be, idle. The fame of his abilities and learning continued to grow. Warburton pronounced him a man of parts and genius; and the praise of Warburton was then no light thing. Such was Johnson's reputation that, in 1747, several eminent booksellers combined to employ him in the arduous work of preparing a *Dictionary of the English Language*, in two folio volumes. The sum which they agreed to pay him was only fifteen hundred guineas; and out of this sum he had to pay several poor men of letters who assisted him in the humbler parts of his task.

The prospectus of the *Dictionary* he addressed to the earl of Chesterfield. Chesterfield had long been celebrated for the politeness of his manners, the brilliancy of his wit, and the delicacy of his taste. He was acknowledged to be the finest speaker in the House of Lords. He had recently governed Ireland, at a momentous conjuncture, with eminent firmness, wisdom and humanity; and he had since become secretary of state. He received Johnson's homage with the most winning affability, and requited it with a few guineas, bestowed doubtless in a very graceful manner, but was by no means desirous to see all his carpets blackened with the London mud, and his soups and wines thrown to right and left over the gowns of fine ladies and the waistcoats of fine gentlemen, by an absent, awkward scholar, who gave strange starts and uttered strange growls, who dressed like a scarecrow and ate like a cormorant. During some time Johnson continued to call on his patron, but, after being repeatedly told by the porter that his lordship was not at home, took the hint, and ceased to present himself at the inhospitable door.

Johnson had flattered himself that he should have completed his *Dictionary* by the end of 1750; but it was not till 1755 that he at length gave his huge volumes to the world. During the seven years which he passed in the drudgery of penning definitions and marking quotations for transcription, he sought for relaxation in literary labour of a more agreeable kind. In January 1749 he published *The Vanity of Human Wishes*, an excellent imitation of the tenth satire of Juvenal, for which he received fifteen guineas.

A few days after the publication of this poem, his tragedy of *Irene*, begun many years before, was brought on the stage by his old pupil, David Garrick, now manager of Drury Lane Theatre. The relation between him and his old preceptor was of a very singular kind. They repelled each other strongly, and yet attracted each other strongly. Nature had made them of very different clay; and circumstances had fully brought out the natural peculiarities of both. Sudden prosperity had turned Garrick's head. Continued adversity had soured Johnson's temper. Johnson saw with more envy than became so great a man the villa, the plate, the china, the Brussels carpet, which the little mimic had got by repeating, with grimaces and gesticulations, what wiser men had written; and the exquisitely sensitive vanity of Garrick was galled by the thought that, while all the rest of the world was applauding him, he could obtain from one morose cynic, whose opinion it was impossible to despise, scarcely any compliment not acidulated with scorn. Yet the two Lichfield men had so many early recollections in common, and sympathized with each other on so many points on which they sympathized with nobody else in the vast population of the capital, that, though the master was often provoked by the monkey-like impertinence of the pupil, and the pupil by the bearish rudeness of the master, they remained friends till they were parted by death. Garrick now brought *Irene* out, with alterations sufficient to displease the author, yet not sufficient to make the piece pleasing to the audience. After nine representations the play was withdrawn. The poet however cleared by his benefit nights, and by the sale of the copyright of his tragedy, about three hundred pounds, then a great sum in his estimation.

About a year after the representation of *Irene*, he began to publish a series of short essays on morals, manners and literature. This species of composition had been brought into fashion by the success of the *Tatler*, and by the still more brilliant success of the *Spectator*. A crowd of small writers had vainly attempted to rival Addison. The *Lay Monastery*, the *Censor*, the *Freethinker*, the *Plain Dealer*, the *Champion*, and other works of the same kind had had their short day. At length Johnson undertook the adventure in which so many aspirants had failed. In the thirty-sixth year after the appearance of the last number of the *Spectator* appeared the first number of the *Rambler*. From March 1750 to March 1752 this paper continued to come out every Tuesday and Saturday.

From the first the *Rambler* was enthusiastically admired by a few eminent men. Richardson, when only five numbers had appeared, pronounced it equal if not superior to the *Spectator*. Young and Hartley expressed their approbation not less warmly. In consequence probably of the good offices of Bubb Dodington, who was then the confidential adviser of Prince Frederick, two of his royal highness's gentlemen carried a gracious message to the printing office, and ordered seven copies for Leicester House. But Johnson had had enough of the patronage of the great to last him all his life, and was not disposed to haunt any other door as he had haunted the door of Chesterfield.

By the public the *Rambler* was at first very coldly received. Though the price of a number was only twopence, the sale did not amount to five hundred. The profits were therefore very small. But as soon as the flying leaves were collected and reprinted they became popular. The author lived to see thirteen thousand copies spread over England alone. Separate editions were published for the Scotch and Irish markets. A large party pronounced the style perfect, so absolutely perfect that in some essays it would be impossible for the writer himself to alter a single word for the better. Another party, not less numerous, vehemently accused him of having corrupted the purity of the English tongue. The best critics admitted that his diction was too monotonous, too obviously artificial, and now and then turgid even to absurdity. But they did justice to the acuteness of his observations on morals and manners, to the constant precision and frequent brilliancy of his language, to the weighty and magnificent eloquence of many serious passages, and to the solemn yet pleasing humour of some of the lighter papers.

The last *Rambler* was written in a sad and gloomy hour. Mrs Johnson had been given over by the physicians. Three days later she died. She left her husband almost broken-hearted. Many people had been surprised to see a man of his genius and learning stooping to every drudgery, and denying himself almost every comfort, for the purpose of supplying a silly, affected old woman with superfluities, which she accepted with but little gratitude. But all his affection had been concentrated on her. He had neither brother nor sister, neither son nor daughter. Her opinion of his writings was more important to him than the voice of the pit of Drury Lane Theatre, or the judgment of the *Monthly Review*. The chief support which had sustained him through the most arduous labour of his life was the hope that she would enjoy the fame and the profit which he anticipated from his *Dictionary*. She was gone; and in that vast labyrinth of streets, peopled by eight hundred thousand human beings, he was alone. Yet it was necessary for him to set himself, as he expressed it, doggedly to work. After three more laborious years, the *Dictionary* was at length complete.

It had been generally supposed that this great work would be dedicated to the eloquent and accomplished nobleman to whom the prospectus had been addressed. Lord Chesterfield well knew the value of such a compliment; and therefore, when the day of publication drew near, he exerted himself to soothe, by a show of zealous and at the same time of delicate and judicious kindness, the pride which he had so cruelly wounded. Since the *Rambler* had ceased to appear, the town had been entertained by a journal called the *World*, to which many men of high rank and fashion contributed. In two successive numbers of the *World*, the *Dictionary* was, to use the modern phrase, puffed with wonderful skill. The writings of Johnson were warmly praised. It was proposed that he should be invested with the authority of a dictator, nay, of a pope, over our language, and that his decisions about the meaning and the spelling of words should be received as final. His two folios, it was said, would of course be bought by everybody who could afford to buy them. It was soon known that these papers were written by Chesterfield. But the just resentment of Johnson was not to be so appeased. In a letter written with singular energy and dignity of thought and language, he repelled the tardy advances of his patron. The *Dictionary* came forth without a dedication. In the Preface the author truly declared that he owed nothing to the great, and described the difficulties with which he had been left to struggle so forcibly and pathetically that the ablest and most malevolent of all the enemies of his fame, Horne Tooke, never could read that passage without tears.

Johnson's *Dictionary* was hailed with an enthusiasm such as no similar work has ever excited. It was indeed the first dictionary which could be read with pleasure. The definitions show so much acuteness of thought and command of language, and the passages quoted from poets, divines and philosophers are so skilfully selected, that a leisure hour may always be very agreeably spent in turning over the pages. The faults of the book resolve themselves, for the most part, into one great fault. Johnson was a wretched etymologist. He knew little or nothing of any Teutonic language except English, which indeed, as he wrote it, was scarcely a Teutonic language; and thus he was absolutely at the mercy of Junius and Skinner.

The *Dictionary*, though it raised Johnson's fame, added nothing to his pecuniary means. The fifteen hundred guineas which the booksellers had agreed to pay him had been advanced and spent before the last sheets issued from the press. It is painful to relate that twice in the course of the year which followed the publication of this great work he was arrested and carried to sponging-houses, and that he was twice indebted for his liberty to his excellent friend Richardson. It was still necessary for the man who had been formerly saluted by the highest authority as dictator of the English language to supply his wants by constant toil. He abridged his *Dictionary*. He proposed to bring out an edition of Shakespeare by subscription, and many subscribers sent in their names and laid down their money; but he soon found the task so little to his taste that he turned to more attractive employments. He contributed many papers to a new monthly journal, which was called the *Literary Magazine*. Few of these papers have much interest; but among them was one of the best things that he ever wrote, a masterpiece both of reasoning and of satirical pleasantry, the review of Jenyns' *Inquiry into the Nature and Origin of Evil*.

In the spring of 1758 Johnson put forth the first of a series of essays, entitled the *Idler*. During two years these essays continued to appear weekly. They were eagerly read, widely circulated, and indeed impudently pirated, while they were still in the original form, and had a large sale when collected into volumes. The *Idler* may be described as a second part of the *Rambler*, somewhat livelier and somewhat weaker than the first part.

While Johnson was busied with his *Idlers*, his mother, who had accomplished her ninetieth year, died at Lichfield. It was long since he had seen her, but he had not failed to contribute largely out of his small means to her comfort. In order to defray the charges of her funeral, and to pay some debts which she had left, he wrote a little book in a single week, and sent off the sheets to the press without reading them over. A hundred pounds were paid him for the copyright, and the purchasers had great cause to be pleased with their bargain, for the book was *Rasselas*, and it had a great success.

The plan of *Rasselas* might, however, have seemed to invite severe criticism. Johnson has frequently blamed Shakespeare for neglecting the proprieties of time and place, and for ascribing to one age or nation the manners and opinions of another. Yet Shakespeare has not sinned in this way more grievously than Johnson. Rasselas and Imlac, Nekayah and Pekuah, are evidently meant to be Abyssinians of the 18th century; for the Europe which Imlac describes is the Europe of the 18th century, and the inmates of the Happy Valley talk familiarly of that law of gravitation which Newton discovered and which was not fully received even at Cambridge till the 18th century. Johnson, not content with turning filthy savages, ignorant of their letters, and gorged with raw steaks cut from living cows, into philosophers as eloquent and enlightened as himself or his friend Burke, and into ladies as highly accomplished as Mrs Lennox or Mrs Sheridan, transferred the whole domestic system of England to Egypt. Into a land of harems, a land of polygamy, a land where women are married without ever being seen, he introduced the flirtations and jealousies of our ball-rooms. In a land where there is boundless liberty of divorce, wedlock is described as the indissoluble compact. "A youth and maiden meeting by chance, or brought together by artifice, exchange glances, reciprocate civilities, go home, and dream of each other. Such," says Rasselas, "is the common process of marriage." A writer who was guilty of such improprieties had little right to blame the poet who made Hector quote Aristotle, and represented Julio Romano as flourishing in the days of the Oracle of Delphi.

By such exertions as have been described Johnson supported himself till the year 1762. In that year a great change in his circumstances took place. He had from a child been an enemy of the reigning dynasty. His Jacobite prejudices had been exhibited with little disguise both in his works and in his conversation. Even in his massy and elaborate *Dictionary* he had, with a strange want of taste and judgment, inserted bitter and contumelious reflexions on the Whig party. The excise, which was a favourite resource of Whig financiers, he had designated as a hateful tax. He had railed against the commissioners of excise in language so coarse that they had seriously thought of prosecuting him. He had with difficulty been prevented from holding up the lord privy seal by name as an example of the meaning of the word "renegade." A pension he had defined as pay given to a state hireling to betray his country; a pensioner as a slave of state hired by a stipend to obey a master. It seemed unlikely that the author of these definitions would himself be pensioned. But that was a time of wonders. George III. had ascended the throne, and had, in the course of a few months, disgusted many of the old friends, and conciliated many of the old enemies of his house. The city was becoming mutinous; Oxford was becoming loyal. Cavendishes and Bentincks were murmuring; Somersets and Wyndhams were hastening to kiss hands. The head of the treasury was now Lord Bute, who was a Tory, and could have no objection to Johnson's Toryism. Bute wished to be thought a patron of men of letters; and Johnson was one of the most eminent and one of the most needy men of letters in Europe. A pension of three hundred a year was graciously offered, and with very little hesitation accepted.

This event produced a change in Johnson's whole way of life. For the first time since his boyhood he no longer felt the daily goad urging him to the daily toil. He was at liberty, after thirty years of anxiety and drudgery, to indulge his constitutional indolence, to lie in bed till two in the afternoon, and to sit up talking till four in the morning, without fearing either the printer's devil or the sheriff's officer.

One laborious task indeed he had bound himself to perform. He had received large subscriptions for his promised edition of Shakespeare; he had lived on those subscriptions during some years; and he could not without disgrace omit to perform his part of the contract. His friends repeatedly exhorted him to make an effort, and he repeatedly resolved to do so. But, notwithstanding their exhortations and his resolutions, month followed month, year followed year, and nothing was done. He prayed fervently against his idleness; he determined, as often as he received the sacrament, that he would no longer doze away and trifle away his time; but the spell under which he lay resisted prayer and sacrament. Happily for his honour, the charm which held him captive was at length broken by no gentle or friendly hand. He had been weak enough to pay serious attention to a story about a ghost which haunted a house in Cock Lane, and had actually gone himself, with some of his friends, at one in the morning, to St John's Church, Clerkenwell, in the hope of receiving a communication from the perturbed spirit. But the spirit, though adjured with all solemnity, remained obstinately silent; and it soon appeared that a naughty girl of eleven had been amusing herself by making fools of so many philosophers. Churchill, who, confident in his powers, drunk with popularity, and burning with party spirit, was looking for some man of established fame and Tory politics to insult, celebrated the Cock Lane ghost in three cantos, nicknamed Johnson Pomposo, asked where the book was which had been so long promised and so liberally paid for, and directly accused the great moralist of cheating. This terrible word proved effectual, and in October 1765 appeared, after a delay of nine years, the new edition of Shakespeare.

This publication saved Johnson's character for honesty, but added nothing to the fame of his abilities and learning. The Preface, though it contains some good passages, is not in his best manner. The most valuable notes are those in which he had an opportunity of showing how attentively he had during many years observed human life and human nature. The best specimen is the note on the character of Polonius. Nothing so good is to be found even in Wilhelm Meister's admirable examination of *Hamlet*. But here praise must end. It would be difficult to name a more slovenly, a more worthless edition of any great classic.[1] Johnson had, in his prospectus, told the world that he was peculiarly fitted for the task which he had undertaken, because he had, as a lexicographer, been under the necessity of taking a wider view of the English language than any of his predecessors. But, unfortunately, he had altogether neglected that very part of our literature with which it is especially desirable that an editor of Shakespeare should be conversant. In the two folio volumes of the *English Dictionary* there is not a single passage quoted from any dramatist of the Elizabethan age except Shakespeare and Ben Jonson. Even from Ben the quotations are few. Johnson might easily in a few months have made himself well acquainted with every old play that was extant. But it never seems to have occurred to him that this was a necessary preparation for the work which he had undertaken. He would doubtless have admitted that it would be the height of absurdity in a man who was not familiar with the works of Aeschylus and Euripides to publish an edition of Sophocles. Yet he ventured to publish an edition of Shakespeare, without having ever in his life, as far as can be discovered, read a single scene of Massinger, Ford, Dekker, Webster, Marlow, Beaumont or Fletcher. His detractors were noisy and scurrilous. He had, however, acquitted himself of a debt which had long lain heavy on his conscience and he sank back into the repose from which the sting of satire had roused him. He long continued to live upon the fame which he had already won. He was honoured by the university of Oxford with a doctor's degree, by the Royal Academy with a professorship, and by the king with an interview, in which his majesty most graciously expressed a hope that so excellent a writer would not cease to write. In the interval between 1765 and 1775 Johnson published only two or three political tracts.

But, though his pen was now idle, his tongue was active. The influence exercised by his conversation, directly upon those with whom he lived, and indirectly on the whole literary world, was altogether without a parallel. His colloquial talents were indeed of the highest order. He had strong sense, quick discernment, wit, humour, immense knowledge of literature and of life, and an infinite store of curious anecdotes. As respected style, he spoke far better than he wrote. Every sentence which dropped from his lips was as correct in structure as the most nicely balanced period of the *Rambler*. But in his talk there were no pompous triads, and little more than a fair proportion of words in *-osity* and *-ation*. All was simplicity, ease and vigour. He uttered his short, weighty, and pointed sentences with a power of voice, and a justness and energy of emphasis, of which the effect was rather increased than diminished by the rollings of his huge form, and by the asthmatic gaspings and puffings in which the peals of his eloquence generally ended. Nor did the laziness which made him unwilling to sit down to his desk prevent him from giving instruction or entertainment orally. To discuss questions of taste, of learning, of casuistry, in language so exact and so forcible that it might have been printed without the alteration of a word, was to him no exertion, but a pleasure. He loved, as he said, to fold his legs and have his talk out. He was ready to bestow the overflowings of his full mind on anybody who would start a subject: on a fellow-passenger in a stage coach, or on the person who sat at the same table with him in an eating-house. But his conversation was nowhere so brilliant and striking as when he was surrounded by a few friends, whose abilities and knowledge enabled them, as he once expressed it, to send him back every ball that he threw. Some of these, in 1764, formed themselves into a club, which gradually became a formidable power in the commonwealth of letters. The verdicts pronounced by this conclave on new books were speedily known over all London, and were sufficient to sell off a whole edition in a day, or to condemn the sheets to the service of the trunkmaker and the pastrycook. Goldsmith was the representative of poetry and light literature, Reynolds of the arts, Burke of political eloquence and political philosophy. There, too, were Gibbon the greatest historian and Sir William Jones the greatest linguist of the age. Garrick brought to the meetings his inexhaustible pleasantry, his incomparable mimicry, and his consummate knowledge of stage effect. Among the most constant attendants were two high-born and high-bred gentlemen, closely bound together by friendship, but of widely different characters and habits—Bennet Langton, distinguished by his skill in Greek literature, by the orthodoxy of his opinions, and by the sanctity of his life, and Topham Beauclerk, renowned for his amours, his knowledge of the gay world, his fastidious taste and his sarcastic wit.

Among the members of this celebrated body was one to whom it has owed the greater part of its celebrity, yet who was regarded with little respect by his brethren, and had not without difficulty obtained a seat among them. This was James Boswell (*q.v.*), a young Scots lawyer, heir to an honourable name and a fair estate. That he was a coxcomb and a bore, weak, vain, pushing, curious, garrulous, was obvious to all who were acquainted with him.

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[1] This famous dictum of Macaulay, though endorsed by Lord Rosebery, has been energetically rebutted by Professor W. Raleigh and others, who recognize both sagacity and scholarship in Johnson's Preface and Notes. Johnson's wide grasp of the discourse and knowledge of human nature enable him in a hundred entangled passages to go straight to the dramatist's meaning.—(T. Se.)

To a man of Johnson's strong understanding and irritable temper, the silly egotism and adulation of Boswell must have been as teasing as the constant buzz of a fly. Johnson hated to be questioned; and Boswell was eternally catechizing him on all kinds of subjects, and sometimes propounded such questions as, "What would you do, sir, if you were locked up in a tower with a baby?" Johnson was a water-drinker and Boswell was a wine-bibber, and indeed little better than an habitual sot. It was impossible that there should be perfect harmony between two such companions. Indeed, the great man was sometimes provoked into fits of passion, in which he said things which the small man, during a few hours, seriously resented. Every quarrel, however, was soon made up. During twenty years the disciple continued to worship the master; the master continued to scold the disciple, to sneer at him, and to love him. The two friends ordinarily resided at a great distance from each other. Boswell practised in the Parliament House of Edinburgh, and could pay only occasional visits to London. During those visits his chief business was to watch Johnson, to discover all Johnson's habits, to turn the conversation to subjects about which Johnson was likely to say something remarkable, and to fill quarto notebooks with minutes of what Johnson had said. In this way were gathered the materials out of which was afterwards constructed the most interesting biographical work in the world.

Soon after the club began to exist, Johnson formed a connexion less important indeed to his fame, but much more important to his happiness, than his connexion with Boswell. Henry Thrale, one of the most opulent brewers in the kingdom, a man of sound and cultivated understanding, rigid principles, and liberal spirit, was married to one of those clever, kind-hearted, engaging, vain, pert young women who are perpetually doing or saying what is not exactly right, but who, do or say what they may, are always agreeable. In 1765 the Thrales became acquainted with Johnson, and the acquaintance ripened fast into friendship. They were astonished and delighted by the brilliancy of his conversation. They were flattered by finding that a man so widely celebrated preferred their house to any other in London. Johnson soon had an apartment at the brewery in Southwark, and a still more pleasant apartment at the villa of his friends on Streatham Common. A large part of every year he passed in those abodes, which must have seemed magnificent and luxurious indeed, when compared with the dens in which he had generally been lodged. But his chief pleasures were derived from what the astronomer of his Abyssinian tale called "the endearing elegance of female friendship." Mrs Thrale rallied him, soothed him, coaxed him, and if she sometimes provoked him by her flippancy, made ample amends by listening to his reproofs with angelic sweetness of temper. When he was diseased in body and in mind, she was the most tender of nurses. No comfort that wealth could purchase, no contrivance that womanly ingenuity, set to work by womanly compassion, could devise, was wanting to his sick room. It would seem that a full half of Johnson's life during about sixteen years was passed under the roof of the Thrales. He accompanied the family sometimes to Bath, and sometimes to Brighton, once to Wales and once to Paris. But he had at the same time a house in one of the narrow and gloomy courts on the north of Fleet Street. In the garrets was his library, a large and miscellaneous collection of books, falling to pieces and begrimed with dust. On a lower floor he sometimes, but very rarely, regaled a friend with a plain dinner—a veal pie, or a leg of lamb and spinach, and a rice pudding. Nor was the dwelling uninhabited during his long absences. It was the home of the most extraordinary assemblage of inmates that ever was brought together. At the head of the establishment Johnson had placed an old lady named Williams, whose chief recommendations were her blindness and her poverty. But, in spite of her murmurs and reproaches, he gave an asylum to another lady who was as poor as herself, Mrs Desmoulins, whose family he had known many years before in Staffordshire. Room was found for the daughter of Mrs Desmoulins, and for another destitute damsel, who was generally addressed as Miss Carmichael, but whom her generous host called Polly. An old quack doctor named Levett, who had a wide practice, but among the very poorest class, poured out Johnson's tea in the morning and completed this strange menagerie. All these poor creatures were at constant war with each other, and with Johnson's negro servant Frank. Sometimes, indeed, they transferred their hostilities from the servant to the master, complained that a better table was not kept for them, and railed or maundered till their benefactor was glad to make his escape to Streatham or to the Mitre Tavern. And yet he, who was generally the haughtiest and most irritable of mankind, who was but too prompt to resent anything which looked like a slight on the part of a purse-proud bookseller, or of a noble and powerful patron, bore patiently from mendicants, who, but for his bounty, must have gone to the workhouse, insults more provoking than those for which he had knocked down Osborne and bidden defiance to Chesterfield. Year after year Mrs Williams and Mrs Desmoulins, Polly and Levett, continued to torment him and to live upon him.

The course of life which has been described was interrupted in Johnson's sixty-fourth year by an important event. He had early read an account of the Hebrides, and had been much interested by learning that there was so near him a land peopled by a race which was still as rude and simple as in the Middle Ages. A wish to become intimately acquainted with a state of society so utterly unlike all that he had ever seen frequently crossed his mind. But it is not probable that his curiosity would have overcome his habitual sluggishness, and his love of the smoke, the mud, and the cries of London, had not Boswell importuned him to attempt the adventure, and offered to be his squire. At length, in August 1773, Johnson crossed the Highland line, and plunged courageously into what was then considered, by most Englishmen, as a dreary and perilous wilderness. After wandering about two months through the Celtic region, sometimes in rude boats which did not protect him from the rain, and sometimes on small shaggy ponies which could hardly bear his weight, he returned to his old haunts with a mind full of new images and new theories. During the following year he employed himself in recording his adventures. About the beginning of 1775 his *Journey to the Hebrides* was published, and was, during some weeks, the chief subject of conversation in all circles in which any attention was paid to literature. His prejudice against the Scots had at length become little more than matter of jest; and whatever remained of the old feeling had been effectually removed by the kind and respectful hospitality with which he had been received in every part of Scotland. It was, of course, not to be expected that an Oxonian Tory should praise the Presbyterian polity and ritual, or that an eye accustomed to the hedgerows and parks of England should not be struck by the bareness of Berwickshire and East Lothian. But even in censure Johnson's tone is not unfriendly. The most enlightened Scotsmen, with Lord Mansfield at their head, were well pleased. But some foolish and ignorant Scotsmen were moved to anger by a little unpalatable truth which was mingled with much eulogy, and assailed him whom they chose to consider as the enemy of their country with libels much more dishonourable to their country than anything that he had ever said or written. They published paragraphs in the newspapers, articles in the magazines, sixpenny pamphlets, five-shilling books. One scribbler abused Johnson for being blear-eyed, another for being a pensioner; a third informed the world that one of the doctor's uncles had been convicted of felony in Scotland, and had found that there was in that country one tree capable of supporting the weight of an Englishman. Macpherson, whose *Fingal* had been treated in the *Journey* as an impudent forgery, threatened to take vengeance with a cane. The only effect of this threat was that Johnson reiterated the charge of forgery in the most contemptuous terms, and walked about, during some time, with a cudgel.

Of other assailants Johnson took no notice whatever. He had early resolved never to be drawn into controversy; and he adhered to his resolution with a steadfastness which is the more extraordinary because he was, both intellectually and morally, of the stuff of which controversialists are made. In conversation he was a singularly eager, acute and pertinacious disputant. When at a loss for good reasons, he had recourse to sophistry; and when heated by altercation, he made unsparing use of sarcasm and invective. But when he took his pen in his hand, his whole character seemed to be changed. A hundred bad writers misrepresented him and reviled him; but not one of the hundred could boast of having been thought by him worthy of a refutation, or even of a retort. One Scotsman, bent on vindicating the fame of Scots learning, defied him to the combat in a detestable Latin hexameter:—

> "Maxime, si tu vis, cupio contendere tecum."

But Johnson took no notice of the challenge. He always maintained that fame was a shuttlecock which could be kept up only by being beaten back as well as beaten forward, and which would soon fall if there were only one battledore. No saying was oftener in his mouth than that fine apophthegm of Bentley, that no man was ever written down but by himself.

Unhappily, a few months after the appearance of the *Journey to the Hebrides*, Johnson did what none of his envious assailants could have done, and to a certain extent succeeded in writing himself down. The disputes between England and her American colonies had reached a point at which no amicable adjustment was possible. War was evidently impending; and the ministers seem to have thought that the eloquence of Johnson might with advantage be employed to inflame the nation against the opposition at home, and against the rebels beyond the Atlantic. He had already written two or three tracts in defence of the foreign and domestic policy of the government; and those tracts, though hardly worthy of him, were much superior to the crowd of pamphlets which lay on the counters of Almon and Stockdale. But his *Taxation no Tyranny* was a pitiable failure. Even Boswell was forced to own that in this unfortunate piece he could detect no trace of his master's powers. The general opinion was that the strong faculties which had produced the *Dictionary* and the *Rambler* were beginning to feel the effect of time and of disease, and that the old man would best consult his credit by writing no more. But this was a great mistake. Johnson had failed, not because his mind was less vigorous than when he wrote *Rasselas* in the evenings of a week, but because he had foolishly chosen, or suffered others to choose for him, a subject such as he would at no time have been competent to treat. He was in no sense a statesman. He never willingly read or thought or talked about affairs of state. He loved biography, literary history, the history of manners; but political history was positively distasteful to him. The question at issue between the colonies and the mother country was a question about which he had really nothing to say. Happily, Johnson soon had an opportunity of proving most signally that his failure was not to be ascribed to intellectual decay.

On Easter Eve 1777 some persons, deputed by a meeting which consisted of forty of the first booksellers in London, called upon him. Though he had some scruples about doing business at that season, he received his visitors with much civility. They came to inform him that a new edition of the English poets, from Cowley downwards, was in contemplation, and to ask him to furnish short biographical prefaces. He readily undertook the task for which he was pre-eminently qualified. His knowledge of the literary history of England since the Restoration was unrivalled. That knowledge he had derived partly from books, and partly from sources which had long been closed: from old Grub Street traditions; from the talk of forgotten poetasters and pamphleteers, who had long been lying in parish vaults; from the recollections of such men as Gilbert Walmesley, who had conversed with the wits of Button, Cibber, who had mutilated the plays of two generations of dramatists, Orrery, who had been admitted to the society of Swift and Savage, who had rendered services of no very honourable kind to Pope. The biographer therefore sat down to his task with a mind full of matter. He had at first intended to give only a paragraph to every minor poet, and only four or five pages to the greatest name. But the flood of anecdote and criticism overflowed the narrow channel. The work, which was originally meant to consist only of a few sheets, swelled into ten volumes—small volumes, it is true, and not closely printed. The first four appeared in 1779, the remaining six in 1781.

The *Lives of the Poets* are, on the whole, the best of Johnson's works. The narratives are as entertaining as any novel. The remarks on life and on human nature are eminently shrewd and profound. The criticisms are often excellent, and, even when grossly and provokingly unjust, well deserve to be studied. *Savage's Life* Johnson reprinted nearly as it had appeared in 1744. Whoever, after reading that life, will turn to the other lives will be struck by the difference of style. Since Johnson had been at ease in his circumstances he had written little and had talked much. When therefore he, after the lapse of years, resumed his pen, the mannerism which he had contracted while he was in the constant habit of elaborate composition was less perceptible than formerly, and his diction frequently had a colloquial ease which it had formerly wanted. The improvement may be discerned by a skilful critic in the *Journey to the Hebrides*, and in the *Lives of the Poets* is so obvious that it cannot escape the notice of the most careless reader. Among the *Lives* the best are perhaps those of Cowley, Dryden and Pope. The very worst is, beyond all doubt, that of Gray; the most controverted that of Milton.

This great work at once became popular. There was, indeed, much just and much unjust censure; but even those who were loudest in blame were attracted by the book in spite of themselves. Malone computed the gains of the publishers at five or six thousand pounds. But the writer was very poorly remunerated. Intending at first to write very short prefaces, he had stipulated for only two hundred guineas. The booksellers, when they saw how far his performance had surpassed his promise, added only another hundred. Indeed Johnson, though he did not despise or affect to despise money, and though his strong sense and long experience ought to have qualified him to protect his own interests, seems to have been singularly unskilful and unlucky in his literary bargains. He was generally reputed the first English writer of his time. Yet several writers of his time sold their copyrights for sums such as he never ventured to ask. To give a single instance, Robertson received £4500 for the *History of Charles V.*

Johnson was now in his seventy-second year. The infirmities of age were coming fast upon him. That inevitable event of which he never thought without horror was brought near to him; and his whole life was darkened by the shadow of death. The strange dependants to whom he had given shelter, and to whom, in spite of their faults, he was strongly attached by habit, dropped off one by one; and, in the silence of his home, he regretted even the noise of their scolding matches. The kind and generous Thrale was no more; and it was soon plain that the old Streatham intimacy could not be maintained upon the same footing. Mrs Thrale herself confessed that without her husband's assistance she did not feel able to entertain Johnson as a constant inmate of her house. Free from the yoke of the brewer, she fell in love with a music master, high in his profession, from Brescia, named Gabriel Piozzi, in whom nobody but herself could discover anything to admire. The secret of this attachment was soon discovered by Fanny Burney, but Johnson at most only suspected it.

In September 1782 the place at Streatham was from motives of economy let to Lord Shelburne, and Mrs Thrale took a house at Brighton, whither Johnson accompanied her; they remained for six weeks on the old familiar footing. In March 1783 Boswell was glad to discover Johnson well looked after and staying with Mrs Thrale in Argyll Street, but in a bad state of health. Impatience of Johnson's criticisms and infirmities had been steadily growing with Mrs Thrale since 1774. She now went to Bath with her daughters, partly to escape his supervision. Johnson was very ill in his lodgings during the summer, but he still corresponded affectionately with his "mistress" and received many favours from her. He retained the full use of his senses during the paralytic attack, and in July he was sufficiently recovered to renew his old club life and to meditate further journeys. In June 1784 he went with Boswell to Oxford for the last time. In September he was in Lichfield. On his return his health was rather worse; but he would submit to no dietary régime. His asthma tormented him day and night, and dropsical symptoms made their appearance. His wrath was excited in no measured terms against the re-marriage of his old friend Mrs Thrale, the news of which he heard this summer. The whole dispute seems, to-day, entirely uncalled-for, but the marriage aroused some of Johnson's strongest prejudices. He wrote inconsiderately on the subject, but we must remember that he was at the time afflicted in body and mentally haunted by dread of impending change. Throughout all his troubles he had clung vehemently to life. The feeling described in that fine but gloomy paper which closes the series of his *Idlers* seemed to grow stronger in him as his last hour drew near. He fancied that he should be able to draw his breath more easily in a southern climate, and would probably have set out for Rome and Naples but for his fear of the expense of the journey. That expense, indeed, he had the means of defraying; for he had laid up about two thousand pounds, the fruit of labours which had made the fortune of several publishers. But he was unwilling to break in upon this hoard, and he seems to have wished even to keep its existence a secret. Some of his friends hoped that the Government might be induced to increase his pension to six hundred pounds a year, but this hope was disappointed, and he resolved to stand one English winter more.

That winter was his last. His legs grew weaker; his breath grew shorter; the fatal water gathered fast, in spite of incisions which he, courageous against pain but timid against death, urged his surgeons to make deeper and deeper. Though the tender care which had mitigated his sufferings during months of sickness at Streatham was withdrawn, and though Boswell was absent, he was not left desolate. The ablest physicians and surgeons attended him, and refused to accept fees from him. Burke parted from him with deep emotion. Windham sat much in the sick-room. Frances Burney, whom the old man had cherished with fatherly kindness, stood weeping at the door; while Langton, whose piety eminently qualified him to be an adviser and comforter at such a time, received the last pressure of his friend's hand within. When at length the moment, dreaded through so many years, came close, the dark cloud passed away from Johnson's mind. Windham's servant, who sat up with him during his last night, declared that "no man could appear more collected, more devout or less terrified at the thoughts of the approaching minute." At hour intervals, often of much pain, he was moved in bed and addressed himself vehemently to prayer. In the morning he was still able to give his blessing, but in the afternoon he became drowsy, and at a quarter past seven in the evening on the 13th of December 1784, in his seventy-sixth year, he passed away. He was laid, a week later, in Westminster Abbey, among the eminent men of whom he had been the historian—Cowley and Denham, Dryden and Congreve, Gay, Prior and Addison. (M.)

Bibliography.—The splendid example of his style which Macaulay contributed in the article on Johnson to the 8th edition of this encyclopaedia has become classic, and has therefore been retained above with a few trifling modifications in those places in which his invincible love of the picturesque has drawn him demonstrably aside from the dull line of veracity. Macaulay, it must be noted, exaggerated persistently the poverty of Johnson's pedigree, the squalor of his early married life, the grotesqueness of his entourage in Fleet Street, the decline and fall from complete virtue of Mrs Thrale, the novelty and success of the *Dictionary*, the complete failure of the Shakespeare and the political tracts. Yet this contribution is far more mellow than the article contributed on Johnson twenty-five years before to the *Edinburgh Review* in correction of Croker. Matthew Arnold, who edited six selected *Lives* of the poets, regarded it as one of Macaulay's happiest and ripest efforts. It was written out of friendship for Adam Black, and "payment was not so much as mentioned." The big reviews, especially the quarterlies, have always been the natural home of Johnsonian study. Sir Walter Scott, Croker, Hayward, Macaulay, Thomas Carlyle (whose famous Fraser article was reprinted in 1853) and Whitwell Elwin have done as much as anybody perhaps to sustain the zest for Johnsonian studies. Macaulay's prediction that the interest in the man would supersede that in his "Works" seemed and seems likely enough to justify itself; but his theory that the man alone mattered and that a portrait painted by the hand of an inspired idiot was a true measure of the man has not worn better than the common run of literary propositions. Johnson's prose is not extensively read. But the same is true of nearly all the great prose masters of the 18th century. As in the case of all great men, Johnson has suffered a good deal at the hands of his imitators and admirers. His prose, though not nearly so uniformly monotonous or polysyllabic as the parodists would have us believe, was at one time greatly overpraised. From the "Life of Savage" to the "Life of Pope" it developed a great deal, and in the main improved. To the last he sacrificed expression rather too much to style, and he was perhaps over conscious of the balanced epithet. But he contributed both dignity and dialectical force to the prose movement of his period.

The best edition of his works is still the Oxford edition of 1825 in 9 vols. At the present day, however, his periodical writings are neglected, and all that can be said to excite interest are, first the *Lives of the Poets* (best edition by Birkbeck Hill and H. S. Scott, 3 vols., 1905), and then the *Letters*, the *Prayers* and *Meditations*, and the *Poems*, to which may doubtfully be added the once idolized *Rasselas*. The *Poems* and *Rasselas* have been reprinted times without number. The others have been re-edited with scrupulous care for the Oxford University Press by the pious diligence of that most enthusiastic of all Johnsonians, Dr Birkbeck Hill. But the tendency at the present day is undoubtedly to prize Johnson's personality and sayings more than any of his works. These are preserved to us in a body of biographical writing, the efficiency of which is unequalled in the whole range of literature. The chief constituents are Johnson's own *Letters* and *Account of his Life from his Birth to his Eleventh Year* (1805), a fragment saved from papers burned in 1784 and not seen by Boswell; the life by his old but not very sympathetic friend and club-fellow, Sir John Hawkins (1787); Mrs Thrale-Piozzi's *Anecdotes* (1785) and *Letters*; the *Diary* and *Letters* of Fanny Burney (D'Arblay) (1841); the shorter Lives of Arthur Murphy, T. Tyers, &c.; far above all, of course, the unique Life by James Boswell, first published in 1791, and subsequently encrusted with vast masses of Johnsoniana in the successive editions of Malone, Croker, Napier, Fitzgerald, Mowbray Morris (Globe), Birrell, Ingpen (copiously illustrated) and Dr Birkbeck Hill (the most exhaustive).

The sayings and Johnsoniana have been reprinted in very many and various forms. Valuable work has been done in Johnsonian genealogy and topography by Aleyn Lyell Reade in his *Johnsonian Gleanings*, &c., and in the *Memorials of Old Staffordshire* (ed. W. Beresford). The most excellent short Lives are those by F. Grant (Eng. Writers) and Sir Leslie Stephen (Eng. Men of Letters). Professor W. Raleigh's essay (Stephen Lecture), Lord Rosebery's estimate (1909), and Sir Leslie Stephen's article in the *Dictionary of National Biography*, with bibliography and list of portraits, should be consulted. Johnson's "Club" ("The Club") still exists, and has contained ever since his time a large proportion of the public celebrities of its day. A "Johnson Club," which has included many Johnson scholars and has published papers, was founded in 1885. Lichfield has taken an active part in the commemoration of Johnson since 1887, when Johnson's birthplace was secured as a municipal museum, and Lichfield was the chief scene of the Bicentenary Celebrations of September 1909 (fully described in A. M. Broadley's *Dr Johnson and Mrs Thrale*, 1909), containing, together with new materials and portraits, an essay dealing with Macaulay's treatment of the Johnson-Thrale episodes by T. Seccombe). Statues both of Johnson and Boswell are in the market-place at Lichfield. A statue was erected in St Paul's in 1825, and there are commemorative tablets in Lichfield Cathedral, St Nicholas (Brighton), Uttoxeter, St Clement Danes (London), Gwaynynog and elsewhere. (T. Se.)

JOHNSON, SIR THOMAS (1664–1729), English merchant, was born in Liverpool in November 1664. He succeeded his father in 1689 as bailiff and in 1695 as mayor. From 1701 to 1723 he represented Liverpool in parliament, and he was knighted by Queen Anne in 1708. He effected the separation of Liverpool from the parish of Walton-on-the-Hill; from the Crown he obtained the grant to the corporation of the site of the old castle where he planned the town market; while the construction of the first floating dock (1708) and the building of St Peter's and St George's churches were due in great measure to his efforts. He was interested in the tobacco trade; in 1715 he conveyed 130 Jacobite prisoners to the American plantations. In 1723, having lost in speculation the fortune which he had inherited from his father, he went himself to Virginia as collector of customs on the Rappahannock river. He died in Jamaica in 1729. A Liverpool street is named Sir Thomas Buildings after him.

JOHNSON, THOMAS, English 18th-century wood-carver and furniture designer. Of excellent repute as a craftsman and an artist in wood, his original conceptions and his adaptations of other men's ideas were remarkable for their extreme flamboyance, and for the merciless manner in which he overloaded them with thin and meretricious ornament. Perhaps his most inept design is that for a table in which a duck or goose is displacing water that falls upon a mandarin, seated, with his head on one side, upon the rail below. No local school of Italian rococo ever produced more extravagant absurdities. His clocks bore scythes and hour-glasses and flashing sunbeams, together with whirls and convolutions and floriated adornments without end. On the other hand, he occasionally produced a mirror frame or a mantelpiece which was simple and dignified. The art of artistic plagiarism has never been so well understood or so dexterously practised as by the 18th-century designers of English furniture, and Johnson appears to have so far exceeded his contemporaries that he must be called a barefaced thief. The three leading "motives" of the time—Chinese, Gothic and Louis Quatorze—were mixed up in his work in the most amazing manner; and he was exceedingly fond of introducing human figures, animals, birds and fishes in highly incongruous places. He appears to have defended his enormities on the ground that "all men vary in opinion, and a fault in the eye of one may be a beauty in that of another; 'tis a duty incumbent on an author to endeavour at pleasing every taste." Johnson, who was in business at the "Golden Boy" in Grafton Street, Westminster, published a folio volume of *Designs for Picture Frames, Candelabra, Ceilings, &c.* (1758); and *One Hundred and Fifty New Designs* (1761).

JOHNSON, SIR WILLIAM (1715–1774), British soldier and American pioneer, was born in Smithtown, County Meath, Ireland, in 1715, the son of Christopher Johnson, a country gentleman. As a boy he was educated for a commercial career, but in 1738 he removed to America for the purpose of managing a tract of land in the Mohawk Valley, New York, belonging to his uncle, Admiral Sir Peter Warren (1703–1752). He established himself on the south bank of the Mohawk river, about 25 m. W. of Schenectady. Before 1743 he removed to the north side of the river. The new settlement prospered from the start, and a valuable trade was built up with the Indians, over whom Johnson exercised an immense influence. The Mohawks adopted him and elected him a sachem. In 1744 he was appointed by Governor George Clinton (d. 1761) superintendent of the affairs of the Six Nations (Iroquois). In 1746 he was made commissary of the province for Indian affairs, and was influential in enlisting and equipping the Six Nations for participation in the warfare with French Canada, two years later (1748) being placed in command of a line of outposts on the New York frontier. The peace of Aix-la-Chapelle put a stop to offensive operations, which he had begun. In May 1750 by royal appointment he became a member for life of the governor's council, and in the same year he resigned the post of superintendent of Indian affairs. In 1754 he was one of the New York delegates to the inter-colonial convention at Albany, N.Y. In 1755 General Edward Braddock, the commander of the British forces in America, commissioned him major-general, in which capacity he directed the expedition against Crown Point, and in September defeated the French and Indians under Baron Ludwig A. Dieskau (1701–1767) at the battle of Lake George, where he himself was wounded. For this success he received the thanks of parliament, and was created a baronet (November 1755). From July 1756 until his death he was "sole superintendent of the Six Nations and other Northern Indians." He took part in General James Abercrombie's disastrous campaign against Ticonderoga (1758), and in 1759 he was second in command in General John Prideaux's expedition against Fort Niagara, succeeding to the chief command on that officer's death, and capturing the fort. In 1760 he was with General Jeffrey Amherst (1717–1797) at the capture of Montreal. As a reward for his services the king granted him a tract of 100,000 acres of land north of the Mohawk river. It was due to his influence that the Iroquois refused to join Pontiac in his conspiracy, and he was instrumental in arranging the treaty of Fort Stanwix in 1768. After the war Sir William retired to his estates, where, on the site of the present Johnstown, he built his residence, Johnson Hall, and lived in all the style of an English baron. He devoted himself to colonizing his extensive lands, and is said to have been the first to introduce sheep and blood horses into the province. He died at Johnstown, N.Y., on the 11th of July 1774. In 1739 Johnson had married Catherine Wisenberg, by whom he had three children. After her death he had various mistresses, including a niece of the Indian chief Hendrick, and Molly Brant, a sister of the famous chief Joseph Brant.

His son, SIR JOHN JOHNSON (1742–1830), who was knighted in 1765 and succeeded to the baronetcy on his father's death, took part in the French and Indian War and in the border warfare during the War of Independence, organizing a loyalist regiment known as the "Queen's Royal Greens," which he led at the battle of Oriskany and in the raids (1778 and 1780) on Cherry Valley and in the Mohawk Valley. He was also one of the officers of the force defeated by General John Sullivan in the engagement at Newtown (Elmira), N.Y., on the 29th of August 1779. He was made brigadier-general of provincial troops in 1782. His estates had been confiscated, and after the war he lived in Canada, where he held from 1791 until his death the office of superintendent-general of Indian affairs for British North America. He received £45,000 from the British government for his losses.

Sir William's nephew, GUY JOHNSON (1740–1788), succeeded his uncle as superintendent of Indian affairs in 1774, and served in the French and Indian War and, on the British side, in the War of Independence.

See W. L. Stone, *Life of Sir William Johnson* (2 vols., 1865); W. E. Griffis, *Sir William Johnson and the Six Nations* (1891) in "Makers of America" series; Augustus C. Buell, *Sir William Johnson* (1903) in "Historic Lives Series"; and J. Watts De Peyster, "The Life of Sir John Johnson, Bart.," in *The Orderly Book of Sir John Johnson during the Oriskany Campaign, 1776–1777*, annotated by William L. Stone (1882).

JOHNSTON, ALBERT SIDNEY (1803–1862), American Confederate general in the Civil War, was born at Washington, Mason county, Kentucky, on the 3rd of February 1803. He graduated from West Point in 1826, and served for eight years in the U.S. infantry as a company officer, adjutant, and staff officer. In 1834 he resigned his commission, emigrated in 1836 to Texas, then a republic, and joined its army as a private. His rise was very rapid, and before long he was serving as commander-in-chief in preference to General Felix Huston, with whom he fought a duel. From 1838 to 1840 he was Texan secretary for war, and in 1839 he led a successful expedition against the Cherokee Indians. From 1840 to the outbreak of the Mexican War he lived in retirement on his farm, but in 1846 he led a regiment of Texan volunteers in the field, and at Monterey, as a staff officer, he had three horses shot under him. In 1849 he returned to the United States army as major and paymaster, and in 1855 became colonel of the 2nd U.S. Cavalry (afterwards 5th), in which his lieut.-colonel was Robert E. Lee, and his majors were Hardee and Thomas. In 1857 he commanded the expedition sent against the Mormons, and performed his difficult and dangerous mission so successfully that the objects of the expedition were attained without bloodshed. He was rewarded with the brevet of brigadier-general. At the outbreak of the Civil War in 1861 Johnston, then in command of the Pacific department, resigned his commission and made his way to Richmond, where Pres. Jefferson Davis, whom he had known at West Point, at once made him a full general in the Confederate army and assigned him to command the department of Kentucky. Here he had to guard a long and weak line from the Mississippi to the Alleghany Mountains, which was dangerously advanced on account of the political necessity of covering friendly country. The first serious advance of the Federals forced him back at once, and he was freely criticized and denounced for what, in ignorance of the facts, the Southern press and people regarded as a weak and irresolute defence. Johnston himself, who had entered upon the Civil War with the reputation of being the foremost soldier on either side, bore with fortitude the reproaches of his countrymen, and Davis loyally supported his old friend. Johnston then marched to join Beauregard at Corinth, Miss., and with the united forces took the offensive against Grant's army at Pittsburg Landing. The battle of Shiloh (*q.v.*) took place on the 6th and 7th of April, 1862. The Federals were completely surprised, and Johnston was in the full tide of success when he fell mortally wounded. He died a few minutes afterwards. President Davis said, in his message to the Confederate Congress, "Without doing injustice to the living, it may safely be said that our loss is irreparable," and the subsequent history of the war in the west went far to prove the truth of his eulogy.

His son, William Preston Johnston (1831–1899), who served on the staff of General Johnston and subsequently on that of President Davis, was a distinguished professor and president of Tulane University. His chief work is the *Life of General Albert Sidney Johnston* (1878), a most valuable and exhaustive biography.

JOHNSTON, ALEXANDER (1849–1889), American historian, was born in Brooklyn, New York, on the 29th of April 1849. He studied at the Polytechnic institute of Brooklyn, graduated at Rutgers College in 1870, and was admitted to the bar in 1875 in New Brunswick, New Jersey, where he taught in the Rutgers College grammar school from 1876 to 1879. He was principal of the Latin school of Norwalk, Connecticut, in 1879–1883, and was professor of jurisprudence and political economy in the College of New Jersey (Princeton University) from 1884 until his death in Princeton, N.J., on the 21st of July 1889. He wrote *A History of American Politics* (1881); *The Genesis of a New England State—Connecticut* (1883), in "Johns Hopkins University Studies"; *A History of the United States for Schools* (1886); *Connecticut* (1887) in the "American Commonwealths Series"; the article on the history of the United States for the 9th edition of the *Encyclopaedia Britannica*, reprinted as *The United States: Its History and Constitution* (1887); a chapter on the history of American political parties in the seventh volume of Winsor's *Narrative and Critical History of America*, and many articles on the history of American politics in Lalor's *Cyclopaedia of Political Science, Political Economy, and Political History of the United States* (1881–1884). These last articles, which like his other writings represent much original research and are excellent examples of Johnston's rare talent for terse narrative and keen analysis and interpretation of facts, were republished in two volumes entitled *American Political History 1763–1876* (1905–1906), edited by Professor J. A. Woodburn.

JOHNSTON, ALEXANDER KEITH (1804–1871), Scottish geographer, was born at Kirkhill near Edinburgh on the 28th of December 1804. After an education at the high school and the university of Edinburgh he was apprenticed to an engraver; and in 1826 joined his brother (afterwards Sir William Johnston, lord provost of Edinburgh) in a printing and engraving business, the well-known cartographical firm of W. and A. K. Johnston. His interest in geography had early developed, and his first important work was the *National Atlas* of general geography, which gained for him in 1843 the appointment of Geographer-Royal for Scotland. Johnston was the first to bring the study of physical geography into competent notice in England. His attention had been called to the subject by Humboldt; and after years of labour he published his magnificent *Physical Atlas* in 1848, followed by a second and enlarged edition in 1856. This, by means of maps with descriptive letterpress, illustrates the geology, hydrography, meteorology, botany, zoology, and ethnology of the globe. The rest of Johnston's life was devoted to geography, his later years to its educational aspects especially. His services were recognized by the leading scientific societies of Europe and America. He died at Ben Rhydding, Yorkshire, on the 9th of July 1871. Johnston published a *Dictionary of Geography* in 1850, with many later editions; *The Royal Atlas of Modern Geography*, begun in 1855; an atlas of military geography to accompany Alison's *History of Europe* in 1848 seq.; and a variety of other atlases and maps for educational or scientific purposes. His son of the same name (1844–1879) was also the author of various geographical works and papers; in 1873–1875 he was geographer to a commission for the survey of Paraguay; and he died in Africa while leading the Royal Geographical Society's expedition to Lake Nyasa.

JOHNSTON, ARTHUR (1587–1641), Scottish physician and writer of Latin verse, was the son of an Aberdeenshire laird Johnston of Johnston and Caskieben, and on his mother's side a grandson of the seventh Lord Forbes. It is probable that he began his university studies at one, or both, of the colleges at Aberdeen, but in 1608 he proceeded to Italy and graduated M.D. at Padua in 1610. Thereafter he resided at Sedan, in the company of the exiled Andrew Melville (*q.v.*), and in 1619 was in practice in Paris. He appears to have returned to England about the time of James I.'s death and to have been in Aberdeen about 1628. He met Laud in Edinburgh at the time of Charles I.'s Scottish coronation (1633) and was encouraged by him in his literary efforts, partly, it is said, for the undoing of Buchanan's reputation as a Latin poet. He was appointed rector of King's College, Aberdeen, in June 1637. Four years later he died at Oxford, on his way to London, whither Laud had invited him.

Johnston left more than ten works, all in Latin. On two of these, published in the same year, his reputation entirely rests: (*a*) his version of the Psalms (*Psalmorum Davidis paraphrasis poetica et canticorum evangelicorum*, Aberdeen, 1637), and (*b*) his anthology of contemporary Latin verse by Scottish poets (*Deliciae poetarum scotorum hujus aevi illustrium*, Amsterdam, 1637). He had published in 1633 a volume entitled *Cantici Salomonis paraphrasis poetica*, which, dedicated to Charles I., had brought him to the notice of Laud. The full version of the Psalms was the result of Laud's encouragement. The book was for some time a strong rival of Buchanan's work, though its good Latinity was not superior to that of the latter. The *Deliciae*, in two small thick volumes of 699 and 575 pages, was a patriotic effort in imitation of the various volumes (under a similar title) which had been popular on the Continent during the second decade of the century. The volumes are dedicated by Johnston to John Scot of Scotstarvet, at whose expense the collected works were published after Johnston's death, at Middelburg (1642). Selections from his own poems occupy pages 439–647 of the first volume, divided into three sections, *Parerga*, *Epigrammata* and *Musae Aulicae*. He published a volume of epigrams at Aberdeen in 1632. In these pieces he shows himself at his best. His sacred poems, which had appeared in the *Opera* (1642), were reprinted by Lauder in his *Poetarum Scotorum musae sacrae* (1739). The earliest lives are by Lauder (*u.s.*) and Benson (in *Psalmi Davidici*, 1741). Ruddiman's *Vindication of Mr George Buchanan's Paraphrase* (1745) began a pamphlet controversy regarding the merits of the rival poets.

JOHNSTON, SIR HENRY HAMILTON (1858–), British administrator and explorer, was born on the 12th of June 1858 at Kennington, London, and educated at Stockwell grammar school and King's College, London. He was a student for four years in the painting schools of the Royal Academy. At the age of eighteen he began a series of travels in Europe and North Africa, chiefly as a student of painting, architecture and languages. In 1879–1880 he visited the then little known interior of Tunisia. He had also a strong bent towards zoology and comparative anatomy, and carried on work of this description at the Royal College of Surgeons, of whose Hunterian Collection he afterwards became one of the trustees. In 1882 he joined the earl of Mayo in an expedition to the southern part of Angola, a district then much traversed by Transvaal Boers. In 1883 Johnston visited H. M. Stanley on the Congo, and was enabled by that explorer to visit the river above Stanley Pool at a time when it was scarcely known to other Europeans than Stanley and De Brazza. These journeys attracted the attention of the Royal Geographical Society and the British Association, and the last-named in concert with the Royal Society conferred on Johnston the leadership of the scientific expedition to Mount Kilimanjaro which started from Zanzibar in April 1884. Johnston's work in this region was also under the direction of Sir John Kirk, British consul at Zanzibar. While in the Kilimanjaro district Johnston concluded treaties with the chiefs of Moshi and Taveta (Taveita). These treaties or concessions were transferred to the merchants who founded the British East Africa Company, and in the final agreement with Germany Taveta fell to Great Britain. In October 1885 Johnston was appointed British vice-consul in

Cameroon and in the Niger delta, and he became in 1887 acting consul of that region. A British protectorate over the Niger delta had been notified in June 1885, and between the date of his appointment and 1888, together with the consul E. H. Hewett, Johnston laid the foundations of the British administration in that part of the delta not reserved for the Royal Niger Company. His action in removing the turbulent chief Ja-ja (an ex-slave who had risen to considerable power in the palm-oil trade) occasioned considerable criticism but was approved by the Foreign Office. It led to the complete pacification of a region long disturbed by trade disputes. During these three years of residence in the Gulf of Guinea Johnston ascended the Cameroon Mountain, and made large collections of the flora and fauna of Cameroon for the British Museum.

In the spring of 1889 he was sent to Lisbon to negotiate an arrangement for the delimitation of the British and Portuguese spheres of influence in South-East Africa, but the scheme drawn up, though very like the later arrangement of those regions, was not given effect to at the time. On his return from Lisbon he was despatched to Mozambique as consul for Portuguese East Africa, and was further charged with a mission to Lake Nyasa to pacify that region, then in a disturbed state owing to the attacks of slave-trading Arabs on the stations of the African Lakes Trading Company—an unofficial war, in which Captain (afterwards Colonel Sir Frederick) Lugard and Mr (afterwards Sir Alfred) Sharpe distinguished themselves. Owing to the unexpected arrival on the scene of Major Serpa Pinto, Johnston was compelled to declare a British protectorate over the Nyasa region, being assisted in this work by John Buchanan (vice-consul), Sir Alfred Sharpe, Alfred Swann and others. A truce was arranged with the Arabs on Lake Nyasa, and within twelve months the British flag, by agreement with the natives, had been hoisted over a very large region which extended north of Lake Tanganyika to the vicinity of Uganda, to Katanga in the Congo Free State, the Shiré Highlands and the central Zambezi. Johnston's scheme, in fact, was that known as the "Cape-to-Cairo," a phrase which he had brought into use in an article in *The Times* in August 1888. According to his arrangement there would have been an all-British route from Alexandria to Cape Town. But by the Anglo-German agreement of the 1st of July 1890 the British sphere north of Tanganyika was abandoned to Germany, and the Cape-to-Cairo route broken by a wedge of German territory. Johnston returned to British Central Africa as commissioner and consul-general in 1891, and retained that post till 1896, in which year he was made a K.C.B. His health having suffered much from African fever, he was transferred to Tunis as consul-general (1897). In the autumn of 1899 Sir Harry Johnston was despatched to Uganda as special commissioner to reorganize the administration of that protectorate after the suppression of the mutiny of the Sudanese soldiers and the long war with Unyoro. His two years' work in Uganda and a portion of what is now British East Africa were rewarded at the close of 1901 by a G.C.M.G. In the spring of the following year he retired from the consular service. After 1904 he interested himself greatly in the affairs of the Liberian republic, and negotiated various arrangements with that negro state by which order was brought into its finances, the frontier with France was delimited, and the development of the country by means of roads was commenced. In 1903 he was defeated as Liberal candidate for parliament at a by-election at Rochester. He met with no better success at West Marylebone at the general election of 1906.

For his services to zoology he was awarded the gold medal of the Zoological Society in 1902, and in the same year was made an honorary doctor of science at Cambridge. He received the gold medal of the Royal Geographical and the Royal Scottish Geographical societies, and other medals for his artistic work from South Kensington and the Society of Arts. His pictures, chiefly dealing with African subjects, were frequently exhibited at the Royal Academy. He was the author of numerous books on Africa, including *British Central Africa* (1897); *The Colonization of Africa* (1899); *The Uganda Protectorate* (1902); *Liberia* (1906); *George Grenfell and the Congo* (1908). During his travels in the north-eastern part of the Congo Free State in 1900 he was instrumental in discovering and naming the okapi, a mammal nearly allied to the giraffe. His name has been connected with many other discoveries in the African fauna and flora.

JOHNSTON, JOSEPH EGGLESTON (1807–1891), American Confederate general in the Civil War, was born near Farmville, Prince Edward county, Virginia, on the 3rd of February 1807. His father, Peter Johnston (1763–1841), a Virginian of Scottish descent, served in the War of Independence, and afterwards became a distinguished jurist; his mother was a niece of Patrick Henry. He graduated at West Point, in the same class with Robert E. Lee, and was made brevet second lieutenant, 4th Artillery, in 1829. He served in the Black Hawk and Seminole wars, and left the army in 1837 to become a civil engineer, but a year afterwards he was reappointed to the army as first lieutenant, Topographical Engineers, and brevetted captain for his conduct in the Seminole war. During the Mexican war he was twice severely wounded in a reconnaissance at Cerro Gordo, 1847, was engaged in the siege of Vera Cruz, the battles of Contreras, Churubusco, and Molino del Rey, the storming of Chapultepec, and the assault on the city of Mexico, and received three brevets for gallant and meritorious service. From 1853 to 1855 he was employed on Western river improvements, and in 1855 he became lieut.-colonel of the 1st U.S. Cavalry. In 1860 he was made quartermaster-general, with the rank of brigadier-general. In April 1861 he resigned from the United States army and entered the Confederate service. He was commissioned major-general of volunteers in the Army of Virginia, and assisted in organizing the volunteers. He was later appointed a general officer of the Confederacy, and assigned to the command of the Army of the Shenandoah, being opposed by the Federal army under Patterson. When McDowell advanced upon the Confederate forces under Beauregard at Manassas, Johnston moved from the Shenandoah Valley with great rapidity to Beauregard's assistance. As senior officer he took command on the field, and at Bull Run (Manassas) (*q.v.*) won the first important Confederate victory. In August 1861 he was made one of the five full generals of the Confederacy, remaining in command of the main army in Virginia. He commanded in the battle of Fair Oaks (May 31, 1862), and was so severely wounded as to be incapacitated for several months. In March 1863, still troubled by his wound, he was assigned to the command of the south-west, and in May was ordered to take immediate command of all the Confederate forces in Mississippi, then threatened by Grant's movement on Vicksburg. When Pemberton's army was besieged in Vicksburg by Grant, Johnston used every effort to relieve it, but his force was inadequate. Later in 1863, when the battle of Chattanooga brought the Federals to the borders of Georgia, Johnston was assigned to command the Army of Tennessee at Dalton, and in the early days of May 1864 the combined armies of the North under Sherman advanced against his lines. For the main outlines of the famous campaign between Sherman and Johnston see AMERICAN CIVIL WAR (§ 29). From the 9th of May to the 17th of July there were skirmishes, actions and combats almost daily. The great numerical superiority of the Federals enabled Sherman to press back the Confederates without a pitched battle, but the severity of the skirmishing may be judged from the casualties of the two armies (Sherman's about 25,000 men, Johnston's over 10,000), and the obstinate steadiness of Johnston by the fact that his opponent hardly progressed more than one mile a day. But a Fabian policy is never acceptable to an eager people, and when Johnston had been driven back to Atlanta he was superseded by Hood with orders to fight a battle. The wisdom of Johnston's plan was soon abundantly clear, and the Confederate cause was already lost when Lee reinstated him on the 23rd of February 1865. With a handful of men he opposed Sherman's march through the Carolinas, and at Bentonville, N.C., fought and almost won a most gallant and skilful battle against heavy odds. But the Union troops steadily advanced, growing in strength as they went, and a few days after Lee's surrender at

Appomattox Johnston advised President Davis that it was in his opinion wrong and useless to continue the conflict, and he was authorized to make terms with Sherman. The terms entered into between these generals, on the 18th of April, having been rejected by the United States government, another agreement was signed on the 26th of April, the new terms being similar to those of the surrender of Lee. After the close of the war Johnston engaged in civil pursuits. In 1874 he published a *Narrative of Military Operations during the Civil War*. In 1877 he was elected to represent the Richmond district of Virginia in Congress. In 1887 he was appointed by President Cleveland U.S. commissioner of railroads. Johnston was married in early life to Louisa (d. 1886), daughter of Louis M'Lane. He died at Washington, D.C., on the 21st of March 1891, leaving no children.

It was not the good fortune of Johnston to acquire the prestige which so much assisted Lee and Jackson, nor indeed did he possess the power of enforcing his will on others in the same degree, but his methods were exact, his strategy calm and balanced, and, if he showed himself less daring than his comrades, he was unsurpassed in steadiness. The duel of Sherman and Johnston is almost as personal a contest between two great captains as were the campaigns of Turenne and Montecucculi. To Montecucculi, indeed, both in his military character and in the incidents of his career, Joseph Johnston bears a striking resemblance.

See Hughes, *General Johnston*, in "Great Commanders Series" (1893).

JOHNSTONE, a police burgh of Renfrewshire, Scotland, on the Black Cart, 11 m. W. of Glasgow by the Glasgow & South-Western railway. Pop. (1901), 10,503. The leading industries include flax-spinning, cotton manufactures (with the introduction of which in 1781 the prosperity of the town began), paper-making, shoe-lace making, iron and brass foundries and engineering works. There are also coal mines and oil works in the vicinity. Elderslie, 1 m. E., is the reputed birthplace of Sir William Wallace, but it is doubtful if "Wallace's Yew," though of great age, and "Wallace's Oak," a fine old tree that perished in a storm in 1856, and the small castellated building (traditionally his house) which preceded the present mansion in the west end of the village, existed in his day.

JOHNSTOWN, a city and the county-seat of Fulton county, New York, U.S.A., on Cayadutta Creek, about 4 m. N. of the Mohawk river and about 48 m. N.W. of Albany. Pop. (1890), 7768; (1900), 10,130 (1653 foreign-born); (1905, state census), 9765; (1910) 10.447. It is served by the Fonda, Johnstown & Gloversville railroad, and by an electric line to Schenectady. The city has a Federal building, a Y.M.C.A. building, a city hall, and a Carnegie library (1902). The most interesting building is Johnson Hall, a fine old baronial mansion, built by Sir William Johnson in 1762 and his home until his death; his grave is just outside the present St John's episcopal church. Originally the hall was flanked by two stone forts, one of which is still standing. In 1907 the hall was bought by the state and was placed in the custody of the Johnstown Historical Society, which maintains a museum here. In the hall Johnson established in 1766 a Masonic lodge, one of the oldest in the United States. Other buildings of historical interest are the Drumm House and the Fulton county court house, built by Sir William Johnson in 1763 and 1772 respectively, and the gaol (1772), at first used for all New York west of Schenectady county, and during the War of Independence as a civil and a military prison. The court house is said to be the oldest in the United States. Three miles south of the city is the Butler House, built in 1742 by Colonel John Butler (d. 1794), a prominent Tory leader during the War of Independence. A free school, said to have been the first in New York state, was established at Johnstown by Sir William Johnson in 1764. The city is (after Gloversville, 3 m. distant) the principal glove-making centre in the United States, the product being valued at $2,581,274 in 1905 and being 14·6% of the total value of this industry in the United States. The manufacture of gloves in commercial quantities was introduced into the United States and Johnstown in 1809 by Talmadge Edwards, who was buried there in the colonial cemetery. The value of the total factory product in 1905 was $4,543,272 (a decrease of 11·3% since 1900). Johnstown was settled about 1760 by a colony of Scots brought to America by Sir William Johnson, within whose extensive grant it was situated, and in whose honour, in 1771, it was named. A number of important conferences between the colonial authorities and the Iroquois Indians were held here, and on the 28th of October 1781, during the War of Independence, Colonel Marinus Willett (1740–1830) defeated here a force of British and Indians, whose leader, Walter Butler, a son of Colonel John Butler, and, with him, a participant in the Wyoming massacres, was mortally wounded near West Canada creek during the pursuit. Johnstown was incorporated as a village in 1808, and was chartered as a city in 1895.

JOHNSTOWN, a city of Cambria county, Pennsylvania, U.S.A., at the confluence of the Conemaugh river and Stony creek, about 75 m. E. by S. of Pittsburg. Pop. (1890), 21,805; (1900), 35,936, of whom 7318 were foreign-born, 2017 being Hungarians, 1663 Germans, and 923 Austrians; (1910 census) 55,482. It is served by the Pennsylvania and the Baltimore & Ohio railways. The city lies about 1170 ft. above the sea, on level ground extending for some distance along the river, and nearly enclosed by high and precipitous hills. Among the public buildings and institutions are the Cambria free library (containing about 14,000 volumes in 1908), the city hall, a fine high school, and the Conemaugh Valley memorial hospital. Roxbury Park, about 3 m. from the city, is reached by electric lines. Coal, iron ore, fire clay and limestone abound in the vicinity, and the city has large plants for the manufacture of iron and steel. The total value of the factory product in 1905 was $28,891,806, an increase of 35·2% since 1900. A settlement was established here in 1791 by Joseph Jahns, in whose honour it was named, and the place was soon laid out as a town, but it was not incorporated as a city until 1889, the year of the disastrous Johnstown flood. In 1852 a dam (700 ft. long and 100 ft. high), intended to provide a storage reservoir for the Pennsylvania canal, had been built across the South Fork, a branch of the Conemaugh river, 12 m. above the city, but the Pennsylvania canal was subsequently abandoned, and in 1888 the dam was bought and repaired by the South Fork hunting and fishing club, and Conemaugh lake was formed. On the 31st of May 1889, during a heavy rainfall, the dam gave way and a mass of water 20 ft. or more in height at its head swept over Johnstown at a speed of about 20 m. an hour, almost completely destroying the city. The Pennsylvania railroad bridge withstood the strain, and against it the flood piled up a mass of wreckage many feet in height and several acres in area. On or in this confused mass many of the inhabitants were saved from drowning, only to be burned alive when it caught fire. Seven other towns and villages in the valley were also swept away, and the total loss of lives was 2000 or more. A relief fund of nearly $3,000,000 was raised, and the city was quickly rebuilt.

JOHOR (Johore is the local official, but incorrect spelling), an independent Malayan state at the southern end of the peninsula, stretching from 2° 40′ S. to Cape Romania (Ramūnya), the most southerly point on the mainland of Asia, and including all the small islands adjacent to the coast which lie to the south of parallel 2° 40′ S. It is bounded N. by the protected native state of Pahang, N.W. by the Negri Sembilan and the territory of Malacca, S. by the strait which divides Singapore island from the mainland, E. by the China Sea, and W. by the Straits of Malacca. The province of Mūar was placed under the administration of Johor by the British government as a temporary measure in 1877, and was still a portion of the sultan's dominions in 1910. The coast-line measures about 250 m. The greatest length from N.W. to S.E. is 165 m., the greatest breadth from E. to W. 100 m. The area is estimated at about 9000 sq. m. The principal rivers are the Mūar, the most important waterway in the south of the peninsula; the Johor, up which river the old capital of the state was situated; the Endau, which marks the boundary with Pahang; and the Bātu Pāhat and Sĕdĕli, of comparative unimportance. Johor is less mountainous than any other state in the peninsula. The highest peak is Gūnong Lĕdang, called Mt Ophir by Europeans, which measures some 4000 ft. in height. Like the rest of the peninsula, Johor is covered from end to end by one vast spread of forest, only broken here and there by clearings and settlements of insignificant area. The capital is Johor Bharu (pop. about 20,000), situated at the nearest point on the mainland to the island of Singapore. The fine palace built by the sultan Abubakar is the principal feature of the town. It is a kind of Oriental Monte Carlo, and is much resorted to from Singapore. The capital of the province of Mūar is Bandar Maharani, named after the wife of the sultan before he had assumed his final title. The climate of Johor is healthy and equable for a country situated so near to the equator; it is cooler than that of Singapore. The shade temperature varies from 98·5° F. to 68·2° F. The rainfall averages 97·28 in. per annum. No exact figures can be obtained as to the population of Johor, but the best estimates place it at about 200,000, of whom 150,000 are Chinese, 35,000 Malays, 15,000 Javanese. We are thus presented with the curious spectacle of a country under Malay rule in which the Chinese outnumber the people of the land by more than four to one. It is not possible to obtain any exact data on the subject of the revenue and expenditure of the state. The revenue, however, is probably about 750,000 dollars, and the expenditure under public service is comparatively small. The revenue is chiefly derived from the revenue farms for opium, spirits, gambling, &c., and from duty on pepper and gambier exported by the Chinese. The cultivation of these products forms the principal industry. Areca-nuts and copra are also exported in some quantities, more especially from Mūar. There is little mineral wealth of proved value.

History.—It is claimed that the Mahommedan empire of Johor was founded by the sultan of Malacca after his expulsion from his kingdom by the Portuguese in 1511. It is certain that Johor took an active part, only second to that of Achin, in the protracted war between the Portuguese and the Dutch for the possession of Malacca. Later we find Johor ruled by an officer of the sultan of Riouw (Rīau), bearing the title of Tumĕnggong, and owing feudal allegiance to his master in common with the Bĕndahāra of Pahang. In 1812, however, this officer seems to have thrown off the control of Riouw, and to have assumed the title of sultan, for one of his descendants, Sultan Husain, ceded the island of Singapore to the East India Company in 1819. In 1855 the then sultan, Ali, was deposed, and his principal chief, the Tumĕnggong, was given the supreme rule by the British. His son Tumĕnggong Abubakar proved to be a man of exceptional intelligence. He made numerous visits to Europe, took considerable interest in the government and development of his country, and was given by Queen Victoria the title of maharaja in 1879. On one of his visits to England he was made the defendant in a suit for breach of promise of marriage, but the plaintiff was non-suited, since it was decided that no action lay against a foreign sovereign in the English law courts. In 1885 he entered into a new agreement with the British government, and was allowed to assume the title of sultan of the state and territory of Johor. He was succeeded in 1895 by his son Sultan Ibrahīm. The government of Johor has been comparatively so free from abuses under its native rulers that it has never been found necessary to place it under the residential system in force in the other native states of the peninsula which are under British control, and on several occasions Abubakar used his influence with good effect on the side of law and order. The close proximity of Johor to Singapore has constantly subjected the rulers of the former state to the influence of European public opinion. None the less, the Malay is by nature but ill fitted for the drudgery which is necessary if proper attention is to be paid to the dull details whereby government is rendered good and efficient. Abubakar's principal adviser, the Dāto 'Mĕntri, was a worthy servant of his able master. Subsequently, however, the reins of government came chiefly into the hands of a set of young men who lacked either experience or the serious devotion to dull duties which is the distinguishing mark of the English civil service. Mūar, in imitation of the British system, is ruled by a rāja of the house of Johor, who bears the title of resident. (H. Cl.)

JOIGNY, a town of central France, capital of an arrondissement in the department of Yonne, 18 m. N.N.W. of Auxerre by the Paris-Lyon-Méditerranée railway. Pop. (1906), 4888. It is situated on the flank of the hill known as the Côte St Jacques on the right bank of the Yonne. Its streets are steep and narrow, and old houses with carved wooden façades are numerous. The church of St Jean (16th century), which once stood within the *enceinte* of the old castle, contains a representation (15th century) of the Holy Sepulchre in white marble. Other interesting buildings are the church of St André (12th, 16th and 17th centuries), of which the best feature is the Renaissance portal with its fine bas-reliefs; and the church of St Thibault (16th century), in which the stone crown suspended from the choir vaulting is chiefly noticeable. The Porte du Bois, a gateway with two massive flanking towers, is a relic of the 10th century castle; there is also a castle of the 16th and 17th centuries, in part demolished. The hôtel de ville (18th century) shelters the library; the law-court contains the sepulchral chapel of the Ferrands (16th century). The town is the seat of a sub-prefect and has tribunals of first instance and of commerce, and a communal college for boys. It is industrially unimportant, but the wine of the Côte St Jacques is much esteemed.

Joigny (*Joviniacum*) was probably of Roman origin. In the 10th century it became the seat of a countship dependent on that of Champagne, which after passing through several hands came in the 18th century into the possession of the family of Villeroi. A fragment of a ladder preserved in the church of St André commemorates the successful resistance offered by the town to the English in 1429.

JOINDER, in English law, a term used in several connexions.

Joinder of causes of action is the uniting in the same action several causes of action. Save in actions for the recovery of land and in actions by a trustee in bankruptcy a plaintiff may without leave join in one action, not several actions, but several "causes of action." Claims by or against husband and wife may be joined with claims by or against either of them separately. Claims by or against an executor or administrator as such may be joined with claims by or against him personally, provided such claims are alleged to arise with reference to the estate of which the plaintiff or defendant sues or is sued as executor or administrator. Claims by plaintiffs jointly may be joined with claims by them or any of them separately against the same defendant.

Joinder in pleading is the joining by the parties on the point of matter issuing out of the allegations and pleas of the plaintiff and the defendant in a cause and the putting the cause upon trial.

Joinder of parties.—Where parties may jointly, severally or in the alternative bring separate actions in respect of or arising out of the same transaction or series of transactions they may, by Order XVI. of the rules of the supreme court, be joined in one action as plaintiffs.

JOINERY, one of the useful arts which contribute to the comfort and convenience of man. As the arts of joinery and carpentry are often followed by the same individual, it appears natural to conclude that the same principles are common to both, but a closer examination leads to a different conclusion. The art of carpentry is directed almost wholly to the support of weight or pressure, and therefore its principles must be sought in the mechanical sciences. In a building it includes all the rough timber work necessary for support, division or connexion, and its proper object is to give firmness and stability. The art of joinery has for its object the addition in a building of all the fixed woodwork necessary for convenience or ornament. The joiner's works are in many cases of a complicated nature, and often require to be executed in an expensive material, therefore joinery requires much skill in that part of geometrical science which treats of the projection and description of lines, surfaces and solids, as well as an intimate knowledge of the structure and nature of wood. A man may be a good carpenter without being a joiner at all, but he cannot be a joiner without being competent, at least, to supervise all the operations required in carpentry. The rough labour of the carpenter renders him in some degree unfit to produce that accurate and neat workmanship which is expected from a modern joiner, but it is no less true that the habit of neatness and the great precision of the joiner make him a much slower workman than the man practised in works of carpentry. In carpentry framing owes its strength mainly to the form and position of its parts, but in joinery the strength of a frame depends to a larger extent upon the strength of the joinings. The importance of fitting the joints together as accurately as possible is therefore obvious. It is very desirable that a joiner shall be a quick workman, but it is still more so that he shall be a good one, and that he should join his materials with firmness and accuracy. It is also of the greatest importance that the work when thus put together shall be constructed of such sound and dry materials, and on such principles, that the whole shall bear the various changes of temperature and of moisture and dryness, so that the least possible shrinkage or swelling shall take place; but provision must be made so that, if swelling or shrinking does occur, no damage shall be done to the work.

In early times every part was rude, and jointed in the most artless manner. The first dawnings of the art of modern joinery appear in the thrones, stalls, pulpits and screens of early Gothic cathedrals and churches, but even in these it is indebted to the carver for everything that is worthy of regard. With the revival of classic art, however, great changes took place in every sort of construction. Forms began to be introduced in architecture which could not be executed at a moderate expense without the aid of new principles, and these principles were discovered and published by practical joiners. These authors, with their scanty geometrical knowledge, had but confused notions of these principles, and accordingly their descriptions are often obscure, and sometimes erroneous. The framed wainscot of small panels gave way to the large bolection moulded panelling. Doors which were formerly heavily framed and hung on massive posts or in jambs of cut stone, were now framed in light panels and hung in moulded dressings of wood. The scarcity of oak timber, and the expense of working it, subsequently led to the importation of fir timber from northern Europe, and this gradually superseded all other material save for special work.

Tools and Materials.—The joiner operates with saws, planes, chisels, gouges, hatchet, adze, gimlets and other boring instruments (aided and directed by chalked lines), gauges, squares, hammers, wallets, floor cramps and a great many other tools. His operations consist principally of sawing and planing in all their varieties, and of setting out and making joints of all kinds. There is likewise a great range of other operations—such as paring, gluing up, wedging, pinning, fixing, fitting and hanging—and many which depend on nailing and screwing, such as laying floors, boarding ceilings, wainscoting walls, bracketing, cradling, firring, and the like. In addition to the wood on which the joiner works, he requires also glue, white lead, nails, brads, screws and hinges, and accessorily he applies bolts, locks, bars and other fastenings, together with pulleys, lines, weights, holdfasts, wall hooks, &c. The joiner's work for a house is for the most part prepared at the shop, where there should be convenience for doing everything in the best and readiest manner, so that little remains when the carcase is ready and the floors laid but to fit, fix and hang. The sashes, frames, doors, shutters, linings and soffits are all framed and put together, *i.e.* wedged up and cleaned off at the shop; the flooring is planed and prepared with rebated or grooved edges ready for laying, and the moulded work—the picture and dado rails, architraves, skirtings and panelling—is all got out at the shop. On a new building the joiner fits up a temporary workshop with benches, sawing stools and a stove for his glue pot. Here he adjusts the work for fitting up and makes any small portions that may still be required.

The preparation of joinery entirely by hand is now the exception—a fact due to the ever-increasing use of machines, which have remarkably shortened the time required to execute the ordinary operations. Various machines rapidly and perfectly execute planing and surfacing, mortising and moulding, leaving the craftsman merely to fit and glue up. Large quantities of machine-made flooring, window-frames and doors are now imported into England from Canada and the continent of Europe. The timber is grown near the place of manufacture, and this, coupled with the fact that labour at a low rate of wages is easily obtainable on the Continent, enables the cost of production to be kept very low.

The structure and properties of wood should be thoroughly understood by every joiner. The man who has made the nature of timber his study has always a decided advantage over those who have neglected this. Timber shrinks considerably in the width, but not appreciably in the length. Owing to this shrinkage certain joints and details, hereinafter described and illustrated, are in common use for the purpose of counteracting the bad effect this movement would otherwise have upon all joinery work.

The kinds of wood commonly employed in joinery are the different species of North European and North American pine, oak, teak and mahogany (see TIMBER). The greater part of English joiners' work is executed in the northern pine exported from the Baltic countries. Hence the joiner obtains the planks, deals, battens and strips from which he shapes his work. The timber reaches the workman from the sawmills in a size convenient for the use he intends, considerable time and labour being saved in this way.

A log of timber sawn to a square section is termed a *balk*. In section it may range from 1 to 1½ ft. square. *Planks* are formed by sawing the balk into sections from 11 to 18 in. wide and 3 to 6 in. thick, and the term *deal* is applied to sawn stuff 9 in. wide and 2 to 4½ in. thick. *Battens* are boards running not more than 3 in. thick and 4 to 7 in. wide. A *strip* is not thicker than 1½ in., the width being about 4 in.

Joints.—*Side joints* (fig. 1) are used for joining boards together edge to edge, and are widely employed in flooring. In the square joint the edges of the boards are carefully shot, the two edges to be joined brought together with glue applied hot, and the boards tightly clamped and left to dry, when the surface is cleaned off with the smoothing plane. A joint in general use for joining up boards for fascias, panels, linings, window-boards, and other work of a like nature is formed in a similar manner to the above, but with a cross-grained tongue inserted, thereby greatly strengthening the work at an otherwise naturally weak point. This is termed a *cross-tongued and glued* joint. The *dowelled* joint is a square glued joint strengthened with hard wood or iron dowels inserted in the edge of each board to a depth of about ¾ in. and placed about 18 in. apart. The *matched* joint is shown in two forms, beaded and jointed. Matched boarding is frequently used as a less expensive substitute for panelled framing. Although of course in appearance it cannot compare with the latter, it has a somewhat ornamental appearance, and the moulded joints allow shrinkage to take place without detriment to the appearance of the work. The *rebated* joint is used in the meeting styles of casements and folding doors, and it is useful in excluding draughts and preventing observation through the joint.

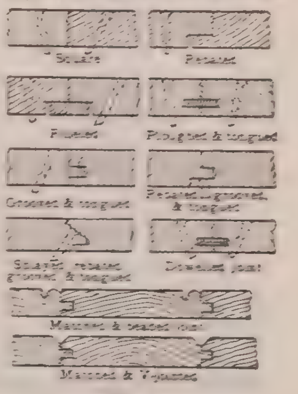


FIG. 1.

Of the *angle joints* (fig. 2) in common use by the joiner the following are the most important. The *mitre* is shown in the drawing, and is so well known as to need little description. Although simple, it needs a practised and accurate hand for its proper execution. The common mitre is essentially weak unless reinforced with blocks glued into the angle at the back of it, and is therefore often strengthened with a feather of wood or iron. Other variations of the mitre are the *mitre and butt*, used where the pieces connected are of unequal thickness; the *mitre and rebate*, with a square section which facilitates nailing or screwing; the *mitre rebate and feather*, similar to the latter, with a feather giving additional strength to the joint; and the *mitre groove and tongue*, having a tongue worked on the material itself in place of the feather of the last-named joint. The last two methods are used in the best work, and, carefully worked and glued, with the assistance of angle blocks glued at the back, obviate the necessity of face screws or nails. The *keyed mitre* consists of a simple mitre joint, which after being glued up has a number of pairs of saw cuts made across the angle, into which are fitted and glued thin triangular slips of hard wood, or as an alternative, pieces of brass or other metal. Other forms of angle joints are based on the rebate with a bead worked on in such a position as to hide any bad effects caused by the joint opening by shrinkage. They may be secured either by nailing or screwing, or by glued angle blocks.

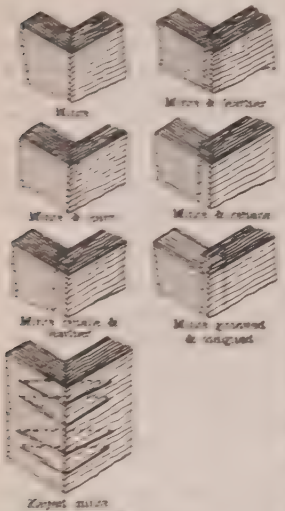


Fig. 2

The *dovetail* is a most important joint; its most usual forms are illustrated in fig. 3. The *mitre dovetail* is used in the best work. It will be seen that the dovetail is a tenon, shaped as a wedge, and it is this distinguishing feature which gives it great strength irrespective of glue or screws. It is invaluable in framing together joiners' fittings; its use in drawers especially provides a good example of its purpose and structure.

Warping in Wide Boards.—It is necessary to prevent the tendency to warp, twist and split, which boards of great width, or several boards glued together edge to edge, naturally possess. On the other hand, swelling and shrinking due to changes in the humidity of the apartment must not be checked, or the result will be disastrous. [illegible] devices are available. The direction of the annular rings in alternate boards may be reversed, and when the boards have been carefully jointed with tongues or dowels and glued up, a hard-wood tapering key, dovetail in section, may be let into a wide dovetail at the back (fig. 4). It must be accurately fitted and driven tightly home, but, of course, not glued. Battens of hard wood may be used for the same purpose, fixed either with hard-wood buttons or by means of brass slots and screws, the slots allowing for any slight movement that may take place. With boards of a substantial thickness light iron rods may be used, holes being bored through the thickness of the boards and rods passed through; the edges are then glued up. This method is very effective and neat in appearance, and is specially suitable when a smooth surface is desired on both sides of the work.

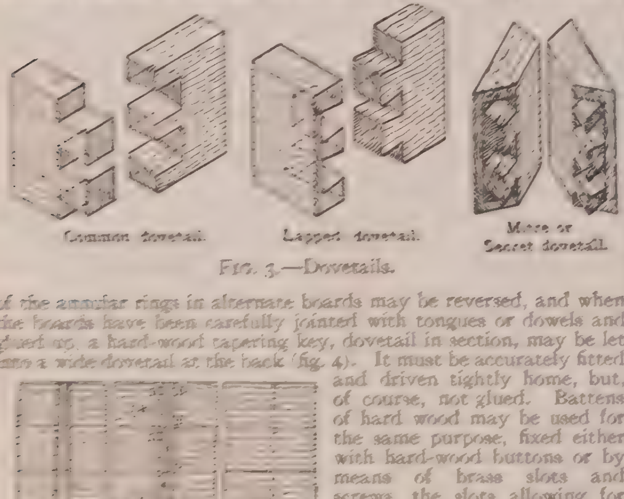


Fig. 3.—Dovetails.

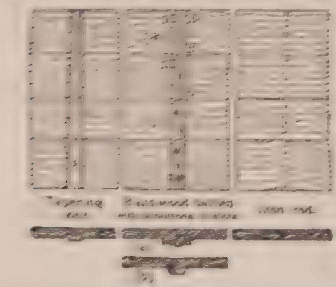


Fig. 4.—Prevention of Warping.

Mouldings are used in joinery to relieve plain surfaces by the contrasts of light and shade formed by their members, and to ornament or accentuate those particular portions which the designer may wish to bring into prominence. Great skill and discrimination are required in designing and applying mouldings, but that matter falls to the qualified designer and is perhaps outside the province of the practical workman, whose work is to carry out in an accurate and finished manner the ideas of the draughtsman. The character of a moulding is greatly affected by the nature and appearance of the wood in which it is worked. A section suitable for a hard regularly grained wood, such as mahogany, would probably look insignificant if worked in a softer wood with pronounced markings. Mouldings worked on woods of the former type may consist of small and delicate members, woods of the latter class require bold treatment.

The mouldings of joinery, as well as of all other moulded work used in connexion with a building, are usually worked in accordance with full-sized detail drawings prepared by the architect, and are designed by him to conform with the style and class of building. There are, however, a number of moulded forms in common use which have particular names; sections are shown of many of these in fig. 5. Most of them occur in the classic architecture of both Greeks and Romans. A striking distinction, however, existed in the mouldings of these two peoples; the curves of the Greek mouldings were either derived from conic sections or drawn in freehand, while in typical Roman work the curved components were segments of a circle. Numerous examples of the use of these forms occur in ordinary joinery work, and may be recognized on reference to the illustrations, which will be easily understood without further description.

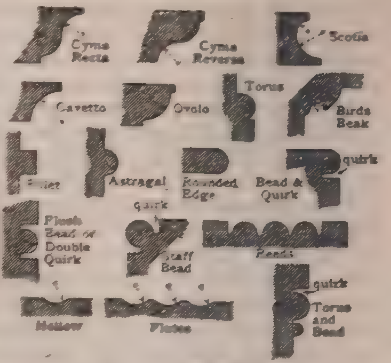


Fig. 5.—Mouldings.

Mouldings may be either stuck or planted on. A *stuck* moulding is worked directly on to the framing it is used to ornament; a *planted* moulding is separately worked and fixed in position with nails or screws. Beads and other small mouldings should always be stuck; larger ones are usually planted on. In the case of mouldings planted on panelled work, the nails should be driven through the moulding into the style or rail of the framing, and on no account into the panel. By adopting the former method the panel is free to shrink—as it undoubtedly will do—without altering the good appearance of the work, but should the moulding be fixed to the panel it will, when the latter shrinks, be pulled out of place, leaving an unsightly gap between it and the framing.

Flooring.—When the bricklayer, mason and carpenter have prepared the carcase of a building for the joiner, one of the first operations is that of laying the floor boards. They should have been stacked under cover on the site for some considerable time, in order to be thoroughly well seasoned when the time to use them arrives. The work of laying should take place in warm dry weather. The joints of flooring laid in winter time or during wet weather are sure to open in the following summer, however tightly they may be cramped up during the process of laying. An additional expense will then be incurred by the necessity of filling in the opened joints with wood slips glued and driven into place. Boards of narrow width are better and more expensive than wide ones. They may be of various woods, the kinds generally preferred, on account of their low comparative cost and ease of working, being yellow deal and white deal. White deal or spruce is an inferior wood, but is frequently used with good results for the floors of less important apartments. A better floor is obtained with yellow deal, which, when of good quality and well seasoned, is lasting and wears well. For floors where a fine appearance is desired, or which will be subjected to heavy wear, some harder and tougher material, such as pitch pine, oak, ash, maple or teak, should be laid. These woods are capable of taking a fine polish and, finished in this way, form a beautiful as well as a durable floor.

Many of the side joints illustrated in fig. 1 are applied to flooring boards, which, however, are not usually glued up. The heart side of the board should be placed downwards so that in drying the tendency will be for the edges to press more tightly to the joists instead of curling upwards. The square joint should be used only on ground floors; if it is used for the upper rooms, dust and water will drop through the crevices and damage the ceiling beneath. Dowelled joints are open to the same objection. One of the best and most economical methods is the *ploughed and tongued* joint. The tongue may be of hard wood or iron, preferably the latter, which is stronger and occupies very narrow grooves. The tongue should be placed as near the bottom of the board as is practicable, leaving as much wearing material as possible. Two varieties of secret joints are shown in fig. 1.—the *splayed, rebated, grooved and tongued*, and the *rebated, grooved and tongued.* Owing to the waste of material in forming these joints and the extra labour involved in laying the boards, they are costly and are only used when it is required that no heads of nails or screws should appear on the surface. The heading joints of flooring are often specified to be splayed or bevelled, but it is far better to rebate them.

Wood block floors are much used, and are exceedingly solid. The blocks are laid directly on a smoothed concrete bed or floor in a damp-proof mastic having bitumen as its base; this fulfils the double purpose of preventing the wood from rotting, and securing the blocks in their places. To check any inclination to warp and rise, however, the edges of the blocks in the better class of floors are connected by dowels of wood or metal, or by a tongued joint. The blocks may be from 1 to 3 in. thick, and are usually 9 or 12 in. long by 3 in. wide.

Parquet floors are made of hard woods of various kinds, laid in patterns on a deal sub-floor, and may be of any thickness from ½ to

1½ in. Great care should be taken in laying the sub-floor, especially for the thinner parquet. The boards should be in narrow widths of well-seasoned stuff and well nailed, for any movement in the sub-floor due to warping or shrinking may have disastrous results on the parquet which is laid upon it. *Plated parquet* consists of selected hard woods firmly fixed on a framed deal backing. It is made in sections for easy transport, and these are fitted together in the apartment for which they are intended. When secured to the joists these form a perfect floor.

Skirtings.—In joinery, the skirting is a board fixed around the base of internal walls to form an ornamental base for the wall (see fig. 7). It also covers the joint between the flooring and the wall, and protects the base of the wall from injury. Skirtings may be placed in two classes—those formed from a plain board with its upper edge either left square or moulded, and those formed of two or more separate members and termed a *built-up* skirting (fig. 6). Small angle fillets or mouldings are often used as skirtings. The skirting should be worked so as to allow it to be fixed with the heart side of the wood outwards; any tendency to warp will then only serve to press the top edge more closely to the wall. In good work a groove should be formed in the floor and the skirting tongued into it so that an open joint is avoided should shrinkage occur. The skirting should be nailed only near the top to wood grounds fixed to wood plugs in the joints of the brickwork. These grounds are about ¾ to 1 in. thick, *i.e.* the same thickness as the plaster, and are generally splayed or grooved on the edge to form a key for the plaster. A rough coat of plaster should always be laid on the wall behind the skirting in order to prevent the space becoming a harbourage for vermin.

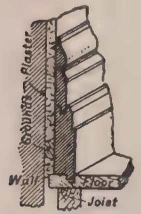

Plaster
Grounds
Wall
Floor
Joist

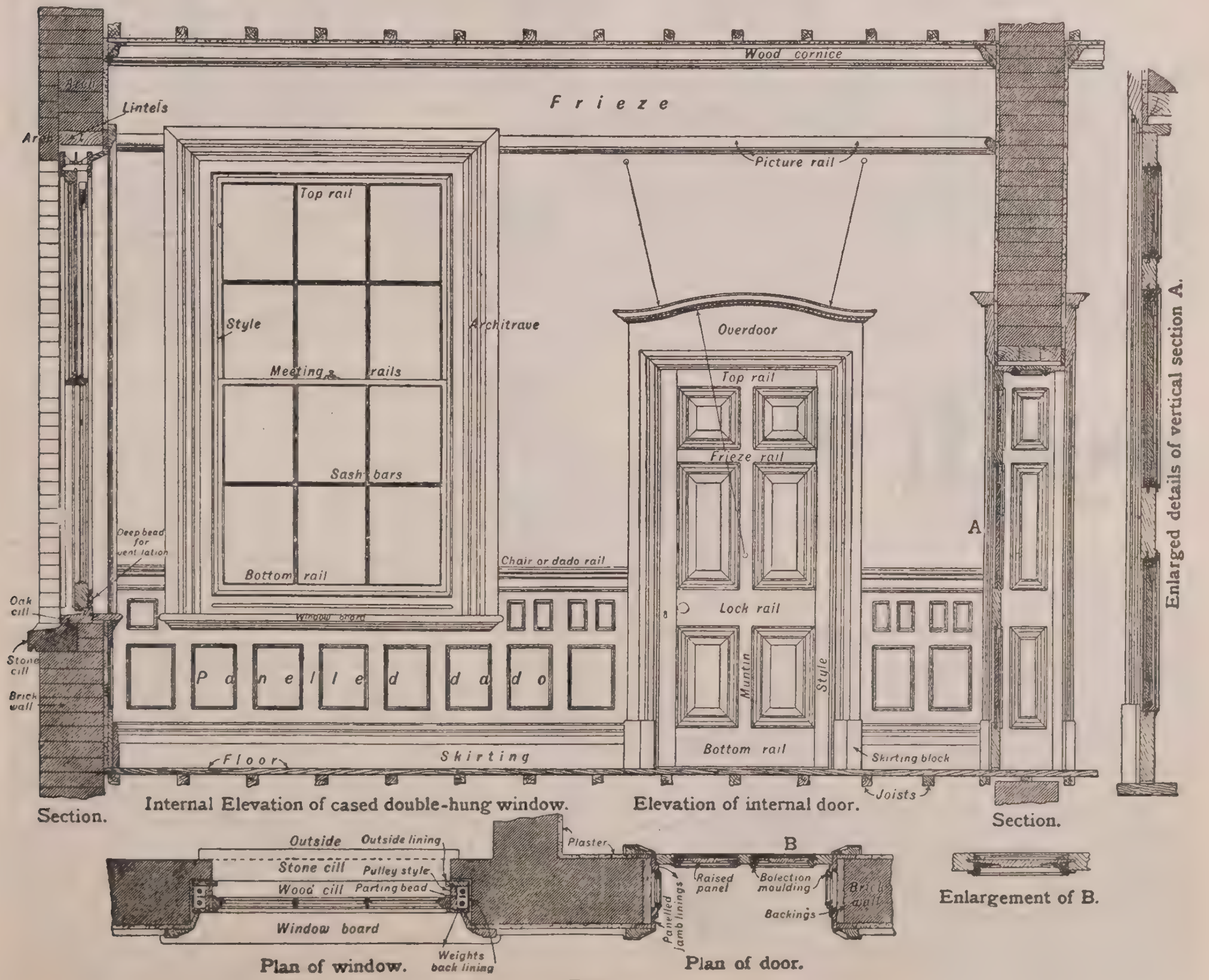
FIG. 6.—Built-up Skirting tongued to floor.

Dados.—A dado, like a skirting, is useful both in a decorative and a protective sense. It is filled in to ornament and protect that portion of the wall between the *chair* or *dado rail* and the skirting. It may be of horizontal boards battened at the back and with cross tongued and glued joints, presenting a perfectly smooth surface, or of matched boarding fixed vertically, or of panelled framing. The last method is of course the most ornate and admits of great variety of design. The work is fixed to rough framed wood grounds which are nailed to plugs driven into the joints of the brickwork. Fig. 7 shows an example of a panelled dado with capping moulding and skirting. A *picture rail* also is shown; it is a small moulding with the top edge grooved to take the metal hooks from which pictures are hung.

Walls are sometimes entirely sheathed with panelling, and very fine effects are obtained in this way. The fixing is effected to rough grounds in a manner similar to that adopted in the case of dados. In England the architects of the Tudor period made great use of oak framing, panelled and richly carved, as a wall covering and decoration, and many beautiful examples may be seen in the remaining buildings of that period.

Windows.—The parts of a window sash are distinguished by the same terms as are applied to similar portions of ordinary framing, being formed of rails and styles, with sash bars rebated for glazing. The upright sides are *styles*; the horizontal ones, which are tenoned into the styles, are *rails* (fig. 7).

Sashes hung by one of their vertical edges are called *casements* (fig. 8). They are really a kind of glazed door and sometimes indeed are used as such, as for example *French casements* (fig. 9). They may be made to open either outwards or inwards. It is very difficult with the latter to form perfectly water-tight joints; with those opening outwards the trouble does not exist to so great an extent. This form of window, though almost superseded in England by the case frame with hung sashes, is in almost universal use on the Continent. *Yorkshire sliding sashes* move in a horizontal direction upon grooved runners with the meeting styles vertical. They are


Wood cornice
Frieze
Lintels
Arch
Picture rail
Top rail
Style
Architrave
Meeting rails
Sash bars
Deep bead for ventilation
Bottom rail
Chair or dado rail
Window board
Oak cill
Stone cill
Brick wall
Panelled dado
Floor
Skirting
Overdoor
Top rail
Frieze rail
Lock rail
Muntin
Style
Bottom rail
Skirting block
Joists
A
Enlarged details of vertical section A.
Outside
Outside lining
Stone cill
Pulley style
Wood cill
Parting bead
Window board
Weights back lining
Plaster
B
Raised panel
Bolection moulding
Brick wall
Backings
Panelled jamb linings

Section. Internal Elevation of cased double-hung window. Elevation of internal door. Section.

Plan of window. Plan of door. Enlargement of B.

FIG. 7.

used, and are apt to admit draughts and wet unless efficient checks are worked upon the styles and frames.

Lights in a position difficult of access are often hung on centre pivots. An example of this method is shown in fig. 6; metal pivots are fixed to the frame and the sockets in which these pivots work are screwed to the sash. Movement is effected by means of a cord

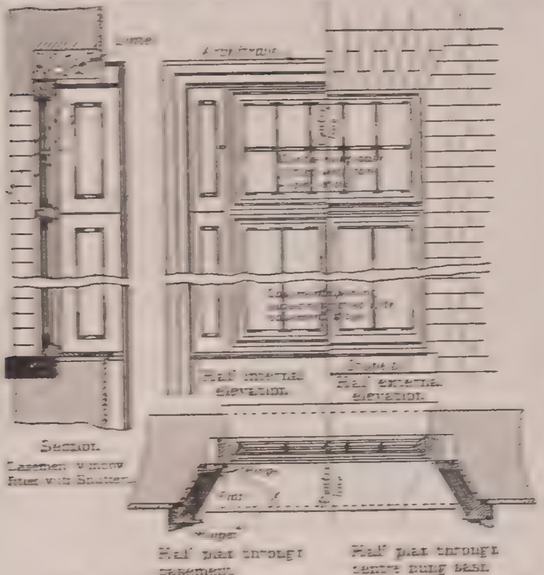

Lintel
Half internal elevation.
Half external elevation.
Section.
Casement window fitted with Shutters.
Half plan through casement.
Half plan through centre hung sash.

Fig. 8.—Casement window fitted with shutters.

fixed so that a single pull opens or closes the window to the desired extent, and the cord is then held by being tied to or twisted round a small metal button or cleat, or a geared fanlight opener may be used. For the top side sashes of lantern lights and for stables and lavatories this form of window is in general use.

In the British Isles and in America the most usual form of window is the cased frame with double hung sliding sashes. This form has many advantages. It is efficient in excluding wet and draughts, ventilation may be easily regulated and the sashes can be lowered and raised without interference with any blinds, curtains or other fittings that may be applied to the windows. In the ordinary window of this type, however, difficulty is experienced in cleaning the external glass without assuming a dangerous position on the sill, but there are many patent sliding sashes now on the market which overcome this difficulty by allowing—usually on the removal of a small thumb-screw—the swinging of the sash on a pivot or hinge.

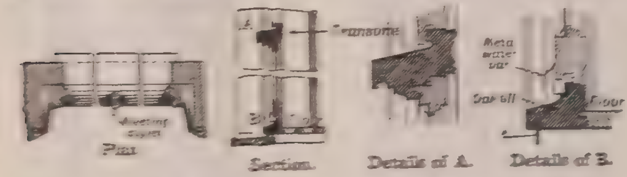


Fig. 9.—Details of French Casement to open inwards.

For a small extra cost these arrangements may be provided; they will be greatly appreciated by those who clean the windows. The cased frames are in the form of boxes to enclose the iron or lead weights which balance the sashes (fig. 7), and consist of a pulley style—which takes the wear of the sashes and is often of hard wood on this account—an inside lining and an outside lining; these three members are continued to form the head of the frame. The sashes are connected with the weights by flax lines working over metal pulleys fixed in the pulley styles. For heavy sashes with plate glass, chains are sometimes used instead of lines. Access to the weights for the purpose of fixing new cords is obtained by removing the pocket piece. A thin back lining is provided to the sides only and is not required in the head. The sill is of oak weathered to throw off the water. A parting bead separates the sashes, and the inside bead keeps them in position. A parting slip hung from the head inside the cased frame separates the balancing weights and ensures their smooth working. The inside lining is usually grooved to take the elbow and soffit linings, and the window board is fitted into a groove formed in the sill. The example shown in fig. 7 has an extra deep bottom rail and bead; this enables the lower sash to be raised so as to permit of ventilation between the meeting rails without causing a draught at the bottom of the sash. This is a considerable improvement upon the ordinary form, and the cost of constructing the sashes in this manner is scarcely greater.

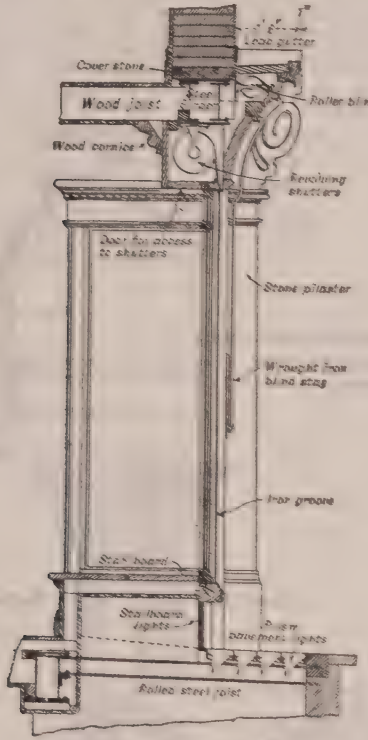
Bay windows with cased frames and double hung sashes often require the exercise of considerable ingenuity in their construction in order that the mullions shall be so small as not to intercept more light than necessary; at the same time the sashes must work easily and the whole framing be stable and strong. The sills should be jointed and tongued at the angles and secured by a hand-rail bolt. Frequently it is not desired to hang all the sashes of a bay window, the side lights being fixed. To enable smaller angle mullions to be obtained, the cords of the front windows may be taken by means of pulleys over the heads of the side lights and attached to counter-balance weights working in casings at the junction of the window with the wall. This enables solid angle mullions to be employed. If all the lights are required to be hung the difficulty may be surmounted by hanging two sashes to one weight. Lead weights take up less space than iron, and are used for heavy sashes.

In framing and fixing *skylights* and *lantern lights* also great care is necessary to ensure the result being capable of resisting rough weather and standing firm in high winds. Glue should not be used in any of the joints, as it would attract moisture from the atmosphere and set up decay. Provision must be made for the escape of the water which condenses on and runs down the under side of the glass, by means of a lead-lined channelled moulding, provided with zinc or copper pipe outlets. The skylight stands on a curb raised at least 6 in. to allow of the exclusion of rain by proper flashing. The sashes of the lantern usually take the form of fixed or hung casements fixed to solid mullions and angle posts which are framed into and support a solid head. The glazed framing of the roof is made up of moulded sash bars framed to hips and ridges of stronger section, these rest on the head, projecting well beyond it in order to throw off the water.

Shutters for domestic windows have practically fallen into disuse, but a reference to the different forms they may take is perhaps necessary. They may be divided into two classes—those fixed to the outside of the window and those fixed inside. They may be battened, panelled or formed with louvres, the latter form admitting air and a little light. External shutters are generally hung by means of hinges to the frame of the window; when the window is set in a reveal these hinges are necessarily of special shape, being of large projection to enable the shutters to fold back against the face of the wall. Internally fixed shutters may be hinged or may slide either vertically or horizontally. Hinged folding boxed shutters are shown in the illustration of a casement window (fig. 8), where the method of working is clearly indicated; they are usually held in position by means of a hinged iron bar secured with a special catch. Lifting shutters are usually fitted in a casing formed in the window back, and the window board is hinged to lift up to allow the shutters to be raised by means of rings fixed in their upper edges. The shutters are balanced by weights enclosed with casings in the manner described for double hung sashes. The panels are of course filled in with wood and not glazed. The shutters are fixed by means of a thumb-screw through the meeting rails, the lower sash being supported on the window board which is closed down when the sashes have been lifted out. Shutters sliding horizontally are also used in some cases, but they are not so convenient as the forms described above.

Shop-fronts.—The forming of shop-fronts may almost be considered a separate branch of joiner's work. The design and construction are attended by many minor difficulties, and, the requirements greatly varying with almost every trade, careful study and close attention to detail are necessary. In the erection of shop-fronts, in order to allow the maximum width of glass with the minimum amount of obstruction, many special sections of sash bars and stanchions are used, the former often being reinforced by cast iron or steel of suitable form. For these reasons the construction of shop-fronts and fittings has been specialized by makers having a knowledge of the requirements of different trades and with facilities for making the special wood and metal fittings and casings necessary. Fig. 10 shows an example of a simple shop-front in Spanish mahogany with rolling shutters and spring roller blind; it indicates the typical construction of a front, and reference to it will inform the reader on many points which need no further description. The London Building Act 1894 requires the following regulations to be complied with in shop-fronts:—(1) In streets of a width not greater than 30 ft. a shop-front may project 5 in. beyond the external wall of the building to which it belongs, and the cornice may project 13 in. (2) In streets of a width greater than 30 ft., the projections of the shop-front may be 10 in. and of the cornice 18 in. beyond the building line. No woodwork of any shop-front shall be fixed higher than 25 ft. above the level of the public pavement. No woodwork shall be fixed nearer than 4 in. to the centre of the party wall. The pier of brick or stone must project at least 4 in. in front of the woodwork. These by-laws will be made clear on reference to fig. 10, which is of a shop-front designed to face on to a road more than 30 ft. wide.

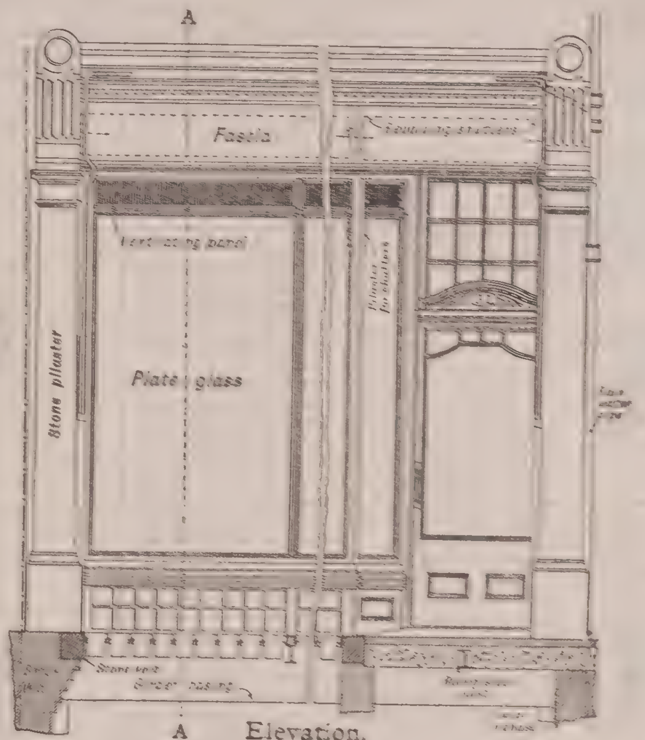
Rolling shutters for shop-fronts are made by a number of firms, and are usually the subject of a separate estimate, being fixed by the makers themselves. The shutter consists of a number of narrow strips of wood, connected with each other by steel bands hinged at every joint, or it may be formed in iron or steel. This construction allows it to be coiled upon a cylinder containing a strong spring and usually fixed on strong brackets behind the fascia. The shutter is guided into position by the edges working in metal grooves a little under an inch wide. When the width of the opening to be closed renders it necessary to divide the shutters into more than one portion, grooved movable pilasters are used, and when the shutters have to be lowered these are fixed in position with bolts, the shutter working on the grooved edges of the pilasters. *Spring roller canvas blinds* work on a similar principle. The wrought-iron blind arms are capable, when the blind is extended, of being pushed up by means of a sliding arrangement, and fixed with a pin at a level high enough to allow foot passengers to pass along the pavement under them.


Lead gutter
Cover stone
Wood joist
Roller blind
Wood cornice
Revolving shutters
Door for access to shutters
Stone pilaster
Wrought iron blind stay
Iron groove
Stall board
Stallboard lights
Prism pavement lights
Rolled steel joist

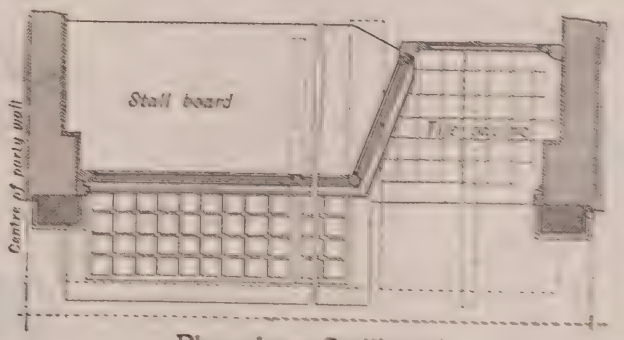
Section on AA.

Inches 12 6 0 1 2 3 4 5 Feet

Detail of Shop-front.


A
Fascia
Revolving shutters
Ventilating band
Pilaster for shutters
Plate glass
Stone pilaster
Stone vault
Girder casing
A

Elevation.


Stall board
Centre of party wall

Plan above Stallboard.

Fig. 10.—Shop-front.

Doors.—External doors are usually hung to solid frames placed in the reveals of the brick or stone wall. The frames are rebated for the door and ornamented by mouldings either stuck or planted on. The *jambs* or *posts* are tenoned, wedged and glued to the head, and the feet secured to the sill by stub tenons or dowels of iron. Solid window frames are of similar construction and are used chiefly for casements and sashes hung on centres as already described. Internal doors are hung to jamb linings (fig. 7). They are usually about 1¼ in. thick and rebated for the door. When the width of jamb allows it, panelling may be introduced as in the example shown. The linings are nailed or screwed to rough framed grounds 1 in. in thickness plugged or nailed to the wall or partition. *Architraves* are the borders or finishing mouldings fixed around a window or door opening, and screwed or nailed to wood grounds. They are variously moulded according to the fancy of the designer. The ordinary form of architrave is shown in the illustration of a cased window frame (fig. 8), and a variation appears in the combined architrave and over door frieze and capping fitted around the six-panelled door (fig. 7). The latter would need to be worked and framed in the shop and fixed entire. Polished hard wood architraves may be secretly fixed, *i.e.* without the heads of nails or screws showing on the face, by putting screws into the grounds with their heads slightly projecting, and hanging the moulding on them by means of keyhole slots formed in the back.

Doors may be made in a variety of ways. The simplest form, the *common ledged* door, consists of vertical boards with plain or matched joints nailed to horizontal battens which correspond to the rails in framed doors. For openings over 2 ft. 3 in. wide, the doors should be furnished with braces. *Ledged and braced* doors are similar, but have, in addition to the ledges at the back, oblique braces which prevent any tendency of the door to drop. The upper end of the brace is birdsmouthed into the under side of the rail near the lock edge of the door and crosses the door in an oblique direction to be birdsmouthed into the upper edge of the rail below, near the hanging edge of the door. This is done between each pair of rails. *Framed ledged and braced* doors are a further development of this form of door. The framing consists of lock and hanging styles, top, middle and bottom rails, with oblique braces between the rails. These members are tenoned together and the door sheathed with boarding. The top rail and styles are the full thickness of the door, the braces and middle and bottom rails being less by the thickness of the sheathing boards, which are tongued into the top rail and styles and carried down over the other members to the bottom of the door. The three forms of door described above are used mainly for temporary purposes, and stables, farm buildings and outhouses of all descriptions. They are usually hung by wrought-iron cross garnet or strap hinges fixed with screws or through bolts and nuts.

The doors in dwelling-houses and other buildings of a like character are commonly *framed and panelled* in one of the many ways possible. The framing consists of styles, rails and muntins or mountings, and these members are grooved to receive and hold the panels, which are inserted previously to the door being glued and wedged up. The common forms are doors in four or six rectangular panels, and although they may be made with any form and number of panels, the principles of construction remain the same. The example shown in fig. 7 is of a six-panel door, with bolection moulded raised panels on one side, and moulded and flat panels on the other (fig. 11).

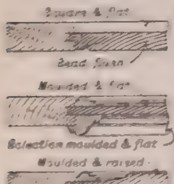


Fig. 11.—Forms of Panelling.

A clear idea of the method of jointing the various members may be obtained from fig. 12. The tongues of raised panels should be of parallel thickness, the bevels being stopped at the moulding. The projecting ends or *horns* of the styles are cut off after the door has been glued and wedged, as they prevent the ends of the styles being damaged by the wedging process.

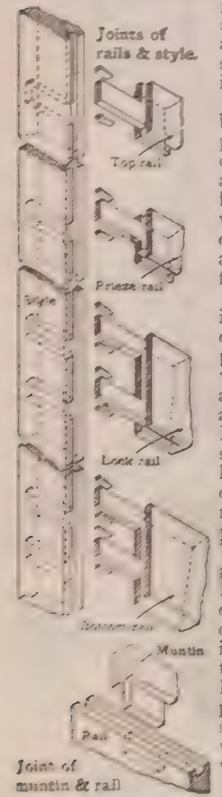


Fig. 12.—Joints.

Where there is a great deal of traffic in both directions *swing doors*, either single or double, are used. To open them it is necessary simply to push, the inconvenience of turning a handle and shutting the door after passing through being avoided, as a spring causes the door to return to its original position without noise. They are usually glazed and should be of substantial construction. The door is hinged at the top on a steel pivot; the bottom part fits into a metal shoe connected with the spring, which is placed in a box fixed below the floor.

For large entrances, notably for hotels and banks, a form of door working on the *turnstile* principle is frequently adopted. It is formed of four leaves fixed in the shape of a cross and working on top and bottom central ball-bearing steel pivots, in a circular framing which forms a kind of vestibule. The leaves of the door are fitted with slips of india-rubber at their edges which, fitting close to the circular framing, prevent draughts.

When an elegant appearance is desired, and it is at the same time necessary to keep the cost of production as low as possible, doors of pine or other soft wood are sometimes covered with a *veneer* or thin layer of hard wood, such as oak, mahogany or teak, giving the appearance of a solid door of the better material. Made in the ordinary way, however, the shrinkage or warping of the soft wood is very liable to cause the veneer to buckle and peel off. Veneered doors made on an improved method obviating this difficulty have been placed on the market by a Canadian company. The core is made up of strips of pine with the grain reversed, dried at a temperature of 200° F., and glued up under pressure. Both the core and the hard wood veneer are grooved over their surfaces, and a special damp-resisting glue is applied; the two portions are then welded together under hydraulic pressure. By reason of their construction these doors possess the advantages of freedom from shrinking, warping and splitting, defects which are all too common in the ordinary veneered and solid hard wood doors.

The best glue for internal woodwork is that made in Scotland. Ordinary animal glue should not be used in work exposed to the weather as it absorbs damp and thus hastens decay; in its place a compound termed *beaumontique*, composed of white lead, linseed oil and litharge, should be employed.

Church Work.—Joinery work in connexion with the fitting up of church interiors must be regarded as a separate branch of the joiner's art. Pitchpine is often used, but the best work is executed in English oak; and when the screens, stalls and seating are well designed and made in this material, a distinction and dignity of effect are added to the interior of the church which cannot be obtained in any other medium. The work is often of the richest character, and frequently enriched with elaborate carving (fig. 13). Many beautiful specimens of early work are to be seen in the English Gothic cathedrals and churches; good work of a later date will be found in many churches and public buildings erected in more recent years. Fine examples of Old English joinery exist at Hampton Court Palace, the Temple Church in London, the Chapel of Henry VII. in Westminster Abbey, and Haddon Hall. Specimens of modern work are to be seen in Beverley Minster in Yorkshire, the Church of St Etheldreda in Ely Place, London, and the Wycliffe Hall Chapel at Oxford. Other examples both ancient and modern abound in the country.

Carving is a trade apart from ordinary joinery, and requires a special ability and some artistic feeling for its successful execution. But even in this work machinery has found a place, and carved ornaments of all descriptions are rapidly wrought with its aid. Small carved mouldings especially are evolved in this manner, and, being incomparably cheaper than those worked by manual labour, are used freely where a rich effect is desired. Elaborately carved panels also are made by machines and a result almost equal to work done entirely by hand is obtained if, after machinery has done all in its power, the hand worker with his chisels and gouges puts the finishing touches to the work.

Ironmongery.—In regard to the finishing of a building, no detail calls for greater consideration than the selection and accurate fixing of suitable ironmongery, which includes the hinges, bolts, locks, door and window fittings, and the many varieties of metal finishings required for the completion of a building. The task of the selection belongs to the employer or the architect; the fixing is performed by the joiner.

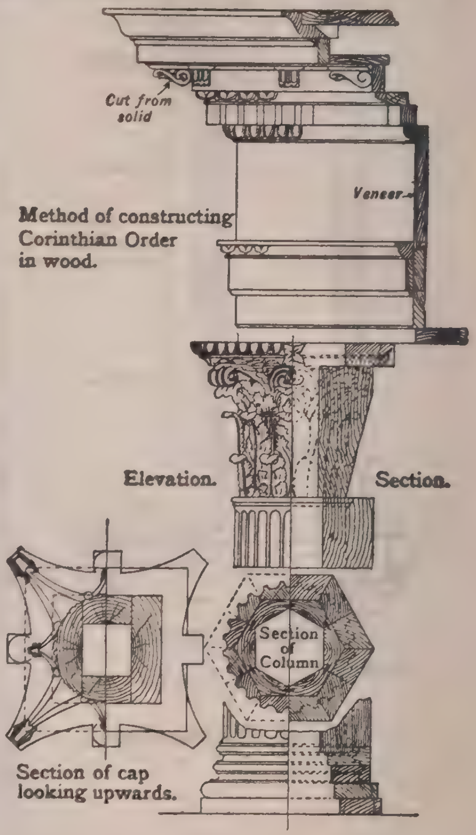

Cut from solid
Veneer
Method of constructing Corinthian Order in wood.
Elevation.
Section.
Section of Column
Section of cap looking upwards.

Fig. 13.

Of *hinges*, the variety termed *butts* are in general use for hanging doors, and are so called from being fitted to the butt edge of the door. They should be of wrought iron, cast-iron butts being liable to snap should they sustain a shock. *Lifting butts* are made with a removable pin to enable the door to be removed and replaced without unscrewing. *Rising butts* have oblique joints which cause the door to rise and clear a thick carpet and yet make a close joint with the floor when shut. Hinges of brass or gun-metal are used in special circumstances. Common forms of hinges used on ledged doors are the *cross garnet* and the *strap*. There are many varieties of *spring hinges* designed to bring the door automatically to a desired position. With such hinges a rubber stop should be fixed on the floor or other convenient place to prevent undue strain through the door being forced back.

Among *locks and fastenings* the ordinary *barrel* or *tower* bolt needs no description. The *flush barrel* is a bolt let in flush with the face of a door. The *espagnolette* is a development of the tower bolt and extends the whole height of the door; a handle at a convenient height, when turned, shooting bolts at the top and bottom simultaneously. Their chief use is for French casements. The *padlock* is used to secure doors by means of a staple and eye. The *stock* lock is a large rim lock with hard wood casing and is used for stables, church doors, &c.; it is in the form of a dead lock opened only by a key, and is often used in conjunction with a Norfolk latch. The *metal cased* rim lock is a cheap form for domestic and general use. The use of a rim lock obviates the necessity of forming a mortice in the thickness of the door which is required when a mortice lock is used. *Finger plates* add greatly to the good appearance of a door, and protect the painted work. *Sash fasteners* are fixed at the meeting rails of double hung sashes to prevent the window being opened from the outside and serve also to clip the two sashes tightly together. They should be of a pattern to resist the attack of a knife inserted between the rails. *Sash lifts* and *pulls* of brass or bronze are fitted to large sashes. Ornamental *casement stays* and fasteners in many different metals are made in numerous designs and styles. *Fanlight openers* for single lights, or geared for a number of sashes, may be designed to suit positions difficult of access.

The following are the principal books of reference on this subject: J. Gwilt, *Encyclopaedia of Architecture*; Sutcliffe, *Modern House Construction*; Rivington, *Notes on Building Construction* (3 vols.); H. Adams, *Building Construction*; C. F. Mitchell, *Building Construction*; Robinson, *Carpentry and Joinery*; J. P. Allen, *Practical Building Construction*; J. Newlands, *Carpenter and Joiner's Assistant*; Bury, *Ecclesiastical Woodwork*; T. Tredgold and Young, *Joinery*; Peter Nicholson, *Carpenter and Joiner's Assistant*. (J. BT.)

JOINT (through Fr. from Lat. *junctum*, *jungere*, to join), that which joins two parts together or the place where two parts are joined. (See JOINERY; JOINTS.) In law, the word is used adjectivally as a term applied to obligations, estates, &c., implying that the rights in question relate to the aggregate of the parties joined. Obligations to which several are parties may be *several*, *i.e* enforceable against each independently of the others, or *joint*, *i.e.* enforceable only against all of them taken together, or *joint and several*, *i.e.* enforceable against each or all at the option of the claimant (see GUARANTEE). So an interest or estate given to two or more persons for their joint lives continues only so long as all the lives are in existence. *Joint-tenants* are co-owners who take together at the same time, by the same title, and without any difference in the quality or extent of their respective interests; and when one of the joint-tenants dies his share, instead of going to his own heirs, lapses to his co-tenants by survivorship. This estate is therefore to be carefully distinguished from *tenancy in common*, when the co-tenants have each a separate interest which on death passes to the heirs and not to the surviving tenants. When several take an estate together any words or facts implying severance will prevent the tenancy from being construed as joint.

JOINTS, in anatomy. The study of joints, or articulations, is known as Arthrology (Gr. ἄρθρον), and naturally begins with the definition of a joint. Anatomically the term is used for any connexion between two or more adjacent parts of the skeleton, whether they be bone or cartilage. Joints may be immovable, like those of the skull, or movable, like the knee.

Immovable joints, or *synarthroses*, are usually adaptations to growth rather than mobility, and are always between bones. When growth ceases the bones often unite, and the joint is then obliterated by a process known as *synostosis*, though whether the union of the bones is the cause or the effect of the stoppage of growth is obscure. Immovable joints never have a cavity between the two bones; there is simply a layer of the substance in which the bone has been laid down, and this remains unaltered. If the bone is being deposited in cartilage a layer of cartilage intervenes, and the joint is called *synchondrosis* (fig. 1), but if in membrane a thin layer of fibrous tissue persists, and the joint is then known as a *suture* (fig. 2). Good examples of synchondroses are the epiphysial lines which separate the epiphyses from the shafts of developing long bones, or the occipito-sphenoid synchondrosis in the base of the skull. Examples of sutures are plentiful in the vault of the skull, and are given special names, such as sutura dentata, s. serrata, s. squamosa, according to the plan of their outline. There are two kinds of fibrous synarthroses, which differ from sutures in that they do not synostose. One of these is a *schindylesis*, in which a thin plate of one bone is received into a slot in another, as in the joint between the sphenoid and vomer. The other is a peg and socket joint, or *gomphosis*, found where the fangs of the teeth fit into the alveoli or tooth sockets in the jaws.

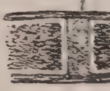


FIG. 1.—Vertical section through a synchondrosis. *b*, *b*, the two bones; *Sc*, the interposed cartilage; *l*, the fibrous membrane which plays the part of a ligament.

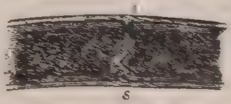


FIG. 2.—Vertical section through a cranial suture. *b*, *b*, the two bones; *s*, opposite the suture; *l*, the fibrous membrane, or periosteum, passing between the two bones, which plays the part of a ligament, and which is continuous with the interposed fibrous membrane.

Movable joints, or *diarthroses*, are divided into those in which there is much and little movement. When there is little movement the term half-joint or *amphiarthrosis* is used. The simplest kind of amphiarthrosis is that in which two bones are connected by bundles of fibrous tissue which pass at right angles from the one to the other; such a joint only differs from a suture in the fact that the intervening fibrous tissue is more plentiful and is organized into definite bundles, to which the name of *interosseous ligament* is given, and also that it does not synostose when growth stops. A joint of this kind is called a *syndesmosis*, though probably the distinction is a very arbitrary one, and depends upon the amount of movement which is brought about by the muscles on the two bones. As an instance of this the inferior tibiofibular joint of mammals may be cited. In man this is an excellent example of a syndesmosis, and there is only a slight play between the two bones. In the mouse there is no movement, and the two bones form a synchondrosis between them which speedily becomes a synostosis, while in many Marsupials there is free mobility between the tibia and fibula and a definite synovial cavity is established. The other variety of amphiarthrosis or half-joint is the *symphysis* which differs from the syndesmosis in having both bony surfaces lined with cartilage and between the two cartilages a layer of fibro-cartilage, the centre of which often softens and forms a small synovial cavity. Examples of this are the symphysis pubis, the mesosternal joint, and the joints between the bodies of the vertebrae (fig. 3).

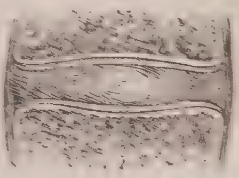


FIG. 3.—Vertical section through an amphiarthrodial joint. *b*, *b*, the two bones; *c*, *c*, the plate of cartilage on the articular surface of each bone; *Fc*, the intermediate fibro-cartilage; *l*, *l*, the external ligaments.

The *true diarthroses* are joints in which there is either fairly free or very free movement. The opposing surfaces of the bones are lined with articular cartilage, which is the unossified remnant of the cartilaginous model in which they are formed and is called the *cartilage of encrustment* (fig. 4, *c*). Between the two cartilages is the *joint cavity*, while surrounding the joint is the capsule (fig. 4, *l*) which is formed chiefly by the superficial layers of the original periosteum or perichondrium, but it may be strengthened, externally, by surrounding fibrous structures, such as the tendons of muscles, which become modified and acquire fresh attachments for the purpose. It may be said generally that the greater the intermittent strain on any part of the capsule the more it responds by increasing in thickness. Lining the interior of the capsule and all other parts of the joint cavity except where the articular cartilage is present, is the *synovial membrane* (fig. 4, dotted line); this is a layer of endothelial cells which secrete the synovial fluid to lubricate the interior of the joint by means of a small percentage of mucin, albumin and fatty matter which it contains.

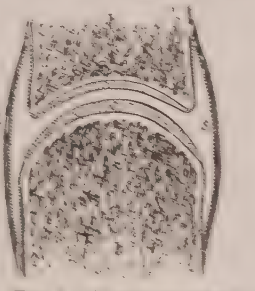


FIG. 4.—Vertical section through a diarthrodial joint. *b*, *b*, the two bones; *c*, *c*, the plate of cartilage on the articular surface of each bone; *l*, *l*, the investing ligament, the dotted line within which represents the synovial membrane. The letter *s* is placed in the cavity of the joint.

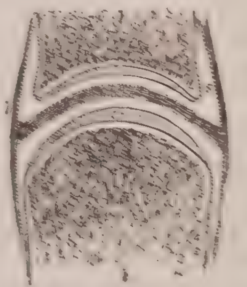


FIG. 5.—Vertical section through a diarthrodial joint, in which the cavity is subdivided into two by an interposed fibro-cartilage or meniscus, *Fc*. The other letters as in fig. 4.

A *compound diarthrodial joint* is one in which the joint cavity is divided partly or wholly into two by a *meniscus* or *inter-articular fibro-cartilage* (fig. 5, *Fc*).

The shape of the joint cavity varies greatly, and the different divisions of movable joints depend upon it. It is often assumed that the structure of a joint determines its movement, but there is something to be said for the view that the movements to which a joint is subject determine its shape. As an example of this it has been found that the mobility of the metacarpo-phalangeal joint of the thumb in a large number of working men is less than it is in a large number of women who use needles and thread, or in a large number of medical students who use pens and scalpels, and that the slightly movable thumb has quite a differently shaped articular surface from the freely movable one (see *J. Anat. and Phys.* xxix. 446). R. Fick, too, has demonstrated that the concavity or convexity of the joint surface depends on the position of the chief muscles which move the joint, and has enunciated the law that when the chief muscle or muscles are attached close to the articular end of the skeletal element that end becomes concave, while, when they are attached far off or are not attached at all, as in the case of the phalanges, the articular end is convex. His mechanical explanation is ingenious and to the present writer convincing (see *Handbuch der Gelenke*, by R. Fick, Jena, 1904). Bernays, however, pointed out that the articular ends were moulded before the muscular tissue was differentiated (*Morph. Jahrb.* iv. 203) but to this Fick replies by pointing out that muscular movements begin before the muscle fibres are formed and may be seen in the chick as early as the second day of incubation.

The freely movable joints (true diarthrosis) are classified as follows:—

(1) *Gliding joints* (*Arthrodia*), in which the articular surfaces are flat, as in the carpal and tarsal bones.

(2) *Hinge joints* (*Ginglymus*), such as the elbow and interphalangeal joints.

(3) *Condyloid joints* (*Condylarthrosis*), allowing flexion and extension as well as lateral movement, but no rotation. The metacarpo-phalangeal and wrist joints are examples of this.

(4) *Saddle-shaped joints* (*Articulus sellaris*), allowing the same movements as the last with greater strength. The carpo-metacarpal joint of the thumb is an example.

(5) *Ball and socket joints* (*Enarthrosis*), allowing free movement in any direction, as in the shoulder and hip.

(6) *Pivot-joint* (*Trochoides*), allowing only rotation round a longitudinal axis, as in the radio-ulnar joints.

Embryology.

Joints are developed in the mesenchyme, or that part of the mesoderm which is not concerned in the formation of the serous cavities. The synarthroses may be looked upon merely as a delay in development, because, as the embryonic tissue of the mesenchyme passes from a fibrous to a bony state, the fibrous tissue may remain along a certain line and so form a suture, or, when chondrification has preceded ossification, the cartilage may remain at a certain place and so form a synchondrosis. The diarthroses represent an arrest of development at an earlier stage, for a part of the original embryonic tissue remains as a plate of round cells, while the neighbouring two rods chondrify and ossify. This plate may become converted into fibro-cartilage, in which case an amphiarthrodial joint results, or it may become absorbed in the centre to form a joint cavity, or, if this absorption occurs in two places, two joint cavities with an intervening meniscus may result. Although, ontogenetically, there is little doubt that menisci arise in the way just mentioned, the teaching of comparative anatomy suggests that, phylogenetically, they originate as an ingrowth from the capsule pushing the synovial membrane in front of them. The subject will be returned to when the comparative anatomy of the individual joints is reviewed. In the human foetus the joint cavities are all formed by the tenth week of intra-uterine life.

ANATOMY

Joints of the Axial Skeleton.

The bodies of the vertebrae except those of the sacrum and coccyx are separated, and at the same time connected, by the *intervertebral disks*. These are formed of alternating concentric rings of fibrous tissue and fibro-cartilage, with an elastic mass in the centre known as the *nucleus pulposus*. The bodies are also bound together by *anterior* and *posterior common ligaments*. The odontoid process of the axis fits into a pivot joint formed by the anterior arch of the atlas in front and the *transverse ligament* behind; it is attached to the basioccipital bone by two strong *lateral check ligaments*, and, in the mid line, by a feebler *middle check ligament* which is regarded morphologically as containing the remains of the notochord. This *atlanto-axial joint* is the one which allows the head to be shaken from side to side. Nodding the head occurs at the *occipito-atlantal joint*, which consists of the two occipital condyles received into the cup-shaped articular facets on the atlas and surrounded by capsular ligaments. The neural arches of the vertebrae articulate one with another by the *articular facets*, each of which has a capsular ligament. In addition to these the laminae are connected by the very elastic *ligamenta subflava*. The spinous processes are joined by *interspinous ligaments*, and their tips by a *supraspinous ligament*, which in the neck is continued from the spine of the seventh cervical vertebra to the external occipital crest and protuberance as the *ligamentum nuchae*, a thin, fibrous, median septum between the muscles of the back of the neck.

The combined effect of all these joints and ligaments is to allow the spinal column to be bent in any direction or to be rotated, though only a small amount of movement occurs between any two vertebrae.

The heads of the ribs articulate with the bodies of two contiguous thoracic vertebrae and the disk between. The ligaments which connect them are called *costo-central*, and are two in number. The anterior of these is the *stellate ligament*, which has three bands radiating from the head of the rib to the two vertebrae and the intervening disk. The other one is the *interarticular ligament*, which connects the ridge, dividing the two articular cavities on the head of the rib, to the disk; it is absent in the first and three lowest ribs.

The *costo-transverse ligaments* bind the ribs to the transverse processes of the thoracic vertebrae. The *superior costo-transverse ligament* binds the neck of the rib to the transverse process of the vertebra above; the *middle* or *interosseous* connects the back of the neck to the front of its own transverse process; while the *posterior* runs from the tip of the transverse process to the outer part of the tubercle of the rib. The inner and lower part of each tubercle forms a diarthrodial joint with the upper and fore part of its own transverse process, except in the eleventh and twelfth ribs. At the junction of the ribs with their cartilages no diarthrodial joint is formed; the periosteum simply becomes perichondrium and binds the two structures together. Where the cartilages, however, join the sternum, or where they join one another, diarthrodial joints with synovial cavities are established. In the case of the second rib this is double, and in that of the first usually wanting. The *mesosternal joint*, between the pre- and mesosternum, has already been given as an example of a symphysis.

Comparative Anatomy.—For the convexity or concavity of the vertebral centra in different classes of vertebrates, see SKELETON: *axial*. The intervertebral disks first appear in the Crocodilia, the highest existing order of reptilia. In many Mammals the middle fasciculus of the stellate ligament is continued right across the ventral surface of the disk into the ligament of the opposite side, and is probably serially homologous with the ventral arch of the atlas. A similar ligament joins the heads of the ribs dorsal to the disk. To these bands the names of anterior (ventral) and posterior (dorsal) *conjugal ligaments* have been given, and they may be demonstrated in a seven months' human foetus (see B. Sutton, *Ligaments*, London, 1902). The *ligamentum nuchae* is a strong elastic band in the Ungulata which supports the weight of the head. In the Carnivora it only reaches as far forward as the spine of the axis.

The **JAW JOINT**, or *temporo-mandibular articulation*, occurs between the sigmoid cavity of the temporal bone and the condyle of the jaw. Between the two there is an interarticular fibro-cartilage or meniscus, and the joint is surrounded by a capsule of which the outer part is the thickest. On first opening the mouth, the joint acts as a hinge, but very soon the condyle begins to glide forward on to the eminentia articularis (see SKULL) and takes the meniscus with it. This gliding movement between the meniscus and temporal bone may be separately brought about by protruding the lower teeth in front of the upper, or, on one side only, by moving the jaw across to the opposite side.

Comparative Anatomy.—The joint between the temporal and mandibular bones is only found in Mammals; in the lower vertebrates the jaw opens between the quadrate and articular bones. In the Carnivora it is a perfect hinge; in many Rodents only the antero-posterior gliding movement is present; while in the Ruminants the lateralizing movement is the chief one. Sometimes, as in the Ornithorhynchus, the meniscus is absent.

Joints of the Upper Extremity.

The *sterno-clavicular articulation*, between the presternum and clavicle, is a gliding joint, and allows slight upward and downward and forward and backward movements. The two bony surfaces are separated by a meniscus, the vertical movements taking place outside and the antero-posterior inside this. There is a well-marked capsule, of which the anterior part is strongest. The two clavicles are joined across the top of the presternum by an *interclavicular ligament.*

The *acromio-clavicular articulation* is also a gliding joint, but allows a swinging or pendulum movement of the scapula on the clavicle. The upper part of the capsule is strongest, and from it hangs down a partial meniscus into the cavity.

Comparative Anatomy.—Bland Sutton regards the inter-clavicular ligament as a vestige of the interclavicle of Reptiles and Monotremes. The menisci are only found in the Primates, but it must be borne in mind that many Mammals have no clavicle, or a very rudimentary one. By some the meniscus of the sterno-clavicular joint is regarded as the homologue of the lateral part of the interclavicle, but the fact that it only occurs in the Primates where movements in different planes are fairly free is suggestive of a physiological rather than a morphological origin for it.

The SHOULDER JOINT is a good example of the ball and socket or enarthrodial variety. Its most striking characteristic is mobility at the expense of strength. The small size of the glenoid cavity in comparison with the head of the humerus, and the great laxity of the capsule, favour this, although the glenoid cavity is slightly deepened by a fibrous lip, called the *glenoid ligament,* round its margin. The presence of the coracoid and acromial processes of the scapula, with the *coraco-acromial ligament* between them, serves as an overhanging protection to the joint, while the biceps tendon runs over the head of the humerus, inside the capsule, though surrounded by a sheath of synovial membrane. Were it not for these two extra safeguards the shoulder would be even more liable to dislocation than it is. The upper part of the capsule, which is attached to the base of the coracoid process, is thickened, and known as the *coraco-humeral ligament,* while inside the front of the capsule are three folds of synovial membrane, called *gleno-humeral folds.*

Comparative Anatomy.—In the lower Vertebrates the shoulder is adapted to support rather than prehension and is not so freely movable as in the Primates. The tendon of the biceps has evidently sunk through the capsule into the joint, and even when it is intra-capsular there is usually a double fold connecting its sheath of synovial membrane with that lining the capsule. In Man this has been broken through, but remains of it persist in the *superior gleno-humeral fold.* The *middle gleno-humeral fold* is the vestige of a strong ligament which steadies and limits the range of movement of the joint in many lower Mammals.

The ELBOW JOINT is an excellent example of the ginglymus or hinge, though its transverse axis of movement is not quite at right angles to the central axis of the limb, but is lower internally than externally. This tends to bring the forearm towards the body when the elbow is bent. The elbow is a great contrast to the shoulder, as the trochlea and capitellum of the humerus are closely adapted to the sigmoid cavity of the ulna and head of the radius (see SKELETON: *appendicular*); consequently movement in one plane only is allowed, and the joint is a strong one. The capsule is divided into anterior, posterior, and two lateral ligaments, though these are all really continuous. The joint cavity communicates freely with that of the superior radio-ulnar articulation.

The *radio-ulnar joints* are three: the upper one is an example of a pivot joint, and in it the disk-shaped head of the radius rotates in a circle formed by the lesser sigmoid cavity of the ulna internally and the *orbicular ligament* in the other three quarters.

The *middle radio-ulnar articulation* is simply an interosseous membrane, the fibres of which run downward and inward from the radius to the ulna.

The *inferior radio-ulnar joint* is formed by the disk-shaped lower end of the ulna fitting into the slightly concave sigmoid cavity of the radius. Below, the cavity of this joint is shut off from that of the wrist by a *triangular fibro-cartilage.* The movements allowed at these three articulations are called pronation and supination of the radius. The head of that bone twists, in the orbicular ligament,round its central vertical axis for about half a circle. Below, however, the whole lower end of the radius circles round the lower end of the ulna, the centre of rotation being close to the styloid process of the ulna. The radius, therefore, in its pronation, describes half a cone, the base of which is below, and the hand follows the radius.

Comparative Anatomy.—In pronograde Mammals the forearm is usually permanently pronated, and the head of the radius, instead of being circular and at the side of the upper end of the ulna, is transversely oval and in front of that bone, occupying the same place that the coronoid process of the ulna does in Man. This type of elbow, which is adapted simply to support and progression, is best seen in the Ungulata; in them both lateral ligaments are attached to the head of the radius, and there is no orbicular ligament, since the shape of the head of the radius does not allow of any supination. The olecranon process of the ulna forms merely a posterior guide or guard to the joint, but transmits no weight. No better example of the maximum changes which the uses of support and prehension bring about can be found than in contrasting the elbow of the Sheep or other Ungulate with that of Man. Towards one or other of these types the elbows of all Mammals tend. It may be roughly stated that, when pronation and supination to the extent of a quarter of a circle are possible, an orbicular ligament appears.

The WRIST JOINT, or *radio-carpal articulation,* lies between the radius and triangular fibro-cartilage above, and the scaphoid, semilunar, and cuneiform bones below. It is a condyloid joint allowing flexion and extension round one axis, and slight lateral movement (abduction and adduction) round the other. There is a well-marked capsule, divided into anterior, posterior, and lateral ligaments. The joint cavity is shut off from the inferior radio-ulnar joint above, and the intercarpal joints below.

The *intercarpal joints* are gliding articulations, the various bones being connected by palmar, dorsal, and a few interosseous ligaments, but only those connecting the first row of bones are complete, and so isolate one joint cavity from another. That part of the intercarpal joints which lies between the first and second rows of carpal bones is called the *transverse carpal joint,* and at this a good deal of the movement which seems to take place at the wrist really occurs.

The *carpo-metacarpal articulations* are, with the exception of that of the thumb, gliding joints, and continuous with the great intercarpal joint cavity. The carpo-metacarpal joint of the thumb is the best example of a saddle-shaped joint in Man. It allows forward and backward and lateral movement, and is very strong.

The *metacarpo-phalangeal joints* are condyloid joints like the wrist, and are remarkable for the great thickness of the palmar ligaments of their capsules. In the four inner fingers these *glenoid ligaments,* as they are called, are joined together by the *transverse metacarpal ligament.*

The *interphalangeal articulations* are simple hinges surrounded by a capsule, of which the dorsal part is very thin.

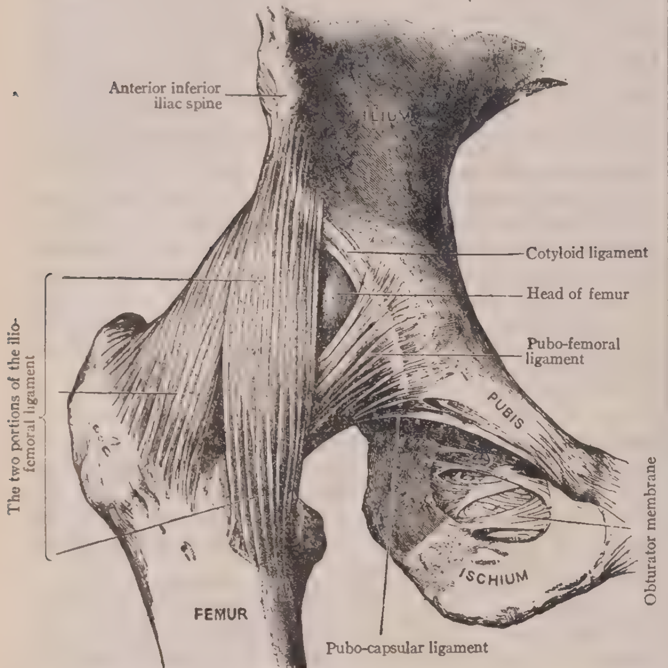
Comparative Anatomy.—The wrist joint of the lower Mammals allows less lateral movement than does that of Man, while the lower end of the ulna is better developed and is received into a cup-shaped socket formed by the cuneiform and pisiform bones. At the same time, unless there is pretty free pronation and supination, the triangular fibro-cartilage is only represented by an interosseous ligament, which may be continuous above with the interosseous membrane between the radius and ulna, and suggests the possibility that the fibro-cartilage is largely a derivative of this membrane. In most Mammals the wrist is divided into two lateral parts, as it is in the human foetus, but free pronation and supination seem to cause the disappearance of the septum.

Joints of the Lower Extremity.

The *sacro-innominate articulation* consists of the *sacro-iliac joint* and the *sacro-sciatic ligaments.* The former is one of the amphiarthroses or half-joints by which the sacrum is bound to the ilium. The mechanism of the human sacrum is that of a suspension bridge slung between the two pillars or ilia by the very strong *posterior sacro-iliac ligaments* which represent the chains. The axis of the joint passes through the second sacral vertebra, but the sacrum is so nearly horizontal that the weight of the body, which is transmitted to the first sacral vertebra, tends to tilt that part down. This tendency is corrected by the great and small *sacro-sciatic ligaments*, which fasten the lower part of the sacrum to the tuberosity and spine of the ischium respectively, so that, although the sacrum is a suspension bridge when looked at from behind, it is a lever of the first kind when seen from the side or in sagittal section.

The *pubic symphysis* is the union between the two pubic bones. It has all the characteristics of a symphysis, already described, and may have a small median cavity.

The HIP JOINT, like the shoulder, is a ball and socket, but does not allow such free movement; this is due to the fact that the socket or acetabulum is deeper than the glenoid cavity and that the capsule is not so lax. At the same time the loss of mobility is made up for by increased strength. The capsule has three thickened bands, of which the most important is the *ilio-femoral* or *Y-shaped ligament of Bigelow*. The stalk of the Y is attached to the anterior inferior spine of the ilium, while the two limbs are fastened to the upper and lower parts of the spiral line of the femur. The ligament is so strong that it hardly ever ruptures in a dislocation of the hip. As a plumb-line, dropped from the centre of gravity of the body, passes behind the centre of the hip joint, this ligament, lying as it does in front of the joint, takes the strain in Man's erect position. The other two thickened parts of the capsule are known as *pubo-femoral* and *ischio-femoral*, from their attachments. Inside the capsule, and deepening the margin of the acetabulum, is a fibrous rim known as the *cotyloid ligament*, which grips the spherical head of the femur and is continued across the cotyloid notch as the *transverse ligament*. The floor of the acetabulum has a horseshoe-shaped surface of articular cartilage, concave downward, and, occupying the "frog" of the horse's hoof, is a mass of fat called the *Haversian pad*. Attached to the inner margin of the horseshoe, and to the transverse ligament where that is deficient, is a reflexion of synovial membrane which forms a covering for the pad and is continued as a tube to the depression on the head of the femur called the *fossa capitis*. This reflexion carries blood-vessels and nerves to the femur, and also contains fibrous tissue from outside the joint. It is known as the *ligamentum teres*.



(From David Hepburn, Cunningham's *Textbook of Anatomy*.)

FIG. 6.—Dissection of the Hip Joint from the front.

Comparative Anatomy.—Bland Sutton regards the *ilio-femoral ligament* as an altered muscle, the scansorius, though against this is the fact that, in those cases in which a scansorius is present in Man, the ligament is as strong as usual, and indeed, if it were not there in these cases, the erect position would be difficult to maintain. He also looks upon the *ligamentum teres* as the divorced tendon of the pectineus muscle. The subject requires much more investigation, but there is every reason to believe that it is a tendon which has sunk into the joint, though whether that of the pectineus is doubtful, since the intra-capsular tendon comes from the ischium in Reptiles. In many Mammals, and among them the Orang, there is no ligamentum teres. In others, such as the Armadillo, the structure has not sunk right into the joint, but is connected with the pubo-femoral part of the capsule.

The KNEE JOINT is a hinge formed by the condyles and trochlea of the femur, the patella, and the head of the tibia. The capsule is formed in front by the ligamentum patellae, and on each side special bands form the lateral ligaments. On the outer side there are two of these: the anterior or *long external lateral ligament* is a round cord running from the external condyle to the head of the fibula, while the posterior is slighter and passes from the same place to the styloid process of the fibula. The *internal lateral ligament* is a flat band which runs from the inner condyle of the femur to the internal surface of the tibia some two inches below the level of the knee joint. The posterior part of the capsule is strengthened by an oblique bundle of fibres running upward and outward from the semimembranosus tendon, and called the *posterior ligament of Winslow*.

The intra-articular structures are numerous and interesting. Passing from the head of the tibia, in front and behind the spine, are the *anterior* and *posterior crucial ligaments*; the former is attached to the outer side of the intercondylar notch above, and the latter to the inner side. These two ligaments cross like an X. The *semilunar fibro-cartilages*—external and internal—are partial menisci, each of which has an anterior and a posterior cornu by which they are attached to the head of the tibia in front and behind the spine. They are also attached round the margin of the tibial head by a *coronary ligament*, but the external one is more movable than the internal, and this perhaps accounts for its coronary ligament being less often ruptured and the cartilage displaced than the inner one is. In addition to these the external cartilage has a fibrous band, called the *ligament of Wrisberg*, which runs up to the femur just behind the posterior crucial ligament. The external cartilage is broader, and forms more of a circle than the internal. The synovial cavity of the knee runs up, deep to the extensor muscles of the thigh, for about two inches above the top of the patella, forming the *bursa suprapatellaris*. At the lower part of the patella it covers a pad of fat, which lies between the ligamentum patellae and the front of the head of the tibia, and is carried up as a narrow tube to the lower margin of the trochlear surface of the femur. This prolongation is known as the *ligamentum mucosum*, and from the sides of its base spring two lateral folds called the *ligamenta alaria*. The tendon of the popliteus muscle is an intracapsular structure, and is therefore covered with a synovial sheath. There are a large number of bursae near the knee joint, one of which, common to the inner head of the gastrocnemius and the semimembranosus, often communicates with the joint. The hinge movement of the knee is accompanied by a small amount of external rotation at the end of extension, and a compensatory internal rotation during flexion. This slight twist is enough to tighten up almost all the ligaments so that they may take a share in resisting over-extension, because, in the erect position, a vertical line from the centre of gravity of the body passes in front of the knee.

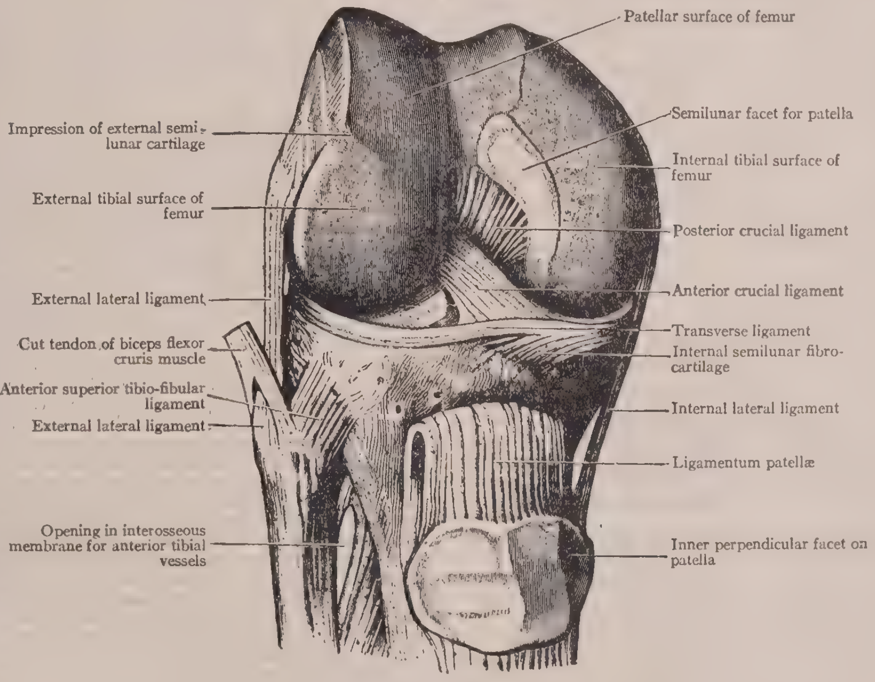
Comparative Anatomy.—In some Mammals, *e.g.* Bradypus and Ornithorhynchus, the knee is divided into three parts, two condylo-tibial and one trochleo-patellar, by synovial folds which in Man are represented by the ligamentum mucosum. In a typical Mammal the external *semilunar cartilage* is attached by its posterior horn to the internal condyle of the femur only, and this explains the *ligament of Wrisberg* already mentioned. In the Monkeys and anthropoid Apes this cartilage is circular. The *semilunar cartilages* first appear in the Amphibia, and, according to B. Sutton, are derived from muscles which are drawn into the joint. When only one kind of movement (hinge) is allowed, as in the fruit bat, the cartilages are not found. In most Mammals the superior tibio-fibular joint communicates with the knee.

The *tibio-fibular articulations* resemble the radio-ulnar in position but are much less movable. The superior in Man is usually cut off from the knee and is a gliding joint; the middle is the interosseous membrane, while the lower has been already used as an example of a syndesmosis or fibrous half joint.

The ANKLE JOINT is a hinge, the astragalus being received into a lateral arch formed by the lower ends of the tibia and fibula. Backward dislocation is prevented by the articular surface of the astragalus being broader in front than behind. The anterior and posterior parts of the capsule are feeble, but the lateral ligaments are very strong, the external consisting of three separate fasciculi which bind the fibula to the astragalus and calcaneum. To avoid confusion it is best to speak of the movements of the ankle as dorsal and plantar flexion.

The *tarsal joints* resemble the carpal in being gliding articulations. There are two between the astragalus and calcaneum, and at these inversion and eversion of the foot largely occur. The inner arch of the foot is maintained by a very important ligament called the *calcaneo-navicular* or *spring ligament;* it connects the sustentaculum tali of the calcaneum with the navicular, and upon it the head of the astragalus rests. When it becomes stretched, flat-foot results. The tarsal bones are connected by dorsal, plantar and interosseous ligaments. The *long* and *short calcaneo-cuboid* are plantar ligaments of special importance, and maintain the outer arch of the foot.

The *tarso-metatarsal*, *metatarso-phalangeal* and *interphalangeal joints* closely resemble those of the hand, except that the tarso-metatarsal joint of the great toe is not saddle-shaped.


Patellar surface of femur
Impression of external semilunar cartilage
Semilunar facet for patella
Internal tibial surface of femur
External tibial surface of femur
Posterior crucial ligament
External lateral ligament
Anterior crucial ligament
Transverse ligament
Cut tendon of biceps flexor cruris muscle
Internal semilunar fibro-cartilage
Anterior superior tibio-fibular ligament
External lateral ligament
Internal lateral ligament
Ligamentum patellæ
Opening in interosseous membrane for anterior tibial vessels
Inner perpendicular facet on patella

(From D. Hepburn, Cunningham's *Text-book of Anatomy*.)

FIG. 7.—Dissection of the Knee-joint from the front: Patella thrown down.

Comparative Anatomy.—The anterior fasciculus of the external lateral ligament of the ankle is only found in Man, and is probably an adaptation to the erect position. In animals with a long foot, such as the Ungulates and the Kangaroo, the lateral ligaments of the ankle are in the form of an X, to give greater protection against lateral movement. In certain marsupials a fibro-cartilage is developed between the external malleolus and the astragalus, and its origin from the deeper fibres of the external lateral ligament of the ankle can be traced. These animals have a rotatory movement of the fibula on its long axis, in addition to the hinge movement of the ankle.

For further details of joints see R. Fick, *Handbuch der Gelenke* (Jena, 1904); H. Morris, *Anatomy of the Joints* (London, 1879); Quain's, Gray's and Cunningham's *Text-books of Anatomy*; J. Bland Sutton, *Ligaments, their Nature and Morphology* (London, 1902); F. G. Parsons, "Hunterian Lectures on the Joints of Mammals," *Journ. Anat. & Phys.*, xxxiv. 41 and 301. (F. G. P.)

DISEASES AND INJURIES OF JOINTS

The affection of the joints of the human body by specific diseases is dealt with under various headings (RHEUMATISM, &c.); in the present article the more direct forms of ailment are discussed. In most joint-diseases the trouble starts either in the synovial lining or in the bone—rarely in the articular cartilage or ligaments. As a rule, the disease begins after an injury. There are three principal types of injury: (1) sprain or strain, in which the ligamentous and tendinous structures are stretched or lacerated; (2) contusion, in which the opposing bones are driven forcibly together; (3) dislocation, in which the articular surfaces are separated from one another.

A *sprain* or *strain* of a joint means that as the result of violence the ligaments holding the bones together have been suddenly stretched or even torn. On the inner aspect the ligaments are lined by a synovial membrane, so when the ligaments are stretched the synovial membrane is necessarily damaged. Small blood-vessels are also torn, and bleeding occurs into the joint, which may become full and distended. If, however, bleeding does not take place, the swelling is not immediate, but synovitis having been set up, serous effusion comes on sooner or later. There is often a good deal of heat of the surrounding skin and of pain accompanying the synovitis. In the case of a healthy individual the effects of a sprain may quickly pass off, but in a rheumatic or gouty person chronic synovitis may obstinately remain. In a person with a tuberculous history, or of tuberculous descent, a sprain is apt to be the beginning of serious disease of the joint, and it should, therefore, be treated with continuous rest and prolonged supervision. In a person of health and vigour, a sprained joint should be at once bandaged. This may be the only treatment needed. It gives support and comfort, and the even pressure around the joint checks effusion into it. Wide pieces of adhesive strapping, layer on layer, form a still more useful support, and with the joint so treated the person may be able at once to use the limb. If strapping is not employed, the bandage may be taken off from time to time in order that the limb and the joint may be massaged. If the sprain is followed by much synovitis a plaster of Paris or leather splint may be applied, complete rest being secured for the limb. Later on, blistering or even "firing" may be found advisable.

Synovitis. — When a joint has been injured, inflammation occurs in the damaged tissue; that is inevitable. But sometimes the attack of inflammation is so slight and transitory as to be scarcely noticeable. This is specially likely to occur if the joint-tissues were in a state of perfect nutrition at the time of the hurt. But if the individual or the joint were at that time in a state of imperfect nutrition, the effects are likely to be more serious. As a rule, it is the synovial membrane lining the fibrous capsule of the joint which first and chiefly suffers; the condition is termed *synovitis.* Synovitis may, however, be due to other causes than mechanical injury, as when the interior of the joint is attacked by the micro-organisms of pyæmia (blood-poisoning), typhoid fever, pneumonia, rheumatism, gonorrhœa or syphilis. Under judicious treatment the synovitis generally clears up, but it may linger on and cause the formation of adhesions which may temporarily stiffen the joint; or it may, especially in tuberculous, septic or pyæmic infections, involve the cartilages, ligaments and bones in such serious changes as to destroy the joint, and possibly call for resection or amputation.

The symptoms of synovitis include stiffness and tenderness in the joint. The patient notices that movements cause pain. Effusion of fluid takes place, and there is marked fullness in the neighbourhood. If the inflammation is advancing, the skin over the joint may be flushed, and if the hand is placed on the skin it feels hot. Especially is this the case if the joint is near the surface, as at the knee, wrist or ankle.

The treatment of an inflamed joint demands rest. This may be conveniently obtained by the use of a light wooden splint, padding and bandages. Slight compression of the joint by a bandage is useful in promoting absorption of the fluid. If the inflamed joint is in the lower extremity, the patient had best remain in bed, or on the sofa; if in the upper extremity, he should wear his arm in a sling. The muscles acting on the joint must be kept in complete control. If the inflammation is extremely acute, a few leeches, followed by a fomentation, will give relief; or an ice-bag or an evaporating lotion may, by causing constriction of the blood-vessels, lessen the congestion of the part and the associated pain. As the inflammation is passing off, massage of the limb and of the joint will prove useful. If the inflammation is long continued, the limb must still be kept at rest. By this time it may be found that some other material for the retentive apparatus is more convenient and comfortable, as, for instance, undressed leather which has been moulded on wet and allowed to dry and harden; poro-plastic felt, which has been softened by heat and applied limp, or house-flannel which has been dipped in a creamy mixture of plaster-of-Paris and water, and secured by a bandage.

Chronic Disease of a Joint may be the tailing off of an acute affection, and under the influence of alternate douchings of hot and cold water, of counter-irritation by blistering or "firing," and of massage, it may eventually clear up, especially if the general health of the individual is looked after. But if chronic disease lingers in the joint of a child or young person, the probability of its being under the influence of tuberculous infection must be considered. In such a case prolonged and absolute rest is the one thing necessary. If the disease be in the hip, knee, ankle or foot, the patient may be fitted with an appropriate Thomas's splint and allowed to walk about; for it is highly important to have these patients out in the fresh air. If the disease be in the shoulder, elbow, wrist or hand, a leather or poro-plastic splint should be moulded on, and the arm worn in a sling. There must be no hurry; convalescence will needs be slow. And if the child can be sent to a bracing sea-side place it will be much in his favour.

As the disease clears up, the surface heat, the pains and the tenderness having disappeared, and the joint having so diminished in size as to be scarcely larger than its fellow—though the wasting of the muscles of the limb may cause it still to appear considerably enlarged—the splint may be gradually left off. This remission may be for an hour or two every other day; then every other night; then every other day, and so on, the freedom being gained little by little, and the surgeon watching the case carefully. On the slightest indication of return of trouble, the former restrictive measures must be again resorted to. Massage and gentle exercises may be given day by day, but there must be no thought of "breaking down the stiffness." Many a joint has in such circumstances been wrecked by the manipulations of a "bone-setter."

Permanent Stiffness.—During the treatment of a case of chronic disease of a joint, the question naturally arises as to whether the joint will be left permanently stiff. People have the idea that if an inflamed joint is kept long on a splint, it may eventually be found permanently stiff. And this is quite correct. But it should be clearly understood that it is not the *rest* of the inflamed joint which causes the stiffness. The matter should be put thus: in tuberculous and other forms of chronic disease stiffness may ensue in spite of long-continued rest. It is the destructive disease, not the enforced rest which causes it; for inflammation of a joint rest is absolutely necessary.

The *Causes of permanent Stiffness* are the destructive changes wrought by the inflammation. In one case it may be that the synovial membrane is so far destroyed by the tuberculous or septic invasion that its future usefulness is lost, and the joint ever afterwards creaks at its work and easily becomes tired and painful. Thus the joint is crippled but not destroyed. In another case the ligaments and the cartilages are implicated as well as the synovial membrane, and when the disease clears up, the bones are more or less locked, only a small range of motion being left, which forcible flexion and other methods of vigorous treatment are unable materially to improve. In another set of cases the inflammatory germs quickly destroy the soft tissues of the joint, and then invade the bones, and, the disease having at last come to an end, the softened ends of the bones solidly join together like the broken fragments in simple fracture. As a result, osseous solidification of the joint (*synostosis*) ensues without, of course, the possibility of any movement. And, inasmuch as the surgeon cannot tell in any case whether the disease may not advance in this direction, he is careful to place the limb in that position in which it will be most useful if the bony union should occur. Thus, the leg is kept straight, and the elbow bent.

In the course of a tuberculous or other chronic disease of a joint, the germs of septic disease may find access to the inflamed area, through a wound or ulceration into the joint, or by the germs being carried thither by the blood-stream. A *joint-abscess* results, which has to be treated by incision and fomentations. If chronic suppuration continues, it may become necessary to scrape out or to excise the joint, or even to amputate the limb. And if tuberculous disease of the joint is steadily progressing in spite of treatment, vigorous measures may be needed to prevent the fluid from quietly ulcerating its way out and thus inviting the entrance of septic germs. The fluid may need to be drawn off by aspiration, and direct treatment of the diseased synovial membrane may be undertaken by injections of chloride of zinc or some other reagent. Or the joint may need scraping out with a sharp spoon with the view of getting rid of the tuberculous material. Later, excision may be deemed necessary, or in extreme cases, amputation. But before these measures are considered, A. C. G. Bier's method of treatment by passive congestion, and the treatment by serum injection, will probably have been tried. If a joint is left permanently stiff in an awkward and useless position, the limb may be greatly improved by excision of the joint. Thus, if the knee is left bent and the joint is excised a useful, straight limb may be obtained, somewhat shortened, and, of course, permanently stiff. If after disease of the hip-joint the thigh remains fixed in a faulty position, it may be brought down straight by dividing the bone near the upper end. A stiff shoulder or elbow may be converted into a useful, movable joint by excision of the articular ends of the bones.

A *stiff joint* may remain as the result of long continued inflammation; the unused muscles are wasted and the joint in consequence looks large. Careful measurement, however, may show that it is not materially larger than its fellow. And though all tenderness may have passed away, and though the neighbouring skin is no longer hot, still the joint remains stiff and useless. No progress being made under the influence of massage, or of gentle exercises, the surgeon may advise that the lingering adhesion be broken down under an anaesthetic, after which the function of the joint may quickly return.

There are the cases over which the "bone-setter" secures his greatest triumphs. A qualified practitioner may have been for months judiciously treating an inflamed joint by rest, and then feels a hesitation with regard to suddenly flexing the stiffened limb. The "bone-setter," however, has no such qualms, and when the case passes out of the hands of the perhaps over-careful surgeon, the unqualified practitioner (because he, from a scientific point of view, knows nothing) fears nothing, and, breaking down inflammatory adhesions, sets the joint free. And his manipulations prove triumphantly successful. But, knowing nothing and fearing nothing, he is apt to do grievous harm in carrying out his rough treatment in other cases. Malignant disease at the end of a bone (sarcoma), tuberculosis of a joint, and a joint stiffened by old inflammation are to him the same thing. "A small bone is out of place," or, "The bone is out of its socket; it has never been put in," and a breaking down of everything that resists his force is the result of the case being taken to him. For the "bone-setter" has only one line of treatment. Of the improvement which he often effects as if by magic the public are told much. Of the cases over which the doctor has been too long devoting skill and care, and which are set free by the "bone-setter," everybody hears—and sometimes to the discomfiture of the medical man. But of the cases in which irreparable damage follows his vigorous manipulation nothing is said—of his rough usage of a tuberculous hip, or of a sarcomatous shoulder-joint, and of the inevitable disaster and disappointment, those most concerned are least inclined to talk! A practical surgeon with common-sense has nothing to learn from the "bone-setter."

Rheumatoid Arthritis, or chronic *Osteo-arthritis*, is generally found in persons beyond middle age; but it is not rare in young people, though with them it need not be the progressive disease which it too often is in their elders. It is an obscure affection of the cartilage covering the joint surfaces of the bones, and it eventually involves the bones and the ligaments. A favourite joint for it is the knee or hip, and when one large joint is thus affected the other joints may escape. But when the hands or feet are implicated pretty nearly all the small joints are apt to suffer. Whether the joint is large or small, the cartilages wear away and new bone is developed about the ends of the bones, so that the joint is large and mis-shapen, the fingers being knotted and the hands deformed. When the spine is affected it becomes bowed and stiff. This is the disease which has crippled the old people in the workhouses and almshouses, and with them it is steadily progressive. Its early signs are stiffness and creaking or cracking in the joints, with discomfort and pain after exercise, and with a little effusion into the capsule of the joint. As regards *treatment*, medicines are of no great value. Wet, cold and damp being bad for the patient, he should be, if possible, got into a dry, bright, sunny place, and he should dress warmly. Perhaps there is no better place for him in the winter than Assuan. Cairo is not so suitable as it used to be before the dam was made, when its climate was drier. For the spring and summer certain British and Continental watering-places serve well. But if this luxury cannot be afforded, the patient must make himself as happy as he can with such hot douchings and massage as he can obtain, keeping himself warm, and his joints covered by flannel bandages and rubbed with stimulating liniments. In people advanced or advancing in years, the disease, as a rule, gets slowly worse, sometimes very slowly, but sometimes rapidly, especially when its makes its appearance in the hip, shoulder or knee as the result of an injury. In young people, however, its course may be cut short by attention being given to the principles stated above.

Charcot's Disease resembles osteo-arthritis in that it causes destruction of a joint and greatly deforms it. The deformity, however, comes on rapidly and without pain or tenderness. It is usually associated with the symptoms of locomotor ataxy, and depends upon disease of the nerves which preside over the nutrition of the joints. It is incurable.

A Loose Cartilage, or a Displaced Cartilage in the Knee Joint is apt to become caught in the hinge between the thigh bone and the leg bone, and by causing a sudden stretching of the ligaments of the joint to give rise to intense pain. When this happens the individual is apt to be thrown down as he walks, for it comes on with great suddenness. And thus he feels himself to be in a condition of perpetual insecurity. After the joint has thus gone wrong, bleeding and serous effusion take place into it, and it becomes greatly swollen. And if the cartilage still remains in the grip of the bones he is unable to straighten or bend his knee. But the surgeon by suddenly flexing and twisting the leg may manage to unhitch the cartilage and restore comfort and usefulness to the limb. As a rule, the slipping of a cartilage first occurs as the result of a serious fall or of a sudden and violent action—often it happens when the man is "dodging" at football, the foot being firmly fixed on the ground and the body being violently twisted at the knee. After the slipping has occurred many times, the amount of swelling, distress and lameness may diminish with each subsequent slipping, and the individual may become somewhat reconciled to his condition. As regards *treatment*, a tightly fitting steel cage-like splint, which, gripping the thigh and leg, limits the movements of the knee to flexion and extension, may prove useful. But for a muscular, athletic individual the wearing of this apparatus may prove vexatious and disappointing. The only alternative is to open the joint and remove the loose cartilage. The cartilage may be found on operation to be split, torn or crumpled, and lying right across between the joint-surfaces of the bones, from which nothing but an operation could possibly have removed it. The operation is almost sure to give complete and permanent relief to the condition, the individual being able to resume his old exercises and amusements without fear of the knee playing him false. It is, however, one that should not be undertaken without due consideration and circumspection, and the details of the operation should be carried out with the utmost care and cleanliness.

An accidental *wound of a joint*, as from the blade of a knife, or a spike, entering the knee is a very serious affair, because of the risk of septic germs entering the synovial cavity either at the time of the injury or later. If the joint becomes thus infected there is great swelling of the part, with redness of the skin, and with the escape of blood-stained or purulent synovia. Absorption takes place of the poisonous substances produced by the action of the germs, and, as a result, great constitutional disturbance arises. Blood-poisoning may thus threaten life, and in many cases life is saved only by amputation. The best treatment is freely to open the joint, to wash it out with a strong antiseptic fluid, and to make arrangement for thorough drainage, the limb being fixed on a splint. Help may also be obtained by increasing the patient's power of resistance to the effect of the poisoning by injections of a serum prepared by cultivation of the septic germs in question. If the limb is saved, there is a great chance of the knee being permanently stiff.

Dislocation.—The ease with which the joint-end of a bone is dislocated varies with its form and structure, and with the position in which it happens to be placed when the violence is applied. The relative frequency of fracture of the bone and dislocation of the joint depends on the strength of the bones above and below the joint relatively to the strength of the joint itself. The strength of the various joints in the body is dependent upon either ligament or muscle, or upon the shape of the bones. In the hip, for instance, all three sources of strength are present; therefore, considering the great leverage of the long thigh bone, the hip is rarely dislocated. The shoulder, in order to allow of extensive movement, has no osseus or ligamentous strength; it is, therefore, frequently dislocated. The wrist and ankle are rarely dislocated; as the result of violence at the wrist the radius gives way, at the ankle the fibula, these bones being relatively weaker than the respective joints. The wrist owes its strength to ligaments, the elbow and the ankle to the shape of the bones. The symptoms of a dislocation are distortion and limited movement, with absence of the grating sensation felt in fracture when the broken ends of the bone are rubbed together. The treatment consists in reducing the dislocation, and the sooner this replacement is effected the better—the longer the delay the more difficult it becomes to put things right. After a variable period, depending on the nature of the joint and the age of the person, it may be impossible to replace the bones. The result will be a more or less useless joint. The administration of an anaesthetic, by relaxing the muscles, greatly assists the operation of reduction. The length of time that a joint has to be kept quiet after it has been restored to its normal shape depends on its form, but, as a rule, early movement is advisable. But when by the formation of the bones a joint is weak, as at the outer end of the collar-bone, and at the elbow-end of the radius, prolonged rest for the joint is necessary or dislocation may recur.

Congenital Dislocation at the Hip.—Possibly as a result of faulty position of the subject during intrauterine life, the head of the thigh-bone leaves, or fails throughout to occupy, its normal situation on the haunch-bone The defect, which is a very serious one, is probably not discovered until the child begins to walk, when its peculiar rolling gait attracts attention. The want of fixation at the joint permits of the surgeon thrusting up the thigh-bone, or drawing it down in a painless, characteristic manner.

The first thing to be done is to find out by means of the X-rays whether a socket exists into which, under an anaesthetic, the surgeon may fortunately be enabled to lodge the end of the thigh-bone. If this offers no prospect of success, there are three courses open: First, to try under an anaesthetic to manipulate the limb until the head of the thigh-bone rests as nearly as possible in its normal position, and then to endeavour to fix it there by splints, weights and bandaging until a new joint is formed; second, to cut down upon the site of the joint, to scoop out a new socket in the haunch-bone, and thrust the end of the thigh-bone into it, keeping it fixed there as just described; and third, to allow the child to run about as it pleases, merely raising the sole of the foot of the short leg by a thick boot, so as to keep the lower part of the trunk fairly level, lest secondary curvature of the spine ensue. The first and second methods demand many months of careful treatment in bed. The ultimate result of the second is so often disappointing that the surgeon now rarely advises its adoption. But, if under an anaesthetic, as the result of skilful manipulation the head of the thigh-bone can be made to enter a more or less rudimentary socket, the case is worth all the time, care and attention bestowed upon it. Sometimes the results of prolonged treatment are so good that the child eventually is able to walk with scarce a limp. But a vigorous attempt at placing the head of the bone in its proper position should be made in every case. (E. O.*)

JOINTS, in engineering, may be classed either (*a*) according to their material, as in stone or brick, wood or metal; or (*b*) according to their object, to prevent leakage of air, steam or water, or to transmit force, which may be thrust, pull or shear; or (*c*) according as they are stationary or moving ("working" in technical language). Many joints, like those of ship-plates and boiler-plates, have simultaneously to fulfil both objects mentioned under (*b*).

All stone joints of any consequence are stationary. It being uneconomical to dress the surfaces of the stones resting on each other smoothly and so as to be accurately flat, a layer of mortar or other cementing material is laid between them. This hardens and serves to transmit the pressure from stone to stone without its being concentrated at the "high places." If the ingredients of the cement are chosen so that when hard the cement has about the same coefficient of compressibility as the stone or brick, the pressure will be nearly uniformly distributed. The cement also adheres to the surfaces of the stone or brick, and allows a certain amount of tension to be borne by the joint. It likewise prevents the stones from slipping one on the other, *i.e.* it gives the joint very considerable shearing strength. The composition of the cement is chosen according as it has to "set" in air or water. The joints are made impervious to air or water by "pointing" their outer edges with a superior quality of cement.

Wood joints are also nearly all stationary. They are made partially fluid-tight by "grooving and tenoning," and by "caulking" with oakum or similar material. If the wood is saturated with water, it swells, the edges of the joints press closer together, and the joints become tighter the greater the water-pressure is which tends to produce leakage. Relatively to its weaker general strength, wood is a better material than iron so far as regards the transmission of a thrust past a joint. So soon as a heavy pressure comes on the joint all the small irregularities of the surfaces in contact are crushed up, and there results an approximately uniform distribution of the pressure over the whole area (*i.e.* if there be no bending forces), so that no part of the material is unduly stressed. To attain this result the abutting surfaces should be well fitted together, and the bolts binding the pieces together should be arranged so as to ensure that they will not interfere with the timber surfaces coming into this close contact. Owing to its weak shearing strength on sections parallel to the fibre, timber is peculiarly unfitted for tension joints. If the pieces exerting the pull are simply bolted together with wooden or iron bolts, the joint cannot be trusted to transmit any considerable force with safety. The stresses become intensely localized in the immediate neighborhood of the bolts. A tolerably strong timber tension-joint can, however, be made by making the two pieces abut, and connecting them by means of iron plates covering the joint and bolted to the sides of the timbers by bolts passing through the wood. These plates should have their surfaces which lie against the wood ribbed in a direction transverse to the pull. The bolts should fit their holes slackly, and should be well tightened up so as to make the ribs sink into the surface of the timber. There will then be very little localized shearing stress brought upon the interior portions of the wood.

Iron and the other commonly used metals possess in variously high degrees the qualities desirable in substances out of which joints are to be made. The joint ends of metal pieces can easily be fashioned to any advantageous form and size without waste of material. Also these metals offer peculiar facilities for the cutting of their surfaces at a comparatively small cost so smoothly and evenly as to ensure the close contact over their whole areas of surfaces placed against each other. This is of the highest importance, especially in joints designed to transmit force. Wrought iron and mild steel are above all other metals suitable for tension joints where there is not continuous rapid motion. Where such motion occurs, a layer, or, as it is technically termed, a "bush," of brass is inserted underneath the iron. The joint then possesses the high strength of a wrought-iron one and at the same time the good frictional qualities of a brass surface. Leakage past moving metal joints can be prevented by cutting the surfaces very accurately to fit each other. Steam-engine slide-valves and their seats, and piston "packing-rings" and the cylinders they work to and fro in, may be cited as examples. A subsidiary compressible "packing" is in other situations employed, an instance of which may be seen in the "stuffing boxes" which prevent the escape of steam from steam-engine cylinders through the piston-rod hole in the cylinder cover. Fixed metal joints are made fluid tight—(*a*) by caulking a riveted joint, *i.e.* by hammering in the edge of the metal with a square-edged chisel (the tighter the joint requires to be against leakage the closer must be the spacing of the rivets—compare the rivet-spacing in bridge, ship and boiler-plate joints); (*b*) by the insertion between the surfaces of a layer of one or other of various kinds of cement, the layer being thick or thin according to circumstances; (*c*) by the insertion of a layer of soft solid substance called "packing" or "insertion."

Apart from cemented and glued joints, most joints are formed by cutting one or more holes in the ends of the pieces to be joined, and inserting in these holes a corresponding number of pins. The word "pin" is technically restricted to mean a cylindrical pin in a movable joint. The word "bolt" is used when the cylindrical pin is screwed up tight with a nut so as to be immovable. When the pin is not screwed, but is fastened by being beaten down on either end, it is called a "rivet." The pin is sometimes rectangular in section, and tapered or parallel lengthwise. "Gibs" and "cottars" are examples of the latter. It is very rarely the case that fixed joints have their pins subject to simple compression in the direction of their length, though they are frequently subject to simple tension in that direction. A good example is the joint between a steam cylinder and its cover, where the bolts have to resist the whole thrust of the steam, and at the same time to keep the joint steam-tight.

JOINTS, in geology. All rocks are traversed more or less completely by vertical or highly inclined divisional planes termed *joints*. Soft rocks, indeed, such as loose sand and uncompacted clay, do not show these planes; but even a soft loam after standing for some time, consolidated by its own weight, will usually be found to have acquired them. Joints vary in sharpness of definition, in the regularity of their perpendicular or horizontal course, in their lateral persistence, in number and in the directions of their intersections. As a rule, they are most sharply defined in proportion to the fineness of grain of the rock. They are often quite invisible, being merely planes of potential weakness, until revealed by the slow disintegrating effects of the weather, which induces fracture along their planes in preference to other directions in the rock; it is along the same planes that a rock breaks most readily under the blow of a hammer. In coarse-textured rocks, on the other hand, joints are apt to show themselves as irregular rents along which the rock has been shattered, so that they present an uneven sinuous course, branching off in different directions. In many rocks they descend vertically at not very unequal distances, so that the spaces between them are marked off into so many wall-like masses. But this symmetry often gives place to a more or less tortuous course with lateral joints in various apparently random directions, more especially where in stratified rocks the beds have diverse lithological characters. A single joint may be traced sometimes for many yards or even for several miles, more particularly when the rock is fine-grained and fairly rigid, as in limestone. Where the texture is coarse and unequal, the joints, though abundant, run into each other in such a way that no one in particular can be identified for so great a distance. The number of joints in a mass of rock varies within wide limits. Among rocks which have undergone little disturbance the joints may be separated from each other by intervals of several yards. In other cases where the terrestrial movement appears to have been considerable, the rocks are so jointed as to have acquired therefrom a fissile character that has almost obliterated their tendency to split along the lines of bedding.

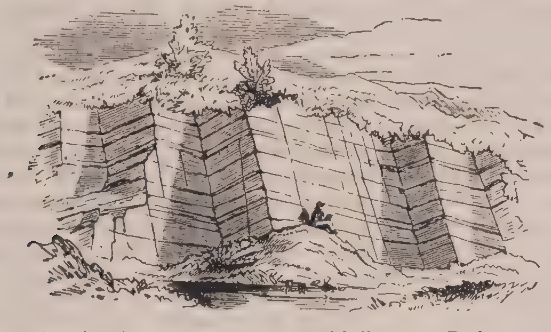
The Cause of Jointing in Rocks.—The continual state of movement in the crust of the earth is the primary cause of the majority of joints. It is to the outermost layers of the lithosphere that joints are confined; in what van Hise has described as the "zone of fracture," which he estimates may extend to a depth of 12,000 metres in the case of rigid rocks. Below the zone of fracture, joints cannot be formed, for there the rocks tend to flow rather than break. The rocky crust, as it slowly accommodates itself to the shrinking interior of the earth, is subjected unceasingly to stresses which induce jointing by tension, compression and torsion. Thus joints are produced during the slow cyclical movements of elevation and depression as well as by the more vigorous movements of earthquakes. Tension-joints are the most widely spread; they are naturally most numerous over areas of upheaval. Compression-joints are generally associated with the more intense movements which have involved shearing, minor-faulting and slaty cleavage. A minor cause of tension-jointing is shrinkage, due either to cooling or to desiccation. The most striking type of jointing is that produced by the cooling of igneous rocks, whereby a regularly columnar structure is developed, often called basaltic structure, such as is found at the Giant's Causeway. This structure is described in connexion with modern volcanic rocks, but it is met with in igneous rocks of all ages. It is as well displayed among the felsites of the Lower Old Red Sandstone, and the basalts of Carboniferous Limestone age as among the Tertiary lavas of Auvergne and Vivarais. This type of jointing may cause the rock to split up into roughly hexagonal prisms no thicker than a lead pencil; on the other hand, in many dolerites and diorites the prisms are much coarser, having a diameter of 3 ft. or more, and they are more irregular in form; they may be so long as to extend up the face of a cliff for 300 or 400 ft. A columnar jointing has often been superinduced upon stratified rocks by contact with intrusive igneous masses. Sandstones, shales and coal may be observed in this condition. The columns diverge perpendicularly from the surface of the injected altering substance, so that when the latter is vertical, the columns are horizontal; or when it undulates the columns follow its curvatures. Beautiful examples of this character occur among the coal-seams of Ayrshire. Occasionally a prismatic form of jointing may be observed in unaltered strata; in this case it is usually among those which have been chemically formed, as in gypsum, where, as noticed by Jukes in the Paris Basin, some beds are divided from top to bottom by vertical hexagonal prisms. Desiccation, as shown by the cracks formed in mud when it dries, has probably been instrumental in causing jointing in a limited number of cases among stratified rocks.

Movement along Joint Planes.—In some conglomerates the joints may be seen traversing the enclosed pebbles as well as the surrounding matrix; large blocks of hard quartz are cut through by them as sharply as if they had been sliced by a lapidary's machine. A similar phenomenon may be observed in flints as they lie embedded in the chalk, and the same joints may be traced continuously through many yards of rock. Such facts show that the agency to which the jointing of rocks was due must have operated with considerable force. Further indication of movement is supplied by the rubbed and striated surfaces of some joints. These surfaces, termed *slickensides*, have evidently been ground against each other.

Influence of Joints on Water-flow and Scenery.—Joints form natural paths for the passage downward and upward of subterranean water and have an important bearing upon water supply. Water obtained directly from highly jointed rock is more liable to become contaminated by surface impurities than that from a more compact rock through which it has had to soak its way; for this reason many limestones are objected to as sources of potable water. On exposed surfaces joints have great influence in determining the rate and type of weathering. They furnish an effective lodgment for surface water, which, frozen by lowering of temperature, expands into ice and wedges off blocks of the rock; and the more numerous the joints the more rapidly does the action proceed. As they serve, in conjunction with bedding, to divide stratified rocks into large quadrangular blocks, their effect on cliffs and other exposed places is seen in the splintered and dislocated aspect so familiar in mountain scenery. Not infrequently, by directing the initial activity of weathering agents, joints have been responsible for the course taken by large streams as well as for the type of scenery on their banks. In limestones, which succumb readily to the solvent action of water, the joints are liable to be gradually enlarged along the course of the underground waterflow until caves are formed of great size and intricacy.

Infilled Joints.—Joints which have been so enlarged by solution are sometimes filled again completely or partially by minerals brought thither in solution by the water traversing the rock; calcite, barytes and ores of lead and copper may be so deposited. In this way many valuable mineral veins have been formed. Widened joints may also be filled in by detritus from the surface, or, in deep-seated portions of the crust, by heated igneous rock, forced from below along the planes of least resistance. Occasionally even sedimentary rocks may be forced up joints from below, as in the case of the so-called "sandstone dykes."

Practical Utility of Joints.—An important feature in the joints of stratified rocks is the direction in which they intersect each other. As the result of observations we learn that they possess two dominant trends, one coincident in a general way with the direction in which the strata are inclined to the horizon, the other running transversely approximately at right angles. The former set is known as *dip-joints*, because they run with the *dip* or inclination of the rocks, the latter is termed *strike-joints*, inasmuch as they conform to the general *strike* or mean outcrop. It is owing to the existence of this double series of joints that ordinary quarrying operations can be carried on. Large quadrangular blocks can be wedged off that would be shattered if exposed to the risk of blasting. A quarry is usually worked on the dip of the rock, hence strike-joints form clean-cut faces in front of the workmen as they advance. These are known as *backs*, and the dip-joints which traverse them as *cutters*. The way in which this double set of joints occurs in a quarry may be seen in the figure, where the parallel lines which traverse the shaded and unshaded faces mark the successive strata. The broad white spaces running along the length of the quarry behind the seated figure are strike-joints or backs, traversed by some highly inclined lines which mark the position of the dip-joints or cutters. The shaded ends looking towards the spectator are cutters from which the rock has been quarried away on one side. In crystalline (igneous) rocks, bedding is absent and very often there is no horizontal jointing to take its place; the joint planes break up the mass more irregularly than in stratified rocks. Granite, for example, is usually traversed by two sets of chief or *master-joints* cutting each other somewhat obliquely. Their effect is to divide the rock into long quadrangular, rhomboidal, or even polygonal columns. But a third set may often be noticed cutting across the columns, though less continuous and dominant than the others. When these transverse joints are few in number, columns many feet in length can be quarried out entire. Such monoliths have been from early times employed in the construction of obelisks and pillars. (J. A. H.)



Joints in Limestone Quarry near Mallow, co. Cork.
(G. V. Du Noyer.)

JOINTURE, in law, a provision for a wife after the death of her husband. As defined by Sir E. Coke, it is "a competent livelihood of freehold for the wife, of lands or tenements, to take effect presently in possession or profit after the death of her husband, for the life of the wife at least, if she herself be not the cause of determination or forfeiture of it" (Co. Litt. 36b). A jointure is of two kinds, legal and equitable. A legal jointure was first authorized by the Statute of Uses. Before this statute a husband had no legal seisin in such lands as were vested in another to his "use," but merely an equitable estate. Consequently it was usual to make settlements on marriage, the most general form being the settlement by deed of an estate to the use of the husband and wife for their lives in joint tenancy (or "jointure"), so that the whole would go to the survivor. Although, strictly speaking, a jointure is a joint estate limited to both husband and wife, in common acceptation the word extends also to a sole estate limited to the wife only. The requisites of a legal jointure are: (1) the jointure must take effect immediately after the husband's death; (2) it must be for the wife's life or for a greater estate, or be determinable by her own act; (3) it must be made before marriage—if after, it is voidable at the wife's election, on the death of the husband; (4) it must be expressed to be in satisfaction of dower and not of part of it. In equity, any provision made for a wife before marriage and accepted by her (not being an infant) in lieu of dower was a bar to such. If the provision was made after marriage, the wife was not barred by such provision, though expressly stated to be in lieu of dower; she was put to her election between jointure and dower (see Dower).

JOINVILLE, the name of a French noble family of Champagne, which traced its descent from Étienne de Vaux, who lived at the beginning of the 11th century. Geoffroi III. (d. 1184), sire de Joinville, who accompanied Henry the Liberal, count of Champagne, to the Holy Land in 1147, received from him the office of seneschal, and this office became hereditary in the house of Joinville. In 1203 Geoffroi V., sire de Joinville, died while on a crusade, leaving no children. He was succeeded by his brother Simon, who married Beatrice of Burgundy, daughter of the count of Auxonne, and had as his son Jean (*q.v.*), the historian and friend of St Louis. Henri (d. 1374), sire de Joinville, the grandson of Jean, became count of Vaudémont, through his mother, Marguerite de Vaudémont. His daughter, Marguerite de Joinville, married in 1393 Ferry of Lorraine (d. 1415), to whom she brought the lands of Joinville. In 1552, Joinville was made into a principality for the house of Lorraine. Mlle de Montpensier, the heiress of Mlle de Guise, bequeathed the principality of Joinville to Philip, duke of Orleans (1693). The castle, which overhung the Marne, was sold in 1791 to be demolished. The title of prince de Joinville (*q.v.*) was given later to the third son of King Louis Philippe. Two branches of the house of Joinville have settled in other countries: one in England, descended from Geoffroi de Joinville, sire de Vaucouleurs, and brother of the historian, who served under Henry III. and Edward I.; the other, descended from Geoffroi de Joinville, sire de Briquenay, and son of Jean, settled in the kingdom of Naples.

See J. Simonnet, *Essai sur l'histoire et la généalogie des seigneurs de Joinville* (1875); H. F. Delaborde, *Jean de Joinville et les seigneurs de Joinville* (1894). (M. P.*)

JOINVILLE, FRANÇOIS FERDINAND PHILIPPE LOUIS MARIE, Prince de (1818–1900), third son of Louis Philippe, duc d'Orléans, afterwards king of the French, was born at Neuilly on the 14th of August 1818. He was educated for the navy, and became lieutenant in 1836. His first conspicuous service was at the bombardment of San Juan de Ulloa, in November 1838, when he headed a landing party and took the Mexican general Arista prisoner with his own hand at Vera Cruz. He was promoted captain, and in 1840 was entrusted with the charge of bringing the remains of Napoleon from St Helena to France. In 1844 he conducted naval operations on the coast of Morocco, bombarding Tangier and occupying Mogador, and was recompensed with the grade of vice-admiral. In the following year he published in the *Revue des deux mondes* an article on the deficiencies of the French navy which attracted considerable attention, and by his hostility to the Guizot ministry, as well as by an affectation of ill-will towards Great Britain, he gained considerable popularity. The revolution of 1848 nevertheless swept him away with the other Orleans princes. He hastened to quit Algeria, where he was then serving, and took refuge at Claremont, in Surrey, with the rest of his family. In 1861, upon the breaking out of the American Civil War, he proceeded to Washington, and placed the services of his son and two of his nephews at the disposal of the United States government. Otherwise, he was little heard of until the overthrow of the Empire in 1870, when he re-entered France, only to be promptly expelled by the government of national defence. Returning incognito, he joined the army of General d'Aurelle de Paladines, under the assumed name of Colonel Lutherod, fought bravely before Orleans, and afterwards, divulging his identity, formally sought permission to serve. Gambretta, however, arrested him and sent him back to England. In the National Assembly, elected in February 1871, the prince was returned by two departments and elected to sit for the Haute Marne, but, by an arrangement with Thiers, did not take his seat until the latter had been chosen president of the provincial republic. His deafness prevented him from making any figure in the assembly, and he resigned his seat in 1876. In 1886 the provisions of the law against pretenders to the throne deprived him of his rank as vice-admiral, but he continued to live in France, and died in Paris on the 16th of June 1900. He had married in 1843 the princess Francisca, sister of Pedro II., emperor of Brazil, and had a son, the duc de Penthièvre (born in 1845), also brought up to the navy, and a daughter Françoise (1844–) who married the duc de Chartres in 1863.

The prince de Joinville was the author of several essays and pamphlets on naval affairs and other matters of public interest, which were originally published for the most part either unsigned or pseudonymously, and subsequently republished under his own name after the fall of the Empire. They include *Essais sur la marine française* (1853); *Études sur la marine* (1859 and 1870); *La Guerre d'Amérique, campagne du Potomac* (1862 and 1872); *Encore un mot sur Sadowa* (Brussels, 1868); and *Vieux souvenirs* (1894).

JOINVILLE, JEAN, Sire de (1224–1319), was the second great writer of history in Old French, and in a manner occupies the interval between Villehardouin and Froissart. Numerous minor chroniclers fill up the gaps, but no one of them has the idiosyncrasy which distinguishes these three writers, who illustrate the three periods of the middle ages—adolescence, complete manhood, and decadence. Joinville was the head of a noble family of the province of Champagne (see Joinville, above). The provincial court of the counts of Champagne had long been a distinguished one, and the action of Thibaut the poet, together with the proximity of the district to Paris, made the province less rebellious than most of the great feudal divisions of France to the royal authority. Joinville's first appearance at the king's court was in 1241, on the occasion of the knighting of Louis IX.'s younger brother Alphonse. Seven years afterwards he took the cross, thereby giving St Louis a valuable follower, and supplying himself with the occasion of an eternal memory. The crusade, in which he distinguished himself equally by wisdom and prowess, taught his practical spirit several lessons. He returned with the king in 1254. But, though his reverence for the personal character of his prince seems to have known no bounds, he had probably gauged the strategic faculties of the saintly king, and he certainly had imbibed the spirit of the dictum that a man's first duties are those to his own house. He was in the intervals of residence on his own fief a constant attendant on the court, but he declined to accompany the king on his last and fatal expedition. In 1282 he was one of the witnesses whose testimony was formally given at St Denis in the matter of the canonization of Louis, and in 1298 he was present at the exhumation of the saint's body. It was not till even later that he began his literary work, the occasion being a request from Jeanne of Navarre, the wife of Philippe le Bel and the mother of Louis le Hutin. The great interval between his experiences and the period of the composition of his history is important for the due comprehension of the latter. Some years passed before the task was completed, on its own showing, in October 1309. Jeanne was by this time dead, and Joinville presented his book to her son Louis the Quarreller. This original manuscript is now lost, whereby hangs a tale. Great as was his age, Joinville had not ceased to be actively loyal, and in 1315 he complied with the royal summons to bear arms against the Flemings. He was at Joinville again in 1317, and on the 11th of July 1319 he died at the age of ninety-five, leaving his possessions and his position as seneschal of Champagne to his second son Anselm. He was buried in the neighbouring church of St Laurent, where during the Revolution his bones underwent profanation. Besides his *Histoire de Saint Louis* and his *Credo* or "Confession of Faith" written much earlier, a considerable number, relatively speaking, of letters and business documents concerning the fief of Joinville and so forth are extant. These have an importance which we shall consider further on; but Joinville owes his place in general estimation only to his history of his crusading experiences and of the subsequent fate of St Louis.

Of the famous French history books of the middle ages Joinville's bears the most vivid impress of the personal characteristics of its composer. It does not, like Villehardouin, give us a picture of the temper and habits of a whole order or cast of men during a heroic period of human history; it falls far short of Froissart in vivid portraying of the picturesque and external aspects of social life; but it is a more personal book than either. The age and circumstances of the writer must not be forgotten in reading it. He is a very old man telling of circumstances which occurred in his youth. He evidently thinks that the times have not changed for the better—what with the frequency with which the devil is invoked in modern France, and the sinful expenditure common in the matter of embroidered silk coats. But this laudation of times past concentrates itself almost wholly on the person of the sainted king, whom, while with feudal independence he had declined to swear fealty to him, "because I was not his man," he evidently regarded with an unlimited reverence. His age, too, while garrulous to a degree, seems to have been free from the slightest taint of boasting. No one perhaps ever took less trouble to make himself out a hero than Joinville. He is constantly admitting that on such and such an occasion he was terribly afraid; he confesses without the least shame that, when one of his followers suggested defiance of the Saracens and voluntary death, he (Joinville) paid not the least attention to him; nor does he attempt to gloss in any way his refusal to accompany St Louis on his unlucky second crusade, or his invincible conviction that it was better to be in mortal sin than to have the leprosy, or his decided preference for wine as little watered as might be, or any other weakness. Yet he was a sincerely religious man, as the curious *Credo*, written at Acre and forming a kind of anticipatory appendix to the history, sufficiently shows. He presents himself as an altogether human person, brave enough in the field, and, at least when young, capable of extravagant devotion to an ideal, provided the ideal was fashionable, but having at bottom a sufficient respect for his own skin and a full consciousness of the side on which his bread is buttered. Nor can he be said to be in all respects an intelligent traveller. There were in him what may be called glimmerings of deliberate literature, but they were hardly more than glimmerings. His famous description of Greek fire has a most provoking mixture of circumstantial detail with absence of verifying particulars. It is as matter-of-fact and comparative as Dante, without a touch of Dante's genius. "The fashion of Greek fire was such that it came to us as great as a tun of verjuice, and the fiery tail of it was as big as a mighty lance; it made such noise in the coming that it seemed like the thunder from heaven, and looked like a dragon flying through the air; so great a light did it throw that throughout the host men saw as though it were day for the light it threw." Certainly the excellent seneschal has not stinted himself of comparisons here, yet they can hardly be said to be luminous. That the thing made a great flame, a great noise, and struck terror into the beholder is about the sum of it all. Every now and then indeed a striking circumstance, strikingly told, occurs in Joinville, such as the famous incident of the woman who carried in one hand a chafing dish of fire, in the other a phial of water, that she might burn heaven and quench hell, lest in future any man should serve God merely for hope of the one or fear of the other. But in these cases the author only repeats what he has heard from others. On his own account he is much more interested in small personal details than in greater things. How the Saracens, when they took him prisoner, he being half dead with a complication of diseases, kindly left him "un mien couverture d'écarlate" which his mother had given him, and which he put over him, having made a hole therein and bound it round him with a cord; how when he came to Acre in a pitiable condition an old servant of his house presented himself, and "brought me clean white hoods and combed my hair most comfortably"; how he bought a hundred tuns of wine and served it—the best first, according to high authority—well-watered to his private soldiers, somewhat less watered to the squires, and to the knights neat, but with a suggestive phial of the weaker liquid to mix "si comme ils vouloient"—these are the details in which he seems to take greatest pleasure, and for readers six hundred years after date perhaps they are not the least interesting details.

It would, however, be a mistake to imagine that Joinville's book is exclusively or even mainly a chronicle of small beer. If he is not a Villehardouin or a Carlyle, his battlepieces are vivid and truthful, and he has occasional passages of no small episodic importance, such as that dealing with the Old Man of the Mountain. But, above all, the central figure of his book redeems it from the possibility of the charge of being commonplace or ignoble. To St Louis Joinville is a nobler Boswell; and hero-worshipper, hero, and heroic ideal all have something of the sublime about them. The very pettiness of the details in which the good seneschal indulges as to his own weakness only serves to enhance the sublime unworldliness of the king. Joinville is a better warrior than Louis, but, while the former frankly prays for his own safety, the latter only thinks of his army's when they have escaped from the hands of the aliens. One of the king's knights boasts that ten thousand pieces have been "forcontés" (counted short) to the Saracens; and it is with the utmost trouble that Joinville and the rest can persuade the king that this is a joke, and that the Saracens are much more likely to have got the advantage. He warns Joinville against wine-bibbing, against bad language, against all manner of foibles small and great; and the pupil acknowledges that this physician at any rate had healed himself in these respects. It is true that he is severe towards infidels; and his approval of the knight who, finding a Jew likely to get the better of a theological argument, resorted to the baculine variety of logic, does not meet the views of the 20th century. But Louis was not of the 20th century but of the 13th, and after his kind he certainly deserved Joinville's admiration. Side by side with his indignation at the idea of cheating his Saracen enemies may be mentioned his answer to those who after Taillebourg complained that he had let off Henry III. too easily. "He is my man now, and he was not before," said the king, a most unpractical person certainly, and in some ways a sore saint for France. But it is easy to understand the half-despairing adoration with which a shrewd and somewhat prosaic person like Joinville must have regarded this flower of chivalry born out of due time. He has had his reward, for assuredly the portrait of St Louis, from the early collection of anecdotes to the last hearsay sketch of the woeful end at Tunis, with the famous *enseignement* which is still the best summary of the theoretical duties of a Christian king in medieval times, is such as to take away all charge of vulgarity or mere *commérage* from Joinville, a charge to which otherwise he might perhaps have been exposed.

The arrangement of the book is, considering its circumstances and the date of its composition, sufficiently methodical. According to its own account it is divided into three parts—the first dealing generally with the character and conduct of the hero; the second with his acts and deeds in Egypt, Palestine, &c., as Joinville knew them; the third with his subsequent life and death. Of these the last is very brief, the first not long; the middle constitutes the bulk of the work. The contents of the first part are, as might be expected, miscellaneous enough, and consist chiefly of stories chosen to show the valour of Louis, his piety, his justice, his personal temperance, and so forth. The second part enters upon the history of the crusade itself, and tells how Joinville pledged all his land save so much as would bring in a thousand livres a year, and started with a brave retinue of nine knights (two of whom besides himself wore bannerets), and shared a ship with the sire d'Aspremont, leaving Joinville without raising his eyes, "pour ce que le cuer ne me attendrisist du biau chastel que je lessoie et de mes deux enfans"; how they could not get out of sight of a high mountainous island (Lampedusa or Pantellaria) till they had made a procession round the masts in honour of the Virgin; how they reached first Cyprus and then Egypt; how they took Damietta, and then entangled themselves in the Delta. Bad generalship, which is sufficiently obvious, unwholesome food—it was Lent, and they ate the Nile fish which had been feasting on the carcases of the slain—and Greek fire did the rest, and personal valour was of little avail, not merely against superior numbers and better generals, but against dysentery and a certain "mal de l'ost" which attacked the mouth and the legs, a curious human version of a well-known bestial malady. After ransom Acre was the chief scene of Louis's stay in the East, and here Joinville lived in some state, and saw not a few interesting things, hearing besides much gossip as to the inferior affairs of Asia from ambassadors, merchants and others. At last they journeyed back again to France, not without considerable experiences of the perils of the deep, which Joinville tells with a good deal of spirit. The remainder of the book is very brief. Some anecdotes of the king's "justice," his favourite and distinguishing attribute during the sixteen years which intervened between the two crusades, are given; then comes the story of Joinville's own refusal to join the second expedition, a refusal which bluntly alleged the harm done by the king's men who stayed at home to the vassals of those who went abroad as the reason of Joinville's resolution to remain behind. The death of the king at Tunis, his *enseignement* to his son, and the story of his canonization complete the work.

The book in which this interesting story is told has had a literary history which less affects its matter than the vicissitudes to which Froissart has been subjected, but which is hardly less curious in its way. There is no reason for supposing that Joinville indulged in various editions, such as those which have given Kervyn de Lettenhove and Siméon Luce so much trouble, and which make so vast a difference between the first and the last redaction of the chronicler of the Hundred Years' War. Indeed the great age of the seneschal of Champagne, and his intimate first-hand acquaintance with his subject, made such variations extremely improbable. But, whereas there is no great difficulty (though much labour) in ascertaining the original and all subsequent texts of Froissart, the original text of Joinville was until recently unknown, and even now may be said to be in the state of a conjectural restoration. It has been said that the book was presented to Louis le Hutin. Now we have a catalogue of Louis le Hutin's library, and, strange to say, Joinville does not figure in it. His book seems to have undergone very much the same fate as that which befell the originals of the first two volumes of the *Paston Letters* which Sir John Fenn presented to George the Third. Several royal library catalogues of the 14th century are known, but in none of these does the *Histoire de St Louis* appear. It does appear in that of Charles V. (1411), but apparently no copy even of this survives. As everybody knows, however, books could be and were multiplied by the process of copying tolerably freely, and a copy at first or second hand which belonged to the fiddler king René of Provence in the 15th century was used for the first printed edition in 1547. Other editions were printed from other versions, all evidently posterior to the original. But in 1741 the well-known medievalist La Curne de St Palaye found at Lucca a manuscript of the 16th century, evidently representing an older text than any yet printed. Three years later a 14th-century copy was found at Brussels, and this is the standard manuscript authority for the text of Joinville. Those who prefer to rest on MS. authority will probably hold to this text, which appears in the well-known collection of Michaud and Poujoulat as well as that of Buchon, and in a careful and useful separate edition by Francisque Michel. The modern science of critical editing, however, which applies to medieval texts the principles long recognized in editing the classics, has discovered in the 16th-century manuscript, and still more in the original miscellaneous works of Joinville, the letters, deeds, &c., already alluded to, the materials for what we have already called a conjectural restoration, which is not without its interest, though perhaps it is possible for that interest to be exaggerated.

For merely general readers Buchon's or Michaud's editions of Joinville will amply suffice. Both include translations into modern French, which, however, are hardly necessary, for the language is very easy. Natalis de Wailly's editions of 1868 and particularly 1874 are critical editions, embodying the modern research connected with the text, the value of which is considerable, but contestable. They are accompanied by ample annotations and appendices, with illustrations of great merit and value. Much valuable information appeared for the first time in the edition of F. Michel (1859). To these may be added A. F. Didot's *Études sur Joinville* (1870) and H. F. Delaborde's *Jean de Joinville* (1894). A good sketch of the whole subject will be found in Aubertin's *Histoire de la langue et de la littérature françaises au moyen âge*, ii. 196–211; see also Gaston Paris, *Litt. française au moyen âge* (1893), and A. Debidour, *Les Chroniqueurs* (1888). There are English translations by T. Johnes (1807), J. Hutton (1868), Ethel Wedgwood (1906), and (more literally) Sir F. T. Marzials ("Everyman's Library," 1908). (G. Sa.)

JOIST, in building, one of a row or tier of beams set edgewise from one wall or partition to another and carrying the flooring boards on the upper edge and the laths of the ceiling on the lower. In double flooring there are three series of joists, *binding*, *bridging*, and *ceiling* joists. The binding joists are the real support of the floor, running from wall to wall, and carrying the bridging joists above and the ceiling joists below (see CARPENTRY), The Mid. Eng. form of the word was *giste* or *gyste*, and was adapted from O. Fr. *giste*, modern *gîte*, a beam supporting the platform of a gun. By origin the word meant that on which anything lies or rests (*gêsir*, to lie; Lat. *jacere*).

The English word "gist," in such phrases as "the gist of the matter," the main or central point in an argument, is a doublet of joist. According to Skeat, the origin of this meaning is an O. Fr. proverbial expression, *Je sçay bien où gist le lièvre*, I know well where the hare lies, *i.e.* I know the real point of the matter.

JÓKAI, MAURUS (1825–1904), Hungarian novelist, was born at Rév-Komárom on the 19th of February 1825. His father, Joseph, was a member of the Asva branch of the ancient Jókay family; his mother was a scion of the noble Pulays. The lad was timid and delicate, and therefore educated at home till his tenth year, when he was sent to Pressburg, subsequently completing his education at the Calvinist college at Pápá, where he first met Petöfi, Alexander Kozma, and several other brilliant young men who subsequently became famous. His family had meant him to follow the law, his father's profession, and accordingly the youth, always singularly assiduous, plodded conscientiously through the usual curriculum at Kecskemet and Pest, and as a full-blown advocate actually succeeded in winning his first case. But the drudgery of a lawyer's office was uncongenial to the ardently poetical youth, and, encouraged by the encomiums pronounced by the Hungarian Academy upon his first play, *Zsidó fiu* ("The Jew Boy"), he flitted, when barely twenty, to Pest in 1845 with a MS. romance in his pocket; he was introduced by Petöfi to the literary notabilities of the Hungarian capital, and the same year his first notable romance *Hétköznapok* ("Working Days"), appeared, first in the columns of the *Pesti Dievatlap*, and subsequently, in 1846, in book form. *Hétköznapok*, despite its manifest crudities and extravagances, was instantly recognized by all the leading critics as a work of original genius, and in the following year Jókai was appointed the editor of *Életképek*, the leading Hungarian literary journal, and gathered round him all the rising talent of the country. On the outbreak of the revolution of 1848 the young editor enthusiastically adopted the national cause, and served it with both pen and sword. Now, as ever, he was a moderate Liberal, setting his face steadily against all excesses; but, carried away by the Hungarian triumphs of April and May 1849, he supported Kossuth's fatal blunder of deposing the Hapsburg dynasty, and though, after the war was over, his life was saved by an ingenious stratagem of his wife, the great tragic actress, Roza Benke Laborfalvi, whom he had married on the 29th of August 1848, he lived for the next fourteen years the life of a political suspect. Yet this was perhaps the most glorious period of his existence, for during it he devoted himself to the rehabilitation of the proscribed and humiliated Magyar language, composing in it no fewer than thirty great romances, besides innumerable volumes of tales, essays, criticisms and facetiæ. This was the period of such masterpieces as *Erdêly Arany Kord* ("The Golden Age of Transylvania"), with its sequel *Törökvilág Magyarországon* ("The Turks in Hungary"), *EgyMagyar Nábob* ("A Hungarian Nabob"), *Karpáthy Zoltán*, *Janicsárok vêgnapjai* ("The Last Days of the Janissaries"), *Szomorú napok* ("Sad Days"). On the re-establishment of the Hungarian constitution by the Composition of 1867, Jókai took an active part in politics. As a constant supporter of the Tisza administration, not only in parliament, where he sat continuously for more than twenty years, but also as the editor of the government organ, *Hon*, founded by him in 1863, he became a power in the state, and, though he never took office himself, frequently extricated the government from difficult places. In 1897 the emperor appointed him a member of the upper house. As a suave, practical and witty debater he was particularly successful. Yet it was to literature that he continued to devote most of his time, and his productiveness after 1870 was stupendous, amounting to some hundreds of volumes. Stranger still, none of this work is slipshod, and the best of it deserves to endure. Amongst the finest of his later works may be mentioned the unique and incomparable *Az arany ember* ("A Man of Gold")—translated into English under the title of *Timar's Two Worlds*—and *A têngerzemü hölgy* ("Eyes like the Sea"), the latter of which won the Academy's prize in 1890. He died at Budapest on the 5th of May 1904; his wife having predeceased him in 1886. Jókai was an arch-romantic, with a perfervid Oriental imagination, and humour of the purest, rarest description. If one can imagine a combination, in almost equal parts, of Walter Scott, William Beckford, Dumas *père*, and Charles Dickens, together with the native originality of an ardent Magyar, one may perhaps form a fair idea of the great Hungarian romancer's indisputable genius.

See Névy László, *Jókai Mór*; Hegedúsis Sándor, *Jókai Mórról*; H. W. Temperley, "Maurus Jokai and the Historical Novel," *Contemporary Review* (July 1904).

JOKJAKARTA, or JOKJOKARTA (more correctly JOKYAKARTA; Du. *Djokjakarta*), a residency of the island of Java, Dutch East Indies, bounded N. by Kedu and Surakarta, E. by Surakarta, S. by the Indian Ocean, W. by Bagelen. Pop. (1897), 858,392. The country is mountainous with the exception of a wedge-like strip in the middle between the rivers Progo and Upak. In the north-west are the southern slopes of the volcano Merapi, and in the east the Kidul hills and the plateau of Sewu. The last-named is an arid and scantily populated chalk range, with numerous small summits, whence it is also known as the Thousand Hills. The remainder of the residency is well-watered and fertile, important irrigation works having been carried out. Sugar, rice and indigo are cultivated; salt-making is practised on the coast. The minerals include coal-beds in the Kidul hills and near Nangulan, marble and gold in the neighbourhood of Kalasan. The natives are poor, owing chiefly to maladministration, the use of opium and the usury practised by foreigners (Chinese, Arabs, &c.). The principality is divided between the sultan (vassal of the Dutch government) and the so-called independent prince Paku Alam; Ngawen and Imogiri are enclaves of Surakarta. There are good roads, and railways connect the chief town with Batavia, Samarang, Surakarta, &c. The town of Jokjakarta (see JAVA) is the seat of the resident, the sultan and the Paku Alam princes; its most remarkable section is the *kraton* or citadel of the sultan. Imogiri, S.W. of the capital, the burial-place of the princes of Surakarta and Jokjakarta, is guarded by priests and officials. Sentolo, Nangulan, Brosot, Kalasan, Tempel, Wonosari are considerable villages. There are numerous remains of Hindu temples, particularly in the neighbourhood of Kalasan near the border of Surakarta and Prambanan, which is just across it. Remarkable sacred grottoes are found on the coast, namely, the so-called Nyabi Kidul and Rongkob, and at Selarong, south-east of Jokjakarta.

JOLIET, a city and the county-seat of Will county, Illinois, U.S.A., in the township of Joliet, in the N.E. part of the state, on the Des Plaines river, 40 m. S.W. of Chicago. Pop. (1890), 23,264; (1900), 29,353, of whom 8536 were foreign-born, 1889 being German, 1579 Austrian, 1206 Irish and 951 Swedish; (1910 census) 34,670. In addition there is a large population in the immediate suburbs: that of the township including the city was 27,438 in 1890, and 50,640 in 1910. Joliet is served by the Atchison, Topeka & Santa Fé, the Chicago & Alton, the Chicago, Rock Island & Pacific, the Michigan Central, the Illinois, Iowa & Minnesota, and the Elgin, Joliet & Eastern railways, by interurban electric lines, and is on the Illinois & Michigan canal and the Chicago Sanitary (ship) canal. The city is situated in a narrow valley, on both sides of the river. It is the seat of the northern Illinois penitentiary, and has a public library (in front of which is a statue, by S. Asbjornsen, of Louis Joliet), the township high school, two hospitals, two Catholic academies and a club-house, erected by the Illinois Steel Company for the use of its employees. There are two municipal parks, West Park and Highland Park; Dellwood Park is an amusement resort, owned by the Chicago & Joliet Electric Railway Company. In the vicinity are large deposits of calcareous building stone, cement and fireclay, and there are coal mines 20 m. distant. Mineral resources and water-power have facilitated the development of manufactures. The factory product in 1905 was valued at $33,788,700 (29·3% more than in 1900), a large part of which was represented by iron and steel goods. There are large industrial establishments just outside the city limits. The first settlement on the site of Joliet (1833) was called Juliet, in honour of the daughter of James B. Campbell, one of the settlers. The present name was adopted in 1845, in memory of Louis Joliet (1645-1700), the French Canadian explorer of the Mississippi, and in 1852 a city charter was secured.

JOLLY (from O. Fr. *jolif*; Fr. *joli*, the French word is obscure in origin; it may be from late Lat. *gaudivus*, from *gaudere*, to rejoice, the change of *d* to *l* being paralleled by *cigada* and *cigale*, or from O. Norse *jol*, Eng. "yule," the northern festival of midwinter), and adjective meaning gay, cheerful, jovial, high-spirited. The colloquial use of the term as an intensive adverb, meaning extremely, very, was in early usage quite literary; thus John Trapp (1601–1669), *Commentaries on the New Testament, Matthew* (1647), writes, "All was jolly quiet at Ephesus before St Paul came hither." In the royal navy "jolly" used as a substantive, is the slang name for a marine. To "jolly" is a slang synonym for "chaff." The word "jolly-boat," the name of a ship's small broad boat, usually clinker-built, is of doubtful etymology. It occurs in English in the 18th century, and is usually connected with Dan. or Swed. *jolle*, Dutch *jol*, a small ship's boat; these words are properly represented in English by "yawl" originally a ship's small boat, now chiefly used of a rig of sailing vessels, with a cutter-rigged foremast and a small mizzen stepped far aft, with a spanker sail (see RIGGING). A connexion has been suggested with a word of much earlier appearance in English, *jolywat*, or *gellywatte*. This occurs at the end of the 15th century and is used of a smaller type of ship's boat. This is supposed to be a corruption of the French *galiote* or Dutch *galjoot*, galliot (see GALLEY). The galliot was, however, a large vessel.

JOLY DE LOTBINIÈRE, SIR HENRI GUSTAVE (1829–1908), Canadian politician, was born at Epernay in France on the 5th of December 1829. His father, Gaspard Pierre Gustave Joly, the owner of famous vineyards at Epernay, was of Huguenot descent, and married Julie Christine, grand-daughter of Eustache Gaspard Michel Chartier de Lotbinière, marquis de Lotbinière (one of Montcalm's engineers at Quebec); he thus became seigneur de Lotbinière. Henri Gustave adopted the name of de Lotbinière in 1888, under a statute of the province of Quebec. He was educated in Paris, and called to the bar of lower Canada in 1858. On the 6th of May 1856 he married Margaretta Josepha (d. 1904), daughter of Hammond Gowen, of Quebec. At the general election of 1861 he was elected to the house of assembly of the province of Canada as Liberal member for the county of Lotbinière, and from 1867 to 1874 he represented the same county in the House of Commons, Ottawa, and in the legislative assembly, Quebec. Joly was opposed to confederation and supported Dorion in the stand which he took on this question. In 1878 he was called by Luc Letellier de St Just, lieutenant-governor of Quebec, to form an administration, which was defeated in 1879, and until 1883 he was leader of the opposition. During his brief administration he adopted a policy of retrenchment, and endeavoured to abolish the legislative council. In 1885, as a protest against the attitude of his party towards Louis Riel, who was tried and executed for high treason, he retired from public life. Early in the year 1895 he was induced again to take an active part in the campaign of his party, and at the general election of 1896 he was returned as member for the county of Portneuf. He had already in 1895 been created K.C.M.G. On the formation of Sir Wilfrid Laurier's administration he accepted the office of controller of inland revenue, and a year later he became a privy councillor, as minister of inland revenue. From 1900 to 1906 he was lieutenant-governor of the province of British Columbia. He twice declined a seat in the senate, but rendered eminent service to Canada by promoting the interest of agriculture, horticulture and of forestry. He died on the 17th of November 1908. (A. G. D.)

JOMINI, ANTOINE HENRI, BARON (1779–1869), general in the French and afterwards in the Russian service, and one of the most celebrated writers on the art of war, was born on the 6th of March 1779 at Payerne in the canton of Vaud, Switzerland, where his father was syndic. His youthful preference for a military life was disappointed by the dissolution of the Swiss regiments of France at the Revolution. For some time he was a clerk in a Paris banking-house, until the outbreak of the Swiss revolution. At the age of nineteen he was appointed to a post on the Swiss headquarters staff, and when scarcely twenty-one to the command of a battalion. At the peace of Lunéville in 1801 he returned to business life in Paris, but devoted himself chiefly to preparing the celebrated *Traité des grandes opérations militaires*, which was published in 1804–1805. Introduced to Marshal Ney, he served in the campaign of Austerlitz as a volunteer aide-de-camp on Ney's personal staff. In December 1805 Napoleon, being much impressed by a chapter in Jomini's treatise, made him a colonel in the French service. Ney thereupon made him his principal aide-de-camp. In 1806 Jomini published his views as to the conduct of the impending war with Prussia, and this, along with his knowledge of Frederick the Great's campaigns, which he had described in the *Traité*, led Napoleon to attach him to his own headquarters. He was present with Napoleon at the battle of Jena, and at Eylau won the cross of the Legion of Honour. After the peace of Tilsit he was made chief of the staff to Ney, and created a baron. In the Spanish campaign of 1808 his advice was often of the highest value to the marshal, but Jomini quarrelled with his chief, and was left almost at the mercy of his numerous enemies, especially Berthier, the emperor's chief of staff. Overtures had been made to him, as early as 1807, to enter the Russian service, but Napoleon, hearing of his intention to leave the French army, compelled him to remain in the service with the rank of general of brigade. For some years thereafter Jomini held both a French and a Russian commission, with the consent of both sovereigns. But when war between France and Russia broke out, he was in a difficult position, which he ended by taking a command on the line of communication. He was thus engaged when the retreat from Moscow and the uprising of Prussia transferred the seat of war to central Germany. He promptly rejoined Ney, took part in the battle of Lützen and, as chief of the staff of Ney's group of corps, rendered distinguished services before and at the battle of Bautzen, and was recommended for the rank of general of division. Berthier, however, not only erased Jomini's name from the list, but put him under arrest and censured him in army orders for failing to supply certain returns that had been called for. How far Jomini was held responsible for certain misunderstandings which prevented the attainment of all the results hoped for from Ney's attack (see BAUTZEN) there is no means of knowing. But the pretext for censure was trivial and baseless, and during the armistice Jomini did as he had intended to do in 1809–10, and went into the Russian service. As things then were, this was tantamount to deserting to the enemy, and so it was regarded by Napoleon and by the French army, and by not a few of his new comrades. It must be observed, in Jomini's defence, that he had for years held a dormant commission in the Russian army, that he had declined to take part in the invasion of Russia in 1812, and that he was a Swiss and not a Frenchman. His patriotism was indeed unquestioned, and he withdrew from the Allied Army in 1814 when he found that he could not prevent the violation of Swiss neutrality. Apart from love of his own country, the desire to study, to teach and to practise the art of war was his ruling motive. At the critical moment of the battle of Eylau he exclaimed, "If I were the Russian commander for two hours!" On joining the allies he received the rank of lieutenant-general and the appointment of aide-de-camp from the tsar, and rendered important assistance during the German campaign, though the charge that he betrayed the numbers, positions and intentions of the French to the enemy was later acknowledged by Napoleon to be without foundation. He declined as a Swiss patriot and as a French officer to take part in the passage of the Rhine at Basel and the subsequent invasion of France.

In 1815 he was with the emperor Alexander in Paris, and attempted in vain to save the life of his old commander Ney.

This almost cost him his position in the Russian service, but he succeeded in making head against his enemies, and took part in the congress of Vienna. Resuming, after a period of several years of retirement and literary work, his post in the Russian army, he was about 1823 made a full general, and thenceforward until his retirement in 1829 he was principally employed in the military education of the tsarevich Nicholas (afterwards emperor) and in the organization of the Russian staff college, which was opened in 1832 and still bears its original name of the Nicholas academy. In 1828 he was employed in the field in the Russo-Turkish War, and at the siege of Varna he was given the grand cordon of the Alexander order. This was his last active service. In 1829 he settled at Brussels where he chiefly lived for the next thirty years. In 1853, after trying without success to bring about a political understanding between France and Russia, Jomini was called to St Petersburg to act as a military adviser to the tsar during the Crimean War. He returned to Brussels on the conclusion of peace in 1856 and some years afterwards settled at Passy near Paris. He was busily employed up to the end of his life in writing treatises, pamphlets and open letters on subjects of military art and history, and in 1859 he was asked by Napoleon III. to furnish a plan of campaign in the Italian War. One of his last essays dealt with the war of 1866 and the influence of the breech-loading rifle, and he died at Passy on the 24th of March 1869 only a year before the Franco-German War. Thus one of the earliest of the great military theorists lived to speculate on the tactics of the present day.

Amongst his numerous works the principal, besides the *Traité*, are: *Histoire critique et militaire des campagnes de la Révolution* (1806; new ed. 1819–1824); *Vie politique et militaire de Napoléon racontée par lui-même* (1827) and, perhaps the best known of all his publications, the theoretical *Précis de l'art de la guerre* (1836).

See Ferdinand Lecomte, *Le Général Jomini, sa vie et ses écrits* (1861; new ed. 1888); C. A. Saint-Beuve, *Le Général Jomini* (1869); A. Pascal, *Observations historiques sur la vie, &c., du général Jomini* (1842).

JOMMELLI, NICCOLA (1714–1774), Italian composer, was born at Aversa near Naples on the 10th of September 1714. He received his musical education at two of the famous music schools of that capital, being a pupil of the Conservatorio de' poveri di Gesù Cristo under Feo, and also of the Conservatorio della pietà dei Turchini under Prota, Mancini and Leo. His first opera, *L'Errore amoroso*, was successfully produced at Naples (under a pseudonym) when Jommelli was only twenty-three. Three years afterwards he went to Rome to bring out two new operas, and thence to Bologna, where he profited by the advice of Padre Martini, the greatest contrapuntist of his age. In the meantime Jommelli's fame began to spread beyond the limits of his country, and in 1748 he went for the first time to Vienna, where one of his finest operas, *Didone*, was produced. Three years later he returned to Italy, and in 1753 he obtained the post of chapel-master to the duke of Württemberg at Stuttgart, which city he made his home for a number of years. In the same year he had ten commissions to write operas for princely courts. In Stuttgart he permitted no operas but his own to be produced, and he modified his style in accordance with German taste, so much that, when after an absence of fifteen years he returned to Naples, his countrymen hissed two of his operas off the stage. He retired in consequence to his native village, and only occasionally emerged from his solitude to take part in the musical life of the capital. His death took place on the 25th of August 1774, his last composition being the celebrated *Miserere*, a setting for two female voices of Saverio Mattei's Italian paraphrase of Psalm li. Jommelli is the most representative composer of the generation following Leo and Durante. He approaches very closely to Mozart in his style, and is important as one of the composers who, by welding together German and Italian characteristics, helped to form the musical language of the great composers of the classical period of Vienna.

JONAH, in the Bible, a prophet born at Gath-hepher in Zebulun, perhaps under Jeroboam (2) (781–741 B.C.?), who foretold the deliverance of Israel from the Aramaeans (2 Kings xiv. 25). This prophet may also be the hero of the much later book of Jonah, but how different a man is he! It is, however, the later Jonah who chiefly interests us. New problems have arisen out of the book which relates to him, but here we can only attempt to consider what, in a certain sense, may be called the surface meaning of the text.

This, then is what we appear to be told. The prophet Jonah is summoned to go to Nineveh, a great and wicked city (cf. 4 Esdras ii. 8, 9), and prophesy against it. Jonah, however, is afraid (iv. 2) that the Ninevites may repent, so, instead of going to Nineveh, he proceeds to Joppa, and takes his passage in a ship bound for Tarshish. But soon a storm arises, and, supplication to the gods failing, the sailors cast lots to discover the guilty man who has brought this great trouble. The lot falls on Jonah, who has been roughly awakened by the captain, and when questioned frankly owns that he is a Hebrew and a worshipper of the divine creator Yahweh, from whom he has sought to flee (as if He were only the god of Canaan). Jonah advises the sailors to throw him into the sea. This, after praying to Yahweh, they actually do; at once the sea becomes calm and they sacrifice to Yahweh. Meantime God has "appointed a great fish" which swallows up Jonah. Three days and three nights he is in the fish's belly, till, at a word from Yahweh, it vomits Jonah on to the dry ground. Again Jonah receives the divine call. This time he obeys. After delivering his message to Nineveh he makes himself a booth outside the walls and waits in vain for the destruction of the city (probably iv. 5 is misplaced and should stand after iii. 4). Thereupon Jonah beseeches Yahweh to take away his worthless life. As an answer Yahweh "appoints" a small quickly-growing tree with large leaves (the castor-oil plant) to come up over the angry prophet and shelter him from the sun. But the next day the beneficent tree perishes by God's "appointment" from a worm-bite. Once more God "appoints" something; it is the east wind, which, together with the fierce heat, brings Jonah again to desperation. The close is fine, and reminds us of Job. God himself gives short-sighted man a lesson. Jonah has pitied the tree, and should not God have pity on so great a city?

Two results of criticism are widely accepted. One relates to the psalm in ch. ii., which has been transferred from some other place; it is in fact an anticipatory thanksgiving for the deliverance of Israel, mostly composed of phrases from other psalms. The other is that the narrative before us is not historical but an imaginative story (such as was called a Midrash) based upon Biblical data and tending to edification. It is, however, a story of high type. The narrator considered that Israel had to be a prophet to the "nations" at large, that Israel had, like Jonah, neglected its duty and for its punishment was "swallowed up" in foreign lands. God had watched over His people and prepared its choicer members to fulfil His purpose. This company of faithful but not always sufficiently charitable men represented their people, so that it might be said that Israel itself (the second Isaiah's "Servant of Yahweh"—see ISAIAH) had taken up its duty, but in an ungenial spirit which grieved the All-merciful One. The book, which is post-exilic, may therefore be grouped with another Midrash, the Book of Ruth, which also appears to represent a current of thought opposed to the exclusive spirit of Jewish legalism.

Some critics, however, think that the key of symbolism needs to be supplemented by that of mythology. The "great fish" especially has a very mythological appearance. The Babylonian dragon myth (see COSMOGONY) is often alluded to in the Old Testament, *e.g.* in Jer. li. 44, which, as the present writer long since pointed out, may supply the missing link between Jonah i. 17 and the original myth. For the "great fish" is ultimately Tiāmat, the dragon of chaos, represented historically by Nebuchadrezzar, by whom for a time God permitted or "appointed" Israel to be swallowed up.

For further details see **T. K. Cheyne**, ***Ency. Bib.***, "**Jonah**"; and his article "Jonah, a Study in Jewish Folklore and Religion," *Theological Review* (1877), pp. 211–219. König, Hastings's *Dict. Bible*, "Jonah," is full but not lucid; C. H. H. Wright, *Biblical Studies* (1886) argues ably for the symbolic theory. Against Cheyne, see Marti's work on the *Minor Prophets* (1894); the "great fish" and the "three days and three nights" remain unexplained by this writer. On these points see Zimmern, *K.A.T.* (3), pp. 366, 389, 508. The difficulties of the mission of a Hebrew prophet to Asshur are diminished by Cheyne's later theory, *Critica Biblica* (1904), pp. 150–152. (T. K. C.)

JONAH, RABBI (Abulwalid Merwan Ibn Janah, also R. Marinus) (*c.* 990–*c.* 1050), the greatest Hebrew grammarian and lexicographer of the middle ages. He was born before the year 990, in Cordova, studied in Lucena, left his native city in 1012, and, after somewhat protracted wanderings, settled in Saragossa, where he died before 1050. He was a physician, and Ibn Abi Uṣaibia, in his treatise on Arabian doctors, mentions him as the author of a medical work. But Rabbi Jonah saw the true vocation of his life in the scientific investigation of the Hebrew language and in a rational biblical exegesis based upon sound linguistic knowledge. It is true, he wrote no actual commentary on the Bible, but his philological works exercised the greatest influence on Judaic exegesis. His first work—composed, like all the rest, in Arabic—bears the title *Almustalḥa*, and forms, as is indicated by the word, a criticism and at the same time a supplement to the two works of Yehuda ʿḤayyuj on the verbs with weak-sounding and double-sounding roots. These two tractates, with which ʿḤayyuj had laid the foundations of scientific Hebrew grammar, were recognized by Abulwalid as the basis of his own grammatical investigations, and Abraham Ibn Daud, when enumerating the great Spanish Jews in his history, sums up the significance of R. Jonah in the words: "He completed what ʿḤayyuj had begun." The principal work of R. Jonah is the *Kitab al Tanḳiḥ* ("Book of Exact Investigation"), which consists of two parts, regarded as two distinct books—the *Kitab al-Lumà* ("Book of Many-coloured Flower-beds") and the *Kitab al-uṣul* ("Book of Roots"). The former (ed. J. Derenbourg, Paris, 1886) contains the grammar, the latter (ed. Ad. Neubauer, Oxford, 1875) the lexicon of the Hebrew language. Both works are also published in the Hebrew translation of Yehuda Ibn Tibbon (*Sefer Ha-Riḳmah*, ed. B. Goldberg, Frankfurt am Main, 1855; *Sefer Ha-Schoraschim*, ed. W. Bacher, Berlin, 1897). The other writings of Rabbi Jonah, so far as extant, have appeared in an edition of the Arabic original accompanied by a French translation (*Opuscules et traités d'Abou'l Walid*, ed. Joseph and Hartwig Derenbourg, Paris 1880). A few fragments and numerous quotations in his principal book form our only knowledge of the *Kitab al-Tashwir* ("Book of Refutation") a controversial work in four parts, in which Rabbi Jonah successfully repelled the attacks of the opponents of his first treatise. At the head of this opposition stood the famous Samuel Ibn Nagdela (S. Ha-Nagid) a disciple of ʿḤayyuj. The grammatical work of Rabbi Jonah extended, moreover, to the domain of rhetoric and biblical hermeneutics, and his lexicon contains many exegetical excursuses. This lexicon is of especial importance by reason of its ample contribution to the comparative philology of the Semitic languages—Hebrew and Arabic, in particular. Abulwalid's works mark the culminating point of Hebrew scholarship during the middle ages, and he attained a level which was not surpassed till the modern development of philological science in the 19th century.

See S. Munk, *Notice sur Abou'l Walid* (Paris, 1851); W. Bacher, *Leben und Werke des Abulwalid und die Quellen seiner Schrifterklärung* (Leipzig, 1885); id., *Aus der Schrifterklärung des Abulwalid* (Leipzig, 1889); id., *Die hebr.-arabische Sprachvergleichung des Abulwalid* (Vienna, 1884); id., *Die hebräisch-neuhebräische und hebr.-aramäische Sprachvergleichung des Abulwalid* (Vienna, 1885). (W. Ba.)

JONAS, JUSTUS (1493–1555), German Protestant reformer, was born at Nordhausen in Thuringia, on the 5th of June 1493. His real name was Jodokus (Jobst) Koch, which he changed according to the common custom of German scholars in the 16th century, when at the university of Erfurt. He entered that university in 1506, studied law and the humanities, and became Master of Arts in 1510. In 1511 he went to Wittenberg, where he took his bachelor's degree in law. He returned to Erfurt in 1514 or 1515, was ordained priest, and in 1518 was promoted doctor in both faculties and appointed to a well-endowed canonry in the church of St Severus, to which a professorship of law was attached. His great admiration for Erasmus first led him to Greek and biblical studies, and his election in May 1519 as rector of the university was regarded as a triumph for the partisans of the New Learning. It was not, however, until after the Leipzig disputation with Eck that Luther won his allegiance. He accompanied Luther to Worms in 1521, and there was appointed by the elector of Saxony professor of canon law at Wittenberg. During Luther's stay in the Wartburg Jonas was one of the most active of the Wittenberg reformers. Giving himself up to preaching and polemics, he aided the Reformation by his gift as a translator, turning Luther's and Melanchthon's works into German or Latin as the case might be, thus becoming a sort of double of both. He was busied in conferences and visitations during the next twenty years, and in diplomatic work with the princes. In 1541 he began a successful preaching crusade in Halle; he became superintendent of its churches in 1542. In 1546 he was present at Luther's deathbed at Eisleben, and preached the funeral sermon; but in the same year was banished from the duchy by Maurice, duke (later elector) of Saxony. From that time until his death, Jonas was unable to secure a satisfactory living. He wandered from place to place preaching, and finally went to Eisfeld (1553), where he died. He had been married three times.

See *Briefswechsel des Justus Jonas, gesammelt und bearbeitet von G. Kawerau* (2 vols., Halle, 1884–1885); Kawerau's article in Herzog-Hauck, *Realencyklopädie*, ed. 3, with bibliography.

JONATHAN (Heb. "Yah [weh] gives"). Of the many Jewish bearers of this name, three are well known: (1) the grandson of Moses, who was priest at Dan (Judg. xviii. 30). The reading Manasseh (see R.V. mg.; obtained by inserting *n* above the consonantal text in the Hebrew) is apparently intended to suggest that he was the son of that idolatrous king. (2) The eldest son of Saul, who, together with his father, freed Israel from the crushing oppression of the Philistines (1 Sam. xiii. seq.). Both are lauded in an elegy quoted from the Book of Jashar (2 Sam. i.) for their warm mutual love, their heroism, and their labours on behalf of the people. Jonathan's name is most familiar for the firm friendship which subsisted between him and David (1 Sam. xviii. 1–4; xix. 1–7; xx., xxii. 8; xxiii. 16–18), and when he fell at the battle of Gilboa and left behind him a young child (1 Sam. xxxi.; 2 Sam. iv. 4), David took charge of the youth and gave him a place at his court (2 Sam. ix.). See further David, Saul. (3) The Maccabee (see Jews; Maccabees).

JONCIÈRES, VICTORIN (1839–1903), French composer, was born in Paris on the 12th of April 1839. He first devoted his attention to painting, but afterwards took up the serious study of music. He entered the Paris Conservatoire, but did not remain there long, because he had espoused too warmly the cause of Wagner against his professor. He composed the following operas: *Sardanapale* (1867), *Le Dernier jour de Pompéi* (1869), *Dimitri* (1876), *La Reine Berthe* (1878), *Le Chevalier Jean* (1885), *Lancelot* (1900). He also wrote incidental music to *Hamlet*, a symphony, and other works. Joncières' admiration for Wagner asserted itself rather in a musical than a dramatic sense. The influence of the German master's earlier style can be traced in his operas. Joncières, however, adhered to the recognized forms of the French opera and did not model his works according to the later developments of the Wagnerian "music drama." He may indeed be said to have been at least as much influenced by Gounod as by Wagner. From 1871 he was musical critic for *La Liberté*. He died on the 26th of October 1903.

JONES, ALFRED GILPIN (1824–1906), Canadian politician, was born at Weymouth, Nova Scotia, in September 1824, the son of Guy C. Jones of Yarmouth, and grandson of a United Empire Loyalist. In 1865 he opposed the federation of the British American provinces, and, in his anger at the refusal of the British government to repeal such portions of the British North America Act as referred to Nova Scotia, made a speech which won for him the name of Haul-down-the-flag Jones. He was for many years a member of the Federal Parliament, and for a few months in 1878 was minister of militia under the Liberal government. Largely owing to his influence the Liberal party refused in 1878 to abandon its Free Trade policy, an obstinacy which led to its defeat in that year. In 1900 he was appointed lieutenant-governor of his native province, and held this position till his death on the 15th of March 1906.

JONES, SIR ALFRED LEWIS (1845–1909), British shipowner, was born in Carmarthenshire, in 1845. At the age of twelve he was apprenticed to the managers of the African Steamship Company at Liverpool, making several voyages to the west coast of Africa. By the time he was twenty-six he had risen to be manager of the business. Not finding sufficient scope in this post, he borrowed money to purchase two or three small sailing vessels, and started in the shipping business on his own account. The venture succeeded, and he made additions to his fleet, but after a few years' successful trading, realizing that sailing ships were about to be superseded by steamers, he sold his vessels. About this time (1891) Messrs. Elder, Dempster & Co., who purchased the business of the old African Steamship Company, offered him a managerial post. This offer he accepted, subject to Messrs. Elder, Dempster selling him a number of their shares, and he thus acquired an interest in the business, and subsequently, by further share purchases, its control. See further STEAMSHIP LINES. In 1901 he was knighted. Sir Alfred Jones took a keen interest in imperial affairs, and was instrumental in founding the Liverpool school of tropical medicine. He acquired considerable territorial interests in West Africa, and financial interests in many of the companies engaged in opening up and developing that part of the world. He also took the leading part in opening up a new line of communication with the West Indies, and stimulating the Jamaica fruit trade and tourist traffic. He died on the 13th of December 1909, leaving large charitable bequests.

JONES, EBENEZER (1820–1860), British poet, was born in Islington, London, on the 20th of January 1820. His father, who was of Welsh extraction, was a strict Calvinist, and Ebenezer was educated at a dull, middle-class school. The death of his father obliged him to become a clerk in the office of a tea merchant. Shelley and Carlyle were his spiritual masters, and he spent all his spare time in reading and writing; but he developed an exaggerated style of thought and expression, due partly to a defective education. The unkind reception of his *Studies of Sensation and Event* (1843) seemed to be the last drop in his bitter cup of life. Baffled and disheartened, he destroyed his manuscripts. He earned his living as an accountant and by literary hack work, and it was not until he was rapidly dying of consumption that he wrote his three remarkable poems, "Winter Hymn to the Snow," "When the World is Burning" and "To Death." The fame that these and some of the pieces in the early volume brought to their author came too late. He died on the 14th of September 1860.

It was not till 1870 that Dante Gabriel Rossetti praised his work in *Notes and Queries*. Rossetti's example was followed by W. B. Scott, Theodore Watts-Dunton, who contributed some papers on the subject to the *Athenaeum* (September and October 1878), and R. H. Sheppard, who edited *Studies of Sensation and Event* in 1879.

JONES, ERNEST CHARLES (1819–1869), English Chartist, was born at Berlin on the 25th of January 1819, and educated in Germany. His father, an officer in the British army, was then equerry to the duke of Cumberland—afterwards king of Hanover. In 1838 Jones came to England, and in 1841 published anonymously *The Wood Spirit*, a romantic novel. This was followed by some songs and poems. In 1844 he was called to the bar at the Middle Temple. In 1845 he joined the Chartist agitation, quickly becoming its most prominent figure, and vigorously carrying on the party's campaign on the platform and in the press. His speeches, in which he openly advocated physical force, led to his prosecution, and he was sentenced in 1848 to two years' imprisonment for sedition. While in prison he wrote, it is said in his own blood on leaves torn from a prayer-book, *The Revolt of Hindostan*, an epic poem. On his release he again became the leader of what remained of the Chartist party and editor of its organ. But he was almost its only public speaker; he was out of sympathy with the other leading Chartists, and soon joined the advanced Radical party. Thenceforward he devoted himself to law and literature, writing novels, tales and political songs. He made several unsuccessful attempts to enter parliament, and was about to contest Manchester, with the certainty of being returned, when he died there on the 26th of January 1869. He is believed to have sacrificed a considerable fortune rather than abandon his Chartist principles. His wife was Jane Atherley; and his son, Llewellyn Atherley-Jones, K.C. (b. 1851), became a well-known barrister and Liberal member of parliament.

JONES, HENRY (1831–1899), English author, well known as a writer on whist under his *nom de guerre* "Cavendish," was born in London on the 2nd of November 1831, being the eldest son of Henry D. Jones, a medical practitioner. He adopted his father's profession, established himself in 1852 and continued for sixteen years in practice in London. The father was a keen devotee of whist, and under his eye the son became early in life a good player. He was a member of several whist clubs, among them the "Cavendish," and in 1862 appeared his *Principles of Whist, stated and explained by "Cavendish,"* which was destined to become the leading authority as to the practice of the game. This work was followed by treatises on the laws of piquet and écarté. "Cavendish" also wrote on billiards, lawn tennis and croquet, and contributed articles on whist and other games to the ninth edition of the *Encyclopaedia Britannica*. "'Cavendish' was not a law-maker, but he codified and commented upon the laws which had been made during many generations of card-playing." One of the most noteworthy points in his character was the manner in which he kept himself abreast of improvements in his favourite game. He died on the 10th of February 1899.

JONES, HENRY ARTHUR (1851–   ), English dramatist, was born at Grandborough, Buckinghamshire, on the 28th of September 1851 the son of Silvanus Jones, a farmer. He began to earn his living early, his spare time being given to literary pursuits. He was twenty-seven before his first piece, *Only Round the Corner*, was produced at the Exeter Theatre, but within four years of his début as a dramatist he scored a great success by *The Silver King* (November 1882), written with Henry Herman, a melodrama produced by Wilson Barrett at the Princess's Theatre. Its financial success enabled the author to write a play "to please himself." *Saints and Sinners* (1884), which ran for two hundred nights, placed on the stage a picture of middle-class life and religion in a country town, and the introduction of the religious element raised considerable outcry. The author defended himself in an article published in the *Nineteenth Century* (January 1885), taking for his starting-point a quotation from the preface to Molière's *Tartuffe*. His next serious piece was *The Middleman* (1889), followed by *Judah* (1890), both powerful plays, which established his reputation. Later plays were *The Dancing Girl* (1891), *The Crusaders* (1891), *The Bauble Shop* (1893), *The Tempter* (1893), *The Masqueraders* (1894), *The Case of Rebellious Susan* (1894), *The Triumph of the Philistines* (1895), *Michael and his Lost Angel* (1896), *The Rogue's Comedy* (1896), *The Physician* (1897), *The Liars* (1897), *Carnac Sahib* (1899), *The Manœuvres of Jane* (1899), *The Lackeys' Carnival* (1900), *Mrs Dane's Defence* (1900), *The Princess's Nose* (1902), *Chance the Idol* (1902), *Whitewashing Julia* (1903), *Joseph Entangled* (1904), *The Chevalier* (1904), &c. A uniform edition of his plays began to be issued in 1891; and his own views of dramatic art have been expressed from time to time in lectures and essays, collected in 1895 as *The Renascence of the English Drama*.

JONES, INIGO (1573–1651), English architect, sometimes called the "English Palladio," the son of a cloth-worker, was born in London on the 15th of July 1573. It is stated that he was apprenticed to a joiner, but at any rate his talent for drawing attracted the attention of Thomas Howard, earl of Arundel (some say William, 3rd earl of Pembroke), through whose help he went to study landscape-painting in Italy. His preference soon transferred itself to architecture, and, following chiefly the style of Palladio, he acquired at Venice such a reputation that in 1604 he was invited by Christian IV. to Denmark, where he is said to have designed the two great royal palaces of Rosenborg and Frederiksborg. In the following year he accompanied Anne of Denmark to the court of James I. of England, where, besides being appointed architect to the queen and Prince Henry, he was employed in supplying the designs and decorations of the court masques. After a second visit to Italy in 1612, Jones was appointed surveyor-general of royal buildings by James I., and was engaged to prepare designs for a new palace at Whitehall. In 1620 he was employed by the king to investigate the origin of Stonehenge, when he came to the absurd conclusion that it had been a Roman temple. Shortly afterwards he was appointed one of the commissioners for the repair of St Paul's, but the work was not begun till 1633. Under Charles I. he enjoyed the same offices as under his predecessor, and in the capacity of designer of the masques he came into collison with Ben Jonson, who frequently made him the butt of his satire. After the Civil War Jones was forced to pay heavy fines as a courtier and malignant. He died in poverty on the 5th of July 1651.

A list of the principal buildings designed by Jones is given in Dallaway's edition of Walpole's *Anecdotes of Painting*, and for an estimate of him as an architect see Fergusson's *History of Modern Architecture. The Architecture of Palladio*, in 4 books, by Inigo Jones, appeared in 1715; *The Most Notable Antiquity of Great Britain, called Stonehenge, restored by Inigo Jones*, in 1655 (ed. with memoir, 1725); the *Designs of Inigo Jones*, by W. Kent, in 1727; and *The Designs of Inigo Jones*, by J. Ware, in 1757. See also G. H. Birch, *London Churches of the XVIIth and XVIIIth Centuries* (1896); W. J. Loftie, *Inigo Jones and Wren, or the Rise and Decline of Modern Architecture in England* (1893).

JONES, JOHN (*c.* 1800–1882), English art collector, was born about 1800 in or near London. He was apprenticed to a tailor, and about 1825 opened a shop of his own in the west-end of London. In 1850 he was able to retire from active management with a large fortune. When quite a young man he had begun to collect articles of *vertu*. The rooms over his shop in which he at first lived were soon crowded, and even the bedrooms of his new house in Piccadilly were filled with art treasures. His collection was valued at approximately £250,000. Jones died in London on the 7th of January 1882, leaving his pictures, furniture and objects of art to the South Kensington Museum.

A *Catalogue of the Jones Bequest* was published by the Museum in 1882, and a *Handbook*, with memoir, in 1883.

JONES, JOHN PAUL (1747–1792), American naval officer, was born on the 6th of July 1747, on the estate of Arbigland, in the parish of Kirkbean and the stewartry of Kirkcudbright, Scotland. His father, John Paul, was gardener to Robert Craik, a member of parliament; and his mother, Jean Macduff, was the daughter of a Highlander. Young John Paul, at the age of twelve, became shipmaster's apprentice to a merchant of Whitehaven, named Younger. At seventeen he shipped as second mate and in the next year as first mate in one of his master's vessels; on being released from his indentures, he acquired an interest in a ship, and as first mate made two voyages between Jamaica and the Guinea coast, trading in slaves. Becoming dissatisfied with this kind of employment, he sold his share in the ship and embarked for England. During the voyage both the captain and the mate died of fever, and John Paul took command and brought the ship safely to port. The owners gave him and the crew 10% of the cargo; after 1768, as captain of one of their merchantmen, John Paul made several voyages to America; but for unknown reasons he suddenly gave up his command to live in America in poverty and obscurity until 1775. During this period he assumed the name of Jones, apparently out of regard for Willie Jones, a wealthy planter and prominent political leader of North Carolina, who had befriended John Paul in his days of poverty.

When war broke out between England and her American colonies, John Paul Jones was commissioned as a first lieutenant by the Continental Congress, on the 22nd of December 1775. In 1776 he participated in the unsuccessful attack on the island of New Providence, and as commander first of the "Providence" and then of the "Alfred" he cruised between Bermuda and Nova Scotia, inflicting much damage on British shipping and fisheries. On the 10th of October 1776 he was promoted captain. On the 1st of November 1777 he sailed in the sloop-of-war "Ranger" for France with despatches for the American commissioners, announcing the surrender of Burgoyne and asking that Jones should be supplied with a swift frigate for harassing the coasts of England. Failing to secure a frigate, Jones sailed from Brest in the "Ranger" on the 10th of April 1778. A few days later he surprised the garrisons of the two forts commanding the harbour of Whitehaven, a port with which he was familiar from boyhood, spiked the guns and made an unsuccessful attempt to fire the shipping. Four days thereafter he encountered the British sloop-of-war "Drake," a vessel slightly superior to his in fighting capacity, and after an hour's engagement the British ship struck her colours and was taken to Brest. By this exploit Jones became a great hero in the eyes of the French, just beginning a war with Great Britain. With the rank of commodore he was now put at the head of a squadron of five ships. His flagship, the "Duras," a re-fitted East Indiaman, was re-named by him the "Bonhomme Richard," as a compliment to Benjamin Franklin, whose *Poor Richard's Almanac* was then popular in France. On the 14th of August the five ships sailed from L'Orient, accompanied by two French privateers. Several of the French commanders under Jones proved insubordinate, and the privateers and three of the men-of-war soon deserted him. With the others, however, he continued to take prizes, and even planned to attack the port of Leith, but was prevented by unfavourable winds. On the evening of the 23rd of September the three men-of-war sighted two British men-of-war, the "Serapis" and the "Countess of Scarbrough," off Flamborough Head. The "Alliance," commanded by Captain Landais, made off, leaving the "Bonhomme Richard" and the "Pallas" to engage the Englishmen. Jones engaged the greatly superior "Serapis," and after a desperate battle of three and a half hours compelled the English ship to surrender. The "Countess of Scarbrough" had meanwhile struck to the more formidable "Pallas." Jones transferred his men and supplies to the "Serapis," and the next day the "Bonhomme Richard" sank.

During the following year Jones spent much of his time in Paris. Louis XVI. gave him a gold-hilted sword and the royal order of military merit, and made him chevalier of France. Early in 1781 Jones returned to America to secure a new command. Congress offered him the command of the "America," a frigate then building, but the vessel was shortly afterwards given to France. In November 1783 he was sent to Paris as agent for the prizes captured in European waters under his own command, and although he gave much attention to social affairs and engaged in several private business enterprises, he was very successful in collecting the prize money. Early in 1787 he returned to America and received a gold medal from Congress in recognition of his services.

In 1788 Jones entered the service of the empress Catherine of Russia, avowing his intention, however, "to preserve the condition of an American citizen and officer." As a rear-admiral he took part in the naval campaign in the Liman (an arm of the Black Sea, into which flow the Bug and Dnieper rivers) against the Turks, but the jealous intrigues of Russian officers caused him to be recalled to St Petersburg for the pretended purpose of being transferred to a command in the North Sea. Here he was compelled to remain in idleness, while rival officers plotted against him and even maliciously assailed his private character. In August 1789 he left St Petersburg a bitterly disappointed man. In May 1790 he arrived in Paris, where he remained in retirement during the rest of his life, although he made several efforts to re-enter the Russian service.

Undue exertion and exposure had wasted his strength before he reached the prime of life, and after an illness, in which he was attended by the queen's physician, he died on the 18th of July 1792. His body was interred in the St Louis cemetery for foreign Protestants, the funeral expenses being paid from the private purse of Pierrot François Simmoneau, the king's commissary. In the confusion during the following years the burial place of Paul Jones was forgotten; but in June 1899 General Horace Porter, American ambassador to France, began a systematic search for the body, and after excavations on the site of the old Protestant cemetery, now covered with houses, a leaden coffin was discovered, which contained the body in a remarkable state of preservation. In July 1905 a fleet of American war-ships carried the body to Annapolis, where it now rests in one of the buildings of the naval academy.

Jones was a seaman of great bravery and technical ability, but over-jealous of his reputation and inclined to be querulous and boastful. The charges by the English that he was a pirate were particularly galling to him. Although of unprepossessing appearance, 5 ft. 7 in. in height and slightly round-shouldered, he was noted for his pleasant manners and was welcomed into the most brilliant courts of Europe.

Romance has played with the memory of Paul Jones to such an extent that few accounts of his life are correct. Of the early biographies the best are Sherburne's (London, 1825), chiefly a collection of Jones's correspondence; the *Janette-Taylor Collection* (New York, 1830), containing numerous extracts from his letters and journals; and the life by A. S. MacKenzie (2 vols., New York, 1846). In recent years a number of new biographies have appeared, including A. C. Buell's (2 vols., 1900), the trustworthiness of which has been discredited, and Hutchins Hapgood's in the Riverside Biographical Series (1901). The life by Cyrus Townsend Brady in the "Great Commanders Series" (1900) is perhaps the best.

JONES, MICHAEL (d. 1649), British soldier. His father was bishop of Killaloe in Ireland. At the outbreak of the English Civil War he was studying law, but he soon took service in the army of the king in Ireland. He was present with Ormonde's army in many of the expeditions and combats of the devastating Irish War, but upon the conclusion of the "Irish Cessation" (see ORMONDE, JAMES BUTLER, DUKE OF) he resolved to leave the king's service for that of the parliament, in which he soon distinguished himself by his activity and skill. In the Welsh War, and especially at the last great victory at Rowton Heath, Jones's cavalry was always far superior to that of the Royalists, and in reward for his services he was made governor of Chester when that city fell into the hands of the parliament. Soon afterwards Jones was sent again to the Irish War, in the capacity of commander-in-chief. He began his work by reorganizing the army in the neighbourhood of Dublin, and for some time he carried on a desultory war of posts, necessarily more concerned for his supplies than for a victory. But at Dungan Hill he obtained a complete success over the army of General Preston, and though the war was by no means ended, Jones was able to hold a large tract of country for the parliament. But on the execution of Charles I., the war entered upon a new phase, and garrison after garrison fell to Ormonde's Royalists. Soon Jones was shut up in Dublin, and then followed a siege which was regarded both in England and Ireland with the most intense interest. On the 2nd of August 1649 the Dublin garrison relieved itself by the brilliant action of Rathmines, in which the royal army was practically destroyed. A fortnight later Cromwell landed with heavy reinforcements from England. Jones, his lieutenant-general, took the field; but on the 19th of December 1649 he died, worn out by the fatigues of the campaign.

JONES, OWEN (1741–1814), Welsh antiquary, was born on the 3rd of September 1741 at Llanvihangel Glyn y Myvyr in Denbighshire. In 1760 he entered the service of a London firm of furriers, to whose business he ultimately succeeded. He had from boyhood studied Welsh literature, and later devoted time and money to its collection. Assisted by Edward William of Glamorgan (Iolo Morganwg) and Dr. Owen Pughe, he published, at a cost of more than £1000, the well-known *Myvyrian Archaiology of Wales* (1801–1807), a collection of pieces dating from the 6th to the 14th century. The manuscripts which he had brought together are deposited in the British Museum; the material not utilized in the *Myvyrian Archaiology* amounts to 100 volumes, containing 16,000 pages of verse and 15,300 pages of prose. Jones was the founder of the Gwyneddigion Society (1772) in London for the encouragement of Welsh studies and literature; and he began in 1805 a miscellany—the *Greal*—of which only one volume appeared. An edition of the poems of *Davydd ab Gwilym* was also issued at his expense. He died on the 26th of December 1814 at his business premises in Upper Thames Street, London.

JONES, OWEN (1809–1874), British architect and art decorator, son of Owen Jones, a Welsh antiquary, was born in London. After an apprenticeship of six years in an architect's office, he travelled for four years in Italy, Greece, Turkey, Egypt and Spain, making a special study of the Alhambra. On his return to England in 1836 he busied himself in his professional work. His forte was interior decoration, for which his formula was: "Form without colour is like a body without a soul." He was one of the superintendents of works for the Exhibition of 1851 and was responsible for the general decoration of the Crystal Palace at Sydenham. Along with Digby Wyatt, Jones collected the casts of works of art with which the palace was filled. He died in London on the 19th of April 1874.

Owen Jones was described in the *Builder* for 1874 as "the most potent apostle of colour that architectural England has had in these days." His range of activity is to be traced in his works: *Plans, Elevations and Details of the Alhambra* (1835–1845), in which he was assisted by MM. Goury and Gayangos; *Designs for Mosaic and Tesselated Pavements* (1842); *Polychromatic Ornament of Italy* (1845); *An Attempt to Define the Principles which regulate the Employment of Colour in Decorative Arts* (1852); *Handbook to the Alhambra Court* (1854); *Grammar of Ornament* (1856), a very important work; *One Thousand and One Initial Letters* (1864); *Seven Hundred and Two Monograms* (1864); and *Examples of Chinese Ornament* (1867).

JONES, RICHARD (1790–1855), English economist, was born at Tunbridge Wells. The son of a solicitor, he was intended for the legal profession, and was educated at Caius College, Cambridge. Owing to ill-health, he abandoned the idea of the law and took orders soon after leaving Cambridge. For several years he held curacies in Sussex and Kent. In 1833 he was appointed professor of political economy at King's College, London, resigning this post in 1835 to succeed T. R. Malthus in the chair of political economy and history at the East India College at Haileybury. He took an active part in the commutation of tithes in 1836 and showed great ability as a tithe commissioner, an office which he filled till 1851. He was for some time, also, a charity commissioner. He died at Haileybury, shortly after he had resigned his professorship, on the 26th of January 1855. In 1831 Jones published his *Essay on the Distribution of Wealth and on the Sources of Taxation*, his most important work. In it he showed himself a thorough-going critic of the Ricardian system.

Jones's method is inductive; his conclusions are founded on a wide observation of contemporary facts, aided by the study of history. The world he professed to study was not an imaginary world, inhabited by abstract "economic men," but the real world with the different forms which the ownership and cultivation of land, and, in general, the conditions of production and distribution, assume at different times and places. His recognition of such different systems of life in communities occupying different stages in the progress of civilization led to his proposal of what he called a "political economy of nations." This was a protest against the practice of taking the exceptional state of facts which exists, and is indeed only partially realized, in a small corner of our planet as representing the uniform type of human societies, and ignoring the effects of the early history and special development of each community as influencing its economic phenomena. Jones is remarkable for his freedom from exaggeration and one-sided statement; thus, whilst holding Malthus in, perhaps, undue esteem, he declines to accept the proposition that an increase of the means of subsistence is necessarily followed by an increase of population; and he maintains what is undoubtedly true, that with the growth of population, in all well-governed and prosperous states, the command over food, instead of diminishing, increases.

A collected edition of Jones's works, with a preface by W. Whewell, was published in 1859.

JONES, THOMAS RUPERT (1819–), English geologist and palaeontologist, was born in London on the 1st of October 1819. While at a private school at Ilminster, his attention was attracted to geology by the fossils that are so abundant in the Lias quarries. In 1835 he was apprenticed to a surgeon at Taunton, and he completed his apprenticeship in 1842 at

Newbury in Berkshire. He was then engaged in practice mainly in London, till in 1849 he was appointed assistant secretary to the Geological Society of London. In 1862 he was made professor of geology at the Royal Military College, Sandhurst. Having devoted his especial attention to fossil microzoa, he now became the highest authority in England on the Foraminifera and Entomostraca. He edited the 2nd edition of Mantell's *Medals of Creation* (1854), the 3rd edition of Mantell's *Geological Excursions round the Isle of Wight* (1854), and the 7th edition of Mantell's *Wonders of Geology* (1857); he also edited the 2nd edition of Dixon's *Geology of Sussex* (1878). He was elected F.R.S. in 1872 and was awarded the Lyell medal by the Geological Society in 1890. For many years he was specially interested in the geology of South Africa.

His publications include *A Monograph of the Entomostraca of the Cretaceous Formation of England* (Palaeontograph. Soc., 1849); *A Monograph of the Tertiary Entomostraca of England* (ibid. 1857); *A Monograph of the Fossil Estheriae* (ibid. 1862); *A Monograph of the Foraminifera of the Crag* (ibid. 1866, &c., with H. B. Brady); and numerous articles in the *Annals and Magazine of Natural History*, the *Geological Magazine*, the *Proceedings of the Geologists' Association*, and other journals.

JONES, WILLIAM (1726–1800), English divine, was born at Lowick, in Northamptonshire on the 30th of July 1726. He was descended from an old Welsh family and one of his progenitors was Colonel John Jones, brother-in-law of Cromwell. He was educated at Charterhouse School, and at University College, Oxford. There a kindred taste for music, as well as a similarity in regard to other points of character, led to his close intimacy with George Horne (*q.v.*), afterwards bishop of Norwich, whom he induced to study Hutchinsonian doctrines. After obtaining his bachelor's degree in 1749, Jones held various preferments. In 1777 he obtained the perpetual curacy of Nayland, Suffolk, and on Horne's appointment to Norwich became his chaplain, afterwards writing his life. His vicarage became the centre of a High Church coterie, and Jones himself was a link between the non-jurors and the Oxford movement. He could write intelligibly on abstruse topics. He died on the 6th of January 1800.

In 1756 Jones published his tractate *On the Catholic Doctrine of the Trinity*, a statement of the doctrine from the Hutchinsonian point of view, with a succinct and able summary of biblical proofs. This was followed in 1762 by an *Essay on the First Principles of Natural Philosophy*, in which he maintained the theories of Hutchinson in opposition to those of Sir Isaac Newton, and in 1781 he dealt with the same subject in *Physiological Disquisitions*. Jones was also the originator of the *British Critic* (May 1793). His collected works, with a life by William Stevens, appeared in 1801, in 12 vols., and were condensed into 6 vols. in 1810. A life of Jones, forming pt. 5 of the *Biography of English Divines*, was published in 1849.

JONES, SIR WILLIAM (1746–1794), British Orientalist and jurist, was born in London on the 28th of September 1746. He distinguished himself at Harrow, and during his last three years there applied himself to the study of Oriental languages, teaching himself the rudiments of Arabic, and reading Hebrew with tolerable ease. In his vacations he improved his acquaintance with French and Italian. In 1764 Jones entered University College, Oxford, where he continued to study Oriental literature, and perfected himself in Persian and Arabic by the aid of a Syrian Mirza, whom he had discovered and brought from London. He added to his knowledge of Hebrew and made considerable progress in Italian, Spanish and Portuguese. He began the study of Chinese, and made himself master of the radical characters of that language. During five years he partly supported himself by acting as tutor to Lord Althorpe, afterwards the second Earl Spencer, and in 1766 he obtained a fellowship. Though but twenty-two years of age, he was already becoming famous as an Orientalist, and when Christian VII. of Denmark visited England in 1768, bringing with him a life of Nadir Shah in Persian, Jones was requested to translate the MS. into French. The translation appeared in 1770, with an introduction containing a description of Asia and a short history of Persia. This was followed in the same year by a *Traité sur la poésie orientale*, and by a French metrical translation of the odes of Hafiz. In 1771 he published a *Dissertation sur la littérature orientale*, defending Oxford scholars against the criticisms made by Anquetil Du Perron in the introduction to his translation of the *Zend-Avesta*. In the same year appeared his *Grammar of the Persian Language*. In 1772 Jones published a volume of *Poems, Chiefly Translations from Asiatick Languages, together with Two Essays on the Poetry of Eastern Nations and on the Arts commonly called Imitative*, and in 1774 a treatise entitled *Poeseos Asiaticæ commentatorium libri sex*, which definitely confirmed his authority as an Oriental scholar.

Finding that some more financially profitable occupation was necessary, Jones devoted himself with his customary energy to the study of the law, and was called to the bar at the Middle Temple in 1774. He studied not merely the technicalities, but the philosophy, of law, and within two years had acquired so considerable a reputation that he was in 1776 appointed commissioner in bankruptcy. Besides writing an *Essay on the Law of Bailments*, which enjoyed a high reputation both in England and America, Jones translated, in 1778, the speeches of Isaeus on the Athenian right of inheritance. In 1780 he was a parliamentary candidate for the university of Oxford, but withdrew from the contest before the day of election, as he found he had no chance of success owing to his Liberal opinions, especially on the questions of the American War and of the slave trade.

In 1783 was published his translation of the seven ancient Arabic poems called *Moallakât*. In the same year he was appointed judge of the supreme court of judicature at Calcutta, then "Fort William," and was knighted. Shortly after his arrival in India he founded, in January 1784, the Bengal Asiatic Society, of which he remained president till his death. Convinced as he was of the great importance of consulting the Hindu legal authorities in the original, he at once began the study of Sanskrit, and undertook, in 1788, the colossal task of compiling a digest of Hindu and Mahommedan law. This he did not live to complete, but he published the admirable beginnings of it in his *Institutes of Hindu Law, or the Ordinances of Manu* (1794); his *Mohammedan Law of Succession to Property of Intestates*; and his *Mohammedan Law of Inheritance* (1792). In 1789 Jones had completed his translation of Kālidāsa's most famous drama, *Sakuntalā*. He also translated the collection of fables entitled the *Hitopadesa*, the *Gītagovinda*, and considerable portions of the Vedas, besides editing the text of Kālidāsa's poem *Ritusamhara*. He was a large contributor also to his society's volumes of *Asiatic Researches*.

His unremitting literary labours, together with his heavy judicial work, told on his health after a ten years' residence in Bengal; and he died at Calcutta on the 27th of April 1794. An extraordinary linguist, knowing thirteen languages well, and having a moderate acquaintance with twenty-eight others, his range of knowledge was enormous. As a pioneer in Sanskrit learning and as founder of the Asiatic Society he rendered the language and literature of the ancient Hindus accessible to European scholars, and thus became the indirect cause of later achievements in the field of Sanskrit and comparative philology. A monument to his memory was erected by the East India Company in St Paul's, London, and a statue in Calcutta.

See the *Memoir* (1804) by Lord Teignmouth, published in the collected edition of Sir W. Jones's works.

JÖNKÖPING, a town of Sweden, capital of the district (*län*) of Jönköping, 230 m. S.W. of Stockholm by rail. Pop. (1900), 23,143. It occupies a beautiful but somewhat unhealthy position between the southern end of Lake Vetter and two small lakes, Roksjö and Munksjö. Two quarters of the town, Svenska Mad and Tyska Mad, recall the time when the site was a marsh (*mad*), and buildings were constructed on piles. The residential suburbs among the hills, especially Dunkehallar, are attractive and healthier than the town. The church of St Kristine (*c.* 1650), the court-houses, town-hall, government buildings, and high school, are noteworthy. The town is one of the leading industrial centres in Sweden. The match manufacture, for which it is principally famous, was founded by Johan Edvard Lundström in 1844. The well-known brand of *säkerhets-tändstickor* (safety-matches) was introduced later. There are also textile manufactures, paper-factories (on Munksjö), and mechanical works. There is a large fire-arms factory at Huskvarna, 5 m E. Water-power is supplied here by a fine series of falls. The hill Taberg, 8 m. S., is a mass of magnetic iron ore, rising 410 ft. above the surrounding country, 2950 ft. long and 1475 ft. broad, but the percentage of iron is low as compared with the rich ores of other parts, and the deposit is little worked. Jönköping is the seat of one of the three courts of appeal in Sweden.

Jönköping received the earliest extant Swedish charter in 1284 from Magnus I. The castle is mentioned in 1263, when Waldemar Birgersson married the Danish princess Sophia. Jönköping was afterwards the scene of many events of moment in Scandinavian history—of parliaments in 1357, 1439, and 1599; of the meeting of the Danish and Swedish plenipotentiaries in 1448; and of the death of Sten Sture, the elder, in 1503. In 1612 Gustavus Adolphus caused the inhabitants to destroy their town lest it should fall into the hands of the Danes; but it was rebuilt soon after, and in 1620 received special privileges from the king. At this period a textile industry was started here, the first of any importance in Sweden. It was from the Dutch and German workmen, introduced at this time, that the quarter Tyska Mad received its name. On the 10th of December 1809 the plenipotentiaries of Sweden and Denmark concluded peace in the town.

JONSON, BEN[1] (1573–1637), English dramatist, was born, probably in Westminster, in the beginning of the year 1573 (or possibly, if he reckoned by the unadopted modern calendar, 1572; see Castelain, p. 4, note 1). By the poet's account his grandfather had been a gentleman who "came from" Carlisle, and originally, the grandson thought, from Annandale. His arms, "three spindles or rhombi," are the family device of the Johnstones of Annandale, a fact which confirms his assertion of Border descent. Ben Jonson further related that he was born a month after the death of his father, who, after suffering in estate and person under Queen Mary, had in the end "turned minister." Two years after the birth of her son the widow married again; she may be supposed to have loved him in a passionate way peculiar to herself, since on one occasion we find her revealing an almost ferocious determination to save his honour at the cost of both his life and her own. Jonson's stepfather was a master bricklayer, living in Hartshorn Lane, near Charing Cross, who provided his stepson with the foundations of a good education. After attending a private school in St Martin's Lane, the boy was sent to Westminster School at the expense, it is said, of William Camden. Jonson's gratitude for an education to which in truth he owed an almost inestimable debt concentrated itself upon the "most reverend head" of his benefactor, then second and afterwards head master of the famous school, and the firm friend of his pupil in later life.

After reaching the highest form at Westminster, Jonson is stated, but on unsatisfactory evidence, to have proceeded to Cambridge—according to Fuller, to St John's College. (For reasons in support of the tradition that he was a member of St John's College, see J. B. Mullinger, the *Eagle*, No. xxv.) He says, however, himself that he studied at neither university, but was put to a trade immediately on leaving school. He soon had enough of the trade, which was no doubt his father's bricklaying, for Henslowe in writing to Edward Alleyne of his affair with Gabriel Spenser calls him "bergemen [*sic*] Jonson, bricklayer." Either before or after his marriage—more probably before, as Sir Francis Vere's three English regiments were not removed from the Low Countries till 1592—he spent some time in that country soldiering, much to his own subsequent satisfaction when the days of self-conscious retrospect arrived, but to no further purpose beyond that of seeing something of the world.

Ben Jonson married not later than 1592. The registers of St Martin's Church state that his eldest daughter Maria died in November 1593 when she was, Jonson tells us (epigram 22), only six months old. His eldest son Benjamin died of the plague ten years later (epigram 45). (A younger Benjamin died in 1635.) His wife Jonson characterized to Drummond as "a shrew, but honest"; and for a period (undated) of five years he preferred to live without her, enjoying the hospitality of Lord Aubigny (afterwards duke of Lennox). Long burnings of oil among his books, and long spells of recreation at the tavern, such as Jonson loved, are not the most favoured accompaniments of family life. But Jonson was no stranger to the tenderest of affections: two at least of the several children whom his wife bore to him he commemorated in touching little tributes of verse; nor in speaking of his lost eldest daughter did he forget "her mother's tears." By the middle of 1597 we come across further documentary evidence of him at home in London in the shape of an entry in Philip Henslowe's diary (July 28) of 3s. 6d. "received of Bengemenes Johnsones share." He was therefore by this time—when Shakespeare, his senior by nearly nine years, was already in prosperous circumstances and good esteem—at least a regular member of the acting profession, with a fixed engagement in the lord admiral's company, then performing under Henslowe's management at the Rose. Perhaps he had previously acted at the Curtain (a former house of the lord admiral's men), and "taken mad Jeronimo's part" on a play-wagon in the highway. This latter appearance, if it ever took place, would, as was pointed out by Gifford, probably have been in Thomas Kyd's *Spanish Tragedy*, since in *The First Part of Jeronimo* Jonson would have had, most inappropriately, to dwell on the "smallness" of his "bulk." He was at a subsequent date (1601) employed by Henslowe to write up *The Spanish Tragedy*, and this fact may have given rise to Wood's story of his performance as a stroller (see, however, Fleay, *The English Drama*, ii. 29, 30). Jonson's additions, which were not the first changes made in the play, are usually supposed to be those printed with *The Spanish Tragedy* in the edition of 1602; Charles Lamb's doubts on the subject, which were shared by Coleridge, seem an instance of that subjective kind of criticism which it is unsafe to follow when the external evidence to the contrary is so strong.

According to Aubrey, whose statement must be taken for what it is worth, "Jonson was never a good actor, but an excellent instructor." His physique was certainly not well adapted to the histrionic conditions of his—perhaps of any—day; but, in any case, it was not long before he found his place in the organism of his company. In 1597, as we know from Henslowe, Jonson undertook to write a play for the lord admiral's men; and in the following year he was mentioned by Merès in his *Palladis Tamia* as one of "the best for tragedy," without any reference to a connexion on his part with the other branch of the drama. Whether this was a criticism based on material evidence or an unconscious slip, Ben Jonson in the same year 1598 produced one of the most famous of English comedies, *Every Man in his Humour*, which was first acted—probably in the earlier part of September—by the lord chamberlain's company at the Curtain. Shakespeare was one of the actors in Jonson's comedy, and it is in the character of Old Knowell in this very play that, according to a bold but ingenious guess, he is represented in the half-length portrait of him in the folio of 1623, beneath which were printed Jonson's lines concerning the picture. *Every Man in his Humour* was published in 1601; the critical prologue first appears in the folio of 1616, and there are other divergences (see Castelain, appendix A). After the Restoration the play was revived in 1751 by Garrick (who acted Kitely) with alterations, and long continued to be known on the stage. It was followed in the same year by *The Case is Altered*, acted by the children of the queen's revels, which contains a satirical attack upon the pageant poet, Anthony Munday. This comedy, which was not included in the folio editions, is one of intrigue rather than of character; it contains obvious reminiscences of Shylock and his daughter. The earlier of these two comedies was indisputably successful.

Before the year 1598 was out, however, Jonson found himself in prison and in danger of the gallows. In a duel, fought on the 22nd of September in Hogsden Fields, he had killed an actor of Henslowe's company named Gabriel Spenser. The quarrel with

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[1] His Christian name of Benjamin was usually abbreviated by himself and his contemporaries; and thus, in accordance with his famous epitaph, it will always continue to be abbreviated.

Henslowe consequent on this event may account for the production of *Every Man in his Humour* by the rival company. In prison Jonson was visited by a Roman Catholic priest, and the result (certainly strange, if Jonson's parentage is considered) was his conversion to the Church of Rome, to which he adhered for twelve years. Jonson was afterwards a diligent student of divinity; but, though his mind was religious, it is not probable that its natural bias much inclined it to dwell upon creeds and their controversies. He pleaded guilty to the charge brought against him, as the rolls of Middlesex sessions show; but, after a short imprisonment, he was released by benefit of clergy, forfeiting his "goods and chattels," and being branded on his left thumb. The affair does not seem to have affected his reputation; in 1599 he is found back again at work for Henslowe, receiving together with Dekker, Chettle and "another gentleman," earnest-money for a tragedy (undiscovered) called *Robert II., King of Scots*. In the same year he brought out through the lord chamberlain's company (possibly already at the Globe, then newly built or building) the elaborate comedy of *Every Man out of his Humour* (quarto 1600; fol. 1616)—a play subsequently presented before Queen Elizabeth. The sunshine of court favour, rarely diffused during her reign in rays otherwise than figuratively golden, was not to bring any material comfort to the most learned of her dramatists, before there was laid upon her the inevitable hand of which his courtly epilogue had besought death to forget the use. Indeed, of his *Cynthia's Revels*, performed by the chapel children in 1600 and printed with the first title of *The Fountain of Self-Love* in 1601, though it was no doubt primarily designed as a compliment to the queen, the most marked result had been to offend two playwrights of note—Dekker, with whom he had formerly worked in company, and who had a healthy if rough grip of his own; and Marston, who was perhaps less dangerous by his strength than by his versatility. According to Jonson, his quarrel with Marston had begun by the latter attacking his morals, and in the course of it they came to blows, and might have come to worse. In *Cynthia's Revels*, Dekker is generally held to be satirized as Hedon, and Marston as Anaides (Fleay, however, thinks Anaides is Dekker, and Hedon Daniel), while the character of Crites most assuredly has some features of Jonson himself. Learning the intention of the two writers whom he had satirized, or at all events of Dekker, to wreak literary vengeance upon him, he anticipated them in *The Poetaster* (1601), again played by the children of the queen's chapel at the Blackfriars and printed in 1602; Marston and Dekker are here ridiculed respectively as the aristocratic Crispinus and the vulgar Demetrius. The play was completed fifteen weeks after its plot was first conceived. It is not certain to what the proceedings against author and play before the lord chief justice, referred to in the dedication of the edition of 1616, had reference, or when they were instituted. Fleay's supposition that the "purge," said in the *Returne from Parnassus* (Pt. II. act IV. sc. iii.) to have been administered by Shakespeare to Jonson in return for Horace's "pill to the poets" in this piece, consisted of *Troilus and Cressida* is supremely ingenious, but cannot be examined here. As for Dekker, he retaliated on *The Poetaster* by the *Satiromastix, or The Untrussing of the Humorous Poet* (1602). Some more last words were indeed attempted on Jonson's part, but in the *Apologetic Dialogue* added to *The Poetaster* in the edition of 1616, though excluded from that of 1602, he says he intends to turn his attention to tragedy. This intention he apparently carried out immediately, for in 1602 he received £10 from Henslowe for a play, entitled *Richard Crookbacke*, now lost—unfortunately so, for purposes of comparison in particular, even if it was only, as Fleay conjectures, "an alteration of Marlowe's play." According to a statement by Overbury, early in 1603, "Ben Johnson, the poet, now lives upon one Townesend," supposed to have been the poet and masque-writer Aurelian Townshend, at one time steward to the 1st earl of Salisbury, "and scornes the world." To his other early patron, Lord Aubigny, Jonson dedicated the first of his two extant tragedies, *Sejanus*, produced by the king's servants at the Globe late in 1603, Shakespeare once more taking a part in the performance. Either on its performance or on its appearing in print in 1605, Jonson was called before the privy council by the Earl of Northampton. But it is open to question whether this was the occasion on which, according to Jonson's statement to Drummond, Northampton "accused him both of popery and treason" (see Castelain, Appendix C). Though, for one reason or another, unsuccessful at first, the endurance of its reputation is attested by its performance, in a German version by an Englishman, John Michael Girish, at the court of the grandson of James I. at Heidelberg.

When the reign of James I. opened in England and an adulatory loyalty seemed intent on showing that it had not exhausted itself at the feet of Gloriana, Jonson's well-stored brain and ready pen had their share in devising and executing ingenious variations on the theme "Welcome—since we cannot do without thee!" With extraordinary promptitude his genius, which, far from being "ponderous" in its operations, was singularly swift and flexible in adapting itself to the demands made upon it, met the new taste for masques and entertainments—new of course in degree rather than in kind—introduced with the new reign and fostered by both the king and his consort. The pageant which on the 7th of May 1603 bade the king welcome to a capital dissolved in joy was partly of Jonson's, partly of Dekker's, devising; and he was able to deepen and diversify the impression by the composition of masques presented to James I. when entertained at houses of the nobility. *The Satyr* (1603) was produced on one of these occasions, Queen Anne's sojourn at Althorpe, the seat of Sir Robert Spencer, afterwards Lord Althorpe, who seems to have previously bestowed some patronage upon him. *The Penates* followed on May-day 1604 at the house of Sir William Cornwallis at Highgate, and the queen herself with her ladies played his *Masque of Blackness* at Whitehall in 1605. He was soon occasionally employed by the court itself—already in 1606 in conjunction with Inigo Jones, as responsible for the "painting and carpentry"—and thus speedily showed himself master in a species of composition for which, more than any other English poet before Milton, he secured an enduring place in the national poetic literature. Personally, no doubt, he derived considerable material benefit from the new fashion—more especially if his statement to Drummond was anything like correct, that out of his plays (which may be presumed to mean his original plays) he had never gained a couple of hundred pounds.

Good humour seems to have come back with good fortune. Joint employment in *The King's Entertainment* (1604) had reconciled him with Dekker; and with Marston also, who in 1604 dedicated to him his *Malcontent*, he was again on pleasant terms. When, therefore, in 1604 Marston and Chapman (who, Jonson told Drummond, was loved of him, and whom he had probably honoured as "Virgil" in *The Poetaster*, and who has, though on doubtful grounds, been supposed to have collaborated in the original *Sejanus*) produced the excellent comedy of *Eastward Ho*, it appears to have contained some contributions by Jonson. At all events, when the authors were arrested on account of one or more passages in the play which were deemed insulting to the Scots, he "voluntarily imprisoned himself" with them. They were soon released, and a banquet at his expense, attended by Camden and Selden, terminated the incident. If Jonson is to be believed, there had been a report that the prisoners were to have their ears and noses cut, and, with reference apparently to this peril, "at the midst of the feast his old mother drank to him, and showed him a paper which she had intended (if the sentence had taken execution) to have mixed in the prison among his drink, which was full of lusty strong poison; and that she was no churl, she told him, she minded first to have drunk of it herself." Strange to say, in 1605 Jonson and Chapman, though the former, as he averred, had so "attempered" his style as to have "given no cause to any good man of grief," were again in prison on account of "a play"; but they appear to have been once more speedily set free, in consequence of a very manly and dignified letter addressed by Jonson to the Earl of Salisbury. As to the relations between Chapman and Jonson, illustrated by newly discovered letters, see Bertram Dobell in the *Athenaeum*

No. 3831 (March 30, 1901), and the comments of Castelain. He thinks that the play in question, in which both Chapman and Jonson took part, was *Sir Gyles Goosecappe*, and that the last imprisonment of the two poets was shortly after the discovery of the Gunpowder Plot. In the mysterious history of the Gunpowder Plot Jonson certainly had some obscure part. On the 7th of November, very soon after the discovery of the conspiracy, the council appears to have sent for him and to have asked him, as a loyal Roman Catholic, to use his good offices in inducing the priests to do something required by the council—one hardly likes to conjecture it to have been some tampering with the secrets of confession. In any case, the negotiations fell through, because the priests declined to come forth out of their hiding-places to be negotiated with—greatly to the wrath of Ben Jonson, who declares in a letter to Lord Salisbury that "they are all so enweaved in it that it will make 500 gentlemen less of the religion within this week, if they carry their understanding about them." Jonson himself, however, did not declare his separation from the Church of Rome for five years longer, however much it might have been to his advantage to do so.

His powers as a dramatist were at their height during the earlier half of the reign of James I.; and by the year 1616 he had produced nearly all the plays which are worthy of his genius. They include the tragedy of *Catiline* (acted and printed 1611), which achieved only a doubtful success, and the comedies of *Volpone, or the Fox* (acted 1605 and printed in 1607 with a dedication "from my house in the Blackfriars"), *Epicoene, or the Silent Woman* (1609; entered in the Stationers' Register 1610), the *Alchemist*(1610; printed in 1610), *Bartholomew Fair* and *The Devil is an Ass* (acted respectively in 1614 and 1616). During the same period he produced several masques, usually in connexion with Inigo Jones, with whom, however, he seems to have quarrelled already in this reign, though it is very doubtful whether the architect is really intended to be ridiculed in *Bartholomew Fair* under the character of Lanthorn Leatherhead. Littlewit, according to Fleay, is Daniel. Among the most attractive of his masques may be mentioned the *Masque of Blackness* (1606), the *Masque of Beauty* (1608), and the *Masque of Queens* (1609), described by Swinburne as "the most splendid of all masques" and as "one of the typically splendid monuments or trophies of English literature." In 1616 a modest pension of 100 marks a year was conferred upon him; and possibly this sign of royal favour may have encouraged him to the publication of the first volume of the folio collected edition of his works (1616), though there are indications that he had contemplated its production, an exceptional task for a playwright of his times to take in hand, as early as 1612.

He had other patrons more bountiful than the Crown, and for a brief space of time (in 1613) had travelled to France as governor (without apparently much moral authority) to the eldest son of Sir Walter Raleigh, then a state prisoner in the Tower, for whose society Jonson may have gained a liking at the Mermaid Tavern in Cheapside, but for whose personal character he, like so many of his contemporaries, seems to have had but small esteem. By the year 1616 Jonson seems to have made up his mind to cease writing for the stage, where neither his success nor his profits had equalled his merits and expectations. He continued to produce masques and entertainments when called upon; but he was attracted by many other literary pursuits, and had already accomplished enough to furnish plentiful materials for retrospective discourse over pipe or cup. He was already entitled to lord it at the Mermaid, where his quick antagonist in earlier wit-combats (if Fuller's famous description be authentic) no longer appeared even on a visit from his comfortable retreat at Stratford. That on the other hand Ben carried his wicked town habits into Warwickshire, and there, together with Drayton, made Shakespeare drink so hard with them as to bring upon himself the fatal fever which ended his days, is a scandal with which we may fairly refuse to load Jonson's memory. That he had a share in the preparing for the press of the first folio of Shakespeare, or in the composition of its preface, is of course a mere conjecture.

It was in the year 1618 that, like Dr Samuel Johnson a century and a half afterwards, Ben resolved to have a real holiday for once, and about midsummer started for his ancestral country, Scotland. He had (very heroically for a man of his habits) determined to make the journey on foot; and he was speedily followed by John Taylor, the water-poet, who still further handicapped himself by the condition that he would accomplish the pilgrimage without a penny in his pocket. Jonson, who put money in his good friend's purse when he came up with him at Leith, spent more than a year and a half in the hospitable Lowlands, being solemnly elected a burgess of Edinburgh, and on another occasion entertained at a public banquet there. But the best-remembered hospitality which he enjoyed was that of the learned Scottish poet, William Drummond of Hawthornden, to which we owe the so-called *Conversations*. In these famous jottings, the work of no extenuating hand, Jonson lives for us to this day, delivering his censures, terse as they are, in an expansive mood whether of praise or of blame; nor is he at all generously described in the postscript added by his fatigued and at times irritated host as "a great lover and praiser of himself, a contemner and scorner of others." A poetical account of this journey, "with all the adventures," was burnt with Jonson's library.

After his return to England Jonson appears to have resumed his former course of life. Among his noble patrons and patronesses were the countess of Rutland (Sidney's daughter) and her cousin Lady Wroth; and in 1619 his visits to the country seats of the nobility were varied by a sojourn at Oxford with Richard Corbet, the poet, at Christ Church, on which occasion he took up the master's degree granted to him by the university; whether he actually proceeded to the same degree granted to him at Cambridge seems unknown. He confessed about this time that he was or seemed growing "restive," *i.e.* lazy, though it was not long before he returned to the occasional composition of masques. The extremely spirited *Gipsies Metamorphosed* (1621) was thrice presented before the king, who was so pleased with it as to grant to the poet the reversion of the office of master of the revels, besides proposing to confer upon him the honour of knighthood. This honour Jonson (hardly in deference to the memory of Sir Petronel Flash) declined; but there was no reason why he should not gratefully accept the increase of his pension in the same year (1621) to £200—a temporary increase only, inasmuch as it still stood at 100 marks when afterwards augmented by Charles I.

The close of King James I.'s reign found the foremost of its poets in anything but a prosperous condition. It would be unjust to hold the Sun, the Dog, the Triple Tun, or the Old Devil with its Apollo club-room, where Ben's supremacy must by this time have become established, responsible for this result; taverns were the clubs of that day, and a man of letters is not considered lost in our own because he haunts a smoking-room in Pall Mall. Disease had weakened the poet's strength, and the burning of his library, as his *Execration upon Vulcan* sufficiently shows, must have been no mere transitory trouble to a poor poet and scholar. Moreover he cannot but have felt, from the time of the accession of Charles I. early in 1625 onwards, that the royal patronage would no longer be due in part to anything like intellectual sympathy. He thus thought it best to recur to the surer way of writing for the stage, and in 1625 produced, with no faint heart, but with a very clear anticipation of the comments which would be made upon the reappearance of the "huge, overgrown play-maker," *The Staple of News*, a comedy excellent in some respects, but little calculated to become popular. It was not printed till 1631. Jonson, whose habit of body was not more conducive than were his ways of life to a healthy old age, had a paralytic stroke in 1626, and a second in 1628. In the latter year, on the death of Middleton, the appointment of city chronologer, with a salary of 100 nobles a year, was bestowed upon him. He appears to have considered the duties of this office as purely ornamental; but in 1631 his salary was suspended until he should have presented some fruits of his labours in his place, or—as he more succinctly phrased it—"yesterday the barbarous court of aldermen have withdrawn their chandlerly pension for verjuice and mustard, £33, 6s. 8d." After being in 1628 arrested by mistake on the utterly false charge of having written certain verses in approval of the assassination of Buckingham, he was soon allowed to return to Westminster, where it would appear from a letter of his "son and contiguous neighbour," James Howell, he was living in 1629, and about this time narrowly escaped another conflagration. In the same year (1629) he once more essayed the stage with the comedy of *The New Inn*, which was actually, and on its own merits not unjustly, damned on the first performance. It was printed in 1631, "as it was never acted but most negligently played"; and Jonson defended himself against his critics in his spirited *Ode to Himself*. The epilogue to *The New Inn* having dwelt not without dignity upon the neglect which the poet had experienced at the hands of "king and queen," King Charles immediately sent the unlucky author a gift of £100, and in response to a further appeal increased his standing salary to the same sum, with the addition of an annual tierce of canary—the poet-laureate's customary royal gift, though this designation of an office, of which Jonson discharged some of what became the ordinary functions, is not mentioned in the warrant dated the 26th of March 1630. In 1634, by the king's desire, Jonson's salary as chronologer to the city was again paid. To his later years belong the comedies, *The Magnetic Lady* (1632) and *The Tale of a Tub* (1633), both printed in 1640, and some masques, none of which met with great success. The patronage of liberal-minded men, such as the earl, afterwards duke, of Newcastle—by whom he must have been commissioned to write his last two masques *Love's Welcome at Welbeck* (1633) and *Love's Welcome at Bolsover* (1634)—and Viscount Falkland, was not wanting, and his was hardly an instance in which the fickleness of time and taste could have allowed a literary veteran to end his career in neglect. He was the acknowledged chief of the English world of letters, both at the festive meetings where he ruled the roast among the younger authors whose pride it was to be "sealed of the tribe of Ben," and by the avowal of grave writers, old or young, not one of whom would have ventured to dispute his titular pre-eminence. Nor was he to the last unconscious of the claims upon him which his position brought with it. When, nearly two years after he had lost his surviving son, death came upon the sick old man on the 6th of August 1637, he left behind him an unfinished work of great beauty, the pastoral drama of *The Sad Shepherd* (printed in 1641). For forty years, he said in the prologue, he had feasted the public; at first he could scarce hit its taste, but patience had at last enabled it to identify itself with the working of his pen.

We are so accustomed to think of Ben Jonson presiding, attentive to his own applause, over a circle of younger followers and admirers that we are apt to forget the hard struggle which he had passed through before gaining the crown now universally acknowledged to be his. Howell records, in the year before Ben's death, that a solemn supper at the poet's own house, where the host had almost spoiled the relish of the feast by vilifying others and magnifying himself, "T. Ca." (Thomas Carew) buzzed in the writer's ear "that, though Ben had barrelled up a great deal of knowledge, yet it seemed he had not read the *Ethics*, which, among other precepts of morality, forbid self-commendation." Self-reliance is but too frequently coupled with self-consciousness, and for good and for evil self-confidence was no doubt the most prominent feature in the character of Ben Jonson. Hence the combativeness which involved him in so many quarrels in his earlier days, and which jarred so harshly upon the less militant and in some respects more pedantic nature of Drummond. But his quarrels do not appear to have entered deeply into his soul, or indeed usually to have lasted long.[1] He was too exuberant in his vituperations to be bitter, and too outspoken to be malicious. He loved of all things to be called "honest," and there is every reason to suppose that he deserved the epithet. The old superstition that Jonson was filled with malignant envy of the greatest of his fellow-dramatists, and lost no opportunity of giving expression to it, hardly needs notice. Those who consider that Shakespeare was beyond criticism may find blasphemy in the saying of Jonson that Shakespeare "wanted art." Occasional jesting allusions to particular plays of Shakespeare may be found in Jonson, among which should hardly be included the sneer at "mouldy" Pericles in his *Ode to Himself*. But these amount to nothing collectively, and to very little individually; and against them have to be set, not only the many pleasant traditions concerning the long intimacy between the pair, but also the lines, prefixed to the first Shakespeare folio, as noble as they are judicious, dedicated by the survivor to "the star of poets," and the adaptation, clearly sympathetic notwithstanding all its buts, *de Shakespeare nostrat.* in the *Discoveries*. But if Gifford had rendered no other service to Jonson's fame he must be allowed to have once for all vindicated it from the cruellest aspersion which has ever been cast upon it. That in general Ben Jonson was a man of strong likes and dislikes, and was wont to manifest the latter as vehemently as the former, it would be idle to deny. He was at least impartial in his censures, dealing them out freely to Puritan poets like Wither and (supposing him not to have exaggerated his free-spokenness) to princes of his church like Cardinal du Perron. And, if sensitive to attack, he seems to have been impervious to flattery—to judge from the candour with which he condemned the foibles even of so enthusiastic an admirer as Beaumont. The personage that he disliked the most, and openly abused in the roundest terms, was unfortunately one with many heads and a tongue to hiss in each—no other than that "general public" which it was the fundamental mistake of his life to fancy he could "rail into approbation" before he had effectively secured its goodwill. And upon the whole it may be said that the admiration of the few, rather than the favour of the many, has kept green the fame of the most independent among all the masters of an art which, in more senses than one, must please to live.

Jonson's learning and industry, which were alike exceptional, by no means exhausted themselves in furnishing and elaborating the materials of his dramatic works. His enemies sneered at him as a translator—a title which the preceding generation was inclined to esteem the most honourable in literature. But his classical scholarship shows itself in other directions besides his translations from the Latin poets (the *Ars poetica* in particular), in addition to which he appears to have written a version of Barclay's *Argenis*; it was likewise the basis of his *English Grammar*, of which nothing but the rough draft remains (the MS. itself having perished in the fire in his library), and in connexion with the subject of which he appears to have pursued other linguistic studies (Howell in 1629 was trying to procure him a Welsh grammar). And its effects are very visible in some of the most pleasing of his non-dramatic poems, which often display that combination of polish and simplicity hardly to be reached—or even to be appreciated—without some measure of classical training.

Exclusively of the few lyrics in Jonson's dramas (which, with the exception of the stately choruses in *Catiline*, charm, and perhaps may surprise, by their lightness of touch), his non-dramatic works are comprised in the following collections. The book of *Epigrams* (published in the first folio of 1616) contained, in the poet's own words, the "ripest of his studies." His notion of an epigram was the ancient, not the restricted modern one—still less that of the critic (R. C., the author of *The Times' Whistle*) in whose language, according to Jonson, "witty" was "obscene." On the whole, these epigrams excel more in encomiastic than in satiric touches, while the pathos of one or two epitaphs in the collection is of the truest kind. In the lyrics and epistles contained in the *Forest* (also in the first folio), Jonson shows greater variety in the poetic styles adopted by him; but the subject of love, which Dryden considered conspicuous by its absence in the author's dramas, is similarly eschewed here. The *Underwoods* (not published collectively till the second and surreptitious folio) are a miscellaneous series, comprising, together with a few religious and a few amatory poems, a large number of epigrams, epitaphs, elegies and "odes," including both the tributes to Shakespeare and several to royal and other patrons and friends, besides the *Execration upon Vulcan*, and the characteristic ode addressed by the poet to himself. To these pieces in verse should be added the *Discoveries—Timber, or Discoveries made upon Men and Matters*, avowedly a commonplace book of aphorisms noted by the poet in his daily readings—thoughts adopted and adapted in more tranquil and perhaps more sober moods than those which gave rise to the outpourings of the *Conversations at Hawthornden*. As to the critical value of these *Conversations* it is far from being only negative; he knew how to admire as well as how to disdain. For these thoughts, though abounding with biographical as well as general interest, Jonson was almost entirely indebted to ancient writers, or (as has been shown by Professor Spingarn and by Percy Simpson) indebted to the humanists of the Renaissance (see *Modern Language Review*, ii. 3, April 1907).

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[1] With Inigo Jones, however, in quarrelling with whom, as Howell reminds Jonson, the poet was virtually quarrelling with his bread and butter, he seems to have found it impossible to live permanently at peace; his satirical *Expostulation* against the architect was published as late as 1635. Chapman's satire against his old associate, perhaps due to this quarrel, was left unfinished and unpublished.

The extant dramatic works of Ben Jonson fall into three or, if his fragmentary pastoral drama be considered to stand by itself, into four distinct divisions. The tragedies are only two in number—*Sejanus his Fall* and *Catiline his Conspiracy*.[1] Of these the earlier, as is worth noting, was produced at Shakespeare's theatre, in all probability before the first of Shakespeare's Roman dramas, and still contains a considerable admixture of rhyme in the dialogue. Though perhaps less carefully elaborated in diction than its successor, *Sejanus* is at least equally impressive as a highly wrought dramatic treatment of a complex historic theme. The character of Tiberius adds an element of curious psychological interest on which speculation has never quite exhausted itself and which, in Jonson's day at least, was wanting to the figures of Catiline and his associates. But in both plays the action is powerfully conducted, and the care bestowed by the dramatist upon the great variety of characters introduced cannot, as in some of his comedies, be said to distract the interest of the reader. Both these tragedies are noble works, though the relative popularity of the subject (for conspiracies are in the long run more interesting than camarillas) has perhaps secured the preference to *Catiline*. Yet this play and its predecessor were alike too manifestly intended by their author to court the goodwill of what he calls the "extraordinary" reader. It is difficult to imagine that (with the aid of judicious shortenings) either could altogether miss its effect on the stage; but, while Shakespeare causes us to forget, Jonson seems to wish us to remember, his authorities. The half is often greater than the whole; and Jonson, like all dramatists and, it might be added, all novelists in similar cases, has had to pay the penalty incurred by too obvious a desire to underline the learning of the author.

Perversity—or would-be originality—alone could declare Jonson's tragedy preferable to his comedy. Even if the revolution which he created in the comic branch of the drama had been mistaken in its principles or unsatisfactory in its results, it would be clear that the strength of his dramatic genius lay in the power of depicting a great variety of characters, and that in comedy alone he succeeded in finding a wide field for the exercise of this power. There may have been no very original or very profound discovery in the idea which he illustrated in *Every Man in his Humour*, and, as it were, technically elaborated in *Every Man out of his Humour*—that in many men one quality is observable which so possesses them as to draw the whole of their individualities one way, and that this phenomenon "may be truly said to be a humour." The idea of the master quality or tendency was, as has been well observed, a very considerable one for dramatist or novelist. Nor did Jonson (happily) attempt to work out this idea with any excessive scientific consistency as a comic dramatist. But, by refusing to apply the term "humour" (*q.v.*) to a mere peculiarity or affectation of manners, and restricting its use to actual or implied differences or distinctions of character, he broadened the whole basis of English comedy after his fashion, as Molière at a later date, keeping in closer touch with the common experience of human life, with a lighter hand broadened the basis of French and of modern Western comedy at large. It does not of course follow that Jonson's disciples, the Bromes and the Cartwrights, always adequately reproduced the master's conception of "humorous" comedy. Jonson's wide and various reading helped him to diversify the application of his theory, while perhaps at times it led him into too remote illustrations of it. Still, Captain Bobadil and Captain Tucca, Macilente and Fungoso, Volpone and Mosca, and a goodly number of other characters impress themselves permanently upon the memory of those whose attention they have as a matter of course commanded. It is a very futile criticism to condemn Jonson's characters as a mere series of types of general ideas; on the other hand, it is a very sound criticism to object, with Barry Cornwall, to the "multitude of characters who throw no light upon the story, and lend no interest to it, occupying space that had better have been bestowed upon the principal agents of the plot."

In the construction of plots, as in most other respects, Jonson's at once conscientious and vigorous mind led him in the direction of originality; he depended to a far less degree than the greater part of his contemporaries (Shakespeare with the rest) upon borrowed plots. But either his inventive character was occasionally at fault in this respect, or his devotion to his characters often diverted his attention from a brisk conduct of his plot. Barry Cornwall has directed attention to the essential likeness in the plot of two of Jonson's best comedies, *Volpone* and *The Alchemist*; and another critic, W. Bodham Donne, has dwelt on the difficulty which, in *The Poetaster* and elsewhere, Ben Jonson seems to experience in sustaining the promise of his actions. *The Poetaster* is, however, a play *sui generis*, in which the real business can hardly be said to begin till the last act.

Dryden, when criticizing Ben Jonson's comedies, thought fit, while allowing the old master humour and incontestable "pleasantness," to deny him wit and those ornaments thereof which Quintilian reckons up under the terms *urbana*, *salsa*, *faceta* and so forth. Such wit as Dryden has in view is the mere outward fashion or style of the day, the euphuism or "sheerwit" or *chic* which is the creed of Fastidious Brisks and of their astute purveyors at any given moment. In this Ben Jonson was no doubt defective; but it would be an error to suppose him, as a comic dramatist, to have maintained towards the world around him the attitude of a philosopher, careless of mere transient externalisms. It is said that the scene of his *Every Man in his Humour* was originally laid near Florence; and his *Volpone*, which is perhaps the darkest social picture ever drawn by him, plays at Venice. Neither locality was ill-chosen, but the real atmosphere of his comedies is that of the native surroundings amidst which they were produced; and Ben Jonson's times live for us in his men and women, his country gulls and town gulls, his alchemists and exorcists, his "skeldring" captains and whining Puritans, and the whole ragamuffin rout of his *Bartholomew Fair*, the comedy *par excellence* of Elizabethan low life. After he had described the pastimes, fashionable and unfashionable, of his age, its feeble superstitions and its flaunting naughtinesses, its vapouring affectations and its lying effronteries, with an odour as of "divine tabacco" pervading the whole, little might seem to be left to describe for his "sons" and successors. Enough, however, remained; only that his followers speedily again threw manners and "humours" into an undistinguishable medley.

The gift which both in his art and in his life Jonson lacked was that of exercising the influence or creating the effects which he wished to exercise or create without the appearance of consciousness. Concealment never crept over his efforts, and he scorned insinuation. Instead of this, influenced no doubt by the example of the free relations between author and public permitted by Attic comedy, he resorted again and again, from *Every Man out of his Humour* to *The Magnetic Lady*, to inductions and commentatory intermezzos and appendices, which, though occasionally effective by the excellence of their execution, are to be regretted as introducing into his dramas an exotic and often vexatious element. A man of letters to the very core, he never quite understood that there is and ought to be a wide difference of methods between the world of letters and the world of the theatre.

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[1] Of *The Fall of Mortimer* Jonson left only a few lines behind him; but, as he also left the argument of the play, factious ingenuity contrived to furbish up the relic into a libel against Queen Caroline and Sir Robert Walpole in 1731, and to revive the contrivance by way of an insult to the princess dowager of Wales and Lord Bute in 1762.

The richness and versatility of Jonson's genius will never be fully appreciated by those who fail to acquaint themselves with what is preserved to us of his "masques," and cognate entertainments. He was conscious enough of his success in this direction—"next himself," he said, "only Fletcher and Chapman could write a masque." He introduced, or at least established, the ingenious innovation of the anti-masque, which Schlegel has described, as a species of "parody added by the poet to his device, and usually prefixed to the serious entry," and which accordingly supplies a grotesque antidote to the often extravagantly imaginative main conception. Jonson's learning, creative power and humorous ingenuity—combined, it should not be forgotten, with a genuine lyrical gift—all found abundant opportunities for displaying themselves in these productions. Though a growth of foreign origin, the masque was by him thoroughly domesticated in the high places of English literature. He lived long enough to see the species produce its poetic masterpiece in *Comus*.

The Sad Shepherd, of which Jonson left behind him three acts and a prologue, is distinguished among English pastoral dramas by its freshness of tone; it breathes something of the spirit of the greenwood, and is not unnatural even in its supernatural element. While this piece, with its charming love-scenes between Robin Hood and Maid Marion, remains a fragment, another pastoral by Jonson, the *May Lord* (which F. G. Fleay and J. A. Symonds sought to identify with *The Sad Shepherd;* see, however, W. W. Greg in introduction to the Louvain reprint), has been lost, and a third, of which Loch Lomond was intended to be the scene, probably remained unwritten.

Though Ben Jonson never altogether recognized the truth of the maxim that the dramatic art has properly speaking no didactic purpose, his long and laborious life was not wasted upon a barren endeavour. In tragedy he added two works of uncommon merit to our dramatic literature. In comedy his aim was higher, his effort more sustained, and his success more solid than were those of any of his fellows. In the subsidiary and hybrid species of the masque, he helped to open a new and attractive though undoubtedly devious path in the field of dramatic literature. His intellectual endowments surpassed those of most of the great English dramatists in richness and breadth; and in energy of application he probably left them all behind. Inferior to more than one of his fellow-dramatists in the power of imaginative sympathy, he was first among the Elizabethans in the power of observation; and there is point in Barrett Wendell's paradox, that as a dramatist he was not really a poet but a painter. Yet it is less by these gifts, or even by his unexcelled capacity for hard work, than by the true ring of manliness that he will always remain distinguished among his peers.

Jonson was buried on the north side of the nave in Westminster Abbey, and the inscription, "O Rare Ben Jonson," was cut in the slab over his grave. In the beginning of the 18th century a portrait bust was put up to his memory in the Poets' Corner by Harley, earl of Oxford. Of Honthorst's portrait of Jonson at Knole Park there is a copy in the National Portrait Gallery; another was engraved by W. Marshall for the 1640 edition of his *Poems*.

BIBLIOGRAPHY.—The date of the first folio volume of Jonson's *Works* (of which title his novel but characteristic use in applying it to plays was at the time much ridiculed) has already been mentioned as 1616; the second, professedly published in 1640, is described by Gifford as "a wretched continuation of the first, printed from MSS. surreptitiously obtained during his life, or ignorantly hurried through the press after his death, and bearing a variety of dates from 1631 to 1641 inclusive." The works were reprinted in a single folio volume in 1692, in which *The New Inn* and *The Case is Altered* were included for the first time, and again in 6 vols 8vo in 1715. Peter Whalley's edition in 7 vols., with a life, appeared in 1756, but was superseded in 1816 by William Gifford's, in 9 vols. (of which the first includes a biographical memoir, and the famous essay on the "Proofs of Ben Jonson's Malignity, from the Commentators on Shakespeare"). A new edition of Gifford's was published in 9 vols. in 1875 by Colonel F. Cunningham, as well as a cheap reprint in 3 vols. in 1870. Both contain the *Conversations* with Drummond, which were first printed in full by David Laing in the *Shakespeare Society's Publications* (1842) and the *Jonsonus Virbius*, a collection (unparalleled in number and variety of authors) of poetical tributes, published about six months after Jonson's death by his friends and admirers. There is also a single-volume edition, with a very readable memoir, by Barry Cornwall (1838). An edition of Ben Jonson's works from the original texts was recently undertaken by C. H. Herford and Percy Simpson. A selection from his plays, edited for the "Mermaid" series in 1893–1895 by B. Nicholson, with an introduction by C. H. Herford, was reissued in 1904. W. W. Bang in his *Materialien zur Kunde des alten englischen Dramas* has reprinted from the folio of 1616 those of Ben Jonson's plays which are contained in it (Louvain, 1905–1906). *Every Man in his Humour* and *Every Man out of his Humour* have been edited for the same series (16 and 17, 1905 and 1907) by W. W. Bang and W. W. Greg. *Every Man in his Humour* has also been edited, with a brief biographical as well as special introduction, to which the present sketch owes some details, by H. B. Wheatley (1877). Some valuable editions of plays by Ben Jonson have been recently published by American scholars in the *Yale Studies in English*, edited by A. S. Cook—*The Poetaster*, ed. H. S. Mallory (1905); *The Alchemist*, ed. C. M. Hathaway (1903); *The Devil is an Ass*, ed. W. S. Johnson (1905); *The Staple of News*, ed. De Winter (1905); *The New Inn*, ed. by G. Bremner (1908); *The Sad Shepherd* (with Waldron's continuation) has been edited by W. W. Greg for Bang's *Materialien zur Kunde des alten englischen Dramas* (Louvain, 1905).

The criticisms of Ben Jonson are too numerous for cataloguing here; among those by eminent Englishmen should be specially mentioned John Dryden's, particularly those in his *Essay on Dramatic Poësy* (1667–1668; revised 1684), and in the preface to *An Evening's Love, or the Mock Astrologer* (1668), and A. C. Swinburne's *Study of Ben Jonson* (1889), in which, however, the significance of the *Discoveries* is misapprehended. See also F. G. Fleay, *Biographical Chronicle of the English Drama* (1891), i. 311–387, ii. 1–18; C. H. Herford, "Ben Jonson" (art. in *Dict. Nat. Biog.*, vol. xxx., 1802); A. W. Ward, *History of English Dramatic Literature*, 2nd ed. (1899), ii. 296–407; and for a list of early impressions, W. W. Greg, *List of English Plays written before 1643 and printed before 1700* (Bibliographical Society, 1900), pp. 55–58 and supplement 11–15. An important French work on Ben Jonson, both biographical and critical, and containing, besides many translations of scenes and passages, some valuable appendices, to more than one of which reference has been made above, is Maurice Castelain's *Ben Jonson, l'homme et l'œuvre* (1907). Among treatises or essays on particular aspects of his literary work may be mentioned Emil Koeppel's *Quellenstudien zu den Dramen Ben Jonson's*, &c. (1895); the same writer's "Ben Jonson's Wirkung auf zeitgenössische Dramatiker," &c., in *Anglicistische Forschungen*, 20 (1906); F. E. Schelling's *Ben Jonson and the Classical School* (1898); and as to his masques, A. Soergel, *Die englischen Maskenspiele* (1882) and J. Schmidt, "Über Ben Jonson's Maskenspiele," in Herrig's *Archiv*, &c., xxvii. 51–91. See also H. Reinsch, "Ben Jonson's Poetik und seine Beziehungen zu Horaz," in *Münchener Beiträge*, 16 (1899). (A. W. W.)

JOPLIN, a city of Jasper county, Missouri, U.S.A., on Joplin creek, about 140 m. S. of Kansas City. Pop. (1890), 9943; (1900), 26,023, of whom 893 were foreign-born and 773 were negroes; (1910 census) 32,073. It is served by the Missouri Pacific, the St Louis & San Francisco, the Missouri, Kansas & Texas, and the Kansas City Southern railways, and by interurban electric lines. The city has a fine court-house, a United States government building, a Carnegie library and a large auditorium. Joplin is the trade centre of a rich agricultural and fruit-growing district, but its growth has been chiefly due to its situation in one of the must productive zinc and lead regions in the country, for which it is the commercial centre. In 1906 the value of zinc-ore shipments from this Missouri-Kansas (or Joplin) district was $12,074,105, and of shipments of lead ore, $3,048,558. The value of Joplin's factory product in 1905 was $3,006,203, an increase of 29.3% since 1900. Natural gas, piped from the Kansas fields, is used for light and power, and electricity for commercial lighting and power is derived from plants on Spring River, near Vark, Kansas, and on Shoal creek. The municipality owns its electric-lighting plant; the water-works are under private ownership. The first settlement in the neighbourhood was made in 1838. In 1871 Joplin was laid out and incorporated as a town; in 1872 it and a rival town on the other side of Joplin creek were united under the name Union City; in 1873 Union City was chartered as a city under the name Joplin; and in 1888 Joplin was chartered as a city of the third class. The city derives its name from the creek, which was named in honour of the Rev. Harris G. Joplin (*c.* 1810–1847), a native of Tennessee.

JOPPA, less correctly JAFFA (Arab. *Yāfā*), a seaport on the coast of Palestine. It is of great antiquity, being mentioned in the tribute lists of Tethmosis (Thothmes) III.; but as it never was in the territory of the pre-exilic Israelites it was to them a place of no importance. Its ascription to the tribe of Dan (Josh. xix. 46) is purely theoretical. According to the authors of Chronicles (2 Chron. ii. 16), Ezra (iii. 7) and Jonah (i. 3) it was a seaport for importation of the Lebanon timber floated down the coasts or for ships plying even to distant Tarshish. About 148 B.C. it was captured from the Syrians by Jonathan Maccabaeus (1 Macc. x. 75) and later it was retaken and garrisoned by Simon his brother (xii. 33, xiii. 11). It was restored to the Syrians by Pompey (Jos., *Ant.* xiv. 4, 4) but again given back to the Jews (ib. xiv. 10, 6) with an exemption from tax. St Peter for a while lodged at Joppa, where he restored the benevolent widow Tabitha to life, and had the vision which taught him the universality of the plan of Christianity.

According to Strabo (xvi. ii.), who makes the strange mistake of saying that Jerusalem is visible from Joppa, the place was a resort of pirates. It was destroyed by Vespasian in the Jewish War (68). Tradition connects the story of Andromeda and the sea-monster with the sea-coast of Joppa, and in early times her chains were shown as well as the skeleton of the monster itself (Jos. *Wars*, iii. 9, 3). The site seems to have been shown even to some medieval pilgrims, and curious traces of it have been detected in modern Moslem legends.

In the 5th and 11th centuries we hear from time to time of bishops of Joppa, under the metropolitan of Jerusalem. In 1126 the district was captured by the knights of St John, but lost to Saladin in 1187. Richard Cœur de Lion retook it in 1191, but it was finally retaken by Malek-el ʽAdil in 1196. It languished for a time; in the 16th century it was an almost uninhabited ruin; but towards the end of the 17th century it began anew to develop as a seaport. In 1799 it was stormed by Napoleon; the fortifications were repaired and strengthened by the British.

The modern town of Joppa derives its importance, first, as a seaport for Jerusalem and the whole of southern Palestine, and secondly as a centre of the fruit-growing industry. During the latter part of the 19th century it greatly increased in size. The old city walls have been entirely removed. Its population is about 35,000 (Moslems 23,000, Christians 5000, Jews 7000; with the Christians are included the "Templars," a semi-religious, semi-agricultural German colony of about 320 souls). The town, which rises over a rounded hillock on the coast, about 100 ft. high, has a very picturesque appearance from the sea. The harbour (so-called) is one of the worst existing, being simply a natural breakwater formed by a ledge of reefs, safe enough for small Oriental craft, but very dangerous for large vessels, which can only make use of the seaport in calm weather; these never come nearer than about a mile from the shore. A railway and a bad carriage-road connect Joppa with Jerusalem. The water of the town is derived from wells, many of which have a brackish taste. The export trade of the town consists of soap of olive oil, sesame, barley, water melons, wine and especially oranges (commonly known as Jaffa oranges), grown in the famous and ever-increasing gardens that lie north and east of the town. The chief imports are timber, cotton and other textile goods, tiles, iron, rice, coffee, sugar and petroleum. The value of the exports in 1900 was estimated at £264,950, the imports £382,405. Over 10,000 pilgrims, chiefly Russians, and some three or four thousand tourists land annually at Joppa. The town is the seat of a kaimakam or lieutenant-governor, subordinate to the governor of Jerusalem, and contains vice-consulates of Great Britain, France, Germany, America and other powers. There are Latin, Greek, Armenian and Coptic monasteries; and hospitals and schools under British, French and German auspices. (R. A. S. M.)

JORDAENS, JACOB (1593–1678), Flemish painter, was born and died at Antwerp. He studied, like Rubens, under Adam van Noort, and his marriage with his master's daughter in 1616, the year after his admission to the gild of painters, prevented him from visiting Rome. He was forced to content himself with studying such examples of the Italian masters as he found at home; but a far more potent influence was exerted upon his style by Rubens, who employed him sometimes to reproduce small sketches in large. Jordaens is second to Rubens alone in their special department of the Flemish school. In both there is the same warmth of colour, truth to nature, mastery of chiaroscuro and energy of expression; but Jordaens is wanting in dignity of conception, and is inferior in choice of forms, in the character of his heads, and in correctness of drawing. Not seldom he sins against good taste, and in some of his humorous pieces the coarseness is only atoned for by the animation. Of these last he seems in some cases to have painted several replicas. He employed his pencil also in biblical, mythological, historical and allegorical subjects, and is well-known as a portrait painter. He also etched some plates.

See the elaborate work on the painter, by Max Rooses (1908).

JORDAN, CAMILLE (1771–1821), French politician, was born in Lyons on the 11th of January 1771 of a well-to-do mercantile family. He was educated in Lyons, and from an early age was imbued with royalist principles. He actively supported by voice, pen and musket his native town in its resistance to the Convention; and when Lyons fell, in October 1793, Jordan fled. From Switzerland he passed in six months to England, where he formed acquaintances with other French exiles and with prominent British statesmen, and imbibed a lasting admiration for the English Constitution. In 1796 he returned to France, and next year he was sent by Lyons as a deputy to the Council of Five Hundred. There his eloquence won him consideration. He earnestly supported what he felt to be true freedom, especially in matters of religious worship, though the energetic appeal on behalf of church bells in his *Rapport sur la liberté des cultes* procured him the sobriquet of Jordan-Cloche. Proscribed at the *coup d'état* of the 18th Fructidor (4th of September 1797) he escaped to Basel. Thence he went to Germany, where he met Goethe. Back again in France by 1800, he boldly published in 1802 his *Vrai sens du vote national pour le consulat à vie*, in which he exposed the ambitious schemes of Bonaparte. He was unmolested, however, and during the First Empire lived in literary retirement at Lyons with his wife and family, producing for the Lyons academy occasional papers on the *Influence réciproque de l'éloquence sur la Révolution et de la Révolution sur l'éloquence*; *Études sur Klopstock*, &c. At the restoration in 1814 he again emerged into public life. By Louis XVIII. he was ennobled and named a councillor of state; and from 1816 he sat in the chamber of deputies as representative of Ain. At first he supported the ministry, but when they began to show signs of reaction he separated from them, and gradually came to be at the head of the constitutional opposition. His speeches in the chamber were always eloquent and powerful. Though warned by failing health to resign, Camille Jordan remained at his post till his death at Paris, on the 19th of May 1821.

To his pen we owe *Lettre à M. Lamourette* (1791); *Histoire de la conversion d'une dame Parisienne* (1792); *La Loi et la religion vengées* (1792); *Adresse à ses commettants sur la révolution du 4 Septembre 1797* (1797); *Sur les troubles de Lyon* (1818); *La Session de 1817* (1818). His *Discours* were collected in 1818. The "Fragments choisis," and translations from the German, were published in *L'Abeille française*. Besides the various histories of the time, see further details vol. x. of the *Revue encyclopédique*; a paper on Jordan and Madame de Staël, by C. A. Sainte-Beuve, in the *Revue des deux mondes* for March 1868 and R. Boubée, "Camille Jordan à Weimar," in the *Correspondant* (1901), ccv. 718–738 and 948–970.

JORDAN, DOROTHEA (1762–1816), Irish actress, was born near Waterford, Ireland, in 1762. Her mother, Grace Phillips, at one time known as Mrs Frances, was a Dublin actress. Her father, whose name was Bland, was according to one account an army captain, but more probably a stage hand. Dorothy Jordan made her first appearance on the stage in 1777 in Dublin as Phoebe in *As You Like It*. After acting elsewhere in Ireland she appeared in 1782 at Leeds, and subsequently at other Yorkshire towns, in a variety of parts, including Lady Teazle. It was at this time that she began calling herself Mrs Jordan. In 1785 she made her first London appearance at Drury Lane as Peggy in *A Country Girl*. Before the end of her first season she had become an established public favourite, her acting in comedy being declared second only to that of Kitty Clive. Her engagement at Drury Lane lasted till 1809, and she played a large variety of parts. But gradually it came to be recognized that her special talent lay in comedy, her Lady Teazle, Rosalind and Imogen being specially liked, and such "breeches" parts as William in *Rosina*. During the rebuilding of Drury Lane she played at the Haymarket; she transferred her services in 1811 to Covent Garden. Here, in 1814, she made her last appearance on the London stage, and the following year, at Margate, retired altogether. Mrs Jordan's private life was one of the scandals of the period. She had a daughter by her first manager, in Ireland, and four children by Sir Richard Ford, whose name she bore for some years. In 1790 she became the mistress of the duke of Clarence (afterwards William IV.), and bore him ten children, who were ennobled under the name of Fitz Clarence, the eldest being created earl of Munster. In 1811 they separated by mutual consent, Mrs Jordan being granted a liberal allowance. In 1815 she went abroad. According to one story she was in danger of imprisonment for debt. If so, the debt must have been incurred on behalf of others—probably her relations, who appear to have been continually borrowing from her—for her own personal debts were very much more than covered by her savings. She is generally understood to have died at St Cloud, near Paris, on the 3rd of July 1816, but the story that under an assumed name she lived for seven years after that date in England finds some credence.

See James Boaden, *Life of Mrs Jordan* (1831); *The Great Illegitimates* (1830); John Genest, *Account of the Stage*; Tate Wilkinson, *The Wandering Patentee*; *Memoirs and Amorous Adventures by Sea and Land of King William IV.* (1830); *The Georgian Era* (1838).

JORDAN, THOMAS (1612?–1685), English poet and pamphleteer, was born in London and started life as an actor at the Red Bull theatre in Clerkenwell. He published in 1637 his first volume of poems, entitled *Poeticall Varieties*, and in the same year appeared *A Pill to Purge Melancholy*. In 1639 he recited one of his poems before King Charles I., and from this time forward Jordan's output in verse and prose was continuous and prolific. He freely borrowed from other authors, and frequently re-issued his own writings under new names. During the troubles between the king and the parliament he wrote a number of Royalist pamphlets, the first of which, *A Medicine for the Times, or an Antidote against Faction*, appeared in 1641. Dedications, occasional verses, prologues and epilogues to plays poured from his pen. Many volumes of his poems bear no date, and they were probably written during the Commonwealth. At the Restoration he eulogized Monk, produced a masque at the entertainment of the general in the city of London and wrote pamphlets in his support. He then for some years devoted his chief attention to writing plays, in at least one of which, *Money is an Ass*, he himself played a part when it was produced in 1668. In 1671 he was appointed laureate to the city of London; from this date till his death in 1685 he annually composed a panegyric on the lord mayor, and arranged the pageantry of the lord mayor's shows, which he celebrated in verse under such titles as *London Triumphant, or the City in Jollity and Splendour* (1672), or *London in Luster, Projecting many Bright Beams of Triumph* (1679). Many volumes of these curious productions are preserved in the British Museum.

In addition to his numerous printed works, of which perhaps *A Royal Arbour of Loyall Poesie* (1664) and *A Nursery of Novelties in Variety of Poetry* are most deserving of mention, several volumes of his poems exist in manuscript. W. C. Hazlitt and other 19th-century critics found more merit in Jordan's writings than was allowed by his contemporaries, who for the most part scornfully referred to his voluminous productions as commonplace and dull.

See Gerard Langbaine, *Account of the English Dramatic Poets* (1691); David Erskine Baker, *Biographia Dramatica* (4 vols., 1812); W. C. Hazlitt, *Handbook to the Popular, Poetical and Dramatic Literature of Great Britain* (1867); F. W. Fairholt, *Lord Mayors' Pageants* (Percy Society, 1843), containing a memoir of Thomas Jordan; John Gough Nichols, *London Pageants* (1831).

JORDAN, WILHELM (1819–1904), German poet and novelist, was born at Insterburg in East Prussia on the 8th of February 1819. He studied, first theology and then philosophy and natural science, at the universities of Königsberg and Berlin. He settled in Leipzig as a journalist; but the democratic views expressed in some essays and the volumes of poems *Glocke und Kanone* (1481) and *Irdische Phantasien* (1842) led to his expulsion from Saxony in 1846. He next engaged in literary and tutorial work in Bremen, and on the outbreak of the revolution, in February 1848, was sent to Paris, as correspondent of the *Bremer Zeitung*. He almost immediately, however, returned to Germany and, throwing himself into the political fray in Berlin, was elected member for Freienwalde, in the first German parliament at Frankfort-on-Main. For a short while he sided with the Left, but soon joined the party of von Gagern. On a vote having been passed for the establishment of a German navy, he was appointed secretary of the committee to deal with the whole question, and was subsequently made ministerial councillor (*Ministerialrat*) in the naval department of the government. The naval project was abandoned, Jordan was pensioned and afterwards resided at Frankfort-on-Main until his death on the 25th of June 1904, devoting himself to literary work, acting as his own publisher, and producing numerous poems, novels, dramas and translations.

Among his best known works are: *Demiurgos* (3 vols., 1852–1854), a "Mysterium," in which he attempted to deal with the problems of human existence, but the work found little favour; *Nibelunge*, an epic poem in alliterative verse, in two parts, (1) *Sigfriedsage* (1867–1868; 13th ed. 1889) and (2) *Hildebrants Heimkehr* (1874; 10th ed. 1892)—in the first part he is regarded as having been remarkably successful; a tragedy, *Die Wittwe des Agis* (1858); the comedies, *Die Liebesleugner* (1855) and *Durchs Ohr* (1870; 6th ed. 1885); and the novels *Die Sebalds* (1885) and *Zwei Wiegen* (1887). Jordan also published numerous translations, notably *Homers Odyssee* (1876; 2nd ed. 1889) and *Homers Ilias* (1881; 2nd ed. 1894); *Die Edda* (1889). He was also distinguished as a reciter, and on a visit to the United States in 1871 read extracts from his works before large audiences.

JORDAN (the down-comer; Arab. *esh-Sheri'a*, the watering-place), the only river of Palestine and one of the most remarkable in the world. It flows from north to south in a deep trough-like valley, the Aulon of the Greeks and Ghōr of the Arabs, which is usually believed to follow the line of a fault or fracture of the earth's crust. Most geologists hold that the valley is part of an old sea-bed, traces of which remain in numerous shingle-banks and beach-levels. This, they say, once extended to the Red Sea and even over N.E. Africa. Shrinkage caused the pelagic limestone bottom to be upheaved in two ridges, between which occurred a long fracture, which can now be traced from Coelesyria down the Wadi Araba to the Gulf of Akaba. The Jordan valley in its lower part keeps about the old level of the sea-bottom and is therefore a remnant of the Miocene world. This theory, however, is not universally accepted, some authorities preferring to assume a succession of more strictly local elevations and depressions, connected with the recent volcanic activity of the Jaulan and Lija districts on the east bank, which brought the contours finally to their actual form. In any case the number of distinct sea-beaches seems to imply a succession of convulsive changes, more recent than the great Miocene upheaval, which are responsible for the shrinkage of the water into the three isolated pans now found. For more than two-thirds of its course the Jordan lies below the level of the sea. It has never been navigable, no important town has ever been built on its banks, and it runs into an inland sea which has no port and is destitute of aquatic life. Throughout history it has exerted a separatist influence, roughly dividing the settled from the nomadic populations; and the crossing of Jordan, one way or the other, was always an event in the history of Israel. In Hebrew times its valley was regarded as a "wilderness" and, except in the Roman era, seems always to have been as sparsely inhabited as now. From its sources to the Dead Sea it rushes down a continuous inclined plane, broken here and there by rapids and small falls; between the Sea of Galilee and the Dead Sea its sinuosity is so great that in a direct distance of 65 m. it traverses at least 200 m. The mean fall is about 9 ft. in the mile. The Jordan has two great sources, one in Tell el-Kadi (Dan) whence springs the Nahr Leddan, a stream 12 ft. broad at its birth; the other at Banias (anc. Paneas, Caesarea-Philippi), some 4 m. N., where the Nahr Banias issues from a cave, about 30 ft. broad. But two longer streams with less water contest their claim, the Nahr Barrighit from Coelesyria, which rises near the springs of the Litany, and the Nahr Hasbany from Hermon. The four streams unite below the fortress of Banias, which once held the gate of the valley, and flow into a marshy tract now called Huleh (Semechonitis, and perhaps Merom of Joshua. There the Jordan begins to fall below sea-level, rushing down 680 ft. in 9 m. to a delta, which opens into the Sea of Galilee. Thereafter it follows a valley which is usually not above 4 m. broad, but opens out twice into the small plains of Bethshan and Jericho. The river actually flows in a depression, the Zor, from a quarter to 2 m. wide, which it has hollowed out for itself in the bed of the Ghor. During the rainy season (January and February), when the Jordan overflows its banks, the Zor is flooded, but when the water falls it produces rich crops. The floor of the Ghor falls gently to the Zor, and is intersected by deep channels, which have been cut by the small streams and winter torrents that traverse it on their way to the Jordan. As far south as Kurn Surtabeh most of the valley is fertile, and even between that point and the Dead Sea there are several well-watered oases. In summer the heat in the Ghor is intense, 110° F. in the shade, but in winter the temperature falls to 40°, and sometimes to 32° at night. During the seasons of rain and melting snow the river is very full, and liable to freshets. After twelve hours' rain it has been known to rise from 4 to 5 ft., and to fall as rapidly. In 1257 the Jordan was dammed up for several hours by a landslip, probably due to heavy rain. On leaving the Sea of Galilee the water is quite clear, but it soon assumes a tawny colour from the soft marl which it washes away from its banks and deposits in the Dead Sea. On the whole it is an unpleasant foul stream running between poisonous banks, and as such it seems to have been regarded by the Jews and other Syrians. The Hebrew poets did not sing its praises, and others compared it unfavourably with the clear rivers of Damascus. The clay of the valley was used for brickmaking, and Solomon established brassfoundries there. From crusading times to this day it has grown sugar-cane. In Roman times it had extensive palm-groves and some small towns (*e.g.* Livias or Julias opposite Jericho) and villages. The Jordan is crossed by two stone bridges—one north of Lake Huleh, the other between that lake and the Sea of Galilee—and by a wooden bridge on the road from Jerusalem to Gilead and Moab. During the Roman period, and almost to the end of the Arab supremacy, there were bridges on all the great lines of communication between eastern and western Palestine, and ferries at other places. The depth of water varies greatly with the season. When not in flood the river is often fordable, and between the Sea of Galilee and the Dead Sea there are then more than fifty fords—some of them of historic interest. The only difficulty is occasioned by the erratic zigzag current. The natural products of the Jordan valley—a tropical oasis sunk in the temperate zone, and overhung by Alpine Hermon—are unique. Papyrus grows in Lake Huleh, and rice and cereals thrive on its shores, whilst below the Sea of Galilee the vegetation is almost tropical. The flora and fauna present a large infusion of Ethiopian types; and the fish, with which the river is abundantly stocked, have a great affinity with those of the rivers and lakes of east Africa. Ere the Jordan enters the Dead Sea, its valley has become very barren and forbidding. It reaches the lake at a minus level of 1290 ft., the depression continuing downwards to twice that depth in the bed of the Dead Sea. It receives two affluents, with perennial waters, on the left, the Yarmuk (Hieromax) which flows in from the volcanic Jaulan a little south of the Sea of Galilee, and the Zerka (Jabbok) which comes from the Belka district to a point more than half-way down the lower course. On the right the Jalud descends from the plain of Esdraelon to near Beisan, and the Far'a from near Nablus. Various salt springs rise in the lower valley. The rest of the tributaries are wadis, dry except after rains.

Such human life as may be found in the valley now is mainly migratory. The Samaritan villagers use it in winter as pasture-ground, and, with the Circassians and Arabs of the east bank, cultivate plots here and there. They retire on the approach of summer. Jericho is the only considerable settlement in the lower valley, and it lies some distance west of the stream on the lower slopes of the Judaean heights.

See W. F. Lynch, *Narrative of the U.S. Expedition*, &c. (1849); H. B. Tristram, *Land of Israel* (1865); J. Macgregor, *Rob Roy on the Jordan* (1870); A. Neubauer, *La Géographie du Talmud* (1868); E. Robinson, *Physical Geography of the Holy Land* (1865); E. Hull, *Mount Seir*, &c. (1885), and *Memoir on the Geology of Arabia Petraea*, &c. (1886); G. A. Smith, *Hist. Geography of the Holy Land* (1894); W. Libbey and F. E. Hoskins, *The Jordan Valley*, &c. (1905). See also PALESTINE. (C. W. W.; D. G. H.)

JORDANES,[1] the historian of the Gothic nation, flourished about the middle of the 6th century. All that we certainly know about his life is contained in three sentences of his history of the Goths (cap. 50), from which, among other particulars as to the history of his family, we learn that his grandfather Paria was notary to Candac, the chief of a confederation of Alans and other tribes settled during the latter half of the 5th century on the south of the Danube in the provinces which are now Bulgaria and the Dobrudscha. Jordanes himself was the notary of Candac's nephew, the Gothic chief Gunthigis, until he took the vows of a monk. This, according to the manner of speaking of that day, is the meaning of his words *ante conversionem meam*, though it is quite possible that he may at the same time have renounced the Arian creed of his forefathers, which it is clear that he no longer held when he wrote his Gothic history. The *Getica* of Jordanes shows Gothic sympathies; but these are probably due to an imitation of the tone of Cassiodorus, from whom he draws practically all his material. He was not himself a Goth, belonging to a confederation of Germanic tribes, embracing Alans and Scyrians, which had come under the influence of the Ostrogoths settled on the lower Danube; and his own sympathies are those of a member of this confederation. He is accordingly friendly to the Goths, even apart from the influence of Cassiodorus; but he is also prepossessed in favour of the eastern emperors in whose territories this confederation lived and whose subject he himself was. This makes him an impartial authority on the last days of the Ostrogoths. At the same time, living in Moesia, he is restricted in his outlook to Danubian affairs. He has little to say of the inner history and policy of the kingdom of Theodoric: his interests lie, as Mommsen says, within a triangle of which the three points are Sirmium, Larissa and Constantinople. Finally, connected as he was with the Alans, he shows himself friendly to them, whenever they enter into his narrative.

We pass from the extremely shadowy personality of Jordanes to the more interesting question of his works.

1. The *Romana*, or, as he himself calls it, *De summa temporum vel origine actibusque gentis Romanorum*, was composed in 551. It was begun before, but published after, the *Getica*. It is a sketch of the history of the world from the creation, based on Jerome, the epitome of Florus, Orosius and the ecclesiastical history of Socrates. There is a curious reference to Iamblichus, apparently the neo-platonist philosopher, whose name Jordanes, being, as he says himself, *agrammatus*, inserts by way of a flourish. The work is only of any value for the century 450–550, when Jordanes is dealing with recent history. It is merely a hasty compilation intended to stand side by side with the *Getica*.[2]

2. The other work of Jordanes commonly called *De rebus Geticis* or *Getica*, was styled by himself *De origine actibusque*

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[1] The evidence of MSS. is overwhelming against the form Jornandes. The MSS. exhibit Jordanis or Jordannis; but these are only Vulgar-Latin spellings of Jordanes.

[2] The terms of the dedication of this book to a certain Vigilius make it impossible that the pope (538–555) of that name is meant.

Getarum, and was also written in 551. He informs us that while he was engaged upon the *Romana* a friend named Castalius invited him to compress into one small treatise the twelve books—now lost—of the senator Cassiodorus, on *The Origin and Actions of the Goths*. Jordanes professes to have had the work of Cassiodorus in his hands for but three days, and to reproduce the sense not the words; but his book, short as it is, evidently contains long verbatim extracts from the earlier author, and it may be suspected that the story of the *triduana lectio* and the apology *quamvis verba non recolo*, possibly even the friendly invitation of Castalius, are mere blinds to cover his own entire want of originality. This suspicion is strengthened by the fact (discovered by von Sybel) that even the very preface to his book is taken almost word for word from Rufinus's translation of Origen's commentary on the epistle to the Romans. There is no doubt, even on Jordanes' own statements, that his work is based upon that of Cassiodorus, and that any historical worth which it possesses is due to that fact. Cassiodorus was one of the very few men who, Roman by birth and sympathies, could yet appreciate the greatness of the barbarians by whom the empire was overthrown. The chief adviser of Theodoric, the East Gothic king in Italy, he accepted with ardour that monarch's great scheme, if indeed, he did not himself originally suggest it, of welding Roman and Goth together into one harmonious state which should preserve the social refinement and the intellectual culture of the Latin-speaking races without losing the hardy virtues of their Teutonic conquerors. To this aim everything in the political life of Cassiodorus was subservient, and this aim he evidently kept before him in his Gothic history. But in writing that history Cassiodorus was himself indebted to the work of a certain Ablabius. It was Ablabius, apparently, who had first used the Gothic sagas (*prisca carmina*); it was he who had constructed the stem of the Amals. Whether he was a Greek, a Roman or a Goth we do not know; nor can we say when he wrote, though his work may be dated conjecturally in the early part of the reign of Theodoric the Great. We can only say that he wrote on the origin and history of the Goths, using both Gothic saga and Greek sources; and that if Jordanes used Cassiodorus, Cassiodorus used, if to a less extent, the work of Ablabius.

Cassiodorus began his work, at the request of Theodoric, and therefore before 526: it was finished by 533. At the root of the work lies a theory, whencesoever derived, which identified the Goths with the Scythians, whose country Darius Hystaspes invaded, and with the Getae of Dacia, whom Trajan conquered. This double identification enabled Cassiodorus to bring the favoured race into line with the peoples of classical antiquity, to interweave with their history stories about Hercules and the Amazons, to make them invade Egypt, to claim for them a share in the wisdom of the semi-mythical Scythian philosopher Zamolxis. He was thus able with some show of plausibility to represent the Goths as "wiser than all the other barbarians and almost like the Greeks" (Jord., *De reb. Get.*, cap. v.), and to send a son of the Gothic king Telephus to fight at the siege of Troy, with the ancestors of the Romans. All this we can now perceive to have no relation to history, but at the time it may have made the subjugation of the Roman less bitter to feel that he was not after all bowing down before a race of barbarian upstarts, but that his Amal sovereign was as firmly rooted in classical antiquity as any Julius or Claudius who ever wore the purple. In the eighteen years which elapsed between 533 and the composition of the *Getica* of Jordanes, great events, most disastrous for the Romano-Gothic monarchy of Theodoric, had taken place. It was no longer possible to write as if the whole civilization of the Western world would sit down contentedly under the shadow of East Gothic dominion and Amal sovereignty. And, moreover, the instincts of Jordanes, as a subject of the Eastern Empire, predisposed him to flatter the sacred majesty of Justinian, by whose victorious arms the overthrow of the barbarian kingdom in Italy had been effected. Hence we perceive two currents of tendency in the *Getica*. On the one hand, as a transcriber of the philo-Goth Cassiodorus, he magnifies the race of Alaric and Theodoric, and claims for them their full share, perhaps more than their full share, of glory in the past. On the other hand he speaks of the great anti-Teuton emperor Justinian, and of his reversal of the German conquests of the 5th century, in language which would certainly have grated on the ears of Totila and his heroes. When Ravenna is taken, and Vitigis carried into captivity, Jordanes almost exults in the fact that "the nobility of the Amals and the illustrious offspring of so many mighty men have surrendered to a yet more illustrious prince and a yet mightier general, whose fame shall not grow dim through all the centuries." (*Getica*, lx. § 315).

This laudation, both of the Goths and of their Byzantine conquerors, may perhaps help us to understand the motive with which the *Getica* was written. In the year 551 Germanus, nephew of Justinian, accompanied by his bride, Matasuntha, grand-daughter of Theodoric, set forth to reconquer Italy for the empire. His early death prevented any schemes for a revived Romano-Gothic kingdom which may have been based on his personality. His widow, however, bore a posthumous child, also named Germanus, of whom Jordanes speaks (cap. 60) as "blending the blood of the Anicii and the Amals, and furnishing a hope under the divine blessing of one day uniting their glories." This younger Germanus did nothing in after life to realize these anticipations; but the somewhat pointed way in which his name and his mother's name are mentioned by Jordanes lends some probability to the view that he hoped for the child's succession to the Eastern Empire, and the final reconciliation of the Goths and Romans in the person of a Gotho-Roman emperor.

The *De rebus Geticis* falls naturally into four parts. The first (chs. i.–xiii.) commences with a geographical description of the three quarters of the world, and in more detail of Britain and Scanzia (Sweden), from which the Goths under their king Berig migrated to the southern coast of the Baltic. Their migration across what has since been called Lithuania to the shores of the Euxine, and their differentiation into Visigoths and Ostrogoths, are nest described. Chs. v.–xiii. contain an account of the intrusive Geto-Scythian element before alluded to.

The second section (chs. xiv.–xxiv.) returns to the true history of the Gothic nation, sets forth the genealogy of the Amal kings, and describes the inroads of the Goths into the Roman Empire in the 3rd century, with the foundation and the overthrow of the great but somewhat shadowy kingdom of Hermanric.

The third section (chs. xxv.–xlvii.) traces the history of the West Goths from the Hunnish invasion to the downfall of the Gothic kingdom in Gaul under Alaric II. (376–507). The best part of this section, and indeed of the whole book, is the seven chapters devoted to Attila's invasion of Gaul and the battle of the Mauriac plains. Here we have in all probability a verbatim extract from Cassiodorus, who (possibly resting on Ablabius) interwove with his narrative large portions of the Gothic sagas. The celebrated expression *certaminis gaudia* assuredly came at first neither from the suave minister Cassiodorus nor from the small-souled notary Jordanes, but is the translation of some thought which first found utterance through the lips of a Gothic minstrel.

The fourth section (chs. xlviii.–lx.) traces the history of the East Goths from the same Hunnish invasion to the first overthrow of the Gothic monarchy in Italy (376–539). In this fourth section are inserted, somewhat out of their proper place, some valuable details as to the *Gothi Minores*, "an immense people dwelling in the region of Nicopolis, with their high priest and primate Vulfilas, who is said also to have taught them letters." The book closes with the allusion to Germanus and the panegyric on Justinian as the conqueror of the Goths referred to above.

Jordanes refers in the *Getica* to a number of authors besides Cassiodorus; but he owes his knowledge of them to Cassiodorus. It is perhaps only when he is using Orosius that we can hold Jordanes to have borrowed directly. Otherwise, as Mommsen says, the *Getica is a mera epitome, laxata ea et perversa, historiae Gothicae Cassiodorianae*.

As to the style and literary character of Jordanes, every author who has used him speaks in terms of severe censure. When he is left to himself and not merely transcribing, he is sometimes scarcely grammatical. There are awkward gaps in his narrative and statements inconsistent with each other. He quotes, as if he were familiarly acquainted with their writings, a number of Greek and Roman writers, of whom it is almost certain that he had not read more than one or two. At the same time he does not quote the chronicler Marcellinus, from whom he has copied verbatim the history of the deposition of Augustulus. All these faults make him a peculiarly unsatisfactory authority where we cannot check his statements by those of other authors. It may, however, be pleaded in extenuation that he is professedly a transcriber, and, if his story be correct, a transcriber in peculiarly unfavourable circumstances. He has also himself suffered much from the inaccuracy of copyists. But nothing has really been more unfortunate for the reputation of Jordanes as a writer than the extreme preciousness of the information which he has preserved to us. The Teutonic tribes whose dim origins he records have in the course of centuries attained to world-wide dominion. The battle in the Mauriac plains of which he is really the sole historian, is now seen to have had important bearings on the destinies of the world. And thus the hasty pamphlet of a half-educated Gothic monk has been forced into prominence, almost into rivalry with the finished productions of the great writers of classical antiquity. No wonder that it stands the comparison badly; but with all its faults the *Getica* of Jordanes will probably ever retain its place side by side with the *De moribus Germanorum* of Tacitus as a chief source of information respecting the history, institutions and modes of thought of our Teutonic forefathers.

EDITIONS.—The classical edition is that of Mommsen (in *Mon. Germ. hist. auct. antiq.*, v., ii.), which supersedes the older editions, such as that in the first volume of Muratori's *Scriptt. rer. Ital.* The best MS. is the Heidelberg MS., written in Germany, probably in the 8th century; but this perished in the fire at Mommsen's house. The next of the MSS. in value are the Vaticanus Palatinus of the 10th century, and the Valenciennes MS. of the 9th.

AUTHORITIES.—Von Sybel's essay, *De fontibus Jordanis* (1838); Schirren's *De ratione quae inter Jordanem et Cassiodorum intercedat Commentatio* (Dorpat, 1858); Kopke's *Die Anfänge des Königthums bei den Gothen* (Berlin, 1859); Dahn's *Die Könige der Germanen*, vol. ii. (Munich, 1861); Ebert's *Geschichte der Christlich-Lateinischen Literatur* (Leipsic, 1874); Wattenbach's *Deutschlands Geschichtsquellen im Mittelalter* (Berlin, 1877); and the introduction of Mommsen to his edition. (T. H.; E. BR.)

JORDANUS (JORDAN CATALANI) (*fl.* 1321–1330), French Dominican missionary and explorer in Asia, was perhaps born at Séverac in Aveyron, north-east of Toulouse. In 1302 he may have accompanied the famous Thomas of Tolentino, via Negropont, to the East; but it is only in 1321 that we definitely discover him in western India, in the company of the same Thomas and certain other Franciscan missionaries on their way to China. Ill-luck detained them at Tana in Salsette island, near Bombay; and here Jordanus' companions ("the four martyrs of Tana") fell victims to Moslem fanaticism (April 7, 1321). Jordanus, escaping, worked some time at Baruch in Gujarat, near the Nerbudda estuary, and at Suali (?) near Surat; to his fellow-Dominicans in north Persia he wrote two letters—the first from Gogo in Gujarat (October 12, 1321), the second from Tana (January 24, 1323/4)—describing the progress of this new mission. From these letters we learn that Roman attention had already been directed, not only to the Bombay region, but also to the extreme south of the Indian peninsula, especially to "Columbum," Quilon, or Kulam in Travancore; Jordanus' words may imply that he had already started a mission there before October 1321. From Catholic traders he had learnt that Ethiopia (*i.e.* Abyssinia and Nubia) was accessible to Western Europeans; at this very time, as we know from other sources, the earliest Latin missionaries penetrated thither. Finally, the *Epistles* of Jordanus, like the contemporary *Secreta* of Marino Sanuto (1306–1321), urge the pope to establish a Christian fleet upon the Indian seas. Jordanus, between 1324 and 1328 (if not earlier), probably visited Kulam and selected it as the best centre for his future work; it would also appear that he revisited Europe about 1328, passing through Persia, and perhaps touching at the great Crimean port of Soldaia or Sudak. He was appointed a bishop in 1328 and nominated by Pope John XXII. to the see of Columbum in 1330. Together with the new bishop of Samarkand, Thomas of Mancasola, Jordanus was commissioned to take the pall to John de Cora, archbishop of Sultaniyah in Persia, within whose province Kulam was reckoned; he was also commended to the Christians of south India, both east and west of Cape Comorin, by Pope John. Either before going out to Malabar as bishop, or during a later visit to the west, Jordanus probably wrote his *Mirabilia*, which from internal evidence can only be fixed within the period 1329–1338; in this work he furnished the best account of Indian regions, products, climate, manners, customs, fauna and flora given by any European in the Middle Ages—superior even to Marco Polo's. In his triple division of the Indies, India Major comprises the shorelands from Malabar to Cochin China; while India Minor stretches from Sind (or perhaps from Baluchistan) to Malabar; and India Tertia (evidently dominated by African conceptions in his mind) includes a vast undefined coast-region west of Baluchistan, reaching into the neighbourhood of, but not including, Ethiopia and Prester John's domain. Jordanus' *Mirabilia* contains the earliest clear African identification of Prester John, and what is perhaps the first notice of the Black Sea under that name; it refers to the author's residence in India Major and especially at Kulam, as well as to his travels in Armenia, north-west Persia, the Lake Van region, and Chaldaea; and it supplies excellent descriptions of Parsee doctrines and burial customs, of Hindu ox-worship, idol-ritual, and suttee, and of Indian fruits, birds, animals and insects. After the 8th of April 1330 we have no more knowledge of Bishop Jordanus.

Of Jordanus' *Epistles* there is only one MS., viz. Paris, National Library, 5006 Lat., fol. 182, r. and v.; of the *Mirabilia* also one MS. only, viz. London, British Museum, *Additional MSS.*, 19,513, fols. 3, r.–12 r. The text of the *Epistles* is in Quétif and Echard, *Scriptores ordinis praedicatorum*, i. 549–550 (Epistle I.); and in Wadding, *Annales minorum*, vi. 359–361 (Epistle II.); the text of the *Mirabilia* in the Paris Geog. Soc.'s *Recueil de voyages*, iv. 1–68 (1839). The Papal letters referring to Jordanus are in Raynaldus, *Annales ecclesiastici, 1330*, §§ lv. and lvii (April 8; Feb. 14). See also Sir H. Yule's *Jordanus*, a version of the *Mirabilia* with a commentary (Hakluyt Soc., 1863) and the same editor's *Cathay*, giving a version of the *Epistles*, with a commentary, &c. (Hak. Soc., 1866) pp. 184–185, 192–196, 225–230; F. Kunstmann, "Die Mission in Meliapor und Tana" and "Die Mission in Columbo" in the *Historisch-politische Blätter* of Phillips and Görres, xxxvii. 25–38, 135–152 (Munich, 1856), &c.; C. R. Beazley, *Dawn of Modern Geography*, iii. 215–235. (C. R. B.)

JORIS, DAVID, the common name of JAN JORISZ or JORISZOON (*c.* 1501–1556), Anabaptist heresiarch who called himself later JAN VAN BRUGGE; was born in 1501 or 1502, probably in Flanders, at Ghent or Bruges. His father, Georgius Joris de Koman, otherwise Joris van Amersfoordt, probably a native of Bruges, was a shopkeeper and amateur actor at Delft; from the circumstance that he played the part of King David, his son received the name of David, but probably not in baptism. His mother was Marytje, daughter of Jan de Gorter, of a good family in Delft. As a child he was clever and delicate. He seems then or later to have acquired some tincture of learning. His first known occupation was that of a glass-painter; in 1522 he painted windows for the church at Enkhuizen, North Holland (the birthplace of Paul Potter). In pursuit of his art he travelled, and is said to have reached England; ill-health drove him homewards in 1524, in which year he married Dirckgen Willems at Delft. In the same year the Lutheran reformation took hold of him, and he began to issue appeals in prose and verse against the Mass and against the pope as antichrist. On Ascension Day 1528 he committed an outrage on the sacrament carried in procession; he was placed in the pillory, had his tongue bored, and was banished from Delft for three years. He turned to the Anabaptists, was rebaptized in 1533, and for some years led a wandering life. He came into relations with John à Lasco, and with Menno Simons. Much influenced by Melchior Hofman, he had no sympathy with the fanatic violence of the Münster faction. At the Buckholdt conference in August 1536 he played a mediating part. His mother, in 1537, suffered martyrdom as an Anabaptist. Soon after he took up a rôle of his own, having visions and a gift of prophecy. He adapted in his own interest the theory (constantly recurrent among mystics and innovators, from the time of Abbot Joachim to the present day) of three dispensations, the old, with its revelation of the Father, the newer with its revelation of the Son, and the final or era of the Spirit. Of this newest revelation Christus David was the mouthpiece, supervening on Christus Jesus. From the 1st of April 1544, bringing with him some of his followers, he took up his abode in Basel, which was to be the New Jerusalem. Here he styled himself Jan van Brugge. His identity was unknown to the authorities of Basel, who had no suspicion of his heresies. By his writings he maintained his hold on his numerous followers in Holland and Friesland. These monotonous writings, all in Dutch, flowed in a continual stream from 1524 (though none is extant before 1529) and amounted to over 200 in number. His *magnum opus* was *'T Wonder Boeck* (*n.d.* 1542, divided into two parts; 1551, handsomely reprinted, divided into four parts; both editions anonymous). Its chief claim to recognition is its use, in the latter part, of the phrase *Restitutio Christi*, which apparently suggested to Servetus his title *Christianismi Restitutio* (1553). In the 1st edition is a figure of the "new man," signed with the author's monogram, and probably drawn as a likeness of himself; it fairly corresponds with the alleged portrait, engraved in 1607, reproduced in the appendix to A. Ross's *Pansebeia* (1655), and idealized by P. Burckhardt in 1900. Another work, *Verklaringe der Scheppenissen* (1553) treats mystically the book of Genesis, a favourite theme with Boehme, Swedenborg and others. His remaining writings exhibit all that easy dribble of triumphant muddiness which disciples take as depth. His wife died on the 22nd of August, and his own death followed on the 25th of August 1556. He was buried, with all religious honours, in the church of St Leonard, Basel. Three years later, Nicolas Blesdijk, who had married his eldest daughter Jannecke (Susanna), but had lost confidence in Jorisz some time before his death, denounced the dead man to the authorities of Basel. An investigation was begun in March 1559, and as the result of a conviction for heresy the exhumed body of Jorisz was burned, together with his portrait, on the 13th of May 1559. Blesdijk's *Historia* (not printed till 1642) accuses Jorisz of having *plures uxores*. Of this there is no confirmation. Theoretically Jorisz regarded polygamy as lawful; there is no proof that his theory affected his own practice.

The first attempt at a true account of Jorisz was by Gottfried Arnold, in his anonymous *Historia* (1713), pursued with much fuller material in his *Kirchen und Ketzer Historie* (best ed. 1740–1742). See also F. Nippold, in *Zeitschrift für die historische Theologie* (1863, 1864, 1868); A. van der Linde, in *Allgemeine Deutsche Biographie* (1881); P. Burckhardt, *Basler Biographien* (1900); Hegler, in Hauck's *Realencyklopädie* (1901), and the bibliography by A. van der Linde, 1867, supplemented by E. Weller, 1869. (A. Go.*)

JORTIN, JOHN (1698–1770), English theologian, the son of a Protestant refugee from Brittany, was born in London on the 23rd of October 1698. He went to Charterhouse School, and in 1715 became a pensioner of Jesus College, Cambridge, where his reputation as a Greek scholar led to his being selected to translate certain passages from Eustathius for the notes to Pope's *Homer*. In 1722 he published a small volume of Latin verse entitled *Lusus poetici*. Having taken orders in 1724, he was in 1726 presented by his college to the vicarage of Swavesey in Cambridgeshire, which he resigned in 1730 to become preacher at a chapel-of-ease in New Street, London. In 1731, along with some friends, he began a publication entitled *Miscellaneous Observations on Authors Ancient and Modern*, which appeared at intervals during two years. He was Boyle lecturer in 1749. Shortly after becoming chaplain to the bishop of London in 1762 he was appointed to a prebendal stall of St Paul's and to the vicarage of Kensington, and in 1764 he was made archdeacon of London. He died at Kensington on the 5th of September 1770.

The principal works of Jortin are: *Discussions Concerning the Truth of the Christian Religion* (1746); *Remarks on Ecclesiastical History* (3 vols. 1751–2–4); *Life of Erasmus* (2 vols. 1750, 1760) founded on the Life by Jean Le Clerc; and *Tracts Philological Critical and Miscellaneous* (1790). A collection of his *Various Works* appeared in 1805–1810. All his writings display wide learning and acuteness. He writes on theological subjects with the detachment of a thoughtful layman, and is witty without being flippant. See John Disney's *Life of Jortin* (1792).

JOSEPH, in the Old Testament, the son of the patriarch Jacob by Rachel; the name of a tribe of Israel. Two explanations of the name are given by the Biblical narrator (Gen. xxx. 23 [E], 24 [J]); a third, "He (God) increases," seems preferable. Unlike the other "sons" of Jacob, Joseph is usually reckoned as two tribes (viz. his "sons" Ephraim and Manasseh), and closely associated with it is the small tribe of Benjamin (*q.v.*), which lay immediately to the south. These three constituted the "sons" of Rachel (the ewe), and with the "sons" of Leah (the antelope?) are thus on a higher level than the "sons" of Jacob's concubines. The "house of Joseph" and its offshoots occupied the centre of Palestine from the plain of Esdraelon to the mountain country of Benjamin, with dependencies in Bashan and northern Gilead (see MANASSEH). Practically it comprised the northern kingdom, and the name is used in this sense in 2 Sam. xix. 20; Amos v. 6; vi. 6 (note the prominence of Joseph in the blessings of Jacob and Moses, Gen. xlix., Deut. xxxiii.). Originally, however, "Joseph" was more restricted, possibly to the immediate neighbourhood of Shechem, its later extension being parallel to the development of the name Jacob. The dramatic story of the tribal ancestor is recounted in Gen. xxxvii.–l. (see GENESIS). Joseph, the younger and envied son, is seized by his brothers at Dothan north of Shechem, and is sold to a party of Ishmaelites or Midianites, who carry him down to Egypt. After various vicissitudes he gains the favour of the king of Egypt by the interpretation of a dream, and obtains a high place in the kingdom.[1] Forced by a famine his brothers come to buy food, and in the incidents that follow Joseph shows his preference for his young brother Benjamin (cf. the tribal data above). His father Jacob is invited to come to Goshen, where a settlement is provided for the family and their flocks. This is followed many years later by the exodus, the conquest of Palestine, and the burial of Joseph's body in the grave at Shechem which his father had bought.

The history of Joseph in Egypt displays some familiarity with the circumstances and usages of that country; see Driver (Hastings's *D.B.*) and Cheyne (*Ency. Bib.*, col. 2589 seq.); although Abrech (xli. 43), possibly the Egyptian *ib rk* (Crum, in Hastings's *D.B.*, i. 665), has been otherwise connected with the Assyrian *abarakku* (a high officer). An interesting parallel to the story of Joseph in Gen. xxxix. is found in the Egyptian tale of *The Two Brothers* (Petrie, *Eg. Tales*, 2nd series, p. 36 seq., 1895), which dates from about 1500 B.C., but the differences are not inconsiderable compared with the points of resemblance, and the tale has features which are almost universal (Frazer, *Golden Bough*, 2nd ed., vol. iii. 351 seq.). On the theory that the historical elements of Joseph's history refer to an official (Yanḥamu) of the time of Amenophis III. and IV., see Cheyne, *op. cit.*, and *Hibbert Journal*, October 1903. That the present form of the narrative has been influenced by current mythological lore is not improbable; on this question see (with caution) Winckler, *Gesch. Israels*, ii. 67–77 (1900); A. Jeremias, *Alte Test.*, pp. 383 sqq. (1906). It may be added that the Egyptian names in the story of Joseph are characteristic of the XXII. and subsequent dynasties. See, also Meyer and Luther, *Die Israeliten* (1906), Index, *s.v.* (S. A. C.)

JOSEPH, in the New Testament, the husband of Mary, the mother of Jesus. He is represented as a descendant of the house of David, and his genealogy appears in two divergent forms in Matt. i. 1–17 and Luke iii. 23–38. The latter is probably much more complete and accurate in details. The former, obviously artificial in structure (notice 3×14 generations), traces the Davidic descent through kings, and is governed by an apologetic purpose. Of Joseph's personal history practically nothing is recorded in the Bible. The facts concerning him common to the two birth-narratives (Matt. i.–ii.; Luke i.–ii.) are: (*a*) that he was a descendant of David, (*b*) that Mary was already betrothed to him when she was found with child of the Holy Ghost, and (*c*) that he lived at Nazareth after the birth of Christ; but these facts are handled differently in each case. It is noticeable that, in Matthew, Joseph is prominent (*e.g.* he receives an annunciation from an angel), while in Luke's narrative he is completely subordinated. Bp Gore (*The Incarnation*, Bampton lecture for 1891, p. 78) points out that Matthew narrates everything from Joseph's side, Luke from Mary's, and infers that the narrative of the former may ultimately be based on Joseph's account, that of the latter on Mary's. The narratives seem to have been current (in a poetical form) among the early Jewish-Christian community of Palestine. At Nazareth Joseph followed the trade of a carpenter (Matt. xiii. 55). It is probable that he had died before the public ministry of Christ; for no mention is made of him in passages relating to this period where the mother and brethren of Jesus are introduced; and from John xix. 26 it is clear that he was not alive at the time of the Crucifixion.

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[1] Joseph's marriage with the daughter of the priest of On might show that the tribes of Ephraim and Manasseh were believed to be half-Egyptian by descent, but it is notoriously difficult to determine how much is of ethnological value and how much belongs to romance (viz. that of the individual Joseph).

Joseph was the father of several children (Matt. xiii. 55), but according to ecclesiastical tradition by a former marriage. The reading of Matt. i. 16, in the Sinaitic Palimpsest (*Joseph . . . . begat Jesus, who is called the Christ*) also makes him the natural father of Jesus, and this was the view of certain early heretical sects, but it seems never to have been held in orthodox Christian circles. According to various apocryphal gospels (conveniently collected in B. H. Cowper's *The Apocryphal Gospels*, 1881), when married to Mary he was a widower already 80 years of age, and the father of four sons and two daughters; his first wife's name was Salome and she was a connexion of the family of John the Baptist.

In the Roman Catholic Church the 19th of March has since 1642 been a feast in Joseph's honour. Two other festivals in his honour have also been established (the Patronage of St Joseph, 3rd Sunday after Easter, and the Betrothal of Mary and Joseph, 23rd of January). In December 1870 St Joseph was proclaimed Patron of the whole Church. (G. H. Bo.)

JOSEPH OF ARIMATHAEA,[1] in the New Testament, a wealthy Jew who had been converted by Jesus Christ. He is mentioned by the Four Evangelists, who are in substantial agreement concerning him: after the Crucifixion he went to Pilate and asked for the body of Jesus, subsequently prepared it for burial and laid it in a tomb. There are, however, minor differences in the accounts, which have given rise to controversy. Matthew (xxvii. 60) says that the tomb was Joseph's own; Mark (xv. 43 seq.), Luke (xxiii. 50 seq.) say nothing of this, while John (xix. 41) simply says that the body was laid in a sepulchre "nigh at hand." Both Mark and Luke say that Joseph was a "councillor" (*εὐσχήμων βουλευτής*, Mark xv. 43), and the Gospel of Peter describes him as a "friend of Pilate and of the Lord." This last statement is probably a late invention, and there is considerable difficulty as to "councillor." That Joseph was a member of the Sanhedrin is improbable. Luke indeed, regarding him as such, says that he "had not consented to their counsel and deed," but Mark (xiv. 64) says that *all* the Sanhedrin "condemned him to be worthy of death." Perhaps the phrase "noble councillor" is intended to imply merely a man of wealth and position. Again Matthew says that Joseph was a disciple, while Mark implies that he was not yet among the definite adherents of Christ, and John describes him as an adherent "secretly for fear of the Jews." Most likely he was a disciple, but belonged only to the wider circle of adherents. The account given in the Fourth Gospel suggests that the writer, faced with these various difficulties, assumed a double tradition: (1) that Joseph of Arimathaea, a wealthy disciple, buried the body of Christ; (2) that the person in question was Joseph of Arimathaea a "councillor," and solved the problem by substituting Nicodemus as the councillor; hence he describes both Joseph and Nicodemus (xix. 39) as co-operating in the burial. Some critics (*e.g.* Strauss, *New Life of Jesus*, ch. 96) have thrown doubt upon the story, regarding some of the details as invented to suit the prophecy in Isa. liii. 9, "they made his grave with the wicked, and with the rich in his death" (for various translations, see Hastings's *Dict. Bible*, ii. 778). But in the absence of any reference to this prophecy in the Gospels, this view is unconvincing, though the correspondence is remarkable.

The striking character of this single appearance of Joseph of Arimathaea led to the rise of numerous legends. Thus William of Malmesbury says that he was sent to Britain by St Philip, and, having received a small island in Somersetshire, there constructed "with twisted twigs" the first Christian church in Britain—afterwards to become the Abbey of Glastonbury. The legend says that his staff, planted in the ground, became a thorn flowering twice a year (see GLASTONBURY). This tradition—which is given only as such by Malmesbury himself—is not confirmed, and there is no mention of it in either Gildas or Bede. Joseph also plays a large part in the various versions of the Legend of the Holy Grail (see GRAIL, THE HOLY).

JOSEPH I. (1678–1711), Roman emperor, was the elder son of the emperor Leopold I. and his third wife, Eleanora, countess palatine, daughter of Philip William of Neuburg. Born in Vienna on the 26th of July 1678, he was educated strictly by Prince Dietrich Otto von Salm, and became a good linguist. In 1687 he received the crown of Hungary, and he was elected king of the Romans in 1690. In 1699 he married Wilhelmina Amalia, daughter of Duke Frederick of Brunswick-Lüneburg, by whom he had two daughters. In 1702, on the outbreak of the War of the Spanish Succession, he saw his only military service. He joined the imperial general Louis of Baden in the siege of Landau. It is said that when he was advised not to go into a place of danger he replied that those who were afraid might retire. He succeeded his father as emperor in 1705, and it was his good fortune to govern the Austrian dominions, and to be head of the Empire during the years in which his trusted general Prince Eugène, either acting alone in Italy or with the duke of Marlborough in Germany and Flanders, was beating the armies of Louis XIV. During the whole of his reign Hungary was disturbed by the conflict with Francis Ráckóczy II., who eventually took refuge in France. The emperor did not himself take the field against the rebels, but he is entitled to a large share of the credit for the restoration of his authority. He reversed many of the pedantically authoritative measures of his father, thus placating all opponents who could be pacified, and he fought stoutly for what he believed to be his rights. Joseph showed himself very independent towards the pope, and hostile to the Jesuits, by whom his father had been much influenced. He had the tastes for art and music which were almost hereditary in his family, and was an active hunter. He began the attempts to settle the question of the Austrian inheritance by a pragmatic sanction, which were continued by his brother Charles VI. Joseph died in Vienna on the 17th of April 1711, of small-pox.

See F. Krones von Marchland, *Grundriss der Oesterreichischen Geschichte* (1882); F. Wagner, *Historia Josephi Caesaris* (1746); J. C. Herchenhahn, *Geschichte der Regierung Kaiser Josephs I.* (1786–1789); C. van Noorden, *Europäische Geschichte im 18. Jahrhundert* (1870–1882).

JOSEPH II. (1741–1790), Roman emperor, eldest son of the empress Maria Theresa and her husband Francis I., was born on the 13th of March 1741, in the first stress of the War of the Austrian Succession. Maria Theresa gave orders that he was only to be taught as if he were amusing himself; the result was that he acquired a habit of crude and superficial study. His real education was given him by the writings of Voltaire and the encyclopaedists, and by the example of Frederick the Great. His useful training was conferred by government officials, who were directed to instruct him in the mechanical details of the administration of the numerous states composing the Austrian dominions and the Empire. In 1761 he was made a member of the newly constituted council of state (*Staatsrath*) and began to draw up minutes, to which he gave the name of "reveries," for his mother to read. These papers contain the germs of his later policy, and of all the disasters which finally overtook him. He was a friend to religious toleration, anxious to reduce the power of the church, to relieve the peasantry of feudal burdens, and to remove restrictions on trade and on knowledge. So far he did not differ from Frederick, Catherine of Russia or his own brother and successor Leopold II., all enlightened rulers of the 18th-century stamp. Where Joseph differed from great contemporary rulers, and where he was very close akin to the Jacobins, was in the fanatical intensity of his belief in the power of the state when directed by reason, of his right to speak for the state uncontrolled by laws, and of the reasonableness of his own reasons. Also he had inherited from his mother all the belief of the house of Austria in its "august" quality, and its claim to acquire whatever it found desirable for its power or its profit. He was unable to understand that his philosophical plans for the moulding of mankind could meet with pardonable opposition. The overweening character of the man was obvious to Frederick, who, after their first interview in 1769, described him as ambitious, and as capable of setting the world on fire. The French minister Vergennes, who met Joseph when he was travelling incognito in 1777, judged him to be "ambitious and despotic."

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[1] Generally identified with Ramathaim-Zophim, the city of Elkanah in the hilly district of Ephraim (1 Sam. i. 1), near Diospolis (Lydda). See Euseb., *Onomasticon*, 225. 12.

Until the death of his mother in 1780 Joseph was never quite free to follow his own instincts. After the death of his father in 1765 he became emperor and was made co-regent by his mother in the Austrian dominions. As emperor he had no real power, and his mother was resolved that neither husband nor son should ever deprive her of sovereign control in her hereditary dominions. Joseph, by threatening to resign his place as co-regent, could induce his mother to abate her dislike to religious toleration. He could, and he did, place a great strain on her patience and temper, as in the case of the first partition of Poland and the Bavarian War of 1778, but in the last resort the empress spoke the final word. During these wars Joseph travelled much. He met Frederick the Great privately at Neisse in 1769, and again at Mährisch-Neustadt in 1770. On the second occasion he was accompanied by Prince Kaunitz, whose conversation with Frederick may be said to mark the starting-point of the first partition of Poland. To this and to every other measure which promised to extend the dominions of his house Joseph gave hearty approval. Thus he was eager to enforce its claim on Bavaria upon the death of the elector Maximilian Joseph in 1777. In April of that year he paid a visit to his sister the queen of France (see Marie Antoinette), travelling under the name of Count Falkenstein. He was well received, and much flattered by the encyclopaedists, but his observations led him to predict the approaching downfall of the French monarchy, and he was not impressed favourably by the army or navy. In 1778 he commanded the troops collected to oppose Frederick, who supported the rival claimant to Bavaria. Real fighting was averted by the unwillingness of Frederick to embark on a new war and by Maria Theresa's determination to maintain peace. In April 1780 he paid a visit to Catherine of Russia, against the wish of his mother.

The death of Maria Theresa on the 27th of November 1780 left Joseph free. He immediately directed his government on a new course, full speed ahead. He proceeded to attempt to realize his ideal of a wise despotism acting on a definite system for the good of all. The measures of emancipation of the peasantry which his mother had begun were carried on by him with feverish activity. The spread of education, the secularization of church lands, the reduction of the religious orders and the clergy in general to complete submission to the lay state, the promotion of unity by the compulsory use of the German language, everything which from the point of view of 18th-century philosophy appeared "reasonable" was undertaken at once. He strove for administrative unity with characteristic haste to reach results without preparation. His anti-clerical innovations induced Pope Pius VI. to pay him a visit in July 1782. Joseph received the pope politely, and showed himself a good Catholic, but refused to be influenced. So many interferences with old customs began to produce unrest in all parts of his dominions. Meanwhile he threw himself into a succession of foreign policies all aimed at aggrandisement, and all equally calculated to offend his neighbours—all taken up with zeal, and dropped in discouragement. He endeavoured to get rid of the Barrier Treaty, which debarred his Flemish subjects from the navigation of the Scheldt; when he was opposed by France he turned to other schemes of alliance with Russia for the partition of Turkey and Venice. They also had to be given up in the face of the opposition of neighbours, and in particular of France. Then he resumed his attempts to obtain Bavaria—this time by exchanging it for Belgium—and only provoked the formation of the *Fürstenbund* organized by the king of Prussia. Finally he joined Russia in an attempt to pillage Turkey. It began on his part by an unsuccessful and discreditable attempt to surprise Belgrade in time of peace, and was followed by the ill-managed campaign of 1788. He accompanied his army, but showed no capacity for war. In November he returned to Vienna with ruined health, and during 1789 was a dying man. The concentration of his troops in the east gave the malcontents of Belgium an opportunity to revolt. In Hungary the nobles were all but in open rebellion, and in his other states there were peasant risings, and a revival of particularist sentiments. Joseph was left entirely alone. His minister Kaunitz refused to visit his sick-room, and did not see him for two years. His brother Leopold remained at Florence. At last Joseph, worn out and broken-hearted, recognized that his servants could not, or would not, carry out his plans. On the 30th of January 1790 he formally withdrew all his reforms, and he died on the 20th of February.

Joseph II. was twice married, first to Isabella, daughter of Philip, duke of Parma, to whom he was attached. After her death on the 27th of November 1763, a political marriage was arranged with Josepha (d. 1767), daughter of Charles Albert, elector of Bavaria (the emperor Charles VII.). It proved extremely unhappy. Joseph left no children, and was succeeded by his brother Leopold II.

Many volumes of the emperor's correspondence have been published. Among them are *Maria Theresia und Joseph II. Ihre Korrespondenz samt Briefen Josephs an seinen Bruder Leopold* (1867–1868); *Joseph II. und Leopold von Toskana. Ihr Briefwechsel 1781–1790* (1872); *Joseph II. und Katharina von Russland. Ihr Briefwechsel* (1869); and *Maria Antoinette, Joseph II. und Leopold II. Ihr Briefwechsel* (1866); all edited by A. Ritter von Arneth. Other collections are: *Joseph II., Leopold II. und Kaunitz. Ihr Briefwechsel*, edited by A. Beer (1873); *Correspondances intimes de l'empereur Joseph II. avec son ami, le comte de Cobenzl et son premier ministre, le prince de Kaunitz*, edited by S. Brunner (1871); *Joseph II. und Graf Ludwig Cobenzl. Ihr Briefwechsel*, edited by A. Beer and J. von Fiedler (1901); and the *Geheime Korrespondenz Josephs II. mit seinem Minister in den Oesterreichischen Niederlanden, Ferdinand Graf Trauttmannsdorff 1787–1789*, edited by H. Schlitter (1902). Among the lives of Joseph may be mentioned: A. J. Gross-Hoffinger, *Geschichte Josephs II.* (1847); C. Paganel, *Histoire de Joseph II.* (1843; German translation by F. Köhler, 1844); H. Meynert, *Kaiser Joseph II.* (1862); A. Beer, *Joseph II.* (1882); A. Jäger, *Kaiser Joseph II. und Leopold II.* (1867); A. Fournier, *Joseph II.* (1885); and J. Wendrinski, *Kaiser Joseph II.* (1880). There is a useful small volume on the emperor by J. Franck Bright (1897). Other books which may be consulted are: G. Wolf, *Das Unterrichtswesen in Oesterreich unter Joseph II.* (1880), and *Oesterreich und Preussen 1780–1790* (1880), A. Wolf and H. von Zwiedeneck-Südenhorst, *Oesterreich unter Maria Theresia, Joseph II. und Leopold II.* (1882–1884); H. Schlitter, *Die Regierung Josephs II. in den Oesterreichischen Niederlanden* (1900); and *Pius VI. und Joseph II. 1782–1784* (1894); O. Lorenz, *Joseph II. und die Belgische Revolution* (1862); and L. Delplace, *Joseph II. et la révolution brabançonne* (1890).

JOSEPH, FATHER (François Leclerc du Tremblay) (1577–1638), French Capuchin monk, the confidant of Richelieu, was the eldest son of Jean Leclerc du Tremblay, president of the chamber of requests of the parlement of Paris, and of Marie Motier de Lafayette. As a boy he received a careful classical training, and in 1595 made an extended journey through Italy, returning to take up the career of arms. He served at the siege of Amiens in 1597, and then accompanied a special embassy to London. In 1599 Baron de Mafflier, by which name he was known at court, renounced the world and entered the Capuchin monastery of Orleans. He embraced the religious life with great ardour, and became a notable preacher and reformer. In 1606 he aided Antoinette d'Orléans, a nun of Fontevrault, to found the reformed order of the Filles du Calvaire, and wrote a manual of devotion for the nuns. His proselytizing zeal led him to send missionaries throughout the Huguenot centres—he had become provincial of Touraine in 1613. He entered politics at the conferences of Loudun, when, as the confidant of the queen and the papal envoy, he opposed the Gallican claims advanced by the parlement, which the princes were upholding, and succeeded in convincing them of the schismatic tendency of Gallicanism. In 1612 he began those personal relations with Richelieu which have indissolubly joined in history and legend the cardinal and the "Eminence grise," relations which research has not altogether made clear. In 1627 the monk assisted at the siege of La Rochelle. A purely religious reason also made him Richelieu's ally against the Habsburgs. He had a dream of arousing Europe to another crusade against the Turks, and believed that the house of Austria was the obstacle to that universal European peace which would make this possible. As Richelieu's agent, therefore, this modern Peter the Hermit manœuvred at the diet of Regensburg (1630) to thwart the aggression of the emperor, and then advised the intervention of Gustavus Adolphus, reconciling himself to the use of Protestant armies by the theory that one poison would counteract another. Thus the monk became a war minister, and, though maintaining a personal austerity of life, gave himself up to diplomacy and politics. He died in 1638, just as the cardinalate was to be conferred upon him. The story that Richelieu visited him when on his deathbed and roused the dying man by the words, "Courage, Father Joseph, we have won Breisach," is apocryphal.

See Fagniez, *Le Père Joseph et Richelieu* (1894), a work based largely on original and unpublished sources. Father Joseph, according to this biography, would seem not to have lectured Richelieu in the fashion of the legends, whatever his moral influence may have been in strengthening Richelieu's hands.

JOSEPHINE (MARIE ROSE JOSEPHINE TASCHER DE LA PAGERIE) (1763–1814), empress of the French, was born in the island of Martinique on the 23rd of June 1763, being the eldest of three daughters of Joseph Tascher de la Pagerie, lieutenant of artillery. Her beauty and grace, though of a languid Creole style, won the affections of the young officer the vicomte de Beauharnais, and, after some family complications, she was married to him. Their married life was not wholly happy, the frivolity of Josephine occasioning her husband anxiety and jealousy. Two children, Eugène and Hortense, were the fruit of the union. During Josephine's second residence in Martinique, whither she proceeded to tend her mother, occurred the first troubles with the slaves, which resulted from the precipitate action of the constituent assembly in emancipating them. She returned to her husband, who at that time entered into political life at Paris. Her beauty and vivacity won her many admirers in the salons of the capital. As the Revolution ran its course her husband, as an ex-noble, incurred the suspicion and hostility of the Jacobins; and his ill-success at the head of a French army on the Rhine led to his arrest and execution. Thereafter Josephine was in a position of much perplexity and some hardship, but the friendship of Barras and of Madame Tallien, to both of whom she was then much attached, brought her into notice, and she was one of the queens of Parisian society in the year 1795, when Napoleon Bonaparte's services to the French convention in scattering the malcontents of the capital (13 Vendémiaire, or October 5, 1795) brought him to the front. There is a story that she became known to Napoleon through a visit paid to him by her son Eugène in order to beg his help in procuring the restoration of his father's sword, but it rests on slender foundations. In any case, it is certain that Bonaparte, however he came to know her, was speedily captivated by her charms. She, on her side, felt very little affection for the thin, impecunious and irrepressible suitor; but by degrees she came to acquiesce in the thought of marriage, her hesitations, it is said, being removed by the influence of Barras and by the nomination of Bonaparte to the command of the army of Italy. The civil marriage took place on the 9th of March 1796, two days before the bridegroom set out for his command. He failed to induce her to go with him to Nice and Italy.

Bonaparte's letters to Josephine during the campaign reveal the ardour of his love, while she rarely answered them. As he came to realize her shallowness and frivolity his passion cooled; but at the time when he resided at Montebello (near Milan) in 1797 he still showed great regard for her. During his absence in Egypt in 1798–1799, her relations to an officer, M. Charles, were most compromising; and Bonaparte on his return thought of divorcing her. Her tears and the entreaties of Eugène and Hortense availed to bring about a reconciliation; and during the period of the consulate (1799–1804) their relations were on the whole happy, though Napoleon's conduct now gave his consort grave cause for concern. His brothers and sisters more than once begged him to divorce Josephine, and it is known that, from the time when he became first consul for life (August 1802) with large powers over the choice of a successor, he kept open the alternative of a divorce. Josephine's anxieties increased on the proclamation of the Empire (May 18, 1804); and on the 1st of December 1804, the eve of the coronation at Notre Dame, she gained her wish that she should be married anew to Napoleon with religious rites. Despite her care, the emperor procured the omission of one formality, the presence of the parish priest; but at the coronation scene Josephine appeared radiant with triumph over her envious relatives. The august marriages contracted by her children Eugène and Hortense seemed to establish her position; but her ceaseless extravagance and, above all, the impossibility that she should bear a son strained the relations between Napoleon and Josephine. She complained of his infidelities and growing callousness. The end came in sight after the campaign of 1809, when Napoleon caused the announcement to be made to her that reasons of state compelled him to divorce her. Despite all her pleadings he held to his resolve. The most was made of the slight technical irregularity at the marriage ceremony of the 1st of December 1804; and the marriage was declared null and void.

At her private retreat, La Malmaison, near Paris, which she had beautified with curios and rare plants and flowers, Josephine closed her life in dignified retirement. Napoleon more than once came to consult her upon matters in which he valued her tact and good sense. Her health declined early in 1814, and after his first abdication (April 11, 1814) it was clear that her end was not far off. The emperor Alexander of Russia and Frederick William III. of Prussia, then in Paris, requested an interview with her. She died on the 24th of May 1814. Her friends, Mme de Rémusat and others, pointed out that Napoleon's good fortune deserted him after the divorce; and it is certain that the Austrian marriage clogged him in several ways. Josephine's influence was used on behalf of peace and moderation both in internal and in foreign affairs. Thus she begged Napoleon not to execute the duc d'Enghien and not to embroil himself in Spanish affairs in 1808.

See M. A. Le Normand, *Mémoires historiques et secrets de Joséphine* (2 vols., 1820); *Lettres de Napoléon à Joséphine* (1833); J. A. Aubenas, *Hist. de l'impératrice Joséphine* (2 vols., 1858–1859); J. Turquan, *L'Impératrice Joséphine* (2 vols., 1895–1896); F. Masson, *Joséphine* (3 vols., 1899–1902); *Napoleon's Letters to Josephine* (1796–1812), translated and edited by H. F. Hall (1903). Also the *Memoirs of* Mme. de Rémusat and of Bausset, and P. W. Sergeant, *The Empress Josephine* (1908). (J. HL. R.)

JOSEPHUS, FLAVIUS (*c.* 37–*c.* 95?), Jewish historian and military commander, was born in the first year of Caligula (37–38). His father belonged to one of the noblest priestly families, and through his mother he claimed descent from the Asmonaean high priest Jonathan. A precocious student of the Law, he made trial of the three sects of Judaism—Pharisees, Sadducees and Essenes—before he reached the age of nineteen. Then, having spent three years in the desert with the hermit Banus, who was presumably an Essene, he became a Pharisee. In 64 he went to Rome to intercede on behalf of some priests, his friends, whom the procurator Felix had sent to render account to Caesar for some insignificant offence. Making friends with Alityrus, a Jewish actor, who was a favourite of Nero, Josephus obtained an introduction to the empress Poppaea and effected his purpose by her help. His visit to Rome enabled him to speak from personal experience of the power of the Empire, when he expostulated with the revolutionary Jews on his return to Palestine. But they refused to listen; and he, with all the Jews who did not fly the country, was dragged into the great rebellion of 66. In company with two other priests, Josephus was sent to Galilee under orders (he says) to persuade the ill-affected to lay down their arms and return to the Roman allegiance, which the Jewish aristocracy had not yet renounced. Having sent his two companions back to Jerusalem, he organized the forces at his disposal, and made arrangements for the government of his province. His obvious desire to preserve law and order excited the hostility of John of Giscala, who endeavoured vainly to remove him as a traitor to the national cause by inciting the Galileans to kill him and by persuading the Sanhedrin at Jerusalem to recall him.

In the spring of 67 the Jewish troops, whom Josephus had drilled so sedulously, fled before the Roman forces of Vespasian and Titus. He sent to Jerusalem for reinforcements, but none came. With the stragglers who remained, he held a stronghold against the Romans by dint of his native cunning, and finally, when the place was taken, persuaded forty men, who shared his hiding-place, to kill one another in turn rather than commit suicide. They agreed to cast lots, on the understanding that the second should kill the first and so on. Josephus providentially drew the last lot and prevailed upon his destined victim to live. Their companions were all dead in accordance with the compact; but Josephus at any rate survived and surrendered. Being led before Vespasian, he was inspired to prophesy that Vespasian would become emperor. In consequence of the prophecy his life was spared, but he was kept close prisoner for two years. When his prophecy was fulfilled he was liberated, assumed the name of Flavius, the family name of Vespasian, and accompanied his patron to Alexandria. There he took another wife, as the Jewess allotted him by Vespasian after the fall of Caesarea had forsaken him, and returned to attend Titus and to act as intermediary between him and the Jews who still held Jerusalem. His efforts in this capacity failed; but when the city was stormed (70) Titus granted him whatever boon he might ask. So he secured the lives of some free men who had been taken and (by the gift of Titus) certain sacred books. After this he repaired to Rome and received one of the pensions, which Vespasian (according to Suetonius) was the first to bestow upon Latin and Greek writers. He was also made a Roman citizen and received an estate in Judaea. Thenceforward he devoted himself to literary work under the patronage of Vespasian, Titus and Domitian. As he mentions the death of Agrippa II. it is probable that he lived into the 2nd century; but the date of Agrippa's death has been challenged and, if his patron Epaphroditus may be identified with Nero's freedman, it is possible that Josephus may have been involved in his fall and perished under Domitian in 95.

WORKS.—1. *The Jewish War* (Περὶ τοῦ Ἰουδαϊκοῦ πολέμου), the oldest of Josephus' extant writings, was written towards the end of Vespasian's reign (69–79) The Aramaic original has not been preserved; but the Greek version was prepared by Josephus himself in conjunction with competent Greek scholars. Its purpose in all probability was, in the first instance, to exhibit to the Babylonian Jews the overwhelming power of Rome and so to deter them from repeating the futile revolt of the Jews of Palestine. Of its seven books, the first two survey the history of the Jews from the capture of Jerusalem by Antiochus Epiphanes to the outbreak of war in 67, and here Josephus relies upon some such general history as that of Nicolaus of Damascus. The rest deals with the events of the war (67–73) which fell more or less within his own knowledge. Vespasian, Titus and Agrippa II. testified (he tells us) to his accuracy. Representatives of the Zealots would probably have protested against his pro-Roman prejudices.

2. *The Jewish Antiquities* (Ἰουδαϊκὴ Ἀρχαιολογία) covers in twenty books the history of the Jews from the creation of the world to the outbreak of the war with Rome. It was finished in the thirteenth year of Domitian (93). Its purpose was to glorify the Jewish nation in the eyes of the Roman world. In the part covered by the books of the Bible Josephus follows them, and that mainly, if not entirely as they are translated into Greek by the Seventy (the Septuagint version). Being a Pharisee, he sometimes introduces traditions of the Elders, which are either inferences from, or embroideries of, the biblical narrative. Sometimes, also, he gives proof of some knowledge of Hebrew and supplements his scriptural authorities, which include 1 Esdras, from general Greek histories. For the later period he uses the Greek Esther, with its additions, 1 Maccabees, Polybius, Strabo and Nicolaus of Damascus. But towards the end he confesses that he has grown weary of his task, and his history becomes meagre. The work contains accounts of John the Baptist and Jesus, which may account for the fact that Josephus' writings were rescued from oblivion by the Christians. But the description of Jesus as "a wise man, if indeed one should call him a man," can hardly be genuine, and the assertion "this was the Christ" is equally doubtful, unless it be assumed that the Greek word *Christos* had become technical in the sense of false-Christ or false-prophet among non-Christian Jews.

3. Josephus wrote a narrative of his own *Life* in order to defend himself against the accusation brought by his enemy Justus of Tiberias to the effect that he had really been the cause of the Jewish rebellion. In his defence Josephus departs from the facts as narrated in the *Jewish War* and represents himself as a partisan of Rome and, therefore, as a traitor to his own people from the beginning.

4. The two books *Against Apion* are a defence or apology directed against current misrepresentations of the Jews. Earlier titles are *Concerning the Antiquity of the Jews* or *Against the Greeks*. Apion was the leader of the Alexandrine embassy which opposed Philo and his companions when they appeared in behalf of the Alexandrine Jews before Caligula. The defence which Josephus puts forward has a permanent value and shows him at his best.

The Greek text of Josephus' works has been edited with full collection of different readings by B. Niese (Berlin, 1887–1895). The Teubner text by Naber is based on this. The translation into English of W. Whiston has been (superficially) revised by A. R. Shilleto (1889–1890). Schürer (*History of the Jewish People*) gives a full bibliography. (J. H. A. H.)

JOSHEKAN, a small province of Persia covering about 1000 sq. m. Pop. about 5000. It has a yearly revenue of about £1200, and is held in fief by the family of Bahram Mirza, Muizz ed Dowleh (d. 1882). Its chief town and the residence of the governor used to be Joshekan-Kali, a large village with fine gardens, formerly famous for its carpets (*kali*), but now the chief place is Maimeh, a little city with a population of 2500, situated at an elevation of 6670 ft., about 63 m. from Isfahan in a north-westerly direction and 13 m. south-west of Joshekan-Kali.

JOSHUA, BOOK OF, the sixth book of the Old Testament, and the first of the group known as the "Former Prophets." It takes its name from Joshua[1] the son of Nūn, an Ephraimite who, on the death of Moses, assumed the leadership to which he had previously been designated by his chief (Deut. xxxi. 14 seq., 23), and proceeded to the conquest of the land of Canaan. The book differs from the Pentateuch or Torah in the absence of legal matter, and in its intimate connexion with the narrative in the books which follow. It is, however, the proper sequel to the origins of the people as related in Genesis, to the exodus of the Israelite tribes from Egypt, and their journeyings in the wilderness. On these and also on literary grounds it is often convenient to class the first six books of the Bible as a unit under the term "Hexateuch." For an exhaustive detailed study has revealed many signs of diversity of authorship which combine to show that the book is due to the incorporation of older material in two main redactions; one deeply imbued with the language and thought of Deuteronomy itself (D), the other of the post-exilic priestly circle (P) which gave the Pentateuch its present form. That the older sources (which often prove to be composite) are actually identical with the Yahwist or Judaean (J) and the Elohist or Ephraimite (E) narratives (on which see GENESIS) is not improbable, though, especially as regards the former, still very uncertain. In general the literary problems are exceedingly intricate, and no attempt can be made here to deal with them as fully as they deserve.

The Invasion.—The book falls naturally into two main parts, of which the first, the crossing of the Jordan and the conquest of Palestine (i.–xii.) is mainly due to Deuteronomic compilers. It opens with the preparations for the crossing of the Jordan and the capture of the powerful city Jericho. Ai, near Bethel, is taken after a temporary repulse, and Joshua proceeds to erect an altar upon Mt Ebal (north of Shechem). For the fullness with which the events are recorded the writers were probably indebted to local stories.

The Israelites are at Abel-Shittim (already reached in Num. xxv. 1). Moses is dead, and Joshua enters upon his task with the help of the Transjordanic tribes who have already received their territory (i). The narrative is of the later prophetic stamp (D; cf. Deut. iii. 18–22, xi. 24, where Moses is the speaker; xxxi. 1–8), but may be based upon an earlier and shorter record (E; *vv.* 1 seq., 10, 11*a*).

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[1] Heb. *Jĕhōshūa*; later *Jēshūa*; Gr. Ἰησοῦς, whence "Jesus" in the A.V. of Heb. iv. 8; another form of the name is Hoshea (Num. xiii. 8, 16). The name may mean "Yah(weh) is wealth, *or* is (our) war-cry, *or* saves." The only extra-biblical notice of Joshua is the inscription of more than doubtful genuineness given by Procopius (*Vand.* ii. 20), and mentioned also by Moses of Chorene (*Hist. Arm.* i. 18). It is said to have stood at Tingis in Mauretania, and to have borne that those who erected it had fled before Ἰησοῦς ὁ λῃστής. For the medieval Samaritan Book of Joshua, see T. Juynboll, *Chronicum Samaritanum* (1846); J. A. Montgomery, *The Samaritans* (1907), pp. 301 sqq.

Of the mission of the spies to Jericho, two versions were current (duplicates ii. 3, 12, 18; *v.* 15 seq. breaks the connexion between *vv.* 13 and 18, but is resumed in *vv.* 22–24); D's addition is to be recognized in ii. 9*b*–11. The incident occupies at least four days, but the main narrative reckons three days between i. 11 and iii. 2. Next follow the passage of the Jordan (commemorated by the erection of twelve stones), the encampment at Gilgal, and the observance of the rite of circumcision and of the passover (iii.–v.). The complicated narrative in iii.–iv. is of composite origin (contrast iii. 17 with iv. 10 seq., 19; iv. 3, 8 with *vv.* 9, 20; and cf. iii. 12 with the superfluous iv. 2, &c.). As in ii., D has amplified (iii. 4*b*, 7, 10*b*, iv. 9–10*a*, 12, 14; more prominently in iv. 21–v. 1, v. 4–8), and subsequently P (or a hand akin to P) has worked over the whole (iii. 4, note the number and the prohibition, cf. Num. i. 51; iii. 8, 15 seq.; iv. 13, 19; v. 10–12). Circumcision, already familiar from Exod. iv. 26, Deut. x. 16, is here regarded as a new rite (v. 2, 9, supplemented by *vv.* 1, 4–8), but the conflicting views have been harmonized by the words "the second time" (*v.* 2). Gilgal is thus named from the "rolling away" of the "reproach of Egypt" (*v.* 9), but iv. 20 suggests a different origin, viz. the sacred stone-circle (cf. Judges iii. 19, R.V. marg.). An older account of the divine commission to Joshua appears in the archaic passage v. 13–15 (cf. Moses in Exod. iii.). Fusion of sources is obvious in the story of the fall of Jericho (contrast vi. 5 and *v.* 10, *vv.* 21 and 24, *vv.* 22 and 25); according to one (E ?) the people march seven times round the city on one day, the ark and the priests occupying a prominent position (vi. 4–6, 7*b*–9, 12 seq., 16*a*, 20 [part], 22–24); but in the other they march every day for seven days. Both here and in the preceding chapters the Septuagint has several variations and omissions, due either to an (unsuccessful) attempt to simplify the present difficulties, or to the use of another recension. The curse pronounced by Joshua upon the destroyed city of Jericho (vi. 26) should be associated with an incident in the reign of Ahab which is acquainted with the story (1 Kings xvi. 34); the city, however, reappears in Joshua xviii. 21; 2 Sam. x. 5. Achan's sacrilege, the cause of the repulse at Ai and of the naming of the valley of Achor (vii.), is introduced by vi. 18 seq., 24*b*, and, as its spirit shows, is of relatively later date. It contains some probable traces of D (in vii. 5, 7, 11 seq., 15, 25) and P (in *vv.* 1, 18, 24 seq.). The capture of Ai has marks of the same dual origin as the preceding chapters (cf. viii. 3a with 10, and contrast viii. 3–9 with *v.* 12; *vv.* 5–7 with 18, 26; *v.* 19 with 28). The general resemblance between chs. vii.–viii. and the war with Benjamin (Judges xx.) should be noticed.

Conquests in Palestine.—The erection of the altar, not at the scene of battle (cf. 1 Sam. xiv. 35) but on Mt Ebal (viii. 30–35, D), presupposes the conquest of central Palestine and the removal of the ark from Gilgal. These, however, are not narrated, and, unless some account of them has been replaced by the present passage, this portion of the conquest was ignored. Possibly the passage is not in its original position: in the Septuagint it appears after ix. 2, while Josephus (*Ant.* v. 1, 19) and the Samaritan book of Joshua read it before ch. xiii.; Dillmann, however, would place it after xi. 23. The capture of Jericho and Ai is followed by the successful stratagem of the Gibeonites to make peace with Israel (ix.). This involves them in a war with the southern Canaanites; Joshua intervenes and obtains a crowning victory (x.). The camp is still at Gilgal. A similar conquest of the northern Canaanites follows (xi.), and the first part of the book concludes with a summary of the results of the Israelite invasion (xii.).

No satisfactory explanation of viii. 30–35 has been found, yet ix. 1 seq. seems to show that it was the prelude to the Canaanite wars. In contrast to the absence of any reference to the occupation of central Palestine, the conquest of the south was current in several divergent traditions. Two records are blended in ix.; one narrates the covenant with the Gibeonites, the other that with the Hivites (properly Hivvites); and in the latter Joshua has no place (*vv.* 4 seq., 6*b*, 7, 11–14, &c.). The former has additions by D (*vv.* 9*b*, 10, 24 seq.) and by P (*v.* 15 last clause, 17–21); the latter, in accordance with the legislation of its day (posterior to Ezek. xliv. 6 sqq.), does not allow the Gibeonites to minister to the temple or altar, but merely to the "congregation," a characteristic post-exilic term (contrast *vv.* 21 and 23; and on 27 see Sept. and commentaries). The story of the covenant conflicts with the notice that Gibeon was still an independent Canaanite city in David's time (2 Sam. xxi. 2). The defeat of the southern coalition is based, as the doublets show, upon two sources; the war arises from two causes (vengeance upon the Gibeonites, and the attempt to overthrow Israel), and concludes with a twofold victory: in x. 16–24 the kings are pursued to Makkedah and slain, in *v.* 11 they are smitten by a great hailstorm in their flight to Azekah (cf. 1 Sam. vii. 10, xiv. 15, in the same district). Redactional links have been added, apparently by D, to whom is possibly due the stanza quoted from the book of Jashar (*v.* 12 seq.), a poetical address to the sun and moon, of the nature of a prayer or spell for their aid (cf. Judges v. 20, and see Ecclus. xlvi. 4). The literal interpretation of this picturesque quotation has been influenced by the prosaic comments at the end of *v.* 13 and beginning of *v.* 14. Verse 15, which closes the account, anticipates *v.* 43; the Septuagint omits both. The generalizing narrative (x. 28–43), which is due to D in its present form, is partly based upon old matter (*e.g.* the capture of Makkedah), but is inconsistent with what precedes (*v.* 37, see *v.* 23 sqq.) and follows (capture of Debir, *v.* 38 seq., see xv. 15; Judges i. 11). The description of the conquest of the northern Canaanites is very similar to that of the south. The main part is from an older source (xi. 1, 4–9; see DEBORAH), the amplifications (*v.* 2 seq.) are due to D, as also are the summary (*vv.* 10–23, cf. style of x. 28–43), and the enumeration of the total results of the invasion (xii.), which includes names not previously mentioned.

Division of the Land.—The result of the events narrated in the first part of the book is to ascribe the entire subjugation of Canaan to Joshua, whose centre was at Gilgal (x. 15, 43). He is now "old and advanced in years," and although much outlying land remained to be possessed, he is instructed to divide the conquered districts among the western tribes (xiii. 1 sqq.). This is detailed at length in the second part of the book. With the completion of the division his mission is accomplished. The main body of this part (xiii. 15–xiv. 5; xv.–xvii.; xviii. 11–xxi. 42; xxii. 7–34) is in its present form almost entirely due to P.

In regard to details, xiii. 2–6 (now D) expresses the view that the conquest was incomplete, and numbers districts chiefly in the south-west and in the Lebanon. Two sources deal with the inheritance of the east Jordan tribes in terms which are—(*a*) general (xiii. 8–12, D), and (*b*) precise (*vv.* 15–32, P). The latter stands between the duplicate passages xiii. 14 and 32 seq. (see the Sept.). With the interest taken in these tribes, cf. for (*a*) i. 12–18; Deut. iii. 12–22, and the sequel in Joshua xxii. 1–6; and for (*b*) xxii. 9 seq.; Num. xxxii. P's account of the division opens with an introductory notice of the manner in which Eleazar the priest and Joshua (note the order) prepare to complete the work which Moses had begun (xiv. 1–5). It opens with Judah, its borders (xv. 1–12) and cities (*vv.* 20–62), and continues with the two Joseph tribes, Ephraim (xvi. 4–9, contrast details in *vv.* 1–3) and Manasseh (xvii. 1–10, cf. Num. xxvi. 30–32, xxvii. 1–11; P). There is now a break in the narrative (xviii. 2–10, source uncertain); seven tribes have not yet received an inheritance, and Joshua (alone) encourages them to send three men from each tribe to walk through the land—excluding the territory of Judah and Joseph—and to bring a description of it to him, after which he divides it among them by lot. P[1] now resumes with an account of the borders and cities of Benjamin (xviii. 11–28), Simeon, Zebulun, Issachar, Asher, Naphtali and Dan (xix.; on *v.* 47, see below); and, after the subscription (xix. 51), concludes with the institution of the cities of refuge (xx., cf. Num. xxxv.), and of the Levitical cities (xxi., contrast the earlier brief notice, xiii. 14, 33). Chapter xx., belonging to the Predaction, has certain points of contact with Deut. xix. which, it is very important to observe, are wanting in the Septuagint; and xxi. 43–45 closes D's account of the division, and in the Septuagint contains matter most of which is now given by P in xix. 49 seq. Two narratives describe the dismissal of the trans-Jordanic tribes after their co-operation in the conquest, viz. xxii. 1–6 (D), and xxii. 9 seq. (P); cf. above, on xiii. 8 seq. P, with the description of the erection of the altar (*v.* 34, Gilead ?; cf. Gen. xxxi. 47 seq.), is apparently a late re-writing of some now obscure incident to emphasize the unity of worship. P's account of the distribution of land among the *nine and a half* tribes by Eleazar and Joshua (from xiv. 1–5 to xix. 51) appears to have been on the lines laid down in Num. xxxiv. (P). The scene, according to xviii. 1, is Shiloh, and this verse, which does not belong to the context, should apparently precede P's narrative in xiv. 1. But of the occupation of Shiloh, the famous Ephraimite sanctuary and the seat of the ark, we have no information. The older source, however, presupposes that Judah and the two Joseph tribes have acquired their territory; the remaining seven are blamed for their indifference (xviii. 2–10, see above), and receive their lot conjointly at the camp at *Shiloh.* But if the location is an attempt to harmonize with xviii. 1, *Gilgal* should probably be restored. The section xviii. 2–10 is followed by xxi. 43 seq. (above), and may have been preceded originally by xiii. 1, 7 (where read: inheritance for the *seven* tribes); in its present form it appears to be due to D. Another account of the exploits of Judah and Joseph can be traced here and there; *e.g.* in xiv. 6–15 (where Caleb receives Hebron as his inheritance and the "land had rest from war"), and xvii. 14–18 (where Joseph receives an additional lot); but where these traditions have not been worked into later narratives, they exist only in fragmentary form and are chiefly recognizable by their standpoint. They are characterized by the view that the conquest was only a partial one, and one which was neither the work of a single man nor at his instigation, but due entirely to individual or tribal achievements. This view can be traced in xiii. 13, xv. 63 (cf. the parallel Judges i. 21 in contrast to *v.* 8), xvi. 10 (Judges i. 29), xvii. 11–13 (Judges i. 27 seq.), and in the references to separate tribal or family exploits: xv. 13–19, xix. 47 (cf. Judges i. 34 seq., xviii.).

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[1] Traces of composite material may be recognized—(*a*) where, in place of boundaries, P has given lists of cities which appear to be taken from other sources (cf. the instructions in xviii. 9), and (*b*) in the double headings (see Addis, *The Hexateuch*, i. 230, note 1, and the commentaries).

Two closing addresses are ascribed to Joshua, one an exhortation similar to the homilies in secondary portions of Deuteronomy (xxiii.; cf. Moses in Deut. xxviii. seq., and Samuel's last address in 1 Sam. xii.), which virtually excludes the other (xxiv.), where Joshua assembles the tribes at Shechem (Shiloh, in the Septuagint) and passes under review the history of Israel from the days of heathenism (before Abraham was brought into Canaan) down through the oppression in Egypt, the exodus, the conquest in East Jordan and the occupation of Canaan. A few otherwise unknown details are to be found (xxiv. 2, 11 seq. 14). The address (which is extremely important for its representation of the religious conditions) is made the occasion for a solemn covenant whereby the people agree to cleave to Yahweh alone. This is commemorated by the erection of a stone under the oak by the sanctuary of Yahweh (for the tree with its sacred pillar, see Gen. xxxv. 4; Judges ix. 6). The people are then dismissed, and the book closes in ordinary narrative style with the death of Joshua and his burial in his inheritance at Timnath-serah in Mt Ephraim (cf. xix. 49 seq.); the burial of Joseph in Shechem; and the death and burial of Eleazar the son of Aaron in the "hill of Phinehas."

Chapter xxiv. presupposes the complete subjection of the Canaanites and is of a late prophetic stamp. Some signs of amplification (*e.g. vv.* 11*b*, 13, 31) suggest that it was inserted by a Deuteronomic hand, evidently distinct from the author of xxiii. But elsewhere there are traces of secondary Deuteronomic expansion and of internal incongruities in Deuteronomic narratives; contrast xiv. 6–15 with Joshua's extermination of the "Anakim" in xi. 21 seq.; the use of this name with the "Philistines" of xiii. 2 (see PHILISTINES), or the conquests in xi. 16–22 with the names in x. 36–43. All these passages are now due to D; but not only is Deuteronomy itself composite, a twofold redaction can be traced in Judges, Samuel and Kings, thus involving the deeper literary problems of Joshua with the historical books generally.[1] Both Joshua xxiii. and xxiv. are closely connected with the very complicated introduction to the era of the "judges" in Judges ii. 6 sqq., and ii. 6–9 actually resume Joshua xxiv. 28 sqq., while the Septuagint appends to the close of Joshua the beginning of the story of Ehud (Judges iii. 12 seq.). Both Judges i.–ii.5 and chap. xvii.–xxi. are of post-Deuteronomic insertion, and they represent conditions analogous to the older notices imbedded in the later work of P (Judges i. 21, xix. 10–12, cf. Joshua xv. 63; see JUDGES *ad fin.*). Moreover, P in its turn shows elsewhere definite indications of different periods and standpoints, and the fluid state of the book at a late age is shown by the presence of Deuteronomic elements in Joshua xx., not found in the Septuagint, and by the numerous and often striking readings which the latter recension presents.

Value of the Book.—The value of the book of Joshua is primarily religious; its fervency, its conviction of the destiny of Israel and its inculcation of the unity and greatness of the God of Israel give expression to the philosophy of Israelite historians. As an historical record its value must depend upon a careful criticism of its contents in the light of biblical history and external information. Its description of the conquest of Canaan comes from an age when the event was a shadow of the past. It is an ideal view of the manner in which a divinely appointed leader guided a united people into the promised land of their ancestors, and, after a few brief wars of extermination (x.–xii.), died leaving the people in quiet possession of their new inheritance (xi. 23; xxi. 44 seq.; xxiii. 1).[2] On the other hand, the earlier inhabitants were not finally subjugated until Solomon's reign (1 Kings ix. 20); Jerusalem was taken by David from the Jebusites (2 Sam. v.); and several sites in its neighbourhood, together with important fortresses like Gezer, Megiddo and Taanach, were not held by Israel at the first. There are traces of other conflicting traditions representing independent tribal efforts which were not successful, and the Israelites are even said to live in the midst of Canaanites, intermarrying with them and adopting their cult (Judges i.–iii. 6). From a careful consideration of all the evidence, both internal and external, biblical scholars are now almost unanimous that the more finished picture of the Israelite invasion and settlement cannot be accepted as a historical record for the age. It accords with this that the elaborate tribal-lists and boundaries prove to be of greater value for the geography than for the history of Palestine, and the attempts to use them as evidence for the early history of Israel have involved numerous additional difficulties and confusion.[3]

The book of Joshua has ascribed to one man conquests which are not confirmed by subsequent history. The capture of Bethel, implied rather than described in Joshua viii., is elsewhere the work of the Joseph tribes (Judges i. 22 sqq., cf. features in the conquest of Jericho, Joshua vi. 25). Joshua's victory in north Palestine has its parallel in Judges iv. at another period (see DEBORAH), and Adoni-zedek of Jerusalem (Joshua x.) can scarcely be severed from the Adoni-bezek taken by the tribes of Judah and Simeon (Judges i. 5–7). The prominence of Joshua as military and religious leader, and especially his connexion with Shechem and Shiloh, have suggested that he was a hero of the Joseph tribes of central Palestine (viz. Ephraim and Manasseh). Moreover, the traditions in Joshua viii. 30–ix. 2, and Deut. xxvii. 1–8 seem to place the arrival at Mt Ebal immediately after the crossing of the Jordan. This implies that Israel (like Jacob in Gen. xxxii.) crossed by the Jabbok, and in fact the Wadi Fariʽā provides an easy road to Shechem, to the south-east of which lies Juleijil; and while this is the Gilgal of Deut. xi. 30, the battles at Jericho and Ai (Joshua ii. seq.) occur naturally after the encampment at the southern Gilgal (near Jericho). The alternative view (see especially Stade, *Gesch. Isr.* 1. 133 sqq.) connects itself partly with the ancestor of all the tribes (Jacob, *i.e.* Israel), and partly with the eponym of the Joseph tribes whose early days were spent around Shechem, the removal of whose bones from Egypt must have found a prominent place in the traditions of the tribes concerned (Gen. l. 25; Exod. xiii. 19; Joshua xxiv. 32). According to one view (Stade, Wellhausen, Guthe, &c.) only the Joseph tribes were in Egypt, and separate tribal movements (see JUDAH) have been incorporated in the growth of the tradition; the probability that the specific traditions of the Joseph tribes have been excised or subordinated finds support in the manner in which the Judaean P has abridged and confused the tribal lists of Ephraim and Manasseh.

The serious character of the problems of early Israelite history can be perceived from the renewed endeavours to present an adequate outline of the course of events; for a criticism of the most prominent hypotheses see Cheyne, *Ency. Bib.* art. "Tribes" (col. 5209 seq.); a new theory has been more recently advanced by E. Meyer (*Die Israeliten u. ihre Nachbarstämme*, 1906). But Joshua as a tribal hero does not belong to the earliest phase in the surviving traditions. He has no place in the oldest surviving narratives of the exodus (Wellhausen, Steuernagel); and only later sources add him to Caleb (Num. xiv. 30; the reference in Deut. i. 38 is part of an insertion), or regard him as the leader of all the tribes (Deut. iii. 21, 28). As an attendant of Moses at the tent of meeting he appears in quite secondary passages (Exod. xxxiii. 7–11; Num. xi. 28). His defeat of the Amalekites is in a narrative (Exod. xvii. 8–16) which belongs more naturally to the wilderness of Shur, and it associates him with traditions of a movement direct into south Palestine which finds its counterpart when the clan Caleb (*q.v.*) is artificially treated as possessing its seats with Joshua's permission. But points of resemblance between Joshua the invader and Saul the founder of the (north) Israelite monarchy gain in weight when the traditions of both recognize the inclusion or possession of Judah, and thus stand upon quite another plane as compared with those of David the founder of the Judaean dynasty. Instead of rejecting the older stories of Joshua's conquests it may be preferable to infer that there were radical divergences in the historical views of the past. Consequently, the parallels between Joshua and Jacob (see Steuernagel's *Commentary*, p. 150) are more significant when the occupation of central Palestine, already implied in the book of Joshua, is viewed in the light of Gen. xlviii. 22, where Jacob as conqueror (cf. the very late form of the tradition in Jubilees xxxiv.) agrees with features in the patriarchal narratives which, in implying a settlement in Palestine, are entirely distinct from those which belong to the descent into Egypt (see especially, Meyer, *op. cit.* pp. 227 seq., 414 seq., 433; Luther, ib. 108 seq.). The elaborate account of the exodus gives the prevailing views which supersede other traditions of the origin both of the Israelites and of the worship of Yahweh (Gen. iv. 26). Several motives have influenced its growth,[1] and the kernel—the revelation of Yahweh to Moses—has been developed until all the tribes of Israel are included and their history as a people now begins. The old traditions of conquest in central Palestine have similarly been extended, and have been adapted to the now familiar view of Israelite origins. It is this subordination of earlier tradition to other and more predominating representations which probably explains the intricacy of a book whose present text may not have been finally fixed until, as Dillmann held, as late as about 200 B.C.

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[1] The close relation between what may be called the Deuteronomic history (Joshua–Kings) and its introduction (the legal book of Deuteronomy) independently show the difficulty of supporting the traditional date ascribed to the latter.

[2] G. F. Moore (*Ency. Bib.*, col. 2608, note 2) draws attention to the instructive parallel furnished by the Greek legends of the Dorian invasion of the Peloponnesus (the "return" of the Heracleidae, the partition of the land by lot, &c.).

[3] The historical problems are noticed in all biblical histories, and in the commentaries on Joshua and Judges. Against the ordinary critical view, see J. Orr, *Problem of the O.T.* (1905) pp. 240 seq. This writer (on whom see A. S. Peake, *The Interpreter*, 1908, pp. 252 seq.) takes the book as a whole, allowance being made for "the generalizing tendency peculiar to all summaries." His argument that "the circumstantiality, local knowledge and evidently full recollection of the narratives (in Joshua) give confidence in the truth of their statements" is one which historical criticism in no field would regard as conclusive, and his contention that a redactor would hardly incorporate conflicting traditions in his narrative "if he believed they contradicted it" begs the question and ignores Oriental literature.

BIBLIOGRAPHY.—See the commentaries of Dillmann, Steuernagel Holzinger (German), or the concise edition by H. W. Robinson in the *Century Bible*; also articles on "Joshua" by G. A. Smith, Hastings's *D. B.*, and G. F. Moore, *Ency. Bib.*; Kittel in *Hist. of the Hebrews*, i. 262 sqq.; W. H. Bennett, in Haupt's *Sacred Books of the Old Testament*; Carpenter and Harford-Battersby, *Comp. of Hexateuch*, ch. xvii; S. R. Driver, *Lit. of the O. T.* (8th ed., 1909). These give further bibliographical information, for which see also the articles on the books of the Pentateuch. (S. A. C.)

JOSHUA THE STYLITE, the reputed author of a chronicle which narrates the history of the war between the Greeks and Persians in 502–506, and which is one of the earliest and best historical documents preserved to us in Syriac. The work owes its preservation to having been incorporated in the third part of the history of pseudo-Dionysius of Tell-Mahrē, and may probably have had a place in the second part of the *Ecclesiastical History* of John of Asia, from whom (as Nau has shown) pseudo-Dionysius copied all or most of the matter contained in his third part. The chronicle in question is anonymous, and Nau has shown that the note of a copyist, which was thought to assign it to the monk Joshua of Zuḳnīn near Āmid, more probably refers to the compiler of the whole work in which it was incorporated. Anyhow the author was an eyewitness of many of the events which he describes, and must have been living at Edessa during the years when it suffered so severely from the Persian War. His view of events is everywhere characterized by his belief in overruling Providence; and as he eulogizes Flavian II., the Chalcedonian patriarch of Antioch, in warmer terms than those in which he praises his great Monophysite contemporaries, Jacob of Sĕrūgh and Philoxenus of Mabbōg, he was probably an orthodox Catholic.

The chronicle was first made known by Assemani's abridged Latin version (*B. O.* i. 260–283) and was edited in 1876 by the abbé Martin and (with an English translation) by W. Wright in 1882. After an elaborate dedication to a friend—the "priest and abbot" Sergius—a brief recapitulation of events from the death of Julian in 363 and a fuller account of the reigns of the Persian kings Pērōz (457–484) and Balāsh (484–488), the writer enters upon his main theme—the history of the disturbed relations between the Persian and Greek Empires from the beginning of the reign of Kawād I. (489–531), which culminated in the great war of 502–506. From October 494 to the conclusion of peace near the end of 506, the author gives an annalistic account, with careful specification of dates, of the main events in Mesopotamia, the theatre of conflict—such as the siege and capture of Āmid by the Persians (502–503), their unsuccessful siege of Edessa (503), and the abortive attempt of the Greeks to recover Āmid (504–505). The work was probably written a few years after the conclusion of the war. The style is graphic and straightforward, and the author was evidently a man of good education and of a simple, honest mind. (N. M.)

JOSIAH (Heb. *yō' shiyyāhū*, perhaps "Yah [weh] supports"), in the Bible, the grandson of Manasseh, and king of Judah. He came to the throne at the age of eight, after the murder of his predecessor Amon. The circumstances of his minority are not recorded, nor is anything related of the Scythian inroads which occurred in the latter half of the 7th century B.C., although some passages in the books of Jeremiah and Zephaniah are supposed to refer to the events. The storm which shook the external states was favourable to the peace of Judah; the Assyrian power was practically broken, and that of the Chaldeans had scarcely developed into an aggressive form. Samaria thus lay within the grasp of Josiah, who may have entertained hopes of forming an independent power of his own. Otherwise, it is not clear why we find him opposing himself to the Egyptian king Necho, since the assumption that he fought as an Assyrian vassal scarcely agrees with the profound reforming policy ascribed to him. At all events, at the battle of Megiddo[2] he lost both his kingdom and his life (608 B.C.), and for a few years Judah was in the hands of Egypt (2 Kings xxiii. 29 seq.). The chronicler gives a rather different account of the battle, and his allusion to the dirge uttered by Jeremiah over his death (2 Chron. xxxv. 20–25; 1 Esd. i. 32) represents the tradition which makes this prophet the author of the book of Lamentations.

The reign of Josiah is important for the biblical account of the great religious reforms which began in his eighteenth year, when he manifested interest in the repair of the Temple at Jerusalem. In the course of this work the high priest Hilkiah discovered a "law-book" which gave rise to the liveliest concern. The reasons for believing that this roll was substantially identical with the book of Deuteronomy were already appreciated by Jerome, Chrysostom, Theodoret and others,[3] and a careful examination shows that the character of the reformation which followed agrees in all its essential features with the prescriptions and exhortations of that book. (See DEUTERONOMY.) But the detailed records in 2 Kings xxii. seq. are evidently written under the influence of the reforms themselves, and are not contemporary (see KINGS, BOOK OF). They are further expanded, to agree with still later ideals, in 2 Chron. xxxiv. seq. The original roll was short enough to be read at least twice in a day (xxii. 8, 10), and hence only some portions of Deuteronomy (or of an allied production) may be intended. Although the character of the reforms throws remarkable light upon the condition of religion in Judah in the time of Josiah, it is to be observed that the writings of the contemporary prophets (Jeremiah, Ezekiel) make it very questionable whether the narratives are thoroughly trustworthy for the history of the king's measures. (See further JEWS, § 16.) (S. A. C.)

JÓSIKA, MIKLOS [NICHOLAS], BARON (1794–1865), Hungarian novelist, was born on the 28th of April 1794 at Torda in Transylvania, of aristocratic and wealthy parents. After finishing the usual course of legal studies at Kolozsvár (Klausenburg), he in 1811 entered the army, joining a cavalry regiment, with which he subsequently took part in the Italian campaign. On the battlefield of Mincio (February 8, 1814) he was promoted to the grade of lieutenant. He served in the campaign against Napoleon, and was present at the entry of the Allied Troops into Paris (March 31, 1814). In 1818 Jósika resigned his commission, returned to Hungary, and married his first wife

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[1] *E.g.* the vicissitudes of Levitical families, other migrations into Palestine, &c. The story of Joseph has probably been used as a link (see Luther, *op. cit.* pp. 142 seq.).

[2] Or "Magdolos" (Herod. ii. 159), *i.e.* some "Migdal" (tower) of Judaea, not the Migdol of Exod. xiv. 2; Jer. xliv. 1.

[3] See *Zeit. f. Alttest. Wissenschaft* (1902), pp. 170 seq., 312 seq.; *Journ Bib. Lit.* (1903), p. 50.

Elizabeth Kallai. The union proving an unhappy one, Jósika parted from his wife, settled on his estate at Szurdok in Transylvania, and devoted himself to agricultural and literary pursuits. Drawn into the sphere of politics, he took part in the memorable Transylvanian diet of 1834. About this time Jósika first began to attract attention as a writer of fiction. In 1836 his *Abafi* laid the foundation of his literary reputation. This novel gives a vivid picture of Transylvania in the time of Sigismund Bátori. Jósika was soon afterwards elected member of the Hungarian Academy of Sciences and of the Kisfaludy Society; of the latter he became, in 1841, director, and in 1842 vice-president. In 1847 he appeared at the Transylvanian diet as second deputy for the county of Szolnok, and zealously supported the movement for the union of Transylvania with Hungary proper. In the same year he was converted to Protestantism, was formally divorced from his wife, and married Baroness Julia Podmaniczky, herself a writer of considerable merit, with whom he lived happily until his death. So great was Jósika's literary activity that by the time of the revolution (1848) he had already produced about sixty volumes of romances and novels, besides numerous contributions to periodicals. Both as magnate of the upper house of the Hungarian diet and by his writings Jósika aided the revolutionary movement, with which he was soon personally identified, being chosen one of the members of the committee of national defence. Consequently, after the capitulation at Világos (Aug. 13, 1849) he found it necessary to flee the country, and settled first at Dresden and then, in 1850, at Brussels, where he resumed his literary pursuits anonymously. In 1864 he removed to Dresden, in which city he died on the 27th of February 1865. The romances of Jósika, written somewhat after the style of Sir Walter Scott, are chiefly of an historical and social-political character, his materials being drawn almost entirely from the annals of his own country. Among his more important works may be specially mentioned, besides *Abafi—The Poet Zrinyi* (1843); *The Last of the Bátoris* (1837); *The Bohemians in Hungary* (1839); *Esther* (1853); *Francis Rákóczy II.* (1861); and *A Végváriak*, a tale of the time of the Transylvanian prince Bethlen Gábor, 1864. Many of Jósika's novels have been translated into German.

See K. Moenich and S. Vutkovich, *Magyar Irók Névtára* (1876); M. Jókai, "Jósika Miklós Emlékezete," *A Kisfaludy-Társaság Evlapjai, Új folyam*, vol. iii. (1869); G. W. Steinacker, *Ungarische Lyriker* (1874). Cf. also Jósika's autobiography—*Emlékirat*, vol. iv. (1865).

JOSIPPON, the name usually given to a popular chronicle of Jewish history from Adam to the age of Titus, attributed to an author Josippon or Joseph ben Gorion.[1] The name, though at one time identified with that of the historian Josephus, is perhaps a corruption of Hegesippus, from whom (according to Trieber) the author derived much of his material. The chronicle was probably compiled in Hebrew early in the 10th century, by a Jewish native of south Italy. The first edition was printed in Mantua in 1476. *Josippon* subsequently appeared in many forms, one of the most popular being in Yiddish (Judaeo-German), with quaint illustrations. Though the chronicle is more legendary than historical, it is not unlikely that some good and even ancient sources were used by the first compiler, the *Josippon* known to us having passed through the hands of many interpolators. The book enjoyed much vogue in England. Peter Morvyn in 1558 translated an abbreviated version into English, and edition after edition was called for. Lucien Wolf has shown that the English translations of the Bible aroused so much interest in the Jews that there was a widespread desire to know more about them. This led to the circulation of many editions of *Josippon*, which thus formed a link in the chain of events which culminated in the readmission of the Jews to England by Cromwell. (I. A.)

JOSS, in the pidgin-English of the Chinese seaports, the name given to idols and deities. It is used adjectivally in regard to many things connected with religious rites, such as "joss-house," a temple; "joss-stick," a stick which when burned gives forth a fragrant odour and is used as incense; "joss-paper," paper cut to resemble money (and sometimes with prayers written upon it) burned in funeral and other ceremonies. "Joss" is not a Chinese word, and is probably a corruption of Port. *deos*, god, applied by Portuguese navigators in the 16th century to the idols worshipped in the East Indies. The Dutch form is *joosge* (diminutive of *joos*), whence the Javanese *dejos*, and the English *yos*, later *joss*. The word seems to have been carried to China by English seamen from Batavia.

JOST, ISAAK MARKUS (1793–1860), Jewish historical writer, was born on the 22nd of February 1793 at Bernburg, and studied at the universities of Göttingen and Berlin. In Berlin he began to teach, and in 1835 received the appointment of upper master in the Jewish commercial school (called the Philanthropin) at Frankfort-on-the-Main. Here he remained until his death, on the 22nd of November 1860. The work by which he is chiefly known is *Geschichte der Israeliten seit der Zeit der Maccabäer*, in 9 vols. (1820–1829), which was afterwards supplemented by *Neuere Geschichte der Israeliten von 1815–1845* (1846–1847), and *Geschichte des Judenthums und seiner Sekten* (1857–1859). He also published an abridgment under the title *Allgemeine Geschichte des israelitischen Volkes* (1831–1832), and an edition of the Mishna with a German translation and notes (6 vols., 1832–1834). The *Israelitische Annalen* were edited by him from 1839 to 1841, and he contributed extensively to periodicals.

See Zirndorf, *Isaak Markus Jost und seine Freunde* (Cincinnati, 1886).

JOTUNHEIM, or JOTUN FJELDE, a mountainous region of southern Norway, lying between Gudbrandsdal on the east and Jostedalsbrae and the head of the Sogne fjord on the west. Within an area of about 950 sq. m. it contains the highest mountain in the Scandinavian Peninsula—Galdhöpiggen (8399 ft.)—and several others but little inferior. Such are Glittertind or Glitretind (8380), and Memurutind (7966), which face Galdhöpiggen across the northward-sloping Visdal; Knutshulstind (7812) and several other peaks exceeding 7000 ft., to the south, between lakes Gjende and Bygdin, and Skagastölstind (7723) in the west of the region, above the Utladal, the chief summit of the magnificent Horunger. The upper parts of the main valleys are of characteristic form, not ending in lofty mountain-walls but comparatively low and level, and bearing lakes. The name Jotunheim (giants' home) is a modern memorial of the mountain-dwelling giants of Norse fable; the alternative name Jotun Fjelde was the first bestowed on the region, when it was explored in 1820 by the geologist Balthasar Matthias Keilhau (1797–1858). In modern times the region has attracted mountaineers and many visitors accustomed to rough lodging and difficult travelling.

JOUBERT, BARTHÉLEMY CATHERINE (1769–1799), French general, the son of an advocate, was born at Pont de Vaux (Ain) on the 14th of April 1769. In 1784 he ran away from school to enlist in the artillery, but was brought back and sent to study law at Lyons and Dijon. In 1791 he joined the volunteers of the Ain, and was elected by his comrades successively corporal and sergeant. In January 1792 he became sub-lieutenant, and in November lieutenant, having in the meantime made his first campaign with the army of Italy. In 1793 he distinguished himself by the brilliant defence of a redoubt at the Col di Tenda, with only thirty men against a battalion of the enemy. Wounded and made prisoner in this affair, Joubert was released on parole by the Austrian commander-in-chief, Devins, soon afterwards. In 1794 he was again actively engaged, and in 1795 he rendered such conspicuous service as to be made general of brigade. In the campaign of 1796 the young general commanded a brigade under Augereau, and soon attracted the special attention of Bonaparte, who caused him to be made a general of division in December, and repeatedly selected him for the command of important detachments. Thus he was in charge of the retaining force at the battle of Rivoli, and in the campaign of 1799

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[1] A prefect of Jerusalem of this name is mentioned by Josephus, *Bell. Jud.* ii. 20. 3.

(invasion of Austria) he commanded the detached left wing of Bonaparte's army in Tirol, and fought his way through the mountains to rejoin his chief in Styria. He subsequently held various commands in Holland, on the Rhine and in Italy, where up to January 1799 he commanded in chief. Resigning the post in consequence of a dispute with the civil authorities, Joubert returned to France and married (June) Mlle de Montholon. But he was almost immediately summoned to the field again. He took over the command in Italy from Moreau about the middle of July, but he persuaded his predecessor to remain at the front and was largely guided by his advice. The odds against the French troops in the disastrous campaign of 1799 (see FRENCH REVOLUTIONARY WARS) were too heavy. Joubert and Moreau were quickly compelled to give battle by their great antagonist Suvorov. The battle of Novi was disastrous to the French arms, not merely because it was a defeat, but above all because Joubert himself was amongst the first to fall (Aug. 15, 1799). Joubert died before it could be shown whether his genius was of the first rank, but he was at any rate marked out as a future great captain by the greatest captain of all ages, and his countrymen intuitively associated him with Hoche and Marceau as a great leader whose early death disappointed their highest hopes. After the battle his remains were brought to Toulon and buried in Fort La Malgue, and the revolutionary government paid tribute to his memory by a ceremony of public mourning (Sept. 16). A monument to Joubert at Bourg was razed by order of Louis XVIII., but another memorial was afterwards erected at Pont de Vaux.

See Guilbert, *Notice sur la vie de B. C. Joubert;* Chevrier, *Le Général Joubert d'après sa correspondance* (2nd ed. 1884).

JOUBERT, JOSEPH (1754–1824), French moralist, was born at Montignac (Corrèze) on the 6th of May 1754. After completing his studies at Toulouse he spent some years there as a teacher. His delicate health proved unequal to the task, and after two years spent at home in study Joubert went to Paris at the beginning of 1778. He allied himself with the chiefs of the philosophic party, especially with Diderot, of whom he was in some sort a disciple, but his closest friendship was with the abbé de Fontanes. In 1790 he was recalled to his native place to act as *juge de paix*, and carried out the duties of his office with great fidelity. He had made the acquaintance of Mme de Beaumont in a Burgundian cottage where she had taken refuge from the Terror, and it was under her inspiration that Joubert's genius was at its best. The atmosphere of serenity and affection with which she surrounded him seemed necessary to the development of what Sainte-Beuve calls his "esprit ailé, ami du ciel et des hauteurs." Her death in 1803 was a great blow to him, and his literary activity, never great, declined from that time. In 1809, at the solicitation of Joseph de Bonald, he was made an inspector-general of education, and his professional duties practically absorbed his interests during the rest of his life. He died on the 3rd of May 1824. His manuscripts were entrusted by his widow to Chateaubriand, who published a selection of *Pensées* from them in 1838 for private circulation. A more complete edition was published by Joubert's nephew, Paul de Raynal, under the title *Pensées, essais, maximes et correspondance* (2 vols. 1842). A selection of letters addressed to Joubert was published in 1883. Joubert constantly strove after perfection, and the small quantity of his work was partly due to his desire to find adequate and luminous expression for his discriminating criticism of literature and morals.

If Joubert's readers in England are not numerous, he is well known at second hand through the sympathetic essay devoted to him in Matthew Arnold's *Essays in Criticism* (1st series). See Sainte-Beuve, *Causeries du lundi*, vol. i.; *Portraits littéraires*, vol. ii.; and a notice by Paul de Raynal, prefixed to the edition of 1842.

JOUBERT, PETRUS JACOBUS (1834–1900), commandant-general of the South African Republic from 1880 to 1900, was born at Cango, in the district of Oudtshoorn, Cape Colony, on the 20th of January 1834, a descendant of a French Huguenot who fled to South Africa soon after the revocation of the Edict of Nantes by Louis XIV. Left an orphan at an early age, Joubert migrated to the Transvaal, where he settled in the Wakkerstroom district near Laing's Nek and the north-east angle of Natal. There he not only farmed with great success, but turned his attention to the study of the law. The esteem in which his shrewdness in both farming and legal affairs was held led to his election to the Volksraad as member for Wakkerstroom early in the sixties, Marthinus Pretorius being then in his second term of office as president. In 1870 Joubert was again elected, and the use to which he put his slender stock of legal knowledge secured him the appointment of attorney-general of the republic, while in 1875 he acted as president during the absence of T. F. Burgers in Europe. During the first British annexation of the Transvaal, Joubert earned for himself the reputation of a consistent irreconcilable by refusing to hold office under the government, as Paul Kruger and other prominent Boers were doing. Instead of accepting the lucrative post offered him, he took a leading part in creating and directing the agitation which led to the war of 1880–1881, eventually becoming, as commandant-general of the Boer forces, a member of the triumvirate that administered the provisional Boer government set up in December 1880 at Heidelberg. He was in command of the Boer forces at Laing's Nek, Ingogo, and Majuba Hill, subsequently conducting the earlier peace negotiations that led to the conclusion of the Pretoria Convention. In 1883 he was a candidate for the presidency of the Transvaal, but received only 1171 votes as against 3431 cast for Kruger. In 1893 he again opposed Kruger in the contest for the presidency, standing as the representative of the comparatively progressive section of the Boers, who wished in some measure to redress the grievances of the Uitlander population which had grown up on the Rand. The poll (though there is good reason for believing that the voting lists had been manipulated by Kruger's agents) was declared to have resulted in 7911 votes being cast for Kruger and 7246 for Joubert. After a protest Joubert acquiesced in Kruger's continued presidency. He stood again in 1898, but the Jameson raid had occurred meantime and the voting was 12,858 for Kruger and 2001 for Joubert. Joubert's position had then become much weakened by accusations of treachery and of sympathy with the Uitlander agitation. He took little part in the negotiations that culminated in the ultimatum sent to Great Britain by Kruger in 1899, and though he immediately assumed nominal command of the operations on the outbreak of hostilities, he gave up to others the chief share in the direction of the war, through his inability or neglect to impose upon them his own will. His cautious nature, which had in early life gained him the sobriquet of "Slim Piet," joined to a lack of determination and assertiveness that characterized his whole career, led him to act mainly on the defensive; and the strategically offensive movements of the Boer forces, such as Elandslaagte and Willow Grange, appear to have been neither planned nor executed by him. As the war went on, physical weakness led to Joubert's virtual retirement, and, though two days earlier he was still reported as being in supreme command, he died at Pretoria from peritonitis on the 28th of March 1900. Sir George White, the defender of Ladysmith, summed up Joubert's character when he called him "a soldier and a gentleman, and a brave and honourable opponent."

JOUFFROY, JEAN (*c.* 1412–1473), French prelate and diplomatist, was born at Luxeuil (Haute-Saône). After entering the Benedictine order and teaching at the university of Paris from 1435 to 1438, he became almoner to Philip the Good, duke of Burgundy, who entrusted him with diplomatic missions in France, Italy, Portugal and Castile. Jouffroy was appointed abbot of Luxeuil (1451?) bishop of Arras (1453), and papal legate (1459). At the French court his diplomatic duties brought him to the notice of the dauphin (afterwards Louis XI.). Jouffroy entered Louis's service, and obtained a cardinal's hat (1461), the bishopric of Albi (1462), and the abbacy of St Denis (1464). On several occasions he was sent to Rome to negotiate the abolition of the Pragmatic Sanction and to defend the interests of the Angevins at Naples. Attached by King Louis to the sieur de Beaujeu in the expedition against John V., count of Armagnac, Jouffroy was accused of taking the town of Lectoure by treachery, and of being a party to the murder of the count of Armagnac (1473). He died at Reuilly the same year.

See C. Fierrille, *Le Cardinal Jean Jouffroy et son temps* (1412–1473) (Coutances, Paris, 1874).

JOUFFROY, THÉODORE SIMON (1796–1842), French philosopher, was born at Pontets, near Mouthe, department of Doubs. In his tenth year, his father, a tax-gatherer, sent him to an uncle at Pontarlier, under whom he commenced his classical studies. At Dijon his compositions attracted the attention of an inspector, who had him placed (1814) in the normal school, Paris. He there came under the influence of Victor Cousin, and in 1817 he was appointed assistant professor of philosophy at the normal and Bourbon schools. Three years later, being thrown upon his own resources, he began a course of lectures in his own house, and formed literary connexions with *Le Courrier français*, *Le Globe*, *L'Encyclopédie moderne*, and *La Revue européenne*. The variety of his pursuits at this time carried him over the whole field of ancient and modern literature. But he was chiefly attracted to the philosophical system represented by Reid and Stewart. The application of "common sense" to the problem of substance supplied a more satisfactory analytic for him than the scepticism of Hume which reached him through a study of Kant. He thus threw in his lot with the Scottish philosophy, and his first dissertations are, in their leading position, adaptations from Reid's *Inquiry*. In 1826 he wrote a preface to a translation of the *Moral Philosophy* of Stewart, demonstrating the possibility of a scientific statement of the laws of consciousness; in 1828 he began a translation of the works of Reid, and in his preface estimated the influence of Scottish criticism upon philosophy, giving a biographical account of the movement from Hutcheson onwards. Next year he was returned to parlement by the *arrondissement* of Pontarlier; but the work of legislation was ill-suited to him. Yet he attended to his duties conscientiously, and ultimately broke his health in their discharge. In 1833 he was appointed professor of Greek and Roman philosophy at the college of France and a member of the Academy of Sciences; he then published the *Mélanges philosophiques* (4th ed. 1866; Eng. trans. G. Ripley, Boston, 1835 and 1838), a collection of fugitive papers in criticism and philosophy and history. In them is foreshadowed all that he afterwards worked out in metaphysics, psychology, ethics and aesthetics. He had already demonstrated in his prefaces the possibility of a psychology apart from physiology, of the science of the phenomena of consciousness distinct from the perceptions of sense. He now classified the mental faculties, premising that they must not be confounded with capacities or properties of mind. They were, according to his analysis, personal will, primitive instincts, voluntary movement, natural and artificial signs, sensibility and the faculties of intellect; on this analytic he founded his scheme of the universe. In 1835 he published a *Cours de droit naturel* (4th ed. 1866), which, for precision of statement and logical coherence, is the most important of his works. From the conception of a universal order in the universe he reasons to a Supreme Being, who has created it and who has conferred upon every man in harmony with it the aim of his existence, leading to his highest good. Good, he says, is the fulfilment of man's destiny, evil the thwarting of it. Every man being organized in a particular way has, of necessity, an aim, the fulfilment of which is good; and he has faculties for accomplishing it, directed by reason. The aim is good, however, only when reason guides it for the benefit of the majority, but that is not absolute good. When reason rises to the conception of universal order, when actions are submitted, by the exercise of a sympathy working necessarily and intuitively to the idea of the universal order, the good has been reached, the true good, good in itself, absolute good. But he does not follow his idea into the details of human duty, though he passes in review fatalism, mysticism, pantheism, scepticism, egotism, sentimentalism and rationalism. In 1835 Jouffroy's health failed and he went to Italy, where he continued to translate the Scottish philosophers. On his return he became librarian to the university, and took the chair of recent philosophy at the faculty of letters. He died in Paris on the 4th of February 1842. After his death were published *Nouveaux mélanges philosophiques* (3rd ed. 1872) and *Cours d'esthétique* (3rd ed. 1875). The former contributed nothing new to the system except a more emphatic statement of the distinction between psychology and physiology. The latter formulated his theory of beauty.

Jouffroy's claim to distinction rests upon his ability as an expositor of other men's ideas. He founded no system; he contributed nothing of importance to philosophical science; he initiated nothing which has survived him. But his enthusiasm for mental science, and his command over the language of popular exposition, made him a great international medium for the transfusion of ideas. He stood between Scotland and France and Germany and France; and, though his expositions are vitiated by loose reading of the philosophers he interpreted, he did serviceable, even memorable work.

See L. Lévy Bruhl, *History of Modern Philos. in France* (1899), pp. 349–357; C. J. Tissot, *Th. Jouffroy: sa vie et ses écrits* (1876); J. P. Damiron, *Essai sur l'histoire de la philos. en France au xix*ᵉ *siècle* (1846).

JOUGS, JUGGS, or JOGGS (O. Fr. *joug*, from Lat. *jugum*, a yoke), an instrument of punishment formerly in use in Scotland, Holland and possibly other countries. It was an iron collar fastened by a short chain to a wall, often of the parish church, or to a tree. The collar was placed round the offender's neck and fastened by a padlock. The jougs was practically a pillory. It was used for ecclesiastical as well as civil offences. Examples may still be seen in Scotland.

JOULE, JAMES PRESCOTT (1818–1889), English physicist, was born on the 24th of December 1818, at Salford, near Manchester. Although he received some instruction from John Dalton in chemistry, most of his scientific knowledge was self-taught, and this was especially the case with regard to electricity and electro-magnetism, the subjects in which his earliest researches were carried out. From the first he appreciated the importance of accurate measurement, and all through his life the attainment of exact quantitative data was one of his chief considerations. At the age of nineteen he invented an electro-magnetic engine, and in the course of examining its performance dissatisfaction with vague and arbitrary methods of specifying electrical quantities caused him to adopt a convenient and scientific unit, which he took to be the amount of electricity required to decompose nine grains of water in one hour. In 1840 he was thus enabled to give a quantitative statement of the law according to which heat is produced in a conductor by the passage of an electric current, and in succeeding years he published a series of valuable researches on the agency of electricity in transformations of energy. One of these contained the first intimation of the achievement with which his name is most widely associated, for it was in a paper read before the British Association at Cork in 1843, and entitled "The Calorific Effects of Magneto-electricity and the Mechanical Value of Heat," that he expressed the conviction that whenever mechanical force is expended an exact equivalent of heat is always obtained. By rotating a small electro-magnet in water, between the poles of another magnet, and then measuring the heat developed in the water and other parts of the machine, the current induced in the coils, and the energy required to maintain rotation, he calculated that the quantity of heat capable of warming one pound of water one degree F. was equivalent to the mechanical force which could raise 838 lb. through the distance of one foot. At the same time he brought forward another determination based on the heating effects observable when water is forced through capillary tubes; the number obtained in this way was 770. A third method, depending on the observation of the heat evolved by the mechanical compression of air, was employed a year or two later, and yielded the number 798; and a fourth—the well-known frictional one of stirring water with a sort of paddle-wheel—yielded the result 890 (see *Brit. Assoc. Report*, 1845), though 781·5 was obtained by subsequent repetitions of the experiment. In 1849 he presented to the Royal Society a memoir which, together with a history of the subject, contained details of a long series of determinations, the result of which was 772. A good many years later he was entrusted by the committee of the British Association on standards of electric resistance with the task of deducing the mechanical equivalent of heat from the thermal effects of electric currents. This inquiry yielded (in 1867) the result 783, and this Joule himself was inclined to regard as more accurate than his old determination by the frictional method; the latter, however, was repeated with every precaution, and again indicated 772·55 foot-pounds as the quantity of work that must be expended at sea-level in the latitude of Greenwich in order to raise the temperature of one pound of water, weighed *in vacuo*, from 60° to 61° F. Ultimately the discrepancy was traced to an error which, not by Joule's fault, vitiated the determination by the electrical method, for it was found that the standard ohm, as actually defined by the British Association committee and as used by him, was slightly smaller than was intended; when the necessary corrections were made the results of the two methods were almost precisely congruent, and thus the figure 772·55 was vindicated. In addition, numerous other researches stand to Joule's credit—the work done in compressing gases and the thermal changes they undergo when forced under pressure through small apertures (with Lord Kelvin), the change of volume on solution, the change of temperature produced by the longitudinal extension and compression of solids, &c. It was during the experiments involved by the first of these inquiries that Joule was incidentally led to appreciate the value of surface condensation in increasing the efficiency of the steam engine. A new form of condenser was tested on the small engine employed, and the results it yielded formed the starting-point of a series of investigations which were aided by a special grant from the Royal Society, and were described in an elaborate memoir presented to it on the 13th of December 1860. His results, according to Kelvin, led directly and speedily to the present practical method of surface-condensation, one of the most important improvements of the steam engine, especially for marine use, since the days of James Watt. Joule died at Sale on the 11th of October 1889.

His scientific papers were collected and published by the Physical Society of London: the first volume, which appeared in 1884, contained the researches for which he was alone responsible, and the second, dated 1887, those which he carried out in association with other workers.

JOURDAN, JEAN BAPTISTE, COUNT (1762–1833), marshal of France, was born at Limoges on the 29th of April 1762, and in his boyhood was apprenticed to a silk merchant of Lyons. In 1776 he enlisted in a French regiment to serve in the American War of Independence, and after being invalided in 1784 he married and set up in business at Limoges. At the outbreak of the revolutionary wars he volunteered, and as a subaltern took part in the first campaigns in the north of France. His rise was even more rapid than that of Hoche and Marceau. By 1793 he had become a general of division, and was selected by Carnot to succeed Houchard as commander-in-chief of the Army of the North; and on the 15th–16th of October 1793 he won the brilliant and important victory of Wattignies (see FRENCH REVOLUTIONARY WARS). Soon afterwards he became a "suspect," the moderation of his political opinions and his misgivings as to the future conduct of the war being equally distasteful to the truculent and enthusiastic Committee of Public Safety. Warned in time by his friend Carnot and by Barère, he avoided arrest and resumed his business as a silk-mercer in Limoges. He was soon reinstated, and early in 1794 was appointed commander-in-chief of the Army of Sambre-et-Meuse. After repeated attempts to force the passage of the Sambre had failed and several severe general actions had been fought without result, Jourdan and his army were discouraged, but Carnot and the civil commissioners urged the general, even with threats, to a last effort, and this time he was successful not only in crossing the Sambre but in winning a brilliant victory at Fleurus (June 26, 1794), the consequence of which was the extension of the French sphere of influence to the Rhine, on which river he waged an indecisive campaign in 1795.

In 1796 his army formed the left wing of the advance into Bavaria. The whole of the French forces were ordered to advance on Vienna, Jourdan on the extreme left and Moreau in the centre by the Danube valley, Bonaparte on the right by Italy and Styria. The campaign began brilliantly, the Austrians under the Archduke Charles being driven back by Moreau and Jourdan almost to the Austrian frontier. But the archduke, slipping away from Moreau, threw his whole weight on Jourdan, who was defeated at Amberg and Würzburg, and forced over the Rhine after a severe rearguard action, which cost the life of Marceau. Moreau had to fall back in turn, and, apart from Bonaparte's marvellous campaign in Italy, the operations of the year were disastrous. The chief cause of failure was the vicious plan of campaign imposed upon the generals by their government. Jourdan was nevertheless made the scapegoat of the government's mistakes and was not employed for two years. In those years he became prominent as a politician and above all as the framer of the famous conscription law of 1798. When the war was renewed in 1799 Jourdan was placed at the head of the army on the Rhine, but again underwent defeat at the hands of the archduke Charles at Stockach (March 25), and, disappointed and broken in health, handed over the command to Masséna. He at once resumed his political duties, and was a prominent opponent of the *coup d'état* of 18 Brumaire, after which he was expelled from the Council of the Five Hundred. Soon, however, he became formally reconciled to the new régime, and accepted from Napoleon fresh military and civil employment. In 1800 he became inspector-general of cavalry and infantry and representative of French interests in the Cisalpine Republic, and in 1804 he was made a marshal of France. He remained in the new kingdom of Italy until 1806, when Joseph Bonaparte, whom his brother made king of Naples in that year, selected Jourdan as his military adviser. He followed Joseph into Spain in the same capacity in 1808. But Joseph's throne had to be maintained by the French army, and throughout the Peninsular War the other marshals, who depended directly upon Napoleon, paid little heed either to Joseph or to Jourdan. After the battle of Vitoria he held no important command up to the fall of the Empire. Jourdan gave in his adhesion to the restoration government of 1814, and though he rejoined Napoleon in the Hundred Days and commanded a minor army, he submitted to the Bourbons again after Waterloo. He refused, however, to be a member of the court which tried Marshal Ney. He was made a count, a peer of France (1819), and governor of Grenoble (1816). In politics he was a prominent opponent of the royalist reactionaries and supported the revolution of 1830. After this event he held the portfolio of foreign affairs for a few days, and then became governor of the Invalides, where his last years were spent. Marshal Jourdan died on the 23rd of November 1833, and was buried in the Invalides.

He wrote *Opérations de l'armée du Danube* (1799); *Mémoires pour servir à l'histoire sur la campagne de 1796* (1819); and unpublished personal memoirs.

JOURNAL (through Fr. from late Lat. *diurnalis*, daily), a daily record of events or business. A private journal is usually an elaborated diary. When applied to a newspaper or other periodical the word is strictly used of one published each day; but any publication issued at stated intervals, such as a magazine or the record of the transactions of a learned society, is commonly called a journal. The word "journalist" for one whose business is writing for the public press (see NEWSPAPERS) seems to be as old as the end of the 17th century.

"Journal" is particularly applied to the record, day by day, of the business and proceedings of a public body. The journals of the British houses of parliament contain an official record of the business transacted day by day in either house. The record does not take note of speeches, though some of the earlier volumes contain references to them. The journals are a lengthened account written from the "votes and proceedings" (in the House of Lords called "minutes of the proceedings"), made day by day by the assistant clerks, and printed on the responsibility of the clerk to the house, after submission to the "sub-committee on the journals." In the Commons the journal is passed by the Speaker before publication. The journals of the House of Commons begin in the first year of the reign of Edward VI. (1547), and are complete, except for a short interval under Elizabeth. Those of the House of Lords date from the first year of Henry VIII. (1509). Before that date the proceedings in parliament were entered in the rolls of parliament, which extend from 1278 to 1503. The journals of the Lords are "records" in the judicial sense, those of the Commons are not (see Erskine May, *Parliamentary Practice*, 1906, pp. 201–202).

The term "journal" is used, in business, for a book in which an account of transactions is kept previous to a transfer to the ledger (see BOOK-KEEPING), and also as an equivalent to a ship's log, as a record of the daily run, observations, weather changes, &c. In mining, a journal is a record describing the various strata passed through in sinking a shaft. A particular use of the word is that, in machinery, for the parts of a shaft which are in contact with the bearings; the origin of this meaning, which is firmly established, has not been explained.

JOURNEY (through O. Fr. *jornee* or *journee*, mod. Fr. *journée*, from med. Lat. *diurnata*, Lat. *diurnus*, of or belonging to *dies*, day), properly that which occupies a day in its performance, and so a day's work, particularly a day's travel, and the distance covered by such, usually reckoned in the middle ages as twenty miles. The word is now used of travel covering a certain amount of distance or lasting a certain amount of time, frequently defined by qualifying words. "Journey" is usually applied to travel by land, as opposed to "voyage," travel by sea. The early use of "journey" for a day's work, or the amount produced by a day's work, is still found in glassmaking, and also at the British Mint, where a "journey" is taken as equivalent to the coinage of 15 ℔ of standard gold, 701 sovereigns, and of 60 ℔ of silver. The term "journeyman" also preserves the original significance of the word. It distinguishes a qualified workman or mechanic from an "apprentice" on the one hand and a "master" on the other, and is applied to one who is employed by another person to work at his trade or occupation at a day's wage.

JOUVENET, JEAN (1647–1717), French painter, born at Rouen, came of a family of artists, one of whom had taught Poussin. He early showed remarkable aptitude for his profession, and, on arriving in Paris, attracted the attention of Le Brun, by whom he was employed at Versailles, and under whose auspices, in 1675, he became a member of the Académie Royale, of which he was elected professor in 1681, and one of the four perpetual rectors in 1707. The great mass of works that he executed, chiefly in Paris, many of which, including his celebrated Miraculous Draught of Fishes (engraved by Audran; also Landon, *Annales*, i. 42), are now in the Louvre, show his fertility in invention and execution, and also that he possessed in a high degree that general dignity of arrangement and style which distinguished the school of Le Brun. Jouvenet died on the 5th of April 1717, having been forced by paralysis during the last four years of his life to work with his left hand.

See *Mém. inéd. acad. roy. de p. et de sc.*, 1854, and D'Argenville, *Vies des peintres*.

JOUY, VICTOR JOSEPH ÉTIENNE DE (1764–1846), French dramatist, was born at Jouy, near Versailles, on the 12th of September 1764. At the age of eighteen he received a commission in the army, and sailed for South America in the company of the governor of Guiana. He returned almost immediately to France to complete his studies, and re-entered the service two years later. He was sent to India, where he met with many romantic adventures which were afterwards turned to literary account. On the outbreak of the Revolution he returned to France and served with distinction in the early campaigns, attaining the rank of adjutant-general. He drew suspicion on himself, however, by refusing to honour the toast of Marat, and had to fly for his life. At the fall of the Terror he resumed his commission but again fell under suspicion, being accused of treasonable correspondence with the English envoy, James Harris, 1st earl of Malmesbury who had been sent to France to negotiate terms of peace. He was acquitted of this charge, but, weary of repeated attacks, resigned his position on the pretext of his numerous wounds. Jouy now turned his attention to literature, and produced in 1807 with immense success his opera *La vestale* (music by Spontini). The piece ran for a hundred nights, and was characterized by the Institute of France as the best lyric drama of the day. Other operas followed, but none obtained so great a success. He published in the *Gazette de France* a series of satirical sketches of Parisian life, collected under the title of *L'Ermite de la Chaussée d'Antin, ou observations sur les mœurs et les usages français au commencement du xix^{e} siècle* (1812–1814, 5 vols.), which was warmly received. In 1821 his tragedy of *Sylla* gained a triumph due in part to the genius of Talma, who had studied the title-rôle from Napoleon. Under the Restoration Jouy consistently fought for the cause of freedom, and if his work was overrated by his contemporaries, they were probably influenced by their respect for the author himself. He died in rooms set apart for his use in the palace of St Germain-en-Laye on the 4th of September 1846.

Out of the long list of his operas, tragedies and miscellaneous writings may be mentioned, *Fernand Cortez* (1809), opera, in collaboration with J. E. Esménard, music by Spontini; *Tippo Saïb*, tragedy (1813); *Bélisaire*, tragedy (1818); *Les Hermites en prison* (1823), written in collaboration with Antoine Jay, like himself a political prisoner; *Guillaume Tell* (1829), with Hippolyte Bis, for the music of Rossini. Jouy was also one of the founders of the *Biographie nouvelle des contemporains*.

JOVELLANOS (or JOVE LLANOS), **GASPAR MELCHOR DE** (1744–1811), Spanish statesman and author, was born at Gijon in Asturias, Spain, on the 5th of January 1744. Selecting law as his profession, he studied at Oviedo, Avila, and Alcalá, and in 1767 became criminal judge at Seville. His integrity and ability were rewarded in 1778 by a judgeship in Madrid, and in 1780 by appointment to the council of military orders. In the capital Jovellanos took a good place in the literary and scientific societies; for the society of friends of the country he wrote in 1787 his most valuable work, *Informe sobre un proyecto de ley agraria*. Involved in the disgrace of his friend, François Cabarrus, Jovellanos spent the years 1790 to 1797 in a sort of banishment at Gijon, engaged in literary work and in founding the Asturian institution for agricultural, industrial, social and educational reform throughout his native province. This institution continued his darling project up to the latest hours of his life. Summoned again to public life in 1797, Jovellanos refused the post of ambassador to Russia, but accepted that of minister of grace and justice, under "the prince of the peace," whose attention had been directed to him by Cabarrus, then a favourite of Godoy. Displeased with Godoy's policy and conduct Jovellanos combined with his colleague Saavedra to procure his dismissal. Godoy returned to power in 1798; Jovellanos was again sent to Gijon, but in 1801 was thrown into prison in Majorca. The revolution of 1808, and the advance of the French into Spain, set him once more at liberty. Joseph Bonaparte, on mounting the Spanish throne, made Jovellanos the most brilliant offers; but the latter, sternly refusing them all, joined the patriotic party, became a member of the central junta, and contributed to reorganize the cortes. This accomplished, the junta at once fell under suspicion, and Jovellanos was involved in its fall. To expose the conduct of the cortes, and to defend the junta and himself were the last labours of his pen. In 1811 he was enthusiastically welcomed to Gijon; but the approach of the French drove him forth again. The vessel in which he sailed was compelled by stress of weather to put in at Vega in Asturias, and there he died on the 27th of November 1811.

The poetical works of Jovellanos comprise a tragedy *El pelayo*, the comedy *El delincuente honrado*, satires, and miscellaneous pieces, including a translation of the first book of *Paradise Lost*. His prose works, especially those on political and legislative economy, constitute his real title to literary fame. In them depth of thought and clear-sighted sagacity are couched in a certain Ciceronian elegance and classical purity of style. Besides the *Ley agraria* he wrote *Elogios*; various political and other essays; and *Memorias politicas* (1801), suppressed in Spain, and translated into French, 1825. An edition of his complete works was published at Madrid (1831–1832) in 7 vols., and another at Barcelona (1839).

See *Noticias historicas de Don G. M. de Jovellanos* (1812), and *Memorias para la vida del Señor . . . Jovellanos*, by J. A. C. Bermudez (1814).

JOVELLAR Y SOLER, JOAQUIN (1819–1892), captain-general of Spain, was born at Palma de Mallorca, on the 28th of December 1819. At the close of his studies at the military academy he was appointed sub-lieutenant, went to Cuba as captain in 1842, returned to the War Office in 1851, was promoted major in 1853, and went to Morocco as private secretary to Marshal O'Donnell, who made him colonel in 1860 after Jovellar had been wounded at the battle of Wad el Ras. In 1863 Jovellar became a brigadier-general, in 1864 under-secretary for war; he was severely wounded in fighting the insurgents in the streets of Madrid, and rose to the rank of general of division in 1866. Jovellar adhered to the revolution, and King Amadeus made him a lieutenant-general in 1872. He absented himself from Spain when the federal republic was proclaimed, and returned in the autumn of 1873, when Castelár sent him to Cuba as governor-general. In 1874 Jovellar came back to the Peninsula, and was in command of the Army of the Centre against the Carlists when Marshal Campos went to Sagunto to proclaim Alfonso XII. General Jovellar became war minister in the first cabinet of the restoration under Canovas, who sent him to Cuba again as governor-general, where he remained until the 18th of June 1878, when the ten years' insurrection closed with the peace of Zaujon. Alfonso XII. made him a captain-general, president of the council, life-senator, and governor-general of the Philippines. Jovellar died in Madrid on the 17th of April 1892.

JOVIAN (Flavius Jovianus) (*c.* 332–364), Roman emperor from June 363 to February 364, was born at Singidunum in Moesia about 332. As captain of the imperial bodyguard he accompanied Julian in his Persian expedition; and on the day after that emperor's death, when the aged Sallust, prefect of the East, declined the purple, the choice of the army fell upon Jovian. His election caused considerable surprise, and it is suggested by Ammianus Marcellinus that he was wrongly identified with another Jovian, chief notary, whose name also had been put forward, or that, during the acclamations, the soldiers mistook the name Jovianus for Julianus, and imagined that the latter had recovered from his illness. Jovian at once continued the retreat begun by Julian, and, continually harassed by the Persians, succeeded in reaching the banks of the Tigris, where a humiliating treaty was concluded with the Persian king, Shapur II. (*q.v.*). Five provinces which had been conquered by Galerius in 298 were surrendered, together with Nisibis and other cities. The Romans also gave up all their interests in the kingdom of Armenia, and abandoned its Christian prince Arsaces to the Persians. During his return to Constantinople Jovian was found dead in his bed at Dadastana, halfway between Ancyra and Nicaea. A surfeit of mushrooms or the fumes of a charcoal fire have been assigned as the cause of death. Under Jovian, Christianity was established as the state religion, and the Labarum of Constantine again became the standard of the army. The statement that he issued an edict of toleration, to the effect that, while the exercise of magical rites would be severely punished, his subjects should enjoy full liberty of conscience, rests on insufficient evidence. Jovian entertained a great regard for Athanasius, whom he reinstated on the archiepiscopal throne, desiring him to draw up a statement of the Catholic faith. In Syriac literature Jovian became the hero of a Christian romance (G. Hoffmann, *Julianus der Abtrünnige*, 1880).

See Ammianus Marcellinus, xxv. 5–10; J. P. de la Bléterie, *Histoire de Jovien* (1740); Gibbon, *Decline and Fall*, chs. xxiv., xxv.; J. Wordsworth in Smith and Wace's *Dictionary of Christian Biography;* H. Schiller, *Geschichte der römischen Kaiserzeit*, vol. ii. (1887); A. de Broglie, *L'Église et l'empire romain au ivᵉ siècle* (4th ed. 1882). For the relations of Rome and Persia see Persia: *Ancient History.*

JOVINIANUS, or Jovianus, a Roman monk of heterodox views, who flourished during the latter half of the 4th century. All our knowledge of him is derived from a passionately hostile polemic of Jerome (*Adv. Jovinianum, Libri II.*), written at Bethlehem in 393, and without any personal acquaintance with the man assailed. According to this authority Jovinian in 388 was living at Rome the celibate life of an ascetic monk, possessed a good acquaintance with the Bible, and was the author of several minor works, but, undergoing an heretical change of view, afterwards became a self-indulgent Epicurean and unrefined sensualist. The views which excited this denunciation were mainly these: (1) Jovinian held that in point of merit, so far as their domestic state was concerned, virgins, widows and married persons who had been baptized into Christ were on a precisely equal footing; (2) those who with full faith have been regenerated in baptism cannot be overthrown (or, according to another reading, tempted) of the devil; (3) to abstain from meats is not more praiseworthy than thankfully to enjoy them; (4) all who have preserved their baptismal grace shall receive the same reward in the kingdom of heaven.[1] Jovinian thus indicates a natural and vigorous reaction against the exaggerated asceticism of the 4th century, a protest shared by Helvidius and Vigilantius. He was condemned by a Roman synod under Bishop Siricius in 390, and afterwards excommunicated by another at Milan under the presidency of Ambrose. The year of his death is unknown, but he is referred to as no longer alive in Jerome's *Contra Vigilantium* (406).

JOVIUS, PAULUS, or Paolo Giovio (1483–1552), Italian historian and biographer, was born of an ancient and noble family at Como on the 19th of April 1483. His father died when he was a child, and Giovio owed his education to his brother Benedetto. After studying the humanities, he applied himself to medicine and philosophy at his brother's request. He was Pomponazzi's pupil at Padua; and afterwards he took a medical degree in the university of Pavia. He exercised the medical profession in Rome, but the attraction of literature proved irresistible for Giovio, and he was bent upon becoming the historian of his age. He presented a portion of his history to Leo X., who read the MS., and pronounced it superior in elegance to anything since Livy. Thus encouraged, Giovio took up his residence in Rome, and attached himself to Cardinal Giulio de' Medici, the pope's nephew. The next pope, Adrian VI., gave him a canonry in Como, on the condition, it is said, that Giovio should mention him with honour in his history. This patronage from a pontiff who was averse from the current tone of Italian humanism proves that Giovio at this period passed for a man of sound learning and sober manners. After Adrian's death, Giulio de' Medici became pope as Clement VII. and assigned him chambers in the Vatican, with maintenance for servants befitting a courtier of rank. In addition to other benefices, he finally, in 1528, bestowed on him the bishopric of Nocera. Giovio had now become in a special sense dependent on the Medici. He was employed by that family on several missions—as when he accompanied Ippolito to Bologna on the occasion of Charles V.'s coronation, and Caterina to Marseilles before her marriage to the duke of Orleans. During the siege of Rome in 1527 he attended Clement in his flight from the Vatican. While crossing the bridge which connected the palace with the castle of S. Angelo, Giovio threw his mantle over the pope's shoulders in order to disguise his master.

In the sack he suffered a serious pecuniary and literary loss, if we may credit his own statement. The story runs that he deposited the MS. of his history, together with some silver, in a box at S. Maria Sopra Minerva for safety. This box was discovered by two Spaniards, one of whom secured the silver, while the other, named Herrera, knowing who Giovio was, preferred to hold the MSS. for ransom. Herrera was so careless, however, as to throw away the sheets he found in paper, reserving only that portion of the work which was transcribed on parchment. This he subsequently sold to Giovo in exchange for a benifice at Cordova, which Clement VII. conceded to the Spaniard. Six books of the history were lost in this transaction. Giovo contented himself with indicating their substance in a summary. Perhaps he was not unwilling that his work should resemble that of Livy, even in its imperfection. But doubt rests upon the whole of this story. Apostolo Zeno affirms that in the middle of the last century three of the missing books turned up among family papers in the possession of Count Giov. Batt. Giovio, who wrote a panegyric on his ancestor. It is therefore not improbable that Giovio possessed his history intact, but preferred to withhold from publication those portions which might have involved him in difficulties with living persons of importance. The omissions were afterwards made good by Curtio Marinello in the Italian edition, published at Venice in 1581. But whether Marinello was the author of these additions is not known.

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[1] See, more fully, Harnack, *Hist. of Dogma*, v. 57.

After Clement's death Giovio found himself out of favour with the next pope, Paul III. The failure of his career is usually ascribed to the irregularity of the life he led in the literary society of Rome. We may also remember that Paul had special causes for animosity against the Medici, whose servant Giovio had been. Despairing of a cardinal's hat, Giovio retired to his villa on the lake of Como, where he spent the wealth he had acquired from donations and benefices in adorning his villa with curiosities, antiquities and pictures, including a very important collection of portraits of famous soldiers and men of letters, now almost entirely dispersed. He died upon a visit to Florence in 1552.

Giovio's principal work was the *History of His Own Times*, from the invasion of Charles VIII. to the year 1547. It was divided into two parts, containing altogether forty-five books. Of these, books v.–xi. of part i. were said by him to have been lost in the sack of Rome, while books xix.–xxiv. of part ii., which should have embraced the period from the death of Leo to the sack, were never written. Giovio supplied the want of the latter six books by his lives of Leo, Adrian, Alphonso I. of Ferrara, and several other personages of importance. But he alleged that the history of that period was too painful to be written in full. His first published work, printed in 1524 at Rome, was a treatise *De piscibus romanis*. After his retirement to Como he produced a valuable series of biographies, entitled *Elogia virorum illustrium*. They commemorate men distinguished for letters and arms, selected from all periods, and are said to have been written in illustration of portraits collected by him for the museum of his villa at Como. Besides these books, we may mention a biographical history of the Visconti, lords of Milan; an essay on mottoes and badges; a dissertation on the state of Turkey; a large collection of familiar epistles; together with descriptions of Britain, Muscovy, the Lake of Como and Giovio's own villa. The titles of these miscellanies will be found in the bibliographical note appended to this article.

Giovio preferred Latin in the composition of his more important works. Though contemporary with Machiavelli, Guicciardini and Varchi, he adhered to humanistic usages, and cared more for the Latinity than for the matter of his histories. His style is fluent and sonorous rather than pointed or grave. Partly owing to the rhetorical defects inherent in this choice of Latin, when Italian had gained the day, but more to his own untrustworthy and shallow character, Giovio takes a lower rank as historian than the bulk and prestige of his writings would seem to warrant. He professed himself a flatterer and a lampooner, writing fulsome eulogies on the princes who paid him well, while he ignored or criticized those who proved less generous. The old story that he said he kept a golden and an iron pen, to use according as people paid him, condenses the truth in epigram. His private morals were of a dubious character, and as a writer he had the faults of the elder humanists, in combination with that literary cynicism which reached its height in Aretino; and therefore his histories and biographical essays are not to be used as authorities, without corroboration. Yet Giovio's works, taken in their entirety and with proper reservation, have real value. To the student of Italy they yield a lively picture of the manners and the feeling of the times in which he lived, and in which he played no obscure part. They abound in vivid sketches, telling anecdotes, fugitive comments, which unite a certain charm of autobiographical romance with the worldly wisdom of an experienced courtier. A flavour of personality makes them not unpleasant reading. While we learn to despise and mistrust the man in Giovio, we appreciate the author. It would not be too far-fetched to describe him as a sort of 16th-century Horace Walpole.

BIBLIOGRAPHY.—The sources of Giovio's biography are: his own works; Tiraboschi's *History of Italian Literature*; Litta's *Genealogy of Illustrious Italian Families*; and Giov. Batt. Giovio's *Uomini illustri della diocesi Comasca*, Modena (1784). Cicogna, in his *Delle inscrizioni Veneziane raccolta* (Venice, 1830), gives a list of Giovio's works, from which the following notices are extracted: 1. Works in Latin: (1) *Pauli Jovii historiarum sui temporis, ab anno 1494 ad an. 1547* (Florence 1550–1552), the same translated into Italian by L. Domenichi, and first published at Florence (1551), afterwards at Venice; (2) *Leonis X., Hadriani VI., Pompeii Columnae Card., vitae* (Florence, 1548), translated by Domenichi (Florence, 1549); (3) *Vitae XII. vicecomitum Mediolani principum* (Paris, 1549), translated by Domenichi (Venice, 1549); (4) *Vita Sfortiae clariss. ducis* (Rome, 1549), translated by Domenichi (Florence, 1549); (5) *Vita Fr. Ferd. Davali* (Florence, 1549), translated by Domenichi (ibid. 1551); (6) *Vita magni Consalvi* (ibid. 1549), translated by Domenichi (ibid. 1550); (7) *Alfonsi Atestensi*, &c. (ibid. 1550), Italian translation by Giov. Batt. Gelli (Florence, 1553); (8) *Elogia virorum bellica virtute illustrium* (ibid. 1551), translated by Domenichi (ibid. 1554); (9) *Elogia clarorum virorum*, &c. (Venice, 1546) (these are biographies of men of letters), translated by Hippolito Orio of Ferrara (Florence, 1552); (10) *Libellus de legatione Basilii Magni principis Moscoviae* (Rome, 1525); (11) *Descriptio Larii Lacus* (Venice, 1559); (12) *Descriptio Britanniae*, &c. (Venice, 1548); (13) *De piscibus romanis* (Rome, 1524); (14) *Descriptiones quotquot extant regionum atque locorum* (Basel, 1571). 2. Works in Italian: (1) *Dialogo delle imprese militari et amorose* (Rome, 1555); (2) *Commentarî delle cose dei Turchi* (Venice, 1541); (3) *Lettere volgari* (Venice, 1560). Some minor works and numerous reprints of those cited have been omitted from this list; and it should also be mentioned that some of the lives with additional matter, are included in the *Vitae illustrium virorum* (Basel, 1576). (J. A. S.)

The best and most complete edition of Giovio's works is that of Basel (1678). For his life see Giuseppe Sanesi, "Alcuni osservazioni e notizie intorno a tre storici minori del cinquecento—Giovio; Nerli, Segni" (in *Archivio Storico Italiano*, 5th series, vol. xxiii.); Eug. Müntz, *Sul museo di ritratti composto da Paolo Giovio* (ibid., vol. xix.).

JOWETT, BENJAMIN (1817–1893), English scholar and theologian, master of Balliol College, Oxford, was born in Camberwell on the 15th of April 1817. His father was one of a Yorkshire family who, for three generations, had been supporters of the Evangelical movement in the Church of England. His mother was a Langhorne, in some way related to the poet and translator of Plutarch. At twelve the boy was placed on the foundation of St Paul's School (then in St Paul's Churchyard), and in his nineteenth year he obtained an open scholarship at Balliol. In 1838 he gained a fellowship, and graduated with first-class honours in 1839. Brought up amongst pious Evangelicals, he came to Oxford at the height of the Tractarian movement, and through the friendship of W. G. Ward was drawn for a time in the direction of High Anglicanism; but a stronger and more lasting influence was that of the Arnold school, represented by A. P. Stanley. Jowett was thus led to concentrate his attention on theology, and in the summers of 1845 and 1846, spent in Germany with Stanley, he became an eager student of German criticism and speculation. Amongst the writings of that period he was most impressed by those of F. C. Baur. But he never ceased to exercise an independent judgment, and his work on St Paul, which appeared in 1855, was the result of much original reflection and inquiry. He was appointed to the Greek professorship in the autumn of that year. He had been a tutor of Balliol and a clergyman since 1842, and had devoted himself to the work of tuition with unexampled zeal. His pupils became his friends for life. He discerned their capabilities, studied their characters, and sought to remedy their defects by frank and searching criticism. Like another Socrates, he taught them to know themselves, repressing vanity, encouraging the despondent, and attaching all alike by his unobtrusive sympathy. This work gradually made a strong impression, and those who cared for Oxford began to speak of him as "the great tutor." As early as 1839 Stanley had joined with Tait, the future archbishop, in advocating certain university reforms. From 1846 onwards Jowett threw himself into this movement, which in 1848 became general amongst the younger and more thoughtful fellows, until it took effect in the commission of 1850 and the act of 1854. Another educational reform, the opening of the Indian civil service to competition, took place at the same time, and Jowett was one of the commission. He had two brothers who served and died in India, and he never ceased to take a deep and practical interest in Indian affairs. A great disappointment, his repulse for the mastership of Balliol, also in 1854, appears to have roused him into the completion of his book on *The Epistles of St Paul*. This work, described by one of his friends as "a miracle of boldness," is full of originality and suggestiveness, but its publication awakened against him a storm of theological prejudice, which followed him more or less through life. Instead of yielding to this, he joined with Henry Bristowe Wilson and Rowland Williams, who had been similarly attacked, in the production of the volume known as *Essays and Reviews*. This appeared in 1860 and gave rise to a strange outbreak of fanaticism. Jowett's loyalty to those who were prosecuted on this account was no less characteristic than his persistent silence while the augmentation of his salary as Greek professor was withheld. This petty persecution was continued until 1865, when E. A. Freeman and Charles Elton discovered by historical research that a breach of the conditions of the professorship had occurred, and Christ Church raised the endowment from £40 a year to £500. Meanwhile Jowett's influence at Oxford had steadily increased. It culminated in 1864, when the country clergy, provoked by the final acquittal of the essayists, had voted in convocation against the endowment of the Greek chair. Jowett's pupils, who were now drawn from the university at large, supported him with the enthusiasm which young men feel for the victim of injustice. In the midst of other labours Jowett had been quietly exerting his influence so as to conciliate all shades of liberal opinion, and bring them to bear upon the abolition of the theological test, which was still required for the M.A. and other degrees, and for university and college offices. He spoke at an important meeting upon this question in London on the 10th of June 1864, which laid the ground for the University Tests Act of 1871. In connexion with the Greek professorship Jowett had undertaken a work on Plato which grew into a complete translation of the *Dialogues*, with introductory essays. At this he laboured in vacation time for at least ten years. But his interest in theology had not abated, and his thoughts found an outlet in occasional preaching. The university pulpit, indeed, was closed to him, but several congregations in London delighted in his sermons, and from 1866 until the year of his death he preached annually in Westminster Abbey, where Stanley had become dean in 1863. Three volumes of selected sermons have been published since his death. The years 1865–1870 were occupied with assiduous labour. Amongst his pupils at Balliol were men destined to high positions in the state, whose parents had thus shown their confidence in the supposed heretic, and gratitude on this account was added to other motives for his unsparing efforts in tuition. In 1870, by an arrangement which he attributed to his friend Robert Lowe, afterwards Lord Sherbrooke (at that time a member of Gladstone's ministry), Scott was promoted to the deanery of Rochester and Jowett was elected to the vacant mastership by the fellows of Balliol. From the vantage-ground of this long-coveted position the *Plato* was published in 1871. It had a great and well-deserved success. While scholars criticized particular renderings (and there were many small errors to be removed in subsequent editions), it was generally agreed that he had succeeded in making Plato an English classic.

If ever there was a beneficent despotism, it was Jowett's rule as master. Since 1866 his authority in Balliol had been really paramount, and various reforms in college had been due to his initiative. The opposing minority were now powerless, and the younger fellows who had been his pupils were more inclined to follow him than others would have been. There was no obstacle to the continued exercise of his firm and reasonable will. He still knew the undergraduates individually, and watched their progress with a vigilant eye. His influence in the university was less assured. The pulpit of St Mary's was no longer closed to him, but the success of Balliol in the schools gave rise to jealousy in other colleges, and old prejudices did not suddenly give way; while a new movement in favour of "the endowment of research" ran counter to his immediate purposes. Meanwhile, the tutorships in other colleges, and some of the headships also, were being filled with Balliol men, and Jowett's former pupils were prominent in both houses of parliament and at the bar. He continued the practice, which he had commenced in 1848, of taking with him a small party of undergraduates in vacation time, and working with them in one of his favourite haunts, at Askrigg in Wensleydale, or Tummel Bridge, or later at West Malvern. The new hall (1876), the organ there, entirely his gift (1885), and the cricket ground (1889), remain as external monuments of the master's activity. Neither business nor the many claims of friendship interrupted literary work. The six or seven weeks of the long vacation, during which he had pupils with him, were mainly employed in writing. The translation of Aristotle's *Politics*, the revision of Plato, and, above all, the translation of Thucydides many times revised, occupied several years. The edition of the *Republic*, undertaken in 1856, remained unfinished, but was continued with the help of Professor Lewis Campbell. Other literary schemes of larger scope and deeper interest were long in contemplation, but were not destined to take effect—an *Essay on the Religions of the World*, a *Commentary on the Gospels*, a *Life of Christ*, a volume on *Moral Ideas*. Such plans were frustrated, not only by his practical avocations, but by his determination to finish what he had begun, and the fastidious self-criticism which it took so long to satisfy. The book on *Morals* might, however, have been written but for the heavy burden of the vice-chancellorship, which he was induced to accept in 1882, by the hope, only partially fulfilled, of securing many improvements for the university. The vice-chancellor was *ex officio* a delegate of the press, where he hoped to effect much; and a plan for draining the Thames Valley, which he had now the power of initiating, was one on which his mind had dwelt for many years. The exhausting labours of the vice-chancellorship were followed by an illness (1887); and after this he relinquished the hope of producing any great original writing. His literary industry was thenceforth confined to his commentary on the *Republic* of Plato, and some essays on Aristotle which were to have formed a companion volume to the translation of the *Politics*. The essays which should have accompanied the translation of Thucydides were never written. Jowett, who never married, died on the 1st of October 1893. The funeral was one of the most impressive ever seen in Oxford. The pall-bearers were seven heads of colleges and the provost of Eton, all old pupils.

Theologian, tutor, university reformer, a great master of a college, Jowett's best claim to the remembrance of succeeding generations was his greatness as a moral teacher. Many of the most prominent Englishmen of the day were his pupils and owed much of what they were to his precept and example, his penetrative sympathy, his insistent criticism, and his unwearying friendship. Seldom have ideal aims been so steadily pursued with so clear a recognition of practical limitations. Jowett's theological work was transitional, and yet has an element of permanence. As has been said of another thinker, he was "one of those deeply religious men who, when crude theological notions are being revised and called in question seek to put new life into theology by wider and more humane ideas." In earlier life he had been a zealous student of Kant and Hegel, and to the end he never ceased to cultivate the philosophic spirit; but he had little confidence in metaphysical systems, and sought rather to translate philosophy into the wisdom of life. As a classical scholar, his scorn of littlenesses sometimes led him into the neglect of *minutiae*, but he had the higher merit of interpreting ideas. His place in literature rests really on the essays in his Plato. When their merits are fully recognized, it will be found that his worth, as a teacher of his countrymen, extends far beyond his own generation.

See *The Life and Letters of Benjamin Jowett*, by E. A. Abbott and Lewis Campbell (1897); *Benjamin Jowett*, by Lionel Tollemache (1895). (L. C.)

JOYEUSE, a small town in the department of Ardèche, France, situated on the Baume, a tributary of the Ardèche, is historically important as having been the seat of a noble French family which derived its name from it. The lordship of Joyeuse came, in the 13th century, into the possession of the house of Châteauneuf-Randon, and was made into a viscountship in 1432. Guillaume, viscount of Joyeuse, was bishop of Alet, but afterwards left the church, and became a marshal of France; he died in 1592. His eldest son Anne de Joyeuse (1561–1587), was one of the favourites of Henry III. of France, who created him duke and peer (1581), admiral of France (1582), and governor of Normandy (1586), and married him to Marguerite de Lorraine-Vaudémont, younger sister of the queen. He gained several successes against the Huguenots, but was recalled by court intrigues at an inopportune moment, and when he marched a second time against Henry of Navarre he was defeated and killed at Coutras. Guillaume had three other sons: François de Joyeuse (d. 1615), cardinal and archbishop of Narbonne, Toulouse and Rouen, who brought about the reconciliation of Henry IV. with the pope; Henri, count of Bouchage, and later duke of Joyeuse, who first entered the army, then became a Capuchin under the name of Père Ange, left the church and became a marshal of France, and finally re-entered the church, dying in 1608; Antoine Scipion, grand prior of Toulouse in the order of the knights of Malta, who was one of the leaders in the League, and died in the retreat of Villemur (1592). Henriette Catherine de Joyeuse, daughter of Henri, married in 1611 Charles of Lorraine, duke of Guise, to whom she brought the duchy of Joyeuse. On the death of her great-grandson, François Joseph de Lorraine, duke of Guise, in 1675, without issue, the duchy of Joyeuse was declared extinct, but it was revived in 1714, in favour of Louis de Melun, prince of Épinoy. (M. P.*)

JOYEUSE ENTRÉE, a famous charter of liberty granted to Brabant by Duke John III. in 1354. John summoned the representatives of the cities of the duchy to Louvain to announce to them the marriage of his daughter and heiress Jeanne of Brabant to Wenceslaus duke of Luxemburg, and he offered them liberal concessions in order to secure their assent to the change of dynasty. John III. died in 1355, and Wenceslaus and Jeanne on the occasion of their state entry into Brussels solemnly swore to observe all the provisions of the charter, which had been drawn up. From the occasion on which it was first proclaimed this charter has since been known in history as *La Joyeuse Entrée.* By this document the dukes of Brabant undertook to maintain the integrity of the duchy, and not to wage war, make treaties, or impose taxes without the consent of their subjects, as represented by the municipalities. All members of the duke's council were to be native-born Brabanters. This charter became the model for other provinces and the bulwark of the liberties of the Netherlands. Its provisions were modified from time to time, but remained practically unchanged from the reign of Charles V. onwards. The ill-advised attempt of the emperor Joseph II. in his reforming zeal to abrogate the *Joyeuse Entrée* caused a revolt in Brabant, before which he had to yield.

See E. Poullet, *La Joyeuse entrée, ou constitution Brabançonne* (1862).

JUAN FERNANDEZ ISLANDS, a small group in the South Pacific Ocean, between 33° and 34° S., 80° W., belonging to Chile and included in the province of Valparaiso. The main island is called *Mas-a-Tierra* (Span. "more to land") to distinguish it from a smaller island, *Mas-a-Fuera* ("more to sea"), 100 m. farther west. Off the S.W. of Mas-a-Tierra lies the islet of Santa Clara. The aspect of Mas-a-Tierra is beautiful; only 13 m. in length by 4 in width, it consists of a series of precipitous rocks rudely piled into irregular blocks and pinnacles, and strongly contrasting with a rich vegetation. The highest of these, 3225 ft., is called, from its massive form, El Yunque (the anvil). The rocks are volcanic. Cumberland Bay on the north side is the only fair anchorage, and even there, from the great depth of water, there is some risk. A wide valley collecting streams from several of the ravines on the north side of the island opens into Cumberland Bay, and is partially enclosed and cultivated. The inhabitants number only some twenty.

The flora and fauna of Juan Fernandez are in most respects Chilean. There are few trees on the island, for most of the valuable indigenous trees have been practically exterminated, such as the sandalwood, which the earlier navigators found one of the most valuable products of the island. Ferns are prominent among the flora, about one-third of which consists of endemic species. There are no indigenous land mammals. Pigs and goats, however, with cattle, horses, asses and dogs, have been introduced, have multiplied, and in considerable numbers run wild. Sea-elephants and fur-seals were formerly plentiful. Of birds, a tyrant and a humming-bird (*Eustephanus fernandensis*) are peculiar to the group, while another humming bird (*E. galerites*), a thrush, and some birds of prey also occur in Chile. *E. fernandensis* has the peculiarity that the male is of a bright cinnamon colour, while the female is green. Both sexes are green in *E. galerites*.

Juan Fernandez was discovered by a Spanish pilot of that name in 1563. Fernandez obtained from the Spanish government a grant of the islands, where he resided for some time, stocking them with goats and pigs. He soon, however, appears to have abandoned his possessions, which were afterwards for many years only visited occasionally by fishermen from the coasts of Chile and Peru. In 1616 Jacob le Maire and Willem Cornelis Schouten called at Juan Fernandez for water and fresh provisions. Pigs and goats were then abundant on the islands. In February 1700 Dampier called at Juan Fernandez and while there Captain Straddling of the "Cinque Porte" galley quarrelled with his men, forty-two of whom deserted but were afterwards taken on board by Dampier; five seamen, however, remained on shore. Other parties had previously colonized the islands but none had remained permanently. In October 1704 the "Cinque Porte" returned and found two of these men, the others having been apparently captured by the French. On this occasion Straddling quarrelled with Alexander Selkirk (*q.v.*), who, at his own request, became the island's most famous colonist, for his adventures are commonly believed to have inspired Daniel Defoe's *Robinson Crusoe.* Among later visits, that of Commodore Anson, in the "Centurion" (June 1741) led, on his return home, to a proposal to form an English settlement on Juan Fernandez; but the Spaniards, hearing that the matter had been mooted in England, gave orders to occupy the island, and it was garrisoned accordingly in 1750. Philip Carteret first observed this settlement in May 1767, and on account of the hostility of the Spaniards preferred to put in at Mas-a-Fuera. After the establishment of the independence of Chile at the beginning of the 19th century, Juan Fernandez passed into the possession of that country. On more than one occasion before 1840 Mas-a-Tierra was used as a state prison by the Chilean government.

JUANGS (Patuas, literally "leaf-wearers"), a jungle tribe of Orissa, India. They are found in only two of the tributary states, Dhenkanal and Keonjhar, most of them in the latter. They are estimated to amount in all to about 10,000. Their language belongs to the Munda family. They have no traditions which connect them with any other race, and they repudiate all connexion with the Hos or the Santals, declaring themselves the aborigines. They say the headquarters of the tribe is the Gonasika. In manners they are among the most primitive people of the world, representing the Stone age in our own day. They do not till the land, but live on the game they kill or on snakes and vermin. Their huts measure about 6 ft. by 8 ft., with very low doorways. The interior is divided into two compartments. In the first of these the father and all the females of a family huddle together; the second is used as a store-room. The boys have a separate hut at the entrance to the village, which serves as a guest-house and general assembly place where the musical instruments of the village are kept. Physically they are small and weak-looking, of a reddish-brown colour, with flat faces, broad noses with wide nostrils, large mouths and thick lips, the hair coarse and frizzly. The women until recently wore nothing but girdles of leaves, the men, a diminutive bandage of cloth. The Juangs declare that the river goddess, emerging for the first time from the Gonasika rock, surprised a party of naked Juangs dancing, and ordered them to wear leaves, with the threat that they should die if they ever gave up the custom. The Juangs' weapons are the bow and arrow and a primitive sling made entirely of cord. Their religion is a vague belief in forest spirits. They offer fowls to the sun when in trouble and to the earth for a bountiful harvest. Polygamy is rare. They burn their dead and throw the ashes into any running stream. The most sacred oaths a Juang can take are those on an ant-hill or a tiger-skin.

See E. W. Dalton, *Descriptive Ethnology of Bengal* (1872).

JUAN MANUEL, DON (1282–1349), infante of Castile, son of the infante Don Manuel and Beatrix of Savoy, and grandson of St Ferdinand, was born at Escalona on the 5th of May 1282. His father died in 1284, and the young prince was educated at the court of his cousin, Sancho IV., with whom his precocious ability made him a favourite. In 1294 he was appointed *adelantado* of Murcia and in his fourteenth year served against the Moors at Granada. In 1304 he was entrusted by the queen-mother, Doña Maria de Molina, to conduct political negotiations with James II. of Aragon on behalf of her son, Ferdinand IV., then under age. His diplomacy was successful and his marriage to James II.'s daughter, Constantina, added to his prestige. On the death of Ferdinand IV. and of the regents who governed in the name of Alphonso XI., Don Juan Manuel acted as guardian of the king who was proclaimed of age in 1325. His ambitious design of continuing to exercise the royal power was defeated by Alphonso XI., who married the ex-regent's daughter Constanza, and removed his father-in-law from the scene by nominating him *adelantado mayor de la frontera*. Alphonso XI.'s repudiation of Constanza, whom he imprisoned at Toro, drove Don Juan Manuel into opposition, and a long period of civil war followed. On the death of his wife Constantina in 1327, Don Juan Manuel strengthened his position by marrying Doña Blanca de la Cerda; he secured the support of Juan Nuñez, *alférez* of Castile, by arranging a marriage between him and Maria, daughter of Don Juan el Tuerto; he won over Portugal by promising the hand of his daughter, the ex-queen Constanza, to the infante of that kingdom, and he entered into alliance with Mahomet III. of Granada. This formidable coalition compelled Alphonso XI. to sue for terms, which he accepted in 1328 without any serious intention of complying with them; but he was compelled to release Doña Constanza. War speedily broke out anew, and lasted till 1331 when Alphonso XI. invited Juan Manuel and Juan Nuñez to a banquet at Villahumbrales with the intention, it was believed, of assassinating them; the plot failed, and Don Juan Manuel joined forces with Peter IV. of Aragon. He was besieged by Alphonso XI. at Garci-Nuñez, whence he escaped on the 30th of July 1336, fled into exile, and kept the rebellion alive till 1338, when he made his peace with the king. He proved his loyalty by serving in further expeditions against the Moors of Granada and Africa, and died a tranquil death in the first half of 1349.

Distinguished as an astute politician, Don Juan Manuel is an author of the highest eminence, and, considering the circumstances of his stormy life, his voluminousness is remarkable. The *Libro de los sabios*, a treatise called *Engeños de Guerra* and the *Libro de cantares*, a collection of verses, were composed between 1320 and 1327; but they have disappeared together with the *Libro de la caballería* (written during the winter of 1326, and the *Reglas como se debe trovar*, a metrical treatise assigned to 1328–1334. Of his surviving writings, Juan Manuel's *Crónica abreviada* was compiled between 1319 and 1325, while the *Libro de la caza* must have been written between 1320 and 1329; and during this period of nine years the *Crónica de España*, the *Crónica complida*, and the *Tratado sobre las armas* were produced. The *Libro del caballero et del escudero* was finished before the end of 1326; the first book of the *Libro de los estados* was finished on the 22nd of May 1330, while the second was begun five days later; the first book of *El Conde Lucanor* was written in 1328, the second in 1330, and the fourth is dated 12th of June 1335. We are unable to assign to any precise date the devout *Tractado* on the Virgin, dedicated to the prior of the monastery at Peñafiel, to which Don Juan Manuel bequeathed his manuscripts; but it seems probable that the *Libro de los frailes predicadores* is slightly later than the *Libro de los estados*; that the *Libro de los castigos* (left unfinished, and therefore known by the alternative title of *Libro infinido*) was written not later than 1333, and that the treatise *De las maneras de amor* was composed between 1334 and 1337.

The historical summaries, pious dissertations and miscellaneous writings are of secondary interest. The *Libro del caballero et del escudero* is on another plane; it is no doubt suggested by Lull's *Libre del orde de cavalleria*, but the points of resemblance have been exaggerated; the morbid mysticism of Lull is rejected, and the carefully finished style justifies the special pride which the author took in this performance. The influence of Lull's *Blanquerna* is likewise visible in the *Libro de los estados;* but there are marked divergences of substance which go to prove Don Juan Manuel's acquaintance with some version (not yet identified) of the Barlaam and Josaphat legend. Nothing is more striking than the curious and varied erudition of the turbulent prince who weaves his personal experiences with historical or legendary incidents, with reminiscences of Aesop and Phaedrus, with the *Disciplina clericalis*, with *Kalilah and Dimnah*, with countless Oriental traditions, and with all the material of anecdotic literature which he embodies in the *Libro de patronio*, best known by the title of *El Conde Lucanor* (the name Lucanor being taken from the prose *Tristan*). This work (also entitled the *Libro de enxemplos*) was first printed by Gonzalo Argote de Molina at Seville in 1575, and it revealed Don Juan Manuel as a master in the art of prose composition, and as the predecessor of Boccaccio in the province of romantic narrative. The *Cento novelle antiche* are earlier in date, but these anonymous tales, derived from popular stories diffused throughout the world, lack the personal character which Don Juan lends to all he touches. They are simple, unadorned variants of folk-lore items; *El Conde Lucanor* is essentially the production of a conscious artist, deliberative and selective in his methods. Don Juan Manuel has not Boccaccio's festive fancy nor his constructive skill; he is too persistently didactic and concerned to point a moral; but he excels in knowledge of human nature, in the faculty of ironical presentation, in tolerant wisdom and in luminous conciseness. He naturalizes the Eastern apologue in Spain, and by the laconic picturesqueness of his expression imports a new quality into Spanish prose which attains its full development in the hands of Juan de Valdés and Cervantes. Some of his themes are utilized for dramatic purposes by Lope de Vega in *La Pobreza estimada*, by Ruiz de Alarcón in *La Prueba de las promesas*, by Calderón in *La Vida es sueño*, and by Cañizares in *Don Juan de Espina en Milán*: there is an evident, though remote, relation between the tale of the *mancebo que casó con una mujer muy fuerte y muy brava* and *The Taming of the Shrew;* and a more direct connexion exists between some of Don Juan Manuel's *enxemplos* and some of Anderson's fairy tales.

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JUAREZ, BENITO PABLO (1806–1872), president of Mexico, was born near Ixtlan, in the state of Oajaca, Mexico, on the 21st of March 1806, of full Indian blood. Early left in poverty by the death of his father, he received from a charitable friar a good general education, and afterwards the means of studying law. Beginning to practise in 1834, Juarez speedily rose to professional distinction, and in the stormy political life of his time took a prominent part as an exponent of liberal views. In 1832 he sat in the state legislature; in 1846 he was one of a legislative triumvirate for his native state and a deputy to the republican congress, and from 1847 to 1852 he was governor of Oajaca. Banished in 1853 by Santa Anna, he returned to Mexico in 1855, and joined Alvarez, who, after Santa Anna's defeat, made him minister of justice. Under Comonfort, who then succeeded Alvarez, Juarez was governor of Oajaca (1855–57), and in 1857 chief justice and secretary of the interior; and, when Comonfort was unconstitutionally replaced by Zuloaga in 1858, the chief justice, in virtue of his office, claimed to be legal president of the republic. It was not, however, till the beginning of 1861 that he succeeded in finally defeating the unconstitutional party and in being duly elected president by congress. His decree of July 1861, suspending for two years all payments on public debts of every kind, led to the landing in Mexico of English, Spanish and French troops. The first two powers were soon induced to withdraw their forces; but the French remained, declared war in 1862, placed Maximilian upon the throne as emperor, and drove Juarez and his adherents to the northern limits of the republic. Juarez maintained an obstinate resistance, which resulted in final success. In 1867 Maximilian was taken at Querétaro, and shot; and in August Juarez was once more elected president. His term of office was far from tranquil; discontented generals stirred up ceaseless revolts and insurrections; and, though he was re-elected in 1871, his popularity seemed to be on the wane. He died of apoplexy in the city of Mexico on the 18th of July 1872. He was a statesman of integrity, ability and determination, whose good qualities are too apt to be overlooked in consequence of his connexion with the unhappy fate of Maximilian.

JUBA, the name of two kings of Numidia.

Juba I. (1st century B.C.), son and successor of Hiempsal, king of Numidia. During the civil wars at Rome he sided with Pompey, partly from gratitude because he had reinstated his father on his throne (Appian, *B.C.*, i. 80), and partly from enmity to Caesar, who had insulted him at Rome by pulling his beard (Suet., *Caesar*, 71). Further, C. Scribonius Curio, Caesar's general in Africa, had openly proposed, 50 B.C., when tribune of the plebs, that Numidia should be sold to colonists, and the king reduced to a private station. In 49 Juba inflicted on the Caesarean army a crushing defeat, in which Curio was slain (Vell. Pat. ii. 54; Caesar, *B.C.* ii. 40). Juba's attention was distracted by a counter invasion of his territories by Bocchus the younger and Sittius; but, finding that his lieutenant Sabura was able to defend his interests, he rejoined the Pompeians with a large force, and shared the defeat at Thapsus. Fleeing from the field with the Roman general M. Petreius, he wandered about as a fugitive. At length, in despair, Juba killed Petreius, and sought the aid of a slave in despatching himself (46). Juba was a thorough savage; brave, treacherous, insolent and cruel. (See Numidia.)

Juba II., son of the above. On the death of his father in 46 B.C. he was carried to Rome to grace Caesar's triumph. He seems to have received a good education under the care of Augustus who, in 29, after Mark Antony's death, gave him the hand of Cleopatra Selene, daughter of Antony and Cleopatra, and placed him on his father's throne. In 25, however, he transferred him from Numidia to Mauretania, to which was added a part of Gaetulia (see Numidia). Juba seems to have reigned in considerable prosperity, though in A.D. 6 the Gaetulians rose in a revolt of sufficient importance to afford the surname Gaetulicus to Cornelius Lentulus Cossus, the Roman general who helped to suppress it. The date of Juba's death is by no means certain; it has been put between A.D. 19 and 24 (Strabo, xvii. 828; Dio Cassius, li. 15; liii. 26; Plutarch, *Ant.* 87; *Caesar*, 55). Juba, according to Pliny, who constantly refers to him, is mainly memorable for his writings. He has been called the African Varro.

He wrote many historical and geographical works, of which some seem to have been voluminous and of considerable value on account of the sources to which their author had access: (1) Ῥωμαϊκὴ ἱστορία: (2) Ἀσσυριακά: (3) Λιβυκά: (4) *De Arabia sive De expeditione arabica*; (5) *Physiologa*; (6) *De Euphorbia herba*; (7) Περὶ ὀποῦ: (8) Περὶ γραφικῆς (Περὶ ζωγράφων): (9) Θεατρικὴ ἱστορία: (10) Ὁμοιότητες: (11) Περὶ φθορᾶς λέξεως: (12) Ἐπίγραμμα.

Fragments and life in Müller, *Frag. Hist. Graec.*, vol. iii.; see also Sevin, *Mém. de l'Acad. des Inscriptions*, vol. iv.; Hullemann, *De vita et scriptis Jubae* (1846). For the denarii of Juba II. found in 1908 at El Ksar on the coast of Morocco see Dieudonné in *Revue Numism.* (1908), pp. 350 seq. They are interesting mainly as throwing light on the chronology of the reign.

JUBA, or Jub, a river of East Africa, exceeding 1000 m. in length, rising on the S.E. border of the Abyssinian highlands and flowing S. across the Galla and Somali countries to the sea. It is formed by the junction of three streams, all having their source in the mountain range N.E. of Lake Rudolf which is the water-parting between the Nile basin and the rivers flowing to the Indian Ocean.

Of the three headstreams, the Web, the Ganale and the Daua, the Ganale (or Ganana) is the central river and the true upper course of the Juba. It has two chief branches, the Black and the Great Ganale. The last-named, the most remote source of the river, rises in 7° 30′ N., 38° E. at an altitude of about 7500 ft., the crest of the mountains reaching another 2500 ft. In its upper course it flows over a rocky bed with a swift current and many rapids. The banks are clothed with dense jungle and the hills beyond with thorn-bush. Lower down the river has formed a narrow valley, 1500 to 2000 ft. below the general level of the country. Leaving the higher mountains in about 5° 15′ N., 40° E., the Ganale enters a large slightly undulating grass plain which extends south of the valley of the Daua and occupies all the country eastward to the junction of the two rivers. In this plain the Ganale makes a semicircular sweep northward before resuming its general S.-E. course. East of 42° E. in 4° 12′ N. it is joined by the Web on the left or eastern bank, and about 10 m. lower down the Daua enters on the right bank.

The Web rises in the mountain chain a little S. and E. of the sources of the Ganale, and some 40 m. from its source passes, first, through a cañon 500 ft. deep, and then through a series of remarkable underground caves hollowed out of a quartz mountain and, with their arches and white columns, presenting the appearance of a pillared temple. The Daua (or Dawa) is formed by the mountain torrents which have their rise S. and W. of the Ganale and is of similar character to that river. It has few feeders and none of any size. The descent to the open country is somewhat abrupt. In its middle course the Daua has cut a deep narrow valley through the plain; lower down it bends N.E. to its junction with the Ganale. The river is not deep and can be forded in many places; the banks are fringed with thick bush and dom-palms. At the junction of the Ganale and the Web the river is swift-flowing and 85 yards across; just below the Daua confluence it is 200 yds. wide, the altitude here—300 m. in a direct line from the source of the Ganale—being only 590 ft.

Below the Daua the river, now known as the Juba, receives no tributary of importance. It first flows in a valley bounded, especially towards the west, by the escarpments of a high plateau, and containing the towns of Lugh (in 3° 50′ N., the centre of active trade), Bardera, 387 m. above the mouth, and Saranli—the last two on opposite sides of the stream, in 2° 20′ N., a crossing-place for caravans. Beyond 1° 45′ N. the country becomes more level and the course of the river very tortuous. On the west a series of small lakes and backwaters receives water from the Juba during the rains. Just south of the equator channels from the long, branching Lake Deshekwama or Hardinge, fed by the Lakdera river, enter from the west, and in 0° 15′ S. the Juba enters the sea across a dangerous bar, which has only one fathom of water at high tide.

From its mouth to 20 m. above Bardera, where at 2° 35′ N. rapids occur, the Juba is navigable by shallow-draught steamers, having a general depth of from 4 to 12 ft., though shallower in places. Just above its mouth it is a fine stream 250 yds. wide, with a current of 2½ knots. Below the mountainous region of the headstreams the Juba and its tributaries flow through a country generally arid away from the banks of the streams. The soil is sandy, covered either with thorn-scrub or rank grass, which in the rainy season affords herbage for the herds of cattle, sheep and camels owned by the Boran Gallas and the Somali who inhabit the district. But by the banks of the lower river the character of the country changes. In this district, known as Gosha, are considerable tracts of forest, and the level of flood water is higher than much of the surrounding land. This low-lying fertile belt stretches along the river for about 300 m., but is not more than a mile or two wide. In the river valley maize, rice, cotton and other crops are cultivated. From Gobwen, a trading settlement about 3 m. above the mouth of the Juba, a road runs S.W. to the seaport of Kismayu, 10 m. distant.

The lower Juba was ascended in 1865 in a steamer by Baron Karl von der Decken, who was murdered by Somali at Bardera, but the river system remained otherwise almost unknown until after 1890. In 1891 a survey of its lower course was executed by Captain F. G. Dundas of the British navy, while in 1892–1893 its headstreams were explored by the Italian officers, Captains Vittorio, Bottego and Grixoni, the former of whom disproved the supposed connexion of the Omo (see Rudolf, Lake) with the Juba system. It has since been further explored by Prince Eugenio Ruspoli, by Bottego's second expedition (1895), by Donaldson Smith, A. E. Butter, Captain P. Maud of the British army, and others. The river, from its mouth to the confluence of the Daua and Ganale, forms the frontier between the

British East Africa protectorate and Italian Somaliland; and from that point to about 4° 20′ N. the Daua is the boundary between British and Abyssinian territory.

JUBBULPORE, or Jabalpur, a city, district, and division of British India in the Central Provinces. The city is 616 m. N.E. of Bombay by rail, and 220 m. S.W. of Allahabad. Pop. (1901), 90,316. The numerous gorges in the neighbouring rocks have been taken advantage of to surround the city with a series of lakes, which, shaded by fine trees and bordered by fantastic crags, add much beauty to the suburbs. The city itself is modern, and is laid out in wide and regular streets. A streamlet separates the civil station and cantonment from the native quarter; but, though the climate is mild, a swampy hollow beneath renders the site unhealthy for Europeans. Formerly the capital of the Saugor and Nerbudda territories, Jubbulpore is now the headquarters of a brigade in the 5th division of the southern army. It is also one of the most important railway centres in India, being the junction of the Great Indian Peninsula and the East Indian systems. It has a steam cotton-mill. The government college educates for the science course of the Allahabad University, and also contains law and engineering classes; there are three aided high schools, a law class, an engineering class and normal schools for male and female teachers. A native association, established in 1869, supports an orphanage, with help from government. A zenana mission manages 13 schools for girls. Waterworks were constructed in 1882.

The District of Jubbulpore lies on the watershed between the Nerbudda and the Son, but mostly within the valley of the former river, which here runs through the famous gorge known as the Marble rocks, and falls 30 ft. over a rocky ledge (the *Dhuan dhar*, or "misty shoot"). Area, 3912 sq. m. It consists of a long narrow plain running north-east and south-west, and shut in on all sides by highlands. This plain, which forms an offshoot from the great valley of the Nerbudda, is covered in its western and southern portions by a rich alluvial deposit of black cotton-soil. At Jubbulpore city the soil is sandy, and water plentiful near the surface. The north and east belong to the Ganges and Jumna basins, the south and west to the Nerbudda basin. In 1901 the population was 680,585, showing a decrease of 9% since 1891, due to the results of famine. The principal crops are wheat, rice, pulse and oil-seeds. A good deal of iron-smelting with charcoal is carried on in the forests, manganese ore is found, and limestone is extensively quarried. The district is traversed by the main railway from Bombay to Calcutta, and by new branches of two other lines which meet at Katni junction. Jubbulpore suffered severely in the famine of 1896–1897, the distress being aggravated by immigration from the adjoining native states. Fortunately the famine of 1900 was less severely felt.

The early history of Jubbulpore is unknown; but inscriptions record the existence during the 11th and 12th centuries of a local line of princes of that Haihai race which is closely connected with the history of Gondwana. In the 16th century the Gond raja of Garha Mandla extended his power over fifty-two districts, including the present Jubbulpore. During the minority of his grandson, Asaf Khan, the viceroy of Karà Manikpur, conquered the Garha principality and held it at first as an independent chief. Eventually he submitted to the emperor Akbar. The Delhi power, however, enjoyed little more than a nominal supremacy; and the princes of Garha Mandla maintained a practical independence until their subjugation by the Mahratta governors of Saugor in 1781. In 1798 the peshwa granted the Nerbudda valley to the Bhonsla princes of Nagpur, who continued to hold the district until the British occupied it in 1818.

The Division of Jubbulpore lies mainly among the Vindhyan and Satpura hill systems. It comprises the five following districts: Jubbulpore, Saugor, Damoh, Seoni and Mandla. Area, 18,950 sq. m.; pop. (1901), 2,081,499.

JUBÉ, the French architectural term (taken from the imperative of Lat. *jubere*, to order) for the chancel or choir screen, which in England is known as the rood-screen (see Rood). Above the screen was a gallery or loft, from which the words "Jube Domine benedicere" were spoken by the deacon before the reading of the Gospel, and hence probably the name. One of the finest *jubés* in France is that of the church of the Madeleine at Troyes, in rich flamboyant Gothic. A later example, of the Renaissance period, *c.* 1600, is in the church of St Étienne du Mont, Paris. In the Low Countries there are many fine examples in marble, of which one of the most perfect from Bois-le-Duc is now in the Victoria and Albert Museum.

JUBILEE (or Jubile), **YEAR OF,** in the Bible, the name applied in the Holiness section of the Priestly Code of the Hexateuch (Lev. xxv.) to the observance of every 50th year, determined by the lapse of seven seven-year periods as a year of perfect rest, when there was to be no sowing, nor even gathering of the natural products of the field and the vine. At the beginning of the jubilee-year the liberation of all Israelitish slaves and the restoration of ancestral possessions was to be proclaimed. As regards the meaning of the name "jubilee" (Heb. *yōbēl*) modern scholars are agreed that it signifies "ram" or "ram's horn." "Year of jubilee" would then mean the year that is inaugurated by the blowing of the ram's horn (Lev. xxv. 9).

According to Lev. xxv. 8–12, at the completion of seven sabbaths of years (*i.e.* $7\times7=49$ years) the trumpet of the jubilee is to be sounded "throughout the land" on the 10th day of the seventh month (Tisri 10), the great Day of Atonement. The 50th year thus announced is to be "hallowed," *i.e.* liberty[1] is to be proclaimed everywhere to everyone, and the people are to return "every man unto his possession and unto his family." As in the sabbatical year, there is to be no sowing, nor reaping that which grows of itself, nor gathering of grapes.

As regards *real property* (Lev. xxv. 13–34) the law is that if any Hebrew under pressure of necessity shall alienate his property he is to get for it a sum of money reckoned according to the number of harvests to be reaped between the date of alienation and the first jubilee-year: should he or any relation desire to redeem the property before the jubilee this can always be done be repaying the value of the harvests between the redemption and the jubilee.

This legal enactment, though it is not found (nor anything like it) in the earlier collections of laws, is evidently based on (or modified from) an ancient custom which conferred on a near kinsman the right of pre-emption as well as of buying back (cf. Jer. xxxii. 6 sqq.). The tendency to impose checks upon the alienation of landed property was exceptionally strong in Israel. The fundamental principle is that the land is a sacred possession belonging to Yahweh. As such it is not to be alienated from Yahweh's people, to whom it was originally assigned. In Ezekiel's restoration programme "crown lands presented by the 'prince' to any of his officials revert to the crown in the year of liberty (? jubilee year)"; only to his sons may any portion of his inheritance be alienated in perpetuity (Ezek. xlvi. 16–18; cf. Code of Hammurabi, § 38 seq.).

The same rule applies to dwelling-houses of unwalled villages; the case is different, however, as regards dwelling-houses in walled cities. These may be redeemed within a year after transfer, but if not redeemed within that period they continue permanently in possession of the purchaser, and this may well be an echo of ancient practice. An exception to this last rule is made for the houses of the Levites in the Levitical cities.

As regards *property in slaves* (Lev. xxv. 35–55) the Hebrew whom necessity has compelled to sell himself into the service of his brother Hebrew is to be treated as a hired servant and sojourner, and to be released absolutely at the jubilee; non-Hebrew bondmen, on the other hand, are to be bondmen for ever. But the Hebrew who has sold himself to a stranger or sojourner is entitled to freedom at the year of jubilee, and further is at any time redeemable by any of his kindred—the redemption price being regulated by the number of years to run between the redemption and the jubilee, according to the ordinary wage of hired servants. Such were the enactments of the Priestly Code—which, of course, represents the latest legislation of the Pentateuch (post-exilic). These enactments, in order to be understood rightly, must be viewed in relation to the earlier similar provisions in connexion with the sabbatical (seventh) year. "The foundations of Lev. xxv. are laid in the ancient provisions of the Book of the Covenant (Exod. xxi. 2 seq.; xxiii. 10 seq.) and in Deuteronomy (xv.). The Book of the Covenant enjoined that the land should lie fallow and Hebrew slaves be liberated in the seventh year; Deuteronomy required in addition the remission of debts" (Benzinger). Deuteronomy, it will be noticed, in accordance with its humanitarian tendency, not only liberates the slave but remits the debt. It is evident that these enactments proved impracticable in real life (cf. Jer. xxxiv. 8 seq.), and so it became necessary in the later legislation of P, represented in the present form of Lev. xxv., to relegate them to the 50th year, the year of jubilee. The latter, however, was a purely theoretic development of the Sabbath idea, which could never have been reduced to practice (its actual observance would have necessitated that for two consecutive years—the 49th and 50th—absolutely nothing could be reaped, while in the 51st only summer fruits could be obtained, sowing being prohibited in the 50th year). That in practice the enactments for the jubilee-year were disregarded is evidenced by the fact that, according to the unanimous testimony of the Talmudists and Rabbins, although the jubilee-years were "reckoned" they were not observed.

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[1] Heb. *dĕrōr*. The same word (*durāru*) is used in the Code of Hammurabi in the similar enactment that wife, son or daughter sold into slavery for debt are to be restored to *liberty* in the fourth year (§ 117).

The conjecture of Kuenen, supported by Wellhausen, that originally Lev. xxv. 8 seq. had reference to the seventh year is a highly probable one. This may be the case also with Ezek. xlvi. 16–18 (cf. Jer. xxxiv. 14). A later Rabbinical device for evading the provisions of the law was the *prosbul* (ascribed to Hillel) —*i.e.* a condition made in the presence of the judge securing to the creditor the right of demanding repayment at any time, irrespective of the year of remission. Further enactments regarding the jubilee are found in Lev. xxvii. 17–25 and Num. xxxvi. 4. (W. R. S.; G. H. Bo.)

JUBILEES, BOOK OF, an apocryphal work of the Old Testament. The Book of Jubilees is the most advanced pre-Christian representative of the Midrashic tendency, which had already been at work in the Old Testament Chronicles. As the chronicler had rewritten the history of Israel and Judah from the standpoint of the Priests' Code, so our author re-edited from the Pharisaic standpoint of his time the history of the world from the creation to the publication of the Law on Sinai. His work constitutes the oldest commentary in the world on Genesis and part of Exodus, an enlarged Targum on these books, in which difficulties in the biblical narration are solved, gaps supplied, dogmatically offensive elements removed and the genuine spirit of later Judaism infused into the primitive history of the world.

Titles of the Book.—The book is variously entitled. First, it is known as τὰ Ἰωβηλαῖα, οἱ Ἰωβηλαῖοι, Heb. היובלים. This name is admirably adapted to our book, as it divides into jubilee periods of forty-nine years each the history of the world from the creation to the legislation on Sinai. Secondly, it is frequently designated "The Little Genesis," ἡ λεπτὴ Γένεσις or ἡ Μικρογένεσις, Heb. בראשית זוטא. This title may have arisen from its dealing more fully with details and minutiae than the biblical work. For the other names by which it is referred to, such as *The Apocalypse of Moses*, *The Testament of Moses*, *The Book of Adam's Daughters* and the *Life of Adam*, the reader may consult Charles's *The Book of Jubilees*, pp. xvii.-xx.

Object.—The object of our author was the defence and exposition of Judaism from the Pharisaic standpoint of the 2nd century B.C. against the disintegrating effects of Hellenism. In his elaborate defence of Judaism our author glorifies circumcision and the sabbath, the bulwarks of Judaism, as heavenly ordinances, the sphere of which was so far extended as to embrace Israel on earth. The Law, as a whole, was to our author the realization in time of what was in a sense timeless and eternal. Though revealed in time it was superior to time. Before it had been made known in sundry portions to the fathers, it had been kept in heaven by the angels, and to its observance there was no limit in time or in eternity. Our author next defends Judaism by his glorification of Israel. Whereas the various nations of the Gentiles were subject to angels, Israel was subject to God alone. Israel was God's son, and not only did the nation stand in this relation to God, but also its individual members. Israel received circumcision as a sign that they were the Lord's, and this privilege of circumcision they enjoyed in common with the two highest orders of angels. Hence Israel was to unite with God and these two orders in the observance of the sabbath. Finally the destinies of the world were bound up with Israel. The world was renewed in the creation of the true man Jacob, and its final renewal was to synchronize with the setting-up of God's sanctuary in Zion and the establishment of the Messianic kingdom. In this kingdom the Gentiles had neither part nor lot.

Versions: Greek, Syriac, Ethiopic and Latin.—Numerous fragments of the Greek Version have come down to us in Justin Martyr, Origen, Diodorus of Antioch, Isidore of Alexandria, Epiphanius, John of Malala, Syncellus and others. This version was the parent of the Ethiopic and Latin. The Ethiopic Version is most accurate and trustworthy, and indeed, as a rule, slavishly literal. It has naturally suffered from the corruptions incident to transmission through MSS. Thus dittographies are frequent and lacunae of occasional occurrence, but the version is singularly free from the glosses and corrections of unscrupulous scribes. The Latin Version, of which about one-fourth has been preserved, is where it exists of almost equal value with the Ethiopic. It has, however, suffered more at the hands of correctors. Notwithstanding, it attests a long array of passages in which it preserves the true text over against corruptions or omissions in the Ethiopic Version. Finally, as regards the Syriac Version, the evidence for its existence is not conclusive. It is based on the fact that a British Museum MS. contains a Syriac fragment entitled "Names of the wives of the Patriarchs according to the Hebrew Book of Jubilees."

The Ethiopic and Latin Versions: Translations from the Greek.—The Ethiopic Version is translated from the Greek, for Greek words such as δρῦς, βάλανος, λίψ, &c., are transliterated in the Greek. Secondly, many passages must be retranslated into Greek before we can discover the source of the various corruptions. And finally, proper names are transliterated as they appear in Greek and not in Hebrew. That the Latin is also a translation from the Greek is no less obvious. Thus in xxxix. 12 *timoris* = δειλίας, corrupt for δουλείας; in xxxviii. 13 *honorem* = τιμήν, but τιμήν should here have been rendered by *tributum*, as the Ethiopic and the context require; in xxxii. 26, *celavit* = ἔκρυψε, corrupt for ἔγραψε (so Ethiopic).

The Greek a Translation from the Hebrew.—The early date of our book—the 2nd century B.C.—and its place of composition speak for a Semitic original, and the evidence bearing on this subject is conclusive. But the question at once arises, was the original Aramaic or Hebrew? Certain proper names in the Latin Version ending in *-in* seem to bespeak an Aramaic original, as Cettin, Filistin, &c. But since in all these cases the Ethiopic transliterations end in *-m* and not in *-n*, it is not improbable that the Aramaism in the Latin Version is due to the translator, who, it has been concluded on other grounds, was a Palestinian Jew.[1] The grounds, on the other hand, for a Hebrew original are weighty and numerous. (1) A work which claims to be from the hand of Moses would naturally be in Hebrew, for Hebrew according to our author was the sacred and national language. (2) The revival of the national spirit of a nation is universally, so far as we know, accompanied by a revival of the national language. (3) The text must be retranslated into Hebrew in order to explain unintelligible expressions and restore the true text. One instance will sufficiently illustrate this statement. In xliii. 11 a certain Ethiopic expression = ἐν ἐμοί, which is a mistranslation of בִּי; for בי in this context, as we know from the parallel passage in Gen. xliv. 18, which our text reproduces almost verbally, = δέομαι. We might observe here that our text attests the presence of dittographies already existing in the Hebrew text. (4) Hebraisms survive in the Ethiopic and Latin Versions. In the former nûḫa in iv. 4, is a corrupt transliteration of נע. In the Latin *eligere in te* in xxii. 10 is a reproduction of בחר ב and *in qua . . . in ipsa* in xix. 8 = בה . . . אשר. This idiom could, of course, be explained on the hypothesis of an Aramaic original. (5) Many paronomasiae discover themselves on retranslation into Hebrew.

Textual Affinities.—A minute study of the text shows that it attests an independent form of the Hebrew text of the Pentateuch. Thus it agrees at times with the Samaritan, or Septuagint, or Syriac, or Vulgate, or even with Onkelos against all the rest. To be more exact, our book represents some form of the Hebrew text of the Pentateuch midway between the forms presupposed by the Septuagint and the Syriac; for it agrees more frequently with the Septuagint, or with combinations into which the Septuagint enters, than with any other single authority, or with any combination excluding the Septuagint. Next to the Septuagint it agrees most often with the Syriac or with combinations into which the Syriac enters. On the other hand, its independence of the Septuagint is shown in a large number of passages, where it has the support of the Samaritan and Massoretic, or of these with various combinations of the Syriac Vulgate and Onkelos. From these and other considerations we may conclude that the textual evidence points to the composition of our book at some period between 250 B.C. and A.D. 100, and at a time nearer the earlier date than the later.

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[1] In the Ethiopic Version in xxi. 12 it should be observed that in the list of the twelve trees suitable for burning on the altar several are transliterated Aramaic names of trees. But in a late Hebrew work (2nd century B.C.) the popular names of such objects would naturally be used. In certain cases the Hebrew may have been forgotten, or, where the tree was of late introduction, been non-existent.

Date.—The book was written between 135 B.C. and the year of Hyrcanus's breach with the Pharisees. This conclusion is drawn from the following facts:—(1) The book was written during the pontificate of the Maccabean family, and not earlier than 135 B.C. For in xxxii. 1 Levi is called a "priest of the Most High God." Now the only high priests who bore this title were the Maccabean, who appear to have assumed it as reviving the order of Melchizedek when they displaced the Zadokite order of Aaron. Jewish tradition ascribes the assumption of this title to John Hyrcanus. It was retained by his successors down to Hyrcanus II. (2) It was written before 96 B.C. or some years earlier in the reign of John Hyrcanus; for since our author is of the strictest sect a Pharisee and at the same time an upholder of the Maccabean pontificate, Jubilees cannot have been written after 96 when the Pharisees and Alexander Jannaeus came to open strife. Nay more, it cannot have been written after the open breach between Hyrcanus and the Pharisees, when the former joined the Sadducean party.

The above conclusions are confirmed by a large mass of other evidence postulating the same date. We may, however, observe that our book points to the period already past—of stress and persecution that preceded the recovery of national independence under the Maccabees, and presupposes as its historical background the most flourishing period of the Maccabean hegemony.

Author.—Our author was a Pharisee of the straitest sect. He maintained the everlasting validity of the law, he held the strictest views on circumcision, the sabbath, and the duty of shunning all intercourse with the Gentiles; he believed in angels and in a blessed immortality. In the next place he was an upholder of the Maccabean pontificate. He glorifies Levi's successors as high-priests and civil rulers, and applies to them the title assumed by the Maccabean princes, though he does not, like the author of the Testaments of the Twelve Patriarchs, expect the Messiah to come forth from among them. He may have been a priest.

The Views of the Author on the Messianic Kingdom and the Future Life.—According to our author the Messianic kingdom was to be brought about gradually by the progressive spiritual development of man and a corresponding transformation of nature. Its members were to reach the limit of 1000 years in happiness and peace. During its continuance the powers of evil were to be restrained, and the last judgment was apparently to take place at its close. As regards the doctrine of a future life, our author adopts a position novel for a Palestinian writer. He abandons the hope of a resurrection of the body. The souls of the righteous are to enjoy a blessed immortality after death. This is the earliest attested instance of this expectation in the last two centuries B.C.

LITERATURE.—*Ethiopic Text and Translations*: This text was first edited by Dillmann from two MSS. in 1859, and in 1895 by R. H. Charles from four (*The Ethiopic Version of the Hebrew Book of Jubilees . . . with the Hebrew, Syriac, Greek and Latin fragments*). In the latter edition, the Greek and Latin fragments are printed together with the Ethiopic. The book was translated into German by Dillmann from one MS. in Ewald's *Jahrbücher*, vols. ii. and iii. (1850, 1851), and by Littmann (in Kautzsch's *Apok. und Pseud.* ii. 39–119) from Charles's Ethiopic text; into English by Schodde (*Bibl. Sacr.* 1885) from Dillmann's text, and by Charles (*Jewish Quarterly Review*, vols. v., vi., vii. (1893–1895) from the text afterwards published in 1895, and finally in his commentary, *The Book of Jubilees* (1902). *Critical Inquiries*: Dillmann, "Das Buch der Jubiläen" (Ewald's *Jahrbücher d. bibl. Wissensch.* (1851), iii. 72–96); "Pseudepig. des Alten Testaments," Herzog's *Realencyk.*^{2} xii. 364–365; "Beiträge aus dem Buche der Jubiläen zur Kritik des Pentateuch Textes" (*Sitzungsberichte der Kgl. Preussischen Akad.*, 1883); Beer, *Das Buch der Jubiläen* (1856); Rönsch, *Das Buch der Jubiläen* (1874); Singer, *Das Buch der Jubiläen* (1898); Bohn, "Die Bedeutung des Buches der Jubiläen" (*Theol. Stud. und Kritiken* (1900), pp. 167–184). A full bibliography will be found in Schürer or in R. H. Charles's commentary, *The Book of Jubilees or the Little Genesis* (1902), which deals exhaustively with all the questions treated in this article. (R. H. C.)

JUBILEE YEAR, an institution in the Roman Catholic Church, observed every twenty-fifth year, from Christmas to Christmas. During its continuance plenary indulgence is obtainable by all the faithful, on condition of their penitently confessing their sins and visiting certain churches a stated number of times, or doing an equivalent amount of meritorious work. The institution dates from the time of Boniface VIII., whose bull *Antiquorum habet fidem* is dated the 22nd of February 1300. The circumstances in which it was promulgated are related by a contemporary authority, Jacobus Cajetanus, according to whose account ("Relatio de centesimo s. jubilaeo anno" in the *Bibliotheca Patrum*) a rumour spread through Rome at the close of 1299 that every one visiting St Peter's on the 1st of January 1300 would receive full absolution. The result was an enormous influx of pilgrims to Rome, which stirred the pope's attention. Nothing was found in the archives, but an old peasant 107 years of age avowed that his father had been similarly benefited a century previously. The bull was then issued, and the pilgrims became even more numerous, to the profit of both clergy and citizens. Originally the churches of St Peter and St Paul in Rome were the only jubilee churches, but the privilege was afterwards extended to the Lateran Church and that of Sta Maria Maggiore, and it is now shared also for the year immediately following that of the Roman jubilee by a number of specified provincial churches. At the request of the Roman people, which was supported by St Bridget of Sweden and by Petrarch, Clement VI. in 1343 appointed, by the bull *Unigenitus Dei filius*, that the jubilee should recur every fifty years instead of every hundred years as had been originally contemplated in the constitution of Boniface; Urban VI., who was badly in need of money, by the bull *Salvator noster* in 1389 reduced the interval still further to thirty-three years (the supposed duration of the earthly life of Christ); and Paul II. by the bull *Ineffabilis* (April 19, 1470) finally fixed it at twenty-five years. Paul II. also permitted foreigners to substitute for the pilgrimage to Rome a visit to some specified church in their own country and a contribution towards the expenses of the Holy Wars. According to the special ritual prepared by Alexander VI. in 1500, the pope on the Christmas Eve with which the jubilee begins goes in solemn procession to a particular walled-up door ("Porta aurea") of St Peter's and knocks three times, using at the same time the words of Ps. cxviii. 19 (*Aperite mihi portas justitiae*). The doors are then opened and sprinkled with holy water, and the pope passes through. A similar ceremony is conducted by cardinals at the other jubilee churches of the city. At the close of the jubilee, the special doorway is again built up with appropriate solemnities.

The last ordinary jubilee was observed in 1900. "Extraordinary" jubilees are sometimes appointed on special occasions, *e.g.* the accession of a new pope, or that proclaimed by Pope Leo XIII. for the 12th of March 1881, "in order to obtain from the mercy of Almighty God help and succour in the weighty necessities of the Church, and comfort and strength in the battle against her numerous and mighty foes." These are not so much jubilees in the ordinary sense as special grants of plenary indulgences for particular purposes (*Indulgentiae plenariae in forma jubilaei*).

JÚCAR, a river of eastern Spain. It rises in the north of the province of Cuenca, at the foot of the Cerro de San Felipe (5906 ft.), and flows south past Cuenca to the borders of Albacete; here it bends towards the east, and maintains this direction for the greater part of its remaining course. On the right it is connected with the city of Albacete by the Maria Cristina canal. After entering Valencia, it receives on the left its chief tributary the Cabriel, which also rises near the Cerro de San Felipe, in the Montes Universales. Near Alcira the Júcar turns south-eastward, and then sharply north, curving again to the south-east before it enters the Mediterranean Sea at Cullera, after a total course of 314 m. Its estuary forms the harbour of Cullera, and its lower waters are freely utilized for purposes of irrigation.

JUD, LEO (1482–1542), known to his contemporaries as Meister Leu, Swiss reformer, was born in Alsace and educated at Basel, where after a course in medicine he turned to the study of theology. This change was due to the influence of Zwingli whose colleague at Zürich Jud became after serving for four years (1518–1522) as pastor of Einsiedeln. His chief activity was as a translator; he was the leading spirit in the translation of the Zürich Bible and also made a Latin version of the Old Testament. He died at Zürich on the 19th of June 1542.

See *Life* by C. Pestalozzi (1860); art. in Herzog-Hauck's *Realencyklopädie*, vol. ix. (1901).

JUDAEA, the name given to the southern part of Palestine as occupied by the Jewish community in post-exilic days under Persian, Greek and Roman overlordship. In Luke and Acts the term is sometimes used loosely to denote the whole of western Palestine. The limits of Judaea were never very precisely defined and—especially on the northern frontier—varied from time to time. After the death of Herod, Archelaus became ethnarch of Samaria, Idumea and Judaea, and when he was deposed Judaea was merged in Syria, being governed by a procurator whose headquarters were in Caesarea.

For a description of the natural features of the country see PALESTINE; for its history see JEWS and JUDAH. Cf. T. Mommsen, *The Provinces of the Roman Empire*, ch. xi.

JUDAH, a district of ancient Palestine, to the south of the kingdom of Israel, between the Dead Sea and the Philistine plain. It falls physically into three parts: the hill-country from Hebron northwards through Jerusalem; the lowland (Heb. *Shĕphelah*) on the west; and the steppes or "dry land" (Heb. *Negeb*) on the south. The district is one of striking contrasts, with a lofty and stony table-land in the centre (which reaches a height of 3300 ft. just north of Hebron), with a strategically important valley dividing the central mountains from the lowland, and with the most desolate of tracts to the east (by the Dead Sea) and south. Some parts, especially around Hebron, are extremely fertile, but the land as a whole has the characteristics of the southern wilderness—the so-called "desert" is not a sterile Sahara—and was more fitted for pastoral occupations; see further G. A. Smith, *Hist. Geog. Holy Land*, chs. x.–xv. Life in ancient Judah is frequently depicted in the Bible, but much of the Judaean history is obscure. In the days of the old Hebrew monarchy there were periods of conflict and rivalry between Judah and Israel—even times when the latter incorporated, or at least claimed supremacy over, the former. Later, from the 5th century B.C. there was a breach between the Jews (the name is derived from Judah) and the Samaritans (*q.v.*). The intervening years after the fall of Samaria (722 B.C.), and after the destruction of Jerusalem (586 B.C.), were probably marked by closer intercourse, similar to the period of union in the popular traditions relating to the pre-monarchical age. The course of Judaean history was conditioned, also, by the proximity of the Philistines in the west, Moab in the east, and by Edom and other southern peoples extending from North Arabia to the delta of the Nile. Judah's stormy history, continued under Greek and Roman domination, reached its climax in the birth of Christianity, and ended with the fall of Jerusalem in A.D. 70 (see JEWS, PALESTINE).

In conformity with ancient methods of genealogy (*q.v.*), Judah is traced back to a son of Jacob or Israel by Leah and along with other "tribes" (Dan, Levi, Simeon, &c.) is included under the collective term Israel. Thus it shares the general traditions of the Israelites, although Judah appears as an individual in the story of his "brother" Joseph (on ch. xxxvii. seq., see GENESIS). Its boundaries in Joshua xv. are manifestly artificial or imaginary; they include the Philistines and number places which are elsewhere ascribed to Simeon or Dan. The origin of the name (*Yĕhūdah*) is quite uncertain; the interpretation "praised" is suggested in Gen. xxix. 35 (cf. xlix. 8 seq.), but some connexion with allied names, as Yehūd (Yahūdīya, E. of Jaffa), or Ēhūd (a Benjamite clan) seems more probable. That Judah, whatever its original connotation, underwent development through the incorporation of other clans appears from 1 Chron. ii., iv., where it is found to contain a large element of non-Israelite population whose names find analogies or parallels in Simeonite, Edomite and other southern lists.[1] Indeed, underlying the account of the Israelite exodus (*q.v.*) there are traces of a separate movement of certain clans—apart from the Israelite invasion of Palestine—who are ultimately found in the south of Judah; and the traditions in Chronicles themselves allow the view that the incorporation of these elements began under David, when Judah first occupies a prominent position in biblical history (cf. Cheyne, *Ency. Bib.*, col. 2618 seq., and see CALEB, JERAHMEEL, KENITES). But such movements were not necessarily limited to one single period, and the evidence connecting (*a*) the non-Israelite clans of Judah with Levites, and (*b*) both with the south, is found in narratives referring to several different ages and might point to an unceasing relationship with the south. On the other hand, clans, which in the traditions of David's time were in the south of Judah, about five hundred years later (in the exile) are found near Jerusalem (*e.g.* Caleb), so that either these survived the strenuous vicissitudes of half a millennium or all perspective of their early history has been lost. In Gen. xxxviii. a curious narrative points to the separation of Judah "from his brethren" and his marriage with Shua the Canaanite; two sons Er and Onan perish and the third Shelah survives. From Judah and Er's widow Tamar are derived Perez and Zerah, and these with Shelah appear in post-exilic times as the three representative families of Judah (Neh. xi. 4–6; 1 Chron. ix. 4–6). This story, amid a number of other motives, appears to reflect the growth of the tribe of Judah and its fluctuations, but that the reference is to any very early period is unlikely, partly because the interest of the story is in post-exilic families, and partly because the scenes (Adullam, Chezib and Timnah) overlap with David's own fights between Hebron and Jerusalem (2 Sam. xxi. xxiii.; see DAVID, *ad fin.*).[2] Even David's conquest of Jerusalem (2 Sam. v.) conflicts both with the statement of its capture by Judah many years previously (Judges i. 8); and with the traditions of the Israelite heroes Joshua and Saul. Consequently, the few surviving data are too uncertain for any decisive conclusions regarding the origin of the tribe of Judah. Judah as a kingdom may have taken its name from a limited district, in which case its growth finds a parallel in the extension of the name Samaria from the city to the province. The location of Yehūd and Ēhūd in the light of 1 Kings iv. 8-19 (perhaps the subdivisions of the Israelite kingdom, see SOLOMON), would necessitate the assumption of a violent separation from the north; this, however, is quite conceivable (see JEWS, §§ 11–13). On the bearing of South Judah upon the historical criticism of the Old Testament, see especially N. Schmidt, *Hibbert Journal* (1908), pp. 322–342, "The Jerahmeel Theory and the Historic Importance of the Negeb, with some account of personal exploration of the country"; also JEWS, § 20. (S. A. C.)

JUDAS ISCARIOT (Ἰούδας Ἰσκαριώτης or Ἰσκαριώθ), in the Bible, the son of Simon Iscariot (John vi. 71, xiii. 26), and one of the twelve apostles. He is always enumerated last with the special mention of the fact that he was the betrayer of Jesus. If the generally accepted explanation of his surname ("man of Kerioth"; see Josh. xv. 25) be correct, he was the only original member of the apostolic band who was not a Galilean. The circumstances which led to his admission into the apostolic circle are not stated; while the motives by which he was actuated in enabling the Jewish authorities to arrest Jesus without tumult have been variously analysed by scholars. According to some (as De Quincey in his famous *Essay*) the sole object of Judas was to place Jesus in a position in which He should be compelled to make what had seemed to His followers the too tardy display of His Messianic power: according to others (and this view seems more in harmony with the Gospel narratives) Judas was an avaricious and dishonest man, who had already abused the confidence placed in him (John xii. 6), and who was now concerned only with furthering his own ends.

As regards the effects of his subsequent remorse and the use to which his ill-gotten gains were put, the strikingly apparent discrepancies between the narratives of Matt. xxvii. 3, 10 and Acts i. 18, 19 have attracted the attention of biblical scholars, ever since Papias, in his fourth book, of which a fragment has been preserved, discussed the subject. The simplest explanation is that they represent different traditions, the Gospel narrative being composed with more special reference to prophetic fulfilments, and being probably nearer the truth than the short explanatory note inserted by the author of the Acts (see Bernard, *Expositor*, June 1904, p. 422 seq.). In ecclesiastical legend and in sacred art Judas Iscariot is generally treated as the very incarnation of treachery, ingratitude and impiety. The Middle Ages, after their fashion, supplied the lacunae in what they deemed his too meagre biography. According to the common form of their story, he belonged to the tribe of Reuben.[1] Before he was born his mother Cyborea had a dream that he was destined to murder his father, commit incest with his mother, and sell his God. The attempts made by her and her husband to avert this curse simply led to its accomplishment. At his birth Judas was enclosed in a chest and flung into the sea; picked up on a foreign shore, he was educated at the court until a murder committed in a moment of passion compelled his flight. Coming to Judaea, he entered the service of Pontius Pilate as page, and during this period committed the first two of the crimes which had been expressly foretold. Learning the secret of his birth, he, full of remorse, sought the prophet who, he had heard, had power on earth to forgive sins. He was accepted as a disciple and promoted to a position of trust, where avarice, the only vice in which he had hitherto been unpractised, gradually took possession of his soul, and led to the complete fulfilment of his evil destiny. This Judas legend, as given by Jacobus de Voragine, obtained no small popularity; and it is to be found in various shapes in every important literature of Europe.

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[1] See especially Wellhausen, *De gentibus et familiis Judaeorum* (Göttingen, 1869), the articles on the relative proper names in the *Ency. Bib.*, and E. Meyer, *Die Israeliten u. ihre Nachbarstämme*, pp. 299–471 (much valuable matter).

[2] For the principle of the Levirate illustrated in Gen. xxxviii., see RUTH. Lagarde (*Orientalia*, ii.) ingeniously conjectured that the chapter typified the suppression of Phoenician (viz. Tamar, the date-palm) and the old Canaanite elements (Zerah = *indigena*) by the younger Israelite invaders (Perez = "branch"). For other discussions, apart from commentaries on Genesis, see B. Luther in Meyer, *op. cit.*, pp. 200 sqq.

For the history of its genesis and its diffusion the reader may consult D'Ancona, *La leggenda di Vergogna e la leggenda di Giuda* (1869), and papers by W. Creizenach in Paul and Braune's *Beitr. zur Gesch. der deutschen Sprache und Litteratur*, vol. ii. (1875), and Victor Diederich in *Russiche Revue* (1880). Cholevius, in his *Geschichte der deutschen Poesie nach ihren antiken Elementen* (1854), pointed out the connexion of the legend with the Oedipus story. According to Daub (*Judas Ischariot, oder Betrachtungen über das Böse im Verhältniss zum Guten*, 1816, 1818) Judas was "an incarnation of the devil," to whom "mercy and blessedness are alike impossible."

The popular hatred of Judas has found strange symbolical expression in various parts of Christendom. In Corfu, for instance, the people at a given signal on Easter Eve throw vast quantities of crockery from their windows and roofs into the streets, and thus execute an imaginary stoning of Judas (see Kirkwall, *Ionian Islands*, ii. 47). At one time (according to Mustoxidi, *Delle cose corciresi*) the tradition prevailed that the traitor's house and country villa existed in the island, and that his descendants were to be found among the local Jews.

Details in regard to some Judas legends and superstitions are given in *Notes and Queries*, 2nd series, v., vi. and vii.; 3rd series, vii.; 4th series, i.; 5th series, vi. See also a paper by Professor Rendel Harris entitled "Did Judas really commit suicide?" in the *American Journal of Philology* (July 1900). Matthew Arnold's poem "St Brandan" gives fine expression to the old story that, on account of an act of charity done to a leper at Joppa, Judas was allowed an hour's respite from hell once a year. (G.Mi.)

JUDAS-TREE, the *Cercis siliquastrum* of botanists, belonging to the section *Caesalpineae* of the natural order Leguminosae. It is a native of the south of France, Spain, Portugal, Italy, Greece and Asia Minor, and forms a handsome low tree with a flat spreading head. In Spring it is covered with a profusion of purplish-pink flowers, which appear before the leaves. The flowers have an agreeable acid taste, and are eaten mixed with salad or made into fritters. The tree was frequently figured by the older herbalists. One woodcut by Castor Durante has the figure of Judas Iscariot suspended from one of the branches, illustrating the popular tradition regarding this tree. A second species, *C. canadensis*, is common in North America from Canada to Alabama and eastern Texas, and differs from the European species in its smaller size and pointed leaves. The flowers are also used in salads and for making pickles, while the branches are used to dye wool a nankeen colour.

JUDD, SYLVESTER (1813–1853) American Unitarian clergyman and author, was born in Westhampton, Massachusetts, on the 23rd of July 1813. He bore the same name as his father and grandfather; the former (1789–1860) made an especial study of local history of the towns of the Connecticut valley, and wrote a *History of Hadley* (1863). The son lived in Northampton after his tenth year, was converted in a revival there in 1826, graduated from Yale in 1836, and taught in 1836 at Templeton, Mass., where he first met Unitarians and soon found the solution of his theological difficulties in their views. He entered the Harvard divinity school, from which he graduated in 1840. In the same year he was ordained pastor of the Unitarian church of Augusta, Maine, where he died on the 26th of January 1853. His widest reputation was as the author of *Margaret, a Tale of the Real and the Ideal,including Sketches of a place not before described, called Mons Christi* (1845; revised 1851), written to exhibit the errors of Calvinistic and all trinitarian theology, and the evils of war, intemperance, capital punishment, the prison system of the time, and the national treatment of the Indians. This story, published anonymously, attracted much attention by its true descriptions of New England life and scenery as well as by its author's earnest purpose. *Richard Edney and the Governor's Family* (1850) is in much the same vein as *Margaret*. A poem entitled *Philo, an Evangeliad* (1850) is a versified defence of Unitarianism. He published, besides, *The Church, in a Series of Discourses* (1854). As a preacher and pastor he urged the desirability of infant baptism. He lectured frequently on international peace and opposed slavery.

See Arethusa Hall, *Life and Character of the Rev. Sylvester Judd* (Boston, 1857) published anonymously.

JUDE, THE GENERAL EPISTLE OF, a book of the New Testament. As with the epistle of James, the problems of the writing centre upon the superscription, which addresses in Pauline phraseology (1 Thess. i. 4; 2 Thess. ii. 13; Rom. i. 7; 1 Cor. 1. 2) the Christian world in general in the name of "Jude, the brother of James" (Matt. xiii. 55; Mark vi. 3). The historical situation depicted must then fall within the lifetime of this Judas, whose two grandchildren Zoker and James (Hegesippus *ap.* Phil. Sidetes) by their testimony before the authorities brought to an end the (Palestinian) persecution of Domitian (Hegesippus *ap.* Eus. *H. E.* iii. 20, 7). These two grandsons of Judas thereafter "lived until the time of Trajan," ruling the churches "because they had (thus) been witnesses (martyrs) and were also relatives of the Lord." But in that case we must either reject the testimony of the same Hegesippus that up to their death, and that of Symeon son of Clopas, successor in the Jerusalem see of James the Lord's brother, "who suffered martyrdom at the age of one hundred and twenty years while Trajan was emperor and Atticus governor," "the church (universal) had remained a pure and uncorrupted virgin" free from "the folly of heretical teachers"; or else we must reject the superscription, which presents the grandfather in vehement conflict with the very heresies in question. For the testimony of Hegesippus is explicit that at the time of the arrest of Zoker and James they were all who survived of the kindred of the Lord. True, there is confusion in the narrative of Hegesippus, and even a probability that the martyrdom of Symeon dated under Trajan really took place in the persecution of Domitian,before the arrest of the grandsons of Jude, for apart from the alleged age of Symeon (the traditional Jewish limit of human life, Gen. vi. 3, Deut. xxxiv. 7), the cause of his apprehension "on the ground that he was *a descendant of David* and a Christian" (Hegesippus *ap.* Eus. *H. E.* iii.32, 3) is inconsistent with both the previous statements regarding the "martyrdom" of Zoker and James, that they were cited as the only surviving Christian Davididae, and that the persecution on this ground collapsed through the manifest absurdity of the accusation. But even if we date the rise of heresies in the reign of Domitian instead of Trajan,[2] the attributing of this epistle against corrupting heresy to "Jude the brother of James" will still be incompatible with the statements of Hegesippus, our only informant regarding his later history.

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[1] Other forms make him a Danite, and consider the passage in Genesis (xlix. 17) a prophecy of the traitor.

[2] On this point (date of the outbreak of heresy) there is some inconsistency in the reported fragments of Hegesippus. In that quoted below from Eus. *H.E.* iii. 32. 7 seq., it is expressly dated after the martyrdom of Symeon and death of the grandsons of Jude under Trajan. In iii. 19 the "ancient tradition" attributing the denunciation of these to "some of the heretics" is perhaps not from Hegesippus; but in iv. 22 the beginning of heresy is traced to a certain Thebuthis, a candidate for the bishopric after the death of James, as rival to Symeon. The same figure of the church as a pure virgin is also used as in iii. 32. But as it is only the envious feeling of Thebuthis which is traced to this early date, Hegesippus doubtless means to place the outbreak later.

The Greek of Jude is also such as to exclude the idea of authorship in Palestine by an unschooled Galilean, at an early date in church history. As F. H. Chase has pointed out: (1) the terms κλητοί, σωτηρία, πίστις, have attained their later technical sense; (2) "the writer is steeped in the language of the LXX.," employing its phraseology independently of other N.T. writers, and not that of the canonical books alone, but of the broader non-Palestinian canon; (3) "he has at his command a large stock of stately, sonorous, sometimes poetical words," proving him a "man of some culture, and, as it would seem, not without acquaintance with Greek writers."

If the superscription be not from the hand of the actual brother of Jesus, the question may well be asked why some apostolic name was not chosen which might convey greater authority? The answer is to be found in the direction toward which the principal defenders of orthodoxy in 100–150 turned for "the deposit of the faith" (Jude 3) in its purity. The Pastoral Epistles point to "the pattern of sound words, even the sayings of our Lord Jesus Christ." (1 Tim. vi. 3, &c.), as the arsenal of orthodoxy against the same foe (with 1 Tim. vi. 3–10; cf. Jude 4, 11, 16, 18 seq.). Ignatius's motto is to "be inseparable from Jesus Christ and from your bishop" (*ad Trall.* vii.), Polycarp's, to "turn unto the word delivered unto us from the beginning" (cf. Jude 3; 1 John ii. 7, iii. 23, iv. 21), "the oracles of the Lord," which the false teachers "pervert to their own lusts." Papias, his ἑταῖρος (Irenaeus), turns in fact from "the vain talk of the many, and from the "alien commandments" to such as were "delivered by the Lord to the faith," offering to the Christian world his *Interpretation of the Lord's Oracles* based upon personal inquiry from those who "came his way," who could testify as to apostolic tradition. Hegesippus, after a journey to all the principal seats of Christian tradition, testifies that all are holding to the true doctrine as transmitted at the original seat, where it was witnessed first by the apostles and afterwards by the kindred of the Lord and "witnesses" of the first generation. All these writers in one form or other revert to the historic tradition against the licence of innovators. Hegesippus indicates plainly the seat of its authority. For the period before the adoption of a written standard the resort was not so much to "apostles" as to "disciples" and "witnesses." The appeal was to "those who from the beginning had been eyewitnesses and ministers of the word" (Luke i. 2); and these were to be found primarily (until the complete destruction of that church during the revolt of Barcochebas and its suppression by Hadrian) in the mother community in Jerusalem (cf. Acts xv. 2). Its life is the measure of the period of oral tradition, whose requiem is sung by Papias. Hegesippus (*ap.* Eus. *H.E.* iii. 32, 7 seq.) looks back to it as the safe guardian of the deposit "of the faith" against all the depredations of heresy which "when the sacred college of apostles had suffered death in various forms, and the generation of those that had been deemed worthy to hear the inspired wisdom with their own ears had passed away . . . attempted thenceforth with a bold face, to proclaim, in opposition to the preaching of the truth, 'the knowledge which is falsely so-called (ψευδώνυμος γνῶσις).'" For an appeal like that of our epistle to the authority of the past against the moral laxity and antinomian teaching of degenerate Pauline churches in the Greek world, the natural resort after Paul himself (Pastoral Epp.) would be the "kindred of the Lord" who were the "leaders and witnesses in every church" in Palestine. Doubtless the framer of Jude 1 would have preferred the aegis of "James the Lord's brother," if this, like that of Paul, had not been already appropriated. Failing this, the next most imposing was "Judas, the brother of James."

The superscription in the case of Jude, unlike that of James, takes hold of the substance of the book. Verse 3 and the farewell (*v.* 24 seq.) show that Jude was composed from the start as an "epistle." If this appearance be not fallacious, the obvious relation between the two superscriptions will be best explained by the supposition that the author of Jude gave currency to the existing homily (James) before composing under the pseudonym of Jude. On the interconnexion of the two see Sieffert, *s.v.* "Judasbrief" in Hauck, *Realencykl.* vol. ix.

Judas is conceived as cherishing the intention of discussing for the benefit of the Christian world (for no mere local church is addressed) the subject of "our common salvation" (the much desiderated authoritative definition of the orthodox faith), but diverted from this purpose by the growth of heresy.

Few writings of this compass afford more copious evidence of date in their literary affinities. The references to Enoch (principally ver. 14 seq. = *Eth. En.* i. 9, but cf. F. H. Chase, *s.v.* "Jude" in Hastings's *Dict. Bible*) and the *Assumption of Moses* (*v.* 9) have more a geographical than a chronological bearing, the stricter canon of Palestine excluding these apocryphal books of 90 B.C. to A.D. 40; but the Pauline writings are freely employed, especially 1 Cor. x. 1–13, Rom. xvi. 25 seq., and probably Eph. and Col. Moreover, the author explicitly refers to the apostolic age as already past, and to the fulfilment of the Pauline prediction (1 Tim. iv. 1 sqq.) of the advent of heresy (*v.* 17 seq.). The Pauline doctrine of "grace" has been perverted to lasciviousness, as by the heretics whom Polycarp opposes (*Ep. Polyc.* vii.), and this doctrine is taught for "hire" (*vv.* 11, 12, 16; cf. 1 Tim. vi. 5). The unworthy "shepherds" (*v.* 12; cf. Ezek. xxxiv. 8; John x. 12 seq.) live at the expense of their flocks, polluting the "love-feasts," corrupting the true disciples. According to Clement of Alexandria this was written prophetically to apply to the Carpocratians, an antinomian Gnostic sect of *c.* 150; but hyper-Paulinists had given occasion to similar complaints already in Rev. ii. 14, 20 (95). Thus Paulinism and its perversion alike are in the past. As regards the undeniable contact of *Didache* ii. 7 with Jude 22 seq. (cf. *Didache*, iv. 1, Jude 8) priority cannot be determined; and the use of 1 John iii. 12 in Jude 11 is doubtful.

On the other hand, practically the whole of Jude is taken up into 2 Pet., the author merely avoiding, so far as he discovers them, the quotations from apocryphal writings, and prefixing and affixing sections of his own to refute the heretical eschatology. On the priority of Jude see especially against Spitta *Zur Gesch. u. Litt. d. Urchristenthums*, ii. 409–411, F. H. Chase, *loc. cit.* p. 803. (On 2 Pet. see PETER EPISTLES OF.) Unfortunately, the date of 2 Pet. cannot be determined as earlier than late in the second century, so that we are thrown back upon internal evidence for the inferior limit.

The treatment of the heresy as the anti-Christ who precedes "the last hour" (*v.* 18), reminds us of 1 John ii. 18, but it is indicative of conditions somewhat less advanced that the heretics have not yet "gone out from" the church. The treatment of the apostolic age as past, and the deposit of the faith as a *regula fidei* (cf. Ign. *ad Trall.* ix.), the presence of antinomian Gnosticism, denying the doctrine of lordship and "glories" (*v.* 8), with "discriminations" between "psychic" and "pneumatic" (*v.* 19), strongly oppose a date earlier than 100.

Sieffert, on account of the superscription, would date as early as 70–80, but acknowledges the hyper-Pauline affinity of the heresy, its propagation as a doctrine, and close relation to the Nicolaitan of Rev. ii. 14. To these phenomena he gives accordingly a correspondingly early date. The nature of the heresy, opposed, however, and the resort to the authority of Jude "the brother of James" against it, favour rather the period of Polycarp and Papias (117–150).

The history of the reception of the epistle into church canons is similar to that of James, beginning with a quotation of it as the work of Jude by Clement of Alexandria (*Paed.* iii. 8), a reference by Tertullian (*De cult. fem.* i. 3), and a more or less hesitant endorsement by Origen ("if one might adduce the epistle of Jude," *In Matt.* tom. xvii. 30) and by the *Muratorianum* (*c.* 200), which excepts Jude and 2 and 3 John from its condemnation of apocryphal literature, placing it on a par with the Wisdom of Solomon "which was written by friends of his in his honour." The use of apocryphal literature in Jude itself may account for much of the critical disposition toward it of many subsequent writers. Eusebius classed it among the "disputed" books, declaring that as with James "not many of the ancients have mentioned it" (*H. E.* ii. 23, 25).

The *Introd. to the New Test.* by Holtzmann, Jülicher, Weiss, Zahn, Davidson, Salmon, Bacon and the standard *Commentaries* of Meyer and Holtzmann, the *International* (Bigg) and other series, contain discussions of authorship and date. The articles *s.v.* in Hastings's *Dict. Bible* (Chase) and the *Ency. Bib.* (Cone) are full and scholarly. In addition the *Histories of the Apostolic Age*, by Hausrath, Weizsäcker, McGiffert, Bartlet, Ropes and others, and the kindred works of Baur, Schwegler and Pfleiderer should be consulted. Moffat's *Historical New Testament*, 2nd ed., p. 589, contains a convenient summary of the evidence with copious bibliography. One of the most thorough of conservative treatments is the *Commentary on Jude and Second Peter* by J. B. Mayor (1907). (B. W. B.)

JUDGE (Lat. *judex*, Fr. *juge*), in the widest legal sense an officer appointed by the sovereign power in a state to administer the law; in English practice, however, justices of the peace and magistrates are not usually regarded as "judges" in the titular sense. The duties of the judge, whether in a civil or a criminal matter, are to hear the statements on both sides in open court, to arrive at a conclusion as to the truth of the facts submitted to him or, when a jury is engaged, to direct the jury to find such a conclusion, to apply to the facts so found the appropriate rules of law, and to certify by his judgment the relief to which the parties are entitled or the obligations or penalties which they have incurred. With the judgment the office of the judge is at an end, but the judgment sets in motion the executive forces of the state, whose duty it is to carry it into execution.

Such is the type of a judicial officer recognized by mature systems of law, but it is not to be accepted as the universal type, and the following qualifying circumstances should be noticed: (1) in primitive systems of law the judicial is not separated from the legislative and other governing functions; (2) although the judge is assumed to take the law from the legislative authority, yet, as the existing law never at any time contains provision for all cases, the judge may be obliged to invent or create principles applicable to the case—this is called by Bentham and the English jurists judge-made and judiciary law; (3) the separation of the function of judge and jury, and the exclusive charge of questions of law given to the judge, are more particularly characteristic of the English judicial system. During a considerable period in the history of Roman law an entirely different distribution of parts was observed. The adjudication of a case was divided between the *magistratus* and the *judex*, neither of whom corresponds to the English judge. The former was a public officer charged with the execution of the law; the latter was an arbitrator whom the magistrates commissioned to hear and report upon a particular case.

The following are points more specially characteristic of the English system and its kindred judicial systems: (1) Judges are absolutely protected from action for anything that they may do in the discharge of their judicial duties. This is true in the fullest sense of judges of the supreme courts. "It is a principle of English law that no action will lie against a judge of one of the superior courts for a judicial act, though it be alleged to have been done maliciously and corruptly." Other judicial officers are also protected, though not to the same extent, against actions. (2) The highest class of judges are irremovable except by what is in effect a special act of parliament, viz. a resolution passed by both houses and assented to by the sovereign. The inferior judges and magistrates are removable for misconduct by the lord chancellor. (3) The judiciary in England is not a separate profession. The judges are chosen from the class of advocates, and almost entirely according to their eminence at the bar. (4) Judges are in England appointed for the most part by the crown. In a few cases municipal corporations may appoint their own judicial officer.

See also LORD HIGH CHANCELLOR; LORD CHIEF JUSTICE; MASTER OF THE ROLLS, &c., &c., and the accounts of judicial systems under country headings.

JUDGE-ADVOCATE-GENERAL, an officer appointed in England to assist the Crown with advice in matters relating to military law, and more particularly as to courts-martial. In the army the administration of justice as pertaining to discipline is carried out in accordance with the provisions of military law, and it is the function of the judge-advocate-general to ensure that these disciplinary powers are exercised in strict conformity with that law. Down to 1793 the judge-advocate-general acted as secretary and legal adviser to the board of general officers, but on the reconstitution of the office of commander-in-chief in that year he ceased to perform secretarial duties, but remained chief legal adviser. He retained his seat in parliament and in 1806 he was made a member of the government and a privy councillor. The office ceased to be political in 1892, on the recommendation of the select committee of 1888 on army estimates, and was conferred on Sir F. Jeune (afterwards Lord St Helier). There was no salary attached to the office when held by Lord St Helier, and the duties were for the most part performed by deputy. On his death in 1905, Thomas Milvain, K.C., was appointed, and the terms and conditions of the post were rearranged as follows: (1) A salary of £2000 a year; (2) the holder to devote his whole time to the duties of the post; (3) the retention of the post until the age of seventy, subject to continued efficiency—but with claim to gratuity or pension on retirement. The holder was to be subordinate to the secretary of state for war, without direct access to the sovereign. The appointment is conferred by letters-patent, which define the exact functions attaching to the office, which practically are the reviewing of the proceedings of all field-general, general and district courts-martial held in the United Kingdom, and advising the sovereign as to the confirmation of the finding and sentence. The deputy judge-advocate is a salaried official in the department of the judge-advocate-general and acts under his letters-patent. A separate judge-advocate-general's department is maintained in India, where at one time deputy judge-advocates were attached to every important command. All general courts-martial held in the United Kingdom are sent to the judge-advocate-general, to be by him submitted to the sovereign for confirmation; and all district courts-martial, after having been confirmed and promulgated, are sent to his office for examination and custody. The judge-advocate-general and his deputy, being judges in the last resort of the validity of the proceedings of courts-martial, take no part in their conduct; but the deputy judge-advocates frame and revise charges and attend at courts-martial, swear the court, advise both sides on law, look after the interests of the prisoner and record the proceedings. In the English navy there is an official whose functions are somewhat similar to those of the judge-advocate-general. He is called counsel and judge-advocate of the fleet.

In the United States there is also a judge-advocate-general's department. In addition to being a bureau of military justice, and keeping the records of courts-martial, courts of inquiry and military commissions, it has the custody of all papers relating to the title of lands under the control of the war department. The officers of the department, in addition to acting as prosecutors in all military trials, sometimes represent the government when cases affecting the army come up in civil courts.

See further MILITARY LAW, and consult C. M. Clode, *Administration of Justice under Military and Martial Law* (1872); *Military Forces of the Crown* (2 vols., 1869).

JUDGES, THE BOOK OF, in the Bible. This book of the Old Testament, which, as we now read it, constitutes a sequel to the book of Joshua, covering the period of history between the death of this conqueror and the birth of Samuel, is so called because it contains the history of the Israelites before the establishment of the monarchy, when the government was in the hands of certain leaders who appear to have formed a continuous succession, although the office was not hereditary. The only other biblical source ascribed to this period is Ruth, whose present position as an appendix to Judges is not original (see BIBLE and RUTH).

Structure.—It is now generally agreed that the present adjustment of the older historical books of the Old Testament to form a continuous record of events from the creation to the Babylonian exile is due to an editor, or rather to successive redactors, who pieced together and reduced to a certain unity older memoirs of very different dates; and closer examination shows that the continuity of many parts of the narrative is more apparent than real. This is very clearly the case in the book of Judges. It consists of three main portions: (1) an introduction, presenting one view of the occupation of Palestine by the Israelites (i. 1–ii. 5); (2) the history of the several judges (ii. 6–xvi.); and (3) an appendix containing two narratives of the period.

1. The first section relates events which are said to have taken place after the death of Joshua, but in reality it covers the same ground with the book of Joshua, giving a brief account of the occupation of Canaan, which in some particulars repeats the statements of the previous book, while in others it is quite independent (see Joshua). It is impossible to regard the warlike expeditions described in this section as supplementary campaigns undertaken after Joshua's death; they are plainly represented as the first efforts of the Israelites to gain a firm footing in the land (at Hebron, Debir, Bethel), in the very cities which Joshua is related to have subdued (Josh. x. 39).[1] Here then we have an account of the settlement of Israel west of the Jordan which is parallel to the book of Joshua, but makes no mention of Joshua himself, and places the tribe of Judah in the front. The author of the chapter cannot have had Joshua or his history in his eye at all, and the words "and it came to pass after the death of Joshua" in Judg. i. 1 are from the hand of the last editor, who desired to make the whole book of Judges, including ch. i., read continuously with that which now precedes it in the canon of the earlier prophets.[2]

2. The second and main section (ii. 6–xvi.) stands on quite another footing. According to Josh. xxiv. 31 the people "served Yahweh" during the lifetime of the great conqueror and his contemporaries. In Judg. ii. 7 this statement is repeated, and the writer proceeds to explain that subsequent generations fell away from the faith, and served the gods of the nations among which they dwelt (ii. 6–iii. 6). The worship of other gods is represented, not as something which went on side by side with Yahweh-worship (cf. x. 6), but as a revolt against Yahweh, periodically repeated and regularly chastised by foreign invasion. The history, therefore, falls into recurring cycles, each of which begins with religious corruption, followed by chastisement, which continues until Yahweh, in answer to the groans of his oppressed people, raises up a "judge" to deliver Israel, and recall them to the true faith. On the death of the "judge," if not sooner, the corruption spreads anew and the same vicissitudes follow. This religious explanation of the course of the history, formally expounded at the outset and repeated in more or less detail from chapter to chapter (especially vi. 1–10, x. 6–18), determines the form of the whole narrative. It is in general agreement with the spirit as also with the language of Deuteronomy, and on this account this section may be conveniently called "the Deuteronomic Book of Judges." But the main religious ideas are not so late and are rather akin to those of Josh. xxiv; in particular the worship of the high places is not condemned, nor is it excused as in 1 Kings iii. 2. The sources of the narrative are obviously older than the theological exposition of its lessons, and herein lies the value and interest of Judges. The importance of such documents for the scientific historian lies not so much in the events they record as in the unconscious witness they bear to the state of society in which the narrator or poet lived. From this point of view the parts of the book are by no means all of equal value; critical analysis shows that often parallel or distinct narratives have been fused together, and that, whilst the older stories gave more prominence to ordinary human motives and combinations, the later are coloured by religious reflection and show the characteristic tendency of the Old Testament to re-tell the fortunes of Israel in a form that lays ever-increasing weight on the work of Yahweh for his people. That the pre-Deuteronomic sources are to be identified with the Judaean (J, or Yahwist) and Ephraimite (E, or Elohist) strands of the Hexateuch is, however, not certain.

To the unity of religious pragmatism in the main stock of the book of Judges corresponds a unity of chronological scheme. The "judges," in spite of the fact that most of them had clearly no more than a local influence, are all represented as successive rulers in Israel, and the history is dated by the years of each judgeship and those of the intervening periods of oppression. But it is impossible to reconcile the numbers with the statement elsewhere that the fourth year of Solomon was the 480th from the exodus (1 Kings vi. 1). See Bible: *Chronology*.

The general introduction (ii. 6–iii. 6) is a blend of Deuteronomic and other sources. The intimate relation between it and the separate narratives (Josh. xxiv. 1–27, a late [Ephraimite] record inserted by a second Deuteronomic hand, and xxiii., D) appears both from their contents and from the fact that Judg. ii. 6–10 is almost identical with the narrative appended to Joshua's address (Joshua xxiv. 28–31). Judg. i.–ii. 5, however, is not touched by D, and hence was probably inserted in its present position at a later date. According to the highly intricate introduction the Hebrews were oppressed: (*a*) to familiarize them with warfare—it is assumed that they had intermarried with the Canaanites and worshipped their gods (iii. 2, 6); (*b*) to test their loyalty to Yahweh (ii. 22; iii. 1); or (*c*) to punish them for their marriage with the heathen and their apostasy (D in ii. 12; cf. Josh. xxiii., and ibid. *v.* 12).

To this succeeds a noteworthy example of the Deuteronomic treatment of tradition in the achievement of Othniel (*q.v.*) the only Judaean "judge," The bareness of detail, not to speak of the improbability of the situation, renders its genuineness doubtful, and the passage is one of the indications of a secondary Deuteronomic redaction. The case, however, is exceptional; the stories of the other great "judges" were not rewritten or to any great extent revised by the Deuteronomic redactor, and his hand appears chiefly in the framework.[3] Thus, in the story of Ehud and the defeat of Moab only iii. 12–15, 29–30 are Deuteronomic. But the rest is not homogeneous, *vv.* 19 and 20 appear to be variants, and the mention of Israel (*v.* 27*b*) is characteristic of the tendency to treat local troubles as national oppressions, whereas other records represent little national unity at this period (i., v.). See further Ehud.

According to the Septuagint addition to Josh. xxiv. 33, Moab was the first of Israel's oppressors. The brief notice of Shamgar, who delivered Israel from the Philistines (iii. 31), is one of the later insertions, and in some MSS. of the LXX. it stands after xvi. 31. The story of the defeat of Sisera appears in two distinct forms, an earlier, in poetical form (v.), and a later, in prose (iv.). D's framework is to be recognized in iv. 1–4, 23 seq., v. 1 (probably), 31 (last clause); see further Deborah. The Midianite oppression (vi.–viii.) is contained in the usual frame (vi. 1–6; viii. 27 seq.), but is not homogeneous, since viii. 4, the pursuit of the kings, cannot be the sequel of viii. 3 (where they have been slain), and viii. 33–35 ignores ix. The structure of vi. 1–viii. 3 is particularly intricate: vi. 25–32 does not continue vi. 11–24 (there are two accounts of Gideon's introduction and divergent representations of Yahweh-worship); vi. 34 forms the sequel of the latter, and vi. 36–40 (with "God") is strange after the description of the miracle in *vv.* 21 seq. (with "Yahweh"). Further, there are difficulties in vi. 34, vii. 23 seq., viii. 1, when compared with vii. 2–8, and in vii. 16–22 two stratagems are combined. There are two sequels: vii. 23 seq. and viii. 4; with the former contrast vi. 35; with viii. 1–3 cf. xii. 1–6, and see below. Chapter viii. 22 seq. comes unexpectedly, and the refusal of the offer of the kingship reflects later ideas (cf. 1 Sam. viii. 7; x. 19; xii. 12, 17). The conclusion, however, shows that Jerubbaal had only a local reputation. Finally, the condemnation of the ephod as part of the worship of Yahweh (viii. 27) agrees with the thought in vi. 25–32 as against that in vi. 11–24. (See Ephod; Gideon.) Chapter ix. (see Abimelech) appears to have been wanting in the Deuteronomic book of Judges, but inserted later perhaps by means of the introduction, viii. 30–32 (post-exilic). It has two accounts of the attack upon Shechem (ix. 26–41 and 42–49).

After a brief notice of two "minor judges" (see below), follows the story of Jephthah. It concludes with the usual Deuteronomic formula (xii. 7), but is prefaced by a detailed introduction to the oppression of Israel (x. 6 sqq.). By the inclusion of the Philistines among the oppressors, and of Judah, Benjamin and Ephraim among the oppressed (x. 7, 9), it appears to have in view not merely the story of Samson, a hero of local interest, but the early chapters in 1 Samuel. This introduction is of composite origin (as also ii.6–21; Josh. xxiii.–xxiv. 25), but a satisfactory analysis seems impossible. As it stands, it has literary connexions with the late narrative in 1 Sam. (vii. seq., xii.), and appears to form the preface to that period of history which ended with Samuel's great victory and the institution of the monarchy. But this belongs to a later scheme (see SAMUEL), and the introduction in its earlier form must have been the prelude to earlier narratives.[1] The story of Jephthah's fight with Ammon is linked to the preceding introduction by x. 17 seq.; for the framework see x. 6 (above), xii. 7. Chapter xi. 12–28 (cf. Num. xx. seq.) is applicable only to Moab, *vv.* 29 and 32 are variants, and Jephthah's home is placed variously in Tob. (xi. 3) and Mizpeh (*v.* 34). In xi. 1–10 the outlaw stipulates that he shall be chief of Gilead if successful, but in *vv.* 12–28 a ruler speaks on behalf of Israel. Both Moab and Ammon had good reason to be hostile to Gilead (Num. xxi.), but the scene of the victory points rather to the former (*v.* 33, possibly conflate). There is a general resemblance between the victories of Gideon and Jephthah, which is emphasized by the close relation between viii. 1–3 and xii. 1–6, the explanation of which in its present context is difficult. See further JEPHTHAH.

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[1] This is confirmed by the circumstance that in Judg. ii. 1 the "angel of Yahweh," who, according to Exod. xiv. 24, xxiii. 20, xxxii. 34, xxxiii. 2, 7 seq., must be viewed as having his local manifestation at the headquarters of the host of Israel, is still found at Gilgal and not at Shiloh.

[2] The chapter was written after Israel had become strong enough to make the Canaanite cities tributary (*v.* 28), that is, after the establishment of the monarchy (see 1 Kings ix. 20–21).

[3] Hence, it is to be inferred that the reviser had older *written* records before him. Had these been in the oral stage he would scarcely incorporate traditions which did not agree with his views; at all events they would hardly have been written down by him in the form in which they have survived. The narratives of the monarchy which are preserved only in Chronicles, on the other hand, illustrate the manner in which tradition was reshaped and rewritten under the influence of a later religious standpoint.

The old stories of Samson the Danite have been scarcely touched by the redaction (xiii. 1; xv. 20; xvi. 31*b*, where he is a "judge"); only xiii. appears to be rather later (*v.* 5 represents him as a forerunner of Samuel and Saul), and gives a rather different impression of the hero of the folk-tales. The cycle illustrates some interesting customs and is in every way valuable as a specimen of popular narrative. See SAMSON.

Grouped among these narratives are the five so-called "minor judges" (x. 1–5; xii. 8–15). By the addition of Shamgar (iii. 31) the number is made to agree with the six more important names. They are not represented as having any immediate religious importance; they really lie outside of the chronological scheme, and their history is plainly not related from such lively and detailed reminiscence as gives charm to the longer episodes of the book. The notices are drawn up in set phraseology, and some of the names, in harmony with a characteristic feature of early Hebrew history, are those of personified families of communities rather than of families.[2]

3. The third and last section of the book embraces chapters xvii.–xxi., and consists of two narratives independent of one another and of the main stock of the book, with which they are not brought into any chronological connexion. They appear to owe their position to the latest redactor (akin to the latest stratum in the Hexateuch) who has heavily worked over xix.–xxi., and put the book into its present form by the addition of i.–ii. 5, ix. and possibly of v.[3]

The first narrative, that of Micah and the Danites, is of the highest interest both as a record of the state of religion and for the picture it gives of the way in which one clan passed from the condition of an invading band into settled possession of land and city. Its interest (xvii. seq.) lies in the foundation of the Ephraimite sanctuary by Micah as also in that of Dan. There are some repetitions in the account, but there is not enough evidence to restore two complete stories. The history of the Levite and the Benjamites is of quite another character, and presupposes a degree of unity of feeling and action among the tribes of Israel which it is not easy to reconcile with the rest of the book. In its present form this episode appears to be not very ancient; it resembles Ruth in giving a good deal of curious archaeological detail (the feast at Shiloh) in a form which suggests that the usages referred to were already obsolete when the narrative was composed. It appears to consist of an old story which has been heavily revised to form an edifying piece of exposition. The older parts are preserved in xix.: the account of the Levite of Mt Ephraim whose concubine from Bethlehem in Judah was outraged, not by the non-Israelite Jebusites of Jerusalem, but by the Benjamites of Gibeah; there are traces of another source in *vv.* 6–8, 10, 13, 15. The older portions of xx. seq. include: the vengeance taken by Israel (*e.g.* xx. 3–8, 14, 19, 29, 36–41, 47), and the reconstruction of the tribe by intermarriage with the women of Shiloh (xxi. 1, 15, 17–19, 21–23). The post-exilic expansions (found chiefly in xx., xxi. 2–14, 16, 24 seq.) describe the punishment of Benjamin by the religious assembly and the massacre of Jabesh-Gilead for its refusal to join Israel, four hundred virgins of the Gileadites being saved for Benjamin. How much old tradition underlies these stories is questionable. It is very doubtful whether Hosea's allusion to the depravity of Gibeah (ix. 9; x. 9) is to be referred hither, but it is noteworthy that whilst Gibeah and Jabesh-Gilead, which appear here in a bad light, are known to be associated with Saul, the sufferer is a Levite of Bethlehem, the traditional home of David. The account of the great fight in xx. is reminiscent of Joshua's battle at Ai (Josh. vii.–viii.).

Historical Value.—The book of Judges consists of a number of narratives collected by Deuteronomic editors; to the same circles are due accounts of the invasions of Palestine and settlement in Joshua, and of the foundation of the monarchy in 1 Samuel. The connexion has been broken by the later insertion of matter (not necessarily of late date itself), and the whole was finally formed into a distinct book by a post-exilic hand. The dates of the older stories preserved in ii. 6–xvi. 6 are quite unknown. If they are trustworthy for the period to which they are relegated (approximately 14th–12th cent. B.C.) they are presumably of very great antiquity, but if they belong to the sources J and E of the Hexateuch (at least some four or five centuries later) their value is seriously weakened. On the other hand, the belief that the monarchy had been preceded by national "judges" may have led to the formation of the collection. It is evident that there was more than one period in Israelite history in which one or other of these stories of local heroes would be equally suitable. They reflect tribal rivalry and jealousy (cf. Isa. ix. 21, and the successors of Jeroboam 2), attacks by nomads and wars with Ammon and Moab; conflicts between newly settled Israelites and indigenous Canaanites have been suspected in the story of Abimelech, and it is not impossible that the post-Deuteronomic writer who inserted ch. ix. so understood the record. A striking exception to the lack of unity among the tribes is afforded by the account of the defeat of Sisera, and here the old poem represents a combined effort to throw off the yoke of a foreign oppressor, while the later prose version approximates the standpoint of Josh. xi. 1–15, with its defeat of the Canaanites. The general stand-point of the stories (esp. Judg. v.) is that of central Palestine; the exceptions are Othniel and Samson—the latter interrupting the introduction in x., and its sequel, the former now entirely due to the Deuteronomic editor. Of the narratives which precede and follow, ch. i. represents central Palestine separated by Canaanite cities from tribes to the south and north; it is the situation recognized in Judg. xix. 10–12, as well as in passages imbedded in the latest portions of the book of Joshua, though it is in contradiction to the older traditions of Joshua himself. Chapters xvii. seq. (like the preceding story of Samson) deal with Danites, but the migration can hardly be earlier than David's time; and xix.–xxi., by describing the extermination of Benjamin, form a link between the presence of the tribe in the late narratives of the exodus and its new prominence in the traditions of Saul (*q.v.*). As an historical source, therefore, the value of Judges will depend largely upon the question whether the Deuteronomic editor (about 600 B.C. at the earliest) would have access to trustworthy documents relating to a period some six or seven centuries previously. See further JEWS, §§ 6, 8; and SAMUEL, BOOKS OF.

LITERATURE.—Biblical scholars are in agreement regarding the preliminary literary questions of the book, but there is divergence of opinion on points of detail, and on the precise growth of the book (*e.g.* the twofold Deuteronomic redaction). See further W. R. Smith, *Ency. Brit.* 9th ed. (upon which the present article is based); G. F. Moore, *International Critical Comm.* (1895); *Ency. Bib.*, art. "Judges"; K. Budde, *Kurzer Handcommentar* (1897); Lagrange, *Livres des juges* (1903); G. W. Thatcher (*Century Bible*); also S. R. Driver, *Lit. of Old Testament* (1909); Moore, in the *Sacred Books of Old Testament* (1898); C. F. Kent, *The Student's Old Testament*, vol. i. (1904). (S. A. C.)

JUDGMENT, in law, a term used to describe (1) the adjudication by a court of justice upon a controversy submitted to it *inter partes* (*post litem contestatam*) and determining the rights of the parties and the relief to be awarded by the court as between them; (2) the formal document issuing from the court in which that adjudication is expressed; (3) the opinions of the judges expressed in a review of the facts and law applicable to the controversy leading up to the adjudication expressed in the formal document. When the judgment has been passed and entered and recorded it binds the parties: the controversy comes to an end (*transit in rem judicatam*), and the person in whose favour the judgment is entered is entitled to enforce it by the appropriate method of "execution." There has been much controversy among lawyers as to the meaning of the expressions "final" and "interlocutory" as applied to judgments, and as to the distinction between a "judgment," a "decree," and an "order." These disputes arise upon the wording of statutes or rules of court and with reference to the appropriate times or modes of appeal or of execution.

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[1] It may be conjectured that the introduction originally formed the prelude to the rise of Saul: the intervening narratives, though not necessarily of late origin themselves, having been subsequently inserted. See S. A. Cook, *Crit. Notes O. T. Hist.*, p. 127 seq.

[2] Tola and Puah (x. 1) are clans of Issachar (Gen. xlvi. 13), for Jair (*v.* 3), see Num. xxxii. 41, and for Elon (xii. 11), see Gen. xlvi. 14. See GENEALOGY: *Biblical.*

[3] To the same post-exilic hand may also be ascribed the introduction of the "minor judges" (so several critics), and smaller additions here and there (ch. i. 1 opening words, *vv.* 4, 8 seq. [contrast 21] 18; viii. 30–32: xi. 2, &c.).

The judgments of one country are not as a rule directly enforceable in another country. In Europe, by treaty or arrangement, foreign judgments are in certain cases and on compliance with certain formalities made executory in various states. A similar provision is made as between England, Scotland and Ireland, for the registry and execution in each country of certain classes of judgments given in the others. But as regards the rest of the king's dominions and foreign states, a "foreign" judgment is in England recognized only as constituting a cause of action which may be sued upon in England. If given by a court of competent jurisdiction it is treated as creating a legal obligation to pay the sum adjudged to be due. Summary judgment may be entered in an English action based on a foreign judgment unless the defendant can show that the foreign court had not jurisdiction over the parties or the subject matter of the action, or that there was fraud on the part of the foreign court or the successful party, or that the foreign proceedings were contrary to natural justice, *e.g.* concluded without due notice to the parties affected. English courts will not enforce foreign judgments as to foreign criminal or penal or revenue laws.

JUDGMENT DEBTOR, in English law, a person against whom a judgment ordering him to pay a sum of money has been obtained and remains unsatisfied. Such a person may be examined as to whether any and what debts are owing to him, and if the judgment debt is of the necessary amount he may be made bankrupt if he fails to comply with a bankruptcy notice served on him by the judgment creditors, or he may be committed to prison or have a receiving order made against him in a judgment summons under the Debtors Act 1869.

JUDGMENT SUMMONS, in English law, a summons issued under the Debtors Act 1869, on the application of a creditor who has obtained a judgment for the payment of a sum of money by instalments or otherwise, where the order for payment has not been complied with. The judgment summons cites the defendant to appear personally in court, and be examined on oath as to the means he has, or has had, since the date of the order or judgment made against him, to pay the same, and to show cause why he should not be committed to prison for his default. An order of commitment obtained in a judgment summons remains in force for a year only, and the extreme term of imprisonment is six weeks, dating from the time of lodging in prison. When a debtor has once been imprisoned, although for a period of less than six weeks, no second order of commitment can be made against him in respect of the same debt. But if the judgment be for payment by instalments a power of committal arises on default of payment for each instalment. If an order of commitment has never been executed, or becomes inoperative through lapse of time, a fresh commitment may be made. Imprisonment does not operate as a satisfaction or extinguishment of a debt, or deprive a person of a right of execution against the land or goods of the person imprisoned in the same manner as if there had been no imprisonment.

JUDICATURE ACTS, an important series of English statutes having for their object the simplification of the system of judicature in its higher branches. They are the Supreme Court of Judicature Act 1873 (36 & 37 Vict. c. 66) and the Supreme Court of Judicature Act 1875 (38 & 39 Vict. c. 77), with various amending acts, the twelfth of these being in 1899. By the act of 1873 the court of chancery, the court of queen's (king's) bench, the court of common pleas, the court of exchequer, the high court of admiralty, the court of probate and the court of divorce and matrimonial causes were consolidated into one Supreme[1] Court of Judicature (sec. 3), divided into two permanent divisions, called "the high court," with (speaking broadly) original jurisdiction, and "the court of appeal" (sec. 4). The objects of the act were threefold—first, to reduce the historically independent courts of common law and equity into one supreme court; secondly, to establish for all divisions of the court a uniform system of pleading and procedure; and thirdly, to provide for the enforcement of the same rule of law in those cases where chancery and common law recognized different rules. It can be seen at once how bold and revolutionary was this new enactment. By one section the august king's bench, the common pleas, in which serjeants only had formerly the right of audience, and the exchequer, which had its origin in the reign of Henry I., and all their jurisdiction, criminal, legal and equitable, were vested in the new court. It must be understood, however, that law and equity were not fused in the sense in which that phrase has generally been employed. The chancery division still remains distinct from the common law division, having a certain range of legal questions under its exclusive control, and possessing to a certain extent a peculiar machinery of its own for carrying its decrees into execution. But all actions may now be brought in the high court of justice, and, subject to such special assignments of business as that alluded to, may be tried in any division thereof.

There were originally three common law divisions of the High Court corresponding with the three former courts of common law. But after the death of Lord Chief Baron Kelly on the 17th of September 1880, and of Lord Chief Justice Cockburn on the 20th of November 1880, the common pleas and exchequer divisions were (by order in council, 10th December 1880) consolidated with the king's bench division into one division under the presidency of the lord chief justice of England, to whom, by the 25th section of the Judicature Act 1881, all the statutory jurisdiction of the chief baron and the chief justice of the common pleas was transferred. The high court, therefore, now consists of the chancery division, the common law division, under the name of the king's bench division; and the probate, divorce and admiralty division. To the king's bench division is also attached, by order of the lord chancellor (Jan. 1, 1884), the business of the London court of bankruptcy.

For a more detailed account of the composition of the various courts, see CHANCERY; KING'S BENCH; and PROBATE, DIVORCE AND ADMIRALTY COURT.

The keystone of the structure created by the Judicature Acts was a strong court of appeal. The House of Lords remained the last court of appeal, as before the acts, but its judicial functions were virtually transferred to an appeal committee, consisting of the lord chancellor and other peers who have held high judicial office, and certain lords of appeal in ordinary created by the act of 1873 (see APPEAL).

The practice and procedure of the Supreme Court are regulated by rules made by a committee of judges, to which have been added the president of the incorporated law society and a practising barrister and one other person nominated by the lord chancellor. The rules now in force are those of 1883, with some subsequent amendments. With the appendices they fill a moderate-sized volume. Complaints are made that they go into too much detail, and place a burden on the time and temper of the busy practitioner which he can ill afford to bear. It is possible that the authors of the rules attempted too much, and it might have been better to provide a simpler and more elastic code of procedure. Rules have sometimes been made to meet individual cases of hardship, and rules of procedure have been piled up from time to time, sometimes embodying a new experiment, and not always consistent with former rules.

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[1] The comte de Franqueville in his interesting work, *Le Système judiciaire de la Grande Bretagne*, criticizes the use of the word "supreme" as a designation of this court, inasmuch as its judgments are subject to appeal to the House of Lords, but in the act of 1873 the appeal to the House of Lords was abolished. He is also severe on the illogical use of the words "division" and "court" in many different senses (i. 180–181).

The most important matter dealt with by the rules is the mode of pleading. The authors of the Judicature Act had before them two systems of pleading, both of which were open to criticism. The common law pleadings (it was said) did not state the facts on which the pleader relied, but only the legal aspect of the facts or the inferences from them, while the chancery pleadings were lengthy, tedious and to a large extent irrelevant and useless. There was some exaggeration in both statements. In pursuing the fusion of law and equity which was the dominant legal idea of law reformers of that period, the framers of the first set of rules devised a system which they thought would meet the defects of both systems, and be appropriate for both the common-law and the chancery divisions. In a normal case, the plaintiff delivered his statement of claim, in which he was to set forth concisely the facts on which he relied, and the relief which he asked. The defendant then delivered his statement of defence, in which he was to say whether he admitted or denied the plaintiff's facts (every averment not traversed being taken to be admitted), and any additional facts and legal defences on which he relied. The plaintiff might then reply, and the defendant rejoin, and so on until the pleaders had exhausted themselves. This system of pleading was not a bad one if accompanied by the right of either party to demur to his opponent's pleading, *i.e.* to say, "admitting all your averments of fact to be true, you still have no cause of action," or "defence" (as the case may be). It may be, however, that the authors of the new system were too intent on uniformity when they abolished the common-law pleading, which, shorn of its abuses (as it had been by the Common Law Procedure Acts), was an admirable instrument for defining the issue between the parties though unsuited for the more complicated cases which are tried in chancery, and it might possibly have been better to try the new system in the first instance in the chancery division only. It should be added that the rules contain provisions for actions being tried without pleadings if the defendant does not require a statement of claim, and for the plaintiff in an action of debt obtaining immediate judgment unless the defendant gets leave to defend. In the chancery division there are of course no pleadings in those matters which by the rules can be disposed of by summons in chambers instead of by ordinary suit as formerly.

The judges seem to have been dissatisfied with the effect of their former rules, for in 1883 they issued a fresh set of consolidated rules, which, with subsequent amendments, are those now in force. By these rules a further attempt was made to prune the exuberance of pleading. Concise forms of statement of claim and defence were given in the appendix for adoption by the pleader. It is true that these forms do not display a high standard of excellence in draftsmanship, and it was said that many of them were undoubtedly demurrable, but that was not of much importance. Demurrers were abolished, and instead thereof it was provided that any point of law raised by the pleadings should be disposed of at or after the trial, provided that by consent or order of the court the same might be set down and disposed of before the trial (Order xxv. rules 1, 2). This, in the opinion of Lord Davey in 1902 (*Ency. Brit.*, 10th ed., xxx. 146), was a disastrous change. The right of either party to challenge his opponent *in limine*, either where the question between them was purely one of law, or where even the view of the facts taken and alleged by his opponent did not constitute a cause of action or defence, was a most valuable one, and tended to the curtailment of both the delay and the expense of litigation. Any possibility of abuse by frivolous or technical demurrers (as undoubtedly was formerly the case) had been met by powers of amendment and the infliction of costs. Many of the most important questions of law had been decided on demurrer both in common law and chancery. Lord Davey considered that demurrer was a useful and satisfactory mode of trying questions in chancery (on bill and demurrer), and it was frequently adopted in preference to a special case, which requires the statement of facts to be agreed to by both parties and was consequently more difficult and expensive. It is obvious that a rule which makes the normal time for decision of questions at law the trial or subsequently, and a preliminary decision the exception, and such exception dependent on the consent of both parties or an order of the court, is a poor substitute for a demurrer as of right, and it has proved so in practice. The editors of the *Yearly Practice* for 1901 (Muir Mackenzie, Lushington and Fox) said (p. 272): "Points of law raised by the pleadings are usually disposed of at the trial or on further consideration after the trial of the issues of fact," that is to say, after the delay, worry and expense of a trial of disputed questions of fact which after all may turn out to be unnecessary. The abolition of demurrers has also (it is believed) had a prejudicial effect on the standard of legal accuracy and knowledge required in practitioners. Formerly the pleader had the fear of a demurrer before him. Nowadays he need not stop to think whether his cause of action or defence will hold water or not, and anything which is not obviously frivolous or vexatious will do by way of pleading for the purpose of the trial and for getting the opposite party into the box.

Another change was made by the rules of 1883, which was regarded by some common law lawyers as revolutionary. Formerly every issue of fact in a common law action, including the amount of damage, had to be decided by the verdict of a jury. "The effect of the rules of 1883," said Lord Lindley, who was a member of the rule committee, "was to make trial without a jury the normal mode of trial, except where trial with a jury is ordered under rules 6 or 7a, or may be had without an order under rule 2" (*Timson* v. *Wilson*, 38 Ch. D. 72, at p. 76). The effect of the rules may be thus summarized: (1) In the chancery division no trial by jury unless ordered by the judge. (2) Generally the judge may order trial without a jury of any cause or issue, which before the Judicature Act might have been so tried without consent of parties, or which involves prolonged investigation of documents or accounts, or scientific or local investigation. (3) Either party has a right to a jury in actions of slander, libel, false imprisonment, malicious prosecution, seduction or breach of promise of marriage, upon notice without order; (4) or in any other action, by order. (5) Subject as above, actions are to be tried without a jury unless the judge, of his own motion, otherwise orders.

Further steps have been taken with a view to simplification of procedure. By Order xxx. rule 1 (as amended in 1897), a summons, called a summons for directions, has to be taken out by a plaintiff immediately after the appearance of the defendant, and upon such summons an order is to be made respecting pleadings, and a number of interlocutory proceedings. To make such an order at that early stage would seem to demand a prescience and intelligent anticipation of future events which can hardly be expected of a master, or even a judge in chambers, except in simple cases, involving a single issue of law or fact which the parties are agreed in presenting to the court. The effect of the rule is that the plaintiff cannot deliver his statement of claim, or take any step in the action without the leave of the judge. In chancery cases the order usually made is that the plaintiff deliver his statement of claim, and the rest of the summons stand over, and the practical effect is merely to add a few pounds to the costs. It may be doubted whether, as applied to the majority of actions, the rule does not proceed on wrong lines, and whether it would not be better to leave the parties, who know the exigencies of their case better even than a judge in chambers, to proceed in their own way, subject to stringent provisions for immediate payment of the costs occasioned by unnecessary, vexatious, or dilatory proceedings. The order does not apply to admiralty cases or to proceedings under the order next mentioned.

The Supreme Court of Judicature Act (Ireland) 1877 follows the same lines as the English acts. The pre-existing courts were consolidated into a supreme court of judicature, consisting of a high court of justice and a court of appeal. The judicature acts did not affect Scottish judicature, but the Appellate Jurisdiction Act included the court of session among the courts from which an appeal lies to the House of Lords.

JUDITH, THE BOOK OF, one of the apocryphal books of the Old Testament. It takes its name from the heroine Judith (Ἰουδίθ, Ἰουδήθ, *i.e.* יְהוּדִית, Jewess), to whom the last nine of its sixteen chapters relate. In the Septuagint and Vulgate it immediately precedes Esther, and along with Tobit comes after Nehemiah; in the English Apocrypha it is placed between Tobit and the apocryphal additions to Esther.

Argument.—In the twelfth year of his reign Nebuchadrezzar, who is described as king of Assyria, having his capital in Nineveh, makes war against Arphaxad, king of Media, and overcomes him in his seventeenth year. He then despatches his chief general Holofernes to take vengeance on the nations of the west who had withheld their assistance. This expedition has already succeeded in its main objects when Holofernes proceeds to attack Judaea. The children of Israel, who are described as having newly returned from captivity, are apprehensive of a desecration of their sanctuary, and resolve on resistance to the uttermost. The inhabitants of Bethulia (Betylūa) and Betomestham in particular (neither place can be identified), directed by Joachim the high priest, guard the mountain passes near Dothaim, and place themselves under God's protection. Holofernes now inquires of the chiefs who are with him about the Israelites, and is answered by Achior the leader of the Ammonites, who enters upon a long historical narrative showing the Israelites to be invincible except when they have offended God. For this Achior is punished by being handed over to the Israelites, who lead him to the governor of Bethulia. Next day the siege begins, and after forty days the famished inhabitants urge the governor Ozias to surrender, which he consents to do unless relieved in five days. Judith, a beautiful and pious widow of the tribe of Simeon, now appears on the scene with a plan of deliverance. Wearing her rich attire, and accompanied by her maid, who carries a bag of provisions, she goes over to the hostile camp, where she is at once conducted to the general, whose suspicions are disarmed by the tales she invents. After four days Holofernes, smitten with her charms, at the close of a sumptuous entertainment invites her to remain within his tent over night. No sooner is he overcome with sleep than Judith, seizing his sword, strikes off his head and gives it to her maid; both now leave the camp (as they had previously been accustomed to do, ostensibly for prayer) and return to Bethulia, where the trophy is displayed amid great rejoicings and thanksgivings. Achior now publicly professes Judaism, and at the instance of Judith the Israelites make a sudden victorious onslaught on the enemy. Judith now sings a song of praise, and all go up to Jerusalem to worship with sacrifice and rejoicing. The book concludes with a brief notice of the closing years of the heroine.

Versions.—Judith was written originally in Hebrew. This is shown not only by the numerous Hebraisms, but also by mistranslations of the Greek translation, as in ii. 2, iii. 9, and other passages (see Fritzsche and Ball *in loc.*), despite the statement of Origen (*Ep. ad Afric.* 13) that the book was not received by the Jews among their apocryphal writings. In his preface to Judith, Jerome says that he based his Latin version on the Chaldee, which the Jews reckoned among their Hagiographa. Ball (*Speaker's Apocrypha*, i. 243) holds that the Chaldee text used by Jerome was a free translation or adaptation of the Hebrew. The book exists in two forms: the shorter, which is preserved only in Hebrew (see under *Hebrew Midrashim* below), is, according to Scholz, Lipsius, Ball and Gaster, the older; the longer form is that contained in the versions.

Greek Version.—This is found in three recensions: (1) in A B, ℵ; (2) in codices 19, 108 (Lucian's text); (3) in codex 58, the source of the old Latin and Syriac.

Syriac and Latin Versions.—Two Syriac versions were made from the Greek—the first, that of the Peshito; and the second, that of Paul of Tella, the so-called Hexaplaric. The Old Latin was derived from the Greek, as we have remarked above, and Jerome's from the Old Latin, under the control of a Chaldee version.

Later Hebrew Midrashim.—These are printed in Jellinek's *Bet ha-Midrasch*, i. 130–131; ii. 12–22; and by Gaster in *Proceedings of the Society of Biblical Archæology* (1894), pp. 156–163.

Date.—The book in its fuller form was most probably written in the 2nd century B.C. The writer places his romance two centuries earlier, in the time of Ochus, as we may reasonably infer from the attack made by Holofernes and Bagoas on Judaea; for Artaxerxes Ochus made an expedition against Phoenicia and Egypt in 350 B.C., in which his chief generals were Holofernes and Bagoas.

Recent Literature.—Ball, *Speaker's Apocrypha* (1888), an excellent piece of work; Scholz, *Das Buch Judith* (1896); Löhr, *Apok. und Pseud.* (1900), ii. 147–164; Porter in Hastings's *Dict. Bible*, ii. 822–824; Gaster, *Ency. Bib.*, ii. 2642–2646. See Ball, pp. 260–261, and Schürer *in loc.*, for a full bibliography. (R. H. C.)

JUDSON, ADONIRAM (1788–1850), American missionary, was born at Malden, Massachusetts, on the 9th of August 1788, the son of a Congregational minister. He graduated at Brown University in 1807, was successively a school teacher and an actor, completed a course at the Andover Theological Seminary in September 1810, and was at once licensed to preach as a Congregational clergyman. In the summer of 1810 he with several of his fellows students at Andover had petitioned the general association of ministers to be sent to Asiatic missionary fields. This application resulted in the establishment of the American board of commissioners for foreign missions, which sent Judson to England to secure, if possible, the co-operation of the London Missionary Society. His ship fell into the hands of a French privateer and he was for some time a prisoner in France, but finally proceeded to London, where his proposal was considered without anything being decided. He then returned to America, where he found the board ready to act independently. His appointment to Burma followed, and in 1812, accompanied by his wife, Ann Hasseltine Judson (1789–1826), he went to Calcutta. On the voyage both became advocates of baptism by immersion, and being thus cut off from Congregationalism, they began independent work. In 1814 they began to receive support from the American Baptist missionary union, which had been founded with the primary object of keeping them in the field. After a few months at Madras, they settled at Rangoon. There Judson mastered Burmese, into which he translated part of the Gospels with his wife's help. In 1824 he removed to Ava, where during the war between the East India Company and Burma he was imprisoned for almost two years. After peace had been brought about (largely, it is said, through his exertions) Mrs Judson died. In 1827 Judson removed his headquarters to Maulmain, where school buildings and a church were erected, and where in 1834 he married Sarah Hall Boardman (1803–1845). In 1833 he completed his translation of the Bible; in succeeding years he compiled a Burmese grammar, a Burmese dictionary, and a Pali dictionary. In 1845 his wife's failing health decided Judson to return to America, but she died during the voyage, and was buried at St Helena. In the United States Judson married Emily Chubbuck (1817–1854), well-known as a poet and novelist under the name of "Fanny Forrester," who was one of the earliest advocates in America of the higher education of women. She returned with him in 1846 to Burma, where the rest of his life was devoted largely to the rewriting of his Burmese dictionary. He died at sea on the 12th of April 1850, while on his way to Martinique, in search of health. Judson was perhaps the greatest, as he was practically the first, of the many missionaries sent from the United States into foreign fields; his fervour, his devotion to duty, and his fortitude in the face of danger mark him as the prototype of the American missionary.

The Judson Memorial, an institutional church, was erected on Washington Square South, New York City, largely through the exertions of his son, Rev. Edward Judson (b. 1844), who became its pastor and director, and who prepared a life of Dr Judson (1883; new ed. 1898). Another biography is by Francis Wayland (2 vols., 1854). See also Robert T. Middleditch's *Life of Adoniram Judson, Burmah's Great Missionary* (New York, 1859). For the three Mrs. Judsons, see Knowles, *Life of Ann Hasseltine Judson* (1829); Emily C. Judson, *Life of Sarah Hall Boardman Judson* (1849); Asahel C. Kendrick, *Life and Letters of Emily Chubbuck Judson* (1861).

JUEL, JENS (1631–1700), Danish statesman, born on the 15th of July 1631, began his diplomatic career in the suite of Count Christian Rantzau, whom he accompanied to Vienna and Regensburg in 1652. In August 1657 Juel was accredited to the court of Poland, and though he failed to prevent King John Casimir from negotiating separately with Sweden he was made a privy councillor on his return home. But it was the reconciliation of Juel's uncle Hannibal Sehested with King Frederick III. which secured Juel's future. As Sehested's representative, he concluded the peace of Copenhagen with Charles X., and after the Danish revolution of 1660 was appointed Danish minister at Stockholm, where he remained for eight years. Subsequently the chancellor Griffenfeldt, who had become warmly attached to him, sent him in 1672, and again in 1674, as ambassador extraordinary to Sweden, ostensibly to bring about a closer union between the two northern kingdoms, but really to give time to consolidate Griffenfeldt's far-reaching system of alliances. Juel completely sympathized with Griffenfeldt's Scandinavian policy, which aimed at weakening Sweden sufficiently to re-establish something like an equilibrium between the two states. Like Griffenfeldt, Juel also feared, above all things, a Swedo-Danish war. After the unlucky Scanian War of 1675–79, Juel was one of the Danish plenipotentiaries who negotiated the peace of Lund. Even then he was for an alliance with Sweden "till we can do better." This policy he consistently followed, and was largely instrumental in bringing about the marriage of Charles XI. with Christian V.'s daughter Ulrica Leonora. But for the death of the like-minded Swedish statesman Johan Gyllenstjerna in June 1680, Juel's "Scandinavian" policy might have succeeded, to the infinite advantage of both kingdoms. He represented Denmark at the coronation of Charles XII. (December 1697), when he concluded a new treaty of alliance with Sweden. He died in 1700.

Juel, a man of very few words and a sworn enemy of phrase-making, was perhaps the shrewdest and most cynical diplomatist of his day. His motto was: "We should wish for what we can get." Throughout life he regarded the political situation of Denmark with absolute pessimism. She was, he often said, the cat's-paw of the Great Powers. While Griffenfeldt would have obviated this danger by an elastic political system, adaptable to all circumstances, Juel preferred seizing whatever he could get in favourable conjunctures. In domestic affairs Juel was an adherent of the mercantile system, and laboured vigorously for the industrial development of Denmark and Norway. For an aristocrat of the old school he was liberally inclined, but only favoured petty reforms, especially in agriculture, while he regarded emancipation of the serfs as quite impracticable. Juel made no secret of his preference for absolutism, and was one of the few patricians who accepted the title of baron. He saw some military service during the Scanian War, distinguishing himself at the siege of Venersborg, and by his swift decision at the critical moment materially contributing to his brother Niels's naval victory in the Bay of Kjoge. To his great honour he remained faithful to Griffenfeldt after his fall, enabled his daughter to marry handsomely, and did his utmost, though in vain, to obtain the ex-chancellor's release from his dungeon.

See Carl Frederik Bricka, *Dansk biografisk lex.*, art. "Juel" (1887, &c.); Adolf Ditlev Jörgensen, *P. Schumacher Griffenfeldt* (1893–1894). (R. N. B.)

JUEL, NIELS (1629–1697), Danish admiral, brother of the preceding, was born on the 8th of May 1629, at Christiania. He served his naval apprenticeship under Van Tromp and De Ruyter, taking part in all the chief engagements of the war of 1652–54 between England and Holland. During a long indisposition at Amsterdam in 1655–1656 he acquired a thorough knowledge of ship-building, and returned to Denmark in 1656 a thoroughly equipped seaman. He served with distinction during the Swedo-Danish wars of 1658–60 and took a prominent part in the defence of Copenhagen against Charles X. During fifteen years of peace, Juel, as admiral of the fleet, laboured assiduously to develop and improve the Danish navy, though he bitterly resented the setting over his head in 1663 of Cort Adelaar on his return from the Turkish wars. In 1661 Juel married Margrethe Ulfeldt. On the outbreak of the Scanian War he served at first under Adelaar, but on the death of the latter in November 1675 he was appointed to the supreme command. He then won a European reputation, and raised Danish sea-power to unprecedented eminence, by the system of naval tactics, afterwards perfected by Nelson, which consists in cutting off a part of the enemy's force and concentrating the whole attack on it. He first employed this manœuvre at the battle of Jasmund off Rügen (May 25, 1676) when he broke through the enemy's line in close column and cut off five of their ships, which, however, nightfall prevented him from pursuing. Juel's operations were considerably hampered at this period by the overbearing conduct of his Dutch auxiliary, Philip Almonde, who falsely accused the Danish admiral of cowardice. A few days after the battle of Jasmund, Cornelius Van Tromp the younger, with 17 fresh Danish and Dutch ships of the line, superseded Juel in the supreme command. Juel took a leading part in Van Tromp's great victory off Öland (June 1, 1676), which enabled the Danes to invade Scania unopposed. On the 1st of June 1677 Juel defeated the Swedish admiral Sjöblad off Möen; on the 30th of June 1677 he won his greatest victory, in the Bay of Kjöge, where, with 25 ships of the line and 1267 guns, he routed the Swedish admiral Evert Horn with 36 ships of the line and 1800 guns. For this great triumph, the just reward of superior seamanship and strategy—at an early stage of the engagement Juel's experienced eye told him that the wind in the course of the day would shift from S.W. to W. and he took extraordinary risks accordingly—he was made lieutenant admiral general and a privy councillor. This victory, besides permanently crippling the Swedish navy, gave the Danes a self-confidence which enabled them to keep their Dutch allies in their proper place. In the following year Van Tromp, whose high-handedness had become unbearable, was discharged by Christian V., who gave the supreme command to Juel. In the spring of 1678 Juel put to sea with 84 ships carrying 2400 cannon, but as the Swedes were no longer strong enough to encounter such a formidable armament on the open sea, his operations were limited to blockading the Swedish ports and transporting troops to Rügen. After the peace of Lund Juel showed himself an administrator and reformer of the first order, and under his energetic supervision the Danish navy ultimately reached imposing dimensions, especially after Juel became chief of the admiralty in 1683. Personally Juel was the noblest and most amiable of men, equally beloved and respected by his sailors, simple, straightforward and unpretentious in all his ways. During his latter years he was popularly known in Copenhagen as "the good old knight." He died on the 8th of April 1697.

See Garde, *Niels Juel* (1842), and *Den dansk. norske Sömagts Historie, 1535–1700* (1861). (R. N. B.)

JUG, a vessel for holding liquid, usually with one handle and a lip, made of earthenware, glass or metal. The origin of the word in this sense is uncertain, but it is probably identical with a shortened form of the feminine name Joan or Joanna; cf. the similar use of Jack and Jill or Gill for a drinking-vessel or a liquor measure. It has also been used as a common expression for a homely woman, a servant-girl, a sweetheart, sometimes in a sense of disparagement. In slang, "jug" or "stone-jug" is used to denote a prison; this may possibly be an adaptation of Fr. *joug*, yoke, Lat. *jugum*. The word "jug" is probably onomatopoeic when used to represent a particular note of the nightingale's song, or applied locally to various small birds, as the hedge-jug, &c.

The British Museum contains a remarkable bronze jug which was found at Kumasi during the Ashanti Expedition of 1896. It dates from the reign of Richard II., and is decorated in relief with the arms of England and the badge of the king. It has a lid, spout and handle, which ends in a quatrefoil. An inscription, on three raised bands round the body of the vessel, modernized runs:—"He that will not spare when he may shall not spend when he would. Deem the best in every doubt till the truth be tried out." The *British Museum Guide to the Medieval Room* contains an illustration of this vessel.

A particular form of jug is the "ewer," the precursor of the ordinary bedroom jug (an adaptation of O. Fr. *ewaire*, med. Lat. *aquaria*, water-pitcher, from *aqua*, water). The ewer was a jug with a wide spout, and was principally used at table for pouring water over the hands after eating, a matter of some necessity before the introduction of forks. Early ewers are sometimes mounted on three feet, and bear inscriptions such as *Venez laver*. A basin of similar material and design accompanied the ewer. In the 13th and 14th centuries a special type of metal ewer takes the form of animals, men on horseback, &c.; these are generally known as *aquamaniles*, from med. Lat. *aqua manile* or *aqua manale* (*aqua*, water, and *manare*, to trickle, pour, drip). The British Museum contains several examples.

In the 18th and early 19th centuries were made the drinking-vessels of pottery known as "Toby jugs," properly Toby Fillpots or Philpots. These take the form of a stout old man, sometimes seated, with a three-cornered hat, the corners of which act as spouts. Similar drinking-vessels were also made representing characters popular at the time, such as "Nelson jugs," &c.

JUGE, BOFFILLE DE (d. 1502), French-Italian adventurer and statesman, belonged to the family of del Giudice, which came from Amalfi, and followed the fortunes of the Angevin dynasty. When John of Anjou, duke of Calabria, was conquered in Italy (1461) and fled to Provence, Boffille followed him. He was given by Duke John and his father, King René, the charge of upholding by force of arms their claims on Catalonia. Louis XI., who had joined his troops to those of the princes of Anjou, attached Boffille to his own person, made him his chamberlain and conferred on him the vice-royalty of Roussillon and Cerdagne (1471), together with certain important lordships, among others the countship of Castres, confiscated from James of Armagnac, duke of Nemours (1476), and the temporalities of the bishopric of Castres, confiscated from John of Armagnac. He also entrusted him with diplomatic negotiations with Flanders and England. In 1480 Boffille married Marie d' Albret, sister of Alain the Great, thus confirming the feudal position which the king had given him in the south. He was appointed as one of the judges in the trial of René of Alençon, and showed such zeal in the discharge of his functions that Louis XI. rewarded him by fresh gifts. However, the bishop of Castres recovered his diocese (1483), and the heirs of the duke of Nemours took legal proceedings for the recovery of the countship of Castres. Boffille, with the object of escaping from his enemies, applied for the command of the armies of the republic of Venice. His application was refused, and he further lost the viceroyalty of Roussillon (1491). His daughter Louise married against his will a gentleman of no rank, and this led to terrible family dissensions. In order to disinherit his own family, Boffille de Juge gave up the countship of Castres to his brother-in-law, Alain d'Albret (1494). He died in 1502.

See P. M. Perret, *Boffille de Juge, comte de Castres, et la république de Venise* (1891); F. Pasquier, *Inventaire des documents concernant Boffille de Juge* (1905). (M. P.*)

JUGGERNAUT, a corruption of Sans. JAGANNĀTHA, "Lord of the World," the name under which the Hindu god Vishnu is worshipped at Puri in Orissa. The legend runs that the sacred blue-stone image of Jagannātha was worshipped in the solitude of the jungle by an outcast, a Savara mountaineer, called Basu. The king of Malwa, Indradyumna, had despatched Brahmans to all quarters of the peninsula, and at last discovered Basu. Thereafter the image was taken to Puri, and a temple, begun in 1174, was completed fourteen years later at a cost of upwards of half a million sterling. The site had been associated for centuries before and after the Christian era with Buddhism, and the famous Car festival is probably based on the Tooth festival of the Buddhists, of which the Chinese pilgrim Fa-Hien gives an account. The present temple is a pyramidal building, 192 ft. high, crowned with the mystic wheel and flag of Vishnu. Its inner enclosure, nearly 400 ft. by 300 ft., contains a number of small temples and shrines. The main temple has four main rooms—the hall of offerings, the dancing hall, the audience chamber, and the shrine itself—the two latter being each 80 ft. square. The three principal images are those of Vishnu, his brother and his sister, grotesque wooden figures roughly hewn. Elaborate services are daily celebrated all the year round, the images are dressed and redressed, and four meals a day are served to them. The attendants on the god are divided into 36 orders and 97 classes. Special servants are assigned the tasks of putting the god to bed, of dressing and bathing him. The annual rent-roll of the temple was put at £68,000 by Sir W. W. Hunter; but the pilgrims' offerings, which form the bulk of the income, are quite unknown and have been said to reach as much as £100,000 in one year. Ranjit Singh bequeathed the Koh-i-nor to Jagannath. There are four chief festivals, of which the famous Car festival is the most important.

The terrible stories of pilgrims crushed to death in the god's honour have made the phrase "Car of Juggernaut" synonymous with the merciless sacrifice of human lives, but these have been shown to be baseless calumnies. The worship of Vishnu is innocent of all bloody rites, and a drop of blood even accidentally spilt in the god's presence is held to pollute the officiating priests, the people, and the consecrated food. The Car festival takes place in June or July, and the feature of its celebration is the drawing of the god from the temple to his "country-house," a distance of less than a mile. The car is 45 ft. in height and 35 ft. square, and is supported on 16 wheels of 7 ft. in diameter. Vishnu's brother and sister have separate cars, slightly smaller. To these cars ropes are attached, and thousands of eager pilgrims vie with each other to have the honour of dragging the god. Though the distance is so short the journey lasts several days, owing to the deep sand in which the wheels sink. During the festival serious accidents have often happened. Sir W. W. Hunter in the *Gazetteer of India* writes: "In a closely packed, eager throng of a hundred thousand men and women under the blazing tropical sun, deaths must occasionally occur. There have doubtless been instances of pilgrims throwing themselves under the wheels in a frenzy of religious excitement, but such instances have always been rare, and are now unknown. The few suicides that did occur were, for the most part, cases of diseased and miserable objects who took this means to put themselves out of pain. The official returns now place this beyond doubt. Nothing could be more opposed to the spirit of Vishnu-worship than self-immolation. Accidental death within the temple renders the whole place unclean. According to Chaitanya, the apostle of Jagannath, the destruction of the least of God's creatures is a sin against the Creator."

See also Sir W. W. Hunter's *Orissa* (1872); and *District Gazetteer of Puri* (1908).

JUGGLER (Lat. *joculator*, jester), in the modern sense a performer of sleight-of-hand tricks and dexterous feats of skill in tossing balls, plates, knives, &c. The term is practically synonymous with conjurer (see CONJURING). The *joculatores* were the mimes of the middle ages (see DRAMA); the French use of the word *jongleurs* (an erroneous form of *jougleur*) included the singers known as *trouvères*; and the humbler English minstrels of the same type gradually passed into the strolling jugglers, from whose exhibitions the term came to cover loosely any acrobatic, pantomimic and sleight-of-hand performances. In ancient Rome various names were given to what we call jugglers, *e.g. ventilatores* (knife-throwers), and *pilarii* (ball-players).

JUGURTHA (Gr. 'Ιογόρθας), king of Numidia, an illegitimate son of Mastanabal, and grandson of Massinissa. After his father's death he was brought up by his uncle Micipsa together with his cousins Adherbal and Hiempsal. Jugurtha grew up strong, handsome and intelligent, a skilful rider, and an adept in warlike exercises. He inherited much of Massinissa's political ability. Micipsa, naturally afraid of him, sent him to Spain (134 B.C.) in command of a Numidian force, to serve under P. Cornelius Scipio Africanus Minor. He became a favourite with Scipio and the Roman nobles, some of whom put into his head the idea of making himself sole king of Numidia, with the help of Roman money.

In 118 B.C. Micipsa died. By his will, Jugurtha was associated with Adherbal and Hiempsal in the government of Numidia. Scipio had written to Micipsa a strong letter of recommendation in favour of Jugurtha; and to Scipio, accordingly, Micipsa entrusted the execution of his will. None the less, his testamentary arrangements utterly failed. The princes soon quarrelled, and Jugurtha claimed the entire kingdom. Hiempsal he contrived to have assassinated; Adherbal he quickly drove out of Numidia. He then sent envoys to Rome to defend his usurpation on the ground that he was the injured party. The senate decided that Numidia was to be divided, and gave the western, the richer and more populous half, to Jugurtha, while the sands and deserts of the eastern half were left to Adherbal. Jugurtha's envoys appear to have found several of the Roman nobles and senators accessible to bribery. Having secured the best of the bargain, Jugurtha at once began to provoke Adherbal to a war of self-defence. He completely defeated him near the modern Philippeville, and Adherbal sought safety in the fortress of Cirta (Constantine). Here he was besieged by Jugurtha, who, notwithstanding the interposition of a Roman embassy, forced the place to capitulate, and treacherously massacred all the inhabitants, among them his cousin Adherbal and a number of Italian merchants resident in the town. There was great wrath at Rome and throughout Italy; and the senate, a majority of which still clung to Jugurtha, were persuaded in the same year (111) to declare war. An army was despatched to Africa under the consul L. Calpurnius Bestia, several of the Numidian towns voluntarily surrendered, and Bocchus, the king of Mauretania, and Jugurtha's father-in-law, offered the Romans his alliance. Jugurtha was alarmed, but having at his command the accumulated treasures of Massinissa, he was successful in arranging with the Roman general a peace which left him in possession of the whole of Numidia. When the facts were known at Rome, the tribune Memmius insisted that Jugurtha should appear in person and be questioned as to the negotiations. Jugurtha appeared under a safe conduct, but he had partisans, such as the tribune C. Baebius, who took care that his mouth should be closed. Soon afterwards he caused his cousin Massiva, then resident at Rome and a claimant to the throne of Numidia, to be assassinated. The treaty was thereupon set aside, and Jugurtha was ordered to quit Rome. On this occasion he uttered the well-known words, "A city for sale, and doomed to perish as soon as it finds a purchaser!" (Livy, *Epit.* 64). The war was renewed, and the consul Spurius Albinus entrusted with the command. The Roman army in Africa was thoroughly demoralized. An unsuccessful attempt was made on a fortified town, Suthul, in which the royal treasures were deposited. The army was surprised by the enemy in a night attack, and the camp was taken and plundered. Every Roman was driven out of Numidia, and a disgraceful peace was concluded (109).

By this time the feeling at Rome and in Italy against the corruption and incapacity of the nobles had become so strong that a number of senators were prosecuted and Bestia and Albinus sentenced to exile. The war was now entrusted to Quintus Metellus, an able soldier and stern disciplinarian, and from the year 109 to its close in 106 the contest was carried on with credit to the Roman arms. Jugurtha was defeated on the river Muthul, after an obstinate and skilful resistance. Once again, however, he succeeded in surprising the Roman camp and forcing Metellus into winter quarters. There were fresh negotiations, but Metellus insisted on the surrender of the king's person, and this Jugurtha refused. Numidia on the whole seemed disposed to assert its independence, and Rome had before her the prospect of a troublesome guerrilla war. Negotiations, reflecting little credit on the Romans, were set on foot with Bocchus (*q.v.*) who for a time played fast and loose with both parties. In 106, Marius was called on by the vote of the Roman people to supersede Metellus, but it was through the perfidy of Bocchus and the diplomacy of L. Cornelius Sulla, Marius's quaestor, that the war was ended. Jugurtha fell into an ambush, and was conveyed a prisoner to Rome. Two years afterwards, in 104, he figured with his two sons in Marius's triumph, and in the subterranean prison beneath the Capitol—" the bath of ice," as he called it—he was either strangled or starved to death.

Though doubtless for a time regarded by his countrymen as their deliverer from the yoke of Rome, Jugurtha mainly owes his historical importance to the full and minute account of him which we have from the hand of Sallust, himself afterwards governor of Numidia.

See A. H. J. Greenidge, *Hist. of Rome* (1904); T. Mommsen, *Hist. of Rome*, book iv. ch. v.; the chief ancient authorities (besides Sallust) are Livy, *Epit.*, lxii.–lxvii.; Plutarch, *Marius and Sulla*; Velleius Paterculus, ii.; Diod. Sic., *Excerpta*, xxxiv.; Florus, iii. 1. See also MARIUS, SULLA, NUMIDIA.

JUJU, a West African word held by some authorities to be a corruption of Mandingo *gru-gru*, a charm. It is more generally believed to have been adapted by the Mandingos directly from Fr. *joujou*, a toy or plaything. The word, as used by Europeans on the Guinea coast, was originally applied to the objects which it was supposed the negroes worshipped, and was transferred from the objects themselves to the spirits or gods who dwelt in them, and finally to the whole religious beliefs of the West Africans. It is currently used in each of these senses, and more loosely to indicate all the manners and customs of the negroes of the Guinea coast, particularly the power of interdiction exercised in the name of spirits (see FETISHISM and TABOO).

JUJUBE. Under this name the fruits of at least two species of *Zizyphus* are usually described, namely, *Z. vulgaris* and *Z. Jujuba*.[1] The genus is a member of the natural order Anacardiaceae. The species are small trees or shrubs, armed with sharp, straight, or hooked spines, having alternate leaves, and fruits which are in most of the species edible, and have an agreeable acid taste; this is especially the case with those of the two species mentioned above.

Z. vulgaris is a tree about 20 feet high, extensively cultivated in many parts of Southern Europe, also in Western Asia, China and Japan. In India it extends from the Punjab to the north-western frontier, ascending in the Punjab Himalaya to a height of 6500 feet, and is found both in the wild and cultivated state. The plant is grown almost exclusively for the sake of its fruit, which both in size and shape resembles a moderate-sized plum; at first the fruits are green, but as they ripen they become of a reddish-brown colour on the outside and yellow within. They ripen in September, when they are gathered and preserved by storing in a dry place; after a time the pulp becomes much softer and sweeter than when fresh. Jujube fruits when carefully dried will keep for a long time, and retain their refreshing acid flavour, on account of which they are much valued in the countries of the Mediterranean region as a winter dessert fruit; and, besides, they are nutritive and demulcent. At one time a decoction was prepared from them and recommended in pectoral complaints. A kind of thick paste, known as jujube paste, was also made of a composition of gum arabic and sugar dissolved in a decoction of jujube fruit evaporated to the proper consistency.

Z. Jujuba is a tree averaging from 30 to 50 ft. high, found both wild and cultivated in China, the Malay Archipelago, Ceylon, India, tropical Africa and Australia. Many varieties are cultivated by the Chinese, who distinguish them by the shape and size of their fruits, which are not only much valued as dessert fruit in China, but are also occasionally exported to England.

As seen in commerce jujube fruits are about the size of a small filbert, having a reddish-brown, shining, somewhat wrinkled exterior, and a yellow or gingerbread coloured pulp enclosing a hard elongated stone.

The fruits of *Zizyphus* do not enter into the composition of the lozenges now known as jujubes which are usually made of gum-arabic, gelatin, &c., and variously flavoured.

JU-JUTSU or **JIU-JITSU** (a Chino-Japanese term, meaning muscle-science), the Japanese method of offence and defence without weapons in personal encounter, upon which is founded the system of physical culture universal in Japan. Some historians assert that it was founded by a Japanese physician who learned its rudiments while studying in China, but most writers maintain that ju-jutsu was in common use in Japan centuries earlier, and that it was known in the 7th century B.C. Originally it was an art practised solely by the nobility, and particularly by the samurai who, possessing the right, denied to commoners, of carrying swords, were thus enabled to show their superiority over common people even when without weapons. It was a secret art, jealously guarded from those not privileged to use it, until the feudal system was abandoned in Japan, and now ju-jutsu is taught in the schools, as well as in public and private gymnasia. In the army, navy and police it receives particular attention. About the beginning of the 20th century, masters of the art began to attract attention in Europe and America, and schools were established in Great Britain and the United States, as well as on the continent of Europe.

Ju-jutsu may be briefly defined as " an application of anatomical knowledge to the purpose of offence and defence. It differs from wrestling in that it does not depend upon muscular strength. It differs from the other forms of attack in that it uses no weapon. Its feat consists in clutching or striking such part of an enemy's body as will make him numb and incapable of resistance. Its object is not to kill, but to incapacitate one for action for the time being " (Inazo Nitobe, *Bushido: the Soul of Japan*).

Many writers translate the term ju-jutsu " to conquer by yielding " (Jap. *ju*, pliant), and this phrase well expresses a salient characteristic of the art, since the weight and strength of the opponent are employed to his own undoing. When, for example, a big man rushes at a smaller opponent, the smaller man, instead of seeking to oppose strength to strength, falls backwards or sidewise, pulling his heavy adversary after him and taking advantage of his loss of balance to gain some lock or hold known to the science. This element of yielding in order to conquer is thus referred to in Lafcadio Hearn's *Out of the East*: " In jiu-jitsu there is a sort of counter for every twist, wrench, pull, push or bend: only the jiu-jitsu expert does not oppose such movements. No; he yields to them. But he does much more than that. He aids them with a wicked sleight that causes the assailant to put out his own shoulder, to fracture his own arm, or, in a desperate case, even to break his own neck or back."

The knowledge of anatomy mentioned by Nitobe is acquired in order that the combatant may know the weak parts of his adversary's body and attack them. Several of these sensitive places, for instance the partially exposed nerve in the elbow popularly known as the " funny-bone " and the complex of nerves over the stomach called the solar plexus, are familiar to the European, but the ju-jutsu expert is acquainted with many others which, when compressed, struck, or pinched, cause temporary paralysis of a more or less complete nature. Such places are the arm-pit, the ankle and wrist bones, the tendon running downward from the ear, the "Adam's apple," and the nerves of the upper arm. In serious fighting almost any hold or attack is resorted to, and a broken or badly sprained limb is the least that can befall the victim; but in the practice of the art as a means of physical culture the knowledge of the different grips is assumed on both sides, as well as the danger of resisting too long. For this reason the combatant, when he feels himself on the point of being disabled, is instructed to signal his acknowledgment of defeat by striking the floor with hand or foot. The bout then ends and both combatants rise and begin afresh. It will be seen that a victory in ju-jutsu does not mean that the opponent shall be placed in some particular position, as in wrestling, but in any position in which his judgment or knowledge tells him that, unless he yields, he will suffer a disabling injury. This difference existed between the wrestling and the *pancratium* of the Olympic games. In the *pancratium* the fight went on until one combatant acknowledged defeat, but, although many a man allowed himself to be beaten into insensibility rather than suffer this humiliation, it was nevertheless held to be a disgrace to kill an opponent.

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[1] The med. Lat. *jujuba* is a much altered form of the Gr. ζίζυφον.

A modern bout at ju-jutsu usually begins by the combatants taking hold with both hands upon the collars of each other's jackets or kimonos, after which, upon the word to start being given, the manœuvring for an advantageous grip begins by pushes, pulls, jerks, falls, grips or other movements. Once the wrist, ankle, neck, arm or leg of an assailant is firmly grasped so that added force will dislocate it, there is nothing for the seized man to do, in case he is still on his feet, but go to the floor, often being thrown clean over his opponent's head. A fall of this kind does not necessarily mean defeat, for the struggle proceeds upon the floor, where indeed most of the combat takes place, and the ju-jutsu expert receives a long training in the art of falling without injury. Blows are delivered, not with the fist, but with the open hand, the exterior edge of which is hardened by exercises.

The physical training necessary to produce expertness is the most valuable feature of ju-jutsu. The system includes a light and nourishing diet, plenty of sleep, deep-breathing exercises, an abundance of fresh air and general moderation in habits, in addition to the actual gymnastic exercises for the purpose of muscle-building and the cultivation of agility of eye and mind as well as of body. It is practised by both sexes in Japan.

Many attempts have been made in England and America to match ju-jutsu experts against wrestlers, mostly of the "catch-as-catch can" school, but these trials have, almost without exception, proved unsatisfactory, since many of the most efficacious tricks of ju-jutsu, such as the strangle holds and twists of wrists and ankles, are accounted foul in wrestling. Nevertheless the Japanese athletes, even when obliged to forgo these, have usually proved more than a match for European wrestlers of their own weight.

See H. Irving Hancock's *Japanese Physical Training* (1904); *Physical Training for Women by Japanese Methods* (1904); *The Complete Kano Jiu-jitsu (Jiudo)* (1905); M. Ohashi, *Japanese Physical Culture* (1904); K. Saito, *Jiu-jitsu Tricks* (1905).

JUJUY, a northern province of the Argentine Republic, bounded N. and N.W. by Bolivia, N.E., E., S. and S.W. by Salta, and W. by the Los Andes territory. Pop. (1895), 49,713; (1905, estimate), 55,450, including many mestizos. Area, 18,977 sq. m., the greater part being mountainous. The province is traversed from N. to S. by three distinct ranges belonging to the great central Andean plateau: the Sierra de Santa Catalina, the Sierra de Humahuaca, and the Sierras de Zenta and Santa Victoria. In the S.E. angle of the province are the low, isolated ranges of Alumbre and Santa Barbara. Between the more eastern of these ranges are valleys of surpassing fertility, watered by the Rio Grande de Jujuy, a large tributary of the Bermejo. The western part, however, is a high plateau (parts of which are 11,500 ft. above sea-level), whose general characteristics are those of the *puna* regions farther west. The surface of this high plateau is broken, semi-arid and desolate, having a very scanty population and no important industry beyond the breeding of a few goats and the fur-bearing chinchilla. There are two large saline lagoons: Toro, or Pozuelos, in the N., and Casabindo, or Guayatayoc, in the S. The climate is cool, dry and healthy, with violent tempests in the summer season. (For a vivid description of this interesting region, see F. O'Driscoll, "A Journey to the North of the Argentine Republic," *Geogr. Jour.* xxiv. 1904.) The agricultural productions of Jujuy include sugar cane, wheat, Indian corn, alfalfa and grapes. The breeding of cattle and mules for the Bolivian and Chilean markets is an old industry. Coffee has been grown in the department of Ledesma, but only to a limited extent. There are also valuable forest areas and undeveloped mineral deposits. Large borax deposits are worked in the northern part of the province, the output in 1901 having been 8000 tons. The province is traversed from S. to N. by the Central Northern railway, a national government line, which has been extended to the Bolivian frontier. It passes through the capital and up the picturesque Humahuaca valley, and promises, under capable management, to be an important international line, affording an outlet for southern Bolivia. The climate of the lower agricultural districts is tropical, and irrigation is employed in some places in the long dry season.

The capital, Jujuy (estimated pop. 1905, 5000), is situated on the Rio Grande at the lower end of the Humahuaca valley, 942 m. from Buenos Aires by rail. It was founded in 1593 and is 4035 ft. above sea-level. It has a mild, temperate climate and picturesque natural surroundings, and is situated on the old route between Bolivia and Tucuman, but its growth has been slow.

JUKES, JOSEPH BEETE (1811–1869), English geologist, was born at Summer Hill, near Birmingham, on the 10th of October 1811. He took his degree at Cambridge in 1836. He began the study of geology under Sedgwick, and in 1839 was appointed geological surveyor of Newfoundland. He returned to England at the end of 1840, and in 1842 sailed as naturalist on board H.M.S. "Fly," despatched to survey Torres Strait, New Guinea, and the east coast of Australia. Jukes landed in England again in June 1846, and in August received an appointment on the geological survey of Great Britain. The district to which he was first sent was North Wales. In 1847 he commenced the survey of the South Staffordshire coal-field and continued this work during successive years after the close of field-work in Wales. The results were published in his *Geology of the South Staffordshire Coal-field* (1853; 2nd ed. 1859), a work remarkable for its accuracy and philosophic treatment. In 1850 he accepted the post of local director of the geological survey of Ireland. The exhausting nature of this work slowly but surely wore out even his robust constitution and on the 29th of July 1869 he died. For many years he lectured as professor of geology, first at the Royal Dublin Society's Museum of Irish Industry, and afterwards at the Royal College of Science in Dublin. He was an admirable teacher, and his *Student's Manual* was the favoured textbook of British students for many years. During his residence in Ireland he wrote an article "On the Mode of Formation of some of the River-valleys in the South of Ireland" (*Quarterly Journ. Geol. Soc.* 1862), and in this now classic essay he first clearly sketched the origin and development of rivers. In later years he devoted much attention to the relations between the Devonian system and the Carboniferous rocks and Old Red Sandstone.

Jukes wrote many papers that were printed in the London and Dublin geological journals and other periodicals. He edited, and in great measure wrote, forty-two memoirs explanatory of the maps of the south, east and west of Ireland, and prepared a geological map of Ireland on a scale of 8 m. to an inch. He was also the author of *Excursions in and about Newfoundland* (2 vols., 1842); *Narrative of the Surveying Voyage of H. M. S. "Fly"* (2 vols., 1847); *A Sketch of the Physical Structure of Australia* (1850); *Popular Physical Geology* (1853); *Student's Manual of Geology* (1857; 2nd ed. 1862; a later edition was revised by A. Geikie, 1872); the article "Geology" in the *Ency. Brit.* 8th ed. (1858) and *School Manual of Geology* (1863). See *Letters, &c., of J. Beete Jukes, edited, with Connecting Memorial Notes, by his Sister* (C. A. Browne) (1871), to which is added a chronological list of Jukes's writings.

JULIAN (Flavius Claudius Julianus) (331–363), commonly called Julian the Apostate, Roman emperor, was born in

Constantinople in 331,[1] the son of Julius Constantius and his wife Basilina, and nephew of Constantine the Great. He was thus a member of the dynasty under whose auspices Christianity became the established religion of Rome. The name Flavius he inherited from his paternal grandfather Constantius Chlorus; Julianus came from his maternal grandfather; Claudius had been assumed by Constantine's family in order to assert a connexion with Claudius Gothicus.

Julian lost his mother not many months after he was born. He was only six when his imperial uncle died; and one of his earliest memories must have been the fearful massacre of his father and kinsfolk, in the interest and more or less at the instigation of the sons of Constantine. Only Julian and his elder half-brother Gallus were spared, Gallus being too ill and Julian too young to excite the fear or justify the cruelty of the murderers. Gallus was banished, but Julian was allowed to remain in Constantinople, where he was carefully educated under the supervision of the family eunuch Mardonius, and of Eusebius, bishop of Nicomedia. About 344 Gallus was recalled, and the two brothers were removed to Macellum, a remote and lonely castle in Cappadocia. Julian was trained to the profession of the Christian religion; but he became early attracted to the old faith, or rather to the idealized amalgam of paganism and philosophy which was current among his teachers, the rhetoricians. Cut off from all sympathy with the reigning belief by the terrible fate of his family, and with no prospect of a public career, he turned with all the eagerness of an enthusiastic temperament to the literary and philosophic studies of the time. The old Hellenic world had an irresistible attraction for him. Love for its culture was in Julian's mind intimately associated with loyalty to its religion.

In the meantime the course of events had left as sole autocrat of the Roman Empire his cousin Constantius, who, feeling himself unequal to the enormous task, called Julian's brother Gallus to a share of power, and in March 351 appointed him Caesar. At the same time Julian was permitted to return to Constantinople, where he studied grammar under Nicocles and rhetoric under the Christian sophist Heçebolius. After a short stay in the capital Julian was ordered to remove to Nicomedia, where he made the acquaintance of some of the most eminent rhetoricians of the time, and became confirmed in his secret devotion to the pagan faith. He promised not to attend the lectures of Libanius, but bought and read them. But his definite conversion to paganism was attributed to the neoplatonist Maximus of Ephesus, who may have visited him at Nicomedia. The downfall of Gallus (354), who had been appointed governor of the East, again exposed Julian to the greatest danger. By his rash and headstrong conduct Gallus had incurred the enmity of Constantius and the eunuchs, his confidential ministers, and was put to death. Julian fell under a like suspicion, and narrowly escaped the same fate. For some months he was confined at Milan (*Mediolanum*) till at the intercession of the empress Eusebia, who always felt kindly towards him, permission was given him to retire to a small property in Bithynia. While he was on his way, Constantius recalled him, but allowed—or rather ordered—him to take up his residence at Athens. The few months he spent there (July–October 355) were probably the happiest of his life.

The emperor Constantius and Julian were now the sole surviving male members of the family of Constantine; and, as the emperor again felt himself oppressed by the cares of government, there was no alternative but to call Julian to his assistance. At the instance of the empress he was summoned to Milan, where Constantius bestowed upon him the hand of his sister Helena, together with the title of Caesar and the government of Gaul.

A task of extreme difficulty awaited him beyond the Alps. During recent troubles the Alamanni and other German tribes had crossed the Rhine; they had burned many flourishing cities, and extended their ravages far into the interior of Gaul. The internal government of the province had also fallen into great confusion. In spite of his inexperience, Julian quickly brought affairs into order. He completely overthrew the Alamanni in the great battle of Strassburg (August 357). The Frankish tribes which had settled on the western bank of the lower Rhine were reduced to submission. In Gaul he rebuilt the cities which had been laid waste, re-established the administration on a just and secure footing, and as far as possible lightened the taxes, which weighed so heavily on the poor provincials. Paris was the usual residence of Julian during his government of Gaul, and his name has become inseparably associated with the early history of the city.

Julian's reputation was now established. He was general of a victorious army enthusiastically attached to him and governor of a province which he had saved from ruin; but he had also become an object of fear and jealousy at the imperial court. Constantius accordingly resolved to weaken his power. A threatened invasion of the Persians was made an excuse for withdrawing some of the best legions from the Gallic army. Julian recognized the covert purpose of this, yet proceeded to fulfil the commands of the emperor. A sudden movement of the legions themselves decided otherwise. At Paris, on the night of the parting banquet, they forced their way into Julian's tent, and, proclaiming him emperor, offered him the alternative either of accepting the lofty title or of an instant death. Julian accepted the empire, and sent an embassy with a deferential message to Constantius. The message being contemptuously disregarded, both sides prepared for a decisive struggle. After a march of unexampled rapidity through the Black Forest and down the Danube, Julian reached Sirmium, and was on the way to Constantinople, when he received news of the death of Constantius, who had set out from Syria to meet him, at Mopsucrene in Cilicia (Nov. 3, 361). Without further trouble Julian found himself everywhere acknowledged the sole ruler of the Roman Empire; it is even asserted that Constantius himself on his death-bed had designated him his successor. Julian entered Constantinople on the 11th of December 361.

Julian had already made a public avowal of paganism, of which he had been a secret adherent from the age of twenty. It was no ordinary profession, but the expression of a strong and even enthusiastic conviction; the restoration of the pagan worship was to be the great aim and controlling principle of his government. His reign was too short to show what precise form the pagan revival might ultimately have taken, how far his feelings might have become embittered by his conflict with the Christian faith, whether persecution, violence and civil war might not have taken the place of the moral suasion which was the method he originally affected. He issued an edict of universal toleration; but in many respects he used his imperial influence unfairly to advance the work of restoration. In order to deprive the Christians of the advantages of culture, and discredit them as an ignorant sect, he forbade them to teach rhetoric. The symbols of paganism and of the imperial dignity were so artfully interwoven on the standards of the legions that they could not pay the usual homage to the emperor without seeming to offer worship to the gods; and, when the soldiers came forward to receive the customary donative, they were required to throw a handful of incense on the altar. Without directly excluding Christians from the high offices of state, he held that the worshippers of the gods ought to have the preference. In short, though there was no direct persecution, he exerted much more than a moral pressure to restore the power and prestige of the old faith.

Having spent the winter of 361–362 at Constantinople, Julian proceeded to Antioch to prepare for his great expedition against Persia. His stay there was a curious episode in his life. It is doubtful whether his pagan convictions or his ascetic life, after the fashion of an antique philosopher, gave most offence to the so-called Christians of the dissolute city. They soon grew heartily tired of each other, and Julian took up his winter quarters at Tarsus, from which in early spring he marched against

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[1] For the date of Julian's birth see Gibbon's *Decline and Fall* (ed. Bury), ii. 247, note 11. The choice seems to lie between May 331 and May 332. If the former be adopted, Julian must have died in the thirty-third, not the thirty-second, year of his age (as stated in Ammianus Marcellinus, xxv. 3, 23).

Persia. At the head of a powerful and well-appointed army he advanced through Mesopotamia and Assyria as far as Ctesiphon, near which he crossed the Tigris, in face of a Persian army which he defeated. Misled by the treacherous advice of a Persian nobleman, he desisted from the siege, and set out to seek the main army of the enemy under Shapur II. (*q.v.*). After a long, useless march he was forced to retreat, and found himself enveloped by the whole Persian army, in a waterless and desolate country, at the hottest season of the year. The Romans repulsed the enemy in many an obstinate battle, but on the 26th of June 363 Julian, who was ever in the front, was mortally wounded. The same night he died in his tent. In the most authentic historian of his reign, Ammianus Marcellinus, we find a noble speech, which he is said to have addressed to his afflicted officers. Soon after his death the rumour spread that the fatal wound had been inflicted by a Christian in the Roman army. The well-known statement, first found in Theodoret (*fl.* 5th century), that Julian threw his blood towards heaven, exclaiming, "Thou hast conquered, O Galilean!" is probably a development of the account of his death in the poems of Ephraem Syrus.

From Julian's unique position as the last champion of a dying polytheism, his character has always excited interest. Authors such as Gregory of Nazianzus have heaped the fiercest anathemas upon him; but a just and sympathetic criticism finds many noble qualities in his character. In childhood and youth he had learned to regard Christianity as a persecuting force. The only sympathetic friends he met were among the pagan rhetoricians and philosophers; and he found a suitable outlet for his restless and inquiring mind only in the studies of ancient Greece. In this way he was attracted to the old paganism; but it was a paganism idealized by the philosophy of the time.

In other respects Julian was no unworthy successor of the Antonines. Though brought up in a studious and pedantic solitude, he was no sooner called to the government of Gaul than he displayed all the energy, the hardihood and the practical sagacity of an old Roman. In temperance, self-control and zeal for the public good, as he understood it, he was unsurpassed. To these Roman qualities he added the culture, literary instincts and speculative curiosity of a Greek. One of the most remarkable features of his public life was the perfect ease and mastery with which he associated the cares of war and statesmanship with the assiduous cultivation of literature and philosophy. Yet even his devotion to culture was not free from pedantry and dilettantism. His contemporaries observed in him a want of naturalness. He had not the moral health or the composed and reticent manhood of a Roman, or the spontaneity of a Greek. He was never at rest; in the rapid torrent of his conversation he was apt to run himself out of breath; his manner was jerky and spasmodic. He showed quite a deferential regard for the sophists and rhetoricians of the time, and advanced them to high offices of state; there was real cause for fear that he would introduce the government of pedants in the Roman empire. Last of all, his love for the old philosophy was sadly disfigured by his devotion to the old superstitions. He was greatly given to divination; he was noted for the number of his sacrificial victims. Wits applied to him the joke that had been passed on Marcus Aurelius: "The white cattle to Marcus Caesar, greeting. If you conquer, there is an end of us."

BIBLIOGRAPHY.—The works of Julian, of which there are complete editions by E. Spanheim (Leipzig, 1696) and F. C. Hertlein (Teubner series, 1875–1876), consist of the following: (1) *Letters*, of which more than eighty have been preserved under his name, although the genuineness of several has been disputed. For his views on religious toleration and his attitude towards Christians and Jews the most important are 25–27, 51, 52, and the fragment in Hertlein, i. 371. The letter of Gallus to Julian, warning him against reverting to heathenism, is probably a Christian forgery. Six new letters were discovered in 1884 by A. Papadopulos Kerameus in a monastery on the island of Chalcis near Constantinople (see *Rheinisches Museum*, xlii., 1887). Separate edition of the letters by L. H. Heyler (1828); see also J. Bidez and F. Cumont, "Recherches sur la tradition MS. des lettres de l'empereur Julien" in *Mémoires couronnés . . . publiés par l'Acad. royale de Belgique*, lvii. (1898) and F. Cumont, *Sur l'authenticité de quelques lettres de Julien* (1889). (2) *Orations*, eight in number—two panegyrics on Constantius, one on the empress Eusebia, two theosophical declamations on King Helios and the Mother of the Gods, two essays on true and false cynicism, and a consolatory address to himself on the departure of his friend Salustius to the East. (3) *Caesares* or *Symposium*, a satirical composition after the manner of Seneca's *Apocolocyntosis*, in which the deified Caesars appear in succession at a banquet given in Olympus, to be censured for their vices and crimes by old Silenus. (4) *Misopogon* (the beard-hater), written at Antioch, a satire on the licentiousness of its inhabitants; while at the same time his own person and manner of life are treated in a whimsical spirit. It also contains a charming description of Lutetia (Paris). It owes its name to the ridicule heaped upon his beard by the Antiocheans, who were in the habit of shaving. (5) Five epigrams, two of which (*Anth. Pal.*, ix. 365, 368) are of some interest. (6) Κατὰ Χριστιανῶν (*Adversus Christianos*) in three books, an attack on Christianity written during the Persian campaign, is lost. Theodosius II. ordered all copies of it to be destroyed, and our knowledge of its contents is derived almost entirely from the *Contra Julianum* of Cyril, bishop of Alexandria, written sixty years later (see *Juliani librorum contra Christianos quae supersunt*, ed. C. J. Neumann 1880). *English Translations*: Select works by J. Duncombe (1784) containing all except the first seven orations (viii. and the fable from vii. are included): the theosophical addresses to King Helios and the Mother of the Gods by Thomas Taylor (1793) and C. W. King in Bohn's *Classical Library* (1888); the public letters, by E. J. Chinnock (1901).

AUTHORITIES.—1. *Ancient*: (*a*) Pagan writers. Of these the most trustworthy and impartial is the historian Ammianus Marcellinus (xv. 8–xxv.), a contemporary and in part an eye-witness of the events he describes (other historians are Zosimus and Eutropius); the sophist Libanius, who in speaking of his imperial friend shows himself creditably free from exaggeration and servility; Eunapius (in his lives of Maximus, Oribasius, the physician and friend of Julian, and Prohaeresius) and Claudius Mamertinus, the panegyrist, are less trustworthy. (*b*) Christian writers. Gregory of Nazianzus, the author of two violent invectives against Julian; Rufinus; Socrates; Sozomen; Theodoret; Philostorgius; the poems of Ephraem Syrus written in 363; Zonaras; Cedrenus; and later Byzantine chronographers. The impression which Julian produced on the Christians of the East is reflected in two Syriac romances published by J. G. E. Hoffmann, *Julianos der Abtrünnige* (1880; see also Th. Nöldeke in *Zeitschrift der deutschen morgenländischen Gesellschaft* [1874], xxviii. 263).

2. *Modern*. For works before 1878 see R. Engelmann, *Scriptores Graeci* (8th ed., by E. Preuss, 1880). Of later works the most important are G. H. Rendall, *The Emperor Julian, Paganism and Christianity* (1879); Alice Gardner, *Julian, Philosopher and Emperor* (1895); G. Negri, *Julian the Apostate* (Eng. trans., 1905); E. Müller, *Kaiser Flavius Claudius Julianus* (1901); P. Allard, *Julien l'apostat* (1900–1903); G. Mau, *Die Religionsphilosophie Kaiser Julians in seinen Reden auf König Helios und die Göttermutter* (1907); J. E. Sandys, *Hist. of Classical Scholarship* (1906), p. 356; W. Christ, *Geschichte der griechischen Litteratur* (1898), § 603; J. Geffcken, "Kaiser Julianus und die Streitschriften seiner Gegner," in *Neue Jahrb. f. das klassische Altertum* (1908), pp. 161–195. The sketch by Gibbon (*Decline and Fall*, chs. xix., xxii.–xxiv.) and the articles by J. Wordsworth in Smith's *Dictionary of Christian Biography* and A. Harnack in Herzog-Hauck's *Realencyklopädie für protestantische Theologie* ix. (1901) are valuable, the last especially for the bibliography.

(T. K.; J. H. F.)

JÜLICH (Fr. *Juliers*), a town of Germany, in the Prussian Rhine province, on the right bank of the Roer, 16 m. N.E. of Aix-la-Chapelle. Pop. (1900), 5459. It contains an Evangelical and two Roman Catholic churches, a gymnasium, a school for non-commissioned officers, which occupies the former ducal palace, and a museum of local antiquities. Its manufactures include sugar, leather and paper. Jülich (formerly also Gülch, Guliche) the capital of the former duchy of that name, is the Juliacum of the *Antonini Itinerarium*; some have attributed its origin to Julius Caesar. It became a fortress in the 17th century, and was captured by the archduke Leopold in 1609, by the Dutch under Maurice of Orange in 1610, and by the Spaniards in 1622. In 1794 it was taken by the French, who held it until the peace of Paris in 1814. Till 1860, when its works were demolished, Jülich ranked as a fortress of the second class.

JÜLICH, or JULIERS, DUCHY OF. In the 9th century a certain Matfried was count of Jülich (pagus Juliacensis), and towards the end of the 11th century one Gerhard held this dignity. This Gerhard founded a family of hereditary counts, who held Jülich as immediate vassals of the emperor, and in 1356 the county was raised to the rank of a duchy. The older and reigning branch of the family died in 1423, when Jülich passed to Adolph, duke of Berg (d. 1437), who belonged to a younger branch, and who had obtained Berg by virtue of the marriage of one of his ancestors. Nearly a century later Mary (d. 1543) the heiress of these two duchies, married John, the heir of the duchy of Cleves, and in 1521 the three duchies, Jülich, Berg and Cleves, together with the counties of Ravensberg and La Marck, were united under John's sway. John died in 1539 and was succeeded by his son William who reigned until 1592.

At the beginning of the 17th century the duchies became very prominent in European politics. The reigning duke, John William, was childless and insane, and several princes were only waiting for his demise in order to seize his lands. The most prominent of these princes were two Protestant princes, Philip Louis, count palatine of Neuburg, who was married to the duke's sister Anna, and John Sigismund, elector of Brandenburg, whose wife was the daughter of another sister. Two other sisters were married to princes of minor importance. Moreover, by virtue of an imperial promise made in 1485 and renewed in 1495, the elector of Saxony claimed the duchies of Jülich and Berg, while the proximity of the coveted lands to the Netherlands made their fate a matter of great moment to the Dutch. When it is remembered that at this time there was a great deal of tension between the Roman Catholics and the Protestants, who were fairly evenly matched in the duchies, and that the rivalry between France and the Empire was very keen, it will be seen that the situation lacked no element of discord. In March 1609 Duke John William died. Having assured themselves of the support of Henry IV. of France and of the Evangelical Union, Brandenburg and Neuburg at once occupied the duchies. To counter this stroke and to support the Saxon claim, the emperor Rudolph II. ordered some imperialist and Spanish troops to seize the disputed lands, and it was probably only the murder of Henry IV. in May 1610 and the death of the head of the Evangelical Union, the elector palatine, Frederick IV., in the following September, which prevented, or rather delayed, a great European war. About this time the emperor adjudged the duchies to Saxony, while the Dutch captured the fortress of Jülich; but for all practical purposes victory remained with the "possessing princes," as Brandenburg and Neuburg were called, who continued to occupy and to administer the lands. These two princes had made a compact at Dortmund in 1609 to act together in defence of their rights, but proposals for a marriage alliance between the two houses broke down and differences soon arose between them. The next important step was the timely conversion of the count palatine's heir, Wolfgang William of Neuburg, to Roman Catholicism, and his marriage with a daughter of the powerful Roman Catholic prince, Duke Maximilian of Bavaria. The rupture between the possessing princes was now complete. Each invited foreign aid. Dutch troops marched to assist the elector of Brandenburg and Spanish ones came to aid the count palatine, but through the intervention of England and France peace was made and the treaty of Xanten was signed in November 1614. By this arrangement Brandenburg obtained Jülich and Berg, the rest of the lands falling to the count palatine. In 1666 the great elector, Frederick William of Brandenburg, made with William, count palatine of Neuburg, a treaty of mutual succession to the duchies, providing that in case the male line of either house became extinct the other should inherit its lands.

The succession to the duchy of Jülich was again a matter of interest in the earlier part of the 18th century. The family of the counts palatine of Neuburg was threatened with extinction and the emperor Charles VI. promised the succession to Jülich to the Prussian king, Frederick William I., in return for a guarantee of the pragmatic sanction. A little later, however, he promised the same duchy to the count palatine of Sulzbach, a kinsman of the count palatine of Neuburg. Then Frederick the Great, having secured Silesia, abandoned his claim to Jülich, which thus passed to Sulzbach when, in 1742, the family of Neuburg became extinct. From Sulzbach the duchy came to the electors palatine of the Rhine, and, when this family died out in 1799, to the elector of Bavaria, the head of the other branch of the house of Wittelsbach. In 1801 Jülich was seized by France, and by the settlement of 1815 it came into the hands of Prussia. Its area was just over 1600 sq. m. and its population about 400,000.

See Kuhl, *Geschichte der Stadt Jülich*; M. Ritter, *Sachsen und der Jülicher Erbfolgestreit* (1873), and *Der Jülicher Erbfolgekrieg, 1610 und 1611* (1877); A. Müller, *Der Jülich-Klevesche Erbfolgestreit im Jahre 1614* (1900) and H. H. Koch, *Die Reformation im Herzogtum Jülich* 1883-1888).

JULIEN, STANISLAS (1797?–1873), French orientalist, was born at Orleans, probably on the 13th of April 1797. Stanislas Julien, a mechanic of Orleans, had two sons, Noël, born on the 13th of April 1797, and Stanislas, born on the 20th of September 1799. It appears that the younger son died in America, and that Noël then adopted his brother's name. He studied classics at the collège de France, and in 1821 was appointed assistant professor of Greek. In the same year he published an edition of the Ἑλένης ἁρπαγή of Coluthus, with versions in French, Latin, English, German, Italian and Spanish. He attended the lectures of Abel Rémusat on Chinese, and his progress was as rapid as it had been in other languages. From the first, as if by intuition, he mastered the genius of the language; and in 1824 he published a Latin translation of a part of the works of Mencius (Mang-tse), one of the nine classical books of the Chinese. Soon afterwards he translated the modern Greek odes of Kalvos under the title of *La Lyre patriotique de la Grèce*. But such works were not profitable in a commercial sense, and, being without any patrimony, Julien was glad to accept the assistance of Sir William Drummond and others, until in 1827 he was appointed sub-librarian to the French institute. In 1832 he succeeded Rémusat as professor of Chinese at the collège de France. In 1833 he was elected a member of the Académie des Inscriptions in the place of the orientalist, Antoine Jean Saint-Martin. For some years his studies had been directed towards the dramatic and lighter literature of the Chinese, and in rapid succession he now brought out translations of the *Hoei-lan-ki* (*L'Histoire du cercle de craie*), a drama in which occurs a scene curiously analogous to the judgment of Solomon; the *Pih shay tsing ki*; and the *Tchao-chi kou eul*, upon which Voltaire had founded his *Orphelin de la Chine* (1755). With the versatility which belonged to his genius, he next turned, apparently without difficulty, to the very different style common to Taoist writings, and translated in 1835 *Le Livre des récompenses et des peines* of Lao-tsze. About this time the cultivation of silkworms was beginning to attract attention in France, and by order of the minister of agriculture Julien compiled, in 1837, a *Résumé des principaux traités chinois sur la culture des mûriers, et l'éducation des vers-à-soie*, which was speedily translated into English, German, Italian and Russian.

Nothing was more characteristic of his method of studying Chinese than his habit of collecting every peculiarity of idiom and expression which he met with in his reading; and, in order that others might reap the benefit of his experiences, he published in 1841 *Discussions grammaticales sur certaines règles de position qui, en chinois, jouent le même rôle que les inflexions dans les autres langues*, which he followed in 1842 by *Exercices pratiques d'analyse, de syntaxe, et de lexigraphie chinoise*. Meanwhile in 1839, he had been appointed joint keeper of the Bibliothèque royale, with the especial superintendence of the Chinese books, and shortly afterwards he was made administrator of the collège de France.

The facility with which he had learned Chinese, and the success which his proficiency commanded, naturally inclined less gifted scholars to resent the impatience with which he regarded their mistakes, and at different times bitter controversies arose between Julien and his fellow sinologues on the one subject which they had in common. In 1842 appeared from his busy pen a translation of the *Tao te King*, the celebrated work in which Lao-tsze attempted to explain his idea of the relation existing between the universe and something which he called *Tao*, and on which the religion of Taoism is based. From Taoism to Buddhism was a natural transition, and about this time Julien turned his attention to the Buddhist literature of China, and more especially to the travels of Buddhist pilgrims to India. In order that he might better understand the references to Indian institutions, and the transcriptions in Chinese of Sanskrit words and proper names, he began the study of Sanskrit, and in 1853 brought out his *Voyages du pêlérin Hiouen-tsang*, which is regarded by some critics as his most valuable work. Six years later he published *Les Avadânas, contes et apologues Indiens inconnus jusqu'à ce jour, suivis de poésies et de nouvelles chinoises*. For the benefit of future students he disclosed his system of deciphering Sanskrit words occurring in Chinese books in his *Méthode pour déchiffrer et transcrire les noms sanscrits qui se rencontrent dans les livres chinois* (1861). This work, which contains much of interest and importance, falls short of the value which its author was accustomed to attach to it. It had escaped his observation that, since the translations of Sanskrit works into Chinese were undertaken in different parts of the empire, the same Sanskrit words were of necessity differently represented in Chinese characters in accordance with the dialectical variations. No hard and fast rule can therefore possibly be laid down for the decipherment of Chinese transcriptions of Sanskrit words, and the effect of this impossibility was felt though not recognized by Julien, who in order to make good his rule was occasionally obliged to suppose that wrong characters had by mistake been introduced into the texts. His Indian studies led to a controversy with Joseph Toussaint Reinaud, which was certainly not free from the gall of bitterness. Among the many subjects to which he turned his attention were the native industries of China, and his work on the *Histoire et fabrication de la porcelaine chinoise* is likely to remain a standard work on the subject. In another volume he also published an account of the *Industries anciennes et modernes de l'empire chinois* (1869), translated from native authorities. In the intervals of more serious undertakings he translated the *San tseu King* (*Le Livre des trois mots*); *Thsien tseu wen* (*Le Livre de mille mots*); *Les Deux cousines*; *Nouvelles chinoises*; the *Ping chan ling yen* (*Les Deux jeunes filles lettrées*); and the *Dialoghi Cinesi, Ji-tch'ang k' eou-t' eou-koa*. His last work of importance was *Syntaxe nouvelle de la langue chinoise* (1869), in which he gave the result of his study of the language, and collected a vast array of facts and of idiomatic expressions. A more scientific arrangement and treatment of his subject would have added much to the value of this work, which, however, contains a mine of material which amply repays exploration. One great secret by which Julien acquired his grasp of Chinese, was, as we have said, his methodical collection of phrases and idiomatic expressions. Whenever in the course of his reading he met with a new phrase or expression, he entered it on a card which took its place in regular order in a long series of boxes. At his death, which took place on the 14th of February 1873, he left, it is said, 250,000 of such cards, about the fate of which, however, little seems to be known. In politics Julien was imperialist, and in 1863 he was made a commander of the legion of honour in recognition of the services he had rendered to literature during the second empire.

See notice and bibliography by Wallon, *Mém. de l'Acad. des Inscr.* (1884), xxxi. 409–458. (R. K. D.)

JULIUS, the name of three popes.

Julius I., pope from 337 to 352, was chosen as successor of Marcus after the Roman see had been vacant four months. He is chiefly known by the part which he took in the Arian controversy. After the Eusebians had, at a synod held in Antioch, renewed their deposition of Athanasius they resolved to send delegates to Constans, emperor of the West, and also to Julius, setting forth the grounds on which they had proceeded. The latter, after expressing an opinion favourable to Athanasius, adroitly invited both parties to lay the case before a synod to be presided over by himself. This proposal, however, the Eastern bishops declined to accept. On his second banishment from Alexandria, Athanasius came to Rome, and was recognized as a regular bishop by the synod held in 340. It was through the influence of Julius that, at a later date, the council of Sardica in Illyria was held, which was attended only by seventy-six Eastern bishops, who speedily withdrew to Philippopolis and deposed Julius, along with Athanasius and others. The Western bishops who remained confirmed the previous decisions of the Roman synod; and by its 3rd, 4th and 5th decrees relating to the rights of revision, the council of Sardica endeavoured to settle the procedure of ecclesiastical appeals. Julius on his death in April 352 was succeeded by Liberius. (L. D.*)

Julius II. (Giuliano della Rovere), pope from the 1st of November 1503 to the 21st of February 1513, was born at Savona in 1443. He was at first intended for a commercial career, but later was sent by his uncle, subsequently Sixtus IV., to be educated among the Franciscans, although he does not appear to have joined that order. He was loaded with favours during his uncle's pontificate, being made bishop of Carpentras, bishop of Bologna, bishop of Vercelli, archbishop of Avignon, cardinal-priest of S. Pietro in Vincoli and of Sti Dodici Apostoli, and cardinal-bishop of Sabina, of Frascati, and finally of Ostia and Velletri. In 1480 he was made legate to France, mainly to settle the question of the Burgundian inheritance, and acquitted himself with such ability during his two years' stay that he acquired an influence in the college of cardinals which became paramount during the pontificate of Innocent VIII. A rivalry, however, growing up between him and Roderigo Borgia, he took refuge at Ostia after the latter's election as Alexander VI., and in 1494 went to France, where he incited Charles VIII. to undertake the conquest of Naples. He accompanied the young king on his campaign, and sought to convoke a council to inquire into the conduct of the pope with a view to his deposition, but was defeated in this through Alexander's machinations. During the remainder of that pontificate Della Rovere remained in France, nominally in support of the pope, for whom he negotiated the treaty of 1498 with Louis XII., but in reality bitterly hostile to him. On the death of Alexander (1503) he returned to Italy and supported the election of Pius III., who was then suffering from an incurable malady, of which he died shortly afterwards. Della Rovere then won the support of Cesare Borgia and was unanimously elected pope. Julius II. from the beginning repudiated the system of nepotism which had flourished under Sixtus IV., Innocent VIII. and Alexander VI., and set himself with courage and determination to restore, consolidate and extend the temporal possessions of the Church. By dexterous diplomacy he first succeeded (1504) in rendering it impossible for Cesare Borgia to remain in Italy. He then pacified Rome and the surrounding country by reconciling the powerful houses of Orsini and Colonna and by winning the other nobles to his own cause. In 1504 he arbitrated on the differences between France and Germany, and concluded an alliance with them in order to oust the Venetians from Faenza, Rimini and other towns which they occupied. The alliance at first resulted only in compelling the surrender of a few unimportant fortresses in the Romagna; but Julius freed Perugia and Bologna in the brilliant campaign of 1506. In 1508 he concluded against Venice the famous league of Cambray with the emperor Maximilian, Louis XII. of France and Ferdinand of Aragon, and in the following year placed the city of Venice under an interdict. By the single battle of Agnadello the Italian dominion of Venice was practically lost; but as the allies were not satisfied with merely effecting his purposes, the pope entered into a combination with the Venetians against those who immediately before had been engaged in his behalf. He absolved the Venetians in the beginning of 1510, and shortly afterwards placed the ban on France. At a synod convened by Louis XII. at Tours in September, the French bishops announced their withdrawal from the papal obedience and resolved, with Maximilian's co-operation, to seek the deposition of Julius. In November 1511 a council actually met at Pisa for this object, but its efforts were fruitless. Julius forthwith formed the Holy league with Ferdinand of Aragon and with Venice against France, in which both Henry VIII. and the emperor ultimately joined. The French were driven out of Italy in 1512 and papal authority was once more securely established in the states immediately around Rome. Julius had already issued, on the 18th of July 1511, the summons for a general council to deal with France, with the reform of the Church, and with a war against the Turks. This council, which is known as the Fifth Lateran, assembled on the 3rd of May 1512, condemned the celebrated pragmatic sanction of the French church, and was still in session when Julius died. In the midst of his combats, Julius never neglected his ecclesiastical duties. His bull of the 14th of January 1505 against simony in papal elections was re-enacted by the Lateran council (February 16, 1513). He condemned duelling by bull of the 24th of February 1509. He effected some reforms in the monastic orders; urged the conversion of the sectaries in Bohemia; and sent missionaries to America, India, Abyssinia and the Congo. His government of the Papal States was excellent. Julius is deserving of particular honour for his patronage of art and literature. He did much to improve and beautify Rome; he laid the foundation-stone of St Peter's (April 18, 1506); he founded the Vatican museum; and he was a friend and patron of Bramante, Raphael and Michelangelo. While moderate in personal expenditure, Julius resorted to objectionable means of replenishing the papal treasury, which had been exhausted by Alexander VI., and of providing funds for his numerous enterprises; simony and traffic in indulgences were increasingly prevalent. Julius was undoubtedly in energy and genius one of the greatest popes since Innocent III., and it is a misfortune of the Church that his temporal policy eclipsed his spiritual office. Though not despising the Machiavellian arts of statecraft so universally practised in his day, he was nevertheless by nature plain-spoken and sincere, and in his last years grew violent and crabbed. He died of a fever on the 21st of February 1513, and was succeeded by Leo X.

See L. Pastor, *History of the Popes*, vol. vi., trans. by F. I. Antrobus (1898); M. Creighton, *History of the Papacy*, vol. v. (1901); F. Gregorovius, *Rome in the Middle Ages*, vol. viii., trans. by Mrs G. W. Hamilton (1900–1902); Hefele-Hergenröther, *Conciliengeschichte*, vol. viii., 2nd ed.; J. Klaczko, *Rome et la renaissance . . . Jules II.* (1898), trans. into English by J. Dennie (New York, 1903); M. Brosch, *Papst Julius II. u. die Gründung des Kirchenstaates* (1878); A. J. Dumesnil, *Histoire de Jules II.* (1873); J. J. I. von Döllinger, *Beiträge zur polit., kirchl., u. Cultur-Geschichte der sechs letzten Jahrhunderte*, vol. iii. (1882); A. Schulte, *Die Fugger in Rom 1495–1523, mit Studien zur Gesch. des kirchlichen Finanzwesens jener Zeit* (1904). (C. H. Ha.)

Julius III. (Giovanni Maria del Monte), pope from 1550 to 1555, was born on the 10th of September 1487. He was created cardinal by Paul III. in 1536, filled several important legations, and was elected pope on the 7th of February 1550, despite the opposition of Charles V., whose enmity he had incurred as president of the council of Trent. Love of ease and desire for peace moved him, however, to adopt a conciliatory attitude, and to yield to the emperor's desire for the reassembling of the council (September 1551), suspended since 1549. But deeming Charles's further demands inconvenient, he soon found occasion in the renewal of hostilities to suspend the council once more (April 1552). As an adherent of the emperor he suffered in consequence of imperial reverses, and was forced to confirm Parma to Ottavio Farnese, the ally of France (1552). Weary of politics, and obeying a natural inclination to pleasure, Julius then virtually abdicated the management of affairs, and gave himself up to enjoyment, amusing himself with the adornment of his villa, near the Porta del Popolo, and often so far forgetting the proprieties of his office as to participate in entertainments of a questionable character. His nepotism was of a less ambitious order than that of Paul III.; but he provided for his family out of the offices and revenues of the Church, and advanced unworthy favourites to the cardinalate. What progress reform made during his pontificate was due to its acquired momentum, rather than to the zeal of the pope. Yet under Julius steps were taken to abolish plurality of benefices and to restore monastic discipline; the Collegium Germanicum, for the conversion of Germans, was established in Rome, 1552; and England was absolved by the cardinal-legate Pole, and received again into the Roman communion (1554). Julius died on the 23rd of March 1555, and was succeeded by Marcellus II.

See Panvinio, continuator of Platina, *De Vitis Pontiff. Rom.*; Ciaconius, *Vitae et res gestae summorum Pontiff. Rom.* (Rome, 1601–1602) (both contemporaries of Julius III.); Ranke, *Popes* (Eng. trans., Austin), i. 276 seq.; v. Reumont, *Gesch. der Stadt Rom.*, iii. 2, 503 seq.; Brosch, *Gesch. des Kirchenstaates* (1880), i. 189 seq.; and extended bibliography in Herzog-Hauck, *Realencyklopädie, s.v.* "Julius III." (T. F. C.)

JULLIEN, LOUIS ANTOINE (1812–1860), musical conductor, was born at Sisteron, Basses Alpes, France, on the 23rd of April 1812, and studied at the Paris conservatoire. His fondness for the lightest forms of music cost him his position in the school, and after conducting the band of the Jardin Turc he was compelled to leave Paris to escape his creditors, and came to London, where he formed a good orchestra and established promenade concerts. Subsequently he travelled to Scotland, Ireland and America with his orchestra. For many years he was a familiar figure in the world of popular music in England, and his portly form with its gorgeous waistcoats occurs very often in the early volumes of *Punch*. He brought out an opera, *Pietro il Grande*, at Covent Garden (1852) on a scale of magnificence that ruined him, for the piece was a complete failure. He was in America until 1854, when he returned to London for a short time; ultimately he went back to Paris, where, in 1859, he was arrested for debt and put into prison. He lost his reason soon afterwards, and died on the 14th of March 1860.

JULLUNDUR, or Jalandhar, a city of British India, giving its name to a district and a division in the Punjab. The city is 260 m. by rail N.W. of Delhi. Pop. (1901), 67,735. It is the headquarters of a brigade in the 3rd division of the northern army. There are an American Presbyterian mission, a government normal school, and high schools supported by Hindu bodies.

The District of Jullundur occupies the lower part of the tract known as the Jullundur Doab, between the rivers Sutlej and Beas, except that it is separated from the Beas by the state of Kapurthala. Area, 1431 sq. m. Pop. (1901), 917,587, showing an increase of 1% in the decade; the average density is 641 persons per square mile, being the highest in the province. Cotton-weaving and sugar manufacture are the principal industries for export trade, and silk goods and wheat are also exported. The district is crossed by the main line of the North-Western railway from Phillaur towards Amritsar.

The Jullundur Doab in early times formed the Hindu kingdom of Katoch, ruled by a family of Rajputs whose descendants still exist in the petty princes of the Kangra hills. Under Mahommedan rule the Doab was generally attached to the province of Lahore, in which it is included as a *circar* or governorship in the great revenue survey of Akbar. Its governors seem to have held an autonomous position, subject to the payment of a fixed tribute into the imperial treasury. The Sikh revival extended to Jullundur at an early period, and a number of petty chieftains made themselves independent throughout the Doab. In 1766 the town of Jullundur fell into the hands of the Sikh confederacy of Faiz-ulla-puria, then presided over by Khushal Singh. His son and successor built a masonry fort in the town, while several other leaders similarly fortified themselves in the suburbs. Meanwhile, Ranjit Singh was consolidating his power in the south, and in 1811 he annexed the Faiz-ulla-puria dominions. Thenceforth Jullundur became the capital of the Lahore possessions in the Doab until the British annexation at the close of the first Sikh war (1846).

The Division of Jullundur comprises the five districts of Kangra, Hoshiarpur, Jullundur, Ludhiana and Ferozepore, all lying along the river Sutlej. Area, 19,410 sq. m. Pop. (1901), 4,306,662.

See *Jullundur District Gazetteer* (Lahore, 1908).

JULY, the seventh month in the Christian calendar, consisting of thirty-one days. It was originally the fifth month of the year, and as such was called by the Romans *Quintilis*. The later name of Julius was given in honour of Julius Caesar (who was born in the month); it came into use in the year of his death. The Anglo-Saxons called July *Hegmônath*, "hay-month," or *Maed-mônath*, "mead-month," the meadows being then in bloom. Another name was *aftera līða*, "the latter mild month," in contradistinction to June, which was named "the former mild month." Chief dates of the month: 3rd July, Dog Days begin; 15th July, St Swithin; 25th July, St James.

JUMALA, the supreme god of the ancient Finns and Lapps. Among some tribes he is called Num or Jilibeambaertje, as protector of the flocks. Jumala indicates rather godhead than a divine being. In the runes Ukko, the grandfather, the sender of the thunder, takes the place of Jumala.

JUMIÈGES, a village of north-western France, in the department of Seine-Inférieure, 17 m. W. of Rouen by road, on a peninsula formed by a bend of the Seine. Pop. (1906), 244. Jumièges is famous for the imposing ruins of its abbey, one of the great establishments of the Benedictine order. The principal remains are those of the abbey-church, built from 1040 to 1067; these comprise the façade with two towers, the walls of the nave, a wall and sustaining arch of the great central tower and débris of the choir (restored in the 13th century). Among the minor relics, preserved in a small museum in a building of the 14th century, are the stone which once covered the grave of Agnes Sorel, and two recumbent figures of the 13th century, commonly known as the *Énervés*, and representing, according to one legend, two sons of Clovis II., who, as a punishment for revolt against their father, had the tendons of their arms and legs cut, and were set adrift in a boat on the Seine. Another tradition states that the statues represent Thassilo, duke of Bavaria, and Theodo his son, relegated to Jumièges by Charlemagne. The church of St Pierre, which adjoins the south side of the abbey-church, was built in the 14th century as a continuation of a previous church of the time of Charlemagne, of which a fragment still survives. Among the other ruins, those of the chapter-house (13th century) and refectory (12th and 15th centuries) also survive.

The abbey of Jumièges was founded about the middle of the 7th century by St Philibert, whose name is still to be read on gold and silver coins obtained from the site. The abbey was destroyed by the Normans, but was rebuilt in 928 by William Longsword, duke of Normandy, and continued to exist till 1790. Charles VII. often resided there with Agnes Sorel, who had a manor at Mesnil-sous-Jumièges in the neighbourhood, and died in the monastery in 1450.

JUMILLA, a town of eastern Spain, in the province of Murcia, 40 m. N. by W. of Murcia by road, on the right bank of the Arroyo del Jua, a left-bank tributary of the Segura. Pop. (1900), 16,446. Jumilla occupies part of a narrow valley, enclosed by mountains. An ancient citadel, several churches, a Franciscan convent, and a hospital are the principal buildings. The church of Santiago is noteworthy for its fine paintings and frescoes, some of which have been attributed, though on doubtful authority, to Peter Paul Rubens and other illustrious artists. The local trade is chiefly in coarse cloth, esparto fabrics, wine and farm produce.

JUMNA, or JAMUNA, a river of northern India. Rising in the Himalayas in Tehri state, about 5 m. N. of the Jamnotri hot springs, in 31° 3′ N. and 78° 30′ E., the stream first flows S. for 7 m., then S.W. for 32 m., and afterwards due S. for 26 m., receiving several small tributaries in its course. It afterwards turns sharply to the W. for 14 m., when it is joined by the large river Tons from the north. The Jumna here emerges from the Himalayas into the valley of the Dun, and flows in a S.W. direction for 22 m., dividing the Kiarda Dun on the W. from the Dehra Dun on the E. It then, at the 95th mile of its course, forces its way through the Siwalik hills, and debouches upon the plains of India at Fyzabad in Saharanpur district. By this time a large river, it gives off, near Fyzabad, the eastern and western Jumna canals. From Fyzabad the river flows for 65 m. in a S.S.W. direction, receiving the Maskarra stream from the east. Near Bidhauli, in Muzaffarnagar district, it turns due S. for 80 m. to Delhi city, thence S.E. for 27 m. to near Dankaur, receiving the waters of the Hindan river on the east. From Dankaur it resumes its southerly course for 100 m. to Mahaban near Muttra, where it turns E. for nearly 200 m., passing the towns of Agra, Ferozabad and Etawah, receiving on its left bank the Karwan-nadi, and on its right the Banganga (Utanghan). From Etawah it flows 140 m. S.E. to Hamirpur, being joined by the Sengar on its north bank, and on the south by the great river Chambal from the west, and by the Sind. From Hamirpur, the Jumna flows nearly due E., until it enters Allahabad district and passes Allahabad city, below which it falls into the Ganges in 25° 25′ N. and 81° 55′ E. In this last part of its course it receives the waters of the Betwa and the Ken. Where the Jumna and the Ganges unite is the *prayag*, or place of pilgrimage, where devout Hindus resort in thousands to wash and be sanctified.

The Jumna, after issuing from the hills, has a longer course through the United Provinces than the Ganges, but is not so large nor so important a river; and above Agra in the hot season it dwindles to a small stream. This is no doubt partly caused by the eastern and western Jumna canals, of which the former, constructed in 1823–1830, irrigates 300,000 acres in the districts of Saharanpur, Muzaffarnagar and Meerut, in the United Provinces; while the latter, consisting of the reopened channels of two canals dating from about 1350 and 1628 respectively, extends through the districts of Umballa, Karnal, Hissar, Rohtak and Delhi, and the native states of Patiala and Jind in the Punjab, irrigating 600,000 acres. The headworks of the two canals are situated near the point where the river issues from the Siwāliks.

The traffic on the Jumna is not very considerable; in its upper portion timber, and in the lower stone, grain and cotton are the chief articles of commerce, carried in the clumsy barges which navigate its stream. Its waters are clear and blue, while those of the Ganges are yellow and muddy; the difference between the streams can be discerned for some distance below the point at which they unite. Its banks are high and rugged, often attaining the proportions of cliffs, and the ravines which run into it are deeper and larger than those of the Ganges. It traverses the extreme edge of the alluvial plain of Hindustan, and in the latter part of its course it almost touches the Bundelkhand offshoots of the Vindhyā range of mountains. Its passage is therefore more tortuous, and the scenery along its banks more varied and pleasing, than is the case with the Ganges.

The Jumna at its source near Jamnotri is 10,849 ft. above the sea-level; at Kotnur, 16 m. lower, it is only 5036 ft.; so that, between these two places, it falls at the rate of 314 ft. in a mile. At its junction with the Tons it is 1686 ft. above the sea; at its junction with the Asan, 1470 ft.; and at the point where it issues from the Siwālik hills into the plains, 1276 ft. The catchment area of the river is 118,000 sq. m.; its flood discharge at Allahabad is estimated at 1,333,000 cub. ft. per second. The Jumna is crossed by railway bridges at Delhi, Muttra, Agra and Allahabad, while bridges of boats are stationed at many places.

JUMPING,[1] a branch of athletics which has been cultivated from the earliest times (see ATHLETIC SPORTS). Leaping competitions formed a part of the *pentathlon*, or quintuple games, of the Olympian festivals, and Greek chronicles record that the athlete Phayllus jumped a distance of 55 Olympian, or more than 30 English, feet. Such a leap could not have been made without weights carried in the hands and thrown backwards at the moment of springing. These were in fact employed by Greek jumpers and were called *haltēres*. They were masses of stone or metal, nearly semicircular, according to Pausanias, and the fingers grasped them like the handles of a shield. Halteres were also used for general exercise, like modern dumb-bells. The Olympian jumping took place to the music of lutes.

Jumping has always been popular with British athletes, and tradition has handed down the record of certain leaps that border on the incredible. Two forms of jumping are included in modern athletic contests, the running long jump and the running high jump; but the same jumps, made from a standing position, are also common forms of competition, as well as the hop step and jump, two hops and jump, two jumps, three jumps, five jumps and ten jumps, either with a run or from a standing position. These events are again divided into two categories by the use of weights, which are not allowed in championship contests.

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[1] The verb "to jump" only dates from the beginning of the 16th century. The *New English Dictionary* takes it to be of onomatopoeic origin and does not consider a connexion with Dan. *gumpe*, Icel. *goppa*, &c., possible. The earlier English word is "leap" (O.E. *hlēapan*, to run, jump, cf. Ger. *laufen*).

In the running long jump anything over 18 ft. was once considered good, while Peter O'Connor's world's record (1901) is 24 ft. $11\frac{3}{4}$ in. The jump is made, after a short fast run on a cinder path, from a joist sunk into the ground flush with the path, the jumper landing in a pit filled with loose earth, its level a few inches below that of the path. The joist, called the "take-off," is painted white, and all jumps are measured from its edge to the nearest mark made by any part of the jumper's person in landing.

In the standing long jump, well spiked shoes should be worn, for it is in reality nothing but a push against the ground, and a perfect purchase is of the greatest importance. Weights held in the hands of course greatly aid the jumper. Without weights J. Darby (professional) jumped 12 ft. $1\frac{1}{2}$ in. and R. C. Ewry (American amateur) 11 ft. $4\frac{7}{8}$ in. With weights J. Darby covered 14 ft. 9 in. at Liverpool in 1890, while the amateur record is 12 ft. $9\frac{1}{2}$ in., made by J. Chandler and G. L. Hellwig (U.S.A.). The standing two, three, five and ten jumps are merely repetitions of the single jump, care being taken to land with the proper balance to begin the next leap. The record for two jumps without weights is 22 ft. $2\frac{1}{2}$ in., made by H. M. Johnson (U.S.A.); for three jumps without weights, R. C. Ewry, 35 ft. $7\frac{1}{4}$ in.; with weights J. Darby, 41 ft. 7 in.

The hop step and jump is popular in Ireland and often included in the programmes of minor meetings, and so is the two hops and a jump. The record for the first, made by W. McManus, is 49 ft. $2\frac{1}{2}$ in. with a run and without weights; for the latter, also with a run and without weights, 49 ft. $\frac{1}{2}$ in., made by J. B. Conolly.

In the running high jump also the standard has improved. In 1864 a jump of 5 ft. 6 in. was considered excellent. The Scotch professional Donald Dinnie, on hearing that M. J. Brooks of Oxford had jumped 6 ft. $2\frac{1}{2}$ in. in 1876, wrote to the newspapers to show that upon *a priori* grounds such an achievement was impossible. Since then many jumpers who can clear over 6 ft. have appeared. In 1895 M. F. Sweeney of New York accomplished a jump of 6 ft. $5\frac{5}{8}$ in. Ireland has produced many first-class high jumpers, nearly all tall men, P. Leahy winning the British amateur record in Dublin in 1898 with a jump of 6 ft. $4\frac{3}{4}$ in. The American A. Bird Page, however, although only 5 ft. $6\frac{3}{4}$ in. in height, jumped 6 ft. 4 in. High jumping is done over a light staff or lath resting upon pins fixed in two uprights upon which a scale is marked. The "take-off," or ground immediately in front of the uprights from which the spring is made, is usually grass in Great Britain and cinders in America. Some jumpers run straight at the bar and clear it with body facing forward, the knees being drawn up almost to the chin as the body clears the bar; others run and spring sideways, the feet being thrown upwards and over the bar first, to act as a kind of lever in getting the body over. There should be a shallow pit of loose earth or a mattress to break the fall.

The standing high jump is rarely seen in regular athletic meetings. The jumper stands sideways to the bar with his arms extended upwards. He then swings his arms down slowly, bending his knees at the same time, and, giving his arms a violent upward swing, springs from the ground. As the body rises the arms are brought down, one leg is thrown over the bar, and the other pulled, almost jerked, after it. The record for the standing high jump without weights is 6 ft., by J. Darby in 1892.

By the use of a spring-board many extraordinary jumps have been made, but this kind of leaping is done only by circus gymnasts and is not recognized by athletic authorities.

For pole-jumping see Pole-vaulting.

See *Encyclopaedia of Sport*; M. W. Ford, "Running High Jump," *Outing*, vol. xviii.; "Running Broad Jump," *Outing*, vol. xix.; "Standing Jumping," *Outing*, vol. xix.; "Miscellaneous Jumping," *Outing*, vol. xx. Also *Sporting and Athletic Register* (annual).

JUMPING-HARE, the English equivalent of springhaas, the Boer name of a large leaping south and east African rodent mammal, *Pedetes caffer*, typifying a family by itself, the *Pedetidae*. Originally classed with the jerboas, to which it has no affinity, this remarkable rodent approximates in the structure of its skull to the porcupine-group, near which it is placed by some naturalists, although others consider that its true position is with the African scaly-tailed flying squirrels (*Anomaluridae*). The colour of the creature is bright rufous fawn; the eyes are large; and the bristles round the muzzle very long, the former having a fringe of long hairs. The front limbs are short, and the hind ones very long; and although the fore-feet have five toes, those of the hind-feet are reduced to four. The bones of the lower part of the hind leg (tibia and fibula) are united for a great part of their length. There are four pairs of cheek-teeth in each jaw, which do not develop roots. The jumping-hare is found in open or mountainous districts, and has habits very like a jerboa. It is nocturnal, and dwells in composite burrows excavated and tenanted by several families. When feeding it progresses on all four legs, but if frightened takes gigantic leaps on the hind-pair alone; the length of such leaps frequently reaches twenty feet, or even more. The young are generally three or four in number, and are born in the summer. A second smaller species has been named. (See Rodentia.)

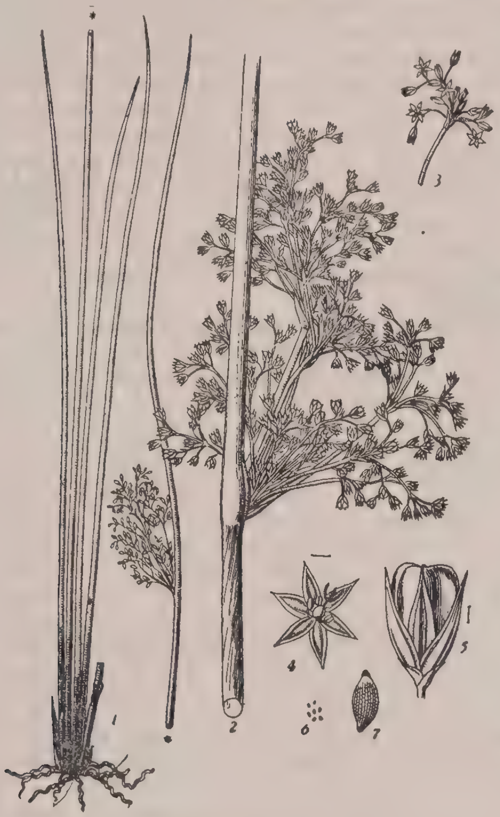
JUMPING-MOUSE, the name of a North American mouse-like rodent, *Zapus hudsonius*, belonging to the family *Jaculidae* (*Dipodidae*), and the other members of the same genus. Although mouse-like in general appearance, these rodents are distinguished by their elongated hind limbs, and, typically, by the presence of four pairs of cheek-teeth in each jaw. There are five toes to all the feet, but the first in the fore-feet is rudimentary, and furnished with a flat nail. The cheeks are provided with pouches. Jumping-mice were long supposed to be confined to North America, but a species is now known from N.W. China. It is noteworthy that whereas E. Coues in 1877 recognized but a single representative of this genus, ranging over a large area in North America, A. Preble distinguishes no fewer than twenty North American species and sub-species, in addition to the one from Szechuen. Among these, it may be noted that *Z. insignis* differs from the typical *Z. hudsonius* by the loss of the premolar, and has accordingly been referred to a sub-genus apart. Moreover, the Szechuen jumping-mouse differs from the typical *Zapus* by the closer enamel-folds of the molars, the shorter ears, and the white tail-tip, and is therefore made the type of another sub-genus. In America these rodents inhabit forest, pasture, cultivated fields or swamps, but are nowhere numerous. When disturbed, they start off with enormous bounds of eight or ten feet in length, which soon diminish to three or four; and in leaping the feet scarcely seem to touch the ground. The nest is placed in clefts of rocks, among timber or in hollow trees, and there are generally three litters in a season. (See Rodentia.)

JUMPING-SHREW, a popular name for any of the terrestrial insectivora of the African family *Macroscelididae*, of which there are a number of species ranging over the African continent, representing the tree-shrews of Asia. They are small long-snouted gerbil-like animals, mainly nocturnal, feeding on insects, and characterized by the great length of the metatarsal bones, which have been modified in accordance with their leaping mode of progression. In some (constituting the genus *Rhyncocyon*) the muzzle is so much prolonged as to resemble a proboscis, whence the name elephant-shrews is sometimes applied to the members of the family.

JUNAGARH, or Junagadh, a native state of India, within the Gujarat division of Bombay, extending inland from the southern coast of the peninsula of Kathiawar. Area, 3284 sq. m.; pop. (1901), 395,428, showing a decrease of 19% in the decade, owing to famine; estimated gross revenue, £174,000; tribute to the British government and the gaekwar of Baroda, £4200; a considerable sum is also received as tribute from minor states in Kathiawar. The state is traversed by a railway from Rajkot, to the seaport of Verawal. It includes the sacred mountain of Girnar and the ruined temple of Somnath, and also the forest of Gir, the only place in India where the lion survives. Junagarh ranks as a first-class state among the many chiefships of Kathiawar, and its ruler first entered into engagements with the British in 1807. Nawab Sir Rasul Khanji, K.C.S.I., was born in 1858 and succeeded his brother in 1892.

The modern town of Junagarh (34,251), 60 m. by rail S. of Rajkot, is handsomely built and laid out. In November 1897 the foundation-stones of a hospital, library and museum were laid, and an arts college has recently been opened.

JUNCACEAE (rush family), in botany, a natural order of flowering plants belonging to the series Liliiflorae of the class Monocotyledons, containing about two hundred species in seven genera, widely distributed in temperate and cold regions. It is well represented in Britain by the two genera which comprise nearly the whole order—*Juncus*, rush, and *Luzula*, wood-rush. They are generally perennial herbs with a creeping underground stem and erect, unbranched, aerial stems, bearing slender leaves which are grass-like or cylindrical or reduced to membranous sheaths. The small inconspicuous flowers are generally more or less crowded in terminal or lateral clusters, the form of the inflorescence varying widely according to the manner of branching and the length of the pedicels. The flowers are hermaphrodite and regular, with the same number and arrangement of parts as in the order Liliaceae, from which they differ in the inconspicuous membranous character of the perianth, the absence of honey or smell, and the brushlike stigmas with long papillae-adaptations to wind-pollination as contrasted with the methods of pollination by insect agency, which characterize the Liliaceae. Juncaceae are, in fact, a less elaborated group of the same series as Liliaceae, but adapted to a simpler and more uniform environment than that larger and much more highly developed family.



Juncus effusus, common rush.

1 Plant.
2. Inflorescence.
3. End of branch of inflorescence, slightly enlarged.
4. Flower, enlarged.
5. Fruit, enlarged.
6. Seed.
7. Seed, much enlarged.

JUNCTION CITY, a city and the county-seat of Geary county, Kansas, U.S.A., between Smoky Hill and Republican rivers, about 3 m. above their confluence to form the Kansas, and 72 m. by rail W. of Topeka. Pop. (1900), 4695, of whom 545 were foreign-born and 292 were negroes; (1905), 5494; (1910), 5598. Junction City is served by the Union Pacific and the Missouri, Kansas & Texas railways. It is the commercial centre of a region in whose fertile valleys great quantities of wheat, Indian corn, oats and hay are grown and live stock is raised, and whose uplands contain extensive beds of limestone, which is quarried for building purposes. Excellent water-power is available and is partly utilized by flour mills. The municipality owns and operates the waterworks. At the confluence of Smoky Hill and Republican rivers and connected with the city by an electric railway is Fort Riley, a U.S. military post, which was established in 1853 as Camp Centre but was renamed in the same year in honour of General Bennett Riley (1787–1853); in 1887 the mounted service school of the U.S. army was established here. Northward from the post is a rugged country over which extends a military reservation of about 19,000 acres. Adjoining the reservation and about 5 m. N.E. of Junction City is the site of the short-lived settlement of Pawnee, where from the 2nd to the 6th of July 1855 the first Kansas legislature met, in a building the ruins of which still remain; the establishment of Pawnee (in December 1854) was a speculative pro-slavery enterprise conducted by the commandant of Fort Riley, other army officers and certain territorial officials, and when a government survey showed that the site lay within the Fort Riley reservation, the settlers were ordered (August 1855) to leave, and the commandant of Fort Riley was dismissed from the army; one of the charges brought against Governor A. H. Reeder was that he had favoured the enterprise. Junction City was founded in 1857 and was chartered as a city in 1859.

JUNE, the sixth month in the Christian calendar, consisting of thirty days. Ovid (*Fasti*, vi. 25) makes Juno assert that the name was expressly given in her honour. Elsewhere (*Fasti*, vi. 87) he gives the derivation *a junioribus*, as May had been derived from *majores*, which may be explained as in allusion either to the two months being dedicated respectively to youth and age in general, or to the seniors and juniors of the government of Rome, the senate and the *comitia curiata* in particular. Others connect the term with the gentile name Junius, or with the consulate of Junius Brutus. Probably, however, it originally denoted the month in which crops grow to ripeness. In the old Latin calendar June was the fourth month, and in the so-called year of Romulus it is said to have had thirty days; but at the time of the Julian reform of the calendar its days were only twenty-nine. To these Caesar added the thirtieth. The Anglo-Saxons called June "the dry month," "midsummer month," and, in contradistinction to July, "the earlier mild month." The summer solstice occurs in June. Principal festival days in this month: 11th June, St Barnabas; 24th June, Midsummer Day (Nativity of St John the Baptist); 29th June, St Peter.

JUNEAU, formerly Harrisburg, a mining and trading town picturesquely situated at the mouth of Gold Creek on the continental shore of Gastineau channel, south-east Alaska, and the capital of Alaska. Pop. (1900), 1864 (450 Indians); (1910), 1644. It has a United States custom-house and court-house. The city has fishing, manufacturing and trading interests, but its prosperity is chiefly due to the gold mines in the adjacent Silver Bow basin, the source of Gold Creek, and the site of the great Perseverance mine, and to those on the Treadwell lode on Douglas Island, 2 m. from Juneau. Placer gold was found at the mouth of the creek in 1879, and the city was settled in 1880 by two prospectors named Joseph Juneau and Richard Harris. The district was called Juneau and the camp Harrisburg by the first settlers; exploring naval officers named the camp Rockwell, in honour of Commander Charles Henry Rockwell, U.S.N. (b. 1840). A town meeting then adopted the name of Juneau. The town was incorporated in 1900. In October 1906 the seat of government of Alaska was removed from Sitka to Juneau.

JUNG, JOHANN HEINRICH (1740–1817), best known by his assumed name of Heinrich Stilling, German author, was born in the village of Grund near Hilchenbach in Westphalia on the 12th of September 1740. His father, Wilhelm Jung, schoolmaster and tailor, was the son of Eberhard Jung, charcoal-burner, and his mother was Dortchen Moritz, daughter of a poor clergyman. Jung became, by his father's desire, schoolmaster and tailor, but found both pursuits equally wearisome. After various teaching appointments he went in 1768 with "half a French dollar" to study medicine at the university of Strassburg. There he met Goethe, who introduced him to Herder. The acquaintance with Goethe ripened into friendship; and it was by his influence that Jung's first and best work, *Heinrich Stillings Jugend* was written. In 1772 he settled at Elberfeld as physician and oculist, and soon became celebrated for operations in cases of cataract. Surgery, however, was not much more to his taste than tailoring or teaching; and in 1778 he was glad to accept the appointment of lecturer on "agriculture, technology, commerce and the veterinary art" in the newly established Kameralschule at Kaiserslautern, a post which he continued to hold when the school was absorbed in the university of Heidelberg. In 1787 he was appointed professor of economical, financial and statistical science in the university of Marburg. In 1803 he resigned his professorship and returned to Heidelberg, where he remained until 1806, when he received a pension from the grand-duke Charles Frederick of Baden, and removed to Karlsruhe, where he remained until his death on the 2nd of April 1817. He was married three times, and left a numerous family. Of his works his autobiography *Heinrich Stillings Leben*, from which he came to be known as Stilling, is the only one now of any interest, and is the chief authority for his life. His early novels reflect the piety of his early surroundings.

A complete edition of his numerous works, in 14 vols. 8vo, was published at Stuttgart in 1835–1838. There are English translations by Sam. Jackson of the *Leben* (1835) and of the *Theorie der Geisterkunde* (London, 1834, and New York, 1851); and of *Theobald, or the Fanatic*, a religious romance, by the Rev. Sam. Schaeffer (1846). See biographies by F. W. Bodemann (1868), J. v. Ewald (1817), Peterson (1890).

JUNG BAHADUR, SIR, MAHARAJA (1816–1877), prime minister of Nepal, was a grand-nephew of Bhim sena Thapa (Bhim sen Thappa), the famous military minister of Nepal, who from 1804 to 1839 was *de facto* ruler of the state under the rani Tripuri and her successor. Bhimsena's supremacy was threatened by the Kala Pandry, and many of his relations, including Jung Bahadur, went into exile in 1838, thus escaping the cruel fate which overtook Bhimsena in the following year. The Pandry leaders, who then reverted to power, were in turn assassinated in 1843, and Matabar Singh, uncle of Jung Bahadur, was created prime minister. He appointed his nephew general and chief judge, but shortly afterwards he was himself put to death. Fateh Jung thereon formed a ministry, of which Jung Bahadur was made military member. In the following year, 1846, a quarrel was fomented, in which Fateh Jung and thirty-two other chiefs were assassinated, and the rani appointed Jung Bahadur sole minister. The rani quickly changed her mind, and planned the death of her new minister, who at once appealed to the maharaja. But the plot failed. The raja and the rani wisely sought safety in India, and Jung Bahadur firmly established his own position by the removal of all dangerous rivals. He succeeded so well that in January 1850 he was able to leave for a visit to England, from which he did not return to Nepal until the 6th of February 1851. On his return, and frequently on subsequent dates, he frustrated conspiracies for his assassination. The reform of the penal code, and a desultory war with Tibet, occupied his attention until news of the Indian Mutiny reached Nepal. Jung Bahadur resisted all overtures from the rebels, and sent a column to Gorakpur in July 1857. In December he furnished a force of 8000 Gurkhas, which reached Lucknow on the 11th of March 1858, and took part in the siege. The moral support of the Nepalese was more valuable even than the military services rendered by them. Jung Bahadur was made a G.C.B., and a tract of country annexed in 1815 was restored to Nepal. Various frontier disputes were settled, and in 1875 Sir Jung Bahadur was on his way to England when he had a fall from his horse in Bombay and returned home. He received a visit from the Prince of Wales in 1876. On the 25th of February 1877 he died, having reached the age of sixty-one. Three of his widows immolated themselves on his funeral pyre. (W. L.-W.)

JUNG-BUNZLAU (Czech, *Mladá Boleslav*), a town of Bohemia, 44 m. N.N.E. of Prague by rail. Pop. (1900), 13,479, mostly Czech. The town contains several old buildings of historical interest, notably the castle, built towards the end of the 10th century, and now used as barracks. There are several old churches. In that of St Maria the celebrated bishop of the Bohemian brethren, Johann August, was buried in 1595; but his tomb was destroyed in 1621. The church of St Bonaventura with the convent, originally belonging to the friars minor and later to the Bohemian brethren, is now a Piaristic college. The church of St Wenceslaus, once a convent of the brotherhood, is now used for military stores. Jung-Bunzlau was built in 995, under Boleslaus II., as the seat of a *gaugraf* or royal count. Early in the 13th century it was given the privileges of a town and pledged to the lords of Michalovic. In the Hussite wars Jung-Bunzlau adhered to the Taborites and became later the metropolis of the Bohemian Brethren. In 1595 Bohuslav of Lobkovic sold his rights as over-lord to the town, which was made a royal city by Rudolf II. During the Thirty Years' War it was twice burned, in 1631 by the imperialists, and in 1640 by the Swedes.

JUNGFRAU, a well-known Swiss mountain (13,669 ft.), admirably seen from Interlaken. It rises on the frontier between the cantons of Bern and of the Valais, and is reckoned among the peaks of the Bernese Oberland, two of which (the Finsteraarhorn, 14,026 ft., and the Aletschhorn, 13,721 ft.) surpass it in height. It was first ascended in 1811 by the brothers Meyer, and again in 1812 by Gottlieb Meyer (son of J. R. Meyer), in both cases by the eastern or Valais side, the foot of which (the final ascent being made by the 1811–1812 route) was reached in 1828 over the Mönchjoch by six peasants from Grindelwald. In 1841 Principal J. D. Forbes, with Agassiz, Desor and Du Châtelier, made the fourth ascent by the 1812 route. It was not till 1865 that Sir George Young and the Rev. H. B. George succeeded in making the first ascent from the west or Interlaken side. This is a far more difficult route than that from the east, the latter being now frequently taken in the course of the summer. (W. A. B. C.)

JUNGLE (Sans. *jāngala*), an Anglo-Indian term for a forest, a thicket, a tangled wilderness. The Hindustani word means strictly waste, uncultivated ground; then such ground covered with trees or long grass; and thence again the Anglo-Indian application is to forest or other wild growth, rather than to the fact that it is not cultivated.

JUNIN, an interior department of central Peru, bounded N. by Huanuco, E. by Loreto and Cuzco, S. by Huancavelica, and W. by Lima and Ancachs. Pop. (1906 estimate), 305,700. It lies wholly within the Andean zone and has an area of 23,353 sq. m. It is rich in minerals, including silver, copper, mercury, bismuth, molybdenum, lead and coal. The Huallaga and Mantaro rivers have their sources in this department, the latter in Lake Junin, or Chanchaycocha, 13,230 ft. above sea-level. The capital of Junin is Cerro de Pasco, and its two principal towns are Jauja and Tarma (pop., 1906, about 12,000 and 5000 respectively).

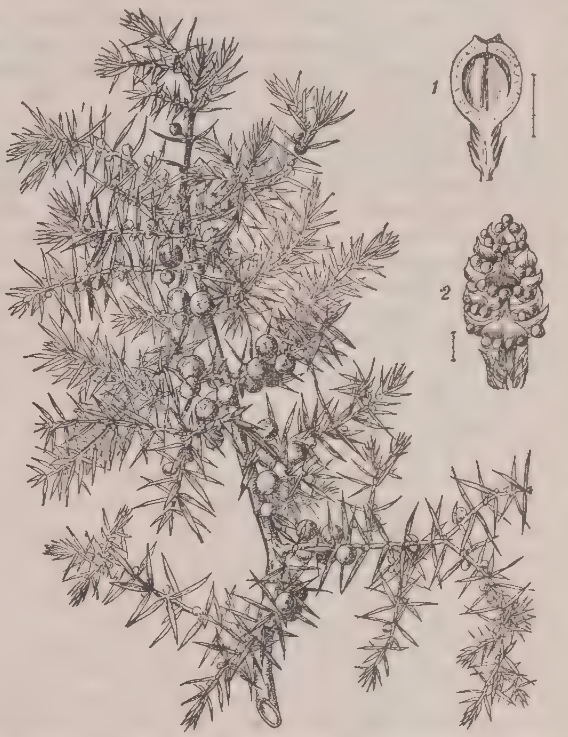
JUNIPER. The junipers, of which there are twenty-five or more species, are evergreen bushy shrubs or low columnar trees, with a more or less aromatic odour, inhabiting the whole of the cold and temperate northern hemisphere, but attaining their maximum development in the Mediterranean region, the North Atlantic islands, and the eastern United States. The leaves are usually articulated at the base, spreading, sharp-pointed and needle-like in form, destitute of oil-glands, and arranged in alternating whorls of three; but in some the leaves are minute and scale-like, closely adhering to the branches, the apex only being free, and furnished with an oil-gland on the back.

Sometimes the same plant produces both kinds of leaves on different branches, or the young plants produce acicular leaves, while those of the older plants are squamiform. The male and female flowers are usually produced on separate plants. The male flowers are developed at the ends of short lateral branches, are rounded or oblong in form, and consist of several antheriferous scales in two or three rows, each scale bearing three or six almost spherical pollen-sacs on its under side. The female flower is a small bud-like cone situated at the apex of a small branch, and consists of two or three whorls of two or three scales. The scales of the upper or middle series each bear one or two erect ovules. The mature cone is fleshy, with the succulent scales fused together and forming the fruit-like structure known to the older botanists as the *galbulus*, or berry of the juniper. The berries are red or purple in colour, varying in size from that of a pea to a nut. They thus differ considerably from the cones of other members of the order Coniferae, of *Gymnosperms* (*q.v.*), to which the junipers belong. The seeds are usually three in number, sometimes fewer (1), rarely more (8), and have the surface near the middle or base marked with large glands containing oil. The genus occurs in a fossil state, four species having been described from rocks of Tertiary age.

The genus is divided into three sections, *Sabina*, *Oxycedrus* and *Caryocedrus*. *Juniperus Sabina* is the savin, abundant on the mountains of central Europe, an irregularly spreading much-branched shrub with scale-like glandular leaves, and emitting a disagreeable odour when bruised. The plant is poisonous, acting as a powerful local and general stimulant, diaphoretic, emmenagogue and anthelmintic; it was formerly employed both internally and externally. The oil of savin is now occasionally used criminally as an abortifacient. *J. bermudiana*, a tree about 40 or 50 ft. in height, yields a fragrant red wood, which was used for the manufacture of " cedar " pencils. The tree is now very scarce in Bermuda, and the " red cedar," *J. virginiana*, of North America is employed instead for pencils and cigar-boxes. The red cedar is abundant in some parts of the United States and in Virginia is a tree 50 ft. in height. It is very widely distributed from the Great Lakes to Florida and round the Gulf of Mexico, and extends as far west as the Rocky Mountains and beyond to Vancouver Island. The wood is applied to many uses in the United States. The fine red fragrant heart-wood takes a high polish, and is much used in cabinet-work and inlaying, but the small size of the planks prevents its more extended use. The galls produced at the ends of the branches have been used in medicine, and the wood yields cedar-camphor and oil of cedar-wood. *J. thurifera* is the incense juniper of Spain and Portugal, and *J. phoenicea* (*J. lycia*) from the Mediterranean district is stated by Loudon to be burned as incense.

J. communis, the common juniper (see fig.), and several other species, belong to the section *Oxycedrus*. The common juniper is a very widely distributed plant, occurring in the whole of northern Europe, central and northern Asia to Kamchatka, and east and west North America. It grows at considerable elevations in southern Europe, in the Alps, Apennines, Pyrenees and Sierra Nevada (4000 to 8000 ft.). It also grows in Asia Minor, Persia, and at great elevations on the Himalayas. In Great Britain it is usually a shrub with spreading branches, less frequently a low tree. In former times the juniper seems to have been a very well-known plant, the name occurring almost unaltered in many languages. The Lat. *juniperus*, probably formed from *juni*—crude form of *juvenis*, fresh, young, and *parere*, to produce, is represented by Fr. *genièvre*, Sp. *enebro*, Ital. *ginepito*, &c. The dialectical names, chiefly in European languages, were collected by Prince L. L. Bonaparte, and published in the *Academy* (July 17, 1880, No. 428, p. 45). The common juniper is official in the British pharmacopoeia and in that of the United States, yielding the oil of juniper, a powerful diuretic, distilled from the unripe fruits. This oil is closely allied in composition to oil of turpentine and is given in doses of a half to three minims. The *Spiritus juniperi* of the British pharmacopoeia is given in doses up to one drachm. Much safer and more powerful diuretics are now in use. The wood is very aromatic and is used for ornamental purposes. In Lapland the bark is made into ropes. The fruits are used for flavouring gin (a name derived from *juniper*, through Fr. *genièvre*); and in some parts of France a kind of beer called *genévrette* was made from them by the peasants. *J. Oxycedrus*, from the Mediterranean district and Madeira, yields cedar-oil which is official in most of the European pharmacopoeias, but not in that of Britain. This oil is largely used by microscopists in what is known as the " oil-immersion lens."

The third section, *Caryocedrus*, consists of a single species, *J. drupacea* of Asia Minor. The fruits are large and edible: they are known in the East by the name *habhel.*



(From Bentley and Trimen's *Medicinal Plants*, by permission of J. & A. Churchill.)
Juniper (*Juniperus communis*).
1. Vertical section of fruit.
2. Male catkin.

JUNIUS, the pseudonym of a writer who contributed a series of letters to the London *Public Advertiser*, from the 21st of January 1769 to the 21st of January 1772. The signature had been already used by him in a letter of the 21st of November 1768, which he did not include in his collection of the *Letters of Junius* published in 1772. The name was chosen in all probability because he had already signed " Lucius " and " Brutus," and wished to exhaust the name of Lucius Junius Brutus the Roman patriot. Whoever the writer was, he wrote under other pseudonyms before, during and after the period between January 1769 and January 1772. He acknowledged that he had written as " Philo-Junius," and there is evidence that he was identical with " Veteran," " Nemesis " and other anonymous correspondents of the *Public Advertiser*. There is a marked distinction between the " letters of Junius " and his so-called miscellaneous letters. The second deal with a variety of subjects, some of a purely personal character, as for instance the alleged injustice of Viscount Barrington the secretary at war to the officials of his department. But the " letters of Junius " had a definite object—to discredit the ministry of the duke of Grafton. This administration had been formed in October 1768, when the earl of Chatham was compelled by ill health to retire from office, and was a reconstruction of his cabinet of July 1766. Junius fought for the return to power of Chatham, who had recovered and was not on good terms with his successors. He communicated with Chatham, with George Grenville, with Wilkes, all enemies of the duke of Grafton, and also with Henry Sampson Woodfall, printer and part owner of the *Public Advertiser*. This private correspondence has been preserved. It is written in the disguised hand used by Junius.

The letters are of interest on three grounds—their political significance, their style, and the mystery which long surrounded their authorship. As political writings they possess no intrinsic value. Junius was wholly destitute of insight, and of the power to disentangle, define and advocate principles. The matter of his letters is always invective. He began by a general attack on the ministry for their personal immorality or meanness. An ill-judged defence of one of the body—the marquess of Granby, commander-in-chief—volunteered by Sir William Draper, gave him an easy victory over a vulnerable opponent. He then went on to pour acrimonious abuse on Grafton, on the duke of Bedford, on King George III. himself in the letter of the 19th of December 1769, and ended with a most malignant and ignorant assault on Lord Chief Justice Mansfield. Several of his accusations were shown to be unfounded. The practical effect of the letters was insignificant. They were noticed and talked about. They provoked anger and retorts. But the letter to the king aroused indignation, and though Grafton's administration fell in January 1770, it was succeeded by the long-lived cabinet of Lord North. Junius confessed himself beaten, in his private letter to Woodfall of the 19th of January 1773. He had materially contributed to his own defeat by his brutal violence. He sinned indeed in a large company. The employment of personal abuse had been habitual in English political controversy for generations, and in the 18th century there was a strong taste for satire. Latin literature, which was not only studied but imitated, supplied the inspiration and the models, in the satires of Juvenal, and the speeches of Cicero against Verres and Catiline.

If, however, Junius was doing what others did, he did it better than anybody else—a fact which sufficiently explains his rapid popularity. His superiority lay in his style. Here also he was by no means original, and he was unequal. There are passages in his writings which can be best described in the words which Burke applied to another writer: "A mere mixture of vinegar and water, at once vapid and sour." But at his best Junius attains to a high degree of artificial elegance and vigour. He shows the influence of Bolingbroke, of Swift, and above all of Tacitus, who appears to have been his favourite author. The imitation is never slavish. Junius adapts, and does not only repeat. The white heat of his malignity animates the whole. No single sentence will show the quality of a style which produces its effect by persistence and repetition, but such a typical passage as follows displays at once the method and the spirit. It is taken from Letter XLIX. to the duke of Grafton, June 22, 1771:—

> "The profound respect I bear to the gracious prince who governs this country with no less honour to himself than satisfaction to his subjects, and who restores you to your rank under his standard, will save you from a multitude of reproaches. The attention I should have paid to your failings is involuntarily attracted to the hand which rewards them; and though I am not so partial to the royal judgment as to affirm that the favour of a king can remove mountains of infamy, it serves to lessen at least, for undoubtedly it divides, the burden. While I remember how much is due to his sacred character, I cannot, with any decent appearance of propriety, call you the meanest and the basest fellow in the kingdom. I protest, my Lord, I do not think you so. You will have a dangerous rival in that kind of fame to which you have hitherto so happily directed your ambition, as long as there is one man living who thinks you worthy of his confidence, and fit to be trusted with any share in his government. . . . With any other prince, the shameful desertion of him in the midst of that distress, which you alone had created, in the very crisis of danger, when he fancied he saw the throne already surrounded by men of virtue and abilities, would have outweighed the memory of your former services. But his majesty is full of justice, and understands the doctrine of compensations; he remembers with gratitude how soon you had accommodated your morals to the necessities of his service, how cheerfully you had abandoned the engagements of private friendship, and renounced the most solemn professions to the public. The sacrifice of Lord Chatham was not lost on him. Even the cowardice and perfidy of deserting him may have done you no disservice in his esteem. The instance was painful, but the principle might please."

What is artificial and stilted in this style did not offend the would-be classic taste of the 18th century, and does not now conceal the fact that the laboriously arranged words, and artfully counterbalanced clauses, convey a venomous hate and scorn.

The pre-established harmony between Junius and his readers accounts for the rapidity of his success, and for the importance attributed to him by Burke and Johnson, far better writers than himself. Before 1772 there appeared at least twelve unauthorized republications of his letters, made by speculative printers. In that year he revised the collection named "*Junius: Stat nominis umbra*," with a dedication to the English people and a preface. Other independent editions followed in quick succession. In 1801 one was published with annotations by Robert Heron. In 1806 another appeared with notes by John Almon. The first new edition of real importance was issued by the Woodfall family in 1812. It contained the correspondence of Junius with H. S. Woodfall, a selection of the miscellaneous letters attributed to Junius, facsimiles of his handwriting, and notes by Dr Mason Good. Curiosity as to the mystery of the authorship began to replace political and literary interest in the writings. Junius himself had been early aware of the advantage he secured by concealment. "The mystery of Junius increases his importance" is his confession in a letter to Wilkes dated the 18th of September 1771. The calculation was a sound one. For two generations after the appearance of the letter of the 21st of January 1769, speculations as to the authorship of Junius were rife, and discussion had hardly ceased in 1910. Joseph Parkes, author with Herman Merivale of the *Memoirs of Sir Philip Francis* (1867), gives a list of more than forty persons who had been supposed to be Junius. They are: Edmund Burke, Lord George Sackville, Lord Chatham, Colonel Barré, Hugh Macaulay Boyd, Dr Butler, John Wilkes, Lord Chesterfield, Henry Flood, William Burke, Gibbon, W. E. Hamilton, Charles Lloyd, Charles Lee (general in the American War of Independence), John Roberts, George Grenville, James Grenville, Lord Temple, Duke of Portland, William Greatrakes, Richard Glover, Sir William Jones, James Hollis, Laughlin Maclean, Philip Rosenhagen, Horne Tooke, John Kent, Henry Grattan, Daniel Wray, Horace Walpole, Alexander Wedderburn (Lord Loughborough), Dunning (Lord Ashburton), Lieut.-General Sir R. Rich, Dr Philip Francis, a "junto" or committee of writers who used a common name, De Lolme, Mrs Catherine Macaulay (1733–91), Sir Philip Francis, Lord Littleton, Wolfram Cornwall and Gov. Thomas Pownall. In the great majority of cases the attribution is based on nothing more than a vague guess. Edmund Burke denied that he could have written the letters of Junius if he would, or would have written them if he could. Grattan pointed out that he was young when they appeared. More plausible claims, such as those made for Lord Temple and Lord George Sackville, could not stand the test of examination. Indeed after 1816 the question was not so much "Who wrote Junius?" as "Was Junius Sir Philip Francis, or some undiscoverable man?" In that year John Taylor was led by a careful study of Woodfall's edition of 1812 to publish *The identity of Junius with a distinguished living character established*, in which he claimed the letters for Sir Philip Francis. He had at first been inclined to attribute them to Sir Philip's father, Dr Francis, the author of translations of Horace and Demosthenes. Taylor applied to Sir Philip, who did not die till 1818, for leave to publish, and received from him answers which to an unwary person might appear to constitute denials of the authorship, but were in fact evasions.

The reasons for believing that Sir Philip Francis (*q.v.*) was Junius are very strong. His evasions were only to be expected. Several of the men he attacked lived nearly as long as himself, the sons of others were conspicuous in society, and King George III. survived him. Sir Philip, who had held office, who had been decorated, and who in his later years was ambitious to obtain the governor-generalship of India, dared not confess that he was Junius. The similarity of his handwriting to the disguised hand used by the writer of the letters is very close. If Sir Philip Francis did, as his family maintain, address a copy of verses to a Miss Giles in the handwriting of Junius (and the evidence that he did is weighty) there can be no further question as to the identity of the two. The similarity of Junius and Francis in regard to their opinions, their likes and dislikes, their knowledge and their known movements, amount, apart from the handwriting, almost to proof. It is certain that many felons have been condemned on circumstantial evidence less complete. The opposition to his claim is based on such assertions as that his known handwriting was inferior to the feigned hand of Junius, and that no man can make a disguised hand better than his own. But the first assertion is unfounded, and the second is a mere expression of opinion. It is also said that Francis must have been guilty of baseness if he wrote Junius, but if that explains why he did not avow the authorship it can be shown to constitute a moral impossibility only by an examination of his life.

AUTHORITIES.—The best edition of the *Letters of Junius*, properly so called, with the *Miscellaneous Letters*, is that of J. Ward (1854). The most valuable contributions to the controversy as to the authorship are: *The Handwriting of Junius investigated by Charles Chabot, expert, with preface and collateral evidence by the Hon. E. Twisleton* (1871); *Memoirs of Sir Philip Francis, K.C.B.*, by Parkes and Merivale (1867); *Junius Revealed by his Surviving Grandson*, by H. R. Francis (1894); *The Francis Letters*, edited by Beata Francis and Eliza Keary, with a note on the Junius controversy by C. F. Keary (1901); and "Francis, Sir Philip," by Sir Leslie Stephen, in *Dict. of Nat. Biog.* The case for those who decline to accept the claim of Sir Philip Francis is stated by C. W. Dilke, *Papers of a Critic* (1875), and Abraham Hayward, *More about Junius, Franciscan Theory Unsound* (1868). (D. H.)

JUNIUS, FRANZ (in French, François du Jon), the name of two Huguenot scholars.

(1) FRANZ JUNIUS (1545–1602) was born at Bourges in France on the 1st of May 1545. He had studied law for two years under Hugo Donellus (1527–1591) when he was given a place in the retinue of the French ambassador to Constantinople, but before he reached Lyons the ambassador had departed. Junius found ample consolation in the opportunities for study at the gymnasium at Lyons. A religious tumult warned him back to Bourges, where he was cured of certain rationalistic principles that he had imbibed at Lyons, and he determined to enter the reformed church. He went in 1562 to study at Geneva, where he was reduced to the direst poverty by the failure of remittances from home, owing to civil war in France. He would accept only the barest sustenance from a humble friend who had himself been a protégé of Junius's family at Bourges, and his health was permanently injured. The long-expected remittance from home was closely followed by the news of the brutal murder of his father by a Catholic fanatic at Issoudun; and Junius resolved to remain at Geneva, where his reputation enabled him to live by teaching. In 1565, however, he was appointed minister of the Walloon church at Antwerp. His foreign birth excluded him from the privileges of the native reformed pastors, and exposed him to persecution. Several times he barely escaped arrest, and finally, after spending six months in preaching at Limburg, he was forced to retire to Heidelberg in 1567. There he was welcomed by the elector Frederick II., and temporarily settled in charge of the Walloon church at Schönau; but in 1568 his patron sent him as chaplain with Prince William of Orange in his unfortunate expedition to the Netherlands. Junius escaped as soon as he could from that post, and returning to his church remained there till 1573. From 1573 till 1578 he was at Heidelberg, assisting Emmanuel Tremellius (1510–1580), whose daughter he married, in his Latin version of the Old Testament (Frankfort, 1579); in 1581 he was appointed to the chair of divinity at Heidelberg. Thence he was taken to France by the duke of Bouillon, and after an interview with Henry IV. was sent again to Germany on a mission. As he was returning to France he was named professor of theology at Leiden, where he died on the 13th of October 1602.

He was a voluminous writer on theological subjects, and translated and composed many exegetical works. He is best known from his own edition of the Latin Old Testament, slightly altered from the former joint edition, and with a version of the New Testament added (Geneva, 1590; Hanover, 1624). The *Opera Theologica Francisci Junii Biturigis* were published at Geneva (2 vols., 1613), to which is prefixed his autobiography, written about 1592 (new ed., edited by Abraham Kuypers, 1882 seq.). The autobiography had been published at Leiden (1595), and is reprinted in the *Miscellanea Groningana*, vol. i., along with a list of the author's other writings.

(2) FRANZ JUNIUS (1589–1677), son of the above, was born at Heidelberg, and brought up at Leiden. His attention was diverted from military to theological studies by the peace of 1609 between Spain and the Netherlands. In 1617 he became pastor at Hillegondsberg, but in 1620 went to England, where he became librarian to Thomas Howard, earl of Arundel, and tutor to his son. He remained in England thirty years, devoting himself to the study of Anglo-Saxon, and afterwards of the cognate old Teutonic languages. His work, intrinsically valuable, is important as having aroused interest in a frequently neglected subject. In 1651 he returned to Holland; and for two years lived in Friesland in order to study the old dialect. In 1675 he returned to England, and during the next year resided in Oxford; in 1677 he went to live at Windsor with his nephew, Isaac Vossius, in whose house he died on the 19th of November 1677. He was buried at Windsor in St George's Chapel.

He was pre-eminently a student. He published *De pictura veterum* (1637) (in English by the author, 1638; enlarged and improved edition, edited by J. G. Graevius, who prefixed a life of Junius, with a catalogue of architects, painters, &c., and their works, Rotterdam, 1694); *Observationes in Willerami Abbatis francicam paraphrasin cantici canticorum* (Amsterdam, 1655); *Annotationes in harmoniam latino-francicam quatuor evangelistarum, latine a Tatiano confectam* (Amsterdam, 1655); *Caedmonis monachi paraphrasis poetica geneseos* (Amsterdam, 1655) (see criticism under CAEDMON); *Quatuor D.N.I.C. evangeliorum versiones perantiquae duae, gothica scilicet et anglo-saxonica* (Dort, 2 vols., 1665) (the Gothic version in this book Junius transcribed from the Silver Codex of Ulfilas; the Anglo-Saxon version is from an edition by Thomas Marshall, whose notes to both versions are given, and a Gothic glossary by Junius); *Etymologicum anglicanum*, edited by Edward Lye, and preceded by a life of Junius and George Hickes's Anglo-Saxon grammar (Oxford, 1743) (its results require careful verification in the light of modern research). His rich collection of ancient MSS., edited and annotated by him, Junius bequeathed to the university of Oxford. Graevius gives a list of them; the most important are a version of the *Ormulum*, the version of Caedmon, and 9 volumes containing *Glossarium v. linguarum septentrionalium*.

JUNK. (1) (Through Port. *junco*, adapted from Javanese *djong*, or Malayan *adjong*, ship), the name of the native sailing vessel, common to the far eastern seas, and especially used by the Chinese and Javanese. It is a flat-bottomed, high-sterned vessel with square bows and masts carrying lug-sails, often made of matting. (2) A nautical term for small pieces of disused rope or cable, cut up to make fenders, oakum, &c., hence applied colloquially by sailors to the salt beef and pork used on board ship. The word is of doubtful origin, but may be connected with "junk" (Lat. *juncus*), a reed, or rush. This word is now obsolete except as applied to a form of surgical appliance, used as a support in cases of fracture where immediate setting is impossible, and consisting of a shaped pillow or cushion stuffed with straw or horsehair, formerly with rushes or reeds.

JUNKER, WILHELM (1840–1892), German explorer of Africa, was born at Moscow on the 6th of April 1840. He studied medicine at Dorpat, Göttingen, Berlin and Prague, but did not practise for long. After a series of short journeys to Iceland, Tunis and Lower Egypt, he remained almost continuously in eastern Equatorial Africa from 1875 to 1886, making first Khartum and afterwards Lado the base of his expeditions, Junker was a leisurely traveller and a careful observer; his main object was to study the peoples with whom he came into contact, and to collect specimens of plants and animals, and the result of his investigations in these particulars is given in his *Reisen in Afrika* (3 vols., Vienna, 1889–1891), a work of high merit. An English translation by A. H. Keane was published in 1890–1892. Perhaps the greatest service he rendered to geographical science was his investigation of the Nile-Congo watershed, when he successfully combated Georg Schweinfurth's hydrographical theories and established the identity of the Welle and Ubangi. The Mahdist rising prevented his return to Europe through the Sudan, as he had planned to do, in 1884, and an expedition, fitted out in 1885 by his brother in St Petersburg, failed to reach him. Junker then determined to go south. Leaving Wadelai on the 2nd of January 1886 he travelled by way of Uganda and Tabora and reached Zanzibar in December 1886. In 1887 he received the gold medal of the Royal Geographical Society. As an explorer Junker is entitled to high rank, his ethnographical observations in the Niam-Niam (Azandeh) country being especially valuable. He died at St Petersburg on the 13th of February 1892.

See the biographical notice by E. G. Ravenstein in *Proceedings of the Royal Geographical Society* (1892), pp. 185–187.

JUNKET, a dish of milk curdled by rennet, served with clotted cream and flavoured with nutmeg, which is particularly associated in England with Devonshire and Cornwall. The word is of somewhat obscure history. It appears to come through O. Fr. *jonquette*, a rush-basket, from Lat. *juncus*, rush. In Norman dialect this word is used of a cream cheese. The commonly accepted origin is that it refers to the rush-basket on which such cream cheeses or curds were served. *Juncade* appears in Rabelais, and is explained by Cotgrave as "spoonmeat, rose-water and sugar." Nicholas Udall (in his translation of Erasmus's *Apophthegms*, 1542) speaks of "marchepaines or wafers with other like junkerie." The word "junket" is also used for a festivity or picnic.

JUNO, the chief Roman and Latin goddess, and the special object of worship by women at all the critical moments of life. The etymology of the name is not certain, but it is usually taken as a shortened form of *Jovino*, answering to *Jovis*, from a root *div*, shining. Under Greek influence Juno was early identified with the Greek Hera, with whose cult and characteristics she has much in common; thus the Juno with whom we are familiar in Latin literature is not the true Roman deity. In the *Aeneid*, for example, her policy is antagonistic to the plans of Jupiter for the conquest of Latium and the future greatness of Rome; though in the fourth *Eclogue*, as Lucina, she appears in her proper rôle as assisting at childbirth. It was under Greek influence again that she became the wife of Jupiter, the mother of Mars; the true Roman had no such personal interest in his deities as to invent family relations for them.

That Juno was especially a deity of women, and represents in a sense the female principle of life, is seen in the fact that as every man had his *genius*, so every woman had her Juno; and the goddess herself may have been a development of this conception. The various forms of her cult all show her in close connexion with women. As Juno Lucina she was invoked in childbirth, and on the 1st of March, the old Roman New Year's day, the matrons met and made offerings at her temple in a grove on the Esquiline; hence the day was known as the *Matronalia*. As *Caprotina* she was especially worshipped by female slaves on the 7th of July (*Nonae Caprotinae*); as *Sospita* she was invoked all over Latium as the saviour of women in their perils, and later as the saviour of the state; and under a number of other titles, *Cinxia*, *Unxia*, *Pronuba*, &c., we find her taking a leading part in the ritual of marriage. Her real or supposed connexion with the moon is explained by the alleged influence of the moon on the lives of women; thus she became the deity of the Kalends, or day of the new moon, when the *regina sacrorum* offered a lamb to her in the *regia*, and her husband the *rex* made known to the people the day on which the Nones would fall. Thus she is brought into close relation with Janus, who also was worshipped on the Kalends by the *rex sacrorum*, and it may be that in the oldest Roman religion these two were more closely connected than Juno and Jupiter. But in historical times she was associated with Jupiter in the great temple on the Capitoline hill as Juno *Regina*, the queen of all Junones or queen of heaven, as Jupiter there was *Optimus Maximus* (see JUPITER), and under the same title she was enticed from Veii after its capture in 392 B.C., and settled in a temple on the Aventine. Thus exalted above all other female deities, she was prepared for that identification with Hera which was alluded to above. That she was in some sense a deity of light seems certain; as Lucina, *e.g.*, she introduced new-born infants "in luminis oras."

See Roscher's article "Juno" in his Lexicon of Mythology, and his earlier treatise on Juno and Hera; Wissowa, *Religion und Kultus der Römer*, 113 foll.; also a fresh discussion by Walter Otto in *Philologus* for 1905 (p. 161 foll.). (W. W. F.*)

JUNOT, ANDOCHE, DUKE OF ABRANTES (1771–1813), French general, was born at Bussy-le-Grand (Côte d'Or), on the 23rd of October 1771. He went to school at Chatillon, and was known among his comrades as a blustering but lovable creature, with a pugnacious disposition. He was studying law in Paris at the outbreak of the Revolution and joined a volunteer battalion. He distinguished himself by his valour in the first year of the Revolutionary wars, and came under the special notice of Napoleon Bonaparte during the siege of Toulon, while serving as his secretary. It is related that as he was taking down a despatch, a shell burst hard by and covered the paper with sand, whereupon he exclaimed, "Bien! nous n'avions pas de sable pour sécher l'encre! en voici!" He remained the faithful companion of his chief during the latter's temporary disgrace, and went with him to Italy as aide-de-camp. He distinguished himself so much at the battle of Millesimo that he was selected to carry back the captured colours to Paris; returning to Italy he went through the campaign with honour, but was badly wounded in the head at Lonato. Many rash incidents in his career may be traced to this wound, from which he never completely recovered. During the expedition to Egypt he became a general of brigade. His devotion to Bonaparte involved him in a duel with General Lanusse, in which he was again wounded. He had to be left in Egypt to recover, and in crossing to France was captured by English cruisers. On his return to France he was made commandant of Paris, and afterwards promoted general of division. It was at this time that he married Laure Permon (see JUNOT, LAURE). He next served at Arras in command of the grenadiers of the army destined for the invasion of England, and made some alterations in the equipment of the troops which received the praise of the emperor. It was, however, a bitter mortification that he was not appointed a marshal of France when he received the grand cross of the legion of honour. He was made colonel-general of hussars instead and sent as ambassador to Lisbon, his entry into which city resembled a royal progress. But he was so restless and dissatisfied in the Portuguese capital that he set out, without leave, for the army of Napoleon, with which he took part in the battle of Austerlitz, behaving with his usual courage and zeal. But he soon gave fresh offence. Although his early devotion was never forgotten by the emperor, his uncertain temper and want of self-control made it dangerous to employ him at court or headquarters, and he was sent to Parma to put down an insurrection and to be out of the way. In 1806 he was recalled and became governor of Paris. His extravagance and prodigality shocked the government, and some rumours of an intrigue with a lady of the imperial family—it is said Pauline Bonaparte—made it desirable again to send him away. He was therefore appointed to lead an invading force into Portugal. For the first time Junot had a great task to perform, and only his own resources to fall back upon for its achievement. Early in November 1807 he set out from Salamanca, crossed the mountains of Beira, rallied his wearied forces at Abrantes, and, with 1500 men, dashed upon Lisbon, in order, if possible, to seize the Portuguese fleet, which had, however, just sailed away with the regent and court to Brazil. The whole movement only took a month; it was undoubtedly bold and well-conducted, and Junot was made duke of Abrantes and invested with the governorship of Portugal. But administration was his weak point. He was not a civil governor, but a *sabreur*, brave, truculent, and also dissipated and rapacious, though in the last respect he was far from being the worst offender amongst the French generals in Spain. His hold on Portugal was never supported by a really adequate force, and his own conduct, which resembled that of an eastern monarch, did nothing to consolidate his conquest. After Wellesley encountered him at Vimiera (see PENINSULAR WAR) he was obliged to conclude the so-called convention of Cintra, and to withdraw from Portugal with all his forces. Napoleon was furious, but, as he said, was spared the necessity of sending his old friend before a court martial by the fact that the English put their own generals on their trial. Junot was sent back to Spain, where, in 1810–1811, acting under Masséna, he was once more seriously wounded. His last campaign was made in Russia, and he received more than a just share of discredit for it. Napoleon next appointed him to govern Illyria. But Junot's mind had become deranged under the weight of his misfortunes, and on the 29th of July 1813, at Montbard, he threw himself from a window in a fit of insanity.

JUNOT, LAURE, DUCHESS OF ABRANTES (1783–1834), wife of the preceding, was born at Montpellier. She was the daughter of Mme. Permon, to whom during her widowhood the young Bonaparte made an offer of marriage—such at least is the version presented by the daughter in her celebrated *Memoirs.* The Permon family, after various vicissitudes, settled at Paris, and Bonaparte certainly frequented their house a good deal after the downfall of the Jacobin party in Thermidor 1794. Mlle. Permon was married to Junot early in the consulate, and at once entered eagerly into all the gaieties of Paris, and became noted for her beauty, her caustic wit, and her extravagance. The first consul nicknamed her *petite peste*, but treated her and Junot with the utmost generosity, a fact which did not restrain her sarcasms and slanders in her portrayal of him in her *Memoirs.* During Junot's diplomatic mission to Lisbon, his wife displayed her prodigality so that on his return to Paris in 1806 he was burdened with debts, which his own intrigues did not lessen. She joined him again at Lisbon after he had entered that city as conqueror at the close of 1807; but even the presents and spoils won at Lisbon did not satisfy her demands; she accompanied Junot through part of the Peninsular War. On her return to France she displeased the emperor by her vivacious remarks and by receiving guests whom he disliked. The mental malady of Junot thereafter threatened her with ruin; this perhaps explains why she took some part in the intrigues for bringing back the Bourbons in 1814. She did not side with Napoleon during the Hundred Days. After 1815 she spent most of her time at Rome amidst artistic society, which she enlivened with her sprightly converse. She also compiled her spirited but somewhat spiteful *Memoirs*, which were published at Paris in 1831–1834 in 18 volumes. Many editions have since appeared.

Of her other books the most noteworthy are *Histoires contemporaines* (2 vols., 1835); *Scènes de la vie espagnole* (2 vols., 1836); *Histoire des salons de Paris* (6 vols., 1837–1838); *Souvenirs d'une ambassade et d'un séjour en Espagne et en Portugal, de 1808 à 1811* (2 vols., 1837). (J. HL. R.)

JUNTA (from *juntar*, to join), a Spanish word meaning (1) any meeting for a common purpose; (2) a committee; (3) an administrative council or board. The original meaning is now rather lost in the two derivative significations. The Spaniards have even begun to make use of the barbarism *mêtin*, corrupted from the English "meeting." The word *junta* has always been and still is used in the other senses. Some of the boards by which the Spanish administration was conducted under the Habsburg and the earlier Bourbon kings were styled *juntas*. The superior governing body of the Inquisition was the *junta suprema*. The provincial committees formed to organize resistance to Napoleon's invasion in 1808 were so called, and so was the general committee chosen from among them to represent the nation. In the War of Independence (1808–1814), and in all subsequent civil wars or revolutionary disturbances in Spain or Spanish America, the local executive bodies, elected, or in some cases self-chosen, to appoint officers, raise money and soldiers, look after the wounded, and discharge the functions of an administration, have been known as juntas.

The form "Junto," a corruption due to other Spanish words ending in *-o*, came into use in English in the 17th century, often in a disparaging sense, of a party united for a political purpose, a faction or cabal; it was particularly applied to the advisers of Charles I., to the Rump under Cromwell, and to the leading members of the great Whig houses who controlled the government in the reigns of William III. and Anne.

JUPITER, the chief deity of the Roman state. The great and constantly growing influence exerted from a very early period on Rome by the superior civilization of Greece not only caused a modification of the Roman god on the analogy of Zeus, the supreme deity of the Greeks, but led the Latin writers to identify the one with the other, and to attribute to Jupiter myths and family relations which were purely Greek and never belonged to the real Roman religion. The Jupiter of actual worship was a Roman god; the Jupiter of Latin literature was more than half Greek. This identification was facilitated by the community of character which really belonged to Jupiter and Zeus as the Roman and Greek developments of a common original conception of the god of the light and the heaven.

That this was the original idea of Jupiter, not only in Rome, but among all Italian peoples, admits of no doubt. The earliest form of his name was *Diovis pater*, or *Diespiter*, and his special priest was the flamen dialis; all these words point to a root *div*, shining, and the connexion with *dies*, day, is obvious (cf. JUNO). One of his most ancient epithets is *Lucetius*, the light-bringer; and later literature has preserved the same idea in such phrases as *sub Jove*, under the open sky. All days of the full moon (*idus*) were sacred to him; all emanations from the sky were due to him and in the oldest form of religious thought were probably believed to be manifestations of the god himself. As Jupiter *Elicius* he was propitiated, with a peculiar ritual, to send rain in time of drought; as Jupiter *Fulgur* he had an altar in the Campus Martius, and all places struck by lightning were made his property and guarded from the profane by a circular wall. The vintage, which needs especially the light and heat of the sun, was under his particular care, and in the festivals connected with it (*Vinalia urbana*) and *Meditrinalia*, he was the deity invoked, and his flamen the priest employed. Throughout Italy we find him worshipped on the summits of hills, where nothing intervened between earth and heaven, and where all the phenomena of the sky could be conveniently observed. Thus on the Alban hill south of Rome was an ancient seat of his worship as Jupiter *Latiaris*, which was the centre of the league of thirty Latin cities of which Rome was originally an ordinary member. At Rome itself it is on the Capitoline hill that we find his oldest temple, described by Livy (i. 10); here we have a tradition of his sacred tree, the oak, common to the worship both of Zeus and Jupiter, and here too was kept the *lapis silex*, perhaps a celt, believed to have been a thunderbolt, which was used symbolically by the fetiales when officially declaring war and making treaties on behalf of the Roman state. Hence the curious form of oath, *Jovem lapidem jurare*, used both in public and private life at Rome.

In this oldest Jupiter of the Latins and Romans, the god of the light and the heaven, and the god invoked in taking the most solemn oaths, we may undoubtedly see not only the great protecting deity of the race, but one, and perhaps the only one, whose worship embodies a distinct moral conception. He is specially concerned with oaths, treaties and leagues, and it was in the presence of his priest that the most ancient and sacred form of marriage, *confarreatio*, took place. The lesser deities, Dius Fidius and Fides, were probably originally identical with him, and only gained a separate existence in course of time by a process familiar to students of ancient religion. This connexion with the conscience, with the sense of obligation and right dealing, was never quite lost throughout Roman history. In Virgil's great poem, though Jupiter is in many ways as much Greek as Roman, he is still the great protecting deity who keeps the hero in the path of duty (*pietas*) towards gods, state and family.

But this aspect of Jupiter gained a new force and meaning at the close of the monarchy with the building of the famous temple on the Capitol, of which the foundations are still to be seen. It was dedicated to Jupiter *Optimus Maximus*, *i.e.* the best and greatest of all the Jupiters, and with him were associated

Juno and Minerva, in a fashion which clearly indicates a Graeco-Etruscan origin; for the combination of three deities in one temple was foreign to the ancient Roman religion, while it is found both in Greece and Etruria. This temple was built on a scale of magnificence quite unknown to primitive Rome, and was beyond doubt the work of Etruscan architects employed, we may presume, by the Tarquinii. Its three *cellae* contained the statues of the three deities, with Jupiter in the middle holding his thunderbolt. Henceforward it was the centre of the religious life of the state, and symbolized its unity and strength. Its dedication festival fell on the 13th of September, on which day the consuls originally succeeded to office; accompanied by the senate and other magistrates and priests, and in fulfilment of a vow made by their predecessors, they offered to the great god a white heifer, his favourite sacrifice, and after rendering thanks for the preservation of the state during the past year, made the same vow as that by which they themselves had been bound. Then followed the *epulum Jovis* or feast of Jupiter, in which the three deities seem to have been visibly present in the form of their statues, Jupiter having a couch and each goddess a *sella*, and shared the meal with senate and magistrates. In later times this day became the central point of the great Roman games (*ludi Romani*), originally games vowed in honour of the god if he brought a war to a successful issue. When a victorious army returned home, it was to this temple that the triumphal procession passed, and the triumph of which we hear so often in Roman history may be taken as a religious ceremonial in honour of Jupiter. The general was dressed and painted to resemble the statue of Jupiter himself, and was drawn on a gilded chariot by four white horses through the Porta Triumphalis to the Capitol, where he offered a solemn sacrifice to the god, and laid on his knees the victor's laurels (see TRIUMPH).

Throughout the period of the Republic the great god of the Capitol in his temple looking down on the Forum continued to overshadow all other worships as the one in which the whole state was concerned, in all its length and breadth, rather than any one gens or family. Under Augustus and the new monarchy it is sometimes said that the Capitoline worship suffered to some extent an eclipse (J. B. Carter, *The Religion of Numa*, p. 160 seq.); and it is true that as it was the policy of Augustus to identify the state with the interests of his own family, he did what was feasible to direct the attention of the people to the worships in which he and his family were specially concerned; thus his temple of Apollo on the Palatine, and that of Mars Ultor in the Forum Augusti, took over a few of the prerogatives of the cult on the Capitol. But Augustus was far too shrewd to attempt to oust Jupiter Optimus Maximus from his paramount position; and he became the protecting deity of the reigning emperor as representing the state, as he had been the protecting deity of the free republic. His worship spread over the whole empire; it is probable that every city had its temple to the three deities of the Roman Capitol, and the fact that the Romans chose the name of Jupiter in almost every case, by which to indicate the chief deity of the subject peoples, proves that they continued to regard him, so long as his worship existed at all, as the god whom they themselves looked upon as greatest.

See ZEUS, ROMAN RELIGION. Excellent accounts of Jupiter may be found in Roscher's *Mythological Lexicon*, and in Wissowa's *Religion und Kultus der Römer* (p. 100 seq.).

(W. M. RA.; W. W. F.*)

JUPITER, in astronomy, the largest planet of the solar system; his size is so great that it exceeds the collective mass of all the others in the proportion of 5 to 2. He travels in his orbit at a mean distance from the sun exceeding that of the earth 5·2 times, or 483,000,000 miles. The eccentricity of this orbit is considerable, amounting to 0·048, so that his maximum and minimum distances are 504,000,000 and 462,000,000 miles respectively. When in opposition and at his mean distance, he is situated 390,000,000 miles from the earth. His orbit is inclined about 1° 18′ 40″ to the ecliptic. His sidereal revolution is completed in 4332·585 days or 11 years 314·9 days, and his synodical period, or the mean interval separating his returns to opposition, amounts to 398·87 days. His real polar and equatorial diameters measure 84,570 and 90,190 miles respectively, so that the mean is 87,380 miles. His apparent diameter (equatorial) as seen from the earth varies from about 32″, when in conjunction with the sun, to 50″ in opposition to that luminary. The oblateness, or compression, of his globe amounts to about $\frac{1}{16}$; his volume exceeds that of the earth 1390 times, while his mass is about 300 times greater. These values are believed to be as accurate as the best modern determinations allow, but there are some differences amongst various observers and absolute exactness cannot be obtained.

The discovery of telescopic construction early in the 17th century and the practical use of the telescope by Galileo and others greatly enriched our knowledge of Jupiter and his system. Four of the satellites were detected in 1610, but the dark bands or belts on the globe of the planet do not appear to have been noticed until twenty years later. Though Galileo first sighted the satellites and perseveringly studied the Jovian orb, he failed to distinguish the belts, and we have to conclude either that these features were unusually faint at the period of his observations, or that his telescopes were insufficiently powerful to render them visible. The belts were first recognized by Nicolas Zucchi and Daniel Bartoli on the 17th of May 1630. They were seen also by Francesco Fontana in the same and immediately succeeding years, and by other observers of about the same period, including Zuppi, Giovanni Battista Riccioli and Francesco Maria Grimaldi. Improvements in telescopes were quickly introduced, and between 1655 and 1666 C. Huygens, R. Hooke and J. D. Cassini made more effective observations. Hooke discovered a large dark spot in the planet's southern hemisphere on the 19th of May 1664, and from this object Cassini determined the rotation period, in 1665 and later years, as 9 hours 56 minutes.

The belts, spots and irregular markings on Jupiter have now been assiduously studied during nearly three centuries. These markings are extremely variable in their tones, tints and relative velocities, and there is little reason to doubt that they are atmospheric formations floating above the surface of the planet in a series of different currents. Certain of the markings appear to be fairly durable, though their rates of motion exhibit considerable anomalies and prove that they must be quite detached from the actual sphere of Jupiter. At various times determinations of the rotation period were made as follows:—

Date.	*Observer.*	*Period.*	*Place of Spot.*
1672	J. D. Cassini	9 h. 55 m. 50 s.	Lat. 16° S.
1692	,,	9 h. 50 m.	Equator.
1708	J. P. Maraldi	9 h. 55 m. 48 s.	S. tropical zone
1773	J. Sylvabelle	9 h. 56 m.	,, ,,
1788	J. H. Schröter	9 h. 55 m. 33·6 s.	Lat. 12° N.
1788	,,	9 h. 55 m. 17·6 s.	Lat. 20° S.
1835	J. H. Mädler	9 h. 55 m. 26·5 s.	Lat. 5° N.
1835	G. B. Airy	9 h. 55 m. 21·3 s.	N. tropical zone.

A great number of Jovian features have been traced in more recent years and their rotation periods ascertained. According to the researches of Stanley Williams the rates of motion for different latitudes of the planet are approximately as under:—

Latitude.	*Rotation Period.*
+85° to +28°	9 h. 55 m. 37·5 s.
+28° to +24°	9 h. 54½ m. to 9 h. 56½ m.
+24° to +20°	9 h. 48 m. to 9 h. 49½ m.
+20° to +10°	9 h. 55 m. 33·9 s.
+10° to −12°	9 h. 50 m. 20 s.
−12° to −18°	9 h. 55 m. 40 s.
−18° to −37°	9 h. 55 m. 18·1 s.
−37° to −55°	9 h. 55 m. 5 s.

W. F. Denning gives the following relative periods for the years 1898 to 1905:—

Latitude.	*Rotation Period.*
N.N. temperate	9 h. 55 m. 41·5 s.
N. temperate	9 h. 55 m. 53·8 s.
N. tropical	9 h. 55 m. 30 s.
Equatorial	9 h. 50 m. 27 s.
S. temperate	9 h. 55 m. 19·5 s.
S.S. temperate	9 h. 55 m. 7 s.

The above are the mean periods derived from a large number of markings. The bay or hollow in the great southern equatorial belt north of the red spot has perhaps been observed for a longer period than any other feature on Jupiter except the red spot itself. H. Schwabe saw the hollow in the belt on the 5th of September 1831 and on many subsequent dates. The rotation period of this object during the seventy years to the 5th of September 1901 was 9 h. 55 m. 36 s. from 61,813 rotations. Since 1901 the mean period has been 9 h. 55 m. 40 s., but it has fluctuated between 9 h. 55 m. 38 s. and 9 h. 55 m. 42 s. The motion of the various features is not therefore dependent upon their latitude, though at the equator the rate seems swifter as a rule than in other zones. But exceptions occur, for in 1880 some spots appeared in about 23° N. which rotated in 9 h. 48 m. though in the region immediately N. of this the spot motion is ordinarily the slowest of all and averages 9 h. 55 m. 53·8 s. (from twenty determinations). These differences of speed remind us of the sun-spots and their proper motions. The solar envelope, however, appears to show a pretty regular retardation towards the poles, for according to Gustav Spörer's formula, while the equatorial period is 25 d. 2 h. 15 m. the latitudes 46° N. and S. give a period of 28 d. 15 h. 0 m.

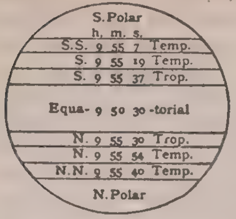


FIG. 1.—Inverted disk of Jupiter, showing the different currents and their rates of rotation.

The Jovian currents flow in a due east and west direction as though mainly influenced by the swift rotatory movement of the globe, and exhibit little sign of deviation either to N. or S. These currents do not blend and pass gradually into each other, but seem to be definitely bounded and controlled by separate phenomena well capable of preserving their individuality. Occasionally, it is true, there have been slanting belts on Jupiter (a prominent example occurred in the spring of 1861), as though the materials were evolved with some force in a polar direction, but these oblique formations have usually spread out in longitude and ultimately formed bands parallel with the equator. The longitudinal currents do not individually present us with an equable rate of motion. In fact they display some curious irregularities, the spots carried along in them apparently oscillating to and fro without any reference to fixed periods or cyclical variations. Thus the equatorial current in 1880 moved at the rate of 9 h. 50 m. 6 s. whereas in 1905 it was 9 h. 50 m. 33 s. The red spot in the S. tropical zone gave 9 h. 55 m. 34 s. in 1879–1880, whereas during 1900–1908 it has varied a little on either side of 9 h. 55 m. 40·6 s. Clearly therefore no fixed period of rotation can be applied for any spot since it is subject to drifts E. or W. and these drifts sometimes come into operation suddenly, and may be either temporary or durable. Between 1878 and 1900 the red spot in the planet's S. hemisphere showed a continuous retardation of speed.

It must be remembered that in speaking of the rotation of these markings, we are simply alluding to the irregularities in the vaporous envelope of Jupiter. The rotation of the planet itself is another matter and its value is not yet exactly known, though it is probably little different from that of the markings, and especially from those of the most durable character, which indicate a period of about 9 h. 56 m. We never discern the actual landscape of Jupiter or any of the individual forms really diversifying it.

Possibly the red spot which became so striking an object in 1878, and which still remains faintly visible on the planet, is the same feature as that discovered by R. Hooke in 1664 and watched by Cassini in following years. It was situated in approximately the same latitude of the planet and appears to have been hidden temporarily during several periods up to 1713. But the lack of fairly continuous observations of this particular marking makes its identity with the present spot extremely doubtful. The latter was seen by W. R. Dawes in 1857, by Sir W. Huggins in 1858, by J. Baxendell in 1859, by Lord Rosse and R. Copeland in 1873, by H. C. Russell in 1876–1877, and in later years it has formed an object of general observation. In fact it may safely be said that no planetary marking has ever aroused such widespread interest and attracted such frequent observation as the great red spot on Jupiter.

The slight inclination of the equator of this planet to the plane of his orbit suggests that he experiences few seasonal changes. From the conditions we are, in fact, led to expect a prevailing calm in his atmosphere, the more so from the circumstance that the amount of the sun's heat poured upon each square mile of it is (on the average) less than the 27th part of that received by each square mile of the earth's surface. Moreover, the seasons of Jupiter have nearly twelve times the duration of ours, so that it would be naturally expected that changes in his atmosphere produced by solar action take place with extreme slowness. But this is very far from being the case. Telescopes reveal the indications of rapid changes and extensive disturbances in the aspect and material forming the belts. New spots covering large areas frequently appear and as frequently decay and vanish, implying an agitated condition of the Jovian atmosphere, and leading us to admit the operation of causes much more active than the heating influence of the sun.

When we institute a comparison between Jupiter and the earth on the basis that the atmosphere of the former planet bears the same relation to his mass as the atmosphere of the earth bears to her mass, we find that a state of things must prevail on Jupiter very dissimilar to that affecting our own globe. The density of the Jovian atmosphere we should expect to be fully six times as great as the density of our air at sea-level, while it would be comparatively shallow. But the telescopic aspect of Jupiter apparently negatives the latter supposition. The belts and spots grow faint as they approach the limb, and disappear as they near the edge of the disk, thus indicating a dense and deep atmosphere. R. A. Proctor considered that the observed features suggested inherent heat, and adopted this conclusion as best explaining the surface phenomena of the planet. He regarded Jupiter as belonging, on account of his immense size, to a different class of bodies from the earth, and was led to believe that there existed greater analogy between Jupiter and the sun than between Jupiter and the earth. Thus the density of the sun, like that of Jupiter, is small compared with the earth's; in fact, the mean density of the sun is almost identical with that of Jupiter, and the belts of the latter planet may be much more aptly compared with the spot zones of the sun than with the trade zones of the earth.

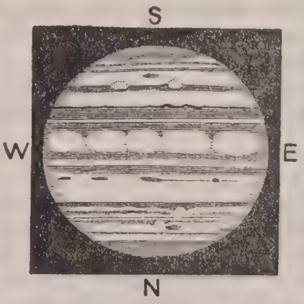


FIG. 2.—Jupiter, 1903, July 10, 2·50 a.m.

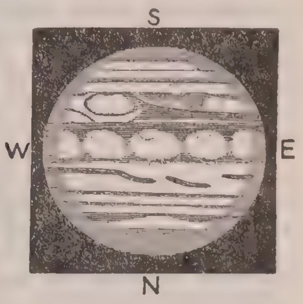


FIG. 3.—Jupiter, 1906, April 15, 5·50 p.m.

In support of the theory of inherent heat on Jupiter it has been said that his albedo (or light reflected from his surface) is much greater than the amount would be were his surface similar to that of the moon, Mercury or Mars, and the reasoning has been applied to the large outer planets, Saturn, Uranus and Neptune, as well as to Jupiter. The average reflecting capacity of the moon and five outer planets would seem to be (on the assumption that they possess no inherent light) as follows:—

Moon	0·1736	Jupiter	0·6238	Uranus	0·6400
Mars	0·2672	Saturn	0·4981	Neptune	0·4848

These values were considered to support the view that the four larger and more distant orbs shine partly by inherent lustre, and the more so as spectroscopic analysis indicates that they are each involved in a deep vapour-laden atmosphere. But certain observations furnish a contradiction to Proctor's views. The absolute extinction of the satellites, even in the most powerful telescopes, while in the shadow of Jupiter, shows that they cannot receive sufficient light from their primary to render them visible, and the darkness of the shadows of the satellites when projected on the planet's disk proves that the latter cannot be self-luminous except in an insensible degree. It is also to be remarked that, were it only moderately self-luminous, the colour of the light which it sends to us would be red, such light being at first emitted from a heated body when its temperature is raised. Possibly, however, the great red spot, when the colouring was intense in 1878 and several following years, may have represented an opening in the Jovian atmosphere, and the ruddy belts may be extensive rifts in the same envelope. If Jupiter's actual globe emitted a good deal of heat and light we should probably distinguish little of it, owing to the obscuring vapours floating above the surface. Venus reflects relatively more light than Jupiter, and there is little doubt that the albedo of a planet is dependent upon atmospheric characteristics, and is in no case a direct indication of inherent light and heat.

The colouring of the belts appears to be due to seasonal variations, for Stanley Williams has shown that their changes have a cycle of twelve years, and correspond as nearly as possible with a sidereal revolution of Jupiter. The variations are of such character that the two great equatorial belts are alternately affected; when the S. equatorial belt displays maximum redness the N. equatorial is at a minimum and vice versa.

The most plausible hypothesis with regard to the red spot is that it is of the nature of an island floating upon a liquid surface, though its great duration does not favour this idea. But it is an open question whether the belts of Jupiter indicate a liquid or gaseous condition of the visible surface. The difficulty in the way of the liquid hypothesis is the great difference in the times of rotation between the equatorial portions of the planet and the spots in temperate latitudes. The latter usually rotate in periods between 9 h. 55 m. and 9 h. 56 m., while the equatorial markings make a revolution in about five minutes less, 9 h. 50 m. to 9 h. 51 m. The difference amounts to 7·5° in a terrestrial day and proves that an equatorial spot will circulate right round the enormous sphere of Jupiter (circumference 283,000 m.) in 48 days. The motion is equivalent to about 6000 m. per day and 250 m. per hour. (W. F. D.)

Satellites of Jupiter.

Jupiter is attended by eight known satellites, resolvable as regards their visibility into two widely different classes. Four satellites were discovered by Galileo and were the only ones known until 1892. In September of that year E. E. Barnard, at the Lick Observatory, discovered a fifth extremely faint satellite, performing a revolution in somewhat less than twleve hours. In 1904 two yet fainter satellites, far outside the other five, were photographically discovered by C. D. Perrine at the Lick Observatory. The eighth satellite was discovered by P. J. Melotte of Greenwich on the 28th of February 1908. It is of the 17th magnitude and appears to be very distant from Jupiter; a re-observation on the 16th of January 1909 proved it to be retrograde, and to have a very eccentric orbit. These bodies are usually numbered in the order of their discovery, the nearest to the sun being V. In apparent brightness each of the four Galilean satellites may be roughly classed as of the sixth magnitude; they would therefore be visible to a keen eye if the brilliancy of the planet did not obscure them. Some observers profess to have seen one or more of these bodies with the naked eye notwithstanding this drawback, but the evidence can scarcely be regarded as conclusive. It does not however seem unlikely that the third, which is the brightest, might be visible when in conjunction with one of the others.

Under good conditions and sufficient telescopic power the satellites are visible as disks, and not mere points of light. Measures of the apparent diameter of objects so faint are, however, difficult and uncertain. The results for the Galilean satellites range between 0″·9 and 1″·5, corresponding to diameters of between 3000 and 5000 kilometres. The smallest is therefore about the size of our moon. Satellite I. has been found to exhibit marked variations in its brightness and aspect, but the law governing them has not been satisfactorily worked out. It seems probable that one hemisphere of this satellite is brighter than the other, or that there is a large dark region upon it. A revolution on its axis corresponding with that of the orbital revolution around the planet has also been suspected, but is not yet established. Variations of light somewhat similar, but less in amount, have been noticed in the second and third satellites.

The most interesting and easily observed phenomena of these bodies are their eclipses and their transits across the disk of Jupiter. The four inner satellites pass through the shadow of Jupiter at every superior conjunction, and across his disk at every inferior conjunction. The outer Galilean satellite does the same when the conjunctions are not too near the line of nodes of the satellites' orbit. When most distant from the nodes, the satellites pass above or below the shadow and below or above the disk. These phenomena for the four Galilean satellites are predicted in the nautical almanacs.

When one of the four Galilean satellites is in transit across the disk of Jupiter it can generally be seen projected on the face of the planet. It is commonly brighter than Jupiter when it first enters upon the limb but sometimes darker near the centre of the disk. This is owing to the fact that the planet is much darker at the limb. During these transits the shadow of the satellites can also be seen projected on the planet as a dark point.

The theories of the motion of these bodies form one of the more interesting problems of celestial mechanics. Owing to the great ellipticity of Jupiter, growing out of his rapid rotation, the influence of this ellipticity upon the motions of the five inner satellites is much greater than that of the sun, or of the satellites on each other. The inclination of the orbits to the equator of Jupiter is quite small and almost constant, and the motion of each node is nearly uniform around the plane of the planet's equator.

The most marked feature of these bodies is a relation between the mean longitudes of Satellites I., II. and III. The mean longitude of I. plus twice that of III. minus three times that of II. is constantly near to 180°. It follows that the same relations subsist among the mean motions. The cause of this was pointed out by Laplace. If we put L_1 L_2 and L_3 for the mean longitudes, and define an angle U as follows:—

$$U = L_1 - 3L_2 + 2L_3.$$

it was shown mathematically by Laplace that if the longitudes and mean motions were such that the angle U differed a little from 180°, there was a minute residual force arising from the mutual actions of the several bodies tending to bring this angle towards the value 180°. Consequently, if the mean motions were such that this angle increased only with great slowness, it would after a certain period tend back toward the value 180°, and then beyond it, exactly as a pendulum drawn out of the perpendicular oscillates towards and beyond it. Thus an oscillation would be engendered in virtue of which the angle would oscillate very slowly on each side of the central value. Computation of the mean longitude from observations has indicated that the angle does differ from 180°, but it is not certain whether this deviation is greater than the possible result of the errors of observation. However this may be, the existence of the libration, and its period if it does exist, are still unknown.

The following are the principal elements of the orbits of the five inner satellites, arranged in the order of distance from Jupiter. The mean longitudes are for 1891, 20th of October, G.M.T., and are referred to the equinox of the epoch, 1891, 2nd of October:—

Satellite	V.	I.	II.	III.	IV.
Mean Long.	264°·29	313°·7193	39°·1187	171°·2448	62°·2000
Synodic Period	11 h. 58 m.	1 d. 18 h. ·48	3d. 13h. ·30	7d. 3h. ·99	16d. 18m. ·09
Mean Distance	106,400 m.	260,000 m.	414,000 m.	661,000 m.	1,162,000 m.
Mass ÷ Mass of Jup.	(?)	·00002831	·00002324	·00008125	·00002149
Stellar Mag.	13	6·0	6·1	5·6	6·6

The following numbers relating to the planet itself have been supplied mostly by Professor Hermann Struve.

	Filar Mic.	Heliom.
Equatorial diameter of Jupiter (Dist. 5·2028)	38″·50	37″·50
Polar diameter of Jupiter	36″·02	35″·23
Ellipticity	1÷15·5	1÷16·5
Theoretical ellipticity from motion of 900″ in the pericentre of Sat. V.		1÷15·3
Centrifugal force÷gravity at equator		0·0900
Mass of Jupiter÷Mass of Sun, now used in tables		1÷1047·34
Inclination of planet's equator to ecliptic		2° 9′·07+0·006*t*
,, ,, ,, ,, orbit	3° 4′·80	
Long. of Node of equator on ecliptic		336° 21′·47+0′·762*t*
,, ,, ,, ,, orbit		135°25′·81+0·729*t*

The longitudes are referred to the mean terrestrial equinox, and *t* is the time in years from 1900.0.

For the elements of Jupiter's orbit, see SOLAR SYSTEM; and for physical constants, see PLANET. (S. N.)

JUR (DIUR), the Dinka name for a tribe of negroes of the upper Nile valley, whose real name is Luoh, or Lwo. They appear to be immigrants, and tradition places their home in the south; they now occupy a district of the Bahr-el-Ghazal between the Bongo and Dinka tribes. Of a reddish black colour, fairer than the Dinka, they are well proportioned, with the hair short. Tattooing is not common, but when found is similar to that of the Dinka; they pierce the ears and nose, and in addition to the ornaments found among the Dinka (*q.v.*) wear a series of iron rings on the forearm covering it from wrist to elbow. They are mainly agricultural, but hunt and fish to a considerable extent; they are also skilful smiths, smelting their own iron, of which they supply quantities to the Dinka. They are a prosperous tribe and in consequence spinsters are unknown among them. Their chief currency is spears and hoe-blades, and cowrie shells are used in the purchase of wives. Their chief weapons are spears and bows.

See G. Schweinfurth, *The Heart of Africa: Travels 1868–1871*, trans. G. E. E. Frewer (2nd ed., 1874); W. Junker, *Travels in Africa* (Eng. ed., 1890–1892).

JURA, a department of France, on the eastern frontier, formed from the southern portion of the old province of Franche-Comté. It is bounded N. by the department of Haute-Saône, N.E. by Doubs, E. by Switzerland, S. by Ain, and W. by Saône-et-Loire and Côte d'Or. Pop. (1906), 257,725. Area, 1951 sq. m. Jura comprises four distinct zones with a general direction from north to south. In the S.E. lie high eastern chains of the central Jura, containing the Crêt Pela (4915 ft.), the highest point in the department. More to the west there is a chain of forest-clad plateaus bordered on the E. by the river Ain. Westward of these runs a range of hills, the slopes of which are covered with vineyards. The north-west region of the department is occupied by a plain which includes the fertile Finage, the northern portion of the Bresse, and is traversed by the Doubs and its left affluent the Loue, between which lies the fine forest of Chaux, 76 sq. m. in area. Jura falls almost wholly within the basin of the Rhone. Besides those mentioned, the chief rivers are the Valouze and the Bienne, which water the south of the department. There are several lakes, the largest of which is that of Chalin, about 12 m. E. of Lons-le-Saunier. The climate is, on the whole, cold; the temperature is subject to sudden and violent changes, and among the mountains winter sometimes lingers for eight months. The rainfall is much above the average of France.

Jura is an agricultural department: wheat, oats, maize and barley are the chief cereals, the culture of potatoes and rape being also of importance. Vines are grown mainly in the cantons of Arbois, Poligny, Salins and Voiteur. Woodlands occupy about a fifth of the area: the oak, hornbeam and beech, and, in the mountains, the spruce and fir, are the principal varieties. Natural pasture is abundant on the mountains. Forests, gorges, torrents and cascades are characteristic features of the scenery. Its minerals include iron and salt and there are stone-quarries. Peat is also worked. Lons-le-Saunier and Salins have mineral springs. Industries include the manufacture of Gruyère, Septmoncel and other cheeses (made in co-operative cheese factories or *fruitières*), metal founding and forging, saw-milling, flour-milling, the cutting of precious stones (at Septmoncel and elsewhere), the manufacture of nails, tools and other iron goods, paper, leather, brier-pipes, toys and fancy wooden-ware and basket-work. The making of clocks, watches, spectacles and measures, which are largely exported, employs much labour in and around Morez. Imports consist of grain, cattle, wine, leaf-copper, horn, ivory, fancy-wood; exports of manufactured articles, wine, cheese, stone, timber and salt. The department is served chiefly by the Paris-Lyon-Méditerranée railway, the main line from Paris to Neuchâtel traversing its northern region. The canal from the Rhone to the Rhine, which utilizes the channel of the Doubs over portions of its course, traverses it for 25 m. Lons-le-Saunier is the chief town of Jura, which embraces four arrondissements named after the towns of Lons-le-Saunier, Dôle, Poligny and St Claude, with 32 cantons and 584 communes. The department forms the diocese of St Claude and part of the ecclesiastical province of Besançon; it comes within the region of the VIIth army corps and the educational circumscription (académie) of Besançon, where is its court of appeal. Lons-le-Saunier, Dôle, Arbois, Poligny, St Claude and Salins, the more noteworthy towns, receive separate notices. At Baume-les-Messieurs, 8 m. N.E. of Lons-le-Saunier, there is an ancient abbey with a fine church of the 12th century.

JURA ("deer island"), an island of the inner Hebrides, the fourth largest of the group, on the west coast of Argyllshire, Scotland. Pop. (1901), 560. On the N. it is separated from the island of Scarba by the whirlpool of Corrievreckan, caused by the rush of the tides, often running over 13 m. an hour, and sometimes accelerated by gales, on the E. from the mainland by the sound of Jura, and on the S. and S.W. from Islay by the sound of Islay. At Kinuachdrach there is a ferry to Aird in Lorne, in Argyllshire, and at Faolin there is a ferry to Port Askaig in Islay. Its area is about 160 sq. m., the greatest length is about 27 m., and the breadth varies from 2 m. to 8 m. The surface is mountainous and the island is the most rugged of the Hebrides. A chain of hills culminating in the Paps of Jura—Beinn-an-Oir (2571 ft.) and Beinn Chaolais (2407 ft.)—runs the whole length of the island, interrupted only by Tarbert loch, an arm of the sea, which forms an indentation nearly 6 m. deep and almost cuts the island in two. Jura derived its name from the red deer which once abounded on it. Cattle and sheep are raised; oats, barley and potatoes are cultivated along the eastern shore, and there is some fishing. Granite is quarried and silicious sand, employed in glass-making is found. The parish of Jura comprises the islands of Balnahua, Fladda, Garvelloch, Jura, Lunga, Scarba and Skervuile.

JURA, a range which may be roughly described as the block of mountains rising between the Rhine and the Rhone, and forming the frontier between France and Switzerland. The gorges by which these two rivers force their way to the plains cut off the Jura from the Swabian and Franconian ranges to the north and those of Dauphiné to the south. But in very early days, before these gorges had been carved out, there were no openings in the Jura at all, and even now its three chief rivers—the Doubs, the Loue and the Ain—flow down the western slope, which is both much longer and but half as steep as the eastern. Some geographers extend the name Jura to the Swabian and Franconian ranges between the Danube and the Neckar and the Main; but, though these are similar in point of composition and direction to the range to the south, it is most convenient to limit the name to the mountain ridges lying between France and Switzerland, and this narrower sense will be adopted here.

The Jura has been aptly described as a huge plateau about 156 m. long and 38 m. broad, hewn into an oblong shape, and raised by internal forces to an average height of from 1950 to 2600 ft. above the surrounding plains. The shock by which it was raised and the vibration caused by the elevation of the great chain of the Alps, produced many transverse gorges or "cluses," while on the plateaus between these subaerial agencies have exercised their ordinary influence.

Geologically the Jura Mountains belong to the Alpine system; and the same forces which crumpled and tore the strata of the one produced the folds and faults in the other. Both chains owe their origin to the mass of crystalline and unyielding rock which forms the central plateau of France, the Vosges and the Black Forest, and which, between the Vosges and the central plateau, lies at no great depth beneath the surface. Against this mass the more yielding strata which lay to the south and west were crushed and folded, and the Alps and the Jura were carved from the ridges which were raised. But the folding decreases in intensity towards the north; the folding in the Alps is much more violent than the folding in the Jura, and in the Jura itself the folding is most marked along its southern flanks.

The Jura is composed chiefly of Jurassic rocks—it is from this chain that the Jurassic system derives its name—but Triassic, Cretaceous and Tertiary beds take part in its formation. It may be divided into three zones which run parallel to the length of the chain and differ from one another in their structure. The innermost zone, which rises directly from the plain of Switzerland, is the *folded Jura* (*Jura plissé*, *Kettenjura*), formed of narrow parallel undulations which diminish in intensity towards the French border. This is followed by the *Jura plateau* (*Jura tabulaire*, *Tafeljura*), in which the beds are approximately horizontal but are broken up into blocks by fractures or faults. Finally, along its western face there is a zone of numerous dislocations, and the range descends abruptly to the plain of the Saône. This is the *Région du vignoble* and is well shown at Arbois.

Owing to the convergence of the faults which bound it, the plateau zone decreases in width towards the south, while towards the north it forms a large proportion of the chain. The folded zone is more constant. Along its inner margin the folds are frequently overthrown, leaning towards France, but elsewhere they are simple anticlinals and synclinals, parallel to the length of the chain, and as a rule there is a remarkable freedom from dislocations of any importance, except towards Neuchâtel and Bienne.

The countless blocks of gneiss, granite and other crystalline formations which are found in such numbers on the slopes of the Jura, and go by the name of "erratic blocks" (of which the best known instance—the Pierre à Bot—is 40 ft. in diameter, and rests on the side of a hill 800 ft. above the Lake of Neuchâtel), have been transported thither from the Alps by ancient glaciers, which have left their mark on the Jura range itself in the shape of striations and moraines.

The general direction of the chain is from north-east to south-west, but a careful study reveals the fact that there were in reality two main lines of upheaval, viz. north to south and east to west, the former best seen in the southern part of the range and the latter in the northern; and it was by the union of these two forces that the lines north-east to south-west (seen in the greater part of the chain), and north-west to south-east (seen in the Villebois range at the south-west extremity of the chain), were produced. This is best realized if we take Besançon as a centre; to the north the ridges run east and west, to the south, north and south, while to the east the direction is north-east to south-west.

Before considering the topography of the interior of the Jura, it may be convenient to take a brief survey of its outer slopes.

1. The *northern face* dominates on one side the famous "Trouée" (or Trench) of Belfort, one of the great geographical centres of Europe, whence routes run north down the Rhine to the North Sea, south-east to the Danube basin and Black Sea, and south-west into France, and so to the Mediterranean basin. It is now so strongly fortified that it becomes a question of great strategical importance to prevent its being turned by means of the great central plateau of the Jura, which, as we shall see, is a network of roads and railways. On the other side it overhangs the "Trouée" of the Black Forest towns on the Rhine (Rheinfelden, Säckingen, Laufenburg and Waldshut), through which the central plain of Switzerland is easily gained. On this north slope two openings offer routes into the interior of the chain—the valley of the Doubs belonging to France, and the valley of the Birse belonging to Switzerland. Belfort is the military, Mülhausen the industrial, and Basel the commercial centre of this slope.

2. The *eastern and western faces* offer many striking parallels. The plains through which flow the Aar and the Saône have each been the bed of an ancient lake, traces of which remain in the lakes of Neuchâtel, Bienne and Morat. The west face runs mainly north and south like its great river, and for a similar reason the east face runs north-east to south-west. Again, both slopes are pierced by many transverse gorges or "cluses" (due to fracture and not to erosion), by which access is gained to the great central plateau of Pontarlier. though these are seen more plainly on the east face than on the west; thus the gorges at the exit from which Lons-le-Saunier, Poligny, Arbois and Salins are built balance those of the Suze, of the Val de Ruz, of the Val de Travers, and of the Val d'Orbe, though on the east face there is but one city which commands all these important routes—Neuchâtel. This town is thus marked out by nature as a great military and industrial centre, just as is Besançon on the west, which has besides to defend the route from Belfort down the Doubs. These easy means of communicating with the Free County of Burgundy or Franche-Comté account for the fact that the dialect of Neuchâtel is Burgundian, and that it was held generally by Burgundian nobles, though most of the country near it was in the hands of the house of Savoy until gradually annexed by Bern. The Chasseron (5286 ft.) is the central point of the eastern face, commanding the two great railways which join Neuchâtel and Pontarlier. This ridge is in a certain sense parallel to the valley of the Loue on the west face, which flows into the Doubs a little to the south of Dôle, the only important town of the central portion of the Saône basin. The Chasseron is wholly Swiss, as are the lower summits of the Chasseral (5279 ft.), the Mont Suchet (5220 ft.), the Aiguille de Baulmes (5128 ft.), the Dent de Vaulion (4879 ft.), the Weissenstein (4223 ft.), and the Chaumont (3845 ft.), the two last-named points being probably the best-known points in the Jura, as they are accessible by carriage road from Soleure and Neuchâtel respectively. South of the Orbe valley the east face becomes a rocky wall which is crowned by all the highest summits (the first and second Swiss, the rest French) of the chain—the Mont Tendre (5512 ft.), the Dôle (5505 ft.), the Reculet (5643 ft.), the Crêt de la Neige (5653 ft.) and the Grand Crédo (5328 ft.), the uniformity of level being as striking as on the west edge of the Jura, though there the absolute height is far less. The position of the Dôle is similar to that of the Chasseron, as along the sides of it run the great roads of the Col de St Cergues (3973 ft.) and the Col de la Faucille (4341 ft.), the latter leading through the Vallée des Dappes, which was divided in 1862 between France and Switzerland, after many negotiations. The height of these roads shows that they are passages across the chain, rather than through natural depressions.

3. The *southern face* is supported by two great pillars—on the east by the Grand Crédo and on the west by the ridge of Revermont (2529 ft.) above Bourg en Bresse; between these a huge bastion (the district of *Bugey*) stretches away to the south, forcing the Rhone to make a long détour. On the two sides of this bastion the plains in which Ambérieu and Culoz stand balance one another, and are the meeting points of the routes which cut through the bastion by means of deep gorges. On the eastern side this great wedge is steep and rugged, ending in the Grand Colombier (5033 ft.) above Culoz, and it sinks on the western side to the valley of the Ain, the district of Bresse, and the plateau of Dombes. The junction of the Ain and the Surand at Pont d'Ain on the west balances that of the Valserine and the Rhone at Bellegarde on the east.

The Jura thus dominates on the north one of the great highways of Europe, on the east and west divides the valleys of the Saône and the Aar, and stretches out to the south so as nearly to join hands with the great mass of the Dauphiné Alps. It therefore commands the routes from France into Germany, Switzerland and Italy, and hence its enormous historical importance.

Let us now examine the topography of the interior of the range. This naturally falls into three divisions, each traversed by one of the three great rivers of the Jura—the Doubs, the Loue and the Ain.

1. In the *northern division* it is the east and west line which prevails—the Lomont, the Mont Terrible, the defile of the Doubs from St Ursanne to St Hippolyte, and the "Trouée" of the Black Forest towns. It thus bars access to the central plateau from the north, and this natural wall does away with the necessity of artificial fortifications. This division falls again into two distinct portions.

(*a*) The first is the *part east of the deep gorge of the Doubs* after it turns south at St Hippolyte; it is thus quite cut off on this side, and is naturally Swiss territory. It includes the basin of the river Birse, and the great plateau between the Doubs and the Aar, on which, at an average height of 2600 ft., are situated a number of towns, one of the most striking features of the Jura. These include Le Locle (*q.v.*) and La Chaux de Fonds (*q.v.*), and are mainly occupied with watch-making, an industry which does not require bulky machinery, and is therefore well fitted for a mountain district.

(*b*) *The part west of the "cluse" of the Doubs*: of this, the district east of the river Dessoubre, isolated in the interior of the range (unlike the Le Locle plateau), is called the Haute Montagne, and is given up to cheese-making, curing of hams, saw-mills, &c. But little watch-making is carried on there, Besançon being the chief French centre of this industry, and being connected with Geneva by a chain of places similarly occupied, which fringe the west plateau of the Jura. The part west of the Dessoubre, or the Moyenne Montagne, a huge plateau north of the Loue, is more especially devoted to agriculture, while along its north edge metal-working and manufacture of hardware are carried on, particularly at Besançon and Audincourt.

2. The *central division* is remarkable for being without the deep gorges which are found so frequently in other parts of the range. It consists of the basin of which Pontarlier is the centre, through notches in the rim of which routes converge from every direction; this is the great characteristic of the middle region of the Jura. Hence its immense strategical and commercial importance. On the north-east roads run to Morteau and Le Locle, on the north-west to Besançon, on the west to Salins, on the south-west to Dôle and Lons-le-Saunier, on the east to the Swiss plain. The Pontarlier plateau is nearly horizontal, the slight indentations in it being due to erosion, *e.g.* by the river Drugeon. The keys to this important plateau are to the east the Fort de Joux, under the walls of which meet the two lines of railway from Neuchâtel, and to the west Salins, the meeting place of the routes from the Col de la Faucille, from Besançon, and from the French plain.

The Ain rises on the south edge of this plateau, and on a lower shelf or step, which it waters, are situated two points of great military importance—Nozeroy and Champagnole. The latter is specially important, since the road leading thence to Geneva traverses one after another, not far from their head, the chief valleys which run down into the South Jura, and thus commands the southern routes as well as those by St Cergues and the Col de la Faucille from the Geneva region, and a branch route along the Orbe river from Jougne. The fort of Les Rousses, near the foot of the Dôle, serves as an advanced post to Champagnole, just as the Fort de Joux does to Pontarlier.

The above sketch will serve to show the character of the central Jura as the meeting place of routes from all sides, and the importance to France of its being strongly fortified, lest an enemy approaching from the north-east should try to turn the fortresses of the "Trouée de Belfort." It is in the western part of the central Jura that the north and south lines first appear strongly marked. There are said to be in this district no less than fifteen ridges running parallel to each other, and it is these which force the Loue to the north, and thereby occasion its very eccentric course. The cultivation of wormwood wherewith to make the tonic "absinthe" has its headquarters at Pontarlier.

3. The *southern division* is by far the most complicated and entangled part of the Jura. The lofty ridge which bounds it to the east forces all its drainage to the west, and the result is a number of valleys of erosion (of which that of the Ain is the chief instance), quite distinct from the natural "cluses" or fissures of those of the Doubs and of the Loue. Another point of interest is the number of roads which intersect it, despite its extreme irregularity. This is due to the great "cluses" of Nantua and Virieu, which traverse it from east to west. The north and south line is very clearly seen in the eastern part of this division; the north-east and south-west is entirely wanting, but in the Villebois range south of Ambérieu we have the principal example of the north-west to south-east line. The plateaus west of the Ain are cut through by the valleys of the Valouse and of the Surand, and like all the lowest terraces on the west slope do not possess any considerable towns. The Ain receives three tributaries from the east:—

(*a*) The Bienne, which flows from the fort of Les Rousses by St Claude, the industrial centre of the south Jura, famous for the manufacture of wooden toys, owing to the large quantity of boxwood in the neighbourhood. Septmoncel is busied with cutting of gems, and Morez with watch and spectacle making. Cut off to the east by the great chain, the industrial prosperity of this valley is of recent origin.

(*b*) The Oignin, which flows from south to north. It receives the drainage of the lake of Nantua, a town noted for combs and silk weaving, and which communicates by the "cluse" of the Lac de Silan with the Valserine valley, and so with the Rhone at Bellegarde, and again with the various routes which meet under the walls of the fort of Les Rousses, while by the Val Romey and the Séran Culoz is easily gained.

(*c*) The Albarine, connected with Culoz by the "cluse" of Virieu, and by the Furan flowing south with Belley, the capital of the district of Bugey (the old name for the South Jura).

The "cluses" of Nantua and Virieu are now both traversed by important railways; and it is even truer than of old that the keys of the south Jura are Lyons and Geneva. But of course the strategic importance of these gorges is less than appears at first sight, because they can be turned by following the Rhone in its great bend to the south.

The range is mentioned by Caesar (*Bell. Gall.* i. 2–3, 6 (1), and 8 (1)), Strabo (iv. 3, 4, and 6, 11), Pliny (iii. 31; iv. 105; xvi. 197) and Ptolemy (ii. ix. 5), its name being a word which appears under many forms (*e.g.* Joux, Jorat, Jorasse, Juriens), and is a synonym for a wood or forest. The German name is Leberberg, *Leber* being a provincial word for a hill.

Politically the Jura is French (departments of the Doubs, Jura and Ain) and Swiss (parts of the cantons of Geneva, Vaud, Neuchâtel, Bern, Soleure and Basel); but at its north extremity it takes in a small bit of Alsace (Pfirt or Ferrette). In the middle ages the southern, western and northern sides were parcelled out into a number of districts, all of which were gradually absorbed by the French crown, viz., Gex, Val Romey, Bresse and Bugey (exchanged in 1601 by Savoy for the marquisate of Saluzzo), Franche-Comté, or the Free County of Burgundy, an imperial fief till annexed in 1674, the county of Montbéliard (Mömpelgard) acquired in 1793, and the county of Ferrette (French 1648–1871). The northern part of the eastern side was held till 1792 (part till 1797) by the bishop of Basel as a fief of the empire, and then belonged to France till 1814, but was given to Bern in 1815 (as a recompense for its loss of Vaud), and now forms the Bernese Jura, a French-speaking district. The centre of the eastern slope formed the principality of Neuchâtel (*q.v.*) and the county of Valangin, which were generally held by Burgundian nobles, came by succession to the kings of Prussia in 1707, and were formed into a Swiss canton in 1815, though they did not become free from formal Prussian claims until 1857. The southern part of the eastern slope originally belonged to the house of Savoy, but was conquered bit by bit by Bern, which was forced in 1815 to accept its subject district Vaud as a colleague and equal in the Swiss Confederation. It was Charles the Bold's defeats at Grandson and Morat which led to the annexation by the confederates of these portions of Savoyard territory.

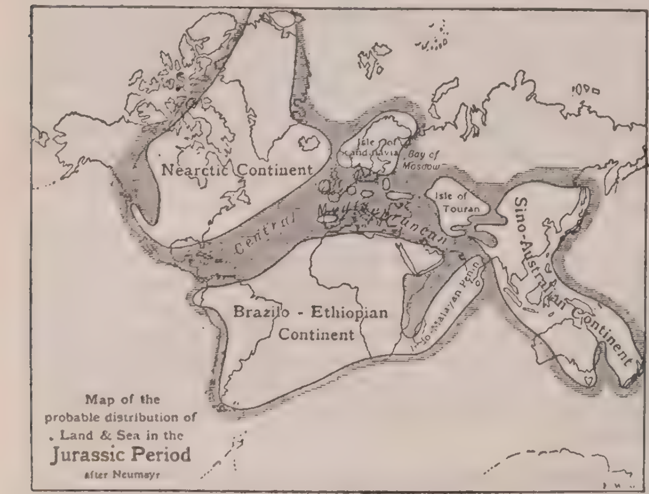
Authorities.—E.F.Berlioux, *Le Jura* (Paris, 1880); F. Machacek, *Der Schweizer Jura* (Gotha, 1905); A. Magnin, *Les lacs du Jura* (Paris, 1895); J. Zimmerli, "Die Sprachgrenze im Jura" (vol. i. of his *Die Deutsch-französische Sprachgrenze in der Schweiz* (Basel, 1891). For the French slope see Joanne's large *Itinéraire* to the Jura, and the smaller volumes relating to the departments of the Ain, Doubs and Jura, in his *Géographies départementales.* For the Swiss slope see 3 vols. in the series of the *Guides Monod* (Geneva); A. Monnier, *La Chaux de Fonds et le Haut-Jura Neuchâtelois*; J. Monod, *Le Jura Bernois*; and E. J. P. de la Harpe, *Le Jura Vaudois.*

(W. A. B. C.)

JURASSIC, in geology, the middle period of the Mesozoic era, that is to say, succeeding the Triassic and preceding the Cretaceous periods. The name Jurassic (French *jurassique*; German *Juraformation* or *Jura*) was first employed by A. Brongniart and A. von Humboldt for the rocks of this age in the western Jura mountains of Switzerland, where they are well developed. It was in England, however, that they were first studied by William Smith, in whose hands they were made to lay the foundations of stratigraphical geology. The names adopted by him for the subdivisions he traced across the country have passed into universal use, and though some of them are uncouth English provincial names, they are as familiar to the geologists of France, Switzerland and Germany as to those of England. During the following three decades Smith's work was elaborated by W. D. Conybeare and W. Phillips. The Jurassic rocks of fossils of the European continent were described by d'Orbigny, 1840–1846; by L. von Buch, 1839; by F. A. Quenstedt, 1843–1888; by A. Oppel, 1856–1858; and since then by many other workers: E. Benecke, E. Hébert, W. Waagen, and others. The study of Jurassic rocks has continued to attract the attention of geologists, partly because the bedding is so well defined and regular—the strata are little disturbed anywhere outside the Swiss Jura and the Alps—and partly because the fossils are numerous and usually well-preserved. The result has been that no other system of rocks has been so carefully examined throughout its entire thickness; many "zones" have been established by means of the fossils—principally by ammonites—and these zones are not restricted to limited districts, but many of them hold good over wide areas. Oppel distinguished no fewer than thirty-three zonal horizons, and since then many more sub-zonal divisions have been noted locally.

The existence of *faunal regions* in Jurassic times was first pointed out by J. Marcou; later M. Neumayr greatly extended observations in this direction. According to Neumayr, three distinct geographical regions of deposit can be made out among the Jurassic rocks of Europe: (1) The Mediterranean province, embracing the Pyrenees, Alps and Carpathians, with all the tracts lying to the south. One of the biological characters of this area was the great abundance of ammonites belonging to the groups of *Heterophylli* (*Phylloceras*) and *Fimbriati* (*Lytoceras*). (2) The central European province, comprising the tracts lying to the north of the Alpine ridge, and marked by the comparative rarity of the ammonites just mentioned, which are replaced by others of the groups *Inflati* (*Aspidoceras*) and *Oppelia*, and by abundant reefs and masses of coral. (3) The boreal or Russian province, comprising the middle and north of Russia, Spitzbergen and Greenland. The life in this area was much less varied than in the others, showing that in Jurassic times there was a perceptible diminution of temperature towards the north. The ammonites of the more southern tracts here disappear, together with the corals.

The cause of these faunal regions Neumayr attributed to climatic belts—such as exist to-day—and in part, at least, he was probably correct. It should be borne in mind, however, that although Neumayr was able to trace a broad, warm belt, some 60° in width, right round the earth, with a narrower mild belt to the north and an arctic or boreal belt beyond, and certain indications of a repetition of the climatic zones on the southern side of the thermal equator, more recent discoveries of fossils seem to show that other influences must have been at work in determining their distribution; in short, the identity of the Neumayrian climatic boundaries becomes increasingly obscured by the advance of our knowledge.



Map of the probable distribution of Land & Sea in the Jurassic Period after Neumayr

The Jurassic period was marked by a great extension of the sea, which commenced after the close of the Trias and reached its maximum during the Callovian and Oxfordian stages; consequently, the Middle Jurassic rocks are much more widely spread than the Lias. In Europe and elsewhere Triassic beds pass gradually up into the Jurassic, so that there is difficulty sometimes in agreement as to the best line for the base of the latter; similarly at the top of the sytsem there is a passage from the Jurassic to the Cretaceous rocks (Alps).

Towards the close of the period elevation began in certain regions; thus, in America, the Sierras, Cascade Mountains, Klamath Mountains, and Humboldt Range probably began to emerge. In England the estuarine Portlandian resulted partly from elevation, but in the Alps marine conditions steadily persisted (in the Tithonian stage). There appears to have been very little crustal disturbance or volcanic activity; tuffs are known in Argentina and California; volcanic rocks of this age occur also in Skye and Mull.

The rocks of the Jurassic system present great petrological diversity. In England the name "Oolites" was given to the middle and higher members of the system on account of the prevalence of oolitic structure in the limestones and ironstones; the same character is a common feature in the rocks of northern Europe and elsewhere, but it must not be overlooked that clays and sandstones together bulk more largely in the aggregate than the oolites. The thickness of Jurassic rocks in England is 4000 to 5000 ft., and in Germany 2000 to 3000 ft. Most of the rocks represent the deposits of shallow seas, but estuarine conditions and land deposits occur as in the Purbeck beds of Dorset and the coals of Yorkshire. Coal is a very important feature among Jurassic rocks, particularly in the Liassic division; it is found in Hungary, where there are twenty-five workable beds; in Persia, Turkestan, Caucasus, south Siberia, China, Japan, Further India, New Zealand and in many of the Pacific Islands.

Being shallow water formations, petrological changes come in rapidly as many of the beds are traced out; sandstones pass laterally into clays, and the latter into limestones, and so on, but a reliable guide to the classification and correlation is found in the fossil contents of the rocks. In the accompanying table a list is given of some of the zonal fossils which regularly occur in the order indicated; other forms are known that are equally useful. It will be noticed that while there is general agreement as to the order in which the zonal forms occur, the line of division between one formation and another is liable to vary according to factors in the personal equation of the authors.

The Jurassic formations stretch across England in a varying band from the mouth of the Tees to the coast of Dorsetshire. They consist of harder sandstones and limestones interstratified with softer clays and shales. Hence they give rise to a characteristic type of scenery—the more durable beds standing out as long ridges, sometimes even with low cliffs, while the clays underlie the level spaces between.

Jurassic rocks cover a vast area in Central Europe. They rise from under the Cretaceous formations in the north-east of France, whence they range southwards down the valleys of the Saone and Rhone to the Mediterranean. They appear as a broken border round the old crystalline nucleus of Auvergne. Eastwards they range through the Jura Mountains up to the high grounds of Bohemia. They appear in the outer chains of the Alps on both sides, and on the south they rise along the centre of the Apennines, and here and there over the Spanish Peninsula. Covered by more recent formations they underlie the great plain of northern Germany, whence they range eastwards and occupy large tracts in central and eastern Russia.

Lower Jurassic rocks are absent from much of northern Russia, the stages represented being the Callovian, Oxfordian and Volgian (of Professor S. Nikitin); the fauna differs considerably from that of western Europe, and the marine equivalents of the Purbeck beds are found in this region. In south Russia, the Crimea and Caucasus, Lias and Lower Jurassic rocks are present. In the Alps, the Lower Jurassic rocks are intimately associated with the underlying Triassic formations, and resemble them in consisting largely of reddish limestones and marbles; the ammonites in this region differ in certain respects from those of western and central Europe. The Oxfordian, Callovian, Corallian and Astartian stages are also present. The Upper Jurassic is mainly represented by a uniform series of limestones, with a peculiar and characteristic fauna, to which Oppel gave the name "Tithonian." This includes most of the horizons from Kimeridgian to Cretaceous; it is developed on the southern flanks of the Alps, Carpathians, Apennines, as well as in south France and other parts of the Mediterranean basin. A characteristic formation on this horizon is the "Diphya limestone," so-called from the fossil *Terebratula diphya* (*Pygope janitor*) seen in the well-known escarpments (*Hochgebirge Kalk*). Above the Diphya limestone comes the Stramberg limestone (Stramberg in Moravia), with "Aptychus" beds and coral reefs. The rocks of the Mediterranean basin are on the whole more calcareous than those of corresponding age in north-west Europe; thus the Lias is represented by 1500 ft. of white crystalline limestone in Calabria and a similar rock occurs in Sicily, Bosnia, Epirus, Corfu; in Spain the Liassic strata are frequently dolomitic; in the Apennines they are variegated limestones and marls. The Higher Jurassic beds of Portugal show traces of the proximity of land in the abundant plant remains that are found in them. In Scania the Lias succeeds the Rhaetic beds in a regular manner, and Jurassic rocks have been traced northward well within the polar circle; they are known in the Lofoten Isles, Spitzbergen, east Greenland, King Charles's Island, Cape Stewart in Scoresby Sound, Grinnell Land, Prince Patrick Land, Bathurst and Exmouth Island; in many cases the fossils denote a climate considerably milder than now obtains in these latitudes.

In the American continent Jurassic rocks are not well developed. Marine Lower and Middle Jurassic beds occur on the Pacific coast (California and Oregon), and in Wyoming, the Dakotas, Colorado, east Mexico and Texas. Above the marine beds in the interior are brackish and fresh-water deposits, the Morrison and Como beds (Atlantosaurus and Baptanodon beds of Marsh). Later Jurassic rocks are found in northern British Columbia and perhaps in Alaska, Wyoming, Utah, Montana, Colorado, the Dakotas, &c. In California some of the gold-bearing metamorphic slates are of this age. Marine Jurassic rocks have not been clearly identified on the Atlantic side of America. The Patuxent and Arundel formations (non-marine) are doubtfully referred to this period. Lower and Middle Jurassic formations occur in Argentina and Bolivia. Jurassic rocks have been recognized in Asia, including India, Afghanistan, Persia, Kurdistan, Asia Minor, the Caspian region, Japan and Borneo. The best marine development is in Cutch, where the following groups are distinguished from above downwards: the Umia series = Portlandian and Tithonian of south Europe, passing upwards into the Neocomian; the Katrol series = Oxfordian (part) and Kimeridgian; the Chari series = Callovian and part of the Oxfordian; the Patcham series = Bathonian. In the western half of the Salt Range and the Himalayas, Spiti shales are the equivalents of the European Callovian and Kimeridgian. The upper part of the Gondwana series is not improbably Jurassic. On the African continent, Liassic strata are found in Algeria, and Bathonian formations occur in Abyssinia, Somaliland, Cape Colony and western Madagascar. In Australia the Permo-Carboniferous formations are succeeded in Queensland and Western Australia by what may be termed the Jura-Trias, which include the coal-bearing "Ipswich" and "Burrum" formations of Queensland. In New Zealand there is a thick series of marine beds with terrestrial plants, the Mataura series in the upper part of Hutton's Hokanui system. Sir J. Hector included also the Putakaka series (as Middle Jurassic) and the Flag series with the Catlin's River and Bastion series below. Jurassic rocks have been recorded from New Guinea and New Caledonia.

Stages[1]				Ammonite Zones	Oppel	Substages of Quenstedt	Von Buch	A. de Lapparent, *Traité*, 5th ed.			Alpine	
JURASSIC SYSTEM	OOLITES	Upper Oolites	Purbeckian	Perisphinctes transitorius	Malm		Upper or White Jura	Purbeckien or Aquilonien	Portlandien	Néojurassique	Ammonitico rosso of Tithonien, southern Alps Aptychen-Kalke and Radiolariengesteine	
			Portlandian	Perisphinctes giganteus Olcostephanus gigas		ζ		Bononien				*Diphya*-Kalke
			Kimeridgian	Reineckia eudoxus Oppelia tenuilobata		ε δ γ		Virgulien Pteroceran	Kimeridgien			*Acanthicus* Beds
		Middle Oolites	Corallian	Peltoceras bimammatum		β		Astartien Rauracien	Sequanien			
			Oxfordian	Peltoceras transversarium Aspidoceras perarmatum		α		Argovien Neuvizien	Oxfordien			
			Callovian	Peltoceras athleta Cosmoceras Jason Macrocephalites macrocephalus		ζ	Middle or Brown Jura	Upper Divesien Lower Divesien	Callovien			
		Lower Oolites	Bathonian	Oppelia aspidoides Parkinsonia ferruginea	Dogger	ε		Bathonien		Mésojurassique		Posidonien Beds (S. Alps) Klauss Beds (N. Alps)
			Bajocian (Inferior Oolite)	Parkinsonia Parkinsoni Cœloceras Humphresianus Sphæroceras Sauzei Sonninia Sowerbyi Harpoceras Murchisonae		δ γ β		Bajocien				*Sauzei*-Kalke Oolite of San Vigilio
			(passage beds)	Harpoceras (Lioçeras) opalinum		α						
	LIAS		Upper Lias	Lytoceras jurense Posidonia Bronni	Lias	ζ ε	Lower or Black Jura	Toarcien	Infra-Lias Système Liassique	Éojurassique	Grestener Beds (Coal) Adneter Kalke Brachiopod or Hierlatz facies Algäu Beds Fleckenmergel	
			Middle Lias	Amaltheus spinatus Amaltheus margaritatus Dactylioceras Davoëi Phylloceras ibex Aegoceras Jamesoni		δ γ		Charmouthien				
			Lower Lias	Arietites raricostatus Oxynoticeras oxynotum Arietites obtusus Arietites Bucklandi Schlotheimia angulata Psiloceras planorbis		β α		Sinemourien Hettangien (part)				
								Hettangien (part) Rhétien				

Life in the Jurassic Period.—The expansion of the sea during this period, with the formation of broad sheets of shallow and probably warmish water, appears to have been favourable to many forms of marine life. Under these conditions several groups of organisms developed rapidly along new directions, so that the Jurassic period as a whole came to have a fauna differing clearly and distinctly from the preceding Palaeozoic or succeeding Tertiary faunas. In the seas, all the main groups were represented as they are to-day

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[1] *Purbeckian* from the "Isle" of Purbeck. *Aquilonien* from Aquilo (Nord). *Bononien* from Bononia (Boulogne). *Virgulien* from *Exogyra virgula*. *Pteroceran* from *Pteroceras oceani*. *Astartien* from *Astarte supracorallina*. *Rauracien* from Rauracia (Jura). *Argovien* from Argovie (Switzerland). *Neuvizien* from Neuvizy (Ardennes). *Divesien* from Dives (Calvados). *Bathonien* from Bath (England). *Bajocien* from Bayeux (Calvados). *Toarcien* from Toarcium (Tours). Charmouthien from Charmouth (England). Sinemourien from Sinemurum, Semur (Côte d'Or). *Hettangien* from Hettange (Lorraine).

Corals were abundant, and in later portions of the period covered large areas in Europe; the modern type of coral became dominant; besides reef-building forms such as *Thamnastrea*, *Isastrea*, *Thecosmilia*, there were numerous single forms like *Montivaltia*. Crinoids existed in great numbers in some of the shallow seas; compared with Palaeozoic forms there is a marked reduction in the size of the calyx with a great extension in the number of arms and pinnules; *Pentacrinus*, *Eugeniacrinus*, *Apiocrinus* are all well known; *Antedon* was a stalkless genus. Echinoids (urchins) were gradually developing the so-called "irregular" type, *Echinobrissus*, *Holectypus*, *Collyrites*, *Clypeus*, but the "regular" forms prevailed, *Cidaris*, *Hemicidaris*, *Acrosalenia*. Sponges were important rock-builders in Upper Jurassic times (*Spongiten Kalk*); they include lithistids such as *Cnemediastrum*, *Hyalotragus*, *Peronidella*; hexactinellids, *Tremadictyon*, *Craticularia*; and horny sponges have been found in the Lias and Middle Jurassic.

Polyzoa are found abundantly in some of the beds, *Stomatopora*, *Berenicia*, &c. Brachiopods were represented principally by terebratulids (*Terebratula*, *Waldheimia*, *Megerlea*), and by rhynchonellids; *Thecae*, *Lingula* and *Crania* were also present. The Palaeozoic spirifirids and athyrids still lingered into the Lias. More important than the brachiopods were the pelecypods; *Ostrea*, *Exogyra*, *Gryphaea* were very abundant (Gryphite limestone, Gryphite grit); the genus *Trigonia*, now restricted to Australian waters, was present in great variety; *Aucella*, *Lima*, *Pecten*, *Pseudomonotis* *Gervillia*, *Astarte*, *Diceras*, *Isocardia*, *Pleuromya* may be mentioned out of many others. Amongst the gasteropods the *Pleurotomariidae* and *Turbinidae* reached their maximum development; the Palaeozoic *Conularia* lived to see the beginning of this period (*Pleurotomaria*, *Nerinea*, *Pteroceras*, *Cerithium*, *Turritella*).

Cephalopods flourished everywhere; first in importance were the ammonites; the Triassic genera *Phylloceras* and *Lytoceras* were still found in the Jurassic waters, but all the other numerous genera were new, and their shells are found with every variation of size and ornamentation. Some are characteristic of the older Jurassic rocks, *Arietites*, *Aegoceras*, *Amaltheus*, *Harpoceras*, *Oxynoticeras*, *Stepheoceras*, and the two genera mentioned above; in the middle stages are found *Cosmoceras*, *Perisphinctes*, *Cardioceras*, *Kepplerites* *Aspidoceras*; in the upper stages *Olcostephanus*, *Perisphinctes*, *Reineckia*, *Oppelia*. So regularly do certain forms characterize definite horizons in the rocks that some thirty zones have been distinguished in Europe, and many of them can be traced even as far as India. Another cephalopod group, the belemnites, that had been dimly outlined in the preceding Trias, now advanced rapidly in numbers and in variety of form, and they, like the ammonites, have proved of great value as zone-indicators. The Sepioids or cuttlefish made their first appearance in this period (*Beloteuthis*, *Geoteuthis*,) and their ink-bags can still be traced in examples from the Lias and lithographic limestone. Nautiloids existed but they were somewhat rare.

A great change had come over the crustaceans; in place of the Palaeozoic trilobites we find long-tailed lobster-like forms, *Penaeus*, *Eryon*, *Magila*, and the broad crab-like type first appeared in *Prosopon*. Isopods were represented by *Archaeoniscus* and others. Insects have left fairly abundant remains in the Lias of England, Schambelen (Switzerland) and Dobbertin (Mecklenburg), and also in the English Purbeck. Neuropterous forms predominate, but hemiptera occur from the Lias upwards; the earliest known flies (Diptera) and ants (Hymenoptera) appeared; orthoptera, cockroaches, crickets, beetles, &c., are found in the Lias, Stonesfield slate and Purbeck beds.

Fishes were approaching the modern forms during this period, heterocercal ganoids becoming scarce (the *Coelacanthidae* reached their maximum development), while the homocercal forms were abundant (*Gyrodus*, *Microdon*, *Lepidosteus*, *Lepidotus*, *Dapedius*). The Chimaeridae, sea-cats, made their appearance (*Squaloraja*). The ancestors of the modern sturgeons, garpikes and selachians, *Hybodus*, *Acrodus* were numerous. Bony-fish were represented by the small *Leptolepis*.

So important a place was occupied by reptiles during this period that it has been well described as the "age of reptiles." In the seas the fish-shaped Ichthyosaurs and long-necked Plesiosaurs dwelt in great numbers and reached their maximum development; the latter ranged in size from 6 to 40 ft. in length. The Pterosaurs, with bat-like wings and pneumatic bones and keeled breast-bone, flew over the land; *Pterodactyl* with short tail and *Rhamphorhyncus* with long tail are the best known. Curiously modified crocodilians appeared late in the period (*Mystriosaurus*, *Geosaurus*, *Steneosaurus*, *Teleosaurus*). But even more striking than any of the above were the Dinosaurs; these ranged in size from a creature no larger than a rabbit up to the gigantic *Atlantosaurus*, 100 ft. long, in the Jurassic of Wyoming. Both herbivorous and carnivorous forms were present; *Brontosaurus*, *Megalosaurus*, *Stegosaurus*, *Cetiosaurus*, *Diplodocus*, *Ceratosaurus* and *Campsognathus* are a few of the genera. By comparison with the Dinosaurs the mammals took a very subordinate position in Jurassic times; only a few jaws have been found, belonging to quite small creatures; they appear to have been marsupials and were probably insectivorous (*Plagiaulax* *Bolodon*, *Triconodon*, *Phascolotherium*, *Stylacodon*). Of great interest are the remains of the earliest known bird (*Archaeopteryx*) from the Solenhofen slates of Bavaria. Although this was a great advance beyond the Pterodactyls in avian characters, yet many reptilian features were retained.

Comparatively little change took place in the vegetation in the time that elapsed between the close of the Triassic and the middle of the Jurassic periods. Cycads, *Zamites*, *Podozamites*, &c., appeared to reach their maximum; Equisetums were still found growing to a great size and Ginkgos occupied a prominent place; ferns were common; so too were pines, yews, cypresses and other conifers, which while they outwardly resembled their modern representatives, were quite distinct in species. No flowering plants had yet appeared, although a primitive form of angiosperm has been reported from the Upper Jurassic of Portugal.

The economic products of the Jurassic system are of considerable importance; the valuable coals have already been noticed; the well-known iron ores of the Cleveland district in Yorkshire and those of the Northampton sands occur respectively in the Lias and Inferior Oolites. Oil shales are found in Germany, and several of the Jurassic formations in England contain some petroleum. Building stones of great value are obtained from the Great Oolite, the Portlandian and the Inferior Oolite; large quantities of hydraulic cement and lime have been made from the Lias. The celebrated lithographic stone of Solenhofen in Bavaria belongs to the upper portion of this system.

See D'Orbigny, *Paléontologie française, Terrain Jurassique* (1840, 1846); L. von Buch, "Über den Jura in Deutschland" (*Abhand. d. Berlin Akad.*, 1839); F. A. Quenstedt, *Flötzgebirge Württembergs* (1843) and other papers, also *Der Jura* (1883–1888); A. Oppel, *Die Juraformation Englands, Frankreichs und s.w. Deutschlands* (1856–1858). For a good general account of the formations with many references to original papers, see A. de Lapparent, *Traité de géologie*, vol. ii. 5th ed. (1906). The standard work for Great Britain is the series of *Memoirs of the Geological Survey* entitled *The Jurassic Rocks of Britain*, i and ii. "Yorkshire" (1892); iii. "The Lias of England and Wales" (1893); iv. "The Lower Oolite Rocks of England (Yorkshire excepted)" (1894); v. "The Middle and Upper Oolitic Rocks of England (Yorkshire excepted)" (1895). The map is after that of M. Neumayr, "Die geographische Verbreitung der Juraformation," *Denkschr. d. k. Akad. d. Wiss., Wien, Math. u. Naturwiss.*, cl. L., *Abth.* i., *Karte* 1. (1885). (J. A. H.)

JURAT (through Fr. from med. Lat. *juratus*, one sworn, Lat. *jurare*, to swear), a name given to the sworn holders of certain offices. Under the *ancien régime* in France, in several towns, of the south-west, such as Rochelle and Bordeaux, the *jurats* were members of the municipal body. The title was also borne by officials, corresponding to aldermen, in the Cinque Ports, but is now chiefly used as a title of office in the Channel Islands. There are two bodies, consisting each of twelve jurats, for Jersey and the bailiwick of Guernsey respectively. They are elected for life, in Jersey by the ratepayers, in Guernsey by the elective states. They form, with the bailiff as presiding judge, the royal court of justice, and are a constituent part of the legislative bodies. In English law, the word jurat (*juratum*) is applied to that part of an affidavit which contains the names of the parties swearing the affidavit and the person before whom it was sworn, the date, place and other necessary particulars.

JURIEN DE LA GRAVIÈRE, JEAN BAPTISTE EDMOND (1812–1892), French admiral, son of Admiral Jurien, who served through the Revolutionary and Napoleonic wars and was a peer of France under Louis Philippe, was born on the 19th of November 1812. He entered the navy in 1828, was made a commander in 1841, and captain in 1850. During the Russian War he commanded a ship in the Black Sea. He was promoted to be rear-admiral on the 1st of December 1855, and appointed to the command of a squadron in the Adriatic in 1859, when he absolutely sealed the Austrian ports with a close blockade. In October 1861 he was appointed to command the squadron in the Gulf of Mexico, and two months later the expedition against Mexico. On the 15th of January 1862 he was promoted to be vice-admiral. During the Franco-German War of 1870 he had command of the French Mediterranean fleet, and in 1871 he was appointed "director of charts." As having commanded in chief before the enemy, the age-limit was waived in his favour, and he was continued on the active list. Jurien died on the 4th of March 1892. He was a voluminous author of works on naval history and biography, most of which first appeared in the *Revue des deux mondes*. Among the most noteworthy of these are *Guerres maritimes sous la république et l'empire*, which was translated by Lord Dunsany under the title of *Sketches of the Last Naval War* (1848); *Souvenirs d'un amiral* (1860), that is, of his father, Admiral Jurien; *La Marine d'autrefois* (1865), largely autobiographical; and *La Marine d'aujourd'hui* (1872). In 1866 he was elected a member of the Academy.

JURIEU, PIERRE (1637–1713), French Protestant divine, was born at Mer, in Orléanais, where his father was a Protestant pastor. He studied at Saumur and Sedan under his grandfather, Pierre Dumoulin, and under Leblanc de Beaulieu. After completing his studies in Holland and England, Jurieu received Anglican ordination; returning to France he was ordained again and succeeded his father as pastor of the church at Mer. Soon after this he published his first work, *Examen de livre de la réunion du Christianisme* (1671). In 1674 his *Traité de la dévotion* led to his appointment as professor of theology and Hebrew at Sedan, where he soon became also pastor. A year later he published his *Apologie pour la morale des Réformés*. He obtained a high reputation, but his work was impaired by his controversial temper, which frequently developed into an irritated fanaticism, though he was always entirely sincere. He was called by his adversaries "the Goliath of the Protestants." On the suppression of the academy of Sedan in 1681, Jurieu received an invitation to a church at Rouen, but, afraid to remain in France on account of his forthcoming work, *La Politique du clergé de France*, he went to Holland and was pastor of the Walloon church of Rotterdam till his death on the 11th of January 1713. He was also professor at the école illustre. Jurieu did much to help those who suffered by the revocation of the Edict of Nantes (1685). He himself turned for consolation to the Apocalypse, and succeeded in persuading himself (*Accomplissement des prophéties*, 1686) that the overthrow of Antichrist (*i.e.* the papal church) would take place in 1689. H. M. Baird says that "this persuasion, however fanciful the grounds on which it was based, exercised no small influence in forwarding the success of the designs of William of Orange in the invasion of England." Jurieu defended the doctrines of Protestantism with great ability against the attacks of Antoine Arnauld, Pierre Nicole and Bossuet, but was equally ready to enter into dispute with his fellow Protestant divines (with Louis Du Moulin and Claude Payon, for instance) when their opinions differed from his own even on minor matters. The bitterness and persistency of his attacks on his colleague Pierre Bayle led to the latter being deprived of his chair in 1693.

One of Jurieu's chief works is *Lettres pastorales adressées aux fidèles de France* (3 vols., Rotterdam, 1686–1687; Eng. trans., 1689), which, notwithstanding the vigilance of the police, found its way into France and produced a deep impression on the Protestant population. His last important work was the *Histoire critique des dogmes et des cultes* (1704; Eng. trans., 1715). He wrote a great number of controversial works.

See the article in Herzog-Hauck, *Realencyklopädie*; also H. M. Baird, *The Huguenots and the Revocation of the Edict of Nantes* (1895).

JURIS, a tribe of South American Indians, formerly occupying the country between the rivers Iça (lower Putumayo) and Japura, north-western Brazil. In ancient days they were the most powerful tribe of the district, but in 1820 their numbers did not exceed 2000. Owing to inter-marrying, the Juris are believed to have been extinct for half a century. They were closely related to the Passēs, and were like them a fair-skinned, finely built people with quite European features.

JURISDICTION, in general, the exercise of lawful authority, especially by a court or a judge; and so the extent or limits within which such authority is exercisable. Thus each court has its appropriate jurisdiction; in the High Court of Justice in England administration actions are brought in the chancery division, salvage actions in the admiralty, &c. The jurisdiction of a particular court is often limited by statute, as that of a county court, which is local and is also limited in amount. In international law jurisdiction has a wider meaning, namely, the rights exercisable by a state within the bounds of a given space. This is frequently referred to as the territorial theory of jurisdiction. (See INTERNATIONAL LAW; INTERNATIONAL LAW, PRIVATE.)

JURISPRUDENCE (Lat. *jurisprudentia*, knowledge of law, from *jus*, right, and *prudentia*, from *providere*, to foresee), the general term for "the formal science of positive law" (T. E. Holland); see LAW. The essential principles involved are discussed below and in JURISPRUDENCE, COMPARATIVE; the details of particular laws or sorts of law (CONTRACT, &c.) and of individual national systems of law (ENGLISH LAW, &c.) being dealt with in separate articles.

The human race may be conceived as parcelled out into a number of distinct groups or societies, differing greatly in size and circumstances, in physical and moral characteristics of all kinds. But they all resemble each other in that they reveal on examination certain rules of conduct in accordance with which the relations of the members *inter se* are governed. Each society has its own system of laws, and all the systems, so far as they are known, constitute the appropriate subject matter of jurisprudence. The jurist may deal with it in the following ways. He may first of all examine the leading conceptions common to all the systems, or in other words define the leading terms common to them all. Such are the terms *law* itself, *right*, *duty*, *property*, *crime*, and so forth, which, or their equivalents, may, notwithstanding delicate differences of connotation, be regarded as common terms in all systems. That kind of inquiry is known in England as analytical jurisprudence. It regards the conceptions with which it deals as fixed or stationary, and aims at expressing them distinctly and exhibiting their logical relations with each other. What is really meant by a right and by a duty, and what is the true connexion between a right and a duty, are types of the questions proper to this inquiry. Shifting our point of view, but still regarding systems of law in the mass, we may consider them, not as stationary, but as changeable and changing, we may ask what general features are exhibited by the record of the change. This, somewhat crudely put, may serve to indicate the field of historical or comparative jurisprudence. In its ideal condition it would require an accurate record of the history of all legal systems as its material. But whether the material be abundant or scanty the method is the same. It seeks the explanation of institutions and legal principles in the facts of history. Its aim is to show how a given rule came to be what it is. The legislative source—the emanation of the rule from a sovereign authority—is of no importance here; what is important is the moral source—the connexion of the rule with the ideas prevalent during contemporary periods. This method, it is evident, involves not only a comparison of successive stages in the history of the same system, but a comparison of different systems, of the Roman with the English, of the Hindu with the Irish, and so on. The historical method as applied to law may be regarded as a special example of the method of comparison. The comparative method is really employed in all generalizations about law; for, although the analysis of legal terms might be conducted with exclusive reference to one system, the advantage of testing the result by reference to other systems is obvious. But, besides the use of comparison for purposes of analysis and in tracing the phenomena of the growth of laws, it is evident that for the purposes of practical legislation the comparison of different systems may yield important results. Laws are contrivances for bringing about certain definite ends, the larger of which are identical in all systems. The comparison of these contrivances not only serves to bring their real object, often obscured as it is in details, into clearer view, but enables legislators to see where the contrivances are deficient, and how they may be improved.

The "science of law," as the expression is generally used, means the examination of laws in general in one or other of the ways just indicated. It means an investigation of laws which exist or have existed in some given society in fact—in other words, positive laws; and it means an examination not limited to the exposition of particular systems. Analytical jurisprudence is in England associated chiefly with the name of John Austin (*q.v.*), whose *Province of Jurisprudence Determined* systematized and completed the work begun in England by Hobbes, and continued at a later date and from a different point of view by Bentham.

Austin's first position is to distinguish between laws properly so called and laws improperly so called. In any of the older writers on law, we find the various senses in which the word is used grouped together as variations of one common meaning. Thus Blackstone advances to his proper subject, municipal laws, through (1) the laws of inanimate matter, (2) the laws of animal nutrition, digestion, &c., (3) the laws of nature, which are rules imposed by God on men and discoverable by reason alone, and (4) the revealed or divine law which is part of the law of nature directly expounded by God. All of these are connected by this common element that they are "rules of action dictated by some superior being." And some such generalization as this is to be found at the basis of most treatises on jurisprudence which have not been composed under the influence of the analytical school. Austin disposes of it by the distinction that some of those laws are commands, while others are not commands. The so-called laws of nature are not commands; they are uniformities which resemble commands only in so far as they may be supposed to have been ordered by some intelligent being. But they are not commands in the only proper sense of that word—they are not addressed to reasonable beings, who may or may not will obedience to them. Laws of nature are not addressed to anybody, and there is no possible question of obedience or disobedience to them. Austin accordingly pronounces them laws improperly so called, and confines his attention to laws properly so called, which are commands addressed by a human superior to a human inferior.

This distinction seems so simple and obvious that the energy and even bitterness with which Austin insists upon it now seem superfluous. But the indiscriminate identification of everything to which common speech gives the name of a law was, and still is, a fruitful source of confusion. Blackstone's statement that when God "put matter into motion He established certain laws of motion, to which all movable matter must conform," and that in those creatures that have neither the power to think nor to will such laws must be invariably obeyed, so long as the creature itself subsists, for its existence depends on that obedience, imputes to the law of gravitation in respect of both its origin and its execution the qualities of an act of parliament. On the other hand the qualities of the law of gravitation are imputed to certain legal principles which, under the name of the law of nature, are asserted to be binding all over the globe, so that "no human laws are of any validity if contrary to this." Austin never fails to stigmatize the use of "natural laws" in the sense of scientific facts as improper, or as metaphorical.

Having eliminated metaphorical or figurative laws, we restrict ourselves to those laws which are commands. This word is the key to the analysis of law, and accordingly a large portion of Austin's work is occupied with the determination of its meaning. A *command* is an order issued by a superior to an inferior. It is a signification of desire distinguished by this peculiarity that "the party to whom it is directed is liable to evil from the other, in case he comply not with the desire." "If you are able and willing to harm me in case I comply not with your wish, the expression of your wish amounts to a command." Being liable to evil in case I comply not with the wish which you signify, I am *bound* or obliged by it, or I lie under a *duty* to obey it. The evil is called a *sanction*, and the command or duty is said to be *sanctioned* by the chance of incurring the evil. The three terms *command*, *duty* and *sanction* are thus inseparably connected. As Austin expresses it in the language of formal logic, "each of the three terms signifies the same notion, but each *denotes* a different part of that notion and *connotes* the residue."

All commands, however, are not laws. That term is reserved for those commands which oblige generally to the performance of acts of a class. A command to your servant to rise at such an hour on such a morning is a particular command, but not a law or rule; a command to rise always at that hour is a law or rule. Of this distinction it is sufficient to say in the meantime that it involves, when we come to deal with positive laws, the rejection of particular enactments to which by inveterate usage the term law would certainly be applied. On the other hand it is not, according to Austin, necessary that a true law should bind persons as a class. Obligations imposed on the grantee of an office specially created by parliament would imply a law; a general order to go into mourning addressed to the whole nation for a particular occasion would not be a law.

So far we have arrived at a definition of laws properly so called. Austin holds superiority and inferiority to be necessarily implied in command, and such statements as that "laws emanate from superiors" to be the merest tautology and trifling. Elsewhere he sums up the characteristics of true laws as ascertained by the analysis thus: (1) laws, being commands, emanate from a determinate source; (2) every sanction is an evil annexed to a command; and (3) every duty implies a command, and chiefly means obnoxiousness to the evils annexed to commands.

Of true laws, those only are the subject of jurisprudence which are laws strictly so called, or positive laws. Austin accordingly proceeds to distinguish positive from other true laws, which are either laws set by God to men or laws set by men to men, not, however, as political superiors nor in pursuance of a legal right. The discussion of the first of these true but not positive laws leads Austin to his celebrated discussion of the utilitarian theory. The laws set by God are either revealed or unrevealed, *i.e.* either expressed in direct command, or made known to men in one or other of the ways denoted by such phrases as the "light of nature," "natural reason," "dictates of nature," and so forth. Austin maintains that the principle of general utility, based ultimately on the assumed benevolence of God, is the true index to such of His commands as He has not chosen to reveal. Austin's exposition of the meaning of the principle is a most valuable contribution to moral science, though he rests its claims ultimately on a basis which many of its supporters would disavow. And the whole discussion is now generally condemned as lying outside the proper scope of the treatise, although the reason for so condemning it is not always correctly stated. It is found in such assumptions of fact as that there is a God, that He has issued commands to men in what Austin calls the "truths of revelation," that He designs the happiness of all His creatures, that there is a predominance of good in the order of the world—which do not now command universal assent. It is impossible to place these propositions on the same scientific footing as the assumptions of fact with reference to human society on which jurisprudence rests. If the "divine laws" were facts like acts of parliament, it is conceived that the discussion of their characteristics would not be out of place in a scheme of jurisprudence.

The second set of laws properly so called, which are not positive laws, consists of three classes: (1) those which are set by men living in a state of nature; (2) those which are set by sovereigns but not as political superiors, *e.g.* when one sovereign commands another to act according to a principle of international law; and (3) those set by subjects but not in pursuance of legal rights. This group, to which Austin gives the name of positive morality, helps to explain his conception of positive law. Men are living in a state of nature, or a state of anarchy, when they are not living in a state of government or as members of a political society. "Political society" thus becomes the central fact of the theory, and some of the objections that have been urged against it arise from its being applied to conditions of life in which Austin would not have admitted the existence of a political society. Again, the third set in the group is intimately connected with positive laws on the one hand and rules of positive morality which are not even laws properly so called on the other. Thus laws set by subjects in consequence of a legal right are clothed with legal sanctions, and are laws positive. A law set by guardian to ward, in pursuance of a right which the guardian is bound to exercise, is a positive law pure and simple; a law set by master to slave, in pursuance of a legal right, which he is not bound to exercise, is, in Austin's phraseology, to be regarded both as a positive moral rule and as a positive law.[1] On the other hand the rules set by a club or society, and enforced upon its members by exclusion from the society, but not in pursuance of any legal right, are laws, but not positive laws. They are imperative and proceed from a determinate source, but they have no legal or political sanction. Closely connected with this positive morality, consisting of true but not positive laws, is the positive morality whose rules are not laws properly so called at all, though they are generally denominated laws. Such are the laws of honour, the laws of fashion, and, most important of all, international law.

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[1] This appears to be an unnecessary complication. The sovereign has authorized the master to set the law, although not compelling him to do so, and enforces the law when set. There seems no good reason why the law should be called a rule of positive morality at all.

Nowhere does Austin's phraseology come more bluntly into conflict with common usage than in pronouncing the law of nations (which in substance is a compact body of well-defined rules resembling nothing so much as the ordinary rules of law) to be not laws at all, even in the wider sense of the term. That the rules of a private club should be law properly so called, while the whole mass of international jurisprudence is mere opinion, shocks our sense of the proprieties of expression. Yet no man was more careful than Austin to observe these properties. He recognizes fully the futility of definitions which involve a painful struggle with the current of ordinary speech. But in the present instance the apparent paralogism cannot be avoided if we accept the limitation of laws properly so called to commands proceeding from a determinate source. And that limitation is so generally present in our conception of law that to ignore it would be a worse anomaly than this. No one finds fault with the statement that the so-called code of honour or the dictates of fashion are not, properly speaking, laws. We repel the same statement applied to the law of nature, because it resembles in so many of its most striking features—in the certainty of a large portion of it, in its terminology, in its substantial principles—the most universal elements of actual systems of law, and because, moreover, the assumption that brought it into existence was nothing else than this, that it consisted of those abiding portions of legal systems which prevail everywhere by their own authority. But, though "positive morality" may not be the best phrase to describe such a code of rules, the distinction insisted on by Austin is unimpeachable.

The elimination of those laws properly and improperly so called which are not positive laws brings us to the definition of positive law, which is the keystone of the system. Every positive law is "set by a sovereign person, or sovereign body of persons, to a member or members of the independent political society wherein that person or body is sovereign or superior." Though possibly sprung directly from another source, it is a positive law, by the institution of that present sovereign in the character of a political superior. The question is not as to the historical origin of the principle, but as to its present authority. "The legislator is he, not by whose authority the law was first made, but by whose authority it continues to be law." This definition involves the analysis of the connected expressions *sovereignty*, *subjection* and *independent political society*, and of *determinate body*—which last analysis Austin performs in connexion with that of commands. These are all excellent examples of the logical method of which he was so great a master. The broad results alone need be noticed here. In order that a given society may form a society political and independent, the *generality or bulk* of its members must be in a *habit* of obedience to a certain and common superior; whilst that certain person or body of persons must not be *habitually* obedient to a certain person or body. All the italicized words point to circumstances in which it might be difficult to say whether a given society is political and independent or not. Several of these Austin has discussed—*e.g.* the state of things in which a political society yields obedience which may or may not be called habitual to some external power, and the state of things in which a political society is divided between contending claimants for sovereign power, and it is uncertain which shall prevail, and over how much of the society. So long as that uncertainty remains we have a state of *anarchy*. Further, an independent society to be political must not fall below a number which can only be called considerable. Neither then in a state of anarchy, nor in inconsiderable communities, nor among men living in a state of nature, have we the proper phenomena of a political society. The last limitation goes some way to meet the most serious criticism to which Austin's system has been exposed, and it ought to be stated in his own words. He supposes a society which may be styled independent, which is considerable in numbers, and which is in a savage or extremely barbarous condition. In such a society, "the bulk of its members is not in the habit of obedience to one and the same superior. For the purpose of attacking an external enemy, or for the purpose of repelling an attack, the bulk of its members who are capable of bearing arms submits to one leader or one body of leaders. But as soon as that emergency passes the transient submission ceases, and the society reverts to the state which may be deemed its ordinary state. The bulk of each of the families which compose the given society renders habitual obedience to its own peculiar chief, but those domestic societies are themselves independent societies, or are not united and compacted into one political society by habitual and general obedience to one common superior, and there is no law (simply or strictly so styled) which can be called the law of that society. The so-called laws which are common to the bulk of the community are purely and properly customary laws—that is to say, laws which are set or imposed by the general opinion of the community, but are not enforced by legal or political sanctions." Such, he says, are the savage societies of hunters and fishers in North America, and such were the Germans as described by Tacitus. He takes no account of societies in an intermediate stage between this and the condition which constitutes political society.

We need not follow the analysis in detail. Much ingenuity is displayed in grouping the various kinds of government, in detecting the sovereign authority under the disguises which it wears in the complicated state system of the United States or under the fictions of English law, in elucidating the precise meaning of abstract political terms. Incidentally the source of many celebrated fallacies in political thought is laid bare. That the question who is sovereign in a given state is a question of fact and not of law or morals or religion, that the sovereign is incapable of legal limitation, that law is such by the sovereign's command, that no real or assumed compact can limit his action—are positions which Austin has been accused of enforcing with needless iteration. He cleared them, however, from the air of paradox with which they had been previously encumbered, and his influence was in no direction more widely felt than in making them the commonplaces of educated opinion in this generation.

Passing from these, we may now consider what has been said against the theory, which may be summed up in the following terms. Laws, no matter in what form they be expressed, are in the last resort reducible to commands set by the person or body of persons who are in fact sovereigns in any independent political society. The sovereign is the person or persons whose commands are habitually obeyed by the great bulk of the community; and by an independent society we mean that such sovereign head is not himself habitually obedient to any other determinate body of persons. The society must be sufficiently numerous to be considerable before we can speak of it as a political society. From command, with its inseparable incident of sanction, come the duties and rights in terms of which laws are for the most part expressed. Duty means that the person of whom it is predicated is liable to the sanction in case he fails to obey the command. Right means that the person of whom it is predicated may set the sanction in operation in case the command be disobeyed.

We may here interpolate a doubt whether the condition of independence on the part of the head of a community is essential to the legal analysis. It seems to us that we have all the elements of a true law present when we point to a community habitually obedient to the authority of a person or determinate body of persons, no matter what the relations of that superior may be to any external or superior power. Provided that in fact the commands of the lawgiver are those beyond which the community never looks, it seems immaterial to inquire whether this lawgiver in turn takes his orders from somebody else or is habitually obedient to such orders when given. One may imagine a community governed by a dependent legislatorial body or person, while the supreme sovereign whose representative and nominee such body or person may be never directly addresses the community at all. We do not see that in such a case anything is gained in clearness by representing the law of the community as set by the suzerain, rather than the dependent legislator. Nor is the ascertainment of the ultimate seat of power necessary to define political societies. That we get when we suppose a community to be in the habit of obedience to a single person or to a determinate combination of persons.

The use of the word "command" is not unlikely to lead to a misconception of Austin's meaning. When we say that a law is a command of the sovereign, we are apt to think of the sovereign as enunciating the rule in question for the first time. Many laws are not traceable to the sovereign at all in this sense. Some are based upon immemorial practices, some can be traced to the influence of private citizens, whether practising lawyers or writers on law, and in most countries a vast body of law owes its existence as such to the fact that it has been observed as law in some other society. The great bulk of modern law owes its existence and its shape ultimately to the labours of the Roman lawyers of the empire. Austin's definition has nothing to do with this, the historical origin of laws. Most books dealing with law in the abstract generalize the modes in which laws may be originated under the name of the "sources" of law, and one of these is legislation, or the direct command of the sovereign body. The connexion of laws with each other as principles is properly the subject matter of historical jurisprudence, the ideal perfection of which would be the establishment of the general laws governing the evolution of law in the technical sense. Austin's definition looks, not to the authorship of the law as a principle, not to its inventor or originator, but to the person or persons who in the last resort cause it to be obeyed. If a given rule is enforced by the sovereign it is a law.

It may be convenient to notice here what is usually said about the sources of law, as the expression sometimes proves a stumbling-block to the appreciation of Austin's system. In the *corpus juris* of any given country only a portion of the laws is traceable to the direct expression of his commands by the sovereign. Legislation is one, but only one, of the sources of law. Other portions of the law may be traceable to other sources, which may vary in effect in different systems. The list given in the *Institutes* of Justinian of the ways in which law may be made—*lex*, *plebiscitum*, *principis placita*, *edicta magistratuum*, and so on—is a list of sources. Among the sources of law other than legislation which are most commonly exemplified are the laws made by judges in the course of judicial decisions, and law originating as custom. The source of the law in the one case is the judicial decision, in the other the custom. In consequence of the decisions and in consequence of the custom the rule has prevailed. English law is largely made up of principles derived in each of those ways, while it is deficient in principles derived from the writings of independent teachers, such as have in other systems exercised a powerful influence on the development of law. The *responsa prudentum*, the opinions of learned men, published as such, did undoubtedly originate an immense portion of Roman law. No such influence has affected English law to any appreciable extent—a result owing to the activity of the courts of the legislature. This difference has profoundly affected the form of English law as compared with that of systems which have been developed by the play of free discussion. These are the most definite of the influences to which the beginning of laws may be traced. The law once established, no matter how, is nevertheless law in the sense of Austin's definition. It is enforced by the sovereign authority. It was originated by something very different. But when we speak of it as a command we think only of the way in which it is to-day presented to the subject. The newest order of an act of parliament is not more positively presented to the people as a command to be obeyed than are the elementary rules of the common law for which no legislative origin can be traced. It is not even necessary to resort to the figure of speech by which alone, according to Sir Henry Maine (*Early History of Institutions*, p. 314), the common law can be regarded as the commands of the government. "The common law," he says, "consists of their commands because they can repeal or alter or restate it at pleasure." "They command because, being by the assumption possessed of uncontrollable force, they could innovate without limit at any moment." On the contrary, it may be said that they command because they do as a matter of fact enforce the rules laid down in the common law. It is not because they could innovate if they pleased in the common law that they are said to command it, but because it is known that they will enforce it as it stands.

The criticism of Austin's analysis resolved itself into two different sets of objections. One relates to the theory of sovereignty which underlies it; the other to its alleged failure to include rules which in common parlance are laws, and which it is felt ought to be included in any satisfactory definition of law. As the latter is to some extent anticipated and admitted by Austin himself, we may deal with it first.

Frederic Harrison (*Fortnightly Review*, vols. xxx., xxxi.) was at great pains to collect a number of laws or rules of law which do not square with the Austinian definition of law as a command creating rights and duties. Take the rule that "every will must be in writing." It is a very circuitous way of looking at things, according to Harrison, to say that such a rule creates a specific right in any determinate person of a definite description. So, again, the rule that "a legacy to the witness of a will is void." Such a rule is not "designed to give any one any rights, but simply to protect the public against wills made under undue influence." Again, the technical rule in Shelley's case that a gift to A for life, followed by a gift to the heirs of A, is a gift to A in fee simple, is pronounced to be inconsistent with the definition. It is an idle waste of ingenuity to force any of these rules into a form in which they might be said to create rights.

This would be a perfectly correct description of any attempt to take any of these rules separately and analyse it into a complete command creating specific rights and duties. But there is no occasion for doing anything of the kind. It is not contended that every grammatically complete sentence in a textbook or a statute is *per se* a command creating rights and duties. A law, like any other command, must be expressed in words, and will require the use of the usual aids to expression. The gist of it may be expressed in a sentence which, standing by itself, is not intelligible; other sentences locally separate from the principal one may contain the exceptions and the modifications and the interpretations to which that is subject. In no one of these taken by itself, but in the substance of them all taken together, is the true law, in Austin's sense, to be found. Thus the rule that every will must be in writing is a mere fragment—only the limb of a law. It belongs to the rule which fixes the rights of devisees or legatees under a will. That rule in whatever form it may be expressed is, without any straining of language, a command of the legislator. That "every person named by a testator in his last will and testament shall be entitled to the property thereby given him" is surely a command creating rights and duties. After testament add "expressed in writing"; it is still a command. Add further, "provided he be not one of the witnesses to the will," and the command, with its product of rights and duties, is still there. Each of the additions limits the operation of the command stated imperatively in the first sentence. So with the rule in Shelley's case. It is resolvable into the rule that every person to whom an estate is given by a conveyance expressed in such and such a way shall take such and such rights. To take another example from later legislation. An English statute passed in 1881 enacts nothing more than this, that an act of a previous session shall be construed as if "that" meant "this." It would be futile indeed to force this into conformity with Austin's definition by treating it as a command addressed to the judges, and as indirectly creating rights to have such a construction respected. As it happens, the section of the previous act referred to (the Burials Act 1880) was an undeniable command addressed to the clergy, and imposed upon them a specific duty. The true command—the law—is to be found in the two sections taken together.

All this confusion arises from the fact that laws are not habitually expressed in imperative terms. Even in a mature system like that of England the great bulk of legal rules is hidden under forms which disguise their imperative quality. They appear as principles, maxims, propositions of fact, generalizations, points of pleading and procedure, and so forth. Even in the statutes the imperative form is not uniformly observed. It might be said that the more mature a legal system is the less do its individual rules take the form of commands. The greater portion of Roman law is expressed in terms which would not misbecome scientific or speculative treatises. The institutional works abound in propositions which have no legal significance at all, but which are not distinguished from the true law in which they are embedded by any difference in the forms of expression. Assertions about matters of history, dubious speculations in philology, and reflections on human conduct are mixed up in the same narrative with genuine rules of law. Words of description are used, not words of command, and rules of law assimilate themselves in form to the extraneous matter with which they are mixed up.

It has been said that Austin himself admitted to some extent the force of these objections. He includes among laws which are not imperative "declaratory laws, or laws explaining the import of existing positive law, and laws abrogating or repealing existing positive law." He thus associates them with rules of positive morality and with laws which are only metaphorically so called. This collocation is unfortunate and out of keeping with Austin's method. Declaratory and repealing laws are as completely unlike positive morality and metaphorical laws as are the laws which he describes as properly so called. And if we avoid the error of treating each separate proposition enunciated by the lawgiver as *a* law, the cases in question need give us no trouble. Read the declaratory and the repealing statutes along with the principal laws which they affect, and the result is perfectly consistent with the proposition that all law is to be resolved into a species of command. In the one case we have in the principal taken together with the interpretative statute a law, and whether it differs or not from the law as it existed before the interpretative statute was passed makes no difference to the true character of the latter. It contributes along with the former to the expression of a command which is a true law. In the same way repealing statutes are to be taken together with the laws which they repeal—the result being that there is no law, no command, at all. It is wholly unnecessary to class them as laws which are not truly imperative, or as exceptions to the rule that laws are a species of commands. The combination of the two sentences in which the lawgiver has expressed himself, yields the result of silence—absence of law—which is in no way incompatible with the assertion that a law, when it exists, is a kind of command. Austin's theory does not logically require us to treat every act of parliament as being a complete law in itself, and therefore to set aside a certain number of acts of parliament as being exceptions to the great generalization which is the basis of the whole system.

Rules of procedure again have been alleged to constitute another exception. They cannot, it is said, be regarded as commands involving punishment if they be disobeyed. Nor is anything gained by considering them as commands addressed to the judge and other ministers of the law. There may be no doubt in the law of procedure a great deal that is resolvable into law in this sense, but the great bulk of it is to be regarded like the rules of interpretation as entering into the substantive commands which are laws. They are descriptions of the sanction and its mode of working. The bare prohibition of murder without any penalty to enforce it would not be a law. To prohibit it under penalty of death implies a reference to the whole machinery of criminal justice by which the penalty is enforced. Taken by themselves the rules of procedure are not, any more than canons of interpretation, complete laws in Austin's sense of the term. But they form part of the complete expression of true laws. They imply a command, and they describe the sanction and the mode in which it operates.

A more formidable criticism of Austin's position is that which attacks the definition of sovereignty. There are countries, it is said, where the sovereign authority cannot by any stretch of language be said to command the laws, and yet where law manifestly exists. The ablest and the most moderate statement of this view is given by Sir Henry Maine in *Early History of Institutions*, p. 380:—

> "It is from no special love of Indian examples that I take one from India, but because it happens to be the most modern precedent in point. My instance is the Indian province called the Punjaub, the country of the Five Rivers, in the state in which it was for about a quarter of a century before its annexation to the British Indian Empire. After passing through every conceivable phase of anarchy and dormant anarchy, it fell under the tolerably consolidated dominion of a half-military half-religious oligarchy known as the Sikhs. The Sikhs themselves were afterwards reduced to subjection by a single chieftain belonging to their order, Runjeet Singh. At first sight there could be no more perfect embodiment than Runjeet Singh of sovereignty as conceived by Austin. He was absolutely despotic. Except occasionally on his wild frontier he kept the most perfect order. He could have commanded anything; the smallest disobedience to his commands would have been followed by death or mutilation; and this was perfectly well known to the enormous majority of his subjects. Yet I doubt whether once in all his life he issued a command which Austin would call a law. He took as his revenue a prodigious share of the produce of the soil. He harried villages which recalcitrated at his exactions, and he executed great numbers of men. He levied great armies; he had all material of power, and he exercised it in various ways. But he never made a law. The rules which regulated the lives of his subjects were derived from their immemorial usages, and those rules were administered by domestic tribunals in families or village communities—that is, in groups no larger or little larger than those to which the application of Austin's principles cannot be effected on his own admission without absurdity."

So far as the mere size of the community is concerned, there is no difficulty in applying the Austinian theory. In postulating a considerably numerous community Austin was thinking evidently of small isolated groups which could not without provoking a sense of the ridiculous be termed nations. Two or three families, let us suppose, occupying a small island, totally disconnected with any great power, would not claim to be and would not be treated as an independent political community. But it does not follow that Austin would have regarded the village communities spoken of by Maine in the same light. Here we have a great community, consisting of a vast number of small communities, each independent of the other, and disconnected with all the others, so far as the administration of anything like law is concerned. Suppose in each case that the headman or council takes his orders from Runjeet Singh, and enforces them, each in his own sphere, relying as the last resort on the force at the disposal of the suzerain. The mere size of the separate communities would make no sort of difference to Austin's theory. He would probably regard the empire of Runjeet Singh as divided into small districts—an assumption which inverts no doubt the true historical order, the smaller group being generally more ancient than the larger. But provided that the other conditions prevail, the mere fact that the law is administered by local tribunals for minute areas should make no difference to the theory. The case described by Maine is that of the undoubted possession of supreme power by a sovereign, coupled with the total absence of any attempt on his part to *originate* a law. That no doubt is, as we are told by the same authority, "the type of all Oriental communities in their native state during their rare intervals of peace and order." The empire was in the main in each case a tax-gathering empire. The unalterable law of the Medes and Persians was not a law at all but an occasional command. So again Maine puts his position clearly in the following sentences: "The Athenian assembly made true laws for residents on Attic territory, but the dominion of Athens over her subject cities and islands was clearly a tax-taking as distinguished from a legislating empire." Maine, it will be observed, does not say that the sovereign assembly did not command the laws in the subject islands—only that it did not legislate.

In the same category may be placed without much substantial difference all the societies that have ever existed on the face of the earth previous to the point at which *legislation* becomes active. Maine is undoubtedly right in connecting the theories of Bentham and Austin with the overwhelming activity of legislatures in modern times. And formal legislation, as he elsewhere shows, comes late in the history of most legal systems. Law is generated in other ways, which seem irreconcilable with anything like legislation. Not only the tax-gathering emperors of the East, indifferent to the condition of their subjects, but even actively benevolent governments have up to a certain point left the law to grow by other means than formal enactments. What is *ex facie* more opposed to the idea of a sovereign's commands than the conception of schools of law? Does it not "sting us with a sense of the ridiculous" to hear principles which are the outcome of long debates between Proculians and Sabinians described as commands of the emperor? How is sectarianism in law possible if the sovereign's command is really all that is meant by a law? No mental attitude is more common than that which regards law as a natural product—discoverable by a diligent investigator, much in the same way as the facts of science or the principles of mathematics. The introductory portions of Justinian's *Institutes* are certainly written from this point of view, which may also be described without much unfairness as the point of view of German jurisprudence. And yet the English jurist who accepts Austin's postulate as true for the English system of our own day would have no difficulty in applying it to German or Roman law generated under the influence of such ideas as these.

Again, referring to the instance of Runjeet Singh, Sir H. Maine says no doubt rightly that " he never did or could have dreamed of changing the civil rules under which his subjects lived. Probably he was as strong a believer in the independent obligatory force of such rules as the elders themselves who applied them." That too might be said with truth of states to which the application of Austin's system would be far from difficult. The sovereign body or person enforcing the rules by all the ordinary methods of justice might conceivably believe that the rules which he enforced had an obligatory authority of their own, just as most lawyers at one time, and possibly some lawyers now, believe in the natural obligatoriness, independently of courts or parliaments, of portions of the law of England. But nevertheless, whatever ideas the sovereign or his delegates might entertain as to " the independent obligatory force " of the rules which they enforce, the fact that they do enforce them distinguishes them from all other rules. Austin seizes upon this peculiarity and fixes it as the determining characteristic of positive law. When the rule is enforced by a sovereign authority as he defines it, it is his command, even if he should never so regard it himself, or should suppose himself to be unable to alter it in a single particular.

It may be instructive to add to these examples of dubious cases one taken from what is called ecclesiastical law. In so far as this has not been adopted and enforced by the state, it would, on Austin's theory, be, not positive law, but either positive morality or possibly a portion of the Divine law. No jurist would deny that there is an essential difference between so much of ecclesiastical law as is adopted by the state and all the rest of it, and that for scientific purposes this distinction ought to be recognized. How near this kind of law approaches to the positive or political law may be seen from the sanctions on which it depended. " The theory of penitential discipline was this: that the church was an organized body with an outward and visible form of government; that all who were outside her boundaries were outside the means of divine grace; that she had a command laid upon her, and authority given to her, to gather men into her fellowship by the ceremony of baptism, but, as some of those who were admitted proved unworthy of their calling, she also had the right by the power of the keys to deprive them temporarily or absolutely of the privilege of communion with her, and on their amendment to restore them once more to church membership. On this power of exclusion and restoration was founded the system of ecclesiastical discipline. It was a purely spiritual jurisdiction. It obtained its hold over the minds of men from the belief, universal in the Catholic church of the early ages, that he who was expelled from her pale was expelled also from the way of salvation, and that the sentence which was pronounced by God's church on earth was ratified by Him in heaven." (Smith's *Dictionary of Christian Antiquities*, art. " Penitence," p. 1587.)

These laws are not the laws of the jurists, though they resemble them closely in many points—indeed in all points except that of the sanction by which they are enforced. It is a spiritual not a political sanction. The force which lies behind them is not that of the sovereign or the state. When physical force is used to compel obedience to the laws of the church they become positive laws. But so long as the belief in future punishments or the fear of the purely spiritual punishments of the church is sufficient to procure obedience to them, they are to be regarded as commands, not by the state, but by the church. That difference Austin makes essential. In rejecting spiritual laws from the field of positive law his example would be followed by jurists who would nevertheless include other laws, not ecclesiastical in purpose, but enforced by very similar methods.

Austin's theory in the end comes to this, that true laws are in all cases obeyed in consequence of the application of regulated physical force by some portion of the community. That is a fair paraphrase of the position that laws are the commands of the sovereign, and is perhaps less objectionable inasmuch as it does not imply or suggest anything about the forms in which laws are enunciated. All rules, customs, practices and laws—or by whatever name these uniformities of human conduct may be called—have either this kind of force at their back or they have not. Is it worth while to make this difference the basis of a scientific system or not? Apparently it is. If it were a question of distinguishing between the law of the law courts and the laws of fashion no one would hesitate. Why should laws or rules having no support from any political authority be termed laws positive merely because there are no other rules in the society having such support?

The question may perhaps be summed up as follows. Austin's definitions are in strict accordance with the facts of government in civilized states; and, as it is put by Maine, certain assumptions or postulates having been made, the great majority of Austin's positions follow as of course or by ordinary logical process. But at the other extreme end of the scale of civilization are societies to which Austin himself refuses to apply his system, and where, it would be conceded on all sides, there is neither political community nor sovereign nor law—none of the facts which jurisprudence assumes to exist. There is an intermediate stage of society in which, while the rules of conduct might and generally would be spoken of as laws, it is difficult to trace the connexion between them and the sovereign authority whose existence is necessary to Austin's system. Are such societies to be thrown out of account in analytical jurisprudence, or is Austin's system to be regarded as only a partial explanation of the field of true law, and his definitions good only for the laws of a portion of the world? The true answer to this question appears to be that when the rules in any given case are habitually enforced by physical penalties, administered by a determinate person or portion of the community, they should be regarded as positive laws and the appropriate subject matter of jurisprudence. Rules which are not so enforced, but are enforced in any other way, whether by what is called public opinion, or spiritual apprehensions, or natural instinct, are rightly excluded from that subject matter. In all stages of society, savage or civilized, a large body of rules of conduct, habitually obeyed, are nevertheless not enforced by any state sanction of any kind. Austin's method assimilates such rules in primitive society, where they subserve the same purpose as positive laws in an advanced society, not to the positive laws which they resemble in purpose but to the moral or other rules which they resemble in operation. If we refuse to accept this position we must abandon the attempt to frame a general definition of law and its dependent terms, or we must content ourselves with saying that law is one thing in one state of society and another thing in another. On the ground of clearness and convenience Austin's method is, we believe, substantially right, but none the less should the student of jurisprudence be on his guard against such assumptions as that legislation is a universal phenomenon, or that the relation of sovereign and subject is discernible in all states of human society. And a careful examination of Maine's criticism will show that it is devoted not so much to a rectification of Austin's position as to correction of the misconceptions into which some of his disciples may have fallen. It is a misconception of the analysis to suppose that it involves a difference in juridical character between custom not yet recognized by any judicial decision and custom after such recognition. There is no such difference except in the case of what is properly called " judicial legislation "—wherein an absolutely new rule is added for the first time to the law. The recognition of a custom or law is not necessarily the beginning of the custom or law. Where a custom possesses the marks by which its legality is determined according to well understood principles, the courts pronounce it to have been law at the time of the happening of the facts as to which their jurisdiction is invoked. The fact that no previous instance of its recognition by a court of justice can be produced is not material. A lawyer before any such decision was given would nevertheless pronounce the custom to be law—with more or less hesitation according as the marks of a legal custom were obvious or not. The character of the custom is not changed when it is for the first time enforced by a court of justice, and hence the language used by Maine must be understood in a very limited sense. " Until customs are enforced by courts of justice "—so he puts the position of Austin—they are merely " positive morality," rules enforced by opinion; but as soon as courts of justice enforce them they become commands of the sovereign, conveyed through the judges who are his delegates or deputies. This proposition, on

Austin's theory, would only be true of customs as to which these marks were absent. It is of course true that when a rule enforced only by opinion becomes for the first time enforceable by a court of justice—which is the same thing as the first time of its being actually enforced—its juridical character is changed. It was positive morality; it is now law. So it is when that which was before the opinion of the judge only becomes by his decision a rule enforceable by courts of justice. It was not even positive morality but the opinion of an individual; it is now law.

The most difficult of the common terms of law to define is *right*; and, as right rather than duty is the basis of classification, it is a point of some importance. Assuming the truth of the analysis above discussed, we may go on to say that in the notion of law is involved an obligation on the part of some one, or on the part of every one, to do or forbear from doing. That obligation is duty; what is right? Dropping the negative of forbearance, and taking duty to mean an obligation to do something, with the alternative of punishment in default, we find that duties are of two kinds. The thing to be done may have exclusive reference to a determinate person or class of persons, on whose motion or complaint the sovereign power will execute the punishment or sanction on delinquents; or it may have no such reference, the thing being commanded, and the punishment following on disobedience, without reference to the wish or complaint of individuals. The last are absolute duties, and the omission to do, or forbear from doing, the thing specified in the command is in general what is meant by a crime. The others are relative duties, each of them implying and relating to a right in some one else. A person has a right who may in this way set in operation the sanction provided by the state. In common thought and speech, however, right appears as something a good deal more positive and definite than this—as a power or faculty residing in individuals, and suggesting not so much the relative obligation as the advantage or enjoyment secured thereby to the person having the right. J. S. Mill, in a valuable criticism of Austin, suggests that the definition should be so modified as to introduce the element of " advantage to the person exercising the right." But it is exceedingly difficult to frame a positive definition of right which shall not introduce some term at least as ambiguous as the word to be defined. T. E. Holland defines right in general as a man's " capacity of influencing the acts of another by means, not of his own strength, but of the opinion or the force of society." Direct influence exercised by virtue of one's own strength, physical or otherwise, over another's acts, is " might " as distinguished from right. When the indirect influence is the opinion of society, we have a " moral right." When it is the force exercised by the sovereign, we have a legal right. It would be more easy, no doubt, to pick holes in this definition than to frame a better one.[1]

The distinction between rights available against determinate persons and rights available against all the world, *jura in personam* and *jura in rem*, is of fundamental importance. The phrases are borrowed from the classical jurists, who used them originally to distinguish actions according as they were brought to enforce a personal obligation or to vindicate rights of property. The owner of property has a right to the exclusive enjoyment thereof, which avails against all and sundry, but not against one person more than another. The parties to a contract have rights available against each other, and against no other persons. The *jus in rem* is the badge of property; the *jus in personam* is a mere personal claim.

That distinction in rights which appears in the division of law into the law of persons and the law of things is thus stated by Austin. There are certain rights and duties, with certain capacities and incapacities, by which persons are determined to various classes. The rights, duties, &c., are the condition or status of the person; and one person may be invested with many status or conditions. The law of persons consists of the rights, duties, &c., constituting conditions or status; the rest of the law is the law of things. The separation is a mere matter of convenience, but of convenience so great that the distinction is universal. Thus any given right may be exercised by persons belonging to innumerable classes. The person who has the right may be under twenty-one years of age, may have been born in a foreign state, may have been convicted of crime, may be a native of a particular county, or a member of a particular profession or trade, &c.; and it might very well happen, with reference to any given right, that, while persons in general, under the circumstances of the case, would enjoy it in the same way, a person belonging to any one of these classes would not. If belonging to any one of those classes makes a difference not to one right merely but to many, the class may conveniently be abstracted, and the variations in rights and duties dependent thereon may be separately treated under the law of persons. The personality recognized in the law of persons is such as modifies indefinitely the legal relations into which the individual clothed with the personality may enter.

T. E. Holland disapproves of the prominence given by Austin to this distinction, instead of that between public and private law. This, according to Holland, is based on the public or private character of the persons with whom the right is connected, public persons being the state or its delegates. Austin, holding that the state cannot be said to have legal rights or duties, recognizes no such distinction. The term " public law " he confines strictly to that portion of the law which is concerned with political conditions, and which ought not to be opposed to the rest of the law, but " ought to be inserted in the law of persons as one of the limbs or members of that supplemental department."

Lastly, following Austin, the main division of the law of things is into (1) primary rights with primary relative duties, (2) sanctioning rights with sanctioning duties (relative or absolute). The former exist, as it has been put, for their own sake, the latter for the sake of the former. Rights and duties arise from facts and events; and facts or events which are violations of rights and duties are *delicts* or *injuries*. Rights and duties which arise from delicts are remedial or sanctioning, their object being to prevent the violation of rights which do not arise from delicts.

There is much to be said for Frederic Harrison's view (first expressed in the *Fortnightly Review*, vol. xxxi.), that the rearrangement of English law on the basis of a scientific classification, whether Austin's or any other, would not result in advantages at all compensating for its difficulties. If anything like a real code were to be attempted, the scientific classification would be the best; but in the absence of that, and indeed in the absence of any habit on the part of English lawyers of studying the system as a whole, the arrangement of facts does not very much matter. It is essential, however, to the abstract study of the principles of law. Scientific arrangement might also be observed with advantage in treatises affecting to give a view of the whole law, especially those which are meant for educational rather than professional uses. As an example of the practical application of a scientific system of classification to a complete body of law, we may point to W. A. Hunter's elaborate *Exposition of Roman Law* (1876).

It is impossible to present the conclusions of historical jurisprudence in anything like the same shape as those which we have been discussing. Under the heading JURISPRUDENCE, COMPARATIVE, an account will be found of the method and results of what is practically a new science. The inquiry is in that stage which is indicated in one way by describing it as a philosophy. It resembles, and is indeed only part of, the study which is described as the philosophy of history. Its chief interest has been in the light which it has thrown upon rules of law and legal institutions which had been and are generally contemplated as positive facts merely, without reference to their history, or have been associated historically with principles and institutions not really connected with them.

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[1] In English speech another ambiguity is happily wanting which in many languages besets the phrase expressing " a right." The Latin " jus." the German " Recht," the Italian " diritto," and the French " droit " express, not only a right, but also law in the abstract. To indicate the distinction between " law " and " a right " the Germans are therefore obliged to resort to such phrases as " objectives " and " subjectives Recht," meaning by the former law in the abstract, and by the latter a concrete right. And Blackstone, paraphrasing the distinction drawn by Roman law between the " jus quod ad res " and the " jus quod ad personas attinet," devotes the first two volumes of his *Commentaries* to the " Rights of Persons and the Rights of Things." See Holland's *Elements of Jurisprudence*, 10th ed., 78 seq.

The historical treatment of law displaces some very remarkable misconceptions. Peculiarities and anomalies abound in every legal system; and, as soon as laws become the special study of a professional class, some mode of explaining or reconciling them will be resorted to. One of the prehistorical ways of philosophizing about law was to account for what wanted explanation by some theory about the origin of technical words. This implied some previous study of words and their history, and is an instance of the deep-seated and persistent tendency of the human mind to identify names with the things they represent. The *Institutes* of Justinian abound in explanations, founded on a supposed derivation of some leading term. *Testamentum*, we are told, *ex eo appellatur quod testatio mentis est.* A testament was no doubt, in effect, a declaration of intention on the part of the testator when this was written. But the *-mentum* is a mere termination, and has nothing to do with *mens* at all. The history of testaments, which, it may be noted incidentally, has been developed with conspicuous success, gives a totally different meaning to the institution from that which was expressed by this fanciful derivation. So the perplexing subject of *possessio* was supposed in some way to be explained by the derivation from *pono* and *sedeo*—*quasi sedibus positio. Posthumi* was supposed to be a compound of *post* and *humus.* These examples belong to the class of rationalizing derivations with which students of philosophy are familiar. Their characteristic is that they are suggested by some prominent feature of the thing as it then appeared to observers—which feature thereupon becomes identified with the essence of the thing at all times and places.

Another prehistorical mode of explaining law may be described as metaphysical. It conceives of a rule or principle of law as existing by virtue of some more general rule or principle in the nature of things. Thus, in the English law of inheritance, until the passing of the Inheritance Act 1833, an estate belonging to a deceased intestate would pass to his uncle or aunt, to the exclusion of his father or other lineal ancestor. This anomaly from an early time excited the curiosity of lawyers, and the explanation accepted in the time of Bracton was that it was an example of the general law of nature: "Descendit itaque jus quasi ponderosum quid cadens deorsum recta linea vel transversali, et nunquam reascendit ea via qua descendit." It has been suggested that the "rule really results from the associations involved in the word descent." It seems more likely, however, that these associations explained rather than that they suggested the rule—that the omission of the lineal ancestor existed in custom before it was discovered to be in harmony with the law of nature. It would imply more influence than the reasoning of lawyers is likely to have exercised over the development of law at that time to believe that a purely artificial inference of this kind should have established so very remarkable a rule. However that may be, the explanation is typical of a way of looking at law which was common enough before the dawn of the historical method. Minds capable of reasoning in this way were, if possible, farther removed from the conceptions implied in the reasoning of the analytical jurists than they were from the historical method itself. In this connexion it may be noticed that the great work of Blackstone marks an era in the development of legal ideas in England. It was not merely the first, as it still remains the only, adequate attempt to expound the leading principles of the whole body of law, but it was distinctly inspired by a rationalizing method. Blackstone tried not merely to express but to illustrate legal rules, and he had a keen sense of the value of historical illustrations. He worked of course with the materials at his command. His manner and his work are obnoxious alike to the modern jurist and to the modern historian. He is accused by the one of perverting history, and by the other of confusing the law. But his scheme is a great advance on anything that had been attempted before; and, if his work has been prolific in popular fallacies, at all events it enriched English literature by a conspectus of the law, in which the logical connexion of its principles *inter se*, and its relations to historical facts, were distinctly if erroneously recognized.

While the historical method has superseded the verbal and metaphysical explanation of legal principles, it had apparently, in some cases, come into conflict with the conclusions of the analytical school. The difference between the two systems comes out most conspicuously in relation to customs. There is an unavoidable break in the analytical method between societies in which rules are backed by regulated physical force and those in which no such force exists. At what point in its development a given society passes into the condition of "an independent political society" it may not be easy to determine, for the evidence is obscure and conflicting. To the historical jurist there is no such breach. The rule which in one stage of society is a law, in another merely a rule of "positive morality," is the same thing to him throughout. By the Irish Land Act 1881 the Ulster custom of tenant-right and other analogous customs were legalized. For the purposes of analytical jurisprudence there is no need to go beyond the act of parliament. The laws known as the Ulster custom are laws solely in virtue of the sovereign government. Between the law as it now is and the custom as it existed before the act there is all the difference in the world. To the historical jurist no such separation is possible. His account of the law would not only be imcomplete without embracing the precedent custom, but the act which made the custom law is only one of the facts, and by no means the most significant or important, in the history of its development. An exactly parallel case is the legalization in England of that customary tenant-right known as copyhold. It is to the historical jurist exactly the same thing as the legalization of the Ulster tenant right. In the one case a practice was made law by formal legislation, and in the other without formal legislation. And there can be very little doubt that in an earlier stage of society, when formal legislation had not become the rule, the custom would have been legalized relatively much sooner than it actually was.

Customs then are the same thing as laws to the historical jurist, and his business is to trace the influences under which they have grown up, flourished and decayed, their dependence on the intellectual and moral conditions of society at different times, and their reaction upon them. The recognized science—and such it may now be considered to be—with which historical, or more properly comparative, jurisprudence has most analogy is the science of language. Laws and customs are to the one what words are to the other, and each separate municipal system has its analogue in a language. Legal systems are related together like languages and dialects, and the investigation in both cases brings us back at last to the meagre and obscure records of savage custom and speech. A great master of the science of language (Max Müller) has indeed distinguished it from jurisprudence, as belonging to a totally different class of sciences. "It is perfectly true," he says, "that if language be the work of man in the same sense in which a statue, or a temple, or a poem, or a law are properly called the works of man, the science of language would have to be classed as an historical science. We should have a history of language as we have a history of art, of poetry and of jurisprudence; but we could not claim for it a place side by side with the various branches of natural history." Whatever be the proper position of either philology or jurisprudence in relation to the natural sciences, it would not be difficult to show that laws and customs on the whole are equally independent of the efforts of individual human wills—which appears to be what is meant by language not being the work of man. The most complete acceptance of Austin's theory that law everywhere and always is the command of the sovereign does not involve any withdrawal of laws from the domain of natural science, does not in the least interfere with the scientific study of their affinities and relationships. Max Müller elsewhere illustrates his conception of the different relations of words and laws to the individual will by the story of the emperor Tiberius, who was reproved for a grammatical mistake by Marcellus, whereupon Capito, another grammarian, observed that, if what the emperor said was not good Latin, it would soon be so.

" Capito," said Marcellus, " is a liar; for, Caesar, thou canst give the Roman citizenship to men, but not to words." The mere impulse of a single mind, even that of a Roman emperor, however, probably counts for little more in law than it does in language. Even in language one powerful intellect or one influential academy may, by its own decree, give a bent to modes of speech which they would not otherwise have taken. But whether law or language be conventional or natural is really an obsolete question, and the difference between historical and natural sciences in the last result is one of names.

The application of the historical method to law has not resulted in anything like the discoveries which have made comparative philology a science. There is no Grimm's law for jurisprudence; but something has been done in that direction by the discovery of the analogous processes and principles which underlie legal systems having no external resemblance to each other. But the historical method has been applied with special success to a single system—the Roman law. The Roman law presents itself to the historical student in two different aspects. It is, regarded as the law of the Roman Republic and Empire, a system whose history can be traced throughout a great part of its duration with certainty, and in parts with great detail. It is, moreover, a body of rationalized legal principles which may be considered apart from the state system in which they were developed, and which have, in fact, entered into the jurisprudence of the whole of modern Europe on the strength of their own abstract authority —so much so that the continued existence of the civil law, after the fall of the Empire, is entitled to be considered one of the first discoveries of the historical method. Alike, therefore, in its original history, as the law of the Roman state, and as the source from which the fundamental principles of modern laws have been taken, the Roman law presented the most obvious and attractive subject of historical study. An immense impulse was given to the history of Roman law by the discovery of the *Institutes* of Gaius in 1816. A complete view of Roman law, as it existed three centuries and a half before Justinian, was then obtained, and as the later *Institutes* were, in point of form, a recension of those of Gaius, the comparison of the two stages in legal history was at once easy and fruitful. Moreover, Gaius dealt with antiquities of the law which had become obsolete in the time of Justinian, and were passed over by him without notice.

Nowhere did Roman law in its modern aspect give a stronger impulse to the study of legal history than in Germany. The historical school of German jurists led the reaction of national sentiment against the proposals for a general code made by Thibaut. They were accused by their opponents of setting up the law of past times as intrinsically entitled to be observed, and they were no doubt strongly inspired by reverence for customs and traditions. Through the examination of their own customary laws, and through the elimination and separate study of the Roman element therein, they were led to form general views of the history of legal principles. In the hands of Savigny, the greatest master of the school, the historical theory was developed into a universal philosophy of law, covering the ground which we should assign separately to jurisprudence, analytical and historical, and to theories of legislation. There is not in Savigny's system the faintest approach to the Austinian analysis. The range of it is not the analysis of law as a command, but that of a *Rechtsverhältniss* or legal relation. Far from regarding law as the creation of the will of individuals, he maintains it to be the natural outcome of the consciousness of the people, like their social habits or their language. And he assimilates changes in law to changes in language. " As in the life of individual men no moment of complete stillness is experienced, but a constant organic development, such also is the case in the life of nations, and in every individual element in which this collective life consists; so we find in language a constant formation and development, and in the same way in law." German jurisprudence is darkened by metaphysical thought, and weakened, as we believe, by defective analysis of positive law. But its conception of laws is exceedingly favourable to the growth of a historical philosophy, the results of which have a value of their own, apart altogether from the character of the first principles. Such, for instance, is Savigny's famous examination of the law of possession.

There is only one other system of law which is worthy of being placed by the side of Roman law, and that is the law of England. No other European system can be compared with that which is the origin and substratum of them all; but England, as it happens, is isolated in jurisprudence. She has solved her legal problems for herself. Whatever element of Roman law may exist in the English system has come in, whether by conscious adaptation or otherwise, *ab extra*; it is not of the essence of the system, nor does it form a large portion of the system. And, while English law is thus historically independent of Roman law, it is in all respects worthy of being associated with it on its own merits. Its originality, or, if the phrase be preferred, its peculiarity, is not more remarkable than the intellectual qualities which have gone to its formation—the ingenuity, the rigid logic, the reasonableness, of the generations of lawyers and judges who have built it up. This may seem extravagant praise for a legal system, the faults of which are and always have been matter of daily complaint, but it would be endorsed by all unprejudiced students. What men complain of is the practical hardship and inconvenience of some rule or process of law. They know, for example, that the law of real property is exceedingly complicated, and that, among other things, it makes the conveyance of land expensive. But the technical law of real property, which rests to this day on ideas that have been buried for centuries, has nevertheless the qualities we have named. So too with the law of procedure as it existed under the " science " of special pleading. The greatest practical law reformer, and the severest critic of existing systems that has ever appeared in any age or country, Jeremy Bentham, has admitted this: " Confused, indeterminate, inadequate, ill-adapted, and inconsistent as to a vast extent the provision or no provision would be found to be that has been made by it for the various cases that have happened to present themselves for decision, yet in the character of a repository of such cases it affords, for the manufactory of real law, a stock of materials which is beyond all price. Traverse the whole continent of Europe, ransack all the libraries belonging to all the jurisprudential systems of the several political states, add the contents together, you would not be able to compose a collection of cases equal in variety, in amplitude, in clearness of statement—in a word, all points taken together, in constructiveness—to that which may be seen to be afforded by the collection of English reports of adjudged cases " (Bentham's *Works*, iv. 460). On the other hand, the fortunes of English jurisprudence are not unworthy of comparison even with the catholic position of Roman law. In the United States of America, in India, and in the vast Colonial Empire, the common law of England constitutes most of the legal system in actual use, or is gradually being superimposed upon it. It would hardly be too much to say that English law of indigenous growth, and Roman law, between them govern the legal relations of the whole civilized world. Nor has the influence of the former on the intellectual habits and the ideas of men been much if at all inferior. Those who set any store by the analytical jurisprudence of the school of Austin will be glad to acknowledge that it is pure outcome of English law. Sir Henry Maine associated its rise with the activity of modern legislatures, which is of course a characteristic of the societies in which English laws prevail. And it would not be difficult to show that the germs of Austin's principles are to be found in legal writers who never dreamed of analysing a law. It is certainly remarkable, at all events, that the acceptance of Austin's system is as yet confined strictly to the domain of English law. Maine found no trace of its being even known to the jurists of the Continent, and it would appear that it has been equally without influence in Scotland, which, like the continent of Europe, is essentially Roman in the fundamental elements of its jurisprudence.

The substance of the above article is repeated from Professor E. Robertson's (Lord Lochee's) article " Law," in the 9th ed. of this work.

Among numerous English textbooks, those specially worth mention are: T. E. Holland, *The Elements of Jurisprudence* (1880; 10th ed., 1906); J. Austin, *Lectures on Jurisprudence* (4th ed., 1873); W. Jethro Brown, *The Austinian Theory of Law* (1906); Sir F. Pollock, *A First Book on Jurisprudence* (1896; 2nd ed., 1904).

JURISPRUDENCE, COMPARATIVE. The object of this article is to give a general survey of the study of the evolution of law. It is not concerned with analytical jurisprudence as a theory of legal thought, or an encyclopaedic introduction to legal teaching. Jurisprudence in such a philosophic or pedagogical sense has certainly to reckon with the methods and results of a comparative study of law, but its aims are distinct from those of the latter: it deals with more general problems. On the other hand, the comparative study of law may itself be treated in two different ways: it may be directed to a comparison of existing systems of legislation and law, with a view to tracing analogies and contrasts in the treatment of practical problems and taking note of expedients and of possible solutions. Or else it may aim at discovering the principles regulating the development of legal systems, with a view to explain the origin of institutions and to study the conditions of their life. In the first sense, comparative jurisprudence resolves itself into a study of home and foreign law (cf. Hofmann in the *Zeitschrift für das private und öffentliche Recht der Gegenwart*, 1878). In the second sense, comparative jurisprudence is one of the aspects of so-called sociology, being the study of social evolution in the special domain of law. From this point of view it is, in substance, immaterial whether the legal phenomena subjected to investigation are ancient or modern, are drawn from civilized or from primitive communities. The fact that they are being observed and explained as features of social evolution characterizes the inquiry and forms the distinctive attribute separating these studies from kindred subjects. It is only natural, however, that early periods and primitive conditions have attracted investigators in this field more than recent developments. The interest of students seems to have stood in inverse ratio to the chronological vicinity of the facts under consideration—the farther from the observer, the more suggestive and worthy of attention the facts were found to be. This peculiarity is easily explained if we take into account the tendency of all evolutionary investigations to obtain a view of origins in order to follow up the threads of development from their initial starting-point. Besides, it has been urged over and over again that the simpler phenomena of ancient and primitive society afford more convenient material for generalizations as to legal evolution than the extremely complex legal institutions of civilized nations. But there is no determined line of division between ancient and modern comparative jurisprudence in so far as both are aiming at the study of legal development. The law of Islam or, for that matter, the German civil code, may be taken up as a subject of study quite as much as the code of Hammurabi or the marriage customs of Australian tribes.

The fact that the comparative study of legal evolution is chiefly represented by investigations of early institutions is therefore a characteristic, but not a necessary feature in the treatment of the subject. But it is essential to this treatment that it should be *historical* and *comparative*. Historical, because it is only as history, *i.e.* a sequence of stages and events, that development can be thought of. Comparative, because it is not the casual notices about one or the other chain of historical facts that can supply the basis for any scientific induction. Comparisons of kindred processes have to be made in order to arrive at any conception of their general meaning and scientific regularity. As linguistic science differs from philology in so far as it treats of the general evolution of language and not of particular languages, even so comparative jurisprudence differs from the history of law as a study of general legal evolution distinct from the development of one or the other national branch of legal enactment. Needless to say that there are intermediate shades between these groups, but it is not to these shades we have to attend, but to the main distinctions and divisions.

1. The idea that the legal enactments and customs of different countries should be compared for the purpose of deducing general principles from them is as old as political science itself. It was realized with especial vividness in epochs when a considerable material of observations was gathered from different sources and in various forms. The wealth of varieties and the recurrence of certain leading views in them led to comparison and to generalizations based on comparison. Aristotle, who lived at the close of a period marked by the growth of free Greek cities, summarized, as it were, their political experience in his *Constitutions* and *Politics*; students of these know that the Greek philosopher had to deal with not only public law and political institutions, but also to some extent private, criminal law, equity, the relations between law and morals, &c.

Another great attempt at comparative observation was made at the close of the pre-revolutionary period of modern Europe. Montesquieu took stock of the analogies and contrasts of law in the commonwealths of his time and tried to show to what extent particular enactments and rules were dependent on certain general currents in the life of societies—on forms of government, on moral conditions corresponding to these, and ultimately on the geographical facts with which various nationalities and states have to reckon in their development.

These were, however, only slight beginnings, general forecasts of a coming line of thought, and Montesquieu's remarks on laws and legal customs read now almost as if they were meant to serve as materials for social utopias, although they were by no means conceived in this sense. At this distance of time we cannot help perceiving how fragmentary, incomplete and uncritical his notions of the facts of legal history were, and how strongly his thought was biased by didactic considerations, by the wish to teach his contemporaries what politics and law should be.

It was reserved for the 19th century to come forward with connected and far-reaching investigations in this field as in many others. We are not deceived by proximity and self-consciousness when we affirm that comparative jurisprudence, as understood in these introductory remarks, dates from the 19th century and especially from its second half.

There were many reasons for such a new departure: two of these reasons have been especially manifest and decisive. The 19th century was an eminently historical and an eminently scientific age. In the domain of history it may be said that it opened an entirely new vista. While, speaking roughly, before that time history was conceived as a narrative of memorable events, more or less skilful, more or less sensational, but appealing primarily to the literary sense of the reader, it became in the course of the 19th century an encyclopaedia of reasoned knowledge, a means of understanding social life by observing its phenomena in the past. The immense growth of historical scholarship in that sense, and the transformation of its aims, can hardly be denied.

Apart from the personal efforts of eminent writers, a great and general movement has to be taken into account in order to explain this remarkable stage of human thought. The historic bent of mind of 19th-century thinkers was to a great extent the result of heightened political and cultural self-consciousness. It was the reflection in the world of letters of the tremendous upheaval in the states of Europe and America which took place from the close of the 18th century onwards. As one of the greatest leaders of the movement, Niebuhr, pointed out, the fact of being a witness of such struggles and catastrophes as the American Revolution, the French Revolution, the Napoleonic Empire and the national reaction against it, taught every one to think historically, to appreciate the importance of historical factors, to measure the force not only of logical argument and moral impulse, but also of instinctive habits and traditional customs. It is not a matter of chance that the *historical school* of jurisprudence, Savigny's doctrine of the organic growth of law, was formed and matured while Europe collected its forces after the most violent revolutionary crisis it had ever experienced, and in most intimate connexion with the romantic movement, a movement animated by enthusiastic belief in the historical, traditional life of social groups as opposed to the intellectual conceptions of individualistic radicalism.

On the other hand, the 19th century was a scientific age and especially an age of biological science. Former periods—the 16th and 17th centuries especially—had bequeathed to it high standards of scientific investigation, an ever-increasing weight of authority in the direction of an exact study of natural phenomena and a conception of the world as ruled by laws and not by capricious interference. But these scientific views had been chiefly applied in the domain of mathematics, astronomy and physics; although great discoveries had already been made in physiology and other branches of biology, yet the achievements of 19th-century students in this respect far surpassed those of the preceding period. And the doctrine of transformation which came to occupy the central place in scientific thought was eminently fitted to co-ordinate and suggest investigations of social facts. As F. York Powell put it, Darwin is the greatest historian of modern times, and certainly an historian not in the sense of a reader of annals, but in that of a guide in the understanding of organic evolution. Though much is expressed in the one name of Darwin, it is perhaps even more momentous as a symbol of the tendency of a great age than as a mark of personal work. To this tendency we are indebted for the rise of anthropology and of sociology, of the scientific study of man and of the scientific study of society. Of course it ought not to be disregarded that the application of scientific principles and methods to human and social facts was made possible by the growth of knowledge in regard to savage and half-civilized nations called forth by the increased activity of European and American business men, administrators and explorers. Ethnography and ethnology have brought some order into the wealth of materials accumulated by generations of workers in this direction, and it is with their help that the far-reaching generalizations of modern inquirers as to man and society have been achieved.

2. It is not difficult to see that the comparative study of legal evolution finds its definite place in a scientific scheme elaborated from such points of view. Let us see how, as a matter of fact, the study in question arose and what its progress has been. The immediate incitement for the formation of comparative jurisprudence was given by the great discoveries of comparative philology. When the labours of Franz Bopp, August Schleicher, Max Müller, W. D. Whitney and others revealed the profound connexion between the different branches of the Indo-European race in regard to their languages, and showed that the development of these languages proceeded on lines which might be studied in a strictly scientific manner, on the basis of comparative observation and with the object of tracing the uniformities of the process, it was natural that students of religion, of folk-lore and of legal institutions took up the same method and tried to win similar results (Sir H. Maine, Rede lecture in *Village Communities*, 3rd ed.).

It is interesting to note that one of the leading scholars of the Germanistic revival in the beginning of the 19th century, Jacob Grimm, a compeer of Savigny in his own line, took up with fervent zeal and remarkable results not only the scientific study of the German language, but also that of Germanic mythology and popular law. His *Rechtsalterthümer* are still unrivalled as a collection of data as to the legal lore of Teutonic tribes. Their basis is undoubtedly a narrow one: they treat of the varieties of legal custom among the continental Germans, the Scandinavians and the Germanic tribes of Great Britain, but the method of treatment is already a comparative one. Grimm takes up the different subjects—property, contract, procedure, succession, crime, &c.—and examines them in the light of national, provincial and local customs, sometimes noticing expressly affinities with Roman and Greek law (*e.g.* the subject of imprisonment for debt, *Rechtsalterthümer*, 4th ed., vol. ii., p. 165).

A broader basis was taken up by a linguist who tried to trace the primitive institutions and customs of the early Aryans before their separation into divers branches. Adolphe Pictet (*Les Origines indo-européennes*, i. 1859; ii. 1863) had to touch constantly on questions of family law, marriage, property, public authority, in his attempt to reconstruct the common civilization of the Aryan race, and he did so on the strength of a comparative study of terms used in the different Indo-European languages. He showed, for instance, how the idea of protection was the predominant element in the position of the father in the Aryan household. The names *pîtar*, *pater*, *πατήρ*, *father*, which recur in most branches of the Aryan race, go back to a root *pā*-, pointing to guardianship or protection. Thus we are led to consider the *patria potestas*, so stringently formulated in Roman law, as an expression of a common Aryan notion, which was already in existence before the Aryan tribes parted company and went their different ways. Descriptions of Aryan early culture have been given several times since in connexion with linguistic observations. An example is W. E. Hearn's *Aryan Household* (1879). Fustel de Coulanges' famous volume on the ancient city and Rudolf von Jhering's studies of primitive Indo-European institutions (*Vorgeschichte der Indoeuropäer*) start from similar observations, although the first of these scholars is chiefly interested in tracing the influence of religion on the material arrangements of life, while the latter draws largely on principles of public and private law, studied more especially in Roman antiquity.

3. The chief work in that direction has been achieved in one sense by a German scholar, B. W. Leist. His Graeco-Roman legal history, his *Jus Gentium of Primitive Aryans*, and his *Jus Civile of Primitive Aryans*, form the most complete and learned attempt not only to reconstitute the fundamental rules of common Aryan law before the separation of tongues and nations, but also to trace the influence of this original stock of juridical ideas in the later development of different branches of the Aryan race. These three books present three stages of comparison, marked by a successive widening of the horizon. He began his legal history by putting together the data as to Roman and Greek legal origins; in the *Alt-arisches Jus Gentium* the material of Hindu law is not only drawn into the range of observation, but becomes its very centre; in the *Alt-arisches Jus Civile* the legal customs of the Zend branch, of Celts, Germans and Slavs, are taken into account, although the most important part of the inquiry is still directed to the combination of Hindu, Greek and Roman law. In this way Leist builds up his theories by the comparative method, but he restricts its use consciously and consistently to a definite range. He does not want to plunge into haphazard analogies, but seeks common ground before all things in order to be able to watch for the appearance of ramifications and to explain them. According to his view comparison is of use only between "coherent" lines of facts. Common origin, not similarity of features, appears to him as the fundamental basis for fruitful comparison. It may be said that Leist's work is characterized by the attempt to draw up a continuous history of a supposed archaic common law of the Aryan race rather than to put different solutions of kindred legal problems by the side of each other. For him Aryan tribal organization with its double-sided relationship—cognatic and agnatic—through men and through women—is one, and although he does not draw its picture as Fustel de Coulanges does by the help of traits taken indiscriminately from Hindu, Roman and Greek material, although he notices divisions, degrees and variations, at bottom he writes the history of one set of principles exemplified and modulated, as it were, in the six or seven main varieties of the race. Even so the nine rules of conduct prescribed by Hindu sacral law are, according to his view, the directing rules of Roman, Greek, Germanic, Celtic, Slavonic legal custom—the duties in regard to gods, parents and fatherland, guests, personal purity, the prohibitions against homicide, adultery and theft—are variations of one and the same religious, moral and legal system, and their original unity is reflected and proved by the unity of legal terminology itself.

The same leading idea is embodied in the books of Otto Schrader—*Urgeschichte und Sprachvergleichung* (1st ed., 1883; 2nd ed., 1890) and *Reallexikon der indogermanischen Altertumskunde* (1901). In this case we have to do not with a jurist but with a linguist and a student of cultural history. His training made him especially fit to trace the national affinities in the data of language, and the sense of the intimate connexion between the growth of institutions on one side, of words and linguistic forms on the other, underlies all his investigations. But Schrader testifies also to another powerful influence—to that of Victor Hehn, the author of a remarkable book on early civilization, *Kulturpflanzen und Hausthiere in ihrem Übergang aus Asien in Europa* (1st ed., 1870; 7th ed., 1902), dealing with the migrations of tribes and their modes of acquiring material civilization. Although the linguistic and archaeological sides naturally predominate in Schrader's works, he has constantly to consider legal subjects, and he strives conscientiously to obtain a clear and common-sense view of the early legal notions of the Aryans. Speaking of the "ordeals," the "waging of God's law," for example, he traces the customs of purification by fire, water, iron, &c., to the practice of oaths (Sans. *am*; Gr. *ὄμνυμι*; O. Ital. *omr* = first group; O. Ger. *aiþs*, Ir. *óeth* = second group; O. Norse *rota*, Arm. *erdnum* = I swear = third group). The central idea of the ordeal is thus shown to be the imprecation—"Let him be cursed whose assertion is false."

The comparative study of the Aryan group assumed another aspect in the works of Sir Henry Maine. He did not rely on linguistic affinities, but made great use of another element of investigation which plays hardly any part in the books of the writers mentioned hitherto. His best personal preparation for the task was that he had not only taught law in England, but had come into contact with living legal customs in India. For him the comparison between the legal lore of Rome and that of India did not depend on linguistic roots or on the philological study of the laws of Manu, but was the result of recognizing again and again, in actual modern custom, the views, rules and institutions of which he had read in Gaius or in the fragments of the Twelve Tables. The sense of historical analogy and evolution which had shown itself already in the lectures on *Ancient Law*, which, after all, were mainly a presentment of Roman legal history mapped out by a man of the world, averse from pedantic disquisitions. But what appears as the expression of Maine's personal aptitude and intelligent reading in *Ancient Law* gets to be the interpretation of popular legal principles by modern as well as by ancient instances of their application in *Village Communities*, *The Early History of Institutions*, *Early Law and Custom*. The evolution of property in land out of archaic collectivism, ancient forms of contract and compulsion, rudimentary forms of feudalism and the like, were treated in a new light in consequence of systematic comparisons with the conditions not only of India but of southern Slavonic nations, medieval celts and Teutons. This breadth of view seemed startling when the lectures appeared, and the original treatment of the subject was hailed on all sides as a most welcome new departure in the study of legal customs and institutions. And yet Maine set very definite boundaries to his comparative surveys. He renounced the chronological limitation confining such inquiries to the domain of antiquaries, but he upheld the ethnographical limitation confining them to laws of the same race. In his case it was the Aryan race, and in his *Law and Custom* he opposed in a determined manner the attempts of more daring students to extend to the Aryans generalizations drawn from the life of savage tribes unconnected with the Aryans by blood.

Thus, notwithstanding all diversities in the treatment of particular problems, one leading methodical principle runs through the works of all the above-mentioned exponents of comparative study. It was to proceed on the basis of common origin and on the assumption of a certain common stock of language, religion, material culture, and law to start with. What Pictet, Leist, Schrader, and Maine were doing for the Aryans, F. Hommel, Robertson Smith and others did in a lesser degree for the Semitic race.

4. The literary group which started from the discoveries of comparative philology and history was met on the way by what may be called the ethnological school of inquirers. The original impetus was given, in this case, by jurists and historians who took up the study in the field of ancient history, but treated it from the beginning in such a way as to break up the subdivisions of historic races and to direct the inquiry to a state of culture best illustrated by savage customs. The first impulse may be said to have come from J. J. Bachofen (*Mutterrecht*, 1861; *Antiquarische Briefe*, 1880; *Die Sage von Tanaquil*). All the representatives of Aryan antiquities are at one in laying stress on the patriarchal and agnatic system of the kindreds in the different Aryan nations; even Leist, although dwelling on the importance of cognatic ties, looks to agnatic relationship for the explanation of military organization and political authority. And undoubtedly, if we argue from the predominant facts and from the linguistic evidence of parallel terms, we are led to assume that already before their separation the Aryans lived in a patriarchal state of society. Now, Bachofen discovered in the very tradition of classical antiquity traces of a fundamentally different state of things, the central conception of which was not patriarchal power, but maternity, relationship being traced through mothers, the wife presenting the constant and directing element of the household, while the husband (and perhaps several husbands) joined her from time to time in more or less inconstant unions. Such a state of society is definitely described by Herodotus in the case of the Lycians, it is clearly noticeable even in later historical times in Sparta; the passage from this matriarchal conception to the recognition of the claims of the father is reflected in poetical fiction in the famous Orestes myth, based on the struggle between the moral incitement which prompted the son to avenge his father and the absolute reverence for the mother required by ancient law. Although chiefly drawing his materials from classical literature, Bachofen included in his *Antiquarian Letters* an interesting study of the marriage custom and systems of relationship of the Malabar Coast in India; they attracted his attention by the contrasts between different layers of legal tradition—the Brahmans living in patriarchal order, while the class next to them, the Nayirs (Nairs), follow rules of matriarchy.

Similar ideas were put forward in a more comprehensive form by J. F. McLennan. His early volume (*Studies in Ancient History*, 1876) contains several essays published some time before that date. He starts from the wide occurrence of marriage by capture in primitive societies, and groups the tribes of which we have definite knowledge into endogamous and exogamous societies according as they take their wives from among the kindred or outside it. Marriage by capture and by purchase are signs of exogamy, connected with the custom in many tribes of killing female offspring. The development of marriage by capture and purchase is a powerful agent in bringing about patriarchal rule, agnatic relationship, and the formation of clans or *gentes*, but the more primitive forms of relationship appear as variations of systems based on mother-right. These views are supported by ethnological observations and used as a clue to the history of relationship and family law in ancient Greece. In further contributions published after McLennan's death these researches are supplemented and developed in many ways. The peculiarities of exogamous societies, for instance, are traced back to the even more primitive practice of Totemism, the grouping of men according to their conceptions of animal worship and to their symbols. McLennan's line of inquiry was taken up in a very effective manner not only by anthropologists like E. B. Tylor or A. Lang, but also in a more special manner by students of primitive family law. One of the most brilliant monographs in this direction is Robertson Smith's study of *Kinship and Marriage in Arabia*.

But perhaps the most decisive influence was exercised on the development of the ethnological study of law by the discoveries of an American, Lewis H. Morgan. In his epoch-making works on *Systems of Consanguinity* (1869) and on *Ancient Society* (1877) he drew attention to the remarkable fact that in the case of a number of tribes—the Red Indians of America, the Australian black tribes, some of the polar races, and several Asiatic tribes, mostly of Turanian race—degrees of relationship are reckoned and distinguished by names, not as ties between individuals, but as ties between entire groups, classes or generations. Instead of a mother and a father a man speaks of fathers and mothers; all the individuals of a certain group are deemed husbands or wives of corresponding individuals of another group; sisters and brothers have to be sought in entire generations, and not among the descendants of a definite and common parent, and so forth. There are variations and types in these forms of organization, and intermediate links may be traced between unions of consanguine people—brothers and sisters of the same blood—on the one hand, and the monogamic marriage prevailing nowadays, on the other; but the central and most striking fact seems to be that in early civilizations, in conditions which we should attribute to savage and barbarian life, marriage appears as a tie, not between single pairs, but between classes, all the men of a class being regarded as potential or actual husbands of the women of a corresponding class. Facts of this kind produce very peculiar and elaborate systems of relationship, which have been copiously illustrated by Morgan in his tables. In his *Ancient Society* he attempted to reduce all the known forms and facts of marriage and kinship arrangements to a comprehensive view of evolution leading up to the Aryan, Semitic and Uralian family, as exhibiting the most modern type of relationship.

These observations, in conjunction with Bachofen's and McLennan's teaching on mother-right, brought about a complete change of perspective in the comparative study of man and society. The rights of ethnologists to have their say in regard to legal, political and social development was forcibly illustrated from both ends, as it were. On the one hand, classical antiquity itself proved to be a rather thin layer of human civilization hardly sufficient to conceal the long periods of barbarism and primitive evolution which had gone to its making. On the other hand, unexpected combinations in regard to family, property, social order, were discovered in every corner of the inhabited world, and our trite notions as to the character of laws and institutions were reduced to the rank of variations on themes which recur over and over again, but may be and have been treated in very different ways.

There is no need to speak of the use made of ethnological material in the wider range of anthropological and sociological studies—the works of Tylor, Lubbock, Lippert, Spencer are in everybody's hands—but attention must be called to the further influence of the ethnological point of view in comparative jurisprudence. An interesting example of the passage from one line of investigation to another, from the historical to the anthropological line, if the expression may be used for the sake of brevity, is presented in the works of one of the founders of the *Zeitschrift für vgl. Rechtswissenschaft*—Franz Bernhöft. He appears in his earlier books as an exponent of the comparative study of Greek and Roman antiquities, more or less in the style of Leist. Like the latter he was gradually incited to draw India into the range of his observations, but unlike Leist, he ended by fully recognizing the importance of ethnological evidence, and although he did not do much original research in that direction himself, the influence of Bachofen and of the ethnologists made itself felt in Bernhöft's treatment of classical antiquity itself: in his *State and Law in Rome at the Time of the Kings* he starts from the view that patricians and plebeians represent two ethnological layers of society—a patriarchal Aryan and a matriarchal pre-Aryan one.

But, of course, the utmost use was made of ethnological evidence by writers who cut themselves entirely free from the special study of classical or European antiquities. The enthusiasm of the explorers of new territory led them naturally to disregard the peculiar claims of European development in the history of higher civilization. They wanted material for a study of the *genus homo* in all its varieties, and they had no time to look after the minute questions of philological and antiquarian research which had so long constituted the daily bread of inquirers into the history of laws. The most characteristic representative of the new methods of extensive comparison was undoubtedly A. H. Post (1839–1895)—the author of many works, in which he ranges over the whole domain of mankind—Hovas, Zulus, Maoris, Tunguses, alternating in a kaleidoscopic fashion with Hindus, Teutons, Jews, Egyptians. The order of his compositions is systematic, not chronological or even ethnographical in the sense of grouping kindred races together. He takes up the different subdivisions of law and traces them through all the various tribes which present any data in regard to them. His method is not only not bound by history, it is opposed to it. He writes:—

> "The method of comparative ethnology is different from the historical method, inasmuch as it collects the given material from an entirely distinct point of view. Historical investigation tries to get at the causes of the facts of rational life by observing the development of these facts from such as preceded them within the range of separate kindreds, tribes and peoples. The investigation of comparative ethnology inquires after the causes of facts in national life by collecting identical or similar ethnological data wherever they may be found in the world, and by drawing inferences from these materials to identical or similar causes. This method is therefore *quite unhistorical*. It severs things that have been hitherto regarded as closely joined and arranges these shreds into new combinations" (*Grundriss*, i. 14).

This is not a mere paradox, but the necessary outcome of the situation in respect of the material used. What is being sought is not common origin or a common stock of ideas, but recourse to similar expedients in similar situations, and it is one of the most striking results of ethnology that it can show how peoples entirely cut off from each other and even placed in very different planes of development can resort to analogous solutions in analogous emergencies. Is not the custom of the so-called *Couvade*—the pretended confinement of the husband when a child is born to his wife—a most quaint and seemingly recondite ceremony? Yet we find it practised in the same way by Basques, Californian Indians, and some Siberian tribes. They have surely not borrowed from each other, nor have they kept the ceremony as a remnant of the time when they formed one race: in each case, evidently the passage from a matriarchal state to a patriarchal has suggested it, and a very appropriate method it seems to establish the fact of fatherhood in a solemn and graphic though artificial manner. Again, an inscription from the Cretan town of Gortyn, published in the American *Journal of Archaeology* (2nd series, vol. i., 1897) by Halbherr, tells us that the weapons of a warrior, the wool of a woman, the plough of a peasant, could not be taken from them as pledges. We find a similar idea in the prohibition to take from a knight his weapons, from a villein his plough, in payment of fines, which obtained in medieval England and was actually inserted in Magna Carta. Here also the similarity extends to details, and is certainly not derived from direct borrowing or common origin but from analogies of situations translating themselves into analogies of legal thought. It may be said in a sense that for the ethnological school the less relationship there is between the compared groups the more instructive the comparison turns out to be.

The collection of ethnological parallels for the use of sociology and comparative jurisprudence has proceeded in a most fruitful manner. By the side of special monographs about single tribes or geographical groups of tribes, such as *Kamilaroi and Kurnai*, by L. Fison & A. W. Howitt (1880), and *The Native Tribes of Australia*, by Baldwin Spencer & F. G. Gillen (1899), the whole range of ethnological jurisprudence was gone through by Wilken in regard to the inhabitants of the Dutch possessions in Asia, by M. M. Kovalevsky in regard to Caucasians, &c. As a rule the special monographs turned out to be more successful than the general surveys, but the interest of the special monographs themselves depended partly on the fact that people's eyes had been opened to the recurrence of certain widespread phenomena and types of development.

5. Ethnologists of Post's school have not had it entirely their own way, however. Not only did their natural opponents, the philologists, historians and jurists, reproach them with lack of critical discrimination, with a tendency to disregard fundamental distinctions, to wipe out characteristic features, to throw the most disparate elements into the same pot. In their own ranks a number of conscientious and scientifically trained

investigators protested against the haphazard manner in which the most intricate problems were treated, and sought to evolve more definite methodical rules. P. and F. Sarrasin in their description of the Ceylon Veddahs showed a most primitive race scattered in small clusters, monogamous and patriarchal in their marriage customs and systems of relationship. E. A. Westermarck challenged the sweeping generalizations indulged in by many ethnologists about primitive promiscuity in sexual relations and the necessary passage of all human tribes through the stages of matriarchy and group marriage.

A very interesting departure was attempted by Dargun in his studies on the origin and development of property and his treatise on mother-right and marriage by capture. His lead was followed by R. Hildebrand in the monograph on law and custom. The principal idea of these inquirers may be stated as follows. We must utilize ethnological as well as historical materials from the whole world, but it is no use doing this indiscriminately. Fruitful comparisons may be instituted mainly in the case of tribes on the same level in their general culture and especially their economic pursuits. Hunting tribes must be primarily compared with other hunters, fishers with fishers, pastoral nations with pastoral nations, agriculturists with agriculturists; nations in transitional stages from one type of culture to the other have to be grouped and examined by themselves. The result would be to establish certain parallel lines in the development of institutions and customs. From this point of view both Dargun and Hildebrand attacked the prevailing theory of primitive communism and insisted on the atomistic individualism of the rudimentary civilization of hunting tribes. Collectivism in the treatment of ownership, common field husbandry, practices of joint holdings, co-aration, common stores, &c., make their appearance according to Dargun in consequence of the drawing together of scattered groups and smaller independent settlements. An evolution of the same kind leading from loose unions around mothers through marriage by capture to patriarchal kindreds was traced in the history of relationship. Grosse (*Die Formen der Familie und der Wirtschaft*, 1896) followed in a similar strain. Another line of criticism was opened up from the side of exact sociological study. Its best exponent is Steinmetz, who represents with Wilken the Dutch group of investigators of social phenomena. He takes up a standpoint which severs him entirely from the linguistic and historic school. In a discourse on the *Meaning of Sociology* (p. 10) he expresses himself in the following words: "One who judges of the social state of the Hindus by the book of Manu takes the ideal notions of one portion of the people for the actual conditions of all its parts." In regard to jurisprudence he distinguishes carefully between art and science. "Jurisprudence in the wider sense is an art, the art of framing rules for social intercourse in so far as these rules can be put into execution by the state and its organs, as well as the art of interpreting and applying these rules. In another sense it is pure science, the investigation of all consciously formulated and actually practised rules, and of their conditions and foundations, in fact of the entire social life of existing and bygone nations, without a knowledge and understanding of which a knowledge and understanding of law as its outcome is, of course, impossible." In this sense jurisprudence is a part of ethnology and of the comparative history of culture. But in order to grapple with such a tremendous task comparative jurisprudence has not only to call to help the study of scattered ethnological facts. This is not sufficient to widen the frame of observation and to realize the relative character of the principles with which practical lawyers operate, without ever putting in question their general acceptance or logical derivations. Ethnological studies themselves have to look for guidance to psychology, especially to the psychology of emotional life and of character. Although these branches of psychological science have been much less investigated than the study of intellectual processes, they still afford material help to the ethnologist and the comparative jurist; and Steinmetz himself made a remarkable attempt to utilize a psychological analysis of the feelings of revenge in his *Origins of Punishment*.

6. The necessity of employing more stringent standards of criticisms and more exact methods is now recognized, and it is characteristic that the foremost contemporary representative of comparative jurisprudence, Joseph Kohler of Berlin, principal editor of the *Zeitschrift für vgl. Rechtswissenschaft*, often gives expression to this view. Beginning with studies of procedure and private law in the provinces of Germany where the French law of the Code Napoléon was still applied, he has thrown his whole energy into monographic surveys and investigations in all the departments of historical and ethnological jurisprudence. The code of Khammurabi and the Babylonian contracts, the ancient Hindu codes and juridical commentaries on them, the legal customs of the different tribes and provinces of India, the collection and sifting of the legal customs of aborigines in the German colonies in Africa, the materials supplied by investigators of Australian and American tribes, the history of legal customs of the Mahommedans, and numberless other points of ethnological research, have been treated by him in articles in his *Zeitschrift* and in other publications. Comprehensive attempts have also been made by him at a synthetic treatment of certain sides of the law—like the law of debt in his *Shakespeare vor dem Forum der Jurisprudenz* (1883) or his *Primitive History of Marriage*. Undoubtedly we have not to deal in this case with mere accumulation of material or with remarks on casual analogies. And yet the importance of these works consists mainly in their extensive range of observation. The critical side is still on the second plane, although not conspicuously absent as in the case of Post and some of his followers. We may sympathize cordially with Kohler's exhortation to work for a universal history of law without yet perceiving clearly what the stages of this universal history are going to be. We may acknowledge the enormous importance of Morgan's and Bachofen's discoveries without feeling bound to recognize that all tribes and nations of the earth have gone substantially through the same forms of development in respect of marriage custom, and without admitting that the evidence for a universal spread of group-marriage has been produced. Altogether the reproach seems not entirely unfounded that investigations of this kind are carried on too much under the sway of a preconceived notion that some highly peculiar arrangement entirely different from what we are practising nowadays—say sexual promiscuity or communism in the treatment of property—must be made out as a universal clue to earlier stages of development. Kohler's occasional remarks on matters of method (*e.g. Zeitschift für vgl. Rechtswissenschaft*, xii. 193 seq.) seem hardly adequate to dispel this impression. But in his own work and in that of some of his compeers and followers, J. E. Hitzig, Hellwig, Max Huber, R. Dareste, more exact forms and means of inquiry are gradually put into practice, and the results testify to a distinct heightening of the scientific standard in this group of studies on comparative jurisprudence. Especially conspicuous in this respect are three tendencies: (*a*) the growing disinclination to accept superficial analysis between phenomena belonging to widely different spheres of culture as necessarily produced by identical causes (*e.g.* Darinsky's review of Kovalevsky's assumptions as to group marriage among the Caucasian tribes, *Z. für vgl. Rw.*, xiv. 151 seq.); (*b*) the selection of definite historical or ethnological territories for monographic inquiries, in the course of which arrangements observed elsewhere are treated as suggestive material for supplying gaps and starting possible explanations: Kohler's own contributions have been mainly of this kind; (*c*) the treatment of selected subjects by an intensive legal analysis, bringing out the principles underlying one or the other rule, its possible differentiation, the means of its application in practice, &c.: Hellwig's monograph on the right of sanctuary in savage communities (*Das Asylrecht der Naturvölker*) may be named in illustration of this analytical tendency. Altogether, there can be no doubt that the stage has been reached by comparative jurisprudence when, after a hasty, one might almost say a voracious consumption of materials, investigators begin to strive towards careful sifting of evidence and a conscious examination of methods and critical rules which have to be followed in order

to make the investigations undertaken in this line worthy of their scientific aims. Until the latter has been done many students, whose trend of thought would seem to lead them naturally into this domain, may be repelled by the uncritical indistinctness with which mere analogies are treated as elusive proofs by some of the representatives of the comparative school. F. W. Maitland, for instance, was always kept back by such considerations.

7. It is desirable, in conclusion, to review the entire domain of comparative jurisprudence, and to formulate the chief principles of method which have to be taken into consideration in the course of this study. It is evident, to begin with, that a scientific comparison of facts must be directed towards two aims—towards establishing and explaining similarity, and towards enumerating and explaining differences. As a matter of fact the same material may be studied from both points of view, though logically these are two distinct processes.

(*a*) Now at this initial stage we have already to meet a difficulty and to guard against a misconception: we have namely to reckon with the *plurality of causes*, and are therefore debarred from assuming that wherever similar phenomena are forthcoming they are always produced by identical causes. Death may be produced by various agents—by sickness, by poison, by a blow. The habit of wearing mourning upon the death of a relation is a widespread habit, and yet it is not always to be ascribed to real or supposed grief and the wish to express it in one's outward get-up. Savage people are known to go into mourning in order to conceal themselves from the terrible spirit of the dead which would recognize them in their everyday costume (Jhering, *Der Zweck im Recht*, 2nd ed., 1884–1886). This is certainly a momentous difficulty at the start, but it can be greatly reduced and guarded against in actual investigation. In the example taken we are led to suppose different origin because we are informed as to the motives of the external ceremony, and thus we are taught to look not only to bare facts, but to the psychological environment in which they appear. And it is evident that the greater the complexity of observed phenomena, the more they are made up of different elements welded into one sum, the less probability there is that we have to do with consequences derived from different causes. The recurrence of group-marriage in Australia and among the Red Indians of North America can in no way be explained by the working of entirely different agencies. And it may be added that in most cases of an analysis of social institutions the limits of human probability and reasonable assumption do not coincide with mathematical possibility in any sense. When we register our facts and causes in algebraic forms, marking the first with a, b, c, and the latter with x, y, z, we are apt to demand a degree of precision which is hardly ever to be met with in dealing with social facts and causes. Let us rest content with reasonable inferences and probable explanations.

(*b*) The easiest way of explaining a given similarity is by attributing it to a direct *loan*. The process of reception, of the borrowing of one people from the other, plays a most notable part in the history of institutions and ideas. The Japanese have in our days engrafted many European institutions on their perfectly distinct civilization; the Germans have used for centuries what was termed euphemistically the Roman law of the present time (*heutiges römisches Recht*); the Romans absorbed an enormous amount of Greek and Oriental law in their famous jurisprudence. A check upon explanation by direct loan will, of course, lie in the fact that two societies are entirely disconnected, so that it comes to be very improbable that one drew its laws from the other. Although migrations of words, legends, beliefs, charms, have been shown by Theodor Benfey and his school to range over much wider areas than might be supposed on the face of it, still, in the case of law, in so far as it has to regulate material conditions, the limits have perhaps to be drawn rather narrowly. In any case we shall not look to India in order to explain the burning of widows among the negroes of Africa; the *suttee* may be the example of this custom which happens to be most familiar to us, but it is certainly not the only root of it on the surface of the earth.

It is much more difficult to make out the share of direct borrowing in the case of peoples who might conceivably have influenced one another. A hard and fast rule cannot be laid down in such cases, and everything depends on the weighing of evidence and sometimes on almost instinctive estimates. The use of a wager for the benefit of the tribunal in the early procedure of the Romans and Greeks, the *sacramentum* and the πρυτανεία, with a similar growth of the sum laid down by the parties in proportion to the interests at stake, has been explained by a direct borrowing by the Romans from the Greeks at the time of the Twelve Tables legislation (Hofmann, *Beiträge zur Geschichte des griechischen und römischen Rechts*). No direct proof is available for this hypothesis, and the question in dispute might have lain for ever between this explanation and that based on the analogous development in the two closely related branches of law. The further study of the legal antiquities of other branches of the Aryan race leads one to suppose, however, that we have actually to do with the latter and not with the former eventuality. Why should the popular custom of the *Vzdání* in Bohemia (Kapras, "Das Pfandrecht in altböhmischen Landrecht," *Z. für vgl. R.-wissenschaft*, xvii. 424 seq.), regulating the wager of litigation in the case of two parties submitting their dispute to the decision of a public tribunal, turn out to be so similar to the Greek and the Roman process? And the Teutonic Wedde would further countenance the view that we have to do in this case with analogous expediency or, possibly, common origin, not loans. But while dwelling on considerations which may disprove the assumption of direct loans, we must not omit to mention circumstances that may render such an assumption the best available explanation for certain points of similarity. We mean especially the recurrence of special secondary traits not deducible from the nature of the relations compared. Terminological parallels are especially convincing in such cases. An example of most careful linguistic investigation attended by important results is presented by W. Thomsen's treatment of the affinities between the languages and cultures of the peoples of northern and eastern Europe. Taking the indications in regard to the influence of Germanic tribes on Finns and Lapps, we find, for instance, that the Finnish race has stood for some 1500 or 2000 years under "the influence of several Germanic languages—partly of a more ancient form of Gothic than that represented by Ulfilas, partly of a northern (Scandinavian) tongue and even possibly of a common Gothic-northern one." The importance of these linguistic investigations for our subject becomes apparent when we find that a series of most important legal and political terms has been imported from Teutonic into Finnish. For example, the Finnish *Kuningas*, "king," comes from a Germanic root illustrated by O. Norse *konung*, O. H. Ger. *chuning*, A.-S. *cyning*, Goth. *thiudans*. The Finnish *valta*, "power," "authority," is of Germanic origin, as shown by O. N. *vald*, Goth. *valdan*. The Finnish *kihla*, a compact secured by solemn promise, is akin with O. N. *gisl*, A.-S. *gīsel*, O. H. Ger. *gīsal*, "hostage." The explanation for Finnish *vuokra*, "interest," "usury," is to be found in Gothic *vokrs*, O. N. *okr*, Ger. *Wucher*, &c. (W. Thomsen, *Über den Einfluss der germanischen Sprachen auf die Finnisch-lappischen*, trans. E. Sievers, 1870, p. 166 seq.; cf. W. Thomsen, *The Relations between Ancient Russia and Scandinavia and the Origin of the Russian State*, p. 127 seq.; Miklosich, "Die Fremdwörter in den slavischen Sprachen," *Denkschriften der Wiener Akademie*, Ph. hist. Klasse, XV.).

(*c*) The next group of analogies is formed by cases which may be reduced to *common origin*. In addition to what has already been said on the subject in connexion with the literature of the historical school, we must point out that in the case of kindred peoples this form of derivation has, of course, to be primarily considered. This is especially the case when we have to deal with the original stock of cultural notions of a race, and when analogies in the framing and working of institutions and legal rules are supported by linguistic affinities. The testimony of the Aryan languages in regard to terms denoting family organization and relationship can in no way be disregarded, whatever our view may be about the most primitive stages of development in this respect. The fact that the common stock of Aryan languages and of Aryan legal customs points to a patriarchal organization of the family may be regarded as established, and it is certainly an important fact drawn from a very ancient stage of human history, although there are indications that still more primitive formations may be discovered.

Inferences in the direction of common origin become more doubtful when we argue, not that certain facts proceed from a common stock of notions embodied in the early culture of a race before it was broken up into several branches, but that they have to be accounted for as instances of a similar treatment of legal problems by different peoples of the same ethnic family. The only thing that can be said in such a case is that, methodically, the customs of kindred nations have the first claim to comparison. It is evident that in dealing with blood feud, composition for homicide, and the like, among the Germans or Slavs, the evidence of other Aryan tribes has to be primarily studied. But it is by no means useless for the investigator of these problems to inform himself about the aspect of such customs in the life of nations of other descent, and especially of savage tribes. The motives underlying legal rules in this respect are to a large extent suggested by feelings and considerations which are not in any way peculiarly Aryan, and may be fully illustrated from other sources, as has been done *e.g.* in Steinmetz's *Origins of Punishment*.

(*d*) This leads to the consideration of what may be called *disconnected analogies*. They are instructive in so far as they go back, not to any continuous development, but to the fundamental, psychological and logical unity of human nature. In similar circumstances human beings are likely to solve the same problems in the same way. Take a rather late and special case. In the Anglo-Saxon laws of Ine, a king who lived in the 7th century, it is enacted that no landowner should be allowed to claim personal labour service from his tenants unless he provides them not merely with land, but with their homesteads. Now an exactly similar rule is found in the statement of rural by-laws to be enforced on great domains in Africa, which had been taken over by the imperial fiscus—the Lex Manciana (cf. Schulten, *Lex manciana*). There is absolutely no reason for assuming a direct transference of the rule from one place to the other: it reflects considerations of natural equity which in both cases were directed against similar encroachments of powerful landowners on a dependent peasant population. In both instances government interfered to draw the line between the payment of rent and the performance of labour, and fastened on the same feature to fix the limit, namely, on the difference between peasants living in their own homes and those who had been settled by the landowner on his farms. Of such analogies, the study of savage life presents a great number, *e.g.* the widely spread practices of purification by ordeal (H. C. Lea, *Superstition and Force*).

(*e*) Organizing thought always seeks to substitute order for chaotic variety. Observations as to disconnected analogies lead to attempts to systematize them from some comprehensive point of view. These attempts may take the shape of a theory of *consecutive stages* of development. Similar facts appear over and over again in ethnological and antiquarian evidence, because all peoples and tribes, no matter what their race and geographical position, go through the same series of social arrangements. This is the fundamental idea which directed the researches of Maine, McLennan, Morgan, Post, Kohler, although each of these scholars formulated his sequence of stages in a peculiar way. McLennan, for instance, puts the idea referred to in the following words:—

> " In short, it is suggested to us, that the history of human society is that of a development following very slowly one general law, and that the variety of forms of life—of domestic and civil institution—is ascribable mainly to the unequal development of the different sections of mankind. . . . The first thing to be done is to inform ourselves of the facts relating to the least developed races. To begin with them is to begin with history at the farthest-back point of time to which, except by argument and inference, we can reach. Their condition, as it may to-day be observed, is truly the most ancient condition of man " (*Studies in Ancient History*, 2nd series, 9, 15).

On this basis we might draw up tables of consecutive stages, of which the simplest may be taken from Post:—

> " Four types of organization: the tribal, the territorial, the seignorial, and the social. The first has as its basis marriage and relationship by blood; the second, neighbouring occupation of a district: the third, patronage relations between lord and dependants; the fourth, social intercourse and contractual relations between individual personalities ". (Post, *Grundriss*, i. 14).

This may be supplemented from Friedrichs in regard to initial stages of family organization. He reckons four stages of this kind: promiscuity, loose relations, matriarchal family, patriarchal family, modern, bilateral family (*Z. f. vgl. R. wissenschaft*). This mode of grouping similar phenomena as a sequence of stages leads to a conception of universal history of a peculiar kind. And as such it has been realized and advocated by Kohler (see *e.g.* his article in Helmolt's *World's History*, Eng. trans. i.). Prompted by this conception several representatives of comparative jurisprudence have found no difficulty to insert such a peculiar institution as group-marriage into the general and obligatory course of legal evolution. It is to be noticed, however, that Kohler himself has entered a distinct protest against McLennan's and Post's view that the more rudimentary a people's culture is, the more archaic it is, and the earlier it has to be placed in the natural sequence of evolution. This would create difficulties in the case of tribes of exceedingly low culture, like the Ceylon Veddahs, who live in monogamous and patriarchal groups. According to Kohler's view, neither the mere fact of a low standard of culture, nor the fact that a certain legal custom precedes another in some cases in point of time, settles the natural sequence of development. The process of development must be studied in cases when it is sufficiently clear, gaps in other cases have to be supplied accordingly, and the working together of distinct institutions, especially in cases when there is no ethnic connexion, has to be especially noticed. These are counsels of perfection, but Kohler's own example shows sufficiently that it is not easy to follow them to the letter. One thing is, however, clearly indicated by these and similar criticisms; it is, at the least, premature to sketch anything like a course of universal development for legal history. We have grave doubts whether the time will ever come for laying down any single course of that kind. The attempts made hitherto have generally led to overstating the value of certain parts of the evidence and to squeezing special traits into a supposed general course of evolution.

(*f*) Another group of thinkers is therefore content to systematize and explain the material from the point of view, not of universal history, but of *correspondence to economic stages and types*. This is, as we have seen, the leading idea in Dargun's or Hildebrand's investigations. It is needless to go into the question of the right or wrong of particular suggestions made by these writers. The place assigned to individualism and collectivism may be adequate or not; how far can be settled only by special inquiries. But the general trend of study initiated in this direction is certainly a promising one, if only one consideration of method is well kept in view. Investigators ought to be very chary of laying down certain combinations as the necessary outcome of certain economic situations. Such combinations or consequences certainly exist; pastoral husbandry, the life of scattered hunting groups, the conditions of agriculturists under feudal rule, certainly contain elements which will recur in divers ethnical surroundings. But we must not forget a feature which is constantly before our eyes in real life: namely, that different minds and characters will draw different and perhaps opposite conclusions in exactly similar outward conditions. This may happen in identical or similar geographical environment; let us only think of ancient Greeks and Turks on the Balkan peninsula, or of ancient Greeks and modern Greeks for that matter. But even the same *historical medium* leaves, as a rule, scope for treatment of legal problems on divers lines. Take systems of succession. They exercise the most potent influence on the structure and life of society. Undivided succession, whether in the form of primogeniture or in that of junior right, sacrifices equity and natural affection to the economic efficiency of estates. Equal-partition rules, like *gavelkind* or *parage*, lead in an exactly opposite direction. And yet both sets of rules co-existed among the agriculturists of feudal England; communities placed in nearly identical historical positions followed one or the other of these rules. The same may be said of types of dwelling and forms of settlement. In other words, it is not enough to start from a given economic condition as if it were bound to regulate with fatalistic precision all the incidents of legal custom and social intercourse. We have to start from actual facts as complex results of many causes, and to try to reduce as much as we can of this material to the action of economic forces in a particular stage or type of development.

(*g*) The psychological diversities of mankind in dealing with the same or similar problems of food and property, of procreation and marriage, of common defence and relationship, of intercourse and contrast, &c., open another possibility for the grouping of facts and the explanation of their evolution. It may be difficult or impossible to trace the reasons and causes of synthetic combinations in the history of society. That is, we can hardly go beyond noting that certain disconnected features of social life appear together and react on each other. But it is easier and more promising to approach the mass of our material from the *analytical* side, taking hold of certain principles, or rules, or institutions, and tracing them to their natural consequences either through a direct systematization of recorded facts or, when these fail, through logical inferences. Some of the most brilliant and useful work in the historical study of law has been effected on these lines. Mommsen's theory of Roman magistracy, Jhering's theory of the struggle for right, Kohler's view of the evolution of contract, &c., have been evolved by such a process of legal analysis; and, even when such generalizations have to be curtailed or complicated later on, they serve their turn as a powerful means of organizing evidence and suggesting reasonable explanations. The attribute of "reasonableness" has to be reckoned with largely in such cases. Analytical explanations are attractive to students because they substitute logical clearness for irrational accumulation of traits and facts. They do so to a large extent through appeals to the logic and to the reason common to us and to the people we are studying. This deductive element has to be closely watched and tested from the side of a concrete study of the evidence, but it seems destined to play a very prominent part in the comparative history of law, because legal analysis and construction have at all times striven to embody logic and equity in the domain of actual interests and forces. And, as we have seen in our survey of the literature of the subject, recent comparative studies tend to make the share of juridical analysis in given relative surroundings larger and larger. What is so difficult of attainment to single workers—a harmonious appreciation of the combined influences of common origin, reception of foreign custom, recurring psychological combinations, the driving forces of economic culture and of the dialectical process of legal thought, will be achieved, it may be hoped, by the enthusiastic and brotherly exertions of all the workers in the field.

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JURJĀNĪ, the name of two Arabic scholars.

1. Abū Bakr ‘Abdu-l-Qāhir ibn ‘Abdur-Raḥmān ul-Jurjānī (d. 1078,) Arabian grammarian, belonged to the Persian school and wrote a famous grammar, the *Kitāb ul-‘Awāmil ul-Mi'a* or *Kitāb Mi'at ‘Āmil*, which was edited by Erpenius (Leiden, 1617), by Baillie (Calcutta, 1803), and by A. Lockett (Calcutta, 1814). Ten Arabic commentaries on this work exist in MS., also two Turkish. It has been versified five times and translated into Persian. Another of his grammatical works on which several commentaries have been written is the *Kitāb Jumal fin-Nahw*.

For other works see C. Brockelmann's *Gesch. der Arabischen Litteratur* (1898), i. 288.

2. ‘Alī ibn Mahommed ul-Jurjānī (1339–1414), Arabian encyclopaedic writer, was born near Astarābād and became professor in Shīrāz. When this city was plundered by Tīmūr (1387) he removed to Samarkand, but returned to Shīrāz in 1405, and remained there until his death. Of his thirty-one extant works, many being commentaries on other works, one of the best known is the *Ta'rifāt* (*Definitions*), which was edited by G. Flügel (Leipzig, 1845), published also in Constantinople (1837), Cairo (1866, &c.), and St Petersburg (1897). (G. W. T.)

JURY, in English law, a body of laymen summoned and sworn (*jurati*) to ascertain, under the guidance of a judge, the truth as to questions of fact raised in legal proceedings whether civil or criminal. The development of the system of trial by jury has been regarded as one of the greatest achievements of English jurisprudence; it has even been said that the ultimate aim of the English constitution is "to get twelve good men into a box."[1] In modern times the English system of trial by jury has been adopted in many countries in which jury trial was not native or had been strangled or imperfectly developed under local conditions.

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[1] *I.e.* the jury-box, or enclosed space in which the jurors sit in court.

The origin of the system in England has been much investigated by lawyers and historians. The result of these investigations is a fairly general agreement that the germ of jury trial is to be found in the Frankish inquest (*recognitio* or *inquisitio*) transplanted into England by the Norman kings. The essence of this inquest was the summoning of a body of neighbours by a public officer to give answer upon oath (*recognoscere veritatem*) on some question of fact or law (*jus*), or of mixed fact and law. At the outset the object of the inquiry was usually to obtain information for the king, *e.g.* to ascertain facts needed for assessing taxation. Indeed Domesday Book appears to be made up by recording the answers of inquests.

The origin of juries is very fully discussed in W. Forsyth's *History of Trial by Jury* (1852), and the various theories advanced are more concisely stated in W. Stubbs's *Constitutional History* (vol. i.) and in E. A. Freeman's *Norman Conquest* (vol. v.). Until the modern examination of historical documents proved the contrary, the jury system, like all other institutions, was popularly regarded as the work of a single legislator, and in England it has been usually assigned to Alfred the Great. This supposition is without historical foundation, nor is it correct to regard the jury as "copied from this or that kindred institution to be found in this or that German of Scandinavian land," or brought over ready made by Hengist or by William.[1] "Many writers of authority," says Stubbs, "have maintained that the entire jury system is indigenous in England, some deriving it from Celtic tradition based on the principles of Roman law, and adopted by the Anglo-Saxons and Normans from the people they had conquered. Others have regarded it as a product of that legal genius of the Anglo-Saxons of which Alfred is the mythical impersonation, or as derived by that nation from the customs of primitive Germany or from their intercourse with the Danes. Nor even when it is admitted that the system of 'recognition' was introduced from Normandy have legal writers agreed as to the source from which the Normans themselves derived it. One scholar maintains that it was brought by the Norsemen from Scandinavia; another that it was derived from the processes of the canon law; another that it was developed on Gallic soil from Roman principles; another that it came from Asia through the crusades," or was borrowed by the Angles and Saxons from their Slavonic neighbours in northern Europe. The true answer is that forms of trial resembling the jury system in various particulars are to be found in the primitive institutions of all nations. That which comes nearest in time and character to trial by jury is the system of recognition by sworn inquest, introduced into England by the Normans. "That inquest," says Stubbs, "is directly derived from the Frank capitularies, into which it may have been adopted from the fiscal regulations of the Theodosian code, and thus own some distant relationship with the Roman jurisprudence." However that may be, the system of "recognition" consisted in questions of fact, relating to fiscal or judicial business, being submitted by the officers of the crown to sworn witnesses in the local courts. Freeman points out that the Norman rulers of England were obliged, more than native rulers would have been, to rely on this system for accurate information. They needed to have a clear and truthful account of disputed points set before them, and such an account was sought for in the oaths of the recognitors.[2] The Norman conquest, therefore, fostered the growth of those native germs common to England with other countries out of which the institution of juries grew. Recognition, as introduced by the Normans, is only, in this point of view, another form of the same principle which shows itself in the compurgators, in the *frith-borh* (frank-pledge), in every detail of the action of the popular courts before the conquest. Admitting with Stubbs that the Norman recognition was the instrument which the lawyers in England ultimately shaped into trial by jury, Freeman maintains none the less that the latter is distinctively English. Forsyth comes to substantially the same conclusion. Noting the jury germs of the Anglo-Saxon period, he shows how out of those elements, which continued in full force under the Anglo-Normans, was produced at last the institution of the jury. "As yet it was only implied in the requirement that disputed questions should be determined by the voice of sworn witnesses taken from the neighbourhood, and deposing to the truth of what they had seen or heard." The conclusions of Sir F. Pollock and F.W. Maitland, expressed in their *History of English Law*, and based on a closer study, are to the same effect.

This inquest then was a royal institution and not a survival from Anglo-Saxon law or popular custom, under which compurgation and the ordeal were the accepted modes of trying issues of fact.

The inquest by recognition, formerly an inquest of office, *i.e.* to ascertain facts in the interests of the crown or the exchequer, was gradually allowed between subjects as a mode of settling disputes of fact. This extension began with the assize of novel disseisin, whereby the king protected by royal writ and inquest of neighbours every seisin of a freehold. This was followed by the grand assize, applicable to questions affecting freehold or status. A defendant in such an action was enabled by an enactment of Henry II. to decline trial by combat and choose trial by assize, which was conducted as follows. The sheriff summoned four knights of the neighbourhood, who being sworn chose the twelve lawful knights most cognisant of the facts, to determine on their oaths which had the better right to the land. If they all knew the facts and were agreed as to their verdict, well and good; if some or all were ignorant, the fact was certified in court, and new knights were named, until twelve were found to be agreed. The same course was followed when the twelve were not unanimous. New knights were added until the twelve were agreed. This was called afforcing the assize. At this time the knowledge on which the jurors acted was their own personal knowledge, acquired independently of the trial. "So entirely," says Forsyth, "did they proceed upon their own previously formed view of the facts in dispute that they seem to have considered themselves at liberty to pay no attention to evidence offered in court, however clearly it might disprove the case which they were prepared to support." The use of recognition is prescribed by the constitutions of Clarendon (1166) for cases of dispute as to lay or clerical tenure. See Forsyth, p. 131; Stubbs, i. 617.

This procedure by the assize was confined to real actions, and while it preceded, it is not identical with the modern jury trial in civil cases, which was gradually introduced by consent of the parties and on pressure from the judges. Jury trial proper differs from the grand and petty assizes in that the assizes were summoned at the same time as the defendant to answer a question formulated in the writ; whereas in the ordinary jury trial no order for a jury could be made till the parties by their pleadings had come to an issue of fact and had put themselves on the country, *posuerunt se super patriam* (Pollock and Maitland, i. 119–128; ii. 601, 615, 621).

The Grand Jury.—In Anglo-Saxon times there was an institution analogous to the grand jury in criminal cases, viz. the twelve senior thegns, who, according to an ordinance of Æthelred II., were sworn in the county court that they would accuse no innocent man and acquit no guilty one. The twelve thegns were a jury of presentment or accusation, like the grand jury of later times, and the absolute guilt or innocence of those accused by them had to be determined by subsequent proceedings—by compurgation or ordeal. Whether this is the actual origin of the grand jury or not, the assizes of Clarendon (1166) and Northampton (1176) establish the criminal jury on a definite basis.

In the laws of Edward the Confessor and the earlier Anglo-Saxon kings are found many traces of a public duty to bring offenders to justice, by hue and cry, or by action of the *frithborh*, township, tithing or hundred. By the assize of Clarendon it is directed that inquiry be made in each county and in each hundred by twelve lawful (*legaliores*) men of the hundred, and by four lawful men from each of the four vills nearest to the scene of the alleged crime, on oath to tell the truth if in the hundred or vill there is any man accused (*rettatus aut publicatus*) as a robber or murderer or thief, or receiver of such. The assize of Northampton added forgery of coin or charters (*falsonaria*) and arson. The inquiry is to be held by the justices in eyre, and by the sheriffs in their county courts. On a finding on the oath aforesaid, the accused was to be taken and to go to the ordeal. By the articles of visitation of 1194, four knights are to be chosen from the county who by their oath shall choose two lawful knights of each hundred or wapentake, or, if knights be wanting, free and legal men, so that the twelve may answer for all matters within the hundred, including, says Stubbs, "all the pleas of the crown, the trial of malefactors and their receivers, as well as a vast amount of civil business." The process thus described is now regarded as an employment of the Frankish inquest for the collection of *fama publica*. It was alternative to the rights of a private accuser by appeal, and the inquest were not exactly either accusers or witnesses, but gave voice to public repute as to the criminality of the persons whom they presented. From this form of inquest has developed the grand jury of presentment or accusation, and the coroner's inquest, which works partly as a grand jury as to homicide cases, and partly as an inquest of office as to treasure trove, &c.

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[1] Freeman, *Norman Conquest*, v, 451.

[2] This fact would account for the remarkable development of the system on English ground, as contrasted with its decay and extinction in France.

The number of the grand jury is fixed by usage at not less than twelve nor more than twenty-three jurors. Unanimity is not required, but twelve must concur in the presentment or indictment.[1] This jury retains so much of its ancient character that it may present of its own knowledge or information, and is not tied down by rules of evidence. After a general charge by the judge as to the bills of indictment on the file of the court, the grand jury considers the bills in private and hears upon oath in the grand jury chamber some or all the witnesses called in support of an indictment whose names are endorsed upon the bill. It does not as a rule hear counsel or solicitors for the prosecution, nor does it see or hear the accused or his witnesses, and it is not concerned with the nature of the defence, its functions being to ascertain whether there is a prima facie case against the accused justifying his trial. If it thinks that there is such a case, the indictment is returned into court as a true bill; if it thinks that there is not, the bill is ignored and returned into court torn up or marked "no bill," or "*ignoramus*." Inasmuch as no man can be put on trial for treason or felony, and few are tried for misdemeanour, without the intervention of the grand jury, the latter has a kind of veto with respect to criminal prosecutions. The grand jurors are described in the indictment as "the jurors for our lord the king." As such prosecutions in respect of indictable offences are now in almost all cases begun by a full preliminary inquiry before justices, and inasmuch as cases rarely come before a grand jury until after committal of the accused for trial, the present utility of the grand jury depends very much on the character of the justices' courts. As a review of the discretion of stipendiary magistrates in committing cases for trial, the intervention of the grand jury is in most cases superfluous; and even when the committing justices are not lawyers, it is now a common opinion that their views as to the existence of a case to be submitted to a jury for trial should not be over-ridden by a lay tribunal sitting in private, and in this opinion many grand jurors concur. But the abolition of the grand jury would involve great changes in criminal procedure for which parliament seems to have no appetite. Forsyth thinks that the grand jury will often baffle "the attempts of malevolence" by ignoring a malicious and unfounded prosecution; but it may also defeat the ends of justice by shielding a criminal with whom it has strong political or social sympathies. The qualification of the grand jurymen is that they should be freeholders of the county—to what amount appears to be uncertain—and they are summoned by the sheriff, or failing him by the coroner.

The *coroner's jury* must by statute (1887) consist of not more than twenty-three nor less than twelve jurors. It is summoned by the coroner to hold an inquest *super visum corporis* in cases of sudden or violent death, and of death in prisons or lunatic asylums, and to deal with treasure trove. The qualification of the coroner's jurors does not depend on the Juries Acts 1825 and 1870, and in practice they are drawn from householders in the immediate vicinity of the place where the inquest is held. Unanimity is not required of a coroner's jury; but twelve must concur in the verdict. If it charges anyone with murder or manslaughter, it is duly recorded and transmitted to a court of assize, and has the same effect as an indictment by a grand jury, *i.e.* it is accusatory only and is not conclusive, and is traversable, and the issue of guilt or innocence is tried by a petty jury.

The Petty Jury.— The ordeal by water or fire was used as the final test of guilt or innocence until its abolition by decree of the Lateran council (1219). On its abolition it became necessary to devise a new mode of determining guilt as distinguished from ill fame as charged by the grand jury. So early as 1221 accused persons had begun to put themselves on the country, or to pay to have a verdict for "good or ill"; and the trial seems to have been by calling for the opinions of the twelve men and the four townships, who may have been regarded as a second body of witnesses who could traverse the opinion of the hundred jury. (See Pollock and Maitland, ii. 646.) The reference to *judicium parium* in Magna Carta is usually taken to refer to the jury, but it is clear that what is now known as the petty jury was not then developed in its present form. "The history of that institution is still in manuscript," says Maitland.

It is not at all clear that at the outset the trial by the country (*in pais; in patria*) was before another and different jury. The earliest instances look as if the twelve men and the four vills were the *patria* and had to agree. But by the time of Edward I. the accused seems to have been allowed to call in a second jury. A person accused by the inquest of the hundred was allowed to have the truth of the charge tried by another and different jury.[2] "There is," says Forsyth, "no possibility of assigning a date to this alteration." "In the time of Bracton (middle of the 13th century) the usual mode of determining innocence or guilt was by combat or appeal. But in most cases the appellant had the option of either fighting with his adversary or putting himself on his country for trial"—the exceptions being murder by secret poisoning, and certain circumstances presumed by the law to be conclusive of guilt.[3] But the separation must have been complete by 1352, in which year it was enacted "that no indictor shall be put in inquests upon deliverance of the indictees of felonies or trespass if he be challenged for that same cause by the indictee."

The jurors, whatever their origin, differed from the Saxon doomsmen and the jurats of the Channel Islands in that they adjudged nothing; and from compurgators or oath-helpers in that they were not witnesses called by a litigant to support his case (Pollock and Maitland, i. 118). Once established, the jury of trial whether of actions or indictments developed on the same lines. But at the outset this jury differed in one material respect from the modern trial jury. The ancient trial jury certify to the truth from their knowledge of the facts, however acquired. In other words, they resemble witnesses or collectors of local evidence or gossip rather than jurors. The complete withdrawal of the witness character from the jury is connected by Forsyth with the ancient rules of law as to proof of written instruments, and a peculiar mode of trial *per sectam*. When a deed is attested by witnesses, you have a difference between the testimony of the witness, who deposes to the execution of the deed, and the verdict of the jury as to the fact of execution. It has been contended with much plausibility that in such cases the attesting witnesses formed part of the jury. Forsyth doubts that conclusion, although he admits that, as the jurors themselves were originally mere witnesses, there was no distinction in principle between them and the attesting witnesses, and that the attesting witnesses might be associated with the jury in the discharge of the function of giving a verdict. However that may be, in the reign of Edward III., although the witnesses are spoken of "as joined to the assize," they are distinguished from the jurors. The trial *per sectam* was used as an alternative to the assize or jury, and resembled in principle the system of compurgation. The claimant proved his case by vouching a certain number of witnesses (*secta*), who had seen the transaction in question, and the defendant rebutted the presumption thus created by vouching a larger number of witnesses on his own side. In cases in which this was allowed, the jury did not interpose at all, but in course of time the practice arose of the witnesses of the *secta* telling their story to the jury. In these two instances we have the jury as judges of the facts sharply contrasted with the witnesses who testify to the facts; and, with the increasing use of juries and the development of rules of evidence, this was gradually established as the true principle of the system. In the reign of Henry IV. we find the judges declaring that the jury after they have been sworn should not see or take with them any other evidence than that which has been offered in open court. But the personal knowledge of the jurors was not as yet regarded as outside the evidence on which they might found a verdict, and the stress laid upon the selection of jurymen from the neighbourhood of the cause of the action shows that this element was counted on, and, in fact, deemed essential to a just consideration of the case. Other examples of the same theory of the duties of the jury may be found in the language used by legal writers. Thus it has been said that the jury may return a verdict although no evidence at all be offered, and again, that the evidence given in court is not binding on the jury, because they are assumed from their local connexion to be sufficiently informed of the facts to give a verdict without or in opposition to the oral evidence. A recorder of London, *temp*. Edward VI., says that, "if the witnesses at a trial do not agree with the jurors, the verdict of the twelve shall be taken and the witnesses shall be rejected." Forsyth suggests as a reason for the continuance of this theory that it allowed the jury an escape from the *attaint*, by which penalties might be imposed on them for delivering a false verdict in a civil case. They could suggest that the verdict was according to the fact, though not according to the evidence.

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[1] Blackstone puts the principle as being that no man shall be convicted except by the unanimous voice of twenty-four of his equals or neighbours—twelve on the grand, and twelve on the petty jury.

[2] The distinction between the functions of the grand jury, which presents or accuses criminals, and the petty jury, which tries them, has suggested the theory that the system of compurgation is the origin of the jury system—the first jury representing the compurgators of the accuser, the second the compurgators of the accused.

[3] Forsyth, 206. The number of the jury (twelve) is responsible for some unfounded theories of the origin of the system. This use of twelve is not confined to England, nor in England or elsewhere to judicial institutions. "Its general prevalence," says Hallam (*Middle Ages*, ch. viii.), "shows that in searching for the origin of trial by jury we cannot rely for a moment upon any analogy which the mere number affords." In a *Guide to English Juries* (1682), by a person of quality (attributed to Lord Somers), the following passage occurs: "In analogy of late the jury is reduced to the number of twelve, like as the prophets were twelve to foretell the truth; the apostles twelve to preach the truth; the discoverers twelve, sent into Canaan to seek and report the truth; and the stones twelve that the heavenly Hierusalem is built on." Lord Coke indulged in similar speculations.

In England the trial jury (also called petty jury or traverse jury) consists of twelve jurors, except in the county court, where the number is eight. In civil but not in criminal cases the trial may by consent be by fewer than twelve jurors, and the verdict may by consent be that of the majority. The rule requiring a unanimous verdict has been variously explained. Forsyth regards the rule as intimately connected with the original character of the jury as a body of witnesses, and with the conception common in primitive society that safety is to be found in the number of witnesses, rather than the character of their testimony. The old notion seems to have been that to justify an accusation, or to find a fact, twelve sworn men must be agreed. The afforcing of the jury, already described, marks an intermediate stage in the development. Where the juries were not unanimous new jurors were added until twelve were found to be of the same opinion. From the unanimous twelve selected out of a large number to the unanimous twelve constituting the whole jury was a natural step, which, however, was not taken without hesitation. In some old cases the verdict of eleven jurors out of twelve was accepted, but it was decided in the reign of Edward III. that the verdict must be the unanimous opinion of the whole jury. Diversity of opinion was taken to imply perversity of judgment, and the law sanctioned the application of the harshest methods to produce unanimity. The jurors while considering their verdict were not allowed a fire nor any refreshment, and it is said in some of the old books that, if they failed to agree, they could be put in a cart and drawn after the justices to the border of the county, and then upset into a ditch. These rude modes of enforcing unanimity has been softened in later practice, but in criminal cases the rule of unanimity is still absolutely fixed.

In civil cases and in trials for misdemeanour, the jurors are allowed to separate during adjournments and to return to their homes; in trials for treason, treason-felony and murder, the jurors, once sworn, must not separate until discharged. But by an act of 1897 jurors on trials for other felonies may be allowed by the court to separate in the same way as on trials for misdemeanour.

These rules do not apply to a jury which has retired to consider its verdict. During the period of retirement it is under the keeping of an officer of the court.

At common law aliens were entitled to be tried by a jury *de medietate linguae*—half Englishmen, half foreigners, not necessarily compatriots of the accused. This privilege was abolished by the Naturalization Act 1870; but by the Juries Act 1870 aliens who have been domiciled in England or Wales for ten years or upwards, if in other respects duly qualified, are liable to jury service as if they were natural-born subjects (s. 8).

A jury of matrons is occasionally summoned, viz. on a writ *de ventre inspiciendo*, or where a female condemned to death pleads pregnancy in stay of execution.

The jurors are selected from the inhabitants of the county, borough or other area for which the court to which they are summoned is commissioned to act. In criminal cases, owing to the rules as to venue and that crime is to be tried in the neighbourhood where it is committed, the mode of selection involves a certain amount of independent local knowledge on the part of the jurors. Where local prejudice has been aroused for or against the accused, which is likely to affect the chance of a fair trial, the proceedings may be removed to another jurisdiction, and there are a good many offences in which by legislation the accused may be tried where he is caught, irrespective of the place where he is alleged to have broken the law. As regards civil cases, a distinction was at an early date drawn between local actions which must be tried in the district in which they originated, and transitory actions which could be tried in any county. These distinctions are now of no importance, as the place of trial of a civil action is decided as a matter of procedure and convenience, and regard is not necessarily paid to the place at which a wrong was done or a contract broken.

The qualifications for, and exemptions from, service as a petty juror are in the main contained in the Juries Acts 1825 and 1870, though a number of further exemptions are added by scattered enactments. The exemptions include members of the legislature and judges, ministers of various denominations, and practising barristers and solicitors, registered medical practitioners and dentists, and officers and soldiers of the regular army. Persons over sixty are exempt but not disqualified. Lists of the jurors are prepared by the overseers in rural parishes and by the town clerks in boroughs, and are submitted to justices for revision. When jurors are required for a civil or criminal trial they are summoned by the sheriff or, if he cannot act, by the coroner.

Special and Common Juries.—For the purpose of civil trials in the superior courts there are two lists of jurors, special and common. The practice of selecting special jurors to try important civil cases appears to have sprung up, without legislative enactment, in the procedure of the courts. Forsyth says that the first statutory recognition of it is so late as 3 Geo. II. c. 25, and that in the oldest book of practice in existence (Powell's *Attourney's Academy*, 1623) there is no allusion to two classes of jurymen. The acts, however, which regulate the practice allude to it as well established. The Juries Act 1870 (33 & 34 Vict. c. 77) defines the class of persons entitled and liable to serve on special juries thus: Every man whose name shall be on the jurors' book for any county, &c., and who shall be legally entitled to be called an esquire, or shall be a person of higher degree, or a banker or merchant, or who shall occupy a house of a certain rateable value (*e.g.* £100 in a town of 20,000 inhabitants, £50 elsewhere), or a farm of £300 or other premises at £100. A special juryman receives a fee of a guinea for each cause. Either party may obtain an order for a special jury, but must pay the additional expenses created thereby unless the judge certifies that it was a proper case to be so tried. For the common jury any man is qualified and liable to serve who has £10 by the year in land or tenements of freehold, copyhold or customary tenure; or £20 on lands or tenement held by lease for twenty-one years or longer, or who being a householder is rated at £30 in the counties of London and Middlesex, or £20 in any other county. A special jury cannot be ordered in cases of treason or felony, and may be ordered in cases of misdemeanour only when the trial is in the king's bench division of the High Court, or the civil side at assizes.

Challenge.—It has always been permissible for the parties to challenge the jurors summoned to consider indictments or to try cases. Both in civil and criminal cases a challenge "for cause" is allowed; in criminal cases a peremptory challenge is also allowed. Challenge "for cause" may be either to the *array*, *i.e.* to the whole number of jurors returned, or to the *polls*, *i. e.* to the jurors individually. A challenge to the array is either a *principal* challenge (on the ground that the sheriff is a party to the cause, or related to one of the parties), or a challenge for *favour* (on the ground of circumstances implying "at least a probability of bias or favour in the sheriff"). A challenge to the polls is an exception to one or more jurymen on either of the following grounds: (1) *propter honoris respectum*, as when a lord of parliament is summoned; (2) *propter defectum*, for want of qualification; (3) *propter affectum*, on suspicion of bias or partiality; and (4) *propter delictum*, when the juror has been convicted of an infamous offence. The challenge *propter affectum* is, like the challenge to the array, either principal challenge or "to the favour." In England as a general rule the juror may be interrogated to show want of qualification; but in other cases the person making the challenge must prove it without questioning the juror, and the courts do not allow the protracted examination on the *voir dire* which precedes every *cause célèbre* in the United States. On indictments for treason the accused has a right peremptorily to challenge thirty-five of the jurors on the panel; in cases of felony the number is limited to twenty, and in cases of misdemeanour there is no right of peremptory challenge. The Crown has not now the right of peremptory challenge and may challenge only for cause certain (Juries Act 1825, s. 29). In the case of felony, on the first call of the list jurors objected to by the Crown are asked to stand by, and the cause of challenge need not be assigned by the Crown until the whole list has been perused or gone through, or unless there remain no longer twelve jurors left to try the case, exclusive of those challenged. This arrangement practically amounts to giving the Crown the benefit of a peremptory challenge.

Function of Jury.—The jurors were originally the mouthpiece of local opinion on the questions submitted to them, or witnesses to fact as to such questions. They have now become the judges of fact upon the evidence laid before them. Their province is strictly limited to questions of fact, and within that province they are still further restricted to matters proved by evidence in the course of the trial and in theory must not act upon their own personal knowledge and observation except so far as it proceeds from what is called a "view" of the subject matter of the litigation. Indeed it is now well established that if a juror is acquainted with facts material to the case, he should inform the court so that he may be dismissed from the jury and called as a witness; and Lord Ellenborough ruled that a judge would misdirect the jury if he told them that they might reject the evidence and go by their own knowledge. The old *decantatum* assigns to judge and jury their own independent functions: *Ad quaestionem legis respondent judices: ad quaestionem facti juratores* (Plowden, 114). But the independence of the jurors as to matters of fact was from an early time not absolute. In certain civil cases a litigant dissatisfied by the verdict could adopt the procedure by attaint, and if the attaint jury of twenty-four found that the first jury had given a false verdict, they were fined and suffered the villainous judgment. Attaints fell into disuse on the introduction about 1665 of the practice of granting new trials when the jury found against the weight of the evidence, or upon a wrong direction as to the law of the case.

In criminal cases the courts attempted to control the verdicts by fining the jurors for returning a verdict *contra plenam et manifestam evidentiam.* But this practice was declared illegal in Bushell's case (1670); and so far as criminal cases are concerned the independence of the jury as sole judges of fact is almost absolute. If they acquit, their action cannot be reviewed nor punished, except on proof of wilful and corrupt consent to "embracery" (Juries Act 1825, s. 61). If they convict no new trial can be ordered except in the rare instances of misdemeanours tried as civil cases in the High Court. In trials for various forms of libel during the 18th century, the judges restricted the powers of juries by ruling that their function was limited to finding whether the libel had in fact been published, and that it was for the court to decide whether the words published constituted an offence.[1] By Fox's Libel Act 1792 the jurors in such cases were expressly empowered to bring in a general verdict of libel or no libel, *i.e.* to deal with the whole question of the meaning and extent of the incriminated publication. In other words, they were given the same independence in cases of libel as in other criminal cases. This independence has in times of public excitement operated as a kind of local option against the existing law and as an aid to procuring its amendment. Juries in Ireland in agrarian cases often acquit in the teeth of the evidence. In England the independence of the jury in criminal trials is to some extent menaced by the provisions of the Criminal Appeal Act 1907.

While the jury is in legal theory absolute as to matters of fact, it is in practice largely controlled by the judges. Not only does the judge at the trial decide as to the relevancy of the evidence tendered to the issues to be proved, and as to the admissibility of questions put to a witness, but he also advises the jury as to the logical bearing of the evidence admitted upon the matters to be found by the jury. The rules as to admissibility of evidence, largely based upon scholastic logic, sometimes difficult to apply, and almost unknown in continental jurisprudence, coupled with the right of an English judge to sum up the evidence (denied to French judges) and to express his own opinion as to its value (denied to American judges), fetter to some extent the independence or limit the chances of error of the jury.

"The whole theory of the jurisdiction of the courts to interfere with the verdict of the constitutional tribunal is that the court is satisfied that the jury have not acted reasonably upon the evidence but have been misled by prejudice or passion" (*Watt* v. *Watt* (1905), App. Cas. 118, per Lord Halsbury). In civil cases the verdict may be challenged on the ground that it is against the evidence or against the weight of the evidence, or unsupported by any evidence. It is said to be against the evidence when the jury have completely misapprehended the facts proved and have drawn an inference so wrong as to be in substance perverse. The dissatisfaction of the trial judge with the verdict is a potent but not conclusive element in determining as to the perversity of a verdict, because of his special opportunity of appreciating the evidence and the demeanour of the witnesses. But his opinion is less regarded now that new trials are granted by the court of appeal than under the old system when the new trial was sought in the court of which he was a member.

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[1] See *R.* v. *Dean of St. Asaph* (1789), 3 T.R. 418.

The appellate court will not upset a verdict when there is substantial and conflicting evidence before the jury. In such cases it is for the jury to say which side is to be believed, and the court will not interfere with the verdict. To upset a verdict on the ground that there is no evidence to go to the jury implies that the judge at the trial ought to have withdrawn the case from the jury. Under modern procedure, in order to avoid the risk of a new trial, it is not uncommon to take the verdict of a jury on the hypothesis that there was evidence for their consideration, and to leave the unsuccessful party to apply for judgment notwithstanding the verdict. The question whether there was any evidence proper to be submitted to the jury arises oftenest in cases involving an imputation of negligence—*e.g.* in an action of damages against a railway company for injuries sustained in a collision. Juries are somewhat ready to infer negligence, and the court has to say whether, on the facts proved, there was any evidence of negligence by the defendant. This is by no means the same thing as saying whether, in the opinion of the court, there was negligence. The court may be of opinion that on the facts there was none, yet the facts themselves may be of such a nature as to be evidence of negligence to go before a jury. When the facts proved are such that a reasonable man might have come to the conclusion that there was negligence, then, although the court would not have come to the same conclusion, it must admit that there is evidence to go before the jury. This statement indicates existing practice but scarcely determines what relation between the facts proved and the conclusion to be established is necessary to make the facts evidence from which a jury may infer the conclusion. The true explanation is to be found in the principle of relevancy. Any fact which is relevant to the issue constitutes evidence to go before the jury, and any fact, roughly speaking, is relevant between which and the fact to be proved there may be a connexion as cause and effect (see EVIDENCE). As regards damages the court has always had wide powers, as damages are often a question of law. But when the amount of the damages awarded by a jury is challenged as excessive or inadequate, the appellate court, if it considers the amount unreasonably large or unreasonably small, must order a new trial unless both parties consent to a reduction or increase of the damages to a figure fixed by the court; see *Watt* v. *Watt* (1905), App. Cas. 115.

Value of Jury System.—The value of the jury in past history as a bulwark against aggression by the Crown or executive cannot be over-rated, but the working of the institution has not escaped criticism. Its use protracts civil trials. The jurors are usually unwilling and are insufficiently remunerated; and jury trials in civil cases often drag out much longer and at greater expense than trials by a judge alone, and the proceedings are occasionally rendered ineffective by the failure of the jurors to agree.

There is much force in the arguments of Bentham and others against the need of unanimity—the application of pressure to force conviction on the minds of jurors, the indifference to veracity which the concurrence of unconvinced minds must produce in the public mind, the probability that jurors will disagree and trials be rendered abortive, and the absence of any reasonable security in the unanimous verdict that would not exist in the verdict of a majority. All this is undeniably true, but disagreements are happily not frequent, and whatever may happen in the jury room no compulsion is now used by the court to induce agreement.

But, apart from any incidental defects, it may be doubted whether, as an instrument for the investigation of truth, the jury system deserves all the encomiums which have been passed upon it. In criminal cases, especially of the graver kind, it is perhaps the best tribunal that could be devised. There the element of moral doubt enters largely into the consideration of the case, and that can best be measured by a popular tribunal. Opinion in England has hitherto been against subjecting a man to serious punishment as a result of conviction before a judge sitting without a jury, and the judges themselves would be the first to deprecate so great a responsibility, and the Criminal Appeal Act 1907, which constituted the court of criminal appeal, recognized the responsibility by requiring a quorum of three judges in order to constitute a court. The same act, by permitting an appeal to persons convicted on indictment both on questions of fact and of law, removed to a great extent any possibility of error by a jury. But in civil causes, where the issue must be determined one way or the other on the balance of probabilities, a single judge would probably be a better tribunal than the present combination of judge and jury. Even if it be assumed that he would on the whole come to the same conclusion as a jury deliberating under his directions, he would come to it more quickly. Time would be saved in taking evidence, summing up would be unnecessary, and the addresses of counsel would inevitably be shortened and concentrated on the real points at issue. Modern legislation and practice in England have very much reduced the use of the jury both in civil and criminal cases.

In the county courts trial by jury is the exception and not the rule. In the court of chancery and the admiralty court it was never used. Under the Judicature Acts many cases which in the courts of common law would have been tried with a jury are now tried before a judge alone, or (rarely) with assessors, or before an official referee. Indeed cynics say that a jury is insisted on chiefly in cases when a jury, from prejudice or other causes, is likely to be more favourable than a judge alone.

In criminal cases, by reason of the enormous number of offences punishable on summary conviction and of the provisions made for trying certain indictable offences summarily if the offender is young or elects for summary trial, juries are less called on in proportion to the number of offences committed than was the practice in former years.

Scotland.—According to the *Regiam Majestatem*, which is identical with the treatise of Glanvill on the law of England (but whether the original or only a copy of that work is disputed), trial by jury existed in Scotland for civil and criminal cases from as early a date as in England, and there is reason to believe that at all events the system became established at a very early date. Its history was very different from that of the English jury system. There was no grand jury under Scots law, but it was introduced in 1708 for the purpose of high treason (7 Anne c. 21). For the trial of criminal cases the petty jury is represented by the criminal "assize." This jury has always consisted of fifteen persons and the jurors are chosen by ballot by the clerk of the court from the list containing the names of the special and common jurors, five from the special, ten from the common. Prosecutor and accused each have five peremptory challenges, of which two only may be directed against the special jurors; but there is no limit to challenges for cause. The jury is not secluded during the trial except in capital cases or on special order of the court made *proprio motu* or on the application of prosecutor or accused. The verdict need not be unanimous, nor is enclosure a necessary preliminary to a majority verdict. It is returned viva voce by the chancellor or foreman, and entered on the record by the clerk of the court, and the entry read to the jury. Besides the verdicts of "guilty" and "not guilty," a Scots jury may return a verdict of "not proven," which has legally the same effect as not guilty in releasing the accused from further proceedings on the particular charge, but inflicts on him the stigma of moral guilt.

Jury trial in civil cases was at one time in general if not prevailing use, but was gradually superseded for most purposes on the institution of the Court of Session (1 Mackay, *Ct. Sess. Pr.* 33). In this, as in many other matters, Scots law and procedure tend to follow continental rather than insular models. The civil jury was reintroduced in 1815 (55 Geo. III. c. 42), mainly on account of the difficulties experienced by the House of Lords in dealing with questions of fact raised on Scottish appeals. At the outset a special court was instituted in the nature of a judicial commission to ascertain by means of a jury facts deemed relevant to the issues in a cause and sent for such determination at the discretion of the court in which the cause was pending. The process was analogous to the sending of an issue out of chancery for trial in a superior court of common law, or in a court of assize. In 1830 the jury court ceased to exist as a separate tribunal and was merged in the Court of Session. By legislation of 1819 and 1825 certain classes of cases were indicated as appropriate to be tried by a jury; but in 1850 the cases so to be tried were limited to actions for defamation and nuisance, or properly and in substance actions for damages, and under an act of 1866 even in these cases the jury may be dispensed with by consent of parties.

The civil jury consists as in England of twelve jurors chosen by ballot from the names on the list of those summoned. There is a right of peremptory challenge limited to four, and also a right to challenge for cause. Unanimity was at first but is not now required. The jury if unanimous may return a verdict immediately on the close of the case. If they are not unanimous they are enclosed and may at any time not less than three hours after being enclosed return a verdict by a bare majority. If after six hours they do not agree by the requisite majority, *i.e.* are equally divided, they must be discharged. It was stated by Commissioner Adam, under whom the Scots civil jury was originated, that in twenty years he knew of only one case in which the jury disagreed. Jury trial in civil cases in Scotland has not flourished or given general satisfaction, and is resorted to only in a small proportion of cases. This is partly due to its being transplanted from England.

Ireland.—The jury laws of Ireland do not differ in substance from those of England. The qualifications of jurors are regulated by O'Hagan's Acts 1871 and 1872, and the Juries Acts 1878 and 1894. In criminal cases much freer use is made than in England of the rights of the accused to challenge, and of the Crown to order jurors to stand by, and what is called "jury-packing" seems to be the object of both sides when some political or agrarian issue is involved in the trial. Until the passing of the Irish Local Government Act 1898, the grand jury, besides its functions as a jury of accusation, had large duties with respect to local government which are now transferred to the county councils and other elective bodies.

British Empire.—In most parts of the British Empire the jury system is in force as part of the original law of the colonists or under the colonial charters of justice or by local legislation. The grand jury is not in use in India; was introduced but later abolished in the Cape Colony; and in Australia has been for most purposes superseded by the public prosecutor. The ordinary trial jury for criminal cases is twelve, but in India may be nine, seven, five or three, according to certain provisions of the Criminal Procedure Code 1898. In countries where the British Crown has foreign jurisdiction the jury for criminal trials has in some cases been fixed at a less number than twelve and the right of the Crown to fix the number is established; see *ex p. Carew*, 1897, A.C. 719. In civil cases the number of the jury is reduced in some colonies, *e.g.* to seven in Tasmania and Trinidad.

European Countries.—In France there is no civil jury. In criminal cases the place of the grand jury is taken by the *chambre des mises en accusation*, and the more serious crimes are tried before a jury of twelve which finds its verdict by a majority, the exact number of which may not be disclosed. In Belgium, Spain, Italy and Germany, certain classes of crime are tried with the aid of a jury.

United States.—The English jury system was part of the law of the American colonies before the declaration of independence; and grand jury, coroner's jury and petty jury continue in full use in the United States. Under the Federal Constitution (Article iii.) there is a right to trial by jury in all criminal cases (except on impeachment) and in all civil actions at common law in which the subject matter exceeds $20 in value (amendments vi. and vii.). The trial jury must be of twelve and its verdict must be unanimous; see Cooley, *Constitutional Limitations* (6th ed.), 389. The respective provinces of judge and jury have been much discussed and there has been a disposition to declare the jury supreme as to law as well as fact. The whole subject is fully treated by reference to English and American authorities, and the conflicting views are stated in *Sparf* v. *United States*, 1895, 156 U.S. 61. The view of the majority of the court in that case was that it is the duty of the jury in a criminal case to receive the law from the court and to apply it as laid down by the court, subject to the condition that in giving a general verdict the jury may incidentally determine both law and fact as compounded in the issues submitted to them in the particular case. The power to give a general verdict renders the duty one of imperfect obligation and enables the jury to take its own view of the terms and merits of the law involved.

The extent to which the jury system is in force in the states of the union depends on the constitution and legislation of each state. In some the use of juries in civil and even in criminal cases is reduced or made subject to the election of the accused. In others unanimous verdicts are not required, while the constitutions of others require the unanimous verdict of the common law dozen. (W. F. C.)

JUS PRIMAE NOCTIS, or DROIT DU SEIGNEUR, a custom alleged to have existed in medieval Europe, giving the overlord a right to the virginity of his vassals' daughters on their wedding-night. For the existence of the custom in a legalized form there is no trustworthy evidence. That some such abuse of power may have been occasionally exercised by brutal nobles in the lawless days of the early middle ages is only too likely, but the *jus*, it seems, is a myth, invented no earlier than the 16th or 17th century. There appears to have been an entirely religious custom established by the council of Carthage in 398, whereby the Church required from the faithful continence on the wedding-night, and this may have been, and there is evidence that it was, known as *Droit du Seigneur*, or "God's right." Later the clerical admonition was extended to the first three days of marriage. This religious abstention, added to the undoubted fact that the feudal lord extorted fines on the marriages of his vassals and their children, doubtless gave rise to the belief that the *jus* was once an established custom.

The whole subject has been exhaustively treated by Louis Veuillot in *Le Droit du seigneur au moyen âge* (1854).

JUS RELICTAE, in Scots law, the widow's right in the movable property of her deceased husband. The deceased must have been domiciled in Scotland, but the right accrues from movable property, wherever situated. The widow's provision amounts to one-third where there are children surviving, and to one-half where there are no surviving children. The widow's right vests by survivance, and is independent of the husband's testamentary provisions; it may however be renounced by contract, or be discharged by satisfaction. It is subject to alienation of the husband's movable estate during his lifetime or by its conversion into heritage. See also WILL.

JUSSERAND, JEAN ADRIEN ANTOINE JULES (1855–), French author and diplomatist, was born at Lyons on the 18th of February 1855. Entering the diplomatic service in 1876, he became in 1878 consul in London. After an interval spent in Tunis he returned to London in 1887 as a member of the French Embassy. In 1890 he became French minister at Copenhagen, and in 1902 was transferred to Washington. A close student of English literature, he produced some very lucid and vivacious monographs on comparatively little-known subjects: *Le Théâtre en Angleterre depuis la conquête jusqu' aux prédécesseurs immédiats de Shakespeare* (1878); *Le Roman au temps de Shakespeare* (1887; Eng. trans. by Miss E. Lee, 1890); *Les Anglais au moyen âge: la vie nomade et les routes d'Angleterre au XIV^e^ siècle* (1884; Eng. trans., *English Wayfaring Life in the Middle Ages*, by L. T. Smith, 1889); and *L'Épopée de Langland* (1893; Eng. trans., *Piers Plowman*, by M. C. R., 1894). His *Histoire littéraire du peuple anglais*, the first volume of which was published in 1895, was completed in three volumes in 1909. In English he wrote *A French Ambassador at the Court of Charles II.* (1892), from the unpublished papers of the count de Cominges.

JUSSIEU, DE, the name of a French family which came into prominent notice towards the close of the 16th century, and for a century and a half was distinguished for the botanists it produced. The following are its more eminent members:—

1. ANTOINE DE JUSSIEU (1686–1758), born at Lyons on the 6th of July 1686, was the son of Christophe de Jussieu (or Dejussieu), an apothecary of some repute, who published a *Nouveau traité de la thériaque* (1708). Antoine studied at the university of Montpellier, and travelled with his brother Bernard through Spain, Portugal and southern France. He went to Paris in 1708, J. P. de Tournefort, whom he succeeded at the Jardin des Plantes, dying in that year. His own original publications are not of marked importance, but he edited an edition of Tournefort's *Institutiones rei herbariae* (3 vols., 1719), and also a posthumous work of Jacques Barrelier, *Plantae per Galliam, Hispaniam, et Italiam observatae*, &c. (1714). He practised medicine, chiefly devoting himself to the very poor. He died at Paris on the 22nd of April 1758.

2. BERNARD DE JUSSIEU (1699–1777), a younger brother of the above, was born at Lyons on the 17th of August 1699. He took a medical degree at Montpellier and began practice in 1720, but finding the work uncongenial he gladly accepted his brother's invitation to Paris in 1722, when he succeeded Sébastien Vaillant as sub-demonstrator of plants in the Jardin du Roi. In 1725 he brought out a new edition of Tournefort's *Histoire des plantes qui naissent aux environs de Paris*, 2 vols., which was afterwards translated into English by John Martyn, the original work being incomplete. In the same year he was admitted into the académie des sciences, and communicated several papers to that body. Long before Abraham Trembley (1700–1784) published his *Histoire des polypes d'eau douce*, Jussieu maintained the doctrine that these organisms were animals, and not the flowers of marine plants, then the current notion; and to confirm his views he made

three journeys to the coast of Normandy. Singularly modest and retiring, he published very little, but in 1759 he arranged the plants in the royal garden of the Trianon at Versailles, according to his own scheme of classification. This arrangement is printed in his nephew's *Genera*, pp. lxiii.–lxx., and formed the basis of that work. He cared little for the credit of enunciating new discoveries, so long as the facts were made public. On the death of his brother Antoine, he could not be induced to succeed him in his office, but prevailed upon L. G. Lemonnier to assume the higher position. He died at Paris on the 6th of November 1777.

3. Joseph de Jussieu (1704–1779), brother of Antoine and Bernard, was born at Lyons on the 3rd of September 1704. Educated like the rest of the family for the medical profession, he accompanied C. M. de la Condamine to Peru, in the expedition for measuring an arc of meridian, and remained in South America for thirty-six years, returning to France in 1771. Amongst the seeds he sent to his brother Bernard were those of *Heliotropium peruvianum*, Linn., then first introduced into Europe. He died at Paris on the 11th of April 1779.

4. Antoine Laurent de Jussieu (1748–1836), nephew of the three preceding, was born at Lyons on the 12th of April 1748. Called to Paris by his uncle Bernard, and carefully trained by him for the pursuits of medicine and botany, he largely profited by the opportunities afforded him. Gifted with a tenacious memory, and the power of quickly grasping the salient points of subjects under observation, he steadily worked at the improvement of that system of plant arrangement which had been sketched out by his uncle. In 1789 was issued his *Genera plantarum secundum ordines naturales disposita, juxta methodum in horto regio Parisiensi exaratam, anno* MDCCLXXIV. This volume formed the basis of modern classification; more than this, it is certain that Cuvier derived much help in his zoological classification from its perusal. Hardly had the last sheet passed through the press, when the French Revolution broke out, and the author was installed in charge of the hospitals of Paris. The muséum d'histoire naturelle was organized on its present footing mainly by him in 1793, and he selected for its library everything relating to natural history from the vast materials obtained from the convents then broken up. He continued as professor of botany there from 1770 to 1826, when his son Adrien succeeded him. Besides the *Genera*, he produced nearly sixty memoirs on botanical topics. He died at Paris on the 17th of September 1836.

5. Adrien Laurent Henri de Jussieu (1797–1853), son of Antoine Laurent, was born at Paris on the 23rd of December 1797. He displayed the qualities of his family in his thesis for the degree of M.D., *De Euphorbiacearum generibus medicisque earundem viribus tentamen*, Paris, 1824. He was also the author of valuable contributions to botanical literature on the *Rutaceae*, *Meliaceae* and *Malpighiaceae* respectively, of "Taxonomie" in the *Dictionnaire universelle d'histoire naturelle*, and of an introductory work styled simply *Botanique*, which reached nine editions, and was translated into the principal languages of Europe. He also edited his father's *Introductio in historiam plantarum*, issued at Paris, without imprint or date, it being a fragment of the intended second edition of the *Genera*, which Antoine Laurent did not live to complete. He died at Paris on the 29th of June 1853, leaving two daughters, but no son, so that with him closed the brilliant botanical dynasty.

6. Laurent Pierre de Jussieu (1792–1866), miscellaneous writer, nephew of Antoine Laurent, was born at Villeurbanne on the 7th of February 1792. His *Simon de Nantua, ou le marchand forain* (1818), reached fifteen editions, and was translated into seven languages. He also wrote *Simples notions de physique et d'histoire naturelle* (1857), and a few geological papers. He died at Passy on the 23rd of February 1866.

JUSTICE (Lat. *justitia*), a term used both in the abstract, for the quality of being or doing what is just, *i.e.* right in law and equity, and in the concrete for an officer deputed by the sovereign to administer justice, and do right by way of judgment. It has long been the official title of the judges of two of the English superior courts of common law, and it is now extended to all the judges in the supreme court of judicature—a judge in the High Court of Justice being styled Mr Justice, and in the court of appeal Lord Justice. The president of the king's bench division of the High Court is styled Lord Chief Justice (*q.v.*). The word is also applied, and perhaps more usually, to certain subordinate magistrates who administer justice in minor matters, and who are usually called *justices of the peace* (*q.v.*).

JUSTICE OF THE PEACE, an inferior magistrate appointed in England by special commission under the great seal to keep the peace within the jurisdiction for which he is appointed. The title is commonly abbreviated to J.P. and is used after the name. "The whole Christian world," said Coke, "hath not the like office as justice of the peace if duly executed." Lord Cowper, on the other hand, described them as "men sometimes illiterate and frequently bigoted and prejudiced." The truth is that the justices of the peace perform without any other reward than the consequence they acquire from their office a large amount of work indispensable to the administration of the law, and (though usually not professional lawyers, and therefore apt to be ill-informed in some of their decisions) for the most part they discharge their duties with becoming good sense and impartiality. For centuries they have necessarily been chosen mainly from the landed class of country gentlemen, usually Conservative in politics; and in recent years the attempt has been made by the Liberal party to reduce the balance by appointing others than those belonging to the landed gentry, such as tradesmen, Nonconformist ministers, and working-men. But it has been recognized that the appointment of justices according to their political views is undesirable, and in 1909 a royal commission was appointed to consider and report whether any and what steps should be taken to facilitate the selection of the most suitable persons to be justices of the peace irrespective of creed and political opinion. In great centres of population, when the judicial business of justices is heavy, it has been found necessary to appoint paid justices or stipendiary magistrates[1] to do the work, and an extension of the system to the country districts has been often advocated.

The commission of the peace assigns to justices the duty of keeping and causing to be kept all ordinances and statutes for the good of the peace and for preservation of the same, and for the quiet rule and government of the people, and further assigns "to you and every two or more of you (of whom any one of the aforesaid A, B, C, D, &c., we will, shall be one) to inquire the truth more fully by the oath of good and lawful men of the county of all and all manner of felonies, poisonings, enchantments, sorceries, arts, magic, trespasses, forestallings, regratings, engrossings, and extortions whatever." This part of the commission is the authority for the jurisdiction of the justices in *sessions*. Justices named specially in the parenthetical clause are said to be on the quorum. Justices for counties are appointed by the Crown on the advice of the lord chancellor, and usually with the recommendation of the lord lieutenant of the county. Justices for boroughs having municipal corporations and separate commissions of the peace are appointed by the crown, the lord chancellor either adopting the recommendation of the town council or acting independently. Justices cannot act as such until they have taken the oath of allegiance and the judicial oath. A justice for a borough while acting as such must reside in or within seven miles of the borough or occupy a house, warehouse or other property in the borough, but he need not be a burgess. The mayor of a borough is *ex officio* a justice during his year of office and the succeeding year. He takes precedence over all borough justices, but not over justices acting in and for the county in which the borough or any part thereof is situated, unless when acting in relation to the business of the borough.

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[1] Where a borough council desire the appointment of a stipendiary magistrate they may present a petition for the same to the secretary of state and it is thereupon lawful for the king to appoint to that office a barrister of seven years' standing. He is by virtue of his office a justice for the borough, and receives a yearly salary, payable in four equal quarterly instalments. On a vacancy, application must again be made as for a first appointment. There may be more than one stipendiary magistrate for a borough.

The chairman of a county council is *ex officio* a justice of the peace for the county, and the chairman of an urban or rural district council for the county in which the district is situated. Justices cannot act beyond the limits of the jurisdiction for which they are appointed, and the warrant of a justice cannot be executed out of his jurisdiction unless it be backed, that is, endorsed by a justice of the jurisdiction in which it is to be carried into execution. A justice improperly refusing to act on his office, or acting partially and corruptly, may be proceeded against by a criminal information, and a justice refusing to act may be compelled to do so by the High Court of Justice. An action will lie against a justice for any act done by him in excess of his jurisdiction, and for any act within his jurisdiction which has been done wrongfully and with malice, and without reasonable or probable cause. But no action can be brought against a justice for a wrongful conviction until it has been quashed. By the Justices' Qualification Act 1744, every justice for a county was required to have an estate of freehold, copyhold, or customary tenure in fee, for life or a given term, of the yearly value of £100. By an act of 1875 the occupation of a house rated at £100 was made a qualification. No such qualifications were ever required for a borough justice, and it was not until 1906 that county justices were put on the same footing in this respect. The Justices of the Peace Act 1906 did away with all qualification by estate. It also removed the necessity for residence within the county, permitting the same residential qualification as for borough justices, "within seven miles thereof." The same act removed the disqualification of solicitors to be county justices and assimilated to the existing power to remove other justices from the commission of the peace the power to exclude *ex officio* justices.

The justices for every petty sessional division of a county or for a borough having a separate commission of the peace must appoint a fit person to be their salaried clerk. He must be either a barrister of not less than fourteen years' standing, or a solicitor of the supreme court, or have served for not less than seven years as a clerk to a police or stipendiary magistrate or to a metropolitan police court. An alderman or councillor of a borough must not be appointed as clerk, nor can a clerk of the peace for the borough or for the county in which the borough is situated be appointed. A borough clerk is not allowed to prosecute. The salary of a justice's clerk comes, in London, out of the police fund; in counties out of the county fund; in county boroughs out of the borough fund, and in other boroughs out of the county fund.

The vast and multifarious duties of the justices cover some portion of every important head of the criminal law, and extend to a considerable number of matters relating to the civil law.

In the United States these officers are sometimes appointed by the executive, sometimes elected. In some states, justices of the peace have jurisdiction in civil cases given to them by local regulations.

JUSTICIAR (med. Lat. *justiciarius* or *justitiarius*, a judge), in English history, the title of the chief minister of the Norman and earlier Angevin kings. The history of the title in this connotation is somewhat obscure. *Justiciarius* meant simply "judge," and was originally applied, as Stubbs points out (*Const. Hist.* i. 389, note), to any officer of the king's court, to the chief justice, or in a very general way to all and sundry who possessed courts of their own or were qualified to act as *judices* in the shire-courts, even the style *capitalis justiciarius* being used of judges of the royal court other than the chief. It was not till the reign of Henry II. that the title *summus* or *capitalis justiciarius*, or *justiciarius totius Angliae* was exclusively applied to the king's chief minister. The office, however, existed before the style of its holder was fixed; and, whatever their contemporary title (*e.g. Custos Angliae*), later writers refer to them as *justiciarii*, with or without the prefix *summus* or *capitalis* (ibid. p. 346). Thus Ranulf Flambard, the minister of William II., who was probably the first to exercise the powers of a justiciar, is called *justiciarius* by Ordericus Vitalis.

The origin of the justiciarship is thus given by Stubbs (ibid. p. 276). The sheriff "was the king's representative in all matters judicial, military and financial in the shire. From him, or from the courts of which he was the presiding officer, appeal lay to the king alone; but the king was often absent from England and did not understand the language of his subjects. In his absence the administration was entrusted to a justiciar, a regent or lieutenant of the kingdom; and the convenience being once ascertained of having a minister who could in the whole kingdom represent the king, as the sheriff did in the shire, the justiciar became a permanent functionary."

The fact that the kings were often absent from England, and that the justiciarship was held by great nobles or churchmen, made this office of an importance which at times threatened to overshadow that of the Crown. It was this latter circumstance which ultimately led to its abolition. Hubert de Burgh (*q.v.*) was the last of the great justiciars; after his fall (1231) the justiciarship was not again committed to a great baron, and the chancellor soon took the position formerly occupied by the justiciar as second to the king in dignity, as well as in power and influence. Finally, under Edward I. and his successor, in place of the justiciar—who had presided over all causes *vice regis*—separate heads were established in the three branches into which the *curia regis* as a judicial body had been divided: justices of common pleas, justices of the king's bench and barons of the exchequer.

Outside England the title justiciar was given under Henry II. to the seneschal of Normandy. In Scotland the title of justiciar was borne, under the earlier kings, by two high officials, one having his jurisdiction to the north, the other to the south of the Forth. They were the king's lieutenants for judicial and administrative purposes and were established in the 12th century, either by Alexander I. or by his successor David I. In the 12th century a *magister justitiarius* also appears in the Norman kingdom of Sicily, title and office being probably borrowed from England; he presided over the royal court (*Magna curia*) and was, with his assistants, empowered to decide, *inter alia*, all cases reserved to the Crown (see Du Cange, *s.v. Magister Justitiarius*).

See W. Stubbs, *Const. Hist. of England*; Du Cange, *Glossarium* (Niort, 1885) *s.v.* "Justitiarius."

JUSTICIARY, HIGH COURT OF, in Scotland, the supreme criminal court, consisting of five of the lords of session together with the lord justice-general and the lord justice-clerk as president and vice-president respectively. The constitution of the court is settled by the Act 1672 c. 16. The lords of justiciary hold circuits regularly twice a year according to the ancient practice, which, however, had been allowed to fall into disuse until revived in 1748. For circuit purposes Scotland is divided into northern, southern and western districts (see CIRCUIT). Two judges generally go on a circuit, and in Glasgow they are by special statute authorized to sit in separate courts. By the Criminal Procedure (Scotland) Act 1887 all the senators of the college of justice are lords commissioners of justiciary. The high court, sitting in Edinburgh, has, in addition to its general jurisdiction, an exclusive jurisdiction for districts not within the jurisdiction of the circuits—the three Lothians, and Orkney and Shetland. The high court also takes up points of difficulty arising before the special courts, like the court for crown cases reserved in England. The court of justiciary has authority to try all crimes, unless when its jurisdiction has been excluded by special enactment of the legislature. It is also stated to have an inherent jurisdiction to punish all criminal acts, even if they have never before been treated as crimes. Its judgments are believed to be not subject to any appeal or review, but it may be doubted whether an appeal on a point of law would not lie to the house of lords. The following crimes must be prosecuted in the court of justiciary: treason, murder, robbery, rape, fire-raising, deforcement of messengers, breach of duty by magistrates, and all offences for which a statutory punishment higher than imprisonment is imposed.

JUSTIFICATION, in law, the showing by a defendant in a suit of sufficient reason why he did what he was called upon to answer, For example, in an action for assault and battery, the defendant may prove in justification that the prosecutor assaulted or beat him first, and that he acted merely in self-defence. The word is employed particularly in actions for defamation, and has in this connexion a somewhat special meaning. When a libel consists of a specific charge a plea of justification is a plea that the words are true in substance and in fact (see Libel and Slander).

JUSTIN I. (450–527), East Roman emperor (518–527), was born in 450 as a peasant in Asia, but enlisting under Leo I. he rose to be commander of the imperial guards of Anastasius. On the latter's death in 518 Justin used for his own election to the throne money that he had received for the support of another candidate. Being ignorant even of the rudiments of letters, Justin entrusted the administration of state to his wise and faithful quaestor Proclus and to his nephew Justinian, though his own experience dictated several improvements in military affairs. An orthodox churchman himself, he effected in 519 a reconciliation of the Eastern and Western Churches, after a schism of thirty-five years (see Hormisdas). In 522 he entered upon a desultory war with Persia, in which he co-operated with the Arabs. In 522 also Justin ceded to Theodoric, the Gothic king of Italy, the right of naming the consuls. On the 1st of April 527 Justin, enfeebled by an incurable wound, yielded to the request of the senate and assumed Justinian at his colleague; on the 1st of August he died. Justin bestowed much care on the repairing of public buildings throughout his empire, and contributed large sums to repair the damage caused by a destructive earthquake at Antioch.

See E. Gibbon, *Decline and Fall of the Roman Empire* (ed. Bury, 1896), iv. 206–209.

JUSTIN II. (d. 578), East Roman emperor (565–578), was the nephew and successor of Justinian I. He availed himself of his influence as master of the palace, and as husband of Sophia, the niece of the late empress Theodora, to secure a peaceful election. The first few days of his reign—when he paid his uncle's debts, administered justice in person, and proclaimed universal religious toleration—gave bright promise, but in the face of the lawless aristocracy and defiant governors of provinces he effected few subsequent reforms. The most important event of his reign was the invasion of Italy by the Lombards (*q.v.*), who, entering in 568, under Alboin, in a few years made themselves masters of nearly the entire country. Justin's attention was distracted from Italy towards the N. and E. frontiers. After refusing to pay the Avars tribute, he fought several unsuccessful campaigns against them. In 572 his overtures to the Turks led to a war with Persia. After two disastrous campaigns, in which his enemies overran Syria, Justin bought a precarious peace by payment of a yearly tribute. The temporary fits of insanity into which he fell warned him to name a colleague. Passing over his own relatives, he raised, on the advice of Sophia, the general Tiberius (*q.v.*) to be Caesar in December 574 and withdrew for his remaining years into retirement.

See E. Gibbon, *Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 2–17; G. Finlay, *History of Greece* (ed. 1877), i. 291–297; J. Bury, *The Later Roman Empire* (1889), ii. 67–79. (M. O. B. C.)

JUSTIN (Junianus Justinus), Roman historian, probably lived during the age of the Antonines. Of his personal history nothing is known. He is the author of *Historiarum Philippicarum libri XLIV.*, a work described by himself in his preface as a collection of the most important and interesting passages from the voluminous *Historiae philippicae et totius mundi origines et terrae situs*, written in the time of Augustus by Pompeius Trogus (*q.v.*). The work of Trogus is lost; but the *prologi* or arguments of the text are preserved by Pliny and other writers. Although the main theme of Trogus was the rise and history of the Macedonian monarchy, Justin yet permitted himself considerable freedom of digression, and thus produced a capricious anthology instead of a regular epitome of the work. As it stands, however, the history contains much valuable information. The style, though far from perfect, is clear and occasionally elegant. The book was much used in the middle ages, when the author was sometimes confounded with Justin Martyr.

Ed. princeps (1470); J. G. Graevius (1668); J. F. Gronovius (1719); C. H. Frotscher (1827–1830); J. Jeep (1859); F. Rühl (1886, with prologues); see also J. F. Fischer, *De elocutione Justini* (1868); F. Rühl, *Die Verbreitung des J. im Mittelalter* (1871); O. Eichert, *Wörterbuch zu J.* (1881); Köhler and Rühl in *Neue Jahrbücher für Philologie*, xci., ci., cxxxiii. There are translations in the chief European languages; in English by A. Goldyng (1564); R. Codrington (1682); Brown-Dykes (1712); G. Turnbull (1746); J. Clarke (1790); J. S. Watson (1853).

JUSTINIAN I. (483–565). Flavius Anicius Justinianus, surnamed the Great, the most famous of all the emperors of the Eastern Roman Empire, was by birth a barbarian, native of a place called Tauresium in the district of Dardania, a region of Illyricum,[1] and was born, most probably, on the 11th of May 483. His family has been variously conjectured, on the strength of the proper names which its members are stated to have borne, to have been Teutonic or Slavonic. The latter seems the more probable view. His own name was originally Uprauda.[2] Justinianus was a Roman name which he took from his uncle Justin I., who adopted him, and to whom his advancement in life was due. Of his early life we know nothing except that he went to Constantinople while still a young man, and received there an excellent education. Doubtless he knew Latin before Greek; it is alleged that he always spoke Greek with a barbarian accent. When Justin ascended the throne in 518, Justinian became at once a person of the first consequence, guiding, especially in church matters, the policy of his aged, childless and ignorant uncle, receiving high rank and office at his hands, and soon coming to be regarded as his destined successor. On Justin's death in 527, having been a few months earlier associated with him as co-emperor, Justinian succeeded without opposition to the throne. About 523 he had married the famous Theodora (*q.v.*), who, as empress regnant, was closely associated in all his actions till her death in 547.

Justinian's reign was filled with great events, both at home and abroad, both in peace and in war. They may be classed under four heads: (1) his legal reforms; (2) his administration of the empire; (3) his ecclesiastical policy; and (4) his wars and foreign policy generally.

1. It is as a legislator and codifier of the law that Justinian's name is most familiar to the modern world; and it is therefore this department of his action that requires to be most fully dealt with here. He found the law of the Roman empire in a state of great confusion. It consisted of two masses, which were usually distinguished as old law (*jus vetus*) and new law (*jus novum*). The first of these comprised: (i.) all such of the statutes (*leges*) passed under the republic and early empire as had not become obsolete; (ii.) the decrees of the senate (*senatus consulta*) passed at the end of the republic and during the first two centuries of the empire; (iii.) the writings of the jurists of the later republic and of the empire, and more particularly of those jurists to whom the right of declaring the law with authority (*jus respondendi*) had been committed by the emperors. As these jurists had in their commentaries upon the *leges*, *senatus consulta* and edicts of the magistrates practically incorporated all that was of importance in those documents, the books of the jurists may substantially be taken as including (i.) and (ii.). These writings were of course very numerous, and formed a vast mass of literature. Many of them had become exceedingly scarce—many had been altogether lost. Some were of doubtful authenticity. They were so costly that no person of moderate means could hope to possess any large number; even the public libraries had nothing approaching to a complete collection. Moreover, as they proceeded from a large number of independent authors, who wrote expressing their own opinions, they contained many discrepancies and contradictions, the dicta of one writer being controverted by another, while yet both writers might enjoy the same formal authority. A remedy had been attempted to be applied to this evil by a law of the

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[1] It is commonly identified with the modern Kūstendil, but Uskūb (the ancient Skupi) has also been suggested. See Tozer, *Highlands of European Turkey*, ii. 370.

[2] The name Uprauda is said to be derived from the word *prauda*, which in Old Slavic means *jus*, *justitia*, the prefix being simply a breathing frequently attached to Slavonic names.

emperors Theodosius II. and Valentinian III., which gave special weight to the writings of five eminent jurists (Papinian, Paulus, Ulpian, Modestinus, Gaius); but it was very far from removing it. As regards the *jus vetus*, therefore, the judges and practitioners of Justinian's time had two terrible difficulties to contend with—first, the bulk of the law, which made it impossible for any one to be sure that he possessed anything like the whole of the authorities bearing on the point in question, so that he was always liable to find his opponent quoting against him some authority for which he could not be prepared; and, secondly, the uncertainty of the law, there being a great many important points on which differing opinions of equal legal validity might be cited, so that the practising counsel could not advise, nor the judge decide, with any confidence that he was right, or that a superior court would uphold his view.

The new law (*jus novum*), which consisted of the ordinances of the emperors promulgated during the middle and later empires (*edicta*, *rescripta*, *mandata*, *decreta*, usually called by the general name of *constitutiones*), was in a condition not much better. These ordinances or constitutions were extremely numerous. No complete collection of them existed, for although two collections (*Codex gregorianus* and *Codex hermogenianus*) had been made by two jurists in the 4th century, and a large supplementary collection published by the emperor Theodosius II. in 438 (*Codex theodosianus*), these collections did not include all the constitutions; there were others which it was necessary to obtain separately, but many whereof it must have been impossible for a private person to procure. In this branch too of the law there existed some, though a less formidable, uncertainty; for there were constitutions which practically, if not formally, repealed or superseded others without expressly mentioning them, so that a man who relied on one constitution might find that it had been varied or abrogated by another he had never heard of or on whose sense he had not put such a construction. It was therefore clearly necessary with regard to both the older and the newer law to take some steps to collect into one or more bodies or masses so much of the law as was to be regarded as binding, reducing it within a reasonable compass, and purging away the contradictions or inconsistencies which it contained. The evil had been long felt, and reforms apparently often proposed, but nothing (except by the compilation of the *Codex theodosianus*) had been done till Justinian's time. Immediately after his accession, in 528, he appointed a commission to deal with the imperial constitutions (*jus novum*), this being the easier part of the problem. The commissioners, ten in number, were directed to go through all the constitutions of which copies existed, to select such as were of practical value, to cut these down by retrenching all unnecessary matter, and gather them, arranged in order of date, into one volume, getting rid of any contradictions by omitting one or other of the conflicting passages.[1] These statute law commissioners, as one may call them, set to work forthwith, and completed their task in fourteen months, distributing the constitutions which they placed in the new collection into ten books, in general conformity with the order of the Perpetual Edict as settled by Salvius Julianus and enacted by Hadrian. By this means the bulk of the statute law was immensely reduced, its obscurities and internal discrepancies in great measure removed, its provisions adapted, by the abrogation of what was obsolete, to the circumstances of Justinian's own time. This *Codex constitutionum* was formally promulgated and enacted as one great consolidating statute in 529, all imperial ordinances not included in it being repealed at one stroke.

The success of this first experiment encouraged the emperor to attempt the more difficult enterprise of simplifying and digesting the older law contained in the treatises of the jurists. Before entering on this, however, he wisely took the preliminary step of settling the more important of the legal questions as to which the older jurists had been divided in opinion, and which had therefore remained sources of difficulty, a difficulty aggravated by the general decline, during the last two centuries, of the level of forensic and judicial learning. This was accomplished by a series of constitutions known as the "Fifty Decisions" (*Quinquaginta decisiones*), along with which there were published other ordinances amending the law in a variety of points, in which old and now inconvenient rules had been suffered to subsist. Then in December 530 a new commission was appointed, consisting of sixteen eminent lawyers, of whom the president, the famous Tribonian (who had already served on the previous commission), was an exalted official (*quaestor*), four were professors of law, and the remaining eleven practising advocates. The instructions given to them by the emperor were as follows:—they were to procure and peruse all the writings of all the authorized jurists (those who had enjoyed the *jus respondendi*); were to extract from these writings whatever was of most permanent and substantial value, with power to change the expressions of the author wherever conciseness or clearness would be thereby promoted, or wherever such a change was needed in order to adapt his language to the condition of the law as it stood in Justinian's time; were to avoid repetitions and contradictions by giving only one statement of the law upon each point; were to insert nothing at variance with any provision contained in the *Codex constitutionum*; and were to distribute the results of their labours into fifty books, subdividing each book into titles, and following generally the order of the Perpetual Edict.[2]

These directions were carried out with a speed which is surprising when we remember not only that the work was interrupted by the terrible insurrection which broke out in Constantinople in January 532, and which led to the temporary retirement from office of Tribonian, but also that the mass of literature which had to be read through consisted of no less than two thousand treatises, comprising three millions of sentences. The commissioners, who had for greater despatch divided themselves into several committees, presented their selection of extracts to the emperor in 533, and he published it as an imperial statute on December 16th of that year, with two prefatory constitutions (those known as *Omnem reipublicae* and *Dedit nobis*). It is the Latin volume which we now call the *Digest* (*Digesta*) or *Pandects* (Πάνδεκται) and which is by far the most precious monument of the legal genius of the Romans, and indeed, whether one regards the intrinsic merits of its substance or the prodigious influence it has exerted and still exerts, the most remarkable law-book that the world has seen. The extracts comprised in it are 9123 in number, taken from thirty-nine authors, and are of greatly varying length, mostly only a few lines long. About one-third (in quantity) come from Ulpian, a very copious writer; Paulus stands next. To each extract there is prefixed the name of the author, and of the treatise whence it is taken.[3] The worst thing about the *Digest* is its highly unscientific arrangement. The order of the Perpetual Edict, which appears to have been taken as a sort of model for the general scheme of books and titles, was doubtless convenient to the Roman lawyers from their familiarity with it, but was in itself rather accidental and historical than logical. The disposition of the extracts inside each title was still less rational; it has been shown by a modern jurist to have been the result of the way in which the committees of the commissioners worked through the books they had to peruse.[4] In enacting the *Digest* as a law book, Justinian repealed all the other law contained in the treatises of the jurists (that *jus vetus* which has been already mentioned), and directed that those treatises should never be cited in future even by way of illustration; and he of course at the same time abrogated all the older statutes, from the Twelve Tables downwards, which had formed a part of the *jus vetus*. This was a necessary incident of his scheme of reform. But he went too far, and indeed attempted what was impossible, when he forbade all commentaries upon the *Digest*. He was obliged to allow a Greek translation to be made of it, but directed this translation to be exactly literal.

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[1] See, for an account of the instructions given to the commission, the constitution *Haec quae*, prefixed to the revised *Codex* in the *Corpus juris civilis*.

[2] See the constitution *Deo auctore* (*Cod.* i. 17, 1).

[3] In the middle ages people used to cite passages by the initial words; and the Germans do so still, giving, however, the number of the paragraph in the extract (if there are more paragraphs than one), and appending the number of the book and title. We in Britain and America usually cite by the numbers of the book, the title and the paragraph, without referring to the initial words.

[4] See Bluhme, "Die Ordnung der Fragmente in den Pandektentiteln," in Savigny's *Zeitschr. f. gesch. Rechtswissenschaft*, vol. iv.

These two great enterprises had substantially despatched Justinian's work; however, he, or rather Tribonian, who seems to have acted both as his adviser and as his chief executive officer in all legal affairs, conceived that a third book was needed, viz. an elementary manual for beginners which should present an outline of the law in a clear and simple form. The little work of Gaius, most of which we now possess under the title of *Commentarii institutionum*, had served this purpose for nearly four centuries; but much of it had, owing to changes in the law, become inapplicable, so that a new manual seemed to be required. Justinian accordingly directed Tribonian, with two coadjutors, Theophilus, professor of law in the university of Constantinople, and Dorotheus, professor in the great law school at Beyrout, to prepare an elementary textbook on the lines of Gaius. This they did while the *Digest* was in progress, and produced the useful little treatise which has ever since been the book with which students commonly begin their studies of Roman law, the *Institutes of Justinian*. It was published as a statute with full legal validity shortly before the *Digest*. Such merits as it possesses—simplicity of arrangement, clearness and conciseness of expression—belong less to Tribonian than to Gaius, who was closely followed wherever the alterations in the law had not made him obsolete. However, the spirit of that great legal classic seems to have in a measure dwelt with and inspired the inferior men who were recasting his work; the *Institutes* is better both in Latinity and in substance than we should have expected from the condition of Latin letters at that epoch, better than the other laws which emanate from Justinian.

In the four years and a half which elapsed between the publication of the *Codex* and that of the *Digest*, many important changes had been made in the law, notably by the publication of the "Fifty Decisions," which settled many questions that had exercised the legal mind and given occasion to intricate statutory provisions. It was therefore natural that the idea should present itself of revising the *Codex*, so as to introduce these changes into it, for by so doing, not only would it be simplified, but the one volume would again be made to contain the whole statute law, whereas now it was necessary to read along with it the ordinances issued since its publication. Accordingly another commission was appointed, consisting of Tribonian with four other coadjutors, full power being given them not only to incorporate the new constitutions with the *Codex* and make in it the requisite changes, but also to revise the *Codex* generally, cutting down or filling in wherever they thought it necessary to do so. This work was completed in a few months; and in November 534 the revised *Codex* (*Codex repetitae praelectionis*) was promulgated with the force of law, prefaced by a constitution (*Cordi nobis*) which sets forth its history, and declares it to be alone authoritative, the former *Codex* being abrogated. It is this revised *Codex* which has come down to the modern world, all copies of the earlier edition having disappeared.

The constitutions contained in it number 4652, the earliest dating from Hadrian, the latest being of course Justinian's own. A few thus belong to the period to which the greater part of the *Digest* belongs, *i.e.* the so-called classical period of Roman law down to the time of Alexander Severus (244); but the great majority are later, and belong to one or other of the four great eras of imperial legislation, the eras of Diocletian, of Constantine, of Theodosius II., and of Justinian himself. Although this *Codex* is said to have the same general order as that of the *Digest*, viz. the order of the Perpetual Edict, there are considerable differences of arrangement between the two. It is divided into twelve books. Its contents, although of course of the utmost practical importance to the lawyers of that time, and of much value still, historical as well as legal, are far less interesting and scientifically admirable than the extracts preserved in the *Digest*. The difference is even greater than that between the English reports of cases decided since the days of Lord Holt and the English acts of parliament for the same two centuries.

The emperor's scheme was now complete. All the Roman law had been gathered into two volumes of not excessive size, and a satisfactory manual for beginners added. But Justinian and Tribonian had grown so fond of legislating that they found it hard to leave off. Moreover, the very simplifications that had been so far effected brought into view with more clearness such anomalies or pieces of injustice as still continued to deform the law. Thus no sooner had the work been rounded off than fresh excrescences began to be created by the publication of new laws. Between 534 and 565 Justinian issued a great number of ordinances, dealing with all sorts of subjects and seriously altering the law on many points—the majority appearing before the death of Tribonian, which happened in 545. These ordinances are called, by way of distinction, new constitutions, *Novellae constitutiones post codicem* (νεαραὶ διατάξεις), *Novels*. Although the emperor had stated in publishing the *Codex* that all further statutes (if any) would be officially collected, this promise does not seem to have been redeemed. The three collections of the *Novels* which we possess are apparently private collections, nor do we even know how many such constitutions were promulgated. One of the three contains 168 (together with 13 Edicts), but some of these are by the emperors Justin II. and Tiberius II. Another, the so-called *Epitome of Julian*, contains 125 Novels in Latin; and the third, the *Liber authenticarum* or *vulgata versio*, has 134, also in Latin. This last was the collection first known and chiefly used in the West during the middle ages; and of its 134 only 97 have been written on by the *glossatores* or medieval commentators; these therefore alone have been received as binding in those countries which recognize and obey the Roman law,—according to the maxim *Quicquid non agnoscit glossa, nec agnoscit curia*. And, whereas Justinian's constitutions contained in the *Codex* were all issued in Latin, the rest of the book being in that tongue, these *Novels* were nearly all published in Greek, Latin translations being of course made for the use of the western provinces. They are very bulky, and with the exception of a few, particularly the 116th and 118th, which introduce the most sweeping and laudable reforms into the law of intestate succession, are much more interesting, as supplying materials for the history of the time, social, economical and ecclesiastical, than in respect of any purely legal merits. They may be found printed in any edition of the *Corpus juris civilis*.

This *Corpus juris*, which bears and immortalizes Justinian's name, consists of the four books described above: (1) The authorized collection of imperial ordinances (*Codex constitutionum*); (2) the authorized collection of extracts from the great jurists (*Digesta* or *Pandectae*); (3) the elementary handbook (*Institutiones*); (4) the unauthorized collection of constitutions subsequent to the *Codex* (*Novellae*).

From what has been already stated, the reader will perceive that Justinian did not, according to a strict use of terms, codify the Roman law. By a codification we understand the reduction of the whole pre-existing body of law to a new form, the re-stating it in a series of propositions, scientifically ordered, which may or may not contain some new substance, but are at any rate new in form. If he had, so to speak, thrown into one furnace all the law contained in the treatises of the jurists and in the imperial ordinances, fused them down, the gold of the one and the silver of the other, and run them out into new moulds, this would have been codification. What he did do was something quite different. It was not codification but consolidation, not remoulding but abridging. He made extracts from the existing law, preserving the old words, and merely cutting out repetitions, removing contradictions, retrenching superfluities, so as immensely to reduce the bulk of the whole. And he made not one set of such extracts but two, one for the jurist law, the other for the statute law. He gave to posterity not one code but two digests or collections of extracts, which are new only to this extent that they are arranged in a new order, having been previously altogether unconnected with one another, and that here and there their words have been modified in order to bring one extract into harmony with some other. Except for this, the matter is old in expression as well as in substance.

Thus regarded, even without remarking that the *Novels*, never having been officially collected, much less incorporated with the *Codex*, mar the symmetry of the structure, Justinian's work may appear to entitle him and Tribonian to much less credit than they have usually received for it. But let it be observed, first, that to reduce the huge and confused mass of pre-existing law into the compass of these two collections was an immense practical benefit to the empire; secondly, that, whereas the work which he undertook was accomplished in seven years, the infinitely more difficult task of codification might probably have been left unfinished at Tribonian's death, or even at Justinian's own, and been abandoned by his successor; thirdly, that in the extracts preserved in the *Digest* we have the opinions of the greatest legal luminaries given in their own admirably lucid, philosophical and concise language, while in the extracts of which the *Codex* is composed we find valuable historical evidence bearing on the administration and social condition of the later Pagan and earlier Christian empire; fourthly, that Justinian's age, that is to say, the intellect of the men whose services he commanded, was quite unequal to so vast an undertaking as the fusing upon scientific principles into one new organic whole of the entire law of the empire. With sufficient time and labour the work might no doubt have been done; but what we possess of Justinian's own legislation, and still more what we know of the general condition of literary and legal capacity in his time, makes it certain that it would not have been well done, and that the result would have been not more valuable to the Romans of that age, and much less valuable to the modern world, than are the results, preserved in the *Digest* and the *Codex*, of what he and Tribonian actually did.

To the merits of the work as actually performed some reference has already been made. The chief defect of the *Digest* is in point of scientific arrangement, a matter about which the Roman lawyers, perhaps one may say the ancients generally, cared very little. There are some repetitions and some inconsistencies, but not more than may fairly be allowed for in a compilation of such magnitude executed so rapidly. Tribonian has been blamed for the insertions the compilers made in the sentences of the old jurists (the so-called *Emblemata Triboniani*); but it was a part of Justinian's plan that such insertions should be made, so as to adapt those sentences to the law as settled in the emperor's time. On Justinian's own laws, contained in the *Codex* and in his *Novels*, a somewhat less favourable judgment must be pronounced. They, and especially the latter, are diffuse and often lax in expression, needlessly prolix, and pompously rhetorical. The policy of many, particularly of those which deal with ecclesiastical matters, may also be condemned; yet some gratitude is due to the legislator who put the law of intestate succession on that plain and rational footing whereon it has ever since continued to stand. It is somewhat remarkable that, although Justinian is so much more familiar to us by his legislation than by anything else, this sphere of his imperial labour is hardly referred to by any of the contemporary historians, and then only with censure. Procopius complains that he and Tribonian were always repealing old laws and enacting new ones, and accuses them of venal motives for doing so.

The *Corpus Juris* of Justinian continued to be, with naturally a few additions in the ordinances of succeeding emperors, the chief law-book of the Roman world till the time of the Macedonian dynasty when, towards the end of the 9th century, a new system was prepared and issued by those sovereigns, which we know as the *Basilica*. It is of course written in Greek, and consists of parts of the substance of the *Codex* and the *Digest*, thrown together and often altered in expression, together with some matter from the *Novels* and imperial ordinances posterior to Justinian. In the western provinces, which had been wholly severed from the empire before the publication of the *Basilica*, the law as settled by Justinian held its ground; but copies of the *Corpus Juris* were extremely rare, nor did the study of it revive until the end of the 11th century.

The best edition of the *Digest* is that of Mommsen (Berlin 1868–1870), and of the *Codex* that of Krüger (Berlin 1875–1877).

2. In his financial administration of the empire, Justinian is represented to us as being at once rapacious and extravagant. His unwearied activity and inordinate vanity led him to undertake a great many costly public works, many of them, such as the erection of palaces and churches, unremunerative. The money needed for these, for his wars, and for buying off the barbarians who threatened the frontiers, had to be obtained by increasing the burdens of the people. They suffered, not only from the regular taxes, which were seldom remitted even after bad seasons, but also from monopolies; and Procopius goes so far as to allege that the emperor made a practice of further recruiting his treasury by confiscating on slight or fictitious pretexts the property of persons who had displeased Theodora or himself. Fiscal severities were no doubt one cause of the insurrections which now and then broke out, and in the gravest of which, (532) thirty thousand persons are said to have perished in the capital. It is not always easy to discover, putting together the trustworthy evidence of Justinian's own laws and the angry complaints of Procopius, what was the nature and justification of the changes made in the civil administration. But the general conclusion seems to be that these changes were always in the direction of further centralization, increasing the power of the chief ministers and their offices, bringing all more directly under the control of the Crown, and in some cases limiting the powers and appropriating the funds of local municipalities. Financial necessities compelled retrenchment, so that a certain number of offices were suppressed altogether, much to the disgust of the office-holding class, which was numerous and wealthy, and had almost come to look on the civil service as its hereditary possession. The most remarkable instance of this policy was the discontinuance of the consulship. This great office had remained a dignity centuries after it had ceased to be a power; but it was a very costly dignity, the holder being expected to spend large sums in public displays. As these sums were provided by the state, Justinian saved something considerable by stopping the payment. He named no consul after Basilius, who was the name-giving consul of 541.

In a bureaucratic despotism the greatest merit of a sovereign is to choose capable and honest ministers. Justinian's selections were usually capable, but not so often honest; probably it was hard to find thoroughly upright officials; possibly they would not have been most serviceable in carrying out the imperial will, and especially in replenishing the imperial treasury. Even the great Tribonian labours under the reproach of corruption, while the fact that Justinian maintained John of Cappadocia in power long after his greed, his unscrupulousness, and the excesses of his private life had excited the anger of the whole empire, reflects little credit on his own principles of government and sense of duty to his subjects. The department of administration in which he seems to have felt most personal interest was that of public works. He spent immense sums on buildings of all sorts, on quays and harbours, on fortifications, repairing the walls of cities and erecting castles in Thrace to check the inroads of the barbarians, on aqueducts, on monasteries, above all, upon churches. Of these works only two remain perfect, St Sophia in Constantinople, now a mosque, and one of the architectural wonders of the world, and the church of SS Sergius and Bacchus, now commonly called Little St Sophia, which stands about half a mile from the great church, and is in its way a very delicate and beautiful piece of work. The church of S. Vitale at Ravenna, though built in Justinian's reign, and containing mosaic pictures of him and Theodora, does not appear to have owed anything to his mind or purse.

3. Justinian's ecclesiastical policy was so complex and varying that it is impossible within the limits of this article to do more than indicate its bare outlines. For many years before the accession of his uncle Justin, the Eastern world had been vexed by the struggles of the Monophysite party, who recognized only one nature in Christ, against the view which then and ever since has maintained itself as orthodox, that the divine and human natures coexisted in Him. The latter doctrine had triumphed at the council of Chalcedon, and was held by the whole Western Church, but Egypt, great part of Syria and Asia Minor, and a considerable minority even in Constantinople clung to Monophysitism. The emperors Zeno and Anastasius had been strongly suspected of it, and the Roman bishops had refused to communicate with the patriarchs of Constantinople since 484, when they had condemned Acacius for accepting the formula of conciliation issued by Zeno. One of Justinian's first public acts was to put an end to this schism by inducing Justin to make the then patriarch renounce this formula and declare his full adhesion to the creed of Chalcedon. When he himself came to the throne he endeavoured to persuade the Monophysites to come in by summoning some of their leaders to a conference. This failing, he ejected suspected prelates, and occasionally persecuted them, though with far less severity than that applied to the heretics of a deeper dye, such as Montanists or even Arians. Not long afterwards, his attention having been called to the spread of Origenistic opinions in Syria, he issued an edict condemning fourteen propositions drawn from the writings of the great Alexandrian,

and caused a synod to be held under the presidency of Mennas (whom he had named patriarch of Constantinople), which renewed the condemnation of the impugned doctrines and anathematized Origen himself. Still later, he was induced by the machinations of some of the prelates who haunted his court, and by the influence of Theodora, herself much interested in theological questions, and more than suspected of Monophysitism, to raise a needless, mischievous, and protracted controversy. The Monophysites sometimes alleged that they could not accept the decrees of the council of Chalcedon because that council had not condemned, but (as they argued) virtually approved, three writers tainted with Nestorian principles, Theodore of Mopsuestia, Theodoret, and Ibas, bishop of Edessa. It was represented to the emperor, who was still pursued by the desire to bring back the schismatics, that a great step would have been taken towards reconciliation if a condemnation of these teachers, or rather of such of their books as were complained of, could be brought about, since then the Chalcedonian party would be purged from any appearance of sympathy with the errors of Nestorius. Not stopping to reflect that in the angry and suspicious state of men's minds he was sure to lose as much in one direction as he would gain in the other, Justinian entered into the idea, and put forth an edict exposing and denouncing the errors contained in the writings of Theodore generally, in the treatise of Theodoret against Cyril of Alexandria, and in a letter of Bishop Ibas (a letter whose authenticity was doubted, but which passed under his name) to the Persian bishop Maris. This edict was circulated through the Christian world to be subscribed by the bishops. The four Eastern patriarchs, and the great majority of the Eastern prelates generally, subscribed, though reluctantly, for it was felt that a dangerous precedent was being set when dead authors were anathematized, and that this new movement could hardly fail to weaken the authority of the council of Chalcedon. Among the Western bishops, who were less disposed both to Monophysitism and to subservience, and especially by those of Africa, the edict was earnestly resisted. When it was found that Pope Vigilius did not forthwith comply, he was summoned to Constantinople. Even there he resisted, not so much, it would seem, from any scruples of his own, for he was not a high-minded man, as because he knew that he dared not return to Italy if he gave way. Long disputes and negotiations followed, the end of which was that Justinian summoned a general council of the church, that which we reckon the Fifth, which condemned the impugned writings, and anathematized several other heretical authors. Its decrees were received in the East but long contested in the Western Church, where a schism arose that lasted for seventy years. This is the controversy known as that of the Three Chapters (*Tria capitula*, τρία κεφάλαια), apparently from the three propositions or condemnations contained in Justinian's original edict, one relating to Theodore's writings and person, the second to the incriminated treatise of Theodoret (whose person was not attacked), the third to the letter (if genuine) of Ibas (see Hefele, *Conciliengeschichte*, ii. 777).

At the very end of his long career of theological discussion, Justinian himself lapsed into heresy, by accepting the doctrine that the earthly body of Christ was incorruptible, insensible to the weaknesses of the flesh, a doctrine which had been advanced by Julian, bishop of Halicarnassus, and went by the name of Aphthartodocetism. According to his usual practice, he issued an edict enforcing this view, and requiring all patriarchs, metropolitans, and bishops to subscribe to it. Some, who not unnaturally held that it was rank Monophysitism, refused at once, and were deprived of their sees, among them Eutychius the eminent patriarch of Constantinople. Others submitted or temporized; but before there had been time enough for the matter to be carried through, the emperor died, having tarnished if not utterly forfeited by this last error the reputation won by a life devoted to the service of Orthodoxy.

As no preceding sovereign had been so much interested in church affairs, so none seems to have shown so much activity as a persecutor both of pagans and of heretics. He renewed with additional stringency the laws against both these classes. The former embraced a large part of the rural population in certain secluded districts, such as parts of Asia Minor and Peloponnesus; and we are told that the efforts directed against them resulted in the forcible baptism of 70,000 persons in Asia Minor alone. Paganism, however, survived; we find it in Laconia in the end of the 9th century, and in northern Syria it has lasted till our own times. There were also a good many crypto-pagans among the educated population of the capital. Procopius, for instance, if he was not actually a Pagan, was certainly very little of a Christian. Inquiries made in the third year of Justinian's reign drove nearly all of these persons into an outward conformity, and their offspring seem to have become ordinary Christians. At Athens, the philosophers who taught in the schools hallowed by memories of Plato still openly professed what passed for Paganism, though it was really a body of moral doctrine, strongly tinged with mysticism, in which there was far more of Christianity and of the speculative metaphysics of the East than of the old Olympian religion. Justinian, partly from religious motives, partly because he discountenanced all rivals to the imperial university of Constantinople, closed these Athenian schools (529). The professors sought refuge at the court of Chosroes, king of Persia, but were soon so much disgusted by the ideas and practices of the fire-worshippers that they returned to the empire, Chosroes having magnanimously obtained from Justinian a promise that they should be suffered to pass the rest of their days unmolested. Heresy proved more obstinate. The severities directed against the Montanists of Phrygia led to a furious war, in which most of the sectaries perished, while the doctrine was not extinguished. Harsh laws provoked the Samaritans to a revolt, from whose effects Palestine had not recovered when conquered by the Arabs in the following century. The Nestorians and the Eutychian Monophysites were not threatened with such severe civil penalties, although their worship was interdicted, and their bishops were sometimes banished; but this vexatious treatment was quite enough to keep them disaffected, and the rapidity of the Mahommedan conquests may be partly traced to that alienation of the bulk of the Egyptian and a large part of the Syrian population which dates from Justinian's persecutions.

4. Justinian was engaged in three great foreign wars, two of them of his own seeking, the third a legacy which nearly every emperor had come into for three centuries, the secular strife of Rome and Persia. The Sassanid kings of Persia ruled a dominion which extended from the confines of Syria to those of India, and from the straits of Oman to the Caucasus. The martial character of their population made them formidable enemies to the Romans, whose troops were at this epoch mainly barbarians, the settled and civilized subjects of the empire being as a rule averse from war. When Justinian came to the throne, his troops were maintaining an unequal struggle on the Euphrates against the armies of Kavadh I. (*q.v.*). After some campaigns, in which the skill of Belisarius obtained considerable successes, a peace was concluded in 533 with Chosroes I. (*q.v.*). This lasted till 539, when Chosroes declared war, alleging that Justinian had been secretly intriguing against him with the Hephthalite Huns, and doubtless moved by alarm and envy at the victories which the Romans had been gaining in Italy. The emperor was too much occupied in the West to be able adequately to defend his eastern frontier. Chosroes advanced into Syria with little resistance, and in 540 captured Antioch, then the greatest city in Asia, carrying off its inhabitants into captivity. The war continued with varying fortunes for four years more in this quarter; while in the meantime an even fiercer struggle had begun in the mountainous region inhabited by the Lazi at the south-eastern corner of the Black Sea (see COLCHIS). When after two-and-twenty years of fighting no substantial advantage had been gained by either party, Chosroes agreed in 562 to a peace which left Lazica to the Romans, but under the dishonourable condition of their paying 30,000 pieces of gold annually to the Persian king. Thus no result of permanent importance flowed from these Persian wars, except that they greatly weakened the Roman Empire, increased Justinian's financial embarrassments, and prevented him from prosecuting with sufficient vigour his

enterprises in the West. (See further PERSIA: *Ancient History*, "The Sassanid Dynasty.")

These enterprises had begun in 533 with an attack on the Vandals, who were then reigning in Africa. Belisarius, despatched from Constantinople with a large fleet and army, landed without opposition, and destroyed the barbarian power in two engagements. North Africa from beyond the straits of Gibraltar to the Syrtes became again a Roman province, although the Moorish tribes of the interior maintained a species of independence; and part of southern Spain was also recovered for the empire. The ease with which so important a conquest had been effected encouraged Justinian to attack the Ostrogoths of Italy, whose kingdom, though vast in extent, for it included part of south-eastern Gaul, Raetia, Dalmatia and part of Pannonia, as well as Italy, Sicily, Sardinia and Corsica, had been grievously weakened by the death first of the great Theodoric, and some years later of his grandson Athalaric, so that the Gothic nation was practically without a head. Justinian began the war in 535, taking as his pretext the murder of Queen Amalasuntha, daughter of Theodoric, who had placed herself under his protection, and alleging that the Ostrogothic kingdom had always owned a species of allegiance to the emperor at Constantinople. There was some foundation for this claim, although of course it could not have been made effective against Theodoric, who was more powerful than his supposed suzerain. Belisarius, who had been made commander of the Italian expedition, overran Sicily, reduced southern Italy, and in 536 occupied Rome. Here he was attacked in the following year by Vitiges, who had been chosen king by the Goths, with a greatly superior force. After a siege of over a year, the energy, skill, and courage of Belisarius, and the sickness which was preying on the Gothic troops, obliged Vitiges to retire. Belisarius pursued his diminished army northwards, shut him up in Ravenna, and ultimately received the surrender of that impregnable city. Vitiges was sent prisoner to Constantinople, where Justinian treated him, as he had previously treated the captive Vandal king, with clemency. The imperial administration was established through Italy, but its rapacity soon began to excite discontent, and the kernel of the Gothic nation had not submitted. After two short and unfortunate reigns, the crown had been bestowed on Totila or Baduila, a warrior of distinguished abilities, who by degrees drove the imperial generals and governors out of Italy. Belisarius was sent against him, but with forces too small for the gravity of the situation. He moved from place to place during several years, but saw city after city captured by or open its gates to Totila, till only Ravenna, Otranto and Ancona remained. Justinian was occupied by the ecclesiastical controversy of the Three Chapters, and had not the money to fit out a proper army and fleet; indeed, it may be doubted whether he would ever have roused himself to the necessary exertions but for the presence at Constantinople of a knot of Roman exiles, who kept urging him to reconquer Italy, representing that with their help and the sympathy of the people it would not be a difficult enterprise. The emperor at last complied, and in 552 a powerful army was despatched under Narses, an Armenian eunuch now advanced in life, but reputed the most skilful general of the age, as Belisarius was the hottest soldier. He marched along the coast of the Gulf of Venice, and encountered the army of Totila at Taginae not far from Cesena. Totila was slain, and the Gothic cause irretrievably lost. The valiant remains of the nation made another stand under Teias on the Lactarian Hill in Campania; after that they disappear from history. Italy was recovered for the empire, but it was an Italy terribly impoverished and depopulated, whose possession carried little strength with it. Justinian's policy both in the Vandalic and in the Gothic War stands condemned by the result. The resources of the state, which might better have been spent in defending the northern frontier against Slavs and Huns and the eastern frontier against Persians, were consumed in the conquest of two countries which had suffered too much to be of any substantial value, and which, separated by language as well as by intervening seas, could not be permanently retained. However, Justinian must have been almost preternaturally wise to have foreseen this: his conduct was in the circumstances only what might have been expected from an ambitious prince who perceived an opportunity of recovering territories that had formerly belonged to the empire, and over which its rights were conceived to be only suspended.

Besides these three great foreign wars, Justinian's reign was troubled by a constant succession of border inroads, especially on the northern frontier, where the various Slavonic and Hunnish tribes who were established along the lower Danube and on the north coast of the Black Sea made frequent marauding expeditions into Thrace and Macedonia, sometimes penetrating as far as the walls of Constantinople in one direction and the Isthmus of Corinth in another. Immense damage was inflicted by these marauders on the subjects of the empire, who seem to have been mostly too peaceable to defend themselves, and whom the emperor could not spare troops enough to protect. Fields were laid waste, villages burnt, large numbers of people carried into captivity; and on one occasion the capital was itself in danger.

5. It only remains to say something regarding Justinian's personal character and capacities, with regard to which a great diversity of opinion has existed among historians. The civilians, looking on him as a patriarch of their science, have as a rule extolled his wisdom and virtues; while ecclesiastics of the Roman Church, from Cardinal Baronius downwards, have been offended by his arbitrary conduct towards the popes, and by his last lapse into heresy, and have therefore been disposed to accept the stories which ascribe to him perfidy, cruelty, rapacity and extravagance. The difficulty of arriving at a fair conclusion is increased by the fact that Procopius, who is our chief authority for the events of his reign, speaks with a very different voice in his secret memoirs (the *Anecdota*) from that which he has used in his published history, and that some of the accusations contained in the former work are so rancorous and improbable that a certain measure of discredit attaches to everything which it contains. The truth seems to be that Justinian was not a great ruler in the higher sense of the word, that is to say, a man of large views, deep insight, a capacity for forming just such plans as the circumstances needed, and carrying them out by a skilful adaptation of means to ends. But he was a man of considerable abilities, wonderful activity of mind, and admirable industry. He was interested in many things, and threw himself with ardour into whatever he took up; he contrived schemes quickly, and pushed them on with an energy which usually made them succeed when no long time was needed, for, if a project was delayed, there was a risk of his tiring of it and dropping it. Although vain and full of self-confidence, he was easily led by those who knew how to get at him, and particularly by his wife. She exercised over him that influence which a stronger character always exercises over a weaker, whatever their respective positions; and unfortunately it was seldom a good influence, for Theodora (*q.v.*) seems to have been a woman who, with all her brilliant gifts of intelligence and manner, had no principles and no pity. Justinian was rather quick than strong or profound; his policy does not strike one as the result of deliberate and well-considered views, but dictated by the hopes and fancies of the moment. His activity was in so far a misfortune as it led him to attempt too many things at once, and engage in undertakings so costly that oppression became necessary to provide the funds for them. Even his devotion to work, which excites our admiration, in the centre of a luxurious court, was to a great extent unprofitable, for it was mainly given to theological controversies which neither he nor any one else could settle. Still, after making all deductions, it is plain that the man who accomplished so much, and kept the whole world so occupied, as Justinian did during the thirty-eight years of his reign, must have possessed no common abilities. He was affable and easy of approach to all his subjects, with a pleasant address; nor does he seem to have been, like his wife, either cruel or revengeful. We hear several times of his sparing those who had conspired against him. But he was not scrupulous in the means he employed, and he was willing to maintain in power detestable ministers if only they served him efficiently and filled his coffers. His chief passion, after that for his own fame and

glory, seems to have been for theology and religion; it was in this field that his literary powers exerted themselves (for he wrote controversial treatises and hymns), and his taste also, for among his numerous buildings the churches are those on which he spent most thought and money. Considering that his legal reforms are those by which his name is mainly known to posterity, it is curious that we should have hardly any information as to his legal knowledge, or the share which he took in those reforms. In person he was somewhat above the middle height, well-shaped, with plenty of fresh colour in his cheeks, and an extraordinary power of doing without food and sleep. He spent most of the night in reading or writing, and would sometimes go for a day with no food but a few green herbs. Two mosaic figures of him exist at Ravenna, one in the apse of the church of S. Vitale, the other in the church of S. Apollinare in Urbe; but of course one cannot be sure how far in such a material the portrait fairly represents the original. He had no children by his marriage with Theodora, and did not marry after her decease. On his death, which took place on the 14th of November 565, the crown passed to his nephew Justin II.

Authorities.—For the life of Justinian the chief authorities are Procopius (*Historiae*, *De aedificiis*, *Anecdota*) and (from 552 A.D.) the *History* of Agathias; the Chronicle of Johannes Malalas is also of value. Occasional reference must be made to the writings of Jordanes and Marcellinus, and even to the late compilations of Cedrenus and Zonaras. The *Vita Justiniani* of Ludewig or Ludwig (Halle, 1731), a work of patient research, is frequently referred to by Gibbon in his important chapters relating to the reign of Justinian, in the *Decline and Fall* (see Bury's edition, 1900). There is a *Vie de Justinien* by Isambert (2 vols., Paris, 1856). See also Hutton's *Church of the Sixth Century* (1897); J. B. Bury's *Later Roman Empire* (1889); Hodgkin's *Italy and her Invaders* (1880). (J. Br.)

JUSTINIAN II., Rhinotmetus (669–711), East Roman emperor 685–695 and 704–711, succeeded his father Constantine IV., at the age of sixteen. His reign was unhappy both at home and abroad. After a successful invasion he made a truce with the Arabs, which admitted them to the joint possession of Armenia, Iberia and Cyprus, while by removing 12,000 Christian Maronites from their native Lebanon, he gave the Arabs a command over Asia Minor of which they took advantage in 692 by conquering all Armenia. In 688 Justinian decisively defeated the Bulgarians. Meanwhile the bitter dissensions caused in the Church by the emperor, his bloody persecution of the Manichaeans, and the rapacity with which, through his creatures Stephanus and Theodatus, he extorted the means of gratifying his sumptuous tastes and his mania for erecting costly buildings, drove his subjects into rebellion. In 695 they rose under Leontius, and, after cutting off the emperor's nose (whence his surname), banished him to Cherson in the Crimea. Leontius, after a reign of three years, was in turn dethroned and imprisoned by Tiberius Absimarus, who next assumed the purple. Justinian meanwhile had escaped from Cherson and married Theodora, sister of Busirus, khan of the Khazars. Compelled, however, by the intrigues of Tiberius, to quit his new home, he fled to Terbelis, king of the Bulgarians. With an army of 15,000 horsemen Justinian suddenly pounced upon Constantinople, slew his rivals Leontius and Tiberius, with thousands of their partisans, and once more ascended the throne in 704. His second reign was marked by an unsuccessful war against Terbelis, by Arab victories in Asia Minor, by devastating expeditions sent against his own cities of Ravenna and Cherson, where he inflicted horrible punishment upon the disaffected nobles and refugees, and by the same cruel rapacity towards his subjects. Conspiracies again broke out: Bardanes, surnamed Philippicus, assumed the purple, and Justinian, the last of the house of Heraclius, was assassinated in Asia Minor, December 711.

See E. Gibbon, *Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 179–183; J. B. Bury, *The Later Roman Empire* (1889), ii. 320–330, 358–367.

JUSTIN MARTYR, one of the earliest and ablest Christian apologists, was born about 100 at Flavia Neapolis (anc. *Sichem*), now Nablus, in Palestinian Syria (Samaria). His parents, according to his own account, were Pagans (*Dial. c. Tryph.* 28). He describes the course of his religious development in the introduction to the dialogue with the Jew Trypho, in which he relates how chance intercourse with an aged stranger brought him to know the truth. Though this narrative is a mixture of truth and fiction, it may be said with certainty that a thorough study of the philosophy of Peripatetics and Pythagoreans, Stoics and Platonists, brought home to Justin the conviction that true knowledge was not to be found in them. On the other hand, he came to look upon the Old Testament prophets as approved by their antiquity, sanctity, mystery and prophecies to be interpreters of the truth. To this, as he tells us in another place (*Apol.* ii. 12), must be added the deep impression produced upon him by the life and death of Christ. His conversion apparently took place at Ephesus; there, at any rate, he places his decisive interview with the old man, and there he had those discussions with Jews and converts to Judaism, the results of which he in later years set down in his *Dialogue.* After his conversion he retained his philosopher's cloak (Euseb., *Hist. Eccl.* iv. 11. 8), the distinctive badge of the wandering professional teacher of philosophy, and went about from place to place discussing the truths of Christianity in the hope of bringing educated Pagans, as he himself had been brought, through philosophy to Christ. In Rome he made a fairly long stay, giving lectures in a class-room of his own, though not without opposition from his fellow-teachers. Among his opponents was the Cynic Crescentius (*Apol.* ii. 13). Eusebius (*Hist. Eccl.* iv. 16. 7–8) concludes somewhat hastily, from the statement of Justin and his disciple Tatian (*Orat. ad Graec.* 19), that the accusation of Justin before the authorities, which led to his death, was due to Crescentius. But we know, from the undoubtedly genuine *Acta SS Justini et sociorum*, that Justin suffered the death of a martyr under the prefect Rusticus between 163 and 167.

To form an opinion of Justin as a Christian and theologian, we must turn to his *Apology* and to the *Dialogue* with the Jew Trypho, for the authenticity of all other extant works attributed to him is disputed with good reason. The *Apology*—it is more correct to speak of one *Apology* than of two, for the second is only a continuation of the first, and dependent upon it—was written in Rome about 150. In the first part Justin defends his fellow-believers against the charge of atheism and hostility to the state. He then draws a positive demonstration of the truth of his religion from the effects of the new faith, and especially from the excellence of its moral teaching, and concludes with a comparison of Christian and Pagan doctrines, in which the latter are set down with naïve confidence as the work of demons. As the main support of his proof of the truth of Christianity appears his detailed demonstration that the prophecies of the old dispensation, which are older than the Pagan poets and philosophers, have found their fulfilment in Christianity. A third part shows, from the practices of their religious worship, that the Christians had in truth dedicated themselves to God. The whole closes with an appeal to the princes, with a reference to the edict issued by Hadrian in favour of the Christians. In the so-called *Second Apology*, Justin takes occasion from the trial of a Christian recently held in Rome to argue that the innocence of the Christians was proved by the very persecutions.

Even as a Christian Justin always remained a philosopher. By his conscious recognition of the Greek philosophy as a preparation for the truths of the Christian religion, he appears as the first and most distinguished in the long list of those who have endeavoured to reconcile Christian with non-Christian culture. Christianity consists for him in the doctrines, guaranteed by the manifestation of the Logos in the person of Christ, of God, righteousness and immortality, truths which have been to a certain extent foreshadowed in the monotheistic religious philosophies. In this process the conviction of the reconciliation of the sinner with God, of the salvation of the world and the individual through Christ, fell into the background before the vindication of supernatural truths intellectually conceived. Thus Justin may give the impression of having rationalized Christianity, and of not having given it its full value as a religion of salvation. It must not, however, be forgotten that Justin is here speaking as the apologist of Christianity to an educated Pagan public, on whose philosophical view of life he had to base his arguments, and from whom he could not expect an intimate comprehension of the religious position of Christians. That he himself had a thorough comprehension of it he showed in the *Dialogue* with the Jew Trypho. Here, where he had to deal with the Judaism that believed in a Messiah, he was far better able to do justice to Christianity as a revelation; and so we find that the arguments of this work are much more completely in harmony with primitive Christian theology than those of the *Apology*. He also displays in this work a considerable knowledge of the Rabbinical writings and a skilful polemical method which was surpassed by none of the later anti-Jewish writers.

Justin is a most valuable authority for the life of the Christian Church in the middle of the 2nd century. While we have elsewhere no connected account of this, Justin's *Apology* contains a few paragraphs (61 seq.), which give a vivid description of the public worship of the Church and its method of celebrating the sacraments (Baptism and the Eucharist). And from this it is clear that though, as a theologian, Justin wished to go his own way, as a believing Christian he was ready to make his standpoint that of the Church and its baptismal confession of faith. His works are also of great value for the history of the New Testament writings. He knows of no canon of the New Testament, *i.e.* no fixed and inclusive collection of the apostolic writings. His sources for the teachings of Jesus are the "Memoirs of the Apostles," by which are probably to be understood the Synoptic Gospels (without the Gospel according to St John), which, according to his account, were read along with the prophetic writings at the public services. From his writings we derive the impression of an amiable personality, who is honestly at pains to arrive at an understanding with his opponents. As a theologian, he is of wide sympathies; as a writer, he is often diffuse and somewhat dull. There are not many traces of any particular literary influence of his writings upon the Christian Church, and this need not surprise us. The Church as a whole took but little interest in apologetics and polemics, nay, had at times even an instinctive feeling that in these controversies that which she held holy might easily suffer loss. Thus Justin's writings were not much read, and at the present time both the *Apology* and the *Dialogue* are preserved in but a single MS. (cod. Paris, 450, A.D. 1364).

BIBLIOGRAPHY.—The editions of Robert Étienne (Stephanus) (1551); H. Sylburg (1593); F. Morel (1615); Prudentius Maranuis (1742) are superseded by J. C. T. Otto, *Justini philosophi et martyris opera quae feruntur omnia* (3rd ed. 5 vols., Jena, 1876–1881). This edition contains besides the *Apologies* (vol. i.) and the *Dialogue* (vol. ii.) the following writings: *Speech to the Greeks* (*Oratio*); *Address to the Greeks* (*Cohortatio*): *On the Monarchy of God*; *Epistle to Diognetus*; *Fragments on the Resurrection and other Fragments*; *Exposition of the True Faith*; *Epistle to Zenas and Serenus*; *Refutation of certain Doctrines of Aristotle*; *Questions and Answers to the Orthodox*; *Questions of Christians to Pagans*; *Questions of Pagans to Christians*. None of these writings, not even the *Cohortatio*, which former critics ascribed to Justin, can be attributed to him. The authenticity of the *Dialogue* has occasionally been disputed, but without reason. For a handy edition of the *Apology* see G. Krüger, *Die Apologien Justins des Märtyrers* (3rd ed. Tübingen, 1904). There is a good German translation with a comprehensive commentary by H. Veil (1894). For English translations consult the "Oxford Library of the Fathers" and the "Ante-Nicene Library." Full information about Justin's history and views may be had from the following monographs: C. Semisch, *Justin der Märtyrer* (2 vols., 1840–1842); J. Donaldson, *A Critical History of Christian Literature and Doctrine*, vol. 2 (1866); C. E. Freppel, *St Justin* (3rd ed., 1886); Moritz von Engelhardt, *Das Christentum Justins des Märtyrers* (1878); T. M. Wehofer, *Die Apologie Justins des Philosophen und Märtyrers in litterarhistorischer Beziehung zum ersten Male untersucht* (1897); Alfred Leonhard Feder, *Justins des Märtyrers Lehre von Jesus Christus* (1906). On the critical questions raised by the spurious writings consult W. Gaul, *Die Abfassungsverhältnisse der pseudo-justinischen Cohortatio ad Graecos* (1902); Adolf Harnack, *Diodor von Tarsus. Vier pseudo-justinische Schriften als Eigentum Diodors nachgewiesen* (1901). (G. K.)

JUTE, a vegetable fibre now occupying a position in the manufacturing scale inferior only to cotton and flax. The term jute appears to have been first used in 1746, when the captain of the "Wake" noted in his log that he had sent on shore "60 bales of gunney with all the jute rope" (*New Eng. Dict. s.v.*). In 1795 W. Roxburgh sent to the directors of the East India Company a bale of the fibre which he described as "the jute of the natives." Importations of the substance had been made at earlier times under the name of *pāt*, an East Indian native term by which the fibre continued to be spoken of in England till the early years of the 19th century, when it was supplanted by the name it now bears. This modern name appears to be derived from *jhot* or *jhout* (Sansk. *jhat*), the vernacular name by which the substance is known in the Cuttack district, where the East India Company had extensive roperies when Roxburgh first used the term.

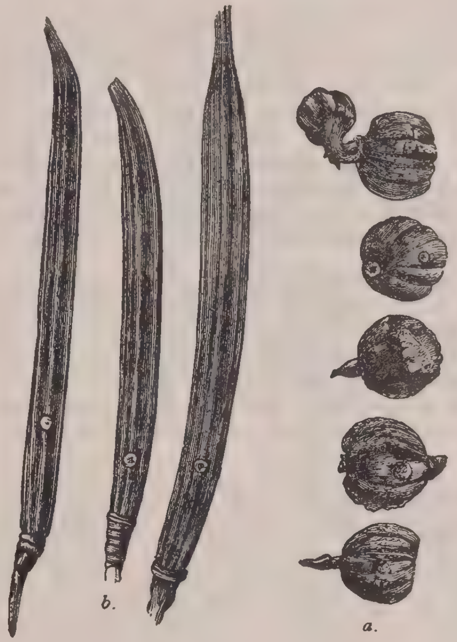

FIG. 1.—Capsules of Jute Plants. *a*, *Corchorus capsularis*; *b*, *C. olitorius*.

The fibre is obtained from two species of *Corchorus* (nat. ord. *Tiliaceae*), *C. capsularis* and *C. olitorius*, the products of both being so essentially alike that neither in commerce nor agriculture is any distinction made between them. These and various other species of *Corchorus* are natives of Bengal, where they have been cultivated from very remote times for economic purposes, although there is reason to believe that the cultivation did not originate in the northern parts of India. The two species cultivated for jute fibre are in all respects very similar to each other, except in their fructification and the relatively greater size attained by *C. capsularis*. They are annual plants from 5 to 10 ft. high, with a cylindrical stalk as thick as a man's finger, and hardly branching except near the top. The light-green leaves are from 4 to 5 in. long by 1½ in. broad above the base, and taper upward into a fine point; the edges are serrated; the two lower teeth are drawn out into bristle-like points. The small whitish-yellow flowers are produced in clusters of two or three opposite the leaves.

The capsules or seed-pods in the case of *C. capsularis* are globular, rough and wrinkled, while in *C. olitorius* they are slender, quill-like cylinders (about 2 in. long), a very marked distinction, as may be noted from fig. 1, in which *a* and *b* show the capsules of *C. capsularis* and *C. olitorius* respectively. Fig. 2 represents a flowering top of *C. olitorius*.

Both species are cultivated in India, not only on account of their fibre, but also for the sake of their leaves, which are there extensively used as a pot-herb. The use of *C. olitorius* for the latter purpose dates from very ancient times, it if may be identified, as some suppose, with the mallows (מלוח) mentioned in Job xxx. 4; hence the name Jew's mallow. It is certain that the Greeks used this plant as a pot-herb; and by many other nations around the shores of the Mediterranean this use of it was, and is still, common. Throughout Bengal the name by which the plants when used as edible vegetables are recognized is *nalitā*; when on the other hand they are spoken of as fibre-producers it is generally under the name *pāt*. The cultivation of *C. capsularis* is most prevalent in central and eastern Bengal, while in the neighbourhood of Calcutta, where, however, the area under cultivation is limited, *C. olitorius* is principally grown. The fibre known as China jute or Tien-tsin jute is the product of another plant, *Abutilon Avicennae*, a member of the Mallow family.

Cultivation and Cropping.—Attempts have been made to grow the jute plant in America, Egypt, Africa and other places, but up to the present the fibre has proved much inferior to that obtained from plants grown in India. Here the cultivation of the plant extends from the Hugli through eastern and northern Bengal. The successful cultivation of the plant demands a hot, moist climate, with a fair amount of rain. Too much rain at the beginning of the season is detrimental to the growth, while a very dry season is disastrous. The climate of eastern and northern Bengal appears to be ideal for the growth of the plant.

The quality of the fibre and the produce per acre depend in a measure on the preparation of the soil. The ground should be ploughed about four times and all weeds removed. The seed is then sown broadcast as in the case of flax. It is only within quite recent years that any attention has been paid to the selection of the seed. The following extract from *Capital* (Jan. 17, 1907) indicates the new interest taken in it.

> "Jute seed experiments are being continued and the report for 1906 has been issued. The object of these experiments is, of course, to obtain a better class of jute seed by growing plants, especially for no other purpose than to obtain their seed. The agricultural department has about 300 maunds (25,000 ℔) of selected seed for distribution this year. The selling price is to be *Rs.* 10 per maund. The agricultural department of the government of Bengal are now fully alive to the importance of fostering the jute industry by showing conclusively that attention to scientific agriculture will make two maunds of jute grow where only one maund grew before. Let them go on (as they will) till all the ryots are thoroughly indoctrinated into the new system."

The time of sowing extends from the middle of March to the middle of June, while the reaping, which depends upon the time of sowing and upon the weather, is performed from the end of June to the middle of October. The crop is said to be ready for gathering when the flowers appear; if gathered before the fibre is weak, while if left until the seed is ripe, the fibre is stronger, but is coarser and lacks the characteristic lustre.

The fibre is separated from the stalks by a process of retting similar to that for flax and hemp. In certain districts of Bengal it is the practice to stack the crop for a few days previous to retting in order to allow the leaves to dry and to drop off the stalks. It is stated that the colour of the fibre is darkened if the leaves are allowed to remain on during the process of retting. It is also thought that the drying of the plants before retting facilitates the separation of the fibre. Any simple operation which improves the colour of the fibre or shortens the operation of retting is worthy of consideration. The benefits to be derived from the above process, however, cannot be great, for the bundles are usually taken direct to the pools and streams. The period necessary for the completion of the retting process varies according to the temperature and to the properties of the water, and may occupy from two days to a month. After the first few days of immersion the stalks are examined daily to test the progress of the retting. When the fibres are easily separated from the stalk, the operation is complete and the bundles should be withdrawn. The following description of the retting of jute is taken from Royle's *Fibrous Plants of India*:—

> "The proper point being attained, the native operator standing up to his middle in water, takes as many of the stalks in his hands as he can grasp, and removing a small portion of the bark from the ends next the roots, and grasping them together, he strips off the whole with a little management from end to end, without breaking either stem or fibre. Having prepared a certain quantity into this half state, he next proceeds to wash off; this is done by taking a large handful, swinging it round his head he dashes it repeatedly against the surface of the water, drawing it through towards him, so as to wash off the impurities; then, with a dexterous throw he fans it out on the surface of the water and carefully picks off all remaining black spots. It is now wrung out so as to remove as much water as possible, and then hung up on lines prepared on the spot, to dry in the sun."

The separated fibre is then made up into bundles ready for sending to one of the jute presses. The jute is carefully sorted into different qualities, and then each lot is subjected to an enormous hydraulic pressure from which it emerges in the shape of the well-known bales, each weighing 400 ℔.

The crop naturally depends upon the quality of the soil, and upon the attention which the fibre has received in its various stages; the yield per acre varies in different districts. Three bales per acre, or 1200 ℔ is termed a 100% crop, but the usual quantity obtained is about 2·6 bales per acre. Sometimes the crop is stated in lakhs of 100,000 bales each. The crop in 1906 reached nearly 9,000,000 bales, and in 1907 nearly 10,000,000 was reached. The following particulars were issued on the 10th of September 1906 by Messrs W. F. Soutar & Co., Dundee:—

Year.	Actual acreage.	Estimated yield (100% equal 3 bales per acre).	Estimated total crop. Bales.	Shipment to Europe.		Shipment to America.		Supplies to Indian mills and local consumption.	Out-turn actual crop. Bales.
				Jute. Bales.	Cuttings. Bales.	Jute. Bales.	Cuttings. Bales.		
1901—1st	2,216,500	94% =	6,250,000						
Final	2,249,000	96% =	6,500,000	3,524,691	54,427	295,927	226,331	3,300,000 =	7,405,376
1902—1st	2,200,000	80% =	5,280,000						
Final	2,200,000	80% =	5,280,000	2,773,621	39,089	230,415	207,999	2,600,000 =	5,851,154
1903—1st	2,100,000	85% =	5,400,000						
Final	2,250,000	91½% =	6,500,000	3,161,791	59,562	329,048	216,959	3,650,000 =	7,437,360
1904—1st	2,700,000	87½% =	7,100,000						
Final	2,850,000	85% =	7,200,000	2,939,949	44,002	251,112	290,354	3,475,782 =	7,002,460
1905—1st	3,161,500	87% =	8,250,000						
Final	3,145,000	87% =	8,200,000	3,420,115	63,116	347,974	245,044	4,086,525 =	8,233,358
		Outlying	250,000	75,364					
			Madras						
1906—1st	3,271,200	87½% =	8,713,000						
Outlying	67,000	Madras	100,000						
Final	3,336,200		8,736,220						
(Outlying districts and Madras, say 250,000 bales additional)									

Estimated consumption of jute 1906–1907.

In Europe	Bales per annum.	
Scotland	1,250,000	
England	20,000	
Ireland	25,000	
France	475,000	
Belgium	120,000	
Germany	750,000	
Austria and Bohemia	262,000	
Norway and Sweden	62,500	
Russia	180,000	
Holland	25,000	
Spain	90,000	
Italy	160,000	
		3,419,500 bales
In America	600,000	
		600,000 ,,
In India—		
Mills	3,900,000	
Local	500,000	
		4,400,000 ,,
		8,419,500 bales

Statistics of consumption of jute, rejections and cuttings.

Consumption.	1894. Bales.	1904. Bales.	1906. Bales.
United Kingdom	1,200,000	1,200,000	1,295,000
Continent	1,100,000	1,800,000	2,124,500
America	500,000	500,000	600,000
Indian mills	1,500,000	2,900,000	3,900,000
Local Indian consumption	500,000	500,000	500,000
Total jute crop consumption	4,800,000	6,900,000	8,419,500

A number of experiments in jute cultivation were made during 1906, and the report showed that very encouraging results were obtained from land manured with cow-dung. If more scientific attention be given to the cultivation it is quite possible that what is now considered as 100% yield may be exceeded.

Characteristics.—The characters by which qualities of jute are judged are colour, lustre, softness, strength, length, firmness, uniformity and absence of roots. The best qualities are of a clear whitish-yellow colour, with a fine silky lustre, soft and smooth to the touch, and fine, long and uniform in fibre. When the fibre is intended for goods in the natural colour it is essential that it should be of a light shade and uniform, but if intended for yarns which are to be dyed a dark shade, the colour is not so important. The cultivated plant yields a fibre with a length of from 6 to 10 ft., but in exceptional cases it has been known to reach 14 or 15 ft. in length. The fibre is decidedly inferior to flax and hemp in strength and tenacity; and, owing to a peculiarity in its microscopic structure, by which the walls of the separate cells composing the fibre vary much in thickness at different points, the single strands of fibre are of unequal strength. Recently prepared fibre is always stronger, more lustrous, softer and whiter than such as has been stored for some time—age and exposure rendering it brown in colour and harsh and brittle in quality. Jute, indeed, is much more woody in texture than either flax or hemp, a circumstance which may be easily demonstrated by its behaviour under appropriate reagents; and to that fact is due the change in colour and character it undergoes on exposure to the air. The fibre bleaches with facility, up to a certain point, sufficient to enable it to take brilliant and delicate shades of dye colour, but it is with great difficulty brought to a pure white by bleaching. A very striking and remarkable fact, which has much practical interest, is its highly hygroscopic nature. While in a dry position and atmosphere it may not possess more than 6% of moisture, under damp conditions it will absorb as much as 23%.

Sir G. Watt, in his *Dictionary of the Economic Products of India*, mentions the following eleven varieties of jute fibre: Serajganji, Narainganji, Desi, Deora, Uttariya, Deswāl, Bākrabadi, Bhatial, Karimginji, Mirganji and Jungipuri. There are several other varieties of minor importance. The first four form the four classes into which the commercial fibre is divided, and they are commonly known as Serajgunge, Naraingunge, Daisee and Dowrah. Serajgunge is a soft fibre, but it is superior in colour, which ranges from white to grey. Naraingunge is a strong fibre, possesses good spinning qualities, and is very suitable for good warp yarns. Its colour, which is not so high as Serajgunge, begins with a cream shade and approaches red at the roots. All the better class yarns are spun from these two kinds. Daisee is similar to Serajgunge in softness, is of good quality and of great length; its drawback is the low colour, and hence it is not so suitable for using in natural colour. It is, however, a valuable fibre for carpet yarns, especially for dark yarns. Dowrah is a strong, harsh and low quality fibre, and is used principally for heavy wefts. Each class is subdivided according to the quality and colour of the material, and each class receives a distinctive mark called a baler's mark. Thus, the finest fibres may be divided as follows:—

Superfine first marks.
Extra fine first marks 1st, 2nd and 3rd numbers.
Superior first marks ,, ,, ,,
Standard ,, ,, ,, ,, ,,
Good ,, ,, ,, ,, ,,
Ordinary ,, ,, ,, ,, ,,
Good second ,, ,, ,, ,,
Ordinary ,, ,, ,, ,, ,,

The lower qualities are, naturally, divided into fewer varieties.

Each baler has his own marks, the fibres of which are guaranteed equal in equality to some standard mark. It would be impossible to give a list of the different marks, for there are hundreds, and new marks are constantly being added. A list of all the principal marks is issued in book form by the Calcutta Jute Baler's association.

The relative prices of the different classes depend upon the crop, upon the demand and upon the quality of the fibre; in 1905 the prices of Daisee jute and First Marks were practically the same, although the former is always considered inferior to the latter. It does not follow that a large crop of jute will result in low prices, for the year 1906–1907 was not only a record one for crops, but also for prices. R. F. C. grade has been as high as £40 per ton, while its lowest recorded price is £12. Similarly the price for First Marks reached £29, 15s. in 1906 as compared with £9, 5s. per ton in 1897. The following table shows a few well-known grades with the average prices during December for the years 1903, 1904, 1905 and 1906.

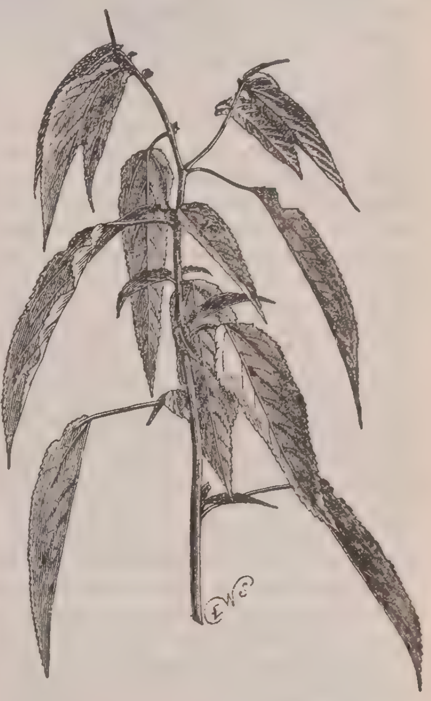

FIG. 2.—*Corchorus olitorius.*

Class.	Dec. 1903.			Dec. 1904.			Dec. 1905.			Dec. 1906.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
First marks	12	15	0	16	0	0	19	15	0	27	15	0
Black S C C	11	2	6	14	5	0	17	15	0	20	15	0
Red S C C	12	0	0	14	17	6	18	15	0	23	15	0
Native rejections	8	2	6		—		14	10	0	15	17	6
S 4 group		—			—		25	10	0	38	0	0
R F block D group		—			—			—		36	0	0
R F circle D group	14	10	0	16	15	0	21	10	0		—	
R F D group	11	15	0	14	2	6	17	12	6	22	0	0
N B green D	14	5	0		—		21	0	0	32	0	0
Heart T 4	14	12	6	17	10	0	22	10	0	34	0	0
Heart T 5	14	12	6	17	10	0	21	0	0	31	0	0
Daisee 2	12	17	6		—		18	15	0	25	10	0
Daisee assortment	12	10	0	14	17	6	18	5	0		—	
Mixed cuttings	4	5	0		—		10	0	0	10	0	0

Jute Manufacture.—Long before jute came to occupy a prominent place amongst the textile fibres of Europe, it formed the raw material of a large and important industry throughout the regions of Eastern Bengal. The Hindu population made the material up into cordage, paper and cloth, the chief use of the latter being in the manufacture of gunny bags. Indeed, up to 1830–1840 there was little or no competition with hand labour for this class of material. The process of weaving gunnies for bags and other coarse articles by these hand-loom weavers has been described as follows:—

> "Seven sticks or chattee weaving-posts, called *tanā parā* or warp, are fixed upon the ground, occupying the length equal to the measure of the piece to be woven, and a sufficient number of twine or thread is wound on them as warp called *tanā*. The warp is taken up and removed to the weaving machine. Two pieces of wood are placed at two ends, which are tied to the *ohari* and *okher* or roller; they are made fast to the *khoti*. The *belut* or treadle is put into the warp; next to that is the *sarsul*: a thin piece of wood is laid upon the warp called *chapari* or regulator. There is no sley used in this, nor is a shuttle necessary: in the room of the latter a stick covered with thread called [illegible] is thrown into the warp as woof, which is beaten in by a piece of plank called *beyno*, and as the cloth is woven it is wound up to the roller. Next to this is a piece of wood called *khetone*, which is used for smoothing and regulating the woof; a stick is fastened to the warp to keep the woof straight."

Gunny cloth is woven of numerous qualities, according to the purpose to which it is devoted. Some kinds are made close and dense in texture, for carrying such seed as poppy or rape and sugar; others less close are used for rice, pulses, and seeds of like size, and coarser and opener kinds again are woven for the outer cover of packages and for the sails of country boats. There is a thin close-woven cloth made and used as garments among the females of the aboriginal tribes near the foot of the Himalayas, and in various localities a cloth of pure jute or of jute mixed with cotton is used as a sheet to sleep on, as well as for wearing purposes. To indicate the variety of uses to which jute is applied, the following quotation may be cited from the official report of Hem Chunder Kerr as applying to Midnapur.

> "The articles manufactured from jute are principally (1) gunny bags; (2) string, rope and cord; (3) *kampa*, a net-like bag for carrying wood or hay on bullocks; (4) *chat*, a strip of stuff for tying bales of cotton or cloth; (5) *dola*, a swing on which infants are rocked to sleep; (6) [illegible], a kind of hanging shelf for little earthen pots, &c.; (7) [illegible], a floor-cloth; (8) *beera*, a small circular stand for wooden plates used particularly in *poojahs*; (9) painter's brush and brush for white-washing; (10) *ghunsi*, a waist-band worn next to the skin; (11) [illegible], a hair-band worn by women; (12) *mukbar*, a net bag used as muzzle for cattle; (13) *parchula*, false hair worn by players; (14) [illegible], a slender arm-band worn at the Rakhi-poornima festival; and (15) *dhup*, small incense sticks burned at *poojahs*."

The fibre began to receive attention in Great Britain towards the close of the 18th century, and early in the 19th century it was spun into yarn and woven into cloth in the town of Abingdon. It is claimed that this was the first British town to manufacture the material. For years small quantities of jute were imported into Great Britain and other European countries and into America, but it was not until the year 1832 that the fibre may be said to have made any great impression in Great Britain. The first really practical experiments with the fibre were made in this year in Chapelshade Works, Dundee, and these experiments proved to be the foundation of an enormous industry. It is interesting to note that the site of Chapelshade Works was in 1907 cleared for the erection of a large new technical college.

In common with practically all new industries progress was slow for a time, but once the value of the fibre and the cloth produced from it had become known the development was more rapid. The pioneers of the work were confronted with many difficulties: most people condemned the fibre and the cloth, many warps were discarded as unfit for weaving, and any attempt to mix the fibre with flax, tow or hemp was considered a form of deception. The real cause of most of these objections was the fact that suitable machinery and methods of treatment had not been developed for preparing yarns from this useful fibre. Warden in his *Linen Trade* says:—

> "For years after its introduction the principal spinners refused to have anything to do with jute, and cloth made of it long retained a tainted reputation. Indeed, it was not until Mr. Rowan got the Dutch government, about 1838, to substitute jute yarns for those made from flax in the manufacture of the coffee bagging for their East Indian possessions, that the jute trade in Dundee got a proper start. That fortunate circumstance gave an impulse to the spinning of the fibre which it never lost, and since that period its progress has been truly astonishing."

The demand for this class of bagging, which is made from fine hessian yarns, is still great. These fine Rio hessian yarns form an important branch of the Dundee trade, and in some weeks during 1906 as many as 1000 bales were despatched to Brazil, besides numerous quantities to other parts of the world.

For many years Great Britain was the only European country engaged in the manufacture of jute, the great seat being Dundee. Gradually, however, the trade began to extend, and now almost every European country is partly engaged in the trade.

The success of the mechanical method of spinning and weaving of jute in Dundee and district led to the introduction of textile machinery into and around Calcutta. The first mill to be run there by power was started in 1854, while by 1872 three others had been established. In the next ten years no fewer than sixteen new mills were erected and equipped with modern machinery from Great Britain, while in 1907 there were thirty-nine mills engaged in the industry. The expansion of the Indian power trade may be gathered from the following particulars of the number of looms and spindles from 1892 to 1906. In one or two cases the number of spindles is obtained approximately by reckoning twenty spindles per loom, which is about the average for the Indian mills.

Year.	Looms.	Spindles.
1892–3	8,479	177,732
1893–4	9,082	189,144
1894–5	9,504	197,673
1895–6	10,071	212,595
1896–7	12,276	254,610
1897–8	12,737	271,363
1898–9	13,323	277,398
1899–1900	14,021	293,218
1900–01	15,242	315,264
1901–02	16,059	329,300
1902–03	17,091	350,120
1904[1]	19,901	398,020[2]
1905[1]	21,318	426,360[2]
1906[1]	26,799	520,980[2]

The Calcutta looms are engaged for the most part with a few varieties of the commoner classes of jute fabrics, but the success in this direction has been really remarkable. Dundee, on the other hand, turns out not only the commoner classes of fabrics, but a very large variety of other fabrics. Amongst these may be mentioned the following: Hessian, bagging, tarpaulin, sacking, scrims, Brussels carpets, Wilton carpets, imitation Brussels, and several other types of carpets, rugs and matting, in addition to a large variety of fabrics of which jute forms a part. Calcutta has certainly taken a large part of the trade which Dundee held in its former days, but the continually increasing demands for jute fabrics for new purposes have enabled Dundee to enter new markets and so to take part in the prosperity of the trade.

The development of the trade with countries outside India from 1828 to 1906 may be seen by the following figures of exports:—

Average per year from	1828	to 1832–33	11,800 cwt.
,, ,, ,,	1833–34	,, 1837–38	67,483 ,,
,, ,, ,,	1838–39	,, 1842–43	117,047 ,,
,, ,, ,,	1843–44	,, 1847–48	234,055 ,,
,, ,, ,,	1848–49	,, 1852–53	439,850 ,,
,, ,, ,,	1853–54	,, 1857–58	710,826 ,,
,, ,, ,,	1858–59	,, 1862–63	969,724 ,,
,, ,, ,,	1863–64	,, 1867–68	2,628,110 ,,
,, ,, ,,	1868–69	,, 1872–73	4,858,162 ,,
,, ,, ,,	1873–74	,, 1877–78	5,362,267 ,,
,, ,, ,,	1878–79	,, 1882–83	7,274,000 ,,
,, ,, ,,	1883–84	,, 1887–88	8,223,859 ,,
,, ,, ,,	1888–89	,, 1892–93	10,372,991 ,,
,, ,, ,,	1893–94	,, 1897–98	12,084,292 ,,
,, ,, ,,	1898–99	,, 1902–03	11,959,189 ,,
,, ,, ,,	1903–04	,, 1905–06	13,693,090 ,,

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[1] End of calendar year, the remainder being taken to the 31st of March, the end of financial year.

[2] Approximate number of spindles.

The subjoined table shows the extent of the trade from an agricultural, as well as from a manufacturing, point of view. The difference between the production and the exports represents the native consumption, for very little jute is sent overland. The figures are taken to the 31st of March, the end of the Indian financial year.

Year.	Acres under cultivation.	Production in cwt.	Exports by sea in cwt.
1893	2,181,334	20,419,000	10,537,512
1894	2,230,570	17,863,000	8,690,133
1895	2,275,335	21,944,400	12,976,791
1896	2,248,593	19,825,000	12,266,781
1897	2,215,105	20,418,000	11,464,356
1898	2,159,908	24,425,000	15,023,325
1899	1,690,739	19,050,000	9,864,545
1900	2,070,668	19,329,000	9,725,245
1901	2,102,236	23,307,000	12,414,552
1902	2,278,205	26,564,000	14,755,115
1903	2,142,700	23,489,000	13,036,486
1904	2,275,050	25,861,000	13,721,447
1905	2,899,700	26,429,000	12,875,312
1906	3,181,600	29,945,000	14,581,307

Manufacture.—In their general features the spinning and weaving of jute fabrics do not differ essentially as to machinery and processes from those employed in the manufacture of hemp and heavy flax goods. Owing, however, to the woody and brittle nature of the fibre, it has to undergo a preliminary treatment peculiar to itself. The pioneers of the jute industry, who did not understand this necessity, or rather who did not know how the woody and brittle character of the fibre could be remedied, were greatly perplexed by the difficulties they had to encounter, the fibre spinning badly into a hard, rough and hairy yarn owing to the splitting and breaking of the fibre. This peculiarity of jute, coupled also with the fact that the machinery on which it was first spun, although quite suitable for the stronger and more elastic fibres for which it was designed, required certain modifications to suit it to the weaker jute, was the cause of many annoyances and failures in the early days of the trade.

The first process in the manufacture of jute is termed batching. Batch setting is the first part of this operation; it consists of selecting the different kinds or qualities of jute for any predetermined kind of yarn. The number of bales for a batch seldom exceeds twelve, indeed it is generally about six, and of these there may be three, four or even more varieties or marks. The "streaks"[1] or "heads" of jute as they come from the bale are in a hard condition in consequence of having been subjected to a high hydraulic pressure during baling; it is therefore necessary to soften them before any further process is entered. The streaks are sometimes partly softened or crushed by means of a steam hammer during the process of opening the bale, then taken to the "strikers-up" where the different varieties are selected and hung on pins, and then taken to the jute softening machine. The more general practice, however, is to employ what is termed a "bale opener," or "jute crusher." The essential parts of one type of bale opener are three specially shaped rollers, the peripheries of which contain a number of small knobs. Two of these rollers are supported in the same horizontal plane of the framework, while the third or top roller is kept in close contact by means of weights and springs acting on each end of the arbor. Another type of machine termed the three pair roller jute opener is illustrated in fig. 3. The layers from the different bales are laid upon the feed cloth which carries them up to the rollers, between which the layers are crushed and partly separated. The proximity of the weighted roller or rollers to the fixed ones depends upon the thickness of material passing through the machine. The fibre is delivered by what is called the delivery cloth, and the batcher usually selects small streaks of about 1½ ℔ to 2 ℔ weight each and passes them on to the attendant or feeder of the softening machine. These small streaks are now laid as regularly as possible upon the feed-cloth of the softening machine, a general view of which is shown in fig. 4. The fibre passes between a series of fluted rollers, each pair of which is kept in contact by spiral springs as shown in the figure. The standard number of pairs is sixty-three, but different lengths obtain. There is also a difference in the structure of the flutes, some being straight, and others spiral, and each pair may or may not contain the same number of flutes. The springs allow the top rollers of each pair to rise as the material passes through the machine. Advantage is taken of this slight upward and downward movement of the top rollers to automatically regulate the flow of water and oil upon the material. The apparatus for this function is placed immediately over the 11th and 12th rollers of the softening machine and an idea of its construction may be gathered from fig. 5. In many cases the water and oil are applied by less automatic, but equally effective, means. The main object is to see that the liquids are distributed evenly while the fibre is passing through, and to stop the supply when the machine stops or when no fibre is passing. The uniform moistening of the fibre in this machine facilitates the subsequent operations, indeed the introduction of this preliminary process (originally by hand) constituted the first important step in the practical solution of the difficulties of jute spinning. The relative quantities of oil and water depend upon the quality of the batch. Sometimes both whale and mineral oils are used, but in most cases the whale oil is omitted. About 1 to 1¼ gallons of oil is the usual amount given per bale of 400 ℔ of jute, while the quantity of water per bale varies from 3 to 7 gallons. The delivery attendants remove the streaks, give them a twist to facilitate future handling, and place them on what are termed jute barrows. The streaks are now handed over to the cutters who cut off the roots, and finally the material is allowed to remain for twelve to twenty-four hours to allow the mixture of oil and water to thoroughly spread over the fibre.

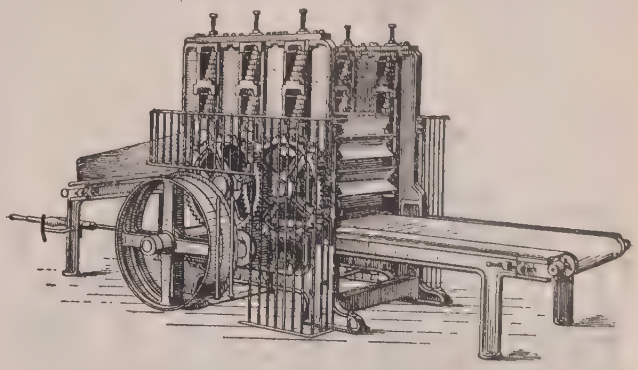

Fig. 3.—Jute Opener. (The three machines shown in this article are made by Urquhart, Lindsay & Co., Ltd., Dundee.)

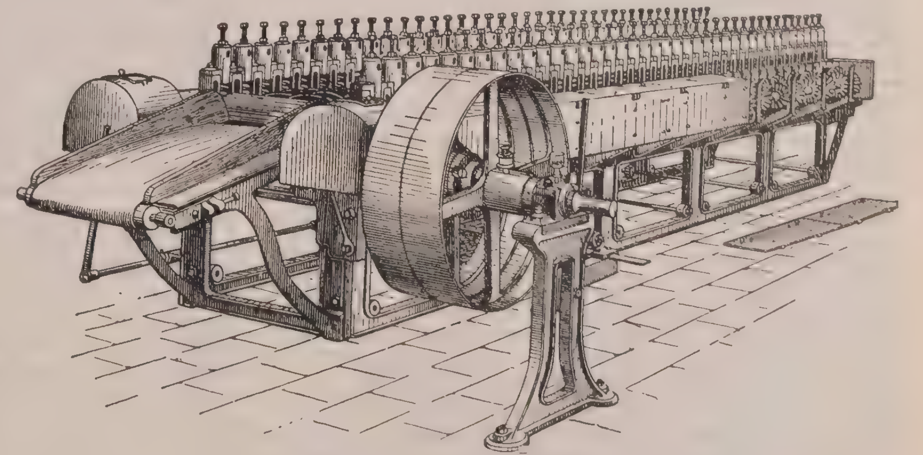

Fig. 4.—Jute Softening Machine.

When the moisture has spread sufficiently, the material is taken to the "breaker card," the first machine in the preparing department. A certain weight of jute, termed a "dollop," is laid upon the feed cloth for each revolution of the latter. The fibre, which should be arranged on the sheet as evenly as possible, is carried up by the feed cloth and passes between the feed roller and the shell on to the large cylinder. This cylinder, which has a high surface speed, carries part of the fibre towards the workers and strippers; the surface speed of the workers being much slower than that of the cylinder. The pins in the two rollers oppose each other, those of the workers being "back-set," and this arrangement, combined with the relative angle of the pins, and the difference in the surface speeds of the two rollers, results in part of the fibre being broken and carried round by the worker towards the stripper. This, as its name implies, strips the fibre off the worker, and carries it round to the cylinder. The pins of the stripper and cylinder point in the same direction, but since the surface speed of the cylinder is much greater than the surface speed of the stripper, it follows that the fibre is combed between the two, and that part is carried forward by the cylinder to be reworked. The strippers and workers are in pairs, of which there may be two or more. After passing the last pair of workers and strippers the fibre is carried forward towards the doffing roller, the pins of which are back-set, and the fibre is removed from the cylinder by the doffer, from which it passes between the drawing and pressing rollers into the conductor, and finally between the delivery and pressing rollers into the sliver can. It may be mentioned that more or less breaking takes place between each pair of rollers, the pins of which are opposed, and that combing and drawing out obtains between those rollers with pins pointing in the same direction. The ratio of the surface speeds of the drawing roller and the feed roller is termed the draft:—

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[1] Also in the forms "streek," "strick" or "strike," as in Chaucer, *Cant. Tales*, Prologue 676, where the Pardoner's hair is compared with a "strike of flax." The term is also used of a handful of hemp or other fibre, and is one of the many technical applications of "strike" or "streak," which etymologically are cognate words.

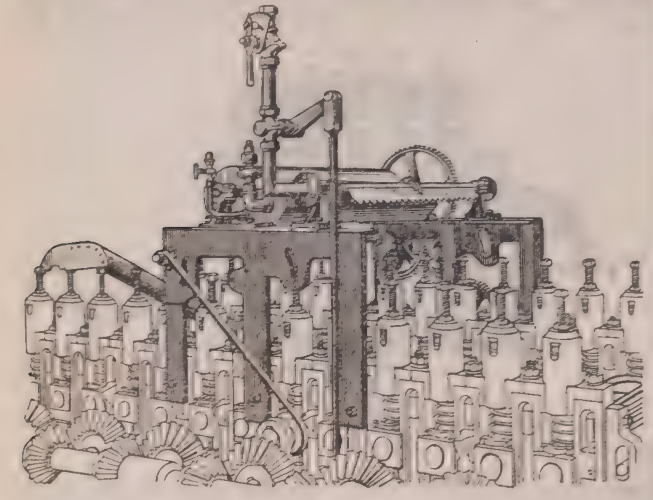

FIG. 5.—Improved Batching Gear.

$$\frac{\text{surface speed of drawing roller}}{\text{surface speed of feed roller}} = \text{draft}.$$

In this machine the draft is usually about thirteen.

The sliver from the can of the breaker card may be wound into balls, or it may be taken direct to the finisher card. In the latter method from eight to fifteen cans are placed behind the feed rollers, and all the slivers from these cans are united before they emerge from the machine. The main difference between a breaker card and a finisher card is that the latter is fitted with finer pins, that it contains two doffing rollers, and that it usually possesses a greater number of pairs of workers and strippers—a full circular finisher card having four sets.

After the fibre has been thoroughly carded by the above machines, the cans containing the sliver from the finisher card are taken to the first drawing frame. A very common method is to let four slivers run into one sliver at the first drawing, then two slivers from the first drawing are run into one sliver at the second drawing frame. There are several types of drawing frames, *e.g.* push-bar or slide, rotary, spiral, ring, open-link or chain, the spiral being generally used for the second drawing. All, however, perform the same function, viz., combing out the fibres and thus laying them parallel, and in addition drawing out the sliver. The designation of the machine indicates the particular method in which the gill pins are moved. These pins are much finer than those of the breaker and finisher cards, consequently the fibres are more thoroughly separated. The draft in the first drawing varies from three to five, while that in the second drawing is usually five to seven. It is easy to see that a certain amount of draft, or drawing out of the sliver, is necessary, otherwise the various doublings would cause the sliver to emerge thicker and thicker from each machine. The doublings play a very important part in the appearance of the ultimate rove and yarn, for the chief reason for doubling threads or slivers is to minimize irregularities of thickness and of colour in the material. In an ordinary case, the total doublings in jute from the breaker card to the end of the second drawing is ninety-six: 12 × 4 × 2 = 96; and if the slivers were made thinner and more of them used the ultimate result would naturally be improved.

The final preparing process is that of roving. In this operation there is no doubling of the slivers, but each sliver passes separately through the machine, from the can to the spindle, is drawn out to about eight times its length, and receives a small amount of twist to strengthen it, in order that it may be successfully wound upon the roving bobbin by the flyer. The chief piece of mechanism in the roving frame is the gearing known as the "differential motion." It works in conjunction with the disk and scroll, the cones, or the expanding pulley, to impart an intermittingly variable speed to the bobbin (each layer of the bobbin has its own particular speed which is constant for the full traverse, but each change of direction of the builder is accompanied by a quick change of speed to the bobbin). It is essential that the bobbin should have such a motion, because the delivery of the sliver and the speed of the flyer are constant for a given size of rove, whereas the layers of rove on the bobbin increase in length as the bobbin fills. In the jute roving frame the bobbin is termed the "follower," because its revolutions per minute are fewer than those of the flyer. Each layer of rove increases the diameter of the material on the bobbin shank; hence, at the beginning of each layer, the speed of the bobbin must be increased, and kept at this increased speed for the whole traverse from top to bottom or vice versa.

Let R = the revolutions per second of the flyer;
r = the revolutions per second of the bobbin;
d = the diameter of bobbin shaft plus the material;
L = the length of sliver delivered per second;
then $(R - r)\,d\,.\,\pi = L$.

In the above expression R, π and L are constant, therefore as d increases the term (R — r) must decrease: this can happen only when r is increased, that is, when the bobbin revolves quicker. It is easy to see from the above expression that if the bobbin were the "leader" its speed would have to decrease as it filled.

The builder, which receives its motion from the disk and scroll, from the cones, or from the expanding pulley, has also an intermittingly variable speed. It begins at a maximum speed when the bobbin is empty, is constant for each layer, but decreases as the bobbin fills.

The rove yarn is now ready for the spinning frame, where a further draft of about eight is given. The principles of jute spinning are similar to those of dry spinning for flax. For very heavy jute yarns the spinning frame is not used—the desired amount of twist being given at the roving frame.

The count of jute yarn is based upon the weight in pounds of 14,400 yds., such length receiving the name of "spyndle." The finest yarns weigh 2½ ℔ to 3 ℔ per spyndle, but the commonest kinds are 7 ℔, 8 ℔, 9 ℔ and 10 ℔ per spyndle. The sizes rise in pounds up to about 20 ℔, then by 2 ℔ up to about 50 ℔ per spyndle, with much larger jumps above this weight. It is not uncommon to find 200 ℔ to 300 ℔ rove yarn, while the weight occasionally reaches 450 ℔ per spyndle. The different sizes of yarn are extensively used in a large variety of fabrics, sometimes alone, sometimes in conjunction with other fibres, *e.g.* with worsted in the various kinds of carpets, with cotton in tapestries and household cloths, with line and tow yarns for the same fabrics and for paddings, &c., and with wool for horse clothing. The yarns are capable of being dyed brilliant colours, but, unfortunately, the colours are not very fast to light. The fibre can also be prepared to imitate human hair with remarkable closeness, and advantage of this is largely taken in making stage wigs.

For detailed information regarding jute, the cloths made from it and the machinery used, see the following works: Watts's *Dictionary of the Economic Products of India*; Royle's *Fibrous Plants of India*; Sharp's *Flax, Tow and Jute Spinning*; Leggatt's *Jute Spinning*; Woodhouse and Milne's *Jute and Linen Weaving*; and Woodhouse and Milne's *Textile Design: Pure and Applied.* (T. Wo.)

JÜTERBOG, or GÜTERBOG, a town of Germany in the Prussian province of Brandenburg, on the Nuthe, 39 m. S.W. of Berlin, at the junction of the main lines of railway from Berlin to Dresden and Leipzig. Pop. (1900), 7407. The town is surrounded by a medieval wall, with three gateways, and contains two Protestant churches, of which that of St Nicholas (14th century) is remarkable for its three fine aisles. There are also a Roman Catholic church, an old town-hall and a modern school. Jüterbog carries on weaving and spinning both of flax and wool, and trades in the produce of those manufactures and in cattle. Vines are cultivated in the neighbourhood. Jüterbog belonged in the later middle ages to the archbishopric of Magdeburg, passing to electoral Saxony in 1648, and to Prussia in 1815. It was here that a treaty over the succession to the duchy of Jülich was made in March 1611 between Saxony and Brandenburg, and here in November 1644 the Swedes defeated the Imperialists. Two miles S.W. of the town is the battlefield of Dennewitz where the Prussians defeated the French on the 6th of September 1813.

JUTES, the third of the Teutonic nations which invaded Britain in the 5th century, called by Bede *Iutae* or *Iuti* (see BRITAIN, ANGLO-SAXON). They settled in Kent and the Isle of Wight together with the adjacent parts of Hampshire. In the latter case the national name is said to have survived until Bede's own time, in the New Forest indeed apparently very much later. In Kent, however, it seems to have soon passed out of use, though there is good reason for believing that the inhabitants of that kingdom were of a different nationality from their neighbours (see KENT, KINGDOM OF). With regard to the origin of the Jutes, Bede only says that Angulus (Angel) lay between the territories of the Saxons and the Iutae—a statement which points to their identity with the Iuti or Jyder of later times, *i.e.* the inhabitants of Jutland. Some recent writers have preferred to identify the Jutes with a tribe called Eucii mentioned in a letter from Theodberht to Justinian (*Mon. Germ. Hist.*, *Epist. iii.*, p. 132 seq.) and settled apparently in the neighbourhood of the Franks. But these people may themselves have come from Jutland.

See Bede, *Hist. Eccles.* i. 15, iv. 16. (H. M. C.)

JUTIGALPA, or JUTICALPA, the capital of the department of Jutigalpa in eastern Honduras, on one of the main roads from the Bay of Fonseca to the Atlantic coast, and on a small left-hand tributary of the river Patuca. Pop. (1905), about 18,000. Jutigalpa is the second city of Honduras, being surpassed only by Tegucigalpa. It is the administrative centre of a mountainous region rich in minerals, though mining is rendered difficult by the lack of communications and the unsettled condition of the country. The majority of the inhabitants are Indians or half-castes, engaged in the cultivation of coffee, bananas, tobacco, sugar or cotton.

JUTLAND (Danish *Jylland*), though embracing several islands as well as a peninsula, may be said to belong to the continental portion of the kingdom of Denmark. The peninsula (Chersonese or Cimbric peninsula of ancient geography) extends northward, from a line between Lübeck and the mouth of the Elbe, for 270 m. to the promontory of the Skaw (Skagen), thus preventing a natural communication directly east and west between the Baltic and North Seas. The northern portion only is Danish, and bears the name Jutland. The southern is German, belonging to Schleswig-Holstein. The peninsula is almost at its narrowest (36 m.) at the frontier, but Jutland has an extreme breadth of 110 m. and the extent from the south-western point (near Ribe) to the Skaw is 180 m. Jutland embraces nine *amter* (counties), namely, Hjörring, Thisted, Aalborg, Ringkjöbing, Viborg, Randers, Aarhus, Vejle and Ribe. The main watershed of the peninsula lies towards the east coast; therefore such elevated ground as exists is found on the east, while the western slope is gentle and consists of a low sandy plain of slight undulation. The North Sea coast (western) and Skagerrack coast (north-western) consist mainly of a sweeping line of dunes with wide lagoons behind them. In the south the northernmost of the North Frisian Islands (Fanö) is Danish. Towards the north a narrow mouth gives entry to the Limfjord, or Liimfjord, which, wide and ramifying among islands to the west, narrows to the east and pierces through to the Cattegat, thus isolating the counties of Hjörring and Thisted (known together as Vendsyssel). It is, however, bridged at Aalborg, and its depth rarely exceeds 12 ft. The seaward banks of the lagoons are frequently broken in storms, and the narrow channels through them are constantly shifting. The east coast is slightly bolder than the west, and indented with true estuaries and bays. From the south-east the chain of islands forming insular Denmark extends towards Sweden, the strait between Jutland and Fünen having the name of the Little Belt. The low and dangerous coasts, off which the seas are generally very shallow, are efficiently served by a series of lifeboat stations. The western coast region is well compared with the Landes of Gascony. The interior is low. The Varde, Omme, Skjerne, Stor and Karup, sluggish and tortuous streams draining into the western lagoons, rise in and flow through marshes, while the eastern Limfjord is flanked by the swamps known as Vildmose. The only considerable river is the Gudenaa, flowing from S.W. into the Randersfjord (Cattegat), and rising among the picturesque lakes of the county of Aarhus, where the principal elevated ground in the peninsula is found in the Himmelbjerg and adjacent hills (exceeding 500 ft.). The German portion of the peninsula is generally similar to that of western Jutland, the main difference lying in the occurrence of islands (the North Frisian) off the west coast in place of sand-bars and lagoons. Erratic blocks are of frequent occurrence in south Jutland. (For geology, and the general consideration of Jutland in connexion with the whole kingdom, see DENMARK.)

Although in ancient times well wooded, the greater portion of the interior of Jutland consisted for centuries of barren drift-sand, which grew nothing but heather; but since 1866, chiefly through the instrumentality of the patriotic Heath association, assisted by annual contributions from the state, a very large proportion of this region has been more or less reclaimed for cultivation. The means adopted are: (i.) the plantation of trees; (ii.) the making of irrigation canals and irrigating meadows; (iii.) exploring for, extracting and transporting loam, a process aided by the construction of short light railways; and (iv.), since 1889, the experimental cultivation of fenny districts. The activity of the association takes the form partly of giving gratuitous advice, partly of experimental attempts, and partly of model works for imitation. The state also makes annual grants directly to owners who are willing to place their plantations under state supervision, for the sale of plants at half price to the poorer peasantry, for making protective or sheltering plantations, and for free transport of marl or loam. The species of timber almost exclusively planted are the red fir (*Picea excelsa*) and the mountain pine (*Pinus montana*). This admirable work quickly caused the population to increase at a more rapid rate in the districts where it was practised than in any other part of the Danish kingdom. The counties of Viborg, Ringkjöbing and Ribe cover the principal heath district.

Jutland is well served by railways. Two lines cross the frontier from Germany on the east and west respectively and run northward near the coasts. The eastern touches the ports of Kolding, Fredericia, Vejle, Horsens, Aarhus, Randers, Aalborg on Limfjord, Frederikshavn and Skagen. On the west the only port of first importance is Esbjerg. The line runs past Skjerne, Ringkjöbing, Vemb and Holstebro to Thisted. Both throw off many branches and are connected by lines east and west between Kolding and Esbjerg, Skanderborg and Skjerne, Langaa and Struer on Limfjord via Viborg. Of purely inland towns only Viborg in the midland and Hjörring in the extreme north are of importance.

JUTURNA (older form Diuturna, the lasting), an old Latin divinity, a personification of the never-failing springs. Her original home was on the river Numicius near Lavinium, where there was a spring called after her, supposed to possess healing qualities (whence the old Roman derivation from *juvare*, to help). Her worship was early transferred to Rome, localized by the Lacus Juturnae near the temple of Vesta, at which Castor and Pollux, after announcing the victory of lake Regillus, were said to have washed the sweat from their horses. At the end of the First Punic War Lutatius Catulus erected a temple in her honour on the Campus Martius, subsequently restored by Augustus. Juturna was associated with two festivals: the Juturnalia on the 11th of January, probably a dedication festival of a temple built by Augustus, and celebrated by the college of the *fontani*, workmen employed in the construction and maintenance of aqueducts and fountains; and the Volcanalia on the 23rd of August, at which sacrifice was offered to Volcanus, the Nymphs and Juturna, as protectors against outbreaks of fire. In Virgil, Juturna appears as the sister of Turnus (probably owing to the partial similarity of the names), on whom Jupiter, to console her for the loss of her chastity, bestowed immortality and the control of all the lakes and rivers of Latium. For the statement that she was the wife of Janus and mother of Fontus (or Fons), the god of fountains, Arnobius (*Adv. gentes* iii. 29) is alone responsible.

See Virgil, *Aeneid*, xii. 139 and Servius *ad loc.*; Ovid, *Fasti*, ii. 583–616; Valerius Maximus, i. 8. 1; L. Deubner, "Juturna und die Ausgrabungen auf dem römischen Forum," in *Neue Jahrb. f. das klassische Altertum* (1902), p. 370.

JUVENAL (Decimus Junius Juvenalis) (*c.* 60–140), Roman poet and satirist, was born at Aquinum. Brief accounts of his life, varying considerably in details, are prefixed to different MSS. of the works. But their common original cannot be traced to any competent authority, and some of their statements are intrinsically improbable. According to the version which appears to be the earliest:—

> "Juvenal was the son or ward of a wealthy freedman; he practised declamation till middle age, not as a professional teacher, but as an amateur, and made his first essay in satire by writing the lines on Paris, the actor and favourite of Domitian, now found in the seventh satire (lines 90 seq.). Encouraged by their success, he devoted himself diligently to this kind of composition, but refrained for a long time from either publicly reciting or publishing his verses. When at last he did come before the public, his recitations were attended by great crowds and received with the utmost favour. But the lines originally written on Paris, having been inserted in one of his new satires, excited the jealous anger of an actor of the time, who was a favourite of the emperor, and procured the poet's banishment under the form of a military appointment to the extremity of Egypt. Being then eighty years of age, he died shortly afterwards of grief and vexation."

Some of these statements are so much in consonance with the indirect evidence afforded by the satires that they may be a series of conjectures based upon them. The rare passages in which the poet speaks of his own position, as in satires xi. and xiii., indicate that he was in comfortable but moderate circumstances. We should infer also that he was not dependent on any professional occupation, and that he was separated in social station, and probably too by tastes and manners, from the higher class to which Tacitus and Pliny belonged, as he was by character from the new men who rose to wealth by servility under the empire. Juvenal is no organ of the pride and dignity, still less of the urbanity, of the cultivated representatives of the great families of the republic. He is the champion of the more sober virtues and ideas, and perhaps the organ of the rancours and detraction, of an educated but depressed and embittered middle class. He lets us know that he has no leanings to philosophy (xiii. 121) and pours contempt on the serious epic writing of the day (i. 162). The statement that he was a trained and practised declaimer is confirmed both by his own words (i. 16) and by the rhetorical mould in which his thoughts and illustrations are cast. The allusions which fix the dates when his satires first appeared, and the large experience of life which they imply, agree with the statement that he did not come before the world as a professed satirist till after middle age.

The statement that he continued to write satires long before he gave them to the world accords well with the nature of their contents and the elaborate character of their composition, and might almost be inferred from the emphatic but yet guarded statement of Quintilian in his short summary of Roman literature. After speaking of the merits of Lucilius, Horace and Persius as satirists, he adds, "There are, too, in our own day, distinguished writers of satire whose names will be heard of hereafter" (*Inst. Or.* x. 1, 94). There is no Roman writer of satire who could be mentioned along with those others by so judicious a critic, except Juvenal. The motive which a writer of satire must have had for secrecy under Domitian is sufficiently obvious; and the necessity of concealment and self-suppression thus imposed upon the writer may have permanently affected his whole manner of composition.

So far the original of these lives follows a not improbable tradition. But when we come to the story of the poet's exile the case is otherwise. The undoubted reference to Juvenal in Sidonius Apollinaris as the victim of the rage of an actor only proves that the original story from which all the varying versions of the lives are derived was generally believed before the middle of the 5th century of our era. If Juvenal was banished at the age of eighty, the author of his banishment could not have been the "enraged actor" in reference to whom the original lines were written, as Paris was put to death in 83, and Juvenal was certainly writing satires long after 100. The satire in which the lines now appear was probably first published soon after the accession of Hadrian, when Juvenal was not an octogenarian but in the maturity of his powers. The cause of the poet's banishment at that advanced age could not therefore have been either the original composition or the first publication of the lines.

An expression in xv. 45 is quoted as a proof that Juvenal had visited Egypt. He may have done so as an exile or in a military command; but it seems hardly consistent with the importance which the emperors attached to the security of Egypt, or with the concern which they took in the interests of the army, that these conditions were combined at an age so unfit for military employment. If any conjecture is warrantable on so obscure a subject, it is more likely that this temporary disgrace should have been inflicted on the poet by Domitian. Among the many victims of Juvenal's satire it is only against him and against one of the vilest instruments of his court, the Egyptian Crispinus, that the poet seems to be animated by personal hatred. A sense of wrong suffered at their hands may perhaps have mingled with the detestation which he felt towards them on public grounds. But if he was banished under Domitian, it must have been either before or after 93, at which time, as we learn from an epigram of Martial, Juvenal was in Rome.

More ancient evidence is supplied by an inscription found at Aquinum, recording, so far as it has been deciphered, the dedication of an altar to Ceres by a Iunius Iuvenalis, tribune of the first cohort of Dalmatians, *duumvir quinquennalis*, and *flamen Divi Vespasiani*, a provincial magistrate whose functions corresponded to those of the censor at Rome. This Juvenalis may have been the poet, but he may equally well have been a relation. The evidence of the satires does not point to a prolonged absence from the metropolis. They are the product of immediate and intimate familiarity with the life of the great city. An epigram of Martial, written at the time when Juvenal was most vigorously employed in their composition, speaks of him as settled in Rome. He himself hints (iii. 318) that he maintained his connexion with Aquinum, and that he had some special interest in the worship of the "Helvinian Ceres." Nor is the tribute to the national religion implied by the dedication of the altar to Ceres inconsistent with the beliefs and feelings expressed in the satires. While the fables of mythology are often treated contemptuously or humorously by him, other passages in the satires clearly imply a conformity to, and even a respect for, the observances of the national religion. The evidence as to the military post filled by Juvenal is curious, when taken in connexion with the confused tradition of his exile in a position of military importance. But it cannot be said that the satires bear traces of military experience; the life described in them is rather such as would present itself to the eyes of a civilian.

The only other contemporary evidence which affords a glimpse of Juvenal's actual life is contained in three epigrams of Martial. Two of these (vii. 24 and 91) were written in the time of Domitian, the third (xii. 18) early in the reign of Trajan, after Martial had retired to his native Bilbilis. The first attests the strong regard which Martial felt for him; but the subject of the epigram seems to hint that Juvenal was not an easy person to get on with. In the second, addressed to Juvenal himself, the epithet *facundus* is applied to him, equally applicable to his "eloquence" as satirist or rhetorician. In the last Martial imagines his friend wandering about discontentedly through the crowded streets of Rome, and undergoing all the discomforts incident to attendance on the levées of the great. Two lines in the poem suggest that the satirist, who inveighed with just severity against the worst corruptions of Roman morals, was not too rigid a censor of the morals of his friend. Indeed, his intimacy with Martial is a ground for not attributing to him exceptional strictness of life.

The additional information as to the poet's life and circumstances derivable from the satires themselves is not important. He had enjoyed the training which all educated men received in his day (i. 15); he speaks of his farm in the territory of Tibur

(xi. 65), which furnished a young kid and mountain asparagus for a homely dinner to which he invites a friend during the festival of the Megalesia. From the satire in which this invitation is contained we are able to form an idea of the style in which he habitually lived, and to think of him as enjoying a hale and vigorous age (203), and also as a kindly master of a household (159 seq.). The negative evidence afforded in the account of his establishment suggests the inference that, like Lucilius and Horace, Juvenal had no personal experience of either the cares or the softening influence of family life. A comparison of this poem with the invitation of Horace to Torquatus (*Ep.* i. 5) brings out strongly the differences not in urbanity only but in kindly feeling between the two satirists. Gaston Boissier has drawn from the indications afforded of the career and character of the persons to whom the satires are addressed most unfavourable conclusions as to the social circumstances and associations of Juvenal. If we believe that these were all real people, with whom Juvenal lived in intimacy, we should conclude that he was most unfortunate in his associates, and that his own relations to them were marked rather by outspoken frankness than civility. But they seem to be more "nominis umbrae" than real men; they serve the purpose of enabling the satirist to aim his blows at one particular object instead of declaiming at large. They have none of the individuality and traits of personal character discernible in the persons addressed by Horace in his *Satires* and *Epistles*. It is noticeable that, while Juvenal writes of the poets and men of letters of a somewhat earlier time as if they were still living, he makes no reference to his friend Martial or the younger Pliny and Tacitus, who wrote their works during the years of his own literary activity. It is equally noticeable that Juvenal's name does not appear in Pliny's letters.

The times at which the satires were given to the world do not in all cases coincide with those at which they were written and to which they immediately refer. Thus the manners and personages of the age of Domitian often supply the material of satiric representation, and are spoken of as if they belonged to the actual life of the present,[1] while allusions even in the earliest show that, as a finished literary composition, it belongs to the age of Trajan. The most probable explanation of these discrepancies is that in their present form the satires are the work of the last thirty years of the poet's life, while the first nine at least may have preserved with little change passages written during his earlier manhood. The combination of the impressions, and, perhaps of the actual compositions, of different periods also explains a certain want of unity and continuity found in some of them.

There is no reason to doubt that the sixteen satires which we possess were given to the world in the order in which we find them, and that they were divided, as they are referred to in the ancient grammarians, into five books. Book I., embracing the first five satires, was written in the freshest vigour of the author's powers, and is animated with the strongest hatred of Domitian. The publication of this book belongs to the early years of Trajan. The mention of the exile of Marius (49) shows that it was not published before 100. In the second satire, the lines 29 seq.,

> "Qualis erat nuper tragico pollutus adulter
> Concubitu,"

show that the memory of one of the foulest scandals of the reign of Domitian was still fresh in the minds of men. The third satire, imitated by Samuel Johnson in his *London*, presents such a picture as Rome may have offered to the satirist at any time in the 1st century of our era; but it was under the worst emperors, Nero and Domitian, that the arts of flatterers and foreign adventurers were most successful, and that such scenes of violence as that described at 277 seq. were most likely to occur;[2] while the mention of Veiento (185) as still enjoying influence is a distinct reference to the court of Domitian. The fourth, which alone has any political significance, and reflects on the emperor as a frivolous trifler rather than as a monster of lust and cruelty, is the reproduction of a real or imaginary scene from the reign of Domitian, and is animated by the profoundest scorn and loathing both of the tyrant himself and of the worst instruments of his tyranny. The fifth is a social picture of the degradation to which poor guests were exposed at the banquets of the rich, but many of the epigrams of Martial and the more sober evidence of one of Pliny's letters show that the picture painted by Juvenal, though perhaps exaggerated in colouring, was drawn from a state of society prevalent during and immediately subsequent to the times of Domitian.[3] Book II. consists of the most elaborate of the satires, by many critics regarded as the poet's masterpiece, the famous sixth satire, directed against the whole female sex, which shares with Domitian and his creatures the most cherished place in the poet's antipathies. It shows certainly no diminution of vigour either in its representation or its invective. The time at which this satire was composed cannot be fixed with certainty, but some allusions render it highly probable that it was given to the world in the later years of Trajan, and before the accession of Hadrian. The date of the publication of Book III., containing the seventh, eighth and ninth satires, seems to be fixed by its opening line to the first years after the accession of Hadrian. In the eighth satire another reference is made (120) to the misgovernment of Marius in Africa as a recent event, and at line 51 there may be an allusion to the Eastern wars that occupied the last years of Trajan's reign. The ninth has no allusion to determine its date, but it is written with the same outspoken freedom as the second and the sixth, and belongs to the period when the poet's power was most vigorous, and his exposure of vice most uncompromising. In Book IV., comprising the famous tenth, the eleventh and the twelfth satires, the author appears more as a moralist than as a pure satirist. In the tenth, the theme of the "vanity of human wishes" is illustrated by great historic instances, rather than by pictures of the men and manners of the age; and, though the declamatory vigour and power of expression in it are occasionally as great as in the earlier satires, and although touches of Juvenal's saturnine humour, and especially of his misogyny, appear in all the satires of this book, yet their general tone shows that the white heat of his indignation is abated; and the lines of the eleventh, already referred to (201 seq.),

> "Spectent juvenes quos clamor et audax
> Sponsio, quos cultae decet assedisse puellae:
> Nostra bibat vernum contracta cuticula solem,"

leave no doubt that he was well advanced in years when they were written.

Two important dates are found in Book V., comprising satires xiii.–xvi. At xiii. 16 Juvenal speaks of his friend Calvinus as now past sixty years of age, having been born in the consulship of Fonteius. Now L. Fonteius Capito was consul in 67. Again at xv. 27 an event is said to have happened in Egypt "nuper consule Iunco." There was a L. Aemilius Iuncus consul *suffectus* in 127. The fifth book must therefore have been published some time after this date. More than the fourth, this book bears the marks of age, both in the milder tone of the sentiments expressed, and in the feebler power of composition exhibited. The last satire is now imperfect, and the authenticity both of this and of the fifteenth has been questioned, though on insufficient grounds.

Thus the satires were published at different intervals, and for the most part composed between 100 and 130, but the most powerful in feeling and vivid in conception among them deal with the experience and impressions of the reign of Domitian, occasionally recall the memories or traditions of the times of Nero and Claudius, and reproduce at least one startling page from the annals of Tiberius.[4] The same overmastering feeling which constrained Tacitus (*Agric.* 2, 3), when the time of long endurance and silence was over, to recall the "memory of the former oppression," acted upon Juvenal. There is no evidence that these two great writers, who lived and wrote at the same time, who were animated by the same hatred of the tyrant under whom the best years of their manhood were spent, and who both felt most deeply the degradation of their times, were even known to one another. Tacitus belonged to the highest official and senatorial class, Juvenal apparently to the middle class and to that of the struggling men of letters; and this difference in position had much influence in determining the different bent of their genius, and in forming one to be a great national historian, the other to be a great social satirist. If the view of the satirist is owing to this circumstance more limited in some directions, and his taste and temper less conformable to the best ancient standards of propriety, he is also saved by it from prejudices to which the traditions of his class exposed the historian. But both writers are thoroughly national in sentiment, thoroughly masculine in tone. No ancient authors express so strong a hatred of evil. The peculiar greatness and value of both Juvenal and Tacitus is that they did not shut their eyes to the evil through which they had lived, but deeply resented it—the one with a vehement and burning passion, like the "saeva indignatio" of Swift, the other with perhaps even deeper but more restrained emotions of mingled scorn and sorrow, like the scorn and sorrow of Milton when "fallen on evil days and evil tongues." In one respect there is a difference. For Tacitus the prospect is not wholly cheerless, the detested tyranny was at an end, and its effects might disappear with a more beneficent rule. But the gloom of Juvenal's pessimism is unlighted by hope.

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[1] This is especially noticeable in the seventh satire, but it applies also to the mention of Crispinus, Latinus, the class of *delatores*, &c., in the first, to the notice of Veiento in the third, of Rubellius Blandus in the eighth, of Gallicus in the thirteenth, &c.

[2] Cf. Tacitus, *Annals*, xiii. 25.

[3] Pliny's remarks on the vulgarity as well as the ostentation of his host imply that he regarded such behaviour as exceptional, at least in the circle in which he himself lived (*Ep.* ii. 6).

[4] x. 56–107.

A. C. Swinburne has suggested that the secret of Juvenal's concentrated power consisted in this, that he knew what he hated, and that what he did hate was despotism and democracy. But it would be hardly true to say that the animating motive of his satire was political. It is true that he finds the most typical examples of lust, cruelty, levity and weakness in the emperors and their wives—in Domitian, Otho, Nero, Claudius and Messalina. It is true also that he shares in the traditional idolatry of Brutus, that he strikes at Augustus in his mention of the "three disciples of Sulla," and that he has no word of recognition for what even Tacitus acknowledges as the beneficent rule of Trajan. So too his scorn for the Roman populace of his time, who cared only for their dole of bread and the public games, is unqualified. But it is only in connexion with its indirect effects that he seems to think of despotism; and he has no thought of democracy at all. It is not for the loss of liberty and of the senatorian rule that he chafes, but for the loss of the old national manliness and self-respect. This feeling explains his detestation of foreign manners and superstitions, his loathing not only of inhuman crimes and cruelties but even of the lesser derelictions from self-respect, his scorn of luxury and of art as ministering to luxury, his mockery of the poetry and of the stale and dilettante culture of his time, and perhaps, too, his indifference to the schools of philosophy and his readiness to identify all the professors of stoicism with the reserved and close-cropped puritans, who concealed the worst vices under an outward appearance of austerity. The great fault of his character, as it appears in his writings, is that he too exclusively indulged this mood. It is much more difficult to find what he loved and admired than what he hated. But it is characteristic of his strong nature that, where he does betray any sign of human sympathy or tenderness, it is for those who by their weakness and position are dependent on others for their protection—as for "the peasant boy with the little dog, his playfellow,"[1] or for "the home-sick lad from the Sabine highlands, who sighs for his mother whom he has not seen for a long time, and for the little hut and the familiar kids."[2]

If Juvenal is to be ranked as a great moralist, it is not for his greatness and consistency as a thinker on moral questions. In the rhetorical exaggeration of the famous tenth satire, for instance, the highest energies of patriotism—the gallant and desperate defence of great causes, by sword or speech—are quoted as mere examples of disappointed ambition; and, in the indiscriminate condemnation of the arts by which men sought to gain a livelihood, he leaves no room for the legitimate pursuits of industry. His services to morals do not consist in any positive contributions to the notions of active duty, but in the strength with which he has realized and expressed the restraining influence of the old Roman and Italian ideal of character, and also of that religious conscience which was becoming a new power in the world. Though he disclaims any debt to philosophy (xiii. 121), yet he really owes more to the "Stoica dogmata," then prevalent, than he is aware of. But his highest and rarest literary quality is his power of painting characters, scenes, incidents and actions, whether from past history or from contemporary life. In this power, which is also the great power of Tacitus, he has few equals and perhaps no superior among ancient writers. The difference between Tacitus and Juvenal in power of representation is that the prose historian is more of an imaginative poet, the satirist more of a realist and a grotesque humorist. Juvenal can paint great historical pictures in all their detail—as in the famous representation of the fall of Sejanus; he can describe a character elaborately or hit it off with a single stroke. The picture drawn may be a caricature, or a misrepresentation of the fact—as that of the father of Demosthenes, "blear-eyed with the soot of the glowing mass," &c.—but it is, with rare exceptions, realistically conceived, and it is brought before us with the vivid touches of a Defoe or a Swift, or of the great pictorial satirist of the 18th century, Hogarth. Yet even in this, his most characteristic talent, his proneness to exaggeration, the attraction which coarse and repulsive images have for his mind, and the tendency to sacrifice general effect to minuteness of detail not infrequently mar his best effects.

The difficulty is often felt of distinguishing between a powerful rhetorician and a genuine poet, and it is felt particularly in the case of Juvenal. He himself knew and has well described (vii. 53 seq.) the conditions under which a great poet could flourish; and he felt that his own age was incapable of producing one. He has little sense of beauty either in human life or nature. Whenever such sense is evoked it is only as a momentary relief to his prevailing sense of the hideousness of contemporary life, or in protest against what he regarded as the enervating influences of art. Even his references to the great poets of the past indicate rather a *blasé* sense of indifference and weariness than a fresh enjoyment of them. Yet his power of touching the springs of tragic awe and horror is a genuine poetical gift, of the same kind as that which is displayed by some of the early English dramatists. But he is, on the whole, more essentially a great rhetorician than a great poet. His training, the practical bent of his understanding, his strong but morose character, the circumstances of his time, and the materials available for his art, all fitted him to rebuke his own age and all after-times in the tones of a powerful preacher, rather than charm them with the art of an accomplished poet. The composition of his various satires shows no negligence, but rather excess of elaboration; but it produces the impression of mechanical contrivance rather than of organic growth. His movement is sustained and powerful, but there is no rise and fall in it. The verse is most carefully constructed, and is also most effective, but it is so with the rhetorical effectiveness of Lucan, not with the musical charm of Virgil. The diction is full, even to excess, of meaning, point and emphasis. Few writers have added so much to the currency of quotation. But his style altogether wants the charm of ease and simplicity. It wearies by the constant strain after effect, its mock-heroics and allusive periphrasis, and excites distrust by its want of moderation.

On the whole no one of the ten or twelve really great writers of ancient Rome leaves on the mind so mixed an impression, both as a writer and as a man, as Juvenal. He has little, if anything at all, of the high imaginative mood—the mood of reverence and noble admiration—which made Ennius, Lucretius and Virgil the truest poetical representatives of the genius of Rome. He has nothing of the wide humanity of Cicero, of the urbanity of Horace, of the ease and grace of Catullus. Yet he represents another mood of ancient Rome, the mood natural to her before she was humanized by the lessons of Greek art and thought. If we could imagine the elder Cato living under Domitian, cut off from all share in public life, and finding no outlet for his combative energy except in literature, we should perhaps understand the motives of Juvenal's satire and the place which is his due as a representative of the genius of his country. As a man he shows many of the strong qualities of the old Roman plebeian—the aggressive boldness, the intolerance of superiority and privilege, which animated the tribunes in their opposition to the senatorian rule. Even where we least like him we find nothing small or mean to alienate our respect from him. Though he loses no opportunity of being coarse, he is not licentious; though he is often truculent, he cannot be called malignant. It is, indeed, impossible to say what motives of personal chagrin, of love of detraction, of the mere literary passion for effective writing, may have contributed to the indignation which inspired his verse. But the prevailing impression we carry away after reading him is that in all his early satires he was animated by a sincere and manly detestation of the tyranny and cruelty, the debauchery and luxury, the levity and effeminacy, the crimes and frauds, which we know from other sources were then rife in Rome, and that a more serene wisdom and a happier frame of mind were attained by him when old age had somewhat allayed the fierce rage which vexed his manhood.

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[1] . . . . "Meliusne hic rusticus infans
Cum matre et casulis et conlusore catello," &c.—ix. 60.

[2] xi. 152, 153.

AUTHORITIES.—The remarkable statements in a "life" found in a late Italian MS. (Barberini, viii. 18), "Iunius Iuvenalis Aquinas Iunio Iuvenale patre matre vero Septumuleia ex Aquinati municipio Claudio Nerone et L. Antistio consulibus (55) natus est, sororem habuit Septumuleiam quae Fuscino (*Sat.* xiv. 1) nupsit," though not necessarily false, cannot be accepted without confirmation.

The earliest evidence for the banishment of Juvenal is that of Sidonius Apollinaris (*c.* 480), *Carm.* ix. 269, "Non qui tempore Caesaris secundi | Aeterno coluit Tomos reatu | Nec qui consimili deinde casu | Ad vulgi tenuem strepentis auram | Irati fuit histrionis exul," lines which by the exact parallel drawn between Ovid's fate and Juvenal's imply the belief that Juvenal died in exile. The banishment is also mentioned by J. Malalas, a Greek historian subsequent to Justinian, who gives the place as Pentapolis in Africa, *Chron.* x. 262, Dindorf. The inscription (on a stone now lost) is as follows, the words and letters in brackets being the conjectural restorations of scholars:—"[Cere] ri sacrum| [D. Iu] nius Iuvenalis | trib. coh. [I] Delmatarum | IIvir quinq. flamen | divi Vespasiani | vovit dedicav[it] que | sua pec.," *Corp. inscr. lat.* X. 5382, xiii. 201 sqq. The best of the known manuscripts of Juvenal (P) is at Montpellier (125); but there are several others which cannot be neglected. Amongst these may be specially mentioned the Bodleian MS. (Canon. Lat. 41), which contains a portion of Satire vi., the existence of which was unknown until E. O. Winstedt published it in the *Classical Review* (1899), pp. 201 seq. Another fragment in the Bibliothèque Nationale was described by C. E. Stuart in the *Classical Quarterly* (Jan. 1909). Numerous scholia and glossaries attest the interest taken in Juvenal in post-classical times and the middle ages. There are two classes of scholia—the older or "Pithoeana," first published by P. Pithoeus, and the "Cornutus scholia" of less value, specimens of which have been published by various scholars. The earliest edition which need now be mentioned is that of P. Pithoeus, 1585, in which P was first used for the text. Amongst later ones we may mention the commentaries of Ruperti (1819) and C. F. Heinrich (1839, with the old scholia), O. Jahn (1851, critical with the old scholia), A. Weidner (1889), L. Friedländer (1895, with a full verbal index). The most useful English commentaries are those of J. E. B. Mayor (a voluminous and learned commentary on thirteen of the *Satires*, ii., vi. and ix. being omitted), J. D. Lewis (1882, with a prose translation) and J. D. Duff (1898, expurgated, and ii. and ix. being omitted). There are recent critical texts: conservative and chiefly based on P, by F. Buecheler (1893, with selections from the scholia) and S. G. Owen (in the Oxford Series of Texts); on the other side, by A. E. Housman (1905) and by the same, but with fewer innovations, in the new *Corpus poetarum latinorum*, fasc. v. The two last-named editors alone give the newly discovered lines of Satire vi. There are no recent translations of Juvenal into English verse. Dryden translated i., iii., vi., x. and xvi., the others being committed to inferior hands. Other versions are Gifford's (1802), of some merit, and C. Badham's (1814). Johnson's imitations of Satires iii. and x. are well known. For the numerous articles and contributions to the criticism and elucidation of the *Satires*, reference should be made to Teuffel's *Geschichte der römischen Litteratur* (Eng. trans. by Warre), § 331, and Schanz, ditto (1901, ii. § 2, § 420*a*). (W. Y. S.; J. P. P.)

JUVENCUS, GAIUS VETTIUS AQUILINUS, Christian poet, flourished during the reign of Constantine the Great. Nothing is known of him except that he was a Spanish presbyter of distinguished family. About 330 he published his *Libri evangeliorum IV.*, each book containing about 800 hexameters. The division into books is possibly a reminiscence of the number of the Gospels. The work itself, written with the idea of ousting the absurdities of Pagan mythology and replacing them by the truths of Christianity, may be called the first Christian epic. In the *Praefatio* the author expresses the hope that the sacredness of his subject may procure him safety at the final conflagration of the world and admission into heaven. The whole is, in the main, a poetical version of the Gospel of Matthew, the other evangelists only being used for supplementary details. It is founded upon a pre-vulgate Latin translation, although there is evidence that Juvencus also consulted the Greek. In spite of metrical irregularities, the language and style are simple and show good taste, being free from the artificiality of other Christian poets and prose writers, and the author has made excellent use of Virgil (his chief model) and other classical writers. Juvencus set the fashion of verse translations of the Bible, and the large number of MSS. of his poem mentioned in lists and still extant are sufficient evidence of its great popularity. According to Jerome, he was also the author of some poems on the sacraments, but no trace of these has survived. The Latin *Heptateuch*, a hexameter version of the first seven books of the Old Testament, has been attributed to Juvencus amongst others; but it is now generally supposed to be the work of a certain Cyprianus, a Gaul who lived in the 6th century, possibly a bishop of Toulon, author of the *Life of Caesarius*, bishop of Arelate (Arles).

See M. Manitius, *Geschichte der christlich-lateinischen Poesie* (1891); A. Ebert, *Allgemeine Geschichte der Literatur des Mittelalters*, vol. i. (1889); editions of Juvencus by C. Marold (1886); J. Hümer in *Corpus scriptorum ecclesiasticorum latinorum*, vol. xxiv. (Vienna, 1891); J. T. Hatfield, *A Study of Juvencus* (1890), dealing with syntax, metre and language; editions of the *Heptateuch* by J. E. B. Mayor (1889; reviewed by W. Sanday in *Classical Review*, October 1889, and by J. T. Hatfield in *American Journal of Philology*, vol. xi., 1890), and R. Peiper, vol. xxiii. of the Vienna series above.

JUVENILE OFFENDERS. In modern social science the question of the proper penal treatment of juvenile (*i.e.* non-adult) offenders has been increasingly discussed; and the reformatory principle, first applied in the case of children, has even been extended to reclaimable adult offenders (juveniles in crime, if not in age) in a way which brings them sufficiently within the same category to be noticed in this article. In the old days the main idea in England was to use the same penal methods for all criminals, young and old; when the child broke the law he was sent to prison like his elders. It was only in comparatively recent times that it was realized that child criminals were too often the victims to circumstances beyond their own control. They were cursed with inherited taint; they were brought up among evil surroundings; they suffered from the culpable neglect of vicious parents, and still more from bad example and pernicious promptings. They were rather potential than actual criminals, calling for rescue and regeneration rather than vindictive reprisals. Under the old system a painstaking English gaol chaplain calculated that 58% of all criminals had made their first lapse at fifteen. Boys and girls laughed at imprisonment. Striplings of thirteen and fourteen had been committed ten, twelve, sixteen or seventeen times. Religion and moral improvement were little regarded in prisons, industrial and technical training were impossible. The chief lesson learnt was an intimate and contemptuous acquaintance with the demoralizing interior of a gaol. There were at one time in London 200 "flash houses" frequented by 6000 boys trained and proficient in thieving and depredation.

The substantial movement for reform dates from the protests of Charles Dickens, who roused public opinion to such an extent that the first Reformatory School Act was passed in 1854. Sporadic efforts to meet the evil had indeed been made earlier. In 1756 the Marine Society established a school for the reception and reform of younger criminals; in 1788 the City of London formed a similar institution, which grew much later into the farm school at Redhill. In 1838 an act of parliament created an establishment at Parkhurst for the detention and correction of juvenile offenders, to whom pardon was given conditional on their entrance into some charitable institution. Parkhurst was technically a prison, and the system combined industrial training with religious and educational instruction. These earlier efforts had, however, been quite insufficient to meet the evils, for in the years immediately preceding 1854 crime was being so constantly reinforced in its beginnings, under the existing penal system, that it threatened to swamp the country. Unofficial, but more or less accurate, figures showed that between 11,000 and 12,000 juveniles passed annually through the prisons of England and Wales, a third of the whole number being contributed by London alone. In 1854 the total reached 14,000. The ages of offenders ranged from less than twelve to seventeen; 60% of the whole were between fourteen and seventeen; 46% had been committed more than once; 18% four times and more.

The Reformatory School Act 1854, which was thrashed out at conferences held in Birmingham in 1851 and 1853, substituted the school for the gaol, and all judicial benches were empowered to send delinquents to schools when they had been guilty of acts punishable by short imprisonment, the limit of which was at first fourteen and became afterwards ten days. A serious flaw in this act long survived; this was the provision that a short period of imprisonment in gaol must precede reception into the reformatory; it was upheld by well-meaning but mistaken people as essential for deterrence. But more enlightened opinion condemned the rule as inflicting an indelible prison taint and breeding contamination, even with ample and effective safeguards. Wiser legislation has followed, and an act of 1899 abolished preliminary imprisonment.

Existing reformatories, or "senior home office schools" as they are officially styled, in England numbered 44 in 1907. They receive all juvenile offenders, up to the age of sixteen, who have been convicted of an offence punishable with penal servitude or imprisonment. The number of these during the years between 1894 and 1906 constantly varied, but the figure of the earliest date, 6604, was never exceeded, and in some years it was considerably less, while in 1906 it was no more than 5586, though the general population had increased by several millions in the period. These figures, in comparison with those of 1854, must be deemed highly satisfactory, even when we take into account that the latter went up to the age of seventeen. Older offenders, between sixteen and twenty-one, come within the category of juvenile adults and are dealt with differently (see *Borstal Scheme* below).

Other schools must be classed with the reformatory, although they have no connexion with prisons and deal with youths who are only potential criminals. The first in importance are the industrial schools. When the newly devised reformatories were doing excellent service it was realized that many of the rising generation might some day lapse into evil ways but were still on the right side and might with proper precautions be kept there. They wanted preventive, not punitive treatment, and for them industrial schools were instituted. The germ of these establishments existed in the Ragged Schools, "intended to educate destitute children and save them from vagrancy and crime." They had been invented by John Pounds (1766–1839), a Portsmouth shoemaker, who, early in the 19th century, was moved with sympathy for these little outcasts and devoted himself to this good work. The ragged school movement found powerful support in active philanthropists when public attention was aroused to the prevalence of juvenile delinquency. The first Industrial School Act was passed in 1856 and applied only to Scotland. Next year its provisions were extended to England, and their growth was rapid. There were 45 schools in the beginning; in 1878 the number had more than been doubled; in 1907 there were 102 in England and Wales and 31 in Scotland.

The provisions of the Education Acts 1871 and 1876 led to a large increase in the number of children committed for breaches of the law and to the establishment of two kinds of subsidiary industrial schools, short detention of truant schools and day industrial schools in which children do not reside but receive their meals, their elementary education and a certain amount of industrial training. The total admissions to truant schools in 1907 were 1368 boys, and the numbers actually in the schools on the last day of that year were 1125 with 2568 on licence. The average length of detention was fourteen weeks and three days on first admission, seventeen weeks and five days on first re-admission, and twenty-three weeks six days on second re-admission. The total number of admissions into truant schools from 1878 to the end of 1907 was 44,315, of whom just half had been licensed and not returned, 11,239 had been licensed and once re-admitted, 8900 had been re-admitted twice or oftener.

The day industrial schools owed their origin to another reason than the enforcement of the Education Acts. It was found that some special treatment was required for large masses of youths in large cities, who were in such a neglected or degraded condition that there was little hope of their growing into healthy men and women or becoming good citizens. They were left unclean, were ill-fed and insufficiently clothed, and were not usefully taught. The total number who attended these day schools in 1907 was 1951 boys and 1232 girls.

The disciplinary system of the English schools is planned upon the establishment or institution system, as opposed to that of the "family" or "boarding out" systems adopted in some countries, and some controversy has been aroused as to the comparative value of the methods. The British practice has always favoured the well-governed school, with the proviso that it is kept small so that the head may know all of his charges. But a compromise has been effected in large establishments by dividing the boys into "houses," each containing a small manageable total as a family under an official father or head. Under this system the idea of the home is maintained, while uniformity of treatment and discipline is secured by grouping several houses together under one general authority. The plan of "boarding out" is not generally approved of in England; the value of the domestic training is questionable and of uncertain quality, depending entirely upon the character and fitness of the foster-parents secured. Education must be less systematic in the private home, industrial training is less easily carried out, and there can be none of that *esprit de corps* that stimulates effort in physical training as applied to athletics and the playing of games. No very definite decision has been arrived at as to the comparative merits of institution life and boarding out. Among the Latin races—France, Italy, Portugal and Spain—the former is as a rule preferred; also in Belgium; in Germany, Holland and the United States placing out in private families is very much the rule; in Austria-Hungary and Russia both methods are in use.

The total admissions to English reformatory schools from their creation to the 31st of December 1907 amounted to 76,455, or 64,031 boys and 12,424 girls. The total discharges for the same period were 70,890, or 59,081 boys and 11,809 girls. The results may be tested by the figures for those discharged in 1904, 1905 and 1906:—

Boys.—3573 were placed out, of whom 66 had died, leaving 3507; of these it was found that 2735 (or about 78%) were in regular employment; 158 (or about 4%) were in casual employment; 439 (or about 13%) had been convicted; and 175 (or about 5%) were unknown.

Girls.—480, of whom 11 had died, leaving 469; of these it was found that 384 (or about 82%) were in regular employment; 28 (or about 6%) were in casual employment; 17 (or about 4%) had been convicted, and 40 (or about 8%) were unknown.

For industrial schools, including truant and day schools, the total admissions, up to the 31st of December 1907, were 153,893, or 120,955 boys and 32,938 girls. The total discharges to the same date (excluding transfers) were 136,961, or 108,398 boys and 28,563 girls. The results as tested by those discharged in 1904, 1905 and 1906 were as follow:—

Boys.—8909 were placed out, of whom 118 had since died, leaving 8791 to be reported on; of these it was found that 7547 (or about 86%) were in regular employment; 415 (or about 4·7%) were in casual employment; 419 (or about 4·7%) convicted or recommitted; and 410 (or about 4·6%) unknown.

Girls.—2505 placed out, of whom 50 had died, leaving 2455; of these 2180 (or about 89 %) were in regular employment; 112 (or about 4 %) were in casual employment; 21 (or about 1 %) convicted or re-committed; and 142 (or about 6 %) unknown.

These results are of course wholly independent of those achieved by the juvenile-adult prison reformatory at Borstal instituted in October 1902. The record of the first year's work of this excellent system showed that 50 % of cases placed out had done well, thanks to the system and philanthropic labours of the Borstal Association.

An interesting point in regard to the reclamation of these criminally inclined juveniles is the nature of the employments to which they have been recommended, and in which, as shown, they have done so well. In 1904, 1905 and 1906, the total number of boys discharged and placed was 12,482. By far the largest number of these, nearly a sixth, joined the army, 679 of them entering the bands; 292 joined the navy; 961 the mercantile marine; 1567 went to farm service; 414 worked in factories or mills as skilled hands; but others joined as labourers, a general class the total of which was 1096. Other jobs found included miners (629), carters (352), iron or steel workers (214), mechanics (301), shoemakers (181), tailors (161), shop assistants (228), carpenters (178), bakers (131), messengers and porters, including 112 errand boys (315). The balance found employment in smaller numbers at other trades. The fate of 585 was unknown, 858 had been re-convicted, and the balance were in unrecorded or casual employment.

The outlets found by the girls from these various schools naturally follow lines appropriate to their sex and the instruction received. Out of a total of 2985 discharged in the three years mentioned, 1235 became general servants, 268 housemaids, 203 laundry-maids, 52 cooks, 98 nursemaids, 65 dressmakers, 221 were engaged in factories and mills, and the balance was made up by marriage, death or casual employment.

In Ireland the reformatory and industrial school system conforms to that of Great Britain. There were in 1905 six reformatory and 70 industrial schools in Ireland, mostly under Roman Catholic management.

A short account of the reformatory methods of dealing with juvenile offenders in certain other countries will fitly find a place here.

Austria-Hungary.—The law leaves children of less than ten years of age to domestic discipline, as also children above that age if not exactly criminal, although the latter may be sent to correctional schools. There they are detained for varying periods, but never after twenty years of age, and they may be sent out on licence to situations or employment found for them. These schools also receive children between ten and fourteen guilty of crimes which are, however, by law deemed "contraventions" only; also the destitute between the same ages and the incorrigible whose parents cannot manage them.

In Hungary the penal code prescribes that children of less than twelve cannot be charged with offences; those between twelve and sixteen may be deemed to have acted without discretion, and thus escape sentence, but are sent to a correctional school where they may be detained till they are twenty years of age. An excellent system prevails in Hungary by which the supervision of those liberated is entrusted to a "protector," a philanthropic person in the district who visits and reports upon the conduct of the boys, much like the "probation officer" in the United States.

Belgium.—The law of November 1891 places the whole mass of juveniles—those who are likely to give trouble and those who have already done so—at the disposal of the state. The system is very elastic, realizing the infinite variety of childish natures. The purely paternal régime would be wasted upon the really vicious; a severe discipline would press too heavily on the well-disposed. Accordingly, all juveniles, male and female, are divided into six principal classes with a corresponding treatment, it being strictly ruled that there is no intermingling of the classes; the very youngest, rescued early, are never to be associated with the older, who may be already vicious and degraded and who could not fail to exercise a pernicious influence. One of the great merits of the Belgian system is that the regulations may be relaxed, and children of whose amendment good hopes are entertained may be released provisionally, either to the care of parents and guardians or to employers, artisans or agriculturists who will teach them a trade.

Denmark.—There were 61 establishments of all classes for juveniles in Denmark in 1906, holding some 2000 inmates. In 1874, by the will of Countess Danner, a large female refuge was founded at Castle Jagerspris, which holds some 360 girls. Another of the same class is the Royal Vodrofsvei Bonnehjem at Copenhagen, founded in the same year by Mlle Schneider. The régime preferred in Denmark is that of the family or the very small school. The Jagerspris system is to divide the whole number of 360 into small parties of 20 each under a nurse or official mother. Employment in Danish schools is mainly agricultural, field labour and gardening, with a certain amount of industrial training; and on discharge the inmates go to farms or to apprenticeship, while a few emigrate.

France.—There are five methods of disposing of juvenile offenders in France:—

1. The preliminary or preventative prison (*maisons d'arrêt* and *de justice*) for those arrested and accused.
2. The ordinary prison for all sentenced to less than six months, whose time of detention is too short to admit of their transfer to a provincial colony. It also receives children whom parents have found unmanageable.
3. The public or private penitentiary colony for the irresponsible children, acquitted as "without discretion," as well as for the guilty sentenced to more than six months' and less than two years' detention.
4. The correctional colony, where the system is more severe, receiving all sentenced for more than two years and all who have misconducted themselves in the milder establishments.
5. Various penitentiary houses for young females, whatever their particular sentence.

Foremost among French penal reformers stands the name of F. A. Demetz (1796–1873), the founder of the famous colony of Mettray. M. Demetz was a judge who, aghast at the evils inflicted upon children whom he was compelled by law to imprison, left the bench and undertook to find some other outlet for them. At that time the French law, while it acquitted minors shown to have acted without discretion, still consigned them for safe keeping and inevitable contamination to the common gaols. M. Demetz conceived the idea of an agricultural colony, and in 1840 organized a small "*société paternelle*," as it was called, of which he became vice-president. Another philanthropist, the Vicomte de Bretignières de Courteilles, a landed proprietor in Touraine, associated himself in the enterprise and endowed the institution with land at Mettray near Tours. The earliest labours at Mettray were in the development of the institution, but as this approached completion they were applied to farmwork, agricultural employment being the chief feature of the place. The motto and device of Mettray was "the moralization of youth by the cultivation of the soil"; a healthy life in the open air was to replace the enervating and demoralizing influences of the confined prisons; and this was effected in the usual farming operations, to which were added gardening, vine-dressing, the raising of stock and the breeding of silkworms. The labour was not light; on the contrary, the directors of the colony sought by constant employment to send their charges to bed tired, ready to sleep soundly and not romp and chatter in their dormitories. The excellence of its aims, and the manifestly good results that were growing out of the system, soon made Mettray a model for imitation in France and beyond it. Many establishments were planned upon it, started by the state or private enterprise; penitentiary colonies were created for boys in connexion with some of the great central prisons. The colony of Val de Yèvre has a good record. It was started by a private philanthropist, Charles J. M. Lucas, (1803–1889) but after five-and-twenty years was handed over to the state. Other cognate establishments are those of Petit Quevilly near Rouen, Petit Bourg near Paris, St Hiliar and Eysses. There are several female colonies, especially that of Darnetal at Rouen.

It is for the magistrate or *juge d'instruction* to select the class of establishment to which the juvenile delinquents brought before him shall be committed. The very young, those of twelve years of age and under, are placed out in the country with families, unless they can be again entrusted to their parents or committed to *maisons paternels*, containing very limited numbers, twenty or thirty, in charge of a large staff. After twelve, and from that age to fourteen or fifteen, the "ungrateful age" as the French call it, boys are sent to a reformatory or "preservative school," where they will be under stronger discipline. For the third class, from fifteen to sixteen or eighteen, stricter measures are necessary, so as to dispose of them in specially selected penal colonies, as has already been done at Eysses, where the discipline is severe, while embodying technical and industrial instruction.

Germany.—In most parts of the German Empire juvenile delinquents and neglected youths are treated in the same establishments. No child of less than twelve years of age can be proceeded against in a court of law, although in some German states destitute or abandoned children have been taken at the ages of six, five and even three years. Youths between twelve and eighteen may be convicted, but their offences are passed over if they are proved to have acted without discretion. There are many kinds of correctional institutions and a number of schools not of a correctional character. These last are generally very small, the largest taking barely a hundred, but are very numerous. Many private persons have devoted themselves to the work. Count A. von der Recke-Volmerstein (1791–1878) about 1821 founded a refuge for neglected children in Düsselthal, between Düsseldorf and Elberstadt. Pastor T. F. Fliedner (1800–1864) built up a fine establishment at Kaiserswerth from 1833, in which was an infant school, a penitentiary and an orphan asylum. Another famous name is that of W. von Türk (1774–1846), who studied under Pestalozzi in Switzerland.

A school which has largely influenced public opinion in Great Britain, as in Germany, is the Rauhe Haus, near Hamburg, founded by Dr Wickern in 1833. This began with a single cottage but had grown in twenty years to a hamlet of twenty houses, with from twelve to sixteen inmates in each. The establishment is a Lutheran one; both boys and girls are admitted, in separate houses, and a marked feature of the place is the number of "brothers," young men of good character qualifying for rescue work as superintendents of homes, prison officers and schoolmasters. They take part in the work and are in constant touch with the boys whom they closely supervise, being bound to "keep them in sight day and night, eat with them, sleep in their dormitories, direct their labour, accompany them to chapel, join in their recreations and sports." These "brothers" are honourably known throughout the world and have performed a large work in distant lands as missionaries, prison officers and schoolmasters. The Rauhe Haus receives three classes of juveniles: first, the boys, mostly street arabs; second, girls of the same category; third, children taken as boarders from private families, who confess their inability to manage them. The instruction given is in trades, in farming operations, gardening and fruit-raising. The pupils are largely assisted on release, through the good offices of the citizens of Hamburg.

Holland.—In the Low Countries, refuges, called "Godshuis," were founded as early as the 14th century, intended for the care and shelter of neglected youth and indigent old age. In the 17th century people came from all parts of Europe to learn from the Dutch how orphans and unfortunate children could best be cared for. The Godshuis of Amsterdam was a vast establishment, into which as many as 4000 juveniles were sometimes crowded, with such disastrous effects that its name was changed to that of "pesthuis," and the government in the beginning of the present century ordered it to be emptied and closed. Other reformatory institutions in Holland are the Netherlands Mettray, the reform school of Zetten, near the Arnheim railway station, for Protestant girls; and that of Alkmaar for boys; the reformatory school of St Vincent de Paul at Amsterdam for both sexes; the Amsterdam reformatory for young vagabonds, male and female; the reform school of Smallepod at Amsterdam. The Netherlands Mettray, which is about five hours' journey from Amsterdam on a farm called Rissjelt, near Zutphen, is planned on the model of the French Mettray and was founded about 1855 by M. Suringar, a veteran Dutch philanthropist, long vice-president of the directors of prisons in Amsterdam.

Italy.—In Italy there is no distinction between the treatment of the offending and the neglected or deserted in youth. There are seventeen or more correctional establishments, eight of which are state institutions and the rest founded by private benevolence or by charitable associations or local communities. None of these is exclusively agricultural; ten are industrial, seven industrial and agricultural combined. In Italy the age of responsibility is nine, below which no child can be charged with an offence. The Italian schools are mostly planned on a large scale. That of Marchiondi Spagliardi accommodates 550, divided among three houses under one supreme head. The Turazza institution at Treviso holds 380, and there are eight others with from 200 to 300 inmates. The régime is very various; the larger number of schools are on the congregate system, with daily labour in association and isolation by night. The "family" method is also practised with small groups, divisions or companies, into which the children are formed according to age or conduct.

Sweden.—All children below the age of sixteen may be sent to a correctional establishment or boarded out in respectable families:—

1. If they have committed acts punishable by law which indicate moral perversity and it is deemed advisable to correct them.
2. If they are neglected, ill-used, or if their moral deterioration is feared from the vicious life and character of parents or friends.
3. If their conduct at school or at home is such that a more severe correctional treatment is necessary for their rescue.

Under this law the state is also to provide special schools to take all above ten who have shown peculiar depravity; all who have reached eighteen and who are not yet thought fit for freedom; all who have relapsed after provisional release. Sweden is rich in institutions devoted to the care of destitute and deserted children, all due to the efforts of the charitable. The largest correctional establishment is that founded at Hall, near the town of Sodertelge on the shores of the Baltic. This admirable agricultural colony, modelled on that of Mettray, owes its existence to the "Oscar-Josephine society," founded by Queen Josephine, widow of Oscar I.

United States.—In the words of a report made in 1878 by F. B. Sanborn, secretary of the American Social Science Society, "America can justly plume herself upon the work accomplished by her juvenile reformatories since their inauguration down to the present time." The first in point of date and still the most considerable of the reformatories in the United States is that founded in 1825, thanks to the unwearied efforts of the great American publicist and philanthropist Edward Livingston, which now has its home on Randall's Island in New York City. In the following year a reformatory of the same class was founded in Boston, and another in the year after in Philadelphia. All were intended to receive criminal youth. There are state reformatories now in almost all the states of the Union, and those for juvenile adults in New York and Massachusetts have attracted world-wide attention, aiming so high and with such an elaboration of means that they deserve particular description.

The great state reformatory establishment of Elmira, New York, called into existence in 1889 with the avowed aim of compassing the reformation of the criminal by new processes, partakes of the system involved in the treatment of juvenile offenders. It was based upon the principle that crime ought to be attacked in its beginnings by other than ordinary punitive and prison methods. Under this view, the right of society to defend itself by punishment was denied, and it was held that a youthful offender was more sinned against than sinning. It was urged that his crime, due largely to inherited defects, mental or physical and vicious surroundings, was not his own fault, and he had a paramount claim to be treated differently by the state when in custody. The state was not justified in using powers of repression to imprison him in the usual mechanical hard and fast fashion and then return him to society, no better, possibly worse, than before; it was bound to regenerate him, to change his nature, improve his physique, and give him a new mental equipment, so that when again at large he might be fitted to take his place amongst honest citizens, to earn his living by reputable means and escape all temptation to drift back into crime. This is the plausible explanation given for the state reformatory movement, which led to the creation on such costly and extensive lines of Elmira, and of Concord in Massachusetts, a cognate establishment. There is very little penal about the treatment, which is that of a boarding school; the education, thorough and carried far, includes languages, music, science and industrial art; diet is plentiful, even luxurious; amusements and varied recreation are permitted; well stocked libraries are provided with entertaining books; a prison newspaper is issued (edited by an inmate). Physical development is sedulously cultivated both by gymnastics and military exercises, and the whole course is well adapted to change entirely the character of the individual subjected to it. The trouble taken in the hope of transforming erring youth into useful members of society goes still further. The original sentence has been indefinite, and release on parole will be granted to inmates who pass through the various courses with credit and are supposed to have satisfied the authorities of their desire to amend. The limit of detention need not exceed twelve months, after which parole is possible, although the average period passed before it is granted is twenty-two months. The hope of permanent amendment is further sought by the fact that a situation, generally with good wages and congenial work, provided by the authorities, awaits every inmate at the time of his discharge. The inmates, selected from a very large class, are first offenders, but guilty generally of criminal offences, which include manslaughter, burglary, forgery, fraud, robbery and receiving. The exact measure of reformation achieved can never be exactly known, from the absence of authentic statistics and the difficulty of following up the surveillance of individuals when released on parole. Reports issued by the manager of Elmira claim that 81% of those paroled have done well, but these results are not definitely authenticated. They are based upon the ascertained good conduct during the term of surveillance, six or twelve months only, during which time these subjects have not yet spent the gratuities earned and have probably still kept the situations found for them on discharge. No doubt the material treated at Elmira and Concord is of a kind to encourage hope of reformation, as they are first offenders and presumably not of the criminal classes. Although the processes are open to criticism, the discipline enforced in these state reformatories does not err in excessive leniency. They are not "hotels," as has been sometimes said in ridicule, where prisoners go to enjoy themselves, have a good time, study Plato and conic sections, and pass out to an assured future. There is plenty of hard work, mental and physical, and the "inmates" rather envy their fellows in state prisons. A point to which great attention is paid is that physical degeneracy lies at the bottom of the criminal character, and great attention is paid to the development of nervous energy and strengthening by every means the normal and healthful functions of the body. A leading feature in the treatment is the frequency and perfection with which bathing is carried out. A series of Turkish baths forms a part of the course of instruction; the baths being fitted elaborately with all the adjuncts of shower bath, cold douche, ending with gymnastic exercises.

A remarkable and unique institution is the state reformatory for women at Sherborn, Massachusetts, for women with sentences of more than a year, who in the opinion of the court are fit subjects for reformatory treatment. The majority of the inmates were convicted of drunkenness, an offence which the law of Massachusetts visits with severity—a sentence of two years being very common. This at once differentiates the class of women from that in ordinary penal establishments. At the same time we find that other women guilty of serious crime are sent by the courts to this prison with a view to their reform. Thus of 352 inmates, while no fewer than 200 were convicted of drunkenness, there were also 63 cases of offences against chastity and 30 of larceny. The average age was thirty-one and the average duration of sentence just over a year. In appearance and in character it more resembles a hospital or home for inebriates than a state convict prison. A system of grades or divisions is relied upon as a stimulus to reform. The difference in grades is denoted by small and scarcely perceptible variations of the little details of everyday life, such as are supposed in a peculiar degree to affect the appreciation of women, *e.g.* in the lowest division the women have their meals off old and chipped china; in the next the china is less chipped; in the highest there is no chipped china; in the next prettily set out with tumblers, cruet-stands and a pepper pot to each prisoner. The superintendent relies greatly also on the moralizing influence of animals and birds. Well-behaved convicts are allowed to tend sheep, calves, pigs, chickens, canaries and parrots. This privilege is highly esteemed and productive, it is said, of the most softening influences.

The "George Junior Republic" (*q.v.*) is a remarkable institution established in 1895 at Freeville, near the centre of New York State, by Mr. William Reuben George. The original features of the institution are that the motto "Nothing without labour" is rigidly enforced, and that self-government is carried to a point that, with mere children, would appear whimsical were it not a proved success. The place is, as the name implies, a miniature "republic" with laws, legislature, courts and administration of its own, all made and carried on by the "citizens" themselves. The tone and spirit of the place appeared to be excellent and there is much evidence that in many cases strong and independent character is developed in children whose antecedents have been almost hopeless.

Borstal Scheme in England.—The American system of state reformatories as above described has been sharply criticized, but the principle that underlies it is recognized as, in a measure, sound, and it has been adopted by the English authorities. Some time back the experiment of establishing a penal reformatory for offenders above the age hitherto committed to reformatory schools was resolved upon. This led to the foundation of the Borstal scheme, which was first formally started in October 1902. The arguments which had led to it may be briefly stated here. It had been conclusively shown that quite half the whole number of professional criminals had been first convicted when under twenty-one years of age, when still at a malleable period of development, when in short the criminal habit had not yet been definitely formed. Moreover these adolescents escaped special reformatory treatment, for sixteen is in Great Britain the age of criminal majority, after which no youthful offenders can be committed to the state reformatory schools. But there was always a formidable contingent of juvenile adults between sixteen and twenty-one, sent to penal servitude, and their numbers although diminishing rose to an average total of 15,000. It was accordingly decided to create a penal establishment under state control, which should be a half-way house between the prison and the reformatory school. A selection was made of juvenile adults, sentenced to not less than six months and sent to Borstal in 1902 to be treated under rules approved by the home secretary. They were to be divided on arrival into three separate classes, penal, ordinary and special, with promotion by industry and good conduct from the lowest to the highest, in which they enjoyed distinctive privileges. The general system, educational and disciplinary, was intelligent and governed by common sense. Instruction, both manual and educational, was well suited to the recipients; the first embraced field work, market gardening, and a knowledge of useful handicrafts; the second was elementary but sound, aided by well-chosen libraries and brightened by the privilege of evening association to play harmless but interesting games. Physical development was also guaranteed by gymnastics and regular exercises. The results were distinctly encouraging. They arrived at Borstal "rough, untrained cubs," but rapidly improved in demeanour and inward character, gaining self-reliance and self-respect, and left the prison on the high road to regeneration. It was wisely remembered that to secure lasting amendment it is not enough to chasten the erring subject, to train his hands, to strengthen his moral sense while still in durance; it is essential to assist him on discharge by helping him to find work, and encourage him by timely advice to keep him in the straight path. Too much praise cannot be accorded to the agencies and associations which labour strenuously and unceasingly to this excellent end. Especial good work has been done by the Borstal association, founded under the patronage of the best known and most distinguished persons in English public life—archbishops, judges, cabinet ministers and privy councillors—which receives the juvenile adults on their release and helps them to employment. Their labours, backed by generous voluntary contributions, have produced very gratifying results. Although the offenders originally selected to undergo the Borstal treatment were those committed for a period of six months, it was recognized that this limit was experimental, and that thoroughly satisfactory results could only be obtained with sentences of at least a year's duration, so as to give the reforming agencies ample time to operate. In the second year's working of the system it was formally applied to young convicts sentenced to penal servitude between the ages of sixteen and twenty-one. In the next year it was adopted for all offenders between the ages of sixteen and twenty-one committed to prison, as far as the length of sentence would permit. The commissioners of prisons, in their *Report* for the year 1908 (Cd. 4300) thus expressed themselves on the working of the experiment:—

> "Experience soon began to point to the probable success of this general application of the principle, in spite of the fact that the prevailing shortness of sentences operated against full benefit being derived from reformatory effort. The success was most marked in those localities where magistrates, or other benevolent persons, personally co-operated in making the scheme a success. Local Borstal committees were established at all prisons, and it was arranged that those members of the local committees should become *ex officio* honorary members of the Central Borstal Association, which it was intended should become, what it now is, the parent society directing the general aid on discharge of this category of young prisoners."

In spite of the general adoption of the Borstal system, there was a large class of young criminals who were outside its effects, those who were sentenced to terms of ten days and under for trifling offences. These juvenile adults, once having had the fear of prison taken away by actual experience, were found to come back again and again. To remedy this state of affairs, a bill was introduced in 1907 to give effect to the principle of a long period of detention for all those showing a tendency to embark on a criminal career. The bill was, however, dropped, but a somewhat similar bill was introduced the next year and became law under the title of The Prevention of Crime Act 1908. This measure introduces a new departure in the treatment of professional crime by initiating a system of detention for habitual criminals (see RECIDIVISM). The act attempts the reformation of young offenders by giving the court power to pass sentence of detention in a Borstal institution for a term of not less than one year nor more than three on those between the ages of sixteen and twenty-one who by reason of criminal habits or tendencies or association with persons of bad character require such instruction and discipline as appear most conducive to their reformation. The power of detention applies also to reformatory school offences, while such persons as are already undergoing penal servitude or imprisonment may be transferred to a Borstal institution if detention would conduce to their advantage. The establishment of other Borstal institutions is authorized by the act, while a very useful provision is the power to release on licence if there is a reasonable probability that the offender will abstain from crime and lead a useful and industrious life. The licence is issued on condition that he is placed under the supervision or authority of some society or person willing to take charge of him. Supervision is introduced after the expiration of the term of sentence, and power is given to transfer to prison incorrigibles or those exercising a bad influence on the other inmates of a Borstal institution. The act marks a noteworthy advance in the endeavour to arrest the growing habit of crime.

(A. G.; T. A. I.)

JUVENTAS (Latin for "youth": later *Juventus*), in Roman mythology, the tutelar goddess of young men. She was worshipped at Rome from very early times. In the front court of the temple of Minerva on the Capitol there was a chapel of Juventas, in which a coin had to be deposited by each youth on his assumption of the *toga virilis*, and sacrifices were offered on behalf of the rising manhood of the state. In connexion with this chapel it is related that, when the temple was in course of erection, Terminus, the god of boundaries, and Juventas refused to quit the sites they had already appropriated as sacred to themselves, which accordingly became part of the new sanctuary. This was interpreted as a sign of the immovable boundaries and eternal youth of the Roman state. It should be observed that in the oldest accounts there is no mention of Juventas, whose name (with that of Mars) was added in support of the augural prediction. After the Second Punic War Greek elements were introduced into her cult. In 218 B.C., by order of the Sibylline books, a *lectisternium* was prepared for Juventas and a public thanksgiving to Hercules, an association which shows the influence of the Greek Hebe, the wife of Heracles. In 207 Marcus Livius Salinator, after the defeat of Hasdrubal at the battle of Sena, vowed another temple to Juventas in the Circus Maximus, which was dedicated in 191 by C. (or M.) Licinius Lucullus; it was destroyed by fire in 16 B.C. and rebuilt by Augustus. In imperial times, Juventas personified, not the youth of the Roman state, but of the future emperor.

See Dion. Halic., iii. 69, iv. 15; Livy v. 54, xxi. 62, xxxvi. 36.

JUXON, WILLIAM (1582–1663), English prelate, was the son of Robert Juxon and was born probably at Chichester, being educated at Merchant Taylors' School, London, and at St John's College, Oxford, where he was elected to a scholarship in 1598. He studied law at Oxford, but afterwards he took holy orders, and in 1609 became vicar of St Giles, Oxford, a living which he retained until he became rector of Somerton, Oxfordshire, in 1615. In December 1621 he succeeded his friend, William Laud, as president of St John's College, and in 1626 and 1627 he was vice-chancellor of the university. Juxon soon obtained other important positions, including that of chaplain-in-ordinary to Charles I. In 1627 he was made dean of Worcester and in 1632 he was nominated to the bishopric of Hereford, an event which led him to resign the presidency of St John's in January 1633. However, he never took up his episcopal duties at Hereford, as in October 1633 he was consecrated bishop of London in succession to Laud. He appears to have been an excellent bishop, and in March 1636 Charles I. entrusted him with important secular duties by making him lord high treasurer of England; thus for the next five years he was dealing with the many financial and other difficulties which beset the king and his advisers. He resigned the treasurership in May 1641. During the Civil War the bishop, against whom no charges were brought in parliament, lived undisturbed at Fulham Palace, and his advice was often sought by the king, who had a very high opinion of him, and who at his execution selected him to be with him on the scaffold and to administer to him the last consolations of religion. Juxon was deprived of his bishopric in 1649 and retired to Little Compton in Gloucestershire, where he had bought an estate, and here he became famous as the owner of a pack of hounds. At the restoration of Charles II. he became archbishop of Canterbury and in his official capacity he took part in the coronation of this king, but his health soon began to fail and he died at Lambeth on the 4th of June 1663. By his will the archbishop was a benefactor to St John's College, where he was buried; he also aided the work of restoring St Paul's Cathedral and rebuilt the great hall at Lambeth Palace.

See W. H. Marah, *Memoirs of Archbishop Juxon and his Times* (1869); the best authority for the archbishop's life is the article by W. H. Hutton in the *Dict. Nat. Biog.* (1892).

K The eleventh letter in the Phoenician alphabet and in its descendant Greek, the tenth in Latin owing to the omission of Teth (see I), and once more the eleventh in the alphabets of Western Europe owing to the insertion of J. In its long history the shape of K has changed very little. It is on the inscription of the Moabite Stone (early 9th cent. B.C.) in the form (written from right to left) of 𐤊 and 𐤊. Similar forms are also found in early Aramaic, but another form 𐤊 or 𐤊, which is found in the Phoenician of Cyprus in the 9th or 10th century B.C. has had more effect upon the later development of the Semitic forms. The length of the two back strokes and the manner in which they join the upright are the only variations in Greek. In various places the back strokes, treated as an angle <, become more rounded (, so that the letter appears as K, a form which in Latin probably affected the development of C (*q.v.*). In Crete it is elaborated into Ƙ and Ƥ. In Latin K, which is found in the earliest inscriptions, was soon replaced by C, and survived only in the abbreviations for *Kalendae* and the proper name *Kaeso*. The original name Kaph became in Greek *Kappa*. The sound of K throughout has been that of the unvoiced guttural, varying to some extent in its pronunciation according to the nature of the vowel sound which followed it. In Anglo-Saxon C replaced K through Latin influence, writing being almost entirely in the hands of ecclesiastics. As the sound-changes have been discussed under C it is necessary here only to refer to the palatalization of K followed earlier by a final *e* as in *watch* (Middle English *wacche*, Anglo-Saxon *wæcce*) by the side of *wake* (M.E. *waken*, A.-S. *wacan*); batch, bake, &c. Sometimes an older form of the substantive survives, as in the Elizabethan and Northern *make* = *mate* alongside *match*. (P. Gi.)

K$_2$, or Mt Godwin-Austen, the second highest mountain in the world, ranking after Mt Everest. It is a peak of the Karakoram extension of the Muztagh range dividing Kashmir from Chinese Turkestan. The height of K$_2$ as at present determined by triangulation is 28,250 ft., but it is possible that an ultimate revision of the values of refraction at high altitudes may have the effect of lowering the height of K$_2$, while it would elevate those of Everest and Kinchinjunga. The latter mountain would then rank second, and K$_2$ third, in the scale of altitude, Everest always maintaining its ascendancy. K$_2$ was ascended for the first time by the duke of the Abruzzi in June 1909, being the highest elevation on the earth's surface ever reached by man.

KA'BA, KAABA, or Kaabeh, the sacred shrine of Mahommedanism, containing the "black stone," in the middle of the great mosque at Mecca (*q.v.*).

KABARDIA, a territory of S. Russia, now part of the province of Terek. It is divided into Great and Little Kabardia by the upper river Terek, and covers 3780 sq. m. on the northern slopes of the Caucasus range (from Mount Elbruz to Pasis-mta, or Edena), including the Black Mountains (Kara-dagh) and the high plains on their northern slope. Before the Russian conquest it extended as far as the Sea of Azov. Its population is now about 70,000. One-fourth of the territory is owned by the aristocracy and the remainder is divided among the *auls* or villages. A great portion is under permanent pasture, part under forests, and some under perpetual snow. Excellent breeds of horses are reared, and the peasants own many cattle. The land is well cultivated in the lower parts, the chief crops being millet, maize, wheat and oats. Bee-keeping is extensively practised, and Kabardian honey is in repute. Wood-cutting and the manufacture of wooden wares, the making of *búrkas* (felt and fur cloaks), and saddlery are very general. Nalchik is the chief town.

The Kabardians are a branch of the Adyghè (Circassians). The policy of Russia was always to be friendly with the Kabardian aristocracy, who were possessed of feudal rights over the Ossetes, the Ingushes, the Abkhasians and the mountain Tatars, and had command of the roads leading into Transcaucasia. Ivan the Terrible took Kabardia under his protection in the 16th century. Later, Russian influence was counterbalanced by that of the Crimean khans, but the Kabardian nobles nevertheless supported Peter the Great during his Caucasian campaign in 1722-23. In 1739 Kabardia was recognized as being under the double protectorate of Russia and Turkey, but thirty-five years later it was definitively annexed to Russia, and risings of the population in 1804 and 1822 were cruelly suppressed. Kabardia is considered as a school of good manners in Caucasia; the Kabardian dress sets the fashion to all the mountaineers. Kabardians constitute the best detachment of the personal Imperial Guards at St Petersburg.

A short grammar of the Kabardian language and a Russian-Kabardian dictionary, by Lopatinsky, were published in *Sbornik Materialov dla Opisaniya Kavkaza* (vol. xii., Tiflis, 1891). Fragments of the poem "Sosyruko," some Persian tales, and the tenets of the Mussulman religion were printed in Kabardian in 1864, by Kazi Atazhukin and Shardanov. The common law of the Kabardians has been studied by Maxim Kovalevsky and Vsevolod Miller.

KABBA, a province of the British protectorate of Northern Nigeria, situated chiefly on the right bank of the Niger, between 7° 5′ and 8° 45′ N. and 5° 30′ and 7° E. It has an area of 7800 sq. m. and an estimated population of about 70,000. The province consists of relatively healthy uplands interspersed with fertile valleys. It formed part at one time of the Nupe emirate, and under Fula rule the armies of Bida regularly raided for slaves and laid waste the country. Amongst the native inhabitants the Igbira are very industrious, and crops of tobacco, indigo, all the African grains, and a good quantity of cotton are already grown. The sylvan products are valuable and include palm oil, kolas, shea and rubber. Lokoja, a town which up to 1902 was the principal British station in the protectorate, is situated in this province. The site of Lokoja, with a surrounding tract of country at the junction of the Benue and the Niger, was ceded to the British government in 1841 by the *attah* of Idah, whose dominions at that time extended to the right bank of the river. The first British settlement was a failure. In 1854 MacGregor Laird, who had taken an active part in promoting the exploration of the river, sent thither Dr W. B. Baikie, who was successful in dealing with the natives and in 1857 became the first British consul in the interior. The town of Lokoja was founded by him in 1860. In 1868 the consulate was abolished and the settlement was left wholly to commercial interests. In 1879 Sir George Goldie formed the Royal Niger Company, which bought out its foreign rivals and acquired a charter from the British government. In 1886 the company made Lokoja its military centre, and on the transfer of the company's territories to the Crown it remained for a time the capital of Northern Nigeria. In 1902 the political capital of the protectorate was shifted to Zungeru in the province of Zaria, but Lokoja remains the commercial centre. The distance of Lokoja from the sea at the Niger mouth is about 250 m.

In the absence of any central native authority the province is entirely dependent for administration upon British initiative. It has been divided into four administrative divisions. British and native courts of justice have been established. A British station has been established at Kabba town, which is an admirable site some 50 m. W. by N. of Lokoja, about 1300 ft. above the sea, and a good road has been made from Kabba to Lokoja. Roads have been opened through the province. (See Nigeria.)

KABBABISH ("goatherds": James Bruce derives the name from *Hebsh*, sheep), a tribe of African nomads of Semitic origin. It is perhaps the largest "Arab" tribe in the Anglo-Egyptian Sudan, and its many clans are scattered over the country extending S.W. from the province of Dongola to the confines of Darfur. The Kabbabish speak Arabic, but their pronunciation differs much from that of the true Arabs. The Kabbabish have a tradition that they came from Tunisia and are of Mogrebin or western descent; but while the chiefs look like Arabs, the tribesmen resemble the Beja family. They themselves declare that one of their clans, Kawahla, is not of Kabbabish blood, but was affiliated to them long ago. Kawahla is a name of Arab formation, and J. L. Burckhardt spoke of the clan as a distinct one living about Abu Haraz and on the Atbara. The Kabbabish probably received Arab rulers, as did the Abābda. They are chiefly employed in cattle, camel and sheep breeding, and before the Sudan wars of 1883–99 they had a monopoly of all transport from the Nile, north of Abu Gussi, to Kordofan. They also cultivate the lowlands which border the Nile, where they have permanent villages. They are of fine physique, dark with black wiry hair, carefully arranged in tightly rolled curls which cling to the head, with regular features and rather thick aquiline noses. Some of the tribes wear large hats like those of the Kabyles of Algeria and Tunisia.

See James Bruce, *Travels to Discover the Source of the Nile* (1790); A. H. Keane, *Ethnology of Egyptian Sudan* (1884); *Anglo-Egyptian Sudan* (edited by Count Gleichen, 1905).

KABBALAH (late Hebrew *ḳabbālah, qabbālah*), the technical name for the system of Jewish theosophy which played an important part in the Christian Church in the middle ages. The term primarily denotes "reception" and then "doctrines received by tradition." In the older Jewish literature the name is applied to the whole body of received religious doctrine with the exception of the Pentateuch, thus including the Prophets and Hagiographa as well as the oral traditions ultimately embodied in the Mishnah.[1] It is only since the 11th or 12th century that Kabbalah has become the exclusive appellation for the renowned system of theosophy which claims to have been transmitted uninterruptedly by the mouths of the patriarchs and prophets ever since the creation of the first man.

Doctrine of the Sephiroth.

The cardinal doctrines of the Kabbalah embrace the nature of the Deity, the Divine emanations or *Sĕphīrōth*, the cosmogony, the creation of angels and man, their destiny, and the import of the revealed law. According to this esoteric doctrine, God, who is boundless and above everything, even above being and thinking, is called *Ēn Sōph* (ἄπειρος); He is the space of the universe containing τὸ πᾶν, but the universe is not his space. In this boundlessness He could not be comprehended by the intellect or described in words, and as such the Ēn Sōph was in a certain sense *Ăyĭn*, non-existent (*Zōhar*, iii. 283).[2] To make his existence known and comprehensible, the Ēn Sōph had to become active and creative. As creation involves intention, desire, thought and work, and as these are properties which imply limit and belong to a finite being, and moreover as the imperfect and circumscribed nature of this creation precludes the idea of its being the direct work of the infinite and perfect, the Ēn Sōph had to become creative, through the medium of ten Sephiroth or intelligences, which emanated from him like rays proceeding from a luminary.

Now the wish to become manifest and known, and hence the idea of creation, is co-eternal with the inscrutable Deity, and the first manifestation of this primordial will is called the first *Sephirah* or emanation. This first Sephirah, this spiritual substance which existed in the Ēn Sōph from all eternity, contained nine other intelligences or *Sephiroth*. These again emanated one from the other, the second from the first, the third from the second, and so on up to ten.

The ten Sephiroth, which form among themselves and with the Ēn Sōph a strict unity, and which simply represent different aspects of one and the same being, are respectively denominated (1) the Crown, (2) Wisdom, (3) Intelligence, (4) Love, (5) Justice, (6) Beauty, (7) Firmness, (8) Splendour, (9) Foundation, and (10) Kingdom. Their evolution was as follows: "When the Holy Aged, the concealed of all concealed, assumed a form, he produced everything in the form of male and female, as things could not continue in any other form. Hence Wisdom, the second Sephirah, and the beginning of development, when it proceeded from the Holy Aged (another name of the first Sephirah) emanated in male and female, for Wisdom expanded, and Intelligence, the third Sephirah, proceeded from it, and thus were obtained male and female, viz. Wisdom the father and Intelligence the mother, from whose union the other pairs of Sephiroth successively emanated" (*Zohar*, iii. 290). These two opposite potencies, viz. the masculine Wisdom or Sephirah No. 2 and the feminine Intelligence or Sephirah No. 3 are joined together by the first potency, the Crown or Sephirah No. 1; they yield the first triad of the Sephiric decade, and constitute the divine head of the archetypal man.

From the junction of Sephiroth Nos. 2 and 3 emanated the masculine potency Love or Mercy (4) and the feminine potency Justice (5), and from the junction of the latter two emanated again the uniting potency Beauty (6). Beauty, the sixth Sephirah, constitutes the chest in the archetypal man, and unites Love (4) and Justice (5), which constitute the divine arms, thus yielding the second triad of the Sephiric decade. From this second conjunction emanated again the masculine potency Firmness (7) and the feminine potency Splendour (8), which constitute the divine legs of the archetypal man; and these sent forth Foundation (9), which is the genital organ and medium of union between them, thus yielding the third triad in the Sephiric decade. Kingdom (10), which emanated from the ninth Sephirah, encircles all the other nine, inasmuch as it is the Shechinah, the divine halo, which encompasses the whole by its all-glorious presence.

In their totality and unity the ten Sephiroth are not only denominated the World of Sephiroth, or the World of Emanations, but, owing to the above representation, are called the primordial or archetypal man (=πρωτόγονος) and the heavenly man. It is this form which, as we are assured, the prophet Ezekiel saw in the mysterious chariot (Ezek. i. 1–28), and of which the earthly man is a faint copy.

As the three triads respectively represent intellectual, moral and physical qualities, the first is called the Intellectual, the second the Moral or Sensuous, and the third the Material World. According to this theory of the archetypal man the three Sephiroth on the right-hand side are masculine and represent the principle of rigour, the three on the left are feminine and represent the principle of mercy, and the four central or uniting Sephiroth represent the principle of mildness. Hence the right is called "the Pillar of Judgment," the left "the Pillar of Mercy," and the centre "the Middle Pillar." The middle Sephiroth are synecdochically used to represent the worlds or triads of which they are the uniting potencies. Hence the Crown, the first Sephirah, which unites Wisdom and Intelligence to constitute the first triad, is by itself denominated the Intellectual World. So Beauty is by itself described as the Sensuous World, and in this capacity is called the Sacred King or simply the King, whilst Kingdom, the tenth Sephirah, which unites all the nine Sephiroth, is used to denote the Material World, and as such is denominated the Queen or the Matron. Thus a trinity of units, viz. the Crown, Beauty and Kingdom, is obtained within the trinity of triads. But further, each Sephirah is as it were a trinity in itself. It (1) has its own absolute character, (2) receives from above, and (3) communicates to what is below. "Just as the Sacred Aged is represented by the number three, so are all the other lights (Sephiroth) of a threefold nature" (*Zohar*, iii. 288). In this all-important doctrine of the Sephiroth, the Kabbalah insists upon the fact that these potencies are not creations of the Ēn Sōph, which would be a diminution of strength; that they form among themselves and with the Ēn Sōph a strict unity, and simply represent different aspects of the same being, just as the different rays which proceed from the light, and which appear different things to the eye, are only different manifestations of one and the same light; that for this reason they all alike partake of the perfections of the Ēn Sōph; and that as emanations from the Infinite, the Sephiroth are infinite and perfect like the Ēn Sōph, and yet constitute the first finite things. They are infinite and perfect when the Ēn Sōph imparts his fullness to them, and finite and imperfect when that fullness is withdrawn from them.

The Universe.

The conjunction of the Sephiroth, or, according to the language of the Kabbalah, the union of the crowned King and Queen, produced the universe in their own image. Worlds came into existence before the Ēn Sōph manifested himself in the human form of emanations, but they could not continue, and necessarily perished because the conditions of development which obtained with the sexual opposites of the Sephiroth did not exist. These worlds which perished are compared to sparks which fly out from a red-hot iron beaten by a hammer, and which are extinguished according to the distance they are removed from the burning mass. Creation is not *ex nihilo*; it is simply a further expansion or evolution of the Sephiroth.[1] The world reveals and makes visible the Boundless and the concealed of the concealed. And, though it exhibits the Deity in less splendour than its Sephiric parents exhibit the Ēn Sōph, because it is farther removed from the primordial source of light than the Sephiroth, still, as it is God manifested, all the multifarious forms in the world point out the unity which they represent. Hence nothing in the whole universe can be annihilated. Everything, spirit as well as body, must return to the source whence it emanated (*Zohar*, ii. 218). The universe consists of four different worlds, each of which forms a separate Sephiric system of a decade of emanations.

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[1] C. Taylor, *Sayings of the Jewish Fathers* (1897), pp. 106 sqq., 175 seq.; W. Bacher, *Jew. Quart. Rev.* xx. 572 sqq. (1908).

[2] On the *Zōhar*, "the Bible of the Kabbalists," see below.

They were evolved in the following order. (1) The World of Emanations, also called the Image and the Heavenly or Archetypal Man, is, as we have seen, a direct emanation from the Ēn Sōph. Hence it is most intimately allied to the Deity, and is perfect and immutable. From the conjunction of the King and Queen (*i.e.* these ten Sephiroth) is produced (2) the World of Creation, or the Briatic world, also called "the Throne." Its ten Sephiroth, being farther removed from the Ēn Sōph, are of a more limited and circumscribed potency, though the substances they comprise are of the purest nature and without any admixture of matter. The angel Metatron inhabits this world. He alone constitutes the world of pure spirit, and is the garment of Shaddai, *i.e.* the visible manifestation of the Deity. His name is numerically equivalent to that of the Lord (*Zohar*, iii. 231). He governs the visible world, preserves the harmony and guides the revolutions of all the spheres, and is the captain of all the myriads of angelic beings. This Briatic world again gave rise to (3) the World of Formation, or Yetziratic World. Its ten Sephiroth, being still farther removed from the Primordial Source, are of a less refined substance. Still they are yet without matter. It is the abode of the angels, who are wrapped in luminous garments, and who assume a sensuous form when they appear to men. The myriads of the angelic hosts who people this world are divided into ten ranks, answering to the ten Sephiroth, and each one of these numerous angels is set over a different part of the universe, and derives his name from the heavenly body or element which he guards (*Zohar*, i. 42). From this world finally emanated (4) the World of Action, also called the World of Matter. Its ten Sephiroth are made up of the grosser elements of the former three worlds; they consist of material substance limited by space and perceptible to the senses in a multiplicity of forms. This world is subject to constant changes and corruption, and is the dwelling of the evil spirits. These, the grossest and most deficient of all forms, are also divided into ten degrees, each lower than the other. The first two are nothing more than the absence of all visible form and organization; the third degree is the abode of darkness; whilst the remaining seven are "the seven infernal halls," occupied by the demons, who are the incarnation of all human vices. These seven hells are subdivided into innumerable compartments corresponding to every species of sin, where the demons torture the poor deluded human beings who have suffered themselves to be led astray whilst on earth. The prince of this region of darkness is Sāmāël, the evil spirit, the serpent who seduced Eve. His wife is the Harlot or the Woman of Whoredom. The two are treated as one person, and are called "the Beast" (*Zohar*, ii. 255–259, with i. 35).

Doctrine of Man.

The whole universe, however, was incomplete, and did not receive its finishing stroke till man was formed, who is the acme of the creation and the microcosm. "The heavenly Adam (*i.e.* the ten Sephiroth) who emanated from the highest primordial obscurity (*i.e.* the Ēn Sōph) created the earthly Adam" (*Zohar*, ii. 70). "Man is both the import and the highest degree of creation, for which reason he was formed on the sixth day. As soon as man was created everything was complete, including the upper and nether worlds, for everything is comprised in man. He unites in himself all forms" (*Zohar*, iii. 48). Each member of his body corresponds to a part of the visible universe. "Just as we see in the firmament above, covering all things, different signs which are formed of the stars and the planets, and which contain secret things and profound mysteries studied by those who are wise and expert in these things; so there are in the skin, which is the cover of the body of the son of man, and which is like the sky that covers all things above, signs and features which are the stars and planets of the skin, indicating secret things and profound mysteries whereby the wise are attracted who understand the reading of the mysteries in the human face" (*Zohar*, ii. 76). The human form is shaped after the four letters which constitute the Jewish Tetragrammaton (*q.v.*; see also JEHOVAH). The head is in the shape of י, the arms and the shoulders are like ה, the breast like ו, and the two legs with the back again resemble ה (*Zohar*, ii. 72). The souls of the whole human race pre-exist in the World of Emanations, and are all destined to inhabit human bodies. Like the Sephiroth from which it emanates, every soul has ten potencies, consisting of a trinity of triads. (1) The Spirit (*nĕshāmah*), which is the highest degree of being, corresponds to and is operated upon by the Crown, which is the highest triad in the Sephiroth, and is called the Intellectual World; (2) the Soul (*rūăḥ*), which is the seat of the moral qualities, corresponds to and is operated upon by Beauty, which is the second triad in the Sephiroth, and is called the Moral World; and (3) the Cruder Soul (*nephesh*), which is immediately connected with the body, and is the cause of its lower instincts and the animal life, corresponds to and is operated upon by Foundation, the third triad in the Sephiroth, called the Material World. Each soul prior to its entering into this world consists of male and female united into one being. When it descends on this earth the two parts are separated and animate two different bodies. "At the time of marriage the Holy One, blessed be he, who knows all souls and spirits, unites them again as they were before; and they again constitute one body and one soul, forming as it were the right and the left of the individual. . . . This union, however, is influenced by the deeds of the man and by the ways in which he walks. If the man is pure and his conduct is pleasing in the sight of God, he is united with that female part of the soul which was his component part prior to his birth" (*Zohar*, i. 91). The soul's destiny upon earth is to develop those perfections the germs of which are eternally implanted in it, and it ultimately must return to the infinite source from which it emanated. Hence, if, after assuming a body and sojourning upon earth, it becomes polluted by sin and fails to acquire the experience for which it descends from heaven, it must three times reinhabit a body, till it is able to ascend in a purified state through repeated trials. If, after its third residence in a human body, it is still too weak to withstand the contamination of sin, it is united with another soul, in order that by their combined efforts it may resist the pollution which by itself it was unable to conquer. When the whole pleroma of preexistent souls in the world of the Sephiroth shall have descended and occupied human bodies and have passed their period of probation and have returned purified to the bosom of the infinite Source, then the soul of Messiah will descend from the region of souls; then the great Jubilee will commence. There shall be no more sin, no more temptation, no more suffering. Universal restoration will take place. Satan himself, "the venomous Beast," will be restored to his angelic nature. Life will be an everlasting feast, a Sabbath without end. All souls will be united with the Highest Soul, and will supplement each other in the Holy of Holies of the Seven Halls (*Zohar*, i. 45, 168; ii. 97).

Antiquity and Influence of Kabbalah.

According to the Kabbalah all these esoteric doctrines are contained in the Hebrew Scriptures. The uninitiated cannot perceive them; but they are plainly revealed to the spiritually minded, who discern the profound import of this theosophy beneath the surface of the letters and words of Holy Writ. "If the law simply consists of ordinary expressions and narratives, such as the words of Esau, Hagar, Laban, the ass of Balaam or Balaam himself, why should it be called the law of truth, the perfect law, the true witness of God? Each word contains a sublime source, each narrative points not only to the single instance in question, but also to generals" (*Zohar*, iii. 149, cf. 152).

To obtain these heavenly mysteries, which alone make the Torah superior to profane codes, definite hermeneutical rules are employed, of which the following are the most important. (1) The words of several verses in the Hebrew Scriptures which are regarded as containing a recondite sense are placed over each other, and the letters are formed into new words by reading them vertically. (2) The words of the text are ranged in squares in such a manner as to be read either vertically or boustrophedon. (3) The words are joined together and redivided. (4) The initials and final letters of several words are formed into separate words. (5) Every letter of a word is reduced to its numerical value, and the word is explained by another of the same quantity. (6) Every letter of a word is taken to be the initial or abbreviation of a word. (7) The twenty-two letters of the alphabet are divided into two halves; one half is placed above the other; and the two letters which thus become associated are interchanged. By this permutation, *Aleph*, the first letter of the alphabet, becomes *Lamed*, the twelfth letter; *Beth* becomes *Mem*, and so on. This cipher alphabet is called *Albam*, from the first interchangeable pairs. (8) The commutation of the twenty-two letters is effected by the last letter of the alphabet taking the place of the first, the last but one the place of the second, and so forth. This cipher is called *Atbash* These hermeneutical canons are much older than the Kabbalah. They obtained in the synagogue from time immemorial, and were used by the Christian fathers in the interpretation of Scripture.[1] Thus Canon V., according to which a word is reduced to its numerical value and interpreted by another word of the same value, is recognized in the New Testament (cf. Rev. xiii. 18). Canon VI. is adopted by Irenaeus, who tells us that, according to the learned among the Hebrews, the name Jesus contains two letters and a half, and signifies that Lord who contains heaven and earth [יהוה שמים וארץ = יש׳] (*Against Heresies*, ii. xxiv., i. 205, ed. Clark). The cipher *Atbash* (Canon VIII.) is used in Jeremiah xxv. 26, li. 41, where Sheshach is written for Babel. In Jer. li. 1, לב קמי, *Leb-Kamai* ("the heart of them that rise up against me"), is written for כשדים, *Chaldea*, by the same rule.

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[1] The view of a mediate creation, in the place of immediate creation out of nothing, and that the mediate beings were emanations, was much influenced by Solomon ibn Gabirol (1021–1070).

Exegesis of this sort is not the characteristic of any single circle, people or century; unscientific methods of biblical interpretation have prevailed from Philo's treatment of the Pentateuch to modern apologetic interpretations of Genesis, ch. i.[2] The Kabbalah itself is but an extreme and remarkable development of certain forms of thought which had never been absent from Judaism; it is bound up with earlier tendencies to mysticism, with man's inherent striving to enter into communion with the Deity. To seek its sources would be futile. The Pythagorean theory of numbers, Neoplatonic ideas of emanation, the Logos, the personified Wisdom, Gnosticism—these and many other features combine to show the antiquity of tendencies which, clad in other shapes, are already found in the old pre-Christian Oriental religions.[3] In its more mature form the Kabbalah belongs to the period when medieval Christian mysticism was beginning to manifest itself (viz. in Eckhart, towards end of 13th century); it is an age which also produced the rationalism of Maimonides (*q.v.*). Although some of its foremost exponents were famous Talmudists, it was a protest against excessive intellectualism and Aristotelian scholasticism. It laid stress, not on external authority, as did the Jewish law, but on individual experience and inward meditation. "The mystics accorded the first place to prayer, which was considered as a mystical progress towards God, demanding a state of ecstasy."[4] As a result, some of the finest specimens of Jewish devotional literature and some of the best types of Jewish individual character have been Kabbalist.[5] On the other hand, the Kabbalah has been condemned, and nowhere more strongly than among the Jews themselves. Jewish orthodoxy found itself attacked by the more revolutionary aspects of mysticism and its tendencies to alter established customs. While the medieval scholasticism denied the possibility of knowing anything unattainable by reason, the spirit of the Kabbalah held that the Deity could be realized, and it sought to bridge the gulf. Thus it encouraged an unrestrained emotionalism, rank superstition, an unhealthy asceticism, and the employment of artificial means to induce the ecstatic state. That this brought moral laxity was a stronger reason for condemning the Kabbalah, and the evil effects of nervous degeneration find a more recent illustration in the mysticism of the Chasidim (*Ḥăsīdīm*, "saints"), a Jewish sect in eastern Europe which started from a movement in the 18th century against the exaggerated casuistry of contemporary rabbis, and combined much that was spiritual and beautiful with extreme emotionalism and degradation.[6] The appearance of the Kabbalah and of other forms of mysticism in Judaism may seem contrary to ordinary and narrow conceptions of orthodox Jewish legalism. Its interest lies, not in its doctrines, which have often been absurdly over-estimated (particularly among Christians), but in its contribution to the study of human thought. It supplied a want which has always been felt by certain types, and it became a movement which had mischievous effects upon ill-balanced minds. As usual, the excessive self-introspection was not checked by a rational criticism; the individual was guided by his own reason, the limitations of which he did not realize; and in becoming a law unto himself he ignored the accumulated experiences of civilized humanity.[7]

A feature of greater interest is the extraordinary part which this theosophy played in the Christian Church, especially at the time of the Renaissance. We have already seen that the Sephiric decade or the archetypal man, like Christ, is considered to be of a double nature, both infinite and finite, perfect and imperfect. More distinct, however, is the doctrine of the Trinity. In Deut. vi. 43, where Yahweh occurs first, then Ĕlōhēnū, and then again Yahweh, we are told "The voice though one, consists of three elements, fire (*i.e.* warmth), air (*i.e.* breath), and water (*i.e.* humidity), yet all three are one in the mystery of the voice and can only be one. Thus also Yahweh, Ĕlōhēnū, Yahweh, constitute one—three forms which are one" (*Zohar*, ii. 43; compare iii. 65). Discussing the thrice holy in Isaiah vi. 3, one codex of the *Zohar* had the following remark: "The first holy denotes the Holy Father, the second the Holy Son, and the third the Holy Ghost" (cf. Galatinus, *De arcanis cathol.* lib. ii. c. 3, p. 31; Wolf, *Bibliotheca hebraica*, i. 1136). Still more distinct is the doctrine of the atonement. "The Messiah invokes all the sufferings, pain, and afflictions of Israel to come upon Him. Now if He did not remove them thus and take them upon Himself, no man could endure the sufferings of Israel, due as their punishment for transgressing the law; as it is written (Isa. liii. 4), Surely He hath borne our griefs and carried our sorrows" (*Zohar*, ii. 12). These and similar statements favouring the doctrines of the New Testament made many Kabbalists of the highest position in the synagogue embrace the Christian faith and write elaborate books to win their Jewish brethren over to Christ. As early as 1450 a company of Jewish converts in Spain, at the head of which were Paul de Heredia, Vidal de Saragossa de Aragon, and Davila, published compilations of Kabbalistic treatises to prove from them the doctrines of Christianity. They were followed by Paul Rici, professor at Pavia, and physician to the emperor Maximilian I. Among the best-known non-Jewish exponents of the Kabbalah were the Italian count Pico di Mirandola (1463–1494), the renowned Johann Reuchlin (1455–1522), Heinrich Cornelius Agrippa of Nettesheim (1487–1535), Theophrastus Paracelsus (1493–1541), and, later, the Englishman Robert Fludd (1574–1637). Prominent among the "nine hundred theses" which Mirandola had placarded in Rome, and which he undertook to defend in the presence of all European scholars, whom he invited to the Eternal City, promising to defray their travelling expenses, was the following: "No science yields greater proof of the divinity of Christ than magic and the Kabbalah." Mirandola so convinced Pope Sixtus of the paramount importance of the Kabbalah as an auxiliary to Christianity that his holiness exerted himself to have Kabbalistic writings translated into Latin for the use of divinity students. With equal zeal did Reuchlin act as the apostle of the Kabbalah. His treatises exercised an almost magic influence upon the greatest thinkers of the time. Pope Leo X. and the early Reformers were alike captivated by the charms of the Kabbalah as propounded by Reuchlin, and not only divines, but statesmen and warriors, began to study the Oriental languages in order to be able to fathom the mysteries of Jewish theosophy. The *Zohar*, that farrago of absurdity and spiritual devotion, was the weapon with which these Christians defended Jewish literature against hostile ecclesiastic bodies (Abrahams, *Jew. Lit.* p. 106). Thus the Kabbalah linked the old scholasticism with the new and independent inquiries in learning and philosophy after the Renaissance, and although it had evolved a remarkably bizarre conception of the universe, it partly anticipated, in its own way, the scientific study of natural philosophy.[1] Jewish theosophy, then, with its good and evil tendencies, and with its varied results, may thus claim to have played no unimportant part in the history of European scholarship and thought.

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[1] See F. Weber, *Jūdische Theologie* (1897), pp. 118 sqq.

[2] See C. A. Briggs, *Study of Holy Scripture* (1899), pp. 427 sqq., 570.

[3] Even the "over-Soul" of the mystic Isaac Luria (1534–1572) is a conception known in the 3rd century A.D. (Rabbi Rēsh Lakish). For the early stages of Kabbalistic theories, see K. Kohler, *Jew. Ency.* iii. 457 seq., and L. Ginzberg, ibid. 459 seq.; and for examples of the relationship between old Oriental (especially Babylonian) and Jewish Kabbalistic teaching (early and late), see especially A. Jeremias, *Babylonisches in N. Test.* (Leipzig, 1905); E. Bischoff, *Bab. Astrales im Weltbilde des Thalmud u. Midrasch* (1907).

[4] L. Ginzberg, *Jew. Ency.* iii. 465.

[5] See, especially, on the mystics of Safed in Upper Galilee, S. Schechter, *Studies* (1908), pp. 202–285.

[6] See the instructive article by S. Schechter, *Studies in Judaism* (London, 1896), pp. 1–55.

[7] See the discriminating estimates by S. A. Hirsch, *Jew. Quart. Rev.* xx. 50–73; I. Abrahams, *Jew. Lit.* (1906), ch. xvii.: *Judaism* (1907), ch. vi.

The main sources to be noticed are:—

Main Sources.

1. The *Sēpher Yĕṣīrah*, or "book of creation," not the old *Hilkoth Y.* ("rules of creation"), which belongs to the Talmudic period (on which see Kohler, *Jew. Ency.* xii. 602 seq.), but a later treatise, a combination of medieval natural philosophy and mysticism. It has been variously ascribed to the patriarch Abraham and to the illustrious rabbi ʿAqiba; its essential elements, however, may be of the 3rd or 4th century A.D., and it is apparently earlier than the 9th (see L. Ginzberg, *op. cit.* 603 sqq.). It has "had a greater influence on the development of the Jewish mind than almost any other book after the completion of the Talmud" (ibid.).

2. The *Bāhīr* ("brilliant," Job. xxxvii. 21), though ascribed to Neḥunyah b. Haqqanah (1st century A.D.), is first quoted by Naḥmanides, and is now attributed to his teacher Ezra or Azriel (1160–1238). It shows the influence of the *Sēpher Yĕṣīrah*, is marked by the teaching of a celestial Trinity, is a rough outline of what the *Zohar* was destined to be, and gave the first opening to a thorough study of metaphysics among the Jews. (See further I. Broydé, *Jew. Ency.* ii. 442 seq.).

3. The *Zohar* ("shining," Dan. xii. 3) is a commentary on the Pentateuch, according to its division into fifty-two hebdomadal lessons. It begins with the exposition of Gen. i. 4 ("let there be light") and includes eleven dissertations: (1) "Additions and Supplements"; (2) "The Mansions and Abodes," describing the structure of paradise and hell; (3) "The Mysteries of the Pentateuch," describing the evolution of the Sephiroth, &c.; (4) "The Hidden Interpretation," deducing esoteric doctrine from the narratives in the Pentateuch; (5) "The Faithful Shepherd," recording discussions between Moses the faithful shepherd, the prophet Elijah and R. Simon b. Yoḥai, the reputed compiler of the *Zohar*; (6) "The Secret of Secrets," a treatise on physiognomy and psycholcgy; (7) "The Aged," *i.e.* the prophet Elijah, discoursing with R. Simon on the doctrine of transmigration as evolved from Exod. xxi. 1–xxiv. 18; (8) "The Book of Secrets," discourses on cosmogony and demonology; (9) "The Great Assembly," discourses of R. Simon to his numerous assembly of disciples on the form of the Deity and on pneumatology; (10) "The Young Man," discourses by young men of superhuman origin on the mysteries of ablutions; and (11) "The Small Assembly," containing the discourses on the Sephiroth which R. Simon delivered to the small congregation of six surviving disciples. The *Zohar* pretends to be a compilation made by Simon b. Yoḥai (the second century A.D.) of doctrines which God communicated to Adam in Paradise, and which have been received uninterruptedly from the mouths of the patriarchs and prophets. It was discovered, so the story went, in a cavern in Galilee where it had been hidden for a thousand years. Amongst the many facts, however, established by modern criticism which prove the *Zohar* to be a compilation of the 13th century, are the following: (1) the *Zohar* itself praises most fulsomely R. Simon, its reputed author, and exalts him above Moses; (2) it mystically explains the Hebrew vowel points, which did not obtain till 570; (3) the compiler borrows two verses from the celebrated hymn called "The Royal Diadem," written by Ibn Gabirol, who was born about 1021; (4) it mentions the capture of Jerusalem by the crusaders and the re-taking of the Holy City by the Saracens; (5) it speaks of the comet which appeared at Rome, 15th July 1264, under the pontificate of Urban IV.; (6) by a slip the *Zohar* assigns a reason why its contents were not revealed before 5060–5066 A.M., *i.e.* 1300–1306 A.D., (7) the doctrine of the Ēn Sōph and the Sephiroth was not known before the 13th century; and (8) the very existence of the *Zohar* itself was not known prior to the 13th century. Hence it is now believed that Moses de Leon (d. 1305), who first circulated and sold the *Zohar* as the production of R. Simon, was himself the author or compiler. That eminent scholars both in the synagogue and in the church should have been induced to believe in its antiquity is owing to the fact that the *Zohar* embodies many older opinions and doctrines, and the undoubted antiquity of some of them has served as a lever in the minds of these scholars to raise the late speculations about the Ēn Sōph, the Sephiroth, &c., to the same age.

LITERATURE.—The study of the whole subject being wrapped up with Gnosticism and Oriental theosophy, the related literature is immense. Among the more important works may be mentioned, Baron von Rosenroth's *Kabbala Denudata* (Sulzbach, 1677–1678; Frankfort, 1684); A. Franck, *La Kabbale* (Paris, 2nd ed., 1889; German by Jellinek, Leipzig, 1844); C. D. Ginsburg, *The Kabbalah, its Doctrines, Development and Literature* (London, 1865); I. Meyer, *Qabbalah* (Philadelphia, 1888); Rubin, *Kabbala und Agada* (Vienna, 1895), *Heidentum und Kabbalah* (1893); Karppe, *Ét. sur les origines du Zohar* (Paris, 1891); A. E. Waite, *Doctrine and Literature of the Kabbalah* (London, 1902); Flügel, *Philosophy, Kabbala, &c.* (Baltimore, 1902); D. Neumark, *Gesch. d. Jüd. Philosophie d. Mittelalters* (Berlin, 1907); also S. A. Binion, in C. D. Warner's *World's Best Literature*, 8425 sqq. See further the very full articles in the *Jewish Ency.* by K. Kohler and L. Ginzberg ("Cabbala"), I. Broydé ("Bahir," "Zohar"), with the references. (C. D. G.; S. A. C.)

KABINDA, a Portuguese possession on the west coast of Africa north of the mouth of the Congo. Westwards it borders the Atlantic, N. and N.E. French Congo, S. and S.E. Belgian Congo. It has a coast-line of 93 m., extends inland, at its greatest breadth, 70 m., and has an area of about 3000 sq. m. In its physical features, flora, fauna and inhabitants, it resembles the coast region of French Congo (*q.v.*). The only considerable river is the Chiloango, which in part forms the boundary between Portuguese and Belgian territory, and in its lower course divides Kabinda into two fairly even portions. The mouth of the river is in 5° 12′ S., 12° 5′ E. The chief town, named Kabinda, is a seaport on the right bank of the small river Bele, in 5° 33′ S., 12° 10′ E.; pop. about 10,000. From the beauty of its situation, and the fertility of the adjacent country, it has been called the paradise of the coast. The harbour is sheltered and commodious, with anchorage in four fathoms. Kabinda was formerly a noted slave mart. Farther north are the ports of Landana and Massabi. Between Kabinda and Landana is Molembo at the head of a small bay of the same name. There is a considerable trade in palm oil, ground nuts and other jungle produce, largely in the hands of British and German firms.

The possession of the enclave of Kabinda by Portugal is a result of the efforts made by that nation during the last quarter of the 19th century to obtain sovereignty over both banks of the lower Congo. Whilst Portugal succeeded in obtaining the southern bank of the river to the limit of navigability from the sea, the northern bank became part of the Congo Free State (see AFRICA, § 5). Portuguese claims to the north of the river were, however, to some extent met by the recognition of her right to Kabinda. The southernmost part of Kabinda is 25 m. (following the coast-line) north of the mouth of the Congo. This district as far north as the Chiloango river (and including the adjacent territory of Belgian Congo) is sometimes spoken of as Kacongo. The name Loango (*q.v.*) was also applied to this region as well as to the coast-lands immediately to the north. Administratively Kabinda forms a division of the Congo district of the province of Angola (*q.v.*). The inhabitants are Bantu negroes who are called Kabindas. They are an intelligent, energetic and enterprising people, daring sailors and active traders.

KABĪR, the most notable of the Vaishnava reformers of religion in northern India, who flourished during the first half of the 15th century. He is counted as one of the twelve disciples of Rāmānand, the great preacher in the north (about A.D. 1400) of the doctrine of *bhakti* addressed to Rāma, which originated with Rāmānuja (12th century) in southern India. He himself also mentions among his spiritual forerunners Jaidēo and Nāmdēo (or Nāmā) the earliest Marāthī poet (both about 1250). Legend relates that Kabīr was the son of a Brāhman widow, by whom he was exposed, and was found on a lotus in Lahar Talāo, a pond near Benares, by a Musalmān weaver named ʿAlī (or

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[1] See, *e.g.*, G. Margoliouth, "The Doctrine of Ether in the Kabbalah," *Jew. Quart. Rev.* xx. 828 sqq. On the influence of the Kabbalah on the Reformation, see Stöckl, *Gesch. d. Philosophie des Mittelalters*, ii. 232–251.

Nūrī), who with his wife Nīmā adopted him and brought him up in their craft as a Musalmān. He lived most of his life at Benares, and afterwards removed to Maghar (or Magahar), in the present district of Bastī, where he is said to have died in 1449. There appears to be no reason to doubt that he was originally a Musalmān and a weaver; his own name and that of his son Kamāl are Mahommedan, not Hindu. His adhesion to the doctrine of Rāmānand is not a solitary instance of the religious syncretism which prevailed at this time in northern India. The religion of the earlier Sikh *Gurus*, which was largely based upon his teaching, also aimed at the fusion of Hinduism and Islam; and the example of Malik Muhammad,[1] the author of the Padmāwat, who lived a century later than Kabīr, shows that the relations between the two creeds were in some cases extremely intimate. It is related that at Kabīr's death the Hindūs and Musalmāns each claimed him as an adherent of their faith, and that when his funeral issued forth from his house at Maghar the contention was only assuaged by the appearance of Kabīr himself, who bade them look under the cloth which covered the corpse, and immediately vanished. On raising the cloth they found nothing but a heap of flowers. This was divided between the rival faiths, half being buried by the Musalmāns and the other half burned by the Hindus.[2]

Kabīr's fame as a preacher of *bhakti*, or enthusiastic devotion to a personal God, whom he preferred to call by the Hindu names of Rāma and Hari, is greater than that of any other of the Vaishnava spiritual leaders. His fervent conviction of the truth and power of his doctrine, and the homely and searching expression given to it in his utterances, in the tongue of the people and not in a learned language remote from their understanding, won for him multitudes of adherents; and his sect, the *Kabīrpanthīs*, is still one of the most numerous in northern India, its numbers exceeding a million. Its headquarters are the *Kabīr Chaurā* at Benares, where are preserved the works attributed to Kabīr (called the *Granth*), the greater part of which, however, were written by his immediate disciples and their followers in his name.

Those works which seem to have the best claim to be considered his own compositions are the *Sākhīs*, or stanzas, some 5000 in number, which have a very wide currency even among those who do not formally belong to the sect, and the *Shabdāwalī*, consisting of a thousand "words" (*shabd*), or short doctrinal expositions. Perhaps some of the *Rēkhtas*, or odes (100 in number), and of the *Ramainīs*—brief mystical poems in very obscure language—may also be from his hand. Of these different forms specimens will be found translated in Professor H. H. Wilson's *Sketch of the Religious Sects of the Hindus*, i. 79–90. Besides the followers who call themselves by Kabīr's name, there may be reckoned to him many other religious sects which bear that of some intermediate *guru* or master, but substantially concur with Kabīr in doctrine and practice. Such, for instance, are the *Nānakshāhīs* in the United Provinces, the Central Provinces, and Bombay, and the *Dādū-panthīs*, numerous in Rajpūtānā (Wilson, *loc. cit.* pp. 103 sqq.); the Sikhs, numbering two and a half millions in the Panjāb, are also his spiritual descendants, and their *Granth* or Scripture is largely stocked with texts drawn from his works.

Kabīr taught the life of *bhakti* (faith, or personal love and devotion), the object of which is a *personal* God, and not a philosophical abstraction or an impersonal quality-less, all-pervading spiritual substance (as in the Vēdānta of Śankarāchārya). His utterances do not, like those of Tulsī Dās, dwell upon the incidents of the human life of Rāma, whom he takes as his type of the Supreme; nevertheless, it is the essence of his creed that God became incarnate to bring salvation to His children, mankind, and that the human mind of this incarnation still subsists in the Divine Person. He proclaims the unity of the Godhead, the vanity of idols, the powerlessness of *brāhmans* or *mullās* to guide or help, and the divine origin of the human soul, *divinae particula aurae*. All evil in the world is ascribed to *Māyā*, illusion or falsehood, and truth in thought, word and deed is enjoined as the chief duty of man: "No act of devotion can equal truth; no crime is so heinous as falsehood; in the heart where truth abides there is My abode."[3] The distinctions of creeds are declared to be of no importance in the presence of God: "The city of *Hara*[4] is to the east, that of '*Alī*[5] is to the west; but explore your own heart, for there are both *Rāma* and *Karīm*;"[6] "Behold but One in all things: it is the second that leads you astray. Every man and woman that has ever been born is of the same nature as yourself. *He*, whose is the world, and whose are the children of '*Alī* and *Rāma*, He is my *Guru*, He is my *Pīr*." He proclaims the universal brotherhood of man, and the duty of kindness to all living creatures. Life is the gift of God, and must not be violated; the shedding of blood, whether of man or animals, is a heinous crime. The followers of Kabīr do not observe celibacy, and live quiet unostentatious lives; Wilson (p. 97) compares them to Quakers for their hatred of violence and unobtrusive piety.

The resemblance of many of Kabīr's utterances to those of Christ, and especially to the ideas set forth in St John's gospel, is very striking; still more so is the existence in the ritual of the sect of a sacramental meal, involving the eating of a consecrated wafer and the drinking of water administered by the *Mahant* or spiritual superior, which bears a remarkable likeness to the Eucharist. Yet, though the deities of Hinduism and the prophet of Islam are frequently mentioned in his sayings, the name of Jesus has nowhere been found in them. It is conjectured that the doctrine of Rāmānand, which came from southern India, has been influenced by the Christian settlements in that region, which go back to very early times. It is also possible that Sūfīism, the pietistic (as distinguished from the theosophic) form of which seems to owe much to eastern Christianity, has contributed some echo of the Gospel to Kabīr's teaching. A third (but scarcely probable) hypothesis is that the sect has borrowed both maxims and ritual, long after Kabīr's own time, from the teaching of the Roman Catholic missionaries, who were established at Agra from the reign of Akbar (1556–1605) onwards.

No critical edition of the writings current under the name of Kabīr has yet been published, though collections of his sayings (chiefly the *Sākhīs*) are constantly appearing from Indian presses. The reader is referred, for a summary account of his life and doctrine, to H. H. Wilson's *Sketch of the Religious Sects of the Hindus* (Works, i. 68 sqq.). Dr E. Trumpp's edition of the *Ādi Granth* (Introduction, pp. xcvii. sqq.) may also be consulted. Recent publications dealing with the subject are the Rev. G. H. Westcott's *Kabīr and the Kabīr Panth* (Cawnpore, 1908), and Mr. M. A. Macauliffe's *The Sikh Religion* (Oxford, 1909), vi. 122–316. (C. J. L.)

KABUL, the capital of Afghanistan, standing at an elevation of 6900 ft. above the sea in 34° 32′ N. and 69° 14′ E. Estimated pop. (1901), 140,000. Lying at the foot of the bare and rocky mountains forming the western boundary of the Kabul valley, just below the gorge made by the Kabul River, the city extends a mile and a half east to west and one mile north to south. Hemmed in by the mountains, there is no way of extending it, except in a northerly direction towards the Sherpur cantonment. As the key of northern India, Kabul has been a city of vast importance for countless ages. It commands all the passes which here debouch from the north through the Hindu Kush, and from the west through Kandahar; and through it passed successive invasions of India by Alexander the Great, Mahmud of Ghazni, Jenghiz Khan, Baber, Nadir Shah and Ahmad Shah. Indeed from the time of Baber to that of Nadir Shah (1526–1738) Kabul was part of the empire of Delhi. It is now some 160 m. from the British frontier post of Jamrud near Peshawar.

Kabul was formerly walled; the old wall had seven gates, of which two alone remain, the Lahori and the Sirdar. The city itself is a huddle of narrow and dirty streets, with the Bala Hissar or fort forming the south-east angle, and rising about 150 ft. above the plain. The Amir's palace is situated outside the town about midway between it and the Sherpur cantonment which lies about a mile to the north-east. Formerly the greatest ornament of the city was the arcaded and roofed bazaar called *Chihâr Chátâ*, ascribed to Ali Mardan Khan, a noble of the 17th century, who has left behind him many monuments of his munificent public spirit both in Kabul and in Hindustan. Its four arms had an aggregate length of about 600 ft., with a breadth of 30. The display of goods was remarkable, and in the evening it was illuminated. This edifice was destroyed by Sir G. Pollock on evacuating Kabul in 1842 as a record of the treachery of the city.

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[1] See article HINDOSTANI LITERATURE.

[2] An exactly similar tale is told of Nānak, the first *Guru* of the Sikhs, who died in 1538.

[3] This and the following passages in quotation marks are from Professor Wilson's translation of 100 *Sākhīs*, pp. 83–90.

[4] Benares; Hara, a name of Śiva.

[5] *I.e.* Mecca.

[6] "The Bountiful," one of the Korānic names of God (Allah).

The tomb of the Sultan Baber stands on a slope about a mile to the west of the city in a charming spot. The grave is marked by two erect slabs of white marble. Near him lie several of his wives and children; the garden was formerly enclosed by a marble wall; a clear stream waters the flower-beds. From the hill that rises behind the tomb there is a noble prospect of his beloved city, and of the all-fruitful plain stretching to the north of it.

After the accession of Abdur Rahman in 1880 the city underwent great changes. The Bala Hissar was destroyed and has never since been entirely rebuilt, and a fortified cantonment at Sherpur (one side of which was represented by the historic Bemaru ridge) had taken the place of the old earthworks of the British occupation of 1842 which were constructed on nearly the same site. The city streets were as narrow and evil-smelling, the surrounding gardens as picturesque and attractive, and the wealth of fruit was as great, as they had been fifty years previously. The amir, however, effected many improvements. Kabul is now connected by well-planned and metalled roads with Afghan Turkestan on the west, with the Oxus and Bokhara on the north, and with India on the east. The road to India was first made by British and is now maintained by Afghan engineers. The road southwards to Ghazni and Kandahar was always naturally excellent and has probably needed little engineering, but the general principle of road-making in support of a military advance has always been consistently maintained, and the expeditions of Kabul troops to Kafiristan have been supported by a very well graded and substantially constructed road up the Kunar valley from Jalalabad to Asmar, and onwards to the Bashgol valley of Kafiristan. The city ways have been improved until it has become possible for wheeled vehicles to pass, and the various roads connecting the suburbs and the city are efficiently maintained. A purely local railway has also been introduced, to assist in transporting building material. The buildings erected by Abdur Rahman were pretentious, but unmarked by any originality in design and hardly worthy representation of the beauty and dignity of Mahommedan architecture. They included a new palace and a durbar hall, a bridge across the river and embankment, a pavilion and garden laid out around the site of Baber's tomb overlooking the Chardeh valley; and many other buildings of public utility connected with stud arrangements, the manufacture of small arms and ammunition, and the requirements of what may be termed a wholesale shop under European direction, besides hospitals, dispensaries, bazaars, &c. The new palace is within an entrenchment just outside the city. It is enclosed in a fine garden, well planted with trees, where the harem serai (or ladies' apartments) occupies a considerable space. The public portion of the buildings comprise an ornamental and lofty pavilion with entrances on each side, and a high-domed octagonal room in the centre, beautifully fitted and appointed, where public receptions take place. The durbar hall, which is a separate building, is 60 yards long by 20 broad, with a painted roof supported by two rows of pillars. But the arrangement of terraced gardens and the lightly constructed pavilion which graces the western slopes of the hills overlooking Chardeh are the most attractive of these innovations. Here, on a summer's day, with the scent of roses pervading the heated air, the cool refreshment of the passing breezes and of splashing fountains may be enjoyed by the officials of the Kabul court, whilst they look across the beauty of the thickly planted plains of Chardeh to the rugged outlines of Paghman and the snows of the Hindu Kush. The artistic taste of the landscape gardening is excellent, and the mountain scenery is not unworthy of Kashmir. It is pleasant to record that the graveyard of those officers who fell in the Kabul campaign of 1879–1880, which lies at the northern end of the Bemaru ridge, is not uncared for.

Kabul is believed to be the *Ortospanum* or *Ortospana* of the geographies of Alexander's march, a name conjectured to be a corruption of *Urddhasthâna*, "high place." This is the meaning of the name Bala Hissar. But the actual name is perhaps also found as that of a people in this position (Ptolemy's *Kabolitae*), if not in the name of a city apparently identical with Ortospana, *Carura*, in some copies read *Cabura*. It was invaded by the Arabs as early as the thirty-fifth year of the Hegira, but it was long before the Mahommedans effected any lasting settlement. In the early Mahommedan histories and geographies we find (according to a favourite Arabic love of jingle) *Kâbul* and *Zâbul* constantly associated. Zâbul appears to have been the country about Ghazni. Kabul first became a capital when Baber made himself master of it in 1504, and here he reigned for fifteen years before his invasion of Hindustan. In modern times it became a capital again, under Timur Shah (see AFGHANISTAN), and so has continued both to the end of the Durani dynasty, and under the Barakzais, who now reign. It was occupied by Sir John Keane in 1839, General Pollock in 1842, and again by Sir Frederick, afterwards Lord Roberts, in 1879.

Kabul is also the name of the province including the city so called. It may be considered to embrace the whole of the plains called Koh Daman and Beghram, &c., to the Hindu Kush northward, with the Kohistan or hill country adjoining. Eastward it extends to the border of Jalalabad at Jagdalak; southward it includes the Logar district, and extends to the border of Ghazni; north-westward it includes the Paghman hills, and the valley of the upper Kabul river, and so to the Koh-i-Baba. Roughly it embraces a territory of about 100 m. square, chiefly mountainous. Wheat and barley are the staple products of the arable tracts. Artificial grasses are also much cultivated, and fruits largely, especially in the Koh Daman. A considerable part of the population spends the summer in tents. The villages are not enclosed by fortifications, but contain small private castles or fortalices.

See C. Yate, *Northern Afghanistan* (1888); J. A. Gray, *At the Court of the Amir* (1895); Sir T. H. H. Holdich, *The Indian Borderland* (1901). (T. H. H.*)

KABUL RIVER, a river of Afghanistan, 300 m. in length. The Kabul (ancient *Kophes*), which is the most important (although not the largest) river in Afghanistan, rises at the foot of the Unai pass leading over the Sanglakh range, an offshoot of the Hindu Kush towards Bamian and Afghan Turkestan. Its basin forms the province of Kabul, which includes all northern Afghanistan between the Hindu Kush and the Safed Koh ranges. From its source to the city of Kabul the course of the river is only 45 m., and this part of it is often exhausted in summer for purposes of irrigation. Half a mile east of Kabul it is joined by the Logar, a much larger river, which rises beyond Ghazni among the slopes of the Gul Koh (14,200 ft.), and drains the rich and picturesque valleys of Logar and Wardak. Below the confluence the Kabul becomes a rapid stream with a great volume of water and gradually absorbs the whole drainage of the Hindu Kush. About 40 m. below Kabul the Panjshir river joins it; 15 m. farther the Tagao; 20 m. from the Tagao junction the united streams of Alingar and Alishang (rivers of Kafiristan); and 20 m. below that, at Balabagh, the Surkhab from the Safed Koh. Two or three miles below Jalalabad it is joined by the Kunar, the river of Chitral. Thenceforward it passes by deep gorges through the Mohmand hills, curving northward until it emerges into the Peshawar plain at Michni. Soon afterwards it receives the Swat river from the north and the Bara river from the south, and after a further course of 40 m. falls into the Indus at Attock. From Jalalabad downwards the river is navigable by boats or rafts of inflated skins, and is considerably used for purposes of commerce.

KABYLES, or KABAIL, a confederation of tribes in Algeria, Tunisia, and a few oases of the Sahara, who form a branch of the great Berber race. Their name is the Arabic *gabīlat* (pl.: *gabāil*), and was at first indiscriminately applied by the Arabs to all Berber peoples. The part of Algeria which they inhabit is usually regarded as consisting of two divisions—Great Kabylia and Lesser Kabylia, the former being also known as the Kabylia of the Jurjura (also called Adrar Budfel, "Mountain of Snow"). Physically many Kabyles do not present much contrast to the Arabs of Algeria. Both Kabyle and Arab are white at birth, but rapidly grow brown through exposure to air and sunshine. Both have in general brown eyes and wavy hair of coarse quality, varying from dark brown to jet black. In stature there is perhaps a little difference in favour of the Kabyle, and he appears also to be of heavier build and more muscular. Both are clearly long-headed. Some, however, of the purer type of Kabyles in Kabylia proper have fair skins, ruddy complexions and blue or grey eyes. In fact there are two distinct types of Kabyles: those which by much admixture have approximated to Arab and negroid types, and those which preserve Libyan features. Active, energetic and enterprising, the Kabyle is to be found far from home—as a soldier in the French army, as a workman in the towns, as a field labourer, or as a pedlar or trader earning the means of purchasing his bit of ground in his native village. The Kabyles are Mahommedans of the Sunnite branch and the Malikite rite, looking to Morocco as the nearer centre of their religion. Some of the Kabyles retain their vernacular speech, while others have more or less completely adopted Arabic. The best known of the Kabyle dialects is the Zouave[1] or Igaouaouen, those speaking it having been settled on the northern side of the Jurjura at least from the time of Ibn Khaldun; it is the principal basis of Hanoteau's *Essai de grammaire kabyle* (Paris, 1858). Unlike their southern brethren, the Kabyles have no alphabet, and their literature is still in the stage of oral transmission, for the most part by professional reciters. Hanoteau's *Poésies populaires de la Kabylie du Jurjura* (Paris, 1867) gives the text and translation of a considerable number of historical pieces, proverbial couplets and quatrains, dancing songs, &c.

Consult General L. L. C. Faidherbe and Dr Paul Topinard, *Instructions sur l'anthropologie de l'Algérie* (Paris, 1874); Melchior Joseph Eugène Daumas, *Le Sahara algérien* (Paris, 1845) and *Mœurs et coutumes de l'Algérie* (1857); De Slane's translation of Ibn Khaldun's *Hist. des Berbères* (Algiers, 1852); Aucapitaine, *Les Kabyles et la colonie de l'Algérie* (Paris, 1864) and *Les Beni M'zab* (1868); L. J. A. C. Hanoteau and A. Letourneux, *La Kabylie et les coutumes kabyles* (Paris, 1893); Charmetant, in *Jahrbücher der Verbreitung des Glaubens* (1874); Masqueray, *Formation des cités . . de l'Algérie* (1886); Dugas, *La Kabylie et le peuple kabyle* (Paris, 1878); Récoux, *La Démographie de l'Algérie* (Paris, 1880); J. Liorel, *Races berbères: les Kabyles* (Paris, 1893); MacIver and Wilkin, *Libyan Notes* (1901).

KACH GANDAVA, or Kachhi (Kach, Kej, Kiz), a low-lying flat region in Baluchistan separating the Bugti hills from those of Kalat. It is driven, like a wedge, into the frontier mountain system and extends for 150 m. from Jacobabad to Sibi, with nearly as great a breadth at its base on the Sind frontier. Area, 5310 sq. m.; pop. (1901), 82,909. The Mula pass, which connects it with the Kalat highlands, was once (when the ancient city of Kandabel was the capital of Gandava) a much trodden trade highway, and is still a practicable route though no longer a popular one. The soil is fertile wherever it can be irrigated by the floods brought down from the surrounding hills; but much of the central portion is sandy waste. It is traversed by the North-Western railway. The climate is unhealthy in summer, when pestilential hot winds are sometimes destructive to life. The annual rainfall averages only 3 in. Kachhi, though subject to the khan of Kalat, is administered under the tribal system. There are no schools, dispensaries or gaols.

See *Baluchistan District Gazetteer*, vol. vi. (Bombay, 1907).

KACHIN HILLS, a mountainous tract in Upper Burma, inhabited by the Kachin or Chingpaw, who are known on the Assam frontier as Singphos. Owing to the great number of tribes, sub-tribes and clans of the Kachins, the part of the Kachin hills which has been taken under administration in the Myitkyina and Bhamo districts was divided into 40 Kachin hill tracts (recently reduced to five). Beyond these tracts there are many Kachins in Katha, Möng Mit and the northern Shan States. The country within the Kachin hill tracts is roughly estimated at 19,177 sq. m., and consists of a series of ranges, for the most part running north and south, and intersected by valleys, all leading towards the Irrawaddy, which drains the country. There were 64,405 Kachins enumerated at the census of 1901. Philological investigations show that it is probable that the progenitors of the Kachins or Chingpaw were the Indo-Chinese race who, before the beginnings of history, but after the Môn-Annam wave had covered Indo-China, forsook their home in western China to pour over the region where Tibet, Assam, Burma and China converge, and that the Chingpaw are the residue left round the headquarters of the Irrawaddy and the Chindwin after those branches, destined to become the Tibetans, the Nagas, the Burmans and the Kuki Chins, had gone westwards and southwards. In the middle of the 19th century the southern limit of the Kachins was 200 m. farther north than it is now. Since then the race has been drifting steadily southward and eastward, a vast aggregate of small independent clans united by no common government, but all obeying a common impulse to move outwards from their original seats along the line of least resistance. Now the Kachins are on both sides of the border of Upper Burma, and are a force to be reckoned with by frontier administrators. According to the Kachin Hill Tribes Regulation of 1895, administrative responsibility is accepted by the British government on the left bank of the Irrawaddy for the country south of the Nmaikha, and on the right bank for the country south of a line drawn from the confluence of the Malikha and Nmaikha through the northern limit of the Laban district and including the jade mines. The tribes north of this line were told that if they abstained from raiding to the south of it they would not be interfered with. South of that line peace was to be enforced and a small tribute exacted, with a minimum of interference in their private affairs. On the British side of the border the chief objects have been the disarmament of the tribes and the construction of frontier and internal roads. A light tribute is exacted.

The Kachins have been the object of many police operations and two regular expeditions: (1) Expedition of 1892–93. Bhamo was occupied by the British on the 28th of December 1885, and almost immediately trouble began. Constant punitive measures were carried on by the military police; but in December 1892 a police column proceeding to establish a post at Sima was heavily attacked, and simultaneously the town of Myitkyina was raided by Kachins. A force of 1200 troops was sent to put down the rising. The enemy received their final blow at Palap, but not before three officers were killed, three wounded, and 102 sepoys and followers killed and wounded. (2) Expedition of 1895–96. The continued misconduct of the Sana Kachins from beyond the administrative border rendered punitive measures necessary. They had remained unpunished since the attack on Myitkyina in December 1892. Two columns were sent up, one of 250 rifles from Myitkyina, the other of 200 rifles from Mogaung, marching in December 1895. The resistance was insignificant, and the operations were completely successful. A strong force of military police is stationed at Myitkyina, with several outposts in the Kachin hills, and the country is never wholly free from crimes of violence committed by the Kachins.

KADUR, a district of Mysore state, in southern India, with an area of 2813 sq. m. Pop. (1901), 362,752, showing an increase of 9% in the decade. The larger portion of the district consists of the Malnad or hill country, which contains some of the wildest mountain scenery in southern India. The western frontier is formed by the chain of the Ghats, of which the highest peaks are the Kudremukh (6215 ft.) and the Meruti Gudda (5451 ft.). The centre is occupied by the horse-shoe range of the Baba Budans, containing the loftiest mountain in Mysore, Mulaingiri (6317 ft.). The Maidan or plain country lying beneath the amphitheatre formed by the Baba Budan hills is a most fertile region, well watered, and with the famous "black cotton soil." The principal rivers are the Tunga and Bhadra, which rise near each other in the Ghats, and unite to form the Tungabhadra, a tributary of the Kistna. The eastern region is watered by the Vedavati. At the point where this river leaves the Baba Budan hills it is embanked to form two extensive tanks which irrigate the lower valley. From all the rivers water is drawn off into irrigation channels by means of anicuts or weirs. The chief natural wealth of Kadur is in its forests, which contain inexhaustible supplies of the finest timber, especially teak, and also furnish shelter for the coffee plantations. Iron is found and smelted at the foot of the hills, and corundum exists in certain localities. Wild beasts and game are numerous, and fish are abundant.

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[1] From the enlistment of Kabyles speaking the Zouave dialect the Zouave regiments of the French army came to be so called.

The largest town is Tarikere (pop. 10,164); the headquarters are at Chikmagalur (9515). The staple crop is rice, chiefly grown on the hill slopes, where the natural rainfall is sufficient, or in the river valley, where the fields can be irrigated. Coffee cultivation is said to have been introduced by a Mahommedan saint, Baba Budan, more than two centuries ago; but it first attracted European capital in 1840. The district is served by the Southern Mahratta railway.

KAEMPFER, ENGELBRECHT (1651–1716), German traveller and physician, was born on the 16th of November 1651 at Lemgo in Lippe-Detmold, Westphalia, where his father was a pastor. He studied at Hameln, Lüneburg, Hamburg, Lübeck and Danzig, and after graduating Ph.D. at Cracow, spent four years at Königsberg in Prussia, studying medicine and natural science. In 1681 he visited Upsala in Sweden, where he was offered inducements to settle; but his desire for foreign travel led him to become secretary to the embassy which Charles XI. sent through Russia to Persia in 1683. He reached Persia by way of Moscow, Kazan and Astrakhan, landing at Nizabad in Daghestan after a voyage in the Caspian; from Shemakha in Shirvan he made an expedition to the Baku peninsula, being perhaps the first modern scientist to visit these fields of "eternal fire." In 1684 he arrived in Isfahan, then the Persian capital. When after a stay of more than a year the Swedish embassy prepared to return, Kaempfer joined the fleet of the Dutch East India Company in the Persian Gulf as chief surgeon, and in spite of fever caught at Bander Abbasi he found opportunity to see something of Arabia and of many of the western coast-lands of India. In September 1689 he reached Batavia; spent the following winter in studying Javanese natural history; and in May 1690 set out for Japan as physician to the embassy sent yearly to that country by the Dutch. The ship in which he sailed touched at Siam, whose capital he visited; and in September 1690 he arrived at Nagasaki, the only Japanese port then open to foreigners. Kaempfer stayed two years in Japan, during which he twice visited Tōkyō. His adroitness, insinuating manners and medical skill overcame the habitual jealousy and reticence of the natives, and enabled him to elicit much valuable information. In November 1692 he left Japan for Java and Europe, and in October 1693 he landed at Amsterdam. Receiving the degree of M.D. at Leiden, he settled down in his native city, becoming also physician to the count of Lippe. He died at Lemgo on the 2nd of November 1716.

The only work Kaempfer lived to publish was *Amoenitatum exoticarum politico-physico-medicarum fasciculi* V. (Lemgo, 1712), a selection from his papers giving results of his invaluable observations in Georgia, Persia and Japan. At his death the unpublished manuscripts were purchased by Sir Hans Sloane, and conveyed to England. Among them was a *History of Japan*, translated from the manuscript into English by J. G. Scheuchzer and published at London, in 2 vols., in 1727. The original German has never been published, the extant German version being taken from the English. Besides Japanese history, this book contains a description of the political, social and physical state of the country in the 17th century. For upwards of a hundred years it remained the chief source of information for the general reader, and is still not wholly obsolete. A life of the author is prefixed to the *History*.

KAFFA, a country of N.E. Africa, part of the Abyssinian empire. Kaffa proper (formerly known also as Gomara) has an area of little more than 5000 sq. m., but the name is used in a general sense to include the neighbouring territories of Gimirra, Jimma, Ennarea, &c. In this larger acceptation Kaffa extends roughly from 6° to 9° N. and from 35° to 37½° E. It forms the S.W. part of the great Abyssinian plateau and consists of broken table-land deeply scored by mountain torrents and densely wooded. The general elevation is about 8000 ft., while several peaks are over 10,000 ft. From the western slopes of the plateau descend headstreams of the Sobat. The principal river however is the Omo, the chief feeder of Lake Rudolf. Kaffa proper is believed to be the native home of the coffee plant (whence the name), which grows in profusion on the mountain sides. The principal town was Bonga, 7½° N., 36° 12′ E., a great trading centre, but the Abyssinian headquarters are at Anderacha, about 12 m. S.S.W. of Bonga. Jiren, the capital of Jimma, 60 m. N.E. of Bonga, is a still more important town, its weekly market being attended by some 20,000 persons.

A great variety of races inhabit these countries of southern Ethiopia. The Kaficho (people of Kaffa proper) are said to be of the same stock as the northern Abyssinians and to have been separated from the rest of the country by the Mahommedan invasion of the 16th century. Thus Jimma, immediately north of Kaffa proper, is peopled by Mahommedan Gallas. The Kaficho, though much mixed with Galla blood, retained their Christianity and a knowledge of Geez, the ecclesiastical tongue of Abyssinia. The ordinary language of the Kaficho has no outward resemblance to modern Abyssinian. Their speech was, however, stated by Dr C. T. Beke (*c.* 1850) to be cognate with the Gonga tongue, spoken in a portion of Damot, on the northern side of the Abai. Kaffa, after having been ruled by independent sovereigns, who were also suzerains of the neighbouring states, was about 1895 conquered by the Abyssinians. The first European explorer of Kaffa was Antoine de'Abbadie, who visited it in 1843. Not until the early years of the 20th century was the country accurately mapped.

KAFFIR BREAD, in botany, the popular name for a species of *Encephalartos* (*E. caffra*), one of the cycads, a native of South Africa, so called from the farinaceous food-stuff which is found at the apex of the stem (Gr. ἐν, in, κεφαλή, head, and ἄρτος, bread). It is a tree reaching nearly 20 ft. in height, with very stiff, spreading pinnate leaves 3 to 4 ft. long and recurving at the tip. The species of *Encephalartos*, which are natives of tropical and South Africa, form handsome greenhouse and conservatory plants; some species are effectively used in subtropical gardening in the summer months.

KAFFIRS (Arabic *Kafir*, an unbeliever), a name given by the Arabs to the native races of the east coast of Africa. The term was current along the east coast at the arrival of the Portuguese, and passed from them to the Dutch and English, and to the natives themselves under the form of *Kafula*. There are no general or collective national names for these peoples, and the various tribal divisions are mostly designated by historical or legendary chiefs, founders of dynasties or hereditary chieftaincies. The term has no real ethnological value, for the Kaffirs have no national unity. To-day it is used to describe that large family of Bantu negroes inhabiting the greater part of the Cape, the whole of Natal and Zululand, and the Portuguese dominions on the east coast south of the Zambezi. The name is also loosely applied to any negro inhabitant of South Africa. For example, the Bechuana of the Transvaal and Orange Free State are usually called Kaffirs.

The Kaffirs are divisible into two great branches: the Ama-Zulu with the Ama-Swazi and Ama-Tonga and the Kaffirs proper, represented by the Ama-Xosa, the Tembu (*q.v.*) and the Pondo (*q.v.*). Hence the compound term Zulu-Kaffir applied in a collective sense to all the Kaffir peoples. Intermediate between these two branches were several broken tribes now collectively known as Ama-Fengu, *i.e.* "wanderers" or "needy" people, from *fenguza*, to seek service[1] (see FINGO).

The ramifications of the Kaffirs proper cannot be understood without reference to the national genealogies, most of the tribal names, as already stated, being those of real or reputed founders of dynasties. Thus the term Ama-Xosa means simply the "people of Xosa," a somewhat mythical chief supposed to have flourished about the year 1530. Ninth in descent from his son Toguh was Palo, who died about 1780, leaving two sons, Gcaleka and Rarabe (pronounced Kha-Kha-bē), from whom came the Ama-Gcaleka, Ama-Dhlambe (T'slambies) and the Ama-Ngquika (Gaika or Sandili's people). The Pondo do not descend from Xosa, but probably from an elder brother, while the Tembu, though apparently representing a younger branch, are regarded by all the Kaffir tribes as the royal race. Hence the Gcaleka chief, who is the head of all the Ama-Xosa tribes, always takes his first or "great wife" from the Tembu royal family, and her issue alone have any claim to the succession. The subjoined genealogical tree will place Kaffir relations in a clearer light:—

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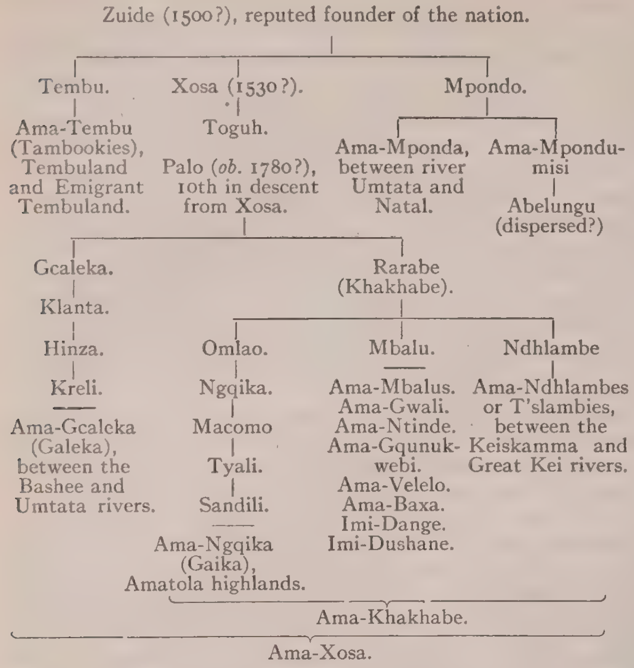
[1] The Ama-Fengu are regarded both by the Zulu and Ama-Xosa as slaves or out-castes, without any right to the privileges of true-born Kaffirs. Any tribes which become broken and mixed would probably be regarded as Ama-Fengu by the other Kaffirs. Hence the multiplicity of clans, such as the Ama-Bele, Aba-Sembotweni Ama-Zizi, Ama-Kuze, Aba-Sekunene, Ama-Ntokaze, Ama-Tetyeni Aba-Shwawa, &c., all of whom are collectively grouped as Ama-Fengu.


Zuide (1500?), reputed founder of the nation.
Tembu.
Xosa (1530?).
Mpondo.
Ama-Tembu (Tambookies), Tembuland and Emigrant Tembuland.
Toguh.
Palo (ob. 1780?), 10th in descent from Xosa.
Ama-Mponda, between river Umtata and Natal.
Ama-Mpondu-misi
Abelungu (dispersed?)
Gcaleka.
Klanta.
Hinza.
Kreli.
Ama-Gcaleka (Galeka), between the Bashee and Umtata rivers.
Rarabe (Khakhabe).
Omlao.
Ngqika.
Macomo
Tyali.
Sandili.
Ama-Ngqika (Gaika), Amatola highlands.
Mbalu.
Ama-Mbalus.
Ama-Gwali.
Ama-Ntinde.
Ama-Gqunuk-webi.
Ama-Velelo.
Ama-Baxa.
Imi-Dange.
Imi-Dushane.
Ndhlambe
Ama-Ndhlambes or T'slambies, between the Keiskamma and Great Kei rivers.
Ama-Khakhabe.
Ama-Xosa.

It will be seen that, as representing the elder branch, the Gcaleka stand apart from the rest of Xosa's descendants, whom they group collectively as Ama-Rarabe (Ama-Khakhabe), and whose genealogies, except in the case of the Gaikas and T'slambies, are very confused. The Ama-Xosa country lies mainly between the Keiskama and Umtata rivers.

The Zulu call themselves Abantu ba-Kwa-Zulu, *i.e.* "people of Zulu's land," or briefly Bakwa-Zulu, from a legendary chief Zulu, founder of the royal dynasty. They were originally an obscure tribe occupying the basin of the Umfolosi river, but rose suddenly to power under Chaka,[1] who had been brought up among the neighbouring and powerful Umtetwas, and who succeeded the chiefs of that tribe and of his own in the beginning of the 19th century. But the true mother tribe seems to have been the extinct Ama-Ntombela, whence the Ama-Tefulu, the U'ndwande, U'mlelas, U'mtetwas and many others, all absorbed or claiming to be true Zulus. But they are only so by political subjection, and the gradual adoption of the Zulu dress, usages and speech. Hence in most cases the term Zulu implies political rather than blood relationship. This remark applies also to the followers of Mosilikatze (properly Umsilikazi), who, after a fierce struggle with the Bechuana, founded about 1820 a second Zulu state about the head waters of the Orange river. In 1837 most of them were driven northwards by the Boers and are now known as Matabele.

The origin of the Zulu-Kaffir race has given rise to much controversy. It is obvious that they are not the aborigines of their present domain, whence in comparatively recent times—since the beginning of the 16th century—they have displaced the Hottentots and Bushmen of fundamentally distinct stock. They themselves are conscious of their foreign origin. Yet they are closely allied in speech (see BANTU LANGUAGES) and physique to the surrounding Basuto, Bechuana and other members of the great South African Negroid family. Hence their appearance in the south-east corner of the continent is sufficiently explained by the gradual onward movement of the populations pressing southward on the Hottentot and Bushman domain. The specific differences in speech and appearance by which they are distinguished from the other branches of the family must in the same way be explained by the altered conditions of their new habitat. Hence it is that the farther they have penetrated southwards the farther have they become differentiated from the pure Negro type. Thus the light and clear brown complexion prevalent amongst the southern Tembu becomes gradually darker as we proceed northwards, passing at last to the blue-black and sepia of the Ama-Swazi and Tekeza. Even many of the mixed Fingo tribes are of a polished ebony colour, like that of the Jolofs and other Senegambian negroes. The Kaffir hair is uniformly of a woolly texture. The head is dolichocephalic, but it is also high or long vertically,[2] and it is in this feature of hypsistenocephaly (height and length combined) that the Kaffir presents the most striking contrast with the pure Negro. But, the nose being generally rather broad[3] and the lips thick, the Kaffir face, though somewhat oval, is never regular in the European sense, the deviations being normally in the direction of the Negro, with which race the peculiar odour of the skin again connects the Kaffirs. In stature they rank next to the Patagonians, Polynesians and West Africans, averaging from 5 ft. 9 in. to 5 ft. 11 in., and even 6 ft.[4] They are slim, well-proportioned and muscular. Owing to the hard life they lead, the women are generally inferior in appearance to the men, except amongst the Zulu, and especially the Tembu. Hence in the matrimonial market, while the Ama-Xosa girl realizes no more than ten or twelve head of cattle, the Tembu belle fetches as many as forty, and if especially fine even eighty.

The more warlike tribes were usually arrayed in leopard or ox skins, of late years generally replaced by European blankets, with feather head-dresses, coral and metal ornaments, bead armlets and necklaces. The Makua and a few others practise tattooing, and the Ama-Xosa are fond of painting or smearing their bodies with red ochre. Their arms consist chiefly of ox-hide shields 4 to 6 ft. long, the kerrie or club, and the assegai, of which there are two kinds, one long, with 9-in. narrow blade, for throwing, the other short, with broad blade 12 to 18 in. long, for stabbing. The dwellings are simple conical huts grouped in kraals or villages. Although cattle form their chief wealth, and hunting and stock-breeding their main pursuits, many have turned to husbandry. The Zulu raise regular crops of "mealies" (maize), and the Pondo cultivate a species of millet, tobacco, water melons, yams and other vegetables. Milk (never taken fresh), millet and maize form the staples of food, and meat is seldom eaten except in time of war.

A young Kaffir attains man's estate socially, not at puberty, but upon his marriage. Polygyny is the rule and each wife is regarded as adding dignity to the household. Marriage is by purchase, the price being paid in cattle. Upon the husband's death family life is continued under the headship of the eldest son of the house, the widows by virtue of levirate becoming the property of the uncle or nearest males, not sons. A son inherits and honourably liquidates, if he can, his father's debts.

Mentally the Kaffirs are superior to the Negro. In their social and political relations they display great tact and intelligence; they are remarkably brave, warlike and hospitable, and were honest and truthful until through contact with the whites they became suspicious, revengeful and thievish, besides acquiring most European vices. Of religion as ordinarily understood they have very little, and have certainly never developed any mythologies or dogmatic systems. It is more than doubtful whether they had originally formed any notion of a Supreme Being. Some conception, however, of a future state is implied by a strongly developed worship of ancestry, and by a belief in spirits and ghosts to whom sacrifices are made. There are no idols or priests, but belief in witchcraft formerly gave the "witch-doctor" or medicine-man overwhelming power.[5] Circumcision and polygyny are universal; the former is sometimes attributed to Mahommedan influences, but has really prevailed almost everywhere in East Africa from the remotest time.

Dearer than anything else to the Kaffir are his cattle; and many ceremonial observances in connexion with them were once the rule. Formerly ox-racing was a common sport, the oxen running, riderless, over a ten-mile course. The owner of a champion racing ox was a popular hero, and these racers were valued at hundreds of head of cattle. Cattle are the currency of the Kaffirs in their wild state. Ten to twenty head are the price of a wife. When a girl marries, her father (if well off) presents her with a cow from his herd. This animal is called *ubulungu* or "doer of good" and is regarded as sacred. It must never be killed nor may its descendants, as long as *it* lives. A hair of its tail is tied round the neck of each child immediately after birth. In large kraals there is the "dancing-ox," usually of red colour. Its horns are trained to peculiar shapes by early mutilations. It figures in many ceremonies when it is paid a kind of knee-worship.

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[1] Seventh in descent from Zulu, through Kumede, Makeba, Punga, Ndaba, Yama and Tezengakona or Senzangakona (Bleek, *Zulu Legends*).

[2] P. Topinard, *Anthropology* (1878), p. 274.

[3] This feature varies considerably, "in the T'slambie tribes being broader and more of the Negro shape than in the Gaika or Gcaleka, while among the Ama-Tembu and Ama-Mpondo it assumes more of the European character. In many of them the perfect Grecian and Roman noses are discernible" (Fleming's *Kaffraria*, p. 92).

[4] Gustav Fritsch gives the mean of the Ama-Xosa as 1·718 metres, less than that of the Guinea Negro (1·724), but more than the English (1·708) and Scotch (1·710).

[5] Since the early years of the 19th century Protestant and Roman Catholic missions have gained hundreds of thousands of converts among the Kaffirs. Purely native Christian churches have also been organized.

The Kaffirs have three, not four, seasons: "Green Heads," "Kindness" and "Cutting"; the first and last referring to the crops, the second to the "warm weather." Women and children only eat after the men are satisfied. A light beer made from sorghum is the national drink.

Of the few industries the chief are copper and iron smelting, practised by the Tembu, Zulu and Swazi, who manufacture weapons, spoons and agricultural implements both for their own use and for trade. The Swazi display some taste in wood-carving, and others prepare a peculiar water-tight vessel of grass. Characteristic of this race is their neglect of the art of navigation. Not the smallest boats are ever made for crossing the rivers, much less for venturing on the sea, except by the Makazana of Delagoa Bay and by the Zambezi people, who have canoes and flat-bottomed boats made of planks.

The Kaffir race had a distinct and apparently very old political system, which may be described as a patriarchal monarchy limited by a powerful aristocracy. Under British rule the tribal independence of the Kaffirs has disappeared. Varying degrees of autonomy have been granted, but the supreme powers of the chiefs have gone, the Swazi being in 1904 the last to be brought to order. In the Transkeian Territories tribal organization exists, but it is modified by special legislation and the natives are under the control of special magistrates. To a considerable extent in Natal and throughout Zululand the Kaffirs are placed in reserves, where tribal organization is kept up under European supervision. In Basutoland the tribal organization is very strong, and the power of chiefs is upheld by the imperial government, which exercises general supervision.

See Gustav Fritsch, *Die Eingeborenen Südafrikas,* with atlas, 30 plates and 120 typical heads (Breslau, 1872); W. H. I. Bleek, *Comparative Grammar of the South African Languages* (London and Cape Town, pt. i., 1862; pt. ii., 1869); Theo. Hahn, *Grundzüge einer Grammatik des Herero* (Berlin, 1857); Dr Colenso, *Grammar of the Zulu-Kafir Language* (1855); Girard de Rialle, *Les Peuples de l'Afrique et de l'Amérique* (Paris, 1880); G. W. Stow, *The Native Races of South Africa* (London, 1905); G. McC. Theal, *History and Ethnography of South Africa, 1505 to 1795* (3 vols., London, 1907–1910) and *History of South Africa since 1795* (5 vols., London, 1908), specially valuable for the political history of the Kaffirs; Caesar C. Henkel, *The Native or Transkeian Territories* (Hamburg, 1903); *The Natives of South Africa* (1901), and its sequel, *The South African Natives* (1908); Dudley Kidd, *The Essential Kafir* (1904) and *Kafir Socialism.* The last four books deal with the many social and economic questions raised by the contact of the Kaffir races with Europeans.

KAFFRARIA, the descriptive name given to the S.E. part of the Cape province, South Africa. Kaffraria, *i.e.* the land of the Kaffirs (*q.v.*), is no longer an official designation. It used to comprise the districts now known as King William's Town and East London, which formed British Kaffraria, annexed to Cape Colony in 1865, and the territory beyond the Kei River south of the Drakensberg Mountains as far as the Natal frontier, known as Kaffraria proper. As a geographical term it is still used to indicate the Transkeian territories of the Cape provinces comprising the four administrative divisions of Transkei, Pondoland, Tembuland and Griqualand East, incorporated into Cape Colony at various periods between 1879 and 1894. They have a total area of 18,310 sq. m., and a population (1904) of 834,644, of whom 16,777 were whites. Excluding Pondoland—not counted previously to 1904—the population had increased from 487,364 in 1891 to 631,887 in 1904.

Physical Features.—The physical characteristics of Kaffraria bear a general resemblance to those of the Cape province proper. The country rises from sea-level in a series of terraces to the rugged range of the Drakensberg. Between that range and the coast-lands are many subsidiary ranges with fertile valleys through which a large number of rivers make their way to the Indian Ocean. These rivers have very rapid falls in comparison to their length and when less than 40 m. from the coast are still 2000 ft. above sea-level. The chief, beginning at the south, are the Kei, the Bashee, the Umtata, the St John's or Umzimvubu, and the Umtamvuna, which separates Kaffraria from Natal. The St John's River rises in the Drakensberg near the Basuto-Natal frontier. The river valley has a length of 140 m., the river with its many twists being double that length. It receives numerous tributaries, one, the Tsitza, possessing a magnificent waterfall, the river leaping over an almost vertical precipice of 375 ft. The St John's reaches the sea between precipitous cliffs some 1200 ft. high and covered with verdure. The mouth is obstructed by a sand bar over which there is 14 ft. of water. None of the rivers of Kaffraria except the St John's is navigable.

Kaffraria is one of the most fertile regions in South Africa. The mountain gorges abound in fine trees, thick forest and bush cover the river banks, grass grows luxuriantly in the lower regions, and the lowlands and valleys are favourable to almost any kind of fruit, field and garden cultivation. The coast districts are very hot in summer, the temperature from October to April on an average varying from 70° to 90° F., while in winter the day temperature is seldom below 50°, though the nights are very cold. But the variation in altitude places climates of all grades within easy reach, from the burning coast to the often snow-clad mountain. Thunderstorms are frequent in summer; the winters are generally dry. On the whole the climate is extremely healthy. At St John's are sulphur springs.

A considerable area is devoted to the raising of wheat and other cereals, especially in the northern district (Griqualand East), where in the higher valleys are many farms owned by Europeans. Large quantities of stock are raised. Most of the land is held by the natives under tribal tenure, and the ease with which their wants are supplied is detrimental to the full cultivation of the land. Kaffraria is, however, one of the chief recruiting grounds for labour throughout South Africa. Most of the white inhabitants are engaged in trade.

Towns and Communication.—The chief town is Kokstad (*q.v.*), pop. (1904), 2903, the capital of Griqualand East. Umtata (2100 ft. above the sea, pop. 2342) on the river of the same name, capital of Tembuland, is the residence of an assistant chief magistrate, headquarters of a division of the Cape Mounted Rifles, and seat of the Anglican bishopric of Kaffraria. The principal buildings are the cathedral, a Gothic structure, built 1901–1906, and the town-hall, a fine building in Renaissance style, erected 1907–1908. Port St John is the chief town in Pondoland, and the only harbour of the country. Butterworth is the chief town in Transkei. Cala (pop. about 1000), in the N.W. part of Tembuland, is the educational centre of Kaffraria. A railway, 107 m. long, the first link in the direct Cape-Natal line, runs from Indwe, 65 m. from Sterkstroom Junction on the main line from East London to the Transvaal, to Maclear, an agricultural centre in Griqualand East. Another railway parallel but south of that described also traverses Kaffraria. Starting from Amabele, a station on the main line from East London to the north, it goes via Butterworth (132 m. from East London) to Umtata (234 m.).

Administration and Justice.—The Cape administrative and judicial system is in force, save as modified by special enactments of the Cape parliament. A "Native Territories Penal Code" which came into operation on the 1st of January 1887 governs the relations of the natives, who are under the jurisdiction of a chief magistrate (resident at Cape Town) with subordinate magistrates in the Territories. In civil affairs the tribal organization and native laws are maintained. No chief, however, exercises criminal jurisdiction. Since 1898 certain provisions of the Glen Grey Act have been applied to Kaffraria (see Glen Grey). The revenue is included in the ordinary budget of the Cape province. The expenditure on Kaffraria considerably exceeds the revenue derived from it. The franchise laws are the same as in the Cape proper. Though the Kaffirs outnumber the whites by fifty to one, white men form the bulk of the electorate, which in 1904 numbered 4778.

Religion.—Numbers of Protestant missionary societies have churches and educational establishments in Kaffraria, but, except in Fingoland, the bulk of the Kaffirs are heathen. The Griquas profess Christianity and have their own churches and ministers. The Anglican diocese of St John's, Kaffraria, was founded in 1873.

Annexation to the Cape.—The story of the conflicts between the Kaffir tribes and the Cape colonists is told under Cape Colony. As early as 1819 Kaffirland, or Kaffraria, was held not to extend west beyond the Keiskamma River. The region east of that river as far as the Kei River became in 1847 the Crown colony of British Kaffraria, and was annexed to Cape Colony in 1865. The Transkeian territories remained in nominal independence until 1875, when the Tembu sought British protection. An inter-tribal war in 1877 between Fingo and Gcaleka resulted in the territory of the Gcaleka chief Kreli being occupied by the British. It was not, however, till 1879 that Fingoland and the Idutywa Reserve, together with the district then commonly called Noman's-land, were proclaimed an integral part of the Cape. About this time most of the rest of Kaffraria came under British control, but it was 1885 before Gcalekaland, the coast region of Transkei, and the various districts comprising Tembuland—Bomvanaland on the coast, Tembuland Proper and Emigrant Tembuland—were annexed to the colony. By the annexation, the frontier of the colony was carried to the Umtata River, so that by 1885 only Pondoland, fronting on the Indian Ocean, separated the Cape from Natal. In Pondoland, Port St John, proclaimed British territory in 1881, was, along with the lower reaches of the St John's River, incorporated with Cape Colony in 1884; in 1886 the Xesibe country (Mount Ayliff) was annexed to the Cape and added to Griqualand East; and in the following year Rhode Valley was included within the boundary line. The rest of Pondoland, chiefly in virtue of a British protectorate established over all the coast region in 1885, was already more or less under British control, and in 1894 it was annexed to the Cape in its entirety. Thus the whole of Kaffraria was incorporated in Cape Colony, with the exception of some 1550 sq. m., then part of Noman's-land, annexed by Natal in 1866 and named Alfred county. To the wise administration of Major Sir Henry G. Elliot, who served in Kaffraria in various official capacities from 1877 to 1903, the country owes much of its prosperity.

Particulars concerning each of the four divisions of Kaffraria follow.

Griqualand East (area, 7594 sq. m.), so called to distinguish it from Griqualand West, a district north of the Orange River, lies between Basutoland (N.W.), Natal (N.E.), Tembuland (S.W.) and Pondoland (S.E.). It occupies the southern slopes of the Drakensberg or the fertile valleys at their feet. It includes most of the region formerly called Noman's-land, and afterwards named Adam Kok's Land from the Griqua chief who occupied it in 1862 with the consent of the British authorities, and governed the country till his death in 1876, establishing a *volksraad* on the Dutch model. The Griquas are still ruled by an officially appointed headman. The majority of the inhabitants are Basutos and Kaffirs (Pondomisi, Ama-Baka and other tribes). The Griquas number about 6000. Since its annexation to Cape Colony Griqualand East has made fairly rapid progress. The population rose from 121,000 in 1881 to 222,685 in 1904, of whom 5901 were whites. Stock-breeding on the uplands, tillage on the lower slopes of the Drakensberg, are the chief industries. On these slopes and uplands the climate is delightful and well suited to Europeans. There is considerable trade with Basutoland in grain and stock, and through Kokstad with Port St John and Port Shepstone, Natal. Much of the best agricultural land is owned by Europeans.

Tembuland (area, 4122 sq. m.), which lies S.W. of Griqualand East and comprises the districts of Tembuland Proper, Emigrant Tembuland and Bomvanaland, takes its name from the Tembu nation, called sometimes Tambookies, one of the most powerful of the Kaffir groups. In the national genealogies the Tembu hold an honourable position, being traditionally descended from Tembu, elder brother of Xosa, from whom most of the other Kaffirs claim descent. The inhabitants increased from about 160,000 in 1881 to 231,472 in 1904, of whom 8056 were whites. The chief town is Umtata.

Transkei (area, 2552 sq. m.) comprises the districts of Fingoland, the Idutywa Reserve and Gcalekaland, this last being named from the Gcaleka nation, who claim to be the senior branch of the Xosa family, the principal royal line of the Kaffir tribes. They still form the chief element of the population, which rose from 136,000 in 1881 to 177,730 in 1904 (1707 whites). Here are some prosperous missionary stations, where the natives are taught agriculture, mechanical industries and a knowledge of letters. The heroic deeds of Hinza, Kreli and other chiefs famous in the wars are still remembered; but witchcraft, rain-making and other pagan practices seem to have died out. Even more advanced in all social respects are the Fingo, who give their name to the district of Fingoland, and also form the bulk of the population in the Idutywa Reserve. They wear European clothes, support their schools by voluntary contributions, edit newspapers, translate English poetry, set their national songs to correct music, and the majority profess Christianity. The industrial institution of Blythswood, about 20 m. N.W. of Butterworth, is a branch of Lovedale (*q.v.*), and is largely supported by the Fingo.

Pondoland (area, 4040 sq. m.; pop. (1904), 202,757 (including 1113 whites), an estimated increase of 36,000 since 1891) is bounded E. by the sea, N. by Natal, W. by Griqualand East, by S. and Tembuland. In Pondoland the primitive organization of the natives has been little altered and the influence of the chiefs is very great. Land is held almost wholly in tribal tenure, though a number of whites possess farms acquired before the annexation of the country. The Pondo have shown some appreciation of the benefits of education.

See G. McCall Theal's *History of South Africa* and other works cited under CAPE COLONY; also *The Native or Transkeian Territories*, by C. C. Henkel (Hamburg, 1903), a useful handbook by an ex-official in the Transkeian Territories.

KAFIRISTAN, a province of Afghanistan. Very little of this country was known with accuracy and nothing at first hand until General Sir W. (then Colonel) Lockhart headed a mission to examine the passes of the Hindu Kush range in 1885–1886. He penetrated into the upper part of the Bashgal valley, but after a few days he found himself compelled to return to Chitral. Previously Major Tanner, R.A., had sought to enter Kafiristan from Jalalabad, but sudden severe illness cut short his enterprise. M'Nair, the famous explorer of the Indian Survey department, believed that he had actually visited this little-known land during an adventurous journey which he made from India and through Chitral in disguise; but the internal evidence of his reports shows that he mistook the Kalash district of Chitral, with its debased and idolatrous population, for the true Kafiristan of his hopes. In 1889 Mr G. S. Robertson (afterwards Sir George Robertson, K.C.S.I.) was sent on a mission to Kafiristan. He only remained a few days, but a year later he revisited the country, staying amongst the Kafirs for nearly a year. Although his movements were hampered, his presence in the country being regarded with suspicion, he was able to study the people, and, in spite of intertribal jealousy, to meet members of many of the tribes. The facts observed and the information collected by him during his sojourn in eastern Kafiristan, and during short expeditions to the inner valleys, are the most trustworthy foundations of our knowledge of this interesting country.

Kafiristan, which literally means "the land of the infidel," is the name given to a tract of country enclosed between Chitral and Afghan territory. It was formerly peopled by pagan mountaineers, who maintained a wild independence until 1895, when they were finally subdued by Abdur Rahman, the amir of Kabul, who also compelled them to accept the religion of Islam. The territory thus ill named is included between 34° 30′ and 36° N., and from about 70° to 71° 30′ E. As the western and northern boundaries are imperfectly known, its size cannot be estimated with any certainty. Its greatest extent is from east to west at 35° 10′ N.; its greatest breadth is probably about 71° E. The total area approximates to 5000 sq. m. Along the N. the boundary is the province of Badakshan, on the N.E. the Lutkho valley of Chitral. Chitral and lower Chitral enclose it to the E., and the Kunar valley on the S.E. Afghanistan proper supplies the S. limit. The ranges above the Nijrao and Pansher valleys of Afghanistan wall it in upon the W. The northern frontier is split by the narrow Minjan valley of Badakshan, which seems to rise in the very heart of Kafiristan.

Speaking generally, the country consists of an irregular series of main valleys, for the most part deep, narrow and tortuous, into which a varying number of still deeper, narrower and more twisted valleys, ravines and glens pour their torrent water. The mountain ranges of Metamorphic rock, which separate the main drainage valleys, are all of considerable altitude, rugged and difficult, with the outline of a choppy sea petrified. During the winter months, when the snow lies deep, Kafiristan becomes a number of isolated communities, with few if any means of intercommunication. In the whole land there is probably nothing in the shape of a plain. Much of the silent, gigantic country warms the heart as well as captivates the eye with its grandeur and varied beauty; much of it is the bare skeleton of the world wasted by countless centuries of storms and frost, and profoundly melancholy in its sempiternal ruin. Every variety of mountain scenery can be found: silent peaks and hard, naked ridges, snowfields and glaciers; mighty pine forests, wooded slopes and grazing grounds; or wild vine and pomegranate thickets bordering sparkling streams. At low elevations the hill-sides are covered with the wild olive and evergreen oaks. Many kinds of fruit trees—walnuts, mulberries, apricots and apples—grow near the villages or by the wayside, as well as splendid horse-chestnuts and other shade trees. Higher in elevation, and from 4000 to 8000 ft., are the dense pine and cedar forests. Above this altitude the slopes become dreary, the juniper, cedar and wild rhubarb gradually giving place to scanty willow patches, tamarisk and stunted birches. Over 13,000 ft. there are merely mosses and rough grass. Familiar wildflowers blossom at different heights. The rivers teem with fish. Immense numbers of red-legged partridges live in the lower valleys, as well as pigeons and doves. Gorgeously plumaged pheasants are plentiful. Of wild animals the chief are the *markhor* (a goat) and the *oorial* (a sheep). In the winter the former are recklessly slaughtered by hunters, being either brought to bay by trained hounds, or trapped in pits, or caught floundering in the snow-drifts; but in the summer immense herds move on the higher slopes. The *ibex* is very rare. Bears and leopards are fairly common, as well as the smaller hill creatures.

Passes and Roads.

All the northern passes leading into Badakshan or into the Minjan valley of Badakshan seem to be over 15,000 ft. in altitude. Of these the chief are the Mandal, the Kamah (these two alone have been explored by a European traveller), the Kti, the Kulam and the Ramgal passes. Those to the east, the Chitral passes, are somewhat lower, ranging from 12,000 to 14,000 ft., *e.g.* the Zidig, the Shui, the Shawal and the Parpit, while the Patkun, which crosses one of the dwindled spurs near the Kunar river, is only 8400 ft. high. Between neighbouring valleys the very numerous communicating footways must rarely be lower than 10,000, while they sometimes exceed 14,000 ft. The western passes are unknown. All these toilsome paths are so faintly indicated, even when free from snow, that to adventure them without a local guide is usually unsafe. Yet the light-framed cattle of these jagged mountains can be forced over many of the worst passes. Ordinarily the herding tracks, near the crest of the ridges and high above the white torrents, are scarcely discoverable to untutored eyes. They wind and waver, rise, drop and twist about the irregular semi-precipitous slopes with baffling eccentricity and abruptness. Nevertheless the cattle nose their way along blunderingly, but without hurt. Of no less importance in the open months, and the sole trade routes during winter, are the lower paths by the river. An unguided traveller is continually at fault upon these main lines of intercourse and traffic.

Rivers.

All the rivers find their tumultuous way into the Kabul, either directly, as the Alingar at Laghman, or after commingling with the Kunar at Arundu and at Chigar-Serai. The Bashgal, draining the eastern portion of the country, empties itself into the Kunar at Arundu. It draws its highest waters from three main sources at the head of the Bashgal valley. It glides gently through a lake close to this origin, and then through a smaller tarn. The first affluent of importance is the Skorigal, which joins it above the village of Pshui. Next comes the noisier Manangal water, from the Shawal pass, which enters the main stream at Lutdeh or Bragamatal, the chief settlement of the Bashgal branch of the Katir tribe. By-and-by the main stream becomes, at the hamlet of Sunra, a raging, shrieking torrent in a dark narrow valley, its run obstructed by giant boulders and great tree-trunks. Racing past Bagalgrom, the chief village of the Madugal Kafirs, the river clamours round the great spur which, 1800 ft. higher up, gives space for the terraces and houses of Kamdesh, the headquarters of the Kam people. The next important affluent is the river which drains the Pittigal valley, its passes and branches. Also on the left bank, and still lower down, is the joining-place of the Gourdesh valley waters. Finally it ends in the Kunar just above Arundu and Birkot. The middle part of Kafiristan, including the valleys occupied by the Presun, Kti, Ashkun and Wai tribes, is drained by a river variously called the Pech, the Kamah, and the Presun or Viron River. It has been only partially explored. Fed by the fountains and snows of the upper Presun valley, it is joined at the village of Shtevgrom by the torrent from the Kamah pass. Thence it moves quietly past meadowland, formerly set apart as holy ground, watering on its way all the Presun villages. Below the last of them, with an abrupt bend, it hurries into the unexplored and rockbound Tsaru country, where it absorbs on the right hand the Kti and the Ashkun and on the left the Wai rivers, finally losing itself in the Kunar, close to Chigar-Serai. Concerning the Alingar or Kao, which carries the drainage of western Kafiristan into the Kabul at Laghman, there are no trustworthy details. It is formed from the waters of all the valleys inhabited by the Ramgal Kafirs, and by that small branch of the Katirs known as the Kalam tribe.

Climate.

The climate varies with the altitude, but in the summer-time it is hot at all elevations. In the higher valleys the winter is rigorous. Snow falls heavily everywhere over 4000 ft. above the sea-level. During the winter of 1890–1891 at Kamdesh (elevation 6100 ft.) the thermometer never fell below 17° F. In many of the valleys the absence of wind is remarkable. Consequently a great deal of cold can be borne without discomfort. The Kunar valley, which is wet and windy in winter, but where snow, if it falls, melts quickly, gives a much greater sensation of cold than the still Kafiristan valleys of much lower actual temperature. A deficiency of rain necessitates the employment of a somewhat elaborate system of irrigation, which in its turn is dependent upon the snowfall.

The Kafirs.

The present inhabitants are probably mainly descended from the broken tribes of eastern Afghanistan, who, refusing to accept Islam (in the 10th century), were driven away by the fervid swordsmen of Mahomet. Descending upon the feeble inhabitants of the trackless slopes and perilous valleys of modern Kafiristan, themselves, most likely, refugees of an earlier date, they subjugated and enslaved them and partially amalgamated with them. These ancient peoples seem to be represented by the Presun tribe, by the slaves and by fragments of lost peoples, now known as the Jazhis and the Aroms. The old division of the tribes into the Siah-Posh, or the black-robed Kafirs, and the Safed-Posh, or the white-robed, was neither scientific nor convenient, for while the Siah-Posh have much in common in dress, language, customs and appearance, the Safed-Posh divisions were not more dissimilar from the Siah-Posh than they were from one another. Perhaps the best division at present possible is into (1) Siah-Posh, (2) Waigulis, and (3) Presungalis or Viron folk.

The Siah-Posh.

The black-robed Kafirs consist of one very large, widely spread tribe, the Katirs, and four much smaller communities, the Kam, the Madugalis, the Kashtan or Kashtoz, and the Gourdesh. Numerically, it is probable that the Katirs are more important than all the remaining tribes put together. They inhabit several valleys, each community being independent of the others, but all acknowledging the same origin and a general relationship. The Katirs fall readily into the following groups: (*a*) Those of the Bashgal valley, also called Kamoz and Lutdehchis, who occupy eleven villages between Badawan and Sunra, the border hamlet of the Madugal country, namely, Ptsigrom, Pshui or Pshowar, Apsai, Shidgal, Bragamatal (Lutdeh), Bajindra, Badamuk, Oulagal, Chabu, Baprok and Purstam; (*b*) the Kti or Katwar Kafirs, who live in two settlements in the Kti valley; (*c*) the Kulam people, who have four villages in the valley of the same name; (*d*) the Ramgalis, or Gabariks, who are the most numerous, and possess the western part on the Afghan border. Of the remaining tribes of the Siah-Posh, the chief is the Kam or Kamtoz, who inhabit the Bashgal valley, from the Madugal boundary to the Kunar valley, and its lateral branches in seven chief settlements, namely, Urmir, Kambrom or Kamdesh, Mergrom, Kamu, Sarat, Pittigal and Bazgal. The next Siah-Posh tribe in importance is the Muman or Madugal Kafirs, who have three villages in the short tract between the Katirs and the Kam in the Bashgal valley. The last Siah-Posh tribe is the Kashtan or Kashtoz, who in 1891 were all located in one greatly overcrowded village, their outlying settlement having been plundered by the Afghan tribes of the Kunar valley. One colony of Siah-Posh Kafirs lives in the Gourdesh valley; but they differ from all the other tribes, and are believed to be descended, in great part, from the ancient people called the Aroms.

The Waigulis.

Our exact knowledge of the Waigulis is scanty. They seem to be related in language and origin with a people fierce, shy and isolated, called the Ashkun, who are quite unknown. The Wai speak a tongue altogether different from that spoken by the Siah-Posh and by the Presungalis. The names of their ten chief villages are Runchi, Nishi, Jamma, Amzhi, Chimion, Kegili, Akun or Akum, Mildesh, Bargal and Prainta. Of these Amzhi and Nishi are the best known.

The Presungalis.

The Presungalis, also called Viron, live in a high valley. In all respects they differ from other Kafirs, in none more than in their unwarlike disposition. Simple, timid, stolid-featured and rather clumsy, they are remarkable for their industry and powers of endurance. They probably represent some of the earliest immigrants. Six large well-built villages are occupied by them—Shtevgrom, Pontzgrom, Diogrom, Kstigigrom, Satsumgrom and Paskigrom.

The Slaves.

The slaves are fairly numerous. Their origin is probably partly from the very ancient inhabitants and partly from war prisoners. Coarse in feature and dark in tint, they cannot be distinguished from the lowest class of freemen, while their dress is indistinctive. They are of two classes—household slaves, who are treated not unkindly; and artisan slaves, who are the skilled handicraftsmen—carvers, blacksmiths, bootmakers and so forth; many of the musicians are also slaves. They live in a particular portion of a village, and were considered to a certain extent unclean, and might not approach closely to certain sacred spots. All slaves seem to wear the Siah-Posh dress, even when they own as masters the feeble Presungal folk.

Women.

Little respect is shown to women, except in particular cases to a few of advanced years. Usually they are mistresses and slaves, saleable chattels and field-workers. Degraded, immoral, overworked and carelessly fed, they are also, as a rule, unpleasant to the sight. Little girls are sometimes quite beautiful, but rough usage and exposure to all weathers soon make their complexions coarse and dark. They are invariably dirty and uncombed. In comparison with the men they are somewhat short. Physically they are capable of enormous labour, and are very enduring. All the field-work falls to them, as well as all kinds of inferior occupations, such as load-carrying. They have no rights as against their husbands or, failing them, their male relations. They cannot inherit or possess property.

Language.

There are certainly three tongues spoken, besides many dialects, that used by the Siah-Posh being of course the most common; and although it has many dialects, the employers of one seem to understand all the others. It is a Prakritic language. Of the remaining two, the Wai and the Presun have no similarity; they are also unlike the Siah-Posh. Kafirs themselves maintain that very young children from any valley can acquire the Wai speech, but that only those born in the Presungal can ever converse in that language, even roughly. To European ears it is disconcertingly difficult, and it is perhaps impossible to learn.

Religion.

Before their conquest by Abdur Rahman all the Kafirs were idolaters of a rather low type. There were lingering traces of ancestor-worship, and perhaps of fire-worship also. The gods were numerous; tribal, family, household deities had to be propitiated, and mischievous spirits and fairies haunted forests, rivers, vales and great stones. Imra was the Creator, and all the other supernatural powers were subordinate to him. Of the inferior gods, Moni seemed to be the most ancient; but Gísh, the war-god, was by far the most popular. It was his worship, doubtless, which kept the Kafirs so long independent. In life as a hero, and after death as a god, he symbolized hatred to the religion of Mahomet. Every village revered his shrine; some possessed two. Imra, Gísh and Moni were honoured with separate little temples, as was usually Dizáni goddess; but three or four of the others would share one between them, each looking out of a small separate square window. The worshipped object was either a large fragment of stone or an image of wood conventionally carved, with round white stones for eyes. Different animals were sacrificed at different shrines: cows to Imra, male goats and bulls to Gísh, sheep to the god of wealth; but goats were generally acceptable, and were also slain ceremonially to discover a complaisant god, to solemnize a vow, to end a quarrel, to ratify brotherhood. The ministers of religion were a hereditary priest, a well-born chanter of praise, and a buffoon of low station, who was supposed to become inspired at each sacrifice, and to have the power of seeing fairies and other spirits whenever they were near, also of understanding their wishes. The blood of the offering, together with flour, wine and butter, was cast on the shrine after the animal and the other gifts had been sanctified with water sprinkled by the officiating priests, while he cried "Súch, súch!" ("Be pure!"). Dense clouds of smoke from burning juniper-cedar, which crackled and gave forth pungent incense, added to the spectacle, which was dignified by the bearing of the officials and solemnized by the devout responses of the congregation. There was no human sacrifice except when a prisoner of war, after a solemn service at a shrine, was taken away and stabbed before the wooden tomb of some unavenged headman. Kafirs believed in a kind of Hell where wicked people burned; but the Hereafter was an underground region entered by a guarded aperture, and inhabited by the shapes which men see in dreams. Suicide was as unknown as fear of dying. Melancholy afflicted only the sick and the bereaved. Religious traditions, miracles and anecdotes were puerile, and pointed no social lesson or any religious law. Music, dancing and songs of praise were acceptable to the gods, and every village (*grom*) had its dancing platform and dancing house (*grom ma*), furnished with a simple altar. No prayers were offered, only invocations, exhortative or remonstrant.

Tribal Organization.

The great majority of the tribes were made up of clans. A person's importance was derived chiefly from the wealth of his family and the number of male adults which it contained. The power of a family, as shown by the number and quality of its fighting men as well as by the strength of its followers, was the index of that family's influence. Weak clans and detached families, or poor but free households, carried their independence modestly. The lowest clan above the slaves sought service with their wealthier tribesmen as henchmen and armed shepherds. By intricate ceremonial, associated with complicated duties, social and religious, which extended over two years, punctuated at intervals by prodigious compulsory banquets, rich men could become elders or *jast*. Still further outlay and ostentation enabled the few who could sustain the cost to rank still higher as chief or *Mír*. Theoretically, all the important and outside affairs of the tribe were managed by the *jast* in council; actually they were controlled by two or three of the most respected of that class. Very serious questions which inflamed the minds of the people would be debated in informal parliaments of the whole tribe. Kafirs have a remarkable fondness for discussing in conclave. Orators, consequently, are influential. The internal business of a tribe was managed by an elected magistrate with twelve assistants. It was their duty to see that the customs of the people were respected; that the proper seasons for gathering fruit were rigidly observed. They regulated the irrigation of the fields, moderating the incessant quarrels which originated in the competition for the water; and they kept the channels in good repair. Their chief, helped by contributions in kind from all householders, entertained tribal guests. He also saw that the weekly Kafir Sabbath, from the sowing to the carrying of the crops, was carefully observed, the fires kept burning, and the dancers collected and encouraged. Opposition to these annual magistrates or infraction of tribal laws was punished by fines, which were the perquisites and the payment of those officials. Serious offences against the whole people were judged by the community itself; the sentences ranged as high as expulsion from the settlement, accompanied with the burning of the culprit's house and the spoliation of his goods. In such cases, the family and the clan refusing to intervene, the offender at once became cowed into submission.

Houses and Villages.

Habitations are generally strong, and built largely of wood. They are frequently two or more storeys high, often with an open gallery at the top. Wealthy owners were fond of elaborate carving in simple designs and devices. A room is square, with a smoke-hole when possible; small windows, with shutters and bolts, and heavy doors fastened by a sliding wooden pin, are common. The nature of the ground, its defensible character, the necessity of not encroaching upon the scanty arable land, and such considerations, determine the design of the villages. Specimens of many varieties may be discovered. There is the shockingly overcrowded oblong kind, fort-shaped, three storeys high, and on a river's bank, which is pierced by an underground way leading to the water. Here all rooms look on to the large central courtyard; outwards are few or no windows. There is also the tiny hamlet of a few piled-up hovels perched on the flattish top of some huge rock, inaccessible when the ladder connecting it with the neighbouring hill-side or leading to the ground is withdrawn. Some villages on mounds are defended at the base by a circular wall strengthened with an entanglement of branches. Others cling to the knife-edged back of some difficult spur. Many are hidden away up side ravines. A few boldly rely upon the numbers of their fighting men, and are unprotected save by watch-towers. While frequently very picturesque at a distance, all are dirty and grimed with smoke; bones and horns of slaughtered animals litter the ground. The ground floor of a house is usually a winter stable for cows and the latrine, as well as the manure store for the household; the middle part contains the family treasures; on the top is the living-place. In cold valleys, such as the Presungal, the houses are often clustered upon a hillock, and penetrate into the soil to the depth of two or more apartments. Notched poles are the universal ladders and stairways.

Characteristics.

In height Kafirs average about 5 ft. 6 in. They are lean; always in hard condition; active jumpers, untiring walkers, expert mountaineers; exceptionally they are tall and heavy. With chests fairly deep, and muscular, springy legs, there is some lightness and want of power about the shoulder muscles, the arms and the hand-grasp. In complexion they are purely Eastern. Some tribes, notably the Wai, are fairer than others, but the average colour is that of the natives of the Punjab. Albinos, or red-haired people, number less than ½% of the population. As a rule, the features are well-shaped, especially the nose. The glance is wild and bold, with the wide-lidded, restless gaze of the hawk; or the exact converse—a shifty, furtive peer under lowered brows. This look is rather common amongst the wealthier families and the most famous tribesmen. The shape of a man's head not uncommonly indicates his social rank. Several have the brows of thinkers and men of affairs. The degraded forms are the bird-of-prey type—low, hairy foreheads, hooked noses with receding chin, or the thickened, coarse features of the darker slave class. Intellectually they are of good average power. Their moral characteristics are passionate covetousness, and jealousy so intense that it smothers prudence. Before finally destroying, it constantly endangered their wildly cherished independence. Revenge, especially on neighbouring Kafirs, is obtained at any price. Kafirs are subtle, crafty, quick in danger and resolute, as might be expected of people who have been plunderers and assassins for centuries, whose lives were the forfeit of a fault in unflinchingness or of a moment's vacillation. Stealthy daring, born of wary and healthy nerves and the training of generations, almost transformed into an instinct, is the national characteristic. Ghastly shadows, they flitted in the precincts of hostile villages far distant from their own valleys, living upon the poorest food carried in a fetid goatskin bag; ever ready to stab in the darkness or to wriggle through apertures, to slay as they slept men, women and babies. Then, with clothing for prize, and human ears as a trophy, they sped, watchful as hares, for their far-away hills, avenger Pathans racing furiously in their track. Kafirs, most faithful to one another, never abandoned a comrade. If he were killed, they sought to carry away his head for funeral observances. As traders, though cunning enough, they are no match for the Afghan. They were more successful as brigands and blackmailers than as skilled thieves. In night robbery and in pilfering they showed little ingenuity. Truth was considered innately dangerous; but a Kafir is far more trustworthy than his Mahommedan neighbours. Although hospitality is generally viewed as a hopeful investment, it can be calculated on, and is unstinted. Kafirs are capable of strong friendship. They are not cruel, being kind to children and to animals, and protective to the weak and the old. Family ties and the claim of blood even triumph over jealousy and covetousness.

Dress, Weapons, Utensils, &c.

The national attire of the men is a badly-cured goatskin, confined at the waist by a leather belt studded with nails, supporting the I-hilted dagger, strong but clumsy, of slave manufacture, sheathed in wood covered with iron or brass, and often prettily ornamented. Women are dressed in a long, very dark tunic of wool, ample below the shoulders, and edged with red. This is fastened at the bosom by an iron pin, a thorn, or a fibula; it is gathered round the body by a woven band, an inch wide, knotted in front to dangle down in tassels. On this girdle is carried a fantastically handled knife in a leather covering. The woman's tunic is sometimes worn by men. As worn by women its shape is something between a long frock-coat and an Inverness cape. Its hue and the blackness of the hairy goatskin give the name of Siah-Posh, "black-robed," to the majority of the clans. The other tribes wear such articles of cotton attire as they can obtain by barter, by theft, or by killing beyond the border, for only woollen cloth is made in the country. Of late years long robes from Chitral and Badakshan have been imported by the wealthy, as well as the material for loose cotton trousers and wide shirts. Clothing, always hard to obtain, is precious property. Formerly little girls, the children of slaves, or else poor relations, used to be sold in exchange for clothes and ammunition. Mahommedans eagerly bought the children, which enabled them in one transaction to acquire a female slave and to convert an infidel. Men go bareheaded, which wrinkles them prematurely, or they wear Chitral caps. Certain priests, and others of like degree, wind a strip of cotton cloth round their brows. Siah-Posh women wear curious horned caps or a small square white head-dress upon informal occasions. Females of other tribes bind their heads with turbans ornamented with shells and other finery. Excellent snow gaiters are made of goat's hair for both sexes, and of woollen material for women. Boots, strongly sewn, of soft red leather cannot be used in the snow or when it is wet, because they are imperfectly tanned. For the ceremonial dances all manner of gay-coloured articles of attire, made of cheap silk, cotton velvet, and sham cloth-of-gold, are displayed, and false jewelry and tawdry ornaments; but they are not manufactured in the country, but brought from Peshawar by pedlars. Woollen blankets and goat's-hair mats cover the bedsteads—four-legged wooden frames laced across with string or leather thongs. Low square stools, 18 in. broad, made upon the same principle as the bedsteads, are peculiar to the Kafirs and their half-breed neighbours of the border. Iron tripod tables, singularly Greek in design, are fashioned in Waigul. A warrior's weapons are a matchlock (rarely a flintlock), a bow and arrows, a spear and the dagger which he never puts aside day or night. The axes, often carried, are light and weak, and chiefly indicate rank. Clubs, carefully ornamented by carving, are of little use in a quarrel; their purpose is that of a walking-stick. As they are somewhat long, these walking-clubs have been often supposed to be leaping-poles. Swords are rarely seen, and shields, carried purely for ostentation, seldom. Soft stone is quarried to make large utensils, and great grim chests of wood become grain boxes or coffins indifferently. Prettily carved bowls with handles, or with dummy spouts, hold milk, butter, water or small quantities of flour. Wine, grain, everything else, is stored or carried in goatskin bags. Musical instruments are represented by reed flageolets, small drums, primitive fiddles, and a kind of harp.

Peculiar Customs.

Isolated and at the outskirts of every village is a house used by women when menstruating and for lying-in. Children are named as soon as born. The infant is given to the mother to suckle, while a wise woman rapidly recites the family ancestral names; the name pronounced at the instant the baby begins to feed is that by which it is thereafter known. Everybody has a double name, the father's being prefixed to that given at birth. Very often the two are the same. There is a special day for the first head-shaving. No hair is allowed on a male's scalp, except from a 4-in. circle at the back of the head, whence long locks hang down straight. Puberty is attained ceremoniously by boys. Girls simply change a fillet for a cotton cap when nature proclaims womanhood. Marriage is merely the purchase of a wife through intermediaries, accompanied by feasting. Divorce is often merely a sale or the sending away of a wife to slave for her parents in shame. Sexual morality is low. Public opinion applauds gallantry, and looks upon adultery as hospitality, provided it is not discovered by the husband. If found out, *in flagrante delicto*, there is a fiscal fine in cows. There is much collusion to get this penalty paid in poor households. Funeral rites are most elaborate, according to the rank and warrior fame of the deceased, if a male, and to the wealth and standing of the family, if a woman. Children are simply carried to the cemetery in a blanket, followed by a string of women lamenting. A really great man is mourned over for days with orations, dancing, wine-drinking and food distribution. Gun-firing gives notice of the procession. After two or three days the corpse is placed in the coffin at a secluded spot, and the observances are continued with a straw figure lashed upon a bed, to be danced about, lamented over, and harangued as before. During regular intervals for business and refreshment old women wail genealogies. A year later, with somewhat similar ritual, a wooden statue is inaugurated preliminary to erection on the roadside or in the village Valhalla. The dead are not buried, but deposited in great boxes collected in an assigned place. Finery is placed with the body, as well as vessels holding water and food. Several corpses may be heaped in one receptacle, which is, rarely, ornamented with flags; its lid is kept from warping by heavy stones. The wooden statues or effigies are at times sacrificed to when there is sickness, and at one of the many annual festivals food is set before them. Among the Presungal there are none of these images. Blood-feuds within a tribe do not exist. The slayer of his fellow, even by accident, has to pay a heavy compensation or else become an outcast. Several hamlets and at least one village are peopled by families who had thus been driven forth from the community. The stigma attaches itself to children and their marriage connexions. Its outward symbol is an inability to look in the face any of the dead person's family. This avoidance is ceremonial. In private and after dark all may be good friends after a decorous interval. The compensation is seldom paid, although payment carries with it much enhancement of family dignity. All the laws to punish theft, assault, adultery and other injury are based on a system of compensation whenever possible, and of enlisting the whole of the community in all acts of punishment. Kafirs have true conceptions of justice. There is no death penalty; a fighting male is too valuable a property of the whole tribe to be so wasted. War begins honourably with proper notice, as a rule, but the murder of an unsuspecting traveller may be the first intimation. Bullets or arrow-heads sent to a tribe or village is the correct announcement of hostilities. The slaying of a tribesman need not in all cases cause a war. Sometimes it may be avoided by the sinning tribe handing over a male to be killed by the injured relations. Ambush, early morning attacks by large numbers, and stealthy killing parties of two or three are the favourite tactics. Peace is made by the sacrifice of cows handed over by the weaker tribe to be offered up to a special god of the stronger. When both sides have shown equal force and address, the same number of animals are exchanged. Field-work falls exclusively to the women. It is poor. The ploughs are light and very shallow. A woman, who only looks as if she were yoked with the ox, keeps the beast in the furrows, while a second holds the handle. All the operations of agriculture are done primitively. Grazing and dairy-farming are the real trade of the Kafirs, the surplus produce being exchanged on the frontier or sold for Kabul rupees. Herders watch their charges fully armed against marauders.

History.—The history of Kafiristan has always been of the floating legendary sort. At the present day there are men living in Chitral and on other parts of the Kafiristan frontier who are prepared to testify as eye-witnesses to marvels observed, and also heard, by them, not only in the more remote valleys but even in the Afghan borderland itself. It is not surprising therefore that the earlier records are to a great extent fairy tales of a more or less imaginative kind and chiefly of value to those interested in folk-lore. Sir Henry Yule, a scientific soldier, a profound geographer and a careful student, as the result of his researches thought that the present Kafiristan was part of that pagan country stretching between Kashmir and Kabul which medieval Asiatics referred to vaguely as *Bilaur*, a name to be found in Marco Polo as *Bolor*. The first distinct mention of the Kafirs as a separate people appears in the history of Timur. On his march to the invasion of India the people at Andarab appealed to Timur for help against the Kator and the Siah-Posh Kafirs. He responded and entered the country of those tribes through the upper part of the Panjhir valley. It was in deep winter weather and Timur had to be let down the snows by *glissade* in a basket guided by ropes. A detachment of 10,000 horse which he speaks of as having been sent against the Siah-Posh to his left, presumably therefore to the north, met with disaster; but he himself claims to have been victorious. Nevertheless he seems quickly to have evacuated the impracticable mountain land, quitting the country at Khawak. He caused an inscription to be carved in the defiles of Kator to commemorate his invasion and to explain its route. Inside the Kafir country on the Najil or Alishang River there is a fort still called Timur's Castle, and in the Kalam fort there is said to be a stone engraved to record that as the farthest point of his advance. In the *Memoirs* of Baber there is mention of the Kafirs raiding into Panjhir and of their taste for drinking, every man having a leathern wine-bottle slung round his neck. The *Ain-i-Akbari* makes occasional mention of the Kafirs, probably on the authority of the famous *Memoirs*; it also contains a passage which may possibly have originated the widespread story that the Kafirs were descendants of the Greeks. Yule however believed that this passage did not refer to the Kafirs at all, but to the claims to descent from Alexander of the rulers in Swat before the time of the Yusufzai. Many of the princelings of the little Hindu-Kush states at the present day pride themselves on a similar origin, maintaining the founders of their race to be Alexander, "the two-horned," and a princess sent down miraculously from heaven to wed him.

Benedict Goes, travelling from Peshawar to Kabul in 1603, heard of a place called *Capperstam*, where no Mahommedan might enter on pain of death. Hindu traders were allowed to visit the country, but not the temples. Benedict Goes tasted the Kafir wine, and from all that he heard suspected that the Kafirs might be Christians. Nothing more is heard of the Kafirs until 1788, when Rennell's *Memoir of a Map of*

Hindostan was published. Twenty-six years later Elphinstone's *Caubal* was published. During the British occupation of Kabul in 1839–1840 a deputation of Kafirs journeyed there to invite a visit to their country from the Christians whom they assumed to be their kindred. But the Afghans grew furiously jealous, and the deputation was sent coldly away.

After Sir George Robertson's sojourn in the country and the visit of several Kafirs to India with him in 1892 an increasing intimacy continued, especially with the people of the eastern valleys, until 1895, when by the terms of an agreement entered into between the government of India and the ruler of Afghanistan the whole of the Kafir territory came nominally under the sway of Kabul. The amir Abdur Rahman at once set about enforcing his authority, and the curtain, partially lifted, fell again heavily and in darkness. Nothing but rumours reached the outside world, rumours of successful invasions, of the wholesale deportation of boys to Kabul for instruction in the religion of Islam, of rebellions, of terrible repressions. Finally even rumour ceased. A powerful Asiatic ruler has the means of ensuring a silence which is absolute, and nothing is ever known from Kabul except what the amir wishes to be known. Probably larger numbers of the growing boys and young men of Kafiristan are fanatical Mahommedans, fanatical with the zeal of the recent convert, while the older people and the majority of the population cherish their ancient customs in secret and their degraded religion in fear and trembling—waiting dumbly for a sign.

See Sir G. S. Robertson, *Kafirs of the Hindu-Kush* (London, 1896). (G. S. R.)

KAGERA, a river of east equatorial Africa, the most remote headstream of the Nile. The sources of its principal upper branch, the Nyavarongo, rise in the hill country immediately east of Lake Kivu. After a course of over 400 m. the Kagera enters Victoria Nyanza on its western shore in 0° 58′ S. It is navigable by steamers for 70 m. from its mouth, being obstructed by rapids above that point. The river was first heard of by J. H. Speke in 1858, and was first seen (by white men) by the same traveller (Jan. 16, 1862) on his journey to discover the Nile source. Speke was well aware that the Kagera was the chief river emptying into the Victoria Nyanza and in that sense *the* headstream of the Nile. By him the stream was called "Kitangŭlé," *kagera* being given as equivalent to "river." The exploration of the Kagera has been largely the work of German travellers.

See NILE; also Speke's *Discovery of the Source of the Nile* (Edinburgh, 1863); R. Kandt's *Caput Nili* (Berlin, 1904); and map by P. Sprigade and M. Moisel in *Grosser deutscher Kolonialatlas*, No. 16 (Berlin, 1906).

KAHLUR, or BILASPUR, a native state of India, within the Punjab. It is one of the hill states that came under British protection after the first Sikh war in 1846. The Gurkhas had overrun the country in the early part of the 19th century, and expelled the raja, who was, however, reinstated by the British in 1815. The state occupies part of the basin of the Sutlej amid the lower slopes of the Himalaya. Area, 448 sq. m. Pop. (1901), 90,873; estimated gross revenue, £10,000; tribute, £530. The chief, whose title is raja, is a Chandel Rajput. The town of Bilaspur is situated on the left bank of the Sutlej, 1465 ft. above sea-level; pop. (1901), 3192.

KAHN, GUSTAVE (1859–), French poet, was born at Metz on the 21st of December 1859. He was educated in Paris at the École des Chartes and the École des langues orientales, and began to contribute to obscure Parisian reviews. After four years spent in Africa he returned to Paris in 1885, and founded in 1886 a weekly review, *La Vogue*, in which many of his early poems appeared. In the autumn of the same year he founded, with Jean Moréas and Paul Adam, a short-lived periodical, *Le Symboliste*, in which they preached the nebulous poetic doctrine of Stéphane Mallarmé; and in 1888 he became one of the editors of the *Revue indépendante*. He contributed poetry and criticism to the French and Belgian reviews favourable to the extreme symbolists, and, with Catulle Mendès, he founded at the Odéon, the Théâtre Antoine and the Théâtre Sarah Bernhardt, matinées for the production of the plays of the younger poets. He claimed to be the earliest writer of the *vers libre*, and explained his methods and the history of the movement in a preface to his *Premiers poèmes* (1897). Later books are *Le Livre d'images* (1897); *Les Fleurs de la passion* (1900); some novels; and a valuable contribution to the history of modern French verse in *Symbolistes et décadents* (1902).

KAHNIS, KARL FRIEDRICH AUGUST (1814–1888), German Lutheran theologian, was born at Greiz on the 22nd of December 1814. He studied at Halle, and in 1850 was appointed professor ordinarius at Leipzig. Ten years later he was made canon of Meissen. He retired in 1886, and died on the 20th of June 1888 at Leipzig. Kahnis was at first a neo-Lutheran, blessed by E. W. Hengstenberg and his pietistic friends. He then attached himself to the Old Lutheran party, interpreting Lutheranism in a broad and liberal spirit and showing some appreciation of rationalism. His *Lutherische Dogmatik, historisch-genetisch dargestellt* (3 vols., 1861–1868; 2nd ed. in 2 vols., 1874–1875), by making concessions to modern criticism, by spiritualizing and adapting the old dogmas, by attacking the idea of an infallible canon of Scripture and the conventional theory of inspiration, by laying stress on the human side of Scripture and insisting on the progressive character of revelation, brought him into conflict with his former friends. A. W. Diekhoff, Franz Delitzsch (*Für und wider Kahnis*, 1863) and Hengstenberg (*Evangelische Kirchenzeitung*, 1862) protested loudly against the heresy, and Kahnis replied to Hengstenberg in a vigorous pamphlet, *Zeugniss für die Grundwahrheiten des Protestantismus gegen Dr Hengstenberg* (1862).

Other works by Kahnis are *Lehre vom Abendmahl* (1851), *Der innere Gang des deutschen Protestantismus seit Mitte des vorigen Jahrhunderts* (1854; 3rd ed. in 2 vols., 1874; Eng. trans., 1856); *Christentum und Luthertum* (1871); *Geschichte der deutschen Reformation*, vol. i. (1872); *Der Gang der Kirche in Lebensbildern* (1881, &c.); and *Über das Verhältnis der alten Philosophie zum Christentum* (1884).

K'AI-FÊNG FU, the capital of the province of Honan, China. It is situated in 34° 52′ N., 114° 33′ E., on a branch line of the Peking-Hankow railway, and forms also the district city of Siang-fu. A city on the present site was first built by Duke Chwang (774–700 B.C.) to mark off (*k'ai*) the boundary of his fief (*fêng*); hence its name. It has, however, passed under several *aliases* in Chinese history. During the Chow, Suy and T'ang dynasties (557–907) it was known as P'ien-chow. During the Wu-tai, or five dynasties (907–960), it was the Tung-king, or eastern capital. Under the Sung and Kin dynasties (960–1260) it was called P'ien-king. By the Yuan or Mongol dynasty (1260–1368) its name was again changed to P'ien-liang, and on the return of the Chinese to power with the establishment of the Ming dynasty (1368–1644), its original name was restored. The city is situated at the point where the last spur of the Kuen-lun mountain system merges in the eastern plain, and a few miles south of the Hwang-ho. Its position, therefore, lays it open to the destructive influences of this river. In 1642 it was totally destroyed by a flood caused by the dikes bursting, and on several prior and subsequent occasions it has suffered injury from the same cause. The city is large and imposing, with broad streets and handsome buildings, the most notable of which are a twelve-storeyed pagoda 600 ft. high, and a watch tower from which, at a height of 200 ft., the inhabitants are able to observe the approach of the yellow waters of the river in times of flood. The city wall forms a substantial protection and is pierced by five gates. The whole neighbourhood, which is the site of one of the earliest settlements of the Chinese in China, is full of historical associations, and it was in this city that the Jews who entered China in A.D. 1163 first established a colony. For many centuries these people held themselves aloof from the natives, and practised the rites of their religion in a temple built and supported by themselves. At last, however, they fell upon evil times, and in 1851, out of the seventy families which constituted the original colony, only seven remained. For fifty years no rabbi had ministered to the wants of this remnant. In 1853 the city was attacked by the T'ai-p'ing rebels, and, though at the first assault its defenders successfully resisted the enemy, it was subsequently taken. The captors looted and partially destroyed the town. It has now little commerce, but contains several schools on Western lines—including a government college opened in 1902, and a military school near the railway station. A mint was established in 1905, and there is a district branch of the imperial post. The population—largely Mahommedan—was estimated (1908) at 200,000. Jews numbered about 400.

KAILAS, a mountain in Tibet. It is the highest peak of the range of mountains lying to the north of Lake Manasorawar, with an altitude of over 22,000 ft. It is famous in Sanskrit literature as Siva's paradise, and is a favourite place of pilgrimage with Hindus, who regard it as the most sacred spot on earth. A track encircles the base of the mountain, and it takes the pilgrim three weeks to complete the round, prostrating himself all the way.

KAIN, the name of a sub-province and of a town of Khorasan, Persia. The sub-province extends about 300 m. N. to S., from Khāf to Seīstān, and about 150 m. W. to E., from the hills of Tūn to the Afghan frontier, comprising the whole of south-western Khorasan. It is very hilly, but contains many wide plains and fertile villages at a mean elevation of 4000 ft. It has a population of about 150,000, rears great numbers of camels and produces much grain, saffron, wool, silk and opium. The chief manufactures are felts and other woollen fabrics, principally carpets, which have a world-wide reputation. The best Kaini carpets are made at Darakhsh, a village in the Zīrkūh district and 50 m. N.E. of Birjend. It is divided into eleven administrative divisions:—Shāhābād (with the capital Birjend), Naharjān, Alghur, Tabas sunnī Khaneh, Zīrkūh Shakhan, Kain, Nīmbulūk, Nehbandān, Khūsf, Arab Khāneh or Momenabad.

The town of Kain, the capital of the sub-province until 1740, when it was supplanted by Birjend, is situated 65 m. N. of Birjend on the eastern side of a broad valley, stretching from N. to S., at the base of the mountain Abuzar, in 33° 42′ N. and 59° 8′ E., and at an elevation of 4500 ft. Its population is barely 5000. It is surrounded by a mud wall and bastions, and near it, on a hill rising 500 ft. above the plain, are the ruins of an ancient castle which, together with the old town, was destroyed either by Shah Rukh (1404–1447), a son, or by Baysunkur (d. 1433), a grandson of Timur (Tamerlane), who afterwards built a new town. After a time the Uzbegs took possession and held the town until Shah Abbas I. (1587–1629) expelled them. In the 18th century it fell under the sway of the Afghans and remained a dependency of Herat until 1851. A large number of windmills are at work outside the town. The great mosque, now in a ruinous state, was built A.H. 796 (A.D. 1394) by Kāren b. Jamshid and repaired by Yūsof Dowlatyār.

KAIRA, or KHEDA, a town and district of British India, in the northern division of Bombay. The town is 20 m. S.W. of Ahmedabad and 7 m. from Mehmadabad railway station. Pop. (1901), 10,392. Its antiquity is proved by the evidence of copperplate grants to have been known as early as the 5th century. Early in the 18th century it passed to the Babi family, with whom it remained till 1763, when it was taken by the Mahrattas; it was finally handed over to the British in 1803. It was a large military station till 1830, when the cantonment was removed to Deesa.

The DISTRICT OF KAIRA has an area of 1595 sq. m.; pop. (1901), 716,332, showing a decrease of 18% in the decade, due to the results of famine. Except a small corner of hilly ground near its northern boundary and in the south-east and south, where the land along the Mahi is furrowed into deep ravines, the district forms one unbroken plain, sloping gently towards the south-west. The north and north-east portions are dotted with patches of rich rice-land, broken by untilled tracts of low brushwood. The centre of the district is very fertile and highly cultivated; the luxuriant fields are surrounded by high hedges, and the whole country is clothed with clusters of shapely trees. To the west this belt of rich vegetation passes into a bare though well-cultivated tract of rice-land, growing more barren and open till it reaches the maritime belt, whitened by a salt-like crust, along the Gulf of Cambay. The chief rivers are the Mahi on the south-east and south, and the Sabarmati on the western boundary. The Mahi, owing to its deeply cut bed and sandbanks, is impracticable for either navigation or irrigation; but the waters of the Sabarmati are largely utilized for the latter purpose. A smaller stream, the Khari, also waters a considerable area by means of canals and sluices. The principal crops are cotton, millets, rice and pulse; the industries are calico-printing, dyeing, and the manufacture of soap and glass. The chief centre of trade is Nadiad, on the railway, with a cotton-mill. A special article of export is *ghi*, or clarified butter. The Bombay & Baroda railway runs through the district. The famine of 1899–1900 was felt more severely here than in any other part of the province, the loss of cattle being specially heavy.

KAIRAWAN (KEROUAN), the "sacred" city of Tunisia, 36 m. S. by W. by rail from Susa, and about 80 m. due S. from the capital. Kairawān is built in an open plain a little west of a stream which flows south to the Sidi-el-Hani lake. Of the luxuriant gardens and olive groves mentioned in the early Arabic accounts of the place hardly a remnant is left. Kairawān, in shape an irregular oblong, is surrounded by a crenellated brick wall with towers and bastions and five gates. The city, however, spreads beyond the walls, chiefly to the south and west. Some of the finest treasures of Saracenic art in Tunisia are in Kairawān; but the city suffered greatly from the vulgarization which followed the Turkish conquest, and also from the blundering attempts of the French to restore buildings falling into ruin. The streets have been paved and planted with trees, but the town retains much of its Oriental aspect. The houses are built round a central courtyard, and present nothing but bare walls to the street. The chief buildings are the mosques, which are open to Christians, Kairawān being the only town in Tunisia where this privilege is granted.

In the northern quarter stands the great mosque founded by Sidi Okba ibn Nafi, and containing his shrine and the tombs of many rulers of Tunisia. To the outside it presents a heavy buttressed wall, with little of either grandeur or grace. It consists of three parts: a cloistered court, from which rises the massive and stately minaret, the maksura or mosque proper, and the vestibule. The maksura is a rectangular domed chamber divided by 296 marble and porphyry columns into 17 aisles, each aisle having 8 arches. The central aisle is wider than the others, the columns being arranged by threes. All the columns are Roman or Byzantine, and are the spoil of many ancient cities. Access to the central aisle is gained through a door of sculptured wood known as the Beautiful Gate. It has an inscription with the record of its construction. The walls are of painted plaster-work; the mimbar or pulpit is of carved wood, each panel bearing a different design. The court is surrounded by a double arcade with coupled columns. In all the mosque contains 439 columns, including two of alabaster given by one of the Byzantine emperors. To the Mahommedan mind the crowning distinction of the building is that through divine inspiration the founder was enabled to set it absolutely true to Mecca. The mosque of Sidi Okba is the prototype of many other notable mosques (see MOSQUE). Of greater external beauty than that of Sidi Okba is the mosque of the Three Gates. Cufic inscriptions on the façade record its erection in the 9th and its restoration in the 15th century A.D. Internally the mosque is a single chamber supported by sixteen Roman columns. One of the finest specimens of Moorish architecture in Kairawān is the *zawia* of Sidi Abid-el-Ghariani (d. *c.* A.D. 1400), one of the Almoravides, in whose family is the hereditary governorship of the city. The entrance, a door in a false arcade of black and white marble, leads into a court whose arches support an upper colonnade. The town contains many other notable buildings, but none of such importance as the mosque of the Companion (*i.e.* of the Prophet), outside the walls to the N.W. This mosque is specially sacred as possessing what are said to be three hairs of the Prophet's beard, buried with the saint, who was one of the companions of Mahomet. (This legend gave rise to the report that the tomb contained the remains of Mahomet's barber.) The mosque consists of several courts and chambers, and contains some beautiful stained glass. The court which forms the entrance to the shrine of the saint is richly adorned with tiles and plaster-work, and is surrounded by an arcade of white marble columns, supporting a painted wooden roof. The minaret is faced with tiles and is surmounted by a gilded crescent. The 19th-century mosque of Sidi Amar Abada, also outside the wall, is in the form of a cross and is crowned with seven cupolas. In the suburbs are huge cisterns, attributed to the 9th century, which still supply the city with water. The cemetery covers a large area and has thousands of Cufic and Arabic inscriptions.

Formerly famous for its carpets and its oil of roses, Kairawān is now known in northern Africa rather for copper vessels, articles in morocco leather, potash and saltpetre. The town has a population of about 20,000, including a few hundred Europeans.

Arab historians relate the foundation of Kairawān by Okba with miraculous circumstances (Ṭabari ii. 63; Yāqūt iv. 213). The date is variously given (see Weil, *Gesch. d. Chalifen*, i. 283 seq.); according to Ṭabari it must have been before 670. The legend says that Okba determined to found a city which should be a rallying-point for the followers of Mahomet in Africa. He led his companions into the desert, and having exhorted the serpents and wild beasts, in the name of the Prophet, to retire, he struck his spear into the ground exclaiming "Here is your Kairawān" (resting-place), so naming the city.[1] In the 8th century Kairawān was the capital of the province of Ifrikia governed by amirs appointed by the caliphs. Later it became the capital of the Aghlabite princes, thereafter following the fortunes of the successive rulers of the country (see TUNISIA: *History*). After Mecca and Medina Kairawān is the most sacred city in the eyes of the Mahommedans of Africa, and constant pilgrimages are made to its shrines. Until the time of the French occupation no Christian was allowed to pass through the gates without a special permit from the bey, whilst Jews were altogether forbidden to approach the holy city. Contrary to expectation no opposition was offered by the citizens to the occupation of the place by the French troops in 1881. On that occasion the native troops hastened to the mosques to perform their devotions; they were followed by European soldiers, and the mosques having thus been "violated" have remained open ever since to non-Mahommedans.

See Murray's *Handbook to Algeria and Tunis*, by Sir R. L. Playfair (1895); A. M. Broadley, *The Last Punic War: Tunis Past and Present* (1882) and H. Saladin, *Tunis et Kairouan* (1908).

KAISERSLAUTERN, a town in the Bavarian palatinate, on the Waldlauter, in the hilly district of Westrich, 41 m. by rail W. of Mannheim. Pop. (1905), 52,306. Among its educational institutions are a gymnasium, a Protestant normal school, a commercial school and an industrial museum. The house of correction occupies the site of Frederick Barbarossa's castle, which was demolished by the French in 1713. Kaiserslautern is one of the most important industrial towns in the palatinate. Its industries include cotton and wool spinning and weaving, iron-founding, and the manufacture of beer, tobacco, gloves, boots, furniture, &c. There is some trade in fruit and in timber.

Kaiserslautern takes its name from the emperor (Kaiser) Frederick I., who built a castle here about 1152, although it appears to have been a royal residence in Carolingian times. It became an imperial city, a dignity which it retained until 1357, when it passed to the palatinate. In 1621 it was taken by the Spanish, in 1631 by the Swedish, in 1635 by the imperial and in 1713 by the French troops. During 1793 and 1794 it was the scene of fighting; and in the Franco-Prussian War of 1870 it was the base of operations of the second German army, under Prince Frederick Charles. It was one of the early stations of the Reformation, and in 1849 was the centre of the revolutionary spirit in the palatinate.

See Lehmann, *Urkundliche Geschichte von Kaiserslautern* (Kaiserslautern, 1853), and E. Jost, *Geschichte der Stadt Kaiserslautern* (Kaiserslautern, 1886).

KAISERSWERTH, a town in the Prussian Rhine province, on the right bank of the Rhine, 6 m. below Düsseldorf. Pop. (1905), 2462. It possesses a Protestant and a large old Romanesque Roman Catholic church of the 12th or 13th century, with a valuable shrine, said to contain the bones of St Suitbert, and has several benevolent institutions, of which the chief is the *Diakonissen Anstalt*, or training-school for Protestant sisters of charity. This institution, founded by Pastor Theodor Fliedner (1800–1864) in 1836, has more than 100 branches, some being in Asia and America; the head establishment at Kaiserswerth includes an orphanage, a lunatic asylum and a Magdalen institution. The Roman Catholic hospital occupies the former Franciscan convent. The population is engaged in silk-weaving and other small industries.

In 710 Pippin of Heristal presented the site of the town to Bishop Suitbert, who built the Benedictine monastery round which the town gradually formed. Until 1214 Kaiserswerth lay on an island, but in that year Count Adolph V. of Berg, who was besieging it, dammed up effectually one arm of the Rhine. About the beginning of the 14th century Kaiserswerth, then an imperial city, came to the archbishopric of Cologne, and afterwards to the duchy of Juliers, whence, after some vicissitudes, it finally passed into the possession of the princes of the palatinate, whose rights, long disputed by the elector of Cologne, were legally settled in 1772. In 1702 the fortress was captured by the Austrians and Prussians, and the Kaiserpfalz, whence the young emperor Henry IV. was abducted by Archbishop Anno of Cologne in 1062, was blown up.

See J. Disselhoff, *Das Diaconissenmutterhaus zu Kaiserswerth* (new ed., 1903; Eng. trans., 1883).

KAITHAL, or KYTHAL, an ancient town of British India in Karnal district, Punjab. Pop. (1901), 14,408. It is said to have been founded by the mythical hero Yudisthira, and is connected by tradition with the monkey-god Hanuman. In 1767 it fell into the hands of the Sikh chieftain, Bhai Desu Singh, whose descendants, the bhais of Kaithal, ranked among the most powerful Cis-Sutlej chiefs. Their territories lapsed to the British in 1843. There remain the fort of the bhais, and several Mahommedan tombs of the 13th century and later. There is some trade in grain, sal-ammoniac, live stock and blankets; and cotton, saltpetre, lac ornaments and toys are manufactured.

KAKAPO, the Maori name, signifying "night parrot," and frequently adopted by English writers, of a bird, commonly called by the British in New Zealand the "ground-parrot" or "owl-parrot." The existence of this singular form was first made known in 1843 by Ernst Dieffenbach (*Travels in N. Zealand*, ii. 194), from some of its tail-feathers obtained by him, and he suggested that it was one of the *Cuculidae*, possibly belonging to the genus *Centropus*, but he added that it was becoming scarce, and that no example had been seen for many years. G. R. Gray, noticing it in June 1845 (*Zool. Voy. "Erebus" and "Terror,"* pt. ix. p. 9), was able to say little more of it, but very soon afterwards a skin was received at the British Museum, of which, in the following September, he published a figure (*Gen. Birds*, pt. xvii.), naming it *Strigops*[2] *habroptilus*, and rightly placing it among the parrots, but he did not describe it technically for another eighteen months (*Proc. Zool. Society*, 1847, p. 61). Many specimens have now been received in Europe, so that it is represented in most museums, and several examples have reached England alive.

In habits the kakapo is almost wholly nocturnal,[3] hiding in holes (which in some instances it seems to make for itself) under the roots of trees or rocks during the day time, and only issuing forth about sunset to seek its food, which is solely vegetable in kind, and consists of the twigs, leaves, seeds and fruits of trees, grass and fern roots—some observers say mosses also. It sometimes climbs trees, but generally remains on the ground, only using its comparatively short wings to balance itself in running or to break its fall when it drops from a tree—though not always then—being apparently incapable of real flight. It thus becomes an easy prey to the marauding creatures—cats, rats and so forth—which European colonists have, by accident or design, let loose in New Zealand. Sir G. Grey says it had been, within the memory of old people, abundant in every part of that country, but (writing in 1854) was then found only in the unsettled districts.

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[1] Though Okba founded his city in a desert place, excavations undertaken in 1908 revealed the existence of Roman ruins, including a temple of Saturn, in the neighbourhood.

[2] This generic term was subsequently altered by Van der Hoeven, rather pedantically, to *Stringops*, a spelling now generally adopted.

[3] It has, however, been occasionally observed abroad by day; and, in captivity, one example at least is said to have been as active by day as by night.

The kakapo is about the size of a raven, of a green or brownish-green colour, thickly freckled and irregularly barred with dark brown, and dashed here and there with longitudinal stripes of light yellow. Examples are subject to much variation in colour and shade, and in some the lower parts are deeply tinged with yellow. Externally the most striking feature of the bird is its head, armed with a powerful beak that it well knows how to use, and its face clothed with hairs and elongated feathers that sufficiently resemble the physiognomy of an owl to justify the generic name bestowed upon it. Of its internal structure little has been described, and that not always correctly. Its furcula has been said (*Proc. Zool. Society*, 1874, p. 594) to be "lost," whereas the clavicles, which in most birds unite to form that bone, are present, though they do not meet, while in like manner the bird has been declared (*op. cit.*, 1867, p. 624, note) to furnish among the *Carinatae* "the only apparent exception to the presence of a keel" to the sternum. The keel, however, is undoubtedly there, as remarked by Blanchard (*Ann. Nat. Sc.*, *Zoologie*, 4th series, vol. xi. p. 83) and A. Milne Edwards (*Ois. Foss. de la France*, ii. 516), and, though much reduced in size, is nearly as much developed as in the Dodo and the Ocydrome. The aborted condition of this process can hardly be regarded but in connexion with the incapacity of the bird for flight, and may very likely be the result of disuse. There can be scarcely any doubt as to the propriety of considering this genus the type of a separate family of *Psittaci*; but whether it stands alone or some other forms (*Pezoporus* or *Geopsittacus*, for example, which in coloration and habits present some curious analogies) should be placed with it, must await future determination. In captivity the kakapo is said to show much intelligence, as well as an affectionate and playful disposition. Unfortunately it does not seem to share the longevity characteristic of most parrots, and none that has been held in confinement appears to have long survived, while many succumb speedily.

For further details see Gould's *Birds of Australia* (ii. 247), and *Handbook* (ii. 539); Dr Finsch's *Die Papageien* (i. 241), and Sir Walter Buller's *Birds of New Zealand* especially. (A. N.)

KAKAR, a Pathan tribe on the Zhob valley frontier of Baluchistan. The Kakars inhabit the back of the Suliman mountains between Quetta and the Gomal river; they are a very ancient race, and it is probable that they were in possession of these slopes long before the advent of Afghan or Arab. They are divided into many distinct tribes who have no connexion beyond the common name of Kakar. Not only is there no chief of the Kakars, or general *jirgah* (or council) of the whole tribe, but in most cases there are no recognized heads of the different clans. In 1901 they numbered 105,444. During the second Afghan War the Kakars caused some annoyance on the British line of communications; and the Kakars inhabiting the Zhob valley were punished by the Zhob valley expedition of 1884.

KALA-AZAR, or Dum-Dum fever, a tropical disease, characterized by remittent fever, anaemia and enlargement of the spleen (splenomegaly) and often of the liver. It is due to a protozoon parasite (see PARASITIC DISEASES), discovered in 1900 by Leishman in the spleen, and is of a malarial type. The treatment is similar to that for malaria. In Assam good results have been obtained by segregation.

KALABAGH, a town of British India in the Mianwali district of the Punjab. Pop. (1901), 5824. It is picturesquely situated at the foot of the Salt range, on the right bank of the Indus, opposite the railway station of Mari. The houses nestle against the side of a precipitous hill of solid rock-salt, piled in successive tiers, the roof of each tier forming the street which passes in front of the row immediately above, and a cliff, also of pure rock-salt, towers above the town. The supply of salt, which is worked from open quarries, is practically inexhaustible. Alum also occurs in the neighbouring hills, and forms a considerable item of local trade. Iron implements are manufactured.

KALACH, also known as DONSKAYA, a village of S.E. Russia, in the territory of the Don Cossacks, and a river port on the Don, 31 m. N.E. of Nizhne-Chirskaya, in 43° 30′ E. and 48° 43′ N. Its permanent population, only about 1200, increases greatly in summer. It is the terminus of the railway (45 m.) which connects the Don with Tsaritsyn on the Volga, and all the goods (especially fish, petroleum, cereals and timber) brought from the Caspian Sea up the Volga and destined for middle Russia, or for export through the Sea of Azov, are unloaded at Tsaritsyn and sent over to Kalach on the Don.

KALAHANDI (formerly KAROND), a feudatory state of India, which was transferred from the Central Provinces to the Orissa division of Bengal in 1905. A range of the Eastern Ghats runs from N.E. to S.W. through the state, with open undulating country to the north. Area 3745 sq. m.; pop. (1901), 350,529; estimated revenue, £8000; tribute, £800. The inhabitants mostly belong to the aboriginal race of Khonds. A murderous outbreak against Hindu settlers called for armed intervention in 1882. The chief, Raghu Kishor Deo, was murdered by a servant in 1897, and during the minority of his son, Brij Mohan Deo, the state was placed in charge of a British political agent. The capital is Bhawani Patna.

KALAHARI DESERT, a region of South Africa, lying mainly between 20° and 28° S. and 19° and 24° E., and covering fully 120,000 sq. m. The greater part of this territory forms the western portion of the (British) Bechuanaland protectorate, but it extends south into that part of Bechuanaland annexed to the Cape and west into German South-West Africa. The Orange river marks its southern limit; westward it reaches to the foot of the Nama and Damara hills, eastward to the cultivable parts of Bechuanaland, northward and north-westward to the valley of the Okavango and the bed of Lake Ngami. The Kalahari, part of the immense inner table-land of South Africa, has an average elevation of over 3000 ft. with a general slope from east to west and a dip northward to Ngami. Described by Robert Moffat as "the southern Sahara," the Kalahari resembles the great desert of North Africa in being generally arid and in being scored by the beds of dried-up rivers. It presents however many points of difference from the Sahara. The surface soil is mainly red sand, but in places limestone overlies shale and conglomerates. The ground is undulating and its appearance is comparable with that of the ocean at times of heavy swell. The crests of the waves are represented by sand dunes, rising from 30 to 100 ft.; the troughs between the dunes vary greatly in breadth. On the eastern border long tongues of sand project into the veld, while the veld in places penetrates far into the desert. There are also, and especially along the river beds, extensive mud flats. After heavy rain these become pans or lakes, and water is then also found in mud-bottomed pools along the beds of the rivers. The water in the pans is often brackish, and in some cases thickly encrusted with salt. Pans also occur in crater-like depressions where rock rises above the desert sands. A tough, sun-bleached grass, growing knee-high in tufts at intervals of about 15 in., covers the dunes and gives the general colour of the landscape. Considerable parts of the Kalahari, chiefly in the west and north, are however covered with dense scrub and there are occasional patches of forest. Next to the lack of water the chief characteristics of the desert are the tuberous and herbaceous plants and the large numbers of big game found in it. Of the plants the most remarkable is the water-melon, of which both the bitter and sweet variety are found, and which supplies both man and beast with water. The game includes the lion, leopard, hippopotamus, rhinoceros, buffalo, zebra, quagga, many kinds of antelope (among them the kudu and gnu), baboon and ostrich. The elephant, giraffe and eland are also found. The hunting of these three last-named animals is prohibited, and for all game there is a close time from the beginning of September to the end of February.

The climate is hot, dry and healthy, save in the neighbourhood of the large marshes in the north, where malarial fever is prevalent. In this region the drainage is N.E. to the great Makarikari marsh and the Botletle, the river connecting the marsh with the Ngami system. In the south the drainage is towards the Orange. The Molopo and the Kuruman, which in their upper course in eastern Bechuanaland are perennial streams, lose their water by evaporation and percolation on their way westward through the Kalahari. The Molopo, a very imposing river on the map, is dry in its lower stretches. The annual rainfall does not exceed 10 in. It occurs in the summer months, September to March, and chiefly in thunderstorms. The country is suffering from progressive desiccation, but there is good evidence of an abundant supply of water not far beneath the surface. In the water-melon season a few white farmers living on the edge of the desert send their herds thither to graze. Such few spots as have been under cultivation by artificial irrigation yield excellent returns to the farmer; but the chief commercial products of the desert are the skins of animals.

The Kalahari is the home of wandering Bushmen (*q.v.*), who live entirely by the chase, killing their prey with poisoned arrows, of Ba-Kalahari, and along the western border of Hottentots, who are both hunters and cattle-rearers. The Ba-Kalahari (men of the Kalahari), who constitute the majority of the inhabitants, appear to belong to the Batau tribe of the Bechuanas, now no longer having separate tribal existence, and traditionally reported to be the oldest of the Bechuana tribes. Their features are markedly negroid, though their skin is less black than that of many negro peoples. They have thin legs and arms. The Ba-Kalahari are said to have possessed enormous herds of large horned cattle until deprived of them and driven into the desert by a fresh migration of more powerful Bechuana tribes. Unlike the Bushmen, and in spite of desert life, the Ba-Kalahari have a true passion for agriculture and cattle-breeding. They carefully cultivate their gardens, though in many cases all they can grow is a scanty supply of melons and pumpkins, and they rear small herds of goats. They are also clever hunters, and from the neighbouring Bechuana chiefs obtain spears, knives, tobacco and dogs in exchange for the skins of the animals they kill. In disposition they are peaceful to timidity, grave and almost morose. Livingstone states that he never saw Ba-Kalahari children at play. An ingenious method is employed to obtain water where there is no open well or running stream. To one end of a reed about 2 ft. long a bunch of grass is tied, and this end of the reed is inserted in a hole dug at a spot where water is known to exist underground, the wet sand being rammed down firmly round it. An ostrich egg-shell, the usual water vessel, is placed on the ground alongside the reed. The water-drawer, generally a woman, then sucks up the water through the reed, dexterously squirting it into the adjacent egg-shell. To aid her aim she places between her lips a straw, the other end of which is inserted in the shell. The shells, when filled, are buried, the object of the Ba-Kalahari being to preserve their supplies from any sudden raid by Bushmen or other foe. Early travellers stated that no amount of bullying or hunting in a Ba-Kalahari village would result in a find of water; but that on friendly relations being established the natives would bring a supply, however arid the district. The British government has since sunk wells in one or two districts. Though the Ba Kalahari have no religion in the strict sense of the word, they show traces of totemism, and as Batau, *i.e.* "men of the lion," revere rather than fear that beast.

The Kalahari was first crossed to Lake Ngami by David Livingstone, accompanied by William C. Oswell, in 1849. In 1878–1879 a party of Boers, with about three hundred wagons, trekked from the Transvaal across the Kalahari to Ngami and thence to the hinterland of Angola. Many of the party, men, women and children, perished of thirst during the journey. Survivors stated that in all some 250 people and 9000 cattle died.

See Bechuanaland. *Die Kalahari*, by Dr Siegfried Passarge (Berlin, 1904), is a valuable treatise on the geology, topography, hydrography, climate and flora of the desert, with maps and bibliography. The author spent two years (1896–1898) in the Kalahari. See also *Missionary Travels and Researches in South Africa*, &c., by David Livingstone (London, 1857).

KALAMATA (officially Καλάμαι, from an ancient town near the site), chief town of the modern Greek nomarchy of Messenia in the Morea, situated on the left bank of the Nedon, about 1 m. from the sea. Pop. (1907), 13,123. There is a suburb on the right bank of the stream. On a hill behind the town are the ruins of a medieval castle, but no ancient Greek remains have been discovered, although some travellers have identified the site with that of the classical Pharae or Pherae. It is the seat of a court of justice and of an archbishop. During the middle ages it was for a time a fief of the Villehardouins. In 1685 Kalamata was captured by the Venetians; in 1770, and again in 1821, it was the revolutionary headquarters in the Morea. In 1825 it was sacked by Ibrahim Pasha. Kalamata is situated in a very fruitful district, of which it is the emporium. The harbour, though recently improved, offers little shelter to shipping. Vessels load and discharge by means of lighters, the outer harbour having a depth at entrance of 24 ft. and inside of 14 ft. The inner harbour has a depth of 15 ft. and is sheltered by a breakwater 1640 ft. in length; in the winter months the fishing craft take shelter in the haven of Armyro. The silk industry, formerly important, still employs about 300 women and girls in four spinning establishments. Olive oil and silk are the chief exports.

KALAMAZOO, a city and the county-seat of Kalamazoo county, Michigan, U.S.A., on the W. bank of the Kalamazoo River, about 49 m. S. of Grand Rapids and 144 m. W. of Detroit. Pop. (1900) 24,404, of whom 4710 were foreign-born; (1910 census) 39,437. It is served by the Michigan Central, the Lake Shore & Michigan Southern, the Grand Rapids & Indiana, the Kalamazoo, Lake Shore & Chicago, and the Chicago, Kalamazoo & Saginaw railways, and by interurban electric lines. The city has a public library, and is the seat of Kalamazoo college (Baptist), which grew out of the Kalamazoo literary institute (1833) and was chartered under its present name in 1855; the Michigan female seminary (Presbyterian), established in 1866; the Western State normal school (1904); Nazareth Academy (1897), for girls; Barbour Hall (1899), a school for boys; two private schools for the feeble-minded; and the Michigan asylum for the insane, opened in 1859. The surrounding country is famous for its celery, and the city is an important manufacturing centre, ranking third among the cities of the state in the value of its factory products in 1904. The value of the factory product in 1904 was $13,141,767, an increase of 82·9% since 1900. The waterworks and electric-lighting plant are owned and operated by the municipality. Kalamazoo was settled in 1829, was known as Bronson (in honour of Titus Bronson, an early settler) until 1836, was incorporated as the village of Kalamazoo in 1838, and in 1884 became a city under a charter granted in the preceding year.

KALAPUYA, or Callapooya, a tribe and stock of North-American Indians, whose former range was the valley of the Willamette River, Oregon. They now number little more than a hundred, on a reservation on Grande Ronde reservation, Oregon.

KALAT, the capital of Baluchistan, situated in 29° 2′ N. and 66° 35′ E., about 6780 ft. above sea-level, 88 m. from Quetta. The town gives its name also to a native state with an area, including Makran and Kharan, of 71,593 m. and a population (1901) of 470,336. The word Kalat is derived from *kala*—a fortress; and Kalat is the most picturesque fortress in the Baluch highlands. It crowns a low hill, round the base of which clusters the closely built mass of flat-roofed mud houses which form the insignificant town. A *miri* or citadel, having an imposing appearance, dominates the town, and contains within its walls the palace of the khan. It was in an upper room of this residence that Mehrab Khan, ruler of Baluchistan, was killed during the storming of the town and citadel by the British troops at the close of the first Afghan War in 1839. In 1901 it had a population of only 2000. The valleys immediately surrounding the fortress are well cultivated and thickly inhabited, in spite of their elevation and the extremes of temperature to which they are exposed. Recent surveys of Baluchistan have determined the position of Hozdar or Khozdar (27° 48′ N., 66° 38′ E.) to be about 50 m. S. of Kalat. Khozdar was the former capital of Baluchistan, and is as directly connected with the southern branches of the Mulla Pass as Kalat is with the northern, the Mulla being the ancient trade route to Gandava (Kandabe) and Sind. In spite of the rugged and barren nature of the mountain districts of the Kalat highlands, the main routes through them (concentrating on Khozdar rather than on Kalat) are comparatively easy. The old "Pathan vat," the trade highway between Kalat and Karachi by the Hab valley, passes through Khozdar. From Khozdar another route strikes a little west of south to Wad, and then passes easily into Las Bela. This is the "Kohan vat." A third route runs to Nal, and leads to the head of the Kolwa valley (meeting with no great physical obstruction), and then strikes into the open high road to Persia. Some of the valleys about Kalat (Mastang, for instance) are wide and fertile, full of thriving villages and strikingly picturesque; and in spite of the great preponderance of mountain wilderness (a wilderness which is, however, in many parts well adapted for the pasturage of sheep) existing in the Sarawan lowlands almost equally with the Jalawan highlands, it is not difficult to understand the importance which the province of Kalat, anciently called Turan (or Tubaran), maintained in the eyes of medieval Arab geographers (see Baluchistan). New light has been thrown on the history of Kalat by the translation of an unpublished manuscript obtained at Tatta by Mr Tate, of the Indian Survey Department, who has added thereto notes from the Tufhat-ul-Kiram, for the use of which he was indebted to Khan Sahib Rasul Baksh, mukhtiardar of Tatta. According to these authorities, the family of the khans of Kalat is of Arabic origin, and not, as is usually stated, of Brahuic extraction. They belong to the Ahmadzai branch of the Mirwari clan, which originally emigrated from Oman to the Kolwa valley of Mekran. The khan of Kalat, Mir Mahmud Khan, who succeeded his father in 1893, is the leading chieftain in the Baluch Confederacy. The revenue of the khan is estimated at nearly £60,000, including subsidies from the British government; and an accrued surplus of £240,000 has been invested in Indian securities.

See G. P. Tate, *Kalat* (Calcutta, 1896); *Baluchistan District Gazetteer*, vol. vi. (Bombay, 1907). (T. H. H.*)

KALAT-I-GHILZAI, a fort in Afghanistan. It is situated on an isolated rocky eminence 5543 ft. above sea-level and 200 ft. above the plain, on the right bank of the river Tarnak, on the road between Kabul and Kandahar, 87 m. from Kandahar and 229 m. from Kabul. It is celebrated for its gallant defence by Captain Craigie and a sepoy garrison against the Afghans in the first Afghan War of 1842. In memory of this feat of arms, the 12th Pioneers still bear the name of "The Kalat-i-Ghilzai Regiment," and carry a special colour with the motto "Invicta."

KALB, JOHANN ("Baron de Kalb") (1721–1780), German soldier in the American War of Independence, was born in Hüttendorf, near Bayreuth, on the 29th of June 1721. He was of peasant parentage, and left home when he was sixteen to become a butler; in 1743 he was a lieutenant in a German regiment in the French service, calling himself at this time Jean de Kalb. He served with the French in the War of the Austrian Succession, becoming captain in 1747 and major in 1756; in the Seven Years' War he was in the corps of the comte de Broglie, rendering great assistance to the French after Rossbach (November 1757) and showing great bravery at Bergen (April 1759); and in 1763 he resigned his commission. As secret agent, appointed by Choiseul, he visited America in 1768–1769 to inquire into the feeling of the colonists toward Great Britain. From his retirement at Milon la Chapelle, Kalb went to Metz for garrison duty under de Broglie in 1775. Soon afterwards he received permission to volunteer in the army of the American colonies, in which the rank of major-general was promised to him by Silas Deane. After many delays he sailed with eleven other officers on the ship fitted out by Lafayette and arrived at Philadelphia in July 1777. His commission from Deane was disallowed, but the Continental Congress granted him the rank of major-general (dating from the 15th of September 1777), and in October he joined the army, where his growing admiration for Washington soon led him to view with disfavour de Broglie's scheme for putting a European officer in chief command. Early in 1778, as second in command to Lafayette for the proposed expedition against Canada, he accompanied Lafayette to Albany; but no adequate preparations had been made, and the expedition was abandoned. In April 1780, he was sent from Morristown, New Jersey, with his division of Maryland men, his Delaware regiment and the 1st artillery, to relieve Charleston, but on arriving at Petersburg, Virginia, he learned that Charleston had already fallen. In his camp at Buffalo Ford and Deep River, General Horatio Gates joined him on the 25th of July; and next day Gates led the army by the short and desolate road directly towards Camden. On the 11th–13th of August, when Kalb advised an immediate attack on Rawdon, Gates hesitated and then marched to a position on the Salisbury–Charlotte road which he had previously refused to take. On the 14th Cornwallis had occupied Camden, and a battle took place there on the 16th when, the other American troops having broken and fled, Kalb, unhorsed and fighting fiercely at the head of his right wing, was wounded eleven times. He was taken prisoner and died on the 19th of August 1780 in Camden. Here in 1825 Lafayette laid the corner-stone of a monument to him. In 1887 a statue of him by Ephraim Keyser was dedicated in Annapolis, Maryland.

See Friedrich Kapp, *Leben des amerikanischen Generals Johann Kalb* (Stuttgart, 1862; English version, privately printed, New York, 1870), which is summarized in George W. Greene's *The German Element in the War of American Independence* (New York, 1876).

KALCKREUTH (or Kalkreuth), **FRIEDRICH ADOLF,** Count von (1737–1818), Prussian soldier, entered the regiment of Gardes du Corps in 1752, and in 1758 was adjutant or aide de camp to Frederick the Great's brother, Prince Henry, with whom he served throughout the later stages of the Seven Years' War. He won special distinction at the battle of Freiberg (Sept. 29, 1762), for which Frederick promoted him major. Personal differences with Prince Henry severed their connexion in 1766, and for many years Kalckreuth lived in comparative retirement. But he made the campaign of the War of the Bavarian Succession as a colonel, and on the accession of Frederick William II. was restored to favour. He greatly distinguished himself as a major-general in the invasion of Holland in 1787, and by 1792 had become count and lieutenant-general. Under Brunswick he took a conspicuous part in the campaign of Valmy in 1792, the siege and capture of Mainz in 1793, and the battle of Kaiserslautern in 1794. In the campaigns against Napoleon in 1806 he played a marked part for good or evil, both at Auerstädt and in the miserable retreat of the beaten Prussians. In 1807 he defended Danzig for 78 days against the French under Marshal Lefebvre, with far greater skill and energy than he had shown in the previous year. He was promoted field marshal soon afterwards, and conducted many of the negotiations at Tilsit. He died as governor of Berlin in 1818.

The *Dictées du Feldmaréchal Kalckreuth* were published by his son (Paris, 1844).

KALCKREUTH, LEOPOLD, Count von (1855–), German painter, a direct descendant of the famous field-marshal (see above), was born at Düsseldorf, received his first training at Weimar from his father, the landscape painter Count Stanislaus von Kalckreuth (1820–1894), and subsequently studied at the academies of Weimar and Munich. Although he painted some portraits remarkable for their power of expression, he devoted himself principally to depicting with relentless realism the monotonous life of the fishing folk on the sea-coast, and of the peasants in the fields. His palette is joyless, and almost melancholy, and in his technique he is strongly influenced by the impressionists. He was one of the founders of the secessionist movement. From 1885 to 1890 Count von Kalckreuth was professor at the Weimar art school. In 1890 he resigned his professorship and retired to his estate of Höckricht in Silesia, where he occupied himself in painting subjects drawn from the life of the country-folk. In 1895 he became a professor at the art school at Karlsruhe. The Munich Pinakothek has his "Rainbow" and the Dresden Gallery his "Old Age." Among his chief works are the "Funeral at Dachau," "Homewards," "Wedding Procession in the Carpathian Mountains," "The Gleaners," "Old Age," "Before the Fish Auction," "Summer," and "Going to School."

See A. Ph. W. v. Kalckreuth, *Gesch. der Herren, Freiherren und Grafen von Kalckreuth* (Potsdam, 1904).

KALEIDOSCOPE (from Gr. *καλός*, beautiful, *εἶδος*, form, and *σκοπεῖν*, to view). The article Reflection explains the symmetrical arrangement of images formed by two mirrors inclined at an angle which is a sub-multiple of four right angles. This is the principle of the kaleidoscope, an optical toy which received its present form at the hands of Sir David Brewster about the year 1815, and which at once became exceedingly popular owing to the beauty and variety of the images and the sudden and unexpected changes from one graceful form to another. A hundred years earlier R. Bradley had employed a similar arrangement which seems to have passed into oblivion (*New Improvements of Planting and Gardening*, 1710). The instrument has been extensively used by designers. In its simplest form it consists of a tube about twelve inches long containing two glass plates, extending along its whole length and inclined at an angle of 60°. The eye-end of the tube is closed by a metal plate having a small hole at its centre near the intersection of the glass plates. The other end is closed by a plate of muffed glass at the distance of distinct vision, and parallel to this is fixed a plate of clear glass. In the intervening space (the *object-box*) are contained a number of fragments of brilliantly coloured glass, and as the tube is turned round its axis these fragments alter their positions and give rise to the various patterns. A third reflecting plate is sometimes employed, the cross-section of the three forming an equilateral triangle. Sir David Brewster modified his apparatus by moving the object-box and closing the end of the tube by a lens of short focus which forms images of distant objects at the distance of distinct vision. These images take the place of the coloured fragments of glass, and they are symmetrically multiplied by the mirrors. In the *polyangular kaleidoscope* the angle between the mirrors can be altered at pleasure. Such instruments are occasionally found in old collections of philosophical apparatus and they have been used in order to explain to students the formation of multiple images. (C. J. J.)

KALERGIS, DIMITRI (Demetrios) (1803–1867), Greek statesman, was a Cretan by birth, studied medicine at Paris and on the outbreak of the War of Greek Independence went to the Morea and joined the insurgents. He fought under Karaiskakis, was taken prisoner by the Turks before Athens and mulcted of an ear; later he acted as aide de camp to the French philhellene Colonel Fabvier and to Count Capo d'Istria, president of Greece. In 1832 he was promoted lieutenant-colonel. In 1843, as commander of a cavalry division, he was the prime mover in the insurrection which forced King Otto to dismiss his Bavarian ministers. He was appointed military commandant of Athens and aide de camp to the king, but after the fall of the Mavrocordato ministry in 1845 was forced to go into exile, and spent several years in London, where he became an intimate of Prince Louis Napoleon. In 1848 he made an abortive descent on the Greek coast, in the hope of revolutionizing the kingdom. He was captured, but soon released and, after a stay in the island of Zante, went to Paris (1853). At the instance of the Western Powers he was recalled on the outbreak of the Crimean War and appointed minister of war in the reconstituted Mavrocordato cabinet (1854). He was, however, disliked by King Otto and his consort, and in October 1855 was forced to resign. In 1861 he was appointed minister plenipotentiary in Paris, in which capacity he took an important part in the negotiations which followed the fall of the Bavarian dynasty and led to the accession of Prince George of Denmark to the Greek throne.

KALEWALA, or Kalevala, the name of the Finnish national epos. It takes its name from the three sons of Kalewa (or Finland), viz. the ancient Wäinämöinen, the inventor of the sacred harp Kantele; the cunning art-smith, Ilmarinen; and the gallant Lemminkäinen, who is a sort of Arctic Don Juan. The adventures of these three heroes are wound about a plot for securing in marriage the hand of the daughter of Louhi, a hero from Pohjola, a land of the cold north. Ilmarinen is set to construct a magic mill, the Sanpo, which grinds out meal, salt and gold, and as this has fallen into the hands of the folk of Pohjola, it is needful to recover it. The poem actually opens, however, with a very poetical theory of the origin of the world. The virgin daughter of the atmosphere, Luonnotar, wanders for seven hundred years in space, until she bethinks her to invoke Ukko, the northern Zeus, who sends his eagle to her; this bird makes its nest on the knees of Luonnotar and lays in it seven eggs. Out of the substance of these eggs the visible world is made. But it is empty and sterile until Wäinämöinen descends upon it and woos the exquisite Aino. She disappears into space, and it is to recover from his loss and to find another bride that Wäinämöinen makes his series of epical adventures in the dismal country of Pohjola. Various episodes of great strangeness and beauty accompany the lengthy recital of the struggle to acquire the magical Sanpo, which gives prosperity to whoever possesses it. In the midst of a battle the Sanpo is broken and falls into the sea, but one fragment floats on the waves, and, being stranded on the shores of Finland, secures eternal felicity for that country. At the very close of the poem a virgin, Mariatta, brings forth a king who drives Wäinämöinen out of the country, and this is understood to refer to the ultimate conquest of Paganism by Christianity.

The *Kalewala* was probably composed at various times and by various bards, but always in sympathy with the latent traditions of the Finnish race, and with a mixture of symbolism and realism exactly accordant with the instincts of that race. While in the other antique epics of the world bloodshed takes a predominant place, the *Kalewala* is characteristically gentle, lyrical and even domestic, dwelling at great length on situations of moral beauty and romantic pathos. It is entirely concerned with the folk-lore and the traditions of the primeval Finnish race. The poem is written in eight-syllabled trochaic verse, and an idea of its style may be obtained from Longfellow's *Hiawatha*, which is a pretty true imitation of the Finnish epic.

Until the 19th century the *Kalewala* existed only in fragments in the memories and on the lips of the peasants. A collection of a few of these scattered songs was published in 1822 by Dr Zacharius Topelius, but it was not until 1835 that anything like a complete and systematically arranged collection was given to the world by Dr Elias Lönnrot. For years Dr Lönnrot wandered from place to place in the most remote districts, living with the peasantry, and taking down from their lips all that they knew of their popular songs. Some of the most valuable were discovered in the governments of Archangel and Olonetz. After unwearied diligence Lönnrot was successful in collecting 12,000 lines. These he arranged as methodically as he could into thirty-two runes or cantos, which he published exactly as he heard them sung or chanted. Continuing his researches, Dr Lönnrot published in 1849 a new edition of 22,793 verses in fifty runes. A still more complete text was published by A. V. Forsman in 1887. The importance of this indigenous epic was at once recognized in Europe, and translations were made into Swedish, German and French. Several translations into English exist, the fullest being that by J. M. Crawford in 1888. The best foreign editions are those of Castren in Swedish (1844), Leouzon le Duc in French (1845 and 1868), Schiefner in German (1852). (E. G.)

KALGAN (Chang-Chia K'ow), a city of China, in the province of Chih-li, with a population estimated at from 70,000 to 100,000. It lies in the line of the Great Wall, 122 m. by rail N.W. of Peking, commanding an important pass between China and Mongolia. Its position is stated as in 40° 50′ N. and 114° 54′ E., and its height above the sea as 2810 ft. The valley amid the mountains in which it is situated is under excellent cultivation, and thickly studded with villages. Kalgan consists of a walled town or fortress and suburbs 3 m. long. The streets are wide, and excellent shops are abundant; but the ordinary houses have an unusual appearance, from the fact that they are mostly roofed with earth and become covered with green-sward. Large quantities of soda are manufactured; and the town is the seat of a very extensive transit trade. In October 1909 it was connected by railway with Peking. In early autumn long lines of camels come in from all quarters for the conveyance of the tea-chests from Kalgan to Kiakhta; and each caravan usually makes three journeys in the winter. Some Russian merchants have permanent residences and warehouses just outside the gate. On the way to Peking the road passes over a beautiful bridge of seven arches, ornamented with marble figures of animals. The name Kalgan is Mongolian, and means a barrier or "gate-beam."

KALGOORLIE, a mining town of Western Australia, 24 m. by rail E.N.E. of Coolgardie. Pop. (1901), 6652. It is a thriving town with an electric tramway service, and is the junction of four lines of railway. The gold-field, discovered in 1893, is very rich, supporting about 15,000 miners. The town is supplied with water, like Coolgardie, from a source near Perth 360 m. distant.

KALI (black), or *Kali Ma* (the Black Mother), in Hindu mythology, the goddess of destruction and death, the wife of Siva. According to one theory, Calcutta owes its name to her, being originally Kalighat, "Kali's landing-place." Siva's consort has many names (*e.g.* Durga, Bhawani, Parvati, &c.). Her idol is black, with four arms, and red palms to the hands. Her eyes are red, and her face and breasts are besmeared with blood. Her hair is matted, and she has projecting fang-like teeth, between which protrudes a tongue dripping with blood. She wears a necklace of skulls, her earrings are dead bodies, and she is girded with serpents. She stands on the body of Siva, to account for which attitude there is an elaborate legend. She is more worshipped in Gondwana and the forest tracts to the east and south of it than in any other part of India. Formerly human sacrifice was the essential of her ritual. The victim, always a male, was taken to her temple after sunset and imprisoned there. When morning came he was dead: the priests told the people that Kali had sucked his blood in the night. At Dantewara in Bastar there is a famous shrine of Kali under the name of Danteswari. Here many a human head has been presented on her altar. About 1830 it is said that upwards of twenty-five full-grown men were immolated at once by the raja. Cutting their flesh and burning portions of their body were among the acts of devotion of her worshippers. Kali is goddess of small-pox and cholera. The Thugs murdered their victims in her honour, and to her the sacred pickaxe, wherewith their graves were dug, was consecrated.

The *Hook-swinging Festival* (*Churruk* or *Churuck Puja*), one of the most notable celebrations in honour of the goddess Kali, has now been prohibited in British territory. Those who had vowed themselves to self-torture submitted to be swung in the air supported only by hooks passed through the muscles over the blade-bones. These hooks were hung from a long crossbeam, which see-sawed upon a huge upright pole. Hoisted into the air by men pulling down the other end of the see-saw beam, the victim was then whirled round in a circle. The torture usually lasted fifteen or twenty minutes.

See A. A. Macdonell, *Vedic Mythology* (Strassburg, 1897).

KĀLIDĀSA, the most illustrious name among the writers of the second epoch of Sanskrit literature, which, as contrasted with the age of the Vedic hymns, may be characterized as the period of artificial poetry. Owing to the absence of the historical sense in the Hindu race, it is impossible to fix with chronological exactness the lifetime of either Kālidāsa or any other Sanskrit author. Native tradition places him in the 1st century B.C.; but the evidence on which this belief rests is worthless. The works of the poet contain no allusions by which their date can be directly determined; yet the extremely corrupt form of the Prākrit or popular dialects spoken by the women and the subordinate characters in his plays, as compared with the Prākrit in inscriptions of ascertained age, led such authorities as Weber and Lassen to agree in fixing on the 3rd century A.D. as the approximate period to which the writings of Kālidāsa should be referred.

He was one of the "nine gems" at the court of King Vikramaditya or Vikrama, at Ujjain, and the tendency is now to regard the latter as having flourished about A.D. 375; others, however, place him as late as the 6th century. The richness of his creative fancy, his delicacy of sentiment, and his keen appreciation of the beauties of nature, combined with remarkable powers of description, place Kālidāsa in the first rank of Oriental poets. The effect, however, of his productions as a whole is greatly marred by extreme artificiality of diction, which, though to a less extent than in other Hindu poets, not unfrequently takes the form of puerile conceits and plays on words. In this respect his writings contrast very unfavourably with the more genuine poetry of the Vedas. Though a true poet, he is wanting in that artistic sense of proportion so characteristic of the Greek mind, which exactly adjusts the parts to the whole, and combines form and matter into an inseparable poetic unity. Kālidāsa's fame rests chiefly on his dramas, but he is also distinguished as an epic and a lyric poet.

He wrote three plays, the plots of which all bear a general resemblance, inasmuch as they consist of love intrigues, which, after numerous and seemingly insurmountable impediments of a similar nature, are ultimately brought to a successful conclusion.

Of these, *Sakuntalā* is that which has always justly enjoyed the greatest fame and popularity. The unqualified praise bestowed upon it by Goethe sufficiently guarantees its poetic merit. There are two recensions of the text in India, the Bengalī and the Devanāgarī, the latter being generally considered older and purer. *Sakuntalā* was first translated into English by Sir William Jones (Calcutta, 1789), who used the Bengalī recension. It was soon after translated into German by G. Forster (1791; new ed. Leipzig, 1879). An edition of the Sanskrit original, with French translation, was published by A. L. Chézy at Paris in 1830. This formed the basis of a translation by B. Hirzel (Zürich, 1830); later trans. by L. Fritze (Chemnitz, 1876). Other editions of the Bengalī recension were published by Prema Chandra (Calcutta, 1860) for the use of European students and by R. Pischel (2nd ed., Kiel, 1886). The Devanāgarī recension was first edited by O. Böhtlingk (Bonn, 1842), with a German translation. On this were based the successive German translations of E. Meier (Tübingen, 1851) and E. Lobedanz (8th ed., Leipzig, 1892). The same recension has been edited by Dr C. Burkhard with a Sanskrit-Latin vocabulary and short Prākrit grammar (Breslau, 1872), and by Professor Monier Williams (Oxford, 2nd ed. 1876), who also translated the drama (5th ed., 1887). There is another translation by P. N. Patankar (Poona, 1888–). There are also a South Indian and a Cashmir recension.

The *Vikramorvasī*, or *Urvasī won by Valour*, abounds with fine lyrical passages, and is of all Indian dramas second only to *Sakuntalā* in poetic beauty. It was edited by R. Lenz (Berlin, 1833) and translated into German by C. G. A. Höfer (Berlin, 1837), by B. Hirzel (1838), by E. Lobedanz (Leipzig, 1861) and F. Bollensen (Petersburg, 1845). There is also an English edition by Monier Williams, a metrical and prose version by Professor H. H. Wilson, and a literal prose translation by Professor E. B. Cowell (1851). The latest editions are by S. P. Pandit (Bombay, 1879) and K. B. Paranjpe (ibid. 1898).

The third play, entitled *Mālavikāgnimitra*, has considerable poetical and dramatic merit, but is confessedly inferior to the other two. It possesses the advantage, however, that its hero Agnimitra and its heroine Mālavikā are more ordinary and human characters than those of the other plays. It is edited by O. F. Tullberg (Bonn, 1840), by Shankar P. Pandit, with English notes (1869), and S. S. Ayyar (Poona, 1896); translated into German by A. Weber (1856), and into English by C. H. Tawney (2nd ed., Calcutta, 1898).

Two epic poems are also attributed to Kālidāsa. The longer of these is entitled *Raghuvamsa*, the subject of which is the same as that of the *Rāmāyana*, viz. the history of Rāma, but beginning with a long account of his ancestors, the ancient rulers of Ayodhya (ed. by A. F. Stenzler, London, 1832; and with Eng. trans. and notes by Gopal Raghunath Nandargikar, Poona, 1897; verse trans. by P. de Lacy Johnstone, 1902). The other epic is the *Kumārasambhava*, the theme of which is the birth of Kumāra, otherwise called Kārttikeya or Skanda, god of war (ed. by Stenzler, London, 1838; K. M. Banerjea, 3rd ed. Calcutta, 1872; Parvanikara and Parab, Bombay, 1893; and M. R. Kale and S. R. Dharadhara, ibid. 1907; Eng. trans. by R. T. Griffith, 1879). Though containing many fine passages, it is tame as a whole.

His lyrical poems are the *Meghadūta* and the *Ritusamhāra*. The *Meghadūta*, or the Cloud-Messenger, describes the complaint of an exiled lover, and the message he sends to his wife by a cloud. It is full of deep feeling, and abounds with fine descriptions of the beauties of nature. It was edited with free English translation by H. H. Wilson (Calcutta, 1813), and by J. Gildemeister (Bonn, 1841); a German adaptation by M. Müller appeared at Königsberg (1847), and one by C. Schütz at Bielefeld (1859). It was edited by F. Johnson, with vocabulary and Wilson's metrical translation (London, 1867); later editions by K. P. Parab (Bombay, 1891) and K. B. Pathak (Poona, 1894). The *Ritusamhāra*, or Collection of the Seasons, is a short poem, of less importance, on the six seasons of the year. There is an edition by P. von Bohlen, with prose Latin and metrical German translation (Leipzig, 1840); Eng. trans. by C. S. Sitaram Ayyar (Bombay, 1897).

Another poem, entitled the *Nalodaya*, or Rise of Nala, edited by F. Benary (Berlin, 1830), W. Yates (Calcutta, 1844) and Vidyasagara (Calcutta, 1873), is a treatment of the story of Nala and Damayanti, but describes especially the restoration of Nala to prosperity and power. It has been ascribed to the celebrated Kālidāsa, but was probably written by another poet of the same name. It is full of most absurd verbal conceits and metrical extravagances.

So many poems, partly of a very different stamp, are attributed to Kālidāsa that it is scarcely possible to avoid the necessity of assuming the existence of more authors than one of that name. It is by no means improbable that there were three poets thus named; indeed modern native astronomers are so convinced of the existence of a triad of authors of this name that they apply the term Kālidāsa to designate the number three.

On Kālidāsa generally, see A. A. Macdonell's *History of Sanskrit Literature* (1900), and on his date G. Huth, *Die Zeit des K.* (Berlin, 1890). (A. A. M.)

KALIMPONG, a village of British India, in the Darjeeling district of Bengal, 4000 ft. above sea-level; pop. (1901), 1069. It is a frontier market for the purchase of wool and mules from Tibet, and an important agricultural fair is held in November. In 1900 Kalimpong was chosen by the Church of Scotland as the site of cottage homes, known as St Andrew's Colonial Homes, for the education and training of poor European and Eurasian children.

KALINGA, or CALINGA, one of the nine kingdoms of southern India in ancient times. Its exact limits varied, but included the eastern Madras coast from Pulicat to Chicacole, running inland from the Bay of Bengal to the Eastern Ghats. The name at one time had a wider and vaguer meaning, comprehending Orissa, and possibly extending to the Ganges valley. The Kalinga of Pliny certainly included Orissa, but latterly it seems to have been confined to the Telugu-speaking country; and in the time of Hsüan Tsang (630 A.D.) it was distinguished on the south and west from Andhra, and on the north from Odra or Orissa. Taranatha, the Tibetan historian, speaks of Kalinga as one division of the country of Telinga. Hsüan Tsang speaks of Kalinga ("Kie-ling-kia") having its capital at what has been identified with the site either of Rajahmundry or Coringa. Both these towns, as well as Singapur, Calingapatam and Chicacole, share the honour of having been the chief cities of Kalinga at different periods; but inscriptions recently deciphered seem to prove that the capital of the Ganga dynasty of Kalinga was at Mukhalingam in the Ganjam district.

KALINJAR, a town and hill fort of British India in the Banda district of the United Provinces. Pop. (1901), 3015. The fort stands on an isolated rock, the termination of the Vindhya range, at an elevation of 1203 ft., overlooking the plains of Bundelkhand. Kalinjar is the most characteristic specimen of the hill-fortresses, originally hill-shrines, of central India. Its antiquity is proved by its mention in the *Mahābhārata*. It was besieged by Mahmud of Ghazni in 1023, and here the Afghan emperor Sher Shah met his death in 1545, and Kalinjar played a prominent part in history down to the time of the Mutiny in 1857, when it was held by a small British garrison. Both the fort and the town, which stands at the foot of the hill, are of interest to the antiquary on account of their remains of temples, sculptures, inscriptions and caves.

KALIR [QALIR], ELEAZER, Hebrew liturgical poet, whose hymns (*piyyutim*) are found in profusion in the festival prayers of the German synagogal rite. The age in which he lived is unknown. Some (basing the view on Saadiah's *Sefer ha-galuy*) place him as early as the 6th century, others regard him as belonging to the 10th century. Kalir's style is powerful but involved; he may be described as a Hebrew Browning.

Some beautiful renderings of Kalir's poems may be found in the volumes of Davis & Adler's edition of the German Festival Prayers entitled *Service of the Synagogue.*

KALISCH, ISIDOR (1816–1886), Jewish divine, was born at Krotoschin in Prussia on the 15th of November 1816, and was educated at Berlin, Breslau and Prague. In 1848 he came to London, but passed on in 1849 to America, where he ministered as rabbi in Cleveland, Cincinnati, Milwaukee, Detroit and Newark, New Jersey. At Newark from 1875 he gave himself entirely to literary work, and exercised a strong influence as leader of the radical and reforming Jewish party.

Among his works are *Wegweisen für rationelle Forschungen in den biblischen Schriften* (1853); and translations of *Nathan der Weise* (1869); *Sepher Jezirah* (1877); and Munz's *History of Philosophy among the Jews* (1881). He also wrote a good deal of German and Hebrew verse.

KALISCH, MARCUS (or MAURICE) (1828–1885), Jewish scholar, was born in Pomerania in 1828, and died in England 1885. He was one of the pioneers of the critical study of the Old Testament in England. At one time he was secretary to the Chief Rabbi; in 1853 he became tutor in the Rothschild family and enjoyed leisure to produce his commentaries and other works. The first instalment of his commentary on the Pentateuch was *Exodus* (1855); this was followed by *Genesis* (1858) and *Leviticus* in two parts (1867–1872). Kalisch wrote before the publication of Wellhausen's works, and anticipated him in some important points. Besides these works, Kalisch published in 1877–1878 two volumes of Bible studies (on *Balaam* and *Jonah*). He was also author of a once popular Hebrew grammar in two volumes (1862–1863). In 1880 he published *Path and Goal*, a brilliant discussion of human destiny. His commentaries are of permanent value, not only because of the author's originality, but also because of his erudition. No other works in English contain such full citations of earlier literature. (I. A.)

KALISPEL, or PEND D'OREILLE, a tribe of North-American Indians of Salishan stock. They formerly ranged the country around Pend d'Oreille Lake, Washington. They number some 600, and are settled on a reservation in Montana.

KALISZ, a government of Russian Poland, having Prussia on the W., and the governments of Warsaw and Piotrków on the E. Its area is 4390 sq. m. Its surface is a lowland, sloping towards the west, and is drained by the Prosna and the Warta and their tributaries, and also by the Bzura. It was formerly covered with countless small lakes and thick forests; the latter are now mostly destroyed, but many lakes and marshes exist still. Pop. (1897), 844,358 of whom 427,978 were women, and 113,609 lived in towns; estimated pop. (1906), 983,200. They are chiefly Poles. Roman Catholics number 83%; Jews and Protestants each amount to 7%. Agriculture is carried to perfection on a number of estates, as also livestock breeding. The crops principally raised are rye, wheat, oats, barley and potatoes. Various domestic trades, including the weaving of linen and wool, are carried on in the villages. There are some factories, producing chiefly cloth and cottons. The government is divided into eight districts, the chief towns of which, with their populations in 1897, are: Kalisz (21,680), Kolo (9400), Konin (8530), Leczyca (8863), Slupec (3758), Sieradz (7019), Turek (8141) and Wielun (7442).

KALISZ, the chief town of the above government, situated in 51° 46′ N. and 18° E., 147 m. by rail W.S.W. of Warsaw, on the banks of the Prosna, which there forms the boundary of Prussia. Pop. (1871), 18,088; (1897), 21,680, of whom 37% were Jews. It is one of the oldest and finest cities of Poland, is the seat of a Roman Catholic bishop, and possesses a castle, a teachers' institute and a large public park. The industrial establishments comprise a brewery, and factories for ribbons, cloth and sugar, and tanneries.

Kalisz is identified with the *Calisia* of Ptolemy, and its antiquity is indicated by the abundance of coins and other objects of ancient art which have been discovered on the site, as well as by the numerous burial mounds existing in the vicinity. It was the scene of the decisive victory of Augustus the Strong of Poland over the Swedes on the 29th of October 1706, of several minor conflicts in 1813, and of the friendly meeting of the Russian and Prussian troops in 1835, in memory of which an iron obelisk was erected in the town by Nicholas I. in 1841. The treaty of 1813 between Russia and Prussia was signed here.

KALK, a town in the Prussian Rhine province, on the right bank of the Rhine, 2 m. E. of Cologne. Pop. (1905), 25,478. Kalk is an important junction of railway lines connecting Cologne with places on the right bank of the river. It has various iron and chemical industries, brickworks and breweries, and an electric tramway joins it with Cologne.

KALKAS, or KHALKAS, a Mongoloid people mainly concentrated in the northern steppes of Mongolia near their kinsmen, the Buriats. According to Sir H. Howorth they derive their name from the river Kalka, which runs into the Buir lake. Of all Mongolians they physically differ most from the true Mongol type (see MONGOLS). Their colour is a brown rather than a yellow, and their eyes are open and not oblique. They have, however, the broad flat face, high cheekbones and lank black hair of their race. They number some 250,000, and their territory is divided into the four khanates of Tushetu (Tushiyetu), Tsetien (Setzen), Sai'noi'm (Sain Noyan) and Jesaktu (Jassaktu).

KALKBRENNER, FRIEDRICH WILHELM (1784–1849), German pianist and composer, son of Christian Kalkbrenner (1755–1806), a Jewish musician of Cassel, was educated at the

Paris Conservatoire, and soon began to play in public. From 1814 to 1823 he was well known as a brilliant performer and a successful teacher in London, and then settled in Paris, dying at Enghien, near there, in 1849. He became a member of the Paris piano-manufacturing firm of Pleyel & Co., and made a fortune by his business and his art combined. His numerous compositions are less remembered now than his instruction-book, with "studies," which have had considerable vogue among pianists.

KÁLLAY, BENJAMIN VON (1839–1903), Austro-Hungarian statesman, was born at Budapest on the 22nd of December 1839. His family derived their name from their estates at Nágy Kallo, in Szabolcs, and claimed descent from the Balogh Semjen tribe, which colonized the counties of Borsod, Szabolcs, and Szatmár, at the close of the 9th century, when the Magyars conquered Hungary. They played a prominent part in Hungarian history as early as the reign of Koloman (1095–1114); and from King Matthias Corvinus (1458–1490) they received their estates at Mezö Tur, near Kecskemét, granted to Michael Kállay for his heroic defence of Jajce in Bosnia, and still held by his descendants. The father of Benjamin von Kállay, a superior official of the Hungarian Government, died in 1845, and his widow, who survived until 1903, devoted herself to the education of her son. At an early age Kállay manifested a deep interest in politics, and especially in the Eastern Question. He travelled in Russia, European Turkey and Asia Minor, gaining a thorough knowledge of Greek, Turkish and several Slavonic languages. He became as proficient in Servian as in his native tongue. In 1867 he entered the Hungarian Diet as Conservative deputy for Mühlbach (Szásy-Szebes); in 1869 he was appointed consul-general at Belgrade; and in 1872 he visited Bosnia for the first time. His views on Balkan questions strongly influenced Count Andrássy, the Austro-Hungarian minister for foreign affairs. Leaving Belgrade in 1875, he resumed his seat in the Diet, and shortly afterwards founded the journal *Kélet Nepe*, or *Eastern Folk*, in which he defended the vigorous policy of Andrássy. After the Russo-Turkish War of 1878 he went to Philippopolis as Austro-Hungarian envoy extraordinary on the International Eastern Rumelian Commission. In 1879 he became second, and soon afterwards first, departmental chief at the foreign office in Vienna. On the 4th of June 1882 he was appointed Imperial minister of finance and administrator of Bosnia and Herzegovina, and the distinction with which he filled this office, for a period of 21 years, is his chief title of fame (see BOSNIA AND HERZEGOVINA). Kállay was an honorary member of the Budapest and Vienna academies of science, and attained some eminence as a writer. He translated J. S. Mill's *Liberty* into Hungarian, adding an introductory critique; while his version of *Galatea*, a play by the Greek dramatist S. N. Basiliades (1843–1874), proved successful on the Hungarian stage. His monographs on Servian history (*Geschichte der Serben*) and on the Oriental ambition of Russia (*Die Orientpolitik Russlands*) were translated into German by J. H. Schwicker, and published at Leipzig in 1878. But, in his own opinion, his masterpiece was an academic oration on the political and geographical position of Hungary as a link between East and West. In 1873 Kállay married the countess Vilma Bethlen, who bore him two daughters and a son. His popularity in Bosnia was partly due to the tact and personal charm of his wife. He died on the 13th of July 1903.

KALMAR (CALMAR), a seaport of Sweden on the Baltic coast, chief town of the district (*län*) of Kalmar, 250 m. S.S.W. of Stockholm by rail. Pop. (1900), 12,715. It lies opposite the island of Öland, mainly on two small islands, but partly on the mainland, where there is a pleasant park. The streets are regular, and most of the houses are of wood. The principal public edifices, however, are constructed of limestone from Öland, including the cathedral, built by Nicodemus Tessin and his son Nicodemus in the second half of the 17th century. Kalmar, a town of great antiquity, was formerly strongly fortified, and there remains the island-fortress of Kalmarnahus, dating partly from the 12th century, but mainly from the 16th and 17th. It contains the beautiful chamber of King Eric XIV. (d. 1577), an historical museum, and in the courtyard a fine ornate well-cover. This stronghold stood several sieges in the 14th, 15th and 16th centuries, and the town gives name to the treaty (Kalmar Union) by which Sweden, Norway and Denmark were united into one kingdom in 1397. Kalmar has an artificial harbour admitting vessels drawing 19 ft. There are a school of navigation, and tobacco and match factories, the produce of which, together with timber and oats, is exported. Shipbuilding is carried on.

KALMUCK, or KALMYK STEPPE, a territory or reservation belonging to the Kalmuck or Kalmyk Tatars, in the Russian government of Astrakhan, bounded by the Volga on the N.E., the Manych on the S.W., the Caspian Sea on the E., and the territory of the Don Cossacks on the N.W. Its area is 36,900 sq. m., to which has to be added a second reservation of 3045 sq. m. on the left bank of the lower Volga. According to I. V. Mushketov, the Kalmuck Steppe must be divided into two parts, western and eastern. The former, occupied by the Ergeni hills, is deeply trenched by ravines and rises 300 and occasionally 630 ft. above the sea. It is built up of Tertiary deposits, belonging to the Sarmatian division of the Miocene period and covered with loess and black earth, and its escarpments represent the old shore-line of the Caspian. No Caspian deposits are found on or within the Ergeni hills. These hills exhibit the usual black earth flora, and they have a settled population. The eastern part of the steppe is a plain, lying for the most part 30 to 40 ft. below the level of the sea, and sloping gently towards the Volga. Post-Pliocene "Aral-Caspian deposits," containing the usual fossils (*Hydrobia*, *Neritina*, eight species of *Cardium*, two of *Dreissena*, three of *Adacna* and *Lithoglyphus caspius*), attain thicknesses varying from 105 ft. to 7 or 10 ft., and disappear in places. Lacustrine and fluviatile deposits occur intermingled with the above. Large areas of moving sands exist near Enotayevsk, where high dunes or *barkhans* have been formed. A narrow tract of land along the coast of the Caspian, known as the "hillocks of Baer," is covered with hillocks elongated from west to east, perpendicularly to the coast-line, the spaces between them being filled with water or overgrown with thickets of reed, *Salix*, *Ulmus campestris*, almond trees, &c. An archipelago of little islands is thus formed close to the shore by these mounds, which are backed on the N. and N.W. by strings of salt lakes, partly desiccated. Small streams originate in the Ergenis, but are lost as soon as they reach the lowlands, where water can only be obtained from wells. The scanty vegetation is a mixture of the flora of south-east Russia and that of the deserts of central Asia. The steppe has an estimated population of 130,000 persons, living in over 27,700 *kibitkas*, or felt tents. There are over 60 Buddhist monasteries. Part of the Kalmucks are settled (chiefly in the hilly parts), the remainder being nomads. They breed horses, cattle and sheep, but suffer heavy losses from murrain. Some attempts at agriculture and tree-planting are being made. The breeding of livestock, fishing, and some domestic trades, chiefly carried on by the women, are the principal sources of maintenance.

See I. V. Mushketov, *Geol. Researches in the Kalmyk Steppe in 1884–1885* (St Petersburg, 1894, in Russian); Kostenkov's works (1868–1870); and other works quoted in Semenov's *Geogr. Dict.* and *Russ. Encycl. Dict.* (P. A. K.; J. T. BE.)

KALNÓKY, GUSTAV SIEGMUND, COUNT (1832–1898), Austro-Hungarian statesman, was born at Lettowitz, in Moravia, on the 29th of December 1832, of an old Transylvanian family which had held countly rank in Hungary from the 17th century. After spending some years in a hussar regiment, in 1854 he entered the diplomatic service without giving up his connexion with the army, in which he reached the rank of general in 1879. He was for the ten years 1860 to 1870 secretary of embassy at London, and then, after serving at Rome and Copenhagen, was in 1880 appointed ambassador at St Petersburg. His success in Russia procured for him, on the death of Baron v. Haymerle in 1881, the appointment of minister of foreign affairs for Austria-Hungary, a post which he held for fourteen years. Essentially a diplomatist, he took little or no part in the vexed internal affairs of the Dual Monarchy, and he came little before the public except at the annual statement on foreign affairs before the Delegations. His management of the affairs of his department was, however, very successful; he confirmed and maintained the alliance with Germany, which had been formed by his predecessors, and co-operated with Bismarck in the arrangements by which Italy joined the alliance. Kalnóky's special influence was seen in the improvement of Austrian relations with Russia, following on the meeting of the three emperors in September 1884 at Skiernevice, at which he was present. His Russophile policy caused some adverse criticism in Hungary. His friendliness for Russia did not, however, prevent him from strengthening the position of Austria as against Russia in the Balkan Peninsula by the establishment of a closer political and commercial understanding with Servia and Rumania. In 1885 he interfered after the battle of Slivnitza to arrest the advance of the Bulgarians on Belgrade, but he lost influence in Servia after the abdication of King Milan. Though he kept aloof from the Clerical party, Kalnóky was a strong Catholic; and his sympathy for the difficulties of the Church caused adverse comment in Italy, when, in 1891, he stated in a speech before the Delegations that the question of the position of the pope was still unsettled. He subsequently explained that by this he did not refer to the Roman question, which was permanently settled, but to the possibility of the pope leaving Rome. The jealousy felt in Hungary against the Ultramontanes led to his fall. In 1895 a case of clerical interference in the internal affairs of Hungary by the nuncio Agliardi aroused a strong protest in the Hungarian parliament, and consequent differences between Bánffy, the Hungarian minister, and the minister for foreign affairs led to Kalnóky's resignation. He died on the 13th of February 1898 at Prödlitz in Moravia.

KALOCSA, a town of Hungary, in the county of Pest-Pilis-Solt-Kis-Kun, 88 m. S. of Budapest by rail. Pop. (1900), 11,372. It is situated in a marshy but highly productive district, near the left bank of the Danube, and was once of far greater importance than at present. Kalocsa is the see of one of the four Roman Catholic archbishops in Hungary. Amongst its buildings are a fine cathedral, the archiepiscopal palace, an astronomical observatory, a seminary for priests, and colleges for training of male and female teachers. The inhabitants of Kalocsa and its wide-spreading communal lands are chiefly employed in the cultivation of the vine, fruit, flax, hemp and cereals, in the capture of water-fowl and in fishing. Kalocsa is one of the oldest towns in Hungary. The present archbishopric, founded about 1135, is a development of a bishopric said to have been founded in the year 1000 by King Stephen the Saint. It suffered much during the 16th century from the hordes of Ottomans who then ravaged the country. A large part of the town was destroyed by a fire in 1875.

KALPI, or Calpee, a town of British India, in the Jalaun district of the United Provinces, on the right bank of the Jumna, 45 m. S.W. of Cawnpore. Pop. (1901), 10,139. It was founded, according to tradition, by Vasudeva, at the end of the 4th century A.D. In 1196 it fell to Kutab-ud-din, the viceroy of Mahommed Ghori, and during the subsequent Mahommedan period it played a large part in the annals of this part of India. About the middle of the 18th century it passed into the hands of the Mahrattas. It was captured by the British in 1803, and since 1806 has remained in British possession. In May 1858 Sir Hugh Rose (Lord Strathnairn) defeated here a force of about 10,000 rebels under the rani of Jhansi. Kalpi had a mint for copper coinage in the reign of Akbar; and the East India Company made it one of their principal stations for providing the "commercial investment." The old town, which is beside the river, has ruins of a fort, and several temples of interest, while in the neighbourhood are many ancient tombs. There is a lofty modern tower ornamented with representations of the battles of the *Ramayana*. The new town lies away from the river to the south-east. Kalpi is still a centre of local trade (principally in grain, *ghi* and cotton), with a station on the Indian Midland railway from Jhansi to Cawnpore, which here crosses the Jumna. There are manufactures of sugar and paper.

KALUGA, a government of middle Russia, surrounded by those of Moscow, Smolensk, Orel and Tula, with an area of 11,942 sq. m. Its surface is an undulating plain, reaching 800 to 900 ft. in its highest parts, which lie in the S.W., and deeply trenched by watercourses, especially in the N.E. The Oka, a main tributary of the Volga, and its confluents (the Zhizdra and Ugra) drain all but a strip of country in the west, which is traversed by the Bolva, an affluent of the Dnieper. The government is built up mainly of carboniferous deposits (coal-bearing), with patches of the soft Jurassic clays and limestones which formerly covered them. Cretaceous deposits occur in the S.W., and Devonian limestones and shales crop out in the S.E. The government is covered with a thick layer of boulder clay in the north, with vast ridges and fields of boulders brought during the Glacial Period from Finland and the government of Olonets; large areas in the middle are strewn with flint boulders and patches of loess are seen farther south. The mean annual temperature is 41° F. Iron ores are the chief mineral wealth, nearly 40,000 persons being engaged in mining. Beds of coal occur in several places, and some of them are worked. Fireclay, china-clay, chalk, grindstone, pure quartz sand, phosphorite and copper are also extracted. Forests cover 20% of the surface, and occur chiefly in the south. The soil is not very suitable for agriculture, and owing to a rather dense population, considerable numbers of the inhabitants find occupation in industry, or as carriers and carpenters for one-half of the year at the Black Sea ports.

The population (1,025,705 in 1860) was 1,176,353 in 1897, nearly all Great Russians. There were 116 women to 100 men, and out of the total population 94,853 lived in towns. The estimated population in 1906 was 1,287,300. Of the total area over 4,000,000 acres are owned by the peasant communities, nearly 3,000,000 acres by private owners and some 250,000 by the Crown. The principal crops are rye, oats, barley, buckwheat, and potatoes. Hemp is grown for local use and export. Bees are kept. The chief non-agricultural industries are distilleries, iron-works, factories for cloth, cottons, paper, matches, leather and china, flour-mills and oil works. Large quantities of wooden wares are fabricated in the villages of the south. A considerable trade is carried on in hemp, hempseed and hempseed oil, corn and hides; and iron, machinery, leather, glass, chemicals and linen are exported. The government is divided into 11 districts, the chief towns of which, with their populations in 1897, are: Kaluga (49,728), Borovsk (8407), Kozelsk (5908), Likhvin (1776), Maloyaroslavets (2500), Medyñ (4392), Meshchovsk (3667), Mosalsk (2652), Peremyshl (3956), Tarusa (1989) and Zhizdra (5996). (P. A. K.; J. T. Be.)

KALUGA, the chief town of the above government, situated on the left bank of the Oka, 117 m. S.W. of Moscow by rail, in 54° 31′ N. and 36° 6′ E. Pop. (1870), 36,880; (1897) 49,728. It is the see of a Greek Orthodox bishop. The public buildings include the cathedral of the Trinity (rebuilt in the 19th century in place of an older edifice dating from 1687), two monastic establishments, an ecclesiastical seminary, and a lunatic asylum. The principal articles of industrial production are leather, oil, bast mats, wax candles, starch and Kaluga cakes. The first historical mention of Kaluga occurs in 1389; its incorporation with the principality of Moscow took place in 1518. In 1607 it was held by the second false Demetrius and vainly besieged for four months by the forces of Sbuisky, who had ascended the Russian throne as Basil IV. on the death of the first false Demetrius. In 1619 Kaluga fell into the hands of the hetman or chief of the Zaporozhian Cossacks. Later two-thirds of its inhabitants were carried off by a plague; and in 1622 the whole place was laid waste by a conflagration. It recovered, however, in spite of several other conflagrations (especially in 1742 and 1754). On several occasions Kaluga was the residence of political prisoners; among others Shamyl, the Lesghian chief, spent his exile there (1859–1870).

KALYAN, a town of British India, in the Thana district of Bombay, situated 33 m. N.E. of Bombay city, where the two main lines of the Great Indian Peninsula railway diverge. Pop. (1901), 10,749. There is a considerable industry of rice-husking. Kalyan is known to have been the capital of a kingdom and a centre of sea-borne commerce in the early centuries of the Christian era. The oldest remains now existing are of Mahommedan times.

KAMA, or KAMADEVA, in Hindu mythology, the god of love. He is variously stated to have been the child of Brahma or Dharma (virtue). In the *Rig Veda*, Kama (desire) is described as the first movement that arose in the One after it had come into life through the power of fervour or abstraction. In the Atharva-Veda Kama does not mean sexual desire, but rather the yearning after the good of all created things. Later Kama is simply the Hindu Cupid. While attempting to lure Siva to sin, he was destroyed by a fiery glance of the goddess' third eye. Thus in Hindu poetry Kama is known as Ananga, the "bodiless god." Kama's wife Rati (voluptuousness) mourned him so greatly that Siva relented, and he was reborn as the child of Krishna and Rukmini. The babe was called Pradyumna (Cupid). He is represented armed with a bow of sugar-cane; it is strung with bees, and its five arrows are tipped with flowers which overcome the five senses. A fish adorns his flag, and he rides a parrot or sparrow, emblematic of lubricity.

KĀMALĀ, a red powder formerly used in medicine as an anthelmintic and employed in India as a yellow dye. It is obtained from *Mallotus philippinensis*, Müll., a small euphorbiaceous tree from 20 to 45 ft. in height, distributed from southern Arabia in the west to north Australia and the Philippines in the east. In India kāmalā has several ancient Sanskrit names, one of which, kapila, signifies dusky or tawny red. Under the name of wars, kanbil, or qinbil, kāmalā appears to have been known to the Arabian physicians as a remedy for tapeworm and skin diseases as early as the 10th century, and indeed is mentioned by Paulus Ægineta still earlier. The drug was formerly in the British Pharmacopoeia, but is inferior to many other anthelmintics and is not now employed.

KAMCHATKA, a peninsula of N.-E. Siberia, stretching from the land of the Chukchis S.S.W. for 750 m., with a width of from 80 to 300 m. (51° to 62° N., and 156° to 163° E.), between the Sea of Okhotsk and Bering Sea. It forms part of the Russian Maritime Province. Area, 104,260 sq. m.

The isthmus which connects the peninsula with the mainland is a flat *tundra*, sloping gently both ways. The mountain chain, which Ditmar calls central, seems to be interrupted under 57° N. by a deep indentation corresponding to the valley of the Tighil. There too the hydrographical network, as well as the south-west to north-east strike of the clay-slates and metamorphic schists on Ditmar's map, seem to indicate the existence of two chains running south-west to north-east, parallel to the volcanic chain of S.-E. Kamchatka. Glaciers were not known till the year 1899, when they were discovered on the Byelaya and Ushkinskaya (15,400 ft.) mountains. Thick Tertiary deposits, probably Miocene, overlie the middle portions of the west coast. The southern parts of the central range are composed of granites, syenites, porphyries and crystalline slates, while in the north of Ichinskaya volcano, which is the highest summit of the peninsula (16,920 ft.), the mountains consist chiefly of Tertiary sandstones and old volcanic rocks. Coal-bearing clays containing fresh-water molluscs and dicotyledonous plants, as also conglomerates, alternate with the sandstones in these Tertiary deposits. Amber is found in them. Very extensive layers of melaphyre and andesite, as also of conglomerates and volcanic tuffs, cover the middle portions of the peninsula. The south-eastern portion is occupied by a chain of volcanoes, running along the indented coast, from Cape Lopatka to Cape Kronotskiy (54° 25′ N.), and separated from the rest of the peninsula by the valleys of the Bystraya (an affluent of the Bolstraya, on the west coast) and Kamchatka rivers. Another chain of volcanoes runs from Ichinskaya (which burst into activity several times in the 18th and 19th centuries) to Shiveluch, seemingly parallel to the above but farther north. The two chains contain twelve active and twenty-six extinct volcanoes, from 7000 to more than 15,000 ft. high. The highest volcanoes are grouped under 56° N., and the highest of them, Kluchevskaya (16,990 ft.), is in a state of almost incessant activity (notable outbreaks in 1729, 1737, 1841, 1853–1854, and 1896–1897), a flow of its lava having reached to Kamchatka river in 1853. The active Shiveluch (9900 ft.) is the last volcano of this chain. Several lakes and probably Avacha Bay are old craters. Copper, mercury, and iron ores, as also pure copper, ochre and sulphur, are found in the peninsula. The principal river is the Kamchatka (325 m. long), which flows first north-eastwards in a fertile longitudinal valley, and then, bending suddenly to the east, pierces the above-mentioned volcanic chain. The other rivers are the Tighil (135 m.) and the Bolstraya (120 m.), both flowing into the Sea of Okhotsk; and the Avacha, flowing into the Pacific.

The floating ice which accumulates in the northern parts of the Sea of Okhotsk and the cold current which flows along the east coast of the peninsula render its summers chilly, but the winter is relatively warm, and temperatures below −40° F. are experienced only in the highlands of the interior and on the Okhotsk littoral. The average temperatures at Petropavlovsk (53° N.) are: year 37° F., January 17°, July 58°; while in the valley of the Kamchatka the average temperature of the winter is 16°, and of the summer as high as 58° and 64°. Rain and snow are copious, and dense fogs enshroud the coast in summer; consequently the mountains are well clothed with timber and the meadows with grass, except in the *tundras* of the north. The natives eat extensively the bulbs of the Martagon lily, and weave cloth out of the fibres of the Kamchatka nettle. *Delphinopterus leucus*, the sea-lion (*Otaria Stelleri*), and walrus abound off the coasts. The sea-otter (*Enhydris marina*) has been destroyed.

The population (5846 in 1870) was 7270 in 1900. The southern part of the peninsula is occupied by Kamchadales, who exhibit many attributes of the Mongolian race, but are more similar to the aborigines of N.E. Asia and N.W. America. Fishing (quantities of salmon enter the rivers) and hunting are their chief occupations. Dog-sledges are principally used as means of communication. The efforts of the government to introduce cattle-breeding have failed. The Kamchadale language cannot be assigned to any known group; its vocabulary is extremely poor. The purity of the tongue is best preserved by the people of the Penzhinsk district on the W. coast. North of 57° N. the peninsula is peopled with Koryaks, settled and nomad, and Lamuts (Tunguses), who came from the W. coast of the Sea of Okhotsk. The principal Russian settlements are: Petropavlovsk, on the E. coast, on Avacha Bay, with an excellent roadstead; Verkhne-Kamchatsk and Nizhne-Kamchatsk in the valley of the Kamchatka river; Bolsheryetsk, on the Bolshaya; and Tighil, on the W. coast.

The Russians made their first settlements in Kamchatka in the end of the 17th century; in 1696 Atlasov founded Verkhne-Kamchatsk, and in 1704 Robelev founded Bolsheryetsk. In 1720 a survey of the peninsula was undertaken; in 1725–1730 it was visited by Bering's expedition; and in 1733–1745 it was the scene of the labours of the Krasheninnikov and Steller expedition.

See G. A. Erman, *Reise um die Erde* iii., (Berlin, 1848); C. von Ditmar, *Reisen und Aufenthalt in Kamchatka in den Jahren 1851–1855* (1890–1900); G. Kennan, *Tent Life in Siberia* (1870), and paper in *Jour. of American Geog. Soc.* (1876); K. Diener, in *Petermann's Mitteilungen* (1891, vol. xxxvii.); V. A. Obruchev, in *Izvestia* of the East Siberian Geographical Society (xxiii. 4, 5; 1892); F. H. H. Guillemard, *Cruise of the "Marchesa"* (2nd ed., London, 1889); and G. E. H. Barrett-Hamilton in *Scott. Geog. Mag.* (May, 1899), with bibliography. (P. A. K.; J. T. Be.)

KAME (a form of Scandinavian *comb*, hill), in physical geography, a short ridge or bunched mound of gravel or sand, "tumultuously stratified," occurring in connexion with glacial deposits, having been formed at the mouths of tunnels under the ice. When the ice-sheet melts, these features, formerly concealed by the glacier, are revealed. They are common in the glaciated portions of the lower Scottish valleys. By some authorities the term "kame," or specifically "serpentine kame," is taken as synonymous with "esker," which however is preferably to be applied to the long mound deposited within the ice-tunnel, not to the bunched mound at its mouth.

KAMENETS PODOLSKIY, or Podolian Kamenets (Polish *Kamieniec*), a town of S.-W. Russia, chief town of the government of Podolia. It stands in 48° 40′ N. and 26° 30′ E., on a high, rocky bluff of the river Smotrich, a left-hand tributary of the Dniester, and near the Austrian frontier. Pop. (1863), 20,699; (1900) 39,113, of whom 50% were Jews and 30% Poles. Round the town lies a cluster of suburban villages, Polish Folwark, Russian Folwark, Zinkovtsui, Karvasarui, &c.; and on the opposite side of the river, accessible by a wooden bridge, stands the castle which long frowned defiance across the Dniester to Khotin in Bessarabia. Kamenets is the see of a Roman Catholic and a Greek Orthodox bishop. The Roman Catholic cathedral of St Peter and St Paul, built in 1361, is distinguished by a minaret, recalling the time when it was used as a mosque by the Turks (1672–1699). The Greek cathedral of John the Baptist dates from the 16th century, but up to 1798 belonged to the Basilian monastery. Other buildings are the Orthodox Greek monastery of the Trinity, and the Catholic Armenian church (founded in 1398), possessing a 14th-century missal and an image of the Virgin Mary that saw the Mongol invasion of 1239–1242. The town contains Orthodox Greek and Roman Catholic seminaries, Jewish colleges, and an archaeological museum for church antiquities, founded in 1890. Kamenets was laid waste by the Mongol leader Batu in 1240. In 1434 it was made the chief town of the province of Podolia. In the 15th and 16th centuries it suffered frequently from the invasions of Tatars, Moldavians and Turks; and in 1672 the hetman of the Cossacks, Doroshenko, assisted by Sultan Mahommed IV. of Turkey, made himself master of the place. Restored to Poland by the peace of Karlowitz (1699), it passed with Podolia to Russia in 1795. Here the Turks were defeated by the Poles in 1633, and here twenty years later peace was concluded between the same antagonists. The fortifications were demolished in 1813.

KAMENZ, a town in the kingdom of Saxony, on the Black Elster, 21 m. N.E. of Dresden, on a branch line of railway from Bischofswerda. Pop. (1900), 9726. It has four Evangelical churches, among them a Wendish one, and a handsome new town-hall with a library. The hospital is dedicated to the memory of Lessing, who was born here. A colossal bust of the poet was placed opposite the Wendish church in 1863, and a monument was raised to him on a neighbouring hill in 1864. The industries of Kamenz include wool-spinning, and the manufacture of cloth, glass, crockery and stoneware. Built about 1200, Kamenz, was known by the name Dreikretcham until the 16th century. In 1318 it passed to the mark of Brandenburg; in 1319 to Bohemia; and in 1635, after suffering much in the Hussite and Thirty Years' wars, it came into the possession of Saxony. In 1706 and 1842 it was almost entirely consumed by fire.

Kamenz is also the name of a village in Prussia, not far from Breslau; pop. 900. This is famous on account of its Cistercian monastery, founded in 1094. Of the house, which was closed in 1810, only a few buildings remain.

KAMES, HENRY HOME, Lord (1696–1782), Scottish lawyer and philosopher, son of George Home of Kames, in Berwickshire, where he was born in 1696. After receiving a somewhat imperfect education from a private tutor, he was in 1712 indentured to a writer to the signet in Edinburgh, but an accidental introduction to Sir Hew Dalrymple, then president of the court of session, determined him to aspire to the position of advocate. He accordingly set himself to studying various branches of literature, specially metaphysics and moral philosophy. He was called to the bar in January 1724, and, as he lacked those brilliant qualities which sometimes command immediate success, he employed his leisure in the compilation of *Remarkable Decisions in the Court of Session from 1716 to 1728* (1728). This work having attracted attention, his power of ingenious reasoning and mastery of law gradually gained him a leading position at the bar. In 1752 he was appointed a judge in the court of session under the title of Lord Kames, and in 1763 he was made one of the lords of justiciary. In 1741 he married Agatha Drummond, through whom in 1761 he succeeded to the estate of Blair Drummond, Perthshire. He continued to discharge his judicial duties till within a few days of his death at Edinburgh on the 27th of December 1782.

Lord Kames took a special interest in agricultural and commercial affairs. In 1755 he was appointed a member of the board of trustees for encouragement of the fisheries, arts and manufactures of Scotland, and about the same time he was named one of the commissioners for the management of the forfeited estates annexed to the Crown. On the subject of agriculture he wrote *The Gentleman Farmer* (1776). In 1765 he published a small pamphlet *On the Flax Husbandry of Scotland*; and, besides availing himself of his extensive acquaintance with the proprietors of Scotland to recommend the introduction of manufactures, he took a prominent part in furthering the project of the Forth and Clyde Canal. He was also one of the founders of the Physical and Literary Society, afterwards the Royal Society of Edinburgh. It is, however, as a writer on philosophy that Lord Kames is best known. In 1751 he published his *Essays on the Principles of Morality and Natural Religion* (Ger. trans., Leipzig, 1772), in which he endeavoured to maintain the doctrine of innate ideas, but conceded to man an apparent but only apparent freedom of the will. His statement of the latter doctrine so aroused the alarm of certain clergymen of the Church of Scotland that he found it necessary to withdraw what was regarded as a serious error, and to attribute man's delusive sense of freedom, not to an innate conviction implanted by God, but to the influence of the passions. His other philosophical works are *An Introduction to the Art of Thinking* (1761), *Elements of Criticism* (1762), *Sketches of the History of Man* (1774).

See *Life of Lord Kames*, by A. F. Tytler, Lord Woodhouselee (2 vols., 1807).

KAMMIN, or Cammin, a town in the Prussian province of Pomerania, 2½ m. from the Baltic, on the Kamminsche Bodden, a lake connected with the sea by the Dievenow. Pop. (1905), 5923. Among its four Evangelical churches, the cathedral and the church of St Mary are noteworthy. Iron-founding and brewing are carried on in the town, which has also some fishing and shipping. There is steamer communication with Stettin, about 40 m. S.S.W. Kammin is of Wendish origin, and obtained municipal privileges in 1274. From about 1200 till 1628 it was the seat of a bishopric, which at the latter date became a secular principality, being in 1648 incorporated with Brandenburg.

See Küchen, *Geschichte der Stadt Kammin* (Kammin, 1885).

KAMPEN, a town in the province of Overysel, Holland, on the left bank of the Ysel, 3½ m. above its mouth, and a terminal railway station 8 m. N.W. of Zwolle. It has regular steamboat communication with Zwolle, Deventer, Amsterdam, and Enkhuizen. Pop. (1900), 19,664. Kampen is surrounded by beautiful gardens and promenades in the place of the old city walls, and has a fine river front. The four turreted gateways furnish excellent examples of 16th and 17th century architecture. Of the churches the Bovenkerk ("upper church"), or church of St Nicholas, ranks with the cathedral of Utrecht and the Janskerk at 's Hertogenbosch as one of the three great medieval churches in Holland. It was begun in 1369, and has double aisles, ambulatory and radiating chapels, and contains some finely carved woodwork. The Roman Catholic Buitenkerk ("outer church") is also a fine building of the 14th century, with good modern panelling. There are many other, though slighter, remains of the ancient churches and monasteries of Kampen; but the most remarkable building is the old town-hall, which is unsurpassed in Holland. It dates from the 14th century, but was partly restored after a fire in 1543. The exterior is adorned with niched statues and beautiful iron trellis work round the windows. The old council-chamber is wainscoted in black oak, and contains a remarkable sculptured chimney-piece (1545) and fine wood carving. The town-hall contains the municipal library, collections of tapestry, portraits and antiquities, and valuable archives relating to the town and province. Kampen is the seat of a Christian Reformed theological school, a gymnasium, a higher burgher school, a municipal school of design, and a large orphanage. There are few or no local taxes, the municipal chest being filled by the revenues derived from the fertile delta-land, the Kampeneiland, which is always being built up at the mouth of the Ysel. There is a considerable trade in dairy produce; and there are shipyards, rope-walks, a tool factory, cigar factories, paper mills, &c.

KAMPTEE, or KAMTHI, a town of British India, in the Nagpur district of the Central Provinces, just below the confluence of the Kanhan with the rivers Pench and Kolar; 10 m. N.E. of Nagpur by rail. Pop. (1901), 38,888, showing a continuous decrease since 1881. Kamptee was founded in 1821, as a military cantonment in the neighbourhood of the native capital of Nagpur, and became an important centre of trade. Since the opening of the railway, trade has largely been diverted to Nagpur, and the garrison has recently been reduced. The town is well laid out with wide roads, gardens and tanks.

KAMRUP, a district of British India, in the Brahmaputra valley division of Eastern Bengal and Assam. The headquarters are at Gauhati. Area, 3858 sq. m.; pop. (1901), 589,187, showing a decrease of 7% in the decade. In the immediate neighbourhood of the Brahmaputra the land is low, and exposed to annual inundation. In this marshy tract reeds and canes flourish luxuriantly, and the only cultivation is that of rice. At a comparatively short distance from the river banks the ground begins to rise in undulating knolls towards the mountains of Bhutan on the north, and towards the Khasi hills on the south. The hills south of the Brahmaputra in some parts reach the height of 800 ft. The Brahmaputra, which divides the district into two nearly equal portions, is navigable by river steamers throughout the year, and receives several tributaries navigable by large native boats in the rainy season. The chief of these are the Manas, Chaul Khoya and Barnadi on the north, and the Kulsi and Dibru on the south bank. There is a government forest preserve in the district and also a plantation where seedlings of teak, *sâl*, *sissu*, *sûm*, and *nahor* are reared, and experiments are being made with the caoutchouc tree. The population is entirely rural, the only town with upwards of 5000 inhabitants being Gauhati (11,661). The temples of Hajo and Kamākhya attract many pilgrims from all quarters. The staple crop of the district is rice, of which there are three crops. The indigenous manufactures are confined to the weaving of silk and cotton cloths for home use, and to the making of brass cups and plates. The cultivation and manufacture of tea by European capital is not very prosperous. The chief exports are rice, oilseeds, timber and cotton; the imports are fine rice, salt, piece goods, sugar, betel-nuts, coco-nuts and hardware. A section of the Assam-Bengal railway starts from Gauhati, and a branch of the Eastern Bengal railway has recently been opened to the opposite bank of the river. A metalled road runs due south from Gauhati to Shillong.

KAMYSHIN, a town of Russia, in the government of Saratov, 145 m. by river S.S.W. of the city of Saratov, on the right bank of the Volga. Pop. (1861), 8644; (1897), 15,934. Being the terminus of the railway to Tambov, Moscow and the Baltic ports, it is an important port for the export of cereals and salt from the Volga, and it imports timber and wooden wares. It is famous for its water-melons. Peter the Great built here a fort, which was known at first as Dmitrievsk, but acquired its present name in 1780.

KANAKA, a Polynesian word meaning "man," used by Polynesians to describe themselves. Its ethnical value, never great, has been entirely destroyed by its indiscriminate use by the French to describe all South Sea islanders, whether black or brown. The corrupt French form *canaque* has been used by some English writers. The term came into prominence in 1884–1885 in connexion with the scandals arising over the kidnapping of South Sea islanders for enforced labour on the sugar plantations of north Queensland.

KANARA, or CANARA, the name of two adjoining districts of British India: North Kanara in the presidency of Bombay, South Kanara in that of Madras. Both are on the western coast.

NORTH KANARA DISTRICT forms part of the southern division of Bombay. The administrative headquarters are at Karwar, which is also the chief seaport. Area, 3945 sq. m.; pop. (1901), 454,490, showing an increase of 2% in the decade. The trade of the interior, which used to pass down to the seaports, has been largely diverted by the opening of the Southern Mahratta railway. Along the coast rice is the chief crop, and coco-nut palms are also important. In the upland there are valuable gardens of areca palms, cardamoms and pepper. Rice and timber are exported, and sandalwood-carving and salt manufacture are carried on. The main feature in the physical geography of the district is the range of the Western Ghats, which, running from north to south, divides it into two parts, a lowland or coast strip (Payanghat), and an upland plateau (Balaghat). The coast-line is only broken by the Karwar headland in the north, and by the estuaries of four rivers and the mouths of many smaller streams, through which the salt water finds an entrance into numerous lagoons winding several miles inland. The breadth of the lowlands varies from 5 to 15 miles. From this narrow belt rise a few smooth, flat-topped hills, from 200 to 300 ft. high; and at places it is crossed by lofty, rugged, densely wooded spurs, which, starting from the main range, maintain almost to the coast a height of not less than 1000 ft. Among these hills lie well-tilled valleys of garden and rice land. The plateau of the Balaghat is irregular, varying from 1500 to 2000 ft. in height. In some parts the country rises into well-wooded knolls, in others it is studded by small, isolated, steep hills. Except on the banks of streams and in the more open glades, the whole is one broad waste of woodland and forest. The open spaces are dotted with hamlets or parcelled out into rice clearings. Of the rivers flowing eastward from the watershed of the Sahyadri hills the only one of importance is the Wardha or Varada, a tributary of the Tungabhadra. Of those that flow westwards, the four principal ones, proceeding from north to south, are the Kali, Gungawali, Tadri and Sharavati. The last of these forms the famous Gersoppa Falls. Extensive forests clothe the hills, and are conserved under the rules of the forest department.

SOUTH KANARA DISTRICT has its headquarters at Mangalore. Area, 4021 sq. m. Pop. (1901), 1,134,713, showing an increase of 7% in the decade. The district is intersected by rivers, none of which exceeds 100 miles in length. They all take their rise in the Western Ghats, and many are navigable during the fair weather for from 15 to 25 miles from the coast. The chief of these streams are the Netravati, Gurpur and Chendragiri. Numerous groves of coco-nut palms extend along the coast, and green rice-fields are seen in every valley. The Western Ghats, rising to a height of 3000 to 6000 ft., fringe the eastern boundary. Forest land of great extent and value exists, but most of it is private property. Jungle products (besides timber) consist of bamboo, cardamoms, wild arrowroot, gall-nuts, gamboge, catechu, fibrous bark, cinnamon, gums, resin, dyes, honey and beeswax. The forests formerly abounded in game, which, however, is rapidly decreasing under incessant shooting. The staple crop is rice. The chief articles of import are piece goods, cotton yarn, oils and salt. Tiles are manufactured in several places out of a fine potter's clay. The Azhikal-Mangalore line of the Madras railway serves the district.

See *South Canara District Manual* (2 vols., Madras, 1894–1895).

KANARESE, a language of the Dravidian family, spoken by about ten millions of people in southern India, chiefly in Mysore, Hyderabad, and the adjoining districts of Madras and Bombay. It has an ancient literature, written in an alphabet closely resembling that employed for Telugu. Since the 12th century the Kanarese-speaking people have largely adopted the Lingayat form of faith, which may be described as an anti-Brahmanical sect of Siva worshippers (see HINDUISM). Most of them are agriculturists, but they also engage actively in trade.

KANARIS (or CANARIS), **CONSTANTINE** (1790–1877), Greek patriot, belonged to the class of coasting sailors who produced if not the most honest, at least the bravest, and the most successful of the combatants in the cause of Greek independence. He belonged by birth to the little island of Psara, to the north-west of Chio. He first became prominent as the effective leader of the signal vengeance taken by the Greeks for the massacre at

Chio in April 1822 by the Turkish Capitan Pasha. The commander of the force of fifty small vessels and eight fireships sent to assail the Turkish fleet was the navarch Miaoulis, but it was Kanaris who executed the attack with the fireships on the flagship of the Capitan Pasha on the night of the 18th of June 1822. The Turks were celebrating the feast of Bahram at the end of the Ramadan fast. Kanaris had two small brigs fitted as fireships, and thirty-six men. He was allowed to come close to the Turkish flagship, and succeeded in attaching his fireships to her, setting them on fire, and escaping with his party. The fire reached the powder and the flagship blew up, sending the Capitan Pasha and 2000 Turks into the air. Kanaris was undoubtedly aided by the almost incredible sloth and folly of his opponents, but he chose his time well, and the service of the fireships was always considered peculiarly dangerous. That Kanaris could carry out the venture with a volunteer party not belonging to a regularly disciplined service, not only proved him to be a clever partisan fighter, but showed that he was a leader of men. He repeated the feat at Tenedos in November of 1822, and was then considered to have disposed of nearly 4000 Turks in the two ventures. When his native island, Psara, was occupied by the Turks he continued to serve under the command of Miaoulis. He was no less distinguished in other attacks with fireships at Samos and Mytilene in 1824, which finally established an utter panic in the Turkish navy. His efforts to destroy the ships of Mehemet Ali at Alexandria in 1825 were defeated by contrary winds. When the Greeks tried to organize a regular navy he was appointed captain of the frigate "Hellas" in 1826. In politics he was a follower of Capo d'Istria. He helped to upset the government of King Otho and to establish his successor, was prime minister in 1864–1865, came back from retirement to preside over the ministry formed during the crisis of the Russo-Turkish war, and died in office on the 15th of September 1877. Kanaris is described as of small stature, simple in appearance, somewhat shy and melancholy. He is justly remembered as the most blameless of the popular heroes of the War of Independence. He was almost the only one among them whom Dundonald, with whom he served in a successful attack on an Egyptian war-ship near Alexandria, exempts from the sweeping charges of cowardice he brings against the Greeks. (D. H.)

KANAUJ, an ancient city of British India, in Farukhabad district, United Provinces, near the left bank of the Ganges. Pop. (1901), 18,552. Kanauj in early times formed the capital of a great Hindu kingdom. Its prosperity dates from a prehistoric period, and seems to have culminated about the 6th century under Harsha. In 1019 it fell before Mahmud of Ghazni, and again in 1194 before Mahommed Ghori. The existing ruins extend over the lands of five villages, occupying a semicircle fully 4 m. in diameter. No Hindu buildings remain intact; but the great mosque, constructed by Ibrahim Shah of Jaunpur in 1406 out of Hindu temples, is still called by Hindus "Sita's Kitchen." Kanauj, which is traditionally said to be derived from *Kanyakubja* (=the crooked maiden), has given its name to an important division of Brahmans in northern India. Hinduism in Lower Bengal also dates its origin from a Brahman migration southwards from this city, about 800 or 900. Kanauj is now noted for the distilling of scents.

KANDAHAR, the largest city in Afghanistan, situated in 31° 37′ N. lat. and 65° 43′ E. long., 3400 ft. above the sea. It is 370 m. distant from Herat on the N.W., by Girishk and Farah—Girishk being 75 m., and Farah 225 m. from Kandahar. From Kabul, on the N.E., it is distant 315 m., by Kalat-i-Ghilzai and Ghazni—Kalat-i-Ghilzai being 85 m., and Ghazni 225 m. from Kandahar. To the Peshin valley the distance is about 110 m., and from Peshin to India the three principal routes measure approximately as follows: by the Zhob valley to Dera Ismail Khan, 300 m.; by the Bori valley to Dera Ghazi Khan, 275 m.; by Quetta and the Bolan to Dadar, 125 m.; and by Chappar and Nari to Sibi, 120 m. The Indian railway system extends to New Chaman, within some 80 m. of Kandahar. Immediately round the city is a plain, highly cultivated and well populated to the south and west; but on the north-west barren, and bounded by a double line of hills, rising to about 1000 ft. above its general level, and breaking its dull monotony with irregular lines of scarped precipices, crowned with fantastic pinnacles and peaks. To the north-west these hills form the watershed between the valleys of the Arghandab and the Tarnak, until they are lost in the mountain masses of the Hazarajat—a wild region inhabited by tribes of Tatar origin, which effectually shuts off Kandahar from communication with the north. On the south-west they lose themselves in the sandy desert of Registan, which wraps itself round the plain of Kandahar, and forms another impassable barrier. But there is a break in these hills—a gate, as it were, to the great high road between Herat and India; and it is this gate which the fortress of Kandahar so effectually guards, and to which it owes its strategic importance. Other routes there are, open to trade, between Herat and northern India, either following the banks of the Hari Rud, or, more circuitously, through the valley of the Helmund to Kabul; or the line of hills between the Arghandab and the Tarnak may be crossed close to Kalat-i-Ghilzai; but of the two former it may be said that they are not ways open to the passage of Afghan armies owing to the hereditary hostility existing between the Aeimak and Hazara tribes and the Afghans generally, while the latter is not beyond striking distance from Kandahar. The one great high road from Herat and the Persian frontier to India is that which passes by Farah and crosses the Helmund at Girishk. Between Kandahar and India the road is comparatively open, and would be available for railway communication but for the jealous exclusiveness of the Afghans.

To the north-west, and parallel to the long ridges of the Tarnak watershed, stretches the great road to Kabul, traversed by Nott in 1842, and by Stewart and subsequently by Roberts in 1880. Between this and the direct route to Peshin is a road which leads through Maruf to the Kundar river and the Guleri pass into the plains of Hindustan at Dera Ismail Khan. This is the most direct route to northern India, but it involves the passage of some rough country, across the great watershed between the basins of the Helmund and the Indus. But the best known road from Kandahar to India is that which stretches across the series of open stony plains interspersed with rocky hills of irregular formation leading to the foot of the Kwaja Amran (Khojak) range, on the far side of which from Kandahar lies the valley of Peshin. The passage of the Kwaja Amran involves a rise and fall of some 2300 ft., but the range has been tunnelled and a railway now connects the frontier post of New Chaman with Quetta. Two lines of railway now connect Quetta with Sind, the one known as the Harnai loop, the other as the Bolan or Mashkaf line. They meet at Sibi (see BALUCHISTAN). Several roads to India have been developed through Baluchistan, but they are all dominated from Kandahar. Thus Kandahar becomes a sort of focus of all the direct routes converging from the wide-stretching western frontier of India towards Herat and Persia, and the fortress of Kandahar gives protection on the one hand to trade between Hindustan and Herat, and on the other it lends to Kabul security from invasion by way of Herat.

Kandahar is approximately a square-built city, surrounded by a wall of about 3¾ m. circuit, and from 25 to 30 ft. high, with an average breadth of 15 ft. Outside the wall is a ditch 10 ft. deep. The city and its defences are entirely mud-built. There are four main streets crossing each other nearly at right angles, the central "chouk" being covered with a dome. These streets are wide and bordered with trees, and are flanked by shops with open fronts and verandas. There are no buildings of any great pretension in Kandahar, a few of the more wealthy Hindus occupying the best houses. The tomb of Ahmad Shah is the only attempt at monumental architecture. This, with its rather handsome cupola, and the twelve minor tombs of Ahmad Shah's children grouped around, contains a few good specimens of fretwork and of inlaid inscriptions. The four streets of the city divide it into convenient quarters for the accommodation of its mixed population of Duranis, Ghilzais, Parsiwans and Kakars, numbering in all some 30,000 souls. Of these the greater proportion are the Parsiwans (chiefly Kizilbashes).

It is reckoned that there are 1600 shops and 182 mosques in the city. The mullahs of these mosques are generally men of considerable power. The walls of the city are pierced by the four principal gates of "Kabul," "Shikarpur," "Herat" and the "Idgah," opposite the four main streets, with two minor gates, called the Top Khana and the Bardurani respectively, in the western half of the city. The Idgah gate passes through the citadel, which is a square-built enclosure with sides of about 260 yds. in length. The flank defences of the main wall are insufficient; indeed there is no pretence at scientific structure about any part of the defences; but the site of the city is well chosen for defence, and the water supply (drawn by canals from the Arghandab or derived from wells) is good.

About 4 m. west of the present city, stretched along the slopes of a rocky ridge, and extending into the plains at its foot, are the ruins of the old city of Kandahar sacked and plundered by Nadir Shah in 1738. From the top of the ridge a small citadel overlooks the half-buried ruins. On the north-east face of the hill forty steps, cut out of solid limestone, lead upward to a small, dome-roofed recess, which contains some interesting Persian inscriptions cut in relief on the rock, recording particulars of the history of Kandahar, and defining the vast extent of the kingdom of the emperor Baber. Popular belief ascribes the foundation of the old city to Alexander the Great.

Although Kandahar has long ceased to be the seat of government, it is nevertheless by far the most important trade centre in Afghanistan, and the revenues of the Kandahar province assist largely in supporting the chief power at Kabul. There are no manufactures or industries of any importance peculiar to Kandahar, but the long lines of bazaars display goods from England, Russia, Hindustan, Persia and Turkestan, embracing a trade area as large probably as that of any city in Asia. The customs and town dues together amount to a sum equal to the land revenue of the Kandahar province, which is of considerable extent, stretching to Pul-i-Sangin, 10 m. south of Kalat-i-Ghilzai on the Kabul side, to the Helmund on the west, and to the Hazara country on the north. Although Farah has been governed from Kandahar since 1863, its revenues are not reckoned as a part of those of the province. The land revenue proper is assessed in grain, the salaries of government officials, pay of soldiers, &c., being disbursed by "barats" or orders for grain at rates fixed by government, usually about 20 % above the city market prices. The greater part of the English goods sold at Herat are imported by Karachi and Kandahar—a fact which testifies to the great insecurity of trade between Meshed and Herat. Some of the items included as town dues are curious. For instance, the tariff on animals exposed for sale includes a charge of 5 % *ad valorem* on slave girls, besides a charge of 1 rupee per head. The kidney fat of all sheep and the skins of all goats slaughtered in the public yard are perquisites of government, the former being used for the manufacture of soap, which, with snuff, is a government monopoly. The imports consist chiefly of English goods, indigo, cloth, boots, leather, sugar, salt, iron and copper, from Hindustan, and of shawls, carpets, "barak" (native woollen cloth), postins (coats made of skins), shoes, silks, opium and carpets from Meshed, Herat and Turkestan. The exports are wool, cotton, madder, cummin seed, asafoetida, fruit, silk and horses. The system of coinage is also curious: 105 English rupees are melted down, and the alloy extracted, leaving 100 rupees' worth of silver; 295 more English rupees are then melted, and the molten metal mixed with the 100 rupees silver; and out of this 808 Kandahari rupees are coined. As the Kandahari rupee is worth about 8 annas (half an English rupee) the government thus realizes a profit of 1 %. Government accounts are kept in "Kham" rupees, the "Kham" being worth about five-sixths of a Kandahari rupee; in other words, it about equals the franc, or the Persian "kran."

Immediately to the south and west of Kandahar is a stretch of well-irrigated and highly cultivated country, but the valley of the Arghandab is the most fertile in the district, and, from the luxuriant abundance of its orchards and vineyards, offers the most striking scenes of landscape beauty. The pomegranate fields form a striking feature in the valley—the pomegranates of Kandahar, with its "sirdar" melons and grapes, being unequalled in quality by any in the East. The vines are grown on artificial banks, probably for want of the necessary wood to trellis them—the grapes being largely exported in a semi-dried state. Fruit, indeed, besides being largely exported, forms the chief staple of the food supply of the inhabitants throughout Afghanistan. The art of irrigation is so well understood that the water supply is at times exhausted, no river water being allowed to run to waste. The plains about Kandahar are chiefly watered by canals drawn from the Arghandab near Baba-wali, and conducted through the same gap in the hills which admits the Herat road. The amount of irrigation and the number of water channels form a considerable impediment to the movements of troops, not only immediately about Kandahar, but in all districts where the main rivers and streams are bordered by green bands of cultivation. Irrigation by "karez" is also largely resorted to. The karez is a system of underground channelling which usually taps a sub-surface water supply at the foot of some of the many rugged and apparently waterless hills which cover the face of the country. The water is not brought to the surface, but is carried over long distances by an underground channel or drain, which is constructed by sinking shafts at intervals along the required course and connecting the shafts by tunnelling. The general agricultural products of the country are wheat, barley, pulse, fruit, madder, asafoetida, lucerne, clover and tobacco.

Of the mineral resources of the Kandahar district not much is known, but an abandoned gold mine exists about 2 m. north of the town. Some general idea of the resources of the Kandahar district may be gathered from the fact that it supplied the British troops with everything except luxuries during the entire period of occupation in 1879–81; and that, in spite of the great strain thrown on those resources by the presence of the two armies of Ayub Khan and of General Roberts, and after the total failure of the autumn crops and only a partial harvest the previous spring, the army was fed without great difficulty until the final evacuation, at one-third of the prices paid in Quetta for supplies drawn from India.

History.—Kandahar has a stormy history. Sultan Mahmud of Ghazni took it in the 11th century from the Afghans who then held it. In the beginning of the 13th century it was taken by Jenghiz Khan, and in the 14th by Timur. In 1507 it was captured by the emperor Baber, but shortly afterwards it fell again into Afghan hands, to be retaken by Baber in 1521. Baber's son, Humayun, agreed to cede Kandahar to Persia, but failed to keep his word, and the Persians besieged the place unsuccessfully. Thus it remained in the possession of the Moguls till 1625, when it was taken by Shah Abbas. Aurangzeb tried to take it in 1649 with 5000 men, but failed. Another attempt in 1652 was equally unsuccessful. It remained in Persian possession till 1709, when it was taken by the Afghans, but was retaken after a two years' siege by Nadir Shah. Nadir Shah was assassinated in 1749, and immediately on hearing the news of his death Ahmad Shah (Abdali) seized Nadir Shah's treasure at Kandahar, and proclaimed himself king, with the consent, not only of the Afghans, but, strange to say, of the Hazaras and Baluchis as well. He at once changed the site of the city to its present position, and thus founded the Afghan kingdom, with modern Kandahar as its capital. Ahmad Shah died in 1773, and was succeeded by his son Timur, who died in 1793, and left the throne to his son Zaman Shah. This prince was deposed by his half-brother Mahmud, who was in his turn deposed by Shah Shuja, the full brother of Zaman Shah. After a short reign Shah Shuja was compelled to abdicate from his inability to repress the rising power of Fateh Khan, a Barakzai chief, and he took refuge first with Ranjit Singh, who then ruled the Punjab, and finally secured the protection of British power. Afghanistan was now practically dismembered. Mahmud was reinstated by Fateh Khan, whom he appointed his vizier, and whose nephews, Dost Mahommed Khan and Kohn dil Khan, he placed respectively in the governments of Kabul and Kandahar. Fateh Khan was barbarously murdered by Kamran (Mahmud's son) near Ghazni in 1818; and in retaliation Mahmud himself was driven from power, and the Barakzai clan secured the sovereignty of Afghanistan. While Dost Mahommed held Kabul, Kandahar became temporarily a sort of independent chiefship under two or three of his brothers. In 1839 the cause of Shah Shuja was actively supported by the British. Kandahar was occupied, and Shah Shuja reinstated on the throne of his ancestors. Dost Mahommed was defeated near Kabul, and after surrender to the British force, was deported into Hindustan. The British army of occupation in southern Afghanistan continued to occupy Kandahar from 1839 till the autumn of 1842, when General Nott marched on Kabul to meet Pollock's advance from Jalalabad. The cantonments near the city, built by Nott's division, were repaired and again occupied by the British army in 1879, when Shere Ali was driven from power by the invasion of Afghanistan, nor were they finally evacuated till the spring of 1881. Trade statistics of late years show a gradual increase of exports to India from Kandahar and the countries adjacent thereto, but a curious falling-off in imports. The short-sighted policy of the amir Abdur Rahman in discouraging imports doubtless affected the balance, nor did his affectation of ignoring the railway between New Chaman and Kila Abdulla (on the Peshin side of the Khojak) conduce to the improvement of trade.

(T. H. H.*)

KANDI, a town of British India, in Murshidabad district, Bengal. Pop. (1901), 12,037. It is the residence of the rajas of Paikpara, a wealthy and devout Hindu family. The founder of this family was Ganga Govind Singh, the banyan or agent of Warren Hastings, who was born at Kandi, and retired hither in his old age with an immense fortune. His name has acquired celebrity for the most magnificent *sraddha*, or funeral obsequies, ever performed in Bengal, celebrated in honour of his mother, at a cost, it is said, of £200,000.

KANDY, a town near the centre of Ceylon, 75 m. from Colombo by rail, formerly the capital of a kingdom of the same name, situated towards the heart of the island, 1718 ft. above the sea. It lies round the margin of an artificial lake constructed by the last king of Kandy in 1806, and is beautifully surrounded by hills. The most striking objects are the temples (of which twelve are Buddhist and four Brahman), the tombs of the Kandian kings, and the various buildings of the royal residence, partly allowed to fall into disrepair, partly utilized by the government. Of the temples the Dalada Malagawa is worthy of particular mention; it claims, as the name indicates, to be in possession of a Buddha tooth.

Kandy was occupied by the Portuguese in the 16th century and by the Dutch in 1763; but in both instances the native kings succeeded in shaking off the foreign yoke. The British got possession of the place in 1803, but the garrison afterwards capitulated and were massacred, and it was not till 1814–15 that the king was defeated and dethroned. The British authority was formally established by the convention of March 2, 1815. In 1848, owing to an attempt at rebellion, the town was for a time under martial law. It has been greatly improved of recent years. Sir William Gregory when governor did much to restore the ancient Kandy decorations, while the Victoria Jubilee Commemoration Building, including "Ferguson Memorial Hall," and two fine hotels, add to the improvements. The Royal Botanic Gardens are situated at Peradeniya, 3 m. distant. Kandy is a uniquely beautiful, highland, tropical town, full of interesting historical and Buddhistic associations. A water supply and electric lighting have been introduced. Roman Catholic missions are active in the work of education, for which a large block of buildings has been erected. Church of England, Wesleyan and Baptist missions are also at work. The population of the town in 1900 was 26,386; of the district, 377,591. Average annual rainfall, 81½ in.; average temperature, 75·3. There is a branch railway from Kandy, north to Matale, 17 m.

KANE, ELISHA KENT (1820–1857), American scientist and explorer, was born in Philadelphia on the 20th of February 1820, the son of the jurist John Kintzing Kane (1795–1858), a friend and supporter of Andrew Jackson, attorney-general of Pennsylvania in 1845–1846, U.S. judge of the Eastern District of Pennsylvania after 1846, and president of the American Philosophical Society in 1856–1858. Young Kane entered the university of Virginia and obtained the degree of M.D. in 1842, and in the following year entered the U.S. navy as surgeon. He had already acquired a considerable reputation in physiological research. The ship to which he was appointed was ordered to China, and he found opportunities during the voyage for indulging his passion for exploration, making a journey from Rio de Janeiro to the base of the Andes, and another from Bombay through India to Ceylon. On the arrival of the ship at its destination he provided a substitute for his post and crossed over to the island of Luzon, which he explored. In 1844 he left China, and, returning by India, Persia, Syria, Egypt, Greece, Austria, Germany and Switzerland, reached America in 1846. In that year he was ordered to the west coast of Africa, where he visited Dahomey, and contracted fever, which told severely on his constitution. On his return in 1847, he exchanged the naval for the military service, and was sent to join the U.S. army in Mexico, where he had some extraordinary adventures, and where he was again stricken with fever.

On the fitting out of the first Grinnell expedition, in 1850, to search for Sir John Franklin, Kane was appointed surgeon and naturalist under Lieut. de Haven, who commanded the ships "Advance" and "Rescue." The expedition, after an absence of sixteen months, during nine of which the ships were ice-bound, returned without having found any trace of the missing vessels. Kane was in feeble health, but worked on at his narrative of the expedition, which was published in 1854, under the title of *The U.S. Grinnell Expedition in Search of Sir John Franklin.* He was determined not to give up the search for Franklin, and in spite of ill-health travelled through the States lecturing to obtain funds, and gave up his pay for twenty months. At length Henry Grinnell fitted out an expedition, in the little brig "Advance," of which Kane was given the command. She sailed in June 1853, and passing up Smith Sound at the head of Baffin Bay advanced into the enclosed sea which now bears the name of Kane Basin, thus establishing the Polar route of many future Arctic expeditions. Here, off the coast of Greenland, the expedition passed two winters, accomplishing much useful geographical, as well as scientific, work, including the attainment of what was to remain for sixteen years the highest northern latitude, 80° 35′ N. (June 1854). From this point a large area of open water was seen which was believed to be an "open Polar Sea," a chimera which played an important and delusive rôle in subsequent explorations. After enduring the greatest hardships it was resolved to abandon the ship, Upernivik being reached on the 5th of August 1855, whence a relief expedition brought the explorers home. Medals were authorized by Congress, and in the following year Dr Kane received the founder's medal of the Royal Geographical Society, and, two years later, a gold medal from the Paris Geographical Society. He published *The Second Grinnell Expedition* in 1856. Dr Kane died at Havana on the 16th of February 1857, at the age of thirty-seven. Between his first and second arctic voyages he made the acquaintance of the Fox family, the spiritualists. With one of the daughters, Margaret, he carried on a long correspondence, which was afterwards published by the lady, who declared that they were privately married.

See *Biography of E. K. Kane*, by William Elder (1858); *Life of E. K. Kane and other American Explorers*, by S. M. Smucker (1858); *The Love-Life of Dr Kane, containing the Correspondence and a History of the Engagement and Secret Marriage between E. K. Kane and Margaret Fox* (New York, 1866); "Discoveries of Dr Kane," in *Jour. of the Roy. Geog. Soc.*, vol. xxviii. (reprinted in *R. G. S. Arctic Papers* of 1875).

KANE, a borough of McKean county, Pennsylvania, U.S.A., about 90 m. E.S.E. of Erie. Pop. (1890), 2944; (1900), 5296, (971 foreign-born); (1910) 6626. It is served by the Pennsylvania, the Baltimore & Ohio, the Kane & Elk, and the Big Level & Kinzua railways. It is situated about 2015 ft. above the sea in a region producing natural gas, oil, lumber and silica, and has some reputation as a summer resort. The borough has manufactories of window glass, plate glass and bottles, and repair shops of the Pennsylvania railroad. Kane was settled in 1859, and was incorporated as a borough in 1887. It was named in honour of its founder Gen. Thomas L. Kane (1822–1883), brother of Elisha Kent Kane.

KANGAROO, the universally accepted, though not apparently the native, designation of the more typical representatives of the marsupial family *Macropodidae* (see MARSUPIALIA). Although intimately connected with the cuscuses and phalangers by means of the musk-kangaroo, the kangaroos and wallabies, together with the rat-kangaroos, are easily distinguishable from other diprotodont marsupials by their general conformation, and by peculiarities in the structure of their limbs, teeth and other organs. They vary in size from that of a sheep to a small rabbit. The head, especially in the larger species, is small, compared with the rest of the body, and tapers forward to the muzzle. The shoulders and fore-limbs are feebly developed, and the hind-limbs of disproportionate strength and magnitude, which give the animals a peculiarly awkward appearance when moving about on all-fours, as they occasionally do when feeding. Rapid progression is, however, performed only by the powerful hind-limbs, the animals covering the ground by a series of immense bounds, during which the fore part of the body is inclined forwards, and balanced by the long, strong and tapering tail, which is carried horizontally backwards. When not moving, they often assume a perfectly upright position, the tail aiding the two hind-legs to form a tripod, and the front-limbs dangling by the side of the chest. This position gives full scope for the senses of sight, hearing and smell to warn of the approach of enemies. The fore-paws have five digits, each armed with a strong, curved claw. The hind-foot is extremely long, narrow and (except in the musk-kangaroo) without the first toe. It consists mainly of one very large and strong toe, corresponding to the fourth of the human foot, ending in a strong curved and pointed claw (fig. 2). Close to the outer side of this lies a smaller fifth digit, and to the inner side two excessively slender toes (the second and third), bound together almost to the extremity in a common integument. The two little claws of these toes, projecting together from the skin, may be of use in scratching and cleaning the fur of the animal, but the toes must have quite lost all connexion with the functions of support or progression. This type of foot-structure is termed syndactylous.

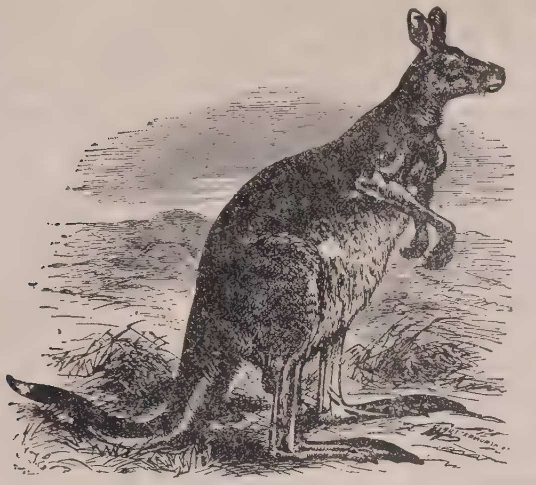


FIG. 1.—The Great Grey Kangaroo (*Macropus giganteus*).

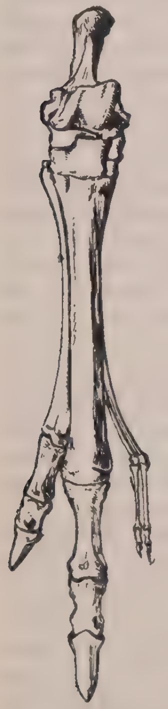


FIG. 2.—Skeleton of right hind-foot of Kangaroo.

The dental formula, when completely developed, is *incisors* $\frac{3}{1}$, *canines* $\frac{1}{0}$, *premolars* $\frac{2}{2}$, *molars* $\frac{4}{4}$ on each side, giving a total of 34 teeth. The three incisors of the upper jaw are arranged in a continuous arched series, and have crowns with broad cutting edges; the first or middle incisor is often larger than the others. Corresponding to these in the lower jaw is but one tooth on each side, which is of great size, directed horizontally forwards, narrow, lanceolate and pointed with sharp edges. Owing to the slight union of the two halves of the lower jaw in front in many species the two lower incisors work together like the blades of a pair of scissors. The canines are absent or rudimentary in the lower, and often deciduous at an early age in the upper jaw. The first two premolars are compressed, with cutting longitudinal edges, the anterior one is deciduous, being lost about the time the second one replaces the milk-molar, so that three premolars are never found in place and use in the same individual. The last premolar and the molars have quadrate crowns, provided with two strong transverse ridges, or with four obtuse cusps. In *Macropus giganteus* and its immediate allies, the premolars and sometimes the first molar are shed, so that in old examples only the two posterior molars and the incisors are found in place. The milk-dentition, as in other marsupials, is confined to a single tooth on each side of each jaw, the other molars and incisors being never changed. The dentition of the kangaroos, functionally considered, thus consists of sharp-edged incisors, most developed near the median line of the mouth, for the purpose of cropping herbage, and ridged or tuberculated molars for crushing.

The number of vertebrae is—in the cervical region 7, dorsal 13, lumbar 6, sacral 2, caudal varying according to the length of the tail, but generally from 21 to 25. In the fore-limb the clavicle and the radius and ulna are well developed, allowing of considerable freedom of motion of the fore-paw. The pelvis has large epipubic or "marsupial" bones. The femur is short, and the tibia and fibula of great length, as is the foot, the whole of which is applied to the ground when the animal is at rest in the upright position.

The stomach is large and very complex, its walls being puckered by longitudinal muscular bands into a number of folds. The alimentary canal is long, and the caecum well developed. The young (which, as in other marsupials, leave the uterus in an extremely small and imperfect condition) are placed in the pouch as soon as they are born; and to this they resort temporarily for shelter for some time after they are able to run, jump and feed upon the herbage which forms the nourishment of the parent. During the early period of their sojourn in the pouch, the blind, naked, helpless young creatures (which in the great kangaroo scarcely exceed an inch in length) are attached by their mouths to the nipple of the mother, and are fed by milk injected into their stomach by the contraction of the muscle covering the mammary gland. In this stage of existence the elongated upper part of the larynx projects into the posterior nares, and so maintains a free communication between the lungs and the external surface, independently of the mouth and gullet, thus averting danger of suffocation while the milk is passing down the gullet.

Kangaroos are vegetable-feeders, browsing on grass and various kinds of herbage, but the smaller species also eat roots. They are naturally timid and inoffensive, but the larger kinds when hard pressed will turn and defend themselves, sometimes killing a dog by grasping it in their fore-paws, and inflicting terrible wounds with the sharp claws of their powerful hind-legs, supporting themselves meanwhile upon the tail. The majority are inhabitants of Australia and Tasmania, forming one of the most prominent and characteristic features of the fauna of these lands, and performing the part of the deer and antelopes of other parts of the world. They were important sources of food-supply to the natives, and are hunted by the colonists, both for sport and on account of the damage they do in consuming grass required for cattle and sheep. A few species are found in New Guinea, and the adjacent islands, which belong, in the zoological sense, to the Australian province, beyond the bounds of which none occurs.

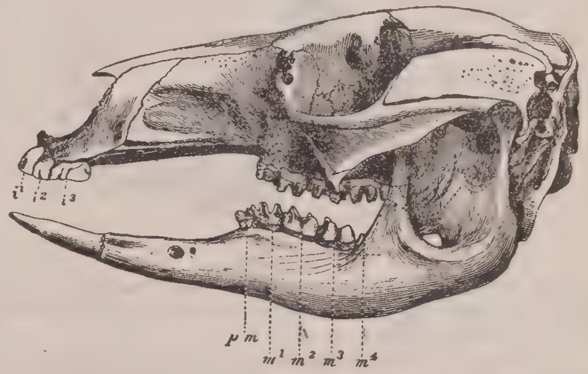


FIG. 3.—Skull and teeth of Bennett's Wallaby (*Macropus ruficollis bennettii*): i^1, i^2, i^3, first, second and third upper incisors; *pm*, second premolar (the first having been already shed); m^1, m^2, m^3, m^4, last premolar and three molars. The last, not fully developed, is nearly concealed by the ascending part of the lower jaw.

The more typical representatives of the group constitute the subfamily *Macropodinae*, in which the cutting-edges of the upper incisors are nearly level, or the first pair but slightly longer than the others (fig. 3). The canines are rudimentary and often wanting. The molars are usually not longer (from before backwards) than the anterior premolars, and less compressed than in the next section. The crowns of the molars have two prominent transverse ridges. The fore-limbs are small with subequal toes, armed with strong, moderately long, curved claws. Hind-limbs very long and strongly made. Head small, with more or less elongated muzzle. Ears generally rather long and ovate.

The typical genus *Macropus*, in which the muzzle is generally naked, the ears large, the fur on the nape of the neck usually directed backwards, the claw of the fourth hind-toe very large, and the tail stout and tapering, includes a large number of species. Among these, the great grey kangaroo (*M. giganteus*, fig. 1) deserves special mention on account of having been discovered during Captain Cook's first voyage in 1770. The great red kangaroo (*M. rufus*) is about the same size, while other large species are *M. antilopinus* and *M. robustus*. The larger wallabies, or brush-kangaroos, such as the red-necked wallaby (*M. ruficollis*) constitute a group of smaller-sized species; while the smaller wallabies, such as the filander (*q.v.*) (*M. muelleri*) and *M. thetidis*, constitute yet another section. The genus ranges from the eastern Austro-Malay islands to New Guinea.

Nearly allied are the rock-wallabies of Australia and Tasmania, constituting the genus *Petrogale*, chiefly distinguished by the thinner tail being more densely haired and terminating in a tuft. Well-known species are *P. penicillata*, *P. xanthopus* and *P. lateralis*. The few species of nail-tailed wallabies, *Onychogale*, which are confined to the Australian mainland, take their name from the presence of a horny spur at the end of the tail, and are further distinguished by the hairy muzzle. *O. unguifer*, *O. fraenatus* and *O. lunatus* represent the group. The hare-wallabies, such as *Lagorchestes leporoides*, *L. hirsutus* and *L. consepicillatus*, constitute a genus with the same distribution as the last, and likewise with a hairy muzzle, but with a rather short, evenly furred tail, devoid of a spur. They are great leapers and swift runners, mostly frequenting open stony plains.

More distinct is the Papuan genus *Dorcopsis*, as typified by *D. muelleri*, although it is to some extent connected with *Macropus* by *D. macleyi*. The muzzle is naked, the fur on the nape of the neck directed more or less completely forward, and the hind-limbs are less disproportionately elongated. Perhaps, however, the most distinctive feature of the genus is the great fore-and-aft length of the penultimate premolar in both jaws. Other species are *D. rufolateralis* and *D. aurantiacus*. In the tree-kangaroos, which include the Papuan *Dendrolagus inustus*, *D. ursinus*, *D. dorianus*, *D. benetianus* and *D. maximus*, and the North Queensland *D. lumholtzi*, the reduction in the length of the hind-limbs is carried to a still further degree, so that the proportions of the fore and hind limbs are almost normal. The genus agrees with *Dorcopsis* in the direction of the hair on the neck, but the muzzle is only partially hairy, and the elongation of the penultimate premolar is less. These kangaroos are largely arboreal in their habits, but they descend to the ground to feed. Lastly, we have the banded wallaby, *Lagostrophus fasciatus*, of Western Australia, a small species characterized by its naked muzzle, the presence of long bristles on the hind-feet which conceal the claws, and also of dark transverse bands on the lower part of the back. The skull has a remarkably narrow and pointed muzzle and much inflated auditory bullae; while the two halves of the lower jaw are firmly welded together at their junction, thus effectually preventing the scissor-like action of the lower incisors distinctive of *Macropus* and its immediate allies. As regards the teeth, canines are wanting, and the penultimate upper premolar is short, from before backwards, with a distinct ledge on the inner side.

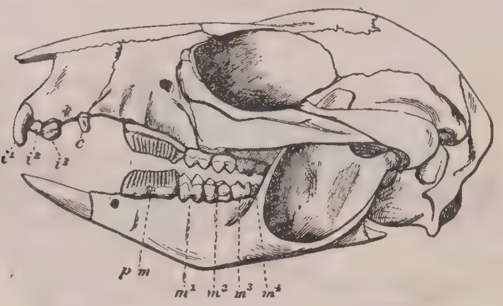


Fig. 4.–Skull and teeth of Lesueuir's Rat-Kangaroo (*Bettongia lesueuiri*). *c*, upper canine. Other letters as in fig. 3. The anterior premolar has been shed.

In the rat-kangaroos, or kangaroo-rats, as they are called in Australia, constituting the sub-family *Potoroinae*, the first upper incisor is narrow, curved, and much exceeds the others in length; the upper canines are persistent, flattened, blunt and slightly curved, and the first two premolars of both jaws have large, simple, compressed crowns, with a nearly straight or slightly concave free cutting-edge, and both outer and inner surfaces usually marked by a series of parallel, vertical grooves and ridges. Molars with quadrate crowns and a blunt conical cusp at each corner, the last notably smaller than the rest, sometimes rudimentary or absent. Fore-feet narrow; the three middle toes considerably exceeding the first and fifth in length and their claws long, compressed and but slightly curved. Hind-feet as in *Macropus*. Tail long, and sometimes partially prehensile when it is used for carrying bundles of grass with which these animals build their nests. The group is confined to Australia and Tasmania, and all the species are relatively small.

In the members of the typical genus *Potorous* (formerly known as *Hypsiprymnus*) the head is long and slender, with the auditory bullae somewhat swollen; while the ridges on the first two premolars are few and perpendicular, and there are large vacuities on the palate. The tarsus is short and the muzzle naked. The genus includes *P. tridactylus*, *P. gilberti* and *P. platyops*. In *Bettongia*, on the other hand, the head is shorter and wider, with smaller and more rounded ears, and more swollen auditory bullae. The ridges on the first two premolars are also more numerous and somewhat oblique (fig. 4); the tarsus is long and the tail is prehensile. The species include *B. lesueuiri*, *B. gaimardi* and *B. cuniculus*. The South Australian *Caloprymnus campestris* represents a genus near akin to the last, but with the edge of the hairy border of the bare muzzle less emarginate in the middle line, still more swollen auditory bullae, very large and posterially expanded nasals and longer vacuities on the palate. The list is completed by *Aepyprymnus rufescens*, which differs from all the others by the hairy muzzle, and the absence of inflation in the auditory bullae and of vacuities in the palate.

Perhaps, however, the most interesting member of the whole group is the tiny musk-kangaroo (*Hypsiprymnodon moschatus*) of north-east Australia, which alone represents the sub-family *Hypsiprymnodontinae*, characterized by the presence of an opposable first toe on the hind-foot and the outward inclination of the penultimate upper premolar, as well by the small and feeble claws. In all these features the musk-kangaroo connects the *Macropodidae* with the *Phalangeridae*. The other teeth are like those of the rat-kangaroos. (W. H. F.; R. L.*)

KANGAROO-RAT, a name applied in different parts of the world to two widely different groups of mammals. In Australia it is used to denote the small kangaroo-like marsupials technically known as *Potoroinae*, which zoologists prefer to call rat-kangaroos (see MARSUPIALIA and KANGAROO). In North America it is employed for certain small jumping rat-like rodents nearly allied to the pocket-gophers and belonging to the family *Geomyidae*. Kangaroo-rats in this latter series are represented by three North American genera, of which *Dipodomys phillipsi*, *Cricetodipus agilis* and *Microdipodops megacephalus* may respectively be taken as examples. Resembling pocket-gophers in the possession of cheek-pouches, kangaroo-rats, together with pocket-mice, are distinguished by their elongated hind-limbs and tails, large eyes, well-developed ears and general jerboa-like appearance and habits. The upper incisor teeth are also relatively narrower, and there are important differences in the skull. The cheek-teeth are rootless in kangaroo-rats, but they develop roots in the pocket-mice. The former inhabit open, sandy districts, where they burrow beneath rocks or stones, and hop about like jerboas; their food consisting of grasses and other plants.

KANGAVAR, a small district of Persia, situated between Hamadan and Kermanshah, and, being held in fief by the family of a deceased court official, forming a separate government. The district is very fertile and contains 30 villages. Its revenues amount to about £500 per annum, and its chief place is the large village of Kangavar, which has a population of about 2500 and is 47 m. from Hamadan on the high road to Kermanshah.

KANGRA, a town and district of British India, in the Jullundur division of the Punjab. The town, sometimes called Nagarkot, is situated 2409 ft. above the sea. Pop. (1901), 4746. The Katoch rajas had a stronghold here, with a fort and rich temples. Mahmud of Ghazni took the fort in 1009 and from one of the temples carried off a vast treasure. In 1360 Kangra was again plundered, by Feroz Shah. The temple of Dêvi Bajreshri was one of the oldest and wealthiest in northern India. It was destroyed, together with the fort and the town, by an earthquake on the 4th of April 1905, when 1339 lives were lost in this place alone, and about 20,000 elsewhere. In 1855 the headquarters of the district were removed to the sanitarium of Dharmsala.

The district of Kangra extends from the Jullundur Doab far into the southern ranges of the Himalaya. Besides some Rajput states, annexed after the Sikh wars, it includes Lahul, Spiti and Kulu, which are essentially Tibetan. The Beas is the only important river. Area, 9978 sq. m., of which Kangra proper ha only 2725. Pop. (1901), 768,124; average density 77 perso sq. m., but with only one person per sq. m. in S cultivation was introduced into Kangra about 1850. The Palampur fair, established by government with a view to fostering commerce with central Asia, attracts a small concourse of Yarkandi merchants. The Lahulis carry on an enterprising trade with Ladakh and countries beyond the frontier, by means of pack sheep and goats. Rice, tea, potatoes, opium, spices, wool and honey are the chief exports.

See *Kangra District Gazetteer* (Lahore, 1906).

KANISHKA, king of Kabul, Kashmir, and north-western India in the 2nd century A.D., was a Tatar of the Kushan tribe, one of the five into which the Yue-chi Tatars were divided. His dominions extended as far down into India as Madurā, and probably as far to the north-west as Bokhāra. Private inscriptions found in the Punjab and Sind, in the Yusufzai district and at Madurā, and referred by European scholars to his reign, are dated in the years five to twenty-eight of an unknown era. It is the references by Chinese historians to the Yue-chi tribes before their incursion into India, together with conclusions drawn from the history of art and literature in his reign, that render the date given the most probable. Kanishka's predecessors on the throne were Pagans; but shortly after his accession he professed himself, probably from political reasons, a Buddhist. He spent vast sums in the construction of Buddhist monuments; and under his auspices the fourth Buddhist council, the council of Jālandhara (Jullunder) was convened under the presidency of Vasumitra. At this council three treatises, commentaries on the Canon, one on each of the three baskets into which it is divided, were composed. King Kanishka had these treatises, when completed and revised by Aśvaghosha, written out on copper plates, and enclosed the latter in stone boxes, which he placed in a memorial mound. For some centuries afterwards these works survived in India; but they exist now only in Chinese translations or adaptations. We are not told in what language they were written. It was probably Sanskrit (not Pali, the language of the Canon)—just as in Europe we have works of exegetical commentary composed, in Latin, on the basis of the Testament and Septuagint in Greek. This change of the language used as a medium of literary intercourse was partly the cause, partly the effect, of a complete revulsion in the intellectual life of India. The reign of Kanishka was certainly the turning-point in this remarkable change. It has been suggested with great plausibility, that the wide extent of his domains facilitated the incursion into India of Western modes of thought; and thus led in the first place to the corruption and gradual decline of Buddhism, and secondly to the gradual rise of Hinduism. Only the publication of the books written at the time will enable us to say whether this hypothesis—for at present it is nothing more—is really a sufficient explanation of the very important results of his reign. In any case it was a migration of nomad hordes in Central Asia that led, in Europe, to the downfall of the Roman civilization; and then, through the conversion of the invaders, to medieval conditions of life and thought. It was the very same migration of nomad hordes that led, in India, to the downfall of the Buddhist civilization; and subsequently, after the conversion of the Saka and Tatar invaders, to medieval Hinduism. As India was nearer to the starting-point of the migration, its results were felt there somewhat sooner.

Authorities.—Vincent A. Smith, *The Early History of India* (Oxford, 1908); "The Kushan Period of Indian History," in *J.R.A.S.* (1903); M. Boyer, "L'Époque de Kaniska," in *Journal Asiatique* (1900); T. Watters, *On Yuan Chwang* (London, 1904, 1905); J. Takakusu, "The Sarvāstivādin Abhidharma Books," in *Jour. of the Pali Text Soc.* (1905), esp. pp. 118–130; Rhys Davids, *Buddhist India* (London, 1903), ch. xvi., "Kanishka." (T. W. R. D.)

KANKAKEE, a city and the county-seat of Kankakee county, Illinois, U.S.A., in the N.E. part of the state, on the Kankakee river, 56 m S. of Chicago. Pop. (1900), 13,595, of whom 3346 were foreign-born; (1910 census), 13,986. Kankakee is served by the Cleveland, Cincinnati, Chicago & St Louis, the Illinois Central, and the Chicago, Indiana & Southern (controlled by the New York Central) railways. It is the seat of the Eastern Hospital for the Insane (1879) a state institution; St Joseph's Seminary (Roman Catholic) and a Conservatory of Music. At Bourbonnais Grove, 3 m. N. of Kankakee is St Viateur's College (founded 1868), a well-known Roman Catholic divinity school, and Notre Dame Academy, another Catholic institution. The city has a public library and four large parks; in Court House Square there is a monument erected by popular subscription in honour of the soldiers from Kankakee county who died in the Civil War. There are rock quarries here, and the city manufactures sewing machines, musical instruments, especially pianos, foundry and machine shop products, agricultural implements and furniture. The total value of the factory product in 1905 was $2,089,143, an increase of 222 % since 1900. Kankakee is also a shipping point for agricultural products. It was first settled in 1832; was platted as the town of Bourbonnais in 1853, when Kankakee county was first organized; was chartered as the city of Kankakee in 1855, and was re-chartered in 1892.

KANKER, a feudatory state of India, within the Central Provinces; area, 1429 sq. m.; pop. (1901), 103,536; estimated revenue, £10,000. It is a hilly tract, containing the headwaters of the Mahanadi. The extensive forests have recently been made profitable by the opening of a branch railway. The residence of the raja, who is of an old Rajput family though ruling over Gonds, is at Kanker (pop. 3906).

KANO, one of the most important provinces of the British protectorate of Northern Nigeria. It includes the ancient emirates of Kano, Katsena, Daura and Kazaure, and covers an area of about 31,000 sq. m. The sub-province of Katagum was incorporated with Kano in 1905, and is included within this area. The population of the double province is estimated at about 2,250,000.

Kano was one of the original seven Hausa states. Written annals carry the record of its kings back to about A.D. 900. Legendary history goes back much further. It was conquered by the Songhoi (Songhay) in the early part of the 16th century, and more than once appears to have made at least partial submission to Bornu. Mahommedanism was introduced at a period which, according to the system adopted for the dating of the annals, must be placed either in the 12th or the 14th century. The Hausa system of government and taxation was adopted by the Fula when in the early part of the 19th century that Mahommedan people overran the Hausa states. It has been erroneously stated that the Fula imposed Mahommedanism on the Hausa states. The fact that they adopted the existing system of government and taxation, which are based upon Koranic law, would in itself be sufficient proof that this was not the case. But the annals of Kano distinctly record the introduction and describe the development of Mahommedanism at an early period of local history.

The capital is the city of Kano, situated in 12° N. and 8° 20′ E., 220 m. S.S.E. of Sokoto and 500 N.E. of Lagos. It is built on an open plain, and is encompassed by a wall 11 m. in perimeter and pierced by thirteen gates. The wall is from 30 to 50 ft. high and about 40 ft. thick at the base. Round the wall is a deep double ditch, a dwarf wall running along its centre. The gates are simply cow-hide, but are set in massive entrance towers. Only about a third of the area (7¼ sq. m.) enclosed by the walls is inhabited nor was the whole space ever occupied by buildings, the intention of the founders of the city being to wall in ground sufficient to grow food for the inhabitants during a siege. The arable land within the city is mainly on the west and north; only to the south-east do the houses come right to the walls. Within the walls are two steep hills, one, Dala, about 120 ft. high being the most ancient quarter of the town. Dala lies north-west. To its east is a great pond, the Jakara, 1½ m. long, and by its north-east shore is the market of the Arab merchants. Here also was the slave market. The palace of the emir, in front of which is a large open space, is in the Fula quarter in the south-east of the city. The palace consists of a number of buildings covering 33 acres and surrounded by a wall 20 to 30 ft. high. The architecture of the city is not without merit. The houses are built of clay with (generally) flat roofs impervious to fire. Traces of Moorish influence are evident and the horseshoe arch is common. The audience hall of the emir's palace—25 ft. sq. and 18 ft. high—is decorated with designs in black, white, green and yellow, the yellow designs (formed of micaceous sand) glistening like gold. The dome-shaped roof is supported by twenty arches.

The city is divided into fourteen quarters, each presided over by a headman, and inhabited by separate sections of the community. It is probably the greatest commercial city in the central Sudan. Other towns, like Zaria, may do as much trade, but Kano is pre-eminent as a manufacturing centre. The chief industry is the weaving of cloth from native grown cotton. Leather goods of all kinds are also manufactured, and from Kano come most of the "morocco leather" goods on the European markets. Dyeing is another large trade, as is the preparation of indigo. Of traders there are four distinct classes. They are: (1) Arabs from Tripoli, who export ostrich feathers, skins and ivory, and bring in burnouses, scents, sweets, tea, sugar, &c.; (2) Salaga merchants who import kola nuts from the hinterland of the Guinea Coast, taking in exchange cloth and live stock and leather and other goods; (3) the Asbenawa traders, who come from the oases of Asben or Air with camels laden with salt and "potash" (*i.e.* sodium carbonates), and with herds of cattle and sheep, receiving in return cotton and hardware and kolas; (4) the Hausa merchants. This last class trades with the other three and despatches caravans to Illorin and other places, where the Kano goods, the "potash" and other merchandise are exchanged for kolas and European goods. The "potash" finds a ready sale among the Yorubas, being largely used for cooking purposes. In Kano itself is a great market for livestock: camels, horses, oxen, asses and goats being on sale.

Besides Hausa, who represent the indigenous population, there are large colonies of Kanuri (from Bornu) and Nupians in Kano. The Fula form the aristocratic class. The population is said to amount to 100,000. About a mile and a half east of Kano is Nassarawa, formerly the emir's suburban residence, but since 1902 the British Residency and barracks.

The city of Kano appears on the map of the Arab geographer, Idrisi, A.D. 1145, and the hill of Dala is mentioned in the earliest records as the original site of Kano. Barth, however, concluded that the present town does not date earlier than the second half of the 16th century, and that before the rise of the Fula power (*c.* 1800) scarcely any great Arab merchant ever visited Kano. The present town may be the successor of an older town occupying a position of similar pre-eminence. Kano submitted to the Fula without much resistance, and under them in the first half of the 19th century flourished greatly. It was visited by Hugh Clapperton, an English officer, in 1824, and in it Barth lived some time in 1851 and again in 1854. Barth's descriptions of the wealth and importance of the city attracted great attention in Europe, and Kano was subsequently visited by several travellers, missionaries, and students of Hausa, but none was permitted to live permanently in the city. In the closing years of the century, Kano became the centre of resistance to British influence, and the emir, Alieu, was the most inveterate of Fula slave raiders. In February 1903 the city was captured by a British force under Colonel T. L. N. Morland, and a new emir, Abbas, a brother of Alieu, installed.

After the occupation by the British in 1903 the province was organized for administration on the same system as that adopted throughout northern Nigeria. The emir on his installation takes an oath of allegiance to the British Crown, and accepts the position of a chief of the first class under British rule. A resident is placed at his court, and assistant residents have their headquarters in the administrative districts of the province. British courts of justice are established side by side with the native courts throughout the province. Taxation is assessed under British supervision and paid into the native treasury. A fixed portion is paid by the emir to the British government. The emir is not allowed to maintain a standing army, and the city of Kano is the headquarters of the British garrison. The conditions of appointment of the emirs are fully laid down in the terms accepted at Sokoto on the close of the Sokoto-Kano campaign of 1903. Since the introduction of British rule there has been no serious trouble in the province. The emir Abbas worked loyally with the British and proved himself a ruler of remarkable ability and intelligence. He was indefatigable in dispensing justice, and himself presided over a native court in which he disposed of from fifty to a hundred cases a month. He also took an active interest in the reform and reorganization of the system of taxation, and in the opening of the country to trade. He further showed himself helpful in arranging difficulties which at times arose in connexion with the lesser chiefs of his province.

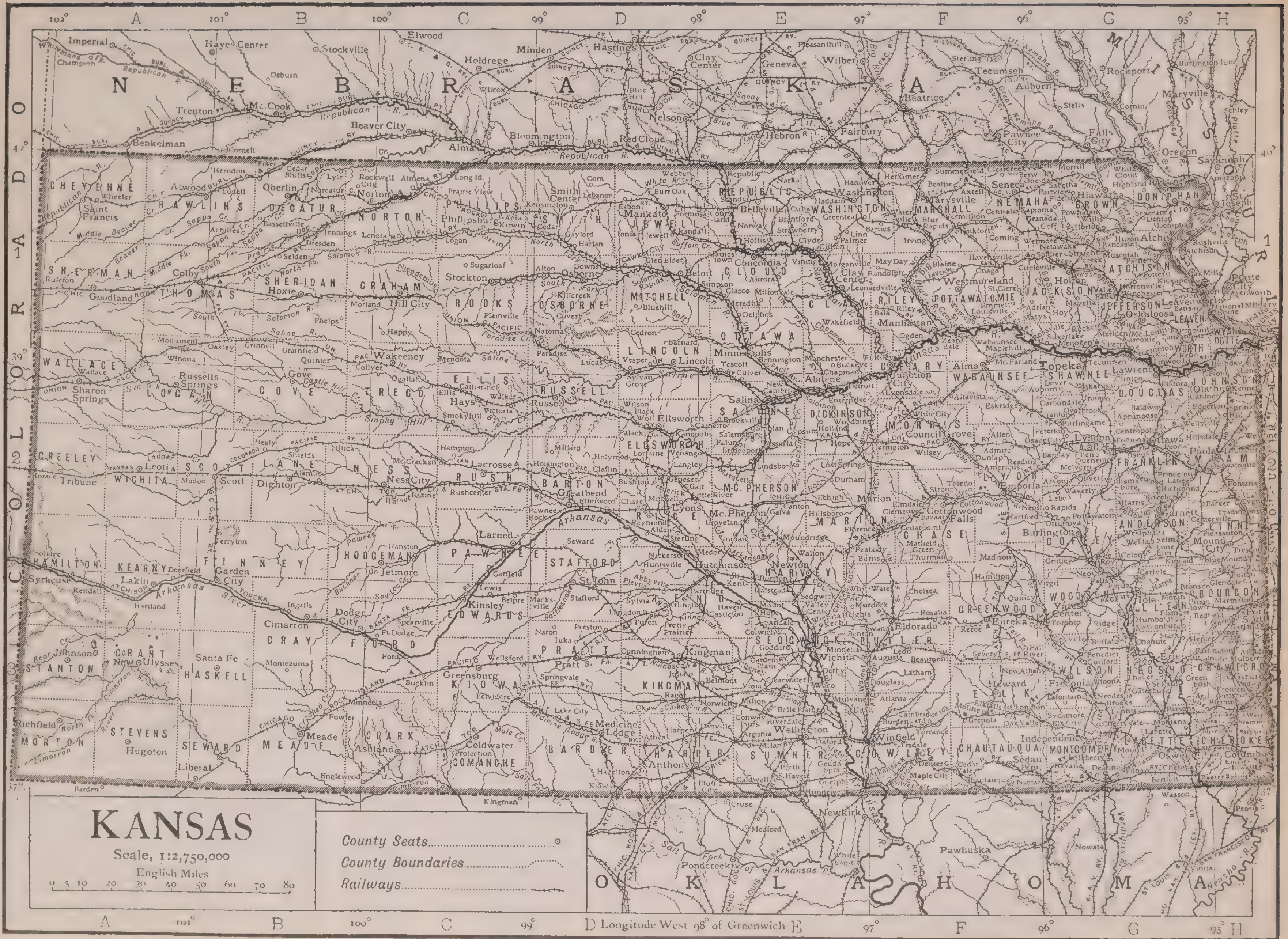
The province of Kano is generally fertile. For a radius of 30 m. round the capital the country is closely cultivated and densely populated, with some 40 walled towns and with villages and hamlets hardly half a mile apart. Kano district proper contains 170 walled towns and about 450 villages. There are many streams, but water is chiefly obtained from wells 15 to 40 ft. deep. The principal crops are African grains, wheat, onions, cotton, tobacco, indigo, with sugar-cane, cassava, &c. The population is chiefly agricultural, but also commercial and industrial. The chief industries are weaving, leather-making, dyeing and working in iron and pottery. Cattle are abundant. (See NIGERIA: *History*; and SOKOTO.)

Consult the *Travels* of Heinrich Barth (new ed., London, 1890); *Hausaland*, by C. H. Robinson (London, 1896); Northern Nigeria, by Sir F. D. Lugard, in vol. xxii. *Geographical Journal* (London, 1904); *A Tropical Dependency*, by Lady Lugard (London, 1905); the Colonial Office *Reports* on Northern Nigeria from 1902 onward, and other works cited under NIGERIA. (F. L. L.)

KANSAS (known as the "Sunflower State"), the central commonwealth of the United States of America, lying between 37° and 40° N. lat. and between 94° 38′ and 102° 1′ 34″ W. long. (*i.e.* 25° W. long. from Washington). It is bounded on the N. by Nebraska, on the E. by Missouri, on the S. by Oklahoma, and on the W. by Colorado. The state is nearly rectangular in shape, with a breadth of about 210 m. from N. to S. and a length of about 410 m. from E. to W. It contains an area of 82,158 sq. m. (including 384 sq. m. of water surface).

Physiography.—Three physiographic regions may be distinguished within the state—the first, a small portion of the Ozark uplift in the extreme south-east corner; the second, the Prairie Plains, covering approximately the east third of the state; the third, the Great Plains, covering the remaining area. Between the latter two there is only the most gradual transition. The entire state is indeed practically an undulating plain, gently sloping from west to east at an average of about 7 ft. per mile. There is also an inclination in the eastern half from north to south, as indicated by the course of the rivers, most of which flow south-easterly (the Kansas, with its general easterly course, is the principal exception), the north-west corner being the highest portion of the state. The lowest point in the state in its south-east part, in Montgomery county, is 725 ft. above sea level. The average elevation of the east boundary is about 850 ft., while contour lines of 3500–3900 ft. run near the west border. Somewhat more than half the total area is below 2000 ft. The gently rolling prairie surface is diversified by an endless succession of broad plains, isolated hills and ridges, and moderate valleys. In places there are terraced uplands, and in others the undulating plain is cut by erosion into low escarpments. The bluffs on the Missouri are in places 200 ft. high, and the valley of the Cimarron, in the south-west, has deep cuts, almost gorges. The west central portion has considerable irregularities of contour, and the north-west is distinctively hilly. In the south-west, below the Arkansas river, is an area of sandhills, and the Ozark Plateau region, as above stated, extends into the south-east corner, though not there much elevated. The great central valley is traversed by the Kansas (or Kaw) river, which, inclusive of the Smoky Hill Branch, extends the entire length of the state, with lateral valleys on the north. Another broad valley is formed in the south half of the state by the Arkansas river, with lateral valleys on the north and south. The south-east portion contains the important Neosho and smaller valleys. In the extreme south-west is the valley of the Cimarron, and along the south boundary is a network of the south tributaries of the Arkansas. Numerous small affluents of the Missouri enrich and diversify the north-east quarter. The streams of Kansas are usually fed by perennial springs, and, as a rule, the east and middle portions of the state are well watered. Most of the streams maintain a good flow of water in the driest seasons, and in case of heavy rains many of them "underflow" the adjacent bottom lands, saturating the permeable substratum of the country with the surplus water, which in time drains out and feeds the subsiding streams. This feature is particularly true of the Saline, Solomon and Smoky Hill rivers. The west part is more elevated and water is less abundant.

Climate.—The climate of Kansas is exceptionally salubrious. Extremes of heat and cold occur, but as a rule the winters are dry and mild, while the summer heats are tempered by the perpetual prairie breezes, and the summer nights are usually cool and refreshing. The average annual temperature of the state for seventeen years preceding 1903 was 54·3° F., the warmest mean being 56·0°, the



KANSAS

Scale, 1:2,750,000

English Miles
0 5 10 20 30 40 50 60 70 80
County Seats
County Boundaries
Railways
Longitude West 98° of Greenwich
NEBRASKA
COLORADO
MISSOURI
OKLAHOMA

Emery Walker sc.

coldest 52·6°. The extreme variation of yearly means throughout the east, west and middle sections during the same period was very slight, 51·6° to 56·6°, and the greatest variation for any one section was 3·7°. The absolute extremes were 116° and −34°. The dryness of the air tempers exceedingly to the senses the cold of winter and the heat of summer. The temperature over the state is much more uniform than is the precipitation, which diminishes somewhat regularly westward. In the above period of seventeen years the yearly means in the west section varied from 11·93 to 29·21 in. (av. 19·21), in the middle from 18·58 to 34·30 (av. 26·68), in the east from 26·00 to 45·71 (av. 34·78); the mean for the state ranging from 20·12 to 35·50 (av. 27·12).[1] The precipitation in the west is not sufficient for confident agriculture in any series of years, since agriculture is practically dependent upon the mean fall; a fact that has been and is of profound importance in the history of the state. The line of 20 in. fall (about the limit of certain agriculture) approximately bisects the state in dry years. The precipitation is very largely in the growing season—at Dodge the fall between April and October is 78 % of that for the year. Freshets and droughts at times work havoc. The former made notable 1844 and 1858; and the latter 1860, 1874 and 1894. Tornadoes are also a not infrequent infliction, least common in the west. The years 1871, 1879, 1881 and 1892 were made memorable by particularly severe storms. There are 150 to 175 "growing days" for crops between the frosts of spring and autumn, and eight in ten days are bright with sunshine—half of them without a cloud. Winds are prevailingly from the south (in the winter often from the north-west).

Fauna and Flora.—The fauna and flora of the state are those which are characteristic of the plain region generally of which Kansas is a part. The state lies partly in the humid, or Carolinian, and partly in the arid, or Upper Sonoran, area of the Upper Austral life-zone; 100° W. long. is approximately the dividing line between these areas. The bison and elk have disappeared. A very great variety of birds is found within the state, either as residents or as visitants from the adjoining avifaunal regions—mountain, plain, northern and southern. In 1886 Colonel N. S. Goss compiled a list of 335 species, of which 175 were known to breed in the state. The wild turkey, once abundant, was near extermination in 1886, and prairie chickens (pinnated grouse) have also greatly diminished in number. The jack-rabbit is characteristic of the prairie. Locusts ("grasshoppers" in local usage) have worked incalculable damage, notably in 1854, 1866, and above all in 1874–1875. In the last two cases their ravages extended over a great portion of the state.

Kansas has no forests. Along the streams there is commonly a fringe of timber, which in the east is fairly heavy. There is an increasing scarcity westward. With the advancing settlement of the state thin wind-break rows become a feature of the prairies. The lessened ravages of prairie fires have facilitated artificial afforesting, and many cities, in particular, are abundantly and beautifully shaded. Oaks, elms, hickory, honey-locusts, white ash, sycamore and willows, the rapid growing but miserable box-elder and cottonwood, are the most common trees. Black walnut was common in the river valleys in Territorial days. The planting of tree reserves by the United States government in the arid counties of this state promises great success. A National Forest of 302,387 acres in Finney, Kearney, Hamilton and Grant counties was set aside in May 1908. Buffalo and bunch, and other short native prairie grasses, very nutritious ranging food but unavailable as hay, once covered the plains and pastured immense herds of buffalo and other animals, but with increasing settlement they have given way generally to exotic bladed species, valuable alike for pasture and for hay, except in the western regions. The hardy and ubiquitous sunflower has been chosen as the state flower or floral emblem. Cactus and yucca occur in the west.

The soil of the upland prairies is generally a deep rich clay loam of a dark colour. The bottom lands near the streams are a black sandy loam; and the intermediate lands, or "second bottoms," show a rich and deep black loam, containing very little sand. These soils are all easily cultivated, free from stones, and exceedingly productive. There are exceptional spots on the upland prairies composed of stiff clay, not as easily cultivated, but very productive when properly managed and enriched. The south-west section is distinctively sandy.

Agriculture.—The United States Census of 1900 shows that of the farming area of the state in 1900 (41,662,970 acres, 79·6 % of the total area), 60·1 % was "improved." The value of all farm property was $864,100,286—of which land and improvements (including buildings), livestock and implements and machinery represented respectively 74·5, 22·1 and 3·4 %. Almost nine-tenths of all farms derived their principal income from livestock or hay and grain, these two sources being about equally important. Of the total value of farm products in 1899 ($209,895,542), crops represented 53·7, animal products 45·9 and forest products only 0·4 %. In 1899 the wheat crop was 38,778,450 bushels, being less than that of Minnesota, North Dakota, Ohio or South Dakota. According to the *Year Book* of the United States Department of Agriculture, the crop in 1906 was 81,830,611 bushels, almost one-ninth of the crop of the entire country for that year, and much more than the crop of any other state. In 1909 it was 87,203,000 bushels (less than the crops of either Minnesota or North Dakota). Winter wheat constitutes almost the entire output. The hard varieties rank in the flour market with the finest Minnesota wheat. The wheat belt crosses the state from north to south in its central third. Greater even than wheat in absolute output, though not relatively to the output of other states, is Indian corn. In 1906 the crop was 195,075,000 bushels, and in 1909 it was 154,225,000. The crop is very variable, according to seasons and prospective markets; ranging *e.g.* in the decade 1892–1901 from 42·6 (1901) to 225·1 (1899) million bushels. The Indian corn belt is mainly in the eastern third of the state. In the five years 1896–1900 the combined value of the crops of Indian corn and wheat exceeded the value of the same crops in any other state of the Union (Illinois being a close second). In the western third irrigation has been tried, in the earlier years unsuccessfully; in all Kansas, in 1899, there were 23,620 acres irrigated, of which 8939 were in Finney and 7071 in Kearney county. In this western third the rainfall is insufficient for Indian corn; but Kafir corn, an exceptional drought-resisting cereal, has made extraordinary progress in this region, and indeed generally over the state, since 1893, its acreage increasing 416·1 % in the decade 1895–1904. With the saccharine variety of sorghum, which increased greatly in the same period, this grain is replacing Indian corn. Oats are the third great cereal crop, the yield being 24,780,000 bushels in 1906 and 27,185,000 in 1909. Alfalfa showed an increased acreage in 1895–1904 of 310·8 %; it is valuable in the west for the same qualities as the Kafir corn. The hay crop in 1909 was 2,652,000 tons. Alfalfa, the Japanese soy bean and the wheat fields—which furnish the finest of pasture in the early spring and ordinarily well into the winter season—are the props of a prosperous dairy industry. In the early 'eighties the organization of creameries and cheese factories began in the county-seats; they depended upon gathered cream. About 1889 separators and the whole-milk system were introduced, and about the same time began the service of refrigerator cars on the railways; the hand separator became common about 1901. Western Kansas is the dairy country. Its great ranges, whose insufficient rainfall makes impossible the certain, and therefore the profitable, cultivation of cereals, or other settled agriculture, lend themselves with profit to stock and dairy farming. Dairy products increased 60·6 % in value from 1895 to 1904, amounting in the latter year to $16,420,095. This value was almost equalled by that of eggs and poultry ($14,050,727), which increased 79·7 % in the same decade. The livestock interest is stimulated by the enormous demand for beef-cattle at Kansas City.

Sugar-beet culture was tried in the years following 1890 with indifferent success until the introduction of bounties in 1901. It has extended along the Arkansas valley from the Colorado beet district and into the north-western counties. There is a large beet-sugar factory at Garden City, Finney county. Experiments have been made unsuccessfully in sugar cane (1885) and silk culture (1885 seq.). The bright climate and pure atmosphere are admirably adapted to the growth of the apple, pear, peach, plum, grape and cherry. The smaller fruits also, with scarce an exception, flourish finely. The fruit product of Kansas ($2,431,773 in 1899) is not, however, as yet particularly notable when compared with that of various other states.

According to the estimates of the state department of agriculture, of the total value of all agricultural products in the twenty years 1885–1904 ($3,078,999,855), Indian corn and wheat together represented more than two-fifths (821·3 and 518·1 million dollars respectively), and livestock products nearly one-third (1024·9 millions). The aggregate value of all agricultural products in 1903–1904 was $754,954,208.

Minerals.—In the east portion of the state are immense beds of bituminous coal, often at shallow depths or cropping out on the surface. In 1907 more than 95 % of the coal came from Crawford, Cherokee, Leavenworth and Osage counties, and about 91·5 % from the first two. The total value of the production of coal in 1905 (6,423,979 tons) was $9,350,542, and in 1908 (6,245,508 tons) $9,292,222. In the central portion, which belongs to the Triassic formation, magnesian limestone, ferruginous sandstone and gypsum are representative rocks. Gypsum (in beautiful crystalline form) is found in an almost continuous bed across the state running north-east and south-west with three principal areas, the northern in Marshall county, the central in Dickinson and Saline counties, and the southern (the heaviest, being 3 to 40 ft. thick) in Barber and Comanche counties. The product in 1908 was valued at $281,339. Magnesian limestone, or dolomite, is especially plentiful along the Blue, Republican and Neosho rivers and their tributaries. This beautiful stone, resembling white, grey and cream-coloured marble, is exceedingly useful for building purposes. It crops out in the bluffs in endless quantities, and is easily worked. The stone resources of the state are largely, but by no means exclusively, confined to the central part. There are marbles in Osage and other counties, shell marble in Montgomery county, white limestone in Chase county, a valuable bandera flagstone and hydraulic cement rock near Fort Scott, &c. The limestones produced in 1908 were valued at $403,176 and the sandstones at $67,950. In the central region salt is produced in immense quantities, within a great north to south belt about Hutchinson. The beds, which are exploited by the brine method at Hutchinson, at Ellsworth (Ellsworth county), at Anthony (Harper county) and at Sterling (Rice county), lie from 400 to 1200 ft. underground, and are in places as much as 350 ft. thick and 99 % pure. At Kanopolis in Ellsworth county, at Lyons in Rice county and at Kingman, Kingman county, the salt is mined and sold as rock-salt. In the south-west salt is found in beds and dry incrustations, varying in thickness from a few inches to 2 ft. The total product from 1880–1899 was valued at $5,538,855; the product of 1908 (when Kansas ranked fourth among the states producing salt) was valued at $882,984. The development has been mainly since 1887 at Hutchinson and since about 1890 in the rock-salt mines. In the west portion of the state, which belongs to the Cretaceous formation, chalks and a species of native quicklime are very prominent in the river bluffs. The white and cream-coloured chalks are much used for building purposes, but the blue is usually too soft for exposure to the weather. The quicklime as quarried from the bluffs slakes perfectly, and with sand makes a fairly good mortar, without calcination or other previous preparation. The lignite found near the Colorado line makes a valuable domestic fuel.

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[1] For the thirty years 1877–1906 the mean rainfall for ten-year periods was: at Dodge, 22·8 in., 18·4 in. and 22·7 in.; and at Lawrence, 35·1 in., 39·2 in. and 36·7 in. for the first, second and third periods respectively.

Natural gas, oil, zinc and lead have been discovered in south-east Kansas and have given that section an extraordinary growth and prosperity. Indications of gas were found about the time of the Civil War, but only in the early 'seventies were they recognized as unmistakable, and they were not successfully developed until the 'eighties. Iola, in Allen county, is the centre of the field, and the gas yields heat, light, and a cheap fuel for smelters, cement-works and other manufacturing plants throughout a large region. The pools lie from 400 to 950 ft. below the surface; some wells have been drilled 1500 ft. deep. The value of the natural gas produced in the state was $15,873 in 1889, $2,261,836 in 1905 and $7,691,587 in 1908, when there were 1917 producing wells, and Kansas ranked fourth of the states of the United States in the value of the natural gas product, being surpassed by Pennsylvania, West Virginia and Ohio. Petroleum was discovered about 1865 in Miami and Bourbon counties, and about 1892 at Neodesha, Wilson county. There was only slight commercial exploitation before 1900. The production increased from 74,714 barrels in that year to 4,250,779 in 1904; in 1908 it was 1,801,781 barrels. Chanute has been the most active centre of production. The field was prospected here in the 'nineties, but developed only after 1900. In 1877 an immense deposit of lead was discovered on land now within the limits of Galena. Rich zinc blendes were at first thrown away among the by-products of the lead mines. After the discovery of their true nature there was a slow development, and at the end of the century a notable boom in the fields. From 1876 to 1897 the total value of the output of the Galena field was between $25,000,000 and $26,000,000; but at present Kansas is far more important as a smelter than as a miner of zinc and lead, and in 1906 58 % of all spelter produced in the United States came from smelters in Kansas. In 1908 the mines' output was 2293 tons of lead valued at $192,612 and 8628 tons of zinc valued at $811,032. Pottery, fire, ochre and brick clays are abundant, the first two mainly in the eastern part of the state. Coffeyville has large vitrified brick interests. In 1908 the total value of all the mineral products (incompletely reported) of Kansas was $26,162,213.

Industry and Trade.—Manufactures are not characteristic of the state. The rank of the state in manufactures in 1900 was sixteenth and in farm products seventh in the Union. The value of the manufactured product in 1900, according to the Twelfth United States Census, was $172,129,398, an increase of 56·2 % over the output of 1890; of this total value, the part representing establishments under the "factory system" was $154,008,544,[1] and in 1905 the value of the factory product was $198,244,992, an increase of 28·7 %. Kansas City, Topeka, Wichita, Leavenworth and Atchison were the only cities which had manufactures whose gross product was valued in 1905 at more than $3,000,000 each; their joint product was valued at $126,515,804, and that of Kansas City alone was $96,473,050, almost half the output of the state. The most important manufacturing industry, both in 1900 and in 1905, was slaughtering and meat-packing—for which Kansas City is the second centre of the country—with a product for the state valued at $77,411,883 in 1900, and $96,375,639 in 1905; in both these years the value of the product of Kansas was exceeded only by that of Illinois. The flour and grist mill industry ranked next, with a product valued at $21,328,747 in 1900 and nearly twice that amount, $42,034,019, in 1905. In 1900 a quarter of the wheat crop was handled by the mills of the state. Lesser manufacturing interests are railway shop construction (value in 1905, $11,521,144); zinc smelting and refining (value in 1905, $10,999,468); the manufacture of cheese, butter and condensed milk (value in 1905, $3,946,349); and of foundry and machine shop products (value in 1905, $3,756,825).

Communications.—Kansas is excellently provided with railways, with an aggregate length in January 1909 of 8914·77 m. (in 1870, 1880, 1890 respectively, 1,501, 3,244 and 8,710 m.). The most important systems are the Atchison, Topeka & Santa Fé, the Missouri Pacific, the Chicago, Rock Island & Pacific, the Union Pacific, the Missouri, Kansas & Texas, the Chicago, Burlington & Quincy, and the St Louis & San Francisco systems. The first train entered Kansas on the Union Pacific in 1860. During the following decade the lines of the Missouri Pacific, the Missouri, Kansas & Texas and the Santa Fé were well under construction. These roads give excellent connexions with Chicago, the Gulf and the Pacific. Kansas has an eastern river front of 150 m. on the Missouri, which is navigable for steamboats of good size. The internal rivers of the state are not utilized for commercial purposes.

Population.—In population Kansas ranked in 1900 and 1910 (1,690,949) twenty-second in the Union. The decennial increases of population from 1860 to 1900 were 239·9, 173·4, 43·3 and 3·0 %, the population in 1900 being 1,470,495, or 18 to the sq. m.[2] Of this number 22·5 % lived in cities of 2500 or more inhabitants. Nine cities numbered more than 10,000 inhabitants: Kansas City (51,418), Topeka—the state capital (33,608), Wichita (24,671), Leavenworth (20,735), Atchison (15,722), Lawrence—the seat of the state university (10,862), Fort Scott (10,322), Galena (10,155) and Pittsburg (10,112). The life of all of these save the last two goes back to Territorial days; but the importance of Fort Scott, like that of Galena and Pittsburg, is due to the development of the mineral counties in the south-east. Other cities of above 5000 inhabitants were Hutchinson (9379), Emporia (8223), Parsons (7682), Ottawa (6934), Newton (6208), Arkansas City (6140), Salina (6074), Argentine (5878) and Iola (5791). The number of negroes (3·5 %) is somewhat large for a northern and western state. This is largely owing to an exodus of coloured people from the South in 1878–1880, at a time when their condition was an unusually hard one: an exodus turned mainly toward Kansas. The population is very largely American-born (91·4 % in 1900; 47·1 % being natives of Kansas). Germans, British, Scandinavians and Russians constitute the bulk of the foreign-born. The west third of the state is comparatively scantily populated, owing to its aridity. In the 'seventies, after a succession of wet seasons, and again in the 'eighties, settlement was pushed far westward, beyond the limits of safe agriculture, but hundreds of settlers—and indeed many entire communities—were literally starved out by the recurrence of droughts. Irrigation has made a surer future for limited areas, however, and the introduction of drought-resisting crops and the substitution of dairy and livestock interests in the place of agriculture have brightened the outlook in the western counties, whose population increased rapidly after 1900. The early 'eighties were made notable by a tremendous "boom" in real estate, rural and urban, throughout the commonwealth. As regards the distribution of religious sects, in 1906 there were 458,190 communicants of all denominations, and of this number 121,208 were Methodists (108,097 being Methodist Episcopalians of the Northern Church), 93,195 were Roman Catholics, 46,299 were Baptists (34,975 being members of the Northern Baptist Convention and 10,011 of the National (Colored) Baptist Convention), 40,765 were Presbyterians (33,465 being members of the Northern Church) and 40,356 were Disciples of Christ. The German-Russian Mennonites, whose immigration became notable about 1874, furnished at first many examples of communal economy, but these were later abandoned. In 1906 the total number of Mennonites was 7445, of whom 3581 were members of the General Conference of Mennonites of North America, 1825 belonged to the Schellenberger Brüder-gemeinde, and the others were distributed among seven other sects.

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[1] All subsequent figures in this paragraph for manufactures in 1900 are given for establishments under the "factory system" only, so as to be comparable with statistics for 1905, which do not include minor establishments.

[2] According to the state census Kansas had in 1905 a total population of 1,544,968; nearly 28 % lived in cities of 2500 or more inhabitants; 13 cities had more than 10,000 inhabitants: Kansas City (67,614), Topeka (37,641), Wichita (31,110), Leavenworth (20,934), Atchison (18,159), Pittsburg (15,012), Coffeyville (13,196), Fort Scott (12,248), Parsons (11,720), Lawrence (11,708), Hutchinson (11,215), Independence (11,206), and Iola (10,287). Other cities of above 5000 inhabitants each were: Chanute (9704), Emporia (8974), Winfield (7845), Salina (7829), Ottawa (7727), Arkansas City (7634), Newton (6601), Galena (6449), Argentine (6053), Junction City (5264) and Cherryvale (5089).

Government.—The constitution is that adopted at Wyandotte on the 29th of July 1859 and ratified by the people on the 4th of October 1859; it came into operation on the 29th of January 1861, and was amended in 1861, 1864, 1867, 1873, 1875, 1876, 1880, 1888, 1900, 1902, 1904 and 1906. An amendment may be proposed by either branch of the legislature, and, if approved by two-thirds of the members elected to each house as well as by a majority of the electors voting on it at a general election, it is adopted. A constitutional convention to revise or amend the constitution may be called in the same manner. Universal manhood suffrage is the rule, but women may vote in school and municipal elections, Kansas being the first state to grant women municipal suffrage as well as the right to hold municipal offices (1887). General elections to state, county and township offices are biennial, in even-numbered years, and take place on the first Tuesday after the first Monday in November. The state executive officers are a governor, lieutenant-governor, secretary of state, auditor, treasurer, attorney-general and superintendent of public instruction, all elected for a term of two years. The governor appoints, with the approval of the Senate, a board of public works and some other administrative boards, and he may veto any bill from the legislature, which cannot thereafter become a law unless again approved by two-thirds of the members elected to each house.

The legislature, consisting of a Senate and a House of Representatives, meets in regular session at Topeka, the capital, on the second Tuesday of January in odd-numbered years. The membership of the senate is limited to 40, and that of the house of representatives to 125. Senators are elected for four years and representatives for two years. In regular sessions not exceeding fifty days and in special sessions not exceeding thirty days the members of both houses are paid three dollars a day besides an allowance for travelling expenses, but they receive no compensation for the extra time of longer sessions. In 1908 a direct primary law was passed applicable to all nominations except for presidential electors, school district officers and officers in cities of less than 5000 inhabitants; like public elections the primaries are made a public charge; nomination is by petition signed by a certain percentage (for state office, at least 1%; for district office, at least 2%; for sub-district or county office, at least 3%) of the party vote; the direct nominating system applies to the candidates for the United States Senate, the nominee chosen by the direct primaries of each party being the nominee of the party.

The judicial power is vested in one supreme court, thirty-eight district courts, one probate court for each county, and two or more justices of the peace for each township. All justices are elected: those of the supreme court, seven in number, for six years, two or three every two years; those of the district courts for four years; and those of the probate courts and the justices of the peace for two years. The more important affairs of each county are managed by a board of commissioners, who are elected by districts for four years, but each county elects also a clerk, a treasurer, a probate judge, a register of deeds, a sheriff, a coroner, an attorney, a clerk of the district court, and a surveyor, and the district court for the county appoints a county auditor. The township officers, all elected for two years, are a trustee, a clerk, a treasurer, two or more justices of the peace, two constables and one road overseer for each road district. Cities are governed under a general law, but by this law they are divided into three classes according to size, and the government is different for each class. Those having a population of more than 15,000 constitute the first class, those having a population of more than 2000 but not more than 15,000 constitute the second class, and those having a population not exceeding 2000 constitute the third class. Municipal elections are far removed from those of the state, being held in odd-numbered years in April. In cities of the first class the state law requires the election of a mayor, city clerk, city treasurer, police judge and councilmen; in those of the second class it requires the election of a mayor, police judge, city treasurer, councilmen, board of education, justices of the peace and constables; and in those of the third class it requires the election of a mayor, police judge and councilmen. Several other offices provided for in each class are filled by the appointment of the mayor.

The principal grounds for a divorce in Kansas are adultery, extreme cruelty, habitual drunkenness, abandonment for one year, gross neglect of duty, and imprisonment in the penitentiary as a felon subsequent to marriage, but the applicant for a divorce must have resided in the state the entire year preceding the presentment of the petition. A married woman has the same rights to her property after marriage as before marriage, except that she is not permitted to bequeath away from her husband more than one-half of it without his written consent, and no will made by the husband can affect the right of the wife, if she survive him, to one-half of the property of which he died seized. Whenever a husband dies intestate, leaving a farm or a house and lot in a town or city which was the residence of the family at his death, his widow, widow and children, or children alone if there be no widow, may hold the same as a homestead to the extent of 160 acres if it be a farm, or one acre if it be a town or city lot. A homestead of this size is exempt from levy for the debts of the intestate except in case of an incumbrance given by consent of both husband and wife, or of obligations for purchase money, or of liens for making improvements, and the homestead of a family cannot be alienated without the joint consent of husband and wife. The homestead status ceases, however, whenever the widow marries again or when all the children arrive at the age of majority. An eight-hour labour law was passed in 1891 and was upheld by the state supreme court. In 1909 a law was passed for state regulation of fire insurance rates (except in the case of farmers' mutuals insuring farm property only) and forbidding local discrimination of rates within the state. In the same year a law was passed requiring that any corporation acting as a common carrier in the state must receive the permission of the state board of railway commissioners for the issue of stocks, bonds or other evidences of indebtedness.

The manufacture and sale of intoxicating liquors except for medical, scientific and mechanical purposes were prohibited by a constitutional amendment adopted in 1880. The Murray liquor law of 1881, providing for the enforcement of the amendment, was declared constitutional by the state supreme court in 1883. At many sessions of the legislature its enemies vainly attempted its repeal. It was more seriously threatened in 1890 by the "Original Package Decision," of the United States Supreme Court, the decision, namely, that the state law could not apply to liquor introduced into Kansas from another state and sold from the original package, such inter-state commerce being within the exclusive jurisdiction of Congress. That body thereupon gave Kansas the power needed, and its action was upheld by the Federal Supreme Court. The enforcement of the law has varied, however, enormously according to the locality. In 1906–1907 a fresh crusade to enforce the law was begun by the attorney-general, who brought ouster suits against the mayors of Wichita, Junction City, Pittsburg and Leavenworth for not enforcing the law and for replacing it with the "fine" system, which was merely an irregular licence. In 1907 the attorney-general's office turned its attention to outside brewing companies doing business in the state and secured injunctions against such breweries doing business in the state and the appointment of receivers of their property. The provision of the law permitting the sale of whisky for medicinal, scientific or mechanical purposes was repealed by a law of 1909 prohibiting the sale, manufacture or barter of spirituous, malt, vinous or any other intoxicating liquors within the state. The severity of this law was ascribed to efforts of the liquor interests to render it objectionable.

The constitution forbids the contraction of a state debt exceeding $1,000,000. The actual debt on the 30th of June 1908 was $605,000, which was a permanent school fund. Taxation is on the general-property system. The entire system has been—as in other states where it prevails—extremely irregular and arbitrary as regards local assessments, and very imperfect; and the figures of total valuation (in 1880 $160,570,761, in 1890 $347,717,218, in 1906 $408,329,749, and in 1908, when it was supposed to be the actual valuation of all taxable property, $2,453,691,859), though significant of taxation methods, are not significant of the general condition or progress of the state.

Education.—Of higher educational institutions, the state supports the university of Kansas at Lawrence (1866), an agricultural college at Manhattan (1863; aided by the United States government); a normal school at Emporia (1865), a western branch of the same at Hays (1902); a manual training normal school (1903) at Pittsburg, western university (Quindaro) for negroes and the Topeka industrial and educational institute (1896, reorganized on the plan of Tuskegee institute in 1900) also for negroes. The university of Kansas was organized in 1864 and opened in 1866. Its engineering department was established in 1870, its normal department in 1876 (abolished 1885), its department of music in 1877, its department of law in 1878, and the department of pharmacy in 1885; in 1891 the preparatory department was abolished and the university was reorganized with "schools" in place of the former "departments." In 1899 a school of medicine was established, in connexion with which the Eleanor Taylor Bell memorial hospital was erected in 1905. In 1907–1908 the university had a faculty of 211, an enrolment of 2063 (1361 men and 702 women); the university library contained 60,000 volumes and 37,000 pamphlets. An efficient compulsory education law was passed in 1903. Kansas ranks very high among the states in its small percentage of illiteracy (inability to write)—in 1900 only 2·9% of persons at least ten years of age; the figures for native whites, foreign whites and negroes being respectively 1·3, 8·5, 22·3. In addition to the state schools, various flourishing private or denominational institutions are maintained. The largest of these are the Kansas Wesleyan University (Methodist Episcopal, 1886) at Salina and Baker University (Methodist Episcopal, 1858) at Baldwin. Among the many smaller colleges are Washburn College (Congregational, 1869) at Topeka, the Southwest Kansas College (Methodist Episcopal, opened 1886) at Winfield, the College of Emporia (Presbyterian, 1883) at Emporia, Bethany College (Lutheran, 1881) at Lindsborg, Fairmount College (non-sectarian, 1895) at Wichita, St Mary's College (Roman Catholic, 1869) at St Mary's, and Ottawa University (Baptist, 1865) at Ottawa. At Topeka is the College of the Sisters of Bethany (Protestant Episcopal, 1861) for women. There are also various small professional schools and private normal schools. An industrial school for Indian children is maintained by the United States near Lawrence (Haskell Institute, 1884). Among the state charitable and reformatory institutions are state hospitals for the insane at Topeka and Osawatomie and a hospital for epileptics at Parsons; industrial reform schools for girls at Beloit, for boys at Topeka, and for criminals under twenty-five at Hutchinson; a penitentiary at Lansing; a soldiers' orphans' home at Atchison and a soldiers' home at Dodge City; and schools for feeble-minded youth at Winfield, for the deaf at Olathe, and for the blind at Kansas City. These institutions are under the supervision of a state board of control. The state contributes also to many institutions on a private basis. Most of the counties maintain poor farms and administer outdoor relief, and some care for insane patients at the cost of the state.

History.—The territory now included in Kansas was first visited by Europeans in 1541, when Francisco de Coronado led his Spaniards from New Mexico across the buffalo plains in search of the wealth of "Quivira," a region located by Bandelier and other authorities in Kansas north-east of the Great Bend of the Arkansas. Thereafter, save for a brief French occupation, 1719–1725, and possibly slight explorations equally inconsequential, Kansas remained in undisturbed possession of the Indians until in 1803 it passed to the United States (all save the part west of 100° long. and south of the Arkansas river) as part of the Louisiana Purchase. The explorations for the United States of Z. M. Pike (1807) and S. H. Long (1819) tended to confirm old ideas of sandy wastes west of the Mississippi. But with the establishment of prairie commerce to Santa Fé (New Mexico), the waves of emigration to the Mormon land and to California, the growth of traffic to Salt Lake, and the explorations for a transcontinental railway, Kansas became well known, and was taken out of that mythical "Great American Desert," in which, thanks especially to Pike and to Washington Irving, it had been supposed to lie. The trade with Santa Fé began about 1804, although regular caravans were begun only about 1825. This trade is one of the most picturesque chapters in border history, and picturesque in retrospect, too, is the army of emigrants crossing the continent in "prairie schooners" to California or Utah, of whom almost all went through Kansas.

But this movement of hunters, trappers, traders, Mormons, miners and homeseekers left nothing to show of settlement in Kansas, for which, therefore, the succession of Territorial governments organized for the northern portion of the Louisiana Purchase had no real significance. Before 1854 Kansas was an Indian land, although on its Indian reservations (created in its east part for eastern tribes removed thither after 1830) some few whites resided: missionaries, blacksmiths, agents, farmers supposed to teach the Indians agriculture, and land "squatters,"—possibly 800 in all. Fort Leavenworth was established in 1827, Fort Scott in 1842, Fort Riley in 1853. There were Methodist (1829), Baptist, Quaker, Catholic and Presbyterian missions active by 1837. Importunities to Congress to institute a Territorial government began in 1852. This was realized by the Kansas-Nebraska Bill of 1854.

By that Act Kansas (which from 1854 to 1861 included a large part of Colorado) became, for almost a decade, the storm centre of national political passion, and her history of prime significance in the unfolding prologue of the Civil War. Despite the Missouri Compromise, which had prohibited slavery in the Louisiana Purchase N. of 36° 30′ N. lat. (except in Missouri), slaves were living at the missions and elsewhere, among Indians and whites, in 1854. The "popular sovereignty" principle of the Kansas-Nebraska Bill involved a sectional struggle for the new Territory. Time showed that the winning of Kansas was a question of the lightest-footed immigrant. Slaveholders were not footloose; they had all to lose if they should carry their blacks into Kansas and should nevertheless fail to make it a slave-state. Thus the South had to establish slavery by other than actual slaveholders, unless Missouri should act for her to establish it. But Missouri did not move her slaves; while her vicinity encouraged border partisans to seek such establishment even without residence—by intimidation, election frauds and outrage. This determined at once the nature of the Kansas struggle and its outcome; and after the South had played and lost in Kansas, "the war for the Union caught up and nationalized the verdict of the Territorial broil."

In the summer of 1854 Missouri "squatters" began to post claims to border lands and warn away intending anti-slavery settlers. The immigration of these from the North was fostered in every way, notably through the New England Emigrant Aid Company (see Lawrence, A. A.), whose example was widely imitated. Little organized effort was made in the South to settle the Territory; Lawrence (Wakarusa) and Topeka, free-state centres, and Leavenworth, Lecompton and Atchison, pro-slavery towns, were among those settled in 1854.

At the first election (Nov. 1854), held for a delegate to Congress, some 1700 armed Missourians invaded Kansas and stuffed the ballot boxes; and this intimidation and fraud was practised on a much larger scale in the election of a Territorial legislature in March 1855. The resultant legislature (at Pawnee, later at Shawnee Mission) adopted the laws of Missouri almost *en bloc*, made it a felony to utter a word against slavery, made extreme pro-slavery views a qualification for office, declared death the penalty for aiding a slave to escape, and in general repudiated liberty for its opponents. The radical free-state men thereupon began the importation of rifles. All criticism of this is inconsequent; "fighting gear" was notoriously the only effective asset of Missourians in Kansas, every Southern band in Kansas was militarily organized and armed, and the free-state men armed only under necessity. Furthermore, a free-state "government" was set up, the "bogus" legislature at Shawnee being "repudiated." Perfecting their organization in a series of popular conventions, they adopted (Dec. 1855) the Topeka Constitution—which declared the exclusion of negroes from Kansas—elected state officials, and sent a contestant delegate to Congress. The Topeka "government" was simply a craftily impressive organization, a standing protest. It met now and then, and directed sentiment, being twice dispersed by United States troops; but it passed no laws, and did nothing that conflicted with the Territorial government countenanced by Congress. On the other hand, the laws of the "bogus" legislature were generally ignored by the free-state partisans, except in cases (*e.g.* the service of a writ) where that was impossible without apparent actual rebellion against the authority of the legislature, and therefore of Congress.

Meanwhile the "border war" began. During the (almost bloodless) "Wakarusa War" Lawrence was threatened by an armed force from Missouri, but was saved by the intervention of Governor Shannon. Up to this time the initiative and the bulk of outrages lay assuredly heavily on the pro-slavery side; hereafter they became increasingly common and more evenly divided. In May 1856 another Missouri force entered Lawrence without resistance, destroyed its printing offices, wrecked buildings and pillaged generally. This was the day before the assault on Charles Sumner (*q.v.*) in the Senate of the United States. These two outrages fired Northern passion and determination. In Kansas they were a stimulus to the most radical elements. Immediately after the sack of Lawrence, John Brown and a small band murdered and mutilated five pro-slavery men, on Pottawatomie Creek; a horrible deed, showing a new spirit on the free-state side, and of ghastly consequence—for it contributed powerfully to widen further the licence of highway robbery, pillage and arson, the ruin of homes, the driving off of settlers, marauding expeditions, attacks on towns, outrages in short of every kind, that made the following months a welter of lawlessness and crime, until Governor Geary—by putting himself above all partisanship, repudiating Missouri, and using Federal troops—

put an end to them late in 1856. (In the isolated south-eastern counties they continued through 1856–1858, mainly to the advantage of the "jay-hawkers" of free-state Kansas and to the terror of Missouri.)

The struggle now passed into another phase, in which questions of state predominate. But something may be remarked in passing of the leaders in the period of turbulence. John Brown wished to deal a blow against slavery, but did nothing to aid any conservative political organization to that end. James H. Lane was another radical, and always favoured force. He was a political adventurer, an enthusiastic, energetic, ambitious, ill-balanced man, shrewd and magnetic. He assuredly did much for the free-state cause; meek politics were not alone sufficient in those years in Kansas. The leader of the conservative free-soilers was Charles Robinson (1818–1894). He was born in Massachusetts, studied medicine at the Berkshire Medical School, and had had political experience in California, whither he had gone in 1849, and where in 1850–1852 he was a member of the legislature and a successful anti-slavery leader. In 1854 he had come to Kansas as an agent of the Emigrant Aid Company. He was the author of the Topeka government idea, or at least was its moving spirit, serving throughout as the "governor" under it; though averse to force, he would use it if necessary, and was first in command in the "Wakarusa War." His partisans say that he saved Kansas, and regard Lane as a fomenter of trouble who accomplished nothing. Andrew H. Reeder (1807–1864), who showed himself a pro-slavery sympathizer as first Territorial governor, was removed from office for favouring the free-state party; he became a leader in the free-state cause. Every governor who followed him was forced by the logic of events and truth tacitly to acknowledge that right lay with the free-state party. Reeder and Shannon fled the Territory in fear of assassination by the pro-slavery party, with which at first they had had most sympathy. Among the pro-slavery leaders David Rice Atchison (1807–1886), United States Senator in 1843–1855, accompanied both expeditions against Lawrence; but he urged moderation, as always, at the end of what was a legitimate result of his radical agitation.

In June 1857 delegates were elected to a constitutional convention. The election Act did not provide for any popular vote upon the constitution they should form, and was passed over Governor John W. Geary's veto. A census, miserably deficient (largely owing to free-state abstention and obstruction), was the basis of apportionment of delegates. The free-state party demanded a popular vote on the constitution. On the justice of this Governor Robert J. Walker and President Buchanan were at first unequivocally agreed, and the governor promised fairplay. Nevertheless only pro-slavery men voted, and the convention was thus pro-slavery. The document it framed is known as the Lecompton Constitution. Before the convention met, the free-state party, abandoning its policy of political inaction, captured the Territorial legislature. On the constitutional convention rested, then, all hope of saving Kansas for slavery; and that would be impossible if they should submit their handiwork to the people. The convention declared slave property to be "before and higher than any constitutional sanction" and forbade amendments affecting it; but it provided for a popular vote on the alternatives, the "constitution with slavery" or the "constitution with no slavery." If the latter should be adopted, slavery should cease "except" that the right to property in slaves in the Territory should not be interfered with. The free-state men regarded this as including the right to property in offspring of slaves, and therefore as pure fraud. Governor Walker stood firmly against this iniquitous scheme; he saw that slavery was, otherwise, doomed, but he thought Kansas could be saved to the Democratic party though lost to slavery. But President Buchanan, under Southern influence, repudiated his former assurances. There is reason to believe that the whole scheme was originated at Washington, and though Buchanan was not privy to it before the event, yet he adopted it. He abandoned Walker, who left Kansas; and he dismissed Acting-Governor Frederick P. Stanton for convoking the (now free-state) legislature. This body promptly ordered a vote on the third alternative, "Against the Constitution."

The free-state men ignored the alternatives set by the Lecompton Convention; but they participated nevertheless in the provisional election for officers under the Lecompton government, capturing all offices, and then, the same day, voted overwhelmingly against the constitution (Jan. 4, 1858).

Nevertheless, Buchanan, against the urgent counsel of Governor Denver, urged on Congress (Feb. 2) the admission of Kansas under the Lecompton Constitution. He was opposed by Senator Stephen A. Douglas, the leader of the Northern Democracy. The Senate upheld the President; the House of Representatives voted down his policy; and finally both houses accepted the English Bill, by which Kansas was virtually offered some millions of acres of public lands if she should accept the Lecompton Constitution.[1] On the 21st of August 1858, by a vote of 11,300 to 1788, Kansas resisted this temptation. The plan of the Administration thus effectually miscarried, and its final result was a profound split in the Democratic party.

The free-state men framed an excellent anti-slavery constitution at Leavenworth in March–April 1858, but the origins of the convention were illegal and their work was still-born. On the 29th of July 1859 still another constitution was therefore framed at Wyandotte, and on the 4th of October it was ratified by the people. Meanwhile the Topeka "government" disappeared, and also, with its single purpose equally served, the free-state party, most of it (once largely Democratic) passing into the Republican party, now first organized in the Territory. On the 29th of January 1861 Kansas was admitted to the Union under the Wyandotte Constitution. The United States Census of 1860 gave her a population of 107,204 inhabitants. The struggle in Kansas, the first physical national struggle over slavery, was of paramount importance in the breaking up of the Whig party, the firm establishment of an uncompromisingly anti-slavery party, the sectionalization of the Democracy, and the general preparation of the country for the Civil War.

Drought and famine came in 1860, and then upon the impoverished state came the strain of the Civil War. Nevertheless Kansas furnished proportionally a very large quota of men to the Union armies. Military operations within her own borders were largely confined to a guerrilla warfare, carrying on the bitter neighbourhood strife between Kansas and Missouri. The Confederate officers began by repressing predatory plundering from Missouri; but after James H. Lane, with an undisciplined brigade, had crossed the border, sacking, burning and killing in his progress, Missouri "bushrangers" retaliated in kind. Freebooters trained in Territorial licence had a free hand on both sides. Kansas bands were long the more successful. But William C. Quantrell, after sacking various small Kansas towns along the Missouri river (1862–63), in August 1863 took Lawrence (*q.v.*) and put it mercilessly to fire and sword—the most ghastly episode in border history. In the autumn of 1864 the Confederate general, Sterling Price, aiming to enter Kansas from Missouri but defeated by General Pleasanton's cavalry, retreated southward, zigzagging on both sides of the Missouri-Kansas line. This ended for Kansas the border raids and the war. Lane was probably the first United States officer to enlist negroes as soldiers. Many of them (and Indians too) fought bravely for the state. Indian raids and wars troubled the state from 1864 to 1878. The tribes domiciled in Kansas were rapidly moved to Indian Territory after 1868.

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[1] The English Bill was not a bribe to the degree that it has usually been considered to be, inasmuch as it "reduced the grant of land demanded by the Lecompton Ordinance from 23,500,000 acres to 3,500,000 acres, and offered only the normal cession to new states." But this grant of 3,500,000 acres was conditioned on the acceptance of the Lecompton Constitution, and Congress made no promise of any grant if that Constitution were not adopted. The bill was introduced by William Hayden English (1822–1896), a Democratic representative in Congress in 1853–1861 (see Frank H. Hodder, "Some Aspects of the English Bill for the Admission of Kansas," in *Annual Report of the American Historical Association* for the Year 1906, i. 201–210).

After the Civil War the Republicans held uninterrupted supremacy in national elections, and almost as complete control in the state government, until 1892. From about 1870 onward, however, elements of reform and of discontent were embodied in a succession of radical parties of protest. Prohibition arose thus, was accepted by the Republicans, and passed into the constitution. Woman suffrage became a vital political issue. Much legislation has been passed to control the railways. General control of the media of commerce, economic co-operation, tax reform, banking reforms, legislation against monopolies, disposal of state lands, legislation in aid of the farmer and labourer, have been issues of one party or another. The movement of the Patrons of Industry (1874), growing into the Grange, Farmers' Alliance, and finally into the People's (Populist) party (see Farmers' Movement), was perhaps of greatest importance. In conjunction with the Democrats the Populists controlled the state government in 1892–1894 and 1896–1898. These two parties decidedly outnumbered the Republicans at the polls from 1890–1898, but they could win only by fusion. In 1892–1893, when the Populists elected the governor and the Senate, and the Republicans (as the courts eventually determined) the House of Representatives, political passion was so high as to threaten armed conflicts in the capital. The Australian ballot was introduced in 1893. In the decade following 1880, struggles in the western counties for the location of county seats (the bitterest local political fights known in western states) repeatedly led to bloodshed and the interference of state militia.

Territorial Governors[1]

Andrew H. Reeder	July 7, 1854–Aug. 16, '55
Wilson Shannon	Sept. 7, 1855–Aug. 18, '56
John W. Geary	Sept. 9, 1856–Mar. 12, '57
Robert J. Walker	May 27, 1857–Nov. 16, '57
James W. Denver	May 12, 1858–Oct. 10, '58
Samuel Medary	Dec. 18, 1858–Dec. 17, '60

Acting Governors[2]

		Aggregate	
Daniel Woodson	5 times	(164 days)	Apr. 17, 1855–Apr. 16, '57
Frederick P. Stanton	2 ,,	(78 ,,)	Apr. 16, 1857–Dec. 21, '57
James W. Denver	1 ,,	(23 ,,)	Dec. 21, 1857–May 12, '58
Hugh S. Walsh	4(5?),,	(177 ,,)	July 3, 1858–June 16, '60
George M. Beebe	2 ,,	(131 ,,)	Sept. 11, 1860–Feb. 9, '61

State Governors

Charles Robinson	Republican	1861–1863
Thomas Carney	,,	1863–1865
Samuel J. Crawford	,,	1865–1869
N. Green (to fill vacancy)	,,	1869 (3 months)
James M. Harvey	,,	1869–1873
Thomas A. Osborn	,,	1873–1877
George T. Anthony	,,	1877–1879
John P. St John	,,	1879–1883
George W. Glick	Democrat	1883–1885
John A. Martin	Republican	1885–1889
Lyman U. Humphrey	,,	1889–1893
Lorenzo D. Lewelling	Populist	1893–1895
Edmund N. Morrill	Republican	1895–1897
John W. Leedy	Democrat-Populist	1897–1899
W. E. Stanley	Republican	1899–1903
Willis J. Bailey	,,	1903–1905
Edward W. Hoch	,,	1905–1909
Walter R. Stubbs	,,	1909–

Authorities.—Consult for physiographic descriptions general works on the United States, exploration, surveys, &c., also paper by George I. Adams in American Geographical Society, *Bulletin* 34 (1902), pp. 89–104. On climate see U.S. Department of Agriculture, *Kansas Climate and Crop Service* (monthly, since 1887). On soil and agriculture, see *Biennial Reports* (Topeka, 1877 seq.) of the State Board of Agriculture; *Experiment Station Bulletin* of the Kansas Agricultural College (Manhattan); and statistics in the United States *Statistical Abstract* (annual, Washington), and Federal Census reports. On manufactures see Federal Census reports; Kansas Bureau of Labor and Industry, *Annual Report* (1885 seq.); Kansas Inspector of Coal Mines, *Annual Report* (1887 seq.). On administration consult the *State of Kansas Blue Book* (Topeka, periodical), and reports of the various state officers (Treasurer, annual, then biennial since 1877–1878; Board of Trustees of State Charities and Corrections, biennial, 1877–1878 seq.; State Board of Health, founded 1885, annual, then biennial reports since 1901–1902; Bureau of Labor Statistics, founded 1885, annual reports; Irrigation Commission, organized 1895, annual reports, &c.). On taxation see *Report and Bill of the State Tax Commission, created* 1901 (Topeka, 1901). On the history of the state, see A. T. Andreas, *History of Kansas* (Chicago, 1883; compiled mainly by J. C. Hebbard); D. W. Wilder's *Annals of Kansas* (Topeka, 1875 and later), indispensable for reference; L. W. Spring's *Kansas* (Boston, 1885, in the American Commonwealth Series); Charles Robinson, *The Kansas Conflict* (New York, 1892); Eli Thayer, *The Kansas Crusade* (New York, 1889); the *Proceedings of the Kansas State Historical Society* (Topeka, 1891 seq.), full of the most valuable material; W. E. Connelley, *Kansas Territorial Governors* (Topeka, 1900); W. E. Miller, *The Peopling of Kansas* (Columbus, O., 1906), a doctoral dissertation of Columbia University; and for the controversy touching John Brown, G. W. Brown's *The Truth at Last, Reminiscences of Old John Brown* (Rockford, Ill., 1880), and W. E. Connelley, *An Appeal to the Record . . . Refuting . . . Things Written for . . . Charles Robinson and G. W. Brown* (Topeka, 1903). W. C. Webb's *Republican Election Methods in Kansas, General Election of 1892, and Legislative Investigations* (Topeka, 1893) may also be mentioned.

KANSAS CITY, a city and the county-seat of Wyandotte county, Kansas, U.S.A., on the W. bank of the Missouri River, at the mouth of the Kansas, altitude about 800 ft. It is separated from its greater neighbour, Kansas City, Missouri, only by the state line, and is the largest city in the state. Pop. (1890), 38,315; (1900), 51,418, of whom 6,377 were foreign-born and 6509 were negroes; (1910 census) 82,331. It is served by the Union Pacific, the Missouri Pacific, the Chicago, Rock Island & Pacific, and the Chicago Great Western railways, and by electric lines connecting with Leavenworth and with Kansas City, Missouri. There are several bridges across the Kansas river. The city covers the low, level bottom-land at the junction of the two rivers, and spreads over the surrounding highlands to the W., the principal residential district. Its plan is regular. The first effective steps toward a city park and boulevard system were taken in 1907, when a board of park commissioners, consisting of three members, was appointed by the mayor. The city has been divided into the South Park District and the North Park District, and at the close of 1908 there were 10 m. of boulevards and parks aggregating 160 acres. A massive steel and concrete toll viaduct, about $1\frac{3}{4}$ m. in length, extends from the bluffs of Kansas City, Kan., across the Kansas valley to the bluffs of Kansas City, Mo., and is used by pedestrians, vehicles and street cars. There is a fine public library building given by Andrew Carnegie. The charities of the city are co-ordinated through the associated charities. Among charitable state-aided institutions are the St Margaret's hospital (Roman Catholic), Bethany hospital (Methodist), a children's home (1893), and, for negroes, the Douglass hospital training school for nurses (1898)—the last the largest private charity of the state. The medical department of the Kansas state university, the other departments of which are in Lawrence, is in Kansas City; and among the other educational institutions of the city are the Western university and industrial school (a co-educational school for negroes), the Kansas City Baptist theological seminary (1902), and the Kansas City university (Methodist Protestant, 1896), which had 454 students in 1908–1909 and comprises Mather college (for liberal arts), Wilson high school (preparatory), a school of elocution and oratory (in Kansas City, Mo.), a Normal School, Kansas City Hahnemann Medical College (in Kansas City, Mo.), and a school of theology. The city is the seat of the Kansas (State) school for the blind. Kansas City is one of the largest cities in the country without a drinking saloon. Industrially the city is important for its stockyards and its meat-packing interests. With the exception of Chicago, it is the largest livestock market in the United States. The product-value of the city's factories in 1905 was $96,473,050; 93·5% consisting of the product of the wholesale slaughtering and meat-packing houses. Especially in the South-west markets Kansas City has an advantage over Chicago, St Louis, and other large packing centres (except St Joseph), not only in freights, but in its situation among the "corn and beef" states; it shares also the extraordinary railway facilities of Kansas City, Missouri. There are various important manufactures, such as soap and candles, subsidiary to the packing industry; and the city has large flour mills, railway and machine shops, and foundries. A large cotton-mill, producing coarse fabrics, was opened in 1907. Natural gas derived from the Kansas fields became available for lighting and heating, and crude oil for fuel, in 1906.

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[1] Terms of actual service in Kansas, not period of commissions. The appointment was for four years. Reeder was removed, all the others resigned.

[2] Secretaries of the Territory who served as governors in the interims of gubernatorial terms or when the governor was absent from the Territory. In the case of H. S. Walsh several dates cannot be fixed with exactness.

Kansas City was founded in 1886 by the consolidation of "old" Kansas City, Armourdale and Wyandotte (in which Armstrong and Riverview were then included). Of these municipalities Wyandotte, the oldest, was originally settled by the Wyandotte Indians in 1843; it was platted and settled by whites in 1857; and was incorporated as a town in 1858, and as a city in 1859. At Wyandotte were made the first moves for the Territorial organization of Kansas and Nebraska. During the Kansas struggle Wyandotte was a pro-slavery town, while Quindaro (1856), a few miles up the Missouri, was a free-state settlement and Wyandotte's commercial rival until after the Civil War. The convention that framed the constitution, the Wyandotte Constitution, under which Kansas was admitted to the Union, met here in July 1859. "Old" Kansas City was surveyed in 1869 and was incorporated as a city in 1872. Armourdale was laid out in 1880 and incorporated in 1882. The packing interest was first established in 1867; the first large packing plant was that of Armour & Co., which was removed to what is now Kansas City in 1871. Kansas City adopted government by commission in 1909.

KANSAS CITY, a city and port of entry of Jackson county, Missouri, U.S.A., the second in size and importance in the state, situated at the confluence of the Missouri and Kansas rivers, adjoining Kansas City, Kansas, and 235 m. W. by N. of St Louis. Pop. (1890), 132,716; (1900), 163,752, of whom 18,410 were foreign born (German, 4816; Irish, 3507; Swedish, 1869; English, 1863; English-Canadian, 1369; Italian, 1034), and 17,567 were negroes; (1910 census) 248,381. Kansas City, the gateway to the South-west, is one of the leading railway centres of the United States. It is served by the Union Pacific, the Missouri Pacific, the 'Frisco System, the Chicago, Burlington & Quincy, the Atchison, Topeka & Santa Fé, the Chicago Great Western, the Chicago, Milwaukee & St Paul, the Chicago & Alton, the Wabash, the Kansas City Southern, the Chicago, Rock Island & Pacific, the Missouri, Kansas & Texas, the Leavenworth, Kansas & Western, the Kansas City, Mexico & Orient, the St Louis, Kansas City & Colorado, the Quincy, Omaha & Kansas City, and the St Joseph & Grand Island railways, and by steamboat lines to numerous river ports.

The present retail, office, and wholesale sections were once high bluffs and deep ravines, but through and across these well graded streets were constructed. South and west of this highland, along the Kansas river, is a low, level tract occupied chiefly by railway yards, stock yards, wholesale houses and manufacturing establishments; north and east of the highland is a flat section, the Missouri River bottoms, occupied largely by manufactories, railway yards, grain elevators and homes of employés. Much high and dry "made" land has been reclaimed from the river flood-plain. Two great railway bridges across the Missouri, many smaller bridges across the Kansas, and a great interstate toll viaduct extending from bluff to bluff across the valley of the latter river, lie within the metropolitan area of the two cities. The streets of the Missouri city are generally wide and excellently paved. The city-hall (1890–1893), the court-house (1888–1892), and the Federal Building (1892–1900) are the most imposing of the public buildings. A convention hall, 314 ft. long and 198 ft. wide, with a seating capacity of about 15,000, is covered by a steel-frame roof without a column for its support; the exterior of the walls is cut stone and brick. The building was erected within three months, to replace one destroyed by fire, for the National Democratic Convention which met here on the 4th of July 1900. The Public Library with walls of white limestone and Texas granite, contained (1908) 95,000 volumes. The Congregational, the Calvary Baptist, the Second Presbyterian, the Independence Avenue Christian, the Independence Avenue Methodist, and the Second Christian Science churches are the finest church buildings. The board of trade building, the building of the *Star* newspaper, and several large office buildings (including the Scarritt, Long, and New York Life Insurance buildings) are worthy of mention.

Kansas City has over 2000 acres in public parks; but Swope Park, containing 1354 acres, lies south of the city limits. The others are distributed with a design to give each section a recreation ground within easy walking distance, and all (including Swope) are connected by parkways, boulevards and street-car lines. The Paseo Parkway, 250 ft. wide, extends from N. to S. through the centre of the city for a distance of 2½ m., and adjoining it near its middle is the Parade, or principal playground. The city has eight cemeteries, the largest of which are Union, Elmwood, Mt Washington, St Mary's and Forest Hill. The charitable institutions and professional schools included in 1908 about thirty hospitals, several children's homes and homes for the aged, an industrial home, the Kansas City school of law, the University medical college, and the Scarritt training school. The city has an excellent public school system. A Methodist Episcopal institutional church, admirably equipped, was opened in 1906. The city has a juvenile court, and maintains a free employment bureau.

Kansas City is primarily a commercial centre, and its trade in livestock, grain and agricultural implements is especially large. The annual pure-bred livestock show is of national importance. The city's factory product increased from $23,588,653 in 1900 to $35,573,049 in 1905, or 50·8 %. Natural gas and crude petroleum from Kansas fields became of industrial importance about 1906. Natural gas is used to light the residence streets and to heat many of the residences.

Kansas City is one of the few cities in the United States empowered to frame its own charter. The first was adopted in 1875 and the second in 1889. In 1905 a new charter, drawn on the lines of the model "municipal program" advocated by the National Municipal League, was submitted to popular vote, but was defeated by the influence of the saloons and other special interests. The charter of 1908 is a revision of this proposed charter of 1905 with the objectionable features eliminated; it was adopted by a large majority vote. Under the provisions of the charter of 1908 the people elect a mayor, city treasurer, city comptroller, and judges of the municipal court, each for a term of two years. The legislative body is the common council composed of two houses, each having as many members as there are wards in the city—14 in 1908. The members of the lower house are elected, one by each ward, in the spring of each even numbered year. The upper house members are elected by the city at large and serve four years. A board of public works, board of park commissioners, board of fire and water commissioners, a board of civil service, a city counsellor, a city auditor, a city assessor, a purchasing agent, and subordinate officers, are appointed by the mayor, without confirmation by the common council. A non-partisan board composed of citizens who must not be physicians has general control of the city's hospitals and health department. A new hospital at a cost of half a million dollars was completed in 1908. The charter provides for a referendum vote on franchises, which may be ordered by the council or by petition of the people, the signatures of 20% of the registered voters being sufficient to force such election. Public work may be prevented by remonstrance of interested property owners except in certain instances, when the city, by vote of the people, may overrule all remonstrances. A civic league attempts to give a non-partisan estimate of all municipal candidates. The juvenile court, the arts and tenement commissions, the municipal employment bureau, and a park board are provided for by the charter. All the members of the city board of election commissioners and a majority of the police board are appointed by the governor of the state; and the police control the grant of liquor licences. The city is supplied with water drawn from the Missouri river above the mouth of the Kansas or Kaw (which is used as a sewer by Kansas City, Kan.); the main pumping station and settling basins being at

Quindaro, several miles up the river in Kansas; whence the water is carried beneath the Kansas, through a tunnel, to a high-pressure distributing station in the west bottoms. The waterworks (direct pressure system) were acquired by the city in 1895. All other public services are in private hands. The street-railway service is based on a universal 5-cent transfer throughout the metropolitan area. Some of the first overhead electric trolleys used in the United States were used here in 1885.

The first permanent settlement within the present limits of Kansas City, which took its name from Kansas river,[1] was established by French fur traders about 1821. Westport, a little inland town—platted 1833, a city 1857, merged in Kansas City in 1899—now a fashionable residence district of Kansas City—was a rival of Independence in the Santa Fé trade which she gained almost *in toto* in 1844 when the great Missouri flood (the greatest the river has known) destroyed the river landing utilized by Independence. Meanwhile, what is now Kansas City, and was then Westport Landing, being on the river where a swift current wore a rocky shore, steadily increased in importance and overshadowed Westport. But in 1838 lots were surveyed and the name changed to the Town of Kansas. It was officially organized in part in 1847, formally incorporated as a town in 1850, chartered under its present name in 1853, rechartered in 1875, in 1889 and in 1908. Before 1850 it was practically the exclusive eastern terminus on the river for the Santa Fé trade,[2] and a great outfitting point for Californian emigrants. The history of this border trade is full of picturesque colour. During the Civil War both Independence and Westport were the scene of battles; Kansas City escaped, but her trade went to Leavenworth, where it had the protection of an army post and a quiet frontier. After the war the railways came, taking away the traffic to Santa Fé, and other cities farther up the Missouri river took over the trade to its upper valley. In 1866 Kansas City was entered by the first railway from St Louis; 1867 saw the beginning of the packing industry; in 1869 a railway bridge across the Missouri assured it predominance over Leavenworth and St Joseph; and since that time—save for a depression shortly after 1890, following a real-estate boom—the material progress of the city has been remarkable; the population increased from 4418 in 1860 to 32,260 in 1870, 55,785 in 1880, and 132,716 in 1890.

See T. S. Case (ed.), *History of Kansas City, Missouri* (Syracuse, 1888); William Griffith, *History of Kansas City* (Kansas City, 1900); for industrial history, the *Greater Kansas City Yearbook* (1907 seq.); for all features of municipal interest, the *Kansas City Annual* (Kansas City, 1907 seq.), prepared for the Business Men's League.

KANSK, a town of eastern Siberia, in the government of Yeniseisk, 151 m. by rail E. of Krasnoyarsk, on the Kan River, a tributary of the Yenisei, and on the Siberian highway. Pop. (1897), 7504. It is the chief town of a district in which gold is found, but lies on low ground subject to inundation by the river.

KAN-SUH, a north-western province of China, bounded N. by Mongolia, E. by Shen-si, S. by Szech'uen, W. by Tibet and N.W. by Turkestan. The boundary on the N. remains undefined, but the province may be said to occupy the territory lying between 32° 30′ and 40° N., and 108° and 98° 20′ E., and to contain about 260,000 sq. m. The population is estimated at 9,800,000. Western Kan-suh is mountainous, and largely a wilderness of sand and snow, but east of the Hwang-ho the country is cultivated. The principal river is the Hwang-ho, and in the mountains to the south of Lan-chow Fu rises the Wei-ho, which traverses Shen-si and flows into the Hwang-ho at Tung-kwan. The chief products of Kan-suh are cloth, horse hides, a kind of curd like butter which is known by the Mongols under the name of *utum*, musk, plums, onions, dates, sweet melons and medicines. (See CHINA.)

KANT, IMMANUEL (1724–1804), German philosopher, was born at Königsberg on the 22nd of April 1724. His grandfather was an emigrant from Scotland, and the name Cant is not uncommon in the north of Scotland, whence the family is said to have come. His father was a saddler in Königsberg, then a stronghold of Pietism, to the strong influence of which Kant was subjected in his early years. In his tenth year he was entered at the Collegium Fredericianum with the definite view of studying theology. His inclination at this time was towards classics, and he was recognized, with his school-fellow, David Ruhnken, as among the most promising classical scholars of the college. His taste for the greater Latin authors, particularly Lucretius, was never lost, and he acquired at school an unusual facility in Latin composition. With Greek authors he does not appear to have been equally familiar. During his university course, which began in 1740, Kant was principally attracted towards mathematics and physics. The lectures on classics do not seem to have satisfied him, and, though he attended courses on theology, and even preached on one or two occasions, he appears finally to have given up the intention of entering the Church. The last years of his university studies were much disturbed by poverty. His father died in 1746, and for nine years he was compelled to earn his own living as a private tutor. Although he disliked the life and was not specially qualified for it—as he used to say regarding the excellent precepts of his *Pädagogik*, he was never able to apply them—yet he added to his other accomplishments a grace and polish which he displayed ever afterwards to a degree somewhat unusual in a philosopher by profession.

In 1755 Kant became tutor in the family of Count Kayserling. By the kindness of a friend named Richter, he was enabled to resume his university career, and in the autumn of that year he graduated as doctor and qualified as privatdocent. For fifteen years he continued to labour in this position, his fame as writer and lecturer steadily increasing. Though twice he failed to obtain a professorship at Königsberg, he steadily refused appointments elsewhere. The only academic preferment received by him during the lengthy probation was the post of under-librarian (1766). His lectures, at first mainly upon physics, gradually expanded until nearly all descriptions of philosophy were included under them.

In 1770 he obtained the chair of logic and metaphysics at Königsberg, and delivered as his inaugural address the dissertation *De mundi sensibilis et intelligibilis forma et principiis*. Eleven years later appeared the *Kritik of Pure Reason*, the work towards which he had been steadily advancing, and of which all his later writings are developments. In 1783 he published the *Prolegomena*, intended as an introduction to the *Kritik*, which had been found to stand in need of some explanatory comment. A second edition of the *Kritik*, with some modifications, appeared in 1787, after which it remained unaltered.

In spite of its frequent obscurity, its novel terminology, and its declared opposition to prevailing systems, the Kantian philosophy made rapid progress in Germany. In the course of ten or twelve years from the publication of the *Kritik of Pure Reason*, it was expounded in all the leading universities, and it even penetrated into the schools of the Church of Rome. Such men as J. Schulz in Königsberg, J. G. Kiesewetter in Berlin, Jakob in Halle, Born and A. L. Heydenreich in Leipzig, K. L. Reinhold and E. Schmid in Jena, Buhle in Göttingen, Tennemann in Marburg, and Snell in Giessen, with many others, made it the basis of their philosophical teaching, while theologians like Tieftrunk, Stäudlin, and Ammon eagerly applied it to Christian doctrine and morality. Young men flocked to Königsberg as to a shrine of philosophy. The Prussian Government even undertook the expense of their support. Kant was hailed by some as a second Messiah. He was consulted as an oracle on all questions of casuistry—as, for example, on the lawfulness of inoculation for the small-pox. This universal homage for a long time left Kant unaffected; it was only in his later years that he spoke of his system as the limit of philosophy, and resented all further progress. He still pursued his quiet round of lecturing and authorship, and contributed from time to time papers to the literary journals. Of these, among the most remarkable was his review of Herder's *Philosophy of History*, which greatly exasperated that author, and led to a violent act of retaliation some years after in his *Metakritik of Pure Reason*. Schiller at this period in vain sought to engage Kant upon his *Horen*. He remained true to the *Berlin Journal*, in which most of his criticisms appeared.

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[1] "Kansas"—in archaic variants of spelling and pronunciation, "Kansaw," and still called, locally and colloquially, the "Kaw."

[2] Before Kansas City, first Old Franklin (opposite Boonville), then Ft. Osage, Liberty, Sibley, Lexington, Independence and Westport had successively been abandoned as terminals, as the transfer-point from boat to prairie caravan was moved steadily up the Missouri. Whisky, groceries, prints and notions were staples sent to Santa Fé; wool, buffalo robes and dried buffalo meat, Mexican silver coin, gold and silver dust and ore came in return. In 1860 the trade employed 3000 wagons and 7000 men, and amounted to millions of dollars in value.

In 1792 Kant, in the full height of his reputation, was involved in a collision with the Government on the question of his religious doctrines. Naturally his philosophy had excited the declared opposition of all adherents of historical Christianity, since its plain tendency was towards a moral rationalism, and it could not be reconciled to the literal doctrines of the Lutheran Church. It would have been much better to permit his exposition of the philosophy of religion to enjoy the same literary rights as his earlier works, since Kant could not be interdicted without first silencing a multitude of theologians who were at least equally separated from positive Christianity. The Government, however, judged otherwise; and after the first part of his book, *On Religion within the Limits of Reason alone*, had appeared in the *Berlin Journal*, the publication of the remainder, which treats in a more rationalizing style of the peculiarities of Christianity, was forbidden. Kant, thus shut out from Berlin, availed himself of his local privilege, and, with the sanction of the theological faculty of his own university, published the full work in Königsberg. The Government, probably influenced as much by hatred and fear of the French Revolution, of which Kant was supposed to be a partisan, as by love of orthodoxy, resented the act; and a secret cabinet order was received by him intimating the displeasure of the king, Frederick William II., and exacting a pledge not to lecture or write at all on religious subjects in future. With this mandate Kant, after a struggle, complied, and kept his engagement till 1797, when the death of the king, according to his construction of his promise, set him free. This incident, however, produced a very unfavourable effect on his spirits. He withdrew in 1794 from society; next year he gave up all his classes but one public lecture on logic or metaphysics; and in 1797, before the removal of the interdict on his theological teaching, he ceased altogether his public labours, after an academic course of forty-two years. He previously, in the same year, finished his treatises on the *Metaphysics of Ethics*, which, with his *Anthropology*, completed in 1798, were the last considerable works that he revised with his own hand. His *Lectures on Logic*, on *Physical Geography*, on *Paedagogics*, were edited during his lifetime by his friends and pupils. By way of asserting his right to resume theological disquisition, he also issued in 1798 his *Strife of the Faculties*, in which all the strongest points of his work on religion were urged afresh, and the correspondence that had passed between himself and his censors was given to the world.

From the date of his retirement from the chair Kant declined in strength, and gave tokens of intellectual decay. His memory began to fail, and a large work at which he wrought night and day, on the connexion between physics and metaphysics, was found to be only a repetition of his already published doctrines. After 1802, finding himself attacked with a weakness in the limbs attended with frequent fits of falling, he mitigated the Spartan severity of his life, and consented to receive medical advice. A constant restlessness oppressed him; his sight gave way; his conversation became an extraordinary mixture of metaphors; and it was only at intervals that gleams of his former power broke out, especially when some old chord of association was struck in natural science or physical geography. A few days before his decease, with a great effort he thanked his medical attendant for his visits in the words, "I have not yet lost my feeling for humanity." On the 12th of February 1804 he died, having almost completed his eightieth year. His stature was small, and his appearance feeble. He was little more than five feet high; his breast was almost concave, and, like Schleiermacher, he was deformed in the right shoulder. His senses were quick and delicate; and, though of weak constitution, he escaped by strict regimen all serious illness.

His life was arranged with mechanical regularity; and, as he never married, he kept the habits of his studious youth to old age. His man-servant, who awoke him summer and winter at five o'clock, testified that he had not once failed in thirty years to respond to the call. After rising he studied for two hours, then lectured other two, and spent the rest of the forenoon, till one, at his desk. He then dined at a restaurant, which he frequently changed, to avoid the influx of strangers, who crowded to see and hear him. This was his only regular meal; and he often prolonged the conversation till late in the afternoon. He then walked out for at least an hour in all weathers, and spent the evening in lighter reading, except an hour or two devoted to the preparation of his next day's lectures, after which he retired between nine and ten to rest. In his earlier years he often spent his evenings in general society, where his knowledge and conversational talents made him the life of every party. He was especially intimate with the families of two English merchants of the name of Green and Motherby, where he found many opportunities of meeting ship-captains, and other travelled persons, and thus gratifying his passion for physical geography. This social circle included also the celebrated J. G. Hamann, the friend of Herder and Jacobi, who was thus a mediator between Kant and these philosophical adversaries.

Kant's reading was of the most extensive and miscellaneous kind. He cared comparatively little for the history of speculation, but his acquaintance with books of science, general history, travels and belles lettres was boundless. He was well versed in English literature, chiefly of the age of Queen Anne, and had read English philosophy from Locke to Hume, and the Scottish school. He was at home in Voltaire and Rousseau, but had little or no acquaintance with the French sensational philosophy. He was familiar with all German literature up to the date of his *Kritik*, but ceased to follow it in its great development by Goethe and Schiller. It was his habit to obtain books in sheets from his publishers Kanter and Nicolovius; and he read over for many years all the new works in their catalogue, in order to keep abreast of universal knowledge. He was fond of newspapers and works on politics; and this was the only kind of reading that could interrupt his studies in philosophy.

As a lecturer, Kant avoided altogether that rigid style in which his books were written. He sat behind a low desk, with a few jottings on slips of paper, or textbooks marked on the margin, before him, and delivered an extemporaneous address, opening up the subject by partial glimpses, and with many anecdotes or familiar illustrations, till a complete idea of it was presented. His voice was extremely weak, but sometimes rose into eloquence, and always commanded perfect silence. Though kind to his students, he refused to remit their fees, as this, he thought, would discourage independence. It was another principle that his chief exertions should be bestowed on the intermediate class of talent, as the geniuses would help themselves, and the dunces were beyond remedy.

Simple, honourable, truthful, kind-hearted and high-minded as Kant was in all moral respects, he was somewhat deficient in the region of sentiment. He had little enthusiasm for the beauties of nature, and indeed never sailed out into the Baltic, or travelled more than 40 miles from Königsberg. Music he disregarded, and all poetry that was more than sententious prose. His ethics have been reproached with some justice as setting up too low an ideal for the female sex. Though faithful in a high degree to the duties of friendship, he could not bear to visit his friends in sickness, and after their death he repressed all allusion to their memory. His engrossing intellectual labours no doubt tended somewhat to harden his character; and in his zeal for rectitude of purpose he forgot the part which affection and sentiment must ever play in the human constitution.

On the 12th of February 1904, the hundredth anniversary of Kant's death, a Kantian society (*Kantgesellschaft*) was formed at Halle under the leadership of Professor H. Vaihinger to promote Kantian studies. In 1909 it had an annual membership of 191; it supports the periodical *Kantstudien* (founded 1896; see BIBLIOGRAPHY, *ad init.*).

THE WRITINGS OF KANT

No other thinker of modern times has been throughout his work so penetrated with the fundamental conceptions of physical science; no other has been able to hold with such firmness the balance between empirical and speculative ideas. Beyond all question much of the influence which the critical philosophy has exercised and continues to exercise must be ascribed to this characteristic feature in the training of its great author.

The early writings of Kant are almost without exception on questions of physical science. It was only by degrees that philosophical problems began to engage his attention, and that the main portion of his literary activity was turned towards them. The following are the most important of the works which bear directly on physical science.

1. *Gedanken von der wahren Schätzung der lebendigen Kräfte* (1747); an essay dealing with the famous dispute between the Cartesians and Leibnitzians regarding the expression for the *amount of a force.* According to the Cartesians, this quantity was directly proportional to velocity; according to their opponents, it varied with the square of the velocity. The dispute has now lost its interest, for physicists have learned to distinguish accurately the two quantities which are vaguely included under the expression *amount of force*, and consequently have been able to show in what each party was correct and in what it was in error. Kant's essay, with some fallacious explanations and divisions, criticizes acutely the arguments of the Leibnitzians, and concludes with an attempt to show that both modes of expression are correct when correctly limited and interpreted.

2. *Whether the Earth in its Revolution has experienced some Change since the Earliest Times* (1754; ed. and trans., W. Hastie, 1900, *Kant's Cosmogony*; cf. Lord Kelvin in *The Age of the Earth*, 1897, p. 7). In this brief essay Kant throws out a notion which has since been carried out, in ignorance of Kant's priority, by Delaunay (1865) and Adams. He points out that the action of the moon in raising the waters of the earth must have a secondary effect in the slight retardation of the earth's motion, and refers to a similar cause the fact that the moon turns always the same face to the earth.

3. *Allgemeine Naturgeschichte und Theorie des Himmels*, published anonymously in 1755 (4th ed. 1808; republished H. Ebert, 1890). In this remarkable work Kant, proceeding from the Newtonian conception of the solar system, extends his consideration to the entire sidereal system, points out how the whole may be mechanically regarded, and throws out the important speculation which has since received the title of the nebular hypothesis. In some details, such *e.g.* as the regarding of the motion of the entire solar system as portion of the general cosmical mechanism, he had predecessors, among others Thomas Wright of Durham, but the work as a whole contains a wonderfully acute anticipation of much that was afterwards carried out by Herschel and Laplace. The hypothesis of the original nebular condition of the system, with the consequent explanation of the great phenomena of planetary formations and movements of the satellites and rings, is unquestionably to be assigned to Kant. (On this question see discussion in W. Hastie's *Kant's Cosmogony*, as above.)

4. *Meditationum quarundam de igne succincta delineatio* (1755): an inaugural dissertation, containing little beyond the notion that bodies operate on one another through the medium of a uniformly diffused, elastic and subtle matter (ether) which is the underlying substance of heat and light. Both heat and light are regarded as vibrations of this diffused ether.

5. *On the Causes of Earthquakes* (1755); *Description of the Earthquake of 1755* (1756); *Consideration of some Recently Experienced Earthquakes* (1756).

6. *Explanatory Remarks on the Theory of the Winds* (1756). In this brief tract, Kant, apparently in entire ignorance of the explanation given in 1735 by Hadley, points out how the varying velocity of rotation of the successive zones of the earth's surface furnishes a key to the phenomena of periodic winds. His theory is in almost entire agreement with that now received. See the parallel statements from Kant's tract and Dove's essay on the influence of the rotation of the earth on the flow of its atmosphere (1835), given in Zöllner's work, *Ueber die Natur der Cometen*, pp. 477–482.

7. *On the Different Races of Men* (1775); *Determination of the Notion of a Human Race* (1785); *Conjectural Beginning of Human History* (1786): three tracts containing some points of interest as regards the empirical grounds for Kant's doctrine of teleology. Reference will be made to them in the notice of the *Kritik of Judgment.*

8. *On the Volcanoes in the Moon* (1785); *On the Influence of the Moon on the Weather* (1794). The second of these contains a remarkable discussion of the relation between the centre of the moon's figure and its centre of gravity. From the difference between these Kant is led to conjecture that the climatic conditions of the side of the moon turned from us must be altogether unlike those of the face presented to us. His views have been restated by Hansen.

9. *Lectures on Physical Geography* (1822): published from notes of Kant's lectures, with the approval of the author.

Consideration of these works is sufficient to show that Kant's mastery of the science of his time was complete and thorough, and that his philosophy is to be dealt with as having throughout a reference to general scientific conceptions. For more detailed treatment of his importance in science, reference may be made to Zöllner's essay on "Kant and his Merits on Natural Science" contained in the work on the *Nature of Comets* (pp. 426–484); to Dietrich, *Kant and Newton*; Schultze, *Kant and Darwin*; Reuschle's careful analysis of the scientific works in the *Deutsche Vierteljahrs-Schrift* (1868); W. Hastie's introduction to *Kant's Cosmogony* (1900), which summarizes criticism to that date; and articles in *Kant-Studien* (1896 foll.).

The notice of the philosophical writings of Kant need not be more than bibliographical, as in the account of his philosophy it will be necessary to consider at some length the successive stages in the development of his thought. Arranged chronologically these works are as follows:—

1755. *Principiorum primorum cognitionis metaphysicae novae dilucidatio.*

1756. *Metaphysicae cum geometria junctae usus in philosophia naturali, cujus specimen I. continet monadologiam physicam.*

1762. *Die falsche Spitzfindigkeit der vier syllogistischen Figuren*, "The False Subtlety of the Four Syllogistic Figures" (trans. T. K. Abbott, *Kant's Introduction to Logic and his Essay on the Mistaken Subtilty of the Figures*, 1885).

1763. *Versuch den Begriff der negativen Grössen in die Weltweisheit einzuführen*, "Attempt to introduce the Notion of Negative Quantities into Philosophy."

1763. *Der einzig mögliche Beweisgrund zu einer Demonstration des Daseins Gottes*, "The only possible Foundation for a Demonstration of the Existence of God."

1764. *Beobachtungen über das Gefühl des Schönen und Erhabenen* (Riga, 1771; Königsberg, 1776).

1764. *Untersuchung über die Deutlichkeit der Grundsätze der natürlichen Theologie und Moral*, "Essay on the Evidence (Clearness) of the Fundamental Propositions of Natural Theology and Ethics."

1766. *Träume eines Geistersehers, erläutert durch Träume der Metaphysik*, "Dreams of a Ghost-seer (or Clairvoyant), explained by the Dreams of Metaphysic" (Eng. trans. E. F. Goerwitz, with introd. by F. Sewall, 1900).

1768. *Von dem ersten Grunde des Unterschiedes der Gegenden im Raum*, "Foundation for the Distinction of Positions in Space."

The above may all be regarded as belonging to the precritical period of Kant's development. The following introduce the notions and principles characteristic of the critical philosophy.

1770. *De mundi sensibilis et intelligibilis forma et principiis.*

1781. *Kritik der reinen Vernunft*, "Kritik of Pure Reason" (revised ed. 1787; ed. Vaihinger, 1881 foll. and B. Erdmann, 1900; Eng. trans., F. Max Müller, 1896, 2nd ed. 1907, and J. M. D. Meiklejohn, 1854).

1783. *Prolegomena zu einer jeden künftigen Metaphysik die als Wissenschaft wird auftreten können*, "Prolegomena to all Future Metaphysic which may present itself as Science" (ed. B. Erdmann, 1878; Eng. trans. J. P. Mahaffy and J. H. Bernard, 2nd ed. 1889; Belfort Bax, 1883 and Paul Carus, 1902; and cf. M. Apel, *Kommentar zu Kants Prolegomena*, 1908).

1784. *Idee zu einer allgemeinen Geschichte im weltbürgerlicher Absicht*, "Notion of a Universal History in a Cosmopolitan Sense." With this may be coupled the review of Herder in 1785.

1785. *Grundlegung zur Metaphysik der Sitten*, "Foundations of the Metaphysic of Ethics" (see T. K. Abbott, *Fundamental Principles of the Metaphysic of Ethics*, 3rd ed. 1907).

1786. *Metaphysische Anfangsgründe der Naturwissenschaft*, "Metaphysical Elements of Natural Science" (ed. A. Höfler, 1900; trans. Belfort Bax, *Prolegomena and Metaphysical Foundations*, 1883).

1788. *Ueber den Gebrauch teleologischer Prinzipien in der Philosophie*, "On the Employment of Teleological Principles in Philosophy."

1788. *Kritik der praktischen Vernunft*, "Kritik of Practical Reason" (trans. T. K. Abbott, ed. 1898).

1790. *Kritik der Urtheilskraft*, "Kritik of Judgment" (trans. with notes J. H. Bernard, 1892).

1790. *Ueber eine Entdeckung, nach der alle neue Kritik der reinen Vernunft durch eine ältere entbehrlich gemacht werden soll*, "On a Discovery by which all the recent Critique of Pure Reason is superseded by a more ancient" (*i.e* by Leibnitz's philosophy).

1791. *Ueber die wirklichen Fortschritte der Metaphysik seit Leibnitz und Wolff*, "On the Real Advances of Metaphysics since Leibnitz and Wolff"; and *Ueber das Misslingen aller philosophischen Versuche in der Theodicee.*

1793. *Die Religion innerhalb der Grenzen der blossen Vernunft*, "Religion within the Bounds of Reason only" (Eng. trans. J. W. Semple, 1838).

1794. *Ueber Philosophie überhaupt*, "On Philosophy generally," and *Das Ende aller Dinge.*

1795. *Zum ewigen Frieden* (Eng. trans., M. Campbell Smith, 1903).

1797. *Metaphysische Anfangsgründe der Rechtslehre* (trans. W Hastie), and *Metaphysische Anfangsgründe der Tugendlehre.*

1798. *Der Streit der Facultäten*, "Contest of the Faculties."

1798. *Anthropologie in pragmatischer Hinsicht.*

The Kantian Philosophy.[1]

Historians are accustomed to divide the general current of speculation into epochs or periods marked by the dominance of some single philosophic conception with its systematic evolution. Perhaps in no case is the character of an epoch more clearly apparent than in that of the critical philosophy. The great work of Kant absolutely closed the lines of speculation along which the philosophical literature of the 18th century had proceeded, and substituted for them a new and more comprehensive method of regarding the essential problems of thought, a method which has prescribed the course of philosophic speculation in the present age. The critical system has thus a twofold aspect. It takes up into itself what had characterized the previous efforts of modern thought, shows the imperfect nature of the fundamental notions therein employed, and offers a new solution of the problems to which these notions had been applied. It opens up a new series of questions upon which subsequent philosophic reflection has been directed, and gives to them the form, under which it is possible that they should be fruitfully regarded. A work of this kind is essentially epoch-making.

In any complete account of the Kantian system it is therefore necessary that there should be constant reference, on the one hand, to the peculiar character of the preceding 18th-century philosophy, and, on the other, hand, to the problems left for renewed treatment to more modern thought. Fortunately the development of the Kantian system itself furnishes such treatment as is necessary of the former reference. For the critical philosophy was a work of slow growth. In the early writings of Kant we are able to trace with great definiteness the successive stages through which he passed from the notions of the preceding philosophy to the new and comprehensive method which gives its special character to the critical work. Scarcely any great mind, it has been said with justice, ever matured so slowly. In the early essays we find the principles of the current philosophies, those of Leibnitz and English empiricism, applied in various directions to those problems which serve as tests of their truth and completeness; we note the appearance of the difficulties or contradictions which manifest the one-sidedness or imperfection of the principle applied; and we can trace the gradual growth of the new conceptions which were destined, in the completed system, to take the place of the earlier method. To understand the Kantian work it is indispensable to trace the history of its growth in the mind of its author.

Of the two preceding stages of modern philosophy, only the second, that of Locke and Leibnitz, seems to have influenced practically the course of Kant's speculation. With the Cartesian movement as a whole he shows little acquaintance and no sympathy, and his own philosophic conception is never brought into relation with the systematic treatment of metaphysical problems characteristic of the Cartesian method. The fundamental question for philosophic reflection presented itself to him in the form which it had assumed in the hands of Locke and his successors in England, of Leibnitz and the Leibnitzian school in Germany. The transition from the Cartesian movement to this second stage of modern thought had doubtless been natural and indeed necessary. Nevertheless the full bearings of the philosophic question were somewhat obscured by the comparatively limited fashion in which it was then regarded. The tendency towards what may be technically called subjectivism, a tendency which differentiates the modern from the ancient method of speculation, is expressed in Locke and Leibnitz in a definite and peculiar fashion. However widely the two systems differ in details, they are at one in a certain fundamental conception which dominates the whole course of their philosophic construction. They are throughout individualist, *i.e.* they accept as given fact the existence of the concrete, thinking subject, and endeavour to show how this subject, as an individual conscious being, is related to the wider universe of which he forms part. In dealing with such a problem, there are evidently two lines along which investigation may proceed. It may be asked how the individual mind comes to know himself and the system of things with which he is connected, how the varied contents of his experience are to be accounted for, and what certainty attaches to his subjective consciousness of things. Regarded from the individualist point of view, this line of inquiry becomes purely psychological, and the answer may be presented, as it was presented by Locke, in the fashion of a natural history of the growth of conscious experience in the mind of the subject. Or, it may be further asked, how is the individual really connected with the system of things apparently disclosed to him in conscious experience? what is the precise significance of the existence which he ascribes both to himself and to the objects of experience? what is the nature of the relation between himself as one part of the system, and the system as a whole? This second inquiry is specifically metaphysical in bearing, and the kind of answer furnished to it by Leibnitz on the one hand, by Berkeley on the other, is in fact prescribed or determined beforehand by the fundamental conception of the individualist method with which both begin their investigations. So soon as we make clear to ourselves the essential nature of this method, we are able to discern the specific difficulties or perplexities arising in the attempt to carry it out systematically, and thus to note with precision the special problems presented to Kant at the outset of his philosophic reflections.

Consider, first, the application of the method on its psychological side, as it appears in Locke. Starting with the assumption of conscious experience as the content or filling-in of the individual mind, Locke proceeds to explain its genesis and nature by reference to the real universe of things and its mechanical operation upon the mind. The result of the interaction of mind, *i.e.* the individual mind, and the system of things, is conscious experience, consisting of ideas, which may be variously compounded, divided, compared, or dealt with by the subjective faculties or powers with which the entity, Mind, is supposed to be endowed. Matter of fact and matter of knowledge are thus at a stroke dissevered. The very notion of relation between mind and things leads at once to the counter notion of the absolute restriction of mind to its own subjective nature. That Locke was unable to reconcile these opposed notions is not surprising; that the difficulties and obscurities of the *Essay* arise from the impossibility of reconciling them is evident on the slightest consideration of the main positions of that work. Of these difficulties the philosophies of Berkeley and Hume are systematic treatments. In Berkeley we find the resolute determination to accept only the one notion, that of mind as restricted to its own conscious experience, and to attempt by this means to explain the nature of the external reality to which obscure reference is made. Any success in the attempt is due only to the fact that Berkeley introduces alongside of his individualist notion a totally new conception, that of mind itself as not in the same way one of the matters of conscious experience, but as capable of reflection upon the whole of experience and of reference to the supreme mind as the ground of all reality. It is only in Hume that we have definitely and completely the evolution of the individualist notion as groundwork of a theory of knowledge; and it is in his writings, therefore, that we may expect to find the fundamental difficulty of that notion clearly apparent. It is not a little remarkable that we should find in Hume, not only the sceptical dissolution of all fixity of cognition, which is the inevitable result of the individualist method, but also the clearest consciousness of the very root of the difficulty. The systematic application of the doctrine that conscious experience consists only of isolated objects of knowledge, impressions or ideas, leads Hume to distinguish between truths reached by analysis and truths which involve real connexion of the objects of knowledge. The first he is willing to accept without further inquiry, though it is an error to suppose, as Kant seems to have supposed, that he regarded mathematical propositions as coming under this head (see HUME); with respect to the second, he finds himself, and confesses that he finds himself, hopelessly at fault. No real connexions between isolated objects of experience are perceived by us. No single matter of fact necessarily implies the existence of any other. In short, if the difficulty be put in its ultimate form, no existence thought as a distinct individual can transcend itself, or imply relation to any other existence. If the parts of conscious experience are regarded as so many distinct things, there is no possibility of connecting them other than contingently, if at all. If the individual mind be really thought as individual, it is impossible to explain how it should have knowledge or consciousness at all. "In short," says Hume, "there are two principles which I cannot render consistent, nor is it in my power to renounce either of them, viz. *that all our distinct perceptions are distinct existences*, and *that the mind never perceives any real connexion among distinct existences.* Did our perceptions either inhere in something simple or individual, or did the mind perceive some real connexion among them, there would be no difficulty in the case" (App. to *Treatise of Human Nature*).

Thus, on the one hand, the individualist conception, when carried out to its full extent, leads to the total negation of all real cognition. If the real system of things, to which conscious experience has reference, be regarded as standing in casual relation to this experience there is no conceivable ground for the extension to reality of the notions which somehow are involved in thought. The same result is apparent, on the other hand, when we consider the theory of knowledge implied in the Leibnitzian individualism. The metaphysical conception of the monads, each of which is the universe *in nuce*, presents insuperable difficulties when the connexion or interdependence of the monads is in question, and these difficulties obtrude themselves when the attempt is made to work out a consistent doctrine of cognition. For the whole mass of cognisable fact, the *mundus intelligibilis*, is contained *impliciter* in each monad, and the several modes of apprehension can only be regarded as so many stages in the developing consciousness of the monad. Sense and understanding, real connexion of facts and analysis of notions, are not, therefore, distinct in kind, but differ only in degree. The same fundamental axioms, the logical principles of identity and sufficient reason, are applicable in explanation of all given propositions. It is true that Leibnitz himself did not work out any complete doctrine of knowledge, but in the hands of his successors the theory took definite shape in the principle that the whole work of cognition is in essence analytical. The process of analysis might be complete or incomplete. For finite intelligences there was an inevitable incompleteness so far as knowledge of matters of fact was concerned. In respect to them, the final result was found in a series of irreducible notions or categories, the *prima possibilia*, the analysis and elucidation of which was specifically the business of philosophy or metaphysics.

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[1] See further IDEALISM; METAPHYSICS; LOGIC, &c., where Kant's relation to subsequent thought is discussed.

It will be observed that, in the Leibnitzian as in the empirical individualism, the fundamental notion is still that of the abstract separation of the thinking subject from the materials of conscious experience. From this separation arise all the difficulties in the effort to develop the notion systematically, and in tracing the history of Kant's philosophical progress we are able to discern the gradual perception on his part that here was to be found the ultimate cause of the perplexities which became apparent in considering the subordinate doctrines of the system. The successive essays which have already been enumerated as composing Kant's precritical work are not to be regarded as so many imperfect sketches of the doctrines of the *Kritik*, nor are we to look in them for anticipations of the critical view. They are essentially tentative, and exhibit with unusual clearness the manner in which the difficulties of a received theory force on a wider and more comprehensive view. There can be no doubt that some of the special features of the *Kritik* are to be found in these precritical essays, *e.g.* the doctrine of the *Aesthetik* is certainly foreshadowed in the *Dissertation* of 1770; the *Kritik*, however, is no patchwork, and what appears in the *Dissertation* takes an altogether new form when it is wrought into the more comprehensive conception of the later treatise.

The particular problem which gave the occasion to the first of the precritical writings is, in an imperfect or particular fashion, the fundamental question to which the *Kritik* is an answer. What is the nature of the distinction between knowledge gained by analysis of notions and knowledge of matters of fact? Kant seems never to have been satisfied with the Wolffian identification of logical axioms and of the principle of sufficient reason. The tract on the *False Subtlety of the Four Syllogistic Figures*, in which the view of thought or reason as analytic is clearly expressed, closes with the significant division of judgments into those which rest upon the logical axioms of identity and contradiction and those for which no logical ground can be shown. Such immediate or indemonstrable judgments, it is said, abound in our experience. They are, in fact, as Kant presently perceived, the foundations for all judgments regarding real existence. It was impossible that the question regarding their nature and legitimacy and their distinction from analytic judgments should not present itself to him. The three tracts belonging to the years 1763–1764 bring forward in the sharpest fashion the essential opposition between the two classes of judgments. In the *Essay on Negative Quantities*, the fundamental thought is the total distinction in kind between logical opposition (the contradictoriness of notions, which Kant always viewed as formed, definite products of thought) and real opposition. For the one adequate explanation is found in the logical axiom of analytical thinking; for the other no such explanation is to be had. Logical ground and real ground are totally distinct. "I can understand perfectly well," says Kant, "how a consequence follows from its reason according to the law of identity, since it is discoverable by mere analysis of the notion contained in it. . . . But how something follows from another thing and not according to the law of identity, this I should gladly have made clear to me. . . . How shall I comprehend that, since something is, something else should be?" Real things, in short, are distinct existences, and, as distinct, not necessarily or logically connected in thought. "I have," he proceeds, "reflected on the nature of our knowledge in relation to our judgment of reason and consequent, and I intend to expound fully the result of my reflections. It follows from them that the relation of a real ground to that which is thereby posited or denied cannot be expressed by a judgment but only by means of a notion, which by analysis may certainly be reduced to yet simpler notions of real grounds, but yet in such a way that the final resort of all our cognition in this regard must be found in simple and irreducible notions of real grounds, the relation of which to their consequents cannot be made clear."

The striking similarity between Kant's expressions in this *Essay* and the remarks with which Hume introduces his analysis of the notion of cause has led to the supposition that at this period of his philosophical career Kant was definitely under the influence of the earlier empirical thinker. Consideration of the whole passage is quite sufficient to show the groundlessness of this supposition. The difficulty with which Kant is presented was one arising inevitably from reflection upon the Leibnitzian theory of knowledge, and the solution does not in any way go beyond that theory. It is a solution, in fact, which must have been impossible had the purport of Hume's empirical doctrine been present to Kant's mind. He is here at the point at which he remained for many years, accepting without any criticism certain fundamental notions as required for real cognition. His ideal of metaphysic is still that of complete analysis of given notions. No glimmering of the further question, Whence come these notions and with what right do we apply them in cognition? is yet apparent. Any direct influence from Hume must be referred to a later period in his career.

The prize essay *On the Principles of Natural Theology and Morals* brings forward the same fundamental opposition—though in a special form. Here, for the first time, appears definitely the distinction between synthesis and analysis, and in the distinction is found the reason for the superior certainty and clearness of mathematics as opposed to philosophy. Mathematics, Kant thinks, proceeds synthetically, for in it the notions are constructed. Metaphysics, on the other hand, is analytical in method; in it the notions are given, and by analysis they are cleared up. It is to be observed that the description of mathematics as synthetic is not an anticipation of the critical doctrine on the same subject. Kant does not, in this place, raise the question as to the reason for assuming that the arbitrary syntheses of mathematical construction have any reference to reality. The deeper significance of synthesis has not yet become apparent.

In the *Only Possible Ground of Proof for the Existence of God*, the argument, though largely Leibnitzian, advances one step farther towards the ultimate inquiry. For there Kant states as precisely as in the critique of speculative theology his fundamental doctrine that real existence is not a predicate to be added in thought to the conception of a possible subject. So far as subjective thought is concerned, possibility, not real existence, is contained in any judgment.

The year 1765 was marked by the publication of Leibnitz's posthumous *Nouveaux Essais*, in which his theory of knowledge is more fully stated than in any of his previous tracts. In all probability Kant gave some attention to this work, though no special reference to it occurs in his writings, and it may have assisted to give additional precision to his doctrine. In the curious essay, *Dreams of a Clairvoyant*, published 1766, he emphasizes his previously reached conclusion that connexions of real fact are mediated in our thought by ultimate notions, but adds that the significance and warrant for such notions can be furnished only by experience. He is inclined, therefore, to regard as the function of metaphysics the complete statement of these ultimate, indemonstrable notions, and therefore the determination of the limits to knowledge by their means. Even at this point, where he approximates more closely to Hume than to any other thinker, the difficulty raised by Hume does not seem to occur to him. He still appears to think that experience does warrant the employment of such notions, and when there is taken into account his correspondence with Lambert during the next few years, one would be inclined to say that the *Architektonik* of the latter represents most completely Kant's idea of philosophy.

On another side Kant had been shaking himself free from the principles of the Leibnitzian philosophy. According to Leibnitz, space, the order of coexisting things, resulted from the relations of monads to one another. But Kant began to see that such a conception did not accord with the manner in which we determine directions or positions in space. In the curious little essay, *On the Ground of distinguishing Particular Divisions in Space*, he pointed out that the idea of space as a whole is not deducible from the experience of particular spaces, or particular relations of objects in space, that we only cognize relations in space by reference to space as a whole, and finally that definite positions involve reference to space as a given whole.

The whole development of Kant's thought up to this point is intelligible when regarded from the Leibnitzian point of view, with which he started. There appears no reason to conclude that Hume at this time exercised any direct influence. One may go still further, and add that even in the *Dissertation* of 1770, generally regarded as more than foreshadowing the *Kritik*, the really critical question is not involved. A brief notice of the contents of this tract will suffice to show how far removed Kant yet was from the methods and principles of the critical or transcendental philosophy. Sense and understanding, according to the *Dissertation*, are the two sources of knowledge. The objects of the one are things of sense or *phenomena*; the objects of the other are *noumena*. These are absolutely distinct, and are not to be regarded as differing only in degree. In *phenomena* we distinguish *matter*, which is given by sense, and *form*, which is the law of the order of sensations. Such form is twofold—the order of space and time. Sensations formed by space and time compose the world of appearance, and this when treated by the understanding, according to logical rules, is *experience*. But the logical use of the understanding is not its only use. Much more important is the *real* use, by which are produced the pure notions whereby we think things as they are. These pure notions are the laws of the operation of the intellect; they are *leges intellectus*.

Apart, then, from the expanded treatment of space and time as subjective forms, we find in the *Dissertation* little more than the very precise and definite formulation of the slowly growing opposition to the Leibnitzian doctrines. That the pure intellectual notions should be defended as springing from the nature of intellect is not out of harmony with the statement of the *Träume eines Geistersehers*, for there the pure notions were allowed to exist, but were not held to have validity for actual things except on grounds of experience. Here they are supposed to exist, dissevered from experience, and are allowed validity as determinations of things in themselves.

The stage which Kant had now reached in his philosophical development was one of great significance. The doctrine of knowledge expressed in the *Dissertation* was the final form which the Wolffian rationalism could assume for him, and, though many of the elements of the *Kritik* are contained therein, it was not really in advance of the Wolffian theory. The doctrine of space and time as forms of sense-perception, the reference of both space and time and the pure intellectual notions to the laws of the activity of mind itself, the distinction between sense and understanding as one of kind, not of degree, with the correlative distinction between phenomena and noumena,—all of these reappear, though changed and modified, in the *Kritik*. But, despite this resemblance, it seems clear that, so far as the *Dissertation* is concerned, the way had only been prepared for the true critical inquiry, and that the real import of Hume's sceptical problem had not yet dawned upon Kant. From the manner, however, in which the doctrine of knowledge had been stated in the *Dissertation*, the further inquiry had been rendered inevitable. It had become quite impossible for Kant to remain longer satisfied with the ambiguous position assigned to a fundamental element of his doctrine of knowledge, the so-called pure intellectual notions. Those notions, according to the *Dissertation*, had no function save in relation to things-in-themselves, *i.e.* to objects which are not directly or immediately brought into relation to our faculty of cognition. They did not serve as the connecting links of formed experience; on the contrary, they were supposed to be absolutely dissevered from all experience which was possible for intelligence like ours. In his previous essays, Kant, while likewise maintaining that such pure, irreducible notions existed, had asserted in general terms that they applied to experience, and that their applicability or justification rested on experience itself, but had not raised the question as to the ground of such justification. Now, from another side, the supreme difficulty was presented—how could such notions have application to any objects whatsoever? For some time the correlative difficulty, how *objects* of sense-perception were possible, does not seem to have suggested itself to Kant. In the *Dissertation* sense-perception had been taken as receptivity of representations of objects, and experience as the product of the treatment of such representations by the logical or analytical processes of understanding. Some traces of this confused fashion of regarding sense-perceptions are left even in the *Kritik*, specially perhaps in the *Aesthetik*, and they give rise to much of the ambiguity which unfortunately attaches to the more developed theory of cognition. So soon, however, as the critical question was put, On what rests the reference of representations in us to the object or thing? in other words, How do we come to have knowledge of objects at all? it became apparent that the problem was one of perfect generality, and applied, not only to cognition through the pure notions, but to sense-perceptions likewise. It is in the statement of this general problem that we find the new and characteristic feature of Kant's work.

There is thus no reason to doubt the substantial accuracy of Kant's reference to the particular occasion or cause of the critical inquiry. Up to the stage indicated by the *Dissertation* he had been attempting, in various ways, to unite two radically divergent modes of explaining cognition—that which would account for the content of experience by reference to affection from things without us, and that which viewed the intellect itself as somehow furnished with the means of pure, rational cognition. He now discovered that Hume's sceptical analysis of the notion of cause was really the treatment of one typical or crucial instance of the much more general problem. If experience, says Hume, consists solely of states of mind somehow given to us, each of which exists as an effect, and therefore as distinct from others, with what right do we make the common assumption that parts of experience are necessarily connected? The only possible answer, drawn from the premises laid down, must be that there is no warrant for such an assumption. Necessity for thought, as Kant had been willing to admit and as Hume also held, involves or implies something more than is given in experience—for that which is given is contingent—and rests upon an a priori or pure notion. But a priori notions, did they exist, could have no claim to regulate experience. Hume, therefore, for his part, rejected entirely the notion of cause as being fictitious and delusive, and professed to account for the habit of regarding experience as necessarily connected by reference to arbitrarily formed custom of thinking. Experience, as given, contingent material, had a certain uniformity, and recurring uniformities generated in us the habit of regarding things as necessarily connected. That such a resort to experience for explanation could lead to no valid conclusion has been already noted as evident to Hume himself.

The dogmatic or individualist conception of experience had thus proved itself inadequate to the solution of Hume's difficulty regarding the notion of cause,—a difficulty which Kant, erroneously, had thought to be the only case contemplated by his predecessor. The perception of its inadequacy in this respect, and the consequent generalization of Hume's problem, are the essential features of the new critical method. For Kant was now prepared to formulate his general inquiry in a definite fashion. His long-continued reflection on the Wolffian doctrine of knowledge had made clear to him that synthetic connexion, the essence of real cognition, was not contained in the products of thinking as a formal activity of mind operating on material otherwise supplied. On the other hand, Hume's analysis enabled him to see that synthetic connexion was not contained in experience regarded as given material. Thus neither the formal nor the material aspect of conscious experience, when regarded from the individualist point of view, supplied any foundation for real knowledge, whether a priori or empirical. An absolutely new conception of experience was necessary, if the fact of cognition was to be explained at all, and the various modes in which Kant expresses the business of his critical philosophy were merely different fashions of stating the one ultimate problem, differing according to the particular aspect of knowledge which he happened to have in view. To inquire how synthetic a priori judgments are possible, or how far cognition extends, or what worth attaches to metaphysical propositions, is simply to ask, in a specific form, what elements are necessarily involved in experience of which the subject is conscious. How is it possible for the individual thinking subject to connect together the parts of his experience in the mode we call cognition?

The problem of the critical philosophy is, therefore, the complete analysis of experience from the point of view of the conditions under which such experience is possible for the conscious subject. The central ideas are thus self-consciousness, as the supreme condition under which experience is subjectively possible, and the manifold details of experience as a varied and complex whole. The solution of the problem demanded the utmost care in keeping the due balance between these ideas; and it can hardly be said that Kant was perfectly successful. He is frequently untrue to the more comprehensive conception which dominates his work as a whole. The influence of his previous philosophical training, nay, even the unconscious influence of terminology, frequently induces in his statements a certain laxity and want of clearness. He selects definitely for his starting point neither the idea of self-consciousness nor the details of experience, but in his actual procedure passes from one to the other, rarely, if ever, taking into full consideration the weighty question of their relation to one another. Above all, he is continuously under the influence of the individualist notion which he had done so much to explode. The conception of conscious experience, which is the net result of the *Kritik*, is indefinitely profounder and richer than that which had ruled the 18th century philosophizing, but for Kant such experience still appears as somehow the arbitrary product of the relation between the individual conscious subject and the realm of real facts. When he is actually analysing the conditions of knowledge, the influence of the individualist conception is not prominent; the conditions are stated as quite general, as conditions of knowledge. But so soon as the deeper, metaphysical problems present themselves, the shadow of the old doctrine reappears. Knowledge is regarded as a mechanical product, part furnished by the subject, part given to the subject, and is thus viewed as mechanically divisible into a priori and a posteriori, into pure and empirical, necessary and contingent. The individual as an agent, conscious of universal moral law, is yet regarded as in a measure opposed to experience, and the Kantian ethical code remains purely formal. The ultimate relation between intelligence and natural fact, expressed in the notion of end, is thought as problematic or contingent. The difficulties or obscurities of the Kantian system, of which the above are merely the more prominent, may all be traced to the one source, the false or at least inadequate idea of the individual. The more thorough explanation of the relation between experience as critically conceived and the individual subject was the problem left by Kant for his successors.

In any detailed exposition of the critical system it would be requisite in the first place to state with some fullness the precise nature of the problems immediately before Kant, and in the second place to follow with some closeness the successive stages of the system as presented in the three main works, the *Kritik of Pure Reason*, the *Kritik of Practical Reason* and the *Kritik of Judgment*, with the more important of the minor works, the *Metaphysic of Nature* and the *Metaphysic of Ethics*. It would be necessary, also, in any such expanded treatment, to bring out clearly the Kantian classification of the philosophical sciences, and to indicate the relation between the critical or transcendental investigation of the several faculties and the more developed sciences to which that investigation serves as introduction. As any detailed statement of the critical system, however compressed, would be beyond the limits of the present article, it is proposed here to select only the more salient doctrines, and to point out in connexion with them what advance had been effected by Kant, and what remained for subsequent efforts at complete solution of the problems raised by him. Much that is of interest and value must necessarily be omitted in any sketch of so elaborate a system, and for all points of special interpretation reference must needs be made to the many elaborate dissertations on or about the Kantian philosophy.

The doctrine from which Kant starts in his critical or transcendental investigation of knowledge is that to which the slow development of his thought had led him. The essence of cognition or knowledge was a synthetic act, an act of combining in thought the detached elements of experience. Now synthesis was explicable neither by reference to pure thought, the logical or elaborative faculty, which in Kant's view remained analytic in function, nor by reference to the effects of external real things upon our faculties of cognition. For, on the one hand, analysis or logical treatment applied only to objects of knowledge as already given in synthetic forms, and, on the other hand, real things could yield only isolated effects and not the combination of these effects in the forms of cognitive experience. If experience is to be matter of knowledge for the conscious subject, it must be regarded as the conjoint product of given material and synthetic combination. Form and matter may indeed be regarded separably and dealt with in isolation for purposes of critical inquiry, but in experience they are necessarily and inseparably united. The problem of the *Kritik* thus becomes for Kant the complete statement of the elements necessarily involved in synthesis, and of the subjective processes by which these elements are realized in our individual consciousness. He is not asking, with Locke, whence the details of experience arise; he is not attempting a natural history of the growth of experience in the individual mind; but he is endeavouring to state exhaustively what conditions are necessarily involved in any fact of knowledge, *i.e.* in any synthetic combination of parts of experience by the conscious subject.

So far as the elements necessarily involved in conscious experience are concerned, these may be enumerated briefly thus:—given data of sense, inner or outer; the forms of perception, *i.e.* space and time; the forms of thought, *i.e.* the categories; the ultimate condition of knowledge, the identity of the pure ego or self. The ego or self is the central unity in reference to which alone is any part of experience cognizable. But the consciousness of self is the foundation of knowledge only when related to given material. The ego has not in itself the element of difference, and the essence of knowledge is the consciousness of unity in difference. For knowledge, therefore, it is necessary that difference should be *given* to the ego. The modes under which it is possible for such given difference to become portion of the conscious experience of the ego, the modes under which the isolated data can be synthetically combined so as to form a cognizable whole, make up the form of cognition, and upon this form rests the possibility of any a priori or rational knowledge.

The notion of the ego as a purely logical unity, containing in itself no element of difference, and having only analytical identity, is fundamental in the critical system, and lies at the root of all its difficulties and perplexities. To say that the ego as an individual does not *produce* the world of experience is by no means the same as to say that the ego is pure unity without element of difference. In the one case we are treating the ego as one of the objects of experience and denying of it productive efficacy; in the second case we are dealing with the unity of the ego as a condition of knowledge, of any experience whatsoever. In this second sense, it is wholly wrong to assert that the ego is pure identity, pure unity. The unity and identity of the ego, so regarded, are taken in abstraction, *i.e.* as dissevered from the more complex whole of which they are necessary elements. When the ego is taken as a condition of knowledge, its unity is not more important than the difference necessarily correlated with it. That the ego as a thing should not produce difference is quite beside the mark. The consequences of the abstract separation which Kant so draws between the ego and the world of experience are apparent throughout his whole system. Assuming at the outset an opposition between the two, self and matter of knowledge, he is driven by the exigencies of the problem of reconciliation to insert term after term as means of bringing them together, but never succeeds in attaining a junction which is more than mechanical. To the end, the ego remains, partly the pure logical ego, partly the concrete individual spirit, and no explanation is afforded of the relation between them. It is for this reason that the system of forms of perception and categories appears so contingent and haphazard. No attempt is made to show how or why the difference supplied for the pure logical ego should present itself necessarily under these forms. They are regarded rather as portions of the subjective mechanism of the individual consciousness. The mind or self appears as though it were endowed with a complex machinery by which alone it could act upon the material supplied to it. Such a crude conception is far, indeed, from doing justice to Kant's view, but it undoubtedly represents the underlying assumption of many of his cardinal doctrines. The philosophy of Fichte is historically interesting as that in which the deficiencies of Kant's fundamental position were first discerned and the attempt made to remedy them.

Unfortunately for the consistency of the *Kritik*, Kant does not attempt to work out systematically the elements involved in knowledge before considering the subjective processes by which knowledge is realized in consciousness. He mixes up the two inquiries, and in the general division of his work depends rather upon the results of previous psychology than upon the lines prescribed by his own new conception of experience. He treats the elements of cognition separately in connexion with the several subjective processes involved in knowledge, viz. sense and understanding. Great ambiguity is the natural result of this procedure. For it was not possible for Kant to avoid the misleading connotation of the terms employed by him. In strictness, sense, understanding, imagination and reason ought to have had their functions defined in close relation to the elements of knowledge with which they are severally connected, and as these elements have no existence as separate facts, but only as factors in the complex organic whole, it might have been possible to avoid the error of supposing that each subjective process furnished a distinct, separately cognizable portion of a mechanical whole. But the use of separate terms, such as sense and understanding, almost unavoidably led to phraseology only interpretable as signifying that each furnished a specific kind of knowledge, and all Kant's previous training contributed to strengthen this erroneous view. Especially noteworthy is this in the case of the categories. Kant insists upon treating these as *Begriffe*, notions, and assigns to them certain characteristics of notions. But it is readily seen, and in the *Logik* Kant shows himself fully aware of the fact, that these pure connective links of experience, general aspects of objects of intelligible experience, do not resemble concepts formed by the so-called logical or elaborative processes from representations of completed objects. Nothing but harm can follow from any attempt to identify two products which differ so entirely. So, again, the *Aesthetik* is rendered extremely obscure and difficult by the prevalence of the view, already noted as obtaining in the *Dissertation*, that sense is a faculty receiving representations of objects. Kant was anxious to avoid the error of Leibnitz, who had taken sense and understanding to differ in degree only, not in kind; but in avoiding the one error he fell into another of no less importance.

The consideration of the several elements which in combination make up the fact of cognition, or perception, as it may be called, contains little or nothing bearing on the origin and nature of the given data of sense, inner or outer. The manifold of sense, which plays so important a part in the critical theory of knowledge, is left in an obscure and perplexed position. So much is clear, however, that according to Kant sense is not to be regarded as receptive of representations of objects. The data of sense are mere *stimuli*, not partial or confused representations. The sense-manifold is not to be conceived as having, *per se*, any of the qualities of objects as actually cognized; its parts are not cognizable *per se*, nor can it with propriety be said to be received successively or simultaneously. When we apply predicates to the sense-manifold regarded in isolation, we make that which is only a factor in the experience of objects into a separate, independent object, and use our predicates transcendently. Kant is not always in his language faithful to his view of the sense-manifold, but the theory as a whole, together with his own express definitions, is unmistakable. On the origin of the data of sense, Kant's remarks are few and little satisfactory. He very commonly employs the term *affection* of the faculty of sense as expressing the mode of origin, but offers no further explanation of a term which has significance only when interpreted after a somewhat mechanical fashion. Unquestionably certain of his remarks indicate the view that the origin is to be sought in things-in-themselves, but against hasty misinterpretations of such remarks there are certain cautions to be borne in mind. The relation between phenomena and noumena in the Kantian system does not in the least resemble that which plays so important a part in modern psychology—between the subjective results of sense affection and the character of the objective conditions of such affection. Kant has pointedly declared that it would be a gross absurdity to suppose that in his view separate, distinct things-in-themselves existed corresponding to the several objects of perception. And, finally, it is not at all difficult to understand why Kant should say that the affection of sense originated in the action of things-in-themselves, when we consider what was the thing-in-itself to which he was referring. The thing-in-itself to which the empirical order and relations of sense-experience are referred is the divine order, which is not matter of knowledge, but involved in our practical or moral beliefs. Critics who limit their view to the *Kritik of Pure Reason*, and there, in all probability, to the first or constructive portion of the work, must necessarily fail to interpret the doctrines of the Kantian system, which do not become clear or definite till the system has been developed. Reason was, for Kant, an organic whole; the speculative and moral aspects are never severed; and the solution of problems which appear at first sight to belong solely to the region of speculative thought may be found ultimately to depend upon certain characteristics of our nature as practical.

Data of sense-affection do not contain in themselves synthetic combination. The first conditions of such combination are found by Kant in the universal forms under which alone sense-phenomena manifest themselves in experience. These universal forms of perception, space and time, are necessary, a priori, and in characteristic features resembling intuitions, not notions. They occupy, therefore, a peculiar position, and one section of the *Kritik*, the *Aesthetik*, is entirely devoted to the consideration of them. It is important to observe that it is only through the a priori character of these perceptive forms that rational science of nature is at all possible. Kant is here able to resume, with fresh insight, his previous discussions regarding the synthetic character of mathematical propositions. In his early essays he had rightly drawn the distinction between mathematical demonstration and philosophic proof, referring the certainty of the first to the fact that the constructions were synthetic in character and entirely determined by the action of constructive imagination. It had not then occurred to him to ask, With what right do we assume that the conclusions arrived at from arbitrary constructions in mathematical matter have applicability to objects of experience? Might not mathematics be a purely imaginary science? To this question he is now enabled to return an answer. Space and time, the two essential conditions of sense-perception, are not data given by things, but universal forms of intellect into which all data of sense must be received. Hence, whatever is true of space and time regarded by imagination as objects, *i.e.* quantitative constructions, must be true of the objects making up our sense-experience. The same forms and the same constructive activity of imagination are involved in mathematical synthesis and in the constitution of objects of sense-experience. The foundation for pure or rational mathematics, there being included under this the pure science of movement, is thus laid in the critical doctrine of space and time.

The *Aesthetik* isolates sense-perception, and considers its forms as though it were an independent, complete faculty. A certain confusion, arising from this, is noticeable in the *Analytik* when the necessity for justifying the position of the categories is under discussion, but the real difficulty in which Kant was involved by his doctrine of space and time has its roots even deeper than the erroneous isolation of sensibility. He has not in any way "deduced" space and time, but, proceeding from the ordinary current view of sense-experience, has found these remaining as residuum after analysis. The relation in which they stand to the categories or pure notions is ambiguous; and, when Kant has to consider the fashion in which category and data of sense are to be brought together, he merely places side by side as a priori elements the pure connective notions and the pure forms of perception, and finds it, apparently, only a matter of contingent convenience that they should harmonize with one another and so render cognition possible. To this point also Fichte was the first to call attention.

Affection of sense, even when received into the pure forms of perception, is not matter of knowledge. For cognition there is requisite synthetic combination, and the intellectual function through which such combination takes place. The forms of intellectual function Kant proceeds to enumerate with the aid of the commonly received logical doctrines. For this reference to logic he has been severely blamed, but the precise nature of the debt due to the commonly accepted logical classification is very generally misconceived. Synthetic combination, Kant points out, is formally expressed in a judgment, which is the act of uniting representations. At the foundation of the judgments which express the types of synthetic combination, through which knowledge is possible, lie the pure general notions, the abstract aspect of the conditions under which objects are cognizable in experience. General logic has also to deal with the union of representations, though its unity is analytic merely, not synthetic. But the same intellectual function which serves to give unity in the analytic judgments of formal logic serves to give unity to the synthetic combinations of real perception. It appeared evident, then, to Kant that in the forms of judgment, as they are stated in the common logic, there must be found the analogues of the types of judgment which are involved in transcendental logic, or in the theory of real cognition. His view of the ordinary logic was wide and comprehensive, though in his restriction of the science to pure form one can trace the influence of his earlier training, and it is no small part of the value of the critical philosophy that it has revived the study of logic and prepared the way for a more thorough consideration of logical doctrines. The position assigned to logic by Kant is not, in all probability, one which can be defended; indeed, it is hard to see how Kant himself, in consistency with the critical doctrine of knowledge, could have retained many of the older logical theorems, but the precision with which the position was stated, and the sharpness with which logic was marked off from cognate philosophic disciplines, prepared the way for the more thoughtful treatment of the whole question.

Formal logic thus yields to Kant the list of the general notions, pure intellectual predicates, or categories, through which alone experience is possible for a conscious subject. It has already been noted how serious was the error involved in the description of these as notions, without further attempt to clear up their precise significance. Kant, indeed, was mainly influenced by his strong opposition to the Leibnitzian rationalism, and therefore assigns the categories to understanding, the logical faculty, without consideration of the question,—which might have been suggested by the previous statements of the *Dissertation*,—what relation these categories held to the empirical notions formed by comparison, abstraction and generalization when directed upon representations of objects. But when the categories are described as notions, *i.e.* formed products of thought, there rises of necessity the problem which had presented itself to Kant at every stage of his pre-critical thinking,—with what right can we assume that these notions apply to objects of experience? The answer which he proceeds to give altogether explodes the definition of the categories as formed products of thought, and enables us to see more clearly the nature of the new conception of experience which lies in the background of all the critical work.

The unity of the ego, which has been already noted as an element entering into the synthesis of cognition, is a unity of a quite distinct and peculiar kind. That the ego to which different parts of experience are presented must be the same ego, if there is to be cognition at all, is analytically evident; but the peculiarity is that the ego must be conscious of its own unity and identity, and this unity of self-consciousness is only possible in relation to difference not contained in the ego but given to it. The unity of apperception, then, as Kant calls it, is only possible in relation to synthetic unity of experience itself, and the forms of this synthetic unity, the categories, are, therefore, on the one hand, necessary as forms in which self-consciousness is realized, and, on the other hand, restricted in their application and validity to the data of given sense, or the particular element of experience. Thus experience presents itself as the organic combination of the particular of sense with the individual unity of the ego through the universal forms of the categories. Reference of representations to the unity of the object, synthetic unity of apperception, and subsumption of data of sense under the categories, are thus three sides or aspects of the one fundamental fact.

In this deduction of the categories, as Kant calls it, there appears for the first time an endeavour to connect together into one organic whole the several elements entering into experience. It is evident, however, that much was wanting before this essential task could be regarded as complete. Kant has certainly brought together self-consciousness, the system of the categories and data of sense. He has shown that the conditions of self-consciousness are the conditions of possible experience. But he has not shown, nor did he attempt to show, how it was that the conditions of self-consciousness are the very categories arrived at by consideration of the system of logical judgments. He does endeavour to show, but with small success, how the junction of category and data of sense is brought about, for according to his scheme these stood, to a certain extent at least, apart from and independent of one another. The failure to effect an organic combination of the several elements was the natural consequence of the false start which had been made.

The mode in which Kant endeavours to show how the several portions of cognition are subjectively realized brings into the clearest light the inconsistencies and imperfections of his doctrine. Sense had been assumed as furnishing the particular of knowledge, understanding as furnishing the universal; and it had been expressly declared that the particular was cognizable only in and through the universal. Still, each was conceived as somehow in itself complete and finished. Sense and understanding had distinct functions, and there was wanting some common term, some intermediary which should bring them into conjunction. Data of sense as purely particular could have nothing in common with the categories as purely universal. But data of sense had at least one universal aspect,—their aspect as the particular of the general forms, space and time. Categories were in themselves abstract and valueless, serviceable only when restricted to possible objects of experience. There was thus a common ground on which category and intuition were united in one, and an intermediate process whereby the universal of the category might be so far individualized as to comprehend the particular of sense. This intermediate process—which is really the junction of understanding and sense—Kant calls productive imagination, and it is only through productive imagination that knowledge or experience is actually realized in our subjective consciousness. The specific forms of productive imagination are called *schemata*, and upon the nature of the schema Kant gives much that has proved of extreme value for subsequent thought.

Productive imagination is thus the concrete element of knowledge, and its general modes are the abstract expression of the a priori laws of all possible experience. The categories are restricted in their applicability to the schema, *i.e.* to the pure forms of conjunction of the manifold in time, and in the modes of combination of schemata and categories we have the foundation for the rational sciences of mathematics and physics. Perception or real cognition is thus conceived as a complex fact, involving data of sense and pure perceptive forms, determined by the category and realized through productive imagination in the schema. The system of principles which may be deduced from the consideration of the mode in which understanding and sense are united by productive imagination is the positive result of the critical theory of knowledge, and some of its features are remarkable enough to deserve attention. According to his usual plan, Kant arranges these principles in conformity with the table of the categories, dividing the four classes, however, into two main groups, the mathematical and the dynamical. The mathematical principles are the abstract expression of the necessary mode in which data of sense are determined by the category in the form of intuitions or representations of objects; the dynamical are the abstract expression of the modes in which the existence of objects of intuition is determined. The mathematical principles are constitutive, *i.e.* express determinations of the objects themselves; the dynamical are regulative, *i.e.* express the conditions under which objects can form parts of real experience. Under the mathematical principles come the general rules which furnish the ground for the application of quantitative reasoning to real facts of experience. For as data of sense are only possible objects when received in the forms of space and time, and as space and time are only cognized when determined in definite fashion by the understanding through the schema of number (quantity) or degree (quality), all intuitions are extensive quantities and contain a real element, that of sense, which has degree. Under the dynamical principles, the general modes in which the existence of objects are determined, fall the analogies of experience, or general rules according to which the existence of objects in relation to one another can be determined, and the postulates of experience, the general rules according to which the existence of objects for us or our own subjective existence can be determined. The analogies of experience rest upon the order of perceptions in time, *i.e.* their permanence, succession or coexistence, and the principles are respectively those of substance, causality and reciprocity. It is to be observed that Kant in the expression of these analogies reaches the final solution of the difficulty which had so long pressed upon him, the difficulty as to the relation of the pure connective notions to experience. These notions are not directly applicable to experience, nor do we find in experience anything corresponding to the pure intellectual notions of substance, cause and reciprocity. But experience is for us the combination of data of sense in the forms of productive imagination, forms determined by the pure intellectual notions, and accordingly experience is possible for us only as in modes corresponding to the notions. The permanent in time is substance in any possible experience, and no experience is possible save through the determination of all changes as in relation to a permanent in time. Determined sequence is the causal relation in any possible experience, and no experience is possible save through the determination of perceived changes as in relation to a determined order in time. So with coexistence and reciprocity.

The postulates of experience are general expressions of the significance of existence in the experience of a conscious subject. The element of reality in such experience must always be given by intuition, and, so far as determination of existence is assumed, external intuition is a necessary condition of inner intuition. The existence of external things is as certain as the existence of the concrete subject, and the subject cannot cognise himself as existing save in relation to the world of facts of external perception. Inner and outer reality are strictly correlative elements in the experience of the conscious subject.

Throughout the positive portion of his theory of cognition, Kant has been beset by the doctrine that the categories, as finished, complete notions, have an import or significance transcending the bounds of possible experience. Morever, the manner in which space and time had been treated made it possible for him to regard these as contingent forms, necessary for intelligences like ours, but not to be viewed as absolutely necessary. The real meaning of these peculiarities is hardly ever expressed by him, though it is clear that the solution of the matter is to be found in the inadequacy of the positive theory to meet the demands of reason for completed explanation. But the conclusion to which he was led was one of the greatest importance for the after development of his system. Cognition is necessarily limited. The categories are restricted in their application to elements of possible experience to that which is presented in intuition, and all intuition is for the ego contingent. But to assert that cognition is limited and its matter contingent is to form the idea of an intelligence for whom cognition would not be limited and for whom the data of intuition would not be given, contingent facts, but necessarily produced along with the pure categories. This idea of an intuitive understanding is the definite expression for the complete explanation which reason demands, and it involves the conception of a realm of objects for such an understanding, a realm of objects which, in opposition to the *phenomena* of our relative and limited experience, may be called *noumena* or things-in-themselves. The *noumenon*, therefore, is in one way the object of a non-sensuous intuition, but more correctly is the expression of the limited and partial character of our knowledge. The idea of a noumenon is thus a limiting notion.

Assuredly, the difficult section of the *Kritik*, on the ground of the distinction between phenomena and noumena, would not have led to so much misconception as it has done, had Kant then brought forward what lies at the root of the distinction, his doctrine of reason and its functions. Understanding, as has been seen, is the faculty of cognition strictly so called; and within its realm, that of space, time and matter, positive knowledge is attainable. But the ultimate conception of understanding, that of the world of objects, quantitatively determined, and standing in relation of mutual reciprocity to one another, is not a final ground of explanation. We are still able and necessitated to reflect upon the whole world of phenomena as thus cognized, and driven to inquire after its significance. In our reflection we necessarily treat the objects, not as phenomena, as matters of positive, scientific knowledge, but as things-in-themselves, as noumena. The distinction between phenomena and noumena is, therefore, nothing but the expression of the distinction between understanding and reason, a distinction which, according to Kant, is merely subjective.

The specific function of reason is the effort after completed explanation of the experience presented in cognition. But in such effort there are no notions to be employed other than the categories, and these, as has already been seen, have validity only in reference to objects of possible experience. We may expect, then, to find the transcendent employment of the categories leading into various difficulties and inconsistencies. The criticism of reason in its specific aspect throws fresh light on the limits to human knowledge and the significance of experience.

Experience has presented itself as the complex result of relation between the ego or subject and the world of phenomena. Reason may therefore attempt a completed explanation either of the ego or of the world of phenomena or of the total relation between them. The three inquiries correspond to the subjects of the three ancient metaphysical sciences, rational psychology, rational cosmology, rational theology. It is readily seen, in regard to the first of them, that all attempts to determine the nature of the ego as a simple, perdurable, immaterial substance rest upon a confusion between the ego as pure logical unity and the ego as object of intuition, and involve a transcendent use of the categories of experience. It profits not to apply such categories to the soul, for no intuition corresponding to them is or can be given. The idea of the soul must be regarded as transcendent. So too when we endeavour, with the help of the categories of quantity, quality, relation and modality, to determine the nature and relation of parts of the world, we find that reason is landed in a peculiar difficulty. Any solution that can be given is too narrow for the demands of reason and too wide for the restrictions of understanding. The transcendent employment of the categories leads to antinomy, or equally balanced statements of apparently contradictory results. Due attention to the relation between understanding and reason enables us to solve the antinomies and to discover their precise origin and significance. Finally, the endeavour to find in the conception of God, as the supreme reality, the explanation of experience, is seen to lead to no valid conclusion. There is not any intuition given whereby we might show the reality of our idea of a Supreme Being. So far as knowledge is concerned, God remains a transcendental ideal.

The criticism of the transcendental ideas, which is also the examination of the claims of metaphysic to rank as a science, yields a definite and intelligible result. These ideas, the expression of the various modes in which unity of reason may be sought, have no objects corresponding to them in the sphere of cognition. They have not, therefore, like the categories, any *constitutive* value, and all attempts at metaphysical construction with the notions or categories of science must be resigned as of necessity hopeless. But the ideas are not, on that account, destitute of all value. They are supremely significant, as indicating the very essence of the function of reason. The limits of scientific cognition become intelligible, only when the sphere of understanding is subjected to critical reflexion and compared with the possible sphere of reason, that is, the sphere of rationally complete cognition. The ideas, therefore, in relation to knowledge strictly so called, have *regulative* value, for they furnish the general precepts for extension and completion of knowledge, and, at the same time, since they spring from reason itself, they have a real value in relation to reason as the very inmost nature of intelligence. Self-consciousness cannot be regarded as merely a mechanically determined result. Free reflection upon the whole system of knowledge is sufficient to indicate that the sphere of intuition, with its rational principles, does not exhaust conscious experience. There still remains, over and above the realm of nature, the realm of free, self-conscious spirit; and, within this sphere, it may be anticipated that the ideas will acquire a significance richer and deeper than the merely regulative import which they possess in reference to cognition.

Where, then, are we to look for this realm of free self-consciousness? Not in the sphere of cognition, where objects are mechanically determined, but in that of will or of reason as practical. That reason is practical or prescribes ends for itself is sufficiently manifest from the mere fact of the existence of the conception of morality or duty, a conception which can have no corresponding object within the sphere of intuition, and which is theoretically, or in accordance with the categories of understanding, incognizable. The presence of this conception is the datum upon which may be founded a special investigation of the conditions of reason as practical, a *Kritik* of pure practical reason, and the analysis of it yields the statement of the formal prescripts of morality.

The realization of duty is impossible for any being which is not thought as free, *i.e.* capable of self-determination. Freedom, it is true, is theoretically not an object of cognition, but its impossibility is not thereby demonstrated. The theoretical proof rather serves as useful aid towards the more exact determination of the nature and province of self-determination, and of its relation to the whole concrete nature of humanity. For in man self-determination and mechanical determination by empirical motives coexist, and only in so far as he belongs and is conscious of belonging both to the sphere of sense and to the sphere of reason does moral obligation become possible for him. The supreme end prescribed by reason in its practical aspect, namely, the complete subordination of the empirical side of nature to the prescripts of morality, demands, as conditions of its possible realization, the permanence of ethical progress in the moral agent, the certainty of freedom in self-determination, and the necessary harmonizing of the spheres of sense and reason through the intelligent author or ground of both. These conditions, the postulates of practical reason, are the concrete expressions of the three transcendental ideas, and in them we have the full significance of the ideas for reason. Immortality of the soul, positive freedom of will, and the existence of an intelligent ground of things are speculative ideas practically warranted, though theoretically neither demonstrable nor comprehensible.

Thus reason as self-determining supplies notions of freedom; reason as determined supplies categories of understanding. Union between the two spheres, which seem at first sight disparate, is found in the necessary postulate that reason shall be realized, for its realization is only possible in the sphere of sense. But such a union, when regarded *in abstracto*, rests upon, or involves, a notion of quite a new order, that of the adaptation of nature to reason, or, as it may be expressed, that of end in nature. Understanding and reason thus coalesce in the faculty of *judgment*, which mediates between, or brings together, the universal and particular elements in conscious experience. Judgment is here merely *reflective*; that is to say, the particular element is given, so determined as to be possible material of knowledge, while the universal, not necessary for cognition, is supplied by reason itself. The empirical details of nature, which are not determined by the categories of understanding, are judged as being arranged or ordered by intelligence, for in no other fashion could nature, in its particular, contingent aspect, be thought as forming a complete, consistent, intelligible whole.

The investigation of the conditions under which adaptation of nature to intelligence is conceivable and possible makes up the subject of the third great *Kritik*, the *Kritik of Judgment*, a work presenting unusual difficulties to the interpreter of the Kantian system. The general principle of the adaptation of nature to our faculties of cognition has two specific applications, with the second of which it is more closely connected than with the first. In the first place, the adaptation may be merely *subjective*, when the empirical condition for the exercise of judgment is furnished by the feeling of pleasure or pain; such adaptation is aesthetic. In the second place, the adaptation may be objective or logical, when empirical facts are given of such a kind that their possibility can be conceived only through the notion of the end realized in them; such adaptation is teleological, and the empirical facts in question are organisms.

Aesthetics, or the scientific consideration of the judgments resting on the feelings of pleasure and pain arising from the harmony or want of harmony between the particular of experience and the laws of understanding, is the special subject of the *Kritik of Judgment*, but the doctrine of teleology there unfolded is the more important for the complete view of the critical system. For the analysis of the teleological judgment and of the consequences flowing from it leads to the final statement of the nature of experience as conceived by Kant. The phenomena of organic production furnish data for a special kind of judgment, which, however, involves or rests upon a quite general principle, that of the contingency of the particular element in nature and its subjectively necessary adaptation to our faculty of cognition. The notion of contingency arises, according to Kant, from the fact that understanding and sense are distinct, that understanding does not determine the particular of sense, and, consequently, that the principle of the adaptation of the particular to our understanding is merely supplied by reason on account of the peculiarity or limited character of understanding. End in nature, therefore, is a subjective or problematic conception, implying the limits of understanding, and consequently resting upon the idea of an understanding constituted unlike ours—of an intuitive understanding in which particular and universal should be given together. The idea of such an understanding is, for cognition, transcendent, for no corresponding fact of intuition is furnished, but it is realized with practical certainty in relation to reason as practical. For we are, from practical grounds, compelled with at least practical necessity to ascribe a certain aim or end to this supreme understanding. The moral law, or reason as practical, prescribes the realization of the highest good, and such realization implies a higher order than that of nature. We must, therefore, regard the supreme cause as a moral cause, and nature as so ordered that realization of the moral end is in it possible. The final conception of the Kantian philosophy is, therefore, that of ethical teleology. As Kant expresses it in a remarkable passage of the *Kritik*, "The systematic unity of ends in this world of intelligences, which, although as mere nature it is to be called only the world of sense, can yet as a system of freedom be called an intelligible, *i.e.* moral world (*regnum gratiae*), leads inevitably to the teleological unity of all things which constitute this great whole according to universal natural laws, just as the unity of the former is according to universal and necessary moral laws, and unites the practical with the speculative reason. The world must be represented as having originated from an idea, if it is to harmonize with that use of reason without which we should hold ourselves unworthy of reason—viz. the moral use, which rests entirely on the idea of the supreme good. Hence all natural research tends towards the form of a system of ends, and in its highest development would be a physico-theology. But this, since it arises from the moral order as a unity grounded in the very essence of freedom and not accidentally instituted by external commands, establishes the teleology of nature on grounds which a priori must be inseparably connected with the inner possibility of things. The teleology of nature is thus made to rest on a transcendental theology, which takes the ideal of supreme ontological perfection as a principle of systematic unity, a principle which connects all things according to universal and necessary natural laws, since they all have their origin in the absolute necessity of a single primal being" (p. 538).

Bibliography.—Editions and works of reference are exceedingly numerous. Since 1896 an indispensable guide is the periodical review *Kantstudien* (Hamburg and Berlin, thrice yearly), edited by Hans Vaihinger and Bruno Bauch, which contains admirable original articles and notices of all important books on Kant and Kantianism. It has reproduced a number of striking portraits of Kant. For books up to 1887 see Erich Adickes in *Philosophical Review* (Boston, 1892 foll.); for 1890–1894 R. Reicke's *Kant Bibliographie* (1895). See also in general the latest edition of Ueberweg's *Grundriss der Geschichte der Philosophie.*

Editions.—Complete editions of Kant's works are as follows: (1) G. Hartenstein (Leipzig, 1838–1839, 10 vols.); (2) K. Rosenkranz and F. W. Schubert (Leipzig, 1838–1840, 12 vols., the 12th containing a history of the Kantian school); (3) G. Hartenstein, "in chronological order" (Leipzig, 1867–1869, 8 vols.); (4) Kirchmann (in the "Philosophische Bibliothek," Berlin, 1868–1873, 8 vols. and supplement); (5) under the auspices of the Königlich Preussische Akademie der Wissenschaften a new collected edition was begun in 1900 (vol. ii., 1906) in charge of a number of editors. It was planned in four sections: Works, Letters, MSS. Remains and *Vorlesungen.* There are also useful editions of the three *Kritiks* by Kehrbach, and critical editions of the *Prolegomena* and *Kritik der reinen Vernunft* by B. Erdmann (see also his *Beiträge zur Geschichte und Revision des Textes von Kants Kritik der reinen Vernunft* (1900). A useful selection (in English) is that of John Watson, *The Philosophy of Kant* (Glasgow, 1888).

Translations.—There are translations in all the principal languages. The chief English translators are J. P. Mahaffy, W. Hastie, T. K. Abbott, J. H. Bernard and Belfort Bax. Their versions have been mentioned in the section on "Works" above.

Biographical.—Schubert in the 11th vol. of Rosenkranz's edition; Borowski, *Darstellung des Lebens und Charakters Kants* (Königsberg, 1804); Wasianski, *Kant in seinen letzten Lebensjahren* (Königsberg, 1804); Stuckenberg, *The Life of Immanuel Kant* (1882); Rudolf Reicke, *Kants Briefwechsel* (1900). See also several of the critical works below. On Kant's portraits see D. Minden, *Ueber Portraits und Abbildungen Imm. Kants* (1868) and cf. frontispieces of *Kantstudien* (as above).

Critical (in alphabetical order of authors).—R. Adamson, *Philosophy of Kant* (1879; Germ. trans., 1880); Felix Adler, *A Critique of Kant's Ethics* (1908); S. Aicher, *Kants Begriff der Erkenntnis verglichen mit dem des Aristoteles* (1907); M. Apel, *Immanuel Kant: Ein Bild seines Lebens und Denkens* (1904); Arnoldt, *Kritische Exkurse im Gebiete der Kantforschung* (1894); C. Bache, "*Kants Prinzip der Autonomie im Verhältnis zur Idee des Reichs der Zwecke*" (*Kantstudien*, 1909); B. Bauch, *Luther und Kant* (1904); Paul Boehm, *Die vorkritischen Schriften Kants* (1906); E. Caird, *Critical Philosophy of Kant* (2 vols., 1889); Chalybäus, *Historische Entwickelung der spekulativen Philosophie von Kant bis Hegel* (5th ed., 1860); H. S. Chamberlain, *Immanuel Kant* (1909); Cousin, *Leçons sur la philosophie de Kant* (4th ed., 1864); B. Erdmann, *Immanuel Kant, Kants Kritizismus in der 1 und 2 Auflage der "Kritik der reinen Vernunft"* (1877); O. Ewald, *Kants kritischer Idealismus als Grundlage von Erkenntnistheorie und Ethik* (1908) and *Kants Methodologie in ihren Grundzügen* (1906); Kuno Fischer, *Immanuel Kant* (4th ed., 1898–1899), *Die beiden Kantischen Schulen in Jena* (1862), and *Commentary on Kant's Kritik of Pure Reason* (1878); F. Förster, *Der Entwicklungsgang der Kantischen Ethik bis zur Kritik der reinen Vernunft* (1893); A. Fouillée, *Le Moralisme de Kant et l'amoralisme contemporaine* (1905); C. R. E. von Hartmann, *Kants Erkenntnistheorie und Metaphysik in den vier Perioden ihrer Entwickelung* (1894); A. Hegler, *Die Psychologie in Kants Ethik* (1891); G. D. Hicks, *Die Begriffe Phänomenon und Noumenon in ihrem Verhältniss zu einander bei Kant* (1897); G. Jacoby, *Herders und Kants Aesthetik* (1907); W. Kabitz, *Studien zur Entwickelungsgeschichte der Fichteschen Wissenschaftslehre aus der Kantischen Philosophie* (1902); M. Kelly, *Kant's Philosophy as rectified by Schopenhauer* (1909); W. Koppelmann, *I. Kant und die Grundlagen der christlichen Religion* (1890); M. Kronenberg, *Kant: Sein Leben und seine Lehre* (1897; 3rd ed., 1905); E. Kühnemann, *Kants und Schillers Begründung der Aesthetik* (1895) and *Die Kantischen Studien Schillers und die Komposition des Wallenstein* (1889); H. Levy, *Kants Lehre vom Schematismus der reinen Verstandesbegriffe* (1901); Arthur O. Lovejoy, *Kant and the English Platonists* (1908); J. P. Mahaffy, *Kant's Critical Philosophy for English Readers* (1872–1874); W. Mengel, *Kants Begründung der Religion* (1900); A. Messer, *Kants Ethik* (1904); H. Meyer-Benfey, *Herder und Kant* (1904); Morris, *Kant's Critique of Pure Reason* (Chicago, 1882); C. Oesterreich, *Kant und die Metaphysik* (1906); F. Paulsen, *Kant: Sein Leben und seine Lehre* (1898; 4th ed., 1904; Eng. 1902); Harold H. Prichard, *Kant's Theory of Knowledge* (1909); A. Seth Pringle-Pattison, *The Development from Kant to Hegel* (1882); and, on Kant's philosophy of religion, in *The Philosophic Radicals* (1907); F. Rademaker, *Kants Lehren vom innern Sinn in der Kritik der reinen Vernunft* (1908); R. Reininger, *Kants Lehre vom inneren Sinn und seine Theorie der Erfahrung* (1900); C. B. Renouvier, *Critique de la doctrine de Kant* (1906); H. Romundt, *Kants philosophische Religionslehre eine Frucht der gesammten Vernunftkritik* (1902); T. Ruyssen, *Kant* (1900); E. Saenger, *Kants Lehre vom Glauben* (1903); O. Schapp, *Kants Lehre vom Genie und die Entstehung der "Kritik der Urteilskraft"* (1901); Carl Schmidt, *Beiträge zur Entwickelung der Kant'schen Ethik* (1900); A. Schweitzer, *Die Religionsphilosophie Kants* (1899); H. Sidgwick, *Lectures on the Philosophy of Kant* (1905); J. H. Stirling, *Text Book to Kant* (1881); G. Simmel, *Kant und Goethe* (1906); L. Staehlin, *Kant, Lotze und Ritschl* (1889); O. Thon, *Die Grundprinzipien der Kantischen Moralphilosophie* (1895); T. Valentiner, *Kant und die platonische Philosophie* (1904); C. Vorländer, *Kant, Schiller, Goethe* (1907); G. C. Uphues, *Kant und sein Vorgänger* (1906); W. Wallace, *Kant* (1905); M. Wartenberg, *Kants Theorie der Kausalität* (1899); John Watson, *Philosophy of Kant Explained* (1908), *Kant and his English Critics*

(1881); A. Weir, *A Student's Introduction to Critical Philosophy* (1906); G. A. Wyneken, *Hegel's Kritik Kants* (1898); W. Windelband, *Kuno Fischer und sein Kant* (1897).

On Kant's theory of education, see E. F. Büchner, *The Educational Theory of Immanuel Kant* (trans., ed., intro., 1904); trans. of *Ueber Pädagogik* by Annette Churton (1899); J. Geluk, *Kant* (1883).

(R. Ad.; X.)

KANURI, or Beriberi, an African tribe of mixed origin, the dominant race of Bornu. They are large-boned and coarse-featured, but contain nevertheless a distinct strain of Fula blood. Beriberi (or Berberi) is the name given them by the Hausa (see Bornu).

KAOLIN, a pure white clay, know also as china-clay, since it is an essential ingredient in the manufacture of china, or porcelain. The word kaolin, formerly written by some authors caulin, is said to be a corruption of the Chinese *Kau-ling*, meaning "High Ridge," the name of a hill east of King-te-chen, whence the earliest samples of the clay sent to Europe were obtained by the Père d'Entrecolles, a French Jesuit missionary in China in the early part of the 18th century. His specimens, examined in Paris by R. A. Réaumur, showed that true porcelain, the composition of which had not previously been known in Europe, contained two essential ingredients, which came to be known—though it now appears incorrectly—as kaolin and petuntse, corresponding respectively to our china-clay and china-stone. The kaolin confers plasticity on the paste and secures retention of form for the ware when exposed to the heat of the kiln, whilst the petuntse gives the translucency so characteristic of porcelain. Some of the earliest discoveries of kaolin in Europe were at Aue, near Schneeberg in Saxony, and at St Yrieix, near Limoges in France. In England it was discovered in Cornwall about the year 1750 by William Cookworthy, of Plymouth; and in 1768 he took out his patent for making porcelain from moorstone or growan (china-stone) and growan clay (kaolin), the latter imparting "whiteness and infusibility" to the china. These raw materials were found first at Tregonning Hill, near Breage, and afterwards at St Stephen's in Brannel, near St Austell; and their discovery led to the manufacture of hard paste, or true porcelain, at Plymouth and subsequently at Bristol.

Kaolin is a hydrous aluminium silicate, having the formula $H_4Al_2Si_2O_9$, or $Al_2Si_2O_7.2H_2O$, but in common clay this silicate is largely mixed with impurities. Certain clays contain pearly white hexagonal scales, usually microscopic, referable to the monoclinic system, and having the chemical composition of kaolin. This crystalline substance was termed kaolinite by S. W. Johnson and J. M. Blake in 1867, and it is now regarded as the basis of pure clay. The kaolinite of Amlwch in Anglesey has been studied by Allan Dick. The origin of kaolin may be traced to the alteration of certain aluminous silicates like feldspar, scapolite, beryl and topaz; but all large deposits of china-clay are due to the decomposition of feldspar, generally in granite, but sometimes in gneiss, pitchstone, &c. The turbidity of many feldspars is the result of partial "kaolinization," or alteration to kaolin. The china-clay rocks of Cornwall and Devon are granites in which the orthoclase has become kaolinized. These rocks are sometimes known as carclazite, a name proposed by J. H. Collins from a typical locality, the Carclaze mine, near St Austell. It has often been supposed that the alteration of the granite has been effected mainly by meteoric agencies, the carbonic acid having decomposed the alkaline silicate of the feldspar, whilst the aluminous silicate assumes a hydrated condition and forms kaolin. In many cases, however, it seems likely that the change has been effected by subterranean agencies, probably by heated vapours carrying fluorine and boron, since minerals containing these elements, like tourmaline, often occur in association with the china-clay. According to F. H. Butler the kaolinization of the west of England granite may have been effected by a solution of carbonic acid at a high temperature, acting from below.

The china-stone, or petuntse, is a granitic rock which still retains much of the unaltered feldspar, on which its fusibility depends. In order to prepare kaolin for the market, the china-clay rock is broken up, and the clay washed out by means of water. The liquid containing the clay in mechanical suspension is run into channels called "drags" where the coarser impurities subside, and whence it passes to another set of channels known as "micas," where the finer materials settle down. Thus purified, the clay-water is led into a series of pits or tanks, in which the finely divided clay is slowly deposited; and, after acquiring sufficient consistency, it is transferred to the drying-house, or "dry," heated by flues, where the moisture is expelled, and the kaolin obtained as a soft white earthy substance. The clay has extensive application in the arts, being used not only in ceramic manufacture but in paper-making, bleaching and various chemical industries.

Under the species "kaolinite" may be included several minerals which have received distinctive names, such as the Saxon mineral called from its pearly lustre nacrite, a name originally given by A. Brongniart to a nacreous mica; pholerite found chiefly in cracks of ironstone and named by J. Guillemin from the Greek φολίς, a scale; and lithomarge, the old German *Steinmark*, a compact clay-like body of white, yellow or red colour. Dr C. Hintze has pointed out that the word pholerite should properly be written pholidite (φολίς, φολίδος). Closely related to kaolinite is the mineral called halloysite, a name given to it by P. Berthier after his uncle Omalius d'Halloy, the Belgian geologist. (F. W. R.*)

KAPUNDA, a municipal town of Light county, South Australia, 48 m. by rail N.N.E. of Adelaide. Pop. (1901), 1805. It is the centre of a large wheat-growing district. The celebrated copper mines discovered in 1843 were closed in 1879. There are quarries near the town, in which is found fine marble of every colour from dark blue to white. This marble was largely used in the Houses of Parliament at Adelaide.

KAPURTHALA, a native state of India, within the Punjab. Area, 652 sq. m.; pop. (1901), 314,341, showing an increase of 5% in the decade; estimated gross revenue, £178,000; tribute, £8700. The Kapurthala family is descended from Jassa Singh, a contemporary of Nadir Shah and Ahmad Shah, who by his intelligence and bravery made himself the leading Sikh of his day. At one time it held possessions on both sides of the Sutlej, and also in the Bari Doab. The cis-Sutlej estates and scattered tracts in the Bari Doab were forfeited owing to the hostility of the chief in the first Sikh war; but the latter were afterwards restored in recognition of the loyalty of Raja Randhir Singh during the mutiny of 1857, when he led a contingent to Oudh which did good service. He also received a grant of land in Oudh, 700 sq. m. in extent, yielding a gross rental of £89,000. In Oudh, however, he exercises no sovereign powers, occupying only the status of a large landholder, with the title of Raja-i-Rajagan. Raja Sir Jagatjit Singh, K.C.S.I., was born in 1872, succeeded his father in 1877, and attained his majority in 1890. During the Tirah expedition of 1897–98 the Kapurthala imperial service infantry took a prominent part. The territory is crossed by the railway from Jullundur to Amritsar. The state has a large export trade in wheat, sugar, tobacco and cotton. The hand-painted cloths and metal-work of Phagwara are well known. The town of Kapurthala is 11 miles from Jullundur; pop. (1901), 18,519.

KARACHI, or Kurrachee, a seaport and district of British India, in the Sind province of Bombay. The city is situated at the extreme western end of the Indus delta, 500 m. by sea from Bombay and 820 m. by rail from Lahore, being the maritime terminus of the North-Western railway, and the main gateway for the trade of the Punjab and part of central Asia. It is also the capital of the province of Sind. Pop. (1881), 73,500; (1891), 105,199; (1901), 115,407. Before 1725 no town appears to have existed here; but about that time some little trade began to centre upon the convenient harbour, and the silting up of Shahbandar, the ancient port of Sind, shortly afterwards drove much of its former trade and population to the rising village. Under the Kalhora princes, the khan of Kalat obtained a grant of the town, but in 1795 it was captured by the Talpur Mirs, who built the fort at Manora, at the entrance to the harbour. They also made considerable efforts to increase the trade of the port and at the time of the British acquisition of the province the town and suburbs contained a population of 14,000. This was in 1843, from which time the importance of the place practically dates.

The harbour of Karachi has an extreme length and breadth of about 5 m. It is protected by the promontory of Manora Head; and the entrance is partially closed by rocks and by the peninsula (formerly an island) of Kiamari. On Manora Head, which is fortified, are the buildings of the port establishment, a cantonment, &c. Kiamari is the landing-place for passengers and goods, and has three piers and railway connexions. The harbour improvements were begun in 1854 with the building of the Napier Mole or causeway connecting Kiamari with the mainland. The entrance has a minimum depth of 25 ft.; and a large number of improvements and extensions have been carried out by the harbour board, which was created in 1880, and transformed in 1886 into the port trust.

The great extension of the canal colonies in the Punjab, entirely devoted to the cultivation of wheat, has immensely increased the export trade of Karachi. It now ranks as the third port of India, being surpassed only by Calcutta and Bombay. The principal articles of export, besides wheat, are oilseeds, cotton, wool, hides and bones. The annual value of exports, including specie, amounts to about nine millions sterling. There are iron works and manufactures of cotton cloth, silk scarves and carpets. The fisheries and oyster beds are important.

Among the principal public buildings are government house, the Frere municipal hall, and the Napier barracks. The military cantonments, stretching north-east of the city, form the headquarters of a brigade in the 4th division of the southern army. An excellent water supply is provided by an underground aqueduct 18 m. in length. The chief educational institutions are the Dayaram Jethmal Arts College, with a law class; five high schools, of which two are for Europeans and one for Mahommedans; a convent school for girls; and an engineering class. The average rainfall for the year is about 5 in. The rainy months are July and August, but one or two heavy showers usually fall about Christmas. The end of May, beginning of June, and first fortnight in October are hot. November, December, January, February and March are delightfully cool and dry; the remaining months are damp with a constant cool sea breeze.

The District of Karachi has an area of 11,970 sq. m. Pop. (1901), 607,439, showing an increase of 6% in the decade. It consists of an immense tract of land stretching from the mouth of the Indus to the Baluch boundary. It differs in general appearance from the rest of Sind, having a rugged, mountainous region along its western border. The country gradually slopes away to the south-east, till in the extreme south the Indus delta presents a broad expanse of low, flat and unpicturesque alluvium. Besides the Indus and its mouths, the only river in the district is the Hab, forming the boundary between Sind and Baluchistan. The Manchhar lake in Sehwan sub-division forms the only considerable sheet of water in Sind. The hot springs at Pir Mangho are 6 m. N. of Karachi town. The principal crops are rice, millets, oil-seeds and wheat. In addition to Karachi, there are seaports at Sirgonda and Keti Bandar, which conduct a considerable coasting trade. Tatta was the old capital of Sind. Kotri is an important railway station on the Indus. The main line of the North-Western railway runs through the district. From Kotri downwards the line has been doubled to Karachi, and at Kotri a bridge has been constructed across the Indus opposite Hyderabad, to connect with the Rajputana railway system.

See A. F. Baillie, *Kurrachee: Past, Present and Future* (1890).

KARAGEORGE (in Servian, *Karadyordye*) (*c.* 1766–1817), the leader of the Servians during their first revolution against the Turks (1804–13), and founder of the Servian dynasty Karageorgevich. His Christian name was George (Dyordye), but being not only of dark complexion but of gloomy, taciturn and easily excitable temper, he was nicknamed by the Servians "Tsrni Dyordye" and by the Turks "Karageorge," both meaning "Black George," the Turkish name becoming soon the generally adopted one. He was born in 1766 (according to some in 1768), the son of an extremely poor Servian peasant, Petroniye Petrovich. When quite a young man, he entered the service of a renowned Turkish brigand, Fazli-Bey by name, and accompanied his master on his adventurous expeditions. When twenty he married and started a small farm. But having killed a Turk, he left Servia for Syrmia, in Croatia-Slavonia, where the monks of the monastery Krushedol engaged him as one of their forest guards. He remained in the service of the monks nearly two years, then enlisted into an Austrian regiment, and as sergeant took part in the Austrian war against Turkey (1788–91). He deserted his regiment, returned to Servia, and settled in the village of Topola, living sometimes as a peaceful farmer and sometimes again as the leader of a small band of "hayduks"—men who attacked, robbed and in most cases killed the travelling Turks in revenge for the oppression of their country.

The circumstances in which the Servians rose against the janissaries of the pashalik of Belgrade are related in the article on Servia. The leaders of the insurgents' bands and other men of influence met about the middle of February 1804 at the village of Orashatz, and there elected Karageorge as the supreme leader (Vrhovni Vozd) of the nation. Under his command the Servians speedily cleared their country not only of the janissaries disloyal to the Sultan, but of all other Turks, who withdrew from the open country to the fortified places. Karageorge and his armed Servians demanded from the Sultan the privileges of self-government. The Porte, confronted by the chances of a war with Russia, decided in the autumn of 1806 to grant to the Servians a fairly large measure of autonomy. Unfortunately Karageorge was comparatively poor in political gifts and diplomatic tact. While the *hattisherif* granting the rights demanded by the Servians was on the way to Servia, Karageorge attacked the Turks in Belgrade and Shabats, captured the towns first and then also the citadels, and allowed the Turkish population of Belgrade to be massacred. At the same time the Russian headquarters in Bucharest informed Karageorge that Russia was at war with Turkey and that the Tsar counted on the co-operation of the Servians. Karageorge and his Servians then definitely rejected all the concessions which the Porte had granted them, and joined Russia, hoping thereby to secure the complete independence of Servia. The co-operation of the Servians with the Russians was of no great importance, and probably disappointing to both parties. But as the principal theatre of war was far away from Servia on the lower Danube, Karageorge was able to give more attention to the internal organization of Servia. The national assembly proclaimed Karageorge the hereditary chief and *gospodar* of the Servians (Dec. 26, 1808), he on his part promising under oath to govern the country "through and by the national council" (senate).

Karageorge's hasty and uncompromising temper and imperious habits, as well as his want of political tact, soon made him many enemies amongst the more prominent Servians (voyvodes and senators). His difficulties were considerably increased by the intrigues of the Russian political agent to Servia, Rodophinikin. A crisis came during the summer months of the year 1813. The treaty of peace, concluded by the Russians somewhat hurriedly in Bucharest in 1812, did not secure efficiently the safety of the Servians. The Turks demanded from Karageorge, as a preliminary condition for peace, that the Servians should lay down their arms, and Karageorge refused to comply. Thereupon the entire Turkish army which fought against the Russians on the Danube, being disengaged, invaded Servia. After a few inefficient attempts to stem the invasion, Karageorge gave up the struggle, and with most of the voyvodes and chiefs of the nation left the country, and crossed to Hungary as a refugee (Sept. 20, 1813). From Hungary he went to Russia and settled in Khotin (Bessarabia), enjoying a pension from the Tsar's government. But in the summer of 1817 he suddenly and secretly left Russia and reappeared quite alone in Servia in the neighbourhood of Semendria (Smederevo) on the Danube. The motives and the object of his return are not clear. Some believe that he was sent by the Hetaerists to raise up Servia to a new war with Turkey and thereby facilitate the rising of the Greek people. It is generally assumed, however, that, having heard that Servia, under the guidance of Milosh Obrenovich, had obtained a certain measure of self-government, he desired to put himself again at the head of the nation. This impression seems to have been that of Milosh himself, who at once reported to the Pasha of Belgrade the arrival of Karageorge. The pasha demanded that Karageorge, alive or dead, should be delivered to him immediately, and made Milosh personally responsible for the execution of that order. Karageorge's removal could not unfortunately be separated from the personal interest of Milosh; already acknowledged as chief of the nation, Milosh did not like to be displaced by his old chief, who in a critical moment had left the country. Karageorge was killed (July 27, O.S., 1817) while he was asleep, and his head was sent to the pasha for transmission to Constantinople. It is impossible to exonerate Milosh Obrenovich from responsibility for the murder, which became the starting-point for a series of tragedies in the modern history of Servia.

Karageorge was one of the most remarkable Servians of the 19th century. No other man could have led the bands of undisciplined and badly-armed Servian peasants to such decisive victories against the Turks. Although he never assumed the title of prince, he practically was the first chief and master (*gospodar*) of the people of Servia. He succeeded, however, not because he was liked but because he was feared. His gloomy silence, his easily aroused anger, his habit of punishing without hesitation the slightest transgressions by death, spread terror among the people. He is believed to have killed his own father in a fit of anger when the old man refused to follow him in his flight to Hungary at the beginning of his career. In another fit of rage at the report that his brother Marinko had assaulted a girl, he ordered his men to seize his brother and to hang him there and then in his presence, and he forbade his mother to go into mourning for him. Even by his admirers he is admitted to have killed by his own hand no fewer than 125 men who provoked his anger. But in battles he is acknowledged to have been always admirable, displaying marvellous energy and valour, and giving proofs of a real military genius. The Servians consider him one of their greatest men. In grateful remembrance of his services to the national cause they elected his younger son, Alexander, in 1842, to be the reigning prince of Servia, and again in 1903 they chose his grandson, Peter Karageorgevich (son of Alexander) to be the king of Servia.

See Servia; also Ranke, *Die serbische Revolution*; Stoyan Novakovich, *Vaskzhs srpske drzhave* (Belgrade, 1904); M. G. Milityevich, *Karadyordye* (Belgrade, 1904). (C. Mi.)

KARA-HISSAR ("Black Castle"). (1) Afium Kara-Hissar (*q.v.*). (2) Ichje, or Ischa Kara-Hissar (anc. *Docimium*), a small village about 14 m. N.E. of No. 1. Docimium was a Macedonian colony established on an older site. It was a self-governing municipality, striking its own coins, and stood on the Apamea-Synnada-Pessinus road, by which the celebrated marble called Synnadic, Docimian and Phrygian was conveyed to the coast. The quarries are 2½ m. from the village, and the marble was carried thence direct to Synnada (Chifut Kassaba). Some of the marble has the rich purple veins in which poets saw the blood of Atys.

See W. M. Ramsay, *Hist. Geog. of Asia Minor* (London, 1890); Murray, *Hbk. to Asia Minor* (1893).

KARA-HISSAR SHARKI [*i.e.* "eastern Kara-Hissar"], also called Shabin Kara-Hissar from the alum mines in its vicinity, the chief town of a sanjak of the same name in the Sivas vilayet of Asia Minor. Pop. about 12,000, two-thirds Mussulman. It is the Roman *Colonia*, which gradually superseded Pompey's foundation, *Nicopolis*, whose ruins lie at Purkh, about 12 m. W. (hence Kara-Hissar is called Nikopoli by the Armenians). In later Byzantine times it was an important frontier station, and did not pass into Ottoman hands till twelve years after the capture of Constantinople. The town, altitude 4860 ft., is built round the foot of a lofty rock, upon which stand the ruins of the Byzantine castle, *Maurocastron*, the Kara Hissar Daula of early Moslem chroniclers. It is connected with its port, Kerasund, and with Sivas, Erzingan and Erzerum, by carriage roads.

KARAISKAKIS, GEORGES (1782–1827), leader in the War of Greek Independence, was born at Agrapha in 1782. During the earlier stages of the war he served in the Morea, and had a somewhat discreditable share in the intrigues which divided the Greek leaders. But he showed a sense of the necessity for providing the country with a government, and was a steady supporter of Capo d'Istria. His most honourable services were performed in the middle and later stages of the war. He helped to raise the first siege of Missolonghi in 1823, and did his best to save the town in the second siege in 1826. In that year he commanded the patriot forces in Rumelia, and though he failed to co-operate effectually with other chiefs, or with the foreign sympathizers fighting for the Greeks, he gained some successes against the Turks which were very welcome amid the disasters of the time. He took a share in the unsuccessful attempts to raise the siege of Athens in 1827, and made an effort to prevent the disastrous massacre of the Turkish garrison of fort S Spiridion. He was shot in action on the 4th of May 1827. Finlay speaks of him as a capable partisan leader who had great influence over his men, and describes him as of "middle size, thin, dark-complexioned, with a bright expressive animal eye which indicated gipsy blood."

See G. Finlay, *History of the Greek Revolution* (London, 1861).

KARAJICH, VUK STEFANOVICH (1787–1864), the father of modern Servian literature, was born on the 6th of November 1787 in the Servian village of Trshich, on the border between Bosnia and Servia. Having learnt to read and write in the old monastery Tronosha (near his native village), he was engaged as writer and reader of letters to the commander of the insurgents of his district at the beginning of the first Servian rising against the Turks in 1804. Mostly in the position of a scribe to different voyvodes, sometimes as school-teacher, he served his country during the first revolution (1804–1813), at the collapse of which he left Servia, but instead of following Karageorge and other voyvodes to Russia he went to Vienna. There he was introduced to the great Slavonic scholar Yerney Kopitar, who, having heard him recite some Servian national ballads, encouraged him to collect the poems and popular songs, write a grammar of the Servian language, and, if possible, a dictionary. This programme of literary work was adhered to by Karajich, who all his life acknowledged gratefully what he owed to his learned teacher.

In the second half of the 18th and in the beginning of the 19th century all Servian literary efforts were written in a language which was not the Servian vernacular, but an artificial language, of which the foundation was the Old Slavonic in use in the churches, but somewhat Russianized, and mixed with Servian words forced into Russian forms. That language, called by its writers "the Slavonic-Servian," was neither Slavonic nor Servian. It was written in Old Cyrillic letters, many of which had no meaning in the Servian language, while there were several sounds in that language which had no corresponding signs or letters in the Old Slavonic alphabet. The Servian philosopher Dositey Obradovich (who at the end of the 18th century spent some time in London teaching Greek) was the first Servian author to proclaim the principle that the books for the Servian people ought to be written in the language of the people. But the great majority of his contemporaries were of opinion that the language of Servian literature ought to be evolved out of the dead Old Slavonic of the church books. The church naturally decidedly supported this view. Karajich was the great reformer who changed all this. Encouraged by Kopitar, he published in 1814 (2nd ed., 1815) in Vienna his first book, *Mala Prostonarodna Slaveno-Serbska Pyesmaritsa* ("A small collection of Slavonic-Servian songs of the common people"), containing a hundred lyric songs, sung by the peasant women of Servia, and six poems about heroes, or as the Servians call them *Yunachke pesme*, which are generally recited by the blind bards or by peasants. From that time Karajich's literary activity moved on two parallel lines: to give scientific justification and foundation to the adoption of the vernacular Servian as the literary language; and, by collecting and publishing national songs, folk-lore, proverbs, &c., to show the richness of the Servian people's poetical and intellectual gifts, and the wealth and beauty of the Servian language. By his reform of the Servian alphabet and orthography, his Servian grammar and his Servian dictionary, he established the fact that the Servian language contains thirty distinct sounds, for six of which the Old Slavonic alphabet had no special letters. He introduced new letters for those special sounds, at the same time throwing out of the Old Slavonic alphabet eighteen letters for which the Servian language had no use. This reform was strenuously opposed by the church and many conservative authors, who went so far as to induce the Servian government to prohibit the printing of books in new letters, a prohibition removed in 1859. Karajich's alphabet facilitated his reform of orthography, his principle being: *write as you speak, and read as it is written!* Hardly any other language in the civilized world has such a simple, logical, scientific spelling system and orthography as the Servian has in Karajich's system. His first grammatical essay was published in Vienna in 1814, *Pismenitsa Serbskoga yezika po govoru prostoga naroda* ("The grammar of the Servian language as spoken by the common people"). An improved edition appeared in Vienna in 1818, together with his great work *Srpski Ryechnik* (Lexicon Serbico-Germanico-Latinum). This dictionary—containing 26,270 words—was full of important contributions to folk-lore, as Karajich never missed an opportunity to add to the meaning of the word the description of the national customs or popular beliefs connected with it. A new edition of his dictionary, containing 46,270 words, was published at Vienna in 1852. Meanwhile he gave himself earnestly to the work of collecting the "creations of the mind of the Servian common people." He travelled through Servian countries (Servia, Bosnia, Herzegovina, Montenegro, Dalmatia, Syrmia, Croatia), and the result was shown in a largely augmented edition of his *Srpske Narodne Pyesme*, of which the first three volumes appeared at Leipzig in 1823 and 1824, the fourth volume appearing at Vienna in 1833. *Popular Stories and Enigmas* was published in 1821, and *Servian National Proverbs* in 1836. From 1826 to 1834 he was the editor of an annual, called *Danitsa* (The Morning Star), which he filled with important contributions concerning the ethnography and modern history of the Servian people. In 1828 he published a historical monograph, *Milosh Obrenovich, Prince of Servia*; in 1837, in German, *Montenegro and Montenegrins*; in 1867, *The Servian Governing Council of State*. He supplied Leopold Ranke with the materials for his *History of the Servian Revolution*. He also translated the New Testament into Servian, for the British and Foreign Bible Society (Vienna, 1847). Karajich died in Vienna on the 6th of February 1864; and his remains were transferred to Belgrade in 1897 with great solemnity and at the expense of the government of Servia. (C. Mi.)

KARA-KALPAKS ("Black Caps"), a Mongolo-Tatar people, originally dominant along the east coast of the Aral Sea, where they still number some thousands. They thus form geographically the transition between the northern Kirghiz and the southern Turkomans. Once a powerful nation, they are scattered for the most part in Astrakhan, Perm, Orenburg, in the Caucasian province of Kuban, and in Tobolsk, Siberia, numbering in all about 50,000. These emigrants have crossed much with the alien populations among whom they have settled; but the pure type on the Aral Sea are a tall powerful people, with broad flat faces, large eyes, short noses and heavy chins. Their women are the most beautiful in Turkestan. The name of "Black Caps" is given them in allusion to their high sheepskin hats. They are a peaceful agricultural folk, who have suffered much from their fierce nomad neighbours.

KARAKORUM (Turkish, "black stone débris"), the name of two cities in Mongolia. One of these, according to G. Potanin, was the capital of the Uighur kingdom in the 8th century, and the other was in the 13th century a capital of the steppe monarchy of Mongolia. The same name seems also to have been applied to the Khangai range at the headwaters of the Orkhon. (1) The Uighur Karakorum, also named Mubalik ("bad town"), was situated on the left bank of the Orkhon, in the Talal-khain-dala steppe, to the south-east of Ughei-nor. It was deserted after the fall of the Uighur kingdom, and in the 10th century Abaki, the founder of the Khitan kingdom, planted on its ruins a stone bearing a description of his victories. (2) The Mongolian Karakorum was founded at the birth of the Mongolian monarchy established by Jenghiz Khan. A palace for the khan was built in it by Chinese architects in 1234, and its walls were erected in 1235. Plano Carpini visited it in 1246, Rubruquis in 1253, and Marco Polo in 1275. Later, the fourth Mongolian king, Kublai, left Karakorum, in order to reside at Kai-pin-fu, near Peking. When the khan Arik-bog declared himself and Karakorum independent of Kublai-Khan, the latter besieged Karakorum, took it by famine, and probably laid it waste so thoroughly that the town was afterwards forgotten.

The exact sites of the two Mongolian capitals were only established in 1889–1891. Sir H. Yule (*The Book of Marco Polo*, 1871) was the first to distinguish two cities of this name. The Russian traveller Paderin in 1871 visited the Uighur capital (see Turks), named now by the Mongols Kara Balghasun ("black city") or Khara-kherem ("black wall"), of which only the wall and a tower are in existence, while the streets and ruins outside the wall are seen at a distance of 1¾ m. Paderin's belief that this was the old Mongol capital has been shown to be incorrect. As to the Mongolian Karakorum, it is identified by several authorities with a site on which towards the close of the 16th century the Buddhist monastery of Erdeni Tsu was built. This monastery lies about 25 m. south by east of the Uighur capital. North and north-east of the monastery are ruins of ancient buildings. Professor D. Pozdnéev, who visited Erdeni Tsu for a second time in 1892, stated that the earthen wall surrounding the monastery might well be part of the wall of the old city. The proper position of the two Karakorums was determined by the expedition of N. Yadrintsev in 1889, and the two expeditions of the Helsingfors Ugro-Finnish society (1890) and the Russian academy of science, under Dr W. Radlov (1891), which were sent out to study Yadrintsev's discovery.

See *Works* (*Trudy*) *of the Orkhon Expedition* (St Petersburg, 1892); Yule's *Marco Polo*, edition revised by Henri Cordier (of Paris), vol. i. ch. xlvi. (London, 1903). Cordier confines the use of Karakorum to the Mongol capital; Pozdnéev, *Mongolia and the Mongols*, vol. i. (St Petersburg, 1896); C. W. Campbell, "Journeys in Mongolia," *Geog. Journ.* vol. xx. (1903), with map. Campbell's report was printed as a parliamentary paper (*China No. 1, 1904*).

KARA-KUL, the name of two lakes ("Great" and "Little") of Russian Turkestan, in the province of Ferghana, and on the Pamir plateau. Great Kara-kul, 12 m. long and 10 m. wide (formerly much larger), is under 39° N., to the south of the Trans-Alai range, and lies at an altitude of 13,200 ft.; it is surrounded by high mountains, and is reached from the north over the Kyzyl-art pass (14,015 ft.). A peninsula projecting from the south shore and an island off the north shore divide it into two basins, a smaller eastern one which is shallow, 42 to 63 ft., and a larger western one, which has depths of 726 to 756 ft. It has no drainage outlet. Little Kara-kul lies in the north-east Pamir, or Sarikol, north-west of the Mustagh-ata peak (25,850 ft.), at an altitude of 12,700 ft. It varies in depth from 79 ft. in the south to 50 to 70 ft. in the middle, and 1000 ft. or more in the north. It is a moraine lake; and a stream of the same name flows through it, but is named Ghez in its farther course towards Kashgar in East Turkestan.

KARA-KUM ("Black Sands"), a flat desert in Russian Central Asia. It extends to nearly 110,000 sq. m., and is bounded on the N.W. by the Ust-urt plateau, between the Sea of Aral and the Caspian Sea, on the N.E. by the Amu-darya, on the S. by the Turkoman oases, and on the W. it nearly reaches the Caspian

Sea. Only part of this surface is covered with sand. There are broad expanses (*takyrs*) of clay soil upon which water accumulates in the spring; in the summer these are muddy, but later quite dry, and merely a few Solanaceae and bushes grow on them. There is also *shor*, similar to the above but encrusted with salt and gypsum, and relieved only by Solanaceae along their borders. The remainder is occupied with sand, which, according to V. Mainov, assumes five different forms. (1) *Barkhans*, chiefly in the east, which are mounds of loose sand, 15 to 35 ft. high, hoof-shaped, having their gently sloping convex sides turned towards the prevailing winds, and a concave side, 30° to 40° steep, on the opposite slope. They are disposed in groups or chains, and the winds drive them at an average rate of 20 ft. annually towards the south and south-east. Some grass (*Stipa pennata*) and bushes of *saksaul* (*Haloxylon ammodendron*) and other steppe bushes (*e.g. Calligonium*, *Halimodendron* and *Atraphaxis*) grow on them. (2) Mounds of sand, of about the same size, but irregular in shape and of a slightly firmer consistence, mostly bearing the same bushes, and also *Artemisia* and *Tamarix*; they are chiefly met with in the east and south. (3) A sandy desert, slightly undulating, and covered in spring with grass and flowers (*e.g.* tulips, *Rheum*, various Umbelliferae), which are soon burned by the sun; they cover very large spaces in the south-east. (4) Sands disposed in waves from 50 to 70 ft., and occasionally up to 100 ft. high, at a distance of from 200 to 400 ft. from each other; they cover the central portion, and their vegetation is practically the same as in the preceding division. (5) Dunes on the shores of the Caspian, composed of moving sands, 35 to 80 ft. high and devoid of vegetation.

A typical feature of the Kara-kum is the number of "old river beds," which may have been either channels of tributaries of the Amu and other rivers or depressions which contained elongated salt lakes. Water is only found in wells, 10 to 20 m. apart—sometimes as much as 100 m.—which are dug in the takyrs and give saline water, occasionally unfit to drink, and in pools of rain-water retained in the lower parts of the takyrs. The population of the Kara-kum, consisting of nomad Kirghiz and Turkomans, is very small. The region in the north of the province of Syr-darya, between Lake Aral and Lake Chalkarteniz, is also called Kara-kum. (P. A. K.; J. T. Be.)

KARAMAN (anc. *Laranda*, a name still used by the Christian inhabitants), a town in the Konia vilayet of Asia Minor, situated in the plain north of Mount Taurus. Pop. 8000. It has few industries and little trade, but the medieval walls, well preserved castle and mosques are interesting, and the old Seljuk *medresse*, or college, is a beautiful building. Karaman is connected with Konia by railway, having a station on the first section of the Bagdad railway. Little is known of its ancient history except that it was destroyed by Perdiccas about 322 B.C., and afterwards became a seat of Isaurian pirates. It was occupied by Frederick Barbarossa in 1190; in 1466 it was captured by Mahommed II., and in 1486 by Bayezid II.

KARAMANIA, formerly an independent inland province in the south of Asia Minor, named after Karaman, the son of an Armenian convert to Islam, who married a daughter of Ala ed-Din Kaikobad, the Seljuk sultan of Rum, and was granted Laranda in fief, and made governor of Selefke, 1223–1245. The name Karaman is, however, Turkoman and that of a powerful tribe, settled apparently near Laranda. The Armenian convert must have been adopted into this. On the collapse of the Seljuk empire, Karaman's grandson, Mahmud, 1279–1319, founded a state, which included Pamphylia, Lycaonia and large parts of Cilicia, Cappadocia and Phrygia. Its capital, Laranda, superseded Konia. This state was frequently at war with the kings of Lesser Armenia, the Lusignan princes of Cyprus and the knights of Rhodes. It was also engaged in a long struggle for supremacy with the Osmanli Turks, which only ended in 1472, when it was definitely annexed by Mahommed II. The Osmanlis divided Karamania into Kharij north, and Ichili south, of the Taurus, and restored Konia to its metropolitan position. The name Karamania is now often given by geographers to Ichili only; but so far as it has had any exact significance in modern times, it has stood for the whole province of Konia. Before the present provincial division was made (1864), Karamania was the eyalet of which Konia was the capital, and it did not extend to the sea, the whole littoral from Adalia eastward being under the pasha of Adana. Nevertheless, in Levantine popular usage at the present day, "Karamania" signifies the coast from Adalia to Messina. (D. G. H.)

KARAMNASA, a river of northern India, tributary to the Ganges on its right bank, forming the boundary between Bengal and the United Provinces. The name means "destroyer of religious merit," which is explained by more than one legend. To this day all high-caste Hindus have to be carried over without being defiled by the touch of its waters.

KARA MUSTAFA (d. 1683), Turkish vizier, surnamed "Merzifunli," was a son of Uruj Bey, a notable Sipahi of Merzifun (Marsovan), and brother-in-law to Ahmed Kuprili, whom he succeeded as grand vizier in 1676, after having for some years held the office of Kaimmakam or *locum tenens*. His greed and ostentation were equalled by his incapacity, and he behaved with characteristic insolence to the foreign ambassadors, from whom he extorted large bribes. After conducting a campaign in Poland which terminated unfortunately, he gave a ready response to the appeal for aid made by the Hungarians under Imre Thököly (*q.v.*) when they rose against Austria, his hope being to form out of the Habsburg dominions a Mussulman empire of the West, of which he should be the sultan. The plan was foiled in part by his own lack of military skill, but chiefly through the heroic resistance of Vienna and its timely relief by John Sobieski, king of Poland. Kara Mustafa paid for his defeat with his life; he was beheaded at Belgrade in 1683 and his head was brought to the sultan on a silver dish.

Another KARA MUSTAFA PASHA (d. 1643), who figures in Turkish history, was by birth a Hungarian, who was enrolled in the Janissaries, rose to be Kapudan Pasha under Murad IV., and after the capture of Bagdad was made grand vizier. He was severe, but just and impartial, and strove to effect necessary reforms by reducing the numbers of the Janissaries, improving the coinage, and checking the state expenditure. But the discontent of the Janissaries led to his dismissal and death in 1643.

KARAMZIN, NIKOLAI MIKHAILOVICH (1765–1826), Russian historian, critic, novelist and poet, was born at the village of Mikhailovka, in the government of Orenburg, and not at Simbirsk as many of his English and German biographers incorrectly state, on the 1st of December (old style) 1765. His father was an officer in the Russian army, of Tatar extraction. He was sent to Moscow to study under Professor Schaden, whence he afterwards removed to St Petersburg, where he made the acquaintance of Dmitriev, a Russian poet of some merit, and occupied himself with translating essays by foreign writers into his native language. After residing some time at St Petersburg, he went to Simbirsk, where he lived in retirement till induced to revisit Moscow. There, finding himself in the midst of the society of learned men, he again betook himself to literary work. In 1789 he resolved to travel, and visited Germany, France, Switzerland and England. On his return he published his *Letters of a Russian Traveller*, which met with great success. These letters were first printed in the *Moscow Journal*, which he edited, but were afterwards collected and issued in six volumes (1797–1801). In the same periodical Karamzin also published translations of some of the tales of Marmontel, and some original stories, among which may be mentioned *Poor Liza* and *Natalia the Boyar's Daughter*. In 1794 and 1795 Karamzin abandoned his literary journal, and published a miscellany in two volumes, entitled *Aglaia*, in which appeared, among other things, "The Island of Bornholm" and "Ilia Mourometz," a story based upon the adventures of the well-known hero of many a Russian legend. In 1797–1799 he issued another miscellany or poetical almanac, *The Aonides*, in conjunction with Derzhávin and Dmitriev. In 1798 he compiled *The Pantheon*, a collection of pieces from the works of the most celebrated authors ancient and modern, translated into Russian. Many of his lighter productions were subsequently printed by him in a volume entitled *My Trifles*. In 1802 and 1803 Karamzin edited the journal the *European Messenger*. It was not until after the publication of this work that he realized where his strength lay, and commenced his *History of the Russian Empire*. In order to accomplish the task, he secluded himself for two years; and, on the cause of his retirement becoming known to the emperor Alexander, Karamzin was invited to Tver, where he read to the emperor the first eight volumes of his history. In 1816 he removed to St Petersburg, where he spent the happiest days of his life, enjoying the favour of Alexander, and submitting to him the sheets of his great work, which the emperor read over with him in the gardens of the palace of Tzarskoë Selo. He did not, however, live to carry his work further than the eleventh volume, terminating it at the accession of Michael Romanov in 1613. He died on the 22nd of May (old style) 1826, in the Taurida palace. A monument was erected to his memory at Simbirsk in 1845.

As an historian Karamzin has deservedly a very high reputation. Till the appearance of his work little had been done in this direction in Russia. The preceding attempt of Tatistchev was merely a rough sketch, inelegant in style, and without the true spirit of criticism. Karamzin was most industrious in accumulating materials, and the notes to his volumes are mines of curious information. The style of his history is elegant and flowing, modelled rather upon the easy sentences of the French prose writers than the long periodical paragraphs of the old Slavonic school. Perhaps Karamzin may justly be censured for the false gloss and romantic air thrown over the early Russian annals, concealing the coarseness and cruelty of the native manners; in this respect he reminds us of Sir Walter Scott, whose writings were at this time creating a great sensation throughout Europe, and probably had their influence upon him. Karamzin appears openly as the panegyrist of the autocracy; indeed, his work has been styled the "Epic of Despotism." He does not hesitate to avow his admiration of Ivan the Terrible, and considers him and his grandfather Ivan III. as the builders up of Russian greatness, a glory which in his earlier writings, perhaps at that time more under the influence of Western ideas, he had assigned to Peter the Great In the battle-pieces (*e.g.* the description of the field of Koulikovo, the taking of Kazan, &c.) we find considerable powers of description; and the characters of many of the chief personages in the Russian annals are drawn in firm and bold lines. As a critic Karamzin was of great service to his country; in fact he may be regarded as the founder of the review and essay (in the Western style) among the Russians.

KARA SEA, a portion of the Arctic Ocean demarcated, and except on the north-west completely enclosed, by Novaya Zemlya, Vaygach Island and the Siberian coast. It is approached from the west by three straits—Matochkin, between the two islands of Novaya Zemlya, and Kara and Yugor to the north and south of Vaygach Island respectively. On the south-east Kara Bay penetrates deeply into the mainland, and to the west of this the short Kara river enters the sea. The sea is all shallow, the deepest parts lying off Vaygach Island and the northern part of Novaya Zemlya. It had long the reputation of being almost constantly ice-bound, but after the Norwegian captain Johannesen had demonstrated its accessibility in 1869, and Nordenskiöld had crossed it to the mouth of the Yenisei in 1875, it was considered by many to offer a possible trade route between European Russia and the north of Siberia. But the open season is in any case very short, and the western straits are sometimes icebound during the entire year.

KARASU-BAZAR, a town of Russia, in the Crimea and government of Taurida, in 45° 3′ N. and 34° 26′ E., 25 m. E.N.E. of Simferopol. Pop. (1897), 12,961, consisting of Tatars, Armenians, Greeks, Qaraite Jews, and about 200 so-called Krymchaki, *i.e.* Jews who have adopted the Tatar language and dress, and who live chiefly by making morocco leather goods, knives, embroidery and so forth. The site is low, but the town is surrounded by hills, which afford protection from the north wind. The dirty streets full of petty traders, the gloomy bazaar with its multitude of tiny shops, the market squares, the blind alleys, the little gates in the dead courtyard walls, all give the place the stamp of a Tatar or Turkish town. Placed on the high road between Simferopol and Kerch, and in the midst of a country rich in corn land, vineyards and gardens, Karasu-Bazar used to be a chief seat of commercial activity in the Crimea; but it is gradually declining in importance, though still a considerable centre for the export of fruit. The caves of Akkaya close by give evidence of early occupation of the spot. When in 1736 Khan Feta Ghirai was driven by the Russians from Bakhchi-sarai he settled at Karasu-Bazar, but next year the town was captured, plundered and burned by the Russians.

KARATEGHIN, a country of Central Asia, subject to Bokhara, and consisting of a highland district bounded on the N. by Samarkand and Ferghana (Khokand), on the E. by Ferghana, on the S. by Darvaz, and on the W. by Hissar and other Bokharian provinces. The plateau is traversed by the Surkhab or Vakhsh, a right-hand tributary of the Amu-darya (Oxus). On the N. border run the Hissar and Zarafshan mountains, and on the S. border the Peter I. (Periokhtan) range (24,900 ft.). The area is 8000 sq. m. and the population about 60,000–five-sixths Tajiks, the rest Kara-kirghiz. With the neighbouring lands Karateghin has no communication except during summer, that is, from May to September. The winter climate is extremely severe; snow begins to fall in October and it is May before it disappears. During the warmer months, however, the mountain sides are richly clothed with the foliage of maple, mountain ash, apple, pear and walnut trees; the orchards furnish, not only apples and pears, but peaches, cherries, mulberries and apricots; and the farmers grow sufficient corn to export. Both cattle and horses are of a small and hardy breed. Rough woollen cloth and mohair are woven by the natives, who also make excellent fire-arms and other weapons. Gold is found in various places and there are salt-pits in the mountains. The chief town, Harm or Garm, is a place of some 2000 inhabitants, situated on a hill on the right bank of the Surkhab.

The native princes, who claimed to be descended from Alexander the Great, were till 1868 practically independent, though their allegiance was claimed in an ineffective way by Khokand, but eventually Bokhara took advantage of their intestine feuds to secure their real submission in 1877.

KARAULI, or KEROWLEE, a native state of India, in the Rajputana agency. Area, 1242 sq. m.; pop. (1901), 156,786; estimated revenue about £330,000. Almost the entire territory is composed of hills and broken ground, but there are no lofty peaks, the highest having an elevation of less than 1400 ft. above sea-level. The Chambal river flows along the south-east boundary of the state. Iron ore and building stone comprise the mineral resources. The prevailing agricultural products are millets, which form the staple food of the people. The only manufactures consist of a little weaving, dyeing, wood-turning and stone-cutting. The principal imports are piece goods, salt, sugar, cotton, buffaloes and bullocks; the exports rice and goats. The feudal aristocracy of the state consists of Jadu Rajputs connected with the ruling house. They pay a tribute in lieu of constant military service, but in case of emergency or on occasions of state display they are bound to attend on the chief with their retainers. The maharaja is the head of the clan, which claims descent from Krishna. Maharaja Bhanwar Pal Deo, who was born in 1862 and succeeded in 1866, was appointed G.C.I.E. in 1897, on the occasion of Queen Victoria's diamond jubilee.

The town of KARAULI had a population in 1901 of 23,482. It dates from 1348, and is well situated in a position naturally defended by ravines on the north and east, while it is further protected by a great wall. The palace of the maharaja is a handsome block of buildings dating mainly from the middle of the 18th century.

KAREN, one of the chief hill races of Burma. The Karens inhabit the central Pegu Yoma range, forming the watershed between the Sittang and Irrawaddy rivers, the Paunglaung range between the Sittang and the Salween, and the eastern slopes of the Arakan Yoma mountains to the west of the Irrawaddy delta. They are supposed to be the descendants of Chinese tribes driven southwards by the pressure of the Shan races, before they were again made to retire into the hills by the expansion of the Môn power. Their own traditions ascribe their original home to the west of the sandy desert of Gobi stretching between China and Tibet. According to the census of 1901 they numbered in all 727,235 persons within British India, divided into the Sgaw, 86,434, the Pwo, 174,070, and the Bghai, 4036, while 457,355 are returned as "unspecified." The Sgaw and Pwo are collectively known as the "White Karens," and chiefly inhabit British territory. They take their name from the colour of their clothes. The Bghai, or "Red Karens," who are supposed by some to be an entirely distinct race, chiefly inhabit the independent hill state of Karen-ni (*q.v.*). The Karen is of a squarer build than the Burman, his skin is fairer, and he has more of the Mongolian obliquity of the eyes. In character also the people differ from the Burmese. They are singularly devoid of humour, they are stolid and cautious, and lack altogether the light gaiety and fascination of the Burmese. They are noted for truthfulness and chastity, but are dirty and addicted to drink. The White Karens furnish perhaps the most notable instance of conversion to Christianity of any native race in the British empire. Prepared by prophecies current among them, and by curious traditions of a biblical flavour, in addition to their antagonism to the dominant Burmese, they embraced with fervour the new creed brought to them by the missionaries, so that out of the 147,525 Christians in Burma according to the census of 1901 upwards of a hundred thousand were Karens. The Red Karens differ considerably from the White Karens. They are the wildest and most lawless of the so-called Karen tribes. Every male belonging to the clan used to have the rising sun tattooed in bright vermilion on his back. The men are small and wizened, but athletic, and have broad reddish-brown faces. Their dress consists of a short pair of breeches, usually of a reddish colour, with black and white stripes interwoven perpendicularly or like a tartan, and a handkerchief is tied round the head. The Karen language is tonal, and belongs to the Siamese-Chinese branch of the Indo-Chinese family.

See D. M. Smeaton, *The Loyal Karens of Burma* (1887); J. Nisbet, *Burma under British Rule* (1901); M. and B. Ferrars, *Burma* (1900); and O'Connor Scott, *The Silken East* (1904). (J. G. Sc.)

KAREN-NI, the country of the Red Karens, a collection of small states, formerly independent, but now feudatory to Burma. It is situated approximately between 18° 50′ and 19° 55′ N. and between 97° 10′ and 97° 50′ E. The tract is bounded on the N. by the Shan states of Möng Pai, Hsatung and Mawkmai; on the E. by Siam; on the S. by the Papun district of Lower Burma; and on the W. a stretch of mountainous country, inhabited by the Bre and various other small tribes, formerly in a state of independence, divides it from the districts of Toungoo and Yamethin. It is divided in a general way into eastern and western Karen-ni; the former consisting of one state, Gantarawadi, with an approximate area of 2500 sq. m.; the latter of the four small states of Kyebogyi, area about 350 sq. m.; Bawlake, 200 sq. m.; Nammekon, 50 sq. m.; and Naungpale, about 30 sq. m. The small states of western Karen-ni were formerly all subject to Bawlake, but the subordination has now ceased. Karen-ni consists of two widely differing tracts of country, which roughly mark now, and formerly actually did mark, the division into east and west. Gantarawadi has, however, encroached westwards beyond the boundaries which nature would assign to it. The first of these two divisions is the southern portion of the valley of the Hpilu, or Balu stream, an open, fairly level plain, well watered and in some parts swampy. The second division is a series of chains of hills, intersected by deep valleys, through which run the two main rivers, the Salween and the Pawn, and their feeder streams. Many of the latter are dried up in the hot season and only flow freely during the rains. The whole country being hilly, the most conspicuous ridge is that lying between the Pawn and the Salween, which has an average altitude of 5000 ft. It is crossed by several tracks, passable for pack-animals, the most in use being the road between Sawlon, the capital of Gantarawadi and Man Maü. The principal peak east of the Salween is on the Loi Lan ridge, 7109 ft. above mean sea-level. Parts of this ridge form the boundary between eastern Karen-ni and Mawkmai on the west and Siam on the east. It falls away rapidly to the south, and at Pang Salang is crossed at a height of 2200 ft. by the road from Hsataw to Mehawnghsawn. West of the Balu valley the continuation of the eastern rim of the Myelat plateau rises in Loi Nangpa to about 5000 ft. The Nam Pawn is a large river, with an average breadth of 100 yds., but is unnavigable owing to its rocky bed. Even timber cannot be floated down it without the assistance of elephants. The Salween throughout Karen-ni is navigated by large native craft. Its tributary, the Me Pai, on the eastern bank, is navigable as far as Mehawnghsawn in Siamese territory. The Balu stream flows out of the Inle lake, and is navigable from that point to close on Lawpita, where it sinks into the ground in a marsh or succession of funnel holes. Its breadth averages 50 yds., and its depth is 15 ft. in some places.

The chief tribes are the Red Karens (24,043), Bres (3500), and Padaungs (1867). Total revenue, Rs. 37,000. An agent of the British government, with a guard of military police, is posted at the village of Loikaw. Little of the history of the Red Karens is known; but it appears to be generally admitted that Bawlake was originally the chief state of the whole country, east and west, but eastern Karen-ni under Papaw-gyi early became the most powerful. Slaving raids far into the Shan states brought on invasions from Burma, which, however, were not very successful. Eastern Karen-ni was never reduced until Sawlapaw, having defied the British government, was overcome and deposed by General Collett in the beginning of 1889. Sawlawi was then appointed myoza, and received a *sanad*, or patent of appointment, on the same terms as the chiefs of the Shan states. The independence of the Western Karen-ni states had been guaranteed by the British government in a treaty with King Mindon in 1875. They were, however, formally recognized as feudatories in 1892 and were presented with *sanads* on the 23rd of January of that year. Gantarawadi pays a regular tribute of Rs. 5000 yearly, whereas these chieflets pay an annual *kadaw*, or *nuzzur*, of about Rs. 100. They are forbidden to carry out a sentence of death passed on a criminal without the sanction of the superintendent of the southern Shan states, but otherwise retain nearly all their customary law.

Tin, or what is called tin, is worked in Bawlake. It appears, however, to be very impure. It is worked intermittently by White Karens on the upper waters of the Hkemapyu stream. Rubies, spinels and other stones are found in the upper Tu valley and in the west of Nammekon state, but they are of inferior quality. The trade in teak is the chief or only source of wealth in Karen-ni. The largest and most important forests are those on the left bank of the Salween. Others lie on both banks of the Nam Pawn, and in western Karen-ni on the Nam Tu. The yearly out-turn is estimated at over 20,000 logs, and forest officers have estimated that an annual out-turn of 9000 logs might be kept up without injury to the forests. Some quantity of cutch is exported, as also stick-lac, which the Red Karens graft so as to foster the production. Other valuable forest produce exists, but is not exported. Rice, areca-nuts, and betel-vine leaf are the chief agricultural products. The Red Karen women weave their own and their husbands' clothing. A characteristic manufacture is the *pa-si* or Karen metal drum, which is made at Ngwedaung. These drums are from 2½ to 3 ft. across the boss, with sides of about the same depth. The sound is out of proportion to the metal used, and is inferior to that of the Shan and Burmese gongs. It is thought that the population of Karen-ni is steadily decreasing. The birth-rate of the people is considered to exceed the death-rate by very little, and the Red Karen habit of life is most unwholesome. Numbers have enlisted in the Burma police, but there are various opinions as to their value. (J. G. Sc.)

KARIKAL, a French settlement in India, situated on the south-east coast, within the limits of Tanjore district, with an area of 53 sq. m., and a population (1901) of 56,595. The site was promised to the French by the Tanjore raja in 1738, in return for services rendered, but was only obtained by them by force in 1739. It was captured by the British in 1760, restored in 1765, again taken in 1768, and finally restored in 1817. The town is neatly built on one of the mouths of the Cauvery, and carries on a brisk trade with Ceylon, exporting rice and importing chiefly European articles and timber. A *chef de l'administration*, subordinate to the government at Pondicherry, is in charge of the settlement, and there is a tribunal of first instance.

KARLI, a village of British India, in the Poona district of the Bombay presidency, famous for its rock caves. Pop. (1901), 903. The great cave of Karli is said by Fergusson to be without exception the largest and finest *chaitya* cave in India; it was excavated at a time when the style was in its greatest purity, and is splendidly preserved. The great *chaitya* hall is 126 ft. long, 45 ft. 7 in. wide, and about 46 ft. high. A row of ornamental columns rises on either side to the ribbed teak roof, and at the far end of the nave is a massive *dagoba*. Dating from the beginning of the Christian era or earlier, this cave has a wooden roof, which repeats the pattern of the walls, and which Fergusson considers to be part of the original design. Since wood rapidly deteriorates in India owing to the climate and the ravages of white ants, the state of preservation of this roof is remarkable.

KARLOWITZ, or CARLOWITZ (Hungarian, *Karlóeza;* Croatian, *Karlovci*), a city of Croatia-Slavonia, in the county of Syrmia; on the right bank of the Danube, and on the railway from Peterwardein, 6 m. N.W. to Belgrade. Pop. (1900), 5643. Karlowitz is the seat of an Orthodox metropolitan, and has several churches and schools, and a hospital. The fruit-farms and vineyards of the Fruška Gora, a range of hills to the south, yield excellent plum brandy and red wine. An obelisk at Slankamen, 13 m. E. by S., commemorates the defeat of the Turks by Louis of Baden, in 1691. The treaty of Karlowitz, between Austria, Turkey, Poland and Venice, was concluded in 1699; in 1848–1849 the city was the headquarters of Servian opposition to Hungary. It was included, until 1881, in the Military Frontier.

KARLSKRONA [CARLSCRONA,] a seaport of Sweden, on the Baltic coast, chief town of the district (*län*) of Blekinge, and headquarters of the Swedish navy. Pop. (1900), 23,955. It is pleasantly situated upon islands and the mainland, 290 m. S.S.W. of Stockholm by rail. The harbour is capacious and secure, with a sufficient depth of water for the largest vessels. It has three entrances; the principal, and the only one practicable for large vessels, is to the south of the town, and is defended by two strong forts, at Drottningskär on the island of Aspö, and on the islet of Kungsholm. The dry docks, of great extent, are cut out of the solid granite. There is slip-accommodation for large vessels. Karlskrona is the seat of the Royal Naval Society, and has a navy-arsenal and hospital, and naval and other schools. Charles XI., the founder of the town as naval headquarters (1680), is commemorated by a bronze statue (1897). There are factories for naval equipments, galvanized metal goods, felt hats, canvas, leather and rice, and breweries and granite quarries. Exports are granite and timber; imports, coal, flour, provisions, hides and machinery.

KARLSRUHE, or CARLSRUHE, a city of Germany, capital of the grand-duchy of Baden, 33 m. S.W. of Heidelberg, on the railway Frankfort-on-Main-Basel, and 39 m. N.W. of Stuttgart. Pop. (1895), 84,030; (1905), 111,200. It stands on an elevated plain, 5 m. E. of the Rhine and on the fringe of the Hardtwald forest. Karlsruhe takes its name from Karl Wilhelm, margrave of Baden, who, owing to disputes with the citizens of Durlach, erected here in 1715 a hunting seat, around which the town has been built. The city is surrounded by beautiful parks and gardens. The palace (Schloss), built in 1751–1776 on the site of the previous erection of 1715, is a plain building in the old French style, composed of a centre and two wings, presenting nothing remarkable except the octagon tower (*Bleiturm*), from the summit of which a splendid view of the city and surrounding country is obtained, and the marble saloon, in which the meridian of Cassini was fixed or drawn. In front of the palace is the Great Circle, a semicircular line of buildings, containing the government offices. From the palace the principal streets, fourteen in number, radiate in the form of an expanded fan, in a S.E., S. and S.W. direction, and are again intersected by parallel streets. This fan-like plan of the older city has, however, been abandoned in the more modern extensions. Karlsruhe has several fine public squares, the principal of which are the Schlossplatz, with Schwanthaler's statue of the grand duke Karl Friedrich in the centre, and market square (Marktplatz), with a fountain and a statue of Louis, grand duke of Baden. In the centre of the Rondelplatz is an obelisk in honour of the grand duke Karl Wilhelm. The finest street is the Kaiserstrasse, running from east to west and having a length of a mile and a half and a uniform breadth of 72 ft. In it are several of the chief public buildings, notably the technical high school, the arsenal and the post office. Among other notable buildings are the town hall; the theatre; the hall of representatives; the mint; the joint museum of the grand-ducal and national collections (natural history, archaeology, ethnology, art and a library of over 150,000 volumes); the palace of the heir-apparent, a late Renaissance building of 1891–1896; the imperial bank (1893); the national industrial hall, with an exhibition of machinery; the new law courts; and the hall of fine arts, which shelters a good picture gallery. The city has six Evangelical and four Roman Catholic Churches. The most noteworthy of these are the Evangelical town church, the burial-place of the margraves of Baden; the Christuskirche, and the Bernharduskirche. Karlsruhe possesses further the Zähringen museum of curiosities, which is in the left wing of the Schloss; an architectural school (1891); industrial art school and museum; cadet school (1892); botanical and electro-technical institutes; and horticultural and agricultural schools. Of its recent public monuments may be mentioned one to Joseph Victor von Scheffel (1826–1886); a bronze equestrian statue of the emperor William I. (1896); and a memorial of the 1870–71 war. Karlsruhe is the headquarters of the XIV. German army corps. Since 1870 the industry of the city has grown rapidly, as well as the city itself. There are large railway workshops; and the principal branches of industry are the making of locomotives, carriages, tools and machinery, jewelry, furniture, gloves, cement, carpets, perfumery, tobacco and beer. There is an important arms factory. Maxau, on the Rhine, serves as the river port of Karlsruhe and is connected with it by a canal finished in 1901.

See Fecht, *Geschichte der Haupt- und Residenzstadt Karlsruhe* (Karlsruhe, 1887); F. von Weech, *Karlsruhe, Geschichte der Stadt und ihrer Verwaltung* (Karlsruhe, 1893–1902); Naeher, *Die Umgebung der Residenz Karlsruhe* (Karlsruhe, 1888); and the annual *Chronik der Haupt- und Residenzstadt Karlsruhe.*

KARLSTAD [CARLSTAD], a town of Sweden, the capital of the district (*län*) of Vermland, on the island of Tingvalla under the northern shore of Lake Vener, 205 m. W. of Stockholm by the Christiania railway. Pop. (1900), 11,869. The fine Klar River here enters the lake, descending from the mountains of the frontier. To the north-west lies the Fryksdal or valley of the Nors River, containing three beautiful lakes and fancifully named the "Swedish Switzerland." In this and other parts of the district are numerous iron-works. Karlstad was founded in 1584. It is the seat of a bishop and has a cathedral. Trade is carried on by way of the lake and the Göta canal. There are mechanical works, match factories and stockinet factories, and a mineral spring rich in iron, the water of which is bottled for export. Under the constitution of united Sweden and Norway, in the event of the necessity of electing a Regent and the disagreement of the parliaments of the two countries, Karlstad was indicated as the meeting-place of a delegacy for the purpose. Here, on the 31st of August 1905 the conference met to decide upon the severance of the union between Sweden and Norway, the delegates concluding their work on the 23rd of September.

KARLSTADT or CARLSTADT (Hungarian, *Károlyváros*; Croatian, *Karlovac*), a royal free city, municipality and garrison town in the county of Agram, Croatia-Slavonia; standing on hilly ground beside the river Kulpa, which here receives the Korana and the Dobra. Pop. (1900), 7396. Karlstadt is on the railway from Agram to Fiume. It consists of the fortress, now obsolete, the inner town and the suburbs. Besides the Roman Catholic and Orthodox churches, its chief buildings are the Franciscan monastery, law-courts and several large schools, including one for military cadets. Karlstadt has a considerable transit trade in grain, wine, spirits and honey, and manufactures the liqueur called *rosoglio.*

KARMA, sometimes written KARMAN, a Sanskrit noun (from the root *kṛi*, to do), meaning deed or action. In addition to this simple meaning it has also, both in the philosophical and the colloquial speech of India a technical meaning, denoting "a person's deeds as determining his future lot." This is not merely in the vague sense that on the whole good will be rewarded and evil punished, but that every single act must work out to the uttermost its inevitable consequences, and receive its retribution, however many ages the process may require. Every part of the material universe—man, woman, insect, tree, stone, or whatever it be—is the dwelling of an eternal spirit that is working out its destiny, and while receiving reward and punishment for the past is laying up reward and punishment for the future. This view of existence as an endless and concomitant sowing and reaping is accepted by learned and unlearned alike as accounting for those inequalities in human life which might otherwise lead men to doubt the justice of God. Every act of every person has not only a moral value producing merit or demerit, but also an inherent power which works out its fitting reward or punishment. To the Hindu this does not make heaven and hell unnecessary. These two exist in many forms more or less grotesque, and after death the soul passes to one of them and there receives its due; but that existence too is marked by desire and action, and is therefore productive of merit or demerit, and as the soul is thus still entangled in the meshes of karma it must again assume an earthly garb and continue the strife. Salvation is to the Hindu simply deliverance from the power of karma, and each of the philosophic systems has its own method of obtaining it. The last book of the Laws of Manu deals with *karmaphalam*, "the fruit of karma," and gives many curious details of the way in which sin is punished and merit rewarded. The origin of the doctrine cannot be traced with certainty, but there is little doubt that it is post-vedic, and that it was readily accepted by Buddha in the 6th century B.C. As he did not believe in the existence of soul he had to modify the doctrine (see BUDDHISM).

KÁRMÁN, JÓZSEF (1769–1795), Hungarian author, was born at Losoncz on the 14th of March 1769, the son of a Calvinist pastor. He was educated at Losoncz and Pest, whence he migrated to Vienna. There he made the acquaintance of the beautiful and eccentric Countess Markovics, who was for a time his mistress, but she was not, as has often been supposed, the heroine of his famous novel *Fanni Hagyományai* (Fanny's testament). Subsequently he settled in Pest as a lawyer. His sensibility, social charm, liberal ideas (he was one of the earliest of the Magyar freemasons) and personal beauty, opened the doors of the best houses to him. He was generally known as the Pest Alcibiades, and was especially at home in the salons of the Protestant magnates. In 1792, together with Count Ráday, he founded the first theatrical society at Buda. He maintained that Pest, not Pressburg, should be the literary centre of Hungary, and in 1794 founded the first Hungarian quarterly, *Urania*, but it met with little support and ceased to exist in 1795, after three volumes had appeared. Kármán, who had long been suffering from an incurable disease, died in the same year. The most important contribution to *Urania* was his sentimental novel, *Fanni Hagyományai*, much in the style of *La nouvelle Héloïse* and *Werther*, the most exquisite product of Hungarian prose in the 18th century and one of the finest psychological romances in the literature. Kármán also wrote two satires and fragments of an historical novel, while his literary programme is set forth in his dissertation *Anemzet csinosodása*.

Kármán's collected works were published in Abafi's *Nemzeti Könyvtár* (Pest, 1878), &c., preceded by a life of Kármán. See F. Baráth, *Joseph Kármán* (Hung., Vas. Ujs, 1874); Zsolt Beöthy, article on Kármán in *Képes Irodalomtörtenet* (Budapest, 1894).

(R. N. B.)

KARNAK, a village in Upper Egypt (pop. 1907, 12,585), which has given its name to the northern half of the ruins of Thebes on the east bank of the Nile, the southern being known as Luxor (*q.v.*). The Karnak ruins comprise three great enclosures built of crude brick. The northernmost and smallest of these contained a temple of the god Mont, built by Amenophis III., and restored by Rameses II. and the Ptolemies. Except a well-preserved gateway dating from the reign of Ptolemy Euergetes I., little more than the plan of the foundations is traceable. Its axis, the line of which is continued beyond the enclosure wall by an avenue of sphinxes, pointed down-stream (N.E.). The southern enclosure contained a temple of the goddess Mūt, also built by Amenophis III., and almost as ruinous as the last, but on a much larger scale. At the back is the sacred lake in the shape of a horse-shoe. The axis of the temple runs approximately northward, and is continued by a great avenue of rams to the southern pylons of the central enclosure. This last is of vast dimensions, forming approximately a square of 1500 ft., and it contains the greatest of all known temples, the Karnak temple of Ammon (see ARCHITECTURE, sect. "Egyptian," with plan).

Inside and outside each of these enclosures there were a number of subsidiary temples and shrines, mostly erected by individual kings to special deities. The triad of Thebes was formed by Ammon, his wife Mūt and their son Khons. The large temple of Khons is in the enclosure of the Ammon temple, and the temple of Mūt, as already stated, is connected with the latter by the avenue of rams. The Mont temple, on the other hand, is isolated from the others and turned away from them; it is smaller than that of Khons. Mont, however, may perhaps be considered a special god of Thebes; he certainly was a great god from very ancient times in the immediate neighbourhood, his seats being about 4 m. N.E. at Medamot, the ancient Madu, and about 10 m. S.W. on the west bank at Hermonthis.

It is probable that a temple of Ammon existed at Karnak under the Old Kingdom, if not in the prehistoric age; but it was unimportant, and no trace of it has been discovered. Slight remains of a considerable temple of the Middle Kingdom survive behind the shrine of the great temple, and numbers of fine statues of the twelfth and later dynasties have been found; two of these were placed against the later seventh pylon, while a large number were buried in a great pit, in the area behind that pylon, which has yielded an enormous number of valuable and interesting monuments reaching to the age of the Ptolemies. The axis of the early temple lay from E. to W., and was followed by the main line of the later growth; but at the beginning of the eighteenth dynasty, Amenophis I. built a temple south of the west front of the old one, and at right angles to it, and thus started a new axis which was later developed in the series of pylons VII.–X., and the avenue to the temple of Mūt. The VIIIth pylon in particular was built by Hatshepsut, probably as an approach to this temple of Amenophis, but eventually Tethmosis III. cleared the latter away entirely. Thebes was then the royal residence, and Ammon of Karnak was the great god of the state. Tethmosis I. built a court round the temple of the Middle Kingdom, entered through a pylon (No. V.), and later added the pylon No. IV. with obelisks in front of it. Hatshepsut placed two splendid obelisks between the Pylons IV. and V., and built a shrine in the court of Tethmosis I., in front of the old temple. Tethmosis III., greatest of the Pharaohs, remodelled the buildings about the obelisks of his unloved sister with the deliberate intention of hiding them from view, and largely reconstructed the surroundings of the court. At a later date, after his wars were over, he altered Hatshepsut's sanctuary, engraving on the walls about it a record of his campaigns; to this time also is to be attributed the erection of a great festival hall at the back of the temple. The small innermost pylon (No. VI.) is likewise the work of Tethmosis III. Amenophis III., though so great a builder at Thebes, seems to have contented himself with erecting a great pylon (No. III.) at the west end. The closely crowded succession of broad pylons here suggests a want of space for westward expansion, and this is perhaps explained by a trace of a quay found by Legrain in 1905 near the southern line of pylons; a branch of the Nile or a large canal may have limited the growth. As has been stated, Tethmosis III. continued on the southern axis; he destroyed the temple of Amenophis I. and erected a larger pylon (No. VII.) to the north of Hatshepsut's No. VIII. To these Haremheb added two great pylons and the long avenue of ram-figures, changing the axis slightly so as to lead direct to the temple of Mūt built by Amenophis III. All of these southern pylons are well spaced. In the angle between these pylons and the main temple was the great rectangular sacred lake. By this time the temple of Karnak had attained to little more than half of its ultimate length from east to west.

With the XIXth Dynasty there is a notable change perhaps due to the filling of the hypothetical canal. No more was added on the southern line of building, but westward Rameses I. erected pylon No. II. at an ample distance from that of Amenophis III., and Seti I. and Rameses II. utilized the space between for their immense Hall of Columns, one of the most celebrated achievements of Egyptian architecture. The materials of which the pylon is composed bear witness to a temple having stood near by of the heretic and unacknowledged kings of the XVIIIth Dynasty. Haremheb's pylon No. IX. was likewise constructed out of the ruins of a temple dedicated by Amenophis IV. (Akhenaten) to the sun-god Harmakhis. Rameses III. built a fine temple, still well preserved, to Ammon at right angles to the axis westward of pylon No. II.; Sheshonk I. (Dynasty XXII.) commenced a great colonnaded court in front of the pylon, enclosing part of this temple and a smaller triple shrine built by Seti II. In the centre of the court Tirhaka (Tirhaka, Dynasty XXV.) set up huge columns 64 ft. high, rivalling those of the central aisle in the Hall of Columns, for some building now destroyed. A vast unfinished pylon at the west end (No. I.), 370 ft. wide and 142½ ft. high, is of later date than the court, and is usually attributed to the Ptolemaic age. It will be observed that the successive pylons diminish in size from the outside inwards. Portions of the solid crude-brick scaffolding are still seen banked against this pylon. About 100 metres west of it is a stone quay, on the platform of which stood a pair of obelisks of Seti II.; numerous graffiti recording the height of the Nile from the XXIst to the XXVIth Dynasties are engraved on the quay.

Besides the kings named above, numbers of others contributed in greater or less measure to the building or decoration of the colossal temple. Alexander the Great restored a chamber in the festival hall of Tethmosis III., and Ptolemy Soter built the central shrine of granite in the name of Philip Arrhidaeus. The walls throughout, as usually in Egyptian temples, are covered with scenes and inscriptions, many of these, such as those which record the annals of Tethmosis III., the campaign of Seti I. in Syria, the exploit of Rameses II. at the battle of Kadesh and his treaty with the Hittites, and the dedication of Sheshonk's victories to Ammon, are of great historical importance. Several large stelae with interesting inscriptions have been found in the ruins, and statues of many ages of workmanship. In December 1903 M. Legrain, who has been engaged for several years in clearing the temple area systematically, first tapped an immense deposit of colossal statues, stelae and other votive objects large and small in the space between pylon No. VII. and the great hypostyle hall. After three seasons' work, much of it in deep water, 750 large monuments have been extracted, while the small figures, &c. in bronze and other materials amount to nearly 20,000. The value of the find, both from the artistic and historical standpoints, is immense. The purpose of the deposit is still in doubt; many of the objects are of the finest materials and finest workmanship, and in perfect preservation: even precious metals are not absent. Multitudes of objects in wood, ivory, &c., have decayed beyond recovery. That all were waste pieces seems incredible. They are found lying in the utmost confusion; in date they range from the XIIth Dynasty to the Ptolemaic period.

The inundation annually reaches the floor of the temple, and the saltpetre produced from the organic matter about the ruins, annually melting and crystallizing, has disintegrated the soft sandstone in the lower courses of the walls and the lower drums and bases of the columns. There is moreover no solid foundation in any part of the temple. Slight falls of masonry have taken place from time to time, and the accumulation of rubbish was the only thing that prevented a great disaster. Repairs, often on a large scale, have therefore gone on side by side with the clearance, especially since the fall of many columns in the great hall in 1899. All the columns which fell in that year were re-erected by 1908.

The temple of Khons, in the S.W. corner of the great enclosure, is approached by an avenue of rams, and entered through a fine pylon erected by Euergetes I. It was built by Rameses III and his successors of the XXth Dynasty, with Hrihōr of Dynasty XXI. Excavations in the opposite S.E. corner have revealed flint weapons and other sepulchral remains of the earliest periods, proving that the history of Thebes goes back to a remote antiquity.

See Baedeker's *Handbook for Egypt*; also *Description de l'Égypte* (*Atlas, Antiquités*, tome iii.); A. Mariette, *Karnak. Étude topographique et archéologique*; L. Borchardt, *Zur Baugeschichte des Ammonstempels von Karnak*; G. Legrain in *Recueil des travaux relatifs à l'arch. Égypt.* vol. xxvii. &c.; and reports in *Annales du service des antiquités de l'Égypte*. (F. Ll. G.)

KARNAL, a town and district of British India, in the Delhi division of the Punjab. The town is 7 m. from the right bank of the Jumna, with a railway station 76 m. N. of Delhi. Pop. (1901), 23,559. There are manufactures of cotton cloth and boots, besides considerable local trade and an annual horse fair.

The District of Karnal stretches along the right bank of the Jumna, north of Delhi. It is entirely an alluvial plain, but is crossed by the low ridge of the watershed between the Indian Ocean and the Bay of Bengal. Area, 3153 sq. m.; pop. (1901), 883,225, showing an increase of nearly 3% in the decade. The principal crops are millets, wheat, pulse, rice, cotton and sugar-cane. There are several factories for ginning and pressing cotton. The district is traversed by the Delhi-Umballa-Kalka railway, and also by the Western Jumna canal. It suffered from famine in 1896–1897, and again to some extent in 1899–1900.

No district of India can boast of a more ancient history than Karnal, as almost every town or stream is connected with the legends of the *Mahabharata*. The town of Karnal itself is said to owe its foundation to Raja Karna, the mythical champion of the Kauravas in the great war which forms the theme of the national epic. Panipat, in the south of the district, is said to have been one of the pledges demanded from Duryodhana by Yudisthira as the price of peace in that famous conflict. In historical times the plains of Panipat have three times proved the theatre of battles which decided the fate of Upper India. It was here that Ibrahim Lodi and his vast host were defeated in 1526 by the veteran army of Baber; in 1556 Akbar reasserted the claims of his family on the same battlefield against the Hindu general of the house of Adil Shah, which had driven the heirs of Baber from the throne for a brief interval; and at Panipat too, on the 7th of January 1761, the Mahratta confederation was defeated by Ahmad Shah Durani. During the troublous period which then ensued the Sikhs managed to introduce themselves, and in 1767 one of their chieftains, Desu Singh, appropriated the fort of Kaithal, which had been built during the reign of Akbar. His descendants, the bhais of Kaithal, were reckoned amongst the most important Cis-Sutlej princes. Different portions of this district have lapsed from time to time into the hands of the British.

KÁROLYI, ALOYS, Count (1825–1889), Austro-Hungarian diplomatist, was born in Vienna on the 8th of August 1825. The greatness of the Hungarian family of Károlyi dates from the time of Alexander Károlyi (1668–1743), one of the generals of Francis Rákóczy II., who in 1711 negotiated the peace of Szatmár between the insurgent Hungarians and the new king, the emperor Charles VI., was made a count of the Empire in 1712, and subsequently became a field marshal in the imperial army. Aloys Károlyi entered the Austrian diplomatic service, and was attached successively to embassies at various European capitals. In 1858 he was sent to St Petersburg on a special mission to seek the support of Russia against Napoleon III. He was ambassador at Berlin in 1866 at the time of the rupture between Prussia and Austria, and after the Seven Weeks' War was charged with the negotiation of the preliminaries of peace at Nikolsburg. He was again sent to Berlin in 1871, acted as second plenipotentiary at the Berlin congress of 1878, and was sent in the same year to London, where he represented Austria for ten years. He died on the 2nd of December 1889 at Tótmegyer.

KAROSS, a cloak made of sheepskin, or the hide of other animals, with the hair left on. It is properly confined to the coat of skin without sleeves worn by the Hottentots and Bushmen of South Africa. These karosses are now often replaced by a blanket. Their chiefs wore karosses of the skin of the wild cat, leopard or caracal. The word is also loosely applied to the cloaks of leopard-skin worn by the chiefs and principal men of the Kaffir tribes. Kaross is probably either a genuine Hottentot word, or else an adaptation of the Dutch *kuras* (Portuguese *couraça*), a cuirass. In a vocabulary dated 1673 *karos* is described as a "corrupt Dutch word."

KARR, JEAN BAPTISTE ALPHONSE (1808–1890), French critic and novelist, was born in Paris, on the 24th of November 1808, and after being educated at the Collège Bourbon, became a teacher there. In 1832 he published a novel, *Sous les tilleuls*, characterized by an attractive originality and a delightful freshness of personal sentiment. A second novel, *Une heure trop tard*, followed next year, and was succeeded by many other popular works. His *Vendredi soir* (1835) and *Le Chemin le plus court* (1836) continued the vein of autobiographical romance with which he had made his first success. *Généviève* (1838) is one of his best stories, and his *Voyage autour de mon jardin* (1845) was deservedly popular. Others were *Feu Bressier* (1848), and *Fort en thème* (1853), which had some influence in stimulating educational reform. In 1839 Alphonse Karr, who was essentially a brilliant journalist, became editor of *Le Figaro*, to which he had been a constant contributor; and he also started a monthly journal, *Les Guêpes*, of a keenly satirical tone, a publication which brought him the reputation of a somewhat bitter wit. His epigrams were frequently quoted; *e.g.* "plus ça change, plus c'est la même chose," and, on the proposal to abolish capital punishment, "je veux bien que messieurs les assassins commencent." In 1848 he founded *Le Journal*. In 1855 he went to live at Nice, where he indulged his predilections for floriculture, and gave his name to more than one new variety. Indeed he practically founded the trade in cut flowers on the Riviera. He was also devoted to fishing, and in *Les Soirées de Sainte-Adresse* (1853) and *Au bord de la mer* (1860) he made use of his experiences. His reminiscences, *Livre de bord*, were published in 1879–1880. He died at St Raphaël (Var), on the 29th of September 1890.

KARRER, FELIX (1825–1903), Austrian geologist, was born in Venice on the 11th of March 1825. He was educated in Vienna, and served for a time in the war department, but he retired from the public service at the age of thirty-two, and devoted himself to science. He made especial studies of the Tertiary formations and fossils of the Vienna Basin, and investigated the geological relations of the thermal and other springs in that region. He became an authority on the foraminifera, on which subject he published numerous papers. He wrote also a little book entitled *Der Boden der Hauptstädte Europas* (1881). He died in Vienna on the 19th of April 1903.

KARROO, two extensive plateaus in the Cape province, South Africa, known respectively as the Great and Little Karroo. Karroo is a corruption of *Karusa*, a Hottentot word meaning dry, barren, and its use as a place-name indicates the character of the plateaus so designated. They form the two intermediate "steps" between the coast-lands and the inner plateau which constitutes the largest part of South Africa. The Little (also called Southern) Karroo is the table-land nearest the southern coast-line of the Cape, and is bounded north by the Zwaarteberg, which separates it from the Great Karroo. From west to east the Little Karroo has a length of some 200 m., whilst its average width is 30 m. West of the Zwaarteberg the Little Karroo merges into the Great Karroo. Eastward it is limited by the hills which almost reach the sea in the direction of St Francis and Algoa Bays. The Great Karroo is of much larger extent. Bounded south, as stated, by the Zwaarteberg, further east by the Zuurberg (of the coast chain), its northern limit is the mountain range which, under various names, such as Nieuwveld and Sneeuwberg, forms the wall of the inner plateau. To the south-west and west it is bounded by the Hex River Mountains and the Cold Bokkeveld, eastward by the Great Fish River. West to east it extends fully 350 m. in a straight line, varying in breadth from more than 80 to less than 40 m. Whilst the Little Karroo is divided by a chain of hills which run across it from east to west, and varies in altitude from 1000 to 2000 ft., the Great Karroo has more the aspect of a vast plain and has a level of from 2000 to 3000 ft. The total area of the Karroo plateaus is stated to be over 100,000 sq. m. The plains are dotted with low ranges of *kopjes*. The chief characteristics of the Karroo are the absence of running water during a great part of the year and the consequent parched aspect of the country. There is little vegetation save stunted shrubs, such as the mimosa (which generally marks the river beds), wild pomegranate, and wax heaths, known collectively as Karroo bush. After the early rains the bush bursts into gorgeous purple and yellow blossoms and vivid greens, affording striking evidence of the fertility of the soil. Such parts of the Karroo as are under perennial irrigation are among the most productive lands in South Africa. Even the parched bush provides sufficient nourishment for millions of sheep and goats. There are also numerous ostrich farms, in particular in the districts of Oudtshoorn and Ladismith in the Little Karroo, where lucerne grows with extraordinary luxuriance. The Karroo is admirably adapted to sufferers from pulmonary complaints. The dryness of the air tempers the heat of summer, which reaches in January a mean maximum of 87° F., whilst July, the coldest month, has a mean minimum of 36° F. A marked feature of the climate is the great daily range (nearly 30°) in temperature; the Karroo towns are also subject to violent dust storms. Game, formerly plentiful, has been, with the exception of buck, almost exterminated. In a looser sense the term Karroo is also used of the vast northern plains of the Cape which are part of the inner table-land of the continent. (See CAPE COLONY.)

KARS, a province of Russian Transcaucasia, having the governments of Kutais and Tiflis on the N., those of Tiflis and Erivan on the E., and Asiatic Turkey on the S. and W. Its area amounts to 7410 sq. m. It is a mountainous, or rather a highland, country, being in reality a plateau, with ranges of mountains running across it. The northern border is formed by the Arzyan range, a branch of the Ajari Mts., which attains altitudes of over 9000 ft. In the south the Kara-dagh reach 10,270 ft. in Mount Ala-dagh, and the Agry-dagh 10,720 ft. in Mount Ashakh; and in the middle Allah-akhbar rises to 10,215 ft. The passes which connect valley with valley often lie at considerable altitudes, the average of those in the S.E. being 9000 ft. Chaldir-gol (altitude 6520 ft.) and one or two other smaller lakes lie towards the N.E.; the Chaldir-gol is overhung on the S.W. by the Kysyr-dagh (10,470 ft.). The east side of the province is throughout demarcated by the Arpa-chai, which receives from the right the Kars river, and as it leaves the province at its S.E. corner joins the Aras. The Kura rises within the province not far from the Kysyr-dagh and flows across it westwards, then eastwards and north-eastwards, quitting it in the north-east. The winters are very severe. The towns of Kaghyshman (4620 ft.) and Sarykamish (7800 ft.) have a winter temperature like that of Finland, and at the latter place, with an annual mean (35° F.) equal to that of Hammerfest in the extreme north of Norway, the thermometer goes down in winter to 40° below zero and rises in summer to 99°. The annual mean temperature at Kars is 40·5° and at Ardahan, farther north, 37°. The Alpine meadows (*yailas*) reach up to 1000 ft. and afford excellent pasturage in spring and summer. The province is almost everywhere heavily forested. Firs and birches flourish as high as 7000 ft., and the vine up to above 3000 ft. Cereals ripen well, and barley and maize grow up to considerable altitudes. Large numbers of cattle and sheep are bred. Extensive deposits of salt occur at Kaghyshman and Olty. The population was 167,610 in 1883 and 292,863 in 1897. The estimated population in 1906 was 349,100. It is mixed. In remote antiquity the province was inhabited by Armenians, the ruins of whose capital, Ani, attest the ancient prosperity of the country. To the Armenians succeeded the Turks, while

Kurds invaded the Alpine pasturages above the valley of the Aras; and after them Kabardians, Circassians, Ossetes and Kara-papaks successively found a refuge in this highland region. After the Russo-Turkish War of 1877–78, when this region was transferred to Russia by the treaty of Berlin, some 82,750 Turks emigrated to Asia Minor, their places being taken by nearly 22,000 Armenians, Greeks and Russians. At the census of 1897 the population consisted principally of Armenians (73,400), Kurds (43,000), Greeks (32,600), Kara-papaks (30,000), Russians, Turks and Persians. The capital is Kars. The province is divided into four districts, the chief towns of which are Kars (*q.v.*), Ardahan (pop. 800 in 1897), Kaghyshman (3435) and Olty. (J. T. Be.)

KARS, a fortified town of Russian Transcaucasia, in the province of Kars, formerly at the head of a sanjak in the Turkish vilayet of Erzerum. It is situated in 40° 37′ N. and 43° 6′ E., 185 m. by rail S.W. of Tiflis, on a dark basalt spur of the Soghanli-dagh, above the deep ravine of the Kars-chai, a sub-tributary of the Aras. Pop. (1878), 8672; (1897), 20,891. There are three considerable suburbs—Orta-kapi to the S., Bairam Pasha to the E., and Timur Pasha on the western side of the river. At the N.W. corner of the town, overhanging the river, is the ancient citadel, in earlier times a strong military post, but completely commanded by the surrounding eminences. The place is, however, still defended by a fort and batteries. There is a 10th century cathedral, Kars being the see of a bishop of the Orthodox Greek Church. Coarse woollens, carpets and felt are manufactured.

During the 9th and 10th centuries the seat of an independent Armenian principality, Kars was captured and destroyed by the Seljuk Turks in the 11th century, by the Mongols in the 13th, and by Timur (Tamerlane) in 1387. The citadel, it would appear, was built by Sultan Murad III. during the war with Persia, at the close of the 16th century. It was strong enough to withstand a siege by Nadir Shah of Persia, in 1731, and in 1807 it successfully resisted the Russians. After a brave defence it surrendered on the 23rd of June 1828 to the Russian general Count I. F. Paskevich, 11,000 men becoming prisoners of war. During the Crimean War the Turkish garrison, guided by General Williams (Sir W. Fenwick Williams of Kars) and other foreign officers, kept the Russians at bay during a protracted siege; but, after the garrison had been devastated by cholera, and food had utterly failed, nothing was left but to capitulate (Nov. 1855). The fortress was again stormed by the Russians in the war of 1877–78, and on its conclusion was transferred to Russia.

See Kmety, *The Defence of Kars* (1856), translated from the German; H. A. Lake, *Kars and our Captivity in Russia* (London, 1856); and *Narrative of the Defence of Kars* (London, 1857); Dr Sandwith, *Narrative of the Siege of Kars* (London, 1856); C. B. Norman, *Armenia and the Campaign of 1877* (London, 1878); Greene, *Russian Army and its Campaigns in Turkey* (1879).

KARSHI, a town of Bokhara, in Central Asia, situated 96 m. S.E. of the city of Bokhara, in a plain at the junction of two main confluents of the Kashka-darya. It is a large and straggling place, with a citadel, and the population amounts to 25,000. There are three colleges, and the Biki mosque is a fine building inlaid with blue and white tiles. Along the river stretches a fine promenade sheltered by poplars. Poppies and tobacco are largely grown, the tobacco being deemed the best in Central Asia. There is a considerable trade in grain; but the commercial prosperity of Karshi is mainly due to its being a meeting-point for the roads from Samarkand, Bokhara, Hissar, Balkh and Maimana, and serves as the market where the Turkomans and Uzbegs dispose of their carpets, knives and fire-arms. Its coppersmiths turn out excellent work. Karshi was a favourite residence of Timur (Tamerlane).

KARST, in physical geography, the region east of the northern part of the Adriatic. It is composed of high and dry limestone ridges. The country is excessively faulted by a long series of parallel fractures that border the N.E. Adriatic and continue inland that series of steps which descend beneath the sea and produce the series of long parallel islands off the coast of Triest and along the Dalmatian shore. It has been shown by E. Suess (*Antlitz der Erde*, vol. i. pt. 2, ch. iii.) that the N. Adriatic is a sunken dish that has descended along these fractures and folds, which are not uncommonly the scene of earthquakes, showing that these movements are still in progress. The crust is very much broken in consequence and the water sinks readily through the broken limestone rocks, which owing to their nature are also very absorbent. The result is that the scenery is barren and desolate, and as this structure always, wherever found, gives rise to similar features, a landscape of this character is called a Karst landscape. The water running in underground channels dissolves and denudes away the underlying rock, producing great caves as at Adelsberg, and breaking the surface with sinks, potholes and unroofed chasms. The barren nature of a purely limestone country is seen in the treeless regions of some parts of Derbyshire, while the underground streams and sinks of parts of Yorkshire, and the unroofed gorge formed by the Cheddar cliffs, give some indication of the action that in the high fractured mountains of the Karst produces a depressing landscape which has some of the features of the "bad lands" of America, though due to a different cause.

KARSTEN, KARL JOHANN BERNHARD (1782–1853), German mineralogist, was born at Bützow in Mecklenburg, on the 26th of November 1782. He was author of several comprehensive works, including *Handbuch der Eisenhüttenkunde* (2 vols., 1816; 3rd ed., 1841); *System der Metallurgie geschichtlich, statistisch, theoretisch und technisch* (5 vols. with atlas, 1831–1832); *Lehrbuch der Salinenkunde* (2 vols., 1846–1847). He was well known as editor of the *Archiv für Bergbau und Hüttenwesen* (20 vols., 1818–1831); and (with H. von Dechen) of the *Archiv für Mineralogie, Geognosie, Bergbau und Hüttenkunde* (26 vols., 1829–1854). He died at Berlin on the 22nd of August 1853. His son, Dr Hermann Karsten (1809–1877), was professor of mathematics and physics in the university of Rostock.

KARTIKEYA, in Hindu mythology, the god of war. Of his birth there are various legends. One relates that he had no mother but was produced by Siva alone, and was suckled by six nymphs of the Ganges, being miraculously endowed with six faces that he might simultaneously obtain nourishment from each. Another story is that six babes, miraculously conceived, were born of the six nymphs, and that Parvati, the wife of Siva, in her great affection for them, embraced the infants so closely that they became one, but preserved six faces, twelve arms, feet, eyes, &c. Kartikeya became the victor of giants and the leader of the armies of the gods. He is represented as riding a peacock. In southern India he is known as Subramanya.

KARUN, an important river of Persia. Its head-waters are in the mountain cluster known since at least the 14th century as Zardeh Kuh (13,000 ft.) and situated in the Bakhtiari country about 115 m. W. of Isfahan. In its upper course until it reaches Shushter it is called Ab i Kurang (also Kurand and Kuran), and in the *Bundahish*, an old cosmographical work in Pahlavi, it is named Kharāē.[1] From the junction of the two principal sources in the Zardeh Kuh at an altitude of about 8000 ft., the Ab i Kurang is a powerful stream, full, deep and flowing with great velocity for most of its upper course between precipices varying in height from 1000 to 3000 ft. The steepness and height of its banks make it in general useless for irrigation purposes. From its principal sources to Shushter the distance as the crow flies is only about 75 m., but the course of the river is so tortuous that it travels 250 m. before it reaches that city. Besides being fed on its journey through the Bakhtiari country by many mountain-side streams, fresh-water and salt, it receives various tributaries, the most important being the Ab i Bazuft from the right and the Ab i Barz from the left. At Shushter it divides into two branches, one the "Gerger," an artificial channel cut in olden times and flowing east of the city, the other the "Shutait" flowing west. These two branches, which are navigable to within a few miles below Shushter, unite after a run of about 50 m. at Band i Kir, 24 m. S. of Shushter, and there also take up the Ab i Diz (river of Dizful). From Band i Kir to a point two miles above Muhamrah the river is called Karun (Rio Carom of the Portuguese writers of the 16th and 17th centuries) and is navigable all the way with the exception of about two miles at Ahvaz, where a series of cliffs and rocky shelves cross the river and cause rapids. Between Ahvaz and Band i Kir (46 m. by river, 24 m. by road) the river has an average depth of about 20 ft., but below Ahvaz down to a few miles above Muhamrah it is in places very shallow, and vessels with a draught exceeding 3 ft. are liable to ground. About 12 m. above Muhamrah and branching off to the left is a choked-up river bed called the "blind Karun," by which the Karun found its way to the sea in former days. Ten miles farther a part of the river branches off to the left and due S. by a channel called Bahmashir (from Bahman-Ardashir, the name of the district in the early middle ages) which is navigable to the sea for vessels of little draught. The principal river, here about a quarter of a mile broad and 20 to 30 ft. deep, now flows west, and after passing Muhamrah enters into the Shatt el Arab about 20 m. below Basra. This part of the river, from the Bahmashir to the Shatt, is a little over three miles in length and, as its name, Hafar ("dug") implies, an artificial channel. It was dug *c.* A.D. 980 by Azud ed-Dowleh to facilitate communication by water between Basra and Ahvaz, as related by the Arab geographer Mukaddasi A.D. 986. The total length of the river is 460 to 470 m. while the distance from the sources to its junction with the Shatt el Arab is only 160 m. as the crow flies. The Karun up to Ahvaz was opened to international navigation on the 30th of October 1888, and Messrs Lynch of London established a fortnightly steamer service on it immediately after.

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[1] The *real* principal source of the river has been correctly located at ten miles above the *reputed* principal source, but the name Kurang has been erroneously explained as standing for Kuh i rang and has been given to the mountain with the real principal source. Kuh i rang has been wrongly explained as meaning the "variegated mountain."

To increase the water supply of Isfahan Shah Tahmasp I. (1524–1576) and some of his successors, notably Shah Abbas I. (1587–1629), undertook some works for diverting the Kurang into a valley which drains into the Zayendeh-rud, the river of Isfahan, by tunnelling, or cutting through a narrow rocky ridge separating the two river systems. The result of many years' work, a cleft 300 yds. long, 15 broad and 18 deep, cut into the rock, probably amounting to no more than one-twentieth of the necessary work, can be seen at the junction of the two principal sources of the Kurang.

On the upper Karun see Mrs Bishop, *Journeys in Persia and Kurdistan* (London, 1891); Lord Curzon, *Persia and the Persian Question* (London, 1892); Lieut.-Colonel H. A. Sawyer, "The Bakhtiari Mountains and Upper Elam," *Geog. Journal* (Dec. 1894). (A. H.–S.)

KARWAR, or Carwar, a seaport of British India, administrative headquarters of North Kanara district in the Bombay presidency; 295 m. S. of Bombay city. Pop. (1901), 16,847. As early as 1660 the East India Company had a factory here, with a trade in muslin and pepper; but it suffered frequently from Dutch, Portuguese and native attacks, and in 1752 the English agent was withdrawn. Old Karwar fell into ruins, but a new town grew up after the transfer of North Kanara to the Bombay presidency. It is the only safe harbour all the year round between Bombay and Cochin. In the bay is a cluster of islets called the Oyster Rocks, on the largest of which is a lighthouse. Two smaller islands in the bay afford good shelter to native craft during the strong north-west winds that prevail from February to April. The commercial importance of Karwar has declined since the opening of the railway to Marmagao in Portuguese territory.

KARWI, a town of British India, in the Banda district of the United Provinces, on a branch of the Indian Midland railway; pop. (1901), 7743. Before the Mutiny it was the residence of a Mahratta noble, who lived in great state, and whose accumulations constituted the treasure afterwards famous as "the Kirwee and Banda Prize Money."

KARYOGAMY (Gr. *κάρυον*, nut or kernel, thus "nucleus," and *γάμος*, marriage), in biology: (1) the fusion of nuclei to form a single nucleus in syngamic processes (see Reproduction); (2) the process of pairing in Infusoria (*q.v.*), in which two migratory nuclei are interchanged and fuse with two stationary nuclei, while the cytoplasmic bodies of the two mates are in intimate temporary union.

KASAI, or Cassai, a river of Africa, the chief southern affluent of the Congo. It enters the main stream in 3° 10′ S., 16° 16′ E. after a course of over 800 m. from its source in the highlands which form the south-western edge of the Congo basin—separating the Congo and Zambezi systems. The Kasai and its many tributaries cover a very large part of the Congo basin. The Kasai rises in about 12° S., 19° E. and flows first in a north-easterly direction. About 10° 35′ S., 22° 15′ E. it makes a rectangular bend northward and then takes a north-westerly direction. Five rivers—the Luembo, Chiumbo, Luijimo or Luashimo, Chikapa and Lovua or Lowo—rise west of the Kasai and run in parallel courses for a considerable distance, falling successively into the parent stream (between 7° and 6° S.) as it bends westward in its northern course. The Luembo and Chiumbo join and enter the Kasai as one river. A number of rapids occur in these streams. A few miles below the confluence of the Lowo, the last of the five rivers named to join the Kasai, the main stream is interrupted by the Wissmann Falls which, though not very high, bar further navigation from the north. Below this point the river receives several right-hand (eastern) tributaries. These also have their source in the Zambezi-Congo watershed, rising just north of 12° S., flowing north in parallel lines, and in their lower course bending west to join the Kasai. The chief of these affluents are the Lulua and the Sankuru, the Lulua running between the Kasai and the Sankuru. The Sankuru makes a bold curve westward on reaching 4° S., following that parallel of latitude a considerable distance. Its waters are of a bright yellow colour. After the junction of the two rivers (in 4° 17′ S., 20° 15′ E.), the united stream of the Kasai flows N.W. to the Congo. From the south it is joined by the Loange and the Kwango. The Kwango is a large river rising a little north of 12° S., and west of the source of the Kasai. Without any marked bends it flows north—is joined from the east by the Juma, Wamba and other streams—and has a course of 600 m. before joining the Kasai in 3° S., 18′ E. The lower reaches of the Kwango are navigable; the upper course is interrupted by rapids. On the north (in 3° 8′ S., 17° E.) the lower Kasai is joined by the Lukenye or Ikatta. This river, the most northerly affluent of the Kasai, rises between 24° and 25° E., and about 3° S. in swampy land through which the Lomami (another Congo affluent) flows northward. The Lukenye has an east to west direction flowing across a level country once occupied by a lake, of which Lake Leopold II. (*q.v.*), connected with the lower course of the Lukenye, is the scanty remnant. Below the lake the Lukenye is known as the Mfini. Near its mouth the Kasai, in its lower course generally a broad stream strewn with islands, is narrowed to about half a mile on passing through a gap in the inner line of the West African highlands, by the cutting of which the old lake of the Kasai basin must have been drained. The Kasai enters the Congo with a minimum depth of 25 feet and a breadth of about 700 yards, at a height of 942 ft. above the sea. The confluence is known as the Kwa mouth, Kwa being an alternative name for the lower Kasai. The volume of water entering the Congo averages 321,000 cub. ft. per second: far the largest amount discharged by any of the Congo affluents. In floodtime the current flows at the rate of 5 or 6 m. an hour. The Kasai and its tributaries are navigable for over 1500 m. by steamer.

The Kwango affluent of the Kasai was the first of the large affluents of the Congo known to Europeans. It was reached by the Portuguese from their settlements on the west coast in the 16th century. Of its lower course they were ignorant. Portuguese travellers in the 18th century are believed to have reached the upper Kasai, but the first accurate knowledge of the river basin was obtained by David Livingstone, who reached the upper Kasai from the east and explored in part the upper Kwango (1854–1855). V. L. Cameron and Paul Pogge crossed the upper Kasai in the early "seventies." The Kwa mouth was seen by H. M. Stanley in his journey down the Congo in 1877, and he rightly regarded it as the outlet of the Kwango, though not surmising it was also the outlet of the Kasai. In 1882 Stanley ascended the river to the Kwango-Kasai confluence and thence proceeding up the Mfini discovered Lake Leopold II. In 1884 George Grenfell journeyed up the river beyond the Kwango confluence. The systematic exploration of the main stream and its chief tributaries was, however, mainly the work of Hermann von Wissmann, Ludwig Wolf, Paul Pogge and other Germans during 1880–1887. (See Wissmann's books, especially *Im Innern Afrikas*, Leipzig, 1888.) On his third journey, 1886, Wissmann was accompanied by Grenfell. Major von Mechow, an Austrian, explored the middle Kwango in 1880, and its lower course was subsequently surveyed by Grenfell and Holman Bentley, a Baptist missionary. In 1899–1900 a Belgian expedition under Captain C. Lemaire traced the Congo-Zambezi watershed, obtaining valuable information concerning the upper courses of the southern Kasai tributaries. The upper Kasai basin and its peoples were further investigated by a Hungarian traveller, E. Torday, in 1908–1909. (See Torday's paper in *Geog. Jour.*, 1910; also CONGO and the authorities there cited.)

KASBEK (Georgian, *Mkin-vari*; Ossetian, *Urs-khokh*), one of the chief summits of the Caucasus, situated in 42° 42′ N. and 44° 30′ E., 7 m. as the crow flies from a station of the same name on the high road to Tiflis. Its altitude is 16,545 ft. It rises on the range which runs north of the main range (main water-parting), and which is pierced by the gorges of the Ardon and the Terek. It represents an extinct volcano, built up of trachyte and sheathed with lava, and has the shape of a double cone, whose base lies at an altitude of 5800 ft. Owing to the steepness of its slopes, its eight glaciers cover an aggregate surface of not more than 8 sq. m., though one of them, Maliev, is 36 m. long. The best-known glacier is the Dyevdorak, or Devdorak, which creeps down the north-eastern slope into a gorge of the same name, reaching a level of 7530 ft. At its eastern foot runs the Georgian military road through the pass of Darial (7805 ft.). The summit was first climbed in 1868 by D. W. Freshfield, A. W. Moore, and C. Tucker, with a Swiss guide. Several successful ascents have been made since, the most valuable in scientific results being that of Pastukhov (1889) and that of G. Merzbacher and L. Purtscheller in 1890. Kasbek has a great literature, and has left a deep mark in Russian poetry.

See D. W. Freshfield in *Proc. Geog. Soc.* (November 1888) and *The Exploration of the Caucasus* (2nd ed., 2 vols., 1902); Hatisian's "Kazbek Glaciers" in *Izvestia Russ. Geog. Soc.* (xxiv., 1888); Pastukhov in *Izvestia of the Caucasus Branch of Russ. Geog. Soc.* (x. 1, 1891, with large-scale map).

KASHAN, a small province of Persia, situated between Isfahan and Kum. It is divided into the two districts *germsir*, the "warm," and *sardsir*, the "cold," the former with the city of Kashan in the plains, the latter in the hills. It has a population of 75,000 to 80,000, and pays a yearly revenue of about £18,000. KASHAN (Cashan) is the provincial capital, in 34° 0′ N. and 51° 27′ E., at an elevation of 3190 ft., 150 m. from Teheran; pop. 35,000, including a few hundred Jews occupied as silk-winders, and a few Zoroastrians engaged in trade. Great quantities of silk stuffs, from raw material imported from Gilan, and copper utensils are manufactured at Kashan and sent to all parts of Persia. Kashan also exports rose-water made in villages in the hilly districts about 20 m. from the city, and is the only place in Persia where cobalt can be obtained, from the mine at Kamsar, 19 m. to the south. At the foot of the hills 4 m. W. of the city are the beautiful gardens of Fin, the scene of the official murder, on the 9th of January 1852, of Mirza Taki Khan, Amir Nizam, the grand vizier, one of the ablest ministers that Persia has had in modern times.

KASHGAR, an important city of Chinese Turkestan, in 39° 24′ 26″ N. lat., 76° 6′ 47″ E. long., 4043 ft. above sea-level. It consists of two towns, Kuhna Shahr or "old city," and Yangi Shahr or "new city," about five miles apart, and separated from one another by the Kyzyl Su, a tributary of the Tarim river. It is called Su-lĕh by the Chinese, which perhaps represents an original Solek or Sorak. This name seems to be older than Kashgar, which is said to mean "variegated houses." Situated at the junction of routes from the valley of the Oxus, from Khokand and Samarkand, Almati, Aksu, and Khotan, the last two leading from China and India, Kashgar has been noted from very early times as a political and commercial centre. Like all other cities of Central Asia, it has changed hands repeatedly, and was from 1864–1887 the seat of government of the Amir Yakub Beg, surnamed the Atalik Ghazi, who established and for a brief period ruled with remarkable success a Mahommedan state comprising the chief cities of the Tarim basin from Turfan round along the skirt of the mountains to Khotan. But the kingdom collapsed with his death and the Chinese retook the country in 1877 and have held it since.

Kuhna Shahr is a small fortified city on high ground overlooking the river Tuman. Its walls are lofty and supported by buttress bastions with loopholed turrets at intervals; the fortifications, however, are but of hard clay and are much out of repair. The city contains about 2500 houses. Beyond the bridge, a little way off, are the ruins of ancient Kashgar, which once covered a large extent of country on both sides of the Tuman, and the walls of which even now are 12 feet wide at the top and twice that in height. This city—Aski Shahr (Old Town) as it is now called—was destroyed in 1514 by Mirza Ababakar (Abubekr) on the approach of Sultan Said Khan's army. About two miles to the north beyond the river is the shrine of Hazrat Afak, the saint king of the country, who died and was buried here in 1693. It is a handsome mausoleum faced with blue and white glazed tiles, standing under the shade of some magnificent silver poplars. About it Yakub Beg erected a commodious college, mosque and monastery, the whole being surrounded by rich orchards, fruit gardens and vineyards. The Yangi Shahr of Kashgar is, as its name implies, modern, having been built in 1838. It is of oblong shape running north and south, and is entered by a single gateway. The walls are lofty and massive and topped by turrets, while on each side is a projecting bastion. The whole is surrounded by a deep and wide ditch, which can be filled from the river, at the risk, however, of bringing down the whole structure, for the walls are of mud, and stand upon a porous sandy soil. In the time of the Chinese, before Yakub Beg's sway, Yangi Shahr held a garrison of six thousand men, and was the residence of the *amban* or governor. Yakub erected his *orda* or palace on the site of the amban's residence, and two hundred ladies of his harem occupied a commodious enclosure hard by. The population of Kashgar has been recently estimated at 60,000 in the Kuhna Shahr and only 2000 in the Yangi Shahr.

With the overthrow of the Chinese rule in 1865 the manufacturing industries of Kashgar declined. Silk culture and carpet manufacture have flourished for ages at Khotan, and the products always find a ready sale at Kashgar. Other manufactures consist of a strong coarse cotton cloth called *kham* (which forms the dress of the common people, and for winter wear is padded with cotton and quilted), boots and shoes, saddlery, felts, furs and sheepskins made up into cloaks, and various articles of domestic use. A curious street sight in Kashgar is presented by the hawkers of meat pies, pastry and sweetmeats, which they trundle about on hand-barrows just as their counterparts do in Europe; while the knife-grinder's cart, and the vegetable seller with his tray or basket on his head, recall exactly similar itinerant traders further west.

The earliest authentic mention of Kashgar is during the second period of ascendancy of the Han dynasty, when the Chinese conquered the Hiungnu, Yutien (Khotan), Sulei (Kashgar), and a group of states in the Tarim basin almost up to the foot of the Tian Shan mountains. This happened in 76 B.C. Kashgar does not appear to have been known in the West at this time but Ptolemy speaks of Scythia beyond the Imaus, which is in a *Kasia Regio*, possibly exhibiting the name whence Kashgar and Kashgaria (often applied to the district) are formed. Next ensues a long epoch of obscurity. The country was converted to Buddhism and probably ruled by Indo-Scythian or Kushan kings. Hsüan Tswang passed through Kashgar (which he calls Ka-sha) on his return journey from India to China. The Buddhist religion, then beginning to decay in India, was working its way to a new growth in China, and contemporaneously the Nestorian Christians were establishing bishoprics at Herat, Merv and Samarkand, whence they subsequently proceeded to Kashgar, and finally to China itself. In the 8th century came the Arab invasion from the west, and we find Kashgar and Turkestan lending assistance to the reigning queen of Bokhara, to enable her to repel the enemy. But although the Mahommedan religion from the very commencement sustained checks, it nevertheless made its weight felt upon the independent states of Turkestan to the north and east, and thus acquired a steadily growing influence. It was not, however, till the 10th century that Islám was established at Kashgar, under the Uighur kingdom (see TURKS). The Uighurs appear to have been the descendants of the people called Tölas and to have been one of the many Turkish tribes who migrated westwards from China. Boghra Khan, the most celebrated prince of this line, was converted to Mahommedanism late in the 10th century and the Uighur kingdom lasted until 1120 but was distracted by complicated dynastic struggles. The Uighurs employed an alphabet based upon the Syriac and borrowed from the Nestorian missionaries. They spoke a dialect of Turkish preserved in the Kudatku Bilik, a moral treatise composed in 1065. Their kingdom was destroyed by an invasion of the Kara-Kitais, another Turkish tribe pressing westwards from the Chinese frontier, who in their turn were swept away in 1219 by Jenghiz Khan. His invasion gave a decided check to the progress of the Mahommedan creed, but on his death, and during the rule of the Jagatai Khans, who became converts to that faith, it began to reassert its ascendancy. Marco Polo visited the city, which he calls Cascar, about 1275 and left some notes on it.

In 1389–1390 Timur ravaged Kashgar, Andijan and the intervening country. Kashgar passed through a troublous time, and in 1514, on the invasion of the Khan Sultan Said, was destroyed by Mirza Ababakar, who with the aid of ten thousand men built the new fort with massive defences higher up on the banks of the Tuman. The dynasty of the Jagatai Khans collapsed in 1572 by the dismemberment of the country between rival representatives; and soon after two powerful Khoja factions, the White and Black Mountaineers (*Ak* and *Kara Taghluk*), arose, whose dissensions and warfares, with the intervention of the Kalmucks of Dzungaria, fill up the history till 1759, when a Chinese army from Ili (Kulja) invaded the country, and, after perpetrating wholesale massacres, finally consolidated their authority by settling therein Chinese emigrants, together with a Manchu garrison. The Chinese had thoughts of pushing their conquests towards western Turkestan and Samarkand, the chiefs of which sent to ask assistance of the Afghan king Ahmed Shah. This monarch despatched an embassy to Peking to demand the restitution of the Mahommedan states of Central Asia, but the embassy was not well received, and Ahmed Shah was too much engaged with the Sikhs to attempt to enforce his demands by arms. The Chinese continued to hold Kashgar, with sundry interruptions from Mahommedan revolts—one of the most serious occurring in 1827, when the territory was invaded and the city taken by Jahanghir Khoja; Chang-lung, however, the Chinese general of Ili, recovered possession of Kashgar and the other revolted cities in 1828. A revolt in 1829 under Mahommed Ali Khan and Yusuf, brother of Jahanghir, was more successful, and resulted in the concession of several important trade privileges to the Mahommedans of the district of Alty Shahr (the "six cities"), as it was then named. Until 1846 the country enjoyed peace under the just and liberal rule of Zahir-ud-din, the Chinese governor, but in that year a fresh Khoja revolt under Kath Tora led to his making himself master of the city, with circumstances of unbridled licence and oppression. His reign was, however, brief, for at the end of seventy-five days, on the approach of the Chinese, he fled back to Khokand amid the jeers of the inhabitants. The last of the Khoja revolts (1857) was of about equal duration with the previous one, and took place under Wali-Khan, a degraded debauchee, and the murderer of the lamented traveller Adolf Schlagintweit.

The great Tungani (Dungani) revolt, or insurrection of the Chinese Mahommedans, which broke out in 1862 in Kansuh, spread rapidly to Dzungaria and through the line of towns in the Tarim basin. The Tungani troops in Yarkand rose, and (10th of August 1863) massacred some seven thousand Chinese, while the inhabitants of Kashgar, rising in their turn against their masters, invoked the aid of Sadik Beg, a Kirghiz chief, who was reinforced by Buzurg Khan, the heir of Jahanghir, and Yakub Beg, his general, these being despatched at Sadik's request by the ruler of Khokand to raise what troops they could to aid his Mahommedan friends in Kashgar. Sadik Beg soon repented of having asked for a Khoja, and eventually marched against Kashgar, which by this time had succumbed to Buzurg Khan and Yakub Beg, but was defeated and driven back to Khokand. Buzurg Khan delivered himself up to indolence and debauchery, but Yakub Beg, with singular energy and perseverance, made himself master of Yangi Shahr, Yangi-Hissar, Yarkand and other towns, and eventually became sole master of the country, Buzurg Khan proving himself totally unfitted for the post of ruler. Kashgar and the other cities of the Tarim basin remained under Yakub Beg's rule until 1877, when the Chinese regained possession of their ancient dominion. (C. E. D. B.; C. EL.)

KASHI, or KASI, formerly the Persian word for all glazed and enamelled pottery irrespectively; now the accepted term for certain kinds of enamelled tile-work, including brick-work and tile-mosaic work, manufactured in Persia and parts of Mahommedan India, chiefly during the 16th and 17th centuries.[1]

Undoubtedly originating in the Semitic word for glass, *kas*, it is quite possible that the name *kashi* is immediately derived from Kashan, a town in Persia noted for its *faïence*. This ancient pottery site, in turn, probably receives its name from the old-time industry; as a "city of the plain" it would obviously have no claim to the farther-eastern suffix *shan*, meaning a mountain. Sir George Birdwood wisely considers that "the art of glazing eathenware has, in Persia, descended in an almost unbroken tradition from the period of the greatness of Chaldaea and Assyria . . . the name *kas*, by which it is known in Arabic and Hebrew, carries us back to the manufacture of glass and enamels for which great Sidon was already famous 1500 years before Christ . . . the designs used in the decoration of Sind and Punjab glazed pottery also go to prove how much these Indian wares have been influenced by Persian examples and the Persian tradition of the much earlier art of Nineveh and Babylon" (*The Industrial Arts of India*, 1880). The two native names for glass, *kanch* and *shisha*, common to Persia and India, are, seemingly, modifications of kashi. The Indian tradition of Chinese potters settling in bygone days at Lahore and Hala respectively, still lingers in the Punjab and Sind provinces, and evidently travelled eastward from Persia with the Moguls. Howbeit in Lahore the name Chíní is sometimes wrongly applied to *kashi* work; and the so-called Chíní-ka-Rauza mausoleum at Agra is an instance of this misuse. It now seems an established fact that a colony of Chinese ceramic experts migrated to Isfahan during the 16th century (probably in the reign, and at the invitation, of Shah Abbas I.), and there helped to revive the jaded pottery industry of that district.

Kashi work consisted of two kinds: (*a*) Enamel-faced tiles and bricks of strongly fired red earthenware, or terra-cotta; (*b*) Enamel-faced tiles and tesserae of lightly fired "lime-mortar," or sandstone. Tile-mosaic work is described by some authorities as the true *kashi*. From examination of figured tile-mosaic patterns, it would appear that, in some instances, the shaped tesserae had been cut out of enamelled slabs or tiles after firing; in other examples to have been cut into shape before receiving their facing of coloured enamel. Mosaic panels in the fort at Lahore are described by J. L. Kipling as "showing a *gul dasta*, or foliated pattern of a branching tree, each leaf of which is a separate piece of pottery." Conventional representations of foliage, flowers and fruit, intricate geometrical figures, interlacing arabesques, and decorative calligraphy—inscriptions in Arabic and Persian—constitute the ordinary *kashi* designs. The colours chiefly used were cobalt blue, copper blue (turquoise colour), lead-antimoniate yellow (mustard colour), manganese purple, iron brown and tin white. A colour-scheme, popular with Mogul and contemporary Persian *kashigars*, was the design, in cobalt blue and copper blue, reserved on a ground of deep mustard yellow. Before applying the enamel colours, the rough face of the tile, or the tesserae, received a thin coating of slip of variable composition. It is probably owing to some defect in this part of the process, or to imperfect firing, that the enamelled tile surfaces on many old buildings, particularly on the south side, have weathered and flaked away.

In India the finest examples of *kashi* work are in the Punjab and Sind provinces. At Lahore, amongst many beautiful structures, the most notable are the mosque of Wazir Khan (A.D. 1634) and the gateways of three famous pleasure gardens, the Shalamar Bagh (A.D. 1637), the Gulabi Bagh (A.D. 1640), and the Charburji (*c.* A.D. 1665). At Tatta the Jami Masjid, built by Shah Jahan (*c.* A.D. 1645), is a splendid illustration; whilst in that "vast cemetery of six square miles" on the adjacent Malki plateau, are numerous Mahommedan tombs (A.D. 1570–1640) with extraordinary *kashi* ornamentation. Delhi, Multan, Jullundur, Shahdara, Lahore cantonment, Agra and Hyderabad (Sind), all possess excellent monuments of the best period viz. those erected during the reigns of Akbar and Jahangir (A.D. 1556–1628).

In Persia, at Isfahan, Kashan, Meshed and Kerman are a few buildings and ruins showing the old *kashi* work; the palace of Chehel Sitûn in Isfahan, built during the reign of Shah Abbas I. (*c.* A.D. 1600), is a magnificent specimen of this art.

Occasional revivals of the manufacture have taken place both in India and Persia. Mahommed Sharíf, a potter of Jullundur in the Punjab, reproduced the Mogul enamelled tile-work in 1885, and there is a manuscript record of a certain Ustad Ali Mahommed, of Isfahan, who revived the Persian processes in 1887. (W. B.*; C. S. C.)

KASHMIR, or CASHMERE, a native state of India, including much of the Himalayan mountain system to the north of the Punjab. It has been fabled in song for its beauty (*e.g.* in Moore's *Lalla Rookh*), and is the chief health resort for Europeans in India, while politically it is important as guarding one of the approaches to India on the north-west frontier. The proper name of the state is Jammu and Kashmir, and it comprises in all an estimated area of 80,900 sq. m., with a population (1901) of 2,905,578, showing an increase of 14·21% in the decade. It is bounded on the north by some petty hills chiefships and by the Karakoram mountains; on the east by Tibet; and on the south and west by the Punjab and North-West Frontier provinces. The state is in direct political subordination to the Government of India, which is represented by a resident. Its territories comprise the provinces of Jammu (including the jagir of Punch), Kashmir, Ladakh, Baltistan and Gilgit; the Shin states of Yaghistan, of which the most important are Chilas, Darel and Tangir, are nominally subordinate to it, and the two former pay a tribute of gold dust. The following are the statistics for the main divisions of the state:—

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[1] Káshí, the Hindu name for the sacred city of Benares, has no ceramic significance.

	Area in sq. m.	Pop. in 1901.
Jammu	5,223	1,521,307
Kashmir	7,922	1,157,394
Frontier Districts	443	226,877

The remainder of the state consists of uninhabited mountains, and its only really important possessions are the districts of Jammu and Kashmir.

Physical Conformation.—The greater portion of the country is mountainous, and with the exception of a strip of plain on the south-west, which is continuous with the great level of the Punjab, may be conveniently divided into the following regions:

(1) The outer hills and the central mountains of Jammu district.
(2) The valley of Kashmir.
(3) The far side of the great central range, including Ladakh, Baltistan and Gilgit.

The hills in the outer region of Jammu, adjoining the Punjab plains, begin with a height of 100 to 200 ft., followed by a tract of rugged country, including various ridges running nearly parallel, with long narrow valleys between. The average height of these ridges is from 3000 to 4000 ft. The central mountains are commonly 8000 to 10,000 ft., covered with pasture or else with forest. Then follow the more lofty mountain ranges, including the region of perpetual snow. A great chain of snowy mountains branching off south-east and north-west divides the drainage of the Chenab and the Jhelum rivers from that of the higher branches of the Indus. It is within spurs from this chain that the valley of Kashmir is enclosed amid hills which rise from 14,000 to 15,000 ft., while the valley itself forms a cup-like basin at an elevation of 5000 to 6000 ft. All beyond that great range is a wide tract of mountainous country, bordering the north-western part of Tibet and embracing Ladakh, Baltistan and Gilgit.

The length of the Kashmir valley, including the inner slopes of its surrounding hills, is about 120 m. from north-west to south-east with a maximum width of about 75 m. The low and comparatively level floor of the basin is 84 m. long and 20 to 24 m. broad.

The hills forming the northern half-circuit of the Kashmir valley, and running beyond, include many lofty mountain masses and peaks, the most conspicuous of which, a little outside the confines of Kashmir, is Nanga Parbat, the fourth highest mountain in the world, 26,656 ft. above the sea, with an extensive area of glacier on its eastern face. The great ridge which is thrown off to the south-west by Nanga Parbat rises, at a distance of 12 m., to another summit 20,740 ft. in height, from which run south-west, and south-east the ridges which are the northern watershed boundary of Kashmir. The former range, after running 70 m. south-west, between the valleys of the Kishenganga and the Kunhar or Nain-sukh, turns southward, closely pressing the river Jhelum, after it has received the Kishenganga, with a break a few miles farther south which admits the Kunhar. This range presents several prominent summits, the highest two 16,487 and 15,544 ft. above the sea. The range which runs south-east from the junction peak above mentioned divides the valley of the Kishenganga from that of the Astor and other tributaries of the Indus. The highest point on this range, where it skirts Kashmir, is 17,202 ft. above the sea. For more than 50 m. from Nanga Parbat there are no glaciers on this range; thence eastward they increase; one, near the Zoji-la pass, is only 10,850 ft. above the sea. The mountains at the east end of the valley, running nearly north and south, drain inwards to the Jhelum, and on the other side to the Wardwan, a tributary of the Chenab. The highest part of this eastern boundary is 14,700 ft. There no are glaciers. The highest point on the Panjal range, which forms the south and south-west boundary, is 15,523 ft. above the sea.

The river Jhelum (*q.v.*) or Behat (Sanskrit (*Vitasta*)—the Hydaspes of Greek historians and geographers—flows north-westward through the middle of the valley. After a slow and winding course it expands about 25 m. below Srinagar, over a slight depression in the plain, and forms the Wular lake and marsh, which is about 12½ m. by 5 m. in extent, and surrounded by the lofty mountains which tower over the north and north-east of the valley. Leaving the lake on the south-west side, near the town of Sopur, the river pursues its sluggish course south-westward, about 18 m. to the gorge at Baramulla. From this point the stream is more rapid through the narrow valley which conducts it westward 75 m. to Muzaffarabad, where it turns sharply south, joined by the Kishenganga. At Islamabad, about 40 m. above Srinagar, the river is 5400 ft. above sea-level, and at Srinagar 5235 ft. It has thus a fall of about 4 ft. per mile in this part of its course. For the next 24 m. to the Wular lake, and thence to Baramulla, its fall is only about 2¼ ft. in the mile. On the 80 m. of the river in the flat valley between Islamabad and Baramulla, there is much boat traffic; but none below Baramulla, till the river comes out into the plains.

On the north-east side of this low narrow plain of the Jhelum is a broad hilly tract between which and the higher boundary range runs the Kishenganga River. Near the east end of this interior hilly tract, and connected with the higher range, is one summit 17,839 ft. Around this peak and between the ridges which run from it are many small glaciers. These heights look down on one side into the beautiful valley of the Sind River, and on another into the valley of the Lidar, which join the Jhelum. Among the hills north of Srinagar rises one conspicuous mountain mass, 16,903 ft. in height, from which on its north side descend tributaries of the Kishenganga, and on the south the Wangat River, which flows into the Sind. By these rivers and their numerous affluents the whole valley of Kashmir is watered abundantly.

Around the foot of many spurs of the hills which run down on the Kashmir plain are pieces of low table-land, called *karéwa*. These terraces vary in height at different parts of the valley from 100 to 300 ft. above the alluvial plain. Those which are near each other are mostly about the same level, and separated by deep ravines. The level plain in the middle of the Kashmir valley consists of fine clay and sand, with water-worn pebbles. The karewas consist of horizontal beds of clay and sand, the lacustrine nature of which is shown by the shells which they contain.

Two passes lead northward from the Kashmir valley, the Burzil (13,500 ft.) and the Kamri (14,050). The Burzil is the main pass between Srinagar and Gilgit via Astor. It is usually practicable only between the middle of July and the middle of September. The road from Srinagar to Lehin Ladakh follows the Sind valley to the Zoji-la-pass (11,300 ft.) Only a short piece of the road, where snow accumulates, prevents this pass being used all the year. At the south-east end of the valley are three passes, the Margan (11,500 ft.), the Hoksar (13,315) and the Marbal (11,500), leading to the valleys of the Chenab and the Ravi. South of Islamabad, on the direct route to Jammu and Sialkot, is the Banihal pass (9236 ft.). Further west on the Panjal range is the Pir Panjal or Panchal pass (11,400 ft.), with a second pass, the Rattan Pir (8200 ft.), across a second ridge about 15 m. south-west of it. Between the two passes is the beautifully situated fort of Baramgali. This place is in the domain of the raja of Punch, cousin and tributary of the maharaja of Kashmir. At Rajaori, south of these passes, the road divides: one line leads to Bhimber and Gujrat, the other to Jammu and Sialkot by Aknur. South-west of Baramulla is the Haji Pir pass (8500 ft.), which indicates the road to Punch. From Punch one road leads down to the plains at the town of Jhelum, another eastward through the hills to the Rattan Pir pass and Rajaori. Lastly, there is the river pass of the Jhelum, which is the easy route from the valley westward, having two ways down to the plains, one by Muzaffarabad and the Hazara valley to Hasan Abdal, the other by the British hill station of Murree to Rawalpindi.

Geology.—The general strike of the beds, and of the folds which have affected them, is from N.W. to S.E., parallel to the mountain ranges. Along the south-western border lies the zone of Tertiary beds which forms the Sub-Himalayas. Next to this is a great belt of Palaeozoic rocks, through which rise the granite, gneiss and schist of the Zanskar and Dhauladhar ranges and of the Pir Panjal. In the midst of the Palaeozoic area lie the alluvium and Pleistocene deposits of the Srinagar valley, and the Mesozoic and Carboniferous basin of the upper part of the Sind valley. Beyond the great Palaeozoic belt is a zone of Mesozoic and Tertiary beds which commences at Kargil and extends south-eastward past the Kashmir boundary to Spiti and beyond. Finally, in Baltistan and the Ladakh range there is a broad zone composed chiefly of gneiss and schist of ancient date.

The oldest fossils found belong either to the Ordovician or Silurian systems. But it is not until the Carboniferous is reached that fossils become at all abundant (so far as is yet known). The Mesozoic deposits belong chiefly to the Trias and Jura, but Cretaceous beds have been found near the head of the Tsarap valley. The Tertiary system includes representatives of all the principal divisions recognized in other parts of the Himalayas.

Climate.—The valley of Kashmir, sheltered from the south-west monsoon by the Panjal range, has not the periodical rains of India. Its rainfall is irregular, greatest in the spring months. Occasional storms in the monsoon pass over the crests of the Panjal and give heavy rain on the elevated plateaus on the Kashmir side. And again clouds pass over the valley and are arrested by the higher hills on the north-east side. Snow falls on the surrounding hills at intervals from October to March. In the valley the first snow generally falls about the end of December, but never to any great amount. The hottest months are July, August and the greater part of September, during which the noon shade temperature varies from 85° to 90° and occasionally 95° at Srinagar, probably the hottest place in the valley. The coldest months are January and February, when for several weeks the average minimum temperature is about 15° below freezing. As a health resort the province, excluding Srinagar, which is insanitary and relaxing, has no rival anywhere in the neighbourhood of India. Its climate is admirably adapted to the European constitution, and in consequence of the varied range of temperature and the facility of moving about the visitor is enabled with ease to select places at elevations most congenial to him. Formerly only 200 passes a year were issued by the government, but now no restriction is placed on visitors, and their number increases annually. European sportsmen and travellers, in addition to residents of India, resort there freely. The railway to Rawalpindi, and a driving road thence to Srinagar make the valley easy of access. When the temperature in Srinagar rises at the beginning of June, there is a general exodus to Gulmarg, which has become a fashionable hill-station. This great influx of visitors has resulted in a corresponding diminution of game. Special game preservation rules have been introduced, and *nullahs* are let out for stated periods with a restriction on the number of head to be shot. The wild animals of the country include ibex, markhor, oorial, the Kashmir stag, and black and brown bears. Many sportsmen now cross into Ladakh and the Pamirs.

People.—The great majority of the inhabitants of Kashmir are professedly Mahommedans, but their conversion to the faith of Islam is comparatively recent and they are still strongly influenced by their ancient superstitions. At the census of 1901 out of a total population in the whole state of 2,905,578, there were 2,154,695 Mahommedans, 689,073 Hindus, 35,047 Buddhists and 25,828 Sikhs. The Hindus are mostly found in Jammu, and the Buddhists are confined to Ladakh. In Kashmir proper the few Hindus (60,682) are almost all Brahmans, known as Pundits. Superstition has made the Kashmiri timid; tyranny has made him a liar; while physical disasters have made him selfish and pessimistic. Up to recent times the cultivator lived under a system of *begar*, which entitled an official to take either labour or commodities free of payment from the villages. Having no security of property, the people had no incentive to effort, and with no security for life they lost the independence of free men. But the land settlement of 1889 swept all these abuses away. Restrictive monopolies, under which bricks, lime, paper and certain other manufactures were closed to private enterprise, were abolished. The results of the settlement are thus enumerated by Sir Walter Lawrence: "Little by little, confidence has sprung up. Land which had no value in 1889 is now eagerly sought after by all classes. Cultivation has extended and improved. Houses have been rebuilt and repaired, fields fenced in, orchards planted, vegetable gardens well stocked and new mills constructed. Women no longer are seen toiling in the fields, for their husbands are now at home to do the work, and the long journeys to Gilgit are a thing of the past. When the harvest is ripe the peasant reaps it at his own good time, and not a soldier ever enters the villages." In consequence of this improvement in their conditions of life and of the influx of wealth into the country brought by visitors, the Kashmiri grows every year in material prosperity and independence of character. The Kashmir women have a reputation for beauty which is not altogether deserved, but the children are always pretty.

The language spoken in Kashmir is akin to that of the Punjab, though marked by many peculiarities. It possesses an ancient literature, which is written in a special character (*see* KASHMIRI).

Natural Calamities.—The effect of physical calamities partly incidental to the climate of Kashmir, upon the character of its inhabitants has been referred to. The list includes fires, floods, earthquakes, famines and cholera. The ravages of fire are chiefly felt in Srinagar, where the wood houses and their thatched roofs fall an easy prey to the flames. The national habit of carrying a *kangar*, or small brazier, underneath the clothes for the purpose of warming the body, is a fruitful cause of fires. Srinagar is said to have been burnt down eighteen times. Many disastrous floods are recorded, the greatest being the terrible inundation which followed the slipping of the Khadanyar mountain below Baramula in A.D. 879. The channel of the Jhelum river was blocked and a large part of the valley submerged. In 1841 a serious flood caused great damage to life and property; there was another in 1893, when six out of the seven bridges in Srinagar were washed away, 25,426 acres under crops were submerged and 2225 houses were wrecked; another flood occurred in July 1903, when the bund between the Dal Lake and the canal gave way, and the lake rose 10 ft. in half an hour. Between two and three thousand houses in and around Srinagar collapsed, while over 40 miles of the tonga road were submerged. Since the 15th century eleven great earthquakes have occurred, all of long duration and accompanied by great loss of life. During the 19th century there were four severe earthquakes, the last two occurring in 1864 and 1885, when some 3500 people were killed. Native historians record nineteen great famines, the last two occurring in 1831 and 1877. In 1878 it was reported that only two-fifths of the total population of the valley survived. During the 19th century also there were ten epidemics of cholera, all more or less disastrous, while the worst (in 1892) was probably the last. During that year 5781 persons died in Srinagar and 5931 in the villages. The centre of infection is generally supposed to be the squalid capital of Srinagar, and some efforts to improve its sanitation have been made of recent years.

Crops.—The staple crop of the valley is rice, which forms the chief food of the people. Indian corn comes next; wheat, barley and oats are also grown. Every kind of English vegetable thrives well, especially asparagus, artichoke, seakale, broad beans, scarlet-runners, beetroot, cauliflower and cabbage. Fruit trees are met with all over the valley, wild but bearing fruit, and the cultivated orchards yield pears, apples, peaches, cherries, &c., equal to the best European produce. The chief trees are deodar, firs and pines, *chenar* or plane, maple, birch and walnut. There are state departments of viticulture, hops, horticulture and sericulture. A complete list of the flora and fauna of the valley will be found in Sir Walter Lawrence's book on Kashmir.

Industries.—The chief industry of Srinagar was formerly the weaving of the celebrated Kashmir shawl, which dates back to the days of the emperor Baber. These shawls first became fashionable in Europe in the reign of Napoleon, when they fetched from £10 to £100; but the industry received a blow at the time of the Franco-German War, and the famine of 1877 scattered the weavers. The place of the Kashmir shawl has to some extent been taken by the Kashmir carpet, but the most thriving industry now is that of silk-weaving. Srinagar is also celebrated for its silver-work, papier mâché and wood-carving. The minerals and metals of the Jammu district are promising, and a company has been formed to work them. Coal of fair quality has been found, but the difficulties of transport interfere with its working.

History.—The metrical chronicle of the kings of Kashmir, called *Rajatarangini*, was pronounced by Professor H. H. Wilson to be the only Sanskrit composition yet discovered to which the title of history can with any propriety be applied. It first became known to the Mahommedans when, on Akbar's invasion of Kashmir in 1588, a copy was presented to the emperor. A translation into Persian was made by his order, and a summary of its contents, from this Persian translation, is given by Abu'l Fazl in the *Ā’īn-i-Akbarī*. The *Rajatarangini*, the first of a series of four Sanskrit histories, was written about the middle of the 12th century by P. Kalhana. His work, in six books, makes use of earlier writings now lost. Commencing with traditional history of very early times, it comes down to the reign of Sangrama Deva, 1006; the second work, by Jonaraja, takes up the history in continuation of Kalhana's, and, entering the Mahommedan period, gives an account of the reigns down to that of Zain-ul-ab-ad-din, 1412. P. Srivara carried on the record to the accession of Fah Shah, 1486. And the fourth work, called *Rājāvalipataka*, by Prajnia Bhatta, completes the history to the time of the incorporation of Kashmir in the dominions of the Mogul emperor Akbar, 1588.

In the *Rājātarangini* it is stated that the valley of Kashmir was formerly a lake, and that it was drained by the great *rishi* or sage, Kasyapa, son of Marichi, son of Brahma, by cutting the gap in the hills at Baramulla (Varaha-mula). When Kashmir had been drained, he brought in the Brahmans to occupy it. This is still the local tradition, and in the existing physical condition of the country we may see some ground for the story which has taken this form. The name of Kasyapa is by history and tradition connected with the draining of the lake, and the chief town or collection of dwellings in the valley was called Kasyapa-pur—a name which has been plausibly identified with the *Κασπάπυρος* of Hecataeus (Steph. Byz., *s.v.*) and *Κασπάτυρος* of Herodotus (iii. 102, iv. 44). Kashmir is the country meant also by Ptolemy's *Κασπήρια*. The ancient name Kasyapa-pur was applied to the kingdom of Kashmir when it comprehended great part of the Punjab and extended beyond the Indus. In the 7th century Kashmir is said by the Chinese traveller Hsuan Tsang to have included Kabul and the Punjab, and the hill region of Gandhara, the country of the Gandarae of classical geography.

At an early date the Sanskrit name of the country became *Kásmír*. The earliest inhabitants, according to the *Rajatarangini*, were the people called Naga, a word which signifies "snake." The history shows the prevalence in early times of tree and serpent worship, of which some sculptured stones found in Kashmir still retain the memorials. The town of Islamabad is called also by its ancient name Anant-nag ("eternal snake"). The source of the Jhelum is at Vir-nag (the powerful snake), &c. The other races mentioned as inhabiting this country and the neighbouring hills are Gandhari, Khasa and Daradae. The Khasa people are supposed to have given the name Kasmir. In the *Mahabharata* the Kasmira and Daradae are named together among the Kshattriya races of northern India. The question whether, in the immigration of the Aryans into India, Kashmir was taken on the way, or entered afterwards by that people after they had reached the Punjab from the north-west, appears to require an answer in favour of the latter view (see vol. ii. of Dr J. Muir's *Sanskrit Texts*). The Aryan races of Kashmir and surrounding hills, which have at the present time separate geographical distribution, are given by Mr Drew as *Kashmírí* (mostly Mahommedan), in the Kashmir basin and a few scattered places outside; *Dard* (mostly Mahommedan) in Gilgit and hills north of Kashmir; *Dogra* (Hindu) in Jamma; *Dogra* (Mahommedan, called *Chibāli*) in Punch and hill country west of Kashmir; *Pahāri* or mountaineers (Hindu) in Kishtwar, east of Kashmir, and hills about the valley of the Chenab.

In the time of Asoka, about 245 B.C., one of the Indian Buddhist missions was sent to Kashmir and Gandhara. After his death Brahmanism revived. Then in the time of the three Kushan princes, Huvishka, Jushka and Kanishka, who ruled over Kashmir about the beginning of the Christian era, Buddhism was to a great extent restored, though for several centuries the two religions existed together in Kashmir, Hinduism predominating. Yet Kashmir, when Buddhism was gradually losing its hold, continued to send Buddhist teachers to other lands. In this Hindu-Buddhist period, and chiefly between the 5th and 10th centuries of the Christian era, were erected the Hindu temples in Kashmir. In the 6th and 7th centuries Kashmir was visited by some of the Chinese Buddhist pilgrims to India. The country is called *Shie-mi* in the narrative of To Yeng and Sung Yun (578). One of the Chinese travellers of the next century was for a time an elephant-tamer to the king of Kashmir. Hsuan Tsang spent two years (631–633) in Kashmir (*Kia-chi-mi-lo*). He entered by Baramula and left by the Pir Panjal pass. He describes the hill-girt valley, and the abundance of flowers and fruits, and he mentions the tradition about the lake. He found in Kashmir many Buddhists as well as Hindus. In the following century the kings of Kashmir appear to have paid homage and tribute to China, though this is not alluded to in the Kashmir chronicle. Hindu kings continued to reign till about 1294, when Udiana Deva was put to death by his Mahommedan vizier, Amir Shah, who ascended the throne under the name of Shams-ud-din.

Of the Mahommedan rulers mentioned in the Sanskrit chronicles, one, who reigned about the close of the 14th century, has made his name prominent by his active opposition to the Hindu religion, and his destruction of temples. This was Sikandar, known as *But-shikan*, or the "idol-breaker." It was in his time that India was invaded by Timur, to whom Sikandar made submission and paid tribute. The country fell into the hands of the Moguls in 1588. In the time of Alamgir it passed to Ahmad Shah Durani, on his third invasion of India (1756); and from that time it remained in the hands of Afghans till it was wrested from them by Ranjit Singh, the Sikh monarch of the Punjab, in 1819. Eight Hindu and Sikh governors under Ranjit Singh and his successors were followed by two Mahommedans similarly appointed, the second of whom, Shekh Imam-ud-din, was in charge when the battles of the first Sikh war 1846 brought about new relations between the British Government and the Sikhs.

Gulab Singh, a Dogra Rajput, had from a humble position been raised to high office by Ranjit Singh, who conferred on him the small principality of Jammu. On the final defeat of the Sikhs at Sobraon (February 1846), Gulab Singh was called to take a leading part in arranging conditions of peace. The treaty of Lahore (March 9, 1846) sets forth that, the British Government having demanded, in addition to a certain assignment of territory, a payment of a crore and a half of rupees (1½ millions sterling), and the Sikh government being unable to pay the whole, the maharaja (Dhulip Singh) cedes, as equivalent for one crore, the hill country belonging to the Punjab between the Beas and the Indus, including Kashmir and Hazara. The governor-general, Sir Henry Hardinge, considered it expedient to make over Kashmir to the Jammu chief, securing his friendship while the British government was administering the Punjab on behalf of the young maharaja. Gulab Singh was well prepared to make up the payment in default of which Kashmir was ceded to the British; and so, in consideration of his services in restoring peace, his independent sovereignty of the country made over to him was recognized, and he was admitted to a separate treaty. Gulab Singh had already, after several extensions of territory east and west of Jammu, conquered Ladakh (a Buddhist country, and till then subject to Lhasa), and had then annexed Skardo, which was under independent Mahommedan rulers. He had thus by degrees half encircled Kashmir, and by this last addition his possessions attained nearly their present form and extent. Gulab Singh died in 1857, and was succeeded by his son, Ranbir Singh, who died in 1885. The next ruler, Maharaja Partab Singh, G.C.S.I. (b. 1850), immediately on his accession inaugurated the settlement reforms already described. His rule was remarkable for the reassertion of the Kashmir sovereignty over Gilgit (*q.v.*). Kashmir imperial service troops participated in the Black Mountain expedition of 1891, the Hunza Nagar operations of 1891, and the Tirah campaign of 1897–1898. The total revenue of the state is about £666,000.

See Drew, *Jammu and Kashmir* (1875); M. A. Stein, *Kalhana's Rajatarangini* (1900); W.R. Lawrence, *The Valley of Kashmir* (1895); Colonel A. Durand, *The Making of a Frontier* (1899); R. Lydekker, "The Geology of the Kashmir and Chamba Territories," *Records of the Geological Survey of India*, vol. xxii. (1883); J. Duke, *Kashmir Handbook* (1903). (T. H. H.*)

KASHMIRI (properly *Kāśmīrī*), the name of the vernacular language spoken in the valley of Kashmir (properly *Kaśmīr*) and in the hills adjoining. In the Indian census of 1901 the number of speakers was returned at 1,007,957. By origin it is the most southern member of the Dard group of the Piśāca languages (see INDO-ARYAN LANGUAGES). The other members of the group are Shīnā, spoken to its north in the country round Gilgit, and Kōhistānī, spoken in the hill country on both sides of the river Indus before it debouches on to the plains of India. The Piśāca languages also include Khōwār, the vernacular of Chitral, and the Kāfir group of speeches, of which the most important is the Bashgali of Kafiristan. Of all these forms of speech Kashmiri is the only one which possesses a literature, or indeed an alphabet. It is also the only one which has been dealt with in the census of India, and it is therefore impossible to give even approximate figures for the numbers of speakers of the others. The whole family occupies the three-sided tract of country between the Hindu-Kush and the north-western frontier of British India.

As explained in INDO-ARYAN LANGUAGES, the Piśāca languages are Aryan, but are neither Iranian nor Indo-Aryan. They represent the speech of an independent Aryan migration over the Hindu-Kush directly into their present inhospitable seats, where they have developed a phonetic system of their own, while they have retained unchanged forms of extreme antiquity which have long passed out of current use both in Persia and in India. Their speakers appear to have left the main Aryan body after the great fission which resulted in the Indo-Aryan migration, but before all the typical peculiarities of Iranian speech had fully developed. They are thus representatives of a stage of linguistic progress later than that of Sanskrit, and earlier than that which we find recorded in the Iranian Avesta.

The immigrants into Kashmir must have been Shīns, speaking a language closely allied to the ancestor of the modern Shīnā. They appear to have dispossessed and absorbed an older non-Aryan people, whom local tradition now classes as Nāgas, or Snake-gods, and, at an early period, to have come themselves under the influence of Indo-Aryan immigrants from the south, who entered the valley along the course of the river Jhelam. The language has therefore lost most of its original Piśāca character, and is now a mixed one. Sanskrit has been actively studied for many centuries, and the Kashmiri vocabulary, and even its grammar, are now largely Indian. So much is this the case that, for convenience' sake, it is now frequently classed (see Indo-Aryan Languages) as belonging to the north-western group of Indo-Aryan languages, instead of as belonging to the Piśāca family as its origin demands. It cannot be said that either classification is wrong.

Kashmiri has few dialects. In the valley there are slight changes of idiom from place to place, but the only important variety is Kishtwārī, spoken in the hills south-west of Kashmir. Smaller dialects, such as Pogul and Rāmbanī of the hills south of the Banihāl pass, may also be mentioned. The language itself is an old one. Pure Kashmiri words are preserved in the Sanskrit *Rājataraṅgiṇī* written by Kalhaṇa in the 12th century A. D., and, judging from these specimens, the language does not appear to have changed materially since his time.

General Character of the Language.—Kashmiri is a language of great philological interest. The two principal features which at once strike the student are the numerous epenthetic changes of vowels and consonants and the employment of pronominal suffixes. In both cases the phenomena are perfectly plain, cause and effect being alike presented to the eye in the somewhat complicated systems of declension and conjugation. The Indo-Aryan languages proper have long ago passed through this stage, and many of the phenomena now presented by them are due to its influence, although all record of it has disappeared. In this way a study of Kashmiri explains a number of difficulties found by the student of Indo-Aryan vernaculars.[1]

In the following account the reader is presumed to be in possession of the facts recorded in the articles Indo-Aryan Languages and Prakrit, and the following contractions will be employed: Ksh. = Kashmiri ; Skr. = Sanskrit ; P. = Piśāca ; Sh. = Shīnā.

A. *Vocabulary.* The vocabulary of Kashmiri is, as has been explained, mixed. At its basis it has a large number of words which are also found in the neighbouring Shīnā, and these are such as connote the most familiar ideas and such as are in most frequent use. Thus, the personal pronouns, the earlier numerals, the words for "father," "mother," "fire," "the sun," are all closely connected with corresponding Shīnā words. There is also a large Indian element, consisting partly of words derived from Sanskrit vocables introduced in ancient times, and partly of words borrowed in later days from the vernaculars of the Punjab. Finally, there is a considerable Persian (including Arabic) element due to the long Mussulman domination of the Happy Valley. Many of these have been considerably altered in accordance with Kashmiri phonetic rules, so that they sometimes appear in strange forms. Thus the Persian *lagām*, a bridle, has become *lākam*, and the Arabic *bābat*, concerning, appears as *bāpat*. The population speaking Kashmiri is mainly Mussulman, there being, roughly speaking, nine Mahommedan Kashmiris to less than one Hindu. This difference of religion has strongly influenced the vocabulary. The Mussulmans use Persian and Arabic words with great freedom, while the Hindus, or "Pandits" as they are called, confine their borrowings almost entirely to words derived from Sanskrit. As the literary class is mostly Hindu, it follows that Kashmiri literature, taken as a whole, while affording most interesting and profitable study, hardly represents the actual language spoken by the mass of the people. There are, however, a few good Kashmiri works written by Mussulmans in their own dialect.

B. *Written Characters.* Mussulmans and Christian missionaries employ an adaptation of the Persian character for their writings. This alphabet is quite unsuited for representing the very complex Kashmiri vowel system. Hindus employ the Sāradā alphabet, of Indian origin and akin to the well-known Nāgarī. Kashmiri vowel sounds can be recorded very successfully in this character, but there is, unfortunately, no fixed system of spelling. The Nagari alphabet is also coming into use in printed books, no Śāradā types being yet in existence.

C. *Phonetics.* Comparing the Kashmiri with the Sanskrit alphabet (see Sanskrit), we must first note a considerable extension of the vowel system. Not only does Ksh. possess the vowels *a*, *ā*, *i*, *ī*, *u*, *ū*, *r*, *ē*, *ai*, *ō*, *au*, and the *anunāsika* or nasal symbol ˜, but it has also a flat *ă* (like the *a* in "hat") a flat *ĕ* (like the *e* in "met"), a short *ǒ* (like the *o* in "hot") and a broad *å* (like the *a* in "all"). It also has a series of what natives call "*mātrā*-vowels," which are represented in the Roman character by small letters above the line, viz. ^{a}, ^{i}, $^{\ddot{u}}$, ^{u}. Of these, ^{a} is simply a very short indeterminate sound something like that of the Hebrew *sh^{a}wā mobile*, except that it may sometimes be the only vowel in a word, as in *ts^{a}h*, thou. The ^{i} is a hardly audible *i*, while $^{\ddot{u}}$ and ^{u} are quite inaudible at the end of a syllable. When ^{i} or ^{u} is followed by a consonant in the same syllable ^{i} generally and ^{u} always becomes a full *i* or *u* respectively and is so pronounced. On the other hand, in similar circumstances, $^{\ddot{u}}$ remains unchanged in writing, but is pronounced like a short German *ü*. It should be observed that this $^{\ddot{u}}$ always represents an older *ī*, and is still considered to be a palatal, not, like ^{u}, a labial vowel. Although these mātrā-vowels are so slightly heard, they exercise a great influence on the sound of a preceding syllable. We may compare the sound of *a* in the English word "mar." If we add *e* to the end of this word we get "mare," in which the sound of the *a* is altogether changed, although the *e* is not itself pronounced in its proper place. The back-action of these mātrā-vowels is technically known as *umlaut* or "epenthesis," and is the most striking feature of the Kashmiri language, the structure of which is unintelligible without a thorough knowledge of the system. In the following pages when a vowel is epenthetically affected by a mātrā-vowel the fact will be denoted by a dot placed under it, thus *kạr^{u}*. This is not the native system, according to which the change is indicated sometimes by a diacritical mark and sometimes by writing a different letter. The changes of pronunciation effected by each mātrā-vowel are shown in the following table. If natives employ a different letter to indicate the change the fact is mentioned. In other cases they content themselves with diacritical marks. When no entry is made, it should be understood that the sound of the vowel remains unaltered:—

Preceding Vowel.	*Pronunciation when followed by*			
	a-mātrā	*i-mātrā*	*ū-mātrā*	*u-mātrā*
ạ	*ạ* (*ạd^{a}r*, be moist) (something like a short German *ö*)	*a^{i}* (*kạr^{i}*, pr. *ka^{i}r^{i}*, made, plural masc.)	*ü* (as in German: *kạr$^{\ddot{u}}$*, pr. *kür*, made, fem. sing.)	*o* (like first *o* in "promote"; *kạr^{u}*, pr. *kor*, made, masc. sing.)
ạ̄	*ö* (*kạ̄ñ^{a}r*, pr. *köñ^{a}r*, make one-eyed) (like a long German *ö*)	*ö^{i}* (German *ö*; *mạ̄r^{i}*, pr. *mö^{i}r^{i}*, killed, masc. plur.)	*ö* (*mạ̄r$^{\ddot{u}}$*, pr. *mör*, killed, fem. sing.)	*å* (*mạ̄r^{u}*, pr. *mår*, written, *mōr^{u}*, killed, masc. sing.)
ị	—	—	*yü* (*lịv$^{\ddot{u}}$*, pr. *lyüv*, plastered, fem. sing.	*yu* (*lịv^{u}*, pr. *lyuv*, written *lyuv^{u}*, plastered, masc. sing.)
ị̄	—	—	—	*yū* (*nīl^{u}*, pr. *nyūl*, written *nyūl^{u}*, blue, masc. sing.)
ụ	—	*u^{i}* (*gụr^{i}*, pr. *gu^{i}r^{i}*, horses)	—	—
ụ̄	—	*ū^{i}* (*gụ̄r^{i}*, pr. *gū^{i}r^{i}*, cowherds)	—	—
ẹ̆	*i* (*lẹ̆d^{a}r*, pr. *lid^{a}r*, be yellow)	—	*yü* (*tsẹ̆l$^{\ddot{u}}$*, pr. *tsyül*, squeezed, fem. sing.)	*yu* (*tsẹ̆l^{u}*, pr. *tsyul*, written *tsyul^{u}*, squeezed, masc. sing.)
ẹ̄	—	*ī* (*phẹ̄r^{i}*, pr. and written *phīr^{i}*, turned, masc. plur.)	*ī* (*phẹ̄r$^{\ddot{u}}$*, pr. *phīr*, written, *phīr$^{\ddot{u}}$*, turned, fem. sing.)	*yū* (*phẹ̄r^{u}*, pr. *phyūr*, written *phyūr^{u}*, turned, masc. sing.)
ọ̆	*u* (*họ̆kh^{a}r*, pr. *hukh^{a}r*, make dry)	*ŏ^{i}* (*wọ̆th^{i}*, pr. *wŏ^{i}th^{i}*, arisen, masc. plur.)	*ü* (*wọ̆th$^{\ddot{u}}$*, pr. *wüth*, arisen, fem. sing.)	*o* (*wọ̆th^{u}*, pr. *woth*, arisen, masc. sing.)
ọ̄	—	*ū^{i}* (*bū^{i}z^{i}*, pr. *bū^{i}z^{i}*, written *būz^{i}*, heard. masc. plur.)	*ū* (*bọ̄z$^{\ddot{u}}$*, pr. *būz*, written, *būz$^{\ddot{u}}$*, heard, fem. sing.)	*ū* (*bōz^{u}*, pr. *būz*, written *būz^{u}*, heard, masc. sing.)

The letters *u* and *i*, even when not *u*-mātrā or *i*-mātrā, often change a preceding long *ā* to *å*, which is usually written *ō*, and *ạ̄* respectively. Thus *rāwukh*, they have lost, is pronounced *råwukh*, and, in the native character, is written *rōwukh*. Similarly *mālis* becomes *mąlis* (*mölis*). The diphthong *ai* is pronounced *ö* when it commences a word; thus, *aiṭh*, eight, is pronounced *öṭh*. When *i* and *u* commence a word they are pronounced *yi* and *wu* respectively. With one important exception, common to all Piśāca languages, Kashmiri employs every consonant found in the Sanskrit alphabet. The exception is the series of aspirated consonants, *gh*, *jh*, *ḍh*, *dh* and *bh*, which are wanting in Ksh., the corresponding unaspirated consonants being substituted for them. Thus, Skr. *ghōṭakas*, but Ksh. *gur*^{u}, a horse; Skr. *bhavati*, Ksh. *bövi*, he will be. There is a tendency to use dental letters where Hindī employs cerebrals, as in Hindi *uṭh*, Ksh. *wŏth*, arise. Cerebral letters are, however, owing to Sanskrit influence, on the whole better preserved in Ksh. than in the other Piśāca languages. The cerebral *ṣ* has almost disappeared, *ś* being employed instead. The only common word in which it is found is the numeral *ṣah*, six, which is merely a learned spelling for *śah*, due to the influence of the Skr. *ṣaṭ*. From the palatals *c*, *ch*, *j*, a new series of consonants has been formed, viz. *ts*, *tsh* (aspirate of *ts*—*i.e.* *ts*+*h*, not *t*+*sh*), and *z* (as in English, not *dz*). Thus, Skr. *cōras*, Ksh. *tsūr*, a thief; Skr. *chalayati*, Ksh. *tshali*, he will deceive; Skr. *jalam*, Ksh. *zal*, water. The sibilant *ś*, and occasionally *s*, are frequently represented by *h*. Thus, Skr. *daśa*, Ksh. *dah*, ten; Skr. *śiras*, Ksh. *hīr*, a head. We may compare with this the Persian word *Hind*, India (compare the Greek Ἰνδός, an Indian), derived from the Skr. *Sindhus*, the river Indus. When such an *h* is followed by a palatal letter the *ś* returns; thus, from the base *hiś*-, like this, we have the nominative masculine *hịh*^{u}, but the feminine *hiś*$^{\bar{u}}$, and the abstract noun *hiśyar*, because $^{\bar{u}}$ and *y* are palatal letters.

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[1] See G. A. Grierson, "On Pronominal Suffixes in the Kāçmīrī Languages," and "On the Radical and Participial Tenses of the Modern Indo-Aryan Languages," in *Journal of the Asiatic Society of Bengal*, vol. lxiv. (1895), pt. i. pp. 336 and 352.

The palatal letters *i*, *e*, *ū-mātrā* and *y* often change a preceding consonant. The modifications will be seen from the following examples: *rāt*-, night; nom. plur. *rą̄ts*$^{\bar{u}}$; *wŏth*, arise; *wọ̆tsh*$^{\bar{u}}$, she arose: *lad*, build; *lạz*$^{\bar{u}}$, she was built: *ran*, cook; *rạñ*$^{\bar{u}}$, she was cooked; *pạṭ*$^{\bar{u}}$, a tablet; Ag. sing. *paci*: *kāth*-, a stalk; nom. plur. *kāchĕ*: *baḍ*-, great; nom. plur. fem. *bajĕ*: *batuk*^{u}, a duck; fem. *bat*^{a}*c*$^{\bar{u}}$: *hŏkh*^{u}, dry; fem. *họ̆ch*$^{\bar{u}}$; *srọ̆g*^{u}, cheap; *srŏjyar*, cheapness: *wą̄l*^{u}, a ring; fem. *wą̄j*$^{\bar{u}}$, a small ring; *lōs*, be weary; *lọ̄s*$^{\bar{u}}$ or *lọ̄ts*$^{\bar{u}}$, she was weary. These changes are each subject to certain rules. Cerebral letters (*ṭ*, *ṭh*, *ḍ*) change only before *i*, *ĕ* or *y*, and not before *ū-mātrā*. The others, on the contrary, do not change *i*, but do change before *ĕ*, *y* or *ū-mātrā*.

No word can end in an unaspirated surd consonant. If such a consonant falls at the end of a word it is aspirated. Thus, *ak*, one, becomes *akh* (but acc. *akis*); *kaṭ*, a ram, becomes *kaṭh*; and *hat*, a hundred, *hath*.

D. *Declension*. If the above phonetic rules are borne in mind, declension in Kashmiri is a fairly simple process. If attention is not paid to them, the whole system at once becomes a field of inextricable confusion. In the following pages it will be assumed that the reader is familiar with them.

Nouns substantive and adjective have two genders, a masculine and a feminine. Words referring to males are masculine, and to females are feminine. Inanimate things are sometimes masculine and sometimes feminine. Pronouns have three genders, arranged on a different principle. One gender refers to male living beings, another to female living beings, and a third (or neuter) to all inanimate things whether they are grammatically masculine or feminine. Nouns ending in ^{u} are masculine, and most, but not all, of those ending in ^{i}, ^{u}, *ĕ* or *ñ* are feminine. Of nouns ending in consonants, some are masculine, and some are feminine. No rule can be formulated regarding these, except that all abstract nouns ending in *ar* (a very numerous class) are masculine. There are four declensions. The first consists of masculine nouns ending in a consonant, in *a*, *ĕ* or $^{\bar{u}}$ (very few of these last two). The second consists of the important class of masculine nouns in ^{u}; the third of feminine nouns in ^{i}, $^{\bar{u}}$, or *ñ* (being the feminines corresponding to the masculine nouns of the second declension); and the fourth of feminine nouns ending in ^{a}, *ĕ* or a consonant.

The noun possesses two numbers, a singular and a plural, and in each number there are, besides the nominative, three organic cases, the accusative, the case of the agent (see below, under "verbs"), and the ablative. The accusative, when not definite, may also be the same in form as the nominative. The following are the forms which a noun takes in each declension, the words chosen as examples being: First declension, *tsūr*, a thief; second declension, *mą̄l*^{u}, a father; third declension, *mạj*$^{\bar{u}}$, a mother; fourth declension, (*a*) *māl*, a garland, (*b*) *rāt*-, night.

	First Declension.	Second Declension.	Third Declension.	Fourth Declension	
				a.	*b*.
Sing.:					
Nom.	*tsūr*	*mạl*^{u} (pr. *mål*)	*mą̄j*$^{\bar{u}}$ (*möj*)	*māl*	*rāth*
Acc.	*tsūras*	*mą̄lis* (*mölis*)	*mājĕ*	*māli*	*rą̄ts*$^{\bar{u}}$ (*röts*)
Ag.	*tsūran*	*mą̄l*^{i} (*mö*^{i}*l*^{i})	*māji*	*māli*	*rą̄ts*$^{\bar{u}}$ (*röts*)
Abl.	*tsūra*	*māli*	*māji*	*māli*	*rą̄ts*$^{\bar{u}}$ (*röts*)
Plur.:					
Nom	*tsūr*	*mạl*^{i} (*mö*^{i}*l*^{i})	*mājĕ*	*māla*	*rą̄ts*$^{\bar{u}}$ (*röts*)
Acc.	*tsūran*	*mālĕn*	*mājĕn*	*mālan*	*rą̄ts*$^{\bar{u}}$*n* (*rötsün*)
Ag. and Abl.	*tsūrau*	*mālyau*	*mājyau*	*mālau*	*rą̄ts*$^{\bar{u}}$*v* (*rötsüv*)

The declension 4*b* is confined to certain nouns in *t*, *th*, *d*, *n*, *h* and *l*, in which the final consonant is liable to change owing to a following *ū-mātrā*.

Other cases are formed (as in true Indo-Aryan languages) by the addition of postpositions, some of which are added to the accusative, while others are added to the ablative case. To the former are added *manz*, in; *kịt*^{u}, to or for; *sụ̄tin*, with, and others. To the ablative are added *sụ̄tin*, when it signifies "by means of"; *putshy*, for; *pĕṭh*^{a}, from, and others. For the genitive, masculine nouns in the singular, signifying animate beings, take *sạnd*^{u}, and if they signify things without life, take *k*^{u}. All masculine plural nouns and all feminine nouns whether singular or plural take *hạnd*^{u}. *Sạnd*^{u} and *hạnd*^{u} are added to the accusative, which drops a final *s*, while *k*^{u} is added to the ablative. Thus, *tsūra sạnd*^{u}, of the thief; *mą̄l*^{i} *sạnd*^{u}, of the father; *sŏnạk*^{u} (usually written *sŏnuk*^{u}), of gold (*sŏn*, abl. sing. *sŏna*); *tsūran nạnd*^{u}, of thieves; *karĕn hạnd*^{u}, of bracelets (second declension); *mājĕ hạnd*^{u}, of the mother; *mājĕn hạnd*^{u}, of the mothers. Masculine proper names, however, take *n*^{u} in the singular, as in *Rādhākrṣṇạn*$_{u}$ of Rādhākrishna. These genitive terminations, and also the dative termination *kịt*^{u}, are adjectives, and agree with the governing noun in gender, number and case. Thus, *tsūṛa sạnd*^{u} *nĕcịv*^{u}, the son of the thief; *tsūra sạnd*^{i} *nĕciv*^{i}, by the son of the thief; *tsūra sạnz*$^{\bar{u}}$ *kōr*^{u}, the daughter of the thief; *kulịk*^{u} *lang*, a bough of the tree; *kulic*$^{\bar{u}}$ *lạṇḍ*$^{\bar{u}}$, a twig of the tree. *Sạnd*^{u} has fem. sing. *sạnz*^{u}, masc. plur. *sạnd*^{i}, fem. plur. *sanza*. Similarly *hạnd*^{u}. *K*^{u} has fem. sing. *c*$^{\bar{u}}$, masc. plur. *k*^{i}, fem. plur. *cè*; *n*^{u}, fem. sing. *ñ*, masc. plur. *n*^{i}, fem. plur. *ñĕ*. Similarly for the dative we have the following forms: *mą̄lis kịt*^{u} *pą̄ñ*^{u}, water (masc.) for the father; *mą̄lis kits*$^{\bar{u}}$ *gāv*, a cow for the father; *mą̄lis kit*^{i} *rav*, blankets (masc. plur.) for the father; *mą̄lis kitsa pōthĕ*, books (fem. plur.) for the father. All these postpositions of the genitive and *kịt*^{u} of the dative are declined regularly as substantives, the masculine ones belonging to the second declension and the feminine ones to the third. Note that the feminine plural of *sạnd*^{u} is *sanza*, not *sanzĕ*, as we might expect; so also feminine nouns in *ts*^{u}, *tsh*^{u}, *z*$^{\bar{u}}$ and *s*$^{\bar{u}}$.

Adjectives ending in ^{u} (second declension) form the feminine in $^{\bar{u}}$, with the usual changes of the preceding consonant. Thus *tạt*^{u}, hot, fem. *tạts*$^{\bar{u}}$ (pronounced *tüts*). Other adjectives do not change for gender. All adjectives agree with the qualified noun in gender, number and case, the postposition, if any, being added to the latter word of the two. Take, for example. *chạt*^{u}, white, and *gur*^{u}, a horse. From these we have *chạt*^{u} *gur*^{u}, a white horse; acc. sing. *chatis guris*; nom. plur. *chạt*^{i} *gụr*^{i}; and *chatyau guryau sụ̄tin*, by means of white horses.

The first two personal pronouns are *bŏh*. I; *mĕ*, me, by me; *ạs*^{i}, we; *asĕ*, us, by us; and *ts*^{a}*h*, thou; *tsĕ*, thee, by thee; *tọ̆h*^{i}, ye; *tŏhĕ* you, by you. Possessive pronouns are employed instead of the genitive. Thus, *myą̄n*^{u}, my; *są̄n*^{u}, our; *cyą̄n*^{u}, thy; *tuhạnd*^{u}, your. For the third person, we have sing. masc. *suh*, fem. *sŏh*, neut. *tih*; acc. sing. (masc. or fem.) *tamis* or *tas*, neut. *tath*; agent sing masc. neut. *tạm*^{i}, fem. *tami*. The plural is of common gender throughout. Nom. *tim*; acc. *timan*; ag. *timau*. The possessive pronoun is *tasạnd*^{u}, of him, of her; *tamyuk*^{n}, of it; *tihạnd*^{u}, of them. The neuter gender is used for all things without life.

Other pronouns are:—This: *yih* (com. gen.); acc. masc. fem. *yimis*, or *nŏmis*, neut, *yith*, *nŏth*; ag. masc. neut., *yim*^{i}, *nọ̆m*^{i}, fem. *yimi*, *nŏmi*; nom. plur. *yim*, fem. *yima*, and so on.

That (within sight): masc. neut. *huh*, fem. *hŏh*; acc. masc. fem. *humis* or *amis*, neut. *huth*, and so on; nom. plur. masc *hum*.

Who, masc. *yus*, fem. *yŏssa*, neut. *yih*; acc. masc. fem. *yĕmis*, *yĕs*, neut. *yĕth*; ag. masc. neut. *yĕm*^{i}, fem. *yĕmi*; nom. plur. masc. *yim*, and so on.

Who? masc. *kus*, fem. *kŏssa*, neut. *kyāh*; acc. masc. fem. *kamis*, *kas*, neut. *kath*; ag. masc. neut. *kam*^{i}, fem. *kami*; nom. plur. masc. *kam*.

Self, *pāna*. Anyone, someone, *kā̃h*, *kū̃h*, or *kā̃tshāh*, neut. *kē̃tshāh*.

Kashmiri makes very free use of pronominal suffixes, which are added to verbs to supply the place of personal terminations. These represent almost any case, and are as follows:—

	First Person.	Second Person.	Third Person.
Sing.—			
Nom.	*s*	*kh*, *h*	none
Acc.	*m*	*th*, *y*	*s*
Dat.	*m*	*y*	*s*
Ag.	*m*	*th*, *y*	*n*
Plur.—			
Nom.	none	*wa*	none
Other cases	none	*wa*	*kh*, *h*

Before these the verbal terminations are often slightly changed for the sake of euphony, and, when necessary for the pronunciation, the vowel *a* is inserted as a junction vowel.

In this connexion we may mention another set of suffixes also commonly added to verbs, with an adverbial force. Of these *na* negatives the verb, as in *chuh*, he is; *chuna*, he is not; *ā* asks a question, as in *chwā*, is he? *ti* adds emphasis, as in *chuti*, he is indeed; and *tyā* asks a question with emphasis, as in *chutyā*, is he indeed?

Two or three suffixes may be employed together, as in *kạr*^{u}, was made, *kạru-m*, was made by me, *kạr*^{u}*-m-akh*, thou wast made by me; *kạr*^{u}*-m-akh-ā*, wast thou made by me? The two *kh* suffixes become *h* when they are followed by a pronominal suffix commencing with a vowel, as in *kạr*^{u}*-h-as* (for *kạr*^{u}*-kh-as*), I was made by them.

E. *Conjugation.* As in the case of the modern Indo-Aryan vernaculars, the conjugation of the verb is mainly participial. Three only of the old tenses, the present, the future and the imperative have survived, the first having become a future, and the second a past conditional. These three we may call radical tenses. The rest, viz. the Kashmiri present, imperfect, past, aorist, perfect and other past tenses are all participial.

The verb substantive, which is also used as an auxiliary verb, has two tenses, a present and a past. The former is made by adding the pronominal suffixes of the nominative to a base *chu*(*h*), and the latter by adding the same to a base *ạs*^{u}. Thus:—

	Singular		*Plural*	
	Masculine	Feminine	Masculine	Feminine
1	*chu-s*, I am	*chĕ-s*, I am	*chih*, we are	*chĕh*, we are
2	*chu-kh*, thou art	*chĕ-kh*, thou art	*chi-wa*, you are	*chĕ-wa*, you are
3	*chuh*, he is	*chĕh*, she is	*chih*, they are	*chĕh*, they are
1	*ạsu-s*, I was	*ạs*^{u}*-s*, I was	*ạs*^{i}, we were	*āsa*, we were
2	*ạsu-kh*, thou wast	*ạs*^{u}*-kh*, thou wast	*ạs*^{i}*-wa*, you were	*āsa-wa*, you were
3	*ạs*^{u}, he was	*ạs*^{u}, she was	*ạs*^{i}, they were	*āsa*, they were

As for the finite verb, the modern future (old present), and the past conditional (old future) do not change for gender, and do not employ suffixes, but retain relics of the old personal terminations of the tenses from which they are derived. They are thus conjugated, taking the verbal root *kar*, as the typical verb.

	Future, I shall make, &c.		Past Conditional, (if) I had made, &c.	
	Singular	*Plural*	*Singular*	*Plural*
1	*kara*	*karav*	*karahā̆*	*karahăv*
2	*karakh*	*kariv*	*karahā̆kh*	*kạr*^{i}*hiv*
3	*kari*	*karan*	*karihē*	*karahăn*

For the imperative we have 2nd person singular, *kar*, plur. *kariv*; third person singular and plural *karin*.

Many of the above forms will be intelligible from a consideration of the closely allied Sanskrit, although they are not derived from that language; but some (*e.g.* those of the second person singular) can only be explained by the analogy of the Iranian and of the Piśāca languages.

The present participle is formed by adding *ān* to the root; thus, *karān*, making. It does not change for gender. From this we get a present and an imperfect, formed by adding respectively the present and past tenses of the auxiliary verb. Thus, *kāran chus*, I (masculine) am making, I make; *karān chĕs*, I (feminine) am making, I make; *karān ạsus*, I (masculine) was making; and so on.

There are several past participles, all of which are liable to change for gender, and are utilized in conjugation. We have:—

	Singular		*Plural*	
	Masculine	Feminine	Masculine	Feminine
Weak past participle	*kạr*^{u}	*kạr*^{u}	*kạr*^{i}	*karĕ*
Strong past participle	*karyōv*	*karyēya*	*karyēy*	*karyēya*
Pluperfect participle	*karyāv*	*karyēya*	*karēyēy*	*karyēya*
Compound past participle	*kạr*^{u}*mạt*^{u}	*kạr*^{u}*mạts*^{u}	*kạr*^{i}*mạ̄t*^{i}	*karĕmatsa*

In the strong past participle and the pluperfect participle, the final *v* and *y* (like the final *h* of *chuh* quoted above) are not parts of the original words, but are only added for the sake of euphony. The true words are *karyō*, *karyē*, *karyā* and *karyēyē*. There are three conjugations. The first includes all transitive verbs. These have both the weak and the strong past participles. The second conjugation consists of sixty-six common intransitive verbs, which also have both of these participles. The third conjugation consists of the remaining intransitive verbs. These have only the strong past participle. The weak past participle in the first two conjugations refers to something which has lately happened, and is used to form an immediate past tense. The strong past participle is more indefinite, and is employed to form a tense corresponding to the Greek aorist. The pluperfect participle refers to something which happened a long time ago, and is used to form the past tense of narration. As the third conjugation has no weak past participle, the strong past participle is employed to make the immediate past, and the pluperfect participle is employed to make the aorist past, while the new pluperfect participle is formed to make the tense of narration. Thus, from the root *wuph*, fly (third conjugation) we have *wuphyōv*, he flew just now, while *karyōv* (first conjugation) means "he was made at some indefinite time"; *wuphyāv*, he flew at some indefinite time, but *karyāv*, he was made a long time ago; finally, the new participle of the third conjugation, *wuphiyāv*, he flew a long time ago.

The corresponding tenses are formed by adding pronominal suffixes to the weak, the strong, or the pluperfect participle. In the last two the final *v* and *y*, being no longer required by euphony, are dropped. In the case of transitive verbs the participles are passive by derivation and in signification, and hence the suffix indicating the subject must be in the agent case. Thus *kạr*^{u} means "made." For "I made" we must say "made by me," *kạru-m*; for "thou madest," *kạru-th*, made by thee, and so on. If the thing made is feminine the participle must be feminine, and similarly if it is plural it must be plural. Thus, *kạru-m*, I made him; *kạr*^{u}*-m*, I made her; *kạri-m*, I made them (masculine); and *karĕ-m*, I made them (feminine). Similarly from the other two participles we have *karyō-m*, I made him; *karyēya-m*, I made her; *karyā-m*, I made him (a long time ago). The past participles of intransitive verbs are not passive, and hence the suffix indicating the subject must be in the nominative form. Thus *tsạl*^{u}, escaped (second conjugation); *tsạlu-s*, escaped-I, I (masculine) escaped; *tsạj*^{u}*-s*, I (feminine) escaped, and so on. Similarly for the third conjugation, *wuphyōv*, flew; *wuphyō-s*, I (masculine) flew; *wuphyēya-s*, I (feminine) flew, &c.

As explained above, these suffixes may be piled one on another. As a further example we may give *kạr*^{u}, made; *kạru-n*, made by him, he made; *kạru-n-as*, made by him I, he made me, or (as *-s* also means "for him") he made for him; *kạru-n-as-ā*, did he make me? or, did he make for him? and so on.

Tenses corresponding to the English perfect and pluperfect are formed by conjugating the auxiliary verb, adding the appropriate suffixes, with the compound past participle. Thus *kạr*^{u}*mạt*^{u} *chu-n-as*, made am-by-him-I, he has made me; *tsạl*^{u} *mạt*^{u} *chu-kh*, escaped art thou, thou hast escaped; *wuphyōmạt*^{u} *chu-s*, flown am-I, I have flown. Similarly for the pluperfect, *kạr*^{u}*mạt*^{u} *ạsu-n-as*, made was-by-him-I, he had made me, and so on.

Many verbs have irregular past participles. Thus *mar*, die, has *mūd*^{u}; *di*, give, has *dịt*^{u}; *khi*, eat, has *khyauv* for its weak, and *khĕyōv* for its strong participle, while *ni*, take, has *nyūv* and *niyōv*, respectively. Others must be learnt from the regular grammars.

The infinitive is formed by adding *-un* to the root; thus *kar-un*, to make. It is declined like a somewhat irregular noun of the first declension, its accusative being *karanas*. There are three forms of the noun of agency, of which typical examples are *kar-awun*^{u}, *kar-an-wạ̄l*^{u}, and *kar-an-grākh*, a maker.

The passive is formed by conjugating the verb *yi*, come, with the ablative of the infinitive. Thus, *karana yiwān chuh*, it is coming by making, or into making, *i.e.* it is being made. A root is made active or causal by adding *-anaw*, *-āw*, or *-*^{a}*rāw*. Thus, *kar-anāw*, cause to make; *kumal*, be tender, *kumal-āw*, make tender; *kal*, be dumb, *kạl-*^{a}*rāw*, make dumb. Some verbs take one form and some another, and there are numerous irregularities, especially in the case of the last.

F. *Indeclinables.* Indeclinables (adverbs, prepositions, conjunctions and interjections) must be learnt from the dictionary. The number of interjections is very large, and they are distinguished by minute rules depending on the gender of the person addressed and the exact amount of respect due to him.

Literature.—Kashmiri possesses a somewhat extensive literature, which has been very little studied. The missionary William Carey published in 1821 a version of the New Testament (in the Śāradā character), which was the first book published in the language. In 1885 the Rev. J. Hinton Knowles published at Bombay a collection of Kashmiri proverbs and sayings, and K. F. Burkhard in 1895 published an edition of Maḥmūd Gāmī's poem on Yūsuf and Zulaikhā. This, with the exception of later translations of the Scriptures in the Persian character and a few minor works, is all the literature that has been printed or about which anything has been written. Maḥmūd Gāmī's poem is valuable as an example of the Kashmiri used by Mussulmans. For Hindu literature, we may quote a history of Krishna by Dīnanātha. The very popular *Lallā-vākya*, a poem on Śaiva philosopy by a woman named *Lālladēvī*, is said to be the oldest work in the language which has survived. Another esteemed work is the *Śiva Pariṇaya* of Kṛṣṇa Rājānaka, a living author. These and other books which have been studied by the present writer have little independent value, being imitations of Sanskrit literature. Nothing is known about the dates of most of the authors.

Authorities.—The scientific study of Kashmiri is of very recent date. The only printed lexicographical work is a short vocabulary by W. J. Elmslie (London, 1872). K. F. Burkhard brought out a grammar of the Mussulman dialect in the *Proceedings of the Royal Bavarian Academy of Science* for 1887–1889, of which a translation by G. A. Grierson appeared in the *Indian Antiquary* of 1895 and the following years (reprinted as a separate publication, Bombay, 1897). T. R. Wade's Grammar (London, 1888) is the merest sketch, and the only attempt at a complete work of the kind in English is G. A. Grierson's *Essays on Kāçmīrī Grammar* (London and Calcutta, 1899). A valuable native grammar in Sanskrit, the *Kaśmīraśabdāmṛta* of Īśvara Kaula, has been edited by the same writer (Calcutta, 1888). For an examination of the origin of Kashmiri grammatical forms and the Piśāca question generally, see G. A. Grierson's "On Certain Suffixes in the Modern Indo-Aryan Vernaculars" in the *Zeitschrift für Vergleichende Sprachforschung auf dem Gebiete der Indogermanischen Sprachen* for 1903 and *The Piśāca Languages of North-Western India* (London, 1906).

The only important text which has been published is Burkhard's edition, with a partial translation, of Mahmūd Gāmī's "Yūsuf and Zulaikhā" in the *Zeitschrift der Deutschen Morgenländischen Gesellschaft* for 1895 and 1899. The text of the *Siva Pariṇaya*, edited by G. A. Grierson, is in course of publication by the Asiatic Society of Bengal. (G. A. Gr.)

KASHUBES (sing. *Kaszub*, plur. *Kaszebe*), a Slavonic people numbering about 200,000, and living on the borders of West Prussia and Pomerania, along the Baltic coast between Danzig and Lake Garden, and inland as far as Konitz. They have no literature and no history, as they consist of peasants and fishermen, the educated classes being mostly Germans or Poles. Their language has been held to be but a dialect of Polish, but it seems better to separate it, as in some points it is quite independent, in some it offers a resemblance to the language of the Polabs (*q.v.*). This is most seen in the western dialect of the so-called Slovinci (of whom there are about 250 left) and Kabatki, whereas the eastern Kashube is more like Polish, which is encroaching upon and assimilating it. Lorentz calls the western dialect a language, and distinguishes 38 vowels. The chief points of Kashube as against Polish are that all its vowels can be nasal instead of *a* and *e* only, that it has preserved quantity and a free accent, has developed several special vowels, *e. g. ö*, *œ*, *ü*, and has preserved the original order, *e.g. gard* as against *grod*. The consonants are very like Polish. (See also Slavs.)

Authorities.—F. Lorentz, *Slovinzische Grammatik* (St Petersburg, 1903) and "Die gegenseitigen Verhältnisse der sogen. Lechischen Sprachen," in *Arch. f. Slav. Phil.* xxiv. (1902); J. Baudouin de Courtenay, "Kurzes Resumé der Kaschubischen Frage," ibid. xxvi. (1904); G. Bronisch, *Kaschubische Dialektstudien* (Leipzig, 1896–1898); S. Ramult, *Słownik języka pomorskiego czyli kaszubskiego*, *i.e.* "Dictionary of the Seacoast (Pomeranian) or Kashube Language" (Cracow, 1893). (E. H. M.)

KASIMOV, a town of Russia, in the government of Ryazañ, on the Oka river, in 54° 56′ N. and 41° 3′ E., 75 m. E.N.E. of Ryazañ. Pop. (1897), 13,545, of whom about 1000 were Tatars. It is famed for its tanneries and leather goods, sheepskins and post-horse bells. Founded in 1152, it was formerly known as Meshcherski Gorodets. In the 15th century it became the capital of a Tatar khanate, subject to Moscow, and so remained until 1667. The town possesses a cathedral, and a mosque supposed to have been built by Kasim, founder of the Tatar principality. Near the mosque stands a mausoleum built by Shah-Ali in 1555. Lying on the direct road from Astrakhan to Moscow and Nizhniy-Novgorod, Kasimov is a place of some trade, and has a large annual fair in July. The waiters in the best hotels of St Petersburg are mostly Kasimov Tatars.

See Veliaminov-Zernov, *The Kasimov Tsars* (St Petersburg, 1863–1866).

KASSA (Germ. *Kaschau*; Lat. *Cassovia*), the capital of the county of Abauj-Torna, in Hungary, 170 m. N.E. of Budapest by rail. Pop. (1900), 35,856. Kassa is one of the oldest and handsomest towns of Hungary, and is pleasantly situated on the right bank of the Hernád. It is surrounded on three sides by hills covered with forests and vineyards, and opens to the S.E. towards a pretty valley watered by the Hernád and the Tarcza. Kassa consists of the inner town, which was the former old town surrounded with walls, and of three suburbs separated from it by a broad glacis. The most remarkable building, considered the grandest masterpiece of architecture in Hungary, is the Gothic cathedral of St Elizabeth. Begun about 1270 by Stephen V., it was continued (1342-1382) by Queen Elizabeth, wife of Charles I., and her son Louis I., and finished about 1468, in the reign of Matthias I. (Corvinus). The interior was transformed in the 18th century to the Renaissance style, and the whole church thoroughly restored in 1877–1896. The church of St Michael and the Franciscan or garrison church date from the 13th century. The royal law academy, founded in 1659, and sanctioned by golden bull of King Leopold I. in 1660, has an extensive library; there are also a museum, a Roman Catholic upper gymnasium and seminary for priests, and other schools and benevolent institutions. Kassa is the see of a Roman Catholic bishopric. It is the chief political and commercial town of Upper Hungary, and the principal *entrepôt* for the commerce between Hungary and Galicia. Its most important manufactures are tobacco, machinery, iron, furniture, textiles and milling. About 3 m. N.W. of the town are the baths of Bankó, with alkaline and ferruginous springs, and about 12 m. N.E. lies Ránk-Herlein, with an intermittent chalybeate spring. About 20 m. W. of Kassa lies the famous Premonstratensian abbey of Jászó, founded in the 12th century. The abbey contains a rich library and valuable archives. In the neighbourhood is a fine stalactite grotto, which often served as a place of refuge to the inhabitants in war time.

Kassa was created a town and granted special privileges by Béla IV. in 1235, and was raised to the rank of a royal free town by Stephen V. in 1270. In 1290 it was surrounded with walls. The subsequent history presents a long record of revolts, sieges and disastrous conflagrations. In 1430 the plague carried off a great number of the inhabitants. In 1458 the right of minting money according to the pattern and value of the Buda coinage was granted to the municipality by King Matthias I. The bishopric was established in 1804. In the revolutionary war of 1848–49 the Hungarians were twice defeated before the walls of Kassa by the Austrians under General Schlick, and the town was held successively by the Austrians, Hungarians and Russians.

KASSALA, a town and *mudiria* of the Anglo-Egyptian Sudan. The town, a military station of some importance, lies on the river Gash (Mareb) in 15° 28′ N., 36° 24′ E., 260 m. E.S.E. of Khartum and 240 m. W. of Massawa, the nearest seaport. Pop. about 20,000. It is built on a plain, 1700 ft. above the sea, at the foot of the Abyssinian highlands 15 m. W. of the frontier of the Italian colony of Eritrea. Two dome-shaped mountains about 2600 ft. high, jebels Mokram and Kassala, rise abruptly from the plain some 3 m. to the east and south-east. These mountains and the numerous gardens Kassala contains give to the place a picturesque appearance. The chief buildings are of brick, but most of the natives dwell in grass *tukls*. A short distance from the town is Khatmia, containing a tomb mosque with a high tower, the headquarters of the Morgani family. The sheikhs El Morgani are the chiefs of a religious brotherhood widely spread and of considerable influence in the eastern Sudan. The Morgani family are of Afghan descent. Long settled in Jidda, the head of the family removed to the Sudan about 1800 and founded the Morgani sect. Kassala was founded by the Egyptians in 1840 as a fortified post from which to control their newly conquered territory near the Abyssinian frontier. In a few years it grew into a place of some importance. In November 1883 it was besieged by the dervishes. The garrison held out till the 30th of July 1885 when owing to lack of food they capitulated. Kassala was captured from the dervishes by an Italian force under Colonel Baratieri on the 17th of July 1894 and by the Italians was handed over on Christmas day 1897 to Egypt. The bulk of the inhabitants are Hallenga "Arabs."

Kassala *mudiria* contains some of the most fertile land in the Anglo-Egyptian Sudan. It corresponds roughly with the district formerly known as Taka. It is a region of light rainfall, and cultivation depends chiefly on the Gash flood. The river is however absolutely dry from October to June. White durra of excellent quality is raised.

KASSASSIN, a village of Lower Egypt 22 m. by rail W. of Ismailia on the Suez Canal. At this place, on the 28th of August and again on the 9th of September 1882 the British force operating against Arabi Pasha was attacked by the Egyptians—both attacks being repulsed (see EGYPT: *Military Operations*).

KASSITES, an Elamite tribe who played an important part in the history of Babylonia. They still inhabited the north-western mountains of Elam, immediately south of Holwan, when Sennacherib attacked them in 702 B.C. They are the Kossaeans of Ptolemy, who divides Susiana between them and the Elymaeans: according to Strabo (xi. 13, 3, 6) they were the neighbours of the Medes. Th. Nöldeke (*Gött. G. G.*, 1874, pp. 173 seq.) has shown that they are the Kissians of the older Greek authors who are identified with the Susians by Aeschylus (*Choeph.* 424, *Pers.* 17. 120) and Herodotus (v. 49. 52). We already hear of them as attacking Babylonia in the 9th year of Samsu-iluna the son of Khammurabi, and about 1780 B.C. they overran Babylonia and founded a dynasty there which lasted for 576 years and nine months. In the course of centuries, however, they were absorbed into the Babylonian population; the kings adopted Semitic names and married into the royal family of Assyria. Like the other languages of the non-Semitic tribes of Elam that of the Kassites was agglutinative; a vocabulary of it has been handed down in a cuneiform tablet, as well as a list of Kassite names with their Semitic equivalents. It has no connexion with Indo-European, as has erroneously been supposed. Some of the Kassite deities were introduced into the Babylonian pantheon, and the Kassite tribe of Khabirā seems to have settled in the Babylonian plain.

See Fr. Delitzsch, *Die Sprache der Kossäer* (1884). (A. H. S.)

KASTAMUNI, or KASTAMBŪL. (1) A vilayet of Asia Minor which includes Paphlagonia and parts of Pontus and Galatia. It is divided into four sanjaks—Kastamuni, Boli, Changra and Sinope—is rich in mineral wealth, and has many mineral springs and extensive forests, the timber being used for charcoal and building and the bark for tanning. The products are chiefly cereals, fruits, opium, cotton, tobacco, wool, ordinary goat-hair and mohair, in which there is a large trade. There are coal-mines at and near Eregli (anc. *Heracleia*) which yield steam coal nearly as good in quality as the English, but they are badly worked. Its population comprises about 993,000 Moslems and 27,000 Christians. (2) The capital of the vilayet, the ancient *Castamon*, altitude 2500 ft., situated in the narrow valley of the Geuk Irmak (*Amnias*), and connected by a carriage road, 54 m., with its port Ineboli on the Black Sea. The town is noted for its copper utensils, but the famous copper mines about 36 m. N., worked from ancient times to the 19th century, are now abandoned. There are over 30 mosques in the town, a dervish monastery, and numerous theological colleges (*medresses*), and the Moslem inhabitants have a reputation for bigotry. The climate though subject to extremes of heat and cold is healthy; in winter the roads are often closed by snow. The population of 16,000 includes about 2500 Christians. Castamon became an important city in later Byzantine times. It lay on the northern trunk-road to the Euphrates and was built round a strong fortress whose ruins crown the rocky hill west of the town. It was taken by the Danishmand Amirs of Sivas early in the 12th century, and passed to the Turks in 1393. (J. G. C. A.)

KASTORIA (Turkish *Kesrie*), a city of Macedonia, European Turkey, in the vilayet of Monastir, 45 m. S. by W. of Monastir (Bitolia). Pop. (1905), about 10,000, one-third of whom are Greeks, one-third Slavs, and the remainder Albanians or Turks. Kastoria occupies part of a peninsula on the western shore of Lake Kastoria, which here receives from the north its affluent the Zhelova. The lake is formed in a deep hollow surrounded by limestone mountains, and is drained on the south by the Bistritsa, a large river which flows S.E. nearly to the Greek frontier, then sharply turns N.E., and finally enters the Gulf of Salonica. The lake has an area of 20 sq. m., and is 2850 ft. above sea-level. Kastoria is the seat of an Orthodox archbishop. It is usually identified with the ancient *Celetrum*, captured by the Romans under Sulpicius, during the first Macedonian campaign, 200 B.C., and better known for the defence maintained by Bryennius against Alexis I. in 1084. A Byzantine wall with round towers runs across the peninsula.

KASUR, a town of British India, in the Lahore district of the Punjab, situated on the north bank of the old bed of the river Beas, 34 m. S.E. of Lahore. Pop. (1901), 22,022. A Rajput colony seems to have occupied the present site before the earliest Mahommedan invasion; but Kasur does not appear in history until late in the Mussulman period, when it was settled by a Pathan colony from beyond the Indus. It has an export trade in grain and cotton, and manufactures of cotton and leather goods.

KATAGUM, the sub-province of the double province of Kano in the British protectorate of Northern Nigeria. It lies approximately between 11° and 13° N. and 8° 20′ and 10° 40′ E. It is bounded N. by the French Sudan, E. by Bornu, S. by Bauchi, and W. by Kano. Katagum consists of several small but ancient Mahommedan emirates—Katagum, Messau, Gummel, Hadeija, Machena, with a fringe of Bedde pagans on its eastern frontier towards Bornu, and other pagans on the south towards Bauchi. The Waube flows from Kano through the province via Hadeija and by Damjiri in Bornu to Lake Chad, affording a route for the transport of goods brought by the Zungeru-Zaria-Kano railway to the headquarters of Katagum and western Bornu. Katagum is a fertile province inhabited by an industrious people whose manufactures rival those of Kano.

In ancient times the province of Katagum formed the debateable country between Bornu and the Hausa states. Though Mahommedan it resisted the Fula invasion. Its northern emirates were for a long time subject to Bornu, and its customs are nearly assimilated to those of Bornu. The province was taken under administrative control by the British in October 1903. In 1904 the capitals of Gummel, Hadeija, Messau and Jemaari, were brought into touch with the administration and native and provincial courts established. At the beginning of 1905 Katagum was incorporated as a sub-province with the province of Kano, and the administrative organization of a double province was extended over the whole. Hadeija, which is a very wealthy town and holds an important position both as a source of supplies and a centre of trade, received a garrison of mounted infantry and became the capital of the sub-province.

Hadeija was an old Habe town and its name, an evident corruption of Khadija, the name of the celebrated wife and first convert of Mahomet, is a strong presumption of the incorrectness of the Fula claim to have introduced Islam to its inhabitants. The ruling dynasty of Hadeija was, however, overthrown by Fula usurpation towards the end of the 18th century, and the Fula ruler received a flag and a blessing from Dan Fodio at the beginning of his sacred war in the opening years of the 19th century. Nevertheless the habit of independence being strong in the town of Hadeija the little emirate held its own against Sokoto, Bornu and all comers. Though included nominally within the province at Katagum it was the boast of Hadeija that it had never been conquered. It had made nominal submission to the British in 1903 on the successful conclusion of the Kano-Sokoto campaign, and in 1905, as has been stated, was chosen as the capital of the sub-province. The emir's attitude became, however, in the spring of 1906 openly antagonistic to the British and a military expedition was sent against him. The emir with his disaffected chiefs made a plucky stand but after five hours' street fighting the town was reduced. The emir and three of his sons were killed, and a new emir, the rightful heir to the throne, who had shown himself in favour of a peaceful policy, was appointed. The offices of the war chiefs in Hadeija were abolished and 150 yards of the town wall were broken down.

Slave dealing is at an end in Katagum. The military station at Hadeija forms a link in the chain of British forts which extends along the northern frontier of the protectorate. (See NIGERIA.) (F. L. L.)

KATANGA, a district of Belgian Congo, forming the south-eastern part of the colony. Area, approximately, 180,000 sq. m.; estimated population 1,000,000. The natives are members of the Luba-Lunda group of Bantus. It is a highly mineralized region, being specially rich in copper ore. Gold, iron and tin are also mined. Katanga is bounded S. and S.E. by Northern Rhodesia, and British capital is largely interested in the development of its resources, the administration of the territory being entrusted to a committee on which British members have seats. Direct railway communication with Cape Town and Beira was established in 1909. There is also a rail and river service via the Congo to the west coast. (See CONGO FREE STATE.)

KATER, HENRY (1777–1835), English physicist of German descent, was born at Bristol on the 16th of April 1777. At first he purposed to study law; but this he abandoned on his father's death in 1794, and entered the army, obtaining a commission in the 12th regiment of foot, then stationed in India, where he rendered valuable assistance in the great trigonometrical survey. Failing health obliged him to return to England; and in 1808, being then a lieutenant, he entered on a distinguished student career in the senior department of the Royal Military College at Sandhurst. Shortly after he was promoted to the rank of captain. In 1814 he retired on half-pay, and devoted the remainder of his life to scientific research. He died at London on the 26th of April 1835.

His first important contribution to scientific knowledge was the comparison of the merits of the Cassegrainian and Gregorian telescopes, from which (*Phil. Trans.*, 1813 and 1814) he deduced that the illuminating power of the former exceeded that of the latter in the proportion of 5 : 2. This inferiority of the Gregorian he explained as being probably due to the mutual interference of the rays as they crossed at the principal focus before reflection at the second mirror. His most valuable work was the determination of the length of the second's pendulum, first at London and subsequently at various stations throughout the country (*Phil. Trans.*, 1818, 1819). In these researches he skilfully took advantage of the well-known property of reciprocity between the centres of suspension and oscillation of an oscillating body, so as to determine experimentally the precise position of the centre of oscillation; the distance between these centres was then the length of the ideal simple pendulum having the same time of oscillation. As the inventor of the floating collimator, Kater rendered a great service to practical astronomy (*Phil. Trans.*, 1825, 1828). He also published memoirs (*Phil. Trans.*, 1821, 1831) on British standards of length and mass; and in 1832 he published an account of his labours in verifying the Russian standards of length. For his services to Russia in this respect he received in 1814 the decoration of the order of St. Anne; and the same year he was elected a fellow of the Royal Society.

His attention was also turned to the subject of compass needles, his Bakerian lecture "On the Best Kind of Steel and Form for a Compass Needle" (*Phil. Trans.*, 1821) containing the results of many experiments. The treatise on "Mechanics" in Lardner's *Cyclopaedia* was partly written by him; and his interest in more purely astronomical questions was evidenced by two communications to the Astronomical Society's *Memoirs* for 1831–1833—the one on an observation of Saturn's outer ring, the other on a method of determining longitude by means of lunar eclipses.

KATHA, a district in the northern division of Upper Burma, with an area of 6994 sq. m., 3730 of which consists of the former separate state of Wuntho. It is bounded N. by the Upper Chindwin, Bhamo and Myitkyina districts, E. by the Kaukkwe River as far as the Irrawaddy, thence east of the Irrawaddy by the Shan State of Möng Mit (Momeik), and by the Shweli River, S. by the Ruby Mines district and Shwebo, and W. by the Upper Chindwin district. Three ranges of hills run through the district, known as the Minwun, Gangaw and Mangin ranges. They separate the three main rivers—the Irrawaddy, the Mèza and the Mu. The Minwun range runs from north to south, and forms for a considerable part of its length the dividing line between the Katha district proper and what formerly was the Wuntho state. Its average altitude is between 1500 and 2000 ft. The Gangaw range runs from the north of the district for a considerable portion of its length close to and down the right bank of the Irrawaddy as far as Tigyaing, where the Myatheindan pagoda gives its name to the last point. Its highest point is 4400 ft., but the average is between 1500 and 2000 ft. The Katha branch of the railway crosses it at Petsut, a village 12 miles west of Katha town. The Mangin range runs through Wuntho (highest peak, Maingthôn, 5450 ft.).

Gold, copper, iron and lead are found in considerable quantities in the district. The Kyaukpazat gold-mines, worked by an English company, gave good returns, but the quartz reef proved to be a mere pocket and is now worked out. The iron, copper and lead are not now worked. Jade and soapstone also exist, and salt is produced from brine wells. There are three forest reserves in Katha, with a total area of 1119 sq. m. The population in 1901 was 176,223, an increase of 32% in the decade. The number of Shans is about half that of Burmese, and of Kadus half that of Shans. The Shans are mostly in the Wuntho subdivision. Rice is the chief crop in the plains, tea, cotton, sesamum and hill rice in the hills. The valley of the Mèza, which is very malarious, was used as a convict settlement under Burmese rule. The district was first occupied by British troops in 1886, but it was not finally quieted till 1890, when the Wuntho sawbwa was deposed and his state incorporated in Katha district.

KATHA is the headquarters of the district. The principal means of communication are the Irrawaddy Flotilla steamers, which run between Mandalay and Bhamo, and the railway which communicates with Sagaing to the south and Myitkyina to the north. A ferry-steamer plies between Katha and Bhamo.

KATHIAWAR, or KATTYWAR, a peninsula of India, within the Gujarat division of Bombay, giving its name to a political agency. Total area, about 23,400 sq. m.; pop. (1901), 2,645,805. These figures include a portion of the British district of Ahmedabad, a portion of the state of Baroda, and the small Portuguese settlement of Diu. The peninsula is bounded N. by the Runn of Cutch, E. by Ahmedabad district and the Gulf of Cambay, and S. and W. by the Arabian Sea. The extreme length is 220 m.; the greatest breadth about 165 m. Generally speaking, the surface is undulating, with low ranges running in various directions. With the exception of the Tangha and Mandav hills, in the west of Jhalawar, and some unimportant hills in Hallar, the northern portion of the country is flat; but in the south, from near Gogo, the Gir range runs nearly parallel with the coast, and at a distance of about 20 m. from it, along the north of Babriawar and Sorath, to the neighbourhood of Girnar. Opposite this latter mountain is the solitary Osam hill, and then still farther west is the Barada group, between Hallar and Barada, running about 20 m. north and south from Gumli to Ranawao. The Girnar group of mountains is an important granitic mass, the highest peak of which rises to 3500 ft. The principal river is the Bhadar, which rises in the Mandav hills, and flowing S.W. falls into the sea at Navi-Bandar; it is everywhere marked by highly cultivated lands adjoining its course of about 115 m. Other rivers are the Aji, Machhu and Satrunji—the last remarkable for romantic scenery. Four of the old races, the Jaitwas, Churasamas, Solunkis and Walas still exist as proprietors of the soil who exercised sovereignty in the country prior to the immigration of the Jhalas, Jadejas, Purmars, Kathis, Gohels, Jats, Mahommedans and Mahrattas, between whom the country is now chiefly portioned out. Kathiawar has many notable antiquities, comprising a rock inscription of Asoka, Buddhist caves, and fine Jain temples on the sacred hill of Girnar and at Palitana.

The political agency of Kathiawar has an area of 20,882 sq. m. In 1901 the population was 2,329,196, showing a decrease of 15% in the decade due to the results of famine. The estimated gross revenue of the several states is £1,278,000; total tribute (payable to the British, the gaekwar of Baroda and the nawab of Junagarh), £70,000. There are altogether 193 states of varying size and importance, of which 14 exercise independent jurisdiction, while the rest are more or less under British administration. The eight states of the first class are Junagaw, Nawanagar, Bhaunagar, Porbandar, Dhrangadra, Morvi, Gondal and Jafarabad. The headquarters of the political agent are at Rajkot, in the centre of the peninsula, where also is the Rajkumar college, for the education of the sons of the chiefs. There is a similar school for *girasias*, or chiefs of lower rank, at Gondal. An excellent system of metre-gauge railways has been provided at the cost of the leading states. Maritime trade is also very active, the chief ports being Porbandar, Mangrol and Verawal. In 1903–1904 the total sea-borne exports were valued at £1,300,000, and the imports at £1,120,000. The progressive prosperity of Kathiawar received a shock from the famine of 1899–1900, which was felt everywhere with extreme severity.

KATKOV, MICHAEL NIKIFOROVICH (1818–1887), Russian journalist, was born in Moscow in 1818. On finishing his course at the university he devoted himself to literature and philosophy, and showed so little individuality that during the reign of Nicholas I. he never once came into disagreeable contact with the authorities. With the Liberal reaction and strong reform movement which characterized the earlier years of Alexander II.'s reign (1855–1881) he thoroughly sympathized, and for some time he warmly advocated the introduction of liberal institutions of the British type, but when he perceived that the agitation was assuming a Socialistic and Nihilist tinge, and that in some quarters of the Liberal camp indulgence was being shown to Polish national aspirations, he gradually modified his attitude until he came to be regarded by the Liberals as a renegade. At the beginning of 1863 he assumed the management and editorship of the *Moscow Gazette*, and he retained that position till his death in 1887. During these twenty-four years he exercised considerable influence on public opinion and even on the Government, by representing with great ability the moderately Conservative spirit of Moscow in opposition to the occasionally ultra-Liberal and always cosmopolitan spirit of St Petersburg. With the Slavophils he agreed in advocating the extension of Russian influence in south-eastern Europe, but he carefully kept aloof from them and condemned their archaeological and ecclesiastical sentimentality. Though generally temperate in his views, he was extremely incisive and often violent in his modes of expressing them, so that he made many enemies and sometimes incurred the displeasure of the press-censure and the ministers, against which he was more than once protected by Alexander III. in consideration of his able advocacy of national interests. He is remembered chiefly as an energetic opponent of Polish national aspirations, of extreme Liberalism, of the system of public instruction based on natural science, and of German political influence. In this last capacity he helped to prepare the way for the Franco-Russian alliance.

KATMANDU (less correctly KHATMANDU), the capital of the state of Nepal, India, situated on the bank of the Vishnumati river at its confluence with the Baghmati, in 27° 36′ N., 85° 24′ E. The town, which is said to have been founded about 723, contains a population estimated at 70,000, occupying 5000 houses made of brick, and usually from two to four storeys high. Many of the houses have large projecting wooden windows or balconies, richly carved. The maharaja's palace, a huge, rambling, ungainly building, stands in the centre of the town, which also contains numerous temples. One of these, a wooden building in the centre of the town, gives it its name (*kat* = wood). The streets are extremely narrow, and the whole town very dirty. A British resident is stationed about a mile north of the town.

KATO, TAKA-AKIRA (1859–   ), Japanese statesman, was born at Nagoya, and commenced life as an employee in the great firm of Mitsu Bishi. In 1887 he became private secretary to Count Okuma, minister of state for foreign affairs. Subsequently he served as director of a bureau in the finance department, and from 1894 to 1899 he represented his country at the court of St James. He received the portfolio of foreign affairs in the fourth Ito cabinet (1900–1901), which remained in office only a few months. Appointed again to the same position in the Saionji cabinet (1906), he resigned after a brief interval, being opposed to the nationalization of the private railways, which measure the cabinet approved. He then remained without office until 1908, when he again accepted the post of ambassador in London. He was decorated with the grand cross of St Michael and St George, and earned the reputation of being one of the strongest men among the junior statesmen.

KATRINE, LOCH, a freshwater lake of Scotland, lying almost entirely in Perthshire. The boundary between the counties of Perth and Stirling runs from Glengyle, at the head of the lake, down the centre to a point opposite Stronachlachar from which it strikes to the south-western shore towards Loch Arklet. The loch, which has a south-easterly trend, is about 8 m. long, and its greatest breadth is 1 m. It lies 364 ft. above the sea-level. It occupies an area of 4¾ square miles and has a drainage basin of 37½ square miles. The average depth is 142 ft., the greatest depth being 495 ft. The average annual rainfall is 78 inches. The mean temperature at the surface is 56·4° F., and at the bottom 41° F. The scenery has been immortalized in Sir Walter Scott's *Lady of the Lake*. The surrounding hills are of considerable altitude, the most remarkable being the head of Ben A'an (1750 ft.) and the grassy craigs and broken contour of Ben Venue (2393 ft.). It is fed by the Gyle and numerous burns, and drained by the Achray to Loch Achray and thence by the Black Avon to Loch Vennacher. Since 1859 it has formed the chief source of the water-supply of Glasgow, the aqueduct leaving the lake about 1½ m. S.E. of Stronachlachar. By powers obtained in 1885 the level of the lake was increased by 5 ft. by a system of sluices regulating the outflow of the Achray. One result of this damming up has been to submerge the Silver Strand and to curtail the dimensions of Ellen's Isle. The principal points on the shores are Glengyle, formerly a fastness of the Macgregors, the Trossachs, the Goblins' Cave on Ben Venue, and Stronachlachar (Gaelic, "the mason's nose"), from which there is a ferry to Coilachra on the opposite side. A road has been constructed from the Trossachs for nearly six miles along the northern shore. During summer steamers ply between the Trossachs and Stronachlachar and there is a daily service of coaches from the Trossachs to Callander (about 10 m.) and to Aberfoyle (9 m.), and between Stronachlachar, to Inversnaid on Loch Lomond (about 4½ m.). The road to Inversnaid runs through the Macgregors' country referred to in Scott's *Rob Roy*.

KATSENA, an ancient state of the western Sudan, now included in the province of Kano in the British protectorate of Northern Nigeria. Katsena was amongst the oldest of the Hausa states. There exist manuscripts which carry back its history for about 1000 years and tradition ascribes the origin of the Hausa population, which is known also by the name of Habe or Habeche, to the union of Bajibda of Bagdad with a prehistoric queen of Daura. The conquest of the Habe of Katsena by the Fula about the beginning of the 19th century made little difference to the country. The more cultivated Habe were already Mahommedan and the new rulers adopted the existing customs and system of government. These were in many respects highly developed and included elaborate systems of taxation and justice.

The capital of the administrative district is a town of the same name, in 13° N., 7° 41′ E., being 160 m. E. by S. of the city of Sokoto, and 84 m. N.W. of Kano. The walls of Katsena have a circuit of between 13 and 14 miles, but only a small part of the enclosed space is inhabited. In the 17th and 18th centuries it appears to have been the largest town in the Hausa countries, and its inhabitants at that time numbered some 100,000. The date of the foundation of the present town must be comparatively modern, for it is believed to have been moved from its ancient site and at the time of Leo Africanus (*c.* 1513) there was no place of any considerable size in the province of Katsena. Before that period Katsena boasted of being the chief seat of learning throughout the Hausa states and this reputation was maintained to the time of the Fula conquest. In the beginning of the 19th century the town fell into the hands of the Fula, but only after a protracted and heroic defence. In March 1903 Sir F. Lugard visited Katsena on his way from Sokoto and the emir and chiefs accepted British suzerainty without fighting. The Katsena district has since formed an administrative district in the double province of Kano and Katagum. The emir was unfaithful to his oath of allegiance to the British crown, and was deposed in 1904. His successor was installed and took the oath of allegiance in December of the same year. Katsena is a rich and populous district.

See the *Travels* of Heinrich Barth (new ed., London, 1890, chs. xxiii. and xxiv.). Consult also the *Annual Reports* on Northern Nigeria issued by the Colonial Office, London, particularly the Report for 1902.

KATSENA is also the name of a town in the district of Katsena-Allah, in the province of Muri, Northern Nigeria. This district is watered by a river of the same name which takes its rise in the mountains of the German colony of Cameroon, and flows into the Benue at a point above Abinsi.

KATSURA, TARO, MARQUESS (1847–), Japanese soldier and statesman, was born in 1847 in Choshu. He commenced his career by fighting under the Imperial banner in the civil war of the Restoration, and he displayed such talent that he was twice sent at public expense to Germany (in 1870 and 1884) to study strategy and tactics. In 1886 he was appointed vice-minister of war, and in 1891 the command of division devolved on him. He led the left wing of the Japanese army in the campaign of 1894–95 against China, and made a memorable march in the depth of winter from the north-east shore of the Yellow Sea to Haicheng, finally occupying Niuchwang, and effecting a junction with the second army corps which moved up the Liaotung peninsula. For these services he received the title of viscount. He held the portfolio of war from 1898 to 1901, when he became premier and retained office for four and a half years, a record in Japan. In 1902 his cabinet concluded the first *entente* with England, which event procured for Katsura the rank of count. He also directed state affairs throughout the war with Russia, and concluded the offensive and defensive treaty of 1905 with Great Britain, receiving from King Edward the grand cross of the order of St Michael and St George, and being raised by the mikado to the rank of marquess. He resigned the premiership in 1905 to Marquess Saionji, but was again invited to form a cabinet in 1908. Marquess Katsura might be considered the chief exponent of conservative views in Japan. Adhering strictly to the doctrine that ministries were responsible to the emperor alone and not at all to the diet, he stood wholly aloof from political parties, only his remarkable gift of tact and conciliation enabling him to govern on such principles.

KATTERFELTO (or KATERFELTO), **GUSTAVUS** (d. 1799), quack doctor and conjurer, was born in Prussia. About 1782 he came to London, where his advertisements in the newspapers, headed "Wonders! Wonders! Wonders!" enabled him to trade most profitably upon the credulity of the public during the widespread influenza epidemic of that year. His public entertainment, which, besides conjuring, included electrical and chemical experiments and demonstrations with the microscope, extracted a flattering testimonial from the royal family, who witnessed it in 1784. The poet William Cowper refers to Katterfelto in *The Task*; he became notorious for a long tour he undertook, exciting marvel by his conjuring performances.

KATTOWITZ, a town in the Prussian province of Silesia, on the Rawa, near the Russian frontier, 5 m. S.E. from Beuthen by rail. Pop. (1875), 11,352; (1905), 35,772. There are large iron-works, foundries and machine shops in the town, and near it zinc and anthracite mines. The growth of Kattowitz, like that of other places in the same district, has been very rapid, owing to the development of the mineral resources of the neighbourhood. In 1815 it was a mere village, and became a town in 1867. It has monuments to the emperors William I. and Frederick III.

See G. Hoffmann, *Geschichte der Stadt Kattowitz* (Kattowitz, 1895).

KATWA, or CUTWA, a town of British India, in Burdwan district, Bengal, situated at the confluence of the Bhagirathi and Ajai rivers. Pop. (1901), 7220. It was the residence of many wealthy merchants, but its commercial importance has declined as it is without railway communication and the difficulties of the river navigation have increased. It was formerly regarded as the key to Murshidabad. The old fort, of which scarcely a vestige remains, is noted as the scene of the defeat of the Mahrattas by Ali Vardi Khan.

KATYDID, the name given to certain North American insects, belonging to the family *Locustidae*, and related to the green or tree grasshoppers of England. As in other members of the family, the chirrup, alleged to resemble the words "Katydid," is produced by the friction of a file on the underside of the left forewing over a ridge on the upperside of the right. Several species, belonging mostly to the genera *Microcentonus* and *Cyrtophallus*, are known.

KAUFBEUREN, a town in the kingdom of Bavaria, on the Wertach, 55 m. S.W. of Munich by rail. Pop. (1905), 8955. Kaufbeuren is still surrounded by its medieval walls and presents a picturesque appearance. It has a handsome town hall with fine paintings, an old tower (the Hexenturm, or witches' tower), a museum and various educational institutions. The most interesting of the ecclesiastical buildings is the chapel of St Blasius, which was restored in 1896. The chief industries are cotton spinning, weaving, bleaching, dyeing, printing, machine building and lithography, and there is an active trade in wine, beer and cheese. Kaufbeuren is said to have been founded in 842, and is first mentioned in chronicles of the year 1126. It appears to have become a free imperial city about 1288, retaining the dignity until 1803, when it passed to Bavaria. It was formerly a resort of pilgrims, and Roman coins have been found in the vicinity.

See F. Stieve, *Die Reichsstadt Kaufbeuren und die bayrische Restaurationspolitik* (Munich, 1870); and Schröder, *Geschichte der Stadt und Katholischen Pfarrei Kaufbeuren* (Augsburg, 1903).

KAUFFMANN, [MARIA ANNA] ANGELICA (1741–1807), the once popular artist and Royal Academician, was born at Coire in the Grisons, on the 30th of October 1741. Her father, John Josef Kauffmann, was a poor man and mediocre painter, but apparently very successful in teaching his precocious daughter. She rapidly acquired several languages, read incessantly, and showed marked talents as a musician. Her greatest progress, however, was in painting; and in her twelfth year she had become a notability, with bishops and nobles for her sitters. In 1754 her father took her to Milan. Later visits to Italy of long duration appear to have succeeded this excursion; in 1763 she visited Rome, returning to it again in 1764. From Rome she passed to Bologna and Venice, being everywhere fêted and caressed, as much for her talents as for her personal charms. Writing from Rome in August 1764 to his friend Franke, Winckelmann refers to her exceptional popularity. She was then painting his picture, a half-length, of which she also made an etching. She spoke Italian as well as German, he says; and she also expressed herself with facility in French and English—one result of the last-named accomplishment being that she painted all the English visitors to the Eternal City. "She may be styled beautiful," he adds, "and in singing may vie with our best virtuosi." While at Venice, she was induced by Lady Wentworth, the wife of the English ambassador to accompany her to London, where she appeared in 1766. One of her first works was a portrait of Garrick, exhibited in the year of her arrival at "Mr Moreing's great room in Maiden Lane." The rank of Lady Wentworth opened society to her, and she was everywhere well received, the royal family especially showing her great favour.

Her firmest friend, however, was Sir Joshua Reynolds. In his pocket-book her name as "Miss Angelica" or "Miss Angel" appears frequently, and in 1766 he painted her, a compliment which she returned by her "Portrait of Sir Joshua Reynolds," aetat. 46. Another instance of her intimacy with Reynolds is to be found in the variation of Guercino's "Et in Arcadia ego" produced by her at this date, a subject which Reynolds repeated a few years later in his portrait of Mrs Bouverie and Mrs Crewe. When, about November 1767, she was entrapped into a clandestine marriage with an adventurer who passed for a Swedish count (the Count de Horn) Reynolds befriended her, and it was doubtless owing to his good offices that her name is found among the signatories to the famous petition to the king for the establishment of the Royal Academy. In its first catalogue of 1769 she appears with "R.A." after her name (an honour which she shared with another lady and compatriot, Mary Moser); and she contributed the "Interview of Hector and Andromache," and three other classical compositions. From this time until 1782 she was an annual exhibitor, sending sometimes as many as seven pictures, generally classic or allegorical subjects. One of the most notable of her performances was the "Leonardo expiring in the Arms of Francis the First," which belongs to the year 1778. In 1773 she was appointed by the Academy with others to decorate St Paul's, and it was she who, with Biagio Rebecca, painted the Academy's old lecture room at Somerset House. It is probable that her popularity declined a little in consequence of her unfortunate marriage; but in 1781, after her first husband's death (she had been long separated from him), she married Antonio Zucchi (1728–1795), a Venetian artist then resident in England. Shortly afterwards she retired to Rome, where she lived for twenty-five years with much of her old prestige. In 1782 she lost her father; and in 1795—the year in which she painted the picture of Lady Hamilton—her husband. She continued at intervals to contribute to the Academy, her last exhibit being in 1797. After this she produced little, and in November 1807 she died, being honoured by a splendid funeral under the direction of Canova. The entire Academy of St Luke, with numerous ecclesiastics and virtuosi, followed her to her tomb in S. Andrea delle Fratte, and, as at the burial of Raphael, two of her best pictures were carried in procession.

The works of Angelica Kauffmann have not retained their reputation. She had a certain gift of grace, and considerable skill in composition. But her drawing is weak and faulty; her figures lack variety and expression; and her men are masculine women. Her colouring, however, is fairly enough defined by Waagen's term "cheerful." Rooms decorated by her brush are still to be seen in various quarters. At Hampton Court is a portrait of the duchess of Brunswick; in the National Portrait Gallery, a portrait of herself. There are other pictures by her at Paris, at Dresden, in the Hermitage at St Petersburg, and in the Alte Pinakothek at Munich. The Munich example is another portrait of herself; and there is a third in the Uffizi at Florence. A few of her works in private collections have been exhibited among the "Old Masters" at Burlington House. But she is perhaps best known by the numerous engravings from her designs by Schiavonetti, Bartolozzi and others. Those by Bartolozzi especially still find considerable favour with collectors. Her life was written in 1810 by Giovanni de Rossi. It has also been used as the basis of a romance by Léon de Wailly, 1838; and it prompted the charming novel contributed by Mrs Richmond Ritchie to the *Cornhill Magazine* in 1875 under the title of "Miss Angel."

(A. D.)

KAUFMANN, CONSTANTINE PETROVICH (1818–1882), Russian general, was born at Maidani on the 3rd of March 1818. He entered the engineer branch in 1838, served in the campaigns in the Caucasus, rose to be colonel, and commanded the sappers and miners at the siege of Kars in 1855. On the capitulation of Kars he was deputed to settle the terms with General Sir W. Fenwick Williams. In 1861 he became director-general of engineers at the War Office, assisting General Milutin in the reorganization of the army. Promoted lieut.-general in 1864, he was nominated aide-de-camp-general and governor of the military conscription of Vilna. In 1867 he became governor of Turkestan, and held the post until his death, making himself a name in the expansion of the empire in central Asia. He accomplished a successful campaign in 1868 against Bokhara, capturing Samarkand and gradually subjugating the whole country. In 1873 he attacked Khiva, took the capital, and forced the khan to become a vassal of Russia. Then followed in 1875 the campaign against Khokand, in which Kaufmann defeated the khan, Nasr-ed-din. Khokand north of the Syr-daria was annexed to Russia, and the independence of the rest of the country became merely nominal. This rapid absorption of the khanates brought Russia into close proximity to Afghanistan, and the reception of Kaufmann's emissaries by the Amir was a main cause of the British war with Afghanistan in 1878. Although Kaufmann was unable to induce his government to support all his ambitious schemes of further conquest, he sent Skobeleff in 1880 and 1881 against the Akhal Tekkés, and was arranging to add Merv to his annexations when he died suddenly at Tashkend on the 15th of May 1882.

KAUKAUNA, a city of Outagamie county, Wisconsin, U.S.A., on the Fox river 7 m. N.E. of Appleton and about 100 m. N. of Milwaukee. Pop. (1900), 5115, of whom 1044 were foreign-born (1905) 4991; (1910) 4717. Kaukauna is served by the Chicago & North-Western railway (which has car-shops here), by inter-urban electric railway lines connecting with other cities in the Fox river, valley, and by river steamboats. It has a Carnegie library, a hospital and manufactories of pulp, paper, lumber and woodenware. Dams on the Fox River furnish a good water-power. The city owns its water-works. A small settlement of Indian traders was made here as early as 1820; in 1830 a Presbyterian mission was established, but the growth of the place was slow, and the city was not chartered until 1885.

KAULBACH, WILHELM VON (1805–1874), German painter, was born in Westphalia on the 15th of October 1805. His father, who was poor, combined painting with the goldsmith's trade, but means were found to place Wilhelm, a youth of seventeen, in the art academy of Düsseldorf, then becoming renowned under the directorship of Peter von Cornelius. Young Kaulbach contended against hardships, even hunger. But his courage never failed; and, uniting genius with industry, he was ere long foremost among the young national party which sought to revive the arts of Germany. The ambitious work by which Louis I. sought to transform Munich into a German Athens afforded the young painter an appropriate sphere. Cornelius had been commissioned to execute the enormous frescoes in the Glyptothek, and his custom was in the winters, with the aid of Kaulbach and others, to complete the cartoons at Düsseldorf, and in the summers, accompanied by his best scholars, to carry out the designs in colour on the museum walls in Munich. But in 1824 Cornelius became director of the Bavarian academy. Kaulbach, not yet twenty, followed, took up his permanent residence in Munich, laboured hard on the public works, executed independent commissions, and in 1849, when Cornelius left for Berlin, succeeded to the directorship of the academy, an office which he held till his death on the 7th of April 1874. His son Hermann (1846–1909) also became a distinguished painter.

Kaulbach matured, after the example of the masters of the Middle Ages, the practice of mural or monumental decoration; he once more conjoined painting with architecture, and displayed a creative fertility and readiness of resource scarcely found since the era of Raphael and Michelangelo. Early in the series of his multitudinous works came the famous Narrenhaus, the appalling memories of a certain madhouse near Düsseldorf; the composition all the more deserves mention for points of contact with Hogarth. Somewhat to the same category belong the illustrations to *Reineke Fuchs*. These, together with occasional figures or passages in complex pictorial dramas, show how dominant and irrepressible were the artist's sense of satire and enjoyment of fun; character in its breadth and sharpness is depicted with keenest relish, and at times the sardonic smile bursts into the loudest laugh. Thus occasionally the grotesque degenerates into the vulgar, the grand into the ridiculous, as in the satire on "the Pigtail Age" in a fresco outside the New Pinakothek. Yet these exceptional extravagances came not of weakness but from excess of power. Kaulbach tried hard to become Grecian and Italian; but he never reached Phidias or Raphael; in short the blood of Dürer, Holbein and Martin Schongauer ran strong in his veins. The art products in Munich during the middle of the 19th century were of a quantity to preclude first-rate quality, and Kaulbach contracted a fatal facility in covering wall and canvas by the acre. He painted in the Hofgarten, the Odeon, the Palace and on the external walls of the New Pinakothek. His perspicuous and showy manner also gained him abundant occupation as a book illustrator: in the pages of the poets his fancy revelled; he was glad to take inspiration from Wieland, Goethe, even Klopstock; among his engraved designs are the Shakespeare gallery, the Goethe gallery and a folio edition of the Gospels. With regard to these examples of "the Munich school," it was asserted that Kaulbach had been unfortunate alike in having found Cornelius for a master and King Louis for a patron, that he attempted "subjects far beyond him, believing that his admiration for them was the same as inspiration"; and supplied the lack of real imagination by "a compound of intellect and fancy."

Nevertheless in such compositions as the Destruction of Jerusalem and the Battle of the Huns Kaulbach shows creative imagination. As a dramatic poet he tells the story, depicts character, seizes on action and situation, and thus as it were takes the spectator by storm. The manner may be occasionally noisy and ranting, but the effect after its kind is tremendous. The cartoon, which, as usual in modern German art, is superior to the ultimate picture, was executed in the artist's prime at the age of thirty. At this period, as here seen, the knowledge was little short of absolute; subtle is the sense of beauty; playful, delicate, firm the touch; the whole treatment artistic.

Ten or more years were devoted to what the Germans term a "cyclus"—a series of pictures depicting the Tower of Babel, the Age of Homer, the Destruction of Jerusalem, the Battle of the Huns, the Crusades and the Reformation. These major tableaux, severally 30 ft. long, and each comprising over one hundred figures above life-size, are surrounded by minor compositions making more than twenty in all. The idea is to congregate around the world's historic dramas the prime agents of civilization; thus here are assembled allegoric figures of Architecture and other arts, of Science and other kingdoms of knowledge, together with lawgivers from the time of Moses, not forgetting Frederick the Great. The chosen situation for this imposing didactic and theatric display is the Treppenhaus or grand staircase in the new museum, Berlin; the surface is a granulated, absorbent wall, specially prepared; the technical method is that known as "water-glass," or "liquid flint," the infusion of silica securing permanence. The same medium was adopted in the later wall-pictures in the Houses of Parliament, Westminster.

The painter's last period brings no new departure; his ultimate works stand conspicuous by exaggerations of early characteristics. The series of designs illustrative of Goethe, which had an immense success, were melodramatic and pandered to popular taste. The vast canvas, more than 30 ft. long, the Sea Fight at Salamis, painted for the Maximilianeum, Munich, evinces wonted imagination and facility in composition; the handling also retains its largeness and vigour; but in this astounding scenic uproar moderation and the simplicity of nature are thrown to the winds, and the whole atmosphere is hot and feverish.

Kaulbach's was a beauty-loving art. He is not supreme as a colourist; he belongs in fact to a school that holds colour in subordination; but he laid, in common with the great masters, the sure foundation of his art in form and composition. Indeed, the science of composition has seldom if ever been so clearly understood or worked out with equal complexity and exactitude; the constituent lines, the relation of the parts to the whole, are brought into absolute agreement; in modern Germany painting and music have trodden parallel paths, and Kaulbach is musical in the melody and harmony of his compositions. His narrative too is lucid, and moves as a stately march or royal triumph; the sequence of the figures is unbroken; the arrangement of the groups accords with even literary form; the picture falls into incident, episode, dialogue, action, plot, as a drama. The style is eclectic; in the Age of Homer the types and the treatment are derived from Greek marbles and vases; then in the Tower of Babel the severity of the antique gives place to the suavity of the Italian renaissance; while in the Crusades the composition is let loose into modern romanticism, and so the manner descends into the midst of the 19th century. And yet this scholastically compounded art is so nicely adjusted and smoothly blended that it casts off all incongruity and becomes homogeneous as the issue of one mind. But a fickle public craved for change; and so the great master in later years waned in favour, and had to witness, not without inquietude, the rise of an opposing party of naturalism and realism. (J. B. A.)

KAUNITZ-RIETBURG, WENZEL ANTON, PRINCE VON (1711–1794), Austrian chancellor and diplomatist, was born at Vienna on the 2nd of February 1711. His father, Max Ulrich, was the third count of Kaunitz, and married an heiress, Maria Ernestine Franziska von Rietburg. The family was ancient, and was believed to have been of Slavonic origin in Moravia. Wenzel Anton, being a second son, was designed for the church, but on the death of his elder brother he was trained for the law and for diplomacy, at Vienna, Leipzig and Leiden, and by travel. His family had served the Habsburgs with some distinction, and Kaunitz had no difficulty in obtaining employment. In 1735 he was a *Reichshofrath*. When the Emperor Charles VI. died in 1740, he is said to have hesitated before deciding to support Maria Theresa. If so, his hesitation did not last long, and left no trace on his loyalty. From 1742 to 1744 he was minister at Turin, and in the latter year was sent as minister with the Archduke Charles of Lorraine, the governor of Belgium. He was therefore an eye-witness of the campaigns in which Marshal Saxe overran Belgium. At this time he was extremely discouraged, and sought for his recall. But he had earned the approval of Maria Theresa, who sent him as representative of Austria to the peace congress of Aix-la-Chapelle in 1748. His tenacity and dexterity established his reputation as a diplomatist. He confirmed his hold on the regard and confidence of the empress by the line he took after the conclusion of the peace. In 1749 Maria Theresa appealed to all her counsellors for advice as to the policy Austria ought to pursue in view of the changed conditions produced by the rise of Prussia. The great majority of them, including her husband Francis I., were of opinion that the old alliance with the sea Powers, England and Holland, should be maintained. Kaunitz, either because he was really persuaded that the old policy must be given up, or because he saw that the dominating idea in the mind of Maria Theresa was the recovery of Silesia, gave it as his opinion that Frederick was now the "most wicked and dangerous enemy of Austria," that it was hopeless to expect the support of Protestant nations against him, and that the only way of recovering Silesia was by an alliance with Russia and France. The empress eagerly accepted views which were already her own, and entrusted the adviser with the execution of his own plans. An ambassador to France from 1750 to 1752, and after 1753 as "house, court and state chancellor," Kaunitz laboured successfully to bring about the alliance which led to the Seven Years' War. It was considered a great feat of diplomacy, and established Kaunitz as the recognized master of the art. His triumph was won in spite of personal defects and absurdities which would have ruined most men. Kaunitz had manias rarely found in company with absolute sanity. He would not hear of death, nor approach a sick man. He refused to visit his dying master Joseph II. for two whole years. He would not breathe fresh air. On the warmest summer day he kept a handkerchief over his mouth when out of doors, and his only exercise was riding under glass, which he did every morning for exactly the same number of minutes. He relaxed from his work in the company of a small dependent society of sycophants and buffoons. He was consumed by a solemn, garrulous and pedantic vanity. When in 1770 he met Frederick the Great at Mährisch-Neustadt, he came with a summary of political principles, which he called a catechism, in his pocket, and assured the king that he must be allowed to speak without interruption. When Frederick, whose interest it was to humour him, promised to listen quietly, Kaunitz rolled his mind out for two hours, and went away with the firm conviction that he had at last enlightened the inferior intellect of the king of Prussia as to what politics really were. Within a very short time Frederick had completely deceived and outmanœuvred him. With all his pomposity and conceit, Kaunitz was astute, he was laborious and orderly; when his advice was not taken he would carry out the wishes of his masters, while no defeat ever damped his pertinacity.

To tell his history from 1750 till his retirement in 1792 would be to tell part of the internal history of Austria, and all the international politics of eastern and central Europe. His governing principle was to forward the interests of "the august house of Austria," a phrase sometimes repeated at every few lines of his despatches. In internal affairs he in 1758 recommended, and helped to promote, a simplification of the confused and subdivided Austrian administration. But his main concern was always with diplomacy and foreign policy. Here he strove with untiring energy, and no small measure of success, to extend the Austrian dominions. After the Seven Years' War he endeavoured to avoid great risks, and sought to secure his ends by alliances, exchanges and claims professing to have a legal basis, and justified at enormous length by arguments both pedantic and hypocritical. The French Revolution had begun to alter all the relations of the Powers before his retirement. He never understood its full meaning. Yet the circular despatch which he addressed to the ambassadors of the emperor on the 17th of July 1794 contains the first outlines of Metternich's policy of "legitimacy," and the first proposal for the combined action of the powers, based on the full recognition of one another's rights, to defend themselves against subversive principles. Kaunitz died at his house, the Garten Palast, near Vienna, on the 27th of June 1794. He married on the 6th of May 1736, Maria Ernestine von Starhemberg, who died on the 6th of September 1754. Four sons were born of the marriage.

See Hormayr, *Oesterreichischer Plutarch* (Vienna, 1823), for a biographical sketch based on personal knowledge. Also see Brunner, *Joseph II.: Correspondance avec Cobenzl et Kaunitz* (Mayence, 1871); A. Beer, *Joseph II., Leopold II. und Kaunitz* (Vienna, 1873).

KAUP, JOHANN JAKOB (1803–1873), German naturalist, was born at Darmstadt on the 10th of April 1803. After studying at Göttingen and Heidelberg he spent two years at Leiden, where his attention was specially devoted to the amphibians and fishes. He then returned to Darmstadt as an assistant in the grand ducal museum, of which in 1840 he became inspector. In 1829 he published *Skizze zur Entwickelungsgeschichte der europäischen Thierwelt*, in which he regarded the animal world as developed from lower to higher forms, from the amphibians through the birds to the beasts of prey; but subsequently he repudiated this work as a youthful indiscretion, and on the publication of Darwin's *Origin of Species* he declared himself against its doctrines. The extensive fossil deposits in the neighbourhood of Darmstadt gave him ample opportunities for palaeontological inquiries, and he gained considerable reputation by his *Beiträge zur näheren Kenntniss der urweltlichen Säugethiere* (1855–1862). He also wrote *Classification der Säugethiere und Vögel* (1844), and, with H. G. Brown (1800–1862) of Heidelberg, *Die Gavial-artigen Reste aus dem Lias* (1842–1844). He died at Darmstadt on the 4th of July 1873.

KAURI PINE, in botany, *Agathis australis*, a conifer native of New Zealand where it is abundant in forests in the North Island between the North Cape and 38° south latitude. The forests are rapidly disappearing owing to use as timber and to destruction by fires. It is a tall resiniferous tree, usually ranging from 80 to 100 ft. in height, with a trunk 4 to 10 ft. in diameter, but reaching 150 ft., with a diameter of 15 to 22 ft.; it has a straight columnar trunk and a rounded bushy head. The thick resiniferous bark falls off in large flat flakes. The leaves, which persist for several years, are very thick and leathery; on young trees they are lance-shaped 2 to 4 in. long and $\frac{1}{4}$ to $\frac{1}{2}$ in. broad, becoming on mature trees linear-oblong or obovate-oblong and $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. The ripe cones are almost spherical, erect, and 2 to 3 in. in diameter; the broad, flat, rather thin cone-scales fall from the axis when ripe. Each scale bears a single compressed seed with a membranous wing. The timber is remarkable for its strength, durability and the ease with which it is worked. The resin, kauri-gum, is an amber-like deposit dug in large quantities from the sites of previous forests, in lumps generally varying in size from that of a hen's egg to that of a man's head. The colour is of a rich brown or amber yellow, or it may be almost colourless and translucent. It is of value for varnish-making.

KAVA (Cava or Ava), an intoxicating, but non-alcoholic beverage, produced principally in the islands of the South Pacific, from the roots or leaves of a variety of the pepper plant (*Piper methysticum*). The method of preparation is somewhat peculiar. The roots or leaves are first chewed by young girls or boys, care being taken that only those possessing sound teeth and excellent general health shall take part in this operation. The chewed material is then placed in a bowl, and water or coco-nut milk is poured over it, the whole is well stirred, and subsequently the woody matter is removed by an ingenious but simple mechanical manipulation. The resulting liquid, which has a muddy or *café-au-lait* appearance, or is of a greenish hue if made from leaves, is now ready for consumption. The taste of the liquid is at first sweet, and then pungent and acrid. The usual dose corresponds to about two mouthfuls of the root. Intoxication (but this apparently only applies to those not inured to the use of the liquor) follows in about twenty minutes. The drunkenness produced by kava is of a melancholy, silent and drowsy character. Excessive drinking is said to lead to skin and other diseases, but *per contra* many medicinal virtues are ascribed to the preparation. There appears to be little doubt that the active principle in this beverage is a poison of an alkaloidal nature. It seems likely that this substance is not present as such (*i.e.* as a free alkaloid) in the plant, but that it exists in the form of a glucoside, and that by the process of chewing this glucoside is split up by one of the ferments in the saliva into the free alkaloid and sugar.

See *Pharm. Journ.* iii. 474; iv. 85; ix. 219; vii. 149; *Comptes Rendus*, l. 436, 598; lii. 206; *Journ. de Pharm.* (1860) 20; (1862) 218; Seeman, *Flora Vitiensis*, 260; Beachy, *Voyage of the "Blossom,"* ii. 120.

KAVADH (Kabades, Kauades), a Persian name which occurs first in the mythical history of the old Iranian kingdom as Kai Kobadh (Kaikobad). It was borne by two kings of the Sassanid dynasty.

(1) Kavadh I., son of Pērōz, crowned by the nobles in 488 in place of his uncle Balash, who was deposed and blinded. At this time the empire was utterly disorganized by the invasion of the Ephthalites or White Huns from the east. After one of their victories against Pērōz, Kavadh had been a hostage among them during two years, pending the payment of a heavy ransom. In 484 Pērōz had been defeated and slain with his whole army. Balash was not able to restore the royal authority. The hopes of the magnates and high priests that Kavadh would suit their purpose were soon disappointed. Kavadh gave his support to the communistic sect founded by Mazdak, son of Bamdad, who demanded that the rich should divide their wives and their wealth with the poor. His intention evidently was, by adopting the doctrine of the Mazdakites, to break the influence of the magnates. But in 496 he was deposed and incarcerated in the "Castle of Oblivion (Lethe)" in Susiana, and his brother Jamasp (Zamaspes) was raised to the throne. Kavadh, however, escaped and found refuge with the Ephthalites, whose king gave him his daughter in marriage and aided him to return to Persia. In 499 he became king again and punished his opponents. He had to pay a tribute to the Ephthalites and applied for subsidies to Rome, which had before supported the Persians. But now the emperor Anastasius refused subsidies, expecting that the two rival powers of the East would exhaust one another in war. At the same time he intervened in the affairs of the Persian part of Armenia. So Kavadh joined the Ephthalites and began war against the Romans. In 502 he took Theodosiopolis in Armenia, in 503 Amida (Diarbekr) on the Tigris. In 505 an invasion of Armenia by the western Huns from the Caucasus led to an armistice, during which the Romans paid subsidies to the Persians for the maintenance of the fortifications on the Caucasus. When Justin I. (518–527) came to the throne the conflict began anew. The Persian vassal, Mondhir of Hira, laid waste Mesopotamia and slaughtered the monks and nuns. In 531 Belisarius was beaten at Callinicum. Shortly afterwards Kavadh died, at the age of eighty-two, in September 531. During his last years his favourite son Chosroes had had great influence over him and had been proclaimed successor. He also induced Kavadh to break with the Mazdakites, whose doctrine had spread widely and caused great social confusion throughout Persia. In 529 they were refuted in a theological discussion held before the throne of the king by the orthodox Magians, and were slaughtered and persecuted everywhere; Mazdak himself was hanged. Kavadh evidently was, as Procopius (*Pers.* i. 6) calls him, an unusually clear-sighted and energetic ruler. Although he could not free himself from the yoke of the Ephthalites, he succeeded in restoring order in the interior and fought with success against the Romans. He built some

towns which were named after him, and began to regulate the taxation.

(2) KAVADH II. SHEROE (Siroes), son of Chosroes II., was raised to the throne in opposition to his father in February 628, after the great victories of the emperor Heraclius. He put his father and eighteen brothers to death, began negotiations with Heraclius, but died after a reign of a few months. (ED. M.)

KAVALA, or CAVALLA, a walled town and seaport of European Turkey in the vilayet of Salonica, on the Bay of Kavala, an inlet of the Aegean Sea. Pop. (1905), about 5000. Kavala is built on a promontory stretching south into the bay, and opposite the island of Thasos. There is a harbour on each side of the promontory. The resident population is increased in summer by an influx of peasantry, of whom during the season 5000 to 6000 are employed in curing tobacco and preparing it for export. The finest Turkish tobacco is grown in the district, and shipped to all parts of Europe and America, to the annual value of about £1,250,000. Mehemet Ali was born here in 1769, and founded a Turkish school which still exists. His birthplace, an unpretentious little house in one of the tortuous older streets, can be distinguished by the tablet which the municipal authorities have affixed to its front wall. Numerous Roman remains have been found in the neighbourhood, of which the chief is the large aqueduct on two tiers of arches which still serves to supply the town and dilapidated citadel with water from Mount Pangeus.

Kavala has been identified with Neapolis, at which St Paul landed on his way from Samothrace to Philippi (Acts xvi. 11). Neapolis was the port of Philippi, as Kavala now is of Seres; in the bay on which it stands the fleet of Brutus and Cassius was stationed during the battle of Philippi. Some authorities identify Neapolis with Datum (Δάτον), mentioned by Herodotus as famous for its gold mines.

KAVANAGH, ARTHUR MACMORROUGH (1831–1889), Irish politician, son of Thomas Kavanagh, M.P., who traced his descent to the ancient kings of Leinster, was born in Co. Carlow, Ireland, on the 25th of March 1831. He had only the rudiments of arms and legs, but in spite of these physical defects had a remarkable career. He learnt to ride in the most fearless way, strapped to a special saddle, and managing the horse with the stumps of his arms; and also fished, shot, drew and wrote, various mechanical contrivances being devised to supplement his limited physical capacities. He travelled extensively in Egypt, Asia Minor, Persia and India between 1846 and 1853, and after succeeding to the family estates in the latter year, he married in 1855 his cousin, Miss Frances Mary Leathley. Assisted by his wife, he was a most philanthropic landlord, and was an active county magistrate and chairman of the board of guardians. A Conservative and a Protestant, he sat in Parliament for Co. Wexford from 1866 to 1868, and for Co. Carlow from 1868 to 1880. He was opposed to the disestablishment of the Irish Church, but supported the Land Act of 1870, and sat on the Bessborough Commission. In 1886 he was made a member of the Privy Council in Ireland. He died of pneumonia on the 25th of December 1889, in London. It is supposed that his extraordinary career suggested the idea of "Lucas Malet's" novel, *The History of Sir Richard Calmady.*

KAVANAGH, JULIA (1824–1877), British novelist, was born at Thurles in Tipperary, Ireland, in 1824. She was the daughter of Morgan Peter Kavanagh (d. 1874), author of various worthless philological works and some poems. Julia spent several years of her early life with her parents in Normandy, laying there the foundation of a mastery of the French language and insight into French modes of thought, which was perfected by her later frequent and long residences in France. Miss Kavanagh's literary career began with her arrival in London about 1844, and her uneventful life affords few incidents to the biographer. Her first book was *Three Paths* (1847), a story for the young; but her first work to attract notice was *Madeleine, a Tale of Auvergne* (1848). Other books followed: *A Summer and Winter in the Two Sicilies* (1858); *French Women of Letters* (1862); *English Women of Letters* (1862); *Woman in France during the 18th Century* (1850); and *Women of Christianity* (1852). The scenes of her stories are almost always laid in France, and she handles her French themes with fidelity and skill. Her style is simple and pleasing rather than striking; and her characters are interesting without being strongly individualized. Her most popular novels were perhaps *Adèle* (1857), *Queen Mab* (1863), and *John Dorrien* (1875). On the outbreak of the Franco-German War Julia Kavanagh removed with her mother from Paris to Rouen. She died at Nice on the 28th of October 1877.

KAVASS, or CAVASS (adapted from the Turkish *qawwas*, a bow-maker; Arabic *qaws*, a bow), a Turkish name for an armed police-officer; also for a courier such as it is usual to engage when travelling in Turkey.

KAVIRONDO, a people of British East Africa, who dwell in the valley of the Nzoia River, on the western slopes of Mount Elgon, and along the north-east coast of Victoria Nyanza. Kavirondo is the general name of two distinct groups of tribes, one Bantu and the other Nilotic. Both groups are immigrants, the Bantu from the south, the Nilotic from the north. The Bantu appear to have been the first comers. The Nilotic tribes, probably an offshoot of the Acholi (*q.v.*), appear to have crossed the lake to reach their present home, the country around Kavirondo Gulf. Of the two groups the Bantu now occupy a more northerly position than their neighbours, and "are practically the most northerly representatives of that race" (Hobley). Their further progress north was stopped by the southward movement of the Nilotic tribes, while the Nilotic Kavirondo in their turn had their wanderings arrested by an irruption of Elgumi people from the east. The Elgumi are themselves probably of Nilotic origin. Both groups of Kavirondo are physically fine, the Nilotic stock appearing more virile than the Bantu. The Bantu Kavirondo are divided into three principal types—the Awa-Rimi, the Awa-Ware and the Awa-Kisii. By the Nilotic Kavirondo their Bantu neighbours are known as Ja-Mwa. The generic name for the Nilotic tribes is Ja-Luo. The Bantu Kavirondo call them Awa-Nyoro. The two groups have many characteristics in common. A characteristic feature of the people is their nakedness. Among the Nilotic Kavirondo married men who are fathers wear a small piece of goat-skin, which though practically useless as a covering must be worn according to tribal etiquette. Even among men who have adopted European clothing this goat-skin must still be worn underneath. Contact with whites has led to the adoption of European clothing by numbers of the men, but the women, more conservative, prefer nudity or the scanty covering which they wore before the advent of Europeans. Among the Bantu Kavirondo married women wear a short fringe of black string in front and a tassel of banana fibre suspended from a girdle behind, this tassel having at a distance the appearance of a tail. Hence the report of early travellers as to a tailed race in Africa. The Nilotic Kavirondo women wear the tail, but dispense with the fringe in front. For "dandy" they wear a goat-skin slung over the shoulders. Some of the Bantu tribes practise circumcision, the Nilotic tribes do not. Patterns are tattooed on chest and stomach for ornament. Men, even husbands, are forbidden to touch the women's tails, which must be worn even should any other clothing be wrapped round the body. The Kavirondo are noted for their independent and pugnacious nature, their honesty and their sexual morality, traits particularly marked among the Bantu tribes. There are more women than men, and thus the Kavirondo are naturally inclined towards polygamy. Among the Bantu tribes a man has the refusal of all the younger sisters of his wife as they attain puberty. Practically no woman lives unmarried all her life, for if no suitor seeks her, she singles out a man and offers herself to him at a "reduced price," an offer usually accepted, as the women are excellent agricultural labourers. The Nilotic Kavirondo incline to exogamy, endeavouring always to marry outside their clan. Girls are betrothed at six or seven, and the husband-elect continually makes small presents to his father-in-law-elect till the bride reaches womanhood. It is regarded as shameful if the girl be not found a virgin on her wedding day. She is sent back to her parents, who have to return the marriage price, and pay a fine. The wife's adultery was formerly punished with death, and the capital penalty was also inflicted on young men and girls guilty of unchastity. Among the Bantu Kavirondo the usual minimum price for a wife is forty hoes, twenty goats and one cow, paid in instalments. The Nilotic Kavirondo pay twenty sheep and two to six cows; the husband-elect can claim his bride when he has made half payment. If a woman dies without bearing children, the amount of her purchase is returnable by her father, unless the widower consents to replace her by another sister. The women are prolific and the birth of twins is common. This is considered a lucky event, and is celebrated by feasting and dances. Among the Bantu Kavirondo the mother of twins must remain in her hut for seven days. Among the Nilotic Kavirondo the parents and the infants must stay in the hut for a whole month. If a Bantu mother has lost two children in succession the next child born is taken out at dawn and placed on the road, where it is left till a neighbour, usually a woman friend who has gone that way on purpose, picks it up. She takes it to its mother who gives a goat in return. A somewhat similar custom prevails among the Nilotic tribes. Names are not male and female, and a daughter often bears her father's name.

The Kavirondo bury their dead. Among one of the Bantu tribes, the Awa-Kisesa, a chief is buried in the floor of his own hut in a sitting position, but at such a depth that the head protrudes. Over the head an earthenware pot is placed, and his principal wives have to remain in the hut till the flesh is eaten by ants or decomposes, when the skull is removed and buried close to the hut. Later the skeleton is unearthed, and reburied with much ceremony in the sacred burial place of the tribe. Married women of the Bantu tribes are buried in their hut lying on their right side with legs doubled up, the hut being then deserted. Among the Nilotic tribes the grave is dug beneath the verandah of the hut. Men of the Bantu tribes are buried in an open space in the midst of their huts; in the Nilotic tribes, if the first wife of the deceased be alive he is buried in her hut, if not, beneath the verandah of the hut in which he died. A child is buried near the door of its mother's hut. A sign of mourning is a cord of banana fibre worn round the neck and waist. A chief chooses, sometimes years before his death, one of his sons to succeed him, often giving a brass bracelet as insignia. A man's property is divided equally among his children.

The Kavirondo are essentially an agricultural people: both men and women work in the fields with large iron hoes. In addition to sorghum, *Eleusine* and maize, tobacco and hemp are both cultivated and smoked. Both sexes smoke, but the use of hemp is restricted to men and unmarried women, as it is thought to injure child-bearing women. Hemp is smoked in a hubble-bubble. The Kavirondo cultivate sesamum and make an oil from its seeds which they burn in little clay lamps. These lamps are of the ancient saucer type, the pattern being, in Hobley's opinion, introduced into the country by the coast people. While some tribes live in isolated huts, those in the north have strongly walled villages. The walls are of mud and formerly, among the Nilotic tribes, occasionally of stone. Since the advent of the British the security of the country has induced the Kavirondo to let the walls fall into disrepair. Their huts are circular with conical thatched roof, and fairly broad verandah all round. A portion of the hut is partitioned off as a sleeping-place for goats, and the fowls sleep indoors in a large basket. Skins form the only bedsteads. In each hut are two fireplaces, about which a rigid etiquette prevails. Strangers or distant relatives are not allowed to pass beyond the first, which is near the door, and is used for cooking. At the second, which is nearly in the middle of the hut, sit the hut owner, his wives, children, brothers and sisters. Around this fireplace the family sleep. Cooking pots, water pots and earthenware grain jars are the only other furniture. The food is served in small baskets. Every full grown man has a hut to himself, and one for each wife. The huts of the Masaba Kavirondo of west Elgon have the apex of the roof surmounted by a carved pole which Sir H. H. Johnston says is obviously a phallus. Among the Bantu Kavirondo a father does not eat with his sons, nor do brothers eat together. Among the Nilotic tribes father and sons eat together, usually in a separate hut with open sides. Women eat apart and only after the men have finished. The Kavirondo keep cattle, sheep, goats, fowls and a few dogs. Women do not eat sheep, fowls or eggs, and are not allowed to drink milk except when mixed with other things. The flesh of the wild cat and leopard is esteemed by most of the tribes. From *Eleusine* a beer is made. The Kavirondo are plucky hunters, capturing the hippopotamus with ropes and traps, and attacking with spears the largest elephants. Fish, of which they are very fond, are caught by line and rod or in traps. Bee-keeping is common, and where trees are scarce the hives are placed on the roof of the hut. Among the Bantu Kavirondo goats and sheep are suffocated, the snout being held until the animal dies. Though a peaceful people the Kavirondo fight well. Their weapons are spears with rather long flat blades without blood-courses, and broad-bladed swords. Some use slings, and most carry shields. Bows and arrows are also used; firearms are however displacing other weapons. Kavirondo warfare was mainly defensive and intertribal, this last a form of vendetta. When a man had killed his enemy in battle he shaved his head on his return and he was rubbed with "medicine" (generally goat's dung), to defend him from the spirit of the dead man. This custom the Awa-Wanga abandoned when they obtained firearms. The young warriors were made to stab the bodies of their slain enemies. Kavirondo industries are salt-making, effected by burning reeds and water-plants and passing water through the ashes; the smelting of iron ore (confined to the Bantu tribes); pottery and basket-work.

The Kavirondo have many tribes, divided, Sir H. H. Johnston suspects, totemically. Their religion appears to be a vague ancestor-worship, but the northern tribes have two gods, Awafwa and Ishishemi, the spirits of good and evil. To the former cattle and goats are sacrificed. The Kavirondo have great faith in divination from the entrails of a sheep. Nearly everybody and everything is to the Kavirondo ominous of good or evil. They have few myths or traditions; the ant-bear is the chief figure in their beast-legends. They believe in witchcraft and practise trial by ordeal. As a race the Kavirondo are on the increase. This is due to their fecundity and morality. Those who live in the low-lying lands suffer from a mild malaria, while abroad they are subject to dysentery and pneumonia. Epidemics of small-pox have occurred. Native medicine is of the simplest. They dress wounds with butter and leaves, and for inflammation of the lungs or pleurisy pierce a hole in the chest. There are no medicine-men—the women are the doctors. Certain of the incisor teeth are pulled out. If a man retains these he will, it is thought, be killed in warfare. Among certain tribes the women also have incisor teeth extracted, otherwise misfortune would befall their husbands. For the same reason the wife scars the skin of her forehead or stomach. A Kavirondo husband, before starting on a perilous journey, cuts scars on his wife's body to ensure him good luck. Of dances the Kavirondo have four—the birth dance, the death dance, that at initiation and one of a propitiatory kind in seasons of drought. Their music is plaintive and sometimes pretty, produced by a large lyre-shaped instrument. They use also various drums.

The Ja-Luo women use for ear ornaments small beads attached to pieces of brass. Like the aggry beads of West Africa these beads are not of local manufacture nor of recent introduction. They are ancient, in colour generally blue, occasionally yellow or green, and are picked up in certain districts after heavy rain. By the natives they are supposed to come down with the rain. They are identical in shape and colour with ancient Egyptian beads and other beads obtained from ancient cities in Baluchistan.

See C. W. Hobley, *Eastern Uganda, an Ethnological Survey* (Anthrop. Inst., *Occasional Papers*, No. 1, London, 1902); Sir H. H. Johnston, *Uganda Protectorate* (1902); J. F. Cunningham, *Uganda and its Peoples* (1905); Paul Kollmann, *The Victoria Nyanza* (1899). (T. A. J.)

KAW, or Kansa, a tribe of North American Indians of Siouan stock. They were originally an offshoot of the Osages. Their early home was in Missouri, whence they were driven to Kansas by the Dakotas. They were moved from one reservation to another, till in 1873 they were settled in Indian Territory; they have since steadily decreased, and now number some 200.

KAWARDHA, a feudatory state of India, within the Central Provinces; area, 798 sq. m.; pop. (1901), 57,474, showing a decrease of 37 % in the decade, due to famine; estimated revenue, £7000. Half the state consists of hill and forest. The residence of the chief, who is a Raj Gond, is at Kawardha (pop. 4772), which is also the headquarters of the Kabirpanthi sect (see Kabir).

KAY, JOHN (1742–1826), Scottish caricaturist, was born near Dalkeith, where his father was a mason. At thirteen he was apprenticed to a barber, whom he served for six years. He then went to Edinburgh, where in 1771 he obtained the freedom of the city by joining the corporation of barber-surgeons. In 1785, induced by the favour which greeted certain attempts of his to etch in aquafortis, he took down his barber's pole and opened a small print shop in Parliament Square. There he continued to flourish, painting miniatures, and publishing at short intervals his sketches and caricatures of local celebrities and oddities, who abounded at that period in Edinburgh society. He died on the 21st of February 1826.

Kay's portraits were collected by Hugh Paton and published under the title *A series of original portraits and caricature etchings by the late John Kay, with biographical sketches and illustrative anecdotes* (Edin., 2 vols. 4to, 1838; 8vo ed., 4 vols., 1842; new 4to ed., with additional plates, 2 vols., 1877), forming a unique record of the social life and popular habits of Edinburgh at its most interesting epoch.

KAY, JOSEPH (1821–1878), English economist, was born at Salford, Lancashire, on the 27th of February 1821. Educated privately and at Trinity College, Cambridge, he was called to the bar at the Inner Temple in 1848. He was appointed judge of the Salford Hundred court of record in 1862 and in 1869 was made a queen's counsel. He is best known for a series of works on the social condition of the poor in France, Switzerland, Holland, Germany and Austria, the materials for which he gathered on a four years' tour as travelling bachelor of his university. They were *The Education of the Poor in England and Europe* (London, 1846); *The Social Condition of the People in England and Europe* (London, 1850, 2 vols.); *The Condition and Education of Poor Children in English and in German Towns* (Manchester, 1853). He was also the author of *The Law relating to Shipmasters and Seamen* (London, 1875) and *Free Trade in Land* (1879, with a memoir). He died at Dorking, Surrey, on the 9th of October 1878.

KAYAK, or CAYAK, an Eskimo word for a fishing boat, in common use from Greenland to Alaska. It has been erroneously derived from the Arabic *caique*, supposed to have been applied to the native boats by early explorers. The boat is made by covering a light wooden framework with sealskin. A hole is pierced in the centre of the top of the boat, and the *kayaker* (also dressed in sealskin) laces himself up securely when seated to prevent the entrance of water. The kayak is propelled like a canoe by a double-bladed paddle. The name *kayak* is properly only applied to the boat used by an Eskimo man—that used by a woman is called an *umiak*.

KAYASTH, the writer caste of Northern India, especially numerous and influential in Bengal. In 1901 their total number in all India was more than two millions. Their claim to be Kshattriyas who have taken to clerical work is not admitted by the Brahmans. Under Mahommedan rule they learnt Persian, and filled many important offices. They are now eager students of English, and have supplied not only several judges to the high court but also the first Hindu to be a member of the governor-general's council. In Bombay their place is taken by the Prabhus, and in Assam by the Kalitas (Kolitas); in Southern India there is no distinct clerical caste.

KAYE, SIR JOHN WILLIAM (1814–1876), English military historian, was the son of Charles Kaye, a solicitor, and was educated at Eton and the Royal Military College, Addiscombe. From 1832 to 1841 he was an officer in the Bengal Artillery, afterwards spending some years in literary pursuits both in India and in England. In 1856 he entered the civil service of the East India Company, and when the government of India was transferred to the British crown succeeded John Stuart Mill as secretary of the political and secret department of the India office. In 1871 he was made a K.C.S.I. He died in London on the 24th of July 1876. Kaye's numerous writings include *History of the Sepoy War in India* (London, 1864–1876), which was revised and continued by Colonel G. B. Malleson and published in six volumes in 1888–1889; *History of the War in Afghanistan* (London, 1851), republished in 1858 and 1874; *Administration of the East India Company* (London, 1853); *The Life and Correspondence of Charles, Lord Metcalfe* (London, 1854); *The Life and Correspondence of Henry St George Tucker* (London, 1854); *Life and Correspondence of Sir John Malcolm* (London, 1856); *Christianity in India* (London, 1859); *Lives of Indian Officers* (London, 1867); and two novels, *Peregrine Pultney* and *Long engagements*. He also edited several works dealing with Indian affairs; wrote *Essays of an Optimist* (London, 1870); and was a frequent contributor to periodicals.

KAYSER, FRIEDRICH HEINRICH EMANUEL (1845–), German geologist and palaeontologist, was born at Königsberg, on the 26th of March 1845. He was educated at Berlin where he took his degree of Ph.D. in 1870. In 1882 he became professor of geology in the university at Marburg. He investigated fossils of various ages and from all parts of the world, but more especially from the Palaeozoic formations, including those of South Africa, the Polar regions, and notably the Devonian fossils of Germany, Bohemia and other parts of Europe.

Among his separate works are *Lehrbuch der Geologie* (2 vols., ii.), *Geologische Formationskunde* 1891 (2nd ed., 1902), and i. *Allgemeine Geologie* (1893), vol. ii. (the volume first issued) was translated and edited by P. Lake, 1893, under the title *Textbook of Comparative Geology*. Another work is *Beiträge zur Kenntniss der Fauna der Siegenschen Grauwacke* (1892).

KAY-SHUTTLEWORTH, SIR JAMES PHILLIPS, BART. (1804–1877), English politician and educationalist, was born at Rochdale, Lancashire, on the 20th of July 1804, the son of Robert Kay. At first engaged in a Rochdale bank, in 1824 he became a medical student at Edinburgh University. Settling in Manchester about 1827, he worked for the Ancoats and Ardwick Dispensary, and the experience which he thus gained of the conditions of the poor in the Lancashire factory districts, together with his interest in economic science, led to his appointment in 1835 as poor law commissioner in Norfolk and Suffolk and later in the London districts. In 1839 he was appointed first secretary of the committee formed by the Privy Council to administer the Government grant for the public education in Great Britain. He is remembered as having founded at Battersea, London, in conjunction with E. Carleton Tufnell, the first training college for school teachers (1839–1840); and the system of national school education of the present day, with its public inspection, trained teachers and its support by state as well as local funds, is largely due to his initiative. In 1842 he married Lady Janet Shuttleworth, assuming by royal licence his bride's name and arms. A breakdown in his health led him to resign his post on the committee in 1849, but subsequent recovery enabled him to take an active part in the working of the central relief committee instituted under Lord Derby, during the Lancashire cotton famine of 1861–1865. He was created a baronet in 1849. Until the end of his life he interested himself in the movements of the Liberal party in Lancashire, and the progress of education. He died in London on the 26th of May 1877. His *Physiology, Pathology and Treatment of Asphyxia* became a standard textbook, and he also wrote numerous papers on public education.

His son, Sir Ughtred James Kay-Shuttleworth (b. 1844), became a well-known Liberal politician, sitting in parliament for Hastings from 1869 to 1880 and for the Clitheroe division of Lancashire from 1885 till 1902, when he was created Baron Shuttleworth. He was chancellor of the duchy of Lancaster in 1886, and secretary to the Admiralty in 1892–1895.

KAZALA, or KAZALINSK, a fort and town in the Russian province of Syr-darya in West Turkestan, at the point where the Kazala River falls into the Syr-darya, about 50 m. from its mouth in Lake Aral, in 45° 45′ N. and 62° 7′ E., "at the junction," to quote Schuyler, "of all the trade routes in Central Asia, as the road from Orenburg meets here with the Khiva, Bokhara and Tashkent roads." Besides carrying on an active trade with the Kirghiz of the surrounding country, it is of growing importance in the general current of commerce. Pop. (1897), 7600. The floods in the river make it an island in spring; in summer it is parched by the sun and hot winds, and hardly a tree can be got to grow. The streets are wide, but the houses, as well as the fairly strong fort, are built of mud bricks.

KAZAÑ, a government of middle Russia, surrounded by the governments of Vyatka, Ufa, Samara, Simbirsk, Nizhniy-Novgorod and Kostroma. Area 24,601 sq. m. It belongs to the basins of the Volga and its tributary the Kama, and by these streams the government is divided into three regions; the first, to the right of the main river, is traversed by deep ravines sloping to the north-east, towards the Volga, and by two ranges of hills, one of which (300 to 500 ft.) skirts the river; the second region, between the left bank of the Volga and the left bank of the Kama, is an open steppe; and the third, between the left bank of the Volga and the right bank of the Kama, resembles in its eastern part the first region, and in its western part is covered with forest. Marls, limestones and sandstones, of Permian or Triassic age, are the principal rocks; the Jurassic formation appears in a small part of the Tetyushi district in the south; and Tertiary rocks stretch along the left bank of the Volga. Mineral springs (iron, sulphur and petroleum) exist in several places. The Volga is navigable throughout its course of 200 m. through Kazan, as well as the Kama (120 m.); and the Vyatka, Kazanka, Rutka, Tsivyl, Greater Kokshaga, Ilet, Vetluga and Mesha, are not without value as waterways. About four hundred small lakes are enumerated within the government; the upper and lower Kaban supply the city of Kazañ with water.

The climate is severe, the annual mean temperature being 37·8° F. The rainfall amounts to 16 in. Agriculture is the chief occupation, and 82% of the population are peasants. Out of 7,672,600 acres of arable land, 4,516,500 are under crops—chiefly rye and oats, with some wheat, barley, buckwheat, lentils, flax, hemp and potatoes. But there generally results great scarcity, and even famine, in bad years. Live stock are numerous. Forests cover 35% of the total area. Bee-keeping is an important industry. Factories employ about 10,000 persons and include flour-mills, distilleries, factories for soap, candles and tallow, and tanneries. A great variety of petty trades, especially those connected with wood, are carried on in the villages, partly for export. The fairs are well attended. There is considerable shipping on the Volga, Kama, Vyatka and their tributaries. Kazañ is divided into twelve districts. The chief town is Kazañ (*q.v.*). The district capitals, with their populations in 1897 are: Cheboksary (4568), Chistopol (20,161), Kozmodemyansk (5212), Laishev (5439), Mamadyzh (4213), Spask (2779), Sviyazhsk (2363), Tetyushi (4754), Tsarevokokshaisk (1654), Tsivylsk (2337) and Yadrin (2467). Population (1879), 1,872,437; (1897), 2,190,185, of whom 1,113,555 were women, and 176,396 lived in towns. The estimated population in 1906 was 2,504,400. It consists principally of Russians and Tatars, with a variety of Finno-Turkish tribes: Chuvashes, Cheremisses, Mordvinians, Votyaks, Mescheryaks, and some Jews and Poles. The Russians belong to the Orthodox Greek Church or are Nonconformists; the Tatars are Mussulmans; and the Finno-Turkish tribes are either pagans or belong officially to the Orthodox Greek Church, the respective proportions being (in 1897): Orthodox Greek, 69·4% of the whole; Nonconformists, 1%; Mussulmans, 28·8%. (P. A. K.; J. T. Be.)

KAZAÑ (called by the Cheremisses *Ozon*), a town of eastern Russia, capital of the government of the same name, situated in 55° 48′ N. and 49° 26″ E., on the river Kazanka, 3 m. from the Volga, which however reaches the city when it overflows its banks every spring. Kazañ lies 650 m. E. from Moscow by rail and 253 E. of Nizhniy-Novgorod by the Volga. Pop. (1883), 140,726; (1900), 143,707, all Russians except for some 20,000 Tatars. The most striking feature of the city is the *kreml* or citadel, founded in 1437, which crowns a low hill on the N.W. Within its wall, capped with five towers, it contains several churches, amongst them the cathedral of the Annunciation, founded in 1562 by Gury, the first archbishop of Kazañ, Kazañ being an archiepiscopal see of the Orthodox Greek Church. Other buildings in the kreml are a magnificent monastery, built in 1556; an arsenal; the modern castle in which the governor resides; and the red brick Suyumbeka tower, 246 ft. high, which is an object of great veneration to the Tatars as the reputed burial-place of one of their saints. A little E. of the kreml is the Bogoroditski convent, built in 1579 for the reception of the Black Virgin of Kazañ, a miracle-working image transferred to Moscow in 1612, and in St Petersburg since 1710. Kazañ is the intellectual capital of eastern Russia, and an important seat of Oriental scholarship. Its university, founded in 1804, is attended by nearly 1000 students. Attached to it are an excellent library of 220,000 vols., an astronomical observatory, a botanical garden and various museums. The ecclesiastical academy, founded in 1846, contains the old library of the Solovetsk (Solovki) monastery, which is of importance for the history of Russian religious sects. The city is adorned with bronze statues of Tsar Alexander II., set up facing the kreml in 1895, and of the poet G. R. Derzhavin (1743–1816); also with a monument commemorating the capture of Kazañ by Ivan the Terrible. The central parts of the city consist principally of small one-storeyed houses, surrounded by gardens, and are inhabited chiefly by Russians, while some 20,000 Tatars dwell in the suburbs. Kazañ is, further, the intellectual centre of the Russian Mahommedans, who have here their more important schools and their printing-presses. Between the city and the Volga is the Admiralty suburb, where Peter the Great had his Caspian fleet built for his campaigns against Persia. The more important manufactures are leather goods, soap, wax candles, sacred images, cloth, cottons, spirits and bells. A considerable trade is carried on with eastern Russia, and with Turkestan and Persia. Previous to the 13th century, the present government of Kazañ formed part of the territory of the Bulgarians, the ruins of whose ancient capital, Bolgari or Bolgary, lie 60 m. S. of Kazañ. The city of Kazañ itself stood, down to the 13th century, 30 m. to the N.E., where traces of it can still be seen. In 1438 Ulugh Mahommed (or Ulu Makhmet), khan of the Golden Horde of the Mongols, founded, on the ruins of the Bulgarian state, the kingdom of Kazañ, which in its turn was destroyed by Ivan the Terrible of Russia in 1552 and its territory annexed to Russia. In 1774 the city was laid waste by the rebel Pugachev. It has suffered repeatedly from fires, especially in 1815 and 1825. The Kazañ Tatars, from having lived so long amongst Russians and Finnish tribes, have lost a good many of the characteristic features of their Tatar (Mongol) ancestry, and bear now the stamp of a distinct ethnographic type. They are found also in the neighbouring governments of Vyatka, Ufa, Orenburg, Samara, Saratov, Simbirsk, Tambov and Nizhniy-Novgorod. They are intelligent and enterprising, and are engaged principally in trade.

See Pineghin's *Kazañ Old and New* (in Russian); Velyaminov-Zernov's *Kasimov Tsars* (3 vols., St Petersburg, 1863–1866); Zarinsky's *Sketches of Old Kazañ* (Kazañ, 1877); Trofimov's *Siege of Kazañ in* 1552 (Kazañ, 1890); Firsov's books on the history of the native population (Kazañ, 1864 and 1869); and Shpilevski, on the antiquities of the town and government, in *Izvestia i Zapiski* of the Kazañ University (1877). A bibliography of the Oriental books published in the city is printed in *Bulletins* of the St Petersburg Academy (1867). Compare also L. Leger's "Kazañ et les tartares," in *Bibl. Univ. de Genève* (1874). (P. A. K.; J. T. Be.)

KĀZERŪN, a district and town of the province of Fars in Persia. The district is situated between Shiraz and Bushire. In its centre is the Kāzerūn Valley with a direction N.W. to S.E., a fertile plain 30 m. long and 7 to 8 m. broad, bounded S.E. by the Parishān Lake (8 m. long, 3 m. broad) N.W. by the Boshavir River, with the ruins of the old city of Beh-Shahpur (Beshāver, Boshāvir, also, short, Shāpūr) and Sassanian bas-reliefs on its banks. There also, in a cave, is a statue of Shapur. The remainder of the district is mostly hilly country intersected by numerous streams, plains and hills being covered with zizyphus, wild almond and oak. The district is divided into two divisions: town and villages, the latter being called Kuh i Marreh and again subdivided into (1) Pusht i Kuh; (2) Yarrūk; (3) Shakān. It has forty-six villages and a population of about 15,000; it produces rice of excellent quality, cotton, tobacco and opium, but very little corn, and bread made of the flour of acorns is a staple of food in many villages. Wild almonds are exported.

Kāzerūn, the chief place of the district, is an unwalled town situated in the midst of the central plain, in 29° 37′ N., 51° 43′ E. at an elevation of 2800 ft., 70 m. from Shiraz, and 96 m. from Bushire. It has a population of about 8000, and is divided into four quarters separated by open spaces. Adjoining it on the W. is the famous Nazar garden, with noble avenues of orange trees planted by a former governor, Hajji Ali Kuli Khan, in 1767. A couple of miles N. of the city behind a low range of hills are the imposing ruins of a marble building said to stand over the grave of Sheik Amin ed din Mahommed b. Zia ed din Mas'ūd, who died A.H. 740 (A.D. 1339). S.E. of the city on a hugh mound are ruins of buildings with underground chambers, popularly known as Kal'eh i Gabr, "castle of the fire-worshippers."

KAZINCZY, FERENCZ (1759–1831), Hungarian author, the most indefatigable agent in the regeneration of the Magyar language and literature at the end of the 18th and beginning of the 19th century, was born on the 27th of October 1759, at Ér-Semlyén, in the county of Bihar, Hungary. He studied law at Kassa and Eperies, and in Pest, where he also obtained a thorough knowledge of French and German literature, and made the acquaintance of Gideon Ráday, who allowed him the use of his library. In 1784 Kazinczy became subnotary for the county of Abaúj; and in 1786 he was nominated inspector of schools at Kassa. There he began to devote himself to the restoration of the Magyar language and literature by translations from classical foreign works, and by the augmentation of the native vocabulary from ancient Magyar sources. In 1788, with the assistance of Baróti Szabó and John Bacsányi, he started at Kassa the first Magyar literary magazine, *Magyar Muzeum*; the *Orpheus*, which succeeded it in 1790, was his own creation. Although, upon the accession of Leopold II., Kazinczy, as a non-Catholic, was obliged to resign his post at Kassa, his literary activity in no way decreased. He not only assisted Gideon Ráday in the establishment and direction of the first Magyar dramatic society, but enriched the repertoire with several translations from foreign authors. His *Hamlet*, which first appeared at Kassa in 1790, is a rendering from the German version of Schröder. Implicated in the democratic conspiracy of the abbot Martinovics, Kazinczy was arrested on the 14th of December 1794, and condemned to death; but the sentence was commuted to imprisonment. He was released in 1801, and shortly afterwards married Sophia Török, daughter of his former patron, and retired to his small estate at Széphalom or "Fairhill," near Sâtor-Ujhely, in the county of Zemplén. In 1828 he took an active part in the conferences held for the establishment of the Hungarian academy in the historical section of which he became the first corresponding member. He died of Asiatic cholera, at Széphalom, on the 22nd of August 1831.

Kazinczy, although possessing great beauty of style, cannot be regarded as a powerful and original thinker; his fame is chiefly due to the felicity of his translations from the masterpieces of Lessing, Goethe, Wieland, Klopstock, Ossian, La Rochefoucauld, Marmontel, Molière, Metastasio, Shakespeare, Sterne, Cicero, Sallust, Anacreon, and many others. He also edited the works of Baróczy (Pest, 1812, 8 vols.) and of the poet Zrinyi (1817, 2 vols.), and the poems of Dayka (1813, 3 vols.) and of John Kis, (1815, 3 vols.). A collective edition of his works (*Szép Literatura*), consisting for the most part of translations, was published at Pest, 1814–1816, in 9 vols. His original productions (*Eredeti Mukái*), largely made up of letters, were edited by Joseph Bajza and Francis Toldy at Pest, 1836–1845, in 5 vols. Editions of his poems appeared in 1858 and in 1863.

KAZVIN, a province and town of Persia. The province is situated N.W. of Teheran and S. of Gilan. On the W. it is bounded by Khamseh. It pays a yearly revenue of about £22,000, and contains many rich villages which produce much grain and fruit, great quantities of the latter being dried and exported.

Kazvin, the capital of the province, is situated at an elevation of 4165 ft., in 36° 15′ N. and 50° E., and 92 m. by road from Teheran. The city is said to have been founded in the 4th century by the Sassanian king Shapur II (309–379). It has been repeatedly damaged by earthquakes. Many of its streets and most of the magnificent buildings seen there by Chardin in 1674 and other travellers during the 17th century are in ruins. The most remarkable remains are the palace of the Safawid shahs and the mosque with its large blue dome. In the 16th century Shah Tahmasp I. (1524–1576) made Kazvin his capital, and it remained so till Shah Abbas I. (1587–1629) transferred the seat of government to Isfahán. The town still bears the title Dar es Salteneh, "the seat of government." Kazvin has many baths and cisterns fed by underground canals. The system of irrigation formerly carried on by these canals rendered the plain of Kazvin one of the most fertile regions in Persia; now most of the canals are choked up. The city has a population of about 50,000 and a thriving transit trade, particularly since 1899 when the carriage road between Resht and Teheran with Kazvin as a half-way stage was opened under the auspices of the Russian "Enzeli-Teheran Road Company." Great quantities of rice, fish and silk are brought to it from Gilan for distribution in Persia and export to Turkey.

KEAN, EDMUND (1787–1833), was born in London on the 17th of March[1] 1787. His father was probably Edmund Kean, an architect's clerk; and his mother was an actress, Ann Carey, grand-daughter of Henry Carey. When in his fourth year Kean made his first appearance on the stage as Cupid in Noverre's ballet of *Cymon*. As a child his vivacity and cleverness, and his ready affection for those who treated him with kindness, made him a universal favourite, but the harsh circumstances of his lot, and the want of proper restraint, while they developed strong self-reliance, fostered wayward tendencies. About 1794 a few benevolent persons provided the means of sending him to school, where he mastered his tasks with remarkable ease and rapidity; but finding the restraint intolerable, he shipped as a cabin boy at Portsmouth. Discovering that he had only escaped to a more rigorous bondage, he counterfeited both deafness and lameness with a histrionic mastery which deceived even the physicians at Madeira. On his return to England he sought the protection of his uncle Moses Kean, mimic, ventriloquist and general entertainer, who, besides continuing his pantomimic studies, introduced him to the study of Shakespeare. At the same time Miss Tidswell, an actress who had been specially kind to him from infancy, taught him the principles of acting. On the death of his uncle he was taken charge of by Miss Tidswell, and under her direction he began the systematic study of the principal Shakespearian characters, displaying the peculiar originality of his genius by interpretations entirely different from those of Kemble. His talents and interesting countenance induced a Mrs Clarke to adopt him, but the slight of a visitor so wounded his pride that he suddenly left her house and went back to his old surroundings. In his fourteenth year he obtained an engagement to play leading characters for twenty nights in York Theatre, appearing as Hamlet, Hastings and Cato. Shortly afterwards, while he was in the strolling troupe belonging to Richardson's show, the rumour of his abilities reached George III., who commanded him to recite at Windsor. He subsequently joined Saunders's circus, where in the performance of an equestrian feat he fell and broke his legs—the accident leaving traces of swelling in his insteps throughout his life. About this time he picked up music from Charles Incledon, dancing from D'Egville, and fencing from Angelo. In 1807 he played leading parts in the Belfast theatre with Mrs Siddons, who began by calling him "a horrid little man" and on further experience of his ability said that he "played very, very well," but that "there was too little of him to make a great actor." An engagement in 1808 to play leading characters in Beverley's provincial troupe was brought to an abrupt close by his marriage (July 17) with Miss Mary Chambers of Waterford, the leading actress. For several years his prospects were very gloomy, but in 1814 the committee of Drury Lane theatre, the fortunes of which were then so low that bankruptcy seemed inevitable, resolved to give him a chance among the "experiments" they were making to win a return of popularity. When the expectation of his first appearance in London was close upon him he was so feverish that he exclaimed "If I succeed I shall go mad." His opening at Drury Lane on the 26th of January 1814 as Shylock roused the audience to almost uncontrollable enthusiasm. Successive appearances in Richard III., Hamlet, Othello, Macbeth and Lear served to demonstrate his complete mastery of the whole range of tragic emotion. His triumph was so great that he himself said on one occasion, "I could not feel the stage under me." On the 29th of November 1820 Kean appeared for the first time in New York as Richard III. The success of his visit to America was unequivocal, although he fell into a vexatious dispute with the press. On the 4th of June 1821 he returned to England.

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[1] This date is apparently settled by a letter from Kean in 1829, to Dr Gibson (see *Rothesay Express* for the 28th of June 1893, where the letter is printed and vouched for), inviting him to dinner on the 17th of March to celebrate Kean's birthday; various other dates have been given in books of reference, the 4th of November having been formerly accepted by this Encyclopaedia.

Probably his irregular habits were prejudicial to the refinement of his taste, and latterly they tended to exaggerate his special defects and mannerisms. The adverse decision in the divorce case of Cox *v.* Kean on the 17th of January 1825 caused his wife to leave him, and aroused against him such bitter feeling, shown by the almost riotous conduct of the audiences before which he appeared about this time, as nearly to compel him to retire permanently into private life. A second visit to America in 1825 was largely a repetition of the persecution which, in the name of morality, he had suffered in England. Some cities showed him a spirit of charity; many audiences submitted him to the grossest insults and endangered his life by the violence of their disapproval. In Quebec he was much impressed with the kindness of some Huron Indians who attended his performances, and he was made chief of the tribe, receiving the name Alanienouidet. Kean's last appearance in New York was on the 5th of December 1826 in Richard III., the rôle in which he was first seen in America. He returned to England and was ultimately received with all the old favour, but the contest had made him so dependent on the use of stimulants that the gradual deterioration of his gifts was inevitable. Still, even in their decay his great powers triumphed during the moments of his inspiration over the absolute wreck of his physical faculties, and compelled admiration after his gait had degenerated into a weak hobble, and the lightning brilliancy of his eyes had become dull and bloodshot, and the tones of his matchless voice marred by rough and grating hoarseness. His appearance in Paris was a failure owing to a fit of drunkenness. His last appearance on the stage was at Covent Garden, on the 25th of March 1833 when he played Othello to the Iago of his son Charles. At the words "Villain, be sure," in scene 3 of act iii., he suddenly broke down, and crying in a faltering voice "O God, I am dying. Speak to them, Charles," fell insensible into his son's arms. He died at Richmond on the 15th of May 1833.

It was in the impersonation of the great creations of Shakespeare's genius that the varied beauty and grandeur of the acting of Kean were displayed in their highest form, although probably his most powerful character was Sir Giles Overreach in Massinger's *A New Way to Pay Old Debts*, the effect of his first impersonation of which was such that the pit rose *en masse*, and even the actors and actresses themselves were overcome by the terrific dramatic illusion. His only personal disadvantage as an actor was his small stature. His countenance was strikingly interesting and unusually mobile; he had a matchless command of facial expression; his fine eyes scintillated with the slightest shades of emotion and thought; his voice, though weak and harsh in the upper register, possessed in its lower range tones of penetrating and resistless power, and a thrilling sweetness like the witchery of the finest music; above all, in the grander moments of his passion, his intellect and soul seemed to rise beyond material barriers and to glorify physical defects with their own greatness. Kean specially excelled as the exponent of passion. In Othello, Iago, Shylock and Richard III., characters utterly different from each other, but in which the predominant element is some form of passion, his identification with the personality, as he had conceived it, was as nearly as possible perfect, and each isolated phase and aspect of the plot was elaborated with the minutest attention to details, and yet with an absolute subordination of these to the distinct individuality he was endeavouring to portray. Coleridge said, "Seeing him act was like reading Shakespeare by flashes of lightning." If the range of character in which Kean attained supreme excellence was narrow, no one except Garrick has been so successful in so many great impersonations. Unlike Garrick, he had no true talent for comedy, but in the expression of biting and saturnine wit, of grim and ghostly gaiety, he was unsurpassed. His eccentricities at the height of his fame were numerous. Sometimes he would ride recklessly on his horse Shylock throughout the night. He was presented with a tame lion with which he might be found playing in his drawing-room. The prizefighters Mendoza and Richmond the Black were among his visitors. Grattan was his devoted friend. In his earlier days Talma said of him, "He is a magnificent uncut gem; polish and round him off and he will be a perfect tragedian." Macready, who was much impressed by Kean's Richard III. and met the actor at supper, speaks of his "unassuming manner . . . partaking in some degree of shyness" and of the "touching grace" of his singing. Kean's delivery of the three words "I answer—NO!" in the part of Sir Edward Mortimer in *The Iron Chest*, cast Macready into an abyss of despair at rivalling him in this rôle. So full of dramatic interest is the life of Edmund Kean that it formed the subject for a play by the elder Dumas, entitled *Kean on désordre et génie*, in which Frederick-Lemaître achieved one of his greatest triumphs.

See Francis Phippen, *Authentic Memoirs of Edmund Kean* (1814); B. W. Procter (Barry Cornwall), *The Life of Edmund Kean* (1835); F. W. Hawkins, *The Life of Edmund Kean* (1869); J. Fitzgerald Molloy, *The Life and Adventures of Edmund Kean* (1888); Edward Stirling, *Old Drury Lane* (1887).

His son, CHARLES JOHN KEAN (1811–1868), was born at Waterford, Ireland, on the 18th of January 1811. After preparatory education at Worplesdon and at Greenford, near Harrow, he was sent to Eton College, where he remained three years. In 1827 he was offered a cadetship in the East India Company's service, which he was prepared to accept if his father would settle an income of £400 on his mother. The elder Kean refused to do this, and his son determined to become an actor. He made his first appearance at Drury Lane on the 1st of October 1827 as Norval in Home's *Douglas*, but his continued failure to achieve popularity led him to leave London in the spring of 1828 for the provinces. At Glasgow, on the 1st of October in this year, father and son acted together in Arnold Payne's *Brutus*, the elder Kean in the title-part and his son as Titus. After a visit to America in 1830, where he was received with much favour, he appeared in 1833 at Covent Garden as Sir Edmund Mortimer in Colman's *The Iron Chest*, but his success was not pronounced enough to encourage him to remain in London, especially as he had already won a high position in the provinces. In January 1838, however, he returned to Drury Lane, and played Hamlet with a success which gave him a place among the principal tragedians of his time. He was married to the actress Ellen Tree (1805–1880) on the 29th of January 1842, and paid a second visit to America with her from 1845 to 1847. Returning to England, he entered on a successful engagement at the Haymarket, and in 1850, with Robert Keeley, became lessee of the Princess Theatre. The most noteworthy feature of his management was a series of gorgeous Shakespearian revivals. Charles Kean was not a great tragic actor. He did all that could be done by the persevering cultivation of his powers, and in many ways manifested the possession of high intelligence and refined taste, but his defects of person and voice made it impossible for him to give a representation at all adequate of the varying and subtle emotions of pure tragedy. But in melodramatic parts such as the king in Boucicault's adaptation of Casimir Delavigne's *Louis XI.*, and Louis and Fabian dei Franchi in Boucicault's adaptation of Dumas's *The Corsican Brothers*, his success was complete. From his "tour round the world" Kean returned in 1866 in broken health, and died in London on the 22nd of January 1868.

See *The Life and Theatrical Times of Charles Kean*, by John William Cole (1859).

KEANE, JOHN JOSEPH (1839–), American Roman Catholic archbishop, was born in Ballyshannon, Co. Donegal, Ireland, on the 12th of September 1839. His family settled in America when he was seven years old. He was educated at Saint Charles's College, Ellicott City, Maryland, and at Saint Mary's Seminary, Baltimore, and in 1866 was ordained a priest and made curate of St Patrick's, Washington, D.C. On the 25th of August 1878 he was consecrated Bishop of Richmond, to succeed James Gibbons, and he had established the Confraternity of the Holy Ghost in that diocese, and founded schools and churches for negroes before his appointment as rector of the Catholic University, Washington, D.C., in 1886, and his appointment in 1888 to the see of Ajasso. He did much to upbuild the Catholic University, but his democratic and liberal policy made him enemies at Rome, whence there came in 1896 a request for his resignation of the rectorate, and where he spent the years 1897–1900 as canon of St John Lateran, assistant bishop at the pontifical throne, and counsellor to the Propaganda. In 1900 he was consecrated archbishop of Dubuque, Iowa. He took a prominent part in the Catholic Young Men's National Union and in the Total Abstinence Union of North America; and was in general charge of the Catholic delegation to the World's Parliament of Religions held at the Columbian Exposition in 1893. He lectured widely on temperance, education and American institutions, and in 1890 was Dudleian lecturer at Harvard University.

A selection from his writings and addresses was edited by Maurice Francis Egan under the title *Onward and Upward: A Year Book* (Baltimore, 1902).

KEARNEY, a city and the county-seat of Buffalo county, Nebraska, U.S.A., about 130 m. W. of Lincoln. Pop. (1890), 8074; (1900), 5634 (650 foreign-born); (1910), 6202. It is on the main overland line of the Union Pacific, and on a branch of the Burlington & Missouri River railroad. The city is situated in the broad, flat bottom-lands a short distance N. of the Platte River. Lake Kearney, in the city, has an area of 40 acres. The surrounding region is rich farming land, devoted especially to the growing of alfalfa and Indian corn. At Kearney are a State Industrial School for boys, a State Normal School, the Kearney Military Academy, and a Carnegie library. Good water-power is provided by a canal from the Platte River about 17 m. above Kearney, and the city's manufactures include foundry and machine-shop products, flour and bricks. Kearney Junction, as Kearney was called from 1872 to 1875, was settled a year before the two railways actually formed their junction here or the city was platted. Kearney became a town in 1873, a city of the second class and the county seat in 1874, and a city of the first class in 1901. It is to be distinguished from an older and once famous prairie city, popularly known as "Dobey Town" (*i.e.* Adobe), founded in the early 'fifties on the edge of the reservation of old Fort Kearney (removed in 1848 from Nebraska City), in Kearney county, on the S. shore of the Platte about 6 m. S.E. of the present Kearney; here in 1861 the post office of Kearney City was established. In the days of the prairie freighting caravans Dobey Town was one of the most important towns between Independence, Missouri, and the Pacific coast, and it had a rough, wild, picturesque history; but it lost its immense freighting interests after the Union Pacific had been extended through it in 1866. The site of Dobey Town, together with the Fort, was abandoned in 1871. Fort Kearney and the city too were named in honour of General Stephen W. Kearny, and the name was at first correctly spelt without a second "e."

KEARNY, PHILIP (1815–1862), American soldier, was born in New York on the 2nd of June 1815, and was originally intended for the legal profession. He graduated at Columbia University (1833), but his bent was decidedly towards soldiering, and in 1837 he obtained a commission in the cavalry regiment of which his uncle, (General) Stephen Watts Kearny (1794–1848), was colonel and Lieutenant Jefferson Davis adjutant. Two years later he was sent to France to study the methods of cavalry training in vogue there. Before his return to the United States in 1840 he had served, on leave, in Algeria. He had inherited a large fortune, but he remained in the service, and his wide experience of cavalry work caused him to be employed on the headquarters staff of the army. After six more years' service Kearny left the army, but almost immediately afterwards he rejoined, bringing with him a company of cavalry, which he had raised and equipped chiefly at his own expense, to take part in the Mexican war. In December 1846 he was promoted captain. In leading a brilliant cavalry charge at Churubusco he lost his left arm, but he remained at the front, and won the brevet of major for his gallantry at Contreras and Churubusco. In 1851 he again resigned, to travel round the world. He saw further active service with his old comrades of the French cavalry in the Italian war of 1859, and received the cross of the Legion of Honour for his conduct at Solferino. Up to the outbreak of the American Civil War he lived in Paris, but early in 1861 he hastened home to join the Federal army. At first as a brigade commander and later as a divisional commander of infantry in the Army of the Potomac, he infused into his men his own cavalry spirit of dash and bravery. At Williamsburg, Seven Pines, and Second Bull Run, he displayed his usual romantic courage, but at Chantilly (Sept. 1, 1862), after repulsing an attack of the enemy, he rode out in the dark too far to the front, and mistaking the Confederates for his own men was shot dead. His body was sent to the Federal lines with a message from General Lee, and was buried in Trinity Churchyard, New York. His commission as major-general of volunteers was dated July 4, 1862, but he never received it.

See J. W. de Peyster, *Personal and Military History of Philip Kearny* (New York, 1869).

KEARNY, a town of Hudson county, New Jersey, U.S.A., between the Passaic and Hackensack rivers, adjoining Harrison, and connected with Newark by bridges over the Passaic. Pop. (1900), 10,896, of whom 3597 were foreign-born; (1910 census), 18,659. The New York & Greenwood Lake division of the Erie railroad has a station at Arlington, the principal village (in the N.W. part), which contains attractive residences of Newark, Jersey City and New York City business men. The town covers an area of about 7 sq. m., including a large tract of marsh-land. In Kearny are railway repair shops of the Pennsylvania system, and a large abattoir; and there are numerous manufactures. The value of the town's factory products increased from \$1,607,002 in 1900 to \$4,427,904 in 1905, or 175·5%. Among its institutions are the State Soldiers' Home, removed here from Newark in 1880, a Carnegie library, two Italian homes for orphans, and a Catholic Industrial School for boys.

The neck of land between the Passaic and the Hackensack rivers, for 7 m. N. from where they unite, was purchased from the proprietors of East Jersey and from the Indians by Captain William Sandford in 1668 and through Nathaniel Kingsland, sergeant-major of Barbadoes, received the name "New Barbadoes." After the town under this name had been extended considerably to the northward, the town of Lodi was formed out of the S. portion in 1825, the town of Harrison was founded out of the S. portion of Lodi in 1840, and in 1867 a portion of Harrison was set apart as a township and named in honour of General Philip Kearny, a former resident. Kearny was incorporated as a town in 1895.

KEARY, ANNIE (1825–1879), English novelist, was born near Wetherby, Yorkshire, on the 3rd of March 1825, the daughter of an Irish clergyman. She was the author of several children's books and novels, of which the best known is *Castle Daly*, an Irish story. She also wrote an *Early Egyptian History* (1861) and *The Nation Around* (1870). She died at Eastbourne on the 3rd of March 1879.

KEATE, JOHN (1773–1852), English schoolmaster, was born at Wells, Somersetshire, in 1773, the son of Prebendary William Keate. He was educated at Eton and King's College, Cambridge, where he had a brilliant career as a scholar; taking holy orders, he became, about 1797, an assistant master at Eton College. In 1809 he was elected headmaster. The discipline of the school was then in a most unsatisfactory condition, and Dr Keate (who took the degree of D.D. in 1810) took stern measures to improve it. His partiality for the birch became a by-word, but he succeeded in restoring order and strengthening the weakened authority of the masters. Beneath an outwardly rough manner the little man concealed a really kind heart, and when he retired in 1834, the boys, who admired his courage, presented him with a handsome testimonial. A couple of years before he had publicly flogged eighty boys on one day. Keate was made a canon of Windsor in 1820. He died on the 5th of March 1852 at Hartley Westpall, Hampshire, of which parish he had been rector since 1824.

See Maxwell Lyte, *History of Eton College* (3rd ed., 1899); Collins, *Etoniana*; Harwood, *Alumni Etonienses*; *Annual Register* (1852); *Gentleman's Magazine* (1852).

KEATS, JOHN (1795–1821), English poet, was born on the 29th or 31st of October 1795 at the sign of the Swan and Hoop, 24 The Pavement, Moorfields, London. He published his first volume of verse in 1817, his second in the following year, his third in 1820, and died of consumption at Rome on the 23rd of February 1821 in the fourth month of his twenty-sixth year. (For the biographical facts see the later section of this article.)

In Keats's first book there was little foretaste of anything greatly or even genuinely good; but between the marshy and sandy flats of sterile or futile verse there were undoubtedly some few purple patches of floral promise. The style was frequently detestable—a mixture of sham Spenserian and mock Wordsworthian, alternately florid and arid. His second book, *Endymion*, rises in its best passages to the highest level of Barnfield and of Lodge, the two previous poets with whom, had he published nothing more, he might most properly have been classed; and this, among minor minstrels, is no unenviable place. His third book raised him at once to a foremost rank in the highest class of English poets. Shelley, up to twenty, had written little or nothing that would have done credit to a boy of ten; and of Keats also it may be said that the merit of his work at twenty-five was hardly by comparison more wonderful than its demerit at twenty-two. His first book fell as flat as it deserved to fall; the reception of his second, though less considerate than on the whole it deserved, was not more contemptuous than that of immeasurably better books published about the same time by Coleridge, Landor and Shelley. A critic of exceptional carefulness and candour might have noted in the first book so singular an example of a stork among the cranes as the famous and notable sonnet on Chapman's Homer; a just judge would have indicated, a partial advocate might have exaggerated, the value of such golden grain amid a garish harvest of tares as the hymn to Pan and the translation into verse of Titian's Bacchanal which glorify the weedy wilderness of *Endymion*. But the hardest thing said of that poem by the *Quarterly* reviewer was unconsciously echoed by the future author of *Adonais*—that it was all but absolutely impossible to read through; and the obscener insolence of the "Blackguard's Magazine," as Landor afterwards very justly labelled it, is explicable though certainly not excusable if we glance back at such a passage as that where Endymion exchanges fulsome and liquorish endearments with the "known unknown *from whom his being sips such darling* (!) *essence*." Such nauseous and pitiful phrases as these, and certain passages in his correspondence, make us understand the source of the most offensive imputations or insinuations levelled against the writer's manhood; and, while admitting that neither his love-letters, nor the last piteous outcries of his wailing and shrieking agony, would ever have been made public by merciful or respectful editors, we must also admit that, if they ought never to have been published, it is no less certain that they ought never to have been written; that a manful kind of man or even a manly sort of boy, in his love-making or in his suffering, will not howl and snivel after such a lamentable fashion. One thing hitherto inexplicable a very slight and rapid glance at his amatory correspondence will amply suffice to explain: how it came to pass that the woman so passionately beloved by so great a poet should have thought it the hopeless attempt of a mistaken kindness to revive the memory of a man for whom the best that could be wished was complete and compassionate oblivion. For the side of the man's nature presented to her inspection, this probably was all that charity or reason could have desired. But that there was a finer side to the man, even if considered apart from the poet, his correspondence with his friends and their general evidence to his character give more sufficient proof than perhaps we might have derived from the general impression left on us by his works; though indeed the preface to *Endymion* itself, however illogical in its obviously implied suggestion that the poem published was undeniably unworthy of publication, gave proof or hint at least that after all its author was something of a man. And the eighteenth of his letters to Miss Brawne stands out in bright and brave contrast with such as seem incompatible with the traditions of his character on its manlier side. But if it must be said that he lived long enough only to give promise of being a man, it must also be said that he lived long enough to give assurance of being a poet who was not born to come short of the first rank. Not even a hint of such a probability could have been gathered from his first or even from his second appearance; after the publication of his third volume it was no longer a matter of possible debate among judges of tolerable competence that this improbability had become a certainty. Two or three phrases cancelled, two or three lines erased, would have left us in *Lamia* one of the most faultless as surely as one of the most glorious jewels in the crown of English poetry. *Isabella*, feeble and awkward in narrative to a degree almost incredible in a student of Dryden and a pupil of Leigh Hunt, is overcharged with episodical effects of splendid and pathetic expression beyond the reach of either. *The Eve of St Agnes*, aiming at no doubtful success, succeeds in evading all casual difficulty in the line of narrative; with no shadow of pretence to such interest as may be derived from stress of incident or depth of sentiment, it stands out among all other famous poems as a perfect and unsurpassable study in pure colour and clear melody—a study in which the figure of Madeline brings back upon the mind's eye, if only as moonlight recalls a sense of sunshine, the nuptial picture of Marlowe's Hero and the sleeping presence of Shakespeare's Imogen. Beside this poem should always be placed the less famous but not less precious *Eve of St Mark*, a fragment unexcelled for the simple perfection of its perfect simplicity, exquisite alike in suggestion and in accomplishment. The triumph of *Hyperion* is as nearly complete as the failure of *Endymion*; yet Keats never gave such proof of a manly devotion and rational sense of duty to his art as in his resolution to leave this great poem unfinished; not, as we may gather from his correspondence on the subject, for the pitiful reason assigned by his publishers, that of discouragement at the reception given to his former work, but on the solid and reasonable ground that a Miltonic study had something in its very scheme and nature too artificial, too studious of a foreign influence, to be carried on and carried out at such length as was implied by his original design. Fortified and purified as it had been on a first revision, when much introductory allegory and much tentative effusion of sonorous and superfluous verse had been rigorously clipped down or pruned away, it could not long have retained spirit enough to support or inform the shadowy body of a subject so little charged with tangible significance. The faculty of assimilation as distinguished from imitation, than which there can be no surer or stronger sign of strong and sure original genius, is not more evident in the most Miltonic passages of the revised *Hyperion* than in the more Shakespearian passages of the unrevised tragedy which no radical correction could have left other than radically incorrigible. It is no conventional exaggeration, no hyperbolical phrase of flattery with more sound than sense in it, to say that in this chaotic and puerile play of *Otho the Great* there are such verses as Shakespeare might not without pride have signed at the age when he wrote and even at the age when he rewrote the tragedy of *Romeo and Juliet*. The dramatic fragment of *King Stephen* shows far more power of hand and gives far more promise of success than does that of Shelley's *Charles the First*. Yet we cannot say with any confidence that even this far from extravagant promise would certainly or probably have been kept; it is certain only that Keats in these attempts did at least succeed in showing a possibility of future excellence as a tragic or at least a romantic dramatist. In every other line of high and serious poetry his triumph was actual and consummate; here only was it no more than potential or incomplete. As a ballad of the more lyrical order, *La Belle dame sans merci* is not less absolutely excellent, less triumphantly perfect in force and clearness of impression, that as a narrative poem is *Lamia*. In his lines on Robin Hood, and in one or two other less noticeable studies of the kind, he has shown thorough and easy mastery of the beautiful metre inherited by Fletcher from Barnfield and by Milton from Fletcher. The simple force of spirit and style which distinguishes the genuine ballad manner from all spurious attempts at an artificial simplicity was once more at least achieved in his verses on the crowning creation of Scott's humaner and manlier genius—Meg Merrilies. No little injustice has been done to Keats by such devotees as fix their mind's eye only on the more salient and distinctive notes of a genius which in fact was very much more various and tentative, less limited and peculiar, than would be inferred from an exclusive study of his more specially characteristic work. But within the limits of that work must we look of course for the genuine credentials of his fame; and highest among them we must rate his unequalled and unrivalled odes. Of these perhaps the two nearest to absolute perfection, to the triumphant achievement and accomplishment of the very utmost beauty possible to human words, may be that to Autumn and that on a Grecian Urn; the most radiant, fervent and musical is that to a Nightingale; the most pictorial and perhaps the tenderest in its ardour of passionate fancy is that to Psyche; the subtlest in sweetness of thought and feeling is that on Melancholy. Greater lyrical poetry the world may have seen than any that is in these; lovelier it surely has never seen, nor ever can it possibly see. From the divine fragment of an unfinished ode to Maia we can but guess that if completed it would have been worthy of a place beside the highest. His remaining lyrics have many beauties about them, but none perhaps can be called thoroughly beautiful. He has certainly left us one perfect sonnet of the first rank and as certainly he has left us but one.

Keats has been promoted by modern criticism to a place beside Shakespeare. The faultless force and the profound subtlety of his deep and cunning instinct for the absolute expression of absolute natural beauty can hardly be questioned or overlooked; and this is doubtless the one main distinctive gift or power which denotes him as a poet among all his equals, and gives him a right to rank for ever beside Coleridge and Shelley. As a man, the two admirers who did best service to his memory were Lord Houghton and Matthew Arnold. These alone, among all of their day who have written of him without the disadvantage or advantage of a personal acquaintance, have clearly seen and shown us the manhood of the man. That ridiculous and degrading legend which imposed so strangely on the generous tenderness of Shelley, while evoking the very natural and allowable laughter of Byron, fell to dust at once for ever on the appearance of Lord Houghton's biography, which gave perfect proof to all time that "men have died and worms have eaten them" but not for fear of critics or through suffering inflicted by reviews. Somewhat too sensually sensitive Keats may have been in either capacity, but the nature of the man was as far as was the quality of the poet above the pitiful level of a creature whose soul could "let itself be snuffed out by an article"; and, in fact, owing doubtless to the accident of a death which followed so fast on his early appearance and his dubious reception as a poet, the insolence and injustice of his reviewers in general have been comparatively and even considerably exaggerated. Except from the chief fountain-head of professional ribaldry then open in the world of literary journalism, no reek of personal insult arose to offend his nostrils; and the tactics of such unwashed malignants were inevitably suicidal; the references to his brief experiment of apprenticeship to a surgeon which are quoted from *Blackwood*, in the shorter as well as in the longer memoir by Lord Houghton, could leave no bad odour behind them save what might hang about men's yet briefer recollection of his assailant's unmemorable existence. The false Keats, therefore, whom Shelley pitied and Byron despised would have been, had he ever existed, a thing beneath compassion or contempt. That such a man could have had such a genius is almost evidently impossible; and yet more evident is the proof which remains on everlasting record that none was ever further from the chance of decline to such degradation than the real and actual man who made that name immortal. (A. C. S.)

Subjoined are the chief particulars of Keats's life.

He was the eldest son of Thomas Keats and his wife Frances Jennings, and was baptized at St Botolph's, Bishopsgate, on the 18th of December 1795. The entry of his baptism is supplemented by a marginal note stating that he was born on the 31st of October. Thomas Keats was employed in the Swan and Hoop livery stables, Finsbury Pavement, London. He had married his master's daughter, and managed the business on the retirement of his father-in-law. In April 1804 Thomas Keats was killed by a fall from his horse, and within a year of this event Mrs Keats married William Rawlings, a stable-keeper. The marriage proved an unhappy one, and in 1806 Mrs Rawlings, with her children John, George, Thomas and Frances Mary (afterwards Mrs Llanos, d. 1889), went to live at Edmonton with her mother, who had inherited a considerable competence from her husband. There is evidence that Keats's parents were by no means of the commonplace type that might be hastily inferred from these associations. They had desired to send their sons to Harrow, but John Keats and his two brothers were eventually sent to a school kept by John Clarke at Enfield, where he became intimate with his master's son, Charles Cowden Clarke. His vivacity of temperament showed itself at school in a love of fighting, but in the last year of his school life he developed a great appetite for reading of all sorts. In 1810 he left school to be apprenticed to Mr Thomas Hammond, a surgeon in Edmonton. He was still within easy reach of his old school, where he frequently borrowed books, especially the works of Spenser and the Elizabethans. With Hammond he quarrelled before the termination of his apprenticeship, and in 1814 the connexion was broken by mutual consent. His mother had died in 1810, and in 1814 Mrs Jennings. The children were left in the care of two guardians, one of whom, Richard Abbey, seems to have made himself solely responsible. John Keats went to London to study at Guy's and St Thomas's hospitals, living at first alone at 8 Dean Street, Borough, and later with two fellow students in St Thomas's Street. It does not appear that he neglected his medical studies, but his chief interest was turned to poetry. In March 1816 he became a dresser at Guy's, but about the same time his poetic gifts were stimulated by an acquaintance formed with Leigh Hunt. His friendship with Benjamin Haydon, the painter, dates from later in the same year. Hunt introduced him to Shelley, who showed the younger poet a constant kindness. In 1816 Keats moved to the Poultry to be with his brothers George and Tom, the former of whom was then employed in his guardian's counting-house, but much of the poet's time was spent at Leigh Hunt's cottage at Hampstead. In the winter of 1816–1817 he definitely abandoned medicine, and in the spring appeared *Poems by John Keats* dedicated to Leigh Hunt, and published by Charles and James Ollier. On the 14th of April he left London to find quiet for work. He spent some time at Shanklin, Isle of Wight, then at Margate and Canterbury, where he was joined by his brother Tom. In the summer the three brothers took lodgings in Well Walk, Hampstead, where Keats formed a fast friendship with Charles Wentworth Dilke and Charles Armitage Brown. In September of the same year (1817) he paid a visit to his friend, Benjamin Bailey, at Oxford, and in November he finished *Endymion* at Burford Bridge, near Dorking. His youngest brother had developed consumption, and in March John went to Teignmouth to nurse him in place of his brother George, who had decided to sail for America with his newly married wife, Georgiana Wylie. In May (1818) Keats returned to London, and soon after appeared *Endymion: A Poetic Romance* (1818), bearing on the title-page as motto "The stretched metre of an antique song." Late in June Keats and his friend Armitage Brown started on a walking tour in Scotland, vividly described in the poet's letters. The fatigue and hardship involved proved too great a strain for Keats, who was forbidden by an Inverness doctor to continue his tour. He returned to London by boat, arriving on the 18th of August. The autumn was spent in constant attendance on his brother Tom, who died at the beginning of December. There is no doubt that he resented the attacks on him in *Blackwood's Magazine* (August 1818), and the *Quarterly Review* (April 1818, published only in September), but his chief preoccupations were elsewhere. After his brother's death he went to live with his friend Brown. He had already made the acquaintance of Fanny Brawne, a girl of seventeen, who lived with her mother close by. For her Keats quickly developed a consuming passion. He was in indifferent health, and, owing partly to Mr Abbey's mismanagement, in difficulties for money. Nevertheless his best work belongs to this period. In July 1819 he went to Shanklin, living with James Rice. They were soon joined by Brown. The next two months Keats spent with Brown at Winchester, enjoying an interval of calmness due to his absence from Fanny Brawne. At Winchester he completed *Lamia* and *Otho the Great*, which he had begun in conjunction with Brown, and began his historical tragedy of *King Stephen*. Before Christmas he had returned to London and his bondage to Fanny. In January 1820 his brother George paid a short visit to London, but received no confidence from him. The fatal nature of Keats's illness showed itself on the 3rd of February, but in March he recovered sufficiently to be present at the private view of Haydon's picture of "Christ's Entry into Jerusalem." In May he removed to a lodging in Wesleyan Place, Kentish Town, to be near Leigh Hunt who eventually took him into his house. In July appeared his third and last book, *Lamia, Isabella, The Eve of St Agnes and other Poems* (1820). Keats left the Hunts abruptly in August in consequence of a delay in receiving one of Fanny Brawne's letters which had been broken open by a servant. He went to Wentworth Place, where he was taken in by the Brawnes. The suggestion that he should spend the winter in Italy was followed up by an invitation from Shelley to Pisa. This, however, he refused. But on the 18th of September 1820 he set out for Naples in company with Joseph Severn, the artist, who had long been his friend. The travellers settled in the Piazza de Spagna, Rome. Keats was devotedly tended by Dr (afterwards Sir) James Clarke and Severn, and died on the 23rd of February 1821. He was buried on the 27th in the old Protestant cemetery, near the pyramid of Cestius.

BIBLIOGRAPHY.—Keats's friends provided the material for the authoritative biography of the poet by Richard Monckton Milnes (afterwards Lord Houghton) entitled *Life, Letters and Literary Remains of John Keats* (1848; revised ed., 1867). *The Poetical Works of John Keats* were issued with a memoir by R. M. Milnes in 1854, 1863, 1865, 1866, 1867, and in the Aldine edition, 1876. The standard edition of Keats is *The Poetical Works and other Writings of John Keats now first brought together, including Poems and numerous Letters not before published, edited with notes and appendices* by Harry Buxton Forman (4 vols., 1883; re-issue with corrections and additions, 1889). Of the many other editions of Keats's poems may be mentioned that in the Muses' Library, *The Poems of John Keats* (1896), edited by G. Thorn Drury with an introduction by Robert Bridges, and another by E. de Sélincourt, 1905. *The Letters of John Keats to Fanny Brawne* (1889) were edited with introduction and notes by H. Buxton Forman, and the *Letters of John Keats to his Family and Friends* (1891) by Sidney Colvin, who is also the author of the monograph, *Keats* (1887), in the English Men of Letters Series. See also *The Papers of a Critic. Selected from the Writings of the late Charles Wentworth Dilke* (1875), and for further bibliographical information and particulars of MS. sources the "Editor's Preface," &c. to a reprint edited by H. Buxton Forman (Glasgow, 1900). A facsimile of Keats's autograph MS. of "Hyperion," purchased by the British Museum in 1904, was published by E. de Sélincourt (Oxford, 1905). (M. BR.)

KEBLE, JOHN (1792–1866), English poet and divine, the author of the *Christian Year*, was born on St Mark's Day (April 25), 1792, at Fairford, Gloucestershire. He was the second child of the Rev. John Keble and his wife Sarah Maule. Descended from a family which had attained some legal eminence in the time of the Commonwealth, John Keble, the father of the poet, was vicar of Coln St Aldwyn, but lived at Fairford, about 3 m. distant from his cure. He was a clergyman of the old High Church school, whose adherents, untouched by the influence of the Wesleys, had moulded their piety on the doctrines on the non-jurors and the old Anglican divines. Himself a good scholar, he did not send his son to any school, but educated him and his brother at home so well that both obtained scholarships at Corpus Christi College, Oxford. John was elected scholar of Corpus in his fifteenth, and fellow of Oriel in his nineteenth year, April 1811. In Easter term 1810 he had obtained double first class honours, a distinction which had been obtained only once before, by Sir Robert Peel. After his election to the Oriel fellowship Keble gained the University prizes, both for the English essay and also for the Latin essay. But he was more remarkable for the rare beauty of his character than even for academic distinctions. Sir John Taylor Coleridge, his fellow scholar at Corpus and his life-long friend, says of him, after their friendship of five and fifty years had closed, "It was the singular happiness of his nature, remarkable even in his undergraduate days, that love for him was always sanctified by reverence—reverence that did not make the love less tender, and love that did but add intensity to the reverence." Oriel College was, at the time when Keble became a fellow, the centre of all the finest ability in Oxford. Copleston, Davison, Whately, were among the fellows who elected Keble; Arnold, Pusey, Newman, were soon after added to the society. In 1815 Keble was ordained deacon, and priest in 1816. His real bent and choice were towards a pastoral cure in a country parish; but he remained in Oxford, acting first as a public examiner in the schools, then as a tutor in Oriel, till 1823. In summer he sometimes took clerical work, sometimes made tours on foot through various English counties, during which he was composing poems, which afterwards took their place in the *Christian Year*. He had a rare power of attracting to himself the finest spirits, a power which lay not so much in his ability or his genius as in his character, so simple, so humble, so pure, so unworldly, yet wanting not that severity which can stand by principle and maintain what he holds to be the truth. In 1823 he returned to Fairford, there to assist his father, and with his brother to serve one or two small and poorly endowed curacies in the neighbourhood of Coln. He had made a quiet but deep impression on all who came within his influence in Oxford, and during his five years of college tutorship had won the affection of his pupils. But it was to pastoral work, and not to academic duty, that he thenceforth devoted himself, associating with it, and scarcely placing on a lower level, the affectionate discharge of his duties as a son and brother. Filial piety influenced in a quite unusual degree his feelings and his action all life through. It was in 1827, a few years after he settled at Fairford, that he published the *Christian Year*. The poems which make up that book had been the silent gathering of years. Keble had purposed in his own mind to keep them beside him, correcting and improving them, as long as he lived, and to leave them to be published only "when he was fairly out of the way." This resolution was at length overcome by the importunities of his friends, and above all by the strong desire of his father to see his son's poems in print before he died. Accordingly they were printed in two small volumes in Oxford, and given to the world in June 1827, but with no name on the title-page. The book continued to be published anonymously, but the name of the author soon transpired.

Between 1827 and 1872 one hundred and fifty-eight editions had issued from the press, and it has been largely reprinted since. The author, so far from taking pride in his widespread reputation, seemed all his life long to wish to disconnect his name with the book, and "as if he would rather it had been the work of some one else than himself." This feeling arose from no false modesty. It was because he knew that in these poems he had painted his own heart, the best part of it; and he doubted whether it was right thus to exhibit himself, and by the revelation of only his better self, to win the good opinion of the world.

Towards the close of 1831 Keble was elected to fill the chair of the poetry professorship in Oxford, as successor to his friend and admirer, Dean Milman. This chair he occupied for ten eventful years. He delivered a series of lectures, clothed in excellent idiomatic Latin (as was the rule), in which he expounded a theory of poetry which was original and suggestive. He looked on poetry as a vent for overcharged feeling, or a full imagination, or some imaginative regret, which had not found their natural outlet in life and action. This suggested to him a distinction between what he called primary and secondary poets—the first employing poetry to relieve their own hearts, the second, poetic artists, composing poetry from some other and less impulsive motive. Of the former kind were Homer, Lucretius, Burns, Scott; of the latter were Euripides, Dryden, Milton. This view was set forth in an article contributed to the *British*

Critic in 1838 on the life of Scott, and was more fully developed in two volumes of *Praelectiones Academicae*.

His regular visits to Oxford kept him in intercourse with his old friends in Oriel common room, and made him familiar with the currents of feeling which swayed the university. Catholic emancipation and the Reform Bill had deeply stirred, not only the political spirit of Oxford, but also the church feeling which had long been stagnant. Cardinal Newman writes, "On Sunday July 14, 1833, Mr Keble preached the assize sermon in the University pulpit. It was published under the title of *National Apostasy*. I have ever considered and kept the day as the start of the religious movement of 1833." The occasion of this sermon was the suppression, by Earl Grey's Reform ministry, of ten Irish bishoprics. Against the spirit which would treat the church as the mere creature of the state Keble had long chafed inwardly, and now he made his outward protest, asserting the claim of the church to a heavenly origin and a divine prerogative. About the same time, and partly stimulated by Keble's sermon, some leading spirits in Oxford and elsewhere began a concerted and systematic course of action to revive High Church principles and the ancient patristic theology, and by these means both to defend the church against the assaults of its enemies, and also to raise to a higher tone the standard of Christian life in England. This design embodied itself in the Tractarian movement, a name it received from the famous *Tracts for the Times*, which were the vehicle for promulgating the new doctrines. If Keble is to be reckoned, as Newman would have it, as the primary author of the movement, it was from Pusey that it received one of its best known names, and in Newman that it soon found its genuine leader. To the tracts Keble made only four contributions:—No. 4, containing an argument, in the manner of Bishop Butler, to show that adherence to apostolical succession is the safest course; No. 13, which explains the principle on which the Sunday lessons in the church service are selected; No. 40, on marriage with one who is unbaptized; No. 89, on the mysticism attributed to the early fathers of the church. Besides these contributions from his own pen, he did much for the series by suggesting subjects, by reviewing tracts written by others, and by lending to their circulation the weight of his personal influence.

In 1835 Keble's father died at the age of ninety, and soon after this his son married Miss Clarke, left Fairford, and settled at Hursley vicarage in Hampshire, a living to which he had been presented by his friend and attached pupil, Sir William Heathcote, and which continued to be Keble's home and cure for the remainder of his life.

In 1841 the tracts were brought to an abrupt termination by the publication of Newman's tract No. 90. All the Protestantism of England was in arms against the author of the obnoxious tract. Keble came forward at the time, desirous to share the responsibility and the blame, if there was any; for he had seen the tract before it was published, and approved it. The same year in which burst this ecclesiastical storm saw the close of Keble's tenure of the professorship of poetry, and thenceforward he was seen but rarely in Oxford. No other public event ever affected Keble so deeply as the secession of Newman to the Church of Rome in 1845. It was to him both a public and a private sorrow, which nothing could repair. But he did not lose heart; at once he threw himself into the double duty, which now devolved on himself and Pusey, of counselling the many who had hitherto followed the movement, and who, now in their perplexity, might be tempted to follow their leader's example, and at the same time of maintaining the rights of the church against what he held to be the encroachments of the state, as seen in such acts as the Gorham judgment, and the decision on *Essays and Reviews*. In all the ecclesiastical contests of the twenty years which followed 1845, Keble took a part, not loud or obtrusive, but firm and resolute, in maintaining those High Anglican principles with which his life had been identified. These absorbing duties, added to his parochial work, left little time for literature. But in 1846 he published the *Lyra Innocentium;* and in 1863 he completed a life of Bishop Wilson.

In the late autumn of the latter year, Keble left Hursley for the sake of his wife's health, and sought the milder climate of Bournemouth. There he had an attack of paralysis, from which he died on the 29th of March 1866. He was buried in his own churchyard at Hursley; and in little more than a month his wife was laid by her husband's side.

Keble also published *A Metrical Version of the Psalter* (1839), *Lyra Innocentium* (1846), and a volume of poems was published posthumously. But it is by the *Christian Year* that he won the ear of the religious world. It was a happy thought that dictated the plan of the book, to furnish a meditative religious lyric for each Sunday of the year, and for each saint's day and festival of the English Church. The subject of each poem is generally suggested by some part of the lessons or the gospel or the epistle for the day. One thing which gives these poems their strangely unique power is the sentiment to which they appeal, and the saintly character of the poet who makes the appeal, illumining more or less every poem.

The intimacy with the Bible which is manifest in the pages of the *Christian Year*; and the unobtrusive felicity with which Biblical sentiments and language are introduced have done much to endear these poems to all Bible readers. "The exactness of the descriptions of Palestine, which Keble had never visited, have been noted, and verified on the spot," by Dean Stanley. He points to features of the lake of Gennesareth, which were first touched in the *Christian Year*; and he observes that throughout the book "the Biblical scenery is treated graphically as real scenery, and the Biblical history and poetry as real history and poetry."

As to its style, the *Christian Year* is calm and grave in tone, and subdued in colour, as beseems its subjects and sentiments. The contemporary poets whom Keble most admired were Scott, Wordsworth and Southey; and of their influence traces are visible in his diction. Yet he has a style of language and a cadence of his own, which steal into the heart with strangely soothing power. Some of the poems are faultless, after their kind, flowing from the first stage to the last, lucid in thought, vivid in diction, harmonious in their pensive melody. In others there are imperfections in rhythm, conventionalities of language, obscurities or over-subtleties of thought, which mar the reader's enjoyment. Yet even the most defective poems commonly have, at least, a single verse, expressing some profound thought or tender shade of feeling, for which the sympathetic reader willingly pardons artistic imperfections in the rest.

Keble's life was written by his life-long friend Mr Justice J. T. Coleridge. The following is a complete list of his writings:—1. Works published in Keble's lifetime: *Christian Year* (1827); *Psalter* (1839); *Praelectiones Academicae* (1844); *Lyra Innocentium* (1846); *Sermons Academical* (1848); *Argument against Repeal of Marriage Law*, and *Sequel* (1857); *Eucharistical Adoration* (1857); *Life of Bishop Wilson* (1863); *Sermons Occasional and Parochial* (1867). 2. Posthumous publications: *Village Sermons on the Baptismal Service* (1868); *Miscellaneous Poems* (1869); *Letters of Spiritual Counsel* (1870); *Sermons for the Christian Year, &c.* (11 vols., 1875–1880); *Occasional Papers and Reviews* (1877); *Studia Sacra* (1877); *Outlines of Instruction or Meditation* (1880).

KECSKEMÉT, a town of Hungary, in the county of Pest-Pilis-Solt-Kiskun, 65 m. S.S.E. of Budapest by rail. Pop. (1900), 56,786. Kecskemét is a poorly built and straggling town, situated in the extensive Kecskemét plain. It contains monasteries belonging to the Piarist and Franciscan orders, a Catholic (founded in 1714), a Calvinistic and a Lutheran school. The manufacture of soap and leather are the principal industries. Besides the raising of cereals, fruit is extensively cultivated in the surrounding district; its apples and apricots are largely exported, large quantities of wine are produced, and cattle-rearing constitutes another great source of revenue. Kecskemét was the birthplace of the Hungarian dramatist József Katona (1792–1830), author of the historical drama, *Bánk-Bán* (1815).

KEDDAH (from Hindu *Khedna*, to chase), the term used in India for the enclosure constructed to entrap elephants. In Ceylon the word employed in the same meaning is *corral*.

KEDGEREE (Hindostani, *khichri*), an Indian dish, composed of boiled rice and various highly-flavoured ingredients. Kedgeree is of two kinds, white and yellow. The white is made with grain, onions, ghee (clarified butter), cloves, pepper and salt. Yellow kedgeree includes eggs, and is coloured by turmeric. Kedgeree is a favourite and universal dish in India; among the poorer classes it is frequently made of rice and pulse only, or rice and beans. In European cookery kedgeree is a similar dish usually made with fish.

KEEL, the bottom timber or combination of plates of a ship or boat, extending longitudinally from bow to stern, and supporting the framework (see SHIP-BUILDING). The origin of the word has been obscured by confusion of two words, the Old Norwegian *kjole* (cf. Swedish *köl*) and a Dutch and German *kiel*. The first had the meaning of the English "keel," the other of ship, boat. The modern usage in Dutch and German has approximated to the English. The word *kiel* is represented in old English by *cêol*, a word applied to the long war galleys of the Vikings, in which sense "keel" or "keele" is still used by archaeologists. On the Tyne "keel" is the name given to a flat-bottomed vessel used to carry coals to the colliers. There is another word "keel," meaning to cool, familiar in Shakespeare (*Love's Labour Lost*, v. ii. 930), "while greasy Joan doth keel the pot," *i.e.* prevents a pot from boiling over by pouring in cold water, &c., stirring or skimming. This is from the Old English *cēlan*, to cool, a common Teutonic word, cf. German *kühlen*.

KEELEY, MARY ANNE (1806–1899), English actress, was born at Ipswich on the 22nd of November 1805 or 1806. Her maiden name was Goward, her father being a brazier and tinman. After some experience in the provinces, she first appeared on the stage in London on the 2nd of July 1825, in the opera *Rosina*. It was not long before she gave up "singing parts" in favour of the drama proper, where her powers of character-acting could have scope. In June 1829 she married Robert Keeley (1793–1869), an admirable comedian, with whom she had often appeared. Between 1832 and 1842 they acted at Covent Garden, at the Adelphi with Buckstone, at the Olympic with Charles Mathews, and at Drury Lane with Macready. In 1836 they visited America. In 1838 she made her first great success as Nydia, the blind girl, in a dramatized version of Bulwer Lytton's *The Last Days of Pompeii*, and followed this with an equally striking impersonation of Smike in *Nicholas Nickleby*. In 1839 came her decisive triumph with her picturesque and spirited acting as the hero of a play founded upon Harrison Ainsworth's *Jack Sheppard*. So dangerous was considered the popularity of the play, with its glorification of the prison-breaking felon, that the lord chamberlain ultimately forbade the performance of any piece upon the subject. It is perhaps mainly as Jack Sheppard that Mrs Keeley lived in the memory of playgoers, despite her long subsequent career in plays more worthy of her remarkable gifts. Under Macready's management she played Nerissa in *The Merchant of Venice*, and Audrey in *As You Like It*. She managed the Lyceum with her husband from 1844 to 1847; acted with Webster and Kean at the Haymarket; returned for five years to the Adelphi; and made her last regular public appearance at the Lyceum in 1859. A public reception was given her at this theatre on her 90th birthday. She died on the 12th of March 1899.

See Walter Goodman, *The Keeleys on the Stage and off* (London, 1895).

KEELING ISLANDS (often called Cocos and COCOS-KEELING ISLANDS), a group of coral islands in the Indian Ocean, between 12° 4′ and 12° 13′ S., and 96° 49′–57′ E., but including a smaller island in 11° 50′ N. and 96° 50′ E. The group furnished Charles Darwin with the typical example of an atoll or lagoon island. There are altogether twenty-three small islands, 9½ m. being the greatest width of the whole atoll. The lagoon is very shallow and the passages between many of the islands are fordable on foot. An opening on the northern side of the reef permits the entrance of vessels into the northern part of the lagoon, which forms a good harbour known as Port Refuge or Port Albion. The coco-nut (as the name Cocos Islands indicates) is the characteristic product and is cultivated on all the islands. The flora is scanty in species. One of the commonest living creatures is a monstrous crab which lives on the coco-nuts; and in some places also there are great colonies of the pomegranate crab. The group was visited by Dr H. O. Forbes in 1878, and later, at the expense of Sir John Murray, by Dr Guppy, Mr Ridley and Dr Andrews. The object of their visits was the investigation of the fauna and flora of the atoll, more especially of the formation of the coral reefs. Dr Guppy was fortunate in reaching North Keeling Island, where a landing is only possible during the calmest weather. The island he found to be about a mile long, with a shallow enclosed lagoon, less than 3 ft. deep at ordinary low water, with a single opening on its east or weather side. A dense vegetation of iron-wood (*Cordia*) and other trees and shrubs, together with a forest of coco-nut palms, covers its surface. It is tenanted by myriads of sea-fowl, frigate-birds, boobies, and terns (*Gygis candida*), which find here an excellent nesting-place, for the island is uninhabited, and is visited only once or twice a year. The excrement from this large colony has changed the carbonate of lime in the soil and the coral nodules on the surface into phosphates, to the extent in some cases of 60–70%, thus forming a valuable deposit, beneficial to the vegetation of the island itself and promising commercial value. The lagoon is slowly filling up and becoming cultivable land, but the rate of recovery from the sea has been specially marked since the eruption of Krakatoa, the pumice from which was washed on to it in enormous quantity, so that the lagoon advanced its shores from 20 to 30 yards. Forbes's and Guppy's investigations go to show that, contrary to Darwin's belief, there is no evidence of upheaval or of subsidence in either of the Keeling groups.

The atoll has an exceedingly healthy climate, and might well be used as a sanatorium for phthisical patients, the temperature never reaching extremes. The highest annual reading of the thermometer hardly ever exceeds 89° F. or falls beneath 70°. The mean temperature for the year is 78·5° F., and as the rainfall rarely exceeds 40 in. the atmosphere never becomes unpleasantly moist. The south-east trade blows almost ceaselessly for ten months of the year. Terrific storms sometimes break over the island; and it has been more than once visited by earthquakes. A profitable trade is done in coco-nuts, but there are few other exports. The imports are almost entirely foodstuffs and other necessaries for the inhabitants, who form a patriarchal colony under a private proprietor.

The islands were discovered in 1609 by Captain William Keeling on his voyage from Batavia to the Cape. In 1823 Alexander Hare, an English adventurer, settled on the southernmost island with a number of slaves. Some two or three years after, a Scotchman, J. Ross, who had commanded a brig during the English occupation of Java, settled with his family (who continued in the ownership) on Direction Island, and his little colony was soon strengthened by Hare's runaway slaves. The Dutch Government had in an informal way claimed the possession of the islands since 1829; but they refused to allow Ross to hoist the Dutch flag, and accordingly the group was taken under British protection in 1856. In 1878 it was attached to the government of Ceylon, and in 1882 placed under the authority of the governor of the Straits Settlements. The ownership and superintendency continued in the Ross family, of whom George Clunies Ross died in 1910, and was succeeded by his son Sydney.

See C. Darwin, *Journal of the Voyage of the "Beagle,"* and *Geological Observations on Coral Reefs*; also Henry O. Forbes, *A Naturalist's Wanderings in the Eastern Archipelago* (London, 1884); H. B. Guppy, "The Cocos-Keeling Islands," *Scottish Geographical Magazine* (vol. v., 1889).

KEEL-MOULDING, in architecture, a round on which there is a small fillet, somewhat like the keel of a ship. It is common in the Early English and Decorated styles.

KEENE, CHARLES SAMUEL (1823–1891), English black-and-white artist, the son of Samuel Browne Keene, a solicitor, was born at Hornsey on the 10th of August 1823. Educated at the Ipswich Grammar School until his sixteenth year, he early showed artistic leanings. Two years after the death of his father he was articled to a London solicitor, but, the occupation proving uncongenial, he was removed to the office of an architect, Mr Pilkington. His spare time was now spent in drawing historical and nautical subjects in water-colour. For these trifles his mother, to whose energy and common sense he was greatly indebted, soon found a purchaser, through whom he was brought to the notice of the Whympers, the wood-engravers. This led to his being bound to them as apprentice for five years. His earliest known design is the frontispiece, signed "Chas. Keene," to *The Adventures of Dick Boldhero in Search of his Uncle*, &c. (Darton & Co., 1842). His term of apprenticeship over, he hired as studio an attic in the block of buildings standing, up to 1900, between the Strand and Holywell Street, and was soon hard at work for the *Illustrated London News*. At this time he was a member of the "Artists' Society" in Clipstone Street, afterwards removed to the Langham studios. In December 1851 he made his first appearance in *Punch* and, after nine years of steady work, was called to a seat at the famous table. It was during this period of probation that he first gave evidence of those transcendent qualities which make his work at once the joy and despair of his brother craftsmen. On the starting of *Once a Week*, in 1859, Keene's services were requisitioned, his most notable series in this periodical being the illustrations to Charles Reade's *A Good Fight* (afterwards rechristened *The Cloister and the Hearth*) and to George Meredith's *Evan Harrington*. There is a quality of conventionality in the earlier of these which completely disappears in the later. In 1858 Keene, who was endowed with a fine voice and was an enthusiastic admirer of old-fashioned music, joined the "Jermyn Band," afterwards better known as the "Moray Minstrels." He was also for many years a member of Leslie's Choir, the Sacred Harmonic Society, the Catch, Glee and Canon Club, and the Bach Choir. He was also an industrious performer on the bagpipes, of which instrument he brought together a considerable collection of specimens. About 1863 the Arts Club in Hanover Square was started, with Keene as one of the original members. In 1864 John Leech died, and Keene's work in *Punch* thenceforward found wider opportunities. It was about this time that the greatest of all modern artists of his class, Menzel, discovered Keene's existence, and became a subscriber to *Punch* solely for the sake of enjoying week by week the work of his brother craftsman. In 1872 Keene, who, though fully possessed of the humorous sense, was not within measurable distance of Leech as a jester, and whose drawings were consequently not sufficiently "funny" to appeal to the laughter-loving public, was fortunate enough to make the acquaintance of Mr Joseph Crawhall, who had been in the habit for many years of jotting down any humorous incidents he might hear of or observe, illustrating them at leisure for his own amusement. These were placed unreservedly at Keene's disposal, and to their inspiration we owe at least 250 of his most successful drawings in the last twenty years of his connexion with *Punch*. A list of more than 200 of these subjects is given at the end of *The Life and Letters of Charles Keene of "Punch."* In 1879 Keene removed to 239 King's Road, Chelsea, which he occupied until his last illness, walking daily to and from his house, 112 Hammersmith Road. In 1881 a volume of his *Punch* drawings was published by Messrs Bradbury & Agnew, with the title *Our People*. In 1883 Keene, who had hitherto been a strong man, developed symptoms of dyspepsia and rheumatism. By 1889 these had increased to an alarming degree, and the last two years of his life were passed in acute suffering borne with the greatest courage. He died unmarried, after a singularly uneventful life, on the 4th of January 1891, and his body lies in Hammersmith cemetery.

Keene, who never had any regular art training, was essentially an artists' artist. He holds the foremost place amongst English craftsmen in black and white, though his work has never been appreciated at its real value by the general public. No doubt the main reason for this lack of public recognition was his unconventionality. He drew his models exactly as he saw them, not as he knew the world wanted to see them. He found enough beauty and romance in all that was around him, and, in his *Punch* work, enough subtle humour in nature seized at her most humorous moments to satisfy him. He never required his models to grin through a horse collar, as Gillray did, or to put on their company manners, as was du Maurier's wont. But Keene was not only a brilliant worker in pen and ink. As an etcher he has also to be reckoned with, notwithstanding the fact that his plates numbered not more than fifty at the outside. Impressions of them are exceedingly rare, and hardly half a dozen of the plates are now known to be in existence. He himself regarded them only as experiments in a difficult but fascinating medium. But in the opinion of the expert they suffice to place him among the best etchers of the 19th century. Apart from the etched frontispieces to some of the *Punch* pocket-books, only three, and these by no means the best, have been published. Writing in *L'Artiste* for May 1891 of a few which he had seen, Bracquemond says: "By the freedom, the largeness of their drawing and execution, these plates must be classed amongst modern etchings of the first rank." A few impressions are in the British Museum, but in the main they were given away to friends and lie hidden in the albums of the collector.

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KEENE, LAURA (*c.* 1820–1873), Anglo-American actress and manager, whose real name was Mary Moss, was born in England. In 1851, in London, she was playing Pauline in *The Lady of Lyons*. She made her first appearance in New York on the 20th of September 1852, on her way to Australia. She returned in 1855 and till 1863 managed Laura Keene's theatre, in which was produced, in 1858, *Our American Cousin*. It was her company that was playing at Ford's theatre, Washington, on the night of Lincoln's assassination. Miss Keene was a successful melodramatic actress, and an admirable manager. She died at Montclair, New Jersey, on the 4th of November 1873.

See John Creahan's *Life of Laura Keene* (1897).

KEENE, a city and the county-seat of Cheshire county, New Hampshire, U.S.A., on the Ashuelot river, about 45 m. S.W. of Concord, N.H., and about 92 m. W.N.W. of Boston. Pop. (1900), 9165, of whom 1255 were foreign-born; (1910 census), 10,068. Area, 36·5 sq. m. It is served by the Boston & Maine railroad and by the Fitchburg railroad (leased by the Boston & Maine). The site is level, but is surrounded by ranges of lofty hills—Monadnock Mountain is about 10 m. S.E. Most of the streets are pleasantly shaded. There are three parks, with a total area of about 219 acres; and in Central Square stands a soldiers' and sailors' monument designed by Martin Milmore and erected in 1871. The principal buildings are the city hall, the county buildings and the city hospital. The Public Library had in 1908 about 16,300 volumes. There are repair shops of the Boston & Maine railroad here, and manufactures of boots and shoes, woollen goods, furniture (especially chairs), pottery, &c. The value of the factory product in 1905 was $2,690,967. The site of Keene was one of the Massachusetts grants made in 1733, but Canadian Indians made it untenable and it was abandoned from 1746 until 1750. In 1753 it was incorporated and was named Keene, in honour of Sir Benjamin Keene (1697–1757), the English diplomatist, who as agent for the South Sea Company and Minister in Madrid, and as responsible for the commerical treaty between England and Spain in 1750, was in high reputation at the time; it was chartered as a city in 1874.

KEEP, ROBERT PORTER (1844–1904), American scholar, was born in Farmington, Connecticut, on the 26th of April 1844. He graduated at Yale in 1865, was instructor there for two years, was United States consul at the Piraeus in Greece in 1869–1871, taught Greek in Williston Seminary, Easthampton, Massachusetts, in 1876–1885, and was principal of Norwich Free Academy, Norwich, Conn., from 1885 to 1903, the school owing its prosperity to him hardly less than to its founders. In 1903 he took charge of Miss Porter's school for girls at Farmington, Conn., founded in 1844 and long controlled by his aunt, Sarah Porter. He died in Farmington on the 3rd of June 1904.

KEEP (corresponding to the French *donjon*), in architecture the inmost and strongest part of a medieval castle, answering to the citadel of modern times. The arrangement is said to have originated with Gundulf, bishop of Rochester (d. 1108), architect of the White Tower. The Norman keep is generally a very massive square tower. There is generally a well in a medieval keep, ingeniously concealed in the thickness of a wall or in a pillar. The most celebrated keeps of Norman times in England are the White Tower in London, those at Rochester

Arundel and Newcastle, Castle Hedingham, &c. When the keep was circular, as at Conisborough and Windsor, it was called a "shell-keep" (see CASTLE). The verb "to keep," from which the noun with its particular meaning here treated was formed, appears in O.E. as *cēpan*, of which the derivation is unknown; no words related to it are found in cognate languages. The earliest meaning (*c.* 1000) appears to have been to lay hold of, to seize, from which its common uses of to guard, observe, retain possession of, have developed.

KEEWATIN, a district of Canada, bounded E. by Committee Bay, Fox Channel, and Hudson and James bays, S. and S.W. by the Albany and English rivers, Manitoba, Lake Winnipeg, and Nelson river, W. by the 100th meridian, and N. by Simpson and Rae straits and gulf and peninsula of Boothia; thus including an area of 445,000 sq. m. Its surface is in general barren and rocky, studded with innumerable lakes with intervening elevations, forest-clad below 60° N., but usually bare or covered with moss or lichens, forming the so-called "barren lands" of the north. With the exception of a strip of Silurian and Devonian rocks, 40 to 80 m. wide, extending from the vicinity of the Severn river to the Churchill, and several isolated areas of Cambrian and Huronian, the district is occupied by Laurentian rocks. The principal river is the Nelson, which, with its great tributary, the Saskatchewan, is 1450 m. long; other tributaries are the Berens, English, Winnipeg, Red and Assiniboine. The Hayes, Severn and Winisk also flow from the south-west into Hudson Bay, and the Ekwan, Attawapiskat and Albany, 500 m. long, into James Bay. The Churchill, 925 m., Thlewliaza, Maguse, and Ferguson rivers discharge into Hudson Bay on the west side; the Kazan, 500 m., and Dubawnt, 660 m., into Chesterfield Inlet; and Back's river, rising near Aylmer Lake, flows north-eastwards 560 m. to the Arctic Ocean. The principal lakes are St Joseph and Seul on the southern boundary; northern part of Lake Winnipeg, 710 ft. above the sea; Island; South Indian; Etawney; Nueltin; Yathkyed, at an altitude of 300 ft.; Maguse; Kaminuriak; Baker, 30 ft.; Aberdeen, 130 ft.; and Garry. The principal islands are Southampton, area 17,800 sq. m.; Marble Island, the usual wintering place for whaling vessels; and Bell and Coats Islands, in Hudson Bay; and Akimiski, in James Bay.

A few small communities at the posts of the Hudson Bay Company constitute practically the whole of the white population. In 1897 there were 852 Indians in the Churchill and Nelson rivers district, but no figures are available for the district as a whole. The principal posts in Keewatin are Norway House, near the outlet of Lake Winnipeg; Oxford House, on the lake of the same name; York Factory, at the mouth of Hayes river; and Forts Severn and Churchill, at the mouths of the Severn and Churchill rivers respectively. In 1905 the district of Keewatin was included in the North-West Territories and the whole placed under an administrator c. acting governor. The derivation of the name is from the Cree—the "north wind."

KEF, more correctly El-Kef (the Rock), a town of Tunisia, 125 m. by rail S.S.W. of the capital, and 75 m. S.E. of Bona in Algeria. It occupies the site of the Roman colony of Sicca Veneria, and is built on the steep slope of a rock in a mountainous region through which flows the Mellegue, an affluent of the Mejerda. Situated at the intersection of main routes from the west and south, Kef occupies a position of strategic importance. Though distant some 22 m. from the Algerian frontier it was practically a border post, and its walls and citadel were kept in a state of defence by the Tunisians. The town with its half-dozen mosques and tortuous, dirty streets, is still partly walled. The southern part of the wall has however been destroyed by the French, and the remainder is being left to decay. Beyond the part of the wall destroyed is the French quarter. The *kasbah*, or citadel, occupies a rocky eminence on the west side of the town. It was built, or rebuilt, by the Turks, the material being Roman. It has been restored by the French, who maintain a garrison here.

The Roman remains include fragments of a large temple dedicated to Hercules, and of the baths. The ancient cisterns remain, but are empty, being used as part of the barracks. The town is however supplied by water from the same spring which filled the cisterns. The Christian cemetery is on the site of a basilica. There are ruins of another Christian basilica, excavated by the French, the apse being intact and the narthex serving as a church. Many stones with Roman inscriptions are built into the walls of Arab houses. The modern town is much smaller than the Roman colony. Pop. about 6000, including about 100 Europeans (chiefly Maltese).

The Roman colony of Sicca Veneria appears from the character of its worship of Venus (Val. Max. ii. 6, § 15) to have been a Phoenician settlement. It was afterwards a Numidian stronghold, and under the Caesars became a fashionable residential city and one of the chief centres of Christianity in North Africa. The Christian apologist Arnobius the Elder lived here.

See H. Barth, *Die Küstenländer des Mittelmeeres* (1849); *Corpus Inscript. Lat.*, vol. viii.; Sombrun in *Bull. de la soc. de géog. de Bordeaux* (1878). Also Cardinal Newman's *Callista: a Sketch of the Third Century* (1856), for a "reconstruction" of the manner of life of the early Christians and their oppressors.

KEHL, a town in the grand-duchy of Baden, on the right bank of the Rhine, opposite Strassburg, with which it is connected by a railway bridge and a bridge of boats. Pop. 4000. It has a considerable river trade in timber, tobacco and coal, which has been developed by the formation of a harbour with two basins. The chief importance of Kehl is its connexion with the military defence of Strassburg, to the strategic area of which it belongs. It is encircled by the strong forts Bose, Blumenthal and Kirchbach of that system. In 1678 Kehl was taken from the imperialists by the French, and in 1683 a new fortress, built by Vauban, was begun. In 1697 it was restored to the Empire and was given to Baden, but in 1703 and again in 1733 it was taken by the French, who did not however retain it for very long. In 1793 the French again took the town, which was retaken by the Austrians and was restored to Baden in 1803. In 1808 the French, again in possession, restored the fortifications, but these were dismantled in 1815, when Kehl was again restored to Baden. In August 1870, during the Franco-German War, the French shelled the defenceless town.

KEIGHLEY (locally KEITHLEY), a municipal borough in the Keighley parliamentary division of the West Riding of Yorkshire, England, 17 m. W.N.W. of Leeds, on branches of the Great Northern and Midland railways. Pop. (1901), 41,564. It is beautifully situated in a deep valley near the junction of the Worth with the Aire. A canal between Liverpool and Hull affords it water communication with both west and east coasts. The principal buildings are the parish church of St Andrew (dating from the time of Henry I., modernized in 1710, rebuilt with the exception of the tower in 1805, and again rebuilt in 1878), and the handsome Gothic mechanics' institute and technical school (1870). A grammar school was founded in 1713, the operations of which have been extended so as to embrace a trade school (1871) for boys, and a grammar school for girls. The principal industries are manufactures of woollen goods, spinning, sewing and washing machines, and tools. The town was incorporated in 1882, and the corporation consists of a mayor, 6 aldermen and 18 councillors.

KEI ISLANDS [*Kę*, *Key*, *Kii*, &c.; native, *Ewab*], a group in the Dutch East Indies, in the residency of Amboyna, between 5° and 6° 5′ S. and 131° 50′ and 133° 15′ E., and consisting of four parts: Nuhu-Iut or Great Kei, Roa or Little Kei, the Tayanda, and the Kur group. Great Kei differs physically in every respect from the other groups. It is of Tertiary formation (Miocene), and has a chain of volcanic elevations along the axis, reaching a height of 2600 ft. Its area is 290 sq. m., the total land area of the group being 572 sq. m. All the other islands are of post-Tertiary formation and of level surface. The group has submarine connexion, under relatively shallow sea, with the Timorlaut group to the south-west and the chain of islands extending north-west towards Ceram; deep water separates it on the east from the Aru Islands and on the west from the inner islands of the Banda Sea. Among the products are coco-nuts, sago, fish, trepang, timber, copra, maize, yams and tobacco. The population is about 23,000, of whom 14,900 are pagans, and 8300 Mahommedans.

The inhabitants are of three types. There is the true Kei Islander, a Polynesian by his height and black or brown wavy hair, with a complexion between the Papuan black and the Malay yellow. There is the pure Papuan, who has been largely merged in the Kei type. Thirdly, there are the immigrant Malays. These (distinguished by the use of a special language and by the profession of Mohammedanism) are descendants of natives of the Banda islands who fled eastward before the encroachments of the Dutch. The pagans have rude statues of deities and places of sacrifice indicated by flat-topped cairns. The Kei Islanders are skilful in carving and celebrated boat-builders.

See C. M. Kan, " Onze geographische kennis der Keij-Eilanden," in *Tijdschrift Aardrijkskundig Genootschap* (1887); Martin, " Die Kei-inseln u. ihr Verhältniss zur Australisch-Asiatischen Grenzlinie," ibid. part vii. (1890); W. R. van Hoëvell, " De Kei-Eilanden," in *Tijdschr. Batavian. Gen.* (1889); " Verslagen van de wetenschappelijke opnemingen en onderzoekingen op de Keij-Eilanden " (1889–1890), by Planten and Wertheim (1893), with map and ethnographical atlas of the south-western and south-eastern islands by Pleyte; Langen, *Die Key- oder Kii-Inseln* (Vienna, 1902).

KEIM, KARL THEODOR (1825–1878), German Protestant theologian, was born at Stuttgart on the 17th of December 1825. His father, Johann Christian Keim, was headmaster of a gymnasium. Here Karl Theodor received his early education, and then proceeded to the Stuttgart Obergymnasium. In 1843 he went to the university of Tübingen, where he studied philosophy under J. F. Reiff, a follower of Hegel, and Oriental languages under Heinrich Ewald and Heinrich Meier. F. C. Baur, the leader of the new Tübingen school, was lecturing on the New Testament and on the history of the church and of dogma, and by him in particular Keim was greatly impressed. The special bent of Keim's mind is seen in his prize essay, *Verhältniss der Christen in den ersten drei Jahrhunderten bis Konstantin zum römischen Reiche* (1847). His first published work was *Die Reformation der Reichstadt Ulm* (1851). In 1850 he visited the university of Bonn, where he attended some of the lectures of Friedrich Bleek, Richard Rothe, C. M. Arndt and Isaak Dorner. He taught at Tübingen from June 1851 until 1856, when, having become a pastor, he was made deacon at Esslingen, Württemberg. In 1859 he was appointed archdeacon; but a few months later he was called to the university of Zürich as professor of theology (1859–1873), where he produced his important works. Before this he had written on church history (*e.g. Schwäbische Reformationsgeschichte bis zum Augsburger Reichstag*, 1855). His inaugural address at Zürich on the human development of Jesus, *Die menschliche Entwicklung Jesu Christi* (1861), and his *Die geschichtliche Würde Jesu* (1864) were preparatory to his chief work, *Die Geschichte Jesu von Nazara in ihrer Verkettung mit dem Gesamtleben seines Volkes* (3 vols., 1867–1872; Eng. trans., *Jesus of Nazareth, and the National Life of Israel*, 6 vols.), 1873–1882. In 1873 Keim was appointed professor of theology at Giessen. This post he resigned, through ill-health, shortly before his death on the 17th of November 1878. He belonged to the " mediation " school of theology.

Chief works, besides the above: *Reformationsblätter der Reichsstadt Esslingen* (1860); *Ambrosius Blarer, der Schwäbische Reformator* (1860); *Der Übertritt Konstantins d. Gr. zum Christenthum* (1862); his sermons, *Freundesworte zur Gemeinde* (2 vols., 1861–1862); and *Celsus' wahres Wort* (1873). In 1881 H. Ziegler published one of Keim's earliest works, *Rom und das Christenthum*, with a biographical sketch. See also Ziegler's article in Herzog-Hauck, *Realencyklopädie*.

KEITH, the name of an old Scottish family which derived its name from the barony of Keith in East Lothian, said to have been granted by Malcolm II., king of Scotland, to a member of the house for services against the Danes. The office of great marishal of Scotland, afterwards hereditary in the Keith family, may have been conferred at the same time; for it was confirmed, together with possession of the lands of Keith, to Sir Robert Keith by a charter of King Robert Bruce, and appears to have been held as annexed to the land by the tenure of grand serjeanty. Sir Robert Keith commanded the Scottish horse at Bannockburn, and was killed at the battle of Neville's Cross in 1346. At the close of the 14th century Sir William Keith, by exchange of lands with Lord Lindsay, obtained the crag of Dunnottar in Kincardineshire, where he built the castle of Dunnottar, which became the stronghold of his descendants. He died about 1407. In 1430 a later Sir William Keith was created Lord Keith, and a few years afterwards earl marishal, and these titles remained in the family till 1716. William, fourth earl marishal (d. 1581), was one of the guardians of Mary queen of Scots during her minority, and was a member of her privy council on her return to Scotland. While refraining from extreme partisanship, he was an adherent of the Reformation; he retired into private life at Dunnottar Castle about 1567, thereby gaining the sobriquet " William of the Tower." He was reputed to be the wealthiest man in Scotland. His eldest daughter Anne married the regent Murray. His grandson George, 5th earl marishal (c. 1553–1623), was one of the most cultured men of his time. He was educated at King's College, Aberdeen, where he became a proficient classical scholar, afterwards studying divinity under Theodore Beza at Geneva. He was a firm Protestant, and took an active part in the affairs of the kirk. His high character and abilities procured him the appointment of special ambassador to Denmark to arrange the marriage of James VI. with the Princess Anne. He was subsequently employed on a number of important commissions; but he preferred literature to public affairs, and about 1620 he retired to Dunnottar, where he died in 1623. He is chiefly remembered as the founder in 1593 of the Marischal College in the university of Aberdeen, which he richly endowed. From an uncle he inherited the title of Lord Altrie about 1590. William, 7th earl marishal (*c.* 1617–1661), took a prominent part in the Civil War, being at first a leader of the covenanting party in north-east Scotland, and the most powerful opponent of the marquess of Huntly. He co-operated with Montrose in Aberdeenshire and neighbouring counties against the Gordons. With Montrose he signed the Bond of Cumbernauld in August 1640, but took no active steps against the popular party till 1648, when he joined the duke of Hamilton in his invasion of England, escaping from the rout at Preston. In 1650 Charles II. was entertained by the marishal at Dunnottar; and in 1651 the Scottish regalia were left for safe keeping in his castle. Taken prisoner in the same year, he was committed to the Tower and was excluded from Cromwell's Act of Grace. He was made a privy councillor at the Restoration and died in 1661. Sir John Keith (d. 1714), brother of the 7th earl marishal, was, at the Restoration, given the hereditary office of knight marishal of Scotland, and in 1677 was created earl of Kintore, and Lord Keith of Inverurie and Keith-Hall, a reward for his share in preserving the regalia of Scotland, which were secretly conveyed from Dunnottar to another hiding-place, when the castle was besieged by Cromwell's troops, and which Sir John, perilously to himself, swore he had carried abroad and delivered to Charles II., thus preventing further search. From him are descended the earls of Kintore.

GEORGE, 10th earl marishal (*c.* 1693–1778), served under Marlborough, and like his brother Francis, Marshal Keith (*q.v.*), was a zealous Jacobite, taking part in the rising of 1715, after which he escaped to the continent. In the following year he was attainted, his estates and titles being forfeited to the Crown. He lived for many years in Spain, where he concerned himself with Jacobite intrigues, but he took no part in the rebellion of 1745, proceeding about that year to Prussia, where he became, like his brother, intimate with Frederick the Great. Frederick employed him in several diplomatic posts, and he is said to have conveyed valuable information to the earl of Chatham, as a reward for which he received a pardon from George II., and returned to Scotland in 1759. His heir male, on whom, but for the attainder of 1716, his titles would have devolved, was apparently his cousin Alexander Keith of Ravelston, to whom the attainted earl had sold the castle and lands of Dunnottar in 1766. From Alexander Keith was descended, through the female line, Sir Patrick Keith Murray of Ochtertyre, who sold the estates of Dunnottar and Ravelston. After the attainder of 1716 the right of the Keiths of Ravelston to be recognized as the representatives of the earls marishal was disputed by Robert Keith (1681–1757), bishop of Fife, a member of another collateral branch of the family. The bishop was a writer of some repute, his chief work, *The History of the Affairs of the Church and State of Scotland* (Edinburgh, 1734), being of considerable value for the reigns of James V., James VI., and Mary Queen of Scots. He also published a *Catalogue of the Bishops of Scotland* (Edinburgh, 1755), and other less important historical and theological works.

Robert Keith (d. 1774), descended from a younger son of the 2nd earl marishal, was British minister in Vienna in 1748, and subsequently held other important diplomatic appointments, being known to his numerous friends, among whom were the leading men of letters of his time, as "Ambassador Keith." His son, Sir Robert Murray Keith (1730–1795), was on Lord George Sackville's staff at the battle of Minden. He became colonel of a regiment (the 87th foot) known as Keith's Highlanders, who won distinction in the continental wars, but were disbanded in 1763; he was then employed in the diplomatic service, in which he achieved considerable success by his honesty, courage, and knowledge of languages. In 1781 he became lieutenant-general; in 1789 he was made a privy councillor.

From the Keith family through the female line was descended George Keith Elphinstone, Baron Keith of Stonehaven, Marishal and afterwards Viscount Keith (*q.v.*), whose titles became extinct at the death of his daughter Margaret, Baroness Keith, in 1867.

See *Calendar of Documents relating to Scotland*, edited by J. Bain (4 vols., Edinburgh, 1881–1888); Peter Buchan, *An Account of the Ancient and Noble Family of Keith* (Edinburgh, 1828); *Memoirs and Correspondence of Sir Robert Murray Keith*, edited by Mrs. Gillespie Smyth (London, 1849); John Spalding, *Memorialls of the Trubles in Scotland, 1624–1645* (2 vols., Spalding Club Publ. 21, 23, Aberdeen, 1850–1851); Sir Robert Douglas, *The Peerage of Scotland* (Edinburgh, 1813); G.E.C., *Complete Peerage*, vol. iv. (London, 1892). (R. J. M.)

KEITH, FRANCIS EDWARD JAMES (1696–1758), Scottish soldier and Prussian field marshal, was the second son of William, 9th earl marishal of Scotland, and was born on the 11th of June 1696 at the castle of Inverugie near Peterhead. Through his careful education under Robert Keith, bishop of Fife, and subsequently at Edinburgh University in preparation for the legal profession, he acquired that taste for literature which afterwards secured him the esteem of the most distinguished savants of Europe; but at an early period his preference for a soldier's career was decided. The rebellion of 1715, in which he displayed qualities that gave some augury of his future eminence, compelled him to seek safety on the Continent. After spending two years in Paris, chiefly at the university, he in 1719 took part in the ill-starred expedition of the Pretender to the Highlands of Scotland. He then passed some time at Paris and Madrid in obscurity and poverty, but eventually obtained a colonelcy in the Spanish army, and, it is said, took part in the siege of Gibraltar (1726–27). Finding his Protestantism a barrier to promotion, he obtained from the king of Spain a recommendation to Peter II. of Russia, from whom he received (1728) the command of a regiment of the guards. He displayed in numerous campaigns the calm, intelligent and watchful valour which was his chief characteristic, obtaining the rank of general of infantry and the reputation of being one of the ablest officers in the Russian service as well as a capable and liberal civil administrator. Judging, however, that his rewards were not commensurate with his merits, he in 1747 offered his services to Frederick II. of Prussia, who at once gave him the rank of field marshal, in 1749 made him governor of Berlin, and soon came to cherish towards him, as towards his brother, the 10th earl marishal, a strong personal regard. In 1756 the Seven Years' War broke out. Keith was employed in high command from the first, and added to his Russian reputation on every occasion by resolution and promptitude of action, not less than by care and skill. In 1756 he commanded the troops covering the investment of Pirna, and distinguished himself at Lobositz. In 1757 he commanded at the siege of Prague; later in this same campaign he defended Leipzig against a greatly superior force, was present at Rossbach, and, while the king was fighting the campaign of Leuthen, conducted a foray into Bohemia. In 1758 he took a prominent part in the unsuccessful Moravian campaign, after which he withdrew from the army to recruit his broken health. He returned in time for the autumn campaign in the Lausitz, and was killed on the 14th of October 1758 at the battle of Hochkirch. His body was honourably buried on the field by Marshal Daun and General Lacy, the son of his old commander in Russia, and was shortly afterwards transferred by Frederick to the garrison church of Berlin. Many memorials were erected to him by the king, Prince Henry, and others. Keith died unmarried, but had several children by his mistress, Eva Mertens, a Swedish prisoner captured by him in the war of 1741–43. In 1889 the 1st Silesian infantry regiment No. 22 of the German army received his name.

See K. A. Varnhagen von Ense, *Biographische Denkmale*, part 7 (1844); *Fragment of a Memoir of Field-Marshal James Keith, written by himself* (1714–1734; edited by Thomas Constable for the Spalding Club, 1843); T. Carlyle, *Frederick the Great, passim*; V. Paczynaski-Tenczyn, *Leben des G. F. M. Jakob Keith* (Berlin, 1889); Peter Buchan, *Account of the Family of Keith* (Edinburgh, 1878); Anon., *Memoir of Marshal Keith* (Peterhead, 1869); Pauli, *Leben grosser Helden*, part iv.

KEITH, GEORGE (*c.* 1639–1716), British divine, was born at Aberdeen about 1639 and was educated for the Presbyterian ministry at Marischal College in his native city. In 1662 he became a Quaker and worked with Robert Barclay (*q.v.*). After being imprisoned for preaching in 1676 he went to Holland and Germany on an evangelistic tour with George Fox and William Penn. Two further terms of imprisonment in England induced him (1684) to emigrate to America, where he was surveyor-general in East New Jersey and then a schoolmaster at Philadelphia. He travelled in New England defending Quakerism against the attacks of Increase and Cotton Mather, but after a time fell out with his own folk on the subject of the atonement, accused them of deistic views, and started a community of his own called "Christian Quakers" or "Keithians." He endeavoured to advance his views in London, but the Yearly Meeting of 1694 disowned him, and he established a society at Turner's Hall in Philpot Lane, where he so far departed from Quaker usage as to administer the two sacraments. In 1700 he conformed to the Anglican Church, and from 1702 to 1704 was an agent of the Society for the Propagation of the Gospel in America. He died on the 27th of March 1716 at Edburton in Sussex, of which parish he was rector. Among his writings were *The Deism of William Penn and his Brethren* (1699); *The Standard of the Quakers examined; or, an Answer to the Apology of Robert Barclay* (1702); *A Journal of Travels* (1706). Gilbert Burnet, bishop of Salisbury, a fellow-Aberdonian, speaks of him as "the most learned man that ever was in that sect, and well versed in the Oriental tongues, philosophy and mathematics."

KEITH, GEORGE KEITH ELPHINSTONE, Viscount (1746–1823), British admiral, fifth son of the 10th Lord Elphinstone, was born in Elphinstone Tower, near Stirling, on the 7th of January 1746. Two of his brothers went to sea, and he followed their example by entering the navy in 1761, in the "Gosport," then commanded by Captain Jervis, afterwards Earl St Vincent. In 1767 he made a voyage to the East Indies in the Company's service, and put £2000 lent him by an uncle to such good purpose in a private trading venture that he laid the foundation of a handsome fortune. He became lieutenant in 1770, commander in 1772, and post captain in 1775. During the war in America he was employed against the privateers, and with a naval brigade at the occupation of Charleston, S.C. In January 1781, when in command of the "Warwick" (50), he captured a Dutch 50-gun ship which had beaten off an English vessel of equal strength a few days before. After peace was signed he remained on shore for ten years, serving in Parliament as member first for Dumbartonshire, and then for Stirlingshire. When war broke out again in 1793 he was appointed to the "Robust" (74), in which he took part in the occupation of Toulon by lord Hood. He particularly distinguished himself by beating a body of the French ashore at the head of a naval brigade of English and Spaniards. He was entrusted with the duty of embarking the fugitives when the town was evacuated. In 1794 he was promoted rear-admiral, and in 1795 he was sent to occupy the Dutch colonies at the Cape of Good Hope and in India. He had a large share in the capture of the Cape in 1795, and in August 1796 captured a whole Dutch squadron in Saldanha Bay. In the interval he had gone on to India, where his health suffered, and the capture at Saldanha was effected on his way home. When the Mutiny at the Nore broke out in 1797 he was appointed to the command, and was soon able to restore order. He was equally successful at Plymouth, where the squadron was also in a state of effervescence. At the close of 1798 he was sent as second in command to St Vincent. It was for a long time a thankless post, for St Vincent was at once half incapacitated by ill-health and very arbitrary, while Nelson, who considered that Keith's appointment was a personal slight to himself, was peevish and insubordinate. The escape of a French squadron which entered the Mediterranean from Brest in May 1799 was mainly due to jarrings among the British naval commanders. Keith followed the enemy to Brest on their retreat, but was unable to bring them to action. He returned to the Mediterranean in November as commander-in-chief. He co-operated with the Austrians in the siege of Genoa, which surrendered on the 4th of June 1800. It was however immediately afterwards lost in consequence of the battle of Marengo, and the French made their re-entry so rapidly that the admiral had considerable difficulty in getting his ships out of the harbour. The close of 1801 and the beginning of the following year were spent in transporting the army sent to recover Egypt from the French. As the naval force of the enemy was completely driven into port, the British admiral had no opportunity of an action at sea, but his management of the convoy carrying the troops, and of the landing at Aboukir, was greatly admired. He was made a baron of the United Kingdom—an Irish barony having been conferred on him in 1797. On the renewal of the war in 1803 he was appointed commander-in-chief in the North Sea, which post he held till 1807. In February 1812 he was appointed commander-in-chief in the Channel, and in 1814 he was raised to a viscounty. During his last two commands he was engaged first in overlooking the measures taken to meet a threatened invasion, and then in directing the movements of the numerous small squadrons and private ships employed on the coasts of Spain and Portugal, and in protecting trade. He was at Plymouth when Napoleon surrendered and was brought to England in the "Bellerophon" by Captain Maitland (1777–1839). The decisions of the British government were expressed through him to the fallen Emperor. Lord Keith refused to be led into disputes, and confined himself to declaring steadily that he had his orders to obey. He was not much impressed by the appearance of his illustrious charge, and thought that the airs of Napoleon and his suite were ridiculous. Lord Keith died on the 10th of March 1823 at Tullyallan, his property in Scotland, and was buried in the parish church. A portrait of him by Owen is in the Painted Hall in Greenwich. He was twice married: in 1787 to Jane Mercer, daughter of Colonel William Mercer of Aldie; and in 1808 to Hester Maria Thrale, who is spoken of as "Queenie" in Boswell's *Life of Johnson* and Mme. D'Arblay's *Diary*. He had a daughter by each marriage, but no son. Thus the viscounty became extinct on his death, but the English and Irish baronies descended to his elder daughter Margaret (1788–1867), who married the Comte de Flahault de la Billarderie, only to become extinct on her death.

There is a panegyrical *Life of Lord Keith* by Alex. Allardyce (Edinburgh, 1882); and biographical notices will be found in John Marshall's *Royal Naval Biography*, i. 43 (1823–1835), and the *Naval Chronicle*, x. 1. (D. H.)

KEITH, a police burgh of Banffshire, Scotland, on the Isla, 53¼ m. N.W. of Aberdeen by the Great North of Scotland railway. Pop. (1901), 4753. A branch of the Highland railway also gives access to Elgin, and there is a line to Buckie and Portessie on the Moray Firth. The burgh includes Old Keith and New Keith on the east bank of the Isla, and Fife-Keith on the west bank. Though Old Keith has a charter dating from William the Lion it fell into gradual decay; New Keith, founded in the 18th century by the second earl of Seafield, being better situated for the growth of a town. Fife-Keith has sprung up since 1816. The principal public buildings include the Turner memorial hospital, the Longmore hall, and the Institute. In the Roman Catholic church there is a painting of the "Incredulity of St Thomas," presented by Charles X. of France. The industries include manufactures of tweeds, blankets, agricultural implements, and boots and shoes; there are also distilleries, breweries, flour mills, and lime and manure works. But the main importance of Keith lies in the fact that it is the centre of the agricultural trade of the shire. The "Summer Eve Fair" held in September is the largest cattle and horse fair in the north of Scotland; the town is also the headquarters of the dressed-meat trade in the north.

KEJ, or Kech, the chief place in a district of the province of Makran in Baluchistan, which has given its name to Kej-Makran, as distinguished from Persian Makran. There is no town, but a number of small villages dominated by a fort built upon a rock, on the eastern bank of the Kej River. This fort, like many others similarly placed throughout the country, is supposed to be impregnable, but is of no strength except against the matchlocks of the surrounding tribes. Kej (or Kiz) was an important trade centre in the days of Arab supremacy in Sind, and the rulers of Kalat at various times marched armies into the province with a view to maintaining their authority. At the beginning of the 19th century it had the reputation of a commercial centre, trading through Panjgur with Kandahar, with Karachi via Bela, and with Muscat and the Persian Gulf by the seaport of Gwadar, distant about 80 m. The present Khan of Kalat exercises but a feeble sway over this portion of his dominion, although he appoints a governor to the province. The principal tribe residing around Kej is that of the Gichki, who claim to be of Rajput origin, and to have settled in Makran during the 17th century, having been driven out of Rajputana. The climate during summer is too hot for Europeans. During winter, however, it is temperate. The principal exports consist of dates, which are considered of the finest quality. A local revolt against Kalat rendered an expedition against Kej necessary in 1898. Colonel Mayne reduced the fortress and restored order in the surrounding districts.

KEKULÉ, FRIEDRICH AUGUST (1829–1896), German chemist, was born at Darmstadt on the 7th of September 1829. While studying architecture at Giessen he came under the influence of Liebig and was induced to take up chemistry. From Giessen he went to Paris, and then, after a short sojourn in Switzerland, he visited England. Both in Paris and in England he enjoyed personal intercourse with the leading chemists of the period. On his return to Germany he started a small chemical laboratory at Heidelberg, where, with a very slender equipment, he carried out several important researches. In 1858 he was appointed professor of chemistry at Ghent, and in 1865 was called to Bonn to fill a similar position, which he held till his death in that town on the 13th of June 1896. Kekulé's main importance lies in the far-reaching contributions which he made to chemical theory, especially in regard to the constitution of the carbon compounds. The doctrine of atomicity had already been enunciated by E. Frankland, when in 1858 Kekulé published a paper in which, after giving reasons for regarding carbon as a tetravalent element, he set forth the essential features of his famous doctrine of the linking of atoms. He explained that in substances containing several carbon atoms it must be assumed that some of the affinities of each carbon atom are bound by the affinities of the atoms of other elements contained in the substance, and some by an equal number of the affinities of the other carbon atoms. The simplest case is when two carbon atoms are combined so that one affinity of the one is tied to one affinity of the other; two, therefore, of the affinities of the two atoms are occupied in keeping the two atoms together, and only the remaining six are available for atoms of other elements. The next simplest case consists in the mutual interchange of two affinity units, and so on. This conception led Kekulé to his "closed-chain" or "ring" theory of the constitution of benzene which has been called the "most brilliant piece of prediction to be found in the whole range of organic chemistry," and this in turn led in particular to the elucidation of the constitution of the "aromatic compounds," and in general to new methods of chemical synthesis and decomposition, and to a deeper insight into the composition of numberless organic bodies and their mutual relations. Professor F. R. Japp, in the Kekulé memorial lecture he delivered before the London Chemical Society on the 15th of December 1897, declared that three-fourths of modern organic chemistry is directly or indirectly the product of Kekulé's benzene theory, and that without its guidance and inspiration the industries of the coal-tar colours and artificial therapeutic agents in their present form and extension would have been inconceivable.

Many of Kekulé's papers appeared in the *Annalen der Chemie*, of which he was editor, and he also published an important work, *Lehrbuch der organischen Chemie*, of which the first three volumes are dated 1861, 1866 and 1882, while of the fourth only one small section was issued in 1887.

KELLER, ALBERT (1845–), German painter, was born at Gais, in Switzerland; he studied at the Munich Academy under Lenbach and Ramberg, and must be counted among the leading colourists of the modern German school. Travels in Italy, France, England and Holland, and a prolonged sojourn in Paris, helped to develop his style, which is marked by a sense of elegance and refinement all too rare in German art. His scenes of society life, such as the famous "Dinner" (1890), are painted with thoroughly Parisian *esprit*, and his portraits are marked by the same elegant distinction. He is particularly successful in the rendering of rustling silk and satin dresses and draperies. His historical and imaginative works are as modern in spirit and as unacademical as his portraits. At the Munich Pinakothek is his painting "Jairi Töchterlein" (1886), whilst the Königsberg Museum contains his "Roman Bath," and the Liebieg collection in Reichenberg the "Audience with Louis XV.," the first picture that drew attention to his talent. Among other important works he painted "Faustina in the Temple of Juno at Praeneste," "The Witches' Sleep" (1888) "The Judgment of Paris," "The Happy Sister," "Temptation" (1892), "Autumn" (1893), "An Adventure" (1896), and "The Crucifixion."

KELLER, GOTTFRIED (1819–1890), German poet and novelist, was born at Zürich on the 19th of July 1819. His father, a master joiner, dying while Gottfried was young, his early education was neglected; he, however, was in 1835 apprenticed to a landscape painter, and subsequently spent two years (1840–1842) in Munich learning to paint. Interest in politics drew him into literature, and his talents were first disclosed in a volume of short poems, *Gedichte* (1846). This obtained him recognition from the government of his native canton, and he was in 1848 enabled to take a short course of philosophical study at the university of Heidelberg. From 1850 to 1855 he lived in Berlin, where he wrote his most important novel, *Der grüne Heinrich* (1851–1853; revised edition 1879–1880), remarkable for its delicate autographic portraiture and the beautiful episodes interwoven with the action. This was followed by *Die Leute von Seldwyla* (1856), studies of Swiss provincial life, including in *Romeo und Julia auf dem Dorfe* one of the most powerful short stories in the German language, and in *Die drei gerechten Kammmacher*, almost as great a masterpiece of humorous writing. Returning to his native city with a considerable reputation, he received in 1861 the appointment of secretary to the canton. For a time his creative faculty seemed paralysed by his public duties, but in 1872 appeared *Sieben Legenden*, and in 1874 a second series of *Die Leute von Seldwyla*, in both of which books he displayed no abatement of power and originality. He retired from the public service in 1876 and employed his leisure in the production of *Züricher Novellen* (1878), *Das Sinngedicht*, a collection of short stories (1881), and a novel, *Martin Salander* (Berlin, 1886). He died on the 15th of July 1890 at Hottingen. Keller's place among German novelists is very high. Few have united such fancy and imagination to such uncompromising realism, or such tragic earnestness to such abounding humour. As a lyric poet, his genius is no less original; he takes rank with the best German poets of this class in the second half of the 19th century.

Keller's *Gesammelte Werke* were published in 10 vols. (1889–1890), to which was added another volume, *Nachgelassene Schriften und Dichtungen*, containing the fragment of a tragedy (1893). In English appeared, *G. Keller: A Selection of his Tales translated with a Memoir by Kate Freiligrath-Kroeker* (1891). For a further estimate of Keller's life and works cf. O. Brahm (1883); E. Brenning, *G. Keller nach seinem Leben und Dichten* (1892); F. Baldensperger, *G. Keller; sa vie et ses oeuvres* (1893); A. Frey, *Erinnerungen an Gottfried Keller* (1893); J. Baechtold, *Kellers Leben. Seine Briefe und Tagebücher* (Berlin, 1894–1897); A. Köster, *G. Keller* (1900; 2nd ed., 1907); and for his work as a painter, H. E. von Berlepsch, *Gottfried Keller als Maler* (1895).

KELLER, HELEN ADAMS (1880–), American blind deaf-mute, was born at Tuscumbia, Alabama, in 1880. When barely two years old she was deprived of sight, smell and hearing, by an attack of scarlet fever. At the request of her parents, who were acquainted with the success attained in the case of Laura Bridgman (*q.v.*), one of the graduates of the Perkins Institution at Boston, Miss Anne M. Sullivan, who was familiar with the teachings of Dr S. G. Howe (*q.v.*), was sent to instruct her at home. Unfortunately an exact record of the steps in her education was not kept; but from 1888 onwards, at the Perkins Institution, Boston, and under Miss Sarah Fuller at the Horace Mann school in New York, and at the Wright Humason school, she not only learnt to read, write, and talk, but became proficient, to an exceptional degree, in the ordinary educational curriculum. In 1900 she entered Radcliffe College, and successfully passed the examinations in mathematics, &c. for her degree of A. B. in 1904. Miss Sullivan, whose ability as a teacher must be considered almost as marvellous as the talent of her pupil, was throughout her devoted companion. The case of Helen Keller is the most extraordinary ever known in the education of blind deaf-mutes (see DEAF AND DUMB *ad fin.*), her acquirements including several languages and her general culture being exceptionally wide. She wrote *The Story of My Life* (1902), and volumes on *Optimism* (1903), and *The World I Live in* (1908), which both in literary style and in outlook on life are a striking revelation of the results of modern methods of educating those who have been so handicapped by natural disabilities.

KELLERMANN, FRANÇOIS CHRISTOPHE DE (1735–1820), duke of Valmy and marshal of France, came of a Saxon family, long settled in Strassburg and ennobled, and was born there on the 28th of May 1735. He entered the French army as a volunteer, and served in the Seven Years' War and in Louis XV.'s Polish expedition of 1771, on returning from which he was made a lieutenant-colonel. He became brigadier in 1784, and in the following year *maréchal-de-camp*. In 1789 Kellermann enthusiastically embraced the cause of the Revolution, and in 1791 became general of the army in Alsace. In April 1792 he was made a lieutenant-general, and in August of the same year there came to him the opportunity of his lifetime. He rose to the occasion, and his victory of Valmy (see FRENCH REVOLUTIONARY WARS) over the Prussians, in Goethe's words, "opened a new era in the history of the world." Transferred to the army on the Moselle, Kellermann was accused by General Custine of neglecting to support his operations on the Rhine; but he was acquitted at the bar of the Convention in Paris, and placed at the head of the army of the Alps and of Italy, in which position he showed himself a careful commander and excellent administrator. Shortly afterwards he received instructions to reduce Lyons, then in revolt against the Convention, but shortly after the surrender he was imprisoned in Paris for thirteen months. Once more honourably acquitted, he was reinstated in his command, and did good service in maintaining the south-eastern border against the Austrians until his army was merged into that of General Bonaparte in Italy. He was then sixty-two years of age, still physically equal to his work, but the young generals who had come to the front in these two years represented the new spirit and the new art of war, and Kellermann's active career came to an end. But the hero of Valmy was never forgotten. When Napoleon came to power Kellermann was named successively senator (1800), honorary marshal of France (1803), and duke of Valmy (1808). He was frequently employed in the administration of the army, the control of the line of communications, and the command of reserve troops, and his long and wide experience made him one of Napoleon's most valuable assistants. In 1814 he voted for the deposition of the emperor and became a peer under the royal government. After the "Hundred Days" he sat in the Chamber of Peers and voted with the Liberals. He died at Paris on the 23rd of September 1820.

See J. G. P. de Salve, *Fragments historiques sur M. le maréchal de Kellermann* (Paris, 1807), and De Botidoux, *Esquisse de la carrière militaire de F. C. Kellermann, duc de Valmy* (Paris, 1817).

His son, François Étienne de Kellermann, duke of Valmy (1770–1835), French cavalry general, was born at Metz and served for a short time in his father's regiment of Hussars previous to entering the diplomatic service in 1791. In 1793 he again joined the army, serving chiefly under his father's command in the Alps, and rising in 1796 to the rank of *chef de brigade*. In the latter part of Bonaparte's celebrated Italian campaign of 1796–97 the younger Kellermann attracted the future emperor's notice by his brilliant conduct at the forcing of the Tagliamento. He was made general of brigade at once, and continued in Italy after the peace of Campo Formio, being employed successively in the armies of Rome and Naples under Macdonald and Championnet. In the campaign of 1800 he commanded a cavalry brigade under the First Consul, and at Marengo (*q.v.*) he initiated and carried out one of the most famous cavalry charges of history, which, with Desaix's infantry attack, regained the lost battle and decided the issue of the war. He was promoted general of division at once, but as early as the evening of the battle he resented what he thought to be an attempt to belittle his exploit. A heated controversy followed as to the influence of Kellermann's charge on the course of the battle, and in this controversy he displayed neither tact nor forbearance. However, his merits were too great for his career to be ruined either by his conduct in the dispute or by the frequent scandals, and even by the frauds, of his private life. Unlike his father's, his title to fame did not rest on one fortunate opportunity. Though not the most famous, he was perhaps the ablest of all Napoleon's cavalry leaders, and distinguished himself at Austerlitz (*q.v.*), in Portugal under Junot (on this occasion as a skilful diplomatist), at the brilliant cavalry combat of Tormes (Nov. 28, 1809), and on many other occasions in the Peninsular War. His rapacity was more than ever notorious in Spain, yet Napoleon met his unconvincing excuses with the words, "General, whenever your name is brought before me, I think of nothing but Marengo." He was on sick leave during the Russian expedition of 1812, but in 1813 and 1814 his skill and leading were as conspicuous as ever. He retained his rank under the first Restoration, but joinedNapoleon during the Hundred Days, and commanded a cavalry corps in the Waterloo campaign. At Quatre Bras he personally led his squadrons in the famous cavalry charge, and almost lost his life in the mêlée, and at Waterloo he was again wounded. He was disgraced at the second Restoration, and, on succeeding to his father's title and seat in the Chamber of Peers in 1820, at once took up and maintained till the fall of Charles X. in 1830 an attitude of determined opposition to the Bourbons. He died on the 2nd of June 1835.

His son François Christophe Edmond de Kellermann, duke of Valmy (1802–1868), was a distinguished statesman, political historian, and diplomatist under the July Monarchy.

KELLGREN, JOHAN HENRIK (1751–1795), Swedish poet and critic, was born at Floby in West Gothland, on the 1st of December 1751. He studied at the university of Åbo, and had already some reputation as a poet when in 1774 he there became a "docent" in aesthetics. Three years later he removed to Stockholm, where in conjunction with Assessor Carl Lenngren he began in 1778 the publication of the journal *Stockholmsposten*, of which he was sole editor from 1788 onwards. Kellgren was librarian to Gustavus III. from 1780, and from 1785 his private secretary. On the institution of the Swedish Academy in 1786 he was appointed one of its first members. He died at Stockholm on the 20th of April 1795. His strong satiric tendency led him into numerous controversies, the chief that with the critic Thomas Thorild, against whom he directed his satire *Nyt försök till orimmad vers*, where he sneers at the "raving of Shakespeare" and "the convulsions of Goethe." His lack of humour detracts from the interest of his polemical writings. His poetical works are partly lyrical, partly dramatic; of the plays the versification belongs to him, the plots being due to Gustavus III. The songs interspersed in the four operas which they produced in common, viz., *Gustaf Vasa*, *Gustaf Adolf och Ebba Brahe*, *Aeneas i Kartago*, and *Drottning Kristina*, are wholly the work of Kellgren. From about the year 1788 a higher and graver feeling pervades Kellgren's verses, partly owing to the influence of the works of Lessing and Goethe, but probably more directly due to his controversy with Thorild. Of his minor poems written before that date the most important are the charming spring-song *Vinterns välde lyktar*, and the satrical *Mina löjen* and *Man eger ej snille för det man är galen*. The best productions of what is called his later period are the satire *Ljusets fiender*, the comic poem *Dumboms lefverne*, the warmly patriotic *Kantat d. 1. jan.* 1789, the ode *Till Kristina*, the fragment *Sigwart och Hilma*, and the beautiful song *Nya skapelsen*, both in thought and form the finest of his works. Among his lyrics are the choicest fruits of the Gustavian age of Swedish letters. His earlier efforts, indeed, express the superficial doubt and pert frivolousness characteristic of his time; but in the works of his riper years he is no mere "poet of pleasure," as Thorild contemptuously styled him, but a worthy exponent of earnest moral feeling and wise human sympathies in felicitous and melodius verse.

His *Samlade skrifter* (3 vols., 1796; a later edition, 1884–1885) were revised by himself. His correspondence with Rosenstein and with Clewberg was edited by H. Schück (1886–1887 and 1894). See Wieselgren, *Sveriges sköna litteratur* (1833–1849); Atterbom, *Svenska siare och skalder* (1841–1855); C. W. Böttiger in *Transactions of the Swedish Academy*, xlv. 167 seq. (1870); and Gustaf Ljunggren's *Kellgren, Leopold, och Thorild*, and his *Svenska vitterhetens häfder* (1873-1877).

KELLOGG, CLARA LOUISE (1842–   ), American singer, was born at Sumterville, South Carolina, in July 1842, and was educated in New York for the musical profession, singing first in opera there in 1861. Her fine soprano voice and artistic gifts soon made her famous. She appeared as prima donna in Italian opera in London, and at concerts, in 1867 and 1868; and from that time till 1887 was one of the leading public singers. She appeared at intervals in London, but was principally engaged in America. In 1874 she organized an opera company which was widely known in the United States, and her enterprise and energy in directing it were remarkable. In 1887 she married Carl Strakosch, and retired from the profession.

KELLS, a market town of county Meath, Ireland, on the Blackwater, 9¾ m. N.W. of Navan on a branch of the Great Northern railway. Pop. of urban district (1901), 2428. The prosperity of the town depends chiefly upon its antiquarian remains. The most notable is St Columbkille's house, orginally an oratory, but afterwards converted into a church, the chancel of which was in existence in 1752. The present church is modern, with the exception of the bell-tower, rebuilt in 1578. Near the church there is a fine though imperfect specimen of the ancient round-tower, 99 ft. in height; and there are several ancient crosses, the finest being that now erected in the market-place. Kells was originally a royal residence, whence its ancient name *Ceanannus*, meaning the *dun* or circular northern fort, in which the king resided, and the intermediate name *Kenlis*, meaning head fort. Here Conn of the Hundred Fights resided in the 2nd century; and here was a palace of Dermot, king of Ireland, in 544–565. The other places in Ireland named Kells are probably derived from *Cealla*, signifying church. In the 6th century Kells, it is said, was granted to St Columbkille. Of the monastery which he is reported to have founded there are no remains, and the town owes its chief ecclesiastical importance to the bishopric founded about 807, and united to Meath in the 13th century. The ecclesiastical establishment was noted as a seat of learning, and a monument of this remains in the *Book of Kells* an illuminated copy of the Gospels in Latin, containing also local records, dating from the 8th century, and preserved in the library of Trinity College, Dublin. The illumination is executed with extraordinary delicacy, and the work is asserted to be the finest extant example of early Christian art of this kind. Neighbouring antiquities are the church of Dulane, with a fine doorway, and the *dun* or fortification of Dimor, the principal erection of a series of defences on the hills about 6 m. W. of Kells. Among several seats in the vicinity is that of the Marquess of Headfort. Kells returned two members to the Irish parliament before the Union.

KELLY, EDWARD (1854–1880), Australian bushranger, was born at Wallan Wallan, Victoria. His father was a transported Belfast convict, and his mother's family included several thieves. As boys he and his brothers were constantly in trouble for horse-stealing, and "Ned" served three years' imprisonment for this offence. In April 1878, an attempt was made to arrest his brother Daniel on a similar charge. The whole Kelly family resisted this and Ned wounded one of the constables. Mrs Kelly and some of the others were captured, but Ned and Daniel escaped to the hills, where they were joined by two other desperadoes, Byrne and Hart. For two years, despite a reward of £8000 offered jointly by the governments of Victoria and New South Wales for their arrest, the gang under the leadership of Kelly terrorized the country on the borderland of Victoria and New South Wales, "holding up" towns and plundering banks. Their intimate knowledge of the district, full of convenient hiding-places, and their elaborate system of well-paid spies, ensured the direct pecuniary interest of many persons and contributed to their long immunity from capture. They never ill-treated a woman, nor preyed upon the poor, thus surrounding themselves with an attractive atmosphere of romance. In June 1880, however, they were at last tracked to a wooden shanty at Glenrowan, near Benalla, which the police surrounded, riddled with bullets, and finally set on fire. Kelly himself, who was outside, could, he claimed, easily have escaped had he not refused to desert his companions, all of whom were killed. He was severely wounded, captured and taken to Beechworth, where he was tried, convicted and hanged in October 1880. The total cost of the capture of the Kelly gang was reckoned at £115,000.

See F. A. Hare, *The Last of the Bushrangers* (London, 1892).

KELLY, SIR FITZROY (1796–1880), English judge, was born in London in October 1796, the son of a captain in the Royal Navy. In 1824 he was called to the bar, where he gained a reputation as a skilled pleader. In 1834 he was made a king's counsel. A strong Tory, he was returned as member of parliament for Ipswich in 1835, but was unseated on petition. In 1837 however he again became member for that town. In 1843 he sat for Cambridge, and in 1852 was elected member for Harwich, but, a vacancy suddenly occurring in East Suffolk, he preferred to contest that seat and was elected. He was solicitor-general in 1845 (when he was knighted), and again in 1852. In 1858–1859 he was attorney-general in Lord Derby's second administration. In 1866 he was raised to the bench as chief baron of the exchequer and made a member of the Privy Council. He died at Brighton on the 18th of September 1880.

See E. Foss, *Lives of the Judges* (1870).

KELLY, HUGH (1739–1777), Irish dramatist and poet, son of a Dublin publican, was born in 1739 at Killarney. He was apprenticed to a staymaker, and in 1760 went to London. Here he worked at his trade for some time, and then became an attorney's clerk. He contributed to various newspapers, and wrote pamphlets for the booksellers. In 1767 he published *Memoirs of a Magdalen, or the History of Louisa Mildmay* (2 vols.), a novel which obtained considerable success. In 1766 he published anonymously *Thespis; or, A Critical Examination into the Merits of All the Principal Performers belonging to Drury Lane Theatre*, a poem in the heroic couplet containing violent attacks on the principal contemporary actors and actresses. The poem opens with a panegyric on David Garrick, however, and bestows foolish praise on friends of the writer. This satire was partly inspired by Churchill's *Rosciad*, but its criticism is obviously dictated chiefly by personal prejudice. In 1767 he produced a second part, less scurrilous in tone, dealing with the Covent Garden actors. His first comedy, *False Delicacy*, written in prose, was produced by Garrick at Drury Lane on the 23rd of January 1768, with the intention of rivalling Oliver Goldsmith's *Good-Natured Man*. It is a moral and sentimental comedy, described by Garrick in the prologue as a sermon preached in acts. Although Samuel Johnson described it as "totally void of character," it was very popular and had a great sale. In French and Portuguese versions it drew crowded houses in Paris and Lisbon. Kelly was a journalist in the pay of Lord North, and therefore hated by the party of John Wilkes, especially as being the editor of the *Public Ledger*. His *Thespis* had also made him many enemies; and Mrs Clive refused to act in his pieces. The production of his second comedy, *A Word to the Wise* (Drury Lane, 3rd of March 1770), occasioned a riot in the theatre, repeated at the second performance, and the piece had to be abandoned. His other plays are: *Clementina* (Covent Garden, 23rd of February 1771), a blank verse tragedy, given out to be the work of a "young American Clergyman" in order to escape the opposition of the Wilkites; *The School for Wives* (Drury Lane, 11th of December 1773), a prose comedy given out as the work of Major (afterwards Sir William) Addington; a two-act piece, *The Romance of an Hour* (Covent Garden, 2nd of December 1774), borrowed from Marmontel's tale *L'Amitié à l'épreuve*; and an unsuccessful comedy, *The Man of Reason* (Covent Garden, 9th of February 1776). He was called to the bar at the Middle Temple in 1774, and determined to give up literature. He failed in his new profession and died in poverty on the 3rd of February 1777.

See *The Works of Hugh Kelly, to which is prefixed the Life of the Author* (1778); Genest, *History of the Stage* (v. 163, 263–269, 308, 399, 457, 517). Pamphlets in reply to *Thespis* are: "Anti-Thespis . . ." (1767); "The Kellyad . . ." (1767), by Louis Stamma; and "The Rescue or Thespian Scourge . . ." (1767), by John Brown-Smith.

KELLY, MICHAEL (1762–1826), British actor, singer and composer, was the son of a Dublin wine-merchant and dancing-master. He had a musical education at home and in Italy, and for four years from 1783 was engaged to sing at the Court Theatre at Vienna, where he became a friend of Mozart. In 1786 he sang in the first performance of the *Nozze di Figaro*. Appearing in London, at Drury Lane in 1787, he had a great success, and thenceforth was the principal English tenor at that theatre. In 1793 he became acting-manager of the King's Theatre, and he was in great request at concerts. He wrote a number of songs (including "The Woodpecker"), and the music for many dramatic pieces, now fallen into oblivion. In 1826 he published his entertaining *Reminiscences*, in writing which he was helped by Theodore Hook. He combined his professional work with conducting a music-shop and a wine-shop, but with disastrous financial results. He died at Margate on the 9th of October 1826.

KELP (in M.E. *culp* or *culpe*, of unknown origin; the Fr. equivalent is *varech*), the ash produced by the incineration of various kinds of sea-weed (*Algae*) obtainable in great abundance on the west coasts of Ireland and Scotland, and the coast of Brittany. It is prepared from the deep-sea tangle (*Laminaria digitata*), sugar wrack (*L. saccharina*), knobbed wrack (*Fucus nodosus*), black wrack (*F. serratus*), and bladder wrack (*F. vesiculosus*). The Laminarias yield what is termed "drift-weed kelp," obtainable only when cast up on the coasts by storms or other causes. The species of *Fucus* growing within the tidal range are cut from the rocks at low water, and are therefore known as "cut-weeds." The weeds are first dried in the sun and are then collected into shallow pits and burned till they form a fused mass, which while still hot is sprinkled with water to break it up into convenient pieces. A ton of kelp is obtained from 20 to 22 tons of wet sea-weed. The average composition may vary as follows: potassium sulphate, 10 to 12%; potassium chloride, 20 to 25%; sodium carbonate, 5%; other sodium and magnesium salts, 15 to 20%; and insoluble ash from 40 to 50%. The relative richness in iodine of different samples varies largely, good drift kelp yielding as much as 10 to 15 lb per ton of 22½ cwts., whilst cut-weed kelp will not give more than 3 to

4 lb. The use of kelp in soap and glass manufacture has been rendered obsolete by the modern process of obtaining carbonate of soda cheaply from common salt (see IODINE).

KELSO, a police burgh and market town of Roxburghshire, Scotland, on the left bank of the Tweed, 52 m. (43 m. by road) S.E. of Edinburgh and 10¼ m. N.E. of Jedburgh by the North British railway. Pop. (1901), 4008. The name has been derived from the Old Welsh *calch*, or Anglo-Saxon *cealc*, "chalk", and the Scots *how*, "hollow," a derivation more evident in the earlier forms Calkon and Calchon, and illustrated in Chalkheugh, the name of a locality in the town. The ruined abbey, dedicated to the Virgin and St John the Evangelist, was founded in 1128 by David I. for monks from Tiron in Picardy, whom he transferred hither from Selkirk, where they had been installed fifteen years before. The abbey, the building of which was completed towards the middle of the 13th century, became one of the richest and most powerful establishments in Scotland, claiming precedence over the other monasteries and disputing for a time the supremacy with St Andrews. It suffered damage in numerous English forays, was pillaged by the 4th earl of Shrewsbury in 1522, and was reduced to ruins in 1545 by the earl of Hertford (afterwards the Protector Somerset). In 1602 the abbey lands passed into the hands of Sir Robert Ker of Cessford, 1st earl of Roxburghe. The ruins were disfigured by an attempt to render part of them available for public worship, and one vault was long utilized as the town gaol. All excrescences, however, were cleared away at the beginning of the 19th century, by the efforts of the Duke of Roxburghe. The late Norman and Early Pointed cruciform church has an unusual ground-plan, the west end of the cross forming the nave and being shorter than the chancel. The nave and transepts extend only 23 ft. from the central tower. The remains include most of the tower, nearly the whole of the walls of the south transept, less than half of the west front with a fragment of the richly moulded and deeply-set doorway, the north and west sides of the north transept, and a remnant of the chancel. The chancel alone had aisles, while its main circular arches were surmounted by two tiers of triforium galleries. The predominant feature is the great central tower, which, as seen from a distance, suggests the keep of a Norman castle. It rested on four Early Pointed arches, each 45 ft. high (of which the south and west yet exist) supported by piers of clustered columns. Over the Norman porch in the north transept is a small chamber with an interlaced arcade surmounted by a network gable.

The Tweed is crossed at Kelso by a bridge of five arches constructed in 1803 by John Rennie. The public buildings include a court house, the town hall, corn exchange, high school and grammar school (occupying the site of the school which Sir Walter Scott attended in 1783). The public park lies in the east of the town, and the race-course to the north of it. The leading industries are the making of fishing tackle, agricultural machinery and implements, and chemical manures, besides coach-building, cabinet-making and upholstery, corn and saw mills, iron founding, &c. James and John Ballantyne, friends of Scott, set up a press about the end of the 18th century, from which there issued, in 1802, the first two volumes of the *Minstrelsy of the Scottish Border*; but when the brothers transferred their business to Edinburgh printing languished. The *Kelso Mail*, founded by James Ballantyne in 1797, is now the oldest of the Border newspapers. The town is an important agricultural centre, there being weekly corn and fortnightly cattle markets, and, every September, a great sale of Border rams.

Kelso became a burgh of barony in 1634 and five years later received the Covenanters, under Sir Alexander Leslie, on their way to the encampment on Duns Law. On the 24th of October 1715 the Old Pretender was proclaimed James VIII. in the market square, but in 1745 Prince Charles Edward found no active adherents in the town.

About 1 m. W. of Kelso is Floors or Fleurs Castle, the principal seat of the duke of Roxburghe. The mansion as originally designed by Sir John Vanbrugh in 1718 was severely plain, but in 1849 William Henry Playfair converted it into a magnificent structure in the Tudor style.

On the peninsula formed by the junction of the Teviot and the Tweed stood the formidable castle and flourishing town of Roxburgh, from which the shire took its name. No trace exists of the town, and of the castle all that is left are a few ruins shaded by ancient ash trees. The castle was built by the Northumbrians, who called it Marchidum, or Marchmound, its present name apparently meaning Rawic's burgh, after some forgotten chief. After the consolidation of the kingdom of Scotland it became a favoured royal residence, and a town gradually sprang up beneath its protection, which reached its palmiest days under David I., and formed a member of the Court of Four Burghs with Edinburgh, Stirling and Berwick. It possessed a church, court of justice, mint, mills, and, what was remarkable for the 12th century, grammar school. Alexander II. was married and Alexander III. was born in the castle. During the long period of Border warfare, the town was repeatedly burned and the castle captured. After the defeat of Wallace at Falkirk the castle fell into the hands of the English, from whom it was delivered in 1314 by Sir James Douglas. Ceded to Edward III. in 1333, it was regained in 1342 by Sir Alexander Ramsay of Dalhousie, only to be lost again four years later. The castle was finally retaken and razed to the ground in 1460. It was at the siege that the king, James II., was killed by the explosion of a huge gun called "the Lion." On the fall of the castle the town languished and was finally abandoned in favour of the rising burgh of Kelso. The town, whose patron-saint was St James, is still commemorated by St James's Fair, which is held on the 5th of every August on the vacant site, and is the most popular of Border festivals.

Sandyknowe or Smailholm Tower, 6 m. W. of Kelso, dating from the 15th century, is considered the best example of a Border Peel and the most perfect relic of a feudal structure in the South of Scotland. Two m. N. by E. of Kelso is the pretty village of Ednam (Edenham, "The Village on the Eden"), the birthplace of the poet James Thomson, to whose memory an obelisk, 52 ft. high, was erected on Ferney Hill in 1820.

KELVIN, WILLIAM THOMSON, BARON (1824–1907), British physicist, the second son of James Thomson, LL.D., professor of mathematics in the university of Glasgow, was born at Belfast, Ireland, on the 26th of June 1824, his father being then teacher of mathematics in the Royal Academical Institution. In 1832 James Thomson accepted the chair of mathematics at Glasgow, and migrated thither with his two sons, James and William, who in 1834 matriculated in that university, William being then little more than ten years of age, and having acquired all his early education through his father's instruction. In 1841 William Thomson entered Peterhouse, Cambridge, and in 1845 took his degree as second wrangler, to which honour he added that of the first Smith's Prize. The senior wrangler in his year was Stephen Parkinson, a man of a very different type of mind, yet one who was a prominent figure in Cambridge for many years. In the same year Thomson was elected fellow of Peterhouse. At that time there were few facilities for the study of experimental science in Great Britain. At the Royal Institution Faraday held a unique position, and was feeling his way almost alone. In Cambridge science had progressed little since the days of Newton. Thomson therefore had recourse to Paris, and for a year worked in the laboratory of Regnault, who was then engaged in his classical researches on the thermal properties of steam. In 1846, when only twenty-two years of age, he accepted the chair of natural philosophy in the university of Glasgow, which he filled for fifty-three years, attaining universal recognition as one of the greatest physicists of his time. The Glasgow chair was a source of inspiration to scientific men for more than half a century, and many of the most advanced researches of other physicists grew out of the suggestions which Thomson scattered as sparks from his anvil. One of his earliest papers dealt with the age of the earth, and brought him into collision with the geologists of the Uniformitarian school, who were claiming thousands of millions of years for the formation of the stratified portions of the earth's crust. Thomson's calculations on the conduction of heat showed that at some time between twenty millions and four hundred millions, probably about one hundred millions, of years ago, the physical conditions of the earth must have been entirely different from those which now obtain. This led to a long controversy, in which the physical principles held their ground. In 1847 Thomson first met James Prescott Joule at the Oxford meeting of the British Association. A fortnight later they again met in Switzerland, and together measured the rise of the temperature of the water in a mountain torrent due to its fall. Joule's views of the nature of heat strongly influenced Thomson's mind, with the result that in 1848

Thomson proposed his absolute scale of temperature, which is independent of the properties of any particular thermometric substance, and in 1851 he presented to the Royal Society of Edinburgh a paper on the dynamical theory of heat, which reconciled the work of N. L. Sadi Carnot with the conclusions of Count Rumford, Sir H. Davy, J. R. Mayer and Joule, and placed the dynamical theory of heat and the fundamental principle of the conservation of energy in a position to command universal acceptance. It was in this paper that the principle of the dissipation of energy, briefly summarized in the second law of thermodynamics, was first stated.

Although his contributions to thermodynamics may properly be regarded as his most important scientific work, it is in the field of electricity, especially in its application to submarine telegraphy, that Lord Kelvin is best known to the world at large. From 1854 he is most prominent among telegraphists. The stranded form of conductor was due to his suggestion; but it was in the letters which he addressed in November and December of that year to Sir G. G. Stokes, and which were published in the *Proceedings of the Royal Society* for 1855, that he discussed the mathematical theory of signalling through submarine cables, and enunciated the conclusion that in long cables the retardation due to capacity must render the speed of signalling inversely proportional to the square of the cable's length. Some held that if this were true ocean telegraphy would be impossible, and sought in consequence to disprove Thomson's conclusion. Thomson, on the other hand, set to work to overcome the difficulty by improvement in the manufacture of cables, and first of all in the production of copper of high conductivity and the construction of apparatus which would readily respond to the slightest variation of the current in the cable. The mirror galvanometer and the siphon recorder, which was patented in 1867, were the outcome of these researches; but the scientific value of the mirror galvanometer is independent of its use in telegraphy, and the siphon recorder is the direct precursor of one form of galvanometer (d'Arsonval's) now commonly used in electrical laboratories. A mind like that of Thomson could not be content to deal with any physical quantity, however successfully from a practical point of view, without subjecting it to measurement. Thomson's work in connexion with telegraphy led to the production in rapid succession of instruments adapted to the requirements of the time for the measurement of every electrical quantity, and when electric lighting came to the front a new set of instruments was produced to meet the needs of the electrical engineer. Some account of Thomson's electrometer is given in the article on that subject, while every modern work of importance on electric lighting describes the instruments which he has specially designed for central station work; and it may be said that there is no quantity which the electrical engineer is ordinarily called upon to measure for which Lord Kelvin did not construct the suitable instrument. Currents from the ten-thousandth of an ampere to ten thousand amperes, electrical pressures from a minute fraction of a volt to 100,000 volts, come within the range of his instruments, while the private consumer of electric energy is provided with a meter recording Board of Trade units.

When W. Weber in 1851 proposed the extension of C. F. Gauss's system of absolute units to electromagnetism, Thomson took up the question, and, applying the principles of energy, calculated the absolute electromotive force of a Daniell cell, and determined the absolute measure of the resistance of a wire from the heat produced in it by a known current. In 1861 it was Thomson who induced the British Association to appoint its first famous committee for the determination of electrical standards, and it was he who suggested much of the work carried out by J. Clerk Maxwell, Balfour Stewart and Fleeming Jenkin as members of that committee. The oscillatory character of the discharge of the Leyden jar, the foundation of the work of H. R. Hertz and of wireless telegraphy were investigated by him in 1853.

It was in 1873 that he undertook to write a series of articles for *Good Words* on the mariner's compass. He wrote the first, but so many questions arose in his mind that it was five years before the second appeared. In the meanwhile the compass went through a process of complete reconstruction in his hands, a process which enabled both the permanent and the temporary magnetism of the ship to be readily compensated, while the weight of the 10-in. card was reduced to one-seventeenth of that of the standard card previously in use, although the time of swing was increased. Second only to the compass in its value to the sailor is Thomson's sounding apparatus, whereby soundings can be taken in 100 fathoms by a ship steaming at 16 knots; and by the employment of piano-wire of a breaking strength of 140 tons per square inch and an iron sinker weighing only 34 lb, with a self-registering pressure gauge, soundings can be rapidly taken in deep ocean. Thomson's tide gauge, tidal harmonic analyser and tide predicter are famous, and among his work in the interest of navigation must be mentioned his tables for the simplification of Sumner's method for determining the position of a ship at sea.

It is impossible within brief limits to convey more than a general idea of the work of a philosopher who published more than three hundred original papers bearing upon nearly every branch of physical science; who one day was working out the mathematics of a vortex theory of matter on hydrodynamical principles or discovering the limitations of the capabilities of the vortex atom, on another was applying the theory of elasticity to tides in the solid earth, or was calculating the size of water molecules, and later was designing an electricity meter, a dynamo or a domestic water-tap. It is only by reference to his published papers that any approximate conception can be formed of his life's work; but the student who had read all these knew comparatively little of Lord Kelvin if he had not talked with him face to face. Extreme modesty, almost amounting to diffidence, was combined with the utmost kindliness in Lord Kelvin's bearing to the most elementary student, and nothing seemed to give him so much pleasure as an opportunity to acknowledge the efforts of the humblest scientific worker. The progress of physical discovery during the last half of the 19th century was perhaps as much due to the kindly encouragement which he gave to his students and to others who came in contact with him as to his own researches and inventions; and it would be difficult to speak of his influence as a teacher in stronger terms than this.

One of his former pupils, Professor J. D. Cormack, wrote of him: "It is perhaps at the lecture table that Lord Kelvin displays most of his characteristics. . . . . His master mind, soaring high, sees one vast connected whole, and, alive with enthusiasm, with smiling face and sparkling eye, he shows the panorama to his pupils, pointing out the similarities and differences of its parts, the boundaries of our knowledge, and the regions of doubt and speculation. To follow him in his flights is real mental exhilaration."

In 1852 Thomson married Margaret, daughter of Walter Crum of Thornliebank, who died in 1870; and in 1874 he married Frances Anna, daughter of Charles R. Blandy of Madeira. In 1866, perhaps chiefly in acknowledgment of his services to trans-Atlantic telegraphy, Thomson received the honour of knighthood, and in 1892 he was raised to the peerage with the title of Baron Kelvin of Largs. The Grand Cross of the Royal Victorian Order was conferred on him in 1896, the year of the jubilee of his professoriate. In 1890 he became president of the Royal Society, and he received the Order of Merit on its institution in 1902. A list of the degrees and other honours which he received during the fifty-three years he held his Glasgow chair would occupy as much space as this article; but any biographical sketch would be conspicuously incomplete if it failed to notice the celebration in 1896 of the jubilee of his professorship. Never before had such a gathering of rank and science assembled as that which filled the halls in the university of Glasgow on the 15th, 16th and 17th of June in that year. The city authorities joined with the university in honouring their most distinguished citizen. About 2500 guests were received in the university buildings, the library of which was devoted to an exhibition of the instruments invented by Lord Kelvin, together with his certificates, diplomas and medals. The Eastern, the Anglo-American and the Commercial

Cable companies united to celebrate the event, and from the university library a message was sent through Newfoundland, New York, Chicago, San Francisco, Los Angeles, New Orleans, Florida and Washington, and was received by Lord Kelvin seven and a half minutes after it had been despatched, having travelled about 20,000 miles and twice crossed the Atlantic during the interval. It was at the banquet in connexion with the jubilee celebration that the Lord Provost of Glasgow thus summarized Lord Kelvin's character: "His industry is unwearied; and he seems to take rest by turning from one difficulty to another—difficulties that would appal most men and be taken as enjoyment by no one else. . . . This life of unwearied industry, of universal honour, has left Lord Kelvin with a lovable nature that charms all with whom he comes in contact."

Three years after this celebration Lord Kelvin resigned his chair at Glasgow, though by formally matriculating as a student he maintained his connexion with the university, of which in 1904 he was elected chancellor. But his retirement did not mean cessation of active work or any slackening of interest in the scientific thought of the day. Much of his time was given to writing and revising the lectures on the wave theory of light which he had delivered at Johns Hopkins University, Baltimore, in 1884, but which were not finally published till 1904. He continued to take part in the proceedings of various learned societies; and only a few months before his death, at the Leicester meeting of the British Association, he attested the keenness with which he followed the current developments of scientific speculation by delivering a long and searching address on the electronic theory of matter. He died on the 17th of December 1907 at his residence, Netherhall, near Largs, Scotland; there was no heir to his title, which became extinct.

In addition to the Baltimore lectures, he published with Professor P. G. Tait a standard but unfinished *Treatise on Natural Philosophy* (1867). A number of his scientific papers were collected in his *Reprint of Papers on Electricity and Magnetism* (1872), and in his *Mathematical and Physical Papers* (1882, 1883 and 1890), and three volumes of his *Popular Lectures and Addresses* appeared in 1889–1894. He was also the author of the articles on "Heat" and "Elasticity" in the 9th edition of the *Encyclopaedia Britannica*.

See Andrew Gray, *Lord Kelvin* (1908); S. P. Thompson, *Life of Lord Kelvin* (1910), which contains a full bibliography of his writings. (W. G.; H. M. R.)

KEMBLE, the name of a family of English actors, of whom the most famous were Mrs Siddons (*q.v.*) and her brother John Philip Kemble, the eldest of the twelve children of ROGER KEMBLE (1721–1802), a strolling player and manager, who in 1753 married an actress, Sarah Wood.

JOHN PHILIP KEMBLE (1757–1823), the second child, was born at Prescot, Lancashire, on the 1st of February 1757. His mother was a Roman Catholic, and he was educated at Sedgeley Park Catholic seminary, near Wolverhampton, and the English college at Douai, with the view of becoming a priest. But at the conclusion of the four years' course he discovered that he had no vocation for the priesthood, and returning to England he joined the theatrical company of Crump & Chamberlain, his first appearance being as Theodosius in Lee's tragedy of that name at Wolverhampton on the 8th of January 1776. In 1778 he joined the York company of Tate Wilkinson, appearing at Wakefield as Captain Plume in Farquhar's *The Recruiting Officer*; in Hull for the first time as Macbeth on the 30th of October, and in York as Orestes in Ambrose Philips's *Distressed Mother*. In 1781 he obtained a "star" engagement at Dublin, making his first appearance there on the 2nd of November as Hamlet. He also achieved great success as Raymond in *The Count of Narbonne*, a play taken from Horace Walpole's *Castle of Otranto*. Gradually he won for himself a high reputation as a careful and finished actor, and this, combined with the greater fame of his sister, led to an engagement at Drury Lane, where he made his first appearance on the 30th of September 1783 as Hamlet. In this rôle he awakened interest and discussion among the critics rather than the enthusiastic approval of the public. But as Macbeth on the 31st of March 1785 he shared in the enthusiasm aroused by Mrs Siddons, and established a reputation among living actors second only to hers. Brother and sister had first appeared together at Drury Lane on the 22nd of November 1783, as Beverley and Mrs Beverley in Moore's *The Gamester*, and as King John and Constance in Shakespeare's tragedy. In the following year they played Montgomerie and Matilda in Cumberland's *The Carmelite*, and in 1785 Adorni and Camiola in Kemble's adaptation of Massinger's *A Maid of Honour*, and Othello and Desdemona. Between 1785 and 1787 Kemble appeared in a variety of rôles, his Mentevole in Jephson's *Julia* producing an overwhelming impression. On the 8th of December 1787 he married Priscilla Hopkins Brereton (1756–1845), the widow of an actor and herself an actress. Kemble's appointment as manager of Drury Lane in 1788 gave him full opportunity to dress the characters less according to tradition than in harmony with his own conception of what was suitable. He was also able to experiment with whatever parts might strike his fancy, and of this privilege he took advantage with greater courage than discretion. His activity was prodigious, the list of his parts including a large number of Shakespearian characters and also a great many in plays now forgotten. In his own version of *Coriolanus*, which was revived during his first season, the character of the "noble Roman" was so exactly suited to his powers that he not only played it with a perfection that has never been approached, but, it is said, unconsciously allowed its influence to colour his private manner and modes of speech. His tall and imposing person, noble countenance, and solemn and grave demeanour were uniquely adapted for the Roman characters in Shakespeare's plays; and, when in addition he had to depict the gradual growth and development of one absorbing passion, his representation gathered a momentum and majestic force that were irresistible. His defect was in flexibility, variety, rapidity; the characteristic of his style was method, regularity, precision, elaboration even of the minutest details, founded on a thorough psychological study of the special personality he had to represent. His elocutionary art, his fine sense of rhythm and emphasis, enabled him to excel in declamation, but physically he was incapable of giving expression to impetuous vehemence and searching pathos. In Coriolanus and Cato he was beyond praise, and possibly he may have been superior to both Garrick and Kean in Macbeth, although it must be remembered that in it part of his inspiration must have been caught from Mrs Siddons. In all the other great Shakespearian characters he was, according to the best critics, inferior to them, least so in Lear, Hamlet and Wolsey, and most so in Shylock and Richard III. On account of the eccentricities of Sheridan, the proprietor of Drury Lane, Kemble withdrew from the management, and, although he resumed his duties at the beginning of the season 1800–1801, he at the close of 1802 finally resigned connexion with it. In 1803 he became manager of Covent Garden, in which he had acquired a sixth share for £23,000. The theatre was burned down on the 20th of September 1808, and the raising of the prices after the opening of the new theatre, in 1809, led to riots, which practically suspended the performances for three months. Kemble had been nearly ruined by the fire, and was only saved by a generous loan, afterwards converted into a gift, of £10,000 from the duke of Northumberland. Kemble took his final leave of the stage in the part of Coriolanus on the 23rd of June 1817. His retirement was probably hastened by the rising popularity of Edmund Kean. The remaining years of his life were spent chiefly abroad, and he died at Lausanne on the 26th of February 1823.

See Boaden, *Life of John Philip Kemble* (1825); Fitzgerald, *The Kembles* (1871).

STEPHEN KEMBLE (1758–1822), the second son of Roger, was rather an indifferent actor, ever eclipsed by his wife and fellow player, Elizabeth Satchell Kemble (*c.* 1763–1841), and a man of such portly proportions that he played Falstaff without padding. He managed theatres in Edinburgh and elsewhere.

CHARLES KEMBLE (1775–1854), a younger brother of John Philip and Stephen, was born at Brecon, South Wales, on the 25th of November 1775. He, too, was educated at Douai.

After returning to England in 1792, he obtained a situation in the post-office, but this he soon resigned for the stage, making his first recorded appearance at Sheffield as Orlando in *As You Like It* in that year. During the early period of his career as an actor he made his way slowly to public favour. For a considerable time he played with his brother and sister, chiefly in secondary parts, and this with a grace and finish which received scant justice from the critics. His first London appearance was on the 21st of April 1794, as Malcolm to his brother's Macbeth. Ultimately he won independent fame, especially in such characters as Archer in George Farquhar's *Beaux' Stratagem*, Dorincourt in Mrs Cowley's *Belle's Stratagem*, Charles Surface and Ranger in Dr Benjamin Hoadley's *Suspicious Husband*. His Laertes and Macduff were hardly less interesting than his brother's Hamlet and Macbeth. In comedy he was ably supported by his wife, Marie Therèse De Camp (1774–1838), whom he married on the 2nd of July 1806. His visit, with his daughter Fanny, to America during 1832 and 1834, aroused much enthusiasm. The later period of his career was clouded by money embarrassments in connexion with his joint proprietorship in Covent Garden theatre. He formally retired from the stage in December 1836, but his final appearance was on the 10th of April 1840. For some time he held the office of examiner of plays. In 1844–1845 he gave readings from Shakespeare at Willis's Rooms. He died on the 12th of November 1854. Macready regarded his Cassio as incomparable, and summed him up as "a first-rate actor of second-rate parts."

See *Gentleman's Magazine*, January 1855; *Records of a Girlhood*, by Frances Anne Kemble.

Elizabeth Whitlock (1761–1836), who was a daughter of Roger Kemble, made her first appearance on the stage in 1783 at Drury Lane as Portia. In 1785 she married Charles E. Whitlock, went with him to America and played with much success there. She had the honour of appearing before President Washington. She seems to have retired about 1807, and she died on the 27th of February 1836. Her reputation as a tragic actress might have been greater had she not been Mrs Siddons's sister.

Frances Anne Kemble (Fanny Kemble) (1809–1893), the actress and author, was Charles Kemble's elder daughter; she was born in London on the 27th of November 1809, and educated chiefly in France. She first appeared on the stage on the 25th of October 1829 as Juliet at Covent Garden. Her attractive personality at once made her a great favourite, her popularity enabling her father to recoup his losses as a manager. She played all the principal women's parts, notably Portia, Beatrice and Lady Teazle, but Julia in Sheridan Knowles's *The Hunchback*, especially written for her, was perhaps her greatest success. In 1832 she went with her father to America, and in 1834 she married there a Southern planter, Pierce Butler. They were divorced in 1849. In 1847 she returned to the stage, from which she had retired on her marriage, and later, following her father's example, appeared with much success as a Shakespearian reader. In 1877 she returned to England, where she lived—using her maiden name—till her death in London on the 15th of January 1893. During this period Fanny Kemble was a prominent and popular figure in the social life of London. Besides her plays, *Francis the First*, unsuccessfully produced in 1832, *The Star of Seville* (1837), a volume of *Poems* (1844), and a book of Italian travel, *A Year of Consolation* (1847), she published a volume of her *Journal* in 1835, and in 1863 another (dealing with life on the Georgia plantation), and also a volume of *Plays*, including translations from Dumas and Schiller. These were followed by *Records of a Girlhood* (1878), *Records of Later Life* (1882), *Notes on some of Shakespeare's Plays* (1882), *Far Away and Long Ago* (1889), and *Further Records* (1891). Her various volumes of reminiscences contain much valuable material for the social and dramatic history of the period.

Adelaide Kemble (1814–1879), Charles Kemble's second daughter, was an opera singer of great promise, whose first London appearance was made in *Norma* on the 2nd of November 1841. In 1843 she married Edward John Sartoris, a rich Italian, and retired after a brief but brilliant career. She wrote *A Week in a French Country House* (1867), a bright and humorous story, and of a literary quality not shared by other tales that followed. Her son, Algernon Charles Sartoris, married General U. S. Grant's daughter.

Among more recent members of the Kemble family, mention may also be made of Charles Kemble's grandson, Henry Kemble (1848–1907), a sterling and popular London actor.

KEMBLE, JOHN MITCHELL (1807–1857), English scholar and historian, eldest son of Charles Kemble the actor, was born in 1807. He received his education partly from Dr Richardson, author of the *Dictionary of the English Language*, and partly at the grammar school of Bury St Edmunds, where he obtained in 1826 an exhibition to Trinity College, Cambridge. At the university his historical essays gained him high reputation. The bent of his studies was turned more especially towards the Anglo-Saxon period through the influence of the brothers Grimm, under whom he studied at Göttingen (1831). His thorough knowledge of the Teutonic languages and his critical faculty were shown in his *Beowulf* (1833–1837), *Über die Stammtafel der Westsachsen* (1836), *Codex Diplomaticus Aevi Saxonici* (1839–1848), and in many contributions to reviews; while his *History of the Saxons in England* (1849; new ed. 1876), though it must now be read with caution, was the first attempt at a thorough examination of the original sources of the early period of English history. He was editor of the *British and Foreign Review* from 1835 to 1844; and from 1840 to his death was examiner of plays. In 1857 he published *State Papers and Correspondence illustrative of the Social and Political State of Europe from the Revolution to the Accession of the House of Hanover*. He died at Dublin on the 26th of March 1857. His *Horae Ferales, or Studies in the Archaeology of Northern Nations*, was completed by Dr R. G. Latham, and published in 1864. He married the daughter of Professor Amadeus Wendt of Göttingen in 1836; and had two daughters and a son; the elder daughter was the wife of Sir Charles Santley, the singer.

KEMÉNY, ZSIGMOND, Baron (1816–1875), Hungarian author, came of a noble but reduced family. In 1837 he studied jurisprudence at Marosvásárhely, but soon devoted himself entirely to journalism and literature. His first unfinished work, *On the Causes of the Disaster of Mohacs* (1840), attracted much attention. In the same year he studied natural history and anatomy at Vienna University. In 1841, along with Lajos Kovács, he edited the Transylvanian newspaper *Erdélyi Hiradó*. He also took an active part in provincial politics and warmly supported the principles of Count Stephen Széchenyi. In 1846 he moved to Pest, where his pamphlet, *Korteskedés és ellenszerei* (Partisanship and its Antidote), had already made him famous. Here he consorted with the most eminent of the moderate reformers, and for a time was on the staff of the *Pesti Hirlap*. The same year he brought out his first great novel, *Pál Gyulay*. He was elected a member of the revolutionary diet of 1848 and accompanied it through all its vicissitudes. After a brief exile he accepted the amnesty and returned to Hungary. Careless of his unpopularity, he took up his pen to defend the cause of justice and moderation, and in his two pamphlets, *Forradalom után* (After the Revolution) and *Még egysz ó a forradalom után* (One word more after the Revolution), he defended the point of view which was realized by Deák in 1867. He subsequently edited the *Pesti Napló*, which became virtually Deák's political organ. Kemény also published several political essays (*e.g. The Two Wesselényis*, and *Stephen Szechenyi*) which are among the best of their kind in any literature. His novels published during these years, such as *Férj és nö* (Husband and Wife), *Szivörvényei* (The Heart's Secrets), &c., also won for him a foremost rank among contemporary novelists. During the 'sixties Kemény took an active part in the political labours of Deák, whose right hand he continued to be, and popularized the Composition of 1867 which he had done so much to bring about. He was elected to the diet of 1867 for one of the divisions of Pest, but took no part in the debates. The last years of his life were passed in complete seclusion in Transylvania. To the works of Kemény already mentioned should be added the fine historical novel *Rajongok* (The Fanatics) (Pest, 1858–1859), and *Collected Speeches* (Hung.) (Pest, 1889).

See L. Nogrady, *Baron Sigismund Kemény's Life and Writings* (Hung.) (Budapest, 1902); G. Beksics, *Sigismund Kemény, the Revolution and the Composition* (Hung.) (Budapest, 1888). (R. N. B.)

KEMP, WILLIAM (*fl.* 1600), English actor and dancer. He probably began his career as a member of the earl of Leicester's company, but his name first appears after the death of Leicester in a list of players authorized by an order of the privy council in 1593 to play 7 m. out of London. Ferdinand Stanley, Lord Strange, was the patron of the company of which Kemp was the leading member until 1598, and in 1594 was summoned with Burbage and Shakespeare to act before the queen at Greenwich. He was the successor, both in parts and reputation, of Richard Tarlton. But it was as a dancer of jigs that he won his greatest popularity, one or two actors dancing and singing with him, and the words doubtless often being improvised. Examples of the music may be seen in the MS. collection of John Dowland now in the Cambridge University library. At the same time Kemp was given parts like Dogberry, and Peter in *Romeo and Juliet*; indeed his name appears by accident in place of those of the characters in early copies. Kemp seems to have exhibited his dancing on the Continent, but in 1602 he was a member of the earl of Worcester's players, and Philip Henslowe's diary shows several payments made to him in that year.

KEMPE, JOHN (*c.* 1380–1454), English cardinal, archbishop of Canterbury, and chancellor, was son of Thomas Kempe, a gentleman of Ollantigh, in the parish of Wye near Ashford, Kent. He was born about 1380 and educated at Merton College, Oxford. He practised as an ecclesiastical lawyer, was an assessor at the trial of Oldcastle, and in 1415 was made dean of the Court of Arches. Then he passed into the royal service, and being employed in the administration of Normandy was eventually made chancellor of the duchy. Early in 1419 he was elected bishop of Rochester, and was consecrated at Rouen on the 3rd of December. In February 1421 he was translated to Chichester, and in November following to London. During the minority of Henry VI. Kempe had a prominent position in the English council as a supporter of Henry Beaufort, whom he succeeded as chancellor in March 1426. In this same year he was promoted to the archbishopric of York. Kempe held office as chancellor for six years; his main task in government was to keep Humphrey of Gloucester in check. His resignation on the 28th of February 1432 was a concession to Gloucester. He still enjoyed Beaufort's favour, and retaining his place in the council was employed on important missions, especially at the congress of Arras in 1435, and the conference at Calais in 1438. In December 1439 he was created cardinal, and during the next few years took less share in politics. He supported Suffolk over the king's marriage with Margaret of Anjou; but afterwards there arose some difference between them, due in part to a dispute about the nomination of the cardinal's nephew, Thomas Kempe, to the bishopric of London. At the time of Suffolk's fall in January 1450 Kempe once more became chancellor. His appointment may have been due to the fact that he was not committed entirely to either party. In spite of his age and infirmity he showed some vigour in dealing with Cade's rebellion, and by his official experience and skill did what he could for four years to sustain the king's authority. He was rewarded by his translation to Canterbury in July 1452, when Pope Nicholas added as a special honour the title of cardinal-bishop of Santa Rufina. As Richard of York gained influence, Kempe became unpopular; men called him "the cursed cardinal," and his fall seemed imminent when he died suddenly on the 22nd of March 1454. He was buried at Canterbury, in the choir. Kempe was a politician first, and hardly at all a bishop; and he was accused with some justice of neglecting his dioceses, especially at York. Still he was a capable official, and a faithful servant to Henry VI., who called him "one of the wisest lords of the land" (*Paston Letters*, i. 315). He founded a college at his native place at Wye, which was suppressed at the Reformation.

For contemporary authorities see under HENRY VI. See also J. Raine's *Historians of the Church of York*, vol. ii.; W. Dugdale's *Monasticon*, iii. 254, vi. 1430–1432; and W. F. Hook's *Lives of Archbishops of Canterbury*, v. 188–267. (C. L. K.)

KEMPEN, a town in the Prussian Rhine Province, 40 m. N. of Cologne by the railway to Zevenaar. Pop. (1900), 6319. It has a monument to Thomas à Kempis, who was born there. The industries are considerable, and include silk-weaving, glass-making and the manufacture of electrical plant. Kempen belonged in the middle ages to the archbishopric of Cologne and received civic rights in 1294. It is memorable as the scene of a victory gained, on the 17th of January 1642, by the French and Hessians over the Imperialists.

See Terwelp, *Die Stadt Kempen* (Kempen, 1894), and Niessen, *Heimatkunde des Kreises Kempen* (Crefeld, 1895).

KEMPENFELT, RICHARD (1718–1782), British rear-admiral, was born at Westminster in 1718. His father, a Swede, is said to have been in the service of James II., and subsequently to have entered the British army. Richard Kempenfelt went into the navy, and saw his first service in the West Indies, taking part in the capture of Portobello. In 1746 he returned to England, and from that date to 1780, when he was made rear-admiral, saw active service in the East Indies with Sir George Pocock and in various quarters of the world. In 1781 he gained, with a vastly inferior force, a brilliant victory, fifty leagues south-west of Ushant, over the French fleet under De Guichen, capturing twenty prizes. In 1782 he hoisted his flag on the "Royal George," which formed part of the fleet under Lord Howe. In August this fleet was ordered to refit at top speed at Portsmouth, and proceed to the relief of Gibraltar. A leak having been located below the waterline of the "Royal George," the vessel was careened to allow of the defect being repaired. According to the version of the disaster favoured by the Admiralty, she was overturned by a breeze. But the general opinion of the navy was that the shifting of her weights was more than the old and rotten timbers of the "Royal George" could stand. A large piece of her bottom fell out, and she went down at once. It is estimated that not fewer than 800 persons went down with her, for besides the crew there were a large number of tradesmen, women and children on board. Kempenfelt, who was in his cabin, perished with the rest. Cowper's poem, the "Loss of the Royal George," commemorates this disaster. Kempenfelt effected radical alterations and improvements in the signalling system then existing in the British navy. A painting of the loss of the "Royal George" is in the Royal United Service Institution, London.

See Charnock's *Biog. Nav.*, vi. 246, and Ralfe's *Naval Biographies*, i. 215.

KEMPT, SIR JAMES (1764–1854), British soldier, was gazetted to the 101st Foot in India in 1783, but on its disbandment two years later was placed on half-pay. It is said that he took a clerkship in Greenwood's, the army agents (afterwards Cox & Co.). He attracted the notice of the Duke of York, through whom he obtained a captaincy (very soon followed by a majority) in the newly raised 113th Foot. But it was not long before his regiment experienced the fate of the old 101st; this time however Kempt was retained on full pay in the recruiting service. In 1799 he accompanied Sir Ralph Abercromby to Holland, and later to Egypt as an aide-de-camp. After Abercromby's death Kempt remained on his successor's staff until the end of the campaign in Egypt. In April 1803 he joined the staff of Sir David Dundas, but next month returned to regimental duty, and a little later received a lieutenant-colonelcy in the 81st Foot. With his new regiment he went, under Craig, to the Mediterranean theatre of operations, and at Maida the light brigade led by him bore the heaviest share of the battle. Employed from 1807 to 1811 on the staff in North America, Brevet-Colonel Kempt at the end of 1811 joined Wellington's army in Spain with the local rank of major-general, which was, on the 1st of January 1812, made substantive. As one of Picton's brigadiers, Kempt took part in the great assault on Badajoz and was severely wounded. On rejoining for duty, he was posted to the command of a brigade of the Light Division (43rd, 52nd and 95th Rifles), which he led at Vera, the Nivelle (where he was again wounded), Bayonne, Orthez and Toulouse. Early in 1815 he was made K.C.B., and in July for his services at Waterloo, G.C.B. At that battle he commanded the 28th, 32nd and 79th as a brigadier under his old chief, Picton, and on Picton's death succeeded to the command of his division. From 1828 to 1830 he was Governor-General of Canada, and at a critical time displayed firmness and moderation. He was afterwards Master-General of the Ordnance. At the time of his death in 1854 he had been for some years a full General.

KEMPTEN, a town in the kingdom of Bavaria on the Iller, 81 m. S.W. of Munich by rail. Pop. (1905), 20,663. The town is well built, has many spacious squares and attractive public grounds, and contains a castle, a handsome town-hall, a gymnasium, &c. The old palace of the abbots of Kempten, dating from the end of the 17th century, is now partly used as barracks, and near to it is the fine abbey church. The industries include wool-spinning and weaving and the manufacture of paper, beer, machines, hosiery and matches. As the commercial centre of the Algäu, Kempten carries on active trade in timber and dairy produce. Numerous remains have been discovered on the Lindenberg, a hill in the vicinity.

Kempten, identified with the Roman Cambodunum, consisted in early times of two towns, the old and the new. The continual hostility that existed between these was intensified by the welcome given by the old town, a free imperial city since 1289, to the Reformed doctrines, the new town keeping to the older faith. The Benedictine abbey of Kempten, said to have been founded in 773 by Hildegarde, the wife of Charlemagne, was an important house. In 1360 its abbot was promoted to the dignity of a prince of the Empire by the emperor Charles IV.; the town and abbey passed to Bavaria in 1803. Here the Austrians defeated the French on the 17th of September 1796.

See Förderreuther, *Die Stadt Kempten und ihre Umgebung* (Kempten, 1901); Haggenmüller, *Geschichte der Stadt und der gefürsteten Grafschaft Kempten*, vol. i. (Kempten, 1840); and Meirhofer, *Geschichtliche Darstellung der dinkwürdigsten Schicksale der Stadt Kempten* (Kempten, 1856).

KEN, THOMAS (1637–1711), the most eminent of the English non-juring bishops, and one of the fathers of modern English hymnology, was born at Little Berkhampstead, Herts, in 1637. He was the son of Thomas Ken of Furnival's Inn, who belonged to an ancient stock,—that of the Kens of Ken Place, in Somersetshire; his mother was a daughter of the now forgotten poet, John Chalkhill, who is called by Walton an " acquaintant and friend of Edmund Spenser." Ken's step-sister, Anne, was married to Izaak Walton in 1646, a connexion which brought Ken from his boyhood under the refining influence of this gentle and devout man. In 1652 Ken entered Winchester College, and in 1656 became a student of Hart Hall, Oxford. He gained a fellowship at New College in 1657, and proceeded B.A. in 1661 and M.A. in 1664. He was for some time tutor of his college; but the most characteristic reminiscence of his university life is the mention made by Anthony Wood that in the musical gatherings of the time " Thomas Ken of New College, a junior, would be sometimes among them, and sing his part." Ordained in 1662, he successively held the livings of Little Easton in Essex, Brighstone (sometimes called Brixton) in the Isle of Wight, and East Woodhay in Hampshire; in 1672 he resigned the last of these, and returned to Winchester, being by this time a prebendary of the cathedral, and chaplain to the bishop, as well as a fellow of Winchester College. He remained there for several years, acting as curate in one of the lowest districts, preparing his *Manual of Prayers for the use of the Scholars of Winchester College* (first published in 1674), and composing hymns. It was at this time that he wrote, primarily for the same body as his prayers, his morning, evening and midnight hymns, the first two of which, beginning " Awake, my soul, and with the sun " and " Glory to Thee, my God, this night," are now household words wherever the English tongue is spoken. The latter is often made to begin with the line " All praise to Thee, my God, this night," but in the earlier editions over which Ken had control, the line is as first given.[1] In 1674 Ken paid a visit to Rome in company with young Izaak Walton, and this journey seems mainly to have resulted in confirming his regard for the Anglican communion. In 1679 he was appointed by Charles II. chaplain to the Princess Mary, wife of William of Orange. While with the court at the Hague, he incurred the displeasure of William by insisting that a promise of marriage, made to an English lady of high birth by a relative of the prince, should be kept; and he therefore gladly returned to England in 1680, when he was immediately appointed one of the king's chaplains. He was once more residing at Winchester in 1683 when Charles came to the city with his doubtfully composed court, and his residence was chosen as the home of Nell Gwynne; but Ken stoutly objected to this arrangement, and succeeded in making the favourite find quarters elsewhere. In August of this same year he accompanied Lord Dartmouth to Tangier as chaplain to the fleet, and Pepys, who was one of the company, has left on record some quaint and kindly reminiscences of him and of his services on board. The fleet returned in April 1684, and a few months after, upon a vacancy occurring in the see of Bath and Wells, Ken, now Dr Ken, was appointed bishop. It is said that, upon the occurrence of the vacancy, Charles, mindful of the spirit he had shown at Winchester, exclaimed, " Where is the good little man that refused his lodging to poor Nell? " and determined that no other should be bishop. The consecration took place at Lambeth on the 25th of January 1685; and one of Ken's first duties was to attend the death-bed of Charles, where his wise and faithful ministrations won the admiration of everybody except Bishop Burnet. In this year he published his *Exposition on the Church Catechism*, perhaps better known by its sub-title, *The Practice of Divine Love.* In 1688, when James reissued his " Declaration of Indulgence," Ken was one of the " seven bishops " who refused to publish it. He was probably influenced by two considerations: first, by his profound aversion from Roman Catholicism, to which he felt he would be giving some episcopal recognition by compliance; but, second and more especially, by the feeling that James was compromising the spiritual freedom of the church. Along with his six brethren, Ken was committed to the Tower on the 8th of June 1688, on a charge of high misdemeanour; the trial, which took place on the 29th and 30th of the month, and which resulted in a verdict of acquittal, is matter of history. With the revolution which speedily followed this impolitic trial, new troubles encountered Ken; for, having sworn allegiance to James, he thought himself thereby precluded from taking the oath to William of Orange. Accordingly, he took his place among the non-jurors, and, as he stood firm to his refusal, he was, in August 1691, superseded in his bishopric by Dr Kidder, dean of Peterborough. From this time he lived mostly in retirement, finding a congenial home with Lord Weymouth, his friend from college days, at Longleat in Wiltshire; and though pressed to resume his diocese in 1703, upon the death of Bishop Kidder, he declined, partly on the ground of growing weakness, but partly no doubt from his love for the quiet life of devotion which he was able to lead at Longleat. His death took place there on the 19th of March 1711.

Although Ken wrote much poetry, besides his hymns, he cannot be called a great poet; but he had that fine combination of spiritual insight and feeling with poetic taste which marks all great hymn-writers. As a hymn-writer he has had few equals in England; it can scarcely be said that even Keble, though possessed of much rarer poetic gifts, surpassed him in his own sphere (see HYMNS). In his own day he took high rank as a pulpit orator, and even royalty had to beg for a seat amongst his audiences; but his sermons are now forgotten. He lives in history, apart from his three hymns, mainly as a man of unstained purity and invincible fidelity to conscience, weak only in a certain narrowness of view which is a frequent attribute of the intense character which he possessed. As an ecclesiastic he was a High Churchman of the old school.

Ken's poetical works were published in collected form in four volumes by W. Hawkins, his relative and executor, in 1721; his prose works were issued in 1838 in one volume, under the editorship of J. T. Round. A brief memoir was prefixed by Hawkins to a selection from Ken's works which he published in 1713; and a life, in two volumes, by the Rev. W. L. Bowles, appeared in 1830. But the standard biographies of Ken are those of J. Lavicount Anderdon (*The Life of Thomas Ken, Bishop of Bath and Wells, by a Layman*, 1851; 2nd ed., 1854) and of Dean Plumptre (2 vols., 1888; revised, 1890). See also the Rev. W. Hunt's article in the *Dict. Nat. Biog.*

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[1] The fact, however, that in 1712—only a year after Ken's death—his publisher, Brome, published the hymn with the opening words " All praise," has been deemed by such a high authority as the 1st earl of Selborne sufficient evidence that the alteration had Ken's authority.

KEN, a river of Northern India, tributary to the Jumna on its right bank, flowing through Bundelkhand. An important reservoir in its upper basin, which impounds about 180 million cubic feet of water, irrigates about 374,000 acres in a region specially liable to drought.

KENA, or KENEH (sometimes written *Qina*), a town of Upper Egypt on a canal about a mile E. of the Nile and 380 m. S.S.E. of Cairo by rail. Pop. (1907), 20,069. Kena, the capital of a province of the same name, was called by the Greeks Caene or Caenepolis (probably the Νέη πόλις of Herodotus; see AKHMIM) in distinction from Coptos (*q.v.*), 15 m. S., to whose trade it eventually succeeded. It is a remarkable fact that its modern name should be derived from a purely Greek word, like Iskenderia from Alexandria, and Nekrāsh from Naucratis; in the absence of any known Egyptian name it seems to point to Kena having originated in a foreign settlement in connexion with the Red Sea trade. It is a flourishing town, specially noted for the manufacture of the porous water jars and bottles used throughout Egypt. The clay for making them is obtained from a valley north of Kena. The pottery is sent down the Nile in specially constructed boats. Kena is also known for the excellence of the dates sold in its bazaars and for the large colony of dancing girls who live there. It carries on a trade in grain and dates with Arabia, via Kosseir on the Red Sea, 100 m. E. in a direct line. This inconsiderable traffic is all that is left of the extensive commerce formerly maintained—chiefly via Berenice and Coptos—between Upper Egypt and India and Arabia. The road to Kosseir is one of great antiquity. It leads through the valley of Hammāmāt, celebrated for its ancient breccia quarries and deserted gold mines. During the British operations in Egypt in 1801 Sir David Baird and his force marched along this road to Kena, taking sixteen days on the journey from Kosseir.

KENDAL, DUKEDOM OF. The English title of duke of Kendal was first bestowed in May 1667 upon Charles (d. 1667), the infant son of the duke of York, afterwards James II. Several persons have been created earl of Kendal, among them being John, duke of Bedford, son of Henry IV.; John Beaufort, duke of Somerset (d. 1444); and Queen Anne's husband, George, prince of Denmark.

In 1719 Ehrengarde Melusina (1667–1743), mistress of the English king George I., was created duchess of Kendal. This lady was the daughter of Gustavus Adolphus, count of Schulenburg (d. 1691), and was born at Emden on the 25th of December 1667. Her father held important positions under the elector of Brandenburg; her brother Matthias John (1661–1747) won great fame as a soldier in Germany and was afterwards commander-in-chief of the army of the republic of Venice. Having entered the household of Sophia, electress of Hanover, Melusina attracted the notice of her son, the future king, whose mistress she became about 1690. When George crossed over to England in 1714, the "Schulenburgin," as Sophia called her, followed him and soon supplanted her principal rival, Charlotte Sophia, Baroness von Kilmannsegge (*c.* 1673–1725), afterwards countess of Darlington, as his first favourite. In 1716 she was created duchess of Munster; then duchess of Kendal; and in 1723 the emperor Charles VI. made her a princess of the Empire. The duchess was very avaricious and obtained large sums of money by selling public offices and titles; she also sold patent rights, one of these being the privilege of supplying Ireland with a new copper coinage. This she sold to a Wolverhampton iron merchant named William Wood (1671–1730), who flooded the country with coins known as "Wood's halfpence," thus giving occasion for the publication of Swift's famous *Drapier's Letters*. In political matters she had much influence with the king, and she received £10,000 for procuring the recall of Bolingbroke from exile. After George's death in 1727 she lived at Kendal House, Isleworth, Middlesex, until her death on the 10th of May 1743. The duchess was by no means a beautiful woman, and her thin figure caused the populace to refer to her as the "maypole." By the king she had two daughters: Petronilla Melusina (*c.* 1693–1778), who was created countess of Walsingham in 1722, and who married the great earl of Chesterfield; and Margaret Gertrude, countess of Lippe (1703–1773).

KENDAL, WILLIAM HUNTER (1843–), English actor, whose family name was Grimston, was born in London on the 16th of December 1843, the son of a painter. He made his first stage appearance at Glasgow in 1862 as Louis XIV., in *A Life's Revenge*, billed as "Mr Kendall." After some experience at Birmingham and elsewhere, he joined the Haymarket company in London in 1866, acting everything from burlesque to Romeo. In 1869 he married Margaret (Madge) Shafto Robertson (b. 1849), sister of the dramatist, T. W. Robertson. As "Mr and Mrs Kendal" their professional careers then became inseparable. Mrs Kendal's first stage appearance was as Marie, "a child," in *The Orphan of the Frozen Sea* in 1854 in London. She soon showed such talent both as actress and singer that she secured numerous engagements, and by 1865 was playing Ophelia and Desdemona. She was Mary Meredith in *Our American Cousin* with Sothern, and Pauline to his Claud Melnotte. But her real triumphs were at the Haymarket in Shakespearian revivals and the old English comedies. While Mr Kendal played Orlando, Charles Surface, Jack Absolute and Young Marlowe, his wife made the combination perfect with her Rosalind, Lady Teazle, Lydia Languish and Kate Hardcastle; and she created Galatea in Gilbert's *Pygmalion and Galatea* (1871). Short seasons followed at the Court theatre and at the Prince of Wales's, at the latter of which they joined the Bancrofts in *Diplomacy* and other plays. Then in 1879 began a long association with Mr (afterwards Sir John) Hare as joint-managers of the St James's theatre, some of their notable successes being in *The Squire*, *Impulse*, *The Ironmaster* and *A Scrap of Paper*. In 1888, however, the Hare and Kendal régime came to an end. From that time Mr and Mrs Kendal chiefly toured in the provinces and in America, with an occasional season at rare intervals in London.

KENDAL, a market town and municipal borough in the Kendal parliamentary division of Westmorland, England, 251 m. N.N.W. from London on the Windermere branch of the London & North-Western railway. Pop. (1901), 14,183. The town, the full name of which is Kirkby-Kendal or Kirkby-in-Kendal, is the largest in the county. It is picturesquely placed on the river Kent, and is irregularly built. The white-walled houses with their blue-slated roofs, and the numerous trees, give it an attractive appearance. To the S.W. rises an abrupt limestone eminence, Scout Scar, which commands an extensive view towards Windermere and the southern mountains of the Lake District. The church of the Holy Trinity, the oldest part of which dates from about 1200, is a Gothic building with five aisles and a square tower. In it is the helmet of Major Robert Philipson, who rode into the church during service in search of one of Cromwell's officers, Colonel Briggs, to do vengeance on him. This major was notorious as "Robin the Devil," and his story is told in Scott's *Rokeby*. Among the public buildings are the town hall, classic in style; the market house, and literary and scientific institution, with a museum containing a fossil collection from the limestone of the locality. Educational establishments include a free grammar school, in modern buildings, founded in 1525 and well endowed; a blue-coat school, science and art school, and green-coat Sunday school (1813). On an eminence east of the town are the ruins of Kendal castle, attributed to the first barons of Kendal. It was the birthplace of Catherine Parr, Henry VIII.'s last queen. On the Castlebrow Hill, an artificial mound probably of pre-Norman origin, an obelisk was raised in 1788 in memory of the revolution of 1688. The woollen manufactures of Kendal have been noted since 1331, when Edward III. is said to have granted letters of protection to John Kemp, a Flemish weaver who settled in the town; and, although the coarse cloth known to Shakespeare as "Kendal green" is no longer made, its place is more than supplied by active manufactures of tweeds, railway rugs, horse clothing, knitted woollen caps and jackets, worsted and woollen yarns, and similar goods. Other manufactures of Kendal are machine-made boots and shoes, cards for wool and cotton, agricultural and other machinery, paper, and, in the neighbourhood, gunpowder. There is a large weekly market for grain, and annual horse and cattle fairs. The town is governed by a mayor, 6 aldermen and 18 councillors. Area, 2622 acres.

The outline of a Roman fort is traceable at Watercrook near Kendal. The barony and castle of Kendal or Kirkby-in-Kendal, held by Turold before the Conquest, were granted by William I. to Ivo de Taillebois, but the barony was divided into three parts in the reign of Richard II., one part with the castle passing to Sir William Parr, knight, ancestor of Catherine Parr. After the death of her brother William Parr, marquess of Northampton, his share of the barony called Marquis Fee reverted to Queen Elizabeth. The castle, being evidently deserted, was in ruins in 1586. Kendal was plundered by the Scots in 1210, and was visited by the rebels in 1715 and again in 1745 when the Pretender was proclaimed king there. Burgesses in Kendal are mentioned in 1345, and the borough with "court housez" and the fee-farm of free tenants is included in a confirmation charter to Sir William Parr in 1472. Richard III. in 1484 granted the inhabitants of the barony freedom from toll, passage and pontage, and the town was incorporated in 1576 by Queen Elizabeth under the title of an alderman and 12 burgesses, but Charles I. in 1635 appointed a mayor, 12 aldermen and 20 capital burgesses. Under the Municipal Reform Act of 1835 the corporation was again altered. From 1832 to 1885 Kendal sent one member to parliament, but since the last date its representation has been merged in that of the southern division of the county. A weekly market on Saturday granted by Richard I. to Roger Fitz Reinfred was purchased by the corporation from the earl of Lonsdale and Captain Bagot, lords of the manor, in 1885 and 1886. Of the five fairs which are now held three are ancient, that now held on the 29th of April being granted to Marmaduke de Tweng and William de Ros in 1307, and those on the 8th and 9th of November to Christiana, widow of Ingelram de Gynes, in 1333.

See *Victoria County History, Westmorland*; Cornelius Nicholson, *The Annals of Kendal* (1861).

KENDALL, HENRY CLARENCE (1841–1882), Australian poet, son of a missionary, was born in New South Wales on the 18th of April 1841. He received only a slight education, and in 1860 he entered a lawyer's office in Sydney. He had always had literary tastes, and sent some of his verses in 1862 to London to be published in the *Athenaeum*. Next year he obtained a clerkship in the Lands Department at Sydney, being afterwards transferred to the Colonial Secretary's office; and he combined this work with the writing of poetry and with journalism. His principal volumes of verse were *Leaves from an Australian Forest* (1869) and *Songs from the Mountains* (1880), his feeling for nature, as embodied in Australian landscape and bush-life, being very true and full of charm. In 1869 he resigned his post in the public service, and for some little while was in business with his brothers. Sir Henry Parkes took an interest in him, and eventually appointed him to an inspectorship of forests. He died on the 1st of August 1882. In 1886 a memorial edition of his poems was published at Melbourne.

KENEALY, EDWARD VAUGHAN HYDE (1819–1880), Irish barrister and author, was born at Cork on the 2nd of July 1819, the son of a local merchant. He was educated at Trinity College, Dublin; was called to the Irish bar in 1840 and to the English bar in 1847; and obtained a fair practice in criminal cases. In 1868 he became a Q.C. and a bencher of Gray's Inn. It was not, however, till 1873, when he became leading counsel for the Tichborne claimant, that he came into any great prominence. His violent conduct of the case became a public scandal, and after the verdict against his client he started a paper to plead his cause and to attack the judges. His behaviour was so extreme that in 1874 he was disbenched and disbarred by his Inn. He then started an agitation throughout the country to ventilate his grievances, and in 1875 was elected to parliament for Stoke; but no member would introduce him when he took his seat. Dr Kenealy, as he was always called, gradually ceased to attract attention, and on the 16th of April 1880 he died in London. He published a great quantity of verse, and also of somewhat mystical theology. His second daughter, Dr Arabella Kenealy, besides practising as a physician, wrote some clever novels.

KĒNG TŪNG, the most extensive of the Shan States in the province of Burma. It is in the southern Shan States' charge and lies almost entirely east of the Salween river. The area of the state is rather over 12,000 sq. m. It is bounded N. by the states of Mang Lön, Möng Lem and Kēng Hūng (Hsip Hsawng Pannā), the two latter under Chinese control; E. by the Mekong river, on the farther side of which is French Lao territory; S. by the Siamese Shan States, and W. in a general way by the Salween river, though it overlaps it in some places. The state is known to the Chinese as Mêng Kêng, and was frequently called by the Burmese "the 32 cities of the Gôn" (Hkön). Kēng Tūng has expanded very considerably since the establishment of British control, by the inclusion of the districts of Hsen Yawt, Hsen Mawng, Möng Hsat, Möng Pu, and the cis-Mekong portions of Kēng Cheng, which in Burmese times were separate charges. The "classical" name of the state is Khemarata or Khemarata Tungkapuri. About 63% of the area lies in the basin of the Mekong river and 37% in the Salween drainage area. The watershed is a high and generally continuous range. Some of its peaks rise to over 7000 ft., and the elevation is nowhere much below 5000 ft. Parallel to this successive hill ranges run north and south. Mountainous country so greatly predominates that the scattered valleys are but as islands in a sea of rugged hills. The chief rivers, tributaries of the Salween, are the Nam Hka, the Hwe Lông, Nam Pu, and the Nam Hsīm. The first and last are very considerable rivers. The Nam Hka rises in the Wa or Vü states, the Nam Hsīm on the watershed range in the centre of the state. Rocks and rapids make both unnavigable, but much timber goes down the Nam Hsīm. The lower part of both rivers forms the boundary of Kēng Tūng state. The chief tributaries of the Mekong are the Nam Nga, the Nam Lwe, the Nam Yawng, Nam Līn, Nam Hôk and Nam Kôk. Of these the chief is the Nam Lwe, which is navigable in the interior of the state, but enters the Mekong by a gorge broken up by rocks. The Nam Līn and the Nam Kôk are also considerable streams. The lower course of the latter passes by Chieng Rai in Siamese territory. The lower Nam Hôk or Mē Huak forms the boundary with Siam.

The existence of minerals was reported by the sawbwa, or chief, to Francis Garnier in 1867, but none is worked or located. Gold is washed in most of the streams. Teak forests exist in Möng Pu and Möng Hsat, and the sawbwa works them as government contracts. One-third of the price realized from the sale of the logs at Moulmein is retained as the government royalty. There are teak forests also in the Mekong drainage area in the south of the state, but there is only a local market for the timber. Rice, as elsewhere in the Shan States, is the chief crop. Next to it is sugar-cane, grown both as a field crop and in gardens. Earth-nuts and tobacco are the only other field crops in the valleys. On the hills, besides rice, cotton, poppy and tea are the chief crops. The tea is carelessly grown, badly prepared, and only consumed locally. A great deal of garden produce is raised in the valleys, especially near the capital. The state is rich in cattle, and exports them to the country west of the Salween. Cotton and opium are exported in large quantities, the former entirely to China, a good deal of the latter to northern Siam, which also takes shoes and sandals. Tea is carried through westwards from Kēng Hūng, and silk from the Siamese Shan States. Cotton and silk weaving are dying out as industries. Large quantities of shoes and sandals are made of buffalo and bullock hide, with Chinese felt uppers and soft iron hobnails. There is a good deal of pottery work. The chief work in iron is the manufacture of guns, which has been carried on for many years in certain villages of the Sam Tao district. The gun barrels and springs are rude but effective, though not very durable. The revenue of the state is collected as the Burmese *thathameda*, a rude system of income-tax. From 1890, when the state made its submission, the annual tributary offerings made in Burmese times were continued to the British government, but in 1894 these offerings were converted into tribute. For the quinquennial period 1903–1908 the state paid Rs. 30,000 (£2000) annually.

The population of the state was enumerated for the first time in 1901, giving a total of 190,698. According to an estimate made by Mr G. C. Stirling, the political officer in charge of the state, in 1897–1898, of the various tribes of Shans, the Hkün and Lü contribute about 36,000 each, the western Shans 32,000, the Lem and Lao Shans about 7000, and the Chinese Shans about 5000. Of the hill tribes, the Kaw or Aka are the most homogeneous with 22,000, but probably the Wa (or Vü), disguised under various tribal names, are at least equally numerous. Nominal Buddhists make up a total of 133,400, and the remainder are classed as animists. Spirit-worship is, however, very conspicuously prevalent amongst all classes even of the Shans. The present sawbwa or chief received his patent from the British government on the 9th of February 1897. The early history of Kēng Tūng is very obscure, but Burmese influence seems to have been maintained since the latter half, at any rate, of the 16th century. The Chinese made several attempts to subdue the state, and appear to have taken the capital in 1765–66, but were driven out by the united Shan and Burmese troops. The same fate seems to have attended the first Siamese invasion of 1804. The second and third Siamese invasions, in 1852 and 1854, resulted in great disaster to the invaders, though the capital was invested for a time.

Kēng Tūng, the capital, is situated towards the southern end of a valley about 12 m. long and with an average breadth of 7 m. The town is surrounded by a brick wall and moat about 5 m. round. Only the central and northern portions are much built over. Pop. (1901), 5695. It is the most considerable town in the British Shan States. In the dry season crowds attend the market held according to Shan custom every five days, and numerous caravans come from China. The military post formerly was 7 m. west of the town, at the foot of the watershed range. At first the headquarters of a regiment was stationed there; this was reduced to a wing, and recently to military police. The site was badly chosen and proved very unhealthy, and the headquarters both military and civil have been transferred to Loi Ngwe Lông, a ridge 6500 ft. above sea-level 12 m. south of the capital. The rainfall probably averages between 50 and 60 in. for the year. The temperature seems to rise to nearly 100° F. during the hot weather, falling 30° or more during the night. In the cold weather a temperature of 40° or a few degrees more or less appears to be the lowest experienced. The plain in which the capital stands has an altitude of 3000 ft. (J. G. Sc.)

KENILWORTH, a market town in the Rugby parliamentary division of Warwickshire, England; pleasantly situated on a tributary of the Avon, on a branch of the London & North-Western railway, 99 m. N.W. from London. Pop. of urban district (1901), 4544. The town is only of importance from its antiquarian interest and the magnificent ruins of its old castle. The walls originally enclosed an area of 7 acres. The principal portions of the building remaining are the gatehouse, now used as a dwelling-house; Caesar's tower, the only portion built by Geoffrey de Clinton now extant, with massive walls 16 ft. thick; the Merwyn's tower of Scott's *Kenilworth*; the great hall built by John of Gaunt with windows of very beautiful design; and the Leicester buildings, which are in a very ruinous condition. Not far from the castle are the remains of an Augustinian monastery founded in 1122, and afterwards made an abbey. Adjoining the abbey is the parish church of St Nicholas, restored in 1865, a structure of mixed architecture, containing a fine Norman doorway, which is supposed to have been the entrance of the former abbey church.

Kenilworth (*Chinewrde*, *Kenillewurda*, *Kinelingworthe*, *Kenilord*, *Killingworth*) is said to have been a member of Stoneleigh before the Norman Conquest and a possession of the Saxon kings, whose royal residence there was destroyed in the wars between Edward and Canute. The town was granted by Henry I. to Geoffrey de Clinton, a Norman who built the castle round which the whole history of Kenilworth centres. He also founded a monastery here about 1122. Geoffrey's grandson released his right to King John, and the castle remained with the crown until Henry III. granted it to Simon de Montfort, earl of Leicester. The famous "Dictum de Kenilworth" was proclaimed here in 1266. After the battle of Evesham the rebel forces rallied at the castle, which, after a siege of six months, was surrendered by Henry de Hastings, the governor, on account of the scarceness of food and of the "pestilent disease" which raged there. The king then granted it to his son Edmund. Through John of Gaunt it came to Henry IV. and was granted by Elizabeth in 1562 to Robert Dudley, afterwards earl of Leicester, but on his death in 1588 again merged in the possessions of the Crown. The earl spent large sums on restoring the castle and grounds, and here in July 1575 he entertained Queen Elizabeth at "excessive cost," as described in Scott's *Kenilworth*. On the queen's first entry "a small floating island illuminated by a great variety of torches . . . made its appearance upon the lake," upon which, clad in silks, were the Lady of the Lake and two nymphs waiting on her, and for the several days of her stay "rare shews and sports were there exercised." During the civil wars the castle was dismantled by the soldiers of Cromwell and was from that time abandoned to decay. The only mention of Kenilworth as a borough occurs in a charter of Henry I. to Geoffrey de Clinton and in the charters of Henry I. and Henry II. to the church of St Mary of Kenilworth confirming the grant of lands made by Geoffrey to this church, and mentioning that he kept the land in which his castle was situated and also land for making his borough, park and fishpond. The town possesses large tanneries.

KENITES, in the Bible a tribe or clan of the south of Palestine, closely associated with the Amalekites, whose hostility towards Israel, however, it did not share. On this account Saul spared them when bidden by Yahweh to destroy Amalek; David, too, whilst living in Judah, appears to have been on friendly terms with them (1 Sam. xv. 6; xxx. 29). Moses himself married into a Kenite family (Judges i. 16), and the variant tradition would seem to show that the Kenites were only a branch of the Midianites (see JETHRO, MIDIAN). Jael, the slayer of Sisera (see DEBORAH), was the wife of Heber the Kenite, who lived near Kadesh in Naphtali; and the appearance of the clan in this locality may be explained from the nomadic habits of the tribe, or else as a result of the northward movement in which at least one other clan or tribe took part (see DAN). There is an obscure allusion to their destruction in an appendage to the oracles of Balaam (Num. xxiv. 21 seq., see G. B. Gray, *Intern. Crit. Comm.* p. 376); and with this, the only unfavourable reference to them, may perhaps be associated the curse of Cain. Although some connexion with the name of Cain is probable, it is difficult, however, to explain the curse (for one view, see LEVITES). More important is the prominent part played by the Kenite (or Midianite) father-in-law of Moses, whose help and counsel are related in Exod. xviii.; and if, as seems probable, the Rechabites (*q.v.*) were likewise of Kenite origin (1 Chron. ii. 55), this obscure tribe had evidently an important part in shaping the religion of Israel.

See on this question, HEBREW RELIGION, and Budde, *Religion of Israel to the Exile*, vol. i.; G. A. Barton, *Semitic Origins*, pp. 272 sqq.; L. B. Paton, *Biblical World* (1906, July and August). On the migration of the Kenites into Palestine (cf. Num. x. 29 with Judges i. 16), see CALEB, GENESIS, JERAHMEEL, JUDAH. (S. A. C.)

KENMORE, a village and parish of Perthshire, Scotland, 6 m. W. of Aberfeldy. Pop. of parish (1901), 1271. It is situated at the foot of Loch Tay, near the point where the river Tay leaves the lake. Taymouth Castle, the seat of the Marquess of Breadalbane, stands near the base of Drummond Hill in a princely park through which flows the Tay. It is a stately four-storeyed edifice with corner towers and a central pavilion, and was built in 1801 (the west wing being added in 1842) on the site of the mansion erected in 1580 for Sir Colin Campbell of Glenorchy. The old house was called Balloch (Gaelic, *bealach*, "the outlet of a lake"). Two miles S.W. of Kenmore are the Falls of the Acharn, 80 ft. high. When Wordsworth and his sister visited them in 1803 the grotto at the cascade was fitted up to represent a "hermit's mossy cell." At the village of Fortingall, on the north side of Loch Tay, are the shell of a yew conjectured to be 3000 years old and the remains of a Roman camp. Glenlyon House was the home of Campbell of Glenlyon, chief agent in the massacre of Glencoe. At Garth, 2½ m. N.E., are the ruins of an ancient castle, said to have been a stronghold of Alexander Stewart, the Wolf of Badenoch (1343–1405), in close proximity to the modern mansion built for Sir Donald Currie.

KENMURE, WILLIAM GORDON, 6th viscount (d. 1716), Jacobite leader, son of Alexander, 5th viscount (d. 1698), was descended from the same family as Sir John Gordon of Lochinvar (d. 1604), whose grandson, Sir John Gordon (d. 1634), was created Viscount Kenmure in 1633. The family had generally adhered to the Presbyterian cause, but Robert, the 4th viscount, had been excepted from the amnesty granted to the Scottish royalists in 1654, and the 5th viscount, who had succeeded his kinsman Robert in 1663, after some vacillation, had joined the court of the exiled Stuarts. The 6th viscount's adherence to the Pretender in 1715 is said to have been due to his wife Mary Dalzell (d. 1776), sister of Robert, 6th earl of Carnwath. He raised the royal standard of Scotland at Lochmaben on the 12th of October 1715, and was joined by about two hundred gentlemen, with Carnwath, William Maxwell, 5th earl of Nithsdale, and George Seton, 5th earl of Wintoun. This small force received some additions before Kenmure reached Hawick, where he learnt the news of the English rising. He effected a junction with Thomas Forster and James Radclyffe, 3rd earl of Derwentwater, at Rothbury. Their united forces of some fourteen hundred men, after a series of rather aimless marches, halted at Kelso, where they were reinforced by a brigade under William Mackintosh. Threatened by an English army under General George Carpenter, they eventually crossed the English border to join the Lancashire Jacobites, and the command was taken over by Forster. Kenmure was taken prisoner at Preston on the 13th of November, and was sent to the Tower. In the following January he was tried with other Jacobite noblemen before the House of Lords, when he pleaded guilty, and appealed to the king's mercy. Immediately before his execution on Tower Hill on the 24th of February he reiterated his belief in the claims of the Pretender. His estates and titles were forfeited, but in 1824 an act of parliament repealed the forfeiture, and his direct descendant, John Gordon (1750–1840), became Viscount Kenmure. On the death of the succeeding peer, Adam, 8th viscount, without issue in 1847, the title became dormant.

KENNEDY, the name of a famous and powerful Scottish family long settled in Ayrshire, derived probably from the name Kenneth. Its chief seat is at Culzean, or Colzean, near Maybole in Ayrshire.

A certain Duncan who became earl of Carrick early in the 13th century is possibly an ancestor of the Kennedys, but a more certain ancestor is John Kennedy of Dunure, who obtained Cassillis and other lands in Ayrshire about 1350. John's descendant, Sir James Kennedy, married Mary, a daughter of King Robert III. and their son, Sir Gilbert Kennedy, was created Lord Kennedy before 1458. Another son was James Kennedy (*c.* 1406–1465), bishop of St Andrews from 1441 until his death in July 1465. The bishop founded and endowed St Salvator's college at St Andrews and built a large and famous ship called the "St Salvator." Andrew Lang (*History of Scotland*, vol. i.) says of him, "The chapel which he built for his college is still thronged by the scarlet gowns of his students; his arms endure on the oaken doors; the beautiful silver mace of his gift, wrought in Paris, and representing all orders of spirits in the universe, is one of the few remaining relics of ancient Scottish plate." Before the bishop had begun to assist in ruling Scotland, a kinsman, Sir Hugh Kennedy, had helped Joan of Arc to drive the English from France.

One of Gilbert Kennedy's sons was the poet, Walter Kennedy (*q.v.*), and his grandson David, third Lord Kennedy (killed at Flodden, 1513), was created earl of Cassillis before 1510; David's sister Janet Kennedy was one of the mistresses of James IV. The earl was succeeded by his son Gilbert, a prominent figure in the history of Scotland from 1513 until he was killed at Prestwick on the 22nd of December 1527. His son Gilbert, the 3rd earl (*c.* 1517–1558), was educated by George Buchanan, and was a prisoner in England after the rout of Solway Moss in 1542. He was soon released and was lord high treasurer of Scotland from 1554 to 1558, although he had been intriguing with the English and had offered to kill Cardinal Beaton in the interests of Henry VIII. He died somewhat mysteriously at Dieppe late in 1558 when returning from Paris, where he had attended the marriage of Mary Queen of Scots, and the dauphin of France. He was the father of the "king of Carrick" and the brother of Quintin Kennedy (1520–1564), abbot of Crossraguel. The abbot wrote several works defending the doctrines of the Roman Catholic Church, and in 1562 had a public discussion on these questions with John Knox, which took place at Maybole and lasted for three days. He died on the 22nd of August 1564.

Gilbert Kennedy, 4th earl of Cassillis (*c.* 1541–1576), called the "king of Carrick," became a protestant, but fought for Queen Mary at Langside in 1568. He is better known through his cruel treatment of Allan Stewart, the commendator abbot of Crossraguel, Stewart being badly burned by the earl's orders at Dunure in 1570 in order to compel him to renounce his title to the abbey lands which had been seized by Cassillis. This "ane werry greedy man" died at Edinburgh in December 1576. His son John (*c.* 1567–1615), who became the 5th earl, was lord high treasurer of Scotland in 1599 and his lifetime witnessed the culmination of a great feud between the senior and a younger branch of the Kennedy family. He was succeeded as 6th earl by his nephew John (*c.* 1595–1668), called "the grave and solemn earl." A strong presbyterian, John was one of the leaders of the Scots in their resistance to Charles I. In 1643 he went to the Westminster Assembly of Divines and several times he was sent on missions to Charles I. and to Charles II.; for a time he was lord justice general and he was a member of Cromwell's House of Lords. His son, John, became the 7th earl, and one of his daughters, Margaret, married Gilbert Burnet, afterwards bishop of Salisbury. His first wife, Jean (1607–1642), daughter of Thomas Hamilton, 1st earl of Haddington, has been regarded as the heroine of the ballad "The Gypsie Laddie," but this identity is now completely disproved. John, the 7th earl, "the heir," says Burnet, "to his father's stiffness, but not to his other virtues," supported the revolution of 1688 and died on the 23rd of July 1701; his grandson John, the 8th earl, died without sons in August 1759.

The titles and estates of the Kennedys were now claimed by William Douglas, afterwards duke of Queensberry, a great-grandson in the female line of the 7th earl and also by Sir Thomas Kennedy, Bart., of Culzean, a descendant of the 3rd earl, *i.e.* by the heir general and the heir male. In January 1762 the House of Lords decided in favour of the heir male, and Sir Thomas became the 9th earl of Cassillis. He died unmarried on the 30th of November 1775, and his brother David, the 10th earl, also died unmarried on the 18th of December 1792, when the baronetcy became extinct. The earldom of Cassillis now passed to a cousin, Archibald Kennedy, a captain in the royal navy, whose father, Archibald Kennedy (d. 1763), had migrated to America in 1722 and had become collector of customs in New York. His son, the 11th earl, had estates in New Jersey and married an American heiress; in 1765 he was said to own more houses in New York than any one else. He died in London on the 30th of December 1794, and was succeeded by his son Archibald (1770–1846), who was created Baron Ailsa in 1806 and marquess of Ailsa in 1831. His great-grandson Archibald (b. 1847) became 3rd marquess.

See the article in vol. ii. of Sir R. Douglas's *Peerage of Scotland*, edited by Sir J. B. Paul (1905). This is written by Lord Ailsa's son and heir, Archibald Kennedy, earl of Cassillis (b. 1872).

KENNEDY, BENJAMIN HALL (1804–1889), English scholar, was born at Summer Hill, near Birmingham, on the 6th of November 1804, the eldest son of Rann Kennedy (1772–1851), who came of a branch of the Ayrshire family which had settled in Staffordshire. Rann Kennedy was a scholar and man of letters, several of whose sons rose to distinction. B. H. Kennedy was educated at Birmingham and Shrewsbury schools, and St John's College, Cambridge. After a brilliant university career he was elected fellow and classical lecturer of St John's College in 1828. Two years later he became an assistant master at Harrow, whence he went to Shrewsbury as headmaster in 1836. He retained this post until 1866, the thirty years of his rule being marked by a long series of successes won by his pupils, chiefly in classics. When he retired from Shrewsbury a large sum was collected as a testimonial to him, and was devoted partly to the new school buildings and partly to the founding of a Latin professorship at Cambridge. The first two occupants of the chair were both Kennedy's old pupils, H. A. J.

Munro and J. E. B. Mayor. In 1867 he was elected regius professor of Greek at Cambridge and canon of Ely. From 1870 to 1880 he was a member of the committee for the revision of the New Testament. He was an enthusiastic advocate for the admission of women to a university education, and took a prominent part in the establishment of Newnham and Girton colleges. He was also a keen politician of liberal sympathies. He died near Torquay on the 6th of April 1889. Among a number of classical school-books published by him are two, a *Public School Latin Primer* and *Public School Latin Grammar*, which were for long in use in nearly all English schools.

His other chief works are: Sophocles, *Oedipus Tyrannus* (2nd ed., 1885), Aristophanes, *Birds* (1874); Aeschylus, *Agamemnon* (2nd ed., 1882), with introduction, metrical translation and notes; a commentary on Virgil (3rd ed., 1881); and a translation of Plato, *Theaetetus* (1881). He contributed largely to the collection known as *Sabrinae Corolla*, and published a collection of verse in Greek, Latin and English under the title of *Between Whiles* (2nd ed., 1882), with many autobiographical details.

His brother, Charles Rann Kennedy (1808–1867), was educated at Shrewsbury school and Trinity College, Cambridge, where he graduated as senior classic (1831). He then became a barrister. From 1849–1856 he was professor of law at Queen's College, Birmingham. As adviser to Mrs Swinfen, the plaintiff in the celebrated will case Swinfen *v.* Swinfen (1856), he brought an action for remuneration for professional services, but the verdict given in his favour at Warwick assizes was set aside by the court of Common Pleas, on the ground that a barrister could not sue for the recovery of his fees. The excellence of Kennedy's scholarship is abundantly proved by his translation of the orations of Demosthenes (1852–1863, in Bohn's *Classical Library*), and his blank verse translation of the works of Virgil (1861). He was also the author of *New Rules for Pleading* (2nd ed., 1841) and *A Treatise on Annuities* (1846). He died in Birmingham on the 17th of December 1867.

Another brother, Rev. William James Kennedy (1814–1891), was a prominent educationalist, and the father of Lord Justice Sir William Rann Kennedy (b. 1846), himself a distinguished Cambridge scholar.

KENNEDY, THOMAS FRANCIS (1788–1879), Scottish politician, was born near Ayr in 1788. He studied for the bar and became advocate in 1811. Having been elected M.P. for the Ayr burghs in 1818, he devoted the greater part of his life to the promotion of Liberal reforms. In 1820 he married the only daughter of Sir Samuel Romilly. He was greatly assisted by Lord Cockburn, then Mr Henry Cockburn, and a volume of correspondence published by Kennedy in 1874 forms a curious and interesting record of the consultations of the two friends on measures which they regarded as requisite for the political regeneration of their native country. One of the first measures to which he directed his attention was the withdrawal of the power of nominating juries from the judges, and the imparting of a right of peremptory challenge to prisoners. Among other subjects were the improvement of the parish schools, of pauper administration, and of several of the corrupt forms of legal procedure which then prevailed. In the construction of the Scottish Reform Act Kennedy took a prominent part; indeed he and Lord Cockburn may almost be regarded as its authors. After the accession of the Whigs to office in 1832 he held various important offices in the ministry, and most of the measures of reform for Scotland, such as burgh reform, the improvements in the law of entail, and the reform of the sheriff courts, owed much to his sagacity and energy. In 1837 he went to Ireland as paymaster of civil services, and set himself to the promotion of various measures of reform. Kennedy retired from office in 1854, but continued to take keen interest in political affairs, and up to his death in 1879 took a great part in both county and parish business. He had a stern love of justice, and a determined hatred of everything savouring of jobbery or dishonesty.

KENNEDY, WALTER (*c.* 1460–*c.* 1508), Scottish poet, was the third son of Gilbert, 1st Lord Kennedy. He matriculated at Glasgow University in 1475 and took his M.A. degree in 1478. In 1481 he was one of four examiners in his university, and in 1492 he acted as depute for his nephew, the hereditary bailie of Carrick. He is best known for his share in the *Flyting* with Dunbar (*q.v.*). In this coarse combat of wits Dunbar taunts his rival with his Highland speech (the poem is an expression of Gaelic and "Inglis," *i.e.* English, antagonism); and implies that he had been involved in treason, and had disguised himself as a beggar in Galloway. With the exception of this share in the *Flyting* Kennedy's poems are chiefly religious in character. They include *The Praise of Aige, Ane Agit Manis Invective against Mouth Thankless, Ane Ballat in Praise of Our Lady, The Passion of Christ* and *Pious Counsale.* They are printed in the rare supplement to David Laing's edition of *William Dunbar* (1834), and they have been re-edited by Dr J. Schipper in the proceedings of the Kais. Akad. der Wissenschaften (Vienna).

See also the prolegomena in the Scottish Text Society's edition of Dunbar; and (for the life) Pitcairn's edition of the *Historie of the Kennedies* (1830).

KENNEL, a small hut or shelter for a dog, also extended to a group of buildings for a pack of hounds (see Dog). The word is apparently from a Norman-French *kenil* (this form does not occur, but is seen in the Norman *kinet*, a little dog), modern French *chenil*, from popular Latin *canile*, place for a dog, *canis*, cf. *ovile*, sheep-cote. The word "kennel," a gutter, a drain in a street or road, is a corruption of the Middle English *canel*, *cannel*, in modern English "channel," from Latin *canalis*, canal.

KENNETH, the name of two kings of the Scots.

Kenneth I., MacAlpin (d. *c.* 860), often described as the first king of Scotland (kingdom of Scone), was the son of the Alpin, called king of the Scots, who had been slain by the Picts in 832 or 834, whilst endeavouring to assert his claim to the Pictish throne. On the death of his father, Kenneth is said to have succeeded him in the kingdom of the Scots. The region of his rule is matter of conjecture, though Galloway seems the most probable suggestion, in which case he probably led a piratic host against the Picts. On the father's side he was descended from the Conall Gabhrain of the old Dalriadic Scottish kingdom, and the claims of father and son to the Pictish throne were probably through female descent. Their chief support seems to have been found in Fife. In the seventh year of his reign (839 or 841) he took advantage of the effects of a Danish invasion of the Pictish kingdom to attack the remaining Picts, whom he finally subdued in 844 or 846. In 846 or 848 he transported the relics of St Columba to a church which he had constructed at Scone. He is said also to have carried out six invasions of Northumbria, in the course of which he burnt Dunbar and took Melrose. According to the *Scalacronica* of Sir Thomas Gray he drove the Angles and Britons over the Tweed, reduced the land as far as that river, and first called his kingdom Scotland. In his reign there appears to have been a serious invasion by Danish pirates, in which Cluny and Dunkeld were burnt. He died in 860 or 862, after a reign of twenty-eight years, at Forteviot and was buried at Iona. The double dates are due to a contest of authorities. Twenty-eight years is the accepted length of his reign, and according to the chronicle of Henry of Huntingdon it began in 832. The Pictish Chronicle, however, gives Tuesday, the 13th of February as the day, and this suits 862 only, in which case his reign would begin in 834.

Kenneth II. (d. 995), son of Malcolm I., king of Alban, succeeded Cuilean, son of Indulph, who had been slain by the Britons of Strathclyde in 971 in Lothian. Kenneth began his reign by ravaging the British kingdom, but he lost a large part of his force on the river Cornag. Soon afterwards he attacked Eadulf, earl of the northern half of Northumbria, and ravaged the whole of his territory. He fortified the fords of the Forth as a defence against the Britons and again invaded Northumbria, carrying off the earl's son. About this time he gave the city of Brechin to the church. In 977 he is said to have slain Amlaiph or Olaf, son of Indulph, king of Alban, perhaps a rival claimant to the throne. According to the English chroniclers, Kenneth paid homage to King Edgar for the cession of Lothian, but these statements are probably due to the controversy as to the position of Scotland. The *mormaers*, or chiefs, of Kenneth were engaged throughout his reign in a contest with Sigurd the Norwegian, earl of Orkney, for the possession of Caithness and the northern district of Scotland as far south as the Spey. In this struggle the Scots attained no permanent success. In 995 Kenneth, whose strength like that of the other kings of his branch of the house of Kenneth MacAlpin lay chiefly north of the Tay, was slain treacherously by his own subjects, according to the later chroniclers at Fettercairn in the Mearns through an intrigue of Einvela, daughter of the earl of Angus. He was buried at Iona.

See *Chronicles of the Picts and Scots*, ed. W. F. Skene (Edinburgh, 1867), and W. F. Skene, *Celtic Scotland* (Edinburgh, 1876).

KENNETT, WHITE (1660–1728), English bishop and antiquary, was born at Dover in August 1660. He was educated at Westminster school and at St Edmund's Hall, Oxford, where, while an undergraduate, he published several translations of Latin works, including Erasmus *In Praise of Folly*. In 1685 he became vicar of Ambrosden, Oxfordshire. A few years afterwards he returned to Oxford as tutor and vice-principal of St Edmund's Hall, where he gave considerable impetus to the study of antiquities. George Hickes gave him lessons in Old English. In 1695 he published *Parochial Antiquities*. In 1700 he became rector of St Botolph's, Aldgate, London, and in 1701 archdeacon of Huntingdon. For a eulogistic sermon on the first duke of Devonshire he was in 1707 recommended to the deanery of Peterborough. He afterwards joined the Low Church party, strenuously opposed the Sacheverel movement, and in the Bangorian controversy supported with great zeal and considerable bitterness the side of Bishop Hoadly. His intimacy with Charles Trimnell, bishop of Norwich, who was high in favour with the king, secured for him in 1718 the bishopric of Peterborough. He died at Westminster in December 1728.

Kennett published in 1698 an edition of Sir Henry Spelman's *History of Sacrilege*, and he was the author of fifty-seven printed works, chiefly tracts and sermons. He wrote the third volume (Charles I.–Anne) of the composite *Compleat History of England* (1706), and a more detailed and valuable *Register and Chronicle* of the Restoration. He was much interested in the Society for the Propagation of the Gospel.

The *Life of Bishop White Kennett*, by the Rev. William Newton (anonymous), appeared in 1730. See also Nichols's *Literary Anecdotes*, and I. Disraeli's *Calamities of Authors*.

KENNEY, JAMES (1780–1849), English dramatist, was the son of James Kenney, one of the founders of Boodles' Club in London. His first play, a farce called *Raising the Wind* (1803), was a success owing to the popularity of the character of "Jeremy Diddler." Kenney produced more than forty dramas and operas between 1803 and 1845, and many of his pieces, in which Mrs Siddons, Madame Vestris, Foote, Lewis, Liston and other leading players appeared from time to time, enjoyed a considerable vogue. His most popular play was *Sweethearts and Wives*, produced at the Haymarket theatre in 1823, and several times afterwards revived; and among the most successful of his other works were: *False Alarms* (1807), a comic opera with music by Braham; *Love, Law and Physic* (1812); *Spring and Autumn* (1827); *The Illustrious Stranger, or Married and Buried* (1827); *Masaniello* (1829); *The Sicilian Vespers*, a tragedy (1840). Kenney, who numbered Charles Lamb and Samuel Rogers among his friends, died in London on the 25th of July 1849. He married the widow of the dramatist Thomas Holcroft, by whom he had two sons and two daughters.

His second son, CHARLES LAMB KENNEY (1823–1881), made a name as a journalist, dramatist and miscellaneous writer. Commencing life as a clerk in the General Post Office in London, he joined the staff of *The Times*, to which paper he contributed dramatic criticism. In 1856, having been called to the bar, he became secretary to Ferdinand de Lesseps, and in 1857 he published *The Gates of the East* in support of the projected construction of the Suez Canal. Kenney wrote the words for a number of light operas, and was the author of several popular songs, the best known of which were "Soft and Low" (1865) and "The Vagabond" (1871). He also published a *Memoir of M. W. Balfe* (1875), and translated the *Correspondence* of Balzac. He included Thackeray and Dickens among his friends in a literary coterie in which he enjoyed the reputation of a wit and an accomplished writer of *vers de société*. He died in London on the 25th of August 1881.

See John Genest, *Some Account of the English Stage, 1660–1830*, vols. vii. and viii. (10 vols., London, 1832); P. W. Clayden, *Rogers and his Contemporaries* (2 vols., London, 1889); *Dict. National Biog*.

KENNGOTT, GUSTAV ADOLPH (1818–1897), German mineralogist, was born at Breslau on the 6th of January 1818. After being employed in the Hofmineralien Cabinet at Vienna, he became professor of mineralogy in the university of Zürich. He was distinguished for his researches on mineralogy, crystallography and petrology. He died at Lugano, on the 7th of March 1897.

PUBLICATIONS.—*Lehrbuch der reinen Krystallographie* (1846); *Lehrbuch der Mineralogie* (1852 and 1857; 5th ed., 1880); *Übersicht der Resultate mineralogischer Forschungen in den Jahren 1844–1865* (7 vols., 1852–1868); *Die Minerale der Schweiz* (1866); *Elemente der Petrographie* (1868).

KENNICOTT, BENJAMIN (1718–1783), English divine and Hebrew scholar, was born at Totnes, Devonshire, on the 4th of April 1718. He succeeded his father as master of a charity school, but by the liberality of friends he was enabled to go to Wadham College, Oxford, in 1744, where he distinguished himself in Hebrew and divinity. While an undergraduate he published two dissertations, *On the Tree of Life in Paradise, with some Observations on the Fall of Man*, and *On the Oblations of Cain and Abel* (2nd ed., 1747), which procured him the honour of a bachelor's degree before the statutory time. In 1747 he was elected fellow of Exeter College, and in 1750 he took his degree of M.A. In 1764 he was made a fellow of the Royal Society, and in 1767 keeper of the Radcliffe Library. He was also canon of Christ Church (1770) and rector of Culham (1753), in Oxfordshire, and was subsequently presented to the living of Menheniot, Cornwall, which he was unable to visit and resigned two years before his death. He died at Oxford, on the 18th of September 1783.

His chief work is the *Vetus Testamentum hebraicum cum variis lectionibus* (2 vols. fol., Oxford, 1776–1780). Before this appeared he had written two dissertations entitled *The State of the Printed Hebrew Text of the Old Testament considered*, published respectively in 1753 and 1759, which were designed to combat the then current ideas as to the "absolute integrity" of the received Hebrew text. The first contains "a comparison of 1 Chron. xi. with 2 Sam. v. and xxiii. and observations on seventy MSS., with an extract of mistakes and various readings"; the second defends the claims of the Samaritan Pentateuch, assails the correctness of the printed copies of the Chaldee paraphrase, gives an account of Hebrew MSS. of the Bible known to be extant, and catalogues one hundred MSS. preserved in the British Museum and in the libraries of Oxford and Cambridge. In 1760 he issued his proposals for collating all Hebrew MSS. of date prior to the invention of printing. Subscriptions to the amount of nearly £10,000 were obtained, and many learned men addressed themselves to the work of collation, Bruns of Helmstadt making himself specially useful as regarded MSS. in Germany, Switzerland and Italy. Between 1760 and 1769 ten "annual accounts" of the progress of the work were given; in its course 615 Hebrew MSS. and 52 printed editions of the Bible were either wholly or partially collated, and use was also made (but often very perfunctorily) of the quotations in the Talmud. The materials thus collected, when properly arranged and made ready for the press, extended to 30 vols. fol. The text finally followed in printing was that of Van der Hooght—unpointed however, the points having been disregarded in collation—and the various readings were printed at the foot of the page. The Samaritan Pentateuch stands alongside the Hebrew in parallel columns. The *Dissertatio generalis*, appended to the second volume, contains an account of the MSS. and other authorities collated, and also a review of the Hebrew text, divided into periods, and beginning with the formation of the Hebrew canon after the return of the Jews from the exile. Kennicott's great work was in one sense a failure. It yielded no materials of value for the emendation of the received text, and by disregarding the vowel points overlooked the one thing in which some result (grammatical if not critical) might have been derived from collation of Massoretic MSS. But the negative result of the publication and of the *Variae* *lectiones* of De Rossi, published some years later, was important. It showed that the Hebrew text can be emended only by the use of the versions aided by conjecture.

Kennicott's work was perpetuated by his widow, who founded two university scholarships at Oxford for the study of Hebrew. The fund yields an income of £200 per annum.

KENNINGTON, a district in the south of London, England, within the municipal borough of Lambeth. There was a royal palace here until the reign of Henry VII. Kennington Common, now represented by Kennington Park, was the site of a gallows until the end of the 18th century, and was the meeting-place appointed for the great Chartist demonstration of the 10th of April 1848. Kennington Oval is the ground of the Surrey County Cricket Club. (See LAMBETH.)

KENORA (formerly RAT PORTAGE), a town and port of entry in Ontario, Canada, and the chief town of Rainy River district, situated at an altitude of 1087 ft. above the sea. Pop. (1891), 1806; (1901) 5222. It is 133 m. by rail east of Winnipeg, on the Canadian Pacific railway, and at the outlet of the Lake of the Woods. The Winnipeg river has at this point a fall of 16 ft., which, with the lake as a reservoir, furnishes an abundant and unfailing water-power. The industrial establishments comprise reduction works, saw-mills and flour-mills, one of the latter being the largest in Canada. It is the distributing point for the gold mines of the district, and during the summer months steamboat communication is maintained on the lake. There is important sturgeon fishing.

KENOSHA, a city and the county-seat of Kenosha county, Wisconsin, U.S.A., on the S.W. shore of Lake Michigan, 35 m. S. of Milwaukee and 50 m. N. of Chicago. Pop. (1900), 11,606, of whom 3333 were foreign-born; (1910), 21,371. It is served by the Chicago & North-Western railway, by interurban electric lines connecting with Chicago and Milwaukee, and by freight and passenger steamship lines on Lake Michigan. It has a good harbour and a considerable lake commerce. The city is finely situated on high bluffs above the lake, and is widely known for its healthiness. At Kenosha is the Gilbert M. Simmons library, with 19,300 volumes in 1908. Just south of the city is Kemper Hall, a Protestant Episcopal school for girls, under the charge of the Sisters of St Mary, opened in 1870 as a memorial to Jackson Kemper (1789–1870), the first missionary bishop (1835–1859), and the first bishop of Wisconsin (1854–1870) of the Protestant Episcopal Church. Among Kenosha's manufactures are brass and iron beds (the Simmons Manufacturing Co.), mattresses, typewriters, leather and brass goods, wagons, and automobiles—the "Rambler" automobile being made at Kenosha by Thomas B. Jeffery and Co. There is an extensive sole-leather tannery. The total value of the factory product in 1905 was $12,362,600, the city ranking third in product value among the cities of the state. Kenosha, originally known as Southport, was settled about 1832, organized as the village of Southport in 1842, and chartered in 1850 as a city under its present name.

KENSETT, JOHN FREDERICK (1818–1872), American artist, was born in Cheshire, Connecticut, on the 22nd of March 1818. After studying engraving he went abroad, took up painting, and exhibited at the Royal Academy, London, in 1845. In 1849 he was elected to the National Academy of Design, New York, and in 1859 he was appointed a member of the committee to superintend the decoration of the United States Capitol at Washington, D.C. After his death the contents of his studio realized at public auction over $150,000. He painted landscapes more or less in the manner of the Hudson River School.

KENSINGTON, a western metropolitan borough of London, England, bounded N.E. by Paddington, and the city of Westminster, S.E. by Chelsea, S.W. by Fulham, N.W. by Hammersmith, and extending N. to the boundary of the county of London. Pop. (1901), 176,628. It includes the districts of Kensal Green (partly) in the north, Notting Hill in the north-central portion, Earl's Court in the south-west, and Brompton in the south-east. A considerable but indefinite area adjoining Brompton is commonly called South Kensington; but the area known as West Kensington is within the borough of Fulham.

The name appears in early forms as *Chenesitun* and *Kenesitune*. Its origin is obscure, and has been variously connected with a Saxon royal residence (King's town), a family of the name of Chenesi, and the word *caen*, meaning wood, from the forest which originally covered the district and was still traceable in Tudor times. The most probable derivation, however, finds in the name a connection with the Saxon tribe or family of Kensings. The history of the manor is traceable from the time of Edward the Confessor, and after the Conquest it was held of the Bishop of Coutances by Aubrey de Vere. Soon after this it became the absolute property of the de Veres, who were subsequently created Earls of Oxford. The place of the manorial courts is preserved in the name of the modern district of Earl's Court. With a few short intervals the manor continued in the direct line until Tudor times. There were also three sub-manors, one given by the first Aubrey de Vere early in the 12th century to the Abbot of Abingdon, whence the present parish church is called St Mary Abbots; while in another, Knotting Barnes, the origin of the name Notting Hill is found.

The brilliant period of history for which Kensington is famous may be dated from the settlement of the Court here by William III. The village, as it was then, had a reputation for healthiness through its gravel soil and pure atmosphere. A mansion standing on the western flank of the present Kensington Gardens had been the seat of Heneage Finch, Lord Chancellor and afterwards Earl of Nottingham. It was known as Nottingham House, but when bought from the second earl by William, who was desirous of avoiding residence in London as he suffered from asthma, it became known as Kensington Palace. The extensive additions and alterations made by Wren according to the taste of the King resulted in a severely plain edifice of brick; the orangery, added in Queen Anne's time, is a better example of the same architect's work. In the palace died Mary, William's consort, William himself, Anne and George II., whose wife Caroline did much to beautify Kensington Gardens, and formed the beautiful lake called the Serpentine (1733). But a higher interest attaches to the palace as the birthplace of Queen Victoria in 1819; and here her accession was announced to her. By her order, towards the close of her life, the palace became open to the public.

Modern influences, one of the most marked of which is the widespread erection of vast blocks of residential flats, have swept away much that was reminiscent of the historical connexions of the "old court suburb." Kensington Square, however, lying south of High Street in the vicinity of St Mary Abbots church, still preserves some of its picturesque houses, nearly all of which were formerly inhabited by those attached to the court; it numbered among its residents Addison, Talleyrand, John Stuart Mill, and Green the historian. In Young Street, opening from the Square, Thackeray lived for many years. His house here, still standing, is most commonly associated with his work, though he subsequently moved to Onslow Square and to Palace Green. Another link with the past is found in Holland House, hidden in its beautiful park north of Kensington Road. It was built by Sir Walter Cope, lord of the manor, in 1607, and obtained its present name on coming into the possession of Henry Rich, earl of Holland, through his marriage with Cope's daughter. He extended and beautified the mansion. General Fairfax and General Lambert are mentioned as occupants after his death, and later the property was let, William Penn of Pennsylvania being among those who leased it. Addison, marrying the widow of the 6th earl, lived here until his death in 1719. During the tenancy of Henry Fox, third Lord Holland (1773–1840), the house gained a European reputation as a meeting-place of statesmen and men of letters. The formal gardens of Holland House are finely laid out, and the rooms of the house are both beautiful in themselves and enriched with collections of pictures, china and tapestries. Famous houses no longer standing were Campden House, in the district north-west of the parish church, formerly known as the Gravel Pits; and Gore House, on the site of the present Albert Hall, the residence of William Wilberforce, and later of the countess of Blessington.

The parish church of St Mary Abbots, High Street, occupies an ancient site, but was built from the designs of Sir Gilbert Scott in 1869. It is in Decorated style, and has one of the loftiest spires in England. In the north the borough includes the cemetery of Kensal Green (with the exception of the Roman Catholic portion, which is in the borough of Hammersmith); it was opened in 1838, and great numbers of eminent persons are buried here. The Roman Catholic church of Our Lady of Victories lies close to Kensington Road, and in Brompton Road is the Oratory of St Philip Neri, a fine building with richly decorated interior, noted for the beauty of its musical services, as is the Carmelite Church in Church Street. St Charles's Roman Catholic College (for boys), near the north end of Ladbroke Grove, was founded by Cardinal Manning in 1863; the buildings are now used as a training centre for Catholic school mistresses. Of secular institutions the principal are the museums in South Kensington. The Victoria and Albert, commonly called the South Kensington, Museum contains various exhibits divided into sections, and includes the buildings of the Royal College of Science. Close by is the Natural History Museum, in a great building by Alfred Waterhouse, opened as a branch of the British Museum in 1880. Near this stood Cromwell House, erroneously considered to have been the residence of Oliver Cromwell, the name of which survives in the adjacent Cromwell Road. In Kensington Gardens, near the upper end of Exhibition Road, which separates the two museums, was held the Great Exhibition of 1851, the hall of which is preserved as the Crystal Palace at Sydenham. The greater part of the gardens, however, with the Albert Memorial, erected by Queen Victoria in memory of Albert, prince consort, the Albert Hall, opposite to it, one of the principal concert-halls in London, and the Imperial Institute to the south, are actually within the city of Westminster, though commonly connected with Kensington. The gardens (275 acres) were laid out in the time of Queen Anne, and have always been a popular and fashionable place of recreation. Extensive grounds at Earl's Court are open from time to time for various exhibitions. Further notable buildings in Kensington are the town-hall and free library in High Street, which is also much frequented for its excellent shops, and the Brompton Consumption Hospital, Fulham Road. In Holland Park Road is the house of Lord Leighton (d. 1896), given to the nation, and open, with its art collection, to the public.

Kensington is a suffragan bishopric in the diocese of London. The parliamentary borough of Kensington has north and south divisions, each returning one member. The borough council consists of a mayor, 10 aldermen and 60 councillors. Area, 2291·1 acres.

KENT, EARLS AND DUKES OF. The first holder of the English earldom of Kent was probably Odo, bishop of Bayeux, and the second a certain William de Ypres (d. 1162), both of whom were deprived of the dignity. The regent Hubert de Burgh obtained this honour in 1227, and in 1321 it was granted to Edmund Plantagenet, the youngest brother of Edward II. Edmund (1301–1330), who was born at Woodstock on the 5th of August 1301, received many marks of favour from his brother the king, whom he steadily supported until the last act in Edward's life opened in 1326. He fought in Scotland and then in France, and was a member of the council when Edward III. became king in 1327. Soon at variance with Queen Isabella and her lover, Roger Mortimer, Edmund was involved in a conspiracy to restore Edward II., who he was led to believe was still alive; he was arrested, and beheaded on the 19th of March 1330. Although he had been condemned as a traitor his elder son Edmund (*c.* 1327–1333) was recognized as earl of Kent, the title passing on his death to his brother John (*c.* 1330–1352).

After John's childless death the earldom appears to have been held by his sister Joan, "the fair maid of Kent," and in 1360 Joan's husband, Sir Thomas de Holand, or Holland, was summoned to parliament as earl of Kent. Holand, who was a soldier of some repute, died in Normandy on the 28th of December 1360, and his widow married Edward the Black Prince, by whom she was the mother of Richard II. The next earl was Holand's eldest son Thomas (1350–1397), who was marshal of England from 1380 to 1385, and was in high favour with his half-brother, Richard II. The 3rd earl of Kent of the Holand family was his son Thomas (1374–1400). In September 1397, a few months after becoming earl of Kent, Thomas was made duke of Surrey as a reward for assisting Richard II. against the lords appellant; but he was degraded from his dukedom in 1399, and was beheaded in January of the following year for conspiring against Henry IV. However, his brother Edmund (1384–1408) was allowed to succeed to the earldom, which became extinct on his death in Brittany in September 1408.

In the same century the title was revived in favour of William, a younger son of Ralph Neville, 1st earl of Westmorland, and through his mother Joan Beaufort a grandson of John of Gaunt, duke of Lancaster. William (*c.* 1405–1463), who held the barony of Fauconberg in right of his wife, Joan, gained fame during the wars in France and fought for the Yorkists during the Wars of the Roses. His prowess is said to have been chiefly responsible for the victory of Edward IV. at Towton in March 1461, and soon after this event he was created earl of Kent and admiral of England. He died in January 1463, and, as his only legitimate issue were three daughters, the title of earl of Kent again became extinct. Neville's natural son Thomas, "the bastard of Fauconberg" (d. 1471), was a follower of Warwick, the "Kingmaker."

The long connexion of the family of Grey with this title began in 1465, when Edmund, Lord Grey of Ruthin, was created earl of Kent. Edmund (*c.* 1420–1489) was the eldest son of Sir John Grey, while his mother, Constance, was a daughter of John Holand, duke of Exeter. During the earlier part of the Wars of the Roses Grey fought for Henry VI.; but by deserting the Lancastrians during the battle of Northampton in 1460 he gave the victory to the Yorkists. He was treasurer of England and held other high offices under Edward IV. and Richard III. His son and successor, George, 2nd earl of Kent (*c.* 1455–1503), also a soldier, married Anne Woodville, a sister of Edward IV.'s queen, Elizabeth, and was succeeded by his son Richard (1481–1524). After Richard's death without issue, his half-brother and heir, Henry (*c.* 1495–1562), did not assume the title of earl of Kent on account of his poverty; but in 1572 Henry's grandson Reginald (d. 1573), who had been member of parliament for Weymouth, was recognized as earl; he was followed by his brother Henry (1541–1615), and then by another brother, Charles (*c.* 1545–1623). Charles's son, Henry, the 8th earl (*c.* 1583–1639), married Elizabeth (1581–1651), daughter of Gilbert Talbot, 7th earl of Shrewsbury. This lady, who was an authoress, took for her second husband the jurist John Selden. Henry died without children in November 1639, when the earldom of Kent, separated from the barony of Ruthin, passed to his cousin Anthony (1557–1643), a clergyman, who was succeeded by his son Henry (1594–1651), Lord Grey of Ruthin. Henry had been a member of parliament from 1640 to 1643, and as a supporter of the popular party was speaker of the House of Lords until its abolition. The 11th earl was his son Anthony (1645–1702), whose son Henry became 12th earl in August 1702, lord chamberlain of the royal household from 1704 to 1710, and in 1706 was created earl of Harold and marquess of Kent, becoming duke of Kent four years later. All his sons predeceased their father, and when the duke died in June 1740, his titles of earl, marquess and duke of Kent became extinct.

In 1799 Edward Augustus, fourth son of George III., was created duke of Kent and Strathearn by his father. Born on the 2nd of November 1767, Edward served in the British army in North America and elsewhere, becoming a field marshal in 1805. To quote Sir Spencer Walpole, Kent, a stern disciplinarian, "was unpopular among his troops; and the storm which was created by his well-intentioned effort at Gibraltar to check the licentiousness and drunkenness of the garrison compelled him finally to retire from the governorship of this colony." Owing to pecuniary difficulties his later years were mainly passed on the continent of Europe. He died at Sidmouth on the 23rd of January 1820. In 1818 the duke married Maria Louisa Victoria (1786–1861), widow of Emich Charles, prince of Leiningen (d. 1814), and sister of Leopold I., king of the Belgians; and his only child was Queen Victoria (*q.v.*).

KENT, JAMES (1763–1847), American jurist, was born at Philippi in New York State on the 31st of July 1763. He graduated at Yale College in 1781, and began to practise law at Poughkeepsie, in 1785 as an attorney, and in 1787 at the bar. In 1791 and 1792–93 Kent was a representative of Dutchess county in the state Assembly. In 1793 he removed to New York, where Governor Jay, to whom the young lawyer's Federalist sympathies were a strong recommendation, appointed him a master in chancery for the city. He was professor of law in Columbia College in 1793–98 and again served in the Assembly in 1796–97. In 1797 he became recorder of New York, in 1798 judge of the supreme court of the state, in 1804 chief justice, and in 1814 chancellor of New York. In 1822 he became a member of the convention to revise the state constitution. Next year, Chancellor Kent resigned his office and was re-elected to his former chair. Out of the lectures he now delivered grew the *Commentaries on American Law* (4 vols., 1826–1830), which by their learning, range and lucidity of style won for him a high and permanent place in the estimation of both English and American jurists. Kent rendered most essential service to American jurisprudence while serving as chancellor. Chancery law had been very unpopular during the colonial period, and had received little development, and no decisions had been published. His judgments of this class (see Johnson's *Chancery Reports*, 7 vols., 1816–1824) cover a wide range of topics, and are so thoroughly considered and developed as unquestionably to form the basis of American equity jurisprudence. Kent was a man of great purity of character and of singular simplicity and guilelessness. He died in New York on the 12th of December 1847.

To Kent we owe several other works (including a *Commentary on International Law*) of less importance than the *Commentaries*. See J. Duer's *Discourse on the Life, Character and Public Services of James Kent* (1848); *The National Portrait Gallery of Distinguished Americans*, vol. ii. (1852); W. Kent, *Memoirs and Letters of Chancellor Kent* (Boston, 1898).

KENT, WILLIAM (1685–1748), English "painter, architect, and the father of modern gardening," as Horace Walpole in his *Anecdotes of Painting* describes him, was born in Yorkshire in 1685. Apprenticed to a coach-painter, his ambition soon led him to London, where he began life as a portrait and historical painter. He found patrons, who sent him in 1710 to study in Italy; and at Rome he made other friends, among them Lord Burlington, with whom he returned to England in 1719. Under that nobleman's roof Kent chiefly resided till his death on the 12th of April 1748—obtaining abundant commissions in all departments of his art, as well as various court appointments which brought him an income of £600 a year. Walpole says that Kent was below mediocrity in painting. He had some little taste and skill in architecture, of which Holkham palace is perhaps the most favourable example. The mediocre statue of Shakespeare in Westminster Abbey sufficiently stamps his powers as a sculptor. His merit in landscape gardening is greater. In Walpole's language, Kent "was painter enough to taste the charms of landscape, bold and opinionative enough to dare and to dictate, and born with a genius to strike out a great system from the twilight of imperfect essays." In short, he was the first in English gardening to vindicate the natural against the artificial. Banishing all the clipped monstrosities of the topiary art in yew, box or holly, releasing the streams from the conventional canal and marble basin, and rejecting the mathematical symmetry of ground plan then in vogue for gardens, Kent endeavoured to imitate the variety of nature, with due regard to the principles of light and shade and perspective. Sometimes he carried his imitation too far, as when he planted dead trees in Kensington gardens to give a greater air of truth to the scene, though he himself was one of the first to detect the folly of such an extreme. Kent's plans were designed rather with a view to immediate effect over a comparatively small area than with regard to any broader or subsequent results.

KENT, one of the kingdoms of Anglo-Saxon Britain, the dimensions of which seem to have corresponded with those of the present county (see below). According to tradition it was the first part of the country occupied by the invaders, its founders, Hengest and Horsa, having been employed by the British king Vortigern against the Picts and Scots. Their landing, according to English tradition, took place between 450–455, though in the Welsh accounts the Saxons are said to have arrived in 428 (cf. *Hist. Britt.* 66). According to *The Anglo-Saxon Chronicle*, which probably used some lost list of Kentish kings, Hengest reigned 455–488, and was succeeded by his son Aesc (Oisc), who reigned till 512; but little value can be attached to these dates. Documentary history begins with Aethelberht, the great-grandson of Aesc, who reigned probably 560–616. He married Berhta, daughter of the Frankish king Haribert, or Charibert, an event which no doubt was partly responsible for the success of the mission of Augustine, who landed in 597. Aethelberht was at this time supreme over all the English kings south of the Humber. On his death in 616 he was succeeded by his son Eadbald, who renounced Christianity and married his stepmother, but was shortly afterwards converted by Laurentius, the successor of Augustine. Eadbald was succeeded in 640 by his son Erconberht, who enforced the acceptance of Christianity throughout his kingdom, and was succeeded in 664 by his son Ecgbert, the latter again by his brother Hlothhere in 673. The early part of Hlothhere's reign was disturbed by an invasion of Aethelred of Mercia. He issued a code of laws, which is still extant, together with his nephew Eadric, the son of Ecgbert, but in 685 a quarrel broke out between them in which Eadric called in the South Saxons. Hlothhere died of his wounds, and was succeeded by Eadric, who, however, reigned under two years.

The death of Eadric was followed by a disturbed period, in which Kent was under kings whom Bede calls "*dubii vel externi.*" An unsuccessful attempt at conquest seems to have been made by the West Saxons, one of whose princes, Mul, brother of Ceadwalla, is said to have been killed in 687. There is some evidence for a successful invasion by the East Saxon king Sigehere during the same year. A king named Oswine, who apparently belonged to the native dynasty, seems to have obtained part of the kingdom in 688. The other part came in 689 into the hands of Swefheard, probably a son of the East Saxon king Sebbe. Wihtred, a son of Ecgbert, succeeded Oswine about 690, and obtained possession of the whole kingdom before 694. From him also we have a code of laws. At Wihtred's death in 725 the kingdom was divided between his sons Aethelberht, Eadberht and Alric, the last of whom appears to have died soon afterwards. Aethelberht reigned till 762; Eadberht, according to the *Chronicle*, died in 748, but some doubtful charters speak of him as alive in 761–762. Eadberht was succeeded by his son Eardwulf, and he again by Eanmund, while Aethelberht was succeeded by a king named Sigered. From 764–779 we find a king named Ecgbert, who in the early part of his reign had a colleague named Heaberht. At this period Kentish history is very obscure. Another king named Aethelberht appears in 781, and a king Ealhmund in 784, but there is some reason for suspecting that Offa annexed Kent about this time. On his death (796) Eadberht Praen made himself king, but in 798 he was defeated and captured by Coenwulf, who made his own brother Cuthred king in his place. On Cuthred's death in 807 Coenwulf seems to have kept Kent in his own possession. His successors Ceolwulf and Beornwulf likewise appear to have held Kent, but in 825 we hear of a king Baldred who was expelled by Ecgbert king of Wessex. Under the West Saxon dynasty Kent, together with Essex, Sussex and Surrey, was sometimes given as a dependent kingdom to one of the royal family. During Ecgbert's reign it was entrusted to his son Aethelwulf, on whose accession to the throne of Wessex, in 839, it was given to Aethelstan, probably his son, who lived at least till 851. From 855 to 860 it was governed by Aethelberht son of Aethelwulf. During the last years of Alfred's reign it seems to have been entrusted by him to his son Edward. Throughout the 9th century we hear also of two earls, whose spheres of authority may have corresponded to those of the two kings whom we find in the 8th century. The last earls of whom we have any record were the two brothers Sigehelm and Sigewulf, who fell at the Holm in 905 when the Kentish army was cut off by the Danes, on Edward the Elder's return from his expedition into East Anglia. At a later period Kent appears to have been held, together with Sussex, by a single earl.

The internal organization of the kingdom of Kent seems to have been somewhat peculiar. Besides the division into West Kent and East Kent, which probably corresponds with the kingdoms of the 8th century, we find a number of lathes, apparently administrative districts under reeves, attached to royal villages. In East Kent there were four of these, namely, Canterbury, Eastry, Wye and Lymne, which can be traced back to the 9th century or earlier. In the 11th century we hear of two lathes in West Kent, those of Sutton and Aylesford.

The social organization of the Kentish nation was wholly different from that of Mercia and Wessex. Instead of two "noble" classes we find only one, called at first eorlcund, later as in Wessex, gesithcund. Again below the ordinary freeman we find three varieties of persons called *laetas*, probably freedmen, to whom we have nothing analogous in the other kingdoms. Moreover the wergeld of the ceorl, or ordinary freeman, was two or three times as great as that of the same class in Wessex and Mercia, and the same difference of treatment is found in all the compensations and fines relating to them. It is not unlikely that the peculiarities of Kentish custom observable in later times, especially with reference to the tenure of land, are connected with these characteristics. An explanation is probably to be obtained from a statement of Bede—that the settlers in Kent belonged to a different nationality from those who founded the other kingdoms, namely the Jutes (*q.v.*).

See Bede, *Historiae ecclesiasticae*, edited by C. Plummer (Oxford, 1896); *Two of the Saxon Chronicles*, edited by J. Earle and C. Plummer (Oxford, 1892–1899); W. de G. Birch, *Cartularium Saxonicum* (London, 1885–1889); B. Seebohm, *Tribal Custom in Anglo-Saxon Law* (London, 1902); H. M. Chadwick, *Studies on Anglo-Saxon Institutions* (Cambridge, 1905); and T. W. Shore, *Origin of the Anglo-Saxon Race* (London, 1906). (F. G. M. B.)

KENT, a south-eastern county of England, bounded N. by the Thames estuary, E. and S.E. by the English Channel, S.W. by Sussex, and W. by Surrey. In the north-west the administrative county of London encroaches upon the ancient county of Kent, the area of which is 1554·7 sq. m. The county is roughly triangular in form, London lying at the apex of the western angle, the North Foreland at that of the eastern and Dungeness at that of the southern. The county is divided centrally, from west to east, by the well-marked range of hills known as the North Downs, entering Kent from Surrey. In the west above Westerham these hills exceed 800 ft.; to the east the height is much less, but even in Kent (for in Surrey they are higher) the North Downs form a more striking physical feature than their height would indicate. They are intersected, especially on the north, by many deep valleys, well wooded. At three points such valleys cut completely through the main line of the hills. In the west the Darent, flowing north to the Thames below Dartford, pierces the hills north of Sevenoaks, but its waters are collected chiefly from a subsidiary ridge of the Downs running parallel to the main line and south of it, and known as the Ragstone Ridge, from 600 to 800 ft. in height. The Medway, however, cuts through the entire hill system, rising in the Forest Ridges of Sussex, flowing N.E. and E. past Tonbridge, collecting feeders from south and east (the Teise, Beult and others) near Yalding, and then flowing N.E. and N. through the hills, past Maidstone, joining the Thames at its mouth through a broad estuary. The rich lowlands, between the Downs and the Forest Ridges to the south (which themselves extend into Kent), watered by the upper Medway and its feeders, are called the Vale of Kent, and fall within the district well known under the name of the Weald. The easternmost penetration of the Downs is that effected by the Stour (Great Stour) which rises on their southern face, flows S.E. to Ashford, where it receives the East Stour, then turns N.E. past Wye and Canterbury, to meander through the lowlands representing the former channel which isolated the Isle of Thanet from the mainland. The channel was called the Wantsume, and its extent may be gathered from the position of the village of Fordwich near Canterbury, which had formerly a tidal harbour, and is a member of the Cinque Port of Sandwich. The Little Stour joins the Great Stour in these lowlands from a deep vale among the Downs.

About two-thirds of the boundary line of Kent is formed by tidal water. The estuary of the Thames may be said to stretch from London Bridge to Sheerness in the Isle of Sheppey, which is divided from the mainland by the narrow channel (bridged at Queensbridge) of the Swale. Sheerness lies at the mouth of the Medway, a narrow branch of which cuts off a tongue of land termed the Isle of Grain lying opposite Sheerness. Along the banks of the Thames the coast is generally low and marshy, embankments being in several places necessary to prevent inundation. At a few points, however, as at Gravesend, spurs of the North Downs descend directly upon the shore. In the estuary of the Medway there are a number of low marshy islands, but Sheppey presents to the sea a range of slight cliffs from 80 to 90 ft. in height. The marshes extend along the Swale to Whitstable, whence stretches a low line of clay and sandstone cliffs towards the Isle of Thanet, when they become lofty and grand, extending round the Foreland southward to Pegwell Bay The coast from Sheppey round to the South Foreland is skirted by numerous flats and sands, the most extensive of which are the Goodwin Sands off Deal. From Pegwell Bay south to a point near Deal the coast is flat, and the drained marshes or levels of the lower Stour extend to the west; but thence the coast rises again into chalk cliffs, the eastward termination of the North Downs, the famous white cliffs which form the nearest point of England to continental Europe, overlooking the Strait of Dover. These cliffs continue round the South Foreland to Folkestone, where they fall away, and are succeeded west of Sandgate by a flat shingly shore. To the south of Hythe this shore borders the wide expanse of Romney Marsh, which, immediately west of Hythe, is overlooked by a line of abrupt hills, but for the rest is divided on the north from the drainage system of the Stour only by a slight uplift. The marsh, drained by many channels, seldom rises over a dozen feet above sea-level. At its south-eastern extremity, and at the extreme south of the county, is the shingly promontory of Dungeness. Within historic times much of this marsh was covered by the sea, and the valley of the river Rother, which forms part of the boundary of Kent with Sussex, entering the sea at Rye harbour, was represented by a tidal estuary for a considerable distance inland.

Geology.—The northern part of the county lies on the southern rim of the London basin; here the beds are dipping northwards. The southern part of the county is occupied by a portion of the Wealden anticline. The London Clay occupies the tongue of land between the estuaries of the Thames and Medway, as well as Sheppey and a district about 8 m. wide stretching southwards from Whitstable to Canterbury, and extending eastwards to the Isle of Thanet. It reappears at Pegwell Bay, and in the neighbourhood of London it rises above the plastic clay into the elevation of Shooter's Hill, with a height of about 450 ft. and a number of smaller eminences. The thickness of the formation near London is about 400 ft., and at Sheppey it reaches 480 ft. At Sheppey it is rich in various kinds of fossil fish and shells. The plastic clay, which rests chiefly on chalk, occupies the remainder of the estuary of the Thames, but at several places it is broken through by outcrops of chalk, which in some instances run northwards to the banks of the river. The Lower Tertiaries are represented by three different formations known as the Thanet beds, the Woolwich and Reading beds, and the Oldhaven and Blackheath beds. The Thanet beds resting on chalk form a narrow outcrop rising into cliffs at Pegwell Bay and Reculver, and consist (1) of a constant base bed of clayey greenish sand, seldom more than 5 ft. in thickness; (2) of a thin and local bed composed of alternations of brown clay and loam; (3) of a bed of fine light buff sand, which in west Kent attains a thickness of more than 60 ft.; (4) of bluish grey sandy marl containing fossils, and almost entirely confined to east Kent, the thickness of the formation being more than 60 ft.; and (5) of fine light grey sand of an equal thickness. also fossiliferous. The middle series of the Lower Tertiaries, known as the Woolwich and Reading beds, rests either on the Thanet beds or on chalk, and consists chiefly of irregular alternations of clay and sand of very various colours, the former often containing estuarine and oyster shells and the latter flint pebbles. The thickness of the formation varies from 15 to 80 ft., but most commonly it is from 25 to 40 ft. The highest and most local series of the Lower Tertiaries is the Oldhaven and Blackheath beds lying between the London Clay and the Woolwich beds. They consist chiefly of flint pebbles or of light-coloured quartzose sand, the thickness being from 20 to 30 ft, and. are best seen at Oldhaven and Blackheath. To the south the London basin is succeeded by the North Downs, an elevated ridge of country consisting of an outcrop of chalk which extends from Westerham to Folkestone with an irregular breadth generally of 3 to 6 miles, but expanding to nearly 12 miles at Dartford and Gravesend and also to the north of Folkestone. After dipping below the London Clay at Canterbury, it sends out an outcrop which forms the greater part of Thanet. Below the chalk is a thin crop of Upper Greensand between Otford and Westerham. To the south of the Downs there is a narrow valley formed by the Gault, a fossiliferous blue clay. This is succeeded by an outcrop of the Lower Greensand—including the Folkestone, Sandgate and Hythe beds with the thin Atherfield Clay at the base—which extends across the country from west to east with a breadth of from 2 to 7 m., and rises into the picturesque elevations of the Ragstone hills. The remains of *Iguanodon* occur in the Hythe beds. The valley, which extends from the borders of Sussex to Hythe, is occupied chiefly by the Weald clays, which contain a considerable number of marine and freshwater fossils. Along the borders of Sussex there is a narrow strip of country consisting of picturesque sandy hills, formed by the Hastings beds, whose highest elevation is nearly 400 ft. and the south-west corner of the county is occupied by Romney Marsh, which within a comparatively recent period has been recovered from the sea. Valley gravels border the Thames, and Pleistocene mammalia have been found in fissures in the Hythe beds at Ightham, where ancient stone implements are common. Remains of crag deposits lie in pipes in the chalk near Lenham. Coal-measures, as will be seen, have been found near Dover.

The London Clay is much used for bricks, coarse pottery and Roman cement. Lime is obtained from the Chalk and Greensand formations. Ironstone is found in the Wadhurst Clay, a subdivision of the Hastings beds, clays and calcareous ironstone in the Ashdown sand, but the industry has long been discontinued. The last Wealden furnace was put out in 1828.

Climate and Agriculture.—The unhealthiness of certain portions of the county caused by the marshes is practically removed by draining. In the north-eastern districts the climate is somewhat uncertain, and damage is often done to early fruit-blossoms and vegetation by cold easterly winds and late frosts. In the large portion of the county sheltered by the Downs the climate is milder and more equable, and vegetation is somewhat earlier. The average temperature for January is 37·9° F. at Canterbury, and 39·8° at Dover; for July 63·3° and 61·6° respectively, and the mean annual 50° and 50·2° respectively. Rainfall is light, the mean annual being 27·72 in. at Dover, and 23·31 at Margate, compared with 23·16 at Greenwich. The soil is varied in character, but on the whole rich and under high cultivation. The methods of culture and the kinds of crop produced are perhaps more widely diversified than those of any other county in England. Upon the London Clay the land is generally heavy and stiff, but very fruitful when properly manured and cultivated. The marsh lands along the banks of the Thames, Medway, Stour and Swale consist chiefly of rich chalk alluvium. In the Isle of Thanet a light mould predominates, which has been much enriched by fish manure. The valley of the Medway, especially the district round Maidstone, is the most fertile part of the county, the soil being a deep loam with a subsoil of brick-earth. On the ragstone the soil is occasionally thin and much mixed with small portions of sand and stone; but in some situations the ragstone has a thick covering of clay loam, which is most suitable for the production of hops and fruits. In the district of the Weald marl prevails, with a substratum of clay. The soil of Romney Marsh is a clay alluvium.

No part of England surpasses the more fertile portions of this county in the peculiar richness of its rural scenery. About three-quarters of the total area is under cultivation. Oats and wheat are grown in almost equal quantities, barley being of rather less importance. A considerable acreage is under beans, and in Thanet mustard, spinach, canary seed and a variety of other seeds are raised. But the county is specially noted for the cultivation of fruit and hops. Market gardens are very numerous in the neighbourhood of London. The principal orchard districts are the valleys of the Darent and Medway, and the tertiary soils overlying the chalk, between Rochester and Canterbury. The county is specially famed for cherries and filberts, but apples, pears, plums, gooseberries, strawberries, raspberries and currants are also largely cultivated. In some cases apples, cherries, filberts and hops are grown in alternate rows. The principal hop districts are the country between Canterbury and Faversham, the valley of the Medway in mid Kent, and the district of the Weald. Much of the Weald, which originally was occupied by a forest, is still densely wooded, and woods are specially extensive in the valley of the Medway. Fine oaks and beeches are numerous, and yew trees of great size and age are seen in some Kentish churchyards, as at Stansted, while the fine oak at Headcorn is also famous. A large extent of woodland consists of ash and chestnut plantations, maintained for the growth of hop poles. Cattle are grazed in considerable numbers on the marsh lands, and dairy farms are numerous in the neighbourhood of London. For the rearing of sheep Kent is one of the chief counties in England. A breed peculiar to the district, known as Kents, is grazed on Romney Marsh, but Southdowns are the principal breed raised on the uplands. Bee-keeping is extensively practised. Dairy schools are maintained by the technical education committee of the county council. The South eastern Agricultural College at Wye is under the control of the county councils of Kent and Surrey.

Other Industries.—There were formerly extensive ironworks in the Weald. Another industry now practically extinct was the manufacture of woollen cloth. The neighbourhood of Lamberhurst and Cranbrook was the special seat of these trades. Among the principal modern industries are paper-making, carried on on the banks of the Darent, Medway, Cray and neighbouring streams; engineering, chemical and other works along the Thames; manufactures of bricks, tiles, pottery and cement, especially by the lower Medway and the Swale. A variety of industries is connected with the Government establishments at Chatham and Sheerness. Shipbuilding is prosecuted here and at Gravesend, Dover and other ports. Gunpowder is manufactured near Erith and Faversham and elsewhere.

Deep-sea fishing is largely prosecuted all round the coast. Shrimps, soles and flounders are taken in great numbers in the estuaries of the Thames and Medway, along the north coast and off Ramsgate. The history of the Kentish oyster fisheries goes back to the time of the Roman occupation, when the fame of the oyster beds off *Rutupiae* (Richborough) extended even to Rome. The principal beds are near Whitstable, Faversham, Milton, Queenborough and Rochester, some being worked by ancient companies or gilds of fishermen.

After the cessation in 1882 of works in connexion with the Channel tunnel, to connect England and France, coal-boring was attempted in the disused shaft, west of the Shakespeare Cliff railway tunnel near Dover. In 1890 coal was struck at a depth of 1190 ft., and further seams were discovered later. The company which took up the mining was unsuccessful, and boring ceased in 1901, but the work was resumed by the Consolidated Kent Collieries Corporation, and an extension of borings revealed in 1905 the probability of a successful development of the mining industry in Kent.

Communications.—Railway communications are practically monopolized by the South Eastern & Chatham Company, a monopoly which has not infrequently been the cause of complaint on the part of farmers, traders and others. This system includes some of the principal channels of communication with the continent, through the ports of Dover, Folkestone and Queenborough. The county contains four of the Cinque Ports, namely, Dover, Hythe, New Romney and Sandwich. Seaside resorts are numerous and populous—on the north coast are Minster (Sheppey), Whitstable and Herne Bay; there is a ring of watering-places round the Isle of Thanet—Birchington, Westgate, Margate, Broadstairs, Ramsgate; while to the south are Sandwich, Deal, Walmer, St Margaret's-at-Cliffe, Dover, Folkestone, Sandgate and Hythe. Tunbridge Wells is a favourite inland watering-place. The influence of London in converting villages into outer residential suburbs is to be observed at many points, whether seaside, along the Thames or inland. The county is practically without inland water communications, excluding the Thames. The Royal military canal which runs along the inland border of Romney Marsh, and connects the Rother with Hythe, was constructed in 1807 as part of a scheme of defence in connexion with the martello towers or small forts along the coast.

Population and Administration.—The area of the ancient county is 995,014 acres, with a population in 1901 of 1,348,841. In 1801 the population was 308,667. Excluding the portion which falls within the administrative county of London the area is 974,950 acres, with a population in 1891 of 807,269 and in 1901 of 935,855. The area of the administrative county is 976,881 acres. The county contains 5 lathes, a partition peculiar to the county. The municipal boroughs are Bromley (pop. 27,354), Canterbury, a city and county borough (24,889), Chatham (37,057), Deal (10,581), Dover (41,794), Faversham (11,290), Folkestone (30,650), Gillingham (42,530), Gravesend (27,196), Hythe (5557), Lydd (2675), Maidstone (33,516), Margate (23,118), New Romney (1328), Queenborough (1544), Ramsgate (27,733), Rochester, a city (30,590), Sandwich (3170), Tenterden (3243), Tunbridge Wells (33,373). The urban districts are Ashford (12,808), Beckenham (26,331), Bexley (12,918), Broadstairs and St Peter's (6466), Cheriton (7091), Chislehurst (7429), Dartford (18,644), Erith (25,296), Foots Cray (5817), Herne Bay (6726), Milton (7086), Northfleet (12,906), Penge (22,465), Sandgate (2294), Sevenoaks (8106), Sheerness (18,179), Sittingbourne (8943), Southborough (6977), Tonbridge (12,736), Walmer (5614), Whitstable (7086), Wrotham (3571). Other small towns are Rainham (3693) near Chatham, Aylesford (2678), East Malling (2391) and West Malling (2312) in the Maidstone district; Edenbridge (2546) and Westerham (2905) on the western border of the county; Cranbrook (3949), Goudhurst (2725) and Hawkhurst (3136) in the south-west. Among villages which have grown into residential towns through their proximity to London, beyond those included among the boroughs and urban districts, there should be mentioned Orpington (4259). The county is in the south-eastern circuit, and assizes are held at Maidstone. It has two courts of quarter sessions, and is divided into 17 petty sessional divisions. The boroughs having separate commissions of the peace and courts of quarter sessions are Canterbury, Deal, Dover, Faversham, Folkestone, Gravesend, Hythe, Maidstone, Margate, Rochester, Sandwich and Tenterden; while those of Lydd, New Romney, Ramsgate and Tunbridge Wells have separate commissions of the peace. The liberty of Romney Marsh has petty and general sessions. The justices of the Cinque Ports exercise certain jurisdiction, the non-corporate members of the Cinque Ports of Dover and Sandwich having separate commissions of the peace and courts of quarter sessions. The central criminal court has jurisdiction over certain parishes adjacent to London. All those civil parishes within the county of Kent of which any part is within twelve miles of, or of which no part is more than fifteen miles from, Charing Cross are within the metropolitan police district. The total number of civil parishes is 427. Kent is mainly in the diocese of Canterbury, but has parts in those of Rochester, Southwark and Chichester. It contains 476 ecclesiastical parishes or districts, wholly or in part. The county (extra-metropolitan) is divided into 8 parliamentary divisions, namely, North-western or Dartford, Western or Sevenoaks, South-western or Tunbridge, Mid or Medway, North-eastern or Faversham, Southern or Ashford, Eastern or St Augustine's and the Isle of Thanet, each returning one member; while the boroughs of Canterbury, Chatham, Dover, Gravesend, Hythe, Maidstone and Rochester each return one member.

History.—For the ancient kingdom of Kent see the preceding article. The shire organization of Kent dates from the time of Aethelstan, the name as well as the boundary being that of the ancient kingdom, though at first probably with the addition of the suffix "shire," the form "Kentshire" occurring in a record of the folkmoot at this date. The inland shire-boundary has varied with the altered course of the Rother. In 1888 the county was diminished by the formation of the county of London.

At the time of the Domesday Survey Kent comprised sixty hundreds, and there was a further division into six lests, probably representing the shires of the ancient kingdom, of which two, Sutton and Aylesford, correspond with the present-day lathes. The remaining four, Borowast Lest, Estre Lest, Limowast Lest and Wiwart Lest, existed at least as early as the 9th century, and were apparently named from their administrative centres, Burgwara (the burg being Canterbury), Eastre, Lymne and Wye, all of which were meeting places of the Kentish Council. The five modern lathes (Aylesford, St Augustine, Scray, Sheppey and Sutton-at-Hone) all existed in the time of Edward I., with the additional lathe of Hedeling, which was absorbed before the next reign in that of St Augustine. The *Nomina Villarum* of the reign of Edward II. mentions all the sixty-six modern hundreds, more than two-thirds of which were at that date in the hands of the church.

Sheriffs of Kent are mentioned in the time of Æthelred II., and in Saxon times the shiremoot met three times a year on Penenden Heath near Maidstone. After the Conquest the great ecclesiastical landholders claimed exemption from the jurisdiction of the shire, and in 1279 the abbot of Battle claimed to have his own coroner in the hundred of Wye. In the 13th century twelve liberties in Kent claimed to have separate bailiffs. The assizes for the county were held in the reign of Henry III. at Canterbury and Rochester, and also at the Lowey of Tonbridge under a mandate from the Crown as a distinct liberty; afterwards at different intervals at East Greenwich, Dartford, Maidstone, Milton-next-Gravesend and Sevenoaks; from the Restoration to the present day they have been held at Maidstone. The liberty of Romney Marsh has petty and quarter sessions under its charters.

Kent is remarkable as the only English county which comprises two entire bishoprics, Canterbury, the see for East Kent, having been founded in 597, and Rochester, the see for West Kent, in 600. In 1291 the archdeaconry of Canterbury was co-extensive with that diocese and included the deaneries of Westbere, Bridge, Sandwich, Dover, Elham, Lympne, Charing, Sutton, Sittingbourne, Ospringe and Canterbury; the archdeaconry of Rochester, also co-extensive with its diocese, included the deaneries of Rochester, Dartford, Malling and Shoreham. In 1845 the deaneries of Charing, Sittingbourne and Sutton were comprised in the new archdeaconry of Maidstone, which in 1846 received in addition the deaneries of Dartford, Malling and Shoreham from the archdeaconry of Rochester. In 1853 the deaneries of Malling and Charing were subdivided into North and South Malling and East and West Charing. Lympne was subdivided into North and South Lympne in 1857 and Dartford into East and West Dartford in 1864. Gravesend and Cobham deaneries were created in 1862 and Greenwich and Woolwich in 1868, all in the archdeaconry of Rochester. In 1873 East and West Bridge deaneries were created in the archdeaconry of Canterbury, and Croydon in the archdeaconry of Maidstone. In 1889 Tunbridge deanery was created in the archdeaconry of Maidstone. In 1906 the deaneries of East and West Dartford, North and South Malling, Greenwich and Woolwich were abolished, and Shoreham and Tunbridge were transferred from Maidstone to Rochester archdeaconry.

Between the Conquest and the 14th century the earldom of Kent was held successively by Odo, bishop of Bayeux, William of Ypres and Hubert de Burgh (sheriff of the county in the reign of Henry III.), none of whom, however, transmitted the honour, which was bestowed by Edward I. on his youngest son Edmund of Woodstock, and subsequently passed to the families of Holland and Neville (see KENT, EARLS AND DUKES OF). In the Domesday Survey only five lay tenants-in-chief are mentioned, all the chief estates being held by the church, and the fact that the Kentish gentry are less ancient than in some remoter shires is further explained by the constant implantation of new stocks from London. Greenwich is illustrious as the birthplace of Henry VIII., Mary and Elizabeth. Sir Philip Sidney was born at Penshurst, being descended from William de Sidney, chamberlain to Henry II. Bocton Malherbe was the seat of the Wottons, from whom descended Nicholas Wotton, privy councillor to Henry VIII., Edward VI., Mary and Elizabeth. The family of Leiborne of Leiborne Castle, of whom Sir Roger Leiborne took an active part in the barons' wars, became extinct in the 14th century. Sir Francis Walsingham was born at Chislehurst, where his family had long flourished; Hever Castle was the seat of the Boleyns and the scene of the courtship of Anne Boleyn by Henry VIII. Allington Castle was the birthplace of Sir Thomas Wyat.

Kent, from its proximity to London, has been intimately concerned in every great historical movement which has agitated the country, while its busy industrial population has steadily resisted any infringement of its rights and liberties. The chief events connected with the county under the Norman kings were the capture of Rochester by William Rufus during the rebellion of Odo of Bayeux; the capture of Dover and Leeds castles by Stephen; the murder of Thomas à Becket at Canterbury in 1170; the submission of John to the pope's legate at Dover in 1213, and the capture of Rochester Castle by the king in the same year. Rochester Castle was in 1216 captured by the dauphin of France, to whom nearly all Kent submitted, and during the wars of Henry III. with his barons was captured by Gilbert de Clare. In the peasants' rising of 1381 the rebels plundered the archbishop's palace at Canterbury, and 100,000 Kentishmen gathered round Wat Tyler of Essex. In 1450 Kent took a leading part in Jack Cade's rebellion; and in 1554 the insurrection of Sir Thomas Wyat began at Maidstone. On the outbreak of the Great Rebellion feeling was much divided, but after capturing Dover Castle the parliament soon subdued the whole county. In 1648, however, a widespread insurrection was organized on behalf of Charles, and was suppressed by Fairfax. The county was among the first to welcome back Charles II. In 1667 the Dutch fleet under De Ruyter advanced up the Medway, levelling the fort at Sheerness and burning the ships at Chatham. In the Kentish petition of 1701 drawn up at Maidstone the county protested against the peace policy of the Tory party.

Among the earliest industries of Kent were the iron-mining in the Weald, traceable at least to Roman times, and the salt industry, which flourished along the coast in the 10th century. The Domesday Survey, besides testifying to the agricultural activity of the country, mentions over one hundred salt-works and numerous valuable fisheries, vines at Chart Sutton and Leeds, and cheese at Milton. The Hundred Rolls of the reign of Edward I. frequently refer to wool, and Flemish weavers settled in the Weald in the time of Edward III. Tiles were manufactured at Wye in the 14th century. Valuable timber was afforded by the vast forest of the Weald, but the restrictions imposed on the felling of wood for fuel did serious detriment to the iron-trade, and after the statute of 1558 forbidding the felling of timber for iron-smelting within fourteen miles of the coast the industry steadily declined. The discovery of coal in the northern counties dealt the final blow to its prosperity. Cherries are said to have been imported from Flanders and first planted in Kent by Henry VIII., and from this period the culture of fruits (especially apples and cherries) and of hops spread rapidly over the county. Thread-making at Maidstone and silk-weaving at Canterbury existed in the 16th century, and before 1590 one of the first paper-mills in England was set up at Dartford. The statute of 1630 forbidding the exportation of wool, followed by the Plague of 1665, led to a serious trade depression, while the former enactment resulted in the vast smuggling trade which spread along the coast, 40,000 packs of wool being smuggled to Calais from Kent and Sussex in two years.

In 1290 Kent returned two members to parliament for the county, and in 1295 Canterbury, Rochester and Tunbridge were also represented; Tunbridge however made no returns after this date. In 1552 Maidstone acquired representation, and in 1572 Queenborough. Under the act of 1832 the county returned four members in two divisions, Chatham was represented by one member and Greenwich by two, while Queenborough was disfranchised. Under the act of 1868 the county returned six members in three divisions and Gravesend returned one member. By the act of 1885 the county returned eight members in eight divisions, and the representation of Canterbury, Maidstone and Rochester was reduced to one member each. By the London Government Act of 1892 the borough of Greenwich was taken out of Kent and made one of the twenty-eight metropolitan boroughs of the county of London.

Antiquities.—As was to be expected from its connexion with the early history of England, and from its beauty and fertility, Kent possessed a larger than average number of monastic foundations. The earliest were the priory of Christ's Church and the abbey of St Peter and St Paul, now called St Augustine's, both at Canterbury, founded by Augustine and the monks who accompanied him to England. Other Saxon foundations were the nunneries at Folkestone (630), Lyminge (633; nunnery and monastery), Reculver (669), Minster-in-Thanet (670), Minster-in-Sheppey (675), and the priory of St Martin at Dover (696), all belonging to the Benedictine order. Some of these were refounded, and the principal monastic remains now existing are those of the Benedictine priories at Rochester (1089), Folkestone (1095), Dover (1140); the Benedictine nunneries at Malling (time of William Rufus), Minster-in-Sheppey (1130), Higham (founded by King Stephen), and Davington (1153); the Cistercian Abbey at Boxley (1146); the Cluniac abbey at Faversham (1147) and priory at Monks Horton (time of Henry II.), the preceptory of Knights Templars at Swingfield (time of Henry II.); the Premonstratensian abbey of St Radigund's, near Dover (1191); the first house of Dominicans in England at Canterbury (1221); the first Carmelite house in England, at Aylesford (1240); and the priory of Augustinian nuns at Dartford (1355). Other houses of which there are slight remains are Lesnes abbey, near Erith, and Bilsington priory near Ashford, established in 1178 and 1253 respectively, and both belonging to the Augustinian canons; and the house of Franciscans at Canterbury (1225). But no remains exist of the priories of Augustinian canons at Canterbury (St Gregory's; 1084), Leeds, near Maidstone (1119), Tunbridge (middle of 12th century), Combwell, near Cranbrook (time of Henry II.); the nunnery of St Sepulchre at Canterbury (about 1100) and Langdon abbey, near Walmer (1192), both belonging to the Benedictines; the Trinitarian priory of Mottenden near Headcorn, the first house of Crutched Friars in England (1224), where miracle plays were presented in the church by the friars on Trinity Sunday; the Carmelite priories at Sandwich (1272) and Losenham near Tenterden (1241); and the preceptory of Knights of St John of Jerusalem at West Peckham, near Tunbridge (1408).

Even apart from the cathedral churches of Canterbury and Rochester, the county is unsurpassed in the number of churches it possesses of the highest interest. For remains of a date before the Conquest the church of Lyminge is of first importance. Here, apart from the monastic remains, there may be seen portions of the church founded by Æthelburga, wife of Edwin, king of Northumberland, and rebuilt, with considerable use of Roman material, in 965 by St Dunstan. There is similar early work in the church of Paddlesworth, not far distant. Among numerous Norman examples the first in interest is the small church at Barfreston, one of the most perfect specimens of its kind in England, with a profusion of ornament, especially round the south doorway and east window. The churches of St Margaret-at-Cliff, Patrixbourne and Darenth are hardly less noteworthy, while the tower of New Romney church should also be mentioned. Among several remarkable Early English examples none is finer than Hythe church, but the churches of SS. Mary and Eanswith, Folkestone, Minster-in-Thanet, Chalk, with its curious porch, Faversham and Westwell, with fine contemporary glass, are also worthy of notice. Stone church, near Dartford, a late example of this style, transitional to Decorated, is very fine; and among Decorated buildings Chartham church exhibits in some of its windows the peculiar tracery known as Kentish Decorated. Perpendicular churches, though numerous, are less remarkable, but the fine glass of this period in Nettlestead church may be noticed. The church of Cobham contains one of the richest collections of ancient brasses in England.

Kent is also rich in examples of ancient architecture other than ecclesiastical. The castles of Rochester and Dover are famous; those of Canterbury and Chilham are notable among others. Ancient mansions are very numerous; among these are the castellated Leeds Castle in the Maidstone district, Penshurst Place, Hever Castle near Edenbridge, Saltwood and Westenhanger near Hythe, the Mote House at Ightham near Wrotham, Knole House near Sevenoaks, and Cobham Hall. Minor examples of early domestic architecture abound throughout the county.

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KENTIGERN, ST, or MUNGO ("dear friend," a name given to him, according to Jocelyn, by St Servanus), a Briton of Strathclyde, called by the Goidels *In Glaschu*, "the Grey Hound," was, according to the legends preserved in the lives which remain, of royal descent. His mother when with child was thrown down from a hill called Dunpelder (Traprain Law, Haddingtonshire), but survived the fall and escaped by sea to Culross on the farther side of the Firth of Forth, where Kentigern was born. It is possible that she may have been a nun, as a convent had been founded in earlier times on Traprain Law. The life then describes the training of the boy by Servanus, but the date of the latter renders this impossible. Returning to Strathclyde Kentigern lived for some time at Glasgow, near a cemetery ascribed to St Ninian, and was eventually made bishop of that region by the king and clergy. This story is partially attested by Welsh documents, in which Kentigern appears as the bishop of Garthmwl, apparently the ruler of the region about Glasgow. Subsequently he was opposed by a pagan king called Morken, whose relatives after his death succeeded in forcing the saint to retire from Strathclyde. He thereupon took refuge with St David at Menevia (St David's), and eventually founded a monastery at Llanelwy (St Asaph's), for which purpose he received grants from Maelgwn, prince of Gwynedd. After the battle of Ardderyd in 573 in which King Rhydderch, leader of the Christian party in Strathclyde, was victorious, Kentigern was recalled. He fixed his see first at Hoddam in Dumfriesshire, but afterwards returned to Glasgow. He is credited with missionary work in Galloway and north of the Firth of Forth, but most of the dedications to him which survive are north of the Mounth in the upper valley of the Dee. The meeting of Kentigern and Columba probably took place soon after 584, when the latter began to preach in the neighbourhood of the Tay.

Authorities.—*Lives* of St Kentigern; Fragment used by John of Fordun, and complete "Life" by Jocelyn of Furness in Forbes's *Historians of Scotland* (Edinburgh, 1874), vol. v.; *Four Ancient Books of Wales* (Edinburgh, ed. W. F. Skene, 1868), ii. 457; *Myvyrian Archaeology* (London, 1801), ii. 34; D. R. Thomas, *History of Diocese of St Asaph* (London, 1874), p. 5; Index of Llyfr Coch Asaph, *Archaeologia Cambrensis*, 3rd series, 1868, vol. xiv. p. 151; W. F. Skene, *Celtic Scotland* (Edinburgh, 1877), ii. 179 ff.; John Rhys, *Celtic Britain* (London, 1904), pp. 145, 146, 174, 199, 250.

KENTON, a city and the county seat of Hardin county, Ohio, U.S.A., on the Scioto river, 60 m. N.W. of Columbus. Pop. (1900), 6852, including 493 foreign-born and 271 negroes; (1910), 7185. It is served by the Erie, the Cleveland, Cincinnati, Chicago & St Louis, and the Ohio Central railways. It is built on the water-parting between Lake Erie and the Gulf of Mexico, here about 1,000 ft. above sea-level. There are shops of the Ohio Central railway here, and manufactories of hardware. The municipality owns and operates its waterworks. Kenton was named in honour of Simon Kenton (1755–1836) a famous scout and Indian fighter, who took part in the border warfare, particularly in Kentucky and Ohio, during the War of American Independence and afterwards. It was platted and became the county seat in 1833, and was chartered as a city in 1885.

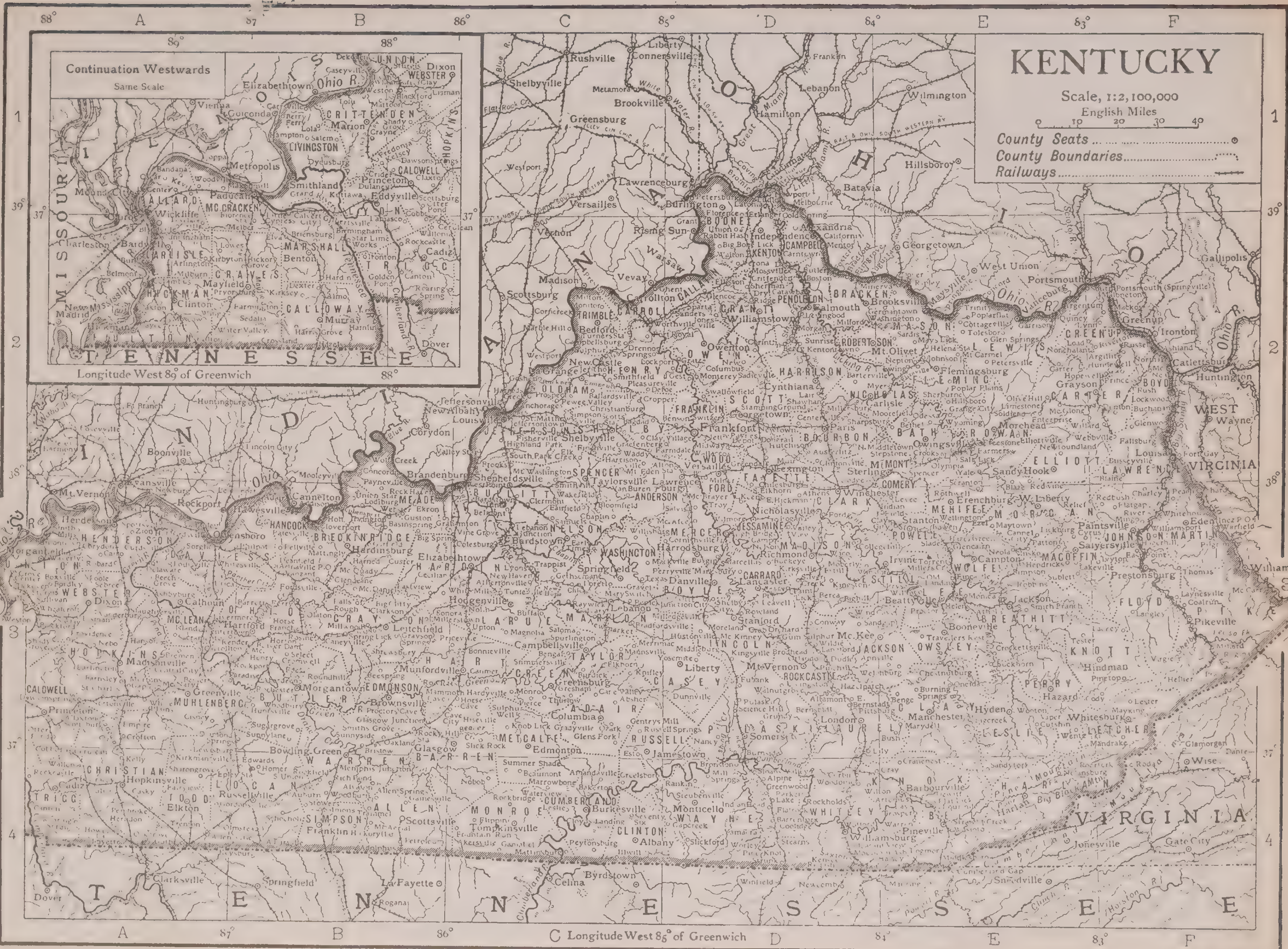
KENT'S CAVERN, or Kent's Hole, the largest of English bone caves, famous as affording evidence of the existence of Man in Devon (England) contemporaneously with animals now extinct or no longer indigenous. It is about a mile east of Torquay harbour and is of a sinuous nature, running deeply into a hill of Devonian limestone. Although long known locally, it was not until 1825 that it was scientifically examined by Rev. J. McEnery, who found worked flints in intimate association with the bones of extinct mammals. He recognized the fact that they proved the existence of man in Devonshire while those animals were alive, but the idea was too novel to be accepted by his contemporaries. His discoveries were afterwards verified by Godwin Austen, and ultimately by the Committee of the British Association, whose explorations were carried on under the guidance of Wm. Pengelly from 1865 to 1880. There are four distinct strata in the cave. (1) The surface is composed of dark earth and contains medieval remains, Roman pottery and articles which prove that it was in use during the Iron, Bronze and Neolithic Ages. (2) Below this is a stalagmite floor, varying in thickness from 1 to 3 ft., and covering (3) the red earth which contained bones of the hyaena, lion, mammoth, rhinoceros and other animals, in association with flint implements and an engraved antler, which proved man to have been an inhabitant of the cavern during its deposition. Above this and below the stalagmite there is in one part of the cave a black band from 2 to 6 in. thick, formed of soil like No. 2, containing charcoal, numerous flint implements, and the bones and teeth of animals, the latter occasionally perforated as if used for ornament. (4) Filling the bottom of the cave was a hard breccia, with the remains of bears and flint implements, the latter in the main ruder than those found above; in some places it was no less than 12 ft. thick. The most remarkable animal remains found in Kent's Cavern are those of the Sabre-toothed tiger, *Machairodus latidens* of Sir Richard Owen. While the value of McEnery's discoveries was in dispute the exploration of the cave of Brixham near Torquay in 1858 proved that man was coeval with the extinct mammalia, and in the following year additional proof was offered by the implements that were found in Wookey Hole, Somerset. Similar remains have been met with in the caves of Wales, and in England as far north as Derbyshire (Cresswell), proving that over the whole of southern and middle England men, in precisely the same stage of rude civilization, hunted the rhinoceros, the mammoth and other extinct animals.

See Sir John Evans, *Ancient Stone Implements of Great Britain* (London, 1897); Lord Avebury's *Prehistoric Times* (1900); W. Pengelly, *Address to the British Association* (1883) and Life of him by his daughter (1897); Godwin Austen, *Proc. Geo. Soc. London*, III. 286; Pengelly, "Literature of Kent's Cavern" in *Trans. Devonshire Association* (1868); William Boyd Dawkins, *Cave-hunting* and *Early Man in Britain*.

KENTUCKY, a South Central State of the United States of America, situated between 36° 30′ and 39° 6′ N., and 82° and 89° 38′ W. It is bounded N., N.W., and N.E. by Illinois, Indiana and Ohio; E. by the Big Sandy river and its E. fork, the Tug, which separates it from West Virginia, and by Virginia; S.E. and S. by Virginia and Tennessee; and W. by the Mississippi river, which separates it from Missouri. It has an area of 40,598 sq. m.; of this, 417 sq. m., including the entire breadth of the Ohio river, over which it has jurisdiction, are water surface.

Physiography.—From mountain heights along its eastern border the surface of Kentucky is a north-western slope across two much dissected plateaus to a gracefully undulating lowland in the north central part and a longer western slope across the same plateaus to a lower and more level lowland at the western extremity. The narrow mountain belt is part of the western edge of the Appalachian Mountain Province in which parallel ridges of folded mountains, the Cumberland and the Pine, have crests 2000–3000 ft. high, and the Big Black Mountain rises to 4000 ft. The highest point in the state is The Double on the Virginia state line, in the eastern part of Harlan county with an altitude of over 4100 ft. The entire eastern quarter of the state, coterminous with the Eastern Kentucky coal-field, is commonly known as the region of the "mountains," but with the exception of the narrow area just described it properly belongs to the Alleghany Plateau Province. This plateau belt is exceedingly rugged with sharp ridges alternating with narrow valleys which have steep sides but are seldom more than 1500 ft. above the sea. The remainder of the state which lies east of the Tennessee river is divided into the Highland Rim Plateau and a lowland basin, eroded in the Highland Rim Plateau and known as the Blue Grass Region; this region is separated from the Highland Rim Plateau by a semicircular escarpment extending from Portsmouth, Ohio, at the mouth of the Scioto river, to the mouth of the Salt river below Louisville; it is bounded north by the Ohio river. The Highland Rim Plateau, lying to the south, east and west of the escarpment, embraces fully one-half of the state, slopes from elevations of 1000–1200 ft. or more in the east to about 500 ft. in the north-west, and is generally much less rugged than the Alleghany Plateau; a peculiar feature of the southern portion of it is the numerous circular depressions (sink holes) in the surface and the cavernous region beneath. Kentucky is noted for its caves, the best-known of which are Mammoth Cave and Colossal Cavern (*qq.v.*). The caves are cut in the beds of limestone (lying immediately below the coal-bearing series) by streams that pass beneath the surface in the "sink holes," and according to Professor N. S. Shaler there are altogether "doubtless a hundred thousand miles of ways large enough to permit the easy passage of man." Down the steep slopes of the escarpment the Highland Rim Plateau drops 200 ft. or more to the famous Blue Grass Region, in which erosion has developed on limestone a gracefully undulating surface. This Blue Grass Region is like a beautiful park, without ragged cliffs, precipitous slopes, or flat marshy bottoms, but marked by rounded hills and dales. Especially within a radius of 20 m. around Lexington, the country is clothed with an unusually luxuriant vegetation. During spring, autumn, and winter in particular, the blue-grass (*Poa compressa* and *Poa pratensis*) spreads a mat, green, thick, fine and soft, over much of the country, and it is a good winter pasture; about the middle of June it blooms, and, owing to the hue of its seed vessels, gives the landscape a bluish hue. Another lowland area embraces that small part of the state in the extreme south-east which lies west of the Tennessee river; this belongs to that part of the Coastal Plain Region which extends north along the Mississippi river; it has in Kentucky an average elevation of less than 500 ft. Most of the larger rivers of the state have their sources among the mountains or on the Alleghany Plateau and flow more or less circuitously in a general north-western direction into the Ohio. Although deep river channels are common, falls or impassable rapids are rare west of the Alleghany Plateau, and the state has an extensive mileage of navigable waters. The Licking, Kentucky, Green and Tradewater are the principal rivers wholly within the state. The Cumberland, after flowing for a considerable distance in the south-east and south central part of the state, passes into Tennessee at a point nearly south of Louisville, and in the extreme south-west the Cumberland and the Tennessee, with only a short distance between them, cross Kentucky and enter the Mississippi at Smithland and Paducah respectively. The drainage of the region under which the caverns lie is mostly underground.

Fauna and Flora.—The first white settlers found great numbers of buffaloes, deer, elks, geese, ducks, turkeys and partridges, also many bears, panthers, lynx, wolves, foxes, beavers, otters, minks, musk-rats, rabbits, squirrels, raccoons, woodchucks, opossums and


KENTUCKY
Scale, 1:2,100,000
English Miles
0 10 20 30 40
County Seats
County Boundaries
Railways
Continuation Westwards
Same Scale
Longitude West 89° of Greenwich
Longitude West 85° of Greenwich
88° A 87 B 86° C 85° D 84° E 83° F
1 2 3 4
39° 38° 37°
OHIO
INDIANA
ILLINOIS
MISSOURI
WEST VIRGINIA
VIRGINIA
TENNESSEE
Ohio R.
Cumberland R.
Tennessee R.
Mississippi R.
Louisville
Frankfort
Lexington
Covington
Paducah
Bowling Green
Owensboro
Henderson
Cincinnati
Evansville
Huntington

Emery Walker sc.

skunks, and the streams were inhabited by trout, perch, buffalo-fish, sun-fish, mullet, eels, and suckers. Of the larger game there remain only a few deer, bears and lynx in the mountain districts, and the numbers of small game and fish have been greatly reduced. In its primeval state Kentucky was generally well timbered, but most of the middle section has been cleared and here the blue grass is now the dominant feature of the flora. Extensive forest areas still remain both in the east and the west. In the east oak, maple, beech, chestnut, elm, tulip-tree (locally "yellow poplar"), walnut, pine and cedar trees are the most numerous; in the west the forests are composed largely of cypress, ash, oak, hickory, chestnut, walnut, beech, tulip-tree, gum and sycamore trees. Locust, pawpaw, cucumber, buck-eye, black mulberry and wild cherry trees also abound, and the grape, raspberry and strawberry are native fruits.

Climate.—The climate is somewhat more mild and even than that of the neighbouring states. The mean annual temperature, about 50° F. on the mountains in the S. E., and 60° W. of the Tennessee, is about 55° F. for the entire state; the thermometer seldom registers as high as 100° or as low as −10°. The mean annual precipitation ranges from about 38 in. in the north-east to 50 in. in the south, and is about 46 in. for the entire state; it is usually distributed evenly throughout the year and very little is in the form of snow. The prevailing winds blow from the west or south-west; rain-bearing winds blow mostly from the south; and the cold waves come from the north or north-west.

Soil.—The best soils are the alluvium in the bottom-lands along some of the larger rivers and that of the Blue Grass Region, which is derived from a limestone rich in organic matter (containing phosphorus) and rapidly decomposing. The soil within a radius of some 20 m. around Lexington is especially rich; outside of this area the Blue Grass soil is less rich in phosphorus and contains a larger mixture of sand. The soils of the Highland Rim Plateau as well as of the lowland west of the Tennessee river vary greatly, but the most common are a clay, containing more or less carbonate of lime, and a sandy loam. On the escarpment around the Blue Grass Region the soils are for the most part either cherty or stiff with clay and of inferior quality. On the mountains and on the Alleghany Plateau, also, much of the soil is very light and thin.

Agriculture.—Kentucky is chiefly an agricultural state. Of the 752,531 of its inhabitants who, in 1900, were engaged in some gainful occupation, 408,185 or 54·2%, were agriculturists, and of its total land surface 21,979,422 acres, or 85·9%, were included in farms. The percentage of improved farm land increased from 35·2 in 1850 to 49·9 in 1880 and to 62·5 in 1900. The number of farms increased from 74,777 in 1850 to 166,453 in 1880 and to 234,667 in 1900; and their average size decreased from 226·7 acres in 1850 to 129·1 acres in 1880 and to 93·7 acres in 1900, these changes being largely due to the breaking up of slave estates, the introduction of a considerable number of negro farmers, and the increased cultivation of tobacco and market-garden produce. In the best stock-raising country, *e.g.* in Fayette county, the opposite tendency prevailed during the latter part of this period and old farms of a few hundred acres were combined to form some vast estates of from 2000 to 4000 acres. Of the 234,667 farms in 1900, 155,189 contained less than 100 acres, 76,450 contained between 100 and 500 acres, and 558 contained more than 1000 acres; 152,216 or 64·86%, were operated by owners or part owners, of whom 5320 were negroes; 16,776 by cash tenants, of whom 789 were negroes; and 60,289 by share tenants, of whom 4984 were negroes. In 1900 the value of farm land and improvements was $291,117,430; of buildings on farms, $90,887,460; of live-stock, $73,739,106. In the year 1899 the value of all farm products was $123,266,785 (of which $21,128,530 was the value of products fed to livestock), including the following items: crops, $74,783,365; animal products, $44,303,940; and forest products, $4,179,840. The total acreage of all crops in 1899 was 6,582,696. Indian corn is the largest and most valuable crop. As late as 1849, when it produced 58,672,591 bu., Kentucky was the second largest Indian-corn producing state in the Union. In 1899 the crop had increased to 73,974,220 bu. and the acreage was 3,319,257 (more than half the acreage of all crops in the state), but the rank had fallen to ninth in product and eleventh in acreage; in 1909 (according to the *Yearbook* of the United States Department of Agriculture) the crop was 103,472,000 bu. (ninth among the states of the United States), and the acreage was 3,568,000 (twelfth among the states). Among the cereals wheat is the next largest crop; it increased from 2,142,822 bu. in 1849 to 11,356,113 bu. in 1879, and to 14,264,500 bu. in 1899; in 1909 it was only 7,906,000 bu. The crop of each of the other cereals is small and in each case was less in 1899 than in 1849. The culture of tobacco, which is the second most valuable crop in the state, was begun in the north part about 1780 and in the west and south early in the 19th century, but it was late in that century before it was introduced to any considerable extent in the Blue Grass Region, where it was then in a measure substituted for the culture of hemp. By 1849 Kentucky ranked second only to Virginia in the production of tobacco, and in 1899 it was far ahead of any other state in both acreage and yield, there being in that year 384,805 acres, which was 34·9% of the total acreage in the continental United States, yielding 314,288,050 ℔. As compared with the state's Indian corn crop of that year, the acreage was only a little more than one-ninth, but the value ($18,541,982) was about 63%. In 1909 the tobacco acreage in Kentucky was 420,000, the crop was 350,700,000 ℔, valued at $37,174,200; the average price per pound had increased from 5·9 cents in 1899 to 10·6 cents in 1909. The two most important tobacco-growing districts are: the Black Patch, in the extreme south-west corner of the state, which with the adjacent counties in Tennessee grows a black heavy leaf bought almost entirely by the agents of foreign governments (especially Austria, Spain and Italy) and called "regie" tobacco; and the Blue Grass Region, as far east as Maysville, and the hill country south and east, whose product, the red and white Burley, is a fine-fibred light leaf, peculiarly absorbent of licorice and other adulterants used in the manufacture of sweet chewing tobacco, and hence a peculiarly valuable crop, which formerly averaged 22 cents a pound for all grades.[1] The high price received by the hill growers of the Burley induced farmers in the Blue Grass to plant Burley tobacco there, where the crop proved a great success, more than twice as much (sometimes 2000 ℔) being grown to the acre in the Blue Grass as in the hills and twice as large patches being easily managed. In the hill country the share tenant could usually plant and cultivate only four acres of tobacco, had to spend 120 days working the crop, and could use the same land for tobacco only once in six years. So, although a price of 6·5 cents a pound covered expenses of the planter of Burley in the Blue Grass, who could use the same land for tobacco once in four years, this price did not repay the hill planter. The additional production of the Blue Grass Region sent the price of Burley tobacco down to this figure and below it. The planters in the Black Patch had met a combination of the buyers by forming a pool, the Planters' Protective Association, into which 40,000 growers were forced by "night-riding" and other forms of coercion and persuasion, and had thus secured an advance to 11 cents a pound from the "regie" buyers and had shown the efficacy of pooling methods in securing better prices for the tobacco crop. Following their example, the planters of the Burley formed the Burley Tobacco Society, a Burley pool, with headquarters at Winchester and associated with the American Society of Equity, which promoted in general the pooling of different crops throughout the country. The tobacco planters secured legislation favourable to the formation of crop pools. The Burley Tobacco Society attempted to pool the entire crop and thus force the buyers of the American Tobacco Company of New Jersey (which usually bought more than three-fourths of the crop of Burley) to pay a much higher price for it. In 1906 and in 1907 the crop was very large; the pool sold its lower grades of the 1906 crop at 16 cents a pound to the American Tobacco Company and forced the independent buyers out of business; and the Burley Society decided in 1907 to grow no more tobacco until the 1906 and 1907 crops were sold, making the price high enough to pay for this period of idleness. Members of the pool had used force to bring planters into the pool; and now some tobacco growers, especially in the hills, planted new crops in the hope of immediate return, and a new "night-riding" war was begun on them. Bands of masked men rode about the country both in the Black Patch and in the Burley, burning tobacco houses of the independent planters, scraping their newly-planted tobacco patches, demanding that planters join their organization or leave the country, and whipping or shooting the recalcitrants. Governor Willson, immediately after his inauguration, took measures to suppress disorder. In general the Planters' Protective Association in the Black Patch was more successful in its pool than the Burley Tobacco Society in its, and there was more violence in the "regie" than in the "Burley" district. In November 1908 the lawlessness subsided in the Burley after the agreement of the American Tobacco Company to purchase the remainder of the 1906 crop at a "round" price of 20½ cents and a part of the 1907 crop at an average price of 17 cents, thus making it profitable to raise a full crop in 1909.

Kentucky is the principal hemp-growing state of the Union; the crop of 1899, which was grown on 14,107 acres and amounted to 10,303,560 ℔, valued at $468,454, was 87·7% of the hemp crop of the whole country. But the competition of cheaper labour in other countries reduced the profits on this plant and the product of 1899 was a decrease from 78,818,000 ℔ in 1859. Hay and forage, the fourth in value of the state's crops in 1899, were grown on 683,139 acres and amounted to 776,534 tons, valued at $6,100,647; in 1909 the acreage of hay was 480,000 and the crop of 653,000 tons was valued at $7,771,000. In 1899 the total value of fruit grown in Kentucky was $2,491,457 (making the state rank thirteenth among the states of the Union in the value of this product), of which $1,943,645 was the value of orchard fruits and $435,462 that of small fruits. Among fruits, apples are produced in greatest abundance, 6,053,717 bu. in 1899, an amount exceeded in only nine states; in 1889 the crop had been 10,679,389 bu. and was exceeded only by the crop of Ohio and by that of Michigan. Kentucky also grows considerable quantities of cherries, pears, plums and peaches, and, for its size, ranks high in its crops of strawberries, blackberries and raspberries. Indian corn is grown in all parts of the state but most largely in the western portion. Wheat is grown both in the Blue Grass Region and farther west; and the best country for fruit is along the Ohio river between Cincinnati and Louisville and in the hilly land surrounding the Blue Grass Region. In the eastern part of the state where crops are generally light, Indian corn, oats and potatoes are the principal products, but tobacco, flax and cotton are grown. The thoroughbred Kentucky horse has long had a world-wide reputation for speed; and the Blue Grass Region, especially Fayette, Bourbon and Woodford counties, is probably the finest horse-breeding region in America and has large breeding farms. In Fayette county, in 1900, the average value of colts between the ages of one and two years was $377·78. In the Blue Grass Region many thoroughbred shorthorn cattle and fine mules are raised. The numbers of horses, mules, cattle and sheep increased quite steadily from 1850 to 1900, but the number of swine in 1880 and in 1900 was nearly one-third less than in 1850. In 1900 the state had 497,245 horses, 198,110 mules, 364,025 dairy cows, 755,714 other neat cattle, 1,300,832 sheep and 2,008,989 swine; in 1910 there were in Kentucky 407,000 horses, 207,000 mules, 394,000 milch cows, 665,000 other neat cattle, 1,060,000 sheep and 989,000 swine. The principal sheep-raising counties in 1905 were Bourbon, Scott and Harrison, and the principal hog-raising counties were Graves, Hardin, Ohio, Union and Hickman.

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[1] North of the Black Patch is a district in which is grown a heavy-leaf tobacco, a large part of which is shipped to Great Britain; and farther north and east a dark tobacco is grown for the American market.

Forests and Timber.—More than one-half of the state (about 22,200 sq. m.) was in 1900 still wooded. In 1900 of the total cut of 777,218 M. ft., B.M., 392,804 were white oak and 279,740 M. ft. were tulip-tree. Logging is the principal industry of several localities, especially in the east, and the lumber product of the state increased in value from $1,502,434 in 1850 to $4,064,361 in 1880, and to $13,774,911 in 1900. The factory product in 1900 was valued at $13,338,533 and in 1905 at $14,539,000. In 1905 of a total of 586,371 M. ft., B.M., of sawed lumber, 295,776 M. ft. were oak and 153,057 M. ft. were "poplar."

The planing mill industry is increasing rapidly, as it is found cheaper to erect mills near the forests; between 1900 and 1905 the capital of planing mills in the state increased 117·2 % and the value of products increased 142·8 %.

Manufactures.—Kentucky's manufactures are principally those for which the products of her farms and forests furnish the raw material. The most distinctive of these is probably distilled liquors, the state's whisky being famous. A colony of Roman Catholic immigrants from Maryland settled in 1787 along the Salt river about 50 m. S.S.E. of Louisville and with the surplus of their Indian corn crop made whisky, a part of which they sold at settlements on the Ohio and the Mississippi. The industry was rapidly developed by distillers, who immediately after the suppression of the Whisky Insurrection, in 1794, removed from Pennsylvania and settled in what is now Mason county and was then a part of Bourbon county—the product is still known as "Bourbon" whisky. During the first half of the 19th century the industry became of considerable local importance in all parts of the state, but since the Civil War the heavy tax imposed has caused its concentration in large establishments. In 1900 nearly 40 % and in 1905 more than one-third of the state's product was distilled in Louisville. Good whisky is made in Maryland and in parts of Pennsylvania from rye, but all efforts in other states to produce from Indian corn a whisky equal to the Bourbon have failed, and it is probable that the quality of the Bourbon is largely due to the character of the Kentucky lime water and the Kentucky yeast germs. The average annual product of the state from 1880 to 1900 was about 20,000,000 gallons; in 1900 the product was valued at $9,786,527; in 1905 at $11,204,649. In 1900 and in 1905 Kentucky ranked fourth among the states in the value of distilled liquors.

The total value of all manufactured products of the state increased from $126,719,857 in 1890 to $154,166,365 in 1900, or 21·7 %, and from 1900 to 1905 the value of factory-made products alone increased from $126,508,660 to $159,753,968, or 26·3 %.[1] Measured by the value of the product, flour and grist mill products rose from third in rank in 1900 to first in rank in 1905, from $13,017,043 to $18,007,786, or 38·3 %; and chewing and smoking tobacco and snuff fell during the same period from first to third in rank, from $14,948,192 to $13,117,000, or 12·3 %; in 1900 Kentucky was second, in 1905 third, among the states in the value of this product. Lumber and timber products held second rank both in 1900 ($13,338,533) and in 1905 ($14,539,000). Distilled liquors were fourth in rank in 1900 and in 1905. Men's clothing rose from tenth in rank in 1900 to fifth in rank in 1905, from $3,420,365 to $6,279,078, or 83·6 %. Other important manufactures, with their product values in 1900 and in 1905, are iron and steel ($5,004,572 in 1900; $6,167,542 in 1905); railway cars ($4,248,029 in 1900; $5,739,071 in 1905); packed meats ($5,177,167 in 1900; $5,693,731 in 1905); foundry and machine shop products ($4,434,610 in 1900; $4,699,559 in 1905); planing mill products, including sash, doors and blinds ($1,891,517 in 1900; $4,593,251 in 1905—an increase already remarked); carriages and wagons ($2,849,713 in 1900; $4,059,438 in 1905); tanned and curried leather ($3,757,016 in 1900; $3,952,277 in 1905); and malt liquors ($3,186,627 in 1900; $3,673,678 in 1905). Other important manufactures (each with a product value in 1905 of more than one million dollars) were cotton-seed oil and cake (in 1900 Kentucky was fifth and in 1905 sixth among the states in the value of cotton-seed oil and cake), cooperage, agricultural implements, boots and shoes, cigars and cigarettes, saddlery and harness, patent medicines and compounds, cotton goods, furniture, confectionery, carriage and wagon materials, wooden packing boxes, woollen goods, pottery and terra cotta ware, structural iron-work, and turned and carved wood. Louisville is the great manufacturing centre, the value of its products amounting in 1905 to $83,204,125, 52·1 % of the product of the entire state, and showing an increase of 25·9 % over the value of the city's factory products in 1900. Ashland is the principal centre of the iron industry.

Minerals.—The mineral resources of Kentucky are important and valuable, though very little developed. The value of all manufactures in 1900 was $154,166,365, and the value of manufactures based upon products of mines or quarries in the same year was $25,204,788; the total value of mineral products was $19,294,341 in 1907. Bituminous coal is the principal mineral, and in 1907 Kentucky ranked eighth among the coal-producing states of the Union; the output in 1907 amounted to 10,753,124 short tons, and in 1902 to 6,766,984 short tons as compared with 2,399,755 tons produced in 1889. In 1902 the amount was about equally divided between the eastern coalfield, which is for the most part in Greenup, Boyd, Carter, Lawrence, Johnson, Lee, Breathitt, Rockcastle, Pulaski, Laurel, Knox, Bell and Whitley counties, and has an area of about 11,180 sq. m., and the western coalfield, which is in Henderson, Union, Webster, Daviess, Hancock, McLean, Ohio, Hopkins, Butler, Muhlenberg and Christian counties, and has an area of 5800 sq. m. In 1907 the output of the western district was 6,295,397 tons; that of the eastern, 4,457,727. The largest coal-producing counties in 1907 were Hopkins (2,064,154 short tons) and Muhlenberg (1,882,913 short tons) in the western coalfield, and Bell (1,437,886 short tons) and Whitley (762,923 short tons) in the south-western part of the eastern coalfield. All Kentucky coal is either bituminous or semi-bituminous, but of several varieties. Of cannel coal Kentucky is the largest producer in the Union, its output for 1902 being 65,317 short tons, and, according to state reports, for 1903, 72,856 tons (of which 46,314 tons were from Morgan county), and for 1904, 68,400 tons (of which 52,492 tons were from Morgan county); according to the *Mineral Resources of the United States* for 1907 (published by the United States Geological Survey) the production of Kentucky in 1907 of cannel coal (including 4650 tons of semi-cannel coal) was 77,733 tons, and exclusive of semi-cannel coal the output of Kentucky was much larger than that of any other state. Some of the coal mined in eastern Kentucky is an excellent steam producer, especially the Jellico coal of Whitley county, Kentucky, and of Campbell county, Tennessee. But with the exception of that mined in Hopkins and Bell counties, very little is fit for making coke; in 1880 the product was 4250 tons of coke (value $12,250), in 1890, 12,343 tons ($22,191); in 1900, 95,532 tons ($235,505); in 1902, 126,879 tons ($317,875), the maximum product up to 1906; and in 1907, 67,068 tons ($157,288). Coal was first mined in Kentucky in Laurel or Pulaski county in 1827; between 1829 and 1835 the annual output was from 2000 to 6000 tons; in 1840 it was 23,527 tons and in 1860 it was 285,760 tons.

Petroleum was discovered on Little Rennick's Creek, near Burkesville, in Cumberland county, in 1829, when a flowing oil well (the "American well," whose product was sold as "American oil" to heal rheumatism, burns, &c.) was struck by men boring for a "salt well," and after a second discovery in the 'sixties at the mouth of Crocus Creek a small but steady amount of oil was got each year. Great pipe lines from Parkersburg, West Virginia, to Somerset, Pulaski county, and with branches to the Ragland, Barbourville and Prestonburg fields, had in 1902 a mileage of 275 m. The principal fields are in the "southern tier," from Wayne to Allen county, including Barren county; farther east, Knox county, and Floyd and Knott counties; to the north-east the Ragland field in Bath and Rowan counties on the Licking river. In 1902 the petroleum produced in the state amounted to 248,950 barrels, valued at $172,837, a gain in quantity of 81·4 % over 1901. Kentucky is the S.W. extreme of the natural gas region of the west flank of the Appalachian system; the greatest amount is found in Martin county in the east, and Breckinridge county in the north-west. The value of the state's natural gas output increased from $38,993 in 1891 to $99,000 in 1896, $286,243 in 1900, $365,611 in 1902, and $380,176 in 1907.

Iron ore has been found in several counties, and an iron furnace was built in Bath county, in the N. E. part of the state, as early as 1791, but since 1860 this mineral has received little attention. In 1902 it was mined only in Bath, Lyon and Trigg counties, of which the total product was 71,006 long tons, valued at only $86,169; in 1904 only 35,000 tons were mined, valued at the mines at $35,000.

In 1898 there began an increased activity in the mining of fluorspar, and Crittenden, Fayette and Livingston counties produced in 1902, 29,030 tons (valued at $143,410) of this mineral, in 1903 30,835 tons (valued at $153,960) and in 1904 19,096 tons (valued at $111,499), amounts (and values) exceeding those produced in any other state for these years; but in 1907 the quantity (21,058 tons) was less than the output of Illinois. Lead and zinc are mined in small quantities near Marion in Crittenden county and elsewhere in connexion with mining for fluorspar; in 1907 the output was 75 tons of lead valued at $7950 and 358 tons of zinc valued at $42,244. Jefferson, Jessamine, Warren, Grayson and Caldwell counties have valuable quarries of an excellent light-coloured öolitic limestone, resembling the Bedford limestone of Indiana, and best known under the name of the finest variety, the "Bowling Green stone" of Warren county; and sandstones good for structural purposes are found in both coal regions, and especially in Rowan county. In 1907 the total value of limestone quarried in the state was $891,500, and of all stone, $1,002,450. Fire and pottery clay and cement rock also abound within the state. The value of clay products was $2,406,350 in 1905 (when Kentucky was tenth among the states) and was $2,611,364 in 1907 (when Kentucky was eleventh among the states). The manufacture of cement was begun in 1829 at Shippingport, a suburb of Louisville, whence the natural cement of Kentucky and Indiana, produced within a radius of 15 m. from Louisville, is called "Louisville cement." In 1905 the value of natural cement manufactured in the state (according to the United States Geological Survey) was only $83,000. The manufacture of Portland cement is of greater importance.

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[1] In the census of 1905 statistics for other than factory-made products, such as those of the hand trades, were not included.

There are mineral springs, especially salt springs, in various parts of the state, particularly in the Blue Grass Region; these are now of comparatively little economic importance; no salt was reported among the state's manufactures for 1905, and in 1907 only 736,920 gallons of mineral waters were bottled for sale. Historically and geologically, however, these springs are of considerable interest. According to Professor N. S. Shaler, state geologist in 1873–1880, "When the rocks whence they flow were formed on the Silurian sea-floors, a good deal of the sea-water was imprisoned in the strata, between the grains of sand or mud and in the cavities of the shells that make up a large part of these rocks. This confined sea-water is gradually being displaced by the downward sinking of the rain-water through the rifts of the strata, and thus finds its way to the surface: so that these springs offer to us a share of the ancient seas, in which perhaps a hundred million of years ago the rocks of Kentucky were laid down." To these springs in prehistoric and historic times came annually great numbers of animals for salt, and in the marshes and swamps around some of them, especially Big Bone Lick (in Boone county, about 20 m. S.W. of Cincinnati) have been found many bones of extinct mammals, such as the mastodon and the long-legged bison.[1] The early settlers and the Indians came to the springs to shoot large game for food, and by boiling the waters the settlers obtained valuable supplies of salt. Several of the Kentucky springs have been somewhat frequented as summer resorts; among these are the Blue Lick in Nicholas county (about 48 m. N.E. of Lexington), Harrodsburg, Crab Orchard in Lincoln county (about 115 m. S.E. of Louisville), Rock Castle springs in Pulaski county (about 23 m. E. of Somerset) and Paroquet Springs (near Shepherdsville, Bullitt county), which was a well-known resort before the Civil War, and near which, at Bullitt Lick, the first salt works in Kentucky are said to have been erected.

Pearls are found in the state, especially in the Cumberland River, and it is supposed that there are diamonds in the kimberlite deposits in Elliott county.

Transportation.—Kentucky in 1909 had 3,503.98 m. of railway. Railway building was begun in the state in 1830, and in 1835 the first train drawn by a steam locomotive ran from Lexington to Franklin, a distance of 27 m. Not until 1851 was the line completed to Louisville. Kentucky's trade during the greater part of the 19th century was very largely with the South, and with the facilities which river navigation afforded for this the development of a railway system was retarded. Up to 1880 the railway mileage had increased to only 1,530; but during the next ten years it increased to 2,942, and railways were in considerable measure substituted for water craft. The principal lines are the Louisville & Nashville, the Chesapeake & Ohio, the Illinois Central, and the Cincinnati Southern (Queen & Crescent route). Most of the lines run south or south-west from Cincinnati and Louisville, and the east border of the state still has a small railway mileage and practically no wagon roads, most of the travel being on horseback. The wagon roads of the Blue Grass Region are excellent, because of the plentiful and cheap supply of stone for road building. The assessment of railway property, and in some measure the regulation of railway rates, are entrusted to a state railway commission.

Population.—The population of Kentucky in 1880[2] was 1,648,690; in 1890, 1,858,635, an increase within the decade of 12·7%; in 1900 it was 2,147,174; and in 1910 it had reached 2,289,905. Of the total population of 1900, 284,865 were coloured and 50,249 were foreign-born; of the coloured, 284,706 were negroes, 102 were Indians, and 57 were Chinese; of the foreign-born, 27,555 were natives of Germany, 9874 were natives of Ireland, and 3256 were natives of England. Of the foreign-born, 21,427, or 42·6%, were inhabitants of the city of Louisville, leaving a population outside of this city of which 98·4% were native born. The rugged east section of the state, a part of Appalachian America, is inhabited by a people of marked characteristics, portrayed in the fiction of Miss Murfree ("Charles Egbert Craddock") and John Fox, Jr. They are nearly all of British—English and Scotch-Irish—descent, with a trace of Huguenot. They have good native ability, but through lack of communication with the outside world their progress has been retarded. Before the Civil War they were owners of land, but for the most part not owners of slaves, so that a social and political barrier, as well as the barriers of nature, separated them from the other inhabitants of the state. In their speech several hundred words persist which elsewhere have been obsolete for three centuries or occur only in dialects in England. Their life is still in many respects very primitive; their houses are generally built of logs, their clothes are often of homespun, Indian corn and ham form a large part of their diet, and their means of transportation are the saddle-horse and sleds and wheeled carts drawn by oxen or mules. In instincts and in character, also, the typical "mountaineers" are to a marked degree primitive; they are, for the most part, very ignorant; they are primitively hospitable and are warm-hearted to friends and strangers, but are implacable in their enmities and are prone to vendettas and family feuds, which often result in the killing in open fight or from ambush of members of one faction by members of another; and their relative seclusion and isolation has brought them, especially in some districts, to a disregard for law, or to a belief that they must execute justice with their own hands. This appears particularly in their attitude toward revenue officers sent to discover and close illicit stills for the distilling from Indian corn of so-called "moon-shine" whisky (consisting largely of pure alcohol). The taking of life and "moon-shining," however, have become less and less frequent among them, and Berea College, at Berea, the Lincoln Memorial University, and other schools in Kentucky and adjoining states have done much to educate them and bring them more in harmony with the outside community.

The population of Kentucky is largely rural. However, in the decade between 1890 and 1900 the percentage of urban population (*i.e.* population of places of 4000 inhabitants or more) to the total population increased from 17·5 to 19·7 and the percentage of semi-urban (*i.e.* population of incorporated places with a population of less than 4000) to the total increased from 8·86 to 9·86%; but 48·3% of the urban population of 1900 was in the city of Louisville. In 1910 the following cities each had a population of more than 5000. Louisville (223,928), Covington (53,270), Lexington (35,099), Newport (30,309), Paducah (22,760), Owensboro (16,011), Henderson (11,452), Frankfort, the capital (10,465), Hopkinsville (9419), Bowling Green (9173), Ashland (8688), Middlesboro (7305), Winchester (7156), Dayton (6979), Bellevue (6683), Maysville (6141), Mayfield (5916), Paris (5859), Danville (5420), Richmond (5340). Of historical interest are Harrodsburg (*q.v.*), the first permanent settlement in the state, and Bardstown (pop. in 1900, 1711), the county-seat of Nelson county. Bardstown was settled about 1775, largely by Roman Catholics from Maryland. It was the see of a Roman Catholic bishop from 1810 to 1841, and the seat of St Joseph's College (Roman Catholic) from 1824 to 1890; and was for some time the home of John Fitch (1743–1798), the inventor, who built his first boat here. The Nazareth Literary and Benevolent Institution, at Nazareth (2 m. N. of Bardstown), was founded in 1829 and is a well-known Roman Catholic school for girls. Boonesborough, founded by Daniel Boone in 1775, in what is now Madison county, long ago ceased to exist, though a railway station named Boone, on the Louisville & Nashville railroad, is near the site of the old settlement.

In 1906 there were 858,324 communicants of different religious denominations in the state, including 311,583 Baptists, 165,908 Roman Catholics, 156,007 Methodists, 136,110 Disciples of Christ, 47,822 Presbyterians and 8091 Protestant Episcopalians.

Administration.—Kentucky is governed under a constitution adopted in 1891.[3] A convention to revise the constitution or to draft a new one meets on the call of two successive legislatures, ratified by a majority of the popular vote, provided that majority be at least one-fourth of the total number of votes cast at the preceding general election. Ordinary amendments are proposed by a three-fifths majority in each house, and are also subject to popular approval. With the usual exceptions of criminals, idiots and insane persons, all male citizens of the United States, who are at least 21 years of age, and have lived in the state one year, in the county six months, and in the voting precinct sixty days next preceding the election, are entitled to vote. The legislature provides by law for registration in cities of the first, second, third and fourth classes—the minimum population for a city of the fourth class being 3000. Corporations are forbidden to contribute money for campaign purposes on penalty of forfeiting their charters, or, if not chartered in the state, their right to carry on business in the state. The executive is composed of a governor, a lieutenant-governor, a treasurer, an auditor of public accounts, a register of the land office, a commissioner of agriculture, labour, and statistics, a secretary of state, an attorney-general and a superintendent of public instruction. All are chosen by popular vote for four years and are ineligible for immediate re-election, and each must be at least 30 years of age and must have been a resident citizen of the state for two years next preceding his election. If a vacancy occurs in the office of governor during the first two years a new election is held; if it occurs during the last two years the lieutenant-governor serves out the term. Lieutenant-governor Beckham, elected in 1900 to fill out the unexpired term of Governor Goebel (assassinated in 1900), was re-elected in 1903, the leading lawyers of the state holding that the constitutional inhibition on successive terms did not apply in such a case.

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[1] For a full account of the "licks," see vol. i. pt. ii. of the *Memoirs of the Kentucky Geological Survey* (1876).

[2] The population of the state at the previous censuses was: 73,677 in 1790; 220,955 in 1800; 406,511 in 1810; 564,317 in 1820; 687,917 in 1830; 779,828 in 1840; 982,405 in 1850; 1,155,684 in 1860 and 1,321,011 in 1870.

[3] There were three previous constitutions—those of 1792, 1799 and 1850.

The governor is commander-in-chief of the militia when it is not called into the service of the United States; he may remit fines and forfeitures, commute sentences, and grant reprieves and pardons, except in cases of impeachment; and he calls extraordinary sessions of the legislature. His control of patronage, however, is not extensive and his veto power is very weak. He may veto any measure, including items in appropriation bills, but the legislature can repass such a measure by a simple majority of the total membership in each house. Among the various state administrative boards are the board of equalization of five members, the board of health of nine members, a board of control of state institutions with four members (bipartisan), and the railroad commission, the prison commission, the state election commission and the sinking fund commission of three members each. Legislative power is vested in a General Assembly, which consists of a Senate and a House of Representatives. Senators are elected for four years, one-half retiring every two years; representatives are elected for two years. The minimum age for a representative is 24 years, for a senator 30 years. There are thirty-eight senators and one hundred representatives. The Senate sits as a court for the trial of impeachment cases. A majority of either house constitutes a quorum, but as regards ordinary bills, on the third reading, not only must they receive a majority of the quorum, but that majority must be at least two-fifths of the total membership of the house. For the enactment of appropriation bills and bills creating a debt a majority of the total membership in each house is required. All revenue measures must originate in the House of Representatives, but the Senate may introduce amendments. There are many detailed restrictions on local and special legislation. The constitution provides for local option elections on the liquor question in counties, cities, towns and precincts; in 1907, out of 119 counties 87 had voted for prohibition.

The judiciary consists of a court of appeals, circuit courts, quarterly courts, county courts, justice of the peace courts, police courts and fiscal courts. The court of appeals is composed of from five to seven judges (seven in 1909), elected, one from each appellate district, for a term of eight years. The senior judge presides as chief justice and in case two or more have served the same length of time one of them is chosen by lot. The governor may for any reasonable cause remove judges on the address of two-thirds of each house of the legislature. The counties are grouped into judicial circuits, those containing a population of more than 150,000 constituting separate districts; each district has a judge and a commonwealth's attorney. The county officials are the judge, clerk, attorney, sheriff, jailor, coroner, surveyor and assessor, elected for four years. Each county contains from three to eight justice of the peace districts. The financial board of the county is composed of the county judge and the justices of the peace, or of the county judge and three commissioners elected on a general ticket.

The municipalities are divided into six classes according to population, a classification which permits considerable special local legislation in spite of the constitutional inhibition. Marriages between whites and persons of negro descent are prohibited by law, and a marriage of insane persons is legally void. Among causes for absolute divorce are adultery, desertion for one year, habitual drunkenness for one year, cruelty, ungovernable temper, physical incapacity at time of marriage, and the joining by either party of any religious sect which regards marriage as unlawful. A homestead law declares exempt from execution an unmortgaged dwelling-house (with appurtenances) not to exceed $1000 in value, and certain property, such as tools of one's trade, libraries (to the value of $500) of ministers and lawyers, and provisions for one year for each member of a family. Child labour is regulated by an act passed by the General Assembly in 1908; this act prohibits the employment of children less than 14 years of age in any gainful occupation during the session of school or in stores, factories, mines, offices, hotels or messenger service during vacations, and prohibits the employment of children between 14 and 16 unless they have employment certificates issued by a superintendent of schools or some other properly authorized person, showing the child's ability to read and write English, giving information as to the child's age (based upon a birth certificate if possible), and identifying the child by giving height and weight and colour of eyes and hair. These certificates must be kept on file and lists of children employed must be posted by employers; labour inspectors receive monthly lists from local school boards of children receiving certificates; and children under 16 are not to work more than 10 hours a day or 60 hours a week, or between 7 p.m. and 7 a.m.

Charitable and Penal Institutions.—The charitable and penal institutions are managed by separate boards of trustees appointed by the governor. There are a deaf and dumb institution at Danville (1823), an institution for the blind at Louisville (1842), and an institution for the education of feeble-minded children at Frankfort (1860). The Eastern Lunatic Asylum at Lexington, established in 1815 as a private institution, came under the control of the state in 1824. The Central Lunatic Asylum at Anchorage, founded in 1869 as a house of refuge for young criminals, became an asylum in 1873. The Western Lunatic Asylum at Hopkinsville was founded in 1848. The main penitentiary at Frankfort was completed in 1799 and a branch was established at Eddyville in 1891. Under an act of 1898 two houses of reform for juvenile offenders, one for boys, the other for girls, were established near Lexington.

Education.—The early history of the schools of Kentucky shows that the rural school conditions have been very unsatisfactory. A system of five trustees, with a sixty-day term of school, was replaced by a three trustee system, first with a one-hundred-day term of school, and subsequently with a one-hundred-and-twenty-day term of school annually. The state fund has not been supplemented locally for the payment of teachers, who have consequently been underpaid. The rural teachers, however, have been paid from the state fund, so that the poorer districts receive aid from the richer districts of the commonwealth. The rural schools are supervised by a superintendent in each county. Throughout the state white and negro children are taught in separate schools. The state makes provision for revenue for school purposes as follows: (1) the interest on the Bond of the Commonwealth for $1,327,000 00; (2) dividends on 798 shares of the capital stock of the Bank of Kentucky—representing a par value of $79,800.00; (3) the interest at 6% on the Bond of the Commonwealth for $381,986.08, which is a perpetual obligation in favour of the several counties; (4) the interest at 6% on $606,641.03, which was received from the United States; (5) the annual tax of 26½ cents on each $100 of value of all real and personal estate and corporate franchises directed to be assessed for taxation; (6) a certain portion of fines, forfeitures and licences realized by the state; and (7) a portion of the dog taxes of each county. The present school system of Kentucky may be summarized under three heads: the rural schools, the graded schools, and the high schools (which are further classified as city and county high schools). The 1908 session of the General Assembly passed an act providing: that each county of the state be the unit for taxation; that the county tax be mandatory; that there be a local subdistrict tax; and that each county be divided into four, six or eight educational divisions, that one trustee be elected for each subdistrict, that the trustees of the subdistricts form division Boards of Education, and that the chairmen of these various division boards form a County Board of Education together with the county superintendent, who is *ex officio* chairman. This system of taxation and supervision is a great advance in the administration of public schools. Any subdistrict, town or city of the fifth or sixth class may provide for a graded school by voting for an *ad valorem* and poll tax which is limited as to amount. There were in 1909 135 districts which had complied with this act, and were known as Graded Common School districts. By special charters the General Assembly has also established 25 special graded schools. Statutes provide that all children between the ages of 7 and 14 years living in such districts must attend school annually for at least eight consecutive weeks. In each city of the first, second and third class there must be, and of the fourth class there may be, maintained under control of a city Board of Education a system of public schools, in which all children between the ages of 6 and 20 residing in the city may be taught at public expense. There were in 1909 62 city public high schools whose graduates are admitted to the State University without examination. A truancy act (1908) provides that every child between the ages of 7 and 14 years living in a city of the first, second, third or fourth class must attend school regularly for the full term of said school. It was provided by statute that before June 1910, there should have been established in each county of the state at least one County High School to which all common school graduates of the county should be admitted without charge. Separate institutes for white and coloured teachers are conducted annually in each county. These institutes are held for a five or ten day session and attendance is required of every teacher. The state provides for the issuance of three kinds of certificates. A state diploma issued by the State Board of Examiners is good for life. A state certificate issued by the State Board of Examiners is good for eight years with one renewal. County certificates issued by the County Board of Examiners are of three classes, valid for one, two and four years respectively.

According to a school census there was in 1908–1909 a school population of 739,352, of which 587,051 were reported from the rural districts. In the school year 1907–1908 the school population was 734,617, the actual enrolment in public schools was 441,377, the average attendance was 260,843; there were approximately 3392 male and 5257 female white teachers and 1274 negro teachers; and the total revenue for school purposes was $3,805,997, of which sum $2,437,942.56 came from the state treasury.

What was formerly the State Agricultural and Mechanical College at Lexington became the State University by legislative enactment (1908); there is no tuition fee except in the School of Law. The State University has a Department of Education. The state maintains for the whites two State Normal Schools, which were established in 1906—one, for the eastern district, at Richmond, and the other, for the western district, at Bowling Green. Under the law establishing State Normal Schools, each county is entitled to one or more appointments of scholarships, one annually for every 500 white school children listed in the last school census. A Kentucky Normal and Industrial School (1886) for negroes is maintained at Frankfort. Among the private and denominational colleges in Kentucky are Central University (Presbyterian), at Danville; Transylvania University, at Lexington; Georgetown College (Baptist) at Georgetown; Kentucky Wesleyan College (M.E. South), at Winchester; and Berea College(non-sectarian) at Berea.

Finance.—Kentucky, in common with other states in this part of the country, suffered from over-speculation in land and railways during 1830–1850. The funded debt of the state amounted to four and one-half millions of dollars in 1850, when the new constitution limited the power of the legislature to contract further obligations or to decrease or misapply the sinking funds. From 1850 to 1880 there was a gradual reduction except during the years of the war. The system of classifying the revenue into separate funds has frequently produced annual deficits, which are, as a rule only nominal, since the total receipts exceed the total expenditures. In 1902 the net bonded debt, exclusive of about two millions of dollars held for educational purposes, was $1,171,394, but this debt was paid in full in the years immediately following. The sinking fund commission is composed of the governor, attorney-general, secretary of state, auditor and treasurer. The first banking currency in Kentucky was issued in 1802 by a co-operative insurance company established by Mississippi Valley traders. The Bank of Kentucky, established at Frankfort in 1806, had a monopoly for several years. In 1818–1819 the legislature chartered 46 banks, nearly all of which went into liquidation during the panic of 1819. The Bank of the Commonwealth was chartered in 1820 as a state institution and the charter of the Bank of Kentucky was revoked in 1822. A court decision denying the legal tender quality of the notes issued by the Bank of the Commonwealth gave rise to a bitter controversy which had considerable influence upon the political history of the state. This bank failed in 1829. In 1834 the legislature chartered the Bank of Kentucky, the Bank of Louisville and the Northern Bank of Kentucky. These institutions survived the panic of 1837 and soon came to be recognized as among the most prosperous and the most conservative banks west of the Alleghanies. The state banking laws are stringent and most of the business is still controlled by banks operating under state charters.

History.—The settlement and the development of that part of the United States west of the Alleghany Mountains has probably been the most notable feature of American history since the close of the Seven Years' War (1763). Kentucky was the first settlement in this movement, the first state west of the Alleghany Mountains admitted into the Union. In 1763 the Kentucky country was claimed by the Cherokees as a part of their hunting grounds, by the Six Nations (Iroquois) as a part of their western conquests, and by Virginia as a part of the territory granted to her by her charter of 1609, although it was actually inhabited only by a few Chickasaws near the Mississippi river and by a small tribe of Shawnees in the north, opposite what is now Portsmouth, Ohio. The early settlers were often attacked by Indian raiders from what is now Tennessee or from the country north of the Ohio, but the work of colonization would have been far more difficult if those Indians had lived in the Kentucky region itself. Dr Thomas Walker (1715–1794), as an agent and surveyor of the Loyal Land Company, made an exploration in 1750 into the present state from the Cumberland Gap, in search of a suitable place for settlement but did not get beyond the mountain region. In the next year Christopher Gist, while on a similar mission for the Ohio Company, explored the country westward from the mouth of the Scioto river. In 1752 John Finley, an Indian trader, descended the Ohio river in a canoe to the site of Louisville. It was Finley's descriptions that attracted Daniel Boone, and soon after Boone's first visit, in 1767, travellers through the Kentucky region became numerous. The first permanent English settlement was established at Harrodsburg in 1774 by James Harrod, and in October of the same year the Ohio Indians, having been defeated by Virginia troops in the battle of Point Pleasant (in what is now West Virginia), signed a treaty by which they surrendered their claims south of the Ohio river. In March 1775 Richard Henderson and some North Carolina land speculators met about 1200 Cherokee Indians in council on the Watauga river and concluded a treaty with them for the purchase of all the territory south of the Ohio river and between the Kentucky and Cumberland rivers. The purchase was named Transylvania, and within less than a month after the treaty was signed, Boone, under its auspices, founded a settlement at Boonesborough which became the headquarters of the colony. The title was declared void by the Virginia government in 1778, but Henderson and his associates received 200,000 acres in compensation, and all sales made to actual settlers were confirmed. During the War of Independence the colonists were almost entirely neglected by Virginia and were compelled to defend themselves against the Indians who were often under British leadership. Boonesborough was attacked in April and in July 1777 and in August 1778. Bryant's (or Bryan's) Station, near Lexington, was besieged in August 1782 by about 600 Indians under the notorious Simon Girty, who after raising the siege drew the defenders, numbering fewer than 200, into an ambush and in the battle of Blue Licks which ensued the Kentuckians lost about 67 killed and 7 prisoners. Kentucky county, practically coterminous with the present state of Kentucky and embracing all the territory claimed by Virginia south of the Ohio river and west of Big Sandy Creek and the ridge of the Cumberland Mountains, was one of three counties which was formed out of Fincastle county in 1776. Four years later, this in turn was divided into three counties, Jefferson, Lincoln and Fayette, but the name Kentucky was revived in 1782 and was given to the judicial district which was then organized for these three counties. The War of Independence was followed by an extensive immigration from Virginia, Maryland and North Carolina[1] of a population of which fully 95%, excluding negro slaves, were of pure English, Scotch or Scotch-Irish descent. The manners, customs and institutions of Virginia were transplanted beyond the mountains. There was the same political rivalry between the slave-holding farmers of the Blue Grass Region and the "poor whites" of the mountain districts that there was in Virginia between the tide-water planters and the mountaineers. Between these extremes were the small farmers of the "Barrens"[2] in Kentucky and of the Piedmont Region in Virginia. The aristocratic influences in both states have always been on the Southern and Democratic side, but while they were strong enough in Virginia to lead the state into secession thev were unable to do so in Kentucky.

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[1] Most of the early settlers of Kentucky made their way thither either by the Ohio river (from Fort Pitt) or—the far larger number—by way of the Cumberland Gap and the "Wilderness Road." This latter route began at Inglis's Ferry, on the New river, in what is now West Virginia, and proceeded west by south to the Cumberland Gap. The "Wilderness Road," as marked by Daniel Boone in 1775, was a mere trail, running from the Watauga settlement in east Tennessee to the Cumberland Gap, and thence by way of what are now Crab Orchard, Danville and Bardstown, to the Falls of the Ohio, and was passable only for men and horses until 1795, when the state made it a wagon road. Consult Thomas Speed, *The Wilderness Road* (Louisville, Ky., 1886), and Archer B. Hulbert, *Boone's Wilderness Road* (Cleveland, O., 1903).

[2] The "Barrens" were in the north part of the state west of the Blue Grass Region, and were so called merely because the Indians had burned most of the forests here in order to provide better pasturage for buffaloes and other game.

At the close of the War of Independence the Kentuckians complained because the mother state did not protect them against their enemies and did not give them an adequate system of local government. Nine conventions were held at Danville from 1784 to 1790 to demand separation from Virginia. The Virginia authorities expressed a willingness to grant the demand provided Congress would admit the new district into the Union as a state. The delay, together with the proposal of John Jay, the Secretary for Foreign Affairs and commissioner to negotiate a commercial treaty with the Spanish envoy, to surrender navigation rights on the lower Mississippi for twenty-five years in order to remove the one obstacle to the negotiations, aroused so much feeling that General James Wilkinson and a few other leaders began to intrigue not only for a separation from Virginia, but also from the United States, and for the formation of a close alliance with the Spanish at New Orleans. Although most of the settlers were too loyal to be led into any such plot they generally agreed that it might have a good effect by bringing pressure to bear upon the Federal government. Congress passed a preliminary act in February 1791, and the state was formally admitted into the Union on the 1st of June 1792. In the Act of 1776 for dividing Fincastle county, Virginia, the ridge of the Cumberland Mountains was named as a part of the east boundary of Kentucky; and now that this ridge had become a part of the boundary between the states of Virginia and Kentucky they, in 1799, appointed a joint commission to run the boundary line on this ridge. A dispute with Tennessee over the southern boundary was settled in a similar manner in 1820.[1] The constitution of 1792 provided for manhood suffrage and for the election of the governor and of senators by an electoral college. General Isaac Shelby was the first governor. The people still continued to have troubles with the Indians and with the Spanish at New Orleans. The Federal government was slow to act, but its action when taken was effective. The power of the Indians was overthrown by General Anthony Wayne's victory in the battle of Fallen Timbers, fought the 20th of August 1794 near the rapids of the Maumee river a few miles above the site of Toledo, Ohio; and the Mississippi question was settled temporarily by the treaty of 1795 and permanently by the purchase of Louisiana in 1803. In 1798–1799 the legislature passed the famous Kentucky Resolutions in protest against the alien and sedition acts.

For several years the Anti-Federalists or Republicans had contended that the administration at Washington had been exercising powers not warranted by the constitution, and when Congress had passed the alien and sedition laws the leaders of that party seized upon the event as a proper occasion for a spirited public protest which took shape principally in resolutions passed by the legislatures of Kentucky and Virginia. The original draft of the Kentucky Resolutions of 1798 was prepared by Vice-President Thomas Jefferson, although the fact that he was the author of them was kept from the public until he acknowledged it in 1821. They were introduced in the House of Representatives by John Breckinridge on the 8th of November, were passed by that body with some amendments but with only one dissenting vote on the 10th, were unanimously concurred in by the Senate on the 13th, and were approved by Governor James Garrard on the 16th. The first resolution was a statement of the ultra states'-rights view of the relation of the states to the Federal government[2] and subsequent resolutions declare the alien and sedition laws unconstitutional and therefore "void and of no force," principally on the ground that they provided for an exercise of powers which were reserved to the state. The resolutions further declare that "this Commonwealth is determined, as it doubts not its co-states are, tamely to submit to undelegated and therefore unlimited powers in no man or body of men on earth," and that "these and successive acts of the same character, unless arrested on the threshold, may tend to drive these states into revolution and blood." Copies of the resolutions were sent to the governors of the various states, to be laid before the different state legislatures, and replies were received from Connecticut, Delaware, Massachusetts, New Hampshire, New York, Rhode Island, Vermont and Virginia, but all except that from Virginia were unfavourable. Nevertheless the Kentucky legislature on the 22nd of November 1799 reaffirmed in a new resolution the principles it had laid down in the first series, asserting in this new resolution that the state "does now unequivocally declare its attachment to the Union, and to that compact [the Constitution], agreeably to its obvious and real intention, and will be among the last to seek its dissolution," but that "the principle and construction contended for by sundry of the state legislatures, that the General Government is the exclusive judge of the extent of the powers delegated to it, stop nothing [short] of *despotism*—since the discretion of those who administer the government, and not the *Constitution*, would be the measure of their powers," "that the several states who formed that instrument, being sovereign and independent, have the unquestionable right to judge of the infraction," and "that a *nullification by those sovereignties of all unauthorized acts done under color of that instrument is the rightful remedy*." These measures show that the state was Democratic-Republican in its politics and pro-French in its sympathies, and that it was inclined to follow the leadership of that state from which most of its people had come.

The constitution of 1799 adopted the system of choosing the governor and senators by popular vote and deprived the supreme court of its original jurisdiction in land cases. The Burr conspiracy (1804–1806) aroused some excitement in the state. Many would have followed Burr in a filibustering attack upon the Spanish in the South-West, but scarcely any would have approved of a separation of Kentucky from the Federal Union. No battles were fought in Kentucky during the War of 1812, but her troops constituted the greater part of the forces under General William Henry Harrison. They took part in the operations at Fort Wayne, Fort Meigs, the river Raisin and the Thames.

The Democratic-Republicans controlled the politics of the state without any serious opposition until the conflict in 1820–1826, arising from the demands for a more adequate system of currency and other measures for the relief of delinquent debtors divided the state into what were known as the relief and anti-relief parties. After nearly all the forty-six banks chartered by the legislature in 1818 had been wrecked in the financial panic of 1819, the legislature in 1820 passed a series of laws designed for the benefit of the debtor class, among them one making state bank notes a legal tender for all debts. A decision of the Clark county district court declaring this measure unconstitutional was affirmed by the court of appeals. The legislature in 1824 repealed all of the laws creating the existing court of appeals and then established a new one. This precipitated a bitter campaign between the anti-relief or "old court" party and the relief or "new court" party, in which the former was successful. The old court party followed the lead of Henry Clay and John Quincy Adams in national politics, and became National Republicans and later Whigs. The new court party followed Andrew Jackson and Martin Van Buren and became Democrats. The electoral vote of the state was cast for Jackson in 1828 and for Clay in 1832. During the next thirty years Clay's conservative influence dominated the politics of the state.[1] Kentucky voted the Whig ticket in every presidential election from 1832 until the party made its last campaign in 1852. When the Whigs were destroyed by the slavery issue some of them immediately became Democrats, but the majority became Americans, or Know-Nothings. They elected the governor in 1855 and almost succeeded in carrying the state for their presidential ticket in 1856. In 1860 the people of Kentucky were drawn toward the South by their interest in slavery and by their social relations, and toward the North by business ties and by a national sentiment which was fostered by the Clay traditions. They naturally assumed the leadership in the Constitutional Union movement of 1860, casting the vote of the state for Bell and Everett. After the election of President Lincoln they also led in the movement to secure the adoption of the Crittenden Compromise or some other peaceful solution of the difficulties between the North and the South.

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[1] The southern boundary to the Tennessee river was surveyed in 1779–1780 by commissioners representing Virginia and North Carolina, and was supposed to be run along the parallel of latitude 36° 30′, but by mistake was actually run north of that parallel. By a treaty of 1819 the Indian title to the territory west of the Tennessee was extinguished, and commissioners then ran a line along the parallel of 36° 30′ from the Mississippi to the Tennessee. In 1820 commissioners representing Kentucky and Tennessee formally adopted the line of 1779–1780 and the line of 1819 as the boundary between the two states.

[2] This resolution read as follows: Resolved, that the several states composing the United States of America are not united on the principle of unlimited submission to their general government; but that by compact under the style of a Constitution for the United States and of amendments thereto, they constituted a general government for special purposes, delegated to that government certain definite powers, reserving each state to itself the residuary mass of right to their own self-government; and that whensoever the general government assumes undelegated powers its acts are unauthoritative, void, and of no force: That to this compact each state acceded as a state, and is an integral party, its co-states forming, as to itself, the other party: That the government created by this compact was not made the exclusive or final judge of the extent of the powers delegated to itself, since that would have made its discretion, and not the Constitution, the measure of its powers; but that, as in all other cases of compact among parties having no common judge, each party has an equal right to judge for itself as well of infractions as of the mode and measure of redress. . .

A large majority of the state legislature, however, were Democrats, and in his message to this body, in January 1861, Governor Magoffin, also a Democrat, proposed that a convention be called to determine "the future of Federal and inter-state relations of Kentucky;" later too, in reply to the president's call for volunteers, he declared, "Kentucky will furnish no troops for the wicked purpose of subduing her sister Southern States." Under these conditions the Unionists asked only for the maintenance of neutrality, and a resolution to this effect was carried by a bare majority—48 to 47. Some of the secessionists took this as a defeat and left the state immediately to join the Confederate ranks. In the next month there was an election of congressmen, and an anti-secession candidate was chosen in nine out of ten districts. An election in August of one-half the Senate and all of the House of Representatives resulted in a Unionist majority in the new legislature of 103 to 35, and in September, after Confederate troops had begun to invade the state, Kentucky formally declared its allegiance to the Union. From September 1861 to the fall of Fort Donelson in February 1862 that part of Kentucky which is south and west of the Green River was occupied by the Confederate army under General A. S. Johnston, and at Russellville in that district a so-called "sovereignty convention" assembled on the 18th of November. This body, composed mostly of Kentucky men who had joined the Confederate army, passed an ordinance of secession, elected state officers, and sent commissioners to the Confederate Congress, which body voted on the 9th of December to admit Kentucky into the Confederacy. Throughout the war Kentucky was represented in the Confederate Congress—representatives and senators being elected by Confederate soldiers from the state. The officers of this "provisional government," headed by G. W. Johnson, who had been elected "governor," left the state when General A. S. Johnston withdrew; Johnson himself was killed at Shiloh, but an attempt was subsequently made by General Bragg to install this government at Frankfort. General Felix K. Zollicoffer (1812–1862) had entered the south-east part of the state through Cumberland Gap in September, and later with a Confederate force of about 7000 men attempted the invasion of central Kentucky, but in October 1861 he met with a slight repulse at Wild Cat Mountain, near London, Laurel county, and on the 19th of January 1862, in an engagement near Mill Springs, Wayne county, with about an equal force under General George H. Thomas, he was killed and his force was utterly routed. In 1862 General Braxton Bragg in command of the Confederates in eastern Tennessee, eluded General Don Carlos Buell, in command of the Federal Army of the Ohio stationed there, and entering Kentucky in August 1862 proceeded slowly toward Louisville, hoping to win the state to the Confederate cause and gain recruits for the Confederacy in the state. His main army was preceded by a division of about 15,000 men under General Edmund Kirby Smith, who on the 30th of August defeated a Federal force under General Wm. Nelson near Richmond and threatened Cincinnati. Bragg met with little opposition on his march, but Buell, also marching from eastern Tennessee, reached Louisville first (Sept. 24), turned on Bragg, and forced him to withdraw. On his retreat, Bragg attempted to set up a Confederate government at Frankfort, and Richard J. Hawes, who had been chosen as G. W. Johnson's successor, was actually "inaugurated," but naturally this state "government" immediately collapsed. On the 8th of October Buell and Bragg fought an engagement at Perryville which, though tactically indecisive, was a strategic victory for Buell; and thereafter Bragg withdrew entirely from the state into Tennessee. This was the last serious attempt on a large scale by the Confederates to win Kentucky; but in February 1863 one of General John H. Morgan's brigades made a raid on Mount Sterling and captured it; in March General Pegram made a raid into Pulaski county; in March 1864 General N. B. Forrest assaulted Fort Anderson at Paducah but failed to capture it; and in June General Morgan made an unsuccessful attempt to take Lexington.

Although the majority of the people sympathized with the Union, the emancipation of the slaves without compensation even to loyal owners, the arming of negro troops, the arbitrary imprisonment of citizens and the interference of Federal military officials in purely civil affairs aroused so much feeling that the state became strongly Democratic, and has remained so almost uniformly since the war. Owing to the panic of 1893, distrust of the free silver movement and the expenditure of large campaign funds, the Republicans were successful in the gubernational election of 1895 and the presidential election of 1896. The election of 1899 was disputed. William S. Taylor, Republican, was inaugurated governor on the 12th of December, but the legislative committee on contests decided in favour of the Democrats. Governor-elect Goebel was shot by an assassin on the 30th of January 1900, was sworn into office on his deathbed, and died on the 3rd of February. Taylor fled the state to escape trial on the charge of murder. Lieutenant-Governor Beckham filled out the unexpired term and was re-elected in 1903. In 1907 the Republicans again elected their candidate for governor.

GOVERNORS OF KENTUCKY

Isaac Shelby	Democratic-Republican	1792–1796
James Garrard	,, ,,	1796–1804
Christopher Greenup	,, ,,	1804–1808
Charles Scott	,, ,,	1808–1812
Isaac Shelby	,, ,,	1812–1816
George Madison*	,, ,,	1816
Gabriel Slaughter (acting)	,, ,,	1816–1820
John Adair	,, ,,	1820–1824
Joseph Desha	,, ,,	1824–1828
Thomas Metcalfe	National ,,	1828–1832
John Breathitt*	Democrat	1832–1834
James T. Morehead (acting)	,,	1834–1836
James Clark*	Whig	1836
Charles A. Wickliffe (acting)	,,	1836–1840
Robert P. Letcher	,,	1840–1844
William Owsley	,,	1844–1848
John J. Crittenden†	,,	1848–1850
John L. Helm†	Democrat	1850–1851
Lazarus W. Powell	,,	1851–1855
Charles S. Morehead	American	1855–1859
Beriah Magoffin	Democrat	1859–1862
James F. Robinson	,,	1862–1863
Thomas E. Bramlette	,,	1863–1867
John L. Helm*	,,	1867
John W. Stevenson‡	,,	1867–1871
Preston H. Leslie‡	,,	1871–1875
James B. McCreary	,,	1875–1879
Luke P. Blackburn	,,	1879–1883
J. Proctor Knott	,,	1883–1887
Simon B. Buckner	,,	1887–1891
John Y. Brown	,,	1891–1895

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[1] He died in 1852, but the traditions which he represented survived.

Governors of Kentucky—*continued*

William O. Bradley	Republican	1895–1899
William S. Taylor §	„	1899–1900
William Goebel*	Democrat	1900
J. C. W. Beckham	„	1900–1907
Augustus E. Willson	Republican	1907–

* Died in office.

† Governor Crittenden resigned on the 31st of July to become Attorney-General of the United States and John L. Helm served out the unexpired term.

‡ Governor Stevenson resigned on the 13th of February 1871 to become U.S. Senator from Kentucky. P. H. Leslie filled out the remainder of the term and was elected in 1871 for a full term.

§ Taylor's election was contested by Goebel, who received the certificate of election.

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KENYA, a great volcanic mountain in British East Africa, situated just south of the equator in 37° 20′ E. It is one of the highest mountains of Africa, its highest peak reaching an altitude of 17,007 ft. (with a possible error of 30 ft. either way). The central core, which consists of several steep pyramids, is that of a very denuded old volcano, which when its crater was complete may have reached 2000 ft. above the present summit. Lavas dip in all directions from the central crystalline core, pointing to the conclusion that the main portion of the mountain represents a single volcanic mass. From the central peaks, of which the axis runs from W.N.W. to S.S.E., ridges radiate outwards, separated by broad valleys, ending upwards in vast cirques. The most important ridges centre in the peak Lenana (16,300 ft.) at the eastern end of the central group, and through it runs the chief water-parting of the mountain, in a generally north to south direction. Three main valleys, known respectively as Hinde, Gorges and Hobley valleys, run down from this to the east, and four—Mackinder, Hausberg, Teleki and Höhnel—to the west. From the central peaks fifteen glaciers, all lying west of the main divide, descend to the north and south, the two largest being the Lewis and Gregory glaciers, each about 1 m. long, which, with the smaller Kolb glacier, lie immediately west of the main divide. Most of the glaciers terminate at an altitude of 14,800–14,900 ft., but the small César glacier, drained to the Hausberg valley, reaches to 14,450. Glaciation was formerly much more extensive, old moraines being observed down to 12,000 ft. In the upper parts of the valleys a number of lakes occur, occupying hollows and rock basins in the agglomerates and ashes, fed by springs, and feeding many of the streams that drain the mountain slopes. The largest of these are Lake Höhnel, lying at an altitude of 14,000 ft., at the head of the valley of the same name, and measuring 600 by 400 yds.; and Lake Michaelson (12,700 ft.?) in the Gorges Valley. At a distance from the central core the radiating ridges become less abrupt and descend with a gentle gradient, finally passing somewhat abruptly, at a height of some 7000 ft., into the level plateau. These outer slopes are clothed with dense forest and jungle, composed chiefly of junipers and *Podocarpus*, and between 8000 and 9800 ft. of huge bamboos. The forest zone extends to about 10,500 ft., above which is the steeper alpine zone, in which pasturages alternate with rocks and crags. This extends to a general height of about 15,000 ft., but in damp, sheltered valleys the pasturages extend some distance higher. The only trees or shrubs in this zone are the giant *Senecio* (groundsel) and *Lobelia*, and tree-heaths, the *Senecio* forming groves in the upper valleys. Of the fauna of the lower slopes, tracks of elephant, leopard and buffalo have been seen, between 11,500 and 14,500 ft. That of the alpine zone includes two species of dassy (*Procavia*), a coney (*Hyrax*), and a rat (*Otomys*). The bird fauna is of considerable interest, the finest species of the upper zone being an eagle-owl, met with at 14,000 ft. At 11,000 ft. was found a brown chat, with a good deal of white in the tail. Both the fauna and flora of the higher levels present close affinities with those of Mount Elgon, of other mountains of East Africa and of Cameroon Mountain. The true native names of the mountain are said to be Kilinyaga, Doenyo Ebor (white mountain) and Doenyo Egeri (spotted mountain). It was first seen, from a distance, by the missionary Ludwig Krapf in 1849; approached from the west by Joseph Thomson in 1883; partially ascended by Count S. Teleki (1889), J. W. Gregory (1893) and Georg Kolb (1896); and its summit reached by H. J. Mackinder in 1899.

See J. W. Gregory, *The Great Rift-Valley* (London, 1896); H. J. Mackinder, "Journey to the Summit of Mount Kenya," *Geog. Jnl.*, May 1900. (E. He.)

KENYON, LLOYD KENYON, 1st Baron (1732–1802), lord chief-justice of England, was descended by his father's side from an old Lancashire family; his mother was the daughter of a small proprietor in Wales. He was born at Gredington, Flintshire, on the 5th of October 1732. Educated at Ruthin grammar school, he was in his fifteenth year articled to an attorney at Nantwich, Cheshire. In 1750 he entered at Lincoln's Inn, London, and in 1756 was called to the bar. As for several years he was almost unemployed, he utilized his leisure in taking notes of the cases argued in the court of King's Bench, which he afterwards published. Through answering the cases of his friend John Dunning, afterwards Lord Ashburton, he gradually became known to the attorneys, after which his success was so rapid that in 1780 he was made king's counsel. He showed conspicuous ability in the cross-examination of the witnesses at the trial of Lord George Gordon, but his speech was so tactless that the verdict of acquittal was really due to the brilliant effort of Erskine, the junior counsel. This want of tact, indeed, often betrayed Kenyon into striking blunders; as an advocate he was, moreover, deficient in ability of statement; and his position was achieved chiefly by hard work, a good knowledge of law and several lucky friendships. Through the influence of Lord Thurlow, Kenyon in 1780 entered the House of Commons as member for Hindon, and in 1782 he was, through the same friendship, appointed attorney-general in Lord Buckingham's administration, an office which he continued to hold under Pitt. In 1784 he received the mastership of the rolls, and was created a baronet. In 1788 he was appointed lord chief justice as successor to Lord Mansfield, and the same year was raised to the peerage as Baron Kenyon of Gredington. As he had made many enemies, his elevation was by no means popular with the bar; but on the bench, in spite of his capricious and choleric temper, he proved himself not only an able lawyer, but a judge of rare and inflexible impartiality. He died at Bath, on the 4th of April 1802. Kenyon was succeeded as 2nd baron by his son George (1776–1855), whose great-grandson, Lloyd (b. 1864), became the 4th baron in 1869.

See *Life* by Hon. G. T. Kenyon, 1873.

KEOKUK, a city of Lee county, Iowa, U.S.A., on the Mississippi river, at the mouth of the Des Moines, in the S.E. corner of the state, about 200 m. above St Louis. Pop. (1900), 14,641; (1905), 14,604, including 1534 foreign-born; (1910), 14,008. It is served by the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Wabash, and the Toledo, Peoria & Western railways. There is a bridge (about 2200 ft. long) across the Mississippi, and another (about 1200 ft. long) across the Des Moines. The city has a public library and St Joseph and Graham hospitals, and is the seat of the Keokuk Medical College (1849). There is a national cemetery here. Much of the city is built on bluffs along the Mississippi. Keokuk is at the foot of the Des Moines Rapids, round which the Federal Government has constructed a navigable canal (opened 1877) about 9 m. long, with a draft at extreme low water of 5 ft.; at the foot a great dam, 1½ m. long and 38 ft. high, has been constructed. Keokuk has various manufactures; its factory product in 1905 was valued at $4,225,915, 38·6% more than in 1900. The city was named after Keokuk, a chief of the Sauk and Foxes (1780–1848), whose name meant "the watchful" or "he who moves alertly." In spite of Black Hawk's war policy in 1832 Keokuk was passive and neutral, and with a portion of his nation remained peaceful while Black Hawk and his warriors fought. His grave, surmounted by a monument, is in Rand Park. The first house on the site of the city was built about 1820, but further settlement did not begin until 1836. Keokuk was laid out as a town in 1837, was chartered as a city in 1848, and in 1907 was one of five cities of the state governed by a special charter.

KEONJHAR, a tributary state of India, within the Orissa division of Bengal; area, 3096 sq. m.; pop. (1901), 285,758; estimated revenue, £20,000. The state is an offshoot from Mayurbhanj. Part of it consists of rugged hills, rising to more than 3000 ft. above sea-level. The residence of the raja is at Keonjhar (pop. 4532).

KEONTHAL, a petty hill state in the Punjab, India, with an area of 116 sq. m.; pop. (1901), 22,499; estimated revenue, £4400. The chief, a Rajput, received the title of raja in 1857. After the Gurkha War in 1815, a portion of Keonthal, which had been occupied by the Gurkhas, was sold to the maharaja of Patiala, the remainder being restored to its hereditary chief. In 1823 the district of Punar was added to the Keonthal state. The raja exercises rights of lordship over the petty states of Kothi, Theog, Madhan and Ratesh.

KEPLER, JOHANN (1571–1630), German astronomer, was born on the 27th of December 1571, at Weil, in the duchy of Württemberg, of which town his grandfather was burgomaster. He was the eldest child of an ill-assorted union. His father, Henry Kepler, was a reckless soldier of fortune; his mother, Catherine Guldenmann, the daughter of the burgomaster of Eltingen, was undisciplined and ill-educated. Her husband found campaigning in Flanders under Alva a welcome relief from domestic life; and, after having lost all he possessed by a forfeited security and tried without success the trade of tavern-keeping in the village of Elmendingen, he finally, in 1589, deserted his family. The misfortune and misconduct of his parents were not the only troubles of Kepler's childhood. He recovered from small-pox in his fourth year with crippled hands and eyesight permanently impaired; and a constitution enfeebled by premature birth had to withstand successive shocks of severe illness. His schooling began at Leonberg in 1577—the year, as he himself tells us, of a great comet; but domestic bankruptcy occasioned his transference to field-work, in which he was exclusively employed for several years. Bodily infirmity, combined with mental aptitude, were eventually considered to indicate a theological vocation; he was, in 1584, placed at the seminary of Adelberg, and thence removed, two years later, to that of Maulbronn. A brilliant examination for the degree of bachelor procured him, in 1588, admittance on the foundation to the university of Tübingen, where he laid up a copious store of classical erudition, and imbibed Copernican principles from the private instructions of his teacher and life-long friend, Michael Maestlin. As yet, however, he had little knowledge of, and less inclination for, astronomy; and it was with extreme reluctance that he turned aside from the more promising career of the ministry to accept, early in 1594, the vacant chair of that science at Gratz, placed at the disposal of the Tübingen professors by the Lutheran states of Styria.

The best recognized function of German astronomers in that day was the construction of prophesying almanacs, greedily bought by a credulous public. Kepler thus found that the first duties required of him were of an astrological nature, and set himself with characteristic alacrity to master the rules of the art as laid down by Ptolemy and Cardan. He, moreover, sought in the events of his own life a verification of the theory of planetary influences; and it is to this practice that we owe the summary record of each year's occurrences which, continued almost to his death, affords for his biography a slight but sure foundation. But his thoughts were already working in a higher sphere. He early attained to the settled conviction that for the actual disposition of the solar system some abstract intelligible reason must exist, and this, after much meditation, he believed himself to have found in an imaginary relation between the "five regular solids" and the number and distances of the planets. He notes with exultation the 9th of July 1595, as the date of the pseudo-discovery, the publication of which in *Prodromus Dissertationum Cosmographicarum seu Mysterium Cosmographicum* (Tübingen, 1596) procured him much fame, and a friendly correspondence with the two most eminent astronomers of the time, Tycho Brahe and Galileo.

Soon after his arrival at Gratz, Kepler contracted an engagement with Barbara von Mühleck, a wealthy Styrian heiress, who, at the age of twenty-three, had already survived one husband and been divorced from another. Before her relatives could be brought to countenance his pretensions, Kepler was obliged to undertake a journey to Württemberg to obtain documentary evidence of the somewhat obscure nobility of his family, and it was thus not until the 27th of April 1597 that the marriage was celebrated. In the following year the archduke Ferdinand, on assuming the government of his hereditary dominions, issued an edict of banishment against Protestant preachers and professors. Kepler immediately fled to the Hungarian frontier, but, by the favour of the Jesuits, was recalled and reinstated in his post. The gymnasium, however, was deserted; the nobles of Styria began to murmur at subsidizing a teacher without pupils; and he found it prudent to look elsewhere for employment. His refusal to subscribe unconditionally to the rigid formula of belief adopted by the theologians of Tübingen permanently closed against him the gates of his *alma mater*. His embarrassment was relieved however by an offer from Tycho Brahe of the position of assistant in his observatory near Prague, which, after a preliminary visit of four months, he accepted. The arrangement was made just in time; for in August 1600 he received definitive notice to leave Gratz, and, having leased his wife's property, he departed with his family for Prague.

By Tycho's unexpected death (Oct. 24, 1601) a brilliant career seemed to be thrown open to Kepler. The emperor Rudolph II.

immediately appointed him to succeed his patron as imperial mathematician, although at a reduced salary of 500 florins; the invaluable treasure of Tycho's observations was placed at his disposal; and the laborious but congenial task was entrusted to him of completing the tables to which the grateful Dane had already affixed the title of *Rudolphine*. The first works executed by him at Prague were, nevertheless, a homage to the astrological proclivities of the emperor. In *De fundamentis astrologiae certioribus* (Prague, 1602) he declared his purpose of preserving and purifying the grain of truth which he believed the science to contain. Indeed, the doctrine of "aspects" and "influences" fitted excellently with his mystical conception of the universe, and enabled him to discharge with a semblance of sincerity the most lucrative part of his professional duties. Although he strictly limited his prophetic pretensions to the estimate of tendencies and probabilities, his forecasts were none the less in demand. Shrewd sense and considerable knowledge of the world came to the aid of stellar lore in the preparation of "prognostics" which, not unfrequently hitting off the event, earned him as much credit with the vulgar as his cosmical speculations with the learned. He drew the horoscopes of the emperor and Wallenstein, as well as of a host of lesser magnates; but, though keenly alive to the unworthy character of such a trade, he made necessity his excuse for a compromise with superstition. "Nature," he wrote, "which has conferred upon every animal the means of subsistence, has given astrology as an adjunct and ally to astronomy." He dedicated to the emperor in 1603 a treatise on the "great conjunction" of that year (*Judicium de trigono igneo*); and he published his observations on a brilliant star which appeared suddenly (Sept. 30, 1604), and remained visible for seventeen months, in *De stella nova in pede Serpentarii* (Prague, 1606). While sharing the opinion of Tycho as to the origin of such bodies by condensation of nebulous matter from the Milky Way, he attached a mystical signification to the coincidence in time and place of the sidereal apparition with a triple conjunction of Mars, Jupiter and Saturn.

The main task of his life was not meanwhile neglected. This was nothing less than the foundation of a new astronomy, in which physical cause should replace arbitrary hypothesis. A preliminary study of optics led to the publication, in 1604, of his *Astronomiae pars optica*, containing important discoveries in the theory of vision, and a notable approximation towards the true law of refraction. But it was not until 1609 that, the "great Martian labour" being at length completed, he was able, in his own figurative language, to lead the captive planet to the foot of the imperial throne. From the time of his first introduction to Tycho he had devoted himself to the investigation of the orbit of Mars, which, on account of its relatively large eccentricity, had always been especially recalcitrant to theory, and the results appeared in *Astronomia nova αἰτιολογητός, seu Physica coelestis tradita commentariis de motibus stellae Martis* (Prague, 1609). In this, the most memorable of Kepler's multifarious writings, two of the cardinal principles of modern astronomy—the laws of elliptical orbits and of equal areas—were established (see Astronomy: *History*); important truths relating to gravity were enunciated, and the tides ascribed to the influence of lunar attraction; while an attempt to explain the planetary revolutions in the then backward condition of mechanical knowledge produced a theory of vortices closely resembling that afterwards adopted by Descartes. Having been provided, in August 1610, by Ernest, archbishop of Cologne, with one of the new Galilean instruments, Kepler began, with unspeakable delight, to observe the wonders revealed by it. He had welcomed with a little essay called *Dissertatio cum Nuncio Sidereo* Galileo's first announcement of celestial novelties; he now, in his *Dioptrice* (Augsburg, 1611), expounded the theory of refraction by lenses, and suggested the principle of the "astronomical" or inverting telescope. Indeed the work may be said to have founded the branch of science to which it gave its name.

The year 1611 was marked by Kepler as the most disastrous of his life. The death by small-pox of his favourite child was followed by that of his wife, who, long a prey to melancholy, was on the 3rd of July carried off by typhus. Public calamity was added to private bereavement. On the 23rd of May 1611 Matthias, brother of the emperor, assumed the Bohemian crown in Prague, compelling Rudolph to take refuge in the citadel, where he died on the 20th of January following. Kepler's fidelity in remaining with him to the last did not deprive him of the favour of his successor. Payments of arrears, now amounting to upwards of 4000 florins, was not, however, in the desperate condition of the imperial finances, to be hoped for; and he was glad, while retaining his position as court astronomer, to accept (in 1612) the office of mathematician to the states of Upper Austria. His residence at Linz was troubled by the harsh conduct of the pastor Hitzler, in excluding him from the rites of his church on the ground of supposed Calvinistic leanings—a decision confirmed, with the addition of an insulting reprimand, on his appeal to Württemberg. In 1613 he appeared with the emperor Matthias before the diet of Ratisbon as the advocate of the introduction into Germany of the Gregorian calendar; but the attempt was for the time frustrated by anti-papal prejudice. The attention devoted by him to chronological subjects is evidenced by the publication about this period of several essays in which he sought to prove that the birth of Christ took place five years earlier than the commonly accepted date.

Kepler's second courtship forms the subject of a highly characteristic letter addressed by him to Baron Stralendorf, in which he reviews the qualifications of eleven candidates for his hand, and explains the reasons which decided his choice in favour of a portionless orphan girl named Susanna Reutlinger. The marriage was celebrated at Linz, on the 30th of October 1613, and seems to have proved a happy and suitable one. The abundant vintage of that year drew his attention to the defective methods in use for estimating the cubical contents of vessels, and his essay on the subject (*Nova Stereometria Doliorum*, Linz, 1615) entitles him to rank among those who prepared the discovery of the infinitesimal calculus. His observations on the three comets of 1618 were published in *De Cometis*, contemporaneously with *De Harmonice Mundi* (Augsburg, 1619), of which the first lineaments had been traced twenty years previously at Gratz. This extraordinary production is memorable as having announced the discovery of the "third law"—that of the sesquiplicate ratio between the planetary periods and distances. But the main purport of the treatise was the exposition of an elaborate system of celestial harmonies depending on the various and varying velocities of the several planets, of which the sentient soul animating the sun was the solitary auditor. The work exhibiting this fantastic emulation of extravagance with genius was dedicated to James I. of England, and the compliment was acknowledged with an invitation to that island, conveyed through Sir Henry Wotton. Notwithstanding the distracted state of his own country, he refused to abandon it, as he had previously, in 1617, declined the post of successor to G. A. Magini in the mathematical chair of Bologna.

The insurmountable difficulties presented by the lunar theory forced Kepler, after an enormous amount of fruitless labour, to abandon his design of comprehending the whole scheme of the heavens in one great work to be called *Hipparchus*, and he then threw a portion of his materials into the form of a dialogue intended for the instruction of general readers. The *Epitome Astronomiae Copernicanae* (Linz and Frankfort, 1618–1621), a lucid and attractive textbook of Copernican science, was remarkable for the prominence given to "physical astronomy," as well as for the extension to the Jovian system of the laws recently discovered to regulate the motions of the planets. The first of a series of ephemerides, calculated on these principles, was published by him at Linz in 1617; and in that for 1620, dedicated to Baron Napier, he for the first time employed logarithms. This important invention was eagerly welcomed by him, and its theory formed the subject of a treatise entitled *Chilias Logarithmorum*, printed in 1624, but circulated in manuscript three years earlier, which largely contributed to bring the new method into general use in Germany.

His studies were interrupted by family trouble. The restless disposition and unbridled tongue of Catherine Kepler, his mother, created for her numerous enemies in the little town of Leonberg; while her unguarded conduct exposed her to a species of calumny at that time readily circulated and believed. As early as 1615 suspicions of sorcery began to be spread against her, which she, with more spirit than prudence, met with an action for libel. The suit was purposely protracted, and at length, in 1620, the unhappy woman, then in her seventy-fourth year, was arrested on a formal charge of witchcraft. Kepler immediately hastened to Württemberg, and owing to his indefatigable exertions she was acquitted after having suffered thirteen month's imprisonment, and endured with undaunted courage the formidable ordeal of "territion," or examination under the imminent threat of torture. She survived her release only a few months, dying on the 13th of April 1622.

Kepler's whole attention was now devoted to the production of the new tables. "Germany," he wrote, "does not long for peace more anxiously than I do for their publication." But financial difficulties, combined with civil and religious convulsions, long delayed the accomplishment of his desires. From the 24th of June to the 29th of August 1626, Linz was besieged, and its inhabitants reduced to the utmost straits by bands of insurgent peasants. The pursuit of science needed a more tranquil shelter; and on the raising of the blockade, Kepler obtained permission to transfer his types to Ulm, where, in September 1627, the *Rudolphine Tables* were at length given to the world. Although by no means free from errors, their value appears from the fact that they ranked for a century as the best aid to astronomy. Appended were tables of logarithms and of refraction, together with Tycho's catalogue of 777 stars, enlarged by Kepler to 1005.

Kepler's claims upon the insolvent imperial exchequer amounted by this time to 12,000 florins. The emperor Ferdinand II., too happy to transfer the burden, countenanced an arrangement by which Kepler entered the service of the duke of Friedland (Wallenstein), who assumed the full responsibility of the debt. In July 1628 Kepler accordingly arrived with his family at Sagan in Silesia, where he applied himself to the printing of his ephemerides up to the year 1636, and whence he issued, in 1629, a *Notice to the Curious in Things Celestial*, warning astronomers of approaching transits. That of Mercury was actually seen by Gassendi in Paris on the 7th of November 1631 (being the first passage of a planet across the sun ever observed); that of Venus, predicted for the 6th of December following, was invisible in western Europe. Wallenstein's promises to Kepler were but imperfectly fulfilled. In lieu of the sums due, he offered him a professorship at Rostock, which Kepler declined. An expedition to Ratisbon, undertaken for the purpose of representing his case to the diet, terminated his life. Shaken by the journey, which he had performed entirely on horseback, he was attacked with fever, and died at Ratisbon, on the 15th of November (N.S.), 1630, in the fifty-ninth year of his age. An inventory of his effects showed him to have been possessed of no inconsiderable property at the time of his death. By his first wife he had five, and by his second seven children, of whom only two, a son and a daughter, reached maturity.

The character of Kepler's genius is especially difficult to estimate. His tendency towards mystical speculation formed a not less fundamental quality of his mind than its strong grasp of positive scientific truth. Without assigning to each element its due value, no sound comprehension of his modes of thought can be attained. His idea of the universe was essentially Pythagorean and Platonic. He started with the conviction that the arrangement of its parts must correspond with certain abstract conceptions of the beautiful and harmonious. His imagination, thus kindled, animated him to those severe labours of which his great discoveries were the fruit. His demonstration that the planes of all the planetary orbits pass through the centre of the sun, coupled with his clear recognition of the sun as the moving power of the system, entitles him to rank as the founder of physical astronomy. But the fantastic relations imagined by him of planetary movements and distances to musical intervals and geometrical constructions seemed to himself discoveries no less admirable than the achievements which have secured his lasting fame. Outside the boundaries of the solar system, the metaphysical side of his genius, no longer held in check by experience, fully asserted itself. The Keplerian like the Pythagorean cosmos was threefold, consisting of the centre, or sun, the surface, represented by the sphere of the fixed stars, and the intermediate space, filled with ethereal matter. It is a mistake to suppose that he regarded the stars as so many suns. He quotes indeed the opinion of Giordano Bruno to that effect, but with dissent. Among his happy conjectures may be mentioned that of the sun's axial rotation, postulated by him as the physical cause of the revolutions of the planets, and soon after confirmed by the discovery of sun-spots; the suggestion of a periodical variation in the obliquity of the ecliptic; and the explanation as a solar atmospheric effect of the radiance observed to surround the totally eclipsed sun.

It is impossible to consider without surprise the colossal amount of work accomplished by Kepler under numerous disadvantages. But his iron industry counted no obstacles, and secured for him the highest triumph of genius, that of having given to mankind the best that was in him. In private character he was amiable and affectionate; his generosity in recognizing the merits of others secured him against the worst shafts of envy; and a life marked by numerous disquietudes was cheered and ennobled by sentiments of sincere piety.

Kepler's extensive literary remains, purchased by the empress Catherine II. in 1724 from some Frankfort merchants, and long inaccessibly deposited in the observatory of Pulkowa, were fully brought to light, under the able editorship of Dr Ch. Frisch, in the first complete edition of his works. This important publication (*Joannis Kepleri opera omnia*, Frankfort, 1858–1871, 8 vols. 8vo) contains, besides the works already enumerated and several minor treatises, a posthumous scientific satire entitled *Joh. Keppleri Somnium* (first printed in 1634) and a vast mass of his correspondence. A careful biography is appended, founded mainly on his private notes and other authentic documents. His correspondence with Herwart von Hohenburg, unearthed by C. Anschütz at Munich, was printed at Prague in 1886.

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KEPPEL, AUGUSTUS KEPPEL, VISCOUNT (1725–1786), British admiral, second son of the second earl of Albemarle, was born on the 25th of April 1725. He went to sea at the age of ten, and had already five years of service to his credit when he was appointed to the "Centurion," and was sent with Anson round the world in 1740. He had a narrow escape of being killed in the capture of Paita (Nov. 13, 1741), and was named acting lieutenant in 1742. In 1744 he was promoted to be commander and post captain. Until the peace of 1748 he was actively employed. In 1747 he ran his ship the "Maidstone" (50) ashore near Belleisle while chasing a French vessel, but was honourably acquitted by a court martial, and reappointed to another command. After peace had been signed he was sent into the Mediterranean to persuade the dey of Algiers to restrain the piratical operations of his subjects. The dey is said to have complained that the king of England should have sent a beardless boy to treat with him, and to have been told that if the beard was the necessary qualification for an ambassador it would have been easy to send a "Billy goat." After trying the effect of bullying without success, the dey made a treaty, and Keppel returned in 1751. During the Seven Years' War he saw constant service. He was in North America in 1755, on the coast of France in 1756, was detached on a cruise to reduce the French settlements on the west coast of Africa in 1758, and his ship the "Torbay" (74) was the first to get into action in the battle of Quiberon in 1759. In 1757 he had formed part of the court martial which had condemned Admiral Byng, and had been active among those who had endeavoured to secure a pardon for him; but neither he nor those who had acted with him could produce any serious reason why the sentence should not be carried out. When Spain joined France in 1762 he was sent as second in command with Sir George Pocock in the expedition which took Havannah. His health suffered from the fever which carried off an immense proportion of the soldiers and sailors, but the

£25,000 of prize money which he received freed him from the unpleasant position of younger son of a family ruined by the extravagance of his father. He became rear-admiral in October 1762, was one of the Admiralty Board from July 1765 to November 1766, and was promoted vice-admiral on the 24th of October 1770. When the Falkland Island dispute occurred in 1770 he was to have commanded the fleet to be sent against Spain, but a settlement was reached, and he had no occasion to hoist his flag. The most important and the most debated period of his life belongs to the opening years of the war of American Independence. Keppel was by family connexion and personal preference a strong supporter of the Whig connexion, led by the Marquess of Rockingham and the Duke of Richmond. He shared in all the passions of his party, then excluded from power by the resolute will of George III. As a member of Parliament, in which he had a seat for Windsor from 1761 till 1780, and then for Surrey, he was a steady partisan, and was in constant hostility with the "King's Friends." In common with them he was prepared to believe that the king's ministers, and in particular Lord Sandwich, then First Lord of the Admiralty, were capable of any villany. When therefore he was appointed to command the Western Squadron, the main fleet prepared against France in 1778, he went to sea predisposed to think that the First Lord would be glad to cause him to be defeated. It was a further misfortune that when Keppel hoisted his flag one of his subordinate admirals should have been Sir Hugh Palliser (1723–1796), who was a member of the Admiralty Board, a member of parliament, and in Keppel's opinion, which was generally shared, jointly responsible with his colleagues for the bad state of the navy. When, therefore, the battle which Keppel fought with the French on the 27th of July 1778 ended in a highly unsatisfactory manner, owing mainly to his own unintelligent management, but partly through the failure of Sir Hugh Palliser to obey orders, he became convinced that he had been deliberately betrayed. Though he praised Sir Hugh in his public despatch he attacked him in private, and the Whig press, with the unquestionable aid of Keppel's friends, began a campaign of calumny to which the ministerial papers answered in the same style, each side accusing the other of deliberate treason. The result was a scandalous series of scenes in parliament and of courts martial. Keppel was first tried and acquitted in 1779, and then Palliser was also tried and acquitted. Keppel was ordered to strike his flag in March 1779. Until the fall of Lord North's ministry he acted as an opposition member of parliament. When it fell in 1782 be became First Lord, and was created Viscount Keppel and Baron Elden. His career in office was not distinguished, and he broke with his old political associates by resigning as a protest against the Peace of Paris. He finally discredited himself by joining the Coalition ministry formed by North and Fox, and with its fall disappeared from public life. He died unmarried on the 2nd of October 1786. Burke, who regarded him with great affection, said that he had "something high" in his nature, and that it was "a wild stock of pride on which the tenderest of all hearts had grafted the milder virtues." His popularity disappeared entirely in his later years. His portrait was six times painted by Sir Joshua Reynolds. The copy which belonged originally to Burke is now in the National Gallery.

There is a full *Life of Keppel* (1842), by his grand-nephew, the Rev. Thomas Keppel. (D. H.)

KEPPEL, SIR HENRY (1809–1904), British admiral, son of the 4th earl of Albemarle and of his wife Elizabeth, daughter of Lord de Clifford, was born on the 14th of June 1809, and entered the navy from the old naval academy of Portsmouth in 1822. His family connexions secured him rapid promotion, at a time when the rise of less fortunate officers was very slow. He became lieutenant in 1829 and commander in 1833. His first command in the "Childers" brig (16) was largely passed on the coast of Spain, which was then in the midst of the convulsions of the Carlist war. Captain Keppel had already made himself known as a good seaman. He was engaged with the squadron stationed on the west coast of Africa to suppress the slave trade. In 1837 he was promoted post captain, and appointed in 1841 to the "Dido" for service in China and against the Malay pirates, a service which he repeated in 1847, when in command of H.M.S. "Maeander." The story of his two commands was told by himself in two publications, *The Expedition to Borneo of H.M.S. "Dido" for the Suppression of Piracy* (1846), and in *A Visit to the Indian Archipelago in H.M.S. "Maeander"* (1853). The substance of these books was afterwards incorporated into his autobiography, which was published in 1899 under the title *A Sailor's Life under four Sovereigns.* In 1853 he was appointed to the command of the "St Jean d'Acre" of 101 guns for service in the Crimean War. But he had no opportunity to distinguish himself at sea in that struggle. As commander of the naval brigade landed to co-operate in the siege of Sevastopol, he was more fortunate, and he had an honourable share in the latter days of the siege and reduction of the fortress. After the Crimean War he was again sent out to China, this time in command of the "Raleigh," as commodore to serve under Sir M. Seymour. The "Raleigh" was lost on an uncharted rock near Hong-Kong, but three small vessels were named to act as her tenders, and Commodore Keppel commanded in them, and with the crew of the "Raleigh," in the action with the Chinese at Fatshan Creek (June 1, 1857). He was honourably acquitted for the loss of the "Raleigh," and was named to the command of the "Alligator," which he held till his promotion to rear-admiral. For his share in the action at Fatshan Creek he was made K.C.B. The prevalence of peace gave Sir Henry Keppel no further chance of active service, but he held successive commands till his retirement from the active list in 1879, two years after he attained the rank of Admiral of the Fleet. He died at the age of 95 on the 17th of January 1904.

KER, JOHN (1673–1726), Scottish spy, was born in Ayrshire on the 8th of August 1673. His true name was Crawfurd, his father being Alexander Crawfurd of Crawfurdland; but having married Anna, younger daughter of Robert Ker, of Kersland, Ayrshire, whose only son Daniel Ker was killed at the battle of Steinkirk in 1692, he assumed the name and arms of Ker in 1697, after buying the family estates from his wife's elder sister. Having become a leader among the extreme Covenanters, he made use of his influence to relieve his pecuniary embarrassments, selling his support at one time to the Jacobites, at another to the government, and whenever possible to both parties at the same time. He held a licence from the government in 1707 permitting him to associate with those whose disloyalty was known or suspected, proving that he was at that date the government's paid spy; and in his *Memoirs* Ker asserts that he had a number of other spies and agents working under his orders in different parts of the country. He entered into correspondence with Catholic priests and Jacobite conspirators, whose schemes, so far as he could make himself cognisant of them, he betrayed to the government. But he was known to be a man of the worst character, and it is improbable that he succeeded in gaining the confidence of people of any importance. The duchess of Gordon was for a time, it is true, one of his correspondents, but in 1707 she had discovered him to be "a knave." He went to London in 1709, where he seems to have extracted considerable sums of money from politicians of both parties by promising or threatening, as the case might be, to expose Godolphin's relations with the Jacobites. In 1713, if his own story is to be believed, business of a semi-diplomatic nature took Ker to Vienna, where, although he failed in the principal object of his errand, the emperor made him a present of his portrait set in jewels. Ker also occupied his time in Vienna, he says, by gathering information which he forwarded to the electress Sophia; and in the following year on his way home he stopped at Hanover to give some advice to the future king of England as to the best way to govern the English. Although in his own opinion Ker materially assisted in placing George I. on the English throne, his services were unrewarded, owing, he would have us believe, to the incorruptibility of his character. Similar ingratitude was the recompense for his revelations of the Jacobite intentions in 1715;

and as he was no more successful in making money out of the East India Company, nor in certain commercial schemes which engaged his ingenuity during the next few years, he died in a debtors' prison, on the 8th of July 1726. While in the King's Bench he sold to Edmund Curll the bookseller, a fellow-prisoner, who was serving a sentence of five months for publishing obscene books, the manuscript of (or possibly only the materials on which were based) the *Memoirs of John Ker of Kersland*, which Curll published in 1726 in three parts, the last of which appeared after Ker's death. For issuing the first part of the *Memoirs*, which purported to make disclosures damaging to the government, but which Curll in self-justification described as "vindicating the memory of Queen Anne," the publisher was sentenced to the pillory at Charing Cross; and he added to the third part of the *Memoirs* the indictment on which he had been convicted.

See the above-mentioned *Memoirs* (London, 1726–1727), and in particular the "preface" to part i.; George Lockhart, *The Lockhart Papers* (2 vols., London, 1817); Nathaniel Hooke, *Correspondence*, edited by W. D. Macray (Roxburghe Club, 2 vols., London, 1870), in which Ker is referred to under several pseudonyms, such as "Wicks," "Trustie," "The Cameronian Mealmonger," &c.

KERAK, a town in eastern Palestine, 10 m. E. of the southern angle of the Lisan promontory of the Dead Sea, on the top of a rocky hill about 3000 ft. above sea-level. It stands on a platform forming an irregular triangle with sides about 3000 ft. in length, and separated by deep ravines from the ranges around on all sides but one. The population is estimated at 6000 Moslems and 1800 Orthodox Greek Christians. Kerak is identified with the Moabite town of Kir-Hareseth (destroyed by the Hebrew-Edomite coalition, 2 Kings iii. 25), and denounced by Isaiah under the name Kir of Moab (xv. 1), Kir-Hareseth (xvi. 7) or Kir-Heres (xvi. 11): Jeremiah also refers to it by the last name (xxxix. 31, 36). The modern name, in the form Χάραξ, appears in 2 Macc. xii. 17. Later, Kerak was the seat of the archbishop of Petra. The Latin kings of Jerusalem, recognizing its importance as the key of the E. Jordan region, fortified it in 1142: from 1183 it was attacked desperately by Saladin, to whom at last it yielded in 1188. The Arabian Ayyubite princes fortified the town, as did the Egyptian Mameluke sultans. The fortifications were repaired by Bibars in the 13th century. For a long time after the Turkish occupation of Palestine and Egypt it enjoyed a semi-independence, but in 1893 a Turkish governor with a strong garrison was established there, which has greatly contributed to secure the safety of travellers and the general quiet of the district. The town is an irregular congeries of flat mud-roofed houses. In the Christian quarter is the church of St George; the mosque also is a building of Christian origin. The town is surrounded by a wall with five towers; entrance now is obtained through breaches in the wall, but formerly it was accessible only by means of tunnels cut in the rocky substratum. The castle, now used as the headquarters of the garrison and closed to visitors, is a remarkably fine example of a crusaders' fortress. (R. A. S. M.)

KERALA, or Chera, the name of one of the three ancient Dravidian kingdoms of the Tamil country of southern India, the other two being the Chola and the Pandya. Its original territory comprised the country now contained in the Malabar district, with Travancore and Cochin, and later the country included in the Coimbatore district and a part of Salem. The boundaries, however, naturally varied much from time to time. The earliest references to this kingdom appear in the edicts of Asoka, where it is called *Keralaputra* (*i.e.* son of Kerala), a name which in a slightly corrupt form is known to Pliny and the author of the *Periplus*. There is evidence of a lively trade carried on by sea with the Roman empire in the early centuries of the Christian era, but of the political history of the Kerala kingdom nothing is known beyond a list of rajas compiled from inscriptions, until in the 10th century the struggle began with the Cholas, by whom it was conquered and held till their overthrow by the Mahommedans in 1310. These in their turn were driven out by a Hindu confederation headed by the chiefs of Vijayanagar, and Kerala was absorbed in the Vijayanagar empire until its destruction by the Mahommedans in 1565. For about 80 years it seems to have preserved a precarious independence under the naiks of Madura, but in 1640 was conquered by the Adil Shah dynasty of Bijapur and in 1652 seized by the king of Mysore.

See V. A. Smith, *Early Hist. of India*, chap. xvi. (2nd ed., Oxford, 1908).

KERASUND (anc. *Choerades*, *Pharnacia*, *Cerasus*), a town on the N. coast of Asia Minor, in the Trebizond vilayet, and the port—an exposed roadstead—of Kara-Hissar Sharki, with which it is connected by a carriage road. Pop. just under 10,000, Moslems being in a slight minority. The town is situated on a rocky promontory, crowned by a Byzantine fortress, and has a growing trade. It exports filberts (for which product it is the centre), walnuts, hides and timber. Cerasus was the place from which the wild cherry was introduced into Italy by Lucullus and so to Europe (hence Fr. *cerise*, "cherry").

KÉRATRY, AUGUSTE HILARION, Comte de (1769–1859), French writer and politician, was born at Rennes on the 28th of December 1769. Coming to Paris in 1790, he associated himself with Bernardin de St Pierre. After being twice imprisoned during the Terror he retired to Brittany, where he devoted himself to literature till 1814. In 1818 he returned to Paris as deputy for Finistère, and sat in the Chamber till 1824, becoming one of the recognized liberal leaders. He was re-elected in 1827, took an active part in the establishment of the July monarchy, was appointed a councillor of state (1830), and in 1837 was made a peer of France. After the *coup d'état* of 1851 he retired from public life. Among his publications were *Contes et Idylles* (1791); *Lysus et Cydippe*, a poem (1801); *Inductions morales et physiologiques* (1817); *Documents pour servir à l'histoire de France* (1820); *Du Beau dans les arts d'imitation* (1822); *Le Dernier des Beaumanoir* (1824). His last work, *Clarisse* (1854), a novel, was written when he was eighty-five. He died at Port-Marly on the 7th of November 1859.

His son, comte Emile de Kératry (1832–), became deputy for Finistère in 1869, and strongly supported the war with Germany in 1870. He was in Paris during part of the siege, but escaped in a balloon, and joined Gambetta. In 1871 Thiers appointed him to the prefecture, first of the Haute-Garonne, and subsequently of the Bouches-du-Rhône, but he resigned in the following year. He is the author of *La Contre-guérilla française au Mexique* (1868); *L'Élévation et la chute de l'empereur Maximilien* (1867); *Le Quatre-septembre et le gouvernement de la défense nationale* (1872); *Mourad V.* (1878), and some volumes of memories.

KERBELA, or Meshed-Ḥosain, a town of Asiatic Turkey, the capital of a sanjak of the Bagdad vilayet, situated on the extreme western edge of the alluvial river plain, about 60 m. S.S.W. of Bagdad and 20 m. W. of the Euphrates, from which a canal extends almost to the town. The surrounding territory is fertile and well cultivated, especially in fruit gardens and palm-groves. The newer parts of the city are built with broad streets and sidewalks, presenting an almost European appearance. The inner town, surrounded by a dilapidated brick wall, at the gates of which octroi duties are still levied, is a dirty Oriental city, with the usual narrow streets. Kerbela owes its existence to the fact that Ḥosain, a son of ʽAli, the fourth caliph, was slain here by the soldiers of Yazid, the rival aspirant to the caliphate, on the 10th of October A.D. 680 (see Caliphate, sec. B, § 2). The most important feature of the town is the great shrine of Ḥosain, containing the tomb of the martyr, with its golden dome and triple minarets, two of which are gilded. Kerbela is a place of pilgrimage of the Shiʽite Moslems, and is only less sacred to them than Meshed ʽAli and Mecca. Some 200,000 pilgrims from the Shiʽite portions of Islam are said to journey annually to Kerbela, many of them carrying the bones of their relatives to be buried in its sacred soil, or bringing their sick and aged to die there in the odour of sanctity. The mullahs, who fix the burial fees, derive an enormous revenue from the faithful. Formerly Kerbela was a self-governing hierarchy and constituted an inviolable sanctuary for criminals; but in 1843 the Turkish government undertook to deprive the city of some of these liberties and to enforce conscription. The Kerbelese resisted, and Kerbela was bombarded (hence the ruined condition of the old walls) and reduced with great slaughter. Since then it has formed an integral part of the Turkish administration of Irak. The enormous influx of pilgrims naturally creates a brisk trade in Kerbela and the towns along the route from Persia to that place and beyond to Nejef. The population of Kerbela, necessarily fluctuating, is estimated at something over 60,000, of whom the principal part are Shi'ites, chiefly Persians, with a goodly mixture of British Indians. No Jews or Christians are allowed to reside there.

See Chodzko, *Théâtre persan* (Paris, 1878); J. P. Peters, *Nippur* (1897). (J. P. Pe.)

KERCH, or Kertch, a seaport of S. Russia, in the government of Taurida, on the Strait of Kerch or Yenikale, 60 m. E.N.E. of Theodosia, in 45° 21′ N. and 36° 30′ E. Pop. (1897), 31,702. It stands on the site of the ancient *Panticapaeum*, and, like most towns built by the ancient Greek colonists in this part of the world, occupies a beautiful situation, clustering round the foot and climbing up the sides of the hill (called after Mithradates) on which stood the ancient citadel or acropolis. The church of St John the Baptist, founded in 717, is a good example of the early Byzantine style. That of Alexander Nevsky was formerly the Kerch museum of antiquities, founded in 1825. The more valuable objects were subsequently removed to the Hermitage at St Petersburg, while those that remained at Kerch were scattered during the English occupation in the Crimean War. The existing museum is a small collection in a private house. Among the products of local industry are leather, tobacco, cement, beer, aerated waters, lime, candles and soap. Fishing is carried on, and there are steam saw-mills and flour-mills. A rich deposit of iron ore was discovered close to Kerch in 1895, and since then mining and blasting have been actively prosecuted. The mineral mud-baths, one of which is in the town itself and the other beside Lake Chokrak (9 m. distant), are much frequented. Notwithstanding the deepening of the strait, so that ships are now able to enter the Sea of Azov, Kerch retains its importance for the export trade in wheat, brought thither by coasting vessels. Grain, fish, linseed, rapeseed, wool and hides are also exported. About 6 m. N.E. are the town and old Turkish fortress of Yenikale, administratively united with Kerch. Two and a half miles to the south are strong fortified works defending the entrance to the Sea of Azov.

The Greek colony of Panticapaeum was founded about the middle of the 6th century B.C., by the town of Miletus. From about 438 B.C. till the conquest of this region by Mithradates the Great, king of Pontus, about 100 B.C., the town and territory formed the kingdom of the Bosporus, ruled over by an independent dynasty. Phanaces, the son of Mithradates, became the founder of a new line under the protection of the Romans, which continued to exist till the middle of the 4th century A.D., and extended its power over the maritime parts of Tauris. After that the town—which had already begun to be known as Bospora—passed successively into the hands of the Eastern empire, of the Khazars, and of various barbarian tribes. In 1318, the Tatars, who had come into possession in the previous century, ceded the town to the Genoese, who soon raised it into new importance as a commercial centre. They usually called the place Cerchio, a corruption of the Russian name K'rtchev (whence Kerch), which appears in the 11th century inscription of Tmutarakan (a Russian principality at the north foot of the Caucasus). Under the Turks, whose rule dates from the end of the 15th century, Kerch was a military port; and as such it plays a part in the Russo-Turkish wars. Captured by the Russians under Dolgorukov in 1771, it was ceded to them along with Yenikale by the peace of Kuchuk-Kainarji, and it became a centre of Russian naval activity. Its importance was greatly impaired by the rise of Odessa and Taganrog; and in 1820 the fortress was dismantled. Kerch suffered severely during the Crimean War.

Archaeologically Kerch is of particular interest, the *kurgans* or sepulchral mounds of the town and vicinity having yielded a rich variety of the most beautiful works of art. Since 1825 a large number of tombs have been opened. In the Altun or Zolotai-oba (Golden Mound) was found a great stone vault similar in style to an Egyptian pyramid; and within, among many objects of minor note, were golden dishes adorned with griffins and beautiful arabesques. In the Kul-oba, or Mound of Cinders (opened in 1830–1831), was a similar tomb, in which were found what would appear to be the remains of one of the kings of Bosporus, of his queen, his horse and his groom. The ornaments and furniture were of the most costly kind; the king's bow and buckler were of gold; his very whip intertwined with gold; the queen had golden diadems, necklace and breast-jewels, and at her feet lay a golden vase. In the Pavlovskoi kurgan (opened in 1858) was the tomb of a Greek lady, containing among other articles of dress and decoration a pair of fine leather boots (a unique discovery) and a beautiful vase on which is painted the return of Persephone from Hades and the setting out of Triptolemus for Attica. In a neighbouring tomb was what is believed to be "the oldest Greek mural painting which has come down to us," dating probably from the 4th century B.C. Among the minor objects discovered in the kurgans perhaps the most noteworthy are the fragments of engraved boxwood, the only examples known of the art taught by the Sicyonian painter Pamphilus.

Very important finds of old Greek art continue to be made in the neighbourhood, as well as at Tamañ, on the east side of the Strait of Kerch. The catacombs on the northern slope of Mithradates Hill, of which nearly 200 have been explored since 1859, possess considerable interest, not only for the relics of old Greek art which some of them contain (although most were plundered in earlier times), but especially as material for the history and ethnography of the Cimmerian Bosporus. In 1890 the first Christian catacomb bearing a distinct date (491) was discovered. Its walls were covered with Greek inscriptions and crosses.

See H. D. Seymour's *Russia on the Black Sea and Sea of Azoff* London, 1855); J. B. Telfer, *The Crimea* (London, 1876); P. Bruhn, *Tchernomore, 1852–1877* (Odessa, 1878); Gilles, *Antiquités du Bosphore Cimmérien* (1854); D. Macpherson, *Antiquities of Kertch* (London, 1857); *Compte rendu de la Commission Imp. Archéologique* (St Petersburg); L. Stephani, *Die Alterthümer vom Kertsch* (St Petersburg, 1880); C. T. Newton, *Essays on Art and Archaeology* (London, 1880); *Reports* of the [Russian] Imp. Archaeological Commission; *Izvestia* (Bulletin) of the Archives Commission for Taurida; *Antiquités du Bosphore Cimmérien, conservées au Musée Impérial de l'Ermitage* (St Petersburg, 1854); *Inscriptiones antiquae orae septentrionalis Ponti Euxini graecae et latinae*, with a preface by V. V. Latyshev (St Petersburg, 1890); *Materials for the Archaeology of Russia*, published by the Imp. Arch. Commission (No. 6, St Petersburg, 1891). (P. A. K.; J. T. Be.)

KERCKHOVEN, JAN POLYANDER VAN DEN (1568–1646), Dutch Protestant divine, was born at Metz, in 1568. He became French preacher at Dort in 1591, and afterwards succeeded Franz Gomarus as professor of theology at Leiden. He was invited by the States General of Holland to revise the Dutch translation of the Bible, and it was he who edited the canons of the synod of Dort (1618–1619).

His many published works include *Responsio ad sophismata A. Cocheletii doctoris surbonnistae* (1610), *Dispute contre l'adoration des reliques des Saincts trespassés* (1611), *Explicatio somae prophetae* (1625).

KERGUELEN ISLAND, Kerguelen's Land, or Desolation Island, an island in the Southern Ocean, to the S.E. of the Cape of Good Hope, and S.W. of Australia, and nearly half-way between them. Kerguelen lies between 48° 39′ and 49° 44′ S. and 68° 42′ and 70° 35′ E. Its extreme length is about 85 m., but the area is only about 1400 sq. m. The island is throughout mountainous, presenting from the sea in some directions the appearance of a series of jagged peaks. The various ridges and mountain masses are separated by steep-sided valleys, which run down to the sea, forming deep fjords, so that no part of the interior is more than 12 m. from the sea. The chief summits are Mounts Ross (6120 ft.), Richards (4000), Crozier (3251), Wyville Thomson (3160), Hooker (2600), Moseley (2400). The coast-line is extremely irregular, and the fjords, at least on the north, east and south, form a series of well-sheltered harbours. As the prevailing winds are westerly, the safest anchorage is on the north-east. Christmas Harbour on the north and Royal Sound on the south are noble harbours, the latter with a labyrinth of islets interspersed over upwards of 20 m. of land-locked waters. The scenery is generally magnificent. A district of considerable extent in the centre of the island is occupied by snowfields, whence glaciers descend east and west to the sea. The whole island, exclusive of the snowfields, abounds in freshwater lakes and pools in the hills and lower ground. Hidden deep mudholes are frequent.

Kerguelen Island is of undoubted volcanic origin, the prevailing rock being basaltic lavas, intersected occasionally by dikes, and an active volcano and hot springs are said to exist in the south-west of the island. Judging from the abundant fossil remains of trees, the island must have been thickly clothed with woods and other vegetation of which it has no doubt been denuded by volcanic action and submergence, and possibly by changes of climate. It presents evidences of having been subjected to powerful glaciation, and to subsequent immersion and immense denudation. The soundings made by the "Challenger" and "Gazelle" and the affinities which in certain respects exist between the islands, seem to point to the existence at one time of an extensive land area in this quarter, of which Kerguelen, Prince Edward's Islands, the Crozets, St Paul and Amsterdam are the remains. The Kerguelen plateau rises in many parts to within 1500 fathoms of the surface of the sea. Beds of coal and of red earth are found in some places. The summits of the flat-topped hills about Betsy Cove, in the south-east of the island, are formed of caps of basalt.

According to Sir J. D. Hooker the vegetation of Kerguelen Island is of great antiquity; and may have originally reached it from the American continent; it has no affinities with Africa. The present climate is not favourable to permanent vegetation; the island lies within the belt of rain at all seasons of the year, and is reached by no drying winds; its temperature is kept down by the surrounding vast expanse of sea, and it lies within the line of the cold Antarctic drift. The temperature, however, is equable. The mean annual temperature is about 39° F., while the summer temperature has been observed to approach 70°. Tempests and squalls are frequent, and the weather is rarely calm. On the lower slopes of the mountains a rank vegetation exists, which, from the conditions mentioned, is constantly saturated with moisture. A rank grass, *Festuca Cookii*, grows thickly in places up to 300 ft., with *Azorella*, *Cotula plumosa*, &c. Sir J. D. Hooker enumerated twenty-one species of flowering plants, and seven of ferns, lycopods, and *Characeae*; at least seventy-four species of mosses, twenty-five of *Hepaticae*, and sixty-one of lichens are known, and there are probably many more. Several of the marine and many species of freshwater algae are peculiar to the island. The characteristic feature of the vegetation, the Kerguelen's Land cabbage, was formerly abundant, but has been greatly reduced by rabbits introduced on to the island. Fur-seals are still found in Kerguelen, though their numbers have been reduced by reckless slaughter. The sea-elephant and sea-leopard are characteristic. Penguins of various kinds are abundant; a teal (*Querquedula Eatoni*) peculiar to Kerguelen and the Crozets is also found in considerable numbers, and petrels, especially the giant petrel (*Ossifraga gigantea*), skuas, gulls, sheath-bills (*Chionis minor*), albatross, terns, cormorants and Cape pigeons frequent the island. There is a considerable variety of insects, many of them with remarkable peculiarities of structure, and with a predominance of forms incapable of flying.

The island was discovered by the French navigator, Yves Joseph de Kerguelen-Trémarec, a Breton noble (1745–1797), on the 13th of February 1772, and partly surveyed by him in the following year. He was one of those explorers who had been attracted by the belief in a rich southern land, and this island, the South France of his first discovery, was afterwards called by him Desolation Land in his disappointment. Captain Cook visited the island in 1776, and, among other expeditions, the "Challenger" spent some time here, and its staff visited and surveyed various parts of it in January 1874. It was occupied from October 1874 to February 1875 by the expeditions sent from England, Germany and the United States to observe the transit of Venus. The German South Polar expedition in 1901–1902 established a meteorological and magnetic station at Royal Sound, under Dr Enzensperger, who died there. In January 1893 Kerguelen was annexed by France, and its commercial exploitation was assigned to a private company.

See Y. J. de Kerguelen-Trémarec, *Rèlation de deux voyages dans les mers australes* (Paris, 1782); Narratives of the Voyages of Captain Cook and the "Challenger" Expedition; *Phil. Trans.*, vol. 168, containing account of the collections made in Kerguelen by the British transit of Venus expedition in 1874–1875; Lieutard, "Mission aux îles Kerguelen," &c., *Annales hydrographiques* (Paris, 1893).

KERGUELEN'S LAND CABBAGE, in botany, *Pringlea antiscorbutica* (natural order Cruciferae), a plant resembling in habit, and belonging to the same family as, the common cabbage (*Brassica oleracea*). The cabbage-like heads of leaves abound in a pale yellow highly pungent essential oil, which gives the plant a peculiar flavour but renders it extremely wholesome. It was discovered by Captain Cook during his first voyage, but the first account of it was published by (Sir) Joseph Hooker in *The Botany of the Antarctic Voyage* of the "Erebus" and "Terror" in 1839–1843. During the stay of the latter expedition on the island, daily use was made of this vegetable either cooked by itself or boiled with the ship's beef, pork or pea-soup. Hooker observes of it, "This is perhaps the most interesting plant procured during the whole of the voyage performed in the Antarctic Sea, growing as it does upon an island the remotest of any from a continent, and yielding, besides this esculent, only seventeen other flowering plants."

KERKUK, or Qerqūq, the chief town of a sanjak in the Mosul vilayet of Asiatic Turkey, situated among the foot hills of the Kurdistan Mountains at an elevation of about 1100 ft. on both banks of the Khassa Chai, a tributary of the Tigris, known in its lower course as Adhem. Pop. estimated at 12,000 to 15,000, chiefly Mahommedan Kurds. Owing to its position at the junction of several routes, Kerkuk has a brisk transit trade in hides, Persian silks and cottons, colouring materials, fruit and timber; but it owes its principal importance to its petroleum and naphtha springs. There are also natural warm springs at Kerkuk, used to supply baths and reputed to have valuable medical properties. In the neighbourhood of the city is a burning mountain, locally famous for many centuries. Kerkuk is evidently an ancient site, the citadel standing upon an artificial mound 130 ft. high. It was a metropolitan see of the Chaldean Christians. There is a Jewish quarter beneath the citadel, and the reputed sarcophagi of Daniel and the Hebrew children are shown in one of the mosques. (J. P. Pe.)

KERMADEC, a small group of hilly islands in the Pacific, about 30° S., 178° W., named from D'Entrecasteaux's captain, Huon Kermadec, in 1791. They are British possessions. The largest of the group is Raoul or Sunday Island, 20 m. in circumference, 1600 ft. high, and thickly wooded. The flora and fauna belong for the most part to those of New Zealand, on which colony the islands are also politically dependent, having been annexed in 1887.

KERMAN (the ancient *Karmania*), a province of Persia, bounded E. by Seistan and Baluchistan, S. by Baluchistan and Fars, W. by Fars, and N. by Yezd and Khorasan. It is of very irregular shape, expanding in the north to Khorasan and gradually contracting in the south to a narrow wedge between Fars and Baluchistan; the extreme length between Seistan and Fars (E. and W.) is about 400 m., the greatest breadth (N. and S.) from south of Yezd to the neighbourhood of Bander Abbasi about 300 m., and the area is estimated at about 60,000 sq. m. Kerman is generally described as consisting of two parts, an uninhabitable desert region in the north and a habitable mountainous region in the south, but recent explorations require this view to be considerably modified. There are mountains and desert tracts in all parts, while much of what appears on maps as forming the western portion of the great Kerman desert consists of the fertile uplands of Kuhbanan, Raver and others stretching along the eastern base of the lofty range which runs from Yezd south-east to Khabis. West of and parallel to this range are two others, one culminating north-west of Bam in the Kuh Hazar (14,700 ft.), the other continued at about the same elevation under the name of the Jamal Bariz (also Jebel Bariz) south-eastward to Makran. These chains traverse fertile districts dividing them into several longitudinal valleys of considerable length, but not averaging more than 12 m. in width. Snow lies on them for a considerable part of the year, feeding the springs and canals by means of which large tracts in this almost rainless region in summer are kept under cultivation. Still farther west the Kuh Dina range is continued from Fars, also in a south-easterly direction to Bashakird beyond Bander Abbasi. Between the south-western highlands and the Jamal Bariz there is some arid and unproductive land, but the true desert of Kerman lies mainly in the north and north-east, where it merges northwards in the great desert "Lut," which stretches into

Khorasan.[1] These southern deserts differ from the kavir of central Persia mainly in three respects: they are far less saline, are more sandy and drier, and present in some places tracts of 80 to 100 miles almost absolutely destitute of vegetation. Yet they are crossed by well-known tracks running from Kerman eastwards and north-eastwards to Seistan and Khorasan and frequently traversed by caravans. It appears that these sandy wastes are continually encroaching on the fertile districts, and this is the case even in Narmashir, which is being invaded by the sands of the desolate plains extending thence north-westwards to Bam. There are also some *kefeh* or salt swamps answering to the kavir in the north, but occurring only in isolated depressions and nowhere of any great extent. The desert of Kerman lies about 1000 ft., or less, above the sea, apparently on nearly the same level as the Lut, from which it cannot be geographically separated. The climate, which varies much with the relief of the land, has the reputation of being unhealthy, because the cool air from the hills is usually attended by chills and agues. Still many of the upland valleys enjoy a genial and healthy climate. The chief products are cotton, gums, dates of unrivalled flavour from the southern parts, and wool, noted for its extreme softness, and the soft underhair of goats (*kurk*), which latter are used in the manufacture of the Kerman shawls, which in delicacy of texture yield only to those of Kashmir, while often surpassing them in design, colour and finish. Besides woollen goods (shawls, carpets, &c.) Kerman exports mainly cotton, grain and dates, receiving in return from India cotton goods, tea, indigo, china, glass, sugar, &c. Wheat and barley are scarce. Bander Abbasi is the natural outport; but, since shipping has shown a preference for Bushire farther west, the trade of Kerman has greatly fallen off.

For administrative purposes the province is divided into nineteen districts, one being the capital of the same name with its immediate neighbourhood (*humeh*); the others are Akta and Urzu; Anar; Bam and Narmashir; Bardsir; Jiruft; Khabis; Khinaman; Kubenan (Kuhbanan); Kuhpayeh; Pariz; Rafsinjan; Rahbur; Raver; Rayin; Rudbar and Bashakird; Sardu; Sirjan; Zerend. The inhabitants number about 700,000, nearly one-third being nomads. (A. H.-S.)

KERMAN, capital of the above province, situated in 30° 17′ N., 56° 59′ E., at an elevation of 6100 ft. Its population is estimated at 60,000, including about 2000 Zoroastrians, 100 Jews, and a few Shikarpuri Indians. Kerman has post and telegraph offices (Indo-European Telegraph Department), British and Russian consulates, and an agency of the Imperial bank of Persia. The neighbouring districts produce little grain and have to get their supplies for four or five months of the year from districts far away. A traveller has stated that it was easier to get a mann (6½ ℔) of saffron at Kerman than a mann of barley for his horse, and in 1879 Sir A. Houtum-Schindler was ordered by the authorities to curtail his excursions in the province "because his horses and mules ate up all the stock." Kerman manufactures great quantities of carpets and felts, and its carpets are almost unsurpassed for richness of texture and durability. The old name of the city was Guvashir. Adjoining the city on hills rising 400 to 500 ft. above the plain in the east are the ruins of two ancient forts with walls built of sun-dried bricks on stone foundations. Some of the walls are in perfect condition. Among the mosques in the city two deserve special notice, one the Masjid i Jama, a foundation of the Muzaffarid ruler Mubariz ed din Mahommed dating from A.H. 1349, the other the Masjid i Malik built by Malik Kaverd Seljuk (1041–1072).

KERMANSHAH, or Kermanshahan, an important province of Persia, situated W. of Hamadan, N. of Luristan, and S. of Kurdistan, and extending in the west to the Turkish frontier. Its population is about 400,000, and it pays a yearly revenue of over £20,000. Many of its inhabitants are nomadic Kurds and Lurs who pay little taxes. The plains are well watered and very fertile, while the hills are covered with rich pastures which support large flocks of sheep and goats. The sheep provide a great part of the meat supply of Teheran. The province also produces much wheat and barley, and could supply great quantities for export if the means of transport were better.

Kermanshah (*Kermisin* of Arab geographers), the capital of the province, is situated at an elevation of 5100 ft., in 34° 19′ N., and 46° 59′ E., about 220 m. from Bagdad, and 250 m. from Teheran. Although surrounded by fortifications with five gates and three miles in circuit, it is now practically an open town, for the walls are in ruins and the moat is choked with rubbish. It has a population of about 40,000. The town is situated on the high road between Teheran and Bagdad, and carries on a transit trade estimated in value at £750,000 per annum.

KERMES (Arab. *qirmiz*; see Crimson), a crimson dye-stuff, now superseded by cochineal, obtained from *Kermes ilicis* (=*Coccus ilicis*, Lat.=*C. vermilio*, G. Planchon). The genus *Kermes* belongs to the *Coccidae* or Scale-insects, and its species are common on oaks wherever they grow. The species from which kermes is obtained is common in Spain, Italy and the South of France and the Mediterranean basin generally, where it feeds on *Quercus coccifera*, a small shrub. As in the case of other scale-insects, the males are relatively small and are capable of flight, while the females are wingless. The females of the genus *Kermes* are remarkable for their gall-like form, and it was not until 1714 that their animal nature was discovered.

In the month of May, when full grown, the females are globose, 6 to 7 millim. in diameter, of a reddish-brown colour, and covered with an ash-coloured powder. They are found attached to the twigs or buds by a circular lower surface 2 millim. in diameter, and surrounded by a narrow zone of white cottony down. At this time there are concealed under a cavity, formed by the approach of the abdominal wall of the insect to the dorsal one, thousands of eggs of a red colour, and smaller than poppy seed, which are protruded and ranged regularly beneath the insect. At the end of May or the beginning of June the young escape by a small orifice, near the point of attachment of the parent. They are then of a fine red colour, elliptic and convex in shape, but rounded at the two extremities, and bear two threads half as long as their body at their posterior extremity. At this period they are extremely active, and swarm with extraordinary rapidity all over the food plant, and in two or three days attach themselves to fissures in the bark or buds, but rarely to the leaves. In warm and dry summers the insects breed again in the months of August and September, according to Eméric, and then they are more frequently found attached to the leaves. Usually they remain immovable and apparently unaltered until the end of the succeeding March, when their bodies become gradually distended and lose all trace of abdominal rings. They then appear full of a reddish juice resembling discoloured blood. In this state, or when the eggs are ready to be extruded, the insects are collected. In some cases the insects from which the young are ready to escape are dried in the sun on linen cloths—care being taken to prevent the escape of the young from the cloths until they are dead. The young insects are then sifted from the shells, made into a paste with vinegar, and dried on skins exposed to the sun, and the paste packed in skins is then ready for exportation to the East under the name of "pâte d'écarlate."

In the pharmacopoeia of the ancients kermes triturated with vinegar was used as an outward application, especially in wounds of the nerves. From the 9th to the 16th century this insect formed an ingredient in the "confectio alkermes," a well known medicine, at one time official in the London pharmacopoeia as an astringent in doses of 20 to 60 grains or more. Syrup of kermes was also prepared. Both these preparations have fallen into disuse.

Mineral kermes is trisulphide of antimony, containing a variable portion of trioxide of antimony both free and combined with alkali. It was known as *poudre des Chartreux* because in 1714 it is said to have saved the life of a Carthusian monk who had been given up by the Paris faculty; but the monk Simon who administered it on that occasion called it *Alkermes mineral*. Its reputation became so great that in 1720 the French government bought the recipe for its preparation. It still appears in the pharmacopoeias of many European countries and in that of the United States. The product varies somewhat according to the mode of preparation adopted. According to the French directions the official substance is obtained by adding 60 grammes of powdered antimony trisulphide to a boiling solution of 1280 grammes of crystallized sodium carbonate in 12,800 grammes of distilled water and boiling for one hour. The liquid is then filtered hot, and on being allowed to cool slowly deposits the kermes, which is washed and dried at 100° C.; prepared in this way it is a brown-red velvety powder, insoluble in water.

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[1] The word *lut* means bare, void of vegetation, arid, waterless, and has nothing in common with the Lot of Holy Writ, as many have supposed.

See G. Planchon, *Le Kermes du chêne* (Montpellier, 1864); Lewis, *Materia Medica* (1784), pp. 71, 365; *Memorias sobre la grana Kermes de España* (Madrid, 1788); Adams, *Paulus Aegineta*, iii. 180; Beckmann, *History of Inventions*.

KERMESSE (also KERMIS and KIRMESS), originally the mass said on the anniversary of the foundation of a church and in honour of the patron, the word being equivalent to "Kirkmass." Such celebrations were regularly held in the Low Countries and also in northern France, and were accompanied by feasting, dancing and sports of all kinds. They still survive, but are now practically nothing more than country fairs and the old allegorical representations are uncommon. The Brussels Kermesse is, however, still marked by a procession in which the effigies of the Mannikin and medieval heroes are carried. At Mons the Kermesse occurs annually on Trinity Sunday and is called the procession of Lumeçon (Walloon for *limaçon*, a snail): the hero is Gilles de Chin, who slays a terrible monster, captor of a princess, in the Grand Place. This is the story of George and the Dragon. At Hasselt the Kermesse (now only septennial) not only commemorates the Christian story of the foundation of the town, but even preserves traces of a pagan festival. The word Kermesse (generally in the form "Kirmess") is applied in the United States to any entertainment, especially one organized in the interest of charity.

See Demetrius C. Boulger, *Belgian Life in Town and Country* (1904).

KERN, JAN HENDRIK (1833–), Dutch Orientalist, was born in Java of Dutch parents on the 6th of April 1833. He studied at Utrecht, Leiden and Berlin, where he was a pupil of the Sanskrit scholar, Albrecht Weber. After some years spent as professor of Greek at Maestricht, he became professor of Sanskrit at Benares in 1863, and in 1865 at Leiden. His studies included the Malay languages as well as Sanskrit. His chief work is *Geschiedenis van het Buddhisme in Indië* (Haarlem, 2 vols., 1881–1883); in English he wrote a translation (Oxford, 1884) of the *Saddharma Pundarîka* and a *Manual of Indian Buddhism* (Strassburg, 1896) for Bühler Kielhorn's *Grundriss der indoarischen Philologie*.

KERNEL (O.E. *cyrnel*, a diminutive of "corn," seed, grain), the soft and frequently edible part contained within the hard outer husk of a nut or the stone of a fruit; also used in botany of the nucleus of a seed, the body within its several integuments or coats, and generally of the nucleus or core of any structure; hence, figuratively, the pith or gist of any matter.

KERNER, JUSTINUS ANDREAS CHRISTIAN (1786–1862), German poet and medical writer, was born on the 18th of September 1786 at Ludwigsburg in Württemberg. After attending the classical schools of Ludwigsburg and Maulbronn, he was apprenticed in a cloth factory, but, in 1804, owing to the good services of Professor Karl Philipp Conz (1762–1827) of Tübingen, was enabled to enter the university there; he studied medicine but had also time for literary pursuits in the company of Uhland, Gustav Schwab and others. He took his doctor's degree in 1808, spent some time in travel, and then settled as a practising physician in Wildbad. Here he completed his *Reiseschatten von dem Schattenspieler Luchs* (1811), in which his own experiences are described with caustic humour. He next co-operated with Uhland and Schwab in producing the *Poetischer Almanach für 1812*, which was followed by the *Deutscher Dichterwald* (1813), and in these some of Kerner's best poems were published. In 1815 he obtained the official appointment of district medical officer (*Oberamtsarzt*) in Gaildorf, and in 1818 was transferred in a like capacity to Weinsberg, where he spent the rest of his life. His house, the site of which at the foot of the historical Schloss Weibertreu was presented by the municipality to their revered physician, became the Mecca of literary pilgrims. Hospitable welcome was extended to all, from the journeyman artisan to crowned heads. Gustavus IV. of Sweden came thither with a knapsack on his back. The poets Count Christian Friedrich Alexander von Württemberg (1801–1844) and Lenau (*q.v.*) were constant guests, and thither came also in 1826 Friederike Hauffe (1801–1829), the daughter of a forester in Prevorst, a somnambulist and clairvoyante, who forms the subject of Kerner's famous work *Die Seherin von Prevorst, Eröffnungen über das innere Leben des Menschen und über das Hineinragen einer Geisterwelt in die unsere* (1829; 6th ed., 1892). In 1826 he published a collection of *Gedichte* which were later supplemented by *Der letzte Blütenstrauss* (1852) and *Winterblüten* (1859). Among others of his well-known poems are the charming ballad *Der reichste Fürst*; a drinking song, *Wohlauf, noch getrunken*, and the pensive *Wanderer in der Sägemühle*.

In addition to his literary productions, Kerner wrote some popular medical books of great merit, dealing with animal magnetism, a treatise on the influence of sebacic acid on animal organisms, *Das Fettgift oder die Fettsäure und ihre Wirkungen auf den tierischen Organismus* (1822); a description of Wildbad and its healing waters, *Das Wildbad im Königreich Württemberg* (1813); while he gave a pretty and vivid account of his youthful years in *Bilderbuch aus meiner Knabenzeit* (1859); and in *Die Bestürmung der württembergischen Stadt Weinsberg im Jahre 1525* (1820), showed considerable skill in historical narrative. In 1851 he was compelled, owing to increasing blindness, to retire from his medical practice, but he lived, carefully tended by his daughters, at Weinsberg until his death on the 21st of February 1862. He was buried beside his wife, who had predeceased him in 1854, in the churchyard of Weinsberg, and the grave is marked by a stone slab with an inscription he himself had chosen: *Friederike Kerner und ihr Justinus.* Kerner was one of the most inspired poets of the Swabian school. His poems, which largely deal with natural phenomena, are characterized by a deep melancholy and a leaning towards the supernatural, which, however, is balanced by a quaint humour, reminiscent of the Volkslied.

Kerner's *Ausgewählte poetische Werke* appeared in 2 vols. (1878); *Sämtliche poetische Werke*, ed. by J. Gaismaier, 4 vols. (1905); a selection of his poems will also be found in Reclam's *Universalbibliothek* (1898). His correspondence was edited by his son in 1897. See also D. F. Strauss, *Kleine Schriften* (1866); A. Reinhard, *J. Kerner und das Kernerhaus zu Weinsberg* (1862; 2nd ed., 1886); G. Rümelin, *Reden und Aufsätze*, vol. iii. (1894); M. Niethammer (Kerner's daughter), *J. Kerners Jugendliebe und mein Vaterhaus* (1877); A. Watts, *Life and Works of Kerner* (London, 1884); T. Kerner, *Das Kernerhaus und seine Gäste* (1894).

KERRY, a county of Ireland in the province of Munster, bounded W. by the Atlantic Ocean, N. by the estuary of the Shannon, which separates it from Clare, E. by Limerick and Cork, and S.E. by Cork. The area is 1,159,356 acres, or 1811 sq. m., the county being the fifth of the Irish counties in extent. Kerry, with its combination of mountain, sea and plain, possesses some of the finest scenery of the British Islands. The portion of the county south of Dingle Bay consists of mountain masses intersected by narrow valleys. Formerly the mountains were covered by a great forest of fir, birch and yew, which was nearly all cut down to be used in smelting iron, and the constant pasturage of cattle prevents the growth of young trees. In the north-east towards Killarney the hills rise abruptly into the ragged range of Macgillicuddy's Reeks, the highest summit of which, Carntual (Carrantuohill), has a height of 3414 ft. The next highest summit is Caper (3200 ft.), and several others are over 2500 ft. Lying between the precipitous sides of the Tomies, the Purple Mountains and the Reeks is the famous Gap of Dunloe. In the Dingle promontory Brandon Mountain attains a height of 3127 ft. The sea-coast, for the most part wild and mountainous, is much indented by inlets, the largest of which, Tralee Bay, Dingle Bay and Kenmare River, lie in synclinal troughs, the anticlinal folds of the rocks forming extensive promontories. Between Kenmare River and Dingle Bay the land is separated by mountain ridges into three valleys. The extremity of the peninsula between Dingle Bay and Tralee Bay is very precipitous, and Mount Brandon, rising abruptly from the ocean, is skirted at its base (in part) by a road from which magnificent views are obtained. From near the village of Ballybunion to Kilconey Point near the Shannon there is a remarkable succession of caves, excavated by the sea. One of these caves inspired Tennyson with some lines in " Merlin and Vivien," which he wrote on the spot. The principal islands are the picturesque Skelligs, Valencia Island and the Blasquet Islands.

The principal rivers are the Blackwater, which, rising in the Dunkerran Mountains, forms for a few miles the boundary line between Kerry and Cork, and then passes into the latter county; the Ruaughty, which with a course resembling the arc of a circle falls into the head of the Kenmare River; the Inny and Ferta, which flow westward, the one into Ballinskellig Bay and the other into Valencia harbour; the Flesk, which flows northward through the lower Lake of Killarney, after which it takes the name of Laune, and flows north-westward to Dingle Bay; the Caragh, which rises in the mountains of Dunkerran, after forming several lakes falls into Castlemaine harbour; the Maine, which flows from Castle Island and south-westward to the sea at Castlemaine harbour, receiving the northern Flesk, which rises in the mountains that divide Cork from Kerry; and the Feale, Gale and Brick, the junction of which forms the Cashin, a short tidal river which flows into the estuary of the Shannon. The lakes of Kerry are not numerous, and none is of great size, but those of Killarney (*q.v.*) form one of the most important features in the striking and picturesque mountain scenery amidst which they are situated. The other principal lakes are Lough Currane (Waterville Lake) near Ballinskellig, and Lough Caragh near Castlemaine harbour. Salmon and trout fishing with the rod is extensively prosecuted in all these waters. Near the summit of Mangerton Mountain an accumulation of water in a deep hollow forms what is known as the Devil's Punchbowl, the surplus water, after making a succession of cataracts, flowing into Muckross Lake at the foot of the mountain. There are chalybeate mineral springs near Killarney, near Valencia Island, and near the mouth of the Inny; sulphurous chalybeate springs near Dingle, Castlemaine and Tralee; and a saline spring at Magherybeg in Corkaguiney, which bursts out of clear white sand a little below high-water mark. Killarney is an inland centre widely celebrated and much visited on account of its scenic attractions; there are also several well-known coast resorts, among them Derrynane, at the mouth of Kenmare Bay, the residence of Daniel O'Connell the " liberator "; Glenbeigh on Dingle Bay, Parknasilla on Kenmare Bay, Waterville (an Atlantic telegraph station) between Ballinskellig Bay and Lough Currane, and Tarbert, a small coast town on the Shannon estuary. Others of the smaller villages have grown into watering-places, such as Ballybunion, Castlegregory and Portmagee.

Geology.—Kerry includes on the north and east a considerable area of Carboniferous shales and sandstones, reaching the coal-measures, with unproductive coals, east of Listowel and on the Glanruddery Mountains. The Carboniferous Limestone forms a fringe to these beds, and is cut off by the sea at Knockaneen Bay, Tralee and Castlemaine. In all the great promontories, Old Red Sandstone, including Jukes's "Glengariff Grits," forms the mountains, while synclinal hollows of Carboniferous Limestone have become submerged to form marine inlets between them. The Upper Lake of Killarney lies in a hollow of the Old Red Sandstone, which here rises to its greatest height in Macgillicuddy's Reeks; Lough Leane however, with its low shores, rests on Carboniferous Limestone. In the Dingle promontory the Old Red Sandstone is strikingly unconformable on the Dingle beds and the Upper Silurian series; the latter include volcanic rocks of Wenlock age. The evidences of local glaciation in this county, especially on the wild slopes of the mountains, are as striking as in North Wales. A copper-mine was formerly worked at Muckross, near Killarney, in which cobalt ores also occurred. Slate is quarried in Valencia Island.

Fauna.—Foxes are numerous, and otters and badgers are not uncommon. The alpine hare is very abundant. The red deer inhabits the mountains round Killarney. The golden eagle, once frequently seen in the higher mountain regions, is now rarely met. The sea eagle haunts the lofty marine cliffs, the mountains and the rocky islets. The osprey is occasionally seen, and also the peregrine falcon. The merlin is common. The common owl is indigenous, the long-eared owl resident, and the short-eared owl a regular winter visitor. Rock pigeons breed on the sea-cliffs, and the turtle-dove is an occasional visitant. The great grey seal is found in Brandon and Dingle bays.

Climate and Agriculture.—Owing to the vicinity of the sea and the height of the mountains, the climate is very moist and unsuitable for the growth of cereals, but it is so mild even in winter that arbutus and other trees indigenous to warm climates grow in the open air, and several flowering plants are found which are unknown in England. In the northern parts the land is generally coarse and poor, except in the valleys, where a rich soil has been formed by rocky deposits. In the Old Red Sandstone valleys there are many very fertile regions, and several extensive districts now covered by bog admit of easy reclamation so as to form very fruitful soil, but other tracts of boggy land scarcely promise a profitable return for labour expended on their reclamation. Over one-third of the total area is quite barren. The numbers of live stock of every kind are generally increased or sustained. Dairy-farming is very largely followed. The Kerry breed of cattle—small finely-shaped animals, black or red in colour, with small upturned horns—are famed for the quality both of their flesh and milk, and are in considerable demand for the parks surrounding mansion-houses. The " Dexter," a cross between the Kerry and an unknown breed, is larger but without its fine qualities. Little regard is paid to the breed of sheep, but those in most common use have been crossed with a merino breed from Spain. Goats share with sheep the sweet pasturage of the higher mountain ridges, while cattle occupy the lower slopes.

Other Industries.—In former times there was a considerable linen trade in Kerry, but this is now nearly extinct, the chief manufacture being that of coarse woollens and linens for home use. At Killarney a variety of articles are made from the wood of the arbutus. A considerable trade in agricultural produce is carried on at Tralee, Dingle and Kenmare, and in slate and stone at Valencia. The deep-sea and coast fisheries are prosperous, and there are many small fishing settlements along the coast, but the centres of the two fishery districts are Valencia and Dingle. Salmon fishing is also an industry, for which the district centres are Kenmare and Killarney.

Communications.—The Great Southern & Western railway almost monopolizes the lines in the county. The principal line traverses the centre of the county, touching Killarney, Tralee and Listowel, and passing ultimately to Limerick. Branches are from Headford to Kenmare; Farranfore to Killorglin, Cahersiveen and Valencia harbour, Tralee to Fenit and to Castlegregory; and the Listowel and Ballybunion railway. All these are lines to the coast. The Tralee and Dingle railway connects these two towns. The only inland branch is from Tralee to Castleisland.

Population and Administration.—The population (179,136 in 1891; 165,726 in 1901) decreases to an extent about equal to the average of the Irish counties, but the emigration returns are among the heaviest. The chief towns are Tralee (the county town, pop. 9867); Killarney (5656), Listowel (3605) and Cahersiveen or Cahirciveen (2013), while Dingle, Kenmare, Killorglin and Castleisland are smaller towns. The county comprises 9 baronies, and contains 85 civil parishes. Assizes are held at Tralee, and quarter sessions at Cahersiveen, Dingle, Kenmare, Killarney, Listowel and Tralee. The headquarters of the constabulary force is at Tralee. Previous to the Union the county returned eight members to the Irish parliament, two for the county, and two for each of the boroughs of Tralee, Dingle and Ardfert. At the Union the number was reduced to three, two for the county and one for the borough of Tralee; but the divisions now number four: north, south, east and west, each returning one member. The county is in the Protestant diocese of Limerick and the Roman Catholic dioceses of Kerry and Limerick.

History.—The county is said to have derived its name from Ciar, who with his tribe, the *Ciarraidhe*, is stated to have inhabited about the beginning of the Christian era the territory lying between Tralee and the Shannon. That portion lying south of the Maine was at a later period included in the kingdom of Desmond (*q.v.*). Kerry suffered frequently from invasions of the Danes in the 9th and 10th centuries, until they were finally overthrown at the battle of Clontarf in 1014. In 1172 Dermot MacCarthy, king of Cork and Desmond, made submission to Henry II. on certain conditions, but was nevertheless gradually compelled to retire within the limits of Kerry, which is one of the areas generally considered to have been made shire ground by King John. An English adventurer, Raymond le Gros, received from this MacCarthy a large portion of the county round Lixnaw. In 1579–1580 attempts were made by the Spaniards to invade Ireland, landing at Limerick harbour, near Dingle, and a fortress was erected here, but was destroyed by the English in 1580. The Irish took advantage of the disturbed state of England at the time of the Puritan revolution to attempt the overthrow of the English rule in Kerry, and ultimately obtained possession of Tralee, but in 1652 the rebellion was completely subdued, and a large number of estates were afterwards confiscated.

There are remains of a round tower at Aghadoe, near Killarney, and another, one of the finest and most perfect specimens in Ireland, 92 ft. high, at Rattoe, not far from Ballybunion. On the summit of a hill to the north of Kenmare River is the remarkable stone fortress known as Staigue Fort. There are several stone cells in the principal Skellig island, where penance, involving the scaling of dangerous rocks, was done by pilgrims, and where there were formerly monastic remains which have been swept away by the sea. The principal groups of sepulchral stones are those on the summits of the Tomie Mountains, a remarkable stone fort at Cahersiveen, a circle of stones with cromlech in the parish of Tuosist, and others with inscriptions near Dingle. The remote peninsula west of a line from Dingle to Smerwick harbour is full of remains of various dates. The most notable monastic ruins are those of Innisfallen, founded by St Finian, a disciple of St Columba, and the fine remains of Muckross Abbey, founded by the Franciscans, but there are also monastic remains at Ardfert, Castlemaine, Derrynane, Kilcoleman and O'Dorney. Among ruined churches of interest are those of Aghadoe, Kilcrohane, Lough Currane, Derrynane and Muckross. The cathedral of Ardfert, founded probably in 1253, was partly destroyed during the Cromwellian wars, but was restored in 1831. Some interesting portions remain (see Tralee). There is a large number of feudal castles.

KERSAINT, ARMAND GUY SIMON DE COETNEMPREN, Comte de (1742–1793), French sailor and politician, was born at Paris on the 29th of July 1742. He came of an old family, his father, Guy François de Coetnempren, comte de Kersaint, being a distinguished naval officer. He entered the navy in 1755, and in 1757, while serving on his father's ship, was promoted to the rank of ensign for his bravery in action. By 1782 he was a captain, and in this year took part in an expedition to Guiana. At that time the officers of the French navy were divided into two parties—the reds or nobles, and the blues or *roturiers*. At the outbreak of the Revolution, Kersaint, in spite of his high birth, took the side of the latter. He adopted the new ideas, and in a pamphlet entitled *Le Bon Sens* attacked feudal privileges; he also submitted to the Constituent Assembly a scheme for the reorganization of the navy, but it was not accepted. On the 4th of January 1791 Kersaint was appointed administrator of the department of the Seine by the electoral assembly of Paris. He was also elected as a *député suppléant* to the Legislative Assembly, and was called upon to sit in it in place of a deputy who had resigned. From this time onward his chief aim was the realization of the navy scheme which he had vainly submitted to the Constituent Assembly. He soon saw that this would be impossible unless there were a general reform of all institutions, and therefore gave his support to the policy of the advanced party in the Assembly, denouncing the conduct of Louis XVI., and on the 10th of August 1792 voting in favour of his deposition. Shortly after, he was sent on a mission to the *armée du Centre*, visiting in this way Soissons, Reims, Sedan and the Ardennes. While thus occupied he was arrested by the municipality of Sedan; he was set free after a few days' detention. He took an active part in one of the last debates of the Legislative Assembly, in which it was decided to publish a *Bulletin officiel*, a report continued by the next Assembly, and known by the name of the *Bulletin de la Convention Nationale*. Kersaint was sent as a deputy to the Convention by the department of Seine-et-Oise in September 1792, and on the 1st of January 1793 was appointed vice-admiral. He continued to devote himself to questions concerning the navy and national defence, prepared a report on the English political system and the navy, and caused a decree to be passed for the formation of a committee of general defence, which after many modifications was to become the famous Committee of Public Safety. He had also had a decree passed concerning the navy on the 11th of January 1793. He had, however, entered the ranks of the Girondins, and had voted in the trial of the king against the death penalty and in favour of the appeal to the people. He resigned his seat in the Convention on the 20th of January. After the death of the king his opposition became more marked; he denounced the September massacres, but when called upon to justify his attitude confined himself to attacking Marat, who was at the time all-powerful. His friends tried in vain to obtain his appointment as minister of the marine; and he failed to obtain even a post as officer. He was arrested on the 23rd of September at Ville d'Avray, near Paris, and taken before the Revolutionary Tribunal, where he was accused of having conspired for the restoration of the monarchy, and of having insulted national representation by resigning his position in the legislature. He was executed on the 4th of December 1793.

His brother, Guy Pierre (1747–1822), also served in the navy, and took part in the American war of independence. He did not accept the principles of the Revolution, but emigrated. He was restored to his rank in the navy in 1803, and died in 1822, after having been *préfet maritime* of Antwerp, and prefect of the department of Meurthe.

See Kersaint's own works, *Le Bon Sens* (1789); the *Rubicon* (1789); *Considérations sur la force publique et l'institution des gardes nationales* (1789); *Lettre à Mirabeau* (1791); *Moyens présentés à l'Assemblée nationale pour rétablir la paix et l'ordre dans les colonies*; also E. Chevalier, *Histoire de la Marine française sous la première République*; E. Charavay, *L'Assemblée électorale de Paris en 1790 et 1791* (Paris, 1890); and Agénor Bardoux, *La Duchesse de Duras* (Paris, 1898), the beginning of which deals with Kersaint, whose daughter married Amédée de Duras. (R. A.*)

KERVYN DE LETTENHOVE, CONSTANTINE BRUNO, Baron, (1817–1891), Belgian historian, was born at Saint-Michel-les-Bruges in 1817. He was a member of the Catholic Constitutional party and sat in the Chamber as member for Eecloo. In 1870 he was appointed a member of the cabinet of Anethan as minister of the interior. But his official career was short. The cabinet appointed as governor of Lille one Decker, who had been entangled in the financial speculations of Langand-Dumonceau by which the whole clerical party had been discredited, and which provoked riots. The cabinet was forced to resign, and Kervyn de Lettenhove devoted himself entirely to literature and history. He had already become known as the author of a book on Froissart (Brussels, 1855), which was crowned by the French Academy. He edited a series of chronicles—*Chroniques relatives à l'histoire de la Belgique sous la domination des ducs de Bourgogne* (Brussels, 1870–1873), and *Rélations politiques des Pays Bas et de l'Angleterre sous le regne de Philippe II.* (Brussels, 1882–1892). He wrote a history of *Les Hugenots et les Gueux* (Bruges, 1883–1885) in the spirit of a violent Roman Catholic partisan, but with much industry and learning. He died at Saint-Michel-les-Bruges in 1891.

See *Notices biographiques et bibliographiques de l'académie de Belgique* for 1887.

KESHUB CHUNDER SEN (Keshava Chandra Sena) (1838–1884), Indian religious reformer, was born of a high-caste family at Calcutta in 1838. He was educated at one of the Calcutta colleges, where he became proficient in English literature and history. For a short time he was a clerk in the Bank of Bengal, but resigned his post to devote himself exclusively to literature and philosophy. At that time Sir William Hamilton, Hugh Blair, Victor Cousin, J. H. Newman and R. W. Emerson were among his favourite authors. Their works made the deepest impression on him, for, as he expressed it, "Philosophy first taught me insight and reflection, and turned my eyes inward from the things of the external world, so that I began to reflect on my position, character and destiny." Like many other educated Hindus, Keshub Chunder Sen had gradually dissociated himself from the popular forms of the native religion, without abandoning what he believed to be its spirit. As early as 1857 he joined the Brahma Samaj, a religious association aiming at the reformation of Hinduism. Keshub Chunder Sen threw himself with enthusiasm into the work of this society and in 1862 himself undertook the ministry of one of its branches. In the same year he helped to found the Albert College and started the *Indian Mirror*, a weekly journal in which social and moral subjects were discussed. In 1863 he wrote *The Brahma Samaj Vindicated*. He also travelled about the country lecturing and preaching. The steady development of his reforming zeal led to a split in the society, which broke into two sections, Chunder Sen putting himself at the head of the reform movement, which took the name "Brahma Samaj of India," and tried to propagate its doctrines by missionary enterprise. Its tenets at this time were the following: (1) The wide universe is the temple of God. (2) Wisdom is the pure land of pilgrimage. (3) Truth is the everlasting scripture. (4) Faith is the root of all religions. (5) Love is the true spiritual culture. (6) The destruction of selfishness is the true asceticism. In 1866 he delivered an address on "Jesus Christ, Europe and Asia," which led to the false impression that he was about to embrace Christianity. This helped to call attention to him in Europe, and in 1870 he paid a visit to England. The Hindu preacher was warmly welcomed by almost all denominations, particularly by the Unitarians, with whose creed the new Brahma Samaj had most in common, and it was the committee of the British and Foreign Unitarian Association that organized the welcome soirée at Hanover Square Rooms on the 12th of April. Ministers of ten different denominations were on the platform, and among those who officially bade him welcome were Lord Lawrence and Dean Stanley. He remained for six months in England, visiting most of the chief towns. His eloquence, delivery and command of the language won universal admiration. His own impression of England was somewhat disappointing. Christianity in England appeared to him too sectarian and narrow, too "muscular and hard," and Christian life in England more materialistic and outward than spiritual and inward. "I came here an Indian, I go back a confirmed Indian; I came here a Theist, I go back a confirmed Theist. I have learnt to love my own country more and more." These words spoken at the farewell soirée may furnish the key to the change in him which so greatly puzzled many of his English friends. He developed a tendency towards mysticism and a greater leaning to the spiritual teaching of the Indian philosophies, as well as a somewhat despotic attitude towards the Samaj. He gave his child daughter in marriage to the raja of Kuch Behar; he revived the performance of mystical plays, and himself took part in one. These changes alienated many followers, who deserted his standard and founded the Sadhārana (General) Brahma Samaj (1878). Chunder Sen did what he could to reinvigorate his own section by a new infusion of Christian ideas and phrases, *e.g.* "the New Dispensation," "the Holy Spirit." He also instituted a sacramental meal of rice and water. Two lectures delivered between 1881 and 1883 throw a good deal of light on his latest doctrines. They were "The Marvellous Mystery, the Trinity," and "Asia's Message to Europe." This latter is an eloquent plea against the Europeanizing of Asia, as well as a protest against Western sectarianism. During the intervals of his last illness he wrote *The New Samhita, or the Sacred Laws of the Aryans of the New Dispensation.* He died in January 1884, leaving many bitter enemies and many warm friends.

See the article BRAHMA SAMAJ; also P. Mozoomdar, *Life and Teachings of Keshub Chunder Sen* (1888).

KÉSMÁRK (Ger. Käsmark), a town of Hungary, in the county of Szepes, 240 m. N.E. of Budapest by rail. Pop. (1900), 5560. It is situated on the Poprad, at an altitude of 1950 ft., and is surrounded on all sides by mountains. Among its buildings are the Roman Catholic parish church, a Gothic edifice of the 15th century with fine carved altars; a wooden Protestant church of the 17th century; and an old town-hall. About 12 m. W. of Késmárk lies the famous watering-place Tatrafüred (Ger. Schmecks), at the foot of the Schlagendorfer peak in the Tatra Mountains. Késmárk is one of the oldest and most important Saxon settlements in the north of Hungary, and became a royal free town at the end of the 13th century. In 1440 it became the seat of the counts of Szepes (Ger., *Zips*), and in 1464 it was granted new privileges by King Matthias Corvinus. During the 16th century, together with the other Saxon towns in the Szepes county, it began to lose both its political and commercial importance. It remained a royal free town until 1876.

KESTREL (Fr. *Cresserelle* or *Crécerelle*, O. Fr. *Quercerelle* and *Quercelle*, in Burgundy *Cristel*), the English name[1] for one of the smaller falcons. This bird, though in the form of its bill and length of its wings one of the true falcons, and by many ornithologists placed among them under its Linnaean name of *Falco tinnunculus*, is by others referred to a distinct genus *Tinnunculus* as *T. alaudarius*—the last being an epithet wholly inappropriate. We have here a case in which the propriety of the custom which requires the establishment of a genus on structural characters may seem open to question. The differences of structure which separate *Tinnunculus* from *Falco* are of the slightest, and, if insisted upon, must lead to including in the former birds which obviously differ from kestrels in all but a few characters arbitrarily chosen; and yet, if structural characters be set aside, the kestrels form an assemblage readily distinguishable by several peculiarities from all other *Falconidae*, and an assemblage separable from the true Falcons of the genus *Falco*, with its subsidiary groups *Aesalon*, *Hypotriorchis*, and the rest (see FALCON). Scarcely any one outside the walls of an ornithological museum or library would doubt for a moment whether any bird shown to him was a kestrel or not; and Gurney has stated his belief (*Ibis*, 1881, p. 277) that the aggregation of species placed by Bowdler Sharpe (*Cat. Birds Brit. Mus.* i. 423–448) under the generic designation of *Cerchneis* (which should properly be *Tinnunculus*) includes "three natural groups sufficiently distinct to be treated as at least separate subgenera, bearing the name of *Dissodectes*, *Tinnunculus* and *Erythropus*." Of these the first and last are not kestrels, but are perhaps rather related to the hobbies (*Hypotriorchis*).

The ordinary kestrel of Europe, *Falco tinnunculus* or *Tinnunculus alaudarius*, is by far the commonest bird of prey in the British Islands. It is almost entirely a summer migrant, coming from the south in early spring and departing in autumn, though examples (which are nearly always found to be birds of the year) occasionally occur in winter, some arriving on the eastern coast in autumn. It is most often observed while hanging in the air for a minute or two in the same spot, by means of short and rapid beats of its wings, as, with head pointing to windward and expanded tail, it is looking out for prey—which consists chiefly of mice, but it will at times take a small bird, and the remains of frogs, insects and even earthworms have been found in its crop. It generally breeds in the deserted nest of a crow or pie, but frequently in rocks, ruins, or even in hollow trees—laying four or five eggs, mottled all over with dark brownish-red, sometimes tinged with orange and at other times with purple. Though it may occasionally snatch up a young partridge or pheasant, the kestrel is the most harmless bird of prey, if it be not, from its destruction of mice and cockchafers, a beneficial species. Its range extends over nearly the whole of Europe from 68° N. lat., and the greater part of Asia—though the form which inhabits Japan and is abundant in north-eastern China has been by some writers deemed distinct and called *T. japonicus*—it is also found over a great part of Africa, being, however, unknown beyond Guinea on the west and Mombasa on the east coast (*Ibis*, 1881, p. 457). The southern countries of Europe have also another and smaller species of kestrel, *T. tinnunculoides* (the *T. cenchris* and *T. naumanni* of some writers), which is widely spread in Africa and Asia, though specimens from India and China are distinguished as *T. pekinensis*.

Three other species are found in Africa—*T. rupicola*, *T. rupicoloides* and *T. alopex*—the first a common bird in the Cape, while the others occur in the interior. Some of the islands of the Ethiopian region have peculiar species of kestrel, as the *T. newtoni* of Madagascar, *T. punctatus* of Mauritius and *T. gracilis* of the Seychelles; while, on the opposite side, the kestrel of the Cape Verde Islands has been separated as *T. neglectus*.

The *T. sparverius*, commonly known in Canada and the United States as the "sparrow-hawk," is a beautiful little bird. Various attempts have been made to recognize several species, more or less in accordance with locality, but the majority of ornithologists seem unable to accept the distinctions which have been elaborated chiefly by Bowdler Sharpe in his *Catalogue* and R. Ridgway (*North American Birds*, iii. 159–175), the former of whom recognizes six species, while the latter admits but three—

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[1] Other English names are windhover and standgale (the last often corrupted into stonegale and stannell).

T. sparverius, *T. leucophrys* and *T. sparverioides*—with five geographical races of the first, viz. the typical *T. sparverius* from the continent of North America except the coast of the Gulf of Mexico; *T. australis* from the continent of South America except the North Atlantic and Caribbean coasts; *T. isabellinus*, inhabiting continental America from Florida to Fr. Guiana; *T. dominicensis* from the Lesser Antilles as far northwards as St Thomas; and lastly *T. cinnamominus* from Chile and western Brazil. *T. leucophrys* is said to be from Haiti and Cuba; and *T. sparverioides* peculiar to Cuba only. This last has been generally allowed to be a good species, though Dr Gundlach, the best authority on the birds of that island, in his *Contribucion á la Ornitologia Cubana* (1876), will not allow its validity. More recently it was found (*Ibis*, 1881, pp. 547–564) that *T. australis* and *T. cinnamominus* cannot be separated, that Ridgway's *T. leucophrys* should properly be called *T. dominicensis*, and his *T. dominicensis T. antillarum*; while Ridgway has recorded the supposed occurrence of *T. sparverioides* in Florida. Of other kestrels *T. moluccensis* is widely spread throughout the islands of the Malay Archipelago, while *T. cenchroides* seems to inhabit the whole of Australia, and has occurred in Tasmania (*Proc. Roy. Soc. Tasmania*, 1875, pp. 7, 8). No kestrel is found in New Zealand, but an approach to the form is made by the very peculiar *Hieracidea* (or *Harpe*) *novae-zelandiae* (of which a second race or species has been described, *H. brunnea* or *H. ferox*), the "sparrow-hawk," "quail-hawk" and "bush-hawk" of the colonists—a bird of much higher courage than any kestrel, and perhaps exhibiting the more generalized and ancestral type from which both kestrels and falcons may have descended. (A. N.)

KESWICK, a market town in the Penrith parliamentary division of Cumberland, England, served by the joint line of the Cockermouth Keswick & Penrith, and London & North-Western railways. Pop. of urban district (1901), 4451. It lies in the northern part of the Lake District, in an open valley on the banks of the river Greta, with the mountain of Skiddaw to the north and the lovely lake of Derwentwater to the south. It is much frequented by visitors as a centre for this famous district—for boating on Derwentwater and for the easy ascent of Skiddaw. Many residences are seen in the neighbourhood, and the town as a whole is modern. Fitz Park, opened in 1887, is a pleasant recreation ground. The town-hall contains a museum of local geology, natural history, &c. In the parish church of Crosthwaite, ¾ m. distant, there is a monument to the poet Southey. His residence, Greta Hall, stands at the end of the main street, close by the river. Keswick is noted for its manufacture of lead pencils; and the plumbago (locally wad) used to be supplied from mines in Borrowdale. Char, caught in the neighbouring lakes, are potted at Keswick in large quantities and exported.

KESWICK CONVENTION, an annual summer reunion held at the above town for the main purpose of "promoting practical holiness" by meetings for prayer, discussion and personal intercourse. It has no denominational limits, and is largely supported by the "Evangelical" section of the Church of England. The convention, started in a private manner by Canon Harford-Battersby, then vicar of Keswick, and Mr Robert Wilson in 1874, met first in 1875, and rapidly grew after the first few years, both in numbers and influence, in spite of attacks on the alleged "perfectionism" of some of its leaders and on the novelty of its methods. Its members take a deep interest in foreign missions.

In the *History of the C.M.S.*, vol. iii. (by Eugene Stock), the missionary influence of the "Keswick men" in Cambridge and elsewhere may be readily traced. See also *The Keswick Convention*: its *Message, its Method and its Men*, edited by C. F. Harford (1906).

KET (or Kett), **ROBERT** (d. 1549), English rebel, is usually called a tanner, but he certainly held the manor of Wymondham in Norfolk. With his brother William he led the men of Wymondham in their quarrel with a certain Flowerden, and having thus come into prominence, he headed the men of Norfolk when they rose in rebellion in 1549 owing to the hardships inflicted by the extensive enclosures of common lands and by the general policy of the protector Somerset. A feast held at Wymondham in July 1549 developed into a riot and gave the signal for the outbreak. Leading his followers to Norwich, Ket formed a camp on Mousehold Heath, where he is said to have commanded 16,000 men, introduced a regular system of discipline, administered justice and blockaded the city. He refused the royal offer of an amnesty on the ground that innocent and just men had no need of pardon, and on the 1st of August 1549 attacked and took possession of Norwich. John Dudley, earl of Warwick, marched against the rebels, and after his offer of pardon had been rejected he forced his way into the city, driving its defenders before him. Then, strengthened by the arrival of some foreign mercenaries, he attacked the main body of the rebels at Dussindale on the 27th of August. Ket's men were easily routed by the trained soldiery, and Robert and William Ket were seized and taken to London, where they were condemned to death for treason. On the 7th of December 1549 Robert was executed at Norwich, and his body was hanged on the top of the castle, while that of William was hanged on the church tower at Wymondham.

See F. W. Russell, *Kett's Rebellion* (1859), and J. A. Froude, *History of England*, vol. iv. (London, 1898).

KETCH, JOHN (d. 1686), English executioner, who as "Jack Ketch" gave the nickname for nearly two centuries to his successors, is believed to have been appointed public hangman in the year 1663. The first recorded mention of him is in *The Plotters Ballad, being Jack Ketch's incomparable Receipt for the Cure of Traytorous Recusants and Wholesome Physick for a Popish Contagion*, a broadside published in December 1672. The execution of William, Lord Russell, on the 21st of July 1683 was carried out by him in a clumsy way, and a pamphlet is extant which contains his "Apologie," in which he alleges that the prisoner did not "dispose himself as was most suitable" and that he was interrupted while taking aim. On the scaffold, on the 15th of July 1685, the duke of Monmouth, addressing Ketch, referred to his treatment of Lord Russell, the result being that Ketch was quite unmanned and had to deal at least five strokes with his axe, and finally use a knife, to sever Monmouth's head from his shoulders. In 1686 Ketch was deposed and imprisoned at Bridewell, but when his successor, Pascha Rose, a butcher, was, after four months in the office, hanged at Tyburn, Ketch was reappointed. He died towards the close of 1686.

KETCHUP, also written *catsup* and *katchup* (said to be from the Chinese *kôe-chiap* or *kê-tsiap*, brine of pickled fish), a sauce or relish prepared principally from the juice of mushrooms and of many other species of edible fungi, salted for preservation and variously spiced. The juices of various fruits, such as cucumbers, tomatoes, and especially green walnuts, are used as a basis of ketchup, and shell-fish ketchup, from oysters, mussels and cockles, is also made; but in general the term is restricted to sauces having the juice of edible fungi as their basis.

KETENES, in chemistry, a group of organic compounds which may be considered as internal anhydrides of acetic acid and its substitution derivatives. Two classes may be distinguished: the aldo-ketenes, including ketene itself, together with its monoalkyl derivatives and carbon suboxide, and the keto-ketenes which comprise the dialkyl ketenes. The aldo-ketenes are colourless compounds which are not capable of autoxidation, are polymerized by pyridine or quinoline, and are inert towards compounds containing the groupings C:N and C:O. The keto-ketenes are coloured compounds, which undergo autoxidation readily, form ketene bases on the addition of pyridine and quinoline, and yield addition compounds with substances containing the C:N and C:O groupings. The ketenes are usually obtained by the action of zinc on ethereal or ethyl acetate solutions of halogen substituted acid chlorides or bromides. They are characterized by their additive reactions: combining with water to form acids, with alcohols to form esters, and with primary amines to form amides.

Ketene, CH_2:CO, was discovered by N. T. M. Wilsmore (*Jour. Chem. Soc.*, 1907, vol. 91, p. 1938) among the gaseous products formed when a platinum wire is electrically heated under the surface of acetic anhydride. It is also obtained by the action of zinc on bromacetyl bromide (H. Staudinger, *Ber.* 1908, 41, p. 594). At ordinary temperatures it is a gas, but it may be condensed to a liquid and finally solidified, the solid melting at −151° C. It is characterized by its penetrating smell. On standing for some time a brown-coloured liquid is obtained, from which a colourless liquid boiling at 126–127° C., has been isolated (Wilsmore, ibid., 1908, 93, p. 946). Although originally described as acetylketen, it has proved to be a cyclic compound (Ber., 1909, 42, p. 4908). It is soluble in water, the solution showing an acid reaction, owing to the formation of aceto-acetic acid, and with alkalis it yields acetates. It differs from the simple ketenes in that it is apparently unacted upon by phenols and alcohols. *Dimethyl ketene*, $(CH_3)_2C:CO$, obtained by the action of zinc on α-brom-isobutyryl bromide, is a yellowish coloured liquid. At ordinary temperatures it rapidly polymerizes (probably to a tetramethylcylobutanedione). It boils at 34° C. (750 mm.) (Staudinger, *Ber.* 1905, 38, p. 1735; 1908, 41, p. 2208). Oxygen rapidly converts it into a white explosive solid. *Diethyl ketene*, $(C_2H_5)_2C:CO$, is formed on heating diethylmalonic anhydride (Staudinger, ibid.). *Diphenyl ketene*, $(C_6H_5)_2C:CO$, obtained by the action of zinc on diphenyl-chloracetyl chloride, is an orange-red liquid which boils at 146° C. (12 mm.). It does not polymerize. Magnesium phenyl bromide gives triphenyl vinyl alcohol.

KETI, a sea-port of British India, in Karachi district, Sind, situated on the Hajamro branch of the Indus. Pop. (1901), 2127. It is an important seat of trade, where sea-borne goods are transferred to and from river boats.

KETONES, in chemistry, organic compounds of the type $R\cdot CO\cdot R'$, where R, R′=alkyl or aryl groups. If the groups R and R′ are identical, the ketone is called a *simple* ketone, if unlike, a *mixed* ketone. They may be prepared by the oxidation of secondary alcohols; by the addition of the elements of water to hydrocarbons of the acetylene type RC CH ; by oxidation of primary alcohols of the type $RR'\cdot CH\cdot CH_2OH:RR'\cdot CH\cdot CH_2OH \rightarrow R\cdot CO\cdot R'+H_2O+H_2CO_2$; by distillation of the calcium salts of the fatty acids, $C_nH_{2n}O_2$; by heating the sodium salts of these acids $C_nH_{2n}O_2$ with the corresponding acid anhydride to 190° C. (W. H. Perkin, *Jour. Chem. Soc.*, 1886, 49, p. 322); by the action of anhydrous ferric chloride on acid chlorides (J. Hamonet, *Bull. de la soc. chim.*, 1888, 50, p. 357),

$$2C_2H_5COCl \rightarrow C_2H_5\cdot CO\cdot CH(CH_3)\cdot COCl$$
$$\rightarrow C_2H_5\cdot CO\cdot CH(CH_3)\cdot CO_2H \rightarrow C_2H_5\cdot CO\cdot CH_2\cdot CH_3;$$

and by the action of zinc alkyls on acid chlorides (M. Freund, *Ann.*, 1861, 118, p. 1), $2CH_3COCl+ZnCH_3)_2=ZnCl_2+2CH_3\cdot CO\cdot CH_3$. In the last reaction complex addition products are formed, and must be quickly decomposed by water, otherwise tertiary alcohols are produced (A. M. Butlerow, *Jahresb.*, 1864, p. 496; *Ann.* 1867, 144, p. 1). They may also be prepared by the decomposition of ketone chlorides with water; by the oxidation of the tertiary hydroxyacids; by the hydrolysis of the ketonic acids or their esters with dilute alkalis or baryta water (see Aceto-acetic Ester); by the hydrolysis of alkyl derivatives of acetone dicarboxylic acid, $HO_2C\cdot CH_2\cdot CO\cdot CHR\cdot CO_2H$; and by the action of the Grignard reagent on nitriles (E. Blaise, *Comptes rendus*, 1901, 132, p. 38),

$$R\cdot CN + R'M_gI \rightarrow RR'C:N\cdot M_gI \rightarrow R\cdot CO\cdot R' + NH_3 + M_gI\cdot OH.$$

The ketones are of neutral reaction, the lower members of the series being colourless, volatile, pleasant-smelling liquids. They do not reduce silver solutions, and are not so readily oxidized as the aldehydes. On oxidation, the molecule is split at the carbonyl group and a mixture of acids is obtained. Sodium amalgam reduces them to secondary alcohols; phosphorus pentachloride replaces the carbonyl oxygen by chlorine, forming the ketone chlorides. Only those ketones which contain a methyl group are capable of forming crystalline addition compounds with the alkaline bisulphites (F. Grimm, *Ann.*, 1871, 157, p. 262). They combine with hydrocyanic acid to form nitriles, which on hydrolysis furnish hydroxyacids,

$$(CH_3)_2CO \rightarrow (CH_3)_2C\cdot OH\cdot CN \rightarrow (CH_3)_2\cdot C\cdot OH\cdot CO_2H;$$

with phenylhydrazine they yield hydrazones; with hydrazine they yield in addition ketazines $RR'\cdot C:N\cdot N:C\cdot RR'$ (T. Curtius), and with hydroxylamine ketoximes. The latter readily undergo the "Beckmann" transformation on treatment with acid chlorides, yielding substituted acid amides,

$$RR'\cdot C:NOH \rightarrow RC(NR')\cdot OH \rightarrow R\cdot CO\cdot NHR'$$

(see Oximes, also A. Hantzsch, *Ber.*, 1891, 24, p. 13). The ketones react with mercaptan to form mercaptols (E. Baumann, *Ber.*, 1885, 18, p. 883), and with concentrated nitric acid they yield dinitroparaffins (G. Chancel, *Bull. de la soc. chim.*, 1879, 31, p. 503). With nitrous acid (obtained from amyl nitrite and gaseous hydrochloric acid, the ketone being dissolved in acetic acid) they form isonitroso-ketones, $R\cdot CO\cdot CH:NOH$ (L. Claisen, *Ber.*, 1887, 20, pp. 656, 2194). With ammonia they yield complex condensation products; acetone forming di- and triacetonamines (W. Heintz, *Ann.* 1875, 178, p. 305; 1877, 189, p. 214. They also condense with aldehydes, under the influence of alkalis or sodium ethylate (L. Claisen, *Ann.*, 1883, 218, pp. 121, 129, 145; 1884, 223, p. 137; S. Kostanecki and G. Rossbach, *Ber.*, 1896, 29, pp. 1488, 1495, 1893, &c.). On treatment with the Grignard reagent, in absolute ether solution, they yield addition products which are decomposed by water with production of tertiary alcohols (V. Grignard, *Comptes rendus*, 1900, 130, p. 1322 et seq.),

$$RR'CO \rightarrow RR'\cdot C(OM_gI)\cdot R'' \rightarrow RR'R''\cdot C(OH) + MgI\cdot OH.$$

Ketones do not polymerize in the same way as aldehydes, but under the influence of acids and bases yield condensation products; thus acetone gives mesityl oxide, phorone and mesitylene (see below).

For *dimethyl ketone* or acetone, see Acetone. *Diethyl ketone*, $(C_2H_5)_2\cdot CO$, is a pleasant-smelling liquid boiling at 102·7° C. With concentrated nitric acid it forms dinitroethane, and it is oxidized by chromic acid to acetic and propionic acids. *Methylnonylketone*, $CH_3\cdot CO\cdot C_9H_{19}$, is the chief constituent of oil of rue, which also contains *methylheptylketone*, $CH_3\cdot CO\cdot C_7H_{15}$, a liquid of boiling-point 85–90° C. (7 mm.), which yields normal caprylic acid on oxidation with hypobromites.

Mesityl oxide, $(CH_3)_2C:CH\cdot CO\cdot CH_3$, is an aromatic smelling liquid of boiling point 129·5–130° C. It is insoluble in water, but readily dissolves in alcohol. On heating with dilute sulphuric acid it yields acetone, but with the concentrated acid it gives mesitylene, C_9H_{12}. Potassium permanganate oxidizes it to acetic acid and hydroxyisobutyric acid (A. Pinner, *Ber.*, 1882, 15, p. 591). It forms hydroxyhydrocollidine when heated with acetamide and anhydrous zinc chloride (F. Canzoneri and G. Spica, *Gazz. chim. Ital.*, 1884, 14, p.349). *Phorone*, $(CH_3)_2C:CH\cdot CO\cdot CH:C(CH_3)_2$, forms yellow crystals which melt at 28° C. and boil at 197·2° C. When heated with phosphorus pentoxide it yields acetone, water and some pseudocumene. Dilute nitric acid oxidizes it to acetic and oxalic acids, while potassium permanganate oxidizes it to acetone, carbon dioxide and oxalic acid.

Diketones.—The diketones contain two carbonyl groups, and are distinguished as α or 1·2 diketones, β or 1·3 diketones, γ or 1·4 diketones, &c., according as they contain the groupings $-CO\cdot CO-$, $-CO\cdot CH_2\cdot CO-$, $-CO\cdot CH_2\cdot CH_2\cdot CO-$, &c.

The α-diketones may be prepared by boiling the product of the action of alkaline bisulphites on isonitrosoketones with 15 % sulphuric acid (H. v. Pechmann, *Ber.*, 1887, 20, p. 3112; 1889, 22, p. 2115), $CH_3\cdot CO\cdot C:(N\cdot OH)\cdot CH_3 \rightarrow CH_3\cdot CO\cdot C:(NHSO_3)\cdot CH_3 \rightarrow CH_3\cdot CO\cdot CO\cdot CH_3$; or by the action of isoamyl nitrite on the isonitrosoketones (O. Manasse, *Ber.*, 1888, 21, p. 2177), $C_2H_5\cdot CO\cdot C:(NOH)\cdot CH_3 + {}_{11}C_5HONO = C_2H_5\cdot CO\cdot CO\cdot CH_3 + C_5H_{11}OH + N_2O$. They condense with orthodiamines to form quinoxalines (O. Hinsberg, *Ann.*, 1887, 237, p. 327), and with ammonia and aldehydes to form imidazoles. *Diacetyl*, $CH_3\cdot CO\cdot CO\cdot CH_3$, is a yellowish green liquid, which boils at 87–88° C., and possesses a pungent smell. It combines with sodium bisulphite and with hydrocyanic acid. Dilute alkalis convert it into paraxyloquinone.

The β-diketones form characteristic copper salts, and in alcoholic solution they combine with semicarbazide to form products which on boiling with ammoniacal silver nitrate solution give pyrazoles (T. Posner, *Ber.*, 1901, 34, p. 3975); with hydroxylamine they form isoxazoles, and with phenylhydrazine pyrazoles. *Acetyl acetone*, $CH_3\cdot CO\cdot CH_2\cdot CO\cdot CH_3$, may be prepared by the action of aluminium chloride on acetyl chloride, or by condensing ethyl acetate with acetone in the presence of sodium (L. Claisen). It is a liquid of boiling point 136° C. It condenses readily with aniline to give αγ-dimethyl quinoline.

The γ-diketones are characterized by the readiness with which they yield furfurane, pyrrol and thiophene derivatives, the furfurane derivatives being formed by heating the ketones with a dehydrating agent, the thiophenes by heating with phosphorus pentasulphide, and the pyrrols by the action of alcoholic ammonia or amines. *Acetonyl acetone*, $CH_3\cdot CO\cdot CH_2\cdot CH_2\cdot CO\cdot CH_3$, a liquid boiling at 194° C., may be obtained by condensing sodium aceto-acetate with mono-chloracetone (C. Paal, *Ber.*, 1885, 18, p. 59),

$$\begin{aligned}&CH_3COCH_2Cl + Na\cdot CH\cdot COCH_3(COOR)\\ &\quad\rightarrow CH_3CO\cdot CH_2\cdot CH\cdot COCH_3(COOR)\\ &\qquad\rightarrow CH_3CO\cdot CH_2\cdot CH_2\cdot COCH_3;\end{aligned}$$

or by the hydrolysis of diaceto-succinic ester, prepared by the action of iodine on sodium aceto-acetate (L. Knorr, *Ber.*, 1889, 22, pp. 169, 2100).

1·5 diketones have been prepared by L. Claisen by condensing ethoxymethylene aceto-acetic esters and similar compounds with β-ketonic esters and with 1·3 diketones. The ethoxymethylene aceto-acetic esters are prepared by condensing aceto-acetic ester with ortho-formic ester in the presence of acetic anhydride (German patents 77354, 79087, 79863). The 1·5 diketones of this type, when heated with aqueous ammonia, form pyridine derivatives. Those in which the keto groups are in combination with phenyl residues give pyridine derivatives on treatment with hydroxylamine, thus benzamarone, $C_6H_5CH[CH(C_6H_5)\cdot CO\cdot C_6H_5]$, gives pentaphenylpyridine, $NC_5(C_6H_5)_5$. On the general reactions of the 1·5 diketones, see E. Knoevenagel (*Ann.*, 1894, 281, p. 25 et seq.) and H. Stobbe (*Ber.*, 1902, 35, p. 1445).

Many cyclic ketones are known, and in most respects they resemble the ordinary aliphatic ketones (see POLYMETHYLENES; TERPENES).

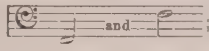
KETTELER, WILHELM EMMANUEL, BARON VON (1811–1877), German theologian and politician, was born at Harkotten, in Bavaria, on the 25th of December 1811. He studied theology at Göttingen, Berlin, Heidelberg and Munich, and was ordained priest in 1844. He resolved to consecrate his life to maintaining the cause of the freedom of the Church from the control of the State. This brought him into collision with the civil power, an attitude which he maintained throughout a stormy and eventful life. Ketteler was rather a man of action than a scholar, and he first distinguished himself as one of the deputies of the Frankfort National Assembly, a position to which he was elected in 1848, and in which he soon became noted for his decision, foresight, energy and eloquence. In 1850 he was made bishop of Mainz, by order of the Vatican, in preference to the celebrated Professor Leopold Schmidt, of Giessen, whose Liberal sentiments were not agreeable to the Papal party. When elected, Ketteler refused to allow the students of theology in his diocese to attend lectures at Giessen, and ultimately founded an opposition seminary in the diocese of Mainz itself. He also founded orders of School Brothers and School Sisters, to work in the various educational agencies he had called into existence, and he laboured to institute orphanages and rescue homes. In 1858 he threw down the gauntlet against the State in his pamphlet on the rights of the Catholic Church in Germany. In 1863 he adopted Lassalle's Socialistic views, and published his *Die Arbeitfrage und das Christenthum.* When the question of papal infallibility arose, he opposed the promulgation of the dogma on the ground that such promulgation was inopportune. But he was not resolute in his opposition. The opponents of the dogma complained at the very outset that he was wavering, half converted by his hosts, the members of the German College at Rome, and further influenced by his own misgivings. He soon deserted his anti-Infallibilist colleagues, and submitted to the decrees in August 1870. He was the warmest opponent of the State in the *Kulturkampf* provoked by Prince Bismarck after the publication of the Vatican decrees, and was largely instrumental in compelling that statesman to retract the pledge he had rashly given, never to "go to Canossa." To such an extent did Bishop von Ketteler carry his opposition, that in 1874 he forbade his clergy to take part in celebrating the anniversary of the battle of Sedan, and declared the Rhine to be a "Catholic river." He died at Burghausen, Upper Bavaria, on the 13th of July 1877.

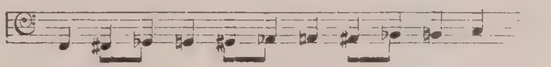
(J. J. L.*)

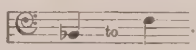
KETTERING, a market town in the eastern parliamentary division of Northamptonshire, England, 72 m. N.N.W. from London by the Midland railway. Pop. of urban district (1891), 19,454; (1901), 28,653. The church of SS Peter and Paul, mainly Perpendicular, has a lofty and ornate tower and spire. The chief manufactures are boots, shoes, brushes, stays, clothing and agricultural implements. There are iron-works in the immediate neighbourhood. The privilege of market was granted in 1227 by a charter of Henry III.

KETTLE, SIR RUPERT ALFRED (1817–1894), English county court judge, was born at Birmingham on the 9th of January 1817. His family had for some time been connected with the glass-staining business. In 1845 he was called to the bar, and in 1859 he was made judge of the Worcestershire county courts, becoming also a bencher of the Middle Temple (1882). He acted as arbitrator in several important strikes, and besides being the first president of the Midland iron trade wages board, he was largely responsible for the formation of similar boards in other staple trades. His name thus became identified with the organization of a system of arbitration between employers and employed, and in 1880 he was knighted for his services in this capacity. In 1851 he married; one of his sons subsequently became a London police magistrate. Kettle died on the 6th of October 1894 at Wolverhampton.

KETTLEDRUM[1] (Fr. *timbales*; Ger. *Pauken*; Ital. *timpani*; Sp. *timbal*), the only kind of drum (*q.v.*) having a definite musical pitch. The kettledrum consists of a hemispherical pan of copper, brass or silver, over which a piece of vellum is stretched tightly by means of screws working on an iron ring, which fits closely round the head of the drum. In the bottom of the pan is a small vent-hole, which prevents the head being rent by the concussion of air. The vellum head may thus be slackened or tightened at will to produce any one of the notes within its compass of half an octave. Each kettledrum gives but one note at a time, and as it takes some little time to alter all the screws, two or three kettledrums, sometimes more, each tuned to a different note, are used in an orchestra or band. For centuries kettledrums have been made and used in Europe in pairs, one large and one small; the relative proportions of the two instruments being well defined and invariable. Even when eight pairs of drums, all tuned to different notes, are used, as by Berlioz in his "Grand Requiem," there are still but the two sizes of drums to produce all the notes. Various mechanisms have been tried with the object of facilitating the change of pitch, but the simple old-fashioned model is still the most frequently used in England. Two sticks, of which there are several kinds, are employed to play the kettledrum; the best of these are made of whalebone for elasticity, and have a small wooden knob at one end, covered with a thin piece of fine sponge. Others have the button covered with felt or india-rubber. The kettledrum is struck at about a quarter of the diameter from the ring.

The compass of kettledrums collectively is not much more than an octave, between ; the larger instruments, which it is inadvisable to tune below F, take any one of the following notes:—



and the smaller are tuned to one of the notes completing the chromatic and enharmonic scale from . These limits comprise all the notes of artistic value that can be obtained from kettledrums. When there are but two drums—the term "drum" used by musicians always denotes the kettledrum—they are generally tuned to the tonic and dominant or to the tonic and subdominant, these notes entering into the composition of most of the harmonies of the key. Formerly the kettledrums used to be treated as transposing instruments, the notation, as for the horn, being in C, the key to which the kettledrums were to be tuned being indicated in the score. Now composers write the real notes.

The tone of a good kettledrum is sonorous, rich, and of great power. When noise rather than music is required uncovered sticks are used. The drums may be muffled or *covered* by placing a piece of cloth or silk over the vellum to damp the sound, a device which produces a lugubrious, mysterious effect and is indicated in the score by the words *timpani coperti*, *timpani con sordini*, *timbales couvertes*, *gedämpfte Pauken*. Besides the beautiful effects obtained by means of delicate gradations of tone, numerous rhythmical figures may be executed on one, two or more notes. German drummers who were renowned during the 17th and 18th centuries, borrowing the terms from the trumpets with which the kettledrums were long associated, recognized the following beats:—

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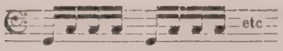
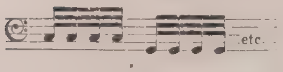
[1] From "drum" and "kettle," a covered metal vessel for boiling water or other liquid; the O. E. word is *cetel*, cf. Du. *ketel*, Ger. *Kessel*, borrowed from Lat. *catillus*, dim. of *catinus*, bowl.

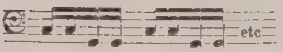
Single tonguing
(*Einfache Zungen*)



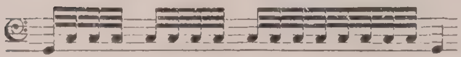
Double tonguing
(*Doppel oder gerissene Zungen*)



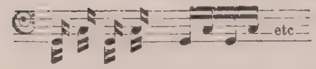
Legato tonguing
(*Tragende Zungen*)



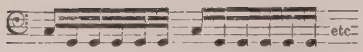
Whole double-tonguing
(*Ganze Doppel-Zungen*)



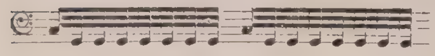
Double cross-beat[1]
(*Doppel Kreuzschläge*)



The roll
(*Wirbel*)



The double roll
(*Doppel Wirbel*)



It is generally stated that Beethoven was the first to treat the kettledrum as a solo instrument, but in *Dido*, an opera by C. Graupner performed at the Hamburg Opera House in 1707, there is a short solo for the kettledrum.[2]

The tuning of the kettledrum is an operation requiring time, even when the screw-heads, as is now usual, are T-shaped; to expedite the change, therefore, efforts have been made in all countries to invent some mechanism which would enable the performer to tune the drum to a fixed note by a single movement. The first mechanical kettledrums date from the beginning of the 19th century. In Holland a system was invented by J. C. N. Stumpff[3]; in France by Labbaye in 1827; in Germany Einbigler patented a system in Frankfort-on-Main in 1836[4]; in England Cornelius Ward in 1837; in Italy C. A. Boracchi of Monza in 1839.[5]

The drawback in most of these systems is the complicated nature of the mechanism, which soon gets out of order, and, being very cumbersome and heavy, it renders the instrument more or less of a fixture. Potter's kettledrum with instantaneous system of tuning, the best known at the present day in England, and used in some military bands with entire success, is a complete contrast to the above. There is practically no mechanism; the system is simple, ingenious, and neither adds to the weight nor to the bulk of the instrument. There are no screws round the head of Potter's kettledrum; an invisible system of cords in the interior, regulated by screws and rods in the form of a Maltese cross, is worked from the outside by a small handle connected to a dial, on the face of which are twenty-eight numbered notches. By means of these the performer is able to tune the drum instantly to any note within the compass by remembering the numbers which correspond to each note and pointing the indicator to it on the face of the dial. Should the cords become slightly stretched, flattening the pitch, causing the representative numbers to change, the performer need only give his indicator an extra turn to bring his instrument back to pitch, each note having several notches at its service. The internal mechanism, being of an elastic nature, has no detrimental effect on the tone but tends to increase its volume and improve its quality.

The origin of the kettledrum is remote and must be sought in the East. Its distinctive characteristic is a hemispherical or convex vessel, closed by means of a single parchment or skin drawn tightly over the aperture, whereas other drums consist of a cylinder, having one end or both covered by the parchment, as in the side-drum and tambourine respectively. The Romans were acquainted with the kettledrum, including it among the *tympana*; the *tympanum leve*, like a sieve, was the tambourine used in the rites of Bacchus and Cybele.[6] The comparatively heavy tympanum of bronze mentioned by Catullus was probably the small kettledrum which appears in pairs on monuments of the middle ages.[7] Pliny[8] states that half pearls having one side round and the other flat were called *tympania*. If the name *tympania* (Gr. τύμπανον, from τύπτειν, to strike) was given to pearls of a certain shape because they resembled the kettledrum, this argues that the instrument was well known among the Romans. It is doubtful, however, if it was adopted by them as a military instrument, since it is not mentioned by Vegetius,[9] who defines very clearly the duties of the service instruments *buccina*, *tuba*, *cornu* and *lituus*.

The Greeks also knew the kettledrum, but as a warlike instrument of barbarians. Plutarch[10] mentions that the Parthians, in order to frighten their enemies, in offering battle used not the horn or *tuba*, but hollow vessels covered with a skin, on which they beat, making a terrifying noise with these tympana. Whether the kettledrum penetrated into western Europe before the fall of the Roman Empire and continued to be included during the middle ages among the tympana has not been definitely ascertained. Isidore of Seville gives a somewhat vague description of tympanum, conveying the impression that his information has been obtained second-hand: "Tympanum est pellis vel corium ligno ex una parte extentum. Est enim pars media symphoniae in similitudinem cribri. Tympanum autem dictum quod medium est. Unde, et margaritum medium tympanum dicitur, et ipsum ut symphonia ad virgulam percutitur."[11] It is clear that in this passage Isidore is referring to Pliny.

The names given during the middle ages to the kettledrum are derived from the East. We have *attambal* or *attabal* in Spain,

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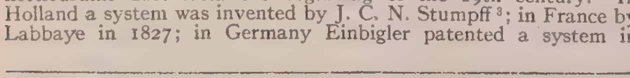
[1] This rhythmical use of kettledrums was characteristic of the military instrument of percussion, rather than the musical member of the orchestra. During the middle ages and until the end of the 18th century, the two different notes obtainable from the pair of kettledrums were probably used more as a means of marking and varying the rhythm than as musical notes entering into the composition of the harmonies. The kettledrums, in fact, approximated to the side drums in technique. The contrast between the purely rhythmical use of kettledrums, given above, and the more modern musical use is well exemplified by the well-known solo for four kettledrums in Meyerbeer's *Robert le Diable*, beginning thus—



[2] See Wilhelm Kleefeld, *Das Orchester der Hamburger Oper* (1678–1738); *Internationale Musikgesellschaft*, Sammelband i. 2, p. 278 (Leipzig, 1899).

[3] See J. Georges Kastner, *Méthode complète et raisonnée de timbales* (Paris), p. 19, where several of the early mechanical kettledrums are described and illustrated.

[4] See Gustav Schilling's *Encyklopädie der gesammten musikal. Wissenschaften* (Stuttgart, 1840), vol v., art. "Pauke."

[5] See *Manuale pel Timpanista* (Milan, 1842), where Boracchi describes and illustrates his invention.

[6] Catullus, lxiii. 8–10; Claud. *De cons. Stilich.* iii. 365; Lucret. ii. 618; Virg. *Aen.* ix. 619, &c.

[7] John Carter, *Specimens of Ancient Sculpture*, bas-relief from seats of choir of Worcester cathedral and of collegiate church of St Katherine near the Tower of London (plates, vol. i. following p. 53 and vol. ii. following p. 22).

[8] *Nat. Hist.* ix. 35, 23.

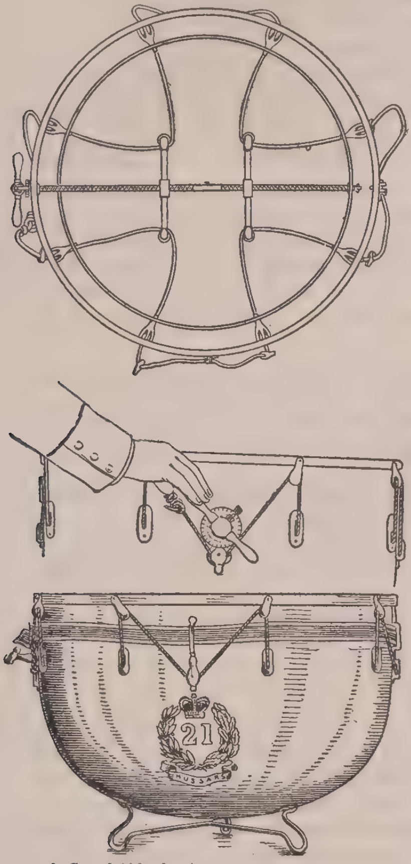
[9] *De re militari*, ii. 22; iii. 5, &c.

[10] *Crassus*, xxiii. 10. See also Justin xli. 2, and Polydorus, lib. 1, cap. xv.

[11] See Isidore of Seville, *Etymologiarum*, lib. iii. cap. 21, 141; Migne, *Patr. curs. completus*, lxxxii. 167.

from the Persian *tambal*, whence is derived the modern French *timbales*; *nacaire*, *naquaire* or *nakeres* (English spelling), from the Arabic *nakkarah* or *noqqārich* (Bengali, *nāgarā*), and the German *Pauke*, M.H.G. *Bûke* or *Pûke*, which is probably derived from *byk*, the Assyrian name of the instrument.

A line in the chronicles of Joinville definitely establishes the identity of the *nakeres* as a kind of drum: " Lor il fist sonner les tabours que l'on appelle *nacaires*." The nacaire is among the instruments mentioned by Froissart as having been used on the occasion of Edward III.'s triumphal entry into Calais in 1347: " trompes, tambours, nacaires, chalemies, muses."[1] Chaucer mentions them in the description of the tournament in the *Knight's Tale* (line 2514):—

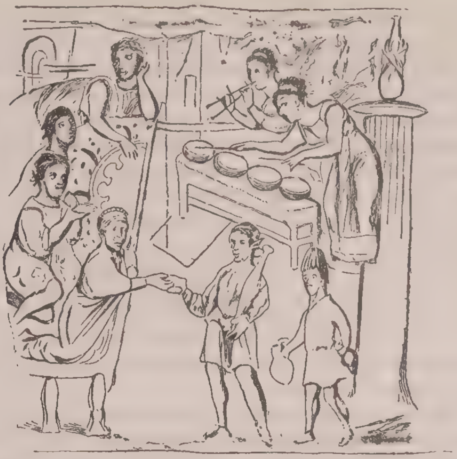


(Geo. Potter & Co. of Aldershot.)

FIG. 1.—Mechanical Kettledrum, showing the system of cords inside the head.
This regiment is now the 21st (Empress of India) Lancers.

> " Pipes, trompes, *nakeres* and clarionnes
> That in the bataille blowen blody sonnes."

The earliest European illustration showing kettledrums is the scene depicting Pharaoh's banquet in the fine illuminated MS. book of Genesis of the 5th or 6th century, preserved in Vienna. There are two pairs of shallow metal bowls on a table, on which a woman is performing with two sticks, as an accompaniment to the double pipes.[2] As a companion illumination may be cited the picture of an Eastern banquet given in a 14th century MS. at the British Museum (Add. MS. 27,695), illuminated by a skilled Genoese. The potentate is enjoying the music of various instruments, among which are two kettledrums strapped to the back of a Nubian slave. This was the earlier manner of using the instrument before it became inseparably associated with the trumpet, sharing its position as the service instrument of the cavalry. Jost Amman[3] gives a picture of a pair of kettledrums with banners being played by an armed knight on horseback.



(From Hartel u. Wickhoff's "Die Wiener Genesis," *Jahrbuch der kunsthistorischen Sammlungen des allerhöchsten Kaiserhauses.*)

Fig. 2.—Kettledrums in an early Christian MS.

As in the case of the trumpet, the use of the kettledrum was placed under great restrictions in Germany and France and to some extent in England, but it was used in churches with the trumpet.[4] No French or German regiment was allowed kettledrums unless they had been captured from the enemy, and the *timbalier* or the *Heerpauker* on parade, in reviews and marches generally, rode at the head of the squadron; in battle his position was in the wings. In England, before the Restoration, only the Guards were allowed kettledrums, but after the accession of James II. every regiment of horse was provided with them.[5] Before the Royal Regiment of Artillery was established, the master-general of ordnance was responsible for the raising of trains of artillery. Among his retinue in time of war were a trumpeter and kettledrummer. The kettledrums were mounted on a chariot drawn by six white horses. They appeared in the field for the first time in a train of artillery during the Irish rebellion of 1689, and the charges for ordnance

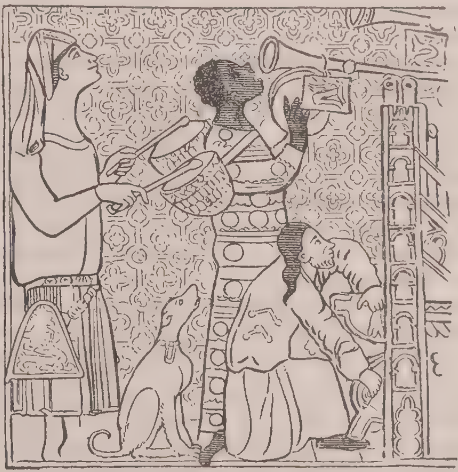


Fig. 3.—Medieval Kettledrums, 14th century. (Brit. Museum.)

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[1] *Panthéon littéraire* (Paris, 1837), J. A. Buchon, vol. i. cap. 322, p. 273.

[2] Reproduced by Franz Wickhoff, " Die Wiener Genesis," supplement to the 15th and 16th volumes of the *Jahrb. d. kunsthistorischen Sammlungen d. allerhöchsten Kaiserhauses* (Vienna, 1895); see frontispiece in colours and plate illustration XXXIV.

[3] *Artliche u. kunstreiche Figuren zu der Reutterey* (Frankfort-on-Main, 1584).

[4] See Michael Praetorius, *Syntagma Musicum* and *Monatshefte f. Musikgeschichte*, Jahrgang x. 51.

[5] See Georges Kastner, *op. cit.*, pp. 10 and 11; Johann Ernst Altenburg, *Versuch einer Anleitung z. heroisch-musikalischen Trompeter u. Paukerkunst* (Halle, 1795), p. 128; and H. G. Farmer, *Memoirs of the Royal Artillery Band*, p. 23, note 1 (London, 1904).

include the item, "large kettledrums mounted on a carriage with cloaths marked I.R. and cost £158, 9s."[1] A model of the kettledrums with their carriage which accompanied the duke of Marlborough to Holland in 1702 is preserved in the Rotunda Museum at Woolwich. The kettledrums accompanied the Royal Artillery train in the Vigo expedition and during the campaign in Flanders in 1748. Macbean[2] states that they were mounted on a triumphal car ornamented and gilt, bearing the ordnance flag and drawn by six white horses. The position of the car on march was in front of the flag gun, and in camp in front of the quarters of the duke of Cumberland with the artillery guns packed round them. The kettledrummer had by order "to mount the kettledrum carriage every night half an hour before the sun sett and beat till gun fireing." In 1759 the kettledrums ceased to form part of the establishment of the Royal Artillery, and they were deposited, together with their carriage, in the Tower, at the same time as a pair captured at Malplaquet in 1709. These Tower drums were frequently borrowed by Handel for performances of his oratorios.

The kettledrums still form part of the bands of the Life Guards and other cavalry regiments. (K. S.)

KEUPER, in geology the third or uppermost subdivision of the Triassic system. The name is a local miners' term of German origin; it corresponds to the French *marnes irisées*. The formation is well exposed in Swabia, Franconia, Alsace and Lorraine and Luxemburg; it extends from Basel on the east side of the Rhine into Hanover, and northwards it spreads into Sweden and through England into Scotland and north-east Ireland; it appears flanking the central plateau of France and in the Pyrenees and Sardinia. In the German region it is usual to divide the Keuper into three groups, the *Rhaetic* or upper Keuper, the middle, *Hauptkeuper* or *gypskeuper*, and the lower, *Kohlenkeuper* or *Lettenkohle*. In Germany the lower division consists mainly of grey clays and *schieferletten* with white, grey and brightly coloured sandstone and dolomitic limestone. The upper part of this division is often a grey dolomite known as the Grenz dolomite; the impure coal beds—*Lettenkohle*—are aggregated towards the base. The middle division is thicker than either of the others (at Göttingen, 450 metres); it consists of a marly series below, grey, red and green marls with gypsum and dolomite—this is the *gypskeuper* in its restricted sense. The higher part of the series is sandy, hence called the *Steinmergel*; it is comparatively free from gypsum. To this division belong the Myophoria beds (*M. Raibliana*) with galena in places; the Estheria beds (*E. laxitesta*); the Schelfsandstein, used as a building-stone; the Lehrberg and Berg-gyps beds; Semionotus beds (*S. Bergeri*) with building-stone of Coburg; and the Burg- and Stubensandstein. The salt, which is associated with gypsum, is exploited in south Germany at Dreuze, Pettoncourt, Vie in Lorraine and Wimpfen on the Neckar. A ½-metre coal is found on this horizon in the Erzgebirge, and another, 2 metres thick, has been mined in Upper Silesia. The upper Keuper, Rhaetic or *Avicula contorta* zone in Germany is mainly sandy with dark grey shales and marls; it is seldom more than 25 metres thick. The sandstones are used for building purposes at Bayreuth, Culmbach and Bamberg. In Swabia and the Wesergebirge are several "bone-beds," thicker than those in the middle Keuper, which contain a rich assemblage of fossil remains of fish, reptiles and the mammalian teeth of *Microlestes antiquus* and *Triglyptus Fraasi*. The name Rhaetic is derived from the Rhaetic Alps where the beds are well developed; they occur also in central France, the Pyrenees and England. In S. Tirol and the Judicarian Mountains the Rhaetic is represented by the Kössener beds. In the Alpine region the presence of coral beds gives rise to the so-called "Lithodendron Kalk."

In Great Britain the Keuper contains the following subdivisions: *Rhaetic or Penarth beds*, grey, red and green marls, black shales and so-called "white lias" (10–150 ft.). *Upper Keuper marl*, red and grey marls and shales with gypsum and rock salt (800–3000 ft.). *Lower Keuper sandstone*, marls and thin sandstones at the top, red and white sandstones (including the so-called "waterstones") below, with breccias and conglomerates at the base (150–250 ft.). The basal or "dolomitic conglomerate" is a shore or scree breccia derived from local materials; it is well developed in the Mendip district. The rock-salt beds vary from 1 in. to 100 ft. in thickness; they are extensively worked (mined and pumped) in Cheshire, Middlesbrough and Antrim. The Keuper covers a large area in the midlands and around the flanks of the Pennine range; it reaches southward to the Devonshire coast, eastward into Yorkshire and north-westward into north Ireland and south Scotland. As in Germany, there are one or more "bone beds" in the English Rhaetic with a similar assemblage of fossils. In the "white lias" the upper hard limestone is known as the "sun bed" or "Jew stone"; at the base is the Cotham or landscape marble.

Representatives of the Rhaetic are found in south Sweden, where the lower portion contains workable coals, in the Himalayas, Japan, Tibet, Burma, eastern Siberia and in Spitzbergen. The upper portion of the Karroo beds of South Africa and part of the Otapiri series of New Zealand are probably of Rhaetic age.

The Keuper is not rich in fossils; the principal plants are cypress-like conifers (*Walchia*, *Voltzia*) and a few calamites with such forms as *Equisetum arenaceum* and *Pterophyllum Jaegeri*, *Avicula contorta*, *Protocardium rhaeticum*, *Terebratula gregaria*, *Myophoria costata*, *M. Goldfassi* and *Lingula tenuessima*, *Anoplophoria lettica* may be mentioned among the invertebrates. Fishes include *Ceratodus*, *Hybodus* and *Lepidotus*. Labyrinthodonts represented by the footprints of *Cheirotherium* and the bones of *Labyrinthodon*, *Mastodonsaurus* and *Capitosaurus*. Among the reptiles are *Hyperodapedon*, *Palaeosaurus*, *Zanclodon*, *Nothosaurus* and *Belodon*. *Microlestes*, the earliest known mammalian genus, has already been mentioned.

See also the article TRIASSIC SYSTEM. (J. A. H.)

KEW, a township in the Kingston parliamentary division of Surrey, England, situated on the south bank of the Thames, 6 m. W.S.W. of Hyde Park Corner, London. Pop. (1901), 2699. A stone bridge of seven arches, erected in 1789, connecting Kew with Brentford on the other side of the river, was replaced by a bridge of three arches opened by Edward VII. in 1903 and named after him. Kew has increased greatly as a residential suburb of London; the old village consisted chiefly of a row of houses with gardens attached, situated on the north side of a green, to the south of which is the church and churchyard and at the west the principal entrance to Kew Gardens. From remains found in the bed of the river near Kew bridge it has been conjectured that the village marks the site of an old British settlement. The name first occurs in a document of the reign of Henry VII., where it is spelt Kayhough. The church of St Anne (1714) has a mausoleum containing the tomb of the duke of Cambridge (d. 1850) son of George III., and is also the burial-place of Thomas Gainsborough the artist, Jeremiah Meyer the painter of miniatures (d. 1789), John Zoffany the artist (d. 1810), Joshua Kirby the architect (d. 1774), and William Aiton the botanist and director of Kew Gardens (d. 1793).

The free school originally endowed by Lady Capel in 1721 received special benefactions from George IV., and the title of "the king's free school."

The estate of Kew House about the end of the 17th century came into the possession of Lord Capel of Tewkesbury, and in 1721 of Samuel Molyneux, secretary to the prince of Wales, afterwards George II. After his death it was leased by Frederick prince of Wales, son of George II., and was purchased about 1789 by George III., who devoted his leisure to its improvement. The old house was pulled down in 1802, and a new mansion was begun from the designs of James Wyatt, but the king's death prevented its completion, and in 1827 the portion built was removed. Dutch House, close to Kew House, was sold by Robert Dudley, earl of Leicester, to Sir Hugh Portman, a Dutch merchant, late in the 16th century, and in 1781 was purchased by George III. as a nursery for the royal children. It is a plain brick structure, now known as Kew Palace.

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[1] Miller's *Artillery Regimental History*; see also H. G. Farmer, *op. cit.*, p. 22; illustration 1702, p. 26.

[2] *Memoirs of the Royal Artillery.*

The Royal Botanic Gardens of Kew originated in the exotic garden formed by Lord Capel and greatly extended by the princess dowager, widow of Frederick, prince of Wales, and by George III., aided by the skill of William Aiton and of Sir Joseph Banks. In 1840 the gardens were adopted as a national establishment, and transferred to the department of woods and forests. The gardens proper, which originally contained only about 11 acres, were subsequently increased to 75 acres, and the pleasure grounds or arboretum adjoining extend to 270 acres. There are extensive conservatories, botanical museums, including the magnificent herbarium and a library. A lofty Chinese pagoda was erected in 1761. A flagstaff 159 ft. high is made out of the fine single trunk of a Douglas pine. In the neighbouring Richmond Old Park is the important Kew Observatory.

KEWANEE, a city of Henry county, Illinois, U.S.A., in the N. W. part of the state, about 55 m. N. by W. of Peoria. Pop. (1900), 8382, of whom 2006 were foreign-born; (1910 census), 9307. It is served by the Chicago Burlington & Quincy railroad and by the Galesburg & Kewanee Electric railway. Among its manufactures are foundry and machine-shop products, boilers, carriages and wagons, agricultural implements, pipe and fittings, working-men's gloves, &c. In 1905 the total factory product was valued at $6,729,381, or 61·5% more than in 1900. Kewanee was settled in 1836 by people from Wethersfield, Connecticut, and was first chartered as a city in 1897.

KEY, SIR ASTLEY COOPER (1821–1888), English admiral, was born in London in 1821, and entered the navy in 1833. His father was Charles Aston Key (1793-1849), a well-known surgeon, the pupil of Sir Astley Cooper, and his mother was the latter's niece. After distinguishing himself in active service abroad, on the South American station (1844–1846), in the Baltic during the Crimean War (C.B. 1855) and China (1857), Key was appointed in 1858 a member of the royal commission on national defence, in 1860 captain of the steam reserve at Devonport, and in 1863 captain of H.M.S. "Excellent" and superintendent of the Royal Naval College. He had a considerable share in advising as to the reorganization of administration, and in 1866, having become rear-admiral, was made director of naval ordnance. Between 1869 and 1872 he held the offices of superintendent of Portsmouth dockyard, superintendent of Malta dockyard, and second in command in the Mediterranean. In 1872 he was made president of the projected Royal Naval College at Greenwich, which was organized by him, and after its opening in 1873 he was made a K.C.B. and a vice-admiral. In 1876 he was appointed commander-in-chief on the North American and West Indian station. Having become full admiral in 1878, he was appointed in 1879 principal A.D.C., and soon afterwards first naval lord of the admiralty, retaining this post till 1885. In 1882 he was made G.C.B. He died at Maidenhead on the 3rd of March, 1888.

See *Memoirs of Sir Astley Cooper Key*, by Vice-Admiral Colomb (1898).

KEY, THOMAS HEWITT (1799–1875), English classical scholar, was born in London on the 20th of March, 1799. He was educated at St John's and Trinity Colleges, Cambridge, and graduated 19th wrangler in 1821. From 1825 to 1827 he was professor of mathematics in the university of Virginia, and after his return to England was appointed (1828) professor of Latin in the newly founded university of London. In 1832 he became joint headmaster of the school founded in connexion with that institution; in 1842 he resigned the professorship of Latin, and took up that of comparative grammar together with the undivided headmastership of the school. These two posts he held till his death on the 29th of November 1875. Key is best known for his introduction of the crude-form (the uninflected form or stem of words) system, in general use among Sanskrit grammarians, into the teaching of the classical languages. This system was embodied in his *Latin Grammar* (1846). In *Language, its Origin and Development* (1874), he upholds the onomatopoeic theory. Key was prejudiced against the German "Sanskritists," and the etymological portion of his *Latin Dictionary*, published in 1888, was severely criticized on this account. He was a member of the Royal Society and president of the Philological Society, to the *Transactions* of which he contributed largely.

See *Proceedings of the Royal Society*, vol. xxiv. (1876); R. Ellis in the *Academy* (Dec. 4, 1875); J. P. Hicks, *T. Hewitt Key* (1893), where a full list of his works and contributions is given.

KEY (in O. Eng. *caég*; the ultimate origin of the word is unknown; it appears only in Old Frisian *kei* of other Teutonic languages; until the end of the 17th century the pronunciation was *kay*, as in other words in O. Eng. ending in *aég*; cf. *daég*, day; *claég*, clay; the *New English Dictionary* takes the change to *kee* to be due to northern influence), an instrument of metal used for the opening and closing of a lock (see LOCK). Until the 14th century bronze and not iron was most commonly used. The terminals of the stem of the keys were frequently decorated, the "bow" or loop taking the form sometimes of a trefoil, with figures inscribed within it; this decoration increased in the 16th century, the terminals being made in the shape of animals and other figures. Still more elaborate ceremonial keys were used by court officials; a series of chamberlains' keys used during the 18th and 19th centuries in several courts in Europe is in the British Museum. The terminals are decorated with crowns, royal monograms and ciphers. The word "key" is by analogy applied to things regarded as means for the opening or closing of anything, for the making clear that which is hidden. Thus it is used of an interpretation as to the arrangement of the letters or words of a cipher, of a solution of mathematical or other problems, or of a translation of exercises or books, &c., from a foreign language. The term is also used figuratively of a place of commanding strategic position. Thus Gibraltar, the "Key of the Mediterranean," was granted in 1462 by Henry IV. of Castile, the arms, *gules*, a castle proper, with key pendant to the gate, *or*; these arms form the badge of the 50th regiment of foot (now 2nd Batt. Essex Regiment) in the British army, in memory of the part which it took in the siege of 1782. The word is also frequently applied to many mechanical contrivances for unfastening or loosening a valve, nut, bolt, &c., such as a spanner or wrench, and to the instruments used in tuning a pianoforte or harp or in winding clocks or watches. A farther extension of the word is to appliances or devices which serve to lock or fasten together distinct parts of a structure, as the "key-stone" of an arch, the wedge or piece of wood, metal, &c., which fixes a joint, or a small metal instrument, shaped like a U, used to secure the bands in the process of sewing in bookbinding.

In musical instruments the term "key" is applied in certain wind instruments, particularly of the wood-wind type, to the levers which open and close valves in order to produce various notes, and in keyboard instruments, such as the organ or the pianoforte, to the exterior white or black parts of the levers which either open or shut the valves to admit the wind from the bellows to the pipes or to release the hammers against the strings (see KEYBOARD). It is from this application of the word to these levers in musical instruments that the term is also used of the parts pressed by the finger in typewriters and in telegraphic instruments.

A key is the insignia of the office of chamberlain in a royal household (see CHAMBERLAIN and LORD CHAMBERLAIN). The "power of the keys" (*clavium potestas*) in ecclesiastical usage represents the authority given by Christ to Peter by the words, "I will give unto thee the keys of the kingdom of heaven" (Matt. xvi. 19). This is claimed by the Roman Church to have been transmitted to the popes as the successors of St Peter.

"Key" was formerly the common spelling of "quay," a wharf, and is still found in America for "cay," an island reef or sandbank off the coast of Florida (see QUAY).

The origin of the name Keys or House of Keys, the lower branch of the legislature, the court of Tynwald, of the Isle of Man, has been much discussed, but it is generally accepted that it is a particular application of the word "key" by English- and not Manx-speaking people. According to A. W. Moore, *History of the Isle of Man*, i. 160 sqq. (1900), in the Manx statutes and records the name of the house was in 1417 *Claves Manniae et Claves legis*, Keys of Man and Keys of the Law; but the popular and also the documentary name till 1585 seems to have been "the 24," in Manx *Kiare as feed*. From 1585 to 1734 the name was in the statutes, &c., "the 24 Keys," or simply "the Keys." Moore suggests that the name was possibly originally due to an English "clerk of the rolls," the members of the house being called in to "unlock or solve the difficulties of the law." There is no evidence for the suggestion that Keys is an English corruption of *Kiare-as*, the first part of *Kiare as feed*. Another suggestion is that it is from a Scandinavian word *keise*, chosen.

KEYBOARD, or MANUAL (Fr. *clavier*; Ger. *Klaviatur*; Ital. *tastatura*), a succession of keys for unlocking sound in stringed, wind or percussion musical instruments, together with the case or board on which they are arranged. The two principal types of keyboard instruments are the organ and the piano; their keyboards, although similarly constructed, differ widely in scope and capabilities. The keyboard of the organ, a purely mechanical contrivance, is the external means of communicating with the valves or pallets that open and close the entrances to the pipes. As its action is incapable of variation at the will of the performer, the keyboard of the organ remains without influence on the quality and intensity of the sound. The keyboard of the piano, on the contrary, besides its purely mechanical function, also forms a sympathetic vehicle of transmission for the performer's rhythmical and emotional feeling, in consequence of the faithfulness with which it passes on the impulses communicated by the fingers. The keyboard proper does not, in instruments of the organ and piano types, contain the complete mechanical apparatus for directly unlocking the sound, but only that external part of it which is accessible to the performer.

The first instrument provided with a keyboard was the organ; we must therefore seek for the prototype of the modern keyboard in connexion with the primitive instrument which marks the transition between the mere syrinx provided with bellows, in which all the pipes sounded at once unless stopped by the fingers, and the first organ in which sound was elicited from a pipe only when unlocked by means of some mechanical contrivance. The earliest contrivance was the simple slider, unprovided with a key or touchpiece and working in a groove like the lid of a box, which was merely pushed in or drawn out to open or close the hole that formed the communication between the wind chest and the hole in the foot of the pipe. These sliders fulfilled in a simple manner the function of the modern keys, and preceded the groove and pallet system of the modern organ. We have no clear or trustworthy information concerning the primitive organ with sliders. Athanasius Kircher[1] gives a drawing of a small mouth-blown instrument under the name of *Magraketha* (*Mashroqitha'*, Dan. iii. 5), and Ugolini[2] describes a similar one, but with a pair of bellows, as the magrēphah of the treatise *'Arākhīn*.[3] By analogy with the evolution of the organ in central and western Europe from the 8th to the 15th century, of which we are able to study the various stages, we may conclude that in principle both drawings were probably fairly representative, even if nothing better than efforts of the imagination to illustrate a text.

The invention of the keyboard with balanced keys has been placed by some writers as late as the 13th or 14th century, in spite of its having been described by both Hero of Alexandria and Vitruvius and mentioned by poets and writers. The misconception probably arose from the easy assumption that the organ was the product of Western skill and that the primitive instruments with sliders found in 11th century documents[4] represent the sum of the progress made in the evolution; in reality they were the result of a laborious effort to reconquer a lost art. The earliest trace of a balanced keyboard we possess is contained in Hero's description of the hydraulic organ said to have been invented by Ctesibius of Alexandria in the 2nd century B.C. After describing the other parts (see ORGAN), Hero passes on to the sliders with perforations corresponding with the open feet of the speaking pipes which, when drawn forward, traverse and block the pipes. He describes the following contrivances: attached to the slider is a three-limbed, pivoted elbow-key, which, when depressed, pushes the slider inwards; in order to provide for its automatic return when the finger is lifted from the key, a slip of horn is attached by a gut string to each elbow-key. When the key is depressed and the slider pushed home, the gut string pulls the slip of horn and straightens it. As soon as the key is released, the piece of horn, regaining its natural bent by its own elasticity, pulls the slider out so that the perforation of the slider overlaps and the pipe is silenced.[5] The description of the keyboard by Vitruvius Pollio, a variant of that of Hero, is less accurate and less complete.[6] From evidence discussed in the article ORGAN, it is clear that the principle of a balanced keyboard was well understood both in the 2nd and in the 5th century A.D. After this all trace of this important development disappears, sliders of all kinds with and without handles doing duty for keys until the 12th or 13th century, when we find the small portative organs furnished with narrow keys which appear to be balanced; the single bellows were manipulated by one hand while the other fingered the keys. As this little instrument was mainly used to accompany the voice in simple chaunts, it needed few keys, at most nine or twelve. The pipes were flue-pipes. A similar little instrument, having tiny invisible pipes furnished with beating reeds and a pair of bellows (therefore requiring two performers) was known as the regal. There are representations of these medieval balanced keyboards with keys of various shapes, the most common being the rectangular with or without rounded corners and the T-shaped. Until the 14th century all the keys were in one row and of the same level, and although the B flat was used for modulation, it was merely placed between A and B natural in the sequence of notes. During the 14th century small square additional keys made their appearance, one or two to the octave, inserted between the others in the position of our black keys but not raised. An example of this keyboard is reproduced by J. F. Riaño[7] from a fresco in the Cistercian monastery of Nuestra Señora de Piedra in Aragon, dated 1390.

So far the history of the keyboard is that of the organ. The only stringed instruments with keys before this date were the *organistrum* and the *hurdy-gurdy*, in which little tongues of wood manipulated by handles or keys performed the function of the fingers in stopping the strings on the neck of the instruments, but they did not influence the development of the keyboard. The advent of the immediate precursors of the pianoforte was at hand. In the *Wunderbuch*[8] (1440), preserved in the Grand Ducal Library at Weimar, are represented a number of musical instruments, all named. Among them are a *clavichordium* and a *clavicymbalum* with narrow additional keys let in between the wider ones, one to every group of two large keys. The same arrangement prevailed in a *clavicymbalum* figured in an anonymous MS. attributed to the 14th century, preserved in the public library at Ghent[9]; from the lettering over the jacks and strings, of which there are but eight, it would seem as though the draughtsman had left the accidentals out of the scheme of notation. These are the earliest known representations of instruments with keyboards. The exact date at which our chromatic keyboard came into use has not been discovered, but it existed in the 15th century and may be studied in the picture of St Cecilia playing the organ on the Ghent altarpiece painted by the brothers Hubert and Jan van Eyck. Praetorius distinctly states that the large Halberstadt organ had the keyboard which he figures (plates xxiv. and xxv.) from the outset, and reproduces the inscription asserting that the organ was built in 1361 by the priest Nicolas Fabri and was renovated in 1495 by Gregorius Kleng. The keyboard of this organ has the arrangement of the present day with raised black notes; it is not improbable that Praetorius's statement was correct, for Germany and the Netherlands led the van in organ-building during the middle ages.

At the beginning of the 16th century, to facilitate the playing of contrapuntal music having a drone bass or *point d'orgue*, the arrangement of the pipes of organs and of the strings of spinets and harpsichords was altered, with the result that the lowest octave of the keyboard was made in what is known as short measure, or mi, ré, ut, *i.e.* a diatonic with B flat included, but grouped in the space of a sixth instead of appearing as a full octave. In order to carry out this device, the note below F was C, instead of E, the missing D and E and the B flat being substituted for the three sharps of F, G and A, and appearing as black notes, thus:—

D E B♭
C F G A B C,

or if the lowest note appeared to be B, it sounded as G and the arrangement was as follows:—

A B
G C D E F G.

This was the most common scheme for the short octave during the 16th and 17th centuries, although others are occasionally found. Praetorius also gives examples in which the black notes of the short octave were divided into two halves, or separate keys, the forward half for the drone note, the back half for the chromatic semitone, thus:—

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[1] See *Musurgia*, bk. II., iv. § 3.

[2] *Thes. Antiq. Sacra.* (Venice, 1744–1769), xxxii. 477.

[3] II. 3 and fol. 10, 2. *'Arākhīn* ("Valuations") is a treatise in the Babylonian Talmud. The word *Magrephah* occurs in the *Mishna*, the description of the instrument in the *gemārā*.

[4] See the Cividale Prayer Book of St Elizabeth in Arthur Haseloff's *Eine Sächs.-thüring. Malerschule*, pl. 26, No. 57, also Bible of St Etienne Harding at Dijon (see ORGAN: *History*).

[5] See the original Greek with translation by Charles Maclean in "The Principle of the Hydraulic Organ," *Intern. Musikges.* vi. 2, 219–220 (Leipzig 1905).

[6] See Clément Loret's account in *Revue archéologique*, pp. 76–102 (Paris, 1890).

[7] *Early Hist. of Spanish Music* (London, 1807).

[8] Reproduced by Dr Alwin Schulz in *Deutsches Leben im XIV. u. XV. Jhdt.*, figs. 522 seq. (Vienna, 1892).

[9] "De diversis monocordis, pentacordis, etc., ex quibus diversa formantur instrumenta musica," reproduced by Edm. van der Straeten in *Hist. de la musique aux Pays-Bas*, i. 278.

F♯ G♯
| |
D E B♭
C F G A B C

This arrangement, which accomplishes its object without sacrifice, was to be found early in the 17th century in the organs of the monasteries of Riddageshausen and of Bayreuth in Vogtland.

See A. J. Hipkins, *History of the Pianoforte* (London, 1896), and the older works of Girolamo Diruta (1597), Praetorius (1618), and Mersenne (1636). (K. S.)

KEYSTONE, the central voussoir of an arch (*q.v.*). The Etruscans and the Romans emphasized its importance by decorating it with figures and busts, and, in their triumphal arches, projected it forward and utilized it as an additional support to the architrave above. Throughout the Italian period it forms an important element in the design, and serves to connect the arch with the horizontal mouldings running above it. In Gothic architecture there is no keystone, but the junction of pointed ribs at their summit is sometimes decorated with a boss to mask the intersection.

KEY WEST (from the Spanish *Cayo Hueso*, "Bone Reef"), a city, port of entry, and the county-seat of Monroe county, Florida, U.S.A., situated on a small coral island (4½m. long and about 1 m. wide) of the same name, 60 m. S. W. of Cape Sable, the most southerly point of the mainland. It is connected by lines of steamers with Miami and Port Tampa, with Galveston, Texas, with Mobile, Alabama, with Philadelphia and New York City, and with West Indian ports, and by regular schooner lines with New York City, the Bahamas, British Honduras, &c. There is now an extension of the Florida East Coast railway from Miami to Key West (155 m.). Pop. (1880), 9890; (1890), 18,080; (1900), 17,114, of whom 7266 were foreign-born and 5562 were negroes; (1910 census), 19,945. The island is notable for its tropical vegetation and climate. The jasmine, almond, banana, cork and coco-nut palm are among the trees. The oleander grows here to be a tree, and there is a banyan tree, said to be the only one growing out of doors in the United States. There are many species of plants in Key West not found elsewhere in North America. The mean annual temperature is 76° F., and the mean of the hottest months is 82·2° F.; that of the coldest months is 69° F.; thus the mean range of temperature is only 13°. The precipitation is 35 in.; most of the rain falls in the "rainy season" from May to November, and is preserved in cisterns by the inhabitants as the only supply of drinking water. The number of cloudy days per annum averages 60. The city occupies the highest portion of the island. The harbour accommodates vessels drawing 27 ft.; vessels of 27–30 ft. draft can enter by either the "Main Ship" channel or the south-west channel; the south-east channel admits vessels of 25 ft. draft or less; and four other channels may be used by vessels of 15–19 ft. draft. The harbour is defended by Fort Taylor, built on the island of Key West in 1846, and greatly improved and modernized after the Spanish-American War of 1898. Among the buildings are the United States custom house, the city hall, a convent, and a public library.

In 1869 the insignificant population of Key West was greatly increased by Cubans who left their native island after an attempt at revolution; they engaged in the manufacture of tobacco, and Key West cigars were soon widely known. Towards the close of the 19th century this industry suffered from labour troubles, from the competition of Tampa, Florida, and from the commercial improvement of Havana, Cuba; but soon after 1900 the tobacco business of Key West began to recover. Immigrants from the Bahama Islands form another important element in the population. They are known as "Conchs," and engage in sponge fishing. In 1905 the value of factory products was $4,254,024 (an increase of 37·7% over the value in 1900); the exports in 1907 were valued at $852,457; the imports were valued at $994,472, the excess over the exports being due to the fact that the food supply of the city is derived from other Florida ports and from the West Indies.

According to tradition the native Indian tribes of Key West, after being almost annihilated by the Caloosas, fled to Cuba. There are relics of early European occupation of the island which suggest that it was once the resort of pirates. The city was settled about 1822. The Seminole War and the war of the United States with Mexico gave it some military importance. In 1861 Confederate forces attempted to seize Fort Taylor, but they were successfully resisted by General William H. French.

KHABAROVSK (known as KHABAROVKA until 1895), a town of Asiatic Russia, capital of the Amur region and of the Maritime Province. Pop. (1897), 14,932. It was founded in 1858 and is situated on a high cliff on the right bank of the Amur, at its confluence with the Usuri, in 48° 28′ N. and 135° 6′ E. It is connected by rail with Vladivostok (480 m.), and is an important entrepôt for goods coming down the Usuri and its tributary the Sungacha, as well as a centre of trade, especially in sables. The town is built of wood, and has a large cathedral, a monument (1891) to Count Muraviev-Amurskiy, a cadet corps (new building 1904), a branch of the Russian Geographical Society, with museum, and a technical railway school.

KHAIRAGARH, a feudatory state in the Central Provinces, India. Area, 931 sq. m.; pop. (1901), 137,554, showing a decrease of 24% in the decade due to the effects of famine; estimated revenue, £20,000; tribute £4600. The chief, who is descended from the old Gond royal family, received the title of raja as an hereditary distinction in 1898. The state includes a fertile plain, yielding rice and cotton. Its prosperity has been promoted by the Bengal-Nagpur railway, which has a station at Dongargarh, the largest town (pop. 5856), connected by road with Khairagarh town, the residence of the raja.

KHAIREDDIN (*Khair-ed-Din* = "Joy of Religion") (d. 1890), Turkish statesman, was of Circassian race, but nothing is known about his birth and parentage. In early boyhood he was in the hands of a Tunisian slave-dealer, by whom he was sold to Hamuda Pasha, then bey of Tunis, who gave him his freedom and a French education. When Khaireddin left school the bey made him steward of his estates, and from this position he rose to be minister of finance. When the prime minister, Mahmud ben Ayad, absconded to France with the treasure-chest of the beylic, Hamuda despatched Khaireddin to obtain the extradition of the fugitive. The mission failed; but the six years it occupied enabled Khaireddin to make himself widely known in France, to become acquainted with French political ideas and administrative methods, and, on his return to Tunisia, to render himself more than ever useful to his government. Hamuda died while Khaireddin was in France, but he was highly appreciated by the three beys—Ahmet (1837), Mohammed (1855), and Sadok (1859)—who in turn followed Hamuda, and to his influence was due the sequence of liberal measures which distinguished their successive reigns. Khaireddin also secured for the reigning family the confirmation from the sultan of Turkey of their right of succession to the beylic. But although Khaireddin's protracted residence in France had imbued him with liberal ideas, it had not made him a French partisan, and he strenuously opposed the French scheme of establishing a protectorate over Tunisia upon which France embarked in the early 'seventies. This rendered him obnoxious to Sadok's prime minister—an apostate Jew named Mustapha ben Ismael—who succeeded in completely undermining the bey's confidence in him. His position thus became untenable in Tunisia, and shortly after the accession of Abdul Hamid he acquainted the sultan with his desire to enter the Turkish service. In 1877 the sultan bade him come to Constantinople, and on his arrival gave him a seat on the Reform Commission then sitting at Tophane. Early in 1879 the sultan appointed him grand vizier, and shortly afterwards he prepared a scheme of constitutional government, but Abdul Hamid refused to have anything to do with it. Thereupon Khaireddin resigned office, on the 28th of July 1879. More than once the sultan offered him anew the grand vizierate, but Khaireddin persistently refused it, and thus incurred disfavour. He died on the 30th of January 1890, practically a prisoner in his own house.

KHAIRPUR, or KHYRPOOR, a native state of India, in the Sind province of Bombay. Area, 6050 sq. m.; pop. (1901), 199,313, showing an apparent increase of 55 % in the decade; estimated revenue, £90,000. Like other parts of Sind, Khairpur consists of a great alluvial plain, very rich and fertile in the neighbourhood of the Indus and the irrigation canals, the remaining area being a continuous series of sand-hill ridges covered with a stunted brushwood, where cultivation is altogether impossible. A small ridge of limestone hills passes through the northern part of the state, being a continuation of a ridge known as the Ghar, running southwards from Rohri. The state is watered by five canals drawn off from the Indus, besides the Eastern Nara, a canal which follows an old bed of the Indus. In the desert tracts are pits of *natron*.

Khairpur town is situated on a canal 15 m. E. of the Indus, with a railway station, 20 m. S. of Sukkur, on the Kotri-Rohri branch of the North-Western railway, which here crosses a corner of the state. Pop. (1901), 14,014. There are manufactures of cloth, carpets, goldsmiths' work and arms, and an export trade in indigo, grain and oilseeds.

The chief, or mir, of Khairpur belongs to a Baluch family, known as the Talpur, which rose on the fall of the Kalhora dynasty of Sind. About 1813, during the troubles in Kabul incidental to the establishment of the Barakzai dynasty, the mirs were able to withhold the tribute which up to that date had been somewhat irregularly paid to the rulers of Afghanistan. In 1832 the individuality of the Khairpur state was recognized by the British government in a treaty under which the use of the river Indus and the roads of Sind were secured. When the first Kabul expedition was decided on, the mir of Khairpur, Ali Murad, cordially supported the British policy; and the result was that, after the battles of Meeanee and Daba had put the whole of Sind at the disposal of the British, Khairpur was the only state allowed to retain its political existence under the protection of the paramount power. The chief mir, Faiz Mahommed Khan, G.C.I.E., who was an enlightened ruler, died in 1909, shortly after returning from a pilgrimage to the Shiite shrine of Kerbela.

KHAJRAHO, a village of Central India, in the state of Chhatarpur, famous for its old temples; pop. (1901), 1242. It is believed to have been the capital of the ancient kingdom of Jijhoti, corresponding with modern Bundelkhand. The temples consist of three groups: Saiva, Vaishnav and Jain, almost all built in the 10th and 11th centuries. They are covered outside and inside with elaborate sculptures, and also bear valuable inscriptions.

KHAKI (from Urdu *khak*, dust), originally a dust-coloured fabric, of the character of canvas, drill or holland, used by the British and native armies in India. It seems to have been first worn by the Guides, a mixed regiment of frontier troops, in 1848, and to have spread to other regiments during the following years. Some at any rate of the British troops had uniforms of khaki during the Indian Mutiny (1857–58), and thereafter drill or holland (generally called "khaki" whatever its colour) became the almost universal dress of British and native troops in Asia and Africa. During the South African War of 1899–1902, drill of a sandy shade of brown was worn by all troops sent out from Great Britain and the Colonies. Khaki drill, however, proved unsuitable material for the cold weather in the uplands of South Africa, and after a time the troops were supplied with dust-coloured serge uniforms. Since 1900 all drab and green-grey uniforms have been, unofficially at any rate, designated khaki.

KHALIFA, THE. Abdullah et Taaisha (Seyyid Abdullah ibn Seyyid Mahommed) (1846–1899), successor of the mahdi Mahommed Ahmed, born in 1846 in the south-western portion of Darfur, was a member of the Taaisha section of the Baggara or cattle-owning Arabs. His father, Mahommed et Taki, had determined to emigrate to Mecca with his family; but the unsettled state of the country long prevented him, and he died in Africa after advising his eldest son, Abdullah, to take refuge with some religious sheikh on the Nile, and to proceed to Mecca on a favourable opportunity. Abdullah, who had already had much connexion with slave-hunters, and had fought against the Egyptian conquest of Darfur, departed for the Nile valley with this purpose; hearing on the way of the disputes of Mahommed Ahmed, who had not yet claimed a sacred character, with the Egyptian officials, he went to him in spite of great difficulties, and, according to his own statement, at once recognized in him the mahdi ("guide") divinely appointed to regenerate Islam in the latter days. His advice to Mahommed to stir up revolt in Darfur and Kordofan being justified by the result, he became his most trusted counsellor, and was soon declared principal khalifa or vicegerent of the mahdi, all of whose acts were to be regarded as the mahdi's own. The mahdi on his deathbed (1885) solemnly named him his successor; and for thirteen years Abdullah ruled over what had been the Egyptian Sudan. Khartum was deserted by his orders, and Omdurman, at first intended as a temporary camp, was made his capital. At length the progress of Sir Herbert (afterwards Lord) Kitchener's expedition compelled him to give battle to the Anglo-Egyptian forces near Omdurman, where on the 2nd of September 1898 his army, fighting with desperate courage, was almost annihilated. The khalifa, who had not left Omdurman since the death of the mahdi, fled to Kordofan with the remnant of his host. On the 25th of November 1899 he gave battle to a force under Colonel (afterwards General Sir) F. R. Wingate, and was slain at Om Debreikat. He met death with great fortitude, refusing to fly, and his principal amirs voluntarily perished with him.

The khalifa was a man of iron will and great energy, and possessed some military skill. By nature tyrannical, he was impatient of all opposition and appeared to delight in cruelty. It must be remembered, however, that he had to meet the secret or open hostility of all the tribes of the Nile valley and that his authority was dependent on his ability to overawe his opponents. He maintained in public the divine character of the power he inherited from the mahdi and inspired his followers to perform prodigies of valour. Although he treated many of his European captives with terrible severity he never had any of them executed. It is said that their presence in Omdurman ministered to his vanity—one of the most marked features of his character. In private life he showed much affection for his family.

Personal sketches of the khalifa are given in Slatin Pasha's *Fire and Sword in the Sudan* (London, 1896), and in Father Ohrwalder's *Ten Years in the Mahdi's Camp* (London, 1892). See also Sir F. R. Wingate's *Mahdiism and the Egyptian Sudan* (London, 1891).

KHALĪL IBN AḤMAD [Abū 'Abdurraḥmān ul-Khalīl ibn Aḥmad ibn 'Amr ibn Tamīm] (718–791), Arabian philologist, was a native of Oman. He was distinguished for having written the first Arabic dictionary and for having first classified the Arabic metres and laid down their rules. He was also a poet, and lived the ascetic life of a poor student. His grammatical work was carried on by his pupil Sībawaihī. The dictionary known as the *Kitāb-ul-'Ain* is ascribed, at least in its inception, to Khalīl. It was probably finished by one of his pupils and was not known in Bagdad until 862. The words were not arranged in alphabetical order but according to physiological principles, beginning with *'Ain* and ending with *Ya*. The work seems to have been in existence as late as the 14th century, but is now only known from extracts in manuscript.

Various grammatical works are ascribed to Khalīl, but their authenticity seems doubtful; cf. C. Brockelmann, *Gesch. der arabischen Literatur*, i. 100 (Weimar, 1898). (G. W. T.)

KHAMGAON, a town of India, in the Buldana district of Berar, 340 m. N.E. of Bombay. Pop. (1901), 18,341. It is an important centre of the cotton trade. The cotton market, the second in the province, was established about 1820. Khamgaon was connected in 1870 with the Great Indian Peninsula railway by a short branch line.

KHAMSEH, a small but important province of Persia, between Kazvin and Tabriz. It consisted formerly of five districts, whence its name Khamseh, "the five," but is now subdivided into seventeen districts. The language of the inhabitants is Turkish. The province pays a revenue of about £20,000 per annum, and its capital is Zenjān.

KHAMSIN (Arabic for "fifty"), a hot oppressive wind arising in the Sahara. It blows in Egypt at intervals for about fifty days during March, April and May, and fills the air with sand. In Guinea the wind from the Sahara is known as harmattan (*q.v.*).

KHAMTIS, a tribe of the north-east frontier of India, dwelling in the hills bordering the Lakhimpur district of Assam. They are of Shan origin, and appear to have settled in their present abode in the middle of the 18th century. In 1839 they raided the British outpost of Sadiya, but they have since given no trouble. Their headquarters are in a valley 200 m. from Sadiya, which can be reached only over high passes and through dense jungle. In 1901 the number of speakers of Khamti was returned as only 1490, mostly in Burma.

KHAN (from the Turkī, hence Persian and Arabic *Khān*), a title of respect in Mahommedan countries. It is a contracted form of *khāqān* (khakan), a word equivalent to sovereign or emperor, used among the Mongol and Turkī-nomad hordes. The title khan was assumed by Jenghis when he became supreme ruler of the Mongols; his successors became known in Europe as the Great Khans (sometimes as the Chams, &c.) of Tatary or Cathay. Khan is still applied to semi-independent rulers, such as the khans of Russian Turkestan, or the khan of Kalat in Baluchistan, and is also used immediately after the name of rulers such as the sultan of Turkey; the meaning of the term has also extended downwards, until in Persia and Afghanistan it has become an affix to the name of any Mahommedan gentleman, like Esquire, and in India it has become a part of many Mahommedan names, especially when Pathan descent is claimed. The title of Khan Bahadur is conferred by the British government on Mahommedans and also on Parsis.

KHANDESH, EAST and **WEST,** two districts of British India, in the central division of Bombay. They were formed in 1906 by the division of the old single district of Khandesh. Their areas are respectively 4544 sq. m. and 5497 sq. m., and the population on these areas in 1901 was 957,728 and 469,654. The headquarters of East Khandesh are at Jalgaon, and those of West Khandesh at Dhulia.

The principal natural feature is the Tapti river, which flows through both districts from east to west and divides each into two unequal parts. Of these the larger lie towards the south, and are drained by the rivers Girna, Bori and Panjhra. Northwards beyond the alluvial plain, which contains some of the richest tracts in Khandesh, the land rises towards the Satpura hills. In the centre and east the country is level, save for some low ranges of barren hills, and has in general an arid, unfertile appearance. Towards the north and west, the plain rises into a difficult and rugged country, thickly wooded, and inhabited by wild tribes of Bhils, who chiefly support themselves on the fruits of the forests and by wood-cutting. The drainage of the district centres in the Tapti, which receives thirteen principal tributaries in its course through Khandesh. None of the rivers is navigable, and the Tapti flows in too deep a bed to be useful for irrigation. The district on the whole, however, is fairly well supplied with surface water. Khandesh is not rich in minerals. A large area is under forest; but the jungles have been denuded of most of their valuable timber. Wild beasts are numerous. In 1901 the population of the old single district was 1,427,382, showing an increase of less than 1% in the decade. Of the aboriginal tribes the Bhils are the most important. They number 167,000, and formerly were a wild and lawless robber tribe. Since the introduction of British rule, the efforts made by kindly treatment, and by the offer of suitable employment, to win the Bhils from their disorderly life have been most successful. Many of them are now employed in police duties and as village watchmen. The principal crops are millets, cotton, pulse, wheat and oilseeds. There are many factories for ginning and pressing cotton, and a cotton-mill at Jalgaon. The eastern district is traversed by the Great Indian Peninsula railway, which branches at Bhusawal (an important centre of trade) towards Jubbulpore and Nagpur. Both districts are crossed by the Tapti Valley line from Surat. Khandesh suffered somewhat from famine in 1896–1897, and more severely in 1899–1900.

KHANDWA, a town of British India, in the Nimar district of the Central Provinces, of which it is the headquarters, 353 m. N.E. of Bombay by rail. Pop. (1901), 19,401. Khandwa is an ancient town, with Jain and other temples. As a centre of trade, it has superseded the old capital of Burhanpur. It is an important railway junction, where the Malwa line from Indore meets the main line of the Great Indian Peninsula. There are factories for ginning and pressing cotton, and raw cotton is exported.

KHANSĀ (Tumāḍir bint ʿAmr, known as al-Khansā) (d. *c.* 645), Arabian poetess of the tribe Sulaim, a branch of Qais, was born in the later years of the 6th century and brought up in such wealth and luxury as the desert could give. Refusing the offer of Duraid ibn uṣ-Ṣimma, a poet and prince, she married Mirdās and had by him three sons. Afterwards she married again. Before the time of Islam she lost her brothers Ṣakhr and Moawiya in battle. Her elegies written on these brothers and on her father made her the most famous poetess of her time. At the fair of ʿUkāz Nābigha Dhubyāni is said to have placed Aʿsha first among the poets then present and Khansā second above Hassān ibn Thābit. Khansā with her tribe accepted Islam somewhat late, but persisted in wearing the heathen sign of mourning, against the precepts of Islam. Her four sons fought in the armies of Islam and were slain in the battle of Kadisīya. Omar wrote her a letter congratulating her on their heroic end and assigned her a pension. She died in her tent *c.* 645. Her daughter ʿAmra also wrote poetry. Opinion was divided among later critics as to whether Khansā or Laila (see ARABIC LITERATURE: §*Poetry*) was the greater.

Her diwan has been edited by L. Cheikho (Beirut, 1895) and translated into French by De Coppier (Beirut, 1889). Cf. T. Nöldeke's *Beiträge zur Kenntniss der Poesie der alten Araber* (Hanover, 1864). Stories of her life are contained in the *Kitāb ul-Aghāni*, xiii. 136–147. (G. W. T.)

KHAR, a small but very fertile province of Persia, known by the ancients as Choara and Choarene; pop. about 10,000. The governor of the province resides at Kishlak Khar, a large village situated 62 m. S.E. of Teheran, or at Aradān, a village 10 m. farther E. The province has an abundant water-supply from the Hableh-rūd, and produces great quantities of wheat, barley and rice. Of the £6000 which it pays to the state, more than £4000 is paid in kind—wheat, barley, straw and rice.

KHARAGHODA, a village of British India, in the Ahmedabad district of Bombay, situated on the Little Runn of Cutch, and the terminus of a branch railway; pop. (1901), 2108. Here is the government factory of salt, known as Baragra salt, producing nearly 2,000,000 cwt. a year, most of which is exported to other provinces in Central and Northern India.

KHARGA (WAH EL-KHARGA, the outer oasis), the largest of the Egyptian oases, and hence frequently called the Great Oasis. It lies in the Libyan desert between 24° and 26° N. and 30° and 31° E., the chief town, also called Kharga, being 435 m. by rail S. by W. of Cairo. It is reached by a narrow-gauge line (opened in 1908) from Kharga junction, a station on the Nile valley line near Farshut. The oasis consists of a depression in the desert some 1200 sq. m. in extent, and is about 100 m. long N. to S. and from 12 to 50 broad E. to W. Formerly, and into historic times, a lake occupied a considerable part of the depression, and the thick deposits of clay and sand then laid down now form the bulk of the cultivated lands of the oasis. It includes, however, a good deal of desert land. The inhabitants numbered (1907 census) 8348. They are of Berber stock. Administratively the oasis forms part of the mudiria of Assiut. It is practically rainless, and there is not now a single natural flowing spring. There are, however, numerous wells, water being obtained freely from the porous sandstone which underlies a great part of the Libyan desert. Some very ancient wells are 400 ft. deep. In water-bearing sandstones near the surface there are underground aqueducts dating from Roman times. The oasis contains many groves of date palms, there being over 60,000 adult trees in 1907. The dom palm, tamarisk, acacia and wild senna are also found. Rice, barley and wheat are the chief cereals cultivated, and lucerne for fodder. Besides agriculture the only industry is basket and mat making—from palm leaves and fibre. Since 1906 extensive boring and land reclamation works have been undertaken in the oasis.

The name of the oasis appears in hieroglyphics as *Kenem*, and that of its capital as *Hebi* (the plough). In Pharaonic times it supported a large population, but the numerous ruins are mostly of later date. The principal ruin, a temple of Ammon, built under Darius, is of sandstone, 142 ft. long by 63 ft. broad and 30 ft. in height. South-east is another temple, a square stone building with the name of Antoninus Pius over one of the entrances. On the eastern escarpment of the oasis on the way to Girga are the remains of a large Roman fort with twelve bastions. On the road to Assiut is a fine Roman columbarium or dove-cote. Next to the great temple the most interesting ruin in the oasis is, however, the necropolis, a burial-place of the early Christians, placed on a hill 3 m. N. of the town of Kharga. There are some two hundred rectangular tomb buildings in unburnt brick with ornamented fronts. In most of the tombs is a chamber in which the mummy was placed, the Egyptian Christians at first continuing this method of preserving the bodies of their dead. In several of the tombs and in the chapel of the cemetery is painted the Egyptian sign of life, which was confounded with the Christian cross. The chapel is basilican; in it and in another building in the necropolis are crude frescoes of biblical subjects.

Kharga town (pop. 1907 census, 5362) is picturesquely situated amid palm groves. The houses are of sun-dried bricks, the streets narrow and winding and for the most part roofed over, the roofs carrying upper storeys. Some of the streets are cut through the solid rock. South of the town are the villages of Genna, Guehda (with a temple dedicated to Ammon, Mut and Khonsu), Bulak (pop. 1012), Dakakin, Beris (pop. 1564), Dush (with remains of a fine temple bearing the names of Domitian and Hadrian), &c.

Kharga is usually identified with the city of Oasis mentioned by Herodotus as being seven days' journey from Thebes and called in Greek the Island of the Blessed. The oasis was traversed by the army of Cambyses when on its way to the oasis of Ammon (Siwa), the army perishing in the desert before reaching its destination. During the Roman period, as it had also been in Pharaonic times, Kharga was used as a place of banishment, the most notable exile being Nestorius, sent thither after his condemnation by the council of Ephesus. Later it became a halting-place for the caravans of slaves brought from Darfur to Egypt.

About 100 m. W. of Kharga is the oasis of Dakhla, the inner or receding oasis, so named in contrast to Kharga as being farther from the Nile. Dakhla has a population (1907) of 18,368. Its chief town, El Kasr, has 3602 inhabitants. The principal ruin, of Roman origin and now called Deir el Hagar (the stone convent), is of considerable size. The Theban triad were the chief deities worshipped here. Some 120 m. N.W. of Dakhla is the oasis of Farafra, population about 1000, said to be the first of the oases conquered by the Moslems from the Christians. It is noted for the fine quality of its olives. The Baharia, or Little Oasis (pop. about 6000), lies 80 m. N.N.E. of Farafra. Many of its inhabitants, who are of Berber race, are Senussites. Baharia is about 250 m. E.S.E. of the oasis of Siwa (see EGYPT: *The Oases*; and SIWA).

See H. Brugsch, *Reise nach dem grossen Oase el-Khargeh in der Libyschen Wüste* (Leipzig, 1878); H. J. L. Beadnell, *An Egyptian Oasis* (London, 1909); Murray's *Handbook for Egypt*, 11th ed. (London, 1907); *Geological and Topographical Report on Kharga Oasis* (1899), on *Farafra Oasis* (1899), on *Dakhla Oasis* (1900), on *Baharia Oasis* (1903), all issued by the Public Works Department, Cairo. (F. R. C.)

KHARKOV, a government of Little Russia, surrounded by those of Kursk, Poltava, Ekaterinoslav, territory of the Don Cossacks, and Voronezh, and belonging partly to the basin of the Don and partly to that of the Dnieper. The area is 21,035 sq. m. In general the government is a table-land, with an elevation of 300 to 450 ft., traversed by deep-cut river valleys. The soil is for the most part of high fertility, about 57% of the surface being arable land and 24% natural pasture; and though the winter is rather severe, the summer heat is sufficient for the ripening of grapes and melons in the open air. The bulk of the population is engaged in agricultural pursuits and the breeding of sheep, cattle and horses, though various manufacturing industries have developed rapidly, more especially since the middle of the 19th century. Horses are bred for the army, and the yield of wool is of special importance. The ordinary cereals, maize, buckwheat, millet, hemp, flax, tobacco, poppies, potatoes and beetroot are all grown, and bee-keeping and silkworm-rearing are of considerable importance. Sixty-three per cent. of the land is owned by the peasants, 25% by the nobility, 6% by owners of other classes, and 6% by the crown and public institutions. Beetroot sugar factories, cotton-mills, distilleries, flour-mills, tobacco factories, brickworks, breweries, woollen factories, ironworks, pottery-kilns and tanneries are the leading industrial establishments. Gardening is actively prosecuted. Salt is extracted at Slavyansk. The mass of the people are Little Russians, but there are also Great Russians, Kalmucks, Germans, Jews and Gypsies. In 1867 the total population was 1,681,486, and in 1897 2,507,277, of whom 1,242,892 were women and 367,602 lived in towns. The estimated population in 1906 was 2,983,900. The government is divided into eleven districts. The chief town is Kharkov (*q.v.*). The other district towns, with their populations in 1897, are Akhtyrka (25,965 in 1900), Bogodukhov (11,928), Izyum (12,959), Kupyansk (7256), Lebedin (16,684), Starobyelsk (13,128), Sumy (28,519 in 1900), Valki (8842), Volchansk (11,322), and Zmiyev (4652).

KHARKOV, a town of southern Russia, capital of the above government, in 56° 37′ N. and 25° 5′ E., in the valley of the Donets, 152 m. by rail S.S.E. of Kursk. Oak forests bound it on two sides. Pop. (1867), 59,968; (1900), 197,405. Kharkov is an archiepiscopal see of the Orthodox Greek Church, and the headquarters of the X. army corps. The four annual fairs are among the busiest in Russia, more especially the Kreshchenskaya or Epiphany fair, which is opened on the 6th (19th) of January, and the Pokrovsky fair in the autumn. The turnover at the former is estimated at £3,000,000 to £4,000,000. Thousands of horses are bought and sold. At the Trinity (Troitsa) fair in June an extensive business (£800,000) is done in wool. A great variety of manufactured goods are produced in the town—linen, felt, beetroot sugar, tobacco, brandy, soap, candles, cast-iron. Kharkov is an educational centre for the higher and middle classes. Besides a flourishing university, instituted in 1805, and attended by from 1600 to 1700 students, it possesses a technological institute (400 students), a railway engineering school, an observatory, a veterinary college, a botanical garden, a theological seminary, and a commercial school. The university building was formerly a royal palace. The library contains 170,000 volumes; and the zoological collections are especially rich in the birds and fishes of southern Russia. Public gardens occupy the site of the ancient military works; and the government has a model farm in the neighbourhood. Of the Orthodox churches one has the rank of cathedral (1781). Among the public institutions are a people's palace (1903) and an industrial museum.

The foundation of Kharkov is assigned to 1650, but there is archaeological evidence of a much earlier occupation of the district, if not of the site. The Cossacks of Kharkov remained faithful to the tsar during the rebellions of the latter part of the 17th century; in return they received numerous privileges, and continued to be a strong advance-guard of the Russian power, till the final subjugation of all the southern region. With other military settlements Kharkov was placed on a new footing in 1765; and at the same time it became the administrative centre of the Ukraine.

KHARPUT, the most important town in the Kharput (or Mamuret el-Aziz) vilayet of Asia Minor, situated at an altitude of 4350 ft., a few miles south of the Murad Su or Eastern Euphrates, and almost as near the source of the Tigris, on the Samsun-Sivas-Diarbekr road. Pop. about 20,000. The town is built on a hill terrace about 1000 ft. above a well-watered plain of exceptional fertility which lies to the south and supports a large population. Kharput probably stands on or near the site of *Carcathiocerta* in Sophene, reached by Corbulo in A.D. 65. The early Moslem geographers knew it as Hisn Ziyad, but the Armenian name was Khartabirt or Kharbirt, whence Kharput. Cedrenus (11th century) writes Χάρποτε. There is a story that in 1122

Joscelin (Jocelyn) of Courtenay, and Baldwin II., king of Jerusalem, both prisoners of the Amir Balak in its castle, were murdered by being cast from its cliffs after an attempted rescue. The story is told by William of Tyre, who calls the place Quart Piert or Pierre, but it is a mere romance. Kharput is an important station of the American missionaries, who have built a college, a theological seminary, and boys' and girls' schools. In November 1895 Kurds looted and burned the Armenian villages on the plain; and in the same month Kharput was attacked and the American schools were burned down. A large number of the Gregorian and Protestant Armenian clergy and people were massacred, and churches, monasteries and houses were looted. The vilayet Kharput was founded in 1888, being the result of a provincial rearrangement, designed to ensure better control over the disturbed districts of Kurdistan. It has much mineral wealth, a healthy climate and a fertile soil. The seat of government is Mezere, on the plain 3 m. S. of Kharput. (D. G. H.)

KHARSAWAN, a feudatory state of India, within the Chota Nagpur division of Bengal; area 153 sq. m.; pop. (1901), 36,540; estimated revenue £2600. Since the opening of the main line of the Bengal-Nagpur railway through the state trade has been stimulated, and it is believed that both iron and copper can be worked profitably.

KHARTUM, the capital of the Anglo-Egyptian Sudan, on the left bank of the Blue Nile immediately above its junction with the White Nile in 15° 36′ N., 32° 32′ E., and 1252 ft. above the sea. It is 432 m. by rail S.W. of Port Sudan, on the Red Sea, and 1345 m. S. of Cairo by rail and steamer. Pop. (1907) with suburbs, but excluding Omdurman, 69,349.

The city, laid out on a plan drawn up by Lord Kitchener in 1898, has a picturesque aspect with its numerous handsome stone and brick buildings surrounded by gardens and its groves of palms and other trees. The river esplanade, 2 m. long, contains the chief buildings. Parallel with it is Khedive Avenue, of equal length. The rest of the city is in squares, the streets forming the design of the union jack. In the centre of the esplanade is the governor-general's palace, occupying the site of the palace destroyed by the Mahdists in 1885. It is a three-storeyed building with arcaded verandas and a fine staircase leading to a loggia on the first floor. Here a tablet indicates the spot in the old palace where General Gordon fell. In the gardens, which cover six acres, is a colossal stone "lamb" brought from the ruins of Soba, an ancient Christian city on the Blue Nile. The "lamb" is in reality a ram of Ammon, and has an inscription in Ethiopian hieroglyphs. In front of the southern façade, which looks on to Khedive Avenue, is a bronze statue of General Gordon seated on a camel, a copy of the statue by Onslow Ford at Chatham, England. Government offices and private villas are on either side of the palace, and beyond, on the east, are the Sudan Club, the military hospital, and the Gordon Memorial College. The college, the chief educational centre in the Sudan, is a large, many-windowed building with accommodation for several hundred scholars and research laboratories and an economic museum. At the western end of the esplanade are the zoological gardens, the chief hotel, the Coptic church and the Mudiria House (residence of the governor of Khartum). Running south from Khedive Avenue at the spot where the Gordon statue stands, is Victoria Avenue, leading to Abbas Square, in the centre of which is the great mosque with two minarets. On the north-east side of the square are the public markets. The Anglican church, dedicated to All Saints, the principal banks and business houses, are in Khedive Avenue. There are Maronite and Greek churches, an Austrian Roman Catholic mission, a large and well-equipped civil hospital and a museum for Sudan archaeology. Outside the city are a number of model villages (each of the principal tribes of the Sudan having its own settlement) in which the dwellings are built after the tribal fashion. Adjacent are the parade ground and racecourse and the golf-links. A line of fortifications extends south of the city from the Blue to the White Nile. The buildings are used as barracks. Barracks for British troops occupy the end of the line facing the Blue Nile.

On the right (northern) bank of the Blue Nile is the suburb of Khartum North, formerly called Halfaya,[1] where is the principal railway station. It is joined to the city by a bridge (completed 1910) containing a roadway and the railway, Khartum itself being served by steam trams and rickshaws. The steamers for the White and the Blue Nile start from the quay along the esplanade. West of the zoological gardens is the point of junction of the Blue and White Niles and here is a ferry across to Omdurman (*q.v.*) on the west bank of the White Nile a mile or two below Khartum. In the river immediately below Khartum is Tuti Island, on which is an old fort and an Arab village.

From its geographical position Khartum is admirably adapted as a commercial and political centre. It is the great entrepôt for the trade of the Anglo-Egyptian Sudan. By the Nile waterways there is easy transport from the southern and western equatorial provinces and from Sennar and other eastern districts. Through Omdurman come the exports of Kordofan and Darfur, while by the Red Sea railway there is ready access to the markets of the world. The only important manufacture is the making of bricks.

The population is heterogeneous. The official class is composed chiefly of British and Egyptians; the traders are mostly Greeks, Syrians and Copts, while nearly all the tribes of the Sudan are represented in the negro and Arab inhabitants.

At the time of the occupation of the Sudan by the Egyptians a small fishing village existed on the site of the present city. In 1822 the Egyptians established a permanent camp here and out of this grew the city, which in 1830 was chosen as the capital of the Sudanese possessions of Egypt. It got its name from the resemblance of the promontory at the confluence of the two Niles to an elephant's trunk, the meaning of *khartum* in the dialect of Arabic spoken in the locality. The city rapidly acquired importance as the Sudan was opened up by travellers and traders, becoming, besides the seat of much legitimate commerce, a great slave mart. It was chosen as the headquarters of Protestant and Roman Catholic missions, and had a population of 50,000 or more. Despite its size it contained few buildings of any architectural merit; the most important were the palace of the governor-general and the church of the Austrian mission. The history of the city is intimately bound up with that of the Sudan generally, but it may be recalled here that in 1884, at the time of the Mahdist rising, General Gordon was sent to Khartum to arrange for the evacuation by the Egyptians of the Sudan. At Khartum he was besieged by the Mahdists, whose headquarters were at Omdurman. Khartum was captured and Gordon killed on the 26th of January 1885, two days before the arrival off the town of a small British relief force, which withdrew on seeing the city in the hands of the enemy. Nearly every building in Khartum was destroyed by the Mahdists and the city abandoned in favour of Omdurman, which place remained the headquarters of the mahdi's successor, the khalifa Abdullah, till September 1898, when it was taken by the Anglo-Egyptian forces under General (afterwards Lord) Kitchener, and the seat of government again transferred to Khartum. It speedily arose from its ruins, being rebuilt on a much finer scale than the original city. In 1899 the railway from Wadi Halfa was completed to Khartum, and in 1906 through communication by rail was established with the Red Sea.

KHASI AND JAINTIA HILLS, a district of British India, in the Hills division of Eastern Bengal and Assam. It occupies the central plateau between the valleys of the Brahmaputra and the Surma. Area, 6027 sq. m.; pop. (1901), 202,250, showing an increase of 2% in the decade.

The district consists of a succession of steep ridges running east and west, with elevated table-lands between. On the southern side, towards Sylhet, the mountains rise precipitously from the valley of the Bārāk or Surma. The first plateau is about 4000 ft. above sea-level. Farther north is another plateau, on which is situated the station of Shillong, 4900 ft. above the sea; behind lies the Shillong range, of which the highest peak rises to 6450 ft. On the north side, towards Kamrūp, are two similar plateaus of lower elevation. The general appearance of all these table-lands is that of undulating downs, covered with grass, but destitute of large timber. At 3000 ft. elevation the indigenous pine predominates over all other vegetation, and forms almost pure pine forests. The highest ridges are clothed with magnificent clumps of timber trees, which superstition has preserved from the axe of the wood-cutter. The characteristic trees in these sacred groves chiefly consist of oaks, chestnuts, magnolias, &c. Beneath the shade grow rare orchids, rhododendrons and wild cinnamon. The streams are merely mountain torrents; many of them pass through narrow gorges of wild beauty. From time immemorial, Lower Bengal has drawn its supply of lime from the Khasi Hills, and the quarries along their southern slope are inexhaustible. Coal of fair quality crops out at several places, and there are a few small coal-mines.

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[1] The village of Halfaya, a place of some importance before the foundation of Khartum, is 4 m. to the N., on the eastern bank of the Nile. From the 15th century up to 1821 it was the capital of a small state, tributary to Sennar, regarded as a continuation of the Christian kingdom of Aloa (see DONGOLA).

The Khasi Hills were conquered by the British in 1833. They are inhabited by a tribe of the same name, who still live in primitive communities under elective chiefs in political subordination to the British government. There are 25 of these chiefs called *Siems*, who exercise independent jurisdiction and pay no tribute. According to the census of 1901 the Khasis numbered 107,500. They are a peculiar race, speaking a language that belongs to the Mon-Anam family, following the rule of matriarchal succession, and erecting monolithic monuments over their dead. The Jaintia Hills used to form a petty Hindu principality which was annexed in 1835. The inhabitants, called Syntengs, a cognate tribe to the Khasis, were subjected to a moderate income tax, an innovation against which they rebelled in 1860 and 1862. The revolt was stamped out by the Khasi and Jaintia Expedition of 1862–63. The headquarters of the district were transferred in 1864 from Cherrapunji to Shillong, which was afterwards made the capital of the province of Assam. A good cart-road runs north from Cherrapunji through Shillong to Gauhati on the Brahmaputra; total length, 97 m. The district was the focus of the great earthquake of the 12th of June 1897, which not only destroyed every permanent building, but broke up the roads and caused many landslips. The loss of life was put at only 916, but hundreds died subsequently of a malignant fever. In 1901 the district had 17,321 Christians, chiefly converts of the Welsh Calvinistic Mission.

See *District Gazetteer* (1906); Major P. R. T. Gurdon, *The Khasis* (1907).

KHASKOY (also *Chaskoi, Haskoi, Khaskioi, Chaskovo, Haskovo*, and in Bulgarian *Khaskovo*), the capital of the department of Khaskoy in the eastern Rumelia, Bulgaria; 45 m. E.S.E. of Philippopolis. Pop. (1900), 14,928. The town has a station 7 m. N. on the Philippopolis-Adrianople section of the Belgrade-Constantinople railway. Carpets and woollen goods are manufactured, and in the surrounding country tobacco and silk are produced.

KHATTAK, an important Pathan tribe in the North-West Frontier Province of India, inhabiting the south-eastern portion of the Peshawar district and the south-eastern and eastern portions of Kohat. They number 24,000, and have always been quiet and loyal subjects of the British government. They furnish many recruits to the Indian army, and make most excellent soldiers.

KHAZARS (known also as Chozars, as Ἀκάτζιροι or Χάζαροι in Byzantine writers, as Khazirs in Armenian and Khwalisses in Russian chronicles, and Ugri Bielii in Nestor), an ancient people who occupied a prominent place amongst the secondary powers of the Byzantine state-system. In the epic of Firdousi Khazar is the representative name for all the northern foes of Persia, and legendary invasions long before the Christian era are vaguely attributed to them. But the Khazars are an historic figure upon the borderland of Europe and Asia for at least 900 years (A.D. 190–1100). The epoch of their greatness is from A.D. 600 to 950. Their home was in the spurs of the Caucasus and along the shores of the Caspian—called by medieval Moslem geographers Bahr-al-Khazar (" sea of the Khazars "); their cities, all populous and civilized commercial centres, were Itil, the capital, upon the delta of the Volga, the " river of the Khazars," Semender (Tarkhu), the older capital, Khamlidje or Khalendsch, Belendscher, the outpost towards Armenia, and Sarkel on the Don. They were the Venetians of the Caspian and the Euxine, the organizers of the transit between the two basins, the universal carriers between East and West; and Itil was the meeting-place of the commerce of Persia, Byzantium, Armenia, Russia and the Bulgarians of the middle Volga. The tide of their dominion ebbed and flowed repeatedly, but the normal Khazari may be taken as the territory between the Caucasus, the Volga and the Don, with the outlying province of the Crimea, or Little Khazaria. The southern boundary never greatly altered; it did at times reach the Kur and the Aras, but on that side the Khazars were confronted by Byzantium and Persia, and were for the most part restrained within the passes of the Caucasus by the fortifications of Dariel. Amongst the nomadic Ugrians and agricultural Slavs of the north their frontier fluctuated widely, and in its zenith Khazaria extended from the Dnieper to Bolgari upon the middle Volga, and along the eastern shore of the Caspian to Astarabad.

Ethnology.—The origin of the Khazars has been much disputed, and they have been variously regarded as akin to the Georgians, Finno-Ugrians and Turks. This last view is perhaps the most probable. Their king Joseph, in answer to the inquiry of Ḥasdai Ibn Shaprūt of Cordova (*c.* 958), stated that his people sprang from Thogarmah, grandson of Japhet, and the supposed ancestor of the other peoples of the Caucasus. The Arab geographers who knew the Khazars best connect them either with the Georgians (Ibn Athīr) or with the Armenians (Dimishqi, ed. Mehren, p. 263); whilst Aḥmad ibn Faḍlān, who passed through Khazaria on a mission from the caliph Moqtadir (A.D. 921), positively asserts that the Khazar tongue differed not only from the Turkish, but from that of the bordering nations, which were Ugrian.

Nevertheless there are many points connected with the Khazars which indicate a close connexion with Ugrian or Turkish peoples. The official titles recorded by Ibn Faḍlān are those in use amongst the Tatar nations of that age, whether Huns, Bulgarians, Turks or Mongols. The names of their cities can be explained only by reference to Turkish or Ugrian dialects (Klaproth, *Mém. sur les Khazars*; Howorth, *Khazars*). Some too amongst the medieval authorities (Ibn Ḥauqal and Iṣṭakhri) note a resemblance between the speech in use amongst the Khazars and the Bulgarians; and the modern Magyar—a Ugrian language—can be traced back to a tribe which in the 9th century formed part of the Khazar kingdom. These characteristics, however, are accounted for by the fact that the Khazars were at one time subject to the Huns (A.D. 448 et seq.), at another to the Turks (*c.* 580), which would sufficiently explain the signs of Tatar influence in their polity, and also by the testimony of all observers, Greeks, Arabs and Russians, that there was a double strain within the Khazar nation. There were *Khazars* and *Kara* (black) *Khazars.* The Khazars were fair-skinned, black-haired and of a remarkable beauty and stature; their women indeed were sought as wives equally at Byzantium and Bagdad; while the Kara Khazars were ugly, short, and were reported by the Arabs almost as dark as Indians. The latter were indubitably the Ugrian nomads of the steppe, akin to the Tatar invaders of Europe, who filled the armies and convoyed the caravans of the ruling caste. But the Khazars proper were a civic commercial people, the founders of cities, remarkable for somewhat elaborate political institutions, for persistence and for good faith—all qualities foreign to the Hunnic character.

They have been identified with the Ἀκάτζιροι (perhaps Ak-Khazari, or White Khazars) who appear upon the lower Volga in the Byzantine annals, and thence they have been deduced, though with less convincing proof, either from the Ἀγάθυρσοι (Agathyrsi) or the Κατίαροι of Herodotus, iv. 104. There was throughout historic times a close connexion which eventually amounted to political identity between the Khazars and the Barsileens (the Passils of Moses of Chorene) who occupied the delta of the Volga; and the Barsileens can be traced through the pages of Ptolemy (*Geog.* v. 9), of Pliny (iv. 26), of Strabo (vii. 306), and of Pomponius Mela (ii. c. 1, p. 119) to the so-called Royal Scyths, Σκύθαι βασιλῆες, who were known to the Greek colonies upon the Euxine, and whose political superiority and commercial enterprise led to this rendering of their name. Such points, however, need not here be further pursued than to establish the presence of this white race around the Caspian and the Euxine throughout historic times. They appear in European history as White Huns (Ephthalites), White Ugrians (Sar-ogours), White Bulgarians. Owing to climatic causes the tract they occupied was slowly drying up. They were the outposts of civilization towards the encroaching desert, and the Tatar nomadism that advanced with it. They held in precarious subjection the hordes whom the conditions of the climate and the soil made it impossible to supplant. They bore the brunt of each of the great waves of Tatar conquests, and were eventually overwhelmed.

History.—Amidst this white race of the steppe the Khazars can be first historically distinguished at the end of the 2nd century A.D. They burst into Armenia with the Barsileens, A.D. 198. They were repulsed and attacked in turn. The pressure of the nomads of the steppe, the quest of plunder or revenge, these seem the only motives of these early expeditions; but in the long struggle between the Roman and Persian empires, of which Armenia was often the battlefield, and eventually the prize, the attitude of the Khazars assumed political importance. Armenia inclined to the civilization and ere long to the Christianity of Rome, whilst her Arsacid princes maintained an inveterate feud with the Sassanids of Persia. It became therefore the policy of the Persian kings to call in the Khazars in every collision with the empire (200–350). During the 4th century however, the growing power of Persia culminated in the annexation of eastern Armenia. The Khazars, endangered by so powerful a neighbour, passed from under Persian influence into that remote alliance with Byzantium which thenceforth characterized their policy, and they aided Julian in his invasion of Persia (363). Simultaneously with the approach of Persia to the Caucasus the terrible empire of the Huns sprang up among the Ugrians of the northern steppes. The Khazars, straitened on every side, remained passive till the danger culminated in the accession of Attila (434). The emperor Theodosius sent envoys to bribe the Khazars (Ἀκάτζιροι) to divert the Huns from the empire by an attack upon their flank. But there was a Hunnic party amongst the Khazar chiefs. The design was betrayed to Attila; and he extinguished the independence of the nation in a moment. Khazaria became the apanage of his eldest son, and the centre of government amongst the eastern subjects of the Hun (448). Even the iron rule of Attila was preferable to the time of anarchy that succeeded it. Upon his death (454) the wild immigration which he had arrested revived. The Khazars and the Sarogours (*i.e.* White Ogors, possibly the Barsileens of the Volga delta) were swept along in a flood of mixed Tatar peoples which the conquests of the Avars had set in motion. The Khazars and their companions broke through the Persian defences of the Caucasus. They appropriated the territory up to the Kur and the Aras, and roamed at large through Iberia, Georgia and Armenia. The Persian king implored the emperor Leo I. to help him defend Asia Minor at the Caucasus (457), but Rome was herself too hard pressed, nor was it for fifty years that the Khazars were driven back and the pass of Derbent fortified against them (*c.* 507).

Throughout the 6th century Khazaria was the mere highway for the wild hordes to whom the Huns had opened the passage into Europe, and the Khazars took refuge (like the Venetians from Attila) amongst the seventy mouths of the Volga. The pressure of the Turks in Asia precipitated the Avars upon the West. The conquering Turks followed in their footsteps (560–580). They beat down all opposition, wrested even Bosporus in the Crimea from the empire, and by the annihilation of the Ephthalites completed the ruin of the White Race of the plains from the Oxus to the Don. The empires of Turks and Avars, however, ran swiftly their barbaric course, and the Khazars arose out of the chaos to more than their ancient renown. They issued from the land of Barsilia, and extended their rule over the Bulgarian hordes left masterless by the Turks, compelling the more stubborn to migrate to the Danube (641). The agricultural Slavs of the Dnieper and the Oka were reduced to tribute, and before the end of the 7th century the Khazars had annexed the Crimea, had won complete command of the Sea of Azov, and, seizing upon the narrow neck which separates the Volga from the Don, had organized the portage which has continued since an important link in the traffic between Asia and Europe. The alliance with Byzantium was revived. Simultaneously, and no doubt in concert, with the Byzantine campaign against Persia (589), the Khazars had reappeared in Armenia, though it was not till 625 that they appear as Khazars in the Byzantine annals. They are then described as "Turks from the East," a powerful nation which held the coasts of the Caspian and the Euxine, and took tribute of the Viatitsh, the Severians and the Polyane. The khakan, enticed by the promise of an imperial princess, furnished Heraclius with 40,000 men for his Persian war, who shared in the victory over Chosroes at Nineveh.

Meanwhile the Moslem empire had arisen. The Persian empire was struck down (637), and the Moslems poured into Armenia. The khakan, who had defied the summons sent him by the invaders, now aided the Byzantine patrician in the defence of Armenia. The allies were defeated, and the Moslems undertook the subjugation of Khazaria (651). Eighty years of warfare followed, but in the end the Moslems prevailed. The khakan and his chieftains were captured and compelled to embrace Islam (737), and till the decay of the Mahommedan empire Khazaria with all the other countries of the Caucasus paid an annual tribute of children and of corn (737–861). Nevertheless, though overpowered in the end, the Khazars had protected the plains of Europe from the Mahommedans, and made the Caucasus the limit of their conquests.

In the interval between the decline of the Mahommedan empire and the rise of Russia the Khazars reached the zenith of their power. The merchants of Byzantium, Armenia and Bagdad met in the markets of Itil (whither since the raids of the Mahommedans the capital had been transferred from Semender), and traded for the wax, furs, leather and honey that came down the Volga. So important was this traffic held at Constantinople that, when the portage to the Don was endangered by the irruption of a fresh horde of Turks (the Petchenegs), the emperor Theophilus himself despatched the materials and the workmen to build for the Khazars a fortress impregnable to their forays (834). Famous as the one stone structure is in that stoneless region, the post became known far and wide amongst the hordes of the steppe as Sar-kel or the White Abode. Merchants from every nation found protection and good faith in the Khazar cities. The Jews, expelled from Constantinople, sought a home amongst them, developed the Khazar trade, and contended with Mahommedans and Christians for the theological allegiance of the Pagan people. The dynasty accepted Judaism (*c.* 740), but there was equal tolerance for all, and each man was held amenable to the authorized code and to the official judges of his own faith. At the Byzantine court the khakan was held in high honour. The emperor Justinian Rhinotmetus took refuge with him during his exile and married his daughter (702). Justinian's rival Vardanes in turn sought an asylum in Khazaria, and in Leo IV. (775) the grandson of a Khazar sovereign ascended the Byzantine throne. Khazar troops were amongst the bodyguard of the imperial court; they fought for Leo VI. against Simeon of Bulgaria; and the khakan was honoured in diplomatic intercourse with the seal of three solidi, which marked him as a potentate of the first rank, above even the pope and the Carolingian monarchs. Indeed his dominion became an object of uneasiness to the jealous statecraft of Byzantium, and Constantine Porphyrogenitus, writing for his son's instruction in the government, carefully enumerates the Alans, the Petchenegs, the Uzes and the Bulgarians as the forces he must rely on to restrain it.

It was, however, from a power that Constantine did not consider that the overthrow of the Khazars came. The arrival of the Varangians amidst the scattered Slavs (862) had united them into a nation. The advance of the Petchenegs from the East gave the Russians their opportunity. Before the onset of those fierce invaders the precarious suzerainty of the khakan broke up. By calling in the Uzes, the Khazars did indeed dislodge the Petchenegs from the position they had seized in the heart of the kingdom between the Volga and the Don, but only to drive them inwards to the Dnieper. The Hungarians, severed from their kindred and their rulers, migrated to the Carpathians, whilst Oleg, the Russ prince of Kiev, passed through the Slav tribes of the Dnieper basin with the cry "Pay nothing to the Khazars" (884). The kingdom dwindled rapidly to its ancient limits between the Caucasus, the Volga and the Don, whilst the Russian traders of Novgorod and Kiev supplanted the Khazars as the carriers between Constantinople and the North. When Ibn Faḍlān visited Khazaria forty years later, Itil was even yet a great city, with baths and market-places and thirty mosques. But there was no domestic product nor manufacture; the kingdom depended solely upon the now precarious transit dues, and administration was in the hands of a major domus also called khakan. At the assault of Swiatoslav of Kiev the rotten fabric crumbled into dust. His troops were equally at home on land and water. Sarkel, Itil and Semender surrendered to him (965–969). He pushed his conquests to the Caucasus, and established Russian colonies upon the Sea of Azov. The principality of Tmutarakan, founded by his grandson Mstislav (988), replaced the kingdom of Khazaria, the last trace of which was extinguished by a joint expedition of Russians and Byzantines (1016). The last of the khakans, George, Tzula, was taken prisoner. A remnant of the nation took refuge in an island of the Caspian (Siahcouyé); others retired to the Caucasus; part emigrated to the district of Kasakhi in Georgia, and appear for the last time joining with Georgia in her successful effort to throw off the yoke of the Seljuk Turks (1089). But the name is thought to survive in Kadzaria, the Georgian title for Mingrelia, and in Kadzaro, the Turkish word for the Lazis. Till the 13th century the Crimea was known to European travellers as Gazaria; the "ramparts of the Khazars" are still distinguished in the Ukraine; and the record of their dominion survives in the names of Kazarek, Kazaritshi, Kazarinovod, Kozar-owka, Kozari, and perhaps in Kazan.

AUTHORITIES.—*Khazar*: The letter of King Joseph to R. Hasdai Ibn Shaprūt, first published by J. Akrish, *Kol Mebasser* (Constantinople, 1577), and often reprinted in editions of Jehuda hal-Levy's *Kuzari*. German translations by Zedner (Berlin, 1840) and Cassel, *Magyar. Alterth.* (Berlin, 1848); French by Carmoly, *Rev. Or.* (1841). Cf. Harkavy, *Russische Revue*, iv. 69; Graetz, *Geschichte*, v. 364, and Carmoly, *Itinéraires de la Terre Sainte* (Brussels, 1847). *Armenian*: Moses of Chorene; cf. Saint-Martin, *Mémoires historiques et géographiques sur l'Armènie* (Paris, 1818). *Arabic*: The account of Ibn Faḍlān (921) is preserved by Yāḳūt, ii. 436 seq. See also Iṣṭakhry (ed. de Geoje, pp. 220 seq.), *Mas'ūdy*, ch. xvii. pp. 406 seq. of Sprenger's translation; *Ibn Ḥauḳal* (ed. de Goeje, pp. 279 seq.) and the histories of Ibn el Athīr and Ṭabary. Much of the Arabic material has been collected and translated by Fraehn, "Veteres Memoriae Chasarorum" in *Mém. de St Pét.* (1822); Dorn (from the Persian Ṭabary), *Mém. de St Pét.* (1844); Dufrémery, *Journ. As.* (1849). See also D'Ohsson's imaginary *Voyage d'Abul Cassim*, based on these sources. *Byzantine Historians*: The relative passages are collected in Stritter's *Memoriae populorum* (St Petersburg, 1778). *Russian*: The *Chronicle* ascribed to Nestor.

Modern: Klaproth, "Mém. sur les Khazars," in *Journ. As.* 1st series, vol. iii.; id., *Tableaux hist. de l'Asie* (Paris, 1823); id., *Tabl. hist. de Caucases* (1827); memoirs on the Khazars by Harkavy and by Howorth (*Congrès intern. des Orientalistes*, vol. ii.); Latham, *Russian and Turk*, pp. 209–217; Vivien St Martin, *Études de géog. ancienne* (Paris, 1850); id., *Recherches sur les populations du Caucase* (1847); id., "Sur les Khazars," in *Nouvelles ann. des voyages* (1857); D'Ohsson, *Peuples du Caucase* (Paris, 1828); S. Krauss, "Zur Geschichte der Chazaren," in *Revue orientale pour les études Ourals-altaïques* (1900). (P. L. G.; C. El.)

KHEDIVE, a Persian word meaning prince or sovereign, granted as a title by the sultan of Turkey in 1867 to his viceroy in Egypt, Ismail, in place of that of "vali."

KHERI, a district of British India, in the Lucknow division of the United Provinces, which takes its name from a small town with a railway station 81 m. N.W. of Lucknow. The area of the district is 2963 sq. m., and its population in 1901 was 905,138. It consists of a series of fairly elevated plateaus, separated by rivers flowing from the north-west, each bordered by alluvial land. North of the river Ul, the country is considered very unhealthy. Through this tract, probably the bed of a lake, flow two rivers, the Kauriala and Chauka, changing their courses constantly, so that the surface is seamed with deserted river beds much below the level of the surrounding country. The vegetation is very dense, and the stagnant waters are the cause of endemic fevers. The people reside in the neighbourhood of the low ground, as the soil is more fertile and less expensive to cultivate than the forest-covered uplands. South of the Ul, the scene changes. Between every two rivers or tributaries stretches a plain, considerably less elevated than the tract to the north. There is very little slope in any of these plains for many miles, and marshes are formed, from which emerge the headwaters of many secondary streams, which in the rains become dangerous torrents, and frequently cause devastating floods. The general drainage of the country is from north-west to south-east. Several large lakes exist, some formed by the ancient channels of the northern rivers, being fine sheets of water, from 10 to 20 ft. deep and from 3 to 4 m. long; in places they are fringed with magnificent groves. The whole north of the district is covered with vast forests, of which a considerable portion are government reserves. *Sāl* occupies about two-thirds of the forest area. The district is traversed by a branch of the Oudh & Rohilkhand railway from Lucknow to Bareilly.

KHERSON, a government of south Russia, on the N. coast of the Black Sea, bounded W. by the governments of Bessarabia and Podolia, N. by Kiev and Poltava, S. by Ekaterinoslav and Taurida. The area is 27,497 sq. m. The aspect of the country, especially in the south, is that of an open steppe, and almost the whole government is destitute of forest. The Dniester marks the western and the Dnieper the south-eastern boundary; the Bug, the Ingul and several minor streams drain the intermediate territory. Along the shore stretch extensive lagoons. Iron, kaolin and salt are the principal minerals. Nearly 45% of the land is owned by the peasants, 31% by the nobility, 12% by other classes, and 12% by the crown, municipalities and public institutions. The peasants rent 1,730,000 acres more from the landlords. Agriculture is well developed and 9,000,000 acres (51·1%) are under crops. Agricultural machinery is extensively used. The vine is widely grown, and yields 1,220,000 gallons of wine annually. Some tobacco is grown and manufactured. Besides the ordinary cereals, maize, hemp, flax, tobacco and mustard are commonly grown; the fruit trees in general cultivation include the cherry, plum, peach, apricot and mulberry; and gardening receives considerable attention. Agriculture has been greatly improved by some seventy German colonies. Cattle-breeding, horse-breeding and sheep-farming are pursued on a large scale. Some sheep farmers own 30,000 or 40,000 merinos each. Fishing is an important occupation. There are manufactures of wool, hemp and leather; also iron-works, machinery and especially agricultural machinery works, sugar factories, steam flour-mills and chemical works. The ports of Kherson, Ochakov, Nikolayev, and especially Odessa, are among the principal outlets of Russian commerce; Berislav, Alexandriya Elisavetgrad, Voznesenask, Olviopol and Tiraspol play an important part in the inland traffic. In 1871 the total population was 1,661,892, and in 1897 2,744,040, of whom 1,332,175 were women and 785,094 lived in towns. The estimated pop. in 1906 was 3,257,600. Besides Great and Little Russians, it comprises Rumanians, Greeks, Germans (123,453), Bulgarians, Bohemians, Swedes, and Jews (30% of the total), and some Gypsies. About 84% belong to the Orthodox Greek Church; there are also numerous Stundists. The government is divided into six districts, the chief towns of which are: Kherson (*q.v.*), Alexandriya (14,002 in 1897), Ananiev (16,713), Elisavetgrad (66,182 in 1900), Odessa (449,673 in 1900), and Tiraspol (29,323 in 1900). This region was long subject to the sway of the Tatar khans of the Crimea, and owes its rapid growth to the colonizing activity of Catherine II., who between 1778 and 1792 founded the cities of Kherson, Odessa and Nikolayev. Down to 1803 this government was called Nikolayev.

KHERSON, a town of south Russia, capital of the above government, on a hill above the right bank of the Dnieper, about 19 m. from its mouth. Founded by the courtier Potemkin in 1778 as a naval station and seaport, it had become by 1786 a place of 10,000 inhabitants, and, although its progress was checked by the rise of Odessa and the removal (in 1794) of the naval establishments to Nikolayev, it had in 1900 a population of 73,185. The Dnieper at this point breaks into several arms, forming islands overgrown with reeds and bushes; and vessels of burden must anchor at Stanislavskoe-selo, a good way down the stream. Of the traffic on the river the largest share is due to the timber, wool, cereals, cattle and hides trade; wool-dressing, soap-boiling, tallow-melting, brewing, flour-milling and the manufacture of tobacco are the chief industries. Kherson is a substantially built and regular town. The cathedral is the burial-place of Potemkin, and near Kherson lie the remains of John Howard, the English philanthropist, who died here in 1790. The fortifications have fallen into decay. The name Kherson was given to the town from the supposition that the site was formerly that of Chersonesus Heracleotica, the Greek city founded by the Dorians of Heraclea.

KHEVENHÜLLER, LUDWIG ANDREAS (1683–1744), Austrian field-marshal, Count of Aschelberg-Frankenburg, came of a noble family, which, originally Franconian, settled in Carinthia in the 11th century. He first saw active service under Prince Eugène in the War of the Spanish Succession, and by 1716 had risen to the command of Prince Eugène's own regiment of dragoons. He distinguished himself greatly at the battles of Peterwardein and Belgrade, and became in 1723 major-general of cavalry (*General-Wachtmeister*), in 1726 proprietary colonel of a regiment and in 1733 lieutenant field marshal. In 1734 the War of the Polish Succession brought him into the field again. He was present at the battle of Parma (June 29), where Count Mercy, the Austrian commander, was killed, and after Mercy's death he held the chief command of the army in Italy till Field Marshal Königsegg's arrival. Under Königsegg he again distinguished himself at the battle of Guastalla (September 19). He was once more in command during the operations which followed the battle, and his skilful generalship won for him the grade of general of cavalry. He continued in military and diplomatic employment in Italy to the close of the war. In 1737 he was made field marshal, Prince Eugène recommending him to his sovereign as the best general in the service. His chief exploit in the Turkish War, which soon followed his promotion, was at Radojevatz (September 28, 1737), where he cut his way through a greatly superior Turkish army. It was in the Austrian Succession War that his most brilliant work was done. As commander-in-chief of the army on the Danube he not only drove out the French and Bavarian invaders of Austria in a few days of rapid marching and sharp engagements (January, 1742), but overran southern Bavaria, captured Munich, and forced a large French corps in Linz to surrender. Later in the summer of 1742, owing to the inadequate forces at his disposal, he had to evacuate his conquests, but in the following campaign, though now subordinated to Prince Charles of Lorraine, Khevenhüller reconquered southern Bavaria, and forced the emperor in June to conclude the unfavourable convention of Nieder-Schönfeld. He disapproved the advance beyond the Rhine which followed these successes, and the event justified his fears, for the Austrians had to fall back from the Rhine through Franconia and the Breisgau, Khevenhüller himself conducting the retreat with admirable skill. On his return to Vienna, Maria Theresa decorated the field marshal with the order of the Golden Fleece. He died suddenly at Vienna on the 26th of January 1744.

He was the author of various instructional works for officers and soldiers (*Des G. F. M. Grafen v. Khevenhüller Observationspunkte für sein Dragoner-regiment* (1734 and 1748) and a *règlement* for the infantry (1737), and of an important work on war in general, *Kurzer Begriff aller militärischen Operationen* (Vienna, 1756; French version, *Maximes de guerre*, Paris, 1771).

KHEVSURS, a people of the Caucasus, kinsfolk of the Georgians. They live in scattered groups in East Georgia to the north and north-west of Mount Borbalo. Their name is Georgian and means "People of the Valleys." For the most part nomadic, they are still in a semi-barbarous state. They have not the beauty of the Georgian race. They are gaunt and thin to almost a ghastly extent, their generally repulsive aspect being accentuated by their large hands and feet and their ferocious expression. In complexion and colour of hair and eyes they vary greatly. They are very muscular and capable of bearing extraordinary fatigue. They are fond of fighting, and still wear armour of the true medieval type. This panoply is worn when the law of vendetta, which is sacred among them as among most Caucasian peoples, compels them to seek or avoid their enemy. They carry a spiked gauntlet, the terrible marks of which are borne by a large proportion of the Khevsur faces.

Many curious customs still prevail among the Khevsurs, as for instance the imprisonment of the woman during childbirth in a lonely hut, round which the husband parades, firing off his musket at intervals. After delivery, food is surreptitiously brought the mother, who is kept in her prison a month, after which the hut is burnt. The boys are usually named after some wild animal, *e.g.* bear or wolf, while the girls' names are romantic, such as Daughter of the Sun, Sun of my Heart. Marriages are arranged by parents when the bride and bridegroom are still in long clothes. The chief ceremony is a forcible abduction of the girl. Divorce is very common, and some Khevsurs are polygamous. Formerly no Khevsur might die in a house, but was always carried out under the sun or stars. The Khevsurs like to call themselves Christians, but their religion is a mixture of Christianity, Mahommedanism and heathen rites. They keep the Sabbath of the Christian church, the Friday of the Moslems and the Saturday of the Jews. They worship sacred trees and offer sacrifices to the spirits of the earth and air. Their priests are a combination of medicine-men and divines.

See G. F. R. Radde, *Die Chevs'uren und ihr Land* (Cassel, 1878); Ernest Chantre, *Recherches anthropologiques dans le Caucase* (Lyons, 1885–1887).

KHILCHIPUR, a mediatized chiefship in Central India, under the Bhopal agency; area, 273 sq. m.; pop. (1901), 31,143; estimated revenue, £7000; tribute payable to Sindhia, £700. The residence of the chief, who is a Khichi Rajput of the Chauhan clan, is at Khilchipur (pop. 5121).

KHINGAN, two ranges of mountains in eastern Asia.

(1) GREAT KHINGAN is the eastern border ridge of the immense plateau which may be traced from the Himalaya to Bering Strait and from the Tian-shan Mountains to the Khingan Mountains. It is well known from 50° N. to Kalgan (41° N., 115° E.), where it is crossed by the highway from Urga to Peking. As a border ridge of the Mongolian plateau, it possesses very great orographical importance, in that it is an important climatic boundary, and constitutes the western limits of the Manchurian flora. The base of its western slope, which is very gentle, lies at altitudes of 3000 to 3500 ft. Its crest rises to 4800 to 6500 ft., but its eastern slope sinks very precipitately to the plains of Manchuria, which have only 1500 to 2000 ft. of altitude. On this stretch one or two subordinate ridges, parallel to the main range and separated from it by longitudinal valleys, fringe its eastern slope, thus marking two different terraces and giving to the whole system a width of from 80 to 100 m. Basalts, trachytes and other volcanic formations are found in the main range and on its south-eastern slopes. The range was in volcanic activity in 1720–1721.

South-west of Peking the Great Khingan is continued by the In-shan mountains, which exhibit similar features to those of the Great Khingan, and represent the same terraced escarpment of the Mongolian plateau. Moreover, it appears from the map of the Russian General Staff (surveys of Skassi, V. A. Obruchev, G. N. Potanin, &c.) that similar terrace-shaped escarpments—but considerably wider apart than in Manchuria—occur in the Shan-si province of China, along the southern border of the South Mongolian plateau. These escarpments are pierced by the Yellow River or Hwang-ho south of the Great Wall, between 38° and 39° N., and in all probability a border range homologous to the Great Khingan separates the upper tributaries of the Hwang-ho (namely the Tan-ho) from those of the Yang-tsze-kiang. But according to Obruchev the escarpments of the Wei-tsi-shan and Lu-huang-lin, by which southern Ordos drops towards the Wei-ho (tributary of the Hwang-ho), can hardly be taken as corresponding to the Kalgan escarpment. They fall with gentle slopes only towards the high plains on the south of them, while a steep descent towards the low plain seems to exist further south only, between 32° and 34°. Thus the southern continuations of the Great Khingan, south of 38° N., possibly consist of two separate escarpments. At its northern end the place where the Great Khingan is pierced by the Amur has not been ascertained by direct observation. Prince P. Kropotkin considers that the upper Amur emerges from the high plateau and its border-ridge, the Khingan, below Albazin and above Kumara.[1] If this view prevail—Petermann has adopted it for his map of Asia, and it has been upheld in all the Gotha publications—it would appear that the Great Khingan joins the Stanovoi ridge or Jukjur, in that portion of it which faces the west coast of the Sea of Okhotsk. At any rate the Khingan, separating the Mongolian plateau from the much lower plains of the Sungari and the Nonni, is one of the most important orographical dividing-lines in Asia.

See Semenov's *Geographical Dictionary* (in Russian); D. V. Putiata, *Expedition to the Khingan in 1891* (St Petersburg, 1893); Potanin, "Journey to the Khingan," in *Izvestia Russ. Geog. Soc.* (1901).

(2) The name LITTLE KHINGAN is applied indiscriminately to two distinct mountain ranges. The proper application of the term would be to reserve it for the typical range which the Amur pierces 40 m. below Ekaterino-Nikolsk (on the Amur), and which is also known as the Bureya mountains, and as Dusse-alin. This range, which may be traced from the Amur to the Sea of Okhotsk, seems to be cleft twice by the Sungari and to be continued under different local names in the same south-westerly direction to the peninsula of Liao-tung in Manchuria. The other range to which the name of Little Khingan is applied is that of the Ilkhuri-alin mountains (51° N., 122°–126° E.), which run in a north-westerly direction between the upper Nonni and the Amur, west of Blagovyeshchensk. (P. A. K.; J. T. BE.)

KHIVA, formerly an important kingdom of Asia, but now a much reduced khanate, dependent upon Russia, and confined to the delta of the Amu-darya (Oxus). Its frontier runs down the left bank of the Amu, from 40° 15′ N., and down its left branch to Lake Aral; then, for about 40 m. along the south coast of Lake Aral, and finally southwards, following the escarpment of the Ust-Urt plateau. From the Transcaspian territory of Russia Khiva is separated by a line running almost W.N.W.–E.S.E. under 40° 30′ N., from the Uzboi depression to the Amu-darya. The length of the khanate from north to south is 200 m., and its greatest width 300 m. The area of the Khiva oasis is 5210 sq. m. while the area of the steppes is estimated at 17,000 sq. m. The population of the former is estimated at 400,000, and that of the latter also at 400,000 (nomadic). The water of the Amu is brought by a number of irrigation canals to the oasis, the general declivity of the surface westwards facilitating the irrigation. Several old beds of the Amu intersect the territory. The water of the Amu and the very thin layer of ooze which it deposits render the oasis very fertile. Millet, rice, wheat, barley, oats, peas, flax, hemp, madder, and all sorts of vegetables and fruit (especially melons) are grown, as also the vine and cotton. The white-washed houses scattered amidst the elms and poplars, and surrounded by flourishing fields, produce the most agreeable contrast with the arid steppes. Livestock, especially sheep, camels, horses and cattle, is extensively bred by the nomads.

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[1] See his sketch of the orography of East Siberia (French trans., with addenda, published by the *Institut Géographique* of Brussels in 1902).

The population is composed of four divisions: Uzbegs (150,000 to 200,000), the dominating race among the settled inhabitants of the oasis, from whom the officials are recruited; Sarts and Tajiks, agriculturists and tradespeople of mixed race; Turkomans (*c.* 170,000), who live in the steppes, south and west of the oasis, and formerly plundered the settled inhabitants by their raids; and the Kara-kalpaks, or Black Bonnets, a Turki tribe some 50,000 in number. They live south of Lake Aral, and in the towns of Kungrad, Khodsheili and Kipchak form the prevailing element. They cultivate the soil, breed cattle, and their women make carpets. There are also about 10,000 Kirghiz, and when the Russians took Khiva in 1873 there were 29,300 Persian slaves, stolen by Turkoman raiders, and over 6500 liberated slaves, mostly Kizil-bashes. The former were set free and the slave trade abolished. Of domestic industries, the embroidering of cloth, silks and leather is worthy of notice. The trade of Khiva is considerable: cotton, wool, rough woollen cloth and silk cocoons are exported to Russia, and various animal products to Bokhara. Cottons, velveteen, hardware and pepper are imported from Russia, and silks, cotton, china and tea from Bokhara. Khivan merchants habitually attend the Orenburg and Nizhniy-Novgorod fairs.

History.—The present khanate is only a meagre relic of the great kingdom which under the name of Chorasmia, Kharezm (Khwārizm) and Urgenj (Jurjānīya, Gurganj) held the keys of the mightiest river in Central Asia. Its possession has consequently been much disputed from early times, but the country has undergone great changes, geographical as well as political, which have lessened its importance. The Oxus (Amu-darya) has changed its outlet, and no longer forms a water-way to the Caspian and thence to Europe, while Khiva is entirely surrounded by territory either directly administered or protected by Russia.

Chorasmia is mentioned by Herodotus, it being then one of the Persian provinces, over which Darius placed satraps, but nothing material of it is known till it was seized by the Arabs in A.D. 680. When the power of the caliphs declined the governor of the province probably became independent; but the first king known to history is Mamun-ibn-Mahommed in 995. Khwārizm fell under the power of Mahmud of Ghazni in 1017, and subsequently under that of the Seljuk Turks. In 1097 the governor Kutb-ud-din assumed the title of king, and one of his descendants, ʿAla-ud-din-Mahommed, conquered Persia, and was the greatest prince in Central Asia when Jenghiz Khan appeared in 1219. Khiva was conquered again by Timur in 1379; and finally fell under the rule of the Uzbegs in 1512, who are still the dominant race under the protection of the Russians.

Russia established relations with Khiva in the 17th century. The Cossacks of the Yaik during their raids across the Caspian learnt of the existence of this rich territory and made more than one plundering expedition to the chief town Urgenj. In 1717 Peter the Great, having heard of the presence of auriferous sand in the bed of the Oxus, desiring also to "open mercantile relations with India through Turan" and to release from slavery some Russian subjects, sent a military force to Khiva. When within 100 miles of the capital they encountered the troops of the khan. The battle lasted three days, and ended in victory for the Russian arms. The Khivans, however, induced the victors to break up their army into small detachments and treacherously annihilated them in detail. It was not until the third decade of the 19th century that the attention of the Muscovite government was again directed to the khanate. In 1839 a force under General Perovsky moved from Orenburg across the Ust-Urt plateau to the Khivan frontiers, to occupy the khanate, liberate the captives and open the way for trade. This expedition likewise terminated in disaster. In 1847 the Russians founded a fort at the mouth of the Jaxartes or Syr-darya. This advance deprived the Khivans not only of territory, but of a large number of tax-paying Kirghiz, and also gave the Russians a base for further operations. For the next few years, however, the attention of the Russians was taken up with Khokand, their operations on that side culminating in the capture of Tashkent in 1865. Free in this quarter, they directed their thoughts once more to Khiva. In 1869 Krasnovodsk on the east shore of the Caspian was founded, and in 1871–1872 the country leading to Khiva from different parts of Russian Turkestan was thoroughly explored and surveyed. In 1873 an expedition to Khiva was carefully organized on a large scale. The army of 10,000 men placed at the disposal of General Kaufmann started from three different bases of operation—Krasnovodsk, Orenburg and Tashkent. Khiva was occupied almost without opposition. All the territory (35,700 sq. m. and 110,000 souls) on the right bank of the Oxus was annexed to Russia, while a heavy war indemnity was imposed upon the khanate. The Russians thereby so crippled the finances of the state that the khan is in complete subjection to his more powerful neighbour.

(J. T. Be.; C. El.)

KHIVA, capital of the khanate of Khiva, in Western Asia, 25 m. W. of the Amu-darya and 240 m. W.N.W. of Bokhara. Pop. about 10,000. It is surrounded by a low earthen wall, and has a citadel, the residence of the khan and the higher officials. There are a score of mosques, of which the one containing the tomb of Polvan, the patron saint of Khiva, is the best, and four large *madrasas* (Mahommedan colleges). Large gardens exist in the western part of the town. A small Russian quarter has grown up. The inhabitants make carpets, silks and cottons.

KHNOPFF, FERNAND EDMOND JEAN MARIE (1858–), Belgian painter and etcher, was born at the château de Grembergen (Termonde), on the 12th of September 1858, and studied under X. Mellery. He developed a very original talent, his work being characterized by great delicacy of colour, tone and harmony, as subtle in spiritual and intellectual as in its material qualities. "A Crisis" (1881) was followed by "Listening to Schumann," "St Anthony" and "The Queen of Sheba" (1883), and then came one of his best known works, "The Small Sphinx" (1884). His "Memories" (1889) and "White, Black and Gold" (1901) are in the Brussels Museum; "Portrait of Mlle R." (1889) in the Venice Museum; "A Stream at Fosset" (1897) at Budapest Museum; "The Empress" (1899) in the collection of the emperor of Austria, and "A Musician" in that of the king of the Belgians. "I lock my Door upon Myself" (1891), which was exhibited at the New Gallery, London, in 1902 and there attracted much attention, was acquired by the Pinakothek at Munich. Other works are "Silence" (1890), "The Idea of Justice" (1905) and "Isolde" (1906), together with a polychrome bust "Sibyl" (1894) and an ivory mask (1897). In quiet intensity of feeling Khnopff was influenced by Rossetti, and in simplicity of line by Burne-Jones, but the poetry and the delicately mystic and enigmatic note of his work are entirely individual. He did good work also as an etcher and dry-pointist.

See L. Dumont-Wilden, *Fernand Khnopff* (Brussels, 1907).

KHOI, a district and town in the province of Azerbaijan, Persia, towards the extreme north-west frontier, between the Urmia Lake and the river Aras. The district contains many flourishing villages, and consists of an elevated plateau 60 m. by 10 to 15, highly cultivated by a skilful system of drainage and irrigation, producing fertile meadows, gardens and fields yielding rich crops of wheat and barley, cotton, rice and many kinds of fruit. In the northern part and bounding on Maku lies the plain of Chaldaran (Kalderan), where in August 1514 the Turks under Sultan Selim I. fought the Persians under Shah Ismail and gained a great victory.

The town of Khoi lies in 38° 37′ N., 45° 15′ E., 77 m. (90 by road) N.W. of Tabriz, at an elevation of 3300 ft., on the great trade route between Trebizond and Tabriz, and about 2 m. from the left bank of the Kotur Chai (river from Kotur) which is crossed there by a seven-arched bridge and is known lower down as the Kizil Chai, which flows into the Aras. The walled part of the town is a quadrilateral with faces of about 1200 yds. in length and fortifications consisting of two lines of bastions, ditches, &c., much out of repair. The population numbers about 35,000, a third living inside the walls. The Armenian quarter, with about 500 families and an old church, is outside the walls. The city within the walls forms one of the best laid out towns in

Persia, cool streams and lines of willows running along the broad and regular streets. There are some good buildings, including the governor's residence, several mosques, a large brick bazaar and a fine caravanserai. There is a large transit trade, and considerable local traffic across the Turkish border. The city surrendered to the Russians in 1827 without fighting and after the treaty of peace (Turkman Chai, Feb. 1828) was held for some time by a garrison of 3000 Russian troops as a guarantee for the payment of the war indemnity. In September 1881 Khoi suffered much from a violent earthquake. It has post and telegraph offices.

KHOJENT, or Khojend, a town of the province of Syr-darya, in Russian Turkestan, on the left bank of the Syr-darya or Jaxartes, 144 m. by rail S.S.E. from Tashkent, in 40° 17′ N. and 69° 30′ E., and on the direct road from Bokhara to Khokand. Pop. (1900), 31,881. The Russian quarter lies between the river and the native town. Near the river is the old citadel, on the top of an artificial square mound, about 100 ft. high. The banks of the river are so high as to make its water useless to the town in the absence of pumping gear. Formerly the entire commerce between the khanates of Bokhara and Khokand passed through this town, but since the Russian occupation (1866) much of it has been diverted. Silkworms are reared, and silk and cotton goods are manufactured. A coarse ware is made in imitation of Chinese porcelain. The district immediately around the town is taken up with cotton plantations, fruit gardens and vineyards. The majority of the inhabitants are Tajiks.

Khojent has always been a bone of contention between Khokand and Bokhara. When the amir of Bokhara assisted Khudayar Khan to regain his throne in 1864, he kept possession of Khojent. In 1866 the town was stormed by the Russians; and during their war with Khokand in 1875 it played an important part.

KHOKAND, or Kokan, a town of Asiatic Russia, in the province of Ferghana, on the railway from Samarkand to Andijan, 85 m. by rail S.W. of the latter, and 20 m. S. of the Syr-darya. Pop. (1900), 86,704. Situated at an altitude of 1375 ft., it has a severe climate, the average temperatures being—year, 56°; January, 22°; July, 65°. Yearly rainfall, 3·6 in. It is the centre of a fertile irrigated oasis, and consists of a citadel, enclosed by a wall nearly 12 m. in circuit, and of suburbs containing luxuriant gardens. The town is modernized, has broad streets and large squares, and a particularly handsome bazaar. The former palace of the khans, which recalls by its architecture the mosques of Samarkand, is the best building in the town. Khokand is one of the most important centres of trade in Turkestan. Raw cotton and silk are the principal exports, while manufactured goods are imported from Russia. Coins bearing the inscription "Khokand the Charming," and known as *khokands*, have or had a wide currency.

The khanate of Khokand was a powerful state which grew up in the 18th century. Its early history is not well known, but the town was founded in 1732 by Abd-ur-Rahim under the name of Iski-kurgan, or Kali-i-Rahimbai. This must relate, however, to the fort only, because Arab travellers of the 10th century mention Hovakend or Hokand, the position of which has been identified with that of Khokand. Many other populous and wealthy towns existed in this region at the time of the Arab conquest of Ferghana. In 1758–1759 the Chinese conquered Dzungaria and East Turkestan, and the begs or rulers of Ferghana recognized Chinese suzerainty. In 1807 or 1808 Alim, son of Narbuta, brought all the begs of Ferghana under his authority, and conquered Tashkent and Chimkent. His attacks on the Bokharan fortress of Ura-tyube were however unsuccessful, and the country rose against him. He was killed in 1817 by the adherents of his brother Omar. Omar was a poet and patron of learning, but continued to enlarge his kingdom, taking the sacred town of Azret (Turkestan), and to protect Ferghana from the raids of the nomad Kirghiz built fortresses on the Syr-darya, which became a basis for raids of the Khokand people into Kirghiz land. This was the origin of a conflict with Russia. Several petty wars were undertaken by the Russians after 1847 to destroy the Khokand forts, and to secure possession, first, of the Ili (and so of Dzungaria), and next of the Syr-darya region, the result being that in 1866, after the occupation of Ura-tyube and Jizakh, the khanate of Khokand was separated from Bokhara. During the forty-five years after the death of Omar (he died in 1822) the khanate of Khokand was the seat of continuous wars between the settled Sarts and the nomad Kipchaks, the two parties securing the upper hand in turns, Khokand falling under the dominion or the suzerainty of Bokhara, which supported Khudayar-khan, the representative of the Kipchak party, in 1858–1866; while Alim-kul, the representative of the Sarts, put himself at the head of the *gazawat* (Holy War) proclaimed in 1860, and fought bravely against the Russians until killed at Tashkent in 1865. In 1868 Khudayar-khan, having secured independence from Bokhara, concluded a commercial treaty with the Russians, but was compelled to flee in 1875, when a new Holy War against Russia was proclaimed. It ended in the capture of the strong fort of Makhram, the occupation of Khokand and Marghelan (1875), and the recognition of Russian superiority by the amir of Bokhara, who conceded to Russia all the territory north of the Naryn river. War, however, was renewed in the following year. It ended, in February 1876, by the capture of Andijan and Khokand and the annexation of the Khokand khanate to Russia. Out of it was made the Russian province of Ferghana.

Authorities.—The following publications are all in Russian: Kuhn, *Sketch of the Khanate of Khokand* (1876); V. Nalivkin, *Short History of Khokand* (French trans., Paris, 1889); Niazi Mohammed, *Tarihi Shahrohi*, or *History of the Rulers of Ferghana*, edited by Pantusov (Kazañ, 1885); Maksheev, *Historical Sketch of Turkestan and the Advance of the Russians* (St Petersburg, 1890); N. Petrovskiy, *Old Arabian Journals of Travel* (Tashkent, 1894); *Russian Encyclopaedic Dictionary*, vol. xv. (1895). (P. A. K.; J. T. Be.)

KHOLM (Polish *Chelm*), a town of Russian Poland, in the government of Lublin, 45 m. by rail E.S.E. of the town of Lublin. Pop. (1897), 19,236. It is a very old city and the see of a bishop, and has an archaeological museum for church antiquities.

KHONDS, or Kandhs, an aboriginal tribe of India, inhabiting the tributary states of Orissa and the Ganjam district of Madras. At the census of 1901 they numbered 701,198. Their main divisions are into Kutia or hill Khonds and plain-dwelling Khonds; the landowners are known as Raj Khonds. Their religion is animistic, and their pantheon includes eighty-four gods. They have given their name to the Khondmals, a subdivision of Angul district in Orissa: area, 800 sq. m.; pop. (1901), 64,214. The Khond language, Kui, spoken in 1901 by more than half a million persons, is much more closely related to Telugu than is Gondi. The Khonds are a finer type than the Gonds. They are as tall as the average Hindu and not much darker, while in features they are very Aryan. They are undoubtedly a mixed Dravidian race, with much Aryan blood.

The Khonds became notorious, on the British occupation of their district about 1835, from the prevalence and cruelty of the human sacrifices they practised. These "Meriah" sacrifices, as they were called, were intended to further the fertilization of the earth. It was incumbent on the Khonds to purchase their victims. Unless bought with a price they were not deemed acceptable. They seldom sacrificed Khonds, though in hard times Khonds were obliged to sell their children and they could then be purchased as Meriahs. Persons of any race, age or sex, were acceptable if purchased. Numbers were bought and kept and well treated; and Meriah women were encouraged to become mothers. Ten or twelve days before the sacrifice the victim's hair was cut off, and the villagers having bathed, went with the priest to the sacred grove to forewarn the goddess. The festival lasted three days, and the wildest orgies were indulged in.

See Major Macpherson, *Religious Doctrines of the Khonds*; his account of their religion in *Jour. R. Asiatic Soc.* xiii. 220–221 and his *Report upon the Khonds of Ganjam and Cuttack* (Calcutta, 1842); also *District Gazetteer of Angul* (Calcutta, 1908).

KHORASAN, or Khorassan (*i.e.* "land of the sun"), a geographical term originally applied to the eastern of the four quarters (named from the cardinal points) into which the ancient monarchy of the Sassanians was divided. After the Arab conquest the name was retained both as the designation of a definite province and in a looser sense. Under the new Persian empire the expression has gradually become restricted to the north-eastern portion of Persia which forms one of the five great provinces of that country. The province is conterminous E. with Afghanistan, N. with Russian Transcaspian territory, W. with Astarabad and Shahrud-Bostam, and S. with Kerman and Yezd. It lies mainly within 29° 45′–38° 15′ N. and 56°–61° E., extending about 320 m. east and west and 570 m. north and south, with a total area of about 150,000 sq. m. The surface is mountainous. The ranges generally run in parallel ridges, inclosing extensive valleys, with a normal direction from N.W. to S.E. The whole of the north is occupied by an extensive highland system composed of a part of the Elburz and its continuation extending to the Paropamisus. This system, sometimes spoken of collectively as the Kuren Dagh, or Kopet Dagh from its chief sections, forms in the east three ranges, the Hazar Masjed, Binalud Kuh and Jagatai, enclosing the Meshed-Kuchan valley and the Jovain plain. The former is watered by the Kashaf-rud (Tortoise River), or river of Meshed, flowing east to the Hari-rud, their junction forming the Tejen, which sweeps round the Daman-i-Kuh, or northern skirt of the outer range, towards the Caspian but loses itself in the desert long before reaching it. The Jovain plain is watered by the Kali-i-mura, an unimportant river which flows south to the Great Kavir or central depression. In the west the northern highlands develop two branches: (1) the Kuren Dagh, stretching through the Great and Little Balkans to the Caspian at Krasnovodsk Bay, (2) the Ala Dagh, forming a continuation of the Binalud Kuh and joining the mountains between Bujnurd and Astarabad, which form part of the Elburz system. The Kuren Dagh and Ala Dagh enclose the valley of the Atrek River, which flows west and south-west into the Caspian at Hassan Kuli Bay. The western offshoots of the Ala Dagh in the north and the mountains of Astarabad in the south enclose the valley of the Gurgan River, which also flows westwards and parallel to the Atrek to the south-eastern corner of the Caspian. The outer range has probably a mean altitude of 8000 ft., the highest known summits being the Hazar Masjed (10,500) and the Kara Dagh (9800). The central range seems to be higher, culminating with the Shah-Jehan Kuh (11,000) and the Ala Dagh (11,500). The southern ridges, although generally much lower, have the highest point of the whole system in the Shah Kuh (13,000) between Shahrud and Astarabad. South of this northern highland several parallel ridges run diagonally across the province in a N.W.–S.E. direction as far as Seistan.

Beyond the Atrek and other rivers watering the northern valleys a few brackish and intermittent rivers lose themselves in the Great Kavir, which occupies the central and western parts of the province. The true character of the kavir, which forms the distinctive feature of east Persia, has scarcely been determined, some regarding it as the bed of a dried-up sea, others as developed by the saline streams draining to it from the surrounding highlands. Collecting in the central depressions, which have a mean elevation of scarcely more than 500 ft. above the Caspian, the water of these streams is supposed to form saline deposits with a thin hard crust, beneath which the moisture is retained for a considerable time, thus producing those dangerous and slimy quagmires which in winter are covered with brine, in summer with a treacherous incrustation of salt. Dr Sven Hedin explored the central depressions in 1906.

The surface of Khorasan thus consists mainly of highlands, saline, swampy deserts and upland valleys, some fertile and well-watered. Of the last, occurring mainly in the north, the chief are the longitudinal valley stretching from near the Herat frontier through Meshed, Kuchan and Shirvan to Bujnurd, the Derrehgez district, which lies on the northern skirt of the outer range projecting into the Akhal Tekkeh domain, now Russian territory, and the districts of Nishapur and Sabzevar which lie south of the Binalud and Jagatai ranges. These fertile tracts produce rice and other cereals, cotton, tobacco, opium and fruits in profusion. Other products are manna, suffron, asafoetida and other gums. The chief manufactures are swords, stoneware, carpets and rugs, woollens, cottons, silks and sheepskin pelisses (*pustin*, Afghan *poshtin*).

The administrative divisions of the province are: 1, Nishapur; 2, Sabzevar; 3, Jovain; 4, Asfarain; 5, Bujnurd; 6, Kuchan; 7, Derrehgez; 8, Kelat; 9, Chinaran; 10, Meshed; 11, Jam; 12, Bakharz; 13, Radkan; 14, Serrakhs; 15, Sar-i-jam; 16, Bam and Safiabad; 17, Turbet i Haidari; 18, Turshiz; 19, Khaf; 20, Tun and Tabbas; 21, Kain; 22, Seistan.

The population consists of Iranians (Tajiks, Kurds, Baluchis), Mongols, Tatars and Arabs, and is estimated at about a million. The Persians proper have always represented the settled, industrial and trading elements, and to them the Kurds and the Arabs have become largely assimilated. Even many of the original Tatar, Mongol and other nomad tribes (*ilat*), instead of leading their former roving and unsettled life of the *sahara-nishin* (dwellers in the desert), are settled and peaceful *shahr-nishin* (dwellers in towns). In religion all except some Tatars and Mongols and the Baluchis have conformed to the national Shiah faith. The revenues (cash and kind) of the province amount to about £180,000 a year, but very little of this amount reaches the Teheran treasury. The value of the exports and imports from and into the whole province is a little under a million sterling a year. The province produces about 10,000 tons of wool and a third of this quantity, or rather more, valued at £70,000 to £80,000, is exported via Russia to the markets of western Europe, notably to Marseilles, Russia keeping only a small part. Other important articles of export, all to Russia, are cotton, carpets, shawls and turquoises, the last from the mines near Nishapur. (A. H.-S.)

KHORREMABAD, a town of Persia, capital of the province of Luristan, in 33° 32′ N., 48° 15′ E., and at an elevation of 4250 ft. Pop. about 6000. It is situated 138 m. W.N.W. of Isfahan and 117 m. S.E. of Kermanshah, on the right bank of the broad but shallow Khorremabad river, also called Ab-i-istaneh, and, lower down, Kashgan Rud. On an isolated rock between the town and the river stands a ruined castle, the Diz-i-siyah (black castle), the residence of the governor of the district (then called Samha) in the middle ages, and, with some modern additions, one of them consisting of rooms on the summit, called Felek ul aflak (heaven of heavens), the residence of the governors of Luristan in the beginning of the 19th century. At the foot of the castle stands the modern residence of the governor, built *c.* 1830, with several spacious courts and gardens. On the left bank of the river opposite the town are the ruins of the old city of Samha. There are a minaret 60 ft. high, parts of a mosque, an aqueduct, a number of walls of other buildings and a four-sided monolith, measuring 9½ ft. in height, by 3 ft. long and 2½ broad, with an inscription partly illegible, commemorating Mahmud, a grandson of the Seljuk king Malik Shah, and dated A.H. 517, or 519 (A.D. 1148–1150). There also remain ten arches of a bridge which led over the river from Samha on to the road to Shapurkhast, a city situated some distance west.

KHORSABAD, a Turkish village in the vilayet of Mosul, 12½ m. N.E. of that town, and almost 20 m. N. of ancient Nineveh, on the left bank of the little river Kosar. Here, in 1843, P. E. Botta, then French consul at Mosul, discovered the remains of an Assyrian palace and town, at which excavations were conducted by him and Flandin in 1843–1844, and again by Victor Place in 1851–1855. The ruins proved to be those of the town of Dur-Sharrukin, "Sargon's Castle," built by Sargon, king of Assyria, as a royal residence. The town, in the shape of a rectangular parallelogram, with the corners pointing approximately toward the cardinal points of the compass, covered 741 acres of ground. On the north-west side, half within and half without the circuit of the walls, protruding into the plain like a great bastion, stood the royal palace, on a terrace, 45 ft. in height, covering about 25 acres. The palace proper was divided into three sections, built around three sides of a large court on the south-east or city side, into which opened the great outer gates, guarded by winged stone bulls, each section containing suites of rooms built around several smaller inner courts. In the centre was the *serai*, occupied by the king and his retinue, with an extension towards the north, opening on a large inner court, containing the public reception rooms, elaborately decorated with sculptures and historical inscriptions, representing scenes of hunting, worship, feasts, battles, and the like. The harem, with separate provisions for four wives, occupied the south corner, the domestic quarters, including stables, kitchen, bakery, wine cellar, &c., being at the east corner, to the north-east of the great entrance court. In the west corner stood a temple, with a stage-tower (*ziggurat*) adjoining. The walls of the rooms, which stood only to the height of one storey, were from 9 to 25 ft. in thickness, of clay, faced with brick, in the reception rooms wainscoted with stone slabs or tiles, elsewhere plastered, or, in the harem, adorned with fresco paintings and arabesques. Here and there the floors were formed of tiles or alabaster blocks, but in general they were of stamped clay, on which were spread at the time of occupancy mats and rugs. The exterior of the palace wall exhibited a system of groups of half columns and stepped recesses, an ornament familiar in Babylonian architecture. The palace and city were completed in 707 B.C., and in 706 Sargon took up his residence there. He died the following year, and palace and city seem to have been abandoned shortly thereafter. Up to 1909 this was the only Assyrian palace which had ever been explored systematically, in its entirety, and fortunately it was found on the whole in an admirable state of preservation. An immense number of statues and bas-reliefs, excavated by Botta, were transported to Paris, and formed the first Assyrian museum opened to the world. The objects excavated by Place, together with the objects found by Fresnel's expedition in Babylonia and a part of the results of Rawlinson's excavations at Nineveh, were unfortunately lost in the Tigris, on transport from Bagdad to Basra. Flandin had, however, made careful drawings and copies of all objects of importance from Khorsabad. The whole material was published by the French government in two monumental publications.

See P. E. Botta and E. Flandin, *Monument de Ninive* (Paris, 1849-1850; 5 vols. 400 plates); Victor Place, *Ninive et l'Assyrie, avec des essais de restauration par F. Thomas* (Paris, 1866–1869; 3 vols.). (J. P. PE.)

KHOTAN (locally ILCHI), a town and oasis of East Turkestan, on the Khotan-darya, between the N. foot of the Kuenlun and the edge of the Takla-makan desert, nearly 200 m. by caravan road S.E. from Yarkand. Pop., about 5000. The town consists of a labyrinth of narrow, winding, dirty streets, with poor, square, flat-roofed houses, half a dozen *madrasas* (Mahommedan colleges), a score of mosques, and some *masars* (tombs of Mahommedan saints). Dotted about the town are open squares, with tanks or ponds overhung by trees. For centuries Khotan was famous for jade or nephrite, a semi-precious stone greatly esteemed by the Chinese for making small fancy boxes, bottles and cups, mouthpieces for pipes, bracelets, &c. The stone is still exported to China. Other local products are carpets (silk and felt), silk goods, hides, grapes, rice and other cereals, fruits, tobacco, opium and cotton. There is an active trade in these goods and in wool with India, West Turkestan and China. The oasis contains two small towns, Kara-kash and Yurun-kash, and over 300 villages, its total population being about 150,000.

Khotan, known in Sanskrit as Kustana and in Chinese as Yu-than, Yu-tien, Kiu-sa-tan-na, and Khio-tan, is mentioned in Chinese chronicles in the 2nd century B.C. In A.D. 73 it was conquered by the Chinese, and ever since has been generally dependent upon the Chinese empire. During the early centuries of the Christian era, and long before that, it was an important and flourishing place, the capital of a kingdom to which the Chinese sent embassies, and famous for its glass-wares, copper tankards and textiles. About the year A.D. 400 it was a city of some magnificence, and the seat of a flourishing cult of Buddha, with temples rich in paintings and ornaments of the precious metals; but from the 5th century it seems to have declined. In the 8th century it was conquered, after a struggle of 25 years, by the Arab chieftain Kotaiba ibn Moslim, from West Turkestan, who imposed Islam upon the people. In 1220 Khotan was destroyed by the Mongols under Jenghiz Khan. Marco Polo, who passed through the town in 1274, says that "Everything is to be had there [at Cotan, *i.e.* Khotan] in plenty, including abundance of cotton, with flax, hemp, wheat, wine, and the like. The people have vineyards and gardens and estates. They live by commerce and manufactures, and are no soldiers."[1] The place suffered severely during the Dungan revolt against China in 1864–1875, and again a few years later when Yakub Beg of Kashgar made himself master of East Turkestan.

The KHOTAN-DARYA rises in the Kuen-lun Mountains in two headstreams, the Kara-kash and the Yurun-kash, which unite towards the middle of the desert, some 90 m. N. of the town of Khotan. The conjoint stream then flows 180 m. northwards across the desert of Takla-makan, though it carries water only in the early summer, and empties itself into the Tarim a few miles below the confluence of the Ak-su with the Yarkand-darya (Tarim). In crossing the desert it falls 1250 ft. in a distance of 270 m. Its total length is about 300 m. and the area it drains probably nearly 40,000 sq. m.

See J. P. A. Rémusat, *Histoire de la ville de Khotan* (Paris, 1820); and Sven Hedin, *Through Asia* (Eng. trans., London, 1898), chs. lx. and lxii., and *Scientific Results of a Journey in Central Asia*, 1899-1902, vol. ii. (Stockholm, 1906). (J. T. BE.)

KHOTIN, or KHOTEEN (variously written Khochim, Choczim, and Chocim), a fortified town of South Russia, in the government of Bessarabia, in 48° 30′ N. and 26° 30′ E., on the right bank of the Dniester, near the Austrian (Galician) frontier, and opposite Podolian Kamenets. Pop. (1897), 18,126. It possesses a few manufactures (leather, candles, beer, shoes, bricks), and carries on a considerable trade, but has always been of importance mainly as a military post, defending one of the most frequented passages of the Dniester. In the middle ages it was the seat of a Genoese colony; and it has been in Polish, Turkish and Austrian possession. The chief events in its annals are the defeat of the Turks in 1621 by Ladislaus IV., of Poland, in 1673 by John Sobieski, of Poland, and in 1739 by the Russians under Münnich; the defeat of the Russians by the Turks in 1768; the capture by the Russians in 1769, and by the Austrians in 1788; and the occupation by the Russians in 1806. It finally passed to Russia with Bessarabia in 1812 by the peace of Bucharest.

KHULNA, a town and district of British India, in the Presidency division of Bengal. The town stands on the river Bhairab, and is the terminus of the Bengal Central railway, 109 m. E. of Calcutta. Pop. (1901), 10,426. It is the most important centre of river-borne trade in the delta.

The DISTRICT OF KHULNA lies in the middle of the delta of the Ganges, including a portion of the Sundarbans or seaward fringe of swamps. It was formed out of Jessore in 1882. Area (excluding the Sundarbans), 2077 sq. m. Besides the Sundarbans, the north-east part of the district is swampy; the north-west is more elevated and drier, while the central part, though low-lying, is cultivated. The whole is alluvial. In 1901 the population was 1,253,043, showing an increase of 6% in the decade. Rice is the principal crop; mustard, jute and tobacco are also grown, and the fisheries are important. Sugar is manufactured from the date palm. The district is entered by the Bengal Central railway, but by far the greater part of the traffic is carried by water.

See *District Gazetteer* (Calcutta, 1908).

KHUNSAR, a town of Persia, sometimes belonging to the province of Isfahan, at others to Irak, 96 m. N.W. of Isfahan, in 33° 9′ N., 50° 23′ E., at an elevation of 7600 ft. Pop., about 10,000. It is picturesquely situated on both sides of a narrow valley through which the Khunsar River, a stream about 12 ft. wide, flows in a north-east direction to Kuom. The town and its fine gardens and orchards straggle some 6 m. along the valley with a mean breadth of scarcely half a mile. There is a great profusion of fruit, the apples yielding a kind of cider which, however, does not keep longer than a month. The climate is cool in summer and cold in winter. There are five caravanserais, three mosques and a post office.

KHURJA, a town of British India, in the Bulandshahr district of the United Provinces, 27 m. N.W. of Aligarh, near the main line of the East Indian railway. Pop. (1901), 29,277. It is an important centre of trade in grain, indigo, sugar and *ghi*, and has cotton gins and presses and a manufacture of pottery. Jain traders form a large and wealthy class; and the principal building in the town is a modern Jain temple, a fine domed structure richly carved and ornamented in gold and colours.

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[1] Sir H. Yule, *The Book of Ser Marco Polo*, bk. i. ch. xxxvi. (3rd ed., London, 1903).

KHYBER PASS, the most important of the passes which lead from Afghanistan into India. It is a narrow defile winding between cliffs of shale and limestone 600 to 1000 ft. high, stretching up to more lofty mountains behind. No other pass in the world has possessed such strategic importance or retains so many historic associations as this gateway to the plains of India. It has probably seen Persian and Greek, Seljuk, Tatar, Mongol and Durani conquerors, with the hosts of Alexander the Great, Mahmud of Ghazni, Jenghiz Khan, Timur, Baber, Nadir Shah, Ahmed Shah, and numerous other warrior chiefs pass and repass through its rocky defiles during a period of 2000 years. The mountain barrier which separates the Peshawar plains from the Afghan highlands differs in many respects from the mountain barrier which intervenes between the Indus plains and the plateau farther south. To the south this barrier consists of a series of flexures folded parallel to the river, through which the plateau drainage breaks down in transverse lines forming gorges and clefts as it cuts through successive ridges. West of Peshawar the strike of the mountain systems is roughly from west to east, and this formation is maintained with more or less regularity as far south as the Tochi River and Waziristan. Almost immediately west of Peshawar, and stretching along the same parallel of latitude from the meridian of Kabul to within ten miles of the Peshawar cantonment, is the great central range of the Safed Koh, which forms throughout its long, straight line of rugged peaks the southern wall, or water-divide, of the Kabul River basin. About the meridian of 71 E. it forks, sending off to the north-east what is locally known as a spur to the Kabul River, but which is geographically only part of that stupendous water-divide which hedges in the Kunar and Chitral valleys, and, under the name of the Shandur Range, unites with the Hindu Kush near the head of the Taghdumbash Pamir. The Kabul River breaks through this northern spur of the Safed Koh; and in breaking through it is forced to the northward in a curved channel or trough, deeply sunk in the mountains between terrific cliffs and precipices, where its narrow waterway affords no foothold to man or beast for many miles. To reach the Kabul River within Afghan territory it is necessary to pass over this water-divide; and the Khyber stream, flowing down from the pass at Landi Kotal to a point in the plains opposite Jamrud, 9 m. W. of Peshawar, affords the opportunity.

Pursuing the main road from Peshawar to Kabul, the fort of Jamrud, which commands the British end of the Khyber Pass, lies some 11 m. W. of Peshawar. The road leads through a barren stony plain, cut up by water-courses and infested by all the worst cut-throats in the Peshawar district. Some three miles beyond Jamrud the road enters the mountains at an opening called Shadi Bagiar, and here the Khyber proper begins. The highway runs for a short distance through the bed of a ravine, and then joins the road made by Colonel Mackeson in 1839–1842, until it ascends on the left-hand side to a plateau called Shagai. From here can be seen the fort of Ali Masjid, which commands the centre of the pass, and which has been the scene of more than one famous siege. Still going westward the road turns to the right, and by an easy zigzag descends to the river of Ali Masjid, and runs along its bank. The new road along this cliff was made by the British during the Second Afghan War (1879–80), and here is the narrowest part of the Khyber, not more than 15 ft. broad, with the Rhotas hill on the right fully 2000 ft. overhead. Some three miles farther on the valley widens, and on either side lie the hamlets and some sixty towers of the Zakka Khel Afridis. Then comes the Loargi Shinwari plateau, some seven miles in length and three in its widest part, ending at Landi Kotal, where is another British fort, which closes this end of the Khyber and overlooks the plains of Afghanistan. After leaving Landi Kotal the great Kabul highway passes between low hills, until it debouches on the Kabul River and leads to Dakka. The whole of the Khyber Pass from end to end lies within the country of the Afridis, and is now recognized as under British control. From Shadi Bagiar on the east to Landi Kotal on the west is about 20 m. in a straight line.

The Khyber has been adopted by the British as the main road to Kabul, but its difficulties (before they were overcome by British engineers) were such that it was never so regarded by former rulers of India. The old road to India left the Kabul River near its junction with the Kunar, and crossed the great divide between the Kunar valley and Bajour; then it turned southwards to the plains. During the first Afghan War the Khyber was the scene of many skirmishes with the Afridis and some disasters to the British troops. In July 1839 Colonel Wade captured the fortress of Ali Masjid. In 1842, when Jalalabad was blockaded, Colonel Moseley was sent to occupy the same fort, but was compelled to evacuate it after a few days owing to scarcity of provisions. In April of the same year it was reoccupied by General Pollock in his advance to Kabul. It was at Ali Masjid that Sir Neville Chamberlain's friendly mission to the amir Shere Ali was stopped in 1878, thus causing the second Afghan War; and on the outbreak of that war Ali Masjid was captured by Sir Samuel Browne. The treaty which closed the war in May 1879 left the Khyber tribes under British control. From that time the pass was protected by jezailchis drawn from the Afridi tribe, who were paid a subsidy by the British government. For 18 years, from 1879 onward, Colonel R. Warburton controlled the Khyber, and for the greater part of that time secured its safety; but his term of office came to an end synchronously with the wave of fanaticism which swept along the north-west border of India during 1897. The Afridis were persuaded by their mullahs to attack the pass, which they themselves had guaranteed. The British government were warned of the intended movement, but only withdrew the British officers belonging to the Khyber Rifles, and left the pass to its fate. The Khyber Rifles, deserted by their officers, made a half-hearted resistance to their fellow-tribesmen, and the pass fell into the hands of the Afridis, and remained in their possession for some months. This was the chief cause of the Tirah Expedition of 1897. The Khyber Rifles were afterwards strengthened, and divided into two battalions commanded by four British officers.

See *Eighteen Years in the Khyber*, by Sir Robert Warburton (1900); *Indian Borderland*, by Sir T. Holdich (1901). (T. H. H.*)

KIAKHTA, a town of Siberia, one of the chief centres of trade between Russia and China, on the Kiakhta, an affluent of the Selenga, and on an elevated plain surrounded by mountains, in the Russian government of Transbaikalia, 320 m. S.W. of Chita, the capital, and close to the Chinese frontier, in 50° 20′ N., 106° 40′ E. Besides the lower town or Kiakhta proper, the municipal jurisdiction comprises the fortified upper town of Troitskosavsk, about 2 m. N., and the settlement of Ust-Kiakhta, 10 m. farther distant. The lower town stands directly opposite to the Chinese emporium of Maimachin, is surrounded by walls, and consists principally of one broad street and a large exchange courtyard. From 1689 to 1727 the trade of Kiakhta was a government monopoly, but in the latter year it was thrown open to private merchants, and continued to improve until 1860, when the right of commercial intercourse was extended along the whole Russian-Chinese frontier. The annual December fairs for which Kiakhta was formerly famous, and also the regular traffic passing through the town, have considerably fallen off since that date. The Russians exchange here leather, sheepskins, furs, horns, woollen cloths, coarse linens and cattle for teas (in value 95% of the entire imports), porcelain, rhubarb, manufactured silks, nankeens and other Chinese produce. The population, including Ust-Kiakhta (5000) and Troitskosavsk (9213 in 1897), is nearly 20,000.

KIANG-SI, an eastern province of China, bounded N. by Hu-peh and Ngan-hui, S. by Kwang-tung, E. by Fu-kien, and

W. by Hu-nan. It has an area of 72,176 sq. m., and a population returned at 22,000,000. It is divided into fourteen prefectures. The provincial capital is Nan-ch'ang Fu, on the Kan Kiang, about 35 m. from the Po-yang Lake. The whole province is traversed in a south-westerly and north-easterly direction by the Nan-shan ranges. The largest river is the Kan Kiang, which rises in the mountains in the south of the province and flows north-east to the Po-yang Lake. It was over the Meiling Pass and down this river that, in old days, embassies landing at Canton proceeded to Peking. During the summer time it has water of sufficient depth for steamers of light draft as far as Nan-ch'ang, and it is navigable by native craft for a considerable distance beyond that city. Another river of note is the Chang Kiang, which has its source in the province of Ngan-hui and flows into the Po-yang Lake, connecting in its course the Wu-yuen district, whence come the celebrated "Moyune" green teas, and the city of King-te-chên, celebrated for its pottery, with Jao-chow Fu on the lake. The black "Kaisow" teas are brought from the Ho-kow district, where they are grown, down the river Kin to Juy-hung on the lake, and the Siu-ho connects by a navigable stream I-ning Chow, in the neighbourhood of which city the best black teas of this part of China are produced, with Wu-ching, the principal mart of trade on the lake. The principal products of the province are tea, China ware, grass-cloth, hemp, paper, tobacco and tallow. Kiu-kiang, the treaty port of the province, opened to foreign trade in 1861, is on the Yangtsze-kiang, a short distance above the junction of the Po-yang Lake with that river.

KIANG-SU, a maritime province of China, bounded N. by Shan-tung, S. by Cheh-kiang, W. by Ngan-hui, and E. by the sea. It has an area of 45,000 sq. m., and a population estimated at 21,000,000. Kiang-su forms part of the great plain of northern China. There are no mountains within its limits, and few hills. It is watered as no other province in China is watered. The Grand Canal runs through it from south to north; the Yangtsze-kiang crosses its southern portion from west to east; it possesses several lakes, of which the T'ai-hu is the most noteworthy, and numberless streams connect the canal with the sea. Its coast is studded with low islands and sandbanks, the results of the deposits brought down by the Hwang-ho. Kiang-su is rich in places of interest. Nanking, "the Southern Capital," was the seat of the Chinese court until the beginning of the 15th century, and it was the headquarters of the T'ai-p'ing rebels from 1853, when they took the city by assault, to 1864, when its garrison yielded to Colonel Gordon's army. Hang-chow Fu and Sú-chow Fu, situated on the T'ai-hu, are reckoned the most beautiful cities in China. "Above there is Paradise, below are Su and Hang," says a Chinese proverb. Shang-hai is the chief port in the province. In 1909 it was connected by railway (270 m. long) via Su-Chow and Chin-kiang with Nanking. Tea and silk are the principal articles of commerce produced in Kiang-su, and next in importance are cotton, sugar and medicines. The silk manufactured in the looms of Su-chow is famous all over the empire. In the mountains near Nanking, coal, plumbago, iron ore and marble are found. Shang-hai, Chin-kiang, Nanking and Su-chow are the treaty ports of the province.

KIAOCHOW BAY, a large inlet on the south side of the promontory of Shantung, in China. It was seized in November 1897 by the German fleet, nominally to secure reparation for the murder of two German missionaries in the province of Shantung. In the negotiations which followed, it was arranged that the bay and the land on both sides of the entrance within certain defined lines should be leased to Germany for 99 years. During the continuance of the lease Germany exercises all the rights of territorial sovereignty, including the right to erect fortifications. The area leased is about 117 sq. m., and over a further area, comprising a zone of some 32 m., measured from any point on the shore of the bay, the Chinese government may not issue any ordinances without the consent of Germany. The native population in the ceded area is about 60,000. The German government in 1899 declared Kiaochow a free port. By arrangement with the Chinese government a branch of the Imperial maritime customs has been established there for the collection of duties upon goods coming from or going to the interior, in accordance with the general treaty tariff. Trade centres at Ts'ingtao, a town within the bay. The country in the neighbourhood is mountainous and bare, but the lowlands are well cultivated. Ts'ingtao is connected by railway with Chinan Fu, the capital of the province; a continuation of the same line provides for a junction with the main Lu-Han (Peking-Hankow) railway. The value of the trade of the port during 1904 was £2,712,145 (£1,808,113 imports and £904,032 exports).

KICKAPOO ("he moves about"), the name of a tribe of North American Indians of Algonquian stock. When first met by the French they were in central Wisconsin. They subsequently removed to the Ohio valley. They fought on the English side in the War of Independence and that of 1812. In 1852 a large band went to Texas and Mexico and gave much trouble to the settlers; but in 1873 the bulk of the tribe was settled on its present reservation in Oklahoma. They number some 800, of whom about a third are still in Mexico.

KIDD, JOHN (1775–1851), English physician, chemist and geologist, born at Westminster on the 10th of September 1775, was the son of a naval officer, Captain John Kidd. He was educated at Bury St Edmunds and Westminster, and afterwards at Christ Church, Oxford, where he graduated B.A. in 1797 (M.D. in 1804). He also studied at Guy's Hospital, London (1797–1801), where he was a pupil of Sir Astley Cooper. He became reader in chemistry at Oxford in 1801, and in 1803 was elected the first Aldrichian professor of chemistry. He then voluntarily gave courses of lectures on mineralogy and geology: these were delivered in the dark chambers under the Ashmolean Museum, and there J. J. and W. D. Conybeare, W. Buckland, C. G. B. Daubeny and others gained their first lessons in geology. Kidd was a popular and instructive lecturer, and through his efforts the geological chair, first held by Buckland, was established. In 1818 he became a F. R. C. P.; in 1822 regius professor of medicine in succession to Sir Christopher Pegge; and in 1834 he was appointed keeper of the Radcliffe Library. He delivered the Harveian oration before the Royal College of Physicians in 1834. He died at Oxford on the 7th of September 1851.

PUBLICATIONS.—*Outlines of Mineralogy* (2 vols., 1809); *A Geological Essay on the Imperfect Evidence in Support of a Theory of the Earth* (1815); *On the Adaptation of External Nature to the Physical Condition of Man*, 1833 (Bridgewater Treatise).

KIDD, THOMAS (1770–1850), English classical scholar and schoolmaster, was born in Yorkshire. He was educated at Giggleswick School and Trinity College, Cambridge. He held numerous scholastic and clerical appointments, the last being the rectory of Croxton, near Cambridge, where he died on the 27th of August 1850. Kidd was an intimate friend of Porson and Charles Burney the younger. He contributed largely to periodicals, chiefly on classical subjects, but his reputation mainly rests upon his editions of the works of other scholars: *Opuscula Ruhnkeniana* (1807), the minor works of the great Dutch scholar David Ruhnken; *Miscellanea Critica* of Richard Dawes (2nd ed., 1827); *Tracts and Miscellaneous Criticisms* of Richard Porson (1815). He also published an edition of the works of Horace (1817) based upon Bentley's recension.

KIDD, WILLIAM [CAPTAIN KIDD] (*c.* 1645–1701), privateer and pirate, was born, perhaps, in Greenock, Scotland, but his origin is quite obscure. He told Paul Lorraine, the ordinary of Newgate, that he was "about 56" at the time of his condemnation for piracy in 1701. In 1691 an award from the council of New York of £150 was given him for his services during the disturbances in the colony after the revolution of 1688. He was commissioned later to chase a hostile privateer off the coast, is described as an owner of ships, and is known to have served with credit against the French in the West Indies. In 1695 he came to London with a sloop of his own to trade. Colonel R. Livingston (1654–1724), a well-known New York landowner, recommended him to the newly appointed colonial governor Lord Bellomont, as a fit man to command a vessel to cruise against the pirates in the Eastern seas (see PIRATE).

Accordingly the "Adventure Galley," a vessel of 30 guns and 275 tons, was privately fitted out, and the command given to Captain Kidd, who received the king's commission to arrest and bring to trial all pirates, and a commission of reprisals against the French. Kidd sailed from Plymouth in May 1696 for New York, where he filled up his crew, and in 1697 reached Madagascar, the pirates' principal rendezvous. He made no effort whatever to hunt them down. On the contrary he associated himself with a notorious pirate named Culliford. The fact would seem to be that Kidd meant only to capture French ships. When he found none he captured native trading vessels, under pretence that they were provided with French passes and were fair prize, and he plundered on the coast of Malabar. During 1698–1699 complaints reached the British government as to the character of his proceedings. Lord Bellomont was instructed to apprehend him if he should return to America. Kidd deserted the "Adventure" in Madagascar, and sailed for America in one of his prizes, the "Quedah Merchant," which he also left in the West Indies. He reached New England in a small sloop with several of his crew and wrote to Bellomont, professing his ability to justify himself and sending the governor booty. He was arrested in July 1699, was sent to England and tried, first for the murder of one of his crew, and then with others for piracy. He was found guilty on both charges, and hanged at Execution Dock, London, on the 23rd of May 1701. The evidence against him was that of two members of his crew, the surgeon and a sailor who turned king's evidence, but no other witnesses could be got in such circumstances, as the judge told him when he protested. "Captain Kidd's Treasure" has been sought by various expeditions and about £14,000 was recovered from Kidd's ship and from Gardiner's Island (off the E. end of Long Island); but its magnitude was palpably exaggerated. He left a wife and child at New York. The so-called ballad about him is a poor imitation of the authentic chant of Admiral Benbow.

Much has been written about Kidd, less because of the intrinsic interest of his career than because the agreement made with him by Bellomont was the subject of violent political controversy. The best popular account is in *An Historical Sketch of Robin Hood and Captain Kidd* by W. W. Campbell (New York, 1853), in which the essential documents are quoted. But see PIRATE.

KIDDERMINSTER, a market town and municipal and parliamentary borough of Worcestershire, England, 135½ m. N.W. by W. from London and 15 m. N. of Worcester by the Great Western railway, on the river Stour and the Staffordshire and Worcestershire canal. Pop. (1901), 24,692. The parish church of All Saints, well placed above the river, is a fine Early English and Decorated building, with Perpendicular additions. Of other buildings the principal are the town hall (1876), the corporation buildings, and the school of science and art and free library. There is a free grammar school founded in 1637. A public recreation ground, Brinton Park, was opened in 1887. Richard Baxter, who was elected by the townsfolk as their minister in 1641, was instrumental in saving the town from a reputation of ignorance and depravity caused by the laxity of their clergy. He is commemorated by a statue, as is Sir Rowland Hill, the introducer of penny postage, who was born here in 1795. Kidderminster is chiefly celebrated for its carpets. The permanency of colour by which they are distinguished is attributed to the properties of the water of the Stour, which is impregnated with iron and fuller's earth. Worsted spinning and dyeing are also carried on, and there are iron foundries, tinplate works, breweries, malthouses, &c. The parliamentary borough returns one member. The town is governed by a mayor, 6 aldermen and 18 councillors. Area, 1214 acres.

In 736 lands upon the river Stour, called Stour in Usmere, which have been identified with the site of Kidderminster (*Chideminstre*), were given to Earl Cyneberght by King Æthelbald to found a monastery. If this monastery was ever built, it was afterwards annexed to the church of Worcester, and the lands on the Stour formed part of the gift of Coenwulf, king of the Mercians, to Deneberht, bishop of Worcester, but were exchanged with the same king in 816 for other property. At the Domesday Survey, Kidderminster was still in the hands of the king and remained a royal manor until Henry II. granted it to Manser Biset. The poet Edmund Waller was one of the 17th century lords of the manor. The town was possibly a borough in 1187 when the men paid £4 to an aid. As a royal possession it appears to have enjoyed various privileges in the 12th century, among them the right of choosing a bailiff to collect the toll and render it to the king, and to elect six burgesses and send them to the view of frankpledge twice a year. The first charter of incorporation, granted in 1636, appointed a bailiff and 12 capital burgesses forming a common council. The town was governed under this charter until the Municipal Reform Act of 1835. Kidderminster sent two members to the parliament of 1295, but was not again represented until the privilege of sending one member was conferred by the Reform Act of 1832. The first mention of the cloth trade for which Kidderminster was formerly noted occurs in 1334, when it was enacted that no one should make woollen cloth in the borough without the bailiff's seal. At the end of the 18th century the trade was still important, but it began to decline after the invention of machinery, probably owing to the poverty of the manufacturers. The manufacture of woollen goods was however replaced by that of carpets, introduced in 1735. At first only the "Kidderminster" carpets were made, but in 1749 a Brussels loom was set up in the town and Brussels carpets were soon produced in large quantities.

See *Victoria County History: Worcestershire*; J. R. Burton, *A History of Kidderminster, with Short Accounts of some Neighbouring Parishes* (1890).

KIDNAPPING (from *kid*, a slang term for a child, and *nap* or *nab*, to steal), originally the stealing and carrying away of children and others to serve as servants or labourers in the American plantations; it was defined by Blackstone as the forcible abduction or stealing away of a man, woman or child from their own country and sending them into another. The difference between kidnapping, abduction (*q.v.*) and false imprisonment is not very great; indeed, kidnapping may be said to be a form of assault and false imprisonment, aggravated by the carrying of the person to some other place. The term is, however, more commonly applied in England to the offence of taking away children from the possession of their parents. By the Offences against the Person Act 1861, "whosoever shall unlawfully, by force or fraud, lead or take away or decoy or entice away or detain any child under the age of fourteen years with intent to deprive any parent, guardian or other person having the lawful care or charge of such child of the possession of such child, or with intent to steal any article upon or about the person of such child, to whomsoever such article may belong, and whosoever shall with any such intent receive or harbour any such child, &c.," shall be guilty of felony, and is liable to penal servitude for not more than seven years, or to imprisonment for any term not more than two years with or without hard labour. The abduction or unlawfully taking away an unmarried girl under sixteen out of the possession and against the will of her father or mother, or any other person having the lawful care or charge of her, is a misdemeanour under the same act. The term is used in much the same sense in the United States.

The kidnapping or forcible taking away of persons to serve at sea is treated under IMPRESSMENT.

KIDNEY DISEASES.[1] (For the anatomy of the kidneys, see URINARY SYSTEM.) The results of morbid processes in the kidney may be grouped under three heads: the actual lesions produced, the effects of these on the composition of the urine, and the effects of the kidney-lesion on the body at large. Affections of the kidney are congenital or acquired. When acquired they may be the result of a pathological process limited to the kidney, in which case they are spoken of as primary, or an accompaniment of disease in other parts of the body, when they may be spoken of as secondary.

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[1] The word "kidney" first appears in the early part of the 14th century in the form *kidenei*, with plural *kideneiren*, *kideneris*, *kidneers*, &c. It has been assumed that the second part of the word is "neer" or "near" (cf. Ger. *Niere*), the common dialect word for "kidney" in northern, north midland and eastern counties of England (see J. Wright, *English Dialect Dictionary*, 1903, *s.v.* Near), and that the first part represents the O.E. *cwið*, belly, womb; this the *New English Dictionary* considers improbable; there is only one doubtful instance of singular *kidnere* and the ordinary form ended in *-ei* or *ey*. Possibly this represents M.E. *ey*, plur. *eyren*, egg, the name being given from the resemblance in shape. The first part is uncertain.

Congenital Affections.—The principal congenital affections are anomalies in the number or position of the kidneys or of their ducts; atrophy; cystic disease and growths. The most common abnormality is the existence of a *single kidney*; rarely a supernumerary kidney may be present. The presence of a single kidney may be due to failure of development, or to atrophy in foetal life; it may also be dependent on the fusion of originally separate kidneys in such a way as to lead to the formation of a *horse-shoe kidney*, the two organs being connected at their lower ends. In some cases of horse-shoe kidney the organs are united merely by fibrous tissue. Occasionally the two kidneys are fused end to end, with two ureters. A third variety is that where the fusion is more complete, producing a disk-like mass with two ureters. The kidneys may be situated in *abnormal positions*; thus they may be in front of the sacro-iliac articulation, in the pelvis, or in the iliac fossa. The importance of such displacements lies in the fact that the organs may be mistaken for tumours. In some cases *atrophy* is associated with mal-development, so that only the medullary portion of the kidney is developed; in others it is associated with arterial obstruction, and sometimes it may be dependent upon obstruction of the ureter. In *congenital cystic disease* the organ is transformed into a mass of cysts, and the enlargement of the kidneys may be so great as to produce difficulties in birth. The cystic degeneration is caused by obstruction of the uriniferous tubules or by anomalies in development, with persistence of portions of the Wolffian body. In some cases cystic degeneration is accompanied by anomalies in the ureters and in the arterial supply. *Growths of the kidney* are sometimes found in infants; they are usually malignant, and may consist of a peculiar form of sarcoma, which has been spoken of as rhabdo-sarcoma, owing to the presence in the mass of involuntary muscular fibres. The existence of these tumours is dependent on anomalies of development; the tissue which forms the primitive kidney belongs to the same layer as that which gives rise to the muscular system (mesoblast). *Anomalies of the excretory ducts*: in some cases the ureter is double, in others it is greatly dilated; in others the pelvis of the kidney may be greatly dilated, with or without dilatation of the ureter.

Acquired Affections. Movable Kidney.—One or both of the kidneys in the adult may be preternaturally mobile. This condition is more common in women, and is usually the result of a severe shaking or other form of injury, or of the abdominal walls becoming lax as a sequel to abdominal distension, to emaciation or pregnancy, or to the effects of tight-lacing. The more extreme forms of movable kidney are dependent, generally, on anomalies in the arrangement of the peritoneum, so that the organ has a partial mesentery; and to this condition, where the kidney can be moved freely from one part of the abdomen to another, the term *floating kidney* is applied. But more usually the organ is loose under the peritoneum, and not efficiently supported in its fatty bed. Movable kidney produces a variety of symptoms, such as pain in the loin and back, faintness, nausea and vomiting—and the function of the organ may be seriously interfered with, owing to the ureter becoming kinked. In this way hydronephrosis, or distension of the kidney with urine, may be produced. The return of blood through the renal vein may also be hindered, and temporary vascular engorgement of the kidney, with haematuria, may be produced.

In some cases the movable kidney may be satisfactorily kept in its place by a pad and belt, but in other cases an operation has to be undertaken. This consists in exposing the kidney (generally the right) through an incision below the last rib, and fixing it in its proper position by several permanent sutures of silk or silkworm gut. The operation is neither difficult nor dangerous, and its results are excellent.

Embolism.—The arrangement of the blood-vessels of the kidney is peculiarly favourable to the production of wedge-shaped areas of necrosis, the result of a blocking by clots. Sometimes the clot is detached from the interior of the heart, the effect being an arrest of the circulation in the part of the kidney supplied by the blocked artery. In other cases, the plug is infective owing to the presence of septic micro-organisms, and this is likely to lead to the formation of small pyaemic abscesses. It is exceptional for the large branches of the renal artery to be blocked, so that the symptoms produced in the ordinary cases are only the temporary appearance of blood or albumen in the urine. Blocking of the main renal vessels as a result of disease of the walls of the vessels may lead to disorganization of the kidneys. Blocking of the veins, leading to extreme congestion of the kidney, also occurs. It is seen in cases of extreme weakness and wasting, sometimes in septic conditions, as in puerperal pyaemia, where a clot, formed first in one of the pelvic veins, may spread up the vena cava and secondarily block the renal veins. Thrombosis of the renal vein also occurs in malignant disease of the kidney and in certain forms of chronic Bright's disease.

Passive congestion of the kidneys occurs in heart-diseases and lung-diseases, where the return of venous blood is interfered with. It may also be produced by tumours pressing on the vena cava. The engorged kidneys become brownish red, enlarged and fibroid, and they secrete a scanty, high-coloured urine.

Active congestion is produced by the excretion in the urine of such materials as turpentine and cantharides and the toxins of various diseases. These irritants produce engorgement and inflammation of the kidney, much as they would that of any other structures with which they come in contact. Renal disturbance is often the result of the excretion of microbic poisons. Extreme congestion of the kidneys may be produced by exposure to cold, owing to some intimate relationship existing between the cutaneous and the renal vessels, the constriction of the one being accompanied by the dilatation of the other. Infective diseases, such as typhoid fever, pneumonia, scarlet fever, in fact, most acute specific diseases, produce during their height a temporary nephritis, not usually followed by permanent alteration in the kidney; but some acute diseases cause a nephritis which may lay the foundation of permanent renal disease. This is most common as a result of scarlet fever.

Bright's disease is the term applied to certain varieties of acute and chronic inflammation of the kidney. Three forms are usually recognized—acute, chronic and the granular or cirrhotic kidney. In the more common form of granular kidney the renal lesion is only part of a widespread affection involving the whole arterial system, and is not actually related to Bright's disease. *Chronic Bright's disease* is sometimes the sequel to acute Bright's disease, but in a great number of cases the malady is chronic from the beginning. The lesions of the kidney are probably produced by irritation of the kidney-structures owing to the excretion of toxic substances either ingested or formed in the body; it is thought by some that the malady may arise as a result of exposure to cold. The principal causes of Bright's disease are alcoholism, gout, pregnancy and the action of such poisons as lead; it may also occur as a sequel to acute diseases, such as scarlet fever. Persons following certain occupations are peculiarly liable to Bright's disease, *e.g.* engineers who work in hot shops and pass out into the cold air scantily clothed; and painters, in whom the malady is dependent on the action of lead on the kidney. In the case of alcohol and lead the poison is ingested; in the case of scarlet fever, pneumonia, and perhaps pregnancy, the toxic agent causing the renal affection is formed in the body. In Bright's disease all the elements of the kidney, the glomeruli, the tubular epithelium, and the interstitial tissue, are affected. When the disease follows scarlet fever, the glomerular structures are mostly affected, the capsules being thickened by fibrous tissue, and the glomerular tuft compressed and atrophied. The epithelium of the convoluted tubules undergoes degeneration; considerable quantities of it are shed, and form the well-known *casts* in the urine. The tubules become blocked by the epithelium, and distended with the pent-up urine; this is one cause of the increase in size that the kidneys undergo in certain forms of Bright's disease. The lesions in the tubules and in the glomeruli are not generally uniform. The interstitial tissue is always affected, and exudation, proliferation and formation of fibrous tissue occur. In the granular and contracted kidney the lesion in the interstitial tissue reaches a high degree of development, little renal secreting tissue being left. Such tubules as remain are dilated, and the epithelium lining them is altered, the cells becoming hyaline and losing their structure. The vessels are narrowed owing to thickening of the subendothelial layer, and the muscular coat undergoes hypertrophic and fibroid changes, so that the vessels are abnormally rigid. When the overgrowth of fibrous tissue is considerable, the surface of the organ becomes uneven, and it is for this reason that the term *granular kidney* has been applied to the condition. In acute Bright's disease the kidney is increased in size and engorged with blood, the changes described above being in active progress. In the chronic form the kidney may be large or small, and is usually white or mottled. If large, the cortex is thickened, pale and waxy, and the pyramids are congested; if small, the fibrous change has advanced and the cortex is diminished. Bright's disease, both acute and chronic, is essentially a disease of the cortical secreting portion of the kidney. The true granular kidney, classified by some as a third variety, is usually part of a general arterial degeneration, the overgrowth of fibrous tissue in the kidney and the lesions in the arteries being well marked.

The principal degenerations affecting the kidney are the fatty and the albuminoid. *Fatty degeneration* often reaches a high degree in alcoholics, where fatty degeneration of the heart and liver are also present. *Albuminoid disease* is frequently associated with some varieties of Bright's disease, and is also seen as a result of chronic bone disease, or of long-continued suppuration involving other parts of the body, or of syphilis. It is due to irritation of the kidneys by toxic products.

Growths of the Kidney.—The principal growths are tubercle, adenoma, sarcoma and carcinoma. In addition, fatty and fibrous growths, the nodules of glanders and the gummata of syphilis, may be mentioned. Tuberculous disease is sometimes primary; more frequently it is secondary to tubercle in other portions of the genito-urinary apparatus. The genito-urinary tract may be infected by tubercle in two ways; *ascending*, in which the primary lesion is in the testicle, epididymis, or urinary bladder, the lesion travelling up by the ureter or the lymphatics to the kidney; *descending*, where the tubercle bacillus reaches the kidney through the blood-vessels. In the latter case, miliary tubercles, as scattered granules, are seen, especially in the cortex of the kidney; the lesion is likely to be bilateral. In primary tuberculosis, and in ascending tuberculosis, the lesion is at first unilateral. *Malignant disease* of the kidney takes the form of sarcoma or carcinoma. Sometimes it is dependent on the malignant growths starting in what are spoken of as "adrenal rests" in the cortex of the kidney. Sarcoma is most often seen in the young; carcinoma in the middle-aged and elderly. Carcinoma may be primary or secondary, but the kidney is not so prone to malignant disease as other organs, such as the stomach, bowel or liver.

Cystic Kidneys.—Cysts may be single—sometimes of large size. Scattered small cysts are met with in chronic Bright's disease and in granular contracted kidney, where the dilatation of tubules reaches a high degree. Certain growths, such as adenomata, are liable to cystic degeneration, and cysts are also found in malignant disease. Finally, there is a rare condition of general cystic disease somewhat similar to the congenital affection. In this form the kidneys, greatly enlarged, consist of a congeries of cysts separated by the remains of renal tissue.

Parasitic Affections.—The more common parasites affecting the kidney, or some other portion of the urinary tract, and causing disease, are filaria, bilharzia and the cysticercus form of the *taenia echinococcus* (hydatids). The presence of *filaria* in the thoracic duct and other lymph-channels may determine the presence of chyle in the urine, together with the ova and young forms of the filaria, owing to the distension and rupture of a lymphatic vessel into some portion of the urinary tract. This is the common cause of chyluria in hot climates, but chyluria is occasionally seen in the United Kingdom without filaria. *Bilharzia*, especially in Egypt and South Africa, causes haematuria. The cysticercus form of the *taenia echinococcus* leads to the production of hydatid cysts in the kidney; this organ, however, is not so often affected as the liver.

Stone in the Kidney.—Calculi are frequently found in the kidney, consisting usually of uric acid, sometimes of oxalates, more rarely of phosphates. Calculous disease of the bladder (*q.v.*) is generally the sequel to the formation of a stone in the kidney, which, passing down, becomes coated by the salts in the urine. Calculi are usually formed in the pelvis of the kidney, and their formation is dependent either on the excessive amounts of uric acid, oxalic acid, &c., in the urine, or on an alteration in the composition of the urine, such as increased acidity, or on uric acid or oxalate of lime being present in an abnormal amount. The formation of abnormal crystals is often due to the presence of some colloid, such as blood, mucus or albumen, in the secretion, modifying the crystalline form. Once a minute calculus has been formed, its subsequent growth is highly probable, owing to the deposition on it of the urinary constituent forming it. Calculi formed in the pelvis of the kidney may be single and may reach a very large size, forming, indeed, an actual cast of the interior of the expanded kidney. At other times they are multiple and of varying size. They may give rise to no symptoms, or on the other hand may cause distressing renal colic, especially when they are small and loose and are passed or are trying to be passed. Serious complications may result from the presence of a stone in the kidney, such as hydronephrosis, from the urinary secretion being pent up behind the obstruction, or complete suppression, which is apparently produced reflexly through the nervous system. In such cases the surgical removal of the stone is often followed by the restoration of the renal secretion.

The symptoms of *renal calculus* may be very slight, or they may be entirely absent if the stone is moulding itself into the interior of the kidney; but if the stone is movable, heavy and rough, it may cause great distress, especially during exercise. There will probably be blood in the urine; and there will be pain in the loin and thigh and down into the testicle. The testicle also may be drawn up by its suspensory muscle, and there may be irritability of the bladder. With stone in one kidney the pains may be actually referred to the kidney of the other side. Generally, but not always, there is tenderness in the loin. If the stone is composed of lime it may throw a shadow on the Röntgen plate, but other stones may give no shadow.

Renal colic is the acute pain felt when a small stone is travelling down the ureter to the bladder. The pain is at times so acute that fomentations, morphia and hot baths fail to ease it, and nothing short of chloroform gives relief.

For the *operative treatment of renal calculus* an incision is made a little below the last rib, and, the muscles having been traversed, the kidney is reached on the surface which is not covered by peritoneum. Most likely the stone is then felt, so it is cut down upon and removed. If it is not discoverable on gently pinching the kidney between the finger and thumb, the kidney had better be opened in its convex border and explored by the finger. Often it has happened that when a man has presented most of the symptoms of renal calculus and has been operated on with a negative result as regards finding a stone, all the symptoms have nevertheless disappeared as the direct result of the blank operation.

Pyelitis.—Inflammation of the pelvis of the kidney is generally produced by the extension of gonorrhoeal or other septic inflammation upwards from the bladder and lower urinary tract, or by the presence of stone or of tubercle in the pelvis of the kidney. Pyonephrosis, or distension of the kidney with pus, may result as a sequel to pyelitis or as a complication of hydronephrosis; in many cases the inflammation spreads to the capsule of the kidney, and leads to the formation of an abscess outside the kidney—a *perinephritic abscess.* In some cases a perinephritic abscess results from a septic plug in a blood-vessel of the kidney, or it may occur as the result of an injury to the loose cellular tissue surrounding the kidney, without lesion of the kidney.

Hydronephrosis, or distension of the kidney with pent-up urine, results from obstruction of the ureter, although all obstructions of the ureter are not followed by it, calculous obstruction, as already noted, often causing complete suppression of urine. Obstruction of the ureter, causing hydronephrosis, is likely to be due to the impaction of a stone, or to pressure on the ureter from a tumour in the pelvis—as, for instance, a cancer of the uterus—or to some abnormality of the ureter. Sometimes a kink of the ureter of a movable kidney causes hydronephrosis. The hydronephrosis produced by obstruction of the ureter may be intermittent; and when a certain degree of distension is produced, either as a result of the shifting of the calculus or of some other cause, the obstruction is temporarily relieved in a great outflow of urine, and the urinary discharge is re-established. When the hydronephrosis has long existed the kidney is converted into a sac, the remains of the renal tissues being spread out as a thin layer.

Effects on the Urine.—Diseases of the kidney produce alterations in the composition of the urine; either the proportion of the normal constituents being altered, or substances not normally present being excreted. In most diseases the quantity of urinary water is diminished, especially in those in which the activity of the circulation is impaired. There are diseases, however, more especially the granular kidney and certain forms of chronic Bright's disease, in which the quantity of urinary water is considerably increased, notwithstanding the profound anatomical changes that have occurred in the kidney. There are two forms of suppression of the urine: one is *obstructive suppression*, seen where the ureter is blocked by stone or other morbid process; the other is *non-obstructive suppression*, which is apt to occur in advanced diseases of the kidney. In other cases complete suppression may occur as the result of injuries to distant parts of the body, as after severe surgical operations. In some diseases in which the quantity of urinary water excreted is normal, or even greater than normal, the efficiency of the renal activity is really diminished, inasmuch as the urine contains few solids. In estimating the efficiency of the kidneys, it is necessary to take into consideration the so-called "solid urine," that is to say, the quantity of solid matter daily excreted, as shown by the specific gravity of the urine. The nitrogenous constituents—urea, uric acid, creatinin, &c.—vary greatly in amount in different diseases. In most renal diseases the quantities of these substances are diminished because of the physiological impairment of the kidney. The chief abnormal constituents of the urine are serum-albumen, serum-globulin, albumoses (albuminuria), blood (haematuria), blood pigment (haemoglobinuria), pus (pyuria), chyle (chyluria) and pigments such as melanuria and urobilinuria.

Effects on the Body at large.—These may be divided into the persistent and the intermittent or transitory. The most important persistent effects produced by disease of the kidney are, first, nutritional changes leading to general ill health, wasting and cachexia; and, secondly, certain cardio-vascular phenomena, such as enlargement (hypertrophy) of the heart, and thickening of the inner, and degeneration of the middle, coat of the smaller arteries. Amongst the intermittent or transitory effects are dropsy, secondary inflammations of certain organs and serous cavities, and uraemia. Some of these effects are seen in every form of severe kidney disease, and uraemia may occur in any advanced kidney disease. Renal dropsy is chiefly seen in certain forms of Bright's disease, and the cardiac and arterial changes are commonest in cases of granular or contracted kidney, but may be absent in other diseases which destroy the kidney tissue, such as hydronephrosis. *Uraemia* is a toxic condition, and three varieties of it are recognized—the acute, the chronic and the latent. Many of these effects are dependent upon the action of poisons retained in the body owing to the deficient action of the kidneys. It is also probable that abnormal substances having a toxic action are produced as a result of a perverted metabolism. Uraemia is of toxic origin, and it is probable that the dropsy of renal disease is due to effects produced in the capillaries by the presence of abnormal substances in the blood. High arterial tension, cardiac hypertrophy and arterial degeneration may also be of toxic origin, or they may be produced by an attempt of the body to maintain an active circulation through the greatly diminished amount of kidney tissue available.

Rupture of the kidney may result from a kick or other direct injury. Vomiting and collapse are likely to ensue, and most likely blood will appear in the urine, or a tumour composed of blood and urine may form in the renal region. An incision made into the swelling from the loin may enable the surgeon to see the torn kidney. An attempt should be made to save the kidney by suturing and draining; unless the damage is obviously past repair, the kidney should not be removed without giving nature a chance. (J. R. B.; E. O.*)

KIDWELLY (*Cydweli*), a decayed market-town and municipal borough of Carmarthenshire, Wales, situated (as its name implies) near the junction of two streams, the Gwendraeth Fawr and the Gwendraeth Fach, a short distance from the shores of Carmarthen Bay. Pop. (1901), 2285. It has a station on the Great Western railway. The chief attraction of Kidwelly is its magnificent and well-preserved castle, one of the finest in South Wales, dating chiefly from the 13th century and admirably situated on a knoll above the Gwendraeth Fach. The parish church of St Mary, of the 14th century, possesses a lofty tower with a spire. The quiet little town has had a stirring history. It was a place of some importance when William de Londres, a companion of Fitz Hamon and his conquering knights, first erected a castle here. In 1135 Kidwelly was furiously attacked by Gwenllian, wife of Griffith ap Rhys, prince of South Wales, and a battle, fought close to the town at a place still known as Maes Gwenllian, ended in the total defeat and subsequent execution of the Welsh princess. Later, the extensive lordship of Kidwelly became the property through marriage of Henry, earl of Lancaster, and to this circumstance is due the exclusive jurisdiction of the town. Kidwelly received its first charter of incorporation from Henry VI.; its present charter dating from 1618. The decline of Kidwelly is due to the accumulation of sand at the mouth of the river, and to the consequent prosperity of the neighbouring Llanelly.

KIEF, KEF or KEIF (a colloquial form of the Arabic *kaif*, pleasure or enjoyment), the state of drowsy contentment produced by the use of narcotics. To "do kef," or to "make kef," is to pass the time in such a state. The word is used in northern Africa, especially in Morocco, for the drug used for the purpose.

KIEL, the chief naval port of Germany on the Baltic, a town of the Prussian province of Schleswig-Holstein. Pop. (1900), 107,938; (1905), 163,710, including the incorporated suburbs. It is beautifully situated at the southern end on the Kieler Busen (bay or harbour of Kiel), 70 m. by rail N. from Hamburg. It consists of a somewhat cramped old town, lying between the harbour and a sheet of water called Kleiner Kiel, and a better built and more spacious new town, which has been increased by the incorporation of the garden suburbs of Brunswick and Düsternbrook. In the old town stands the palace, built in the 13th century, enlarged in the 18th and restored after a fire in 1838. It was once the seat of the dukes of Holstein-Gottorp, who resided here from 1721 to 1773, and became the residence of Prince Henry of Prussia. Other buildings are the church of St Nicholas (restored in 1877–1884), dating from 1240, with a lofty steeple; the old town-hall on the market square; the church of the Holy Ghost; three fine modern churches, those of St James, and St Jürgen and of St Ansgar; and the theatre. Further to the north and facing the bay is the university, founded in 1665 by Christian Albert, duke of Schleswig, and named after him "Christian Albertina." The new buildings were erected in 1876, and connected with them are a library of 240,000 volumes, a zoological museum, a hospital, a botanical garden and a school of forestry. The university, which is celebrated as a medical school, is attended by nearly 1000 students, and has a teaching staff of over 100 professors and docents. Among other scientific and educational institutions are the Schleswig-Holstein museum of national antiquities in the old university buildings, the Thaulow museum (rich in Schleswig-Holstein wood-carving of the 16th and 17th centuries), the naval academy, the naval school and the school for engineers.

The pride of Kiel is its magnificent harbour, which has a comparatively uniform depth of water, averaging 40 ft., and close to the shores 20 ft. Its length is 11 m. and its breadth varies from ¼ m. at the southern end to 4½ m. at the mouth. Its defences, which include two forts on the west and four on the east side, all situated about 5 m. from the head of the harbour at the place (Friedrichsort) where its shores approach one another, make it a place of great strategic stength. The imperial docks (five in all) and ship-building yards are on the east side facing the town, between Gaarden and Ellerbeck, and comprise basins capable of containing the largest war-ships afloat. The imperial yard employs 7000 hands, and another 7000 are employed in two large private ship-building works, the Germania (Krupp's) and Howalds'. The Kaiser Wilhelm Canal, commonly called the Kiel Canal, connecting the Baltic with the North Sea at Brunsbüttel, has its eastern entrance at Wik, 1½ m. N. of Kiel (see GERMANY: *Waterways*). The town and adjacent villages, *e.g.* Wik, Heikendorf and Laboe, are resorted to for sea-bathing, and in June of each year a regatta, attended by yachts from all countries, is held. The *Kieler Woche* is one of the principal social events in Germany, and corresponds to the "Cowes week" in England. Kiel is connected by day and night services with Korsör in Denmark by express passenger boats. The harbour yields sprats which are in great repute. The principal industries are those connected with the imperial navy and ship-building, but embrace also flour-mills, oil-works, iron-foundries, printing-works, saw-mills, breweries, brick-works, soap-making and fish-curing. There is an important trade in coal, timber, cereals, fish, butter and cheese.

The name of Kiel appears as early as the 10th century in the form Kyl (probably from the Anglo-Saxon *Kille* = a safe place for ships). Kiel is mentioned as a city in the next century; in 1242 it received the Lübeck rights; in the 14th century it acquired various trading privileges, having in 1284 entered the Hanseatic League. In recent times Kiel has been associated with the peace concluded in January 1814 between Great Britain, Denmark and Sweden, by which Norway was ceded to Sweden. In 1773 Kiel became part of Denmark, and in 1866 it passed with the rest of Schleswig-Holstein to Prussia. Since being made a great naval arsenal, Kiel has rapidly developed in prosperity and population.

See Prahl, *Chronika der Stadt Kiel* (Kiel, 1856); Erichsen, *Topographie des Landkreises Kiel* (Kiel, 1898); H. Eckardt, *Alt-Kiel in Wort und Bild* (Kiel, 1899); P. Hasse, *Das Kieler Stadtbuch, 1264–1289* (Kiel, 1875); *Das älteste Kieler Rentebuch 1300, 1487*, edited by C. Reuter (Kiel, 1893); *Das zweite Kieler Rentebuch 1487, 1586*, edited by W. Stern (Kiel, 1904); and the *Mitteilungen der Gesellschaft für Kieler Stadtgeschichte* (Kiel, 1877, 1904).

KIELCE, a government in the south-west of Russian Poland, surrounded by the governments of Piotrkow and Radom and by Austrian Galicia. Area, 3896 sq. m. Its surface is an elevated plateau 800 to 1000 ft. in altitude, intersected in the north-east by a range of hills reaching 1350 ft. and deeply trenched in the south. It is drained by the Vistula on its south-east border, and by its tributaries, the Nida and the Pilica, which have a very rapid fall and give rise to inundations. Silurian and Devonian quartzites, dolomite, limestones and sandstones prevail in the north, and contain rich iron ores, lead and copper ores. Carboniferous deposits containing rich coal seams occur chiefly in the south, and extend into the government of Piotrkow. Permian limestones and sandstones exist in the south. The Triassic deposits contain very rich zinc ores of considerable thickness and lead. The Jurassic deposits consist of iron-clays and limestones, containing large caves. The Cretaceous deposits yield gypsum, chalk and sulphur. White and black marble are also extracted. The soil is of great variety and fertile in parts, but owing to the proximity of the Carpathians, the climate is more severe than might be expected. Rye, wheat, oats, barley and buckwheat are grown; modern intensive culture is spreading, and land fetches high prices, the more so as the peasants' allotments were small at the outset and are steadily decreasing. Out of a total of 2,193,300 acres suitable for cultivation 53·4% are actually cultivated. Grain is exported. Gardening is a thriving industry in the south; beet is grown for sugar in the south-east. Industries are considerably developed: zinc ores are extracted, as well as some iron and a little sulphur. Tiles, metallic goods, leather, timber goods and flour are the chief products of the manufactures. Pop. (1897), 765,212, for the most part Poles, with 11% Jews; (1906, estimated), 910,900. By religion 88% of the people are Roman Catholics. Kielce is divided into seven districts, the chief towns of which, with populations in 1897, are Kielce (*q.v.*), Jedrzejow (Russ. Andreyev, 5010), Miechow (4156), Olkusz (3491), Pinczów (8095), Stopnica (4659) and Wloszczowa (23,065).

KIELCE, a town of Russian Poland, capital of the above government, 152 m. by rail S. of Warsaw, situated in a picturesque hilly country. Pop. (1890), 12,775; (1897), 23,189. It has a castle, built in 1638 and for some time inhabited by Charles XII.; it was renowned for its portrait gallery and the library of Zaluski, which was taken to St Petersburg. The squares and boulevards are lined with handsome modern buildings. The principal factories are hemp-spinning, cotton-printing and cement works. The town was founded in 1173 by a bishop of Cracow. In the 16th century it was famous for its copper mines, but they are no longer worked.

KIEPERT, HEINRICH (1818–1899), German geographer, was born at Berlin on the 31st of July 1818. He was educated at the university there, studying especially history, philology and geography. In 1840–1846, in collaboration with Karl Ritter, he issued his first work, *Atlas von Hellas und den hellenischen Kolonien,* which brought him at once into eminence in the sphere of ancient historical cartography. In 1848 his *Historisch-geographischer Atlas der alten Welt* appeared, and in 1854 the first edition of the *Atlas antiquus,* which has obtained very wide recognition, being issued in English, French, Russian, Dutch and Italian. In 1894 Kiepert produced the first part of a larger atlas of the ancient world under the title *Formae orbis antiqui*; his valuable maps in *Corpus inscriptionum latinarum* must also be mentioned. In 1877–1878 his *Lehrbuch der alten Geographie* was published, and in 1879 *Leitfaden der alten Geographie,* which was translated into English (*A Manual of Ancient Geography,* 1881) and into French. Among Kiepert's general works one of the most important was the excellent *Neuer Handatlas über alle Teile der Erde* (1855 et seq.), and he also compiled a large number of special and educational maps. Asia Minor was an area in which he took particular interest. He visited it four times in 1841–1888; and his first map (1843–1846), together with his *Karte des osmanischen Reiches in Asien* (1844 and 1869), formed the highest authority for the geography of the region. Kiepert was professor of geography in the university of Berlin from 1854. He died at Berlin on the 21st of April 1899. He left unpublished considerable material in various departments of his work, and with the assistance of this his son Richard (b. 1846), who followed his father's career, was enabled to issue a map of Asia Minor in 24 sheets, on a scale of 1: 400,000 (1902 et seq.), and to carry on the issue of *Formae orbis antiqui.*

KIERKEGAARD, SÖREN AABY (1813–1855), Danish philosopher, the seventh child of a Jutland hosier, was born in Copenhagen on the 5th of May 1813. As a boy he was delicate, precocious and morbid in temperament. He studied theology at the university of Copenhagen, where he graduated in 1840 with a treatise *On Irony.* For two years he travelled in Germany, and in 1842 settled finally in Copenhagen, where he died on the 11th of November 1855. He had lived in studious retirement, subject to physical suffering and mental depression. His first volume, *Papers of a Still Living Man* (1838), a characterization of Hans Andersen, was a failure, and he was for some time unnoticed. In 1843 he published *Euten—Eller* (*Either—or*) (4th ed., 1878), the work on which his reputation mainly rests; it is a discussion of the ethical and aesthetic ideas of life. In his last years he carried on a feverish agitation against the theology and practice of the state church, on the ground that religion is for the individual soul, and is to be separated absolutely from the state and the world. In general his philosophy was a reaction against the speculative thinkers—Steffens (*q.v.*), Niels Treschow (1751–1833) and Frederik Christian Sibbern (1785–1872); it was based on the absolute dualism of Faith and Knowledge. His chief follower was Rasmus Nielsen (1809–1884) and he was opposed by Georg Brandes, who wrote a brilliant account of his life and works. As a dialectician he has been described as little inferior to Plato, and his influence on the literature of Denmark is considerable both in style and in matter. To him Ibsen owed his character Brand in the drama of that name.

See his posthumous autobiographical sketch, *Syns punktelfor min Forfattervirksomhed* ("Standpoint of my Literary Work"); Georg Brandes, *Sören Kierkegaard* (Copenhagen, 1877); A. Bärthold, *Noten zu K.'s Lebensgeschichte* (Halle, 1876), *Die Bedeutung der ästhetischen Schriften S. Kierkegaarde* (Halle, 1879) and *S. K.'s Persönlichkeit in ihrer Verwirklichung der Ideale* (Gütersloh, 1886); F. Petersen, *S. K.'s Christendomsforkyndelae* (Christiania, 1877). For Kierkegaard's relation to recent Danish thought, see Höffding's *Archiv für Geschichte der Philosophie* (1888), vol. ii.

KIEV, Kieff, or Kiyeff, a government of south-western Russia, conterminous with those of Minsk, Poltava, Chernigov, Podolia, Kherson and Volhynia; area 19,686 sq. m. It represents a deeply trenched plateau, 600 to 800 ft. in altitude, reaching 950 to 1050 ft. in the west, assuming a steep character in the middle, and sloping gently northwards to the marshy regions of the Pripet, while on the east it falls abruptly to the valley of the Dnieper, which lies only 250 to 300 ft. above the sea. General A. Tillo has shown that neither geologically nor tectonically can "spurs of the Carpathians" penetrate into Kiev. Many useful minerals are extracted, such as granites, gabbro, labradorites of a rare beauty, syenites and gneiss, marble, grinding stones, pottery clay, phosphorites, iron ore and mineral colours. Towards the southern and central parts the surface is covered by deep rich "black earth." Nearly the whole of the government belongs to the basin of the Dnieper, that river forming part of its eastern boundary. In the south-west are a few small tributaries of the Bug. Besides the Dnieper the only navigable stream is its confluent the Pripet. The climate is more moderate than in middle Russia, the average temperatures at the city of Kiev being—year, 44·5°; January, 21°; July, 68°; yearly rainfall, 22 inches. The lowlands of the north are covered with woods; they have the flora of the Polyesie, or marshy woodlands of Minsk, and are peopled with animals belonging to higher latitudes.[1] The population, which was 2,017,262 in 1863, reached 3,575,457 in 1897, of whom 1,791,503 were women, and 147,878 lived in towns; and in 1904 it reached 4,042,526, of whom 2,030,744 were women. The estimated population in 1906 was 4,206,100. In 1897 there were 2,738,977 Orthodox Greeks, 14,888 Nonconformists, 91,821 Roman Catholics, 423,875 Jews, and 6820 Protestants.

No less than 41% of the land is in large holdings, and 45% belongs to the peasants. Out of an area of 12,600,000 acres, 11,100,000 acres are available for cultivation, 4,758,000 acres are under crops, 650,000 acres under meadows, and 1,880,000 acres under woods. About 290,000 acres are under beetroot, for sugar. The crops principally grown are wheat, rye, oats, millet, barley and buckwheat, with, in smaller quantities, hemp, flax, vegetables, fruit and tobacco. Camels have been used for agricultural work. Bee-keeping and gardening are general. The chief factories are sugar works and distilleries. The former produce 850,000 to 1,150,000 tons of sugar and over 50,000 tons of molasses annually. The factories include machinery works and iron foundries, tanneries, steam flour-mills, petroleum refineries and tobacco factories. Two main railways, starting from Kiev and Cherkasy respectively, cross the government from N.E. to S.W., and two lines traverse its southern part from N.W. to S.E., parallel to the Dnieper. Steamers ply on the Dnieper and some of its tributaries. Wheat, rye, oats, barley and flour are exported. There are two great fairs, at Kiev and Berdichev respectively, and many of minor importance. Trade is very brisk, the river traffic alone being valued at over one million sterling annually. The government is divided into twelve districts. The chief town is Kiev (*q.v.*)and the district towns, with their populations in 1897, Berdichev (53,728), Cherkasy (29,619), Chigirin (9870), Kanev (8892), Lipovets (6068), Radomysl (11,154), Skvira (16,265), Tarashcha (11,452), Umañ (28,628), Vasilkov (17,824) and Zvenigorodka (16,972).

The plains on the Dnieper have been inhabited since probably the Palaeolithic period, and the burial-grounds used since the

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[1] Schmahlhausen's *Flora of South-West Russia* (Kiev, 1886) contains a good description of the flora of the province.

Stone Age. The burial mounds (*kurgans*) of both the Scythians and the Slavs, traces of old forts (*gorodishche*), stone statues, and more recent caves offer abundant material for anthropological and ethnographical study.

KIEV, a city of Russia, capital of the above government, on the right or west bank of the Dnieper, in 50° 27′ 12″ N. and 30° 30′ 18″ E., 628 m. by rail S.W. of Moscow and 406 m. by rail N.N.E. of Odessa. The site of the greater part of the town consists of hills or bluffs separated by ravines and hollows, the elevation of the central portions being about 300 ft. above the ordinary level of the Dnieper. On the opposite side of the river the country spreads out low and level like a sea. Having received all its important tributaries, the Dnieper is here a broad (400 to 580 yds.) and navigable stream; but as it approaches the town it divides into two arms and forms a low grassy island of considerable extent called Tukhanov. During the spring floods there is a rise of 16 or even 20 ft., and not only the island but the country along the left bank and the lower grounds on the right bank are laid under water. The bed of the river is sandy and shifting, and it is only by costly engineering works that the main stream has been kept from returning to the more eastern channel, along which it formerly flowed. Opposite the southern part of the town, where the currents have again united, the river is crossed by a suspension bridge, which at the time of its erection (1848–1853) was the largest enterprise of the kind in Europe. It is about half a mile in length and 52⅔ ft. in breadth, and the four principal spans are each 440 ft. The bridge was designed by Vignoles, and cost about £400,000. Steamers ply in summer to Kremenchug, Ekaterinoslav, Mogilev, Pinsk and Chernigov. Altogether Kiev is one of the most beautiful cities in Russia, and the vicinity too is picturesque.

Until 1837 the town proper consisted of the Old Town, Pechersk and Podoli; but in that year three districts were added, and in 1879 the limits were extended to include Kurenevka, Lukyanovka, Shulyavka and Solomenka. The administrative area of the town is 13,500 acres.

The Old Town, or Old Kiev quarter (Starokievskaya Chast), occupies the highest of the range of hills. Here the houses are most closely built, and stone structures most abundant. In some of the principal streets are buildings of three to five storeys, a comparatively rare thing in Russia, indeed in the main street (Kreshchatik) fine structures have been erected since 1896. In the 11th century the area was enclosed by earthen ramparts, with bastions and gateways; but of these the only surviving remnant is the Golden Gate. In the centre of the Old Town stands the cathedral of St Sophia, the oldest cathedral in the Russian empire. Its external walls are of a pale green and white colour, and it has ten cupolas, four spangled with stars and six surmounted each with a cross. The golden cupola of the four-storeyed campanile is visible for many miles across the steppes. The statement frequently made that the church was a copy of St Sophia's in Constantinople has been shown to be a mistake. The building measures in length 177 ft., while its breadth is 118 ft. But though the plan shows no imitation of the great Byzantine church, the decorations of the interior (mosaics, frescoes, &c.) do indicate direct Byzantine influence. During the occupation of the church by the Uniats or United Greek Church in the 17th century these were covered with whitewash, and were only discovered in 1842, after which the cathedral was internally restored; but the chapel of the Three Pontiffs has been left untouched to show how carefully the old style has been preserved or copied. Among the mosaics is a colossal representation of the Virgin, 15 ft. in height, which, like the so-called "indestructible wall" in which it is inlaid, dates from the time (1019–1054) of Prince Yaroslav. This prince founded the church in 1037 in gratitude for his victory over the Petchenegs, a Turkish race then settled in the Dnieper valley. His sarcophagus, curiously sculptured with palms, fishes, &c., is preserved. The church of St Andrew the Apostle occupies the spot where, according to Russian tradition, that apostle stood when as yet Kiev was not, and declared that the hill would become the site of a great city. The present building, in florid rococo style, dates from 1744–1767. The church of the Tithes, rebuilt in 1828–1842, was founded in the close of the 10th century by Prince Vladimir in honour of two martyrs whom he had put to death; and the monastery of St Michael (or of the Golden Heads—so called from the fifteen gilded cupolas of the original church) claims to have been built in 1108 by Svyatopolk II., and was restored in 1655 by the Cossack chieftain Bogdan Chmielnicki. On a plateau above the river, the favourite promenade of the citizens, stands the Vladimir monument (1853) in bronze. In this quarter, some distance back from the river, is the new and richly decorated Vladimir cathedral (1862–1896), in the Byzantine style, distinguished for the beauty and richness of its paintings.

Until 1820 the south-eastern district of Pechersk was the industrial and commercial quarter; but it has been greatly altered in carrying out fortifications commenced in that year by Tsar Nicholas I. Most of the houses are small and old-fashioned. The monastery—the Kievo-Pecherskaya—is the chief establishment of its kind in Russia; it is visited every year by about 250,000 pilgrims. Of its ten or twelve conventual churches the chief is that of the Assumption. There are four distinct quarters in the monastery, each under a superior, subject to the archimandrite: the Laura proper or New Monastery, that of the Infirmary, and those of the Nearer and the Further Caves. These caves or catacombs are the most striking characteristic of the place; the name Pechersk, indeed, is connected with the Russian *peshchera*, "a cave." The first series of caves, dedicated to St Anthony, contains eighty saints' tombs; the second, dedicated to St Theodosius, a saint greatly venerated in Russia, about forty-five. The bodies were formerly exposed to view; but the pilgrims who now pass through the galleries see nothing but the draperies and the inscriptions. Among the more notable names are those of Nestor the chronicler, and Iliya of Murom, the Old Cossack of the Russian epics. The foundation of the monastery is ascribed to two saints of the 11th century—Anthony and Hilarion, the latter metropolitan of Kiev. By the middle of the 12th century it had become wealthy and beautiful. Completely ruined by the Mongol prince Batu in 1240, it remained deserted for more than two centuries. Prince Simeon Oblkovich was the first to begin the restoration. A conflagration laid the buildings waste in 1716, and their present aspect is largely due to Peter the Great. The cathedral of the Assumption, with seven gilded cupolas, was dedicated in 1089, destroyed by the Mongols in 1240, and restored in 1729; the wall-paintings of the interior are by V. Vereshchagin. The monastery contains a school of picture-makers of ancient origin, whose productions are widely diffused throughout the empire, and a printing press, from which have issued liturgical and religious works, the oldest known examples bearing the date 1616. It possesses a wonder-working ikon or image of the "Death of the Virgin," said to have been brought from Constantinople in 1073, and the second highest bell-tower in Russia.

The Podol quarter lies on the low ground at the foot of the bluffs. It is the industrial and trading quarter of the city, and the seat of the great fair of the "Contracts," the transference of which from Dubno in 1797 largely stimulated the commercial prosperity of Kiev. The present regular arrangement of its streets arose after the great fire of 1811. Lipki district (from the *lipki* or lime trees, destroyed in 1833) is of recent origin, and is mainly inhabited by the well-to-do classes. It is sometimes called the palace quarter, from the royal palace erected between 1868 and 1870, on the site of the older structure dating from the time of Tsaritsa Elizabeth. Gardens and parks abound; the palace garden is exceptionally fine, and in the same neighbourhood are the public gardens with the place of amusement known as the Château des Fleurs.

In the New Buildings, or the Lybed quarter, are the university and the botanical gardens. The Ploskaya Chast (Flat quarter) or Obolon contains the lunatic asylum; the Lukyanovka Chast, the penitentiary and the camp and barracks; and the Bulvarnaya Chast, the military gymnasium of St Vladimir and the railway station. The educational and scientific institutions of Kiev rank next to those of the two capitals. Its university, removed from Vilna to Kiev in 1834, has about 2500 students, and is well provided with observatories, laboratories, libraries and museums; five scientific societies and two societies for aid to poor students are attached to it. There are, besides, a theological academy, founded in 1615; a society of church archaeology, which possesses a museum built in 1900, very rich in old ikons, crosses, &c., both Russian and Oriental; an imperial academy of music; university courses for ladies; a polytechnic, with 1300 students—the building was completed in 1900 and stands on the other side of Old Kiev, away from the river. Of the learned societies the more important are the medical (1840), the naturalists' (1869), the juridical (1876), the historical of Nestor the Chronicler (1872), the horticultural (1875), and the dramatic (1879), the archaeological commission (1843), and the society of church archaeology.

Kiev is the principal centre for the sugar industry of Russia, as well as for the general trade of the region. Its Stryetenskaya fair is important. More than twenty caves were discovered on the slope of a hill (Kirilov Street), and one of them, excavated in 1876, proved to have belonged to neolithic troglodytes. Numerous graves, both from the pagan and the Christian periods, the latter containing more than 2000 skeletons, with a great number of small articles, were discovered in the same year in the same neighbourhood. Many colonial Roman coins of the 3rd and 4th centuries, and silver *dirhems*, stamped at Samarkand, Balkh, Merv, &c., were also found in 1869.

In 1862 the population of Kiev was returned as 70,341; in 1874 the total was given as 127,251; and in 1902 as 319,000. This includes 20,000 Poles and 12,000 Jews. Kiev is the headquarters of the IX. Army Corps, and of a metropolitan of the Orthodox Greek Church.

The history of Kiev cannot be satisfactorily separated from that of Russia. According to Nestor's legend it was founded in 864 by three brothers, Kiy, Shchek and Khoriv, and after their deaths the principality was seized by two Varangians (Scandinavians), Askold and Dir, followers of Rurik, also in 864. Rurik's successor Oleg conquered Kiev in 882 and made it the chief town of his principality. It was in the waters of the Dnieper opposite the town that Prince Vladimir, the first saint of the Russian church, caused his people to be baptized (988), and Kiev became the seat of the first Christian church, of the first Christian school, and of the first library in Russia. For three hundred and seventy-six years it was an independent Russian city; for eighty years (1240–1320) it was subject to the Mongols; for two hundred and forty-nine years (1320–1569) it belonged to the Lithuanian principality; and for eighty-five years to Poland (1569–1654). It was finally united to the Russian empire in 1686. The city was devastated by the khan of the Crimea in 1483. The Magdeburg rights, which the city enjoyed from 1516, were abolished in 1835, and the ordinary form of town government introduced; and in 1840 it was made subject to the common civil law of the empire.

The Russian literature concerning Kiev is voluminous. Its bibliography will be found in the *Russian Geographical Dictionary* of P. Semenov, and in the *Russian Encyclopaedic Dictionary*, published by Brockhaus and Efron (vol. xv., 1895). Among recent publications are: Rambaud's *La Russie épique* (Paris, 1876); Avenarius, *Kniga o Kievskikh Bogatuiryakh* (St Petersburg, 1876), dealing with the early Kiev heroes; Zakrevski, *Opisanie Kieva* (1868); the materials issued by the commission for the investigation of the ancient records of the city; Taranovskiy, *Gorod Kiev* (Kiev, 1881); De Baye, *Kiev, la mère des villes russes* (Paris, 1896); Goetz, *Das Kiewer Höhlenkloster als Kulturzentrum des Vormongolischen Russlands* (Passau, 1904). See also Count Bobrinsky, *Kurgans of Smiela* (1897); and N. Byelyashevsky, *The Mints of Kiev*.

(P. A. K.; J. T. Be.)

KILBARCHAN, a burgh of barony of Renfrewshire, Scotland, 1 m. from Milliken Park station on the Glasgow & South-Western railway, 13 m. W. by S. of Glasgow. Pop. (1901), 2886. The public buildings include a hall, library and masonic lodge (dating from 1784). There is also a park. In a niche in the town steeple (erected in 1755) is the statue of the famous piper, who died about the beginning of the 17th century and is commemorated in the elegy on "The Life and Death of Habbie Simson, Piper of Kilbarchan" by Robert Sempill of Beltrees (1595–1665). The chief industries are manufactures of linen (introduced in 1739 and dating the rise of the prosperity of the town), cotton, silks and "Paisley" shawls, and calico-printing, besides quarries, coal and iron mines in the neighbourhood. Two miles south-west is a great rock of greenstone called Clochoderrick, 12 ft. in height, 22 ft. in length, and 17 ft. in breadth. About 2 m. north-west on Gryfe Water, lies Bridge of Weir (pop. 2242), the industries of which comprise tanning, currying, calico-printing, thread-making and wood-turning. It has a station on the Glasgow & South-Western railway. Immediately to the south-west of Bridge of Weir are the ruins of Ranfurly Castle, the ancient seat of the Knoxes. Sir John de Knocks (*fl.* 1422) is supposed to have been the great-grandfather of John Knox; and Andrew Knox (1559–1633), one of the most distinguished members of the family, was successively bishop of the Isles, abbot of Icolmkill (Iona), and bishop of Raphoe. About 4 m. N.W. of Bridge of Weir lies the holiday resort of Kilmalcolm (pronounced Kilmacome; pop. 2220), with a station on the Glasgow & South-Western railway. It has a golf-course, public park and hydropathic establishment. Several charitable institutions have been built in and near the town, amongst them the well-known Quarrier's Orphan Homes of Scotland.

KILBIRNIE, a town in north Ayrshire, Scotland, on the Garnock, $20\frac{1}{2}$ m. S.W. of Glasgow, with stations on the Glasgow & South-Western and the Caledonian railways. Pop. (1901), 4571. The industries include flax-spinning, rope works, engineering works, and manufactures of linen thread, wincey, flannels and fishing-nets, and there are iron and steel works and coal mines in the vicinity. The parish church is of historical interest, most of the building dating from the Reformation. In the churchyard are the recumbent effigies of Captain Thomas Crawford of Jordanhill (d. 1603), who in 1575 effected the surprise of Dumbarton Castle, and his lady. Near Kilbirnie Place, a modern mansion, are the ruins of Kilbirnie Castle, an ancient seat of the earls of Crawford, destroyed by fire in 1757. About 1 m. E. is Kilbirnie Loch, $1\frac{1}{3}$ m. long.

KILBRIDE, WEST, a town on the coast of Ayrshire, Scotland, near the mouth of Kilbride Burn, 4 m. N.N.W. of Ardrossan and $35\frac{3}{4}$ m. S.W. of Glasgow by the Glasgow & South-Western railway. Pop. (1901), 2315. It has been growing in repute as a health resort; the only considerable industry is weaving. In the neighbourhood are the ruins of Law Castle, Crosbie Castle and Portincross Castle, the last, dating from the 13th century, said to be a seat of the Stuart kings. Farland Head, with cliffs 300 ft. high, lies 2 m. W. by N.; and the inland country is hilly, one point, Kaim Hill, being 1270 ft. above sea-level.

KILDARE, a county of Ireland in the province of Leinster, bounded W. by Queen's County and King's County, N. by Meath, E. by Dublin and Wicklow, and S. by Carlow. The area is 418,496 acres or about 654 sq. m. The greater part of Kildare belongs to the great central plain of Ireland. In the east of the county this plain is bounded by the foot-hills of the mountains of Dublin and Wicklow; in the centre it is interrupted by an elevated plateau terminated on the south by the hills of Dunmurry, and on the north by the Hill of Allen (300 ft.) which rises abruptly from the Bog of Allen. The principal rivers are the Boyne, which with its tributary the Blackwater rises in the north part of the county, but soon passes into Meath; the Barrow, which forms the boundary of Kildare with Queen's County, and receives the Greese and the Lane shortly after entering Kildare; the Lesser Barrow, which flows southward from the Bog of Allen to near Rathangan; and the Liffey, which enters the county near Ballymore Eustace, and flowing north-west and then north-east quits it at Leixlip, having received the Morrel between Celbridge and Clane, and the Ryewater at Leixlip. Trout are taken in the upper waters, and there are salmon reaches near Leixlip.

Geology.—The greater part of the county is formed of typical grey Carboniferous limestone, well seen in the flat land about Clane. The natural steps at the Salmon Falls at Leixlip are formed from similar strata. Along the south-east the broken ground of Silurian shales forms the higher country, rising towards the Leinster chain. The granite core of the latter, with its margin of mica-schist produced by the metamorphism of the Silurian beds, appears in the south round Castledermot. A parallel ridge of Silurian rocks, including an interesting series of basic lavas, rises from the plain north of Kildare town (Hill of Allen and Chair of Kildare), with some Old Red Sandstone on its flanks. The limestone in this ridge is rich in fossils of Bala age, and has been compared with that at Portrane in county Dublin. The low ground is diversified by eskers and masses of glacial gravel, notably at the dry sandy plateau of the Curragh; but in part it retains sufficient moisture to give rise to extensive bogs. The Liffey, which comes down as a mountain-stream in the Silurian area, forming a picturesque fall in the gorge of Pollaphuca, wanders through the limestone region between low banks as a true river of the plain.

Climate and Industries.—Owing to a considerable degree to the large extent of bog, the climate of the northern districts is very moist, and fogs are frequent, but the eastern portion is drier, and the climate of the Liffey valley is very mild and healthy. The soil, whether resting on the limestone or on the clay slate, is principally a rich deep loam inclining occasionally to clay, easily cultivated and very fertile if properly drained. About 40,000 acres in the northern part of the county are included in the Bog of Allen, which is, however, intersected in many places by elevated tracts of firm ground. To the east of the town of Kildare is the Curragh, an undulating down upwards of 4800 acres in extent. The most fertile and highly cultivated districts of Kildare are the valleys of the Liffey and a tract in the south watered by the Greese. The demesne lands along the valley of the Liffey are finely wooded. More attention is paid to drainage and the use of manures on the larger farms than is done in many other parts of Ireland. The pastures which are not subjected to the plough are generally very rich and fattening. The proportion of tillage to pasture is roughly as 1 to 2½. Wheat is a scanty crop, but oats, barley, turnips and potatoes are all considerably cultivated. Cattle and sheep are grazed extensively, and the numbers are well sustained. Of the former, crosses with the shorthorn or the Durham are the commonest breed. Leicesters are the principal breed of sheep. Poultry farming is a growing industry.

Though possessing a good supply of water-power the county is almost destitute of manufactures; there are a few small cotton, woollen and paper mills, as well as breweries and distilleries, and several corn mills. Large quantities of turf are exported to Dublin by canal. The main line of the Midland Great Western follows the northern boundary of the county, with a branch to Carbury and Edenderry; and that of the Great Southern & Western crosses the county by way of Newbridge and Kildare, with southward branches to Naas (and Tullow, county Carlow) and to Athy and the south. The northern border is traversed by the Royal Canal, which connects Dublin with the Shannon at Cloondara. Farther south the Grand Canal, which connects Dublin with the Shannon at Shannon Harbour, occupies the valley of the Liffey until at Sallins it enters the Bog of Allen, passing into King's County near the source of the Boyne. Several branch canals afford communication with the southern districts.

Population and Administration.—The decreasing population (70,206 in 1891; 63,566 in 1901) shows an unusual excess of males over females, in spite of an excess of male emigrants. About 86% of the population are Roman Catholics. The county comprises 14 baronies and contains 110 civil parishes. Assizes are held at Naas, and quarter sessions at Athy, Kildare, Maynooth and Naas. The military stations at Newbridge and the Curragh constitute the Curragh military district, and the barracks at Athy and Naas are included in the Dublin military district. The principal towns are Athy (pop. 3599), Naas (3836) and Newbridge (2903); with Maynooth (which is the seat of a Roman Catholic college), Celbridge, Kildare (the county town), Monasterevan, Kilcullen and Leixlip. Ballitore, one of the larger villages, is a Quaker settlement, and at a school here Edmund Burke was educated. Kildare returned ten members to the Irish parliament, of whom eight represented boroughs; it sends only two (for the north and south divisions of the county) to the parliament of the United Kingdom. The county is in the Protestant diocese of Dublin and the Roman Catholic dioceses of Dublin and of Kildare and Leighlin.

History and Antiquities.—According to a tale in the Book of Leinster the original name of Kildare was *Druim Criaidh* (Drumcree), which it retained until the time of St Brigit, after which it was changed to *Cilldara*, the church of the oak, from an old oak under whose shadow the saint had constructed her cell. For some centuries it was under the government of the Macmurroughs, kings of Leinster, but with the remainder of Leinster it was granted by Henry II. to Strongbow. On the division of the palatinate of Leinster among the five grand-daughters of Strongbow, Kildare fell to Sibilla, the fourth daughter, who married William de Ferrars, earl of Derby. Through the marriage of the only daughter of William de Ferrars it passed to William de Vescy—who, when challenged to single combat by John Fitz Thomas, baron of Offaly, for accusing him of treason, fled to France. His lands were thereupon in 1297 bestowed on Fitz Thomas, who in 1316 was created earl of Kildare, and in 1317 was appointed sheriff of Kildare, the office remaining in the family until the attainder of Gerald, the ninth earl, in the reign of Henry VIII. Kildare was a liberty of Dublin until 1296, when an act was passed constituting it a separate county.

In the county are several old gigantic pillar-stones, the principal being those at Punchestown, Harristown, Jigginstown and Mullamast. Among remarkable earthworks are the raths at Mullamast, Knockcaellagh near Kilcullen, Ardscull near Naas, and the numerous sepulchral mounds in the Curragh. Of the round towers the finest is that of Kildare; there are remains of others at Taghadoe, Old Kilcullen, Oughterard and Castledermot. Formerly there were an immense number of religious houses in the county. There are remains of a Franciscan abbey at Castledermot. At Graney are ruins of an Augustinian nunnery and portions of a building said to have belonged to the Knights Templars. The town of Kildare has ruins of four monastic buildings, including the nunnery founded by St Brigit. The site of a monastery at Old Kilcullen, said to date from the time of St Patrick, is marked by two stone crosses, one of which is curiously sculptured. The fine abbey of Monasterevan is now the seat of the marquess of Drogheda. On the Liffey are the remains of Great Connel Abbey near Celbridge, of St Wolstan's near Celbridge, and of New Abbey. At Moone, where there was a Franciscan monastery, are the remains of an ancient cross with curious sculpturings. Among castles may be mentioned those of Athy and Castledermot, built about the time of the Anglo-Norman invasion; Maynooth Castle, built by the Fitzgeralds; Kilkea, originally built by the seventh earl of Kildare, and restored within the 19th century; and Timolin, erected in the reign of King John.

KILDARE, a market town and the county town of county Kildare, Ireland, in the south parliamentary division, a junction on the main line of the Great Southern & Western railway, 30. m. S.W. from Dublin, the branch line to Athy, Carlow and Kilkenny diverging southward. Pop. (1901), 1576. The town is of high antiquarian interest. There is a Protestant cathedral church, the diocese of which was united with Dublin in 1846. St Brigit or Bridget founded the religious community in the 5th century, and a fire sacred to the memory of the saint is said to have been kept incessantly burning for several centuries (until the Reformation) in a small ancient chapel called the Fire House, part of which remains. The cathedral suffered with the town from frequent burnings and destructions at the hands of the Danes and the Irish, and during the Elizabethan wars. The existing church was partially in ruins when an extensive restoration was begun in 1875 under the direction of G.E. Street; while the choir, which dated from the latter part of the 17th century, was rebuilt in 1896. Close to the church are an ancient cross and a very fine round tower (its summit unhappily restored with a modern battlement) 105½ ft. high, with a doorway with unusual ornament of Romanesque character. There are remains of a castle of the 13th century, and of a Carmelite monastery. From the elevated situation of the town, a striking view of the great central plain of Ireland is afforded. Kildare was incorporated by James II., and returned two members to the Irish parliament.

KILHAM, ALEXANDER (1762–1798), English Methodist, was born at Epworth, Lincolnshire, on the 10th of July 1762. He was admitted by John Wesley in 1785 into the regular itinerant ministry. He became the leader and spokesman of the democratic party in the Connexion which claimed for the laity the free election of class-leaders and stewards, and equal representation with ministers at Conference. They also contended that the ministry should possess no official authority or pastoral prerogative, but should merely carry into effect the decisions of majorities in the different meetings. Kilham further advocated the complete separation of the Methodists from the Anglican Church. In the violent controversy that ensued he wrote many pamphlets, often anonymous, and frequently not in the best of taste. For this he was arraigned before the Conference of 1796 and expelled, and he then founded the Methodist New Connexion (1798, merged since 1906 in the United Methodist Church). He died in 1798, and the success of the church he founded is a tribute to his personality and to the principles for which he strove. Kilham's wife (Hannah Spurr, 1774–1832), whom he married only a few months before his death, became a Quaker, and worked as a missionary in the Gambia and at Sierra Leone; she reduced to writing several West African vernaculars.

KILIA, a town of S. Russia, in the government of Bessarabia, 100 m. S.W. of Odessa, on the Kilia branch of the Danube, 20 m. from its mouth. Pop. (1897), 11,703. It has steam flour-mills and a rapidly increasing trade. The town, anciently known as Chilia, Chele, and Lycostomium, was a place of banishment for political dignitaries of Byzantium in the 12th–13th centuries. After belonging to the Genoese from 1381–1403 it was occupied successively by Walachia and Moldavia, until in 1484 it fell into the hands of the Ottoman Turks. It was taken from them by the Russians in 1790. After being bombarded by the Anglo-French fleet in July 1854, it was given to Rumania on the conclusion of the war; but in 1878 was transferred to Russia with Bessarabia.

KILIAN (CHILIAN, KILLIAN), **ST,** British missionary bishop and the apostle of eastern Franconia, where he began his labours towards the end of the 7th century. There are several biographies of him, the first of which dates back to the 9th century (*Bibliotheca hagiographica latina*, Nos. 4660–4663). The oldest texts which refer to him are an 8th century necrology at Würzburg and the notice by Hrabanus Maurus in his martyrology. According to Maurus Kilian was a native of Ireland, whence with his companions he went to eastern Franconia. After having preached the gospel in Würzburg, the whole party were put to death by the orders of an unjust judge named Gozbert. It is difficult to fix the period with precision, as the judge (or duke) Gozbert is not known through other sources. Kilian's comrades, Coloman and Totman, were, according to the Würzburg necrology, respectively priest and deacon. The elevation of the relics of the three martyrs was performed by Burchard, the first bishop of Würzburg, and they are venerated in the cathedral of that town. His festival is celebrated on the 8th of July.

See *Acta Sanctorum*, Julii, ii. 599–619; F. Emmerich, *Der heilige Kilian* (Würzburg, 1896); J. O'Hanlon, *Lives of the Irish Saints*, vii. 122–143 (Dublin, 1875–1904); A. Hauck, *Kirchengeschichte Deutschlands*, 3rd ed., i. 382 seq. (H. DE.)

KILIMANJARO, a great mountain in East Africa, its centre lying in 3° 5′ S. and 37° 23′ E. It is the highest known summit of the continent, rising as a volcanic cone from a plateau of about 3000 ft. to 19,321 ft. Though completely isolated it is but one of several summits which crown the eastern edge of the great plateau of equatorial Africa. About 200 m. almost due north, across the wide expanse of the Kapte and Kikuyu uplands, lies Mount Kenya, somewhat inferior in height and mass to Kilimanjaro; and some 25 m. due west rises the noble mass of Mount Meru.

The major axis of Kilimanjaro runs almost east and west, and on it rise the two principal summits, Kibo in the west, Mawenzi (Ki-mawenzi) in the east. Kibo, the higher, is a truncated cone with a nearly perfect extinct crater, and marks a comparatively recent period of volcanic activity; while Mawenzi (16,892 ft.) is the very ancient core of a former summit, of which the crater walls have been removed by denudation. The two peaks, about 7 m. apart, are connected by a saddle or plateau, about 14,000 ft. in altitude, below which the vast mass slopes with great regularity in a typical volcanic curve, especially in the south, to the plains below. The sides are furrowed on the south and east by a large number of narrow ravines, down which flow streams which feed the Pangani and Lake Jipe in the south and the Tsavo tributary of the Sabaki in the east. South-west of Kibo, the Shira ridge seems to be of independent origin, while in the north-west a rugged group of cones, of comparatively recent origin, has poured forth vast lava-flows. In the south-east the regularity of the outline is likewise broken by a ridge running down from Mawenzi.

The lava slopes of the Kibo peak are covered to a depth of some 200 ft. with an ice-cap, which, where ravines occur, takes the form of genuine glaciers. The crater walls are highest on the south, three small peaks, uncovered by ice, rising from the rim on this side. To the central and highest of these, the culminating point of the mountain, the name Kaiser Wilhelm Spitze has been given. The rim here sinks precipitously some 600 ft. to the interior of the crater, which measures rather over 2000 yds. in diameter, and is in part covered by ice, in part by a bare cone of ashes. On the west the rim is breached, allowing the passage of an important glacier formed from the snow which falls within the crater. Lower down this cleft, which owed its origin to dislocation, is occupied by two glaciers, one of which reaches a lower level (13,800 ft.) than any other on Kilimanjaro. On the north-west three large glaciers reach down to 16,000 ft.

Mawenzi peak has no permanent ice-cap, though at times snow lies in patches. The rock of which it is composed has become very jagged by denudation, forming stupendous walls and precipices. On the east the peak falls with great abruptness some 6500 ft. to a vast ravine, due apparently to dislocation and sinking of the ground. Below this the slope is more gradual and more symmetrical. Like the other high mountains of eastern Africa, Kilimanjaro presents well-defined zones of vegetation. The lowest slopes are arid and scantily covered with scrub, but between 4000 and 6000 ft. on the south side the slopes are well watered and cultivated. The forest zone begins, on the south, at about 6500 ft., and extends to 9500, but in the north it is narrower, and in the north-west, the driest quarter of the mountain, almost disappears. In the alpine zone, marked especially by tree lobelias and *Senecio*, flowering plants extend up to 15,700 ft. on the sheltered south-west flank of Mawenzi, but elsewhere vegetation grows only in dwarfed patches beyond 13,000 ft. The special fauna and flora of the upper zone are akin to those of other high African mountains, including Cameroon. The southern slopes, between 4000 and 6000 ft., form the well-peopled country of Chaga, divided into small districts.

As the natives believe that the summit of Kilimanjaro is composed of silver, it is conjectured that Aristotle's reference to "the so-called Silver Mountain" from which the Nile flows was based on reports about this mountain. It is possible, however, that the "Silver Mountain" was Ruwenzori (*q.v.*), from whose snow-clad heights several headstreams of the Nile do descend. It is also possible, though improbable, that Ruwenzori and not Kilimanjaro nor Kenya may be the range known to Ptolemy and to the Arab geographers of the middle ages as the Mountains of the Moon. Reports of the existence of mountains covered with snow were brought to Zanzibar about 1845 by Arab traders. Attracted by these reports Johannes Rebmann of the Church Missionary Society journeyed inland from Mombasa in 1848 and discovered Kilimanjaro, which is some 200 m. inland. Rebmann's account, though fully borne out by his colleague Dr Ludwig Krapf, was at first received with great incredulity by professional geographers. The matter was finally set at rest by the visits paid to the mountain by Baron Karl von der Decken (1861 and 1862) and Charles New (1867), the latter of whom reached the lower edge of the snow. Kilimanjaro has since been explored by Joseph Thomson (1883), Sir H. H. Johnston (1884), and others. It has been the special study of Dr Hans Meyer, who made four expeditions to it, accomplishing the first ascent to the summit in 1889. In the partition of Africa between the powers of western Europe, Kilimanjaro was secured by Germany (1886) though the first treaties concluded with native chiefs in that region had been made in 1884 by Sir H. H. Johnston on behalf of a British company. On the southern side of the mountain at Moshi is a German government station.

See R. Thornton (the geologist of von der Decken's party) in *Proc. of Roy. Geog. Soc.* (1861–1862); Ludwig Krapf, *Travels in East Africa* (1860); Charles New, *Life . . . in East Africa* (1873); Sir J. D. Hooker in *Journal of Linnean Society* (1875); Sir H. H. Johnston, *The Kilimanjaro Expedition* (1886); Hans Meyer, *Across East African Glaciers* (1891); *Der Kilimanjaro* (Berlin, 1900). Except the last-named all these works were published in London. (E. HE.)

KILIN, or CH'-I-LIN, one of the four symbolical creatures which in Chinese mythology are believed to keep watch and ward over the Celestial Empire. It is a unicorn, portrayed in Chinese art as having the body and legs of a deer and an ox's tail. Its advent on earth heralds an age of enlightened government and civic prosperity. It is regarded as the noblest of the animal creation and as the incarnation of fire, water, wood, metal and earth. It lives for a thousand years, and is believed to step so softly as to leave no footprints and to crush no living thing.

KILKEE, a seaside resort of county Clare, Ireland, the terminus of a branch of the West Clare railway. Pop. (1901), 1661. It lies on a small and picturesque inlet of the Atlantic named Moore Bay, with a beautiful sweep of sandy beach. The coast, fully exposed to the open ocean, abounds in fine cliff scenery, including numerous caves and natural arches, but is notoriously dangerous to shipping. Moore Bay is safe and attractive for bathers. Bishop's Island, a bold isolated rock in the vicinity, has remains of an oratory and house ascribed to the recluse St Senan.

KILKENNY, a county of Ireland, in the province of Leinster, bounded N. by Queen's County, E. by Carlow and Wexford, S. by Waterford, and W. by Waterford and Tipperary. The area is 511,775 acres, or about 800 sq. m. The greater part of Kilkenny forms the south-eastern extremity of the great central plain of Ireland, but in the south-east occurs an extension of the mountains of Wicklow and Carlow, and the plain is interrupted in the north by a hilly region forming part of the Castlecomer coal-field, which extends also into Queen's County and Tipperary. The principal rivers, the Suir, the Barrow and the Nore, have their origin in the Slieve Bloom Mountains (county Tipperary and Queen's County), and after widely divergent courses southward discharge their waters into Waterford Harbour. The Suir forms the boundary of the county with Waterford, and is navigable for small vessels to Carrick. The Nore, which is navigable to Innistioge, enters the county at its north-western boundary, and flows by Kilkenny to the Barrow, 9 m. above Ross, having received the King's River at Jerpoint and the Argula near Innistioge. The Barrow, which is navigable beyond the limits of Kilkenny into Kildare, forms the eastern boundary of the county from near New Bridge. There are no lakes of any extent, but turloughs or temporary lakes are occasionally formed by the bursting up of underground streams.

The coal of the Castlecomer basin is anthracite, and the most productive portions of the bed are in the centre of the basin at Castlecomer. Hematitic iron of a rich quality is found in the Cambro-Silurian rocks at several places; and tradition asserts that silver shields were made about 850 B.C. at Argetros or Silverwood on the Nore. Manganese is obtained in some of the limestone quarries, and also near the Barrow. Marl is abundant in various districts. Pipeclay and potter's clay are found, and also yellow ochre. Copper occurs near Knocktopher.

The high synclinal coal-field forms the most important feature of the north of the county. A prolongation of the field runs out south-west by Tullaroan. The lower ground is occupied by Carboniferous limestone. The Old Red Sandstone, with a Silurian core, forms the high ridge of Slievenaman in the south; and its upper laminated beds contain *Archanodon*, the earliest known freshwater mollusc, and plant-remains, at Kiltorcan near Ballyhale. The Leinster granite appears mainly as inliers in the Silurian of the south-east. The Carboniferous sandstones furnish the hard pavement-slabs sold as "Carlow flags." The black limestone with white shells in it at Kilkenny is quarried as an ornamental marble. Good slates are quarried at Kilmoganny, in the Silurian inlier on the Slievenaman range.

On account of the slope of the country, and the nature of the soil, the surface occupied by bog or wet land is very small, and the air is dry and healthy. So temperate is it in winter that the myrtle and arbutus grow in the open air. There is less rain than at Dublin, and vegetation is earlier than in the adjacent counties. Along the banks of the Suir, Nore and Barrow a very rich soil has been formed by alluvial deposits. Above the Coal-measures in the northern part of the county there is a moorland tract devoted chiefly to pasturage. The soil above the limestone is for the most part a deep and rich loam admirably adapted for the growth of wheat. The heath-covered hills afford honey with a flavour of peculiar excellence. Proportionately to its area, Kilkenny has an exceptionally large cultivable area. The proportion of tillage to pasturage is roughly as 1 to 2¼. Oats, barley, turnips and potatoes are all grown; the cultivation of wheat has very largely lapsed. Cattle, sheep, pigs and poultry are extensively reared, the Kerry cattle being in considerable request.

The linen manufacture introduced into the county in the 17th century by the duke of Ormonde to supersede the woollen manufacture gradually became extinct, and the woollen manufacture now carried on is also very small. There are, however, breweries, distilleries, tanneries and flour-mills, as well as marble polishing works. The county is traversed from N. to S. by the Maryborough, Kilkenny and Waterford branch of the Great Southern & Western railway, with a connexion from Kilkenny to Bagenalstown on the Kildare and Carlow line; and the Waterford and Limerick line of the same company runs for a short distance through the southern part of the county.

The population (87,496 in 1891; 79,159 in 1901) includes about 94% of Roman Catholics. The decrease of population is a little above the average, though emigration is distinctly below it. The chief towns and villages are Kilkenny (*q.v.*), Callan (1840), Castlecomer, Thomastown and Graigue. The county comprises 10 baronies and contains 134 civil parishes. The county includes the parliamentary borough of Kilkenny, and is divided into north and south parliamentary divisions, each returning one member. Kilkenny returned 16 members to the Irish parliament, two representing the county. Assizes are held at Kilkenny, and quarter sessions at Kilkenny, Pilltown, Urlingford, Castlecomer, Callan, Grace's Old Castle and Thomastown. The county is in the Protestant diocese of Ossory and the Roman Catholic dioceses of Ossory and Kildare and Leighlin.

Kilkenny is one of the counties generally considered to have been created by King John. It had previously formed part of the kingdom of Ossory, and was one of the liberties granted to the heiresses of Strongbow with palatinate rights. Circular groups of stones of very ancient origin are on the summits of Slieve Grian and the hill of Cloghmanta. There are a large number of cromlechs as well as raths (or encampments) in various parts of the county. Besides numerous forts and mounds there are five round towers, one adjoining the Protestant cathedral of Kilkenny, and others at Tulloherin, Kilree, Fertagh and Aghaviller. All, except that at Aghaviller, are nearly perfect. There are remains of a Cistercian monastery at Jerpoint, said to have been founded by Dunnough, King of Ossory, and of another belonging to the same order at Graigue, founded by the earl of Pembroke in 1212. The Dominicans had an abbey at Rosbercon founded in 1267, and another at Thomastown, of which there are some remains. The Carmelites had a monastery at Knocktopher. There were an Augustinian monastery at Inistioge, and priories at Callan and Kells, of all of which there are remains. There are also ruins of several old castles, such as those of Callan, Legan, Grenan and Clonamery, besides the ancient portions of Kilkenny Castle.

KILKENNY, a city and municipal and parliamentary borough (returning one member), the capital of county Kilkenny, Ireland, finely situated on the Nore, and on the Great Southern and Western railway, 81 m. S.W. of Dublin. Pop. (1901), 10,609. It consists of Englishtown (or Kilkenny proper) and Irishtown, which are separated by a small rivulet, but although Irishtown retains its name, it is now included in the borough of Kilkenny. The city is irregularly built, possesses several spacious streets with many good houses, while its beautiful environs and imposing ancient buildings give it an unusual interest and picturesque appearance. The Nore is crossed by two handsome bridges. The cathedral of St Canice, from whom the town takes its name, dates in its present form from about 1255. The see of Ossory, which originated in the monastery of Aghaboe founded by St Canice in the 6th century, and took its name from the early kingdom of Ossory, was moved to Kilkenny (according to conjecture) about the year 1200. In 1835 the diocese of Ferns and Leighlin was united to it. With the exception of St Patrick's, Dublin, the cathedral is the largest ecclesiastical building in Ireland, having a length from east to west of 226 ft., and a breadth along the transepts from north to south of 123 ft. It occupies an eminence at the western extremity of Irishtown. It is a cruciform structure mainly in Early English style, with a low massive tower supported on clustered columns of the black marble peculiar to the district. The building was extensively restored in 1865. It contains many old sepulchral monuments and other ancient memorials. The north transept incorporates the parish church. The adjacent library of St Canice contains numerous ancient books of great value. A short distance from the south transept is a round tower 100 ft. high; the original cap is wanting. The episcopal palace near the east end of the cathedral was erected in the time of Edward III. and enlarged in 1735. Besides the cathedral the principal churches are the Protestant church of St Mary, a plain cruciform structure of earlier foundation than the present cathedral; that of St John, including a portion of the hospital of St John founded about 1220; and the Roman Catholic cathedral, of the diocese of Ossory, dedicated to St Mary (1843–1857), a cruciform structure in the Early Pointed style, with a massive central tower. There are important remains of two monasteries—the Dominican abbey founded in 1225, and now used as a Roman Catholic church; and the Franciscan abbey on the banks of the Nore, founded about 1230. But next in importance to the cathedral is the castle, the seat of the marquess of Ormonde, on the summit of a precipice above the Nore. It was originally built by Strongbow, but rebuilt by William Marshall after the destruction of the first castle in 1175; and many additions and restorations by members of the Ormonde family have maintained it as a princely residence. The Protestant college of St John, originally founded by Pierce Butler, 8th earl of Ormonde, in the 16th century, and re-endowed in 1684 by James, 1st duke of Ormonde, stands on the banks of the river opposite the castle. In it Swift, Farquhar, Congreve and Bishop Berkeley received part of their education. On the outskirts of the city is the Roman Catholic college of St Kyran (Kieran), a Gothic building completed about 1840. The other principal buildings are the modern court-house, the tholsel or city court (1764), the city and county prison, the barracks and the county infirmary. In the neighbourhood are collieries as well as long-established quarries for marble, the manufactures connected with which are an important industry of the town. The city also possesses corn-mills, breweries and tanneries. Not far from the city are the remarkable limestone caverns of Dunmore, which have yielded numerous human remains. The corporation of Kilkenny consists of a mayor, 6 aldermen and 18 councillors.

Kilkenny proper owes its origin to an English settlement in the time of Strongbow, and it received a charter from William Marshall, who married Strongbow's daughter. This charter was confirmed by Edward III., and from Edward IV. Irishtown received the privilege of choosing a portreeve independent of Kilkenny. By Elizabeth the boroughs, while retaining their distinct rights, were constituted one corporation, which in 1609 was made a free borough by James I., and in the following year a free city. From James II. the citizens received a new charter, constituting the city and liberties a distinct county, to be styled the county of the city of Kilkenny, the burgesses of Irishtown continuing, however, to elect a portreeve until the passing of the Muncipal Reform Act. Frequent parliaments were held at Kilkenny from the 14th to the 16th century, and so late as the reign of Henry VIII. it was the occasional residence of the lord-lieutenant. In 1642 it was the meeting-place of the assembly of confederate Catholics. In 1648 Cromwell, in the hope of obtaining possession of the town by means of a plot, advanced towards it, but before his arrival the plot was discovered. In 1650 it was, however, compelled to surrender after a long and resolute defence. At a very early period Kilkenny and Irishtown returned each two members to the Irish parliament, but since the Union one member only has been returned to Westminster for the city of Kilkenny.

The origin of the expression "to fight like Kilkenny cats," which, according to the legend, fought till only their tails were left, has been the subject of many conjectures. It is said to be an allegory on the disastrous municipal quarrels of Kilkenny and Irishtown which lasted from the end of the 14th to the end of the 17th centuries (*Notes and Queries*, 1st series, vol. ii. p. 71). It is referred also to the brutal sport of some Hessian soldiers, quartered in Kilkenny during the rebellions of 1798 or 1803, who tied two cats together by their tails, hung them over a line and left them to fight. A soldier is said to have freed them by cutting off their tails to escape censure from the officers (ibid. 3rd series, vol. v. p. 433). Lastly, it is attributed to the invention of J. P. Curran. As a sarcastic protest against cock-fighting in England, he declared that he had witnessed in Sligo (?) fights between trained cats, and that once they had fought so fiercely that only their tails were left (ibid. 7th series, vol. ii. p. 394).

KILKENNY, STATUTE OF, the name given to a body of laws promulgated in 1366 with the object of strengthening the English authority in Ireland. In 1361, when Edward III. was on the English throne, he sent one of his younger sons, Lionel, duke of Clarence, who was already married to an Irish heiress, to represent him in Ireland. From the English point of view the country was in a most unsatisfactory condition. Lawless and predatory, the English settlers were hardly distinguishable from the native Irish, and the authority of the English king over both had been reduced to vanishing point. In their efforts to cope with the prevailing disorder Lionel and his advisers summoned a parliament to meet at Kilkenny early in 1366 and here the statute of Kilkenny was passed into law. This statute was written in Norman-French, and nineteen of its clauses are merely repetitions of some ordinances which had been drawn up at Kilkenny fifteen years earlier. It began by relating how the existing state of lawlessness was due to the malign influence exercised by the Irish over the English, and, like Magna Carta, its first positive provision declared that the church should be free. As a prime remedy for the prevailing evils all marriages between the two races were forbidden. Englishmen must not speak the Irish tongue, nor receive Irish minstrels into their dwellings, nor even ride in the Irish fashion; while to give or sell horses or armour to the Irish was made a treasonable offence. Moreover English and not Breton law was to be employed, and no Irishman could legally be receivd into a religious house, nor presented to a benefice. The statute also contained clauses for compelling the English settlers to keep the laws. For each county four wardens of the peace were to be appointed, while the sheriffs were to hold their tourns twice a year and were not to oppress the people by their exactions. An attempt was made to prevent the emigration of labourers, and finally the spiritual arm was invoked to secure obedience to these laws by threats of excommunication. The statute, although marking an interesting stage in the history of Ireland, had very little practical effect.

The full text is published in the *Statutes and Ordinances of Ireland. John to Henry V.*, by H. F. Berry (1907).

KILLALA (pron. *Killálla*), a small town on the north coast of county Mayo, Ireland, in the northern parliamentary division, on the western shore of a fine bay to which it gives name. Pop. (1901), 510. It is a terminus of a branch of the Midland Great Western railway. Its trade is almost wholly diverted to Ballina on the river Moy, which enters the bay, but Killala is of high antiquarian and historical interest. It was for many centuries a bishop's see, the foundation being attributed to St Patrick in the 5th century, but the diocese was joined with Achonry early in the 17th century and with Tuam in 1833. The cathedral church of St Patrick is a plain structure of the 17th century. There is a fine souterrain, evidently connected with a rath, or encampment, in the graveyard. A round tower, 84 ft. in height, stands boldly on an isolated eminence. Close to Killala the French under Humbert landed in 1798, being diverted by contrary winds from the Donegal coast. Near the Moy river, south of Killala, are the abbeys of Moyne and Roserk or Rosserick, both Decorated in style, and both possessing fine cloisters. At Rathfran, 2 m. N., is a Dominican abbey (1274), and in the neighbourhood are camps, cromlechs, and an inscribed ogham stone, 12 ft. in height. Killala gives name to a Roman Catholic diocese, the seat of which, however, is at Ballina.

KILLALOE, a town of county Clare, Ireland, in the east parliamentary division, at the lower extremity of Lough Derg on the river Shannon, at the foot of the Slieve Bernagh mountains. Pop. (1901), 885. It is connected, so as to form one town, with Ballina (county Tipperary) by a bridge of 13 arches. Ballina is the terminus of a branch of the Great Southern and Western railway, 15 m. N.E. of Limerick. Slate is quarried in the vicinity, and there were formerly woollen manufactures. The cathedral of St Flannan occupies the site of a church founded by St Dalua in the 6th century. The present building is mainly of the 12th century, a good cruciform example of the period, preserving, however, a magnificent Romanesque doorway. It was probably completed by Donall O'Brien, king of Munster, but part of the fabric dates from a century before his time. In the churchyard is an ancient oratory said to date from the period of St Dalua. Near Killaloe stood Brian Boru's palace of Kincora, celebrated in verse by Moore; for this was the capital of the kings of Munster. Killaloe is frequented by anglers for the Shannon salmon-fishing and for trout-fishing in Lough Derg. Killaloe gives name to Protestant and Roman Catholic dioceses.

KILLARNEY, a market town of county Kerry, Ireland, in the east parliamentary division, on a branch line of the Great Southern & Western railway, 185¼ m. S.W. from Dublin. Pop. of urban district (1901), 5656. On account of the beautiful scenery in the neighbourhood the town is much frequented by tourists. The principal buildings are the Roman Catholic cathedral and bishop's palace of the diocese of Kerry, designed by A. W. Pugin, a large Protestant church and several hotels. Adjoining the town is the mansion of the earl of Kenmare. There is a school of arts and crafts, where carving and inlaying are prosecuted. The only manufacture of importance now carried on at Killarney is that of fancy articles from arbutus wood; but it owed its origin to iron-smelting works, for which abundant fuel was obtained from the neighbouring forests.

The lakes of Killarney, about 1½ m. from the town, lie in a basin between several lofty mountain groups, some of which rise abruptly from the water's edge, and all clothed with trees and shrubbery almost to their summits. The lower lake, or Lough Leane (area 5001 acres), is studded with finely wooded islands, on the largest of which, Ross Island, are the ruins of Ross Castle, an old fortress of the O'Donoghues; and on another island, the "sweet Innisfallen" of Moore, are the picturesque ruins of an abbey founded by St Finian the leper at the close of the 6th century. Between the lower lake and the middle or Torc lake (680 acres in extent) stands Muckross Abbey, built by Franciscans about 1440. With the upper lake (430 acres), thickly studded with islands, and close shut in by mountains, the lower and middle lakes are connected by the Long Range, a winding and finely wooded channel, 2½ m. in length, and commanding magnificent views of the mountains. Midway in its course is a famous echo caused by the Eagle's Nest, a lofty pyramidal rock.

Besides the lakes of Killarney themselves, the immediate neighbourhood includes many features of natural beauty and of historic interest. Among the first are Macgillicuddy's Reeks and the Torc and Purple Mountains, the famous pass known as the Gap of Dunloe, Mount Mangerton, with a curious depression (the Devil's Punchbowl) near its summit, the waterfalls of Torc and Derrycunihy, and Lough Guitane, above Lough Leane. Notable ruins and remains, besides Muckross and Innisfallen, include Aghadoe, with its ruined church of the 12th century (formerly a cathedral) and remains of a round tower; and the Ogham Cave of Dunloe, a souterrain containing inscribed stones. The waters of the neighbourhood provide trout and salmon, and the flora is of high interest to the botanist. Innumerable legends centre round the traditional hero O'Donoghue.

KILLDEER, a common American plover, so called in imitation of its whistling cry, the *Charadrius vociferus* of Linnaeus, and the *Aegialitis vocifera* of modern ornithologists. About the size of a snipe, it is mostly sooty-brown above, but showing a bright buff on the tail coverts, and in flight a white bar on the wings; beneath it is pure white except two pectoral bands of deep black. It is one of the finest as well as the largest of the group commonly known as ringed plovers or ring dotterels,[1] forming the genus *Aegialitis* of Boie. Mostly wintering in the south or only on the sea-shore of the more northern states, in spring it spreads widely over the interior, breeding on the newly ploughed lands or on open grass-fields. The nest is made in a slight hollow, and is often surrounded with small pebbles and fragments of shells. Here the hen lays her pear-shaped, stone-coloured eggs, four in number, and always arranged with their pointed ends touching each other, as is the custom of most Limicoline birds. The parents exhibit the greatest anxiety for their offspring on the approach of an intruder. It is the best-known bird of its family in the United States, where it is less abundant in the north-east than farther south or west. In Canada it does not range farther northward than 56° N.; it is not known in Greenland, and hardly in Labrador, though it is a passenger in Newfoundland every spring and autumn.[2] In winter it finds its way to Bermuda and to some of the Antilles, but it is not recorded from any of the islands to the windward of Porto Rico. In the other direction, however, it travels down the Isthmus of Panama and the west coast of South America to Peru. The killdeer has several other congeners in America, among which may be noticed *Ae. semipalmata*, curiously resembling the ordinary ringed plover of the Old World, *Ae. hiaticula*, except that it has its toes connected by a web at the base; and *Ae. nivosa*, a bird inhabiting the western parts of both the American continents, which in the opinion of some authors is only a local form of the widely spread *Ae. alexandrina* or *cantiana*, best known as Kentish plover, from its discovery near Sandwich towards the end of the 18th century, though it is far more abundant in many other parts of the Old World. The common ringed plover, *Ae. hiaticula*, has many of the habits of the killdeer, but is much less often found away from the sea-shore, though a few colonies may be found in dry warrens in certain parts of England many miles from the coast, and in Lapland at a still greater distance. In such localities it paves its nest with small stones (whence it is locally known as "Stone hatch"), a habit almost unaccountable unless regarded as an inherited instinct from shingle-haunting ancestors.

(A. N.)

KILLIECRANKIE, a pass of Perthshire, Scotland, 3¾ m. N.N.W. of Pitlochry by the Highland railway. Beginning close to Killiecrankie station it extends southwards to the bridge of Garry for nearly 1½ m. through the narrow, extremely beautiful, densely wooded glen in the channel of which flows the Garry. A road constructed by General Wade in 1732 runs up the pass, and between this and the river is the railway, built in 1863. The battle of the 27th of July 1689, between some 3000 Jacobites under Viscount Dundee and the royal force, about 4000 strong, led by General Hugh Mackay, though named from the ravine, was not actually fought in the pass. When Mackay emerged from the gorge he found the Highlanders already in battle array on the high ground on the right bank of the Girnaig, a tributary of the Garry, within half a mile of where the railway station now is. Before he had time to form on the more open table-land, the clansmen charged impetuously with their claymores and swept his troops back into the pass and the Garry. Mackay lost nearly half his force, the Jacobites about 900, including their leader. Urrard House adjoins the spot where Viscount Dundee received his death-wound.

KILLIGREW, SIR HENRY (d. 1603), English diplomatist, belonged to an old Cornish family and became member of parliament for Launceston in 1553. Having lived abroad during the whole or part of Mary's reign, he returned to England when Elizabeth came to the throne and at once began to serve the new queen as a diplomatist. He was employed on a mission to Germany, and in conducting negotiations in Scotland, where he had several interviews with Mary Queen of Scots. He was knighted in 1591, and after other diplomatic missions in various parts of Europe he died early in 1603. Many of Sir Henry's letters on public matters are in the Record Office, London, and in the British Museum. His first wife, Catherine (*c.* 1530–1583), daughter of Sir Anthony Cooke (1504–1576), tutor to Edward VI., was a lady of talent.

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[1] The word dotterel seems properly applicable to a single species only, the *Charadrius morinellus* of Linnaeus, which, from some of its osteological characters, may be fitly regarded as the type of a distinct genus, *Eudromias*. Whether any other species agree with it in the peculiarity alluded to is at present uncertain.

[2] A single example is said to have been shot near Christchurch, in Hampshire, England, in April 1857 (*Ibis*, 1862, p. 276).

Another celebrated member of this family was Sir ROBERT KILLIGREW (*c.* 1579–1633), who was knighted by James I. in the same year (1603) as his father, Sir William Killigrew. Sir William was an officer in Queen Elizabeth's household and a member of parliament; he died in November 1622. Sir Robert was a member of all the parliaments between 1603 and his death, but he came more into prominence owing to his alleged connexion with the death of Sir Thomas Overbury. A man of some scientific knowledge, he had been in the habit of supplying powders to Robert Carr, earl of Somerset, but it is not certain that the fatal powder came from the hands of Killigrew. He died early in 1633, leaving five sons, three of whom attained some reputation (see below).

KILLIGREW, THOMAS (1612–1683), English dramatist and wit, son of Sir Robert Killigrew, was born in Lothbury, London, on the 7th of February 1612. Pepys says that as a boy he satisfied his love of the stage by volunteering at the Red Bull to take the part of a devil, thus seeing the play for nothing. In 1633 he became page to Charles I., and was faithfully attached to the royal house throughout his life. In 1635 he was in France, and has left an account (printed in the *European Magazine*, 1803) of the exorcizing of an evil spirit from some nuns at Loudun. In 1641 he published two tragi-comedies, *The Prisoners* and *Claracilla*, both of which had probably been produced before 1636. In 1647 he followed Prince Charles into exile. His wit, easy morals and accommodating temper recommended him to Charles, who sent him to Venice in 1651 as his representative. Early in the following year he was recalled at the request of the Venetian ambassador in Paris. At the Restoration he became groom of the bedchamber to Charles II., and later chamberlain to the queen. He received in 1660, with Sir William Davenant, a patent to erect a new playhouse, the performances in which were to be independent of the censorship of the master of the revels. This infringement of his prerogative caused a dispute with Sir Henry Herbert, then holder of the office, but Killigrew settled the matter by generous concessions. He acted independently of Davenant, his company being known as the King's Servants. They played at the Red Bull, until in 1663 he built for them the original Theatre Royal in Drury Lane. Pepys writes in 1664 that Killigrew intended to have four opera seasons of six weeks each during the year, and with this end in view paid several visits to Rome to secure singers and scene decorators. In 1664 his plays were published as *Comedies and Tragedies. Written by Thomas Killigrew.* They are *Claracilla*; *The Princess, or Love at First Sight*; *The Parson's Wedding*; *The Pilgrim*; *Cicilia and Clorinda, or Love in Arms*; *Thomaso, or the Wanderer*; and *Bellamira, her Dream, or Love of Shadows*. *The Parson's Wedding* (acted *c.* 1640, reprinted in the various editions of Dodsley's *Old Plays* and in the *Ancient British Drama*) is an unsavoury play, which displays nevertheless considerable wit, and some of its jokes were appropriated by Congreve. It was revived after the Restoration in 1664 and 1672 or 1673, all the parts being in both cases taken by women. Killigrew succeeded Sir Henry Herbert as master of the revels in 1673. He died at Whitehall on the 19th of March 1683. He was twice married, first to Cecilia Crofts, maid of honour to Queen Henrietta Maria, and secondly to Charlotte de Hesse, by whom he had a son Thomas (1657–1719), who was the author of a successful little piece, *Chit-Chat*, played at Drury Lane on the 14th of February 1719, with Mrs Oldfield in the part of Florinda.

Killigrew enjoyed a greater reputation as a wit than as a dramatist. Sir John Denham said of him:—

> Had Cowley ne'er spoke, Killigrew ne'er writ,
> Combined in one, they'd made a matchless wit.

Many stories are related of his bold speeches to Charles I. Pepys (Feb. 12, 1668) records that he was said to hold the title of King's Fool or Jester, with a cap and bells at the expense of the king's wardrobe, and that he might therefore revile or jeer anybody, even the greatest, without offence.

His elder brother, Sir WILLIAM KILLIGREW (1606–1695), was a court official under Charles I. and Charles II. He attempted to drain the Lincolnshire fens, and was the author of four plays (printed 1665 and 1666) of some merit.

A younger brother, Dr HENRY KILLIGREW (1613–1700), was chaplain and almoner to the duke of York, and master of the Savoy after the Restoration. A juvenile play of his, *The Conspiracy*, was printed surreptitiously in 1638, and in an authenticated version in 1653 as *Pallantus and Eudora.* He had two sons, HENRY KILLIGREW (d. 1712), an admiral, and JAMES KILLIGREW, also a naval officer, who was killed in an encounter with the French in January 1695; and a daughter, ANNE (1660–1685), poet and painter, who was maid of honour to the duchess of York, and was the subject of an ode by Dryden, which Samuel Johnson thought the noblest in the language.

A sister, ELIZABETH KILLIGREW, married Francis Boyle, 1st Viscount Shannon, and became a mistress of Charles II.

KILLIN, a village and parish of Perthshire, Scotland, at the south-western extremity of Loch Tay, 4 m. N.E. of Killin Junction on a branch line of the Callander & Oban railway. Pop. of parish (1901), 1423. It is situated near the confluence of the rivers and glens of the Dochart and Lochay, and is a popular tourist centre, having communication by steamer with Kenmore at the other end of the lake, and thence by coach to Aberfeldy, the terminus of a branch of the Highland railway. It has manufactures of tweeds. In a field near the village a stone marks the site of what is known as Fingal's Grove. An island in the Dochart (which is crossed at Killin by a bridge of five arches) is the ancient burial-place of the clan Macnab. Finlarig Castle, a picturesque mass of ivy-clad ruins, was a stronghold of the Campbells of Glenorchy, and several earls of Breadalbane were buried in ground adjoining it, where the modern mausoleum of the family stands. Three miles up the Lochay, which rises in the hills beyond the forest of Mamlorn and has a course of 15 m., the river forms a graceful cascade. The Dochart, issuing from Loch Dochart, flows for 13 m. in a north-easterly direction and falls into Loch Tay. The ruined castle on an islet in the loch once belonged to the Campbells of Lochawe.

KILLIS, a town of N. Syria, in the vilayet of Aleppo, 60 m. N. of Aleppo city. It is situated in an extremely fertile plain, and is completely surrounded with olive groves, the produce of which is reckoned the finest oil of all Syria; and its position on the carriage-road from Aleppo to Aintab and Birejik gives it importance. The population (20,000) consists largely of Circassians, Turkomans and Arabs, the town lying just on the northern rim of the Arab territory. As Killis lies also very near the proposed junction of the Bagdad and the Beirut-Aleppo railways (at Tell Habesh), it is likely to increase in importance.

KILLYBEGS, a seaport and market town of county Donegal, Ireland, in the south parliamentary division, on the north coast on Donegal Bay, the terminus of the Donegal railway. Pop. (1901), 607. It derives some importance from its fine land-locked harbour, which, affording accommodation to large vessels, is used as a naval station, and is the centre of an important fishery. There is a large pier for the fishing vessels. The manufacture of carpets occupies a part of the population, employing both male and female labour—the productions being known as Donegal carpets. There are slight remains of a castle and ancient church; and a mineral spring is still used. The town received a charter from James I., and was a parliamentary borough, returning two members, until the Union.

KILLYLEAGH, a small seaport and market town of county Down, Ireland, in the east parliamentary division, on the western shore of Strangford Lough. Pop. (1901), 1410. Linen manufacture is the principal industry, and agricultural produce is exported. Killyleagh was an important stronghold in early times, and the modern castle preserves the towers of the old building. Sir John de Courcy erected this among many other fortresses in the neighbourhood; it was besieged by Shane O'Neill (1567), destroyed by Monk (1648), and subsequently rebuilt. The town was incorporated by James I., and returned two members to the Irish parliament.

KILMAINE, CHARLES EDWARD (1751–1799), French general, was born at Dublin on the 19th of October 1751. At the age of eleven he went with his father, whose surname was Jennings, to France, where he changed his name to Kilmaine, after a village in Mayo. He entered the French army as an officer in a dragoon regiment in 1774, and afterwards served as a volunteer in the Navy (1778), during which period he was engaged in the fighting in Senegal. From 1780 to 1783 he took part in the War of American Independence under Rochambeau, rejoining the army on his return to France. In 1791, as a retired captain, he took the civic oath and was recalled to active service, becoming lieutenant-colonel in 1792, and colonel, brigadier-general, and lieutenant-general in 1793. In this last capacity he distinguished himself in the wars on the northern and eastern frontiers. But he became an object of suspicion on account of his foreign birth and his relations with England. He was suspended on the 4th of August 1793, and was not recalled to active service till 1795. He then took part in the Italian campaigns of 1796 and 1797, and was made commandant of Lombardy. He afterwards received the command of the cavalry in Bonaparte's "army of England," of which, during the absence of Desaix, he was temporarily commander-in-chief (1798). He died on the 15th of December 1799

See J. G. Alger, *Englishmen in the French Revolution* (1889); Eugène Fieffé, *Histoire des troupes étrangères au service de France* (1854); Etienne Charavay, *Correspondance de Carnot*, tome iii.

KILMALLOCK, a market town of county Limerick, Ireland, in the east parliamentary division, 124¼ m. S.W. of Dublin by the Great Southern & Western main line. Pop. (1901), 1206. It commands a natural route (now followed by the railway) through the hills to the south and south-west, and is a site of great historical interest. It received a charter in the reign of Edward III., at which time it was walled and fortified, and entered by four gates, two of which remain. It was a military post of importance in Elizabeth's reign, but its fortifications were for the most part demolished by order of Cromwell. Two castellated mansions are still to be seen. The church of St Peter and St Paul belonged to a former abbey, and has a tower at the north-west corner which is a converted round tower. The Dominican Abbey, of the 13th century, has Early English remains of great beauty and a tomb to Edmund, the last of the White Knights, a branch of the family of Desmond intimately connected with Kilmallock, who received their title from Edward III. at the battle of Halidon Hill. The foundation of Kilmallock, however, is attributed to the Geraldines, who had several towns in this vicinity. Eight miles from the town is Lough Gur, near which are numerous stone circles and other remains. Kilmallock returned two members to the Irish parliament.

KILMARNOCK, a municipal and police burgh of Ayrshire, Scotland, on Kilmarnock Water, a tributary of the Irvine, 24 m. S.W. of Glasgow by the Glasgow & South-Western railway. Pop. (1901), 35,091. Among the chief buildings are the town hall, court-house, corn-exchange (with the Albert Tower, 110 ft. high), observatory, academy, corporation art gallery, institute (containing a free library and a museum), Kay schools, School of Science and Art, Athenaeum, theatre, infirmary, Agricultural Hall, and Philosophical Institution. The grounds of Kilmarnock House, presented to the town in 1893, were laid out as a public park. In Kay Park (48¾ acres), purchased from the duke of Portland for £9000, stands the Burns Memorial, consisting of two storeys and a tower, and containing a museum in which have been placed many important MSS. of the poet and the McKie library of Burns's books. The marble statue of the poet, by W. G. Stevenson, stands on a terrace on the southern face. A Reformers' monument was unveiled in Kay Park in 1885. Kilmarnock rose into importance in the 17th century by its production of striped woollen "Kilmarnock cowls" and broad blue bonnets, and afterwards acquired a great name for its Brussels, Turkey and Scottish carpets. Tweeds, blankets, shawls, tartans, lace curtains, cottons and winceys are also produced. The boot and shoe trade is prosperous, and there are extensive engineering and hydraulic machinery works. But the iron industry is prominent, the town being situated in the midst of a rich mineral region. Here, too, are the workshops of the Glasgow & South-Western railway company. Kilmarnock is famous for its dairy produce, and every October holds the largest cheese-show in Scotland. The neighbourhood abounds in freestone and coal. The burgh, which is governed by a provost and council, unites with Dumbarton, Port Glasgow, Renfrew and Rutherglen in returning one member to parliament. Alexander Smith, the poet (1830–1867), whose father was a lace-pattern designer, and Sir James Shaw (1764–1843), lord mayor of London in 1806, to whom a statue was erected in the town in 1848, were natives of Kilmarnock. It dates from the 15th century, and in 1591 was made a burgh of barony under the Boyds, the ruling house of the district. The last Boyd who bore the title of Lord Kilmarnock was beheaded on Tower Hill, London, in 1746, for his share in the Jacobite rising. The first edition of Robert Burns's poems was published here in 1786.

KILMAURS, a town in the Cunningham division of Ayrshire, Scotland, on the Carmel, 21½ m. S. by W. of Glasgow by the Glasgow & South-Western railway. Pop. (1901), 1803. Once noted for its cutlery, the chief industries now are shoe and bonnet factories, and there are iron and coal mines in the neighbourhood. The parish church dates from 1170, and was dedicated either to the Virgin or to a Scottish saint of the 9th century called Maure. It was enlarged in 1403 and in great part rebuilt in 1888. Adjoining it is the burial-place of the earls of Glencairn, the leading personages in the district during several centuries, some of whom bore the style of Lord Kilmaurs. Their family name was Cunningham, adopted probably from the manor which they acquired in the 12th century. The town was made a burgh of barony in 1527 by the earl of that date. Burns's patron, the thirteenth earl, on whose death the poet wrote his touching "Lament," sold the Kilmaurs estate in 1786 to the marchioness of Titchfield.

KILN (O. E. *cylene*, from the Lat. *culina*, a kitchen, cooking-stove), a place for burning, baking or drying. Kilns may be divided into two classes—those in which the materials come into actual contact with the flames, and those in which the furnace is beneath or surrounding the oven. Lime-kilns are of the first class, and brick-kilns, pottery-kilns, &c., of the second, which also includes places for merely drying materials, such as hop-kilns, usually called "oasts" or "oast-houses."

KILPATRICK, NEW, or **EAST,** also called BEARSDEN, a town of Dumbartonshire, Scotland, 5½ m. N.W. of Glasgow by road, with a station on the North British railway company's branch line from Glasgow to Milngavie. Pop. (1901), 2705. The town is largely inhabited by business men from Glasgow. The public buildings include the Shaw convalescent home, Buchanan Retreat, house of refuge for girls, library, and St Peter's College, a fine structure, presented to the Roman Catholic Church in 1892 by the archbishop of Glasgow. There is some coal-mining, and lime is manufactured. Remains of the Wall of Antoninus are close to the town. At Garscube and Garscadden, both within 1½ m. of New Kilpatrick, are extensive iron-works, and at the former place coal is mined and stone quarried.

KILPATRICK, OLD, a town of Dumbartonshire, Scotland, on the right bank of the Clyde, 10½m. N.W. of Glasgow by rail, with stations on the North British and Caledonian railways. Pop. (1901), 1533. It is traditionally the birthplace of St Patrick, whose father is said to have acted there as a Roman magistrate. Roman remains occur in the district, and the Wall of Antoninus ran through the parish. To the north, occupying an area of about 6 m. from east to west and 5 m. from north to south run the Kilpatrick Hills, of which the highest points are Duncomb and Fynloch Hill (each 1313 ft.).

KILRUSH, a seaport and watering-place of county Clare, Ireland, in the west parliamentary division, on the north shore of the Shannon estuary 45 m. below Limerick. Pop. of urban district (1901), 4179. It is the terminus of a branch of the West Clare railway. The only seaport of importance in the county, it has a considerable export trade in peat fuel, extensive fisheries, and flagstone quarries; while general fairs, horse fairs and annual agricultural shows are held. The inner harbour admits only small vessels, but there is a good pier a mile south of the town. Off the harbour lies Scattery Island (*Inis Cathaigh*), where St Senan (d. 544) founded a monastery. There are the remains of his oratory and house and of seven rude churches or chapels, together with a round tower and a holy well still in repute. The island also received the epithet of Holy, and was a favourite burial-ground until modern times.

KILSYTH, a police burgh of Stirlingshire, Scotland, on the Kelvin, 13 m. N.N.E. of Glasgow by the North British railway, and close to the Forth and Clyde canal. Pop. (1901), 7292. The principal buildings are the town and public halls, and the academy. The chief industries are coal-mining and iron-works; there are also manufactures of paper and cotton, besides quarrying of whinstone and sandstone. There are considerable remains of the Wall of Antoninus south of the town, and to the north the ruins of the old castle. Kilsyth dates from the middle of the 17th century and became a burgh of barony in 1826. It was the scene of Montrose's defeat of the Covenanters on the 15th of August 1645. The town was the centre of remarkable religious revivals in 1742–3 and 1839, the latter conducted by William Chalmers Burns (1815–1868), the missionary to China.

KILT, properly the short loose skirt or petticoat, reaching to the knees and usually made of tartan, forming part of the dress of a Scottish Highlander (see Costume). The word means that which is "girded or tucked up," and is apparently of Scandinavian origin, cf. Danish *kilte*, to tuck up. The early kilt was not a separate garment but was merely the lower part of the plaid, in which the Highlander wrapped himself, hanging down in folds below the belt.

KILWA (Quiloa), a seaport of German East Africa, about 200 m. S. of Zanzibar. There are two Kilwas, one on the mainland—Kilwa Kivinje; the other, the ancient city, on an island—Kilwa Kisiwani. Kilwa Kivinje, on the northern side of Kilwa Bay, is regularly laid out, the houses in the European quarter being large and substantial. The government house and barracks are fortified and are surrounded by fine public gardens. The adjacent country is fertile and thickly populated, and the trade of the port is considerable. Much of it is in the hands of Banyans. Kilwa is a starting-point for caravans to Lake Nyasa. Pop. about 5000. Most of the inhabitants are Swahili.

Kilwa Kisiwani, 18 m. to the south of the modern town, possesses a deep harbour sheltered from all winds by projecting coral reefs. The island on which it is built is separated from the mainland by a shallow and narrow channel. The ruins of the city include massive walls and bastions, remains of a palace and of two large mosques, of which the domed roofs are in fair preservation, besides several Arab forts. The new quarter contains a customs house and a few Arab buildings. Pop. about 600. On the island of Songa Manara, at the southern end of Kilwa Bay, hidden in dense vegetation, are the ruins of another city, unknown to history. Fragments of palaces and mosques in carved limestone exist, and on the beach are the remains of a lighthouse. Chinese coins and pieces of porcelain have been found on the sea-shore, washed up from the reefs.

The sultanate of Kilwa is reputed to have been founded about A.D. 975 by Ali ibn Ḥasan, a Persian prince from Shiraz, upon the site of the ancient Greek colony of Rhapta. The new state, at first confined to the town of Kilwa, extended its influence along the coast from Zanzibar to Sofala, and the city came to be regarded as the capital of the Zenj "empire" (see Zanzibar: "Sultanate"). An Arab chronicle gives a list of over forty sovereigns who reigned at Kilwa in a period of five hundred years (cf. A. M. H J. Stokvis, *Manuel d'histoire*, Leiden, 1888, i. 558). Pedro Alvares Cabral, the Portuguese navigator, was the first European to visit it. His fleet, on its way to India, anchored in Kilwa Bay in 1500. Kilwa was then a large and wealthy city, possessing, it is stated, three hundred mosques. In 1502 Kilwa submitted to Vasco da Gama, but the sultan neglecting to pay the tribute imposed upon him, the city in 1505 was occupied by the Portuguese. They built a fort there; the first erected by them on the east coast of Africa. Fighting ensued between the Arabs and the Portuguese, the city was destroyed; and in 1512 the Portuguese, whose ranks had been decimated by fever, temporarily abandoned the place. Subsequently Kilwa became one of the chief centres of the slave trade. Towards the end of the 17th century it fell under the dominion of the imams of Muscat, and on the separation in 1856 of their Arabian and African possessions became subject to the sultan of Zanzibar. With the rest of the southern part of the sultan's continental dominions Kilwa was acquired by Germany in 1890 (see Africa, § 5; and German East Africa).

KILWARDBY, ROBERT (d. 1279), archbishop of Canterbury and cardinal, studied at the university of Paris, where he soon became famous as a teacher of grammar and logic. Afterwards joining the order of St Dominic and turning his attention to theology, he was chosen provincial prior of his order in England in 1261, and in October 1272 Pope Gregory X. terminated a dispute over the vacant archbishopric of Canterbury by appointing Kilwardby. Although the new archbishop crowned Edward I. and his queen Eleanor in August 1274, he took little part in business of state, but was energetic in discharging the spiritual duties of his office. He was charitable to the poor, and showed liberality to the Dominicans. In 1278 Pope Nicholas III. made him cardinal-bishop of Porto and Santa Rufina; he resigned his archbishopric and left England, carrying with him the registers and other valuable property belonging to the see of Canterbury. He died in Italy on the 11th of September 1279. Kilwardby was the first member of a mendicant order to attain a high position in the English Church. Among his numerous writings, which became very popular among students, are *De ortu scientiarum*, *De tempore*, *De Universali*, and some commentaries on Aristotle.

See N. Trevet, *Annales sex regum Angliae*, edited by T. Hog (London, 1845); W. F. Hook, *Lives of the Archbishops of Canterbury*, vol. iii. (London, 1860–1876); J. Quétif and J. Échard, *Scriptores ordinis Predicatorum* (Paris, 1719–1721).

KILWINNING, a municipal and police burgh of Ayrshire, Scotland, on the right bank of the Garnock, 24 m. S.W. of Glasgow by the Caledonian railway, and 26¾ m. by the Glasgow & South-Western railway. Pop. (1901), 4440. The chief buildings include the public library, the Masonic hall and the district hospital. The centre of interest, however, is the ruined abbey, originally one of the richest in Scotland. Founded about 1140 by Hugh de Morville, lord of Cunninghame, for Tyronensian monks of the Benedictine order, it was dedicated to St Winnin, who lived on the spot in the 8th century and has given his name to the town. This beautiful specimen of Early English architecture was partly destroyed in 1561, and its lands were granted to the earl of Eglinton and others. Kilwinning is the traditional birthplace of Scottish freemasonry, the lodge, believed to have been founded by the foreign architects and masons who came to build the abbey, being regarded as the mother lodge in Scotland. The royal company of archers of Kilwinning—dating, it is said, as far back as 1488—meet every July to shoot at the popinjay. The industry in weaving shawls and lighter fabrics has died out; and the large iron, coal and fire-clay works at Eglinton, and worsted spinning, employ most of the inhabitants. About a mile from Kilwinning is Eglinton Castle, the seat of the earls of Eglinton, built in 1798 in the English castellated style.

KIMBERLEY, JOHN WODEHOUSE, 1st Earl of (1826–1902), English statesman, was born on the 7th of January 1826, being the eldest son of the Hon. Henry Wodehouse and grandson of the 2nd Baron Wodehouse (the barony dating from 1797), whom he succeeded in 1846. He was educated at Eton and Christ Church, Oxford, where he took a first-class degree in classics in 1847; in the same year married Lady Florence Fitzgibbon (d. 1895), daughter of the last earl of Clare. He was by inheritance a Liberal in politics, and in 1852–1856 and 1859–1861 he was under secretary of state for foreign affairs in Lord Aberdeen's and Lord Palmerston's ministries. In the interval (1856–1858) he had been envoy-extraordinary to Russia; and in 1863 he was sent on a special mission to Copenhagen on the forlorn hope of finding a peaceful solution of the Schleswig-Holstein question. The mission was a failure, but probably nothing else was possible. In 1864 he became under secretary for India, but towards the end of the year was made Lord-Lieutenant of Ireland. In that capacity he had to grapple with the first manifestations of Fenianism, and in recognition of his vigour and success he was created (1866) earl of Kimberley. In July 1866 he vacated his office with the fall of Lord Russell's ministry, but in 1868 he became Lord Privy Seal in Mr Gladstone's cabinet, and in July 1870 was transferred from that post to be secretary of state for the colonies. It was the moment of the great diamond discoveries in South Africa, and the new town of Kimberley was named after the colonial secretary of the day. After an interval of opposition from 1874 to 1880, Lord Kimberley returned to the Colonial Office in Mr Gladstone's next ministry; but at the end of 1882 he exchanged this office first for that of chancellor of the duchy of Lancaster and then for the secretaryship of state for India, a post he retained during the remainder of Mr Gladstone's tenure of power (1882–1886, 1892–1894), though in 1892–1894 he combined with it that of the lord presidency of the council. In Lord Rosebery's cabinet (1894–1895) he was foreign secretary. Lord Kimberley was an admirable departmental chief, but it is difficult to associate his own personality with any ministerial act during his occupation of all these posts. He was at the colonial office when responsible government was granted to Cape Colony, when British Columbia was added to the Dominion of Canada, and during the Boer War of 1880–81, with its conclusion at Majuba; and he was foreign secretary when the misunderstanding arose with Germany over the proposed lease of territory from the Congo Free State for the Cape to Cairo route. He was essentially a loyal Gladstonian party man. His moderation, common sense, and patriotism had their influence, nevertheless, on his colleagues. As leader of the Liberal party in the House of Lords he acted with undeviating dignity; and in opposition he was a courteous antagonist and a critic of weight and experience. He took considerable interest in education, and after being for many years a member of the senate of London University, he became its chancellor in 1899. He died in London on the 8th of April 1902, being succeeded in the earldom by his eldest and only surviving son, Lord Wodehouse (b. 1848).

KIMBERLEY, a town of the Cape province, South Africa, the centre of the Griqualand West diamond industry, 647 m. N.E. of Cape Town and 310 m. S.W. of Johannesburg by rail. Pop. (1904), 34,331, of whom 13,556 were whites. The town is built on the bare veld midway between the Modder and Vaal Rivers and is 4012 ft. above the sea. Having grown out of camps formed round the diamond mines, its plan is very irregular and in striking contrast with the rectangular outline common to South African towns. Grouped round market square are the law courts, with a fine clock tower, the post and telegraph offices and the town-hall. The public library and the hospital are in Du Toits Pan Road. In the district of Newton, laid out during the siege of 1899–1900, a monument to those who fell during the operations has been erected where four roads meet. Siege Avenue, in the suburb of Kenilworth, 250 ft. wide, a mile and a quarter long, and planted with 16 rows of trees, was also laid out during the siege. In the public gardens are statues of Queen Victoria and Cecil Rhodes. The diamond mines form, however, the chief attraction of the town (see DIAMOND). Of these the Kimberley is within a few minutes' walk of market square. The De Beers mine is one mile east of the Kimberley mine. The other principal mines, Bultfontein, Du Toits Pan and Wesselton, are still farther distant from the town. Barbed wire fencing surrounds the mines, which cover about 180 acres. The Kaffirs who work in the mines are housed in large compounds. Wire netting is spread over these enclosures, and every precaution taken to prevent the illicit disposal of diamonds. Ample provision is made for the comfort of the inmates, who in addition to food and lodging earn from 17s. to 24s. a week. Most of the white workmen employed live at Kenilworth, laid out by the De Beers company as a "model village." Beaconsfield, near Du Toits Pan Mine, is also dependent on the diamond industry.

Kimberley was founded in 1870 by diggers who discovered diamonds on the farms of Du Toits Pan and Bultfontein. In 1871 richer diamonds were found on the neighbouring farm of Vooruitzight at places named De Beers and Colesberg Kopje. There were at first three distinct mining camps, one at Du Toits Pan, another at De Beers (called De Beers Rush or Old De Beers) and the third at the Colesberg Kopje (called De Beers New Rush, or New Rush simply). The Colesberg Kopje mine was in July 1873 renamed Kimberley in honour of the then secretary of state for the colonies, the 1st earl of Kimberley, by whose direction the mines were—in 1871—taken under the protection of Great Britain. Kimberley was also chosen as the name of the town into which the mining camps developed. Doubt having arisen as to the rights of the crown to the minerals on Vooruitzight farm, litigation ensued, ending in the purchase of the farm by the state for £100,000 in 1875. In 1880 the town was incorporated in Cape Colony (see GRIQUALAND). In 1874 a great part of the population left for the newly discovered gold diggings in the Lydenburg district of the Transvaal, but others took their place. Among those early attracted to Kimberley were Cecil Rhodes and "Barney" Barnato, who in time came to represent two groups of financiers controlling the mines. The amalgamation of their interests in 1889—when the De Beers group purchased the Kimberley mine for £5,338,650—put the whole diamond production of the Kimberley fields in the hands of one company, the De Beers Consolidated Mines, Ltd., so named after the former owners of the farms on which are situated the chief mines. Kimberley in consequence became largely dependent on the good-will of the De Beers corporation, the town having practically no industries other than diamond mining. Horse-breeding is carried on to a limited extent. The value of the annual output of diamonds averages about £4,500,000. The importance of the industry led to the building of a railway from Cape Town, opened in 1885. On the outbreak of war between the British and the Boers in 1899 Kimberley was invested by a Boer force. The siege began on the 12th of October and lasted until the 15th of February 1900, when the town was relieved by General Sir John French. Among the besieged was Cecil Rhodes, who placed the resources of the De Beers company at the disposal of the defenders. In 1906 the town was put in direct railway communication with Johannesburg, and in 1908 the completion of the line from Bloemfontein gave Natal direct access to Kimberley, which thus became an important railway centre.

KIMERIDGIAN, in geology, the basal division of the Upper Oolites in the Jurassic system. The name is derived from the hamlet of Kimeridge or Kimmeridge near the coast of Dorsetshire, England. It appears to have been first suggested by T. Webster in 1812; in 1818, in the form Kimeridge Clay, it was used by Buckland. From the Dorsetshire coast, where it is splendidly exposed in the fine cliffs from St Alban's Head to Gad Cliff, it follows the line of Jurassic outcrop through Wiltshire, where there is a broad expanse between Westbury and Devizes, as far as Yorkshire, there it appears in the vale of Pickering and on the coast in Filey Bay. It generally occupied broad valleys, of which the vale of Aylesbury may be taken as typical. Good exposures occur at Seend, Calne, Swindon, Wootton Bassett, Faringdon, Abingdon, Culham, Shotover Hill, Brill, Ely and Market Rasen. Traces of the formation are found as far north as the east coast of Cromarty and Sutherland at Eathie and Helmsdale.

In England the Kimeridgian is usually divisible into an Upper Series, 600–650 ft. in the south, dark bituminous shales, paper shales and clays with layers and nodules of cement-stones and septaria. These beds merge gradually into the overlying Portlandian formation. The Lower Series, with a maximum thickness of 400 ft., consists of clays and dark shales with septaria, cement-stones and calcareous "doggers." These lithological characters are very persistent. The Upper Kimeridgian is distinguished as the zone of *Perisphinctes biplex*, with the sub-zone of *Discina latissima* in the higher portions. *Cardioceras alternans* is the zonal ammonite characteristic of the lower division, with the sub-zone of *Ostrea deltoidea* in the lower portion. *Exogyra virgula* is common in the upper part of the lower division, and the lower part of the Upper Kimeridgian. A large number of ammonites are peculiar to this formation, including *Reineckia eudoxus*, *R. Thurmanni*, *Aspidoceras longispinus*, &c. Large dinosaurian reptiles are abundant, *Cetiosaurus*, *Gigantosaurus*, *Megalosaurus*, also plesiosaurs and ichthyosaurs; crocodilian and chelonian remains are also found. *Protocardia striatula*, *Thracia depressa*, *Belemnites abreviatus*, *B. Blainvillei*, *Lingula ovalis*, *Rhynchonella inconstans* and *Exogyra nana* are characteristic fossils. Alum has been obtained from the Kimeridge Clay, and the cement-stones have been employed in Purbeck; coprolites are found in small quantities. Bricks, tiles, flower-pots, &c., are made from the clay at Swindon, Gillingham, Brill, Ely, Horncastle, and other places. The so-called "Kimeridge coal" is a highly bituminous shale capable of being used as fuel, which has been worked on the cliff at Little Kimeridge.

The "Kimeridgien" of continental geologists is usually made to contain the three sub-divisions of A. Oppel and W. Waagen, viz.:—

Kimeridgien	Upper	(Virgulian)	with *Exogyra virgula*
	Middle	(Pteroceran)	with *Pteroceras oceani*
	Lower	(Astartian)	with *Astarte supracorallina*;

but the upper portion of this continental Kimeridgian is equivalent to some of the British Portlandian; while most of the Astartian corresponds to the Corallian. A. de Lapparent now recognizes only the Virgulian and Pteroceran in the Kimeridgien. Clays and marls with occasional limestones and sandstones represent the Kimeridgien of most of northern Europe, including Russia. In Swabia and some other parts of Germany the curious ruiniform marble *Felsenkalk* occurs on this horizon, and most of the Kimeridgien of southern Europe, including the Alps, is calcareous. Representatives of the formation occur in Caucasia, Algeria, Abyssinia, Madagascar; in South America with volcanic rocks, and possibly in California (Maripan beds), Alaska and King Charles's Land.

See "Jurassic Rocks of Britain," vols. v. and i., *Memoirs of the Geological Survey* (vol. v. contains references to literature up to 1895). (J. A. H.)

ḲIMḤI, or Qimḥi, the family name of three Jewish grammarians and biblical scholars who worked at Narbonne in the 12th century and the beginning of the 13th, and exercised great influence on the study of the Hebrew language. The name, as is shown by manuscript testimony, was also pronounced *Ḳamḥi* and further mention is made of the French surname Petit.

Joseph Ḳimḥi was a native of southern Spain, and settled in Provence, where he was one of the first to set forth in the Hebrew language the results of Hebraic philology as expounded by the Spanish Jews in their Arabic treatises. He was acquainted moreover with Latin grammar, under the influence of which he resorted to the innovation of dividing the Hebrew vowels into five long vowels and five short, previous grammarians having simply spoken of seven vowels without distinction of quantity. His grammatical textbook, *Sefer Ha-Zikkaron*, "Book of Remembrance" (ed. W. Bacher, Berlin, 1888), was marked by methodical comprehensiveness, and introduced into the theory of the verbs a new classification of the stems which has been retained by later scholars. In the far more ample *Sefer Ha-Galuy*, "Book of Demonstration" (ed. Matthews, Berlin, 1887), Joseph Ḳimḥi attacks the philological work of the greatest French Talmud scholar of that day, R. Jacob Tam, who espoused the antiquated system of Menaḥem b.Saruq, and this he supplements by an independent critique of Menaḥem. This work is a mine of varied exegetical and philological details. He also wrote commentaries—the majority of which are lost—on a great number of the scriptural books. Those on Proverbs and Job have been published. He composed an apologetic work under the title *Sefer Ha-Berith* ("Book of the Bond"), a fragment of which is extant, and translated into Hebrew the ethico-philosophical work of Baḥya ibn Paquda ("Duties of the Heart"). In his commentaries he also made contributions to the comparative philology of Hebrew and Arabic.

Moses Ḳimḥi was the author of a Hebrew grammar, known—after the first three words—as *Mahalak Shebile Ha-daat*, or briefly as *Mahalak*. It is an elementary introduction to the study of Hebrew, the first of its kind, in which only the most indispensable definitions and rules have a place, the remainder being almost wholly occupied by paradigms. Moses Ḳimḥi was the first who made the verb *paqadh* a model for conjugation, and the first also who introduced the now usual sequence in the enumeration of stem-forms. His handbook was of great historical importance as in the first half of the 16th century it became the favourite manual for the study of Hebrew among non-Judaic scholars (1st ed., Pesaro, 1508). Elias Levita (*q.v.*) wrote Hebrew explanations, and Sebastian Münster translated it into Latin. Moses Ḳimḥi also composed commentaries to the biblical books; those on Proverbs, Ezra and Nehemiah are in the great rabbinical bibles falsely ascribed to Abraham ibn Ezra.

David Ḳimḥi (*c.* 1160–1235), also known as *Redaq* (= R. David Ḳimḥi), eclipsed the fame both of his father and his brother. From the writings of the former he quotes a great number of explanations, some of which are known only from this source. His *magnum opus* is the *Sefer Miklol*, "Book of Completeness." This falls into two divisions: the grammar, to which the title of the whole, *Miklol*, is usually applied (first printed in Constantinople, 1532–1534, then, with the notes of Elias Levita, at Venice, 1545), and the lexicon, *Sefer Hashorashim*, "Book of Roots," which was first printed in Italy before 1480, then at Naples in 1490, and at Venice in 1546 with the annotations of Elias. The model and the principal source for this work of David Ḳimḥi's was the book of R. Jonah (Abulwalid), which was cast in a similar bipartite form; and it was chiefly due to Ḳimḥi's grammar and lexicon that, while the contents of Abulwalid's works were common knowledge, they themselves remained in oblivion for centuries. In spite of this dependence on his predecessors his work shows originality, especially in the arrangement of his material. In the grammar he combined the paradigmatic method of his brother Moses with the procedure of the older scholars who devoted a close attention to details. In his dictionary, again, he recast the lexicological materials independently, and enriched lexicography itself, especially by his numerous etymological explanations. Under the title *Eṭ Sofer*, "Pen of the Writer" (Lyk, 1864), David Ḳimḥi composed a sort of grammatical compendium as a guide to the correct punctuation of the biblical manuscripts; it consists, for the most part, of extracts from the *Miklol*. After the completion of his great work he began to write commentaries on portions of the Scriptures. The first was on Chronicles, then followed one on the Psalms, and finally his exegetical masterpiece—the commentary on the prophets. His annotations on the Psalms are especially interesting for the polemical excursuses directed against the Christian interpretation. He was also responsible for a commentary on Genesis (ed. A. Günsburg, Pressburg, 1842), in which he followed Moses Maimonides in explaining biblical narratives as visions. He was an enthusiastic adherent of Maimonides, and, though far advanced in years, took an active part in the battle which raged in southern France and Spain round his philosophico-religious writings. The popularity of his biblical exegesis is demonstrated by the fact that the first printed texts of the Hebrew Bible were accompanied by his commentary: the Psalms 1477, perhaps at Bologna; the early Prophets, 1485, Soncino; the later Prophets, ibid. 1486.

His commentaries have been frequently reprinted, many of them in Latin translations. A new edition of that on the Psalms was begun by Schiller-Szinessy (*First Book of Psalms*, Cambridge, 1883). Abr. Geiger wrote of the three Ḳimḥis in the Hebrew periodical *Oẓar Neḥmad* (vol. ii., 1857 = A. Geiger, *Gesammelte Schriften*, v. 1–47). See further the *Jewish Encyclopedia*. (W. Ba.)

KIN (O. E. *cyn*, a word represented in nearly all Teutonic languages, cf. Du. *kunne*, Dan. and Swed. *kön*, Goth *kuni*, tribe; the Teutonic base is *kunya*; the equivalent Aryan root *gan-* to beget, produce, is seen in Gr. *γένος*, Lat. *genus*, cf. "kind"), a collective word for persons related by blood, as descended from a common ancestor. In law, the term "next of kin" is applied to the person or persons who, as being in the nearest degree of blood relationship to a person dying intestate, share according to degree in his personal estate (see INTESTACY, and INHERITANCE). "Kin" is frequently associated with "kith" in the phrase "kith and kin," now used as an emphasized form of "kin" for family relatives. It properly means one's "country and kin," or one's "friends and kin." Kith (O.E. *cyððe* and *cyð*, native land, acquaintances) comes from the stem of *cunnan*, to know, and thus means the land or people one knows familiarly.

The suffix *-kin*, chiefly surviving in English surnames, seems to have been early used as a diminutive ending to certain Christian names in Flanders and Holland. The termination is represented by the diminutive *-chen* in German, as in *Kindchen*, *Häuschen*, &c. Many English words, such as "pumpkin," "firkin," seem to have no diminutive significance, and may have been assimilated from earlier forms, *e.g.* "pumpkin" from "pumpion."

KINCARDINESHIRE, or THE MEARNS, an eastern county of Scotland, bounded E. by the North Sea, S. and S.W. by Forfarshire, and N.W. and N. by Aberdeenshire. Area, 243,974 acres, or 381 sq. m. In the west and north-west the Grampians are the predominant feature. The highest of their peaks is Mount Battock (2555 ft.), where the counties of Aberdeen, Forfar and Kincardine meet, but there are a score of hills exceeding 1500 ft. in height. In the extreme north, on the confines of Aberdeenshire, the Hill of Fare, famous for its sheep walks, attains an altitude of 1545 ft. In the north the county slopes from the Grampians to the picturesque and finely-wooded valley of the Dee, and in the south it falls to the Howe (Hollow) of the Mearns, which is a continuation north-eastwards of Strathmore. The principal rivers are Bervie Water (20 m. long), flowing south-eastwards to the North Sea; the Water of Feugh (20 m.) taking a north-easterly direction and falling into the Dee at Banchory, and forming near its mouth a beautiful cascade; the Dye (15 m.) rising in Mount Battock and ending its course in the Feugh; Luther Water (14 m.) springing not far from the castle of Drumtochty and meandering pleasantly to its junction with the North Esk; the Cowie (13 m.) and the Carron (8½ m.) entering the sea at Stonehaven. The Dee and North Esk serve as boundary streams during part of their course, the one of Aberdeenshire, the other of Forfarshire. Loch Loirston, in the parish of Nigg, and Loch Lumgair, in Dunnottar parish, both small, are the only lakes in the shire. Of the glens Glen Dye in the north centre of the county is remarkable for its beauty, and the small Den Fenella, to the south-east of Laurencekirk, contains a picturesque waterfall. Its name perpetuates the memory of Fenella, daughter of a thane of Angus, who was slain here after betraying Kenneth II. to his enemies, who (according to local tradition) made away with him in Kincardine Castle. Excepting in the vicinity of St Cyrus, the coast from below Johnshaven to Girdle Ness presents a bold front of rugged cliffs, with an average height of from 100 to 250 ft., interrupted only by occasional creeks and bays, as at Johnshaven, Gourdon, Bervie, Stonehaven, Portlethen, Findon, Cove and Nigg.

Geology.—The great fault which traverses Scotland from shore to shore passes through this county from Craigeven Bay, about a mile north of Stonehaven, by Fenella Hill to Edzell. On the northern side of this line are the old crystalline schists of the Dalradian group; on the southern side Old Red Sandstone occupies all the remaining space. Good exposures of the schists are seen, repeatedly folded, in the cliffs between Aberdeen and Stonehaven. They consist of a lower series of greenish slates and a higher, more micaceous and schistose series with grits; bands of limestone occur in these rocks near Bunchory. Besides the numerous minor flexures the schists are bent into a broad synclinal fold which crosses the county, its axis lying in a south-westerly-north-easterly direction. Rising through the schists are several granite masses, the largest being that forming the high ground around Mt Battock; south of the Dee are several smaller masses, some of which have been extensively quarried. The lower part of the Old Red Sandstone consists of flags, red sandstones and purple clays in great thickness; these are followed by coarse conglomerates, well seen in the cliff at Dunnottar Castle, with ashy grits and some thin sheets of diabase. The diabase forms the Bruxie and Leys Hills and some minor elevations. Above the volcanic series more red sandstones, conglomerates and marls appear. The Old Red Sandstone is folded synclinally in a direction continuing the vale of Strathmore; south of this is an anticline, as may be seen on the coast between St Cyrus and Kinneff. Glacial striae on the higher ground and débris on the lower ground show that the direction taken by the ice flow was south-eastward on the hills but as the shore was approached it gradually took on an easterly and finally a northerly direction.

Climate and Agriculture.—The climate is healthy, but often cold, owing to the exposure to east winds. The average temperature for the year is 45° F., for July 58°, and for January 37°. The average annual rainfall is 34 in. Much of the Grampian territory is occupied by grouse moors, but the land by the Dee, in the Howe and along the coast, is scientifically farmed and yields well. The soil of the Howe is richer and stronger than that in the Dee valley, but the most fertile region is along the coast, where the soil is generally deep loam resting on clay, although in some places it is poor and thin, or stiff and cold. Oats are the principal crop, wheat is not largely grown, but the demands of the distillers maintain a very considerable acreage under barley. Rather more than one-tenth of the total area is under wood. Turnips form the main green crop, but potatoes are extensively raised. A little more than half the holdings consist of 50 acres and under. Great attention is paid to livestock. Shorthorns are the most common breed, but the principal home-bred stock is a cross between shorthorned and polled, though there are many valuable herds of pure polled. Cattle-feeding is carried on according to the most advanced methods. Blackfaced sheep are chiefly kept on the hill runs, Cheviots or a cross with Leicesters being usually found on the lowland farms. Most of the horses are employed in connexion with the cultivation of the soil, but several good strains, including Clydesdales, are retained for stock purposes. Pigs are also reared in considerable numbers.

Other Industries.—Apart from agriculture, the principal industry is the fishing, of which Stonehaven is the centre. The coast being dangerous and the harbours difficult in rough weather, the fishermen often run great risks. The village of Findon (pron. *Finnan*) has given its name to the well-known smoked haddocks, which were first cured in this way at that hamlet. The salmon fisheries of the sea and the rivers yield a substantial annual return. Manufactures are of little more than local importance. Woollens are made at Stonehaven, and at Bervie, Laurencekirk and a few other places flax-spinning and weaving are carried on. There are also some distilleries, breweries and tanneries. Stonehaven, Gourdon and Johnshaven are the chief ports for seaborne trade.

The Deeside railway runs through the portion of the county on the northern bank of the Dee. The Caledonian and North British railways run to Aberdeen via Laurencekirk to Stonehaven, using the same metals, and there is a branch line of the N.B.R. from Montrose to Bervie. There are also coaches between Blairs and Aberdeen, Bervie and Stonehaven, Fettercairn and Edzell, Banchory and Birse, and other points.

Population and Government.—The population was 35,492 in 1891, and 40,923 in 1901, when 103 persons spoke Gaelic and English. The chief town is Stonehaven (pop. in 1901, 4577) with Laurencekirk (1512) and Banchory (1475), but part of the city of Aberdeen, with a population of 9386, is within the county. The county returns one member to parliament, and Bervie, the only royal burgh, belongs to the Montrose group of parliamentary burghs. Kincardine is united in one sheriffdom with the shires of Aberdeen and Banff, and one of the Aberdeen sheriffs-substitute sits at Stonehaven. The county is under school-board jurisdiction. The academy at Stonehaven and a few of the public schools earn grants for higher education. The county council hands over the "residue" grant to the county secondary education committee, which expends it in technical education grants. At Blairs, in the north-east of the shire near the Dee, is a Roman Catholic college for the training of young men for the priesthood.

History.—The annals of Kincardineshire as a whole are almost blank. The county belonged of old to the district of Pictavia and apparently was overrun for a brief period by the Romans. In the parish of Fetteresso are the remains of the camp of Raedykes, in which, according to tradition, the Caledonians under Galgacus were lodged before their battle with Agricola. It is also alleged that in the same district Malcolm I. was killed (954) whilst endeavouring to reduce the unruly tribes of this region. Mearns, the alternative name for the county, is believed to have been derived from Mernia, a Scottish king, to whom the land was granted, and whose brother, Angus, had obtained the adjoining shire of Forfar. The antiquities consist mostly of stone circles, cairns, tumuli, standing stones and a structure in the parish of Dunnottar vaguely known as a "Picts' kiln." By an extraordinary reversion of fortune the town which gave the shire its name has practically vanished. It stood about 2 m. N.E. of Fettercairn, and by the end of the 16th century had declined to a mere hamlet, being represented now only by the ruins of the royal castle and an ancient burial-ground. The Bruces, earls of Elgin, also bear the title of earl of Kincardine.

See A. Jervise, *History and Traditions of the Lands of the Lindsays* (1853), *History and Antiquities of the Mearns* (1858), *Memorials of Angus and the Mearns* (1861); J. Anderson, *The Black Book of Kincardineshire* (Stonehaven, 1879); C. A. Mollyson, *The Parish of Fordoun* (Aberdeen, 1893); A. C. Cameron, *The History of Fettercairn* (Paisley, 1899).

KINCHINJUNGA, or Kanchanjanga, the third (or second; see K2) highest mountain in the world. It is a peak of the eastern Himalayas, situated on the boundary between Sikkim and Nepal, with an elevation of 28,146 ft. Kinchinjunga is best seen from the Indian hill-station of Darjeeling, where the view of this stupendous mountain, dominating all intervening ranges and rising from regions of tropical undergrowth to the altitude of eternal snows, is one of the grandest in the world.

KIND (O. E. *ge-cynde*, from the same root as is seen in "kin," *supra*), a word in origin meaning birth, nature, or as an adjective, natural. From the application of the term to the natural disposition or characteristic which marks the class to which an object belongs, the general and most common meaning of "class," genus or species easily develops; that of race, natural order or group, is particularly seen in such expressions as "mankind." The phrase "payment in kind," *i.e.* in goods or produce as distinguished from money, is used as equivalent to the Latin *in specie*; in ecclesiastical usage "communion in both kinds" or "in one kind" refers to the elements of bread and wine (Lat. *species*) in the Eucharist. The present main sense of the adjective "kind," *i.e.* gentle, friendly, benevolent, has developed from the meaning "born," "natural," through "of good birth, disposition or nature," "naturally well-disposed."

KINDERGARTEN, a German word meaning "garden of children," the name given by Friedrich Froebel to a kind of "play-school" invented by him for furthering the physical, moral and intellectual growth of children between the ages of three and seven. For the theories on which this type of school was based see Froebel. Towards the end of the 18th century Pestalozzi planned, and Oberlin formed, day-asylums for young children. Schools of this kind took in the Netherlands the name of "play school," and in England, where they have especially thriven, of "infant schools" (*q.v.*). But Froebel's idea of the "Kindergarten" differed essentially from that of the infant schools. The child required to be prepared for society by being early associated with its equals; and young children thus brought together might have their employments, especially their chief employment, play, so organized as to draw out their capacities of feeling and thinking, and even of inventing and creating.

Froebel therefore invented a course of occupations, most of which are social games. Many of the games are connected with the "gifts," as he called the simple playthings provided for the children. These "gifts" are, in order, six coloured balls, a wooden ball, a cylinder and a cube, a cube cut to form eight smaller cubes, another cube cut to form eight parallelograms, square and triangular tablets of coloured wood, and strips of lath, rings and circles for pattern-making. In modern kindergartens much stress has been laid on such occupations as sand-drawing, modelling in clay and paper, pattern-making, plaiting, &c. The artistic faculty was much thought of by Froebel, and, as in the education of the ancients, the sense of rhythm in sound and motion was cultivated by music and poetry introduced in the games. Much care was to be given to the training of the senses, especially those of sight, sound and touch. Intuition or first-hand experience (*Anschauung*) was to be recognized as the true basis of knowledge, and though stories were to be told, instruction of the imparting and "learning-up" kind was to be excluded. Froebel sought to teach the children not what to think but how to think, in this following in the steps of Pestalozzi, who had done for the child what Bacon nearly two hundred years before had done for the philosopher. Where possible the children were to be much in the open air, and were each to cultivate a little garden.

The first kindergarten was opened at Blankenburg, near Rudolstadt, in 1837, but after a needy existence of eight years was closed for want of funds. In 1851 the Prussian government declared that "schools founded on Froebel's principles or principles like them could not be allowed." As early as 1854 it was introduced into England, and Henry Barnard reported on it that it was "by far the most original, attractive and philosophical form of infant development the world has yet seen" (*Report to Governor of Connecticut*, 1854). The great propagandist of Froebelism, the Baroness Berta von Marenholtz-Bülow (1811–1893), drew the attention of the French to the kindergarten from the year 1855, and Michelet declared that Froebel had "solved the problem of human education." In Italy the kindergarten was introduced by Madame Salis-Schwabe. In Austria it is recognized and regulated by the government, though the Volks-Kindergärten are not numerous. But by far the greatest developments of the kindergarten system are in the United States and in Belgium. The movement was begun in the United States by Miss Elizabeth Peabody in 1867, aided by Mrs Horace Mann and Dr Henry Barnard. The first permanent kindergarten was established in St Louis in 1873 by Miss Susan Blow and Dr W. T. Harris. In Belgium the mistresses of the "Écoles gardiennes" are instructed in the "idea of the kindergarten" and "Froebel's method," and in 1880 the minister of public instruction issued a programme for the "Écoles Gardiennes Communales," which is both in fact and in profession a kindergarten manual.

For the position of the kindergarten system in the principal countries of the world see *Report of a Consultative Committee upon the School Attendance of Children below the Age of Five*, English Board of Education Reports (Cd. 4259, 1908); and "The Kindergarten," by Laura Fisher, *Report of the United States Commissioner for Education for 1903*, vol. i. ch. xvi. (Washington, 1905).

KINDĪ [Abū Yūsuf Ya‘qūb ibn Ishāq ul-Kindī, sometimes called pre-eminently "The Philosopher of the Arabs"] flourished in the 9th century, the exact dates of his birth and death being unknown. He was born in Kufa, where his father was governor under the Caliphs Mahdi and Harun al-Rashīd. His studies were made in Baṣra and Bagdad, and in the latter place he remained, occupying according to some a government position. In the orthodox reaction under Motawakkil, when all philosophy was suspect, his library was confiscated, but he himself seems to have escaped. His writings—like those of other Arabian philosophers—are encyclopaedic and are concerned with most of the sciences; they are said to have numbered over two hundred, but fewer than twenty are extant. Some of these were known in the middle ages, for Kindī is placed by Roger Bacon in the first rank after Ptolemy as a writer on optics. His work *De Somniorum Visione* was translated by Gerard of Cremona (*q.v.*) and another was published as *De medicinarum compositarum gradibus investigandis Libellus* (Strassburg, 1531). He was one of the earliest translators and commentators of Aristotle, but like Fārābī (*q.v.*) appears to have been superseded by Avicenna.

See G. Flügel, *Al Kindi genannt der Philosoph der Araber* (Leipzig, 1857), and T. J. de Boer, *Geschichte der Philosophie im Islam* (Stuttgart, 1901), pp. 90 sqq.; also Arabian Philosophy. (G. W. T.)

KINEMATICS (from Gr. *κίνημα*, a motion), the branch of mechanics which discusses the phenomena of motion without reference to force or mass (see Mechanics).

KINETICS (from Gr. *κινεῖν*, to move), the branch of mechanics which discusses the phenomena of motion as affected by force; it is the modern equivalent of dynamics in the restricted sense (see Mechanics).

KING, CHARLES WILLIAM (1818–1888), English writer on ancient gems, was born at Newport (Mon.) on the 5th of September 1818. He entered Trinity College, Cambridge, in 1836; graduated in 1840, and obtained a fellowship in 1842; he was senior fellow at the time of his death in London on the 25th of March 1888. He took holy orders, but never held any cure. He spent much time in Italy, where he laid the foundation of his collection of gems, which, increased by subsequent purchases in London, was sold by him in consequence of his failing eyesight and was presented in 1881 to the Metropolitan Museum of Art, New York. King was recognized universally as one of the greatest authorities in this department of art. His chief works on the subject are: *Antique Gems, their Origin, Uses and Value* (1860), a complete and exhaustive treatise; *The Gnostics and their Remains* (2nd ed. by J. Jacobs, 1887, which led to an animated correspondence in the *Athenaeum*); *The Natural History of Precious Stones and Gems and of the Precious Metals* (1865); *The Handbook of Engraved Gems* (2nd ed., 1885); *Early Christian Numismatics* (1873). King was thoroughly familiar with the works of Greek and Latin authors, especially Pausanias and the elder Pliny, which bore upon the subject in which he was most interested; but he had little taste for the minutiae of verbal criticism. In 1869 he brought out an edition of Horace, illustrated from antique gems; he also translated Plutarch's *Moralia* (1882) and the theosophical works of the Emperor Julian (1888) for Bohn's Classical Library.

KING, CLARENCE (1842–1901), American geologist, was born at Newport, Rhode Island, U.S.A., on the 6th of January 1842. He graduated at Yale in 1862. His most important work was the geological exploration of the fortieth parallel, of which the main reports (1876 and 1877) comprised the geological and topographical atlas of the Rocky Mountains, the Green River and Utah basins, and the Nevada plateau and basin. When the United States Geological Survey was consolidated in 1879 King was chosen director, and he vigorously conducted investigations in Colorado, and in the Eureka district and on the Comstock lode in Nevada. He held office for a year only; in later years his only noteworthy contribution to geology was an essay on the age of the earth, which appeared in the annual report of the Smithsonian Institution for 1893. He died at Phoenix, Arizona, on the 24th of December 1901.

KING, EDWARD (1612–1637), the subject of Milton's *Lycidas*, was born in Ireland in 1612, the son of Sir John King, a member of a Yorkshire family which had migrated to Ireland. Edward King was admitted a pensioner of Christ's College, Cambridge, on the 9th of June 1626, and four years later was elected a fellow. Milton, though two years his senior and himself anxious to secure a fellowship, remained throughout on terms of the closest friendship with his rival, whose amiable character seems to have endeared him to the whole college. King served from 1633 to 1634 as praelector and tutor of his college, and was to have entered the church. His career, however, was cut short by the tragedy which inspired Milton's verse. In 1637 he set out for Ireland to visit his family, but on the 10th of August the ship in which he was sailing struck on a rock near the Welsh coast, and King was drowned. Of his own writings many Latin poems contributed to different collections of Cambridge verse survive, but they are not of sufficient merit to explain the esteem in which he was held.

A collection of Latin, Greek and English verse written in his memory by his Cambridge friends was printed at Cambridge in 1638, with the title *Justa Edouardo King naufrago ab amicis moerentibus amoris et μνείας χάριν*. The second part of this collection has a separate title-page, *Obsequies to the Memorie of Mr Edward King, Anno Dom. 1638*, and contains thirteen English poems, of which *Lycidas* [1] (signed J. M.) is the last.

KING, EDWARD (1829–1910), English bishop, was the second son of the Rev. Walter King, archdeacon of Rochester and rector of Stone, Kent. Graduating from Oriel College, Oxford, he was ordained in 1854, and four years later became chaplain and lecturer at Cuddesdon Theological College. He was principal at Cuddesdon from 1863 to 1873, when he became regius professor of pastoral theology at Oxford and canon of Christ Church. To the world outside he was only known at this time as one of Dr Pusey's most intimate friends and as a leading member of the English Church Union. But in Oxford, and especially among the younger men, he exercised an exceptional influence, due, not to special profundity of intellect, but to his remarkable charm in personal intercourse, and his abounding sincerity and goodness. In 1885 Dr King was made bishop of Lincoln. The most eventful episode of his episcopate was his prosecution (1888–1890) for ritualistic practices before the archbishop of Canterbury, Dr Benson, and, on appeal, before the judicial committee of the Privy Council (see LINCOLN JUDGMENT). Dr King, who loyally conformed his practices to the archbishop's judgment, devoted himself unsparingly to the work of his diocese; and, irrespective of his High Church views, he won the affection and reverence of all classes by his real saintliness of character. The bishop, who never married, died at Lincoln on the 8th of March 1910.

See the obituary notice in *The Times*, March 9, 1910.

KING, HENRY (1591–1669), English bishop and poet, eldest son of John King, afterwards bishop of London, was baptized on the 16th of January 1591. With his younger brother John he proceeded from Westminster School to Christ Church, Oxford, where both matriculated on the 20th of January 1609. Henry King entered the church, and after receiving various ecclesiastical preferments he was made bishop of Chichester in 1642, receiving at the same time the rich living of Petworth, Sussex. On the 29th of December of that year Chichester surrendered to the Parliamentary army, and King was among the prisoners. After his release he found an asylum with his brother-in-law, Sir Richard Hobart of Langley, Buckinghamshire, and afterwards at Richkings near by, with Lady Salter, said to have been a sister of Dr Brian Duppa (1588–1662). King was a close friend of Duppa and personally acquainted with Charles I. In one of his poems dated 1649 he speaks of the *Eikon Basilike* as the king's own work. Restored to his benefice at the Restoration, King died at Chichester on the 30th of September 1669. His works include *Poems, Elegies, Paradoxes and Sonets* (1657), *The Psalmes of David from the New Translation of the Bible, turned into Meter* (1651), and several sermons. He was one of the executors of John Donne, and prefixed an elegy to the 1663 edition of his friend's poems.

King's Poems and Psalms were edited, with a biographical sketch, by the Rev. J. Hannah (1843).

KING, RUFUS (1755–1827), American political leader, was born on the 24th of March 1755 at Scarborough, Maine, then a part of Massachusetts. He graduated at Harvard in 1777, read law at Newburyport, Mass., with Theophilus Parsons, and was admitted to the bar in 1780. He served in the Massachusetts General Court in 1783–1784 and in the Confederation Congress in 1784–1787. During these critical years he adopted the "states' rights" attitude. It was largely through his efforts that the General Court in 1784 rejected the amendment to the Articles of Confederation authorizing Congress to levy a 5% impost. He was one of the three Massachusetts delegates in Congress in 1785 who refused to present the resolution of the General Court proposing a convention to amend the articles. He was also out of sympathy with the meeting at Annapolis in 1786. He did good service, however, in opposing the extension of slavery. Early in 1787 King was moved by the Shays Rebellion and by the influence of Alexander Hamilton to take a broader view of the general situation, and it was he who introduced the resolution in Congress, on the 21st of February 1787, sanctioning the call for the Philadelphia constitutional convention. In the convention he supported the large-state party, favoured a strong executive, advocated the suppression of the slave trade, and opposed the counting of slaves in determining the apportionment of representatives. In 1788 he was one of the most influential members of the Massachusetts convention which ratified the Federal Constitution. He married Mary Alsop (1769–1819) of New York in 1786 and removed to that city in 1788. He was elected a member of the New York Assembly in the spring of 1789, and at a special session of the legislature held in July of that year was chosen one of the first representatives of New York in the United States Senate. In this body he served in 1789–1796, supported Hamilton's financial measures, Washington's neutrality proclamation and the Jay Treaty, and became one of the recognized leaders of the Federalist party. He was minister to Great Britain in 1796–1803 and again in 1825–1826, and was the Federalist candidate for vice-president in 1804 and 1808, and for president in 1816, when he received 34 electoral votes to 183 cast for Monroe. He was again returned to the Senate in 1813, and was re-elected in 1819 as the result of a struggle between the Van Buren and Clinton factions of the Democratic-Republican party. In the Missouri Compromise debates he supported the anti-slavery programme in the main, but for constitutional reasons voted against the second clause of the Tallmadge Amendment providing that all slaves born in the state after its admission into the Union should be free at the age of twenty-five years. He died at Jamaica, Long Island, on the 29th of April 1827.

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[1] J. W. Hales, in the *Athenaeum* for the 1st of August 1891, suggests that in writing King's elegy Milton had in his mind, besides the idylls of Theocritus, a Latin eclogue of Giovanni Baptista Amalteo entitled *Lycidas*, in which Lycidas bids farewell to the land he loves and prays for gentle breezes on his voyage. He was familiar with the Italian Latin poets of the Renaissance, and he may also have been influenced in his choice of the name by the shepherd Lycidas in Sannazaro's eclogue *Phillis*.

The Life and Correspondence of Rufus King, begun about 1850 by his son, Charles King, was completed by his grandson, Charles R. King, and published in six volumes (New York, 1894–1909).

Rufus King's son, JOHN ALSOP KING (1788–1867), was educated at Harrow and in Paris, served in the war of 1812 as a lieutenant of a cavalry company, and was a member of the New York Assembly in 1819–1821 and of the New York Senate in 1823. When his father was sent as minister to Great Britain in 1825 he accompanied him as secretary of the American legation, and when his father returned home on account of ill health he remained as chargé d'affaires until August 1826. He was a member of the New York Assembly again in 1832 and in 1840, was a Whig representative in Congress in 1849–1851, and in 1857–1859 was governor of New York State. He was a prominent member of the Republican party, and in 1861 was a delegate to the Peace Conference in Washington.

Another son, CHARLES KING (1789–1867), was also educated abroad, was captain of a volunteer regiment in the early part of the war of 1812, and served in 1814 in the New York Assembly, and after working for some years as a journalist was president of Columbia College in 1849–1864.

A third son, JAMES GORE KING (1791–1853), was an assistant adjutant-general in the war of 1812, was a banker in Liverpool and afterwards in New York, and was president of the New York & Erie railroad until 1837, when by his visit to London he secured the loan to American bankers of £1,000,000 from the governors of the Bank of England. In 1849–1851 he was a representative in Congress from New Jersey.

Charles King's son, RUFUS KING (1814–1876), graduated at the U.S. Military Academy in 1833, served for three years in the engineer corps, and, after resigning from the army, became assistant engineer of the New York & Erie railroad. He was adjutant-general of New York state in 1839–1843, and became a brigadier-general of volunteers in the Union army in 1861, commanded a division in Virginia in 1862–1863, and, being compelled by ill health to resign from the army, was U.S. minister to the Papal States in 1863–1867.

His son, CHARLES KING (b. 1844), served in the artillery until 1870 and in the cavalry until 1879; he was appointed brigadier-general U.S. Volunteers in the Spanish War in 1898, and served in the Philippines. He wrote *Famous and Decisive Battles* (1884), *Campaigning with Crook* (1890), and many popular romances of military life.

KING, THOMAS (1730–1805), English actor and dramatist, was born in London on the 20th of August 1730. Garrick saw him when appearing as a strolling player in a booth at Windsor, and engaged him for Drury Lane. He made his first appearance there in 1748 as the Herald in *King Lear*. He played the part of Allworth in the first presentation of Massinger's *New Way to Pay Old Debts* (1748), and during the summer he played Romeo and other leading parts in Bristol. For eight years he was the leading comedy actor at the Smock Alley theatre in Dublin, but in 1759 he returned to Drury Lane and took leading parts until 1802. One of his earliest successes was as Lord Ogleby in *The Clandestine Marriage* (1766), which was compared to Garrick's Hamlet and Kemble's Coriolanus, but he reached the climax of his reputation when he created the part of Sir Peter Teazle at the first representation of *The School for Scandal* (1777). He was the author of a number of farces, and part-owner and manager of several theatres, but his fondness for gambling brought him to poverty. He died on the 11th of December 1805.

KING, WILLIAM (1650–1729), Anglican divine, the son of James King, an Aberdeen man who migrated to Antrim, was born in May 1650. He was educated at Trinity College, Dublin, and after being presented to the parish of St Werburgh, Dublin, in 1679, became dean of St Patrick's in 1689, bishop of Derry in 1691, and archbishop of Dublin in 1702. In 1718 he founded the divinity lectureship in Trinity College, Dublin, which bears his name. He died in May 1729. King was the author of *The State of the Protestants in Ireland under King James's Government* (1691), but is best known by his *De Origine Mali* (1702; Eng. trans., 1731), an essay deemed worthy of a reply by Bayle and Leibnitz. King was a strong supporter of the Revolution, and his voluminous correspondence is a valuable help to our knowledge of the Ireland of his day.

See *A Great Archbishop of Dublin, William King, D.D.*, edited by Sir C. S. King, Bart. (1908).

KING, WILLIAM (1663–1712), English poet and miscellaneous writer, son of Ezekiel King, was born in 1663. From his father he inherited a small estate and he was connected with the Hyde family. He was educated at Westminster School under Dr Busby, and at Christ Church, Oxford (B.A. 1685; D.C.L. 1692). His first literary enterprise was a defence of Wycliffe, written in conjunction with Sir Edward Hannes (d. 1710) and entitled *Reflections upon Mons. Varillas's History of Heresy* . . . (1688). He became known as a humorous writer on the Tory and High Church side. He took part in the controversy aroused by the conversion of the once stubborn non-juror William Sherlock, one of his contributions being an entertaining ballad, "The Battle Royal," in which the disputants are Sherlock and South. In 1694 he gained the favour of Princess Anne by a defence of her husband's country entitled *Animadversions on the Pretended Account of Denmark*, in answer to a depreciatory pamphlet by Robert (afterwards Viscount) Molesworth. For this service he was made secretary to the princess. He supported Charles Boyle in his controversy with Richard Bentley over the genuineness of the *Epistles of Phalaris*, by a letter (printed in *Dr Bentley's Dissertations* . . . (1698), more commonly known as *Boyle against Bentley*), in which he gave an account of the circumstances of Bentley's interview with the bookseller Bennet. Bentley attacked Dr King in his *Dissertation* in answer (1699) to this book, and King replied with a second letter to his friend Boyle. He further satirized Bentley in ten *Dialogues of the Dead relating to . . . the Epistles of Phalaris* (1699). In 1700 he published *The Transactioneer, with some of his Philosophical Fancies, in two Dialogues*, ridiculing the credulity of Hans Sloane, who was then the secretary of the Royal Society. This was followed up later with some burlesque *Useful Transactions in Philosophy* (1709). By an able defence of his friend, James Annesley, 5th earl of Anglesey, in a suit brought against him by his wife before the House of Lords in 1701, he gained a legal reputation which he did nothing further to advance. He was sent to Ireland in 1701 to be judge of the high court of admiralty, and later became sole commissioner of the prizes, keeper of the records in the Bermingham Tower of Dublin Castle, and vicar-general to the primate. About 1708 he returned to London. He served the Tory cause by writing for *The Examiner* before it was taken up by Swift. He wrote four pamphlets in support of Sacheverell, in the most considerable of which, "A Vindication of the Rev. Dr Henry Sacheverell . . . in a Dialogue between a Tory and a Whig" (1711), he had the assistance of Charles Lambe of Christ Church and of Sacheverell himself. In December 1711 Swift obtained for King the office of gazetteer, worth from £200 to £250. King was now very poor, but he had no taste for work, and he resigned his office on the 1st of July 1712. He died on the 25th of December in the same year.

The other works of William King include: *A Journey to London, in the year 1698. After the Ingenious Method of that made by Dr Martin Lister to Paris, in the same Year* . . . (1699), which was considered by the author to be his best work; *Adversaria, or Occasional Remarks on Men and Manners*, a selection from his critical note-book, which shows wide and varied reading; *Rufinus, or An Historical Essay on the Favourite Ministry* (1712), a satire on the duke of Marlborough. His chief poems are: *The Art of Cookery: in imitation of Horace's*

Art of Poetry. With some Letters to Dr Lister and Others (1708), one of his most amusing works; *The Art of Love; in imitation of Ovid . . .* (1709); "Mully of Mountoun," and a burlesque "Orpheus and Eurydice." A volume of *Miscellanies in Prose and Verse* appeared in 1705; his *Remains* . . . . were edited by J. Brown in 1732; and in 1776 John Nichols produced an excellent edition of his *Original Works . . . with Historical Notes and Memoirs of the Author.* Dr Johnson included him in his *Lives of the Poets*, and his works appear in subsequent collections.

King is not to be confused with another William King (1685–1763), author of a mock-heroic poem called *The Toast* (1736) satirizing the countess of Newburgh, and principal of St Mary Hall, Oxford.

KING [OF OCKHAM], PETER KING, 1st Baron (1669–1734), lord chancellor of England, was born at Exeter in 1669. In his youth he was interested in early church history, and published anonymously in 1691 *An Enquiry into the Constitution, Discipline, Unity and Worship of the Primitive Church that flourished within the first Three Hundred Years after Christ.* This treatise engaged the interest of his cousin, John Locke, the philosopher, by whose advice his father sent him to the university of Leiden, where he stayed for nearly three years. He entered the Middle Temple in 1694 and was called to the bar in 1698. In 1700 he was returned to parliament for Beer Alston in Devonshire; he was appointed recorder of Glastonbury in 1705 and recorder of London in 1708. He was chief justice of the common pleas from 1714 to 1725, when he was appointed speaker of the House of Lords and was raised to the peerage. In June of the same year he was made lord chancellor, holding office until compelled by a paralytic stroke to resign in 1733. He died at Ockham, Surrey, on the 22nd of July 1734. Lord King as chancellor failed to sustain the reputation which he had acquired at the common law bar. Nevertheless he left his mark on English law by establishing the principles that a will of immovable property is governed by the *lex loci rei sitae*, and that where a husband had a legal right to the personal estate of his wife, which must be asserted by a suit in equity, the court would not help him unless he made a provision out of the property for the wife, if she required it. He was also the author of the Act (4 Geo. II. c. 26) by virtue of which English superseded Latin as the language of the courts. Lord King published in 1702 a *History of the Apostles' Creed* (Leipzig, 1706; Basel, 1750) which went through several editions and was also translated into Latin.

His great-great-grandson, William (1805–1893), married in 1835 the only daughter of Lord Byron the poet, and was created earl of Lovelace in 1838. Another descendant, Peter John Locke King (1811–1885), who was member of parliament for East Surrey from 1847 to 1874, won some fame as an advocate of reform, being responsible for the passing of the Real Estate Charges Act of 1854, and for the repeal of a large number of obsolete laws.

KING (O. Eng. *cyning*, abbreviated into *cyng*, *cing*; cf. O.H.G. *chun- kuning*, *chun- kunig*, M.H.G. *künic*, *künec*, *künc*, Mod. Ger. *König*, O. Norse *konungr*, *kongr*, Swed. *konung*, *kung*), a title, in its actual use generally implying sovereignty of the most exalted rank. Any inclusive definition of the word "king" is, however, impossible. It always implies sovereignty, but in no special degree or sense; *e.g.* the sovereigns of the British Empire and of Servia are both kings, and so too, at least in popular parlance, are the chiefs of many barbarous peoples, *e.g.* the Zulus. The use of the title is, in fact, involved in considerable confusion, largely the result of historic causes. Freeman, indeed, in his *Comparative Politics* (p. 138) says: "There is a common idea of kingship which is at once recognized however hard it may be to define it. This is shown among other things by the fact that no difficulty is ever felt as to translating the word king and the words which answer to it in other languages." This, however, is subject to considerable modification. "King," for instance, is used to translate the Homeric ἄναξ equally with the Athenian βασιλεύς or the Roman *rex*. Yet the Homeric "kings" were but tribal chiefs; while the Athenian and Roman kings were kings in something more than the modern sense, as supreme priests as well as supreme rulers and lawgivers (see Archon; and Rome: *History*). In the English Bible, too, the title of king is given indiscriminately to the great king of Persia and to potentates who were little more than Oriental sheiks. A more practical difficulty, moreover, presented itself in international intercourse, before diplomatic conventions became, in the 19th century, more or less stereotyped. Originally the title of king was superior to that of emperor, and it was to avoid the assumption of the superior title of *rex* that the chief magistrates of Rome adopted the names of *Caesar*, *imperator* and *princeps* to signalize their authority. But with the development of the Roman imperial idea the title emperor came to mean more than had been involved in that of *rex*; very early in the history of the Empire there were subject kings; while with the Hellenizing of the East Roman Empire its rulers assumed the style of βασιλεύς, no longer to be translated "king" but "emperor." From this Roman conception of the supremacy of the emperor the medieval Empire of the West inherited its traditions. With the barbarian invasions the Teutonic idea of kingship had come into touch with the Roman idea of empire and with the theocratic conceptions which this had absorbed from the old Roman and Oriental views of kingship. With these the Teutonic kingship had in its origin but little in common.

Etymologically the Romance and Teutonic words for king have quite distinct origins. The Latin *rex* corresponds to the Sanskrit *rajah*, and meant originally steersman. The Teutonic king on the contrary corresponds to the Sanskrit *ganaka*, and "simply meant father, the father of a family, the king of his own kin, the father of a clan, the father of a people."[1] The Teutonic kingship, in short, was national; the king was the supreme representative of the people, "hedged with divinity" in so far as he was the reputed descendant of the national gods, but with none of that absolute theocratic authority associated with the titles of *rex* or βασιλεύς. This, however, was modified by contact with Rome and Christianity. The early Teutonic conquerors had never lost their reverence for the Roman emperor, and were from time to time proud to acknowledge their inferiority by accepting titles, such as "patrician," by which this was implied. But by the coronation of Charles, king of the Franks, as emperor of the West, the German kingship was absorbed into the Roman imperial idea, a process which exercised a profound effect on the evolution of the Teutonic kingship generally. In the symmetrical political theory of medieval Europe pope and emperor were sun and moon, kings but lesser satellites; though the theory only partially and occasionally corresponded with the facts. But the elevation of Charlemagne had had a profound effect in modifying the *status* of kingship in nations that never came under his sceptre nor under that of his successors. The shadowy claim of the emperors to universal dominion was in theory everywhere acknowledged; but independent kings hastened to assert their own dignity by surrounding themselves with the ceremonial forms of the Empire and occasionally, as in the case of the Saxon *bretwaldas* in England, by assuming the imperial style. The mere fact of this usurpation showed that the title of king was regarded as inferior to that of emperor; and so it continued, as a matter of sentiment at least, down to the end of the Holy Roman Empire in 1806 and the cheapening of the imperial title by its multiplication in the 19th century. To the last, moreover, the emperor retained the prerogative of creating kings, as in the case of the king of Prussia in 1701, a right borrowed and freely used by the emperor Napoleon. Since 1814 the title of king has been assumed or bestowed by a consensus of the Powers; *e.g.* the elector of Hanover was made king by the congress of Vienna (1814), and *per contra* the title of king was refused to the elector of Hesse by the congress of Aix-la-Chapelle (1818). In general the title of king is now taken to imply a sovereign and independent international position. This was implied in the recognition of the title of king in the rulers of Greece, Rumania, Servia and Bulgaria when these countries were declared absolutely independent of Turkey. The fiction of this independent sovereignty is preserved even in the case of the kings of Bavaria, Saxony and Württemberg, who are technically members of a free confederation of sovereign states, but are not independent, since their relations with foreign Powers are practically controlled by the king of Prussia as German emperor.

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[1] Max Müller, *Lect. Sci. Lang.*, 2nd series, p. 255, "All people, save those who fancy that the name *king* has something to do with a Tartar *khan* or with a 'canning' . . . man, are agreed that the English *cyning* and the Sanskrit *ganaka* both come from the same root, from that widely spread root whence comes our own *cyn* or kin and the Greek γένος. The only question is whether there is any connexion between *cyning* and *ganaka* closer than that which is implied in their both coming from the same original root. That is to say, are we to suppose that *cyning* and *ganaka* are strictly the same word common to Sanskrit and Teutonic, or is it enough to think that *cyning* is an independent formation made after the Teutons had separated themselves from the common stock? . . . The difference between the two derivations is not very remote, as the *cyn* is the ruling idea in any case; but if we make the word immediately cognate with *ganaka* we bring in a notion about 'the father of his people' which has no place if we simply derive *cyning* from *cyn*." See also O. Schrader, *Reallexikon der Indogermanischen Altertumskunde* (Strassburg, 1901) *s.v.* "König": the *chuning* (King) is but the *chunni* (Kin) personified; cf. A.S. *léod* masc. = "prince"; *léod* fem. = "race," *i.e.* Lat. *gens*.

Divine Right of Kings.

The theory of the "divine right" of kings, as at present understood, is of comparatively modern growth. The principle that the kingship is "descendible in one sacred family," as George Canning put it, is not only still that of the British constitution, as that of all monarchical states, but is practically that of kingship from the beginning. This is, however, quite a different thing from asserting with the modern upholders of the doctrine of "divine right" not only that "legitimate" monarchs derive their authority from, and are responsible to, God alone, but that this authority is by divine ordinance hereditary in a certain order of succession. The power of popular election remained, even though popular choice was by custom or by religious sentiment confined within the limits of a single family. The custom of primogeniture grew up owing to the obvious convenience of a simple rule that should avoid ruinous contests; the so-called "Salic Law" went further, and by excluding females, removed another possible source of weakness. Neither did the Teutonic kingship imply absolute power. The idea of kingship as a theocratic function which played so great a part in the political controversies of the 17th century, is due ultimately to Oriental influences brought to bear through Christianity. The crowning and anointing of the emperors, borrowed from Byzantium and traceable to the influence of the Old Testament, was imitated by lesser potentates; and this "sacring" by ecclesiastical authority gave to the king a character of special sanctity. The Christian king thus became, in a sense, like the Roman *rex*, both king and priest. Shakespeare makes Richard II. say, "Not all the water in the rough rude sea can wash the balm off from an anointed king" (act iii. sc. 2); and this conception of the kingship tended to gather strength with the weakening of the prestige of the papacy and of the clergy generally. Before the Reformation the anointed king was, within his realm, the accredited vicar of God for secular purposes; after the Reformation he became this in Protestant states for religious purposes also. In England it is not without significance that the sacerdotal vestments, generally discarded by the clergy—dalmatic, alb and stole—continued to be among the insignia of the sovereign (see CORONATION). Moreover, this sacrosanct character he acquired not by virtue of his "sacring," but by hereditary right; the coronation, anointing and vesting were but the outward and visible symbol of a divine grace adherent in the sovereign by virtue of his title. Even Roman Catholic monarchs, like Louis XIV., would never have admitted that their coronation by the archbishop constituted any part of their title to reign; it was no more than the consecration of their title. In England the doctrine of the divine right of kings was developed to its extremest logical conclusions during the political controversies of the 17th century. Of its exponents the most distinguished was Hobbes, the most exaggerated Sir Robert Filmer. It was the main issue to be decided by the Civil War, the royalists holding that "all Christian kings, princes and governors" derive their authority direct from God, the parliamentarians that this authority is the outcome of a contract, actual or implied, between sovereign and people. In one case the king's power would be unlimited, according to Louis XIV.'s famous saying: "*L' état, c'est moi!*" or limitable only by his own free act; in the other his actions would be governed by the advice and consent of the people, to whom he would be ultimately responsible. The victory of this latter principle was proclaimed to all the world by the execution of Charles I. The doctrine of divine right, indeed, for a while drew nourishment from the blood of the royal "martyr"; it was the guiding principle of the Anglican Church of the Restoration; but it suffered a rude blow when James II. made it impossible for the clergy to obey both their conscience and their king; and the revolution of 1688 made an end of it as a great political force. These events had effects far beyond England. They served as precedents for the crusade of republican France against kings, and later for the substitution of the democratic kingship of Louis Philippe, "king of the French by the grace of God and the will of the people," for the "legitimate" kingship of Charles X., "king of France by the grace of God."

The theory of the crown in Britain, as held by descent modified and modifiable by parliamentary action, and yet also "by the grace of God," is in strict accordance with the earliest traditions of the English kingship; but the rival theory of inalienable divine right is not dead. It is strong in Germany and especially in Prussia; it survives as a militant force among the Carlists in Spain and the Royalists in France (see LEGITIMISTS); and even in England a remnant of enthusiasts still maintain the claims of a remote descendant of Charles I. to the throne (see JACOBITES).

See J. Neville Figgis, *Theory of the Divine Right of Kings* (Cambridge, 1896). (W. A. P.)

KING-BIRD, the *Lanius tyrannus* of Linnaeus, and the *Tyrannus carolinensis* or *T. pipiri* of most later writers, a common and characteristic inhabitant of North America, ranging as high as 57° N. lat. or farther, and westward to the Rocky Mountains, beyond which it is found in Oregon, in Washington (State), and in British Columbia, though apparently not occurring in California. In Canada and the northern states of the Union it is a summer visitor, wintering in the south, but also reaching Cuba; and, passing through Central America, it has been found in Bolivia and eastern Peru. Both the scientific and common names of this species are taken from the way in which the cock will at times assume despotic authority over other birds, attacking them furiously as they fly, and forcing them to divert or altogether desist from their course. Yet it is love of his mate or his young that prompts this bellicose behaviour, for it is only in the breeding season that he indulges in it; but then almost every large bird that approaches his nest, from an eagle downwards, is assaulted, and those alone that possess greater command of flight can escape from his repeated charges, which are accompanied by loud and shrill cries. On these occasions it may be that the king-bird displays the emblem of his dignity, which is commonly concealed; for, being otherwise rather plainly coloured—dark-ashy grey above and white beneath—the erectile feathers of the crown of the head, on being parted, form as it were a deep furrow, and reveal their base, which is of a bright golden-orange in front, deepening into scarlet, and then passing into silvery white. This species seems to live entirely on insects, which it captures on the wing; it is in bad repute with bee-keepers,[1] though, according to Dr E. Coues, it "destroys a thousand noxious insects for every bee it eats." It builds, often in an exposed situation, a rather large nest, coarsely constructed outside, but neatly lined with fine roots or grasses, and lays five or six eggs of a pale salmon colour, beautifully marked with blotches and spots of purple, brown and orange, generally disposed in a zone near the larger end.

Nearly akin to the king-bird is the petchary or chicheree, so called from its loud and petulant cry, *T. dominicensis*, or *T. griseus*, one of the most characteristic and conspicuous birds of the West Indies, and the earliest to give notice of the break of day. In habits, except that it eats a good many berries, it is the very counterpart of its congener, and is possibly even more jealous of any intruder. At all events its pugnacity extends to animals from which it could not possibly receive any harm, and is hardly limited to any season of the year.

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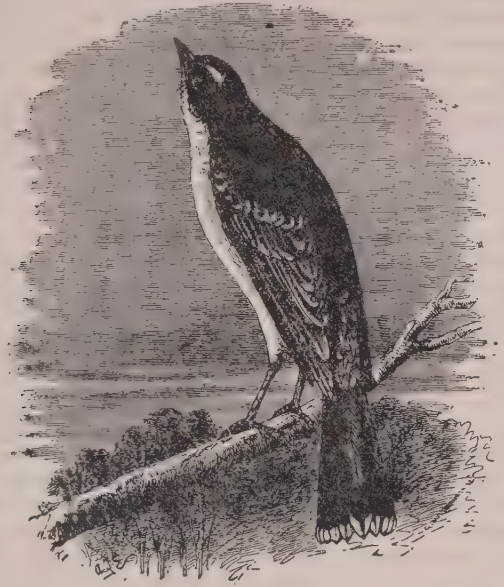
[1] It is called in some parts the bee-martin.

In several respects both of these birds, with several of their allies, resemble some of the shrikes; but it must be clearly understood that the likeness is but of analogy, and that there is no near affinity between the two families *Laniidae* and *Tyrannidae*, which belong to wholly distinct sections of the great Passerine order; and, while the former is a comparatively homogeneous group, much diversity of form and habits is found among the latter. Similarly many of the smaller *Tyrannidae* bear some analogy to certain *Muscicapidae*, with which they were at one time confounded (see FLYCATCHER), but the difference between them is deep seated.[1] Nor is this all, for out of the seventy genera, or thereabouts, into which the *Tyrannidae* have been divided, comprehending perhaps three hundred and fifty species, all of which are peculiar to the New World, a series of forms can be selected which find a kind of parallel to a series of forms to be found in the other group of *Passeres*; and the genus *Tyrannus*, though that from which the family is named, is by no means a fair representative of it; but it would be hard to say which genus should be so accounted. The birds of the genus *Muscisaxicola* have the habits and almost the appearance of wheat-ears; the genus *Alectorurus* calls to mind a water-wagtail; *Euscarthmus* may suggest a titmouse, *Elainea* perhaps a willow-wren; but the greatest number of forms have no analogous bird of the Old World with which they can be compared; and, while the combination of delicate beauty and peculiar external form possibly attains its utmost in the long-tailed *Milvulus*, the glory of the family may be said to culminate in the king of king-birds, *Muscivora regia*. (A. N.)



King-Bird.

KING-CRAB, the name given to an Arachnid, belonging to the order Xiphosurae, of the grade Delobranchia or Hydropneustea. King-crabs, of which four, possibly five, existing species are known, were formerly referred to the genus *Limulus*, a name still applied to them in all zoological textbooks. It has recently been shown, however, that the structural differences between some of the species are sufficiently numerous and important to warrant the recognition of three genera—*Xiphosura*, of which *Limulus* is a synonym, *Tachypleus* and *Carcinoscorpius*. In *Xiphosura* the genital operculum structurally resembles the gill-bearing appendages in that the inner branches consist of three distinct segments, the distal of which is lobate and projects freely beyond the margin of the adjacent distal segment of the outer branch; the entosternite (see ARACHNIDA) has two pairs of antero-lateral processes, and in the male only the ambulatory appendages of the second pair are modified as claspers. In *Tachypleus* and *Carcinoscorpius*, on the other hand, the genital operculum differs from the gill-bearing appendages in that the inner branches consist of two segments, the distal of which are apically pointed, partially or completely fused in the middle line, and do not project beyond the distal segments of the outer branches; the entosternite has only one pair of antero-lateral processes, and in the male the second and third pairs of ambulatory limbs are modified as claspers. *Tachypleus* differs from *Carcinoscorpius* in possessing a long movable spur upon the fourth segment of the sixth ambulatory limb, in having the postanal spine triangular in section instead of round, and the claspers in the male hemichelate, owing to the suppression of the immovable finger, which is well developed in *Carcinoscorpius*. At the present time king-crabs have a wide but discontinuous distribution. *Xiphosura*, of which there is but one species, *X. polyphemus*, ranges along the eastern side of North America from the coast of Maine to Yucatan. *Carcinoscorpius*, which is also represented by a single species, *C. rotundicauda*, extends from the Bay of Bengal to the coast of the Moluccas and the Philippines, while of the two better-known species of *Tachypleus*, *T. gigas* (= *moluccanus*) ranges from Singapore to Torres Straits, and *T. tridentatus* from Borneo to southern Japan. A third species, *T. hoeveni*, has been recorded from the Moluccas. But although *Xiphosura* is now so widely sundered geographically from *Tachypleus* and *Carcinoscorpius*, the occurrence of the remains of extinct species of king-crabs in Europe, both in Tertiary deposits and in Triassic, Jurassic and Cretaceous strata, suggests that there was formerly a continuous coast-line, with tropical or temperate conditions, extending from Europe westward to America, and eastward to southern Asia. There are, however, no grounds for the assumption that the supposed coast-line between America and Europe synchronized with that between Europe and south Asia. King-crabs do not appear to differ from each other in habits. Except in the breeding season they live in water ranging in depth from about two to six fathoms, and creep about the bottom or bury themselves in the sand. Their food consists for the most part of soft marine worms, which are picked up in the nippers, thrust into the mouth, and masticated by the basal segments of the appendages between which the mouth lies. At the approach of the breeding season, which in the case of *Xiphosura polyphemus* is in May, June and July, king-crabs advance in pairs into very shallow water at the time of the high tides, the male holding securely to the back of the female by means of his clasping nippers. No actual union between the sexes takes place, the spawn of the female being fertilized by the male at the time of being laid in the sand or soon afterwards. This act accomplished, the two retreat again into deeper water. Deposited in the mud or sand near high-water mark, the eggs are eventually hatched by the heat of the sun, to which they are exposed every day for a considerable time. The newly hatched young is minute and subcircular in shape, but bears a close resemblance to its parents except in the absence of the caudal spine and in the presence of a fringe of stiff bristles round the margin of the body. During growth it undergoes a succession of moults, making its exit from the old integument through a wide split running round the edge of the carapace. Moulting is effected in exactly the same way in scorpions, Pedipalpi, and normally in spiders. The caudal spine appears at the second moult and gradually increases in length with successive changes of the skin. This organ is of considerable importance, since it enables the king-crab to right itself when overturned by rough water or other causes. Without it the

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[1] Two easy modes of discriminating them externally may be mentioned. All the *Laniidae* and *Muscicapidae* have but *nine* primary quills in their wings, and their tarsi are covered with scales in front only; while in the *Tyrannidae* there are *ten* primaries, and the tarsal scales extend the whole way round. The more recondite distinction in the structure of the trachea seems to have been first detected by Macgillivray, who wrote the anatomical descriptions published in 1839 by Audubon (*Orn. Biography*, v. 421, 422); but its value was not appreciated till the publication of Johannes Müller's classical treatise on the vocal organs of Passerine birds (*Abhandl. k. Akad. Wissensch. Berlin*, 1845, pp. 321, 405).

animal would remain helpless like an upturned turtle, because it is unable to reach the ground with its legs when lying on its back. Before the tail is sufficiently developed to be used for that purpose, the young king-crab succeeds in regaining the normal position by flapping its flattened abdominal appendages and rising in the water by that means. The king-crab fishery is an industry of some importance in the United States, and in the East Indies the natives eat the animal and tip their lances and arrows with the caudal spine. They also use the hollow empty shell as a water-ladle or pan—hence the name "pan-fish" or "saucepan-crab" by which the animal is sometimes known. Fossil king-crabs have been recorded from strata of the Tertiary and Secondary epochs, and related but less specialized types of the same order are found in rocks of Palaeozoic age. Of these the most important are *Belinurus* of the Carboniferous, *Protolimulus* of the Devonian, and *Hemiaspis* of the Silurian periods. These ancient forms differ principally from true king-crabs in having the segments of the opisthosoma or hinder half of the body distinctly defined instead of welded into a hexagonal shield. (R. I. P.)

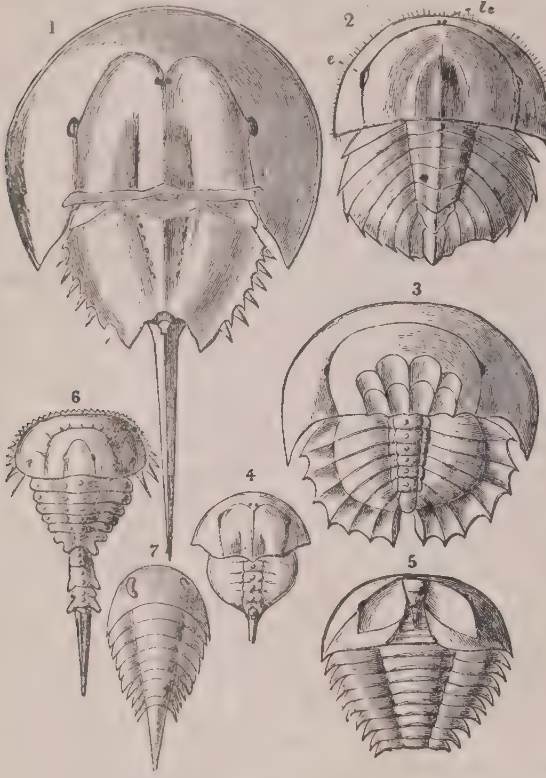

FIG. 1.

1, *Limulus polyphemus*, adult (dorsal aspect).
2, *Limulus polyphemus*, young (dorsal aspect).
3, *Prestwichia rotundata*, Coal M., Shropshire.
4, *Prestwichia Birtwelli*, Coal M., Lancashire.
5, *Neolimulus falcatus*, U. Silurian, Lanark.
6, *Hemiaspis limuloides*, L. Ludlow, Leintwardine, Shropshire.
7, *Pseudoniscus aculeatus*, U. Silurian, Russia.

KINGFISHER (Ger.[1] *Königsfischer;* Walloon *Roi-pêkeux=pêcheur*), the *Alcedo ispida* of ornithologists, one of the most beautiful and well-known of European birds, being found, though nowhere very abundantly, in every European country, as well as in North Africa and South-Western Asia as far as Sindh. Its blue-green back and rich chestnut breast render it conspicuous as it frequents the streams and ponds whence it procures its food, by plunging almost perpendicularly into the water, and emerging a moment after with the prey—whether a small fish, crustacean, or an aquatic insect—it has captured. In hard frosts it resorts to the sea-shore, but a severe winter is sure to occasion a great mortality in the species, for many of its individuals seem unable to reach the tidal waters where only in such a season they could obtain sustenance; and to this cause rather than any other is perhaps to be ascribed its general scarcity. Very early in the year it prepares its nest, which is at the end of a tunnel bored by itself in a bank, and therein the six or eight white, glossy, translucent eggs are laid, sometimes on the bare soil, but often on the fishbones which, being indigestible, are thrown up in pellets by the birds; and, in any case, before incubation is completed these *rejectamenta* accumulate so as to form a pretty cup-shaped structure that increases in bulk after the young are hatched, but, mixed with their fluid excretions and with decaying fishes brought for their support, soon becomes a dripping fetid mass.

The kingfisher is the subject of a variety of legends and superstitions, both classical and medieval. Of the latter one of the most curious is that having been originally a plain grey bird it acquired its present bright colours by flying towards the sun on its liberation from Noah's ark, when its upper surface assumed the hue of the sky above it and its lower plumage was scorched by the heat of the setting orb to the tint it now bears.[2] More than this, the kingfisher was supposed to possess many virtues. Its dried body would avert thunderbolts, and if kept in a wardrobe would preserve from moths the woollen stuffs therein laid, or hung by a thread to the ceiling of a chamber would point with its bill to the quarter whence the wind blew. All readers of Ovid (*Metam.*, bk. xi.) know how the faithful but unfortunate Ceyx and Alcyone were changed into kingfishers—birds which bred at the winter solstice, when through the influence of Aeolus, the wind-god and father of the fond wife, all gales were hushed and the sea calmed so that their floating nest might ride uninjured over the waves during the seven proverbial "Halcyon days"; while a variant or further development of the fable assigned to the halcyon itself the power of quelling storms.[3]

The common kingfisher of Europe is the representative of a well-marked family of birds, the *Alcedinidae* or *Halcyonidae* of ornithologists, which is considered by most authorities[4] to be closely related to the *Bucerotidae* (see HORNBILL); but the affinity can scarcely be said as yet to be proved. Be that as it may, the present family forms the subject of an important work by Bowdler Sharpe.[5] Herein are described one hundred and twenty-five species, nearly all of them being beautifully figured by Keulemans, and that number may be taken even now as approximately correct; for, while the validity of a few has been denied by some eminent men, nearly as many have since been made known, and it seems likely that two or three more described by older writers may yet be rediscovered. These one hundred and twenty-five species Sharpe groups in nineteen genera, and divides into two sub-families, *Alcedininae* and *Daceloninae*,[6] the one containing five and the other fourteen genera. With existing anatomical materials perhaps no better arrangement could have been made, but the method afterwards published by Sundevall (*Tentamen*, pp. 95, 96) differs from it not inconsiderably. Here, however, it will be convenient to follow Sharpe. Externally, which is almost all we can at present say, kingfishers present a great uniformity of structure. One of their most remarkable features is the feebleness of their feet, and the union (syndactylism) of the third and fourth digits for the greater part of their length; while, as if still further to show the comparatively functionless character of these members, in two of the genera, *Alcyone* and *Ceyx*, the second digit is aborted, and the birds have but three toes. In most forms the bill does not differ much from that of the common *Alcedo ispida*, but in *Syma* its edges are serrated, while in *Carcineutes*, *Dacelo* and *Melidora* the maxilla is prolonged, becoming in the last a very pronounced hook. Generally the wings are short and rounded, and the tail is in many forms inconspicuous; but in *Tanysiptera*, one of the most beautiful groups, the middle pair of feathers is greatly elongated and spatulate, while this genus possesses only ten rectrices, all the rest having twelve. Sundevall relies on a character not noticed by Sharpe, and makes his principal divisions depend on the size of the scapulars, which in one form a mantle, and in the other are so small as not to cover the back. The *Alcedinidae* are a cosmopolitan family, but only one genus, *Ceryle*, is found in America, and that extends as well over a great part of the Old World, though not into the Australian region, which affords by far the greater number both of genera and species, having no fewer than ten of the former and fifty-nine of the latter peculiar to it.[1]

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[1] But more commonly called *Eisvogel*, which finds its counterpart in the Anglo-Saxon *Isern* or *Isen*.

[2] Rolland, *Faune populaire de la France*, ii. 74.

[3] In many of the islands of the Pacific Ocean the prevalent kingfisher is the object of much veneration.

[4] Cf. Eyton, *Contrib. Ornithology* (1850), p. 80; Wallace, *Ann. Nat. History*, series 2, vol. xviii. pp. 201, 205; and Huxley, *Proc. Zool. Society* (1867), p. 467.

[5] *A Monograph of the Alcedinidae or Family of the Kingfishers*, by R. B. Sharpe, 4to (London, 1868–1871). Some important anatomical points were briefly noticed by Professor Cunningham (*Proc. Zool. Soc.*, 1870, p. 280).

[6] The name of this latter sub-family as constituted by Sharpe would seem to be more correctly *Ceycinae*—the genus *Ceyx*, founded in 1801 by Lacépède, being the oldest included in it. The word *Dacelo*, invented by Leach in 1815, is simply an anagram of *Alcedo*, and, though of course without any etymological meaning, has been very generally adopted.

In habits kingfishers display considerable diversity, though all, it would seem, have it in common to sit at times motionless on the watch for their prey, and on its appearance to dart upon it, seize it as they fly or dive, and return to a perch where it may be conveniently swallowed. But some species, and especially that which is the type of the family, are not always content to await at rest their victim's showing itself. They will hover like a hawk over the waters that conceal it, and, in the manner already described, precipitate themselves upon it. This is particularly the way with those that are fishers in fact as well as in name; but no inconsiderable number live almost entirely in forests, feeding on insects, while reptiles furnish the chief sustenance of others. The last is characteristic of at least one Australian form, which manages to thrive in the driest districts of that country, where not a drop of water is to be found for miles, and the air is at times heated to a degree that is insupportable by most animals. The belted kingfisher of North America, *Ceryle alcyon*, is a characteristic bird of that country, though its habits greatly resemble those of the European species; and the so-called "laughing jackass" of New South Wales and South Australia, *Dacelo gigas*—with its kindred forms, *D. leachi*, *D. cervina* and *D. occidentalis*, from other parts of the country—deserve special mention. Attention must also be called to the speculations of Dr Bowdler Sharpe (*op. cit.*, pp. xliv.–xlvii.) on the genetic affinity of the various forms of *Alcedinidae*, and it is to be regretted that hitherto no light has been shed by palaeontologists on this interesting subject, for the only fossil referred to the neighbourhood of the family is the *Halcyornis toliapicus* of Sir R. Owen (*Br. Foss. Mamm. and Birds*, p. 554) from the Eocene of Sheppey—the very specimen said to have been previously placed by König (*Icon. foss. sectiles*, fig. 153) in the genus *Larus*. (A. N.)

KINGHORN, a royal and police burgh of Fifeshire, Scotland. Pop. (1901), 1550. It is situated on the Firth of Forth, 2¼ m. E. by N. of Burntisland, on the North British railway. The public buildings include a library and town-hall. It enjoys some repute as a summer resort. The leading industries are ship-building, bleaching and the making of flax and glue. At the time of his visit Daniel Defoe found thread-making in vogue, which employed the women while the men were at sea. Alexander III. created Kinghorn a burgh, but his connexion with the town proved fatal to him. As he was riding from Inverkeithing on the 12th of March 1286 he was thrown by his horse and fell over the cliffs, since called King's Wud End, a little to the west of the burgh, and killed. A monument was erected in 1887 to mark the supposed scene of the accident. The Witch Hill used to be the place of execution of those poor wretches. Kinghorn belongs to the Kirkcaldy district group of parliamentary burghs. At PETTYCUR, 1 m. to the south, is a good harbour for its size, and at Kinghorn Ness a battery has been established in connexion with the fortifications on Inchkeith. The hill above the battery was purchased by government in 1903 and is used as a point of observation. About 1 m. to the north of Kinghorn is the estate of Grange, which belonged to Sir William Kirkcaldy. INCHKEITH, an island in the fairway of the Firth of Forth, 2½ m. S. by E. of Kinghorn and 3½ m. N. by E. of Leith, belongs to the parish of Kinghorn. It has a north-westerly and south-easterly trend, and is nearly 1 m. long and ¼ m. wide. It is a barren rock, on the summit of which stands a lighthouse visible at night for 21 m. In 1881 forts connected by a military road were erected on the northern, western and southern headlands.

KINGLAKE, ALEXANDER WILLIAM (1809–1891), English historian and traveller, was born at Taunton on the 5th of August 1809. His father, a successful solicitor, intended his son for a legal career. Kinglake went to Eton and Trinity College, Cambridge, where he matriculated in 1828, being a contemporary and friend of Tennyson and Thackeray. After leaving Cambridge he joined Lincoln's Inn, and was called to the bar in 1837. While still a student he travelled, in 1835, throughout the East, and the impression made upon him by his experiences was so powerful that he was seized with a desire to record them in literature. *Eothen*, a sensitive and witty record of impressions keenly felt and remembered, was published in 1844, and enjoyed considerable reputation. In 1854 he went to the Crimea, and was present at the battle of the Alma. During the campaign he made the acquaintance of Lord Raglan, who was so much attracted by his talents that he suggested to Kinglake the plan for an elaborate *History of the Crimean War*, and placed his private papers at the writer's disposal. For the rest of his life Kinglake was engaged upon the task of completing this monumental history. Thirty-two years elapsed between its commencement and the publication of the last volume, and eight volumes in all appeared at intervals between 1863 and 1887. Kinglake lived principally in London, and sat in parliament for Bridgwater from 1857 until the disfranchisement of the borough in 1868. He died on the 2nd of January 1891. Kinglake's life-work, *The History of the Crimean War*, is in scheme and execution too minute and conscientious to be altogether in proportion, but it is a wonderful example of painstaking and talented industry. It is not without errors of partisanship, but it shows remarkable skill in the moulding of vast masses of despatches and technical details into an absorbingly interesting narrative; it is illumined by natural descriptions and character-sketches of great fidelity and acumen; and, despite its length, it remains one of the most picturesque, most vivid and most actual pieces of historical narrative in the English language.

KINGLET, a name applied in many books to the bird called by Linnaeus *Motacilla regulus*, and by most modern ornithologists *Regulus cristatus*, the golden-crested or golden-crowned wren of ordinary persons. This species is the type of a small group which has been generally placed among the *Sylviidae* or true warblers, but by certain systematists it is referred to the titmouse family, *Paridae*. That the kinglets possess many of the habits and actions of the latter is undeniable, but on the other hand they are not known to differ in any important points of organization or appearance from the former—the chief distinction being that the nostril is covered by a single bristly feather directed forwards. The golden-crested wren is the smallest of British birds, its whole length being about 3½ in., and its wing measuring only 2 in. from the carpal joint. Generally of an olive-green colour, the top of its head is bright yellow, deepening into orange, and bounded on either side by a black line, while the wing coverts are dull black, and some of them tipped with white, forming a somewhat conspicuous bar. The cock has a pleasant but weak song. The nest is a beautiful object, thickly felted of the softest moss, wool, and spiders' webs, lined with feathers, and usually built under and near the end of the branch of a yew, fir or cedar, supported by the interweaving of two or three laterally diverging and pendent twigs, and sheltered by the rest. The eggs are from six to ten in number, of a dull white sometimes finely freckled with reddish-brown. The species is particularly social, living for the most part of the year in family parties, and often joining bands of any species of titmouse in a common search for food. Though to be met with in Britain at all seasons, the bird in autumn visits the east coast in enormous flocks, apparently emigrants from Scandinavia, while hundreds perish in crossing the North Sea, where they are well known to the fishermen as "woodcock's pilots." A second and more local European species is the fire-crested wren, *R. ignicapillus*, easily recognizable by the black streak on each side of the head, before and behind the eye, as well as by the deeper colour of its crown. A third species, *R. maderensis*, inhabits the Madeiras, to which it is peculiar; and examples from the Himalayas and Japan have been differentiated as *R. himalayensis* and *R. japonicus*. North America has two well-known species, *R. satrapa*, very like the European *R. ignicapillus*, and the ruby-crowned wren, *R. calendula*, which is remarkable for a loud song that has been compared to that of a canary-bird or a skylark, and for having the characteristic nasal feather in a rudimentary or aborted condition. (A. N.)

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[1] Cf. Wallace, *Geog. Distr. Animals*, ii. 315.

KINGS, FIRST AND SECOND BOOKS OF, two books of the Bible, the last of the series of Old Testament histories known as the Earlier or Former Prophets. They were originally reckoned as a single book (Josephus; Origen *ap.* Eus., *H.E.* vi. 25; Peshitta; Talmud), though modern Bibles follow the bipartition which is derived from the Septuagint. In that version they are called the third and fourth books of "kingdoms" (βασιλειῶν), the first and second being our books of Samuel. The division into two books is not felicitous, and even the old Hebrew separation between Kings and Samuel must not be taken to mean that the history from the birth of Samuel to the exile was treated by two distinct authors in independent volumes. We cannot speak of the author of Kings or Samuel, but only of an editor or of successive editors whose main work was to arrange in a continuous form extracts or abstracts from earlier sources. The introduction of a chronological scheme and of a series of editorial comments and additions, chiefly designed to enforce the religious meaning of the history, gives a kind of unity to the book of Kings as we now read it; but beneath this we can still distinguish a variety of documents, which, though sometimes mutilated in the process of piecing together, retain sufficient individuality of style and colour to prove their original independence.

Of these documents one of the best defined is the vivid picture of David's court at Jerusalem (2 Sam. ix.–xx.) from which the first two chapters of 1 Kings manifestly cannot be separated. As it would be unreasonable to suppose that the editor of the history of David closed his work abruptly before the death of the king, breaking off in the middle of a valuable memoir which lay before him, this observation leads us to conclude that the books of Samuel and Kings are not independent histories. They have at least one source in common, and a single editorial hand was at work on both. From an historical point of view, however, the division which makes the beginning of Solomon's reign the beginning of a new book is very convenient. The conquest of Palestine by the Israelite tribes, recounted in the book of Joshua, leads up to the era of the "judges" (Judg. ii. 6–23; iii. sqq.), and the books of Samuel follow with the institution of the monarchy and the first kings. The books of Kings bring to a close the life of David (*c.* 975 B.C.), which forms the introduction to the reign of Solomon (1 Kings ii. 12–xi.), the troubles in whose time prepared the way for the separation into the two distinct kingdoms, viz. Judah and the northern tribes of Israel (xii. sqq.). After the fall of Samaria, the history of these Israelites is rounded off with a review (2 Kings xvii.–xviii. 12). The history of the surviving kingdom of Judah is then carried down to the destruction of Jerusalem and the exile (5 and 6), and, after an account of the Chaldean governorship, concludes with the release of the captive king Jehoiachin (561 B.C.) and with an allusion to his kind treatment during the rest of his lifetime.

The most noticeable feature in the book is the recurring interest in the centralization of worship in the Temple at Jerusalem as prescribed in Deuteronomy and enforced by Josiah. Amidst the great variety in style and manner which marks the several parts of the history, features which are imbued with the teaching of Deuteronomy recur regularly in similar stereotyped forms. They point in fact to a specific redaction, and thus it would seem that the editor who treated the foundation of the Temple, the central event of Solomon's life, as a religious epoch of the first importance, regarded this as the beginning of a new era—the history of Israel under the one sanctuary.

Successive Redactions.

When we assume that the book of Kings was thrown into its present form by a Deuteronomistic redactor we do not affirm that he was the first who digested the sources of the history into a continuous work, nor must we ascribe absolute finality to his work. He gave the book a definite shape and character, but the recognized methods of Hebrew literature left it open to additions and modifications by later hands. Even the redaction in the spirit of Deuteronomy seems itself to have had more than one stage, as Ewald long ago recognized.

The evidence to be detailed presently shows that there was a certain want of definiteness about the redaction. The mass of disjointed materials, not always free from inconsistencies, which lay before the editor in separate documents or in excerpts already partially arranged by an earlier hand, could not have been reduced to real unity without critical sifting, and an entire recasting of the narrative in a way foreign to the ideas and literary habits of the Hebrews. The unity which the editor aimed at was limited to (*a*) chronological continuity in the events recorded and (*b*) a certain uniformity in the treatment of the religious meaning of the narrative. Even this could not be perfectly attained in the circumstances, and the links of the history were not firmly enough riveted to prevent disarrangement or rearrangement of details by later scribes.

(*a*) The continued efforts of successive redactors can be traced in the chronology of the book. The chronological method of the narrative appears most clearly in the history after Solomon, where the events of each king's reign are thrown into a kind of stereotyped framework on this type: "In the twentieth year of Jeroboam, king of Israel, Asa began to reign over Judah, and reigned in Jerusalem forty-one years." . . . "In the third year of Asa, king of Judah, Baasha began to reign over Israel in Tirzah twenty-four years." The history moves between Judah and Israel according to the date of each accession; as soon as a new king has been introduced, everything that happened in his reign is discussed, and wound up by another stereotyped formula as to the death and burial of the sovereign; and to this mechanical arrangement the natural connexion of events is often sacrificed. In this scheme the elaborate synchronisms between contemporary monarchs of the north and south give an aspect of great precision to the chronology. But in reality the data for Judah and Israel do not agree, and remarkable deviations are sometimes found. The key to the chronology is 1 Kings vi. 1, which, as Wellhausen has shown, was not found in the original Septuagint, and contains internal evidence of post-Chaldean date. In fact the system as a whole is necessarily later than 535 B.C., the fixed point from which it counts back, and although the numbers for the duration of the reigns may be based upon early sources, the synchronisms appear to have been inserted at a much later stage in the history of the text.

(*b*) Another aspect in the redaction may be called theological. Its characteristic is the retrospective application to the history of a standard belonging to the later developments of Old Testament religion. Thus the redactor regards the sins of Jeroboam as the real cause of the downfall of Israel (2 Kings xvii. 21 seq.), and passes an unfavourable judgment upon all its rulers, not merely to the effect that they did evil in the sight of Yahweh but that they followed in the way of Jeroboam. But his opinion was manifestly not shared by Elijah or Elisha, nor by the original narrator of the lives of these prophets. Moreover, the redactor in 1 Kings iii. 2 seq. regards worship at the high places as sinful after the building of the Temple, although even the best kings before Hezekiah made no attempt to suppress these shrines. This feature in the redaction displays itself not only in occasional comments or homiletical excursuses, but in that part of the narrative in which all ancient historians allowed themselves free scope for the development of their reflections—the speeches placed in the mouths of actors in the history. Here also there is often textual evidence that the theological element is somewhat loosely attached to the earlier narrative and underwent successive additions.

General Structure.

Consequently it is necessary to distinguish between the older sources and the peculiar setting in which the history has been placed; between earlier records and that specific colouring which, from its affinity to Deuteronomy and to other portions of the Old Testament which appear to have been similarly treated under the influence of its teaching, may be conveniently termed "Deuteronomistic." For his sources the compiler refers chiefly to two distinct works, the "words" or "chronicles" of the kings of Israel and those of the kings of Judah. Precisely how much is copied from these works and how much has been expressed in the compiler's own language is of course uncertain. It is found on inspection that the present history consists usually of an epitome of each reign. It states the king's age at succession (so Judah only), length of reign, death and burial, with allusions to his buildings, wars, and other political events.[1] In the case of Judah, also, the name of the royal or queen-mother is specifically mentioned. The references to the respective "chronicles," made as though they were still accessible, are wanting in the case of Jehoram and Hoshea of Israel, and of Solomon, Ahaziah, Athaliah, Jehoahaz, Jehoiachin and Zedekiah of Judah. But for Solomon the authority cited, "book of the acts of Solomon" (1 Kings xi. 41), presumably presupposes Judaean chronicles, and the remaining cases preserve details of an annalistic character. Moreover, distinctive annalistic material is found for the Israelite kings Saul and Ishbosheth in 1 Sam. xiii. 1; xiv. 47–51; 2 Sam. ii. 8–10*a* (including even their age at accession), and for David in 2 Sam. ii. 11 and parts of v. and viii.

The use which the compiler makes of his sources shows that his aim was not the *history* of the past but its *religious significance.* It is rare that even qualified praise is bestowed upon the kings of Israel (Jehoram, 2 Kings iii. 2; Jehu x. 30; Hoshea xvii. 2). Kings of great historical importance are treated with extreme brevity (Omri, Jeroboam (2), Uzziah), and similar meagreness of historical information is apparent when the editorial details and the religious judgments are eliminated from the accounts of Nadab, Baasha, and the successors of Jeroboam (2) in Israel or of Abijam and Manasseh in Judah.

Solomon.

To gain a more exact idea of the character of the book we may divide the history into three sections: (1) the life of Solomon, (2) the kingdoms of Ephraim (or Samaria)[2] and Judah, and (3) the separate history of Judah after the fall of Samaria. I. *Solomon.*—The events which lead up to the death of David and the accession of Solomon (1 Kings i., ii.) are closely connected with 2 Sam. ix.–xx. The unity is broken by the appendix 2 Sam. xxi. xxi.–xxiv. which is closely connected, as regards general subject-matter, with ibid. v.–viii.; the literary questions depend largely upon the structure of the books of Samuel (*q.v.*). It is evident, at least, that either the compiler drew upon other sources for the occasion and has been remarkably brief elsewhere, or that his epitomes have been supplemented by the later insertion of material not necessarily itself of late origin. At present 1 Kings i., ii. are both the close of David's life (no source is cited) and the necessary introduction to Solomon. But Lucian's recension of the Septuagint (ed. Lagarde), as also Josephus, begin the book at ii. 12, thus separating the annalistic accounts of the two. Since the contents of 1 Kings iii.–xi. do not form a continuous narrative, the compiler's authority ("Acts of S." xi. 41) can hardly have been an ordinary chronicle. The chapters comprise (*a*) sundry notices of the king's prosperous and peaceful career, severed by (*b*) a description of the Temple and other buildings; and they conclude with (*c*) some account of the external troubles which prove to have unsettled the whole of his reign. After an introduction (iii.), *a* contains generalizing statements of Solomon's might, wealth and wisdom (iv. 20 seq., 25, 29–34; x. 23–25, 27) and stories of a distinctly late and popular character (iii. 16–28, x. i–10, 13). The present lack of unity can in some cases be remedied by the Septuagint, which offers many deviations from the Hebrew text; this feature together with the present form of the parallel texts in Chronicles will exemplify the persistence of fluctuation to a late period (4th–2nd cent. B.C.).

Thus iii. 2 seq. cannot be by the same hand as *v.* 4, and *v.* 2 is probably a later Deut. gloss upon *v.* 3 (earlier Deut.), which represents the compiler's view and (on the analogy of the framework) comes closely after ii. 12.[3] Ch. iii. 1 can scarcely be severed from ix. 16, and in the Septuagint they appear in iv. in the order: iv. 1–19 (the officers), 27 seq. (their duties), 22–24 (the daily provision), 29–34 (Solomon's reputation), iii. 1; ix. 16–17*a* (alliance with Egypt); iv. 20 seq. 25 are of a generalizing character and recur in the Septuagint with much supplementary matter in ii. Ch. iv. 26 is naturally related to x. 26 (cf. 2 Chron. i. 14) and takes its place in Lucian's recension (cf. 2 Chron. ix. 25). There is considerable variation again in ix. 10–x. 29, and the order ix. 10–14, 26–28, x. 1–22 (so partly Septuagint) has the advantage of recording continuously Solomon's dealings with Hiram. The intervening verses belong to a class of floating notices (in a very unnatural order) which seem to have got stranded almost by chance at different points in the two recensions; contrast also 2 Chron. viii. Solomon's preliminary arrangements with Hiram in ch. v. have been elaborated to emphasize the importance of the Temple (*vv.* 3–5, cf. 2 Sam. vii.); further difficulty is caused by the relation between 13 seq. and 15 seq. (see 2 Chron. ii. 17 seq.) and between both of these and ix. 20 seq. xi. 28. The account of the royal buildings now sandwiched in between the related fragments of *a* is descriptive rather than narrative, and the accurate details might have been obtained by actual observation of the Temple at a date long subsequent to Solomon. It is not all due to a single hand. Ch. vi. 11–14 (with several late phrases) break the connexion and are omitted by the Septuagint; *vv.* 15–22, now untranslatable, appear in a simple and intelligible form in the Septuagint. The account of the dedication contains many signs of a late date; viii. 14–53, 54–61 are due to a Deuteronomic writer, and that they are an expansion of the older narrative (*vv.* 1–13) is suggested by the fact that the ancient fragment, *vv.* 12, 13 (imperfect in the Hebrew) appears in the Septuagint after *v.* 53 in completer form and with a reference to the book of Jashar as source (*βιβλίον τῆς ᾠδῆς* ספר (השיר) הישר). The redactional insertion displaced it in one recension and led to its mutilation in the other. With viii. 27–30, cf. generally Isa. xl.–lvi.; *vv.* 44–51 presuppose the exile, *vv.* 54–61 are wanting in Chron., and even the older parts of this chapter have also been retouched in conformity with later (even post-exilic) ritual and law. The Levites who appear at *v.* 4 in contrast to the priests, in a way unknown to the pre-exilic history, are not named in the Septuagint, which also omits the post-exilic term "congregation" (*'ēdah*) in *v.* 5. There is a general similarity of subject with Deut. xxviii.

The account of the end of Solomon's reign deals with (*a*) his religious laxity (xi. 1–13, now in a Deuteronomic form), as the punishment for which the separation of the two kingdoms is announced; and (*b*) the rise of the adversaries who, according to xi. 25, had troubled the whole of his reign, and therefore cannot have been related originally as the penalty for the sins of his old age. Both, however, form an introduction to subsequent events, and the life of Solomon concludes with a brief annalistic notice of his death, length of reign, successor, and place of burial. (See further SOLOMON.)

The Divided Kingdom.

II. *Ephraim and Judah.*—In the history of the two kingdoms the redactor follows a fixed scheme determined, as has been seen, by the order of succession. The fluctuation of tradition concerning the circumstances of the schism is evident from a comparison with the Septuagint, and all that is related of Ahijah falls under suspicion of being foreign to the oldest history.[4] The story of the man of God from Judah (xiii.) is shown to be late by its general tone (conceptions of prophetism and revelation),[5] and by the term "cities of Samaria" (*v.* 32, for Samaria as a *province*, cf. 2 Kings xvii. 24, 26; for the building of the city by Omri see 1 Kings xvi. 24). It is a late Judaean narrative inserted after the Deuteronomic redaction, and breaks the connexion between xii. 31 and xiii. 33 seq. The latter describe the idolatrous worship instituted by the first king of the schismatic north, and the religious attitude occurs regularly throughout the compiler's epitome, however brief the reigns of the kings. In the account of Nadab, xv. 25 seq., 29*b*, 30 seq. are certainly the compiler's, and the synchronism in *v.* 28 must also be editorial; xv. 32 (Septuagint omit) and 16 are duplicates leading up to the Israelite and Judaean accounts of Baasha respectively. But xv. 33–xvi. 7 contains little annalistic information, and the prophecy in xvi. 1–4 is very similar to xiv. 7–11, which in turn breaks the connexion between *vv.* 6 and 12. Ch. xvi. 7 is a duplicate to *vv.* 1–4 and out of place; the Septuagint inserts it in the *middle* of *v.* 8. The brief reign of Elah preserves an important entract in xvi. 9, but the date in *v.* 10*a* (LXX. omits) presupposes the late finished chronological scheme. Zimri's seven days receive the inevitable condemnation, but the older material embedded in the framework (xvi. 15*b*–18) is closely connected with *v.* 9 and is continued in the non-editorial portions of Omri's reign (xvi. 21 seq., length of reign in *v.* 23, and *v.* 24). The achievements of Omri to which the editor refers can fortunately be gathered from external sources (see OMRI). Under Omri's son Ahab the separate kingdoms converge.

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[1] Cp. the brief annalistic form of the Babylonian chronicles (for a specimen, see C. F. Kent, *Israel's Hist. and Biog. Narratives*, p. 502 seq.). For a synchronistic history of Assyria and Babylonia, prepared for diplomatic purposes, see Schrader's *Keilinschr. Bibl.* i. 194 sqq.; also L. W. King, *Studies in Eastern Hist.* i. (Tukulti-Ninib), pp. 1, 75 seq. (with interesting variant traditions).

[2] The term "Israel" as applied to the northern kingdom is apt to be ambiguous, since as a general national name, with a religious significance, it can include or suggest the inclusion of Judah.

[3] Here and elsewhere a careful study (*e.g.* of the marginal references in the Revised Version) will prove the close relation between the "Deuteronomic" passages and the book of Deuteronomy itself. The bearing of this upon the traditional date of that book should not be overlooked.

[4] See art. JEROBOAM; also W. R. Smith, *Old Test. in Jew. Church*, pp. 117 sqq.; H. Winckler, *Alttest. Untersuchungen*, pp. 1 sqq., and the subsequent criticisms by C. F. Burney (*Kings*, pp. 163 sqq.); J. Skinner (*Kings*, pp. 443 sqq.); and Ed. Meyer (*Israeliten u. Nachbarstämme*, pp. 357 sqq.).

[5] Notice should everywhere be taken of those prophetical stories which have the linguistic features of the Deuteronomic writers, or which differ in style and expression from the prophecies of Amos, Hosea and others, previous to Jeremiah.

Next, as to Judah: the vivid account of the accession of Rehoboam in xii. 1–16 is reminiscent of the full narratives in 2 Sam. ix.–xx.; 1 Kings i., ii. (cf. especially *v.* 16 with 2 Sam. xx. 1); xii. 15*b* refers to the prophecy of Ahijah (see above), and "unto this day," *v.* 19, cannot be by a contemporary author.; *v.* 17 (LXX. omits) finds a parallel in 2 Chron. xi. 16 seq., and could represent an Ephraimite standpoint. The Judaean standpoint is prominent in *vv.* 21–24, where (*a*) the inclusion of Benjamin and (*b*) the cessation of war (at the command of Shemaiah) conflict with (*a*) xi. 32, 36, xii. 20 and (*b*) xiv. 30 respectively. Rehoboam's history, resumed by the redactor in xiv. 21–24, continues with a brief account of the spoiling of the Temple and palace by Sheshonk (Shishak). (The incident appears in 2 Chron. xii. in a rather different context, *before* the details which now precede *v.* 21 seq.) The reign of Abijam is entirely due to the editor, whose brief statement of the war in xv. 7*b* is supplemented by a lengthy story in 2 Chron. xiii. (where the name is Abijah). Ch. xv. 5*b* (last clause) and *v.* 6 are omitted by the Septuagint, the former is a unique gloss (see 2 Sam. xi. seq.), the latter is a mere repetition of xiv. 30; with xv. 2 cf. *v.* 10. The account of Asa's long reign contains a valuable summary of his war with Baasha, xv. 16–22; the isolated *v.* 15 is quite obscure and is possibly related to *v.* 18 (but cf. vii. 51). His successor Jehoshaphat is now dealt with completely in xxii. 41–50 after the death of Ahab; but the Septuagint, which follows a different chronological scheme (placing his accession in the reign of Omri), gives the summary (with some variations) after xvi. 28. Another light is thrown upon the incomplete annalistic fragments (xxii. 44, 47–49) by 2 Chron. xx. 35–37: the friendship between Judah and Israel appears to have been displeasing to the redactor of Kings.

Ephraim from Ahab to Jehu.

The history of the few years between the close of Ahab's life and the accession of Jehu covers about one-third of the entire book of Kings. This is due to the inclusion of a number of narratives which are partly of a political character, and partly are interested in the work of contemporary prophets. The climax is reached in the overthrow of Omri's dynasty by the usurper Jehu, when, after a period of close intercourse between Israel and Judah, its two kings perished. The annals of each kingdom would naturally deal independently with these events, but the present literary structure of 1 Kings xvii.–2 Kings xi. is extremely complicated by the presence of the narratives referred to. First as regards the framework, the epitome of Ahab is preserved in xvi. 29–34 and xxii. 39; it contains some unknown references (his ivory house and cities), and a stern religious judgment upon his Phoenician alliance, on which the intervening chapters throw more light. The colourless summary of his son Ahaziah (xxii. 51–53)[1] finds its conclusion in 2 Kings i. 17 seq. where *v.* 18 should precede the accession of his brother Jehoram (*v.* 17b). Jehoram is again introduced in iii. 1–3 (note the variant synchronism), but the usual conclusion is wanting. In Judah, Jehoshaphat was succeeded by his son Jehoram, who had married Athaliah the daughter of Ahab and Jezebel (viii. 16–24); to the annalistic details (*vv.* 20–22) 2 Chron. xxi. 11 sqq. adds a novel narrative. His son Ahaziah (viii. 25 sqq.) is similarly denounced for his relations with Israel. He is again introduced in the isolated ix. 29, while Lucian's recension adds after x. 36 a variant summary of his reign but *without* the regular introduction. Further confusion appears in the Septuagint, which inserts after i. 18 (Jehoram of Israel) a notice corresponding to iii. 1–3, and concludes "and the anger of the Lord was kindled against the house of Ahab." This would be appropriate in a position nearer ix. seq. where the deaths of Jehoram and Ahaziah are described. These and other examples of serious disorder in the framework may be associated with the literary features of the narratives of Elijah and Elisha.

Of the more detailed narratives those that deal with the northern kingdom are scarcely Judaean (see 1 Kings xix. 3), and they do not criticize Elijah's work, as the Judaean compiler denounces the whole history of the north. But they are plainly not of one origin. To supplement the articles ELIJAH and ELISHA, it is to be noticed that the account of Naboth's death in the history of Elijah (1 Kings xxi.) differs in details from that in the history of Elisha and Jehu (2 Kings ix.), and the latter more precise narrative presupposes events recorded in the extant accounts of Elijah but not these events themselves. In 1 Kings xx., xxii. 1–28 (xxi. follows xix. in the LXX.) Ahab is viewed rather more favourably than in the Elijah-narratives (xix., xxi.) or in the compiler's summary. Ch. xxii. 6, moreover, proves that there is some exaggeration in xviii. 4, 13; the great contest between Elijah and the king, between Yahweh and Baal, has been idealized. The denunciation of Ahab in xx. 35–43 has some notable points of contact with xiii. and seems to be a supplement to the preceding incidents. Ch. xxii. is important for its ideas of prophetism (especially *vv.* 19–23; cf. Ezek. xiv. 9; 2 Sam. xxiv. 1 [in contrast to 1 Chron. xxi. 1]); a gloss at the end of *v.* 28, omitted by the Septuagint, wrongly identifies Micaiah with the well-known Micah (i. 2). Although the punishment passed upon Ahab in xxi. 20 sqq. (20*b*-26 betray the compiler's hand; cf. xiv. 10 seq.) is modified in *v.* 29, this is ignored in the account of his death, xxii. 38, which takes place at Samaria (see below).

The episode of Elijah and Ahaziah (2 Kings i.) is marked by the revelation through an angel. The prophet's name appears in an unusual form (viz. *ēliyyah*, not *-yahu*), especially in *vv.* 2–8. The prediction of Ahaziah's fate finds a parallel in 2 Chron. xxi. 12–15; the more supernatural additions have been compared with the late story in 1 Sam. xix. 18–24. The ascension of Elijah (2 Kings ii.) is related as the introduction to the work of Elisha, which apparently begins before the death of Jehoshaphat (see iii. 1, 11 sqq.; contrast 2 Chron. *loc. cit.*). Among the stories of Elisha are some which find him at the head of the prophetic gilds (iv. 1, 38–44, vi. 1–7), whilst in others he has friendly relations with the "king of Israel" and the court. As a personage of almost superhuman dignity he moves in certain narratives where political records appear to have been utilized to describe the activity of the prophets. The Moabite campaign (iii.) concerns a revolt already referred to in the isolated i. 1; there are parallels with the story of Jehoshaphat and Ahab (iii. 7, 11 seq.; cf. 1 Kings xxii. 4 seq., 7 sqq.), contrast, however, xxii. 7 (where Elijah is not even named) and iii. 11 seq. But Jehoshaphat's death has been already recorded (1 Kings xxii. 50), and, while Lucian's recension in 2 Kings iii. reads Ahaziah, i. 17 presupposes the accession of the *Judaean* Jehoram. Other political narratives may underlie the stories of the Aramaean wars; with vi. 24–vii. 20 (after the complete cessation of hostilities in vi. 23) compare the general style of 1 Kings xx., xxii.; with the famine in Samaria, vi. 25; cf. ibid. xvii.; with the victory, cf. ibid. xx. The account of Elisha and Hazael (viii. 7–15) implies friendly relations with Damascus (in *v.* 12 the terrors of war are in the future), but the description of Jehu's accession (ix.) is in the midst of hostilities. Ch. ix. 7–10*a* are a Deuteronomic insertion amplifying the message in *vv.* 3–6 (cf. 1 Kings xxi. 20 seq.). The origin of the repetition in ix. 14–15*a* (cf. viii. 28 seq.) is not clear. The oracle in ix. 25 seq. is not that in 1 Kings xxi. 19 seq., and mentions the additional detail that Naboth's sons were slain. Here his field or portion is located near Jezreel, but in 1 Kings xxi. 18 his vineyard is by the royal palace in Samaria (cf. xxii. 38 and contrast xxi. 1, where the LXX. omits reference to Jezreel). This fluctuation reappears in 2 Kings x. 1, 11 seq., and 17; in ix. 27 compared with 2 Chron. xxii. 9; and in the singular duplication of an historical incident, viz. the war against the Aramaeans at Ramoth-Gilead (*a*) by Jehoshaphat and Ahab, and (*b*) by Ahaziah and Jehoram, in each case with the death of the Israelite king, at Samaria and Jezreel respectively (see above and observe the contradiction in 1 Kings xxi. 29 and xxii. 38). These and other critical questions in this section are involved with (*a*) the probability that Elisha's work belongs rather to the accession of Jehu, with whose dynasty he was on most intimate terms until his death some forty-five years later (2 Kings xiii. 14–21), and (*b*) the problem of the wars between Israel and Syria which appear to have begun only in the time of Jehu (x. 32). See *Jew. Quart. Rev.* (1908), pp. 597–630, and Jews: *History*, § 11 seq.

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[1] The division of the two books at this point is an innovation first made in the LXX. and Vulgate.

Dynasty of Jehu.

In the annals of Jehu's dynasty the editorial introduction to Jehu himself is wanting (x. 32 sqq.), although Lucian's recension in x. 36 concludes in annalistic manner the lives of Jehoram of Israel and Ahaziah of Judah. The summary mentions the beginning of the Aramaean wars, the continuation of which is found in the redactor's account of his successor Jehoahaz (xiii. 1–9). But xiii. 4–6 modify the disasters, and by pointing to the "saviour" or deliverer (cf. Judg. iii. 9, 15) anticipate xiv. 27. The self-contained account of his son Jehoash (xiii. 10–13) is supplemented (*a*) by the story of the death of Elisha (*vv.* 14–21) and (*b*) by some account of the Aramaean wars (*vv.* 22–25), where *v.* 23, like *vv.* 4–6 (Lucian's recension actually reads it after *v.* 7), is noteworthy for the sympathy towards the northern kingdom. Further (*c*) the defeat of Amaziah of Judah appears in xiv. 8–14 after the annals of Judah, although from an Israelite source (*v.* 11*b* Bethshemesh defined as belonging to Judah, see also *v.* 15, and with the repetition of the concluding statements in *v.* 15 seq., see xiii. 12 seq.). These features and the transference of xiii. 12 seq. after xiii. 25 in Lucian's recension point to late adjustment. In Judaean history, Jehu's reform and the overthrow of Jezebel in the north (ix., x. 15–28) find their counterpart in the murder of Athaliah and the destruction of the temple of Baal in Judah (xi. 18). But the framework is incomplete. The editorial conclusion of the reign of Ahaziah, the introduction to that of Athaliah, and the sources for both are wanting. A lengthy Judaean document is incorporated detailing the accession of Joash and the prominence of the abruptly introduced priest Jehoiada. The interest in the Temple and temple-procedure is obvious; and both xi. and xii. have points of resemblance with xxii. seq. (see below and cf. also xi. 4, 7, 11, 19, with 1 Kings xiv. 27 seq.). The usual epitome is found in xi. 21–xii. 3 (the age at accession should follow the synchronism, so Lucian), with fragments of annalistic matter in xii. 17–21 (another version in 2 Chron. xxiv. 23 sqq.). For Joash's son Amaziah see above; xiv. 6 refers to Deut. xxiv. 16, and 2 Chron. xxv. 5–16 replaces *v.* 7 by a lengthy narrative with some interesting details. Azariah or Uzziah is briefly summarized in xv. 1–7, hence the notice in xiv. 22 seems out of place; perhaps the usual statements of Amaziah's death and burial (cf. xiv. 20*b*, 22*b*), which were to be expected after *v.* 18, have been supplemented by the account of the rebellion (*vv.* 19, 20*a*, 21).[1] The chronological notes for the accession of Azariah imply different views of the history of Judah after the defeat of Amaziah; with xiv. 17, cf. xiii. 10, xiv. 2, 23, but contrast xv. 1, and again *v.* 8.[2]

The important reign of Jeroboam (2) is dismissed as briefly as that of Azariah (xiv. 23–29). The end of the Aramaean war presupposed by *v.* 25 is supplemented by the sympathetic addition in *v.* 26 seq. (cf. xiii. 4 seq. 23). Of his successors Zechariah, Shallum and Menahem only the briefest records remain, now imbedded in the editorial framework (xv. 8–25). The summary of Pekah (perhaps the same as Pekahiah, the confusion being due to the compiler) contains excerpts which form the continuation of the older material in *v.* 25 (cf. also *vv.* 10, 14, 16, 19, 20). For an apparently similar adjustment of an earlier record to the framework see above on 1 Kings xv. 25–31, xvi. 8–25. The account of Hoshea's conspiracy (xv. 29 seq.) gives the Israelite version with which Tiglath-Pileser's own statement can now be compared. Two accounts of the fall of Samaria are given, one of which is under the reign of the contemporary Judaean Hezekiah (xvii. 1–6, xviii. 9–12); the chronology is again intricate. Reflections on the disappearance of the northern kingdom appear in xvii. 7–23 and xviii. 12; the latter belongs to the Judaean history. The former is composite; xvii. 21–23 (cf. *v.* 18) look back to the introduction of calf-worship by Jeroboam (1), and agree with the compiler's usual standpoint; but *vv.* 19–20 include Judah and presuppose the exile. The remaining verses survey types of idolatry partly of a general kind (*vv.* 9–12, 16*a*), and partly characteristic of Judah in the last years of the monarchy (*vv.* 16*b*, 17). The brief account of the subsequent history of Israel in xvii. 24–41 is not from one source, since the piety of the new settlers (*v.* 32–34*a*, 41) conflicts with the later point of view in 34*b*–40. The last-mentioned supplements the eqilogue in xvii. 7–23, forms a solemn conclusion to the history of the northern kingdom, and is apparently aimed at the Samaritans.

Judah.

III. *Later History of Judah.*—The summary of Jotham (xv. 32–38) shows interest in the Temple (*v.* 35) and alludes to the hostility of Pekah (*v.* 37) upon which the Israelite annals are silent. 2. Chron. xxvii. expands the former but replaces the latter by other not unrelated details (see Uzziah). But xv. 37 is resumed afresh in the account of the reign of Ahaz (xvi. 5 sqq.; the text in *v.* 6 is confused)—another version in 2 Chron. xxviii. 5 sqq. —and is supplemented by a description, evidently from the Temple records, in which the ritual innovations by "king Ahaz" (in contrast to "Ahaz" alone in *vv.* 5–9) are described (*vv.* 10–18). There is further variation of detail in 2 Chron. xxviii. 20–27. The summary of Hezekiah (xviii. 1–8) emphasizes his important religious reforms (greatly expanded in 2 Chron. xxix. seq. from a later standpoint), and includes two references to his military achievements. Of these *v.* 8 is ignored in Chron., and *v.* 7 is supplemented by (*a*) the annalistic extract in *vv.* 13–16, and (*b*) narratives in which the great contemporary prophet Isaiah is the central figure. The latter are later than Isaiah himself (xix. 37 refers to 681 B.C.) and reappear, with some abbreviation and rearrangement, in Isa. xxxvi.–xxxix. (see Isaiah). They are partly duplicate (cf. xix. 7 with *vv.* 28, 33; *vv.* 10–13 with xviii. 28–35), and consist of two portions, xviii. 17–xix. 8 (Isa. xxxvi. 2–xxxvii. 8) and xix. 9*b*–35 (Isa. xxxvii. 9*b*–36); to which of these xix. 9*a* and *v.* 36 seq. belong is disputed. 2 Chron. xxxii. (where these accounts are condensed) is in general agreement with 2 Kings xviii. 7, as against *vv.* 14–16. The poetical fragment, xix. 21–28, is connected with the sign in *vv.* 29–31; both seem to break the connexion between xix. 20 and 32 sqq. Chap. xx. 1–19 appears to belong to an earlier period in Hezekiah's reign (see *v.* 6 and cf. 2 Chron. xxxii. 25 seq.); with *vv.* 1–11 note carefully the forms in Isa. xxxviii. 1–8, 21 seq., and 2 Chron. xxxii. 24–26; with xx. 12–19 (Isa. xxxix) contrast the brief allusion in 2 Chron. xxxii. 31. In *v.* 17 seq. the exile is foreshadowed. Use has probably been made of a late cycle of Isaiah-stories; such a work is actually mentioned in 2 Chron. xxxii. 32. The accounts of the reactionary kings Manasseh and Amon, although now by the compiler, give some reference to political events (see xxi. 17, 23 seq.); xxi. 7–15 refer to the exile and find a parallel in xxiii. 26 seq., and xxi. 10 sqq. are replaced in 2 Chron. xxxiii. 10–20 by a novel record of Manasseh's penitence (see also ibid. *v.* 23 and note omission of 2 Kings xxiii. 26 from Chron).

Josiah's reign forms the climax of the history. The usual framework (xxii. 1; 2, xxiii. 28, 30*b*) is supplemented by narratives dealing with the Temple repairs and the reforms of Josiah. These are closely related to xi. seq. (cf. xxii. 3–7 with xii. 4 sqq.), but show many signs of revision; xxii. 16 seq., xxiii. 26 seq., point distinctly to the exile, and xxiii. 16–20 is an insertion (the altar in *v.* 16 is already destroyed in *v.* 15) after 1 Kings xiii. But it is difficult elsewhere to distinguish safely between the original records and the later additions. In their present shape the reforms of Josiah are described in terms that point to an acquaintance with the teaching of Deuteronomy which promulgates the reforms themselves.[1]

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[1] Both xiv. 22 and xv. 5 presuppose fuller records of which 2 Chron. xxvi. 6–7, 16–20 may represent merely later and less trustworthy versions.

[2] See F. Rühl, *Deutsche Zeit. f. Geschichtwissens.* xii. 54 sqq.; also Jews: *History*, § 12.

[1] See further the special study by E. Day, *Journ. Bib. Lit.* (1902), pp. 197 sqq.

The annalistic notice in xxiii. 29 seq. (contrast xxii. 20) should precede *v.* 28; 2 Chron. xxxv. 20–27 gives another version in the correct position and ignores 2 Kings xxiii. 24–27 (see however the Septuagint). For the last four kings of Judah, the references to the worship at the high places (presumably abolished by Josiah) are wanting, and the literary source is only cited for Jehoiakim; xxiv. 3 seq. (and probably *v.* 2), which treat the fall of Judah as the punishment for Manasseh's sins, are a Deuteronomistic insertion (2 Chron. xxxvi. 6 sqq. differs widely; see, however, the Septuagint); *v.* 13 seq. and *v.* 15 seq. are duplicates. With xxiv. 18–xxv. 21 cf. Jer. lii. 1-27 (the text of the latter, especially *vv.* 19 sqq. is superior); and the fragments ibid. xxxix. 1–10. Ch. xxv. 22–26 appears in much fuller form in Jer. xl. seq. (see xl. 7–9, xli. 1–3, 17 seq.). It is noteworthy that Jeremiah does not enter into the history in Kings (contrast Isaiah above). The book of Chronicles in general has a briefer account of the last years, and ignores both the narratives which also appear in Jeremiah and the concluding hopeful note struck by the restoration of Jehoiachin (xxv. 27–30). This last, with the addition of statistical data, forms the present conclusion also of the book of Jeremiah.

Conclusions.—A survey of these narratives as a whole strengthens our impression of the merely mechanical character of the redaction by which they are united. Though editors have written something of their own in almost every chapter, generally from the standpoint of religious pragmatism, there is not the least attempt to work the materials into a history in our sense of the word; and in particular the northern and southern histories are practically independent, being merely pieced together in a sort of mosaic in consonance with the chronological system, which we have seen to be really later than the main redaction. It is very probable that the order of the pieces was considerably readjusted by the author of the chronology; of this indeed the Septuagint still shows traces. But with all its imperfections as judged from a modern standpoint, the redaction has the great merit of preserving material nearer to the actual history than would have been the case had narratives been rewritten from much later standpoints—as often in the book of Chronicles.

Questions of date and of the growth of the literary process are still unsettled, but it is clear that there was an independent history of (north) Israel with its own chronological scheme. It was based upon annals and fuller political records, and at some period apparently passed through circles where the purely domestic stories of the prophets (Elisha) were current.[1] This was ultimately taken over by a Judaean editor who was under the influence of the far-reaching reforms ascribed to the 18th year of Josiah (621 B.C.). Certain passages seem to imply that in his time the Temple was still standing and the Davidic dynasty uninterrupted. Also the phrase "unto this day" sometimes apparently presupposes a pre-exilic date. On the other hand, the history is carried down to the end of Jehoiachin's life (xxv. 27 refers to his fifty-fifth year, *vv.* 29 seq. look back on his death), and a number of allusions point decisively to the post-exilic period. Consequently, most scholars are agreed that an original pre-exilic Deuteronomic compilation made shortly after Josiah's reforms received subsequent additions from a later Deuteronomic writer.

These questions depend upon several intricate literary and historical problems. At the outset (*a*) the compiler deals with history from the Deuteronomic standpoint, selecting certain notices and referring further to *separate* chronicles of Israel and Judah. The canonical book of Chronicles refers to such a *combined* work, but is confined to Judah; it follows the religious judgment passed upon the kings, but it introduces new details apparently derived from extant annals, replaces the annalistic excerpts found in Kings by other passages, or uses new narratives which at times are clearly based upon older sources. Next (*b*) the Septuagint proves that Kings did not reach its present form until a very late date; "each represents a stage and not always the same stage in the long protracted labours of the redactors" (Kuenen).[2] In agreement with this are the unambiguous indications of the post-exilic age (especially in the Judaean history) consisting of complete passages, obvious interpolations, and also sporadic phrases in narratives whose pre-exilic origin is sometimes clear and sometimes only to be presumed. Further (*c*), the Septuagint supports the independent conclusion that the elaborate synchronisms belong to a late stage in the redaction. Consequently it is necessary to allow that the previous arrangement of the material may have been different; the actual wording of the introductory notices was necessarily also affected. In general, it becomes ever more difficult to distinguish between passages incorporated by an early redactor and those which may have been inserted later, though possibly from old sources. Where the regular framework is disturbed such considerations become more cogent. The relation of annalistic materials in 1 Sam. (xiii. 1; xiv. 47–51, &c.) to the longer detailed narratives will bear upon the question, as also the relation of 2 Sam. ix-xx. to 1 Kings i. seq. (see SAMUEL, BOOKS OF). Again (*d*) the lengths of the reigns of the Judaean kings form an integral part of the framework, and their total, with fifty years of exile, allows four hundred and eighty years from the beginning of the Temple to the return from Babylon.[3] This round number (cf. again 1 Kings vi. 1) points to a date subsequent to 537, and Robertson Smith has observed that almost all events dated by the years of the kings of Jerusalem have reference to the affairs of the Temple. This suggests a connexion between the chronology and the incorporation of those narratives in which the Temple is clearly the centre of interest. (*e*) But, apart from the question of the origin of the more detailed Judaean records, the arguments for a pre-exilic Judaean Deuteronomic compilation are not quite decisive. The phrase "unto this day" is not necessarily valid (cf. 2 Chron. v. 9, viii. 8, xxi. 10 with 1 Kings viii. 8, ix. 21, 2 Kings viii. 22), and depends largely upon the compiler's sagacity. Also, the existence of the Temple and of the Davidic dynasty (1 Kings viii. 14–53; ix. 3; xi. 36–38; xv. 4; 2 Kings viii. 19; cf. 2 Chron. xiii. 5) is equally applicable to the time of the second temple when Zerubbabel, the Davidic representative, kindled new hopes and aspirations. Indeed, if the object of the Deuteronomic compiler is to show from past history that "the sovereign is responsible for the purity of the national religion" (Moore, *Ency. Bib.* col. 2079), a date somewhere after the death of Jehoiachin (released in 561) in the age of Zerubbabel and the new Temple equally satisfies the conditions. With this is concerned (*f*) the question whether, on historical grounds, the account of the introduction of Deuteronomic reforms by Josiah is trustworthy.[4] Moreover, although a twofold Deuteronomic redaction of Kings is generally recognized, the criteria for the presumably pre-exilic form are not so decisive as those which certainly distinguish the post-exilic portions, and it is frequently very difficult to assign Deuteronomic passages to the earlier rather than to the later. Again, apart from the contrast between the Israelite detailed narratives (relatively early) and those of Judaean origin (often secondary), it is noteworthy that the sympathetic treatment of northern history in 2 Kings xiii. 4 seq. 23, xiv. 26 has literary parallels in the Deuteronomic redaction of Judges (where Israelite tradition is again predominant), but is quite distinct from the hostile feeling to the north which is also Deuteronomic. Even the northern prophet Hosea (*q.v.*) approximates the Deuteronomic standpoint, and the possibility that the first Deuteronomic compilation of Kings could originate outside Judah is strengthened by the fact that an Israelite source could be drawn upon for an impartial account of Judaean history (2 Kings xiv. 8–15). Finally, (*g*) literary and historical problems here converge. Although Judaean writers ultimately rejected as heathen a people who could claim to be followers of Yahweh (Ezra iv. 2; 2 Kings xvii. 28, 33; contrast ibid. 34–40, a *secondary* insertion), the anti-Samaritan feeling had previously been at most only in an incipient stage, and there is reason to infer that relations between the peoples of north and south had been closer.[1] The book of Kings reveals changing historical conditions in its literary features, and it is significant that the very age where the background is to be sought is that which has been (intentionally?) left most obscure: the chronicler's history of the Judaean monarchy (Chron.—Ezra—Nehemiah), as any comparison will show, has its own representation of the course of events, and has virtually superseded both Kings and Jeremiah, which have now an abrupt conclusion. (See further S. A. Cook, *Jew. Quart. Rev.* (1907), pp. 158 sqq.; and the articles JEWS: *History*, §§ 20, 22; PALESTINE: *History*).

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[1] Cf. similarly the prophetic narratives in the books of Samuel (*q.v.*).

[2] "The LXX. of Kings is not a corrupt reproduction of the Hebrew *receptus*, but represents another recension of the text. Neither recension can claim absolute superiority. The defects of the LXX. lie on the surface, and are greatly aggravated by the condition of the Greek text, which has suffered much in transmission, and particularly has in many places been corrected after the later Greek versions that express the Hebrew *receptus* of the 2nd century of our era. Yet the LXX. not only preserves many good readings in detail, but throws much light on the long-continued process of redaction at the hand of successive editors or copyists of which the extant Hebrew of Kings is the outcome. Even the false readings of the Greek are instructive, for both recensions were exposed to corrupting influences of precisely the same kind" (W. R. SMITH).

[3] See W. R. Smith, *Journ. of Philology*, x. 209 sqq.; *Prophets of Israel*, p. 147 seq.; and K. Marti, *Ency. Bib.* art. "Chronology."

[4] Against earlier doubts by Havet (1878), Vernes (1887) and Horst (1888), see W. E. Addis, *Documents of Hexateuch*, ii. 2 sqq.; but the whole question has been reopened by E. Day (*loc. cit.* above) and R. H. Kennett (*Journ. Theol. Stud.*, July 1906, 481 sqq).

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KING'S BENCH, COURT OF, in England, one of the superior courts of common law. This court, the most ancient of English courts—in its correct legal title, "the court of the king before the king himself," *coram ipso rege*—is far older than parliament itself, for it can be traced back clearly, both in character and the essence of its jurisdiction, to the reign of King Alfred. The king's bench, and the two offshoots of the *aula regia*, the common pleas and the exchequer, for many years possessed co-ordinate jurisdiction, although there were a few cases in which each had exclusive authority, and in point of dignity precedence was given to the court of king's bench, the lord chief justice of which was also styled lord chief justice of England, being the highest permanent judge of the Crown. The court of exchequer attended to the business of the revenue, the common pleas to private actions between citizens, and the king's bench retained criminal cases and such other jurisdiction as had not been divided between the other two courts. By an act of 1830 the court of exchequer chamber was constituted as a court of appeal for errors in law in all three courts. Like the court of exchequer, the king's bench assumed by means of an ingenious fiction the jurisdiction in civil matters which properly belonged to the common pleas.

Under the Judicature Act 1873 the court of king's bench became the king's bench division of the High Court of Justice. It consists of the lord chief justice and fourteen puisne judges. It exercises original jurisdiction and also appellate jurisdiction from the county courts and other inferior courts. By the act of 1873 (sec. 45) this appellate jurisdiction is conferred upon the High Court generally, but in practice it is exercised by a divisional court of the king's bench division only. The determination of such appeals by the High Court is final, unless leave to appeal is given by the court which heard the appeal or by the court of appeal. There was an exception to this rule as regards certain orders of quarter sessions, the history of which involves some complication. But by sec. 1 (5) of the Court of Session Act 1894 the rule applies to all cases where there is a right of appeal to the High Court from any court or person. It may be here mentioned that if leave is given to appeal to the court of appeal there is a further appeal to the House of Lords, except in bankruptcy (Bankruptcy Appeals (County Courts) Act 1884), when the decision of the court of appeal on appeal from a divisional court sitting in appeal is made final and conclusive.

There are masters in the king's bench division. Unlike the masters in the chancery division, they have original jurisdiction, and are not attached to any particular judge. They hear applications in chambers, act as taxing masters and occasionally as referees to conduct inquiries, take accounts, and assess damages. There is an appeal from the master to the judge in chambers. Formerly there was an appeal from the judge in chambers to a divisional court in every case and thence to the court of appeal, until the multiplication of appeals in small interlocutory matters became a scandal. Under the Supreme Court of Judicature (Procedure) Act 1894 there is no right of appeal to the court of appeal in any interlocutory matters (except those mentioned in subs. (b)) without the leave of the judge or of the court of appeal, and in matters of "practice and procedure" the appeal lies (with leave) directly to the court of appeal from the judge in chambers.

KINGSBRIDGE, a market town in the Totnes parliamentary division of Devonshire, England, 48 m. S.S.W. of Exeter, on a branch of the Great Western railway. Pop. of urban district (1901), 3025. It lies 6 m. from the English Channel, at the head of an inlet or estuary which receives only small streams, on a sharply sloping site. The church of St Edmund is mainly Perpendicular, but there are Transitional Norman and Early English portions. The town-hall contains a natural history museum. A house called Pindar Lodge stands on the site of the birthplace of John Wolcot ("Peter Pindar," 1738–1819). William Cookworthy (1705–1780), a porcelain manufacturer, the first to exploit the deposits of kaolin in the south-west of England, was also born at Kingsbridge. The township of Dodbrooke, included within the civil parish, adjoins Kingsbridge on the north-east. Some iron-founding and ship-building, with a coasting trade, are carried on.

Kingsbridge (*Kyngysbrygge*) was formerly included in the manor of Churchstow, the first trace of its separate existence being found in the Hundred Roll of 1276, which records that in the manor of Churchstow there is a new borough, which has a Friday market and a separate assize of bread and ale. The name Kingsbridge however does not appear till half a century later. When Kingsbridge became a separate parish is not certainly known, but it was before 1414 when the church was rebuilt and consecrated to St Edmund. In 1461 the abbot of Buckfastleigh obtained a Saturday market at Kingsbridge and a three-days' fair at the feast of St Margaret, both of which are still held. The manor remained in possession of the abbot until the Dissolution, when it was granted to Sir William Petre. Kingsbridge was never represented in parliament or incorporated by charter, the government being by a portreeve, and down to the present day the steward of the manor holds a court leet and court baron and appoints a portreeve and constables. In 1798 the town mills were converted into a woollen manufactory, which up to recent times produced large quantities of cloth, and the serge manufacture was introduced early in the 19th century. The town has been famous from remote times for a beverage called "white ale." Included in Kingsbridge is the little town of Dodbrooke, which at the time of the Domesday Survey had a population of 42, and a flock of 108 sheep and 27 goats; and in 1257 was granted a Wednesday market and a fair at the Feast of St Mary Magdalene.

See "Victoria County History": *Devonshire; Kingsbridge and Sulcombe, with the intermediate Estuary, historically and topographically depicted* (Kingsbridge, 1819); S. F. Fox, *Kingsbridge Estuary* (Kingsbridge, 1864).

KING'S COUNTY, a county of Ireland in the province of Leinster, bounded N. by Meath and Westmeath, W. by Roscommon, Galway and Tipperary (the boundary with the first two counties being the river Shannon); S. by Tipperary and Queen's County, and E. by Kildare. The area is 493,999 acres or about 772 sq. m. The greater part of the county is included in the central plain of Ireland. In the south-east the Slieve Bloom Mountains form the boundary between King's County and Queen's County, and run into the former county from south-west to north-east for a distance of about 20 m. consisting of a mass of lofty and precipitous crags through which there are two narrow passes, the Black Gap and the Gap of Glandine. In the north-east Croghan Hill, a beautiful green eminence, rises to a height over 700 ft. The remainder of the county is flat, but a range of low hills crosses its north-eastern division to the north of the Barrow. In the centre of the county from east to west a large portion is occupied by the Bog of Allen. The county shares in the advantage of the navigation of the Shannon, which skirts its western side. The Brosna, which issues from Loch Ennell in Westmeath, enters the county near the town of Clara, and flowing south-westwards across its north-west corner, discharges itself into the Shannon after receiving the Clodagh and the Broughill. A small portion of the north-eastern extremity is skirted by the upper Boyne. The Barrow forms the south-eastern boundary with Queen's County. The Little Brosna, which rises in the Slieve Bloom Mountains, forms the boundary of King's County with Tipperary, and falls into the Shannon.

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[1] See Kennett, *Journ. Theol. Stud.* 1905, pp. 169 sqq.; 1906, pp. 488 sqq.; and cf. J. A. Montgomery, *The Samaritans* (1907), pp. 47, 53 seq., 57, 59, 61 sqq.

This county lies in the great Carboniferous Limestone plain, with clay-soils and bogs upon its surface, and many drier deposits of esker-gravels rising as green hills above the general level. The Slieve Bloom Mountains, consisting of Old Red Sandstone with Silurian inliers, form a bold feature in the south. North of Philipstown, the prominent mass of Croghan Hill is formed of basic volcanic rocks contemporaneous with the Carboniferous Limestone, and comparable with those in Co. Limerick.

Notwithstanding the large area occupied by bogs, the climate is generally healthy, and less moist than that of several neighbouring districts. The whole of the county would appear to have been covered formerly by a vast forest, and the district bordering on Tipperary is still richly wooded. The soil naturally is not of great fertility except in special cases, but is capable of being rendered so by the judicious application of bog and lime manures according to its special defects. It is generally either a deep bog or a shallow gravelly loam. On the borders of the Slieve Bloom Mountains there are some very rich and fertile pastures, and there are also extensive grazing districts on the borders of Westmeath, which are chiefly occupied by sheep. Along the banks of the Shannon there are some fine tracts of meadow land. With the exception of the tract occupied by the Bog of Allen, the remainder of the county is nearly all under tillage, the most productive portion being that to the north-west of the Hill of Croghan. The percentage of tillage to pasture is roughly as 1 to 2¼. Oats, barley and rye, potatoes and turnips, are all considerably grown; wheat is almost neglected, and the acreage of all crops has a decreasing tendency. Cattle, sheep, pigs and poultry are bred increasingly; dairies are numerous in the north of the county, and the sheep are pastured chiefly in the hilly districts.

The county is traversed from S.E. to N.W. by the Portarlington, Tullamore, Clara and Athlone line of the Great Southern and Western railway, with a branch from Clara to Banagher; from Roscrea (Co. Tipperary) a branch of this company runs to Parsonstown (Birr); while the Midland Great Western has branches from its main line from Enfield (Co. Kildare) to Edenderry, and from Streamstown (Co. Westmeath) to Clara. The Grand Canal runs through the length of the county from east to west, entering the Shannon at Shannon harbour.

The population (65,563 in 1891; 60,187 in 1901), decreasing through emigration, includes about 89% of Roman Catholics. The decrease is rather below the average. The chief towns are Tullamore (the county town, pop. 4639) and Birr or Parsonstown (4438), with Edenderry and Clara. Philipstown near Tullamore was formerly the capital of the county and was the centre of the kingdom of Offaly. The county comprises 12 baronies and 46 civil parishes. It returns two members to parliament, for the Birr and Tullamore divisions respectively. Previous to the Union, King's County returned six members to parliament, two for the county, and two for each of the boroughs of Philipstown and Banagher. Assizes are held at Tullamore and quarter sessions at Parsonstown, Philipstown and Tullamore. The county is divided into the Protestant dioceses of Killaloe, Meath and Ossory; and the Roman Catholic dioceses of Ardagh, Kildare and Leighlin, Ossory and Clonfert.

King's County, with portions of Tipperary, Queen's County and Kildare, at an early period formed one kingdom under the name of Offaly, a title which it retained after the landing of the English. Subsequently it was known as Glenmallery, Western Glenmallery pretty nearly corresponding to the present King's County, and Eastern Glenmallery to Queen's County. By a statute of 1556 the western district was constituted a shire under the name of King's County in honour of Philip, consort of Queen Mary—the principal town, formerly the seat of the O'Connors, being called Philipstown; and the eastern district at the same time received the name of Queen's County in honour of Mary. Perhaps the oldest antiquarian relic is the large pyramid of white stones in the Slieve Bloom Mountains called the Temple of the Sun or the White Obelisk. There are a considerable number of Danish raths, and a chain of moats commanding the passes of the bogs extended throughout the county. On the borders of Tipperary is an ancient causeway leading presumably to a crannog or lake-dwelling. The most important ecclesiastical ruins are those of the seven churches of Clonmacnoise (*q.v.*) on the Shannon in the north-west of the county, where an abbey was founded by St Kieran in 648, and where the remains include those of churches, two round towers, crosses, inscribed stones and a castle. Among the more famous religious houses in addition to Clonmacnoise were Durrow Abbey, founded by St Columba in 550; Monasteroris founded in the 14th century by John Bermingham, earl of Louth; and Seirkyran Abbey, founded in the beginning of the 5th century. The principal old castles are Rathmore, probably the most ancient in the county; Banagher, commanding an important pass on the Shannon; Leap Castle, in the Slieve Bloom Mountains; and Birr or Parsonstown, now the seat of the earl of Rosse.

KINGSDOWN, THOMAS PEMBERTON LEIGH, Baron (1793–1867), the eldest son of Thomas Pemberton, a chancery barrister, was born in London on the 11th of February 1793. He was called to the bar at Lincoln's Inn in 1816, and at once acquired a lucrative equity practice. He sat in parliament for Rye (1831–1832) and for Ripon (1835–1843). He was made a king's counsel in 1829. Of a retiring disposition, he seldom took part in parliamentary debates, although in 1838 in the case of *Stockdale* v. *Hansard* he took a considerable part in upholding the privileges of parliament. In 1841 he accepted the post of attorney-general for the duchy of Cornwall. In 1842 a relative, Sir Robert H. Leigh, left him a life interest in his Wigan estates, amounting to some £15,000 a year; he then assumed the additional surname of Leigh. Having accepted the chancellorship of the duchy of Cornwall and a privy councillorship, he became a member of the judicial committee of the privy council, and for nearly twenty years devoted his energies and talents to the work of that body; his judgments, more particularly in prize cases, of which he took especial charge, are remarkable not only for legal precision and accuracy, but for their form and expression. In 1858, on the formation of Lord Derby's administration, he was offered the Great Seal, but declined; in the same year, however, he was raised to the peerage as Baron Kingsdown. He died at his seat, Lorry Hill, near Sittingbourne, Kent, on the 7th of October 1867. Lord Kingsdown never married, and his title became extinct.

See *Recollections of Life at the Bar and in Parliament*, by Lord Kingsdown (privately printed for friends, 1868); *The Times* (8th of October 1867).

KING'S EVIL, an old, but not yet obsolete, name given to the scrofula, which in the popular estimation was deemed capable of cure by the royal touch. The practice of "touching" for the scrofula, or "King's Evil," was confined amongst the nations of Europe to the two Royal Houses of England and France. As the monarchs of both these countries owned the exclusive right of being anointed with the pure chrism, and not with the ordinary sacred oil, it has been surmised that the common belief in the sanctity of the chrism was in some manner inseparably connected with faith in the healing powers of the royal touch. The kings both of France and England claimed a sole and special right to this supernatural gift: the house of France deducing its origin from Clovis (5th century) and that of England declaring Edward the Confessor the first owner of this virtue. That the Saxon origin of the royal power of healing was the popular theory in England is evident from the striking and accurate description of the ceremony in *Macbeth* (act vi. scene iii.). Nevertheless the practice of this rite cannot be traced back to an earlier date than the reign of Edward III. in England, and of St Louis (Louis IX.) in France; consequently, it is believed that the performance of healing by the touch emanated in the first instance from the French Crusader-King, whose miraculous powers were subsequently transmitted to his descendant and representative, Isabella of Valois, wife of Edward II. of England. In any case, Queen Isabella's son and heir, Edward III., claimant to the French throne through his mother, was the first English king to order a public display of an attribute that had hitherto been associated with the Valois kings alone. From his reign dates the use of the "touch-piece," a gold medal given to the sufferer as a kind of talisman, which was originally the angel coin, stamped with designs of St Michael and of a three-masted ship.

The actual ceremony seems first to have consisted of the sovereign's personal act of washing the diseased flesh with water, but under Henry VII. the use of an ablution was omitted, and a regular office was drawn up for insertion in the Service Book. At the "Ceremonies for the Healing" the king now merely touched his afflicted subject in the presence of the court chaplain who offered up certain prayers and afterwards presented the touch-piece, pierced so that it might be suspended by a ribbon round the patient's neck. Henry VII.'s office was henceforth issued with variations from time to time under successive kings, nor did it disappear from certain editions of the Book of Common Prayer until the middle of the 18th century. The practice of the Royal Healing seems to have reached the height of its popularity during the reign of Charles II., who is stated on good authority to have touched over 100,000 strumous persons. So great a number of applicants becoming a nuisance to the Court, it was afterwards enacted that special certificates should in future be granted to individuals demanding the touch, and such certificates are occasionally to be found amongst old parish registers of the close of the 17th century. After the Revolution, William of Orange refused to touch, and referred all applicants to the exiled James II. at St Germain; but Queen Anne touched frequently, one of her patients being Dr Samuel Johnson in his infancy. The Hanoverian kings declined to touch, and there exists no further record of any ceremony of healing henceforward at the English court. The practice, however, was continued by the exiled Stuarts, and was constantly performed in Italy by James Stuart, "the Old Pretender," and by his two sons, Charles and Henry (Cardinal York). (H. M. V.)

KINGSFORD, WILLIAM (1819–1898), British engineer and Canadian historian, was born in London on the 23rd of December 1819. He first studied architecture, but disliking the confinement of an office enlisted in the 1st Dragoon Guards, obtaining his discharge in Canada in 1841. After serving for a time in the office of the city surveyor of Montreal he made a survey for the Lachine canal (1846–1848), and was employed in the United States in the building of the Hudson River railroad in 1849, and in Panama on the railroad being constructed there in 1851. In 1853 he was surveyor and, afterwards district superintendent for the Grand Trunk railroad, remaining in the employment of that company until 1864. The following year he went to England but returned to Canada in 1867 in the hope of taking part in the construction of the Intercolonial Railway. In this he was unsuccessful, but from 1872 to 1879 he held a government post in charge of the harbours of the Great Lakes and the St Lawrence. He had previously written books on engineering and topographical subjects, and in 1880 he began to study the records of Canadian history at Ottawa. Among other books he published *Canadian Archaeology* (1886) and *Early Bibliography of Ontario* (1892). But the great work of his life was a *History of Canada* in 10 volumes (1887–1897), ending with the union of Upper and Lower Canada in 1841. Kingsford died on the 28th of September 1898.

KINGSLEY, CHARLES (1819–1875), English clergyman, poet and novelist, was born on the 12th of June 1819, at Holne vicarage, Dartmoor, Devon. His early years were spent at Barnack in the Fen country and at Clovelly in North Devon. The scenery of both made a great impression on his mind, and was afterwards described with singular vividness in his writings. He was educated at private schools and at King's College, London, after his father's promotion to the rectory of St Luke's, Chelsea. In 1838 he entered Magdalene College, Cambridge, and in 1842 he was ordained to the curacy of Eversley in Hampshire, to the rectory of which he was not long afterwards presented, and this, with short intervals, was his home for the remaining thirty-three years of his life. In 1844 he married Fanny, daughter of Pascoe Grenfell, and in 1848 he published his first volume, *The Saint's Tragedy*. In 1859 he became chaplain to Queen Victoria; in 1860 he was appointed to the professorship of modern history at Cambridge, which he resigned in 1869; and soon after he was appointed to a canonry at Chester. In 1873 this was exchanged for a canonry at Westminster. He died at Eversley on the 23rd of January 1875.

With the exception of occasional changes of residence in England, generally for the sake of his wife's health, one or two short holiday trips abroad, a tour in the West Indies, and another in America to visit his eldest son settled there as an engineer, his life was spent in the peaceful, if active, occupations of a clergyman who did his duty earnestly, and of a vigorous and prolific writer. But in spite of this apparently uneventful life, he was for many years one of the most prominent men of his time, and by his personality and his books he exercised considerable influence on the thought of his generation. Though not profoundly learned, he was a man of wide and various information, whose interests and sympathies embraced many branches of human knowledge. He was an enthusiastic student in particular of natural history and geology. Sprung on the father's side from an old English race of country squires, and on his mother's side from a good West Indian family who had been slaveholders for generations, he had a keen love of sport and a genuine sympathy with country-folk, but he had at the same time something of the scorn for lower races to be found in the members of a dominant race.

With the sympathetic organization which made him keenly sensible of the wants of the poor, he threw himself heartily into the movement known as Christian Socialism, of which Frederick Denison Maurice was the recognized leader, and for many years he was considered as an extreme radical in a profession the traditions of which were conservative. While in this phase he wrote his novels *Yeast* and *Alton Locke*, in which, though he pointed out unsparingly the folly of extremes, he certainly sympathized not only with the poor, but with much that was done and said by the leaders in the Chartist movement. Yet even then he considered that the true leaders of the people were a peer and a dean, and there was no real inconsistency in the fact that at a later period he was among the most strenuous defenders of Governor Eyre in the measures adopted by him to put down the Jamaican disturbances. He looked rather to the extension of the co-operative principle and to sanitary reform for the amelioration of the condition of the people than to any radical political change. His politics might therefore have been described as Toryism tempered by sympathy, or as Radicalism tempered by hereditary scorn of subject races. He was bitterly opposed to what he considered to be the medievalism and narrowness of the Oxford Tractarian Movement. In *Macmillan's Magazine* for January 1864 he asserted that truth for its own sake was not obligatory with the Roman Catholic clergy, quoting as his authority John Henry Newman (*q.v.*). In the ensuing controversy Kingsley was completely discomfited. He was a broad churchman, who held what would be called a liberal theology, but the Church, its organization, its creed, its dogma, had ever an increasing hold upon him. Although at one period he certainly shrank from reciting the Athanasian Creed in church, he was towards the close of his life found ready to join an association for the defence of this formulary. The more orthodox and conservative elements in his character gained the upper hand as time went on, but careful students of him and his writings will find a deep conservatism underlying the most radical utterances of his earlier years, while a passionate sympathy for the poor, the afflicted and the weak held possession of him till the last hour of his life.

Both as a writer and in his personal intercourse with men, Kingsley was a thoroughly stimulating teacher. As with his own teacher, Maurice, his influence on other men rather consisted in inducing them to think for themselves than in leading them to adopt his own views, never, perhaps, very definite. But his healthy and stimulating influence was largely due to the fact that he interpreted the thoughts which were stirring in the minds of many of his contemporaries.

As a preacher he was vivid, eager and earnest, equally plain-spoken and uncompromising when preaching to a fashionable congregation or to his own village poor. One of the very best of his writings is a sermon called *The Message of the Church to Working Men*; and the best of his published discourses are the *Twenty-five Village Sermons* which he preached in the early years of his Eversley life.

As a novelist his chief power lay in his descriptive faculties. The descriptions of South American scenery in *Westward Ho!*, of the Egyptian desert in *Hypatia*, of the North Devon scenery in *Two Years Ago*, are among the most brilliant pieces of word-painting in English prose-writing; and the American scenery is even more vividly and more truthfully described when he had seen it only by the eye of his imagination than in his work *At Last*, which was written after he had visited the tropics. His sympathy for children taught him how to secure their interests. His version of the old Greek stories entitled *The Heroes*, and *Water-babies* and *Madam How and Lady Why*, in which he deals with popular natural history, take high rank among books for children.

As a poet he wrote but little, but there are passages in *The Saint's Tragedy* and many isolated lyrics, which are worthy of a place in all standard collections of English literature. *Andromeda* is a very successful attempt at naturalizing the hexameter as a form of English verse, and reproduces with great skill the sonorous roll of the Greek original.

In person Charles Kingsley was tall and spare, sinewy rather than powerful, and of a restless excitable temperament. His complexion was swarthy, his hair dark, and his eye bright and piercing. His temper was hot, kept under rigid control; his disposition tender, gentle and loving, with flashing scorn and indignation against all that was ignoble and impure; he was a good husband, father and friend. One of his daughters, Mary St Leger Kingsley (Mrs Harrison), has become well known as a novelist under the pseudonym of "Lucas Malet."

Kingsley's life was written by his widow in 1877, entitled *Charles Kingsley, his Letters and Memories of his Life*, and presents a very touching and beautiful picture of her husband, but perhaps hardly does justice to his humour, his wit, his overflowing vitality and boyish fun.

The following is a list of Kingsley's writings:—*Saint's Tragedy*, a drama (1848); *Alton Locke*, a novel (1849); *Yeast*, a novel (1849) *Twenty-five Village Sermons* (1849); *Phaeton, or Loose Thoughts for Loose Thinkers* (1852); *Sermons on National Subjects* (1st series, 1852); *Hypatia*, a novel (1853); *Glaucus, or the Wonders of the Shore* (1855); *Sermons on National Subjects* (2nd series, 1854); *Alexandria and her Schools* (1854); *Westward Ho!* a novel (1855); *Sermons for the Times* (1855); *The Heroes*, Greek fairy tales (1856); *Two Years Ago*, a novel (1857); *Andromeda and other Poems* (1858); *The Good News of God*, sermons (1859); *Miscellanies* (1859); *Limits of Exact Science applied to History* (Inaugural Lectures, 1860); *Town and Country Sermons* (1861); *Sermons on the Pentateuch* (1863); *Water-babies* (1863); *The Roman and the Teuton* (1864); *David and other Sermons* (1866); *Hereward the Wake*, a novel (1866); *The Ancient Régime* (Lectures at the Royal Institution, 1867); *Water of Life and other Sermons* (1867); *The Hermits* (1869); *Madam How and Lady Why* (1869); *At last* (1871); *Town Geology* (1872); *Discipline and other Sermons* 1872); *Prose Idylls* (1873); *Plays and Puritans* (1873); *Health and Education* (1874); *Westminster Sermons* (1874); *Lectures delivered in America* (1875). He was a large contributor to periodical literature; many of his essays are included in *Prose Idylls* and other works in the above list. But no collection has been made of some of his more characteristic writings in the *Christian Socialist* and *Politics for the People*, many of them signed by the pseudonym he then assumed, "Parson Lot."

KINGSLEY, HENRY (1830–1876), English novelist, younger brother of Charles Kingsley, was born at Barnack, Northamptonshire, on the 2nd of January 1830. In 1853 he left Oxford, where he was an undergraduate at Worcester College, for the Australian goldfields. This venture, however, was not a success, and after five years he returned to England. He achieved considerable popularity with his *Recollections of Geoffrey Hamlyn* (1859), a novel of Australian life. This was the first of a series of novels of which *Ravenshoe* (1861) and *The Hillyars and The Burtons* (1865) are the best known. These stories are characterized by much vigour, abundance of incident, and healthy sentiment. He edited for eighteen months the *Edinburgh Daily Review*, for which he had acted as war correspondent during the Franco-German War. He died at Cuckfield, Sussex, on the 24th of May 1876.

KINGSLEY, MARY HENRIETTA (1862–1900), English traveller, ethnologist and author, daughter of George Henry Kingsley (1827–1892), was born in Islington, London, on the 13th of October 1862. Her father, though less widely known than his brothers, Charles and Henry (see above), was a man of versatile abilities, with a passion for travelling which he managed to indulge in combination with his practice as a doctor. He wrote one popular book of travel, *South Sea Bubbles, by the Earl and the Doctor* (1872), in collaboration with the 13th earl of Pembroke. Mary Kingsley's reading in history, poetry and philosophy was wide if desultory, but she was most attracted to natural history. Her family moved to Cambridge in 1886, where she studied the science of sociology. The loss of both parents in 1892 left her free to pursue her own course, and she resolved to study native religion and law in West Africa with a view to completing a book which her father had left unfinished. With her study of "raw fetish" she combined that of a scientific collector of fresh-water fishes. She started for the West Coast in August 1893; and at Kabinda, at Old Calabar, Fernando Po and on the Lower Congo she pursued her investigations, returning to England in June 1894. She gained sufficient knowledge of the native customs to contribute an introduction to Mr R. E. Dennett's *Notes on the Folk Lore of the Fjort* (1898). Miss Kingsley made careful preparations for a second visit to the same coast; and in December 1894, provided by the British Museum authorities with a collector's equipment, she proceeded via Old Calabar to French Congo, and ascended the Ogowé River. From this point her journey, in part across country hitherto untrodden by Europeans, was a long series of adventures and hairbreadth escapes, at one time from the dangers of land and water, at another from the cannibal Fang. Returning to the coast Miss Kingsley went to Corisco and to the German colony of Cameroon, where she made the ascent of the Great Cameroon (13,760 ft.) from a direction until then unattempted. She returned to England in October 1895. The story of her adventures and her investigations in fetish is vividly told in her *Travels in West Africa* (1897). The book aroused wide interest, and she lectured to scientific gatherings on the fauna, flora and folk-lore of West Africa, and to commercial audiences on the trade of that region and its possible developments, always with a protest against the lack of detailed knowledge characteristic of modern dealings with new fields of trade. In both cases she spoke with authority, for she had brought back a considerable number of new specimens of fishes and plants, and had herself traded in rubber and oil in the districts through which she passed. But her chief concern was for the development of the negro on African, not European, lines and for the government of the British possessions on the West Coast by methods which left the native "a free unsmashed man—not a whitewashed slave or an enemy." With undaunted energy Miss Kingsley made preparations for a third journey to the West Coast, but the Anglo-Boer War changed her plans, and she decided to go first to South Africa to nurse fever cases. She died of enteric fever at Simon's Town, where she was engaged in tending Boer prisoners, on the 3rd of June 1900. Miss Kingsley's works, besides her *Travels*, include *West African Studies*, *The Story of West Africa*, a memoir of her father prefixed to his *Notes on Sport and Travel* (1899), and many contributions to the study of West African law and folk-lore. To continue the investigation of the subjects Miss Kingsley had made her own "The African Society" was founded in 1901.

Valuable biographical information from the pen of Mr George A. Macmillan is prefixed to a second edition (1901) of the *Studies*.

KING'S LYNN (LYNN or LYNN REGIS), a market town, seaport and municipal and parliamentary borough of Norfolk, England, on the estuary of the Great Ouse near its outflow into the Wash. Pop. (1901), 20,288. It is 97 m. N. by E. from London by the Great Eastern railway, and is also served by the Midland and Great Northern joint line. On the land side the town was formerly defended by a fosse, and there are still considerable remains of the old wall, including the handsome South Gate of the 15th century. Several by-channels of the river, passing through the town, are known as fleets, recalling the similar *flethe* of Hamburg. The Public Walks forms a pleasant promenade parallel to the wall, and in the centre of it stands a picturesque octagonal Chapel of the Red Mount, exhibiting ornate Perpendicular work, and once frequented by pilgrims. The church of St Margaret, formerly the priory church, is a fine building with two towers at the west end, one of which was formerly surmounted by a spire, blown down in 1741. Norman or transitional work appears in the base of both towers, of which the southern also shows Early English and Decorated work, while the northern is chiefly Perpendicular. There is a fine Perpendicular east window of circular form. The church possesses two of the finest monumental brasses in existence, dated respectively 1349 and 1364. St Nicholas chapel, at the north end of the town, is also of rich Perpendicular workmanship, with a tower of earlier date. All Saints' church in South Lynn is a beautiful Decorated cruciform structure. Of a Franciscan friary there remains the Perpendicular Grey Friars' Steeple, and the doorway remains of a priests' college founded in 1502. At the grammar school, founded in the reign of Henry VIII., but occupying modern buildings, Eugene Aram was usher. Among the other public buildings are the guildhall, with Renaissance front, the corn exchange, the picturesque custom-house of the 17th century, the athenaeum (including a museum, hall and other departments), the Stanley Library and the municipal buildings. The fisheries of the town are important, including extensive mussel-fisheries under the jurisdiction of the corporation, and there are also breweries, corn-mills, iron and brass foundries, agricultural implement manufactories, ship-building yards, rope and sail works. Lynn Harbour has an area of 30 acres and an average depth at low tide of 10 ft. There is also good anchorage in the roads leading from the Wash to the docks. There are two docks of 6¾ and 10 acres area respectively. A considerable traffic is carried on by barges on the Ouse. The municipal and parliamentary boroughs of Lynn are co-extensive; the parliamentary borough returns one member. The town is governed by a mayor, 6 aldermen and 18 councillors. Area, 3061 acres.

As Lynn (Lun, Lenne, Bishop's Lynn) owes its origin to the trade which its early settlers carried by the Ouse and its tributaries its history dates from the period of settled occupation by the Saxons. It belonged to the bishops of Thetford before the Conquest and remained with the see when it was translated to Norwich. Herbert de Losinga (*c.* 1054–1119) granted its jurisdiction to the cathedral of Norwich but this right was resumed by a later bishop, John de Gray, who in 1204 had obtained from John a charter establishing Lynn as a free borough. A fuller grant in 1206 gave the burgesses a gild merchant, the husting court to be held once a week only, and general liberties according to the customs of Oxford, saving the rights of the bishop and the earl of Arundel, whose ancestor William D'Albini had received from William II. the moiety of the tolbooth. Among numerous later charters one of 1268 confirmed the privilege granted to the burgesses by the bishop of choosing a mayor; another of 1416 re-established his election by the aldermen alone. Henry VIII. granted Lynn two charters, the first (1524) incorporating it under mayor and aldermen; the second (1537) changing its name to King's Lynn and transferring to the corporation all the rights hitherto enjoyed by the bishop. Edward VI. added the possessions of the gild of the Trinity, or gild merchant, and St George's gild, while Queen Mary annexed South Lynn. Admiralty rights were granted by James I. Lynn, which had declared for the Crown in 1643, surrendered its privileges to Charles II. in 1684, but recovered its charter on the eve of the Revolution. A fair held on the festival of St Margaret (July 20) was included in the grant to the monks of Norwich about 1100. Three charters of John granting the bishop fairs on the feasts of St Nicholas, St Ursula and St Margaret are extant, and another of Edward I., changing the last to the feast of St Peter ad Vincula (Aug. 1). A local act was passed in 1558–1559 for keeping a mart or fair once a year. In the eighteenth century besides the pleasure fair, still held in February, there was another in October, now abolished. A royal charter of 1524 established the cattle, corn and general provisions market, still held every Tuesday and Saturday. Lynn has ranked high among English seaports from early times.

See E. M. Beloe, *Our Borough* (1899); H. Harrod, *Report on Deeds, &c., of King's Lynn* (1874); *Victoria County History: Norfolk*.

KING'S MOUNTAIN, a mountainous ridge in Gaston county, North Carolina and York county, South Carolina, U.S.A. It is an outlier of the Blue Ridge running parallel with it, *i.e.* N.E. and S.W., but in contrast with the other mountains of the Blue Ridge, King's Mountain has a crest marked with sharp and irregular notches. Its highest point and great escarpment are in North Carolina. About 1½ m. S. of the line between the two states, where the ridge is about 60 ft. above the surrounding country and very narrow at the top, the battle of King's Mountain was fought on the 7th of October 1780 between a force of about 100 Provincial Rangers and about 1000 Loyalist militia under Major Patrick Ferguson (1744-1780), and an American force of about 900 backwoodsmen under Colonels William Campbell (1745–1781), Benjamin Cleveland (1738–1806), Isaac Shelby, John Sevier and James Williams (1740–1780), in which the Americans were victorious. The British loss is stated as 119 killed (including the commander), 123 wounded, and 664 prisoners; the American loss was 28 killed (including Colonel Williams) and 62 wounded. The victory largely contributed to the success of General Nathanael Greene's campaign against Lord Cornwallis. There has been some dispute as to the exact site of the engagement, but the weight of evidence is in favour of the position mentioned above, on the South Carolina side of the line. A monument erected in 1815 was replaced in 1880 by a much larger one, and a monument for which Congress appropriated $30,000 in 1906, was completed in 1909.

See L. C. Draper, *King's Mountain and its Heroes* (Cincinnati, 1881); and Edward McCrady, *South Carolina in the Revolution 1775–1780* (New York, 1901).

KINGSTON, ELIZABETH, DUCHESS OF (1720–1788), sometimes called countess of Bristol, was the daughter of Colonel Thomas Chudleigh (d. 1726), and was appointed maid of honour to Augusta, princess of Wales, in 1743, probably through the good offices of her friend, William Pulteney, earl of Bath. Being a very beautiful woman Miss Chudleigh did not lack admirers, among whom were James, 6th duke of Hamilton, and Augustus John Hervey, afterwards 3rd earl of Bristol. Hamilton, however, left England, and on the 4th of August 1744 she was privately married to Hervey at Lainston, near Winchester. Both husband and wife being poor, their union was kept secret to enable Elizabeth to retain her post at court, while Hervey, who was a naval officer, rejoined his ship, returning to England towards the close of 1746. The marriage was a very unhappy one, and the pair soon ceased to live together; but when it appeared probable that Hervey would succeed his brother as earl of Bristol, his wife took steps to obtain proof of her marriage. This did not, however, prevent her from becoming the mistress of Evelyn Pierrepont, 2nd duke of Kingston, and she was not only a very prominent figure in London society, but in 1765 in Berlin she was honoured by the attentions of Frederick the Great. By this time Hervey wished for a divorce from his wife; but Elizabeth, although equally anxious to be free, was unwilling to face the publicity attendant upon this step. However she began a suit of jactitation against Hervey. This case was doubtless collusive, and after Elizabeth had sworn she was unmarried, the court in February 1769 pronounced her a spinster. Within a month she married Kingston, who died four years later, leaving her all his property on condition that she remained a widow. Visiting Rome the duchess was received with honour by Clement XIV.; after which she hurried back to England to defend herself from a charge of bigamy, which had been preferred against her by Kingston's nephew, Evelyn Meadows (d. 1826). The house of Lords in 1776 found her guilty, and retaining her fortune she hurriedly left England to avoid further proceedings on the part of the Meadows family, who had a reversionary interest in the Kingston estates. She lived for a time in Calais, and then repaired to St Petersburg, near which city she bought an estate which she named "Chudleigh." Afterwards she resided in Paris, Rome, and elsewhere, and died in Paris on the 26th of August 1788. The duchess was a coarse and licentious woman, and was ridiculed as Kitty Crocodile by the comedian Samuel Foote in a play *A Trip to Calais*, which, however, he was not allowed to produce. She is said to have been the original of Thackeray's characters, Beatrice and Baroness Bernstein.

There is an account of the duchess in J. H. Jesse's *Memoirs of the Court of England 1688–1760*, vol. iv. (1901).

KINGSTON, WILLIAM HENRY GILES (1814–1880), English novelist, son of Lucy Henry Kingston, was born in London on the 28th of February 1814. Much of his youth was spent at Oporto, where his father was a merchant, but when he entered the business, he made his headquarters in London. He early wrote newspaper articles on Portuguese subjects. These were translated into Portuguese, and the author received a Portuguese order of knighthood and a pension for his services in the conclusion of the commercial treaty of 1842. In 1844 his first book, *The Circassian Chief*, appeared, and in 1845 *The Prime Minister, a Story of the Days of the Great Marquis of Pombal*. The *Lusitanian Sketches* describe Kingston's travels in Portugal. In 1851 *Peter the Whaler*, his first book for boys, came out. These books proved so popular that Kingston retired from business, and devoted himself to the production of tales of adventure for boys. Within thirty years he wrote upwards of one hundred and thirty such books. He had a practical knowledge of seamanship, and his stories of the sea, full of thrilling adventures and hairbreadth escapes, exactly hit the taste of his boy readers. Characteristic specimens of his work are *The Three Midshipmen*; *The Three Lieutenants*; *The Three Commanders*; and *The Three Admirals*. He also wrote popular accounts of famous travellers by land and sea, and translated some of the stories of Jules Verne.

In all philanthropic schemes Kingston took deep interest; he was the promoter of the mission to seamen; and he acted as secretary of a society for promoting an improved system of emigration. He was editor of the *Colonist* for a short time in 1844 and of the *Colonial Magazine and East Indian Review* from 1849 to 1851. He was a supporter of the volunteer movement in England from the first. He died at Willesden on the 5th of August 1880.

KINGSTON, the chief city of Frontenac county, Ontario, Canada, at the north-eastern extremity of Lake Ontario, and the mouth of the Cataraqui River. Pop. (1901), 17,961. It is an important station on the Grand Trunk railway, the terminus of the Kingston & Pembroke railway, and has steamboat communication with other ports on Lake Ontario and the Bay of Quinte, on the St Lawrence and the Rideau canal. It contains a fine stone graving dock, 280 ft. long, 100 ft. wide, and with a depth of 16 ft. at low water on the sill. The fortifications, which at one time made it one of the strongest fortresses in Canada, are now out of date. The sterility of the surrounding country, and the growth of railways have lessened its commercial importance, but it still contains a number of small factories, and important locomotive works and ship-building yards. As an educational and residential centre it retains high rank, and is a popular summer resort. It is the seat of an Anglican and of a Roman Catholic bishopric, of the Royal Military College (founded by the Dominion government in 1875), of an artillery school, and of Queen's University, an institution founded in 1839 under the nominal control of the Presbyterian church, now including about 1200 students. In the suburbs are a Dominion penitentiary, and a provincial lunatic asylum. Founded by the French in 1673, under the name of Kateracoui, soon changed to Fort Frontenac, it played an important part in the wars between English and French. Taken and destroyed by the English in 1758, it was refounded in 1782 under its present name, and was from 1841 to 1844 the capital of Canada.

KINGSTON, a city and the county-seat of Ulster county, New York, U.S.A., on the Hudson River, at the mouth of Rondout Creek, about 90 m. N. of New York and about 53 m. S. of Albany. Pop. (1900), 24,535—3551 being foreign-born; (1910 census) 25,908. It is served by the West Shore (which here crosses Rondout Creek on a high bridge), the New York Ontario & Western, the Ulster & Delaware, and the Wallkill Valley railways, by a ferry across the river to Rhinecliff, where connexion is made with the New York Central & Hudson River railroad, and by steamboat lines to New York, Albany and other river points. The principal part of the city is built on a level plateau about 150 ft. above the river; other parts of the site vary from flatlands to rough highlands. To the N.W. is the mountain scenery of the Catskills, to the S.W. the Shawangunk Mountains and Lake Mohonk, and in the distance across the river are the Berkshire Hills. The most prominent public buildings are the post office and the city hall; in front of the latter is a Soldiers' and Sailors' Monument. The city has a Carnegie library. The "Senate House"—now the property of the state, with a colonial museum—was erected about 1676; it was the meeting place of the first State Senate in 1777, and was burned (except the walls) in October of that year. The court house (1818) stands on the site of the old court house, in which Governor George Clinton was inaugurated in July 1777, and in which Chief Justice John Jay held the first term of the New York Supreme Court in September 1777. The Elmendorf Tavern (1723) was the meeting-place of the New York Council of Safety in October 1777. Kingston Academy was organized in 1773, and in 1864 was transferred to the Kingston Board of Education and became part of the city's public school system; its present building dates from 1806. Kingston's principal manufactures are tobacco, cigars and cigarettes, street railway cars and boats; other manufactures are Rosendale cement, bricks, shirts, lace curtains, brushes, motor wheels, sash and blinds. The city ships large quantities of building and flag stones quarried in the vicinity. The total value of the factory product in 1905 was $5,000,922, an increase of 26·5 % since 1900.

In 1614 a small fort was built by the Dutch at the mouth of Rondout Creek, and in 1652 a settlement was established in the vicinity and named Esopus after the Esopus Indians, who were a subdivision of the Munsee branch of the Delawares, and whose name meant "small river," referring possibly to Rondout Creek. The settlement was deserted in 1655-56 on account of threatened Indian attacks. In 1658 a stockade was built by the order of Governor Peter Stuyvesant, and from this event the actual founding of the city is generally dated. In 1659 the massacre of several drunken Indians by the soldiers caused a general rising of the Indians, who unsuccessfully attacked the stockade, killing some of the soldiers and inhabitants, and capturing and torturing others. Hostilities continued into the following year. In 1661 the governor named the place Wiltwyck and gave it a municipal charter. In 1663 it suffered from another Indian attack, a number of the inhabitants being slain or taken prisoners. The English took possession in 1664, and in 1669 Wiltwyck was named Kingston, after Kingston Lisle, near Wantage, England, the family seat of Governor Francis Lovelace. In the same year the English garrison was removed. In 1673–1674 Kingston was again temporarily under the control of the Dutch, who called it Swanenburg. In 1777 the convention which drafted the new state constitution met in Kingston, and during part of the year Kingston was the seat of the new state government. On the 16th of October 1777 the British under General Sir John Vaughan (1748–95) sacked it and burned nearly all its buildings. In 1908 the body of George Clinton was removed from Washington, D.C., and reinterred in Kingston on the 250th anniversary of the building of the stockade. In 1787 Kingston was one of the places contemplated as a site for the national capital. In 1805 it was incorporated as a village, and in 1872 it absorbed the villages of Rondout and Wilbur and was made a city.

See M. Schoonmaker, *History of Kingston* (New York, 1888).

KINGSTON, a borough of Luzerne county, Pennsylvania, U.S.A., on the North Branch of the Susquehanna river, opposite Wilkes-Barré. Pop. (1900), 3846 (1039 foreign-born); (1910) 6449. Kingston is served by the Delaware, Lackawanna & Western and the Lehigh Valley railways. It is the seat of Wyoming Seminary (1844; co-educational), a well-known secondary school. Anthracite coal is mined here; there are railway repair and machine-shops; and among the borough's manufactures are hosiery, silk goods, underwear and adding machines. Kingston (at first called "Kingstown," from Kings Towne, Rhode Island) was commonly known in its early days as the "Forty Township," because the first permanent settlement was made by forty pioneers from Connecticut, who were sent out by the Susquehanna Company and took possession of the district in its name in 1769. In 1772 the famous "Forty Fort," a stockade fortification, was built here, and in 1777 it was rebuilt, strengthened and enlarged. Here on the 3rd of July 1778 about 400 men and boys met, and under the command of Colonel Zebulon Butler (1731–95) went out to meet a force of about 1100 British troops and Indians, commanded by Major John Butler and Old King (Sayenqueraghte). The Americans were defeated in the engagement that followed, and many of the prisoners taken were massacred or tortured by the Indians. A monument near the site of the fort commemorates the battle and massacre. Kingston was incorporated as a borough in 1857. (See Wyoming Valley.)

KINGSTON, the capital and chief port of Jamaica, West Indies. Pop. (1901), 46,542, mostly negroes. It is situated in the county of Surrey, in the south-east of the island, standing on the north shore of a land-locked harbour—for its size one of the finest in the world—and with its suburbs occupying an area of 1080 acres. The town contains the principal government offices. It has a good water supply, a telephone service and a supply of both gas and electric light, while electric trams ply between the town and its suburbs. The Institute of Jamaica maintains a public library, museum and art gallery especially devoted to local interests. The old parish church in King Street, dating probably from 1692 was the burial-place of William Hall (1699) and Admiral Benbow (1702). The suburbs are remarkable for their beauty. The climate is dry and healthy, and the temperature ranges from 93° to 66° F. Kingston was founded in 1693, after the neighbouring town of Port Royal had been ruined by an earthquake in 1692. In 1703, Port Royal having been again laid waste by fire, Kingston became the commercial, and in 1872 the political, capital of the island. On several occasions Kingston was almost entirely consumed by fire, the conflagrations of 1780, 1843, 1862 and 1882 being particularly severe. On the 14th of January 1907 it was devastated by a terrible earthquake. A long immunity had led to the erection of many buildings not specially designed to withstand such shocks, and these and the fire which followed were so destructive that practically the whole town had to be rebuilt. (See Jamaica.)

KINGSTON-ON-THAMES, a market town and municipal borough in the Kingston parliamentary division of Surrey, England, 11 m. S.W. of Charing Cross, London; on the London and South-Western railway. Pop. (1901), 34,375. It has a frontage with public walks and gardens upon the right bank of the Thames, and is in close proximity to Richmond and Bushey Parks, its pleasant situation rendering it a favourite residential district. The ancient wooden bridge over the river, which was in existence as early as 1223, was superseded by a structure of stone in 1827. The parish church of All Saints, chiefly Perpendicular in style, contains several brasses of the 15th century, and monuments by Chantrey and others; the grammar school, rebuilt in 1878, was originally founded as a chantry by Edward Lovekyn in 1305, and converted into a school by Queen Elizabeth. Near the parish church stood the chapel of St Mary, where it is alleged the Saxon kings were crowned. The ancient stone said to have been used as a throne at these coronations was removed to the market-place in 1850. At Norbiton, within the borough, is the Royal Cambridge Asylum for soldiers' widows (1854). At Kingston Hill is an industrial and training school for girls, opened in 1892. There are large market gardens in the neighbourhood, and the town possesses oil-mills, flour-mills, breweries and brick and tile works. The borough is under a mayor, 8 aldermen and 24 councillors. Area, 1133 acres.

The position of Kingston (*Cyningestun*, *Chingestune*) on the Thames where there was probably a ford accounts for its origin; its later prosperity was due to the bridge which existed in 1223 and possibly long before. In 836 or 838 it was the meeting-place of the council under Ecgbert, and in the 10th century some if not all of the West Saxon kings were crowned at Kingston. In the time of Edward the Confessor it was a royal manor, and in 1086 included a church, five mills and three fisheries. Domesday also mentions bedels in Kingston. The original charters were granted by John in 1200 and 1209, by which the free men of Kingston were empowered to hold the town in fee-farm for ever, with all the liberties that it had while in the king's hands. Henry III. sanctioned the gild-merchant which had existed previously, and granted other privileges. These charters were confirmed and extended by many succeeding monarchs down to Charles I. Henry VI. incorporated the town under two bailiffs. Except for temporary surrenders of their corporate privileges under Charles II. and James II. the government of the borough continued in its original form until 1835, when it was reincorporated under the title of mayor, aldermen and burgesses. Kingston returned two members to parliament in 1311, 1313, 1353 and 1373, but never afterwards. The market, still held on Saturdays, was granted by James I., and the Wednesday market by Charles II. To these a cattle-market on Thursdays has been added by the corporation. The only remaining fair, now held on the 13th of November, was granted by Henry III., and was then held on the morrow of All Souls and seven days following.

KINGSTON-UPON-HULL, EARLS AND DUKES OF. These titles were borne by the family of Pierrepont, or Pierrepoint, from 1628 to 1773.

Robert Pierrepont (1584–1643), second son of Sir Henry Pierrepont of Holme Pierrepont, Nottinghamshire, was member of parliament for Nottingham in 1601, and was created Baron Pierrepont and Viscount Newark in 1627, being made earl of Kingston-upon-Hull in the following year. He remained neutral on the outbreak of the Civil War; but afterwards he joined the king, and was appointed lieutenant-general of the counties of Lincoln, Rutland, Huntingdon, Cambridge and Norfolk. Whilst defending Gainsborough he was taken prisoner, and was accidentally killed on the 25th of July 1643 while being conveyed to Hull. The earl had five sons, one of whom was Francis Pierrepont (d. 1659), a colonel in the parliamentary army and afterwards a member of the Long Parliament; and another was William Pierrepont (*q.v.*), a leading member of the parliamentary party.

His son Henry Pierrepont (1606–1680), 2nd earl of Kingston and 1st marquess of Dorchester, was member of parliament for Nottinghamshire, and was called to the House of Lords as Baron Pierrepont in 1641. During the earlier part of the Civil War he was at Oxford in attendance upon the king, whom he represented at the negotiations at Uxbridge. In 1645 he was made a privy councillor and created marquess of Dorchester; but in 1647 he compounded for his estates by paying a large fine to the parliamentarians. Afterwards the marquess, who was always fond of books, spent his time mainly in London engaged in the study of medicine and law, his devotion to the former science bringing upon him a certain amount of ridicule and abuse. After the Restoration he was restored to the privy council, and was made recorder of Nottingham and a fellow of the Royal Society. Dorchester had two daughters, but no sons, and when he died in London on the 8th of December 1680 the title of marquess of Dorchester became extinct. He was succeeded as 3rd earl of Kingston by Robert (d. 1682), a son of Robert Pierrepont of Thoresby, Nottinghamshire, and as 4th earl by Robert's brother William (d. 1690).

Evelyn Pierrepont (*c.* 1655–1726), 5th earl and 1st duke of Kingston, another brother had been member of parliament for East Retford before his accession to the peerage. While serving as one of the commissioners for the union with Scotland he was created marquess of Dorchester in 1706, and took a leading part in the business of the House of Lords. He was made a privy councillor and in 1715 was created duke of Kingston; afterwards serving as lord privy seal and lord president of the council. The duke, who died on the 5th of March 1726, was a prominent figure in the fashionable society of his day. He was twice married, and had five daughters, among whom was Lady Mary Wortley Montagu (*q.v.*), and one son, William, earl of Kingston (d. 1713).

The latter's son, Evelyn Pierrepont (1711–1773), succeeded his grandfather as second duke of Kingston. When the rebellion of 1745 broke out he raised a regiment called "Kingston's light horse," which distinguished itself at Culloden. The duke, who attained the rank of general in the army, is described by Horace Walpole as "a very weak man, of the greatest beauty and finest person in England." He is chiefly famous for his connexion with Elizabeth Chudleigh, who claimed to be duchess of Kingston (*q.v.*). The Kingston titles became extinct on the duke's death without children on the 23rd of September 1773, but on the death of the duchess in 1788 the estates came to his nephew Charles Meadows (1737–1816), who took the name of Pierrepont and was created Baron Pierrepont and Viscount Newark in 1796, and Earl Manvers in 1806. His descendant, the present Earl Manvers, is thus the representative of the dukes of Kingston.

KINGSTOWN, a seaport of Co. Dublin, Ireland, in the south parliamentary division, at the south-eastern extremity of Dublin Bay, 6 m. S.E. from Dublin by the Dublin & South-Eastern railway. Pop. of urban district (1901), 17,377. It is a large seaport and favourite watering-place, and possesses several fine streets, with electric trams, and terraces commanding picturesque sea views. The original name of Kingstown was Dunleary, which was exchanged for the present designation after the embarkation of George IV. at the port on his return from Ireland in 1821, an event which is also commemorated by a granite obelisk erected near the harbour. The town was a mere fishing village until the construction of an extensive harbour, begun in 1817 and finally completed in 1859. The eastern pier has a length of 3500 ft. and the western of 4950 ft., the total area enclosed being about 250 acres, with a varying depth of from 15 to 27 ft. Kingstown is the station of the City of Dublin Steam Packet Company's mail steamers to Holyhead in connexion with the London & North-Western railway. It has large export and import trade both with Great Britain and foreign countries. The principal export is cattle, and the principal imports corn and provisions. Kingstown is the centre of an extensive sea-fishery; and there are three yacht clubs: the Royal Irish, Royal St George and Royal Alfred.

KING-TÊ CHÊN, a town near Fu-liang Hien, in the province of Kiang-si, China, and the principal seat of the porcelain manufacture in that empire. Being situated on the south bank of the river Chang, it was in ancient times known as *Chang-nan Chên*, or "town on the south of the river Chang." It is unwalled, and straggles along the bank of the river. The streets are narrow, and crowded with a population which is reckoned at a million, the vast majority of whom find employment at the porcelain factories. Since the Ch'in dynasty (557–589) this has been the great trade of the place, which was then called by its earlier name. In the reign of King-tê (Chên-tsung) of the Sung dynasty, early in the 11th century A.D., a manufactory was founded there for making vases and objects of art for the use of the emperor. Hence its adoption of its present title. Since the time of the Ming dynasty a magistrate has been specially appointed to superintend the factories and to despatch at regulated intervals the imperial porcelain to Peking. The town is situated on a vast plain surrounded by mountains, and boasts of three thousand porcelain furnaces. These constantly burning fires are the causes of frequent conflagrations, and at night give the city the appearance of a place on fire. The people are as a rule orderly, though they have on several occasions shown a hostile bearing towards foreign visitors. This is probably to be accounted for by a desire to keep their art as far as possible a mystery, which appears less unreasonable when it is remembered that the two kinds of earth of which the porcelain is made are not found at King-tê Chên, but are brought from K'i-mun in the neighbouring province of Nganhui, and that there is therefore no reason why the trade should be necessarily maintained at that place. The two kinds of earth are known as pai-tun-tsze, which is a fine fusible quartz powder, and kao-lin, which is not fusible, and is said to give strength to the ware. Both materials are prepared in the shape of bricks at K'i-mun, and are brought down the Chang to the seat of the manufacture.

KINGUSSIE, a town of Inverness-shire, Scotland. Pop. (1901), 987. It lies at a height of 750 ft. above sea-level, on the left bank of the Spey, here crossed by a bridge, 46½ m. S. by S.E. of Inverness by the Highland railway. It was founded towards the end of the 18th century by the duke of Gordon, in the hope of its becoming a centre of woollen manufactures. This expectation, however, was not realized, but in time the place grew popular as a health resort, the scenery in every direction being remarkably picturesque. On the right bank of the river is Ruthven, where James Macpherson was born in 1736, and on the left bank, some 2½ m. from Kingussie, is the house of Belleville (previously known as Raitts) which he acquired from Mackintosh of Borlum and where he died in 1796. The mansion, renamed Balavil by Macpherson's great-grandson, was burned down in 1903, when the fine library (including some MSS. of Sir David Brewster, who had married the poet's second daughter) was destroyed. Of Ruthven Castle, one of the residences of the Comyns of Badenoch, only the ruins of the walls remain. Here the Jacobites made an ineffectual rally under Lord George Murray after the battle of Culloden.

KING WILLIAM'S TOWN, a town of South Africa, in the Cape province and on the Buffalo River, 42 m. by rail W.N.W. of the port of East London. Pop. (1904), 9506, of whom 5987 were whites. It is the headquarters of the Cape Mounted Police. "King," as the town is locally called, stands 1275 ft. above the sea at the foot of the Amatola Mountains, and in the midst of a thickly populated agricultural district. The town is well laid out and most of the public buildings and merchants' stores are built of stone. There are manufactories of sweets and jams, candles, soap, matches and leather, and a large trade in wool, hides and grains is done with East London. "King" is also an important entrepôt for trade with the natives throughout Kaffraria, with which there is direct railway communication. Founded by Sir Benjamin D'Urban in May 1835 during the Kaffir War of that year, the town is named after William IV. It was abandoned in December 1836, but was reoccupied in 1846 and was the capital of British Kaffraria from its creation in 1847 to its incorporation in 1865 with Cape Colony. Many of the colonists in the neighbouring districts are descendants of members of the German legion disbanded after the Crimean War and provided with homes in Cape Colony; hence such names as Berlin, Potsdam, Braunschweig, Frankfurt, given to settlements in this part of the country.

KINKAJOU (*Cercoleptes caudivolvulus* or *Potos flavus*), the single species of an aberrant genus of the raccoon family (*Procyonidae*). It has been split up into a number of local races. A native of the forests of the warmer parts of South and Central America, the kinkajou is about the size of a cat, of a uniform pale, yellowish-brown colour, nocturnal and arboreal in its habits, feeding on fruit, honey, eggs and small birds and mammals, and is of a tolerably gentle disposition and easily tamed. (See CARNIVORA.)

KINKEL, JOHANN GOTTFRIED (1815–1882), German poet, was born on the 11th of August 1815 at Obercassel near Bonn. Having studied theology at Bonn and afterwards in Berlin, he established himself at Bonn in 1836 as *privat docent* of theology, later became master at the gymnasium there, and was for a short time assistant preacher in Cologne. Changing his religious opinions, he abandoned theology and delivered lectures on the history of art, in which he had become interested on a journey to Italy in 1837. In 1846 he was appointed extraordinary professor of the history of art at Bonn University. For his share in the revolution in the Palatinate in 1849 Kinkel was arrested and, sentenced to penal servitude for life, was interned in the fortress of Spandau. His friend Carl Schurz contrived in November 1850 to effect his escape to England, whence he went to the United States. Returning to London in 1853, he for several years taught German and lectured on German literature, and in 1858 founded the German paper *Hermann*. In 1866 he accepted the professorship of archaeology and the history of art at the Polytechnikum in Zürich, in which city he died on the 13th of November 1882.

The popularity which Kinkel enjoyed in his day was hardly justified by his talent; his poetry is of the sweetly sentimental type which was much in vogue in Germany about the middle of the 19th century. His *Gedichte* first appeared in 1843, and have gone through several editions. He is to be seen to most advantage in the verse romances, *Otto der Schütz, eine rheinische Geschichte in zwölf Abenteuern* (1846) which in 1896 had attained its 75th edition, and *Der Grobschmied von Antwerpen* (1868). Among Kinkel's other works may be mentioned the tragedy *Nimrod* (1857), and his history of art, *Geschichte der bildenden Künste bei den christlichen Völkern* (1845). Kinkel's first wife, Johanna, *née* Mockel (1810–1858), assisted her husband in his literary work, and was herself an author of considerable merit. Her admirable autobiographical novel *Hans Ibeles in London* was not published until 1860, after her death. She also wrote on musical subjects.

See A. Strodtmann, *Gottfried Kinkel* (2 vols., Hamburg, 1851); and O. Henne am Rhyn, *G. Kinkel, ein Lebensbild* (Zürich, 1883).

KINNING PARK, a southern suburb of Glasgow, Scotland. Pop. (1901), 13,852. It is situated on the left bank of the Clyde between Glasgow, with which it is connected by tramway and subway, and Govan. Since 1850 it has grown from a rural village to a busy centre mainly inhabited by artisans and labourers. Its principal industries are engineering, bread and biscuit baking, soap-making and paint-making.

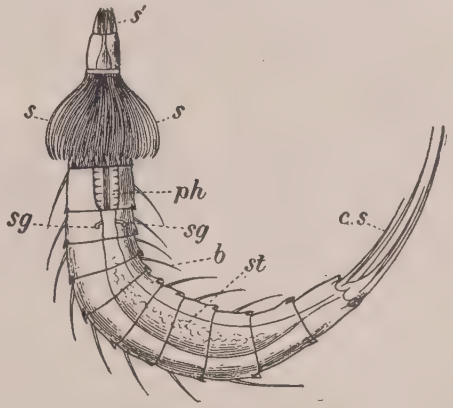
KINNOR (Gr. κινύρα), the Hebrew name for an ancient stringed instrument, the first mentioned in the Bible (Gen. iv. 21), where it is now always translated "harp." The identification of the instrument has been much discussed, but, from the standpoint of the history of musical instruments, the weight of evidence is in favour of the view that the Semitic *kinnor* is the Greek *cithara* (*q.v.*). This instrument was already in use before 2000 B.C. among the Semitic races and in a higher state of development than it ever attained in Greece during the best classic period. It is unlikely that an instrument (which also appears on Hebrew coins) so widely known and used in various parts of Asia Minor in remote times, and occurring among the Hittite sculptures, should pass unmentioned in the Bible, with the exception of the verses in Dan. iii.

KINO, the West African name of an astringent drug introduced into European medicine in 1757 by John Fothergill. When described by him it was believed to have been brought from the river Gambia in West Africa, and when first imported it was sold in England as *Gummi rubrum astringens gambiense*. It was obtained from *Pterocarpus erinaceus*. The drug now recognized as the legitimate kind is East Indian, Malabar or Amboyna kino, which is the evaporated juice obtained from incisions in the trunk of *Pterocarpus Marsupium* (Leguminosae), though Botany Bay or eucalyptus kino is used in Australia. When exuding from the tree it resembles red-currant jelly, but hardens in a few hours after exposure to the air and sun. When sufficiently dried it is packed into wooden boxes for exportation. When these are opened it breaks up into angular brittle fragments of a blackish-red colour and shining surface. In cold water it is only partially dissolved, leaving a pale flocculent residue which is soluble in boiling water but deposited again on cooling. It is soluble in alcohol and caustic alkalis, but not in ether.

The chief constituent of the drug is kino-tannic acid, which is present to the extent of about 75%; it is only very slightly soluble in cold water. It is not absorbed at all from the stomach and only very slowly from the intestine. Other constituents are gum, pyrocatechin, and kinoin, a crystalline neutral principle. Kino-red is also present in small quantity, being an oxidation product of kino-tannic acid. The useful preparations of this drug are the tincture (dose ½–1 drachm), and the *pulvis kino compositus* (dose 5–20 gr.) which contains one part of opium in twenty. The drug is frequently used in diarrhoea, its value being due to the relative insolubility of kino-tannic acid, which enables it to affect the lower part of the intestine. In this respect it is parallel with catechu. It is not now used as a gargle, antiseptics being recognized as the rational treatment for sore-throat.

KINORHYNCHA, an isolated group of minute animals containing the single genus *Echinoderes* F. Dujardin, with some eighteen species. They occur in mud and on sea-weeds at the bottom of shallow seas below low-water mark and devour organic débris.

The body is enclosed in a stout cuticle, prolonged in places into spines and bristles. These are especially conspicuous in two rings round the proboscis and in the two posterior caudal spines. The body is divided into eleven segments and the protrusible proboscis apparently into two, and the cuticle of the central segment is thickened to form three plates, one dorsal and two ventrolateral. The cuticle is secreted by an epidermis in which no cell boundaries are to be seen; it sends out processes into the bristles. The mouth opens at the tip of the retractile proboscis; it leads into a short thin-walled tube which opens into an oval muscular gizzard lined with a thick cuticle; at the posterior end of this are some minute glands and then follows a large stomach slightly sacculated in each segment, this tapers through the rectum to the terminal anus. A pair of pear-shaped, ciliated glands inside lie in the eighth segment and open on the ninth. They are regarded as kidneys. The nervous system consists of a ganglion or brain, which lies dorsally about the level of the junction of the pharynx and the stomach, a nerve ring and a segmented neutral cord. The only sense organs described are eyes, which occur in some species, and may number one to four pairs.



(After Hartog, from *Cambridge Natural History*, vol. ii., "Worms, &c.," by permission of Messrs. Macmillan & Co., Ltd.)

b, bristle; *cs*, caudal spine; *ph*, pharynx; *s* & *s'*, the spines on the two segments of the proboscis; *sg*, salivary glands; *st*, stomach.

The Kinorhyncha are dioecious. The testes reach forward to the fifth and even to the second segment, and open one each side of the anus. The ovaries open in a similar position but never reach farther forward than the fourth segment. The external openings in the male are armed with a pair of hollowed spines. The animals are probably oviparous.

Literature.—F. Dujardin, *Ann. Sci. Nat.*, 3rd series, Zool. xv. 1851, p. 158; W. Reinhard, *Zeitschr. wiss. Zool.* xlv. 1887, pp. 401–467, t. xx.–xxii.; C. Zelinka, *Verh. d. Deutsch. Zool. Ges.*, 1894. (A. E. S.)

KINROSS-SHIRE, a county of Scotland, bounded N. and W. by Perthshire, on the extreme S.W. by Clackmannanshire and S. and E. by Fifeshire. Its area is 52,410 acres or 81·9 sq. m. Excepting Clackmannan it is the smallest county in Scotland both in point of area and of population. On its confines the shire is hilly. To the N. and W. are several peaks of the Ochils, the highest being Innerdouny (1621 ft.) and Mellock (1573); to the E. are the heights of the Lomond group, such as White Craigs (1492 ft.) and Bishop Hill; to the S. are Benarty (1131 ft.) on the Fife border and farther west the Cleish Hills, reaching in Dumglow an altitude of 1241 ft. With the exception of the Leven, which drains Loch Leven and of which only the first mile of its course belongs to the county, all the streams are short. Green's Burn, the North and South Queich, and the Gairney are the principal. Loch Leven, the only lake, is remarkable rather for its associations than its natural features. The scenery on the Devon, west of the Crook, the river here forming the boundary with Perthshire, is of a lovely and romantic character. At one place the stream rushes through the rocky gorge with a loud clacking sound which has given to the spot the name of the Devil's Mill, and later it flows under the Rumbling Bridge. In reality there are two bridges, one built over the other, in the same vertical line. The lower one dates from 1713 and is unused; but the loftier and larger one, erected in 1816, commands a beautiful view. A little farther west is the graceful cascade of the Caldron Linn, the fall of which was lessened, however, by a collapse of the rocks in 1886.

Geology.—The northern higher portion of the county is occupied by the Lower Old Red Sandstone volcanic lavas and agglomerates of the Ochils. The coarse character of some of the lower agglomerate beds is well seen in the gorge at Rumbling Bridge. The beds dip gently towards the S.S.E.; in a north-easterly direction they contain more sandy sediments, and the agglomerates and breccias frequently become conglomerates. The plain of Kinross is occupied by the soft sandstones, marls and conglomerates of the upper Old Red Sandstone, which rest unconformably upon the lower division with a strong dip. Southward and eastward these rocks dip conformably beneath the Lower Carboniferous cement stone series of the Calciferous Sandstone group. The overlying Carboniferous limestone occupies only a small area in the south and east of the county. Intrusive basalt sheets have been intercalated between some of the Carboniferous strata, and the superior resisting power of this rock has been the cause of the existence of West Lomond, Benarty, Cleish Hills and Bishop Hill, which are formed of soft marls and sandstones capped by basalt. The Hurlet limestone is worked on the Lomond and Bishop Hills. East- and west-running dikes of basalt are found in the north-east of the county, traversing the Old Red volcanic rocks. Kames of gravel and sand and similar glacial detritus are widely spread over the older rocks.

Climate and Industries.—The lower part of the county is generally well sheltered and adapted to all kinds of crops; and the climate, though wet and cold, offers no hindrance to high farming. The average annual rainfall is 35·5 inches, and the temperature for the year is 48° F., for January 38° F. and for July 59°·5 F. More than half of the holdings exceed 50 acres each. Much of the land has been reclaimed, the mossy tracts when drained and cultivated being very fertile. Barley is the principal crop, and oats also is grown largely, but the acreage under wheat is small. Turnips and potatoes are the chief green crops, the former the more important. The raising of livestock is pursued with great enterprise, the hilly land being well suited for this industry, although many cattle are pastured on the lowland farms. The cattle are mainly a native breed, which has been much improved by crossing. The number of sheep is high for the area. Although most of the horses are used for agricultural work, a considerable proportion are kept solely for breeding. Tartans, plaids and other woollens, and linen are manufactured at Kinross and Milnathort, which is besides an important centre for livestock sales. Brewing and milling are also carried on in the county town, but stock-raising and agriculture are the staple interests. The North British railway company's lines, from the south and west run through the county via Kinross, and the Mid-Fife line branches off at Mawcarse Junction.

Population and Government.—The population was 6673 in 1891 and 6981 in 1901, when 55 persons spoke Gaelic and English. The only towns are Kinross (pop. in 1901, 2136) and Milnathort (1052). Kinross is the county town, and of considerable antiquity. The county unites with Clackmannanshire to return one member to parliament. It forms a sheriffdom with Fifeshire and a sheriff-substitute sits at Kinross. The shire is under school-board jurisdiction.

History.—For several centuries the shire formed part of Fife, and during that period shared its history. Towards the middle of the 13th century, however, the parishes of Kinross and Orwell seem to have been constituted into a shire, which, at the date (1305) of Edward I.'s ordinance for the government of Scotland, had become an hereditary sheriffdom, John of Kinross then being named for the office. James I. dispensed with the attendance of small barons in 1427 and introduced the principle of representation, when the shire returned one member to the Scots parliament. The inclusion of the Fife parishes of Portmoak, Cleish and Tullibole in 1685, due to the influence of Sir William Bruce, the royal architect and heritable sheriff, converted the older shire into the modern county. Excepting, however, the dramatic and romantic episodes connected with the castle of Loch Leven, the annals of the shire, so far as the national story is concerned, are vacant. As to its antiquities, there are traces of an ancient fort or camp on the top of Dumglow, and on a hill on the northern boundary of the parish of Orwell a remarkable cairn, called Cairn-a-vain, in the centre of which a stone cist was discovered in 1810 containing an urn full of bones and charcoal. Close to the town of Kinross, on the margin of Loch Leven, stands Kinross House, which was built in 1685 by Sir William Bruce as a residence for the Duke of York (James II.) in case the Exclusion Bill should debar him from the throne of England. The mansion, however, was never occupied by royalty.

See Æ. J.G. Mackay, *History of Fife and Kinross* (Edinburgh, 1896); W. J. N. Liddall, *The Place Names of Fife and Kinross* (Edinburgh, 1895); C. Ross, *Antiquities of Kinross-shire* (Perth, 1886); R. B. Begg, *History of Lochleven Castle* (Kinross, 1887).

KINSALE, a market town and seaport of Co. Cork, Ireland, in the south-east parliamentary division, on the east shore of Kinsale Harbour (the estuary of the Bandon river) 24 m. south of Cork by the Cork Bandon & South Coast railway, the terminus of a branch line. Pop. of urban district (1901), 4250. The town occupies chiefly the acclivity of Compass Hill, and while of picturesque appearance is built in a very irregular manner, the streets being narrow and precipitous. The Charles Fort was completed by the duke of Ormonde in 1677 and captured by the earl of Marlborough in 1690. The parish church of St Multose is an ancient but inelegant structure, said to have been founded as a conventual church in the 12th century by the saint to whom it is dedicated. Kinsale, with the neighbouring villages of Scilly and Cove, is much frequented by summer visitors, and is the headquarters of the South of Ireland Fishing Company, with a fishery pier and a commodious harbour with 6 to 8 fathoms of water; but the general trade is of little importance owing to the proximity of Queenstown and Cork. The Old Head of Kinsale, at the west of the harbour entrance, affords fine views of the coast, and is commonly the first British land sighted by ships bound from New York, &c., to Queenstown.

Kinsale is said to derive its name from *cean taile*, the headland in the sea. At an early period the town belonged to the De Courcys, a representative of whom was created baron of Kinsale or Kingsale in 1181. It received a charter of incorporation from Edward III., having previously been a borough by prescription, and its privileges were confirmed and extended by various subsequent sovereigns. For several centuries previous to the Union it returned two members to the Irish parliament. It was the scene of an engagement between the French and English fleets in 1380, was forcibly entered by the English in 1488, captured by the Spaniards and retaken by the English in 1601, and entered by the English in 1641, who expelled the Irish inhabitants. Finally, it was the scene of the landing of James II. and of the French army sent to his assistance in 1689, and was taken by the English in the following year.

KINTORE, a royal and police burgh of Aberdeenshire, Scotland. Pop. (1901), 789. It is situated on the Don, 13¼ m. N.W. of Aberdeen by the Great North of Scotland railway. It is a place of some antiquity, having been made a royal burgh in the reign of William the Lion (d. 1214). Kintore forms one of the Elgin group of parliamentary burghs, the others being Banff, Cullen, Elgin, Inverurie and Peterhead. One mile to the south-west are the ruins of Hallforest Castle, of which two storeys still exist, once a hunting-seat of Robert Bruce and afterwards a residence of the Keiths, earls marischal. There are several examples of sculptured stones and circles in the parish, and 2 m. to the north-west is the site of Bruce's camp, which is also ascribed to the period of the Romans. Near it is Thainston House, the residence of Sir Andrew Mitchell (1708–1771), the British envoy to Frederick the Great. Kintore gives the title of earl in the Scottish, and of baron in the British peerage to the head of the Keith-Falconer family.

KIOTO (KYOTO), the former capital of Japan, in the province of Yamashiro, in 35° 01′ N., 135° 46′ E. Pop. (1903), 379,404. The Kamo-gawa, upon which it stands, is a mere rivulet in ordinary times, trickling through a wide bed of pebbles; but the city is traversed by several aqueducts, and was connected with Lake Biwa in 1890 by a canal 6⅞ m. long, which carries an abundance of water for manufacturing purposes, brings the great lake and the city into navigable communication, and forms with the Kamo-gawa canal and the Kamo-gawa itself a through route to Osaka, from which Kioto is 25 m. distant by rail. Founded in the year 793, Kioto remained the capital of the empire during nearly eleven centuries. The emperor Kwammu, when he selected this remarkably picturesque spot for the residence of his court, caused the city to be laid out with mathematical accuracy, after the model of the Tang dynasty's capital in China. Its area, 3 m. by 3½, was intersected by 18 principal thoroughfares, 9 running due north and south, and 9 due east and west, the two systems being connected at intervals by minor streets. At the middle of the northern face stood the palace, its enclosure covering three-quarters of a square mile, and from it to the centre of the south face ran an avenue 283 ft. wide and 3½ m. long. Conflagrations and subsequent reconstructions modified the regularity of this plan, but much of it still remains, and its story is perpetuated in the nomenclature of the streets. In its days of greatest prosperity Kioto contained only half a million inhabitants, thus never even approximating to the size of the Tokugawa metropolis, Yedo, or the Hojo capital Kamakura. The emperor Kwammu called it Heian-jo, or the "city of peace," when he made it the seat of government; but the people knew it as Miyako, or Kyoto, terms both of which signify "capital," and in modern times it is often spoken of as Saikyo, or western capital, in opposition to Tokyo, or eastern capital. Having been so long the imperial, intellectual, political and artistic metropolis of the realm, the city abounds with evidences of its unique career. Magnificent temples and shrines, grand monuments of architectural and artistic skill, beautiful gardens, gorgeous festivals, and numerous *ateliers* where the traditions of Japanese art are obeyed with attractive results, offer to the foreign visitor a fund of interest. Clear water ripples everywhere through the city, and to this water Kioto owes something of its importance, for nowhere else in Japan can fabrics be bleached so white or dyed in such brilliant colours. The people, like their neighbours of Osaka, are full of manufacturing energy. Not only do they preserve, amid all the progress of the age, their old-time eminence as producers of the finest porcelain, faience, embroidery, brocades, bronze, *cloisonné* enamel, fans, toys and metal-work of all kinds, but they have also adapted themselves to the foreign market, and weave and dye quantities of silk fabrics, for which a large and constantly growing demand is found in Europe and America. Nowhere else can be traced with equal clearness the part played in Japanese civilization by Buddhism, with its magnificent paraphernalia and imposing ceremonial spectacles; nowhere else, side by side with this luxurious factor, can be witnessed in more striking juxtaposition the austere purity and severe simplicity of the Shinto cult; and nowhere else can be more intelligently observed the fine faculty of the Japanese for utilizing, emphasizing and enhancing the beauties of nature. The citizens' dwellings and the shops, on the other hand, are insignificant and even sombre in appearance, their exterior conveying no idea of the pretty chambers within or of the tastefully laid-out grounds upon which they open behind. Kioto is celebrated equally for its cherry and azalea blossoms in the spring, and for the colours of its autumn foliage.

KIOWAS, a tribe and stock of North American Indians. Their former range was around the Arkansas and Canadian rivers, in Indian Territory (Oklahoma), Colorado and New Mexico. A fierce people, they made raids upon the settlers in western Texas until 1868, when they were placed on a reservation in Indian Territory. In 1874 they broke out again, but in the following year were finally subdued. In number about 1200, and settled in Oklahoma, they are the sole representatives of the Kiowan linguistic stock.

See J. Mooney, "Calendar History of the Kiowa Indians," *17th Report of Bureau of American Ethnology* (Washington, 1898).

KIPLING, RUDYARD (1865–), British author, was born in Bombay on the 30th of December 1865. His father, John Lockwood Kipling (1837–1911), an artist of considerable ability, was from 1875 to 1893 curator of the Lahore museum in India. His mother was Miss Alice Macdonald of Birmingham, two of whose sisters were married respectively to Sir E. Burne-Jones and Sir Edward Poynter. He was educated at the United Services College, Westward Ho, North Devon, of which a somewhat lurid account is given in his story *Stalky and Co.* On his return to India he became at the age of seventeen the sub-editor of the Lahore *Civil and Military Gazette.* In 1886, in his twenty-first year, he published *Departmental Ditties*, a volume of light verse chiefly satirical, only in two or three poems giving promise of his authentic poetical note. In 1887 he published *Plain Tales from the Hills*, a collection mainly of the stories contributed to his own journal. During the next two years he brought out, in six slim paper-covered volumes of Wheeler's Railway Library (Allahabad), *Soldiers Three, The Story of the Gadsbys, In Black and White, Under the Deodars, The Phantom 'Rickshaw* and *Wee Willie Winkee*, at a rupee apiece. These were in form and substance a continuation of the *Plain Tales.* This series of tales, all written before the author was twenty-four, revealed a new master of fiction. A few, but those the best, he afterwards said that his father gave him. The rest were the harvest of his own powers of observation vitalized by imagination. In method they owed something to Bret Harte; in matter and spirit they were absolutely original. They were unequal, as his books continued to be throughout; the sketches of Anglo-Indian social life being generally inferior to the rest. The style was to some extent disfigured by jerkiness and mannered tricks. But Mr Kipling possessed the supreme spell of the story-teller to entrance and transport. The freshness of the invention, the variety of character, the vigour of narrative, the raciness of dialogue, the magic of atmosphere, were alike remarkable. The soldier-stories, especially the exuberant vitality of the cycle which contains the immortal Mulvaney, established the author's fame throughout the world. The child-stories and tales of the British official were not less masterly, while the tales of native life and of adventure "beyond the pale" disclosed an even finer and deeper vein of romance. India, which had been an old story for generations of Englishmen, was revealed in these brilliant pictures as if seen for the first time in its variety, colour and passion, vivid as mirage, enchanting as the *Arabian Nights.* The new author's talent was quickly recognized in India, but it was not till the books reached England that his true rank was appreciated and proclaimed. Between 1887 and 1889 he travelled through India, China, Japan and America, finally arriving in England to find himself already famous. His travel sketches, contributed to *The Civil and Military Gazette* and *The Pioneer*, were afterwards collected (the author's hand having been forced by unauthorized publication) in the two volumes *From Sea to Sea* (1899). A further set of Indian tales, equal to the best, appeared in *Macmillan's Magazine* and were republished with others in *Life's Handicap* (1891). In *The Light that Failed* (1891, after appearing with a different ending in *Lippincott's Magazine*) Mr Kipling essayed his first long story (dramatized 1905), but with comparative unsuccess. In his subsequent work his delight in the display of descriptive and verbal technicalities grew on him. His polemic against "the sheltered life" and "little Englandism" became more didactic. His terseness sometimes degenerated into abruptness and obscurity. But in the meanwhile his genius became prominent in verse. Readers of the *Plain Tales* had been impressed by the snatches of poetry prefixed to them for motto, certain of them being subscribed "Barrack Room Ballad." Mr Kipling now contributed to the *National Observer*, then edited by W. E. Henley, a series of *Barrack Room Ballads.* These vigorous verses in soldier slang, when published in a book in 1892, together with the fine ballad of "East and West" and other poems, won for their author a second fame, wider than he had attained as a story-teller. In this volume the Ballads of the "Bolivar" and of the "Clampherdown," introducing Mr Kipling's poetry of the ocean and the engine-room, and "The Flag of England," finding a voice for the Imperial sentiment, which—largely under the influence of Mr Kipling's own writings—had been rapidly gaining force in England, gave the key-note of much of his later verse. In 1898 Mr Kipling paid the first of several visits to South Africa and became imbued with a type of imperialism that reacted on his literature, not altogether to its advantage. Before finally settling in England Mr Kipling lived some years in America and married in 1892 Miss Caroline Starr Balestier, sister of the Wolcott Balestier to whom he dedicated *Barrack Room Ballads*, and with whom in collaboration he wrote the *Naulahka* (1891), one of his less successful books. The next collection of stories, *Many Inventions* (1893), contained the splendid Mulvaney extravaganza, "My Lord the Elephant"; a vividly realized tale of metempsychosis, "The Finest Story in the World"; and in that fascinating tale "In the Rukh," the prelude to the next new exhibition of the author's genius. This came in 1894 with *The Jungle Book*, followed in 1895 by *The Second Jungle Book.* With these inspired beast-stories Kipling conquered a new world and a new audience, and produced what many critics regard as his most flawless work. His chief subsequent publications were *The Seven Seas* (poems), 1896; *Captains Courageous* (a yarn of deep-sea fishery), 1897; *The Day's Work* (collected stories), 1898; *A Fleet in Being* (an account of a cruise in a man-of-war), 1898; *Stalky and Co.* (mentioned above), 1899; *From Sea to Sea* (mentioned above), 1899; *Kim*, 1901; *Just So Stories* (for children), 1902; *The Five Nations* (poems, concluding with what proved Mr Kipling's most universally known and popular poem, "Recessional," originally published in *The Times* on the 17th of July 1897 on the occasion of Queen Victoria's second jubilee), 1903; *Traffics and Discoveries* (collected stories), 1904; *Puck of Pook's Hill* (stories), 1906; *Actions and Reactions* (stories), 1909. Of these *Kim* was notable as far the most successful of Mr Kipling's longer narratives, though it is itself rather in the nature of a string of episodes. But everything he wrote, even to a farcical extravaganza inspired by his enthusiasm for the motor-car, breathed the meteoric energy that was the nature of the man. A vigorous and unconventional poet, a pioneer in the modern phase of literary Imperialism, and one of the rare masters in English prose of the art of the short story, Mr Kipling had already by the opening of the 20th century won the most conspicuous place among the creative literary forces of his day. His position in English literature was recognized in 1907 by the award to him of the Nobel prize.

See Rudyard Kipling's chapter in *My First Book* (Chatto, 1894); "A Bibliography of Rudyard Kipling," by John Lane, in *Rudyard Kipling: a Criticism*, by Richard de Gallienne; "Mr Kipling's Short Stories" in *Questions at Issue*, by Edmund Gosse (1893); "Mr Kipling's Stories" in *Essays in Little*, by Andrew Lang; "Mr Kipling's Stories," by J. M. Barrie in the *Contemporary Review* (March 1891); articles in the *Quarterly Review* (July 1892) and *Edinburgh Review* (Jan. 1898); and section on Kipling in *Poets of the Younger Generation*, by William Archer (1902). See also for bibliography to 1903 *English Illustrated Magazine*, new series, vol. xxx. pp. 298 and 429–432. (W. P. J.)

KIPPER, properly the name by which the male salmon is known at some period of the breeding season. At the approach of this season the male fish develops a sharp cartilaginous beak, known as the "kip," from which the name "kipper" is said to be derived. The earliest uses of the word (in Old English *cypera* and Middle English *kypre*) seem to include salmon of both sexes, and there is no certainty as to the etymology. Skeat derives it from the Old English *kippian*, "to spawn." The term has been applied by various writers to salmon both during and after milting; early quotations leave the precise meaning of the word obscure, but generally refer to the unwholesomeness of the fish as food during the whole breeding season. It has been usually accepted, without much direct evidence, that from the practice of rendering the breeding (*i.e.* "kipper") salmon fit for food by splitting, salting and smoke-drying them, the term "kipper" is also used of other fish, particularly herrings cured in the same way. The "bloater" as distinct from the "kipper" is a herring cured whole without being split open.

KIPPIS, ANDREW (1725–1795), English nonconformist divine and biographer, son of Robert Kippis, a silk-hosier, was born at Nottingham on the 28th of March 1725. From school at Sleaford in Lincolnshire he passed at the age of sixteen to the nonconformist academy at Northampton, of which Dr Doddridge was then president. In 1746 Kippis became minister of a church at Boston; in 1750 he removed to Dorking in Surrey; and in 1753 he became pastor of a Presbyterian congregation at Westminster, where he remained till his death on the 8th of October 1795. Kippis took a prominent part in the affairs of his church. From 1763 till 1784 he was classical and philological tutor in Coward's training college at Hoxton; and subsequently for some years at another institution of the same kind at Hackney. In 1778 he was elected a fellow of the Antiquarian Society, and a fellow of the Royal Society in 1779.

Kippis was a very voluminous writer. He contributed largely to *The Gentleman's Magazine*, *The Monthly Review* and *The Library*; and he had a good deal to do with the establishment and conduct of *The New Annual Register.* He published also a number of sermons and occasional pamphlets; and he prefixed a life of the author to a collected edition of Dr Nathaniel Lardner's *Works* (1788). He wrote a life of Dr Doddridge, which is prefixed to Doddridge's *Exposition of the New Testament* (1792). His chief work is his edition of the *Biographia Britannica*, of which, however, he only lived to publish 5 vols. (folio, 1778–1793). In this work he had the assistance of Dr Towers. See notice by A. Rees, D.D., in *The New Annual Register* for 1795.

KIRBY, WILLIAM (1759–1850), English entomologist, was born at Witnesham in Suffolk on the 19th of September 1759. From the village school of Witnesham he passed to Ipswich grammar school, and thence to Caius College, Cambridge, where he graduated in 1781. Taking holy orders in 1782, he spent his entire life in the peaceful seclusion of an English country parsonage at Barham in Suffolk. His favourite study was natural history; and eventually entomology engrossed all his leisure. His first work of importance was his *Monographia Apum Angliae* (2 vols. 8vo, 1802), which as the first scientific treatise on its subject brought him into notice with the leading entomologists of his own and foreign countries. The practical result of a friendship formed in 1805 with William Spence, of Hull, was the jointly written *Introduction to Entomology* (4 vols., 1815–1826; 7th ed., 1856), one of the most popular books of science that have ever appeared. In 1830 he was chosen to write one of the *Bridgewater Treatises*, his subject being *The History, Habits, and Instincts of Animals* (2 vols., 1835). This undeniably fell short of his earlier works in point of scientific value. He died on the 4th of July 1850.

Besides the books already mentioned he was the author of many papers in the *Transactions of the Linnean Society*, the *Zoological Journal* and other periodicals; *Strictures on Sir James Smith's Hypothesis respecting the Lilies of the Field of our Saviour and the Acanthus of Virgil* (1819); *Seven Sermons on our Lord's Temptations* (1829); and he wrote the sections on insects in the *Account of the Animals seen by the late Northern Expedition while within the Arctic Circle* (1821), and in *Fauna Boreali-Americana* (1837). His *Life* by the Rev. John Freeman, published in 1852, contains a list of his works.

KIRCHER, ATHANASIUS (1601–1680), German scholar and mathematician, was born on the 2nd of May 1601, at Geisa near Fulda. He was educated at the Jesuit college of Fulda, and entered upon his noviciate in that order at Mainz in 1618. He became professor of philosophy, mathematics, and Oriental languages at Würzburg, whence he was driven (1631) by the troubles of the Thirty Years' War to Avignon. Through the influence of Cardinal Barberini he next (1635) settled in Rome, where for eight years he taught mathematics in the Collegio Romano, but ultimately resigned this appointment to study hieroglyphics and other archaeological subjects. He died on the 28th of November 1680.

Kircher was a man of wide and varied learning, but singularly devoid of judgment and critical discernment. His voluminous writings in philology, natural history, physics and mathematics often accordingly have a good deal of the historical interest which attaches to pioneering work, however imperfectly performed; otherwise they now take rank as curiosities of literature merely. They include *Ars Magnesia* (1631); *Magnes, sive de arte magnetica opus tripartitum* (1641); and *Magneticum naturae regnum* (1667); *Prodromus Coptus* (1636); *Lingua Aegyptiaca restituta* (1643); *Obeliscus Pamphilius* (1650); and *Oedipus Aegyptiacus, hoc est universalis doctrinae hieroglyphicae instauratio* (1652–1655)—works which may claim the merit of having first called attention to Egyptian hieroglyphics; *Ars magna lucis et umbrae in mundo* (1645–1646); *Musurgia universalis, sive ars magna consoni et dissoni* (1650); *Polygraphia, seu artificium linguarum quo cum omnibus mundi populis poterit quis respondere* (1663); *Mundus subterraneus, quo subterrestris mundi opificium, universae denique naturae divitiae, abditorum effectuum causae demonstrantur* (1665–1678); *China illustrata* (1667); *Ars magna sciendi* (1669); and *Latium* (1669), a work which may still be consulted with advantage. The *Specula Melitensis Encyclica* (1638) gives an account of a kind of calculating machine of his invention. The valuable collection of antiquities which he bequeathed to the Collegio Romano has been described by Buonanni (*Musaeum Kircherianum*, 1709; republished by Battara in 1773).

KIRCHHEIM-UNTER-TECK, a town of Germany, in the kingdom of Württemberg, is prettily situated on the Lauter, at the north-west foot of the Rauhe Alb, 15 m. S.E. of Stuttgart by rail. Pop. (1905), 8830. The town has a royal castle built in 1538, two schools and several benevolent institutions. The manufactures include cotton goods, damask, pianofortes, machinery, furniture, chemicals and cement. The town also has wool-spinning establishments and breweries, and a corn exchange. It is the most important wool market in South Germany, and has also a trade in fruit, timber and pigs. In the vicinity are the ruins of the castle of Teck, the hereditary stronghold of the dukes of that name. Kirchheim has belonged to Württemberg since 1381.

KIRCHHOFF, GUSTAV ROBERT (1824–1887), German physicist, was born at Königsberg (Prussia) on the 12th of March 1824, and was educated at the university of his native town, where he graduated Ph.D. in 1847. After acting as *privat-docent* at Berlin for some time, he became extraordinary professor of physics at Breslau in 1850. Four years later he was appointed professor of physics at Heidelberg, and in 1875 he was transferred to Berlin, where he died on the 17th of October 1887. Kirchhoff's contributions to mathematical physics were numerous and important, his strength lying in his powers of stating a new physical problem in terms of mathematics, not merely in working out the solution after it had been so formulated. A number of his papers were concerned with electrical questions. One of the earliest was devoted to electrical conduction in a thin plate, and especially in a circular one, and it also contained a theorem which enables the distribution of currents in a network of conductors to be ascertained. Another discussed conduction in curved sheets; a third the distribution of electricity in two influencing spheres; a fourth the determination of the constant on which depends the intensity of induced currents; while others were devoted to Ohm's law, the motion of electricity in submarine cables, induced magnetism, &c. In other papers, again, various miscellaneous topics were treated—the thermal conductivity of iron, crystalline reflection and refraction, certain propositions in the thermodynamics of solution and vaporization, &c. An important part of his work was contained in his *Vorlesungen über mathematische Physik* (1876), in which the principles of dynamics, as well as various special problems, were treated in a somewhat novel and original manner. But his name is best known for the researches, experimental and mathematical, in radiation which led him, in company with R. W. von Bunsen, to the development of spectrum analysis as a complete system in 1859–1860. He can scarcely be called its inventor, for not only had many investigators already used the prism as an instrument of chemical inquiry, but considerable progress had been made towards the explanation of the principles upon which spectrum analysis rests. But to him belongs the merit of having, most probably without knowing what had already been done, enunciated a complete account of its theory, and of thus having firmly established it as a means by which the chemical constituents of celestial bodies can be discovered through the comparison of their spectra with those of the various elements that exist on this earth.

KIRCHHOFF, JOHANN WILHELM ADOLF (1826–1908), German classical scholar and epigraphist, was born in Berlin on the 6th of January 1826. In 1865 he was appointed professor of classical philology in the university of his native city. He died on the 26th of February 1908. He is the author of *Die Homerische Odyssee* (1859), putting forward an entirely new theory as to the composition of the *Odyssey*; editions of Plotinus (1856), Euripides (1855 and 1877–1878). Aeschylus (1880), Hesiod (*Works and Days*, 1889), Xenophon, *On the Athenian Constitution* (3rd ed., 1889); *Über die Entstehungszeit des Herodotischen Geschichtswerkes* (2nd ed., 1878); *Thukydides und sein Urkundenmaterial* (1895).

The following works are the result of his epigraphical and palaeographical studies: *Die Umbrischen Sprachdenkmäler* (1851); *Das Stadtrecht von Bantia* (1853), on the tablet discovered in 1790 at Oppido near Banzi, containing a plebiscite relating to the municipal affairs of the ancient Bantia; *Das Gotische Runenalphabet* (1852); *Die Fränkischen Runen* (1855); *Studien zur Geschichte des Griechischen Alphabets* (4th ed., 1887). The second part of vol. iv. of the *Corpus Inscriptionum Graecarum* (1859, containing the Christian inscriptions) and vol. i. of the *C. I. Atticarum* (1873, containing the inscriptions before 403) with supplements thereto (vol. iv. pts. 1–3, 1877–1891) are edited by him.

KIRGHIZ, a large and widespread division of the Turkish family, of which there are two main branches, the Kara-Kirghiz of the uplands and the Kirghiz-Kazaks of the steppe. They jointly number about 3,000,000, and occupy an area of perhaps the same number of square miles, stretching from Kulja westwards to the lower Volga, and from the headstreams of the Ob southwards to the Pamir and the Turkoman country. They seem closely allied ethnically to the Mongolians and in speech to the Tatars. But both Mongols and Tatars belonged themselves originally to one racial stock and formed part of the same hordes or nomadic armies: also the Western Turks have to a large extent lost their original physique and become largely assimilated to the regular "Caucasian" type. But the Kirghiz have either remained nearly altogether unmixed, as in the uplands, or else have intermingled in the steppe mainly with the Volga Kalmucks in the west, and with the Dzungarian nomads in the east, all alike of Mongol stock. Hence they have everywhere to a large extent preserved the common Mongolian features, while retaining their primitive Tatar speech. Physically they are a middle-sized, square-built race, inclined to stoutness, especially in the steppe, mostly with long black hair, scant beard or none, small, black and oblique eyes, though blue or grey also occur in the south, broad Mongoloid features, high cheekbones, broad, flat nose, small mouth, brachycephalous head, very small hands and feet, dirty brown or swarthy complexion, often yellowish, but also occasionally fair. These characteristics, while affiliating them directly to the Mongol stock, also betray an admixture of foreign elements, probably due to Finnish influences in the north, and Tajik or Iranian blood in the south. Their speech also, while purely Turkic in structure, possesses, not only many Mongolian and a few Persian and even Arabic words, but also some terms unknown to the other branches of the Mongolo-Tatar linguistic family, and which should perhaps be traced to the Kiang-Kuan, Wu-sun, Ting-ling, and other peoples of South Siberia partly absorbed by them.

The Kara-Kirghiz.—The Kara or "Black" Kirghiz, so called from the colour of their tents, are known to the Russians either as Chernyie (Black) or Dikokammenyie (Wild Stone or Rocky) Kirghiz, and are the Block Kirghiz of some English writers. They are on the whole the purest and best representatives of the race, and properly speaking to them alone belongs the distinctive national name Kirghiz or Krghiz. This term is commonly traced to a legendary chief, Kirghiz, sprung of Oghuz-Khan, ninth in descent from Japheth. It occurs in its present form for the first time in the account of the embassy sent in 569 by the East Roman emperor Justin II. to the Uighur Khan, Dugla-Ditubulu, where it is stated that this prince presented a slave of the Kirghiz tribe to Zemark, head of the mission. In the Chinese chronicles the word assumes the form Ki-li-ki-tz', and the writers of the Yuan dynasty (1280–1367) place the territory of these people 10,000 li north-west of Pekin, about the head-streams of the Yenisei. In the records of the T'ang dynasty (618–907) they are spoken of under the name of Kha-kia-tz' (pronounced Khaka, and sometimes transliterated Haka), and it is mentioned that these Khakas were of the same speech as the Khoei-khu. From this it follows that they were of Mongolo-Tatar stock, and are wrongly identified by some ethnologists with the Kiang-Kuan, Wu-sun, or Ting-ling, all of whom are described as tall, with red hair, "green" or grey eyes, and fair complexion, and must therefore have been of Finnish stock, akin to the present Soyotes of the upper Yenisei.

The Kara-Kirghiz are by the Chinese and Mongolians called *Burut*, where *ut* is the Mongolian plural ending, as in Tangut, Yakut, modified to *yat* in Buryat, the collective name of the Siberian Mongolians of the Baikal district. Thus the term *Bur* is the common Mongolian designation both of the Baikal Mongols and of the Kara-Kirghiz, who occupied this very region and the upper Yenisei valley generally till comparatively recent times. For the original home of their ancestors, the Khakas, lay in the south of the present governments of Yeniseisk and Tomsk, stretching thence southwards beyond the Sayan range to the Tannuola hills in Chinese territory. Here the Russians first met them in the 17th century, and by the aid of the Kazaks exterminated all those east of the Irtish, driving the rest farther west and south-westwards. Most of them took refuge with their kinsmen, the Kara-Kirghiz nomad highlanders, whose homes, at least since the 13th century, have been the Ala-tau range, the Issyk-kul basin, the Tekes, Chu and Talass river valleys, the Tian-shan range, the uplands draining both to the Tarim and to the Jaxartes and Oxus, including Khokand, Karateghin and Shignan southwards to the Pamir table-land, visited by them in summer. They thus occupy most of the uplands along the Russo-Chinese frontier, between 35° and 50° N. lat. and between 70° and 85° E. long.

The Kara-Kirghiz are all grouped in two main sections—the On or "Right" in the east, with seven branches (Bogu, Sary-Bagishch, Son-Bagishch, Sultu or Solye, Cherik, Sayak, Bassinz), and the Sol or "Left" in the west, with four branches (Kokche or Kûchy, Soru, Mundus, Kitai or Kintai). The Sol section occupies the region between the Talass and Oxus headstreams in Ferghana (Khokand) and Bokhara, where they come in contact with the Galchas or Highland Tajiks. The On section lies on both sides of the Tian-shan, about Lake Issyk-kul, and in the Chu, Tekes and Narin (upper Jaxartes) valleys.

The total number of Kara-Kirghiz exceeds 800,000.

All are essentially nomads, occupied mainly with stock breeding, chiefly horses of a small but hardy breed, sheep of the fat-tailed species, oxen used both for riding and as pack animals, some goats, and camels of both species. Agriculture is limited chiefly to the cultivation of wheat, barley and millet, from the last of which a coarse vodka or brandy is distilled. Trade is carried on chiefly by barter, cattle being taken by the dealers from China, Turkestan and Russia in exchange for manufactured goods.

The Kara-Kirghiz are governed by the "manaps," or tribal rulers, who enjoy almost unlimited authority, and may even sell or kill their subjects. In religious matters they differ little from the Kazaks, whose practices are described below. Although generally recognizing Russian sovereignty since 1864, they pay no taxes.

The Kazaks.—Though not unknown to them, the term Kirghiz is never used by the steppe nomads, who always call themselves simply Kazaks, commonly interpreted as riders. The first authentic reference to this name is by the Persian poet and historian Firdousi (1020), who speaks of the Kazak tribes as much dreaded steppe marauders, all mounted and armed with lances. From this circumstance the term Kazak came to be gradually applied to all freebooters similarly equipped, and it thus spread from the Aralo-Caspian basin to South Russia, where it still survives under the form of Cossack, spelt Kazak or Kozak in Russian. Hence though Kazak and Cossack are originally the same word, the former now designates a Mongolo-Tatar nomad race, the latter various members of the Slav family. Since the 18th century the Russians have used the compound expression Kirghiz-Kazak, chiefly in order to distinguish them from their own Cossacks, at that time overrunning Siberia. Siegmund Herberstein (1486–1566) is the first European who mentions them by name, and it is noteworthy that he speaks of them as "Tartars," that is, a people rather of Turki than Mongolian stock.

In their present homes, the so-called "Kirghiz steppes," they are far more numerous and widespread than their Kara-Kirghiz kinsmen, stretching almost uninterruptedly from Lake Balkash round the Aral and Caspian Seas westwards to the lower Volga, and from the river Irtish southwards to the lower Oxus and Ust-Urt plateau. Their domain, which is nearly 2,000,000 sq. m. in extent, thus lies mainly between 45° and 55° N. lat. and from 45° to 80° E. long. Here they came under the sway of Jenghiz Khan, after whose death they fell to the share of his son Juji, head of the Golden Horde, but continued to retain their own khans. When the Uzbegs acquired the ascendancy, many of the former subjects of the Juji and Jagatai hordes fell off and joined the Kazaks. Thus about the year 1500 were formed two powerful states in the Kipchak and Kheta steppes, the Mogul-Ulus and the Kazak, the latter of whom, under their khan Arslane, are said by Sultan Baber to have had as many as 400,000 fighting men. Their numbers continued to be swollen by voluntary or enforced accessions from the fragments of the Golden Horde, such as the Kipchaks, Naimans, Konrats, Jalairs, Kankali, whose names are still preserved in the tribal divisions of the Kazaks. And as some of these peoples were undoubtedly of true Mongolian stock, their names have given a colour to the statement that all the Kazaks were rather of Mongol than of Turki origin. But the universal prevalence of a nearly pure variety of the Turki speech throughout the Kazak steppes is almost alone sufficient to show that the Tatar element must at all times have been in the ascendant. Very various accounts have been given of the relationship of the Kipchak to the Kirghiz, but at present they seem to form a subdivision of the Kirghiz-Kazaks. The Kara-Kalpaks are an allied but apparently separate tribe.

The Kirghiz-Kazaks have long been grouped in three large "hordes" or encampments, further subdivided into a number of so-called "races," which are again grouped in tribes, and these in sections, branches and auls, or communities of from five to fifteen tents. The division into hordes has been traditionally referred to a powerful khan, who divided his states amongst his three sons, the eldest of whom became the founder of the Ulu-Yuz, or Great Horde, the second of the Urta-Yuz, or Middle Horde, and the third of the Kachi-Yuz, or Little Horde. The last two under their common khan Abulkhair voluntarily submitted in 1730 to the Empress Anne. Most of the Great Horde were subdued by Yunus, khan of Ferghana, in 1798, and all the still independent tribes finally accepted Russian sovereignty in 1819.

Since 1801 a fourth division, known as the Inner or Bukeyevskaya Horde, from the name of their first khan, Bukei, has been settled in the Orenburg steppe.

But these divisions affect the common people alone, all the higher orders and ruling families being broadly classed as White and Black Kost or Bones. The White Bones comprise only the khans and their descendants, besides the issue of the khojas or Moslem "saints." The Black Bones include all the rest, except the *Telengut* or servants of the khans, and the *Kûl* or slaves.

The Kazaks are an honest and trustworthy people, but heavy, sluggish, sullen and unfriendly. Even the hospitality enjoined by the Koran is displayed only towards the orthodox Sunnite sect. So essentially nomadic are all the tribes that they cannot adopt a settled life without losing the very sentiment of their nationality, and becoming rapidly absorbed in the Slav population. They dwell exclusively in semicircular tents consisting of a light wooden framework, and red cloth or felt covering, with an opening above for light and ventilation.

The camp life of the Kazaks seems almost unendurable to Europeans in winter, when they are confined altogether to the tent, and exposed to endless discomforts. In summer the day is spent mostly in sleep or drinking koumiss, followed at night by feasting and the recital of tales, varied with songs accompanied by the music of the flute and balalaika. But horsemanship is the great amusement of all true Kazaks, who may almost be said to be born in the saddle. Hence, though excellent riders, they are bad walkers. Though hardy and long-lived, they are uncleanly in their habits and often decimated by small-pox and Siberian plague. They have no fixed meals, and live mainly on mutton and goat and horse flesh, and instead of bread use the so-called balamyk, a mess of flour fried in dripping and diluted in water. The universal drink is koumiss, which is wholesome, nourishing and a specific against all chest diseases.

The dress consists of the chapân, a flowing robe of which one or two are worn in summer and several in winter, fastened with a silk or leather girdle, in which are stuck a knife, tobacco pouch, seal and a few other trinkets. Broad silk or cloth pantaloons are often worn over the chapân, which is of velvet, silk, cotton or felt, according to the rank of the wearer. Large black or red leather boots, with round white felt pointed caps, complete the costume, which is much the same for both sexes.

Like the Kara-Kirghiz, the Kazaks are nominally Sunnites, but Shamanists at heart, worshipping, besides the Kudai or good divinity, the Shaitan or bad spirit. Their faith is strong in the *talchi* or soothsayer and other charlatans, who know everything, can do everything, and heal all disorders at pleasure. But they are not fanatics, though holding the abstract doctrine that the "Kafir" may be lawfully oppressed, including in this category not only Buddhists and Christians, but even Mahommedans of the Shiah sect. There are no fasts or ablutions, mosques or mollahs, or regular prayers. Although Mussulmans since the beginning of the 16th century, they have scarcely yet found their way to Mecca, their pilgrims visiting instead the more convenient shrines of the "saints" scattered over eastern Turkestan. Unlike the Mongolians, the Kazaks treat their dead with great respect, and the low steppe hills are often entirely covered with monuments raised above their graves.

Letters are neglected to such an extent that whoever can merely write is regarded as a savant, while he becomes a prodigy of learning if able to read the Koran in the original. Yet the Kazaks are naturally both musical and poetical, and possess a considerable number of national songs, which are usually repeated with variations from mouth to mouth.

The Kazaks still choose their own khans, who, though confirmed by the Russian government, possess little authority beyond their respective tribes. The real rulers are the elders or umpires and sultans, all appointed by public election. Brigandage and raids arising out of tribal feuds, which were formerly recognized institutions, are now severely punished, sometimes even with death. Capital punishment, usually by hanging or strangling, is inflicted for murder and adultery, while three, nine or twenty-seven times the value of the stolen property is exacted for theft.

The domestic animals, daily pursuits and industries of the Kazaks differ but slightly from those of the Kara-Kirghiz. Some of the wealthy steppe nomads own as many as 20,000 of the large fat-tailed sheep. Goats are kept chiefly as guides for these flocks; and the horses, though small, are hardy, swift, light-footed and capable of covering from 50 to 60 miles at a stretch. Amongst the Kazaks there are a few workers in silver, copper and iron, the chief arts besides, being skin dressing, wool spinning and dyeing, carpet and felt weaving. Trade is confined mainly to an exchange of live stock for woven and other goods from Russia, China and Turkestan.

Since their subjection to Russia the Kazaks have become less lawless, but scarcely less nomadic. A change of habit in this respect is opposed alike to their tastes and to the climatic and other outward conditions. See also TURKS.

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KIRIN, a province of central Manchuria, with a capital bearing the same name. The province has an area of 90,000 sq. m., and a population of 6,500,000. The chief towns besides the capital are Kwang-chêng-tsze, 80 m. N.W. of the capital, and Harbin on the Sungari river. The city of KIRIN is situated at the foot of the Lau-Ye-Ling mountains, on the left bank of the Sungari or Girin-ula, there 300 yds. wide, and is served by a branch of the Manchurian railway. The situation is one of exceptional beauty; but the streets are narrow, irregular and indescribably filthy. The western part of the town is built upon a swamp and is under water a great part of the year. The dockyards are supplied with machinery from Europe and are efficient. Tobacco is the principal article of trade, the kind grown in the province being greatly prized throughout the Chinese empire under the name of "Manchu leaf." Formerly ginseng was also an important staple, but the supply from this quarter of the country has been exhausted. Outside the town lies a plain "thickly covered with open coffins containing the dead bodies of Chinese emigrants exposed for identification and removal by their friends; if no claim is made during ten years the remains are buried on the spot." Kirin was chosen by the emperor Kʻanghi as a military post during the wars with the Eleuths; and it owes its Chinese name of Chʻuen-chʻang, *i.e.* Naval Yard, to his building there the vessels for the transport of his troops. The population was estimated at 300,000 in 1812; in 1909 it was about 120,000.

KIRK, SIR JOHN (1832–   ), British naturalist and administrator, son of the Rev. John Kirk, was born at Barry, near Arbroath, on the 19th of December 1832. He was educated at Edinburgh for the medical profession, and after serving on the civil medical staff throughout the Crimean War, was appointed in February 1858 physician and naturalist to David Livingstone's second expedition to Central Africa. He was by Livingstone's side in most of his journeyings during the next five years, and was one of the first four white men to behold Lake Nyassa (Sept. 16, 1859). He was finally invalided home on the 9th of May 1863. The reputation he gained during this expedition led to his appointment in January 1866 as acting surgeon to the political agency at Zanzibar. In 1868 he became assistant political agent, being raised to the rank of consul-general in 1873 and agent in 1880. He retired from that post in 1887. The twenty-one years spent by Kirk in Zanzibar covered the most critical period of the history of European intervention in East Africa; and during the greater part of that time he was the virtual ruler of the country. With Seyyid Bargash, who became sultan in 1870, he had a controlling influence, and after the failure of Sir Bartle Frere's efforts he succeeded in obtaining (June 5, 1873) the sultan's signature to a treaty abolishing the slave trade in his dominions. In 1877 Bargash offered to a British merchant—Sir W. Mackinnon—a lease of his mainland territories, and he gave Kirk a declaration in which he bound himself not to cede territory to any other power than Great Britain, a declaration ignored by the British government. When Germany in 1885 claimed districts considered by the sultan to belong to Zanzibar, Kirk intervened to prevent Bargash going in person to Berlin to protest and induced him to submit to the dismemberment of his dominions. In the delicate negotiations which followed

Kirk used his powers to checkmate the German designs to supplant the British in Zanzibar itself; this he did without destroying the Arab form of government. He also directed the efforts, this time successful, to obtain for Britain a portion of the mainland—Bargash in May 1887 granting to Mackinnon a lease of territory which led to the foundation of British East Africa. Having thus served both Great Britain and Zanzibar, Kirk resigned his post (July 1887), retiring from the consular service. In 1889–1890 he was a plenipotentiary at the slave trade conference in Brussels, and was one of the delegates who fixed the tariff duties to be imposed in the Congo basin. In 1895 he was sent by the British government on a mission to the Niger; and on his return he was appointed a member of the Foreign Office committee for constructing the Uganda railway. As a naturalist Kirk took high rank, and many species of the flora and fauna of Central Africa were made known by him, and several bear his name, *e.g.* the *Otogale kirkii* (a lemuroid), the *Madoqua kirkii* (a diminutive antelope), the *Landolphia kirkii* and the *Clematis kirkii.* For his services to geography he received in 1882 the patrons' medal of the Royal Geographical Society, of which society he became foreign secretary. Kirk was created K.C.B. in 1900. He married, in 1867, Miss Helen Cooke.

KIRKBY, JOHN (d. 1290), English ecclesiastic and statesman, entered the public service as a clerk of the chancery during the reign of Henry III. Under Edward I. he acted as keeper of the great seal during the frequent absences of the chancellor, Robert Burnell, being referred to as vice-chancellor. In 1282 he was employed by the king to make a tour through the counties and boroughs for the purpose of collecting money; this and his other services to Edward were well rewarded, and although not yet ordained priest he held several valuable benefices in the church. In 1283 he was chosen bishop of Rochester, but owing to the opposition of the archbishop of Canterbury, John Peckham, he did not press his claim to this see. In 1286, however, two years after he had become treasurer, he was elected bishop of Ely, and he was ordained priest and then consecrated by Peckham. He died at Ely on the 26th of March 1290. Kirkby was a benefactor to his see, to which he left some property in London, including the locality now known as Ely Place, where for many years stood the London residence of the bishop of Ely.

Kirkby's Quest is the name given to a survey of various English counties which was made under the bishop's direction probably in 1284 and 1285. For this see *Inquisitions and Assessments relating to Feudal Aids, 1284–1431*, vol. i. (London, 1899).

KIRKCALDY (locally pronounced *Kerkawdi*), a royal, municipal and police burgh and seaport of Fifeshire, Scotland. Pop. (1901), 34,079. It lies on the Firth of Forth, 26 m. N. of Edinburgh by the North British railway, via the Forth Bridge. Although Columba is said to have planted a church here, the authoritative history of the town does not begin for several centuries after the era of the saint. In 1240 the church was bestowed by David, bishop of St Andrews, on Dunfermline Abbey, and in 1334 the town with its harbour was granted by David II. to the same abbey, by which it was conveyed to the bailies and council in 1450, when Kirkcaldy was created a royal burgh. In the course of another century it had become an important commercial centre, the salt trade of the district being then the largest in Scotland. In 1644, when Charles I. raised it to a free port, it owned a hundred vessels, and six years later it was assessed as the sixth town in the kingdom. After the Union its shipping fell off, Jacobite troubles and the American War of Independence accelerating the decline. But its linen manufactures, begun early in the 18th century, gradually restored prosperity; and when other industries had taken root its fortunes advanced by leaps and bounds, and there is now no more flourishing community in Scotland. The chief topographical feature of the burgh is its length, from which it is called the "lang toun." Formerly it consisted of little besides High Street, with closes and wynds branching off from it; but now that it has absorbed Invertiel, Linktown and Abbotshall on the west, and Pathhead, Sinclairtown and Gallatown on the east, it has reached a length of nearly 4 m. Its public buildings include the parish church, in the Gothic style, St Brycedale United Free church, with a spire 200 ft. high, a town-hall, corn exchange, public libraries, assembly rooms, fever hospital, sheriff court buildings, people's club and institute, high school (1894)—on the site of the ancient burgh school (1582)—the Beveridge hall and free library, and the Adam Smith memorial hall. To the west lies Beveridge Park of 110 acres, including a large sheet of water, which was presented to the town in 1892. The harbour has an inner and outer division, with wet dock and wharves. Plans for its extension were approved in 1903. They include the extension of the east pier, the construction of a south pier 800 ft. in length, and of a tidal harbour 5 acres in area and a dock of 4 acres. Besides the manufacture of sheeting, towelling, ticks, dowlas and sail-cloth, the principal industries include flax-spinning, net-making, bleaching, dyeing, tanning, brewing, brass and iron founding, and there are potteries, flour-mills, engineering works, fisheries, and factories for the making of oil-cloth and linoleum. In 1847 Michael Nairn conceived the notion of utilizing the fibre of cork and oil-paint in such a way as to produce a floor-covering more lasting than carpet and yet capable of taking a pattern. The result of his experiments was oil-cloth, in the manufacture of which Kirkcaldy has kept the predominance to which Nairn's enterprise entitled it. Indeed, this and the kindred linoleum business (also due to Nairn, who in 1877 built the first linoleum factory in Scotland) were for many years the monopoly of Kirkcaldy. There is a large direct export trade with the United States. Among well-known natives of the town were Adam Smith, Henry Balnaves of Halhill, the Scottish reformer and lord of session in the time of Queen Mary; George Gillespie, the theologian and a leading member of the Westminster Assembly, and his younger brother Patrick (1617–1675), a friend of Cromwell and principal of Glasgow University; John Ritchie (1778–1870), one of the founders of the *Scotsman*; General Sir John Oswald (1771–1840), who had a command at San Sebastian and Vittoria. Sir Michael Scott of Balwearie castle, about 1½ m. W. of the town, was sent with Sir David Wemyss to bring the Maid of Norway to Scotland in 1290; Sir Walter Scott was therefore in error in adopting the tradition that identified him with the wizard of the same name, who died in 1234. Carlyle and Edward Irving were teachers in the town, where Irving spent seven years, and where he made the acquaintance of the lady he afterwards married. Kirkcaldy combines with Dysart, Kinghorn and Burntisland to return one member to parliament.

KIRKCALDY OF GRANGE, SIR WILLIAM (*c.* 1520–1573), Scottish politician, was the eldest son of Sir James Kirkcaldy of Grange (d. 1556), a member of an old Fifeshire family. Sir James was lord high treasurer of Scotland from 1537 to 1543 and was a determined opponent of Cardinal Beaton, for whose murder in 1546 he was partly responsible. William Kirkcaldy assisted to compass this murder, and when the castle of St Andrews surrendered to the French in July 1547 he was sent as a prisoner to Normandy, whence he escaped in 1550. He was then employed in France as a secret agent by the advisers of Edward VI., being known in the cyphers as *Corax*; and later he served in the French army, where he gained a lasting reputation for skill and bravery. The sentence passed on Kirkcaldy for his share in Beaton's murder was removed in 1556, and returning to Scotland in 1557 he came quickly to the front; as a Protestant he was one of the leaders of the lords of the congregation in their struggle with the regent, Mary of Lorraine, and he assisted to harass the French troops in Fife. He opposed Queen Mary's marriage with Darnley, being associated at this time with Murray, and was forced for a short time to seek refuge in England. Returning to Scotland, he was accessory to the murder of Rizzio, but he had no share in that of Darnley; and he was one of the lords who banded themselves together to rescue Mary after her marriage with Bothwell. After the fight at Carberry Hill the queen surrendered herself to Kirkcaldy, and his generalship was mainly responsible for her defeat at Langside.

He seems, however, to have believed that an arrangement with Mary was possible, and coming under the influence of Maitland of Lethington, whom in September 1569 he released by a stratagem from his confinement in Edinburgh, he was soon "vehemently suspected of his fellows." After the murder of Murray Kirkcaldy ranged himself definitely among the friends of the imprisoned queen. About this time he forcibly released one of his supporters from imprisonment, a step which led to an altercation with his former friend John Knox, who called him a "murderer and throat-cutter." Defying the regent Lennox, Kirkcaldy began to strengthen the fortifications of Edinburgh castle, of which he was governor, and which he held for Mary, and early in 1573 he refused to come to an agreement with the regent Morton because the terms of peace did not include a section of his friends. After this some English troops arrived to help the Scots, and in May 1573 the castle surrendered. Strenuous efforts were made to save Kirkcaldy from the vengeance of his foes, but they were unavailing; Knox had prophesied that he would be hanged, and he was hanged on the 3rd of August 1573.

See Sir James Melville's *Memoirs*, edited by T. Thomson (Edinburgh, 1827); J. Grant, *Memoirs and Adventures of Sir W. Kirkaldy* (Edinburgh, 1849); L. A. Barbé, *Kirkcaldy of Grange* (1897); and A. Lang, *History of Scotland*, vol. ii. (1902).

KIRKCUDBRIGHT (pron. *Ker-kû-bri*), a royal and police burgh, and county town of Kirkcudbrightshire, Scotland. Pop. (1901), 2386. It is situated at the mouth of the Dee, 6 m. from the sea and 30 m. S.W. of Dumfries by the Glasgow & South-Western railway, being the terminus of a branch line. The old form of the name of the town was Kilcudbrit, from the Gaelic *Cil Cudbert*, "the chapel of Cuthbert," the saint's body having lain here for a short time during the seven years that lapsed between its exhumation at Lindisfarne and the re-interment at Chester-le-Street. The estuary of the Dee is divided at its head by the peninsula of St Mary's Isle, but though the harbour is the best in south-western Scotland, the great distance to which the tide retreats impairs its usefulness. Among the public buildings are the academy, Johnstone public school, the county buildings, town-hall, museum, Mackenzie hall and market cross, the last-named standing in front of the old court-house, which is now used as a drill hall and fire-station. No traces remain of the Greyfriars' or Franciscan convent founded by Alexander II., nor of the nunnery that was erected in the parish of Kirkcudbright. The ivy-clad ruins of Bomby castle, founded in 1582 by Sir Thomas Maclellan, ancestor of the barons of Kirkcudbright, stand at the end of the chief street. The town, which witnessed much of the international strife and Border lawlessness, was taken by Edward I. in 1300. It received its royal charter in 1455. After the battle of Towton, Henry VI. crossed the Solway (August 1461) and landed at Kirkcudbright to join Queen Margaret at Linlithgow. It successfully withstood the English siege in 1547 under Sir Thomas Carleton, but after the country had been overrun was compelled to surrender at discretion. Lord Maxwell, earl of Morton, as a Roman Catholic, mustered his tenants here to act in concert with the Armada; but on the approach of King James VI. to Dumfries he took ship at Kirkcudbright and was speedily captured. The burgh is one of the Dumfries district group of parliamentary burghs. On St Mary's Isle was situated the seat of the earl of Selkirk, at whose house Robert Burns gave the famous Selkirk grace:—

> "Some ha'e meat, and canna eat,
> And some wad eat that want it;
> But we ha'e meat, and we can eat,
> And sae the Lord be thankit."

Fergus, lord of Galloway, a celebrated church-builder of the 12th century, had his principal seat on Palace Isle in a lake called after him Loch Fergus, near St Mary's Isle, where he erected the priory de Trayle, in token of his penitence for rebellion against David I. The priory was afterwards united as a dependent cell to the abbey of Holyrood. DUNDRENNAN ABBEY, 4½ m. S.E., was, however, his greatest achievement. It was a Cistercian house, colonized from Rievaulx, and was built in 1140. There now remain only the transept and choir, a unique example of the Early Pointed style. TONGUELAND (or Tungland), 2½ m. N. by E., has interesting historical associations. It was the site of a Præmonstratensian abbey built by Fergus, and it was here that Queen Mary rested in her flight from the field of Langside (May 13, 1568). The well near Tongueland bridge from which she drank still bears the name of the Queen's Well.

KIRKCUDBRIGHTSHIRE (also known as the STEWARTRY OF KIRKCUDBRIGHT and EAST GALLOWAY), a south-western county of Scotland, bounded N. and N.W. by Ayrshire, W. and S.W. by Wigtownshire, S. and S.E. by the Irish Sea and Solway Firth, and E. and N.E. by Dumfriesshire. It includes the small islands of Hestan and Little Ross, which are utilized as lighthouse stations. It has an area of 575,565 acres or 899 sq. m. The north-western part of the shire is rugged, wild and desolate. In this quarter the principal mountains are Merrick (2764 ft.), the highest in the south of Scotland, and the group of the Rinns of Kells, the chief peaks of which are Corscrine (2668), Carlins Cairn (2650), Meikle Millyea (2446) and Millfire (2350). Towards the south-west the chief eminences are Lamachan (2349), Larg (2216), and the bold mass of Cairnsmore of Fleet (2331). In the south-east the only imposing height is Criffel (1866). In the north rises the majestic hill of Cairnsmuir of Carsphairn (2612), and close to the Ayrshire border is the Windy Standard (2287). The southern section of the shire is mostly level or undulating, but characterized by much picturesque scenery. The shore is generally bold and rocky, indented by numerous estuaries forming natural harbours, which however are of little use for commerce owing to the shallowness of the sea. Large stretches of sand are exposed in the Solway at low water and the rapid flow of the tide has often occasioned loss of life. The number of "burns" and "waters" is remarkable, but their length seldom exceeds 7 or 8 m. Among the longer rivers are the Cree, which rises in Loch Moan and reaches the sea near Creetown after a course of about 30 m., during which it forms the boundary, at first of Ayrshire and then of Wigtownshire; the Dee or Black Water of Dee (so named from the peat by which it is coloured), which rises in Loch Dee and after a course mainly S.E. and finally S., enters the sea at St Mary's Isle below Kirkcudbright, its length being nearly 36 m.; the Urr, rising in Loch Urr on the Dumfriesshire border, falls into the sea a few miles south of Dalbeattie 27 m. from its source; the Ken, rising on the confines of Ayrshire, flows mainly in a southerly direction and joins the Dee at the southern end of Loch Ken after a course of 24 m. through lovely scenery; and the Deugh which, rising on the northern flank of the Windy Standard, pursues an extraordinarily winding course of 20 m. before reaching the Ken. The Nith, during the last few miles of its flow, forms the boundary with Dumfriesshire, to which county it almost wholly belongs. The lochs and mountain tarns are many and well distributed; but except Loch Ken, which is about 6 m. long by ½ m. wide, few of them attain noteworthy dimensions. There are several passes in the hill regions, but the only well-known glen is Glen Trool, not far from the district of Carrick in Ayrshire, the fame of which rests partly on the romantic character of its scenery, which is very wild around Loch Trool, and more especially on its associations with Robert Bruce. It was here that when most closely beset by his enemies, who had tracked him to his fastness by sleuth hounds, Bruce with the aid of a few faithful followers won a surprise victory over the English in 1307 which proved the turning-point of his fortunes.

Geology.—Silurian and Ordovician rocks are the most important in this county; they are thrown into oft-repeated folds with their axes lying in a N.E.-S.W. direction. The Ordovician rocks are graptolitic black shales and grits of Llandeilo and Caradoc age. They occupy all the northern part of the county north-west of a line which runs some 3 m. N. of New Galloway and just S. of the Rinns of Kells. South-east of this line graptolitic Silurian shales of Llandovery age prevail; they are found around Dalry, Creetown, New Galloway, Castle Douglas and Kirkcudbright. Overlying the Llandovery beds on the south coast are strips of Wenlock rocks; they extend from Bridgehouse Bay to Auchinleck and are well exposed in Kirkcudbright Bay, and they can be traced farther round the coast between the granite and the younger rocks. Carboniferous rocks appear in small faulted tracts, unconformable on the Silurian, on the shores of the Solway Firth. They are best developed about Kirkbean, where they include a basal red breccia followed by conglomerates, grits and cement stones of Calciferous Sandstone age. Brick-red sandstones of Permian age just come within the county on the W. side of the Nith at Dumfries. Volcanic necks occur in the Permian and basalt dikes penetrate the Silurian at Borgue, Kirkandrews, &c. Most of the highest ground is formed by the masses of granite which have been intruded into the Ordovician and Silurian rocks; the Criffel mass lies about Dalbeattie and Bengairn, another mass extends east and west between the Cairnsmore of Fleet and Loch Ken, another lies N.W. and S.E. between Loch Doon and Loch Dee and a small mass forms the Cairnsmore of Carsphairn. Glacial deposits occupy much of the low ground; the ice, having travelled in a southerly or south-easterly direction, has left abundant striae on the higher ground to indicate its course. Radiation of the ice streams took place from the heights of Merrick, Kells, &c.; local moraines are found near Carsphairn and in the Deagh and Minnoch valleys. Glacial drumlins of boulder clay lie in the vales of the Dee, Cree and Urr.

Climate and Agriculture.—The climate and soil are better fitted for grass and green crops than for grain. .The annual rainfall averages 45·7 in. The mean temperature for the year is 48° F.; for January 38·5°; for July 59°. The major part of the land is either waste or poor pasture. More than half the holdings consist of 50 acres and over. Oats is the predominant grain crop, the acreage under barley being small and that under wheat insignificant. Turnips are successfully cultivated, and potatoes are the only other green crop raised on a moderately large scale. Sheep-rearing has been pursued with great enterprise. The average is considerably in excess of that for Scotland. Black-faced and Cheviots are the most common on the high ground, and a cross of Leicester with either is also in favour. Cattle-breeding is followed with steady success; the black polled Galloway is the general breed, but Aryshires have been introduced for dairying, cheese-making occupying much of the farmers' attention. Horses are extensively raised, a breed of small-sized hardy and spirited animals being specifically known as Galloways. Most of the horses are used in agricultural work, but a large number are also kept for stock; Clydesdales are bred to some extent. Pig-rearing is an important pursuit, pork being supplied to the English markets in considerable quantities. During the last quarter of the 19th century the number of pigs increased 50%. Bee-keeping has been followed with special care and the honey of the shire is consequently in good repute. The proportion of woodland in the county is small.

Industries.—The shire ranks next to Aberdeen as a granite-yielding county and the quarries occupy a large number of hands. In some towns and villages there are manufactures of linen, woollen and cotton goods; at various places distilling, brewing, tanning and paper-making are carried on, and at Dalbeattie there are brick and tile works. There is a little ship-building at Kirkcudbright. The Solway fishery is of small account, but salmon fishing is prosecuted at the mouth of certain rivers, the Dee fish being notable for their excellence.

The only railway communication is by the Glasgow & South-Western railway running from Dumfries to Castle Douglas, from which there is a branch to Kirkcudbright, and the Portpatrick and Wigtownshire railway, beginning at Castle Douglas and leaving the county at Newton Stewart. These are supplemented by coaches between various points, as from New Galloway to Carsphairn, from Dumfries to New Abbey and Dalbeattie, and from Auchencairn to Dalbeattie.

Population and Government.—The population was 39,985 in 1891 and 39,383 in 1901, when 98 persons spoke Gaelic and English. The chief towns are Castle Douglas (pop. in 1901, 3018), Dalbeattie (3469), Kirkcudbright (2386), Maxwelltown (5796) with Creetown (991), and Gatehouse of Fleet (1013). The shire returns one member to parliament, and the county town (Kirkcudbright) belongs to the Dumfries district group of parliamentary burghs, and Maxwelltown is combined with Dumfries. The county forms part of the sheriffdom of Dumfries and Galloway, and there is a resident sheriff-substitute at Kirkcudbright. The county is under school-board jurisdiction. There is an academy at Kirkcudbright, high schools at Dumfries and Newton Stewart, and technical classes at Kirkcudbright, Dalbeattie, Castle Douglas and Dumfries.

History.—The country west of the Nith was originally peopled by a tribe of Celtic Gaels called Novantae, or Atecott Picts, who, owing to their geographical position, which prevented any ready intermingling with the other Pictish tribes farther north, long retained their independence. After Agricola's invasion in A.D. 79 the country nominally formed part of the Roman province, but the evidence is against there ever having been a prolonged effective Roman occupation. After the retreat of the Romans the Novantae remained for a time under their own chiefs, but in the 7th century accepted the overlordship of Northumbria. The Saxons, soon engaged in struggles with the Norsemen, had no leisure to look after their tributaries, and early in the 9th century the Atecotts made common cause with the Vikings. Henceforward they were styled, probably in contempt, *Gall-gaidhel*, or stranger Gaels (*i.e.* Gaels who fraternized with the foreigners), the Welsh equivalent for which, *Gallwyddel*, gave rise to the name of *Galloway* (of which Galway is a variant), which was applied to their territory and still denotes the Stewartry of Kirkcudbright and the shire of Wigtown. When Scotland was consolidated under Kenneth MacAlpine (crowned at Scone in 844), Galloway was the only district in the south that did not form part of the kingdom; but in return for the services rendered to him at this crisis Kenneth gave his daughter in marriage to the Galloway chief, Olaf the White, and also conferred upon the men of Galloway the privilege of marching in the van of the Scottish armies, a right exercised and recognized for several centuries. During the next two hundred years the country had no rest from Danish and Saxon incursions and the continual lawlessness of the Scandinavian rovers. When Malcolm Canmore defeated and slew Macbeth in 1057 he married the dead king's widow Ingibiorg, a Pictish princess, an event which marked the beginning of the decay of Norse influence. The Galloway chiefs hesitated for a time whether to throw in their lot with the Northumbrians or with Malcolm; but language, race and the situation of their country at length induced them to become lieges of the Scottish king. By the close of the 11th century the boundary between England and Scotland was roughly delimited on existing lines. The feudal system ultimately destroyed the power of the Galloway chiefs, who resisted the innovation to the last. Several of the lords or "kings" of Galloway, a line said to have been founded by Fergus, the greatest of them all, asserted in vain their independence of the Scottish crown; and in 1234 the line became extinct in the male branch on the death of Fergus's great-grandson Alan. One of Alan's daughters, Dervorguila, had married John de Baliol (father of the John de Baliol who was king of Scotland from 1292 until his abdication in 1296), and the people, out of affection for Alan's daughter, were lukewarm in support of Robert Bruce. In 1308 the district was cleared of the English and brought under allegiance to the king, when the lordship of Galloway was given to Edward Bruce. Later in the 14th century Galloway espoused the cause of Edward Baliol, who surrendered several counties, including Kirkcudbright, to Edward III. In 1372 Archibald the Grim, a natural son of Sir James Douglas "the Good," became Lord of Galloway and received in perpetual fee the Crown lands between the Nith and Cree. He appointed a steward to collect his revenues and administer justice, and there thus arose the designation of the *Stewartry* of Kirkcudbright. The high-handed rule of the Douglases created general discontent, and when their treason became apparent their territory was overrun by the king's men in 1455; Douglas was attainted, and his honours and estates were forfeited. In that year the great stronghold of the Thrieve, the most important fortress in Galloway, which Archibald the Grim had built on the Dee immediately to the west of the modern town of Castle Douglas, was reduced and converted into a royal keep. (It was dismantled in 1640 by order of the Estates in consequence of the hostility of its keeper, Lord Nithsdale, to the Covenant.) The famous cannon Mons Meg, now in Edinburgh Castle, is said, apparently on insufficient evidence, to have been constructed in order to aid James III. in this siege. As the Douglases went down the Maxwells rose, and the debateable land on the south-east of

Dumfriesshire was for generations the scene of strife and raid, not only between the two nations but also among the leading families, of whom the Maxwells, Johnstones and Armstrongs were always conspicuous. After the battle of Solway Moss (1542) the shires of Kirkcudbright and Dumfries fell under English rule for a short period. The treaty of Norham (March 24, 1550) established a truce between the nations for ten years; and in 1552, the Wardens of the Marches consenting, the debateable land ceased to be matter for debate, the parish of Canonbie being annexed to Dumfriesshire, that of Kirkandrews to Cumberland. Though at the Reformation the Stewartry became fervent in its Protestantism, it was to Galloway, through the influence of the great landowners and the attachment of the people to them, that Mary owed her warmest adherents, and it was from the coast of Kirkcudbright that she made her luckless voyage to England. Even when the crowns were united in 1603 turbulence continued; for trouble arose over the attempt to establish episcopacy, and nowhere were the Covenanters more cruelly persecuted than in Galloway. After the union things mended slowly but surely, curious evidence of growing commercial prosperity being the enormous extent to which smuggling was carried on. No coast could serve the "free traders" better than the shores of Kirkcudbright, and the contraband trade flourished till the 19th century. The Jacobite risings of 1715 and 1745 elicited small sympathy from the inhabitants of the shire.

See Sir Herbert Maxwell, *History of Dumfries and Galloway* (Edinburgh, 1896); Rev. Andrew Symson, *A Large Description of Galloway* (1684; new ed., 1823); Thomas Murray, *The Literary History of Galloway* (1822); Rev. William Mackenzie, *History of Galloway* (1841); P. H. McKerlie, *History of the Lands and their Owners in Galloway* (Edinburgh, 1870–1879); *Galloway Ancient and Modern* (Edinburgh, 1891); J. A. H. Murray, *Dialect of the Southern Counties of Scotland* (London, 1873).

KIRKE, PERCY (*c.* 1646–1691), English soldier, was the son of George Kirke, a court official to Charles I. and Charles II. In 1666 he obtained his first commission in the Lord Admiral's regiment, and subsequently served in the Blues. He was with Monmouth at Maestricht (1673), and was present during two campaigns with Turenne on the Rhine. In 1680 he became lieutenant-colonel, and soon afterwards colonel of one of the Tangier regiments (afterwards the King's Own Royal Lancaster Regt.) In 1682 Kirke became governor of Tangier, and colonel of the old Tangier regiment (afterwards the Queen's Royal West Surrey). He distinguished himself very greatly as governor, though he gave offence by the roughness of his manners and the wildness of his life. On the evacuation of Tangier "Kirke's Lambs" (so called from their badge) returned to England, and a year later their colonel served as a brigadier in Faversham's army. After Sedgemoor the rebels were treated with great severity; but the charges so often brought against the "Lambs" are now known to be exaggerated, though the regiment shared to the full in the ruthless hunting down of the fugitives. It is often stated that it formed Jeffreys's escort in the "Bloody Assize," but this is erroneous. Brigadier Kirke took a notable part in the Revolution three years later, and William III. promoted him. He commanded at the relief of Derry, and made his last campaign in Flanders in 1691. He died, a lieutenant-general, at Brussels in October of that year. His eldest son, Lieut.-General Percy Kirke (1684–1741), was also colonel of the "Lambs."

KIRKEE (or Kirki), a town and military cantonment of British India in Poona district, Bombay, 4 m. N.W. of Poona city. Pop. (1901), 10,797. It is the principal artillery station in the Bombay presidency, and has a large ammunition factory. It was the scene of a victory over Baji Rao, the last peshwa, in 1817.

KIRKINTILLOCH, a municipal and police burgh of Dumbartonshire, Scotland. Pop. (1901), 10,680. It is situated 8 m. N.E. of Glasgow, by the North British railway, a portion of the parish extending into Lanarkshire. It lies on the Forth & Clyde canal, and the Kelvin—from which Lord Kelvin, the distinguished scientist, took the title of his barony—flows past the town, where it receives from the north the Glazert and from the south the Luggie, commemorated by David Gray. The Wall of Antoninus ran through the site of the town, the Gaelic name of which (*Caer*, a fort, not *Kirk*, a church) means "the fort at the end of the ridge." The town became a burgh of barony under the Comyns in 1170. The cruciform parish church with crow-stepped gables dates from 1644. The public buildings include the town-hall, with a clock tower, the temperance hall, a convalescent home, the Broomhill home for incurables (largely due to Miss Beatrice Clugston, to whom a memorial was erected in 1891), and the Westermains asylum. In 1898 the burgh acquired as a private park the Peel, containing traces of the Roman Wall, a fort, and the foundation of Comyn's Castle. The leading industries are chemical manufactures, iron-founding, muslin-weaving, coal mining and timber sawing. Lenzie, a suburb, a mile to the south of the old town, contains the imposing towered edifice in the Elizabethan style which houses the Barony asylum. David Gray, the poet, was born at Merkland, near by, and is buried in Kirkintilloch churchyard, where a monument was erected to his memory in 1865.

KIRK-KILISSEH (Kirk-Kilisse or Kirk-Kilissia), a town of European Turkey, in the vilayet of Adrianople, 35 m. E. of Adrianople. Pop. (1905), about 16,000, of whom about half are Greeks, and the remainder Bulgarians, Turks and Jews. Kirk-Kilisseh is built near the headwaters of several small tributaries of the river Ergene, and on the western slope of the Istranja Dagh. It owes its chief importance to its position at the southern outlet of the Fakhi defile over these mountains, through which passes the shortest road from Shumla to Constantinople. The name Kirk-Kilisseh signifies "four churches," and the town possesses many mosques and Greek churches. It has an important trade with Constantinople in butter and cheese, and also exports wine, brandy, cereals and tobacco.

KIRKSVILLE, a city and the county-seat of Adair county, Missouri, U.S.A., about 129 m. N. by W. of Jefferson City. Pop. (1900), 5966, including 112 foreign-born and 291 negroes; (1910), 6347. It is served by the Wabash and the Quincy, Omaha & Kansas City railways. It lies on a rolling prairie at an elevation of 975 ft. above the sea. It is the seat of the First District Missouri State Normal School (1870); of the American School of Osteopathy (opened 1892); and of the related A. T. Still Infirmary (incorporated 1895), named in honour of its founder, Andrew Taylor Still (b. 1820), the originator of osteopathic treatment, who settled here in 1875. In 1908 the School of Osteopathy had 18 instructors and 398 students. Grain and fruit are grown in large quantities, and much coal is mined in the vicinity of Kirksville. Its manufactures are shoes, bricks, lumber, ice, agricultural implements, wagons and handles. Kirksville was laid out in 1842, and was named in honour of Jesse Kirk. It was incorporated as a town in 1857 and chartered as a city of the third class in 1892. In April 1899 a cyclone caused serious damage to the city.

KIRKWALL (Norse, *Kirkjuvagr*, "church bay"), a royal, municipal and police burgh, seaport and capital of the Orkney Islands, county of Orkney, Scotland. Pop. (1901), 3711. It is situated at the head of a bay of the same name on the east of the island of Pomona, or Mainland, 247 m. N. of Leith and 54 m. N. of Wick by steamer. Much of the city is quaint-looking and old-fashioned, its main street (nearly 1 m. long) being in parts so narrow that two vehicles cannot pass each other. The more modern quarters are built with great regularity and the suburbs contain several substantial villas surrounded by gardens. Kirkwall has very few manufactures. The linen trade introduced in the middle of the 18th century is extinct, and a like fate has overtaken the kelp and straw-plaiting industries. Distilling however prospers, and the town is important not only as regards its shipping and the deep-sea fishery, but also as a distributing centre for the islands and the seat of the superior law courts. The port has two piers. Kirkwall received its first charter from James III. in 1486, but the provisions of this instrument being disregarded by such men as Robert (d. 1592) and Patrick Stewart (d. 1614), 1st and 2nd earls of Orkney, and others, the Scottish parliament passed an act in 1670 confirming the charter granted by Charles II. in 1661. The prime object of interest is the cathedral of St Magnus, a stately cruciform red sandstone structure in the severest Norman, with touches of Gothic. It was founded by Jarl Rognvald (Earl Ronald) in 1137 in memory of his uncle Jarl Magnus who was assassinated in the island of Egilshay in 1115, and afterwards canonized and adopted as the patron saint of the Orkneys. The remains of St Magnus were ultimately interred in the cathedral. The church is 234 ft. long from east to west and 56 ft. broad, 71 ft. high from floor to roof, and 133 ft. to the top of the present spire—the transepts being the oldest portion. The choir was lengthened and the beautiful eastern rose window added by Bishop Stewart in 1511, and the porch and the western end of the nave were finished in 1540 by Bishop Robert Reid. Saving that the upper half of the original spire was struck by lightning in 1671, and not rebuilt, the cathedral is complete at all points, but it underwent extensive repairs in the 19th century. The disproportionate height and narrowness of the building lend it a certain distinction which otherwise it would have lacked. The sandstone has not resisted the effects of weather, and much of the external decorative work has perished. The choir is used as the parish church. The *skellat*, or fire-bell, is not rung now. The church of St Olaf, from which the town took its name, was burned down by the English in 1502; and of the church erected on its site by Bishop Reid—the greatest building the Orkneys ever had—little more than the merest fragment survives. Nothing remains of the old castle, a fortress of remarkable strength founded by Sir Henry Sinclair (d. 1400), earl and prince of Orkney and 1st earl of Caithness, its last vestiges having been demolished in 1865 to provide better access to the harbour; and the earthwork to the east of the town thrown up by the Cromwellians has been converted into a battery of the Orkney Artillery Volunteers. Adjoining the cathedral are the ruins of the bishop's palace, in which King Haco died after his defeat at Largs in 1263. The round tower, which still stands, was added in 1550 by Bishop Reid. It is known as the Mass Tower and contains a niche in which is a small effigy believed to represent the founder, who also endowed the grammar school which is still in existence. To the east of the remains of the bishop's palace are the ruins of the earl's palace, a structure in the Scottish Baronial style, built about 1600 for Patrick Stewart, 2nd earl of Orkney, and on his forfeiture given to the bishops for a residence. Tankerness House is a characteristic example of the mansion of an Orkney laird of the olden time. Other public buildings include the municipal buildings, the sheriff court and county buildings, Balfour hospital, and the fever hospital. There is daily communication with Scrabster pier (Thurso), via Scapa pier, on the southern side of the waist of Pomona, about 1½ m. to the S. of Kirkwall; and steamers sail at regular intervals from the harbour to Wick, Aberdeen and Leith. Good roads place the capital in touch with most places in the island and a coach runs twice a day to Stromness. Kirkwall belongs to the Wick district group of parliamentary burghs, the others being Cromarty, Dingwall, Dornoch and Tain.

KIRRIEMUIR, a police burgh of Forfarshire, Scotland. Pop. (1901), 4096. It is situated on a height above the glen through which the Gairie flows, 6¼ m. N.W. of Forfar by a branch line of the Caledonian railway of which it is the terminus. There are libraries, a public hall and a park. The staple industry is linen-weaving. The hand-loom lingered longer here than in any other place in Scotland and is not yet wholly extinct. The Rev. Dr Alexander Whyte (b. 1837) and J. M. Barrie (b. 1860) are natives, the latter having made the town famous under the name of "Thrums." The original Secession church—the kirk of the Auld Lichts—was founded in 1806 and rebuilt in 1893. Kinnordy, 1½ m. N.W., was the birthplace of Sir Charles Lyell the geologist; and Cortachy castle, a fine mansion in the Scottish Baronial style, about 4 m. N., is the seat of the earl of Airlie.

KIRSCH (or KIRSCHENWASSER), a potable spirit distilled from cherries. Kirsch is manufactured chiefly in the Black Forest in Germany, and in the Vosges and Jura districts in France. Generally the raw material consists of the wild cherry known as *Cerasus avium*. The cherries are subjected to natural fermentation and subsequent distillation. Occasionally a certain quantity of sugar and water are added to the cherries after crushing, and the mass so obtained is filtered or pressed prior to fermentation. The spirit is usually "run" at a strength of about 50% of absolute alcohol. Compared with brandy or whisky the characteristic features of kirsch are (*a*) that it contains relatively large quantities of higher alcohols and compound ethers, and (*b*) the presence in this spirit of small quantities of hydrocyanic acid, partly as such and partly in combination as benzaldehyde-cyanhydrine, to which the distinctive flavour of kirsch is largely due.

KIR-SHEHER, the chief town of a sanjak of the same name in the Angora vilayet of Asia Minor, situated on a tributary of the Kizil Irmak (*Halys*), on the Angora-Kaisarieh road. It is on the line of the projected railway from Angora to Kaisarieh. The town gives its name to the excellent carpets made in the vicinity. On the outskirts there is a hot chalybeate spring. Population about 9000 (700 Christians, mostly Armenians). Kir-sheher represents the ancient *Mocissus*, a small town which became important in the Byzantine period: it was enlarged by the emperor Justinian, who re-named it *Justinianopolis*, and made it the capital of a large division of Cappadocia, a position it still retains.

KIRWAN, RICHARD (1733–1812), Irish scientist, was born at Cloughballymore, Co. Galway, in 1733. Part of his early life was spent abroad, and in 1754 he entered the Jesuit novitiate either at St Omer or at Hesdin, but returned to Ireland in the following year, when he succeeded to the family estates through the death of his brother in a duel. In 1766, having conformed to the established religion two years previously, he was called to the Irish bar, but in 1768 abandoned practice in favour of scientific pursuits. During the next nineteen years he resided chiefly in London, enjoying the society of the scientific men living there, and corresponding with many savants on the continent of Europe, as his wide knowledge of languages enabled him to do with ease. His experiments on the specific gravities and attractive powers of various saline substances formed a substantial contribution to the methods of analytical chemistry, and in 1782 gained him the Copley medal from the Royal Society, of which he was elected a fellow in 1780; and in 1784 he was engaged in a controversy with Cavendish in regard to the latter's experiments on air. In 1787 he removed to Dublin, where four years later he became president of the Royal Irish Academy. To its proceedings he contributed some thirty-eight memoirs, dealing with meteorology, pure and applied chemistry, geology, magnetism, philology, &c. One of these, on the primitive state of the globe and its subsequent catastrophe, involved him in a lively dispute with the upholders of the Huttonian theory. His geological work was marred by an implicit belief in the universal deluge, and through finding fossils associated with the trap rocks near Portrush he maintained basalt was of aqueous origin. He was one of the last supporters in England of the phlogistic hypothesis, for which he contended in his *Essay on Phlogiston and the Constitution of Acids* (1787), identifying phlogiston with hydrogen. This work, translated by Madame Lavoisier, was published in French with critical notes by Lavoisier and some of his associates; Kirwan attempted to refute their arguments, but they proved too strong for him, and he acknowledged himself a convert in 1791. His other books included *Elements of Mineralogy* (1784), which was the first systematic work on that subject in the English language, and which long remained standard; *An Estimate of the Temperature of Different Latitudes* (1787); *Essay of the Analysis of Mineral Waters* (1799), and *Geological Essays* (1799). In his later years he turned to philosophical questions, producing a paper on human liberty in 1798, a treatise on logic in 1807, and a volume of metaphysical essays in 1811, none of any worth. Various stories are told of his eccentricities as well as of his conversational powers. He died in Dublin in June 1812.

KISFALUDY, KÁROLY [CHARLES] (1788–1830), Hungarian author, was born at Téte, near Raab, on the 6th of February

1788. His birth cost his mother her life and himself his father's undying hatred. He entered the army as a cadet in 1804; saw active service in Italy, Servia and Bavaria (1805–1809), especially distinguishing himself at the battle of Leoben (May 25, 1809), and returned to his quarters at Pest with the rank of first lieutenant. It was during the war that he composed his first poems, *e.g.* the tragedy *Gyilkos* ("The Murder," 1808), and numerous martial songs for the encouragement of his comrades. It was now, too, that he fell hopelessly in love with the beautiful Katalin Heppler, the daughter of a wealthy tobacco merchant. Tiring of the monotony of a soldier's life, yet unwilling to sacrifice his liberty to follow commerce or enter the civil service, Kisfaludy, contrary to his father's wishes, now threw up his commission and made his home at the house of a married sister at Vörröck, where he could follow his inclinations. In 1812 he studied painting at the Vienna academy and supported himself precariously by his brush and pencil, till the theatre at Vienna proved a still stronger attraction. In 1812 he wrote the tragedy *Klára Zách*, and in 1815 went to Italy to study art more thoroughly. But he was back again within six months, and for the next three years flitted from place to place, living on the charity of his friends, lodging in hovels and dashing off scores of daubs which rarely found a market. The united and repeated petitions of the whole Kisfaludy family failed to bring about a reconciliation between the elder Kisfaludy and his prodigal son. It was the success of his drama *Ilka*, written for the Fehérvár dramatic society, that first made him famous and prosperous. The play was greeted with enthusiasm both at Fehérvár and Buda (1819). Subsequent plays, *The Voivode Stiber* and *The Petitioners* (the first original Magyar dramas), were equally successful. Kisfaludy's fame began to spread. He had found his true vocation as the creator of the Hungarian drama. In May 1820 he wrote three new plays for the dramatic society (he could always turn out a five-act drama in four days) which still further increased his reputation. From 1820 onwards, under the influence of the great critic Kazinczy, he learnt to polish and refine his style, while his friend and adviser György Gaal (who translated some of his dramas for the Vienna stage) introduced him to the works of Shakespeare and Goethe. By this time Kisfaludy had evolved a literary theory of his own which inclined towards romanticism; and in collaboration with his elder brother Alexander (see below) he founded the periodical *Aurora*(1822), which he edited to the day of his death. The *Aurora* was a notable phenomenon in Magyar literature. It attracted towards it many of the rising young authors of the day (including Vörösmarty, Bajza and Czuczor) and speedily became the oracle of the romanticists. Kisfaludy's material position had now greatly improved, but he could not shake off his old recklessness and generosity, and he was never able to pay a tithe of his debts. The publication of *Aurora* so engrossed his time that practically he abandoned the stage. But he contributed to *Aurora* ballads, epigrams, short epic pieces, and, best of all, his comic stories. Kisfaludy was in fact the founder of the school of Magyar humorists and his comic types amuse and delight to this day. When the folk-tale became popular in Europe, Kisfaludy set to work upon folk-tales also and produced (1828) some of the masterpieces of that genre. He died on the 21st of November 1830. Six years later the great literary society of Hungary, the *Kisfaludy Társaság*, was founded to commemorate his genius. Apart from his own works it is the supreme merit of Kisfaludy to have revived and nationalized the Magyar literature, giving it a range and scope undreamed of before his time.

The first edition of Kisfaludy's works, in 10 volumes, appeared at Buda in 1831, shortly after his death, but the 7th edition (Budapest 1893) is the best and fullest. See Ferenc Toldy, *Lives of the Magyar Poets* (Hung.) (Budapest, 1870); Zsolt Beöthy, *The Father of Hungarian Comedy* (Budapest, 1882); Tamás Szana, *The Two Kisfaludys* (Hung.) (Budapest, 1876). Kisfaludy's struggles and adventures are also most vividly described in Jókai's novel, *Eppur si muove* (Hung.).

Sándor [Alexander] Kisfaludy (1772–1844), Hungarian poet, elder brother of the preceding, was born at Zala on the 27th of September 1772, educated at Raab, and graduated in philosophy and jurisprudence at Pressburg. He early fell under the influence of Schiller and Kleist, and devoted himself to the resuscitation of the almost extinct Hungarian literature. Disgusted with his profession, the law, he entered the Life Guards (1793) and plunged into the gay life of Vienna, cultivating literature, learning French, German and Italian, painting, sketching, assiduously frequenting the theatre, and consorting on equal terms with all the literary celebrities of the Austrian capital. In 1796 he was transferred to the army in Italy for being concerned with some of his brother officers of the Vienna garrison in certain irregularities. When Milan was captured by Napoleon Kisfaludy was sent a prisoner of war to Vaucluse, where he studied Petrarch with enthusiasm and fell violently in love with Caroline D'Esclapon, a kindred spirit to whom he addressed his melancholy *Himfy Lays*, the first part of the subsequently famous sonnets. On returning to Austria he served with some distinction in the campaigns of 1798 and 1799 on the Rhine and in Switzerland; but tiring of a military life and disgusted at the slowness of his promotion, he quitted the army in September 1799, and married his old love Rózá Szegedy at the beginning of 1800. The first five happy years of their life were passed at Kám in Vás county, but in 1805 they removed to Sümeg where Kisfaludy gave himself up entirely to literature.

At the beginning of the 19th century he had published a volume of erotics which made him famous, and his reputation was still further increased by his *Regék* or Tales. During the troublous times of 1809, when the gentry of Zala county founded a confederation, the palatine appointed Kisfaludy one of his adjutants. Subsequently, by command, he wrote an account of the movement for presentation to King Francis, which was committed to the secret archives, and Kisfaludy was forbidden to communicate its contents. In 1820 the Marczebánya Institute crowned his *Tales* and the palatine presented him with a prize of 400 florins in the hall of the Pest county council. In 1822 he started the *Aurora* with his younger brother Károly (see above). When the academy was founded in 1830 Kisfaludy was the first county member elected to it. In 1835 he resigned because he was obliged to share the honour of winning the academy's grand prize with Vörösmarty. After the death of his first wife (1832) he married a second time, but by neither of his wives had he any child. The remainder of his days were spent in his Tusculum among the vineyards of Sümeg and Somla. He died on the 28th of October 1844. Alexander Kisfaludy stands alone among the rising literary schools of his day. He was not even influenced by his friend the great critic Kazinczy, who gave the tone to the young classical writers of his day. Kisfaludy's art was self-taught, solitary and absolutely independent. If he imitated any one it was Petrarch; indeed his famous *Himfy szerelmei* ("The Loves of Himfy"), as his collected sonnets are called, have won for him the title of "The Hungarian Petrarch." But the passion of Kisfaludy is far more sincere and real than ever Petrarch's was, and he completely Magyarized everything he borrowed. After finishing the sonnets Kisfaludy devoted himself to more objective writing, as in the incomparable *Regék*, which reproduce the scenery and the history of the delightful counties which surround Lake Balaton. He also contributed numerous tales and other pieces to *Aurora*. Far less successful were his plays, of which *Hunyádi János* (1816), by far the longest drama in the Hungarian language, need alone be mentioned.

The best critical edition of Sándor Kisfaludy's works is the fourth complete edition, by David Angyal, in eight volumes (Budapest, 1893). See Tamás Szana, *The two Kisfaludys* (Hung.) (Budapest, 1876); Imre Sándor, *The Influence of the Italian on the Hungarian Literature* (Hung.) (Budapest, 1878); Kálmán Sümegi, *Kisfaludy and his Tales* (Hung.) (Budapest, 1877). (R. N. B.)

KĪSH, or Kais (the first form is Persian and the second Arabic), an island in the Persian Gulf. It is mentioned in the 12th century as being the residence of an Arab pirate from Oman, who exacted a tribute from the pearl fisheries of the gulf and had the title of "King of the Sea," and it rose to importance in the

13th century with the fall of Siraf as a transit station of the trade between India and the West. In the 14th century it was supplanted by Hormuz and lapsed into its former insignificance. The island is nearly 10 m. long and 5 m. broad, and contains a number of small villages, the largest, Mashi, with about 100 houses, being situated on its north-eastern corner in 26° 34′ N. and 54° 2′ E. The highest part of the island has an elevation of 120 ft. The inhabitants are Arabs, and nearly all pearl fishers, possessing many boats, which they take to the pearl banks on the Arabian coast. The water supply is scanty and there is little vegetation, but sufficient for sustaining some flocks of sheep and goats and some cattle. Near the centre of the north coast are the ruins of the old city, now known as Harira, with remains of a mosque, with octagonal columns, masonry, water-cisterns (two 150 ft. long, 40 ft. broad, 24 ft. deep) and a fine underground canal, or aqueduct, half a mile long and cut in the solid rock 20 ft. below the surface. Fragments of glazed tiles and brown and blue pottery, of thin white and blue Chinese porcelain, of green céladon (some with white scroll-work or figures in relief), glass beads, bangles, &c., are abundant. Kīsh is the Kataia of Arrian; Chisi and Quis of Marco Polo; Quixi, Queis, Caez, Cais, &c., of Portuguese writers; and Khenn, or Kenn, of English.

KISHANGARH, a native state of India, in the Rajputana agency. Area, 858 sq. m.; pop. (1901), 90,970, showing a decrease of 27% in the decade, due to the famine of 1899–1900; estimated revenue, £34,000; there is no tribute. The state was founded in the reign of the emperor Akbar, by a younger son of the raja of Jodhpur. In 1818 Kishangarh first came into direct relations with the British government, by entering into a treaty, together with the other Rajput states, for the suppression of the Pindari marauders by whom the country was at that time overrun. The chief, whose title is maharaja, is a Rajput of the Rathor clan. Maharaja Madan Singh ascended the throne in 1900 at the age of sixteen, and attended the Delhi Durbar of 1903 as a cadet in the Imperial Cadet Corps. The administration, under the *diwan*, is highly spoken of. Irrigation from tanks and wells has been extended; factories for ginning and pressing cotton have been started; and the social reform movement, for discouraging excessive expenditure on marriages, has been very successful. The state is traversed by the Rajputana railway. The town of KISHANGARH is 18 m. N.W. of Ajmere by rail. Pop. (1901), 12,663. It is the residence of many Jain merchants.

KISHINEV (*Kishlanow* of the Moldavians), a town of south-west Russia, capital of the government of Bessarabia, situated on the right bank of the Byk, a tributary of the Dniester, and on the railway between Odessa and Jassy in Rumania, 120 m. W.N.W. from the former. At the beginning of the 19th century it was but a poor village, and in 1812 when it was acquired by Russia from Moldavia it had only 7000 inhabitants; twenty years later its population numbered 35,000, while in 1862 it had with its suburbs 92,000 inhabitants, and in 1900 125,787, composed of the most varied nationalities—Moldavians, Walachians, Russians, Jews (43%), Bulgarians, Tatars, Germans and Gypsies. A massacre (*pogrom*) of the Jews was perpetrated here in 1903. The town consists of two parts—the old or lower town, on the banks of the Byk, and the new or upper town, situated on high crags, 450 to 500 ft. above the river. The wide suburbs are remarkable for their gardens, which produce great quantities of fruits (especially plums, which are dried and exported), tobacco, mulberry leaves for silkworms, and wine. The buildings of the town are sombre, shabby and low, but built of stone; and the streets, though wide and shaded by acacias, are mostly unpaved. Kishinev is the seat of the archbishop of Bessarabia, and has a cathedral, an ecclesiastical seminary with 800 students, a college, and a gardening school, a museum, a public library, a botanic garden, and a sanatorium with sulphur springs. The town is adorned with statues of Tsar Alexander II. (1886) and the poet Pushkin (1885). There are tallow-melting houses, steam flour-mills, candle and soap works, distilleries and tobacco factories. The trade is very active and increasing, Kishinev being a centre for the Bessarabian trade in grain, wine, tobacco, tallow, wool and skins, exported to Austria and to Odessa. The town played an important part in the war between Russia and Turkey in 1877–78, as the chief centre of the Russian invasion.

KISHM (also Arab. *Jazīrat ut-tawīlah*, Pers. *Jazarīh i darāz*, *i.e.* Long Island), an island at the mouth of the Persian Gulf, separated from the Persian mainland by the Khor-i-Jafari, a strait which at its narrowest point is less than 2 m. broad. On British Admiralty charts it figures as "Clarence Strait," the name given to it by British surveyors in 1828 in honour of the duke of Clarence (William IV.). The island is 70 m. long, its main axis running E.N.E. by W.S.W. Its greatest breadth is 22 m. and the mean breadth about 7 m. A range of hills from 300 to 600 ft. high, with strongly marked escarpments, runs nearly parallel to the southern coast; they are largely composed, like those of Hormuz and the neighbouring mainland, of rock salt, which is regularly quarried in several places, principally at Nimakdan (*i.e.* salt-cellar) and Salakh on the south coast, and forms one of the chief products of the island, finding its way to Muscat, India and Zanzibar. In the centre of the island some hills, consisting of sandstone and marl, rise to an elevation of 1300 ft. In its general aspect the island is parched and barren-looking, like the south of Persia, but it contains fertile portions, which produce grain, dates, grapes, melons, &c. Traces of naphtha were observed near Salakh, but extensive boring operations in 1892 did not lead to any result. The town of Kishm (pop. 5000) is on the eastern extremity of the island. The famous navigator, William Baffin, was killed here in January 1622 by a shot from the Portuguese castle close by, which a British force was then besieging. Lafit (Laft, Leit), the next place in importance (reduced by a British fleet in 1809), is situated about midway on the northern coast in the most fertile part of the island. There are also many flourishing villages. At Basidu or Bassadore (correct name Baba Saʿidu), on the western extremity of the island, the British government maintained until 1879 a sanatorium for the crews of their gunboats in the gulf, with barracks for a company of sepoys belonging to the marine battalion at Bombay, workshops, hospital, &c. The village is still British property, but its occupants are reduced to a couple of men in charge of a coal depot, a provision store and about 90 villagers. In December 1896 a terrible earthquake destroyed about four-fifths of the houses on the island and over 1000 persons lost their lives. The total population is generally estimated at about 15,000 to 20,000, but the German Admiralty's *Segelhandbuch für den Persischen Golf* for 1907 has 40,000.

Kishm is the ancient *Oaracta*, or *Uorochta*, a name said to have survived until recently in a village called Brokt, or Brokht. It was also called the island of the Beni Kavan, from an Arab tribe of that name which came from Oman. (A. H.-S.)

KISKUNFÉLEGYHÁZA, a town of Hungary, in the county of Pest-Pilis-Solt-Kiskun, 80 m. S.S.E. of Budapest by rail. Pop. (1900), 33,242. Among the principal buildings are a fine town hall, a Roman Catholic gymnasium and a modern large parish church. The surrounding country is covered with vineyards, fruit gardens, and tobacco and corn fields. The town itself, which is an important railway junction, is chiefly noted for its great cattle-market. Numerous Roman urns and other ancient relics have been dug up in the vicinity. In the 17th century the town was completely destroyed by the Turks, and it was not recolonized and rebuilt till 1743.

KISLOVODSK, a town and health-resort of Russian Caucasia, in the province of Terek, situated at an altitude of 2690 ft., in a deep caldron-shaped valley on the N. side of the Caucasus, 40 m. by rail S.W. of Pyatigorsk. Pop. (1897), 4078. The limestone hills which surround the town rise by successive steps or terraces, and contain numerous caves. The mineral waters are strongly impregnated with carbonic acid gas and have a temperature of 51° F. The principal spring is known as Narsan, and its water is called by the Circassians the "drink of heroes."

KISMET, fate, destiny, a term used by Mahommedans to express all the incidents and details of man's lot in life. The word is the Turkish form of the Arabic *gismat*, from *gasama*, to divide.

KISS, the act of pressing or touching with the lips, cheek, hand or lips of another, as a sign or expression of love, affection, reverence or greeting. Skeat (*Etym. Dict.*, 1898) connects the Teut. base *kussa* with Lat. *gustus*, taste, and with Goth. *kustus*, test, from *kinsan*, to choose, and takes "kiss" as ultimately a doublet of "choice."

For the liturgical *osculum pacis* or "kiss of peace," see PAX. See further C. Nyrop, *The Kiss and its History*, trans. by W. F. Harvey (1902); J. J. Claudius, *Dissertatio de salutationibus veterum* (Utrecht, 1702); and "Baisers d'étiquette" (1689) in *Archives curieuses de l'histoire de France* (1834–1890, series ii. tom. 12).

KISSAR, or GYTARAH BARBARYEH, the ancient Nubian lyre, still in use in Egypt and Abyssinia. It consists of a body having instead of the traditional tortoiseshell back a shallow, round bowl of wood, covered with a sound-board of sheepskin, in which are three small round sound-holes. The arms, set through the sound-board at points distant about the third of the diameter from the circumference, have the familiar fan shape. Five gut strings, knotted round the bar and raised from the sound-board by means of a bridge tailpiece similar to that in use on the modern guitar, are plucked by means of a plectrum by the right hand for the melody, while the left hand sometimes twangs some of the strings as a soft drone accompaniment.

KISSINGEN, a town and watering-place of Germany, in the kingdom of Bavaria, delightfully situated in a broad valley surrounded by high and well-wooded hills, on the Franconian Saale, 656 ft. above sea-level, 62 m. E. of Frankfort-on-Main, and 43 N.E. of Würzburg by rail. Pop. (1900), 4757. Its streets are regular and its houses attractive. It has an Evangelical, an English, a Russian and three Roman Catholic churches, a theatre, and various benevolent institutions, besides all the usual buildings for the lodging, cure and amusement of the numerous visitors who are attracted to this, the most popular watering-place in Bavaria. In the Kurgarten, a tree-shaded expanse between the Kurhaus and the handsome colonnaded Konversations-Saal, are the three principal springs, the Rákóczy, the Pandur and the Maxbrunnen, of which the first two, strongly impregnated with iron and salt, have a temperature of 51·26° F.; the last (50·72°) is like Selters or Seltzer water. At short distances from the town are the intermittent artesian spring Solensprudel, the Schönbornsprudel and the Theresienquelle; and in the same valley as Kissingen are the minor spas of Bocklet and Brückenau. The waters of Kissingen are prescribed for both internal and external use in a great variety of diseases. They are all highly charged with salt, and productive government salt-works were at one time stationed near Kissingen. The number of persons who visit the place amounts to about 20,000 a year. The manufactures of the town, chiefly carriages and furniture, are unimportant; there is also a trade in fruit and wine.

The salt springs were known in the 9th century, and their medicinal properties were recognized in the 16th, but it was only during the 19th century that Kissingen became a popular resort. The town belonged to the counts of Henneberg until 1394, when it was sold to the bishop of Würzburg. With this bishopric it passed later to Bavaria. On the 10th of July 1866 the Prussians defeated the Bavarians with great slaughter near Kissingen. On the 13th of July 1874 the town was the scene of the attempt of the fanatic Kullmann to assassinate Prince Bismarck, to whom a statue has been erected. There are also monuments to Kings Louis I. and Maximilian I. of Bavaria.

See Balling, *Die Heilquellen und Bäder zu Kissingen* (Kissingen, 1886); A. Sotier, *Bad Kissingen* (Leipzig, 1883); Werner, *Bad Kissingen als Kurort* (Berlin, 1904); Leusser, *Kissingen für Herzkranke* (Würzburg, 1902); Diruf, *Kissingen und seine Heilquellen* (Würzburg, 1892); and Roth, *Bad Kissingen* (Würzburg, 1901).

KISTNA, or KRISHNA, a large river of southern India. It rises near the Bombay sanatorium of Mahabaleshwar in the Western Ghats, only about 40 m. from the Arabian Sea, and, as it discharges into the Bay of Bengal, it thus flows across almost the entire peninsula from west to east. It has an estimated basin area of 97,000 sq. m., and its length is 800 m. Its source is held sacred, and is frequented by pilgrims in large numbers. From Mahabaleshwar the Kistna runs southward in a rapid course into the nizam's dominions, then turns to the east, and ultimately falls into the sea by two principal mouths, carrying with it the waters of the Bhima from the north and the Tungabadhra from the south-west. Along this part of the coast runs an extensive strip of land which has been entirely formed by the detritus washed down by the Kistna and Godavari. The river channel is throughout too rocky and the stream too rapid to allow navigation even by small native craft. In utility for irrigation the Kistna is also inferior to its two sister streams, the Godavari and Cauvery. By far the greatest of its irrigation works is the Bezwada anicut, begun by Sir Arthur Cotton in 1852. Bezwada is a small town at the entrance of the gorge by which the Kistna bursts through the Eastern Ghats and immediately spreads over the alluvial plain. The channel there is 1300 yds. wide. During the dry season the depth of water is barely 6 ft., but sometimes it rises to as much as 36 ft., the maximum flood discharge being calculated at 1,188,000 cub. ft. per second. Of the two main canals connected with the dam, that on the left bank breaks into two branches, the one running 39 m. to Ellore, the other 49 m. to Masulipatam. The canal on the right bank proceeds nearly parallel to the river, and also sends off two principal branches, to Nizampatam and Comamur. The total length of the main channels is 372 m. and the total area irrigated in 1903–1904 was about 700,000 acres.

KISTNA (or KRISHNA), a district of British India, in the N.E. of the Madras Presidency. Masulipatam is the district headquarters. Area, 8490 sq. m. The district is generally a flat country, but the interior is broken by a few low hills, the highest being 1857 ft. above sea-level. The principal rivers are the Kistna, which cuts the district into two portions, and the Munyeru, Paleru and Naguleru (tributaries of the Gundlakamma and the Kistna); the last only is navigable. The Kolar lake, which covers an area of 21 by 14 m., and the Romparu swamp are natural receptacles for the drainage on the north and south sides of the Kistna respectively.

In 1901 the population was 2,154,803, showing an increase of 16% in the decade. Subsequently the area of the district was reduced by the formation of the new district of Guntur (*q.v.*), though Kistna received an accretion of territory from Godavari district. The population in 1901 on the area as reconstituted (5899 sq. m.) was 1,744,138. The Kistna delta system of irrigation canals, which are available also for navigation, connect with the Godavari system. The principal crops are rice, millets, pulse, oil-seeds, cotton, indigo, tobacco and a little sugar-cane. There are several factories for ginning and pressing cotton. The cigars known in England as Lunkas are partly made from tobacco grown on *lankas* or islands in the Kistna. The manufacture of chintzes at Masulipatam is a decaying industry, but cotton is woven everywhere for domestic use. Salt is evaporated, under government supervision, along the coast. Bezwada, at the head of the delta, is a place of growing importance, as the central junction of the East Coast railway system, which crosses the inland portion of the district in three directions. Some seaborne trade, chiefly coasting, is carried on at the open roadsteads of Masulipatam and Nizampatam, both in the delta. The Church Missionary Society supports a college at Masulipatam.

The early history of Kistna is inseparable from that of the northern Circars. Dharanikota and the adjacent town of Amravati were the seats of early Hindu and Buddhist governments; and the more modern Rajahmundry owed its importance to later dynasties. The Chalukyas here gave place to the Cholas, who in turn were ousted by the Reddi kings, who flourished during the 14th century, and built the forts of Bellamkonda, Kondavi and Kondapalli in the north of the district, while the Gajapati dynasty of Orissa ruled in the north. Afterwards the entire district passed to the Kutb Shahis of Golconda, until annexed to the Mogul empire by Aurangzeb in 1687. Meantime the English had in 1611 established a small factory at Masulipatam, where they traded with varying fortune from 1759, when, Masulipatam being captured from the French by Colonel Forde with a force sent by Lord Clive from Calcutta, the power of the English in the greater part of the district was complete.

KIT. (1) (Probably an adaptation of the Middle Dutch *kitte*, a wooden tub, usually with a lid and handles; in modern Dutch *kit* means a tankard), a tub, basket or pail used for holding milk, butter, eggs, fish and other goods; also applied to similar receptacles for various domestic purposes, or for holding a workman's tools, &c. The comprehensive "kit" came to mean the outer equipment, but more commonly personal effects such as clothing, especially those of a soldier or sailor, the word including the knapsack or other receptacle in which the effects are packed. (2) The name (perhaps a corruption of "cittern," Gr. *cithara*) of a small violin, about 16 in. long, and played with a bow of nearly the same length, much used at one time by dancing masters. The French name is *pochette*, the instrument being small enough to go into the pocket.

KITASATO, SHIBASABURO (1856–), Japanese doctor of medicine, was born at Kumamoto in 1856 and studied in Germany under Koch from 1885 to 1892. He became one of the foremost bacteriologists of the world, and enjoys the credit of having discovered the bacilli of tetanus, diphtheria and plague, the last in conjunction with Dr Aoyama, who accompanied him to Hong Kong in 1894 during an outbreak of that pest.

KIT-CAT CLUB, a club of Whig wits, patriots, politicians and men of letters, founded in London about 1700. The name was derived from that of Christopher Cat, the keeper of the pie-house in which the club met in Shire Lane, near Temple Bar. The meetings were afterwards held at the Fountain tavern in the Strand, and latterly in a room specially built for the purpose at Barn Elms, the residence of the secretary, Jacob Tonson, the publisher. In summer the club met at the Upper Flask, Hampstead Heath. The club originally consisted of thirty-nine, afterwards of forty-eight members, and included among others the duke of Marlborough, Lords Halifax and Somers, Sir Robert Walpole, Vanbrugh, Congreve, Steele and Addison. The portraits of many of the members were painted by Sir Godfrey Kneller, himself a member, of a uniform size suited to the height of the Barn Elms room in which the club dined. The canvas, 36 × 28 in., admitted of less than a half-length portrait but was sufficiently long to include a hand, and this is known as the kit-cat size. The club was dissolved about 1720.

KITCHEN (O. Eng. *cycene*; this and other cognate forms, such as Dutch *keuken*, Ger. *Küche*, Dan. *kökken*, Fr. *cuisine*, are formed from the Late Lat. *coquina*, *coquere*, to cook), the room or place in a house set apart for cooking, in which the culinary and other domestic utensils are kept. The range or cooking stove, fitted with boiler for hot water, oven and other appliances, is often known as a "kitchener" (see Cookery and Heating). Archaeologists have used the term "kitchen-midden" (a translation of Dan. *kökkenmödding*, kitchen refuse heap) for the refuse heaps of prehistoric man, containing bones, remains of food and implements, &c. (see Shell-mounds). "Midden," in Middle English *myddyng*, is a Scandinavian word, from *mög*, muck, dung, and *dyng*, heap; the latter word gives the English "dung."

KITCHENER, HORATIO HERBERT KITCHENER, Viscount (1850–), British field marshal, was the son of Lieut.-Colonel H. H. Kitchener and was born at Bally Longford, Co. Kerry, on the 24th of June 1850. He entered the Royal Military Academy, Woolwich, in 1868, and was commissioned second lieutenant, Royal Engineers, in 1871. As a subaltern he was employed on survey work in Cyprus and Palestine, and on promotion to captain in 1883 was attached to the Egyptian army, then in course of reorganization under British officers. In the following year he served on the staff of the British expeditionary force on the Nile, and was promoted successively major and lieutenant-colonel by brevet for his services. From 1886 to 1888 he was commandant at Suakin, commanding and receiving a severe wound in the action of Handub in 1888. In 1889 he commanded a brigade in the actions of Gemaizah and Toski. From 1890 to 1892 he served as adjutant-general of the army. He had become lieutenant-colonel in the British army in 1888, and he received the C.B. in 1889 after the action of Toski. In 1892 Colonel Kitchener succeeded Sir Francis (Lord) Grenfell as sirdar of the Egyptian army, and three years later, when he had completed his predecessor's work of re-organizing the forces of the khedive, he began the formation of an expeditionary force on the sound military frontier of Wadi Halfa. The advance into the Sudan (see Sudan: *History*, *Campaigns*) was prepared by thorough administrative work on his part which gained universal admiration. In 1896 Kitchener won the action of Firket (June 7) and advanced the frontier and the railway to Dongola. In 1897 Sir Archibald Hunter's capture of Abu Hamed (Aug. 7) carried the Egyptian flag one stage further and in 1898 the resolve to destroy the Mahdi's power was openly indicated by the despatch of a British force to co-operate with the Egyptians. The sirdar, who in 1896 became a British major-general and received the K.C.B., commanded the united army, which stormed the Mahdist zareba on the river Atbara on the 8th of April, and, the outposts being soon afterwards advanced to Metemmeh and Nasri, the British force was augmented to the strength of a division for the final advance on Khartum. Kitchener's work was crowned and the power of the Dervishes utterly destroyed by the victory of Omdurman (Sept. 2), for which he was raised to the peerage as Baron Kitchener of Khartum, received the G.C.B., the thanks of parliament and a grant of £30,000. Little more than a year afterwards, while still sirdar of the Egyptian army, he was promoted lieutenant-general and appointed chief-of-staff to Lord Roberts in the South African War (see Transvaal: *History*). In this capacity he served in the campaign of Paardeberg, the advance on Bloemfontein and the subsequent northward advance to Pretoria, and on Lord Roberts's return to England in November 1900 succeeded him as commander-in-chief, receiving at the same time the local rank of general. In June 1902 the long and harassing war came to its close, and Kitchener was rewarded by advancement to the dignity of viscount, promotion to the substantive rank of general "for distinguished service," the thanks of parliament and a grant of £50,000. He was also included in the Order of Merit.

Immediately after the peace he went to India as commander-in-chief in the East Indies, and in this position, which he held for seven years, he carried out not only many far-reaching administrative reforms but a complete reorganization and strategical redistribution of the British and native forces. On leaving India in 1909 he was promoted field marshal, and succeeded the duke of Connaught as commander-in-chief and high commissioner in the Mediterranean. This post, not of great importance in itself, was regarded as a central command of the colonial as distinct from the home and the Indian forces, and on his appointment Lord Kitchener (after a visit to Japan) undertook a tour of inspection of the forces of the empire, and went to Australia and New Zealand in order to assist in drawing up local schemes of defence. In this mission he was highly successful and earned golden opinions. But soon after his return to England in April 1910 he declined to take up his Mediterranean appointment, owing to his dislike of its inadequate scope, and he was succeeded in June by Sir Ian Hamilton.

KITE, the Kyte or Glede[1] of Chaucer and Milton, and of modern ornithologists, once probably the most familiar bird of prey in Great Britain, and now one of the rarest. Three or four hundred years ago foreigners were struck with its abundance in the streets of London. It was doubtless the scavenger in ordinary of that and other large towns (as kindred species now are in Eastern lands), except where its place was taken by the raven; but Sir Thomas Browne (c. 1660) wrote of the birds of Norwich—"in good plenty about the city which makes so few kites to be seen hereabout." John Wolley has well remarked of the modern Londoners that few "who see the paper toys hovering over the fields in fine days of summer, have any idea that the bird from which they derive their name used to float all day in fair weather high over the heads of their ancestors." Even at the beginning of the 19th century the kite formed a feature of many a rural landscape in England, as they had done in the days when the poet Cowper wrote of them. But an evil time soon came upon the species. It must have been always hated by the henwife, but the resources of civilization in the shape of the gun and the gin were denied to her. They were, however, employed with fatal zeal by the gamekeeper; for the kite, which had long afforded the supremest sport to the falconer, was now left friendless,"[1] and in a very few years it seems to have been exterminated throughout the greater part of England, certain woods in the Western Midlands, as well as Wales, excepted. In these latter a small remnant still exists; but the well-wishers of this beautiful species are naturally chary of giving information that might lead to its further persecution. In Scotland there is no reason to suppose that its numbers suffered much diminution until about 1835, or even later, when the systematic destruction of "vermin" on so many moors was begun. In Scotland, however, it is now as much restricted to certain districts as in England or Wales, and those districts it would be most inexpedient to indicate.

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[1] "Glede" is [illegible] word common to cognate languages [illegible], cognate with "glide" is [illegible] another English name.

The kite is, according to its sex, from 25 to 27 in. in length, about one half of which is made up by its deeply forked tail, capable of great expansion, and therefore a powerful rudder, enabling the bird while soaring on its wide wings, more than 5 ft. in extent, to direct its circling course with scarcely a movement that is apparent to the spectator below. Its general colour is pale reddish-brown or cinnamon, the head being greyish-white, but almost each feather has the shaft dark. The tail feathers are broad, of a light red, barred with deep brown, and furnish the salmon fisher with one of the choicest materials of his "flies." The nest, nearly always built in the crotch of a large tree, is formed of sticks intermixed with many strange substances collected as chance may offer, but among them rags[2] seem always to have a place. The eggs, three or four in number, are of a dull white, spotted and blotched with several shades of brown, and often lilac. It is especially mentioned by old authors that in Great Britain the kite was resident throughout the year; whereas on the Continent it is one of the most regular and marked migrants, stretching its wings towards the south in autumn, wintering in Africa, and returning in spring to the land of its birth.

There is a second European species, not distantly related, the *Milvus migrans* or *M. ater* of most authors,[3] smaller in size, with a general dull blackish-brown plumage and a less forked tail. In some districts this is much commoner than the red kite, and on one occasion it has appeared in England. Its habits are very like those of the species already described, but it seems to be more addicted to fishing. Nearly allied to this black kite are the *M. aegyptius* of Africa, the *M. govinda* (the common pariah kite of India),[4] the *M. melanotis* of Eastern Asia, and the *M. affinis* and *M. isurus*; the last is by some authors removed to another genus or sub-genus as *Lophoictinia*, and is peculiar to Australia, while *M. affinis* also occurs in Ceylon, Burma, and some of the Malay countries as well. All these may be considered true kites, while those next to be mentioned are more aberrant forms. First there is *Elanus*, the type of which is *E. caeruleus*, a beautiful little bird, the black-winged kite of English authors, that comes to the south of Europe from Africa, and has several congeners—*E. axillaris* and *E. scriptus* of Australia being most worthy of notice. An extreme development of this form is found in the African *Nauclerus riocourii*, as well as in *Elanoides furcatus*, the swallow-tailed kite, a widely-ranging bird in America, and remarkable for its length of wing and tail, which gives it a marvellous power of flight, and serves to explain the unquestionable fact of its having twice appeared in Great Britain. To *Elanus* also *Ictinia*, another American form, is allied, though perhaps more remotely, and it is represented by *I. mississippiensis*, the Mississippi kite, which is by some considered to be but the northern race of the Neotropical *I. plumbea*. *Gampsonyx*, *Rostrhamus* and *Cymindis*, all belonging to the Neotropical region, complete the series of forms that seem to compose the sub-family *Milvinae*, though there may be doubt about the last, and some systematists would thereto add the perns or honey-buzzards, *Perninae*.

(A. N.)

KITE-FLYING, the art of sending up into the air, by means of the wind, light frames of varying shapes covered with paper or cloth (called kites, after the bird—in German *Drache*, dragon), which are attached to long cords or wires held in the hand or wound on a drum. When made in the common diamond form, or triangular with a semicircular head, kites usually have a pendulous tail appended for balancing purposes. The tradition is that kites were invented by Archytas of Tarentum four centuries before the Christian era, but they have been in use among Asiatic peoples and savage tribes like the Maoris of New Zealand from time immemorial. Kite-flying has always been a national pastime of the Koreans, Chinese, Japanese, Tonkinese, Annamese, Malays and East Indians. It is less popular among the peoples of Europe. The origin of the sport, although obscure, is usually ascribed to religion. With the Maoris it still retains a distinctly religious character, and the ascent of the kite is accompanied by a chant called the kite-song. The Koreans attribute its origin to a general, who, hundreds of years ago, inspirited his troops by sending up a kite with a lantern attached, which was mistaken by his army for a new star and a token of divine succour. Another Korean general is said to have been the first to put the kite to mechanical uses by employing one to span a stream with a cord, which was then fastened to a cable and formed the nucleus of a bridge. In Korea, Japan and China, and indeed throughout Eastern Asia, even the tradespeople may be seen indulging in kite-flying while waiting for customers. Chinese and Japanese kites are of many shapes, such as birds, dragons, beasts and fishes. They vary in size, but are often as much as 7 ft. in height or breadth, and are constructed of bamboo strips covered with rice paper or very thin silk. In China the ninth day of the ninth month is "Kites' Day," when men and boys of all classes betake themselves to neighbouring eminences and fly their kites. Kite-fighting is a feature of the pastime in Eastern Asia. The cord near the kite is usually stiffened with a mixture of glue and crushed glass or porcelain. The kite-flyer manœuvres to get his kite to windward of that of his adversary, then allows his cord to drift against his enemy's, and by a sudden jerk to cut it through and bring its kite to grief. The Malays possess a large variety of kites, mostly without tails. The Sultan of Johor sent to the Columbian Exposition at Chicago in 1893 a collection of fifteen different kinds. Asiatic musical kites bear one or more perforated reeds or bamboos which emit a plaintive sound that can be heard for great distances. The ignorant, believing that these kites frighten away evil spirits, often keep them flying all night over their houses.

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[1] George, third earl of Orford, died in 1791, and Colonel Thornton, who with him had been the latest follower of this highest branch of the art of falconry, broke up his hawking establishment not many years after. There is no evidence that the pursuit of the kite was in England or any other country reserved to kings or privileged persons, but the taking of it was quite beyond the powers of the ordinary trained falcons, and in older days practically became limited to those of the sovereign. Hence the kite had attached to it, especially in France, the epithet of "royal," which has still survived in the specific appellation of *regalis* applied to it by many ornithologists. The scandalous work of Sir Antony Weldon (*Court and Character of King James*, p. 104) bears witness to the excellence of the kite as a quarry in an amusing story of the "British Solomon," whose master-falconer, Sir Thomas Monson, being determined to outdo the performance of the French king's falconer, who, when sent to England to show sport, "could not kill one kite, ours being more magnanimous than the French kite," at last succeeded, after an outlay of £1000, in getting a cast of hawks that took nine kites running—"never missed one." On the strength of this, James was induced to witness a flight at Royston, "but the kite went to such a mountee as all the field lost sight of kite and hawke and all, and neither kite nor hawke were either seen or heard of to this present."

[2] Thus justifying the advice of Shakespeare's Autolycus (*Winter's Tale*, iv. 3)—"When the kite builds, look to lesser linen"—very necessary in the case of the laundresses in olden time, when the bird commonly frequented their drying-grounds.

[3] Dr R. Bowdler Sharpe (*Cat. Birds Brit. Mus.* i. 322) calls it *M. korschun*, but the figure of S. G. Gmelin's *Accipiter Korschun*, whence the name is taken, unquestionably represents the moor-buzzard (*Circus aeruginosus*).

[4] The Brahminy kite of India, *Haliastur Indus*, seems to be rather a fishing eagle.

There are various metaphorical uses of the term "kite-flying," such as in commercial slang, when "flying a kite" means raising money on credit (cf. "raising the wind"), or in political slang for seeing "how the wind blows." And "flying-kites," in nautical language, are the topmost sails.

Kite-flying for scientific purposes began in the middle of the 18th century. In 1752 Benjamin Franklin made his memorable kite experiment, by which he attracted electricity from the air and demonstrated the electrical nature of lightning. A more systematic use of kites for scientific purposes may, however, be said to date from the experiments made in the last quarter of the 19th century. (E. B.)

Meteorological Use.—Many European and American meteorological services employ kites regularly, and obtain information not only of the temperature, but also of the humidity and velocity of the air above. The kites used are mostly modifications of the so-called box-kites, invented by L. Hargrave. Roughly these kites may be said to resemble an ordinary box with the two ends removed, and also the middle part of each of the four sides. The original Hargrave kite, the form generally used, has a rectangular section; in Russia a semicircular section with the curved part facing the wind is most in favour; in England the diamond-shaped section is preferred for meteorological purposes owing to its simplicity of construction. Stability depends on a multitude of small details of construction, and long practice and experience are required to make a really good kite. The sizes most in use have from 30 to 80 sq. ft. of sail area. There is no difficulty about raising a kite to a vertical height of one or even two miles on suitable days, but heights exceeding three miles are seldom reached. On the 29th of November 1905 at Lindenberg, the Prussian Aeronautical Observatory, the upper one of a train of six kites attained an altitude of just four miles. The total lifting surface of these six kites was nearly 300 sq. ft., and the length of wire a little over nine miles. The kites are invariably flown on a steel wire line, for the hindrance to obtaining great heights is not due so much to the weight of the line as to the wind pressure upon it, and thus it becomes of great importance to use a material that possesses the greatest possible strength, combined with the smallest possible size. Steel piano wire meets this requirement, for a wire of $\frac{1}{32}$ in. diameter will weigh about 16 lb to the mile, and stand a strain of some 250–280 lb before it breaks. Some stations prefer to use one long piece of wire of the same gauge throughout without a join, others prefer to start with a thin wire and join on thicker and thicker wire as more kites are added. The process of kite-flying is as follows. The first kite is started either with the self-recording instruments secured in it, or hanging from the wire a short distance below it. Wire is then paid out, whether quickly or slowly depends on the strength of the wind, but the usual rate is from two to three miles per hour. The quantity that one kite will take depends on the kite and on the wind, but roughly speaking it may be said that each 10 sq. ft. of lifting surface on the kite should carry 1000 ft. of $\frac{1}{32}$ in. wire without difficulty. When as much wire as can be carried comfortably has run out another kite is attached to the line, and the paying out is continued; after a time a third is added, and so on. Each kite increases the strain upon the wire, and moreover adds to the height and makes it more uncertain what kind of wind the upper kites will encounter; it also adds to the time that is necessary to haul in the kites. In each way the risk of their breaking away is increased, for the wind is very uncertain and is liable to alter in strength. Since to attain an exceptional height the wire must be strained nearly to its breaking point, and under such conditions a small increase in the strength of the wind will break the wire, it follows that great heights can only be attained by those who are willing to risk the trouble and expense of frequently having their wire and train of kites break away. The weather is the essential factor in kite-flying. In the S.E. of England in winter it is possible on about two days out of three, and in summer on about one day out of three. The usual cause of failure is want of wind, but there are a few days when the wind is too strong. (For meteorological results, &c., see METEOROLOGY.) (W. H. DI.)

Military Use.—A kite forms so extremely simple a method of lifting anything to a height in the air that it has naturally been suggested as being suitable for various military purposes, such as signalling to a long distance, carrying up flags, or lamps, or semaphores. Kites have been used both in the army and in the navy for floating torpedoes on hostile positions. As much as two miles of line have been paid out. For purposes of photography a small kite carrying a camera to a considerable height may be caused to float over a fort or other place of which a bird's-eye view is required, the shutter being operated by electric wire, or slow match, or clockwork. Many successful photographs have been thus obtained in England and America.

The problem of lifting a man by means of kites instead of by a captive balloon is a still more important one. The chief military advantages to be gained are: (1) less transport is required; (2) they can be used in a strong wind; (3) they are not so liable to damage, either from the enemy's fire or from trees, &c., and are easier to mend; (4) they can be brought into use more quickly; (5) they are very much cheaper, both in construction and in maintenance, not requiring any costly gas.

Captain B. F. S. Baden-Powell, of the Scots Guards, in June 1894 constructed, at Pirbright Camp, a huge kite 36 ft. high, with which he successfully lifted a man on different occasions. He afterwards improved the contrivance, using five or six smaller kites attached together in preference to one large one. With this arrangement he frequently ascended as high as 100 ft. The kites were hexagonal, being 12 ft. high and 12 ft. across. The apparatus, which could be packed in a few minutes into a simple roll, weighed in all about 1 cwt. This appliance was proved to be capable of raising a man even during a dead calm, the retaining line being fixed to a wagon and towed along. Lieut. H.D. Wise made some trials in America in 1897 with some large kites of the Hargrave pattern (Hargrave having previously himself ascended in Australia), and succeeded in lifting a man 40 ft. above the ground. In the Russian army a military kite apparatus has also been tried, and was in evidence at the manœuvres in 1898. Experiments have also been carried out by most of the European powers. (B. F. S. B.-P.)

KIT-FOX (*Canis* [*Vulpes*] *velox*), a small fox, from north-western America, measuring less than a yard in length, with a tail of nearly a third this length. There is a good deal of variation in the colour of the fur, the prevailing tint being grey. A specimen in the Zoological Gardens of London had the back and tail dark grey, the tail tipped with black, and a rufous wash on the cheeks, shoulders, flanks and outer surface of the limbs, with the under surface white. The specific name was given on account of the extraordinary swiftness of the animal. (See CARNIVORA.)

KITTO, JOHN (1804–1854), English biblical scholar, was the son of a mason at Plymouth, where he was born on the 4th of December 1804. An accident brought on deafness, and in November 1819 he was sent to the workhouse, where he was employed in making list shoes. In 1823 a fund was raised on his behalf, and he was sent to board with the clerk of the guardians, having his time at his own disposal, and the privilege of making use of a public library. After preparing a small volume of miscellanies, which was published by subscription, he studied dentistry with Anthony Norris Groves in Exeter. In 1825 he obtained congenial employment in the printing office of the Church Missionary Society at Islington, and in 1827 was transferred to the same society's establishment at Malta. There he remained for eighteen months, but shortly after his return to England he accompanied Groves and other friends on a private missionary enterprise to Bagdad, where he obtained personal knowledge of Oriental life and habits which he afterwards applied with tact and skill in the illustration of biblical scenes and incidents. Plague broke out, the missionary establishment was broken up, and in 1832 Kitto returned to England. On arriving in London he was engaged in the preparation of various serial publications of the Society for the Diffusion of Useful Knowledge, the most important of which were the *Pictorial History of Palestine* and the *Pictorial Bible*. The *Cyclopaedia of Biblical Literature*, edited under his superintendence, appeared in two volumes in 1843–1845 and passed through three editions. His *Daily Bible Illustrations* (8 vols. 1849–1853) received an appreciation which is not yet extinct. In 1850 he received an annuity of £100 from the civil list. In August 1854 he went to Germany for the waters of Cannstatt on the Neckar, where on the 25th of November he died.

See Kitto's own work, *The Lost Senses* (1845); J. E. Ryland's *Memoirs of Kitto* (1856); and John Eadie's *Life of Kitto* (1857).

KITTUR, a village of British India, in the Belgaum district of Bombay; pop. (1901), 4922. It contains a ruined fort, formerly the residence of a Mahratta chief. In connexion with a disputed succession to this chiefship in 1824, St John Thackeray, an uncle of the novelist, was killed when approaching the fort under a flag of truce; and a nephew of Sir Thomas Munro, governor of Madras, fell subsequently when the fort was stormed.

KITZINGEN, a town of Germany, in the kingdom of Bavaria on the Main, 95 m. S.E. of Frankfort-on-Main by rail, at the junction of the main-lines to Passau, Würzburg and Schweinfurt. Pop. (1900), 8489. A bridge, 300 yards long, connects it with its suburb Etwashausen on the left bank of the river. A railway bridge also spans the Main at this point. Kitzingen is still surrounded by its old walls and towers, and has an Evangelical and two Roman Catholic churches, two municipal museums, a town-hall, a grammar school, a richly endowed hospital and two old convents. Its chief industries are brewing, cask-making and the manufacture of cement and colours. Considerable trade in wine, fruit, grain and timber is carried on by boats on the Main. Kitzingen possessed a Benedictine abbey in the 8th century, and later belonged to the bishopric of Würzburg.

See F. Bernbeck, *Kitzinger Chronik 745–1565* (Kitzingen, 1899).

KIU-KIANG FU, a prefecture and prefectural city in the province of Kiang-si, China. The city, which is situated on the south bank of the Yangtsze-kiang, 15 m. above the point where the Kan Kiang flows into that river from the Po-yang lake, stands in 29° 42′ N. and 116° 8′ E. The north face of the city is separated from the river by only the width of a roadway, and two large lakes lie on its west and south fronts. The walls are from 5 to 6 m. in circumference, and are more than usually strong and broad. As is generally the case with old cities in China, Kiu-Kiang has repeatedly changed its name. Under the Tsin dynasty (A.D. 265–420), it was known as Sin-Yang, under the Liang dynasty (502–557) as Kiang Chow, under the Suy dynasty (589–618) as Kiu-Kiang, under the Sung dynasty (960–1127) as Ting-Kiang, and under the Ming dynasty (1368–1644) it assumed the name it at present bears. Kiu-Kiang has played its part in the history of the empire, and has been repeatedly besieged and sometimes taken, the last time being in February 1853, when the T'ai-p'ing rebels gained possession of the city. After their manner they looted and utterly destroyed it, leaving only the remains of a single street to represent the once flourishing town. The position of Kiu-Kiang on the Yangtsze-kiang and its proximity to the channels of internal communication through the Po-yang lake, more especially to those leading to the green-tea-producing districts of the provinces of Kiang-si and Ngan-hui, induced Lord Elgin to choose it as one of the treaty ports to be opened under the terms of his treaty (1861). Unfortunately, however, it stands above instead of below the outlet of the Po-yang lake, and this has proved to be a decided drawback to its success as a commerical port. The immediate effect of opening the town to foreign trade was to raise the population in one year from 10,000 to 40,000. The population in 1908, exclusive of foreigners, was officially estimated at 36,000. The foreign settlement extends westward from the city, along the bank of the Yangtsze-kiang, and is bounded on its extreme west by the P'un river, which there runs into the Yangtsze. The bund, which is 500 yards long, was erected by the foreign community. The climate is good, and though hot in the summer months is invariably cold and bracing in the winter. According to the customs returns the value of the trade of the port amounted in 1902 to £2,854,704, and in 1904 to £3,489,816, of which £1,726,506 were imports and £1,763,310 exports. In 1904 322,266 ℔. of opium were imported.

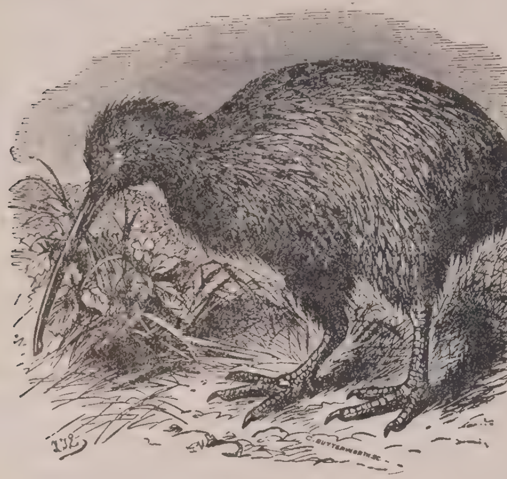
KIUSTENDIL, the chief town of a department in Bulgaria, situated in a mountainous country, on a small affluent of the Struma, 43 m. S.W. of Sofia by rail. Pop. (1906), 12,353. The streets are narrow and uneven, and the majority of the houses are of clay or wood. The town is chiefly notable for its hot mineral springs, in connexion with which there are nine bathing establishments. Small quantities of gold and silver are obtained from mines near Kiustendil, and vines, tobacco and fruit are largely cultivated. Some remains survive of the Roman period, when the town was known as Pautalia, Ulpia Pautalia, and Pautalia Aurelii. In the 10th century it became the seat of a bishopric, being then and during the later middle ages known by the Slavonic name of Velbuzhd. After the overthrow of the Servian kingdom it came into the possession of Constantine, brother of the despot Yovan Dragash, who ruled over northern Macedonia. Constantine was expelled and killed by the Turks in 1394. In the 15th century Kiustendil was known as Velbushka Banya, and more commonly as Konstantinova Banya (Constantine's Bath), from which has developed the Turkish name Kiustendil.

KIVU, a considerable lake lying in the Central African (or Albertine) rift-valley, about 60 m. N. of Tanganyika, into which it discharges its waters by the Rusizi River. On the north it is separated from the basin of the Nile by a line of volcanic peaks. The length of the lake is about 55 m., and its greatest breadth over 30, giving an area, including islands, of about 1100 sq. m. It is about 4830 ft. above sea-level and is roughly triangular in outline, the longest side lying to the west. The coast-line is much broken, especially on the south-east, where the indentations present a fjord-like character. The lake is deep, and the shores are everywhere high, rising in places in bold precipitous cliffs of volcanic rock. A large island, Kwijwi or Kwichwi, oblong in shape and traversed by a hilly ridge, runs in the direction of the major axis of the lake, south-west of the centre, and there are many smaller islands. The lake has many fish, but no crocodiles or hippopotami. South of Kivu the rift-valley is blocked by huge ridges, through which the Rusizi now breaks its way in a succession of steep gorges, emerging from the lake in a foaming torrent, and descending 2000 ft. to the lacustrine plain at the head of Tanganyika. The lake fauna is a typically fresh-water one, presenting no affinities with the marine or "halolimnic" fauna of Tanganyika and other Central African lakes, but is similar to that shown by fossils to have once existed in the more northern parts of the rift-valley. The former outlet or extension in this direction seems to have been blocked in recent geological times by the elevation of the volcanic peaks which dammed back the water, causing it finally to overflow to the south. This volcanic region is of great interest and has various names, that most used being Mfumbiro (*q.v.*), though this name is sometimes restricted to a single peak. Kivu and Mfumbiro were first heard of by J. H. Speke in 1861, but not visited by a European until 1894, when Count von Götzen passed through the country on his journey across the continent. The lake and its vicinity were subsequently explored by Dr R. Kandt, Captain Bethe, E. S. Grogan, J. E. S. Moore, and Major St Hill Gibbons. The ownership of Kivu and its neighbourhood was claimed by the Congo Free State and by Germany, the dispute being settled in 1910, after Belgium had taken over the Congo State. The frontier agreed upon was the west bank of the Rusizi, and the west shore of the lake. The island of Kwijwi also fell to Belgium.

See R. Kandt, *Caput Nili* (Berlin, 1904), and *Karte des Kivusees*, 1: 285,000, with text by A. v. Bockelmann (Berlin, 1902); E. S. Grogan and A. H. Sharpe, *From the Cape to Cairo* (London, 1900); J. E. S. Moore, *To the Mountains of the Moon* (London, 1901); A. St H. Gibbons, *Africa from South to North*, ii. (London, 1904).

KIWI, or KIWI-KIWI, the Maori name—first apparently introduced to zoological literature by Lesson in 1828 (*Man.*

d'Ornithologie, ii. 210, or *Voy. de la "Coquille," zoologie*, p. 418), and now very generally adopted in English—of one of the most characteristic forms of New Zealand birds, the *Apteryx* of scientific writers. This remarkable bird was unknown till George Shaw described and figured it in 1813 (*Nat. Miscellany*, pls. 1057, 1058) from a specimen brought to him from the southern coast of that country by Captain Barcley of the ship "Providence." At Shaw's death, in the same year, it passed into the possession of Lord Stanley, afterwards 13th earl of Derby, and president of the Zoological Society, and it is now with the rest of his collection in the Liverpool Museum. Considering the state of systematic ornithology at the time, Shaw's assignment of a position to this new and strange bird, of which he had but the skin, does him great credit, for he said it seemed "to approach more nearly to the Struthious and Gallinaceous tribes than to any other." And his credit is still greater when we find the venerable John Latham, who is said to have examined the specimen with Shaw, placing it some years later among the penguins (*Gen. Hist. Birds*, x. 394), being apparently led to that conclusion through its functionless wings and the backward situation of its legs. In this false allocation, James Francis Stephens also in 1826 acquiesced (*Gen. Zoology*, xiii. 70). Meanwhile in 1820 K. J. Temminck, who had never seen a specimen, had assorted it with the dodo in an order to which he applied the name of *Inertes* (*Man. d'Ornithologie*, i. cxiv.). In 1831 R. P. Lesson, who had previously (*loc. cit.*) made some blunders about it, placed it (*Traité d'Ornithologie*, p. 12), though only, as he says, "par analogie et *a priori*," in his first division of birds, "Oiseaux Anomaux," which is equivalent to what we now call *Ratitae*, making of it a separate family "Nullipennes." At that time no second example was known, and some doubt was felt, especially on the Continent, as to the very existence of such a bird [1]—though Lesson had himself when in the Bay of Islands in April 1824 (*Voy. "Coquille," ut supra*) heard of it; and a few years later J. S. C. Dumont d'Urville had seen its skin, which the naturalists of his expedition procured, worn as a tippet by a Maori chief at Tolaga Bay (Houa-houa),[2] and in 1830 gave what proves to be on the whole very accurate information concerning it (*Voy. "Astrolabe,"* ii. 107). To put all suspicion at rest, Lord Derby sent his unique specimen for exhibition at a meeting of the Zoological Society, on the 12th of February 1833 (*Proc. Zool. Society*, 1833, p. 24), and a few months later (*tom. cit.*, p. 80) William Yarrell communicated to that body a complete description of it, which was afterwards published in full with an excellent portrait (*Trans. Zool. Society*, vol. i. p. 71, pl. 10). Herein the systematic place of the species, as akin to the Struthious birds, was placed beyond cavil, and the author called upon all interested in zoology to aid in further research as to this singular form. In consequence of this appeal a legless skin was within two years sent to the society (*Proceedings*, 1835, p. 61) obtained by W. Yate of Waimate, who said it was the second he had seen, and that he had kept the bird alive for nearly a fortnight, while in less than another couple of years additional information (*op. cit.*, 1837, p. 24) came from T. K. Short to the effect that he had seen two living, and that all Yarrell had said was substantially correct, except underrating its progressive powers. Not long afterwards Lord Derby received and in March 1838 transmitted to the same society the trunk and viscera of an *Apteryx*, which, being entrusted to Sir R. Owen, furnished that eminent anatomist, in conjunction with other specimens of the same kind received from Drs Lyon and George Bennett, with the materials of the masterly monograph laid before the society in instalments, and ultimately printed in its *Transactions* (ii. 257; iii. 277). From this time the whole structure of the kiwi has certainly been far better known than that of nearly any other bird, and by degrees other examples found their way to England, some of which were distributed to the various museums of the Continent and of America.[3]



Kiwi.

In 1847 much interest was excited by the reported discovery of another species of the genus (*Proceedings*, 1847, p. 51), and though the story was not confirmed, a second species was really soon after made known by John Gould (*tom. cit.*, p. 93; *Transactions*, vol. iii. p. 379, pl. 57) under the name of *Apteryx oweni*—a just tribute to the great master who had so minutely explained the anatomy of the group. Three years later A. D. Bartlett drew attention to the manifest difference existing among certain examples, all of which had hitherto been regarded as specimens of *A. australis*, and the examination of a large series led him to conclude that under that name two distinct species were confounded. To the second of these, the third of the genus (according to his views), he gave the name of *A. mantelli* (*Proceedings*, 1850, p. 274), and it soon turned out that to this new form the majority of the specimens already obtained belonged. In 1851 the first kiwi known to have reached England alive was presented to the Zoological Society by Eyre, then lieutenant-governor of New Zealand. This was found to belong to the newly described *A. mantelli*, and some careful observations on its habits in captivity were published by John Wolley and another (*Zoologist*, pp. 3409, 3605).[4] Subsequently the society has received several other live examples of this form, besides one of the real *A. australis* (*Proceedings*, 1872, p. 861), some of *A. oweni*, and one of a supposed fourth species, *A. haasti*, characterized in 1871 by Potts (*Ibis*, 1872, p. 35; *Trans. N. Zeal. Institute*, iv. 204; v. 195).[5]

The kiwis form a group of the subclass *Ratitae* to which the rank of an order may fitly be assigned, as they differ in many important particulars from any of the other existing forms of Ratite birds. The most obvious feature the *Apteryges* afford is the presence of a back toe, while the extremely aborted condition of the wings, the position of the nostrils—almost at the tip of the maxilla—and the absence of an after-shaft in the feathers, are characters nearly as manifest, and others not less determinative, though more recondite, will be found on examination. The kiwis are peculiar to New Zealand, and it is believed that *A. mantelli* is the representative in the North Island of the southern *A. australis*, both being of a dark reddish-brown, longitudinally striped with light yellowish-brown, while *A. oweni*, of a light greyish-brown transversely barred with black, is said to occur in both islands. About the size of a large domestic fowl, they are birds of nocturnal habit, sleeping, or at least inactive, by day, feeding mostly on earth-worms, but occasionally swallowing berries, though in captivity they will eat flesh suitably minced. Sir Walter Buller writes (*B. of New Zealand*, p. 362):—

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[1] Cuvier in the second edition of his *Règne Animal* only referred to it in a footnote (i. 498).

[2] Cruise in 1822 (*Journ. Residence in New Zealand*, p. 313) had spoken of an "emeu" found in that island, which must of course have been an *Apteryx*.

[3] In 1842, according to Broderip (*Penny Cyclopaedia*, xxiii. 146), two had been presented to the Zoological Society by the New Zealand Company, and two more obtained by Lord Derby, one of which he had given to Gould. In 1844 the British Museum possessed three, and the sale catalogue of the Rivoli Collection, which passed in 1846 to the Academy of Natural Sciences at Philadelphia, includes a single specimen—probably the first taken to America.

[4] This bird in 1859 laid an egg, and afterwards continued to lay one or two more every year. In 1865 a male of the same species was introduced, but though a strong disposition to breed was shown on the part of both, and the eggs, after the custom of the *Ratitae*, were incubated by him, no progeny was hatched (*Proceedings*, 1868, p. 329).

[5] A fine series of figures of all these supposed species is given by Rowley (*Orn. Miscellany*, vol. i. pls. 1–6). Some others, as *A. maxima*, *A. mollis*, and *A. fusca* have also been indicated, but proof of their validity has yet to be adduced.

> "The kiwi is in some measure compensated for the absence of wings by its swiftness of foot. When running it makes wide strides and carries the body in an oblique position, with the neck stretched to its full extent and inclined forwards. In the twilight it moves about cautiously and as noiselessly as a rat, to which, indeed, at this time it bears some outward resemblance. In a quiescent posture, the body generally assumes a perfectly rotund appearance; and it sometimes, but only rarely, supports itself by resting the point of its bill on the ground. It often yawns when disturbed in the daytime, gaping its mandibles in a very grotesque manner. When provoked it erects the body, and, raising the foot to the breast, strikes downwards with considerable force and rapidity, thus using its sharp and powerful claws as weapons of defence. . . . While hunting for its food the bird makes a continual sniffing sound through the nostrils, which are placed at the extremity of the upper mandible. Whether it is guided as much by touch as by smell I cannot safely say; but it appears to me that both senses are used in the action. That the sense of touch is highly developed seems quite certain, because the bird, although it may not be audibly sniffing, will always first touch an object with the point of its bill, whether in the act of feeding or of surveying the ground; and when shut up in a cage or confined in a room it may be heard, all through the night, tapping softly at the walls. . . . It is interesting to watch the bird, in a state of freedom, foraging for worms, which constitute its principal food: it moves about with a slow action of the body; and the long, flexible bill is driven into the soft ground, generally home to the very root, and is either immediately withdrawn with a worm held at the extreme tip of the mandibles, or it is gently moved to and fro, by an action of the head and neck, the body of the bird being perfectly steady. It is amusing to observe the extreme care and deliberation with which the bird draws the worm from its hiding-place, coaxing it out as it were by degrees, instead of pulling roughly or breaking it. On getting the worm fairly out of the ground, it throws up its head with a jerk, and swallows it whole."

The foregoing extract refers to *A. mantelli*, but there is little doubt of the remarks being equally applicable to *A. australis*, and probably also to *A. oweni*, though the different proportion of the bill in the last points to some diversity in the mode of feeding. (A. N.)

KIZILBASHES (Turkish, "Red-Heads"), the nickname given by the Orthodox Turks to the Shiitic Turkish immigrants from Persia, who are found chiefly in the plains from Kara-Hissar along Tokat and Amasia to Angora. During the wars with Persia the Turkish sultans settled them in these districts. They are strictly speaking persianized Turks, and speak pure Persian. There are many Kizilbashes in Afghanistan. Their immigration dates only from the time of Nadir Shah (1737). They are an industrious honest folk, chiefly engaged in trade and as physicians, scribes, and so on. They form the bulk of the amir's cavalry. Their name seems to have been first used in Persia of the Shiites in allusion to their red caps.

See Ernest Chantre, *Recherches anthropologiques dans l'Asie occidentale* (Lyons, 1895).

KIZIL IRMAK, *i.e.* "Red River" (anc. *Halys*), the largest river in Asia Minor, rising in the Kizil Dagh at an altitude of 6500 ft., and running south-west past Zara to Sivas. Below Sivas it flows south to the latitude of Kaisarieh, and then curves gradually round to the north. Finally, after a course of about 600 m., it discharges its waters into the Black Sea between Sinope and Samsun, where it forms a large delta. The only important tributaries are the Delije Irmak on the right and the Geuk Irmak on the left bank.

KIZLYAR (KIZLIAR, or KIZLAR), a town of Russia, in Caucasia, in the province of Terek, 120 m. N.E. of Vladikavkaz, in the low-lying delta of the river Terek, about 35 m. from the Caspian. The population decreased from 8309 in 1861 to 7353 in 1897. The town lies to the left of the main stream between two of the larger secondary branches, and is subject to flooding. The town proper, which spreads out round the citadel, has Tatar, Georgian and Armenian quarters. The public buildings include the Greek cathedral, dating from 1786; a Greek nunnery, founded by the Georgian chief Daniel in 1736; the Armenian church of SS Peter and Paul, remarkable for its size and wealth. The population is mainly supported by the gardens and vineyards irrigated by canals from the river. A government vineyard and school of viticulture are situated 3½ m. from the town. About 1,200,000 gallons of Kizlyar wine are sold annually at the fair of Nizhniy-Novgorod. Silk and cotton are woven. Kizlyar is mentioned as early as 1616, but the most notable accession of inhabitants (Armenians, Georgians and Persians) took place in 1715. Its importance as a fortress dates from 1736, but the fortress is no longer kept in repair.

KIZYL-KUM, a desert of Western Asia, stretching S.E. of the Aral Lake between the river Syr-darya on the N.E. and the river Amu-darya on the S.W. It measures some 370 by 220 m., and is in part covered with drift-sand or dunes, many of which are advancing slowly but steadily towards the S.W. In character they resemble those of the neighbouring Kara-kum desert (see KARA-KUM). On the whole the Kizyl-kum slopes S.W. towards the Aral Lake, where its altitude is only about 160 ft. as compared with 2000 in the S.E. In the vicinity of that lake the surface is covered with Aralo-Caspian deposits; but in the S.E., as it ascends towards the foothills of the Tian-shan system, it is braided with deep accumulations of fertile loess.

KJERULF, HALFDAN (1815–1868), Norwegian musical composer, the son of a high government official, was born at Christiania on the 15th of September 1815. His early education was at Christiania University, for a legal career, and not till he was nearly 26—on the death of his father—was he able to devote himself entirely to music. As a fact, he actually started on his career as a music teacher and composer of songs before ever having seriously studied music at all, and not for ten years did he attract any particular notice. Then, however, his Government paid for a year's instruction for him at Leipzig. For many years after his return to Norway Kjerulf tried in vain to establish serial classical concerts, while he himself was working with Björnson and other writers at the composition of lyrical songs. His fame rests almost entirely on his beautiful and manly national part-songs and solos; but his pianoforte music is equally charming and simple. Kjerulf died at Grefsen, on the 11th of August 1868.

KJERULF, THEODOR (1825–1888), Norwegian geologist, was born at Christiania on the 30th of March 1825. He was educated in the university at Christiania, and subsequently studied at Heidelberg, working in Bunsen's laboratory. In 1858 he became professor of geology in the university of his native city, and he was afterwards placed in charge of the geological survey of the country, then established mainly through his influence. His contributions to the geology of Norway were numerous and important, especially in reference to the southern portion of the country, and to the structure and relations of the Archaean and Palaeozoic rocks, and the glacial phenomena. His principal results were embodied in his work *Udsigt over det sydlige Norges Geologi* (1879). He was author also of some poetical works. He died at Christiania on the 25th of October 1888.

KLADNO, a mining town of Bohemia, Austria, 18 m. W.N.W. of Prague by rail. Pop. (1900), 18,600, mostly Czech. It is situated in a region very rich in iron-mines and coal-fields and possesses some of the largest iron and steel works in Bohemia. Near it is the mining town of Buschtěhrad (pop. 3510), situated in the centre of very extensive coal-fields. Buschtěhrad was originally the name of the castle only. This was from the 15th century to 1630 the property of the lords of Kolovrat, and came by devious inheritance through the grand-dukes of Tuscany, to the emperor Francis Joseph. The name Buschtěhrad was first given to the railway, and then to the town, which had been called Buckow since its foundation in 1700. There is another castle of Buschtěhrad near Hořic. Kladno, which for centuries had been a village of no importance, was sold in 1705 by the grand-duchess Anna Maria of Tuscany to the cloister in

Břewnow, to which it still belongs. The mining industry began in 1842.

KLAFSKY, KATHARINA (1855–1896), Hungarian operatic singer, was born at Szt János, Wieselburg, of humble parents. Being employed at Vienna as a nurserymaid, her fine soprano voice led to her being engaged as a chorus singer, and she was given good lessons in music. By 1882 she became well-known in Wagnerian rôles at the Leipzig theatre, and she increased her reputation at other German musical centres. In 1892 she appeared in London, and had a great success in Wagner's operas, notably as Brünnhilde and as Isolde, her dramatic as well as vocal gifts being of an exceptional order. She sang in America in 1895, but died of brain disease in 1896.

A *Life*, by L. Ordemann, was published in 1903 (Leipzig).

KLAGENFURT (Slovene, *Celovec*), the capital of the Austrian duchy of Carinthia, 212 m. S.W. of Vienna by rail. Pop. (1900), 24,314. It is picturesquely situated on the river Glan, which is in communication with the Wörther-see by the 3 m. long Lend canal. Among the more noteworthy buildings are the parish church of St Ægidius (1709), with a tower 298 ft. in height; the cathedral of SS Peter and Paul (1582–1593, burnt 1723, restored 1725); the churches of the Benedictines (1613), of the Capuchins (1646), and of the order of St Elizabeth (1710). To these must be added the palace of the prince-bishop of Gurk, the *burg* or castle, existing in its present form since 1777; and the *Landhaus* or house of assembly, dating from the end of the 14th century, and containing a museum of natural history, and collection of minerals, antiquities, seals, paintings and sculptures. The most interesting public monument is the great *Lindwurm* or Dragon, standing in the principal square (1590). The industrial establishments comprise white lead factories, machine and iron foundries, and commerce is active, especially in the mineral products of the region.

Upon the Zollfeld to the north of the city once stood the ancient Roman town of Virunum. During the Middle Ages Klagenfurt became the property of the crown, but by a patent of Maximilian I. of the 24th of April 1518, it was conceded to the Carinthian estates, and has since then taken the place of St Veit as capital of Carinthia. In 1535, 1636, 1723 and 1796 Klagenfurt suffered from destructive fires, and in 1690 from the effects of an earthquake. On the 29th of March 1797 the French took the city, and upon the following day it was occupied by Napoleon as his headquarters.

KLAJ (latinized CLAJUS), **JOHANN** (1616–1656), German poet, was born at Meissen in Saxony. After studying theology at Wittenberg he went to Nuremberg as a "candidate for holy orders," and there, in conjunction with Georg Philipp Harsdörffer, founded in 1644 the literary society known as the Pegnitz order. In 1647 he received an appointment as master in the Sebaldus school in Nuremberg, and in 1650 became preacher at Kitzingen, where he died in 1656. Klaj's poems consist of dramas, written in stilted language and redundant with adventures, among which are *Höllen- und Himmelfahrt Christi* (Nuremberg, 1644), and *Herodes, der Kindermörder* (Nuremberg, 1645), and a poem, written jointly with Harsdörffer, *Pegnesische Schäfergedicht* (1644), which gives in allegorical form the story of his settlement in Nuremberg.

See Tittmann, *Die Nürnberger Dichterschule* (Göttingen, 1847).

KLAMATH, a small tribe of North American Indians of Lutuamian stock. They ranged around the Klamath river and lakes, and are now on the Klamath reservation, southern Oregon.

See A. S. Gatschet, "Klamath Indians of Oregon," *Contributions to North American Ethnology*, vol. ii. (Washington, 1890).

KLAPKA, GEORG (1820–1892), Hungarian soldier, was born at Temesvár on the 7th of April 1820, and entered the Austrian army in 1838. He was still a subaltern when the Hungarian revolution of 1848 broke out, and he offered his services to the patriot party. He served in important staff appointments during the earlier part of the war which followed; then, early in 1849, he was ordered to replace General Mészáros, who had been defeated at Kaschau, and as general commanding an army corps he had a conspicuous share in the victories of Kapólna, Isaszeg, Waitzen, Nagy Sarlo and Komárom. Then, as the fortune of war turned against the Hungarians, Klapka, after serving for a short time as minister of war, took command at Komárom, from which fortress he conducted a number of successful expeditions until the capitulation of Világos in August put an end to the war in the open field. He then brilliantly defended Komárom for two months, and finally surrendered on honourable terms. Klapka left the country at once, and lived thenceforward for many years in exile, at first in England and afterwards chiefly in Switzerland. He continued by every means in his power to work for the independence of Hungary, especially at moments of European war, such as 1854, 1859 and 1866, at which an appeal to arms seemed to him to promise success. After the war of 1866 (in which as a Prussian major-general he organized a Hungarian corps in Silesia) Klapka was permitted by the Austrian government to return to his native country, and in 1867 was elected a member of the Hungarian Chamber of Deputies, in which he belonged to the Deák party. In 1877 he made an attempt to reorganize the Turkish army in view of the war with Russia. General Klapka died at Budapest on the 17th of May 1892. A memorial was erected to his memory at Komárom in 1896.

He wrote *Memoiren* (Leipzig, 1850); *Der Nationalkrieg in Ungarn*, &c. (Leipzig, 1851); a history of the Crimean War, *Der Krieg im Orient . . . bis Ende Juli 1855* (Geneva, 1855); and *Aus meinen Erinnerungen* (translated from the Hungarian, Zürich, 1887).

KLAPROTH, HEINRICH JULIUS (1783–1835), German Orientalist and traveller, was born in Berlin on the 11th of October 1783, the son of the chemist Martin Heinrich Klaproth (*q.v.*). He devoted his energies in quite early life to the study of Asiatic languages, and published in 1802 his *Asiatisches Magazin* (Weimar, 1802–1803). He was in consequence called to St Petersburg and given an appointment in the academy there. In 1805 he was a member of Count Golovkin's embassy to China. On his return he was despatched by the academy to the Caucasus on an ethnographical and linguistic exploration (1807–1808), and was afterwards employed for several years in connexion with the academy's Oriental publications. In 1812 he moved to Berlin; but in 1815 he settled in Paris, and in 1816 Humboldt procured him from the king of Prussia the title and salary of professor of Asiatic languages and literature, with permission to remain in Paris as long as was requisite for the publication of his works. He died in that city on the 28th of August 1835.

The principal feature of Klaproth's erudition was the vastness of the field which it embraced. His great work *Asia polyglotta* (Paris, 1823 and 1831, with *Sprachatlas*) not only served as a *résumé* of all that was known on the subject, but formed a new departure for the classification of the Eastern languages, more especially those of the Russian Empire. To a great extent, however, his work is now superseded. The *Itinerary of a Chinese Traveller* (1821), a series of documents in the military archives of St Petersburg purporting to be the travels of George Ludwig von ——, and a similar series obtained from him in the London foreign office, are all regarded as spurious.

Klaproth's other works include: *Reise in den Kaukasus und Georgien in den Jahren 1807 und 1808* (Halle, 1812–1814; French translation, Paris, 1823); *Geographisch-historische Beschreibung des östlichen Kaukasus* (Weimar, 1814); *Tableaux historiques de l'Asie* (Paris, 1826); *Mémoires relatifs à l'Asie* (Paris, 1824–1828); *Tableau historique, geographique, ethnographique et politique de Caucase* (Paris, 1827); and *Vocabulaire et grammaire de la langue géorgienne* (Paris, 1827).

KLAPROTH, MARTIN HEINRICH (1743–1817), German chemist, was born at Wernigerode on the 1st of December 1743. During a large portion of his life he followed the profession of an apothecary. After acting as assistant in pharmacies at Quedlinburg, Hanover, Berlin and Danzig successively he came to Berlin on the death of Valentin Rose the elder in 1771 as manager of his business, and in 1780 he started an establishment on his own account in the same city, where from 1782 he was pharmaceutical assessor of the Ober-Collegium Medicum. In 1787 he was appointed lecturer in chemistry to the Royal Artillery, and when the university was founded in 1810 he was selected to be the professor of chemistry. He died in Berlin on the 1st of January 1817. Klaproth was the leading chemist of his time in Germany.

An exact and conscientious worker, he did much to improve and systematize the processes of analytical chemistry and mineralogy, and his appreciation of the value of quantitative methods led him to become one of the earliest adherents of the Lavoisierian doctrines outside France. He was the first to discover uranium, zirconium and titanium, and to characterize them as distinct elements, though he did not obtain any of them in the pure metallic state; and he elucidated the composition of numerous substances till then imperfectly known, including compounds of the then newly recognized elements: tellurium, strontium, cerium and chromium.

His papers, over 200 in number, were collected by himself in *Beiträge zur chemischen Kenntniss der Mineralkörper* (5 vols., 1795–1810) and *Chemische Abhandlungen gemischten Inhalts* (1815). He also published a *Chemisches Wörterbuch* (1807–1810), and edited a revised edition of F. A. C. Gren's *Handbuch der Chemie* (1806).

KLÉBER, JEAN BAPTISTE (1753–1800), French general, was born on the 9th of March 1753, at Strassburg, where his father was a builder. He was trained, partly at Paris, for the profession of architect, but his opportune assistance to two German nobles in a tavern brawl obtained for him a nomination to the military school of Munich. Thence he obtained a commission in the Austrian army, but resigned it in 1783 on finding his humble birth in the way of his promotion. On returning to France he was appointed inspector of public buildings at Belfort, where he studied fortification and military science. In 1792 he enlisted in the Haut-Rhin volunteers, and was from his military knowledge at once elected adjutant and soon afterwards lieutenant-colonel. At the defence of Mainz he so distinguished himself that though disgraced along with the rest of the garrison and imprisoned, he was promptly reinstated, and in August 1793 promoted general of brigade. He won considerable distinction in the Vendéan war, and two months later was made a general of division. In these operations began his intimacy with Marceau, with whom he defeated the Royalists at Le Mans and Savenay. For openly expressing his opinion that lenient measures ought to be pursued towards the Vendéans he was recalled; but in April 1794 he was once more reinstated and sent to the Army of the Sambre-and-Meuse. He displayed his skill and bravery in the numerous actions around Charleroi, and especially in the crowning victory of Fleurus, after which in the winter of 1794–95 he besieged Mainz. In 1795 and again in 1796 he held the chief command of an army temporarily, but declined a permanent appointment as commander-in-chief. On the 13th of October 1795 he fought a brilliant rearguard action at the bridge of Neuwied, and in the offensive campaign of 1796 he was Jourdan's most active and successful lieutenant. Having, after the retreat to the Rhine (see FRENCH REVOLUTIONARY WARS), declined the chief command, he withdrew into private life early in 1798. He accepted a division in the expedition to Egypt under Bonaparte, but was wounded in the head at Alexandria in the first engagement, which prevented his taking any further part in the campaign of the Pyramids, and caused him to be appointed governor of Alexandria. In the Syrian campaign of 1799, however, he commanded the vanguard, took El-Arish, Gaza and Jaffa, and won the great victory of Mount Tabor on the 15th of April 1799. When Napoleon returned to France towards the end of 1799 he left Kléber in command of the French forces. In this capacity, seeing no hope of bringing his army back to France or of consolidating his conquests, he made the convention of El-Arish. But when Lord Keith, the British admiral, refused to ratify the terms, he attacked the Turks at Heliopolis, though with but 10,000 men against 60,000, and utterly defeated them on the 20th of March 1800. He then retook Cairo, which had revolted from the French. Shortly after these victories he was assassinated at Cairo by a fanatic on the 14th of June 1800, the same day on which his friend and comrade Desaix fell at Marengo. Kléber was undoubtedly one of the greatest generals of the French revolutionary epoch. Though he distrusted his powers and declined the responsibility of supreme command, there is nothing in his career to show that he would have been unequal to it. As a second in command he was not excelled by any general of his time. His conduct of affairs in Egypt at a time when the treasury was empty and the troops were discontented for want of pay, shows that his powers as an administrator were little—if at all—inferior to those he possessed as a general.

Ernouf, the grandson of Jourdan's chief of staff, published in 1867 a valuable biography of Kléber. See also Reynaud, *Life of Merlin de Thionville*; Ney, *Memoirs*; Dumas, *Souvenirs*; Las Casas, *Memorial de Ste Hélène*; J. Charavaray, *Les Généraux morts pour la patrie*; General Pajol, *Kléber*; lives of Marceau and Desaix; M. F. Rousseau, *Kléber et Menou en Egypte* (Paris, 1900).

KLEIN, JULIUS LEOPOLD (1810–1876), German writer of Jewish origin, was born at Miskolcz, in Hungary. He was educated at the gymnasium in Pest, and studied medicine in Vienna and Berlin. After travelling in Italy and Greece, he settled as a man of letters in Berlin, where he remained until his death on the 2nd of August 1876. He was the author of many dramatic works, among others the historical tragedies *Maria von Medici* (1841); *Luines* (1842); *Zenobia* (1847); *Moreto* (1859); *Maria* (1860); *Strafford* (1862) and *Heliodora* (1867); and the comedies *Die Herzogin* (1848); *Ein Schützling* (1850); and *Voltaire* (1862). The tendency of Klein as a dramatist was to become bombastic and obscure, but many of his characters are vigorously conceived, and in nearly all his tragedies there are passages of brilliant rhetoric. He is chiefly known as the author of the elaborate though uncompleted *Geschichte des Dramas* (1865–1876), in which he undertook to record the history of the drama from the earliest times. He died when about to enter upon the Elizabethan period, to the treatment of which he had looked forward as the chief part of his task. The work, which is in thirteen bulky volumes, gives proof of immense learning, but is marred by eccentricities of style and judgment.

Klein's *Dramatische Werke* were collected in 7 vols. (1871–1872).

KLEIST, BERND HEINRICH WILHELM VON (1777–1811), German poet, dramatist and novelist, was born at Frankfort-on-Oder on the 18th of October 1777. After a scanty education, he entered the Prussian army in 1792, served in the Rhine campaign of 1796 and retired from the service in 1799 with the rank of lieutenant. He next studied law and philosophy at the university of Frankfort-on-Oder, and in 1800 received a subordinate post in the ministry of finance at Berlin. In the following year his roving, restless spirit got the better of him, and procuring a lengthened leave of absence he visited Paris and then settled in Switzerland. Here he found congenial friends in Heinrich Zschokke (*q.v.*) and Ludwig Friedrich August Wieland (1777–1819), son of the poet; and to them he read his first drama, a gloomy tragedy, *Die Familie Schroffenstein* (1803), originally entitled *Die Familie Ghonorez*. In the autumn of 1802 Kleist returned to Germany; he visited Goethe, Schiller and Wieland in Weimar, stayed for a while in Leipzig and Dresden, again proceeded to Paris, and returning in 1804 to his post in Berlin was transferred to the *Domänenkammer* (department for the administration of crown lands) at Königsberg. On a journey to Dresden in 1807 Kleist was arrested by the French as a spy, and being sent to France was kept for six months a close prisoner at Châlons-sur-Marne. On regaining his liberty he proceeded to Dresden, where in conjunction with Adam Heinrich Müller (1779–1829) he published in 1808 the journal *Phöbus*. In 1809 he went to Prague, and ultimately settled in Berlin, where he edited (1810–1811) the *Berliner Abendblätter*. Captivated by the intellectual and musical accomplishments of a certain Frau Henriette Vogel, Kleist, who was himself more disheartened and embittered than ever, agreed to do her bidding and die with her, carrying out this resolution by first shooting the lady and then himself on the shore of the Wannsee near Potsdam, on the 21st of November 1811. Kleist's whole life was filled by a restless striving after ideal and illusory happiness, and this is largely reflected in his work. He was by far the most important North German dramatist of the Romantic movement, and no other of the Romanticists approaches him in the energy with which he expresses patriotic indignation.

His first tragedy, *Die Familie Schroffenstein*, has been already referred to; the material for the second, *Penthesilea* (1808), queen of the Amazons, is taken from a Greek source and presents a picture of wild passion. More successful than either of these was his romantic play, *Das Käthchen von Heilbronn, oder Die Feuerprobe* (1808), a poetic drama full of medieval bustle and mystery, which has retained its popularity. In comedy, Kleist made a name with *Der zerbrochene Krug* (1811), while *Amphitryon* (1808), an adaptation of Molière's comedy, is of less importance. Of Kleist's other dramas, *Die Hermannschlacht* (1809) is a dramatic treatment of an historical subject and is full of references to the political conditions of his own times. In it he gives vent to his hatred of his country's oppressors. This, together with the drama *Prinz Friedrich von Homburg*, the latter accounted Kleist's best work, was first published by Ludwig Tieck in *Kleists hinterlassene Schriften* (1821). *Robert Guiskard*, a drama conceived on a grand plan, was left a fragment. Kleist was also a master in the art of narrative, and of his *Gesammelte Erzählungen* (1810–1811), *Michael Kohlhaas*, in which the famous Brandenburg horse dealer in Luther's day (see KOHLHASE) is immortalized, is one of the best German stories of its time. He also wrote some patriotic lyrics. His *Gesammelte Schriften* were published by Ludwig Tieck (3 vols. 1826) and by Julian Schmidt (new ed. 1874); also by F. Muncker (4 vols. 1882); by T. Zolling (4 vols. 1885); by K. Siegen, (4 vols. 1895); and in a critical edition by E. Schmidt (5 vols. 1904–1905). His *Ausgewählte Dramen* were published by K. Siegen (Leipzig, 1877); and his letters were first published by E. von Bülow, *Heinrich von Kleists Leben und Briefe* (1848).

See further A. Wilbrandt, *Heinrich von Kleist* (1863); O. Brahm, *Heinrich von Kleist* (1884); R. Bonafous, *Henri de Kleist, sa vie et ses œuvres* (1894); H. Conrad, *Heinrich von Kleist als Mensch und Dichter* (1896); G. Minde-Pouet, *Heinrich von Kleist, seine Sprache und sein Stil* (1897); R. Steig, *Heinrich von Kleists Berliner Kämpfe* (1901); F. Servaes, *Heinrich von Kleist* (1902); S. Wukadinowic, *Kleist-Studien* (1904); S. Rahmer, *H. von Kleist als Mensch und Dichter* (1909).

KLEIST, EWALD CHRISTIAN VON (1715–1759), German poet, was born at Zeblin, near Köslin in Pomerania, on the 7th of March 1715. After attending the Jesuit school in Deutschkrona and the gymnasium in Danzig, he proceeded in 1731 to the university of Königsberg, where he studied law and mathematics. On the completion of his studies, he entered the Danish army, in which he became an officer in 1736. Recalled to Prussia by Frederick II. in 1740, he was appointed lieutenant in a regiment stationed at Potsdam, where he became acquainted with J. W. L. Gleim (*q.v.*), who interested him in poetry. After distinguishing himself at the battle of Mollwitz (April 10, 1741) and the siege of Neisse (1741), he was promoted captain in 1749 and major in 1756. Quartered during the winter of 1757–1758 in Leipzig, he found relief from his irksome military duties in the society of Gotthold Ephraim Lessing (*q.v.*). Shortly afterwards in the battle of Kunersdorf, on the 12th of August 1759, he was mortally wounded while leading the attack, and died at Frankfort-on-Oder on the 24th of August following.

Kleist's chief work is a poem in hexameters, *Der Frühling* (1749), for which Thomson's *Seasons* largely supplied ideas. In his description of the beauties of nature Kleist shows real poetical genius, an almost modern sentiment and fine taste. He also wrote some charming odes, idylls and elegies, and a small epic poem *Cissides und Paches* (1759), the subject being two Thessalian friends who die an heroic death for their country in a battle against the Athenians.

Kleist published in 1756 the first collection of his *Gedichte*, which was followed by a second in 1758. After his death his friend Karl Wilhelm Ramler (*q.v.*) published an edition of *Kleists sämtliche Werke* in 2 vols. (1760). A critical edition was published by A. Sauer, in 3 vols. (1880–1882). Cf. further, A. Chuquet, *De Ewaldi Kleistii vita et scriptis* (Paris, 1887), and H. Pröhle, *Friedrich der Grosse und die deutsche Literatur* (1872).

KLERKSDORP, a town of the Transvaal, 118 m. S.W. of Johannesburg and 192 m. N.E. of Kimberley by rail. Pop. (1904), 4276 of whom 2203 were whites. The town, built on the banks of the Schoonspruit 10 m. above its junction with the Vaal, possesses several fine public buildings. In the neighbourhood are gold-mines, the reef appearing to form the western boundary of the Witwatersrand basin. Diamonds (green in colour) and coal are also found in the district. Klerksdorp was one of the villages founded by the first Boers who crossed the Vaal, dating from 1838. The modern town, which is on the side of the *spruit* opposite the old village, was founded in 1888.

KLESL (or KHLESL), **MELCHIOR** (1552–1630), Austrian statesman and ecclesiastic, was the son of a Protestant baker, and was born in Vienna. Under the influence of the Jesuits he was converted to Roman Catholicism, and having finished his education at the universities of Vienna and Ingolstadt, he was made chancellor of the university of Vienna; and as official and vicar-general of the bishop of Passau he exhibited the zeal of a convert in forwarding the progress of the counter-reformation in Austria. He became bishop of Vienna in 1598; but more important was his association with the archduke Matthias which began about the same time. Both before and after 1612, when Matthias succeeded his brother Rudolph II. as emperor, Klesl was the originator and director of his policy, although he stoutly opposed the concessions to the Hungarian Protestants in 1606. He assisted to secure the election of Matthias to the imperial throne, and sought, but without success, to strengthen the new emperor's position by making peace between the Catholics and the Protestants. When during the short reign of Matthias the question of the imperial succession demanded prompt attention, the bishop, although quite as anxious as his opponents to retain the empire in the house of Habsburg and to preserve the dominance of the Roman Catholic Church, advised that this question should be shelved until some arrangement with the Protestant princes had been reached. This counsel was displeasing to the archduke Maximilian and to Ferdinand, afterwards the emperor Ferdinand II. who believed that Klesl was hostile to the candidature of the latter prince. It was, however, impossible to shake his influence with the emperor; and in June 1618, a few months before the death of Matthias, he was seized by order of the archdukes and imprisoned at Ambras in Tirol. In 1622 Klesl, who had been a cardinal since 1615, was transferred to Rome by order of Pope Gregory XV., and was released from imprisonment. In 1627 Ferdinand II. allowed him to return to his episcopal duties in Vienna, where he died on the 18th of September 1630.

See J. Freiherr von Hammer-Purgstall, *Khlesls Leben* (Vienna, 1847–1851); A. Kerschbaumer, *Kardinal Klesl* (Vienna, 1865); and *Klesls Briefe an Rudolfs II. Obersthofmeister A. Freiherr von Dietrichstein*, edited by V. Bibl. (Vienna, 1900).

KLINGER, FRIEDRICH MAXIMILIAN VON (1752–1831), German dramatist and novelist, was born of humble parentage at Frankfort-on-Main, on the 17th of February 1752. His father died when he was a child, and his early years were a hard struggle. He was enabled, however, in 1774 to enter the university of Giessen, where he studied law; and Goethe, with whom he had been acquainted since childhood, helped him in many ways. In 1775 Klinger gained with his tragedy *Die Zwillinge* a prize offered by the Hamburg theatre, under the auspices of the actress Sophie Charlotte Ackermann (1714–1792) and her son the famous actor and playwright, Friedrich Ludwig Schröder (1744–1816). In 1776 Klinger was appointed *Theaterdichter* to the "Seylersche Schauspiel-Gesellschaft" and held this post for two years. In 1778 he entered the Austrian military service and took part in the Bavarian war of succession. In 1780 he went to St Petersburg, became an officer in the Russian army, was ennobled and attached to the Grand Duke Paul, whom he accompanied on a journey to Italy and France. In 1785 he was appointed director of the corps of cadets, and having married a natural daughter of the empress Catharine, was made praeses of the Academy of Knights in 1799. In 1803 Klinger was nominated by the emperor Alexander curator of the university of Dorpat, an office he held until 1817; in 1811 he became lieutenant-general. He then gradually gave up his official posts, and after living for many years in honourable retirement, died at Dorpat on the 25th of February 1831.

Klinger was a man of vigorous moral character and full of fine feeling, though the bitter experiences and deprivations of his youth are largely reflected in his dramas. It was one of his earliest works, *Sturm und Drang* (1776), which gave its name to this literary epoch. In addition to this tragedy and *Die Zwillinge* (1776), the chief plays of his early period of passionate fervour and restless "storm and stress" are *Die neue Arria* (1776), *Simsone Grisaldo* (1776) and *Stilpo und seine Kinder* (1780). To a later period belongs the fine double tragedy of *Medea in Korinth* and *Medea auf dem Kaukasos* (1791). In Russia he devoted himself mainly to the writing of philosophical romances, of which the best known are *Fausts Leben, Taten und Höllenfahrt* (1791), *Geschichte Giafars des Barmeciden* (1792) and *Geschichte Raphaels de Aquillas* (1793). This series was closed in 1803 with *Betrachtungen und Gedanken über verschiedene Gegenstände der Welt und der Literatur*. In these works Klinger gives calm and dignified expression to the leading ideas which the period of *Sturm und Drang* had bequeathed to German classical literature.

Klinger's works were published in twelve volumes (1809–1815), also 1832–1833 and 1842. The most recent edition is in eight volumes (1878–1880); but none of these is complete. A selection will be found in A. Sauer, *Stürmer und Dränger*, vol. i. (1883). See E. Schmidt, *Lenz und Klinger* (1878); M. Rieger, *Klinger in der Sturm- und Drangperiode* (1880); and *Klinger in seiner Reife* (1896).

KLINGER, MAX (1857–), German painter, etcher and sculptor, was born at Plagwitz near Leipzig. He attended the classes at the Carlsruhe art school in 1874, and went in the following year to Berlin, where in 1878 he created a sensation at the Academy exhibition with two series of pen-and-ink drawings—the "Series upon the Theme of Christ" and "Fantasies upon the Finding of a Glove." The daring originality of these imaginative and eccentric works caused an outburst of indignation, and the artist was voted insane; nevertheless the "Glove" series was bought by the Berlin National Gallery. His painting of "The Judgment of Paris" caused a similar storm of indignant protest in 1887, owing to its rejection of all conventional attributes and the naïve directness of the conception. His vivid and somewhat morbid imagination, with its leaning towards the gruesome and disagreeable, and the Goyaesque turn of his mind, found their best expression in his "cycles" of etchings: "Deliverances of Sacrificial Victims told in Ovid," "A Brahms Phantasy," "Eve and the Future," "A Life," and "Of Death"; but in his use of the needle he does not aim at the technical excellence of the great masters; it supplies him merely with means of expressing his ideas. After 1886 Klinger devoted himself more exclusively to painting and sculpture. In his painting he aims neither at classic beauty nor modern truth, but at grim impressiveness not without a touch of mysticism. His "Pietà" at the Dresden Gallery, the frescoes at the Leipzig University, and the "Christ in Olympus," at the Modern Gallery in Vienna, are characteristic examples of his art. The Leipzig Museum contains his sculptured "Salome" and "Cassandra." In sculpture he favours the use of vari-coloured materials in the manner of the Greek chryselephantine sculpture. His "Beethoven" is a notable instance of his work in this direction.

KLIPSPRINGER, the Boer name of a small African mountain-antelope (*Oreotragus saltator*), ranging from the Cape through East Africa to Somaliland and Abyssinia, and characterized by its blunt rounded hoofs, thick pithy hair and gold-spangled colouring. The klipspringer represents a genus by itself, the various local forms not being worthy of more than racial distinction. The activity of these antelopes is marvellous.

KLONDIKE, a district in Yukon Territory, north-western Canada, approximately in 64° N. and 140° W. The limits are rather indefinite, but the district includes the country to the south of the Klondike River, which comes into the Yukon from the east and has several tributaries, as well as Indian River, a second branch of the Yukon, flowing into it some distance above the Klondike. The richer gold-bearing gravels are found along the creeks tributary to these two rivers within an area of about 800 sq. m. The Klondike district is a dissected peneplain with low ridges of rounded forms rising to 4250 ft. above the sea at the Dome which forms its centre. All of the gold-bearing creeks rise not far from the Dome and radiate in various directions toward the Klondike and Indian rivers, the most productive being Bonanza with its tributary Eldorado, Hunker, Dominion and Gold Run. Of these, Eldorado, for the two or three miles in which it was gold-bearing, was much the richest, and for its length probably surpassed any other known placer deposit. Rich gravel was discovered on Bonanza Creek in 1896, and a wild rush to this almost inaccessible region followed, a population of 30,000 coming in within the next three or four years with a rapidly increasing output of gold, reaching in 1900 the climax of $22,000,000. Since then the production has steadily declined, until in 1906 it fell to $5,600,000. The richest gravels were worked out before 1910, and most of the population had left the Klondike for Alaska and other regions; so that Dawson, which for a time was a bustling city of more than 10,000, dwindled to about 3000 inhabitants. As the ground was almost all frozen, the mines were worked by a thawing process, first by setting fires, afterwards by using steam, new methods being introduced to meet the unusual conditions. Later dredges and hydraulic mining were resorted to with success.

The Klondike, in spite of its isolated position, brought together miners and adventurers from all parts of the world, and it is greatly to the credit of the Canadian government and of the mounted police, who were entrusted with the keeping of order, that life and property were as safe as elsewhere and that no lawless methods were adopted by the miners as in placer mining camps in the western United States. The region was at first difficult of access, but can now be reached with perfect comfort in summer, travelling by well-appointed steamers on the Pacific and the Yukon River. Owing to its perpetually frozen soil, summer roads were excessively bad in earlier days, but good wagon roads have since been constructed to all the important mining centres. Dawson itself has all the resources of a civilized city in spite of being founded on a frozen peat-bog; and is supplied with ordinary market vegetables from farms just across the river. During the winter, when for some time the sun does not appear above the hills, the cold is intense, though usually without wind, but the well-chinked log houses can be kept comfortably warm. When winter travel is necessary dog teams and sledges are generally made use of, except on the stage route south to White Horse, where horses are used. A telegraph line connects Dawson with British Columbia, but the difficulties in keeping it in order are so great over the long intervening wilderness that communication is often broken. Gold is practially the only economic product of the Klondike, though small amounts of tin ore occur, and lignite coal has been mined lower down on the Yukon. The source of the gold seems to have been small stringers of quartz in the siliceous and sericitic schists which form the bed rock of much of the region, and no important quartz veins have been discovered; so that unlike most other placer regions the Klondike has not developed lode mines to continue the production of gold when the gravels are exhausted.

KLOPP, ONNO (1822–1903), German historian, was born at Leer on the 9th of October 1822, and was educated at the universities of Bonn, Berlin and Göttingen. For a few years he was a teacher at Leer and at Osnabrück; but in 1858 he settled at Hanover, where he became intimate with King George V., who made him his *Archivrat*. Thoroughly disliking Prussia, he was in hearty accord with George in resisting her aggressive policy; and after the annexation of Hanover in 1866 he accompanied the exiled king to Hietzing. He became a Roman Catholic in 1874. He died at Penzing, near Vienna, on the 9th of August 1903. Klopp is best known as the author of *Der Fall des Hauses Stuart* (Vienna, 1875–1888), the fullest existing account of the later Stuarts.

His *Der König Friedrich II. und seine Politik* (Schaffhausen, 1867) and *Geschichte Ostfrieslands* (Hanover, 1854–1858) show his dislike of Prussia. His other works include *Der dreissigjährige Krieg bis zum Tode Gustav Adolfs* (Paderborn, 1891–1896); a revised edition of his *Tilly im dreissigjährigen Kriege* (Stuttgart, 1861); a life of George V., *König Georg V.* (Hanover, 1878); *Phillipp Melanchthon* (Berlin, 1897). He edited *Corrispondenza epistolare tra Leopoldo I. imperatore ed il P. Marco l'Aviano capuccino* (Gratz, 1888). Klopp also wrote much in defence of George V. and his claim to Hanover, including the *Offizieller Bericht über die Kriegsereignisse zwischen Hannover und Preussen im Juni 1866* (Vienna, 1867), and he edited the works of Leibnitz in eleven volumes (1861–1884).

See W. Klopp, *Onno Klopp: ein Lebenslauf* (Wehberg, 1907).

KLOPSTOCK, GOTTLIEB FRIEDRICH (1724–1803), German poet, was born at Quedlinburg, on the 2nd of July 1724, the eldest son of a lawyer, a man of sterling character and of a deeply religious mind. Both in his birthplace and on the estate of Friedeburg on the Saale, which his father later rented, young Klopstock passed a happy childhood; and more attention having been given to his physical than to his mental development he grew up a strong healthy boy and was an excellent horseman and skater. In his thirteenth year Klopstock returned to Quedlinburg where he attended the gymnasium, and in 1739 proceeded to the famous classical school of Schulpforta. Here he soon became an adept in Greek and Latin versification, and wrote some meritorious idylls and odes in German. His original intention of making the emperor Henry I. (" The Fowler ") the hero of an epic, was, under the influence of Milton's *Paradise Lost*, with which he became acquainted through Bodmer's translation, abandoned in favour of the religious epic. While yet at school, he had already drafted the plan of *Der Messias*, upon which his fame mainly rests. On the 21st of September 1745 he delivered on quitting school a remarkable " leaving oration " on epic poetry—*Abschiedsrede über die epische Poesie, kultur- und literargeschichtlich erläutert*—and next proceeded to Jena as a student of theology, where he elaborated the first three cantos of the *Messias* in prose. The life at this university being uncongenial to him, he removed in the spring of 1746 to Leipzig, and here joined the circle of young men of letters who contributed to the *Bremer Beiträge*. In this periodical the first three cantos of the *Messias* in hexameters were anonymously published in 1748. A new era in German literature had commenced, and the name of the author soon became known. In Leipzig he also wrote a number of odes, the best known of which is *An meine Freunde* (1747), afterwards recast as *Wingolf* (1767). He left the university in 1748 and became a private tutor in the family of a relative at Langensalza. Here unrequited love for a cousin (the " Fanny " of his odes) disturbed his peace of mind. Gladly therefore he accepted in 1750 an invitation from Jakob Bodmer (*q.v.*), the translator of *Paradise Lost*, to visit him in Zürich. Here Klopstock was at first treated with every kindness and respect and rapidly recovered his spirits. Bodmer, however, was disappointed to find in the young poet of the *Messias* a man of strong worldly interests, and a coolness sprang up between the two friends.

At this juncture Klopstock received from Frederick V. of Denmark, on the recommendation of his minister Count von Bernstorff (1712–1772), an invitation to settle at Copenhagen, with an annuity of 400 talers, with a view to the completion of the *Messias*. The offer was accepted; on his way to the Danish capital Klopstock met at Hamburg the lady who in 1754 became his wife, Margareta (Meta) Moller, (the " Cidli " of his odes), an enthusiastic admirer of his poetry. His happiness was short; she died in 1758, leaving him almost broken-hearted. His grief at her loss finds pathetic expression in the 15th canto of the *Messias*. The poet subsequently published his wife's writings, *Hinterlassene Werke von Margareta Klopstock* (1759), which give evidence of a tender, sensitive and deeply religious spirit. Klopstock now relapsed into melancholy; new ideas failed him, and his poetry became more and more vague and unintelligible. He still continued to live and work at Copenhagen, and next, following Heinrich Wilhelm von Gerstenberg (*q.v.*), turned his attention to northern mythology, which he conceived should replace classical subjects in a new school of German poetry. In 1770, on the dismissal by King Christian VII. of Count Bernstorff from office, he retired with the latter to Hamburg, but retained his pension together with the rank of councillor of legation. Here, in 1773, he issued the last five cantos of the *Messias*. In the following year he published his strange scheme for the regeneration of German letters, *Die Gelehrtenrepublik* (1774). In 1775 he travelled south, and making the acquaintance of Goethe on the way, spent a year at the court of the margrave of Baden at Karlsruhe. Thence, in 1776, with the title of *Hofrat* and a pension from the margrave, which he retained together with that from the king of Denmark, he returned to Hamburg where he spent the remainder of his life. His latter years he passed, as had always been his inclination, in retirement, only occasionally relieved by association with his most intimate friends, busied with philological studies, and hardly interesting himself in the new developments of German literature. The American War of Independence and the Revolution in France aroused him, however, to enthusiasm. The French Republic sent him the diploma of honorary citizenship; but, horrified at the terrible scenes the Revolution had enacted in the place of liberty, he returned it. When 67 years of age he contracted a second marriage with Johanna Elisabeth von Winthem, a widow and a niece of his late wife, who for many years had been one of his most intimate friends. He died at Hamburg on the 14th of March 1803, mourned by all Germany, and was buried with great pomp and ceremony by the side of his first wife in the churchyard of the village of Ottensen.

Klopstock's nature was best attuned to lyrical poetry, and in it his deep, noble character found its truest expression. He was less suited for epic and dramatic representation; for, wrapt up in himself, a stranger to the outer world, without historical culture, and without even any interest in the events of his time, he was lacking in the art of plastic representation such as a great epic requires. Thus the *Messias*, despite the magnificent passages which especially the earlier cantos contain, cannot satisfy the demands such a theme must necessarily make. The subject matter, the Redemption, presented serious difficulties to adequate epic treatment. The Gospel story was too scanty, and what might have been imported from without and interwoven with it was rejected by the author as profane. He had accordingly to resort to Christian mythology; and here again, circumscribed by the dogmas of the Church, he was in danger of trespassing on the fundamental truths of the Christian faith. The personality of Christ could scarcely be treated in an individual form, still less could angels and devils—and in the case of God Himself it was impossible. The result was that, despite the groundwork—the Gospels, the *Acts of the Apostles*, the *Revelation of St John*, and the model ready to hand in Milton's *Paradise Lost*—material elements are largely wanting and the actors in the poem, Divine and human, lack plastic form. That the poem took twenty-five years to complete could not but be detrimental to its unity of design; the original enthusiasm was not sustained until the end, and the earlier cantos are far superior to the later. Thus the intense public interest the work aroused in its commencement had almost vanished before its completion. It was translated into seventeen languages and led to numerous imitations. In his odes Klopstock had more scope for his peculiar talent. Among the best are *An Fanny*; *Der Zürchersee*; *Die tote Klarissa*; *An Cidli*; *Die beiden Musen*; *Der Rheinwein*; *Die frühen Gräber*; *Mein Vaterland*. His religious odes mostly take the form of hymns, of which the most beautiful is *Die Frühlingsfeier*. His dramas, in some of which, notably *Hermanns Schlacht* (1769) and *Hermann und die Fürsten* (1784), he celebrated the deeds of the ancient German hero Arminius, and in others, *Der Tod Adams* (1757) and *Salomo* (1764), took his materials from the Old Testament, are essentially lyrical in character and deficient in action. In addition to *Die Gelehrtenrepublik*, he was also the author of *Fragmente über Sprache und Dichtkunst* (1779) and *Grammatische Gespräche* (1794), works in which he made important contributions to philology and to the history of German poetry.

Klopstock's *Werke* first appeared in seven quarto volumes (1798–1809). At the same time a more complete edition in twelve octavo volumes was published (1798–1817), to which six additional volumes were added in 1830. More recent editions were published in 1844–1845, 1854–1855, 1879 (ed. by R. Boxberger), 1884 (ed. by R. Hamel) and 1893 (a selection edited by F. Muncker). A critical edition of the *Odes* was published by F. Muncker and J. Pawel in 1889; a commentary on these by H. Düntzer (1860; 2nd ed., 1878). For Klopstock's correspondence see K. Schmidt, *Klopstock und seine Freunde* (1810); C. A. H. Clodius, *Klopstocks Nachlass* (1821); J. M. Lappenberg, *Briefe von und an Klopstock* (1867). Cf. further K. F. Cramer, *Klopstock, er und über ihn* (1780–1792); J. G. Gruber, *Klopstocks Leben* (1832); R. Hamel, *Klopstock-Studien* (1879–1880); F. Muncker, *F. G. Klopstock*, the most authoritative biography, (1888); E. Bailly, *Étude sur la vie et les œuvres de Klopstock* (Paris, 1888).

KLOSTERNEUBURG, a town of Austria, in Lower Austria, 5½ m. N.W. of Vienna by rail. Pop. (1900), 11,595. It is situated on the right bank of the Danube, at the foot of the Kahlenberg, and is divided by a small stream into an upper and a lower town. As an important pioneer station Klosterneuburg has various military buildings and stores, and among the schools it possesses an academy of wine and fruit cultivation.

On a hill rising directly from the banks of the Danube stand the magnificent buildings (erected 1730–1834) of the Augustine canonry, founded in 1106 by Margrave Leopold the Holy. This foundation is the oldest and richest of the kind in Austria; it owns much of the land upon which the north-western suburbs of Vienna stand. Among the points of interest within it are the old chapel of 1318, with Leopold's tomb and the altar of Verdun, dating from the 12th century, the treasury and relic-chamber, the library with 30,000 volumes and many MSS., the picture gallery, the collection of coins, the theological hall, and the wine-cellar, containing an immense tun like that at Heidelberg. The inhabitants of Klosterneuburg are mainly occupied in making wine, of excellent quality. There is a large cement factory outside the town. In Roman times the castle of Citium stood in the region of Klosterneuburg. The town was founded by Charlemagne, and received its charter as a town in 1298.

KLOTZ, REINHOLD (1807–1870), German classical scholar, was born near Chemnitz in Saxony on the 13th of March 1807. In 1849 he was appointed professor in the university of Leipzig in succession to Gottfried Hermann, and held this post till his death on the 10th of August 1870. Klotz was a man of unwearied industry, and devoted special attention to Latin literature.

He was the author of editions of several classical authors, of which the most important were: the complete works of Cicero (2nd ed., 1869–1874); Clement of Alexandria (1831–1834); Euripides (1841–1867), in continuation of Pflugk's edition, but unfinished; Terence (1838–1840), with the commentaries of Donatus and Eugraphius. Mention should also be made of: *Handwörterbuch der lateinischen Sprache* (5th ed., 1874); *Römische Litteraturgeschichte* (1847), of which only the introductory volume appeared; an edition of the treatise *De Graecae linguae particulis* (1835–1842) of Matthaeus Deverius (Devares), a learned Corfiote (*c.* 1500–1570), and corrector of the Greek MSS. in the Vatican; the posthumous *Index Ciceronianus* (1872) and *Handbuch der lateinischen Stilistik* (1874). From 1831–1855 Klotz was editor of the *Neue Jahrbücher für Philologie* (Leipzig). During the troubled times of 1848 and the following years he showed himself a strong conservative.

A memoir by his son Richard will be found in the *Jahrbücher* for 1871, pp. 154–163.

KNARESBOROUGH, a market town in the Ripon parliamentary division of the West Riding of Yorkshire, England, 16½ m. W. by N. from York by a branch of the North Eastern railway. Pop. of urban district (1901), 4979. Its situation is most picturesque, on the steep left bank of the river Nidd, which here follows a well-wooded valley, hemmed in by limestone cliffs. The church of St John the Baptist is Early English, but has numerous Decorated and Perpendicular additions; it is a cruciform building containing several interesting monuments. Knaresborough Castle was probably founded in 1070 by Serlo de Burgh. Its remains, however, are of the 14th century, and include a massive keep rising finely from a cliff above the Nidd. After the battle of Marston Moor it was taken by Fairfax, and in 1648 it was ordered to be dismantled. To the south of the castle is St Robert's chapel, an excavation in the rock constructed into an ecclesiastical edifice in the reign of Richard I. Several of the excavations in the limestone, which is extensively quarried, are incorporated in dwelling-houses. A little farther down the river is St Robert's cave, which is supposed to have been the residence of the hermit, and in 1744 was the scene of the murder of Daniel Clarke by Eugene Aram, whose story is told in Lytton's well-known novel. Opposite the castle is the Dropping Well, the waters of which are impregnated with lime and have petrifying power, this action causing the curious and beautiful incrustations formed where the water falls over a slight cliff. The Knaresborough free grammar school was founded in 1616. There is a large agricultural trade, and linen and leather manufactures and the quarries also employ a considerable number of persons.

Knaresborough (*Canardesburg*, *Cnarreburc*, *Cknareburg*), which belonged to the Crown before the Conquest, formed part of William the Conqueror's grant to his follower Serlo de Burgh. Being forfeited by his grandson Eustace FitzJohn in the reign of Stephen, Knaresborough was granted to Robert de Stuteville, from whose descendants it passed through marriage to Hugh de Morville, one of the murderers of Thomas Becket, who with his three accomplices remained in hiding in the castle for a whole year. During the 13th and 14th centuries the castle and lordship changed hands very frequently; they were granted successively to Hubert de Burgh, whose son forfeited them after the battle of Evesham, to Richard, earl of Cornwall, whose son Edmund died without issue; to Piers Gaveston, and lastly to John of Gaunt, duke of Lancaster, and so to the Crown as parcel of the duchy of Lancaster. In 1317 John de Lilleburn, who was holding the castle of Knaresburgh for Thomas duke of Lancaster against the king, surrendered under conditions to William de Ros of Hamelak, but before leaving the castle managed to destroy all the records of the liberties and privileges of the town which were kept in the castle. In 1368 an inquisition was taken to ascertain these privileges, and the jurors found that the burgesses held "all the soil of their borough yielding 7s. 4d. yearly and doing suit at the king's court." In the reign of Henry VIII. Knaresborough is said by Leland to be "no great thing and meanely builded but the market there is quik." During the civil wars Knaresborough was held for some time by the Royalists, but they were obliged to surrender, and the castle was among those ordered to be destroyed by parliament in 1646. A market on Wednesday and a fortnightly fair on the same day from the Feast of St Mark to that of St Andrew are claimed under a charter of Charles II. confirming earlier charters. Lead ore was found and worked on Knaresborough Common in the 16th century. From 1555 to 1867 the town returned two members to parliament, but in the latter year the number was reduced to one, and in 1885 the representation was merged in that of the West Riding.

KNAVE (O.E. *cnafa*, cognate with Ger. *Knabe*, boy), originally a male child, a boy (Chaucer, *Canterbury Tales*: "Clerk's Tale," 1. 388). Like Lat. *puer*, the word was early used as a name for any boy or lad employed as a servant, and so of male servants in general (Chaucer: "Pardoner's Tale," 1. 204). The current use of the word for a man who is dishonest and crafty, a rogue, was however an early usage, and is found in Layamon (*c.* 1205). In playing-cards the lowest court card of each suit, the "jack," representing a medieval servant, is called the "knave." (See also Valet.)

KNEBEL, KARL LUDWIG VON (1744–1834), German poet and translator, was born at the castle of Wallerstein in Franconia on the 30th of November 1744. After having studied law for a short while at Halle, he entered the regiment of the crown prince of Prussia in Potsdam and was attached to it as officer for ten years. Disappointed in his military career, owing to the slowness of promotion, he retired in 1774, and accepting the post of tutor to Prince Konstantin of Weimar, accompanied him and his elder brother, the hereditary prince, on a tour to Paris. On this journey he visited Goethe in Frankfort-on-Main, and introduced him to the hereditary prince, Charles Augustus. This meeting is memorable as being the immediate cause of Goethe's later intimate connexion with the Weimar court. After Knebel's return and the premature death of his pupil he was pensioned. receiving the rank of major. In 1798 he married the singer Luise von Rudorf, and retired to Ilmenau; but in 1805 he removed to Jena, where he lived until his death on the 23rd of February 1834. Knebel's *Sammlung kleiner Gedichte* (1815), issued anonymously, and *Distichen* (1827) contain many graceful sonnets, but it is as a translator that he is best known. His translation of the elegies of Propertius, *Elegien des Properz* (1798), and that of Lucretius' *De rerum natura* (2 vols., 1831) are deservedly praised. Since their first acquaintance Knebel and Goethe were intimate friends, and not the least interesting of Knebel's writings is his correspondence with the eminent poet, *Briefwechsel mit Goethe* (ed. G. E. Guhrauer, 2 vols., 1851).

Knebel's *Literarischer Nachlass und Briefwechsel* was edited by K. A. Varnhagen von Ense and T. Mundt in 3 vols. (1835; 2nd ed., 1840). See Hugo von Knebel-Döberitz, *Karl Ludwig von Knebel* (1890).

KNEE (O. E. *cnéow*, a word common to Indo-European languages, cf. Ger. *Knie*, Fr. *genou*, Span. *hinojo*, Lat. *genu*, Gr. *γόνυ*, Sansk. *janu*), in human anatomy, the articulation of the upper and lower parts of the leg, the joint between the femur and the tibia (see Joints). The word is also used of articulation resembling the knee-joint in shape or position in other animals; it thus is applied to the carpal articulation of the fore leg of a horse, answering to the ankle in man, or to the tarsal articulation or heel of a bird's foot.

KNELLER, SIR GODFREY (1648–1723), a portrait painter whose celebrity belongs chiefly to England, was born in Lübeck in the duchy of Holstein, of an ancient family, on the 8th of August 1648. He was at first intended for the army, and was sent to Leyden to learn mathematics and fortification. Showing, however, a marked preference for the fine arts, he studied in the school of Rembrandt, and under Ferdinand Bol in Amsterdam. In 1672 he removed to Italy, directing his chief attention to Titian and the Caracci; Carlo Maratta gave him some guidance and encouragement. In Rome, and more especially in Venice, Kneller earned considerable reputation by historical paintings as well as portraits. He next went to Hamburg, painting with still increasing success. In 1674 he came to England at the invitation of the duke of Monmouth, was introduced to Charles II., and painted that sovereign, much to his satisfaction, several times. Charles also sent him to Paris, to take the portrait of Louis XIV. When Sir Peter Lely died in 1680, Kneller, who produced in England little or nothing in the historical department, remained without a rival in the ranks of portrait painting; there was no native-born competition worth speaking of. Charles appointed him court painter; and he continued to hold the same post into the days of George I. Under William III. (1692) he was made a knight, under George I. (1715) a baronet, and by order of the emperor Leopold I. a knight of the Roman Empire. Not only his court favour but his general fame likewise was large: he was lauded by Dryden, Addison, Steele, Prior, Tickell and Pope. Kneller's gains also were very considerable; aided by habits of frugality which approached stinginess, he left property yielding an annual income of £2000. His industry was maintained till the last. His studio had at first been in Covent Garden, but in his closing years he lived in Kneller Hall, Twickenham. He died of fever, the date being generally given as the 7th of November 1723, though some accounts say 1726. He was buried in Twickenham church, and has a monument in Westminster Abbey. An elder brother, John Zachary Kneller, an ornamental painter, had accompanied Godfrey to England, and had died in 1702. The style of Sir Godfrey Kneller as a portrait painter represented the decline of that art as practised by Vandyck; Lely marks the first grade of descent, and Kneller the second. His works have much freedom, and are well drawn and coloured; but they are mostly slight in manner, and to a great extent monotonous, this arising partly from the habit which he had of lengthening the oval of all his heads. The colouring may be called brilliant rather than true. He indulged much in the commonplaces of allegory; and, though he had a quality of dignified elegance not unallied with simplicity, genuine simple nature is seldom to be traced in his works. His fame has greatly declined, and could not but do so after the advent of Reynolds. Among Kneller's principal paintings are the "Forty-three Celebrities of the Kit-Cat Club," and the "Ten Beauties of the Court of William III.," now at Hampton Court; these were painted by order of the queen; they match, but match unequally, the "Beauties of the Court of Charles II.," painted by Lely. He executed altogether the likenesses of ten sovereigns, and fourteen of his works appear in the National Portrait Gallery. It is said that Kneller's own favourite performance was the portrait of the "Converted Chinese" in Windsor Castle. His later works are confined almost entirely to England, not more than two or three specimens having gone abroad after he had settled here.

(W. M. R.)

KNICKERBOCKER, HARMEN JANSEN (*c.* 1650–*c.* 1720), Dutch colonist of New Netherland (New York), was a native of Wyhe (Wie), Overyssel, Holland. Before 1683 he settled near what is now Albany, New York, and there in 1704 he bought through Harme Gansevoort one-fourth of the land in Dutchess county near Red Hook, which had been patented in 1688 to Peter Schuyler, who in 1722 deeded seven (of thirteen) lots in the upper fourth of his patent to the seven children of Knickerbocker. The eldest of these children, Johannes Harmensen, received from the common council of the city of Albany a grant of 50 acres of meadow and 10 acres of upland on the south side of Schaghticoke Creek. This Schaghticoke estate was held by Johannes Harmensen's son Johannes (1723–1802), a colonel in the Continental Army in the War of Independence, and by his son Harmen (1779–1855), a lawyer, a Federalist representative in Congress in 1809–1811, a member of the New York Assembly in 1816, and a famous gentleman of the old school, who for his courtly hospitality in his manor was called "the prince of Schaghticoke" and whose name was borrowed by Washington Irving for use in his (Diedrich) *Knickerbocker's History of New York* (1809). Largely owing to this book, the name "Knickerbockers" has passed into current use as a designation of the early Dutch settlers in New York and their descendants. The son of Johannes, David Buel Knickerbacker (1833–1894), who returned to the earlier spelling of the family name, graduated at Trinity College in 1853 and at the General Theological Seminary in 1856, was a rector for many years at Minneapolis, Minnesota, and in 1883 was consecrated Protestant Episcopal bishop of Indiana.

See the series of articles by W. B. Van Alstyne on "The Knickerbocker Family," beginning in vol. xxix., No. 1 (Jan. 1908) of the *New York Genealogical and Biographical Record.*

KNIFE (O. E. *cnif*, a word appearing in different forms in many Teutonic languages, cf. Du. *knijf*, Ger. *Kneif*, a shoemaker's knife, Swed. *knif*; the ultimate origin is unknown; Skeat finds the origin in the root of "nip," formerly "knip"; Fr. *canif* is also of Teutonic origin), a small cutting instrument, with the blade either fixed to the handle or fastened with a hinge so as to clasp into the handle (see CUTLERY). For the knives chipped from flint by prehistoric man see ARCHAEOLOGY and FLINT IMPLEMENTS.

KNIGGE, ADOLF FRANZ FRIEDRICH, FREIHERR VON (1752–1796), German author, was born on the family estate of Bredenbeck near Hanover on the 16th of October 1752. After studying law at Göttingen he was attached successively to the courts of Hesse-Cassel and Weimar as gentleman-in-waiting. Retiring from court service in 1777, he lived a private life with his family in Frankfort-on-Main, Hanau, Heidelberg and Hanover until 1791, when he was appointed *Oberhauptmann* (civil administrator) in Bremen, where he died on the 6th of May 1796. Knigge, under the name "Philo," was one of the most active members of the *Illuminati*, a mutual moral and intellectual improvement society founded by Adam Weishaupt (1748–1830) at Ingolstadt, and which later became affiliated to the Freemasons. Knigge is known as the author of several novels, among which *Der Roman meines Lebens* (1781–1787; new ed., 1805) and *Die Reise nach Braunschweig* (1792), the latter a rather coarsely comic story, are best remembered. His chief literary achievement was, however, *Über den Umgang mit Menschen* (1788), in which he lays down rules to be observed for a peaceful, happy and useful life; it has been often reprinted.

Knigge's *Schriften* were published in 12 volumes (1804–1806). See K. Goedeke, *Adolf, Freiherr von Knigge* (1844); and H. Klencke, *Aus einer alten Kiste* (*Briefe, Handschriften und Dokumente aus dem Nachlasse Knigges*) (1853).

KNIGHT, CHARLES (1791–1873), English publisher and author, the son of a bookseller and printer at Windsor, was born on the 15th of March 1791. He was apprenticed to his father, but on the completion of his indentures he took up journalism and interested himself in several newspaper speculations. In 1823, in conjunction with friends he had made as publisher (1820–1821) of *The Etonian*, he started *Knight's Quarterly Magazine*, to which W. M. Praed, Derwent Coleridge and Macaulay contributed. The venture was brought to a close with its sixth number, but it initiated for Knight a career as publisher and author which extended over forty years. In 1827 Knight was compelled to give up his publishing business, and became the superintendent of the publications of the Society for the Diffusion of Useful Knowledge, for which he projected and edited *The British Almanack and Companion*, begun in 1828. In 1829 he resumed business on his own account with the publication of *The Library of Entertaining Knowledge*, writing several volumes of the series himself. In 1832 and 1833 he started *The Penny Magazine* and

The Penny Cyclopaedia, both of which had a large circulation. *The Penny Cyclopaedia*, however, on account of the heavy excise duty, was only completed in 1844 at a great pecuniary sacrifice. Besides many illustrated editions of standard works, including in 1842 *The Pictorial Shakespeare*, which had appeared in parts (1838–1841), Knight published a variety of illustrated works, such as *Old England* and *The Land we Live in*. He also undertook the series known as *Weekly Volumes*. He himself contributed the first volume, a biography of William Caxton. Many famous books, Miss Martineau's *Tales*, Mrs Jameson's *Early Italian Painters* and G. H. Lewes's *Biographical History of Philosophy*, appeared for the first time in this series. In 1853 he became editor of *The English Cyclopaedia*, which was practically only a revision of *The Penny Cyclopaedia*, and at about the same time he began his *Popular History of England* (8 vols., 1856–1862). In 1864 he withdrew from the business of publisher, but he continued to write nearly to the close of his long life, publishing *The Shadows of the Old Booksellers* (1865), an autobiography under the title *Passages of a Working Life during Half a Century* (2 vols., 1864–1865), and an historical novel, *Begg'd at Court* (1867). He died at Addlestone, Surrey, on the 9th of March 1873.

See A. A. Clowes, *Knight, a Sketch* (1892); and F. Espinasse, in *The Critic* (May 1860).

KNIGHT, DANIEL RIDGWAY (1845–), American artist, was born at Philadelphia, Penn., in 1845. He was a pupil at the École des Beaux-Arts, Paris, under Gleyre, and later worked in the private studio of Meissonier. After 1872 he lived in France, having a house and studio at Poissy on the Seine. He painted peasant women out of doors with great popular success. He was awarded the silver medal and cross of the Legion of Honour, Exposition Universelle, Paris, 1889, and was made a knight of the Royal Order of St Michael of Bavaria, Munich, 1893, receiving the gold medal of honour from the Pennsylvania Academy of Fine Arts, Philadelphia, 1893. His son, Ashton Knight, is also known as a landscape painter.

KNIGHT, JOHN BUXTON (1843–1908), English landscape painter, was born at Sevenoaks, Kent; he started as a schoolmaster, but painting was his hobby, and he subsequently devoted himself to it. In 1861 he had his first picture hung at the Academy. He was essentially an open-air painter, constantly going on sketching tours in the most picturesque spots of England, and all his pictures were painted out of doors. He died at Dover on the 2nd of January 1908. The Chantrey trustees bought his "December's Bareness Everywhere" for the nation in the following month. Most of his best pictures had passed into the collection of Mr Iceton of Putney (including "White Walls of Old England" and "Hereford Cathedral"), Mr Walter Briggs of Burley in Wharfedale (especially "Pinner"), and Mr S. M. Phillips of Wrotham (especially two water-colours of Richmond Bridge).

KNIGHTHOOD and **CHIVALRY.** These two words, which are nearly but not quite synonymous, designate a single subject of inquiry, which presents itself under three different although connected and in a measure intermingled aspects. It may be regarded in the first place as a mode or variety of feudal tenure, in the second place as a personal attribute or dignity, and in the third place as a scheme of manners or social arrangements. The first of these aspects is discussed under the headings FEUDALISM and KNIGHT SERVICE: we are concerned here only with the second and third. For the more important religious as distinguished from the military orders of knighthood or chivalry the reader is referred to the headings ST JOHN OF JERUSALEM, KNIGHTS OF; TEUTONIC KNIGHTS; and TEMPLARS.

"The growth of knighthood" (writes Stubbs) "is a subject on which the greatest obscurity prevails": and, though J. H. Round has done much to explain the introduction of the system into England,[1] its actual origin on the continent of Europe is still obscure in many of its most important details.

The words *knight* and *knighthood* are merely the modern forms of the Anglo-Saxon or Old English *cniht* and *cnihthád*. Of these the primary signification of the first was a boy or youth, and of the second that period of life which intervenes between childhood and manhood. But some time before the middle of the 12th century they had acquired the meaning they still retain of the French *chevalier* and *chevalerie*. In a secondary sense *cniht* meant a servant or attendant answering to the German *Knecht*, and in the Anglo-Saxon Gospels a disciple is described as a *leorning cniht*. In a tertiary sense the word appears to have been occasionally employed as equivalent to the Latin *miles*—usually translated by *thegn*—which in the earlier middle ages was used as the designation of the domestic as well as of the martial officers or retainers of sovereigns and princes or great personages.[2] Sharon Turner suggests that *cniht* from meaning an attendant simply may have come to mean more especially a military attendant, and that in this sense it may have gradually superseded the word thegn.[3] But the word thegn itself, that is, when it was used as the description of an attendant of the king, appears to have meant more especially a military attendant. As Stubbs says "the thegn seems to be primarily the warrior gesith"—the gesithas forming the chosen band of companions (*comites*) of the German chiefs (*principes*) noticed by Tacitus—"he is probably the gesith who had a particular military duty in his master's service"; and he adds that from the reign of Athelstan "the gesith is lost sight of except very occasionally, the more important class having become thegns, and the lesser sort sinking into the rank of mere servants of the king."[4] It is pretty clear, therefore, that the word *cniht* could never have superseded the word thegn in the sense of a military attendant, at all events of the king. But besides the king, the ealdormen, bishops and king's thegns themselves had their thegns, and to these it is more than probable that the name of *cniht* was applied.

Around the Anglo-Saxon magnates were collected a crowd of retainers and dependants of all ranks and conditions; and there is evidence enough to show that among them were some called *cnihtas* who were not always the humblest or least considerable of their number.[5] The testimony of Domesday also establishes the existence in the reign of Edward the Confessor of what Stubbs describes as a "large class" of landholders who had commended themselves to some lord, and he regards it as doubtful whether their tenure had not already assumed a really feudal character. But in any event it is manifest that their condition was in many respects similar to that of a vast number of unquestionably feudal and military tenants who made their appearance after the Norman Conquest. If consequently the former were called *cnihtas* under the Anglo-Saxon régime, it seems sufficiently probable that the appellation should have been continued to the latter—practically their successors—under the Anglo-Norman régime. And if the designation of knights was first applied to the military tenants of the earls, bishops and barons—who although they held their lands of mesne lords owed their services to the king—the extension of that designation to the whole body of military tenants need not have been a very violent or prolonged process. Assuming, however, that *knight* was originally used to describe the military tenant of a noble person, as *cniht* had sometimes been used to describe the thegn of a noble person, it would, to begin with, have defined rather his social status than the nature of his services. But those whom the English called *knights* the Normans called *chevaliers*, by which term the nature of their services was defined, while their social status was left out of consideration. And at first *chevalier* in its general and honorary signification seems to have been rendered not by *knight* but by *rider*, as may be inferred from the Anglo-Saxon Chronicle, wherein it is recorded under the year 1085 that William the Conqueror "dubbade his sunu Henric to ridere."[6] But, as E. A. Freeman says, "no such title is heard of in the earlier days of England. The thegn, the ealdorman, the king himself, fought on foot; the horse might bear him to the field, but when the fighting itself came he stood on his native earth to receive the onslaught of her enemies."[1] In this perhaps we may behold one of the most ancient of British insular prejudices, for on the Continent the importance of cavalry in warfare was already abundantly understood. It was by means of their horsemen that the Austrasian Franks established their superiority over their neighbours, and in time created the Western Empire anew, while from the word *caballarius*, which occurs in the *Capitularies* in the reign of Charlemagne, came the words for knight in all the Romance languages.[2] In Germany the chevalier was called *Ritter*, but neither *rider* nor *chevalier* prevailed against *knight* in England. And it was long after *knighthood* had acquired its present meaning with us that *chivalry* was incorporated into our language. It may be remarked too in passing that in official Latin, not only in England but all over Europe, the word *miles* held its own against both *eques* and *caballarius*.

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[1] *Feudal England*, pp. 225 sqq.

[2] Du Cange, *Gloss.*, *s.v.* "Miles."

[3] *History of England*, iii. 12.

[4] Stubbs, *Constitutional History*, i. 156.

[5] Ibid. i. 156, 366; Turner, iii. 125–129.

[6] Ingram's edition, p. 290.

Origin of Medieval Knighthood.

Concerning the origin of knighthood or chivalry as it existed in the middle ages—implying as it did a formal assumption of and initiation into the profession of arms—nothing beyond more or less probable conjecture is possible. The medieval knights had nothing to do in the way of derivation with the "equites" of Rome, the knights of King Arthur's Round Table, or the Paladins of Charlemagne. But there are grounds for believing that some of the rudiments of chivalry are to be detected in early Teutonic customs, and that they may have made some advance among the Franks of Gaul. We know from Tacitus that the German tribes in his day were wont to celebrate the admission of their young men into the ranks of their warriors with much circumstance and ceremony. The people of the district to which the candidate belonged were called together; his qualifications for the privileges about to be conferred upon him were inquired into; and, if he were deemed fitted and worthy to receive them, his chief, his father, or one of his near kinsmen presented him with a shield and a lance. Again, among the Franks we find Charlemagne girding his son Louis the Pious, and Louis the Pious girding his son Charles the Bald with the sword, when they arrived at manhood.[3] It seems certain here that some ceremony was observed which was deemed worthy of record not for its novelty, but as a thing of recognized importance. It does not follow that a similar ceremony extended to personages less exalted than the sons of kings and emperors. But if it did we must naturally suppose that it applied in the first instance to the mounted warriors who formed the most formidable portion of the warlike array of the Franks. It was among the Franks indeed, and possibly through their experiences in war with the Saracens, that cavalry first acquired the pre-eminent place which it long maintained in every European country. In early society, where the army is not a paid force but the armed nation, the cavalry must necessarily consist of the noble and wealthy, and cavalry and chivalry, as Freeman observes,[4] will be the same. Since then we discover in the *Capitularies* of Charlemagne actual mention of "caballarii" as a class of warriors, it may reasonably be concluded that formal investiture with arms applied to the "caballarii" if it was a usage extending beyond the sovereign and his heir-apparent. "But," as Hallam says, "he who fought on horseback and had been invested with peculiar arms in a solemn manner wanted nothing more to render him a knight;" and so he concludes, in view of the verbal identity of "chevalier" and "caballarius," that "we may refer chivalry in a general sense to the age of Charlemagne."[5] Yet, if the "caballarii" of the *Capitularies* are really the precursors of the later knights, it remains a difficulty that the Latin name for a knight is "miles," although "caballarius" became in various forms the vernacular designation.

Knighthood in England.

Before it was known that the chronicle ascribed to Ingulf of Croyland is really a fiction of the 13th or 14th century, the knighting of Heward or Hereward by Brand, abbot of Burgh (now Peterborough), was accepted from Selden to Hallam as an historical fact, and knighthood was supposed, not only to have been known among the Anglo-Saxons, but to have had a distinctively religious character which was contemned by the Norman invaders. The genuine evidence at our command altogether fails to support this view. When William of Malmesbury describes the knighting of Athelstan by his grandfather Alfred the Great, that is, his investiture "with a purple garment set with gems and a Saxon sword with a golden sheath," there is no hint of any religious observance. In spite of the silence of our records, Dr Stubbs thinks that kings so well acquainted with foreign usages as Ethelred, Canute and Edward the Confessor could hardly have failed to introduce into England the institution of chivalry then springing up in every country of Europe; and he is supported in this opinion by the circumstance that it is nowhere mentioned as a Norman innovation. Yet the fact that Harold received knighthood from William of Normandy makes it clear either that Harold was not yet a knight, which in the case of so tried a warrior would imply that "dubbing to knighthood" was not yet known in England even under Edward the Confessor, or, as Freeman thinks, that in the middle of the 11th century the custom had grown in Normandy into "something of a more special meaning" than it bore in England.

Regarded as a method of military organization, the feudal system of tenures was always far better adapted to the purposes of defensive than of offensive warfare. Against invasion it furnished a permanent provision both in men-at-arms and strongholds; nor was it unsuited for the campaigns of neighbouring counts and barons which lasted for only a few weeks, and extended over only a few leagues. But when kings and kingdoms were in conflict, and distant and prolonged expeditions became necessary, it was speedily discovered that the unassisted resources of feudalism were altogether inadequate. It became therefore the manifest interest of both parties that personal services should be commuted into pecuniary payments. Then there grew up all over Europe a system of fining the knights who failed to respond to the sovereign's call or to stay their full time in the field; and in England this fine developed, from the reign of Henry II. to that of Edward II., into a regular war-tax called *escuage* or *scutage* (*q.v.*). In this way funds for war were placed at the free disposal of sovereigns, and, although the feudatories and their retainers still formed the most considerable portion of their armies, the conditions under which they served were altogether changed. Their military service was now far more the result of special agreement. In the reign of Edward I., whose warlike enterprises after he was king were confined within the four seas, this alteration does not seem to have proceeded very far, and Scotland and Wales were subjugated by what was in the main, if not exclusively, a feudal militia raised as of old by writ to the earls and barons and the sheriffs.[6] But the armies of Edward III., Henry V. and Henry VI. during the century of intermittent warfare between England and France were recruited and sustained to a very great extent on the principle of contract.[7] On the Continent the systematic employment of mercenaries was both an early and a common practice.

The Crusades.

Besides consideration for the mutual convenience of sovereigns and their feudatories, there were other causes which materially contributed towards bringing about those changes in the military system of Europe which were finally accomplished in the 13th and 14th centuries. During the Crusades vast armies were set on foot in which feudal rights and obligations had no place, and it was seen that the volunteers who flocked to the standards of the various commanders were not less but even more efficient in the field than the vassals they had hitherto been accustomed to lead. It was thus established that pay, the love of enterprise and the prospect of plunder—if we leave zeal for the sacred cause which they had espoused for the moment out of sight—were quite as useful for the purpose of enlisting troops and keeping them together as the tenure of land and the solemnities of homage and fealty. Moreover, the crusaders who survived the difficulties and dangers of an expedition to Palestine were seasoned and experienced although frequently impoverished and landless soldiers, ready to hire themselves to the highest bidder, and well worth the wages they received. Again, it was owing to the crusades that the church took the profession of arms under her peculiar protection, and thenceforward the ceremonies of initiation into it assumed a religious as well as a martial character.

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[1] *Comparative Politics*, p. 74.

[2] Baluze, *Capitularia Regum Francorum*, ii. 794, 1069.

[3] Du Cange, *Gloss.*, *s.v.* "Arma."

[4] Freeman, *Comparative Politics*, p. 73.

[5] Hallam, *Middle Ages*, iii. 392.

[6] Stubbs, *Const. Hist.* ii. 278; also compare Grosse, *Military Antiquities*, i. 65 seq.

[7] There has been a general tendency to ignore the extent to which the armies of Edward III. were raised by compulsory levies even after the system of raising troops by free contract had begun. Luce (ch. vi.) points out how much England relied at this time on what would now be called conscription: and his remarks are entirely borne out by the Norwich documents published by Mr W. Hudson (Norf. and Norwich Archaeological Soc. xiv. 263 sqq.), by a Lynn corporation document of 18th Edw. III. (Hist. MSS. Commission Report XI. Appendix pt. iii. p. 189), and by Smyth's *Lives of the Berkeleys*, i. 312, 319, 320.

Knighthood independent of Feudalism.

To distinguished soldiers of the cross the honours and benefits of knighthood could hardly be refused on the ground that they did not possess a sufficient property qualification—of which perhaps they had denuded themselves in order to their equipment for the Holy War. And thus the conception of knighthood as of something distinct from feudalism both as a social condition and a personal dignity arose and rapidly gained ground. It was then that the analogy was first detected between the order of knighthood and the order of priesthood, and that an actual union of monachism and chivalry was effected by the establishment of the religious orders of which the Knights Templars and the Knights Hospitallers were the most eminent examples. As comprehensive in their polity as the Benedictines or Franciscans, they gathered their members from, and soon scattered their possessions over, every country in Europe. And in their indifference to the distinctions of race and nationality they merely accommodated themselves to the spirit which had become characteristic of chivalry itself, already recognized, like the church, as a universal institution which knit together the whole warrior caste of Christendom into one great fraternity irrespective alike of feudal subordination and territorial boundaries. Somewhat later the adoption of hereditary surnames and armorial bearings marked the existence of a large and noble class who either from the subdivision of fiefs or from the effects of the custom of primogeniture were very insufficiently provided for. To them only two callings were generally open, that of the churchman and that of the soldier, and the latter as a rule offered greater attractions than the former in an era of much licence and little learning. Hence the favourite expedient for men of birth, although not of fortune, was to attach themselves to some prince or magnate in whose military service they were sure of an adequate maintenance and might hope for even a rich reward in the shape of booty or of ransom.[1] It is probably to this period and these circumstances that we must look for at all events the rudimentary beginnings of the military as well as the religious orders of chivalry. Of the existence of any regularly constituted companionships of the first kind there is no trustworthy evidence until between two and three centuries after fraternities of the second kind had been organized. Soon after the greater crusading societies had been formed similar orders, such as those of St James of Compostella, Calatrava and Alcantara, were established to fight the Moors in Spain instead of the Saracens in the Holy Land. But the members of these orders were not less monks than knights, their statutes embodied the rules of the cloister, and they were bound by the ecclesiastical vows of celibacy, poverty and obedience. From a very early stage in the development of chivalry, however, we meet with the singular institution of brotherhood in arms; and from it the ultimate origin if not of the religious fraternities at any rate of the military companionships is usually derived.[2] By this institution a relation was created between two or more monks by voluntary agreement, which was regarded as of far more intimacy and stringency than any which the mere accident of consanguinity implied. Brothers in arms were supposed to be partners in all things save the affections of their "lady-loves." They shared in every danger and in every success, and each was expected to vindicate the honour of another as promptly and zealously as his own. The plot of the medieval romance of *Amis and Amiles* is built entirely on such a brotherhood. Their engagements usually lasted through life, but sometimes only for a specified period or during the continuance of specified circumstances, and they were always ratified by oath, occasionally reduced to writing in the shape of a solemn bond and often sanctified by their reception of the Eucharist together. Romance and tradition speak of strange rites—the mingling and even the drinking of blood—as having in remote and rude ages marked the inception of these martial and fraternal associations.[3] But in later and less barbarous times they were generally evidenced and celebrated by a formal and reciprocal exchange of weapons and armour. In warfare it was customary for knights who were thus allied to appear similarly accoutred and bearing the same badges or cognisances, to the end that their enemies might not know with which of them they were in conflict, and that their friends might be unable to accord more applause to one than to the other for his prowess in the field. It seems likely enough therefore that there should grow up bodies of knights banded together by engagements of fidelity, although free from monastic obligations; wearing a uniform or livery, and naming themselves after some special symbol or some patron saint of their adoption. And such bodies placed under the command of a sovereign or grand master, regulated by statutes, and enriched by ecclesiastical endowments would have been precisely what in after times such orders as the Garter in England, the Golden Fleece in Burgundy, the Annunziata in Savoy and the St Michael and Holy Ghost in France actually were.[4]

Grades of Knighthood.

During the 14th and 15th centuries, as well as somewhat earlier and later, the general arrangements of a European army were always and everywhere pretty much the same.[5] Under the sovereign the constable and the marshal or marshals held the chief commands, their authority being partly joint and partly several. Attendant on them were the heralds, who were the officers of their military court, wherein offences committed in the camp and field were tried and adjudged, and among whose duties it was to carry orders and messages, to deliver challenges and call truces, and to identify and number the wounded and the slain. The main divisions of the army were distributed under the royal and other principal standards, smaller divisions under the banners of some of the greater nobility or of knights banneret, and smaller divisions still under the pennons of knights or, as in distinction from knights banneret they came to be called, knights bachelors. All knights whether bachelors or bannerets were escorted by their squires. But the banner of the banneret always implied a more or less extensive command, while every knight was entitled to bear a pennon and every squire a pencel. All three flags were of such a size as to be conveniently attached to and carried on a lance, and were emblazoned with the arms or some portion of the bearings of their owners. But while the banner was square the pennon, which resembled it in other respects, was either pointed or forked at its extremity, and the pencel, which was considerably less than the others, always terminated in a single tail or streamer.[6]

If indeed we look at the scale of chivalric subordination from another point of view, it seems to be more properly divisible into four than into three stages, of which two may be called provisional and two final. The bachelor and the banneret were both equally knights, only the one was of greater distinction and authority than the other. In like manner the squire and the page were both in training for knighthood, but the first had advanced further in the process than the second. It is true that the squire was a combatant while the page was not, and that many squires voluntarily served as squires all their lives owing to the insufficiency of their fortunes to support the costs and charges of knighthood. But in the ordinary course of a chivalrous education the successive conditions of page and squire were passed through in boyhood and youth, and the condition of knighthood was reached in early manhood. Every feudal court and castle was in fact a school of chivalry, and although princes and great personages were rarely actually pages or squires, the moral and physical discipline through which they passed was not in any important particular different from that to which less exalted candidates for knighthood were subjected.[1] The page, or, as he was more anciently and more correctly called, the "valet" or "damoiseau," commenced his service and instruction when he was between seven and eight years old, and the initial phase continued for seven or eight years longer. He acted as the constant personal attendant of both his master and mistress. He waited on them in their hall and accompanied them in the chase, served the lady in her bower and followed the lord to the camp.[2] From the chaplain and his mistress and her damsels he learnt the rudiments of religion, of rectitude and of love,[3] from his master and his squires the elements of military exercise, to cast a spear or dart, to sustain a shield, and to march with the measured tread of a soldier; and from his master and his huntsmen and falconers the "mysteries of the woods and rivers," or in other words the rules and practices of hunting and hawking. When he was between fifteen and sixteen he became a squire. But no sudden or great alteration was made in his mode of life. He continued to wait at dinner with the pages, although in a manner more dignified according to the notions of the age. He not only served but carved and helped the dishes, proffered the first or principal cup of wine to his master and his guests, and carried to them the basin, ewer or napkin when they washed their hands before and after meat. He assisted in clearing the hall for dancing or minstrelsy, and laid the tables for chess or draughts, and he also shared in the pastimes for which he had made preparation. He brought his master the "vin de coucher" at night, and made his early refection ready for him in the morning. But his military exercises and athletic sports occupied an always increasing portion of the day. He accustomed himself to ride the "great horse," to tilt at the quintain, to wield the sword and battle-axe, to swim and climb, to run and leap, and to bear the weight and overcome the embarrassments of armour. He inured himself to the vicissitudes of heat and cold, and voluntarily suffered the pains or inconveniences of hunger and thirst, fatigue and sleeplessness. It was then too that he chose his "lady-love," whom he was expected to regard with an adoration at once earnest, respectful, and the more meritorious if concealed. And when it was considered that he had made sufficient advancement in his military accomplishments, he took his sword to the priest, who laid it on the altar, blessed it, and returned it to him.[4] Afterwards he either remained with his early master, relegating most of his domestic duties to his younger companions, or he entered the service of some valiant and adventurous lord or knight of his own selection. He now became a "squire of the body," and truly an "armiger" or "scutifer," for he bore the shield and armour of his leader to the field, and, what was a task of no small difficulty and hazard, cased and secured him in his panoply of war before assisting him to mount his courser or charger. It was his function also to display and guard in battle the banner of the baron or banneret or the pennon of the knight he served, to raise him from the ground if he were unhorsed, to supply him with another or his own horse if his was disabled or killed, to receive and keep any prisoners he might take, to fight by his side if he was unequally matched, to rescue him if captured, to bear him to a place of safety if wounded, and to bury him honourably when dead. And after he had worthily and bravely, borne himself for six or seven years as a squire, the time came when it was fitting that he should be made a knight. This, at least, was the current theory; but it is specially dangerous in medieval history to assume too much correspondence between theory and fact. In many castles, and perhaps in most, the discipline followed simply a natural and unwritten code of "fagging" and seniority, as in public schools or on board men-of-war some hundred years or so ago.

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[1] J. B. de Lacurne de Sainte Palaye, *Mémoires sur l'Ancienne Chevalerie*, i. 363, 364 (ed. 1781).

[2] Du Cange, *Dissertation sur Joinville*, xxi.; Sainte Palaye, *Mémoires*, i. 272; G. F. Beltz, *Memorials of the Order of the Garter* (1841,) p. xxvii.

[3] Du Cange, *Dissertation*, xxi., and *Lancelot du Lac*, among other romances.

[4] Anstis, *Register of the Order of the Garter*, i. 63.

[5] Grose, *Military Antiq.* i. 207 seq.; Stubbs, *Const. Hist.* ii. 276 seq., and iii. 278 seq.

[6] Grose's *Military Antiquities*, ii. 256.

Modes of conferring Knighthood.

Two modes of conferring knighthood appear to have prevailed from a very early period in all countries where chivalry was known. In both of them the essential portion seems to have been the accolade or stroke of the sword. But while in the one the accolade constituted the whole or nearly the whole of the ceremony, in the other it was surrounded with many additional observances. The former and simpler of these modes was naturally that used in war: the candidate knelt before "the chief of the army or some valiant knight," who struck him thrice with the flat of a sword, pronouncing a brief formula of creation and of exhortation which varied at the creator's will.[5]

In this form a number of knights were made before and after almost every battle between the 11th and the 16th centuries, and its advantages on the score of both convenience and economy gradually led to its general adoption both in time of peace and time of war. On extraordinary occasions indeed the more elaborate ritual continued to be observed. But recourse was had to it so rarely that in England about the beginning of the 15th century it came to be exclusively appropriated to a special king of knighthood. When Segar, garter king of arms, wrote in the reign of Queen Elizabeth, this had been accomplished with such completeness that he does not even mention that there were two ways of creating knights bachelors. "He that is to be made a knight," he says, "is striken by the prince with a sword drawn upon his back or shoulder, the prince saying, 'Soys Chevalier,' and in times past was added 'Saint George.' And when the knight rises the prince sayeth 'Avencez.' This is the manner of dubbing knights at this present, and that term 'dubbing' was the old term in this point, not 'creating.' This sort of knights are by the heralds called knights bachelors." In our days when a knight is personally made he kneels before the sovereign, who lays a sword drawn, ordinarily the sword of state, on either of his shoulders and says, "Rise," calling him by his Christian name with the addition of "Sir" before it.

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[1] Sainte Palaye, *Mémoires*, i. 36; Froissart, bk. iii. ch. 9.

[2] Sainte Palaye, *Mémoires*, pt. i. and Mills, *History of Chivalry*, vol. i. ch. 2.

[3] See the long sermon in the romance of *Petit Jehan de Saintré*, pt. i. ch. v., and compare the theory there set forth with the actual behaviour of the chief personages. Even Gautier, while he contends that chivalry did much to refine morality, is compelled to admit the prevailing immorality to which medieval romances testify, and the extraordinary free behaviour of the unmarried ladies. No doubt these romances, taken alone, might give as unfair an idea as modern French novels give of Parisian morals, but we have abundant other evidence for placing the moral standard of the age of chivalry definitely below that of educated society in the present day.

[4] Sainte Palaye, *Mémoires*, i. 11 seq.: "C'est peut-être à cette cérémonie et non à celles de la chevalerie qu'on doit rapporter ce qui se lit dans nos historiens de la première et de la seconde race au sujet des premières armes que les Rois et les Princes remettoient avec solemnité au jeunes Princes leurs enfans."

[5] There are several obscure points as to the relation of the longer and shorter ceremonies, as well as the origin and original relation of their several parts. There is nothing to show whence came "dubbing" or the "accolade." It seems certain that the word "dub" means to strike, and the usage is as old as the knighting of Henry by William the Conqueror (*supra*, pp. 851, 852). So, too, in the Empire a dubbed knight is "ritter geschlagen." The "accolade" may etymologically refer to the embrace, accompanied by a blow with the hand, characteristic of the longer form of knighting. The derivation of "adouber," corresponding to "dub," from "adoptare," which is given by Du Cange, and would connect the ceremony with "adoptio per arma," is certainly inaccurate. The investiture with arms, which formed a part of the longer form of knighting, and which we have seen to rest on very ancient usage, may originally have had a distinct meaning. We have observed that Lanfranc invested Henry I. with arms, while William "dubbed him to rider." If there was a difference in the meaning of the two ceremonies, the difficulty as to the knighting of Earl Harold (*supra*, p. 852) is at least partly removed.

Very different were the solemnities which attended the creation of a knight when the complete procedure was observed. "The ceremonies and circumstances at the giving this dignity," says Selden, "in the elder time were of two kinds especially, which we may call courtly and sacred. The courtly were the feasts held at the creation, giving of robes, arms, spurs and the like. The sacred were the holy devotions and what else was used in the church at or before the receiving of the dignity.[1] But the leading authority on the subject is an ancient tract written in French, which will be found at length either in the original or translated by Segar, Dugdale, Byshe and Nicolas, among other English writers.[2] Daniel explains his reasons for transcribing it, "tant à cause du detail que de la naïveté du stile et encore plus de la bisarrerie des ceremonies que se faisoient pourtant alors fort sérieusement," while he adds that these ceremonies were essentially identical in England, France, Germany, Spain and Italy.

The process of inauguration was commenced in the evening by the placing of the candidate under the care of two "esquires of honour grave and well seen in courtship and nurture and also in the feats of chivalry," who were to be "governors in all things relating to him." Under their direction, to begin with, a barber shaved him and cut his hair. He was then conducted by them to his appointed chamber, where a bath was prepared hung within and without with linen and covered with rich cloths, into which after they had undressed him he entered. While he was in the bath two "ancient and grave knights" attended him "to inform, instruct and counsel him touching the order and feats of chivalry," and when they had fulfilled their mission they poured some of the water of the bath over his shoulders, signing the left shoulder with the cross, and retired. He was then taken from the bath and put into a plain bed without hangings, in which he remained until his body was dry, when the two esquires put on him a white shirt and over that "a robe of russet with long sleeves having a hood thereto like unto that of an hermit." Then the "two ancient and grave knights" returned and led him to the chapel, the esquires going before them "sporting and dancing" with "the minstrels making melody." And when they had been served with wines and spices they went away leaving only the candidate, the esquires, "the priest, the chandler and the watch," who kept the vigil of arms until sunrise, the candidate passing the night "bestowing himself in orisons and prayers." At daybreak he confessed to the priest, heard matins, and communicated in the mass, offering a taper and a piece of money stuck in it as near the lighted end as possible, the first "to the honour of God" and the second "to the honour of the person that makes him a knight." Afterwards he was taken back to his chamber, and remained in bed until the knights, esquires and minstrels went to him and aroused him. The knights then dressed him in distinctive garments, and they then mounted their horses and rode to the hall where the candidate was to receive knighthood; his future squire was to ride before him bareheaded bearing his sword by the point in its scabbard with his spurs hanging from its hilt. And when everything was prepared the prince or subject who was to knight him came into the hall, and, the candidate's sword and spurs having been presented to him, he delivered the right spur to the "most noble and gentle" knight present, and directed him to fasten it on the candidate's right heel, which he kneeling on one knee and putting the candidate's right foot on his knee accordingly did, signing the candidate's knee with the cross, and in like manner by another "noble and gentle" knight the left spur was fastened to his left heel. And then he who was to create the knight took the sword and girded him with it, and then embracing him he lifted his right hand and smote him on the neck or shoulder, saying, "Be thou a good knight," and kissed him. When this was done they all went to the chapel with much music, and the new knight laying his right hand on the altar promised to support and defend the church, and ungirding his sword offered it on the altar. And as he came out from the chapel the master cook awaited him at the door and claimed his spurs as his fee, and said, "If you do anything contrary to the order of chivalry (which God forbid), I shall hack the spurs from your heels."[3]

The full solemnities for conferring knighthood seem to have been so largely and so early superseded by the practice of dubbing or giving the accolade alone that in England it became at last restricted to such knights as were made at coronations and some other occasions of state. And to them the particular name of Knights of the Bath was assigned, while knights made in the ordinary way were called in distinction from them knights of the sword, as they were also called knights bachelors in distinction from knights banneret.[4] It is usually supposed that the first creation of knights of the Bath under that designation was at the coronation of Henry IV.; and before the order of the Bath as a companionship or capitular body was instituted the last creation of them was at the coronation of Charles II. But all knights were also knights of the spur or "equites aurati," because their spurs were golden or gilt,—the spurs of squires being of silver or white metal,—and these became their peculiar badge in popular estimation and proverbial speech. In the form of their solemn inauguration too, as we have noticed, the spurs together with the sword were always employed as the leading and most characteristic ensigns of knighthood.[5]

With regard to knights banneret, various opinions have been entertained as to both the nature of their dignity and the qualifications they were required to possess for receiving it at different periods and in different countries. On the Continent the distinction which is commonly but incorrectly made between the nobility and the gentry has never arisen, and it was unknown here while chivalry existed and heraldry was understood. Here, as elsewhere in the old time, a nobleman and a gentleman meant the same thing, namely, a man who under certain conditions of descent was entitled to armorial bearings. Hence Du Cange divides the medieval nobility of France and Spain into three classes: first, barons or ricos hombres; secondly, chevaliers or caballeros; and thirdly, écuyers or infanzons; and to the first, who with their several special titles constituted the greater nobility of either country, he limits the designation of banneret and the right of leading their followers to war under a banner, otherwise a "drapeau quarré" or square flag.[6] Selden shows especially from the parliament rolls that the term banneret has been occasionally employed in England as equivalent to baron.[7] In Scotland, even as late as the reign of James VI., lords of parliament were always created bannerets as well as barons at their investiture, "part of the ceremony consisting in the display of a banner, and such 'barones majores' were thereby entitled to the privilege of having one borne by a retainer before them to the field of a quadrilateral form."[8] In Scotland, too, lords of parliament and bannerets were also called bannerents, banrents or baronets, and in England banneret was often corrupted to baronet. "Even in a patent passed to Sir Ralph Fane, knight under Edward VI., he is called 'baronettus' for 'bannerettus.'"[9] In this manner it is not improbable that the title of baronet may have been suggested to the advisers of James I. when the order of Baronets was originally created by him, for it was a question whether the recipients of the new dignity should be designated by that or some other name.[1] But there is no doubt that as previously used it was merely a corrupt synonym for banneret, and not the name of any separate dignity. On the Continent, however, there are several recorded examples of bannerets who had an hereditary claim to that honour and its attendant privileges on the ground of the nature of their feudal tenure.[2] And generally, at any rate to commence with, it seems probable that bannerets were in every country merely the more important class of feudatories, the "ricos hombres" in contrast to the knights bachelors, who in France in the time of St Louis were known as "pauvres hommes." In England all the barons or greater nobility were entitled to bear banners, and therefore Du Cange's observations would apply to them as well as to the barons or greater nobility of France and Spain. But it is clear that from a comparatively early period bannerets whose claims were founded on personal distinction rather than on feudal tenure gradually came to the front, and much the same process of substitution appears to have gone on in their case as that which we have marked in the case of simple knights. According to the *Sallade* and the *Division du Monde*, as cited by Selden, bannerets were clearly in the beginning feudal tenants of a certain magnitude and importance and nothing more, and different forms for their creation are given in time of peace and in time of war.[3] But in the French *Gesta Romanorum* the warlike form alone is given, and it is quoted by both Selden and Du Cange. From the latter a more modern version of it is given by Daniel as the only one generally in force.

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[1] Selden, *Titles of Honor*, 639.

[2] Daniel, *Histoire de la Milice Françoise*, i. 99–104; Byshe's Upton, *De Studio Militari*, pp. 21–24; Dugdale, *Warwickshire*, ii. 708–710; Segar, *Honor Civil and Military*, pp. 69 seq. and Nicolas, *Orders of Knighthood*, vol. ii. (*Order of the Bath*) pp. 19 seq. . .It is given as "the order and manner of creating Knights of the Bath in time of peace according to the custom of England," and consequently dates from a period when the full ceremony of creating knights bachelors generally had gone out of fashion. But as Ashmole, speaking of Knights of the Bath, says, "if the ceremonies and circumstances of their creation be well considered. it will appear that this king [Henry IV.] did not institute but rather restore the ancient manner of making knights, and consequently that the Knights of the Bath are in truth no other than knights bachelors, that is to say, such as are created with those ceremonies wherewith knights bachelors were formerly created." (Ashmole, *Order of the Garter*, p. 15). See also Selden, *Titles of Honor*, p. 678, and the *Archæological Journal*, v. 258 seq.

[3] As may be gathered from Selden, Favyn, La Colombiers, Menestrier and Sainte Palaye, there were several differences of detail in the ceremony at different times and in different places. But in the main it was everywhere the same both in its military and its ecclesiastical elements. In the *Pontificale Romanum*, the old *Ordo Romanus* and the manual or Common Prayer Book in use in England before the Reformation forms for the blessing or consecration of new knights are included, and of these the first and the last are quoted by Selden.

[4] Selden, *Titles of Honor*, p. 678; Ashmole, *Order of the Garter*, p. 15; Favyn, *Théâtre d'Honneur*, ii. 1035.

[5] "If we sum up the principal ensigns of knighthood, ancient and modern, we shall find they have been or are a horse, gold ring, shield and lance, a belt and sword, gilt spurs and a gold chain or collar." —Ashmole, *Order of the Garter*, pp. 12, 13.

[6] On the banner see Grose, *Military Antiquities*, ii. 257; and Nicolas, *British Orders of Knighthood*, vol. i. p. xxxvii.

[7] *Titles of Honor*, pp. 356 and 608. See also Hallam, *Middle Ages*, iii. 126 seq. and Stubbs, *Const. Hist.* iii. 440 seq.

[8] Riddell's *Law and Practice in Scottish Peerages*, p. 578; also Nisbet's *System of Heraldry*, ii. 49 and Selden's *Titles of Honor*, p. 702.

[9] Selden, *Titles of Honor*, pp. 608 and 657.

The knight bachelor whose services and landed possessions entitled him to promotion would apply formally to the commander in the field for the title of banneret. If this were granted, the heralds were called to cut publicly the tails from his pennon: or the commander, as a special honour, might cut them off with his own hands.[4] The earliest contemporary mention of knights banneret is in France, Daniel says, in the reign of Philip Augustus, and in England, Selden says in the reign of Edward I. But in neither case is reference made to them in such a manner as to suggest that the dignity was then regarded as new or even uncommon, and it seems pretty certain that its existence on one side could not have long preceded its existence on the other side of the Channel. Sir Alan Plokenet, Sir Ralph Daubeney and Sir Philip Daubeney are entered as bannerets on the roll of the garrison of Caermarthen Castle in 1282, and the roll of Carlaverock records the names and arms of eighty-five bannerets who accompanied Edward I. in his expedition into Scotland in 1300.

What the exact contingent was which bannerets were expected to supply to the royal host is doubtful.[5] But, however this may be, in the reign of Edward III. and afterwards bannerets appear as the commanders of a military force raised by themselves and marshalled under their banners: their status and their relations both to the crown and to their followers were mainly the consequences of voluntary contract not of feudal tenure. It is from the reigns of Edward III. and Richard II. also that the two best descriptions we possess of the actual creation of a banneret have been transmitted to us.[6] Sir Thomas Smith, writing towards the end of the 16th century, says, after noticing the conditions to be observed in the creation of bannerets, "but this order is almost grown out of use in England";[7] and, during the controversy which arose between the new order of baronets and the crown early in the 17th century respecting their precedence, it was alleged without contradiction in an argument on behalf of the baronets before the privy council that "there are not bannerets now in being, peradventure never shall be."[8] Sir Ralph Fane, Sir Francis Bryan and Sir Ralph Sadler were created bannerets by the Lord Protector Somerset after the battle of Pinkie in 1547, and the better opinion is that this was the last occasion on which the dignity was conferred. It has been stated indeed that Charles I. created Sir John Smith a banneret after the battle of Edgehill in 1642 for having rescued the royal standard from the enemy. But of this there is no sufficient proof. It was also supposed that George III. had created several naval officers bannerets towards the end of the last century, because he knighted them on board ship under the royal standard displayed. This, however, is unquestionably an error.[9]

Existing Orders of Knighthood.

On the continent of Europe the degree of knight bachelor disappeared with the military system which had given rise to it. It is now therefore peculiar to the British Empire, where, although very frequently conferred by letters patent, it is yet the only dignity which is still even occasionally created—as every dignity was formerly created—by means of a ceremony in which the sovereign and the subject personally take part. Everywhere else dubbing or the accolade seems to have become obsolete, and no other species of knighthood, if knighthood it can be called, is known except that which is dependent on admission to some particular order. It is a common error to suppose that baronets are hereditary knights. Baronets are not knights unless they are knighted like anybody else; and, so far from being knights because they are baronets, one of the privileges granted to them shortly after the institution of their dignity was that they, not being knights, and their successors and their eldest sons and heirs-apparent should, when they attained their majority, be entitled if they desired to receive knighthood.[10] It is a maxim of the law indeed that, as Coke says, "the knight is by creation and not by descent," and, although we hear of such designations as the "knight of Kerry" or the "knight of Glin," they are no more than traditional nicknames, and do not by any means imply that the persons to whom they are applied are knights in a legitimate sense. Notwithstanding, however, that simple knighthood has gone out of use abroad, there are innumerable grand crosses, commanders and companions of a formidable assortment of orders in almost every part of the world.[11] (See the section on "Orders of Knighthood" below.)

The United Kingdom has eight orders of knighthood—the Garter, the Thistle, St Patrick, the Bath, the Star of India, St Michael and St George, the Indian Empire and the Royal Victorian Order; and, while the first is undoubtedly the oldest as well as the most illustrious anywhere existing, a fictitious antiquity has been claimed and is even still frequently conceded

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[1] See "Project concerninge the conferinge of the title of vidom," wherein it is said that "the title of vidom (vicedominus) was an ancient title used in this kingdom of England both before and since the Norman Conquest" (*State Papers*, James I. Domestic Series, lxiii. 150 B, probable date April 1611).

[2] Selden, *Titles of Honor*, pp. 452 seq.

[3] Ibid. pp. 449 seq.

[4] Du Cange, *Dissertation*, ix.; Selden, *Titles of Honor*, p. 452; Daniel, *Milice Françoise*, i. 86 (Paris, 1721).

[5] Selden, *Titles of Honor*, p. 656; Grose, *Military Antiquities*, ii. 206.

[6] Froissart, Bk. I. ch. 241 and Bk. II. ch. 53. The recipients were Sir John Chandos and Sir Thos. Trivet.

[7] *Commonwealth of England* (ed. 1640), p. 48.

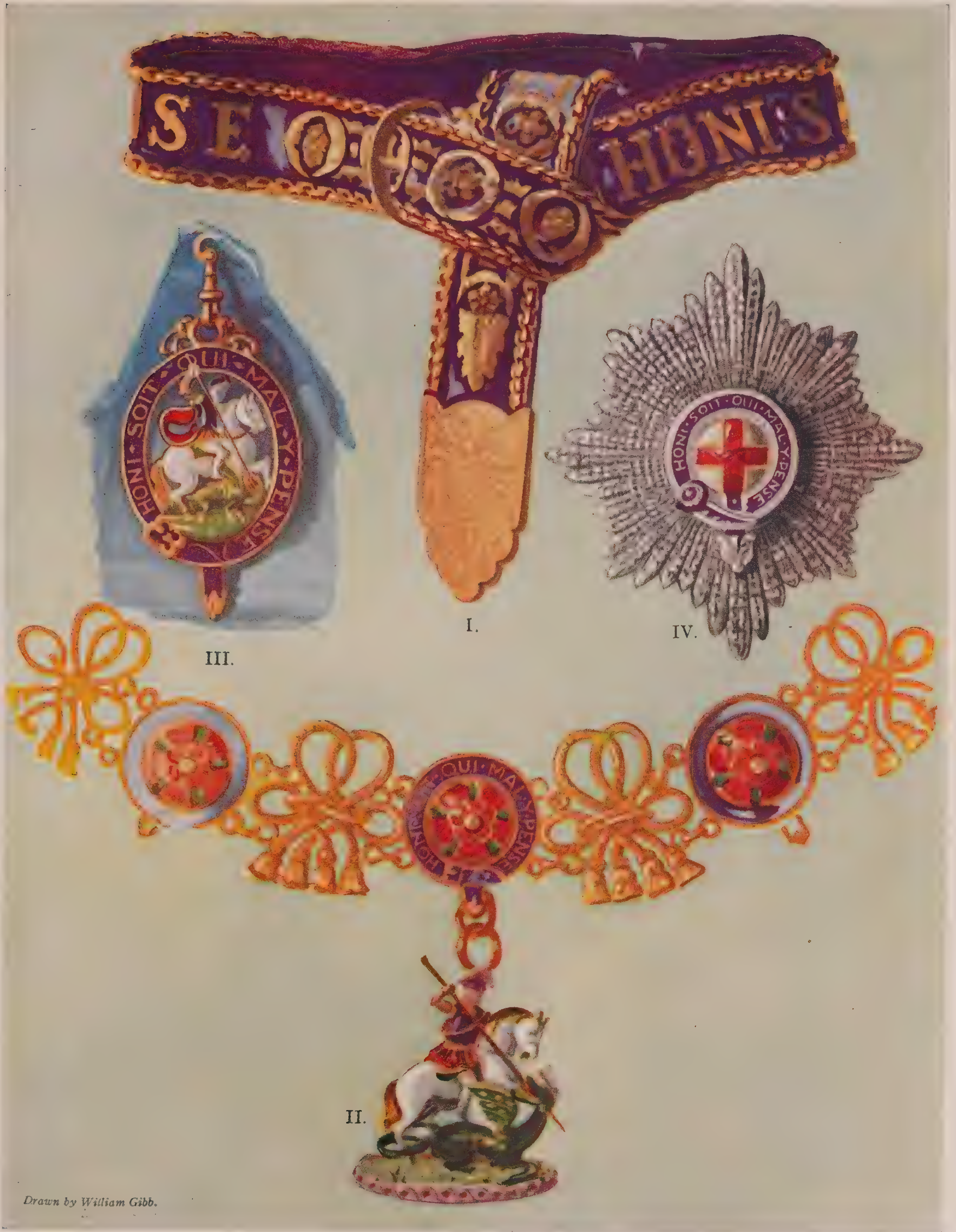
[8] *State Papers*, Domestic Series, James the First, lxvii. 119.

[9] "Thursday, June 24th: His Majesty was pleased to confer the honour of knights banneret on the following flag officers and commanders under the royal standard, who kneeling kissed hands on the occasion: Admirals Pye and Sprye; Captains Knight, Bickerton and Vernon," *Gentleman's Magazine* (1773) xliii. 299. Sir Harris Nicolas remarks on these and the other cases (*British Orders of Knighthood*, vol. xliii.) and Sir William Fitzherbert published anonymously a pamphlet on the subject, *A Short Inquiry into the Nature of the Titles conferred at Portsmouth*, &c., which is very scarce, but is to be found under the name of "Fitzherbert" in the catalogue of the British Museum Library.

[10] "Sir Henry Ferrers, Baronet, was indicted by the name of Sir Henry Ferrers, Knight, for the murther of one Stone whom one Nightingale feloniously murthered, and that the said Sir Henry was present aiding and abetting, &c. Upon this indictment Sir Henry Ferrers being arraigned said he never was knighted, which being confessed, the indictment was held not to be sufficient, wherefore he was indicted *de novo* by the name of Sir Henry Ferrers, Baronet." Brydall, *Jus Imaginis apud Anglos, or the Law of England relating to the Nobility and Gentry* (London, 1675), p. 20. Cf. *Patent Rolls*, 10 Jac. I., pt. x. No. 18; Selden, *Titles of Honor*, p. 687.

[11] Louis XIV. introduced the practice of dividing the members of military orders into several degrees when he established the order of St Louis in 1693.

INSIGNIA OF SOME OF THE PRINCIPAL ORDERS OF KNIGHTHOOD, DRAWN BY GRACIOUS PERMISSION FROM THOSE IN THE POSSESSION OF HIS LATE MAJESTY KING EDWARD VII AND ARRANGED IN ACCORDANCE WITH HIS MAJESTY'S WISHES AND COMMAND.


SE
HONI S
I.
III.
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IV.
HONI · SOIT · QUI · MAL · Y · PENSE
HONI SOIT QUI MAL Y PENSE
II.

Drawn by William Gibb.

THE ORDER OF THE GARTER.

(i.) The Garter; (ii.) The Collar and George; (iii.) The Lesser George and Ribbon; (iv.) Star.

to the second and fourth, although the third, fifth, sixth, seventh, and eighth appear to be as contentedly as they are unquestionably recent.

Order of the Garter.

It is, however, certain that the "most noble" Order of the Garter at least was instituted in the middle of the 14th century, when English chivalry was outwardly brightest and the court most magnificent. But in what particular year this event occurred is and has been the subject of much difference of opinion. All the original records of the order until after 1416 have perished, and consequently the question depends for its settlement not on direct testimony but on inference from circumstances. The dates which have been selected vary from 1344 (given by Froissart, but almost certainly mistaken) to 1351. The evidence may be examined at length in Nicolas and Beltz; it is indisputable that in the wardrobe account from September 1347 to January 1349, the 21st and 23rd Edward III., the issue of certain habits with garters and the motto embroidered on them is marked for St George's Day; that the letters patent relating to the preparation of the royal chapel of Windsor are dated in August 1348; and that in the treasury accounts of the prince of Wales there is an entry in November 1348 of the gift by him of "twenty-four garters to the knights of the Society of the Garter."[1] But that the order, although from this manifestly already fully constituted in the autumn of 1348, was not in existence before the summer of 1346 Sir Harris Nicolas proves pretty conclusively by pointing out that nobody who was not a knight could under its statutes have been admitted to it, and that neither the prince of Wales nor several others of the original companions were knighted until the middle of that year.

Regarding the occasion there has been almost as much controversy as regarding the date of its foundation. The "vulgar and more general story," as Ashmole calls it, is that of the countess of Salisbury's garter. But commentators are not at one as to which countess of Salisbury was the heroine of the adventure, whether she was Katherine Montacute or Joan the Fair Maid of Kent, while Heylyn rejects the legend as "a vain and idle romance derogatory both to the founder and the order, first published by Polydor Vergil, a stranger to the affairs of England, and by him taken upon no better ground than *fama vulgi*, the tradition of the common people, too trifling a foundation for so great a building."[2]

Another legend is that contained in the preface to the Register or Black Book of the order, compiled in the reign of Henry VIII., by what authority supported is unknown, that Richard I., while his forces were employed against Cyprus and Acre, had been inspired through the instrumentality of St George with renewed courage and the means of animating his fatigued soldiers by the device of tying about the legs of a chosen number of knights a leathern thong or garter, to the end that being thereby reminded of the honour of their enterprise they might be encouraged to redoubled efforts for victory. This was supposed to have been in the mind of Edward III. when he fixed on the garter as the emblem of the order, and it was stated so to have been by Taylor, master of the rolls, in his address to Francis I. of France on his investiture in 1527.[3] According to Ashmole the true account of the matter is that "King Edward having given forth his own garter as the signal for a battle which sped fortunately (which with Du Chesne we conceive to be that of Crécy), the victory, we say, being happily gained, he thence took occasion to institute this order, and gave the garter (assumed by him for the symbol of unity and society) pre-eminence among the ensigns of it. But, as Sir Harris Nicolas points out—although Ashmole is not open to the correction—this hypothesis rests for its plausibility on the assumption that the order was established before the invasion of France in 1346. And he further observes that "a great variety of devices and mottoes were used by Edward III.; they were chosen from the most trivial causes and were of an amorous rather than of a military character. Nothing," he adds, "is more likely than that in a crowded assembly a lady should accidentally have dropped her garter; that the circumstance should have caused a smile in the bystanders; and that on its being taken up by Edward he should have reproved the levity of his courtiers by so happy and chivalrous an exclamation, placing the garter at the same time on his own knee, as 'Dishonoured be he who thinks ill of it.' Such a circumstance occurring at a time of general festivity, when devices, mottoes and conceits of all kinds were adopted as ornaments or badges of the habits worn at jousts and tournaments, would naturally have been commemorated as other royal expressions seem to have been by its conversion into a device and motto for the dresses at an approaching hastilude."[4] Moreover, Sir Harris Nicolas contends that the order had no loftier immediate origin than a joust or tournament. It consisted of the king and the Black Prince, and 24 knights divided into two bands of 12 like the tilters in a hastilude—at the head of the one being the first, and of the other the second; and to the companions belonging to each, when the order had superseded the Round Table and had become a permanent institution, were assigned stalls either on the sovereign's or the prince's side of St George's Chapel. That Sir Harris Nicolas is accurate in this conjecture seems probable from the selection which was made of the "founder knights." As Beltz observes, the fame of Sir Reginald Cobham, Sir Walter Manny and the earls of Northampton, Hereford and Suffolk was already established by their warlike exploits, and they would certainly have been among the original companions had the order been then regarded as the reward of military merit only. But, although these eminent warriors were subsequently elected as vacancies occurred, their admission was postponed to that of several very young and in actual warfare comparatively unknown knights, whose claims to the honour may be most rationally explained on the assumption that they had excelled in the particular feats of arms which preceded the institution of the order. The original companionship had consisted of the sovereign and 25 knights, and no change was made in this respect until 1786, when the sons of George III. and his successors were made eligible notwithstanding that the chapter might be complete. In 1805 another alteration was effected by the provision that the lineal descendants of George II. should be eligible in the same manner, except the Prince of Wales for the time being, who was declared to be "a constituent part of the original institution"; and again in 1831 it was further ordained that the privilege accorded to the lineal descendants of George II. should extend to the lineal descendants of George I. Although, as Sir Harris Nicolas observes, nothing is now known of the form of admitting ladies into the order, the description applied to them in the records during the 14th and 15th centuries leaves no doubt that they were regularly received into it. The queen consort, the wives and daughters of knights, and some other women of exalted position, were designated "Dames de la Fraternité de St George," and entries of the delivery of robes and garters to them are found at intervals in the Wardrobe Accounts from the 50th Edward III. (1376) to the 10th of Henry VII. (1495), the first being Isabel, countess of Bedford, the daughter of the one king, and the last being Margaret and Elizabeth, the daughters of the other king. The effigies of Margaret Byron, wife of Sir Robert Harcourt, K.G., at Stanton Harcourt, and of Alice Chaucer, wife of William de la Pole, duke of Suffolk, K.G., at Ewelme, which date from the reigns of Henry VI. and Edward IV., have garters on their left arms. (See further under "Orders of Knighthood" below.)

It has been the general opinion, as expressed by Sainte Palaye and Mills, that formerly all knights were qualified to confer knighthood.[5] But it may be questioned whether the privilege

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[1] G. F. Beltz, *Memorials of the Most Noble Order of the Garter* (1841), p. 385.

[2] Heylyn, *Cosmographie and History of the Whole World*, bk. i. p. 286.

[3] Beltz, *Memorials*, p. xlvi.

[4] *Orders of Knighthood*, vol. i. p. lxxxiii.

[5] *Mémoires*, i. 67, i. 22; *History of Chivalry*; Gibbon, *Decline and Fall*, vii. 200.

Persons empowered to confer Knighthood.

was thus indiscriminately enjoyed even in the earlier days of chivalry. It is true that as much might be inferred from the testimony of the romance writers; historical evidence, however, tends to limit the proposition, and the sounder conclusion appears to be, as Sir Harris Nicolas says, that the right was always restricted in operation to sovereign princes, to those acting under their authority or sanction, and to a few other personages of exalted rank and station.[1] In several of the writs for distraint of knighthood from Henry III. to Edward III. a distinction is drawn between those who are to be knighted by the king himself or by the sheriffs of counties respectively, and bishops and abbots could make knights in the 11th and 12th centuries.[2] At all periods the commanders of the royal armies had the power of conferring knighthood; as late as the reign of Elizabeth it was exercised among others by Sir Henry Sidney in 1583, and Robert, earl of Essex, in 1595, while under James I. an ordinance of 1622, confirmed by a proclamation of 1623, for the registration of knights in the college of arms, is rendered applicable to all who should receive knighthood from either the king or any of his lieutenants.[3] Many sovereigns, too, both of England and of France, have been knighted after their accession to the throne by their own subjects, as, for instance, Edward III. by Henry, earl of Lancaster, Edward VI. by the lord protector Somerset, Louis XI. by Philip, duke of Burgundy, and Francis I. by the Chevalier Bayard. But when in 1543 Henry VIII. appointed Sir John Wallop to be captain of Guisnes, it was considered necessary that he should be authorized in express terms to confer knighthood, which was also done by Edward VI. in his own case when he received knighthood from the duke of Somerset.[4] But at present the only subject to whom the right of conferring knighthood belongs is the lord-lieutenant of Ireland, and to him it belongs merely by long usage and established custom. But, by whomsoever conferred, knighthood at one time endowed the recipient with the same status and attributes in every country wherein chivalry was recognized. In the middle ages it was a common practice for sovereigns and princes to dub each other knights much as they were afterwards, and are now, in the habit of exchanging the stars and ribbons of their orders. Henry II. was knighted by his great-uncle David I. of Scotland, Alexander III. of Scotland by Henry III., Edward I. when he was prince by Alphonso X. of Castile, and Ferdinand of Portugal by Edmund of Langley, earl of Cambridge.[5] And, long after the military importance of knighthood had practically disappeared, what may be called its cosmopolitan character was maintained: a knight's title was recognized in all European countries, and not only in that country in which he had received it. In modern times, however, by certain regulations, made in 1823, and repeated and enlarged in 1855, not only is it provided that the sovereign's permission by royal warrant shall be necessary for the reception by a British subject of any foreign order of knighthood, but further that such permission shall not authorize "the assumption of any style, appellation, rank, precedence, or privilege appertaining to a knight bachelor of the United Kingdom."[6]

Degradation.

Since knighthood was accorded either by actual investiture or its equivalent, a counter process of degradation was regarded as necessary for the purpose of depriving anybody who had once received it of the rank and condition it implied.[7] The cases in which a knight has been formally degraded in England are exceedingly few, so few indeed that two only are mentioned by Segar, writing in 1602, and Dallaway says that only three were on record in the College of Arms when he wrote in 1793. The last case was that of Sir Francis Michell in 1621, whose spurs were hacked from his heels, his sword-belt cut, and his sword broken over his head by the heralds in Westminster Hall.[8]

Roughly speaking, the age of chivalry properly so called may be said to have extended from the beginning of the crusades to the end of the Wars of the Roses. Even in the way of pageantry and martial exercise it did not long survive the middle ages. In England tilts and tourneys, in which her father had so much excelled, were patronized to the last by Queen Elizabeth, and were even occasionally held until after the death of Henry, prince of Wales. But on the Continent they were discredited by the fatal accident which befell Henry II. of France in 1559. The golden age of chivalry has been variously located. Most writers would place it in the early 13th century, but Gautier would remove it two or three generations further back. It may be true that, in the comparative scarcity of historical evidence, 12th-century romances present a more favourable picture of chivalry at that earlier time; but even such historical evidence as we possess, when carefully scrutinized, is enough to dispel the illusion that there was any period of the middle ages in which the unselfish championship of "God and the ladies" was anything but a rare exception.

It is difficult to describe the true spirit and moral influence of knighthood, if only because the ages in which it flourished differed so widely from our own. At its very best, it was always hampered by the limitations of medieval society. Moreover, many of the noblest precepts of the knightly code were a legacy from earlier ages, and have survived the decay of knighthood just as they will survive all transitory human institutions, forming part of the eternal heritage of the race. Indeed, the most important of these precepts did not even attain to their highest development in the middle ages. As a conscious effort to bring religion into daily life, chivalry was less successful than later puritanism; while the educated classes of our own day far surpass the average medieval knight in discipline, self-control and outward or inward refinement. Freeman's estimate comes far nearer to the historical facts than Burke's: "The chivalrous spirit is above all things a class spirit. The good knight is bound to endless fantastic courtesies towards men and still more towards women of a certain rank; he may treat all below that rank with any decree of scorn and cruelty. The spirit of chivalry implies the arbitrary choice of one or two virtues to be practised in such an exaggerated degree as to become vices, while the ordinary laws of right and wrong are forgotten. The false code of honour supplants the laws of the commonwealth, the law of God and the eternal principles of right. Chivalry again in its military aspect not only encourages the love of war for its own sake without regard to the cause for which war is waged, it encourages also an extravagant regard for a fantastic show of personal daring which cannot in any way advance the objects of the siege or campaign which is going on. Chivalry in short is in morals very much what feudalism is in law: each substitutes purely personal obligations devised in the interests of an exclusive class, for the more homely duties of an honest man and a good citizen" (*Norman Conquest*, v. 482). The chivalry from which Burke drew his ideas was, so far as it existed at all, the product of a far later age. In its own age, chivalry rested practically, like the highest civilization of ancient Greece and Rome, on slave labour;[9] and if many of its most brilliant outward attractions have now faded for ever, this is only because modern civilization tends so strongly to remove social barriers. The knightly ages will always enjoy the glory of having formulated a code of honour which aimed at rendering the upper classes worthy of their exceptional privileges; yet we must judge chivalry not only by its formal code but also by its practical fruits. The ideal is well summed up by F. W. Cornish: “ Chivalry taught the world the duty of noble service willingly rendered. It upheld courage and enterprise in obedience to rule, it consecrated military prowess to the service of the Church, glorified the virtues of liberality, good faith, unselfishness and courtesy, and above all, courtesy to women. Against these may be set the vices of pride, ostentation, love of bloodshed, contempt of inferiors, and loose manners. Chivalry was an imperfect discipline, but it was a discipline, and one fit for the times. It may have existed in the world too long: it did not come into existence too early; and with all its shortcomings it exercised a great and wholesome influence in raising the medieval world from barbarism to civilization” (p. 27). This was the ideal, but to give the reader a clear view of the actual features of knightly society in their contrast with that of our own day, it is necessary to bring out one or two very significant shadows.

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[1] *Orders of Knighthood*, vol. i. p. xi.

[2] Selden, *Titles of Honor*, p. 638.

[3] Harleian MS. 6063; Hargrave MS. 325.

[4] *Patent Rolls*, 35th Hen. VIII., pt. xvi., No. 24; Burnet, *Hist. of Reformation*, i. 15.

[5] Spelman, "De milite dissertatio," *Posthumous Works*, p. 181.

[6] *London Gazette*, December 6, 1823, and May 15, 1855.

[7] On the Continent very elaborate ceremonies, partly heraldic and partly religious, were observed in the degradation of a knight, which are described by Sainte Palaye, *Mémoires*, i. 316 seq., and after him by Mills, *History of Chivalry*, i. 60 seq. Cf. *Titles of Honor*, p. 653.

[8] Dallaway's *Heraldry*, p. 303.

[9] Even in 13th century England more than half the population were serfs, and as such had no claim to the privileges of Magna Carta; disputes between a serf and his lord were decided in the latter's court, although the king's courts attempted to protect the serf's life and limb and necessary implements of work. By French feudal law, the villein had no appeal from his lord save to God (Pierre de Fontaines, *Conseil*, ch. xxi. art. 8); and, though common sense and natural good feeling set bounds in most cases to the tyranny of the nobles, yet there was scarcely any injustice too gross to be possible. "How mad are they who exult when sons are born to their lords!" wrote Cardinal Jacques de Vitry early in the 13th century (*Exempla*, p. 64, Folk Lore Soc. 1890).

Far too much has been made of the extent to which the knightly code, and the reverence paid to the Virgin Mary, raised the position of women (*e.g.* Gautier, p. 360). As Gautier himself admits, the feudal system made it difficult to separate the woman's person from her fief: instead of the freedom of Christian marriage on which the Church in theory insisted, lands and women were handed over together, as a business bargain, by parents or guardians. In theory, the knight was the defender of widows and orphans; but in practice wardships and marriages were bought and sold as a matter of everyday routine like stocks and shares in the modern market. Lord Thomas de Berkeley (1245–1321) counted on this as a regular and considerable source of income (Smyth, *Lives*, i. 157). Late in the 15th century, in spite of the somewhat greater liberty of that age, we find Stephen Scrope writing nakedly to a familiar correspondent “for very need [of poverty], I was fain to sell a little daughter I have for much less than I should have done by possibility,” *i.e.* than the fair market price (Gairdner, *Paston Letters*, Introduction, p. clxxvi; cf. ccclxxi). Startling as such words are, it is perhaps still more startling to find how frequently and naturally, in the highest society, ladies were degraded by personal violence. The proofs of this which Schultz and Gautier adduce from the *Chansons de Geste* might be multiplied indefinitely. The Knight of La Tour-Landry (1372) relates, by way of warning to his daughters, a tale of a lady who so irritated her husband by scolding him in company, that he struck her to the earth with his fist and kicked her in the face, breaking her nose. Upon this the good knight moralizes: “And this she had for her euelle and gret langage, that she was wont to saie to her husbonde. And therfor the wiff aught to suffre and lete her husbonde haue the wordes, and to be maister, for that is her worshippe; for it is shame to here striff betwene hem, and in especial before folke. But y saie not but whanne thei be allone, but she may tolle hym with goodly wordes, and counsaile hym to amende yef he do amys” (La Tour, chap. xviii.; cf. xvii. and xix.). The right of wife-beating was formally recognized by more than one code of laws, and it was already a forward step when, in the 13th century, the *Coutumes du Beauvoisis* provided “ que le mari ne doit battre sa femme que *raisonnablement* ” (Gautier, p. 349). This was a natural consequence not only of the want of self-control which we see everywhere in the middle ages, but also of the custom of contracting child-marriages for unsentimental considerations. Between 1288 and 1500 five marriages are recorded in the direct line of the Berkeley family in which the ten contracting parties averaged less than eleven years of age: the marriage contract of another Lord Berkeley was drawn up before he was six years old. Moreover, the same business considerations which dictated those early marriages clashed equally with the strict theory of knighthood. In the same Berkeley family, the lord Maurice IV. was knighted in 1338 at the age of seven to avoid the possible evils of wardship, and Thomas V. for the same reason in 1476 at the age of five. Smyth's record of this great family shows that, from the middle of the 13th century onwards, the lords were not only statesmen and warriors, but still more distinguished as gentlemen-farmers on a great scale, even selling fruit from the castle gardens, while their ladies would go round on tours of inspection from dairy to dairy. The lord Thomas III. (1326–1361), who was noted as a special lover of tournaments, spent in two years only £90, or an average of about £15 per tournament; yet he was then laying money by at the rate of £450 a year, and, a few years later, at the rate of £1150, or nearly half his income! Indeed, economic causes contributed much to the decay of romantic chivalry. The old families had lost heavily from generation to generation, partly by personal extravagances, but also by gradual alienations of land to the Church and by the enormous expenses of the crusades. Already, in the 13th century, they were hard pressed by the growing wealth of the burghers, and even the greatest nobles could scarcely keep up their state without careful business management. It is not surprising therefore, to find that at least as early as the middle of the 13th century the commercial side of knighthood became very prominent. Although by the code of chivalry no candidate could be knighted before the age of twenty-one, we have seen how great nobles like the Berkeleys obtained that honour for their infant heirs in order to avoid possible pecuniary loss; and French writers of the 14th century complained of this knighting of infants as a common and serious abuse.[1] Moreover, after the knight's liability to personal service in war had been modified in the 12th century by the scutage system, it became necessary in the first quarter of the 13th to compel landowners to take up the knighthood which in theory they should have coveted as an honour—a compulsion which was soon systematically enforced (*Distraint of Knighthood*, 1278), and became a recognized source of royal income. An indirect effect of this system[2] was to break down another rule of the chivalrous code—that none could be dubbed who was not of gentle birth.[3] This rule, however, had often been broken before; even the romances of chivalry speak not infrequently of the knighting of serfs or *jongleurs*;[4] and other causes besides distraint of knighthood tended to level the old distinctions. While knighthood was avoided by poor nobles, it was coveted by rich citizens. It is recorded in 1298 as “ an immemorial custom ” in Provence that rich burghers enjoyed the honour of knighthood; and less than a century later we find Sacchetti complaining that the dignity is open to any rich upstart, however disreputable his antecedents.[5] Similar causes contributed to the decay of knightly ideas in warfare. Even in the 12th century, when war was still rather the pastime of kings and knights than a national effort, the strict code of chivalry was more honoured in the breach than in the observance.[1] But when the Hundred Years' War brought a real national conflict between England and France, when archery became of supreme importance, and a large proportion even of the cavalry were mercenary soldiers, then the exigencies of serious warfare swept away much of that outward display and those class-conventions on which chivalry had always rested. Siméon Luce (chap. vi.) has shown how much the English successes in this war were due to strict business methods. Several of the best commanders (*e.g.* Sir Robert Knolles and Sir Thomas Dagworth) were of obscure birth, while on the French side even Du Guesclin had to wait long for his knighthood because he belonged only to the lesser nobility. The tournament again, which for two centuries had been under the ban of the Church, was often almost as definitely discouraged by Edward III. as it was encouraged by John of France; and while John's father opened the Crécy campaign by sending Edward a challenge in due form of chivalry, Edward took advantage of this formal delay to amuse the French king with negotiations while he withdrew his army by a rapid march from an almost hopeless position. A couple of quotations from Froissart will illustrate the extent to which war had now become a mere business. Much as he admired the French chivalry, he recognized their impotence at Crécy. "The sharp arrows ran into the men of arms and into their horses, and many fell, horse and men. . . . And also among the Englishmen there were certain rascals that went afoot with great knives, and they went in among the men of arms, and slew and murdered many as they lay on the ground, both earls, barons, knights and squires, whereof the king of England was after displeased, for he had rather they had been taken prisoners." How far Edward's solicitude was disinterested may be gauged from Froissart's parallel remark about the battle of Aljubarrota, where, as at Agincourt, the handful of victors were obliged by a sudden panic to slay their prisoners. "Lo, behold the great evil adventure that fell that Saturday. For they slew as many good prisoners as would well have been worth, one with another, four hundred thousand franks." In 1402 Lord Thomas de Berkeley bought, as a speculation, 24 Scottish prisoners. Similar practical considerations forced the nobles of other European countries either to conform to less sentimental methods of warfare and to growing conceptions of nationality, or to become mere Ishmaels of the type which outlived the middle ages in Götz von Berlichingen and his compeers.

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[1] Sainte Palaye, ii. 90.

[2] Medley, *English Constitutional History* (2nd ed., pp. 291, 466), suggests that Edward might have deliberately calculated this degradation of the older feudal ideal.

[3] Being made to “ ride the barriers ” was the penalty for anybody who attempted to take part in a tournament without the qualification of name and arms. Guillim (*Display of Heraldry*, p. 66) and Nisbet (*System of Heraldry*, ii. 147) speak of this subject as concerning England and Scotland. See also Ashmole's *Order of the Garter*, p. 284. But in England knighthood has always been conferred to a great extent independently of these considerations. At almost every period there have been men of obscure and illegitimate birth who have been knighted. Ashmole cites authorities for the contention that knighthood ennobles, insomuch that whosoever is a knight it necessarily follows that he is also a gentleman; “ for, when a king gives the dignity to an ignoble person whose merit he would thereby recompense, he is understood to have conferred whatsoever is requisite for the completing of that which he bestows.” By the common law, if a villein were made a knight he was thereby enfranchised and accounted a gentleman, and if a person under age and in wardship were knighted both his minority and wardship terminated. (*Order of the Garter*, p. 43; Nicolas, *British Orders of Knighthood*, i. 5.)

[4] Gautier, pp. 21, 249.

[5] Du Cange, *s.v. miles* (ed. Didot, t. iv. p. 402); Sacchetti, *Novella*, cliii. All the medieval *orders* of knighthood, however, insisted in their statutes on the noble birth of the candidate.

BIBLIOGRAPHY.—Froissart is perhaps the source from which we may gather most of chivalry in its double aspect, good and bad. The brilliant side comes out most clearly in Joinville, the *Chronique de Du Guesclin*, and the *Histoire de Bayart*; the darker side appears in the earlier chronicles of the crusades, and is especially emphasized by preachers and moralists like Jacques de Vitry, Étienne de Bourbon, Nicole Bozon and John Gower. John Smyth's *Lives of the Berkeleys* (Bristol and Gloucs. Archaeol. Soc., 2 vols.) and the *Book of the Knight of La Tour-Landry* (ed. A. de Montaiglon, or in the old English trans. published by the Early English Text Soc.) throw a very vivid light on the inner life of noble families. Of modern books, besides those quoted by their full titles in the notes, the best are A. Schultz, *Höfisches Leben z. Zeit der Minnesänger* (Leipzig, 1879); S. Luce, *Hist. de Du Guesclin et de son Époque* (2nd ed., Paris, 1882), masterly but unfortunately unfinished at the author's death; Léon Gautier, *La Chevalerie* (Paris, 1883), written with a strong apologetic bias, but full and correct in its references; and F. W. Cornish, *Chivalry* (London, 1901), too little reference to the more prosaic historical documents, but candid and without intentional partiality. (G. G. Co.)

ORDERS OF KNIGHTHOOD

When orders ceased to be fraternities and became more and more marks of favour and a means of recognizing meritorious services to the Crown and country, the term "orders" became loosely applied to the insignia and decorations themselves. Thus "orders," irrespective of the title or other specific designation they confer, fall in Great Britain generally into three main categories, according as the recipients are made "knights grand cross," "knights commander," or "companions." In some orders the classes are more numerous, as in the Royal Victorian, for instance, which has five, numerous foreign orders a like number, some six, while the Chinese "Dragon" boasts no less than eleven degrees. Generally speaking, the insignia of the "knights grand cross" consist of a star worn on the left breast and a badge, usually some form either of the cross *patée* or of the Maltese cross, worn suspended from a ribbon over the shoulder or, in certain cases, on days of high ceremonial from a collar. The "commanders" wear the badge from a ribbon round the neck, and the star on the breast; the "companions" have no star and wear the badge from a narrow ribbon at the button-hole.

Orders may, again, be grouped according as they are (1) PRIME ORDERS OF CHRISTENDOM, conferred upon an exclusive class only. Here belong, *inter alia*, the well-known orders of the *Garter* (England), *Golden Fleece* (Austria and Spain), *Annunziata* (Italy), *Black Eagle* (Prussia), *St Andrew* (Russia), *Elephant* (Denmark) and *Seraphim* (Sweden). Of these the first three only, which are usually held to rank *inter se* in the order given, are historically identified with chivalry. (2) FAMILY ORDERS, bestowed upon members of the royal or princely class, or upon humbler individuals according to classes, in respect of "personal" services rendered to the family. To this category belong such orders as the Royal Victorian and the Hohenzollern (Prussia). (3) ORDERS OF MERIT, whether military, civil or joint orders. Such have, as a rule, at least three, oftener five classes, and here belong such as the *Order of the Bath* (British), *Red Eagle* (Prussia), *Legion of Honour* (France). There are also certain orders, such as the recently instituted *Order of Merit* (British), and the *Pour le Mérite* (Prussia), which have but one class, all members being on an equality of rank within the order.

Of the three great military and religious orders, branches survive of two, the Teutonic Order (*Der hohe deutsche Ritter Orden* or *Marianen Orden*) and the Knights of St John of Jerusalem (*Johanniter Orden, Malteser Orden*), for the history of which and the present state see TEUTONIC ORDER and ST JOHN OF JERUSALEM, KNIGHTS OF THE ORDER OF.

Great Britain.—The history and constitution of the "most noble" *Order of the Garter* has been treated above. The officers of the order are five—the prelate, chancellor, registrar, king of arms and usher—the first, third and fifth having been attached to it from the commencement, while the fourth was added by Henry V. and the second by Edward IV. The prelate has always been the bishop of Winchester; the chancellor was formerly the bishop of Salisbury, but is now the bishop of Oxford; the registrarship and the deanery of Windsor have been united since the reign of Charles I.; the king of arms, whose duties were in the beginning discharged by Windsor herald, is Garter Principal King of Arms; and the usher is the gentleman usher of the Black Rod. The chapel of the order is St George's Chapel, Windsor. The insignia of the order are illustrated on Plate I.

The "most ancient" *Order of the Thistle* was founded by James II. in 1687, and dedicated to St Andrew. It consisted of the sovereign and eight knights companions, and fell into abeyance at the Revolution of 1688. In 1703 it was revived by Queen Anne, when it was ordained to consist of the sovereign and 12 knights companions, the number being increased to 16 by statute in 1827. The officers of the order are the dean, the secretary, Lyon King of Arms and the gentleman usher of the Green Rod. The chapel, in St Giles's, Edinburgh, was begun in 1909. The star, badge and ribbon of the order are illustrated on Plate II., figs. 5 and 6. The collar is formed of thistles, alternating with sprigs of rue, and the motto is *Nemo me impune lacessit.*

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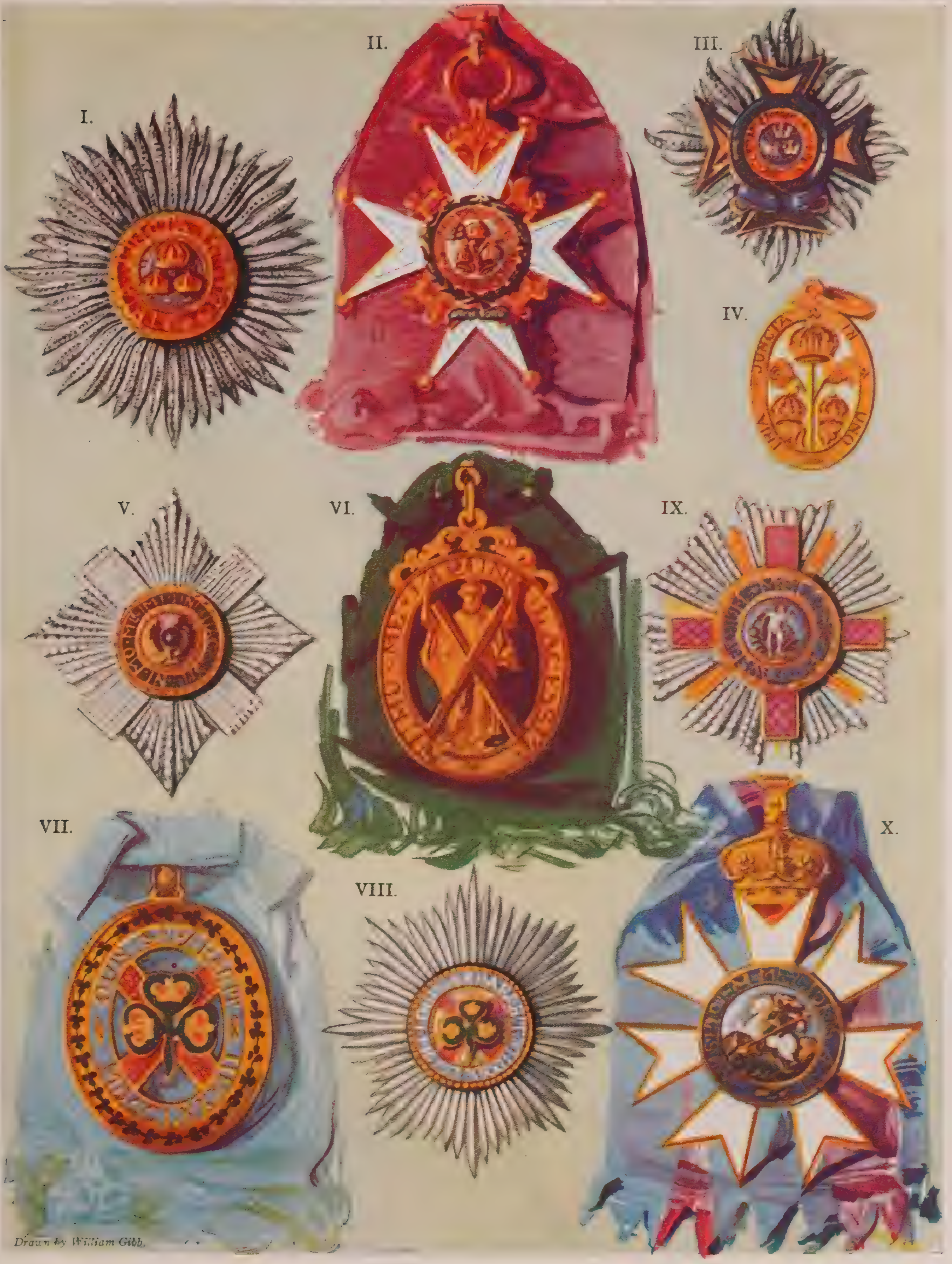
[1] Lecoy de la Marche (*Chaire française au moyen âge*, 2nd ed., p. 387) gives many instances to prove that "al chevalerie, au xiii^e siècle, est déjà sur son déclin." But already about 1160 Peter of Blois had written, "The so-called order of knighthood is nowadays mere disorder" (*ordo militum nunc est, ordinem non tenere.* Ep. xciv.: the whole letter should be read); and, half a century earlier still, Guibert of Nogent gives an equally unflattering picture of contemporary chivalry in his *De vita sua* (Migne, *Pat. Lat.*, tom. clvi.).

INSIGNIA OF SOME OF THE PRINCIPAL ORDERS OF KNIGHTHOOD, DRAWN BY GRACIOUS PERMISSION FROM THOSE IN THE POSSESSION OF HIS LATE MAJESTY KING EDWARD VII AND ARRANGED IN ACCORDANCE WITH HIS MAJESTY'S WISHES AND COMMAND.


II.
III.
I.
IV.
TRIA JUNCTA IN UNO
V.
VI.
IX.
VII.
X.
VIII.

Drawn by William Gibb.

THE BATH. (i.) Star; (ii.) Grand Cross (Mil.); (iii.) Star; (iv.) Grand Cross (Civ.) THE THISTLE. (v.) Star; (vi.) Badge. THE ST. PATRICK. (vii.) Badge; (viii.) Star. THE ST. MICHAEL AND ST. GEORGE. (ix.) Star; (x.) Grand Cross.

The "most illustrious" *Order of St Patrick* was instituted by George III. in 1788, to consist of the sovereign, the lord lieutenant of Ireland as grand master and 15 knights companions, enlarged to 22 in 1833. The chancellor of the order is the chief secretary to the lord lieutenant of Ireland, and the king of arms is Ulster King of Arms; Black Rod is the usher. The chapel is in St Patrick's Cathedral, Dublin. The star, badge and ribbon are illustrated on Plate II., figs. 7 and 8. The collar is formed of alternate roses with red and white leaves, and gold harps linked by gold knots; the badge is suspended from a harp surmounted by an imperial jewelled crown. The motto is *Quis separabit?*

The "most honourable" *Order of the Bath* was established by George I. in 1725, to consist of the sovereign, a grand master and 36 knights companions. This was a pretended revival of an order supposed to have been created by Henry IV. at his coronation in 1399. But, as has been shown in the preceding section, no such order existed. Knights of the Bath, although they were allowed precedence before knights bachelors, were merely knights bachelors who were knighted with more elaborate ceremonies than others and on certain great occasions. In 1815 the order was instituted, in three classes, "to commemorate the auspicious termination of the long and arduous contest in which the Empire has been engaged"; and in 1847 the civil knights commanders and companions were added. Exclusive of the sovereign, royal princes and distinguished foreigners, the order is limited to 55 military and 27 civil knights grand cross, 145 military and 108 civil knights commanders, and 705 military and 298 civil companions. The officers of the order are the dean (the dean of Westminster), Bath King of Arms, the registrar, and the usher of the Scarlet Rod. The ribbon and badges of the knights grand cross (civil and military) and the stars are illustrated on Plate II., figs. 1, 2, 3 and 4.

The "most distinguished" *Order of St Michael and St George* was founded by the prince regent, afterwards George IV., in 1818, in commemoration of the British protectorate of the Ionian Islands, "for natives of the Ionian Islands and of the island of Malta and its dependencies, and for such other subjects of his majesty as may hold high and confidential situations in the Mediterranean." By statute of 1832 the lord high commissioner of the Ionian Islands was to be the grand master, and the order was directed to consist of 15 knights grand crosses, 20 knights commanders and 25 cavaliers or companions. After the repudiation of the British protectorate of the Ionian Islands, the order was placed on a new basis, and by letters patent of 1868 and 1877 it was extended and provided for such of "the natural born subjects of the Crown of the United Kingdom as may have held or shall hold high and confidential offices within her majesty's colonial possessions, and in reward for services rendered to the crown in relation to the foreign affairs of the Empire." It is now (by the enlargement of 1902) limited to 100 knights grand cross, of whom the first or principal is grand master, exclusive of extra and honorary members, of 300 knights commanders and 600 companions. The officers are the prelate, chancellor, registrar, secretary and officer of arms. The chapel of the order, in St Paul's Cathedral, was dedicated in 1906. The badge of the knights grand cross and the ribbon are illustrated on Plate II., figs. 9 and 10. The star of the knights grand cross is a seven-rayed star of silver with a small ray of gold between each, in the centre is a red St George's cross bearing a medallion of St Michael encountering Satan, surrounded by a blue fillet with the motto *Auspicium melioris aevi.*

The *Order of St Michael and St George* ranks between the "most exalted" *Order of the Star of India* and the "most eminent" *Order of the Indian Empire*, of both of which the viceroy of India for the time being is *ex officio* grand master. Of these the first was instituted in 1861 and enlarged in 1876. 1897 and 1903, in three classes, knights grand commanders, knights commanders and companions, and the second was established (for "companions" only) in 1878 and enlarged in 1887, 1892, 1897 and 1903, also in the same three classes, in commemoration of Queen Victoria's assumption of the imperial style and title of the Empress of India. The badges, stars and ribbons of the knights grand commanders of the two orders are illustrated on Plate III., figs. 3, 4, 5 and 6. The collar of the *Star of India* is composed of alternate links of the lotus flower, red and white roses and palm branches enamelled on gold, with an imperial crown in the centre; that of the *Indian Empire* is composed of elephants, peacocks and Indian roses.

The *Royal Victorian Order* was instituted by Queen Victoria on the 25th of April 1896, and conferred for personal services rendered to her majesty and her successors on the throne. It consists of the sovereign, chancellor, secretary and five classes—knights grand commanders, knights commanders, commanders and members of the fourth and fifth classes, the distinction between these last divisions lying in the badge and in the precedence enjoyed by the members. The knights of this order rank in their respective classes immediately after those of the *Indian Empire*, and its numbers are unlimited. The badge, star and ribbon of the knights grand cross are illustrated on Plate III., figs. 1 and 2.

To the class of orders without the titular appellation "knight" belongs the *Order of Merit*, founded by King Edward VII. on the occasion of his coronation. The order is founded on the lines of the Prussian *Ordre pour le mérite* (see below), yet more comprehensive, including those who have gained distinction in the military and naval services of the Empire, and such as have made themselves a great name in the fields of science, art and literature. The number of British members has been fixed at twenty-four, with the addition of such foreign persons as the sovereign shall appoint. The names of the first recipients were: Earl Roberts, Viscount Wolseley, Viscount Kitchener, Sir Henry Keppel, Sir Edward Seymour, Lord Lister, Lord Rayleigh, Lord Kelvin, John Morley, W. E. H. Lecky, G. F. Watts and Sir William Huggins. The only foreign recipients up to 1910 were Field Marshals Yamagata and Oyama and Admiral Togo. A lady, Miss Florence Nightingale, received the order in 1907. The badge is a cross of red and blue enamel surmounted by an imperial crown; the central blue medallion bears the inscription "For Merit" in gold, and is surrounded by a wreath of laurel. The badge of the military and naval members bears two crossed swords in the angles of the cross. The ribbon is garter blue and crimson and is worn round the neck.

The *Distinguished Service Order*, an order of military merit, was founded on the 6th of September 1886 by Queen Victoria, its object being to recognize the special services of officers in the army and navy. Its numbers are unlimited, and its designation the letters D.S.O. It consists of one class only, who take precedence immediately after the 4th class of the Royal Victorian Order. The badge is a white and gold cross with a red centre bearing the imperial crown surrounded by a laurel wreath. The ribbon is red edged with blue. The *Imperial Service Order* was likewise instituted on the 26th of June 1902, and finally revised in 1908, to commemorate King Edward's coronation, and is specially designed as a recognition of faithful and meritorious services rendered to the British Crown by the administrative members of the civil service in various parts of the Empire, and is to consist of companions only. The numbers are limited to 475, of whom 250 belong to the home and 225 to the civil services of the colonies and protectorates (Royal Warrant, June 1909). Women as well as men are eligible. The members of the order have the distinction of adding the letters I.S.O. after their names. In precedence the order ranks after the *Distinguished Service Order*. The badge is a gold medallion bearing the royal cipher and the words "For Faithful Service" in blue; for men it rests on a silver star, for women it is surrounded by a silver wreath. The ribbon is one blue between two crimson stripes.

In addition to the above, there are two British orders confined to ladies. The *Royal Order of Victoria and Albert*, which was instituted in 1862, is a purely court distinction. It consists of four classes, and it has as designation the letters V.A. The *Imperial Order of the Crown of India* is conferred for like purposes as the Order of the Indian Empire. Its primary object is to recognize the services of ladies connected with the court of India. The letters C.I. are its designation.

The sovereign's permission by royal warrant is necessary before a British subject can receive a foreign order of knighthood. For other decorations, see under MEDALS.

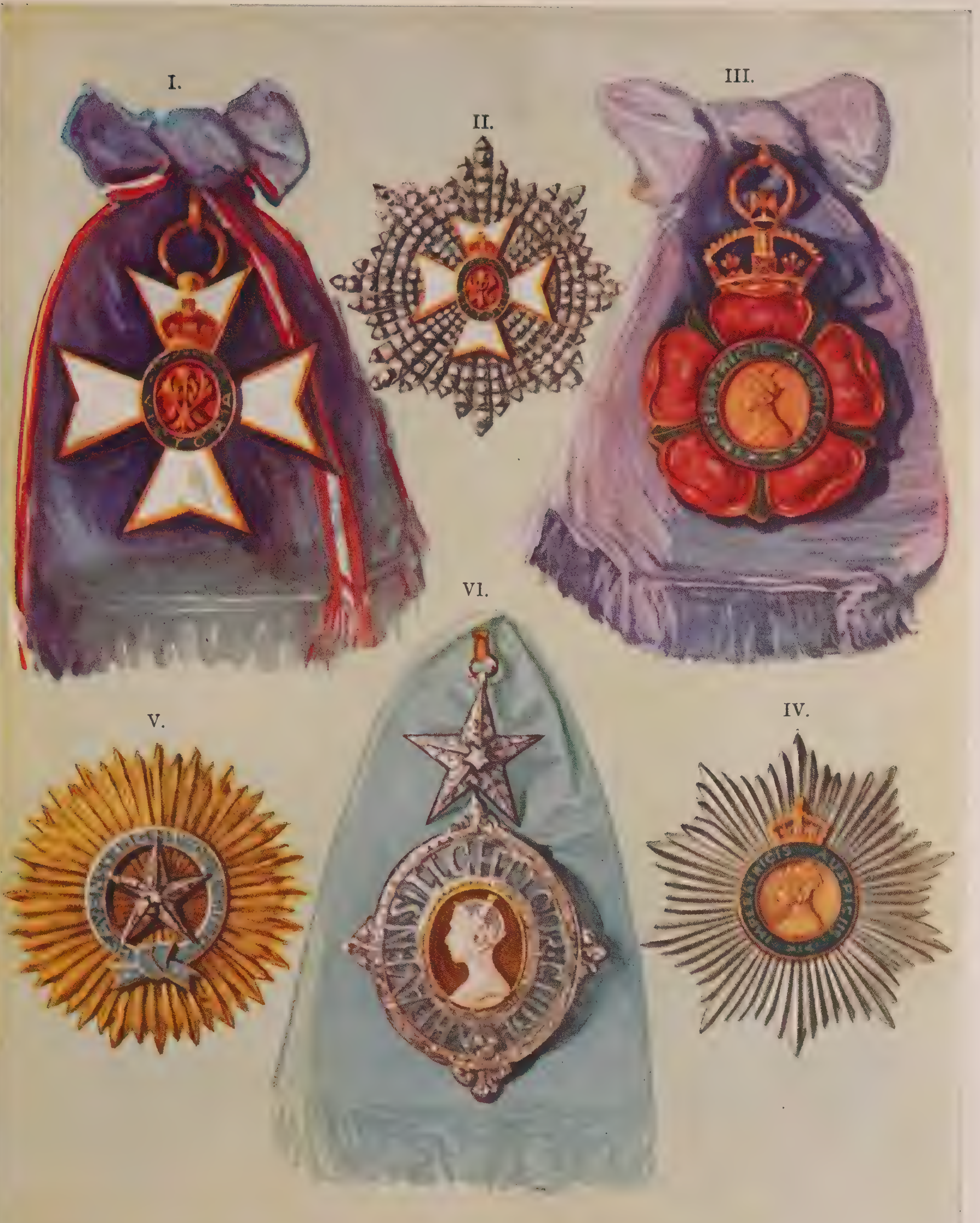
The Golden Fleece (*La Toison d'Or*) ranks historically and in distinction as one of the great knightly orders of Europe. It is now divided into two branches, of Austria and Spain. It was founded on the 10th of January, 1429/30 by Philip the Good, duke of Burgundy, on the day of his marriage with Isabella of Portugal at Bruges, in her honour and dedicated to the Virgin and St Andrew. No certain origin can be given for the name. It seems to have been in dispute even in the early history of the order. Four different sources have been suggested; the classical myth of the voyage of Jason and the Argonauts for the golden fleece, the scriptural story of Gideon, the staple trade of Flanders in wool, and the fleece of golden hair of Marie de Rambrugge, the duke's mistress. Motley (*Rise of Dutch Rep.*, i. 48) says: "What could be more practical and more devout than the conception? Did not the Lamb of God, suspended at each knight's heart, symbolize at once the woollen fabrics to which so much of Flemish wealth and Burgundian power was owing, and the gentle humility of Christ which was ever to characterize the order?" At its constitution the number of the knights was limited to 24, exclusive of the grand master, the sovereign. The members were to be *gentilshommes de nom et d'armes et sans reproche*, not knights of any other order, and vowed to join their sovereign in the defence of the Catholic faith, the protection of Holy Church, and the upholding of virtue and good morals. The sovereign undertook to consult the knights before embarking on a war, all disputes between the knights were to be settled by the order, at each chapter the deeds of each knight were held in review, and punishments and admonitions were dealt out to offenders; to this the sovereign was expressly subject. Thus we find that the emperor Charles V. accepted humbly the criticism of the knights of the Fleece on his over-centralization of the government and the wasteful personal attention to details (E. A. Armstrong, *Charles V.*, 1902, ii. 373). The knights could claim as of right to be tried by their fellows on charges of rebellion, heresy and treason, and Charles V. conferred on the order exclusive jurisdiction over all crimes committed by the knights. The arrest of the offender had to be by warrant signed by at least six knights, and during the process of charge and trial he remained not in prison but *dans l'aimable compagnie du dit ordre*. It was in defiance of this right that Alva refused the claim of Counts Egmont and Horn to be tried by the knights of the Fleece in 1568. During the 16th century the order frequently acted as a consultative body in the state; thus in 1539 and 1540 Charles summons the knights with the council of state and the privy council to decide what steps should be taken in face of the revolt of Ghent (Armstrong, *op. cit.*, i. 302), in 1562 Margaret of Parma, the regent, summons them to Brussels to debate the dangerous condition of the provinces (Motley, i. 48), and they were present at the abdication of Charles in the great hall at Brussels in 1555. The history of the order and its subsequent division into the two branches of Austria and Spain may be briefly summarized. By the marriage of Mary, only daughter of Charles the Bold of Burgundy to Maximilian, archduke of Austria, 1477, the grand mastership of the order came to the house of Habsburg and, with the Netherlands provinces, to Spain in 1504 on the accession of Philip, Maximilian's son, to Castile. On the extinction of the Habsburg dynasty in Spain by the death of Charles II. in 1700 the grand-mastership, which had been filled by the kings of Spain after the loss of the Netherlands, was claimed by the emperor Charles VI., and he instituted the order in Vienna in 1713. Protests were made at various times by Philip V., but the question has never been finally decided by treaty, and the Austrian and Spanish branches have continued as independent orders ever since as the principal order of knighthood in the respective states. It may be noticed that while the Austrian branch excludes any other than Roman Catholics from the order, the Spanish Fleece may be granted to Protestants. The badges of the two branches vary slightly in detail, more particularly in the attachment of fire-stones (*fusils* or *furisons*) and steels by which the fleece is attached to the ribbon of the collar. The Spanish form is given on Plate IV., fig. 2. The collar is composed of alternate links of furisons and double steels interlaced to form the letter B for Burgundy. A magnificent exhibition of relics, portraits of knights and other objects connected with the order of the Golden Fleece was held at Bruges in 1907.

The chief history of the order is Baron de Reiffenberg's *Histoire de l'Ordre de la Toison d'Or* (1830); see also an article by Sir J. Balfour Paul, Lyon King of Arms, in the *Scottish Historical Review* (July 1908).

Austria-Hungary.—The following are the principal orders other than that of the Golden Fleece (*supra*). *The Order of St Stephen of Hungary*, the royal Hungarian order, founded in 1764 by the empress Maria Theresa, consists of the grand master (the sovereign), 20 knights grand cross, 30 knights commanders and 50 knights. The badge is a green enamelled cross with gold borders, suspended from the Hungarian crown; the red enamelled medallion in the centre of the cross bears a white patriarchal cross issuing from a coroneted green mound; on either side of the cross are the letters M.T. in gold, and the whole is surrounded by a white fillet with the legend *Publicum Meritorum Praemium.* The ribbon is green with a crimson central stripe. The collar, only worn by the knights grand cross, is of gold, and consists of Hungarian crowns linked together alternately by the monograms of St Stephen, S.S., and the foundress, M.T.; the centre of the collar is formed by a flying lark encircled by the motto *Stringit amore.* An illustration of the star of the grand cross is given on Plate V. fig. 4. *The Order of Leopold*, for civil and military service, was founded in 1808 by the emperor Francis I. in memory of his father Leopold II. The three classes take precedence next after the corresponding classes of the order of St Stephen. The badge is a red enamelled cross bordered with white and gold and surmounted by the imperial crown; the red medallion in the centre bears the letters F.I.A., and on the encircling white fillet is the inscription *Integritati et Merito.* When conferred for service in war the cross rests on a green laurel wreath. The ribbon is scarlet with two white stripes. The collar consists of imperial crowns, the initials F. and L. and oak wreaths. *The Order of the Iron Crown*, *i.e.* of Lombardy, was founded by Napoleon as king of Italy in 1809, and refounded as an Austrian order of civil and military merit in 1816 by the emperor Francis I.; the number of knights is limited to 100—20 grand cross, 30 commanders, 50 knights. The badge consists of the double-headed imperial eagle with sword and orb; below it is the jewelled iron crown of Lombardy, and above the imperial crown; on the breast of the eagle is a gold-bordered blue shield with the letter F. in gold. The military decoration for war service also bears two green laurel branches. The ribbon is yellow edged with narrow blue stripes. The collar is formed of Lombard crowns, oak wreaths and the monogram F.P. (*Franciscus Primus*). *The Order of Francis Joseph*, for personal merit of every kind, was founded in 1849 by the emperor Francis Joseph I. It is of the three usual classes and is unlimited in numbers. The badge is a black and gold imperial eagle surmounted by the imperial crown. The eagle bears a red cross with a white medallion, containing the letters F. J., and to the beaks of the two heads of the eagle is attached a chain on which is the legend *Viribus Unitis.* The ribbon is deep red. The *Order of Maria Theresa* was founded by the empress Maria Theresa in 1757. It is a purely military order and is given to officers for personal distinguished conduct in the field. There are three classes. There were originally only two, grand cross and knights. The emperor Joseph II. added a commanders' class in 1765. The badge is a white cross with gold edge, in the centre a red medallion with a white gold-edged *fesse*, surrounded by a fillet with the inscription *Fortitudini.* The ribbon is red with a white central stripe The *Order of Elizabeth Theresa*, also a military order for officers, was founded in 1750 by the will of Elizabeth Christina, widow of the emperor Charles VI. It was renovated in 1771 by her daughter, the empress Maria Theresa. The order is limited to 21 knights in three divisions. The badge is an oval star with eight points, enamelled half red and white, dependent from a gold imperial crown. The central medallion bears the initials of the founders, with the encircling inscription *M. Theresa parentis gratiam perennem voluit.* The ribbon is black. The *Order of the Starry Cross*, for high-born ladies of the Roman Catholic faith who devote themselves to good works, spiritual and temporal, was founded in 1668 by the empress Eleanor, widow of the emperor Ferdinand III. and mother of Leopold I., to commemorate the recovery of a relic of the true cross from a dangerous fire in the imperial palace at Vienna. The relic was supposed to have been peculiarly treasured by the emperor Maximilian I. and the emperor Frederick III. The patroness of the order must be a princess of the imperial Austrian house. The badge is the black double-headed eagle surrounded by a blue-enamelled ornamented border, with the inscription *Salus et Gloria* on a white fillet; the eagle bears a red Greek cross with gold and blue borders. The *Order of Elizabeth*, also for ladies, was founded in 1898.

Belgium.—The *Order of Leopold*, for civil and military merit, was founded in 1832 by Leopold I., with four classes, a fifth being added in 1838. The badge is a white enamelled cross, with gold borders and balls, suspended from a royal crown and resting on a green laurel and oak wreath. In the centre a medallion, surrounded by a red fillet with the motto of the order, *L'union fait la force*, bears a golden Belgian lion on a black field. The ribbon is watered red.

INSIGNIA OF SOME OF THE PRINCIPAL ORDERS OF KNIGHTHOOD, DRAWN BY GRACIOUS PERMISSION FROM THOSE IN THE POSSESSION OF HIS LATE MAJESTY KING EDWARD VII AND ARRANGED IN ACCORDANCE WITH HIS MAJESTY'S WISHES AND COMMAND.


I.
II.
III.
IV.
V.
VI.
VICTORIA
IMPERATRICIS AUSPICIIS

Drawn by William Gibb.

ROYAL VICTORIAN ORDER. (i.) Grand Cross; (ii.) Star. ORDER OF THE INDIAN EMPIRE. (iii.) Badge Of Knight Grand Commander; (iv.) Star. THE STAR OF INDIA. (v.) Star; (vi.) Badge of Knight Grand Commander.

The *Order of the Iron Cross*, the badge of which is a black cross with gold borders, with a gold centre bearing a lion, was instituted by Leopold II. in 1867 as an order of civil merit. The military cross was instituted in 1885. There are also the following orders instituted by Leopold II. for service in the Congo State: the *Order of the African Star* (1888), the *Royal Order of the Lion* (1891) and the *Congo Star* (1889).

Bulgaria.—The *Order of SS Cyril and Methodius* was instituted in 1909 by King Ferdinand to commemorate the elevation of the principality to the position of an independent kingdom. It now takes precedence of the *Order of St Alexander*, which was founded by Prince Alexander in 1881, and reconstituted by Prince Ferdinand in 1888. There are six classes. The plain white cross, suspended from the Bulgarian crown, bears the name of the patron saint in old Cyrillic letters in the centre.

Denmark.—The *Order of the Elephant*, one of the chief European orders of knighthood, was, it is said, founded by Christian I. in 1462; a still earlier origin has been assigned to it, but its regular institution was that of Christian V. in 1693. The order, exclusive of the sovereign and his sons, is limited to 30 knights, who must be of the Protestant religion. The badge of the order is illustrated on Plate IV. fig. 5. The ribbon is light watered blue, the collar of alternate gold elephants with blue housings and towers, the star of silver with a purple medallion bearing a silver or brilliant cross surrounded by a silver laurel wreath. The motto is *Magnanime pretium.* The *Order of the Dannebrog* is, according to Danish tradition, of miraculous origin, and was founded by Valdemar II. in 1219 as a memorial of a victory over the Esthonians, won by the appearance in the sky of a red banner bearing a white cross. Historically the order dates from the foundation in 1671 by Christian V. at the birth of his son Frederick, the statutes being published in 1693. Originally restricted to 50 knights and granted as a family or court decoration, it was reconstituted as an unlimited order of merit in 1808 by Frederick VI.; alterations have been made in 1811 and 1864. It now consists of three classes—grand cross, commander (two grades), knight, and of one rank of ordinary members (*Dannebrogs maender*). The badge of the order is, with variations for the different classes, a white enamelled Danish cross with red and gold borders, bearing in the centre the letter W (V) and on the four arms the inscription *Gud og Kongen* (For God and King). The ribbon is white with red edging.

France.—The Legion of Honour, the only order of France, and one which in its higher grades ranks in estimation with the highest European orders, was instituted by Napoleon Bonaparte on the 19th of May 1802 (29 Floreal of the year X.) as a general military and civil order of merit. All soldiers on whom "swords of honour" had been already conferred were declared *legionaries ipso facto*, and all citizens after 25 years' service were declared eligible, whatever their birth, rank or religion. On admission all were to swear to co-operate so far as in them lay for the assertion of the principles of liberty and equality. The organization as laid down by Napoleon in 1804 was as follows: Napoleon was grand master; a grand council of 7 grand officers administered the order; the order was divided into 15 "cohorts" of 7 grand officers, 20 commanders, 30 officers and 350 legionaries, and at the headquarters of the cohorts, for which the territory of France was separated into 15 divisions, were maintained hospitals for the support of the sick and infirm legionaries. Salaries (*traitements*) varying in each rank were attached to the order. In 1805 the rank of "Grand Eagle" (now Grand Cross, or *Grand Cordon*) was instituted, taking precedence of the grand officers. At the Restoration many changes were made, the old military and religious orders were restored, and the *Legion of Honour*, now *Ordre Royale de la Legion d'Honneur*, took the lowest rank. The revolution of July 1830 restored the order to its unique place. The constitution of the order now rests on the decrees of the 16th of March and 24th of November 1852, the law of the 25th of July 1873, the decree of the 29th of December 1892, and the laws of the 16th of April 1895 and the 28th of January 1897, and a decree of the 26th of June 1900. The president of the republic is the grand master of the order; the administration is in the hands of a grand chancellor, who has a council of the order nominated by the grand master. The chancellery is housed in the *Palais de la Legion de l'Honneur*, which, burnt during the Commune, was rebuilt in 1878. The order consists of the five classes of grand cross (limited to 80), grand officer (200), commander (1000), officers (4000), and chevalier or knight, in which the number is unlimited. These limitations in number do not affect the foreign recipients of the order. Salaries (*traitements*) are attached to the military and naval recipients of the order when on the active list, viz. 3000 francs for grand cross, 2000 francs for grand officers, 1000 francs for commanders, 250 francs for chevaliers. The numbers of the recipients of the order *sans traitement* are limited through all classes. In ordinary circumstances twenty years of military, naval or civil service must have been performed before a candidate can be eligible for the rank of chevalier, and promotions can only be made after definite service in the lower rank. Extraordinary service in time of war and extraordinary services in civil life admit to any rank. Women have been decorated, notably Rosa Bonheur, Madame Curie and Madame Bartet. The Napoleonic form of the grand cross and ribbon is illustrated on Plate IV, fig. 6; the cross from which the drawing was made was given to King Edward VII. when prince of Wales in 1863. In the present order of the French Republic the symbolical head of the Republic appears in the centre, and a laurel wreath replaces the imperial crown; the inscription round the medallion is *République française.* Since 1805 there has existed an institution, *Maison d'éducation de la Legion d'Honneur*, for the education of the daughters, granddaughters, sisters and nieces of members of the Legion of Honour. There are three houses, at Saint Denis, at Écouen and Les Loges (see *Dictionnaire de l'administration française*, by M. Block and E. Magnéro, 1905, *s.v.* "Decorations").

Among the orders swept away at the French Revolution, restored in part at the Restoration, and finally abolished at the revolution of July 1830 were the following: The *Order of St Michael* was founded by Louis XI. in 1469 for a limited number of knights of noble birth. Later the numbers were so much increased under Charles IX. that it became known as *Le Collier à toutes bêtes.* In 1816 the order was granted for services in art and science. In view of the low esteem into which the *Order of St Michael* had fallen, Henry III. founded in 1578 the *Order of the Holy Ghost* (*St Esprit*). The badge of the order was a white Maltese cross decorated in gold, with the gold lilies of France at the angles, in the centre a white dove with wings outstretched, the ribbon was sky blue (*cordon bleu*). The motto of the order was *Duce et auspice.* The *Order of St Louis* was founded by Louis XIV. in 1693 for military merit, and the *Order of Military Merit* by Louis XV. in 1759, originally for Protestant officers.

Germany.—i. *Anhalt.* The *Order of Albert the Bear*, a family order or *Hausorden*, was founded in 1836 by the dukes Henry of Anhalt-Köthen, Leopold Frederick of Anhalt-Dessau and Alexander Charles of Anhalt-Bernburg. Changes in the constitution have been made at various dates. It now consists of five classes, grand cross, commander (2 classes) and knights (2 classes). The badge is a gold oval bearing in gold a crowned and collared bear on a crenellated wall; below the ring by which the badge is attached to the ribbon is a shield with the arms of the house of Anhalt, on the reverse those of the house of Ascania. Round the oval is the motto *Fürchte Gott und folge seine Befehle.* The ribbon is green with two red stripes. The grand master alone wears a collar.

ii. *Baden.* The *Order of Fidelity or Loyalty* (*Hausorden der Treue*) was instituted by William, margrave of Baden-Durlach in 1715, and reconstituted in 1803 by the elector Charles Frederick. There is now only one class, for princes of the reigning house, foreign sovereigns and eminent men of the state. The badge is a red enamelled cross with gold borders and double C's interlaced in the angles; in the centre a white medallion with red monogram over a green mound surmounted by the word *Fidelitas* in black; the cross is suspended from a ducal crown. The ribbon is orange with silver edging. The military *Order of Charles Frederick* was founded in 1807. There are three classes. The badge is a white cross resting on a green laurel wreath, the ribbon is red with a yellow stripe bordered with white. The order is conferred for long and meritorious military service. The *Order of the Zähringen Lion* was founded in 1812 in commemoration of the descent of the reigning house of Baden from the dukes of Zähringen. It has been reconstituted in 1840 and 1877. It now consists of five classes. The badge is a green enamel cross with gold clasps in the angles; in the central medallion an enamelled representation of the ruined castle of Zähringen. The ribbon is green with two orange stripes. Since 1896 the *Order of Berthold I.* has been a distinct order; it was founded in 1877 as a higher class of the *Zähringen Lion.*

iii. *Bavaria.* The *Order of St Hubert*, one of the oldest and most distinguished knightly orders, was founded in 1444 by duke Gerhard V. of Jülich-Berg in honour of a victory over Count Arnold of Egmont at Ravensberg on the 3rd of November, St Hubert's day. The knights wore a collar of golden hunting horns, whence the order was also known as the *Order of the Horn.* Statutes were granted in 1476, but the order fell into abeyance at the extinction of the dynasty in 1609. It was revived in 1708 by the elector palatine, John William of Neuberg, and its constitution was altered at various times, its final form being given by the elector Maximilian Joseph, first king of Bavaria, in 1808. Exclusive of the sovereign and princes of the blood, and foreign sovereigns and princes, it consists of twelve capitular knights of the rank of count or *Freiherr*. The badge of the order and the ribbon are illustrated in Plate V. fig. 3. The central medallion represents the conversion of St Hubert. The collar is composed of gold and blue enamel figures of the conversion linked by the Gothic monogram I.T.V., *In Trau Vast*, the motto of the order, alternately red and green. The *Order of St George*, said to have been founded in the 12th century as a crusading order and revived by the emperor Maximilian I. in 1494, dates historically from its institution in 1729 by the elector Charles Albert, afterwards the emperor Charles VII. It was confirmed by the elector Charles Theodore in 1778 and by the elector Maximilian Joseph IV. as the second Bavarian order. Various new statutes have been granted from 1827 to 1875. The order is divided into two branches, "of German and foreign languages," and it also has a "spiritual class." The members of the order must be Roman Catholics. The badge is a blue enamelled cross with white and gold edging suspended from the mouth of a gold lion's head; in the angles of the cross are blue lozenges containing the letters V.I.B.I., *Virgini Immaculatae Bavaria Immaculata*. The central medallion contains a figure of the Immaculate Conception. The medallion on the reverse contains a figure of St George and the Dragon and the corresponding initials J.U.P.F., *Justus ut Palma Florebit*, the motto of the order. Besides the above Bavaria possesses the *Military Order of Maximilian Joseph*, 1806, and the *Civil Orders of Merit of St Michael*, 1693, and of the *Bavarian Crown*, 1808, and other minor orders and decorations, civil and military. There are also the two illustrious orders for ladies, the *Order of Elizabeth*, founded in 1766, and the *Order of Theresa*, in 1827. The foundations of *St Anne of Munich* and of *St Anne of Würzburg* for ladies are not properly orders.

iv. *Brunswick*. The *Order of Henry the Lion*, for military and civil merit, was founded by Duke William in 1834. There are five classes, and a cross of merit of two classes. The badge is a blue enamelled cross dependent from a lion surmounted by the ducal crown; the angles of the cross are filled by crowned W's and the centre bears the arms of Brunswick, a crowned pillar and a white horse, between two sickles. The ribbon is deep red bordered with yellow.

v. *Hanover*. The *Order of St George* (one class only) was instituted by King Ernest Augustus I. in 1839 as the family order of the house of Hanover; the *Royal Guelphic Order* (three classes) by George, prince regent, afterwards George IV. of Great Britain, in 1815; and the *Order of Ernest Augustus* by George V. of Hanover in 1865. These orders have not been conferred since 1866, when Hanover ceased to be a kingdom, and the *Royal Guelphic Order*, which from its institution was more British than Hanoverian, not since the death of William IV. in 1837. The last British grand cross was the late duke of Cambridge.

vi. *Hesse*. Of the various orders founded by the houses of Hesse-Cassel and Hesse-Darmstadt the following are still bestowed in the grand duchy of Hesse. The *Order of Louis*, founded by the grand duke Louis I. of Hesse-Darmstadt in 1807; there are five classes; the black, red and gold bordered cross bears the initial L. in the centre, the ribbon is black with red borders; the *Order of Philip the Magnanimous*, founded by the grand duke Louis II. in 1840 has five classes; the white cross of the badge bears the effigy of Philip surrounded by the motto *Si Deus vobiscum quis contra nos*. The *Order of the Golden Lion* was founded in 1770 by the landgrave Frederick II. of Hesse-Cassel, the knights are 41 in number and take precedence of the members of the two former orders. The badge is an open oval of gold with the Hessian lion in the centre. The ribbon is crimson.

vii. *Mecklenburg*. The grand duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz possess jointly the *Order of the Wendish Crown*, founded in 1864 by the grand dukes Frederick Francis II. of Schwerin and Frederick William of Strelitz; there are four classes, with two divisions of the grand cross, and also an affiliated cross of merit; the grand cross can be granted to ladies. The badge is a white cross bearing on a blue centre the Wendish crown, surrounded by the motto, for the Schwerin knights, *Per aspera ad astra*, for the Strelitz knights, *Avito viret honore* The *Order of the Griffin*, founded in 1884 by Frederick Francis III. of Schwerin, was made common to the duchies in 1904.

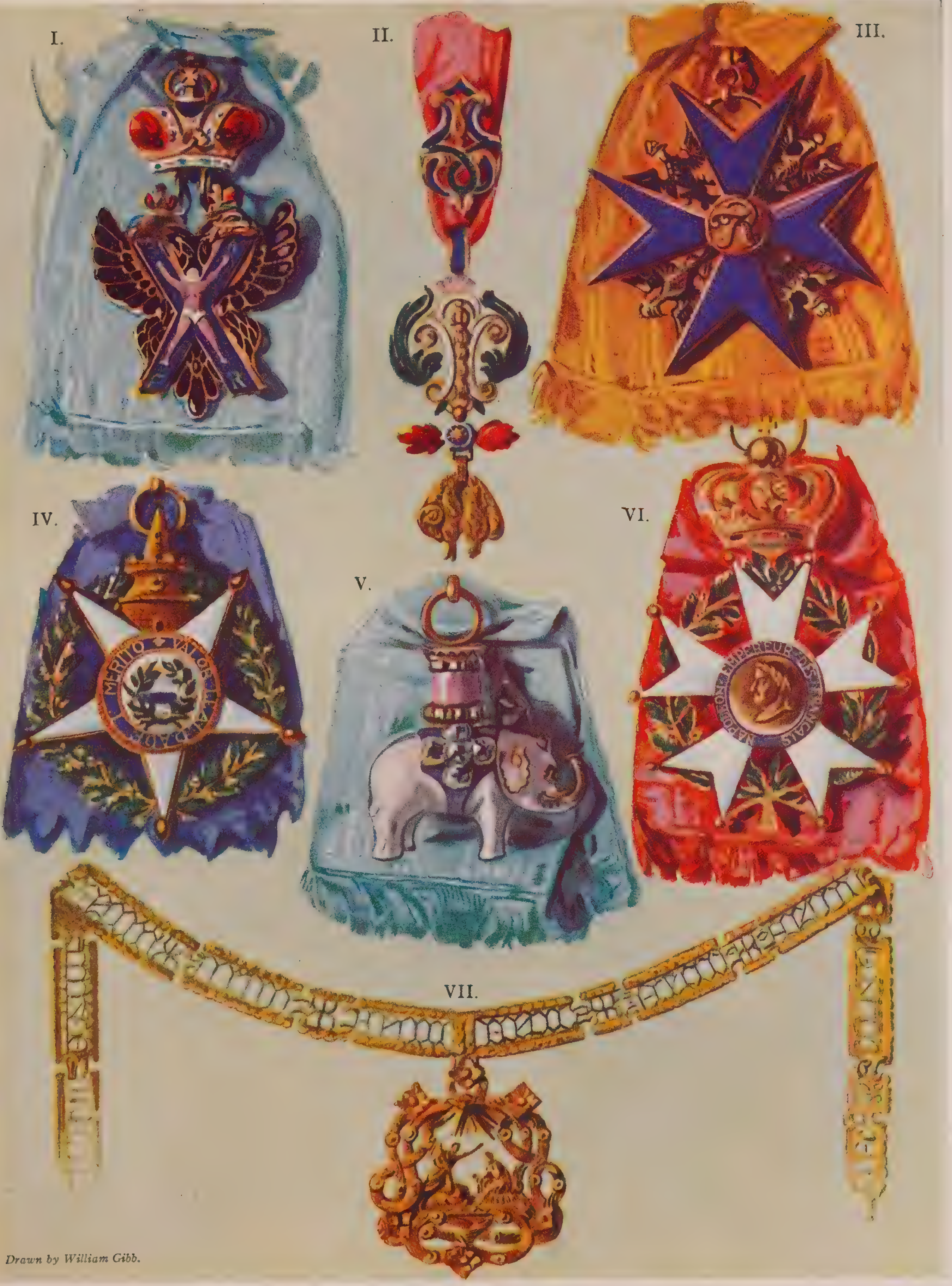
viii. *Oldenberg*. The *Order of Duke Peter Frederick Louis*, a family order and order of merit, was founded by the grand duke Paul Frederick Augustus in memory of his father in 1838. It has two divisions, each of five classes, of capitular knights and honorary members. The badge is a white gold bordered cross suspended from a crown, in the centre the crowned monogram P.F.L. surrounded by the motto *Ein Gott, Ein Recht, Eine Wahrheit*; the ribbon is dark blue bordered with red.

ix. *Prussia*. The *Order of the Black Eagle*, one of the most distinguished of European orders, was founded in 1701 by the elector of Brandenburg, Frederick I., in memory of his coronation as king of Prussia. The order consists of one class only and the original statutes limited the number, exclusive of the princes of the royal house and foreign members, to 30. But the number has been exceeded. It is only conferred on those of royal lineage and upon high officers of state. It confers the nobiliary particle *von*. Only those who have received the *Order of the Red Eagle* are eligible. An illustration of the badge of the order with ribbon is given on Plate IV. fig. 3. The star of silver bears the black eagle on an orange ground surrounded by a silver fillet on which is the motto of the order *Suum Cuique*. The collar is formed of alternate black eagles and a circular medallion with the motto on a white centre surrounded by the initials F.R. repeated in green, the whole in a circle of blue with four gold crowns on the exterior rim. The *Order of the Red Eagle*, the second of the Prussian orders, was founded originally as the *Order of Sincerity* (*L'Ordre de la Sincerité*) in 1705 by George William, hereditary prince of Brandenburg-Bayreuth. The original constitution and insignia are now entirely changed, with the exception of the red eagle which formed the centre of the cross of the badge. The order had almost fallen into oblivion when it was revived in 1734 by the margrave George Frederick Charles as the *Order of the Brandenburg Red Eagle*. It consisted of 30 nobly born knights. The numbers were increased and a grand cross class added in 1759. On the cession of the principality to Prussia in 1791 the order was transferred and King Frederick William raised it to that place in Prussian orders which it has since maintained. The order was divided into four classes in 1810 and there are now five classes with numerous sub-divisions. It is an order of civil and military merit. The grand cross resembles the badge of the Black Eagle, but is white and the eagles in the corners red, the central medallion bearing the initials W.R. (those of William I.) surrounded by a blue fillet with the motto *Sincere et Constanter*. The numerous classes and subdivisions have exceedingly complicated distinguishing marks, some bearing crossed swords, a crown, or an oak-leaf surmounting the cross. The ribbon is white with two orange stripes.

The *Order for Merit* (*Ordre pour le Mérite*), one of the most highly prized of European orders of merit, has now two divisions, military and for science and art. It was originally founded by the electoral prince Frederick, afterwards Frederick I. of Prussia, in 1667 as the *Order of Generosity*; it was given its present name and granted for civil and military distinction by Frederick the Great, 1740. In 1810 the order was made one for military merit against the enemy in the field exclusively. In 1840 the class for distinction for science and art, or peace class (*Friedensklasse*) was founded by Frederick William IV., for those "who have gained an illustrious name by wide recognition in the spheres of science and art." The number is limited to 30 German and 30 foreign members. The *Academy of Sciences and Arts* on a vacancy nominates three candidates, from which one is selected by the king. It is interesting to note that this was the only distinction which Thomas Carlyle would accept. The badge of the military order is a blue cross with gold uncrowned eagles in the angles; on the topmost arm is the initial F., with a crown; on the other arms the inscription *Pour le Mérite*. The ribbon is black with a silver stripe at the edges. In 1866 a special grand cross was instituted for the crown prince (afterwards Frederick III.) and Prince Frederick Charles. It was in 1879 granted to Count von Moltke as a special distinction. The badge of the class for science or art is a circular medallion of white, with a gold eagle in the centre surrounded by a blue border with the inscription *Pour le Mérite*; on the white field the letters ꟻF. II. four times repeated, and four crowns in gold projecting from the rim. The ribbon is the same as for the military class. The *Order of the Crown*, founded by William I. in 1861, ranks with the Red Eagle. There are four classes, with many subdivisions. Other Prussian orders are the *Order of William*, instituted by William II. in 1896; a Prussian branch of the knights of St John of Jerusalem, *Johanniter Orden*, in its present form dating from 1893; and the family *Order of the House of Hohenzollern*, founded in 1851 by Frederick William IV. There are two divisions, military and civil, divided into four classes. The military badge is a white cross with black and gold edging, resting on a green oak and laurel wreath; the central medallion bears the Prussian Eagle with the arms of Hohenzollern, and is surrounded by a blue fillet with the motto *Vom Fels zum Meer*; the civil badge is a black eagle, with the head encircled with a blue fillet with the motto. There are also for ladies the *Order of Service*, founded in 1814 by Frederick William III., in one class, but enlarged in 1850 and in 1865. The decoration of merit for ladies (*Verdienst-kreuz*), founded in 1870, was raised to an order in 1907. For the famous military decoration, the *Iron Cross*, see MEDALS.

x. *Saxony*.—The *Order of the Crown of Rue* (*Rauten Krone*) was founded as a family order by Frederick Augustus I. in 1807. It is of one class only, and the sons and nephews of the sovereign are born knights of the order. It is granted to foreign ruling princes and subjects of high rank. The badge is a pale green enamelled cross resting on a gold crown with eight rue leaves, the centre is white with the crowned monogram of the founder surrounded by a green circlet of rue; the star bears in its centre the motto *Providentiae Memor*. The ribbon is green. Other Saxon orders are the military *Order of St Henry*, for distinguished service in the field, founded in 1736 in one class; since 1829 it has had four classes; the ribbon is sky blue with two yellow stripes, the gold cross bears in the centre the effigy of the emperor Henry II.; the *Order of Albert*, for civil and military merit, founded in 1850 by Frederick Augustus II. in memory of Duke Albert the Bold, the founder of the Albertine line of Saxony, has six classes; the *Order of Civil Merit*, was founded in

INSIGNIA OF SOME OF THE PRINCIPAL ORDERS OF KNIGHTHOOD, DRAWN BY GRACIOUS PERMISSION FROM THOSE IN THE POSSESSION OF HIS LATE MAJESTY KING EDWARD VII AND ARRANGED IN ACCORDANCE WITH HIS MAJESTY'S WISHES AND COMMAND.



Drawn by William Gibb.

(i.) THE ST. ANDREW (Russia). (ii.) THE GOLDEN FLEECE (Spain). (iii.) THE BLACK EAGLE (Prussia). (iv.) THE TOWER AND SWORD (Portugal.) (v.) THE ELEPHANT (Denmark). (vi.) THE LEGION OF HONOUR (France-Napoleonic). (vii.) THE ANNUNZIATA (Italy).

1815. For ladies there are the *Order of Sidonia*, 1870, in memory of the wife of Albert the Bold, the mother (*Stamm-Mutter*) of the Albertine line; and the *Maria Anna Order*, 1906.

xi. The duchies of *Saxe Altenburg*, *Saxe Coburg Gotha* and *Saxe Meiningen* have in common the family *Order of Ernest*, founded in 1833 in memory of Duke Ernest the Pious of Saxe Gotha and as a revival of the *Order of German Integrity* (*Orden der deutschen Redlichkeit*) founded in 1690. Saxe Coburg Gotha and Saxe Meiningen have also separate crosses of merit in science and art.

xii. *Saxe Weimar*.—The *Order of the White Falcon* or *of Vigilance* was founded in 1732 and renewed in 1815.

xiii. *Württemberg*.—The *Order of the Crown of Württemberg* was founded in 1818, uniting the former *Order of the Golden Eagle* and an order of civil merit. It has five classes. The badge is a white cross surmounted by the royal crown, in the centre the initial F surrounded by a crimson fillet on which is the motto *Furchtlos und Treu*; in the angles of the cross are four golden leopards; the ribbon is crimson with two black stripes. Besides the military *Order of Merit* founded in 1759, and the silver cross of merit, 1900, Württemberg has also the *Order of Frederick*, 1830, and the *Order of Olga*, 1871, which is granted to ladies as well as men.

Greece.—The *Order of the Redeemer* was founded as such in 1833 by King Otto, being a conversion of a decoration of honour instituted in 1829 by the National Assembly at Argos. There are five classes, the numbers being regulated for each. An illustration of the badge and ribbon of the grand cross is given on Plate V. fig. 1.

Holland.—The *Order of William*, for military merit, was founded in 1815 by William I.; there are four classes; the badge is a white cross resting on a green laurel Burgundian cross, in the centre the Burgundian flint-steel, as in the order of the Golden Fleece. The motto *Voer Moed, Belied, Trouw* (For Valour, Devotion, Loyalty), appears on the arms of the cross. The cross is surmounted by a jewelled crown; the ribbon is orange with dark blue edging. The *Order of the Netherlands Lion*, for civil merit, was founded in 1818; there are four classes. The family *Order of the Golden Lion of Nassau* passed in 1890 to the grand duchy of Luxembourg (see under *Luxemburg*). In 1892 Queen Wilhelmina instituted the *Order of Orange-Nassau* with five classes. The *Teutonic Order* (*q.v.*), surviving in the Ballarde (Bailiwick) of Utrecht, was officially established in the Netherlands by the States General in 1580. It was abolished by Napoleon in 1811 and was restored in 1815.

Italy.—The *Order of the Annunziata*, the highest order of knighthood of the Italian kingdom, was instituted in 1362 by Amadeus VI., count of Savoy, as the Order of the Collare or Collar, from the silver collar made up of love-knots and roses, which was its badge, in honour of the fifteen joys of the Virgin; hence the number of the knights was restricted to fifteen, the fifteen chaplains recited fifteen masses each day, and the clauses of the original statute of the order were fifteen (Amadeus VIII. added five others in 1434). Charles III. decreed that the order should be called the Annunziata, and made some other alterations in 1518. His son and successor, Emmanuel Philibert, made further modifications in the statute and the costume. The church of the order was originally the Carthusian monastery of Pierre-châtel in the district of Bugey, but after Charles Emmanuel I. had given Bugey and Bresse to France in 1601 the church of the order was transferred to the Camaldolese monastery near Turin. That religious order having been suppressed at the time of the French Revolution, King Charles Albert decreed in 1840 that the Carthusian church of Collegno should be the chapel of the order. The knights of the Annunziata have the title of "cousins of the king," and enjoy precedence over all the other officials of the state. The costume of the order is of white satin embroidered in silk, with a purple velvet cloak adorned with roses and gold embroidery, but it is now never worn; in the collar the motto *Fert* is inserted, on the meaning of which there is great uncertainty,[1] and from it hangs a pendant enclosing a medallion representing the Annunciation (see Plate IV. fig. 7). An account of the order is given in Count Luigi Cibrario's *Ordini Cavallereschi* (Turin, 1846) with coloured plates of the costume and badges.

The *Order of St Maurice and St Lazarus* (SS Maurizio e Lazzaro), is a combination of two ancient orders. The Order of St Maurice was originally founded by Amadeus VIII., duke of Savoy, in 1434, when he retired to the hermitage of Ripaille, and consisted of a group of half-a-dozen councillors who were to advise him on such affairs of state as he continued to control. When he became pope as Felix V. the order practically ceased to exist. It was re-established at the instance of Emmanuel Philibert by Pope Pius V. in 1572 as a military and religious order, and the following year it was united to that of St Lazarus by Gregory XIII. The latter order had been founded as a military and religious community at the time of the Latin kingdom of Jerusalem with the object of assisting lepers, many of whom were among its members. Popes, princes and nobles endowed it with estates and privileges, including that of administering and succeeding to the property of lepers, which eventually led to grave abuses. With the advance of the Saracens the knights of St Lazarus, when driven from the Holy Land and Egypt, migrated to France (1291) and Naples (1311), where they founded leper hospitals. The order in Naples, which alone was afterwards recognized as the legitimate descendant of the Jerusalem community, was empowered to seize and confine anyone suspected of leprosy, a permission which led to the establishment of a regular inquisitorial system of blackmail. In the 15th and 16th centuries dissensions broke out among the knights, and the order declined in credit and wealth, until finally the grand master, Giannotto Castiglioni, resigned his position in favour of Emmanuel Philibert, duke of Savoy, in 1571. Two years later the orders of St Lazarus and St Maurice were incorporated into one community, the members of which were to devote themselves to the defence of the Holy See and to fight its enemies as well as to continue assisting lepers. The galleys of the order subsequently took part in various expeditions against the Turks and the Barbary pirates. Leprosy, which had almost disappeared in the 17th century, broke out once more in the 18th, and in 1773 a hospital was established by the order at Aosta, made famous by Xavier de Maistre's tale, *Le Lépreux de la cité d'Aoste*. The statutes were published in 1816, by which date the order had lost its military character; it was reformed first by Charles Albert (1831), and later by Victor Emmanuel II., king of Italy (1868). The knighthood of St Maurice and St Lazarus is now a dignity conferred by the king of Italy (the grand master) on persons distinguished in the public service, science, art and letters, trade, and above all in charitable works, to which its income is devoted. There are five classes. The badge of the combined order is composed of the white cross with trefoil termination of St Lazarus resting on the green cross of St Maurice; both crosses are bordered gold. The first four classes wear the badge suspended from a royal crown. The ribbon is dark green.

See L. Cibrario, *Descrizione storica degli Ordini Cavallereschi*, vol. i. (Turin, 1846); *Calendario Reale*, an annual publication issued in Rome.

The military *Order of Savoy* was founded in 1815 by Victor Emmanuel of Sardinia; badge modified 1855 and 1857. It has now five classes. The badge is a white cross, the arms of which expand and terminate in an obtuse angle; round the cross is a green laurel and oak wreath; the central medallion is red, bearing in gold two crossed swords, the initials of the founder and the date 1855. The ribbon is red with a central stripe of blue. The *Civil Order of Savoy*, founded in 1831 by Charles Albert of Sardinia, is of one class, and in statutes of 1868 is limited to 60 members. The badge is the plain Savoy cross in blue, with silver medallion, the ribbon is blue with white borders. The *Order of the Crown of Italy* was founded in 1868 by Victor Emmanuel II. in commemoration of the union of Italy into a kingdom. There are five classes.

Luxemburg.—The *Order of the Golden Lion* was founded as a family order of the house of Nassau by William III. of the Netherlands and Adolphus of Nassau jointly. On the death of William in 1890 it passed to the grand duke of Luxemburg; it has only one class. The *Order of Adolphus of Nassau*, for civil and military merit, in four classes, was founded in 1858, and the *Order of the Oak Crown* as a general order of merit, in five classes, in 1841, modified 1858.

Monaco.—The *Order of St Charles*, five classes, was founded in 1858 by Prince Charles III. and remodelled in 1863. It is a general order of merit.

Montenegro.—The *Order of St Peter*, founded in 1852, is a family order, in one class, and only given to members of the princely family; the *Order of Danilo*, or of the *Independence of Montenegro*, is a general order of merit, in four classes, with subdivisions, also founded in 1852.

Norway.—The *Order of St Olaf* was founded in 1847 by Oscar I. in honour of St Olaf, the founder of Christianity in Norway, as a general order of merit, military and civil. There are three classes, the last two being, in 1873 and 1890, subdivided into two grades each. The badge and ribbon is illustrated on Plate V, fig. 5. The reverse bears the motto *Ret og Sandhed* (Right and Truth). The *Order of the Norwegian Lion*, founded in 1904 by Oscar II., has only one class; foreigners on whom the order is conferred must be sovereigns or heads of states or members of reigning houses.

Papal.—The arrangement and constitution of the papal orders was remodelled by a brief of Pius X. in 1905. The *Order of Christ*, the supreme pontifical order, is of one class only; for the history of this ancient order see *Portugal* (*infra*). The badge and ribbon is the same as the older Portuguese form. The *Order of Pius* was founded in 1847 by Pius IX.; there are now three classes; the badge is an eight-pointed blue star with golden flames between the rays, a white centre bears the founder's name; the ribbon is blue with two red stripes at each border. The *Order of St Gregory the Great*, founded in 1831, is in two divisions, civil and military, each having three classes. The *Order of St Sylvester* was originally founded as the *Order of the Golden Spur* by Paul IV. in 1559 as a military body, though tradition assigns it to Constantine the Great and Pope Sylvester. It was reorganized as an order of merit by Gregory XVI. in 1841. In 1905 the order was divided into three classes, and a separate order, that of the *Golden Spur* or *Golden Legion* (*Militia Aurata*) was established, in one class, with the numbers limited to a hundred. The cross *Pro Ecclesia et Pontifice*, instituted by Leo XIII.

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[1] It has been taken as the Latin word meaning "he bears" or as representing the initials of the legend *Fortitudo Ejus Rhodum Tenuit*, with an allusion to a defence of the island of Rhodes by an ancient count of Savoy.

in 1888 is a decoration, not an order. There remains the venerable *Order of the Holy Sepulchre*, of which tradition assigns the foundation to Godfrey de Bouillon. It was, however, probably founded as a military order for the protection of the Holy Sepulchre by Alexander VI. in 1496. The right to nominate to the order was shared with the pope as grand master by the guardian of the *Fratres Minores* in Jerusalem, later by the Franciscans, and then by the Latin patriarch in Jerusalem. In 1905 the latter was nominated grand master, but the pope reserves the joint right of nomination. The badge of the order is a red Jerusalem cross with red Latin crosses in the angles.

Portugal.—The *Order of Christ* was founded on the abolition of the Templars by Dionysius or Diniz of Portugal and in 1318 in conjunction with Pope John XXII., both having the right to nominate to the order. The papal branch survives as a distinct order. In 1522 it was formed as a distinct Portuguese order and the grand mastership vested in the crown of Portugal. In 1789 its original religious aspect was abandoned, and with the exception that its members must be of the Roman Catholic faith, it is entirely secularized. There are three classes. The original badge of the order was a long red cross with expanded flat ends bearing a small cross in white; the ribbon is red. The modern badge is a blue enamelled cross resting on a green laurel wreath; the central medallion, in white, contains the old red and white cross. The older form is worn with the collar by the grand-crosses. The *Order of the Tower and Sword* was founded in 1808 in Brazil by the regent, afterwards king John VI. of Portugal, as a revival of the old *Order of the Sword*, said to have been founded by Alfonso V. in 1459. It was remodelled in 1832 under its present name and constitution as a general order of military and civil merit. There are five classes. The badge of the order and ribbon is illustrated on Plate IV. fig 4. The *Order of St Benedict of Aviz* (earlier of *Evora*), founded in 1162 as a religious military order, was secularized in 1789 as an order of military merit, in four classes. The badge is a green cross *fleury*; the ribbon is green. The *Order of St James of the Sword*, or *James of Compostella*, is a branch of the Spanish order of that name (see under *Spain*). It also was secularized in 1789, and in 1862 was constituted an order of merit for science, literature and art in five classes. The badge is the lily-hilted sword of St James, enamelled red with gold borders; the ribbon is violet. In 1789 these three orders were granted a common badge uniting the three separate crosses in a gold medallion; the joint ribbon is red, green and violet, and to the separate crosses was added a red sacred heart and small white cross. There are also the *Order of Our Lady of Villa Viçosa* (1819), for both sexes, and the *Order of St Isabella*, 1801, for ladies.

Rumania.—The *Order of the Star of Rumania* was founded in 1877, and the *Order of the Crown of Rumania* in 1881, both in five classes, for civil and military merit; the ribbon of the first is red with blue borders, of the second light blue with two silver stripes.

Russia.—The *Order of St Andrew* was founded in 1698 by Peter the Great. It is the chief order of the empire, and admission carries with it according to the statutes of 1720 the orders of *St Anne*, *Alexander Nevski*, and the *White Eagle*; there is only one class. The badge and ribbon is illustrated in Plate IV. fig 5. The collar is composed of three members alternately, the imperial eagle bearing on a red medallion a figure of St George slaying the Dragon, the badge of the grand duchy of Moscow, the cypher of the emperor Paul I. in gold on a blue ground, surmounted by the imperial crown, and surrounded by a trophy of weapons and green and white flags, and a circular red and gold star with a blue St Andrew's cross. The *Order of St Catherine*, for ladies, ranks next to the St Andrew. It was founded under the name of the *Order of Rescue* by Peter the Great in 1714 in honour of the empress Catherine and the part she had taken in rescuing him at the battle of the Pruth in 1711. There are two classes. The grand cross is only for members of the imperial house and ladies of the highest nobility. The second class was added in 1797. The badge of the order is a cross of diamonds bearing in a medallion the effigy of St Catherine. The ribbon is red with the motto *For Love and Fatherland* in silver letters. The *Order of St Alexander Nevski* was founded in 1725 by the empress Catherine I. There is only one class. The badge is a red enamelled cross with gold eagles in the angles, bearing in a medallion the mounted effigy of St Alexander Nevski. The ribbon is red. The *Order of the White Eagle* was founded in 1713 by Augustus II. of Poland and was adopted as a Russian order in 1831; there is one class. The *Order of St Anne* was founded by Charles Frederick, duke of Holstein-Gottorp in 1735 in honour of his wife, Anna Petrovna, daughter of Peter the Great. It was adopted as a Russian order in 1797 by their grandson, the emperor Paul. There are four classes. Other orders are those of *St Vladimir*, founded by Catherine II., 1782, four classes, and of *St Stanislaus*, founded originally as a Polish order by Stanislaus Augustus Poniatowski in 1765, and adopted as a Russian order in 1831.

The military *Order of St George* was founded by the empress Catherine II. in 1769 for military service on land and sea, with four classes; a fifth class for non-commissioned officers and men, the *Soldier's Cross*, was added in 1807. The badge is a white cross with gold borders, with a red central medallion on which is the figure of St George slaying the dragon. The ribbon is orange with three black stripes.

Servia.—The *Order of the White Eagle*, the principal order, was founded by Milan I. in 1882, statutes 1883, in five classes; the *Order of St Sava*, founded 1883, also in five classes, is an order of merit for science and art; the *Order of the Star of Karageorgevich*, four classes, was founded by Peter I. in 1904. The military *Order of Takovo* and the *Order of Milosh the Great*, founded originally by Michael Obrenovich, renewed in 1898, are since the dynastic revolution of 1903 no longer bestowed. The *Order of St Lazarus* is only a personal order, the cross and ribbon being only worn by the king.

Spain.—The Spanish branch of the order of the *Golden Fleece* has been treated above. The three great knightly orders of Santiago or St James of Compostella, or St James of the Sword, of Alcantara and of Calatrava, still exist as orders of merit, the first in three classes, the last two in one class, admission being in the class. They were all originally founded as military religious orders, like the crusading Templars and the Hospitallers, but to fight for the faith against the Moors in Spain. The present badges of the orders represent the crosses worn by the knights upon their mantles. That of St James of Compostella is the red lily-hilted sword of St James; the ribbon is also red. The other two orders wear the cross fleury—Alcantara green, Calatrava red, with correspondingly coloured ribbons. A short history of these orders may be here given. The first gives the foundation of the *Order of Knights of St James of Compostella* to Ramiro II., king of Leon, in the 9th century, to commemorate a victory over the Moors, but historically the order dates from the confirmation in 1175 by Pope Alexander III. It gained great reputation in the wars against the Moors and became very wealthy. In 1493 the grand-mastership was annexed by Ferdinand and Isabella, and was vested permanently in the crown of Spain by Pope Adrian VI. in 1523.

The *Order of Knights of Alcantara* was found about 1156 by the brothers Don Suarez and Don Gomez de Barrientos for protection against the Moors. In 1177 they were constituted as a religious order of knighthood under Benedictine rule by Pope Alexander III. Until about 1213 they were known as the Knights of San Julian del Pereiro, but when the fortress of Alcantara, newly captured from the Moors by Alfonso IX. of Castile was entrusted to them they took their name from that town. For a considerable time they were to some degree subject to the grand master of the kindred order of Calatrava. Ultimately, however, they asserted their independence by electing a grand master of their own, the first holder of the office being Don Diego Sanchez. During the rule of thirty-seven successive grand masters, similarly chosen, the influence and wealth of the order constantly increased until the knights of Alcantara were almost as powerful as the sovereign. In 1494–1495 Juan de Zuñiga was prevailed upon to resign the grand-mastership to Ferdinand, who thereupon vested it in his own person as king, and this arrangement was ratified by a bull of Pope Alexander VI., and was declared permanent by Pope Adrian VI. in 1523. The yearly income of Zuñiga at the time of his resignation amounted to 150,000 ducats. In 1540 Pope Paul III. released the knights from the celibate vow of the Benedictine rule by giving them permission to marry, though second marriage was forbidden. The three vows were henceforth *obedientia*, *castitas conjugalis* and *conversio morum*. At various times the fortunes of the order has been somewhat chequered. When Joseph Bonaparte became king of Spain in 1808, he deprived the knights of their revenues, which were only partially recovered on the restoration of Ferdinand VII. in 1814. The order ceased to exist as a spiritual body in 1835.

The *Order of Knights of Calatrava* was founded in 1158 by Don Sancho III. of Castile, who entrusted the town of Calatrava, newly won from the Moors, to them to guard. In 1164 Pope Alexander III. granted confirmation as a religious military order under Cistercian rule. In 1197 Calatrava fell into the hands of the Moors and the order removed to the castle of Salvatierra, but recovered their town in 1212. In 1489 Ferdinand seized the grand-mastership, and it was finally vested in the crown of Spain in 1523. The order became a military order of merit in 1808 and was reorganized in 1874. The *Royal and Distinguished Order of Charles III.* was founded in 1771 by Charles III., in two classes; altered in 1804, it was abolished by Joseph Bonaparte in 1808, together with all the Spanish orders except the Golden Fleece, and the *Royal Order of the Knights of Spain* was established. In 1814 Ferdinand VII. restored the order, but in 1847 it received its present constitution, and it has three classes with commanders of two divisions. The badge of the order is a blue and white cross suspended from a green laurel wreath; in the angles are golden lilies, and the oval centre bears a figure of the Virgin in a golden glory. The ribbon is blue and white. The *Order of Isabella the Catholic* was founded in 1815 under the patronage of St Isabella, wife of Alfonso of Portugal, originally instituted to reward loyalty in defence of the Spanish possessions in America. It is now a general order of merit, in three classes. The badge is a red enamelled cross with gold rays in the angles; in the centre a representation of the pillars of Hercules; the cross is attached to the yellow and white ribbon by a green laurel wreath. Other Spanish orders are the Maria Louisa, 1792, for noble ladies; the military and naval orders of merit of St Ferdinand, founded by the Cortes in 1811, four classes; of St Hermenegild (Hermenegildo), 1814, three classes; of Military Merit and Naval Merit, 1866, and of Maria Christina, 1890; the order of Beneficence, for civil merit, 1856; and of

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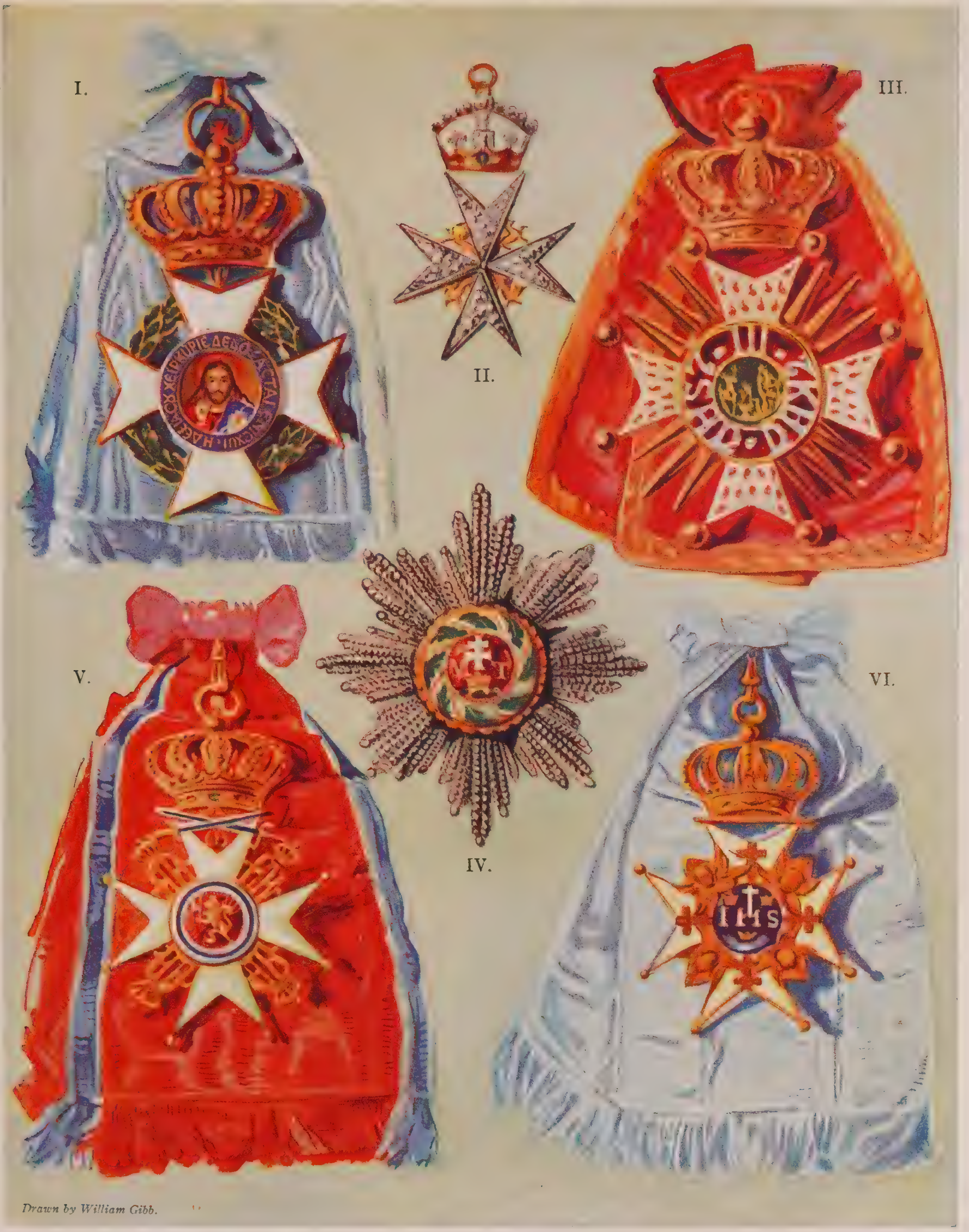

Drawn by William Gibb.

(i.) The Redeemer (Greece). (ii.) The Order of the Knights of St. John of Jerusalem (English Branch. Badge of the Sovereign and Patron). (iii.) The St. Hubert (Bavaria). (iv.) The St. Stephen (Hungary). (v.) The St. Olaf (Norway). (vi.) The Seraphim (Sweden).

Alfonso XII. for merit in science, literature and art, 1902, and the *Civil Order of Alfonso XII.*, 1902.

Sweden.—The *Order of the Seraphim* (the "Blue Ribbon"). Tradition attributes the foundation of this most illustrious order of knighthood to Magnus I. in 1280, more certainty attaches to the fact that the order was in existence in 1336. In its modern form the order dates from its reconstitution in 1748 by Frederick I., modified by statutes of 1798 and 1814. Exclusive of the sovereign and the princes of the blood, the order is limited to 23 Swedish and 8 foreign members. The native members must be already members of the *Order of the Sword* or the *Pole Star*. There is a prelate of the order which is administered by a chapter; the chapel of the knights is in the Riddar Holmskyrka at Stockholm. The badge and ribbon of the grand cross is illustrated on Plate V. fig. 6. The collar is formed of alternate gold seraphim and blue enamelled patriarchal crosses. The motto is *Iesus Hominum Salvator*. The *Order of the Sword* (the "Yellow Ribbon"), the principal Swedish military order, was founded, it is said, by Gustavus I. Vasa in 1522, and was re-established by Frederick I., with the *Seraphim* and the *Pole Star* in 1748; modifications have been made in 1798, 1814 and 1889. There are five classes, with subdivisions. The badge is a white cross, in the angles gold crowns, the points of the cross joined by gold swords entwined with gold and blue belts, in the blue centre an upright sword with the three crowns in gold, the whole surmounted by the royal crown The ribbon is yellow with blue edging. The *Order of the Pole Star* (*Polar Star, North Star*, the "Black Ribbon"), founded in 1748 for civil merit, has since 1844 three classes. The white cross bears a five-pointed silver star on a blue medallion. The ribbon is black. The *Order of Vasa* (the "Green Ribbon"), founded by Gustavus III. in 1772 as an order of merit for services rendered to the national industries and manufactures, has three classes, with subdivisions. The white cross badge bears on a blue centre the charge of the house of Vasa, a gold sheaf shaped like a vase with two handles. The ribbon is green. The *Order of Charles XIII.*, founded in 1811, is granted to Freemasons of high degree. It is thus quite unique.

Turkey.—The *Nischan-i-Imtiaz*, or *Order of Privilege*, was founded by Abdul Hamid II. in 1879 as a general order of merit in one class; the *Nischan-el-Iftikhar*, or *Order of Glory*, also one class, founded 1831 by Mahmoud II.; the *Nischan-i-Mejidi*, the *Mejidieh*, was founded as a civil and military order of merit in 1851 by Abdul Medjid. There are five classes; the badge is a silver sun of seven clustered rays, with crescent and star between each cluster; on a gold centre is the sultan's name in black Turkish lettering, surrounded by a red fillet inscribed with the words *Zeal, Devotion, Loyalty*; it is suspended from a red crescent and star; the ribbon is red with green borders. The khedive of Egypt has authority, delegated by the sultan, to grant this order. The *Nischan-i-Osmanie*, the *Osmanieh*, for civil and military merit, was founded by Abdul Aziz in 1862; it has four classes. The badge is a gold sun with seven gold-bordered green rays; the red centre bears the crescent, and it is also suspended from a gold crescent and star; the ribbon is green bordered with red. The *Nischan-i-Schefakat of Compassion or Benevolence*, was instituted for ladies, in three classes, in 1878 by the sultan in honour of the work done for the non-combatant victims of the Russo-Turkish war of 1877 in connexion with the Turkish Compassionate Fund started by the late Baroness Burdett-Coutts. She was one of the first to receive the order. There are also the family order, for Turkish princes, the *Hanédani-Ali-Osman*, founded in 1893, and the *Ertogroul*, in 1903.

Non-European Orders.—Of the various states of Central and South America, Nicaragua has the *American Order of San Juan* or *Grey Town*, founded in 1857, in three classes; and Venezuela that of the *Bust of Bolivar*, 1854, five classes; the ribbon is yellow, blue and red. Mexico has abolished its former orders, the *Mexican Eagle*, 1865, and *Our Lady of Guadalupe*, 1853; as has Brazil those of the *Southern Cross*, 1822, *Dom Pedro I.*, 1826, *the Rose*, 1829, and the Brazilian branches of the Portuguese orders of *Christ*, *St Benedict of Aviz* and *St James*. The republican *Order of Columbus*, founded in 1890, was abolished in 1891.

China.—There are no orders for natives, and such distinctions as are conferred by the different coloured buttons of the mandarins, the grades indicated by the number of peacocks' feathers, the gift of the yellow jacket and the like, are rather insignia of rank or personal marks of honour than orders, whether of knighthood or merit, in the European sense. For foreigners, however, the emperor in 1882 established the sole order, that of the *Imperial Double Dragon*, in five classes, the first three of which are further divided into three grades each, making eleven grades in all. The recipients eligible for the various classes are graded, from the first grade of the first class for reigning sovereigns down to the fifth class for merchants and manufacturers. The insignia of the order are unique in shape and decoration. Of the three grades of the first class the badge is a rectangular gold and yellow enamel plaque, decorated with two upright blue dragons, with details in green and white, between the heads for the first grade a pearl, for the second a ruby, for the third a coral, set in green, white and gold circles. The size of the plaque varies for the different classes. The badges of the other four classes are round plaques, the first three with indented edges, the last plain; in the second class the dragons are in silver on a yellow and gold ground, the jewel is a cut coral; the grades differ in the colour, shape, &c., of the borders and indentations; in the third class the dragons are gold, the ground green, the jewel a sapphire; in the fourth the silver dragons are on a blue ground, the jewel a lapis lazuli; in the fifth green dragons on a silver ground, the jewel a pearl. The ribbons, decorated with embroidered dragons, differ for the various grades and classes.

Japan.—The Japanese orders have all been instituted by the emperor Mutsu Hito. In design and workmanship the insignia of the orders are beautiful examples of the art of the native enamellers. The *Order of the Chrysanthemum* (*Kikkwa Daijasho*), founded in 1877, has only one class. It is but rarely conferred on others than members of the royal house or foreign rulers or princes. The badge of the order may be described as follows: From a centre of red enamel representing the sun issue 32 white gold-bordered rays in four sharply projecting groups, between the angles of which are four yellow conventional chrysanthemum flowers with green leaves forming a circle on which the rays rest; the whole is suspended from a larger yellow chrysanthemum. The ribbon is deep red bordered with purple. The collar, which may be granted with the order or later, is composed of four members repeated, two gold chrysanthemums, one with green leaves, the other surrounded by a wreath of palm, and two elaborate arabesque designs. The *Order of the Paulownia Sun* (*Tokwa Daijasho*), founded in 1888, in one class, may be in a sense regarded as the highest class of the *Rising Sun* (*Kiokujitsasho*) founded in eight classes, in 1875. The badge of both orders is essentially the same, viz. the red sun with white and gold rays; in the former the lilac flowers of the Paulownia tree, the flower of the Tycoon's arms, take a prominent part. The ribbon of the first order is deep red with white edging, of the second scarlet with white central stripe. The last two classes of the *Rising Sun* wear a decoration formed of the Paulownia flower and leaves. The *Order of the Mirror* or *Happy Sacred Treasure* (*Zaihosho*) was founded in 1888, with eight classes. The cross of white and gold clustered rays bears in a blue centre a silver star-shaped mirror. The ribbon is pale blue with orange stripes. There is also an order for ladies, that of the *Crown*, founded in five classes in 1888. The military order of Japan is the *Order of the Golden Kite*, founded in 1890, in seven classes. The badge has an elaborate design; it consists of a star of purple, red, yellow, gold and silver rays, on which are displayed old Japanese weapons, banners and shields in various coloured enamels, the whole surmounted by a golden kite with outstretched wings. The ribbon is green with white stripes.

Persia.—The *Order of the Sun and Lion*, founded by Fath 'Ali Shāh in 1808, has five classes. There is also the *Nischan-i-Aftab*, for ladies, founded in 1873.

Siam.—The *Sacred Order*, or the *Nine Precious Stones*, was founded in 1869, in one class only, for the Buddhist princes of the royal house. The *Order of the White Elephant*, founded in 1861, is in five classes. This is the principal general order. The badge is a striking example of Oriental design adapted to a European conventional form. The circular plaque is formed of a triple circle of lotus leaves in gold, red and green, within a blue circlet with pearls a richly caparisoned white elephant on a gold ground, the whole surmounted by the jewelled gold pagoda crown of Siam; the collar is formed of alternate white elephants, red, blue and white royal monograms and gold pagoda crowns. The ribbon is red with green borders and small blue and white stripes. Other orders are the *Siamese Crown* (*Mongkut Siam*), five classes, founded 1869; the family *Order of Chulah-Chon-Clao*, three classes, 1873; and the *Maha Charkrkri*, 1884, only for princes and princesses of the reigning family. (C. WE.)

KNIGHT-SERVICE, the dominant and distinctive tenure of land under the feudal system. It is associated in its origin with that development in warfare which made the mailed horseman, armed with lance and sword, the most important factor in battle. Till within recent years it was believed that knight-service was developed out of the liability, under the English system, of every five hides to provide one soldier in war. It is now held that, on the contrary, it was a novel system which was introduced after the Conquest by the Normans, who relied essentially on their mounted knights, while the English fought on foot. They were already familiar with the principle of knight-service, the knight's fee, as it came to be termed in England, being represented in Normandy by the *fief du haubert*, so termed from the hauberk or coat of mail (*lorica*) which was worn by the knight. Allusion is made to this in the coronation charter of Henry I. (1100), which speaks of those holding by knight-service as *milites qui per loricam terras suas deserviunt*.

The Conqueror, it is now held, divided the lay lands of England among his followers, to be held by the service of a fixed number of knights in his host, and imposed the same service on most of the great ecclesiastical bodies which retained their landed endowments. No record evidence exists of this action on his part, and the quota of knight-service exacted was not determined by the area or value of the lands granted (or retained), but was based upon the *unit* of the feudal host, the *constabularia* of ten knights. Of the tenants-in-chief or barons (*i.e.* those who held directly of the crown), the principal were called on to find one or more of these units, while of the lesser ones some were called on for five knights, that is, half a *constabularia*. The same system was adopted in Ireland when that country was conquered under Henry II. The baron who had been enfeoffed by his sovereign on these terms could provide the knights required either by hiring them for pay or, more conveniently when wealth was mainly represented by land, by a process of subenfeoffment, analogous to that by which he himself had been enfeoffed. That is to say, he could assign to an under-tenant a certain portion of his fief to be held by the service of finding one or more knights. The land so held would then be described as consisting of one or more knights' fees, but the knight's fee had not, as was formerly supposed, any fixed area. This process could be carried farther till there was a chain of mesne lords between the tenant-in-chief and the actual holder of the land; but the liability for performance of the knight-service was always carefully defined.

The primary obligation incumbent on every knight was service in the field, when called upon, for forty days a year, with specified armour and arms. There was, however, a standing dispute as to whether he could be called upon to perform this service outside the realm, nor was the question of his expenses free from difficulty. In addition to this primary duty he had, in numerous cases at least, to perform that of "castle ward" at his lord's chief castle for a fixed number of days in the year. On certain baronies also was incumbent the duty of providing knights for the guard of royal castles, such as Windsor, Rockingham and Dover. Under the feudal system the tenant by knight-service had also the same pecuniary obligations to his lord as had his lord to the king. These consisted of (1) "relief," which he paid on succeeding to his lands; (2) "wardship," that is, the profits from his lands during a minority; (3) "marriage," that is, the right of giving in marriage, unless bought off, his heiress, his heir (if a minor) and his widow; and also of the three "aids" (see Aids).

The chief sources of information for the extent and development of knight-service are the returns (*cartae*) of the barons (*i.e.* the tenants-in-chief) in 1166, informing the king, at his request, of the names of their tenants by knight-service with the number of fees they held, supplemented by the payments for "scutage" (see Scutage) recorded on the pipe rolls, by the later returns printed in the *Testa de Nevill*, and by the still later ones collected in *Feudal Aids*. In the returns made in 1166 some of the barons appear as having enfeoffed more and some less than the number of knights they had to find. In the latter case they described the balance as being chargeable on their "demesne," that is, on the portion of their fief which remained in their own hands. These returns further prove that lands had already been granted for the service of a fraction of a knight, such service being in practice already commuted for a proportionate money payment; and they show that the total number of knights with which land held by military service was charged was not, as was formerly supposed, sixty thousand, but, probably, somewhere between five and six thousand. Similar returns were made for Normandy, and are valuable for the light they throw on its system of knight-service.

The principle of commuting for money the obligation of military service struck at the root of the whole system, and so complete was the change of conception that "tenure by knight-service of a mesne lord becomes, first in fact and then in law, tenure by escuage (*i.e.* scutage)." By the time of Henry III., as Bracton states, the test of tenure was scutage; liability, however small, to scutage payment made the tenure military.

The disintegration of the system was carried farther in the latter half of the 13th century as a consequence of changes in warfare, which were increasing the importance of foot soldiers and making the service of a knight for forty days of less value to the king. The barons, instead of paying scutage, compounded for their service by the payment of lump sums, and, by a process which is still obscure, the nominal quotas of knight-service due from each had, by the time of Edward I., been largely reduced. The knight's fee, however, remained a knight's fee, and the pecuniary incidents of military tenure, especially wardship, marriage, and fines on alienation, long continued to be a source of revenue to the crown. But at the Restoration (1660) tenure by knight-service was abolished by law (12 Car. II. c. 24), and with it these vexatious exactions were abolished.

Bibliography.—The returns of 1166 are preserved in the *Liber Niger* (13th cent.), edited by Hearne, and the *Liber Rubeus* or *Red Book of the Exchequer* (13 cent.), edited by H. Hall for the Rolls Series in 1896. The later returns are in *Testa de Nevill* (Record Commission, 1807) and in the Record Office volumes of *Feudal Aids*, arranged under counties. For the financial side of knight-service the early pipe rolls have been printed by the Record Commission and the Pipe Roll Society, and abstracts of later ones will be found in *The Red Book of the Exchequer*, which may be studied on the whole question; but the editor's view must be received with caution and checked by J. H. Round's *Studies on the Red Book of the Exchequer* (for private circulation). The *Baronia Anglica* of Madox may also be consulted. The existing theory on knight-service was enunciated by Mr Round in *English Historical Review*, vi., vii., and reissued by him in his *Feudal England* (1895). It is accepted by Pollock and Maitland (*History of English Law*), who discuss the question at length; by Mr. J. F. Baldwin in his *Scutage and Knight-service in England* (University of Chicago Press, 1897), a valuable monograph with bibliography; and by Petit-Dutaillis, in his *Studies supplementary to Stubbs' Constitutional History* (Manchester University Series, 1908). (J. H. R.)

KNIGHTS OF THE GOLDEN CIRCLE, a semi-military secret society in the United States in the Middle West, 1861–1864, the purpose of which was to bring the Civil War to a close and restore the "Union as it was." There is some evidence that before the Civil War there was a Democratic secret organization of the same name, with its principal membership in the Southern States. After the outbreak of the Civil War many of the Democrats of the Middle West, who were opposed to the war policy of the Republicans, organized the Knights of the Golden Circle, pledging themselves to exert their influence to bring about peace. In 1863, owing to the disclosure of some of its secrets, the organization took the name of Order of American Knights, and in 1864 this became the Sons of Liberty. The total membership of this order probably reached 250,000 to 300,000, principally in Ohio, Indiana, Illinois, Iowa, Wisconsin, Kentucky and south-western Pennsylvania. Fernando Wood of New York seems to have been the chief officer and in 1864 Clement L. Vallandigham became the second in command. The great importance of the Knights of the Golden Circle and its successors was due to its opposition to the war policy of the Republican administration. The plan was to overthrow the Lincoln government in the elections and give to the Democrats the control of the state and Federal governments, which would then make peace and invite the Southern States to come back into the Union on the old footing. In order to obstruct and embarrass the Republican administration the members of the order held peace meetings to influence public opinion against the continuance of the war; purchased arms to be used in uprisings, which were to place the peace party in control of the Federal government, or failing in that to establish a north-western confederacy; and took measures to set free the Confederate prisoners in the north and bring the war to a forced close. All these plans failed at the critical moment, and the most effective work done by the order was in encouraging desertion from the Federal armies, preventing enlistments, and resisting the draft. Wholesale arrests of leaders and numerous seizures of arms by the United States authorities resulted in a general collapse of the order late in 1864. Three of the leaders were sentenced to death by military commissions, but sentence was suspended until 1866, when they were released under the decision of the United States Supreme Court in the famous case *Ex parte Milligan*.

Authorities.—*An Authentic Exposition of the Knights of the Golden Circle* (Indianapolis, 1863); J. F. Rhodes, *History of the United States from the Compromise of 1850* (New York, 1905) vol. v.; E. McPherson, *Political History of the Rebellion* (Washington, 1876); and W. D. Foulke, *Life of O. P. Morton* (2 vols., New York, 1899). (W. L. F.)

KNIPPERDOLLINCK (or Knipperdolling), **BERNT** (Berend or Bernhardt) (*c.* 1490–1536), German divine, was a prosperous cloth-merchant at Münster when in 1524 he joined Melchior Rinck and Melchior Hofman in a business journey to Stockholm, which developed into an abortive religious errand. Knipperdollinck, a man of fine presence and glib tongue, noted from his youth for eccentricity, had the ear of the Münster populace when in 1527 he helped to break the prison of Tonies Kruse, in the teeth of the bishop and the civic authorities. For this he made his peace with the latter; but, venturing on another business journey, he was arrested, imprisoned for a year, and released on payment of a high fine—in regard of which treatment he began an action before the Imperial Chamber. Though his aims were political rather than religious, he attached himself to the reforming movement of Bernhardt Rothmann, once (1529) chaplain of St Mauritz, outside Münster, now (1532) pastor of the city church of St Lamberti. A new bishop directed a mandate (April 17, 1532) against Rothmann, which had the effect of alienating the moderates in Münster from the democrats. Knipperdollinck was a leader of the latter in the surprise (December 26, 1532) which made prisoners of the negotiating nobles at Telgte, in the territory of Münster. In the end, Münster was by charter from Philip of Hesse (February 14, 1533) constituted an evangelical city. Knipperdollinck was made a burgomaster in February 1534. Anabaptism had already (September 8, 1533) been proclaimed at Münster by a journeyman smith; and, before this, Heinrich Roll, a refugee, had brought Rothmann (May 1533) to a rejection of infant baptism. From the 1st of January 1534 Roll preached Anabaptist doctrines in a city pulpit; a few days later, two Dutch emissaries of Jan Matthysz, or Matthyssen, the master-baker and Anabaptist prophet of Haarlem, came on a mission to Münster. They were followed (January 13) by Jan Beukelsz (or Bockelszoon, or Buchholdt), better known as John of Leiden. It was his second visit to Münster; he came now as an apostle of Matthysz. He was twenty-five, with a winning personality, great gifts as an organizer, and plenty of ambition. Knipperdollinck, whose daughter Clara was ultimately enrolled among the wives of John of Leiden, came under his influence. Matthysz himself came to Münster (1534) and lived in Knipperdollinck's house, which became the centre of the new movement to substitute Münster for Strassburg (Melchior Hofmann's choice) as the New Jerusalem. On the death of Matthysz, in a foolish raid (April 5, 1534), John became supreme. Knipperdollinck, with one attempt at revolt, when he claimed the kingship for himself, was his subservient henchman, wheedling the Münster democracy into subjection to the fantastic rule of the "king of the earth." He was made second in command, and executioner of the refractory. He fell in with the polygamy innovation, the protest of his wife being visited with a penance. In the military measures for resisting the siege of Münster he took no leading part. On the fall of the city (June 25, 1535) he hid in a dwelling in the city wall, but was betrayed by his landlady. After six months' incarceration, his trial, along with his comrades, took place on the 19th of January, and his execution, with fearful tortures, on the 22nd of January 1536. Knipperdollinck attempted to strangle himself, but was forced to endure the worst. His body, like those of the others, was hung in a cage on the tower of St Lamberti, where the cages are still to be seen. An alleged portrait, from an engraving of 1607, is reproduced in the appendix to A. Ross's *Pansebeia*, 1655.

See L. Keller, *Geschichte der Wiedertäufer und ihres Reichs zu Münster* (1880); C. A. Cornelius, *Historische Arbeiten* (1899); E. Belfort Bax, *Rise and Fall of the Anabaptists* (1903). (A. Go.*)

KNITTING (from O.E. *cnyttan*, to knit; cf. Ger. *Knütten*; the root is seen in "knot"), the art of forming a single thread or strand of yarn into a texture or fabric of a loop structure, by employing needles or wires. "Crochet" work is an analogous art in its simplest form. It consists of forming a single thread into a single chain of loops. All warp knit fabrics are built on this structure. Knitting may be said to be divided into two principles, viz. (1) hand knitting and (2) frame-work knitting (see Hosiery). In hand knitting, the wires, pins or needles used are of different lengths or gauges, according to the class of work wanted to be produced. They are made of steel, bone, wood or ivory. Some are headed to prevent the loops from slipping over the ends. Flat or selvedged work can only be produced on them. Others are pointed at both ends, and by employing three or more a circular or circular-shaped fabric can be made. In hand knitting each loop is formed and thrown off individually and in rotation and is left hanging on the new loop formed. The cotton, wool and silk fibres are the principal materials from which knitting yarns are manufactured, wool being the most important and most largely used. "Lamb's-wool," "wheeling," "fingering" and worsted yarns are all produced from the wool fibre, but may differ in size or fineness and quality. Those yarns are largely used in the production of knitted underwear. Hand knitting is to-day principally practised as a domestic art, but in some of the remote parts of Scotland and Ireland it is prosecuted as an industry to some extent. In the Shetland Islands the wool of the native sheep is spun, and used in its natural colour, being manufactured into shawls, scarfs, ladies' jackets, &c. The principal trade of other districts is hose and half-hose, made from the wool of the sheep native to the district. The formation of the stitches in knitting may be varied in a great many ways, by "purling" (knitting or throwing loops to back and front in rib form), "slipping" loops, taking up and casting off and working in various coloured yarns to form stripes, patterns, &c. The articles may be shaped according to the manner in which the wires and yarns are manipulated.

KNOBKERRIE (from the Taal or South African Dutch, *knopkirie*, derived from Du. *knop*, a knob or button, and *kerrie*, a Bushman or Hottentot word for stick), a strong, short stick with a rounded knob or head used by the natives of South Africa in warfare and the chase. It is employed at close quarters, or as a missile, and in time of peace serves as a walking-stick. The name has been extended to similar weapons used by the natives of Australia, the Pacific islands, and other places.

KNOLLES, RICHARD (*c.* 1545–1610), English historian, was a native of Northamptonshire, and was educated at Lincoln College, Oxford. He became a fellow of his college, and at some date subsequent to 1571 left Oxford to become master of a school at Sandwich, Kent, where he died in 1610. In 1603 Knolles published his *Generall Historie of the Turkes*, of which several editions subsequently appeared, among them a good one edited by Sir Paul Rycaut (1700), who brought the history down to 1699. It was dedicated to King James I., and Knolles availed himself largely of Jean Jacques Boissard's *Vitae et Icones Sultanorum Turcicorum* (Frankfort, 1596). Although now entirely superseded, it has considerable merits as regards style and arrangement. Knolles published a translation of J. Bodin's *De Republica* in 1606, but the *Grammatica Latina, Graeca et Hebraica*, attributed to him by Anthony Wood and others, is the work of the Rev. Hanserd Knollys (*c.* 1599–1691), a Baptist minister.

See the *Athenaeum*, August 6, 1881.

KNOLLES (or Knollys), **SIR ROBERT** (*c.* 1325–1407), English soldier, belonged to a Cheshire family. In early life he served in Brittany, and he was one of the English survivors who were taken prisoners by the French after the famous "combat of the thirty" in March 1351. He was, however, quickly released and was among the soldiers of fortune who took advantage of the distracted state of Brittany, at this time the scene of a savage civil war, to win fame and wealth at the expense of the wretched inhabitants. After a time he transferred his operations to Normandy, when he served under the allied standards of England and of Charles II. of Navarre. He led the "great company" in their work of devastation along the valley of the Loire, fighting at this time for his own hand and for booty, and winning a terrible reputation by his ravages. After the conclusion of the treaty of Brétigny in 1360 Knolles returned to Brittany and took part in the struggle for the possession of the duchy between John of Montfort (Duke John IV.) and Charles of Blois, gaining great fame by his conduct in the fight at Auray (September 1364), where

Du Guesclin was captured and Charles of Blois was slain. In 1367 he marched with the Black Prince into Spain and fought at the battle of Nâjera; in 1369 he was with the prince in Aquitaine. In 1370 he was placed by Edward III. at the head of an expedition which invaded France and marched on Paris, but after exacting large sums of money as ransom a mutiny broke up the army, and its leader was forced to take refuge in his Breton castle of Derval and to appease the disappointed English king with a large monetary gift. Emerging from his retreat Knolles again assisted John of Montfort in Brittany, where he acted as John's representative; later he led a force into Aquitaine, and he was one of the leaders of the fleet sent against the Spaniards in 1377. In 1380 he served in France under Thomas of Woodstock, afterwards duke of Gloucester, distinguishing himself by his valour at the siege of Nantes; and in 1381 he went with Richard II. to meet Wat Tyler at Smithfield. He died at Sculthorpe in Norfolk on the 15th of August 1407. Sir Robert devoted much of his great wealth to charitable objects. He built a college and an almshouse at Pontefract, his wife's birthplace, where the almshouse still exists; he restored the churches of Sculthorpe and Harpley; and he helped to found an English hospital in Rome. Knolles won an immense reputation by his skill and valour in the field, and ranks as one of the foremost captains of his age. French writers call him Canolles, or Canole.

KNOLLYS, the name of an English family descended from Sir Thomas Knollys (d. 1435), lord mayor of London. The first distinguished member of the family was Sir Francis Knollys (*c.* 1514–1596), English statesman, son of Robert Knollys, or Knolles (d. 1521), a courtier in the service and favour of Henry VII. and Henry VIII. Robert had also a younger son, Henry, who took part in public life during the reign of Elizabeth and who died in 1583.

Francis Knollys, who entered the service of Henry VIII. before 1540, became a member of parliament in 1542 and was knighted in 1547 while serving with the English army in Scotland. A strong and somewhat aggressive supporter of the reformed doctrines, he retired to Germany soon after Mary became queen, returning to England to become a privy councillor, vice-chamberlain of the royal household and a member of parliament under Queen Elizabeth, whose cousin Catherine (d. 1569), daughter of William Carey and niece of Anne Boleyn, was his wife. After serving as governor of Plymouth, Knollys was sent in 1566 to Ireland, his mission being to obtain for the queen confidential reports about the conduct of the lord-deputy Sir Henry Sidney. Approving of Sidney's actions he came back to England, and in 1568 was sent to Carlisle to take charge of Mary Queen of Scots, who had just fled from Scotland; afterwards he was in charge of the queen at Bolton Castle and then at Tutbury Castle. He discussed religious questions with his prisoner, although the extreme Protestant views which he put before her did not meet with Elizabeth's approval, and he gave up the position of guardian just after his wife's death in January 1569. In 1584 he introduced into the House of Commons, where since 1572 he had represented Oxfordshire, the bill legalizing the national association for Elizabeth's defence, and he was treasurer of the royal household from 1572 until his death on the 19th of July 1596. His monument may still be seen in the church of Rotherfield Grays, Oxfordshire. Knollys was repeatedly free and frank in his objections to Elizabeth's tortuous foreign policy; but, possibly owing to his relationship to the queen, he did not lose her favour, and he was one of her commissioners on such important occasions as the trials of Mary Queen of Scots, of Philip Howard earl of Arundel, and of Anthony Babington. An active and lifelong Puritan, his attacks on the bishops were not lacking in vigour, and he was also very hostile to heretics. He received many grants of land from the queen, and was chief steward of the city of Oxford and a knight of the garter.

Sir Francis's eldest son Henry (d 1583), and his sons Edward (d. *c.* 1580), Robert (d. 1625), Richard (d. 1596), Francis (d. *c.* 1648), and Thomas, were all courtiers and served the queen in parliament or in the field. His daughter Lettice (1540–1634) married Walter Devereux, earl of Essex, and then Robert Dudley, earl of Leicester; she was the mother of Elizabeth's favourite, the 2nd earl of Essex.

Some of Knollys's letters are in T. Wright's *Queen Elizabeth and her Times* (1838) and the *Burghley Papers*, edited by S. Haynes (1740); and a few of his manuscripts are still in existence. A speech which Knollys delivered in parliament against some claims made by the bishops was printed in 1608 and again in W. Stoughton's *Assertion for True and Christian Church Policie* (London, 1642).

Sir Francis Knollys's second son William (*c.* 1547–1632) served as a member of parliament and a soldier during the reign of Queen Elizabeth, being knighted in 1586. His eldest brother Henry, having died without sons in 1583, William inherited his father's estates in Oxfordshire, becoming in 1596 a privy councillor and comptroller of the royal household; in 1602 he was made treasurer of the household. Sir William enjoyed the favour of the new king James I., whom he had visited in Scotland in 1585, and was made Baron Knollys in 1603 and Viscount Wallingford in 1616. But in this latter year his fortunes suffered a temporary reverse. Through his second wife Elizabeth (1586–1658), daughter of Thomas Howard, earl of Suffolk, Knollys was related to Frances, countess of Somerset, and when this lady was tried for the murder of Sir Thomas Overbury her relatives were regarded with suspicion; consequently Lord Wallingford resigned the treasurership of the household and two years later the mastership of the court of wards, an office which he had held since 1614. However, he regained the royal favour, and was created earl of Banbury in 1626. He died in London on the 25th of May 1632.

His wife, who was nearly forty years her husband's junior, was the mother of two sons, Edward (1627–1645) and Nicholas (1631–1674), whose paternity has given rise to much dispute. Neither is mentioned in the earl's will, but in 1641 the law courts decided that Edward was earl of Banbury, and when he was killed in June 1645 his brother Nicholas took the title. In the Convention Parliament of 1660 some objection was taken to the earl sitting in the House of Lords, and in 1661 he was not summoned to parliament; he had not succeeded in obtaining his writ of summons when he died on the 14th of March 1674.

Nicholas's son Charles (1662–1740), the 4th earl, had not been summoned to parliament when in 1692 he killed Captain Philip Lawson in a duel. This raised the question of his rank in a new form. Was he, or was he not, entitled to trial by the peers? The House of Lords declared that he was not a peer and therefore not so entitled, but the court of king's bench released him from his imprisonment on the ground that he was the earl of Banbury and not Charles Knollys a commoner. Nevertheless the House of Lords refused to move from its position, and Knollys had not received a writ of summons when he died in April 1740. His son Charles (1703–1771), vicar of Burford, Oxfordshire, and his grandsons, William (1726–1776) and Thomas Woods (1727–1793), were successively titular earls of Banbury, but they took no steps to prove their title. However, in 1806 Thomas Woods's son William (1763–1824), who attained the rank of general in the British army, asked for a writ of summons as earl of Banbury, but in 1813 the House of Lords decided against the claim. Several peers, including the great Lord Erskine, protested against this decision, but General Knollys himself accepted it and ceased to call himself earl of Banbury. He died in Paris on the 20th of March 1834. His eldest son, Sir William Thomas Knollys (1797–1883), entered the army and served with the Guards during the Peninsular War. Remaining in the army after the conclusion of the peace of 1815 he won a good reputation and rose high in his profession. From 1855 to 1860 he was in charge of the military camp at Aldershot, then in its infancy, and in 1861 he was made president of the council of military education. From 1862 to 1877 he was comptroller of the household of the prince of Wales, afterwards King Edward VII. From 1877 until his death on the 23rd of June 1883 he was gentleman usher of the black rod; he was also a privy councillor and colonel of the Scots Guards. His son Francis (b. 1837), private secretary to Edward VII. and George V., was created Baron Knollys in 1902; another son, Sir Henry Knollys (b. 1840), became private secretary to King Edward's daughter Maud, queen of Norway.

See Sir N. H. Nicolas, *Treatise on the Law of Adulterine Bastardy* 1833); and G. E. C(okayne), *Complete Peerage* (1887), vol. i.

KNOT, a Limicoline bird very abundant at certain seasons on the shores of Britain and many countries of the northern hemisphere. Camden in the edition of his *Britannia* published in 1607 (p. 408) inserted a passage not found in the earlier issues of that work, connecting the name with that of King Canute, and this account of its origin has been usually received. But no other evidence in its favour is forthcoming, and Camden's statement is merely the expression of an opinion,[1] so that there is perhaps ground for believing him to have been mistaken, and that the clue afforded by Sir Thomas Browne, who (*c.* 1672) wrote the name "Gnatts or Knots," may be the true one.[2] Still the statement was so determinedly repeated by successive authors that Linnaeus followed them in calling the species *Tringa canutus*, and so it remains with nearly all modern ornithologists.[3] Rather larger than a snipe, but with a shorter bill and legs, the knot visits the coasts of some parts of Europe, Asia and North America at times in vast flocks; and, though in temperate climates a good many remain throughout the winter, these are nothing in proportion to those that arrive towards the end of spring, in England generally about the 15th of May, and after staying a few days pass northward to their summer quarters, while early in autumn the young of the year throng to the same places in still greater numbers, being followed a little later by their parents. In winter the plumage is ashy-grey above (save the rump, which is white) and white beneath. In summer the feathers of the back are black, broadly margined with light orange-red, mixed with white, those of the rump white, more or less tinged with red, and the lower parts are of a nearly uniform deep bay or chestnut. The birds which winter in temperate climates seldom attain the brilliancy of colour exhibited by those which arrive from the south; the luxuriance generated by the heat of a tropical sun seems needed to develop the full richness of hue. The young when they come from their birthplace are clothed in ashy-grey above, each feather banded with dull black and ochreous, while the breast is more or less deeply tinged with warm buff. Much curiosity has long existed among zoologists as to the egg of the knot, of which not a single identified or authenticated specimen is known to exist in collections. The species was found breeding abundantly on the North Georgian (now commonly called the Parry) Islands by Parry's Arctic expedition, as well as soon after on Melville Peninsula by Captain Lyons, and again during the voyage of Sir George Nares on the northern coast of Grinnell Land and the shores of Smith Sound, where Major Feilden obtained examples of the newly hatched young (*Ibis*, 1877, p. 407), and observed that the parents fed largely on the buds of *Saxifraga oppositifolia*. These are the only localities in which this species is known to breed, for on none of the arctic lands lying to the north of Europe or Asia has it been unquestionably observed.[4] In winter its wanderings are very extensive, as it is recorded from Surinam, Brazil, Walfisch Bay in South Africa, China, Queensland and New Zealand. Formerly this species was extensively netted in England, and the birds fattened for the table, where they were esteemed a great delicacy, as witness the entries in the Northumberland and Le Strange Household Books; and the British Museum contains an old treatise on the subject: "The maner of kepyng of knotts, after Sir William Askew and my Lady, given to my Lord Darcy, 25 Hen. VIII." (*MSS. Sloane*, 1592, 8 *cat.* 663). (A. N.)

KNOT (O.E. *cnotta*, from a Teutonic stem *knutt*; cf. "knit," and Ger. *knoten*), an intertwined loop of rope, cord, string or other flexible material, used to fasten two such ropes, &c., to one another, or to another object. (For the various forms which such "knots" may take see below.) The word is also used for the distance-marks on a log-line, and hence as the equivalent of a nautical mile (see LOG), and for any hard mass, resembling a knot drawn tight, especially one formed in the trunk of a tree at the place of insertion of a branch. Knots in wood are the remains of dead branches which have become buried in the wood of the trunk or branch on which they were borne. When a branch dies down or is broken off, the dead stump becomes grown over by a healing tissue, and, as the stem which bears it increases in thickness, gradually buried in the newer wood. When a section is made of the stem the dead stump appears in the section as a knot; thus in a board it forms a circular piece of wood, liable to fall out and leave a "knot-hole." "Knot" or "knob" is an architectural term for a bunch of flowers, leaves or other ornamentation carved on a corbel or on a boss. The word is also applied figuratively to any intricate problem, hard to disentangle, a use stereotyped in the proverbial "Gordian knot," which, according to the tradition, was cut by Alexander the Great (see GORDIUM).

Knots, Bends, Hitches, Splices and Seizings are all ways of fastening cords or ropes, either to some other object such as a spar, or a ring, or to one another. The "knot" is formed to make a knob on a rope, generally at the extremity, and by untwisting the strands at the end and weaving them together. But it may be made by turning the rope on itself through a loop, as for instance, the "overhand knot" (fig. 1). A "bend" (from the same root as "bind"), and a "hitch" (an O.E. word), are ways of fastening or tying ropes together, as in the "Carrick bend" (fig. 21), or round spars as the Studding Sail Halyard Bend (fig. 19), and the Timber Hitch (fig. 20). A "splice" (from the same root as "split") is made by untwisting two rope ends and weaving them together. A "seizing" (Fr. *saisir*) is made by fastening two spars to one another by a rope, or two ropes by a third, or by using one rope to make a loop on another—as for example the Racking Seizing (fig. 41), the Round Seizing (fig. 40), and the Midshipman's Hitch (fig. 29). The use of the words is often arbitrary. There is, for instance, no difference in principle between the Fisherman's Bend (fig. 18) and the Timber Hitch (fig. 20). Speaking generally, the Knot and the Seizing are meant to be permanent, and must be unwoven in order to be unfastened, while the Bend and Hitch can be undone at once by pulling the ropes in the reverse direction from that in which they are meant to hold. Yet the Reef Knot (figs. 3 and 4) can be cast loose with ease, and is wholly different in principle, for instance, from the Diamond Knot (figs. 42 and 43). These various forms of fastening are employed in many kinds of industry, as for example in scaffolding, as well as in seamanship. The governing principle is that the strain which pulls against them shall draw them tighter. The ordinary "knots and splices" are described in every book on seamanship.

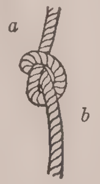

FIG. 1.

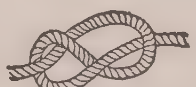

FIG. 2.

Overhand Knot (fig. 1).—Used at the end of ropes to prevent their unreeving and as the commencement of other knots. Take the end *a* round the end *b*.

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[1] His words are simply "*Knotts*, i. *Canuti aues*, vt opinor e Dania enim aduolare creduntur." In the margin the name is spelt "Cnotts," and he possibly thought it had to do with a well-known story of that king. Knots undoubtedly frequent the sea-shore, where Canute is said on one occasion to have taken up his station, but they generally retreat, and that nimbly, before the advancing surf, which he is said in the story not to have done.

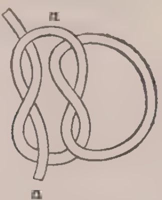
[2] In this connexion we may compare the French *maringouin*, ordinarily a gnat or mosquito, but also, among the French Creoles of America, a small shore-bird, either a *Tringa* or an *Aegialitis*, according to Descourtilz (*Voyage*, ii. 249). See also Littré's *Dictionnaire, s.v.*

[3] There are few of the *Limicolae*, to which group the knot belongs, that present greater changes of plumage according to age or season, and hence before these phases were understood the species became encumbered with many synonyms, as *Tringa cinerea, ferruginea, grisea, islandica, naevia* and so forth. The confusion thus caused was mainly cleared away by Montagu and Temminck.

[4] The *Tringa canutus* of Payer's expedition seems more likely to have been *T. maritima*, which species is not named among the birds of Franz Josef Land, though it can hardly fail to occur there.

Figure-of-Eight Knot (fig. 2).—Used only to prevent ropes from unreeving; it forms a large knob.

Reef Knot (figs. 3, 4).—Form an overhand knot as above. Then take the end *a* over the end *b* and through the bight. If the end *a* were taken under the end *b*, a *granny* would be formed. This knot is so named from being used in tying the reef-points of a sail.



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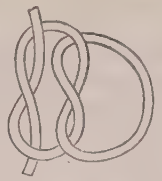
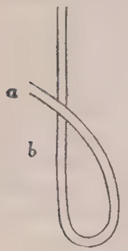


FIG. 4.

Bowline (figs. 5–7).—Lay the end *a* of a rope over the standing part *b*. Form with *b* a bight *c* over *a*. Take *a* round behind *b* and down through the bight *c*. This is a most useful knot employed to form a loop which will not slip. *Running bowlines* are formed by making a bowline round its own standing part above *b*. It is the most common and convenient temporary running noose.



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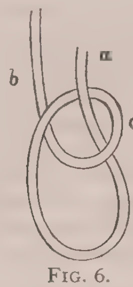

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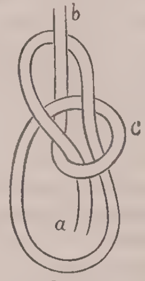

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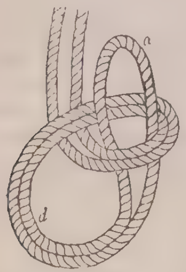

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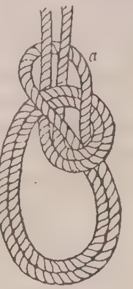

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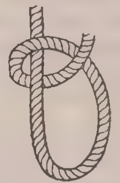


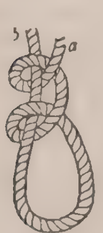
FIG. 10.

Bowline on a Bight (figs. 8, 9).—The first part is made similar to the above with the double part of the rope; then the bight *a* is pulled through sufficiently to allow it to be bent over past *d* and come up in the position shown in fig. 9. It makes a more comfortable sling for a man than a single bight.

Half-Hitch (fig. 10).—Pass the end *a* of the rope round the standing part *b* and through the bight.

Two Half-Hitches (fig. 11).—The half-hitch repeated; this is commonly used, and is capable of resisting to the full strength of the rope. A stop from *a* to the standing part will prevent it jamming.

Clove Hitch (figs. 12, 13).—Pass the end *a* round a spar and cross it over *b*. Pass it round the spar again and put the end *a* through the second bight.



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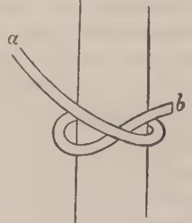

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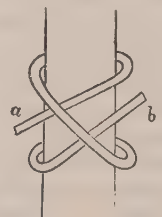
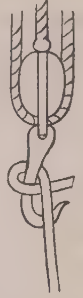


FIG. 13.

Blackwall Hitch (fig. 14).—Form a bight at the end of a rope, and put the hook of a tackle through the bight so that the end of the rope may be jammed between the standing part and the back of the hook.

Double Blackwall Hitch (fig. 15).—Pass the end *a* twice round the hook and under the standing part *b* at the last cross.

Cat's-paw (fig. 16).—Twist up two parts of a lanyard in opposite directions and hook the tackle in the eyes *i*, *i*. A piece of wood should be placed between the parts at *g*. A large lanyard should be clove-hitched round a large toggle and a strap passed round it below the toggle.



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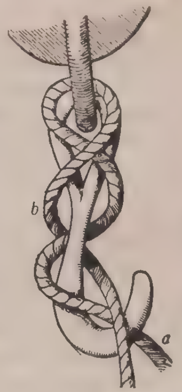

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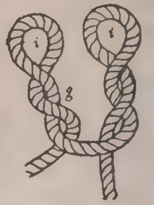

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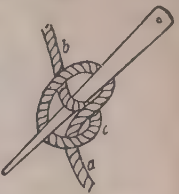
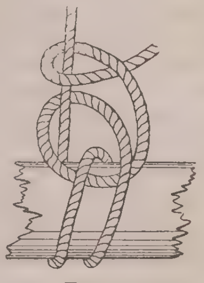


FIG. 17.

Marling-spike Hitch (fig. 17).—Lay the end *a* over *c*; fold the loop over on the standing part *b*; then pass the marline-spike through, over both parts of the bight and under the part *b*. Used for tightening each turn of a seizing.

Fisherman's Bend (fig. 18).—Take two turns round a spar, then a half-hitch round the standing part and between the spar and the turns, lastly a half-hitch round the standing part.



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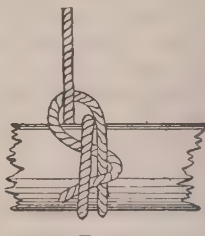

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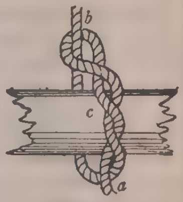


FIG. 20.

Studding-sail Halyard Bend (fig. 19).—Similar to the above, except that the end is tucked under the first round turn; this is more snug. A *magnus hitch* has two round turns and one on the other side of the standing part with the end through the bight.

Timber Hitch (fig. 20).—Take the end *a* of a rope round a spar, then round the standing part *b*, then several times round its own part *c*, against the lay of the rope.

Carrick Bend (fig. 21).—Lay the end of one hawser over its own part to form a bight as *e′*, *b*; pass the end of another hawser up through that bight near *b*, going out over the first end at *c*, crossing under the first long part and over its end at *d*, then under both long parts, forming the loops, and above the first short part at *b*, terminating at the end *e″*, in the opposite direction vertically and horizontally to the other end. The ends should be securely stopped to their respective standing parts, and also a stop put on the becket or extreme end to prevent it catching a pipe or chock; in that form this is the best quick means of uniting two large hawsers, since they cannot jam. When large hawsers have to work through small pipes, good security may be obtained either by passing ten or twelve taut racking turns with a suitable strand and securing each end to a standing part of the hawser, or by taking half as many round turns taut, crossing the ends between the hawsers over the seizing and reef-knotting the ends. This should be repeated in three places and the extreme ends well stopped. Connecting hawsers by bowline knots is very objectionable, as the bend is large and the knots jam.

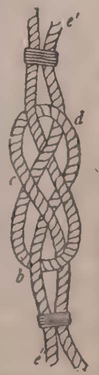


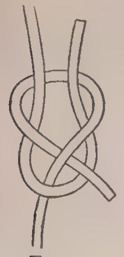
FIG. 21.

Sheet Bend (fig. 22).—Pass the end of one rope through the bight of another, round both parts of the other, and under its own standing part. Used for bending small sheets to the clews of sails, which present bights ready for the hitch. An ordinary net is composed of a series of sheet bends. A *weaver's knot* is made like a sheet bend.

Single Wall Knot (fig. 23).—Unlay the end of a rope, and with the strand *a* form a bight. Take the next strand *b* round the end of *a*.

Take the last strand *c* round the end of *b* and through the bight made by *a*. Haul the ends taut.

Single Wall Crowned (fig. 24).—Form a single wall, and lay one of the ends, *a*, over the knot. Lay *b* over *a*, and *c* over *b* and through the bight of *a*. Haul the ends taut.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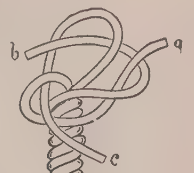

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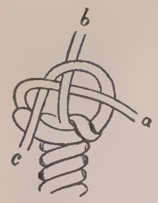
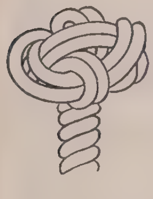


FIG. 24.

Double Wall and Double Crown (fig. 25).—Form a single wall crowned; then let the ends follow their own parts round until all the parts appear double. Put the ends down through the knot.

Matthew Walker (figs. 26, 27).—Unlay the end of a rope. Take the first strand round the rope and through its own bight; the second strand round the rope, through the bight of the first, and through its own bight; the third through all three bights. Haul the ends taut.

Inside Clinch (fig. 28).—The end is bent close round the standing part till it forms a circle and a half, when it is securely seized at *a*, *b* and *c*, thus making a running eye; when taut round anything it jams the end. It is used for securing hemp cables to anchors, the standing parts of topsail sheets, and for many other purposes. If the eye were formed outside the bight an *outside clinch* would be made, depending entirely on the seizings, but more ready for slipping.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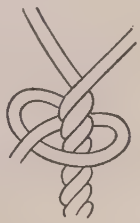
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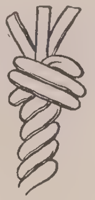
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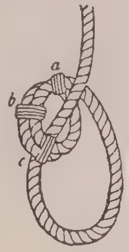
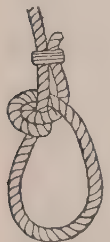


FIG. 28.

Midshipman's Hitch (fig. 29).—Take two round turns inside the bight, the same as a half-hitch repeated; stop up the end or let another half-hitch be taken or held by hand. Used for hooking a tackle for a temporary purpose.

Turk's Head (fig. 30).—With fine line (very dry) make a clove hitch round the rope; cross the bights twice, passing an end the reverse way (up or down) each time; then keeping the whole spread flat, let each end follow its own part round and round till it is too tight to receive any more. Used as an ornament variously on side-ropes and foot-ropes of jibbooms. It may also be made with three ends, two formed by the same piece of line secured through the rope and one single piece. Form with them a diamond knot; then each end crossed over its neighbour follows its own part as above.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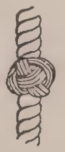
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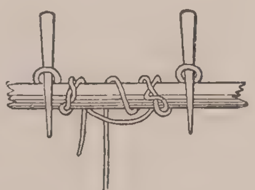
FIG. 31.

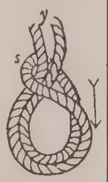

FIG. 32.

Spanish Windlass (fig. 31).—An iron bar and two marling-spikes are taken; two parts of a seizing are twisted like a cat's-paw (fig. 16), passed round the bar, and hove round till sufficiently taut. In heaving shrouds together to form an eye two round turns are taken with a strand and the two ends hove upon. When a lever is placed between the parts of a long lashing or frapping and hove round, we have what is also called a Spanish windlass.

Slings (fig. 32).—This is simply the bight of a rope turned up over its own part; it is frequently made of chain, when a shackle (bow up) takes the place of the bight at *s* and another at *y*, connecting the two ends with the part which goes round the mast-head. Used to sling lower yards. For boat's yards it should be a grummet with a thimble seized in at *y*. As the tendency of all yards is to cant forward with the weight of the sail, the part marked by an arrow should be the fore-side—easily illustrated by a round ruler and a piece of twine.

Sprit-Sail Sheet Knot (fig. 33).—This knot consists of a double wall and double crown made by the two ends, consequently with six strands, with the ends turned down. Used formerly in the clews of sails, now as an excellent stopper, a lashing or shackle being placed at *s* and a lanyard round the head at *l*.

Turning in a Dead-Eye Cutter-Stay fashion (fig. 34).—A bend is made in the stay or shroud round its own part and hove together with a bar and strand; two or three seizings diminishing in size (one round and one or two either round or flat) are hove on taut and snug, the end being at the side of the fellow part. The dead-eye is put in and the eye driven down with a commander.

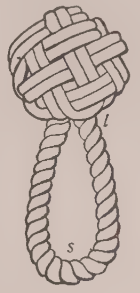

FIG. 33.

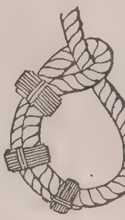
FIG 34.

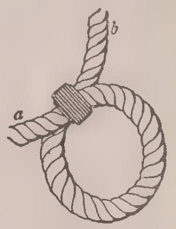

FIG. 35.

Turning in a Dead-Eye end up (fig. 35).—The shroud is measured round the dead-eye and marked where a throat-seizing is hove on; the dead-eye is then forced into its place, or it may be put in first. The end beyond *a* is taken up taut and secured with a round seizing; higher still the end is secured by another seizing. As it is important that the lay should always be kept in the rope as much as possible, these eyes should be formed conformably, either right-handed or left-handed. It is easily seen which way a rope would naturally kink by putting a little extra twist into it. A shroud whose dead-eye is turned in end up will bear a fairer strain, but is more dependent on the seizings; the under turns of the throat are the first to break and the others the first to slip. With the cutter-stay fashion the standing part of the shroud gives way under the nip of the eye. A rope will afford the greatest resistance to strain when secured round large thimbles with a straight end and a sufficient number of flat or racking seizings. To splice shrouds round dead-eyes is objectionable on account of opening the strands and admitting water, thus hastening decay. In small vessels, especially yachts, it is admissible on the score of neatness; in that case a round seizing is placed between the dead-eye and the splice. The dead-eyes should be in diameter 1½ times the circumference of a hemp shroud and thrice that of wire; the lanyard should be half the nominal size of hemp and the same size as wire: thus, hemp-shroud 12 in., wire 6 in., dead-eye 18 in., lanyard 6 in.

Short Splice (fig. 36).—The most common description of splice is when a rope is lengthened by another of the same size, or nearly so. FIG. 36 represents a splice of this kind: the strands have been unlaid, married and passed through with the assistance of a marling-spike, over one strand and under the next, twice each way. The ends are then cut off close. To render the splice neater the strands should have been halved before turning them in a second time, the upper half of each strand only being turned in; then all are cut off smooth.

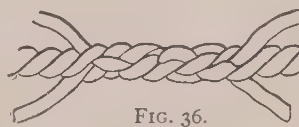
FIG. 36.

Eye Splice.—Unlay the strands and place them upon the same rope spread at such a distance as to give the size of the eye; enter the centre strand (unlaid) under a strand of the rope (as above), and the other two in a similar manner on their respective sides of the first; taper each end and pass them through again. If neatness is desired, reduce the ends and pass them through once more; cut off smooth and serve the part disturbed tightly with suitable hard line. Uses too numerous to mention. *Cut Splice.*—Made in a similar manner to an eye splice, but of two pieces of rope, therefore with two splices. Used for mast-head pendants, jib-guys, breast backstays, and even odd shrouds, to keep the eyes of the rigging lower by one part. It is not so strong as two separate eyes. *Horseshoe Splice.*—Made similar to the above, but one part much shorter than the other, or another piece of rope is spliced across an eye, forming a horseshoe with two long legs. Used for back-ropes on dolphin striker, back stays (one on each side) and cutter's runner pendants. *Long Splice.*—The strands must be unlaid about three times as much as for a short splice and married—care being taken to preserve the lay or shape of each. Unlay one of the strands still further and follow up the vacant space with the corresponding strand of the other part, fitting it firmly into the rope till only a few inches remain. Treat the other side in a similar manner. There will then appear two long strands in the centre and a long and a short one on each side. The splice is practically divided into three distinct parts; at each the strands are divided and the corresponding halves knotted (as shown on the top of fig. 38) and turned in twice. The half strand may, if desired, be still further reduced before the halves are turned in for the second time. This and all other splices should be well stretched and hammered into shape before the ends are cut off. The long splice alone is adapted to running ropes.

Shroud Knot (fig. 37).—Pass a stop at such distance from each end of the broken shroud as to afford sufficient length of strands, when it is unlaid, to form a single wall knot on each side after the parts have been married; it will then appear as represented in the figure, the strands having been well tarred and hove taut separately. The part *a* provides the knot on the opposite side and the ends *b*, *b*; the part *c* provides the knot and the ends *d*, *d*. After the knot has been well stretched the ends are tapered, laid smoothly between the strands of the shroud, and firmly served over. This knot is used when shrouds or stays are broken. *French Shroud Knot.*—Marry the parts with a similar amount of end as before; stop one set of strands taut up on the shroud (to keep the parts together), and turn the ends back on their own part, forming bights. Make a single wall knot with the other three strands round the said bights and shroud; haul the knot taut first and stretch the whole; then heave down the bights close: it will look like the ordinary shroud knot. It is very liable to slip. If the ends by which the wall knot is made after being hove were passed through the bights, it would make the knot stronger. The ends would be tapered and served.

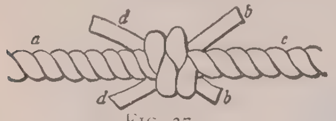

FIG. 37.

Flemish Eye (fig. 38).—Secure a spar or toggle twice the circumference of the rope intended to be rove through the eye; unlay the rope which is to form the eye about three times its circumference, at which part place a strong whipping. Point the rope vertically under the eye, and bind it taut up by the core if it is four-stranded rope, otherwise by a few yarns. While doing so arrange six or twelve pieces of spun-yarn at equal distances on the wood and exactly halve the number of yarns that have been unlaid. If it is a small rope, select two or three yarns from each side near the centre; cross them over the top at *a*, and half-knot them tightly. So continue till all are expended and drawn down tightly on the opposite side to that from which they came, being thoroughly intermixed. Tie the pieces of spun-yarn which were placed under the eye tightly round various parts, to keep the eye in shape when taken off the spar, till they are replaced by turns of marline hove on as taut as possible, the hitches forming a central line outside the eye. Heave on a good seizing of spun-yarn close below the spar, and another between six and twelve inches below the first; it may then be parcelled and served; the eye is served over twice, and well tarred each time. As large ropes are composed of so many yarns, a greater number must be knotted over the toggle each time; a 4-in. rope has 132 yarns, which would require 22 knottings of six each time; a 10-in. rope has 834 yarns, therefore, if ten are taken from each side every time, about twice that number of hitches will be required; sometimes only half the yarns are hitched, the others being merely passed over. The chief use of these eyes has been to form the collars of stays, the whole stay in each case having to be rove through it—a very inconvenient device. It is almost superseded for that purpose by a leg spliced in the stay and lashing eyes abaft the mast, for which it is commonly used at present. This eye is not always called by the same name, but the weight of evidence is in favour of calling it a Flemish eye. *Ropemaker's Eye*, which also has alternative names, is formed by taking out of a rope one strand longer by 6 in. or a foot than the required eye, then placing the ends of the two strands a similar distance below the disturbance of the one strand, that is, at the size of the eye; the single strand is led back through the vacant space it left till it arrives at the neck of the eye, with a similar length of spare end to the other two strands. They are all seized together, scraped, tapered, marled and served. The principal merit is neatness. *Mouse on a Stay.*—Formed by turns of coarse spun-yarn hove taut round the stay, over parcelling at the requisite distance from the eye to form the collar; assistance is given by a padding of short yarns distributed equally round the rope, which, after being firmly secured, especially at what is to be the under part, are turned back over the first layer and seized down again, thus making a shoulder; sometimes it is formed with parcelling only. In either case it is finished by marling, followed by serving or grafting. The use is to prevent the Flemish eye in the end of the stay from slipping up any farther.

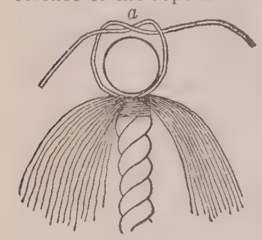

FIG. 38.

Rolling Hitch (fig. 39).—Two round turns are taken round a spar or large rope in the direction in which it is to be hauled and one half-hitch on the other side of the hauling part. This is very useful, as it can be put on and off quickly.

Round Seizing (fig. 40).—So named when the rope it secures does not cross another and there are three sets of turns. The size of the seizing line is about one-sixth (nominal) that of the ropes to be secured, but varies according to the number of turns to be taken. An eye is spliced in the line and the end rove through it, embracing both parts. If either part is to be spread open, commence farthest from that part; place tarred canvas under the seizing; pass the line round as many times (with much slack) as it is intended to have under-turns; and pass the end back through them all and through the eye. Secure the eye from rendering round by the ends of its splice; heave the turns on with a marling-spike (see fig. 17), perhaps seven or nine; haul the end through taut, and commence again the riding turns in the hollows of the first. If the end is not taken back through the eye, but pushed up between the last two turns (as is sometimes recommended), the riders must be passed the opposite way in order to follow the direction of the under-turns, which are always one more in number than the riders. When the riders are complete, the end is forced between the last lower turns and two cross turns are taken, the end coming up where it went down, when a wall knot is made with the strands and the ends cut close; or the end may be taken once round the shroud. *Throat Seizing.*—Two ropes or parts of ropes are laid on each other parallel and receive a seizing similar to that shown in figure 35—that is with upper and riding but no cross turns. As the two parts of rope are intended to turn up at right angles to the direction in which they were secured, the seizing should be of stouter line and short, not exceeding seven lower and six riding turns. The end is better secured with a turn round the standing part. Used for turning in dead-eyes and variously. *Flat Seizing.*—Commenced similarly to the above, but it has neither riding nor cross turns.

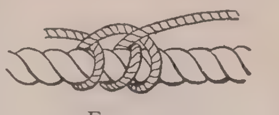

FIG. 39.

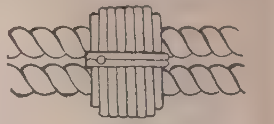

FIG. 40.

Racking Seizing (fig. 41).—A running eye having been spliced round one part of the rope, the line is passed entirely round the other part, crossed back round the first part, and so on for ten to twenty turns, according to the expected strain, every turn being hove as tight as possible; after which round turns are passed to fill the spaces at the back of each rope, by taking the end *a* over both parts into the hollow at *b*, returning at *c*, and going over to *d*. When it reaches *e* a turn may be taken round that rope only, the end rove under it, and a half-hitch taken, which will form a clove-hitch; knot the end and cut it close. When the shrouds are wire (which is half the size of hemp) and the end turned up round a dead-eye of any kind, wire seizings are preferable. It appears very undesirable to have wire rigging combined with plates or screws for setting it up, as in case of accident—such as that of the mast going over the side, a shot or collision breaking the ironwork—the seamen are powerless.

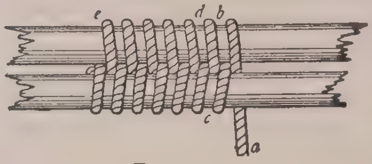

FIG. 41.

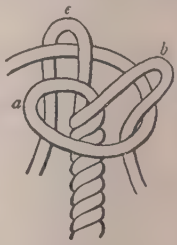

FIG. 42.

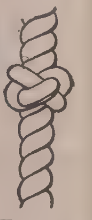

FIG. 43.

Diamond Knot (figs. 42, 43).—The rope must be unlaid as far as the centre if the knot is required there, and the strands handled with great care to keep the lay in them. Three bights are turned up as in fig. 42, and the end of *a* is taken over *b* and up the bight *c*. The end of *b* is taken over *c* and up through *a*. The end *c* is taken over *a* and through *b*. When hauled taut and the strands are laid up again it will appear as in fig. 43. Any number of knots may be made on the same rope. They were used on man-ropes, the foot-ropes on the jib-boom, and similar places, where it was necessary to give a good hold for the hands or feet. Turk's heads are now generally used. *Double Diamond.*—Made by the ends of a single diamond following their own part till the knot is repeated. Used at the upper end of a side rope as an ornamental stopper-knot.

Stropping-Blocks.—There are various modes of securing blocks to ropes; the most simple is to splice an eye at the end of the rope a little longer than the block and pass a round seizing to keep it in place; such is the case with jib-pendants. As a general rule, the parts of a strop combined should possess greater strength than the parts of the fall which act against it. The shell of an ordinary block should be about three times the circumference of the rope which is to reeve through it, as a 9-in. block for a 3-in. rope; but small ropes require larger blocks in proportion, as a 4-in. block for a 1-in. rope. When the work to be done is very important the blocks are much larger: brace-blocks are more than five times the nominal size of the brace. Leading-blocks and sheaves in racks are generally smaller than the blocks through which the ropes pass farther away, which appears to be a mistake, as more power is lost by friction. A clump-block should be double the nominal size of the rope. A single strop may be made by joining the ends of a rope of sufficient length to go round the block and thimble by a common short splice, which rests on the crown of the block (the opposite end to the thimble) and is stretched into place by a jigger; a strand is then passed twice round the space between the block and the thimble and hove taut by a Spanish windlass to cramp the parts together ready for the reception of a small round seizing. The cramping or pinching into shape is sometimes done by machinery invented by a rigger in Portsmouth dockyard. The strop may be made the required length by a long splice, but it would not possess any advantage.

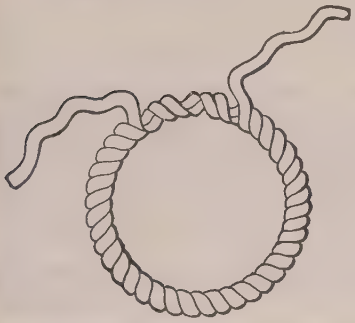

FIG. 44.

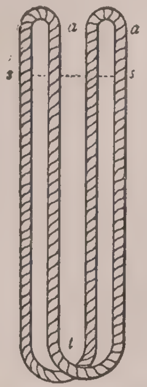

FIG. 45.

Grummet-Strop (fig. 44).—Made by unlaying a piece of rope of the desired size about a foot more than three times the length required for the strop. Place the centre of the rope round the block and thimble; mark with chalk where the parts cross; take one strand out of the rope; bring the two chalk marks together; and cross the strand in the lay on both sides, continuing round and round till the two ends meet the third time; they are then halved, and the upper halves half-knotted and passed over and under the next strands, exactly as one part of a long splice. A piece of worn or well-stretched rope will better retain its shape, upon which success entirely depends. The object is neatness, and if three or multiples of three strops are to be made it is economical.

Double Strop (fig. 45).—Made with one piece of rope, the splice being brought as usual to the crown of the block *t*, the bights fitting into scores some inches apart, converging to the upper part, above which the thimble receives the bights *a*, *a*; and the four parts of the strop are secured at *s*, *s* by a round seizing doubly crossed. If the block be not then on the right slew (the shell horizontal or vertical) a union thimble is used with another strop, which produces the desired effect; thus the fore and main brace-blocks, being very large and thin, are required (for appearance) to lie horizontally; a single strop round the yard vertically has a union thimble between it and the double strop round the block. The double strop is used for large blocks; it gives more support to the shell than the single strop and admits of smaller rope being used. Wire rope is much used for block-strops; the fitting is similar. Metal blocks are also used in fixed positions; durability is their chief recommendation. Great care should be taken that they do not chafe the ropes which pass by them as well as those which reeve through.

Selvagee Strop.—Twine, rope-yarn or rope is warped round two or more pegs placed at the desired distance apart, till it assumes the requisite size and strength; the two ends are then knotted or spliced. Temporary firm seizings are applied in several places to bind the parts together before the rope or twine is removed from the pegs, after which it is marled with suitable material. A large strop should be warped round four or six pegs in order to give it the shape in which it is to be used. This description of strop is much stronger and more supple than rope of similar size. Twine strops (covered with duck) are used for boats' blocks and in similar places requiring neatness. Rope-yarn and spun-yarn strops are used for attaching luff-tackles to shrouds and for many similar purposes. To bring to a shroud or hawser, the centre of the strop is passed round the rope and each part crossed three or four times before hooking the "luff"; a spun-yarn stop above the centre will prevent slipping and is very necessary with wire rope. As an instance of a large selvagee block-strop being used—when the "Melville" was hove down at Chusan (China), the main-purchase-block was double stropped with a selvagee containing 28 parts of 3-in. rope; that would produce 112 parts in the neck, equal to a breaking strain of 280 tons, which is more than four parts of a 19-in cable. The estimated strain it bore was 80 tons.

Stoppers for ordinary running ropes are made by splicing a piece of rope to a bolt or to a hook and thimble, unlaying 3 or 4 ft., tapering it by cutting away some of the yarns, and marling it down securely, with a good whipping also on the end. It is used by taking a half-hitch round the rope which is to be hauled upon, dogging the end up in the lay and holding it by hand. The rope can come through it when hauled, but cannot go back.

Whipping and Pointing.—The end of every working rope should at least be whipped to prevent it fagging out; in ships of war and yachts they are invariably pointed. Whipping is done by placing the end of a piece of twine or knittle-stuff on a rope about an inch from the end, taking three or four turns taut over it (working towards the end); the twine is then laid on the rope again lengthways contrary to the first, leaving a slack bight of twine; and taut turns are repeatedly passed round the rope, over the first end and over the bight, till there are in all six to ten turns; then haul the bight taut through between the turns and cut it close. To point a rope, place a good whipping a few inches from the end, according to size; open out the end entirely; select all the outer yarns and twist them into knittles either singly or two or three together; scrape down and taper the central part, marling it firmly. Turn every alternate knittle and secure the remainder down by a turn of twine or a smooth yarn hitched close up, which acts as the weft in weaving. The knittles are then reversed and another turn of the weft taken, and this is continued till far enough to look well. At the last turn the ends of the knittles which are laid back are led forward over and under the weft and hauled through tightly, making it present a circle of small bights, level with which the core is cut off smoothly. Hawsers and large ropes have a becket formed in their ends during the process of pointing. A piece of 1 to $1\frac{1}{2}$ in. rope about $1\frac{1}{2}$ to 2 ft. long is spliced into the core by each end while it is open: from four to seven yarns (equal to a strand) are taken at a time and twisted up; open the ends of the becket only sufficient to marry them close in; turn in the twisted yarns between the strands (as splicing) three times, and stop it above and below. Both ends are treated alike; when the pointing is completed a loop a few inches in length will protrude from the end of the rope, which is very useful for reeving it. A hauling line or reeving line should only be rove through the becket as a fair lead. *Grafting* is very similar to pointing, and frequently done the whole length of a rope, as a side-rope. Pieces of white line more than double the length of the rope, sufficient in number to encircle it, are made up in hanks called foxes; the centre of each is made fast by twine and the weaving process continued as in pointing. Block-strops are sometimes so covered; but, as it causes decay, a small wove mat which can be taken off occasionally is preferable.

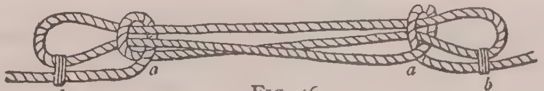

FIG. 46.

Sheep-Shank (fig. 46).—Formed by making a long bight in a top-gallant back-stay, or any rope which it is desirable to shorten, and taking a half-hitch near each bend, as at *a*, *a*. Rope-yarn stops at *b*, *b* are desirable to keep it in place till the strain is brought on it. Wire rope cannot be so treated, and it is injurious to hemp rope that is large and stiff.

Knotting Yarns (fig. 47).—This operation becomes necessary when a comparatively short piece of junk is to be made into spun-yarn, or large rope into small, which is called twice laid. The end of each yarn is divided, rubbed smooth and married (as for splicing). Two of the divided parts, as *c*, *c* and *d*, *d*, are passed in opposite directions round all the other parts and knotted. The ends *e* and *f* remain passive. The figure is drawn open, but the forks of *A* and *B* should be pressed close together, the knot hauled taut and the ends cut off.

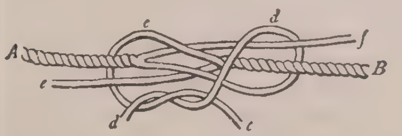

FIG. 47.

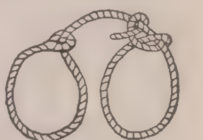

FIG. 48.

Butt Slings (fig. 48).—Made of 4-in. rope, each pair being 26 ft. in length, with an eye spliced in one end, through which the other is rove before being placed over one end of the cask; the rope is then passed round the opposite side of the cask and two half-hitches made with the end, forming another running eye, both of which are beaten down taut as the tackle receives the weight. Slings for smaller casks requiring care should be of this description, though of smaller rope, as the cask cannot possibly slip out. *Bale Slings* are made by splicing the ends of about 3 fathoms of 3-in. rope together, which then looks like a long strop, similar to the double strop represented in fig. 45—the bights *t* being placed under the cask or bale and one of the bights *a*, *a* rove through the other and attached to the whip or tackle.

For a complete treatise on the subject the reader may be referred to *The Book of Knots, being a Complete Treatise on the Art of Cordage, illustrated by 172 Diagrams, showing the Manner of making every Knot, Tie and Splice*, by Tom Bowling (London, 1890).

Mathematical Theory of Knots.

In the scientific sense a knot is an endless physical line which cannot be deformed into a circle. A physical line is flexible and inextensible, and cannot be cut—so that no lap of it can be drawn through another.

The founder of the theory of knots is undoubtedly Johann Benedict Listing (1808–1882). In his "Vorstudien zur Topologie" (*Göttinger Studien*, 1847), a work in many respects of startling originality, a few pages only are devoted to the subject.[1] He treats knots from the elementary notion of twisting one physical line (or thread) round another, and shows that from the projection of a knot on a surface we can thus obtain a notion of the relative situation of its coils. He distinguishes "reduced" from "reducible" forms, the number of crossings in the reduced knot being the smallest possible. The simplest form of reduced knot is of two species, as in figs. 49 and 50. Listing points out that these are formed, the first by right-handed the second by left-handed twisting. In fact, if three half-twists be given to a long strip of paper, and the ends be then pasted together, the two edges become one line, which is the knot in question. We may free it by slitting the paper along its middle line; and then we have the juggler's trick of putting a knot on an endless unknotted band. One of the above forms cannot be deformed into the other. The one is, in Listing's language, the "perversion" of the other, *i.e.* its image in a plane mirror. He gives a method of symbolizing reduced knots, but shows that in this method the same knot may, in certain cases, be represented by different symbols. It is clear that the brief notice he published contains a mere sketch of his investigations.

The most extensive dissertation on the properties of knots is that of Peter Guthrie Tait (*Trans. Roy. Soc. Edin.*, xxviii. 145, where the substance of a number of papers in the *Proceedings* of the same society is reproduced). It was for the most part written in ignorance of the work of Listing, and was suggested by an inquiry concerning vortex atoms.

Tait starts with the almost self-evident proposition that, if any plane closed curve have double points only, in passing continuously along the curve from one of these to the same again an even number of double points has been passed through. Hence the crossings may be taken alternately over and under. On this he bases a scheme for the representation of knots of every kind, and employs it to find all the distinct forms of knots which have, in their simplest projections, 3, 4, 5, 6 and 7 crossings only. Their numbers are shown to be 1, 1, 2, 4 and 8. The unique knot of three crossings has been already given as drawn by Listing. The unique knot of four crossings merits a few words, because its properties lead to a very singular conclusion. It can be deformed into any of the four forms—figs. 51 and 52 and their perversions. Knots which can be deformed into their own perversion Tait calls "amphicheiral" (from the Greek ἀμφί, on both sides, around, χείρ, hand), and he has shown that there is at least one knot of this kind for every even number of crossings. He shows also that "links" (in which two endless physical lines are linked together) possess a similar property; and he then points out that there is a third mode of making a complex figure of endless physical lines, without either knotting or linking. This may be called "lacing" or "locking." Its nature is obvious from fig. 53, in which it will be seen that no one of the three lines is knotted, no two are linked, and yet the three are inseparably fastened together.

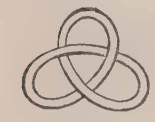
FIG. 49.

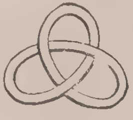
FIG. 50.

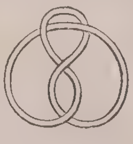
FIG. 51.

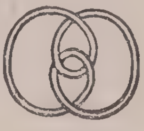
FIG. 52.

The rest of Tait's paper deals chiefly with numerical characteristics of knots, such as their "knottiness," "beknottedness" and "knotfulness." He also shows that any knot, however complex, can be fully represented by three closed plane curves, none of which has double points and no two of which intersect. It may be stated here that the notion of beknottedness is founded on a remark of Gauss, who in 1833 considered the problem of the number of interlinkings of two closed circuits, and expressed it by the electrodynamic measure of the work required to carry a unit magnetic pole round one of the interlinked curves, while a unit electric current is kept circulating in the other. This original suggestion has been developed at considerable length by Otto Boeddicker (*Erweiterung der Gauss'schen Theorie der Verschlingungen* (Stuttgart, 1876). This author treats also of the connexion of knots with Riemann's surfaces.

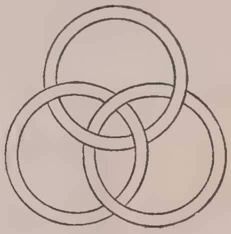
FIG. 53.

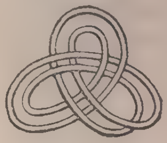
FIG. 54.

It is to be noticed that, although every knot in which the crossings are alternately over and under is irreducible, the converse is not generally true. This is obvious at once from fig. 54, which is merely the three-crossing knot with a doubled string—what Listing calls "paradromic."

Christian Felix Klein, in the *Mathematische Annalen*, ix. 478, has proved the remarkable proposition that knots cannot exist in space of four dimensions. (P. G. T.)

KNOUT (from the French transliteration of a Russian word of Scandinavian origin; cf. A.-S. *cnotta*, Eng. knot), the whip used in Russia for flogging criminals and political offenders. It is said to have been introduced under Ivan III. (1462–1505). The knout had different forms. One was a lash of raw hide, 16 in. long, attached to a wooden handle, 9 in. long. The lash ended in a metal ring, to which was attached a second lash as long, ending also in a ring, to which in turn was attached a few inches of hard leather ending in a beak-like hook. Another kind consisted of many thongs of skin plaited and interwoven with wire, ending in loose wired ends, like the cat-o'-nine tails. The victim was tied to a post or on a triangle of wood and stripped, receiving the specified number of strokes on the back. A sentence of 100 or 120 lashes was equivalent to a death sentence; but few lived to receive so many. The executioner was usually a criminal who had to pass through a probation and regular training; being let off his own penalties in return for his services. Peter the Great is traditionally accused of knouting his son Alexis to death, and there is little doubt that the boy was actually beaten till he died, whoever was the executioner. The emperor Nicholas I. abolished the earlier forms of knout and substituted the *pleti*, a three-thonged lash. Ostensibly the knout has been abolished throughout Russia and reserved for the penal settlements.

KNOWLES, SIR JAMES (1831–1908), English architect and editor, was born in London in 1831, and was educated, with a view to following his father's profession, as an architect at University College and in Italy. His literary tastes also brought him at an early age into the field of authorship. In 1860 he published *The Story of King Arthur*. In 1867 he was introduced to Tennyson, whose house, Aldworth, on Blackdown, he designed; this led to a close friendship, Knowles assisting Tennyson in business matters, and among other things helping to design scenery for *The Cup*, when Irving produced that play in 1880. Knowles became intimate with a number of the most interesting men of the day, and in 1869, with Tennyson's cooperation, he started the Metaphysical Society, the object of which was to attempt some intellectual *rapprochement* between religion and science by getting the leading representatives of faith and unfaith to meet and exchange views.

The members from first to last were as follows: Dean Stanley, Seeley, Roden Noel, Martineau, W. B. Carpenter, Hinton, Huxley Pritchard, Hutton, Ward, Bagehot, Froude, Tennyson, Tyndall Alfred Barry, Lord Arthur Russell, Gladstone, Manning, Knowles. Lord Avebury, Dean Alford, Alex. Grant, Bishop Thirlwall, F. Harrison, Father Dalgairns, Sir G. Grove, Shadworth Hodgson,

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[1] See P. G. Tait "On Listing's *Topologie*," *Phil. Mag.*, xvii. 30.

H. Sidgwick, E. Lushington, Bishop Ellicott, Mark Pattison, duke of Argyll, Ruskin, Robert Lowe, Grant Duff, Greg, A. C. Fraser, Henry Acland, Maurice, Archbishop Thomson, Mozley, Dean Church, Bishop Magee, Croom Robertson, FitzJames Stephen, Sylvester, J. C. Bucknill, Andrew Clark, W. K. Clifford, St George Mivart, M. Boulton, Lord Selborne, John Morley, Leslie Stephen, F. Pollock, Gasquet, C. B. Upton, William Gull, Robert Clarke, A. J. Balfour, James Sully and A. Barratt.

Papers were read and discussed at the various meetings on such subjects as the ultimate grounds of belief in the objective and moral sciences, the immortality of the soul, &c. An interesting description of one of the meetings was given by Magee (then bishop of Peterborough) in a letter of 13th of February 1873:—

> "Archbishop Manning in the chair was flanked by two Protestant bishops right and left; on my right was Hutton, editor of the *Spectator*, an Arian; then came Father Dalgairns, a very able Roman Catholic priest; opposite him Lord A. Russell, a Deist; then two Scotch metaphysical writers, Freethinkers; then Knowles, the *very* broad editor of the *Contemporary*; then, dressed as a layman and looking like a country squire, was Ward, formerly Rev. Ward, and earliest of the perverts to Rome; then Greg, author of *The Creed of Christendom*, a Deist; then Froude, the historian, once a deacon in our Church, now a Deist; then Roden Noel, an actual Atheist and red republican, and looking very like one! Lastly Ruskin, who read a paper on miracles, which we discussed for an hour and a half! Nothing could be calmer, fairer, or even, on the whole, more reverent then the discussion. In my opinion, we, the Christians, had much the best of it. Dalgairns, the priest, was very masterly; Manning, clever and precise and weighty; Froude, very acute, and so was Greg. We only wanted a Jew and a Mahommedan to make our Religious Museum complete" (*Life*, i. 284).

The last meeting of the society was held on 16th May 1880. Huxley said that it died "of too much love"; Tennyson, "because after ten years of strenuous effort no one had succeeded in even defining metaphysics." According to Dean Stanley, "We all meant the same thing if we only knew it." The society formed the nucleus of the distinguished list of contributors who supported Knowles in his capacity as an editor. In 1870 he became editor of the *Contemporary Review*, but left it in 1877 and founded the *Nineteenth Century* (to the title of which, in 1901, were added the words *And After*). Both periodicals became very influential under him, and formed the type of the new sort of monthly review which came to occupy the place formerly held by the quarterlies. In 1904 he received the honour of knighthood. He died at Brighton on the 13th of February 1908.

KNOWLES, JAMES SHERIDAN (1784–1862), Irish dramatist and actor, was born in Cork, on the 12th of May 1784. His father was the lexicographer, James Knowles (1759–1840), cousin-german of Richard Brinsley Sheridan. The family removed to London in 1793, and at the age of fourteen Knowles published a ballad entitled *The Welsh Harper*, which, set to music, was very popular. The boy's talents secured him the friendship of Hazlitt, who introduced him to Lamb and Coleridge. He served for some time in the Wiltshire and afterwards in the Tower Hamlets militia, leaving the service to become pupil of Dr Robert Willan (1757–1812). He obtained the degree of M.D., and was appointed vaccinator to the Jennerian Society. Although, however, Dr Willan generously offered him a share in his practice, he resolved to forsake medicine for the stage, making his first appearance probably at Bath, and playing Hamlet at the Crow Theatre, Dublin. At Wexford he married, in October 1809, Maria Charteris, an actress from the Edinburgh Theatre. In 1810 he wrote *Leo*, in which Edmund Kean acted with great success; another play, *Brian Boroihme*, written for the Belfast Theatre in the next year, also drew crowded houses, but his earnings were so small that he was obliged to become assistant to his father at the Belfast Academical Institution. In 1817 he removed from Belfast to Glasgow, where, besides conducting a flourishing school, he continued to write for the stage. His first important success was *Caius Gracchus*, produced at Belfast in 1815; and his *Virginius*, written for Edmund Kean, was first performed in 1820 at Covent Garden. In *William Tell* (1825) Macready found one of his favourite parts. His best-known play, *The Hunchback*, was produced at Covent Garden in 1832; *The Wife* was brought out at the same theatre in 1833; and *The Love Chase* in 1837. In his later years he forsook the stage for the pulpit, and as a Baptist preacher attracted large audiences at Exeter Hall and elsewhere. He published two polemical works—the *Rock of Rome* and the *Idol Demolished by its own Priests*—in both of which he combated the special doctrines of the Roman Catholic Church. Knowles was for some years in the receipt of an annual pension of £200, bestowed by Sir Robert Peel. He died at Torquay on the 30th of November 1862.

A full list of the works of Knowles and of the various notices of him will be found in the *Life* (1872), privately printed by his son, Richard Brinsley Knowles (1820–1882), who was well known as a journalist.

KNOW NOTHING (or AMERICAN) **PARTY,** in United States history, a political party of great importance in the decade before 1860. Its principle was political proscription of naturalized citizens and of Roman Catholics. Distrust of alien immigrants, because of presumptive attachment to European institutions, has always been more or less widely diffused, and race antagonisms have been recurrently of political moment; while anti-Catholic sentiment went back to colonial sectarianism. These were the elements of the political "nativism"—*i.e.* hostility to foreign influence in politics—of 1830–1860. In these years Irish immigration became increasingly preponderant; and that of Catholics was even more so. The geographical segregation and the clannishness of foreign voters in the cities gave them a power that Whigs and Democrats alike (the latter more successfully) strove to control, to the great aggravation of naturalization and election frauds. "No one can deny that ignorant foreign suffrage had grown to be an evil of immense proportions" (J. F. Rhodes). In labour disputes, political feuds and social clannishness, the alien elements—especially the Irish and German—displayed their power, and at times gave offence by their hostile criticism of American institutions.[1] In immigration centres like Boston, Philadelphia and New York, the Catholic Church, very largely foreign in membership and proclaiming a foreign allegiance of disputed extent, was really "the symbol and strength of foreign influence" (Scisco); many regarded it as a transplanted foreign institution, un-American in organization and ideas.[2] Thus it became involved in politics. The decade 1830–1840 was marked by anti-Catholic (anti-Irish) riots in various cities and by party organization of nativists in many places in local elections. Thus arose the American-Republican (later the Native-American) Party, whose national career begun practically in 1845, and which in Louisiana in 1841 first received a state organization. New York City in 1844 and Boston in 1845 were carried by the nativists, but their success was due to Whig support, which was not continued,[3] and the national organization was by 1847—in which year it endorsed the Whig nominee for the presidency—practically dead. Though some Whig leaders had strong nativist leanings, and though the party secured a few representatives in Congress, it accomplished little at this time in national politics. In the early 'fifties nativism was revivified by an unparalleled inflow of aliens. Catholics, moreover, had combated the Native-Americans defiantly. In 1852 both Whigs and Democrats were forced to defend their presidential nominees against charges of anti-Catholic sentiment. In 1853–1854 there was a wide-spread "anti-popery" propaganda and riots against Catholics in various cities. Meanwhile the Know Nothing Party had sprung from nativist secret societies, whose relations remain obscure.[4] Its organization was secret; and hence its name—for a member, when interrogated, always answered that he knew nothing about it. Selecting candidates secretly from among those nominated by the other parties, and giving them no public endorsement, the Know Nothings, as soon as they gained the balance of power, could shatter at will Whig and Democratic calculations. Their power was evident by 1852—from which time, accordingly, "Know-Nothingism" is most properly dated. The charges they brought against naturalization abuses were only too well founded; and those against election frauds not less so—though, unfortunately, the Know Nothings themselves followed scandalous election methods in some cities. The proposed proscription of the foreign-born knew no exceptions: many wished never to concede to them all the rights of natives, nor to their children unless educated in the public schools. As for Catholics, the real animus of Know Nothingism was against *political* Romanism; therefore, secondarily, against papal allegiance and episcopal church administration (in place of administration by lay trustees, as was earlier common practice in the United States); and, primarily, against public aid to Catholic schools, and the alleged greed (*i.e.* the power and success) of the Irish in politics. The times were propitious for the success of an aggressive third party; for the Whigs were broken by the death of Clay and Webster and the crushing defeat of 1852, and both the Whig and Democratic parties were disintegrating on the slavery issue. But the Know Nothings lacked aggression. In entering national politics the party abandoned its mysteries, without making compensatory gains; when it was compelled to publish a platform of principles, factions arose in its ranks; moreover, to draw recruits the faster from Whigs and Democrats, it "straddled" the slavery question, and this, although a temporary success, ultimately meant ruin. In 1854, however, Know Nothing gains were remarkable.[1] Thereafter the organization spread like wildfire in the South, in which section there were almost no aliens, and the Whig dissolution was far advanced. The Virginia election of May 1855 proved conclusively, however, that Know Nothingism was no stronger against the Democrats than was the Whig party it had absorbed; it was the same organization under a new name. In the North it was even clearer that slavery must be faced. Know Nothing evasion probably helped the South,[2] but neither Republicans nor Democrats would endure the evasion; Douglas and Seward, and later (1855–1856) their parties, denounced it. In the North-West the Know Nothings were swept into the anti-slavery movement in 1854 without retaining their organization. In the state campaigns of 1855 professions were measured to the latitude. The national platform of 1856 (adopted by a secret grand council), besides including anti-alien and anti-Catholic planks, offered sops to the North, the South and the "doughfaces" on the slavery issue. Millard Fillmore was nominated for the presidency. The anti-slavery delegates of eight Northern states bolted the convention, and eight months later the Republican wave swept the Know Nothings out of the North.[3] The national field being thus lost, the state councils became supreme, and local opportunism fostered variation and weakness. By 1859 the party was confined almost entirely to the border states. The Constitutional Union—the "Do Nothing"—Party of 1860 was mainly composed of Know Nothing remnants.[4] The year 1860 practically marked, also, the disappearance of the party as a local power.[5]

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[1] *E.g.* for some extraordinary "reform" programmes among German immigrants see Schmeckebier (as below), pp. 48–50.

[2] "The actual offence of the Catholic Church was its non-conformity to American methods of church administration and popular education" (Scisco).

[3] The Whigs bargained aid in New York city for "American" support in the state, and charged that the latter was not given. Millard Fillmore attributed the Whig loss of the state (see LIBERTY PARTY) to the disaffection of Catholic Whigs angered by the alliance with the nativists.

[4] The Order of United Americans and the Order of the Star Spangled Banner, established in New York respectively in 1845 and 1850, were the most important sources of its membership.

Except in city politics nativism had no vitality; in state and national politics it really had no excuse. Race antipathies gave it local cohesive power in the North; various causes, already mentioned, advanced it in the South; and as a device to win offices it was of wide-spread attraction. Its only real contribution to government was the proof that nativism is not Americanism. Public opinion has never accepted its estimate of the alien nor of Catholic citizens. Some of its anti-Church principles, however—as the non-support of denominational schools—have been generally accepted; others—as the refusal to exclude the (Protestant) Bible from public schools—have been generally rejected; others—as the taxation of all Church property—remain disputed.

See L. D. Scisco, *Political Nativism in New York State* (doctoral thesis, Columbia University, New York, 1901); L. F. Schmeckebier, *Know Nothing Party in Maryland* (Johns Hopkins University, Baltimore, 1899); G. H. Haynes, "A Know Nothing Legislature" (Mass., 1855), in *American Historical Assoc. Report*, pt. 1 (1896); J. B. McMaster, *With the Fathers*, including "The Riotous Career of the Know Nothings" (New York, 1896); H. F. Desmond, *The Know Nothing Party* (Washington, 1905).

KNOX, HENRY (1750–1806), American general, was born in Boston, Massachusetts, of Scottish-Irish parentage, on the 25th of July 1750. He was prominent in the colonial militia and tried to keep the Boston crowd and the British soldiers from the clash known as the Boston massacre (1770). In 1771 he opened the "London Book-Store" in Boston. He had read much of tactics and strategy, joined the American army at the outbreak of the War of Independence, and fought at Bunker Hill, planned the defences of the camps of the army before Boston, and brought from Lake George and border forts much-needed artillery. At Trenton he crossed the river before the main body, and in the attack rendered such good service that he was made brigadier-general and chief of artillery in the Continental army on the following day. He was present at Princeton; was chiefly responsible for the mistake in attacking the "Chew House" at Germantown; urged New York as the objective of the campaign of 1778; served with efficiency at Monmouth and at Yorktown; and after the surrender of Cornwallis was promoted major-general, and served as a commissioner on the exchange of prisoners. His services throughout the war were of great value to the American cause; he was one of General Washington's most trusted advisers, and he brought the artillery to a high degree of efficiency. From December 1783 until June 1784 he was the senior officer of the United States army. In April 1783 he had drafted a scheme of a society to be formed by the American officers and the French officers who had served in America during the war, and to be called the "Cincinnati"; of this society he was the first secretary-general (1783–1799) and in 1805 became vice-president-general. In 1785–1794 Knox was secretary of war, being the first man to hold this position after the organization of the Federal government in 1789. He urged ineffectually a national militia system, to enroll all citizens over 18 and under 60 in the "advanced corps," the "main corps" or the "reserve," and for this and his close friendship with Washington was bitterly assailed by the Republicans. In 1793 he had begun to build his house, Montpelier, at Thomaston, Maine, where he speculated unsuccessfully in the holdings of the Eastern Land Association; and he lived there until his death on the 25th of October 1806.

See F. S. Drake, *Memoir of General Henry Knox* (Boston, 1873); and Noah Brooks, *Henry Knox* (New York, 1900) in the "American Men of Energy" series.

KNOX, JOHN (*c.* 1505–1572), Scottish reformer and historian. Of his early life very little is certainly known, in spite of the fact that his *History of the Reformation* and his private letters, especially the latter, are often vividly autobiographical. Even the year of his birth, usually given as 1505, is matter of dispute. Beza, in his *Icones*, published in 1580, makes it 1515; Sir Peter Young (tutor to James VI. of Scotland), writing to Beza from Edinburgh in 1579, says 1513; and a strong case has been made out for holding that the generally accepted date is due to an error in transcription (see Dr Hay Fleming in the *Bookman*, Sept. 1905). But Knox seems to have been reticent about his early life, even to his contemporaries. What is known is that he was a son of William Knox, who lived in or near the town of Haddington, that his mother's name was Sinclair, and that his forefathers on both sides had fought under the banner of the Bothwells. William Knox was "simple," not "gentle"—perhaps a prosperous East Lothian peasant. But he sent his son John to school (no doubt the well-known grammar school of Haddington), and thereafter to the university, where, like his contemporary George Buchanan, he sat "at the feet" of John Major. Major was a native of Haddington, who had recently returned to Scotland from Paris with a great academical reputation. He retained to the last, as his *History of Greater Britain* shows, the repugnance characteristic of the university of Paris to the tyranny of kings and nobles; but like it, he was now alarmed by the revolt of Luther, and ceased to urge its ancient protest against the supremacy of the pope. He exchanged his "regency" or professorship in Glasgow University for one in that of St Andrews in 1523. If Knox's college time was later than that date (as it must have been, if he was born near 1515), it was no doubt spent, as Beza narrates, at St Andrews, and probably exclusively there. But in Major's last Glasgow session a "Joannes Knox" (not an uncommon name, however, at that time in the west of Scotland) matriculated there; and if this were the future reformer, he may thereafter either have followed his master to St Andrews or returned from Glasgow straight to Haddington. But till twenty years after that date his career has not been again traced. Then he reappears in his native district as a priest without a university degree (Sir John Knox) and a notary of the diocese of St Andrews. In 1543 he certainly signed himself "minister of the sacred altar" under the archbishop of St Andrews. But in 1546 he was carrying a two-handed sword in defence of the reformer George Wishart, on the day when the latter was arrested by the archbishop's order. Knox would have resisted, though the arrest was by his feudal superior, Lord Bothwell; but Wishart himself commanded his submission, with the words "One is sufficient for a sacrifice," and was handed over for trial at St Andrews. And next year the archbishop himself had been murdered, and Knox was preaching in St Andrews a fully developed Protestantism.

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[1] This year "American Party" became the official name. Its strength in Congress was almost thirty-fold that of 1852. It elected governors, legislatures, or both, in four New England states, and in Maryland, Kentucky and California; minor officers elsewhere; and almost won six Southern states.

[2] For it delayed anti-slavery organization in the North, and presumably discouraged immigration, which was a source of strength to the North rather than to the South.

[3] They carried only Maryland. The popular vote in the North was under one-seventh, in the South above three-sevenths, of the total vote cast.

[4] Note the presidential vote. Seward's loss of the Republican nomination was partly due to Know Nothing hostility.

[5] Its firmest hold was in Maryland. Its rule in Baltimore (1854–1860) was marked by disgraceful riots and abuses.

Knox gives us no information as to how this startling change in himself was brought about. During those twenty years Scotland had been slowly tending to freedom in religious profession, and to friendship with England rather than with France. The Scottish hierarchy, by this time corrupt and even profligate, saw the twofold danger and met it firmly. James V., the "Commons' King" had put himself into the hands of the Beatons, who in 1528 burned Patrick Hamilton. On James's death there was a slight reaction, but the cardinal-archbishop took possession of the weak regent Arran, and in 1546 burned George Wishart. England had by this time rejected the pope's supremacy. In Scotland by a recent statute it was death even to argue against it; and Knox after Wishart's execution was fleeing from place to place, when, hearing that certain gentlemen of Fife had slain the cardinal and were in possession of his castle of St Andrews, he gladly joined himself to them. In St Andrews he taught "John's Gospel" and a certain catechism—probably that which Wishart had got from "Helvetia" and translated; but his teaching was supposed to be private and tutorial and for the benefit of his friends' "bairns." The men about him however—among them Sir David Lindsay of the Mount, "Lyon King" and poet—saw his capacity for greater things, and, on his at first refusing "to run where God had not called him," planned a solemn appeal to Knox from the pulpit to accept "the public office and charge of preaching." At the close of it the speaker (in Knox's own narrative) "said to those that were present, 'Was not this your charge to me? And do ye not approve this vocation?' They answered, 'It was, and we approve it.' Whereat the said Johnne, abashed, burst forth in most abundant tears and withdrew himself to his chamber," remaining there in "heaviness" for days, until he came forth resolved and prepared. Knox is probably not wrong in regarding this strange incident as the spring of his own public life. The St Andrews invitation was really one to danger and death; John Rough, who spoke it, died a few years after in the flames at Smithfield. But it was a call which many in that ardent dawn were ready to accept, and it had now at length found, or made, a statesman and leader of men. For what to the others was chiefly a promise of personal salvation became for the indomitable will of Knox an assurance also of victory, even in this world, over embattled forces of ancient wrong. It is certain at least that from this date he never changed and scarcely even varied his public course. And looking back upon that course afterwards, he records with much complacency how his earliest St Andrews sermon built up a whole fabric of aggressive Protestantism upon Puritan theory, so that his startled hearers muttered, "Others sned (snipped) the branches; this man strikes at the root."

Meantime the system attacked was safe for other thirteen years. In June 1547 St Andrews yielded to the French fleet, and the prisoners, including Knox, were thrown into the galleys on the Loire, to remain in irons and under the lash for at least nineteen months. Released at last (apparently through the influence of the young English king, Edward VI.), Knox was appointed one of the licensed preachers of the new faith for England, and stationed in the great garrison of Berwick, and afterwards at Newcastle. In 1551 he seems to have been made a royal chaplain; in 1552 he was certainly offered an English bishopric, which he declined; and during most of this year he used his influence, as preacher at court and in London, to make the new English settlement more Protestant. To him at least is due the Prayer-book rubric which explains that, when kneeling at the sacrament is ordered, "no adoration is intended or ought to be done." While in Northumberland Knox had been betrothed to Margaret Bowes, one of the fifteen children of Richard Bowes, the captain of Norham Castle. Her mother, Elizabeth, co-heiress of Aske in Yorkshire, was the earliest of that little band of women-friends whose correspondence with Knox on religious matters throws an unexpected light on his discriminating tenderness of heart. But now Mary Tudor succeeded her brother, and Knox in March 1554 escaped into five years' exile abroad, leaving Mrs. Bowes a fine treatise on "Affliction," and sending back to England two editions of a more acrid "Faithful Admonition" on the crisis there. He first drifted to Frankfort, where the English congregation divided as English Protestants have always done, and the party opposed to Knox got rid of him at last by a complaint to the authorities of treason against the emperor Charles V. as well as Philip and Mary. At Geneva he found a more congenial pastorate. Christopher Goodman (*c.* 1520–1603) and he, with other exiles, began there the Puritan tradition, and prepared the earlier English version of the Bible, "the household book of the English-speaking nations" during the great age of Elizabeth. Here, and afterwards at Dieppe (where he preached in French), Knox kept in communication with the other Reformers, studied Greek and Hebrew in the interest of theology, and having brought his wife and her mother from England in 1555 lived for years a peaceful life.

But even here Knox was preparing for Scotland, and facing the difficulties of the future, theoretical as well as practical. In his first year abroad he consulted Calvin and Bullinger as to the right of the civil "authority" to prescribe religion to his subjects—in particular, whether the godly should obey "a magistrate who enforces idolatry and condemns true religion," and whom should they join "in the case of a religious nobility resisting an idolatrous sovereign." In August 1555 he visited his native country and found the queen-mother, Mary of Lorraine, acting as regent in place of the real "sovereign," the youthful and better-known Mary, now being brought up at the court of France. Scripture-reading and the new views had spread widely, and the regent was disposed to wink at this in the case of the "religious nobility." Knox was accordingly allowed to preach privately for six months throughout the south of Scotland, and was listened to with an enthusiasm which made him break out, "O sweet were the death which should follow such forty days in Edinburgh as here I have had three!" Before leaving he even addressed a letter to the regent, urging her to favour the Evangel. She accepted it jocularly as a “pasquil,” and Knox on his departure was condemned and burned in effigy. But he left behind him a “Wholesome Counsel” to Scottish heads of families, reminding them that within their own houses they were “bishop and kings,” and recommending the institution of something like the early apostolic worship in private congregations. Of the Protestant barons Knox, though in exile, seems to have been henceforward the chief adviser; and before the end of 1557 they, under the name of the “Lords of the Congregation,” had entered into the first of the religious “bands” or “covenants” afterwards famous in Scotland. In 1558 he published his “Appellation” to the nobles, estates and commonalty against the sentence of death recently pronounced upon him, and along with it a stirring appeal “To his beloved brethren, the Commonalty of Scotland,” urging that the care of religion fell to them also as being “God’s creatures, created and formed in His own image,” and having a right to defend their conscience against persecution. About this time, indeed, there was in Scotland a remarkable approximation to that solution of the toleration difficulty which later ages have approved; for the regent was understood to favour the demand of the “congregation” that at least the penal statutes against heretics “be suspended and abrogated,” and “that it be lawful to us to *use ourselves* in matters of religion and conscience as we must answer to God.” It was a consummation too ideal for that early date; and next year the regent, whose daughter was now queen of France and there mixed up with the persecuting policy of the Guises, forbade the reformed preaching in Scotland. A rupture ensued at once, and Knox appeared in Edinburgh on the 2nd of May 1559 “even in the brunt of the battle.” He was promptly “blown to the horn” at the Cross there as an outlaw, but escaped to Dundee, and commenced public preaching in the chief towns of central Scotland. At Perth and at St Andrews his sermons were followed by the destruction of the monasteries, institutions disliked in that age in Scotland alike by the devout and the profane. But while he notes that in Perth the act was that of “the rascal multitude,” he was glad to claim in St Andrews the support of the civic “authority”; and indeed the burghs, which were throughout Europe generally in favour of freedom, soon became in Scotland a main support of the Reformation. Edinburgh was still doubtful, and the queen regent held the castle; but a truce between her and the lords for six months to the 1st of January 1560 was arranged on the footing that every man there “may have freedom to use his own conscience to the day foresaid”—a freedom interpreted to let Knox and his brethren preach publicly and incessantly.

Scotland, like its capital, was divided. Both parties lapsed from the freedom-of-conscience solution to which each when unsuccessful appealed; both betook themselves to arms; and the immediate future of the little kingdom was to be decided by its external alliances. Knox now took a leading part in the great transaction by which the friendship of France was exchanged for that of England. He had one serious difficulty. Before Elizabeth’s accession to the English crown, and after the queen mother in Scotland had disappointed his hopes, he had published a treatise against what he called “The Monstrous Regiment (regimen or government) of Women”; though the despotism of that despotic age was scarcely appreciably worse when it happened to be in female hands. Elizabeth never forgave him; but Cecil corresponded with the Scottish lords, and their answer in July 1559, in Knox’s handwriting, assures England not only of their own constancy, but of “a charge and commandment to our posterity, that the amity and league between you and us, contracted and begun in Christ Jesus, may by them be kept inviolated for ever.” The league was promised by England; but the army of France was first in the field, and towards the end of the year drove the forces of the “congregation” from Leith into Edinburgh, and then out of it in a midnight rout to Stirling—“that dark and dolorous night,” as Knox long afterwards said, “wherein all ye, my lords, with shame and fear left this town,” and from which only a memorable sermon by their great preacher roused the despairing multitude into new hope. Their leaders renounced allegiance to the regent; she ended her not unkindly, but as Knox calls it “unhappy,” life in the castle of Edinburgh; the English troops, after the usual Elizabethan delays and evasions, joined their Scots allies; and the French embarked from Leith. On the 6th of July 1560 a treaty was at last made, nominally between Elizabeth and the queen of France and Scotland; while Cecil instructed his mistress’s plenipotentiaries to agree “that the government of Scotland be granted to the nation of the land.” The revolution was in the meantime complete; and Knox, who takes credit for having done much to end the enmity with England which was so long thought necessary for Scotland’s independence, was strangely enough destined, beyond all other men, to leave the stamp of a more inward independence upon his country and its history.

At the first meeting of the Estates, in August 1560, the Protestants were invited to present a confession of their faith. Knox and three others drafted it, and were present when it was offered and read to the parliament. The statute-book says it was “by the estates of Scotland ratified and approved, as wholesome and sound doctrine grounded upon the infallible truth of God’s word.” The Scots confession, though of course drawn up independently, is in substantial accord with the others then springing up in the countries of the Reformation, but is Calvinist rather than Lutheran. It remained for two centuries the authorized Scottish creed, though in the first instance the faith of only a fragment of the people. Yet its approval became the basis for three acts passed a week later; the first of which, abolishing the pope’s authority and jurisdiction in Scotland, may perhaps have been consistent with toleration, as the second, rescinding old statutes which had established and enforced that and other catholic tenets, undoubtedly was. But the third, inflicting heavy penalties, with death on a third conviction, on those who should celebrate mass or even be present at it, showed that the reformer and his friends had crossed the line, and that their position could no longer be described as, in Knox’s words, “requiring nothing but the liberty of conscience, and our religion and fact to be tried by the word of God.” He was prepared indeed to fall back upon that, in the event of the Estates at any time refusing sanction to either church or creed, as their sovereign in Paris promptly refused it. But the parliament of 1560 gave no express sanction to the Reformed Church, and Knox did not wait until it should do so. Already “in our towns and places reformed,” as the Confession puts it, there were local or “particular kirks,” and these grew and spread and were provincially united, till, in the last month of this memorable year, the first General Assembly of their representatives met, and became the “universal kirk,” or “the whole church convened.” It had before it the plan for church government and maintenance, drafted in August at the same time with the Confession, under the name of *The Book of Discipline*, and by the same framers. Knox was even more clearly in this case the chief author, and he had by this time come to desire a much more rigid Presbyterianism than he had sketched in his “Wholesome Counsel” of 1555. In planning it he seems to have used his acquaintance with the “Ordonnances” of the Genevan Church under Calvin, and with the “Forma” of the German Church in London under John Laski (or A. Lasco). Starting with “truth” contained in Scripture as the church’s foundation, and the Word and Sacraments as means of building it up, it provides ministers and elders to be elected by the congregations, with a subordinate class of “readers,” and by their means sermons and prayers each “Sunday” in every parish. In large towns these were to be also on other days, with a weekly meeting for conference or “prophesying.” The “plantation” of new churches is to go on everywhere under the guidance of higher church officers called superintendents. All are to help their brethren, “for no man may be permitted to live as best pleaseth him within the Church of God.” And above all things the young and the ignorant are to be instructed, the former by a regular gradation or ladder of parish or elementary schools, secondary schools and universities. Even the poor were to be fed by the Church’s hands; and behind its moral influence, and a discipline over both poor and rich, was to be not only the coercive authority of the civil power but its money. Knox had from the first proclaimed that "the *teinds* (tithes of yearly fruits) by God's law do not appertain of necessity to the kirkmen." And this book now demands that out of them "must not only the ministers be sustained, but also the poor and schools." But Knox broadens his plan so as to claim also the property which had been really gifted to the Church by princes and nobles—given by them indeed, as he held, without any moral right and to the injury of the people, yet so as to be Church patrimony. From all such property, whether land or the sheaves and fruits of land, and also from the personal property of burghers in the towns, Knox now held that the state should authorize the kirk to claim the salaries of the ministers, and the salaries of teachers in the schools and universities, but above all, the relief of the poor—not only of the absolutely "indigent" but of "your poor brethren, the labourers and handworkers of the ground." For the danger now was that some gentlemen were already cruel in exactions of their tenants, "requiring of them whatever before they paid to the Church, so that the papistical tyranny shall only be changed into the tyranny of the lords or of the laird." The danger foreseen alike to the new Church, and to the commonalty and poor, began to be fulfilled a month later, when the lords, some of whom had already acquired, as others were about to acquire, much of the Church property, declined to make any of it over for Knox's magnificent scheme. It was, they said, "a devout imagination." Seven years afterwards, however, when the contest with the Crown was ended, the kirk was expressly acknowledged as the only Church in Scotland, and jurisdiction given it over all who should attempt to be outsiders; while the preaching of the Evangel and the planting of congregations went on in all the accessible parts of Scotland. Gradually too stipends for most Scottish parishes were assigned to the ministers out of the yearly *teinds*; and the Church received—what it retained even down to recent times—the administration both of the public schools and of the Poor Law of Scotland. But the victorious rush of 1560 was already somewhat stayed, and the very next year raised the question whether the transfer of intolerance to the side of the new faith was as wise as it had at first seemed to be successful.

Mary Queen of Scots had been for a short time also queen of France, and in 1561 returned to her native land, a young widow on whom the eyes of Europe were fixed. Knox's objections to the "regiment of women" were theoretical, and in the present case he hoped at first for the best, favouring rather his queen's marriage with the heir of the house of Hamilton. Mary had put herself into the hands of her half-brother, Lord James Stuart afterwards earl of Moray, the only man who could perhaps have pulled her through. A proclamation now continued the "state of religion" begun the previous year; but mass was celebrated in the queen's household, and Lord James himself defended it with his sword against Protestant intrusion. Knox publicly protested; and Moray, who probably understood and liked both parties, brought the preacher to the presence of his queen. There is nothing revealed to us by "the broad clear light of that wonderful book,"[1] *The History of the Reformation in Scotland*, more remarkable than the four Dialogues or interviews, which, though recorded only by Knox, bear the strongest stamp of truth, and do almost more justice to his opponent than to himself. Mary took the aggressive and very soon raised the real question. "Ye have taught the people to receive another religion than their princes can allow; and how can that doctrine be of God, seeing that God commands subjects to obey their princes?" The point was made keener by the fact that Knox's own Confession of Faith (like all those of that age, in which an unbalanced monarchical power culminated) had held kings to be appointed "for maintenance of the true religion," and suppression of the false; and the reformer now fell back on his more fundamental principle, that "right religion took neither original nor authority from worldly princes, but from the Eternal God alone." All through this dialogue too, as in another at Lochleven two years afterwards, Knox was driven to axioms, not of religion but of constitutionalism, which Buchanan and he may have learned from their teacher Major, but which were not to be accepted till a later age. "'Think ye,' quoth she, 'that subjects, having power, may resist their princes?' 'If their princes exceed their bounds, Madam, they may be resisted and even deposed,'" Knox replied. But these dialectics, creditable to both parties, had little effect upon the general situation. Knox had gone too far in intolerance, and Moray and Maitland of Lethington gradually withdrew their support. The court and parliament, guided by them, declined to press the queen or to pass the Book of Discipline; and meantime the negotiations as to the queen's marriage with a Spanish, a French or an Austrian prince revealed the real difficulty and peril of the situation. Her marriage to a great Catholic prince would be ruinous to Scotland, probably also to England, and perhaps to all Protestantism. Knox had already by letter formally broken with the earl of Moray, "committing you to your own wit, and to the conducting of those who better please you"; and now, in one of his greatest sermons before the assembled lords, he drove at the heart of the situation—the risk of a Catholic marriage. The queen sent for him for the last time and burst into passionate tears as she asked, "What have you to do with my marriage? Or what are you within this commonwealth?" "A subject born within the same," was the answer of the son of the East Lothian peasant; and the Scottish nobility, while thinking him overbold, refused to find him guilty of any crime, even when, later on, he had "convocated the lieges" to Edinburgh to meet a crown prosecution. In 1564 a change came. Mary had wearied of her guiding statesmen, Moray and the more pliant Maitland; the Italian secretary David Rizzio, through whom she had corresponded with the pope, now more and more usurped their place; and a weak fancy for her handsome cousin, Henry Darnley, brought about a sudden marriage in 1565 and swept the opposing Protestant lords into exile. Darnley, though a Catholic, thought it well to go to Knox's preaching; but was so unfortunate as to hear a very long sermon, with allusions not only to "babes and women" as rulers, but to Ahab who did not control his strong-minded wife. Mary and the lords still in her council ordered Knox not to preach while she was in Edinburgh, and he was absent or silent during the weeks in which the queen's growing distaste for her husband, and advancement of Rizzio over the nobility remaining in Edinburgh, brought about the conspiracy by Darnley, Morton and Ruthven. Knox does not seem to have known beforehand of Rizzio's "slaughter," which had been intended to be a semi-judicial act; but soon after it he records that "that vile knave Davie was justly punished, for abusing of the commonwealth, and for other villainy which we list not to express." The immediate effect however of what Knox thus approved was to bring his cause to its lowest ebb, and on the very day when Mary rode from Holyrood to her army, he sat down and penned the prayer, "Lord Jesus, put an end to this my miserable life, for justice and truth are not to be found among the sons of men!" He added a short autobiographic fragment, whose mingled self-abasement and exultation are not unworthy of its striking title—"John Knox, with deliberate mind, to his God." During the rest of the year he was hidden in Ayrshire or elsewhere, and throughout 1566 he was forbidden to preach when the court was in Edinburgh. But he was influential at the December Assembly in the capital where a greater tragedy was now preparing, for Mary's infatuation for Bothwell was visible to all. At the Assembly's request, however, Knox undertook a long visit to England, where his two sons by his first wife were being educated, and were afterwards to be Fellows of St John's, Cambridge, the younger becoming a parish clergyman. It was thus during the reformer's absence that the murder of Darnley, the abduction and subsequent marriage of Mary, the flight of Bothwell, and the imprisonment in Lochleven of the queen, unrolled themselves before the eyes of Scotland. Knox returned in time to guide the Assembly which sat on the 25th of June 1567 in dealing with this unparalleled crisis, and to wind up the revolution by preaching at Stirling on the 9th of July 1567, after Mary's abdication, at the coronation of the infant king.

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[1] John Hill Burton (*Hist. of Scotland*, iii. 339). Mr Burton's view (differing from that of Professor Hume Brown) was that the dialogues—the earlier of them at least—must have been spoken in the French tongue, in which Knox had recently preached for a year.

His main work was now really done; for the parliament of 1567 made Moray regent, and Knox was only too glad to have his old friend back in power, though they seem to have differed on the question whether the queen should be allowed to pass into retirement without trial for her husband's death, as they had differed all along on the question of tolerating her private religion. Knox's victory had not come too early, for his physical strength soon began to fail. But Mary's escape in 1568 resulted only in her defeat at Langside, and in a long imprisonment and death in England. In Scotland the regent's assassination in 1570 opened a miserable civil war, but it made no permanent change. The massacre of St Bartholomew rather united English and Scottish Protestantism; and Knox in St Giles' pulpit, challenging the French ambassador to report his words, denounced God's vengeance on the crowned murderer and his posterity. When open war broke out between Edinburgh Castle, held by Mary's friends, and the town, held for her son, both parties agreed that the reformer, who had already had a stroke of paralysis, should remove to St Andrews. While there he wrote his will, and published his last book, in the preface to which he says, "I heartily take my good-night of the faithful of both realms . . . for as the world is weary of me, so am I of it." And when he now merely signs his name, it is "John Knox, with my dead hand and glad heart." In the autumn of 1572 he returned to Edinburgh to die, probably in the picturesque house in the "throat of the Bow," which for generations has been called by his name. With him were his wife and three young daughters; for though he had lost Margaret Bowes at the close of his year of triumph 1560, he had four years after married Margaret Stewart, a daughter of his friend Lord Ochiltree. She was a bride of only seventeen and was related to the royal house; yet, as his Catholic biographer put it, "by sorcery and witchcraft he did so allure that poor gentlewoman that she could not live without him." But lords, ladies and burghers also crowded around his bed, and his colleague and his servant have severally transmitted to us the words in which his weakness daily strove with pain, rising on the day before his death into a solemn exultation—yet characteristically, not so much on his own account as for "the troubled Church of God." He died on the 24th of November 1572, and at his funeral in St Giles' Churchyard the new Regent Morton, speaking under the hostile guns of the castle, expressed the first surprise of those around as they looked back on that stormy life, that one who had "neither flattered nor feared any flesh" had now "ended his days in peace and honour." Knox himself had a short time before put in writing a larger claim for the historic future, "What I have been to my country, though this unthankful age will not know, yet the ages to come will be compelled to bear witness to the truth."

Knox was a rather small man, with a well-knit body; he had a powerful face, with dark blue eyes under a ridge of eyebrow, high cheek-bones, and a long black beard which latterly turned grey. This description, taken from a letter in 1579 by his junior contemporary Sir Peter Young, is very like Beza's fine engraving of him in the *Icones*—an engraving probably founded on a portrait which was to be sent by Young to Beza along with the letter. The portrait, which was unfortunately adopted by Carlyle, has neither pedigree nor probability. After his two years in the French galleys, if not before, Knox suffered permanently from gravel and dyspepsia, and he confesses that his nature "was for the most part oppressed with melancholy." Yet he was always a hard worker; as sole minister of Edinburgh studying for two sermons on Sunday and three during the week, besides having innumerable cares of churches at home and abroad. He was undoubtedly sincere in his religious faith, and most disinterested in his devotion to it and to the good of his countrymen. But like too many of them, he was self-conscious, self-willed and dogmatic; and his transformation in middle life, while it immensely enriched his sympathies as well as his energies, left him unable to put himself in the place of those who retained the views which he had himself held. All his training too, university, priestly and in foreign parts, tended to make him logical overmuch. But this was mitigated by a strong sense of humour (not always sarcastic, though sometimes savagely so), and by tenderness, best seen in his epistolary friendships with women; and it was quite overborne by an instinct and passion for great practical affairs. Hence it was that Knox as a statesman so often struck successfully at the centre of the complex motives of his time, leaving it to later critics to reconcile his theories of action. But hence too he more than once took doubtful short-cuts to some of his most important ends; giving the ministry within the new Church more power over laymen than Protestant principles would suggest, and binding the masses outside who were not members of it, equally with their countrymen who were, to join in its worship, submit to its jurisdiction, and contribute to its support. And hence also his style (which contemporaries called anglicized and modern), though it occasionally rises into liturgical beauty, and often flashes into vivid historical portraiture, is generally kept close to the harsh necessities of the few years in which he had to work for the future. That work was indeed chiefly done by the living voice; and in speaking, this "one man," as Elizabeth's very critical ambassador wrote from Edinburgh, was "able in one hour to put more life in us than five hundred trumpets continually blustering in our ears." But even his eloquence was constraining and constructive—a personal call for immediate and universal co-operation; and that personal influence survives to this day in the institutions of his people, and perhaps still more in their character. His countrymen indeed have always believed that to Knox more than to any other man Scotland owes her political and religious individuality. And since his 19th century biography by Dr Thomas McCrie, or at least since his recognition in the following generation by Thomas Carlyle, the same view has taken its place in literature.

BIBLIOGRAPHY.—Knox's books, pamphlets, public documents and letters are collected into the great edition in six volumes of *Knox's Works*, by David Laing (Edinburgh, 1846–1864), with introductions, appendices and notes. Of his books the chief are the following: 1.—*The History of the Reformation in Scotland*, incorporating the Confession and the Book of Discipline. Begun by Knox as a party manifesto in 1560, it was continued and revised by himself in 1566 as so to form four books, with a fifth book apparently written after his death from materials left by him. It was partly printed in London in 1586 by Vautrollier, but was suppressed by authority and published by David Buchanan, with a *Life*, in 1664. 2.—*On Predestination: an Answer to an Anabaptist* (London, 1591). 3.—*On Prayer* (1554). 4.—*On Affliction* (1556). 5.—*Epistles*, and *Admonition*, both to English Brethren in 1554. 6.—*The First Blast of the Trumpet against the Monstrous Regiment of Women* (1558). 7.—*An Answer to a Scottish Jesuit* (1572).

Knox's life is more or less touched upon by all the Scottish histories and Church histories which include his period, as well as in the mass of literature as to Queen Mary. Dr Laing's edition of the *Works* contains important biographical material. But among the many express biographies two especially should be consulted—those by Thomas McCrie (Edinburgh, 1811; revised and enlarged in 1813, the later editions containing valuable notes by the author); and by P. Hume Brown (Edinburgh, 1895). *John Knox and the Reformation*, by Andrew Lang (London, 1905), is not so much a biography as a collection of materials, bearing upon many parts of the life, but nearly all on the unfavourable side. (A. T. I.)

KNOX, PHILANDER CHASE (1853–), American lawyer and political leader, was born in Brownsville, Pennsylvania, on the 4th of May 1853. He graduated from Mount Union College (Ohio) in 1872, and was admitted to the Pennsylvania bar in 1875. He settled in Pittsburg, where he continued in private practice, with the exception of two years' service (1876–1877) as assistant United States district attorney, acquiring a large practice as a corporation lawyer. In April 1901 he became attorney-general of the United States in the cabinet of President McKinley, and retained this position after the accession of President Roosevelt until June 1904, when he was appointed by Governor Pennypacker of Pennsylvania to fill the unexpired term of Matthew S. Quay in the United States Senate; in 1905 he was re-elected to the Senate for the full term. In March 1909 he became secretary of state in the cabinet of President Taft.

KNOXVILLE, a city and the county-seat of Knox county, Tennessee, U.S.A., in the E. part of the state, 160 m. E. of Nashville, and about 190 m. S.E. of Louisville, Kentucky, on the right bank of the Tennessee river, 4 m. below the point where it is formed by the junction of the French Broad and Holston Rivers. Pop. (1880), 9693; (1890), 22,535; (1900), 32,637, of whom 7359 were negroes and 895 were foreign-born; (1910 census), 36,346. It is served by the main line and by branches of the Louisville & Nashville and the Southern railways, by the Knoxville & Bristol railway (Morristown to Knoxville, 58 m.), by the short Knoxville & Augusta railroad (Knoxville to Walland, 26 m.), and by passenger and freight steamboat lines on the Tennessee river, which is here navigable for the greater part of the year. A steel and concrete street-car bridge crosses the Tennessee at Knoxville. Knoxville is picturesquely situated at an elevation of from 850 to 1000 ft. in the valley between the Smoky Mountains and the Cumberland Mountains, and is one of the healthiest cities in the United States. There are several beautiful parks, of which Chilhowie and Fountain City are the largest, and among the public buildings are a city-hall, Federal building, court-house, the Knoxville general hospital, the Lincoln memorial hospital, the Margaret McClung industrial home, a Young Men's Christian Association building and the Lawson-McGhee public library. A monument to John Sevier stands on the site of the blockhouse first built there. Knoxville is the seat of Knoxville College (United Presbyterian, 1875) for negroes, East Tennessee institute, a secondary school for girls, the Baker-Himel school for boys, Tennessee Medical College (1889), two commercial schools and the university of Tennessee. The last, a state co-educational institution, was chartered as Blount College in 1794 and as East Tennessee College in 1807, but not opened until 1820—the present name was adopted in 1879. It had in 1907–1908 106 instructors, 755 students (536 in academic departments), and a library of 25,000 volumes With the university is combined the state college of agriculture and engineering; and a large summer school for teachers is maintained. At Knoxville are the Eastern State insane asylum, state asylums for the deaf and dumb (for both white and negro), and a national cemetery in which more than 3200 soldiers are buried. Knoxville is an important commercial and industrial centre and does a large jobbing business. It is near hardwood forests and is an important market for hardwood mantels. Coal-mines in the vicinity produce more than 2,000,000 tons annually, and neighbouring quarries furnish the famous Tennessee marble, which is largely exported. Excellent building and pottery clays are found near Knoxville. Among the city's industrial establishments are flour and grist mills, cotton and woollen mills, furniture, desk, office supplies and sash, door, and blind factories, meat-packing establishments, clothing factories, iron, steel and boiler works, foundries and machine shops, stove works and brick and cement works. The value of the factory product increased from $6,201,840 in 1900 to $12,432,880 in 1905, or 100·5 %, in 1905 the value of the flour and grist mill products alone being $2,048,509. Just outside the city the Southern railway maintains large car and repair shops. Knoxville was settled in 1786 by James White (1737–1815), a North Carolina pioneer, and was first known as "White's Fort"; it was laid out as a town in 1791, and named in honour of General Henry Knox, then secretary of war in Washington's cabinet. In 1791 the *Knoxville Gazette*, the first newspaper in Tennessee (the early issue, printed at Rogersville) began publication. From 1792 to 1796 Knoxville was the capital of the "Territory South of the Ohio," and until 1811 and again in 1817 it was the capital of the state. In 1796 the convention which framed the constitution of the new state of Tennessee met here, and here later in the same year the first state legislature was convened. Knoxville was chartered as a city in 1815. In its early years it was several times attacked by the Indians, but was never captured. During the Civil War there was considerable Union sentiment in East Tennessee, and in the summer of 1863 the Federal authorities determined to take possession of Knoxville as well as Chattanooga and to interrupt railway communications between the Confederates of the East and West through this region. As the Confederates had erected only slight defences for the protection of the city, Burnside, with about 12,000 men, easily gained possession on the 2nd of September 1863. Fortifications were immediately begun for its defence, and on the 4th of November, Bragg, thinking his position at Chattanooga impregnable against Grant, Sherman, Thomas and Hooker, despatched a force of 20,000 men under Longstreet to engage Burnside. Longstreet arrived in the vicinity on the 16th of November, and on the following day began a siege, which was continued with numerous assaults until the 28th, when a desperate but unsuccessful attack was made on Fort Sanders, and upon the approach of a relief force under Sherman, Longstreet withdrew on the night of the 4th of December. The Confederate losses during the siege were 182 killed, 768 wounded and 192 captured or missing; the Union losses were 92 killed, 394 wounded and 207 captured or missing. West Knoxville (incorporated in 1888) and North Knoxville (incorporated in 1889) were annexed to Knoxville in 1898.

See the sketch by Joshua W. Caldwell in *Historic Towns of the Southern States*, edited by L. P. Powell (New York, 1900); and W. Rule, G. F. Mellen and J. Wooldridge, *Standard History of Knoxville* (Chicago, 1900).

KNUCKLE (apparently the diminutive of a word for "bone," found in Ger. *Knochen*), the joint of a finger, which, when the hand is shut, is brought into prominence. In mechanical use the word is applied to the round projecting part of a hinge through which the pin is run, and in ship-building to an acute angle on some of the timbers. A "knuckle-duster," said to have originally come from the criminal slang of the United States, is a brass or metal instrument fitting on to the hand across the knuckles, with projecting studs and used for inflicting a brutal blow.

KNUCKLEBONES (Hucklebones, Dibs, Jackstones, Chuckstones, Five-stones), a game of very ancient origin, played with five small objects, originally the knucklebones of a sheep, which are thrown up and caught in various ways. Modern "knucklebones" consist of six points, or knobs, proceeding from a common base, and are usually of metal. The winner is he who first completes successfully a prescribed series of throws, which, while of the same general character, differ widely in detail. The simplest consists in tossing up one stone, the *jack*, and picking up one or more from the table while it is in the air; and so on until all five stones have been picked up. Another consists in tossing up first one stone, then two, then three and so on, and catching them on the back of the hand. Different throws have received distinctive names, such as "riding the elephant," "peas in the pod," and "horses in the stable."

The origin of knucklebones is closely connected with that of dice, of which it is probably a primitive form, and is doubtless Asiatic. Sophocles, in a fragment, ascribed the invention of draughts and knucklebones (*astragaloi*) to Palamedes, who taught them to his Greek countrymen during the Trojan War. Both the *Iliad* and the *Odyssey* contain allusions to games similar in character to knucklebones, and the Palamedes tradition, as flattering to the national pride, was generally accepted throughout Greece, as is indicated by numerous literary and plastic evidences. Thus Pausanias (*Corinth* xx.) mentions a temple of Fortune in which Palamedes made an offering of his newly invented game. According to a still more ancient tradition, Zeus, perceiving that Ganymede longed for his playmates upon Mount Ida, gave him Eros for a companion and golden dibs with which to play, and even condescended sometimes to join in the game (Apollonius). It is significant, however, that both Herodotus and Plato ascribe to the game a foreign origin. Plato (*Phaedrus*) names the Egyptian god Theuth as its inventor, while Herodotus relates that the Lydians, during a period of famine in the days of King Atys, originated this game and indeed almost all other games except chess. There were two methods of playing in ancient times. The first, and probably the primitive method, consisted in tossing up and catching the bones on the back of the hand, very much as the game is played to-day. In the Museum of Naples may be seen a painting excavated at Pompeii, which represents the goddesses Latona, Niobe, Phoebe, Aglaia and Hileaera, the last two being engaged in playing at Knucklebones (see GREEK ART, fig. 42). According to an epigram of Asclepiodotus, astragals were given as prizes to school-children, and we are reminded of Plutarch's anecdote of the youthful Alcibiades, who, when a teamster threatened to drive over some of his knucklebones that had fallen into the wagon-ruts, boldly threw himself in front of the advancing team. This simple form of the game was generally played only by women and children, and was called *pentalitha* or five-stones. There were several varieties of it besides the usual toss and catch, one being called *tropa*, or hole-game, the object having been to toss the bones into a hole in the earth. Another was the simple and primitive game of "odd or even."

The second, probably derivative, form of the game was one of pure chance, the stones being thrown upon a table, either with the hand or from a cup, and the values of the sides upon which they fell counted. In this game the shape of the pastern-bones used for astralagoi, as well as for the *tali* of the Romans, with whom knucklebones was also popular, determined the manner of counting. The pastern-bone of a sheep, goat or calf has, besides two rounded ends upon which it cannot stand, two broad and two narrow sides, one of each pair being concave and one convex. The convex narrow side, called *chios* or "the dog" counted 1; the convex broad side 3; the concave broad side 4; and the concave narrow side 6. Four astragals were used and 35 different scores were possible at a single throw, many receiving distinctive names such as Aphrodite, Midas, Solon, Alexander, and, among the Romans, Venus, King, Vulture, &c. The highest throw in Greece, counting 40, was the Euripides, and was probably a combination throw, since more than four sixes could not be thrown at one time. The lowest throw, both in Greece and Rome, was the Dog.

See *Cassell's Book of Sports and Pastimes* (London, 1896); *Games and Songs of American Children*, by W. W. Newell (1893); and *The Young Folks' Cyclopaedia of Games and Sports* (New York, 1899), for the modern children's game. For the history see *Les Jeux des Anciens*, by L. Becq de Fouquières (Paris, 1869); *Das Knochelspiel der Alten*, by Bolle (Wismar, 1886); *Die Spiele der Griechen und Römer*, by W. Richter (Leipzig, 1887).

KNUTSFORD, a market town in the Knutsford parliamentary division of Cheshire, England; on the London & North Western and Great Central railways, 24 m. E.N.E. of Chester, on the Chesire Lines and London & North-Western railway. Pop. of urban district (1901), 5172. It is pleasantly situated on an elevated ridge, with the fine domains of Tatton Park and Tabley respectively north and west of it. The meres in these domains are especially picturesque. Knutsford is noted in modern times as the scene of Mrs Gaskell's novel *Cranford*. Among several ancient houses the most interesting are a cottage with the date 1411 carved on its woodwork, and the Rose and Crown tavern, dated 1641. A number of curious old customs linger in the town, such as the practice of working designs in coloured sand, when a wedding takes place, before the bride's house. In what is probably the oldest Unitarian graveyard in the kingdom Mrs Gaskell lies buried; and in a churchyard a mile from the town stood the ancient church, which, though partially rebuilt in the time of Henry VIII., fell into ruin in 1741. The church of St John, built in 1744, and enlarged in 1879, was supplemented, in 1880, by St Cross Church, in Perpendicular style. The town has a grammar school, founded before the reign of Henry VIII., but reorganized in 1885. Lord Egerton built the Egerton schools in 1893. The industries comprise cotton, worsted and leather manufactures; but Knutsford is mainly a residential town, as many Manchester merchants have settled here, attracted by the fine climate and surroundings. Knutsford was the birthplace of Sir Henry Holland, Physician Extraordinary to Queen Victoria (1788–1873); and his son, the second Sir Henry, who was secretary of state for the colonies (1887–1892), was raised to the peerage in 1888 with the title of Baron Knutsford.

The name Knutsford (*Cunetesford*, *Knotesford*) is said to signify Cnut's ford, but there is no evidence of a settlement here previous to Domesday. In 1086 Erthebrand held Knutsford immediately of William FitzNigel, baron of Halton, who was himself a mesne lord of Hugh Lupus earl of Chester. In 1292 William de Tabley, lord of both Over and Nether Knutsford, granted free burgage to his burgesses in both Knutsfords. This charter is the only one which gives Knutsford a claim to the title of borough. It provided that the burgesses might elect a bailiff from amongst themselves every year. The office however carried little real power with it, and soon lapsed. In the same year as the charter to Knutsford the king granted to William de Tabley a market every Saturday at Nether Knutsford, and a three days' fair at the Feast of St Peter and St Paul. When this charter was confirmed by Edward III. another market (Friday) and another three days' fair (Feast of St Simon and St Jude) were added. The Friday market was certainly dropped by 1592, if it was ever held. May-day revels are still kept up here and attract large crowds from the neighbourhood. A silk mill was erected here in 1770, and there was also an attempt to foster the cotton trade, but the lack of means of communication made the undertaking impossible.

See Henry Green, *History of Knutsford* (1859).

KOALA (*Phascolarctus cinereus*), a stoutly built marsupial, of the family *Phascolmyidae*, which also contains the wombats. This animal, which inhabits the south-eastern parts of the Australian continent, is about 2 ft. in length, and of an ash-grey colour, an excellent climber, residing generally in lofty eucalyptus trees, the buds and tender shoots of which form its principal food, though occasionally it descends to the ground in the night in search of roots. From its shape the koala is called by the colonists the "native bear"; the term "native sloth" being also applied to it, from its arboreal habits and slow deliberate movements. The flesh is highly prized by the natives, and is palatable to Europeans. The skins are largely imported into England, for the manufacture of articles in which a cheap and durable fur is required.

KOBDO, a town of the Chinese Empire, in north-west Mongolia, at the northern foot of the Mongolian Altai, on the right bank of the Buyantu River, 13 m. from its entrance into Lake Khara-usu; 500 m. E.S.E. of Biysk (Russian), and 470 m. W. of Ulyasutai. It is situated amidst a dreary plain, and consists of a fortress, the residence of the governor of the Kobdo district, and a small trading town, chiefly peopled by Chinese and a few Mongols. It is, however, an important centre for trade between the cattle-breeding nomads and Peking. It was founded by the Chinese in 1731, and pillaged by the Mussulmans in 1872. The district of KOBDO occupies the north-western corner of Mongolia, and is peopled chiefly by Mongols, and also by Kirghiz and a few Soyotes, Uryankhes and Khotons. It is governed by a Chinese commissioner, who has under him a special Mongol functionary (Mongol, *dzurgan*). The chief monastery is at Ulangom. Considerable numbers of sheep (about 1,000,000), sheepskins, sheep and camel wool are exported to China, while Chinese cottons, brick tea and various small goods are imported. Leather, velveteen, cotton, iron and copper goods boxes, &c., are imported from Russia in exchange for cattle, furs and wool. The absence of a cart road to Biysk hinders the development of this trade.

KOBELL, WOLFGANG XAVER FRANZ, BARON VON (1803–1882), German mineralogist, was born at Munich on the 19th of July 1803. He studied chemistry and mineralogy at Landshut (1820–1823), and in 1826 became professor of mineralogy in the university of Munich. He introduced some new methods of mineral analyses, and in 1855 invented the stauroscope for the study of the optical properties of crystals. He contributed numerous papers to scientific journals, and described many new minerals. He died at Munich on the 11th of November, 1882.

PUBLICATIONS.—*Charakteristik der Mineralien* (2 vols. 1830–1831); *Tafeln zur Bestimmung der Mineralien* &c. (1833; and later editions, ed. 12, by K. Oebbeke, 1884); *Grundzüge der Mineralogie* (1838); *Geschichte der Mineralogie von 1650–1860* (1864).

KOCH, ROBERT (1843–1910), German bacteriologist, was born at Klausthal, Hanover, on the 11th of December 1843. He studied medicine at Göttingen, and it was while he was practising as a physician at Wollstein that he began those bacteriological researches that made his name famous. In 1876 he obtained a pure culture of the bacillus of anthrax, announcing a method of preventive inoculation against that disease seven years later. He became a member of the Sanitary Commission at Berlin and a professor at the School of Medicine in 1880, and five years later he was appointed to a chair in Berlin University and director of the Institute of Health. In 1882, largely as the result of the improved methods of bacteriological investigation he was able to elaborate, he discovered the bacillus of tuberculosis; and in the following year, having been sent on an official mission to Egypt and India to study the aetiology of Asiatic cholera, he identified the comma bacillus as the specific organism of that malady. In 1890 great hopes were aroused by the announcement that in tuberculin he had prepared an agent which exercised an inimical influence on the growth of the tubercle bacillus, but the expectations that were formed of it as a remedy for consumption were not fulfilled, though it came into considerable vogue as a means of diagnosing the existence of tuberculosis in animals intended for food. At the Congress on Tuberculosis held in London in 1901 he maintained that tuberculosis in man and in cattle is not the same disease, the practical inference being that the danger to men of infection from milk and meat is less than from other human subjects suffering from the disease. This statement, however, was not regarded as properly proved, and one of its results was the appointment of a British Royal Commission to study the question. Dr Koch also investigated the nature of rinderpest in South Africa in 1896, and found means of combating the disease. In 1897 he went to Bombay at the head of a commission formed to investigate the bubonic plague, and he subsequently undertook extensive travels in pursuit of his studies on the origin and treatment of malaria. He was summoned to South Africa a second time in 1903 to give expert advice on other cattle diseases, and on his return was elected a member of the Berlin Academy of Sciences. In 1906–1907 he spent eighteen months in East Africa, investigating sleeping-sickness. He died at Baden-Baden of heart-disease on the 28th of May 1910. Koch was undoubtedly one of the greatest bacteriologists ever known, and a great benefactor of humanity by his discoveries. Honours were showered upon him, and in 1905 he was awarded the Nobel prize for medicine.

Among his works may be mentioned: *Weitere Mitteilungen über ein Heilmittel gegen Tuberkulose* (Leipzig, 1891); and *Reiseberichte über Rinderpest, Bubonenpest in Indien und Afrika, Tsetse- oder Surra-Krankheit, Texasfieber, tropische Malaria, Schwarzwasserfieber* (Berlin, 1898). From 1886 onwards he edited, with Dr Karl Flugge, the *Zeitschrift für Hygiene und Infektionskrankheiten* (published at Leipzig). See Loeffler, "Robert Koch, zum 60ten Geburtstage" in *Deut. Medizin. Wochenschr.* (No. 50, 1903).

KOCH, a tribe of north-eastern India, which has given its name to the state of Kuch Behar (*q.v.*). They are probably of Mongolian stock, akin to the Mech, Kachari, Garo and Tippera tribes, and originally spoke, like these, a language of the Bodo group. But since one of their chiefs established a powerful kingdom at Kuch Behar in the 16th century they have gradually become Hinduized, and now adopt the name of Rajbansi (= "of royal blood"). In 1901 the number in Eastern Bengal and Assam was returned at nearly 2½ millions.

KOCK, CHARLES PAUL DE (1793–1871), French novelist, was born at Passy on the 21st of May 1793. He was a posthumous child, his father, a banker of Dutch extraction, having been a victim of the Terror. Paul de Kock began life as a banker's clerk. For the most part he resided on the Boulevard St Martin, and was one of the most inveterate of Parisians. He died in Paris on the 27th of April 1871. He began to write for the stage very early, and composed many operatic libretti. His first novel, *L'Enfant de ma femme* (1811), was published at his own expense. In 1820 he began his long and successful series of novels dealing with Parisian life with *Georgette, ou la mère du Tabellion*. His period of greatest and most successful activity was the Restoration and the early days of Louis Philippe. He was relatively less popular in France itself than abroad, where he was considered as the special painter of life in Paris. Major Pendennis's remark that he had read nothing of the novel kind for thirty years except Paul de Kock, "who certainly made him laugh," is likely to remain one of the most durable of his testimonials, and may be classed with the legendary question of a foreign sovereign to a Frenchman who was paying his respects, "Vous venez de Paris et vous devez savoir des nouvelles. Comment se porte Paul de Kock?" The disappearance of the *grisette* and of the cheap dissipation described by Henri Murger practically made Paul de Kock obsolete. But to the student of manners his portraiture of low and middle class life in the first half of the 19th century at Paris still has its value.

The works of Paul de Kock are very numerous. With the exception of a few not very felicitous excursions into historical romance and some miscellaneous works of which his share in *La Grande ville, Paris* (1842), is the chief, they are all stories of middle-class Parisian life, of *guinguettes* and *cabarets* and equivocal adventures of one sort or another. The most famous are *André le Savoyard* (1825) and *Le Barbier de Paris* (1826).

His *Mémoires* were published in 1873. See also Th. Trimm, *La Vie de Charles Paul de Kock* (1873).

KODAIKANAL, a sanatorium of southern India, in the Madura district of Madras, situated in the Palni hills, about 7000 ft. above sea-level; pop. (1901), 1912, but the number in the hot season would be much larger. It is difficult of access, being 44 m. from a railway station, and the last 11 m. are impracticable for wheeled vehicles. It contains a government observatory, the appliances of which are specially adapted for the study of terrestrial magnetism, seismology and solar physics.

KODAMA, GENTARO, COUNT (1852–1907), Japanese general, was born in Choshu. He studied military science in Germany, and was appointed vice-minister of war in 1892. He became governor-general of Formosa in 1900, holding at the same time the portfolio of war. When the conflict with Russia became imminent in 1903, he gave up his portfolio to become vice-chief of the general staff, a sacrifice which elicited much public applause. Throughout the Russo-Japanese War (1904–5) he served as chief of staff to Field Marshal Oyama, and it was well understood that his genius guided the strategy of the whole campaign, as that of General Kawakami had done in the war with China ten years previously. General Kodama was raised in rapid succession to the ranks of baron, viscount and count, and his death in 1907 was regarded as a national calamity.

KODUNGALUR (or CRANGANUR), a town of southern India, in Cochin state, within the presidency of Madras. Though now a place of little importance, its historical interest is considerable. Tradition assigns to it the double honour of having been the first field of St Thomas's labours (A.D. 52) in India and the seat of Cheraman Perumal's government. The visit of St Thomas is generally considered mythical; but it is certain that the Syrian Church was firmly established here before the 9th century (Burnell), and probably the Jews' settlement was still earlier. The latter, in fact, claim to hold grants dated A.D. 378. The cruelty of the Portuguese drove most of the Jews to Cochin. Up to 1314, when the Vypin harbour was formed, the only opening in the Cochin backwater, and outlet for the Periyar, was at Kodungalur, which must then have been the best harbour on the coast. In 1502 the Syrian Christians invoked the protection of the Portuguese. In 1523 the latter built their first fort there, and in 1565 enlarged it. In 1661 the Dutch took the fort, the possession of which for the next forty years was contested between this nation, the zamorin, and the raja of Kodungalur. In 1776 Tippoo seized the stronghold. The Dutch recaptured it two years later, and, having ceded it to Tippoo in 1784, sold it to the Travancore raja, and again in 1789 to Tippoo, who destroyed it in the following year. The country round Kodungalur now forms an autonomous principality, tributary to the raja of Cochin.

KOENIG, KARL DIETRICH EBERHARD (1774–1851), German palaeontologist, was born at Brunswick in 1774, and was educated at Göttingen. In 1807 he became assistant keeper, and in 1813 he was appointed keeper, of the department of natural history in the British Museum, and afterwards of geology and mineralogy, retaining the post until the close of his life. He described many fossils in the British Museum in a classic work entitled *Icones fossilium sectiles* (1820–1825). He died in London on the 6th of September 1851.

KOESFELD, a town of Germany, in the Prussian province of Westphalia, on the Berkel, 38 m. by rail N.N.W. of Dortmund. Pop. (1905), 8449. It has three Roman Catholic churches, one of which—the Gymnasial Kirche—is used by the Protestant community. Here are the ruins of the Ludgeri Castle, formerly the residence of the bishops of Münster, and also the castle of Varlar, the residence of the princes of Salm-Horstmar. The leading industries include the making of linen goods and machinery.

KOHAT, a town and district of British India, in the Peshawar division of the North-West Frontier Province. The town is 37 m. south of Peshawar by the Kohat Pass, along which a military road was opened in 1901. The population in 1901 was 30,762, including 12,670 in the cantonment, which is garrisoned by artillery, cavalry and infantry. In the Tirah campaign of 1897–98 Kohat was the starting-point of Sir William Lockhart's expedition against the Orakzais and Afridis. It is the military base for the southern Afridi frontier as Peshawar is for the northern frontier of the same tribe, and it lies in the heart of the Pathan country.

The District of Kohat has an area of 2973 sq. m. It consists chiefly of a bare and intricate mountain region east of the Indus, deeply scored with river valleys and ravines, but enclosing a few scattered patches of cultivated lowland. The eastern or Khattak country especially comprises a perfect labyrinth of ranges, which fall, however, into two principal groups, to the north and south of the Teri Toi river. The Miranzai valley, in the extreme west, appears by comparison a rich and fertile tract. In its small but carefully tilled glens, the plane, palm, fig and many orchard trees flourish luxuriantly; while a brushwood of wild olive, mimosa and other thorny bushes clothes the rugged ravines upon the upper slopes. Occasional grassy glades upon their sides form favourite pasture grounds for the Waziri tribes. The Teri Toi, rising on the eastern limit of Upper Miranzai, runs due eastward to the Indus, which it joins 12 m. N. of Makhad, dividing the district into two main portions. The drainage from the northern half flows southward into the Teri Toi itself, and northward into the parallel stream of the Kohat Toi. That of the southern tract falls northwards also into the Teri Toi, and southwards towards the Kurram and the Indus. The frontier mountains, continuations of the Safed Koh system, attain in places a considerable elevation, the two principal peaks, Dupa Sir and Mazi Garh, just beyond the British frontier, being 8260 and 7940 ft. above the sea respectively. The Waziri hills, on the south, extend like a wedge between the boundaries of Bannu and Kohat, with a general elevation of less than 4000 ft. The salt-mines are situated in the low line of hills crossing the valley of the Teri Toi, and extending along both banks of that river. The deposit has a width of a quarter of a mile, with a thickness of 1000 ft.; it sometimes forms hills 200 ft. in height, almost entirely composed of solid rock-salt, and may probably rank as one of the largest veins of its kind in the world. The most extensive exposure occurs at Bahadur Khel, on the south bank of the Teri Toi. The annual output is about 16,000 tons, yielding a revenue of £40,000. Petroleum springs exude from a rock at Panoba, 23 m. east of Kohat; and sulphur abounds in the northern range. In 1901 the population was 217,865, showing an increase of 11 % in the decade. The frontier tribes on the Kohat border are the Afridis, Orakzais, Zaimukhts and Turis. All these are described under their separate names. A railway runs from Kushalgarh through Kohat to Thal, and the river Indus has been bridged at Kushalgarh.

KOHAT PASS, a mountain pass in the North-West Frontier Province of India, connecting Kohat with Peshawar. From the north side the defile commences at 4½ m. S.W. of Fort Mackeson, whence it is about 12 or 13 m. to the Kohat entrance. The pass varies from 400 yds. to 1¼ m. in width, and its summit is some 600 to 700 ft. above the plain. It is inhabited by the Adam Khel Afridis, and nearly all British relations with that tribe have been concerned with this pass, which is the only connexion between two British districts without crossing and recrossing the Indus (see Afridi). It is now traversed by a cart-road.

KOHISTAN, a tract of country on the Peshawar border of the North-West Frontier Province of India. Kohistan means the "country of the hills" and corresponds to the English word highlands; but it is specially applied to a district, which is very little known, to the south and west of Chilas, between the Kagan valley and the river Indus. It comprises an area of over 1000 sq. m., and is bounded on the N.W. by the river Indus, on the N.E. by Chilas, and on the S. by Kagan, the Chor Glen and Allai. It consists roughly of two main valleys running east and west, and separated from each other by a mountain range over 16,000 ft. high. Like the mountains of Chilas, those in Kohistan are snow-bound and rocky wastes from their crests downwards to 12,000 ft. Below this the hills are covered with fine forest and grass to 5000 or 6000 ft., and in the valleys, especially near the Indus, are fertile basins under cultivation. The Kohistanis are Mahommedans, but not of Pathan race, and appear to be closely allied to the Chilasis. They are a well-built, brave but quiet people who carry on a trade with British districts, and have never given the government much trouble. There is little doubt that the Kohistanis are, like the Kafirs of Kafiristan, the remnants of old races driven by Mahommedan invasions from the valleys and plains into the higher mountains. The majority have been converted to Islam within the last 200 years. The total population is about 16,000.

An important district also known as Kohistan lies to the north of Kabul in Afghanistan, extending to the Hindu Kush. The Kohistani Tajiks proved to be the most powerful and the best organized clans that opposed the British occupation of Kabul in 1879–80. Part of their country is highly cultivated, abounding in fruit, and includes many important villages. It is here that the remains of an ancient city have been lately discovered by the amir's officials, which may prove to be the great city of Alexander's founding, known to be to the north of Kabul, but which had hitherto escaped identification.

The name of Kohistan is also applied to a tract of barren and hilly country on the east border of Karachi district, Sind.

KOHL. (1) The name of the cosmetic used from the earliest times in the East by women to darken the eyelids, in order to increase the lustre of the eyes. It is usually composed of finely powdered antimony, but smoke black obtained from burnt almond-shells or frankincense is also used. The Arabic word *koḥl*, from which has been derived "alcohol," is derived from *kaḥala*, to stain. (2) "Kohl" or "kohl-rabi" (cole-rape, from Lat. *caulis*, cabbage) is a kind of cabbage (*q.v.*), with a turnip-shaped top, cultivated chiefly as food for cattle.

KOHLHASE, HANS, a German historical figure about whose personality some controversy exists. He is chiefly known as the hero of Heinrich von Kleist's novel, *Michael Kohlhaas*. He was a merchant, and not, as some have supposed, a horsedealer, and he lived at Kölln in Brandenburg. In October 1532, so the story runs, whilst proceeding to the fair at Leipzig, he was attacked and his horses were taken from him by the servants of a Saxon nobleman, one Günter von Zaschwitz. In consequence of the delay the merchant suffered some loss of business at the fair and on his return he refused to pay the small sum which Zaschwitz demanded as a condition of returning the horses. Instead Kohlhase asked for a substantial amount of money as compensation for his loss, and failing to secure this he invoked the aid of his sovereign, the elector of Brandenburg. Finding however that it was impossible to recover his horses, he paid Zaschwitz the sum required for them, but reserved to himself the right to take further action. Then unable to obtain redress in the courts of law, the merchant, in a *Fehdebrief*, threw down a challenge not only to the aggressor, but to the whole of Saxony. Acts of lawlessness were soon attributed to him, and after an attempt to settle the feud had failed, the elector of Saxony, John Frederick I., set a price upon the head of the angry merchant. Kohlhase now sought revenge in earnest. Gathering around him a band of criminals and of desperadoes he spread terror throughout the whole of Saxony; travellers were robbed, villages were burned and towns were plundered. For some time the authorities were practically powerless to stop these outrages, but in March 1540 Kohlhase and his principal associate, Georg Nagelschmidt, were seized, and on the 22nd of the month they were broken on the wheel in Berlin.

The life and fate of Kohlhase are dealt with in several dramas. See Burkhardt, *Der historische Hans Kohlhase und H. von Kleists Michael Kohlhaas* (Leipzig, 1864).

KOKOMO, a city and the county-seat of Howard county, Indiana, U.S.A., on the Wildcat River, about 50 m. N. of Indianapolis. Pop. (1890) 8261; (1900) 10,609, of whom 400 were foreign-born and 319 negroes; (1910 census) 17,010. It is served by the Lake Erie & Western, the Pittsburg, Cincinnati, Chicago & St Louis, and the Toledo, St Louis & Western railways, and by two interurban electric lines. Kokomo is a centre of trade in agricultural products, and has various manufactures, including flint, plate and opalescent glass, &c. The total value of the factory product increased from $2,561,136 in 1900 to $3,931,205 in 1905, or 53.5%; and in 1905 the glass product was valued at $862,586, or 21.9% of the total. Kokomo was settled about 1840 and became a city (under a state law) in 1865.

KOKO-NOR (or Kuku-Nor), (*Tsing-hai* of the Chinese and *Tso-ngombo* of the Tanguts), a lake of Central Asia, situated at an altitude of 10,975 ft., in the extreme N.E. of Tibet, 50 m. from the W. frontier of the Chinese province of Kan-suh, in 100° E. and 37° N. It lies amongst the eastern ranges of the Kuen-lun, having the Nan-shan Mountains to the north, and the southern Koko-nor range (16,000 ft.) on the south. It measures 66 m. by 40 m., and contains half a dozen islands, on one of which is a Buddhist (i.e. Lamaist) monastery, to which pilgrims resort. The water is salt, though an abundance of fish live in it, and it often remains frozen for three months together in winter. The surface is at times subject to considerable variations of level. The lake is entered on the west by the river Buhain-gol. The nomads who dwell round its shores are Tanguts.

KOKSHAROV, NIKOLAĪ ĪVANOVICH VON (1818–1893), Russian mineralogist and major-general in the Russian army, was born at Ust-Kamenogorsk in Tomsk, on the 5th of December 1818 (O.S.). He was educated at the military school of mines in St Petersburg. At the age of twenty-two he was selected to accompany R. I. Murchison and De Verneuil, and afterwards De Keyserling, in their geological survey of the Russian Empire. Subsequently he devoted his attention mainly to the study of mineralogy and mining, and was appointed director of the Institute of Mines. In 1865 he became director of the Imperial Mineralogical Society of St Petersburg. He contributed numerous papers on euclase, zircon, sphene, orthite, monazite and other mineralogical subjects to the St Petersburg and Vienna academies of science, to Poggendorff's *Annalen*, Leonhard and Bronn's *Jahrbuch*, &c. He also issued as separate works *Materialien zur Mineralogie Russlands* (10 vols., 1853–1891), and *Vorlesungen über Mineralogie* (1865). He died in St Petersburg on the 3rd of January 1893 (O.S.).

KOKSTAD, a town of South Africa, the capital of Griqualand East, 236 m. by rail S.W. of Durban, 110 m. N. by W. of Port Shepstone, and 130 m. N. of Port St John, Pondoland. Pop. (1904) 2903, of whom a third were Griquas. The town is built on the outer slopes of the Drakensberg and is 4270 ft. above the sea. Behind it Mount Currie rises to a height of 7400 ft. An excellent water supply is derived from the mountains. The town is well laid out, and possesses several handsome public buildings. It is the centre of a thriving agricultural district and has a considerable trade in wool, grain, cattle and horses with Basutoland, Pondoland and the neighbouring regions of Natal. The town is named after the Griqua chief Adam Kok, who founded it in 1869. In 1879 it came into the possession of Cape Colony and was granted municipal government in 1893. It is the residence of the Headman of the Griqua nation. (See KAFFRARIA and GRIQUALAND.)

KOLA, a peninsula of northern Russia, lying between the Arctic Ocean on the N. and the White Sea on the S. It forms part of the region of Lapland and belongs administratively to the government of Archangel. The Arctic coast, known as the Murman coast (Murman being a corruption of Norman), is 260 m. long, and being subject to the influence of the North Atlantic drift, is free from ice all the year round. It is a rocky coast, built of granite, and rising to 650 ft., and is broken by several excellent bays. On one of these, Kola Bay, the Russian government founded in 1899 the naval harbour of Alexandrovsk. From May to August a productive fishery is carried on along this coast. Inland the peninsula rises up to a plateau, 1000 ft. in general elevation, and crossed by several ranges of bare mountains which go up to over 3000 ft. in altitude. The lower slopes of these mountains are clothed with forest up to 1300 ft., and in places thickly studded with lakes, some of them of very considerable extent, e.g. Imandra (330 sq. m.), Ump-jaur, Nuoto-jarvi, Guolle-jaur or Kola Lake, and Lu-jaur. From these issue streams of appreciable magnitude, such as the Tuloma, Voronya, Yovkyok or Yokanka, and Ponoi, all flowing into the Arctic, and the Varsuga and Umba, into the White Sea. The area of the peninsula is estimated at 50,000 sq. m.

See A. O. Kihlmann and Palmén, *Die Expedition nach der Halbinsel Kola 1887–1892* (Helsingfors); A. O. Kihlmann, *Bericht einer naturwissenschaftlichen Reise durch Russisch-Lappland* (Helsingfors, 1890); and W. Ramsay, *Geologische Beobachtungen auf der Halbinsel Kola* (Helsingfors, 1899).

KOLABA (or COLABA), a district of British India, in the southern division of Bombay. Area, 2131 sq. m.; pop. (1901) 605,566, showing an increase of 2% in the decade. The headquarters are at Alibagh. Lying between the Western Ghats and the sea, Kolaba district abounds in hills, some being spurs running at right angles to the main range, while others are isolated peaks or lofty detached ridges. The sea frontage, of about 50 m., is throughout the greater part of its length fringed by a belt of coco-nut and betel-nut palms. Behind this belt lies a stretch of flat country devoted to rice cultivation. In many places along the banks of the salt-water creeks there are extensive tracts of salt marshland, some of them reclaimed, some still subject to tidal inundation, and others set apart for the manufacture of salt. The district is traversed by a few small streams. Tidal inlets, of which the principal are the Nagothna on the north, the Roha or Chaul in the west, and the Bankot creek in the south, run inland for 30 or 40 m., forming highways for a brisk trade in rice, salt, firewood, and dried fish. Near the coast especially the district is well supplied with reservoirs. The Western Ghats have two remarkable peaks—Raigarh, where Sivaji built his capital, and Miradongar. There are extensive teak and blackwood forests, the value of which is increased by their proximity to Bombay. The Great Indian Peninsula railway crosses part of the district, and communication with Bombay is maintained by a steam ferry. Owing to its nearness to that city, the district has suffered severely from plague. Kolaba district takes its name from a little island off Alibagh, which was one of the strongholds of Angria, the Mahratta pirate of the 18th century. The same island has given its name to Kolaba Point, the spur of Bombay Island running south that protects the entrance to the harbour. On Kolaba Point are the terminus of the Bombay & Baroda railway, barracks for a European regiment, lunatic asylum and observatory.

KOLAR, a town and district of India, in the state of Mysore. The town is 43 m. E. of Bangalore. Pop. (1901) 12,210. Although of ancient foundation, it has been almost completely modernized. Industries include the weaving of blankets and the breeding of turkeys for export.

The District of Kolar has an area of 3180 sq. m. It occupies the portion of the Mysore table-land immediately bordering the Eastern Ghats. The principal watershed lies in the north-west, around the hill of Nandidrug (4810 ft.), from which rivers radiate in all directions; and the whole country is broken by numerous hill ranges. The chief rivers are the Palar, the South Pinakini or Pennar, the North Pinakini, and the Papagani, which are industriously utilized for irrigation by means of anicuts and tanks. The rocks of the district are mostly syenite or granite, with a small admixture of mica and feldspar. The soil in the valleys consists of a fertile loam; and in the higher levels sand and gravel are found. The hills are covered with scrub, jungle and brushwood. In 1901 the population was 723,600, showing an increase of 22 % in the decade. The district is traversed by the Bangalore line of the Madras railway, with a branch 10 m. long, known as the Kolar Goldfields railway. Gold prospecting in this region began in 1876, and the industry is now settled on a secure basis. Here are situated the mines of the Mysore, Champion Reef, Ooregum, and Nandidrug companies. To the end of 1904 the total value of gold produced was 21 millions sterling, and there had been paid in dividends 9 millions, and in royalty to the Mysore state one million. The municipality called the Kolar Gold Fields had in 1901 a population of 38,204; it has suffered severely from plague. Electricity from the falls of the Cauvery (93 m. distant) is utilized as the motive power in the mines. Sugar manufacture and silk and cotton weaving are the other principal industries in the district. The chief historical interest of modern times centres round the hill fort of Nandidrug, which was stormed by the British in 1791, after a bombardment of 21 days.

KOLBE, ADOLPHE WILHELM HERMANN (1818–1884), German chemist, was born on the 27th of September 1818 at Elliehausen, near Göttingen, where in 1838 he began to study chemistry under F. Wöhler. In 1842 he became assistant to R. W. von Bunsen at Marburg, and three years later to Lyon Playfair at London. From 1847 to 1851 he was engaged at Brunswick in editing the *Dictionary of Chemistry* started by Liebig, but in the latter year he went to Marburg as successor to Bunsen in the chair of chemistry. In 1865 he was called to Leipzig in the same capacity, and he died in that city on the 25th of November 1884. Kolbe had an important share in the great development of chemical theory that occurred about the middle of the 19th century, especially in regard to the constitution of organic compounds, which he viewed as derivatives of inorganic ones, formed from the latter—in some cases directly—by simple processes of substitution. Unable to accept Berzelius's doctrine of the unalterability of organic radicals, he also gave a new interpretation to the meaning of copulae under the influence of his fellow-worker Edward Frankland's conception of definite atomic saturation-capacities, and thus contributed in an important degree to the subsequent establishment of the structure theory. Kolbe was a very successful teacher, a ready and vigorous writer, and a brilliant experimentalist whose work revealed the nature of many compounds the composition of which had not previously been understood. He published a *Lehrbuch der organischen Chemie* in 1854, smaller textbooks of organic and inorganic chemistry in 1877–1883, and *Zur Entwickelungsgeschichte der theoretischen Chemie* in 1881. From 1870 he was editor of the *Journal für praktische Chemie*, in which many trenchant criticisms of contemporary chemists and their doctrines appeared from his pen.

KOLBERG (or Colberg), a town of Germany, and seaport of the Prussian province of Pomerania, on the right bank of the Persante, which falls into the Baltic about a mile below the town, and at the junction of the railway lines to Belgard and Gollnow. Pop. (1905), 22,804. It has a handsome marketplace with a statue of Frederick William III.; and there are extensive suburbs, of which the most important is Münde. The principal buildings are the huge red-brick church of St Mary, with five aisles, one of the most remarkable churches in Pomerania, dating from the 14th century; the council-house (Rathaus), erected after the plans of Ernst F. Zwirner; and the citadel. Kolberg also possesses four other churches, a theatre, a gymnasium, a school of navigation, and an exchange. Its bathing establishments are largely frequented and attract a considerable number of summer visitors. It has a harbour at the mouth of the Persante, where there is a lighthouse. Woollen cloth, machinery and spirits are manufactured; there is an extensive salt-mine in the neighbouring Zillenberg; the salmon and lamprey fisheries are important; and a fair amount of commercial activity is maintained. In 1903 a monument was erected to the memory of Gneisenau and the patriot, Joachim Christian Nettelbeck (1738–1824), through whose efforts the town was saved from the French in 1806–7.

Originally a Slavonic fort, Kolberg is one of the oldest places of Pomerania. At an early date it became the seat of a bishop, and although it soon lost this distinction it obtained municipal privileges in 1255. From about 1276 it ranked as the most important place in the episcopal principality of Kamin, and from 1284 it was a member of the Hanseatic League. During the Thirty Years' War it was captured by the Swedes in 1631, passing by the treaty of Westphalia to the elector of Brandenburg, Frederick William I., who strengthened its fortifications. The town was a centre of conflict during the Seven Years' War. In 1758 and again in 1760 the Russians besieged Kolberg in vain, but in 1762 they succeeded in capturing it. Soon restored to Brandenburg, it was vigorously attacked by the French in 1806 and 1807, but it was saved by the long resistance of its inhabitants. In 1887 the fortifications of the town were razed, and it has since become a fashionable watering-place, receiving annually nearly 15,000 visitors.

See Riemann, *Geschichte der Stadt Kolberg* (Kolberg, 1873); Stoewer, *Geschichte der Stadt Kolberg* (Kolberg, 1897); Schönlein, *Geschichte der Belagerungen Kolbergs in den Jahren 1758, 1760, 1761 und 1807* (Kolberg, 1878); and Kempin, *Führer durch Bad Kolberg* (Kolberg, 1899).

KÖLCSEY, FERENCZ (1790–1838), Hungarian poet, critic and orator, was born at Szodemeter, in Transylvania, on the 8th of August 1790. In his fifteenth year he made the acquaintance of Kazinczy and zealously adopted his linguistic reforms. In 1809 Kölcsey went to Pest and became a "notary to the royal board." Law proved distasteful, and at Cseke in Szatmár county he devoted his time to aesthetical study, poetry, criticism, and the defence of the theories of Kazinczy. Kölcsey's early metrical pieces contributed to the *Transylvanian Museum* did not attract much attention, whilst his severe criticisms of Csokonai, Kis, and especially Berzsenyi, published in 1817, rendered him very unpopular. From 1821 to 1826 he published many separate poems of great beauty in the *Aurora*, *Hebe*, *Aspasia*, and other magazines of polite literature. He joined Paul Szemere in a new periodical, styled *Élet és literatura* ("Life and Literature"), which appeared from 1826 to 1829, in 4 vols., and gained for Kölcsey the highest reputation as a critical writer. From 1832 to 1835 he sat in the Hungarian Diet, where his extreme liberal views and his singular eloquence soon rendered him famous as a parliamentary leader. Elected on the 17th of November 1830 a member of the Hungarian Academy of Sciences, he took part in its first grand meeting; in 1832, he delivered his famous oration on Kazinczy, and in 1836 that on his former opponent Daniel Berzsenyi. When in 1838 Baron Wesselényi was unjustly thrown into prison upon a charge of treason, Kölcsey eloquently though unsuccessfully conducted his defence; and he died about a week afterwards (August 24) from internal inflammation. His collected works, in 6 vols., were published at Pest, 1840–1848, and his journal of the diet of 1832–1836 appeared in 1848. A monument erected to the memory of Kölcsey was unveiled at Szatmár-Németi on the 25th of September 1864.

See G. Steinacker, *Ungarische Lyriker* (Leipzig, and Pest, 1874); F. Toldy, *Magyar Költök élete* (2 vols., Pest, 1871); J. Ferenczy and J. Danielik, *Magyar Irók* (2 vols., Pest, 1856–1858).

KOLDING, a town of Denmark in the *amt* (county) of Vejle, on the east coast of Jutland, on the Koldingfjord, an inlet of the

Little Belt, 9 m. N. of the German frontier. Pop. (1901), 12,516. It is on the Eastern railway of Jutland. The harbour throughout has a depth of over 20 ft. A little to the north-west is the splendid remnant of the royal castle Koldinghuus, formerly called Oernsborg or Arensborg. It was begun by Duke Abel in 1248; in 1808 it was burned. The large square tower was built by Christian IV. (1588-1648), and was surmounted by colossal statues, of which one is still standing. It contains an antiquarian and historical museum (1892). The name of Kolding occurs in the 10th century, but its earliest known town-rights date from 1321. In 1644 it was the scene of a Danish victory over the Swedes, and on the 22nd of April 1849 of a Danish defeat by the troops of Schleswig-Holstein. A comprehensive view of the Little Belt with its islands, and over the mainland, is obtained from the Skamlingsbank, a slight elevation 8½ m. S.E., where an obelisk (1863) commemorates the effort made to preserve the Danish language in Schleswig.

KOLGUEV, Kolgueff or Kalguyev, an island off the north-west of Russia in Europe, belonging to the government of Archangel. It lies about 50 m. from the nearest point of the mainland, and is of roughly oval form, 54 m. in length from N.N.E. to S.S.W. and 39 m. in extreme breadth. It lies in a shallow sea, and is quite low, the highest point being 250 ft. above the sea. Peat-bogs and grass lands cover the greater part of the surface; there are several considerable streams and a large number of small lakes. The island is of recent geological formation; it consists almost wholly of disintegrated sandstone or clay (which rises at the north-west into cliffs up to 60 ft. high), with scattered masses of granite. Vegetation is scanty, but bears, foxes and other Arctic animals, geese, swans, &c., provide means of livelihood for a few Samoyed hunters.

KOLHAPUR, a native state of India, within the Deccan division of Bombay. It is the fourth in importance of the Mahratta principalities, the other three being Baroda, Gwalior and Indore; and it is the principal state under the political control of the government of Bombay. Together with its *jagirs* or feudatories, it covers an area of 3165 sq. m. In 1901 the population was 910,011. The estimated revenue is £300,000. Kolhapur stretches from the heart of the Western Ghats eastwards into the plain of the Deccan. Along the spurs of the main chain of the Ghats lie wild and picturesque hill slopes and valleys, producing little but timber, and till recently covered with rich forests. The centre of the state is crossed by several lines of low hills running at right angles from the main range. In the east the country becomes more open and presents the unpicturesque uniformity of a well-cultivated and treeless plain, broken only by an occasional river. Among the western hills are the ancient Mahratta strongholds of Panhala, Vishalgarh, Bavda and Rungna. The rivers, though navigable during the rains by boats of 2 tons burthen, are all fordable during the hot months. Iron ore is found in the hills, and smelting was formerly carried on to a considerable extent; but now the Kolhapur mineral cannot compete with that imported from Europe. There are several good stone quarries. The principal agricultural products are rice, millets, sugar-cane, tobacco, cotton, safflower and vegetables.

The rajas of Kolhapur trace their descent from Raja Ram, a younger son of Sivaji the Great, the founder of the Mahratta power. The prevalence of piracy caused the British government to send expeditions against Kolhapur in 1765 and 1792; and in the early years of the 19th century the misgovernment of the chief compelled the British to resort to military operations, and ultimately to appoint an officer to manage the state. In recent years the state has been conspicuously well governed, on the pattern of British administration. The raja Shahu Chhatrapati, G.C.S.I. (who is entitled to a salute of 21 guns) was born in 1874, and ten years later succeeded to the throne by adoption. The principal institutions are the Rajaram college, the high school, a technical school, an agricultural school, and training-schools for both masters and mistresses. The state railway from Miraj junction to Kolhapur town is worked by the Southern Mahratta company. In recent years the state has suffered from both famine and plague.

The town of Kolhapur, or Karvir, is the terminus of a branch of the Southern Mahratta railway, 30 m. from the main line. Pop. (1901), 54,373. Besides a number of handsome modern public buildings, the town has many evidences of antiquity. Originally it appears to have been an important religious centre, and numerous Buddhist remains have been discovered in the neighbourhood.

KOLIN, or Neu-Kolin (also *Kollin*; Czech, *Nový Kolin*), a town of Bohemia, Austria, 40 m. E. of Prague by rail. Pop. (1900), 15,025, mostly Czech. It is situated on the Elbe, and amongst its noteworthy buildings may be specially mentioned the beautiful early Gothic church of St Bartholomew, erected during the latter half of the 14th century. The industries of the town include sugar-refining, steam mills, brewing, and the manufacture of starch, syrup, spirits, potash and tin ware. The neighbourhood is known for the excellence of its fruit and vegetables. Kolin is chiefly famous on account of the battle here on the 18th of June 1757, when the Prussians under Frederick the Great were defeated by the Austrians under Daun (see Seven Years' War). The result was the raising of the siege of Prague and the evacuation of Bohemia by the Prussians. Kolin was colonized in the 13th century by German settlers and made a royal city. In 1421 it was captured by the men of Prague, and the German inhabitants who refused to accept "the four articles" were expelled. In 1427 the town declared against Prague, was besieged by Prokop the Great, and surrendered to him upon conditions at the close of the year.

KOLIS, a caste or tribe of Western India, of uncertain origin. Possibly the name is derived from the Turki *kuleh* a slave; and, according to one theory, this name has been passed on to the familiar word "cooly" for an agricultural labourer. They form the main part of the inferior agricultural population of Gujarat, where they were formerly notorious as robbers; but they also extend into the Konkan and the Deccan. In 1901 the number of Kolis in all India was returned as nearly 3¾ millions; but this total includes a distinct weaving caste of Kolis or Koris in northern India.

KÖLLIKER, RUDOLPH ALBERT VON (1817–1905), Swiss anatomist and physiologist, was born at Zürich on the 6th of July 1817. His father and his mother were both Zürich people, and he in due time married a lady from Aargau, so that Switzerland can claim him as wholly her own, though he lived the greater part of his life in Germany. His early education was carried on in Zürich, and he entered the university there in 1836. After two years, however, he moved to the university of Bonn, and later to that of Berlin, becoming at the latter place the pupil of Johannes Müller and of F. G. J. Henle. He graduated in philosophy at Zürich in 1841, and in medicine at Heidelberg in 1842. The first academic post which he held was that of prosector of anatomy under Henle; but his tenure of this office was brief, for in 1844 his native city called him back to its university to occupy a chair as professor extraordinary of physiology and comparative anatomy. His stay here too, however, was brief, for in 1847 the university of Würzburg, attracted by his rising fame, offered him the post of professor of physiology and of microscopical and comparative anatomy. He accepted the appointment, and at Würzburg he remained thenceforth, refusing all offers tempting him to leave the quiet academic life of the Bavarian town, where he died on the 2nd of November 1905.

Kölliker's name will ever be associated with that of the tool with which during his long life he so assiduously and successfully worked, the microscope. The time at which he began his studies coincided with that of the revival of the microscopic investigation of living beings. Two centuries earlier the great Italian Malpighi had started, and with his own hand had carried far the study by the help of the microscope of the minute structure of animals and plants. After Malpighi this branch of knowledge, though continually progressing, made no remarkable bounds forward until the second quarter of the 19th century, when the improvement of the compound microscope on the one hand, and the promulgation by Theodor Schwann and Matthias Schleiden of the "cell theory" on the other, inaugurated a new era of microscopic investigation. Into this new learning Kölliker threw himself with all the zeal of youth, wisely initiated into it by his great teacher Henle, whose sober and exact mode of inquiry went far at the time to give the new learning a right direction and to counteract the somewhat fantastic views which, under the name of the cell theory, were tending to be prominent. Henle's labours were for the most part limited to the microscopic investigation of the minute structure of the tissues of man and of the higher animals, the latter being studied by him mainly with the view of illustrating the former. But Kölliker had another teacher besides Henle, the even greater Johannes Müller, whose active mind was sweeping over the whole animal kingdom, striving to pierce the secrets of the structure of living creatures of all sorts, and keeping steadily in view the wide biological problems of function and of origin, which the facts of structure might serve to solve. We may probably trace to the influence of these two great teachers, strengthened by the spirit of the times, the threefold character of Kölliker's long-continued and varied labours. In all of them, or in almost all of them, the microscope was the instrument of inquiry, but the problem to be solved by means of the instrument belonged now to one branch of biology, now to another.

At Zürich, and afterwards at Würzburg, the title of the chair which he held laid upon him the duty of teaching comparative anatomy, and very many of the numerous memoirs which he published, including the very first paper which he wrote, and which appeared in 1841 before he graduated, "On the Nature of the so-called Seminal Animalcules," were directed towards elucidating, by help of the microscope, the structure of animals of the most varied kinds—that is to say, were zoological in character. Notable among these were his papers on the Medusae and allied creatures. His activity in this direction led him to make zoological excursions to the Mediterranean Sea and to the coasts of Scotland, as well as to undertake, conjointly with his friend C. T. E. von Siebold, the editorship of the *Zeitschrift für Wissenschaftliche Zoologie*, which, founded in 1848, continued under his hands to be one of the most important zoological periodicals.

At the time when Kölliker was beginning his career the influence of Karl Ernst von Baer's embryological teaching was already being widely felt, men were learning to recognize the importance to morphological and zoological studies of a knowledge of the development of animals; and Kölliker plunged with enthusiasm into the relatively new line of inquiry. His earlier efforts were directed to the invertebrata, and his memoir on the development of cephalopods, which appeared in 1844, is a classical work; but he soon passed on to the vertebrata, and studied not only the amphibian embryo and the chick, but also the mammalian embryo. He was among the first, if not the very first, to introduce into this branch of biological inquiry the newer microscopic technique—the methods of hardening, section-cutting and staining. By doing so, not only was he enabled to make rapid progress himself, but he also placed in the hands of others the means of a like advance. The remarkable strides forward which embryology made during the middle and during the latter half of the 19th century will always be associated with his name. His *Lectures on Development*, published in 1861, at once became a standard work.

But neither zoology nor embryology furnished Kölliker's chief claim to fame. If he did much for these branches of science, he did still more for histology, the knowledge of the minute structure of the animal tissues. This he made emphatically his own. It may indeed be said that there is no fragment of the body of man and of the higher animals on which he did not leave his mark, and in more places than one his mark was a mark of fundamental importance. Among his earlier results may be mentioned the demonstration in 1847 that smooth or unstriated muscle is made up of distinct units, of nucleated muscle-cells. In this work he followed in the footsteps of his master Henle. A few years before this men were doubting whether arteries were muscular, and no solid histological basis as yet existed for those views as to the action of the nervous system on the circulation, which were soon to be put forward, and which had such a great influence on the progress of physiology. By the above discovery Kölliker completed that basis.

Even to enumerate, certainly to dwell on, all his contributions to histology would be impossible here: smooth muscle, striated muscle, skin, bone, teeth, blood-vessels and viscera were all investigated by him; and he touched none of them without striking out some new truths. The results at which he arrived were recorded partly in separate memoirs, partly in his great textbook on microscopical anatomy, which first saw the light in 1850, and by which he advanced histology no less than by his own researches. In the case of almost every tissue our present knowledge contains something great or small which we owe to Kölliker; but it is on the nervous system that his name is written in largest letters. So early as 1845, while still at Zürich, he supplied what was as yet still lacking, the clear proof that nerve-fibres are continuous with nerve-cells, and so furnished the absolutely necessary basis for all sound speculations as to the actions of the central nervous system. From that time onward he continually laboured, and always fruitfully, at the histology of the nervous system, and more especially at the difficult problems presented by the intricate patterns in which fibres and cells are woven together in the brain and spinal cord. In his old age, at a time when he had fully earned the right to fold his arms, and to rest and be thankful, he still enriched neurological science with results of the highest value. From his early days a master of method, he saw at a glance the value of the new Golgi method for the investigation of the central nervous system, and, to the great benefit of science, took up once more in his old age, with the aid of a new means, the studies for which he had done so much in his youth. It may truly be said that much of that exact knowledge of the inner structure of the brain, which is rendering possible new and faithful conceptions of its working, came from his hands.

Lastly, Kölliker was in his earlier years professor of physiology as well as of anatomy; and not only did his histological labours almost always carry physiological lessons, but he also enriched physiology with the results of direct researches of an experimental kind, notably those on curare and some other poisons. In fact, we have to go back to the science of centuries ago to find a man of science of so many-sided an activity as he. His life constituted in a certain sense a protest against that specialized differentiation which, however much it may under certain aspects be regretted, seems to be one of the necessities of modern development. In Johannes Müller's days no one thought of parting anatomy and physiology; nowadays no one thinks of joining them together. Kölliker did in his work join them together, and indeed said himself that he thought they ought never to be kept apart.

Naturally a man of so much accomplishment was not left without honours. Formerly known simply as Kölliker, the title "von" was added to his name. He was made a member of the learned societies of many countries; in England, which he visited more than once, and where he became well known, the Royal Society made him a fellow in 1860, and in 1897 gave him its highest token of esteem, the Copley medal. (M. F.)

KOLLONTAJ, HUGO (1750–1812), Polish politician and writer, was born in 1750 at Niecislawice in Sandomir, and educated at Pinczow and Cracow. After taking orders he went (1770) to Rome, where he obtained the degree of doctor of theology and common law, and devoted himself enthusiastically to the study of the fine arts, especially of architecture and painting. At Rome too he obtained a canonry attached to Cracow cathedral, and on his return to Poland in 1755 threw himself heart and soul into the question of educational reform. His efforts were impeded by the obstruction of the clergy of Cracow, who regarded him as an adventurer; but he succeeded in reforming the university after his own mind, and was its rector for three years (1782–1785). Kollontaj next turned his attention to politics. In 1786 he was appointed *referendarius* of Lithuania, and during the Four Years' Diet (1788–1792) displayed an amazing and many-sided activity as one of the reformers of the constitution. He grouped around him all the leading writers, publicists and progressive young men of the day; declaimed against prejudices; stimulated the timid; inspired the lukewarm with enthusiasm; and never rested till the constitution of the 3rd of May 1791 had been carried through. In June 1791 Kollontaj was appointed vice-chancellor. On the triumph of the reactionaries and the fall of the national party, he secretly placed in the king's hands his adhesion to the triumphant Confederation of Targowica, a false step, much blamed at the time, but due not to personal ambition but to a desire to save something from the wreck of the constitution. He then emigrated to Dresden. On the outbreak of Kosciuszko's insurrection he returned to Poland, and as member of the national government and minister of finance took a leading part in affairs. But his radicalism had now become of a disruptive quality, and he quarrelled with and even thwarted Kosciuszko because the dictator would not admit that the Polish republic could only be saved by the methods of Jacobinism. On the other hand, the more conservative section of the Poles regarded Kollontaj as "a second Robespierre," and he is even suspected of complicity in the outrages of the 17th and 18th of June 1794, when the Warsaw mob massacred the political prisoners. On the collapse of the insurrection Kollontaj emigrated to Austria, where from 1795 to 1802 he was detained as a prisoner. He was finally released through the mediation of Prince Adam Czartoryski, and returned to Poland utterly discredited. The remainder of his life was a ceaseless struggle against privation and prejudice. He died at Warsaw on the 28th of February 1812.

Of his numerous works the most notable are: *Political Speeches as Vice-Chancellor* (Pol.) (in 6 vols., Warsaw, 1791); *On the Erection and Fall of the Constitution of May* (Pol.) (Leipzig, 1793; Paris, 1868); *Correspondence with T. Czacki* (Pol.) (Cracow, 1854); *Letters written during Emigration, 1792–1794* (Pol.) (Posen, 1872).

See Ignacz Badeni, *Necrology of Hugo Kollontaj* (Pol.) (Cracow, 1819); Henryk Schmitt, *Review of the Life and Works of Kollontaj* (Pol.) (Lemberg, 1860); Wojciek Grochowski, "Life of Kollontaj" (Pol.) in *Tygod Illus.* (Warsaw, 1861). (R. N. B.)

KOLOMEA (Polish, *Kolomyja*), a town of Austria, in Galicia, 122 m. S. of Lemberg by rail. Pop. (1900), 34,188, of which half were Jews. It is situated on the Pruth, and has an active trade in agricultural products. To the N.E. of Kolomea, near the Dniester, lies the village of Czernelica, with ruins of a strongly fortified castle, which served as the residence of John Sobieski during his campaigns against the Turks. Kolomea is a very old town and is mentioned already in 1240, but the assertion that it was a Roman settlement under the name of *Colonia* is not proved. It was the principal town of the Polish province of Pokutia, and it suffered severely during the 15th and 16th centuries from the attacks of the Moldavians and the Tatars.

KOLOMNA, a town of Russia, in the government of Moscow, situated on the railway between Moscow and Ryazan, 72 m. S.E. of Moscow, at the confluence of the Moskva river with the Kolomenka. Pop. (1897), 20,970. It is an old town, mentioned in the annals in 1177, and until the 14th century was the capital of the Ryazan principality. It suffered greatly from the invasions of the Tatars in the 13th century, who destroyed it four times, as well as from the wars of the 17th century; but it always recovered and has never lost its commercial importance. During the 19th century it became a centre for the manufacture of silks, cottons, ropes and leather. Here too are railway workshops, where locomotives and wagons are made. Kolomna carries on an active trade in grain, cattle, tallow, skins, salt and timber. It has several old churches of great archaeological interest, including two of the 14th century, one being the cathedral. One gate (restored in 1895) of the fortifications of the Kreml still survives.

KOLOZSVÁR (Ger. *Klausenburg*; Rum. *Cluj*), a town of Hungary, in Transylvania, the capital of the county of Kolozs, and formerly the capital of the whole of Transylvania, 248 m. E.S.E. of Budapest by rail. Pop. (1900), 46,670. It is situated in a picturesque valley on the banks of the Little Szamos, and comprises the inner town (formerly surrounded with walls) and five suburbs. The greater part of the town lies on the right bank of the river, while on the other side is the so-called Bridge Suburb and the citadel (erected in 1715). Upon the slopes of the citadel hill there is a gipsy quarter. With the exception of the old quarter, Kolozsvár is generally well laid out, and contains many broad and fine streets, several of which diverge at right angles from the principal square. In this square is situated the Gothic church of St Michael (1396–1432); in front is a bronze equestrian statue of King Matthias Corvinus by the Hungarian sculptor Fadrusz (1902). Other noteworthy buildings are the Reformed church, built by Matthias Corvinus in 1486 and ceded to the Calvinists by Bethlen Gabor in 1622; the house in which Matthias Corvinus was born (1443), which contains an ethnographical museum; the county and town halls, a museum, and the university buildings. A feature of Kolozsvár is the large number of handsome mansions belonging to the Transylvanian nobles, who reside here during the winter. It is the seat of a Unitarian bishop, and of the superintendent of the Calvinists for the Transylvanian circle. Kolozsvár is the literary and scientific centre of Transylvania, and is the seat of numerous literary and scientific associations. It contains a university (founded in 1872), with four faculties—theology, philosophy, law and medicine—frequented by about 1900 students in 1905; and amongst its other educational establishments are a seminary for Unitarian priests, an agricultural college, two training schools for teachers, a commercial academy, and several secondary schools for boys and girls. The industry comprises establishments for the manufacture of woollen and linen cloth, paper, sugar, candles, soap, earthenwares, as well as breweries and distilleries.

Kolozsvár is believed to occupy the site of a Roman settlement named *Napoca*. Colonized by Saxons in 1178, it then received its German name of *Klausenburg*, from the old word *Klause*, signifying a "mountain pass." Between the years 1545 and 1570 large numbers of the Saxon population left the town in consequence of the introduction of Unitarian doctrines. In 1798 the town was to a great extent destroyed by fire. As capital of Transylvania and the seat of the Transylvanian diets, Kolozsvár from 1830 to 1848 became the centre of the Hungarian national movement in the grand principality; and in December 1848 it was taken and garrisoned by the Hungarians under General Bem.

KOLPINO, one of the chief iron-works of the crown in Russia, in the government of St Petersburg, 16 m. S.E. of the city of St Petersburg, on the railway to Moscow, and on the Izhora river. Pop. (1897), 8076. A sacred image of St Nicholas in the Trinity church is visited by numerous pilgrims on the 22nd of May every year. Here is an iron-foundry of the Russian admiralty.

KOLS, a generic name applied by Hindus to the Munda, Ho and Oraon tribes of Bengal. The Mundas are an aboriginal tribe of Dravidian physical type, inhabiting the Chota Nagpur division, and numbering 438,000 in 1901. The majority of them are animists in religion, but Christianity is making rapid strides among them. The village community in its primitive form still exists among the Mundas; the discontent due to the oppression of their landlords led to the Munda rising of 1899, and to the remedy of the alleged grievances by a new settlement of the district. The Hos, who are closely akin to the Mundas, also inhabit the Chota Nagpur division; in 1901 they numbered 386,000. They were formerly a very pugnacious race, who successfully defended their territory against all comers until they were subdued by the British in the early part of the 19th century, being known as the Larka (or fighting) Kols. They are still great sportsmen, using the bow and arrow. Like the Mundas they are animists, but they show little inclination for Christianity. Both Mundas and Hos speak dialects of the obscure linguistic family known as Munda or Kol.

See *Imp. Gazetteer of India*, vols. xiii., xviii. (Oxford, 1908).

KOLYVAÑ. (1) A town of West Siberia, in the government of Tomsk, on the Chaus river, 5 m. from the Ob and 120 m. S.S.W. of the city of Tomsk. It is a wealthy town, the merchants carrying on a considerable export trade in cattle, hides, tallow, corn and fish. It was founded in 1713 under the name of Chausky Ostrog, and has grown rapidly. Pop. (1897), 11,703. (2) KOLYVAÑSKIY ZAVOD, another town of the same government, in the district of Biysk, Altai region, on the Byelaya river, 192 m.

S.E. of Barnaul; altitude, 1290 ft. It is renowned for its stone-cutting factory, where marble, jasper, various porphyries and breccias are worked into vases, columns, &c. Pop., 5000. (3) Old name of Reval (*q.v.*).

KOMÁROM (Ger., *Komorn*), the capital of the county of Komárom, Hungary, 65 m. W.N.W. of Budapest by rail. Pop. (1900), 16,816. It is situated at the eastern extremity of the island Csallóköz or Grosse Schütt, at the confluence of the Waag with the Danube. Just below Komárom the two arms into which the Danube separates below Pressburg, forming the Grosse Schütt island, unite again. Since 1896 the market-town of Uj-Szöny, which lies on the opposite bank of the Danube, has been incorporated with Komárom. The town is celebrated chiefly for its fortifications, which form the centre of the inland fortifications of the Austro-Hungarian monarchy. A brisk trade in cereals, timber, wine and fish is carried on. Komárom is one of the oldest towns of Hungary, having received its charter in 1265. The fortifications were begun by Matthias Corvinus, and were enlarged and strengthened during the Turkish wars (1526–64). New forts were constructed in 1663 and were greatly enlarged between 1805 and 1809. In 1543, 1594, 1598 and 1663 it was beleaguered by the Turks. It was raised to the dignity of a royal free town in 1751. During the revolutionary war of 1848–49 Komárom was a principal point of military operations, and was long unsuccessfully besieged by the Austrians, who on the 11th of July 1849 were defeated there by General Görgei, and on the 3rd of August by General Klapka. On the 27th of September the fortress capitulated to the Austrians upon honourable terms, and on the 3rd and 4th of October was evacuated by the Hungarian troops. The treasure of the Austrian national bank was removed here from Vienna in 1866, when that city was threatened by the Prussians.

KOMATI, a river of south-eastern Africa. It rises at an elevation of about 5000 ft. in the Ermelo district of the Transvaal, 11 m. W. of the source of the Vaal, and flowing in a general N. and E. direction reaches the Indian Ocean at Delagoa Bay, after a course of some 500 miles. In its upper valley near Steynsdorp are gold-fields, but the reefs are almost entirely of low grade ore. The river descends the Drakensberg by a pass 30 m. S. of Barberton, and at the eastern border of Swaziland is deflected northward, keeping a course parallel to the Lebombo mountains. Just W. of 32° E. and in 25° 25′ S. it is joined by one of the many rivers of South Africa named Crocodile. This tributary rises, as the Elands river, in the Bergendal (6437 ft.) near the upper waters of the Komati, and flows E. across the high veld, being turned northward as it reaches the Drakensberg escarpment. The fall to the low veld is over 2000 ft. in 30 m., and across the country between the Drakensberg and the Lebombo (100 m.) there is a further fall of 3000 ft. A mile below the junction of the Crocodile and Komati, the united stream, which from this point is also known as the Manhissa, passes to the coast plain through a cleft 626 ft. high in the Lebombo known as Komati Poort, where are some picturesque falls. At Komati Poort, which marks the frontier between British and Portuguese territory, the river is less than 60 m. from its mouth in a direct line, but in crossing the plain it makes a wide sweep of 200 m., first N. and then S., forming lagoon-like expanses and backwaters and receiving from the north several tributaries. In flood time there is a connexion northward through the swamps with the basin of the Limpopo. The Komati enters the sea 15 m. N. of Lourenço Marques. It is navigable from its mouth, where the water is from 12 to 18 ft. deep, to the foot of the Lebombo.

The railway from Lourenço Marques to Pretoria traverses the plain in a direct line, and at mile 45 reaches the Komati. It follows the south bank of the river and enters the high country at Komati Poort. At a small town with the same name, 2 m. W. of the Poort, on the 23rd of September 1900, during the war with England, 3000 Boers crossed the frontier and surrendered to the Portuguese authorities. From the Poort westward the railway skirts the south bank of the Crocodile river throughout its length.

KOMOTAU (Czech, *Chomûtov*), a town of Bohemia, Austria 79 m. N.N.W. of Prague by rail. Pop. (1900), 15,925, almost exclusively German. It has an old Gothic church, and its town-hall was formerly a commandery of the Teutonic knights. The industrial establishments comprise manufactories of woollen cloth, linen and paper, dyeing houses, breweries, distilleries, vinegar works and the central workshops of the Buschtěhrad railway. Lignite is worked in the neighbourhood. Komotau was originally a Czech market-place, but in 1252 it came into the possession of the Teutonic Order and was completely Germanized. In 1396 it received a town charter; and in 1416 the knights sold both town and lordship to Wenceslaus IV. On the 16th of March 1421, the town was stormed by the Taborites, sacked and burned. After several changes of ownership, Komotau came in 1588 to Popel of Lobkovic, who established the Jesuits here, which led to trouble between the Protestant burghers and the over-lord. In 1594 the lordship fell to the crown, and in 1605 the town purchased its freedom and was created a royal city.

KOMURA, JUTARO, Count (1855–), Japanese statesman, was born in Hiuga. He graduated at Harvard in 1877, and entered the foreign office in Tokyo in 1884. He served as chargé d'affaires in Peking, as Japanese minister in Seoul, in Washington, in St Petersburg, and in Peking (during the Boxer trouble), earning in every post a high reputation for diplomatic ability. In 1901 he received the portfolio of foreign affairs, and held it throughout the course of the negotiations with Russia and the subsequent war (1904–5), being finally appointed by his sovereign to meet the Russian plenipotentiaries at Portsmouth, and subsequently the Chinese representatives in Peking, on which occasions the Portsmouth treaty of September 1905 and the Peking treaty of November in the same year were concluded. For these services, and for negotiating the second Anglo-Japanese alliance, he received the Japanese title of count and was made a K.C.B. by King Edward VII. He resigned his portfolio in 1906 and became privy councillor, from which post he was transferred to the embassy in London, but he returned to Tokyo in 1908 and resumed the portfolio of foreign affairs in the second Katsura cabinet.

KONARAK or Kanarak, a ruined temple in India, in the Puri district of Orissa, which has been described as for its size "the most richly ornamented building—externally at least—in the whole world." It was erected in the middle of the 13th century, and was dedicated to the sun-god. It consisted of a tower, probably once over 180 ft. high, with a porch in front 140 ft. high, sculptured with figures of lions, elephants, horses, &c.

KONG, the name of a town, district and range of hills in the N.W. of the Ivory Coast colony, French West Africa. The hills are part of the band of high ground separating the inner plains of West Africa from the coast regions. In maps of the first half of the 19th century the range is shown as part of a great mountain chain supposed to run east and west across Africa, and is thus made to appear a continuation of the Mountains of the Moon, or the snow-clad heights of Ruwenzori. The culminating point of the Kong system is the Pic des Kommono, 4757 ft. high. In general the summits of the hills are below 2000 ft. and not more than 700 ft. above the level of the country. The "circle of Kong," one of the administrative divisions of the Ivory Coast colony, covers 46,000 sq. m. and has a population of some 400,000. The inhabitants are negroes, chiefly Bambara and Mandingo. About a fourth of the population profess Mahommedanism; the remainder are spirit worshippers. The town of Kong, situated in 9° N., 4°20′ W., is not now of great importance. Probably René Caillié, who spent some time in the western part of the country in 1827, was the first European to visit Kong. In 1888 Captain L. G. Binger induced the native chiefs to place themselves under the protection of France, and in 1893 the protectorate was attached to the Ivory Coast colony. For a time Kong was overrun by the armies of Samory (see Senegal), but the capture of that chief in 1898 was followed by the peaceful development of the district by France (see Ivory Coast).

KONGSBERG, a mining town of Norway in Buskerud *amt* (county), on the Laagen, 500 ft. above the sea, and 61 m. W.S.W.

of Christiania by rail. Pop. (1900), 5585. With the exception of the church and the town-house, the buildings are mostly of wood. The origin and whole industry of the town are connected with the government silver-mines in the neighbourhood. Their first discovery was made by a peasant in 1623, since which time they have been worked with varying success. During the 18th century Kongsberg was more important than now, and contained double its present population. Within the town are situated the smelting-works, the mint, and a Government weapon factory. Three miles below the Laagen forms a fine fall of 140 ft. (Labrofos). The neighbouring Jonksnut (2950 ft.) commands extensive views of the Telemark. A driving-road from Kongsberg follows a favourite route for travellers through this district, connecting with routes to Sand and Odde on the west coast.

KONIA. (1) A vilayet in Asia Minor which includes the whole, or parts of, Pamphylia, Pisidia, Phrygia, Lycaonia, Cilicia and Cappadocia. It was formed in 1864 by adding to the old eyalet of Karamania the western half of Adana, and part of south-eastern Anadoli. It is divided into five sanjaks: Adalia, Buldur, Hamid-abad, Konia and Nigdeh. The population (990,000 Moslems and 80,000 Christians) is for the most part agricultural and pastoral. The only industries are carpet-weaving and the manufacture of cotton and silk stuffs. There are mines of chrome, mercury, cinnabar, argentiferous lead and rock salt. The principal exports are salt, minerals, opium, cotton, cereals, wool and live stock; and the imports cloth-goods, coffee, rice and petroleum. The vilayet is now traversed by the Anatolian railway, and contains the railhead of the Ottoman line from Smyrna.

(2) The chief town [anc. *Iconium* (*q.v.*)], altitude 3320 ft., situated at the S.W. edge of the vast central plain of Asia Minor, amidst luxuriant orchards famous in the middle ages for their yellow plums and apricots and watered by streams from the hills. Pop. 45,000, including 5000 Christians. There are interesting remains of Seljuk buildings, all showing strong traces of Persian influence in their decorative details. The principal ruin is that of the palace of Kilij Arslan II., which contained a famous hall. The most important mosques are the great *Tekke*, which contains the tomb of the poet Mevlana Jelal ed-din Rumi, a mystic (sufi) poet, founder of the order of Mevlevi (whirling) dervishes, and those of his successors, the "Golden" mosque and those of Ala ed-Din and Sultan Selim. The walls, largely the work of Ala ed-Din I., are preserved in great part and notable for the number of ancient inscriptions built into them. They once had twelve gates and were 30 ells in height. The climate is good—hot in summer and cold, with snow, in winter. Konia is connected by railway with Constantinople and is the starting-point of the extension towards Bagdad. After the capture of Nicaea by the Crusaders (1097), Konia became the capital of the Seljuk Sultans of Rum (see SELJUKS and TURKS). It was temporarily occupied by Godfrey, and again by Frederick Barbarossa, but this scarcely affected its prosperity. During the reign of Ala ed-Din I. (1219–1236) the city was thronged with artists, poets, historians, jurists and dervishes, driven westwards from Persia and Bokhara by the advance of the Mongols, and there was a brief period of great splendour. After the break up of the empire of Rum, Konia became a secondary city of the amirate of Karamania and in part fell to ruin. In 1472 it was annexed to the Osmanli empire by Mahommed II. In 1832 it was occupied by Ibrahim Pasha who defeated and captured the Turkish general, Reshid Pasha, not far from the walls. It had come to fill only part of its ancient circuit, but of recent years it has revived considerably, and, since the railway reached it, has acquired a semi-European quarter, with a German hotel, cafés and Greek shops, &c.

See W. M. Ramsay, *Historical Geography of Asia Minor* (1890); *St Paul the Traveller* (1895); G. Le Strange, *Lands of the E. Caliphate* (1905). (D. G. H.)

KONIECPOLSKI, STANISLAUS (1591–1646), Polish soldier, was the most illustrious member of an ancient Polish family which rendered great services to the Republic. Educated at the academy of Cracow, he learned the science of war under the great Jan Chodkiewicz, whom he accompanied on his Muscovite campaigns, and under the equally great Stanislaus Zolkiewski, whose daughter Catherine he married. On the death of his first wife he wedded, in 1619, Christina Lubomirska. In 1619 he took part in the expedition against the Turks which terminated so disastrously at Cecora, and after a valiant resistance was captured and sent to Constantinople, where he remained a close prisoner for three years. On his return he was appointed commander of all the forces of the Republic, and at the head of an army of 25,000 men routed 60,000 Tatars at Martynow, following up this success with fresh victories, for which he received the thanks of the diet and the palatinate of Sandomeria from the king. In 1625 he was appointed guardian of the Ukraine against the Tatars, but in 1626 was transferred to Prussia to check the victorious advance of Gustavus Adolphus. Swedish historians have too often ignored the fact that Koniecpolski's superior strategy neutralized all the efforts of the Swedish king, whom he defeated again and again, notably at Homerstein (April 1627) and at Trzciand (April 1629). But for the most part the fatal parsimony of his country compelled Koniecpolski to confine himself to the harassing guerrilla warfare in which he was an expert. In 1632 he was appointed to the long vacant post of *hetman wielki koronny*, or commander in chief of Poland, and in that capacity routed the Tatars at Sasowy Rogi (April 1633) and at Paniawce (April and October 1633), and the Turks, with terrific loss, at Abazd Basha. To keep the Cossacks of the Ukraine in order he also built the fortress of Kudak. As one of the largest proprietors in the Ukraine he suffered severely from Cossack depredations and offered many concessions to them. Only after years of conflict, however, did he succeed in reducing these unruly desperadoes to something like obedience. In 1644 he once more routed the Tatars at Ockmatow, and again in 1646 at Brody. This was his last exploit, for he died the same year, to the great grief of Wladislaus IV., who had already concerted with him the plan for a campaign on a grand scale against the Turks, and relied principally upon the Grand Hetman for its success. Though less famous than his contemporaries Zolkiehwski and Chodkiewicz, Koniecpolski was fully their equal as a general, and his inexorable severity made him an ideal lord-marcher.

See an unfinished biography in the *Tyg. Illus. of Warsaw* for 1863; Stanislaw Przylenski, *Memorials of the Koniecpolskis* (Pol.) (Lemberg, 1842). (R. N. B.)

KÖNIG, KARL RUDOLPH (1832–1901), German physicist, was born at Königsberg (Prussia) on the 26th of November 1832, and studied at the university of his native town, taking the degree of Ph.D. About 1852 he went to Paris, and became apprentice to the famous violin-maker, J. B. Vuillaume, and some six years later he started business on his own account. He called himself a "maker of musical instruments," but the instruments for which his name is best known are tuning-forks, which speedily gained a high reputation among physicists for their accuracy and general excellence. From this business König derived his livelihood for the rest of his life. He was, however, very far from being a mere tradesman, and even as a manufacturer he regarded the quality of the articles that left his workshop as a matter of greater solicitude than the profits they yielded. Acoustical research was his real interest, and to that he devoted all the time and money he could spare from his business. An exhibit which he sent to the London Exhibition of 1862 gained a gold medal, and at the Philadelphia Exposition at 1876 great admiration was expressed for a tonometric apparatus of his manufacture. This consisted of about 670 tuning-forks, of as many different pitches, extending over four octaves, and it afforded a perfect means for testing, by enumeration of the beats, the number of vibrations producing any given note and for accurately tuning any musical instrument. An attempt was made to secure this apparatus for the university of Pennsylvania, and König was induced to leave it behind him in America on the assurance that it would be purchased; but, ultimately, the money not being forthcoming, the arrangement fell through, to his great disappointment and pecuniary loss. Some of the forks he disposed of to the university of Toronto and the remainder he used as a nucleus for the construction of a still more elaborate tonometer. While the range of the old apparatus was only between 128 and 4096 vibrations a second, the lowest fork of the new one made only 16 vibrations a second, while the highest gave a sound too shrill to be perceptible by the human ear. König will also be remembered as the inventor and constructor of many other beautiful pieces of apparatus for the investigation of acoustical problems, among which may be mentioned his wave-sirens, the first of which was shown at Philadelphia in 1876. His original work dealt, among other things, with Wheatstone's sound-figures, the characteristic notes of the different vowels, manometric flames, &c.; but perhaps the most important of his researches are those devoted to the phenomena produced by the interference of two tones, in which he controverted the views of H. von Helmholtz as to the existence of summation and difference tones. He died in Paris on the 2nd of October 1901.

KÖNIGGRÄTZ (Czech, *Hradec Králové*), a town and episcopal see of Bohemia, Austria, 74 m. E. of Prague by rail. Pop. (1900), 9773, mostly Czech. It is situated in the centre of a very fertile region called the "Golden Road," and contains many buildings of historical and architectural interest. The cathedral was founded in 1303 by Elizabeth, wife of Wenceslaus II; and the church of St John, built in 1710, stands on the ruins of the old castle. The industries include the manufacture of musical instruments, machinery, colours, and *carton-pierre*, as well as gloves and wax candles. The original name of Königgrätz, one of the oldest settlements in Bohemia, was *Chlumec Dobroslavský*; the name *Hradec*, or "the Castle," was given to it when it became the seat of a count, and *Kralove*, "of the queen" (Ger. *Königin*), was prefixed when it became one of the dower towns of the queen of Wenceslaus II., Elizabeth of Poland, who lived here for thirty years. It remained a dower town till 1620. Königgrätz was the first of the towns to declare for the national cause during the Hussite wars. After the battle of the White Mountain (1620) a large part of the Protestant population left the place. In 1639 the town was occupied for eight months by the Swedes. Several churches and convents were pulled down to make way for the fortifications erected under Joseph II. The fortress was finally dismantled in 1884. Near Königgrätz took place, on the 3rd of July 1866, the decisive battle (formerly called Sadowa) of the Austro-Prussian war (see SEVEN WEEKS' WAR).

KÖNIGINHOF (*Dvur Kralove* in Czech), the seat of a provincial district and of a provincial law-court, is situated in north-eastern Bohemia on the left bank of the Elbe, about 160 kilometres from Prague. Brewing, corn-milling and cotton-weaving are the principal industries. Pop. about 11,000. The city is of very ancient origin. Founded by King Wenceslaus II. of Bohemia (1278–1305), it was given by him to his wife Elizabeth, and thus received the name of Dvur Kralove (the court of the queen). During the Hussite wars, Dvur Kralove was several times taken and retaken by the contending parties. In a battle fought partly within the streets of the town, the Austrian army was totally defeated by the Prussians on the 29th of June 1866. In the 19th century Dvur Kralove became widely known as the spot where a MS. was found that was long believed to be one of the oldest written documents in the Czech language. In 1817 Wenceslas Hanka, afterwards for a long period librarian of the Bohemian museum, declared that he had found in the church tower in the town of Dvur Kralove when on a visit there, a very ancient MS. containing epic and lyric poems. Though Dobrovsky, the greatest Czech philologist of the time, from the first expressed suspicions, the MS. known as the Kralodvorsky Rukopis manuscript of Königinhof was long accepted as genuine, frequently printed and translated into most European languages. Doubts as to the genuineness of the document never, however, ceased, and they became stronger when Hanka was convicted of having fabricated other false Bohemian documents. A series of works and articles written by Professors Goll, Gebauer, Masoryk, and others have recently proved that the MS. is a forgery, and hardly any Bohemian scholars of the present day believe in its genuineness.

The discussion of the authenticity of the MS. of Dvur Kralove lasted with short interruptions about seventy years, and the Bohemian works written on the subject would fill a considerable library. Count Lützow's *History of Bohemian Literature* gives a brief account of the controversy.

KÖNIGSBERG (Polish *Krolewiec*), a town of Germany, capital of the province of East Prussia and a fortress of the first rank. Pop. (1880), 140,800; (1890), 161,666; (1905), 219,862 (including the incorporated suburbs). It is situated on rising ground, on both sides of the Pregel, 4½ m. from its mouth in the Frische Haff, 397 m. N. E. of Berlin, on the railway to Eydtkuhnen and at the junction of lines to Pillau, Tilsit and Kranz. It consists of three parts, which were formerly independent administrative units, the Altstadt (old town), to the west, Löbenicht to the east, and the island Kneiphof, together with numerous suburbs, all embraced in a circuit of 9½ miles. The Pregel, spanned by many bridges, flows through the town in two branches, which unite below the Grüne Brücke. Its greatest breadth within the town is from 80 to 90 yards, and it is usually frozen from November to March. Königsberg does not retain many marks of antiquity. The Altstadt has long and narrow streets, but the Kneiphof quarter is roomier. Of the seven market-places only that in the Altstadt retains something of its former appearance. Among the more interesting buildings are the Schloss, a long rectangle begun in 1255 and added to later, with a Gothic tower 277 ft. high and a chapel built in 1592, in which Frederick I. in 1701 and William I. in 1861 crowned themselves kings of Prussia; and the cathedral, begun in 1333 and restored in 1856, a Gothic building with a tower 164 ft. high, adjoining which is the tomb of Kant. The Schloss was originally the residence of the Grand Masters of the Teutonic order and later of the dukes of Prussia. Behind is the parade-ground, with the statues of Albert I. and of Frederick William III. by August Kiss, and the grounds also contain monuments to Frederick I. and William I. To the east is the Schlossteich, a long narrow ornamental lake covering 12 acres. The north-west side of the parade-ground is occupied by the new university buildings, completed in 1865; these and the new exchange on the south side of the Pregel are the finest architectural features of the town. The university (Collegium Albertinum) was founded in 1544 by Albert I., duke of Prussia, as a "purely Lutheran" place of learning. It is chiefly distinguished for its mathematical and philosophical studies, and possesses a famous observatory, established in 1811 by Frederick William Bessel, a library of about 240,000 volumes, a zoological museum, a botanical garden, laboratories and valuable mathematical and other scientific collections. Among its famous professors have been Kant (who was born here in 1724 and to whom a monument was erected in 1864), J. G. von Herder, Bessel, F. Neumann and J. F. Herbart. It is attended by about 1000 students and has a teaching staff of over 100. Among other educational establishments, Königsberg numbers four classical schools (gymnasia) and three commercial schools, an academy of painting and a school of music. The hospitals and benevolent institutions are numerous. The town is less well equipped with museums and similar institutions, the most noteworthy being the Prussia museum of antiquities, which is especially rich in East Prussian finds from the Stone age to the Viking period. Besides the cathedral the town has fourteen churches.

Königsberg is a naval and military fortress of the first order. The fortifications were begun in 1843 and were only completed in 1905, although the place was surrounded by walls in early times. The works consist of an inner wall, brought into connexion with an outlying system of works, and of twelve detached forts, of which six are on the right and six on the left bank of the Pregel. Between them lie two great forts, that of Friedrichsburg on an island in the Pregel and that of the Kaserne Kronprinz on the east of the town, both within the environing ramparts. The protected position of its harbour has made Königsberg one of the most important commercial cities of Germany. A new channel has recently been made between it and its port, Pillau, 29 miles distant, on the outer side of the Frische Haff, so as to admit vessels drawing 20 feet of water right up to the quays of

Königsberg, and the result has been to stimulate the trade of the city. It is protected for a long distance by moles, in which a break has been left in the Fischhauser Wiek, to permit of freer circulation of the water and to prevent damage to the mainland.

The industries of Königsberg have made great advances within recent years, notable among them are printing-works and manufactures of machinery, locomotives, carriages, chemicals, toys, sugar, cellulose, beer, tobacco and cigars, pianos and amber wares. The principal exports are cereals and flour, cattle, horses, hemp, flax, timber, sugar and oilcake. There are two pretty public parks, one in the Hufen, with a zoological garden attached, another the Luisenwahl which commemorates the sojourn of Queen Louisa of Prussia in the town in the disastrous year 1806.

The Altstadt of Königsberg grew up around the castle built in 1255 by the Teutonic Order, on the advice of Ottaker II. King of Bohemia, after whom the place was named. Its first site was near the fishing village of Steindamm, but after its destruction by the Prussians in 1263 it was rebuilt in its present position. It received civic privileges in 1286, the two other parts of the present town—Löbenicht and Kneiphof—receiving them a few years later. In 1340 Königsberg entered the Hanseatic League. From 1457 it was the residence of the grand master of the Teutonic Order, and from 1525 till 1618 of the dukes of Prussia. The trade of Königsberg was much hindered by the constant shifting and silting up of the channels leading to its harbour; and the great northern wars did it immense harm, but before the end of the 17th century it had almost recovered.

In 1724 the three independent parts were united into a single town by Frederick William I.

Königsberg suffered severely during the war of liberation and was occupied by the French in 1807. In 1813 the town was the scene of the deliberations which led to the successful uprising of Prussia against Napoleon. During the 19th century the opening of a railway system in East Prussia and Russia gave a new impetus to its commerce, making it the principal outlet for the Russian staples—grain, seeds, flax and hemp. It has now regular steam communication with Memel, Stettin, Kiel, Amsterdam and Hull.

See Faber, *Die Haupt- und Residenzstadt Königsberg in Preussen* (Königsberg, 1840); Schubert, *Zur 600-jährigen Jubelfeier Königsbergs* (Königsberg, 1855); Beckherrn, *Geschichte der Befestigungen Königsbergs* (Königsberg, 1890); H. G. Prutz, *Die königliche Albertus-Universität zu Königsberg im 19 Jahrhundert* (Königsberg, 1894); Armstedt, *Geschichte der königlichen Haupt- und Residenzstadt Königsberg* (Stuttgart, 1899); M. Schultze, *Königsberg und Ostpreussen zu Anfang 1813* (Berlin, 1901); and Gordak, *Wegweiser durch Königsberg* (Königsberg, 1904).

KÖNIGSBORN, a spa of Germany, in the Prussian province of Westphalia, immediately to the N. of the town of Unna, of which it practically forms a suburb. It has large saltworks, producing annually over 15,000 tons. The brine springs, in connexion with which there is a hydropathic establishment, have a temperature of 93° F., and are efficacious in skin diseases, rheumatism and scrofula.

See Wegele, *Bad Königsborn und seine Heilmittel* (Essen, 1902).

KÖNIGSHÜTTE, a town of Germany, in the Prussian province of Silesia, situated in the middle of the Upper Silesian coal and iron district, 3 m. S. of Beuthen and 122 m. by rail S.E. of Breslau. Pop. (1852), 4495; (1875), 26,040; (1900), 57,919. In 1869 it was incorporated with various neighbouring villages, and raised to the dignity of a town. It has two Protestant and three Roman Catholic churches and several schools and benevolent institutions. The largest iron-works in Silesia is situated at Königshütte, and includes puddling works, rolling-mills, and zinc-works. Founded in 1797, it was formerly in the hands of government, but is now carried on by a company. There are also manufactures of bricks and glass and a trade in wood and coal. Nearly one-half of the population of the town consists of Poles.

See Mohr, *Geschichte der Stadt Königshütte* (Königshütte, 1890).

KÖNIGSLUTTER, a town of Germany, in the duchy of Brunswick, on the Lutter 36 m. E. of Brunswick by the railway to Eisleben and Magdeburg. Pop. (1905), 3260. It possesses an Evangelical church, a castle and some interesting old houses. Its chief manufactures are sugar, machinery, paper and beer. Near the town are the ruins of a Benedictine abbey founded in 1135. In its beautiful church, which has not been destroyed, are the tombs of the emperor Lothair II., his wife Richenza, and of his son-in-law, Duke Henry the Proud of Saxony and Bavaria.

KÖNIGSMARK, MARIA AURORA, Countess of (1662–1728), mistress of Augustus the Strong, elector of Saxony and king of Poland, belonged to a noble Swedish family, and was born on the 8th of May 1662. Having passed some years at Hamburg, where she attracted attention both by her beauty and her talents, Aurora went in 1694 to Dresden to make inquiries about her brother Philipp Christoph, count of Königsmark, who had suddenly and mysteriously disappeared from Hanover. Here she was noticed by Augustus, who made her his mistress; and in October 1696 she gave birth to a son Maurice, afterwards the famous marshal de Saxe. The elector however quickly tired of Aurora, who then spent her time in efforts to secure the position of abbess of Quedlinburg, an office which carried with it the dignity of a princess of the Empire, and to recover the lost inheritance of her family in Sweden. She was made coadjutor abbess and lady-provost (*Pröpstin*) of Quedlinburg, but lived mainly in Berlin, Dresden and Hamburg. In 1702 she went on a diplomatic errand to Charles XII. of Sweden on behalf of Augustus, but her adventurous journey ended in failure. The countess, who was described by Voltaire as "the most famous woman of two centuries," died at Quedlinburg on the 16th of February 1728.

See F. Cramer, *Denkwürdigkeiten der Gräfin M. A. Königsmark* (Leipzig, 1836); and *Biographische Nachrichten von der Gräfin M. A. Königsmark* (Quedlinburg, 1833); W. F. Palmblad, *Aurora Königsmark und ihre Verwandte* (Leipzig, 1848–1853); C. L. de Pöllnitz, *La Saxe galante* (Amsterdam, 1734); and O. J. B. von Corvin-Wiersbitzki, *Maria Aurora, Gräfin von Königsmark* (Rudolstadt, 1902).

KÖNIGSMARK, PHILIPP CHRISTOPH, Count of (1665–1694), was a member of a noble Swedish family, and is chiefly known as the lover of Sophia Dorothea, wife of the English king George I. then electoral prince of Hanover. Born on the 14th of March 1665, Königsmark was a brother of the countess noticed above. After wandering and fighting in various parts of Europe he entered the service of Ernest Augustus, elector of Hanover. Here he made the acquaintance of Sophia Dorothea, and assisted her in one or two futile attempts to escape from Hanover. Regarded, rightly or wrongly, as the lover of the princess, he was seized, and disappeared from history, probably by assassination, on the 1st of July 1694. One authority states that George I. was accustomed to boast about this deed; but this statement is doubted, and the Hanoverian court resolutely opposed all efforts to clear up the mystery. It is not absolutely certain that Sophia Dorothea was guilty of a criminal intrigue with Königsmark, as it is probable that the letters which purport to have passed between the pair are forgeries. The question of her guilt or innocence, however, has been and still remains a fruitful and popular subject for romance and speculation.

See *Briefwechsel des Grafen Königsmark und der Prinzessin Sophie Dorothea von Celle*, edited by W. F. Palmblad (Leipzig, 1847); A. Köcher, "Die Prinzessin von Ahlden," in the *Historische Zeitschrift* (Munich, 1882); and W. H. Wilkins, *The Love of an Uncrowned Queen* (London, 1900).

KÖNIGSSEE, or Lake of St Bartholomew, a lake of Germany, in the kingdom of Bavaria, province of Upper Bavaria, about 2½ m. S. from Berchtesgaden, 1850 ft. above sea-level. It has a length of 5 m., and a breadth varying from 500 yards to a little over a mile, and attains a maximum depth of 600 ft. The Königssee is the most beautiful of all the lakes in the German Alps, pent in by limestone mountains rising to an altitude of 6500 ft., the flanks of which descend precipitously to the green waters below. The lake abounds in trout, and the surrounding country is rich in game. On a promontory by the side of the lake is a chapel to which pilgrimages are made on St Bartholomew's Day. Separated by a narrow strip of land from the Königssee is the Obersee, a smaller lake.

KÖNIGSTEIN, a town of Germany, in the kingdom of Saxony, situated in a deep valley on the left bank of the Elbe, at the influx of the Biela, in the centre of Saxon Switzerland, 25 m. S.E. of Dresden by the railway to Bodenbach and Testchen. It contains a Roman Catholic and a Protestant church, a monument to the composer Julius Otto, and has some small manufactures of machinery, celluloid, paper, vinegar and buttons. It is chiefly remarkable for the huge fortress, lying immediately to the north-west of the town, which crowns a sandstone rock rising abruptly from the Elbe to a height of 750 ft. Across the Elbe lies the Lilienstein, a similar formation, but unfortified. The fortress of Königstein was probably a Slav stronghold as early as the 12th century, but it is not mentioned in chronicles before the year 1241, when it was a fief of Bohemia. In 1401 it passed to the margraves of Meissen and by the treaty of Eger in 1459 it was formally ceded by Bohemia to Saxony. About 1540 the works were strengthened, and the place was used as a *point d'appui* against inroads from Bohemia. Hence the phrase frequently employed by historians that Königstein is "the key to Bohemia." As a fact, the main road from Dresden into that country lies across the hills several miles to the south-west, and the fortress has exercised little, if any, influence in strategic operations, either during the middle ages or in modern times. It was further strengthened under the electors Christian I., John George I. and Frederick Augustus II. of Saxony, the last of whom completed it in its present form. During the Prussian invasion of Saxony in 1756 it served as a place of refuge for the King of Poland, Augustus III., as it did also in 1849, during the Dresden insurrection of May in that year, to the King of Saxony, Frederick Augustus II. and his ministers. It was occupied by the Prussians in 1867, who retained possession of it until the peace of 1871. It is garrisoned by detachments of several Saxon infantry regiments, and serves as a treasure house for the state and also as a place of detention for officers sentenced to fortress imprisonment. A remarkable feature of the place is a well, hewn out of the solid rock to a depth of 470 ft.

See Klemm, *Der Königstein in alter und neuer Zeit* (Leipzig, 1905); and Gautsch, *Aelteste Geschichte der sächsischen Schweiz* (Dresden, 1880).

KÖNIGSWINTER, a town and summer resort of Germany, in the Prussian Rhine province, on the right bank of the Rhine, 24 m. S.S.E. of Cologne by the railway to Frankfort-on-Main, at the foot of the Siebengebirge. Pop. (1905), 3944. The romantic Drachenfels (1010 ft.), crowned by the ruins of a castle built early in the 12th century by the archbishop of Cologne, rises behind the town. From the summit, to which there is a funicular railway, there is a magnificent view, celebrated by Byron in *Childe Harold's Pilgrimage*. A cave in the hill is said to have sheltered the dragon which was slain by the hero Siegfried. The mountain is quarried, and from 1267 onward supplied stone (trachyte) for the building of Cologne cathedral. The castle of Drachenburg, built in 1883, is on the north side of the hill. Königswinter has a Roman Catholic and an Evangelical church, some small manufactures and a little shipping. It has a monument to the poet, Wolfgang Müller. Near the town are the ruins of the abbey of Heisterbach.

KONINCK, LAURENT GUILLAUME DE (1809–1887), Belgian palaeontologist and chemist, was born at Louvain on the 3rd of May 1809. He studied medicine in the university of his native town, and in 1831 he became assistant in the chemical schools. He pursued the study of chemistry in Paris, Berlin and Giessen, and was subsequently engaged in teaching the science at Ghent and Liége. In 1856 he was appointed professor of chemistry in the Liége University, and he retained this post until the close of his life. About the year 1835 he began to devote his leisure to the investigation of the Carboniferous fossils around Liége, and ultimately he became distinguished for his researches on the palaeontology of the Palaeozoic rocks, and especially for his descriptions of the mollusca, brachiopods, crustacea and crinoids of the Carboniferous limestone of Belgium. In recognition of this work the Wollaston medal was awarded to him in 1875 by the Geological Society of London, and in 1876 he was appointed professor of palaeontology at Liége. He died at Liége on the 16th of July 1887.

Publications.—*Éléments de chimie inorganique* (1839); *Description des animaux fossiles qui se trouvent dans le terrain Carbonifère de Belgique* (1842–1844, supp. 1851); *Recherches sur les animaux fossiles* (1847, 1873). See *Notice sur L. G. de Koninck*, by E. Dupont; *Annuaire de l'Acad. roy. de Belgique* (1891), with portrait and bibliography.

KONINCK, PHILIP DE [de Coninck, de Koningh, van Koening] (1619–1688), Dutch landscape painter, was born in Amsterdam in 1619. Little is known of his history, except that he was a pupil of Rembrandt, whose influence is to be seen in all his work. He painted chiefly broad sunny landscapes, full of space, light and atmosphere. Portraits by him, somewhat in the manner of Rembrandt, also exist; there are examples of these in the galleries at Copenhagen and Christiania. Of his landscapes the principal are "Vue de l'embouchure d'une rivière," at the Hague; a slightly larger replica is in the National Gallery, London; "Lisière d'un bois," and "Paysage" (with figures by A. Vandevelde) at Amsterdam; and landscapes in Brussels, Florence (Uffizi), Berlin and Cologne.

Several of his works have been falsely attributed to Rembrandt, and many more to his namesake and fellow-townsman Salomon de Koninck (1609–1656), who was also a disciple of Rembrandt; his paintings and etchings consist mainly of portraits and biblical scenes.

Both these painters are to be distinguished from David de Koninck (1636–? 1687), who is also known as "Rammelaar." He was born in Antwerp. He studied there under Jan Fyt, and later settled in Rome, where he is stated to have died in 1687; this is, however, doubtful. His pictures are chiefly landscapes with animals, and still-life.

KONITZ, a town of Germany, in the province of West Prussia, at the junction of railways to Schneidemühl and Gnesen, 68 m. S.W. of Danzig. Pop. (1905), 11,014. It is still surrounded by its old fortifications, has two Evangelical and two Roman Catholic churches, a new town-hall, handsome public offices, and a prison. It has iron-foundries, saw-mills, electrical works, and manufactures of bricks. Konitz was the first fortified post established in Prussia by Hermann Balk, who in 1230 had been commissioned as *Landmeister*, by the grand-master of the Teutonic order, to reduce the heathen Prussians. For a long time it continued to be a place of military importance.

See Uppenkamp, *Geschichte der Stadt Konitz* (Konitz, 1873).

KONKAN, or Concan, a maritime tract of Western India, situated within the limits of the Presidency of Bombay, and extending from the Portuguese settlement of Goa on the S. to the territory of Daman, belonging to the same nation, on the N. On the E. it is bounded by the Western Ghats, and on the W. by the Indian Ocean. This tract comprises the three British districts of Thana, Ratnagiri and Kolaba, and the native states of Janjira and Sawantwari. It may be estimated at 300 m. in length, with an average breadth of about 40. From the mountains on its eastern frontier, which in one place attain a height of 4700 ft., the surface, marked by a succession of irregular hilly spurs from the Ghats, slopes to the westward, where the mean elevation of the coast is not more than 100 ft. above the level of the sea. Several mountain streams, but none of any magnitude, traverse the country in the same direction. One of the most striking characteristics of the climate is the violence of the monsoon rains—the mean annual fall at Mahabaleshwar amounting to 239 in. The coast has a straight general outline, but is much broken into small bays and harbours. This, with the uninterrupted view along the shore, and the land and sea breezes, which force vessels steering along the coast to be always within sight of it, rendered this country from time immemorial the seat of piracy; and so formidable had the pirates become in the 18th century, that all ships suffered which did not receive a pass from their chiefs. The Great Mogul maintained a fleet for the express purpose of checking them, and they were frequently attacked by the Portuguese. British commerce was protected by occasional expeditions from Bombay; but the piratical system was not finally extinguished until 1812. The southern Konkan has given its name to a dialect of Marathi, which is the vernacular of the Roman Catholics of Goa.

KONTAGORA, a province in the British protectorate of Northern Nigeria, on the east bank of the Niger to the north of Nupe and opposite Borgu. It is bounded W. by the Niger, S. by the province of Nupe, E. by that of Zaria, and N. by that of Sokoto. It has an area of 14,500 sq. m. and a population estimated at about 80,000. At the time of the British occupation of Northern Nigeria the province formed a Fula emirate. Before the Fula domination, which was established in 1864, the ancient pagan kingdom of Yauri was the most important of the lesser kingdoms which occupied this territory. The Fula conquest was made from Nupe on the south and a tribe of independent and warlike pagans continued to hold the country between Kontagora and Sokoto on the north. The province was brought under British domination in 1901 as the result of a military expedition sent to prevent audacious slave-raiding in British protected territory and of threats directed against the British military station of Jebba on the Niger. The town of Kontagora was taken in January of 1901. The emir Ibrahim fled, and was not captured till early in 1902. The province, after having been held for a time in military occupation, was organized for administration on the same system as the rest of the protectorate. In 1903 Ibrahim, after agreeing to take the oath of allegiance to the British crown and to accept the usual conditions of appointment, which include the abolition of the slave trade within the province, was reinstated as emir and the British garrison was withdrawn. Since then the development of the province has progressed favourably. Roads have been opened and Kontagora connected by telegraph with headquarters at Zungeru. British courts of justice have been established at the British headquarters, and native courts in every district. In 1904 an expedition reduced to submission the hitherto independent tribes in the northern belt, who had up to that time blocked the road to Sokoto. Their arms were confiscated and their country organized as a district of the province under a chief and a British assistant resident.

KOORINGA [Burra], a town of Burra county, South Australia on Burra Creek, 101 m. by rail N. by E. of Adelaide. Pop. (1901), 1994. It is the centre of a mining and agricultural district in which large areas are devoted to wheat-growing. The famous Burra Burra copper mine, discovered by a shepherd in 1844, is close to the town, while silver and lead ore is also found in the vicinity.

KÖPENICK (Cöpenick), a town of Germany, in the Prussian province of Brandenburg, on an island in the Spree, 9 m. S.E. from Berlin by the railway to Fürstenwalde. Pop. (1905), 27,721. It contains a royal residence, which was built on the site of a palace which belonged to the great elector, Frederick William. This is surrounded by gardens and contains a fine banqueting hall and a chapel. Other buildings are a Roman Catholic and a Protestant church and a teachers' seminary. The varied industries embrace the manufacture of glass, linoleum, sealing-wax and ink. In the vicinity is Spindlersfeld, with important dye-works.

Köpenick, which dates from the 12th century, received municipal rights in 1225. Shortly afterwards, it became the bone of contention between Brandenburg and Meissen, but, at the issue of the feud, remained with the former, becoming a favourite residence of the electors of Brandenburg. In the palace the famous court martial was held in 1730, which condemned the crown-prince of Prussia, afterwards Frederick the Great, to death. In 1906 the place derived ephemeral fame from the daring feat of a cobbler, one Wilhelm Voigt, who, attired as a captain in the army, accompanied by soldiers, whom his apparent rank deceived, took the mayor prisoner, on a fictitious charge of having falsified accounts and absconded with a considerable sum of municipal money. The "captain of Köpenick" was arrested, tried, and sentenced to a term of imprisonment.

See Graf zu Dohna, *Kurfürstliche Schlösser in der Mark Brandenburg* (Berlin, 1890).

KOPISCH, AUGUST (1799–1853), German poet, was born at Breslau on the 26th of May 1799. In 1815 he began the study of painting at the Prague academy, but an injury to his hand precluded the prospects of any great success in this profession, and he turned to literature. After a residence in Dresden Kopisch proceeded, in 1822, to Italy, where, at Naples, he formed an intimate friendship with the poet August, count of Platen Hallermund. He was an expert swimmer, a quality which enabled him in company with Ernst Fries to discover the blue grotto of Capri. In 1828 he settled at Berlin and was granted a pension by Frederick William IV., who in 1838 conferred upon him the title of professor. He died at Berlin on the 3rd of February 1853. Kopisch produced some very original poetry, light in language and in form. He especially treated legends and popular subjects, and among his *Gedichte* (Berlin, 1836) are some naïve and humorous little pieces such as *Die Historie von Noah, Die Heinzelmännchen, Das grüne Tier* and *Der Scheiderjunge von Krippstedt*, which became widely popular. He also published a translation of Dante's *Divine Comedy* (Berlin, 1840), and under the title *Agrumi* (Berlin, 1838) a collection of translations of Italian folk songs.

Kopisch's collected works were published in 5 vols. (Berlin, 1856.)

KOPP, HERMANN FRANZ MORITZ (1817–1892), German chemist, was born on the 30th of October 1817 at Hanau, where his father, Johann Heinrich Kopp (1777–1858), a physician, was professor of chemistry, physics and natural history at the Lyceum.

After attending the gymnasium of his native town, he studied at Marburg and Heidelberg, and then, attracted by the fame of Liebig, went in 1839 to Giessen, where he became a *privatdozent* in 1841, and professor of chemistry twelve years later. In 1864 he was called to Heidelberg in the same capacity, and he remained there till his death on the 20th of February 1892. Kopp devoted himself especially to physico-chemical inquiries, and in the history of chemical theory his name is associated with several of the most important correlations of the physical properties of substances with their chemical constitution. Much of his work was concerned with specific volumes, the conception of which he set forth in a paper published when he was only twenty-two years of age; and the principles he established have formed the basis of subsequent investigations in that subject, although his results have in some cases undergone modification. Another question to which he gave much attention was the connexion of the boiling-point of compounds, organic ones in particular, with their composition. In addition to these and other laborious researches, Kopp was a prolific writer. In 1843–1847 he published a comprehensive *History of Chemistry*, in four volumes, to which three supplements were added in 1869–1875. The *Development of Chemistry in Recent Times* appeared in 1871–1874, and in 1886 he published a work in two volumes on *Alchemy in Ancient and Modern Times*. In addition he wrote (1863) on theoretical and physical chemistry for the Graham-Otto *Lehrbuch der Chemie*, and for many years assisted Liebig in editing the *Annalen der Chemie* and the *Jahresbericht*.

He must not be confused with Emil Kopp (1817–1875), who, born at Wärselnheim, Alsace, became in 1847 professor of toxicology and chemistry at the École supérieure de Pharmacie at Strasburg, in 1849 professor of physics and chemistry at Lausanne, in 1852 chemist to a Turkey-red factory near Manchester, in 1868 professor of technology at Turin, and finally, in 1871, professor of technical chemistry at the Polytechnic of Zürich, where he died in 1875.

KÖPRÜLÜ, or Kuprili (Bulgarian *Valésa*, Greek *Vélissa*), a town of Macedonia, European Turkey, in the vilayet of Salonica, situated 600 ft. above sea-level, on the river Vardar, and on the Salonica-Mitrovitza railway, 25 m. S.E. of Uskub. Pop. (1905), about 22,000. Koprülü has a flourishing trade in silk; maize and mulberries are cultivated in the neighbourhood. The Greek and Bulgarian names of the town may be corrupt forms of the ancient Bylazora, described by Polybius as the chief city of Paeonia.

KORA, or Cora, an ancient town of Northern India, in the Fatehpur district of the United Provinces. Pop. (1901), 2806. As the capital of a Mahommedan province, it gave its name to part of the tract (with Allahabad) granted by Lord Clive to the titular Mogul emperor, Shah Alam, in 1765.

KORAN. The Koran (Kor'án) is the sacred Book of Islam. on which the religion of more than two hundred millions of Mahommedans is founded, being regarded by them as the immediate word of God. And since the use of the Koran in public worship, in schools and otherwise, is much more extensive than, for example, the reading of the Bible in most Christian countries, it has been truly described as the most widely-read book in existence. This circumstance alone is sufficient to give it an urgent claim on our attention, whether it suit our taste and fall in with our religious and philosophical views or not. Besides, it is the work of Mahomet, and as such is fitted to afford a clue to the spiritual development of that most successful of all prophets and religious personalities. It must be owned that the first perusal leaves on a European an impression of chaotic confusion—not that the book is so very extensive, for it is not quite as large as the New Testament. This impression can in some degree be modified only by the application of a critical analysis with the assistance of Arabian tradition.

To the faith of the Moslems, as has been said, the Koran is the word of God. and such also is the claim which the book itself advances. For except in sur. i.—which is a prayer for men—and some few passages where Mahomet (vi. 104, 114; xxvii. 93; xlii.8) or the angels (xix. 65; xxxvii. 164 sqq.) speak in the first person without the intervention of the usual imperative "say" (sing. or pl.), the speaker throughout is God, either in the first person singular or more commonly the plural of majesty "we." The same mode of address is familiar to us from the prophets of the Old Testament; the human personality disappears, in the moment of inspiration, behind the God by whom it is filled. But all the greatest of the Hebrew prophets fall back speedily upon the unassuming human "I"; while in the Koran the divine "I" is the stereotyped form of address. Mahomet, however, really felt himself to be the instrument of God; this consciousness was no doubt brighter at his first appearance than it afterwards became, but it never entirely forsook him. Nevertheless we cannot doubt his good-faith, not even in the cases in which the moral quality of his actions leaves most to be desired. In spite of all, the dominant fact remains, that to the end he was zealous for his God and for the salvation of his people, nay, of the whole of humanity, and that he never lost the unconquerable certainty of his divine mission.

Mahomet's View of Revelation.

The rationale of revelation is explained in the Koran itself as follows: In heaven is the original text ("the mother of the book," xliii. 3; "a concealed book," lv. 77; "a well-guarded tablet," lxxxv. 22). By the process of "sending down" (*tanzīl*), one piece after another was communicated to the Prophet. The mediator was an angel, who is called sometimes the "Spirit" (xxvi. 193), sometimes the "holy Spirit" (xvi. 104), and at a later time "Gabriel" (only in ii. 91, 92; lxvi. 4). This angel dictates the revelation to the Prophet, who repeats it after him, and afterwards proclaims it to the world (lxxxvii. 6, &c.). It is plain that we have here a somewhat crude attempt of the Prophet to represent to himself the more or less unconscious process by which his ideas arose and gradually took shape in his mind. It is no wonder if in such confused imagery the details are not always self-consistent. When, for example, this heavenly archetype is said to be in the hands of "exalted scribes" (lxxx. 13 sqq.), this seems a transition to a quite different set of ideas, namely, the books of fate, or the record of all human actions—conceptions which are actually found in the Koran. It is to be observed, at all events, that Mahomet's transcendental idea of God, as a Being exalted altogether above the world, excludes the thought of direct intercourse between the Prophet and God.

It is an explicit statement of the Koran that the sacred book was revealed ("sent down") by God, not all at once, but piecemeal and gradually (xxv. 34). This is evident from the actual composition of the book, and is confirmed by Moslem tradition. That is to say, Mahomet issued his revelations in fly-leaves of greater or less extent. A single piece of this kind was called either, like the entire collection, *kor'ān*, *i.e.* "recitation," "reading," or, better still, is the equivalent of Aramaic *geryānā* "lectionary"; or *kitāb*, "writing"; or *sūra*, which is perhaps the late-Hebrew *shūrā*, and means literally "series." The last became, in the lifetime of Mahomet, the regular designation of the individual sections as distinguished from the whole collection; and accordingly it is the name given to the separate chapters of the existing Koran. These chapters are of very unequal length. Since many of the shorter ones are undoubtedly complete in themselves, it is natural to assume that the longer, which are sometimes very comprehensive, have arisen from the amalgamation of various originally distinct revelations. This supposition is favoured by the numerous traditions which give us the circumstances under which this or that short piece, now incorporated in a larger section, was revealed; and also by the fact that the connexion of thought in the present sūras often seems to be interrupted. And in reality many pieces of the long sūras have to be severed out as originally independent; even in the short ones parts are often found which cannot have been there at first. At the same time we must beware of carrying this sifting operation too far,—as Nöldeke now believes himself to have done in his earlier works, and as Sprenger also sometimes seems to do. That some sūras were of considerable length from the first is seen, for example, from xii., which contains a short introduction, then the history of Joseph, and then a few concluding observations, and is therefore perfectly homogeneous. In like manner, xx., which is mainly occupied with the history of Moses, forms a complete whole. The same is true of xviii., which at first sight seems to fall into several pieces; the history of the seven sleepers, the grotesque narrative about Moses, and that about Alexander "the Horned," are all connected together, and the same rhyme through the whole sūra. Even in the separate narrations we may observe how readily the Koran passes from one subject to another, how little care is taken to express all the transitions of thought, and how frequently clauses are omitted, which are almost indispensable. We are not at liberty, therefore, in every case where the connexion in the Koran is obscure, to say that it is really broken, and set it down as the clumsy patchwork of a later hand. Even in the old Arabic poetry such abrupt transitions are of very frequent occurrence. It is not uncommon for the Koran, after a new subject has been entered on, to return gradually or suddenly to the former theme,—a proof that there at least separation is not to be thought of. In short, however imperfectly the Koran may have been redacted, in the majority of cases the present sūras are identical with the originals.

Component Parts of the Koran.

How these revelations actually arose in Mahomet's mind is a question which it is almost as idle to discuss as it would be to analyse the workings of the mind of a poet. In his early career, sometimes perhaps in its later stages also, many revelations must have burst from him in uncontrollable excitement, so that he could not possibly regard them otherwise than as divine inspirations. We must bear in mind that he was no cold systematic thinker, but an Oriental visionary, brought up in crass superstition, and without intellectual discipline; a man whose nervous temperament had been powerfully worked on by ascetic austerities, and who was all the more irritated by the opposition he encountered, because he had little of the heroic in his nature. Filled with his religious ideas and visions, he might well fancy he heard the angel bidding him recite what was said to him. There may have been many a revelation of this kind which no one ever heard but himself, as he repeated it to himself in the silence of the night (lxxiii. 4). Indeed the Koran itself admits that he forgot some revelations (lxxxvii. 7). But by far the greatest part of the book is undoubtedly the result of deliberation, touched more or less with emotion, and animated by a certain rhetorical rather than poetical glow. Many passages are based upon purely intellectual reflection. It is said that Mahomet occasionally uttered such a passage immediately after one of those epileptic fits which not only his followers, but (for a time at least) he himself also, regarded as tokens of intercourse with the higher powers. If that is the case, it is impossible to say whether the trick was in the utterance of the revelation or in the fit itself.

The Koran Written.

How the various pieces of the Koran took literary form is uncertain. Mahomet himself, so far as we can discover, never wrote down anything. The question whether he could read and write has been much debated among Moslems, unfortunately more with dogmatic arguments and spurious traditions than authentic proofs. At present one is inclined to say that he was not altogether ignorant of these arts, but that from want of practice he found it convenient to employ some one else whenever he had anything to write. After the migration to Medina (A.D. 622) we are told that short pieces—chiefly legal decisions—were taken down immediately after they were revealed, by an adherent whom he summoned for the purpose; so that nothing stood in the way of their publication. Hence it is probable that in Mecca, where the art of writing was commoner than in Medina, he had already begun to have his oracles committed to writing. That even long portions of the Koran existed in written form from an early date may be pretty safely inferred from various indications; especially from the fact that in Mecca the Prophet had caused insertions to be made, and pieces to be erased in his previous revelations. For we cannot suppose that he knew the longer sūras by heart so perfectly that he was able after a time to lay his finger upon any particular passage. In some instances, indeed, he may have relied too much on his memory. For example, he seems to have occasionally dictated the same sūra to different persons in slightly different terms. In such cases, no doubt, he may have partly intended to introduce improvements; and so long as the difference was merely in expression, without affecting the sense, it could occasion no perplexity to his followers. None of them had literary pedantry enough to question the consistency of the divine revelation on that ground. In particular instances, however, the difference of reading was too important to be overlooked. Thus the Koran itself confesses that the unbelievers cast it up as a reproach to the Prophet that God sometimes substituted one verse for another (xvi. 103). On one occasion, when a dispute arose between two of his own followers as to the true reading of a passage which both had received from the Prophet himself, Mahomet is said to have explained that the Koran was revealed in seven forms. In this apparently genuine dictum seven stands, of course, as in many other cases, for an indefinite but limited number. But one may imagine what a world of trouble it has cost the Moslem theologians to explain the saying in accordance with their dogmatic beliefs. A great number of explanations are current, some of which claim the authority of the Prophet himself; as, indeed, fictitious utterances of Mahomet play throughout a conspicuous part in the exegesis of the Koran. One very favourite, but utterly untenable interpretation is that the "seven forms," are seven different Arabic dialects.

Abrogated Readings.

When such discrepancies came to the cognizance of Mahomet it was doubtless his desire that only one of the conflicting texts should be considered authentic; only he never gave himself much trouble to have his wish carried into effect. Although in theory he was an upholder of verbal inspiration, he did not push the doctrine to its extreme consequences; his practical good sense did not take these things so strictly as the theologians of later centuries. Sometimes, however, he did suppress whole sections or verses, enjoining his followers to efface or forget them, and declaring them to be "abrogated." A very remarkable case is that of the two verses in liii., when he had recognized three heathen goddesses as exalted beings, possessing influence with God. This had occurred in a moment of weakness, in order that by such a promise, which yet left Allah in his lofty position, he might gain over his fellow-countrymen. This object he achieved, but soon his conscience smote him, and he declared these words to have been an inspiration of Satan.

Abrogated Laws.

So much for abrogated readings; the case is somewhat different when we come to the abrogation of laws and directions to the Moslems, which often occurs in the Koran. There is nothing in this at variance with Mahomet's idea of God. God is to him an absolute despot, who declares a thing right or wrong from no inherent necessity but by his arbitrary fiat. This God varies his commands at pleasure, prescribes one law for the Christians, another for the Jews, and a third for the Moslems; nay, he even changes his instructions to the Moslems when it pleases him. Thus, for example, the Koran contains very different directions, suited to varying circumstances, as to the treatment which idolaters are to receive at the hands of believers. But Mahomet showed no anxiety to have these superseded enactments destroyed. Believers could be in no uncertainty as to which of two contradictory passages remained in force; and they might still find edification in that which had become obsolete. That later generations might not so easily distinguish the "abrogated" from the "abrogating" did not occur to Mahomet, whose vision, naturally enough, seldom extended to the future of his religious community. Current events were invariably kept in view in the revelations. In Medina it called forth the admiration of the Faithful to observe how often God gave them the answer to a question whose settlement was urgently required at the moment. The same näiveté appears in a remark of the Caliph Othman about a doubtful case: "If the Apostle of God were still alive, methinks there had been a Koran passage revealed on this point." Not unfrequently the divine word was found to coincide with the advice which Mahomet had received from his most intimate disciples. "Omar was many a time of a certain opinion," says one tradition, "and the Koran was then revealed accordingly."

Contents of the Koran.

The contents of the different parts of the Koran are extremely varied. Many passages consist of theological or moral reflections. We are reminded of the greatness, the goodness, the righteousness of God as manifested in Nature, in history, and in revelation through the prophets, especially through Mahomet. God is magnified as the One, the All-powerful. Idolatry and all deification of created beings, such as the worship of Christ as the Son of God, are unsparingly condemned. The joys of heaven and the pains of hell are depicted in vivid sensuous imagery, as is also the terror of the whole creation at the advent of the last day and the judgment of the world. Believers receive general moral instruction, as well as directions for special circumstances. The lukewarm are rebuked, the enemies threatened with terrible punishment, both temporal and eternal. To the sceptical the truth of Islam is held forth; and a certain, not very cogent, method of demonstration predominates. In many passages the sacred book falls into a diffuse preaching style, others seem more like proclamations or general orders. A great number contain ceremonial or civil laws, or even special commands to individuals down to such matters as the regulation of Mahomet's harem. In not a few definite questions are answered which had actually been propounded to the Prophet by believers or infidels. Mahomet himself, too, repeatedly receives direct injunctions, and does not escape an occasional rebuke. One sūra (i.) is a prayer, two (cxiii. cxiv.) are magical formulas. Many sūras treat of a single topic, others embrace several.

Narratives.

From the mass of material comprised in the Koran—and the account we have given is far from exhaustive—we should select the histories of the ancient prophets and saints as possessing a peculiar interest. The purpose of Mahomet is to show from these histories how God in former times had rewarded the righteous and punished their enemies. For the most part the old prophets only serve to introduce a little variety in point of form, for they are almost in every case facsimiles of Mahomet himself. They preach exactly like him, they have to bring the very same charges against their opponents, who on their part behave exactly as the unbelieving inhabitants of Mecca. The Koran even goes so far as to make Noah contend against the worship of certain false gods, mentioned by name, who were worshipped by the Arabs of Mahomet's time. In an address which is put in the mouth of Abraham (xxvi. 75 sqq.), the reader quite forgets that it is Abraham, and not Mahomet (or God himself), who is speaking. Other narratives are intended rather for amusement, although they are always well seasoned with edifying phrases. It is no wonder that the godless Korrishites thought these stories of the Koran not nearly so entertaining as those of Rostam and Ispandiār, related by Naḍr the son of Ḥārith, who had learned in the course of his trade journeys on the Euphrates the heroic mythology of the Persians. But the Prophet was so exasperated by this rivalry that when Naḍr fell into his power after the battle of Badr, he caused him to be executed; although in all other cases he readily pardoned his fellow-countrymen.

Relation to the Old and New Testaments.

These histories are chiefly about Scripture characters, especially those of the Old Testament. But the deviations from the Biblical narratives are very marked. Many of the alterations are found in the legendary anecdotes of the Jewish Haggada and the New Testament Apocrypha; but many more are due perhaps to misconceptions such as only a listener (not the reader of a book) could fall into. One would suppose that the most ignorant Jew could never have mistaken Haman, the minister of Ahasuerus, for the minister of Pharaoh, as happens in the Koran, or identified Miriam, the sister of Moses, with Mary (=Mariām), the mother of Christ. So long, however, as we have no closer acquaintance with Arab Judaism and Christianity, we must always reckon with the possibility that many of these mistakes were due to adherents of these religions who were his authorities, or were a naïve reproduction of versions already widely accepted by his contemporaries. In addition to his misconceptions there are sundry capricious alterations, some of them very grotesque, due to Mahomet himself. For instance, in his ignorance of everything out of Arabia, he makes the fertility of Egypt—where rain is almost never seen and never missed—depend on rain instead of the inundations of the Nile (xii. 49).

It is uncertain whether his account of Alexander was borrowed from Jews or Christians, since the romance of Alexander belonged to the stereotyped literature of that age. The description of Alexander as "the Horned" in the Koran is, however, in accordance with the result of recent researches, to be traced to a Syrian legend dating from A.D. 514–515 (Th. Nöldeke, "Beiträge zur Gesch. des Alexanderromanes" in *Denkschriften Akad. Wien*, vol. xxxviii. No. 5, p. 27, &c.). According to this, God caused horns to grow on Alexander's head to enable him to overthrow all things. This detail of the legend is ultimately traceable, as Hottinger long ago supposed, to the numerous coins on which Alexander is represented with the ram's horns of Ammon.[1] Besides Jewish and Christian histories there are a few about old Arabian prophets. In these he seems to have handled his materials even more freely than in the others.

The opinion has already been expressed that Mahomet did not make use of written sources. Coincidences and divergences alike can always be accounted for by oral communications from Jews who knew a little and Christians who knew next to nothing. Even in the rare passages where we can trace direct resemblances to the text of the Old Testament (cf. xxi. 105 with Ps. xxxvii. 29; i. 5 with Ps. xxvii. 11) or the New (cf. vii. 48 with Luke xvi. 24; xlvi. 19 with Luke xvi. 25), there is nothing more than might readily have been picked up in conversation with any Jew or Christian. In Medina, where he had the opportunity of becoming acquainted with Jews of some culture, he learned some things out of the Mishna, *e.g.* v. 35 corresponds almost word for word with Mishna *Sanhedrin* iv. 5; compare also ii. 183 with Mishna *Berak'hoth* i. 2. That these are only cases of oral communication will be admitted by any one with the slightest knowledge of the circumstances. Otherwise we might even conclude that Mahomet had studied the Talmud; *e.g.* the regulation as to ablution by rubbing with sand, where water cannot be obtained (iv. 46), corresponds to a talmudic ordinance (*Berak'hoth* 15 *a*). Of Christianity he can have been able to learn very little, even in Medina; as may be seen from the absurd travesty of the institution of the Eucharist in v. 112 sqq. For the rest, it is highly improbable that before the Koran any real literary production—anything that could be strictly called a book—existed in the Arabic language.

Style.

In point of style and artistic effect, the different parts of the Koran are of very unequal value. An unprejudiced and critical reader will certainly find very few passages where his aesthetic susceptibilities are thoroughly satisfied. But he will often be struck, especially in the older pieces, by a wild force of passion, and a vigorous, if not rich, imagination. Descriptions of heaven and hell, and allusions to God's working in Nature, not unfrequently show a certain amount of poetic power. In other places also the style is sometimes lively and impressive; though it is rarely indeed that we come across such strains of touching simplicity as in the middle of xciii. The greater part of the Koran is decidedly prosaic; much of it indeed is stiff in style. Of course, with such a variety of material, we cannot expect every part to be equally vivacious, or imaginative, or poetic. A decree about the right of inheritance, or a point of ritual, must necessarily be expressed in prose, if it is to be intelligible. No one complains of the civil laws in Exodus or the sacrificial ritual in Leviticus, because they want the fire of Isaiah or the tenderness of Deuteronomy. But Mahomet's mistake consists in persistent and slavish adherence to the semi-poetic form which he had at first adopted in accordance with his own taste and that of his hearers. For instance, he employs rhyme in dealing with the most prosaic subjects, and thus produces the disagreeable effect of incongruity between style and matter. It has to be considered, however, that many of those sermonizing pieces which are so tedious to us, especially when we read two or three in succession (perhaps in a very inadequate translation), must have had a quite different effect when recited under the burning sky and on the barren soil of Mecca. There, thoughts about God's greatness and man's duty, which are familiar to us from childhood, were all new to the hearers—it is hearers we have to think of in the first instance, not readers—to whom, at the same time, every allusion had a meaning which often escapes our notice. When Mahomet spoke of the goodness of the Lord in creating the clouds, and bringing them across the cheerless desert, and pouring them out on the earth to restore its rich vegetation, that must have been a picture of thrilling interest to the Arabs, who are accustomed to see from three to five years elapse before a copious shower comes to clothe the wilderness once more with luxuriant pastures. It requires an effort for us, under our clouded skies, to realize in some degree the intensity of that impression.

Rhetorical Form and Rhyme.

The fact that scraps of poetical phraseology are specially numerous in the earlier sūras, enables us to understand why the prosaic mercantile community of Mecca regarded their eccentric townsman as a "poet," or even a "possessed poet." Mahomet himself had to disclaim such titles, because he felt himself to be a divinely inspired prophet; but we too, from our standpoint, shall fully acquit him of poetic genius. Like many other predominantly religious characters, he had no appreciation of poetic beauty; and if we may believe one anecdote related of him, at a time when every one made verses, he affected ignorance of the most elementary rules of prosody. Hence the style of the Koran is not poetical but rhetorical; and the powerful effect which some portions produce on us is gained by rhetorical means. Accordingly the sacred book has not even the artistic form of poetry; which, among the Arabs, includes a stringent metre, as well as rhyme. The Koran is never metrical, and only a few exceptionally eloquent portions fall into a sort of spontaneous rhythm. On the other hand, the rhyme is regularly maintained; although, especially in the later pieces, after a very slovenly fashion. Rhymed prose was a favourite form of composition among the Arabs of that day, and Mahomet adopted it; but if it imparts a certain sprightliness to some passages, it proves on the whole a burdensome yoke. The Moslems themselves have observed that the tyranny of the rhyme often makes itself apparent in derangement of the order of words, and in the choice of verbal forms which would not otherwise have been employed; *e.g.* an imperfect instead of a perfect. In one place, to save the rhyme, he calls Mount Sinai *Sīnīn* (xcv. 2) instead of *Sīnā* (xxiii. 20); in another Elijah is called *Ilyāsīn* (xxxvii. 130) instead of *Ilyās* (vi. 85; xxxvii. 123). The substance even is modified to suit exigencies of rhyme. Thus the Prophet would scarcely have fixed on the unusual number of *eight* angels round the throne of God (lxix. 17) if the word *thamāniyah*, "eight," had not happened to fall in so well with the rhyme. And when lv. speaks of *two* heavenly gardens, each with *two* fountains and *two* kinds of fruit, and again of *two* similar gardens, all this is simply because the dual termination (*ān*) corresponds to the syllable that controls the rhyme in that whole sūra. In the later pieces, Mahomet often inserts edifying remarks, entirely out of keeping with the context, merely to complete his rhyme. In Arabic it is such an easy thing to accumulate masses of words with the same termination, that the gross negligence of the rhyme in the Koran is doubly remarkable. One may say that this is another mark of the Prophet's want of mental training, and incapacity for introspective criticism.

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[1] Reproductions of such Ptolemaic and Lysimachan coins are to be found in J. J. Bernouilli, *Die erhaltenen Darstellungen Alexanders d. Gr.* (Munich, 1905), Tab. VIII.; also in Theodor Schreiber, "Studien über das Bildniss Alexanders des Gr." in the *Abh. Sachs. Gesellschaft der Wissenschaften*, Bd. xxi. (1903), Tab. XIII.

Stylistic Weaknesses.

On the whole, while many parts of the Koran undoubtedly have considerable rhetorical power, even over an unbelieving reader, the book, aesthetically considered, is by no means a first-rate performance. To begin with what we are most competent to criticize, let us look at some of the more extended narratives. It has already been noticed how vehement and abrupt they are where they ought to be characterized by epic repose. Indispensable links, both in expression and in the sequence of events, are often omitted, so that to understand these histories is sometimes far easier for us than for those who heard them first, because we know most of them from better sources. Along with this, there is a great deal of superfluous verbiage; and nowhere do we find a steady advance in the narration. Contrast in these respects the history of Joseph (xii.) and its glaring improprieties with the admirably conceived and admirably executed story in Genesis. Similar faults are found in the non-narrative portions of the Koran. The connexion of ideas is extremely loose, and even the syntax betrays great awkwardness. Anacolutha are of frequent occurrence, and cannot be explained as conscious literary devices. Many sentences begin with a "when" or "on the day when" which seems to hover in the air, so that the commentators are driven to supply a "think of this" or some such ellipsis. Again, there is no great literary skill evinced in the frequent and needless harping on the same words and phrases; in xviii., for example, "till that" (*ḥattā idhā*) occurs no fewer than eight times. Mahomet, in short, is not in any sense a master of style. This opinion will be endorsed by any European who reads through the book with an impartial spirit and some knowledge of the language, without taking into account the tiresome effect of its endless iterations. But in the ears of every pious Moslem such a judgment will sound almost as shocking as downright atheism or polytheism. Among the Moslems, the Koran has always been looked on as the most perfect model of style and language. This feature of it is in their dogmatic the greatest of all miracles, the incontestable proof of its divine origin. Such a view on the part of men who knew Arabic infinitely better than the most accomplished European Arabist will ever do, may well startle us. In fact, the Koran boldly challenged its opponents to produce ten sūras, or even a single one, like those of the sacred book, and they never did so. That, to be sure, on calm reflection, is not so very surprising. Revelations of the kind which Mahomet uttered, no unbeliever could produce without making himself a laughing-stock. However little real originality there is in Mahomet's doctrines, as against his own countrymen he was thoroughly original, even in the form of his oracles. To compose such revelations at will was beyond the power of the most expert literary artist; it would have required either a prophet or a shameless impostor. And if such a character appeared *after* Mahomet, still he could never be anything but an imitator, like the false prophets who arose about the time of his death and afterwards. That the adversaries should produce any sample whatsoever of poetry or rhetoric equal to the Koran is not at all what the Prophet demands. In that case he would have been put to shame, even in the eyes of many of his own followers, by the first poem that came to hand. Nevertheless, it is on a false interpretation of this challenge that the dogma of the incomparable excellence of the style and diction of the Koran is based. The rest has been accomplished by dogmatic prejudice, which is quite capable of working other miracles besides turning a defective literary production into an unrivalled masterpiece in the eyes of believers. This view once accepted, the next step was to find everywhere evidence of the perfection of the style and language. And if here and there, as one can scarcely doubt, there was among the old Moslems a lover of poetry who had his difficulties about this dogma, he had to beware of uttering an opinion which might have cost him his head. We know of at least one rationalistic theologian who defined the dogma in such a way that we can see he did not believe it (Shahrastānī, p. 39). The truth is, it would have been a miracle indeed if the style of the Koran had been perfect. For although there was at that time a recognized poetical style, already degenerating to mannerism, a developed prose style did not exist. All beginnings are difficult; and it can never be esteemed a serious charge against Mahomet that his book, the first prose work of a high order in the language, testifies to the awkwardness of the beginner. And further, we must always remember that entertainment and aesthetic effect were at most subsidiary objects. The great aim was persuasion and conversion; and, say what we will, that aim has been realized on the most imposing scale.

Dogma of the Stylistic Perfection of the Koran.

Foreign Words.

Mahomet repeatedly calls attention to the fact that the Koran is not written, like other sacred books, in a strange language, but in Arabic, and therefore is intelligible to all. At that time, along with foreign ideas, many foreign words had crept into the language; especially Aramaic terms for religious conceptions of Jewish or Christian origin. Some of these had already passed into general use, while others were confined to a more limited circle. Mahomet, who could not fully express his new ideas in the common language of his countrymen, but had frequently to find out new terms for himself, made free use of such Jewish and Christian words, as was done, though perhaps to a smaller extent, by certain thinkers and poets of that age who had more or less risen above the level of heathenism. In Mahomet's case this is the less wonderful because he was indebted to the instruction of Jews and Christians, whose Arabic—as the Koran pretty clearly intimates with regard to one of them—was very defective. On the other hand, it is yet more remarkable that several of such borrowed words in the Koran have a sense which they do not possess in the original language. It is not necessary that this phenomenon should in every case be due to the same cause. Just as the prophet often misunderstood traditional traits of the sacred history, he may, as an unlearned man, likewise have often employed foreign expressions wrongly. Other remarkable senses of words were possibly already acclimatized in the language of Arabian Jews or Christians. Thus, *forqān* means really "redemption," but Mahomet uses it for "revelation." The widespread opinion that this sense first asserted itself in reference to the Arab root فرق (*faraqa*), "sever," or "decide," is open to considerable doubt. There is, for instance, no difficulty in deriving the Arab meaning of "revelation" from the common Aramaic "salvation," and this transference must have taken place in a community for which salvation formed the central object of faith, *i.e.* either amongst those Jews who looked to the coming of a Messiah or, more probably, among Christians, since Christianity is in a very peculiar sense the religion of salvation. *Milla* is properly "word" (=Aramaic *mellthā*), but in the Koran "religion." It is actually used of the religion of the Jews and Christians (once), of the heathen (5 times), but mostly (8 times) of the religion of Abraham, which Mahomet in the Medina period places on the same level with Islam. Although of the Aramaic dialects none employs the term *Melltha* in the sense of religion, it appears that the prophet found such a use. *Illiyūn*, which Mahomet uses of a heavenly book (Sūra 83; 18, 19), is clearly the Hebrew *elyōn*, "high" or "exalted." It is, however, doubtful in what sense this word appeared to him, either as a name of God, as in the Old Testament it often occurs and regularly without the article, or actually as the epithet of a heavenly book, although this use cannot be substantiated from Jewish literature. So again the word *mat͡hānī* is, as Geiger has conjectured, the regular plural of the Aramaic *mathnīthā*, which is the same as the Hebrew *Mishnah*, and denotes in Jewish usage a legal decision of some of the ancient Rabbins. But in the Koran Mahomet appears to have understood it in the sense of "saying" or "sentence" (cf. xxxix. 24). On the other hand, it is by no means certain that by "the Seven Mathani" (xv. 87) the seven verses of Sūra i. are meant. Words of undoubtedly Christian origin are less frequent in the Koran. It is an interesting fact that of these a few have come over from the Abyssinian; such as *hawārīyūn* "apostles," *māida* "table," *munāfig* "doubter, sceptic," *ragūn* "cursed," *miḥrāb* "temple"; the first three of these make their first appearance in sūras of the Medina period. The word *shaitān* "Satan," which was likewise borrowed, at least in the first instance, from the Abyssinian, had probably been already introduced into the language. Sprenger has rightly observed that Mahomet makes a certain parade of these foreign terms, as of other peculiarly constructed expressions; in this he followed a favourite practice of contemporary poets. It is the tendency of the imperfectly educated to delight in out-of-the-way expressions, and on such minds they readily produce a remarkably solemn and mysterious impression. This was exactly the kind of effect that Mahomet desired, and to secure it he seems even to have invented a few odd vocables, as *ghislīn* (lxix. 36), *sijjīn* (lxxxiii. 7, 8), *tasnīm* (lxxxiii. 27), and *salsabīl* (lxxvi. 18). But, of course, the necessity of enabling his hearers to understand ideas which they must have found sufficiently novel in themselves, imposed tolerably narrow limits on such eccentricities.

Date of the Several Parts.

The constituents of our present Koran belong partly to the Mecca period[1] (before A.D. 622), partly to the period commencing with the migration to Medina (from the autumn of 622 to 8th June 632). Mahomet's position in Medina was entirely different from that which he had occupied in his native town. In the former he was from the first the leader of a powerful party, and gradually became the autocratic ruler of Arabia; in the latter he was only the despised preacher of a small congregation. This difference, as was to be expected, appears in the Koran. The Medina pieces, whether entire sūras or isolated passages interpolated in Meccan sūras, are accordingly pretty broadly distinct, as to their contents, from those issued in Mecca. In the great majority of cases there can be no doubt whatever whether a piece first saw the light in Mecca or in Medina; and for the most part the internal evidence is borne out by Moslem tradition. And since the revelations given in Medina frequently take notice of events about which we have fairly accurate information, and whose dates are at least approximately known, we are often in a position to fix their date with at any rate considerable certainty; here again tradition renders valuable assistance. Even with regard to the Medina passages, however, a great deal remains uncertain, partly because the allusions to historical events and circumstances are generally rather obscure, partly because traditions about the occasion of the revelation of the various pieces are often fluctuating, and often rest on misunderstanding or arbitrary conjecture. An important criterion for judging the period during which individual Meccan sūras, interpolated in Medina revelations, arose (*e.g.* *Sūr.* xvi. 124, vi. 162) is provided by the Ibrāhīm legend, the great importance of which, as throwing light on the evolution of Mahomet's doctrine in its relation to older revealed religions, has been convincingly set forth by Dr Snouck Hurgronje in his dissertation for the doctor's degree and in later essays.[2] According to this, Ibrāhīm, after the controversy with the Jews, first of all became Mahomet's special forerunner in Medina, then the first Moslem, and finally the founder of the Ka'ba. But at all events it is far easier to arrange in some sort of chronological order the Medina sūras than those composed in Mecca. There is, indeed, one tradition which professes to furnish a chronological list of all the sūras. But not to mention that it occurs in several divergent forms, and that it takes no account of the fact that our present sūras are partly composed of pieces of different dates, it contains so many suspicious or undoubtedly false statements, that it is impossible to attach any great importance to it. Besides, it is a priori unlikely that a contemporary of Mahomet should have drawn up such a list; and if any one had made the attempt he would have found it almost impossible to obtain reliable information as to the order of the earlier Meccan sūras. We have in this list no genuine tradition, but rather the lucubrations of an undoubtedly conscientious Moslem critic, who may have lived about a century after the Flight.

The Meccan Sūras.

Among the revelations put forth in Mecca there is a considerable number of (for the most part) short sūras, which strike every attentive reader as being the oldest. They are in an altogether different strain from many others, and in their whole composition they show least resemblance to the Medina pieces. It is no doubt conceivable—as Sprenger supposes—that Mahomet might have returned at intervals to his earlier manner; but since this group possesses a remarkable similarity of style, and since the gradual formation of a different style is on the whole an unmistakable fact, the assumption has little probability; and we shall therefore abide by the opinion that these form a distinct group. At the opposite extreme from them stands another cluster, showing quite obvious affinities with the style of the Medina sūras, which must therefore be assigned to the later part of the Prophet's work in Mecca. Between these two groups stand a number of other Meccan sūras, which in every respect mark the transition from the first period to the third. It need hardly be said that the three periods—which were first distinguished by Professor Weil—are not separated by sharp lines of division. With regard to some sūras, it may be doubtful whether they ought to be reckoned amongst the middle group, or with one or other of the extremes. And it is altogether impossible, within these groups, to establish even a probable chronological arrangement of the individual revelations. In default of clear allusions to well-known events, or events whose date can be determined, we might indeed endeavour to trace the psychological development of the Prophet by means of the Koran, and arrange its parts accordingly. But in such an undertaking one is always apt to take subjective assumptions or mere fancies for established data. Good traditions about the origin of the Meccan revelations are not very numerous. In fact the whole history of Mahomet previous to the Flight is so imperfectly related that we are not even sure in what year he appeared as a prophet. Probably it was in A.D. 610; it may have been somewhat earlier, but scarcely later. If, as one tradition says, xxx. 1 seq. ("The Romans are overcome in the nearest neighbouring land") refers to the defeat of the Byzantines by the Persians, not far from Damascus, about the spring of 614, it would follow that the third group, to which this passage belongs, covers the greater part of the Meccan period. And it is not in itself unlikely that the passionate vehemence which characterizes the first group was of short duration. Nor is the assumption contradicted by the tolerably well attested, though far from incontestable statement, that when Omar was converted (A.D. 615 or 616), xx., which belongs to the second group, already existed in writing. But the reference of xxx. 1 seq. to this particular battle is by no means so certain that positive conclusions can be drawn from it. It is the same with other allusions in the Meccan sūras to occurrences whose chronology can be partially ascertained. It is better, therefore, to rest satisfied with a merely relative determination of the order of even the three great clusters of Meccan revelations.

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[1] For the schemes of Nöldeke and Grimm see MAHOMMEDAN RELIGION.

[2] See Bibliography at end.

Oldest Meccan Sūras.

In the pieces of the first period the convulsive excitement of the Prophet often expresses itself with the utmost vehemence. He is so carried away by his emotion that he cannot choose his words; they seem rather to burst from him. Many of these pieces remind us of the oracles of the old heathen soothsayers, whose style is known to us from imitations, although we have perhaps not a single genuine specimen. Like those other oracles, the sūras of this period, which are never very long, are composed of short sentences with tolerably pure but rapidly changing rhymes. The oaths, too, with which many of them begin were largely used by the soothsayers. Some of these oaths are very uncouth and hard to understand, some of them perhaps were not meant to be understood, for indeed all sorts of strange things are met with in these chapters. Here and there Mahomet speaks of visions, and appears even to see angels before him in bodily form. There are some intensely vivid descriptions of the resurrection and the last day which must have exercised a demonic power over men who were quite unfamiliar with such pictures. Other pieces paint in glowing colours the joys of heaven and the pains of hell. However, the sūras of this period are not all so wild as these; and those which are conceived in a calmer mood appear to be the oldest. Yet, one must repeat, it is exceedingly difficult to make out any strict chronological sequence. For instance, it is by no means certain whether the beginning of xcvi. is really, what a widely circulated tradition calls it, the oldest part of the whole Koran. That tradition goes back to the Prophet's favourite wife Ayesha; but as she was not born at the time when the revelation is said to have been made, it can only contain at the best what Mahomet told her years afterwards, from his own not very clear recollection, with or without fictitious additions, and this woman is little trustworthy. Moreover, there are other pieces mentioned by others as the oldest. In any case xcvi. 1 sqq. is certainly very early. According to the traditional view, which appears to be correct, it treats of a vision in which the Prophet receives an injunction to recite a revelation conveyed to him by the angel. It is interesting to observe that here already two things are brought forward as proofs of the omnipotence and care of God: one is the creation of man out of a seminal drop—an idea to which Mahomet often recurs; the other is the then recently introduced art of writing, which the Prophet instinctively seizes on as a means of propagating his doctrines. It was only after Mahomet encountered obstinate resistance that the tone of the revelations became thoroughly passionate. In such cases he was not slow to utter terrible threats against those who ridiculed the preaching of the unity of God, of the resurrection, and of the judgment. His own uncle Abū Lahab had rudely repelled him, and in a brief special sūra (cxi.) he and his wife are consigned to hell. The sūras of this period form almost exclusively the concluding portions of the present text. One is disposed to assume, however, that they were at one time more numerous, and that many of them were lost at an early period.

Since Mahomet's strength lay in his enthusiastic and fiery imagination rather than in the wealth of ideas and clearness of abstract thought on which exact reasoning depends, it follows that the older sūras, in which the former qualities have free scope, must be more attractive to us than the later. In the sūras of the second period the imaginative glow perceptibly diminishes; there is still fire and animation, but the tone becomes gradually more prosaic. As the feverish restlessness subsides, the periods are drawn out, and the revelations as a whole become longer. The truth of the new doctrine is proved by accumulated instances of God's working in nature and in history; the objections of opponents, whether advanced in good faith or in jest, are controverted by arguments; but the demonstration is often confused or even weak. The histories of the earlier prophets, which had occasionally been briefly touched on in the first period, are now related, sometimes at great length. On the whole, the charm of the style is passing away.

The Fātiḥa.

There is one piece of the Koran, belonging to the beginning of this period, if not to the close of the former, which claims particular notice. This is Sūra i., the Lord's Prayer of the Moslems, a vigorous hymn of praise to God, the Lord of both worlds, which ends in a petition for aid and true guidance (*hudā*). The words of this sūra, which is known as *al-fātiḥa* (" the opening one "), are as follows:—

> (1) In the name of God, the compassionate compassioner. (2) Praise be [literally " is "] to God, the Lord of the worlds, (3) the compassionate compassioner, (4) the Sovereign of the day of judgment. (5) Thee do we worship and of Thee do we beg assistance. (6) Direct us in the right way; (7) in the way of those to whom Thou hast been gracious, on whom there is no wrath, and who go not astray.

The thoughts are so simple as to need no explanation; and yet the prayer is full of meaning. It is true that there is not a single original idea of Mahomet's in it. Of the seven verses of the sūra no less than five (verses 1, 2, 3, 4, 6) have an extremely suspicious relationship with the stereotyped formulae of Jewish and Christian liturgies. Verse 6 agrees, word for word, with Ps. xxvii. 11. On the other hand, the question must remain open whether Mahomet only gave free renderings of the several borrowed formulae, or whether in actually composing them he kept existing models. The designation of God as the " Compassioner," *Raḥmān*, is simply the Jewish *Raḥmānā*, which was a favourite name for God in the Talmudic period. The word had long before Mahomet's time been used for God in southern Arabia (cf. *e.g.* the Sabaean Inscriptions, Glaser, 554, line 32; 618, line 2).

Mahomet seems for a while to have entertained the thought of adopting *al-Raḥmān* as a proper name of God, in place of *Allāh*, which was already used by the heathens.[1] This purpose he ultimately relinquished, but it is just in the sūras of the second period that the use of *Raḥmān* is specially frequent. If, for this reason, it is to a certain extent certain that Sūra i. belongs to this period, yet we can neither prove that it belongs to the beginning of the Mecca period nor that the present introductory formula " In the name of God," &c., belonged to it from the first. It may therefore even be doubted whether Mahomet at the outset looked upon the latter as revealed. Tradition, of course, knows in this connexion no doubt, and looks upon the Fātiḥa precisely as the most exalted portion of the Koran. Every Moslem who says his five prayers regularly—as the most of them do—repeats it not less than twenty times a day.

Latest Meccan Sūras.

The sūras of the third Meccan period, which form a fairly large part of our present Koran, are almost entirely prosaic. Some of the revelations are of considerable extent, and the single verses also are much longer than in the older sūras. Only now and then a gleam of poetic power flashes out. A sermonizing tone predominates. The sūras are very edifying for one who is already reconciled to their import, but to us at least they do not seem very well fitted to carry conviction to the minds of unbelievers. That impression, however, is not correct, for in reality the demonstrations of these longer Meccan sūras appear to have been peculiarly influential for the propagation of Islam. Mahomet's mission was not to Europeans, but to a people who, though quick-witted and receptive, were not accustomed to logical thinking, while they had outgrown their ancient religion.

When we reach the Medina period it becomes, as has been indicated, much easier to understand the revelations in their historical relations, since our knowledge of the history of

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[1] Since in Arabic also the root رحم signifies " to have pity," the Arabs must have at once perceived the force of the new name. While the foreign word *Raḥmān* is, in accordance with its origin, everywhere in the Koran to be understood as " Merciful," there is some doubt as to *Raḥīm*. The close connexion of the two expressions, it is true, makes it probable that Mahomet only added the adjective *Raḥīm* to the substantive *Raḥmān* in order to strengthen the conception. But the genuine Arab meaning of *Raḥīm* is " gracious," and thus, the old Mahommedan Arab papyri render this word by φιλάνθρωπος.

Medinan Sūras.

Mahomet in Medina is tolerably complete. In many cases the historical occasion is perfectly clear, in others we can at least recognize the general situation from which they arose, and thus approximately fix their time. There still remains, however, a remnant, of which we can only say that it belongs to Medina.

The style of this period bears a fairly close resemblance to that of the latest Meccan period. It is for the most part pure prose, enriched by occasional rhetorical embellishments. Yet even here there are many bright and impressive passages, especially in those sections which may be regarded as proclamations to the army of the faithful. For the Moslems Mahomet has many different messages. At one time it is a summons to do battle for the faith; at another, a series of reflections on recently experienced success or misfortune, or a rebuke for their weak faith; or an exhortation to virtue, and so on. He often addresses himself to the "doubters," some of whom vacillate between faith and unbelief, others make a pretence of faith, while others scarcely take the trouble even to do that. They are no consolidated party, but to Mahomet they are all equally vexatious, because, as soon as danger has to be encountered, or a contribution is levied, they all alike fall away. There are frequent outbursts, ever increasing in bitterness, against the Jews, who were very numerous in Medina and its neighbourhood when Mahomet arrived. He has much less to say against the Christians, with whom he never came closely in contact; and as for the idolaters, there was little occasion in Medina to have many words with them. A part of the Medina pieces consists of formal laws belonging to the ceremonial, civil and criminal codes; or directions about certain temporary complications. The most objectionable parts of the whole Koran are those which treat of Mahomet's relations with women. The laws and regulations were generally very concise revelations, but most of them have been amalgamated with other pieces of similar or dissimilar import, and are now found in very long sūras.

Such is an imperfect sketch of the composition and the internal history of the Koran, but it is probably sufficient to show that the book is a very heterogeneous collection. If only those passages had been preserved which had a permanent value for the theology, the ethics, or the jurisprudence of the Moslems, a few fragments would have been amply sufficient. Fortunately for knowledge, respect for the sacredness of the letter has led to the collection of all the revelations that could possibly be collected—the "abrogating" along with the "abrogated," passages referring to passing circumstances as well as those of lasting importance. Every one who takes up the book in the proper religious frame of mind, like most of the Moslems, reads pieces directed against long-obsolete absurd customs of Mecca just as devoutly as the weightiest moral precepts—perhaps even more devoutly, because he does not understand them so well.

Mysterious Letters.

At the head of twenty-nine of the sūras stand certain initial letters, from which no clear sense can be obtained. Thus, before ii. iii. xxxi. xxxii. we find الم (*Alif Lām Mīm*), before xl.–xlvi. حم (*Ḥā Mīm*). Nöldeke at one time suggested that these initials did not belong to Mahomet's text, but might be the monograms of possessors of codices, which, through negligence on the part of the editors, were incorporated in the final form of the Koran; he now deems it more probable that they are to be traced to the Prophet himself, as Sprenger, Loth and others suppose. One cannot indeed admit the truth of Loth's statement that in the proper opening words of these sūras we may generally find an allusion to the accompanying initials; but it can scarcely be accidental that the first verse of the great majority of them (in iii. it is the second verse) contains the word "book," "revelation," or some equivalent. They usually begin with: "This is the book," or "Revelation ('down sending') of the book," or something similar. Of sūras which commence in this way only a few (xviii. xxiv. xxv. xxxix.) want the initials, while only xxix. and xxx. have the initials and begin differently. These few exceptions may easily have proceeded from ancient corruptions; at all events they cannot neutralize the evidence of the greater number. Mahomet seems to have meant these letters for a mystic reference to the archetypal text in heaven. To a man who regarded the art of writing, of which at the best he had but a slight knowledge, as something supernatural, and who lived amongst illiterate people, an A B C may well have seemed more significant than to us who have been initiated into the mysteries of this art from our childhood. The Prophet himself can hardly have attached any particular meaning to these symbols: they served their purpose if they conveyed an impression of solemnity and enigmatical obscurity. In fact, the Koran admits that it contains many things which neither can be, nor were intended to be, understood (iii. 5). To regard these letters as ciphers is a precarious hypothesis, for the simple reason that cryptography is not to be looked for in the very infancy of Arabic writing. If they are actually ciphers, the multiplicity of possible explanations at once precludes the hope of a plausible interpretation. None of the efforts in this direction, whether by Moslem scholars or by Europeans, has led to convincing results. This remark applies even to the ingenious conjecture of Sprenger, that the letters كهيعص (*Kāf Hē Yē Ain Sād*) before xix. (which treats of John and Jesus, and, according to tradition, was sent to the Christian king of Abyssinia) stand for *Jesus Nazarenus Rex Judaeorum.* Sprenger arrives at this explanation by a very artificial method; and besides, Mahomet was not so simple as the Moslem traditionalists, who imagined that the Abyssinians could read a piece of the Arabic Koran. It need hardly be said that the Moslems have from of old applied themselves with great assiduity to the decipherment of these initials, and have sometimes found the deepest mysteries in them. Generally, however, they are content with the prudent conclusion that God alone knows the meaning of these letters.

Transmission of the Koran.

Zaid's First Koran.

It is probable (see above) that Mahomet had already caused revelations to be written down at Mecca, and that this began from the moment when he felt certain that he was the transmitter of the actual text of a heavenly book to mankind. It is even true that he may at some time or another have formed the intention of collecting these revelations. The idea of a heavenly model would in itself have suggested such a course and, only in an inferior degree to this, the necessity of setting a new and uncorrupted document of the divine will over against the sacred scriptures of the Jews and Christians, the people of the Book, as the Koran calls them. In any case, when Mahomet died, the separate pieces of the Koran, notwithstanding their theoretical sacredness, existed only in scattered copies; they were consequently in great danger of being partially or entirely destroyed. Many Moslems knew large portions by heart, but certainly no one knew the whole; and a merely oral propagation would have left the door open to all kinds of deliberate and inadvertent alterations. But now, after the death of the Prophet, most of the Arabs revolted against his successor, and had to be reduced to submission by force. Especially sanguinary was the struggle against the prophet Maslama (Mubarrad, *Kāmil* 443, 5), commonly known by the derisive diminutive Mosailima. At that time (A.D. 633) many of the most devoted Moslems fell, the very men who knew most Koran pieces by heart. Omar then began to fear that the Koran might be entirely forgotten, and he induced the Caliph Abū Bekr to undertake the collection of all its parts. The Caliph laid the duty on Zaid ibn Thābit, a native of Medina, then about twenty-two years of age, who had often acted as amanuensis to the Prophet, in whose service he is even said to have learned the Jewish letters. The account of this collection of the Koran has reached us in several substantially identical forms, and goes back to Zaid himself. According to it, he collected the revelations from copies written on flat stones, pieces of leather, ribs of palm-leaves (not palm-leaves themselves), and such-like material, but chiefly "from the breasts of men," *i.e.* from their memory. From these he wrote a fair copy, which he gave to Abū Bekr, from whom it came to his successor Omar, who again bequeathed it to his daughter Ḥafṣa, one of the widows of the Prophet. This redaction, commonly called *al-ṣohof* ("the leaves"), had from the first no canonical authority; and its internal arrangement can only be conjectured.

The Moslems were as far as ever from possessing a uniform text of the Koran. The bravest of their warriors sometimes knew deplorably little about it; distinction on *that* field they cheerfully accorded to pious men like Ibn Mas'ūd. It was inevitable, however, that discrepancies should emerge between the texts of professed scholars, and as these men in their several localities were authorities on the reading of the Koran, quarrels began to break out between the levies from different districts about the true form of the sacred book. During a campaign in A.H. 30 (A.D. 650–651), Ḥodhaifa, the victor in the great and decisive battle of Nehāveand (see CALIPHATE; and PERSIA: *History*) perceived that such disputes might become dangerous, and therefore urged on the caliph Othmān the necessity for a universally binding text. The matter was entrusted to Zaid, who had made the former collection, with three leading Koreishites. These brought together as many copies as they could lay their hands on, and prepared an edition which was to be canonical for all Moslems. To prevent any further disputes, they burned all the other codices except that of Ḥafṣa, which, however, was soon afterwards destroyed by Merwān the governor of Medina. The destruction of the earlier codices was an irreparable loss to criticism; but, for the essentially political object of putting an end to controversies by admitting only one form of the common book of religion and of law, this measure was necessary.

Othman's Koran.

The result of these labours is in our hands; as to how they were conducted we have no trustworthy information, tradition being here too much under the influence of dogmatic presuppositions. The critical methods of a modern scientific commission will not be expected of an age when the highest literary education for an Arab consisted in ability to read and write. It now appears highly probable that this second redaction took this simple form: Zaid read off from the codex which he had previously written, and his associates, simultaneously or successively, wrote one copy each to his dictation. These three manuscripts will therefore be those which the caliph, according to trustworthy tradition, sent in the first instance as standard copies to Damascus, Basra and Kufa to the warriors of the provinces of which these were the capitals, while he retained one at Medina. Be that as it may, it is impossible now to distinguish in the present form of the book what belongs to the first redaction from what is due to the second.

In the arrangement of the separate sections, a classification according to contents was impracticable because of the variety of subjects often dealt with in one sūra. A chronological arrangement was out of the question, because the chronology of the older pieces must have been imperfectly known, and because in some cases passages of different dates had been joined together. Indeed, systematic principles of this kind were altogether disregarded at that period. The pieces were accordingly arranged in indiscriminate order, the only rule observed being to place the long sūras first and the shorter towards the end, and even that was far from strictly adhered to. The two magic formulae, sūras cxiii., cxiv. owe their position at the end of the collection to their peculiar contents, which differ from all the other sūras; they are protecting spells for the faithful. Similarly it is by reason of its contents that sūra i. stands at the beginning: not only because it is in praise of Allah, as Psalm i. is in praise of the righteous man, but because it gives classical expression to important articles of the faith. These are the only special traces of design. The combination of pieces of different origin may proceed partly from the possessors of the codices from which Zaid compiled his first complete copy, partly from Zaid himself. The individual sūras are separated simply by the superscription: "In the name of God, the compassionate Compassioner," which is wanting only in the ninth. The additional headings found in our texts (the name of the sūras, the number of verses, &c.) were not in the original codices, and form no integral part of the Koran.

It is said that Othmān directed Zaid and his associates, in cases of disagreement, to follow the Ḳoreish dialect; but, though well attested, this account can scarcely be correct. The extremely primitive writing of those days was quite incapable of rendering such minute differences as can have existed between the pronunciation of Mecca and that of Medina.

The Koran not complete.

Othmān's Koran was not complete. Some passages are evidently fragmentary; and a few detached pieces are still extant which were originally parts of the Koran, although they have been omitted by Zaid. Amongst these are some which there is no reason to suppose Mahomet desired to suppress. Zaid may easily have overlooked a few stray fragments, but that he purposely omitted anything which he believed to belong to the Koran is very unlikely. It has been conjectured that in deference to his superiors he kept out of the book the names of Mahomet's enemies, if they or their families came afterwards to be respected. But it must be remembered that it was never Mahomet's practice to refer explicitly to contemporary persons and affairs in the Koran. Only a single friend, his adopted son Zaid (xxxiii. 37), and a single enemy, his uncle Abū Lahab (cxi.)—and these for very special reasons—are mentioned by name; and the name of the latter has been left in the Koran with a fearful curse annexed to it, although his son had embraced Islam before the death of Mahomet, and his descendants belonged to the noblest families. So, on the other hand, there is no single verse or clause which can be plausibly made out to be an interpolation by Zaid at the instance of Abū Bekr, Omar, or Othmān. Slight clerical errors there may have been, but the Koran of Othmān contains none but genuine elements—though sometimes in very strange order. All efforts of European scholars to prove the existence of later interpolations in the Koran have failed.

Of the four exemplars of Othmān's Koran, one was kept in Medina, and one was sent to each of the three metropolitan cities, Kufa, Baṣra, and Damascus. It can still be pretty clearly shown in detail that these four codices deviated from one another in points of orthography, in the insertion or omission of a *wa* ("and") and such-like minutiae; but these variations nowhere affect the sense. All later manuscripts are derived from these four originals.

Other Editions.

At the same time, the other forms of the Koran did not at once become extinct. In particular we have some information about the codex of Ubay ibn Kaʽb. If the list which gives the order of its sūras is correct, it must have contained substantially the same materials as our text; in that case Ubay ibn Kaʽb must have used the original collection of Zaid. The same is true of the codex of Ibn Masʽūd, of which we have also a catalogue. It appears that the principle of putting the longer sūras before the shorter was more consistently carried out by him than by Zaid. He omits i. and the magical formulae of cxiii., cxiv. Ubay, on the other hand, had embodied two additional short prayers, which we may regard as Mahomet's. One can easily understand that differences of opinion may have existed as to whether and how far formularies of this kind belonged to the Koran. Some of the divergent readings of both these texts have been preserved as well as a considerable number of other ancient variants. Most of them are decidedly inferior to the received readings, but some are quite as good, and a few deserve preference.

Ibn Masʽūd.

The only man who appears to have seriously opposed the general introduction of Othmān's text is Ibn Masʽūd. He was one of the oldest disciples of the Prophet, and had often rendered him personal service; but he was a man of contracted views, although he is one of the pillars of Moslem theology. His opposition had no effect. Now when we consider that at that time there were many Moslems who had heard the Koran from the mouth of the Prophet, that other measures of the imbecile Othmān met with the most vehement resistance on the part of the bigoted champions of the faith, that these were still further incited against him by some of his ambitious old comrades until at last they murdered him, and finally that in the civil wars after his death the several parties were glad of any pretext for branding their opponents as infidels;—when we consider all this, we must regard it as a strong testimony in favour of Othmān's Koran that no party found fault with his conduct in this matter, or repudiated the text formed by Zaid, who was one of the most devoted adherents of Othmān and his family, and that even among the Shiites criticism of the caliph's action is only met with as a rare exception.

But this redaction is not the close of the textual history of the Koran. The ancient Arabic alphabet was very imperfect; it not only wanted marks for the short and in part even for the long vowels, but it often expressed several consonants by the same sign, *e.g.* one and the same character could mean B, T, Th at the beginning and N and J (I) in the middle of words. Hence there were

Later History of the Text.

many words which could be read in very different ways. This variety of possible readings was at first very great, and many readers seem to have actually made it their object to discover pronunciations which were new, provided they were at all appropriate to the ambiguous text. There was also a dialectic licence in grammatical forms, which had not as yet been greatly restricted. An effort was made by many to establish a more refined pronunciation for the Koran than was usual in common life or in secular literature. The various schools of "readers" differed very widely from one another; although for the most part there was no important divergence as to the sense of words. A few of them gradually rose to special authority, and the rest disappeared. Seven readers are generally reckoned chief authorities, but for practical purposes this number was continually reduced in process of time; so that at present only two "reading-styles" are in actual use,—the common style of Ḥafṣ, and that of Nāfiʽ; which prevails in Africa to the west of Egypt. There is, however, a very comprehensive massoretic literature in which a number of other styles are indicated. The invention of vowel-signs of diacritic points to distinguish similarly formed consonants, and of other orthographic signs, soon put a stop to arbitrary conjectures on the part of the readers. Many zealots objected to the introduction of these innovations in the sacred text, but theological consistency had to yield to practical necessity. In accurate codices, indeed, all such additions, as well as the titles of the sūra, &c., are written in coloured ink, while the black characters profess to represent exactly the original of Othmān. But there is probably no copy quite faithful in this respect. Moreover, the right recitation of the Koran is an art which even people of Arab tongue can only learn with great difficulty. In addition to the nuances of pronunciation already alluded to, there is a semi-musical modulation. In these matters also the various schools differ.

Manuscripts.

In European libraries, besides innumerable modern manuscripts of the Koran, there are also codices, or fragments, of high antiquity, some of them probably dating from the 1st century of the Flight. For the restoration of the text, however, the works of ancient scholars on its readings and modes of writing are more important than the manuscripts; which, however elegantly they may be written and ornamented, proceed from irresponsible copyists. The original, written by Othmān himself, has indeed been exhibited in various parts of the Mahommedan world. The library of the India Office contains one such manuscript, bearing the subscription: "Written by ʽOthmān the son of ʽAffān." These, of course, are barefaced forgeries, although of very ancient date; so are those which profess to be from the hand of ʽAlī, one of which is preserved in the same library. In recent times the Koran has been often printed and lithographed, both in the East and the West. In Mahommedan countries lithography alone is employed.

Commentators.

Shortly after Mahomet's death certain individuals applied themselves to the exposition of the Koran. Much of it was obscure from the beginning, other sections were unintelligible apart from a knowledge of the circumstances of their origin. Unfortunately, those who took possession of this field were not very honourable. Ibn ʽAbbās, a cousin of Mahomet, and the chief source of the traditional exegesis of the Koran, has, on theological and other grounds, given currency to a number of falsehoods; and at least some of his pupils have emulated his example. These earliest expositions dealt more with the sense and connexion of whole verses than with the separate words. Afterwards, as the knowledge of the old language declined, and the study of philology arose, more attention began to be paid to the explanation of vocables. A good many fragments of this older theological and philological exegesis have survived from the first two centuries of the Flight, although we have no complete commentary of this period. The great commentary of Ṭabarī, A.D. 839–923, of which for the last few years we have possessed an Oriental edition in 30 parts (Cairo A.H. 1321 = A.D. 1903), is very full when it comes to speak of canonical law, as well as in its accounts of the occasions of the several revelations; for, as in his great historical work, he faithfully records a large number of traditions with the channels by which they have come down to us (genealogical trees, *isnād*). In other respects the hopes based upon this commentary have not been fulfilled.

Translations.

Another very famous commentary is that of Zamakhsharī (A.D. 1075–1144), edited by Nassau-Lees, Calcutta, 1859; but this scholar, with his great insight and still greater subtlety, is too apt to read his own scholastic ideas into the Koran. The favourite commentary of Baiḍāwī (d. A.D. 1286), edited by Fleischer (Leipzig, 1846–1848), is little more than an abridgment of Zamakhsharī's. Thousands of commentaries on the Koran, some of them of prodigious size, have been written by Moslems; and even the number of those still extant in manuscript is by no means small. Although these works all contain much that is useless or false, yet they are invaluable aids to our understanding of the sacred book. An unbiased European can, no doubt, see many things at a glance more clearly than a good Moslem who is under the influence of religious prejudice; but we should still be helpless without the exegetical literature of the Mahommedans. Even the Arabian Moslems would only understand the Koran very dimly and imperfectly if they did not give special attention to the study of its interpretation. The advantage of being in a language commonly understood, which the holy book claims for itself, has vanished in the course of thirteen centuries. According to the dominant view, however, the ritual use of the Koran is not in the least concerned with the sacred words being understood, but solely with their being quite properly recited. Nevertheless, a great deal remains to be accomplished by European scholarship for the correct interpretation of the Koran. We want, for example, an exhaustive classification and discussion of all the Jewish elements in the Koran; a praiseworthy beginning was made in Geiger's youthful essay *Was hat Mohamed aus dem Judenthum aufgenommen?* (Bonn, 1833; the "second revised edition," Leipzig, 1902, is only a reprint). We want especially a thorough commentary, executed with the methods and resources of modern science. No European language, it would seem, can even boast of a translation which completely satisfies modern requirements. The best are in English; where we have the extremely paraphrastic, but for its time admirable translation of George Sale (repeatedly printed), that of Rodwell (1861), which seeks to give the pieces in chronological order, and that of Palmer (1880), who wisely follows the traditional arrangements. The introduction which accompanies Palmer's translation is not in all respects abreast of the most recent scholarship. Considerable extracts from the Koran are well translated in E. W. Lane's *Selections from the Kur-ān*. Not much can be said in praise of the complete translations into the German language, neither of that of Ullmann, which has appeared in several editions, nor of that of Henning (Leipzig) and Grigull (Halle), all of them shallow amateurs who have no notion of the difficulties to be met with in the task, and are almost entirely dependent on Sale. Friedrich Rückert's excellent version (published by August Müller, Frankfort-on-Maine, 1888) gives only selections. M. Klamroth's translation of the fifty oldest sūras, *Die fünfzig ältesten Suren* (Hamburg, 1890) attempts successfully to reproduce the rhymed form of the originals. The publication of the translation of the Koran by the great Leipzig Arabic scholar, H. L. Fleischer (d. 1888) has so far unfortunately been delayed. (For modern editions, commentaries, &c., see MAHOMMEDAN RELIGION: *Bibliography*).

Besides commentaries on the whole Koran, or on special parts and topics, the Moslems possess a whole literature bearing on their sacred book. There are works on the spelling and right pronunciation of the Koran, works on the beauty of its language, on the number of its verses, words and letters, &c.; nay, there are even works which would nowadays be called "historical and critical introductions." Moreover, the origin of Arabic philology is intimately connected with the recitation and exegesis of the Koran. To exhibit the importance of the sacred book for the whole mental life of the Moslems would be simply to write the history of that life itself; for there is no department in which its all-pervading, but unfortunately not always salutary, influence has not been felt.

Eternity of the Koran.

The unbounded reverence of the Moslems for the Koran reaches its climax in the dogma that this book, as the divine word, *i.e.* thought, is immanent in God, and consequently *eternal* and *uncreated*. This dogma, which was doubtless due to the influence of the Christian doctrine of the eternal Word of God, has been accepted by almost all Mahommedans since the beginning of the 3rd century. Some theologians did indeed protest against it with great energy; it was in fact too preposterous to declare that a book composed of unstable words and letters, and full of variants, was absolutely divine. But what were the distinctions and sophisms of the theologians for, if they could not remove such contradictions, and convict their opponents of heresy?

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(TH. N.; FR. SY.)

KORAT, the capital of the provincial division (*Monton*) of Nakawn Racha Sema, or "the frontier country," in Siam; in 102° 5′ E., 14° 59′ N. Pop. about 7000, mixed Cambodian and Siamese. It is the headquarters of a high commissioner and of an army division. It is the terminus of a railway from Bangkok, 170 m. distant, and the distributing centre for the whole of the plateau district which forms the eastern part of Siam. There are copper mines of reputed wealth in the neighbourhood. It is the centre of a silk-growing district and is the headquarters of the government sericultural department, instituted in 1904 with the assistance of Japanese experts for the purpose of improving the quality of Siamese silk. The government is that of an ordinary provincial division of Siam. A French vice-consul resides here. Since the founding of Ayuthia in the 14th century, Korat has been tributary to, or part of, Siam, with occasional lapses into independence or temporary subjection to Cambodia. Before that period it was probably part of Cambodia, as appears from the nature of the ruins still to be seen in its neighbourhood. In 1896 the last vestige of its tributary condition vanished with the introduction of the present system of Siamese rural administration.

KORDOFAN, a country of north-east Africa, forming a *mudiria* (province) of the Anglo-Egyptian Sudan. It lies mainly between 12° and 16° W. and 29° and 32½° E., and has an area of about 130,000 sq. m., being bounded W. by Darfur, N. by the Bayuda steppes, E. by the White Nile mudiria and S. by the country of the Shilluks and other negro tribes, forming part of the Upper Nile mudiria.

The greater part of Kordofan consists of undulating plains, riverless, barren, monotonous, with an average altitude of 1500 ft. Thickets and small acacias dot the steppes, which, green during the *kharif* or rainy season, at other times present a dull brown burnt-up aspect. In the west, isolated peaks, such as Jebel Abu Senum and Jebel Kordofan, rise from 150 to 600 ft. above the plain. North-west are the mountain groups of Kaja and Katul (2000 to 3000 ft.), in the east are the Jebel Daier and Jebel Tagale (Togale), ragged granitic ranges with precipitous sides. In the south are flat, fertile and thickly wooded plains, which give place to jungle at the foot of the hills of Dar Nuba, the district forming the south-east part of Kordofan. Dar Nuba is well-watered, the scenery is diversified and pretty, affording a welcome contrast to that of the rest of the country. Some of the Nuba hills exceed 3000 ft. in height. The south-western part of the country, a vast and almost level plain, is known as Dar Homr. A granitic sand with abundance of mica and feldspar forms the upper stratum throughout the greater part of Kordofan; but an admixture of clay, which is observable in the north, becomes strongly marked in the south, where there are also stretches of black vegetable mould. Beneath there appears to be an unbroken surface of mica schist. Though there are no perennial rivers, there are watercourses (*khors* or *wadis*) in the rainy season; the chief being the Khor Abu Habl, which traverses the south-central region. In Dar Homr the Wadi el Ghalla and the Khor Shalango drain towards the Homr affluent of the Bahr el Ghazal. During the rainy season there is a considerable body of water in these channels, but owing partly to rapid evaporation and partly to the porous character of the soil the surface of the country dries rapidly. The water which has found its way through the granitic sand flows over the surface of the mica schist and settles in the hollows, and by sinking wells to the solid rock a supply of water can generally be obtained. It is estimated that (apart from those in a few areas where the sand stratum is thin and water is reached at the depth of a few feet) there are about 900 of these wells. They are narrow shafts going down usually 30 to 50 ft., but some are over 200 ft. deep. The water is raised by rope and bucket at the cost of enormous labour, and in few cases is any available for irrigation. The very cattle are trained to go a long time without drinking. Entire villages migrate after the harvest to the neighbourhood of some plentiful well. In a few localities the surface depressions hold water for the greater part of the year but there is only one permanent lake—Keilat, which is some four miles by two. As there is no highland area draining into Kordofan, the underground reservoirs are dependent on the local rainfall, and a large number of the wells are dry during many months. The rainy season lasts from mid-June to the end of September, rain usually falling every three or four days in brief but violent showers. In general the climate is healthy except in the rainy season, when large tracts are converted into swamps and fever is very prevalent. In the *shita* or cold weather (October to February inclusive) there is a cold wind from the north. The *seif* or hot weather lasts from March to mid-June; the temperature rarely exceeds 105° F.

The chief constituent of the low scrub which covers the northern part of the country is the grey gum acacia (*hashob*). In the south the red gum acacias (*talh*) are abundant. In Dar Hamid, in the N.W. of Kordofan, date, dom and other palms grow. The basbab or calabash tree, known in the eastern Sudan as the *tebeldi* and locally *Homr*, is fairly common and being naturally hollow the trees collect water, which the natives regularly tap. Another common source of water supply is a small kind of water melon which grows wild and is also cultivated. In the dense jungles of the south are immense creepers, some of them rubber-vines. The cotton plant is also found. The fauna includes the elephant, rhinoceros, buffalo, giraffe, lion, leopard, cheetah, roan-antelope, hartebeeste, kudu and many other kinds of antelope, wart-hog, hares, quail, partridge, jungle-fowl, bustard and guinea-fowl. Nearly all the kinds of game mentioned are found chiefly in the western and southern districts. The ril or addra gazelle found in N. and N.W. Kordofan are not known elsewhere in the eastern Sudan. Reptiles, sand-flies and mosquitoes are common. Ostriches are found in the northern steppes. The chief wealth of the people consists in the gum obtained from the grey acacias, in oxen, camels and ostrich feathers. The finest cattle are of the humped variety, the bulls of the Baggara being trained to the saddle and to carry burdens. There are large herds of camel, the camel-owning Arabs usually owning also large numbers of sheep and goats. Dukhn, a species of millet which can grow in the arid northern districts is there the chief grain crop, its place in the south being taken by durra. Dukhn is, however, the only crop cultivated in Dar Homr. From this grain a beer called *merissa* is brewed. Barley and cotton are cultivated in some districts. A little gold dust is obtained, but the old gold and other mines in the Tagale country have been, apparently, worked out. Iron is found in many districts and is smelted in a few places. In the absence of fuel the industry is necessarily a small one. There are large beds of hematite some 60 m. N.W. and the same distance N.E. of El Obeid.

Inhabitants.—The population of Kordofan was officially estimated in 1903 to be 550,000. The inhabitants are roughly divisible into two types—Arabs in the plains and Nubas in the hills. Many of the villagers of the plains are however of very mixed blood—Arab, Egyptian, Turkish, Levantine and Negro. It is said that some village communities are descended from the original negro inhabitants. They all speak Arabic. The most important village tribe is the Gowama, who own most of the gum-producing country. Other large tribes are the Dar Hamid and the Bederia—the last-named living round El Obeid. The nomad Arabs are of two classes, camel owners (*Siat El Ilbil*) and cattle owners (*Baggara*), the first-named dwelling in the dry northern regions, the Baggara in southern Kordofan. Of the camel-owning tribes the chief are the Hamar and the Kabbabish. Many of the Hamar have settled down in villages. The Baggara are great hunters, and formerly were noted slave raiders. They possess many horses, but when journeying place their baggage on their oxen. They use a stabbing spear, small throwing spears, and a broad-bladed short sword. Some of the richer men possess suits of chain armour. The principal Baggara tribes are the Hawazma, Meseria, Kenana, Habbania, and Homr. The Homr are said to have entered Kordofan from Wadai about the end of the 18th century and to have come from North Africa. They speak a purer Arabic than the riverain tribes. The Nubas are split into many tribes, each under a *mek* or king, who is not uncommonly of Arab descent. The Nubas have their own language, though the inhabitants of each hill have usually a different dialect. They are a primitive race, very black, of small build but distinctive negro features. They have feuds with one another and with the Baggara. During the *mahdia* they maintained their independence. The Nubas appear to have been the aboriginal inhabitants of the country and are believed to be the original stock of the Nubians of the Nile Valley (see NUBIA). In the northern hills are communities of black people with woolly hair but of non-negro features. They speak Arabic and are called Nuba Arabs. Some of the southern hills are occupied by Arab-speaking negroes, escaped slaves and their descendants, who called themselves after the tribe they formerly served and who have little intercourse with the Nubas.

The capital, El Obeid (*q.v.*), is centrally situated. On it converge various trade routes, notably from Darfur and from Dueim, a town on the White Nile 125 m. above Khartum, which served as port for the province. Thence was despatched the gum for the Omdurman market. But the railway from Khartum to El Obeid, via Sennar, built in 1909–1911, crosses the Nile some 60 m. farther south above Abba Island. Nahud (pop. about 10,000), 165 m. W.S.W. of El Obeid, is a commercial centre which has sprung into importance since the fall of the dervishes. All the trade with Darfur passes through the town, the chief commerce being in cattle, feathers, ivory and cotton goods. Trade is largely in the hands of Greeks, Syrians, Danagla and Jaalin. Taiara, on the route between El Obeid and the Nile, was destroyed by the dervishes but has been rebuilt and is a thriving mart for the gum trade. El Odoaiya or Eddaiya is the headquarters of the Homr country. It and Baraka in the Muglad district are on the trade road between Nahud and Shakka in Darfur.

Bara is a small town some 50 m. N.N.E. of Obeid. Talodi and Tendek are government stations in the Nuba country. The Nubas have no large towns. They live in villages on the hillsides or summits. The usual habitation built both by Arabs and Nubas is the *tukl*, a conical-shaped hut made of stone, mud, wattle and daub or straw. The Nuba tukls are the better built. In the chief towns houses are built of mud bricks with flat roofs.

History.—Of the early history of Kordofan there is little record. It never formed an independent state. About the beginning of the 16th century Funj from Sennar settled in the country; towards the end of that century Kordofan was conquered by Suleiman Solon, sultan of Darfur. About 1775 it was conquered by the Funj, and there followed a considerable immigration of Arab tribes into the country. The Sennari however suffered a decisive defeat in 1784 and thereafter under Darfur viceroys the country enjoyed prosperity. In 1821 Kordofan was conquered by Mahommed Bey the defterdar, son-in-law of Mehemet Ali, pasha of Egypt. It remained under Egyptian rule till 1882 when Mahommed Ahmed, the mahdi, raised the country to revolt. It was in Kordofan that Hicks Pasha and his army, sent to crush the revolt, were annihilated (Nov. 1883). The Baggara of Kordofan from that time onward were the chief supporters of the mahdi, and his successor, the khalifa Abdullah, was a Baggara. In Kordofan in 1899 the khalifa met his death, the country having already passed into the hands of the new Sudan government. The chief difficulty experienced by the administration was to habituate the Arabs and Nubas, both naturally warlike, to a state of peace. In consequence of the anti-slave raiding measures adopted, the Arabs of Talodi in May 1906 treacherously massacred the mamur of that place and 40 men of the Sudanese regiment. The promptness with which this disturbance was suppressed averted what otherwise might have been a serious rising. (See SUDAN: *Anglo-Egyptian*, § "History.")

See *The Anglo-Egyptian Sudan*, edited by Count Gleichen (London, 1905); H. A. MacMichael, *Notes on the History of Kordofan before the Egyptian Conquest* (Cairo, 1907); John Petherick, *Egypt, the Sudan, and Central Africa* (London, 1861); Ignaz Pallme, *Beschreibung von Kordofan* (Stuttgart, 1843; trans. *Travels in Kordofan*, London, 1844); Major H. G. Prout, *General Report on Province of Kordofan* (Cairo, 1877); Ernst Marno, *Reise in der egypt. Equat. Provinz* (Vienna, 1879); papers (with maps) by Capt. W. Lloyd in the *Geog. Journ.* (June 1907 and March 1910); and the bibliography given under SUDAN: *Anglo-Egyptian.*

KOREA, or COREA (CH'AO HSIEN, DAI HAN). Its mainland portion consists of a peninsula stretching southwards from Manchuria, with an estimated length of about 600 m., an extreme breadth of 135 m., and a coast-line of 1740 m. It extends from 34° 18′ to 43° N., and from 124° 36′ to 130° 47′ E. Its northern boundary is marked by the Tumen and Yalu rivers; the eastern boundary by the Sea of Japan; the southern boundary by Korea Strait; and the western boundary by the Yalu and the Yellow Sea. For 11 m. along the Tumen river the north frontier is conterminous with Russia (Siberia); otherwise Korea has China (Manchuria) on its land frontier. Nearly the whole surface of the country is mountainous. (For map, see JAPAN.)

The south and west coasts are fringed by about 200 islands (exclusive of islets), two-thirds of which are inhabited; 100 of them are from 100 to 2000 ft. in height, and many consist of bold bare masses of volcanic rock. The most important are Quelpart and the Nan Hau group. The latter, 36 m. from the eastern end of Quelpart, possesses the deep, well-sheltered and roomy harbour of Port Hamilton, which lies between the north points of the large and well-cultivated islands of Sun-ho-dan and So-dan, which have a population of 2000. Aitan, between their south-east points, completes this noble harbour. The east coast of Korea is steep and rock-bound, with deep water and a tidal rise and fall of 1 to 2 ft. The west coast is often low and shelving, and abounds in mud-banks, and the tidal rise and fall is from 20 to 36 ft. Korean harbours, except two or three which are closed by drift ice for some weeks in winter, are ice-free. Among them are Port Shestakov, Port Lazarev, and Wön-san (Gensan), in Broughton Bay;[1] Fusan, Ma-san-po, at the mouth of the Nak-tong, on the south coast; Mok-po, Chin-nampo, near the mouth of the Tai-dong; and Chemulpo, near the mouth of the Han, the port of the capital and the sea terminus of the first Korean railway on the west coast.

Korea is distinctly mountainous, and has no plains deserving the name. In the north there are mountain groups with definite centres, the most notable being Paik-tu San or Pei-shan (8700 ft.) which contains the sources of the Yalu and Tumen. From these groups a lofty range runs southwards, dividing the empire into two unequal parts. On its east, between it and the coast, which it follows at a moderate distance, is a fertile strip difficult of access, and on the west it throws off so many lateral ranges and spurs as to break up the country into a chaos of corrugated and precipitous hills and steep-sided valleys, each with a rapid perennial stream. Farther south this axial range, which includes the Diamond Mountain group, falls away towards the sea in treeless spurs and small and often infertile levels. The northern groups and the Diamond Mountain are heavily timbered, but the hills are covered mainly with coarse, sour grass and oak and chestnut scrub. The rivers are shallow and rocky, and are usually only navigable for a few miles from the sea. Among the exceptions are the Yalu (Amnok), Tumen, Tai-dong, Naktong, Mok-po, and Han. The last, rising in Kang-wön-do, 30 m. from the east coast, cuts Korea nearly in half, reaching the sea on the west coast near Chemulpo; and, in spite of many serious rapids, is a valuable highway for commerce for over 150 miles.

Geology.—The geology of Korea is very imperfectly known. Crystalline schists occupy a large part of the country, forming all the higher mountain ranges. They are always strongly folded and it is in them that the mineral wealth of Korea is situated. Towards the Manchurian frontier they are covered unconformably by some 1600 ft. of sandstones, clay-slates and limestones, which contain Cambrian fossils and are the equivalents of a part of the Sinian system of China. Carboniferous beds, consisting chiefly of slates, sandstones and conglomerates, are found in the south-eastern provinces. They contain a few seams of coal, but the most important coal-bearing deposits of the country belong to the Tertiary period. Recent eruptive and volcanic rocks are met with in the interior of Korea and also in the island of Quelpart. The principal mountain in the latter, Hal-la-san (or Mount Auckland), according to Chinese stories, was in eruption in the year 1007. With this possible exception there are no active volcanoes in Korea, and the region has also been remarkably free from earthquakes throughout historic times.

Climate.—The climate is superb for nine months of the year, and the three months of rain, heat and damp are not injurious to health. Koreans suffer from malaria, but Europeans and their children are fairly free from climatic maladies, and enjoy robust health. The summer mean temperature of Seoul is about 75° F., that of winter about 33°; the average rainfall, 36·3 in. in the year, and of the rainy season 21·86 in. The rains come in July and August on the west and north-east coasts, and from April to July on the south coast, the approximate mean annual rainfall of these localities being 30, 35 and 42 in. respectively. These averages are based on the observations of seven years only.

Flora.—The plants and animals await study and classification. Among the indigenous trees are the *Abies excelsa*, *Abies microsperma*, *Pinus sinensis*, *Pinus pinea*, three species of oak, five of maple, lime, birch, juniper, mountain ash, walnut, Spanish chestnut, hazel, willow, hornbeam, hawthorn, plum, pear, peach, *Rhus vernicifera*, (?) *Rhus semipinnata*, *Acanthopanax ricinifolia*, *Zelkawa*, *Thuja orientalis*, *Elaeagnus*, *Sophora Japonica*, &c. Azaleas and rhododendrons are widely distributed, as well as other flowering shrubs and creepers, *Ampelopsis Veitchii* being universal. Liliaceous plants and cruciferae are numerous. The native fruits, except walnuts and chestnuts, are worthless. The persimmon attains perfection, and experiment has proved the suitability of the climate to many foreign fruits. The indigenous economic plants are few, and are of no commercial value, excepting wild *ginseng*, bamboo, which is applied to countless uses, and "tak-pul" (*Hibiscus Manihot*), used in the manufacture of paper.

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[1] Named after William Robert Broughton (1762–1821), an English navigator who explored these seas in 1795–1798.

Fauna.—The tiger takes the first place among wild animals. He is of great size, his skin is magnificent, and he is so widely distributed as to be a peril to man and beast. Tiger-hunting is a profession with special privileges. Leopards are numerous, and have even been shot within the walls of Seoul. There are deer (at least five species), boars, bears, antelopes, beavers, otters, badgers, tiger-cats, marten, an inferior sable, striped squirrels, &c. Among birds there are black eagles, peregrines (largely used in hawking), and, specially protected by law, turkey bustards, three varieties of pheasants, swans, geese, common and spectacled teal, mallards, mandarin ducks white and pink ibis, cranes, storks, egrets, herons, curlews, pigeons, doves, nightjars, common and blue magpies, rooks, crows, orioles, halcyon and blue kingfishers, jays, nut-hatches, redstarts, snipe, grey shrikes, hawks, kites, &c. But, pending further observations, it is not possible to say which of the smaller birds actually breed in Korea and which only make it a halting-place in their annual migrations.

Area and Population.—The estimated area is 82,000 sq. m.—somewhat under that of Great Britain. The first complete census was taken in 1897, and returned the population in round numbers at 17,000,000, females being in the majority. It was subsequently, however, estimated at a maximum of 12,000,000. There is a foreign population of about 65,000, of whom 60,000 are Japanese. It is estimated that little more than half the arable land is under cultivation, and that the soil could support an additional 7,000,000. The native population is absolutely homogeneous. Northern Korea, with its severe climate, is thinly peopled, while the rich and warm provinces of the south and west are populous. A large majority of the people are engaged in agriculture. There is little emigration, except into Russian and Chinese territory, but some Koreans have emigrated to Hawaii and Mexico.

The capital is the inland city of Seoul, with a population of nearly 200,000. Among other towns, Songdo (Kaisöng), the capital from about 910 to 1392, is a walled city of the first rank, 25 m. N.W. of Seoul, with a population of 60,000. It possesses the stately remains of the palace of the Korean kings of the Wang dynasty, is a great centre of the grain trade and the sole centre of the *ginseng* manufacture, makes wooden shoes, coarse pottery and fine matting, and manufactures with sesamum oil the stout oiled paper for which Korea is famous. Phyöng-yang, a city on the Tai-dong, had a population of 60,000 before the war of 1894, in which it was nearly destroyed; but it fast regained its population. It lies on rocky heights above a region of stoneless alluvium on the east, and with the largest and richest plain in Korea on the west. It has five coal-mines within ten miles, and the district is rich in iron, silk, cotton, and grain. It has easy communication with the sea (its port being Chin-nampo), and is important historically and commercially. Auriferous quartz is worked by a foreign company in its neighbourhood. Near the city is the illustrated standard of land measurement cut by Ki-tze in 1124 B.C.

With the exceptions of Kang-hwa, Chöng-ju, Tung-nai, Fusan, and Wön-san, it is very doubtful if any other Korean towns reach a population of 15,000. The provincial capitals and many other cities are walled. Most of the larger towns are in the warm and fertile southern provinces. One is very much like another, and nearly all their streets are replicas of the better alleys of Seoul. The actual antiquities of Korea are dolmens, sepulchral pottery, and Korean and Japanese fortifications.

Race.—The origin of the Korean people is unknown. They are of the Mongol family; their language belongs to the so-called Turanian group, is polysyllabic, possesses an alphabet of 11 vowels and 14 consonants, and a script named *En-mun*. Literature of the higher class and official and upper class correspondence are exclusively in Chinese characters, but since 1895 official documents have contained an admixture of *En-mun*. The Koreans are distinct from both Chinese and Japanese in physiognomy, though dark straight hair, dark oblique eyes, and a tinge of bronze in the skin are always present. The cheek-bones are high; the nose inclined to flatness; the mouth thin-lipped and refined among patricians, and wide and full-lipped among plebeians; the ears are small, and the brow fairly well developed. The expression indicates quick intelligence rather than force and mental calibre. The male height averages 5 ft. 4½ in. The hands and feet are small and well-formed. The physique is good, and porters carry on journeys from 100 to 200 lb. Men marry at from 18 to 20 years, girls at 16, and have large families, in which a strumous taint is nearly universal. Women are secluded and occupy a very inferior position. The Koreans are rigid monogamists, but concubinage has a recognized status.

Production and Industries. i. *Minerals.*—Extensive coal-fields, producing coal of fair quality, as yet undeveloped, occur in Hwang-hai Do and elsewhere. Iron is abundant, especially in Phyöng-an Do, and rich copper ore, silver and galena are found. Crystal is a noted product of Korea, and talc of good quality is also present. In 1885 the rudest process of "placer" washing produced an export of gold dust amounting to £120,000; quartz-mining methods were subsequently introduced, and the annual declared value of gold produced rose to about £450,000; but much is believed to have been sent out of the country clandestinely. The reefs were left untouched till 1897, when an American company, which had obtained a concession in Phyöng-an Do in 1895, introduced the latest mining appliances, and raised the declared export of 1898 to £240,047, believed to represent a yield for that year of £600,000. Russian, German, English, French and Japanese applicants subsequently obtained concessions. The *concessionnaires* regard Korean labour as docile and intelligent. The privilege of owning mines in Korea was extended to aliens under the Mining Regulations of 1906.

ii. *Agriculture.*—Korean soil consists largely of light sandy loam, disintegrated lava, and rich, stoneless alluvium, from 3 to 10 ft. deep. The rainfall is abundant during the necessitous months of the year, facilities for the irrigation of the rice crop are ample, and drought and floods are seldom known. Land is held from the proprietors on the terms of receiving seed from them and returning half the produce, the landlord paying the taxes. Any Korean can become a landowner by reclaiming and cultivating unoccupied crown land for three years free of taxation, after which he pays taxes annually. Good land produces two crops a year. The implements used are two makes of iron-shod wooden ploughs; a large shovel, worked by three or five men, one working the handle, the others jerking the blade by ropes attached to it; a short sharp-pointed hoe, a bamboo rake, and a wooden barrow, all of rude construction. Rice is threshed by beating the ears on a log; other grains, with flails on mud threshing-floors. Winnowing is performed by throwing up the grain on windy days. Rice is hulled and grain coarsely ground in stone querns or by water pestles. There are provincial horse-breeding stations, where pony stallions, from 10 to 12 hands high, are bred for carrying burdens. Magnificent red bulls are bred by the farmers for ploughing and other farming operations, and for the transport of goods. Sheep and goats are bred on the imperial farms, but only for sacrifice. Small, hairy, black pigs, and fowls, are universal. The cultivation does not compare in neatness and thoroughness with that of China and Japan. There are no trustworthy estimates of the yield of any given measurement of land. The farmers put the average yield of rice at thirty-fold, and of other grain at twenty-fold. Korea produces all cereals and root crops except the tropical, along with cotton, tobacco, a species of the Rhea plant used for making grass-cloth, and the *Brousonettia papyrifera*. The articles chiefly cultivated are rice, millet, beans, *ginseng* (at Songdo), cotton, hemp, oil-seeds, bearded wheat, oats, barley, sorghum, and sweet and Irish potatoes. Korean agriculture suffers from infamous roads, the want of the exchange of seed, and the insecurity of the gains of labour. It occupies about three-fourths of the population.

iii. *Other Industries.*—The industries of Korea, apart from supplying the actual necessaries of a poor population, are few and rarely collective. They consist chiefly in the manufacture of sea-salt, of varied and admirable paper, thin and poor silk, horse-hair crinoline for hats, fine split bamboo blinds, hats and mats, coarse pottery, hemp cloth for mourners, brass bowls and grass-cloth. Won-san and Fusan are large fishing centres, and salt fish and fish manure are important exports; but the prolific fishing-grounds are worked chiefly by Japanese labour and capital. Paper and *ginseng* are the only manufactured articles on the list of Korean exports. The arts are nil.

Commerce.—A commercial treaty was concluded with Japan in 1876, and treaties with the European countries and the United States of America were concluded subsequently. An imperial edict of the 20th of May 1904 annulled all Korean treaties with Russia. After the opening of certain Korean ports to foreign trade, the customs were placed under the management of European commissioners nominated by Sir Robert Hart from Peking. The ports and other towns open are Seoul, Chemulpo, Fusan, Wön-san, Chin-nampo, Mok-po, Kun-san, Ma-san-po, Song-chin, Wiju, Yong-ampo, and Phyöng-yang. The value of foreign trade of the open ports has fluctuated considerably, but has shown a tendency to increase on the whole. For example, in 1884 imports were valued at £170,113 and exports at £95,377. By 1890 imports had risen to £790,261, and thereafter fluctuated greatly, standing at only £473,598 in 1893, but at £1,017,238 in 1897, and £1,382,352 in 1901, but under abnormal conditions in 1904 this last amount was nearly doubled. Exports in 1890 were valued at £591,746; they also fluctuated greatly, falling to £316, 072 in 1893, but standing at £863,828 in 1901, and having a further increase in some subsequent years. These figures exclude the value of gold dust. The principal imports are cotton goods, railway materials, mining supplies and metals, tobacco, kerosene, timber, and clothing. Japanese cotton yarns are imported to be woven into a strong cloth on Korean hand-looms. Beans and peas, rice, cowhides, and *ginseng* are the chief exports, apart from gold.

Communications.—Under Japanese auspices a railway from Chemulpo to Seoul was completed in 1900. This became a branch of the longer line from Fusan to Seoul (286 m.), the concession for which was granted in 1898. This line was pushed forward rapidly on the outbreak of the Russo-Japanese War, and the whole was opened early in 1905. A railway from Seoul to Wiju was planned under French engineers, but the work was started by the Korean government. This line also, however, was taken over by the Japanese military authorities, and the first trains ran through early in 1905, in which year Japan obtained control of the whole of the Korean internal communications. The main roads centring in Seoul are seldom fit even for the passage of ox-carts, and the secondary roads are bad bridle-tracks, frequently degenerating into " rock ladders." Some improvements, however, have been effected under Japanese direction. The inland transit of goods is almost entirely on the backs of bulls carrying from 450 to 600 ℔, on ponies carrying 200 ℔, and on men carrying from 100 to 150 ℔, bringing the average cost up to a fraction over 8d. per mile per ton. The *corvée* exists, with its usual hardships. Bridges are made of posts, carrying a framework either covered with timber or with pine branches and earth. They are removed at the beginning of the rainy season, and are not replaced for three months. The larger rivers are unbridged, but there are numerous government ferries. The infamous roads and the risks during the bridgeless season greatly hamper trade. Japanese steamers ply on the Han between Chemulpo and Seoul.

A postal system, established in 1894–1895, has been gradually extended. There are postage stamps of four values. The Japanese, under the agreement of 1905, took over the postal, telegraphic and telephone services. Korea is connected with the Chinese and Japanese telegraph systems by a Japanese line from Chemulpo via Seoul to Fusan, and by a line acquired by the empire between Seoul and Wiju. The state has also lines from Seoul to the open ports, &c. Korea has regular steam communication with ports in Japan, the Gulf of Pechili, Shanghai, &c. Her own mercantile marine is considerable.

Government.—From 1895, when China renounced her claims to suzerainty, to 1910 the king (since 1897 emperor) was in theory an independent sovereign, Japan in 1904 guaranteeing the welfare and dignity of the imperial house. Under a treaty signed at Seoul on the 17th of November 1905, Japan directed the external relations of Korea, and Japanese diplomatic and consular representatives took charge of Korean subjects and interests in foreign countries. Japan undertook the maintenance of existing treaties between Korea and foreign powers; and Korea agreed that her future foreign treaties should be concluded through the medium of Japan. A resident-general represented Japan at Seoul, to direct diplomatic affairs, the first being the Marquis Ito. Under a further convention of July 1907, the resident-general's powers were enormously increased. In administrative reforms the Korean government followed his guidance; laws could not be enacted nor administrative measures undertaken without his consent; the appointment and dismissal of high officials, and the engagement of foreigners in government employ, were subject to his pleasure. Each department of state has a Japanese vice-minister, and a large proportion of Japanese officials were introduced into these departments as well as Japanese chiefs of the bureaus of police and customs. By a treaty dated August 22nd 1910, which came into effect seven days later the emperor of Korea made " complete and permanent cession to the emperor of Japan of all rights of sovereignty over the whole of Korea." The entire direction of the administration was then taken over by the Japanese resident-general, who was given the title of governor-general. The jurisdiction of the consular courts was abolished but Japan guaranteed the continuance of the existing Korean tariff for ten years.

Local Administration.—Korea for administrative purposes is divided into provinces and prefectures or magistracies. Japanese reforms in this department have been complete. Each provincial government has a Japanese secretary, police inspector and clerks. The secretary may represent the governor in his absence.

Law.—A criminal code, scarcely equalled for barbarity, though twice mitigated by royal edict since 1785, remained in force in its main provisions till 1895. Subsequently, a mixed commission of revision carried out some good work. Elaborate legal machinery was devised, though its provisions were constantly violated by the imperial will and the gross corruption of officials. Five classes of law courts were established, and provision was made for appeals in both civil and criminal cases. Abuses in legal administration and in tax-collecting were the chief grievances which led to local insurrections. Oppression by the throne and the official and noble classes prevailed extensively; but the weak protected themselves by the use of the *Kyei*, or principle of association, which developed among Koreans into powerful trading gilds, trades-unions, mutual benefit associations, money-lending gilds, &c. Nearly all traders, porters and artisans were members of gilds, powerfully bound together and strong by combined action and mutual helpfulness in time of need. Under the Japanese régime the judiciary and the executive were rigidly separated. The law courts, including the court of cassation, three courts of appeal, eight local courts, and 115 district courts, were put under Japanese judges, and the codification of the laws was undertaken. The prison system was also reformed.

Finance and Money.—Until 1904 the finances of Korea were completely disorganized; the currency was chaotic, and the budget was an official formality making little or no attempt at accuracy. By agreement of the 22nd of August 1904, Korea accepted a Japanese financial adviser; and valuable reforms were quickly entered upon under the direction of the first Japanese official, Mr T. Megata. He had to contend against corrupt officialdom, indiscriminate expenditure, and absence of organization in the collection of revenue, apart from the confusion with regard to the currency. This last was nominally on a silver standard. The coins chiefly in use were (i) copper *cash*, which were strung in hundreds on strings of straw, and, as about 9℔ weight was equal to one shilling, were excessively cumbrous, but were nevertheless valued at their face value; (ii) nickel coins, which, being profitable to mint, were issued in enormous quantities, quickly depreciated, and were moreover extensively forged. The Dai Ichi Ginko (First Bank of Japan), which has a branch in Seoul and agencies in other towns, was made the government central treasury, and its notes were recognized as legal tender in Korea. The currency of Korea being thus fixed, the first step was to reorganize the nickel coinage. From the 1st of August 1905 the old nickels paid into the treasury were remitted and the issue carefully regulated; so also with the cash, which was retained as a subsidiary coinage, while a supplementary coinage was issued of silver 10-sen pieces and bronze 1-sen and half-sen pieces. To aid the free circulation of money and facilitate trade, the government grants subsidies for the establishment of co-operative warehouse companies with bonded warehouses. Regulations have also been promulgated with respect to promissory notes, which have long existed in Korea. They took the form of a piece of paper about an inch broad and five to eight inches long, on which was written the sum, the date of payment and the name of the payer and payee, with their seals; the paper was then torn down its length, and one half given to each party. The debtor was obliged to pay the amount of the debt to any person who presented the missing half of the bill. The readiness with which they were accepted led to over-issue, and, consequently, financial crises. The new regulations require the amount of the notes to be expressed in yen, not to be payable in old nickel coins or cash. The notes can only be issued by members of a note association, a body constituted under government regulations, whose members must uphold the credit and validity of their notes. The notes must also be made payable to a definite person and require endorsement, safeguards which were previously lacking. Administrative reform was also taken in hand; the large number of superfluous and badly paid officials was considerably reduced, and the status and salary of all existing government officials considerably improved. An endeavour was made to publish an annual budget, in which the revenue and expenditure should accurately represent the sums actually received and expended. Regulations were framed for the purpose of establishing adequate supervision over the revenue and expenditure for the abolition of irregular taxation and extortions, as well as the practice of farming out the collection of the revenue to individuals, and, generally, to adapt the whole collection and expenditure of the national revenue to modern ideas of public finance. Down to 1910 the sum expended by Japan on Korean reforms was estimated to approach fifteen millions sterling. Among reforms not specifically referred to may be mentioned the improvement of coastwise navigation, the provision of posts, roads, railways, public buildings, hospitals and sanitary works, and the official advancement of industries.

Religion.—Buddhism, which swayed Korea from the 10th to the 14th century, has been discredited for three centuries, and its priests are ignorant, immoral and despised. Confucianism is the official cult, and all officials offer sacrifices and homage at stated seasons in the Confucian temples. Confucian ethics are the basis of morality and social order. Ancestor-worship is universal. The popular cult is, however, the propitiation of demons, a modification of the Shamanism of northern Asia. The belief in demons, mostly malignant, keeps the Koreans in constant terror, and much of their substance is spent on propitiations. Sorceresses and blind sorcerers are the intermediaries. At the close of the 19th century the fees annually paid to these persons were estimated at £150,000; there were in Seoul 1000 sorceresses, and very large sums are paid to the male sorcerers and geomancers.

Putting aside the temporary Christian work of a Jesuit chaplain to the Japanese Christian General Konishe, in 1594 during the Japanese invasion, as well as that on a larger scale by students who received the evangel in the Roman form from Peking in 1792, and had made 4000 converts by the end of 1793, the first serious attempt at the conversion of Korea was made by the French *Société des Missions Étrangères* in 1835. In spite of frequent persecutions, there were 16,500 converts in 1857 and 20,000 in 1866, in which year the French bishops and priests were martyred by order of the emperor's father, and several thousand native Christians were beheaded, banished or imprisoned. This mission in 1900 had about 30 missionaries and 40,000 converts. In 1884 and 1885, toleration being established, Protestant missionaries of the American Presbyterian and Methodist Episcopal Churches entered Korea, and were followed by a large number of agents of other denominations. An English bishop, clergy, doctors and nursing sisters arrived in 1890. Hospitals, orphanages, schools and an admirable college in Seoul have been founded, along with tri-lingual (Chinese, Korean and English) printing-presses; religious, historical and scientific works and much of the Bible have been translated into *En-mun*, and periodicals of an enlightened nature in the Korean script are also circulated. The progress of Protestant missions was very slow for some years, but from 1895 converts multiplied.

Education.—The "Royal Examinations" in Chinese literature held in Seoul up to 1894, which were the entrance to official position, being abolished, the desire for a purely Chinese education diminished. In Seoul there were established an imperial English school with two foreign teachers, a reorganized Confucian college, a normal college under a very efficient foreign principal, Japanese, Chinese, Russian and French schools, chiefly linguistic, several Korean primary schools, mission boarding-schools, and the *Pai Chai* College connected with the American Methodist Episcopal Church, under imperial patronage, and subsidized by government, in which a liberal education of a high class was given and *En-mun* receives much attention. The Koreans are expert linguists, and the government made liberal grants to the linguistic schools. In the primary schools boys learn arithmetic, and geography and Korean history are taught, with the outlines of the governmental systems of other civilized countries. The education department has been entirely reorganized under the Japanese régime, Japanese models being followed

History.—By both Korean and Chinese tradition Ki-tze—a councillor of the last sovereign of the 3rd Chinese dynasty, a sage, and the reputed author of parts of the famous Chinese classic, the *Shu-King*—is represented as entering Korea in 1122 B.C. with several thousand Chinese emigrants, who made him their king. The peninsula was then peopled by savages living in caves and subterranean holes. By both learned and popular belief in Korea Ki-tze is recognized as the founder of Korean social order, and is greatly reverenced. He called the new kingdom *Ch'ao-Hsien*, pacified and policed its borders, and introduced laws and Chinese etiquette and polity. Korean ancient history is far from satisfying the rigid demands of modern criticism, but it appears that Ki-tze's dynasty ruled the peninsula until the 4th century B.C., from which period until the 10th century A.D. civil wars and foreign aggressions are prominent. Nevertheless, Hiaksai, which with Korai and Shinra then constituted Korea, was a centre of literary culture in the 4th century, through which the Chinese classics and the art of writing reached the other two kingdoms. Buddhism, a forceful civilizing element, reached Hiaksai in A.D. 384, and from it the sutras and images of northern Buddhism were carried to Japan, as well as Chinese letters and ethics. Internecine wars were terminated about 913 by Wang the Founder, who unified the peninsula under the name Korai, made Song-do its capital, and endowed Buddhism as the state religion. In the 11th century Korea was stripped of her territory west of the Yalu by a warlike horde of Tungus stock, since which time her frontiers have been stationary. The Wang dynasty perished in 1392, an important epoch in the peninsula, when Ni Taijo, or Litan, the founder of the present dynasty, ascended the throne, after his country had suffered severely from Jenghiz and Khublai Khan. He tendered his homage to the first Ming emperor of China, received from him his investiture as sovereign, and accepted from him the Chinese calendar and chronology, in itself a declaration of fealty. He revived the name *Ch'ao-Hsien*, changed the capital from Song-do to Seoul, organized an administrative system, which with some modifications continued till 1895, and exists partially still, carried out vigorous reforms, disestablished Buddhism, made merit in Chinese literary examinations the basis of appointment to office, made Confucianism the state religion, abolished human sacrifices and the burying of old men alive, and introduced that Confucian system of education, polity, and social order which has dominated Korea for five centuries. Either this king or an immediate successor introduced the present national costume, the dress worn by the Chinese before the Manchu conquest. The early heirs of this vigorous and capable monarch used their power, like him, for the good of the people; but later decay set in, and Japanese buccaneers ravaged the coasts, though for two centuries under Chinese protection Korea was free from actual foreign invasion. In 1592 occurred the epoch-making invasion of Korea by a Japanese army of 300,000 men, by order of the great regent Hideyoshi. China came to the rescue with 60,000 men, and six years of a gigantic and bloody war followed, in which Japan used firearms for the first time against a foreign foe. Seoul and several of the oldest cities were captured, and in some instances destroyed, the country was desolated, and the art treasures and the artists were carried to Japan. The Japanese troops were recalled in 1598 at Hideyoshi's death. The port and fishing privileges of Fusan remained in Japanese possession, a heavy tribute was exacted, and until 1790 the Korean king stood in humiliating relations towards Japan. Korea never recovered from the effects of this invasion, which bequeathed to all Koreans an intense hatred of the Japanese.

In 1866, 1867, and 1871 French and American punitive expeditions attacked parts of Korea in which French missionaries and American adventurers had been put to death, and inflicted much loss of life, but retired without securing any diplomatic successes, and Korea continued to preserve her complete isolation. The first indirect step towards breaking it down had been taken in 1860, when Russia obtained from China the cession of the Usuri province, thus bringing a European power down to the Tumen. A large emigration of famine-stricken Koreans and persecuted Christians into Russian territory followed. The emigrants were very kindly received, and many of them became thrifty and prosperous farmers. In 1876 Japan, with the consent of China, wrung a treaty from Korea by which Fusan was fully opened to Japanese settlement and trade, and Won-san (Gensan) and Inchiun (Chemulpo) were opened to her in 1880. In 1882 China promulgated her "Trade and Frontier Regulations," and America negotiated a commercial treaty, followed by Germany and Great Britain in 1883, Italy and Russia in 1884, France in 1886, and Austria in 1892. A "Trade Convention" was also concluded with Russia. Seoul was opened in 1884 to foreign residence, and the provinces to foreign travel, and the diplomatic agents of the contracting powers obtained a recognized status at the capital. These treaties terminated the absolute isolation which Korea had effectually preserved. During the negotiations, although under Chinese suzerainty, she was treated with as an independent state. Between 1897 and 1899, under diplomatic pressure, a number of ports were opened to foreign trade and residence. From 1882 to 1894 the chief event in the newly opened kingdom was a plot by the Tai-won-Kun, the father of the emperor, to seize on power, which led to an attack on the Japanese legation, the members of which were compelled to fight their way, and that not bloodlessly, to the sea. Japan secured ample compensation; and the Chinese resident, aided by Chinese troops, deported the Tai-won-Kun to Tientsin. In 1884 at an official banquet the leaders of the progressive party assassinated six leading Korean statesmen, and the intrigues in Korea of the banished or escaped conspirators created difficulties which were very slow to subside. In spite of a constant struggle for ascendancy between the queen and the returned Tai-won-Kun, the next decade was one of quiet. China, always esteemed in Korea, consolidated her influence under the new conditions through a powerful resident; prosperity advanced, and certain reforms were projected by foreign "advisers." In May 1894 a more important insurrectionary rising than usual led the king to ask armed aid from China. She landed 2000 troops on the 10th of June, having previously, in accordance with treaty provisions, notified Japan of her intention. Soon after this Japan had 12,000 troops in Korea, and occupied the capital and the treaty ports. Then Japan made three sensible proposals for Korean reform, to be undertaken jointly by herself and China. China replied that Korea must be left to reform herself, and that the withdrawal of the Japanese troops must precede negotiations. Japan rejected this suggestion, and on the 23rd of July attacked and occupied the royal palace. After some further negotiations and fights by land and sea between Japan and China war was declared formally by Japan; and Korea was for some time the battle-ground of the belligerents. The Japanese victories resulted for Korea in the solemn renunciation of Chinese suzerainty by the Korean king, the substitution of Japanese for Chinese influence, the introduction of many important reforms under Japanese advisers, and of checks on the absolutism of the throne. Everything promised well. The finances flourished under the capable control of Mr (afterwards Sir) M‘Leavy Brown, C.M.G. Large and judicious retrenchments were carried out in most of the government departments. A measure of judicial and prison reform was granted. Taxation was placed on an equable basis. The pressure of the trade gilds was relaxed. Postal and educational systems were introduced. An approach to a constitution was made. The distinction between patrician and plebeian, domestic slavery, and beating and slicing to death were abolished. The age for marriage of both sexes was raised. Chinese literary examinations ceased to be a passport to office. Classes previously degraded were enfranchised, and the alliance between two essentially corrupt systems of government was severed. For about eighteen months all the departments were practically under Japanese control. On the 8th of October 1895 the Tai-won-Kun, with Korean troops, aided by Japanese troops under the orders of Viscount Miura, the Japanese minister, captured the palace, assassinated the queen, and made a prisoner of the king, who, however, four months later, escaped to the Russian legation, where he remained till the spring of 1897. Japanese influence waned. The engagements of the advisers were not renewed. A strong retrograde movement set in. Reforms were dropped. The king, with the checks upon his absolutism removed, reverted to the worst traditions of his dynasty, and the control and arrangements of finance were upset by Russia.

At the close of 1897 the king assumed the title of emperor, and changed the official designation of the empire to *Dai Han*—Great Han. By 1898 the imperial will, working under partially new conditions, produced continual chaos, and by 1900 succeeded in practically overriding all constitutional restraints. Meanwhile Russian intrigue was constantly active. At last Japan resorted to arms, and her success against Russia in the war of 1904–5 enabled her to resume her influence over Korea. On the 23rd of February 1904 an agreement was determined whereby Japan resumed her position as administrative adviser to Korea, guaranteed the integrity of the country, and bound herself to maintain the imperial house in its position. Her interests were recognized by Russia in the treaty of peace (September 5, 1905), and by Great Britain in the Anglo-Japanese agreement of the 12th of August 1905. The Koreans did not accept the restoration of Japanese influence without demur. In August 1905 disturbances arose owing to an attempt by some merchants to obtain special assistance from the treasury on the pretext of embarrassment caused by Japanese financial reforms; these disturbances spread to some of the provinces, and the Japanese were compelled to make a show of force. Prolonged negotiations were necessary to the completion of the treaty of the 17th of November 1905, whereby Japan obtained the control of Korea's foreign affairs and relations, and the confirmation of previous agreements, the far-reaching results of which have been indicated. Nor was opposition to Japanese reforms confined to popular demonstration. In 1907 a Korean delegacy, headed by Prince Yong, a member of the imperial family, was sent out to lay before the Hague conference of that year, and before all the principal governments, a protest against the treatment of Korea by Japan. While this was of course fruitless from the Korean point of view, it indicated that the Japanese must take strong measures to suppress the intrigues of the Korean court.

At the instigation of the Korean ministry the emperor abdicated on the 19th of July 1907, handing over the crown to his son. Somewhat serious *émeutes* followed in Seoul and elsewhere, and the Japanese proposals for a new convention, increasing the powers of the resident general, had to be presented to the cabinet under a strong guard. The convention was signed on the 25th of July. One of the reforms immediately undertaken was the disbanding of the Korean standing army, which led to an insurrection and an intermittent guerrilla warfare which, owing to the nature of the country, was not easy to subdue. Under the direction of Prince Ito (*q.v.*) the work of reform was vigorously prosecuted. In July 1909, General Teranchi, Japanese minister of war, became resident-general, with the mission to bring about annexation. This was effected peacefully in August 1910, the emperor of Korea by formal treaty surrendering his country and crown. (See JAPAN.)

AUTHORITIES.—The first Asiatic notice of Korea is by Khordadbeh, an Arab geographer of the 9th century A.D., in his *Book of Roads and Provinces*, quoted by Baron Richthofen in his great work on *China*, p. 575. The earliest European source of information is a narrative by H. Hamel, a Dutchman, who was shipwrecked on the coast of Quelpart in 1654, and held in captivity in Korea for thirteen years. The amount of papers on Korea scattered through English, German, French and Russian magazines, and the proceedings of geographical societies, is very great, and for the last three centuries Japanese writers have contributed largely to the sum of general knowledge of the peninsula. The list which follows includes some of the more recent works which illustrate the history, manners and customs, and awakening of Korea: *British Foreign Office Reports on Korean Trade, Annual Series* (London); *Bibliographie koréanne* (3 vols., Paris, 1897); Mrs. I. L. Bishop, *Korea and her Neighbours* (2 vols., London, 1897); M. von Brandt, *Ostasiatische Fragen* (Leipzig, 1897); A. E. J. Cavendish and H. E. Goold Adams, *Korea, and the Sacred White Mountain* (London, 1894); Stewart Culin, *Korean Games* (Philadelphia, 1895); Curzon, *Problems of the Far East* (London, 1896); Dallet, *Histoire de l'église de Korée* (2 vols., Paris, 1874); J. S. Gale, *Korean Sketches* (Edinburgh, 1898); W. E. Griffis, *The Hermit Nation* (8th and revised edition, New York, 1907); H. Hamel, *Relation du naufrage d'un vaisseau Halindois, &c., traduite du Flamond par M. Minutoli* (Paris, 1670); Okoji Hidemoto, *Der Feldzug der Japanir gegen Korea im Jahre 1597: translated from Japanese by Professor von Pfizmaier* (2 vols., Vienna, 1875); M. Jametel, "La Korée: ses ressources, son avenir commercial," *L'Économiste française* (Paris, July 1881); Percival Lowell, *Choson: The Land of the Morning Calm* (London, Boston, 1886); L. J. Miln, *Quaint Korea* (Harper, New York, 1895); V. de Laguerie, *La Korée indépendante, russe ou japonaise?* (Paris, 1898); J. Ross, *Korea: Its History, Manners and Customs* (Paisley, 1880); W. H. Wilkinson, *The Korean Government: Constitutional Changes in Korea during the period 23rd July 1894—30th June 1896* (Shanghai, 1896); A. Hamilton, *Korea* (London, 1903); C. J. D. Taylor, *Koreans at Home* (London, 1904); E. Boudaret, *En Corée* (Paris, 1904); Laurent-Crémazy, *Le Code pénal de la Corée* (Paris, 1904); G. T. Ladd, *In Korea with Marquis Itō* (London, 1908); Dictionaries and vocabularies by W. F. Myers (English secretary of Legation at Peking), the French missionaries, and others, were superseded in 1898 by a large and learned volume by the Rev J. S. Gale, a Presbyterian missionary, who devoted some years to the work. On geology, see C. Gottsche, "Geologische Skizze von Korea," *Sitz. preuss. Akad. Wiss.* (Berlin, Jahrg. 1886, pp. 857–873, Pl. viii.). A summary of this paper, with a reproduction of the map, is given by L. Pervinquière in *Rev. sci.* Paris, 5th series, vol. i. (1904), pp. 545–552. (I. L. B.; O. J. R. H.)

KOREA, a tributary state of India, transferred from Bengal to the Central Provinces in 1905; area, 1631 sq. m.; pop. (1901), 35,113, or only 22 persons per sq. m.; estimated revenue, £1200. It consists of an elevated table-land, with hills rising to above 3000 ft. Such traffic as there is is carried by means of pack-bullocks.

KORESHAN ECCLESIA, THE, or Church Archtriumphant, a communistic body, founded by Cyrus R. Teed, a medical practitioner, who was born at Utica, New York, in 1839. Teed was regarded by his adherents as "the new Messiah now in the World," and many other extravagant views both in science and economics are held by them. Two communities were founded: in Chicago (1886) and at Estero, in Lee county, Florida (1894), where in 1903 the Chicago community removed. Their name is derived from Koresh, the Hebrew form of Cyrus, and they have a journal, *The Flaming Sword.*

KŌRIN, OGATA (*c.* 1657–1716), Japanese painter and lacquerer, was born at Kōtō, the son of a wealthy merchant who had a taste for the arts and is said to have given his son some elementary instruction therein. Kōrin also studied under Soken Yamamoto, Kanō, Tsunenobu and Gukei Sumiyoshi; and he was greatly influenced by his predecessors Kōyetsu and Sōtatsu. On arriving at maturity, however, he broke away from all tradition, and developed a very original and quite distinctive style of his own, both in painting and in the decoration of lacquer. The characteristic of this is a bold impressionism, which is expressed in few and simple highly idealized forms, with an absolute disregard either of realism or of the usual conventions. In lacquer Kōrin's use of white metals and of mother-of-pearl is notable; but herein he followed Kōyetsu. Kōrin died on the 2nd of June 1716, at the age of fifty-nine. His chief pupils were Kagei Tatebashi and Shikō Watanable; but the present knowledge and appreciation of his work are largely due to the efforts of Hōitsu Sakai, who brought about a revival of Kōrin's style.

See A. Morrison, *The Painters of Japan* (1902); S. Tajima, *Masterpieces selected from the Kōrin School* (1903); S. Hōitsu, *The 100 Designs by Kōrin* (1815) and *More Designs by Kōrin* (1826). (E. F. S.)

KORKUS, an aboriginal tribe of India, dwelling on the Satpura hills in the Central Provinces. They are of interest as being the westernmost representatives of the Munda family of speech. They are rapidly becoming hinduized, as may be gathered from the figures of the census of 1901, which show 140,000 Korkus by race, but only 88,000 speakers of the Korku language.

KÖRMÖCZBÁNYA (German, *Kremnitz*), an old mining town, in the county of Bars, in Hungary, 158 m. N. of Budapest by rail. Pop. (1900), 4299. It is situated in a deep valley in the Hungarian Ore Mountains region. Among its principal buildings are the castle, several Roman Catholic (from the 13th and 14th centuries) and Lutheran churches, a Franciscan monastery (founded 1634), the town-hall, and the mint where the celebrated Kremnitz gold ducats were formerly struck. The bulk of the inhabitants find employment in connexion with the gold and silver mines. By means of a tunnel 9 m. in length, constructed in 1851–1852, the water is drained off from the mines into the river Gran. According to tradition, Körmöczbánya was founded in the 8th century by Saxons. The place is mentioned in documents in 1317, and became a royal free town in 1328, being therefore one of the oldest free towns in Hungary.

KÖRNER, KARL THEODOR (1791–1813), German poet and patriot, often called the German "Tyrtaeus," was born at Dresden on the 23rd of September 1791. His father, Christian Gottfried Körner (1756–1831), a distinguished Saxon jurist, was Schiller's most intimate friend. He was educated at the Kreuzschule in Dresden and entered at the age of seventeen the mining academy at Freiburg in Saxony, where he remained two years. Here he occupied himself less with science than with verse, a collection of which appeared under the title *Knospen* in 1810. In this year he went to the university of Leipzig, in order to study law; but he became involved in a serious conflict with the police and was obliged to continue his studies in Berlin. In August 1811 Körner went to Vienna, where he devoted himself entirely to literary pursuits; he became engaged to the actress Antonie Adamberger, and, after the success of several plays produced in 1812, he was appointed poet to the Hofburgtheater. When the German nation rose against the French yoke, in 1813, Körner gave up all his prospects at Vienna and joined Lützow's famous corps of volunteers at Breslau. On his march to Leipzig he passed through Dresden, where he issued his spirited *Aufruf an die Sachsen*, in which he called upon his countrymen to rise against their oppressors. He became lieutenant towards the end of April, and took part in a skirmish at Kitzen near Leipzig on the 7th of June, when he was severely wounded. After being nursed by friends at Leipzig and Carlsbad, he rejoined his corps and fell in an engagement outside a wood near Gadebusch in Mecklenburg on the 26th of August 1813. He was buried by his comrades under an oak close to the village of Wöbbelin, where there is a monument to him.

The abiding interest in Körner is patriotic and political rather than literary. His fame as a poet rests upon his patriotic lyrics, which were published by his father under the title *Leier und Schwert* in 1814. These songs, which fired the poet's comrades to deeds of heroism in 1813, bear eloquent testimony to the intensity of the national feeling against Napoleon, but judged as literature they contain more bombast than poetry. Among the best known are "Lützow's wilde verwegene Jagd," "Gebet während der Schlacht" (set to music by Weber) and "Das Schwertlied." This last was written immediately before his death, and the last stanza added on the fatal morning. As a dramatist Körner was remarkably prolific, but his comedies hardly touch the level of Kotzebue's and his tragedies, of which the best is *Zriny* (1814), are rhetorical imitations of Schiller's.

His works have passed through many editions. Among the more recent are: *Sämtliche Werke* (Stuttgart, 1890), edited by Adolf Stern; by H. Zimmer (2 vols., Leipzig, 1893) and by E. Goetze (Berlin, 1900). The most valuable contributions to our knowledge of the poet have been furnished by E. Peschel, the founder and director of the Körner Museum in Dresden, in *Theodor Körners Tagebuch und Kriegslieder, aus dem Jahre 1813* (Freiburg, 1893) and, in conjunction with E. Wildenow, *Theodor Körner und die Seinen* (Leipzig, 1898).

KORNEUBURG, a town of Austria, in Lower Austria, 9 m. N.W. of Vienna by rail. Pop. (1900), 8298. It is situated on the left bank of the Danube, opposite Klosterneuburg. It is a steamship station and an important emporium of the salt and corn trade. The industry comprises the manufacture of coarse textiles, pasteboard, &c. Its charter as a town dates from 1298, and it was a much frequented market in the preceding century. At the beginning of the 15th century it was surrounded by walls, and in 1450 a fortress was erected. It was frequently involved in the conflict between the Hungarian king Matthias Corvinus and the emperor Frederick William III., and also during the Thirty Years' War.

KOROCHA, a town of central Russia, in the government of Kursk, 75 m. S.S.E. of the city of Kursk, on the Korocha river. Pop. (1897), 14,405. Its inhabitants live by gardening, exporting large quantities of dried cherries, by making candles and leather, and by trade; the merchants purchase cattle, grain and salt in the south and send them to Moscow. Founded in 1638, Korocha was formerly a small fort intended to check the Tatar invasions.

KORSÖR, a seaport of Denmark, in the *amt* (county) of the island of Zealand, 69 m. by rail W.S.W. of Copenhagen, on the east shore of the Great Belt. Pop. (1901), 6054. The harbour, which is formed by a bay of the Baltic, has a depth throughout of 20 ft. It is the point of departure and arrival of the steam ferry to Nyborg on Fünen, lying on the Hamburg, Schleswig, Fredericia and Copenhagen route. There is also regular communication by water with Kiel. The chief exports are fish, cereals, bacon; imports, petroleum and coal. A market town since the 14th century, Korsör has ruins of an old fortified castle, on the south side of the channel, dating from the 14th and 17th centuries.

KORTCHA (Slavonic, *Goritza* or *Koritza*), a city of Albania, European Turkey, in the vilayet of Iannina, in a wide plain watered by the Devol and Dunavitza rivers, and surrounded by mountains on every side except the north, where Lake Malik constitutes the boundary. Pop. (1905), about 10,000, including Greeks, Albanians and Slavs. Kortcha is the see of an Orthodox Greek metropolitan, whose large cathedral is richly decorated in the interior with paintings and statues. The Kortcha school for girls, conducted by American missionaries, is the only educational establishment in which the Turkish government permits the use of Albanian as the language of instruction. The local trade is chiefly agricultural.

KORYAKS, a Mongoloid people of north-eastern Siberia, inhabiting the coast-lands of the Bering Sea to the south of the Anadyr basin and the country to the immediate north of the Kamchatka Peninsula, the southernmost limit of their range being Tigilsk. They are akin to the Chukchis, whom they closely resemble in physique and in manner of life. Thus they are divided into the settled fishing tribes and the nomad reindeer breeders and hunters. The former are described as being more morally and physically degraded even than the Chukchis, and hopelessly poor. The Koryaks of the interior, on the other hand, still own enormous reindeer herds, to which they are so attached that they refuse to part with an animal to a stranger at any price. They are in disposition brave, intelligent and self-reliant, and recognize no master. They have ever tenaciously resisted Russian aggression, and in their fights with the Cossacks have proved themselves recklessly brave. When outnumbered they would kill their women and children, set fire to their homes, and die fighting. Families usually gather in groups of sixes or sevens, forming miniature states, in which the nominal chief has no predominating authority, but all are equal. The Koryaks are polygamous, earning their wives by working for their fathers-in-law. The women and children are treated well, and Koryak courtesy and hospitality are proverbial. The chief wedding ceremony is a forcible abduction of the bride. They kill the aged and infirm, in the belief that thus to save them from protracted sufferings is the highest proof of affection. The victims choose their mode of death, and young Koryaks practise the art of giving the fatal blow quickly and mercifully. Infanticide was formerly common, and one of twins was always sacrificed. They burn their dead. The prevailing religion is Shamanism; sacrifices are made to evil spirits, the heads of the victims being placed on stones facing east.

See G. Kennan, *Tent Life in Siberia* (1871); "Über die Koriaken u. ihnen nahe verwandten Tchouktchen," in *Bul. Acad. Sc. St. Petersburg*, xii. 99.

KOSCIUSCO, the highest mountain in Australia, in the range of the Australian Alps, towards the south-eastern extremity of New South Wales. Its height is 7328 ft. An adjacent peak to the south, Mueller's Peak, long considered the highest in the continent, is 7268 ft. high. A meteorological station was established on Kosciusco in 1897.

KOSCIUSZKO, TADEUSZ ANDRZEJ BONAWENTURA (1746–1817), Polish soldier and statesman, the son of Ludwik Kosciuszko, sword-bearer of the palatinate of Brzesc, and Tekla Ratomska, was born in the village of Mereczowszczyno. After being educated at home he entered the corps of cadets at Warsaw, where his unusual ability and energy attracted the notice of Prince Adam Casimir Czartoryski, by whose influence in 1769 he was sent abroad at the expense of the state to complete his military education. In Germany, Italy and France he studied diligently, completing his course at Brest, where he learnt fortification and naval tactics, returning to Poland in 1774 with the rank of captain of artillery. While engaged in teaching the daughters of the Grand Hetman, Sosnowski of Sosnowica, drawing and mathematics, he fell in love with the youngest of them, Ludwika, and not venturing to hope for the consent of her father, the lovers resolved to fly and be married privately. Before they could accomplish their design, however, the wooer was attacked by Sosnowski's retainers, but defended himself valiantly till, covered with wounds, he was ejected from the house. This was in 1776. Equally unfortunate was Kosciuszko's wooing of Tekla Zurowska in 1791, the father of the lady in this case also refusing his consent.

In the interval between these amorous episodes Kosciuszko won his spurs in the New World. In 1776 he entered the army of the United States as a volunteer, and brilliantly distinguished himself, especially during the operations about New York and at Yorktown. Washington promoted Kosciuszko to the rank of a colonel of artillery and made him his adjutant. His humanity and charm of manner made him moreover one the most popular of the American officers. In 1783 Kosciuszko was rewarded for his services and his devotion to the cause of American independence with the thanks of Congress, the privilege of American citizenship, a considerable annual pension with landed estates, and the rank of brigadier-general, which he retained in the Polish service.

In the war following upon the proclamation of the constitution of the 3rd of May 1791 and the formation of the reactionary Confederation of Targowica (see Poland: *History*), Kosciuszko took a leading part. As the commander of a division under Prince Joseph Poniatowski he distinguished himself at the battle of Zielence in 1792, and at Dubienka (July 18) with 4000 men and 10 guns defended the line of the Bug for five days against the Russians with 18,000 men and 60 guns, subsequently retiring upon Warsaw unmolested. When the king acceded to the Targowicians, Kosciuszko with many other Polish generals threw up his commission and retired to Leipzig, which speedily became the centre of the Polish emigration. In January 1793, provided with letters of introduction from the French agent Perandier, Kosciuszko went on a political mission to Paris to induce the revolutionary government to espouse the cause of Poland. In return for assistance he promised to make the future government of Poland as close a copy of the French government as possible; but the Jacobins, already intent on detaching Prussia from the anti-French coalition, had no serious intention of fighting Poland's battles. The fact that Kosciuszko's visit synchronized with the execution of Louis XVI. subsequently gave the enemies of Poland a plausible pretext for accusing her of Jacobinism, and thus prejudicing Europe against her. On his return to Leipzig Kosciuszko was invited by the Polish insurgents to take the command of the national armies, with dictatorial power. He hesitated at first, well aware that a rising in the circumstances was premature. "I will have nothing to do with Cossack raiding," he replied; "if war we have, it must be a regular war." He also insisted that the war must be conducted on the model of the American War of Independence, and settled down in the neighbourhood of Cracow to await events. When, however, he heard that the insurrection had already broken out, and that the Russian armies were concentrating to crush it, Kosciuszko hesitated no longer, but hastened to Cracow, which he reached on the 23rd of March 1794. On the following day his arms were consecrated according to ancient custom at the church of the Capucins, by way of giving the insurrection a religious sanction incompatible with Jacobinism. The same day, amidst a vast concourse of people in the market-place, Kosciuszko took an oath of fidelity to the Polish nation; swore to wage war against the enemies of his country; but protested at the same time that he would fight only for the independence and territorial integrity of Poland.

The insurrection had from the first a purely popular character. We find none of the great historic names of Poland in the lists of the original confederates. For the most part the confederates of Kosciuszko were small squires, traders, peasants and men of low degree generally. Yet the comparatively few gentlemen who joined the movement sacrificed everything to it. Thus, to take but a single instance, Karol Prozor sold the whole of his ancestral estates and thus contributed 1,000,000 thalers to the cause. From the 24th of March to the 1st of April Kosciuszko remained at Cracow organizing his forces. On the 3rd of April at Raclawice, with 4000 regulars, and 2000 peasants armed only with scythes and pikes, and next to no artillery, he defeated the Russians, who had 5000 veterans and 30 guns. This victory had an immense moral effect, and brought into the Polish camp crowds of waverers to what had at first seemed a desperate cause. For the next two months Kosciuszko remained on the defensive near Sandomir. He durst not risk another engagement with the only army which Poland so far possessed, and he had neither money, officers nor artillery. The country, harried incessantly during the last two years, was in a pitiable condition. There was nothing to feed the troops in the very provinces they occupied, and provisions had to be imported from Galicia. Money could only be obtained by such desperate expedients as the melting of the plate of the churches and monasteries, which was brought in to Kosciuszko's camp at Pinczow and subsequently coined at Warsaw, minus the royal effigy, with the inscription: "Freedom, Integrity and Independence of the Republic, 1794." Moreover, Poland was unprepared. Most of the regular troops were incorporated in the Russian army, from which it was very difficult to break away, and until these soldiers came in Kosciuszko had principally to depend on the valour of his scythemen. But in the month of April the whole situation improved. On the 17th of that month the 2000 Polish troops in Warsaw expelled the Russian garrison after days of street fighting, chiefly through the ability of General Mokronowski, and a provisional government was formed. Five days later Jakob Jasinski drove the Russians from Wilna.

By this time Kosciuszko's forces had risen to 14,000, of whom 10,000 were regulars, and he was thus able to resume the offensive. He had carefully avoided doing anything to provoke Austria or Prussia. The former was described in his manifestoes as a potential friend; the latter he never alluded to as an enemy. "Remember," he wrote, "that the only war we have upon our hands is war to the death against the Muscovite tyranny." Nevertheless Austria remained suspicious and obstructive; and the Prussians, while professing neutrality, very speedily effected a junction with the Russian forces. This Kosciuszko, misled by the treacherous assurances of Frederick William's ministers, never anticipated, when on the 4th of June he marched against General Denisov. He encountered the enemy on the 5th of June at Szczekociny, and then discovered that his 14,000 men had to do not merely with a Russian division but with the combined forces of Russia and Prussia, numbering 25,000 men. Nevertheless, the Poles acquitted themselves manfully, and at dusk retreated in perfect order upon Warsaw unpursued. Yet their losses had been terrible, and of the six Polish generals present three, whose loss proved to be irreparable, were slain, and two of the others were seriously wounded. A week later another Polish division was defeated at Kholm; Cracow was taken by the Prussians on the 22nd of June; and the mob at Warsaw broke upon the gaols and murdered the political prisoners in cold blood. Kosciuszko summarily punished the ringleaders of the massacres and had 10,000 of the rank and file drafted into his camp, which measures had a quieting effect. But now dissensions broke out among the members of the Polish government, and it required all the tact of Kosciuszko to restore order amidst this chaos of suspicions and recriminations. At this very time too he had need of all his ability and resource to meet the external foes of Poland. On the 9th of July Warsaw was invested by Frederick William of Prussia with an army of 25,000 men and 179 guns, and the Russian general Fersen with 16,000 men and 74 guns, while a third force of 11,000 occupied the right bank of the Vistula. Kosciuszko for the defence of the city and its outlying fortifications could dispose of 35,000 men, of whom 10,000 were regulars. But the position, defended by 200 inferior guns, was a strong one, and the valour of the Poles and the engineering skill of Kosciuszko, who was now in his element, frustrated all the efforts of the enemy. Two unsuccessful assaults were made upon the Polish positions on the 26th of August and the 1st of September, and on the 6th the Prussians, alarmed by the progress of the Polish arms in Great Poland, where Jan Henryk Dabrowski captured the Prussian fortress of Bydogoszcz and compelled General Schwerin with his 20,000 men to retire upon Kalisz, raised the siege. Elsewhere, indeed, after a brief triumph the Poles were everywhere worsted, and Suvarov, after driving them before him out of Lithuania was advancing by forced marches upon Warsaw. Even now, however, the situation was not desperate, for the Polish forces were still numerically superior to the Russian. But the Polish generals proved unequal to carrying out the plans of the dictator; they allowed themselves to be beaten in detail, and could not prevent the junction of Suvarov and Fersen. Kosciuszko himself, relying on the support of Poninski's division 4 m. away, attacked Fersen at Maciejowice on the 10th of October. But Poninski never appeared, and after a bloody encounter the Polish army of 7000 was almost annihilated by the 16,000 Russians; and Kosciuszko, seriously wounded and insensible, was made a prisoner on the field of battle. The long credited story that he cried "Finis Poloniae!" as he fell is a fiction.

Kosciuszko was conveyed to Russia, where he remained till the accession of Paul in 1796. On his return on the 19th of December 1796 he paid a second visit to America, and lived at Philadelphia till May 1798, when he went to Paris, where the First Consul earnestly invited his co-operation against the Allies. But he refused to draw his sword unless Napoleon undertook to give the restoration of Poland a leading place in his plans; and to this, as he no doubt foresaw, Bonaparte would not consent. Again and again he received offers of high commands in the French army, but he kept aloof from public life in his house at Berville, near Paris, where the emperor Alexander visited him in 1814. At the Congress of Vienna his importunities on behalf of Poland finally wearied Alexander, who preferred to follow the counsels of Czartoryski; and Kosciuszko retired to Solothurn, where he lived with his friend Zeltner. Shortly before his death, on the 2nd of April 1817, he emancipated his serfs, insisting only on the maintenance of schools on the liberated estates. His remains were carried to Cracow and buried in the cathedral; while the people, reviving an ancient custom, raised a huge mound to his memory near the city.

Kosciuszko was essentially a democrat, but a democrat of the school of Jefferson and Lafayette. He maintained that the republic could only be regenerated on the basis of absolute liberty and equality before the law; but in this respect he was far in advance of his age, and the aristocratic prejudices of his countrymen compelled him to resort to half measures. He wrote *Manœuvres of Horse Artillery* (New York, 1808) and a description of the campaign of 1792 (in vol. xvi. of E. Raczynski's *Sketch of the Poles and Poland* (Posen, 1843).

See Jozef Zajaczek, *History of the Revolution of* 1794 (Pol.) (Lemberg, 1881); Leonard Jakob Borejko Chodzko, *Biographie du général Kosciuszko* (Fontainebleau, 1837); Karol Falkenstein, *Thaddäus Kosciuszko* (2nd ed., Leipzig, 1834; French ed., Paris, 1839); Antoni Choloniewski, *Tadeusz Kosciuszko* (Pol.) (Lemberg, 1902); Franciszek Rychlicki, *T. Kosciuszko and the Partition of Poland* (Pol.) (Cracow, 1875). (R. N. B.)

KÖSEN, a village and summer resort of Germany, in the Prussian province of Saxony, 33 m. by rail S. by W. of Halle, on the Saale. Pop. (1905), 2990. The town has a mineral spring, which is used for bathing, being efficacious for rheumatism and other complaints. Kösen, which became a town in 1869, has large mill-works; it has a trade in wood and wine. On the adjacent Rudelsburg, where there is a ruined castle, the German students have erected a monument to their comrades who fell in the Franco-German War of 1870–71. Hereon are also memorials to Bismarck and to the emperor William I. The town is famous as the central meeting-place of the German students' corps, which hold an annual congress here every Whitsuntide.

See Techow, *Führer durch Kösen und Umgegend* (Kösen, 1889); and Rosenberg, *Kösen* (Naumburg, 1877).

KOSHER, or Kasher (Hebrew clean, right, or fit), the Jewish term for any food or vessels for food made ritually fit for use, in contradistinction to those *pasul*, unfit, and *terefah*, forbidden. Thus the vessels used at the Passover are "kosher," as are also new metal vessels bought from a Gentile after they have been washed in a ritual bath. But the term is specially used of meat slaughtered in accordance with the law of Moses. The *schochat* or butcher must be a devout Jew and of high moral character, and be duly licensed by the chief rabbi. The slaughtering—the object of which is to insure the complete bleeding of the body, the Jews being forbidden to eat blood—is done by severing the windpipe with a long and razor-sharp knife by one continuous stroke backwards and forwards. No unnecessary force is permitted, and no stoppage must occur during the operation. The knife is then carefully examined, and if there be the slightest flaw in its blade the meat cannot be eaten, as the cut would not have been clean, the uneven blade causing a thrill to pass through the beast and thus driving the blood again through the arteries. After this every portion of the animal is thoroughly examined, for if there is any organic disease the devout Jew cannot taste the meat. In order to soften meat before it is salted, so as to allow the salt to extract the blood more freely, the meat is soaked in water for about half an hour. It is then covered with salt for about an hour and afterwards washed three times. Kosher meat is labelled with the name of the slaughterer and the date of killing.

KÖSLIN, or Cöslin, a town of Germany, in the Prussian province of Pomerania, at the foot of the Gollenberg (450 ft.), 5 m. from the Baltic, and 105 m. N.E. of Stettin by rail. Pop. (1905), 21,474. The town has two Evangelical and a Roman Catholic church, a gymnasium, a cadet academy and a deaf and dumb asylum. In the large market place is the statue of the Prussian king Frederick William I., erected in 1824, and there is a war memorial on the Friedrich Wilhelm Platz. The industries include the manufacture of soap, tobacco, machinery, paper, bricks and tiles, beer and other goods. Köslin was built about 1188 by the Saxons, and raised to the rank of a town in 1266. In 1532 it accepted the doctrines of the Reformation. It was severely tried in the Thirty Years' War and in the Seven Years' War, and in 1720 it was burned down. On the Gollenberg stands a monument to the memory of the Pomeranians who fell in the war of 1813–15.

KOSSOVO, or Kosovo, a vilayet of European Turkey, comprising the sanjak of Uskub in Macedonia, and the sanjaks of Prizren and Novibazar (*q.v.*) in northern Albania. Pop. (1905), about 1,100,000; area, 12,700 sq. m. For an account of the physical features of Kossovo, see Albania and Macedonia. The inhabitants are chiefly Albanians and Slavs, with smaller communities of Greeks, Turks, Vlachs and gipsies. A few good roads traverse the vilayet (see Usküb), and the railway from Salonica northward bifurcates at Usküb, the capital, one branch going to Mitrovitza in Albania, the other to Nish in Servia. Despite the undoubted mineral wealth of the vilayet, the only mines working in 1907 were two chrome mines, at Orasha and Verbeshtitza. In the volume of its agricultural trade, however, Kossovo is unsurpassed by any Turkish province. The exports, worth about £950,000, include livestock, large quantities of grain and fruit, tobacco, vegetables, opium, hemp and skins. Rice is cultivated for local consumption, and sericulture is a growing industry, encouraged by the Administration of the Ottoman Debt. The yearly value of the imports is approximately £1,200,000; these include machinery and other manufactured goods, metals, groceries, chemical products and petroleum, which is used in the flour-mills and factories on account of the prohibitive price of coal. There is practically no trade with Adriatic ports; two-thirds of both exports and imports pass through Salonica, the remainder going by rail into Servia. The chief towns, Usküb (32,000), Prizren (30,000), Koprülü (22,000), Ishtib [Slav. *Stip*] (21,000), Novibazar (12,000) and Prishtina (11,000) are described in separate articles.

In the middle ages the vilayet formed part of the Servian Empire, its northern districts are still known to the Serbs as Old Servia (*Stara Srbiya*). The plain of Kossovo (Kossovopolje, "Field of Blackbirds"), a long valley lying west of Prishtina and watered by the Sibnitza, a tributary of the Servian Ibar, is famous in Balkan history and legend as the scene of the battle of Kossovo (1389), in which the power of Servia was destroyed by the Turks. (See Servia: *History*.)

KOSSUTH, FERENCZ LAJOS AKOS (1841–   ), Hungarian statesman, the son of Lajos Kossuth, was born on the 16th of November 1841, and educated at the Paris Polytechnic and the London University, where in 1859 he won a prize for political economy. After working as a civil engineer on the Dean Forest railway he went (1861) to Italy, where he resided for the next thirty-three years, taking a considerable part in the railway construction of the peninsula, and at the same time keeping alive the Hungarian independence question by a whole series of pamphlets and newspaper articles. At Cesena in 1876 he married Emily Hoggins. In 1885 he was decorated for his services by the Italian government. His last great engineering work was the construction of the steel bridges for the Nile. In 1894 he escorted his father's remains to Hungary, and the following year resolved to settle in his native land and took the oath of allegiance. As early as 1867 he had been twice elected a member of the Hungarian diet, but on both occasions refused to accept the mandate. On the 10th of April 1895 he was returned for Tapolca and in 1896 for Cegléd, and from that time took an active part in Hungarian politics. In the autumn of 1898 he became the leader of the obstructionists or "Independence Party," against the successive Szell, Khuen-Haderváry, Szápáry and Stephen Tisza administrations (1898—1904), exercising great influence not only in parliament but upon the public at large through his articles in the *Egyetértés*. The elections of 1905 having sent his party back with a large majority, he was received in audience by the king and helped to construct the Wekerle ministry, of which he was one of the most distinguished members.

See Sturm, *The Almanack of the Hungarian Diet* (1905–1910), art. "Kossuth" (Hung.) (Budapest, 1905).

KOSSUTH, LAJOS [Louis] (1802–1894), Hungarian patriot, was born at Monok, a small town in the county of Zemplin, on the 19th of September 1802. His father, who was descended from an old untitled noble family and possessed a small estate, was by profession an advocate. Louis, who was the eldest of four children, received from his mother a strict religious training. His education was completed at the Calvinist college of Sárospatak and at the university of Budapest. At the age of nineteen he returned home and began practice with his father. His talents and amiability soon won him great popularity, especially among the peasants. He was also appointed steward to the countess Szápáry, a widow with large estates, and as her representative had a seat in the county assembly. This position he lost owing to a quarrel with his patroness, and he was accused of appropriating money to pay a gambling debt. His fault cannot have been very serious, for he was shortly afterwards (he had in the meantime settled in Pesth) appointed by Count Hunyady to be his deputy at the National Diet in Pressburg (1825–1827, and again in 1832). It was a time when, under able leaders, a great national party was beginning the struggle for reform against the stagnant Austrian government. As deputy he had no vote, and he naturally took little share in the debates, but it was part of his duty to send written reports of the proceedings to his patron, since the government, with a well-grounded fear of all that might stir popular feeling, refused to allow any published reports. Kossuth's letters were so excellent that they were circulated in MS. among the Liberal magnates, and soon developed into an organized parliamentary gazette (*Orszagyulesi tudositasok*), of which he was editor. At once his name and influence spread. In order to increase the circulation, he ventured on lithographing the letters. This brought them under the official censure, and was forbidden. He continued the paper in MS., and when the government refused to allow it to be circulated through the post sent it out by hand. In 1836 the Diet was dissolved. Kossuth continued the agitation by reporting in letter form the debates of the county assemblies, to which he thereby gave a political importance which they had not had when each was ignorant of the proceedings of the others. The fact that he embellished with his own great literary ability the speeches of the Liberals and Reformers only added to the influence of his news-letters. The government in vain attempted to suppress the letters, and other means having failed, he was in May 1837, with Weszelenyi and several others, arrested on a charge of high treason. After spending a year in prison at Ofen, he was tried and condemned to four more years' imprisonment. His confinement was strict and injured his health, but he was allowed the use of books. He greatly increased his political information, and also acquired, from the study of the Bible and Shakespeare, a wonderful knowledge of English. His arrest had caused great indignation. The Diet, which met in 1839, supported the agitation for the release of the prisoners, and refused to pass any government measures; Metternich long remained obdurate, but the danger of war in 1840 obliged him to give way. Immediately after his release Kossuth married Teresa Meszleny, a Catholic, who during his prison days had shown great interest in him. Henceforward she strongly urged him on in his political career; and it was the refusal of the Roman priests to bless their union that first prompted Kossuth to take up the defence of mixed marriages.

He had now become a popular leader. As soon as his health was restored he was appointed (January 1841) editor of the *Pesti Hirlap*, the newly founded organ of the party. Strangely enough, the government did not refuse its consent. The success of the paper was unprecedented. The circulation soon reached what was then the immense figure of 7000. The attempts of the government to counteract his influence by founding a rival paper, the *Vilag*, only increased his importance and added to the political excitement. The warning of the great reformer Szechenyi that by his appeal to the passions of the people he was leading the nation to revolution was neglected. Kossuth, indeed, was not content with advocating those reforms—the abolition of entail, the abolition of feudal burdens, taxation of the nobles—which were demanded by all the Liberals. By insisting on the superiority of the Magyars to the Slavonic inhabitants of Hungary, by his violent attacks on Austria (he already discussed the possibility of a breach with Austria), he raised the national pride to a dangerous pitch. At last, in 1844, the government succeeded in breaking his connexion with the paper. The proprietor, in obedience to orders from Vienna (this seems the most probable account), took advantage of a dispute about salary to dismiss him. He then applied for permission to start a paper of his own. In a personal interview Metternich offered to take him into the government service. The offer was refused, and for three years he was without a regular position. He continued the agitation with the object of attaining both the political and commercial independence of Hungary. He adopted the economic principles of List, and founded a society, the "Vedegylet," the members of which were to consume none but home produce. He advocated the creation of a Hungarian port at Fiume. With the autumn of 1847 the great opportunity of his life came. Supported by the influence of Louis Batthyany, after a keenly fought struggle he was elected member for Budapest in the new Diet. "Now that I am a deputy, I will cease to be an agitator," he said. He at once became chief leader of the Extreme Liberals. Deak was absent. Batthyany, Szechenyi, Szemere, Eotvos, his rivals, saw how his intense personal ambition and egoism led him always to assume the chief place, and to use his parliamentary position to establish himself as leader of the nation; but before his eloquence and energy all apprehensions were useless. His eloquence was of that nature, in its impassioned appeals to the strongest emotions, that it required for its full effect the highest themes and the most dramatic situations. In a time of rest, though he could never have been obscure, he would never have attained the highest power. It was therefore a necessity of his nature, perhaps unconsciously, always to drive things to a crisis. The crisis came, and he used it to the full.

On the 3rd of March 1848, as soon as the news of the revolution in Paris had arrived, in a speech of surpassing power he demanded parliamentary government for Hungary and constitutional government for the rest of Austria. He appealed to the hope of the Habsburgs, "our beloved Archduke Francis Joseph," to perpetuate the ancient glory of the dynasty by meeting half-way the aspirations of a free people. He at once became the leader of the European revolution; his speech was read aloud in the streets of Vienna to the mob by which Metternich was overthrown (March 13), and when a deputation from the Diet visited Vienna to receive the assent of the emperor to their petition it was Kossuth who received the chief ovation. Batthyany, who formed the first responsible ministry, could not refuse to admit Kossuth, but he gave him the ministry of finance, probably because that seemed to open to him fewest prospects of engrossing popularity. If that was the object, it was in vain. With wonderful energy he began developing the internal resources of the country: he established a separate Hungarian coinage—as always, using every means to increase the national self-consciousness; and it was characteristic that on the new Hungarian notes which he issued his own name was the most prominent inscription; hence the name of *Kossuth Notes*, which was long celebrated. A new paper was started, to which was given the name of *Kossuth Hirlapia*, so that from the first it was Kossuth rather than the Palatine or the president of the ministry whose name was in the minds of the people associated with the new government. Much more was this the case when, in the summer, the dangers from the Croats, Serbs and the reaction at Vienna increased. In a great speech of 11th July he asked that the nation should arm in self-defence, and demanded 200,000 men; amid a scene of wild enthusiasm this was granted by acclamation. When Jellachich was marching on Pesth he went from town to town rousing the people to the defence of the country, and the popular force of the *Honved* was his creation. When Batthyany resigned he was appointed with Szemere to carry on the government provisionally, and at the end of September he was made President of the Committee of National Defence. From this time he was in fact, if not in name, the dictator. With marvellous energy he kept in his own hands the direction of the whole government. Not a soldier himself, he had to control and direct the movements of armies; can we be surprised if he failed, or if he was unable to keep control over the generals or to establish that military co-operation so essential to success? Especially it was Görgei (*q.v.*) whose great abilities he was the first to recognize, who refused obedience; the two men were in truth the very opposite to one another: the one all feeling, enthusiasm, sensibility; the other cold, stoical, reckless of life. Twice Kossuth deposed him from the command; twice he had to restore him. It would have been well if Kossuth had had something more of Görgei's calculated ruthlessness, for, as has been truly said, the revolutionary power he had seized could only be held by revolutionary means; but he was by nature soft-hearted and always merciful; though often audacious, he lacked decision in dealing with men. It has been said that he showed a want of personal courage; this is not improbable, the excess of feeling which made him so great an orator could hardly be combined with the coolness in danger required of a soldier; but no one was able, as he was, to infuse courage into others. During all the terrible winter which followed, his energy and spirit never failed him. It was he who overcame the reluctance of the army to march to the relief of Vienna; after the defeat of Schwechat, at which he was present, he sent Bem to carry on the war in Transylvania. At the end of the year, when the Austrians were approaching Pesth, he asked for the mediation of Mr Stiles, the American envoy. Windischgrätz, however, refused all terms, and the Diet and government fled to Debreczin, Kossuth taking with him the regalia of St Stephen, the sacred Palladium of the Hungarian nation. Immediately after the accession of the Emperor Francis Joseph all the concessions of March had been revoked and Kossuth with his colleagues outlawed. In April 1849, when the Hungarians had won many successes, after sounding the army, he issued the celebrated declaration of Hungarian independence, in which he declared that "the house of Habsburg-Lorraine, perjured in the sight of God and man, had forfeited the Hungarian throne." It was a step characteristic of his love for extreme and dramatic action, but it added to the dissensions between him and those who wished only for autonomy under the old dynasty, and his enemies did not scruple to accuse him of aiming at the crown himself. For the time the future form of government was left undecided, but Kossuth was appointed responsible governor. The hopes of ultimate success were frustrated by the intervention of Russia; all appeals to the western powers were vain, and on the 11th of August Kossuth abdicated in favour of Görgei, on the ground that in the last extremity the general alone could save the nation. How Görgei used his authority to surrender is well known; the capitulation was indeed inevitable, but a greater man than Kossuth would not have avoided the last duty of conducting the negotiations so as to get the best terms.

With the capitulation of Villagos Kossuth's career was at an end. A solitary fugitive, he crossed the Turkish frontier. He was hospitably received by the Turkish authorities, who, supported by Great Britain, refused, notwithstanding the threats of the allied emperors, to surrender him and the other fugitives to the merciless vengeance of the Austrians. In January 1849 he was removed from Widdin, where he had been kept in honourable confinement, to Shumla, and thence to Katahia in Asia Minor. Here he was joined by his children, who had been confined at Pressburg; his wife (a price had been set on her head) had joined him earlier, having escaped in disguise. In September 1851 he was liberated and embarked on an American man-of-war. He first landed at Marseilles, where he received an enthusiastic welcome from the people, but the prince-president refused to allow him to cross France. On the 23rd of October he landed at Southampton and spent three weeks in England, where he was the object of extraordinary enthusiasm, equalled only by that with which Garibaldi was received ten years later. Addresses were presented to him at Southampton, Birmingham and other towns; he was officially entertained by the lord mayor of London; at each place he pleaded the cause of his unhappy country. Speaking in English, he displayed an eloquence and command of the language scarcely excelled by the greatest orators in their own tongue. The agitation had no immediate effect, but the indignation which he aroused against Russian policy had much to do with the strong anti-Russian feeling which made the Crimean War possible.

From England he went to the United States of America: there his reception was equally enthusiastic, if less dignified; an element of charlatanism appeared in his words and acts which soon destroyed his real influence. Other Hungarian exiles protested against the claim he appeared to make that he was the one national hero of the revolution. Count Casimir Batthyany attacked him in *The Times*, and Szemere, who had been prime minister under him, published a bitter criticism of his acts and character, accusing him of arrogance, cowardice and duplicity. He soon returned to England, where he lived for eight years in close connexion with Mazzini, by whom, with some misgiving, he was persuaded to join the Revolutionary Committee. Quarrels of a kind only too common among exiles followed; the Hungarians were especially offended by his claim still to be called governor. He watched with anxiety every opportunity of once more freeing his country from Austria. An attempt to organize a Hungarian legion during the Crimean War was stopped; but in 1859 he entered into negotiations with Napoleon, left England for Italy, and began the organization of a Hungarian legion, which was to make a descent on the coast of Dalmatia. The Peace of Villafranca made this impossible. From that time he resided in Italy; he refused to follow the other Hungarian patriots, who, under the lead of Deak, accepted the composition of 1867; for him there could be no reconciliation with the house of Habsburg, nor would he accept less than full independence and a republic. He would not avail himself of the amnesty, and, though elected to the Diet of 1867, never took his seat. He never lost the affections of his countrymen, but he refrained from an attempt to give practical effect to his opinions, nor did he allow his name to become a new cause of dissension. A law of 1879, which deprived of citizenship all Hungarians who had voluntarily been absent ten years, was a bitter blow to him.

He died in Turin on the 20th of March 1894; his body was taken to Pesth, where he was buried amid the mourning of the whole nation, Maurus Jokai delivering the funeral oration. A bronze statue, erected by public subscription, in the Kerepes cemetery, commemorates Hungary's purest patriot and greatest orator.

Many points in Kossuth's career and character will probably always remain the subject of controversy. His complete works were published in Hungarian at Budapest in 1880–1895. The fullest account of the Revolution is given in Helfert, *Geschichte Oesterreichs* (Leipzig, 1869, &c.), representing the Austrian view, which may be compared with that of C. Gracza, *History of the Hungarian War of Independence, 1848–1849* (in Hungarian) (Budapest, 1894). See also E. O. S., *Hungary and its Revolutions, with a Memoir of Louis Kossuth* (Bohn, 1854); Horvath, *25 Jahre aus der Geschichte Ungarns, 1823–1848* (Leipzig, 1867); Maurice, *Revolutions of 1848-1849*; W. H. Stiles, *Austria in 1848–1849* (New York, 1852); Szemere, *Politische Charakterskizzen: III. Kossuth* (Hamburg, 1853); Louis Kossuth, *Memoirs of my Exile* (London, 1880); Pulszky, *Meine Zeit, mein Leben* (Pressburg, 1880); A. Somogyi, *Ludwig Kossuth* (Berlin, 1894). (J. W. HE.)

KOSTER (or COSTER), **LAURENS** (*c.* 1370–1440), Dutch printer, whose claims to be considered at least one of the inventors of the art (see TYPOGRAPHY) have been recognized by many investigators. His real name was Laurens Janssoen-Koster (*i.e.* sacristan) being merely the title which he bore as an official of the great parish church of Haarlem. We find him mentioned several times between 1417 and 1434 as a member of the great council, as an assessor (*scabinus*), and as the city treasurer. He probably perished in the plague that visited Haarlem in 1439–1440; his widow is mentioned in the latter year. His descendants, through his daughter Lucia, can be traced down to 1724.

See Peter Scriver, *Beschryvinge der Stad Harlem* (Haarlem, 1628); Scheltema, *Levensschets van Laurens d. Koster* (Haarlem, 1834); Van der Linde, *De Haarlemsche Costerlegende* (Hague, 1870).

KOSTROMA, a government of central Russia, surrounded by those of Vologda, Vyatka, Nizhniy-Novgorod, Vladimir and Yaroslav, lying mostly on the left bank of the upper Volga. It has an area of 32,480 sq. m. Its surface is generally undulating, with hilly tracts on the right bank of the Volga, and extensive flat and marshy districts in the east. Rocks of the Permian system predominate, though a small tract belongs to the Jurassic, and both are overlain by thick deposits of Quaternary clays. The soil in the east is for the most part sand or a sandy clay; a few patches, however, are fertile black earth. Forests, yielding excellent timber for ship-building, and in many cases still untouched, occupy 61% of the area of the government. The export of timber is greatly facilitated by the navigable tributaries of the Volga, *e.g.* the Kostroma, Unzha, Neya, Vioksa and Vetluga. The climate is severe; frosts of −22° F. are common in January, and the mean temperature of the year is only 3°·1 (summer, 64°·5; winter, −13°·3). The population, which numbered 1,176,000 in 1870 and 1,424,171 in 1897, is almost entirely Russian. The estimated population in 1906 was 1,596,700. Out of 20,000,000 acres, 7,861,500 acres belong to private owners, 6,379,500 to the peasant communities, 3,660,800 to the crown, and 1,243,000 to the imperial family. Agriculture is at a low ebb; only 4,000,000 acres are under crops (rye, oats, wheat and barley), and the yield of corn is insufficient for the wants of the population. Flax and hops are cultivated to an increasing extent. But market-gardening is of some importance. Bee-keeping was formerly an important industry. The chief articles of commerce are timber, fuel, pitch, tar, mushrooms, and wooden wares for building and household purposes, which are largely manufactured by the peasantry and exported to the steppe governments of the lower Volga and the Don. Boat-building is also carried on. Some other small industries, such as the manufacture of silver and copper wares, leather goods, bast mats and sacks, lace and felt boots, are carried on in the villages; but the trade in linen and towelling, formerly the staple, is declining. There are cotton, flax and linen mills, engineering and chemical works, distilleries, tanneries and paper mills. The government of Kostroma is divided into twelve districts, the chief towns of which, with populations in 1897, are Kostroma (*q.v.*), Bui (2626), Chukhloma (2200), Galich (6182), Kineshma (7564), Kologriv (2566), Makariev (6068), Nerekhta (3002), Soligalich (3420), Varnavin (1140), Vetluga (5200) and Yurievets (4778).

KOSTROMA, a town of Russia, capital of the government of the same name, 230 m. N.N.E. of Moscow and 57 m. E.N.E. from Yaroslav, on the left bank of the Volga, at the mouth of the navigable Kostroma, with suburbs on the opposite side of the Volga. Pop. (1897), 41,268. Its glittering gilded cupolas make it a conspicuous feature in the landscape as it climbs up the terraced river bank. It is one of the oldest towns of Russia, having been founded in 1152. Its fort was often the refuge of the princes of Moscow during war, but the town was plundered more than once by the Tatars. The cathedral, built in 1239 and rebuilt in 1773, is situated in the kreml, or citadel, and is a fine monument of old Russian architecture. In the centre of the town is a monument to the peasant Ivan Susanin and the tsar Michael (1851). The former sacrificed his own life in 1669 by leading the Poles astray in the forests in order to save the life of his own tsar Michael Fedeorovich. On the opposite bank of the Volga, close to the water's edge, stands the monastery of Ipatiyev, founded in 1330, with a cathedral built in 1586, both associated with the election of Tsar Michael (1669). Kostroma has been renowned since the 16th century for its linen, which was exported to Holland, and the manufacture of linen and linen-yarn is still kept up to some extent. The town has also cotton-mills, tanneries, saw-mills, an iron-foundry and a machine factory. It carries on an active trade—importing grain, and exporting linen, linen yarn, leather, and especially timber and wooden wares.

KÖSZEG (Ger. *Güns*), a town in the county of Vas, in Hungary, 173 m. W. of Budapest by rail. Pop. (1900), 7422. It is pleasantly situated in the valley of the Güns, and is dominated towards the west by the peaks of Altenhaus (2000 ft.) and of the Geschriebene Stein (2900 ft.). It possesses a castle of Count Esterhazy, a modern Roman Catholic Church in Gothic style and two convents. It has important cloth factories and a lively trade in fruit and wine. The town has a special historical interest for the heroic and successful defence of the fortress by Nicolas Jurisics against a large army of Sultan Soliman, in July–August 1532, which frustrated the advance of the Turks to Vienna for that year.

To the south-east of Köszeg, at the confluence of the Güns with the Raab, is situated the town of Sárvár (pop. 3158), formerly fortified, where in 1526 the first printing press in Hungary was established.

KOTAH, a native state of India, in the Rajputana agency, with an area of 5684 sq. m. The country slopes gently northwards from the high table-land of Malwa, and is drained by the Chambal with its tributaries, all flowing in a northerly or north-easterly direction. The Mokandarra range, from 1200 to 1600 ft. above sea-level, runs from south-east to north-west. The Mokandarra Pass through these hills, in the neighbourhood of the highest peak (1671 ft.), has been rendered memorable by the passage of Colonel Monson's army on its disastrous retreat in 1804. There are extensive game preserves, chiefly covered with grass. In addition to the usual Indian grains, wheat, cotton, poppy, and a little tobacco of good quality are cultivated. The manufactures are very limited. Cotton fabrics are woven, but are being rapidly superseded by the cheap products of Bombay, and Manchaster. Articles of wooden furniture are also constructed. The chief articles of export are opium and grain; salt, cotton and woollen cloth are imported.

Kotah is an offshoot from Bundi state, having been bestowed upon a younger son of the Bundi raja by the emperor Shah Jahan in return for services rendered him when the latter was in rebellion against his father Jahangir. In 1897 a considerable portion of the area taken to form Jhalawar (*q.v.*) in 1838 was restored to Kotah. In 1901 the population was 544,879, showing a decrease of 24% due to the results of famine. The estimated revenue is £206,000; tribute, £28,000. The maharao Umad Singh, was born in 1873, and succeeded in 1889. He was educated at the Mayo College, Ajmere, and became a major in the British army. A continuation of the branch line of the Indian Midland railway from Goona to Baran passes through Kotah, and it is also traversed by a new line, opened in 1909. The state suffered from drought in 1896–1897, and again more severely in 1899–1900.

The town of Kotah is on the right bank of the Chambal. Pop. (1901), 33,679. It is surrounded and also divided into three parts by massive walls, and contains an old and a new palace of the maharao and a number of fine temples. Muslins are the chief articles of manufacture, but the town has no great trade, and this and the unhealthiness of the site may account for the decrease in population.

KOTAS (Kotar, Koter, Kohatur, Gauhatar), an aboriginal tribe of the Nilgiri hills, India. They are a well-made people, of good features, tall, and of a dull copper colour, but some of them are among the fairest of the hill tribes. They recognize no caste among themselves, but are divided into *keris* (streets), and a man must marry outside his *keri*. Their villages (of which there are seven) are large, averaging from thirty to sixty huts. They are agriculturists and herdsmen, and the only one of the hill tribes who practise industrial arts, being excellent as carpenters, smiths, tanners and basket-makers. They do menial work for the Todas, to whom they pay a tribute. They worship ideal gods, which are not represented by any images. Their language is an old and rude dialect of Kanarese. In 1901 they numbered 1267.

KOTKA, a seaport of Finland, in the province of Viborg, 35 m. by rail from Kuivola junction on the Helsingfors railway, on an island of the same name at the mouth of the Kymmene river. Pop. (1904), 7628. It is the chief port for exports from and imports to east Finland and a centre of the timber trade.

KOTRI, a town of British India, in Karachi district, Sind, situated on the right bank of the Indus. Pop. (1901), 7617. Kotri is the junction of branches of the North-Western railway, serving each bank of the Indus, which is here crossed by a railway bridge. It was formerly the station for Hyderabad, which lies across the Indus, and the headquarters of the Indus steam flotilla, now abolished in consequence of the development of railway facilities. Besides its importance as a railway centre, however, Kotri still has a considerable general transit trade by river.

KOTZEBUE, AUGUST FRIEDRICH FERDINAND VON (1761–1819), German dramatist, was born on the 3rd of May, 1761, at Weimar. After attending the gymnasium of his native town, he went in his sixteenth year to the university of Jena, and afterwards studied about a year in Duisburg. In 1780 he completed his legal course and was admitted an advocate. Through the influence of Graf Görtz, Prussian ambassador at the Russian court, he became secretary of the governor-general of St Petersburg, In 1783 he received the appointment of assessor to the high court of appeal in Reval, where he married the daughter of a Russian lieutenant-general. He was ennobled in 1785, and became president of the magistracy of the province of Esthonia. In Reval he acquired considerable reputation by his novels, *Die Leiden der Ortenbergischen Familie* (1785) and *Geschichte meines Vaters* (1788), and still more by the plays *Adelheid von Wulfingen* (1789), *Menschenhass und Reue* (1790) and *Die Indianer in England* (1790). The good impression produced by these works was, however, almost effaced by a cynical dramatic satire, *Doktor Bahrdt mit der eisernen Stirn*, which appeared in 1790 with the name of Knigge on the title-page. After the death of his first wife Kotzebue retired from the Russian service, and lived for a time in Paris and Mainz; he then settled in 1795 on an estate which he had acquired near Reval and gave himself up to literary work. Within a few years he published six volumes of miscellaneous sketches and stories (*Die jüngsten Kinder meiner Laune*, 1793–1796) and more than twenty plays, the majority of which were translated into several European languages. In 1798 he accepted the office of dramatist to the court theatre in Vienna, but owing to differences with the actors he was soon obliged to resign. He now returned to his native town, but as he was not on good terms with Goethe, and had openly attacked the Romantic school, his position in Weimar was not a pleasant one. He had thoughts of returning to St Petersburg, and on his journey thither he was, for some unknown reason, arrested at the frontier and transported to Siberia. Fortunately he had written a comedy which flattered the vanity of the emperor Paul I.; he was consequently speedily brought back, presented with an estate from the crown lands of Livonia, and made director of the German theatre in St Petersburg. He returned to Germany when the emperor Paul died, and again settled in Weimar; he found it, however, as impossible as ever to gain a footing in literary society, and turned his steps to Berlin, where in association with Garlieb Merkel (1769–1850) he edited *Der Freimütige* (1803–1807) and began his *Almanach dramatischer Spiele* (1803–1820). Towards the end of 1806 he was once more in Russia, and in the security of his estate in Esthonia wrote many satirical articles against Napoleon in his journals *Die Biene* and *Die Grille*. As councillor of state he was attached in 1816 to the department for foreign affairs in St Petersburg, and in 1817 went to Germany as a kind of spy in the service of Russia, with a salary of 15,000 roubles. In a weekly journal (*Literarisches Wochenblatt*) which he published in Weimar he scoffed at the pretensions of those Germans who demanded free institutions, and became an object of such general dislike that he was obliged to move to Mannheim. He was especially detested by the young enthusiasts for liberty, and one of them, Karl Ludwig Sand, a theological student, stabbed him, in Mannheim, on the 23rd of March 1819. Sand was executed, and the government made his crime an excuse for placing the universities under strict supervision.

Besides his plays, Kotzebue wrote several historical works, which, however, are too one-sided and prejudiced to have much value. Of more interest are his autobiographical writings, *Meine Flucht nach Paris im Winter 1790* (1791), *Über meinen Aufenthalt in Wien* (1799), *Das merkwürdigste Jahr meines Lebens* (1801), *Erinnerungen aus Paris* (1804), and *Erinnerungen von meiner Reise aus Liefland nach Rom und Neapel* (1805). As a dramatist he was extraordinarily prolific, his plays numbering over 200; his popularity, not merely on the German, but on the European stage, was unprecedented. His success, however, was due less to any conspicuous literary or poetic ability than to an extraordinary facility in the invention of effective situations; he possessed, as few German playwrights before or since, the unerring instinct for the theatre; and his influence on the *technique* of the modern drama from Scribe to Sardou and from Bauernfeld to Sudermann is unmistakable. Kotzebue is to be seen to best advantage in his comedies, such as *Der Wildfang*, *Die beiden Klingsberg* and *Die deutschen Kleinstädter*, which contain admirable genre pictures of German life. These plays held the stage in Germany long after the once famous *Menschenhass und Reue* (known in England as *The Stranger*), *Graf Benjowsky*, or ambitious exotic tragedies like *Die Sonnenjungfrau* and *Die Spanier in Peru* (which Sheridan adapted as *Pizarro*) were forgotten.

Two collections of Kotzebue's dramas were published during his lifetime: *Schauspiele* (5 vols., 1797); *Neue Schauspiele* (23 vols., 1798–1820). His *Sämtliche dramatische Werke* appeared in 44 vols., in 1827–1829, and again, under the title *Theater*, in 40 vols., in 1840–1841. A selection of his plays in 10 vols. appeared at Leipzig in 1867–1868. Cp. H. Döring, *A. von Kotzebues Leben* (1830); W. von Kotzebue, *A. von Kotzebue* (1881); Ch. Rabany, *Kotzebue, sa vie et son temps* (1893); W. Sellier, *Kotzebue in England* (1901).

KOTZEBUE, OTTO VON (1787–1846), Russian navigator, second son of the foregoing, was born at Reval on the 30th of December 1787. After being educated at the St Petersburg school of cadets, he accompanied Krusenstern on his voyage of 1803–1806. After his promotion to lieutenant Kotzebue was placed in command of an expedition, fitted out at the expense of the imperial chancellor, Count Rumantsoff, in the brig "Rurick." In this vessel, with only twenty-seven men, Kotzebue set out on the 30th of July 1815 to find a passage across the Arctic Ocean and explore the less-known parts of Oceania. Proceeding by Cape Horn, he discovered the Romanzov, Rurik and Krusenstern Islands, then made for Kamchatka, and in the middle of July proceeded northward, coasting along the north-west coast of America, and discovering and naming Kotzebue Gulf or Sound and Krusenstern Cape. Returning by the coast of Asia, he again sailed to the south, sojourned for three weeks at the Sandwich Islands, and on the 1st of January 1817 discovered New Year Island. After some further cruising in the Pacific he again proceeded north, but a severe attack of illness compelling him to return to Europe, he reached the Neva on the 3rd of August 1818, bringing home a large collection of previously unknown plants and much new ethnological information. In 1823 Kotzebue, now a captain, was entrusted with the command of an expedition in two ships of war, the main object of which was to take reinforcements to Kamchatka. There was, however, a staff of scientists on board, who collected much valuable information and material in geography, ethnography and natural history. The expedition, proceeding by Cape Horn, visited the Radak and Society Islands, and reached Petropavlovsk in July 1824. Many positions along the coast were rectified, the Navigator islands visited, and several discoveries made. The expedition returned by the Marianna, Philippine, New Caledonia and Hawaiian Islands, reaching Kronstadt on the 10th of July 1826. There are English translations of both Kotzebue's narratives: *A Voyage of Discovery into the South Sea and Beering's Straits for the Purpose of exploring a North-East Passage, undertaken in the Years 1815–1818* (3 vols. 1821), and *A New Voyage Round the World in the Years 1823–1826* (1830). Three years after his return from his second voyage, Kotzebue died at Reval on the 15th of February 1846.

KOUMISS, milk-wine, or milk brandy, a fermented alcoholic beverage prepared from milk. It is of very ancient origin, and according to Herodotus was known to the Scythians. The name is said to be derived from an ancient Asiatic tribe, the Kumanes or Komans. It is one of the staple articles of diet of the Siberian and Caucasian races, but of late years it has also been manufactured on a considerable scale in western Europe, on account of its valuable medicinal properties. It is generally made from mares' or camels' milk by a process of fermentation set up by the addition to the fresh milk of a small quantity of the finished article. This fermentation, which appears to be of a symbiotic nature, being dependent on the action of two distinct types of organisms, the one a fission fungus, the other a true yeast, eventuates in the conversion of a part of the milk sugar into lactic acid and alcohol. Koumiss generally contains 1 to 2% of alcohol, 0·5 to 1·5% of lactic acid, 2 to 4% of milk sugar and 1 to 2% of fat. *Kefir* is similar to koumiss, but is usually prepared from cows' milk, and the fermentation is brought about by the so-called Kefir Grains (derived from a plant).

KOUMOUNDOUROS, ALEXANDROS (1814–1883), Greek statesman, whose name is commonly spelt Coumoundouros, was born in 1814. His studies at the university of Athens were repeatedly interrupted for lack of means, and he began to earn his living as a clerk. He took part in the Cretan insurrection of 1841, and in the demonstration of 1843, by which the Greek constitution was obtained from King Otto, he was secretary to General Theodoraki Grivas. He then settled down to the bar at Kalamata in Messenia, where he married a lady belonging to the Mavromichalis family. He was elected to the chamber in 1851, and four years later his eloquence and ability had secured the president's chair for him. He became minister of finance in 1856, and again in 1857 and 1859. He adhered to the moderate wing of the Liberal party until the revolution of 1862 and the dethronement of King Otto, when he was minister of justice in the provincial government. He was twice minister of the interior under Kanaris, in 1864 and in 1865. In March 1865 he became prime minister, and he formed several subsequent administrations in the intervals of the ascendancy of Tricoupi. During the Cretan insurrection of 1866–68 he made active warlike preparations against Turkey, but was dismissed by King George, who recognized that Greece could not act without the support of the Powers. He was again premier at the time of the outbreak of the insurrection in Thessaly in January 1878, and supported by Delyanni as minister of foreign affairs he sent an army of 10,000 men to help the insurgents against Turkey. The troops were recalled on the understanding that Greece should be represented at the Congress of Berlin. In October 1880 the fall of the Tricoupi ministry restored him to power, when he resumed his warlike policy, but repeated appeals to the courts of Europe yielded little practical result, and Koumoundouros was obliged to reduce his territorial demands and to accept the limited cessions in Thessaly and Epirus, which were carried out in July 1881. His ministry was overturned in 1882 by the votes of the new Thessalian deputies, who were dissatisfied with the administrative arrangements of the new province, and he died at Athens on the 9th of March 1883.

KOUSSO (Kosso or Cusso), a drug which consists of the panicles of the pistillate flowers of *Brayera anthelmintica*, a handsome rosaceous tree 60 ft. high, growing throughout the table-land of Abyssinia, at an elevation of 3000 to 8000 ft. above the sea-level. The drug as imported is in the form of cylindrical rolls, about 18 in. in length and 2 in. in diameter, and comprises the entire inflorescence or panicle kept in form by a band wound transversely round it. The active principle is koussin or kosin, $C_{31}H_{38}O_{10}$, which is soluble in alcohol and alkalis, and may be given in doses of thirty grains. Kousso is also used in the form of an unstrained infusion of ¼ to ½ oz. of the coarsely powdered flowers, which are swallowed with the liquid. It is considered to be an effectual vermifuge for *Taenia solium*. In its anthelmintic action it is nearly allied to male fern, but it is much inferior to that drug and is very rarely used in Great Britain.

KOVALEVSKY, SOPHIE (1850–1891), Russian mathematician, daughter of General Corvin-Krukovsky, was born at Moscow on the 15th of January 1850. As a young girl she was fired by the aspiration after intellectual liberty that animated so many young Russian women at that period, and drove them to study at foreign universities, since their own were closed to them. This led her, in 1868, to contract one of those conventional marriages in vogue at the time, with a young student, Waldemar Kovalevsky, and the two went together to Germany to continue their studies. In 1869 she went to Heidelberg, where she studied under H. von Helmholtz, G.R. Kirchhoff, L. Königsberger and P. du Bois-Reymond, and from 1871–1874 read privately with Karl Weierstrass at Berlin, as the public lectures were not then open to women. In 1874 the university of Göttingen granted her a degree *in absentia*, excusing her from the oral examination on account of the remarkable excellence of the three dissertations sent in, one of which, on the theory of partial differential equations, is one of her most remarkable works. Another was an elucidation of P.S. Laplace's mathematical theory of the form of Saturn's rings. Soon after this she returned to Russia with her husband, who was appointed professor of palaeontology at Moscow, where he died in 1883. At this time Madame Kovalevsky was at Stockholm, where Gustaf Mittag Leffler, also a pupil of Weierstrass, who had been recently appointed to the chair of mathematics at the newly founded university, had procured for her a post as lecturer. She discharged her duties so successfully that in 1884 she was appointed full professor. This post she held till her death on the 10th of February 1891. In 1888 she achieved the greatest of her successes, gaining the Prix Bordin offered by the Paris Academy. The problem set was "to perfect in one important point the theory of the movement of a solid body round an immovable point," and her solution added a result of the highest interest to those transmitted to us by Leonhard Euler and J. L. Lagrange. So remarkable was this work that the value of the prize was doubled as a recognition of unusual merit. Unfortunately Madame Kovalevsky did not live to reap the full reward of her labours, for she died just as she had attained the height of her fame and had won recognition even in her own country by election to membership of the St Petersburg Academy of Science.

See E. de Kerbedz, "Sophie de Kowalevski," *Benidiconti del circolo mathematico di Palermo* (1891); the obituary notice by G. Mittag Leffler in the *Acta mathematica*, vol. xvi.; and J. C. Poggendorff, *Biographisch-literarisches Handwörterbuch*.

KOVNO (in Lithuanian *Kauna*), a government of north-western Russia, bounded N. by the governments of Courland and Vitebsk, S.E. by that of Vilna, and S. and S.W. by Suwalki and the province of East Prussia, a narrow strip touching the Baltic near Memel. It has an area of 15,687 sq. m. The level uniformity of its surface is broken only by two low ridges which nowhere rise above 800 ft. The geological character is varied, the Silurian, Devonian, Jurassic and Tertiary systems being all represented: the Devonian is that which occurs most frequently, and all are covered with Quaternary boulder-clays. The soil is either a sandy clay or a more fertile kind of black earth. The government is drained by the Niemen, Windau, Courland Aa and Dvina, which have navigable tributaries. In the flat depressions covered with boulder-clays there are many lakes and marshes, while forests occupy about 25½ % of the surface. The climate is comparatively mild, the mean temperature at the city of Kovno being 44° F. The population was 1,156,040 in 1870, and 1,553,244 in 1897. The estimated population in 1906 was 1,683,600. It is varied, consisting of Lithuanians proper and Zhmuds (together 74%), Jews (14%), Germans (2½%), Poles (9%), with Letts and Russians; 76·6% are Roman Catholics, 13·7 Jews, 4·5 Protestants, and 5% belong to the Greek Church. Of the total 788,102 were women in 1897 and 147,878 were classed as urban. The principal occupation of the inhabitants is agriculture, 63% of the surface being under crops; both grain (wheat, rye, oats and barley) and potatoes are exported. Flax is cultivated and the linseed exported. Dairying flourishes, and horse and cattle breeding are attracting attention. Fishing is important, and the navigation on the rivers is brisk. A variety of petty domestic industries are carried on by the Jews, but only to a slight extent in the villages. As many as 18,000 to 24,000 men are compelled every year to migrate in search of work. The factories consist principally of distilleries, tobacco and steam flour-mills, and hardware manufactories. Trade, especially the transit trade, is brisk, from the situation of the government on the Prussian frontier, the custom-houses of Yerburg and Tauroggen being amongst the most important in Russia. The chief towns of the seven districts into which the government is divided, with their populations in 1897, are Kovno (*q.v.*), (Novo-Alexandrovsk (6370), Ponevyezh (13,044), Rosieny (7455), Shavli (15,914), Telshi (6215) and Vilkomir (13,509).

The territory which now constitutes the government of Kovno was formerly known as Samogitia and formed part of Lithuania. During the 13th, 14th and 15th centuries the Livonian and Teutonic Knights continually invaded and plundered it, especially the western part, which was peopled with Zhmuds. In 1569 it was annexed, along with the rest of the principality of Lithuania, to Poland; and it suffered very much from the wars of Russia with Sweden and Poland, and from the invasion of Charles XII. in 1701. In 1795 the principality of Lithuania was annexed to Russia, and until 1872, when the government of Kovno was constituted, the territory now forming it was a part of the government of Vilna.

KOVNO, a town and fortress of Russia, capital of the government of the same name, stands at the confluence of the Niemen with the Viliya, 550 m. S.W. of St Petersburg by rail, and 55 m. from the Prussian frontier. Pop. (1863), 23,937; (1903), 73,743, nearly one-half being Jews. It consists of a cramped Old Town and a New Town stretching up the side of the Niemen. It is a first-class fortress, being surrounded at a mean distance of 2½ m. by a girdle of forts, eleven in number. The town lies for the most part in the fork and is guarded by three forts in the direction of Vilna, one covers the Vilna bridge, while the southern approaches are protected by seven. Kovno commands and bars the railway Vilna-Eydtkuhnen. Its factories produce nails, wire-work and other metal goods, mead and bone-meal. It is an important entrepôt for timber, cereals, flax, flour, spirits, bone-meal, fish, coal and building-stone passing from and to Prussia. The city possesses some 15th-century churches. It was founded in the 11th century; and from 1384 to 1398 belonged to the Teutonic Knights. Tsar Alexis of Russia plundered and burnt it in 1655. Here the Russians defeated the Poles on the 26th of June 1831.

KOVROV, a town of Russia, in the government of Vladimir, 40 m. N.E. of the city of Vladimir by the railway from Moscow to Nizhniy-Novgorod, and on the Klyazma River. It has railway-carriage works, cotton mills, steam flour mills, tallow works and quarries of limestone, and carries on an active trade in the export of wooden wares and in the import of grain, salt and fish, brought from the Volga governments. Pop. (1890), 6600; (1900), 16,806.

KOWTOW, or KOTOU, the Chinese ceremonial act of prostration as a sign of homage, submission, or worship. The word is formed from *ko*, knock, and *tou*, head. To the emperor, the "kowtow" is performed by kneeling three times, each act accompanied by touching the ground with the forehead.

KOZLOV, a town of Russia, in the government of Tambov, on the Lyesnoi Voronezh River, 45 m. W.N.W. of the city of Tambov by rail. Pop. (1900), 41,555. Kozlov had its origin in a small monastery, founded in the forest in 1627; nine years later, an earthwork was raised close by, for the protection of the Russian frontier against the Tatars. Situated in a very fertile country, on the highway to Astrakhan and at the head of water communication with the Don, the town soon became a centre of trade; as the junction of the railways leading to the Sea of Azov, to Tsaritsyn on the lower Volga, to Saratov and to Orel, its importance has recently been still further increased. Its export of cattle, grain, meat, eggs (22,000,000), tallow, hides, &c., is steadily growing, and it possesses factories, flour mills, tallow works, distilleries, tanneries and glue works.

KRAAL, also spelt *craal*, *kraul*, &c. (South African Dutch, derived possibly from a native African word, but probably from the Spanish *corral*, Portuguese *curral*, an enclosure for horses, cattle and the like), in South and Central Africa, a native village surrounded by a palisade, mud wall or other fencing roughly circular in form; by transference, the community living within the enclosure. Folds for animals and enclosures made specially for defensive purposes are also called kraals.

KRAFFT (or KRAFT), **ADAM** (*c.* 1455–1507), German sculptor, of the Nuremberg school, was born, probably at Nuremberg, about the middle of the 15th century, and died, some say in the hospital, at Schwabach, about 1507. He seems to have emerged as sculptor about 1490, the date of the seven reliefs of scenes from the life of Christ, which, like almost every other specimen of his work, are at Nuremberg. The date of his last work, an Entombment, with fifteen life-size figures, in the Holzschuher chapel of the St John's cemetery, is 1507. Besides these, Krafft's chief works are several monumental reliefs in the various churches of Nuremberg; he produced the great Schreyer monument (1492) for St Sebald's at Nuremberg, a skilful though mannered piece of sculpture opposite the Rathaus, with realistic figures in the costume of the time, carved in a way more suited to wood than stone, and too pictorial in effect; Christ bearing the Cross, above the altar of the same church; and various works made for public and private buildings, as the relief over the door of the Wagehaus, a St George and the Dragon, several Madonnas, and some purely decorative pieces, as coats of arms. His masterpiece is perhaps the magnificent tabernacle, 62 ft. high, in the church of St Laurence (1493–1500). He also made the great tabernacle for the Host, 80 ft. high, covered with statuettes, in Ulm Cathedral, and the very spirited "Stations of the Cross" on the road to the Nuremberg cemetery.

See *Adam Krafft und seine Schule*, by Friedrich Wanderer (1869); *Adam Krafft und die Künstler seiner Zeit*, by Berthold Daun (1897); Albert Gümbel in *Repertorium für Kunstwissenschaft*, Bd. xxv. Heft 5, 1902.

KRAGUYEVATS (also written KRAGUIEVATZ and KRAGUJEVAC), the capital of the Kraguyevats department of Servia; situated 59 m. S.S.W. of Belgrade, in a valley of the Shumadia, or "forest-land," and on the Lepenitsa, a small stream flowing north-east to join the Morava. On the opposite bank stands the picturesque hamlet of Obilichevo, with a large powder factory. Kraguyevats itself is the main arsenal of Servia, and possesses an iron-foundry and a steam flour-mill. It is the seat of the district prefecture, of a tribunal, of a fine library, and of a large garrison. It boasts the finest college building and the finest modern cathedral (in Byzantine style) in Servia. In the first years of Servia's autonomy under Prince Milosh, it was the residence of the prince and the seat of government (1818–1839). Even later, between 1868 and 1880, the national assembly (*Narodna Skupshtina*) usually met there. In 1885 it was connected by a branch line (Kraguyevats-Lapovo) with the principal railway (Belgrade-Nish), and thenceforward the prosperity of the town steadily increased. Pop. (1900), 14,160.

KRAKATOA (KRAKATAO, KRAKATAU), a small volcanic island in Sunda Strait, between the islands of Java and Sumatra, celebrated for its eruption in 1883, one of the most stupendous ever recorded. At some early period a large volcano rose in the centre of the tract where the Sunda Strait now runs. Long before any European had visited these waters an explosion took place by which the mountain was so completely blown away that only the outer portions of its base were left as a broken ring of islands. Subsequent eruptions gradually built up a new series of small cones within the great crater ring. Of these the most important rose to a height of 2623 ft. above the sea and formed the peak of the volcanic island of Krakatoa. But compared with the great neighbouring volcanoes of Java and Sumatra, the islets of the Sunda Strait were comparatively unknown. Krakatoa was uninhabited, and no satisfactory map or chart of it had been made. In 1680 it appears to have been in eruption, when great earthquakes took place and large quantities of pumice were ejected. But the effects of this disturbance had been so concealed by the subsequent spread of tropical vegetation that the very occurrence of the eruption had sometimes been called in question. At last, about 1877, earthquakes began to occur frequently in the Sunda Strait and continued for the next few years. In 1883 the manifestations of subterranean commotion became more decided, for in May Krakatoa broke out in eruption. For some time the efforts of the volcano appear to have consisted mainly in the discharge of pumice and dust, with the usual accompaniment of detonations and earthquakes. But on the 26th of August a succession of paroxysmal explosions began which lasted till the morning of the 28th. The four most violent took place on the morning of the 27th. The whole of the northern and lower portion of the island of Krakatoa, lying within the original crater ring of prehistoric times, was blown away; the northern part of the cone of Rakata almost entirely disappeared, leaving a vertical cliff which laid bare the inner structure of that volcano. Instead of the volcanic island which had previously existed, and rose from 300 to 1400 ft. above the sea, there was now left a submarine cavity, the bottom of which was here and there more than 1000 ft. below the sea-level. This prodigious evisceration was the result of successive violent explosions of the superheated vapour absorbed in the molten magma within the crust of the earth. The vigour and repetition of these explosions, it has been suggested, may have been caused by sudden inrushes of the water of the ocean as the throat of the volcano was cleared and the crater ring was lowered and ruptured. The access of large bodies of cold water to the top of the column of molten lava would probably give rise at once to some minor explosions, and then to a chilling of the surface of the lava and a consequent temporary diminution or even cessation of the volcanic eructations. But until the pent-up water-vapour in the lava below had found relief it would only gather strength until it was able to burst through the chilled crust and overlying water, and to hurl a vast mass of cooled lava, pumice and dust into the air.

The amount of material discharged during the two days of paroxysmal energy was enormous, though there are no satisfactory data for even approximately estimating it. A large cavity was formed where the island had previously stood, and the sea-bottom around this crater was covered with a wide and thick sheet of fragmentary materials. Some of the surrounding islands received such a thick accumulation of ejected stones and dust as to bury their forests and greatly to increase the area of the land. So much was the sea filled up that a number of new islands rose above its level. But a vast body of the fine dust was carried far and wide by aerial currents, while the floating pumice was transported for many hundreds of miles on the surface of the ocean. At Batavia, 100 m. from the centre of eruption, the sky was darkened by the quantity of ashes borne across it, and lamps had to be used in the houses at midday. The darkness even reached as far as Bandong, a distance of nearly 150 miles. It was computed that the column of stones, dust and ashes projected from the volcano shot up into the air for a height of 17 m. or more. The finer particles coming into the higher layers of the atmosphere were diffused over a large part of the surface of the earth, and showed their presence by the brilliant sunset glows to which they gave rise. Within the tropics they were at first borne along by air-currents at an estimated rate of about 73 m. an hour from east to west, until within a period of six weeks they were diffused over nearly the whole space between the latitudes 30° N. and 45° S. Eventually they spread northwards and southwards and were carried over North and South America, Europe, Asia, South Africa and Australasia. In the Old World they spread from the north of Scandinavia to the Cape of Good Hope.

Another remarkable result of this eruption was the world-wide disturbance of the atmosphere. The culminating paroxysm on the morning of the 27th of August gave rise to an atmospheric wave or oscillation, which, travelling outwards from the volcano as a centre, became a great circle at 180° from its point of origin, whence it continued travelling onwards and contracting till it reached a node at the antipodes to Krakatoa. It was then reflected or reproduced, travelling backwards again to the volcano, whence it once more returned in its original direction. "In this manner its repetition was observed not fewer than seven times at many of the stations, four passages having been those of the wave travelling from Krakatoa, and three those of the wave travelling from its antipodes, subsequently to which its traces were lost" (Sir R. Strachey).

The actual sounds of the volcanic explosions were heard over a vast area, especially towards the west. Thus they were noticed at Rodriguez, nearly 3000 English miles away, at Bangkok (1413 m.), in the Philippine Islands (about 1450 m.), in Ceylon (2058 m.) and in West and South Australia (from 1300 to 2250 m.). On no other occasion have sound-waves ever been perceived at anything like the extreme distances to which the detonations of Krakatoa reached.

Not less manifest and far more serious were the effects of the successive explosions of the volcano upon the waters of the ocean. A succession of waves was generated which appear to have been of two kinds, long waves with periods of more than an hour, and shorter but higher waves, with irregular and much briefer intervals. The greatest disturbance, probably resulting from a combination of both kinds of waves, reached a height of about 50 ft. The destruction caused by the rush of such a body of sea-water along the coasts and low islands was enormous. All vessels lying in harbour or near the shore were stranded, the towns, villages and settlements close to the sea were either at once, or by successive inundations, entirely destroyed, and more than 36,000 human beings perished. The sea-waves travelled to vast distances from the centre of propagation. The long wave reached Cape Horn (7818 geographical miles) and possibly the English Channel (11,040 m.). The shorter waves reached Ceylon and perhaps Mauritius (2900 m.).

See R. D. M. Verbeek, *Krakatau* (Batavia, 1886); "The Eruption of Krakatoa and Subsequent Phenomena," *Report of the Krakatoa Committee of the Royal Society* (London, 1888).

KRAKEN, in Norwegian folk-lore, a sea-monster, believed to haunt the coasts of Norway. It was described in 1752 by the Norwegian bishop Pontoppidan as having a back about a mile and a half round and a body which showed above the sea like an island, and its arms were long enough to enclose the largest ship. The further assertion that the kraken darkened the water around it by an excretion suggests that the myth was based on the appearance of some gigantic cuttle-fish.

See J. Gibson, *Monsters of the Sea* (1887); A. S. Packard, "Colossal Cuttle-fishes," *American Naturalist* (Salem, 1873), vol. vii.; A. E. Verrill, "The Colossal Cephalopods of the Western Atlantic," in *American Naturalist* (Salem, 1875), vol. ix.; and "Gigantic Squids," in *Trans. of Connecticut Academy* (1879), vol. v.

KRALYEVO (sometimes written KRALJEVO or KRALIEVO), a city of Servia, and capital of a department bearing the same name. Kralyevo is built beside the river Ibar, 4 m. W. of its confluence with the Servian Morava; and in the midst of an upland valley, between the Kotlenik Mountains, on the north, and the Stolovi Mountains, on the south. Formerly known as Karanovats, Kralyevo received its present name, signifying "the King's Town," from King Milan (1868–1889), who also made it a bishopric, instead of Chachak, 22 m. W. by N. Kralyevo is a garrison town, with a prefecture, court of first instance, and an agricultural school. But by far its most interesting feature is the Coronation church belonging to Jicha monastery. Here six or seven kings are said to have been crowned. The church is Byzantine in style, and has been partially restored; but the main tower dates from the year 1210, when it was founded by St Sava, the patron saint of Servia. Pop. (1900), about 3600.

The famous monastery of Studenitsa, 24 m. S. by W. of Kralyevo, stands high up among the south-western mountains, overlooking the Studenitsa, a tributary of the Ibar. It consists of a group of old-fashioned timber and plaster buildings, a tall belfry, and a diminutive church of white marble, founded in 1190 by King Stephen Nemanya, who himself turned monk and was canonized as St Simeon. The carvings round the north, south and west doors have been partially defaced by the Turks. The inner walls are decorated with Byzantine frescoes, among which only a painting of the Last Supper, and the portraits of five saints, remain unrestored. The dome and narthex are modern additions. Besides the silver shrine of St Simeon, many gold and silver ornaments, church vessels and old manuscripts, there are a set of vestments and a reliquary, believed by the monks to have been the property of St Sava.

KRANTZ (or CRANTZ), **ALBERT** (*c.* 1450–1517), German historian, was a native of Hamburg. He studied law, theology and history at Rostock and Cologne, and after travelling through western and southern Europe was appointed professor, first of philosophy and subsequently of theology, in the university of Rostock, of which he was rector in 1482. In 1493 he returned to Hamburg as theological lecturer, canon and prebendary in the cathedral. By the senate of Hamburg he was employed on more than one diplomatic mission abroad, and in 1500 he was chosen by the king of Denmark and the duke of Holstein as arbiter in their dispute regarding the province of Dithmarschen. As dean of the cathedral chapter, to which office he was appointed in 1508, Krantz applied himself with zeal to the reform of ecclesiastical abuses, but, though opposed to various corruptions connected with church discipline, he had little sympathy with the drastic measures of Wycliffe or Huss. With Luther's protest against the abuse of Indulgences he was in general sympathy, but with the reformer's later attitude he could not agree. When, on his death-bed, he heard of the ninety-five theses, he is said, on good authority, to have exclaimed: "Brother, Brother, go into thy cell and say, God have mercy upon me!" Krantz died on the 7th of December 1517.

Krantz was the author of a number of historical works which for the period when they were written are characterized by exceptional impartiality and research. The principal of these are *Chronica regnorum aquilonarium Daniae, Sueciae, et Norvagiae* (Strassburg, 1546); *Vandalia, sive Historia de Vandalorum vera origine*, &c. (Cologne, 1518); *Saxonia* (1520); and *Metropolis, sive Historia de ecclesiis sub Carolo Magno in Saxonia* (Basel, 1548). See life by N. Wilckens (Hamburg, 1722).

KRASNOVODSK, a seaport of Russian Transcaspia, on the N. shore of Balkhan or Krasnovodsk Bay, on the S. side of the Caspian Sea, opposite to Baku, and at 69 ft. below sea-level. Pop. (1897), 6359. It is defended by a fort. Here begins the Transcaspian railway to Merv and Bokhara. There is a fishing industry, and salt and sulphur are obtained. Krasnovodsk, which is the capital of the Transcaspian province, was founded in 1869.

KRASNOYARSK, a town of Eastern Siberia, capital of the government of Yeniseisk, on the left bank of the Yenisei River, at its confluence with the Kacha, and on the highway from Moscow to Irkutsk, 670 m. by rail N.W. from the latter. Pop. (1900), 33,337. It has a municipal museum and a railway technical school. It was founded by Cossacks in 1628, and during the early years of its existence it was more than once besieged by the Tatars and the Kirghiz. Its commercial importance depends entirely upon the gold-washings of the Yeniseisk district. Brick-making, soap-boiling, tanning and iron-founding are carried on. The climate is very cold, but dry. The Yenisei River is frozen here for 160 days in the year.

KRASZEWSKI, JOSEPH IGNATIUS (1812–1887), Polish novelist and miscellaneous writer, was born at Warsaw on the 28th of July 1812, of an aristocratic family. He showed a precocious talent for authorship, beginning his literary career with a volume of sketches from society as early as 1829, and for more than half a century scarcely ever intermitting his literary production, except during a period of imprisonment upon a charge of complicity in the insurrection of 1831. He narrowly escaped being sent to Siberia, but, rescued by the intercession of powerful friends, he settled upon his landed property near Grodno, and devoted himself to literature with such industry that a mere selection from his fiction alone, reprinted at Lemberg from 1871 to 1875, occupies 102 volumes. He was thus the most conspicuous literary figure of his day in Poland. His extreme fertility was suggestive of haste and carelessness, but he declared that the contrivance of his plot gave him three times as much trouble as the composition of his novel. Apart from his gifts as a story-teller, he did not possess extraordinary mental powers; the "profound thoughts" culled from his writings by his admiring biographer Bohdanowicz are for the most part mere truisms. His copious invention is nevertheless combined with real truth to nature, especially evinced in the beautiful little story of *Jermola the Potter* (1857), from which George Eliot appears to have derived the idea of *Silas Marner*, though she can only have known it at second hand. Compared with the exquisite art of *Silas Marner*, *Jermola* appears rude and unskilful, but it is not on this account the less touching in its fidelity to the tenderest elements of human nature. Kraszewski's literary activity falls into two well-marked epochs, the earlier when, residing upon his estate, he produced romances like *Jermola*, *Ulana* (1843), *Kordecki* (1852), devoid of any special tendency, and that after 1863, when the suspicions of the Russian government compelled him to settle in Dresden. To this period belong several political novels published under the pseudonym of *Boleslawita*, historical fictions such as *Countess Cosel*, and the "culture" romances *Morituri* (1874–1875) and *Resurrecturi* (1876), by which he is perhaps best known out of his own country. In 1884 he was accused of plotting against the German government and sentenced to seven years' imprisonment in a fortress, but was released in 1886, and withdrew to Geneva, where he died on the 19th of March 1887. His remains were brought to Poland and interred at Cracow. Kraszewski was also a poet and dramatist; his most celebrated poem is his epic *Anafielas* (3 vols., 1840–1843) on the history of Lithuania. He was indefatigable as literary critic, editor and translator, wrote several historical works, and was conspicuous as a restorer of the study of national archaeology in Poland. Among his most valuable works were *Litwa* (Warsaw, 2 vols., 1847–1850), a collection of Lithuanian antiquities; and an aesthetic history of Poland (Posen, 3 vols., 1873–1875). (R. G.)

KRAUSE, KARL CHRISTIAN FRIEDRICH (1781–1832), German philosopher, was born at Eisenberg on the 4th of May 1781, and died at Munich on the 27th of September 1832. Educated at first at Eisenberg, he proceeded to Jena, where he studied philosophy under Hegel and Fichte and became *privatdozent* in 1802. In the same year, with characteristic imprudence, he married a wife without dowry. Two years after, lack of pupils compelled him to move to Rudolstadt and later to Dresden, where he gave lessons in music. In 1805 his ideal of a universal world-society led him to join the Freemasons, whose principles seemed to tend in the direction he desired. He published two books on Freemasonry, *Die drei ältesten Kunsturkunden der Freimaurerbrüderschaft* and *Höhere Vergeistigung der echt überlieferten Grundsymbole der Freimaurerei*, but his opinions drew upon him the opposition of the Masons. He lived for a time in Berlin and became a *privatdozent*, but was unable to obtain a professorship. He therefore proceeded to Göttingen and afterwards to Munich, where he died of apoplexy at the very moment when the influence of Franz von Baader had at last obtained a position for him.

One of the so-called "Philosophers of Identity," Krause endeavoured to reconcile the ideas of a God known by Faith or Conscience and the world as known to sense. God, intuitively known by Conscience, is not a personality (which implies limitations), but an all-inclusive essence (*Wesen*), which contains the Universe within itself. This system he called *Panentheism*, a combination of Theism and Pantheism. His theory of the world and of humanity is universal and idealistic. The world itself and mankind, its highest component, constitute an organism (*Gliedbau*), and the universe is therefore a divine organism (*Wesengliedbau*). The process of development is the formation of higher unities, and the last stage is the identification of the world with God. The form which this development takes, according to Krause, is Right or the Perfect Law. Right is not the sum of the conditions of external liberty but of absolute liberty, and embraces all the existence of nature, reason and humanity. It is the mode, or rationale, of all progress from the lower to the highest unity or identification. By its operation the reality of nature and reason rises into the reality of humanity. God is the reality which transcends and includes both nature and humanity. Right is, therefore, at once the dynamic and the safeguard of progress. Ideal society results from the widening of the organic operation of this principle from the individual man to small groups of men, and finally to mankind as a whole. The differences disappear as the inherent identity of structure predominates in an ever-increasing degree, and in the final unity Man is merged in God.

The comparatively small area of Krause's influence was due partly to the overshadowing brilliance of Hegel, and partly to two intrinsic defects. The spirit of his thought is mystical and by no means easy to follow, and this difficulty is accentuated, even to German readers, by the use of artificial terminology. He makes use of germanized foreign terms which are unintelligible to the ordinary man. His principal works are (beside those quoted above): *Entwurf des Systems der Philosophie* (1804); *System der Sittenlehre* (1810); *Das Urbild der Menschheit* (1811); and *Vorlesungen über das System der Philosophie* (1828). He left behind him at his death a mass of unpublished notes, part of which has been collected and published by his disciples, H. Ahrens (1808–1874), Leonhardi, Tiberghien and others.

See H. S. Lindemann, *Uebersichtliche Darstellung des Lebens . . . Krauses* (1839); P. Hohlfeld, *Die Krausesche Philosophie* (1879); A. Procksch, *Krause, ein Lebensbild nach seinen Briefen* (1880); R. Eucken, *Zur Erinnerung an Krause* (1881); B. Martin, *Krauses Leben und Bedeutung* (1881), and Histories of Philosophy by Zeller, Windelband and Höffding.

KRAWANG, a residency of the island of Java, Dutch East Indies, bounded E. and S. by Charibon and the Preanger, W. by Batavia, and N. by the Java Sea, and comprising a few insignificant islands. The natives are Sundanese, but contain a large admixture of Middle Javanese and Bantamers in the north, where they established colonies in the 17th century. Like the residency of Batavia, the northern half of Krawang is flat and occasionally marshy, while the southern half is mountainous and volcanic. Warm and cold mineral, salt and sulphur springs occur in the hills. Salt is extracted by the government, though in smaller quantities now than formerly. The principal products are rice, coffee, sugar, vanilla, indigo and nutmeg. Fishing is practised along the coast and forest culture in the hills, while the industries also include the manufacture of coarse linen, sacks and leather tanning. Gold and silver were formerly thought to be hidden in the Parang mountain in the Gandasoli district south-west of Purwakarta, and mining was begun by the Dutch East India Company in 1722. The largest part of the residency consists of private lands, and only the Purwakarta and Krawang divisions forming the middle and north-west sections come directly under government control. The remainder of the residency is divided between the Pamanukan-Chiasem lands occupying the whole eastern half of the residency and the Tegalwaru lands in the south-western corner. The former is owned by a company and forms the largest estate in Java. The Tegalwaru is chiefly owned by Chinese proprietors. Purwakarta is the capital of the residency. Subang and Pamanukan both lie at the junction of several roads near the borders of Cheribon and are the chief centres of activity in the east of the residency.

KRAY VON KRAJOVA, PAUL, Freiherr (1735–1804), Austrian soldier. Entering the Austrian army at the age of nineteen, he arrived somewhat rapidly at the grade of major, but it was many years before he had any opportunity of distinguishing himself. In 1784 he suppressed a rising in Transylvania, and in the Turkish wars he took an active part at Porczeny and the Vulcan Pass. Made major-general in 1790, three years later he commanded the advanced guard of the Allies operating in France. He distinguished himself at Famars, Charleroi, Fleurus, Weissenberg, and indeed at almost every encounter with the troops of the French Republic. In the celebrated campaign of 1796 on the Rhine and Danube he did conspicuous service as a corps commander. At Wetzlar he defeated Kléber, and at Amberg and Würzburg he was largely responsible for the victory of the archduke Charles. In the following year he was less successful, being twice defeated on the Lahn and the Main. Kray commanded in Italy in 1799, and reconquered from the French the plain of Lombardy. For his victories of Verona, Mantua, Legnago and Magnano he was promoted *Feldzeugmeister*, and he ended the campaign by further victories at Novi and Fossano. Next year he commanded on the Rhine against Moreau. (For the events of this memorable campaign see French Revolutionary Wars.) As a consequence of the defeats he underwent at Biberach, Messkirch, &c., Kray was driven into Ulm, but by a skilful march round Moreau's flank succeeded in escaping to Bohemia. He was relieved of his command by the Austrian government, and passed his remaining years in retirement. He died in 1804. Kray was one of the best representatives of the old Austrian army. Tied to an obsolete system and unable from habit to realize the changed conditions of warfare, he failed, but his enemies held him in the highest respect as a brave, skilful and chivalrous opponent. It was he who at Altenkirchen cared for the dying Marceau, and the white uniforms of Kray and his staff mingled with the blue of the French in the funeral procession of the young general of the Republic.

KREMENCHUG, a town of south-west Russia, in the government of Poltava, on the left bank of the Dnieper (which periodically overflows its banks), 73 m. S.W. of the city of Poltava; on the Kharkov-Nikolayev railway. Pop. (1887), 31,000; (1897, with Kryukov suburb), 58,648. The most notable public buildings are the cathedral (built in 1808), the arsenal and the town-hall. The town is supposed to have been founded in 1571. From its situation at the southern terminus of the navigable course of the Dnieper, and on the highway from Moscow to Odessa, it early acquired great commercial importance, and by 1655 it was a wealthy town. From 1765 to 1789 it was the capital of "New Russia." It has a suburb, Kryukov, on the right bank of the Dnieper, united with the town by a railway bridge. Nearly all commercial transactions in salt with White Russia are effected at Kremenchug. The town is also the centre of the tallow trade with Warsaw; considerable quantities of timber are floated down to this place. Nearly all the trade in the brandy manufactured in the government of Kharkov, and destined for the governments of Ekaterinoslav and Taurida, is concentrated here, as also is the trade in linseed between the districts situated on the left affluents of the Dnieper and the southern ports. Other articles of commerce are rye, rye-flour, wheat, oats and buckwheat, which are sent partly up the Dnieper to Pinsk, partly by land to Odessa and Berislav, but principally to Ekaterinoslav, on light boats floated down during the spring floods. The Dnieper is crossed at Kremenchug by a tubular bridge 1081 yds. long; there is also a bridge of boats. The manufactures consist of carriages, agricultural machinery, tobacco, steam flour-mills, steam saw-mills and forges.

KREMENETS (Polish, *Krzemieniec*), a town of south-west Russia, in the government of Volhynia, 130 m. W. of Zhitomir, and 25 m. E. of Brody railway station (Austrian Galicia). Pop. (1900), 16,534. It is situated in a gorge of the Kremenets Hills The Jews, who are numerous, carry on a brisk trade in tobacco and grain exported to Galicia and Odessa. The picturesque ruins of an old castle on a crag close by the town are usually known as the castle of Queen Bona, *i.e.* Bona Sforza (wife of Sigismund I. of Poland); it was built, however, in the 8th or 9th century. The Mongols vainly besieged it in 1241 and 1255. From that time Kremenets was under the dominion alternately of Lithuania and Poland, till 1648, when it was taken by the Zaporogian Cossacks. From 1805 to 1832 its Polish lyceum was the centre of superior instruction for the western provinces of Little Russia; but after the Polish insurrection of 1831 the lyceum was transferred to Kiev, and is now the university of that town.

KREMS, a town of Austria, in lower Austria, 40 m. W.N.W. of Vienna by rail. Pop. (1900), 12,657. It is situated at the confluence of the Krems with the Danube. The manufactures comprise steel goods, mustard and vinegar, and a special kind of white lead (*Kremser Weiss*) is prepared from deposits in the neighbourhood. The trade is mainly in these products and in wine and saffron. The Danube harbour of Krems is at the adjoining town of Stein (pop., 4299).

KREMSIER, (Czech, *Kroměříž*), a town of Austria, in Moravia, 37 m. E. by N. of Brünn by rail. Pop. (1900), 13,991, mostly Czech. It is situated on the March, in the fertile region of the Hanna, and not far from the confluence of these two rivers. It is the summer residence of the bishop of Olmütz, whose palace, surrounded by a fine park and gardens, and containing a picture gallery, library and various collections, forms the chief object of interest. Its industries include the manufacture of machinery and iron-founding, brewing and corn-milling, and there is a considerable trade in corn, cattle, fruit and manufactures. In 1131 Kremsier was the seat of a bishopric. It suffered considerably during the Hussite war; and in 1643 it was taken and burned by the Swedes. After the rising of 1848 the Austrian parliament met in the palace at Kremsier from November 1848 till March 1849. In August 1885 a meeting took place here between the Austrian and the Russian emperors.

KREUTZER, KONRADIN (1780–1849), German musical composer, was born on the 22nd of November 1780 in Messkirch in Baden, and died on the 14th of December 1849 in Riga. He owes his fame almost exclusively to one opera, *Das Nachtlager von Granada* (1834), which kept the stage for half a century in spite of the changes in musical taste. It was written in the style of Weber, and is remarkable especially for its flow of genuine melody and depth of feeling. The same qualities are found in Kreutzer's part-songs for men's voices, which at one time were extremely popular in Germany, and are still listened to with pleasure. Amongst these "Der Tag des Herrn" ("The Lord's Day") may be named as the most excellent. Kreutzer was a prolific composer, and wrote a number of operas for the theatre at Vienna, which have disappeared from the stage and are not likely to be revived. He was from 1812 to 1816 Kapellmeister to the king of Württemberg, and in 1840 became conductor of the opera at Cologne. His daughter, Cecilia Kreutzer, was a singer of some renown.

KREUTZER, RUDOLPH (1766–1831), French violinist, of German extraction, was born at Versailles, his father being a musician in the royal chapel. Rudolph gradually became famous as a violinist, playing with great success at various continental capitals. It was to him that in 1803 Beethoven dedicated his famous violin sonata (*op.* 47) known as the "Kreutzer." Apart, however, from his fame as a violinist, Kreutzer was also a prolific composer; he wrote twenty-nine operas, many of which were successfully produced, besides nineteen violin concertos and chamber music. He died at Geneva in 1831.

KREUZBURG, a town of Germany, in the Prussian province of Silesia, on the Stober, 24 m. N.N.E. of Oppeln. Pop. (1905), 10,919. It has an Evangelical and a Roman Catholic church, a gymnasium and a teacher's seminary. Here are flour-mills, distilleries, iron-works, breweries, and manufactories of sugar and of machinery. Kreuzburg, which became a town in 1252, was the birthplace of the novelist Gustav Freytag.

KREUZNACH (Creuznach), a town and watering-place of Germany, in the Prussian Rhine province, situated on the Nahe, a tributary of the Rhine, 9 m. by rail S. of Bingerbrück. Pop. (1900), 21,321. It consists of the old town on the right bank of the river, the new town on the left, and the Bade Insel (bath island), connected by a fine stone bridge. The town has two Evangelical and three Roman Catholic churches, a gymnasium, a commercial school and a hospital. There is a collection of Roman and medieval antiquities, among which is preserved a fine Roman mosaic discovered in 1893. On the Bade Insel is the Kurhaus (1872) and also the chief spring, the Elisabethquelle, impregnated with iodine and bromine, and prescribed for scrofulous, bronchial and rheumatic disorders. The chief industries are marble-polishing and the manufacture of leather, glass and tobacco. Vines are cultivated on the neighbouring hills, and there is a trade in wine and corn.

The earliest mention of the springs of Kreuznach occurs in 1478, but it was only in the early part of the 19th century that Dr Prieger, to whom there is a statue in the town, brought them into prominence. Now the annual number of visitors amounts to several thousands. Kreuznach was evidently a Roman town, as the ruins of a Roman fortification, the Heidenmauer, and various antiquities have been found in its immediate neighbourhood. In the 9th century it was known as Cruciniacum, and it had a palace of the Carolingian kings. In 1065 the emperor Henry IV. presented it to the bishopric of Spires; in the 13th century it obtained civic privileges and passed to the counts of Sponheim; in 1416 it became part of the Palatinate. The town was ceded to Prussia in 1814. In 1689 the French reduced the strong castle of Kauzenberg to the ruin which now stands on a hill above Kreuznach.

See Schneegans, *Historisch-topographische Beschreibung Kreuznachs und seiner Umgebung* (7th ed., 1904); Engelmann, *Kreuznach und seine Heilquellen* (8th ed., 1890); and Stabel, *Das Solbad Kreuznach für Ärzte dargestellt* (Kreuznach, 1887).

KRIEGSPIEL (Kriegsspiel), the original German name, still used to some extent in England, for the War Game (*q.v.*).

KRIEMHILD (Grîmhild), the heroine of the Nibelungenlied and wife of the hero Siegfried. The name (from O. H. Ger. *grîma*, a mask or helm, and *hiltja* or *hilta*, war) means "the masked warrior woman," and has been taken to prove her to have been originally a mythical, daemonic figure, an impersonation of the powers of darkness and of death. In the north, indeed, the name *Grimhildr* continued to have a purely mythical character and to be applied only to daemonic beings; but in Germany, the original home of the Nibelungen myth, it certainly lost all trace of this significance, and in the *Nibelungenlied* Kriemhild is no more than a beautiful princess, the daughter of King Dancrât and Queen Uote, and sister of the Burgundian kings Gunther, Giselhêr and Gêrnôt, the masters of the Nibelungen hoard. As she appears in the Nibelungen legend, however, Kriemhild would seem to have an historical origin, as the wife of Attila, king of the Huns, as well as sister of the Nibelung kings. According to Jordanes (*c.* 49), who takes his information from the contemporary and trustworthy account of Priscus, Attila died of a violent hemorrhage at night, as he lay beside a girl named Ildico (*i.e.* O. H. Ger. Hildikô). The story got abroad that he had perished by the hand of a woman in revenge for her relations slain by him; according to some (*e.g.* Saxo Poeta and the Quedlinburg chronicle) it was her father whom she revenged; but when the treacherous overthrow of the Burgundians by Attila had become a theme for epic poets, she figured as a Burgundian princess, and her act as done in revenge for her brothers. Now the name Hildikô is the diminutive of Hilda or Hild, which again—in accordance with a custom common enough—may have been used as an abbreviation of Grîmhild (cf. *Hildr* for *Brynhildr*). It has been suggested (Symons, *Heldensage*, p. 55) that when the legend of the overthrow of the Burgundians, which took place in 437, became attached to that of the death of Attila (453), Hild, the supposed sister of the Burgundian kings, was identified with the daemonic Grîmhild, the sister of the mythical Nibelung brothers, and thus helped the process by which the Nibelung myth became fused with the historical story of the fall of the Burgundian kingdom. The older story, according to which Grîmhild slays her husband Attila in revenge for her brothers, is preserved in the Norse tradition, though Grîmhild's part is played by Gudrun, a change probably due to the fact, mentioned above, that the name Grîmhild still retained in the north its sinister significance. The name of Grîmhild is transferred to Gudrun's mother, the "wise wife," a semi-daemonic figure, who brews the potion that makes Sigurd forget his love for Brunhild and his plighted troth. In the *Nibelungenlied*, however, the primitive supremacy of the blood-tie has given place to the more modern idea of the supremacy of the passion of love, and Kriemhild marries Attila (Etzel) in order to compass the death of her brothers, in revenge for the murder of Siegfried. Theodor Abeling, who is disposed to reject or minimize the mythical origins, further suggests a confusion of the story of Attila's wife Ildico with that of the murder of Sigimund the Burgundian by the sons of Chrothildis, wife of Clovis. (See Nibelungenlied.)

See B. Symons, *Germanische Heldensage* (Strassburg, 1905); F. Zarnke, *Das Nibelungenlied*, p. ii. (Leipzig, 1875); T. Abeling, *Einleitung in das Nibelungenlied* (Freiburg-im-Breisgau, 1909). (W. A. P.)

KRILOFF (or Kruilov), **IVAN ANDREEVICH** (1768–1844), the great national fabulist of Russia, was born on the 14th of February 1768, at Moscow, but his early years were spent at Orenburg and Tver. His father, a distinguished military officer, died in 1779; and young Kriloff was left with no richer patrimony than a chest of old books, to be brought up by the exertions of a heroic mother. In the course of a few years his mother removed to St Petersburg, in the hope of securing a government pension; and there Kriloff obtained a post in the civil service, but he gave it up immediately after his mother's death in 1788. Already in 1783 he had sold to a bookseller a comedy of his own composition, and by this means had procured for himself the works of Molière, Racine, Boileau; and now, probably under the influence of these writers, he produced *Philomela* and *Cleopatra*, which gave him access to the dramatic circle of Knyazhin. Several attempts he made to start a literary magazine met with little success; but, together with his plays, they served to make the author known in society. For about four years (1797–1801) Kriloff lived at the country seats of Prince Sergius Galitzin, and when the prince was appointed military governor of Livonia he accompanied him as official secretary. Of the years which follow his resignation of this post little is known, the common opinion being that he wandered from town to town under the influence of a passion for card-playing. Before long he found his place as a fabulist, the first collection of his *Fables*, 23 in number, appearing in 1809. From 1812 to 1841 he held a congenial appointment in the Imperial Public Library—first as assistant, and then as head of the Russian books department. He died on the 21st of November 1844. His statue in the Summer Garden is one of the finest monuments in St Petersburg.

Honours were showered upon Kriloff while he yet lived: the Academy of Sciences admitted him a member in 1811, and bestowed upon him its gold medal; in 1838 a great festival was held under imperial sanction to celebrate the jubilee of his first appearance as an author; and the emperor assigned him a handsome pension. Before his death about 77,000 copies of his *Fables* had found sale in Russia; and his wisdom and humour had become the common possession of the many. He was at once poet and sage. His fables for the most part struck root in some actual event, and they told at once by their grip and by their beauty. Though he began as a translator and imitator he soon showed himself a master of invention, who found abundant material in the life of his native land. To the Russian ear his verse is of matchless quality; while word and phrase are direct, simple and eminently idiomatic, colour and cadence vary with the theme.

A collected edition of Kriloff's works appeared at St Petersburg, 1844. Of the numerous editions of his *Fables*, which have been often translated, may be mentioned that illustrated by Trutovski, 1872. The author's life has been written in Russian by Pletneff, by Lebanoff and by Grot, *Liter. zhizn Kruilova.* "Materials" for his life are published in vol. vi. of the *Sbornik Statei* of the literary department of the Academy of Sciences. W. R. S. Ralston prefixed an excellent sketch to his English prose version of the *Fables* (1868; 2nd ed. 1871). Another translation, by T. H. Harrison, appeared in 1883.

KRISHNA (the Dark One), an incarnation of Vishnu, or rather the form in which Vishnu himself is the most popular object of worship throughout northern India. In origin, Krishna, like Rama, was undoubtedly a deified hero of the Kshatriya caste. In the older framework of the *Mahābhārata* he appears as a great chieftain and ally of the Pandava brothers; and it is only in the interpolated episode of the *Bhagavad-gita* that he is identified with Vishnu and becomes the revealer of the doctrine of *bhakti* or religious devotion. Of still later date are the popular developments of the modern cult of Krishna associated with Radha, as found in the *Vishnu Purana*. Here he is represented as the son of a king saved from a slaughter of the innocents, brought up by a cowherd, sporting with the milkmaids, and performing miraculous feats in his childhood. The scene is laid in the neighbourhood of Muttra, on the right bank of the Jumna, where the whole country to the present day is holy ground. Another place associated with incidents of his later life is Dwarka, the westernmost point in the peninsula of Kathiawar. The two most famous preachers of Krishna-worship and founders of sects in his honour were Vallabha and Chaitanya, both born towards the close of the 15th century. The followers of the former are now found chiefly in Rajputana and Gujarat. They are known as Vallabhacharyas, and their *gosains* or high priests as maharajas, to whom semi-divine honours are paid. The licentious practices of this sect were exposed in a lawsuit before the high court at Bombay in 1862. Chaitanya was the Vaishnav reformer of Bengal, with his home at Nadiya. A third influential Krishna-preacher of the 19th century was Swami Narayan, who was encountered by Bishop Heber in Gujarat, where his followers at this day are numerous and wealthy. Among the names of Krishna are *Gopal*, the cowherd; *Gopinath*, the lord of the milkmaids; and *Mathuranath*, the lord of Muttra. His legitimate consort was Rukmini, daughter of the king of Berar; but Radha is always associated with him in his temples. (See Hinduism.)

KRISHNAGAR, a town of British India, headquarters of Nadia district in Bengal, situated on the left bank of the river Jalangi and connected with Ranaghat, on the Eastern Bengal railway, by a light railway. Pop. (1901), 24,547. It is the residence of the raja of Nadia and contains a government college. Coloured clay figures are manufactured.

KRISTIANSTAD (Christianstad), a port of Sweden, chief town of the district (*län*) of Kristianstad, on a peninsula in Lake Sjövik, an expansion of the river Helge, 10 m. from the Baltic. Pop. (1900), 10,318. Its harbour, custom-house, &c., are at Åhus at the mouth of the river. It is among the first twelve manufacturing towns of Sweden as regards value of output, having engineering works, flour-mills, distilleries, weaving mills and sugar factories. Granite and wood-pulp are exported, and coal and grain imported. The town is the seat of the court of appeal for the provinces of Skane and Blekinge. It was founded and fortified in 1614 by Christian IV. of Denmark, who built the fine ornate church. The town was ceded to Sweden in 1658, retaken by Christian V. in 1676, and again acquired by Sweden in 1678.

KRIVOY ROG, a town of south Russia, in the government of Kherson, on the Ingulets River, near the station of the same name on the Ekaterinoslav railway, 113 m. S.W. of the city of Ekaterinoslav. Pop. (1900), about 10,000. It is the centre of a district very rich in minerals, obtained from a narrow stretch of crystalline schists underlying the Tertiary deposits. Iron ores (60 to 70% of iron), copper ores, colours, brown coal, graphite, slate, and lithographic stone are obtained—nearly 2,000,000 tons of iron ore annually.

KROCHMAL, NAḤMAN (1785–1840), Jewish scholar, was born at Brody in Galicia in 1785. He was one of the pioneers in the revival of Jewish learning which followed on the age of Moses Mendelssohn. His chief work was the *Moreh Nebuche hazeman* ("Guide for the Perplexed of the Age"), a title imitated from that of the 12th-century "Guide for the Perplexed" of Maimonides (*q.v.*). This book was not published till after the author's death, when it was edited by Zunz (1851). The book is a philosophy of Jewish history, and has a double importance. On the one side it was a critical examination of the Rabbinic literature and much influenced subsequent investigators. On the other side, Krochmal, in the words of N. Slouschz, "was the first Jewish scholar who views Judaism, not as a distinct and independent entity, but as a part of the whole of civilization." Krochmal, under Hegelian influences, regarded the nationality of Israel as consisting in its religious genius, its spiritual gifts. Thus Krochmal may be called the originator of the idea of the mission of the Jewish people, "cultural Zionism" as it has more recently been termed. He died at Tarnopol in 1840.

See S. Schechter, *Studies in Judaism* (1896), pp. 56 seq.; N. Slouschz, *Renascence of Hebrew Literature* (1909), pp. 63 seq.

(I. A.)

KRONENBERG, a town of Germany in the Prussian Rhine Province, 6 m. S.W. from Elberfeld, with which it is connected by railway and by an electric tramway line. Pop. (1905), 11,340. It is a scattered community, consisting of an agglomeration of seventy-three different hamlets. It has a Roman Catholic and two Protestant churches, a handsome modern town-hall and considerable industries, consisting mainly of steel and iron manufactures.

KRONSTADT or Cronstadt, a strongly fortified seaport town of Russia, the chief naval station of the Russian fleet in the northern seas, and the seat of the Russian admiralty. Pop. (1867), 45,115; (1897), 59,539. It is situated on the island of Kotlin, near the head of the Gulf of Finland, 20 m. W. of St Petersburg, of which it is the chief port, in 59° 59′ 30″ N. and 29° 46′ 30″ E. Kronstadt, always strong, has been thoroughly refortified on modern principles. The old "three-decker" forts, five in number, which formerly constituted the principal defences of the place, and defied the Anglo-French fleets during the Crimean War, are now of secondary importance. From the plans of Todleben a new fort, Constantine, and four batteries were constructed (1856–1871) to defend the principal approach, and seven batteries to cover the shallower northern channel. All these modern fortifications are low and thickly armoured earthworks, powerfully armed with heavy Krupp guns in turrets. The town itself is surrounded with an *enceinte*. The island of Kotlin, or Kettle (Finn., *Retusari*, or Rat Island) in general outline forms an elongated triangle, 7½ m. in length by about 1 in breadth, with its base towards St Petersburg. The eastern or broad end is occupied by the town of Kronstadt, and shoals extend for a mile and a half from the western point of the island to the rock on which the Tolbaaken lighthouse is built. The island thus divides the seaward approach to St Petersburg into two channels; that on the northern side is obstructed by shoals which extend across it from Kotlin to Lisynos on the Finnish mainland, and is only passable by vessels drawing less than 15 ft. of water; the southern channel, the highway to the capital, is narrowed by a spit which projects from opposite Oranienbaum on the Russian mainland, and, lying close to Kronstadt, has been strongly guarded by batteries. The approach to the capital has been greatly facilitated by the construction in 1875–1885 of a canal, 23 ft. deep, through the shallows. The town of Kronstadt is built on level ground, and is thus exposed to inundations, from one of which it suffered in 1824. On the south side of the town there are three harbours—the large western or merchant harbour, the western flank of which is formed by a great mole joining the fortifications which traverse the breadth of the island on this side; the middle harbour, used chiefly for fitting out and repairing vessels; and the eastern or war harbour for vessels of the Russian navy. The Peter and Catherine canals, communicating with the merchant and middle harbours, traverse the town. Between them stood the old Italian palace of Prince Menshikov, the site of which is now occupied by the pilot school. Among other public buildings are the naval hospital, the British seaman's hospital (established in 1867), the civic hospital, admiralty (founded 1785), arsenal, dockyards and foundries, school of marine engineering, the cathedral of St Andrew, and the English church. The port is ice-bound for 140 to 160 days in the year, from the beginning of December till April. A very large proportion of the inhabitants are sailors, and large numbers of artisans are employed in the dockyards. Kronstadt was founded in 1710 by Peter the Great, who took the island of Kotlin from the Swedes in 1703, when the first fortifications were constructed. (P. A. K.; J. T. Be.)

KROONSTAD, a town of Orange River Colony, 127 m. by rail N.E. of Bloemfontein and 130 m. S.W. of Johannesburg. Pop. (1904), 7191, of whom 3708 were whites. Kroonstad lies 4489 ft. above the sea and is built on the banks of the Valsch River, a perennial tributary of the Vaal. It is a busy town, being the centre of a rich agricultural district and of the diamond and coal-mining industry of the north-western parts of the colony. It is also a favourite residential place and resort of visitors from Johannesburg. It enjoys a healthy climate, affords opportunities for boating rare in South Africa, and boasts a golf-links. The principal building is the Dutch Reformed church in the centre of the market square.

On the capture of Bloemfontein by the British during the Anglo-Boer War of 1899–1902 Kroonstad was chosen by the Orange Free State Boers as the capital of the state, a dignity it held from the 13th of March to the 11th of May 1900. On the following day the town was occupied by Lord Roberts. The linking of the town in 1906 with the Natal system made the route via Kroonstad the shortest railway connexion between Cape Town and Durban. Another line goes N.W. from Kroonstad to Klerksdorp, passing (17 miles) the Lace diamond mine and (45 miles) the coal mines at Vierfontein.

KROPOTKIN, PETER ALEXEIVICH, Prince (1842–), Russian geographer, author and revolutionary, was born at Moscow in 1842. His father, Prince Alexei Petrovich Kropotkin, belonged to the old Russian nobility; his mother, the daughter of a general in the Russian army, had remarkable literary and liberal tastes. At the age of fifteen Prince Peter Kropotkin, who had been designed by his father for the army, entered the Corps of Pages at St Petersburg (1857). Only a hundred and fifty boys—mostly children of the nobility belonging to the court—were educated in this privileged corps, which combined the character of a military school endowed with special rights and of a Court institution attached to the imperial household. Here he remained till 1862, reading widely on his own account, and giving special attention to the works of the French encyclopaedists and to modern French history. Before he left Moscow Prince Kropotkin had developed an interest in the condition of the Russian peasantry, and this interest increased as he grew older. The years 1857–1861 witnessed a rich growth in the intellectual forces of Russia, and Kropotkin came under the influence of the new Liberal-revolutionary literature, which indeed largely expressed his own aspirations. In 1862 he was promoted from the Corps of Pages to the army. The members of the corps had the prescriptive right of choosing the regiment to which they would be attached. Kropotkin had never wished for a military career, but, as he had not the means to enter the St Petersburg University, he elected to join a Siberian Cossack regiment in the recently annexed Amur district, where there were prospects of administrative work. For some time he was aide de camp to the governor of Transbaikalia at Chita, subsequently being appointed attaché for Cossack affairs to the governor-general of East Siberia at Irkutsk. Opportunities for administrative work, however, were scanty, and in 1864 Kropotkin accepted charge of a geographical survey expedition, crossing North Manchuria from Transbaikalia to the Amur, and shortly afterwards was attached to another expedition which proceeded up the Sungari River into the heart of Manchuria. Both these expeditions yielded most valuable geographical results. The impossibility of obtaining any real administrative reforms in Siberia now induced Kropotkin to devote himself almost entirely to scientific exploration, in which he continued to be highly successful. In 1867 he quitted the army and returned to St Petersburg, where he entered the university, becoming at the same time secretary to the physical geography section of the Russian Geographical Society. In 1873 he published an important contribution to science, a map and paper in which he proved that the existing maps of Asia entirely misrepresented the physical formation of the country, the main structural lines being in fact from south-west to north-east, not from north to south, or from east to west as had been previously supposed. In 1871 he explored the glacial deposits of Finland and Sweden for the Russian Geographical Society, and while engaged in this work was offered the secretaryship of that society. But by this time he had determined that it was his duty not to work at fresh discoveries but to aid in diffusing existing knowledge among the people at large, and he accordingly refused the offer, and returned to St Petersburg, where he joined the revolutionary party. In 1872 he visited Switzerland, and became a member of the International Workingmen's Association at Geneva. The socialism of this body was not, however, advanced enough for his views, and after studying the programme of the more violent Jura Federation at Neuchâtel and spending some time in the company of the leading members, he definitely adopted the creed of anarchism (*q.v.*) and, on returning to Russia, took an active part in spreading the nihilist propaganda. In 1874 he was arrested and imprisoned, but escaped in 1876 and went to England, removing after a short stay to Switzerland, where he joined the Jura Federation. In 1877 he went to Paris, where he helped to start the socialist movement, returning to Switzerland in 1878, where he edited for the Jura Federation a revolutionary newspaper, *Le Révolté*, subsequently also publishing various revolutionary pamphlets. Shortly after the assassination of the tsar Alexander II. (1881) Kropotkin was expelled from Switzerland by the Swiss government, and after a short stay at Thonon (Savoy) went to London, where he remained for nearly a year, returning to Thonon towards the end of 1882. Shortly afterwards he was arrested by the French government, and, after a trial at Lyons, sentenced by a police-court magistrate (under a special law passed on the fall of the Commune) to five years' imprisonment, on the ground that he had belonged to the International Workingmen's Association (1883). In 1886 however, as the result of repeated agitation on his behalf in the French Chamber, he was released, and settled near London.

Prince Kropotkin's authority as a writer on Russia is universally acknowledged, and he has contributed largely to the *Encyclopaedia Britannica.* Among his other works may be named *Paroles d'un révolté* (1884); *La Conquête du pain* (1888); *L'Anarchie: sa philosophie, son idéal* (1896); *The State, its Part in History* (1898); *Fields, Factories and Workshops* (1899); *Memoirs of a Revolutionist* (1900); *Mutual Aid, a Factor of Evolution* (1902); *Modern Science and Anarchism* (Philadelphia, 1903); *The Desiccation of Asia* (1904); *The Orography of Asia* (1904); and *Russian Literature* (1905).

KROTOSCHIN (in Polish, *Krotoszyn*), a town of Germany, in the Prussian province of Posen, 32 m. S.E. of Posen. Pop. (1900), 12,373. It has three churches, a synagogue, steam saw-mills and a steam brewery, and carries on trade in grain and seeds. The castle of Krotoschin is the chief place of a mediatized principality which was formed in 1819 out of the domains of the Prussian crown and was granted to the prince of Thurn and Taxis in compensation for the relinquishment by him of the monopoly of the Prussian postal system, formerly held by his family.

KRÜDENER, BARBARA JULIANA, BARONESS VON (1764–1824), Russian religious mystic and author, was born at Riga in Livonia on the 11th of November 1764. Her father, Otto Hermann von Vietinghoff, who had fought as a colonel in Catherine II.'s wars, was one of the two councillors for Livonia and a man of immense wealth; her mother, *née* Countess Anna Ulrica von Münnich, was a grand-daughter of the celebrated field marshal. Juliana, as she was usually called, was one of a numerous family. Her education, according to her own account, consisted of lessons in French spelling, deportment and sewing; and at the age of eighteen (Sept. 29, 1782) she was married to Baron Burckhard Alexis Constantin von Krüdener, a widower sixteen years her senior. The baron, a diplomatist of distinction, was cold and reserved; the baroness was frivolous, pleasure-loving, and possessed of an insatiable thirst for attention and flattery; and the strained relations due to this incompatibility of temper were embittered by her limitless extravagance, which constantly involved herself and her husband in financial difficulties. At first indeed all went well. On the 31st of January 1784 a son was born to them, named Paul after the grand-duke Paul (afterwards emperor), who acted as god-father. The same year Baron Krüdener became ambassador at Venice,[1] where he remained until transferred to Copenhagen in 1786.

In 1787 the birth of a daughter (Juliette) aggravated the nervous disorders from which the baroness had for some time been suffering, and it was decided that she must go to the south for her health; she accordingly left, with her infant daughter and her step-daughter Sophie. In 1789 she was at Paris when the states general met; a year later, at Montpellier, she met a young cavalry captain, Charles Louis de Frégeville, and a passionate attachment sprang up between them. They returned together to Copenhagen, where the baroness told her husband that her heart could no longer be his. The baron was coldly kind; he refused to hear of a divorce and attempted to arrange a *modus vivendi*, which was facilitated by the departure of De Frégeville for the war. All was useless; Juliana refused to remain at Copenhagen, and, setting out on her travels, visited Riga, St Petersburg—where her father had become a senator[2]—Berlin, Leipzig and Switzerland. In 1798 her husband became ambassador at Berlin, and she joined him there. But the stiff court society of Prussia was irksome to her; money difficulties continued; and by way of climax, the murder of the tsar Paul, in whose favour Baron Krüdener had stood high, made the position of the ambassador extremely precarious. The baroness seized the occasion to leave for the baths of Teplitz, whence she wrote to her husband that the doctors had ordered her to winter in the south. He died on the 14th of June 1802, without ever having seen her again.

Meanwhile the baroness had been revelling in the intellectual society of Coppet and of Paris. She was now thirty-six; her charms were fading, but her passion for admiration survived. She had tried the effect of the shawl dance, in imitation of Emma, Lady Hamilton; she now sought fame in literature, and in 1803, after consulting Chateaubriand and other writers of distinction, published her *Valérie*, a sentimental romance, of which under a thin veil of anonymity she herself was the heroine. In January 1804 she returned to Livonia.

At Riga occurred her "conversion." A gentleman of her acquaintance when about to salute her fell dying at her feet. The shock overset her not too well balanced mind; she sought for consolation, and found it in the ministrations of her shoemaker, an ardent disciple of the Moravian Brethren. Though she had "found peace," however, the disorder of her nerves continued, and she was ordered by her doctor to the baths of Wiesbaden. At Königsberg she had an interview with Queen Louise, and, more important still, with one Adam Müller, a rough peasant, to whom the Lord had revealed a prophetic mission to King Frederick William III. "Chiliasm" was in the air. Napoleon was evidently Antichrist; and the "latter days" were about to be accomplished. Under the influence of the pietistic movement the belief was widely spread, in royal courts, in country parsonages, in peasants' hovels: a man would be raised up "from the north . . . from the rising of the sun" (Isa. xli. 25); Antichrist would be overthrown, and Christ would come to reign a thousand years upon the earth. The interview determined the direction of the baroness's religious development. A short visit to the Moravians at Herrenhut followed; then she went, via Dresden, to Karlsruhe, to sit at the feet of Heinrich Jung-Stilling (*q.v.*), the high priest of occultist pietism, whose influence was supreme at the court of Baden and infected those of Stockholm and St Petersburg.[3] By him she was instructed in the chiliastic faith and in the mysteries of the supernatural world. Then, hearing that a certain pastor in the Vosges, Jean Frédéric Fontaines, was prophesying and working miracles, she determined to go to him. On the 5th of June 1801, accordingly, she arrived at the Protestant parsonage of Sainte Marie-aux-Mines, accompanied by her daughter Juliette, her step-daughter Sophie and a Russian valet.

This remained for two years her headquarters. Fontaines, half-charlatan, half-dupe, had introduced into his household a prophetess named Marie Gottliebin Kummer,[4] whose visions, carefully calculated for her own purposes, became the oracle of the divine mysteries for the baroness. Under this influence she believed more firmly than ever in the approaching millennium and her own mission to proclaim it. Her rank, her reckless charities, and her exuberant eloquence produced a great effect on the simple country folk; and when, in 1809, it was decided to found a colony of the "elect" in order to wait for "the coming of the Lord," many wretched peasants sold or distributed all they possessed and followed the baroness and Fontaines into Württemberg, where the settlement was established at Catharinenplaisir and the château of Bönnigheim, only to be dispersed (May 1) by an unsympathetic government.[5] Further wanderings followed: to Lichtenthal near Baden; to Karlsruhe and the congenial society of pietistic princesses; to Riga, where she was present at the deathbed of her mother (Jan. 24, 1811); then back to Karlsruhe. The influence of Fontaines, to whom she had been "spiritually married" (Madame Fontaines being content with the part of Martha in the household, so long as the baroness's funds lasted), had now waned, and she had fallen under that of Johann Kaspar Wegelin (1766–1833), a pious linen-draper of Strassburg, who taught her the sweetness of "complete annihilation of the will and mystic death." Her preaching and her indiscriminate charities now began to attract curious crowds from afar; and her appearance everywhere was accompanied by an epidemic of visions and prophesyings, which culminated in the appearance in 1811 of the comet, a sure sign of the approaching end. In 1812 she was at Strassburg, whence she paid more than one visit to J. F. Oberlin (*q.v.*), the famous pastor of Waldbach in Steinthal (Ban de la Roche), and where she had the glory of converting her host, Adrien de Lazay-Marnesia, the prefect. In 1813 she was at Geneva, where she established the faith of a band of young pietists in revolt against the Calvinist Church authorities—notably Henri Louis Empeytaz, afterwards destined to be the companion of her crowning evangelistic triumph. In September 1814 she was again at Waldbach, where Empeytaz had preceded her; and at Strassburg, where the party was joined by Franz Karl von Berckheim, who afterwards married

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[1] A portrait of Madame de Krüdener and her son as "Venus disarming Cupid," by Angelica Kauffmann, of this period, is in the Louvre.

[2] He died while she was there in 1792.

[3] The consorts of Alexander I. of Russia and of Gustavus Adolphus IV. of Sweden were princesses of Baden.

[4] She had been condemned some years previously in Württemberg to the pillory and three years' imprisonment as a "swindler" (*Betrügerin*), on her own confession. Her curious history is given in detail by M. Muhlenbeck.

[5] In 1809 it was obviously inconvenient to have people proclaiming Napoleon as "the Beast."

Juliette.[1] At the end of the year she returned with her daughters and Empeytaz to Baden, a fateful migration.

The empress Elizabeth of Russia was now at Karlsruhe; and she and the pietist ladies of her entourage hoped that the emperor Alexander might find at the hands of Madame de Krüdener the peace which an interview with Jung-Stilling had failed to bring him. The baroness herself wrote urgent letters to Roxane de Stourdza, sister of the tsar's Rumanian secretary, begging her to procure an interview. There seemed to be no result; but the correspondence paved the way for the opportunity which a strange chance was to give her of realizing her ambition. In the spring of 1815 the baroness was settled at Schlüchtern, a piece of Baden territory *enclavé* in Württemberg, busy persuading the peasants to sell all and fly from the wrath to come. Near this, at Heilbronn, the emperor Alexander established his headquarters on the 4th of June. That very night the baroness sought and obtained an interview. To the tsar, who had been brooding alone over an open Bible, her sudden arrival seemed an answer to his prayers; for three hours the prophetess preached her strange gospel, while the most powerful man in Europe sat, his face buried in his hands, sobbing like a child; until at last he declared that he had "found peace." At the tsar's request she followed him to Heidelberg and later to Paris, where she was lodged at the Hôtel Montchenu, next door to the imperial headquarters in the Elysée Palace. A private door connected the establishments, and every evening the emperor went to take part in the prayer-meetings conducted by the baroness and Empeytaz. Chiliasm seemed to have found an entrance into the high councils of Europe, and the baroness von Krüdener had become a political force to be reckoned with. Admission to her religious gatherings was sought by a crowd of people celebrated in the intellectual and social world; Châteaubriand came, and Benjamin Constant, Madame Récamier, the duchesse de Bourbon, and Madame de Duras. The fame of the wonderful conversion, moreover, attracted other members of the chiliastic fraternity, among them Fontaines, who brought with him the prophetess Marie Kummer.

In this religious forcing-house the idea of the Holy Alliance germinated and grew to rapid maturity. On the 26th of September the portentous proclamation, which was to herald the opening of a new age of peace and goodwill on earth, was signed by the sovereigns of Russia, Austria and Prussia (see HOLY ALLIANCE; and EUROPE: *History*). Its authorship has ever been a matter of dispute. Madame de Krüdener herself claimed that she had suggested the idea, and that Alexander had submitted the draft for her approval. This is probably correct, though the tsar later, when he had recovered his mental equilibrium, reproved her for her indiscretion in talking of the matter. His eyes, indeed, had begun to be opened before he left Paris, and Marie Kummer was the unintentional cause. At the very first séance the prophetess, whose revelations had been praised by the baroness in extravagant terms, had the evil inspiration to announce in her trance to the emperor that it was God's will that he should endow the religious colony to which she belonged! Alexander merely remarked that he had received too many such revelations before to be impressed. The baroness's influence was shaken but not destroyed, and before he left Paris Alexander gave her a passport to Russia. She was not, however, destined to see him again.

She left Paris on the 22nd of October 1815, intending to travel to St Petersburg by way of Switzerland. The tsar, however, offended by her indiscretions and sensible of the ridicule which his relations with her had brought upon him, showed little disposition to hurry her arrival. She remained in Switzerland, where she presently fell under the influence of an unscrupulous adventurer named J. G. Kellner. For months Empeytaz, an honest enthusiast, struggled to save her from this man's clutches, but in vain. Kellner too well knew how to flatter the baroness's inordinate vanity: the author of the Holy Alliance could be none other than the "woman clothed with the sun" of Rev. xii. 1. She wandered with Kellner from place to place, proclaiming her mission, working miracles, persuading her converts to sell all and follow her. Crowds of beggars and rapscallions of every description gathered wherever she went, supported by the charities squandered from the common fund. She became a nuisance to the authorities and a menace to the peace; Württemberg had expelled her, and the example was followed by every Swiss canton she entered in turn. At last, in August 1817, she set out for her estate in Livonia, accompanied by Kellner and a remnant of the elect.

The emperor Alexander having opened the Crimea to German and Swiss chiliasts in search of a land of promise, the baroness's son-in-law Berckheim and his wife now proceeded thither to help establish the new colonies. In November 1820 the baroness at last went herself to St Petersburg, where Berckheim was lying ill. She was there when the news arrived of Ypsilanti's invasion of the Danubian principalities, which opened the war of Greek independence. She at once proclaimed the divine mission of the tsar to take up arms on behalf of Christendom. Alexander, however, had long since exchanged her influence for that of Metternich, and he was far from anxious to be forced into even a holy war. To the baroness's overtures he replied in a long and polite letter, the gist of which was that she must leave St Petersburg at once. In 1823 the death of Kellner, whom to the last she regarded as a saint, was a severe blow to her. Her health was failing, but she allowed herself to be persuaded by Princess Galitzin to accompany her to the Crimea, where she had established a Swiss colony. Here, at Karasu Bazar, she died on the 25th of December 1824.

Sainte-Beuve said of Madame de Krüdener: "Elle avait un immense besoin que le monde s'occupât d'elle . . . ; l'amour propre, toujours l'amour propre . . . !" A kindlier epitaph might, perhaps, be written in her own words, uttered after the revelation of the misery of the Crimean colonists had at last opened her eyes: "The good that I have done will endure; the evil that I have done (for how often have I not mistaken for the voice of God that which was no more than the result of my imagination and my pride) the mercy of God will blot out."

Much information about Madame de Krüdener, coloured by the author's views, is to be found in H. L. Empeytaz's *Notice sur Alexandre, empereur de Russie* (2nd ed., Paris, 1840). The *Vie de Madame de Krudener* (2 vols., Paris, 1849), by the Swiss banker and Philhellene J. G. Eynard, was long the standard life and contains much material, but is far from authoritative. In English appeared the *Life and Letters of Madame de Krüdener*, by Clarence Ford (London, 1893). The most authoritative study, based on a wealth of original research, is E. Muhlenbeck's *Étude sur les origines de la Sainte-Alliance* (Paris, 1909), in which numerous references are given. (W. A. P.)

KRUG, WILHELM TRAUGOTT (1770–1842), German philosopher and author, was born at Radis in Prussia on the 22nd of June 1770, and died at Leipzig on the 12th of January 1842. He studied at Wittenberg under Reinhard and Jehnichen, at Jena under Reinhold, and at Göttingen. From 1801 to 1804 he was professor of philosophy at Frankfort-on-the-Oder, after which he succeeded Kant in the chair of logic and metaphysics at the university of Königsberg. From 1809 till his death he was professor of philosophy at Leipzig. He was a prolific writer on a great variety of subjects, in all of which he excelled as a popularizer rather than as an original thinker. In philosophy his method was psychological; he attempted to explain the Ego by examining the nature of its reflection upon the facts of consciousness. Being is known to us only through its presentation in consciousness; consciousness only in its relation to Being. Both Being and Consciousness, however, are immediately known to us, as also the relation existing between them. By this Transcendental Synthesis he proposed to reconcile Realism and Idealism, and to destroy the traditional difficulty between transcendental, or pure, thought and "things in themselves." Apart from the intrinsic value of his work, it is admitted that it had the effect of promoting the study of philosophy and of stimulating freedom of thought in religion and politics. His principal works are: *Briefe über den neuesten Idealismus*

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[1] Berckheim had been French commissioner of police in Mainz and had abandoned his post in 1813.

(1801); *Versuch über die Principien der philosophischen Erkenntniss* (1801); *Fundamentalphilosophie* (1803); *System der theoretischen Philosophie* (1806–1810), *System der praktischen Philosophie* (1817–1819); *Handbuch der Philosophie* (1820; 3rd ed., 1828); *Logik oder Denklehre* (1827); *Geschichte der Philos. alter Zeit* (1815; 2nd ed., 1825); *Allgemeines Handwörterbuch der philosophischen Wissenschaften* (1827–1834; 2nd ed., 1832–1838); *Universal-philosophische Vorlesungen für Gebildete beiderlei Geschlechts.* His work *Beiträge zur Geschichte der Philos. des XIX. Jahrh.* (1835–1837) contains interesting criticisms of Hegel and Schelling.

See also his autobiography, *Meine Lebensreise* (Leipzig, 2nd ed., 1840).

KRUGER, STEPHANUS JOHANNES PAULUS (1825–1904), president of the Transvaal Republic, was born in Colesberg, Cape Colony, on the 10th of October 1825. His father was Caspar Jan Hendrick Kruger, who was born in 1796, and whose wife bore the name of Steyn. In his ancestry on both sides occur Huguenot names. The founder of the Kruger family appears to have been a German named Jacob Kruger, who in 1713 was sent with others by the Dutch East India Company to the Cape. At the age of ten Paul Kruger—as he afterwards came to be known—accompanied his parents in the migration, known as the Great Trek, from the Cape Colony to the territories north of the Orange in the years 1835–1840. From boyhood his life was one of adventure. Brought up on the borderland between civilization and barbarism, constantly trekking, fighting and hunting, his education was necessarily of the most primitive character. He learnt to read and to write, and was taught the narrowest form of Dutch Presbyterianism. His literature was almost confined to the Bible, and the Old Testament was preferred to the New. It is related of Kruger, as indeed it has been said of Piet Retief and others of the early Boer leaders, that he believed himself the object of special Divine guidance. At about the age of twenty-five he is said to have disappeared into the veldt, where he remained alone for several days, under the influence of deep religious fervour. During this sojourn in the wilderness Kruger stated that he had been especially favoured by God, who had communed with and inspired him. Throughout his life he professed this faith in God's will and guidance, and much of his influence over his followers is attributable to their belief in his sincerity and in his enjoyment of Divine favour. The Dutch Reformed Church in the Transvaal, pervaded by a spirit and faith not unlike those which distinguished the Covenanters, was divided in the early days into three sects. Of these the narrowest, most puritanical, and most bigoted was the Dopper sect, to which Kruger belonged. His Dopper following was always unswerving in its support, and at all critical times in the internal quarrels of the state rallied round him. The charge of hypocrisy, frequently made against Kruger—if by this charge is meant the mere juggling with religion for purely political ends—does not appear entirely just. The subordination of reason to a sense of superstitious fanaticism is the keynote of his character, and largely the explanation of his life. Where faith is so profound as to believe the Divine guidance *all*, and the individual intelligence *nil*, a man is able to persuade himself that any course he chooses to take is the one he is directed to take. Where bigotry is so blind, reason is but dust in the balance. At the same time there were incidents in Kruger's life which but ill conform to any Biblical standard he might choose to adopt or feel imposed upon him. Even van Oordt, his eloquent historian and apologist, is cognisant of this fact.

When the lad, who had already taken part in fights with the Matabele and the Zulus, was fourteen his family settled north of the Vaal and were among the founders of the Transvaal state. At the age of seventeen Paul found himself an assistant field cornet, at twenty he was field cornet, and at twenty-seven held a command in an expedition against the Bechuana chief Sechele—the expedition in which David Livingstone's mission-house was destroyed.

In 1853 he took part in another expedition against Montsioa. When not fighting natives in those early days Kruger was engaged in distant hunting excursions which took him as far north as the Zambezi. In 1852 the Transvaal secured the recognition of its independence from Great Britain in the Sand River convention. For many years after this date the condition of the country was one bordering upon anarchy, and into the faction strife which was continually going on Kruger freely entered. In 1856–1857 he joined M. W. Pretorius in his attempt to abolish the district governments in the Transvaal and to overthrow the Orange Free State government and compel a federation between the two countries. The raid into the Free State failed; the blackest incident in connexion with it was the attempt of the Pretorius and Kruger party to induce the Basuto to harass the Free State forces behind, while they were attacking them in front.

From this time forward Kruger's life is so intimately bound up with the history of his country, and even in later years of South Africa, that a study of that history is essential to an understanding of it (see Transvaal and South Africa). In 1864, when the faction fighting ended and Pretorius was president, Kruger was elected commandant-general of the forces of the Transvaal. In 1870 a boundary dispute arose with the British government, which was settled by the Keate award (1871). The decision caused so much discontent in the Transvaal that it brought about the downfall of President Pretorius and his party; and Thomas François Burgers, an educated Dutch minister, resident in Cape Colony, was elected to succeed him. During the term of Burgers' presidency Kruger appeared to great disadvantage. Instead of loyally supporting the president in the difficult task of building up a stable state, he did everything in his power to undermine his authority, going so far as to urge the Boers to pay no taxes while Burgers was in office. The faction of which he was a prominent member was chiefly responsible for bringing about that *impasse* in the government of the country which drew such bitter protest from Burgers and terminated in the annexation by the British in April 1877. At this period of Transvaal history it is impossible to trace any true patriotism in the action of the majority of the inhabitants. The one idea of Kruger and his faction was to oust Burgers from office on any pretext, and, if possible, to put Kruger in his place. When the downfall of Burgers was assured and annexation offered itself as the alternative resulting from his downfall, it is true that Kruger opposed it. But matters had gone too far. Annexation became an accomplished fact, and Kruger accepted paid office under the British government. He continued, however, so openly to agitate for the retrocession of the country, being a member of two deputations which went to England endeavouring to get the annexation annulled, that in 1878 Sir Theophilus Shepstone, the British administrator, dismissed him from his service. In 1880 the Boer rebellion occurred, and Kruger was one of the famous triumvirate, of which General Piet Joubert and Pretorius were the other members, who, after Majuba, negotiated the terms of peace on which the Pretoria convention of August 1881 was drafted. In 1883 he was elected president of the Transvaal, receiving 3431 votes as against 1171 recorded for Joubert.

In November 1883 President Kruger again visited England, this time for the purpose of getting another convention. The visit was successful, the London convention, which for years was a subject of controversy, being granted by Lord Derby in 1884 on behalf of the British government. The government of the Transvaal being once more in the hands of the Boers, the country rapidly drifted towards that state of national bankruptcy from which it had only been saved by annexation in 1877. In 1886, the year in which the Rand mines were discovered, President Kruger was by no means a popular man even among his own followers; as an administrator of internal affairs he had shown himself grossly incompetent, and it was only the specious success of his negotiations with the British government which had retained him any measure of support. In 1888 he was elected president for a second term of office. In 1889 Dr. Leyds, a young Hollander, was appointed state secretary, and the system of state monopolies around which so much corruption grew up was soon in full course of development. The principle of government monopoly in trade being thus established, President Kruger now turned his attention to the further securing of Boer political monopoly. The Uitlanders were increasing in numbers, as well as providing the state with a revenue. In 1890, 1891, 1892, and 1894 the franchise laws (which at the time of the convention were on a liberal basis) were so modified that all Uitlanders were practically excluded altogether. In 1893 Kruger had to face a third presidential election, and on this occasion the opposition he had raised among the burgers, largely by the favouritism he displayed to the Hollander party, was so strong that it was fully anticipated that his more liberal opponent, General Joubert, would be elected. Before the election was decided Kruger took care to conciliate the volksraad members, as well as to see that at all the volksraad elections, which occurred shortly before the presidential election, his supporters were returned, or, if not returned, that his opponents were objected to on some trivial pretext, and by this means prevented from actually sitting in the volksraad until the presidential election was over. The Hollander and *concessionnaire* influence, which had become a strong power in the state, was all in favour of President Kruger. In spite of these facts Kruger's position was insecure. "General Joubert was, without any doubt whatever, elected by a very considerable majority."[1] But the figures as announced gave Kruger a majority of about 700 votes. General Joubert accused the government of tampering with the returns, and appealed to the volksraad. The appeal, however, was fruitless, and Kruger retained office. The action taken by President Kruger at this election, and his previous actions in ousting President Burgers and in absolutely excluding the Uitlanders from the franchise, all show that at any cost, in his opinion, the government must remain a close corporation, and that while he lived he must remain at the head of it.

From 1877 onward Kruger's external policy was consistently anti-British, and on every side—in Bechuanaland, in Rhodesia, in Zululand—he attempted to enlarge the frontiers of the Transvaal at the expense of Great Britain. In these disputes he usually gained something, and it was not until 1895 that he was definitely defeated in his endeavours to obtain a seaport. His internal policy was blind, reckless and unscrupulous, and inevitably led to disaster. It may be summed up in his own words when replying to a deputation of Uitlanders, who desired to obtain the legalization of the use of the English language in the Transvaal. "This," said Kruger, "is my country; these are my laws. Those who do not like to obey my laws can leave my country." This rejection of the advances of the Uitlanders—by whose aid he could have built up a free and stable republic—led to his downfall, though the failure of the Jameson Raid in the first days of 1896 gave him a signal opportunity to secure the safety of his country by the grant of real reforms. But the Raid taught him no lesson of this kind, and despite the intervention of the British government the Uitlanders' grievances were not remedied.

In 1898 Kruger was elected president of the Transvaal for the fourth and last time. In 1899 relations between the Transvaal and Great Britain had become so strained, by reason of the oppression of the foreign population, that a conference was arranged at Bloemfontein between Sir Alfred (afterwards Lord) Milner, the high commissioner, and President Kruger. Kruger was true to his principles. At every juncture in his life his object had been to gain for himself and his own narrow policy everything that he could, while conceding nothing in return. It was for this reason that he invariably failed to come to any arrangement with Sir John Brand while the latter was president of the Free State. In 1889, the very year following President Brand's death, he was able to make a treaty with President Reitz, his successor, which bound each of the Boer republics to assist the other in case its independence was menaced, unless the quarrel could be shown to be an unjust one on the part of the state so menaced. In effect it bound the Free State to share all the hazardous risk of the reckless anti-British Transvaal policy, without the Free State itself receiving anything in return. Kruger thus achieved one of the objects of his life. With such a history of apparent success, it is not to be wondered at that the Transvaal president came to Bloemfontein to meet Sir Alfred Milner in no mood for concession. It is true that he made an ostensible offer on the franchise question, but that proposal was made dependent on so many conditions that it was a palpable sham. Every proposition which Sir Alfred Milner made was met by the objection that it threatened the independence of the Transvaal. This retort was President Kruger's rallying cry whenever he found himself in the least degree pressed, either from within or without the state. To admit Uitlanders to the franchise, to no matter how moderate a degree, would destroy the independence of the state. In October 1899, after a long and fruitless correspondence with the British government, war with Great Britain was ushered in by an ultimatum from the Transvaal. Immediately after the ultimatum Natal and the Cape Colony were invaded by the Boers both of the Transvaal and the Free State. Yet one of the most memorable utterances made by Kruger at the Bloemfontein conference was couched in the following terms: "We follow out what God says, 'Accursed be he that removeth his neighbour's landmark.' As long as your Excellency lives you will see that we shall never be the attacking party on another man's land." The course of the war that followed is described under TRANSVAAL. In 1900, Bloemfontein and Pretoria having been occupied by British troops, Kruger, too old to go on commando, with the consent of his executive proceeded to Europe, where he endeavoured to induce the European powers to intervene on his behalf, but without success.

From this time he ceased to have any political influence. He took up his residence at Utrecht, where he dictated a record of his career, published in 1902 under the title of *The Memoirs of Paul Kruger*. He died on the 14th of July 1904 at Clarens, near Vevey, on the shores of the Lake of Geneva, whither he had gone for the sake of his health. He was buried at Pretoria on the following 16th of December, Dingaan's Day, the anniversary of the day in 1838 when the Boers crushed the Zulu king Dingaan—a fight in which Kruger, then a lad of thirteen, had taken part. Kruger was thrice married, and had a large family. His second wife died in 1891. When he went to Europe he left his third wife in Lord Roberts's custody at Pretoria, but she gradually failed, and died there (July 1901). It was in her grave that the body of her husband was laid. It is recorded that when a statue to President Kruger at Pretoria was erected, it was by Mrs. Kruger's wish that the hat was left open at the top, in order that the rain-water might collect there for the birds to drink.

See J. F. van Oordt, *P. Kruger en de opkomst d. Zuid-Afrikaansche Republiek* (Amsterdam, 1898); the *Memoirs* already mentioned; F. R. Statham, *Paul Kruger and his Times* (1898); and, among works with a wider scope, G. M. Theal, *History of South Africa* (for events down to 1872 only); Sir J. P. Fitzpatrick, *The Transvaal from Within* (1899); *The Times History of the War in South Africa* (1900–9); and A. P. Hillier, *South African Studies* (1900).

KRUGERSDORP, a town of the Transvaal, 21 m. N.W. of Johannesburg by rail. Pop. (1904), 20,073, of whom 6946 were whites. It is built on the Witwatersrand at an elevation of 5709 ft. above the sea, and is a mining centre of some importance. It is also the starting-point of a railway to Zeerust and Mafeking. Krugersdorp was founded in 1887 at the time of the discovery of gold on the Rand and is named after President Kruger. Within the municipal area is the Paardekraal monument erected to commemorate the victory gained by the Boers under Andries Pretorius in 1838 over the Zulu king Dingaan, and on the 16th of December each year, kept as a public holiday, large numbers of Boers assemble at the monument to celebrate the event. Here in December 1880 a great meeting of Boers resolved again to proclaim the independence of the Transvaal. The formal proclamation was made on Dingaan's Day, and after the defeat of the British at Majuba Hill in 1881 that victory was also commemorated at Paardekraal on the 16th of December. The monument, which was damaged during the war of 1899–1902, was restored by the British authorities. It was at Doornkop, near Krugersdorp, that Dr L. S. Jameson and his "raiders" surrendered to Commandant Piet Cronje on the 2nd of January 1896 (see TRANSVAAL: *History*). At Sterkfontein, 8 m. N.W. of Krugersdorp, are limestone caves containing beautiful stalactites.

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[1] Sir Percy Fitzpatrick, in *The Transvaal from Within*, ch. iii.

KRUMAU (in Czech, *Krumlov*), is a town in Bohemia situated on the banks of the Moldau (Vitava). It has about 8000 inhabitants, partly of Czech, partly of German nationality. Krumau is principally celebrated because its ancient castle was long the stronghold of the Rosenberg family, known also as *pani z ruze*, the lords of the rose. Henry II. of Rosenberg (d. 1310) was the first member of the family to reside at Krumau. His son Peter I. (d. 1349) raised the place to the rank of a city. The last two members of the family were two brothers, William, created prince of Ursini-Rosenberg in 1556 (d. 1592), and Peter Vok, who played a very large part in Bohemian history. Their librarian was Wenceslas Brezan, who has left a valuable work on the annals of the Rosenberg family. Peter Vok of Rosenberg, a strong adherent of the Utraquist party, sold Krumau shortly before his death (1611), because the Jesuits had established themselves in the neighbourhood.

The lordship, one of the most extensive in the monarchy, was bought by the emperor Rudolph II. for his natural son, Julius of Austria. In 1622 the emperor Ferdinand II. presented the lordship to his minister, Hans Ulrich von Eggenberg, and in 1625 raised it to the rank of an hereditary duchy in his favour. From the Eggenberg family Krumau passed in 1719 to Prince Adam Franz Karl of Schwarzenberg, who was created duke of Krumau in 1723. The head of the Schwarzenberg family bears the title of duke of Krumau. The castle, one of the largest and finest in Bohemia, preserves much of its ancient character.

See W. Brezan, *Zivot Vilema z Rosenberka* (Life of William of Rosenberg), 1847; also *Zivot Petra Voka z Rosenberka* (Life of Peter Vok of Rosenberg), 1880.

KRUMBACHER, CARL (1856–1909), German Byzantine scholar, was born at Kürnach in Bavaria on the 23rd of September 1856. He was educated at the universities of Munich and Leipzig, and held the professorship of the middle age and modern Greek language and literature in the former from 1897 to his death. His greatest work is his *Geschichte der byzantinischen Litteratur* (from Justinian to the fall of the Eastern Empire, 1453), a second edition of which was published in 1897, with the collaboration of A. Ehrhard (section on theology) and H. Gelzer (general sketch of Byzantine history, A.D. 395–1453). The value of the work is greatly enhanced by the elaborate bibliographies contained in the body of the work and in a special supplement. Krumbacher also founded the *Byzantinische Zeitschrift* (1892) and the *Byzantinisches Archiv* (1898). He travelled extensively and the results of a journey to Greece appeared in his *Griechische Reise* (1886). Other works by him are: *Casia* (1897), a treatise on a 9th-century Byzantine poetess, with the fragments; *Michael Glykas* (1894); "Die griechische Litteratur des Mittelalters" in P. Hinneberg's *Die Kultur der Gegenwart*, i. 8 (1905); *Das Problem der neugriechischen Schriftsprache* (1902), in which he strongly opposed the efforts of the purists to introduce the classical style into modern Greek literature, and *Populäre Aufsätze* (1909).

KRUMEN (KROOMEN, KROOBOYS, KRUS, or CROOS), a negro people of the West Coast of Africa. They dwell in villages scattered along the coast of Liberia from below Monrovia nearly to Cape Palmas. The name has been wrongly derived from the English word "crew," with reference to the fact that Krumen were the first West African people to take service in European vessels. It is probably from Kraoh, the primitive name of one of their tribes. Under Krumen are now grouped many kindred tribes, the Grebo, Basa, Nifu, &c., who collectively number some 40,000. The Krus proper live in the narrow strip of coast between the Sino river and Cape Palmas, where are their five chief villages, Kruber, Little Kru, Settra Kru, Nana Kru and King William's Town. They are traditionally from the interior, but have long been noted as skilful seamen and daring fishermen. They are a stout, muscular, broad-chested race, probably the most robust of African peoples. They have true negro features—skin of a blue-black hue and woolly and abundant hair. The women are of a lighter shade than negro women generally, and in several respects come much nearer to a European standard. Morally as well as physically the Krumen are one of the most remarkable races in Africa. They are honest, brave, proud, so passionately fond of freedom that they will starve or drown themselves to escape capture, and have never trafficked in slaves. Politically the Krus are divided into small commonwealths, each with an hereditary chief whose duty is simply to represent the people in their dealings with strangers. The real government is vested in the elders, who wear as insignia iron rings on their legs. Their president, the head fetish-man, guards the national symbols, and his house is sanctuary for offenders till their guilt is proved. Personal property is held in common by each family. Land also is communal, but the rights of the actual cultivator cease only when he fails to farm it.

At 14 or 15 the Kru "boys" eagerly contract themselves for voyages of twelve or eighteen months. Generally they prefer work near at home, and are to be found on almost every ship trading on the Guinea coast. As soon as they have saved enough to buy a wife they return home and settle down. Krumen ornament their faces with tribal marks—black or blue lines on the forehead and from ear to ear. They tattoo their arms and mutilate the incisor teeth. As a race they are singularly intelligent, and exhibit their enterprise in numerous settlements along the coast. Sierra Leone, Grand Bassa and Monrovia all have their Kru towns. Dr Bleek classifies the Kru language with the Mandingo family, and in this he is followed by Dr R. G. Latham; Dr Kölle, who published a Kru grammar (1854), considers it as distinct.

See A. de Quatrefages and E. T. Hamy, *Crania ethnica*, ix. 363 (1878–1879); Schlagintweit-Sakunlunski, in the *Sitzungsberichte* of the academy at Munich (1875); Nicholas, in *Bull. de la Soc. d'Anthrop.* (Paris, 1872); J. Büttikofer, *Reisebilder aus Liberia* (Leiden, 1890); Sir H. H. Johnston, *Liberia* (London, 1906).

KRUMMACHER, FRIEDRICH ADOLF (1767–1845), German theologian, was born on the 13th of July 1767 at Tecklenburg, Westphalia. Having studied theology at Lingen and Halle, he became successively rector of the grammar school at Mörs (1793), professor of theology at Duisburg (1800), preacher at Crefeld, and afterwards at Kettwig, *Consistorialrath* and superintendent in Bernburg, and, after declining an invitation to the university of Bonn, pastor of the Ansgariuskirche in Bremen (1824). He died at Bremen on the 14th of April 1845. He was the author of many religious works, but is best known by his *Parabeln* (1805; 9th ed. 1876; Eng. trans. 1844).

A. W. Möller published his life and letters in 1849.

His brother GOTTFRIED DANIEL KRUMMACHER (1774–1837), who studied theology at Duisburg and became pastor successively in Bärl (1798), Wülfrath (1801) and Elberfeld (1816), was the leader of the "pietists" of Wupperthal, and published several volumes of sermons, including one entitled *Die Wanderungen Israels durch d. Wüste nach Kanaan* (1834).

FRIEDRICH WILHELM KRUMMACHER (1796–1868), son of Friedrich Adolf, studied theology at Halle and Jena, and became pastor successively at Frankfort (1819), Ruhrort (1823), Gemarke, near Barmen in the Wupperthal (1825), and Elberfeld (1834). In 1847 he received an appointment to the Trinity Church in Berlin, and in 1853 he became court chaplain at Potsdam. He was an influential promoter of the Evangelical Alliance. His best-known works are *Elias der Thisbiter* (1828–1833; 6th ed. 1874; Eng. trans. 1838); *Elisa* (1837) and *Das Passionsbuch, der leidende Christus* (1854, in English *The Suffering Saviour*, 1870). His *Autobiography* was published in 1869 (Eng. trans. 1871).

EMIL WILHELM KRUMMACHER (1798–1886), another son, was born at Mörs in 1798. In 1841 he became pastor in Duisburg. He wrote, amongst other works, *Herzensmanna aus Luthers*

Werken (1852). His son Hermann (1828–1890), who was appointed *Consistorialrath* in Stettin in 1877, was the author of *Deutsches Leben in Nordamerika* (1874).

KRUPP, ALFRED (1812–1887), German metallurgist, was born at Essen on the 26th of April 1812. His father, Friedrich Krupp (1787–1826), had purchased a small forge in that town about 1810, and devoted himself to the problem of manufacturing cast steel; but though that product was put on the market by him in 1815, it commanded but little sale, and the firm was far from prosperous. After his death the works were carried on by his widow, and Alfred, as the eldest son, found himself obliged, a boy of fourteen, to leave school and undertake their direction. For many years his efforts met with little success, and the concern, which in 1845 employed only 122 workmen, did scarcely more than pay its way. But in 1847 Krupp made a 3 pdr. muzzle-loading gun of cast steel, and at the Great Exhibition of London in 1851 he exhibited a solid flawless ingot of cast steel weighing 2 tons. This exhibit caused a sensation in the industrial world, and the Essen works sprang into fame. Another successful invention, the manufacture of weldless steel tires for railway vehicles, was introduced soon afterwards. The profits derived from these and other steel manufactures were devoted to the expansion of the works and to the development of the artillery with which the name of Krupp is especially associated (see ORDNANCE). The model settlement, which is one of the best-known features of the Krupp works, was started in the 'sixties, when difficulty began to be found in housing the increasing number of workmen; and now there are various "colonies," practically separate villages, dotted about to the south and south-west of the town, with schools, libraries, recreation grounds, clubs, stores, &c. The policy also was adopted of acquiring iron and coal mines, so that the firm might have command of supplies of the raw material required for its operations. Alfred Krupp, who was known as the "Cannon King," died at Essen on the 14th of July 1887, and was succeeded by his only son, Friedrich Alfred Krupp (1854–1902), who was born at Essen on the 17th of February 1854. The latter devoted himself to the financial rather than to the technical side of the business, and under him it again underwent enormous expansion. Among other things he in 1896 leased the "Germania" shipbuilding yard at Kiel, and in 1902 it passed into the complete ownership of the firm. In the latter year, which was also the year of his death, on the 22nd of November, the total number of men employed at Essen and its associated works was over 40,000. His elder daughter Bertha, who succeeded him, was married in October 1906 to Dr Gustav von Bohlen und Halbach, who on that occasion received the right to bear the name Krupp von Bohlen und Halbach. The enormous increase in the German navy involved further expansion in the operations of the Krupp firm as manufacturers of the armour plates and guns required for the new ships, and in 1908 its capital, then standing at £9,000,000, was augmented by £2,500,000.

KRUSENSTERN, ADAM IVAN (1770–1846), Russian navigator, hydrographer and admiral, was born at Haggud in Esthonia on the 19th of November 1770. In 1785 he entered the corps of naval cadets, after leaving which, in 1788, with the grade of midshipman, he served in the war against Sweden. Having been appointed to serve in the British fleet for several years (1793–1799), he visited America, India and China. After publishing a paper pointing out the advantages of direct communication between Russia and China by Cape Horn and the Cape of Good Hope, he was appointed by the emperor Alexander I. to make a voyage to the east coast of Asia to endeavour to carry out the project. Two English ships were bought, in which the expedition left Kronstadt in August 1803 and proceeded by Cape Horn and the Sandwich Islands to Kamchatka, and thence to Japan. Returning to Europe by the Cape of Good Hope, after an extended series of explorations, Krusenstern reached Kronstadt in August 1806, his being the first Russian expedition to circumnavigate the world. The emperor conferred several honours upon him, and he ultimately became admiral. As director of the Russian naval school Krusenstern did much useful work. He was also a member of the scientific committee of the marine department, and his contrivance for counteracting the influence of the iron in vessels on the compass was adopted in the navy. He died at Reval on the 24th of August 1846.

Krusenstern's *Voyage Round the World in 1803–1806* was published at St Petersburg in 1810–1814, in 3 vols., with folio atlas of 104 plates and maps (Eng. ed., 2 vols. 1813; French ed., 2 vols., and atlas of 30 plates, 1820). His narrative contains a good many important discoveries and rectifications, especially in the region of Japan, and the contributions made by the various savants were of much scientific importance. A valuable work is his *Atlas de l'Océan Pacifique*, with its accompanying *Recueil des mémoires hydrographiques* (St Petersburg, 1824–1827). See *Memoir* by his daughter, Madame Charlotte Bernhardi, translated by Sir John Ross (1856).

KRUSHEVATS (or KRUŠEVAC), a town of Servia, lying in a fertile region of hills and dales near the right bank of the Servian Morava. Pop. (1900), about 10,000. Krushevats is the capital of a department bearing the same name, and has an active trade in tobacco, hemp, flax, grain and livestock, for the sale of which it possesses about a dozen markets. It was in Krushevats that the last Servian tsar, Lazar, assembled his army to march against the Turks, and lose his empire, at Kosovo, in 1389. The site of his palace is marked by a ruined enclosure containing a fragment of the tower of Queen Militsa, whither, according to legend, tidings of the defeat were brought her by crows from the battlefield. Within the enclosure stands a church, dating from the reign of Stephen Dushan (1336–1356), with beautiful rose windows and with imperial peacocks, dragons and eagles sculptured on the walls. Several old Turkish houses were left at the beginning of the 20th century, besides an ancient Turkish fountain and bath.

KSHATTRIYA, one of the four original Indian castes, the other three being the Brahman, the Vaisya and the Sudra. The Kshattriya was the warrior caste, and their function was to protect the people and abstain from sensual pleasures. On the rise of Brahmin ascendancy the Kshattriyas were repressed, and their consequent revolt gave rise to Buddhism and Jainism, the founders of both these religions belonging to the Kshattriya caste. Though, according to tradition, the Kshattriyas were all exterminated by Parasurama, the rank is now conceded to the modern Rajputs, and also to the ruling families of native states. (See CASTE.)

KUBAN, a river of southern Russia, rising on the W. slope of the Elbruz, in the Caucasus, at an altitude of 13,930 ft., races down the N. face of the Caucasus as a mountain torrent, but upon getting down to the lower-lying steppe country S. of Stavropol it turns, at 1075 ft. altitude, towards the N.W., and eventually, assuming a westerly course, enters the Gulf of Kyzyl-tash, on the Black Sea, in the vicinity of the Straits of Kerch. Its lower course lies for some distance through marshes, where in times of overflow its breadth increases from the normal 700 ft. to over half a mile. Its total length is 500 m., the area of its basin 21,480 sq. m. It is navigable for steamers for 73 m., as far as the confluence of its tributary, the Laba (200 m. long). This, like its other affluents, the Byelaya (155 m.), Urup, and Great and Little Zelenchuk, joins it from the left. The Kuban is the ancient Hypanis and Vardanes and the Pshishche of the Circassians.

KUBAÑ, a province of Russian Caucasia, having the Sea of Azov on the W., the territory of Don Cossacks on the N., the government of Stavropol and the province of Terek on the E., and the government of Kutais and the Black Sea district on the S. and S.W. It thus contains the low and marshy lowlands on the Sea of Azov, the western portion of the fertile steppes of northern Caucasia, and the northern slopes of the Caucasus range from its north-west extremity to the Elbruz. The area is 36,370 sq. m. On the south the province includes the parallel ranges of the Black Mountains (Kara-dagh), 3000 to 6000 ft. high, which are intersected by gorges that grow deeper and wider as the main range is approached. Owing to a relatively wet climate and numerous streams, these mountains are densely clothed with woods, under the shadow of which a thick undergrowth of rhododendrons, "Caucasian palms" (*Buxus sempervirens*), ivy, clematis, &c., develops, so as to render the forests almost impassable. These cover altogether nearly 20% of the aggregate area. Wide, treeless plains, from 1000 to 2000 ft. high, stretch north of the Kubañ, and are profusely watered by that river and its many tributaries—the Little and Great Zelenchuk, Urup, Laba, Byelaya, Pshish—mountain torrents that rush through narrow gorges from the Caucasus range. In its lower course the Kubañ forms a wide, low delta, covered with rushes, haunted by wild boar, and very unhealthy. The same characteristics mark the low plains on the east of the Sea of Azov, dotted over with numerous semi-stagnant lakes. Malaria is the enemy of these regions, and is especially deadly on the Tamañ Peninsula, as also along the left bank of the lower and middle Kubañ.

There is considerable mineral wealth. Coal is found on the Kubañ and its tributaries, but its extraction is still insignificant (less than 10,000 tons per annum). Petroleum wells exist in the district of Maikop, but the best are in the Tamañ Peninsula, where they range over 570 sq. m. Iron ores, silver and zinc are found; alabaster is extracted, as also some salt, soda and Epsom salts. The best mineral waters are at Psekup and Tamañ, where there are also numbers of mud volcanoes, ranging from small hillocks to hills 365 ft. high and more. The soil is very fertile in the plains, parts of which consist of black earth and are being rapidly populated.

The population reached 1,928,419 in 1897, of whom 1,788,622 were Russians, 13,926 Armenians, 20,137 Greeks and 20,778 Germans. There were at the same date 945,873 women, and only 156,486 people lived in towns. The estimated population in 1906 was 2,275,400. The aborigines were represented by 100,000 Circassians, 5000 Nogai Tatars and some Ossetes. The Circassians or Adyghe, who formerly occupied the mountain valleys, were compelled, after the Russian conquest in 1861, either to settle on the flat land or to emigrate; those who refused to move voluntarily were driven across the mountains to the Black Sea coast. Most of them (nearly 200,000) emigrated to Turkey, where they formed the Bashi-bazouks. Peasants from the interior provinces of Russia occupied the plains of the Kubañ, and they now number over 1,000,000, while the Kubañ Cossacks in 1897 numbered 804,372 (405,428 women). In point of religion 90% of the population were in 1897 members of the Orthodox Greek Church, 4% Raskolniks and other Christians and 5·4% Mahommedans, the rest being Jews.

Wheat is by far the chief crop (nearly three-quarters of the total area under crops are under wheat); rye, oats, barley, millet, Indian corn, some flax and potatoes, as also tobacco, are grown. Agricultural machinery is largely employed, and the province is a reserve granary for Russia. Livestock, especially sheep, is kept in large numbers on the steppes. Bee-keeping is general, and gardening and vine-growing are spreading rapidly. Fishing in the Black Sea and Sea of Azov, as also in the Kubañ, is important.

Two main lines of railway intersect the province, one running N.W. to S.E., from Rostov to Vladikavkaz, and another starting from the former south-westwards to Novorossiysk on the north coast of the Black Sea. The province is divided into seven districts, the chief towns of which, with their populations in 1897, are Ekaterinodar, capital of the province (65,697), Anapa (6676), Labinsk (6388), Batalpashinsk (8100), Maikop (34,191), Temryuk (14,476) and Yeisk (35,446).

The history of the original settlements of the various native tribes, and their language and worship before the introduction of Mahommedanism, remain a blank page in the legends of the Caucasus. The peninsula of Tamañ, a land teeming with relics of ancient Greek colonists, has been occupied successively by the Cimmerians, Sarmatians, Khazars, Mongols and other nations. The Genoese, who established an extensive trade in the 13th century, were expelled by the Turks in 1484, and in 1784 Russia obtained by treaty the entire peninsula and the territory on the right bank of the Kubañ, the latter being granted by Catherine II. in 1792 to the Cossacks of the Dnieper. Then commenced the bloody struggle with the Circassians, which continued for more than half a century. Not only domestic, but even field work, is conducted mostly by the women, who are remarkable for their physical strength and endurance. The native mountaineers, known under the general name of Circassians, but locally distinguished as the Karachai, Abadsikh, Khakuchy, Shapsugh, have greatly altered their mode of life since the pacification of the Caucasus, still, however, maintaining Mahommedanism, speaking their vernacular, and strictly observing the customs of their ancestors. Exports include wheat, tobacco, leather, wool, petroleum, timber, fish, salt and live cattle; imports, dry goods, grocery and hardware. Local industry is limited to a few tanneries, petroleum refineries and spirit distilleries. (P. A. K.; J. T. Be.)

KUBELIK, JAN (1880–), Bohemian violinist, was born near Prague, of humble parentage. He learnt the violin from childhood, and appeared in public at Prague in 1888, subsequently being trained at the Conservatorium by the famous teacher Ottakar Sevčik. From him he learnt an extraordinary technique, and from 1898 onwards his genius was acclaimed at concerts throughout Europe. He first appeared in London in 1900, and in America in 1901, creating a *furore* everywhere. In 1903 he married the Countess Czaky Szell.

KUBERA (or Kuvera), in Hindu mythology, the god of wealth. Originally he appears as king of the powers of evil, a kind of Pluto. His home is Alaka in Mount Kailasa, and his garden, the world's treasure-house, is Chaitraratha, on Mount Mandara. Kubera is half-brother to the demon Ravana, and was driven from Ceylon by the latter.

KUBLAI KHAN (or Ḳaan, as the supreme ruler descended from Jenghiz was usually distinctively termed in the 13th century) (1216–1294), the most eminent of the successors of Jenghiz (Chinghiz), and the founder of the Mongol dynasty in China. He was the second son of Tulē, youngest of the four sons of Jenghiz by his favourite wife. Jenghiz was succeeded in the khanship by his third son Okkodai, or Ogdai (1229), he by his son Kuyuk (1246), and Kuyuk by Mangu, eldest son of Tulē (1252). Kublai was born in 1216, and, young as he was, took part with his younger brother Hulagu (afterwards conqueror of the caliph and founder of the Mongol dynasty in Persia) in the last campaign of Jenghiz (1226–27). The Mongol poetical chronicler, Sanang Setzen, records a tradition that Jenghiz himself on his deathbed discerned young Kublai's promise and predicted his distinction.

Northern China, Cathay as it was called, had been partially conquered by Jenghiz himself, and the conquest had been followed up till the Kin or "golden" dynasty of Tatars, reigning at K'ai-fēng Fu on the Yellow River, were completely subjugated (1234). But China south of the Yangtsze-kiang remained many years later subject to the native dynasty of Sung, reigning at the great city of Lingan, or Kinsai (*King-sz'*, "capital"), now known as Hang-chow Fu. Operations to subdue this region had commenced in 1235, but languished till Mangu's accession. Kublai was then named his brother's lieutenant in Cathay, and operations were resumed. By what seems a vast and risky strategy, of which the motives are not quite clear, the first campaign of Kublai was directed to the subjugation of the remote western province of Yunnan. After the capture of Tali Fu (well known in recent years as the capital of a Mahommedan insurgent sultan), Kublai returned north, leaving the war in Yunnan to a trusted general. Some years later (1257) the khan Mangu himself entered on a campaign in west China, and died there, before Ho-chow in Szech'uen (1259).

Kublai assumed the succession, but it was disputed by his brother Arikbugha and by his cousin Kaidu, and wars with these retarded the prosecution of the southern conquest. Doubtless, however, this was constantly before Kublai as a great task to be accomplished, and its fulfilment was in his mind when he selected as the future capital of his empire the Chinese city that we now know as Peking. Here, in 1264, to the north-east of the old city, which under the name of Yenking had been an occasional residence of the Kin sovereigns, he founded his new capital, a great rectangular plot of 18 m. in circuit. The (so-called) "Tatar city" of modern Peking is the city of Kublai, with about one-third at the north cut off, but Kublai's walls are also on this retrenched portion still traceable.

The new city, officially termed T'ai-tu ("great court"), but known among the Mongols and western people as Kaan-baligh ("city of the khan") was finished in 1267. The next year war against the Sung Empire was resumed, but was long retarded by the strenuous defence of the twin cities of Siang-yang and Fan-chēng, on opposite sides of the river Han, and commanding two great lines of approach to the basin of the Yangtsze-kiang. The siege occupied nearly five years. After this Bayan, Kublai's best lieutenant, a man of high military genius and noble character, took command. It was not, however, till 1276 that the Sung capital surrendered, and Bayan rode into the city (then probably the greatest in the world) as its conqueror. The young emperor, with his mother, was sent prisoner to Kaan-baligh; but two younger princes had been despatched to the south before the fall of the city, and these successively were proclaimed emperor by the adherents of the native throne. An attempt to maintain their cause was made in Fu-kien, and afterwards in the province of Kwang-tung; but in 1279 these efforts were finally extinguished, and the faithful minister who had inspired them terminated the struggle by jumping with his young lord into the sea.

Even under the degenerate Sung dynasty the conquest of southern China had occupied the Mongols during half a century of intermittent campaigns. But at last Kublai was ruler of all China, and probably the sovereign (at least nominally) of a greater population than had ever acknowledged one man's supremacy. For, though his rule was disputed by the princes of his house in Turkestan, it was acknowledged by those on the Volga, whose rule reached to the frontier of Poland, and by the family of his brother Hulagu, whose dominion extended from the Oxus to the Arabian desert. For the first time in history the name and character of an emperor of China were familiar as far west as the Black Sea and not unknown in Europe. The Chinese seals which Kublai conferred on his kinsmen reigning at Tabriz are stamped upon their letters to the kings of France, and survive in the archives of Paris. Adventurers from Turkestan, Persia, Armenia, Byzantium, even from Venice, served him as ministers, generals, governors, envoys, astronomers or physicians; soldiers from all Asia to the Caucasus fought his battles in the south of China. Once in his old age (1287) Kublai was compelled to take the field in person against a serious revolt, raised by Nayan, a prince of his family, who held a vast domain on the borders of Manchuria. Nayan was taken and executed. The revolt had been stirred up by Kaidu, who survived his imperial rival, and died in 1301. Kublai himself died in 1294, at the age of seventy-eight.

Though a great figure in Asiatic history, and far from deserving a niche in the long gallery of Asiatic tyrants, Kublai misses a record in the short list of the good rulers. His historical locus was a happy one, for, whilst he was the first of his race to rise above the innate barbarism of the Mongols, he retained the force and warlike character of his ancestors, which vanished utterly in the effeminacy of those who came after him. He had great intelligence and a keen desire for knowledge, with apparently a good deal of natural benevolence and magnanimity. But his love of splendour, and his fruitless expeditions beyond sea, created enormous demands for money, and he shut his eyes to the character and methods of those whom he employed to raise it. A remarkable narrative of the oppressions of one of these, Ahmed of Fenāket, and of the revolt which they provoked, is given by Marco Polo, in substantial accordance with the Chinese annals.

Kublai patronized Chinese literature and culture generally. The great astronomical instruments which he caused to be made were long preserved at Peking, but were carried off to Berlin in 1900. Though he put hardly any Chinese into the first ranks of his administration, he attached many to his confidence, and was personally popular among them. Had his endeavour to procure European priests for the instruction of his people, of which we know through Marco Polo, prospered, the Roman Catholic church, which gained some ground under his successors, might have taken stronger root in China. Failing this momentary effort, Kublai probably saw in the organized force of Tibetan Buddhism the readiest instrument in the civilization of his countrymen, and that system received his special countenance. An early act of his reign had been to constitute a young lama of intelligence and learning the head of the Lamaite Church, and eventually also prince of Tibet, an act which may be regarded as a precursory form of the rule of the "grand lamas" of Lassa. The same ecclesiastic, Mati Dhwaja, was employed by Kublai to devise a special alphabet for use with the Mongol language. It was chiefly based on Tibetan forms of Nagari; some coins and inscriptions in it are extant; but it had no great vogue, and soon perished. Of the splendour of his court and entertainments, of his palaces, summer and winter, of his great hunting expeditions, of his revenues and extraordinary paper currency, of his elaborate system of posts and much else, an account is given in the book of Marco Polo, who passed many years in Kublai's service.

We have alluded to his foreign expeditions, which were almost all disastrous. Nearly all arose out of a hankering for the nominal extension of his empire by claiming submission and tribute. Expeditions against Japan were several times repeated; the last, in 1281, on an immense scale, met with huge discomfiture. Kublai's preparations to avenge it were abandoned owing to the intense discontent which they created. In 1278 he made a claim of submission upon Champa, an ancient state representing what we now call Cochin China. This eventually led to an attempt to invade the country through Tongking, and to a war with the latter state, in which the Mongols had much the worst of it. War with Burma (or Mien, as the Chinese called it) was provoked in very similar fashion, but the result was more favourable to Kublai's arms. The country was overrun as far as the Irrawaddy delta, the ancient capital, Pagān, with its magnificent temples, destroyed, and the old royal dynasty overthrown. The last attempt of the kind was against Java, and occurred in the last year of the old khan's reign. The envoy whom he had commissioned to claim homage was sent back with ignominy. A great armament was equipped in the ports of Fu-kien to avenge this insult; but after some temporary success the force was compelled to re-embark with a loss of 3000 men. The death of Kublai prevented further action.

Some other expeditions, in which force was not used, gratified the khan's vanity by bringing back professions of homage, with presents, and with the curious reports of foreign countries in which Kublai delighted. Such expeditions extended to the states of southern India, to eastern Africa, and even to Madagascar.

Of Kublai's twelve legitimate sons, Chingkim, the favourite and designated successor, died in 1284/5; and Timur, the son of Chingkim, took his place. No great king arose in the dynasty after Kublai. He had in all nine successors of his house on the throne of Kaan-baligh, but the long and imbecile reign of the ninth, Toghon Timur, ended (1368) in disgrace and expulsion and the native dynasty of Ming reigned in their stead. (H. Y.)

KUBUS, a tribe inhabiting the central parts of Sumatra. They are nomadic savages living entirely in the forests in shelters of branches and leaves built on platforms. It has been suggested that they represent a Sumatran aboriginal race; but Dr J. G. Garson, reporting on Kubu skulls and skeletons submitted to him by Mr. H. O. Forbes, declared them decidedly Malay, though the frizzle in the hair might indicate a certain mixture of negrito blood (*Jour. Anthrop. Instit.*, April 1884). They are of a rich olive-brown tint, their hair jet black and inclined to curl, and, though not dwarfs, are below the average height.

KUCHĀN, a fertile and populous district of the province Khorasan in Persia, bounded N. by the Russian Transcaspian territory, W. by Bujnurd, S. by Isfaraīn, and extending in the E. to near Radkan. Its area is about 3000 sq. m. and its population, principally composed of Zafaranlu Kurds, descendants of tribes settled there by Shah Abbas I. in the 17th century, is estimated at 100,000. About 3000 families are nomads and live in tents. The district produces much grain, 25,000 to 30,000 tons yearly, and contains two towns, Kuchan and Shirvan (pop. 6000), and many villages.

Kuchan, the capital of the district, has suffered much from the effects of earthquakes, notably in 1875, 1894 and 1895. The last earthquake laid the whole town in ruins and caused considerable loss of life. About 8000 of the survivors removed to a site 7½ m. E. and there built a new town named Nasseriyeh after Nasr-ud-din Shah, but known better as Kuchan i jadid, *i.e.* New Kuchan, and about 1000 remained in the ruined city in order to be near their vineyards and gardens. The geographical position of the old town is 37° 8′ N., 58° 25′ E., elevation 4100 ft. The new town has been regularly laid out with broad streets and spacious bazaars, and, situated as it is half-way between Meshed and Askabad on the cart-road connecting those two places, has much trade. Its population is estimated at 10,000. There are telegraph and post offices.

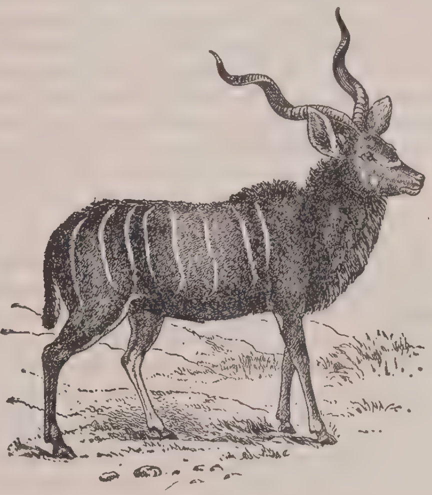
KUCH BEHAR, or Cooch Behar, a native state of India, in Bengal, consisting of a submontane tract, not far from Darjeeling, entirely surrounded by British territory. Area, 1307 sq. m. Pop. (1901), 566,974; estimated revenue, £140,000. The state forms a level plain of triangular shape, intersected by numerous rivers. The greater portion is fertile and well cultivated, but tracts of jungle are to be seen in the north-east corner, which abuts upon Assam. The soil is uniform in character throughout, consisting of a light, friable loam, varying in depth from 6 in. to 3 ft., superimposed upon a deep bed of sand. The whole is detritus, washed down by torrents from the neighbouring Himalayas. The rivers all pass through the state from north to south, to join the main stream of the Brahmaputra. Some half-dozen are navigable for small trading boats throughout the year, and are nowhere fordable; and there are about twenty minor streams which become navigable only during the rainy season. The streams have a tendency to cut new channels for themselves after every annual flood, and they communicate with one another by cross-country watercourses. Rice is grown on three-fourths of the cultivated area. Jute and tobacco are also largely grown for export. The only special industries are the weaving of a strong silk obtained from worms fed on the castor-oil plant, and of a coarse jute cloth used for screens and bedding. The external trade is chiefly in the hands of Marwari immigrants from Rajputana. Among other improvements a railway has been constructed, with the assistance of a loan from the British government. The earthquake of the 12th of June 1897 caused damage to public buildings, roads, &c., in the state to the estimated amount of £100,000.

The Koch or Rajbansi, from which the name of the state is derived, are a widely spread tribe, evidently of aboriginal descent, found throughout all northern Bengal, from Purnea district to the Assam valley. They are akin to the Indo-Chinese races of the north-east frontier; but they have now become largely hinduized, especially in their own home, where the appellation "Koch" has come to be used as a term of reproach. Their total number in all India was returned in 1901 as nearly 2½ millions.

As in the case of many other small native states, the royal family of Kuch Behar lays claim to a divine origin in order to conceal an impure aboriginal descent. The greatest monarch of the dynasty was Nar Narayan, the son of Visu Singh, who began to reign about 1550. He conquered the whole of Kamrup, built temples in Assam, of which ruins still exist bearing inscriptions with his name, and extended his power southwards over what is now part of the British districts of Rangpur and Purnea. His son, Lakshmi Narayan, who succeeded him in Kuch Behar, became tributary to the Mogul Empire. In 1772 a competitor for the throne, having been driven out of the country by his rivals, applied for assistance to Warren Hastings. A detachment of sepoys was accordingly marched into the state; the Bhutias, whose interference had led to this intervention, were expelled, and forced to sue for peace through the mediation of the lama of Tibet. By the treaty made on this occasion, April 1773, the raja acknowledged subjection to the Company, and made over to it one-half of his annual revenues. In 1863, on the death of the raja, leaving a son and heir only ten months old, a British commissioner was appointed to undertake the direct management of affairs during the minority of the prince, and many important reforms were successfully introduced. The maharaja Sir Nripendra Narayan, G.C.I.E., born in 1862, was educated under British guardianship at Patna and Calcutta, and became hon. lieutenant-colonel of the 6th Bengal Cavalry. In 1897–98 he served in the Tirah campaign on the staff of General Yeatman-Biggs, and received the distinction of a C.B. He was present at the Jubilee in 1887, the Diamond Jubilee of 1897, and King Edward's Coronation in 1902, and became a well-known figure in London society. In 1878 he married a daughter of Keshub Chunder Sen, the Brahmo leader. His eldest son was educated in England.

The town of Kuch Behar is situated on the river Tursa, and has a railway station. Pop. (1901), 10,458. It contains a college affiliated to the Calcutta University.

KUDU (*koodoo*), the native name for a large species of African antelope (*q.v.*), with large corkscrew-like horns in the male, and the body marked with narrow vertical white lines in both sexes. The female is hornless. *Strepsiceros capensis* (or *S. strepsiceros*) is the scientific name of the true kudu, which ranges from the Cape to Somaliland; but there is also a much smaller species (*S. imberbis*) in East and North-East Africa.



Male Kudu.

KUENEN, ABRAHAM (1828–1891), Dutch Protestant theologian, the son of an apothecary, was born on the 16th of September 1828, at Haarlem, North Holland. On his father's death it became necessary for him to leave school and take a humble place in the business. By the generosity of friends he was educated at the gymnasium at Haarlem and afterwards at the university of Leiden. He studied theology, and won his doctor's degree by an edition of thirty-four chapters of Genesis from the Arabic version of the Samaritan Pentateuch. In 1853 he became professor extraordinarius of theology at Leiden, and in 1855 full professor. He married a daughter of W. Muurling, one of the founders of the Gröningen school, which made the first pronounced breach with Calvinistic theology in the Reformed Church of Holland. Kuenen himself soon became one of the main supports of the modern theology, of which J. N. Scholten (1811–1885) and Karel Willem Opzoomer (b. 1821) were the chief founders, and of which Leiden became the headquarters. His first great work, an historico-critical introduction to the Old Testament, *Historisch-kritisch onderzoek naar het onstaan en de verzameling van de boeken des Ouden Verbonds* (3 vols., 1861–1865; 2nd ed., 1885–1893; German by T. Weber and C. T. Müller, 1885–1894), followed the lines of the dominant school of Heinrich Ewald. But before long he came under the influence of J. W. Colenso, and learned to regard the prophetic narrative of Genesis, Exodus, and Numbers as older than what was by the Germans denominated *Grundschrift* ("Book of Origins"). In 1869–1870 he published his book on the religion of Israel, *De godsdienst van Israël tot den ondergang van der Joodschen Staat* (Eng. trans., 1874–1875). This was followed in 1875 by a study of Hebrew prophecy, *De profeten en de profetie onder Israel* (Eng. trans., 1877), largely polemical in its scope, and specially directed against those who rest theological dogmas on the fulfilment of prophecy. In 1882 Kuenen went to England to deliver a course of Hibbert lectures, *National Religions and Universal Religion*; in the following year he presided at the congress of Orientalists held at Leiden. In 1886 his volume on the Hexateuch was published in England. He died at Leiden on the 10th of December 1891.

Kuenen was also the author of many articles, papers and reviews; a series on the Hexateuch, which appeared in the *Theologisch Tijdschrift*, of which in 1866 he became joint editor, is one of the finest products of modern criticism. His collected works were translated into German and published by K. Budde in 1894. Several of his works have been translated into English by Philip Wicksteed. See the article in Herzog-Hauck, *Realencyklopädie*.

KUEN-LUN, or Kwen-Lun, a term used to designate generally the mountain ranges which run along the northern edge of the great Tibetan plateau in Central Asia. In a wider application it means the succession of ranges which extend from the Pamirs on the W. to 113° E., until it strikes against or merges in the steep escarpments of the S.E. flank of the Mongolian plateau. In the narrower acceptation it applies only to those ranges which part the desert of Takla-makan on the N. from the Tibetan plateau on the S. between the Pamirs and the transverse glen of the Kara-muren, that is, nearly to the longitude of the town of Cherchen (about 85½° E.). Although the use of the name is thus restricted in geographical usage, the mountain system so designated does, as a fact, extend eastwards as far as the great depression of Tsaidam (say 95° E.), though it is uncertain whether its direct orographical continuation eastwards is to be identified with the Astin-tagh, or, as F. Grenard and K. Bogdanovich believe—and with them Sven Hedin is inclined to agree—with the parallel ranges of Kalta-alaghan and Arka-tagh, which lie S. of the Astin-tagh. At any rate the Astin-tagh, whether it is the principal continuation of the Kuen-lun or only a subsidiary flanking system, is itself the westward continuation of the Nan-shan or Southern Mountains, which reach down far into China (to 113° E.).

Taken in its widest meaning, the Kuen-lun Mountains thus stretch in a wavy line for nearly 2500 m. from E. to W., and while in the W. their constituent ranges are folded and squeezed by lateral compression into a breadth of some 150–200 m., their summits being forced up to correspondingly higher altitudes, in the E. they spread out to a breadth of some 600 m., the ranges being in that quarter less folded, and consequently both flatter and lower. In the tectonic structure of Asia the Kuen-lun forms, as it were, the backbone of the continent. In point of age it is very much older than either the Himalayas to the S. or the Tian-shan to the N. But although the crests of its component ranges reach altitudes of 21,500 to 22,000 ft., they are not as a rule overtopped by individual peaks of commanding and towering elevation, as the Himalayas are, but run on the whole tolerably uniform and relatively at little greater altitude than the lofty valleys which separate them one from another. It is a strikingly marked characteristic of the northern edge of the Tibetan plateau that its outermost border-range (*e.g.* Western Kuen-lun and Astin-tagh) is throughout double; and this "twinning" of the mountain-ranges, as also of the intermont lake-basins among the Kuen-lun ranges, is a peculiar feature of the Tibetan plateau.

The supreme orographic importance of this great Central Asian mountain system was recognized in a fashion even by the geographers of ancient Greece. They used to suppose that an immense range of mountains crossed Asia from west to east on the parallel of the island of Rhodes, extending through Asia Minor, the Kurdish highlands, the N. of Persia, the N. of Bactria (Afghanistan), the Hindukush, and so on into China. This long range they supposed to separate the waters which flow N. to the Arctic from those which flow S. to the Indian Ocean. K. Ritter (*Asien*, ii.) was the first of modern geographers to recognize the true character of the Kuen-lun as a border range of the Tibetan plateau; and Baron von Richthofen (*China*, i. 1876) still further defined and accentuated the conception of the system by representing it as a complex arrangement of several parallel ranges, running in wavy lines from the Pamirs (76° E.) eastwards to 118° E. But though von Richthofen's general conception of the Kuen-lun system was broadly sound and in accordance with facts, the details both of his description and of that of his pupil Wegener[1] require now very considerable revision, and need even to be in part recast, as a consequence of explorations and investigations made since they wrote by, amongst others, the Russian explorers N. M. Przhevalsky, M. V. Pyevtsov, V. I. Roborovsky, P. K. Kozlov, K. Bogdanovich, V. A. Obruchev, and (?) Skassi; by the Englishmen A. D. Carey, A. Dalgleish, St G. R. Littledale, H. Bower, H. H. P. Deasy and M. S. Wellby; by the American W. W. Rockhill; the Frenchmen J. L. Dutreuil de Rhins, F. Grenard, P. G. Bonvalot and Prince Henri d'Orléans; by the Hungarians L. von Loczy and Count Szechényi; and above all by the Swede Sven Hedin.

Western Kuen-lun.—On the east the Pamir highlands are fenced off from the East Turkestan lowlands by the double border-ridge of Sarik-kol (the Sarik-kol range and the Muztagh or Kashgar range), which has its eastern foot down in the Tarim basin (4000–4500 ft.) and its western up on the Pamirs at 10,500 to 13,000 ft. above sea-level, while its own summits, *e.g.* the Muztagh-ata (25,780 ft.), shoot up far above the limits of perpetual snow. This double border-ridge is continued east of the meridian of Yarkand or Yarkent (77° E.) by a succession of twin ranges, all running, though under different names, from the W.N.W. to the E.S.E. According to the investigations of F. Stoliczka and K. Bogdanovich, the same fossils occur in both sets of border ranges, in the Sarik-kol and in their eastward continuations, *e.g.* corals. *Stromatophorae*, *Bryozoa*, *Atrypa reticularis*, *A. latilinguis* and *A. aspera*, *Spirifer verneuili*, &c., and these the latter geologist assigns to the Devonian epoch. These eastward continuations of the double border-range of the Pamirs are the constituent ranges of the Kuen-lun proper. The names given to them are the Kilian or Kiliang, the Khotan and the Keriya Mountains in the more northerly range and the Raskem or Raskan, the Sughet and the Ullugh-tagh Mountains in the more southerly range. Although they all decrease in altitude from west to east, they nevertheless reach elevations of 19,000 ft., with individual peaks ascending some 2000–2500 ft. higher. From the East Turkestan lowlands on the north the ascent is very steep, and the passes across both sets of ranges lie at great altitudes; for example, the pass of Sanju-davan in the lower range is 16,325 ft. above sea-level, and the Kyzyl-davan, farther east, is 16,900 ft., while the Sughet-davan in the higher range is 17,825 ft. The latter range is separated from the Karakorum Mountains by the deeply trenched gorge of the Raskem or Yarkand-darya, while the deep glen of the Kara-kash or Khotan-darya intervenes between the upper (Sughet Mountains) and the lower (Kilian Mountains) border-ranges. Altogether this western extremity of the Kuen-lun system is a very rugged mountainous region, a consequence partly of the intricacy of the flanking ranges and spurs, partly of the powerful lateral compression to which they have been subjected, and partly of the great and abrupt differences in vertical elevation between the crests of the ranges and the bottoms of the deep, narrow, rugged glens between them. In the broad orographical disposition of the ranges there is considerable similarity between north Tibet and west Persia, in that in both cases the ranges are crowded together in the west, but spread out wider as they advance towards the east. To the two principal ranges in this part of the system F. Grenard, who accompanied J. L. Dutreuil de Rhins on his journey in 1890–1895, gives the names the Altyn-tagh and Ustun-tagh, though he names no less than six parallel ranges altogether. Now as Altyn-tagh[2] is an accepted, though in point of fact erroneous, name for Astin-tagh, it is clear that Grenard considers the main Kuen-lun ranges to be continued directly by the Astin-tagh.

From the transverse breach of the Keriya-darya (about 81½° E.) to that of the Kara-muren in the longitude of Cherchen (about 85½° E.) the parallel border-ranges of the Tibetan plateau trend to the E.N.E., and here occur in the lower or outer range the passes of Dalai-kurghan-art (14,290 ft.), Choka-davan, *i.e.* Littledale's Chokur Pass (9530 ft.) and others at altitudes ranging from 8600 to

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[1] In "Orographie des Kwen-lun," in *Zeitschrift der Gesellschaft für Erdkunde zu Berlin* (1891).

[2] It is used, for instance, on the map of "Inner-Asien" (No. 62) of *Stieler's Hand-atlas* (ed. 1905) and in the *Atlas* of the Russian General Staff. Etymologically the correct form is Astin-tagh or Astun-tagh, meaning the Lower or Nearer Mountains. Ustun-tagh, which appears on Stieler's map as an *alternative* name for Altyn-tagh, means Higher or Farther Mountains, and though not used locally of any specific range, would be appropriately employed to designate the higher and more southerly of the twin border-ranges of the Tibetan plateau.

11,500 ft., while in the upper range are the At-to-davan (16,600 ft.), Yapkak-lik-davan (15,550 ft.), Sarshu-davan (15,680 ft.) and others not named at 16,590 and 17,300 ft.

Middle Kuen-lun.—Between the upper transverse glens of the Kara-muren (or Mitt River) and the Cherchen-darya stretches the short range of Tokuz-davan. From it, on the east side of the Cher chendaryt, in about 86° E., the component ranges of the middle Kuen-lun begin to diverge and radiate outwards (*i.e.* to north and to south) like the fingers of the outspread human hand. And here at least four principal ranges or groups of ranges admit of being discriminated, namely the Astin-tagh, the Chimen-tagh, the Kalta-alaghan and the Arka-tagh, all belonging to the mountainous country which borders on the north the actual plateau region of Tibet. Although these several ranges, or systems of ranges, differ considerably in their orographical characteristics, the following description will apply generally to the entire region from the Astin-tagh southwards to the Arka-tagh. The broad features of the surface configuration are a series of nearly parallel mountain-ranges, running from W.S.W. E.N.E. to W.N.W. E.S.E., and separated by high intermont valleys, which are choked with disintegrated material and divided into a chequered pattern of self-contained, shallow lacustrine basins. As a rule the crests of the ranges are worn down by aerial denudation and have the general appearance of rounded domes. Hard rock (mostly granite and crystalline schists, with red sandstone in places) appears only in the transverse glens, which are often choked with their débris in the form either of gravel-and-shingle or loose blocks of stone or both. The flanks of the mountains are so deeply buried in disintegrated material that the difference in vertical altitude between the floors of the valleys and the summits of the ranges is comparatively small. But as each successive range, proceeding south, represents a higher step in the terraced ascent from the desert of Gobi to the plateau of Tibet, the ranges when viewed from the north frequently appear like veritable upstanding mountain ranges, and this appearance is accentuated by the general steepness of the ascent; whereas, when viewed on the other hand from the south, these several ranges, owing to their long and gentle slope in that direction, have the appearance of comparatively gentle swellings of the earth's service rather than of well-defined mountain ranges. As a rule, the streams flow alternately east and west down the intermont latitudinal valleys, until they break through some transverse glen in the range on the northern side of the valley. In the western parts of the system they mostly go to feed the Kara-muren or the Cherchen-darya, while farther east they flow down into some larger self-contained basin of internal drainage, such as the Achik-kol, the two lakes Kara-kol, or the Ghaz-kol, and even yet farther east make their way, some of them into the lakes of the Tsaidam depression or become lost in its sands or in those of the Kum-tagh desert on the north, or go to feed the headstreams of the great rivers, the Hwang-ho (Yellow River) and the Yangtsze-kiang (Blue River) in the south. It appears to be a rule that the rivers which eventually terminate in the deserts of Gobi and Takla-makan grow increasingly larger in magnitude from east to west. Another law appears to distinguish the hydrography of at any rate the great latitudinal valleys of the Arka-tagh and the Chimen valley (north of the Chimen-tagh): the streams flow close under the foot of the range that shuts in each individual valley on the north. But in respect of precipitation there is a very marked difference between the valleys of the north and those of the south. Whereas both the mountains and valleys of the Astin-tagh and of the Akato-tagh (the next large range to the Astin-tagh on the south) are arid and desolate in the extreme, smitten as it were with the desiccating breath of the desert, those of the Arka-tagh and beyond are supersaturated with moisture, so that, at any rate in summer, the surface is in many parts little better than a quaking quagmire. Throughout vegetation is scanty and faunal life poor in species, though in some respects certain of the species, *e.g.* wild yaks, wild asses (*kulans*), antelopes (*orongo* and others), marmots, hares and partridges exist locally in large numbers. The wild camel approaches the north outliers of the Astin-tagh, but rarely, if ever, ventures to enter their fastnesses. Bears, wolves, foxes, goats (*kökmet*), wild sheep (*arkharis*), lizards, earth-rats, and a small rodent (*teshikan*), with ravens, eagles, wild ducks and wild geese are the other varieties principally encountered. The vegetation consists almost entirely of scrubby bushes of several varieties, including tamarisks and wild briers, of reeds (*kamish*), and of grass on the *yaylaks* (pasture-grounds) of the middle ranges. On the Arka-tagh even the moss, the last surviving representative of the flora, disappears entirely. In the eastern Astin-tagh a variety of wild tea (*chay*, mountain tea) is used by the Mongols. Gold is obtained in very small quantities in a few places in the Astin-tagh and the Kalta-alaghan. The nomenclature of the numerous ranges in this part of the Kuen-lun is extremely confusing, owing to different travellers having applied the same name to different ranges and to different travellers have applied different names to what is probably often identically the same range. In this article the nomenclature adopted is that employed by the latest, and probably the most thorough, explorer of this part of Central Asia, namely, Sven Hedin. Nevertheless, owing to the fact that nearly all the longer and more important crossings of Tibet and its northern montane region have been made from north to south, or vice versa, that is, transversely across the ranges, and comparatively few from east to west along the intermont latitudinal valleys, the identifications between ranges in the east and ranges in the west are in more than one instance more or less doubtful.

The *Astin-tagh*, although it occupies a similar position to the twin ranges of the Western Kuen-lun, in that it forms the outermost escarpment or border-ridge on the north of the Tibetan plateau, would appear in the opinion of the most competent judges (*e.g.* Grenard, Bogdanovich, Sven Hedin, Przhevalsky), to be only a branch or subsidiary range of the main range of the Kuen-lun. It is not however a single, long, continuous chain, as it is shown, for example, on the map of the Russian general staff, but consists of two parallel main ranges, and in the east of three, and even to the N.E. of Tsaidam of four, parallel main ranges, flanked throughout by several subsidiary chains, spurs and offshoots. Beyond that it swells out into the vast *massif* of Anambaruin-ula, which is traversed by at least three minor parallel chains. But on the east of the Anambaruin-ula it once more contracts to two main ranges, the more southerly being that which Przhevalsky called the Humboldt Range (crossed by a pass at 13,200 ft.). This branch is probably continued in the range which overhangs the Koko-nor on the south, namely, the south Koko-nor Range. The northern branch merges eastwards into the Nan-shan or Southern Mountains.[1] The passes in the Lower Astin-tagh range from altitudes of 10,150 to 10,700 ft., and in the Upper Astin-tagh at 11,770 to 15,680 ft. (Tash-davan), though one pass beside the Charkhlik-su is only 9660 ft. high. And as the relative altitudes of crest and pass remain approximately the same as in the Western Kuen-lun, it is evident how greatly the general elevation of the twin border ridge decreases towards the east. But there exists a striking difference between the crests of the Astin-tagh and those of the ranges which give rise to the gigantic ridge and furrow arrangement on the Tibetan plateau. "Here in the Astin-tagh the mountains, like those in the Kuruk-tagh,[2] are indeed severely weathered, but they always consist, from base to summit, of hard rock, bare and barren, most frequently piled up in eccentric, rugged masses, denticulated, pinnacled crests and peaks. On the Tibetan plateau, on the other hand, most of the ranges are distinguished by their rounded outlines and soft consistency, and their striking poverty in hard rock, which in the best cases only crops out near the summits. There too disintegration has been to a remarkable extent operative. This gives rise to the great morphological difference, that in the former regions, the Astin-tagh and the Kuruk-tagh, the products of disintegration are almost always carried away by the wind, and so disappear; no matter how powerful or how active the disintegration may be, none of the loosened material ever succeeds either in gathering amongst the mountains or in accumulating at their foot. The climate is so arid, and precipitation so extremely rare, that the fine powdery material falls a helpless prey to the winds. On the other hand, the precipitation on the Tibetan plateau is so copious, and so uniformly distributed, that it is able to retain the loosened material *in situ*, and causes it to heap itself up in rounded masses on the flanks of the mountains that are its primitive source of origin, these projecting in great part like skeletons from the midst of their own ruins."[3] The twin ranges of the Astin-tagh are fairly equivalent in point of magnitude and regularity; but while the Lower Range, on the north, sensibly decreases in altitude towards the east, the Upper Range, on the south, maintains its general altitude in a remarkable way, and is gapped by steep, wild, deeply incised transverse glens directed towards the north, and generally fenced in by dark precipitous walls of rock. The great valley between the two is "cut up into a series of self-contained basins, each serving as the gathering ground of the brooks that run down off the adjacent mountains. Outside the lower end of each large transverse glen there is a scree of sedimentary matter. These screes are however very flat and their lower edges generally reach all the way down to the central part of the basin, which is occupied by an expanse of yellow clay, perfectly flat and fairly hard, as well as dry and barren, often cracked into polygonal cakes and drawn out in the direction of the long axis of the valley. . . . But though the great morphological features of this latitudinal valley forcibly recall the latitudinal valleys of Tibet, the climatic differences give rise to differences between the basins corresponding to the differences between the mountain-ranges themselves. For while the self-contained basins of Tibet generally possess a salt lake in the middle, into which brooks and streams of greater or less magnitude gather, often from very considerable distances, these self-contained basins of the Astin-tagh are very small in area, and it is extremely seldom that their central parts receive any water at all, only in fact after copious rain. These terminal lakes, or more accurately sedimentary plains, are therefore almost always dry."[4]

The next parallel range on the south, the *Akato-tagh*, and the valley which separates it from the Astin-tagh, are equally arid and waterless. The valley, known by the general name of Kakir, meaning a "hard, dry, sterile expanse of clay," is chequered with shallow self-contained basins of the usual type and has remarkably gentle slopes up to the mountains on both north and south. Its surface slopes from altitudes of 10,100 to 10,600 ft. in the west, where is the lake of Uzunshor (9650 ft.) to 9400 ft. in the east, in which direction it continues as far as the Anambaruin-ula (see below) and the plain or flat basin of Särtäng, a north extension of Tsaidam. This range of Akato-tagh, the Altun Range of Carey, is the same as that which on the map of the Russian general staff bears the name Chimen-tagh. Like the Astin-tagh it stretches towards the E.N.E., and, like it, appears to be built up of granite and schists, but its crest is greatly denuded, so that it is a mere crumbling skeleton protruding above the deep mantle of disintegrated material which masks its flanks. The slopes on both north and south are extremely gentle, but that on the south is eight to ten times as long as that on the north. In the east the range is mostly narrow, and dies away on the edge of the Tsaidam depression; but in the west it swells out into the lofty and imposing mass of the Ilve-chimen or Shia-manglay, which is capped with perpetual snow. This part of the range is crossed by the pass of Chopur-alik at an altitude of 16,160 ft., but farther east the passes lie at altitudes of 13,380 to 10,520 ft. The latitudinal valley that intervenes between the Akato-tagh and the next great range on the south, the Chimen-tagh, slopes for the most part eastwards, from 12,500 ft. down to the shallow salt lake of Ghaz-kol or Chimen-koli (9305 ft.). In the western part of this valley occurs the very important transverse water-divide of Gulcha-davan (14,150 ft.), which separates the basin of the Cherchen-darya that goes down into the Tarim basin from the area that drains down to the Ghaz-kol, which belongs to the Tsaidam depression. This, the Chimen valley, contains in places a good deal of drift-sand, which however is stationary in the mass and heaped up along the northern foot of the Chimen-tagh. Nevertheless the Akato-tagh is only of secondary importance in the general Kuen-lun system, being nothing more than a central ridge running along the broad Kakir valley that separates the Astin-tagh from the Chimen-tagh.

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[1] The Northern Mountains are the Pe-shan in the desert of Gobi (see Gobi).

[2] On the opposite or north side of the desert of Lop (desert of Gobi).

[3] Sven Hedin, *Scientific Results*, iii. 308.

[4] Ibid. 310–311.

The latter range, the *Chimen-tagh*, is identical in its western parts with the Piazlik-tagh and in the east must be equated with the Tsaidam chain of Przhevalsky; and it is probably continued westwards by the range which the Russian explorers call the Moscow Range or the Achik-tagh, running north of the Achik-kol and, according to Przhevalsky, connecting on the west with the Tokuz-davan. The Chimen-tagh rises into imposing summits, some rounded, some pyramidal in outline, which are capped with snow, though the snow melts in summer. This range acts as a "breakwater" to the clouds, arresting and condensing the moisture which is carried northwards by the south winds. Hence its slopes are not so arid as those of the Akato-tagh and the Astin-tagh. Snow falls all the year round on the Chimen-tagh, even in July, and water is abundant everywhere. The southern slope of the range is gentle but short, the northern slope long and steep. Grass is able to grow, and animal life is more abundant. The range is crossed by passes at 13,970, 13,230 and 13,760 ft., and the Piazlik-tagh by a pass at an altitude of 13,640 ft.

The next important range, still going south, is the *Kalta-alaghan*, Carey's Chimen-tagh Range, Przhevalsky's Columbus Range and the range which is variously designated (*e.g.* by Pyevtsov) as the Ambal-ashkan, Kalga-lagan and Ara-tagh. This last is, however, properly the name of a short secondary range which rises along the middle (*ara* = middle) of the valley between the Chimen-tagh and the Kalta-alaghan. Not only is it of lower elevation than them both, but it dies away towards the west, the valleys on each side of it meeting round its extremity to form one broad, open valley, with an altitude of 11,790 to 13,725 ft. The Ara-tagh is crossed by a pass at an altitude of 14,345 ft. In the Kalta-alaghan, which is the culminating range of this part of the Kuen-lun, and is overtopped by towering, snow-clad peaks, the passes climb to considerably higher altitudes, namely, 14,560, 14,470, 14,430 and 14,190 ft., while the pass of Avraz-davan ascends to 15,700 ft. This range appears to be linked on to the Tokuz-davan by the Muzluk-tagh, in which there are passes at 16,870 and 15,450 ft. It is possible however that the Muzluk-tagh belongs more intimately to the Chimen-tagh system, that is, to the Moscow or Achik-kol ranges. Indeed Bogdanovich considers that the Tokuz-davan, the Muzluk-tagh, the Moscow Range and the Chimen-tagh form one single closely connected chain, in which he also places Przhevalsky's isolated peak of Mount Kreml (15,055 ft.). Sven Hedin, whilst agreeing that this may possibly be the true conception, inclines to the view that the Achik-kol Range dies away towards the E., and that the Chimen-tagh and the Kalta-alaghan merge westwards into the border-ranges that lie north of the Muzluk-tagh and the Tokuz-davan. Unlike most of the other parallel ranges of N. Tibet, the Kalta-alaghan does not decrease, but it increases in elevation towards the east, where, like the Chimen-tagh, it abuts upon and merges in the ranges that border Tsaidam on the south.

Immediately south of the Kalta-alaghan comes a relatively deep depression, the *Kum-kol valley*, forming a very well-marked feature in the physical conformation of this region. It is crossed transversely by a water-divide which separates the basin of the twin-lakes of Kum-kol (12,700 ft.) from the basin of Tsaidam, some 3500 ft. lower. The floor of the valley consequently slopes away in both directions, like the Chimen valley between the Akato-tagh and the Chimen-tagh; and in so far as it slopes westwards towards the Kum-kol lakes it differs from nearly all the other great latitudinal valleys that run parallel with it, because they slope generally towards the east. Not far from the Kum-kol lakes there is a drift-sand area, though the dunes are stationary. The upper lake of Kum-kol (Chon-kum-kol) (12,730 ft.), which contains fresh water, is of small area (8 sq. m.) and in depth nowhere exceeds 13 ft.; but the lower lake (Ayak-kum-kol) (12,685 ft.), which is salt, is much bigger (283 sq. m.) and goes down to depths of 64 and 79 ft. Farther west, lying between the Muzluk-tagh and the Arka-tagh, is the lake of Achik-kol (13,940 ft.), 16½ m. broad and 50 m. in circuit.

The next great parallel range is the lofty and imposing *Arka-tagh*, the Przhevalsky Range of the Russian geographers, which has its eastward continuations in the Marco Polo Range (general altitude 15,750–16,250 ft.) and Gurbu-naiji Mountains of Przhevalsky. The Arka-tagh[1] is the true backbone of the Kuen-lun system, and in Central Asia is exceeded in elevation only by the Tang-la, a long way farther south, this last being probably an eastern wing of the Karakorum Mountains of the Pamirs region. At the same time the Arka-tagh is the actual border-range of the Tibetan plateau properly so-called; to the south of it none of the long succession of lofty parallel ranges which ridge the Tibetan highlands seems to have any connexion with the Kuen-lun system. Of great length, the Arka-tagh, which is a mountain-system rather than a range, varies greatly in configuration in different parts, sometimes exhibiting a sharply defined main crest, with several lower flanking ranges, and sometimes consisting of numerous parallel crests of nearly uniform altitude. Amongst these it is possible to distinguish in the middle of the system four predominant ranges, of which the second from the north is probably the principal range, though the fourth is the highest. The passes across the first range (north) lie at altitudes of 15,675, 16,420, 17,320 and 18,300 ft.; across the second at 16,830, 17,020, 17,070 and 17,220 ft.; across the third at 16,800, 16,660, 17,065, 17,830 and 17,880 ft.; and across the fourth at 16,540, 16,765, 16,780, 18,100 and 18,110 ft. The crests of the ranges lie comparatively little higher than the valleys which separate them, the altitudes in the latter running at 14,940 to 16,700 ft., if not higher, and being only 500 to 1000 ft. lower than the crests of the accompanying ranges. The Arka-tagh ranges do not culminate in lofty jagged, pinnacled peaks, but in broad rounded, flattened domes, a characteristic feature of the system throughout. These Arka-tagh mountains are built up, at all events superficially, of sand and powdery, finely sifted disintegrated material. Where the hard rock does crop out on the surface, it is so excessively weathered as to be with difficulty recognized as rock at all. The culminating summits of the ranges generally present the appearance of a flat, rounded swelling, and when they are crowned with glaciers, as many of them are, these shape themselves into what may be described as a mantle, a breastplate, or a flat cap, from which lappets and fringes project at intervals; nowhere do there exist any of the long, narrow, winding glacier tongues which are so characteristic of the Alps of Europe. But not the slightest indication has been discovered that these mountains were ever panoplied with ice. The process of disintegration and levelling down has reached such an advanced stage that, if ever there did exist evidences of former glaciation, they have now become entirely obliterated, even to the complete pulverization of the erratic blocks, supposing there were any. The view that meets the eye southwards from the heights of the Kalta-alaghan is the picture of a chaos of mountain chains, ridges, crests, peaks, spurs, detached masses, in fact, montane conformations of every possible description and in every possible arrangement. Immediately north of the Arka-tagh the country is studded with three or four exceptionally conspicuous and imposing detached mountain masses, all capped with snow and some of them carrying small glaciers. Amongst them are Shapka Monomakha or the Monk's Cap; the Chulak-akkan, which may however be only Shapka Monomakha seen from a different point of view; Tömürlik-tagh[2] (*i.e.* the Iron Mountain); and farther west, Ullugh-muz-tagh, which, according to Grenard, reaches an altitude of 24,140 ft. But the relations in which these detached mountain-masses stand to one another and to the Arka-tagh behind them have not yet been elucidated. In the vicinity of the Ullugh-muz-tagh there exist numerous indications of former volcanic activity, the eminences and summits frequently being capped with tuff, and smaller fragments of tuff are scattered over other parts of the Arka-tagh ranges.

The next succeeding parallel range, the *Koko-shili*, which is continued eastwards by the Bayan-khara-ula, between the upper headstreams of the Hwang-ho or Yellow River and the Yangtsze-kiang, belongs orographically to the plateau of Tibet.

The succession of ranges which follow one another from the deserts of Takla-makan and Gobi up to the plateau proper of Tibet rise in steps or terraces, each range being higher than the range to the north of it and lower than the range to the south of it. The difference in altitude between the lowest, most northerly range, the Lower Astin-tagh, and the most southerly of the Arka-tagh ranges amounts to nearly 7500 ft. With one exception, namely the climb out of the Kum-kol valley to the Arka-tagh, the first three steps are individually the biggest; whereas the Upper Astin-tagh exceeds the Lower Astin-tagh by an altitude of some 1350 ft., it is itself exceeded by the Akato-tagh to the extent of 1760 ft. There is also a considerable rise of 880 ft. from the Akato-tagh to the Chimen-tagh. But between the Chimen-tagh, the Ara-tagh and the Kalta-alaghan there is comparatively little difference in point of elevation, namely, 730 ft. in all. The biggest ascent is that from the Kalta-alaghan to the Arka-tagh, namely, nearly 1850 ft. The ranges of the Arka-tagh, again, run at pretty nearly the same absolute general altitudes, namely, 16,470 to 17,260 ft. When the altitudes of the intermont latitudinal valleys are compared, the significance orographically of the Chimen valley and of the Kum-kol valley is strikingly emphasized. Both are much more deeply excavated than all the other latitudinal valleys that run parallel to them, the Chimen valley being 875 ft. above the valley to the north of it, but no less than 2235 ft. below the valley to the south of it. The case of the Kum-kol valley is altogether exceptional, for it lies not higher, but 680 ft. lower, than the valley to the north of it, and consequently the climb up out of it to the first (on north) of the Arka-tagh valleys amounts to no less than 2900 ft. Hence these ten parallel ranges of the middle Kuen-lun system may be grouped in three divisions—(1) the more strictly border ranges of the Upper and Lower Astin-tagh and the Akato-tagh; (2) the three ranges of Chimen-tagh, Ara-tagh and Kalta-alaghan, which may be considered as forming a transitional system between the foregoing and the third division; (3) the Arka-tagh, which constitute the elevated rampart of the Tibetan plateau proper. (J. T. Be.)

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[1] This is the correct form, Arka-tagh meaning the Farther or Remoter Mountains. The form Akka-tagh is incorrect.

[2] The form Tumenlik-tagh is erroneous.

The *Nan-shan Highlands* overlook Tsaidam on the N.E. They embrace a region 380 m. long and 260 m. wide, entirely occupied with parallel mountain ranges all running from the N.W. to the S.E. Broad, flat, longitudinal valleys, at altitudes of 12,000 to 14,000 ft. (9000 to 10,000 at the south-western border) and dotted with lakes (Koko-nor, 9970 ft.; Khara-nor, 13,285 ft.), fill up the space between these mountain ranges. In the S.E. the Nan-shan highlands abut upon the highlands of the Chinese province of Kan-suh, and near the great northward bend of the Hwang-ho they meet the escarpments by which the Great Khingan and the In-shan ranges are continued, and by which the Mongolian plateau steps down to the lowlands of China. On the N.E. the Nan-shan highlands have their foot on the Mongolian plateau (average altitude, 4000 ft.), *i.e.* in the Ala-shan. On the N.W. they are fringed by a border range, the Da-sue-shan, a continuation of the Astin-tagh, which rises to 12,200–13,000 ft. in its passes, and is pierced by several rivers flowing west to Lake Khala-chi or Khara-nor. This border-range, which continues on to the 97th meridian, separates the Nan-shan range from the Pe-shan range.

On the S.W. the Nan-shan mountains consist of short irregular chains, separated by broad plains, dotted with lakes, which differ but slightly in altitude from Tsaidam (8800–9000 ft.). Next a succession of narrow ranges intervene between this lower border terrace and the higher terrace (12,000–13,500 ft.). The first mountain range on this higher terrace is Ritter's range, covered in part with extensive snow-fields. The passes at both ends of this snow-clad *massif* lie at altitudes of 15,990 ft. and 14,680 ft. The next range is Humboldt or Ama-surgu range, which runs N.W. to S.E. from the Astin-tagh to about 38° N., and is perhaps continued by the southern Kuku (Koko)-nor range, which strikes the Hwang-ho with an elevation of 7440 ft. It includes, in fact, several other parallel ranges—*e.g.* the Mushketov, Semenov, Suess, Alexander III., Bain-sarlyk—the mutual relations of which are, however, not yet definitely settled.

Small lateral chains of mountains, rising some 2000 ft. above the general level of that plateau, connect the central Nan-shan with the next parallel ranges, namely, those of the eastern Nan-shan. The mutual relations of the latter, as well as the names of the several constituent chains, are equally unsettled. Thus, one of them is named indiscriminately Nan-shan, Richthofen Range and Momo-shan. In fact, the region is dominated by three ranges of nearly equal altitude, all lifting many of their peaks above the snow-line. Finally, there is a range of mountains, about 10,000 ft. high, named Lung-shan by Obruchev, which borders the Kan-chow and Lian-chow valley on the N.E., and belongs to the Nan-shan system. But the string of oases in Kan-suh province, which stretches between the towns named, lies on the lower level of the Mongolian plateau (4000 to 5000 ft.), so that the Lung-shan ought possibly to be regarded as a continuation of the Pe-shan mountains of the Gobi.

Generally speaking, the Nan-shan highlands are a region raised 12,000 to 14,000 ft. above the sea, and intersected by wild, stony and partly snow-clad mountains, towering another 4000 to 7000 ft. above its surface, and arranged in narrow parallel chains all running N.W. to S.E. The chains of mountains are severally from 8 to 17 m. wide, seldom as much as 35, while the broad, flat valleys between them attain widths of 20 to 27 m. As a rule the passes are at an altitude of 12,000 to 14,000 ft., and the peaks reach 18,000 to 20,000 ft. in the western portion of the highlands, while in the eastern portion they may be about 2000 ft. lower. The glaciers also attain a greater development in the western portion of the Nan-shan, but the valleys are dry, and the slopes of both the mountains and the valleys, furrowed by deep ravines, are devoid of vegetation. Good pasture grounds are only found near the streams. The soil is dry gravel and clay, upon which bushes of *Ephedra*, *Nitraria* and *Salsolaceae* grow sparsely. In the north-eastern Nan-shan, on the contrary, a stream runs through each gorge, and both the mountain slopes and the bottoms of the valleys are covered with vegetation. Forests of conifers (*Picea obovata*) and deciduous trees—Przhevalsky's poplar, birch, mountain ash, &c., and a variety of bushes—are common everywhere. Higher up, in the picturesque gorges, grow rhododendrons, willows, *Potentilla fruticosa*, *Spriaeae*, *Lonicereae*, &c., and the rains must evidently be more copious and better distributed. In the central Nan-shan it is only the north-eastern slopes that bear forests. In the south, where the Nan-shan enters Kan-suh province, extensive accumulations of loess make their appearance, and it is only the northern slopes of the hills that are clothed with trees. (P. A. K.)

AUTHORITIES.—An enumeration of the works published before 1890, and a map of itineraries, will be found in Wegener's *Versuch einer Orographie des Kuen-lun* (Marburg, 1891), but his map is only approximately correct. Of the books published since 1890 the most important are Sven Hedin's *Scientific Results of a Journey in Central Asia, 1899–1902* (Stockholm, 1905–1907, 6 vols.), with an elaborate atlas and a general map of Tibet on the scale of 1 : 1,000,000; H. H. P. Deasy's *In Tibet and Chinese Turkestan* (London, 1901), with a good map; F. Grenard's vol. (iii.) of J. L. Dutreuil de Rhins's *Mission scientifique dans la haute Asie, 1890–1895* (n.p., 1897), also with a very useful map; W. W. Rockhill's *Diary of a Journey through Mongolia and Tibet in 1891 and 1892* (Washington, 1894); M. S. Wellby's *Through Unknown Tibet* (London, 1898); P. G. Bonvalot's *De Paris au Tonkin à travers le Tibet inconnu* (Paris, 1892); St G. R. Littledale's "A Journey across Tibet," in *Geog. Journal* (May 1896); H. Bower's *Diary of a Journey across Tibet* (London, 1894); the *Izvestia* of the Russian Geog. Soc. and *Geog. Journal*, both *passim*.

KUFA, a Moslem city, situated on the shore of the Hindieh canal, about 4 m. E. by N. of Nejef (32° 4′ N., 44° 20′ E.), was founded by the Arabs after the battle of Kadesiya in A.D. 638 as one of the two capitals of the new territory of Irak, the whole country being divided into the *sawads*, or districts, of Basra and Kufa. The caliph ʿAli made it his residence and the capital of his caliphate. After the removal of the capital to Bagdad, in the middle of the following century, Kufa lost its importance and began to fall into decay. At the beginning of the 19th century, travellers reported extensive and important ruins as marking the ancient site. Since that time the ruins have served as quarries for bricks for the building of Nejef, and at the present time little remains but holes in the ground, representing excavations for bricks, with broken fragments of brick and glass strewn over a considerable area. A mosque still stands on the spot where ʿAli is reputed to have worshipped. (For history see CALIPHATE.)

KUHN, FRANZ FELIX ADALBERT (1812–1881), German philologist and folklorist, was born at Königsberg in Neumark on the 19th of November 1812. From 1841 he was connected with the Köllnisches Gymnasium at Berlin, of which he was appointed director in 1870. He died at Berlin on the 5th of May 1881. Kuhn was the founder of a new school of comparative mythology, based upon comparative philology. Inspired by Grimm's *Deutsche Mythologie*, he first devoted himself to German stories and legends, and published *Märkische Sagen und Märchen* (1842), *Norddeutsche Sagen, Märchen und Gebräuche* (1848), and *Sagen, Gebräuche und Märchen aus Westfalen* (1859). But it is on his researches into the language and history of the Indo-Germanic peoples as a whole that his reputation is founded. His chief works in this connexion are : *Zur ältesten Geschichte der Indogermanischen Völker* (1845), in which he endeavoured to give an account of the earliest civilization of the Indo-Germanic peoples before their separation into different families, by comparing and analysing the original meaning of the words and stems common to the different languages; *Die Herabkunft des Feuers und des Göttertranks* (1859; new ed. by E. Kuhn, under title of *Mythologische Studien*, 1886); and *Über Entwicklungsstufen der Mythenbildung* (1873), in which he maintained that the origin of myths was to be looked for in the domain of language, and that their most essential factors were polyonymy and homonymy. The *Zeitschrift für vergleichende Sprachforschung auf dem Gebiete der Indogermanischen Sprachen*, with which he was intimately connected, is the standard periodical on the subject.

See obituary notice by C. Bruchmann in Bursian's *Biographisches Jahrbuch* (1881) and J. Schmidt in the above *Zeitschrift*, xxvi. n.s. 6.

KÜHNE, WILLY (1837–1900), German physiologist, was born at Hamburg on the 28th of March 1837. After attending the gymnasium at Lüneburg, he went to Göttingen, where his master in chemistry was F. Wöhler and in physiology R. Wagner. Having graduated in 1856, he studied under various famous physiologists, including E. Du Bois-Reymond at Berlin, Claude Bernard in Paris, and K. F. W. Ludwig and E. W. Brücke in Vienna. At the end of 1863 he was put in charge of the chemical department of the pathological laboratory at Berlin, under R. von Virchow; in 1868 he was appointed professor of physiology at Amsterdam; and in 1871 he was chosen to succeed H. von Helmholtz in the same capacity at Heidelberg, where he died on the 10th of June 1900. His original work falls into two main groups—the physiology of muscle and nerve, which occupied the earlier years of his life, and the chemistry of digestion, which he began to investigate while at Berlin with Virchow. He was also known for his researches on vision and the chemical changes occurring in the retina under the influence of light. The visual purple, described by Franz Boll in 1876, he attempted to make the basis of a photochemical theory of vision, but though he was able to establish its importance in connexion with vision in light of low intensity, its absence from the retinal area of most distinct vision detracted from the completeness of the theory and precluded its general acceptance.

KUKA, or KUKAWA, a town of Bornu, a Mahommedan state of the central Sudan, incorporated in the British protectorate of Nigeria (see BORNU). Kuka is situated in 12° 55′ N. and 13° 34′ E., 4½ m. from the western shores of Lake Chad, in the midst of an extensive plain. It is the headquarters of the British administration in Bornu, and was formerly the residence of the native sovereign, who in Bornu bears the title of shehu.

The modern town of Kuka was founded *c.* 1810 by Sheikh Mahommed al Amin al Kanemi, the deliverer of Bornu from the Fula invaders. It is supposed to have received its name from the *kuka* or monkey bread tree (*Adansonia digitata*), of which there are extensive plantations in the neighbourhood. Kuka or Kaoukaou was a common name in the Sudan in the middle ages. The number of towns of this name gave occasion for much geographical confusion, but Idrisi writing in the 12th century, and Ibn Khaldun in the 14th century, both mention two important towns called Kaou Kaou, of which one would seem to have occupied a position very near to that of the modern Kuka. Ibn Khaldun speaks of it as the capital of Bornu and as situated on the meridian of Tripoli. In 1840 the present town was laid waste by Mahommed Sherif, the sultan of Wadai; and when it was restored by Sheikh Omar he built two towns separated by more than half a mile of open country, each town being surrounded by walls of white clay. It was probably owing to there being two towns that the plural *Kukawa* became the ordinary designation of the town in Kano and throughout the Sudan, though the inhabitants used the singular *Kuka*. The town became wealthy and populous (containing some 60,000 inhabitants), being a centre for caravans to Tripoli and a stopping-place of pilgrims from the Hausa countries going across Africa to Mecca. The chief building was the great palace of the sheikh. Between 1823 and 1872 Kuka was visited by several English and German travellers. In 1893 Bornu was seized by the ex-slave Rabah (*q.v.*), an adventurer from the Bahr-el-Ghazal, who chose a new capital, Dikwa, Kuka falling into complete decay. The town was found in ruins in 1902 by the British expedition which replaced on the throne of Bornu a descendant of the ancient rulers. In the same year the rebuilding of Kuka was begun and the town speedily regained part of its former importance. It is now one of the principal British stations of eastern Bornu. Owing, however, to the increasing importance of Maidugari, a town 80 m. S. S. W. of Kuka, the court of the shehu was removed thither in 1908.

For an account of Kuka before its destruction by Rabah, see the *Travels* of Heinrich Barth (new ed., London, 1890); and *Sahara und Sudan*, by Gustav Nachtigal (Berlin, 1879), i. 581–748.

KU KLUX KLAN, the name of an American secret association of Southern whites united for self-protection and to oppose the Reconstruction measures of the United States Congress, 1865–1876. The name is generally applied not only to the order of Ku Klux Klan, but to other similar societies that existed at the same time, such as the Knights of the White Camelia, a larger order than the Klan; the White Brotherhood; the White League; Pale Faces; Constitutional Union Guards; Black Cavalry; White Rose; The '76 Association; and hundreds of smaller societies that sprang up in the South after the Civil War. The object was to protect the whites during the disorders that followed the Civil War, and to oppose the policy of the North towards the South, and the result of the whole movement was a more or less successful revolution against the Reconstruction and an overthrow of the governments based on negro suffrage. It may be compared in some degree to such European societies as the Carbonara, Young Italy, the Tugendbund, the Confréries of France, the Freemasons in Catholic countries, and the Vehmgericht.

The most important orders were the Ku Klux Klan and the Knights of the White Camelia. The former began in 1865 in Pulaski, Tennessee, as a social club of young men. It had an absurd ritual and a strange uniform. The members accidentally discovered that the fear of it had a great influence over the lawless but superstitious blacks, and soon the club expanded into a great federation of regulators, absorbing numerous local bodies that had been formed in the absence of civil law and partaking of the nature of the old English neighbourhood police and the ante-bellum slave patrol. The White Camelia was formed in 1867 in Louisiana and rapidly spread over the states of the late Confederacy. The period of organization and development of the Ku Klux movement was from 1865 to 1868; the period of greatest activity was from 1868 to 1870, after which came the decline.

The various causes assigned for the origin and development of this movement were: the absence of stable government in the South for several years after the Civil War; the corrupt and tyrannical rule of the alien, renegade and negro, and the belief that it was supported by the Federal troops which controlled elections and legislative bodies; the disfranchisement of whites; the spread of ideas of social and political equality among the negroes; fear of negro insurrections; the arming of negro militia and the disarming of the whites; outrages upon white women by black men; the influence of Northern adventurers in the Freedmen's Bureau (*q.v.*) and the Union League (*q.v.*) in alienating the races; the humiliation of Confederate soldiers after they had been paroled—in general, the insecurity felt by Southern whites during the decade after the collapse of the Confederacy.

In organization the Klan was modelled after the Federal Union. Its Prescript or constitution, adopted in 1867, and revised in 1868, provided for the following organization: The entire South was the Invisible Empire under a Grand Wizard, General N. B. Forrest; each state was a Realm under a Grand Dragon; several counties formed a Dominion under a Grand Titan; each county was a Province under a Grand Giant; the smallest division being a Den under a Grand Cyclops. The staff officers bore similar titles, relics of the time when the order existed only for amusement: Genii, Hydras, Furies, Goblins, Night Hawks, Magi, Monks and Turks. The private members were called Ghouls. The Klan was twice reorganized, in 1867 and in 1868, each time being more centralized; in 1869 the central organization was disbanded and the order then gradually declined. The White Camelia with a similar history had a similar organization, without the queer titles. Its members were called Brothers and Knights, and its officials Commanders.

The constitutions and rituals of these secret orders have declarations of principles, of which the following are characteristic: to protect and succour the weak and unfortunate, especially the widows and orphans of Confederate soldiers; to protect members of the white race in life, honour and property from the encroachments of the blacks; to oppose the Radical Republican party and the Union League; to defend constitutional liberty, to prevent usurpation, emancipate the whites, maintain peace and order, the laws of God, the principles of 1776, and the political and social supremacy of the white race—in short, to oppose African influence in government and society, and to prevent any intermingling of the races.

During the Reconstruction the people of the South were divided thus: nearly all native whites (the most prominent of whom were disfranchised) on one side irrespective of former political faith, and on the other side the ex-slaves organized and led by a few native and Northern whites called respectively scalawags and carpet-baggers, who were supported by the United States government and who controlled the Southern state governments. The Ku Klux movement in its wider aspects was the effort of the first class to destroy the control of the second class. To control the negro the Klan played upon his superstitious fears by having night patrols, parades and drills of silent horsemen covered with white sheets, carrying skulls with coals of fire for eyes, sacks of bones to rattle, and wearing hideous masks. In calling upon dangerous blacks at night they pretended to be the spirits of dead Confederates, "just from Hell," and to quench their thirst would pretend to drink gallons of water which was poured into rubber sacks concealed under their robes. Mysterious signs and warnings were sent to disorderly negro politicians. The whites who were responsible for the conduct of the blacks were warned or driven away by social and business ostracism or by violence. Nearly all southern whites (except "scalawags"), whether members of the secret societies or not, in some way took part in the Ku Klux movement. As the work of the societies succeeded, they gradually passed out of existence. In some communities they fell into the control of violent men and became simply bands of outlaws, dangerous even to the former members; and the anarchical aspects of the movement excited the North to vigorous condemnation.[1] The United States Congress in 1871–1872 enacted a series of "Force Laws" intended to break up the secret societies and to control the Southern elections. Several hundred arrests were made, and a few convictions were secured. The elections were controlled for a few years, and violence was checked, but the Ku Klux movement went on until it accomplished its object by giving protection to the whites, reducing the blacks to order, replacing the whites in control of society and state, expelling the worst of the carpet-baggers and scalawags, and nullifying those laws of Congress which had resulted in placing the Southern whites under the control of a party composed principally of ex-slaves.

AUTHORITIES.—J. C. Lester and D. L. Wilson, *Ku Klux Klan* (New York, 1905); W. L. Fleming, *Civil War and Reconstruction in Alabama* (New York, 1905), and *Documentary History of Reconstruction* (Cleveland, 1906); J. W. Garner, *Reconstruction in Mississippi* (New York, 1901); W. G. Brown, *Lower South in American History* (New York, 1901); J. M. Beard, *Ku Klux Sketches* (Philadelphia, 1876); J. W. Burgess, *Reconstruction and the Constitution* (New York, 1901). (W. L. F.)

KUKU KHOTO (Chinese *Kwei-hwa*), a city of the Chinese province of Shan-si, situated to the north of the Great Wall, in 40° 50′ N. and 111° 45′ E., about 160 m. W. of Kalgan. It lies in the valley of a small river which joins the Hwang-ho 50 m. to the south. There are two distinct walled towns in Kuku Khoto, at an interval of a mile and a half; the one is the seat of the civil governor and is surrounded by the trading town, and the other is the seat of the military governor, and stands in the open country. In the first or old town more especially there are strong traces of western Asiatic influence; the houses are not in the Chinese style, being built all round with brick or stone and having flat roofs, while a large number of the people are still Mahommedans and, there is little doubt, descended from western settlers. The town at the same time is a great seat of Buddhism—the lamaseries containing, it is said, no less than 20,000 persons devoted to a religious life. As the southern terminus of the routes across the desert of Gobi from Ulyasutai and the Tian Shan, Kuku Khoto is a great mart for the exchange of flour, millet and manufactured goods for the raw products of Mongolia. A Catholic and a Protestant mission are maintained in the town. Lieut. Watts-Jones, R.E., was murdered at Kwei-hwa during the Boxer outbreak in 1900.

Early notices of Kuku Khoto will be found in Gerbillon (1688–1698, in Du Halde (vol. ii., Eng. ed.), and in Astley's *Collection* (vol. iv.)

KULJA (Chinese, *Ili-ho*), a territory in north-west China; bounded, according to the treaty of St Petersburg of 1881, on the W. by the Semiryechensk province of Russian Turkestan, on the N. by the Boro-khoro Mountains, and on the S. by the mountains Khan-tengri, Muz-art, Terskei, Eshik-bashi and Narat. It comprises the valleys of the Tekez (middle and lower portion), Kunghez, the Ili as far as the Russian frontier and its tributary, the Kash, with the slopes of the mountains turned towards these rivers. Its area occupies about 19,000 sq. m. (Grum-Grzimailo). The valley of the Kash is about 160 m. long, and is cultivated in its lower parts, while the Boro-khoro Mountains are snow-clad in their eastern portion, and fall with very steep slopes to the valley. The Avral Mountains, which separate the Kash from the Kunghez, are lower, but rocky, naked and difficult of access. The valley of the Kunghez is about 120 m. long; the river flows first in a gorge, then amidst thickets of rushes, and very small portions of its valley are fit for cultivation. The Narat Mountains in the south are also very wild, but are covered with forests of deciduous trees (apple tree, apricot tree, birch, poplar, &c.) and pine trees. The Tekez flows in the mountains, and pierces narrow gorges. The mountains which separate it from the Kunghez are also snow-clad, while those to the south of it reach 24,000 ft. of altitude in Khan-tengri, and are covered with snow and glaciers—the only pass through them being the Muzart. Forests and alpine meadows cover their northern slopes. Agriculture was formerly developed on the Tekez, as is testified by old irrigation canals. The Ili is formed by the junction of the Kunghez with the Tekez, and for 120 m. it flows through Kulja, its valley reaching a width of 50 m. at Horgos-koljat. This valley is famed for its fertility, and is admirably irrigated by canals, part of which, however, fell into decay after 55,000 of the inhabitants migrated to Russian territory in 1881. The climate of this part of the valley is, of course, continental—frosts of − 22° F. and heats of 170° F. being experienced—but snow lasts only for one and a half months, and the summer heat is tempered by the proximity of the high mountains. Apricots, peaches, pears and some vines are grown, as also some cotton-trees near the town of Kulja, where the average yearly temperature is 48°·5 F. (January 15°, July 77°). Barley is grown up to an altitude of 6500 ft.

The population may number about 125,000, of whom 75,000 are settled and about 50,000 nomads (Grum-Grzimailo). The Taranchis from East Turkestan represent about 40 % of the population; about 40,000 of them left Kulja when the Russian troops evacuated the territory, and the Chinese government sent some 8000 families from different towns of Kashgaria to take their place. There are, besides, about 20,000 Sibos and Solons, 3500 Kara-kidans, a few Dungans, and more than 10,000 Chinese. The nomads are represented by about 18,000 Kalmucks, and the remainder by Kirghiz. Agriculture is insufficient to satisfy the needs of the population, and food is imported from Semiryechensk. Excellent beds of coal are found in different places, especially about Kulja, but the fairly rich copper ores and silver ores have ceased to be worked.

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[1] The judgment of the historian William Garrott Brown, himself a Southerner, is worth quoting: "That violence was often used cannot be denied. Negroes were often whipped, and so were carpet-baggers. The incidents related in such stories as Tourgée's *A Fool's Errand* all have their counterparts in the testimony before congressional committees and courts of law. In some cases, after repeated warnings, men were dragged from their beds and slain by persons in disguise, and the courts were unable to find or to convict the murderers. Survivors of the orders affirm that such work was done in most cases by persons not connected with them or acting under their authority. It is impossible to prove or disprove their statements. When such outrages were committed, not on worthless adventurers, who had no station in the Northern communities from which they came, but on cultivated persons who had gone South from genuinely philanthropic motives—no matter how unwisely or tactlessly they went about their work—the natural effect was to horrify and enrage the North."

The chief towns are Suidun, capital of the province, and Kulja. The latter (Old Kulja) is on the Ili river. It is one of the chief cities of the region, owing to the importance of its bazaars, and is the seat of the Russian consul and a telegraph station. The walled town is nearly square, each side being about a mile in length; and the walls are not only 30 ft. high but broad enough on the top to serve as a carriage drive. Two broad streets cut the enclosed area into four nearly equal sections. Since 1870 a Russian suburb has been laid out on a wide scale. The houses of Kulja are almost all clay-built and flat-roofed, and except in the special Chinese quarter in the eastern end of the town only a few public buildings show the influence of Chinese architecture. Of these the most noteworthy are the Taranchi and Dungan mosques, both with turned-up roofs, and the latter with a pagoda-looking minaret. The population is mainly Mahommedan, and there are only two Buddhist pagodas. A small Chinese Roman Catholic church has maintained its existence through all the vicissitudes of modern times. Paper and vermicelli are manufactured with rude appliances in the town. The outskirts are richly cultivated with wheat, barley, lucerne and poppies. Schuyler estimated the population, which includes Taranchis, Dungans, Sarts, Chinese, Kalmucks and Russians, at 10,000 in 1873; it has since increased.

New Kulja, Manchu Kulja, or Ili, which lies lower down the valley on the same side of the stream, has been a pile of ruins since the terrible massacre of all its inhabitants by the insurgent Dungans in 1868. It was previously the seat of the Chinese government for the province, with a large penal establishment and strong garrison; its population was about 70,000.

History.—Two centuries B.C. the region was occupied by the fair and blue-eyed Ussuns, who were driven away in the 6th century of our era by the northern Huns. Later the Kulja territory became a dependency of Dzungaria. The Uighurs, and in the 12th century the Kara-Khitai, took possession of it in turn. Jenghiz Khan conquered Kulja in the 13th century, and the Mongol Khans resided in the valley of the Ili. It is supposed (Grum-Grzimailo) that the Oirads conquered it at the end of the 16th or the beginning of the 17th century; they kept it till 1755, when the Chinese annexed it. During the insurrection of 1864 the Dungans and the Taranchis formed here the Taranchi sultanate, and this led to the occupation of Kulja by the Russians in 1871. Ten years later the territory was restored to China.

KULM (**Culm**). (1) A town of Germany, in the province of West Prussia, 33 m. by rail N.W. of Thorn, on an elevation above the plain, and 1 m. E. of the Vistula. Pop. (1905), 11,665. It is surrounded by old walls, dating from the 13th century, and contains some interesting buildings, notably its churches, of which two are Roman Catholic and two Protestant, and its medieval town-hall. The cadet school, founded here in 1776 by Frederick the Great, was removed to Köslin in 1890. There are large oil mills, also iron foundries and machine shops, as well as an important trade in agricultural produce, including fruit and vegetables. Kulm gives name to the oldest bishopric in Prussia, although the bishop resides at Pelplin. It was presented about 1220 by Duke Conrad of Masovia to the bishop of Prussia. Frederick II. pledged it in 1226 to the Teutonic order, to whom it owes its early development. By the second peace of Thorn in 1466 it passed to Poland, and it was annexed to Prussia in 1772. It joined the Hanseatic League, and used to carry on very extensive manufactures of cloth.

(2) A village of Bohemia about 3 m. N.E. of Teplitz, at the foot of the Erzgebirge, celebrated as the scene of a battle in which the French were defeated by the Austrians, Prussians and Russians on the 29th and 30th of August 1813 (see Napoleonic Campaigns).

KULMBACH, or Culmbach, a town of Germany, in the Bavarian province of Upper Franconia, picturesquely situated on the Weisser Main, and the Munich-Bamberg-Hof railway, 11 m. N.W. from Bayreuth. Pop. (1900), 9428. It contains a Roman Catholic and three Protestant churches, a museum and several schools. The town has several linen manufactories and a large cotton spinnery, but is chiefly famed for its many extensive breweries, which mainly produce a black beer, not unlike English porter, which is largely exported. Connected with these are malting and bottling works. On a rocky eminence, 1300 ft. in height, to the south-east of the town stands the former fortress of Plassenburg, during the 14th and 15th centuries the residence of the margraves of Bayreuth, called also margraves of Brandenburg-Kulmbach. It was dismantled in 1807, and is now used as a prison. Kulmbach and Plassenburg belonged to the dukes of Meran, and then to the counts of Orlamunde, from whom they passed in the 14th century to the Hohenzollerns, burgraves of Nuremberg, and thus to the margraves of Bayreuth.

See F. Stein, *Kulmbach und die Plassenburg in alter und neuer Zeit* (Kulmbach, 1903); Huther, *Kulmbach und Umgebung* (Kulmbach, 1886); and C. Meyer, *Quellen zur Geschichte der Stadt Kulmbach* (Munich, 1895).

KULMSEE, a town of Germany, in the Prussian province of West Prussia, on a lake, 14 m. by rail N. of Thorn and at the junction of railways to Bromberg and Marienburg. Pop. (1900), 8987. It has a fine Roman Catholic cathedral, which was built in the 13th, and restored in the 15th century, and an Evangelical church. Until 1823 the town was the seat of the bishops of Kulm.

KULP, a town of Russian Transcaucasia, in the government of Erivan, 60 m. W.S.W. from the town of Erivan and 2 m. S. of the Aras river. Pop. (1897), 3074. Close by is the Kulp salt mountain, about 1000 ft. high, consisting of beds of clay intermingled with thick deposits of rock salt, which has been worked from time immemorial. Regular galleries are cut in the transparent, horizontal salt layers, from which cubes of about 70 ℔ weight are extracted, to the amount of 27,500 tons every year.

KULU, a subdivision of Kangra district, Punjab, British India, which nominally includes the two Himalayan cantons or *waziris* of Lahul and Spiti. The *tahsil* of Kulu has an area of 1054 sq. m., of which only 60 sq. m. are cultivated; pop. (1901), 68,954. The Sainj, which joins the Beas at Largi, divides the tract into two portions, Kulu proper and Soraj. Kulu proper, north of the Sainj, together with inner Soraj, forms a great basin or depression in the midst of the Himalayan system, having the narrow gorge of the Beas at Largi as the only outlet for its waters. North and east the Bara Bangahal and mid-Himalayan ranges rise to a mean elevation of 18,000 ft., while southward the Jalori and Dhaoladhar ridges attain a height of 11,000 ft. The higher villages stand 9000 ft. above the sea; and even the cultivated tracts have probably an average elevation of 5000 ft. The houses consist of four-storeyed châlets in little groups, huddled closely together on the ledges or slopes of the valleys, picturesquely built with projecting eaves and carved wooden verandas. The Beas, which, with its tributaries, drains the entire basin, rises at the crest of the Rohtang pass, 13,326 ft. above the sea, and has an average fall of 125 ft. per mile. Its course presents a succession of magnificent scenery, including cataracts, gorges, precipitous cliffs, and mountains clad with forests of deodar, towering above the tiers of pine on the lower rocky ledges. It is crossed by several suspension bridges. Great mineral wealth exists, but the difficulty of transport and labour prevents its development. Hot springs occur at three localities, much resorted to as places of pilgrimage. The character of the hillmen resembles that of most other mountaineers in its mixture of simplicity, independence and superstition. Tibetan polyandry still prevails in Soraj, but has almost died out elsewhere. The temples are dedicated rather to local deities than to the greater gods of the Hindu pantheon. Kulu is an ancient Rajput principality, which was conquered by Ranjit Singh about 1812. Its hereditary ruler, with the title of rai, is now recognized by the British government as *jagirdar* of Rupi.

KUM, a small province in Persia, between Teheran on the N. and Kashan on the S. It is divided into seven *bulūk* (districts): (1) Humeh, with town; (2) Kumrud; (3) Vazkerud; (4) Kinar Rud Khaneh; (5) Kuhistan; (6) Jasb; (7) Ardahal; has a population of 45,000 to 50,000, and pays a yearly revenue of about £8000. The province produces much grain and a fine quality of cotton with a very long staple.

Kum, the capital, in 34° 39′ N. and 50° 55′ E., on the Anarbar river, which rises near Khunsar, has an elevation of 3100 ft. It owes much of its importance to the fact that it contains the tomb of Imam Reza's sister Fatmeh, who died there A.D. 816, and large numbers of pilgrims visit the city during six or seven months of the year. The fixed population is between 25,000 and 30,000. A carriage road 92 m. in length, constructed in 1890–1893, connects the city with Teheran. It has post and telegraph offices.

See *Eastern Persian Irak*, R. G. S. suppl. (London, 1896).

KUMAIT IBN ZAID (679–743), Arabian poet, was born in the reign of the first Omayyad caliph and lived in the reigns of nine others. He was, however, a strong supporter of the house of Hāshim and an enemy of the South Arabians. He was imprisoned by the caliph Hishām for his verse in praise of the Hāshimites, but escaped by the help of his wife and was pardoned by the intercession of the caliph's son Maslama. Taking part in a rebellion, he was killed by the troops of Khālid ul-Qasrī.

His poems, the *Hāshimīyyāt*, have been edited by J. Horovitz (Leiden, 1904). An account of him is contained in the *Kitāb ul-Aghānī*, xv. 113–130. (G. W. T.)

KUMAON, or Kumaun, an administrative division of British India, in the United Provinces, with headquarters at Naini Tal. It consists of a large Himalayan tract, together with two submontane strips called the Tarai and the Bhabhar; area 13,725 sq. m.; pop. (1901), 1,207,030, showing an increase of less than 2% in the decade. The submontane strips were up to 1850 an almost impenetrable forest, given up to wild animals; but since then the numerous clearings have attracted a large population from the hills, who cultivate the rich soil during the hot and cold seasons, returning to the hills in the rains. The rest of Kumaon is a maze of mountains, some of which are among the loftiest known. In a tract not more than 140 m. in length and 40 m. in breadth there are over thirty peaks rising to elevations exceeding 18,000 ft. (see Himalaya). The rivers rise chiefly in the southern slope of the Tibetan watershed north of the loftiest peaks, amongst which they make their way down valleys of rapid declivity and extraordinary depth. The principal are the Sarda (Kali), the Pindar and Kailganga, whose waters join the Alaknanda. The valuable timber of the yet uncleared forest tracts is now under official supervision. The chief trees are the *chir*, or three-leaved Himalayan pine, the cypress, fir, alder, *sāl* or iron-wood, and *saindan*. Limestone, sandstone, slate, gneiss and granite constitute the principal geological formations. Mines of iron, copper, gypsum, lead and asbestos exist; but they are not thoroughly worked. Except in the submontane strips and deep valleys the climate is mild. The rainfall of the outer Himalayan range, which is first struck by the monsoon, is double that of the central hills, in the average proportion of 80 in. to 40. No winter passes without snow on the higher ridges, and in some years it is universal throughout the mountain tract. Frosts, especially in the valleys, are often severe. Kumaon is occasionally visited by epidemic cholera. Leprosy is most prevalent in the east of the district. Goitre and cretinism afflict a small proportion of the inhabitants. The hill fevers at times exhibit the rapid and malignant features of plague.

In 1891 the division was composed of the three districts of Kumaon, Garhwal and the Tarai; but the two districts of Kumaon and the Tarai were subsequently redistributed and renamed after their headquarters, Naini Tal and Almora. Kumaon proper constituted an old Rajput principality, which became extinct at the beginning of the 19th century. The country was annexed after the Gurkha war of 1815, and was governed for seventy years on the non-regulation system by three most successful administrators—Mr Traill, Mr J. H. Batten and Sir Henry Ramsay.

KUMASI, or Coomassie, the capital of Ashanti, British West Africa, in 6° 34′ 50″ N., 2° 12′ W., 168 m. by rail N. of Sekondi and 120 m. by road N.N.W. of Cape Coast. Pop. (1906), 6280; including suburbs, over 12,000. Kumasi is situated on a low rocky eminence, from which it extends across a valley to the hill opposite. It lies in a clearing of the dense forest which covers the greater part of Ashanti, and occupies an area about 1½ m. in length and over 3 m. in circumference. The land immediately around the town, once marshy, has been drained. On the north-west is the small river Dah, one of the headstreams of the Prah. The name Kum-asi, more correctly Kum-ase (under the okum tree) was given to the town because of the number of those trees in its streets. The most imposing building in Kumasi is the fort, built in 1896. It is the residence of the chief commissioner and is capable of holding a garrison of several hundred men. There are also officers' quarters and cantonments outside the fort, European and native hospitals, and stations of the Basel and Wesleyan missions. The native houses are built with red clay in the style universal throughout Ashanti. They are somewhat richly ornamented, and those of the better class are enclosed in compounds within which are several separate buildings. Near the railway station are the leading mercantile houses. The principal Ashanti chiefs own large houses, built in European style, and these are leased to strangers.

Before its destruction by the British in 1874 the city presented a handsome appearance and bore many marks of a comparatively high state of culture. The king's palace, built of red sandstone, had been modelled, it is believed, on Dutch buildings at Elmina. It was blown up by Sir Garnet (subsequently Viscount) Wolseley's forces on the 6th of February 1874, and but scanty vestiges of it remain. The town was only partially rebuilt on the withdrawal of the British troops, and it is difficult from the meagre accounts of early travellers to obtain an adequate idea of the capital of the Ashanti kingdom when at the height of its prosperity (middle of the 18th to middle of the 19th century). The streets were numerous, broad and regular; the main avenue was 70 yds. wide. A large market-place existed on the south-east, and behind it in a grove of trees was the Spirit House. This was the place of execution. Of its population before the British occupation there is no trustworthy information. It appears not to have exceeded 20,000 in the first quarter of the 19th century. This is owing partly to the fact that the commercial capital of Ashanti, and the meeting-place of several caravan routes from the north and east, was Kintampo, a town farther north. The decline of Kumasi after 1874 was marked. A new royal palace was built, but it was of clay, not brick, and within the limits of the former town were wide stretches of grass-grown country. In 1896 the town again suffered at the hands of the British, when several of the largest and most ancient houses in the royal and priestly suburb of Bantama were destroyed by fire. In the revolt of 1900 Kumasi was once more injured. The railway from the coast, which passes through the Tarkwa and Obuassi gold-fields, reached Kumasi in September 1903. Many merchants at the Gold Coast ports thereupon opened branches in Kumasi. A marked revival in trade followed, leading to the rapid expansion of the town. By 1906 Kumasi had supplanted the coast towns and had become the distributing centre for the whole of Ashanti.

KUMISHAH, a district and town in the province of Isfahan, Persia. The district, which has a length of 50 and a breadth of 16 m., and contains about 40 villages, produces much grain. The town is situated on the high road from Isfahan to Shiraz, 52 m. S. of the former. It was a flourishing city several miles in circuit when it was destroyed by the Afghans in 1722, but is now a decayed place, with crumbled walls and mouldering towers and a population of barely 15,000. It has post and telegraph offices. South of the city and extending to the village Maksudbeggi, 16 m. away, is a level plain, which in 1835 (February 28) was the scene of a battle in which the army (2000 men, 16 guns) of Mahommed Shah, commanded by Sir H. Lindsay-Bethune, routed the much superior combined forces (6000 men) of the shah's two rebellious uncles, Firman-Firma and Shuja es Saltana.

KUMQUAT (*Citrus japonica*), a much-branched shrub from 8 to 12 ft. high, the branches sometimes bearing small thorns, with dark green glossy leaves and pure white orange-like flowers standing singly or clustered in the leaf-axils. The bright orange-yellow fruit is round or ellipsoidal, about 1 in. in diameter, with a thick minutely tuberculate rind, the inner lining of which is sweet, and a watery acidulous pulp. It has long been cultivated in China and Japan, and was introduced to Europe in 1846 by Mr Fortune, collector for the London Horticultural Society, and shortly after into North America. It is much hardier than most plants of the orange tribe, and succeeds well when grafted on the wild species, *Citrus trifoliata*. It is largely used by the Chinese as a sweetmeat preserved in sugar.

KUMTA, or COOMPTA, a sea-coast town of British India, in the North Kanara district of Bombay, 40 m. S. of Karwar. Pop. (1901), 10,818. It has an open roadstead, with a considerable trade. Carving in sandal-wood is a speciality. The commercial importance of Kumta has declined since the opening of the Southern Mahratta railway system.

KUMYKS, a people of Turkish stock in Caucasia, occupying the Kumyk plateau in north Daghestan and south Terek, and the lands bordering the Caspian. It is supposed that Ptolemy knew them under the name of Kami and Kamaks. Various explorers see in them descendants of the Khazars. A. Vambéry supposes that they settled in their present quarters during the flourishing period of the Khazar kingdom in the 8th century. It is certain that some Kabardians also settled later. The Russians built forts in their territory in 1559 and under Peter I. Having long been more civilized than the surrounding Caucasian mountaineers, the Kumyks have always enjoyed some respect among them. The upper terraces of the Kumyk plateau, which the Kumyks occupy, leaving its lower parts to the Nogai Tatars, are very fertile.

KUNAR, a river and valley of Afghanistan, on the north-west frontier of British India. The Kunar valley (Khoaspes in the classics) is the southern section of that great river system which reaches from the Hindu Kush to the Kabul river near Jalalabad, and which, under the names of Yarkhun, Chitral, Kashkar, &c., is more extensive than the Kabul basin itself. The lower reaches of the Kunar are wide and comparatively shallow, the river meandering in a multitude of channels through a broad and fairly open valley, well cultivated and fertile, with large flourishing villages and a mixed population of Mohmand and other tribes of Afghan origin. Here the hills to the eastward are comparatively low, though they shut in the valley closely. Beyond them are the Bajour uplands. To the west are the great mountains of Kafiristan, called Kashmund, snow-capped, and running to 14,000 ft. of altitude. Amongst them are many wild but beautiful valleys occupied by Kafirs, who are rapidly submitting to Afghan rule. From 20 to 30 miles up the river on its left bank, under the Bajour hills, are thick clusters of villages, amongst which are the ancient towns of Kunar and Pashat. The chief tributary from the Kafiristan hills is the Pechdara, which joins the river close to Chagan Sarai. It is a fine, broad, swift-flowing stream, with an excellent bridge over it (part of Abdur Rahman's military road developments), and has been largely utilized for irrigation. The Pechdara finds its sources in the Kafir hills, amongst forests of pine and deodar and thick tangles of wild vine and ivy, wild figs, pomegranates, olives and oaks, and dense masses of sweet-scented shrubs. Above Chagan Sarai, as far as Arnawai, where the Afghan boundary crosses the river, and above which the valley belongs to Chitral, the river narrows to a swift mountain stream obstructed by boulders and hedged in with steep cliffs and difficult "parris" or slopes of rocky hill-side. Wild almond here sheds its blossoms into the stream, and in the dawn of summer much of the floral beauty of Kashmir is to be found. At Asmar there is a slight widening of the valley, and the opportunity for a large Afghan military encampment, spreading to both sides of the river and connected by a very creditable bridge built on the cantilever system. There are no apparent relics of Buddhism in the Kunar, such as are common about Jalalabad or Chitral, or throughout Swat and Dir. This is probably due to the late occupation of the valley by Kafirs, who spread eastwards into Bajour within comparatively recent historical times, and who still adhere to their fastnesses in the Kashmund hills. The Kunar valley route to Chitral and to Kafiristan is being developed by Afghan engineering. It may possibly extend ultimately unto Badakshan, in which case it will form the most direct connexion between the Oxus and India, and become an important feature in the strategical geography of Asia. (T. H. H.*)

KUNBIS, the great agricultural caste of Western India, corresponding to the Kurmis in the north and the Kapus in the Telugu country. Ethnically they cannot be distinguished from the Mahrattas, though the latter name is sometimes confined to the class who claim higher rank as representing the descendants of Sivaji's soldiers. In some districts of the Deccan they form an actual majority of the population, which is not the case with any other Indian caste. In 1901 the total number of both Kunbis and Mahrattas in all India was returned at nearly 8¾ millions.

KUNDT, AUGUST ADOLPH EDUARD EBERHARD (1839–1894), German physicist, was born at Schwerin in Mecklenburg on the 18th of November 1839. He began his scientific studies at Leipzig, but afterwards went to Berlin. At first he devoted himself to astronomy, but coming under the influence of H. G. Magnus, he turned his attention to physics, and graduated in 1864 with a thesis on the depolarization of light. In 1867 he became *privatdozent* in Berlin University, and in the following year was chosen professor of physics at the Zürich Polytechnic; then, after a year or two at Würzburg, he was called in 1872 to Strassburg, where he took a great part in the organization of the new university, and was largely concerned in the erection of the Physical Institute. Finally in 1888 he went to Berlin as successor to H. von Helmholtz in the chair of experimental physics and directorship of the Berlin Physical Institute. He died after a protracted illness at Israelsdorf, near Lübeck, on the 21st of May 1894. As an original worker Kundt was especially successful in the domains of sound and light. In the former he developed a valuable method for the investigation of aerial waves within pipes, based on the fact that a finely divided powder—lycopodium, for example—when dusted over the interior of a tube in which is established a vibrating column of air, tends to collect in heaps at the nodes, the distance between which can thus be ascertained. An extension of the method renders possible the determination of the velocity of sound in different gases. In light Kundt's name is widely known for his inquiries in anomalous dispersion, not only in liquids and vapours, but even in metals, which he obtained in very thin films by means of a laborious process of electrolytic deposition upon platinized glass. He also carried out many experiments in magneto-optics, and succeeded in showing, what Faraday had failed to detect, the rotation under the influence of magnetic force of the plane of polarization in certain gases and vapours.

KUNDUZ, a khanate and town of Afghan Turkestan. The khanate is bounded on the E. by Badakshan, on the W. by Tashkurghan, on the N. by the Oxus and on the S. by the Hindu Kush. It is inhabited mainly by Uzbegs. Very little is known about the town, which is the trade centre of a considerable district, including Kataghan, where the best horses in Afghanistan are bred.

KUNENE, formerly known also as Nourse, a river of South-West Africa, with a length of over 700 m., mainly within Portuguese territory, but in its lower course forming the boundary between Angola and German South-West Africa. The upper basin of the river lies on the inner versant of the high plateau region which runs southwards from Bihe parallel to the coast, forming in places ranges of mountains which give rise to many streams running south to swell the Kunene. The main stream rises in 12° 30′ S. and about 160 m. in a direct line from the sea at Benguella, runs generally from north to south through four degrees of latitude, but finally flows west to the sea through a break in the outer highlands. A little south of 16° S. it receives the Kulonga from the east, and in about 16° 50′ the Kakulovar from the west. The Kakulovar has its sources in the Serra da Chella and other ranges of the Humpata district behind Mossamedes, but, though the longest tributary of the Kunene, is but a small river in its lower course, which traverses the arid region comprised within the lower basin of the Kunene. Between the mouths of the Kulonga and Kakulovar the Kunene traverses a swampy plain, inundated during high water, and containing several small lakes at other parts of the year. From this swampy region divergent branches run S.E. They are mainly intermittent, but the Kwamatuo, which leaves the main stream in about 15° 8′ E., 17° 15′ S., flows into a large marsh or lake called Etosha, which occupies a depression in the inner table-land about 3400 ft. above sea-level. From the S.E. end of the Etosha lake streams issue in the direction of the Okavango, to which in times of great flood they contribute some water. From the existence of this divergent system it is conjectured that at one time the Kunene formed part of the Okavango, and thus of the Zambezi basin. (See NGAMI.)

On leaving the swampy region the Kunene turns decidedly to the west, and descends to the coast plain by a number of cataracts, of which the chief (in 17° 25′ S., 14° 20′ E.) has a fall of 330 ft. The river becomes smaller in volume as it passes through an almost desert region with little or no vegetation. The stream is sometimes shallow and fordable, at others confined to a narrow rocky channel. Near the sea the Kunene traverses a region of sand-hills, its mouth being completely blocked at low water. The river enters the Atlantic in 17° 18′ S., 11° 40′ E. There are indications that a former branch of the river once entered a bay to the south.

KUNERSDORF, a village of Prussia, 4 m. E. of Frankfurt-on-Oder, the scene of a great battle, fought on the 12th of August 1759, between the Prussian army commanded by Frederick the Great and the allied Russians under Soltykov and Austrians under Loudon, in which Frederick was defeated with enormous losses and his army temporarily ruined. (See SEVEN YEARS' WAR.)

KUNGRAD, a trading town of Asiatic Russia, in the province of Syr-darya, in the delta of the Amu-darya, 50 m. S. of Lake Aral; altitude 260 ft. It is the centre of caravan routes leading to the Caspian Sea and the Uralsk province.

KUNGUR, a town of eastern Russia, in the government of Perm, on the highway to Siberia, 58 m. S.S.E. of the city of Perm. Pop. (1892), 12,400; (1897), 14,324. Tanneries and the manufacture of boots, gloves, leather, overcoats, iron castings and machinery are the chief industries. It has trade in boots, iron wares, cereals, tallow and linseed exported, and in tea imported direct from China.

KUNKEL (or KUNCKEL) **VON LOWENSTJERN, JOHANN** (1630–1703), German chemist, was born in 1630 (or 1638), near Rendsburg, his father being alchemist to the court of Holstein. He became chemist and apothecary to the dukes of Lauenburg, and then to the elector of Saxony, Johann Georg II., who put him in charge of the royal laboratory at Dresden. Intrigues engineered against him caused him to resign this position in 1677, and for a time he lectured on chemistry at Annaberg and Wittenberg. Invited to Berlin by Frederick William, in 1679 he became director of the laboratory and glass works of Brandenburg, and in 1688 Charles XI. brought him to Stockholm, giving him the title of Baron von Lowenstjern in 1693 and making him a member of the council of mines. He died on the 20th of March 1703 (others say 1702) at Dreissighufen, his country house near Pernau. Kunkel shares with Boyle the honour of having discovered the secret of the process by which Brand of Hamburg had prepared phosphorus in 1669, and he found how to make artificial ruby (red glass) by the incorporation of purple of Cassius. His work also included observations on putrefaction and fermentation, which he spoke of as sisters, on the nature of salts, and on the preparation of pure metals. Though he lived in an atmosphere of alchemy, he derided the notion of the alkahest or universal solvent, and denounced the deceptions of the adepts who pretended to effect the transmutation of metals; but he believed mercury to be a constituent of all metals and heavy minerals, though he held there was no proof of the presence of "sulphur comburens."

His chief works were *Oeffentliche Zuschrift von dem Phosphor Mirabil* (1678); *Ars vitriaria experimentalis* (1689) and *Laboratorium chymicum* (1716).

KUNLONG, the name of a district and ferry on the Salween, in the northern Shan States of Burma. Both are insignificant, but the place has gained notoriety from being the nominal terminus in British territory of the railway across the northern Shan States to the borders of Yunnan, with its present terminus at Lashio. In point of fact, however, this terminus will be 7 m. below the ferry and outside of Kunlong circle. At present Kunlong ferry is little used, and the village was burnt by Kachins in 1893. It is served by dug-outs, three in number in 1899, and capable of carrying about fifteen men on a trip. Formerly the trade was very considerable, and the Burmese had a customs station on the island, from which the place takes its name; but the rebellion in the great state of Theinni, and the southward movement of the Kachins, as well as the Mahommedan rebellion in Yunnan, diverted the caravans to the northern route to Bhamo, which is still chiefly followed. The Wa, who inhabit the hills immediately overlooking the Nam Ting valley, now make the route dangerous for traders. The great majority of these Wa live in unadministered British territory.

KUNZITE, a transparent lilac-coloured variety of spodumene, used as a gem-stone. It was discovered in 1902 near Pala, in San Diego county, California, not far from the locality which yields the fine specimens of rubellite and lepidolite, well known to mineralogists. The mineral was named by Dr C. Baskerville after Dr George F. Kunz, the gem expert of New York, who first described it. Analysis by R. O. E. Davis showed it to be a spodumene. Kunzite occurs in large crystals, some weighing as much as 1000 grams each, and presents delicate hues from rosy lilac to deep pink. It is strongly dichroic. Near the surface it may lose colour by exposure. Kunzite becomes strongly phosphorescent under the Röntgen rays, or by the action of radium or on exposure to ultra-violet rays. (See SPODUMENE.)

KUOPIO, a province of Finland, which includes northern Karelia, bounded on the N.W. and N. by Uleåborg, on the E. by Olonets, on the S.E. by Viborg, on the S. by St Michel and on the W. by Vasa. Its area covers 16,500 sq. m., and the population (1900) was 313,951, of whom 312,875 were Finnish-speaking, The surface is hilly, reaching from 600 to 800 ft. of altitude in the north (Suomenselkä hills), and from 300 to 400 ft. in the south. It is built up of gneisso-granites, which are covered, especially in the middle and east, with younger granites, and partly of gneisses, quartzite, and talc schists and augitic rocks. The whole is covered with glacial and later lacustrine deposits. The soil is of moderate fertility, but often full of boulders. Large lakes cover 16% of surface, marshes and peat bogs over 29% of the area, and forests occupy 2,672,240 hectares. Steamers ply along the lakes as far as Joensuu. The climate is severe, the average temperature being for the year 36° F., for January 13° and for July 63°. Only 2·3% of the whole surface is under cultivation. Rye, barley, oats and potatoes are the chief crops, and in good years these meet the needs of the population. Dairy farming and cattle breeding are of rapidly increasing importance. Nearly 38,800 tons of iron ore are extracted every year, and nearly 12,000 tons of pig iron and 6420 tons of iron and steel are obtained in ten iron-works. Engineering and chemical works, tanneries, saw-mills, paper-mills and distilleries are the chief industrial establishments. The preparation of carts, sledges and other wooden goods is an important domestic industry. Timber, iron, butter, furs and game are exported. The chief towns of the government are Kuopio (13,519), Joensuu (3954) and Iisalmi (1871).

KUOPIO, capital of the Finnish province of that name, situated on Lake Kalla-vesi, 180 m. by rail from the Kuivola junction of the St Petersburg-Helsingfors main line. Pop. (1904), 13,519. It is picturesquely situated, is the seat of a bishop, and has a cathedral, two lyceums and two gymnasia (both for boys and girls), a commercial and several professional schools. There is an agricultural school at Leväis, close by. Kuopio, in consequence of its steamer communication with middle Finland and the sea (via Saima Canal), is a trading centre of considerable importance.

KUPRILI, spelt also Köprili, Koeprulu, Keuprulu, &c., the name of a family of Turkish statesmen.

1. Mahommed Kuprili (*c.* 1586–1661) was the grandson of an Albanian who had settled at Kupri in Asia Minor. He began life as a scullion in the imperial kitchen, became cook, then purse-bearer to Khosrev Pasha, and so, by wit and favour, rose to be master of the horse, "pasha of two tails," and governor of a series of important cities and sanjaks. In 1656 he was appointed governor of Tripoli; but before he had set out to his new post he was nominated to the grand vizierate at the instance of powerful friends. He accepted office only on condition of being allowed a free hand. He signalized his accession to power by suppressing an *émeute* of orthodox Mussulman fanatics in Constantinople (Sept. 22), and by putting to death certain favourites of the powerful Valide Sultana, by whose corruption and intrigues the administration had been confused. A little later (January 1657) he suppressed with ruthless severity a rising of the spahis; a certain Sheik Salim, leader of the fanatical mob of the capital, was drowned in the Bosporus; and the Greek Patriarch, who had written to the voivode of Wallachia to announce the approaching downfall of Islam, was hanged. This impartial severity was a foretaste of Kuprili's rule, which was characterized throughout by a vigour which belied the expectations based upon his advanced years, and by a ruthlessness which in time grew to be almost blood-lust. His justification was the new life which he breathed into the decaying bones of the Ottoman empire.

Having cowed the disaffected elements in the state, he turned his attention to foreign enemies. The victory of the Venetians off Chios (May 2, 1657) was a severe blow to the Turkish sea-power, which Kuprili set himself energetically to repair. A second battle, fought in the Dardanelles (July 17–19), ended by a lucky shot blowing up the Venetian flag-ship; the losses of the Ottoman fleet were repaired; and in the middle of August Kuprili appeared off Tenedos, which was captured on the 31st and reincorporated permanently in the Turkish empire. Thus the Ottoman prestige was restored at sea, while Kuprili's ruthless enforcement of discipline in the army and suppression of revolts, whether in Europe or Asia, restored it also on land. It was, however, due to his haughty and violent temper that the traditional friendly relations between Turkey and France were broken. The French ambassador, de la Haye, had delayed bringing him the customary gifts, with the idea that he would, like his predecessors, speedily give place to a new grand vizier; Kuprili was bitterly offended, and, on pretext of an abuse of the immunities of diplomatic correspondence, bastinadoed the ambassador's son and cast him and the ambassador himself into prison. A special envoy, sent by Louis XIV., to make inquiries and demand reparation, was treated with studied insult; and the result was that Mazarin abandoned the Turkish alliance and threw the power of France on to the side of Venice, openly assisting the Venetians in the defence of Crete.

Kuprili's restless energy continued to the last, exhibiting itself on one side in wholesale executions, on the other in vast building operations. By his orders castles were built at the mouth of the Don and on the bank of the Dnieper, outworks against the ever-aggressive Tatars, as well as on either shore of the Dardanelles. His last activity as a statesman was to spur the sultan on to press the war against Hungary. He died on the 31st of October 1661. The advice which, on his death-bed, he is said to have given to the sultan is characteristic of his Machiavellian statecraft. This was: never to pay attention to the advice of women, to allow nobody to grow too rich, to keep his treasury well filled, and himself and his troops constantly occupied. Had he so desired, Kuprili might have taken advantage of the revolts of the Janissaries to place himself on the throne; instead, he recommended the sultan to appoint his son as his successor, and so founded a dynasty of able statesmen who occupied the grand vizierate almost without interruption for half a century.

2. Fazil Ahmed Kuprili (1635–1676), son of the preceding, succeeded his father as grand vizier in 1661 (this being the first instance of a son succeeding his father in that office since the time of the Chenderélis). He began life in the clerical career, which he left, at the age of twenty-three, when he had attained the rank of *muderris*. Usually humane and generous, he sought to relieve the people of the excessive taxation and to secure them against unlawful exactions. Three years after his accession to office Turkey suffered a crushing defeat at the battle of St Gothard and was obliged to make peace with the Empire. But Kuprili's influence with the sultan remained unshaken, and five years later Crete fell to his arms (1669). The next war in which he was called upon to take part was with Poland, in defence of the Cossacks, who had appealed to Turkey for protection. At first successful, Kuprili was defeated by the Poles under John Sobieski at Khotin and Lemberg; the Turks, however, continued to hold their own, and finally in October 1676 consented to honourable terms of peace by the treaty of Zurawno (October 16, 1676), retaining Kaminiec, Podolia and the greater part of the Ukraine. Three days later Ahmed Kuprili died. His military capacity was far inferior to his administrative qualities. He was a liberal protector of art and literature, and the kindliness of his disposition formed a marked contrast to the cruelty of his father; but he was given to intemperance, and the cause of his death was dropsy brought on by alcoholic abuse.

3. Zade Mustafa Kuprili (1637–1691), surnamed Fazil, son of Mahommed Kuprili, became grand vizier to Suleiman II. in 1689. Called to office after disaster had driven Turkey's forces from Hungary and Poland and her fleets from the Mediterranean, he began by ordering strict economy and reform in the taxation; himself setting the example, which was widely followed, of voluntary contributions for the army, which with the navy he reorganized as quickly as he could. His wisdom is shown by the prudent measures which he took by enacting the *Nizam-i-jedid*, or new regulations for the improvement of the condition of the Christian rayas, and for affording them security for life and property; a conciliatory attitude which at once bore fruit in Greece, where the people abandoned the Venetian cause and returned to their allegiance to the Porte. He met his death at the battle of Salankamen in 1691, when the total defeat of the Turks by the Austrians under Prince Louis of Baden led to their expulsion from Hungary.

4. Hussein Kuprili (surnamed Amuja-Zade) was the son of Hassan, a younger brother of Mahommed Kuprili. After occupying various important posts he became grand vizier in 1697, and owing to his ability and energy the Turks were able to drive the Austrians back over the Save, and Turkish fleets were sent into the Black Sea and the Mediterranean. The efforts of European diplomacy succeeded in inducing Austria and Turkey to come to terms by the treaty of Carlowitz, whereby Turkey was shorn of her chief conquests (1699). After this event Hussein Kuprili, surnamed "the Wise," devoted himself to the suppression of the revolts which had broken out in Arabia, Egypt and the Crimea, to the reduction of the Janissaries, and to the institution of administrative and financial reform. Unfortunately the intrigues against him drove him from office in 1702, and soon afterwards he died.

5. Numan Kuprili, son of Mustafa Fazil, became grand vizier in 1710. The expectations formed of him were not fulfilled, as although he was tolerant, wise and just like his father, he injudiciously sought to take upon himself all the details of administration, a task which proved to be beyond his powers. He failed to introduce order into the administration and was dismissed from office in less than fourteen months after his appointment

6. Abdullah Kuprili, a son of Mustafa Fazil Kuprili, was appointed Kaimmakam or *locum tenens* of the grand vizier in 1703. He commanded the Persian expedition in 1723 and captured Tabriz in 1725, resigning his office in 1726. In 1735 he again commanded against the Persians, but fell at the disastrous battle of Bagaverd, thus emulating his father's heroic death at Selankamen.

KURAKIN, BORIS IVANOVICH, Prince (1676–1727), Russian diplomatist, was the brother-in-law of Peter the Great, their wives being sisters. He was one of the earliest of Peter's pupils. In 1697 he was sent to Italy to learn navigation. His long and honourable diplomatic career began in 1707, when he was sent to Rome to induce the pope not to recognize Charles XII.'s candidate, Stanislaus Leszczynski, as king of Poland. From 1708 to 1712 he represented Russia at London, Hanover, and the Hague successively, and, in 1713, was the principal Russian plenipotentiary at the peace congress of Utrecht. From 1716 to 1722 he held the post of ambassador at Paris, and when, in 1724, Peter set forth on his Persian campaign, Kurakin was appointed the supervisor of all the Russian ambassadors accredited to the various European courts. "The father of Russian diplomacy," as he has justly been called, was remarkable throughout his career for infinite tact and insight, and a wonderfully correct appreciation of men and events. He was most useful to Russia perhaps when the Great Northern war (see Sweden, *History*) was drawing to a close. Notably he prevented Great Britain from declaring war against Peter's close ally, Denmark, at the crisis of the struggle. Kurakin was one of the best-educated Russians of his day, and his autobiography, carried down to 1709, is an historical document of the first importance. He intended to write a history of his own times with Peter the Great as the central figure, but got no further than the summary, entitled *History of Tsar Peter Aleksievich and the People Nearest to Him* (1682–1694) (Rus.).

See *Archives of Prince A. Th. Kurakin* (Rus.) (St Petersburg, 1890); A. Brückner, *A Russian Tourist in Western Europe in the beginning of the XVIIIth Century* (Rus.) (St Petersburg, 1892). (R. N. B.)

KURBASH, or Kourbash (from the Arabic *qurbash*, a whip; Turkish *qirbach*; and French *courbache*), a whip or strap about a yard in length, made of the hide of the hippopotamus or rhinoceros. It is an instrument of punishment and torture used in various Mahommedan countries, especially in the Turkish empire. "Government by kurbash" denotes the oppression of a people by the constant abuse of the kurbash to maintain authority, to collect taxes, or to pervert justice. The use of the kurbash for such purposes, once common in Egypt, has been abolished by the British authorities.

KŪRDISTĀN, in its wider sense, the "country of the Kūrds" (Koords), including that part of Mount Taurus which buttresses the Armenian table-land (see Armenia), and is intersected by the Batman Su, the Bohtan Su, and other tributaries of the Tigris; and the wild mountain district, watered by the Great and Little Zab, which marks the western termination of the great Iranian plateau.

Population.—The total Kūrd population probably exceeds two and a half millions, namely, Turkish Kūrds 1,650,000, Persian 800,000, Russian 50,000, but there are no trustworthy statistics. The great mass of the population has its home in Kūrdistān. But Kūrds are scattered irregularly over the country from the river Sakarīa on the west to Lake Urmia on the east, and from Kars on the north to Jebel Sinjar on the south. There is also an isolated settlement in Khorasan. The tribes, *ashiret*, into which the Kūrds are divided, resemble in some respects the Highland clans of Scotland. Very few of them number more than 10,000 souls, and the average is about 3000. The sedentary and pastoral Kūrds, *Yerli*, who live in villages in winter and encamp on their own pasture-grounds in summer, form an increasing majority of the population. The nomad Kūrds, *Kocher*, who always dwell in tents, are the wealthiest and most independent. They spend the summer on the mountains and high plateaus, which they enter in May and leave in October; and pass the winter on the banks of the Tigris and on the great plain north of Jebel Sinjar, where they purchase right of pasturage from the Shammar Arabs. Each tribe has its own pasture-grounds, and trespass by other tribes is a fertile source of quarrel. During the periodical migrations Moslem and Christian alike suffer from the predatory instincts of the Kūrd, and disturbances are frequent in the districts traversed. In Turkey the sedentary Kūrds pay taxes; but the nomads only pay the sheep tax, which is collected as they cross the Tigris on their way to their summer pastures.

Character.—The Kūrd delights in the bracing air and unrestricted liberty of the mountains. He is rarely a muleteer or camel-man, and does not take kindly to handicrafts. The Kūrds generally bear a very indifferent reputation, a worse reputation perhaps, than they really deserve. Being aliens to the Turks in language and to the Persians in religion, they are everywhere treated with mistrust, and live as it were in a state of chronic warfare with the powers that be. Such a condition is not of course favourable to the development of the better qualities of human nature. The Kūrds are thus wild and lawless; they are much given to brigandage; they oppress and frequently maltreat the Christian populations with whom they are brought in contact,—these populations being the Armenians in Diarbekr, Erzerum and Van, the Jacobites and Syrians in the Jebel-Tūr, and the Nestorians and Chaldaeans in the Hakkāri country.

Perhaps the most distinguishing characteristic of the Kūrdish chief is pride of ancestry. This feeling is in many cases exaggerated, for in reality the present tribal organization does not date from any great antiquity. In the list indeed of eighteen principal tribes of the nation which was drawn up by the Arabian historian Masudi, in the 10th century, only two or three names are to be recognized at the present day. A 14th-century list, however, translated by Quatremère,[1] presents a great number of identical names, and there seems no reason to doubt that certain Kūrdish families can trace their descent from the Omayyad caliphs, while only in recent years the Babān chief of Suleimania, representing the old Sohrans, and the Ardelān chief of Sinna,[2] representing an elder branch of the Gurāns, each claimed an ancestry of at least five hundred years. There was up to a recent period no more picturesque or interesting scene to be witnessed in the east than the court of one of these great Kūrdish chiefs, where, like another Saladin, the bey ruled in partriarchal state, surrounded by an hereditary nobility, regarded by his clansmen with reverence and affection, and attended by a bodyguard of young Kūrdish warriors, clad in chain armour, with flaunting silken scarfs, and bearing javelin, lance and sword as in the time of the crusades.

Though ignorant and unsophisticated the Kūrd is not wanting in natural intelligence. In recent years educated Kūrds have held high office under the sultan, including that of grand vizier, have assisted in translating the Bible into Turkish, and in editing a newspaper. The men are lithe, active and strong, but rarely of unusual stature. The women do not veil, and are allowed great freedom. The Kūrds as a race are proud, faithful and hospitable, and have rude but strict feelings of honour. They are, however, much under the influence of dervishes, and when their fanaticism is aroused their habitual lawlessness is apt to degenerate into savage barbarity. They are not deficient in martial spirit, but have an innate dislike to the restraints of military service. The country is rich in traditions and legends, and in lyric and in epic poems, which have been handed down from earlier times and are recited in a weird melancholy tone.

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[1] See *Notices et Extraits des MSS.*, xiii. 305. Of the tribes enumerated in this work of the 14th century who still retain a leading place among the Kūrds, the following names may be quoted: *Guranieh* of Dartang, modern Gurans; *Zengeneh*, [illegible] Hamadan hills, now in Kermānshāh; *Hasnani* of Kirkuk and Arbil, now in the Dersim mountains, having originally come from Khorāsān according to tradition; *Sohrīeh* of Shekelabad and Tel-Haftūn, modern Sohrān, from whom descend the Babān of Suleimanieh; *Zerzari* of Hinjarīn mountains, modern Zerzas of Ushnu (cuneiform pillars of Kel-i-shīn and Sidek noticed by author); *Julamerkīeh*, modern Julamerik, said to be descended from the caliph Merwān-ibn-Hakam; *Hakkarīeh*, Hakkāri inhabiting *Zuzan* of Arab geography; *Bokhtieh*, modern Bohtān. The *Rowadi*, to whom Saladin belonged, are probably modern Rawendi, as they held the fortress of Arbil (Arbela). Some twenty other names are mentioned, but the orthography is so doubtful that it is useless to try to identify them.

[2] The *Sheref-nama*, a history of the Kūrds dating from the 16th century, tells us that "towards the close of the reign of the Jenghizians, a man named Baba Ardilān, a descendant of the governors of Diarbekr, and related to the famous Ahmed-ibn-Merwān, after remaining for some time among the Gurāns, gained possession of the country of Shahrizor" and the Ardelān family history, with the gradual extension of their power over Persian Kūrdistān, is then traced down to the Saffavid period.

Antiquities.—Kūrdistān abounds in antiquities of the most varied and interesting character. But it has been very little opened up to modern research. A series of rock-cut cuneiform inscriptions extend from Malatia on the west to Miandoāb (in Persia) on the east, and from the banks of the Aras on the north to Rowanduz on the south, which record the glories of a Turanian dynasty, who ruled the country of Nairi during the 8th and 7th centuries, B.C., contemporaneously with the lower Assyrian empire. Intermingled with these are a few genuine Assyrian inscriptions of an earlier date; and in one instance, at Van, a later tablet of Xerxes brings the record down to the period of Grecian history. The most ancient monuments of this class, however, are to be found at Holwān and in the neighbourhood, where the sculptures and inscriptions belong probably to the Guti and Luli tribes, and date from the early Babylonian period.

In the northern Kūrdish districts which represent the Arzanene, Intilene, Anzitene, Zabdicene, and Moxuene of the ancients, there are many interesting remains of Roman cities, *e.g.* at Arzen, Miyafarikin (anc. *Martyropolis*), Sisauronon, and the ruins of Dunisir near Dara, which Sachau identified with the Armenian capital of Tigranocerta. Of the Macedonian and Parthian periods there are remains both sculptured and inscribed at several points in Kūrdistān; at Bisitun or Behistun (*q.v.*), in a cave at Amadīa, at the Mithraic temple of Kereftū, on the rocks at Sir Pūl-o-Zohab near the ruins of Holwān, and probably in some other localities, such as the Bālik country between Lahijān and Koi-Sanjāk; but the most interesting site in all Kūrdistān, perhaps in all western Asia, is the ruined fire temple of Pāī Kūlī on the southern frontier of Suleimanīa. Among the débris of this temple, which is scattered over a bare hillside, are to be found above one hundred slabs, inscribed with Parthian and Pahlavi characters, the fragments of a wall which formerly supported the eastern face of the edifice, and bore a bilingual legend of great length, dating from the Sassanian period. There are also remarkable Sassanian remains in other parts of Kūrdistān—at Salmūs to the north, and at Kermānshāh and Kasr-i-Shīrīn on the Turkish frontier to the south.

Language.—The Kūrdish language, Kermānjī, is an old Persian patois, intermixed to the north with Chaldaean words and to the south with a certain Turanian element which may not improbably have come down from Babylonian times. Several peculiar dialects are spoken in secluded districts in the mountains, but the only varieties which, from their extensive use, require to be specified are the Zaza and the Gurān. The Zaza is spoken throughout the western portion of the Dersim country, and is said to be unintelligible to the Kermānjī-speaking Kūrds. It is largely intermingled with Armenian, and may contain some trace of the old Cappadocian, but is no doubt of the same Aryan stock as the standard Kūrdish. The Gurān dialect again, which is spoken throughout Ardelān and Kermānshāh[1] chiefly differs from the northern Kūrdish in being entirely free from any Semitic intermixture. It is thus somewhat nearer to the Persian than the Kermānjī dialect, but is essentially the same language. It is a mistake to suppose that there is no Kūrdish literature. Many of the popular Persian poets have been translated into Kūrdish, and there are also books relating to the religious mysteries of the Ali-Illāhis in the hands of the Dersimlis to the north and of the Gurāns of Kermānshāh to the south. The New Testament in Kurdish was printed at Constantinople in 1857. The Rev. Samuel Rhea published a grammar and vocabulary of the Hakkāri dialect in 1872. In 1879 there appeared, under the auspices of the imperial academy of St Petersburg a French-Kūrdish dictionary compiled originally by Mons. Jaba, many years Russian consul at Erzerum, but completed by Ferdinand Justi by the help of a rich assortment of Kurdish tales and ballads, collected by Socin and Prym in Assyria.

Religion.—The great body of the nation, in Persia as well as in Turkey, are Sunnis of the Shafi'ite sect, but in the recesses of the Dersim to the north and of Zagros to the south there are large half-pagan communities, who are called indifferently Ali-Illahi and Kizjil-bāsh, and who hold tenets of some obscurity, but of considerable interest. Outwardly professing to be Shi'ites or "followers of Ali," they observe secret ceremonies and hold esoteric doctrines which have probably descended to them from very early ages, and of which the essential condition is that there must always be upon the earth a visible manifestation of the Deity. While paying reverence to the supposed incarnations of ancient days, to Moses, David, Christ, Ali and his tutor Salmān-ul-Farisi, and several of the Shi'ite imams and saints, they have thus usually some recent local celebrity at whose shrine they worship and make vows; and there is, moreover, in every community of Ali-Illahis some living personage, not necessarily ascetic, to whom, as representing the godhead, the superstitious tribesmen pay almost idolatrous honours. Among the Gurāns of the south the shrine of Baba Yadgār, in a gorge of the hills above the old city of Holwān, is thus regarded with a supreme veneration. Similar institutions are also found in other parts of the mountains, which may be compared with the tenets of the Druses and Nosairis in Syria and the Ismailites in Persia.

History.—With regard to the origin of the Kūrds, it was formerly considered sufficient to describe them as the descendants of the Carduchi, who opposed the retreat of the Ten Thousand through the mountains, but modern research traces them far beyond the period of the Greeks. At the dawn of history the mountains overhanging Assyria were held by a people named *Gūtū*, a title which signified "a warrior," and which was rendered in Assyrian by the synonym of *Gardu* or *Kardu*, the precise term quoted by Strabo to explain the name of the Cardaces (Κάρδακες). These *Gūtū* were a Turanian tribe of such power as to be placed in the early cuneiform records on an equality with the other nations of western Asia, that is, with the Syrians and Hittites, the Susians, Elamites, and Akkadians of Babylonia; and during the whole period of the Assyrian empire they seem to have preserved a more or less independent political position. After the fall of Nineveh they coalesced with the Medes, and, in common with all the nations inhabiting the high plateaus of Asia Minor, Armenia and Persia, became gradually Aryanized, owing to the immigration at this period of history of tribes in overwhelming numbers which, from whatever quarter they may have sprung, belonged certainly to the Aryan family.

The *Gūtū* or Kūrdu were reduced to subjection by Cyrus before he descended upon Babylon, and furnished a contingent of fighting men to his successors, being thus mentioned under the names of Saspirians and Alarodians in the muster roll of the army of Xerxes which was preserved by Herodotus.

In later times they passed successively under the sway of the Macedonians, the Parthians, and Sassanians, being especially befriended, if we may judge from tradition as well as from the remains still existing in the country, by the Arsacian monarchs, who were probably of a cognate race. Gotarzes indeed, whose name may perhaps be translated "chief of the *Gūtū*," was traditionally believed to be the founder of the Gurāns, the principal tribe of southern Kūrdistān,[2] and his name and titles are still preserved in a Greek inscription at

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[1] The Gurān are mentioned in the *Mesalik-el-Absār* as the dominant tribe in southern Kūrdistān in the 14th century, occupying very much the same seats as at present, from the Hamadan frontier to Shahrizor. Their name probably signifies merely "the mountaineers," being derived from *gur* or *giri*, "a mountain," which is also found in Zagros, *i.e. za-giri*, "beyond the mountain," or *Pusht-i-koh*, as the name is translated in Persian. They are a fine, active and hardy race, individually brave, and make excellent soldiers, though in appearance very inferior to the tribal Kūrds of the northern districts. These latter indeed delight in gay colours, while the Gurāns dress in the most homely costume, wearing coarse blue cotton vests, with felt caps and coats. In a great part of Kūrdistān the name Gurān has become synonymous with an agricultural peasantry, as opposed to the migratory shepherds.

[2] "The Kalhūr tribe are traditionally descended from Gudarz-ibn-Gīo, whose son Roham was sent by Bahman Keiāni to destroy Jerusalem and bring the Jews into captivity. This Roham is the individual usually called Bokht-i-nasser (Nebuchadrezzar) and he ultimately succeeded to the throne. The neighbouring country has ever since remained in the hands of his descendants, who are called Gurāns" (*Sheref-Nama*, Persian MS.). The same popular tradition still exists in the country, and ΓΩΤΑΡΖΗΟ ΓΕΟΠΟΘΡΟΣ is found on the rock at Behistun, showing that Gudarz-ibn-Gīo was really an historic personage. See *Journ. Roy. Geog. Soc.* ix. 114.

Behistun near the Kurdish capital of Kermānshāh. Under the caliphs of Bagdad the Kūrds were always giving trouble in one quarter or another. In A.D. 838, and again in 905, there were formidable insurrections in northern Kūrdistān; the amir, Adod-addaula, was obliged to lead the forces of the caliphate against the southern Kūrds, capturing the famous fortress of Sermāj, of which the ruins are to be seen at the present day near Behistun, and reducing the province of Shahrizor with its capital city now marked by the great mound of Yassin Teppeh. The most flourishing period of Kūrdish power was probably during the 12th century of our era, when the great Saladin, who belonged to the Rawendi branch of the Hadabāni tribe, founded the Ayyubite dynasty of Syria, and Kūrdish chiefships were established, not only to the east and west of the Kūrdistān mountains, but as far as Khorāsān upon one side and Egypt and Yemen on the other. During the Mongol and Tatar domination of western Asia the Kūrds in the mountains remained for the most part passive, yielding a reluctant obedience to the provincial governors of the plains.

When Sultan Selim I., after defeating Shah Ismail, 1514, annexed Armenia and Kūrdistān, he entrusted the organization of the conquered territories to Idris, the historian, who was a Kūrd of Bitlis. Idris found Kūrdistān bristling with castles, held by hereditary tribal chiefs of Kūrd, Arab, and Armenian descent, who were practically independent, and passed their time in tribal warfare or in raiding the agricultural population. He divided the territory into sanjaks or districts, and, making no attempt to interfere with the principle of heredity, installed the local chiefs as governors. He also resettled the rich pastoral country between Erzerūm and Erivan, which had lain waste since the passage of Timūr, with Kūrds from the Hakkiari and Bohtan districts. The system of administration introduced by Idris remained unchanged until the close of the Russo-Turkish War of 1828–29. But the Kūrds, owing to the remoteness of their country from the capital and the decline of Turkey, had greatly increased in influence and power, and had spread westwards over the country as far as Angora. After the war the Kūrds attempted to free themselves from Turkish control, and in 1834 it became necessary to reduce them to subjection. This was done by Reshid Pasha. The principal towns were strongly garrisoned, and many of the Kūrd beys were replaced by Turkish governors. A rising under Bedr Khān Bey in 1843 was firmly repressed, and after the Crimean War the Turks strengthened their hold on the country. The Russo-Turkish War of 1877–78 was followed by the attempt of Sheikh Obaidullah, 1880–81, to found an independent Kūrd principality under the protection of Turkey. The attempt, at first encouraged by the Porte, as a reply to the projected creation of an Armenian state under the suzerainty of Russia (see ARMENIA), collapsed after Obaidullah's raid into Persia, when various circumstances led the central government to reassert its supreme authority. Until the Russo-Turkish War of 1828–29 there had been little hostile feeling between the Kūrds and the Armenians, and as late as 1877–1878 the mountaineers of both races had got on fairly well together. Both suffered from Turkey, both dreaded Russia. But the national movement amongst the Armenians, and its encouragement by Russia after the last war, gradually aroused race hatred and fanaticism. In 1891 the activity of the Armenian Committees induced the Porte to strengthen the position of the Kūrds by raising a body of Kūrdish irregular cavalry, which was well armed and called Hamidieh after the Sultan. The opportunities thus offered for plunder and the gratification of race hatred brought out the worst qualities of the Kūrds. Minor disturbances constantly occurred, and were soon followed by the massacre of Armenians at Sasūn and other places, 1894–96, in which the Kūrds took an active part.

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KŪRDISTĀN, in the narrower sense, a province of Persia, situated in the hilly districts between Azerbaïjan and Kermanshah, and extending to the Turkish frontier on the W., and bounded on the E. by Gerrus and Hamadan. In proportion to its size and population it pays a very small yearly revenue—only about £14,000—due to the fact that a great part of the population consists of wild and disorderly nomad Kūrds. Some of these nomads pass their winters in Turkish territory, and have their summer pasture-grounds in the highlands of Kūrdistān. This adds much to the difficulty of collecting taxation. The province is divided into sixteen districts, and its eastern part, in which the capital is situated, is known as Ardelan. The capital is Senendij, usually known as Sinna (not Sihna, or Sahna, as some writers have it), situated 60 m. N.W. of Hamadan, in 35° 15′ N., 47° 18′ E., at an elevation of 5300 ft. The city has a population of about 35,000 and manufactures great quantities of carpets and felts for the supply of the province and for export. Some of the carpets are very fine and expensive, rugs 2 yards by $1\frac{1}{2}$ costing £15 to £20. Post and telegraph offices have been established since 1879.

KURGAN, a town (founded 1553) of West Siberia, in the government of Tobolsk, on the Siberian railway, 160 m. E. of Chelyabinsk, and on the left bank of the Tobol, in a wealthy agricultural district. Pop. (1897), 10,579. Owing to its position at the terminus of steam navigation up the river Tobol, it has become second only to Tyumeñ as a commercial centre. It has a public library and a botanic garden. There is a large trade in cattle with Petropavlovsk, and considerable export of grain, tallow, meat, hides, butter, game and fish, there being three large fairs in the year. In the vicinity are a great number of prehistoric kurgans or burial-mounds.

KURIA MURIA ISLANDS, a group of five islands in the Arabian Sea, close under the coast of Arabia, belonging to Britain and forming a dependency of Aden. They are lofty and rocky, and have a total area of 28 sq. m., that of the largest, Hallania, being 22 sq. m. They are identified with the ancient *Insulae Zenobii*, and were ceded by the sultan of Muscat to Britain in 1854 for the purposes of a cable station. They are inhabited by a few families of Arabs, who however speak a dialect differing considerably from the ordinary Arabic. The islands yield some guano.

KURILES (Jap. *Chishima*, "thousand islands"), a chain of small islands belonging to Japan, stretching in a north-easterly direction from Nemuro Bay, on the extreme east of the island of Yezo, to Chishima-kaikyo (Kuriles Strait), which separates them from the southernmost point of Kamchatka. They extend from 44° 45′ to 50° 56′ N. and from 145° 25′ to 156° 32′ E. Their coasts measure 1496 m.; their area is 6159 sq. m.; their total number is 32, and the names of the eight principal islands, counting from the south, are Kunashiri, Shikotan, Etorofu (generally called Etorop, and known formerly to Europe as Staten Island), Urup, Simusir, Onnekotan, Paramoshiri (Paramusir) and Shumshiri. From Noshapzaki (Notsu-no-sake or Notsu Cape), the most easterly point of Nemuro province, to Tomari, the most westerly point in Kunashiri, the distance is $7\frac{3}{4}$ m., and the Kuriles Strait separating Shumshiri from Kamchatka is about the same width. The name "Kurile" is derived from the Russian *kurit* (to smoke), in allusion to the active volcanic character of the group. The dense fogs that envelop these islands, and the violence of the currents in their vicinity, have greatly hindered exploration, so that little is known of their physiography. They lie entangled in a vast net of sea-weed; are the resort of innumerable birds, and used to be largely frequented by seals and sea-otters, which, however, have been almost completely driven away by unregulated hunting. Near the south-eastern coast of Kunashiri stands a mountain called Rausu-nobori (3005 ft. high), round whose base sulphur bubbles up in large quantities, and hot springs as well as a hot stream are found. On the west coast of the same island is a boiling lake, called Ponto, which deposits on its bed and round its shores black sand, consisting almost entirely of pure sulphur. This island has several lofty peaks; Ponnobori-yama near the eastcoast, and Chachanobori and Rurindake in the north. Chachanobori (about 7382 ft.) is described by Messrs Chamberlain and Mason as "a cone within a cone, the inner and higher of the two being—so the natives say—surrounded by a lake." The island has extensive forests of conifers with an undergrowth of ferns and flowering plants, and bears are numerous. The chief port of Kunashiri is Tomari, on the south coast. The island of Shikotan is remarkable for the growth of a species of bamboo (called Shikotan-chiku), having dark brown spots on the cane. Etorofu has a coast-line broken by deep bays, of which the principal are Naibo-wan, Rubetsu-wan and Bettobuwan on the northern shore and Shitokap-wan on the southern. It is covered almost completely with dense forest, and has a number of streams abounding with salmon. Shana, the chief port, is in Rubetsu Bay. This island, the principal of the group, is divided into four provinces for administrative purposes, namely, Etorofu, Furubetsu, Shana and Shibetoro. Its mountains are Atosha-nobori (4035 ft.) in Etorofu; Chiripnupari (5009 ft.) in Shana; and Mokoro-nobori (3930 ft.) and Atuiyadake (3932 ft.) in Shibetoro. Among the other islands three only call for notice on account of their altitudes, namely, Ketoi-jima, Rashua-jima and Matua-jima, which rise to heights of 3944, 3304 and 5240 ft. respectively.

Population.—Not much is known about the aborigines. By some authorities Ainu colonists are supposed to have been the first settlers, and to have arrived there via Yezo; by others, the earliest comers are believed to have been a hyperborean tribe travelling southwards by way of Kamchatka. The islands themselves have not been sufficiently explored to determine whether they furnish any ethnological evidences. The present population aggregates about 4400, or 0·7 per sq. m., of whom about 600 are Ainu (*q.v.*). There is little disposition to emigrate thither from Japan proper, the number of settlers being less than 100 annually.

History.—The Kurile Islands were discovered in 1634 by the Dutch navigator Martin de Vries. The three southern islands, Kunashiri, Etorofu, and Shikotan, are believed to have belonged to Japan from a remote date, but at the beginning of the 18th century the Russians, having conquered Kamchatka, found their way to the northern part of the Kuriles in pursuit of fur-bearing animals, with which the islands then abounded. Gradually these encroachments were pushed farther south, simultaneously with aggressions imperilling the Japanese settlements in the southern half of Sakhalin. Japan's occupation was far from effective in either region, and in 1875 she was not unwilling to conclude a convention by which she agreed to withdraw altogether from Sakhalin provided that Russia withdrew from the Kuriles.

An officer of the Japanese navy, Lieut. Gunji, left Tokyo with about forty comrades in 1892, his intention being to form a settlement on Shumshiri, the most northerly of the Kurile Islands. They embarked in open boats, and for that reason, as well as because they were going to constitute themselves their country's extreme outpost, the enterprise attracted public enthusiasm. After a long struggle the immigrants became fairly prosperous.

See Capt. H. J. Snow, *Notes on the Kurile Islands* (London, 1896).

KURISCHES HAFF, a lagoon of Germany, on the Baltic coast of East Prussia, stretching from Labiau to Memel, a distance of 60 m., has an area of nearly 680 sq. m. It is mostly shallow and only close to Memel attains a depth of 23 ft. It is thus unnavigable except for small coasting and fishing boats, and sea-going vessels proceed through the Memeler Tief (Memel Deep), which connects the Baltic with Memel and has a depth of 19 ft. and a breadth of 800 to 1900 ft. The Kurisches Haff is separated from the Baltic by a long spit, or tongue of land, the so-called Kurische Nehrung, 72 m. in length and with a breadth of 1 to 2 miles. The latter is fringed throughout its whole length by a chain of dunes, which rise in places to a height of nearly 200 ft. and threaten, unless checked, to be pressed farther inland and silt up the whole Haff.

See Berendt, *Geologie des Kurischen Haffs* (Königsberg, 1869); Sommer, *Das Kurische Haff* (Danzig, 1889); A. Bezzenberger, *Die Kurische Nehrung und ihre Bewohner* (Stuttgart, 1889); and Lindner, *Die Preussische Wüste einst und jetzt, Bilder von der Kurischen Nehrung* (Osterwieck, 1898).

KURNOOL, or KARNUL, a town and district of British India, in the Madras presidency. The town is built on a rocky soil at the junction of the Hindri and Tungabhadra rivers 33 m. from a railway station. The old Hindu fort was levelled in 1865, with the exception of one of the gates, which was preserved as a specimen of ancient architecture. Cotton cloth and carpets are manufactured. Pop. (1901), 25,376, of whom half are Mussulmans.

The DISTRICT OF KURNOOL has an area of 7578 sq. m., pop. (1901), 872,055, showing an increase of 6% in the decade. Two long mountain ranges, the Nallamalais and the Yellamalais, extend in parallel lines, north and south, through its centre. The principal heights of the Nallamalai range are Biranikonda (3149 ft.), Gundlabrahmeswaram (3055 ft.), and Durugapukonda (3086 ft.). The Yellamalai is a low range, generally flat-topped with scarped sides; the highest point is about 2000 ft. Several low ridges run parallel to the Nallamalais, broken here and there by gorges, through which mountain streams take their course. Several of these gaps were dammed across under native rule, to form tanks for purposes of irrigation. The principal rivers are the Tungabhadra and Kistna, which bound the district on the north. When in flood, the Tungabhadra averages 900 yards broad and 15 ft. deep. The Kistna here flows chiefly through uninhabited jungles, sometimes in long smooth reaches, with intervening shingly rapids. The Bhavanasi rises on the Nallamalais, and falls into the Kistna at Sungameswaram, a place of pilgrimage. During the 18th century Kurnool formed the *jagir* of a semi-independent Pathan Nawab, whose descendant was dispossessed by the British government for treason in 1838. The principal crops are millets, cotton, oil-seeds, and rice, with a little indigo and tobacco. Kurnool suffered very severely from the famine of 1876–1877, and to a slight extent in 1896–1897. It is the chief scene of the operations of the Madras Irrigation Company taken over by government in 1882. The canal, which starts from the Tungabhadra river near Kurnool town, was constructed at a total cost of two millions sterling, but has not been a financial success. A more successful work is the Cumbum tank, formed under native rule by damming a gorge of the Gundlakamma river. Apart from the weaving of coarse cotton cloth, the chief industrial establishments are cotton presses, indigo vats, and saltpetre refineries. The district is served by the Southern Mahratta railway.

KUROKI, ITEI, COUNT (1844–), Japanese general, was born in Satsuma. He distinguished himself in the Chino-Japanese War of 1894–95. He commanded the I. Army in the Russo-Japanese War (1904–5), when he won the opening battle of the war at the Yalu river, and afterwards advanced through the mountains and took part with the other armies in the battles of Liao-Yang, Shaho and Mukden (see RUSSO-JAPANESE WAR). He was created baron for his services in the former war, and count for his services in the latter.

KUROPATKIN, ALEXEI NIKOLAIEVICH (1848–), Russian general, was born in 1848 and entered the army in 1864. From 1872 to 1874 he studied at the Nicholas staff college, after which he spent a short time with the French troops in Algiers. In 1875 he was employed in diplomatic work in Kashgaria and in 1876 he took part in military operations in Turkistan, Kokan and Samerkand. In the war of 1877–78 against Turkey he earned a great reputation as chief of staff to the younger Skobelev, and after the war he wrote a detailed and critical history of the operations which is still regarded as the classical work on the subject and is available for other nations in the German translation by Major Krahmer. After the war he served again on the south-eastern borders in command of the Turkestan Rifle Brigade, and in 1881 he won further fame by a march of 500 miles from Tashkent to Geok-Tēpē, taking part in the storming of the latter place. In 1882 he was promoted major-general, at the early age of 34, and he henceforth was regarded by the army as the natural successor of Skobelev. In 1890 he was promoted lieutenant-general, and thirteen years later, having acquired in peace and war the reputation of being one of the foremost soldiers in Europe, he quitted the post of minister of war which he then held and took command of the Russian army then gathering in Manchuria for the contest with Japan. His ill-success in the great war of 1904–5, astonishing as it seemed at the time, was largely attributable to his subjection to the superior command of Admiral Alexeiev, the tsar's viceroy in the Far East, and to internal friction amongst the generals, though in his history of the war (Eng. trans., 1909) he frankly admitted his own mistakes and paid the highest tribute to the gallantry of the troops who had been committed to battle under conditions unfavourable to success. After the defeat of Mukden and the retirement of the whole army to Tieling he resigned the command to General Linievich, taking the latter officer's place at the head of one of the three armies in Manchuria. (See Russo-Japanese War.)

KURO SIWO, or Kuro Shio (literally blue salt), a stream current in the Pacific Ocean, easily distinguishable by the warm temperature and blue colour of its waters, flowing north-eastwards along the east coast of Japan, and separated from it by a strip of cold water. The current persists as a stream to about 40 N., between the meridians of 150° E. and 160° E., when it merges in the general easterly drift of the North Pacific. The Kuro Siwo is the analogue of the Gulf Stream in the Atlantic.

KURRAM, a river and district on the Kohat border of the North-West Frontier province of India. The Kurram river drains the southern flanks of the Safed Koh, enters the plains a few miles above Bannu, and joins the Indus near Isa-Khel after a course of more than 200 miles. The district has an area of 1278 sq. m.; pop. (1901), 54,257. It lies between the Miranzai Valley and the Afghan border, and is inhabited by the Turis, a tribe of Turki origin who are supposed to have subjugated the Bangash Pathans five hundred years ago. It is highly irrigated, well peopled, and crowded with small fortified villages, orchards and groves, to which a fine background is afforded by the dark pine forests and alpine snows of the Safed Koh. The beauty and climate of the valley attracted some of the Mogul emperors of Delhi, and the remains exist of a garden planted by Shah Jahan. Formerly the Kurram valley was under the government of Kabul, and every five or six years a military expedition was sent to collect the revenue, the soldiers living meanwhile at free quarters on the people. It was not until about 1848 that the Turis were brought directly under the control of Kabul, when a governor was appointed, who established himself in Kurram. The Turis, being Shiah Mahommedans, never liked the Afghan rule. During the second Afghan War, when Sir Frederick Roberts advanced by way of the Kurram valley and the Peiwar Kotal to Kabul, the Turis lent him every assistance in their power, and in consequence their independence was granted them in 1880. The administration of the Kurram valley was finally undertaken by the British government, at the request of the Turis themselves, in 1890. Technically it ranks, not as a British district, but as an agency or administered area. Two expeditions in the Kurram valley also require mention: (1) The Kurram expedition of 1856 under Brigadier Chamberlain. The Turis on the first annexation of the Kohat district by the British had given much trouble. They had repeatedly leagued with other tribes to harry the Miranzai valley, harbouring fugitives, encouraging resistance, and frequently attacking Bangash and Khattak villages in the Kohat district. Accordingly in 1856 a British force of 4896 troops traversed their country, and the tribe entered into engagements for future good conduct. (2) The Kohat-Kurram expedition of 1897 under Colonel W. Hill. During the frontier risings of 1897 the inhabitants of the Kurram valley, chiefly the Massozai section of the Orakzais, were infected by the general excitement, and attacked the British camp at Sadda and other posts. A force of 14,230 British troops traversed the country, and the tribesmen were severely punished. In Lord Curzon's reorganization of the frontier in 1900–1901, the British troops were withdrawn from the forts in the Kurram valley, and were replaced by the Kurram militia, reorganized in two battalions, and chiefly drawn from the Turi tribe.

KURSEONG, or Karsiang, a sanatorium of northern India, in the Darjeeling district of Bengal, 20 m. S. of Darjeeling and 4860 ft. above sea level; pop. (1901), 4469. It has a station on the mountain railway, and is a centre of the tea trade. It also contains boys' and girls' schools for Europeans and Eurasians.

KURSK, a government of middle Russia, bounded N. by the government of Orel, E. by that of Voronezh, S. by Kharkov and W. by Chernigov. Area, 17,932 sq. m. It belongs to the central plateau of middle Russia, of which it mostly occupies the southern slope, the highest parts being in Orel and Kaluga, to the north of Kursk. Its surface is 700 to 1100 ft. high, deeply trenched by ravines, and consequently assumes a hilly aspect when viewed from the river valleys. Cretaceous and Eocene rocks prevail, and chalk, iron-stone, potters' clay and phosphates are among the economic minerals. No fewer than four hundred streams are counted within its borders, but none of them is of any service as waterways. A layer of fertile loess covers the whole surface, and Kursk belongs almost entirely to the black-earth region. The flora is distinct from that of the governments to the north, not only on account of the black-earth flora which enters into its composition, but also of the plants of south-western Russia which belong to it, a characteristic which is accentuated in the southern portion of the government. The climate is milder than that of middle Russia generally, and winds from the south-east and the south-west prevail in winter. The average temperatures are—for the year 42° F., for January 14° F. and for July 67° F. The very interesting magnetic phenomenon, known as the Byelgorod anomaly, covering an oval area 20 m. long and 12 m. wide, has been studied near the town of this name. The population, 1,893,597 in 1862, was 2,391,091 in 1897, of whom 1,208,488 were women and 199,676 lived in towns. The estimated pop. in 1906 was 2,797,000. It is thoroughly Russian (76 % Great Russians and 24 % Little Russians), and 94 % are peasants who own over 59% of the land, and live mostly in large villages. Owing to the rapid increase of the peasantry and the small size of the allotments given at the emancipation of the serfs in 1861, emigration, chiefly to Siberia, is on the increase, while 80,000 to 100,000 men leave home every summer to work in the neighbouring governments. Three-quarters of the available land is under crops, chiefly rye, other crops being wheat, oats, barley, buckwheat, millet, potatoes, sugar-beets, hemp, flax, sunflowers and fruits. Grain is exported in considerable quantities. Bees are commonly kept, as also are large numbers of livestock. Factories (steam flour-mills, sugar-factories, distilleries, wool-washing, tobacco factories) give occupation to about 23,000 workers. Domestic and petty trades are on the increase in the villages, and new ones are being introduced, the chief products being boots, ikons (sacred images) and shrines, toys, caps, vehicles, baskets, and pottery. About 17 m. from the chief town is held the Korennaya fair, formerly the greatest in South Russia, and still with an annual trade valued at £900,000. The Kursk district contains more than sixty old town sites; and barrows or burial mounds (*kurgans*) are extremely abundant. Notwithstanding the active efforts of the local councils (*zemstvos*), less than 10% of the population read and write. The government is crossed from north to south and from west to south by two main lines of railway. The trade in grain, hemp, hemp-seed oil, sheepskins, hides, tallow, felt goods, wax, honey and leather goods is very brisk. There are fifteen districts, the chief towns of which, with their populations in 1897, are Kursk (*q.v.*) Byelgorod (21,850), Dmitriev (7315), Fatezh (4959), Graivoron (7669), Korocha (14,405), Lgov (5376), Novyi Oskol (2762), Oboyañ (11872), Putivl (8965), Rylsk (11,415), Staryi Oskol (16,662), Shchigry (3329), Suja (12,856) and Tim (7380). There are more than twenty villages which have from 5000 to 12,000 inhabitants each. (P. A K.; J. T. Be.)

KURSK, a town of Russia, capital of the government of the same name, at the junction of the railways from Moscow, Kiev and Kharkov, 330 m. S.S.W. from Moscow. Pop. (1897), 52,896. It is built on two hills (750 ft.), the slopes of which are planted with orchards. The environs all round are well wooded and the woods are famous for their nightingales. Among the public buildings the more noticeable are a monastery with an image of the Virgin, greatly venerated since 1295; the Orthodox Greek cathedral (18th century); and the episcopal palace, Kursk being a bishopric of the national church. It is essentially a provincial town, and is revered as the birthplace of Theodosius, one of the most venerated of Russian saints. It has a public garden, and has become the seat of several societies (medical, musical, educational and for sport). Its factories include steam flour-mills, distilleries, tobacco-works, hemp-crushing mills, tanneries, soap-works and iron-works. It has a great yearly fair (*Korennaya*), and an active trade in cereals, linen, leather, fruit, horses, cattle, hides, sheepskins, furs, down, bristles, wax, tallow and manufactured goods.

Kursk was in existence in 1032. It was completely destroyed by the Mongols in 1240. The defence of the town against an incursion of the Turkish Polovtsi (or Comans or Cumani) is celebrated in *The Triumph of Igor*, an epic which forms one of the most valuable relics of early Russian literature. From 1586 to the close of the 18th century the citadel was a place of considerable strength; the remains are now comparatively few.

KURTZ, JOHANN HEINRICH (1809–1890), German Lutheran theologian, was born at Montjoie near Aix la Chapelle on the 13th of December 1809, and was educated at Halle and Bonn. Abandoning the idea of a commercial career, he gave himself to the study of theology and became religious instructor at the gymnasium of Mitau in 1835, and ordinary professor of theology (church history, 1850; exegesis, 1859) at Dorpat. He resigned his chair in 1870 and went to live at Marburg, where he died on the 26th of April 1890. Kurtz was a prolific writer, and many of his books, especially the *Lehrbuch der heiligen Geschichte* (1843), became very popular. In the field of biblical criticism he wrote a *Geschichte des Alten Bundes* (1848–1855), *Zur Theologie der Psalmen* (1865) and *Erklärung des Briefs an die Hebräer* (1869). His chief work was done in church history, among his productions being *Lehrbuch der Kirchengeschichte für Studierende* (1849), *Abriss der Kirchengeschichte* (1852) and *Handbuch der allgemeinen Kirchengeschichte* (1853–1856). Several of his books have been translated into English.

KURUMAN, a town in the Bechuanaland division of Cape Colony, 120 m. N.W. of Kimberley and 85 m. S.W. of Vryburg. It is a station of the London Missionary Society, founded in 1818, and from 1821 to 1870 was the scene of the labours of Robert Moffat (*q.v.*) who here translated the Bible into the Bechuana tongue. In the middle period of the 19th century Kuruman was the rendezvous of all travellers going north or south. Of these the best known is David Livingstone. The trunk railway line passing considerably to the east of the town, Kuruman is no longer a place of much importance. It is pleasantly situated on the upper course of the Kuruman river, being beautified by gardens and orchards, and presents a striking contrast to the desert conditions of the surrounding country. Its name is that of the son and heir of Mosilikatze, the founder of the Matabele nation. Kuruman disappeared during his father's lifetime and the succession passed to Lobengula (see Rhodesia: *History*). In November 1899 the town was besieged by a Boer force. The garrison, less than a hundred strong, held out for six weeks against over 1000 of the enemy, but was forced to surrender on the 1st of January 1900. In June following it was reoccupied by the British.

KURUMBAS and **KURUBAS,** aboriginal tribes of southern India, by some thought to be of distinct races. There are two types of Kurumbas, those who live on the Nilgiri plateau, speak the Kurumba dialect and are mere savages; and those who live in the plains, speak Kanarese and are civilized. The former are a small people, with wild matted hair and scanty beard, sickly-looking, pot-bellied, large-mouthed, with projecting jaws, prominent teeth and thick lips. Their villages are called *mottas*, groups of four or five huts, built in mountain glens or forests. At the 1901 census the numbers were returned at 4083.

See James W. Breeks, *An Account of Primitive Tribes of the Nilgiris* (1873); Dr John Shortt, *Hill Ranges of Southern India*, pt. i. 47–53; Rev. F. Metz, *Tribes Inhabiting the Neilgherry Hills* (Mangalore, 1864).

KURUNEGALA, the chief town in the north-western province of Ceylon. Pop. of the town, 6483; of the district, 249,429. It was the residence of the kings of Ceylon from A.D. 1319 to 1347, and is romantically situated under the shade of Adagalla (the rock of the Tusked Elephant), which is 600 ft. high. It was in 1902 the terminus of the Northern railway (59 m. from Colombo, which has since been extended 200 m. farther, to the northernmost coast of the Jaffna Peninsula. Kurunegala is the centre of rice, coco-nut, tea, coffee and cocoa cultivation.

KURUNTWAD, or Kurandvad, a native state of India, in the Deccan division of Bombay, forming part of the Southern Mahratta jagirs. Originally created in 1772 by a grant from the peshwa, the state was divided in 1811 into two parts, one of which, called Shedbal, lapsed to the British government in 1857. In 1855 Kuruntwad was further divided between a senior and a junior branch. The territory of both is widely scattered among other native states and British districts. Area of the senior branch, 185 sq. m.; pop. (1901), 42,474; revenue, £13,000. Area of junior branch, 114 sq. m.; pop. (1901), 34,003; revenue, £9000. The joint tribute is £640. The chiefs are Brahmans by caste, of the Patwardhan family. The town of Kuruntwad, in which both branches have their residence, is on the right bank of the Panchganga river near its junction with the Kistna. Pop. (1901), 10,451.

KURZ, HERMANN (1813–1873), German poet and novelist, was born at Reutlingen on the 30th of November 1813. Having studied at the theological seminary at Maulbronn and at the university of Tübingen, he was for a time assistant pastor at Ehningen. He then entered upon a literary career, and in 1863 was appointed university librarian at Tübingen, where he died on the 10th of October 1873. Kurz is less known to fame by his poems, *Gedichte* (1836) and *Dichtungen* (1839), than by his historical novels, *Schillers Heimatjahre* (1843, 3rd ed., 1899) and *Der Sonnenwirt* (1854, 2nd ed., 1862), and his excellent translations from English, Italian and Spanish. He also published a successful modern German version of Gottfried von Strassburg's *Tristan und Isolde* (1844). His collected works were published in ten volumes (Stuttgart, 1874), also in twelve volumes (Leipzig, 1904).

His daughter, Isolde Kurz, born on the 21st of December 1853 at Stuttgart, takes a high place among contemporary lyric poets in Germany with her *Gedichte* (Stuttgart, 1888, 3rd ed. 1898) and *Neue Gedichte* (1903). Her short stories, *Florentiner Novellen* (1890, 2nd ed. 1893), *Phantasien und Märchen* (1890), *Italienische Erzählungen* (1895) and *Von Dazumal* (1900) are distinguished by a fine sense of form and clear-cut style.

KUSAN ("lake" or "inland bay"), a small group of North American Indian tribes, formerly living on the Coos river and the coast of Oregon. They call themselves Anasitch, and other names given them have been Ka-us or Kwo-Kwoos, Kowes and Cook-koo-oose. They appear to be in no way related to their neighbours. The few survivors, mostly of mixed blood, are on the Siletz reservation, Oregon.

KUSHALGARH, a village in the Kohat district of the North-West Frontier province of India. It is only notable as the point at which the Indus is bridged to permit of the extension of the strategic frontier railway from Rawalpindi to the Miranzai and Kurram valleys.

KUSHK, a river of Afghanistan, which also gives its name to the chief town in the Afghan province of Badghis, and to a military post on the border of Russian Turkestan. The river Kushk, during a portion of its course, forms the boundary between Afghan and Russian territory; but the town is some 20 m. from the border. Kushk, or Kushkinski Post, is now a fourth-class Russian fortress, on a Russian branch railway from Merv, the terminus of which is 12 m. to the south, at Chahil Dukteran. It is served by both the Transcaspian and the Orenburg-Tashkent railways. The terminus is only 66 m. from Herat, and in the event of war would become an important base for a Russian advance. Some confusion has arisen through the popular application of the name of Kushk to this terminus, though it is situated neither at the Russian post nor at the old town. (T. H. H.*)

KUSTANAISK, a town of Asiatic Russia, in the province of Turgai, on the Tobol river, 410 m. E.N.E. of Orenburg, in a very fertile part of the steppes. Pop. (1897), 14,065. The first buildings were erected in 1871, and it has since grown with American-like rapidity. The immigrants from Russia built a large village, which became the centre of the district administration in 1884, and a town in 1893, under the name of Nicolaevsk, changed later into Kustanaisk. It is an educational centre, and a cathedral has been built. There are tanneries, tallow works, potteries, and a fair for cattle, while its trade makes it a rival to Orenburg and Troitsk.

KÜSTENLAND (coast-land or littoral), a common name for the three crown-lands of Austria, Görz and Gradisca, Istria and Trieste. Their combined area is 3084 sq. m., and their population in 1900 was 755,183. They are united for certain administrative purposes under the governor of Trieste, the legal and financial authorities of which also exercise jurisdiction over the entire littoral.

KUTAIAH, Kutaya, or Kiutahia, the chief town of a sanjak in the vilayet of Brusa (Khudavendikiar), Asia Minor, is situated on the Pursaksu, an affluent of the Sakaria (anc. *Sangarius*). The town lies at an important point of the great road across Asia Minor from Constantinople to Aleppo, and is connected by a branch line with the main line from Eski-shehr to Afium Kara-Hissar, of the Anatolian railway. It has a busy trade; pop. estimated at 22,000. Kutaiah has been identified with the ancient Cotiaeum.

See V. Cuinet, *Turquie d'Asie*, vol. iv. (Paris, 1894).

KUTAIS, a government of Russian Transcaucasia, situated between the Caucasus range on the N. and the Black Sea on the W., the government of Tiflis on the E. and the province of Kars on the S. Area, 14,313 sq. m. The government includes the districts of Guria, Mingrelia, Imeretia, Abkhasia and Svanetia, and consists of four distinct parts: (1) the lowlands, drained by the Rion, and continued N.W. along the shore of the Black Sea; (2) the southern slopes of the main Caucasus range; (3) the western slopes of the Suram mountains, which separate Kutais from Tiflis; and (4) the slopes of the Armenian highlands, as well as a portion of the highlands themselves, drained by the Chorokh and its tributary, the Ajaris-tskhali, which formerly constituted the Batum province. Generally speaking, the government is mountainous in the north and south. Many secondary ridges and spurs shoot off the main range, forming high, narrow valleys (see Caucasus). The district of Batum and Artvin in the S.W., which in 1903 were in part separated for administration as the semi-military district of Batum, are filled up by spurs of the Pontic range, 9000 to 11,240 ft. high, the Arzyan ridge separating them from the plateau of Kars. Deep gorges, through which tributaries of the Chorokh force their passage to the main river, intersect these highlands, forming most picturesque gorges. The lowlands occupy over 2400 sq. m. They are mostly barren in the littoral region, but extremely fertile higher up the Rion.

The climate is very moist and warm. The winters are often without frost at all in the lowlands, while the lowest temperatures observed are 18° F. at Batum and 9° at Poti. The mountains condense the moisture brought by the west winds, and the yearly amount of rain varies from 50 to 120 in. The chief rivers are the Rion, which enters the Black Sea at Poti; the Chorokh, which enters the same sea at Batum; and the Ingur, the Kodor and the Bzyb, also flowing into the Black Sea in Abkhasia. The vegetation is extremely rich, its character suggesting the sub-tropic regions of Japan (see Caucasia). The population belongs almost entirely to the Kartvelian or Georgian group, and is distributed as follows: Imeretians, 41·2%; Mingrelians and Lazes, 22·5%; Gurians, 7·3%; Ajars, 5·8%; Svanetians, 1·3%; of other nationalities there are 6% of Abkhasians, 2·6% of Turks, 2·3% of Armenians, besides Russians, Jews, Greeks, Persians, Kurds, Ossetes and Germans. By religion 87% of the population are Greek Orthodox and only 10% Mussulmans. The total population was 933,773 in 1897, of whom 508,468 were women and 77,702 lived in towns. The estimated population in 1906 was 924,800. The land is excessively subdivided, and, owing to excellent cultivation, fetches very high prices. The chief crops are maize, wheat, barley, beans, rye, hemp, potatoes and tobacco. Maize, wine and timber are largely exported. Some cotton-trees have been planted. The vine, olive, mulberry and all sorts of fruit trees are cultivated, as also many exotic plants (eucalyptus, cork-oak, camellia, and even tea). Manganese ore is the chief mineral, and is extracted for export to the extent of 160,000 to 180,000 tons annually, besides coal, lead and silver ores, copper, naphtha, some gold, lithographic stone and marble. Factories are still in infancy, but silk is spun. A railway runs from the Caspian Sea, via Tiflis and the Suram tunnel, to Kutais, and thence to Poti and Batum, and from Kutais to the Tkvibuli coal and manganese mines. The export of both local produce and goods shipped by rail from other ports of Transcaucasia is considerable, Batum and Poti being the two chief ports of Caucasia. Kutais is divided into seven districts, of which the chief towns, with their populations in 1897, are Kutais, capital of the province (*q.v.*); Lailashi (834), chief town of Lechgum, of which Svanetia makes a separate administrative unit; Ozurgeti (4694); Oni, chief town of Racha; Senaki (101); Kvirili, of Sharopan district; Zugdidi; and two semi-military districts—Batum (28,512) with Artvin (7000) and Sukhum-kaleh (7809). (P. A. K.—J. T. Be.)

KUTAIS, a town of Russian Caucasia, capital of the government of the same name, 60 m. by rail E. of Poti and 5 m. from the Rion station of the railway between Poti and Tiflis. Pop. (1897), 32,492. It is one of the oldest towns of Caucasia, having been the ancient capital (Aea or Kutaea) of Colchis, and later the capital of Imeretia (from 792); Procopius mentions it under the name of Kotatision. Persians, Mongols, Turks and Russians have again and again destroyed the town and its fortress. In 1810 it became Russian. It is situated on both banks of the Rion river, which is spanned by three bridges. Its most remarkable building is the ruined cathedral, erected in the 11th century by the Bagratids, the ruling dynasty of Georgia, and destroyed by the Turks in 1692; it is the most important representative extant of Georgian architecture. The fort, mentioned by Procopius, is now a heap of ruins, destroyed by the Russians in 1770. The inhabitants make hats and silks, and trade in agricultural produce and wine. On the right bank of the Rion is a government model garden, with a model farm.

KUT-EL-AMARA, a small town in Turkish Asia, on the east bank of the Tigris (32° 29′ 19″ N., 44° 45′ 37″ E.) at the point where the Shatt-el-Haï leaves that stream. It is a coaling station of the steamers plying between Basra and Bagdad, and an important Turkish post for the control of the lower Tigris.

KUTENAI (Kutonaga), a group of North-American Indian tribes forming the distinct stock of Kitunahan. Their former range was British Columbia, along the Kootenay lake and river. They were always friendly to the whites and noted for their honesty. In 1904 there were some 550 in British Columbia; and in 1908 there were 606 on the Flathead Agency, Montana.

KUTTALAM, or Courtallum, a sanatorium of southern India, in the Tinnevelly district of Madras; pop. (1901), 1197. Though situated only 450 ft. above sea-level, it possesses the climate of a much higher elevation, owing to the breezes that reach it through a gap in the Ghats. It has long been a favourite resort for European visitors, the season lasting from July to September; and it has recently been made more accessible by the opening of the railway from Tinnevelly into Travancore. The scenery is most picturesque, including a famous waterfall.

KUTTENBERG (Czech, *Kutná Hora*), a town of Bohemia, Austria, 45 m. E. by S. of Prague. Pop. (1900), 14,799, mostly

Czech. Amongst its buildings are the Gothic five-naved church of St Barbara, begun in 1368, the Gothic church of St Jacob (14th century) and the Late Gothic Trinity church (end of 15th century). The Wälscher Hof, formerly a royal residence and mint, was built at the end of the 13th century, and the Gothic Steinerne Haus, which since 1849 serves as town-hall, contains one of the richest archives in Bohemia. The industry includes sugar-refining, brewing, the manufacture of cotton and woollen stuffs, leather goods and agricultural implements.

The town of Kuttenberg owes its origin to the silver mines, the existence of which can be traced back to the first part of the 13th century. The city developed with great rapidity, and at the outbreak of the Hussite troubles, early in the 14th century, was next to Prague the most important in Bohemia, having become the favourite residence of several of the Bohemian kings. It was here that, on the 18th of January 1419, Wenceslaus IV. signed the famous decree of Kuttenberg, by which the Bohemian nation was given three votes in the elections to the faculty of Prague University as against one for the three other "nations." In the autumn of the same year Kuttenberg was the scene of horrible atrocities. The fierce mining population of the town was mainly German, and fanatically Catholic, in contrast with Prague, which was Czech and utraquist. By way of reprisals for the Hussite outrages in Prague, the miners of Kuttenberg seized on any Hussites they could find, and burned, beheaded or threw them alive into the shafts of disused mines. In this way 1600 people are said to have perished, including the magistrates and clergy of the town of Kauřim, which the Kuttenbergers had taken. In 1420 the emperor Sigismund made the city the base for his unsuccessful attack on the Taborites; Kuttenberg was taken by Žižka, and after a temporary reconciliation of the warring parties was burned by the imperial troops in 1422, to prevent its falling again into the hands of the Taborites. Žižka none the less took the place, and under Bohemian auspices it awoke to a new period of prosperity. In 1541 the richest mine was hopelessly flooded; in the insurrection of Bohemia against Ferdinand I. the city lost all its privileges; repeated visitations of the plague and the horrors of the Thirty Years' War completed its ruin. Half-hearted attempts after the peace to repair the ruined mines failed; the town became impoverished, and in 1770 was devastated by fire. The mines were abandoned at the end of the 18th century; one mine was again opened by the government in 1874, but the work was discontinued in 1903.

KUTUSOV [Golenishchev-Kutusov], **MIKHAIL LARIONOVICH,** Prince of Smolensk (1745–1813), Russian field marshal, was born on the 16th of September 1745 at St Petersburg, and entered the Russian army in 1759 or 1760. He saw active service in Poland, 1764–69, and against the Turks, 1770–74; lost an eye in action in the latter year; and after that travelled for some years in central and western Europe. In 1784 he became major-general, in 1787 governor-general of the Crimea; and under Suvorov, whose constant companion he became, he won considerable distinction in the Turkish War of 1788–91, at the taking of Ochakov, Odessa, Benda and Ismail, and the battles of Rimnik and Mashin. He was now (1791) a lieutenant-general, and successively occupied the positions of ambassador at Constantinople, governor-general of Finland, commandant of the corps of cadets at St Petersburg, ambassador at Berlin, and governor-general of St Petersburg. In 1805 he commanded the Russian corps which opposed Napoleon's advance on Vienna (see Napoleonic Campaigns), and won the hard-fought action of Dürrenstein on the 18th–19th of November.

On the eve of Austerlitz (*q.v.*) he tried to prevent the Allied generals from fighting a battle, and when he was overruled took so little interest in the event that he fell asleep during the reading of the orders. He was, however, present at the battle itself, and was wounded. From 1806 to 1811 Kutusov was governor-general of Lithuania and Kiev, and in 1811, being then commander-in-chief in the war against the Turks, he was made a prince. Shortly after this he was called by the unanimous voice of the army and the people to command the army that was retreating before Napoleon's advance. He gave battle at Borodino (*q.v.*), and was defeated, but not decisively, and after retreating to the south-west of Moscow, he forced Napoleon to begin the celebrated retreat. The old general's cautious pursuit evoked much criticism, but at any rate he allowed only a remnant of the Grand Army to regain Prussian soil. He was now field marshal and prince of Smolensk—this title having been given him for a victory over part of the French army at that place in November 1812. Early in the following year he carried the war into Germany, took command of the allied Russians and Prussians, and prepared to raise all central Europe in arms against Napoleon's domination, but before the opening of the campaign he fell ill and died on the 25th of March 1813 at Bunzlau. Memorials have been erected to him at that place and at St Petersburg.

Mikhailovsky-Danilevski's life of Kutusov (St Petersburg, 1850) was translated into French by A. Fizelier (Paris, 1850).

KUWĒT (Kuweit, Koweit), a port in Arabia at the north-western angle of the Persian Gulf in 29° 20′ N. and 48″ E., about 80 m. due S. of Basra and 60 m. S.W. of the mouth of the Shat el Arab. The name Kuwēt is the diminutive form of Kut, a common term in Irāk for a walled village; it is also shown in some maps as Grane or Grain, a corruption of Kurēn, the diminutive of Karn, a horn. It lies on the south side of a bay 20 m. long and 5 m. wide, the mouth of which is protected by two islands, forming a fine natural harbour, with good anchorage in from 4 to 9 fathoms of water. The town has 15,000 inhabitants and is clean and well built; the country around being practically desert, it depends entirely on the sea and its trade, and its sailors have a high reputation as the most skilful and trustworthy on the Persian Gulf; while its position as the nearest port to Upper Nejd gives it great importance as the port of entry for rice, piece goods, &c., and of export for horses, sheep, wool and other products of the interior. Kuwēt was recommended in 1850 by General F. R. Chesney as the terminus of his proposed Euphrates Valley railway, and since 1898, when the extension of the Anatolian railway to Bagdad and the Gulf has been under discussion, attention has again been directed to it. An alternative site for the terminus has been suggested in Um Khasa, at the head of the Khor ʽAbdallah, where a branch of the Shat el Arab formerly entered the sea; it lies some 20 m. N.E. of Kuwēt and separated from it by the island of Bubiān, which has for some time been in Turkish occupation. An attempt by Turkey to occupy Kuwēt in 1898 was met by a formal protest from Great Britain against any infringement of the *status quo*, and in 1899 Sheikh Mubārak of Kuwēt placed his interests under British protection.

The total trade passing through Kuwēt in 1904–1905 was valued at £160,000. The imports include arms and ammunition, piece goods, rice, coffee, sugar, &c.; and the exports, horses, pearls, dates, wool, &c. The steamers of the British India Steamship Company call fortnightly. (R. A. W.)

KUZNETSK, two towns of Russia. (1) A town in the government of Saratov, 74 m. by rail east of Penza. It has grown rapidly since the development of the railway system in the Volga basin. It has manufactures of agricultural machinery and hardware, in a number of small factories and workshops, besides tanneries, rope-works, boot and shoe making in houses, and there is considerable trade in sheepskins, grain, salt and wooden goods exported to the treeless regions of south-east Russia. Pop. (1897), 21,740. (2) A town in West Siberia, in the government of Tomsk, 150 m. E.N.E. of Barnaul, on the Upper Tom river, at the head of navigation. It has trade in grain, cattle, furs, cedarwood, nuts, wax, honey and tallow, and is the centre of a coal-mining district. Pop. (1897), 3141.

KVASS, or Kwass (a Russian word for "leaven"), one of the national alcoholic drinks of Russia, and popular also in eastern Europe. It is made, by a simultaneous acid and alcoholic fermentation, of wheat, rye, barley and buckwheat meal or of rye-bread, with the addition of sugar or fruit. It has been a universal drink in Russia since the 16th century. Though in the large towns it is made commercially, elsewhere it is frequently an article of domestic production. Kvass is of very low alcoholic content (0·7 to 2·2 %). There are, beside the ordinary kind, superior forms of the drink, such as apple or raspberry kvass.

KWAKIUTL, a tribe of North-American Indians of Wakashan stock. They number about 2000. Formerly the term was used of the one tribe in the north-east of Vancouver, but now it is the collective name for a group of Wakashan peoples. The Kwakiutl Indians are remarkable for their conservatism in all matters and specially their adherence to the custom of Potlatch, which it is sometimes suggested originated with them. Tribal government is in the hands of secret societies. There are three social ranks, hereditary chiefs, middle and third estates, most of the latter being slaves or their descendants. Entry to the societies is forbidden the latter, and can only be obtained by the former after torture and fasting. The *hamatsa* or cannibal society is only open to those who have been members of a lower society for eight years.

KWANGCHOW BAY (Kwangchow Wan), a coaling station on the south coast of China, acquired, along with other concessions, by the French government in April 1898. It is situated on the east side of the peninsula of Lienchow, in the province of Kwangtung, and directly north of the island of Hainan. It is held on lease for 99 years on similar terms to those by which Kiaochow is held by Germany, Port Arthur by Japan and Wei-hai-wei by Great Britain. The cession includes the islands lying in the bay; these enclose a roadstead 18 m. long by 6 m. wide, with admirable natural defences and a depth at no part of less than 33 ft. The bay forms the estuary of the Ma-Ts'e river, navigable by the largest men-of-war for 12 m. from the coast. The limits of the concession inland were fixed in November 1899. On the left bank of the Ma-Ts'e France gained from Kow Chow Fu a strip of territory 11 m. by 6 m., and on the right bank a strip 15 m. by 11 m. from Lei Chow Fu. The country is well populated; the capital and chief town is Lei Chow. The cession carries with it full territorial jurisdiction during the continuance of the lease. In January 1900 it was placed under the authority of the governor-general of Indo-China, who in the same month appointed a civil administrator over the country, which was divided into three districts. The population of the territory is about 189,000. A mixed tribunal has been instituted, but the local organization is maintained for purposes of administration. In addition to the territory acquired, the right has been given to connect the bay by railway with the city and harbour of Ompon, situated on the west side of the peninsula, and in consequence of difficulties which were offered by the provincial government on the occasion of taking possession, and which compelled the French to have recourse to arms, the latter demanded and obtained exclusive mining rights in the three adjoining prefectures. Two lines of French steamships call at the bay. By reason of the great strategical importance of the bay, and the presence of large coal-beds in the near neighbourhood, much importance is attached by the French to the acquirement of Kwangchow Wan.

KWANG-SI, a southern province of China, bounded N. by Kwei-chow and Hu-nan, E. and S. by Kwang-tung, S.W. and W. by French Indo-Chino and Yun-nan. It covers an area of 80,000 sq. m. It is the least populous province of China, its inhabitants numbering (1908) little over 5,000,000. The Skias, an aboriginal race, form two-thirds of the population. The provincial capital is Kwei-lin Fu, or City of the Forest of Cinnamon Trees, and there are besides ten prefectural cities. The province is largely mountainous. The principal rivers are the Si-kiang and the Kwei-kiang, or Cinnamon River, which takes its rise in the district of Hing-gan, in the north of the province, and in the neighbourhood of that of the Siang river, which flows northward through Hu-nan to the Tung-t'ing Lake. The Kwei-kiang, on the other hand, takes a southerly course, and passes the cities of Kwei-lin, Yang-so Hien, P'ing-lē Fu, Chao-p'ing Hien, and so finds its way to Wu-chow Fu, where it joins the waters of the Si-kiang. Another considerable river is the Liu-kiang, or Willow River, which rises in the mountains inhabited by the Miao-tsze, in Kwei-chow. Leaving its source it takes a south-easterly direction, and enters Kwang-si, in the district of Hwai-yuen. After encircling the city of that name, it flows south as far as Liu-ch'ĕng Hien, where it forms a junction with the Lung-kiang, or Dragon River. Adopting the trend of this last-named stream, which has its head-waters in Kwei-chow, the mingled flow passes eastward, and farther on in a south-easterly direction, by Lai-chow Fu, Wu-suan Hien, and Sin-chow Fu, where it receives the waters of the Si-kiang, and thenceforth changes its name for that of its affluent. The treaty ports in Kwang-si are Wuchow Fu, Lung-chow and Nanning Fu.

KWANG-TUNG, a southern province of China, bounded N. by Hu-nan, Kiang-si and Fu-kien, S. and E. by the sea, and W. by Kwang-si. It contains an area, including the island of Hainan, of 75,500 sq. m., and is divided into nine prefectures; and the population is estimated at about 30,000,000. Its name, which signifies "east of Kwang," is derived, according to Chinese writers, from the fact of its being to the east of the old province of Hu-kwang, in the same way that Kwang-si derives its name from its position to the west of Hu-kwang. Kwang-tung extends for more than 600 m. from east to west, and for about 420 from north to south. It may be described as a hilly region, forming part as it does of the Nan Shan ranges. These mountains, speaking generally, trend in a north-east and south-westerly direction, and are divided by valleys of great fertility. The principal rivers of the province are the Si-kiang, the Pei-kiang, or North River, which rises in the mountains to the north of the province, and after a southerly course joins the Si-kiang at San-shui Hien; the Tung-kiang, or East River, which, after flowing in a south-westerly direction from its source in the north-east of the province, empties itself into the estuary which separates the city of Canton from the sea; and the Han River, which runs a north and south course across the eastern portion of the province, taking its rise in the mountains on the western frontier of Fu-kien and emptying itself into the China Sea in the neighbourhood of Swatow. Kwang-tung is one of the most productive provinces of the empire. Its mineral wealth is very considerable, and the soil of the valleys and plains is extremely fertile. The principal article of export is silk, which is produced in the district forming the river delta, extending from Canton to Macao and having its apex at San-shui Hien. Three large coal-fields exist in the province, namely, the Shao-chow Fu field in the north; the Hwa Hien field, distant about 30 m. from Canton; and the west coast field, in the south-west. The last is by far the largest of the three and extends over the districts of Wu-ch'uen, Tien-pai, Yang-kiang, Yang-ch'un, Gan-p'ing, K'ai-p'ing, Sin-hing, Ho-shan, Sin-hwang, and Sin-ning. The coal from the two first-named fields is of an inferior quality, but that in the west coast field is of a more valuable kind. Iron ore is found in about twenty different districts, notably in Ts'ing-yuen, Ts'ung-hwa, Lung-mĕn, and Lu-fĕng. None, however, is exported in its raw state, as all which is produced is manufactured in the province, and principally at Fat-shan, which has been called the Birmingham of China. The Kwang-tung coast abounds with islands, the largest of which is Hainan, which forms part of the prefecture of K'iung-chow Fu. This island extends for about 100 m. from north to south and the same distance from east to west. The southern and eastern portions of Hainan are mountainous, but on the north there is a plain of some extent. Gold is found in the central part; and sugar, coco-nuts, betel-nuts, birds' nests, and agar agar, or sea vegetable, are among the other products of the island. Canton, Swatow, K'iung-chow (in Hainan), Pakhoi, San-shui are among the treaty ports. Three ports in the province have been ceded or leased to foreign powers—Macao to Portugal, Hong-Kong (with Kowloon) to Great Britain, and Kwangchow to France.

KWANZA (Coanza or Quanza), a river of West Africa, with a course of about 700 m. entirely within the Portuguese territory of Angola. The source lies in about 13° 40′ S., 17° 30′ E. on the Bihe plateau, at an altitude of over 5000 ft. It runs first N.E. and soon attains fairly large dimensions. Just north of 12° it is about 60 yds. wide and 13 to 16 ft. deep. From this point to 10° it flows N.W., receiving many tributaries, especially the Luando from the east. In about 10°, and at intervals during its westerly passage through the outer plateau escarpments, its course is broken by rapids, the river flowing in a well-defined valley flanked by higher ground. The lowest fall is that of Kambamba, or Livingstone, with a drop of 70 ft. Thence to the sea, a distance of some 160 m., it is navigable by small steamers, though very shallow in the dry season. The river enters the sea in 9° 15′ S., 13° 20′ E., 40 m. S. of Loanda. There is a shifting bar at its mouth, difficult to cross, but the river as a waterway has become of less importance since the fertile district in its middle basin has been served by the railway from Loanda to Ambaca (see ANGOLA).

KWEI-CHOW, a south-western province of China, bounded N. by Sze-ch'uen, E. by Hu-nan, S. by Kwang-si, and W. by Yun-nan. It contains 67,000 sq. m., and has a population of about 8,000,000. Kwei-yang Fu is the provincial capital, and besides this there are eleven prefectural cities in the province. With the exception of plains in the neighbourhood of Kwei-yang Fu, Ta-ting Fu, and Tsun-i Fu, in the central and northern regions, the province may be described as mountainous. The mountain ranges in the south are largely inhabited by Miao-tsze, who are the original owners of the soil and have been constantly goaded into a state of rebellion by the oppression to which they have been subjected by the Chinese officials. To this disturbing cause was added another in 1861 by the spread of the Mahommedan rebellion in Yun-nan into some of the south-western districts of the province. The devastating effects of these civil wars were most disastrous to the trade and the prosperity of Kwei-chow. The climate is by nature unhealthy, the supply of running water being small, and that of stagnant water, from which arises a fatal malaria, being considerable. The agricultural products of the province are very limited, and its chief wealth lies in its minerals. Copper, silver, lead, and zinc are found in considerable quantities, and as regards quicksilver, Kwei-chow is probably the richest country in the world. This has been from of old the chief product of the province, and the belt in which it occurs extends through the whole district from south-west to north-east. One of the principal mining districts is K'ai Chow, in the prefecture of Kwei-yang Fu, and this district has the advantage of being situated near Hwang-p'ing Chow, from which place the products can be conveniently and cheaply shipped to Hankow. Cinnabar, realgar, orpiment and coal form the rest of the mineral products of Kwei-chow. Wild silk is another valuable article of export. It is chiefly manufactured in the prefecture of Tsun-i Fu.

KYAUKPYU, a district in the Arakan division of Lower Burma, on the eastern coast of the Bay of Bengal. It consists of, first, a strip of mainland along the Bay of Bengal, extending from the An pass, across the main range, to the Ma-ī River, and, secondly, the large islands of Ramree and Cheduba, with many others to the south, lying off the coast of Sandoway. The mainland in the north and east is highly mountainous and forest-clad, and the lower portion is cut up into numerous islands by a network of tidal creeks. Between the mainland and Ramree lies a group of islands separated by deep, narrow, salt-water inlets, forming the north-eastern shore of Kyaukpyu harbour, which extends for nearly 30 m. along Ramree in a south-easterly direction, and has an average breadth of 3 m. The principal mountains are the Arakan Yomas, which send out spurs and sub-spurs almost to the sea-coast. The An pass, an important trade route, rises to a height of 4664 ft. above sea-level. The Dha-let and the An rivers are navigable by large boats for 25 and 45 m. respectively. Above these distances they are mere mountain torrents. Large forests of valuable timber cover an area of about 650 sq. m. Kyaukpyu contains numerous "mud volcanoes," from which marsh gas is frequently discharged, with occasional issue of flame. The largest of these is situated in the centre of Cheduba island. Earth-oil wells exist in several places in the district. The oil when brought to the surface has the appearance of a whitish-blue water, which gives out brilliant straw-coloured rays, and emits a strong pungent odour. Limestone, iron and coal are also found. Area 4387 sq. m.; pop. (1901), 168,827, showing an increase in the decade of 2·3%.

The chief town, Kyaukpyu, had a population in 1901 of 3145. It has a municipal committee of twelve members, three *ex officio* and nine appointed by the local government, and there is a third-class district gaol. Kyaukpyu is a port under the Indian Ports Act (X. of 1889), and the steamers of the British India Navigation Company call there once a week going and coming between Rangoon and Calcutta.

KYAUKSĒ, a district in the Meiktila division of Upper Burma, with an area of 1274 sq. m., and a population in 1901 of 141,253. It is also known as the *Ko-kayaing*, so called from the original nine canals of the district. It consists of a generally level strip running north and south at the foot of the Shan Hills, and of a hilly region rising up these hills to the east, and including the Yeyaman tract, which lies between 21° 30′ and 21° 40′ N. and 96° 15′ and 96° 45′ E., with peaks rising to between 4500 and 5000 ft. This tract is rugged and scored by ravines, and is very sparsely inhabited. The Panlaung and Zawgyi rivers from the Shan States flow through the district and are utilized for the numerous irrigation canals. Notwithstanding this, much timber is floated down, and the Panlaung is navigable for small boats all the year round. Rain is very scarce, but the canals supply ample water for cultivation and all other purposes. They are said to have been dug by King Nawrahtā in 1092. He is alleged to have completed the system of nine canals and weirs in three years' time. Others have been constructed since the annexation of Upper Burma. At that time many were in serious disrepair, but most of them have been greatly improved by the construction of proper regulators and sluices. Two-thirds of the population are dependent entirely on cultivation for their support, and this is mainly rice on irrigated land. In the Yeyaman tract the chief crop is rice. The great majority of the population is pure Burmese, but in the hills there are a good many Danus, a cross between Shans and Burmese. The railway runs through the centre of the rice-producing area, and feeder roads open up the country as far as the Shan foot-hills. The greater part of the district consists of state land, the cultivators being tenants of government, but there is a certain amount of hereditary freehold.

KYAUKSĒ town is situated on the Zawgyi River and on the Rangoon-Mandalay railway line, and is well laid out in regular streets, covering an area of about a square mile. It has a population (1901) of 5420, mostly Burmese, with a colony of Indian traders. Above it are some bare rocky hillocks, picturesquely studded with pagodas.

KYD, THOMAS (1558–1594), one of the most important of the English Elizabethan dramatists who preceded Shakespeare. Kyd remained until the last decade of the 19th century in what appeared likely to be impenetrable obscurity. Even his name was forgotten until Thomas Hawkins about 1773 discovered it in connexion with *The Spanish Tragedy* in Thomas Heywood's *Apologie for Actors*. But by the industry of English and German scholars a great deal of light has since been thrown on his life and writings. He was the son of Francis Kyd, citizen and scrivener of London, and was baptized in the church of St Mary Woolnoth, Lombard Street, on the 6th of November 1558. His mother, who survived her son, was named Agnes, or Anna. In October 1565 Kyd entered the newly founded Merchant Taylors' School, where Edmund Spenser and perhaps Thomas Lodge were at different times his school-fellows. It is thought that Kyd did not proceed to either of the universities; he apparently followed, soon after leaving school, his father's business as a scrivener. But Nashe describes him as a "shifting companion that ran through every art and throve by none." He showed a fairly wide range of reading in Latin. The author on whom he draws most freely is Seneca, but there are many reminiscences, and occasionally mistranslations of other authors. Nashe contemptuously said that "English Seneca read by candlelight yeeldes many good sentences," no doubt exaggerating his indebtedness to Thomas Newton's translation. John Lyly had a more marked influence on his manner than any of his contemporaries. It is believed that he produced his famous play, *The Spanish Tragedy*, between 1584 and 1589; the quarto in the British Museum (which is probably earlier than the Göttingen and Ellesmere quartos, dated 1594 and 1599) is undated, and the play was licensed for the press in 1592. The full title runs, *The Spanish Tragedie containing the Lamentable End of Don Horatio and Bel-imperia; with the Pitiful Death of Old Hieronimo*, and the play is commonly referred to by Henslowe and other contemporaries as *Hieronimo*. This drama enjoyed all through the age of Elizabeth and even of James I. and Charles I. so unflagging a success that it has been styled the most popular of all old English plays. Certain expressions in Nashe's preface to the 1589 edition of Robert Greene's *Menaphon* may be said to have started a whole world of speculation with regard to Kyd's activity. Much of this is still very puzzling; nor is it really understood why Ben Jonson called him "sporting Kyd." In 1592 there was added a sort of prologue to *The Spanish Tragedy*, called *The First Part of Jeronimo, or The Warres of Portugal*, not printed till 1605. Professor Boas concludes that Kyd had nothing to do with this melodramatic production, which gives a different version of the story and presents Jeronimo as little more than a buffoon. On the other hand, it becomes more and more certain that what German criticism calls the *Ur-Hamlet*, the original draft of the tragedy of the prince of Denmark, was a lost work by Kyd, probably composed by him in 1587. This theory has been very elaborately worked out by Professor Sarrazin, and confirmed by Professor Boas; these scholars are doubtless right in holding that traces of Kyd's play survive in the first two acts of the 1603 first quarto of *Hamlet*, but they probably go too far in attributing much of the actual language of the last three acts to Kyd. Kyd's next work was in all probability the tragedy of *Soliman and Perseda*, written perhaps in 1588 and licensed for the press in 1592, which, although anonymous, is assigned to him on strong internal evidence by Mr Boas. No copy of the first edition has come down to us; but it was reprinted, after Kyd's death, in 1599. In the summer or autumn of 1590 Kyd seems to have given up writing for the stage, and to have entered the service of an unnamed lord, who employed a troop of "players." Kyd was probably the private secretary of this nobleman, in whom Professor Boas sees Robert Radcliffe, afterwards fifth earl of Sussex. To the wife of the earl (Bridget Morison of Cassiobury) Kyd dedicated in the last year of his life his translation of Garnier's *Cornelia* (1594), to the dedication of which he attached his initials. Two prose works of the dramatist have survived, a treatise on domestic economy, *The Householder's Philosophy*, translated from the Italian of Tasso (1588); and a sensational account of *The Most Wicked and Secret Murdering of John Brewer, Goldsmith* (1592). His name is written on the title-page of the unique copy of the last-named pamphlet at Lambeth, but probably not by his hand. That many of Kyd's plays and poems have been lost is proved by the fact that fragments exist, attributed to him, which are found in no surviving context. Towards the close of his life Kyd was brought into relations with Marlowe. It would seem that in 1590, soon after he entered the service of this nobleman, Kyd formed his acquaintance. If he is to be believed, he shrank at once from Marlowe as a man "intemperate and of a cruel heart" and "irreligious." This, however, was said by Kyd with the rope round his neck, and is scarcely consistent with a good deal of apparent intimacy between him and Marlowe. When, in May 1593, the "lewd libels" and "blasphemies" of Marlowe came before the notice of the Star Chamber, Kyd was immediately arrested, papers of his having been found "shuffled" with some of Marlowe's, who was imprisoned a week later. A visitation on Kyd's papers was made in consequence of his having attached a seditious libel to the wall of the Dutch churchyard in Austin Friars. Of this he was innocent, but there was found in his chamber a paper of "vile heretical conceits denying the deity of Jesus Christ." Kyd was arrested and put to the torture in Bridewell. He asserted that he knew nothing of this document and tried to shift the responsibility of it upon Marlowe, but he was kept in prison until after the death of that poet (June 1, 1593). When he was at length dismissed, his patron refused to take him back into his service. He fell into utter destitution, and sank under the weight of "bitter times and privy broken passions." He must have died late in 1594, and on the 30th of December of that year his parents renounced their administration of the goods of their deceased son, in a document of great importance discovered by Professor Schick.

The importance of Kyd, as the pioneer in the wonderful movement of secular drama in England, gives great interest to his works, and we are now able at last to assert what many critics have long conjectured, that he takes in that movement the position of a leader and almost of an inventor. Regarded from this point of view, *The Spanish Tragedy* is a work of extraordinary value, since it is the earliest specimen of effective stage poetry existing in English literature. It had been preceded only by the pageant-poems of Peele and Lyly, in which all that constitutes in the modern sense theatrical technique and effective construction was entirely absent. These gifts, in which the whole power of the theatre as a place of general entertainment was to consist, were supplied earliest among English playwrights to Kyd, and were first exercised by him, so far as we can see, in 1586. This, then, is a more or less definite starting date for Elizabethan drama, and of peculiar value to its historians. Curiously enough, *The Spanish Tragedy*, which was the earliest stage-play of the great period, was also the most popular, and held its own right through the careers of Shakespeare, Ben Jonson, and Fletcher. It was not any shortcoming in its harrowing and exciting plot, but the tameness of its archaic versification, which probably led in 1602 to its receiving "additions," which have been a great stumbling-block to the critics. It is known that Ben Jonson was paid for these additional scenes, but they are extremely unlike all other known writings of his, and several scholars have independently conjectured that John Webster wrote them. Of Kyd himself it seems needful to point out that neither the Germans nor even Professor Boas seems to realize how little definite merit his poetry has. He is important, not in himself, but as a pioneer. The influence of Kyd is marked on all the immediate predecessors of Shakespeare, and the bold way in which scenes of violent crime were treated on the Elizabethan stage appears to be directly owing to the example of Kyd's innovating genius. His relation to *Hamlet* has already been noted, and *Titus Andronicus* presents and exaggerates so many of his characteristics that Mr Sidney Lee and others have supposed that tragedy to be a work of Kyd's touched up by Shakespeare. Professor Boas, however, brings cogent objections against this theory, founding them on what he considers the imitative inferiority of *Titus Andronicus* to *The Spanish Tragedy*. The German critics have pushed too far their attempt to find indications of Kyd's influence on later plays of Shakespeare. The extraordinary interest felt for Kyd in Germany is explained by the fact that *The Spanish Tragedy* was long the best known of all Elizabethan plays abroad. It was acted at Frankfort in 1601, and published soon afterwards at Nuremberg. It continued to be a stock piece in Germany until the beginning of the 18th century; it was equally popular in Holland, and potent in its effect upon Dutch dramatic literature.

Kyd's works were first collected and his life written by Professor F. S. Boas in 1901. Of modern editions of *The Spanish Tragedy* may be mentioned that by Professor J. M. Manly in *Specimens of the Pre-Shakespearean Drama*, vol. ii. (Boston, 1897), and by J. Schick in the *Temple Dramatists* (1898). See also *Cornelia* (ed. H. Gassner, 1894); C. Markscheffel, *T. Kyd's Tragödien* (1885); Gregor Sarrazin, *Thomas Kyd und sein Kreis* (1892); G. O. Fleischer, "Bemerkungen über Thomas Kyd's Spanish Tragedy" (*Jahresbericht der Drei-König-schule zu Dresden-Neustadt* (1896); J. Schick, "T. Kyd's Spanish Tragedy" (*Literarhistorische Forschungen*, vol. 19, 1901); and R. Koppel, in Prölss, *Altengl. Theater* (vol. i., 1904). (E. G.)

KYFFHÄUSER, a double line of hills in Thuringia, Germany. The northern part looks steeply down upon the valley of the Goldene Aue, and is crowned by two ruined castles, Rothenburg (1440 ft.) on the west, and Kyffhausen (1542 ft.) on the east. The latter, built probably in the 10th century, was frequently the residence of the Hohenstaufen emperors, and was finally destroyed in the 16th century. The existing ruins are those of the Oberburg with its tower, and of the Unterburg with its chapel. The hill is surmounted by an imposing monument to the emperor William I., the equestrian statue of the emperor being 31 ft.

high and the height of the whole 210 ft. This was erected in 1896. According to an old and popular legend, the emperor Frederick Barbarossa sits asleep beside a marble table in the interior of the mountain, surrounded by his knights, awaiting the destined day when he shall awaken and lead the united peoples of Germany against her enemies, and so inaugurate an era of unexampled glory. But G. Vogt has advanced cogent reasons (see *Hist. Zeitschrift*, xxvi. 131–187) for believing that the real hero of the legend is the other great Hohenstaufen emperor, Frederick II., not Frederick I. Around him gradually crystallized the hopes of the German peoples, and to him they looked for help in the hour of their sorest need. But this is not the only legend of a slumbering future deliverer which lives on in Germany. Similar hopes cling to the memory of Charlemagne, sleeping in a hill near Paderborn; to that of the Saxon hero Widukind, in a hill in Westphalia; to Siegfried, in the hill of Geroldseck; and to Henry I., in a hill near Goslar.

See Richter, *Das deutsche Kyffhäusergebirge* (Eisleben, 1876); Lemcke, *Der deutsche Kaisertraum und der Kyffhäuser* (Magdeburg, 1887); and *Führer durch das Kyffhäusergebirge* (Sangerhausen, 1891); Baltzer, *Das Kyffhäusergebirge* (Rudolstadt, 1882); A. Fulda, *Die Kyffhäusersage* (Sangerhausen, 1889); and Anemüller, *Kyffhäuser und Rothenburg* (Detmold, 1892).

KYNASTON, EDWARD (*c.* 1640–1706), English actor, was born in London and first appeared in Rhodes's company, having been, like Betterton, a clerk in Rhodes's book-shop before he set up a company in the Cockpit in Drury Lane. Kynaston was probably the last and certainly the best of the male actors of female parts, for which his personal beauty admirably fitted him. His last female part was Evadne in *The Maid's Tragedy* in 1661 with Killigrew's company. In 1665 he was playing important male parts at Covent Garden. He joined Betterton at Lincoln's Inn Fields in 1695, after which he received less important rôles, retiring in 1699. He died in 1706, and was buried on the 18th of January.

KYNETON, a town of Dalhousie county, Victoria, Australia, on the river Campaspe, 56 m. by rail N.N.W. of Melbourne. Pop. (1901), 3274. It is the centre of a prosperous agricultural and pastoral district. Important stock sales and an annual exhibition of stock are held. There are, moreover, some rich gold quartz reefs in the neighbourhood. Kyneton lies at an elevation of 1687 ft., and the scenery of the district, which includes some beautiful waterfalls, attracts visitors in summer.

KYŌSAI, SHO-FU (1831–1889), Japanese painter, was born at Koga in the province of Shimotsuke, Japan, in 1831. After working for a short time, as a boy, with Kuniyoshi, he received his artistic training in the studio of Kanō Dōhaku, but soon abandoned the formal traditions of his master for the greater freedom of the popular school. During the political ferment which produced and followed the revolution of 1867, Kyōsai attained a considerable reputation as a caricaturist. He was three times arrested and imprisoned by the authorities of the shogunate. Soon after the assumption of effective power by the mikado, a great congress of painters and men of letters was held, at which Kyōsai was present. He again expressed his opinion of the new movement in a caricature, which had a great popular success, but also brought him into the hands of the police—this time of the opposite party. Kyōsai must be considered the greatest successor of Hokusai (of whom, however, he was not a pupil), and as the first political caricaturist of Japan. His work—like his life—is somewhat wild and undisciplined, and "occasionally smacks of the *sakē* cup." But if he did not possess Hokusai's dignity, power and reticence, he substituted an exuberant fancy, which always lends interest to draughtsmanship of very great technical excellence. In addition to his caricatures, Kyōsai painted a large number of pictures and sketches, often choosing subjects from the folk-lore of his country. A fine collection of these works is preserved in the British Museum; and there are also good examples in the National Art Library at South Kensington, and the Musée Guimet at Paris. Among his illustrated books may be mentioned *Yehon Taka-kagami*, Illustrations of Hawks (5 vols., 1870, &c.); *Kyōsai Gwafu* (1880); *Kyōsai Dongwa*; *Kyōsai Raku-gwa*; *Kyōsai Riaku-gwa*; *Kyōsai Mangwa* (1881); *Kyōsai Suigwa* (1882); and *Kyōsai Gwaden* (1887). The latter is illustrated by him under the name of Kawanabe Tōyoku, and two of its four volumes are devoted to an account of his own art and life. He died in 1889.

See Guimet (É.) and Regamey (F.), *Promenades japonaises* (Paris, 1880); Anderson (W.), *Catalogue of Japanese Painting in the British Museum* (London, 1886); Mortimer Menpes, "A Personal View of Japanese Art: A Lesson from Kyōsai," *Magazine of Art* (1888).
(E. F. S.)

KYRIE (in full *kyrie eleison*, or *eleeson*, Gr. κύριε ἐλέησον; cf. Ps. cxxii. 3, Matt. xv. 22, &c., meaning "Lord, have mercy"), the words of petition used at the beginning of the Mass and in other offices of the Eastern and Roman Churches. In the Anglican Book of Common Prayer the Kyrie is introduced into the orders for Morning and Evening Prayer, and also, with an additional petition, as a response made by the congregation after the reading of each of the Ten Commandments at the opening of the Communion Service. These responses are usually sung, and the name Kyrie is thus also applied to their musical setting. In the Lutheran Church the Kyrie is still said or sung in the original Greek. "Kyrielle," a shortened form of *Kyrie eleison*, is applied to eight-syllabled four-line verses, the last line in each verse being repeated as a refrain.

KYRLE, JOHN (1637–1724), "the Man of Ross," English philanthropist, was born in the parish of Dymock, Gloucestershire, on the 22nd of May 1637. His father was a barrister and M.P., and the family had lived at Ross, in Herefordshire, for many generations. He was educated at Balliol College, Oxford, and having succeeded to the property at Ross took up his abode there. In everything that concerned the welfare of the little town in which he lived he took a lively interest—in the education of the children, the distribution of alms, in improving and embellishing the town. He delighted in mediating between those who had quarrelled and in preventing lawsuits. He was generous to the poor and spent all he had in good works. He lived a great deal in the open air working with the labourers on his farm. He died on the 7th of November 1724, and was buried in the chancel of Ross Church. His memory is preserved by the Kyrle Society, founded in 1877, to better the lot of working people, by laying out parks, encouraging house decoration, window gardening and flower growing. Ross was eulogized by Pope in the third *Moral Epistle* (1732), and by Coleridge in an early poem (1794).

KYSHTYM, a town of Russia, in the government of Perm, 56 m. by rail N.N.W. of Chelyabinsk, on a river of the same name which connects two lakes. Pop. (1897), 12,331. The official name is Verkhne-Kyshtymskiy-Zavod, or Upper Kyshtym Works, to distinguish it from the Lower (Nizhne) Kyshtym Works, situated two miles lower down the same river.

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A. Gl.	Arnold Glover, M.A., LL.B. (d. 1905) Trinity College, Cambridge; Joint-editor of *Beaumont and Fletcher* for the Cambridge University Press.	**Layard.**
A. Go.*	Rev. Alexander Gordon, M.A. Lecturer in Church History in the University of Manchester.	**Laurentius, Paul;** **Libertines.**
A. G. D.	Arthur George Doughty, C.M.G., M.A., Litt.D., F.R. Hist.S., F.R.S.(Canada). Dominion Archivist of Canada. Member of the Geographical Board of Canada. Author of *The Cradle of New France*; &c. Joint editor of *Documents relating to the Constitutional History of Canada.*	**Lafontaine.**
A. H. S.	Rev. Archibald Henry Sayce, Litt.D., LL.D. See the biographical article: Sayce, A. H.	**Laodicea.**
A. J. G.	Rev. Alexander James Grieve, M.A., B.D. Professor of New Testament and Church History, Yorkshire United Independent College, Bradford. Sometime Registrar of Madras University, and Member of Mysore Educational Service.	**Logos** (*in part*).
A. J. L.	Andrew Jackson Lamoureux. Librarian, College of Agriculture, Cornell University. Editor of the *Rio News* (Rio de Janeiro), 1879–1901.	**Lima** (*Peru*).
A. L.	Andrew Lang. See the biographical article: Lang, Andrew.	**La Cloche.**
A. M. An.	Adelaide Mary Anderson, M.A. H.M. Principal Lady Inspector of Factories, Home Office. Clerk to the Royal Commission on Labour, 1892–1894. Gamble Gold Medallist, Girton College, Cambridge, 1893. Author of various articles on Industrial Life and Legislation, &c.	**Labour Legislation.**
A. M. C.	Agnes Mary Clerke. See the biographical article: Clerke, A. M.	**Lagrange; Laplace;** **Leverrier.**
A. N.	Alfred Newton, F.R.S. See the biographical article: Newton, Alfred.	**Lämmergeyer; Lapwing;** **Lark; Linnet; Loom.**
A. P. C.	Arthur Philemon Coleman, M.A., Ph.D., F.R.S. Professor of Geology in the University of Toronto. Geologist, Bureau of Mines, Toronto, 1893–1910. Author of *Reports of the Bureau of Mines of Ontario.*	**Labrador** (*in part*).

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A. Se.*	Adam Sedgwick, M.A., F.R.S. Professor of Zoology at the Imperial College of Science and Technology, London. Fellow, and formerly Tutor, of Trinity College, Cambridge. Professor of Zoology in the University of Cambridge, 1907–1909.	**Larval Forms.**
A. Sl.	Arthur Shadwell, M.A., M.D., LL.D., F.R.C.P. Member of Council of Epidemiological Society. Author of *The London Water-Supply*; *Industrial Efficiency*; *Drink, Temperance and Legislation.*	**Liquor Laws.**
A. So.	Albrecht Socin, Ph.D. (1844–1899). Formerly Professor of Semitic Philology in the Universities of Leipzig and Tübingen. Author of *Arabische Grammatik*; &c.	**Lebanon** (*in part*).
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A. St H. G.	Alfred St Hill Gibbons. Major, East Yorkshire Regiment. Explorer in South Central Africa. Author of *Africa from South to North through Marotseland.*	**Lewanika.**
A. S. M.	Alexander Stuart Murray, LL.D. See the biographical article: Murray, Alexander Stuart.	**Lamp.**
A. S. W.	Augustus Samuel Wilkins, M.A., LL.D., Litt.D. (1843–1905). Professor of Latin, Owens College, Manchester, 1869–1905. Author of *Roman Literature*; &c.	**Latin Language** (*in part*).
A. T. T.	A. T. Thorson. Official in Life Saving Service, U.S.A.	**Life-boat:** *United States.*
A. W. H.*	Arthur William Holland. Formerly Scholar of St John's College, Oxford. Bacon Scholar of Gray's Inn, 1900.	**Leopold I.** (*Roman Emperor*); **Levellers.**
A. W. Hu.	Rev. Arthur Wollaston Hutton, M.A. Rector of Bow Church, Cheapside. Librarian National Liberal Club, 1889–1899. Author of *Life of Cardinal Newman*; *Life of Cardinal Manning*; &c.	**Leo XIII.**
A. W. R.	Alexander Wood Renton, M.A., LL.B. Puisne Judge of the Supreme Court of Ceylon. Editor of *Encyclopaedia of the Laws of England.*	**Landlord and Tenant;** **Letters Patent;** **Lodger and Lodgings.**
A. W. W.	Adolphus William Ward, Litt.D., LL.D. See the biographical article: Ward, Adolphus William.	**Lodge, Thomas.**
B. D. J.	Benjamin Daydon Jackson, Ph.D. General Secretary of the Linnean Society. Secretary to Departmental Committee of H.M. Treasury on Botanical Work, 1900–1901. Author of *Glossary of Botanic Terms*; &c.	**Linnaeus.**
C.	The Rt. Hon. the Earl of Crewe. See the biographical article: Crewe, 1st Earl of.	**Laprade.**
C. C. W.	Charles Crawford Whinery, A.M. Cornell University. Assistant editor 11th Edition of the *Encyclopaedia Britannica.*	**La Salle;** **Lincoln, Abraham** (*in part*).
C. Di.	Charles Dibdin, F.R.G.S. Secretary of the Royal National Life-boat Institution. Hon. Secretary of the Civil Service Life-boat Fund, 1870–1906.	**Life-boat:** *British*
C. D. W.	Hon. Carroll Davidson Wright. See the biographical article: Wright, Hon. Carroll Davidson.	**Labour Legislation:** *United States.*
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C. H.*	Sir Charles Holroyd. See the biographical article: Holroyd, Sir Charles.	**Legros.**
C. H. Ha.	Carlton Huntley Hayes, A.M., Ph.D. Assistant Professor of History in Columbia University, New York City. Member of the American Historical Association.	**Leo I.-X.** (*Popes*).
C. J. B.*	Rev. Charles James Ball, M.A. University Lecturer in Assyriology, Oxford. Author of *Light from the East.*	**Lamentations.**
C. L. K.	Charles Lethbridge Kingsford, M.A., F.R.Hist.S., F.S.A. Assistant Secretary, Board of Education. Author of *Life of Henry V*: Editor of *Chronicles of London* and Stow's *Survey of London.*	**Lancaster, John of Gaunt, duke of.**
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C. Mo.	William Cosmo Monkhouse. See the biographical article: Monkhouse, W. C.	**Leighton, Lord.**
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De B.	Henri G. S. A. de Blowitz. See the biographical article: Blowitz, H. de.	**Lesseps, Ferdinand de.**
D. F. T.	Donald Francis Tovey. Author of *Essays in Musical Analysis*: comprising *The Classical Concerto*, *The Goldberg Variations*, and analysis of many other classical works.	**Lasso, Orlando.**
D. G. H.	David George Hogarth, M.A. Keeper of the Ashmolean Museum, Oxford. Fellow of Magdalen College, Oxford. Fellow of the British Academy. Excavated at Paphos, 1888; Naucratis, 1899 and 1903; Ephesus, 1904–1905; Assiut, 1906–1907; Director, British School at Athens, 1897–1900; Director, Cretan Exploration Fund, 1899.	**Latakia;** **Lebanon** (*in part*).
D. H.	David Hannay. Formerly British Vice-Consul at Barcelona. Author of *Short History of the Royal Navy*; *Life of Emilio Castelar*; &c.	**La Hogue, Battle of;** **Lauria, Roger de;** **Lepanto, Battle of; Lissa.**
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D. Mn.	Rev. Dugald Macfadyen, M.A. Minister of South Grove Congregational Church, Highgate. Author of *Constructive Congregational Ideals*; &c.	**Leighton, Robert** (*in part*).
D. M. W.	Sir Donald Mackenzie Wallace, K.C.I.E., K.C.V.O. Extra Groom of the Bedchamber to H.M. King George V. Director of the Foreign Department of *The Times*, 1891–1899. Member of the Institut de Droit International and Officier de l'Instruction Publique (France). Joint-editor of New Volumes (10th ed.) of the *Encyclopaedia Britannica*. Author of *Russia*; *Egypt and the Egyptian Question*; *The Web of Empire*; &c.	**Lobánov-Rostovski.**
E. B.*	Ernest Charles François Babelon. Professor at the Collège de France. Keeper of the department of Medals and Antiquities at the Bibliothèque Nationale. Member of the Académie des Inscriptions et de Belles Lettres, Paris. Chevalier of the Legion of Honour. Author of *Descriptions Historiques des Monnaies de la République Romaine*; *Traités des Monnaies Grecques et Romaines*; *Catalogue des Camées de la Bibliothèque Nationale*.	**Leptis.**
E. C. B.	Edward Cuthbert Butler, O.S.B., M.A., D.Litt. (Dublin). Abbot of Downside Abbey, Bath. Author of "The Lausiac History of Palladius," in *Cambridge Texts and Studies*, vol. vi.	**Leo, Brother.**
E. Da.	Edward George Dannreuther (1844–1905). Member of Board of Professors, Royal College of Music, 1895–1905. Conducted the first Wagner Concerts in London, 1873–1874. Author of *The Music of the Future*; &c. Editor of a critical edition of Liszt's *Études*.	**Liszt.**
E. D. J. W.	Edward D. J. Wilson. Formerly Leader-writer on *The Times*.	**Londonderry, 2nd Marquess of.**
E. G.	Edmund Gosse, LL.D., D.C.L. See the biographical article: Gosse, Edmund.	**Lampoon; Lie, Jonas L. E.**
E. Ga.	Emile Garcke, M.Inst.E.E. Managing Director of British Electric Traction Co., Ltd. Author of *Manual of Electrical Undertakings*; &c.	**Lighting:** *Electric (Commercial Aspects).*
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E. V. L.	Edward Verrall Lucas. Editor of *Works of Charles Lamb*. Author of *Life of Charles Lamb*.	**Lamb, Charles.**
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F. E. W.	Rev. Frederick Edward Warren, M.A., B.D., F.S.A. Rector of Bardwell, Bury St Edmunds. Fellow of St John's College, Oxford, 1865–1882. Author of *The Old Catholic Ritual done into English and compared with the Corresponding Offices in the Roman and Old German Manuals*; *The Liturgy and Ritual of the Celtic Church*; &c.	**Lection, Lectionary;** **Lector;** **Litany;** **Liturgy.**
F. G. M. B.	Frederick George Meeson Beck, M.A. Fellow and Lecturer in Classics, Clare College, Cambridge.	**Lombards** (*in part*).
F. G. P.	Frederick Gymer Parsons, F.R.C.S., F.Z.S., F.R.Anthrop.Inst. Vice-President, Anatomical Society of Great Britain and Ireland. Lecturer on Anatomy at St Thomas's Hospital and the London School of Medicine for Women. Formerly Hunterian Professor at the Royal College of Surgeons.	**Liver:** *Anatomy*.
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F. L.*	Sir Franklin Lushington, M.A. Formerly Chief Police Magistrate for London. Author of *Wagers of Battle*.	**Lear, Edward.**
F. V. B.	F. Vincent Brooks.	**Lithography.**
F. v. H.	Baron Friedrich von Hügel. Member of Cambridge Philological Society; Member of Hellenic Society. Author of *The Mystical Element of Religion*.	**Loisy.**
F. Wa.	Francis Watt, M.A. Barrister-at-Law, Middle Temple. Author of *Law's Lumber Room*; *Scotland of to-day*; &c.	**Law, John.**
F. W. R.*	Frederick William Rudler, I.S.O., F.G.S. Curator and Librarian of the Museum of Practical Geology, London, 1879–1902. President of the Geologists' Association, 1887–1889.	**Labradorite;** **Lapis Lazuli.**
F. W. Ra.	Francis William Raikes, K.C., LL.D. (1842–1906). Judge of County Courts, Hull, 1898–1906. Joint-author of *The New Practice*; &c.	**Lien.**
G. A. Gr.	George Abraham Grierson, C.I.E., Ph.D., D.Litt. (Dubl.). Member of the Indian Civil Service, 1873–1903. In charge of Linguistic Survey of India, 1898–1902. Gold Medallist, Royal Asiatic Society, 1909. Vice-President of the Royal Asiatic Society. Formerly Fellow of Calcutta University. Author of *The Languages of India*; &c.	**Lahnda.**
G. E.	Rev. George Edmundson, M.A., F.R.Hist.S. Formerly Fellow and Tutor of Brasenose College, Oxford. Ford's Lecturer, 1909–1910. Employed by British Government in preparation of the British Case in the British Guiana-Venezuelan and British Guiana-Brazilian boundary arbitrations.	**Limburg.**
G. F. B.	George Frederick Barwick. Assistant-Keeper of Printed Books and Superintendent of Reading-room, British Museum.	**Lavigerie.**
G. F. K.	George Frederick Kunz, A.M., Ph.D., D.Sc. Gem Expert to Messrs Tiffany & Co., New York. Hon. Curator of Precious Stones, American Museum of Natural History, New York. Fellow of Geological Society of America. Author of *Precious Stones of North America*; &c. Senior Editor of *Book of the Pearl*.	**Lapidary and Gem-cutting.**
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G. Sa.	George Saintsbury, D.C.L., LL.D. See the biographical article: Saintsbury, George E. B.	**La Bruyère; La Fontaine;** **Lamartine;** **La Rochefoucauld; Le Sage.**
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H. A. L.	Hendrik Antoon Lorentz. Professor of Physics in the University of Leiden. Author of *La théorie electromagnétique de Maxwell et son application aux corps mouvants*.	**Light:** *Nature of*.
H. B. W.*	Henry Benjamin Wheatley, F.S.A. Assistant Secretary, Royal Society of Arts, 1879–1909. President of the Samuel Pepys Club, 1903–1910. Vice-President of the Bibliographical Society, 1908–1910. Author of *The Story of London*; *London Past and Present*; &c.	**London:** *History*.
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H. Ch.	Hugh Chisholm, M.A. Formerly Scholar of Corpus Christi College, Oxford. Editor of the 11th edition of the *Encyclopaedia Britannica*; Co-editor of the 10th edition.	**Lloyd George, D.**
H. De.	Rev. Hippolyte Delehaye, S.J. Bollandist. Joint-author of the *Acta Sanctorum.*	**Lawrence, St;** **Linus.**
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H. F. P.	Henry Francis Pelham, LL.D. See the biographical article: Pelham, H. F.	**Livy** (*in part*).
H. H. J.	Sir Henry Hamilton Johnston, K.C.B., G.C.M.G. See the biographical article: Johnston, Sir Henry Hamilton.	**Liberia.**
H. M. S.	Henry Morse Stephens, M.A., Litt.D. Professor of History and Director of University Extension, University of California. Author of *History of the French Revolution*; *Revolutionary Europe*; &c.	**Littré.**
H. R. T.	Henry Richard Tedder, F.S.A. Secretary and Librarian of the Athenaeum Club, London.	**Libraries** (*in part*).
H. St.	Henry Sturt, M.A. Author of *Idola Theatri*; *The Idea of a Free Church*; and *Personal Idealism*.	**Lange, Friedrich Albert.**
H. T. A.	Rev. Herbert Thomas Andrews. Professor of New Testament Exegesis, New College, London. Author of the "Commentary on Acts," in the *Westminster New Testament*; *Handbook on the Apocryphal Books* in the "Century Bible."	**Logia.**
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H. W. C. D.	Henry William Carless Davis, M.A. Fellow and Tutor of Balliol College, Oxford. Fellow of All Souls' College, Oxford, 1895–1902. Author of *Charlemagne*; *England under the Normans and Angevins*; &c.	**Lanfranc;** **Langton, Stephen.**
H. Y.	Sir Henry Yule, K.C.S.I. See the biographical article: Yule, Sir Henry.	**Lhasa** (*in part*).
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J. Dr.	Sir James Dewar, F.R.S., LL.D. See the biographical article: Dewar, Sir J.	**Liquid Gases.**
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J. D. Br.	James Duff Brown. Borough Librarian, Islington Public Libraries. Vice-President of the Library Association. Author of *Guide to Librarianship*; &c.	**Libraries** (*in part*).
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J. F. St.	John Frederick Stenning, M.A. Dean and Fellow of Wadham College, Oxford. University Lecturer in Aramaic, Lecturer in Divinity and Hebrew at Wadham College.	**Leviticus.**
J. Ga.	James Gairdner, C.B., LL.D. See the biographical article: Gairdner, James.	**Lancaster, House of;** **Leicester, Robert Dudley, earl of.**
J. G. F.	Sir Joshua Girling Fitch, LL.D. See the biographical article: Fitch, Sir J. G.	**Lancaster, Joseph.**

J. G. N.	John George Nicolay (1832–1901). Marshal of the U.S. Supreme Court, 1872–1887. Joint-author of *Abraham Lincoln:* &c.	**Lincoln, Abraham** (*in part*).
J. G. P.*	James Gordon Parker, D.Sc., F.C.S. Principal of Leathersellers Technical College, London. Gold Medallist, Society of Arts. Author of *Leather for Libraries*; *Principles of Tanning*; &c.	**Leather.**
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J. Hn.	Justus Hashagen, Ph.D. Privat-dozent in Medieval and Modern History, University of Bonn. Author of *Das Rheinland unter der französische Herrschaft.*	**Lang, Karl Heinrich;** **Ledochowski;** **Leo, Heinrich.**
J. H. F.	John Henry Freese, M.A. Formerly Fellow of St John's College, Cambridge.	**Leo VI.** (*Emperor of the East*).
J. Hl. R.	John Holland Rose, M.A., Litt.D. Lecturer on Modern History to the Cambridge University Local Lectures Syndicate. Author of *Life of Napoleon I.*; *Napoleonic Studies*; *The Development of the European Nations*; *The Life of Pitt*; &c.	**Las Casas.**
J. J. L.*	Rev. John James Lias, M.A. Chancellor of Llandaff Cathedral. Formerly Hulsean Lecturer in Divinity and Lady Margaret Preacher, University of Cambridge.	**Langen.**
J. K. I.	John Kells Ingram, LL.D. See the biographical article: Ingram, J. K.	**Leslie, Thomas E. C.**
J. Le.	Rev. James Legge, M.A. See the biographical article: Legge, James.	**Lâo-Tsze.**
J. L. M.	John Linton Myres, M.A., F.S.A., F.R.G.S. Wykeham Professor of Ancient History in the University of Oxford. Formerly Gladstone Professor of Greek and Lecturer in Ancient Geography, University of Liverpool. Lecturer in Classical Archaeology in University of Oxford.	**Leleges;** **Locri** (*Greece*).
J. L. W.	Jessie Laidlay Weston. Author of *Arthurian Romances unrepresented in Malory.*	**Lancelot.**
J. Mu.	Sir John Murray, K.C.B., F.R.S. See the biographical article: Murray, Sir John.	**Lake.**
J. M. C.	Rev. James M. Crombie. Author of *Braemar: its Topography and Natural History; Lichenes Britannici.*	**Lichens** (*in part*).
J. M. G.	John Miller Gray (1850–1894). Art Critic and Curator of the Scottish National Portrait Gallery, 1884–1894. Author of *David Scott, R.S.A.*; *James and William Tassie.*	**Leech, John.**
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J. P. Pe.	Rev. John Punnett Peters, Ph.D., D.D. Canon Residentiary, P. E. Cathedral of New York. Formerly Professor of Hebrew in the University of Pennsylvania. Director of the University Expedition to Babylonia, 1888–1895. Author of *Nippur, or Explorations and Adventures on the Euphrates*; *Scriptures, Hebrew and Christian.*	**Lagash;** **Larsa.**
J. S.	James Sully, LL.D. See the biographical article: Sully, James.	**Lewes, George Henry** (*in part*).
J. Si.	James Sime, M.A. (1843–1895). Author of *A History of Germany*; &c.	**Lessing** (*in part*).
J. S. F.	John Smith Flett, D.Sc., F.G.S. Petrographer to the Geological Survey. Formerly Lecturer on Petrology in Edinburgh University. Neill Medallist of the Royal Society of Edinburgh. Bigsby Medallist of the Geological Society of London.	**Laccolite; Lamprophyres;** **Laterite;** **Leucite:** *Leucite Rocks*; **Limestone.**
J. S. K.	John Scott Keltie, LL.D., F.S.S., F.S.A. (Scot.). Secretary, Royal Geographical Society. Hon. Member, Geographical Societies of Paris, Berlin, Rome, &c. Editor of the *Statesman's Year Book*. Editor of the *Geographical Journal.*	**Livingstone.**
J. S. W.	John Stephen Willison, LL.D., F.R.S. (Canada). Editor of *The News* (Toronto). Canadian Correspondent of *The Times*. Author of *Sir Wilfrid Laurier and the Liberal Party*; &c.	**Laurier.**
J. T. Be.	John Thomas Bealby. Joint-author of Stanford's *Europe*. Formerly Editor of the *Scottish Geographical Magazine*. Translator of Sven Hedin's *Through Asia, Central Asia and Tibet*; &c.	**Ladoga** (*in part*); **Livonia** (*in part*); **Lop-nor.**
J. T. Br.	J. Taylor Brown.	**Leighton, Robert** (*in part*).

J. T. C.	Joseph Thomas Cunningham, M.A., F.Z.S. Lecturer on Zoology at the South-Western Polytechnic, London. Formerly Fellow of University College, Oxford. Assistant Professor of Natural History in the University of Edinburgh. Naturalist to the Marine Biological Association.	**Lamellibranchia** (*in part*).
J. T. S.*	James Thomson Shotwell, Ph.D. Professor of History in Columbia University, New York City.	**Languedoc.**
J. V.*	Jules Viard. Archivist at the National Archives, Paris. Officer of Public Instruction. Author of *La France sous Philippe VI. de Valois*; &c.	**Le Maçon.**
J. W. D.	Captain J. Whitly Dixon, R.N. Nautical Assessor to the Court of Appeal.	**Log.**
J. W. He.	James Wycliffe Headlam, M.A. Staff Inspector of Secondary Schools under the Board of Education. Formerly Fellow of King's College, Cambridge. Professor of Greek and Ancient History at Queen's College, London. Author of *Bismarck and the Foundation of the German Empire*; &c.	**Lasker.**
J. W. L. G.	James Whitbread Lee Glaisher, M.A., D.Sc., F.R.S. Fellow of Trinity College, Cambridge. Formerly President of the Cambridge Philosophical Society, and the Royal Astronomical Society. Editor of *Messenger of Mathematics* and the *Quarterly Journal of Pure and Applied Mathematics*.	**Legendre, A. M.;** **Logarithm.**
K. H.	Killingworth Hedges, M.Inst.C.E., M.Inst.Elect.E. Hon. Secretary of the Lightning Research Committee. Author of *Modern Lightning Conductors*; &c.	**Lightning Conductor.**
K. S.	Kathleen Schlesinger. Editor of *The Portfolio of Musical Archaeology.* Author of *The Instruments of the Orchestra.*	**Lituus.**
L. A. W.	Laurence Austine Waddell, C.B., C.I.E., LL.D., M.B. Lieut.-Colonel I.M.S. (retired). Author of *Lhasa and its Mysteries*; &c.	**Lhasa** (*in part*).
L. B.	Laurence Binyon. See the biographical article: Binyon, L.	**Lawson, Cecil Gordon.**
L. D.*	Louis Marie Olivier Duchesne. See the biographical article: Duchesne, L. M. O.	**Liberius.**
L. J. S.	Leonard James Spencer, M.A. Assistant in the Department of Mineralogy, British Museum. Formerly Scholar of Sidney Sussex College, Cambridge, and Harkness Scholar. Editor of the *Mineralogical Magazine.*	**Leadhillite;** **Lepidolite;** **Leucite** (*in part*); **Liroconite.**
L. T. D.	Sir Lewis Tonna Dibdin, M.A., D.C.L., F.S.A. Dean of the Arches; Master of the Faculties; and First Church Estates Commissioner. Bencher of Lincoln's Inn. Author of *Monasticism in England*; &c.	**Lincoln Judgment, The.**
L. V.*	Luigi Villari. Italian Foreign Office (Emigration Dept.). Formerly Newspaper Correspondent in east of Europe. Italian Vice-Consul in New Orleans, 1906, Philadelphia, 1907, and Boston, U.S.A., 1907–1910. Author of *Italian Life in Town and Country*; &c.	**Leopold II.** (*Grand Duke of Tuscany*).
M. Br.	Margaret Bryant.	**Landor:** *Bibliography*; **La Sale.**
M. Ca.	Moritz Cantor, Ph.D. Honorary Professor of Mathematics in the University of Heidelberg. Author of *Vorlesungen über die Geschichte der Mathematik*; &c.	**Leonardo of Pisa.**
M. H. S.	Marion H. Spielmann, F.S.A. Formerly Editor of the *Magazine of Art*. Member of Fine Art Committee of International Exhibitions of Brussels, Paris, Buenos Aires, Rome, and the Franco-British Exhibition, London. Author of *History of "Punch"*; *British Portrait Painting to the Opening of the Nineteenth Century*; *Works of G. F. Watts, R.A.*; *British Sculpture and Sculptors of To-day*; *Henriette Ronner*; &c.	**Line Engraving** (*in part*).
M. N. T.	Marcus Niebuhr Tod, M.A. Fellow and Tutor of Oriel College, Oxford. University Lecturer in Epigraphy. Joint-author of *Catalogue of the Sparta Museum*.	**Laconia;** **Leonidas; Leotychides.**
M. O. B. C.	Maximilian Otto Bismarck Caspari, M.A. Reader in Ancient History at London University. Lecturer in Greek at Birmingham University, 1905–1908.	**Leo I.-V.** (*Emperors of the East*); **Lesbos; Leuctra.**
M. P.*	Leon Jacques Maxime Prinet. Formerly Archivist to the French National Archives. Auxiliary of the Institute of France (Academy of Moral and Political Sciences).	**L'Aubespine.**
N. G. G.	Nicholas G. Gedye. Chief Engineer to the Tyne Improvement Commission.	**Lighthouse** (*in part*).
O. Hr.	Otto Henker, Ph.D. On the Staff of the Carl Zeiss Factory, Jena, Germany.	**Lens.**
P. A. K.	Prince Peter Alexeivitch Kropotkin. See the biographical article: Kropotkin, Prince P. A.	**Ladoga** (*in part*); **Lithuanians and Letts:** *History*; **Livonia** (*in part*).

P. C. M.	Peter Chalmers Mitchell, M.A., F.R.S., D.Sc., LL.D. Secretary to the Zoological Society of London. University Demonstrator in Comparative Anatomy and Assistant to Linacre Professor at Oxford, 1888–1891. Lecturer on Biology at Charing Cross Hospital, 1892–1894; at London Hospital, 1894. Examiner in Biology to the Royal College of Physicians, 1892–1896, 1901–1903. Examiner in Zoology to the University of London, 1903.	**Life; Longevity.**
P. C. Y.	Philip Chesney Yorke, M.A. Magdalen College, Oxford.	**Laud, Archbishop;** **Lauderdale, Duke of;** **Leeds, 1st Duke of.**
P. G.	Percy Gardner, Litt.D., LL.D., F.S.A. See the biographical article: Gardner, Percy.	**Leochares.**
P. Gi.	Peter Giles, M.A., LL.D., Litt.D. Fellow and Classical Lecturer of Emmanuel College, Cambridge, and University Reader in Comparative Philology. Late Secretary of the Cambridge Philological Society. Author of *Manual of Comparative Philology*; &c.	**L.**
P. G. H.	Philip Gilbert Hamerton. See the biographical article: Hamerton, Philip Gilbert.	**Line Engraving** (*in part*).
R. A. S. M.	Robert Alexander Stewart Macalister, M.A., F.S.A. St John's College, Cambridge. Director of Excavations for the Palestine Exploration Fund.	**Lachish.**
R. G.	Richard Garnett, LL.D. See the biographical article: Garnett, Richard.	**Leopardi.**
R. I. P.	Reginald Innes Pocock, F.Z.S. Superintendent of the Zoological Gardens, London.	**Leaf-insect;** **Locust** (*in part*).
R. J. M.	Ronald John McNeill, M.A. Christ Church, Oxford. Barrister-at-Law. Formerly Editor of the *St James's Gazette*, London.	**Lawn Tennis;** **Leicester, R. Sidney, earl of;** **Lockhart, George.**
R. K. D.	Sir Robert Kennaway Douglas. Formerly Professor of Chinese, King's College, London. Keeper of Oriental Printed Books and MSS. at British Museum, 1892–1907. Member of the Chinese Consular Service, 1858–1865. Author of *The Language and Literature of China*; *Europe and the Far East*; &c.	**Li Hung Chang.**
R. L.*	Richard Lydekker, F.R.S., F.G.S., F.Z.S. Member of the Staff of the Geological Survey of India, 1874–1882. Author of *Catalogue of Fossil Mammals, Reptiles and Birds in the British Museum*; *The Deer of all Lands*; *The Game Animals of Africa*; &c.	**Langur;** **Lemming** (*in part*); **Lemur;** **Leopard** (*in part*); **Lion** (*in part*); **Litopterna.**
R. M'L.	Robert M'Lachlan. Editor of the *Entomologists' Monthly Magazine*.	**Locust** (*in part*).
R. M. B.	Robert Michael Ballantyne. See the biographical article: Ballantyne, R. M.	**Life-boat:** *British* (*in part*).
R. N. B.	Robert Nisbet Bain (d. 1909). Assistant Librarian, British Museum, 1883–1909. Author of *Scandinavia: the Political History of Denmark, Norway and Sweden, 1513–1900*; *The First Romanovs, 1613–1725*; *Slavonic Europe: the Political History of Poland and Russia from 1469 to 1796*; &c.	**Ladislaus I. and IV. of Hungary;** **Laski.**
R. S. C.	Robert Seymour Conway, M.A., D.Litt. (Cantab.). Professor of Latin and Indo-European Philology in the University of Manchester. Formerly Professor of Latin in University College, Cardiff; and Fellow of Gonville and Caius College, Cambridge. Author of *The Italic Dialects*.	**Latin Language** (*in part*); **Liguria:** *Archaeology and Philology*.
R. We.	Richard Webster, A.M. Formerly Fellow in Classics, Princeton University. Editor of *The Elegies of Maximianus*; &c.	**Long Island.**
R. W. C.	The Very Rev. R. W. Church, D.D. See the biographical article: Church, R. W.	**Lombards:** *The Kingdom in Italy.*
S. A. C.	Stanley Arthur Cook, M.A. Lecturer in Hebrew and Syriac, and formerly Fellow, Gonville and Caius College, Cambridge. Editor for Palestine Exploration Fund. Examiner in Hebrew and Aramaic, London University, 1904–1908. Author of *Glossary of Aramaic Inscriptions*; *The Laws of Moses and the Code of Hammurabi*; *Critical Notes on Old Testament History*; *Religion of Ancient Palestine*; &c.	**Levites.**
S. C.	Sidney Colvin, LL.D. See the biographical article: Colvin, Sidney.	**Leonardo da Vinci.**
St C.	Viscount St Cyres. See the biographical article: Iddesleigh, 1st Earl of.	**Liguori.**
S. D. F. S.	Rev. Stewart Dingwall Fordyce Salmon, M.A., D.D. (1838–1905). Professor of Systematic Theology and Exegesis of the Epistles, U.F.C. College Aberdeen, 1876–1905. Author of *The Parables of our Lord*; &c. Editor of *The International Library of Theology*; &c.	**Logos** (*in part*).
S. N.	Simon Newcomb, LL.D., D.Sc. See the biographical article: Newcomb, Simon.	**Latitude;** **Light:** *Velocity*.

T. As.	Thomas Ashby, M.A., D.Litt., F.S.A. Director of the British School of Archaeology at Rome. Corresponding Member of the Imperial German Archaeological Institute. Formerly Scholar of Christ Church, Oxford. Craven Fellow, Oxford, 1897. Author of *The Classical Topography of the Roman Campagna*; &c.	**Labicana, Via; Labici: Lampedusa; Lanciano; Lanuvium; Larino; Latina, Via; Latium; Laurentina, Via; Lavinium; Lecce; Leghorn; Leontini; Licodia Eubea; Ligures Baebiani; Liguria:** *History*; **Locri:** *Italy*.
T. A. I.	Thomas Allan Ingram, M.A., LL.D. Trinity College, Dublin.	**Livery Companies; London:** *Finance*.
T. Ca.	Thomas Case, M.A. President of Corpus Christi College, Oxford. Formerly Waynflete Professor of Moral and Metaphysical Philosophy at Oxford and Fellow of Magdalen College. Author of *Physical Realism*; &c.	**Logic.**
T. C. A.	Sir Thomas Clifford Allbutt, K.C.B., M.A., M.D., D.Sc., LL.D., F.R.S. Regius Professor of Physic in the University of Cambridge. Physician to Addenbrooke's Hospital, Cambridge. Fellow of Gonville and Caius College, Cambridge. Editor of *Systems of Medicine*.	**Lister, 1st Baron.**
T. Da.	Thomas Davidson, LL.D.	**Longfellow.**
T. F. C.	Theodore Freylinghuysen Collier, Ph.D. Assistant Professor of History, Williams College, Williamstown, Mass., U.S.A.	**Laodicea, Synod of.**
T. F. H.	Thomas F. Henderson. Author of *Mary Queen of Scots and the Casket Letters*; &c.	**Latimer.**
T. H. H.*	Sir Thomas Hungerford Holdich, K.C.M.G., K.C.I.E., D.Sc., F.R.G.S. Colonel in the Royal Engineers. Superintendent, Frontier Surveys, India, 1892–1898. Gold Medallist, R.G.S. (London), 1887. H.M. Commissioner for the Perso-Beluch Boundary, 1896. Author of *The Indian Borderland*; *The Gates of India*; &c.	**Ladakh and Baltistan**
T. K.	Thomas Kirkup, M.A., LL.D. Author of *An Inquiry into Socialism*; *Primer of Socialism*; &c.	**Lassalle.**
T. Mo.	Thomas Moore, F.L.S. (1821–1887). Curator of the Garden of the Apothecaries Company at Chelsea, 1848–1887. Editor of the *Gardeners' Magazine of Botany*; Author of *Handbook of British Ferns*; *Index Filicum*; *Illustrations of Orchidaceous Plants*.	**Labyrinth.**
T. M. L.	Rev. Thomas Martin Lindsay, LL.D., D.D. Principal of the United Free Church College, Glasgow. Formerly Assistant to the Professor of Logic and Metaphysics in the University of Edinburgh. Author of *History of the Reformation*; *Life of Luther*; &c.	**Lollards.**
T. Se.	Thomas Seccombe, M.A. Lecturer in History, East London and Birkbeck Colleges, University of London. Stanhope Prizeman, Oxford, 1887. Assistant Editor of *Dictionary of National Biography*, 1891–1900. Author of *The Age of Johnson*; &c.	**Lever, Charles.**
T. W. R. D.	Thomas William Rhys Davids, LL.D., Ph.D. Professor of Comparative Religion, Manchester University. Professor of Pali and Buddhist Literature, University College, London, 1882–1904. President of the Pali Text Society. Fellow of the British Academy. Secretary and Librarian of Royal Asiatic Society, 1885–1902. Author of *Buddhism*; *Sacred Books of the Buddhists*; *Early Buddhism*; *Buddhist India*; *Dialogues of the Buddha*; &c.	**Lāmāism.**
T. Wo.	Thomas Woodhouse. Head of the Weaving and Textile Designing Department, Technical College, Dundee.	**Linen and Linen Manufactures.**
V. B. L.	Vivian Byam Lewes, F.I.C., F.C.S. Professor of Chemistry, Royal Naval College. Chief Superintendent Gas Examiner to the Corporation of the City of London.	**Lighting:** *Oil and Gas*.
V. H. B.	Vernon Herbert Blackman, M.A., D.Sc. Professor of Botany in the University of Leeds. Formerly Fellow of St John's College, Cambridge.	**Lichens** (*in part*).
W. A. B. C.	Rev. William Augustus Brevoort Coolidge, M.A., F.R.G.S. Fellow of Magdalen College, Oxford. Professor of English History, St David's College, Lampeter, 1880–1881. Author of *Guide to Switzerland*; *The Alps in Nature and in History*; &c. Editor of *The Alpine Journal*, 1880–1889.	**Lausanne; Leuk; Liechtenstein; Linth; Locarno; Locle, Le.**
W. A. P.	Walter Alison Phillips, M.A. Formerly Exhibitioner of Merton College and Senior Scholar of St John's College, Oxford. Author of *Modern Europe*; &c.	**Laibach, Congress of; Lights, Ceremonial use of.**
W. E. Co.	The Rt. Rev. William Edward Collins, M.A., D.D. Bishop of Gibraltar. Formerly Professor of Ecclesiastical History, King's College, London. Lecturer of Selwyn and St John's Colleges, Cambridge. Author of *The Study of Ecclesiastical History*; *Beginnings of English Christianity*; &c.	**Libellatici.**
W. F. I.	William Fergusson Irvine, Hon. M.A. (Liverpool). Hon. Secretary and General Editor of Historical Society of Lancashire and Cheshire. Hon. Local Secretary for Cheshire of the Society of Antiquaries. Author of *Liverpool in the reign of Charles II.*; *Old Halls of Wirral*; &c.	**Liverpool.**

W. H. Be.	William Henry Bennett, M.A., D.D., D.Litt. (Cantab.). Professor of Old Testament Exegesis in New and Hackney Colleges, London. Formerly Fellow of St John's College, Cambridge. Lecturer in Hebrew at Firth College, Sheffield. Author of *Religion of the Post-Exilic Prophets*; &c.	**Lamech.**
W. H. F.	Sir William Henry Flower, F.R.S. See the biographical article: Flower, Sir W. H.	**Lemming** (*in part*); **Leopard** (*in part*); **Lion** (*in part*).
W. M. R.	William Michael Rossetti. See the biographical article: Rossetti, Dante Gabriel.	**Lely, Sir Peter;** **Lippi.**
W. P. T.	William Peterfield Trent, LL.D., D.C.L. Professor of English Literature. Columbia University. Author of *English Culture in Virginia*; *A Brief History of American Literature*; &c.	**Lanier.**
W. R. So.	William Ritchie Sorley, M.A., Litt.D., LL.D. Professor of Moral Philosophy in the University of Cambridge. Fellow of King's College, Cambridge. Fellow of the British Academy. Formerly Fellow of Trinity College. Author of *The Ethics of Naturalism*; *The Interpretation of Evolution*; &c.	**Leibnitz.**
W. R. S.-R.	William Ralston Shedden-Ralston, M.A. Formerly Assistant in the Department of Printed Books, British Museum. Author of *Russian Folk Tales*; &c.	**Lermontov.**
W. T. Ca.	William Thomas Calman, D.Sc., F.Z.S. Assistant in charge of Crustacea, Natural History Museum, South Kensington. Author of "Crustacea" in *A Treatise on Zoology*, edited by Sir E. Ray Lankester.	**Lobster.**
W. T. D.	William Tregarthen Douglass, M.Inst.C.E., M.I.M.E. Consulting Engineer to Governments of Western Australia, New South Wales, Victoria, Cape of Good Hope, &c. Erected the Eddystone and Bishop Rock Lighthouses. Author of *The New Eddystone Lighthouse*; &c.	**Lighthouse** (*in part*).
W. W. R.*	William Walker Rockwell, Lic.Theol. Assistant Professor of Church History, Union Theological Seminary, New York.	**Leo XI. and XII.** (*popes*).
W. W. S.	Walter William Skeat, Litt.D., LL.D., D.C.L. See the biographical article: Skeat, W. W.	**Layamon.**
W. Y. S.	William Young Sellar, LL.D. See the biographical article: Sellar, William Young.	**Latin Literature** (*in part*).

PRINCIPAL UNSIGNED ARTICLES

Labiatae.
Lacrosse.
Lagos.
Lahore.
Lake District.
Lambeth Conferences.
Lanarkshire.
Lancashire.
Lantern.
Lapland.
Larceny.
Larch.
Lead Poisoning.
Leeds.
Legitimacy.
Leguminosae.
Leicestershire.
Leipzig.
Leith.
Lemnos.
Lemon.
Lent.
Leprosy.
Libel.
Liberal Party.
Liliaceae.
Lille.
Lily.
Limitation, Statutes of
Lincoln.
Lincolnshire.
Lippe.
Lisbon.

ENCYCLOPÆDIA BRITANNICA

ELEVENTH EDITION

VOLUME XVI

L a letter which was the twelfth letter of the Phoenician alphabet. It has in its history passed through many changes of form, ending curiously enough in its usual manuscript form with a shape almost identical with that which it had about 900 B.C. (⌊ ∠). As was the case with B and some other letters the Greeks did not everywhere keep the symbol in the position in which they had borrowed it ⌊. This, which was its oldest form in Attica and in the Chalcidian colonies of Italy, was the form adopted by the Romans, who in time converted it into the rectangle L, which passed from them to the nations of western Europe. In the Ionic alphabet, however, from which the ordinary Greek alphabet is derived it appeared as Λ. A still more common form in other parts of Greece was Ʌ, with the legs of unequal length. The editors of Herodotus have not always recognized that the name of Labda, the mother of Cypselus, in the story (v. 92) of the founding of the great family of Corinthian despots, was derived from the fact that she was lame and so suggested the form of the Corinthian Ʌ. Another form Ͱ or ⊦ was practically confined to the west of Argolis. The name of the Greek letter is ordinarily given as *Lambda*, but in Herodotus (above) and in Athenaeus x. p. 453 *e*, where the names of the letters are given, the best authenticated form is *Labda*. The Hebrew name, which was probably identical with the Phoenician, is *Lamed*, which, with a final vowel added as usual, would easily become *Lambda*, *b* being inserted between *m* and another consonant. The pronunciation of *l* varies a great deal according to the point at which the tongue makes contact with the roof of the mouth. The contact, generally speaking, is at the same point as for *d*, and this accounts for an interchange between these sounds which occurs in various languages, *e.g.* in Latin *lacrima* from the same root as the Greek δάκρυ and the English *tear*. The change in Latin occurs in a very limited number of cases and one explanation of their occurrence is that they are borrowed (Sabine) words. In pronunciation the breath may be allowed to escape at one or both sides of the tongue. In most languages *l* is a fairly stable sound. Orientals, however, have much difficulty in distinguishing between *l* and *r*. In Old Persian *l* is found in only two foreign words, and in Sanskrit different dialects employ *r* and *l* differently in the same words. Otherwise, however, the interchanges between *r* and *l* were somewhat exaggerated by the older philologists. Before other consonants *l* becomes silent in not a few languages, notably in French, where it is replaced by *u*, and in English where it has occasionally been restored in recent times, *e.g.* in *fault* which earlier was spelt without *l* (as in French whence it was borrowed), and which Goldsmith could still rhyme with *aught*. In the 15th century the Scottish dialect of English dropped *l* largely both before consonants and finally after *a* and *ū*, *a'* =all, *fa'*=fall, *pu'*=pull, *'oo'*=wool, *bulk* pronounced like *book*, &c., while after *o* it appears as *w*, *row* (pronounced *rau*)= roll, *know*=knoll, &c. It is to be observed that L=50 does not come from this symbol, but was an adaptation of ↓, the western Greek form of χ, which had no corresponding sound in Latin and was therefore not included in the ordinary alphabet. This symbol was first rounded into Ⴑ and then changed first to ⊥ and ultimately to L. (P. Gi.)

LAACHER SEE, a lake of Germany, in the Prussian Rhine Province, 5 m. W. of Brohl on the Rhine, and N. of the village of Niedermendig. It occupies what is supposed to be a crater of the Eifel volcanic formation, and the pumice stone and basalt found in great quantities around it lend credence to this theory. It lies 850 ft. above the sea, is 5 m. in circumference and 160 ft. deep, and is surrounded by an amphitheatre of high hills. The water is sky blue in colour, very cold and bitter to the taste. The lake has no natural outlet and consequently is subjected to a considerable rise and fall. On the western side lies the Benedictine abbey of St Maria Laach (*Abbatia Lacensis*) founded in 1093 by Henry II., count palatine of the Rhine. The abbey church, dating from the 12th century, was restored in 1838. The history of the monastery down to modern times appears to have been uneventful. In 1802 it was abolished and at the close of the Napoleonic wars it became a Prussian state demesne. In 1863 it passed into the hands of the Jesuits, who, down to their expulsion in 1873, published here a periodical, which still appears, entitled *Stimmen aus Maria Laach*. In 1892 the monastery was again occupied by the Benedictines.

LAAGER, a South African Dutch word (Dutch *leger*, Ger. *lager*, connected with Eng. "lair") for a temporary defensive encampment, formed by a circle of wagons. The English word is "leaguer," an armed camp, especially that of a besieging or "beleaguering" army. The Ger. *lager*, in the sense of "store," is familiar as the name of a light beer (see BREWING).

LAAS, ERNST (1837–1885), German philosopher, was born on the 16th of June 1837 at Fürstenwalde. He studied theology and philosophy under Trendelenburg at Berlin, and eventually became professor of philosophy in the new university of Strassburg. In *Kant's Analogien der Erfahrung* (1876) he keenly criticized Kant's transcendentalism, and in his chief work *Idealismus und Positivismus* (3 vols., 1879–1884), he drew a clear contrast between Platonism, from which he derived transcendentalism, and positivism, of which he considered Protagoras the founder. Laas in reality was a disciple of Hume. Throughout his philosophy he endeavours to connect metaphysics with ethics and the theory of education.

His chief educational works were *Der deutsche Aufsatz in den obern Gymnasialklassen* (1868; 3rd ed., part i., 1898, part ii., 1894), and *Der deutsche Unterricht auf höhern Lehranstalten* (1872; 2nd ed. 1886). He contributed largely to the *Vierteljahrsschr. f. wiss. Philos.* (1880–1882); the *Litterarischer Nachlass*, a posthumous collection, was published at Vienna (1887). See Hanisch, *Der Positivismus von Ernst Laas* (1902); Gjurits, *Die Erkenntnistheorie des Ernst Laas* (1903); Falckenberg, *Hist. of Mod. Philos.* (Eng. trans., 1895).

LA BADIE, JEAN DE (1610–1674), French divine, founder of the school known as the Labadists, was born at Bourg, not far from Bordeaux, on the 13th of February 1610, being the son of Jean Charles de la Badie, governor of Guienne. He was sent to the Jesuit school at Bordeaux, and when fifteen entered the Jesuit college there. In 1626 he began to study philosophy and theology. He was led to hold somewhat extreme views about the efficacy of prayer and the direct influence of the Holy Spirit upon believers, and adopted Augustinian views about grace, free will and predestination, which brought him into collision with his order. He therefore separated from the Jesuits, and then became a preacher to the people, carrying on this work in Bordeaux, Paris and Amiens. At Amiens in 1640 he was appointed a canon and teacher of theology. The hostility of Cardinal Mazarin, however, forced him to retire to the Carmelite hermitage at Graville. A study of Calvin's *Institutes* showed him that he had more in common with the Reformed than with the Roman Catholic Church, and after various adventures he joined the Reformed Church of France and became professor of theology at Montauban in 1650. His reasons for doing so he published in the same year in his *Déclaration de Jean de la Badie*. His accession to the ranks of the Protestants was deemed a great triumph; no such man since Calvin himself, it was said, had left the Roman Catholic Church. He was called to the pastorate of the church at Orange on the Rhone in 1657, and at once became noted for his severity of discipline. He set his face zealously against dancing, card-playing and worldly entertainments. The unsettled state of the country, recently annexed to France, compelled him to leave Orange, and in 1659 he became a pastor in Geneva. He then accepted a call to the French church in London, but after various wanderings settled at Middelburg, where he was pastor to the French-speaking congregation at a Walloon church. His peculiar opinions were by this time (1666) well known, and he and his congregation found themselves in conflict with the ecclesiastical authorities. The result was that la Badie and his followers established a separate church in a neighbouring town. In 1669 he moved to Amsterdam. He had enthusiastic disciples, Pierre Yvon (1646–1707) at Montauban, Pierre Dulignon (d. 1679), François Menuret (d. 1670), Theodor Untereyk (d. 1693), F. Spanheim (1632–1701), and, more important than any, Anna Maria v. Schürman (1607–1678), whose book *Eucleria* is perhaps the best exposition of the tenets of her master. At the head of his separatist congregation, la Badie developed his views for a reformation of the Reformed Churches: the church is a communion of holy people who have been born again from sin; baptism is the sign and seal of this regeneration, and is to be administered only to believers; the Holy Spirit guides the regenerate into all truth, and the church possesses throughout all time those gifts of prophecy which it had in the ancient days; the community at Jerusalem is the continual type of every Christian congregation, therefore there should be a community of goods, the disciples should live together, eat together, dance together; marriage is a holy ordinance between two believers, and the children of the regenerate are born without original sin, marriage with an unregenerate person is not binding. They did not observe the Sabbath, because—so they said—their life was a continual Sabbath. The life and separatism of the community brought them into frequent collision with their neighbours and with the magistrates, and in 1670 they accepted the invitation of the princess Elizabeth, abbess of Herford in Westphalia, to take up their abode within her territories, and settled in Herford to the number of about fifty. Not finding the rest they expected they migrated to Bremen in 1672, and afterwards to Altona, where they were dispersed on the death of the leaders. Small communities also existed in the Rhineland, and a missionary settlement was established in New York. Jean de la Badie died in February 1674.

La Badie's works include *La Prophétie* (1668), *Manuel de piété* (1669), *Protestation de bonne foi et saine doctrine* (1670), *Briève déclaration de nos sentiments touchant l'Église* (1670). See H. van Berkum, *De Labadie en de Labadisten* (Sneek, 1851); Max Göbel (1811–1857), *Gesch. d. christl. Lebens in der rheinisch-westphälischen Kirche* (Coblenz, 3 vols., 1849–1860); Heinrich Heppe (1820–1879), *Geschichte des Pietismus* (Leiden, 1879); Albrecht Ritschl, *Geschichte des Pietismus*, vol. i. (Bonn, 1880); and especially Peter Yvon, *Abrégé précis de la vie et de la conduite et des vrais sentiments de feu Mr de Labadie*, and Anna Maria v. Schürman, *Eucleria* (Altona, 1673, 1678). Cf. the article in Herzog-Hauck, *Realencyklopädie*.

LABARUM, the sacred military standard of the early Christian Roman emperors, first adopted by Constantine the Great after his miraculous vision in 312, although, according to Gibbon, he did not exhibit it to the army till 323. The name seems to have been known before, and the banner was simply a Christianized form of the Roman cavalry standard. Eusebius (*Life of Const.* i. 31) describes the first labarum as consisting of a long gilded spear, crossed at the top by a bar from which hung a square purple cloth, richly jewelled. At the upper extremity of the spear was a golden wreath encircling the sacred monogram, formed of the first two letters of the name of Christ. In later banners the monogram was sometimes embroidered on the cloth. A special guard of fifty soldiers was appointed to protect the sacred standard. The derivation of the word labarum is disputed; it appears to be connected with the Basque *labarva*, signifying standard. See Flag.

LABÉ, LOUISE CHARLIN PERRIN (c. 1525–1566), French poet, called *La Belle Cordière*, was born at Lyons about 1525, the daughter of a rich ropemaker, named Charley or Charlin. At the siege of Perpignan she is said to have fought on horseback in the ranks of the Dauphin, afterwards Henry II. Some time before 1551 she married Ennemond Perrin, a ropemaker. She formed a library and gathered round her a society which included many of the learned ladies of Lyons,—Pernette du Guillet, Claudine and Sibylle Scève and Clémence de Bourges, and the poets Maurice Scève, Charles Fontaine, Pontus de Tyard; and among the occasional visitors were Clément Marot and his friend Melin de Saint-Gelais, with probably Bonaventure des Périers and Rabelais. About 1550 the poet Olivier de Magny passed through Lyons on his way to Italy in the suite of Jean d'Avanson, the French envoy to the Holy See. As the friend of Ronsard, "Prince of Poets," he met with an enthusiastic reception from Louise, who straightway fell in love with him. There seems little doubt that her passion for Magny inspired her eager, sincere verse, and the elegies probably express her grief at his first absence. A second short visit to Lyons was followed by a second longer absence. Magny's influence is shown more decisively in her *Sonnets*, which, printed in 1555, quickly attained great popularity. During his second visit to Italy Magny had apparently consoled himself, and Louise, despairing of his return, encouraged another admirer, Claude Rubys, when her lover returned unexpectedly. Louise dismissed Rubys, but Magny's jealousy found vent in an ode addressed to the Sire Aymon (Ennemond), which ruined her reputation; while Rubys, angry at his dismissal, avenged himself later in his *Histoire véritable de Lyons* (1573). This scandal struck a fatal blow at Louise's position. Shortly afterwards her husband died, and she returned to her country house at Parcieu, where she died on the 25th of April 1566, leaving the greater part of the fortune she was left to the poor. Her works include, besides the *Elegies* and *Sonnets* mentioned, a prose *Débat de folie et d'amour* (translated into English by Robert Greene in 1608).

See editions of her *Œuvres* by P. Blanchemain (1875), and by C. Boy (2 vols., 1887). A sketch of Louise Labé and of the Lyonnese

Society is in Miss Edith Sichel's *Women and Men of the French Renaissance* (1901). See also J. Favre, *Olivier de Magny* (1885).

LABEL (a French word, now represented by *lambeau*, possibly a variant; it is of obscure origin and may be connected with a Teutonic word appearing in the English "lap," a flap or fold), a slip, ticket, or card of paper, metal or other material, attached to an object, such as a parcel, bottle, &c., and containing a name, address, description or other information, for the purpose of identification. Originally the word meant a band or ribbon of linen or other material, and was thus applied to the fillets (*infulae*) attached to a bishop's mitre. In heraldry the "label" is a mark of "cadency."

In architecture the term "label" is applied to the outer projecting moulding over doors, windows, arches, &c., sometimes called "Dripstone" or "Weather Moulding," or "Hood Mould." The former terms seem scarcely applicable, as this moulding is often inside a building where no rain could come, and consequently there is no drip. In Norman times the label frequently did not project, and when it did it was very little, and formed part of the series of arch mouldings. In the Early English styles they were not very large, sometimes slightly undercut, sometimes deeply, sometimes a quarter round with chamfer, and very frequently a "roll" or "scroll-moulding," so called because it resembles the part of a scroll where the edge laps over the body of the roll. Labels generally resemble the string-courses of the period, and, in fact, often return horizontally and form strings. They are less common in Continental architecture than in English.

LABEO, MARCUS ANTISTIUS (*c.* 50 B.C.–A.D. 18), Roman jurist, was the son of Pacuvius Antistius Labeo, a jurist who caused himself to be slain after the defeat of his party at Philippi. A member of the plebeian nobility, and in easy circumstances, the younger Labeo early entered public life, and soon rose to the praetorship; but his undisguised antipathy to the new régime, and the somewhat brusque manner in which in the senate he occasionally gave expression to his republican sympathies—what Tacitus (*Ann.* iii. 75) calls his *incorrupta libertas*—proved an obstacle to his advancement, and his rival, Ateius Capito, who had unreservedly given in his adhesion to the ruling powers, was promoted by Augustus to the consulate, when the appointment should have fallen to Labeo; smarting under the wrong done him, Labeo declined the office when it was offered to him in a subsequent year (Tac. *Ann.* iii. 75; Pompon, in fr. 47, *Dig.* i, 2). From this time he seems to have devoted his whole time to jurisprudence. His training in the science had been derived principally from Trebatius Testa. To his knowledge of the law he added a wide general culture, devoting his attention specially to dialectics, philology (*grammatica*), and antiquities, as valuable aids in the exposition, expansion, and application of legal doctrine (Gell. xiii. 10). Down to the time of Hadrian his was probably the name of greatest authority; and several of his works were abridged and annotated by later hands. While Capito is hardly ever referred to, the dicta of Labeo are of constant recurrence in the writings of the classical jurists, such as Gaius, Ulpian and Paul; and no inconsiderable number of them were thought worthy of preservation in Justinian's *Digest*. Labeo gets the credit of being the founder of the Proculian sect or school, while Capito is spoken of as the founder of the rival Sabinian one (Pomponius in fr. 47, *Dig.* i. 2); but it is probable that the real founders of the two *scholae* were Proculus and Sabinus, followers respectively of the methods of Labeo and Capito.

Labeo's most important literary work was the *Libri Posteriorum*, so called because published only after his death. It contained a systematic exposition of the common law. His *Libri ad Edictum* embraced a commentary, not only on the edicts of the urban and peregrine praetors, but also on that of the curule aediles. His *Probabilium* (πιθανῶν) *lib. VIII.*, a collection of definitions and axiomatic legal propositions, seems to have been one of his most characteristic productions.

See van Eck, "De vita, moribus, et studiis M. Ant. Labeonis" (Franeker, 1692), in Oelrichs's *Thes. nov.*, vol. i.; Mascovius, *De sectis Sabinianor. et Proculianor.* (1728); Pernice, *M. Antistius Labeo. Das röm. Privatrecht im ersten Jahrhunderte der Kaizerzeit* (Halle, 1873–1892).

LABERIUS, DECIMUS (*c.* 105–43 B.C.), Roman knight and writer of mimes. He seems to have been a man of caustic wit, who wrote for his own pleasure. In 45 Julius Caesar ordered him to appear in one of his own mimes in a public contest with the actor Publilius Syrus. Laberius pronounced a dignified prologue on the degradation thus thrust on his sixty years, and directed several sharp allusions against the dictator. Caesar awarded the victory to Publilius, but restored Laberius to his equestrian rank, which he had forfeited by appearing as a mimus (Macrobius, *Sat.* ii. 7). Laberius was the chief of those who introduced the mimus into Latin literature towards the close of the republican period. He seems to have been a man of learning and culture, but his pieces did not escape the coarseness inherent to the class of literature to which they belonged; and Aulus Gellius (xvi. 7, 1) accuses him of extravagance in the coining of new words. Horace (*Sat.* i. 10) speaks of him in terms of qualified praise.

In addition to the prologue (in Macrobius), the titles of forty-four of his mimi have been preserved; the fragments have been collected by O. Ribbeck in his *Comicorum Latinorum reliquiae* (1873).

LABIATAE (*i.e.* "lipped," Lat. *labium*, lip), in botany, a natural order of seed-plants belonging to the series Tubiflorae of the dicotyledons, and containing about 150 genera with 2800 species. The majority are annual or perennial herbs inhabiting the temperate zone, becoming shrubby in warmer climates. The stem is generally square in section and the simple exstipulate leaves are arranged in decussating pairs (*i.e.* each pair is in a plane at right angles to that of the pairs immediately above and below it); the blade is entire, or toothed, lobed or more or less deeply cut. The plant is often hairy, and the hairs are frequently glandular, the secretion containing a scent characteristic of the genus or species. The flowers are borne in the axils of the leaves or bracts; they are rarely solitary as in *Scutellaria* (skull-cap), and generally form an apparent whorl (*verticillaster*) at the node, consisting of a pair of cymose inflorescences each of which is a simple three-flowered dichasium as in *Brunella*, *Salvia*, &c., or more generally a dichasium passing over into a pair of monochasial cymes as in *Lamium* (fig. 1), *Ballota*, *Nepeta*, &c. A number of whorls may be crowded at the apex of the stem and the subtending leaves reduced to small bracts, the whole forming a raceme- or spike-like inflorescence as in *Mentha* (fig. 2, 5) *Brunella*, &c.; the bracts are sometimes large and coloured as in *Monarda*, species of *Salvia*, &c., in the latter the apex of the stem is sometimes occupied with a cluster of sterile coloured bracts. The plan of the flower is remarkably uniform (fig. 1, 3); it is bisexual, and zygomorphic in the

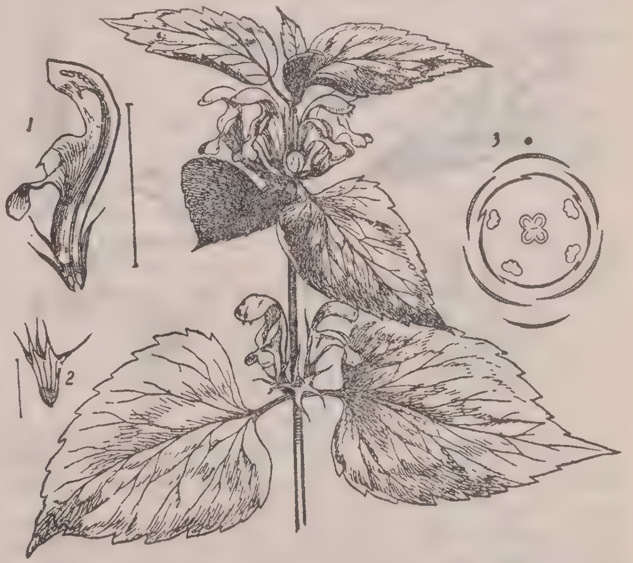

Fig. 1.—Flowering Shoot of Dead-nettle (*Lamium album*). *1*, Flower cut lengthwise, enlarged; *2* calyx, enlarged; *3*, floral diagram.

median plane, with 5 sepals united to form a persistent cup-like calyx, 5 petals united to form a two-lipped gaping corolla, 4 stamens inserted on the corolla-tube, two of which, generally the anterior pair, are longer than the other two (didynamous arrangement)—sometimes as in *Salvia*, the posterior pair is aborted—and two superior median carpels, each very early divided by a constriction in a vertical plane, the pistil consisting of four cells each containing one erect anatropous ovule attached to the base of an axile placenta; the style springs from the centre of the pistil between the four segments (*gynobasic*), and is simple with a bifid apex. The fruit comprises four one-seeded nutlets included in the persistent calyx; the seed has a thin testa and the embryo almost or completely fills it. Although the general form and plan of arrangement of the flower is very uniform, there are wide variations in detail. Thus the calyx may be tubular, bell-shaped, or almost spherical, or straight or bent, and the length and form of the teeth or lobes varies also; it may be equally toothed as in mint (*Mentha*) (fig. 2, *3*), and marjoram (*Origanum*), or two-lipped as in thyme (*Thymus*), *Lamium* (fig. 1) and *Salvia* (fig. 2, *1*); the number of nerves affords useful characters for distinction of genera, there are normally five main nerves between which simple or forked secondary nerves are more or less developed. The shape of the corolla varies widely, the differences being doubtless intimately associated with the pollination of the flowers by insect-agency. The tube is straight or variously bent and often widens towards the mouth. Occasionally the limb is equally five-toothed, or forms, as in *Mentha* (fig. 2, *3*, *4*) an almost regular four-toothed corolla by union of the two posterior teeth. Usually it is two-lipped, the upper lip being formed by the two posterior, the lower lip by the three anterior petals (see fig. 1, and fig. 2, *1*, *6*); the median lobe of the lower lip is generally most developed and forms a resting-place for the bee or other insect when probing the flower for honey, the upper lip shows great variety in form, often, as in *Lamium* (fig. 1), *Stachys*, &c., it is arched forming a protection from rain for the stamens, or it may be flat as in thyme. In the tribe *Ocimoideae* the four upper petals form the upper lip, and the single anterior one the lower lip, and in *Teucrium* the upper lip is absent, all five lobes being pushed forward to form the lower. The posterior stamen is sometimes present as a staminode, but generally suppressed; the upper pair are often reduced to staminodes or more or less completely suppressed as in *Salvia* (fig. 2, *2*, *6*); rarely are these developed and the anterior pair reduced. In *Coleus* the stamens are monadelphous. In *Nepeta* and allied genera the posterior pair are the longer, but this is rare, the didynamous character being generally the result of the anterior pair being the longer. The anthers are two-celled, each cell splitting lengthwise; the connective may be more or less developed between the cells; an extreme case is seen in *Salvia* (fig. 2, *2*), where the connective is filiform and jointed to the filament, while the anterior anther-cell is reduced to a sterile appendage. Honey is secreted by a hypogynous disk. In the more general type of flower the anthers and stigmas are protected by the arching upper lip as in dead-nettle (fig. 1) and many other British genera; the lower lip affords a resting-place for the insect which in probing the flower for the honey, secreted on the lower side of the disk, collects pollen on its back. Numerous variations in detail are found in the different genera; in *Salvia* (fig. 2), for instance, there is a lever mechanism, the barren half of each anther forming a knob at the end of a short arm which when touched by the head of an insect causes the anther at the end of the longer arm to descend on the insect's back. In the less common type, where the anterior part of the flower is more developed, as in the *Ocimoideae*, the stamens and style lie on the under lip and honey is secreted on the upper side of the hypogynous disk; the insect in probing the flower gets smeared with pollen on its belly and legs. Both types include brightly-coloured flowers with longer tubes adapted to the visits of butterflies and moths, as species of *Salvia*, *Stachys*, *Monarda*, &c.; some South American species of *Salvia* are pollinated by humming-birds. In *Mentha* (fig. 2, *3*), thyme, marjoram (*Origanum*), and allied genera, the flowers are nearly regular and the stamens spread beyond the corolla.

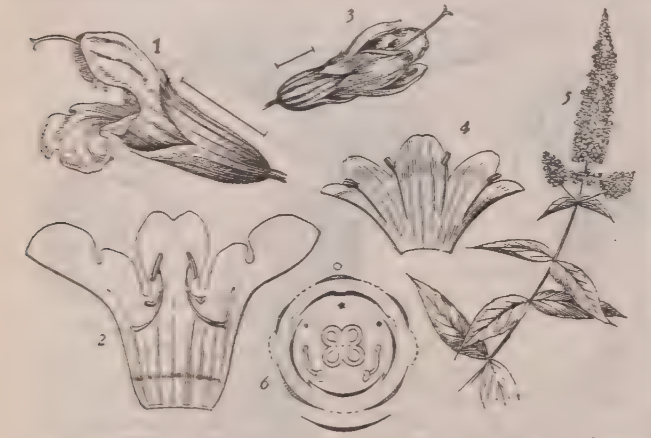

FIG. 2.—*1*, Flower of Sage (*Salvia officinalis*). *2*, Corolla of same cut open showing the two stamens; *3*, flower of spearmint (*Mentha viridis*); *4*, corolla of same cut open showing stamens; *5*, flowering shoot of same, reduced; *6*, floral diagram of *Salvia*.

The persistent calyx encloses the ripe nutlets, and aids in their distribution in various ways, by means of winged spiny or hairy lobes or teeth; sometimes it forms a swollen bladder. A scanty endosperm is sometimes present in the seed; the embryo is generally parallel to the fruit axis with a short inferior radicle and generally flat cotyledons.

The order occurs in all warm and temperate regions; its chief centre is the Mediterranean region, where some genera such as *Lavandula*, *Thymus*, *Rosmarinus* and others form an important feature in the vegetation. The tribe *Ocimoideae* is exclusively tropical and subtropical and occurs in both hemispheres. The order is well represented in Britain by seventeen native genera; *Mentha* (mint) including also *M. piperita* (peppermint) and *M. Pulegium* (pennyroyal); *Origanum vulgare* (marjoram); *Thymus Serpyllum* (thyme); *Calamintha* (calamint), including also *C. Clinopodium* (wild basil) and *C. Acinos* (basil thyme); *Salvia* (sage), including *S. Verbenaca* (clary); *Nepeta Cataria* (catmint), *N. Glechoma* (ground-ivy); *Brunella* (self-heal); *Scutellaria* (skull-cap); *Stachys* (woundwort); *S. Betonica* is wood betony; *Galeopsis* (hemp-nettle); *Lamium* (dead-nettle); *Ballota* (black horehound); *Teucrium* (germander); and *Ajuga* (bugle).

Labiatae are readily distinguished from all other orders of the series excepting Verbenaceae, in which, however, the style is terminal; but several genera, *e.g. Ajuga*, *Teucrium* and *Rosmarinus*, approach Verbenaceae in this respect, and in some genera of that order the style is more or less sunk between the ovary lobes. The fruit-character indicates an affinity with Boraginaceae from which, however, they differ in habit and by characters of ovule and embryo.

The presence of volatile oil renders many genera of economic use, such are thyme, marjoram (*Origanum*), sage (*Salvia*), lavender (*Lavandula*), rosemary (*Rosmarinus*), patchouli (*Pogostemon*). The tubers of *Stachys Sieboldi* are eaten in France.

LABICANA, VIA, an ancient highroad of Italy, leading E.S.E. from Rome. It seems possible that the road at first led to Tusculum, that it was then prolonged to Labici, and later still became a road for through traffic; it may even have superseded the Via Latina as a route to the S.E., for, while the distance from Rome to their main junction at Ad Bivium (or to another junction at Compitum Anagninum) is practically identical, the summit level of the former is 725 ft. lower than that of the latter, a little to the west of the pass of Algidus. After their junction it is probable that the road bore the name Via Latina rather than Via Labicana. The course of the road after the first six miles from Rome is not identical with that of any modern road, but can be clearly traced by remains of pavement and buildings along its course.

See T. Ashby in *Papers of the British School at Rome*, i. 215 sqq. (T. As.)

LABICHE, EUGÈNE MARIN (1815–1888), French dramatist, was born on the 5th of May 1815, of *bourgeois* parentage. He read for the bar, but literature had more powerful attractions, and he was hardly twenty when he gave to the *Chérubin*—an impertinent little magazine, long vanished and forgotten—a short story, entitled, in the cavalier style of the period, *Les plus belles sont les plus fausses.* A few others followed much in the same strain, but failed to catch the attention of the public. He tried his hand at dramatic criticism in the *Revue des théâtres*, and in 1838 made a double venture on the stage. The small Théâtre du Panthéon produced, amid some signs of popular favour, a drama of his, *L'Avocat Loubet*, while a vaudeville, *Monsieur de Coislin ou l'homme infiniment poli*, written in collaboration with Marc Michel, and given at the Palais Royal, introduced for the first time to the Parisians a provincial actor who was to become and to remain a great favourite with them, Grassot, the famous low comedian. In the same year Labiche, still doubtful about his true vocation, published a romance called *La Clé des champs.* M. Léon Halévy, his successor at the Academy and his panegyrist, informs us that the publisher became a bankrupt soon after the novel was out. "A lucky misadventure, for," the biographer concludes, "this timely warning of Destiny sent him back to the stage, where a career of success was awaiting him." There was yet another obstacle in the way. When he married, he solemnly promised his wife's parents that he would renounce a profession then considered incompatible with moral regularity and domestic happiness. But a year afterwards his wife spontaneously released him from his vow, and Labiche recalled the incident when he dedicated the first edition of his complete works: "To my wife." Labiche, in conjunction with Varin,[1] Marc Michel,[2] Clairville,[3] Dumanoir,[4] and others contributed comic plays interspersed with couplets to various Paris theatres. The series culminated in the memorable farce in five acts, *Un Chapeau de paille d'Italie* (August 1851). It remains an accomplished specimen of the French *imbroglio*, in which some one is in search of something, but does not find it till five minutes before the curtain falls. Prior to that date Labiche had been only a successful *vaudevilliste* among a crowd of others; but a twelvemonth later he made a new departure in *Le Misanthrope et l'Auvergnat.* All the plays given for the next twenty-five years, although constructed on the old plan, contained a more or less appreciable dose of that comic observation and good sense which gradually raised the French farce almost to the level of the comedy of character and manners. "Of all the subjects," he said, "which offered themselves to me, I have selected the *bourgeois.* Essentially mediocre in his vices and in his virtues, he stands half-way between the hero and the scoundrel, between the saint and the profligate." During the second period of his career Labiche had the collaboration of Delacour,[5] Choler,[6] and others. When it is asked what share in the authorship and success of the plays may be claimed for those men, we shall answer in Émile Augier's words: "The distinctive qualities which secured a lasting vogue for the plays of Labiche are to be found in all the comedies written by him with different collaborators, and are conspicuously absent from those which they wrote without him." A more useful and more important collaborator he found in Jean Marie Michel Geoffroy (1813–1883) whom he had known as a *débutant* in his younger days, and who remained his faithful interpreter to the last. Geoffroy impersonated the *bourgeois* not only to the public, but to the author himself; and it may be assumed that Labiche, when writing, could see and hear Geoffroy acting the character and uttering, in his pompous, fussy way, the words that he had just committed to paper. *Célimare le bien-aimé* (1863), *Le Voyage de M. Perrichon* (1860), *La Grammaire*, *Un Pied dans le crime*, *La Cagnotte* (1864), may be quoted as the happiest productions of Labiche.

In 1877 he brought his connexion with the stage to a close, and retired to his rural property in Sologne. There he could be seen, dressed as a farmer, with low-brimmed hat, thick gaiters and an enormous stick, superintending the agricultural work and busily engaged in reclaiming land and marshes. His lifelong friend, Augier, visited him in his principality, and, being left alone in the library, took to reading his host's dramatic productions, scattered here and there in the shape of theatrical *brochures.* He strongly advised Labiche to publish a collected and revised edition of his works. The suggestion, first declined as a joke and long resisted, was finally accepted and carried into effect. Labiche's comic plays, in ten volumes, were issued during 1878 and 1879. The success was even greater than had been expected by the author's most sanguine friends. It had been commonly believed that these plays owed their popularity in great measure to the favourite actors who had appeared in them; but it was now discovered that all, with the exception of Geoffroy, had introduced into them a grotesque and caricatural element, thus hiding from the spectator, in many cases, the true comic vein and delightful delineation of human character. The amazement turned into admiration, and the *engouement* became so general that very few dared grumble or appear scandalized when, in 1880, Labiche was elected to the French Academy. It was fortunate that, in former years, he had never dreamt of attaining this high distinction; for, as M. Pailleron justly observed, while trying to get rid of the little faults which were in him, he would have been in danger of losing some of his sterling qualities. But when the honour was bestowed upon him, he enjoyed it with his usual good sense and quiet modesty. He died in Paris on the 23rd of January 1888.

Some foolish admirers have placed him on a level with Molière, but it will be enough to say that he was something better than a public *amuseur*. Many of his plays have been transferred to the English stage. They are, on the whole, as sound as they are entertaining. Love is practically absent from his theatre. In none of his plays did he ever venture into the depths of feminine psychology, and womankind is only represented in them by pretentious old maids and silly, insipid, almost dumb, young ladies. He ridiculed marriage according to the invariable custom of French playwrights, but in a friendly and good-natured manner which always left a door open to repentance and timely amendment. He is never coarse, never suggestive. After he died the French farce, which he had raised to something akin to literature, relapsed into its former grossness and unmeaning complexity. (A. Fi.)

His *Théâtre complet* (10 vols., 1878–1879) contains a preface by Émile Augier.

LABICI, an ancient city of Latium, the modern Monte Compatri, about 17 m. S.E. from Rome, on the northern slopes of the Alban Hills, 1739 ft. above sea-level. It occurs among the thirty cities of the Latin League, and it is said to have joined the Aequi in 419 B.C. and to have been captured by the Romans in 418. After this it does not appear in history, and in the time of Cicero and Strabo was almost entirely deserted if not destroyed. Traces of its ancient walls have been noticed. Its place was taken by the *respublica Lavicanorum Quintanensium*, the post-station established in the lower ground on the Via Labicana (see Labicana, Via), a little S.W. of the modern village of Colonna, the site of which is attested by various inscriptions and by the course of the road itself.

See T. Ashby in *Papers of the British School at Rome*, i. 256 sqq. (T. As.)

LABĪD (Abū 'Aqīl Labīd ibn Rabī'a) (*c.* 560–*c.* 661), Arabian poet, belonged to the Banī 'Āmir, a division of the tribe of the Hawāzin. In his younger years he was an active warrior and his verse is largely concerned with inter-tribal disputes. Later, he was sent by a sick uncle to get a remedy from Mahomet at Medina and on this occasion was much influenced by a part of the Koran. He accepted Islam soon after, but seems then to have ceased writing. In Omar's caliphate he is said to have settled in Kufa. Tradition ascribes to him a long life, but dates given are uncertain and contradictory. One of his poems is contained in the *Mo'allakat* (*q.v.*).

Twenty of his poems were edited by Chalidī (Vienna, 1880); another thirty-five, with fragments and a German translation of the whole, were edited (partly from the remains of A. Huber) by C. Brockelmann (Leiden, 1891); cf. A. von Kremer, *Über die Gedichte des Lebyd* (Vienna, 1881). Stories of Labid are contained in the *Kitābul-Aghānī*, xiv. 93 ff. and xv. 137 ff. (G. W. T.)

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[1] Victor Varin, pseudonym of Charles Voirin (1798–1869).

[2] Marc Antoine Amédée Michel (1812–1868), vaudevillist.

[3] Louis François Nicolaise, called Clairville (1811–1879), part-author of the famous *Fille de Mme Angot* (1872).

[4] Philippe François Pinel, called Dumanoir (1806–1865).

[5] Alfred Charlemagne Lartigue, called Delacour (1815–1885). For a list of this author's pieces see O. Lorenz, *Catalogue Général* (vol. ii., 1868).

[6] Adolphe Joseph Choler (1822–1889).

LABIENUS, the name of a Roman family, said (without authority) to belong to the gens Atia. The most important member was TITUS LABIENUS. In 63 B.C., at Caesar's instigation, he prosecuted Gaius Rabirius (*q.v.*) for treason; in the same year, as tribune of the plebs, he carried a plebiscite which indirectly secured for Caesar the dignity of pontifex maximus (Dio Cassius xxxvii. 37). He served as a legatus throughout Caesar's Gallic campaigns and took Caesar's place whenever he went to Rome. His chief exploits in Gaul were the defeat of the Treviri under Indutiomarus in 54, his expedition against Lutetia (Paris) in 52, and his victory over Camulogenus and the Aedui in the same year. On the outbreak of the civil war, however, he was one of the first to desert Caesar, probably owing to an overweening sense of his own importance, not adequately recognized by Caesar. He was rapturously welcomed on the Pompeian side; but he brought no great strength with him, and his ill fortune under Pompey was as marked as his success had been under Caesar. From the defeat at Pharsalus, to which he had contributed by affecting to despise his late comrades, he fled to Corcyra, and thence to Africa. There he was able by mere force of numbers to inflict a slight check upon Caesar at Ruspina in 46. After the defeat at Thapsus he joined the younger Pompey in Spain, and was killed at Munda (March 17th, 45).

LABLACHE, LUIGI (1794–1858), Franco-Italian singer, was born at Naples on the 6th of December 1794, the son of a merchant of Marseilles who had married an Irish lady. In 1806 he entered the Conservatorio della Pieta de Turchini, where he studied music under Gentili and singing under Valesi, besides learning to play the violin and violoncello. As a boy he had a beautiful alto voice, and by the age of twenty he had developed a magnificent bass with a compass of two octaves from E♭ below to E♭ above the bass stave. After making his first appearance at Naples he went to Milan in 1817, and subsequently travelled to Turin, Venice and Vienna. His first appearances in London and Paris in 1830 led to annual engagements in both the English and French capitals. His reception at St Petersburg a few years later was no less enthusiastic. In England he took part in many provincial musical festivals, and was engaged by Queen Victoria to teach her singing. On the operatic stage he was equally successful in comic or tragic parts, and with his wonderfully powerful voice he could express either humour or pathos. Among his friends were Rossini, Bellini, Donizetti and Mercadante. He was one of the thirty-two torch-bearers chosen to surround the coffin at Beethoven's funeral in 1827. He died at Naples on the 23rd of January 1858 and was buried at Maison Lafitte, Paris. Lablache's Leporello in *Don Giovanni* was perhaps his most famous impersonation; among his principal other rôles were Dandini in *Cenerentola* (Rossini), Assur in *Semiramide* (Rossini), Geronimo in *La Gazza Ladra* (Rossini), Henry VIII. in *Anna Bolena* (Donizetti), the Doge in *Marino Faliero* (Donizetti), the title-rôle in *Don Pasquale* (Donizetti), Geronimo in *Il Matrimonio Segreto* (Cimarosa), Gritzenko in *L'Étoile du Nord* (Meyerbeer), Caliban in *The Tempest* (Halévy).

LABOR DAY, in the United States, a legal holiday in nearly all of the states and Territories, where the first Monday in September is observed by parades and meetings of labour organizations. In 1882 the Knights of Labor paraded in New York City on this day; in 1884 another parade was held, and it was decided that this day should be set apart for this purpose. In 1887 Colorado made the first Monday in September a legal holiday; and in 1909 Labor Day was observed as a holiday throughout the United States, except in Arizona and North Dakota; in Louisiana it is a holiday only in New Orleans (Orleans parish), and in Maryland, Wyoming and New Mexico it is not established as a holiday by statute, but in each may be proclaimed as such in any year by the governor.

LA BOURBOULE, a watering-place of central France, in the department of Puy-de-Dôme, 4½ m. W. by N. of Mont-Dore by road. Pop. (1906) 1401. La Bourboule is situated on the right bank of the Dordogne at a height of 2790 ft. Its waters, of which arsenic is the characteristic constituent, are used in cases of diseases of the skin and respiratory organs, rheumatism, neuralgia, &c. Though known to the Romans they were not in much repute till towards the end of the 19th century. The town has three thermal establishments and a casino.

LABOUR CHURCH, THE, an organization intended to give expression to the religion of the labour movement. This religion is not theological—it leaves theological questions to private individual conviction—but "seeks the realization of universal well-being by the establishment of Socialism—a commonwealth founded upon justice and love." It asserts that "improvement of social conditions and the development of personal character are both essential to emancipation from social and moral bondage, and to that end insists upon the duty of studying the economic and moral forces of society." The first Labour Church was founded at Manchester (England) in October 1891 by a Unitarian minister, John Trevor. This has disappeared, but vigorous successors have been established not only in the neighbourhood, but in Bradford, Birmingham, Nottingham, London, Wolverhampton and other centres of industry, about 30 in all, with a membership of 3000. Many branches of the Independent Labour Party and the Social Democratic Federation also hold Sunday gatherings for adults and children, using the Labour Church hymn-book and a similar form of service, the reading being chosen from Dr Stanton Coit's *Message of Man*. There are special forms for child-naming, marriages and burials. The separate churches are federated in a Labour Church Union, which holds an annual conference and business meeting in March. At the conference of 1909, held in Ashton-under-Lyne, the name "Labour Church" was changed to "Socialist Church."

LA BOURDONNAIS, BERTRAND FRANÇOIS, COUNT MAHÉ DE (1699–1753), French naval commander, was born at Saint Malo on the 11th of February 1699. He went to sea when a boy, and in 1718 entered the service of the French India Company as a lieutenant. In 1724 he was promoted captain, and displayed such bravery in the capture of Mahé of the Malabar coast that the name of the town was added to his own. For two years he was in the service of the Portuguese viceroy of Goa, but in 1735 he returned to French service as governor of the Île de France and the Île de Bourbon. His five years' administration of the islands was vigorous and successful. A visit to France in 1740 was interrupted by the outbreak of hostilities with Great Britain, and La Bourdonnais was put at the head of a fleet in Indian waters. He saved Mahé, relieved General Dupleix at Pondicherry, defeated Lord Peyton, and in 1746 participated in the siege of Madras. He quarrelled with Dupleix over the conduct of affairs in India, and his anger was increased on his return to the Île de France at finding a successor to himself installed there by his rival. He set sail on a Dutch vessel to present his case at court, and was captured by the British, but allowed to return to France on parole. Instead of securing a settlement of his quarrel with Dupleix, he was arrested (1748) on a charge of gubernatorial peculation and maladministration, and secretly imprisoned for over two years in the Bastille. He was tried in 1751 and acquitted, but his health was broken by the imprisonment and by chagrin at the loss of his property. To the last he made unjust accusations against Dupleix. He died at Paris on the 10th of November 1753. The French government gave his widow a pension of 2400 livres.

La Bourdonnais wrote *Traité de la mâture des vaisseaux* (Paris 1723), and left valuable memoirs which were published by his grandson, a celebrated chess player, Count L. C. Mahé de la Bourdonnais (1795–1840) (latest edition, Paris, 1890). His quarrel with Dupleix has given rise to much debate; for a long while the fault was generally laid to the arrogance and jealousy of Dupleix, but W. Cartwright and Colonel Malleson have pointed out that La Bourdonnais was proud, suspicious and over-ambitious.

See P. de Gennes, *Mémoire pour le sieur de la Bourdonnais, avec les pièces justificatives* (Paris, 1750); *The Case of Mde la Bourdonnais, in a Letter to a Friend* (London, 1748); Fantin des Odoards, *Révolutions de l'Inde* (Paris, 1796); Collin de Bar, *Histoire de l'Inde ancienne et moderne* (Paris, 1814); Barchou de Penhoën, *Histoire de la conquête et de la fondation de l'empire anglais dans l'Inde* (Paris, 1840); Margry, "Les Isles de France et de Bourbon sous le gouvernement de La Bourdonnais," in *La Revue maritime et coloniale* (1862); W. Cartwright, "Dupleix et l'Inde française," in *La Revue britannique* (1882); G. B. Malleson, *Dupleix* (Oxford, 1895); Anandaranga Pillai, *Les Français dans l'Inde, Dupleix et Labourdonnais, extraits du journal d'Anandaran-gappoullé 1736–1748*, trans. in French by Vinsor in *École spéciale des langues orientales vivantes*, series 3, vol. xv. (Paris, 1894).

LABOUR EXCHANGE, a term very frequently applied to registries having for their principal object the better distribution of labour (see UNEMPLOYMENT). Historically the term is applied to the system of equitable labour exchanges established in England between 1832 and 1834 by Robert Owen and his followers. The idea is said to have originated with Josiah Warren, who communicated it to Owen. Warren tried an experiment in 1828 at Cincinnati, opening an exchange under the title of a "time store." He joined in starting another at Tuscarawas, Ohio, and a third at Mount Vernon, Indiana, but none were quite on the same line as the English exchanges. The fundamental idea of the English exchanges was to establish a currency based upon labour; Owen in *The Crisis* for June 1832 laid down that all wealth proceeded from labour and knowledge; that labour and knowledge were generally remunerated according to the time employed, and that in the new exchanges it was proposed to make *time* the standard or measure of wealth. This new currency was represented by "labour notes," the notes being measured in hours, and the hour reckoned as being worth sixpence, this figure being taken as the mean between the wage of the best and the worst paid labour. Goods were then to be exchanged for the new currency. The exchange was opened in extensive premises in the Gray's Inn Road, near King's Cross, London, on the 3rd of September 1832. For some months the establishment met with considerable success, and a considerable number of tradesmen agreed to take labour notes in payment for their goods. At first, an enormous number of deposits was made, amounting in seventeen weeks to 445,501 hours. But difficulties soon arose from the lack of sound practical valuators, and from the inability of the promoters to distinguish between the labour of the highly skilled and that of the unskilled. Tradesmen, too, were quick to see that the exchange might be worked to their advantage; they brought unsaleable stock from their shops, exchanged it for labour notes, and then picked out the best of the saleable articles. Consequently the labour notes began to depreciate; trouble also arose with the proprietors of the premises, and the experiment came to an untimely end early in 1834.

See F. Podmore's *Robert Owen*, ii. c. xvii. (1906); B. Jones, *Co-operative Production*, c. viii. (1894); G. J. Holyoake, *History of Co-operation*, c. viii. (1906).

LABOUR LEGISLATION. Regulation of labour,[1] in some form or another, whether by custom, royal authority, ecclesiastical rules or by formal legislation in the interests of a community, is no doubt as old as the most ancient forms of civilization. And older than all civilization is the necessity for the greater part of mankind to labour for maintenance, whether freely or in bonds, whether for themselves and their families or for the requirements or superfluities of others. Even while it is clear, however, that manual labour, or the application of the bodily forces—with or without mechanical aid—to personal maintenance and the production of goods, remains the common lot of the majority of citizens of the most developed modern communities, still there is much risk of confusion if modern technical terms such as "labour," "employer," "labour legislation" are freely applied to conditions in bygone civilizations with wholly different industrial organization and social relationships. In recent times in England there has been a notable disappearance from current use of correlative terms implying a social relationship which is greatly changed, for example, in the rapid passage from the Master and Servant Act 1867 to the Employer and Workman Act 1875. In the 18th century the term "manufacturer" passed from its application to a working craftsman to its modern connotation of at least some command of capital, the employer being no longer a small working master. An even more significant later change is seen in the steady development of a labour legislation, which arose in a clamant social need for the care of specially helpless "protected" persons in factories and mines, into a wider legislation for the promotion of general industrial health, safety and freedom for the worker from fraud in making or carrying out wage contracts.

If, then, we can discern these signs of important changes within so short a period, great caution is needed in rapidly reviewing long periods of time prior to that industrial revolution which is traced mainly to the application of mechanical power to machinery in aid of manual labour, practically begun and completed within the second half of the 18th century. "In 1740 save for the fly-shuttle the loom was as it had been since weaving had begun . . . and the law of the land was" (under the Act of Apprentices of 1563) "that wages in each district should be assessed by Justices of the Peace."[2] Turning back to still earlier times, legislation—whatever its source or authority—must clearly be devoted to aims very different from modern aims in regulating labour, when it arose before the labourer, as a man dependent on an "employer" for the means of doing work, had appeared, and when migratory labour was almost unknown through the serfdom of part of the population and the special status secured in towns to the artisan.

In the great civilizations of antiquity there were great aggregations of labour which was not solely, though frequently it was predominantly, slave labour; and some of the features of manufacture and mining on a great scale arose, producing the same sort of evils and industrial maladies known and regulated in our own times. Some of the maladies were described by Pliny and classed as "diseases of slaves." And he gave descriptions of processes, for example in the metal trades, as belonging entirely to his own day, which modern archaeological discoveries trace back through the earliest known Aryan civilizations to a prehistoric origin in the East, and which have never died out in western Europe, but can be traced in a concentrated manufacture with almost unchanged methods, now in France, now in Germany, now in England.

Little would be gained in such a sketch as this by an endeavour to piece together the scattered and scanty materials for a comparative history of the varying conditions and methods of labour regulation over so enormous a range. While our knowledge continually increases of the remains of ancient craft, skill and massed labour, much has yet to be discovered that may throw light on methods of organization of the labourers. While much, and in some civilizations most, of the labour was compulsory or forced, it is clear that too much has been sometimes assumed, and it is by no means certain that even the pyramids of Egypt, much less the beautiful earliest Egyptian products in metal work, weaving and other skilled craft work, were typical products of slave labour. Even in Rome it was only at times that the proportion of slaves valued as property was greater than that of hired workers, or, apart from capture in war or self-surrender in discharge of a debt, that purchase of slaves by the trader, manufacturer or agriculturist was generally considered the cheapest means of securing labour. As in early England the various stages of village industrial life, medieval town manufacture, and organization in craft gilds, and the beginnings of the mercantile system, were parallel with a greater or less prevalence of serfdom and even with the presence in part of slavery, so in other ages and civilizations the various methods of organization of labour are found to some extent together. The Germans in their primitive settlements were accustomed to the notion of slavery, and in the decline of the

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[1] The term "labour" (Lat. *labor*) means strictly any energetic work, though in general it implies hard work, but in modern parlance it is specially confined to industrial work of the kind done by the "working-classes."

[2] H. D. Traill, *Social England*, v. 602 (1896).

Roman Empire Roman captives from among the most useful craftsmen were carried away by their northern conquerors.

The history and present details of the labour laws of various countries are dealt with below in successive sections: (1) history of legislation in the United Kingdom; (2) the results as shown by the law in force in 1909, with the corresponding facts for (3) Continental Europe and (4) the United States. Under other headings (TRADE-UNIONS, STRIKES AND LOCK-OUTS, ARBITRATION AND CONCILIATION, &c., &c.) are many details on cognate subjects.

1. HISTORY IN THE UNITED KINGDOM

1. *Until the Close of the 15th Century.*—Of the main conditions of industrial labour in early Anglo-Saxon England details are scanty. Monastic industrial communities were added in Christian times to village industrial communities. While generally husbandry was the first object of toil, and developed under elaborate regulation in the manorial system, still a considerable variety of industries grew up, the aim being expressly to make each social group self-sufficing, and to protect and regulate village artisans in the interest of village resources. This protective system, resting on a communal or co-operative view of labour and social life, has been compared as analogous to the much later and wider system under which the main purpose was to keep England as a whole self-sufficing.[1] It has also been shown how greatly a fresh spirit of enterprise in industry and trade was stimulated first by the Danish and next by the Norman invasion; the former brought in a vigour shown in growth of villages, increase in number of freemen, and formation of trading towns; the latter especially opened up new communications with the most civilized continental people, and was followed by a considerable immigration of artisans, particularly of Flemings. In Saxon England slavery in the strictest sense existed, as is shown in the earliest English laws, but it seems that the true slave class as distinct from the serf class was comparatively small, and it may well be that the labour of an ordinary serf was not practically more severe, and the remuneration in maintenance and kind not much less than that of agricultural labourers in recent times. In spite of the steady protest of the Church, slavery (as the exception, not the general rule) did not die out for many centuries, and was apt to be revived as a punishment for criminals, *e.g.* in the fierce provisions of the statute of Edward VI. against beggars, not repealed until 1597. At no time, however, was it general, and as the larger village and city populations grew the ratio of serfs and slaves to the freemen in the whole population rapidly diminished, for the city populations "had not the habit and use of slavery," and while serfs might sometimes find a refuge in the cities from exceptionally severe taskmasters, "there is no doubt that freemen gradually united with them under the lord's protection, that strangers engaged in trade sojourned among them, and that a race of artisans gradually grew up in which original class feelings were greatly modified." From these conditions grew two parallel tendencies in regulation of labour. On the one hand there was, under royal charters, the burgh or municipal organization and control of artisan and craft labour, passing later into the more specialized organization in craft gilds; on the other hand, there was a necessity, sometimes acute, to prevent undue diminution in the numbers available for husbandry or agricultural labour. To the latter cause must be traced a provision appearing in a succession of statutes (see especially an act of Richard II., 1388), that a child under twelve years once employed in agriculture might never be transferred to apprenticeship in a craft. The steady development of England, first as a wool-growing, later as a cloth-producing country, would accentuate this difficulty. During the 13th century, side by side with development of trading companies for the export of wool from England, may be noted many agreements on the part of monasteries to sell their wool to Florentines, and during the same century absorption of alien artisans into the municipal system was practically completed. Charters of Henry I. provided for naturalization of these aliens. From the time of Edward I. to Edward III. a gradual transference of burgh customs, so far as recognized for the common good, to statute law was in progress, together with an assertion of the rights of the crown against ecclesiastical orders. "The statutes of Edward I.," says Dr. Cunningham, "mark the first attempt to deal with Industry and Trade as a public matter which concerns the whole state, not as the particular affair of leading men in each separate locality." The first direct legislation for labour by statute, however, is not earlier than the twenty-third year of the reign of Edward III., and it arose in an attempt to control the decay and ruin, both in rural and urban districts, which followed the Hundred Years' War, and the pestilence known as the Black Death. This first "Statute of Labourers" was designed for the benefit of the community, not for the protection of labour or prevention of oppression, and the policy of enforcing customary wages and compelling the able-bodied labourer, whether free or bond, not living in merchandise or exercising any craft, to work for hire at recognized rates of pay, must be reviewed in the circumstances and ideals of the time. Regulation generally in the middle ages aimed at preventing any individual or section of the community from making what was considered an exceptional profit through the necessity of others.[2] The scarcity of labour by the reduction of the population through pestilence was not admitted as a justification for the demands for increased pay, and while the unemployed labourer was liable to be committed to gaol if he refused service at current rates, the lords of the towns or manors who promised or paid more to their servants were liable to be sued treble the sum in question. Similar restrictions were made applicable to artificers and workmen. By another statute, two years later, labourers or artificers who left their work and went into another county were liable to be arrested by the sheriff and brought back. These and similar provisions with similar aims were confirmed by statutes of 1360, 1368 and 1388, but the act of 1360, while prohibiting "all alliances and covins of masons, carpenters, congregations, chapters, ordinances and oaths betwixt them made," allowed "every lord to bargain or covenant for their works in gross with such labourers and artificers when it pleaseth them, so that they perform such works well and lawfully according to the bargain and covenant with them thereof made." Powers were given by the acts of 1368 and 1388 to justices to determine matters under these statutes and to fix wages. Records show that workmen of various descriptions were pressed by writs addressed to sheriffs to work for their king at wages regardless of their will as to terms and place of work. These proceedings were founded on notions of royal prerogative, of which impressment of seamen survived as an example to a far later date. By an act of 1388 no servant or labourer, man or woman, however, could depart out of the hundred to serve elsewhere unless bearing a letter patent under the king's seal stating the cause of going and time of return. Such provisions would appear to have widely failed in their purpose, for an act of 1414 declares that the servants and labourers fled from county to county, and justices were empowered to send writs to the sheriffs for fugitive labourers as for felons, and to examine labourers, servants and their masters, as well as artificers, and to punish them on confession. An act of 1405, while putting a property qualification on apprenticeship and requiring parents under heavy penalties to put their children to such labour as their estates required, made a reservation giving freedom to any person "to send their children to school to learn literature." Up to the end of the 15th century a monotonous succession of statutes strengthening, modifying, amending the various attempts (since the first Statute of Labourers) to limit free movement of labour, or demands by labourers for increased wages, may be seen in the acts of 1411, 1427, 1444, 1495. It was clearly found extremely difficult, if not impracticable, to carry out the minute control of wages considered desirable, and exceptions in favour of certain occupations were in some of the statutes themselves. In 1512 the penalties for giving wages contrary to law were repealed so

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[1] W. Cunningham, *Growth of English Commerce and Industry.*

[2] W. Cunningham, *Growth of English Commerce and Industry.*

far as related to masters, but it also appears that London workmen would not endure the prevalent restrictions as to wages, and that they secured in practice a greater freedom to arrange rates when working within the city. Several of these statutes, and especially one of 1514, fixed the hours of labour when limiting wages. During March to September the limits were 5 A.M. to 7 or 8 P.M., with half an hour off for breakfast and an hour and a half off for midday dinner. In winter the outside limits were fixed by the length of daylight.

Throughout the 15th century the rapidly increasing manufacture of cloth was subject to a regulation which aimed at maintaining the standard of production and prevention of bad workmanship, and the noteworthy statute 4 Edward IV. c. 1, while giving power to royal officers to supervise size of cloths, modes of sealing, &c., also repressed payment to workers in "pins, girdles and unprofitable wares," and ordained payment in true and lawful money. This statute (the first against "Truck") gives an interesting picture of the way in which clothiers—or, as we should call them, wholesale merchants and manufacturers—delivered wool to spinners, carders, &c., by weight, and paid for the work when brought back finished. It appears that the work was carried on in rural as well as town districts. While this industry was growing and thriving other trades remained backward, and agriculture was in a depressed condition. Craft gilds had primarily the same purpose as the Edwardian statutes, that is, of securing that the public should be well served with good wares, and that the trade and manufacture itself should be on a sound basis as to quality of products and should flourish. Incidentally there was considerable regulation by the gilds of the conditions of labour, but not primarily in the interests of the labourer. Thus night work was prohibited because it tended to secrecy and so to bad execution of work; working on holidays was prohibited to secure fair play between craftsmen and so on. The position of apprentices was made clear through indentures, but the position of journeymen was less certain. Signs are not wanting of a struggle between journeymen and masters, and towards the end of the 15th century masters themselves, in at least the great wool trade, tended to develop from craftsmen into something more like the modern capitalist employer; from an act of 1555 touching weavers it is quite clear that this development had greatly advanced and that cloth-making was carried on largely by employers with large capitals. Before this, however, while a struggle went on between the town authorities and the craft gilds, journeymen began to form companies of their own, and the result of the various conflicts may be seen in an act of Henry VI., providing that in future new ordinances of gilds shall be submitted to justices of the peace—a measure which was strengthened in 1503.

2. *From Tudor Days until the Close of the 18th Century.*—A detailed history of labour regulation in the 16th century would include some account of the Tudor laws against vagrancy and methods of dealing with the increase of pauperism, attributable, at least in part, to the dissolution of the monasteries under Henry VIII., and to the confiscation of craft gild funds, which proceeded under Somerset and Edward VI. It is sufficient here to point to the general recognition of the public right to compel labourers to work and thus secure control of unemployed as well as employed. The statutes of Henry VIII. and Edward VI. against vagrancy differed rather in degree of severity than in principle from legislation for similar purposes in previous and subsequent reigns. The Statute of Labourers, passed in the fifth year of Elizabeth's reign (1562), as well as the poor law of the same year, was to a considerable extent both a consolidating and an amending code of law, and was so securely based on public opinion and deeply rooted custom that it was maintained in force for two centuries. It avowedly approves of principles and aims in earlier acts, regulating wages, punishing refusal to work, and preventing free migration of labour. It makes, however, a great advance in its express aim of protecting the poor labourer against insufficient wages, and of devising a machinery, by frequent meeting of justices, which might yield "unto the hired person both in time of scarcity and in time of plenty a convenient proportion of wages." Minute regulations were made governing the contract between master and servant, and their mutual rights and obligations on parallel lines for (*a*) artificers, (*b*) labourers in husbandry. Hiring was to be by the year, and any unemployed person qualified in either calling was bound to accept service on pain of imprisonment, if required, unless possessed of property of a specified amount or engaged in art, science or letters, or being a "gentleman." Persons leaving a service were bound to obtain a testimonial, and might not be taken into fresh employment without producing such testimonial, or, if in a new district, until after showing it to the authorities of the place. A master might be fined £5, and a labourer imprisoned, and if contumacious, whipped, for breach of this rule. The carefully devised scheme for technical training of apprentices embodied to a considerable extent the methods and experiences of the craft gilds. Hours of labour were as follows: "All artificers and labourers being hired for wages by the day or week shall, betwixt the midst of the months of March and September, be and continue at their work at or before 5 o'clock in the morning and continue at work and not depart until betwixt 7 and 8 o'clock at night, except it be in the time of breakfast, dinner or drinking, the which time at the most shall not exceed two hours and a half in a day, that is to say, at every drinking half an hour, for his dinner one hour and for his sleep when he is allowed to sleep, the which is from the midst of May to the midst of August, half an hour; and all the said artificers and labourers betwixt the midst of September and the midst of March shall be and continue at their work from the spring of the day in the morning until the night of the same day, except it be in time afore appointed for breakfast and dinner, upon pain to lose and forfeit one penny for every hour's absence, to be deducted and defaulked out of his wages that shall so offend." Although the standpoint of the Factory Act and Truck Act in force at the beginning of the 20th century as regards hours of labour or regulation of fines deducted from wages is completely reversed, yet the difference is not great between the average length of hours of labour permissible under the present law for women and those hours imposed upon the adult labourer in Elizabeth's statute. Apart from the standpoint of compulsory imposition of fines, one advantage in the definiteness of amount deductable from wages would appear to lie on the side of the earlier statute.

Three points remain to be touched on in connexion with the Elizabethan poor law. In addition to (*a*) consolidation of measures for setting vagrants to work, we find the first compulsory contributions from the well-to-do towards poor relief there provided for, (*b*) at least a theoretical recognition of a right as well as an obligation on the part of the labourer to be hired, (*c*) careful provision for the apprenticing of destitute children and orphans to a trade.

One provision of considerable interest arose in Scotland, which was nearly a century later in organizing provisions for fixing conditions of hire and wages of workmen, labourers and servants, similar to those consolidated in the Elizabethan Statute of Labourers. In 1617 it was provided (and reaffirmed in 1661) that power should be given to the sheriffs to compel payment of wages, "that servants may be the more willing to obey the ordinance." The difficulties in regulation of compulsory labour in Scotland must, however, have been great, for in 1672 houses of correction were erected for disobedient servants, and masters of these houses were empowered to force them to work and to correct them according to their demerits. While servants in manufacture were compelled to work at reasonable rates they might not enter on a new hire without their previous master's consent.

Such legislation continued, at least theoretically, in force until the awakening effected by the beginning of the industrial revolution—that is, until the combined effects of steady concentration of capital in the hands of employers and expansion of trade, followed closely by an unexampled development of invention in machinery and application of power to its use.

completely altered the face of industrial England. From time to time, in respect of particular trades, provisions against truck and for payment of wages in current coin, similar to the act of Edward IV. in the woollen industry, were found necessary, and this branch of labour legislation developed through the reigns of Anne and the four Georges until consolidation and amendment were effected, after the completion of the industrial revolution, in the Truck Act of 1831. From the close of the 17th century and during the 18th century the legislature is no longer mainly engaged in devising means for compelling labourers and artisans to enter into involuntary service, but rather in regulating the summary powers of justices of the peace in the matter of dispute between masters and servants in relation to contracts and agreements, express or implied, presumed to have been entered into voluntarily on both sides. While the movement to refer labour questions to the jurisdiction of the justices thus gradually developed, the main subject matter for their exercise of jurisdiction in regard to labour also changed, even when theoretically for a time the two sets of powers—such as (*a*) moderation of craft gild ordinances and punishment of workers refusing hire, or (*b*) fixing scales of wages and enforcement of labour contracts—might be concurrently exercised. Even in an act of George II. (1746) for settlement of disputes and differences as to wages or other conditions under a contract of labour, power was retained for the justices, on complaint of the masters of misdemeanour or ill-behaviour on the part of the servant, to discharge the latter from service or to send him to a house of correction "there to be corrected," that is, to be held to hard labour for a term not exceeding a month or to be corrected by whipping. In an act with similar aims of George IV. (1823), with a rather wider scope, the power to order corporal punishment, and in 1867 to hard labour, for breach of labour contracts had disappeared, and soon after the middle of the 19th century the right to enforce contracts of labour also disappeared. Then breach of such labour contracts became simply a question of recovery of damages, unless both parties agreed that security for performance of the contract shall be given instead of damages.

While the endeavour to enforce labour apart from a contract died out in the latter end of the 18th century, sentiment for some time had strongly grown in favour of developing early industrial training of children. It appears to have been a special object of charitable and philanthropic endeavour in the 17th century, as well as the 18th, to found houses of industry, in which little children, even under five years of age, might be trained for apprenticeship with employers. Connected as this development was with poor relief, one of its chief aims was to prevent future unemployment and vagrancy by training in habits and knowledge of industry, but not unavowed was another motive: "from children thus trained up to constant labour we may venture to hope the lowering of its price."[1] The evils and excesses which lay enfolded within such a movement gave the first impulse to the new ventures in labour legislation which are specially the work of the 19th century. Evident as it is "that before the Industrial Revolution very young children were largely employed both in their own homes and as apprentices under the Poor Law," and that "long before Peel's time there were misgivings about the apprenticeship system," still it needed the concentration and prominence of suffering and injury to child life in the factory system to lead to parliamentary intervention.

3. *From 1800 to the Codes of 1872 and 1878.*—A serious outbreak of fever in 1784 in cotton mills near Manchester appears to have first drawn widespread and influential public opinion to the overwork of children, under terribly dangerous and insanitary conditions, on which the factory system was then largely being carried on. A local inquiry, chiefly by a group of medical men presided over by Dr Percival, was instituted by the justices of the peace for Lancashire, and in the forefront of the resulting report stood a recommendation for limitation and control of the working hours of the children. A resolution by the county justices followed, in which they declared their intention in future to refuse "indentures of parish Apprentices whereby they shall be bound to Owners of Cotton Mills and other works in which children are obliged to work in the night or more than ten hours in the day." In 1795 the Manchester Board of Health was formed, which, with fuller information, more definitely advised legislation for the regulation of the hours and conditions of labour in factories. In 1802 the Health and Morals of Apprentices Act was passed, which in effect formed the first step towards prevention of injury to and protection of labour in factories. It was directly aimed only at evils of the apprentice system, under which large numbers of pauper children were worked in cotton and woollen mills without education, for excessive hours, under wretched conditions. It did not apply to places employing fewer than twenty persons or three apprentices, and it applied the principle of limitation of hours (to twelve a day) and abolition of night work, as well as educational requirements, only to apprentices. Religious teaching and suitable sleeping accommodation and clothing were provided for in the act, also as regards apprentices. Lime-washing and ventilation provisions applied to all cotton and woollen factories employing more than twenty persons. "Visitors" were to be appointed by county justices for repression of contraventions, and were empowered to "direct the adoption of such sanitary regulations as they might on advice think proper." The mills were to be registered by the clerk of the peace, and justices had power to inflict fines of from £2 to £5 for contraventions. Although enforcement of the very limited provisions of the act was in many cases poor or non-existent, in some districts excellent work was done by justices, and in 1803 the West Riding of Yorkshire justices passed a resolution substituting the ten hours' limit for the twelve hours' limit of the act, as a condition of permission for indenturing of apprentices in mills.

Rapid development of the application of steam power to manufacture led to growth of employment of children in populous centres, otherwise than on the apprenticeship system, and before long the evils attendant on this change brought the general question of regulation and protection of child labour in textile factories to the front. The act of 1819, limited as it was, was a noteworthy step forward, in that it dealt with this wider scope of employment of children in cotton factories, and it is satisfactory to record that it was the outcome of the efforts and practical experiments of a great manufacturer, Robert Owen. Its provisions fell on every point lower than the aims he put forward on his own experience as practicable, and notably in its application only to cotton mills instead of all textile factories. Prohibition of child labour under nine years of age and limitation of the working day to twelve in the twenty-four (without specifying the precise hour of beginning and closing) were the main provisions of this act. No provision was made for enforcement of the law beyond such as was attempted in the act of 1802. Slight amendments were attempted in the acts of 1825 and 1831, but the first really important factory act was in 1833 applying to textile factories generally, limiting employment of young persons under eighteen years of age, as well as children, prohibiting night work between 8.30 P.M. and 5.30 A.M., and first providing for "inspectors" to enforce the law. This is the act which was based on the devoted efforts of Michael Sadler, with whose name in this connexion that of Lord Ashley, afterwards earl of Shaftesbury, was from 1832 associated. The importance of this act lay in its provision for skilled inspection and thus for enforcement of the law by an independent body of men unconnected with the locality in which the manufactures lay, whose specialization in their work enabled them to acquire information needed for further development of legislation for protection of labour. Their powers were to a certain extent judicial, being assimilated to those possessed by justices; they could administer oaths and make such "rules, regulations and orders" as were necessary for execution of the act, and could hear complaints and impose penalties under the act. In 1844 a textile factory act modified these extensive inspectoral powers, organizing the service on lines resembling those of our own time, and added provision for certifying surgeons to examine workers under sixteen years of age as to physical fitness for employment and to grant certificates of age and ordinary strength. Hours of labour, by the act of 1833, were limited for children under eleven to 9 a day or 48 in the week, and for young persons under eighteen to 12 a day or 69 in the week. Between 1833 and 1844 the movement in favour of a ten hours' day, which had long been in progress, reached its height in a time of great commercial and industrial distress, but could not be carried into effect until 1847. By the act of 1844 the hours of adult women were first regulated, and were limited (as were already those of "young persons") to 12 a day; children were permitted either to work the same hours on alternate days or "half-time," with compulsory school attendance as a condition of their employment. The aim in thus adjusting the hours of the three classes of workers was to provide for a practical standard working-day. For the first time detailed provisions for health and safety began to make their appearance in the law. Penal compensation for preventible injuries due to unfenced machinery was also provided, and appears to have been the outcome of a discussion by witnesses before the Royal Commission on Labour of Young Persons in Mines and Manufactures in 1841.

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[1] From an "Essay on Trade" (1770), quoted in *History of Factory Legislation*, by B. L. Hutchins and A. Harrison (1903), pp. 5, 6.

From this date, 1841, begin the first attempts at protective legislation for labour in mining. The first Mines Act of 1842 following the terrible revelations of the Royal Commission referred to excluded women and girls from underground working, and limited the employment of boys, excluding from underground working those under ten years, but it was not until 1850 that systematic reporting of fatal accidents and until 1855 that other safeguards for health, life and limb in mines were seriously provided by law. With the exception of regulations against truck there was no protection for the miner before 1842; before 1814 it was not customary to hold inquests on miners killed by accidents in mines. From 1842 onwards considerable interaction in the development of the two sets of acts (mines and factories), as regards special protection against industrial injury to health and limb, took place, both in parliament and in the department (Home Office) administering them. Another strong influence tending towards ultimate development of scientific protection of health and life in industry began in the work and reports of the series of sanitary commissions and Board of Health reports from 1843 onwards. In 1844 the mines inspector made his first report, but two years later women were still employed to some extent underground. Organized inspection began in 1850, and in 1854 the Select Committee on Accidents adopted a suggestion of the inspectors for legislative extension of the practice of several colliery owners in framing special safety rules for working in mines. The act of 1855 provided seven general rules, relating to ventilation, fencing of disused shafts, proper means for signalling, proper gauges and valve for steam-boiler, indicator and brake for machine lowering and raising; also it provided that detailed special rules submitted by mine-owners to the secretary of state, might, on his approval, have the force of law and be enforceable by penalty. The Mines Act of 1860, besides extending the law to ironstone mines, following as it did on a series of disastrous accidents and explosions, strengthened some of the provisions for safety. At several inquests strong evidence was given of incompetent management and neglect of rules, and a demand was made for enforcing employment only of certificated managers of coal mines. This was not met until the act of 1872, but in 1860 certain sections relating to wages and education were introduced. Steady development of the coal industry, increasing association among miners, and increased scientific knowledge of means of ventilation and of other methods for securing safety, all paved the way to the Coal Mines Act of 1872, and in the same year health and safety in metalliferous mines received their first legislative treatment in a code of similar scope and character to that of the Coal Mines Act. This act was amended in 1886, and repealed and recodified in 1887; its principal provisions are still in force, with certain revised special rules and modifications as regards reporting of accidents (1906) and employment of children (1903). It was based on the recommendations of a Royal Commission, which had reported in 1864, and which had shown the grave excess of mortality and sickness among metalliferous miners, attributed to the inhalation of gritty particles, imperfect ventilation, great changes of temperature, excessive physical exertion, exposure to wet, and other causes. The prohibition of employment of women and of boys under ten years underground in this class of mines, as well as in coal mines, had been effected by the act of 1842, and inspection had been provided for in the act of 1860; these were in amended form included in the code of 1872, the age of employment of boys underground being raised to twelve. In the Coal Mines Act of 1872 we see the first important effort to provide a complete code of regulation for the special dangers to health, life and limb in coal mines apart from other mines; it applied to "mines of coal, mines of stratified ironstone, mines of shale and mines of fire-clay." Unlike the companion act—applying to all other mines—it maintained the age limit of entering underground employment for boys at ten years, but for those between ten and twelve it provided for a system of working analogous to the half-time system in factories, including compulsory school attendance. The limits of employment for boys from twelve to sixteen were 10 hours in any one day and 54 in any one week. The chief characteristics of the act lay in extension of the "general" safety rules, improvement of the method of formulating "special" safety rules, provision for certificated and competent management, and increased inspection. Several important matters were transferred from the special to the general rules, such as compulsory use of safety lamps where needed, regulation of use of explosives, and securing of roofs and sides. Special rules, before being submitted to the secretary of state for approval, must be posted in the mine for two weeks, with a notice that objections might be sent by any person employed to the district inspector. Wilful neglect of safety provisions became punishable in the case of employers as well as miners by imprisonment with hard labour. But the most important new step lay in the sections relating to daily control and supervision of every mine by a manager holding a certificate of competency from the secretary of state, after examination by a board of examiners appointed by the secretary of state, power being retained for him to cause later inquiry into competency of the holder of the certificate, and to cancel or suspend the certificate in case of proved unfitness.

Returning to the development of factory and workshop law from the year 1844, the main line of effort—after the act of 1847 had restricted hours of women and young persons to 10 a day and fixed the daily limits between 6 A.M. and 6 P.M. (Saturday 6 A.M. to 2 P.M.)—lay in bringing trade after trade in some degree under the scope of this branch of law, which had hitherto only regulated conditions in textile factories. Bleaching and dyeing works were included by the acts of 1860 and 1862; lace factories by that of 1861; calendering and finishing by acts of 1863 and 1864; bakehouses became partially regulated by an act of 1863, with special reference to local authorities for administration of its clauses. The report of the third Children's Employment Commission brought together in accessible form the miserable facts relating to child labour in a number of unregulated industries in the year 1862, and the act of 1864 brought some of (these earthenware-making, lucifer match-making, percussion cap and cartridge making, paper-staining, and fustian cutting) partly under the scope of the various textile factory acts in force. A larger addition of trades was made three years later, but the act of 1864 is particularly interesting in that it first embodied some of the results of inquiries of expert medical and sanitary commissioners, by requiring ventilation to be applied to the removal of injurious gases, dust, and other impurities generated in manufacture, and made a first attempt to engraft part of the special rules system from the mines acts. The provisions for framing such rules disappeared in the Consolidating Act of 1878, to be revived in a better form later.

The Sanitary Act of 1866, administered by local authorities, provided for general sanitation in any factories and workshops not under existing factory acts, and the Workshops Regulation Act of 1867, similarly to be administered by local authorities, amended in 1870, practically completed the application of the main principle of the factory acts to all places in which manual labour was exercised for gain in the making or finishing of articles or parts of articles for sale. A few specially dangerous or injurious trades brought under regulation in 1864 and 1867 (*e.g.* earthenware and lucifer match making, glass-making) ranked as "factories," although not using mechanical power, and for a time employment of less than fifty persons relegated certain work-places to the category of "workshops," but broadly the presence or absence of such motor power in aid of process was made and has remained the distinction between factories and workshops. The Factory Act of 1874, the last of the series before the great Consolidating Act of 1878, raised the minimum age of employment for children to ten years in textile factories. In most of the great inquiries into conditions of child labour the fact has come clearly to light, in regard to textile and non-textile trades alike, that parents as much as any employers have been responsible for too early employment and excessive hours of employment of children, and from early times until to-day in factory legislation it has been recognized that they must to some extent be held responsible for due observation of the limits imposed. For example, in 1831 it was found necessary to protect occupiers against parental responsibility for false certificates of age, and in 1833 parents of a child or " any Person having any benefit from the wages of such child " were made to share responsibility for employment of children without school attendance or beyond legal hours.

During the discussions on the bill which became law in 1874, it had become apparent that revision and consolidation of the multiplicity of statutes then regulating manufacturing industry had become pressingly necessary; modifications and exceptions for exceptional conditions in separate industries needed reconsideration and systematization on clear principles, and the main requirements of the law could with great advantage be applied more generally to all the industries. In particular, the daily limits as to period of employment, pauses for meals, and holidays, needed to be unified for non-textile factories and workshops, so as to bring about a standard working-day, and thus prevent the tendency in "the larger establishments to farm out work among the smaller, where it is done under less favourable conditions both sanitary and educational."[1] In these main directions, and that of simplifying definitions, summarizing special sanitary provisions that had been gradually introduced for various trades, and centralizing and improving the organization of the inspectorate, the Commission of 1876 on the Factory Acts made its recommendations, and the Factory Act of 1878 took effect. In the fixed working-day, provisions for pauses, holidays, general and special exceptions, distinctions between systems of employment for children, young persons and women, education of children and certificates of fitness for children and young persons, limited regulation of domestic workshops, general principles of administration and definitions, the law of 1878 was made practically the same as that embodied in the later principal act of 1901. More or less completely revised are: (*a*) the sections in the 1878 act relating to mode of controlling sanitary conditions in workshops (since 1891 primarily enforced by the local sanitary authority); (*b*) provision for reporting accidents and for enforcing safety (other than fencing of mill gearing and dangerous machinery); (*c*) detailed regulation of injurious and dangerous process and trades; (*d*) powers of certifying surgeons; (*e*) amount of overtime permissible (greatly reduced in amount and now confined to adults); (*f*) age for permissible employment of a child has been raised from ten years to twelve years. Entirely new since the act of 1878 are the provisions: (*a*) for control of outwork; (*b*) for supplying particulars of work and wages to piece-workers, enabling them to compute the total amount of wages payable to them; (*e*) extension of the act to laundries; (*f*) a tentative effort to limit the too early employment of mothers after childbirth.

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Factories and Workshops.—The act of 1878 remained until 1901, although much had been meanwhile superimposed, a monument to the efforts of the great factory reformers of the first half of the 19th century, and the general groundwork of safety for workers in factories and workshops in the main divisions of sanitation, security against accidents, physical fitness of workers, general limitation of hours and times of employment for young workers and women. The act of 1901, which came into force 1st January 1902 (and became the principal act), was an amending as well as a consolidating act. Comparison of the two acts shows, however, that, in spite of the advantages of further consolidation and helpful changes in arrangement of sections and important additions which tend towards a specialized hygiene for factory life, the fundamental features of the law as fought out in the 19th century remain undisturbed. So far as the law has altered in character, it has done so chiefly by gradual development of certain sanitary features, originally subordinate, and by strengthening provision for security against accidents and not by retreat from its earlier aims. At the same time a basis for possible new developments can be seen in the protection of " outworkers " as well as factory workers against fraudulent or defective particulars of piece-work rates of wages.

Later acts directly and indirectly affecting the law are certain acts of 1903, 1906, 1907, to be touched on presently.

Additions to act of 1878.

The act of 1878, in a series of acts from 1883 to 1895, received striking additions, based (1) on the experience gained in other branches of protective legislation, *e.g.* development of the method of regulation of dangerous trades by "special rules" and administrative inquiry into accidents under Coal Mines Acts; (2) on the findings of royal commissions and parliamentary inquiries, *e.g.* increased control of "outwork" and domestic workshops, and limitation of "overtime"; (3) on the development of administrative machinery for enforcing the more modern law relating to public health, *e.g.* transference of administration of sanitary provisions in workshops to the local sanitary authorities; (4) on the trade-union demand for means for securing trustworthy records of wage-contracts between employer and workman, *e.g.* the section requiring particulars of work and wages for piece-workers. The first additions to the act of 1878 were, however, almost purely attempts to deal more adequately than had been attempted in the code of 1878 with certain striking instances of trades injurious to health. Thus the Factory and Workshop Act of 1883 provided that white-lead factories should not be carried on without a certificate of conformity with certain conditions, and also made provision for special rules, on lines later superseded by those laid down in the act of 1891, applicable to any employment in a factory or workshop certified as dangerous or injurious by the secretary of state. The act of 1883 also dealt with sanitary conditions in bakehouses. Certain definitions and explanations of previous enactments touching overtime and employment of a child in any factory or workshop were also included in the act. A class of factories in which excessive heat and humidity seriously affected the health of operatives was next dealt with in the Cotton Cloth Factories Act 1889. This provided for special notice to the chief inspector from all occupiers of cotton cloth factories (*i.e.* any room, shed, or workshop or part thereof in which weaving of cotton cloth is carried on) who intend to produce humidity by artificial means; regulated both temperature of workrooms and amount of moisture in the atmosphere, and provided for tests and records of the same; and fixed a standard minimum volume of fresh air (600 cub. ft.) to be admitted in every hour for every person employed in the factory. Power was retained for the secretary of state to modify by order the standard for the maximum limit of humidity of the atmosphere at any given temperature. A short act in 1870 extended this power to other measures for the protection of health.

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[1] Minutes of Evidence, House of Commons, 1876; quoted in *History of Factory Legislation*, by Harrison and Hutchinson, p. 179.

The special measures from 1878 to 1889 gave valuable precedents for further developments of special hygiene in factory life, but the next advance in the Factory and Workshop Act 1891, following the House of Lords Committee on the sweating system and the Berlin International Labour Conference, extended over much wider ground. Its principal objects were: (*a*) to render administration of the law relating to workshops more efficient, particularly as regards sanitation; with this end in view it made the primary controlling authority for sanitary matters in workshops the local sanitary authority (now the district council), acting by their officers, and giving them the powers of the less numerous body of factory inspectors, while at the same time the provisions of the Public Health Acts replaced in workshops the very similar sanitary provisions of the Factory Acts; (*b*) to provide for greater security against accidents and more efficient fencing of machinery in factories; (*c*) to extend the method of regulation of unhealthy or dangerous occupations by application of special rules and requirements to any incident of employment (other than in a domestic workshop) certified by the secretary of state to be dangerous or injurious to health or dangerous to life or limb; (*d*) to raise the age of employment of children and restrict the employment of women immediately after childbirth; (*e*) to require particulars of rate of wages to be given with work to piece-workers in certain branches of the textile industries; (*f*) to amend the act of 1878 in various subsidiary ways, with the view of improving the administration of its principles, *e.g.* by increasing the means of checking the amount of overtime worked, empowering inspectors to enter work-places used as dwellings without a justice's warrant, and the imposition of minimum penalties in certain cases. On this act followed four years of greatly accelerated administrative activity. No fewer than sixteen trades were scheduled by the secretary of state as dangerous to health. The manner of preparing and establishing suitable rules was greatly modified by the act of 1901 and will be dealt with in that connexion.

The Factory and Workshop Act 1895 followed thus on a period of exercise of new powers of administrative regulation (the period being also that during which the Royal Commission on Labour made its wide survey of industrial conditions), and after two successive annual reports of the chief inspector of factories had embodied reports and recommendations from the women inspectors, who in 1893 were first added to the inspectorate. Again, the chief features of an even wider legislative effort than that of 1891 were the increased stringency and definiteness of the measures for securing hygienic and safe conditions of work. Some of these measures, however, involved new principles, as in the provision for the prohibition of the use of a dangerous machine or structure by the order of a magistrate's court, and the power to include in the special rules drawn up in pursuance of section 8 of the act of 1891, the prohibition of the employment of any class of persons, or the limitation of the period of employment of any class of persons in any process scheduled by order of the secretary of state. These last two powers have both been exercised, and with the exercise of the latter passed away, without opposition, the absolute freedom of the employer of the adult male labourer to carry on his manufacture without legislative limitation of the hours of labour. Second only in significance to these new developments was the addition, for the first time since 1867, of new classes of workplaces not covered by the general definitions in section 93 of the Consolidating Act of 1878, viz. : (*a*) laundries (with special conditions as to hours, &c.); (*b*) docks, wharves, quays, warehouses and premises on which machinery worked by power is temporarily used for the purpose of the construction of a building or any structural work in connexion with the building (for the purpose only of obtaining security against accidents). Other entirely new provisions in the act of 1895, later strengthened by the act of 1901, were the requirement of a reasonable temperature in workrooms, the requirement of lavatories for the use of persons employed in any department where poisonous substances are used, the obligation on occupiers and medical practitioners to report cases of industrial poisoning; and the penalties imposed on an employer wilfully allowing wearing apparel to be made, cleaned or repaired in a dwelling-house where an inmate is suffering from infectious disease. Another provision empowered the secretary of state to specify classes of outwork and areas with a view to the regulation of the sanitary condition of premises in which outworkers are employed. Owing to the conditions attached to its exercise, no case was found in which this power could come into operation, and the act of 1901 deals with the matter on new lines. The requirement of annual returns from occupiers of persons employed, and the competency of the person charged with infringing the act to give evidence in his defence, were important new provisions, as was also the adoption of the powers to direct a formal investigation of any accident on the lines laid down in section 45 of the Coal Mines Regulation Act 1887. Other sections, relating to sanitation and safety, were developments of previous regulations, *e.g.* the fixing of a standard of overcrowding, provision of sanitary accommodation separate for each sex where the standard of the Public Health Act Amendment Act of 1890 had not been adopted by the competent local sanitary authority, power to order a fan or other mechanical means to carry off injurious gas, vapour or other impurity (the previous power covering only dust). The fencing of machinery and definition of accidents were made more precise, young persons were prohibited from cleaning dangerous machinery, and additional safeguards against risk of injury by fire or panic were introduced. On the question of employment the foremost amendments lay in the almost complete prohibition of overtime for young persons, and the restriction of the power of an employer to employ protected persons outside his factory or workshop on the same day that he had employed them in the factory or workshop. Under the head of particulars of work and wages to piece-workers an important new power, highly valued by the workers, was given to apply the principle with the necessary modifications by order of the secretary of state to industries other than textile and to outworkers as well as to those employed inside factories and workshops.

The act of 1901.

In 1899 an indirect modification of the limitation to employment of children was effected by the Elementary Education Amendment Act, which, by raising from eleven to twelve the minimum age at which a child may, by the by-laws of a local authority, obtain total or partial exemption from the obligation to attend school, made it unlawful for an occupier to take into employment any child under twelve in such a manner as to prevent full-time attendance at school. The age of employment became generally thereby the same as it has been for employment at a mine above ground since 1887. The act of 1901 made the prohibition of employment of a child under twelve in a factory or workshop direct and absolute. Under the divisions of sanitation, safety, fitness for employment, special regulation of dangerous trades, special control of bakehouses, exceptional treatment of creameries, new methods of dealing with home work and outworkers, important additions were made to the general law by the act of 1901, as also in regulations for strengthened administrative control. New general sanitary provisions were those prescribing : (*a*) ventilation *per se* for every workroom, and empowering the secretary of state to fix a standard of sufficient ventilation; (*b*) drainage of wet floors; (*c*) the power of the secretary of state to define in certain cases what shall constitute sufficient and suitable sanitary accommodation. New safety provisions were those relating to—(*a*) Examination and report on steam boilers; (*b*) prohibition of employment of a child in cleaning below machinery in motion; (*c*) power of the district council to make by-laws for escape in case of fire. The most important administrative alterations were : (*a*) a justice engaged in the same trade as, or being officer of an association of persons engaged in the same trade as, a person charged with an offence may not act at the hearing and determination of the charge; (*b*) ordinary supervision of sanitary conditions under which outwork is carried on was transferred to the district council, power being reserved to the Home Office to intervene in case of neglect or default by any district council.

Acts of 1903, 1906, 1907.

The Employment of Children Act 1903, while primarily providing for industries outside the scope of the Factory Act, incidentally secured that children employed as half-timers should not also be employed in other occupations. The Notice of Accidents Act 1906 amended the whole system of notification of accidents, simultaneously in mines, quarries, factories and workshops, and will be set out in following paragraphs. The Factory and Workshop Act of 1907 amended the law in respect of laundries by generally applying the provisions of 1901 to trade laundries while granting them choice of new exceptional periods, and by extending the provisions of the act (with certain powers to the Home Office by Orders laid before parliament to allow variations) to institution laundries carried on for charitable or reformatory purposes. The Employment of Women Act 1907 repealed an exemption in the act of 1901 (and earlier acts) relating to employment of women in flax scutch mills, thus bringing this employment under the ordinary provisions as to period of employment.

The following paragraphs aim at presenting an idea of the scope of the modified and amended law, as a whole, adding where clearly necessary reference to the effect of acts, which ceased to apply after the 31st of December 1901:—

Definitions.

The workplaces to which the act applies are, first, "factories" and "workshops"; secondly, laundries, docks, wharves, &c., enumerated above as introduced and regulated partially only by the act of 1895 and subsequent acts. Apart from this secondary list, and having regard to workplaces which remain undefined by the law, the act may broadly be said to apply to premises, rooms or places in which manual labour, with or without the aid of mechanical power, is exercised for gain in or incidental to the making, altering, repairing, ornamenting, washing, cleaning or finishing or adapting for sale of any article or part of any article. If steam, water or other mechanical power is used in aid of the manufacturing process, the workplace is a factory; if not, it is a workshop. There is, however, a list of eighteen classes of works (brought under the factory law for reasons of safety, &c., before workshops generally were regulated) which are defined as factories whether power is used in them or not. Factories are, again, subdivided into textile and non-textile: they are textile if the machinery is employed in preparing, manufacturing or finishing cotton, wool, hair, silk, flax, hemp, jute, tow, China grass, cocoanut fibre or other like material either separately or mixed together, or mixed with any other material, or any fabric made thereof; all other factories are non-textile. The distinction turns on the historical origin of factory regulation and the regulations in textile factories remain in some respects slightly more stringent than in the non-textile factories and workshops, though the general provisions are almost the same. Three special classes of workshops have for certain purposes to be distinguished from ordinary workshops, which include tenement workshops: (*a*) Domestic workshops, *i.e.* any private house, room or place, which, though used as a dwelling, is by reason of the work carried on there a workshop, and in which the only persons employed are members of the same family, dwelling there alone—in these women's hours are unrestricted; (*b*) Women's workshops, in which neither children nor young persons are employed—in these a more elastic arrangement of hours is permissible than in ordinary workshops; (*c*) Workshops in which men only are employed—these come under the same general regulations in regard to sanitation as other workshops, also under the provisions of the Factory Act as regards security, and, if certified by the secretary of state, may be brought under special regulations. They are otherwise outside the scope of the act of 1901.

The person to whom the regulations apply in the above-defined workplaces are *children*, *i.e.* persons between the ages of twelve and fourteen, *young persons*, *i.e.* boys or girls between the ages of fourteen (or if an educational certificate has been obtained, thirteen) and eighteen years of age, and *women*, *i.e.* females above the age of eighteen; these are all "protected" persons to whom the general provisions of the act, inclusive of the regulation of hours and times of employment, apply. To adult men generally those provisions broadly only apply which are aimed at securing sanitation and safety in the conduct of the manufacturing process.

The person generally responsible for observance of the provisions of the law, whether these relate to health, safety, limitation of the hours of labour or other matters, is the *occupier* (a term undefined in the act) of the factory, workshop or laundry. There are, however, limits to his responsibility: (*a*) generally, where the occupier has used due diligence to enforce the execution of the act, and can show that another person, whether agent, servant, workman or other person, is the real offender; (*b*) specially in a factory the sections relating to employment of protected persons, where the owner or hirer of a machine or implement driven by mechanical power is some person other than the occupier of the factory, the owner or hirer, so far as respects any offence against the act committed in relation to a person who is employed in connexion with the machine or implement, and is in the employment or pay of the owner or hirer, shall be deemed to be the occupier of the factory; (*c*) for the one purpose of reporting accidents, the actual employer of the person injured in any factory or workshop is bound under penalty immediately to report the same to the occupier; (*d*) so far as relates to sanitary conditions, fencing of machinery, affixing of notices in *tenement* factories, the *owner* (as defined by the Public Health Act 1875), generally speaking, takes the place of the occupier.

Employment in a factory or workshop includes work whether for wages or not: (*a*) in a manufacturing process or handicraft, (*b*) in cleaning any place used for the same, (*c*) in cleaning or oiling any part of the machinery, (*d*) any work whatsoever incidental to the process or handicraft, or connected with the article made. Persons found in any part of the factory or workshop, where machinery is used or manufacture carried on, except at meal-times, or when machinery is stopped, are deemed to be employed until the contrary is proved, The act, however, does not apply to employment for the sole purpose of repairing the premises or machinery, nor to the process of preserving and curing fish immediately upon its arrival in the fishing boats in order to prevent the fish from being destroyed or spoiled, nor to the process of cleaning and preparing fruit so far as is necessary to prevent it from spoiling during the months of June, July, August and September. Certain light handicrafts carried on by a family only in a private house or room at irregular intervals are also outside the scope of the act.

Sanitation.

The foremost provisions are those relating to the sanitary condition of the workplaces and the general security of every class of worker. Every factory must be kept in a cleanly condition, free from noxious effluvia, ventilated in such a manner as to render harmless, so far as practicable, gases, vapours, dust or other impurities generated in the manufacture; must be provided with sufficient and suitable sanitary conveniences separate for the sexes; must not be overcrowded (not less than 250 cubic ft. during the day, 400 during overtime, for each worker). In these matters the law of public health takes in workshops the place of the Factory Act, the requirements being substantially the same. Although, however, primarily the officers of the district council enforce the sanitary provisions in workshops, the government factory inspectors may give notice of any defect in them to the district council in whose district they are situate; and if proceedings are not taken within one month by the latter, the factory inspector may act in default and recover expenses from the district council. This power does not extend to domestic workshops which are under the law relating to public health so far as general sanitation is concerned. General powers are reserved to the secretary of state, where he is satisfied that the Factory Act or law relating to public health as regards workplaces has not been carried out by any district council, to authorize a factory inspector during a period named in his order to act instead of the district council. Other general sanitary provisions administered by the government inspectors are the requirement in factories and workshops of washing conveniences where poisonous substances are used; adequate measures for securing and maintaining a reasonable temperature of such a kind as will not interfere with the purity of the air in each room in which any person is employed; maintenance of sufficient means of ventilation in every room in a factory or workshop (in conformity with such standard as may be prescribed by order of the secretary of state); provision of a fan to carry off injurious dust, gas or other impurity, and prevent their inhalation in any factory or workshop; drainage of floors where wet processes are carried on. For laundries and bakehouses there are further sanitary regulations; *e.g.* in laundries all stoves for heating irons shall be sufficiently separated from any ironing-room or ironing-table, and the floors shall be "drained in such a manner as will allow the water to flow off freely"; and in bakehouses a cistern supplying water to a bakehouse must be quite separate from that supplying water to a water-closet, and the latter may not communicate directly with the bakehouse. Use of underground bakehouses (*i.e.* a baking room with floor more than 3 ft. below the ground adjoining) is prohibited, except where already used at the passing of the act; further, in these cases, after 1st January 1904, a certificate as to suitability in light, ventilation, &c., must be obtained from the district council. In other trades certified by the secretary of state further sanitary regulations may be made to increase security for health by special rules to be presently touched on. The secretary of state may also make sanitary requirements a condition of granting such exceptions to the general law as he is empowered to grant. In factories, as distinct from workshops, a periodical lime washing (or washing with hot water and soap where paint and varnish have been used) of all inside walls and ceilings once at least in every fourteen months is generally required (in bakehouses once in six months). As regards sufficiency and suitability of sanitary accommodation, the standards determined by order of the secretary of state shall be observed in the districts to which it is made applicable. An order was made called the Sanitary Accommodation Order, on the 4th of February 1903, the definitions and standards in which have also been widely adopted by local sanitary authorities in districts where the Order itself has no legal force, the local authority having parallel power under the Public Health Act of 1890.

Security and accidents.

Security in the use of machinery is provided for by precautions as regards the cleaning of machinery in motion and working between the fixed and traversing parts of self-acting machines driven by power, by fencing of machinery, and by empowering inspectors to obtain an order from a court of summary jurisdiction to prohibit the use, temporarily or absolutely, of machinery, ways, works or plant, including use of a steam boiler, which cannot be used without danger to life and limb. Every hoist and fly-wheel directly connected with mechanical power, and every part of a water-wheel or engine worked by mechanical power, and every wheel race, must be fenced, whatever its position, and every part of mill-gearing or dangerous machinery must either be fenced or be in such position that it is as safe as if fenced. No protected persons may clean any part of mill-gearing in motion, and children may further not clean any part of or below manufacturing machinery in motion by aid of mechanical power; young persons further may not clean any machinery if the inspector notifies it to the occupier as dangerous. Security as regards the use of dangerous premises is provided for by empowering courts of summary jurisdiction, on the application of an inspector, to prohibit their use until the danger has been removed. The district council, or, in London, the county council, or in case of their default the factory inspector, can require certain provisions for escape in case of fire in factories and workshops in which more than forty persons are employed; special powers to make by-laws for means of escape from fire in any factory or workshop are, in addition to any powers for prevention of fire that they possess, given to every district council, in London to the county council. The means of escape must be kept free from obstruction. Provisions are made for doors to open outwards in each room in which more than ten persons are employed, and to prevent the locking, bolting or fastening of doors so that they cannot easily be opened from inside when any person is employed or at meals inside the workplace. Further, provisions for security may be provided in special regulations. Every boiler for generating steam in a factory or workshop or place where the act applies must have a proper safety valve, a steam gauge, and a water gauge, and every such boiler, valve and gauge must be maintained in proper condition. Examination by a competent person must take place at least once in every fourteen months. The occupier of any factory or workshop may be liable for penal compensation not exceeding £100 in case of injury or death due to neglect of any provision or special rule, the whole or any part of which may be applied for the benefit of the injured person or his family, as the secretary of state determines. When a death has occurred by accident in a factory or workshop, the coroner must advise the factory inspector for the district of the place and time of the inquest. The secretary of state may order a formal investigation of the circumstances of any accident as in the case of mines. Careful and detailed provisions are made for the reporting by occupiers to inspectors, and entry in the registers at factories and workshops of accidents which occur in a factory or workshop and (*a*) cause loss of life to a person employed there, or (*b*) are due to machinery moved by mechanical power, molten metal, hot liquid, explosion, escape of gas or steam, electricity, so disabling any person employed in the factory or workshop as to cause him to be absent throughout at least one whole day from his ordinary work, (*c*) are due to any other special cause which the secretary of state may determine, (*d*) not falling under the previous heads and yet cause disablement for more than seven days' ordinary work to any person working in the factory or workshop. In the case of (*a*) or (*b*) notice has also to be sent to the certifying surgeon by the occupier. Cases of lead, phosphorus, arsenical and mercurial poisoning, or anthrax, contracted in any factory or workshop must similarly be reported and registered by the occupier, and the duty of reporting these cases is also laid on medical practitioners under whose observation they come. The list of classes of poisoning can be extended by the secretary of state's order.

Physical fitness of workers.

Certificates of physical fitness for employment must be obtained by the occupier from the certifying surgeon for the district for all persons under sixteen years of age employed in a factory, and in any class of workshops to which the requirement has been extended by order of the secretary of state, and an inspector may suspend any such persons for re-examination in a factory, or for examination in a workshop, when "disease or bodily infirmity" unfits the person, in his opinion, for the work of the place. The certifying surgeon may examine the process as well as the person submitted, and may qualify the certificate he grants by conditions as to the work on which the person is fit to be employed. An occupier of a factory or workshop or laundry shall not knowingly allow a woman to be employed therein within four weeks after childbirth.

Hours of protected persons.

The employment of children, young persons and women is regulated as regards ordinary and exceptional hours of work, ordinary and exceptional meal-times, length of spells and holidays. The outside limits of ordinary periods of employment and holidays are, broadly, the same for textile factories as for non-textile factories and workshops; the main difference lies in the requirement of not less than a total two hours' interval for meals out of the twelve, and a limit of four and a half hours for any spell of work, a longer weekly half holiday, and a prohibition of overtime, in textile factories, as compared with a total one and a half hours' interval for meals and a limit of five hours for spells and (conditional) permission of overtime in non-textile factories. The hours of work must be specified, and from Monday to Friday may be between 6 A.M. and 6 P.M., or 7 A.M. to 7 P.M.; in non-textile factories and workshops the hours also may be taken between 8 A.M. and 8 P.M. or by order of the secretary of state for special industries 9 A.M. to 9 P.M. Between these outside limits, with the proviso that meal-times must be fixed and limits as to spells observed, women and young persons may be employed the full time, children on the contrary only half time, on alternate days, or in alternate sets attending school half time regularly. On Saturdays, in textile factories in which the period commences at 6 A.M. all manufacturing work must cease at 12 if not less than one hour is given for meals, or 11.30 if less than one hour is given for meals (half an hour extra allowed for cleaning), and in non-textile factories and workshops at 2 P.M., 3 P.M. or 4 P.M., according as the hour of beginning is 6 A.M., 7 A.M. or 8 A.M. In "domestic workshops" the total number of hours for young persons and children must not exceed those allowed in ordinary workshops, but the outside limits for beginning and ending are wider; and the case is similar as regards hours of women in "women's workshops." Employment outside a factory or workshop in the business of the same is limited in a manner similar to that laid down in the Shop Hours Act, to be touched on presently. Overtime in certain classes of factories, workshops and warehouses attached to them is permitted, under conditions specified in the acts, for women, to meet seasonal or unforeseen pressure of business, or where goods of a perishable nature are dealt with, for young persons only in a very limited degree in factories liable to stoppage for drought or flood, or for an unfinished process. These and other cases of exceptional working are under minute and careful administrative regulations. Broadly these same regulations as to exceptional overtime may apply in *laundries* but the act of 1907 granted to laundries not merely ancillary to the manufacture carried on in a factory or workshop (*e.g.* shirt and collar factories), additional power to fix different periods of employment for different days of the week, and to make use of one or other of two exceptional methods of arranging the daily periods so as to permit of periods of different length on different days; these exceptional periods cannot be worked in addition to overtime permissible under the general law. Laundries carried on in connexion with charitable or reformatory institutions were brought in 1907 within the scope of the law, but special schemes for regulation as to hours, meals, holidays, &c., may be submitted by the managers to the secretary of state, who is empowered to approve them if he is satisfied that they are not less favourable than the corresponding provisions of the principal act; such schemes shall be laid as soon as possible before both Houses of Parliament.

Night work is allowed in certain specified industries, under conditions, for male young persons, but for no other workers under eighteen, and overtime for women may never be later than 10 P.M. or before 6 A.M. Sunday work is prohibited except, under conditions, for Jews; and in factories, workshops and laundries six holidays (generally the Bank holidays) must be allowed in the year. In creameries in which women and young persons are employed the secretary of state may by special order vary the beginning and end of the daily period of employment, and allow employment for not more than three hours on Sundays and holidays.

Dangerous and unhealthy industries.

The general provisions of the act may be supplemented where specially dangerous or unhealthy trades are carried on, by special regulations. This was provided for in the law in force until 31st December 1901, as in the existing principal act, and the power to establish rules had been exercised between 1892 and 1901 in twenty-two trades or processes where injury arose either from handling of dangerous substances, such as lead and lead compounds, phosphorus, arsenic or various chemicals, or where there is inhalation of irritant dust or noxious fumes, or where there is danger of explosion or infection of anthrax. Before the rule could be drawn up under the acts of 1891 to 1895, the secretary of state had to certify that in the particular case or class of cases in question (*e.g.* process or machinery), there was, in his opinion, danger to life or limb or risk of injury to health; thereupon the chief inspector might propose to the occupier of the factory or workshop such special rules or measures as he thought necessary to meet the circumstances. The occupier might object or propose modifications, but if he did not the rules became binding in twenty-one days; if he objected, and the secretary of state did not assent to any proposed modification, the matters in difference had to be referred to arbitration, the award in which finally settled the rules or requirement to be observed. In November 1901, in the case of the earthenware and china industry, the last arbitration of the kind was opened and was finally concluded in 1903. The parties to the arbitration were the chief inspector, on behalf of the secretary of state, and the occupier or occupiers, but the workmen interested might be and were represented on the arbitration. In the establishing of the twenty-two sets of existing special rules only thrice has arbitration been resorted to, and only on two of these occasions were workmen represented. The provisions as to the arbitration were laid down in the first schedule to the Act of 1891, and were similar to those under the Coal Mines Regulation Acts. Many of these codes have still the force of law and will continue until in due course revised under the amended procedure of the act of 1901. They might not only regulate conditions of employment, but also restrict or prohibit employment of any class of workers; where such restriction or prohibition affected adult workers the rules had to be laid for forty days before both Houses of Parliament before coming into operation. The obligation to observe the rules in detail lies on workers as well as on occupiers, and the section in the act of 1891 providing a penalty for non-observance was drafted, as in the case of the mines, so as to provide for a simultaneous fine for each (not exceeding two pounds for the worker, not exceeding ten pounds for the employer).

The provisions as to special regulations of the act of 1901 touch primarily the method of procedure for making the regulations, but they also covered for the first time domestic workshops and added a power as to the kind of regulations that may be made; further, they strengthened the sanction for observance of any rules that may be established, by placing the occupier in the same general position as regards penalty for non-observance as in other matters under the act. On the certificate of the secretary of state that any manufacture, machinery, plant, process or manual labour used in factories or workshops is dangerous or injurious to life, health or limb, such regulations as appear to the secretary of state to meet the necessity of the case may be made by him after he has duly published notice: (1) of his intention; (2) of the place where copies of the draft regulations can be obtained; and (3) of the time during which objections to them can be made by persons affected. The secretary of state may modify the regulations to meet the objections made. If not, unless the objection is withdrawn or appears to him frivolous, he shall, before making the regulations, appoint a competent person to hold a public inquiry with regard to the draft regulations and to report to him thereon. The inquiry is to be made under such rules as the secretary of state may lay down, and when the regulations are made, they must be laid as soon as possible before parliament. Either House may annul these regulations or any of them, without prejudice to the power of the secretary of state to make new regulations. The regulations may apply to all factories or workshops in which the certified manufacture, process, &c., is used, or to a specified class. They may, among other things, (*a*) prohibit or limit employment of any person or class of persons; (*b*) prohibit, limit, or control use of any material or process; (*c*) modify or extend special regulations contained in the Act. Regulations have been established among others in the following trades and processes: felt hat-making where any inflammable solvent is used; file-cutting by hand; manufacture of electric accumulators; docks, processes of loading, unloading, &c.; tar distilling; factories in which self-acting mules are used; use of locomotives; spinning and weaving of flax, hemp and jute; manufacture of paints and colours; heading of yarn dyed by means of lead compounds.

Measures and particulars to piece-workers.

Although the Factory and Workshop Acts have not directly regulated wages, they have made certain provision for securing to the worker that the amount agreed upon shall be received: (*a*) by extending every act in force relating to the inspection of weights, measures and weighing machines for use in the sale of goods to those used in a factory or workshop for checking or ascertaining the wages of persons employed; (*b*) by ensuring that piece-workers in the textile trades (and other trades specified by the secretary of state) shall receive, before commencing any piece of work, clear particulars of the wages applicable to the work to be done and of the work to which that rate is to be applied. Unless the particulars of work are ascertainable by an automatic indicator, they must be given to textile workers in writing, and in the case of weavers in the cotton, worsted and woollen trades the particulars of wages must be supplied separately to each worker, and also shown on a placard in a conspicuous position. In other textile processes, it is sufficient to furnish the particulars separately to each worker. The secretary of state has used his powers to extend this protection to non-textile workers, with suitable modifications, in various hardware industries, including pen-making, locks, chains, in wholesale tailoring and making of wearing apparel, in fustian cutting, umbrella-making, brush-making and a number of other piece-work trades. He further has in most of these and other trades used his power to extend this protection to outworkers.

Administration.

With a view to efficient administration of the act (*a*) certain notices have to be conspicuously exhibited at the factory or workshop, (*b*) registers and lists kept, and (*c*) notices sent to the inspector by the occupier. Among the first the most important are the prescribed abstract of the act, the names and addresses of the inspector and certifying surgeon, the period of employment, and specified meal-times (which may not be changed without fresh notice to the inspector), the air space and number of persons who may legally be employed in each room, and prescribed particulars of exceptional employment; among the second are the general registers of children and young persons employed, of accidents, of limewashing, of overtime, and lists of outworkers; among the third are the notice of beginning to occupy a factory or workshop, which the occupier must send within one month, report of overtime employment, notice of accident, poisoning or anthrax, and returns of persons employed, with such other particulars as may be prescribed. These must be sent to the chief inspector at intervals of not less than one and not more than three years, as may be directed by the secretary of state.

The secretary of state for the Home Department controls the administration of the acts, appoints the inspectors referred to in the acts, assigns to them their duties, and regulates the manner and cases in which they are to exercise the powers of inspectors. The act, however, expressly assigns certain duties and powers to a chief inspector and certain to district inspectors. Many provisions of the acts depend as to their operation on the making of orders by the secretary of state. These orders may impose special obligations on occupiers and increase the stringency of regulations, may apply exceptions as to employment, and may modify or relax regulations to meet special classes of circumstances. In certain cases, already indicated, his orders guide or determine the action of district councils, and, generally, in case of default by a council he may empower his inspectors to act as regards workplaces, instead of the council, both under the Factory Acts and Public Health Acts.

The powers of an inspector are to enter, inspect and examine, by day or by night, at any reasonable time, any factory or workshop (or laundry, dock, &c.), or part of one, when he has reason to believe that any person is employed there; to take with him a constable if he has reasonable cause to expect obstruction; to require production of registers, certificates, &c., under the acts; to examine, alone or in the presence of any other person, as he sees fit, every person in the factory or workshop, or in a school where the children employed are being educated; to prosecute, conduct or defend before a court of summary jurisdiction any proceeding under the acts; and to exercise such other powers as are necessary for carrying the act into effect. The inspector has also the duty of enforcing the Truck Acts in places, and in respect of persons, under the Factory Acts. Certifying surgeons are appointed by the chief inspector subject to the regulations of the secretary of state, and their chief duties are (*a*) to examine workers under sixteen, and persons under special rules, as to physical fitness for the daily work during legal periods, with power to grant qualified certificates as to the work for which the young worker is fit, and (*b*) to investigate and report on accidents and cases of lead, phosphorus or other poisoning and anthrax.

In 1907 there were registered as under inspection 110,276 factories, including laundries with power, 146,917 workshops (other than men's workshops), including laundries without power; of works under special rules or regulations (included in the figures just given) there were 10,586 and 19,687 non-textile works under orders for supply of particulars to piece-workers. Of notices of accidents received there were 124,325, of which 1179 were fatal; of reported cases of poisoning there were 653, of which 40 were fatal. Prosecutions were taken by inspectors in 4474 cases and convictions obtained in 4211 cases. Of persons employed there were, according to returns of occupiers, 1904, 4,165,791 in factories and 688,756 in workshops.

Coal Mines.—The mode of progress to be recorded in the regulation of coal mines since 1872 can be contrasted in one aspect with the progress just recorded of factory legislation since 1878. Consolidation was again earlier adopted when large amendments were found necessary, with the result that by far the greater part of the law is to be found in the act of 1887, which repealed and re-enacted, with amendments, the Coal Mines Acts of 1872 and 1886, and the Stratified Ironstone Mines (Gunpowder) Act, 1881. The act of 1881 was simply concerned with rules relating to the use of explosives underground. The act of 1886 dealt with three questions: (*a*) The election and payment of checkweighers (*i.e.* the persons appointed and paid by miners in pursuance of section 13 of the act of 1887 for the purpose of taking a correct account on their behalf of the weight of the mineral gotten by them, and for the correct determination of certain deductions for which they may be liable); (*b*) provision for new powers of the secretary of state to direct a formal investigation of any explosion or accident, and its causes and circumstances, a provision which was later adopted in the law relating to factories; (*c*) provision enabling any relatives of persons whose death may have been caused by explosions or accidents in or about mines to attend in person, or by agent, coroners' inquests thereon, and to examine witnesses. The act of 1887, which amended, strengthened and consolidated these acts and the earlier Consolidating Act of 1872, may also be contrasted in another aspect with the general acts of factory legislation. In scope it formed, as its principal forerunner had done, a general code; and in some measure it went farther in the way of consolidation than the Factory Acts had done, inasmuch as certain questions, which in factories are dealt with by statutes distinct from the Factory Acts, have been included in the Mines Regulation Acts, *e.g.* the prohibition of the payment of wages in public-houses, and the machinery relating to weights and measures whereby miners control their payment; further, partly from the less changing nature of the industry, but probably mainly from the power of expression gained for miners by their organization, the code, so far as it went, at each stage answered apparently on the whole more nearly to the views and needs of the persons protected than the parallel law relating to factories. This was strikingly seen in the evidence before the Royal Commission on Labour in 1892–1894, where the repeated expression of satisfaction on the part of the miners with the provisions as distinct from the administration of the code (" with a few trifling exceptions ") is in marked contrast with the long and varied series of claims and contentions put forward for amendment of the Factory Acts.

Since the act of 1887 there have followed five minor acts, based on the recommendation of the officials acting under the acts, while two of them give effect to claims made by the miners before the Royal Commission on Labour. Thus, in 1894, the Coal Mines (Checkweigher) Act rendered it illegal for an employer (" owner, agent, or manager of any mine, or any person employed by or acting under the instructions of any such owner, agent, or manager ") to make the removal of a particular checkweigher a condition of employment, or to exercise improper influence in the appointment of a checkweigher. The need for this provision was demonstrated by a decision of the Court of Session in Edinburgh, which upheld an employer in his claim to the right of dismissing all the workmen and re-engaging them on condition that they would dismiss a particular checkweigher. In 1896 a short act extended the powers to propose, amend and modify special rules, provided for representation of workmen on arbitration under the principal act on any matter in difference, modified the provision for plans of mines in working and abandoned mines, amended three of the general rules (inspection before commencing work, use of safety lamp and non-inflammable substances for stemming), and empowered the secretary of state by order to prohibit or regulate the use of any explosive likely to become dangerous. In 1900 another brief act raised the age of employment of boys underground from twelve to thirteen. In 1903 another amending act allowed as an alternative qualification for a manager's certificate a diploma in scientific and mining training after at least two years' study at a university mining school or other educational institution approved by the secretary of state, coupled with practical experience of at least three years in a mine. In the same year the Employment of Children Act affected children in mines to the extent already indicated in connexion with factories. In 1905 a Coal Mines (Weighing of Minerals) Act improved some provisions relating to appointment and pay of checkweighers and facilities for them and their duly appointed deputies in carrying out their duties. In 1906 the Notice of Accidents Act provided for improved annual returns of accidents and for immediate reporting to the district inspector of accidents under newly-defined conditions as they arise in coal and metalliferous mines.

Act of 1887.

While the classes of mines regulated by the act of 1887 are the same as those regulated by the act of 1872 (*i.e.* mines of coal, of stratified ironstone, of shale and of fire-clay, including works above ground where the minerals are prepared for use by screening, washing, &c.) the interpretation of the term " mine " is wider and simpler, including " every shaft in the course of being sunk, and every level and inclined plane in the course of being driven, and all the shafts, levels, planes, works, tramways and sidings, both below ground and above ground, in and adjacent to and belonging to the mine." Of the persons responsible under penalty for the observance of the acts the term " owner " is defined precisely as in the act of 1872, but the term " agent " is modified to mean " any person appointed as the representative of the owner in respect of any mine or any part thereof, and, as such, superior to a manager appointed in pursuance of this act." Of the persons protected, the term " young person " disappeared from the act, and " boy," *i.e.* " a male under the age of sixteen years," and " girl," *i.e.* " a female under the age of sixteen years," take their place, and the term " woman " means, as before, " a female of the age of sixteen years and upwards." The prohibition of employment underground of women and girls remains untouched, and the prohibition of employment underground of boys has been successively extended from boys of the age of ten in 1872 to boys of twelve in 1887 and to boys of thirteen in 1900. The age of employment of boys and girls above ground in connexion with any mine is raised from ten years in 1872 to twelve years since 1887. The hours of employment of a boy below ground may not exceed fifty-four in any one week, nor ten in any one day from the time of leaving the surface to the time of returning to the surface. Above ground any boy or girl under thirteen (and over twelve) may not be employed on more than six days in any one week; if employed on more than three days in one week, the daily total must not exceed six hours, or in any other case ten hours. Protected persons above thirteen are limited to the same daily and weekly total of hours as boys below ground, but there are further provisions with regard to intervals for meals and prohibiting employment for more than five hours without an interval of at least half an hour for a meal. Registers must be kept of all protected persons, whether employed above or below ground. Section 38 of the Public Health Act 1875, which requires separate and sufficient sanitary conveniences for persons of each sex, was first extended by the act of 1887 to the portions of mines above ground in which girls and women are employed; underground this matter is in metalliferous mines in Cornwall now provided for by special rules. Ventilation, the only other requirement in the acts that can be classed as sanitary, is provided for in every mine in the " general rules " which are aimed at securing safety of mines, and which, so far as ventilation is concerned, seek to dilute and render harmless noxious or inflammable gases. The provision which prohibits employment of any persons in mines not provided with at least two shafts is made much more stringent by the act of 1887 than in the previous code, by increasing the distance between the two shafts from 10 to 15 yds., and increasing the height of communications between them. Other provisions amended or strengthened are those relating to the following points: (*a*) Daily personal supervision of the mine by the certificated manager; (*b*) classes of certificates and constitution of board for granting certificates of competency; (*c*) plan of workings of any mine to be kept up to a date not more than three months previously at the office of the mine; (*d*) notice to be given to the inspector of the district by the owner, agent or manager, of accidents in or about any mine which cause loss of life or serious personal injury, or are caused by explosion of coal or coal dust or any explosive or electricity or any other special cause that the secretary of state specifies by order, and which causes any personal injury to any person employed in or about the mine; it is provided that the place where an explosion or accident occurs causing loss of life or serious personal injury shall be left for inspection for at least three days, unless this would tend to increase or continue a danger or impede working of the mine: this was new in the act of 1887; (*e*) notice to be given of opening and abandonment of any mine: this was extended to the opening or abandonment of any seam; (*f*) plan of an abandoned mine or seam to be sent within three months; (*g*) formal investigation of any explosion or accident by direction of the secretary of state: this provision, first introduced by the act of 1886, was modified in 1887 to admit the appointment by the secretary of state of " any competent person " to hold the investigation, whereas under the earlier section only an inspector could be appointed.

General rules.

The " general rules " for safety in mines have been strengthened in many ways since the act of 1872. Particular mention may be made of rule 4 of the act of 1887, relating to the inspection of conditions as to gas ventilation beyond appointed stations at the entrance to the mine or different parts of the mine; this rule generally removed the earlier distinction between mines in which inflammable gas has been found within the preceding twelve months, and mines in which it has not been so found; of rules 8, 9, 10 and 11, relating to the construction, use, &c., of safety lamps, which are more detailed and stringent than rule 7 of the act of 1872, which they replaced; of rule 12, relating to the use of explosives below ground; of rule 24, which requires the appointment of a competent male person not less than twenty-two years of age for working the machinery for lowering and raising persons at the mine; of rule 34, which first required provision of ambulances or stretchers with splints and bandages at the mine ready for immediate use; of rule 38, which strengthened the provision for periodical inspection of the mine by practical miners on behalf of the workmen at their own cost. With reference to the last-cited rule, during 1898 a Prussian mining commission visited Great Britain, France and Belgium, to study and compare the various methods of inspection by working miners established in these three countries. They found that, so far as the method had been applied, it was most satisfactory in Great Britain, where the whole cost is borne by the workers' own organizations, and they attributed part of the decrease in number of accidents per thousand employed since 1872 to the inauguration of this system.

Special rules.

The provisions as to the proposal, amendment and modification of " special rules," last extended by the act of 1896, may be contrasted with those of the Factory Act. In the latter it is not until an industry or process has been scheduled as dangerous or injurious by the secretary of state's order that occasion arises for the formation of special rules, and then the initiative rests with the Factory Department whereas in mines it is incumbent in every case on the owner, agent or manager to propose within three months of the commencement of any working, for the approval of the secretary of state, special rules best calculated to prevent dangerous accidents, and to provide for the safety, convenience and proper discipline of the persons employed in or about the mine. These rules may, if they relate to lights and lamps used in the mine, description of explosives, watering and damping of the mine, or prevention of accidents from inflammable gas or coal dust, supersede any general rule in the principal act. Apart from the initiation of the rules, the methods of establishing them, whether by agreement or by resort to arbitration of the parties (*i.e.* the mine owners and the secretary of state), are practically the same as under the Factory Act, but there is special provision in the Mines Acts for enabling the persons working in the mine to transmit objections to the proposed rules, in addition to their subsequent right to be represented on the arbitration, if any.

Of the sections touching on wages questions, the prohibition of the payment of wages in public-houses remains unaltered, being re-enacted in 1887; the sections relating to payment by weight for amount of mineral gotten by persons employed, and for checkweighing the amount by a "checkweigher" stationed by the majority of workers at each place appointed for the weighing of the material, were revised, particularly as to the determination of deductions by the act of 1887, with a view to meeting some problems raised by decisions on cases under the act of 1872. The attempt seems not to have been wholly successful, the highest legal authorities having expressed conflicting opinions on the precise meaning of the terms "mineral contracted to be gotten." The whole history of the development of this means of securing the fulfilment of wage contract to the workers may be compared with the history of the sections affording protection to piece-workers by particulars of work and wages in the textile trades since the Factory Act of 1891.

Administration.

As regards legal proceedings, the chief amendments of the act of 1872 are: the extension of the provision that the "owner, agent, or manager" charged in respect of any contravention by another person might be sworn and examined as an ordinary witness, to any person charged with any offence under the act. The result of the proceedings against workmen by the owner, agent or manager in respect of an offence under the act is to be reported within twenty-one days to the inspector of the district. The powers of inspectors were extended to cover an inquiry as to the care and treatment of horses and other animals in the mine, and as to the control, management or direction of the mine by the manager.

An important act was passed in 1908 (Coal Mines Regulation Act 1908) limiting the hours of work for workmen below ground. It enacted that, subject to various provisions, a workman was not to be below ground in a mine for the purpose of his work, and of going to and from his work, for more than eight hours in any consecutive twenty-four hours. Exception was made in the case of those below ground for the purpose of rendering assistance in the event of an accident, or for meeting any danger, or for dealing with any emergency or work incompleted, through unforeseen circumstances, which requires to be dealt with to avoid serious interference in the work of the mine. The authorities of every mine must fix the times for the lowering and raising of the men to begin and be completed, and such times must be conspicuously posted at the pit head. These times must be approved by an inspector. The term "workman" in the act means any person employed in a mine below ground who is not an official of the mine (other than a fireman, examiner or deputy), or a mechanic or a horse keeper or a person engaged solely in surveying or measuring. In the case of a fireman, examiner, deputy, onsetter, pump minder, fanman or furnace man, the maximum period for which he may be below ground is nine hours and a half. A register must be kept by the authorities of the mine of the times of descent and ascent, while the workmen may, at their own cost, station persons (whether holding the office of checkweigher or not) at the pit head to observe the times. The authorities of the mine may extend the hours of working by one hour a day on not more than sixty days in one calendar year (s. 3). The act may be suspended by order in council in the event of war or of imminent national danger or great emergency, or in the event of any grave economic disturbance due to the demand for coal exceeding the supply available at any time. The act came into force on the 1st of July 1909 except for the counties of Northumberland and Durham where its operation was postponed until the 1st of January 1910.

In 1905 the number of coal-mines reported on was 3126, and the number of persons employed below ground was 691,112 of whom 43,443 were under 16 years of age. Above ground 167,261 were employed, of whom 6154 were women and girls. The number of separate fatal accidents was 1006, causing the loss of 1205 lives. Of prosecutions by far the greater number were against workmen, numbering in coal and metalliferous mines 953; owners and managers were prosecuted in 72 cases, and convictions obtained in 43 cases.

Quarries.—From 1878 until 1894 open quarries (as distinct from underground quarries regulated by the Metalliferous Mines Regulation Act) were regulated only by the Factory Acts so far as they then applied. It was laid down in section 93 of the act of 1878 (41 Vict. c. 16), that "any premises or place shall not be excluded from the definition of a factory or workshop by reason only that such premises, &c., are or is in the open air," thereby overruling the decision in *Kent* v. *Astley* that quarries in which the work, as a whole, was carried on in the open air were not factories; in a schedule to the same act quarries were defined as "any place not being a mine in which persons work in getting slate, stone, coprolites or other minerals." The Factory Act of 1891 made it possible to bring these places in part under "special rules" adapted to meet the special risks and dangers of the operations carried on in them, and by order of the secretary of state they were certified, December 1892, as dangerous, and thereby subject to special rules. Until then, as reported by one of the inspectors of factories, quarries had been placed under the Factory Acts without insertion of appropriate rules for their safe working, and many of them were "developed in a most dangerous manner without any regard for safety, but merely for economy," and managers of many had "scarcely seen a quarry until they became managers." In his report for 1892 it was recommended by the chief inspector of factories that quarries should be subject to the jurisdiction of the government inspectors of mines. At the same time currency was given, by the published reports of the evidence before the Royal Commission on Labour, to the wish of large numbers of quarrymen that open as well as underground quarries should come under more specialized government inspection. In 1893 a committee of experts, including inspectors of mines and of factories, was appointed by the Home Office to investigate the conditions of labour in open quarries, and in 1894 the Quarries Act brought every quarry, as defined in the Factory Act 1878, any part of which is more than 20 ft. deep, under certain of the provisions of the Metalliferous Mines Acts, and under the inspection of the inspectors appointed under those acts; further, it transferred the duty of enforcing the Factory and Workshop Acts, so far as they apply in quarries over 20 ft. deep, from the Factory to the Metalliferous Mines inspectors.

The provisions of the Metalliferous Mines Acts 1872 and 1875, applied to quarries, are those relating to payment of wages in public-houses, notice of accidents to the inspector, appointment and powers of inspectors, arbitration, coroners' inquests, special rules, penalties, certain of the definitions, and the powers of the secretary of state finally to decide disputed questions whether places come within the application of the acts. For other matters, and in particular fencing of machinery and employment of women and young persons, the Factory Acts apply, with a proviso that nothing shall prevent the employment of young persons (boys) in three shifts for not more than eight hours each. In 1899 it was reported by the inspectors of mines that special rules for safety had been established in over 2000 quarries. In the reports for 1905 it was reported that the accounts of blasting accidents indicated that there was "still much laxity in observance of the Special rules, and that many irregular and dangerous practices are in vogue." The absence or deficiency of external fencing to a quarry dangerous to the public has been since 1887 (50 & 51 Vict. c. 19) deemed a nuisance liable to be dealt with summarily in the manner provided by the Public Health Act 1875.

In 1905, 94,819 persons were employed, of whom 59,978 worked inside the actual pits or excavations, and 34,841 outside. Compared with 1900, there was a total increase of 924 in the number of persons employed. Fatal accidents resulted in 1900 in 127 deaths; compared with 1899 there was an increase of 10 in the number of deaths, and, as Professor Le Neve Foster pointed out, this exceeded the average death-rate of underground workers at mines under the Coal Mines Acts during the previous ten years, in spite of the quarrier "having nothing to fear from explosions of gas, underground fires or inundations." He attributed the difference to a lax observance of precautions which might in time be remedied by stringent administration of the law. In 1905 there were 97 fatal accidents resulting in 99 deaths. In 1900 there were 92 prosecutions against owners or agents, with 67 convictions, and 13 prosecutions of workers, with 12 convictions, and in 1905 there were 45 prosecutions of owners or agents with 43 convictions and 9 prosecutions of workmen with 5 convictions.

Payment of wages in public-houses.

In 1883 a short act extended to all "workmen" who are manual labourers other than miners, with the exception of domestic or menial servants, the prohibition of payment of wages in public-houses, beer-shops and other places for the sale of spirituous or fermented liquor, laid down in the Coal Mines Regulations and Metalliferous Mines Regulation Acts. The places covered by the prohibition include any office, garden or place belonging to or occupied with the places named, but the act does not apply to such wages as are paid by the resident, owner or occupier of the public-house, beer-shop and other places included in the prohibition to any workman *bona fide* employed by him. The penalty for an offence against this act is one not exceeding £10 (compare the limit of £20 for the corresponding offence under the Coal Mines Act), and all offences may be prosecuted and penalties recovered in England and Scotland under the Summary Jurisdiction Acts. The act does not apply to Ireland, and no special inspectorate is charged with the duty of enforcing its provisions.

Shop Hours.—In four brief acts, 1892 to 1899, still in force, the first very limited steps were taken towards the positive regulation of the employment of shop assistants. In the act of 1904 certain additional optional powers were given to any local authority making a "closing order" fixing the hour (not earlier than 7 P.M. or on one day in the week 1 P.M.) at which shops shall cease to serve customers throughout the area of the authority or any specified part thereof as regards all shops or as regards any specified class of shops. Before such an order can be made (1) a prima facie case for it must appear to the local authority; (2) the local authority must inquire and agree; (3) the order must be drafted and sent for confirmation or otherwise to the central authority, that is, the secretary of state for the Home Department; (4) the order must be laid before both Houses of Parliament. The Home Office has given every encouragement to the making of such orders, but their number in England is very small, and the act is practically inoperative in London and many large towns where the need is greatest. As the secretary of state pointed out in the House of Commons on the 1st of May 1907, the local authorities have not taken enough initiative, but at the same time there is a great difficulty for them in obtaining the required two-thirds majority, among occupiers of the shops to be affected, in favour of the order, and at the same time shop assistants have no power to set the law in motion. In England 364 local authorities have taken no steps, but in Scotland rather better results have been obtained. The House resolved, on the date named, that more drastic legislation is required. As regards shops, therefore, in place of such general codes as apply to factories, laundries, mines—only three kinds of protective requirement are binding on employers of shop assistants: (1) Limitation of the weekly total of hours of work of persons under eighteen years of age to seventy-four inclusive of meal-times; (2) prohibition of the employment of such persons in a shop on the same day that they have, to the knowledge of the employer, been employed in any factory or workshop for a longer period than would, in both classes of employment together, amount to the number of hours permitted to such persons in a factory or workshop; (3) provision for the supply of seats by the employer, in all rooms of a shop or other premises where goods are retailed to the public, for the use of female assistants employed in retailing the goods—the seats to be in the proportion of not fewer than one to every three female assistants. The first two requirements are contained in the act of 1892, which also prescribed that a notice, referring to the provisions of the act, and stating the number of hours in the week during which a young person may be lawfully employed in the shop, shall be kept exhibited by the employer; the third requirement was first provided by the act of 1899. The intervening acts of 1893 and 1895 are merely supplementary to the act of 1892; the former providing for the salaries and expenses of the inspectors which the council of any county or borough (and in the City of London the Common Council) were empowered by the act of 1892 to appoint; the latter providing a penalty of 40s. for failure of an employer to keep exhibited the notice of the provisions of the acts, which in the absence of a penalty it had been impossible to enforce. The penalty for employment contrary to the acts is a fine not exceeding £1 for each person so employed, and for failure to comply with the requirements as to seats, a fine not exceeding £3 for a first offence, and for any subsequent offence a fine of not less than £1 and not exceeding £5.

Meaning of "shop."

A wide interpretation is given by the act of 1892 to the class of workplace to which the limitation of hours applies. "Shop" means retail and wholesale shops, markets, stalls and warehouses in which assistants are employed for hire, and includes licensed public-houses and refreshment houses of any kind. The person responsible for the observance of the acts is the "employer" of the "young persons" (*i.e.* persons under the age of eighteen years), whose hours are limited, and of the "female assistants" for whom seats must be provided. Neither the term "employer" nor "shop assistant" (used in the title of the act of 1899) is defined; but other terms have the meaning assigned to them in the Factory and Workshop Act 1878. The "employer" has, in case of any contravention alleged, the same power as the "occupier" in the Factory Acts to exempt himself from fine on proof of due diligence and of the fact that some other person is the actual offender. The provisions of the act of 1892 do not apply to members of the same family living in a house of which the shop forms part, or to members of the employer's family, or to any one wholly employed as a domestic servant.

In London, where the County Council has appointed men and women inspectors to apply the acts of 1892 to 1899, there were, in 1900, 73,929 premises, and in 1905, 84,269, under inspection. In the latter year there were 22,035 employing persons under 18 years of age. In 1900 the number of young persons under the acts were: indoors, 10,239 boys and 4428 girls; outdoors, 35,019 boys, 206 girls. In 1905 the ratio between boys and girls had decidedly altered: indoors, 6602 boys, 4668 girls; outdoors, 22,654 boys, 308 girls. The number of irregularities reported in 1900 were 9204 and the prosecutions were 117; in 1905 the irregularities were 6966 and the prosecutions numbered 34. As regards the act of 1899, in only 1088 of the 14,844 shops affected in London was there found in 1900 to be failure to provide seats for the women employed in retailing goods. The chief officer of the Public Control Department reported that with very few exceptions the law was complied with at the end of the first year of its application.

As regards cleanliness, ventilation, drainage, water-supply and sanitary condition generally, shops have been since 1878 (by 41 Vict. c. 16, s. 101) subject to the provisions of the Public Health Act 1875, which apply to all buildings, except factories under the Factory Acts, in which any persons, whatever their number be, are employed. Thus, broadly, the same sanitary provisions apply in shops as in workshops, but in the former these are enforced solely by the officers of the local authority, without reservation of any power, as in workshops for the Home Office inspectorate, to act in default of the local authority.

Shop assistants, so far as they are engaged in manual, not merely clerical labour, come under the provisions of the Truck Acts 1831 to 1887, and in all circumstances they fall within the sections directed against unfair and unreasonable fines in the Truck Act of 1896; but, unlike employés in factories, workshops, laundries and mines, they are left to apply these provisions so far as they can themselves, since neither Home Office inspectors nor officers of the local authority have any specially assigned powers to administer the Truck Acts in shops.

Truck.—Setting aside the special Hosiery Manufacture (Wages) Act 1874, aimed at a particular abuse appearing chiefly in the hosiery industry—the practice of making excessive charges on wages for machinery and frame rents—only two acts, those of 1887 and 1896, have been added to the general law against truck since the act of 1831, which repealed all prior Truck Acts and which remains the principal act. Further amendments of the law have been widely and strenuously demanded, and are hoped for as the result of the long inquiry by a departmental committee appointed early in 1906. The Truck Act Amendment Act 1887, amended and extended the act without adding any distinctly new principle; the Truck Act of 1896 was directed towards providing remedies for matters shown by decisions under the earlier Truck Acts to be outside the scope of the principles and provisions of those acts. Under the earlier acts the main objects were: (1) to make the wages of workmen, *i.e.* the reward of labour, payable only in current coin of the realm, and to prohibit whole or part payment of wages in food or drink or clothes or any other articles; (2) to

The Truck Act 1887.

Persons benefited by Truck Acts.

forbid agreements, express or implied, between employer and workmen as to the manner or place in which, or articles on which, a workman shall expend his wages, or for the deduction from wages of the price of articles (other than materials to be used in the labour of the workmen) supplied by the employer. The act of 1887 added a further prohibition by making it illegal for an employer to charge interest on any advance of wages, "whenever by agreement, custom, or otherwise a workman is entitled to receive in anticipation of the regular period of the payment of his wages an advance as part or on account thereof." Further, it strengthened the section of the principal act which provided that no employer shall have any action against his workman for goods supplied at any shop belonging to the employer, or in which the employer is interested, by (*a*) securing any workman suing an employer for wages against any counter-claim in respect of goods supplied to the workman by any person under any order or direction of the employer, and (*b*) by expressly prohibiting an employer from dismissing any worker on account of any particular time, place or manner of expending his wages. Certain exemptions to the prohibition of payment otherwise than in coin were provided for in the act of 1831, if an agreement were made in writing and signed by the worker, viz. rent, victuals dressed and consumed under the employer's roof, medicine, fuel, provender for beasts of burden used in the trade, materials and tools for use by miners, advances for friendly societies or savings banks; in the case of fuel, provender and tools there was also a proviso that the charge should not exceed the real and true value. The act of 1887 amended these provisions by requiring a correct annual audit in the case of deductions for medicine or tools, by permitting part payment of servants in husbandry in food, drink (not intoxicants) or other allowances, and by prohibiting any deductions for sharpening or repairing workmen's tools except by agreement not forming part of the condition of hiring. Two important administrative amendments were made by the act of 1887: (1) a section similar to that in the Factory and Mines Acts was added, empowering the employer to exempt himself from penalty for contravention of the acts on proof that any other person was the actual offender and of his own due diligence in enforcing the execution of the acts; (2) the duty of enforcing the acts in factories, workshops, and mines was imposed upon the inspectors of the Factory and Mines Departments, respectively, of the Home Office, and to their task they were empowered to bring all the authorities and powers which they possessed in virtue of the acts under which they are appointed; these inspectors thus prosecute defaulting employers and recover penalties under the Summary Jurisdiction Acts, but they do not undertake civil proceedings for improper deductions or payments, proceedings for which would lie with workmen under the Employers and Workmen Act 1875. The persons to whom the benefits of the act applied were added to by the act of 1887, which repealed the complicated list of trades contained in the principal act and substituted the simpler definition of the Employers and Workmen Act, 1875. Thus the acts 1831 to 1887, and also the act of 1896, apply to all workers (men, women and children) engaged in manual labour, except domestic servants; they apply not only in mines, factories and workshops, but, to quote the published Home Office Memorandum on the acts, "in all places where workpeople are engaged in manual labour under a contract with an employer, whether or no the employer be an owner or agent or a parent, or be himself a workman; and therefore a workman who employs and pays others under him must also observe the Truck Acts." The law thus in certain circumstances covers outworkers for a contractor or sub-contractor. A decision of the High Court at Dublin in 1900 (*Squire* v. *Sweeney*) strengthened the inspectors in investigation of offences committed amongst outworkers by supporting the contention that inquiry and exercise of all the powers of an inspector could legally take place in parts of an employer's premises other than those in which the work is given out. It defined for Ireland, in a narrower sense than had hitherto been understood and acted upon by the Factory Department, the classes of outworkers protected, by deciding that only such as were under a contract personally to execute the work were covered. In 1905 the law in England was similarly declared in the decided case of *Squire* v. *The Midland Lace Co.* The judges (Lord Alverstone, C.J.; and Kennedy and Ridley, J.J.) stated that they came to the conclusion with "reluctance," and said: "We venture to express the hope that some amendment of the law may be made so as to extend the protection of the Truck Act to a class of workpeople indistinguishable from those already within its provisions." The workers in question were lace-clippers taking out work to do in their homes, and in the words of the High Court decision "though they do sometimes employ assistants are evidently, as a class, wage-earning manual labourers and not contractors in the ordinary and popular sense." The principle relied on in the decision was that in the case of *Ingram* v. *Barnes.*

Meaning of "wages."

The Truck Act 1896.

At the time of the passing of the act of 1887 it seems to have been generally believed that the obligation under the principal act to pay the "entire amount of wages earned" in coin rendered illegal any deductions from wages in respect of fines. Important decisions in 1888 and 1889 showed this belief to have been ill-founded. The essential point lies in the definition of the word "wages" as the "recompense, reward or remuneration of labour," which implies not necessarily any gross sum in question between employer and workmen where there is a contract to perform a certain piece of work, but that part of it, the real *net* wage, which the workman was to get as his *recompense* for the labour performed. As soon as it became clear that excessive deductions from wages as well as payments by workers for materials used in the work were not illegal, and that deductions or payments by way of compensation to employers or by way of discipline might legally (with the single exception of fines for lateness for women and children, regulated by the Employers and Workmen Act 1875) even exceed the degree of loss, hindrance or damage to the employer, it also came clearly into view that further legislation was desirable to extend the principles at the root of the Truck Acts. It was desirable, that is to say, to hinder more fully the unfair dealing that may be encouraged by half-defined customs in work-places, on the part of the employer in making a contract, while at the same time leaving the principle of freedom of contract as far as possible untouched. The Truck Act of 1896 regulates the conditions under which deductions can be made by or payments made to the employer, out of the "sum contracted to be paid to the worker," *i.e.* out of any gross sum whatever agreed upon between employer and workman. It makes such deductions or payments illegal unless they are in pursuance of a contract; and it provides that deductions (or payments) for (*a*) fines, (*b*) bad work and damaged goods, (*c*) materials, machines, and any other thing provided by the employer in relation to the work shall be reasonable, and that particulars of the same in writing shall be given to the workman. In none of the cases mentioned is the employer to make any profit; neither by fines, for they may only be imposed in respect of acts or omissions which cause, or are likely to cause, loss or damage; nor by sale of materials, for the price may not exceed the cost to the employer; nor by deductions or payments for damage, for these may not exceed the actual or estimated loss to the employer. Fines and charges for damage must be "fair and reasonable having regard to all the circumstances of the case," and no contract could make legal a fine which a court held to be unfair to the workman in the sense of the act. The contract between the employer and workman must either be in writing signed by the workman, or its terms must be clearly stated in a notice constantly affixed in a place easily accessible to the workman to whom, if a party to the contract, a copy shall be given at the time of making the contract, and who shall be entitled, on request, to obtain from the employer a copy of the notice free of charge. On each occasion when a deduction or payment is made, full particulars in writing must be supplied to the workman. The employer is bound to keep a register of deductions or payments, and to enter therein particulars of any fine made under the contract, specifying the amount and nature of the act or omission in respect of which the fine was imposed. This register must be at all times open to inspectors of mines or factories, who are entitled to make a copy of the contract or any part of it. This act as a whole applies to all workmen included under the earlier Truck Acts; the sections relating to fines apply also to shop assistants. The latter, however, apparently are left to enforce the provisions of the law themselves, as no inspectorate is empowered to intervene on their behalf. In these and other cases a prosecution under the Truck Acts may be instituted by any person. Any workman or shop assistant may recover any sum deducted by or paid to his employer contrary to the act of 1896, provided that proceedings are commenced within six months, and that where he has acquiesced in the deduction or payment he shall only recover the excess over the amount which the court may find to have been fair and reasonable in all the circumstances of the case. It is expressly declared in the act that nothing in it shall affect the provisions of the Coal Mines Acts with reference to payment by weight, or legalize any deductions, from payments made, in pursuance of those provisions. The powers and duties of inspectors are extended to cover the case of a laundry, and of any place where work is given out by the occupier of a factory or workshop or by a contractor or sub-contractor. Power is reserved for the secretary of state to exempt by order specified trades or branches of them in specified areas from the provisions of the act of 1896, if he is satisfied that they are unnecessary for the protection of the workmen. This power has been exercised only in respect of one highly organized industry, the Lancashire cotton industry. The effect of the exemption is not to prevent fines and deductions from being made, but the desire for it demonstrated that there are cases where leaders among workers have felt competent to make their own terms on their own lines without the specific conditions laid down in this act. The reports of the inspectors of factories have demonstrated that in other industries much work has had to be done under this act, and knowledge of a highly technical character to be gradually acquired, before opinions could be formed as to the reasonableness and fairness, or the contrary, of many forms of deduction. Owing partly to difficulties of legal interpretation involving the necessity of taking test cases into court, partly to the margin for differences of opinion as to what constitutes "reasonableness" in a deduction, the average number of convictions obtained on prosecutions is not so high as under the Factory Acts, though the average penalty imposed is higher. In 1904, 61 cases were taken into court resulting in 34 convictions with an average penalty of £1, 10s. In 1905, 38 cases resulting in 34 convictions were taken with an average penalty of £1, 3s. In 1906, 37 cases resulting in 25 convictions were taken with an average penalty of £1, 10s.

Reference should here be made to the Shop Clubs Act of 1902 as closely allied with some of the provisions of the Truck Acts by its provision that employers shall not make it a condition of employment that any workman shall become a member of a shop club unless it is registered under the Friendly Societies Act of 1896. As in the case of payment of wages in Public Houses Act, no special inspectorate has the duty of enforcing this act.

III. CONTINENTAL EUROPE

In comparing legislation affecting factories, mines, shops and truck in the chief industrial countries of the continent with that of Great Britain, it is essential to a just view that inquiry should be extended beyond the codes themselves to the general social order and system of law and administration in each country. Further, special comparison of the definitions and the sanctions of each industrial code must be recognized as necessary, for these vary in all. In so brief a summary as is appended here no more is possible than an outline indication of the main general requirements and prohibitions of the laws as regards: (1) hours and times of employment, (2) ordinary sanitation and special requirements for unhealthy and dangerous industries, (3) security against accidents, and (4) prevention of fraud and oppression in fulfilment of wage contracts. As regards the first of these subdivisions, in general in Europe the ordinary legal limit is rather wider than in Great Britain, being in several countries not less than 11 hours a day, and while in some, as in France, the normal limit is 10 hours daily, yet the administrative discretion in granting exceptions is rather more elastic. The weekly half-holiday is a peculiarly British institution. On the other hand, in several European countries, notably France, Austria, Switzerland and Russia, the legal maximum day applies to adult as well as youthful labour, and not only to specially protected classes of persons. As regards specialized sanitation for unhealthy factory industries, German regulations appear to be most nearly comparable with British. Mines' labour regulation in several countries, having an entirely different origin linked with ownership of mines, is only in few and most recent developments comparable with British Mines Regulation Acts. In regulation of shops, Germany, treating this matter as an integral part of her imperial industrial code, has advanced farther than has Great Britain. In truck legislation most European countries (with the exception of France) appear to have been influenced by the far earlier laws of Great Britain, although in some respects Belgium, with her rapid and recent industrial development, has made interesting original experiments. The rule of Sunday rest (see SUNDAY) has been extended in several countries, most recently in Belgium and Spain. In France this partially attempted rule has been so modified as to be practically a seventh day rest, not necessarily Sunday.

France.—Hours of labour were, in France, first limited in factories (*usines et manufactures*) for adults by the law of the 9th of September 1848 to 12 in the 24. Much uncertainty existed as to the class of workplaces covered. Finally, in 1885, an authoritative decision defined them as including: (1) Industrial establishments with motor power or continual furnaces, (2) workshops employing over 20 workers. In 1851, under condition of notification to the local authorities, exceptions, still in force, were made to the general limitation, in favour of certain industries or processes, among others for letterpress and lithographic printing, engineering works, work at furnaces and in heating workshops, manufacture of projectiles of war, and any work for the government in the interests of national defence or security. The limit of 12 hours was reduced, as regards works in which women or young workers are employed, in 1900 to 11, and was to be successively reduced to 10½ hours and to 10 hours at intervals of two years from April 1900. This labour law for adults was preceded in 1841 by one for children, which prevented their employment in factories before 8 years of age and prohibited night labour for any child under 13. This was strengthened in 1874, particularly as regards employment of girls under 21, but it was not until 1892 that the labour of women was specially regulated by a law, still in force, with certain amendments in 1900. Under this law factory and workshop labour is prohibited for children under 13 years, though they may begin at 12 if qualified by the prescribed educational certificate and medical certificate of fitness. The limit of daily hours of employment is the same as for adult labour, and, similarly, from the 1st of April 1902 was 10½, and two years later became 10 hours in the 24. Notice of the hours must be affixed, and meal-times or pauses with absolute cessation of work of at least one hour must be specified. By the act of 1892 one day in the week, not necessarily Sunday, had to be given for entire absence from work, in addition to eight recognized annual holidays, but this was modified by a law of 1906 which generally requires Sunday rest, but allows substitution of another day in certain industries and certain circumstances. Night labour—work between 9 P.M. and 5 A.M.—is prohibited for workers under 18, and only exceptionally permitted, under conditions, for girls and women over 18 in specified trades. In mines and underground quarries employment of women and girls is prohibited except at surface works, and at the latter is subject to the same limits as in factories. Boys of 13 may be employed in certain work underground, but under 16 may not be employed more than 8 hours in the 24 from bank to bank. A law of 1905 provided for miners a 9 hours' day and in 1907 an 8 hours' day from the foot of the entrance gallery back to the same point.

As in Great Britain, distinct services of inspection enforce the law in factories and mines respectively. In factories and workshops an inspector may order re-examination as to physical fitness for the work imposed of any worker under 16; certain occupations and processes are prohibited—*e.g.* girls under 16 at machines worked by treadles, and the weights that may be lifted, pushed or carried by girls or boys under 18 are carefully specified. The law applies generally to philanthropic and religious institutions where industrial work is carried on, as in ordinary trading establishments; and this holds good even if the work is by way of technical instruction. Domestic workshops are not controlled unless the industry is classed as dangerous or unhealthy; introduction of motor power brings them under inspection. General sanitation in industrial establishments is provided for in a law of 1893, amended in 1903, and is supplemented by administrative regulations for special risks due to poisons, dust, explosive substances, gases, fumes, &c. Ventilation, both general and special, lighting, provision of lavatories, cloakrooms, good drinking water, drainage and cleanliness are required in all workplaces, shops, warehouses, restaurant kitchens, and where workers are lodged by their employers hygienic conditions are prescribed for dormitories. In many industries women, children and young workers are either absolutely excluded from specified unhealthy processes, or are admitted only under conditions. As regards shops and offices, the labour laws are: one which protects apprentices against overwork (law of 22nd February 1851), one (law of 29th December 1900) which requires that seats shall be provided for women and girls employed in retail sale of articles, and a decree of the 28th of July 1904 defining in detail conditions of hygiene in dormitories for workmen and shop assistants. The law relating to seats is enforced by the inspectors of factories. In France there is no special penal legislation against abuses of the truck system, or excessive fines and deductions from wages, although bills with that end in view have frequently been before parliament. Indirect protection to workers is no doubt in many cases afforded in organized industries by the action of the *Conseils de Prud'hommes.*

Belgium.—In 1848 in Belgium the Commission on Labour proposed legislation to limit, as in France, the hours of labour for adults, but this proposal was never passed. Belgian regulation of labour in industry remains essentially, in harmony with its earliest beginnings in 1863 and onwards, a series of specialized provisions to meet particular risks of individual trades, and did not, until 1889, give any adherence to a common principle of limitation of hours and times of labour for "protected" persons. This was in the law of the 13th of December 1889, which applies to mines, quarries, factories, workshops classed as unhealthy, wharves and docks, transports. As in France, industrial establishments having a charitable or philanthropic or educational character are included. The persons protected are girls and women under 21 years, and boys under 16; and women over 21 only find a place in the law through the prohibition of their employment within four weeks after childbirth. As the hours of labour of adult women remain ordinarily unlimited by law, so are the hours of boys from 16 to 21. The law of Sunday rest dated the 17th of July 1905, however, applies to labour generally in all industrial and commercial undertakings except transport and fisheries, with certain regulated exceptions for (*a*) cases of breakdown or urgency due to *force majeure*, (*b*) certain repairs and cleaning, (*c*) perishable materials, (*d*) retail food supply. Young workers are excluded from the exceptions. The absolute prohibitions of employment are: for children under 12 years in any industry, manufacturing or mining or transport, and for women and girls under 21 years below the surface in working of mines. Boys under 16 years and women and girls under 21 years may in general not be employed before 5 A.M. or after 9 P.M., and one day in the seven is to be set apart for rest from employment; to these rules exception may be made either by royal decree for classes or groups of processes, or by local authorities in exceptional cases. The exceptions may be applied, generally, only to workers over 14 years, but in mines, by royal decree, boys over 12 years may be employed from 4 A.M. The law of 1889 fixes only a maximum of 12 hours of effective work, to be interrupted by pauses for rest of not less than 1½ hours, empowering the king by decree to formulate more precise limits suited to the special circumstances of individual industries. Royal decrees have accordingly laid down the conditions for many groups, including textile trades, manufacture of paper, pottery, glass, clothing, mines, quarries, engineering and printing works. In some the daily limit is 10 hours, but in more 10½ or 11 hours. In a few exceptionally unhealthy trades, such as the manufacture of lucifer matches, vulcanization of india-rubber by means of carbon bi-sulphide, the age of exclusion from employment has been raised, and in the last-named process hours have been reduced to 5, broken into two spells of 2½ hours each. As a rule the conditions of health and safeguarding of employments in exceptionally injurious trades have been sought by a series of decrees under the law of 1863 relating to public health in such industries. Special regulations for safety of workers have been introduced in manufactures of white-lead, oxides of lead, chromate of lead, lucifer match works, rag and shoddy works; and for dangers common to many industries, provisions against dust, poisons, accidents and other risks to health or limb have been codified in a decree of 1896. A royal decree of the 31st of March 1903 prohibits employment of persons under 16 years in fur-pulling and in carotting of rabbit skins, and another of the 13th of May 1905 regulates use of lead in house-painting. In 1898 a law was passed to enable the authorities to deal with risks in quarries under the same procedure. Safety in mines (which are not private property, but state concessions to be worked under strict state control) has been provided for since 1810. In matters of hygiene, until 1899 the powers of the public health authorities to intervene were insufficient, and a law was passed authorizing the government to make regulations for every kind of risk in any undertaking, whether classed under the law of public health or not. By a special law of 1888 children and young persons under 18 years are excluded from employment as pedlars, hawkers or in circuses, except by their parents, and then only if they have attained 14 years. Abuses of the truck system have, since 1887, been regulated with care. The chief objects of the law of 1887 were to secure payment in full to all workers, other than those in agriculture or domestic service, of wages in legal tender, to prohibit payment of wages in public-houses, and to secure prompt payment of wages. Certain deductions were permitted under careful control for specific customary objects: lodging, use of land, uniforms, food, firing. A royal order of the 10th of October 1903 required use of automatic indicators for estimating wages in certain cases in textile processes. The law of the 15th of June 1896 regulates the affixing in workplaces, where at least five workers are employed, of a notice of the working rules, the nature and rate of fines, if any, and the mode of their application. Two central services the mines inspectorate and the factory and workshop inspectorate, divide the duties above indicated. There is also a system of local administration of the regulations relating to industries classed as unhealthy, but the tendency has been to give the supreme control in these matters to the factory service, with its expert staff.

Holland.—The first law for regulation of labour in manufacture was passed in 1874, and this related only to employment of children. The basis of all existing regulations was established in the law of the 5th of May 1889, which applies to all industrial undertakings, excluding agriculture and forestry, fishing, stock-rearing. Employment of children under 12 years is prohibited, and hours are limited for young persons under 16 and for women of any age. These protected persons may be excluded by royal decree from unhealthy industries, and such industries are specified in a decree of 1897 which supersedes other earlier regulations. Hours of employment must not exceed 11 in the 24, and at least one hour for rest must be given between 11 A.M. and 3 P.M., which hour must not be spent in a workroom. Work before 5 A.M. or after 7 P.M., Sunday work, and work on recognized holidays is generally prohibited, but there are exceptions. Overtime from 7 to 10 P.M., under conditions, is allowed for women and young workers, and Sunday work for women, for example, in butter and cheese making, and night work for boys over 14 in certain industries. Employment of women within four weeks of childbirth is prohibited. Notices of working hours must be affixed in workplaces. Underground work in mines is prohibited for women and young persons under 16, but in Holland mining is a very small industry. In 1895 the first legislative provision was made for protection of workers against risk of accident or special injury to health. Sufficient cubic space, lighting, ventilation, sanitary accommodation, reasonable temperature, removal of noxious gases or dust, fencing of machinery, precautions against risk from fire and other matters are provided for. The manufacture of lucifer matches by means of white phosphorus was forbidden and the export, importation and sale was regulated by a law of the 28th of May 1901. By a regulation of the 16th of March 1904 provisions for safety and health of women and young workers were strengthened in processes where lead compounds or other poisons are used, and their employment at certain dangerous machines and in cleaning machinery or near driving belts was prohibited. No penal provision against truck exists in Holland, but possibly abuses of the system are prevented by the existence of industrial councils representing both employers and workers, with powers to mediate or arbitrate in case of disputes.

Switzerland.—In Switzerland separate cantonal legislation prepared the way for the general Federal labour law of 1877 on which subsequent legislation rests. Such legislation is also cantonal as well as Federal, but in the latter there is only amplification or interpretation of the principles contained in the law of 1877, whereas cantonal legislation covers industries not included under the Federal law, *e.g.* single workers employed in a trade (*métier*) and employment in shops, offices and hotels. The Federal law is applied to factories, workshops employing young persons under 18 or more than 10 workers, and workshops in which unhealthy or dangerous processes are carried on. Mines are not included, but are regulated in some respects as regards health and safety by cantonal laws. Further, the Law of Employers' Liability 1881–1887, which requires in all industries precautions against accidents and reports of all serious accidents to the cantonal governments, applies to mines. This led, in 1896, to the creation of a special mining department, and mines, of which there are few, have to be inspected once a year by a mining engineer. The majority of the provisions of the Federal labour law apply to adult workers of both sexes, and the general limit of the 11-hours' day exclusive of at least one hour for meals, applies to men as well as women. The latter have, however, a legal claim, when they have a household to manage, to leave work at the dinner-hour half an hour earlier than the men. Men and unmarried women may be employed in such subsidiary work as cleaning before or after the general legal limits. On Saturdays and eves of the eight public holidays the 11-hours' day is reduced to 10. Sunday work and night work are forbidden, but exceptions are permitted conditionally. Night work is defined as 8 P.M. to 5 A.M. in summer, 8 P.M. to 6 A.M. in winter. Children are excluded from employment in workplaces under the law until 14 years of age, and until 16 must attend continuation schools. Zürich canton has fixed the working day for women at 10 hours generally, and 9 hours on Saturdays and eves of holidays. Bâle-Ville canton has the same limits and provides that the very limited Sunday employment permitted shall be compensated by double time off on another day. In the German-speaking cantons girls under 18 are not permitted to work overtime; in all cantons except Glarus the conditional overtime of 2 hours must be paid for at an enhanced wage.

Sanitary regulations and fencing of machinery are provided for with considerable minuteness in a Federal decree of 1897. The plans of every new factory must be submitted to the cantonal government. In the case of lucifer match factories, not only the building but methods of manufacture must be submitted. Since 1901 the manufacture, sale and import of matches containing white phosphorus have been forbidden. Women must be absent from employment during eight weeks before and after childbirth. In certain dangerous occupations, *e.g.* where lead or lead compounds are in use, women may not legally be employed during pregnancy. A resolution of the federal council in 1901 classed thirty-four different substances in use in industry as dangerous and laid down that in case of clearly defined illness of workers directly caused by use of any of these substances the liability provided by article 3 of the law of the 25th of June 1881, and article 1 of the law of the 26th of April 1887, should apply to the manufacture. Legislative provision against abuses of the truck system appears to be of earlier origin in Switzerland (17th century) than any other European country outside England (15th century). The Federal Labour Law 1877 generally prohibits payment of wages otherwise than in current coin, and provides that no deduction shall be made without an express contract. Some of the cantonal laws go much farther than the British act of 1896 in forbidding certain deductions; *e.g.* Zürich prohibits any charge for cleaning, warming or lighting workrooms or for hire of machinery. By the Federal law fines may not exceed half a day's wage. Administration of the Labour laws is divided between inspectors appointed by the Federal Government and local authorities, under supervision of the cantonal governments. The Federal Government forms a court of appeal against decisions of the cantonal governments.

Germany.—Regulation of the conditions of labour in industry throughout the German empire is provided for in the Imperial Industrial Code and the orders of the Federal Council based thereon. By far the most important recent amendment socially is the law regulating child-labour, dated the 30th of March 1903, which relates to establishments having industrial character in the sense of the Industrial Code. This Code is based on earlier industrial codes of the separate states, but more especially on the Code of 1869 of the North German Confederation. It applies in whole or in part to all trades and industrial occupations, except transport, fisheries and agriculture. Mines are only included so far as truck, Sunday and holiday rest, prohibition of employment underground of female labour, limitation of the hours of women and young workers are concerned; otherwise the regulations for protection of life and limb of miners vary, as do the mining laws of the different states. To estimate the force of the Industrial Code in working, it is necessary to bear in mind the complicated political history of the empire, the separate administration by the federated states, and the generally considerable powers vested in administration of initiating regulations. The Industrial Code expressly retains power for the states to initiate certain additions or exceptions to the Code which in any given state may form part of the law regulating factories there. The Code (unlike the Austrian Industrial Code) lays down no general limit for a normal working day for adult male workers, but since 1891 full powers were given to the Imperial government to limit hours for any classes of workers in industries where excessive length of the working day endangers the health of the worker (R.G.O. § 120*e*). Previously application had been made of powers to reduce the working day in such unhealthy industries as silvering of mirrors by mercury and the manufacture of white-lead. Separate states had, under mining laws, also limited hours of miners. Sunday rest was, in 1891, secured for every class of workers, commercial, industrial and mining. Annual holidays were also secured on church festivals. These provisions, however, are subject to exceptions under conditions. An important distinction has to be shown when we turn to the regulations for hours and times of labour for protected persons (women, young persons and children). Setting aside for the moment hours of shop assistants (which are under special sections since 1900), it is to "factory workers" and not to industrial workers in general that these limits apply, although they may be, and in some instances have been, further extended—for instance, in ready-made clothing trades—by imperial decree to workshops, and by the Child Labour Law of 1903 regulation of the scope and duration of employment of children is much strengthened in workshops, commerce, transport and domestic industries. The term "factory" (*Fabrik*) is not defined in the Code, but it is clear from various decisions of the supreme court that it only in part coincides with the English term, and that some workplaces, where processes are carried on by aid of mechanical power, rank rather as English workshops. The distinction is rather between wholesale manufacturing industry, with subdivision of labour, and small industry, where the employer works himself. Certain classes of undertaking, viz. forges, timber-yards, dockyards, brickfields and open quarries, are specifically ranked as factories. Employment of protected persons at the surface of mines and underground quarries, and in salt works and ore-dressing works, and of boys underground comes under the factory regulations. These exclude children from employment under 13 years, and even later if an educational certificate has not been obtained; until 14 years hours of employment may not exceed 6 in the 24. In processes and occupations under the scope of the Child Labour Law children may not be employed by their parents or guardians before 10 years of age or by other employers before 12 years of age; nor between the hours of 8 P.M. and 8 A.M., nor otherwise than in full compliance with requirements of educational authorities for school attendance and with due regard to prescribed pauses. In school term time the daily limit of employment for children is three hours, in holiday time three hours. As regards factories Germany, unlike Great Britain, France and Switzerland, requires a shorter day for young persons than for women—10 hours for the former, 11 hours for the latter. Women over 16 years may be employed 11 hours. Night work is forbidden, *i.e.* work between 8.30 P.M. and 5.30 A.M. Overtime may be granted to meet unforeseen pressure or for work on perishable articles, under conditions, by local authorities and the higher administrative authorities. Prescribed meal-times are—an unbroken half-hour for children in their 6 hours; for young persons a mid-day pause of one hour, and half an hour respectively in the morning and afternoon spells; for women, an hour at mid-day, but women with the care of a household have the claim, on demand, to an extra half-hour, as in Switzerland. No woman may be employed within four weeks after childbirth, and unless a medical certificate can then be produced, the absence must extend to six weeks. Notice of working periods and meal-times must be affixed, and copies sent to the local authorities. Employment of protected persons in factory industries where there are special risks to health or morality may be forbidden or made dependent on special conditions. By the Child Labour Law employment of children is forbidden in brickworks, stone breaking, chimney sweeping, street cleaning and other processes and occupations. By an order of the Federal Council in 1902 female workers were excluded from main processes in forges and rolling mills. All industrial employers alike are bound to organize labour in such a manner as to secure workers against injury to health and to ensure good conduct and propriety. Sufficient light, suitable cloakrooms and sanitary accommodation, and ventilation to carry off dust, vapours and other impurities are especially required. Dining-rooms may be ordered by local authorities. Fencing and provision for safety in case of fire are required in detail. The work of the trade accident insurance associations in preventing accidents is especially recognized in provisions for special rules in dangerous or unhealthy industries. Officials of the state factory departments are bound to give opportunity to trustees of the trade associations to express an opinion on special rules. In a large number of industries the Federal Council has laid down special rules comparable with those for unhealthy occupations in Great Britain. Among the regulations most recently revised and strengthened are those for manufacture of lead colours and lead compounds, and for horse-hair and brush-making factories. The relations between the state inspectors of factories and the ordinary police authorities are regulated in each state by its constitution. Prohibitions of truck in its original sense—that is, payment of wages otherwise than in current coin—apply to any persons under a contract of service with an employer for a specified time for industrial purposes; members of a family working for a parent or husband are not included; outworkers are covered. Control of fines and deductions from wages applies only in factory industries and shops employing at least 20 workers. Shop hours are regulated by requiring shops to be closed generally between 9 P.M. and 5 A.M., by requiring a fixed mid-day rest of 1½ hours and at least 10 hours' rest in the 24 for assistants. These limits can be modified by administrative authority. Notice of hours and working rules must be affixed. During the hours of compulsory closing sale of goods on the streets or from house to house is forbidden. Under the Commercial Code, as under the Civil Code, every employer is bound to adopt every possible measure for maintaining the safety, health and good conduct of his employés. By an order of the Imperial Chancellor under the Commercial Code seats must be provided for commercial assistants and apprentices.

Austria.—The Industrial Code of Austria, which in its present outline (modified by later enactments) dates from 1883, must be carefully distinguished from the Industrial Code of the kingdom of Hungary. The latter is, owing to the predominantly agricultural character of the population, of later origin, and hardly had practical force before the law of 1893 provided for inspection and prevention of accidents in factories. No separate mining code exists in Hungary, and conditions of labour are regulated by the Austrian law of 1854. The truck system is repressed on lines similar to those in Austria and Germany. As regards limitation of hours of adult labour, Hungary may be contrasted with both those empires in that no restriction of hours applies either to men's or women's hours, whereas in Austrian factories both are limited to an 11-hours' day with exceptional overtime for which payment must always be made to the worker. The Austrian Code has its origin, however, like the British Factory Acts, in protection of child labour. Its present scope is determined by the Imperial "Patent" of 1859, and all industrial labour is included except mining, transport, fisheries, forestry, agriculture and domestic industries. Factories are defined as including industries in which a "manufacturing process is carried on in an enclosed place by the aid of not less than twenty workers working with machines, with subdivision of labour, and under an employer who does not himself manually assist in the work." In smaller handicraft industries the compulsory gild system of organization still applies. In every industrial establishment, large or small, the sanitary and safety provisions, general requirement of Sunday rest, and annual holidays (with conditional exceptions), prohibition of truck and limitation of the ages of child labour apply. Night work for women, 8 P.M. to 5 A.M., is prohibited only in factory industries; for young workers it is prohibited in any industry. Pauses in work are required in all industries; one hour at least must be given at mid-day, and if the morning and afternoon spells exceed 5 hours each, another half-hour's rest at least must be given. Children may not be employed in industrial work before 12 years, and then only 8 hours a day at work that is not injurious and if educational requirements are observed. The age of employment is raised to 14 for "factories," and the work must be such as will not hinder physical development. Women may not be employed in regular industrial occupation within one month after childbirth. In certain scheduled unhealthy industries, where certificates of authorization from local authorities must be obtained by intending occupiers, conditions of health and safety for workers can be laid down in the certificate. The Minister of the Interior is empowered to draw up regulations prohibiting or making conditions for the employment of young workers or women in dangerous or unhealthy industries. The provisions against truck cover not only all industrial workers engaged in manual labour under a contract with an employer, but also shop-assistants; the special regulations against fines and deductions apply to factory workers and shops where at least 20 workers are employed. In mines under the law of 1884, which supplements the general mining law, employment of women and girls underground is prohibited; boys from 12 to 16 and girls from 12 to 18 may only be employed at light work above ground; 14 is the earliest age of admission for boys underground. The shifts from bank to bank must not exceed 12 hours, of which not more than 10 may be effective work. Sunday rest must begin not later than 6 A.M., and must be of 24 hours' duration. These last two provisions do not hold in case of pressing danger for safety, health or property. Sick and accident funds and mining associations are legislated for in minutest detail. The general law provides for safety in working, but special rules drawn up by the district authorities lay down in detail the conditions of health and safety. As regards manufacturing industry, the Industrial Code lays no obligation on employers to report accidents, and until the Accident Insurance Law of 1889 came into force no statistics were available. In Austria, unlike Germany, the factory inspectorate is organized throughout under a central chief inspector.

Scandinavian Countries.—In Sweden the Factory Law was amended in January 1901; in Denmark in July 1901. Until that year, however, Norway was in some respects in advance of the other two countries by its law of 1892, which applied to industrial works, including metal works of all kinds and mining. Women were thereby prohibited from employment: (*a*) underground; (*b*) in cleaning or oiling machinery in motion; (*c*) during six weeks after childbirth, unless provided with a medical certificate stating that they might return at the end of four weeks without injury to health; (*d*) in dangerous, unhealthy or exhausting trades during pregnancy. Further, work on Sundays and public holidays is prohibited to all workers, adult and youthful, with conditional exceptions under the authority of the inspectors. Children over 12 are admitted to industrial work on obtaining certificates of birth, of physical fitness and of elementary education. The hours of children are limited to 6, with pauses, and of young persons (of 14 to 18 years) to 10, with pauses. Night work between 8 P.M. and 6 A.M. is prohibited. All workers are entitled to a copy of a code of factory rules containing the terms of the contract of work drawn up by representatives of employés with the employers and sanctioned by the inspector. Health and safety in working are provided for in detail in the same law of 1892. Special rules may be made for dangerous trades, and in 1899 such rules were established for match factories, similar to some of the British rules, but notably providing for a dental examination four times yearly by a doctor. In Denmark, regulation began with unhealthy industries, and it was not until the law of 1901 came into force, on the 1st of January 1902, that children under 12 years have been excluded from factory labour. Control of child labour can be strengthened by municipal regulation, and this has been done in Copenhagen by an order of the 23rd of May 1903. In Sweden the 12 years' limit had for some time held in the larger factories; the scope has been extended so that it corresponds with the Norwegian law. The hours of children are, in Denmark, 6½ for those under 14 years; in Sweden 6 for those under 13 years. Young persons may not in either country work more than 10 hours daily, and night work, which is forbidden for persons under 18 years, is now defined as in Norway. Women may not be employed in industry within four weeks of childbirth, except on authority of a medical certificate. All factories in Sweden where young workers are employed are subject to medical inspection once a year. Fencing of machinery and hygienic conditions (ventilation, cubic space, temperature, light) are regulated in detail. In Denmark the use of white phosphorus in manufacture of lucifer matches has been prohibited since 1874, and special regulations have been drawn up by administrative orders which strengthen control of various unhealthy or dangerous industries, *e.g.* dry-cleaning works, printing works and type foundries, iron foundries and engineering works. A special act of the 6th of April 1906 regulates labour and sanitary conditions in bakehouses and confectionery works.

Italy and Spain.—The wide difference between the industrial development of these southern Latin countries and the two countries with which this summary begins, and the far greater importance of the agricultural interests, produced a situation, as regards labour legislation until as recently as 1903, which makes it convenient to touch on the comparatively limited scope of their regulations at the close of the series. It was stated by competent and impartial observers from each of the two countries, at the International Congress on Labour Laws held at Brussels in 1897, that the lack of adequate measures for protection of child labour and inefficient administration of such regulations as exist was then responsible for abuse of their forces that could be found in no other European countries. "Their labour in factories, workshops, and mines constitutes a veritable martyrdom" (Spain). "I believe that there is no country where a sacrifice of child life is made that is comparable with that in certain Italian factories and industries" (Italy). In both countries important progress has since been made in organizing inspection and preventing accidents. In Spain the first step in the direction of limitation of women's hours of labour was taken by a law of 1900, which took effect in 1902, in regulations for reduction of hours of labour for adults to 11, normally, in the 24. Hours of children under 14 must not exceed 6 in any industrial work nor 8 in any commercial undertaking. Labour before the age of 10 years and night work between 6 P.M. and 5 A.M. was prohibited, and powers were taken to extend the prohibition of night work to young persons under 16 years. The labour of children in Italy was until 1902 regulated in the main by a law of 1886, but a royal decree of 1899 strengthened it by classing night work for children under 12 years as "injurious," such work being thereby generally prohibited for them, though exceptions are admitted; at the same time it was laid down that children from 12 to 15 years might not be employed for more than 6 hours at night. The law of 1886 prohibits employment of children under 9 years in industry and under 10 years in underground mining. Night work for women was in Italy first prohibited by the law of the 19th of June 1902, and at the same time also for boys under 15, but this regulation was not to take full effect for 5 years as regards persons already so employed; by the same law persons under 15 and women of any age were accorded the claim to one day's complete rest of 24 hours in the week; the age of employment of children in factories, workshops, laboratories, quarries, mines, was raised to 12 years generally and 14 years for underground work; the labour of female workers of any age was prohibited in underground work, and power was reserved to further restrict and regulate their employment as well as that of male workers under 15. Spain and Italy, the former by the law of the 13th of March 1900, the latter by the law of the 19th of June 1902, prohibit the employment of women within a fixed period of childbirth; in Spain the limit is three weeks, in Italy one month, which may be reduced to three weeks on a medical certificate of fitness. Sunday rest is secured in industrial works, with regulated exceptions in Spain by the law of the 3rd of March 1904. It is in the direction of fencing and other safeguards against accidents and as regards sanitary provisions, both in industrial workplaces and in mines, that Italy has made most advance since her law of 1890 for prevention of accidents. Special measures for prevention of malaria are required in cultivation of rice by a ministerial circular of the 23rd of April 1903; work may not begin until an hour after sunrise and must cease an hour before sunset; children under 13 may not be employed in this industry. (A. M. An.)

IV. United States

History.

Under the general head of Labour Legislation all American statute laws regulating labour, its conditions, and the relation of employer and employé must be classed. It includes what is properly known as factory legislation. Labour legislation belongs to the latter half of the 19th century, so far as the United States is concerned. Like England in the far past, the Americans in colonial days undertook to regulate wages and prices, and later the employment of apprentices. Legislation relating to wages and prices was long ago abandoned, but the laws affecting the employment of apprentices still exist in some form, although conditions of employment have changed so materially that apprenticeships are not entered as of old; but the laws regulating the employment of apprentices were the basis on which English legislation found a foothold when parliament wished to regulate the labour of factory operatives. The code of labour laws of the present time is almost entirely the result of the industrial revolution during the latter part of the 18th century, under which the domestic or hand-labour system was displaced through the introduction of power machinery. As this revolution took place in the United States at a somewhat later date than in England, the labour legislation necessitated by it belongs to a later date. The factory, so far as textiles are concerned, was firmly established in America during the period from 1820 to 1840, and it was natural that the English legislation found friends and advocates in the United States, although the more objectionable conditions accompanying the English factory were not to be found there.

Early attempts to regulate hours.

The first attempt to secure legislation regulating factory employment related to the hours of labour, which were very long—from twelve to thirteen hours a day. As machinery was introduced it was felt that the tension resulting from speeded machines and the close attention required in the factory ought to be accompanied by a shorter work-day. This view took firm hold of the operatives, and was the chief cause of the agitation which has resulted in a great body of laws applying in very many directions. As early as 1806 the caulkers and shipbuilders of New York City agitated for a reduction of hours to ten per day, but no legislation followed. There were several other attempts to secure some regulation relative to hours, but there was no general agitation prior to 1831. As Massachusetts was the state which first recognized the necessity of regulating employment (following in a measure, and so far as conditions demanded, the English labour or factory legislation), the history of such legislation in that state is indicative of that in the United States, and as it would be impossible in this article to give a detailed history of the origin of laws in the different states, the dates of their enactment, and their provisions, it is best to follow primarily the course of the Eastern states, and especially that of Massachusetts, where the first general agitation took place and the first laws were enacted. That state in 1836 regulated by law the question of the education of young persons employed in manufacturing establishments. The regulation of hours of labour was warmly discussed in 1832, and several legislative committees and commissions reported upon it, but no specific action on the general question of hours of labour secured the indorsement of the Massachusetts legislature until 1874, although the day's labour of children under twelve years of age was limited to ten hours in 1842. Ten hours constituted a day's labour, on a voluntary basis, in many trades in Massachusetts and other parts of the country as early as 1853, while in the shipbuilding trades this was the work-day in 1844. In April 1840 President Van Buren issued an order "that all public establishments will hereafter be regulated, as to working hours, by the ten-hours system." The real aggressive movement began in 1845, through numerous petitions to the Massachusetts legislature urging a reduction of the day's labour to eleven hours, but nothing came of these petitions at that time. Again, in 1850, a similar effort was made, and also in 1851 and 1852, but the bills failed. Then there was a period of quiet until 1865, when an unpaid commission made a report relative to the hours of labour, and recommended the establishment of a bureau of statistics for the purpose of collecting data bearing upon the labour question. This was the first step in this direction in any country. The first bureau of the kind was established in Massachusetts in 1869, but meanwhile, in accordance with reports of commissions and the address of Governor Bullock in 1866, and the general sentiment which then prevailed, the legislature passed an act regulating in a measure the conditions of the employment of children in manufacturing establishments; and this is one of the first laws of the kind in the United States, although the first legislation in the United States relating to the hours of labour which the writer has been able to find, and for which he can fix a date, was enacted by the state of Pennsylvania in 1849, the law providing that ten hours should be a day's work in cotton, woollen, paper, bagging, silk and flax factories.

Employment of children.

The Massachusetts law of 1866 provided, firstly, that no child under ten should be employed in any manufacturing establishment, and that no child between ten and fourteen should be so employed unless he had attended some public or private school at least six months during the year preceding such employment, and, further, that such employment should not continue unless the child attended school at least six months in each and every year; secondly, a penalty not exceeding $50 for every owner or agent or other person knowingly employing a child in violation of the act; thirdly, that no child under the age of fourteen should be employed in any manufacturing establishment more than eight hours in any one day; fourthly, that any parent or guardian allowing or consenting to employment in violation of the act should forfeit a sum not to exceed $50 for each offence; fifthly, that the Governor instruct the state constable and his deputies to enforce the provisions of all laws for regulating the employment of children in manufacturing establishments. The same legislature also created a commission of three persons, whose duty it was to investigate the subject of hours of labour in relation to the social, educational and sanitary condition of the working classes. In 1867 a fundamental law relating to schooling and hours of labour of children employed in manufacturing and mechanical establishments was passed by the Massachusetts legislature. It differed from the act of the year previous in some respects, going deeper into the general question. It provided that no child under ten should be employed in any manufacturing or mechanical establishment of the commonwealth, and that no child between ten and fifteen should be so employed unless he had attended school, public or private, at least three months during the year next preceding his employment. There were provisions relating to residence, &c., and a further provision that no time less than 120 half-days of actual schooling should be deemed an equivalent of three months, and that no child under fifteen should be employed in any manufacturing or mechanical establishment more than sixty hours any one week. The law also provided penalties for violation. It repealed the act of 1866.

In 1869 began the establishment of that chain of offices in the United States, the principle of which has been adopted by other countries, known as bureaus of statistics of labour, their especial purpose being the collection and dissemination of information relating to all features of industrial employment. As a result of the success of the first bureau, bureaus are in existence in thirty-three states, in addition to the United States Bureau of Labour.

A special piece of legislation which belongs to the commonwealth of Massachusetts, so far as experience shows, was that in 1872, providing for cheap morning and evening trains for the accommodation of working men living in the vicinity of Boston. Great Britain had long had such trains, which were called parliamentary trains. Under the Massachusetts law some of the railways running out of Boston furnished the accommodation required, and the system has since been in operation.

Factory legislation, 1877.

In different parts of the country the agitation to secure legislation regulating the hours of labour became aggressive again in 1870 and the years immediately following, there being a constant repetition of attempts to secure the enactment of a ten-hours law, but in Massachusetts all the petitions failed till 1874, when the legislature of that commonwealth established the hours of labour at sixty per week not only for children under eighteen, but for women, the law providing that no minor under eighteen and no woman over that age should be employed by any person, firm or corporation in any manufacturing establishment more than ten hours in any one day. In 1876 Massachusetts reconstructed its laws relating to the employment of children, although it did not abrogate the principles involved in earlier legislation, while in 1877 the commonwealth passed Factory Acts covering the general provisions of the British laws. It provided for the general inspection of factories and public buildings, the provisions of the law relating to dangerous machinery, such as belting, shafting, gearing, drums, &c., which the legislature insisted must be securely guarded, and that no machinery other than steam engines should be cleaned while running. The question of ventilation and cleanliness was also attended to. Dangers connected with hoistways, elevators and well-holes were minimized by their protection by sufficient trap-doors, while fire-escapes were made obligatory on all establishments of three or more storeys in height. All main doors, both inside and outside, of manufacturing establishments, as well as those of churches, school-rooms, town halls, theatres and every building used for public assemblies, should open outwardly whenever the factory inspectors of the commonwealth deemed it necessary. These provisions remain in the laws of Massachusetts, and other states have found it wise to follow them.

The labour legislation in force in 1910 in the various states of the Union might be classified in two general branches: (A) protective labour legislation, or laws for the aid of workers who, on account of their economic dependence, are not in a position fully to protect themselves; (B) legislation having for its purpose the fixing of the legal status of the worker as an employé, such as laws relating to the making and breaking of the labour contract, the right to form organizations and to assemble peaceably, the settlement of labour disputes, the licensing of occupations, &c.

Factory and workshop acts.

(A) The first class includes factory and workshop acts, laws relating to hours of labour, work on Sundays and holidays, the payment of wages, the liability of employers for injuries to their employés, &c. Factory acts have been passed by nearly all the states of the Union. These may be considered in two groups—first, laws which relate to conditions of employment and affect only children, young persons and women; and second, laws which relate to the sanitary condition of factories and workshops and to the safety of employés generally. The states adopting such laws have usually made provision for factory inspectors, whose duties are to enforce these laws and who have power to enter and inspect factories and workshops. The most common provisions of the factory acts in the various states are those which fix an age limit below which employment is unlawful. All but five states have enacted such provisions, and these five states have practically no manufacturing industries. In some states the laws fixing an age limit are restricted in their application to factories, while in others they extend also to workshops, bakeries, mercantile establishments and other work places where children are employed. The prescribed age limit varies from ten to fourteen years. Provisions concerning the education of children in factories and workshops may be considered in two groups, those relating to apprenticeship and those requiring a certain educational qualification as a pre-requisite to employment. Apprenticeship laws are numerous, but they do not now have great force, because of the practical abrogation of the apprenticeship system through the operation of modern methods of production. Most states have provisions prohibiting illiterates under a specified age, usually sixteen, from being employed in factories and workshops. The provisions of the factory acts relating to hours of labour and night work generally affect only the employment of women and young persons. Most of the states have enacted such provisions, those limiting the hours of children occurring more frequently than those limiting the hours of women. The hour limit for work in such cases ranges from six per day to sixty-six per week. Where the working time of children is restricted, the minimum age prescribed for such children ranges from twelve to twenty-one years. In some cases the restriction of the hours of labour of women and children is general, while in others it applies only to employment in one or more classes of industries. Other provisions of law for the protection of women and children, but not usually confined in their operation to factories and workshops, are such as require seats for females and separate toilet facilities for the sexes, and prohibit employment in certain occupations as in mines, places where intoxicants are manufactured or sold, in cleaning or operating dangerous machinery, &c. Provisions of factory acts relating to the sanitary condition of factories and workshops and the safety of employés have been enacted in nearly all the manufacturing states of the Union. They prohibit overcrowding, and require proper ventilation, sufficient light and heat, the lime-washing or painting of walls and ceilings, the provision of exhaust fans and blowers in places where dust or dangerous fumes are generated, guards on machinery, mechanical belts and gearing shifters, guards on elevators and hoistways, hand-rails on stairs, fire-escapes, &c.

Hours of labour.

The statutes relating to hours of labour may be considered under five groups, namely: (1) general laws which merely fix what shall be regarded as a day's labour in the absence of a contract; (2) laws defining what shall constitute a day's work on public roads; (3) laws limiting the hours of labour per day on public works; (4) laws limiting the hours of labour in certain occupations; and (5) laws which specify the hours per day or per week during which women and children may be employed. The statutes included in the first two groups place no restrictions upon the number of hours which may be agreed upon between employers and employés, while those in the other three groups usually limit the freedom of contract and provide penalties for their violation. A considerable number of states have enacted laws which fix a day's labour in the absence of any contract, some at eight and others at ten hours, so that when an employer and an employé make a contract and they do not specify what shall constitute a day's labour, eight or ten hours respectively would be ruled as the day's labour in an action which might come before the courts. In a number of the states it is optional with the citizens to liquidate certain taxes either by cash payments or by rendering personal service. In the latter case the length of the working day is defined by law, eight hours being usually specified. The Federal government and nearly one-half of the states have laws providing that eight hours shall constitute a day's work for employés on public works. Under the Federal Act it is unlawful for any officer of the government or of any contractor or subcontractor for public works to permit labourers and mechanics to work longer than eight hours per day. The state laws concerning hours of labour have similar provisions. Exceptions are provided for cases of extraordinary emergencies, such as danger to human life or property. In many states the hours of labour have been limited by law in occupations in which, on account of their dangerous or insanitary character, the health of the employés would be jeopardized by long hours of labour, or in which the fatigue occasioned by long hours would endanger the lives of the employés or of the public. The occupations for which such special legislation has been enacted are those of employés on steam and street railways, in mines and other underground workings, smelting and refining works, bakeries and cotton and woollen mills. Laws limiting the hours of labour of women and children have been considered under factory and workshop acts.

Sunday labour.

Nearly all states and Territories of the Union have laws prohibiting the employment of labour on Sunday. These laws usually make it a misdemeanour for persons either to labour themselves or to compel or permit their apprentices, servants or other employés, to labour on the first day of the week. Exceptions are made in the case of household duties or works of necessity or charity, and in the case of members of religious societies who observe some other than the first day of the week.

Payment of wages.

Statutes concerning the payment of wages of employés may be considered in two groups: (1) those which relate to the employment contract, such as laws fixing the maximum period of wage payments, prohibiting the payment of wages in scrip or other evidences of indebtedness in lieu of lawful money, prohibiting wage deductions on account of fines, breakage of machinery, discounts for prepayments, medical attendance, relief funds or other purposes, requiring the giving of notice of reduction of wages, &c.; (2) legislation granting certain privileges or affording special protection to working people with respect to their wages, such as laws exempting wages from attachment, preferring wage claims in assignments, and granting workmen liens upon buildings and other constructions on which they have been employed.

Employers' liability.

Employers' liability laws have been passed to enable an employé to recover damages from his employer under certain conditions when he has been injured through accident occurring in the works of the employer. The common-law maxim that the principal is responsible for the acts of his agent does not apply where two or more persons are working together under the same employer and one of the employés is injured through the carelessness of his fellow-employé, although the one causing the accident is the agent of the principal, who under the common law would be responsible. The old Roman law and the English and American practice under it held that the co-employé was a party to the accident. The injustice of this rule is seen by a single illustration. A weaver in a cotton factory, where there are hundreds of operatives, is injured by the neglect or carelessness of the engineer in charge of the motive power. Under the common law the weaver could not recover damages from the employer, because he was the co-employé of the engineer. So, one of thousands of employés of a railway system, sustaining injuries through the carelessness of a switchman whom he never saw, could recover no damages from the railway company, both being co-employés of the same employer. The injustice of this application of the common-law rule has been recognized, but the only way to avoid the difficulty was through specific legislation providing that under such conditions as those related, and similar ones, the doctrine of co-employment should not apply, and that the workman should have the same right to recover damages as a passenger upon a railway train. This legislation has upset some of the most notable distinctions of law.

The first agitation for legislation of this character occurred in England in 1880. A number of states in the Union have now enacted statutes fixing the liability of employers under certain conditions and relieving the employé from the application of the common-law rule. Where the employé himself is contributory to the injuries resulting from an accident he cannot recover, nor can he recover in some cases where he knows of the danger from the defects of tools or implements employed by him. The legislation upon the subject involves many features of legislation which need not be described here, such as those concerning the power of employés to make a contract, and those defining the conditions, often elaborate, which lead to the liability of the employer and the duties of the employé, and the relations in which damages for injuries sustained in employment may be recovered from the employer.

(B) The statutes thus far considered may be regarded as protective labour legislation. There is, besides, a large body of statutory laws enacted in the various states for the purpose of fixing the legal status of employers and employés and defining their rights and privileges as such.

Labour contract.

A great variety of statutes have been enacted in the various states relating to the labour contract. Among these are laws defining the labour contract, requiring notice of termination of contract, making it a misdemeanour to break a contract of service and thereby endanger human life or expose valuable property to serious injury, or to make a contract of service and accept transportation or pecuniary advancements with intent to defraud, prohibiting contracts of employment whereby employés waive the right to damages in case of injury, &c. A Federal statute makes it a misdemeanour for any one to prepay the transportation or in any way assist or encourage the importation of aliens under contract to perform labour or service of any kind in the United States, exceptions being made in the case of skilled labour that cannot otherwise be obtained, domestic servants and persons belonging to any of the recognized professions.

Licensed occupations.

The Federal government and nearly all the states and territories have statutory provisions requiring the examination and licensing of persons practising certain trades other than those in the class of recognized professions. The Federal statute relates only to engineers on steam vessels, masters, mates, pilots, &c. The occupations for which examinations and licences are required by the various state laws are those of barbers, horseshoers, elevator operators, plumbers, stationary firemen, steam engineers, telegraph operators on railroads and certain classes of mine workers and steam and street railway employés.

Labour organizations.

The right of combination and peaceable assembly on the part of employés is recognized at common law throughout the United States. Organizations of working-men formed for their mutual benefit, protection and improvement, such as for endeavouring to secure higher wages, shorter hours of labour or better working conditions, are nowhere regarded as unlawful. A number of states and the Federal government have enacted statutes providing for the incorporation of trade unions, but owing to the freedom from regulation or inspection enjoyed by unincorporated trade unions, very few have availed themselves of this privilege. A number of states have enacted laws tending to give special protection to and encourage trade unions. Thus, nearly one-half of the states have passed acts declaring it unlawful for employers to discharge workmen for joining labour organizations, or to make it a condition of employment that they shall not belong to such bodies. Laws of this kind have generally been held to be unconstitutional. Nearly all the states have laws protecting trade unions in the use of the union label, insignia of membership, credentials, &c., and making it a misdemeanour to counterfeit or fraudulently use them. A number of the states exempt labour organizations from the operations of the anti-trust and insurance acts.

Labour disputes.

Until recent years all legal action concerning labour disturbances was based upon the principles of the common law. Some of the states have now fairly complete statutory enactments concerning labour disturbances, while others have little or no legislation of this class. The right of employés to strike for any cause or for no cause is sustained by the common law everywhere in the United States. Likewise an employer has a right to discharge any or all of his employés when they have no contract with him, and he may refuse to employ any person or class of persons for any reason or for no reason. Agreements among strikers to take peaceable means to induce others to remain away from the works of an employer until he yields to the demands of the strikers are not held to be conspiracies under the common law, and the carrying out of such a purpose by peaceable persuasion and without violence, intimidation or threats, is not unlawful. However, any interference with the constitutional rights of another to employ whom he chooses or to labour when, where or on what terms he pleases, is illegal. The boycott has been held to be an illegal conspiracy in restraint of trade. The statutory enactments of the various states concerning labour disturbances are in part re-enactments of the rules of common law and in part more or less departures from or additions to the established principles. The list of such statutory enactments is a large one, and includes laws relating to blacklisting, boycotting, conspiracy against working-men, interference with employment, intimidation, picketing and strikes of railway employés; laws requiring statements of causes of discharge of employés and notice of strikes in advertisements for labour; laws prohibiting deception in the employment of labour and the hiring of armed guards by employers; and laws declaring that certain labour agreements do not constitute conspiracy. Some of these laws have been held to be unconstitutional, and some have not yet been tested in the courts.

Arbitration and conciliation.

The laws just treated relate almost entirely to acts either of employers or of employés, but there is another form of law, namely, that providing for action to be taken by others in the effort to prevent working people from losing employment, either by their own acts or by those of their employers, or to settle any differences which arise out of controversies relating to wages, hours of labour, terms and conditions of employment, rules, &c. These laws provide for the mediation and the arbitration of labour disputes (see ARBITRATION AND CONCILIATION). Twenty-three states and the Federal government have laws or constitutional provisions of this nature. In some cases they provide for the appointment of state boards, and in others of local boards only. A number of states provide for local or special boards in addition to the regular state boards. In some states it is required that a member of a labour organization must be a member of the board, and, in general, both employers and employés must be represented. Nearly all state boards are required to attempt to mediate between the parties to a dispute when information is received of an actual or threatened labour trouble. Arbitration may be undertaken in some states on application from either party, in others on the application of both parties. An agreement to maintain the *status quo* pending arbitration is usually required. The modes of enforcement of obedience to the awards of the boards are various. Some states depend on publicity alone, some give the decisions the effect of judgments of courts of law which may be enforced by execution, while in other states disobedience to such decisions is punishable as for contempt of court. The Federal statute applies only to common carriers engaged in interstate commerce, and provides for an attempt to be made at mediation by two designated government officials in controversies between common carriers and their employés, and, in case of the failure of such an attempt, for the formation of a board of arbitration consisting of the same officials together with certain other parties to be selected. Such arbitration boards are to be formed only at the request or upon the consent of both parties to the controversy.

The judicial enforcement of labour laws.

The enforcement of laws by executive or judicial action is an important matter relating to labour legislation, for without action such laws would remain dead letters. Under the constitutions of the states, the governor is the commander-in-chief of the military forces, and he has the power to order the militia or any part of it into active service in case of insurrection, invasion, tumult, riots or breaches of the peace or imminent danger thereof. Frequent action has been taken in the case of strikes with the view of preventing or suppressing violence threatened or happening to persons or property, the effect being, however, that the militia protects those working or desiring to work, or the employers. The president of the United States may use the land and naval forces whenever by reason of insurrection, domestic violence, unlawful obstructions, conspiracy, combinations or assemblages of persons it becomes impracticable to enforce the laws of the land by the ordinary course of judicial proceedings, or when the execution of the laws is so hindered by reason of such events that any portion or class of the people are deprived thereby of their rights and privileges under the constitution and laws of the country. Under this general power the United States forces have been used for the protection of both employers and employés indirectly, the purpose being to protect mails and, as in the states, to see that the laws are carried out.

The power of the courts to interfere in labour disputes is through the injunction and punishment thereunder for contempt of court. It is a principle of law that when there are interferences, actual or threatened, with property or with rights of a pecuniary nature, and the common or statute law offers no adequate and immediate remedy for the prevention of injury, a court of equity may interpose and issue its order or injunction as to what must or must not be done, a violation of which writ gives the court which issued it the power to punish for contempt. The doctrine is that something is necessary to be done to stop at once the destruction of property and the obstruction of business, and the injunction is immediate in its action. This writ has been resorted to frequently for the indirect protection of employés and of employers. (C. D. W.)

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LABOUR PARTY, in Great Britain, the name given to the party in parliament composed of working-class representatives. As the result of the Reform Act of 1884, extending the franchise to a larger new working-class electorate, the votes of "labour" became more and more a matter of importance for politicians; and the Liberal party, seeking for the support of organized labour in the trade unions, found room for a few working-class representatives, who, however, acted and voted as Liberals. It was not till 1893 that the Independent Labour party, splitting off under Mr J. Keir Hardie (b. 1856) from the socialist organization known as the Social Democratic Federation (founded 1881), was formed at Bradford, with the object of getting independent candidates returned to parliament on a socialist programme. In 1900 Mr Keir Hardie, who as secretary of the Lanarkshire Miners' Union had stood unsuccessfully as a labour candidate for Mid-Lanark in 1888, and sat as M.P. for West Ham in 1892–1895, was elected to parliament for Merthyr-Tydvil by its efforts, and in 1906 it obtained the return of 30 members, Mr Keir Hardie being chairman of the group. Meanwhile in 1899 the Trade Union Congress instructed its parliamentary committee to call a conference on the question of labour representation; and in February 1900 this was attended by trade union delegates and also by representatives of the Independent Labour party, the Social Democratic Federation and the Fabian Society. A resolution was carried "to establish a distinct labour group in parliament, who shall have their own whips, and agree upon their own policy, which must embrace a readiness to co-operate with any party which for the time being may be engaged in promoting legislation in the direct interest of labour," and the committee (the Labour Representation Committee) was elected for the purpose. Under their auspices 29 out of 51 candidates were returned at the election of 1906. These groups were distinct from the Labour members ("Lib.-Labs") who obeyed the Liberal whips and acted with the Liberals. In 1908 the attempts to unite the parliamentary representatives of the Independent Labour party with the Trades Union members were successful. In June of that year the Miners' Federation, returning 15 members, joined the Independent Labour party, now known for parliamentary purposes as the "Labour Party"; other Trades Unions, such as the Amalgamated Society of Railway Servants, took the same step. This arrangement came into force at the general election of 1910, when the bulk of the miners' representatives signed the constitution of the Labour party, which after the election numbered 40 members of parliament.

LABRADOR,[1] a great peninsula in British North America, bounded E. by the North Atlantic, N. by Hudson Strait, W. by Hudson and James Bays, and S. by an arbitrary line extending eastwards from the south-east corner of Hudson Bay, near 51° N., to the mouth of the Moisie river, on the Gulf of St Lawrence, in 50° N., and thence eastwards by the Gulf of St Lawrence. It extends from 50° to 63° N., and from 55° to 80° W., and embraces an approximate area of 511,000 sq. m. Recent explorations and surveys have added greatly to the knowledge of this vast region, and have shown that much of the peninsula is not a land of "awful desolation," but a well-wooded country, containing latent resources of value in its forests, fisheries and minerals.

Physical Geography.—Labrador forms the eastern limb of the V in the Archaean protaxis of North America (see Canada), and includes most of the highest parts of that area. Along some portions of the coasts of Hudson and also of Ungava Bay there is a fringe of lowland, but most of the interior is a plateau rising toward the south and east. The highest portion extends east and west between 52° and 54° N., where an immense granite area lies between the headwaters of the larger rivers of the four principal drainage basins; the lowest area is between Hudson Bay and Ungava Bay in the north-west, where the general level is not more than 500 ft. above the sea. The only mountains are the range along the Atlantic coast, extending from the Strait of Belle Isle to Cape Chidley; in their southern half they rarely exceed 1500 ft., but increase in the northern half to a general elevation of upwards of 2000 ft., with numerous sharp peaks between 3000 and 5000 ft., some say 7000 or 8000 ft. The coasts are deeply indented by irregular bays and fringed with rocky islands, especially along the high Atlantic coast, where long narrow fiords penetrate inland. Hamilton Inlet, 250 m. north of the Strait of Belle Isle, is the longest of these bays, with a length of 150 m. and a breadth varying from 2 to 30 m. The surface of the outer portions of the plateau is deeply seamed by valleys, cut into the crystalline rocks by the natural erosion of rivers, depending for their length and depth upon the volume of water flowing through them. The valley of the Hamilton river is the greatest, forms a continuation of the valley of the Inlet and extends 300 m. farther inland, while its bottom lies from 500 to 1500 ft. below the surface of the plateau into which it is cut. The depressions between the low ridges of the interior are occupied by innumerable lakes, many of great size, including Mistassini, Mishikamau, Clearwater, Kaniapiskau and Seal, all from 50 to 100 m. long. The streams discharging these lakes, before entering their valleys, flow on a level with the country and occupy all depressions, so that they frequently spread out into lake-expansions and are often divided into numerous channels by large islands. The descent into the valleys is usually abrupt, being made by heavy rapids and falls; the Hamilton, from the level interior, in a course of 12 m. falls 760 ft. into the head of its valley, this descent including a sheer drop of 315 ft. at the Grand Falls, which, taken with the large volume of the river, makes it the greatest fall in North America. The rivers of the northern and western watersheds drain about two-thirds of the peninsula; the most important of the former are the Koksoak, the largest river of Labrador (over 500 m. long), the George, Whale and Payne rivers, all flowing into Ungava Bay. The large rivers flowing westwards into Hudson Bay are the Povungnituk, Kogaluk, Great Whale, Big, East Main and Rupert, varying in length from 300 to 500 m. The rivers flowing south are exceedingly rapid, the Moisie, Romaine, Natashkwan and St Augustine being the most important; all are about 300 m. long. The Atlantic coast range throws most of the drainage northwards into the Ungava basin, and only small streams fall into the ocean, except the Hamilton, North-west and Kenamou, which empty into the head of Hamilton Inlet.

Geology.—The peninsula is formed largely of crystalline schists and gneisses associated with granites and other igneous rocks, all of archaean age; there are also large areas of non-fossiliferous, stratified limestones, cherts, shales and iron ores, the unaltered equivalents of part of the schists and gneisses. Narrow strips of Animikie (Upper Huronian or perhaps Cambrian) rocks occur along the low-lying southern and western shores, but there are nowhere else indications of the peninsula having been below sea-level since an exceedingly remote time. During the glacial period the country was covered by a thick mantle of ice, which flowed out radially from a central collecting-ground. Owing to the extremely long exposure to denudation, to the subsequent removal of the greater part of the decomposed rock by glaciers, and to the unequal weathering of the component rocks, it is now a plateau, which ascends somewhat abruptly within a few miles of the coast-line to heights of between

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[1] From the Portuguese *llavrador* (a yeoman farmer). The name was originally given to Greenland (1st half of 16th century) and was transferred to the peninsula in the belief that it formed part of the same country as Greenland. The name was bestowed "because he who first gave notice of seeing it [Greenland] was a farmer (*llavrador*) from the Azores." See the historical sketch of Labrador by W. S. Wallace in Grenfell's *Labrador, &c.*, 1909.

500 and 2000 ft. The interior is undulating, and traversed by ridges of low, rounded hills, seldom rising more than 500 ft. above the surrounding general level.

Minerals.—The mineral wealth is undeveloped. Thick beds of excellent iron ore cover large areas in the interior and along the shores of Hudson and Ungava Bays. Large areas of mineralized Huronian rocks have also been discovered, similar to areas in other parts of Canada, where they contain valuable deposits of gold, copper, nickel and lead; good prospects of these metals have been found.

Climate.—The climate ranges from cold temperate on the southern coasts to arctic on Hudson Strait, and is generally so rigorous that it is doubtful if the country is fit for agriculture north of 51°, except on the low grounds near the coast. On James Bay good crops of potatoes and other roots are grown at Fort George, 54° N., while about the head of Hamilton Inlet, on the east coast, and in nearly the same latitude, similar crops are easily cultivated. On the outer coasts the climate is more rigorous, being affected by the floating ice borne southwards on the Arctic current. In the interior at Mistassini, 50° 30′ N., a crop of potatoes is raised annually, but they rarely mature. No attempts at agriculture have been made elsewhere inland. Owing to the absence of grass plains, there is little likelihood that it will ever be a grazing district. There are only two seasons in the interior: winter begins early in October, with the freezing of the small lakes, and lasts until the middle of June, when the ice on rivers and lakes melts and summer suddenly bursts forth. From unconnected observations the lowest temperatures of the interior range from −50° F. to −60° F., and are slightly higher along the coast. The mean summer temperature of the interior is about 55° F., with frosts during every month in the northern portion. On the Atlantic coast and in Hudson Bay the larger bays freeze solid between the 1st and 15th of December, and these coasts remain ice-bound until late in June. Hudson Strait is usually sufficiently open for navigation about the 10th of July.

Vegetation.—The southern half is included in the sub-Arctic forest belt, and nine species of trees constitute the whole arborescent flora of this region; these species are the white birch, poplar, aspen, cedar, Banksian pine, white and black spruce, balsam fir and larch. The forest is continuous over the southern portion to 53° N., the only exceptions being the summits of rocky hills and the outer islands of the Atlantic and Hudson Bay, while the low margins and river valleys contain much valuable timber. To the northward the size and number of barren areas rapidly increase, so that in 55° N. more than half the country is treeless, and two degrees farther north the limit of trees is reached, leaving, to the northward, only barrens covered with low Arctic flowering plants, sedges and lichens.

Fisheries.—The fisheries along the shores of the Gulf of St Lawrence and of the Atlantic form practically the only industry of the white population scattered along the coasts, as well as of a large proportion of the inhabitants of Newfoundland. The census (1891) of Newfoundland gave 10,478 men, 2081 women and 828 children employed in the Labrador fishery in 861 vessels, of which the tonnage amounted to 33,689; the total catch being 488,788 quintals of cod, 1275 tierces of salmon and 3828 barrels of herring, which, compared with the customs returns for 1880, showed an increase of cod and decreases of salmon and herring. The salmon fishery along the Atlantic coast is now very small, the decrease being probably due to excessive use of cod-traps. The cod fishery is now carried on along the entire Atlantic coast and into the eastern part of Ungava Bay, where excellent catches have been made since 1893. The annual value of the fisheries on the Canadian portion of the coast is about $350,000. The fisheries of Hudson Bay and of the interior are wholly undeveloped, though both the bay and the large lakes of the interior are well stocked with several species of excellent fish, including Arctic trout, brook trout, lake trout, white fish, sturgeon and cod.

Population.—The population is approximately 14,500, or about one person to every 35 sq. m.; it is made up of 3500 Indians, 2000 Eskimo and 9000 whites. The last are confined to the coasts and to the Hudson Bay Company's trading posts of the interior. On the Atlantic coast they are largely immigrants from Newfoundland, together with descendants of English fishermen and Hudson Bay Company's servants. To the north of Hamilton Inlet they are of more or less mixed blood from marriage with Eskimo women. The Newfoundland census of 1901 gave 3634 as the number of permanent white residents along the Atlantic coast, and the Canadian census (1891) gave a white population of 5728, mostly French Canadians, scattered along the north shore of the Gulf of St Lawrence, while the whites living at the inland posts did not exceed fifty persons. It is difficult to give more than a rough approximation of the number of the native population, owing to their habits of roving from one trading post to another, and the consequent liability of counting the same family several times if the returns are computed from the books of the various posts, the only available data for an enumeration. The following estimate is arrived at in this manner: Indians—west coast, 1200; Ungava Bay, 200; east coast, 200; south coast, 1900. Eskimo—Atlantic coast, 1000; south shore of Hudson Strait, 800; east coast of Hudson Bay, 500. The Indians roam over the southern interior in small bands, their northern limit being determined by that of the trees on which they depend for fuel. They live wholly by the chase, and their numbers are dependent upon the deer and other animals; as a consequence there is a constant struggle between the Indian and the lower animals for existence, with great slaughter of the latter, followed by periodic famines among the natives, which greatly reduce their numbers and maintain an equilibrium. The native population has thus remained about stationary for the last two centuries. The Indians belong to the Algonquin family, and speak dialects of the Cree language. By contact with missionaries and fur-traders they are more or less civilized, and the great majority of them are Christians. Those living north of the St Lawrence are Roman Catholic, while the Indians of the western watershed have been converted by the missionaries of the Church Mission Society; the eastern and northern bands have not yet been reached by the missionaries, and are still pagans. The Eskimo of the Atlantic coast have long been under the guidance of the Moravian missionaries, and are well advanced in civilization; those of Hudson Bay have been taught by the Church Mission Society, and promise well; while the Eskimo of Hudson Strait alone remain without teachers, and are pagans. The Eskimo live along the coasts, only going inland for short periods to hunt the barren-ground caribou for their winter clothing; the rest of the year they remain on the shore or the ice, hunting seals and porpoises, which afford them food, clothing and fuel. The christianized Indians and Eskimo read and write in their own language; those under the teaching of the Church Mission Society use a syllabic character, the others make use of the ordinary alphabet.

Political Review.—The peninsula is divided politically between the governments of Canada, Newfoundland and the province of Quebec. The government of Newfoundland, under Letters Patent of the 28th of March 1876, exercises jurisdiction along the Atlantic coast; the boundary between its territory and that of Canada is a line running due north and south from Anse Sablon, on the north shore of the Strait of Belle Isle, to 52° N., the remainder of the boundary being as yet undetermined. The northern boundary of the province of Quebec follows the East Main river to its source in Patamisk lake, thence by a line due east to the Ashuanipi branch of the Hamilton river; it then follows that river and Hamilton Inlet to the coast area under the jurisdiction of Newfoundland. The remainder of the peninsula, north of the province of Quebec, by order in council dated the 18th of December 1897, was constituted Ungava District, an unorganized territory under the jurisdiction of the government of the Dominion of Canada.

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LABRADORITE, or LABRADOR SPAR, a lime-soda felspar of the plagioclase (*q.v.*) group, often cut and polished as an ornamental stone. It takes its name from the coast of Labrador, where it was discovered, as boulders, by the Moravian Mission about 1770, and specimens were soon afterwards sent to the secretary in London, the Rev. B. Latrobe. The felspar itself is generally of a dull grey colour, with a rather greasy lustre, but many specimens exhibit in certain directions a magnificent play of colours—blue, green, orange, purple or red; the colour in some specimens changing when the stone is viewed in different directions. This optical effect, known sometimes as "labradorescence," seems due in some cases to the presence of minute laminae of certain minerals, like göthite or haematite, arranged parallel to the surface which reflects the colour; but in other cases it may be caused not so much by inclusions as by a delicate lamellar structure in the felspar. An aventurine effect is produced by the presence of microscopic enclosures. The original labradorite was found in the neighbourhood of Nain, notably in a lagoon about 50 m. inland, and in St Paul's Island. Here it occurs with hypersthene, of a rich bronzy sheen, forming a coarse-grained norite. When wet, the stones are remarkably brilliant, and have been called by the natives "fire rocks." Russia has also yielded chatoyant labradorite, especially near Kiev and in Finland; a fine blue labradorite has been brought from Queensland; and the mineral is also known in several localities in the United States, as at Keeseville, in Essex county, New York. The ornamental stone from south Norway, now largely used as a decorative material in architecture, owes its beauty to a felspar with a blue opalescence, often called labradorite, but really a kind of orthoclase which Professor W. C. Brögger has termed cryptoperthite, whilst the rock in which it occurs is an augite-syenite called by him laurvigite, from its chief locality, Laurvik in Norway. Common labradorite, without play of colour, is an important constituent of such rocks as gabbro, diorite, andesite, dolerite and basalt. (See PLAGIOCLASE.) Ejected crystals of labradorite are found on Monti Rossi, a double parasitic cone on Etna.

The term labradorite is unfortunately used also as a rock-name, having been applied by Fouqué and Lévy to a group of basic rocks rich in augite and poor in olivine. (F. W. R.*)

LABRADOR TEA, the popular name for a species of *Ledum*, a small evergreen shrub growing in bogs and swamps in Greenland and the more northern parts of North America. The leaves are tough, densely covered with brown wool on the under face, fragrant when crushed and have been used as a substitute for tea. The plant is a member of the heath family (Ericaceae).

LABRUM (Lat. for "lip"), the large vessel of the warm bath in the Roman thermae. These were cut out of great blocks of marble and granite, and have generally an overhanging lip. There is one in the Vatican of porphyry over 12 ft. in diameter. The term *labrum* is used in zoology, of a lip or lip-like part; in entomology it is applied specifically to the upper lip of an insect, the lower lip being termed *labium*.

LA BRUYÈRE, JEAN DE (1645–1696), French essayist and moralist, was born in Paris on the 16th of August 1645, and not, as was once the common statement, at Dourdan (Seine-et-Oise) in 1639. His family was of the middle class, and his reference to a certain Geoffroy de la Bruyère, a crusader, is only a satirical illustration of a method of self-ennoblement common in France as in some other countries. Indeed he himself always signed the name Delabruyère in one word, thus avowing his *roture*. His progenitors, however, were of respectable position, and he could trace them back at least as far as his great-grandfather, who had been a strong Leaguer. La Bruyère's own father was controller-general of finance to the Hôtel de Ville. The son was educated by the Oratorians and at the university of Orleans; he was called to the bar, and in 1673 bought a post in the revenue department at Caen, which gave the status of noblesse and a certain income. In 1687 he sold this office. His predecessor in it was a relation of Bossuet, and it is thought that the transaction was the cause of La Bruyère's introduction to the great orator. Bossuet, who from the date of his own preceptorship of the dauphin, was a kind of agent-general for tutorships in the royal family, introduced him in 1684 to the household of the great Condé, to whose grandson Henri Jules de Bourbon as well as to that prince's girl-bride Mlle de Nantes, one of Louis XIV.'s natural children, La Bruyère became tutor. The rest of his life was passed in the household of the prince or else at court, and he seems to have profited by the inclination which all the Condé family had for the society of men of letters. Very little is known of the events of this part—or, indeed, of any part—of his life. The impression derived from the few notices of him is of a silent, observant, but somewhat awkward man, resembling in manners Joseph Addison, whose master in literature La Bruyère undoubtedly was. Yet despite the numerous enemies which his book raised up for him, most of these notices are favourable—notably that of Saint-Simon, an acute judge and one bitterly prejudiced against *roturiers* generally. There is, however, a curious passage in a letter from Boileau to Racine in which he regrets that "nature has not made La Bruyère as agreeable as he would like to be." His *Caractères* appeared in 1688, and at once, as Nicolas de Malezieu had predicted, brought him "bien des lecteurs et bien des ennemis." At the head of these were Thomas Corneille, Fontenelle and Benserade, who were pretty clearly aimed at in the book, as well as innumerable other persons, men and women of letters as well as of society, on whom the cap of La Bruyère's fancy-portraits was fitted by manuscript "keys" compiled by the scribblers of the day. The friendship of Bossuet and still more the protection of the Condés sufficiently defended the author, and he continued to insert fresh portraits of his contemporaries in each new edition of his book, especially in the 4th (1689). Those, however, whom he had attacked were powerful in the Academy, and numerous defeats awaited La Bruyère before he could make his way into that guarded hold. He was defeated thrice in 1691, and on one memorable occasion he had but seven votes, five of which were those of Bossuet, Boileau, Racine, Pellisson and Bussy-Rabutin. It was not till 1693 that he was elected, and even then an epigram, which, considering his admitted insignificance in conversation, was not of the worst, *haesit lateri*:—

> "Quand la Bruyère se présente
> Pourquoi faut il crier haro ?
> Pour faire un nombre de quarante
> Ne falloit il pas un zéro ?"

His unpopularity was, however, chiefly confined to the subjects of his sarcastic portraiture, and to the hack writers of the time, of whom he was wont to speak with a disdain only surpassed by that of Pope. His description of the *Mercure galant* as "*immédiatement au dessous de rien*" is the best-remembered specimen of these unwise attacks; and would of itself account for the enmity of the editors, Fontenelle and the younger Corneille. La Bruyère's discourse of admission at the Academy, one of the best of its kind, was, like his admission itself, severely criticized, especially by the partisans of the "Moderns" in the "Ancient and Modern" quarrel. With the *Caractères*, the translation of Theophrastus, and a few letters, most of them addressed to the prince de Condé, it completes the list of his literary work, with the exception of a curious and much-disputed posthumous treatise. La Bruyère died very suddenly, and not long after his admission to the Academy. He is said to have been struck with dumbness in an assembly of his friends, and, being carried home to the Hôtel de Condé, to have expired of apoplexy a day or two afterwards, on the 10th of May 1696. It is not surprising that, considering the recent panic about poisoning, the bitter personal enmities which he had excited and the peculiar circumstances of his death, suspicions of foul play should have been entertained, but there was apparently no foundation for them. Two years after his death appeared certain *Dialogues sur le Quiétisme*, alleged to have been found among his papers incomplete, and to have been completed by the editor. As these dialogues are far inferior in literary merit to La Bruyère's other works, their genuineness has been denied. But the straightforward and circumstantial account of their appearance given by this editor, the Abbé du Pin, a man of acknowledged probity, the intimacy of La Bruyère with Bossuet, whose views in his contest with Fénelon these dialogues are designed to further, and the entire absence, at so short a time after the alleged author's death, of the least protest on the part of his friends and representatives, seem to be decisive in their favour.

Although it is permissible to doubt whether the value of the *Caractères* has not been somewhat exaggerated by traditional French criticism, they deserve beyond all question a high place.

The plan of the book is thoroughly original, if that term may be accorded to a novel and skilful combination of existing elements. The treatise of Theophrastus may have furnished the first idea, but it gave little more. With the ethical generalizations and social Dutch painting of his original La Bruyère combined the peculiarities of the Montaigne essay, of the *Pensées* and *Maximes* of which Pascal and La Rochefoucauld are the masters respectively, and lastly of that peculiar 17th-century product, the "portrait" or elaborate literary picture of the personal and mental characteristics of an individual. The result was quite unlike anything that had been before seen, and it has not been exactly reproduced since, though the essay of Addison and Steele resembles it very closely, especially in the introduction of fancy portraits. In the titles of his work, and in its extreme desultoriness, La Bruyère reminds the reader of Montaigne, but he aimed too much at sententiousness to attempt even the apparent continuity of the great essayist. The short paragraphs of which his chapters consist are made up of maxims proper, of criticisms literary and ethical, and above all of the celebrated sketches of individuals baptized with names taken from the plays and romances of the time. These last are the great feature of the work, and that which gave it its immediate if not its enduring popularity. They are wonderfully piquant, extraordinarily life-like in a certain sense, and must have given great pleasure or more frequently exquisite pain to the originals, who were in many cases unmistakable and in most recognizable.

But there is something wanting in them. The criticism of Charpentier, who received La Bruyère at the Academy, and who was of the opposite faction, is in fact fully justified as far as it goes. La Bruyère literally "est [trop] descendu dans le particulier." He has neither, like Molière, embodied abstract peculiarities in a single life-like type, nor has he, like Shakespeare, made the individual pass *sub speciem aeternitatis*, and serve as a type while retaining his individuality. He is a photographer rather than an artist in his portraiture. So, too, his maxims, admirably as they are expressed, and exact as their truth often is, are on a lower level than those of La Rochefoucauld. Beside the sculpturesque precision, the Roman brevity, the profoundness of ethical intuition "piercing to the accepted hells beneath," of the great Frondeur, La Bruyère has the air of a literary *petit-maître* dressing up superficial observation in the finery of *esprit*. It is indeed only by comparison that he loses, but then it is by comparison that he is usually praised. His abundant wit and his personal "malice" have done much to give him his rank in French literature, but much must also be allowed to his purely literary merits. With Racine and Massillon he is probably the very best writer of what is somewhat arbitrarily styled classical French. He is hardly ever incorrect—the highest merit in the eyes of a French academic critic. He is always well-bred, never obscure, rarely though sometimes "precious" in the turns and niceties of language in which he delights to indulge, in his avowed design of attracting readers by form, now that, in point of matter, "tout est dit." It ought to be added to his credit that he was sensible of the folly of impoverishing French by ejecting old words. His chapter on "Les ouvrages de l'esprit" contains much good criticism, though it shows that, like most of his contemporaries except Fénelon, he was lamentably ignorant of the literature of his own tongue.

The editions of La Bruyère, both partial and complete, have been extremely numerous. *Les Caractères de Théophraste traduits du Grec, avec les caractères et les mœurs de ce siècle*, appeared for the first time in 1688, being published by Michallet, to whose little daughter, according to tradition, La Bruyère gave the profits of the book as a dowry. Two other editions, little altered, were published in the same year. In the following year, and in each year until 1694, with the exception of 1693, a fresh edition appeared, and, in all these five, additions, omissions and alterations were largely made. A ninth edition, not much altered, was put forth in the year of the author's death. The Academy speech appeared in the eighth edition. The Quietist dialogues were published in 1699; most of the letters, including those addressed to Condé, not till 1867. In recent times numerous editions of the complete works have appeared, notably those of Walckenaer (1845), Servois (1867, in the series of *Grands écrivains de la France*), Asselineau (a scholarly reprint of the last original edition, 1872) and finally Chassang (1876); the last is one of the most generally useful, as the editor has collected almost everything of value in his predecessors. The literature of "keys" to La Bruyère is extensive and apocryphal. Almost everything that can be done in this direction and in that of general illustration was done by Edouard Fournier in his learned and amusing *Comédie de La Bruyère* (1866); M. Paul Morillot contributed a monograph on La Bruyère to the series of *Grands écrivains français* in 1904.

(G. SA.)

LABUAN (a corruption of the Malay word *labuh-an*, signifying an "anchorage"), an island of the Malay Archipelago, off the north-west coast of Borneo in 5° 16′ N., 115° 15′ E. Its area is 30·23 sq. m.; it is distant about 6 m. from the mainland of Borneo at the nearest point, and lies opposite to the northern end of the great Brunei Bay. The island is covered with low hills rising from flats near the shore to an irregular plateau near the centre. About 1500 acres are under rice cultivation, and there are scattered patches of coco-nut and sago palms and a few vegetable gardens, the latter owned for the most part by Chinese. For the rest Labuan is covered over most of its extent by vigorous secondary growth, amidst which the charred trunks of trees rise at frequent intervals, the greater part of the forest of the island having been destroyed by great accidental conflagrations. Labuan was ceded to Great Britain in 1846, chiefly through the instrumentality of Sir James Brooke, the first raja of Sarawak, and was occupied two years later.

At the time of its cession the island was uninhabited, but in 1881 the population numbered 5731, though it had declined to 5361 in 1891. The census returns for 1901 give the population at 8411. The native population consists of Malay fishermen, Chinese, Tamils and small shifting communities of Kadayans, Tutongs and other natives of the neighbouring Bornean coast. There are about fifty European residents. At the time of its occupation by Great Britain a brilliant future was predicted for Labuan, which it was thought would become a second Singapore. These hopes have not been realized. The coal deposits, which are of somewhat indifferent quality, have been worked with varying degrees of failure by a succession of companies, one of which, the Labuan & Borneo Ltd., liquidated in 1902 after the collapse of a shaft upon which large sums had been expended. It was succeeded by the Labuan Coalfields Ltd. The harbour is a fine one, and the above-named company possesses three wharves capable of berthing the largest Eastern-going ocean steamers. To-day Labuan chiefly exists as a trading depôt for the natives of the neighbouring coast of Borneo, who sell their produce—beeswax, edible birds-nests, camphor, gutta, trepang, &c.,—to Chinese shopkeepers, who resell it in Singapore. There is also a considerable trade in sago, much of which is produced on the mainland, and there are three small sago-factories on the island where the raw product is converted into flour. The Eastern Extension Telegraph Company has a central station at Labuan with cables to Singapore, Hong-Kong and British North Borneo. Monthly steam communication is maintained by a German firm between Labuan, Singapore and the Philippines. The colony joined the Imperial Penny Postage Union in 1889. There are a few miles of road on the island and a metre-gauge railway from the harbour to the coal mines, the property of the company. There is a Roman Catholic church with a resident priest, an Anglican church, visited periodically by a clergyman from the mainland, two native and Chinese schools, and a sailors' club, built by the Roman Catholic mission. The bishop of Singapore and Sarawak is also bishop of Labuan. The European graveyard has repeatedly been the scene of outrages perpetrated, it is believed, by natives from the mainland of Borneo, the graves being rifled and the hair of the head and other parts of the corpses being carried off to furnish ornaments to weapons and ingredients in the magic philtres of the natives. Pulau Dat, a small island in the near neighbourhood of Labuan, is the site of a fine coco-nut plantation whence nuts and copra are exported in bulk. The climate is hot and very humid.

Until 1869 the expenditure of the colony was partly defrayed by imperial grants-in-aid, but after that date it was left to its own resources. A garrison of imperial troops was maintained until 1871, when the troops were withdrawn after many deaths from fever and dysentery had occurred among them. Since then law and order have been maintained without difficulty by a small mixed police force of Punjabis and Malays. From the 1st of January 1890 to the 1st of January 1906 Labuan was transferred for administrative purposes to the British North Borneo Company, the governor for the time being of the company's territories holding also the royal commission as governor of Labuan. This arrangement did not work satisfactorily and called forth frequent petitions and protests from the colonists. Labuan was then placed under the government of the Straits Settlements, and is administered by a deputy governor who is a member of the Straits Civil Service.

LABURNUM, known botanically as *Laburnum vulgare* (or *Cytisus Laburnum*), a familiar tree of the pea family (Leguminosae); it is also known as "golden chain" and "golden rain." It is a native of the mountains of France, Switzerland, southern Germany, northern Italy, &c., has long been cultivated as an ornamental tree throughout Europe, and was introduced into north-east America by the European colonists. Gerard records it as growing in his garden in 1597 under the names of anagyris, laburnum or beane trefoyle (*Herball*, p. 1239), but the date of its introduction into England appears to be unknown. In France it is called *l'aubour*—a corruption from laburnum according to Du Hamel—as also *arbois, i.e. arc-bois,* "the wood having been used by the ancient Gauls for bows. It is still so employed in some parts of the Mâconnois, where the bows are found to preserve their strength and elasticity for half a century" (Loudon, *Arboretum*, ii. 590).

Several varieties of this tree are cultivated, differing in the size of the flowers, in the form of the foliage, &c., such as the "oak-leafed" (*quercifolium*), *pendulum*, *crispum*, &c.; var. *aureum* has golden yellow leaves. One of the most remarkable forms is *Cytisus Adami* (*C. purpurascens*), which bears three kinds of blossoms, viz. racemes of pure yellow flowers, others of a purple colour and others of an intermediate brick-red tint. The last are hybrid blossoms, and are sterile, with malformed ovules, though the pollen appears to be good. The yellow and purple "reversions" are fertile. It originated in Paris in 1828 by M. Adam, who inserted a "shield" of the bark of *Cytisus purpureus* into a stock of Laburnum. A vigorous shoot from this bud was subsequently propagated. Hence it would appear that the two distinct species became united by their cambium layers, and the trees propagated therefrom subsequently reverted to their respective parentages in bearing both yellow and purple flowers, but produce as well blossoms of an intermediate or hybrid character. Such a result may be called a "graft-hybrid." For full details see Darwin's *Animals and Plants under Domestication*.

The laburnum has highly poisonous properties. The roots taste like liquorice, which is a member of the same family as the laburnum. It has proved fatal to cattle, though hares and rabbits eat the bark of it with avidity (*Gardener's Chronicle*, 1881, vol. xvi. p. 666). The seeds also are highly poisonous, possessing emetic as well as acrid narcotic principles, especially in a green state. Gerard (*loc. cit.*) alludes to the powerful effect produced on the system by taking the bruised leaves medicinally. Pliny states that bees will not visit the flowers (*N.H.* xvi. 31), but this is an error, as bees and butterflies play an important part in the fertilization of the flowers, which they visit for the nectar.

The heart wood of the laburnum is of a dark reddish-brown colour, hard and durable, and takes a good polish. Hence it is much prized by turners, and used with other coloured woods for inlaying purposes. The laburnum has been called false ebony from this character of its wood.

LABYRINTH (Gr. *λαβύρινθος*, Lat. *labyrinthus*), the name given by the Greeks and Romans to buildings, entirely or partly subterranean, containing a number of chambers and intricate passages, which rendered egress puzzling and difficult. The word is considered by some to be of Egyptian origin, while others connect it with the Gr. *λαῦρα*, the passage of a mine. Another derivation suggested is from *λάβρυς*, a Lydian or Carian word meaning a "double-edged axe" (*Journal of Hellenic Studies*, xxi. 109, 268), according to which the Cretan labyrinth or palace of Minos was the house of the double axe, the symbol of Zeus.

Pliny (*Nat. Hist.* xxxvi. 19, 91) mentions the following as the four famous labyrinths of antiquity.

1. The Egyptian: of which a description is given by Herodotus (ii. 148) and Strabo (xvii. 811). It was situated to the east of Lake Moeris, opposite the ancient site of Arsinoë or Crocodilopolis. According to Egyptologists, the word means "the temple at the entrance of the lake." According to Herodotus, the entire building, surrounded by a single wall, contained twelve courts and 3000 chambers, 1500 above and 1500 below ground. The roofs were wholly of stone, and the walls covered with sculpture. On one side stood a pyramid 40 orgyiae, or about 243 ft. high. Herodotus himself went through the upper chambers, but was not permitted to visit those underground, which he was told contained the tombs of the kings who had built the labyrinth, and of the sacred crocodiles. Other ancient authorities considered that it was built as a place of meeting for the Egyptian nomes or political divisions; but it is more likely that it was intended for sepulchral purposes. It was the work of Amenemhē III., of the 12th dynasty, who lived about 2300 B.C. It was first located by the Egyptologist Lepsius to the north of Hawara in the Fayum, and (in 1888) Flinders Petrie discovered its foundation, the extent of which is about 1000 ft. long by 800 ft. wide. Immediately to the north of it is the pyramid of Hawara, in which the mummies of the king and his daughter have been found (see W. M. Flinders Petrie, *Hawara, Biahmu, and Arsinoë*, 1889).

2. The Cretan: said to have been built by Daedalus on the plan of the Egyptian, and famous for its connexion with the legend of the Minotaur. It is doubtful whether it ever had any real existence and Diodorus Siculus says that in his time it had already disappeared. By the older writers it was placed near Cnossus, and is represented on coins of that city, but nothing corresponding to it has been found during the course of the recent excavations, unless the royal palace was meant. The rocks of Crete are full of winding caves, which gave the first idea of the legendary labyrinth. Later writers (for instance, Claudian, *De sexto Cons. Honorii*, 634) place it near Gortyna, and a set of winding passages and chambers close to that place is still pointed out as the labyrinth; these are, however, in reality ancient quarries.

3. The Lemnian: similar in construction to the Egyptian. Remains of it existed in the time of Pliny. Its chief feature was its 150 columns.

4. The Italian: a series of chambers in the lower part of the tomb of Porsena at Clusium. This tomb was 300 ft. square and 50 ft. high, and underneath it was a labyrinth, from which it was exceedingly difficult to find an exit without the assistance of a clew of thread. It has been maintained that this tomb is to be recognized in the mound named Poggio Gajella near Chiusi.

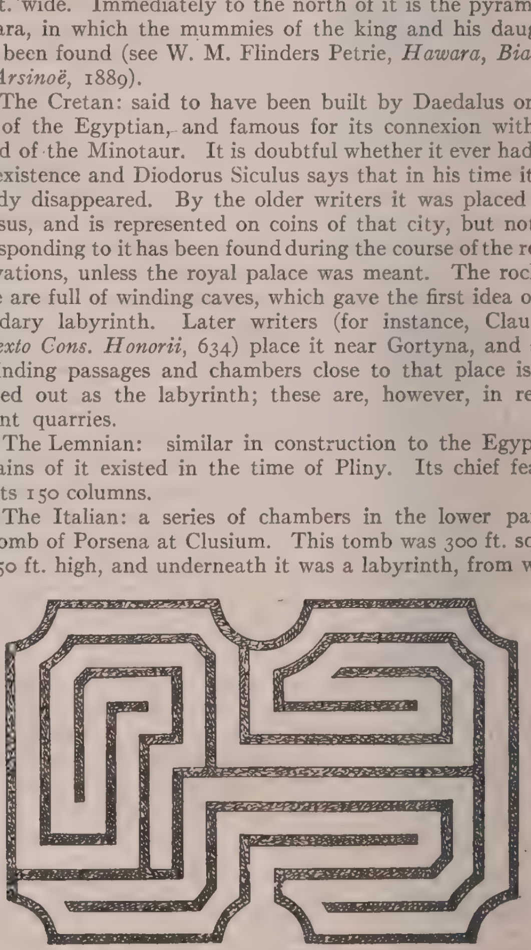


FIG. 1.—Labyrinth of London and Wise.

Lastly, Pliny (xxxvi. 19) applies the word to a rude drawing on the ground or pavement, to some extent anticipating the modern or garden maze.

On the Egyptian labyrinth see A. Wiedemann, *Ägyptische Geschichte* (1884), p. 258, and his edition of the second book of Herodotus (1890); on the Cretan, C. Höck, *Kreta* (1823–1829), and

A. J. Evans in *Journal of Hellenic Studies*; on the subject generally, articles in Roscher's *Lexikon der Mythologie* and Daremberg and Saglio's *Dictionnaire des antiquités*.

In gardening, a labyrinth or *maze* means an intricate network of pathways enclosed by hedges or plantations, so that those who enter become bewildered in their efforts to find the centre or make their exit. It is a remnant of the old geometrical style of gardening. There are two methods of forming it. That which is perhaps the more common consists of walks, or alleys as they were formerly called, laid out and kept to an equal width or nearly so by parallel hedges, which should be so close and thick that the eye cannot readily penetrate them. The task is to get to the centre, which is often raised, and generally contains a covered seat, a fountain, a statue or even a small group of trees. After reaching this point the next thing is to return to the entrance, when it is found that egress is as difficult as ingress. To every design of this sort there should be a key, but even those who know the key are apt to be perplexed. Sometimes the design consists of alleys only, as in fig. 1, published in 1706 by London and Wise. In such a case, when the farther end is reached, there only remains to travel back again. Of a more pretentious character was a design published by Switzer in 1742. This is of octagonal form, with very numerous parallel hedges and paths, and "six different entrances, whereof there is but one that leads to the centre, and that is attended with some difficulties and a great many stops." Some of the older designs for labyrinths, however, avoid this close parallelism of the alleys, which, though equally involved and intricate in their windings, are carried through blocks of thick planting, as shown in fig. 2, from a design published in 1728 by Batty Langley. These blocks of shrubbery have been called wildernesses. To this latter class belongs the celebrated labyrinth at Versailles (fig. 3), of which Switzer observes, that it "is allowed by all to be the noblest of its kind in the world."

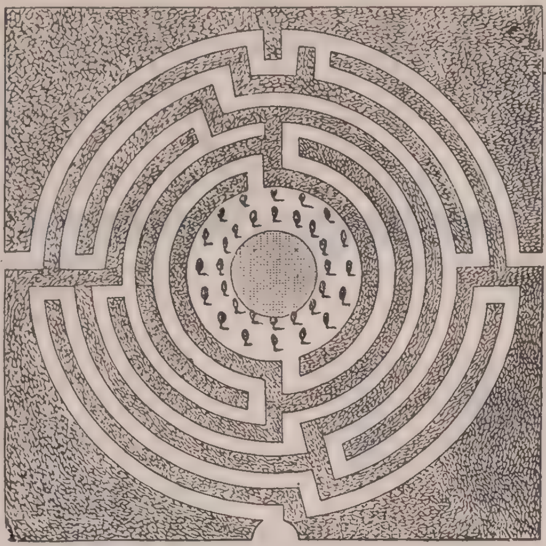


FIG. 2.—Labyrinth of Batty Langley.

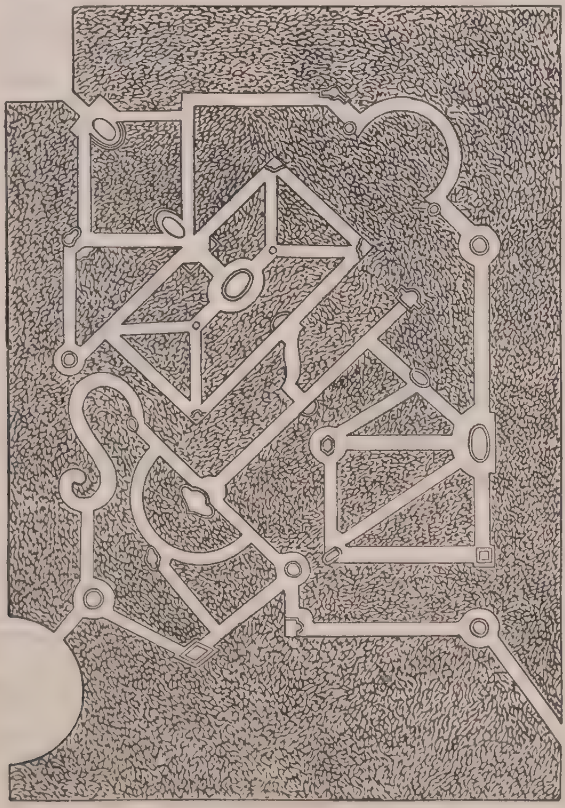


FIG. 3.—Labyrinth at Versailles.

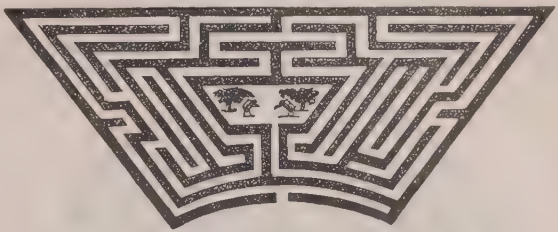


FIG. 4.—Maze at Hampton Court.

Whatever style be adopted, it is essential that there should be a thick healthy growth of the hedges or shrubberies that confine the wanderer. The trees used should be impenetrable to the eye, and so tall that no one can look over them; and the paths should be of gravel and well kept. The trees chiefly used for the hedges, and the best for the purpose, are the hornbeam among deciduous trees, or the yew among evergreens. The beech might be used instead of the hornbeam on suitable soil. The green holly might be planted as an evergreen with very good results, and so might the American arbor vitae if the natural soil presented no obstacle. The ground must be well prepared, so as to give the trees a good start, and a mulching of manure during the early years of their growth would be of much advantage. They must be kept trimmed in or clipped, especially in their earlier stages; trimming with the knife is much to be preferred to clipping with shears. Any plants getting much in advance of the rest should be topped, and the whole kept to some 4 ft. or 5 ft. in height until the lower parts are well thickened, when it may be allowed to acquire the allotted height by moderate annual increments. In cutting, the hedge (as indeed all hedges) should be

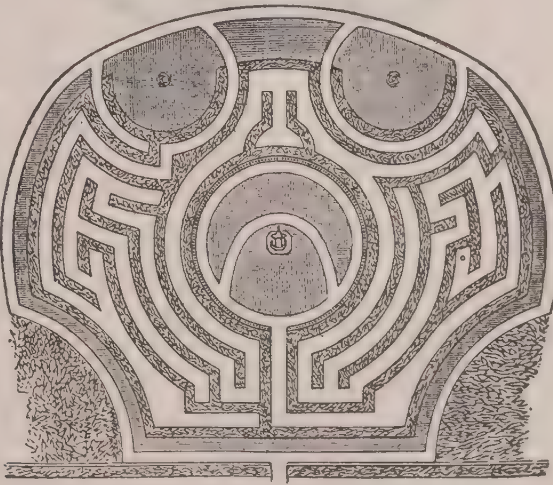


FIG. 5.—Maze at Somerleyton Hall.

kept broadest at the base and narrowed upwards, which prevents it from getting thin and bare below by the stronger growth being drawn to the tops.

The maze in the gardens at Hampton Court Palace (fig. 4) is considered one of the finest examples in England. It was planted in the early part of the reign of William III., though it has been supposed that a maze had existed there since the time of Henry VIII. It is constructed on the hedge and alley system, and was, it is believed, originally planted with hornbeam, but many of the plants have been replaced by hollies, yews, &c., so that the vegetation is mixed. The walks are about half a mile in length, and the ground occupied is a little over a quarter of an acre. The centre contains two large trees, with a seat beneath each. The key to reach this resting place is to keep the right hand continuously in contact with the hedge from first to last, going round all the stops.

The maze in the gardens at Somerleyton Hall, near Lowestoft (fig. 5), was designed by Mr John Thomas. The hedges are of English yew, are about 6½ ft. high, and have been planted about sixty years. In the centre is a grass mound, raised to the height of the hedges, and on this mound is a pagoda, approached by a curved grass path. At the two corners on the western side are banks of laurels 15 or 16 ft. high. On each side of the hedges throughout the labyrinth is a small strip of grass.

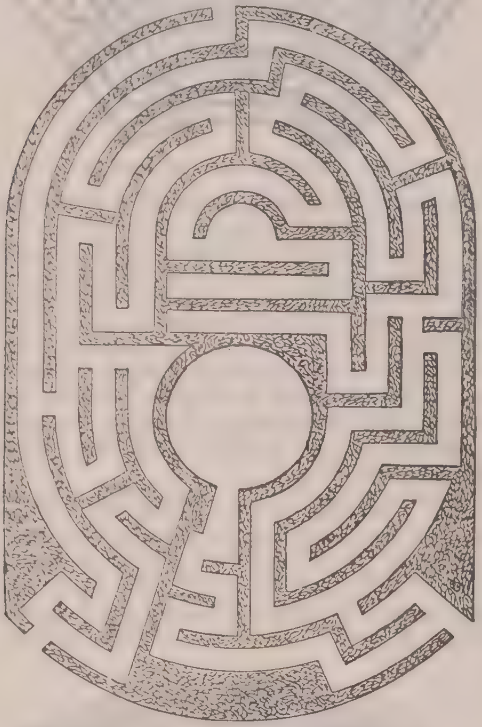


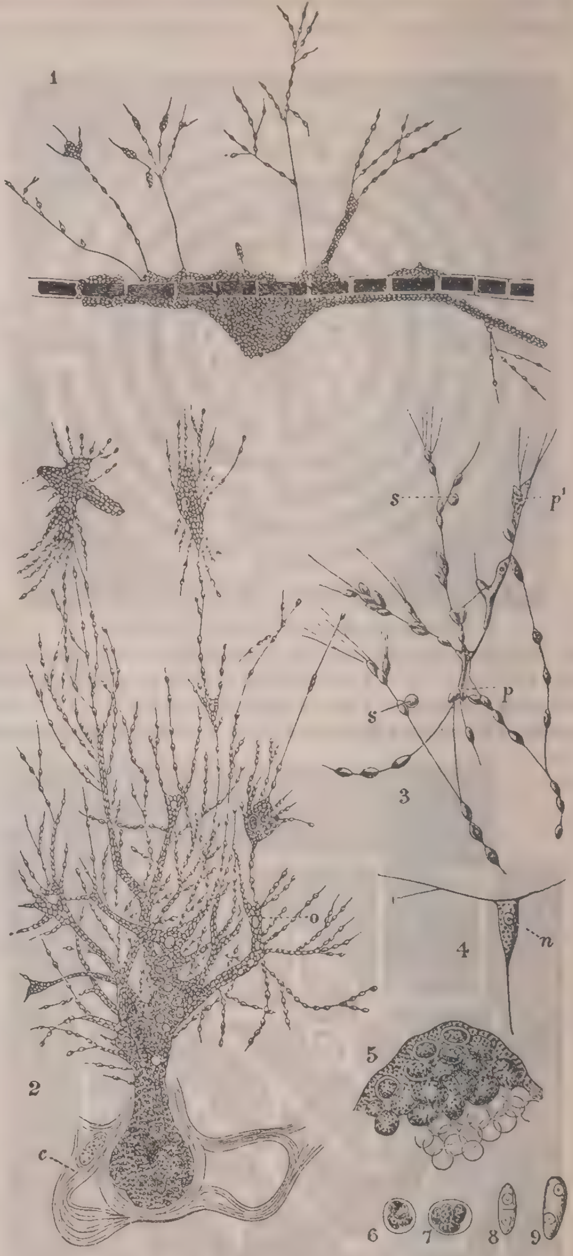
Fig. 6.—Labyrinth in Horticultural Society's Garden.

There was also a labyrinth at Theobald's Park, near Cheshunt, when this place passed from the earl of Salisbury into the possession of James I. Another is said to have existed at Wimbledon House, the seat of Earl Spencer, which was probably laid out by Brown in the 18th century. There is an interesting labyrinth, somewhat after the plan of fig 2, at Mistley Place, Manningtree.

When the gardens of the Royal Horticultural Society at South Kensington were being planned, Albert, Prince Consort, the president of the society, especially desired that there should be a maze formed in the ante-garden, which was made in the form shown in fig. 6. This labyrinth, designed by Lieut. W. A. Nesfield, was for many years the chief point of attraction to the younger visitors to the gardens; but it was allowed to go to ruin, and had to be destroyed. The gardens themselves are now built over. (T. Mo.)

LABYRINTHULIDEA, the name given by Sir Ray Lankester (1885) to Sarcodina (*q.v.*) forming a reticulate plasmodium, the denser masses united by fine pseudopodical threads, hardly distinct from some Proteomyxa, such as *Archerina*.

This is a small and heterogeneous group. *Labyrinthula*, discovered by L. Cienkowsky, forms a network of relatively stiff threads on which are scattered large spindle-shaped enlargements, each representing an amoeba, with a single nucleus. The threads are pseudopods, very slowly emitted and withdrawn. The amoebae multiply by fission in the active state. The nearest approach to a "reproductive" state is the approximation of the amoebae, and their separate encystment in an irregular heap,



Labyrinthulidea.

1. A colony or "cell-heap" of *Labyrinthula vitellina*, Cienk., crawling upon an Alga.
2. A colony or "cell-heap" of *Chlamydomyxa labyrinthuloides*, Archer, with fully expanded network of threads on which the oat-shaped corpuscles (cells) are moving. *o*, Is an ingested food particle; at *c* a portion of the general protoplasm has detached itself and become encysted.
3. A portion of the network of *Labyrinthula vitellina*, Cienk., more highly magnified. *p*, Protoplasmic mass apparently produced by fusion of several filaments. *p'*, Fusion of several cells which have lost their definite spindle-shaped contour. *s*, Corpuscles which have become spherical and are no longer moving (perhaps about to be encysted).
4. A single spindle cell and threads of *Labyrinthula macrocystis*, Cienk. *n*, Nucleus.
5. A group of encysted cells of *L. Macrocystis*, embedded in a tough secretion.

6, 7. Encysted cells of *L. macrocystis*, with enclosed protoplasm divided into four spores.

8, 9. Transverse division of a non-encysted spindle-cell of *L. macrocystis*.

recalling the Acrasieae. From each cyst ultimately emerges a single amoebae, or more rarely four (figs. 6, 7). The saprophyte *Diplophrys* (?) *stercorea* (Cienk.) appears closely allied to this.

Chlamydomyxa (W. Archer) resembles *Labyrinthula* in its freely branched plasmodium, but contains yellowish chromatophores, and minute oval vesicles ("physodes") filled with a substance allied to tannin—possibly phloroglucin—which glide along the plasmodial tracks. The cell-body contains numerous nuclei; but in its active state is not resolvable into distinct oval amoeboids. It is amphitrophic, ingesting and digesting other Protista, as well as "assimilating" by its chromatophores, the product being oil, not starch. The whole body may form a laminated cellulose resting cyst, from which it may only temporarily emerge (fig. 2), or it may undergo resolution into nucleate cells which then encyst, and become multinucleate before rupturing the cyst afresh.

Leydenia (F. Schaudinn) is a parasite in malignant diseases of the pleura. The pseudopodia of adjoining cells unite to form a network; but its affinities seem to such social naked Foraminifera as *Mikrogromia*.

See Cienkowsky, *Archiv f. Microscopische Anatomie*, iii. 274 (1867), xii. 44 (1876); W. Archer, *Quart. Jour. Microscopic Science*, xv. 107 (1875); E. R. Lankester, *Ibid.*, xxxix., 233 (1896); Hieronymus and Jenkinson, *Ibid.*, xlii. 89 (1899); W. Zopf, *Beiträge zur Physiologie und Morphologie niederer Organismen*, ii. 36 (1892), iv. 60 (1894); Pènard, *Archiv für Protistenkunde*, iv. 296 (1904); F. Schaudinn and Leyden, *Sitzungsberichte der Königlich preussischen Akademie der Wissenschaft*, vi. (1896).

LAC, a resinous incrustation formed on the twigs and young branches of various trees by an insect, *Coccus lacca*, which infests them. The term lac (*laksha*, Sanskrit; *lakh*, Hindi) is the same as the numeral lakh—a hundred thousand—and is indicative of the countless hosts of insects which make their appearance with every successive generation. Lac is a product of the East Indies, coming especially from Bengal, Pegu, Siam and Assam, and is produced by a number of trees of the species *Ficus*, particularly *F. religiosa*. The insect which yields it is closely allied to the cochineal insect, *Coccus cacti*; kermes, *C. ilicis* and Polish grains, *C. polonicus*, all of which, like the lac insect, yield a red colouring matter. The minute larval insects fasten in myriads on the young shoots, and, inserting their long proboscides into the bark, draw their nutriment from the sap of the plant. The insects begin at once to exude the resinous secretion over their entire bodies; this forms in effect a cocoon, and, the separate exudations coalescing, a continuous hard resinous layer regularly honeycombed with small cavities is deposited over and around the twig. From this living tomb the female insects, which form the great bulk of the whole, never escape. After their impregnation, which takes place on the liberation of the males, about three months from their first appearance, the females develop into a singular amorphous organism consisting in its main features of a large smooth shining crimson-coloured sac—the ovary—with a beak stuck into the bark, and a few papillary processes projected above the resinous surface. The red fluid in the ovary is the substance which forms the lac dye of commerce. To obtain the largest amount of both resin and dye-stuff it is necessary to gather the twigs with their living inhabitants in or near June and November. Lac encrusting the twigs as gathered is known in commerce as "stick lac"; the resin crushed to small fragments and washed in hot water to free it from colouring matter constitutes "seed lac"; and this, when melted, strained through thick canvas, and spread out into thin layers, is known as "shellac," and is the form in which the resin is usually brought to European markets. Shellac varies in colour from a dark amber to an almost pure black; the palest, known as "orange-lac," is the most valuable; the darker varieties —"liver-coloured," "ruby," "garnet," &c.—diminish in value as the colour deepens. Shellac may be bleached by dissolving it in a boiling lye of caustic potash and passing chlorine through the solution till all the resin is precipitated, the product being known as white shellac. Bleached lac takes light delicate shades of colour, and dyed a golden yellow it is much used in the East Indies for working into chain ornaments for the head and for other personal adornments. Lac is a principal ingredient in sealing-wax, and forms the basis of some of the most valuable varnishes, besides being useful in various cements, &c. Average stick lac contains about 68 % of resin, 10 of lac dye and 6 of a waxy substance. Lac dye is obtained by evaporating the water in which stick lac is washed, and comes into commerce in the form of small square cakes. It is in many respects similar to, although not identical with, cochineal.

LACAILLE, NICOLAS LOUIS DE (1713–1762), French astronomer, was born at Rumigny, in the Ardennes, on the 15th of March 1713. Left destitute by the death of his father, who held a post in the household of the duchess of Vendôme, his theological studies at the Collège de Lisieux in Paris were prosecuted at the expense of the duke of Bourbon. After he had taken deacon's orders, however, he devoted himself exclusively to science, and, through the patronage of J. Cassini, obtained employment, first in surveying the coast from Nantes to Bayonne, then, in 1739, in remeasuring the French arc of the meridian. The success of this difficult operation, which occupied two years, and achieved the correction of the anomalous result published by J. Cassini in 1718, was mainly due to Lacaille's industry and skill. He was rewarded by admission to the Academy and the appointment of mathematical professor in Mazarin college, where he worked in a small observatory fitted for his use. His desire to observe the southern heavens led him to propose, in 1750, an astronomical expedition to the Cape of Good Hope, which was officially sanctioned, and fortunately executed. Among its results were determinations of the lunar and of the solar parallax (Mars serving as an intermediary), the first measurement of a South African arc of the meridian, and the observation of 10,000 southern stars. On his return to Paris in 1754 Lacaille was distressed to find himself an object of public attention; he withdrew to Mazarin college, and there died, on the 21st of March 1762, of an attack of gout aggravated by unremitting toil. Lalande said of him that, during a comparatively short life, he had made more observations and calculations than all the astronomers of his time put together. The quality of his work rivalled its quantity, while the disinterestedness and rectitude of his moral character earned him universal respect.

His principal works are: *Astronomiae Fundamenta* (1757), containing a standard catalogue of 398 stars, re-edited by F. Baily (*Memoirs Roy. Astr. Society*, v. 93); *Tabulae Solares* (1758); *Coelum australe stelliferum* (1763) (edited by J. D. Maraldi), giving zone-observations of 10,000 stars, and describing fourteen new constellations; "Observations sur 515 étoiles du Zodiaque" (published in t. vi. of his *Éphémérides*, 1763); *Leçons élémentaires de Mathématiques* (1741), frequently reprinted; ditto *de Mécanique* (1743), &c.; ditto *d'Astronomie* (1746), 4th edition augmented by Lalande (1779); ditto *d'Optique* (1750), &c. Calculations by him of eclipses for eighteen hundred years were inserted in *L'Art de vérifier les dates* (1750); he communicated to the Academy in 1755 a classed catalogue of forty-two southern nebulae, and gave in t. ii. of his *Éphémérides* (1755) practical rules for the employment of the lunar method of longitudes, proposing in his additions to Pierre Bouguer's *Traité de Navigation* (1760) the model of a nautical almanac.

See G. de Fouchy, "Éloge de Lacaille," *Hist. de l'Acad. des Sciences*, p. 197 (1762); G. Brotier, Preface to Lacaille's *Coelum australe*; Claude Carlier, *Discours historique*, prefixed to Lacaille's *Journal historique du voyage fait au Cap* (1763); J. J. Lalande, *Connoissance des temps*, p. 185 (1767); *Bibl. astr.* pp. 422, 456, 461, 482; J. Delambre, *Hist. de l'astr. au XVIII^e siècle*, pp. 457-542; J. S. Bailly, *Hist. de l'astr. moderne*, tomes ii., iii., *passim*; J. C. Poggendorff, *Biog. Lit. Handwörterbuch*; R. Grant, *Hist. of Physical Astronomy*, pp. 486, &c.; R. Wolf, *Geschichte der Astronomie*. A catalogue of 9766 stars, reduced from Lacaille's observations by T. Henderson, under the supervision of F. Baily, was published in London in 1847.

LACAITA, SIR JAMES [GIACOMO] (1813–1895), Anglo-Italian politician and writer. Born at Manduria in southern Italy, he practised law in Naples, and having come in contact with a number of prominent Englishmen and Americans in that city, he acquired a desire to study the English language. Although a moderate Liberal in politics, he never joined any secret society, but in 1851 after the restoration of Bourbon autocracy he was arrested for having supplied Gladstone with information on Bourbon misrule. Through the intervention of the British and Russian ministers he was liberated, but on the publication of Gladstone's famous letters to Lord Aberdeen he was obliged to leave Naples. He first settled in Edinburgh, where he married Maria Carmichael, and then in London where he made numerous friends in literary and political circles, and was professor of Italian at Queen's College from 1853 to 1856. In the latter year he accompanied Lord Minto to Italy, on which occasion he first met Cavour. From 1857 to 1863 he was private secretary (non-political) to Lord Lansdowne, and in 1858 he accompanied Gladstone to the Ionian Islands as secretary, for which services he was made a K.C.M.G. the following year. In 1860 Francis II. of Naples had implored Napoleon III. to send a squadron to prevent Garibaldi from crossing over from Sicily to Calabria; the emperor expressed himself willing to do so provided Great Britain co-operated, and Lord John Russell was at first inclined to agree. At this juncture Cavour, having heard of the scheme, entrusted Lacaita, at the suggestion of Sir James Hudson, the British minister at Turin, with the task of inducing Russell to refuse co-operation. Lacaita, who was an intimate friend both of Russell and his wife, succeeded, with the help of the latter, in winning over the British statesman just as he was about to accept the Franco-Neapolitan proposal, which was in consequence abandoned. He returned to Naples late in 1860 and the following year was elected member of parliament for Bitonto, although he had been naturalized a British subject in 1855. He took little part in parliamentary politics, but in 1876 was created senator. He was actively interested in a number of English companies operating in Italy, and was made one of the directors of the Italian Southern Railway Co. He had a wide circle of friends in many European countries and in America, including a number of the most famous men in politics and literature. He died in 1895 at Posilipo near Naples.

An authority on Dante, he gave many lectures on Italian literature and history while in England; and among his writings may be mentioned a large number of articles on Italian subjects in the *Encyclopaedia Britannica* (1857–1860), and an edition of Benvenuto da Imola's Latin lectures on Dante delivered in 1375; he co-operated with Lord Vernon in the latter's great edition of Dante's *Inferno* (London, 1858–1865), and he compiled a catalogue in four volumes of the duke of Devonshire's library at Chatsworth (London, 1879).

LA CALLE, a seaport of Algeria, in the arrondissement of Bona, department of Constantine, 56 m. by rail E. of Bona and 10 m. W. of the Tunisian frontier. It is the centre of the Algerian and Tunisian coral fisheries and has an extensive industry in the curing of sardines; but the harbour is small and exposed to the N.E. and W. winds. The old fortified town, now almost abandoned, is built on a rocky peninsula about 400 yds. long, connected with the mainland by a bank of sand. Since the occupation of La Calle by the French in 1836 a new town has grown up along the coast. Pop. (1906) of the town, 2774; of the commune, 4612.

La Calle from the times of its earliest records in the 10th century has been the residence of coral merchants. In the 16th century exclusive privileges of fishing for coral were granted by the dey of Algiers to the French, who first established themselves on a bay to the westward of La Calle, naming their settlement Bastion de France; many ruins still exist of this town. In 1677 they moved their headquarters to La Calle. The company—*Compagnie d'Afrique*—who owned the concession for the fishery was suppressed in 1798 on the outbreak of war between France and Algeria. In 1806 the British consul-general at Algiers obtained the right to occupy Bona and La Calle for an annual rent of £11,000; but though the money was paid for several years no practical effect was given to the agreement. The French regained possession in 1817, were expelled during the wars of 1827, when La Calle was burnt, but returned and rebuilt the place in 1836. The boats engaged in the fishery were mainly Italian, but the imposition, during the last quarter of the 19th century, of heavy taxes on all save French boats drove the foreign vessels away. For some years the industry was abandoned, but was restarted on a small scale in 1903.

See Abbé Poiret, *Voyage en Barbarie* . . . (Paris, 1789); E. Broughton, *Six Years' Residence in Algiers* (London, 1839) and Sir R. L. Playfair, *Travels in the Footsteps of Bruce* (London, 1877).

LA CALPRENÈDE, GAUTHIER DE COSTES, Seigneur de (*c.* 1610–1663), French novelist and dramatist, was born at the Château of Tolgou, near Sarlat (Dordogne), in 1609 or 1610. After studying at Toulouse, he came to Paris and entered the regiment of the guards, becoming in 1650 gentleman-in-ordinary of the royal household. He died in 1663 in consequence of a kick from his horse. He was the author of several long heroic romances ridiculed by Boileau. They are: *Cassandre* (10 vols., 1642–1650); *Cléopatre* (1648); *Faramond* (1661); and *Les Nouvelles, ou les Divertissements de la princesse Alcidiane* (1661) published under his wife's name, but generally attributed to him. His plays lack the spirit and force that occasionally redeem the novels. The best is *Le Comte d'Essex*, represented in 1638, which supplied some ideas to Thomas Corneille for his tragedy of the same name.

LA CARLOTA, a town of the province of Negros Occidental, Philippine Islands, on the W. coast of the island and the left bank of San Enrique river, about 18 m. S. of Bacolod, the capital of the province. Pop. (1903), after the annexation of San Enrique, 19,192. There are fifty-four villages or barrios in the town; the largest had a population in 1903 of 3254 and two others had each more than 1000 inhabitants. The Panayano dialect of the Visayan language is spoken by most of the inhabitants. At La Carlota the Spanish government established a station for the study of the culture of sugar-cane; by the American government this has been converted into a general agricultural experiment station, known as "Government Farm."

LACCADIVE ISLANDS, a group of coral reefs and islands in the Indian Ocean, lying between 10° and 12° 20′ N. and 71° 40′ and 74° E. The name Laccadives (*laksha dwipa*, the "hundred thousand isles") is that given by the people of the Malabar coast, and was probably meant to include the Maldives; they are called by the natives simply *Divi*, "islands," or *Amendivi*, from the chief island. There are seventeen separate reefs, "round each of which the 100-fathom line is continuous" (J. S. Gardiner). There are, however, only thirteen islands, and of these only eight are inhabited. They fall into two groups—the northern, belonging to the collectorate of South Kanara, and including the inhabited islands of Amini, Kardamat, Kiltan and Chetlat; and the southern, belonging to the administrative district of Malabar, and including the inhabited islands of Agatti, Kavaratti, Androth and Kalpeni. Between the Laccadives and the Maldives to the south lies the isolated Minikoi, which physically belongs to neither group, though somewhat nearer to the Maldives (*q.v.*). The principal submerged banks lie north of the northern group of islands; they are Munyal, Coradive and Sesostris, and are of greater extent than those on which the islands lie. The general depth over these is from 23 to 28 fathoms, but Sesostris has shallower soundings "indicating patches growing up, and some traces of a rim" (J. S. Gardiner). The islands have in nearly all cases emerged from the eastern and protected side of the reef, the western being completely exposed to the S.W. monsoon. The islands are small, none exceeding a mile in breadth, while the total area is only about 80 sq. m. They lie so low that they would be hardly discernible but for the coco-nut groves with which they are thickly covered. The soil is light coral sand, beneath which, a few feet down, lies a stratum of coral stretching over the whole of the islands. This coral, generally a foot to a foot and a half in thickness, has been in the principal islands wholly excavated, whereby the underlying damp sand is rendered available for cereals. These excavations—a work of vast labour—were made at a remote period, and according to the native tradition by giants. In these spaces (*totam*, "garden") coarse grain, pulse, bananas and vegetables are cultivated; coco-nuts grow abundantly everywhere. For rice the natives depend upon the mainland.

Population and Trade.—The population in 1901 was 10,274. The people are Moplas, *i.e.* of mixed Hindu and Arab descent, and are Mahommedans. Their manners and customs are similar to those of the coast Moplas; but they maintain their own ancient caste distinctions. The language spoken is Malayalim, but it is written in the Arabic character. Reading and writing are common accomplishments among the men. The chief industry is the manufacture of coir. The various processes are entrusted to the women. The men employ themselves with boatbuilding and in conveying the island produce to the coast. The exports from the Laccadives are of the annual value of about £17,000.

History.—No data exist for determining at what period the Laccadives were first colonized. The earliest mention of them as distinguished from the Maldives seems to be by Albírúní (*c.* 1030), who divides the whole archipelago (Díbaját) into the *Dívah Kúzah* or Cowrie Islands (the Maldives), and the *Divah Kanbar* or Coir Islands (the Laccadives). (See *Journ. Asiat. Soc.*, September 1844, p. 265). The islanders were converted to Islam by an Arab apostle named Mumba Mulyaka, whose grave at Androth still imparts a peculiar sanctity to that island. The kazee of Androth was in 1847 still a member of his family, and was said to be the twenty-second who had held the office in direct line from the saint. This gives colour to the tradition that the conversion took place about 1250. It is also further corroborated by the story given by the Ibn Batuta of the conversion of the Maldives, which occurred, as he heard, four generations (say one hundred and twenty years) before his visit to these islands in 1342. The Portuguese discovered the Laccadives in May 1498, and built forts upon them, but about 1545 the natives rose upon their oppressors. The islands subsequently became a suzerainty of the raja of Cannanore, and after the peace of Seringapatam, 1792 the southern group was permitted to remain under the management of the native chief at a yearly tribute. This was often in arrear, and on this account these islands were sequestrated by the British government in 1877.

See *The Fauna and Geography of the Maldive and Laccadive Archipelagoes*, ed. J. Stanley Gardiner (Cambridge 1901–1905); *Malabar District Gazetteer* (Madras, 1908); G. Pereira, "As Ilhas de Dyve" (*Boletim da Soc. Geog.*, Lisbon, 1898–1899) gives details relating to the Laccadives from the 16th-century MS. volume *De insulis et peregrinatione lusitanorum* in the National Library, Lisbon.

LACCOLITE (Gr. λάκκος, cistern, λίθος, stone), in geology, the name given by Grove K. Gilbert to intrusive masses of igneous rock possessing a cake-like form, which he first described from the Henry Mountains of southern Utah. Their characteristic is that they have spread out along the bedding planes of the strata, but are not so broad and thin as the sheets or intrusive sills which, consisting usually of basic rocks, have spread over immense distances without attaining any great thickness. Laccolites cover a comparatively small area and have greater thickness. Typically they have a domed upper surface while their base is flat. In the Henry Mountains they are from 1 to 5 m. in diameter and range in thickness up to about 5000 ft. The cause of their peculiar shape appears to be the viscosity of the rock injected, which is usually of intermediate character and comparatively rich in alkalis, belonging to the trachytes and similar lithological types. These are much less fluid than the basalts, and the latter in consequence spread out much more readily along the bedding planes, forming thin flat-topped sills. At each side the laccolites thin out rapidly so that their upper surface slopes steeply to the margins. The strata above them which have been uplifted and bent are often cracked by extension, and as the igneous materials well into the fissures a large number of dikes is produced. At the base of the laccolite, on the other hand, the strata are flat and dikes are rare, though there may be a conduit up which the magma has flowed into the laccolite. The rocks around are often much affected by contact alteration, and great masses of them have sometimes sunk into the laccolite, where they may be partly melted and absorbed.

Gilbert obtained evidence that these laccolites were filled at depths of 7000 to 10,000 ft. and did not reach the surface, giving rise to volcanoes. From the effects on the drainage of the country it seemed probable that above the laccolites the strata swelled up in flattish eminences. Often they occur side by side in groups belonging to a single period, though all the members of each group are not strictly of the same age. One laccolite may be formed on the side of an earlier one, and compound laccolites also occur. When exposed by erosion they give rise to hills, and their appearance varies somewhat with the stage of development.

In the western part of South America laccolites agreeing in all essential points with those described by Gilbert occur in considerable numbers and present some diversity of types. Occasionally they are asymmetrical, or have one steep or vertical side while the other is gently inclined. In other cases they split into a number of sheets spreading outwards through the rocks around. But the term laccolite has also been adopted by geologists in Britain and elsewhere to describe a variety of intrusive masses not strictly identical in character with those of the Henry Mountains. Some of these rest on a curved floor, like the gabbro masses of the Cuillin Hills in Skye; others are injected along a flattish plane of unconformability where one system of rocks rests on the upturned and eroded edges of an older series. An example of the latter class is furnished by the felsite mass of the Black Hill in the Pentlands, near Edinburgh, which has followed the line between the Silurian and the Old Red Sandstone, forcing the rocks upwards without spreading out laterally to any great extent.

The term laccolite has also been applied to many granite intrusions, such as those of Cornwall. We know from the evidence of mining shafts which have been sunk in the country near the edge of these granites that they slope downwards underground with an angle of twenty to thirty degrees. They have been proved also to have been injected along certain wall-marked horizons; so that although the rocks of the country have been folded in a very complicated manner the granite can often be shown to adhere closely to certain members of the stratigraphical sequence for a considerable distance. Hence it is clear that their upper surfaces are convex and gently arched, and it is conjectured that the strata must extend below them, though at a great depth, forming a floor. The definite proof of this has not been attained for no borings have penetrated the granites and reached sedimentary rocks beneath them. But often in mountainous countries where there are deep valleys the bases of great granite laccolites are exposed to view in the hill sides. These granite sills have a considerable thickness in proportion to their length, raise the rocks above them and fill them with dikes, and behave generally like typical laccolites. In contradistinction to intrusions of this type with a well-defined floor we may place the batholiths, bysmaliths, plutonic plugs and stocks, which have vertical margins and apparently descend to unknown depths. It has been conjectured that masses of this type eat their way upwards by dissolving the rock above them and absorbing it, or excavate a passage by breaking up the roof of the space they occupy while the fragments detached sink downwards and are lost in the ascending magma. (J. S. F.)

LACE (corresponding to Ital. *merletto*, *trina*; Genoese *pizzo*; Ger. *spitzen*; Fr. *dentelle*; Dutch *kanten*; Span. *encaje*; the English word owes something to the Fr. *lassis* or *lacis*, but both are connected with the earlier Lat. *laqueus*; early French laces were also called *passements* or insertions and *dents* or edgings), the name applied to ornamental open work formed of threads of flax, cotton, silk, gold or silver, and occasionally of mohair or aloe fibre, looped or plaited or twisted together by hand, (1) with a needle, when the work is distinctively known as "needlepoint lace"; (2) with bobbins, pins and a pillow or cushion, when the work is known as "pillow lace"; and (3) by steam-driven machinery, when imitations of both needlepoint and pillow laces are produced. Lace-making implies the production of ornament and fabric concurrently. Without a pattern or design the fabric of lace cannot be made.

The publication of patterns for needlepoint and pillow laces dates from about the middle of the 16th century. Before that period lace described such articles as cords and narrow braids of plaited and twisted threads, used not only to fasten shoes, sleeves and corsets together, but also in a decorative manner to braid the hair, to wind round hats, and to be sewn as trimmings upon costumes. In a Harleian MS. of the time of Henry VI. and Edward IV., about 1471, directions are given for the making of "lace Bascon, lace indented, lace bordered, lace covert, a brode lace, a round lace, a thynne lace, an open lace, lace for hattys," &c. The MS. opens with an illuminated capital letter, in which is the figure of a woman making these articles. The MS. supplies a clear description how threads in combinations of twos, threes, fours, fives, to tens and fifteens, were to be twisted and plaited together. Instead of the pillow, bobbins and pins with which pillow lace soon afterwards was made, the hands were used, each finger of a hand serving as a peg upon which was placed a "bowys" or "bow," or little ball of thread. Each ball might be of different colour from the other. The writer of the MS. says that the first finger next the thumb shall be called A, the next B, and so on. According to the sort of cord or braid to be made, so each of the four fingers, A, B, C, D might be called into service. A "thynne lace" might be made with three threads, and then only fingers A, B, C would be required. A "round" lace, stouter than the "thynne" lace, might require the service of four or more fingers. By occasionally dropping the use of threads from certain fingers a sort of indented lace or braid might be made. But when laces of more importance were wanted, such as a broad lace for "hattys," the fingers on the hands of assistants were required. The smaller cords or "thynne laces," when fastened in simple or fantastic loops along the edges of collars and cuffs, were called "purls" (see the small edge to the collar worn by Catherine de' Medici, Pl. II. fig. 4). In another direction from which some suggestion may be derived as to the evolution of lace-making, notice should be taken of the fact that at an early period the darning of varied ornamental devices, stiff and geometric in treatment into hand-made network of small square meshes (see squares of "lacis," Pl. I. fig. 1) became specialized in many European countries. This is held by some writers to be "opus filatorium," or "opus araneum" (spider work). Examples of this "opus filatorium," said to date from the 13th century exist in public collections. The productions of this darning in the early part of the 16th century came to be known as "punto a maglia quadra" in Italy and as "lacis" in France, and through a growing demand for household and wearing linen, very much of the "lacis" was made in white threads not only in Italy and France but also in Spain. In appearance it is a filmy fabric. With white threads also were the "purlings" above mentioned made, by means of leaden bobbins or "fuxii," and were called "merletti a piombini" (see lower border, Pl. II. fig. 3). Cut and drawn thread linen work (the latter known as "tela tirata" in Italy and as "deshilado" in Spain) were other forms of embroidery as much in vogue as the darning on net and the "purling." The ornament of much of this cut and drawn linen work (see collar of Catherine de' Medici, Pl. II. fig. 4), more restricted in scope than that of the darning on net, was governed by the recurrence of open squares formed by the withdrawal of the threads. Within these squares and rectangles radiating devices usually were worked by means of whipped and buttonhole stitches (Pl. fig. 5). The general effect in the linen was a succession of insertions or borders of plain or enriched reticulations, whence the name "punto a reticella" given to this class of embroidery in Italy. Work of similar style and especially that with whipped stitches was done rather earlier in the Grecian islands, which derived it from Asia Minor and Persia. The close connexion of the Venetian republic with Greece and the eastern islands, as well as its commercial relations with the East, sufficiently explains an early transplanting of this kind of embroidery into Venice, as well as in southern Spain. At Venice besides being called "reticella," cut work was also called "punto tagliato." Once fairly established as home industries such arts were quickly exploited with a beauty and variety of pattern, complexity of stitch and delicacy of execution, until insertions and edgings made independently of any linen as a starting base (see first two borders, Pl. II. fig. 3) came into being under the name of "Punto in aria" (Pl. II. fig. 7). This was the first variety of Venetian and Italian needlepoint lace in the middle of the 16th century,[1] and its appearance then almost coincides in date with that of the "merletti a piombini," which was the earliest Italian cushion or pillow lace (see lower edging, Pl. II. fig. 3).

The many varieties of needlepoint and pillow laces will be touched on under the heading allotted to each of these methods of making lace. Here, however, the general circumstances of their genesis may be briefly alluded to. The activity in cord and braid-making and in the particular sorts of ornamental needlework already mentioned clearly postulated such special labour as was capable of being converted into lace-making. And from the 16th century onwards the stimulus to the industry in Europe was afforded by regular trade demand, coupled with the exertions of those who encouraged their dependents or protegés to give their spare time to remunerative home occupations. Thus the origin and perpetuation of the industry have come to be associated with the women folk of peasants and fishermen in circumstances which present little dissimilarity whether in regard to needle lace workers now making lace in whitewashed cottages and cabins at Youghal and Kenmare in the south of Ireland, or those who produced their "punti in aria" during the 16th century about the lagoons of Venice, or Frenchwomen who made the sumptuous "Points de France" at Alençon and elsewhere in the 17th and 18th centuries; or pillow lace workers to be seen at the present day at little seaside villages tucked away in Devonshire dells, or those who were engaged more than four hundred years ago in "merletti a piombini" in Italian villages or on "Dentelles au fuseau" in Flemish lowlands. The ornamental character, however, of these several laces would be found to differ much; but methods, materials, appliances and opportunities of work would in the main be alike. As fashion in wearing laces extended, so workers came to be drawn together into groups by employers who acted as channels for general trade.[2] Nuns in the past as in the present have also devoted attention to the industry, often providing in the convent precincts workrooms not only for peasant women to carry out commissions in the service of the church or for the trade, but also for the purpose of training children in the art. Elsewhere lace schools have been founded by benefactors or organized by some leading local lace-maker[3] as much for trading as for education. In all this variety of circumstance, development of finer work has depended upon the abilities of the workers being exercised under sound direction, whether derived through their own intuitions, or supplied by intelligent and tasteful employers. Where any such direction has been absent the industry viewed commercially has suffered, its productions being devoid of artistic effect or adaptability to the changing tastes of demand.

It is noteworthy that the two widely distant regions of Europe where pictorial art first flourished and attained high perfection, north Italy and Flanders, were precisely the localities where lace-making first became an industry of importance both from an artistic and from a commercial point of view. Notwithstanding more convincing evidence as to the earlier development of pillow lace making in Italy the invention of pillow lace is often credited to the Flemings; but there is no distinct trace of the time or the locality. In a picture said to exist in the church of St Gomar at Lierre, and sometimes attributed to Quentin Matsys (1495), is introduced a girl apparently working at some sort of lace with pillow, bobbins, &c., which are somewhat similar to the implements in use in more recent times.[4] From the very infancy of Flemish art an active intercourse was maintained between the Low Countries and the great centres of Italian art; and it is therefore only what might be expected that the wonderful examples of the art and handiwork of Venice in lace-making should soon have come to be known to and rivalled among the equally industrious, thriving and artistic Flemings. At the end of the 16th century pattern-books were issued in Flanders having the same general character as those published for the guidance of the Venetian and other Italian lace-makers.

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[1] The prevalence of fashion in the above-mentioned sorts of embroidery during the 16th century is marked by the number of pattern-books then published. In Venice a work of this class was issued by Alessandro Pagannino in 1527; another of a similar nature, printed by Pierre Quinty, appeared in the same year at Cologne; and *La Fleur de la science de pourtraicture et patrons de broderie, façon arabicque et ytalique*, was published at Paris in 1530. From these early dates until the beginning of the 17th century pattern-books for embroidery in Italy, France, Germany and England were published in great abundance. The designs contained in many of those dating from the early 16th century were to be worked for costumes and hangings, and consisted of scrolls, arabesques, birds, animals, flowers, foliage, herbs and grasses. So far, however, as their reproduction as laces might be concerned, the execution of complicated work was involved which none but practised lace-workers, such as those who arose a century later, could be expected to undertake.

[2] A very complete account of how these conditions began and developed at Alençon, for instance, is given in Madame Despierre's *Histoire du Point d'Alençon* (1886) to which is appended an interesting and annotated list of merchants, designers and makers of Point d'Alençon.

[3] *E.g.* The family of Camusat at Alençon from 1602 until 1795.

[4] The picture, however, as Seguin has pointed out, was probably painted some thirty years later, and by Jean Matsys.

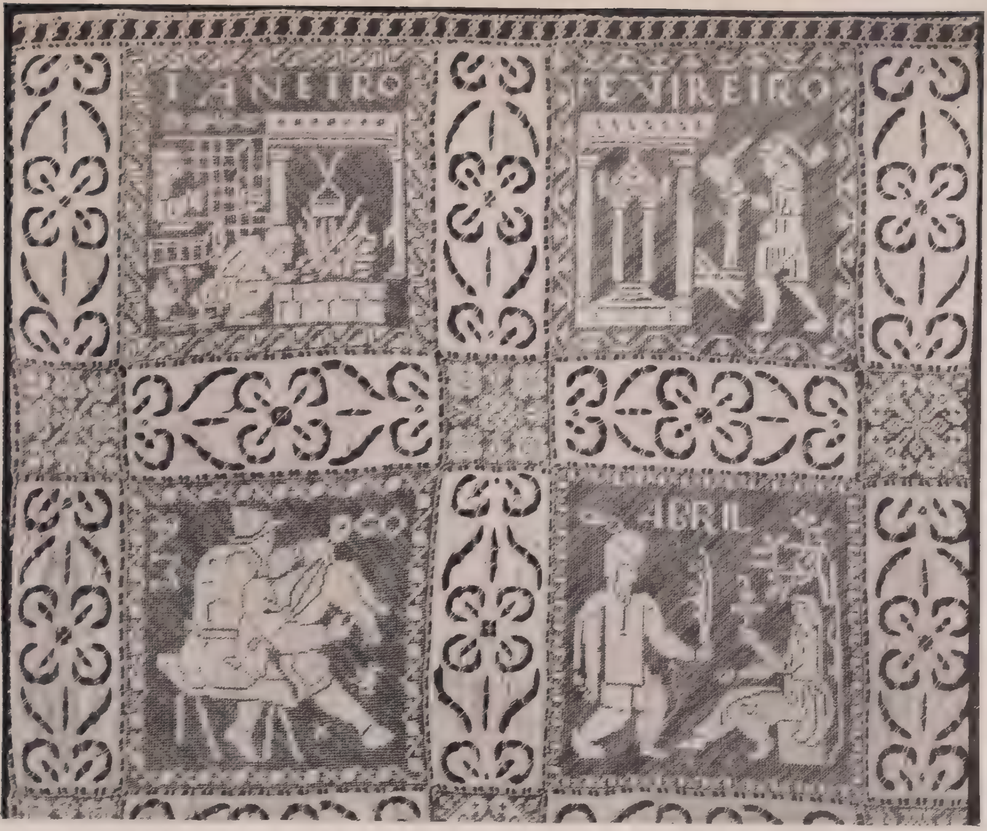

FIG. 1.—PORTION OF A COVERLET COMPOSED OF SQUARES OF "LACIS" OR DARNED NETTING, DIVIDED BY LINEN CUT-WORK BANDS
The squares are worked with groups representing the twelve months and with a scene from the old Spanish dramatic story "Celestina." Spanish or Portuguese. 16th century. Victoria and Albert Museum.

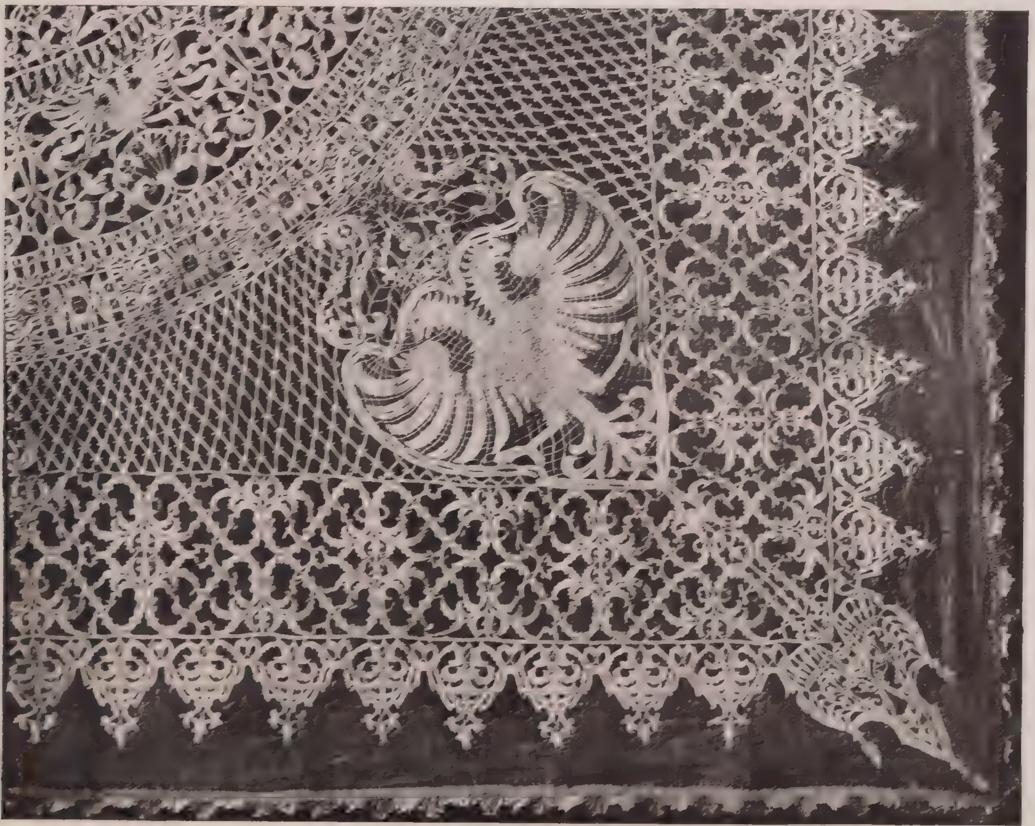

FIG. 2.—CORNER OF A BED-COVER OF PILLOW-MADE LACE OF A TAPE-LIKE TEXTURE WITH CHARACTERISTICS IN THE TWISTED AND PLAITED THREADS RELATING THE WORK TO ITALIAN "MERLETTI A PIOMBINI" OR EARLY ENGLISH "BONE LACE."
Probably made in Flanders [illegible] eagle of Austria [illegible] German Emperor. Victoria and Albert Museum.

LACE

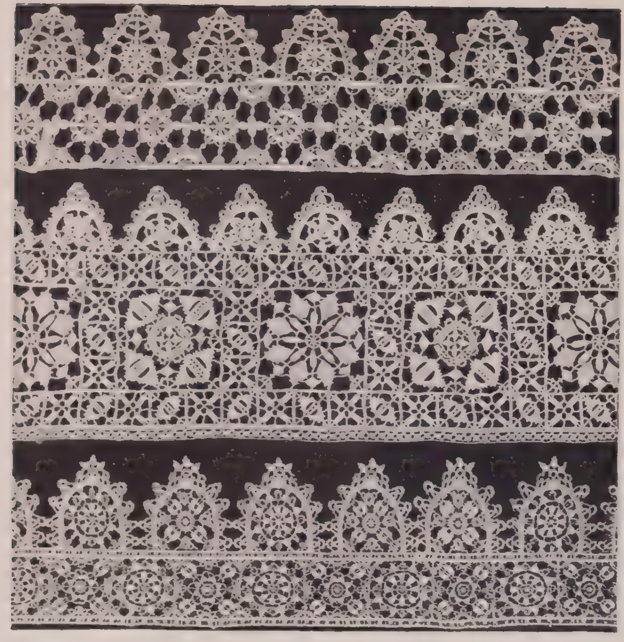

FIG. 3.—THREE VANDYKE OR DENTATED BORDERS OF ITALIAN LACE OF THE LATE 16TH CENTURY.

Style usually called "Reticella" on account of the patterns being based on repeated squares or reticulations. The two first borders are of needlepoint work; the lower border is of such pillow lace as was known in Italy as "merletti a piombini."

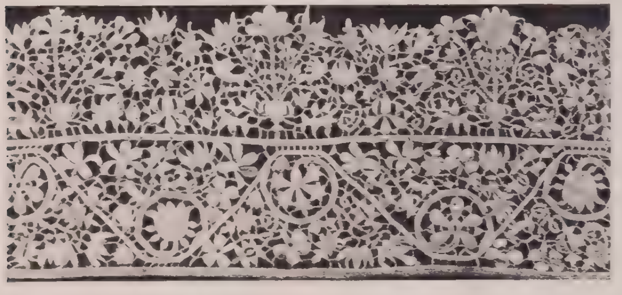

FIG. 7.—BORDER OF FLAT NEEDLEPOINT LACE OF FULLER TEXTURE THAN THAT OF FIG. 3, AND FROM A FREER STYLE OF DESIGN IN WHICH CONVENTIONALIZED FLORAL FORMS HELD TOGETHER BY SMALL BARS OR TYES ARE USED.

Style called "Punto in Aria," chiefly on account of its independence of squares or reticulations. Italian. Early 17th century.

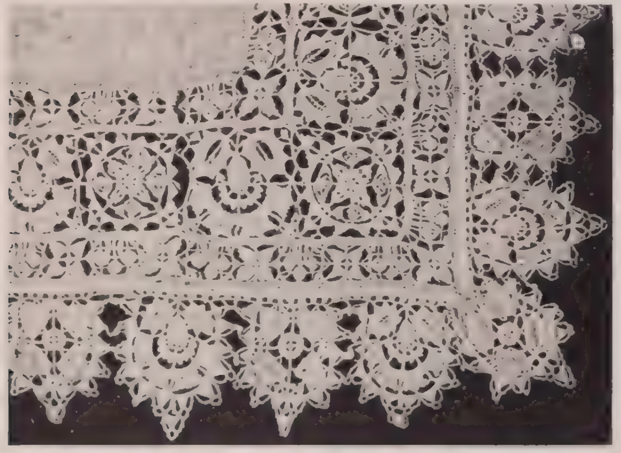

FIG. 5.—CORNER OF A NAPKIN OR HANDKERCHIEF BORDERED WITH "RETICELLA" NEEDLEPOINT LACE IN THE DESIGN OF WHICH ACORNS AND CARNATIONS ARE MINGLED WITH GEOMETRIC RADIATIONS. Probably of English early 17th century.

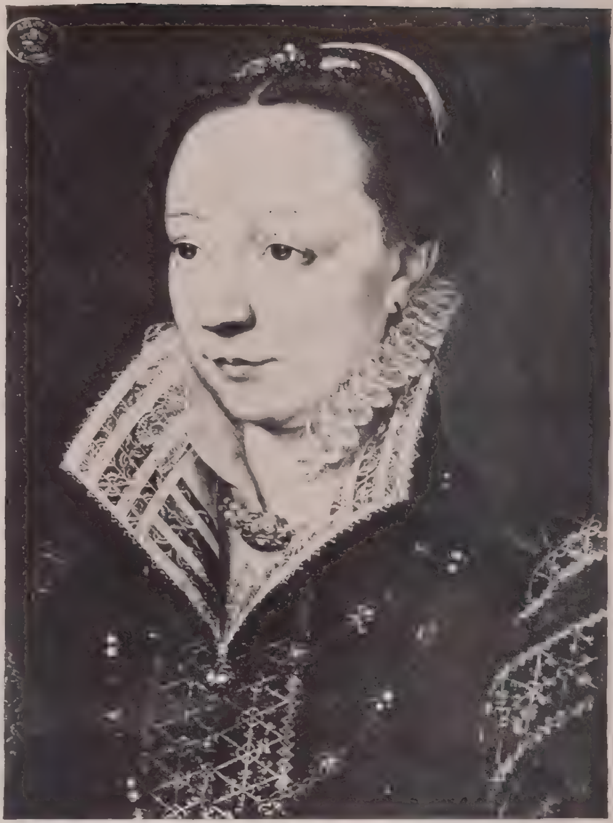

FIG. 4.—CATHERINE DE MEDICI, WEARING A LINEN UPTURNED COLLAR OF CUT WORK AND NEEDLEPOINT LACE. Louvre. About 1540.

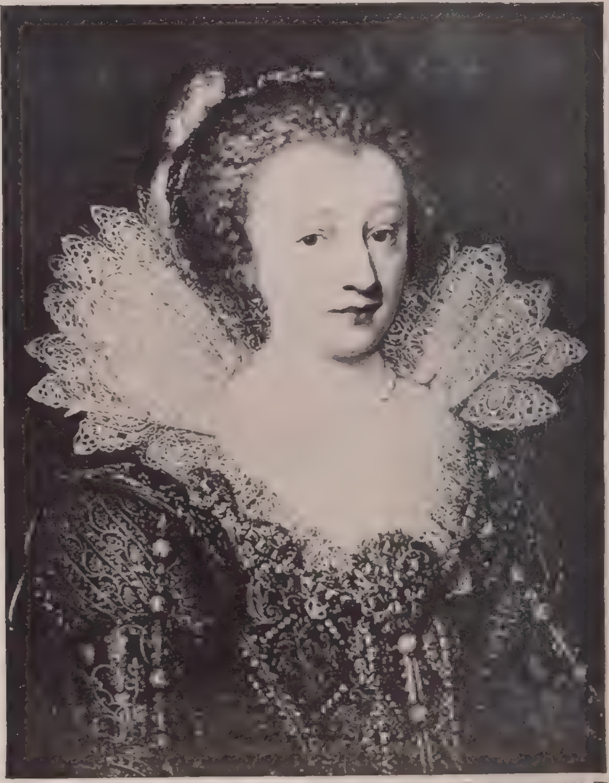

FIG. 6.—AMELIE ELISABETH, COMTESSE DE HAINAULT, WEARING A RUFF OF NEEDLEPOINT RETICELLA LACE. By MORCELSE. The Hague. About 1600.

(Figs. 4 and 6 by permission of Messrs Braun, Clement & Co., Dornach (Alsace), and Paris.)

France and England were not far behind Venice and Flanders in making needle and pillow lace. Henry III. of France (1574–1589) appointed a Venetian, Frederic Vinciolo, pattern maker for varieties of linen needle works and laces to his court. Through the influence of this fertile designer the seeds of a taste for lace in France were principally sown. But the event which *par excellence* would seem to have fostered the higher development of the French art of lace-making was the aid officially given it in the following century by Louis XIV., acting on the advice of his minister Colbert. Intrigue and diplomacy were put into action to secure the services of Venetian lace-workers; and by an edict dated 1665 the lace-making centres at Alençon, Quesnoy, Arras, Reims, Sedan, Château Thierry, Loudun and elsewhere were selected for the operations of a company in aid of which the state made a contribution of 36,000 francs; at the same time the importation of Venetian, Flemish and other laces was strictly forbidden.[1] The edict contained instructions that the lace-makers should produce all sorts of thread work, such as those done on a pillow or cushion and with the needle, in the style of the laces made at Venice, Genoa, Ragusa and other places; these French imitations were to be called "points de France." By 1671 the Italian ambassador at Paris writes, "Gallantly is the minister Colbert on his way to bring the 'lavori d'aria' to perfection." Six years later an Italian, Domenigo Contarini, alludes to the "punto in aria," "which the French can now do to admiration." The styles of design which emanated from the chief of the French lace centre, Alençon, were more fanciful and less severe than the Venetian, and it is evident that the Flemish lace-makers later on adopted many of these French patterns for their own use. The provision of French designs (fig. 24) which owes so much to the state patronage, contrasts with the absence of corresponding provision in England and was noticed early in the 18th century by Bishop Berkeley. "How," he asks, "could France and Flanders have drawn so much money from other countries for figured silk, lace and tapestry, if they had not had their academies of design?"

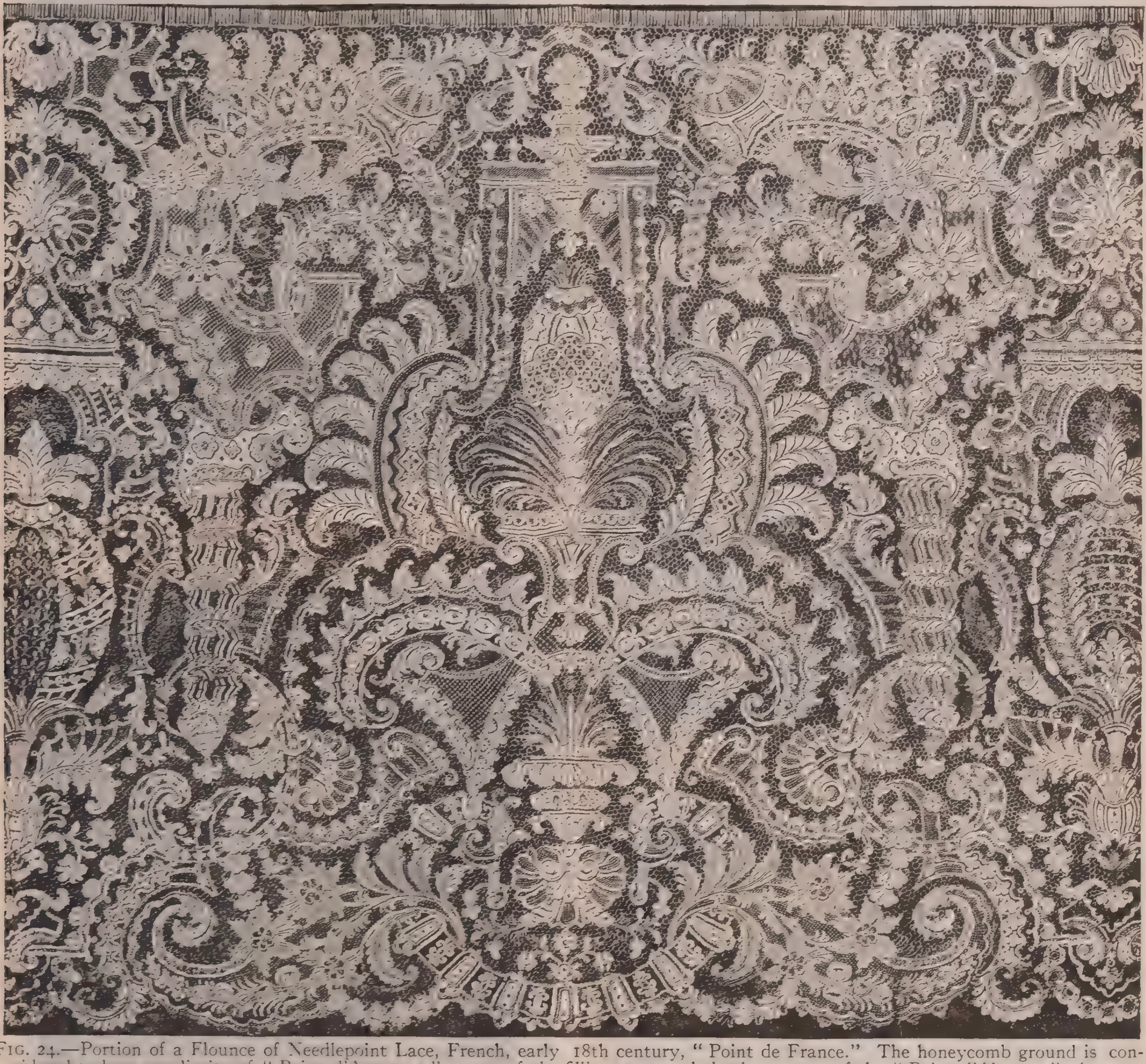

FIG. 24.—Portion of a Flounce of Needlepoint Lace, French, early 18th century, "Point de France." The honeycomb ground is considered to be a peculiarity of "Point d'Argentan": some of the fillings are made in the manner of the "Point d'Alençon" *réseau.*

It is fairly evident too that the French laces themselves, known as "bisette," "gueuse," "campane" and "mignonette," were small and comparatively insignificant works, without pretence to design.

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[1] See the poetical skit *Révolte des passements et broderies,* written by Mademoiselle de la Tousse, cousin of Madame de Sévigné, in the middle of the 17th century, which marks the favour which foreign laces at that time commanded amongst the leaders of French fashion.

The humble endeavours of peasantry in England (which could boast of no schools of design), Germany, Sweden, Russia and Spain could not result in work of so high artistic pretension as that of France and Flanders. In the 18th century good lace was made in Devonshire, but it is only in recent years that to some extent the hand lace-makers of England and Ireland have become impressed with the necessity of well-considered designs for their work. Pillow lace making under the name of "bone lace making" was pursued in the 17th century in Buckinghamshire, Hertfordshire and Bedfordshire, and in 1724 Defoe refers to the manufacture of bone lace in which villagers were "wonderfully exercised and improved within these few years past." "Bone" lace dates from the 17th century in England and was practically the counterpart of Flemish "dentelles au fuseau," and related also to the Italian "merletti a piombini" (see Pl. fig. 10). In Germany, Barbara Uttmann, a native of Nuremberg, instructed peasants of the Harz mountains to twist and plait threads in 1561. She was assisted by certain refugees from Flanders. A sort of "purling" or imitation of the Italian "merletti a piombini" was the style of work produced then.

Lace of comparatively simple design has been made for centuries in villages of Andalusia as well as in Spanish conventual establishments. The "point d'Espagne," however, appears to have been a commercial name given by French manufacturers of a class of lace made in France with gold or silver threads on the pillow and greatly esteemed by Spaniards in the 17th century. No lace pattern-books have been found to have been published in Spain. The needle-made laces which came out of Spanish monasteries in 1830, when these institutions were dissolved, were mostly Venetian needle-made laces. The lace vestments preserved at the cathedral at Granada hitherto presumed to be of Spanish work are verified as being Flemish of the 17th century (similar in style to Pl. fig. 14). The industry is not alluded to in Spanish ordinances of the 15th, 16th or 17th centuries, but traditions which throw its origin back to the Moors or Saracens are still current in Seville and its neighbourhood, where a twisted and knotted arrangement of fine cords is often worked[1] under the name of "Morisco" fringe, elsewhere called macramé lace. Black and white silk pillow laces, or "blondes," date from the 18th century. They were made in considerable quantity in the neighbourhood of Chantilly, and imported for mantillas by Spain, where corresponding silk lace making was started. Although after the 18th century the making of silk laces more or less ceased at Chantilly and the neighbourhood, the craft is now carried on in Normandy—at Bayeux and Caen—as well as in Auvergne, which is also noted for its simple "torchon" laces. Silk pillow lace making is carried on in Spain, especially at Barcelona. The patterns are almost entirely imitations from 18th-century French ones of a large and free floral character. Lace-making is said to have been promoted in Russia through the patronage of the court, after the visit of Peter the Great to Paris in the early days of the 18th century. Peasants in the districts of Vologda, Balakhua (Nijni-Novgorod), Bieleff (Tula) and Mzensk (Orel) make pillow laces of simple patterns. Malta is noted for producing a silk pillow lace of black or white, or red threads, chiefly of patterns in which repetitions of circles, wheels and radiations of shapes resembling grains of wheat are the main features. This characteristic of design, appearing in white linen thread laces of similar make which have been identified as Genoese pillow laces of the early 17th century, reappears in Spanish and Paraguayan work. Pillow lace in imitation of Maltese, Buckinghamshire and Devonshire laces is made to a small extent in Ceylon, in different parts of India and in Japan. A successful effort has also been made to re-establish the industry in the island of Burano near Venice, and pillow and needlepoint lace of good design is made there.

At present the chief sources of hand-made lace are France, Belgium, Ireland and England.

France is faithful to her traditions in maintaining a lively and graceful taste in lace-making. Fashion of late years has called for ampler and more boldly effective laces, readily produced with both braids and cords and far less intricate needle or pillow work than was required for the dainty and smaller laces of earlier date.

In Belgium the social and economic conditions are, as they have been in the past, more conducive and more favourable than elsewhere to lace-making at a sufficiently remunerative rate of wages. The production of hand-made laces in Belgium was in 1900 greater than that of France. The principal modern needle-made lace of Belgium is the "Point de Gaze"; "Duchesse" and Bruges laces are the chief pillow-made laces; whilst "Point Appliqué" and "Plat Appliqué" are frequently the results not only of combining needle-made and pillow work, but also of using them in conjunction with machine-made net. Ireland is the best producer of that substantial looped-thread work known as crochet (see figs. 25, 26, 27), which must be regarded as a hand-made lace fabric although not classifiable as a needlepoint or pillow lace. It is also quite distinct in character from pseudo-laces, which are really embroideries with a lace-like appearance, *e.g.* embroideries on net, cut and embroidered cambrics and fine linen. For such as these Ireland maintains a reputation in its admirable Limerick and Carrickmacross laces, made not only in Limerick and Carrickmacross, but also

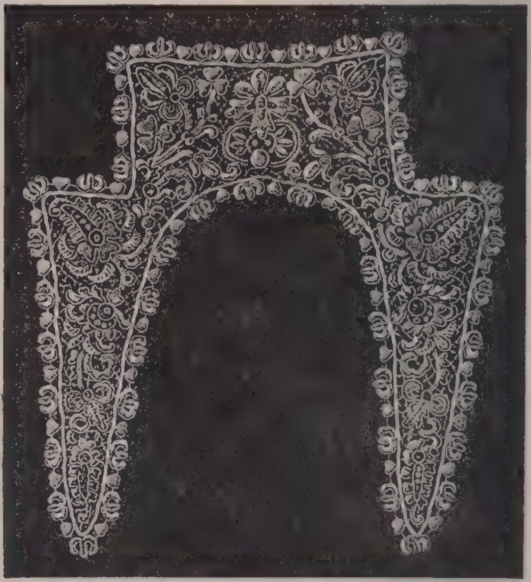

FIG. 25.—Collar and Berthe of Irish Crochet Lace.

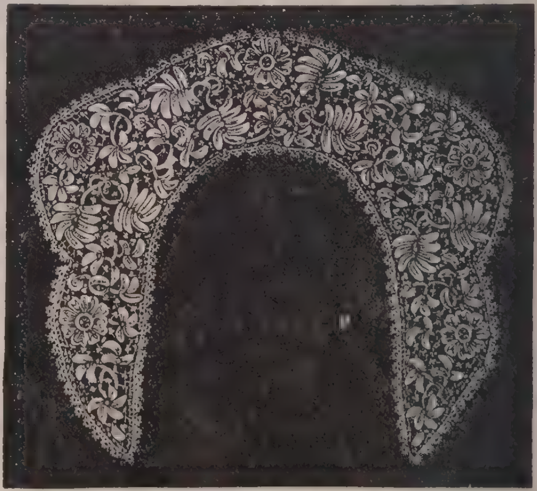

FIG. 26.—Collar of Irish Crochet Lace.

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[1] Useful information has been communicated to the writer of the present article on lace by Mrs B. Wishaw of Seville.

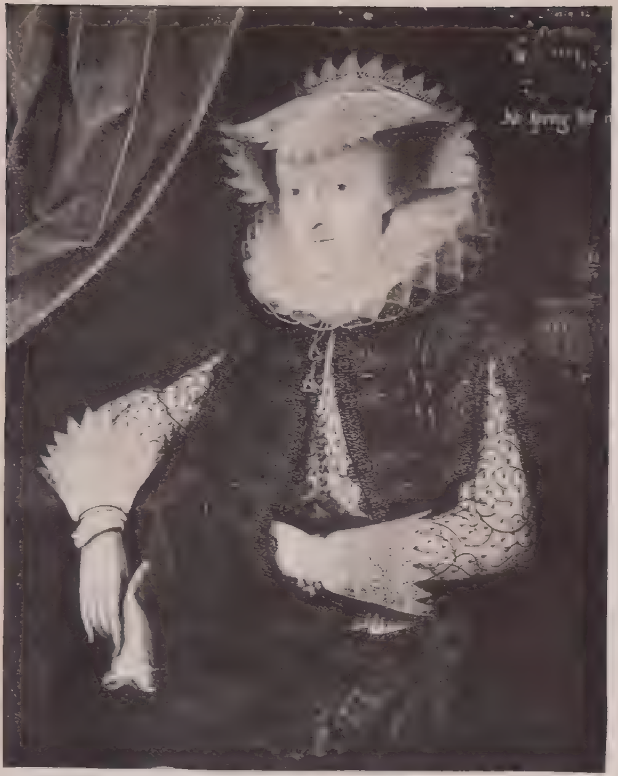

FIG. 8.—MARY, COUNTESS OF PEMBROKE, WEARING A COIF AND CUFFS OF RETICELLA LACE.
National Portrait Gallery. Dated 1614.

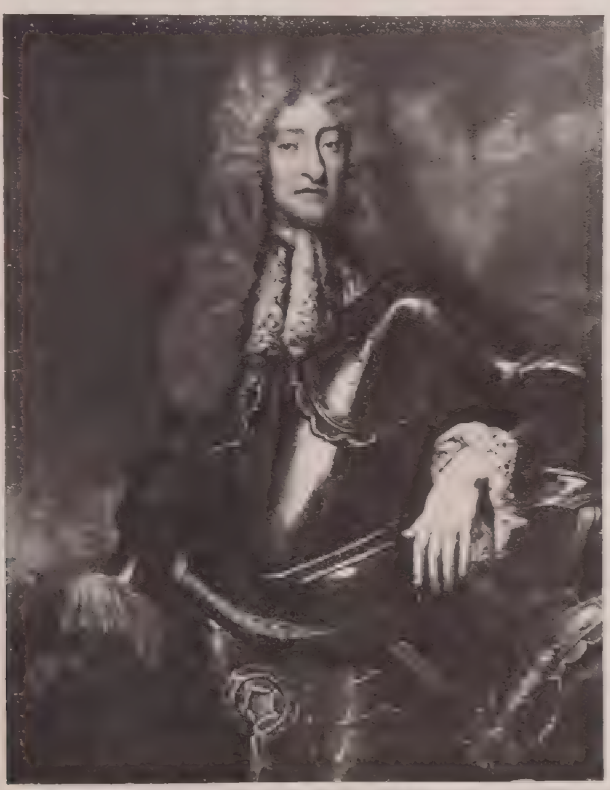

FIG. 11.—JAMES II. WEARING A JABOT AND CUFFS OF RAISED NEEDLEPOINT LACE.
By RILEY. National Portrait Gallery. About 1685.
(Figs. 8 and 11, photo by Emery Walker.)

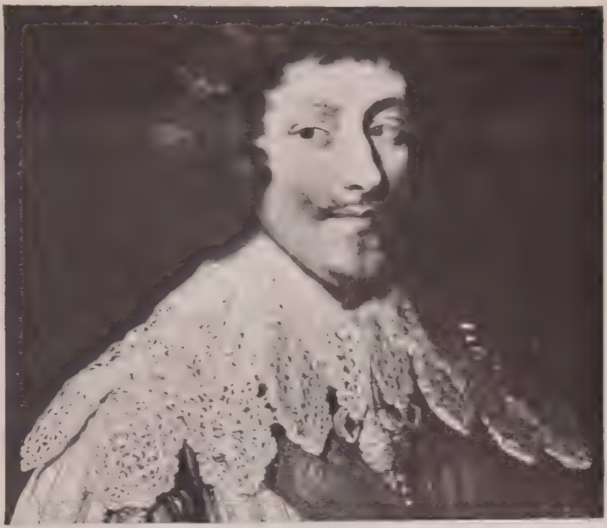

FIG. 9.—HENRI II., DUC DE MONTMORENCY, WEARING A FALLING LACE COLLAR. By LE NAIN. Louvre. About 1628.
(By permission of Messrs Braun, Clement & Co., Dornach (Alsace), and Paris.)

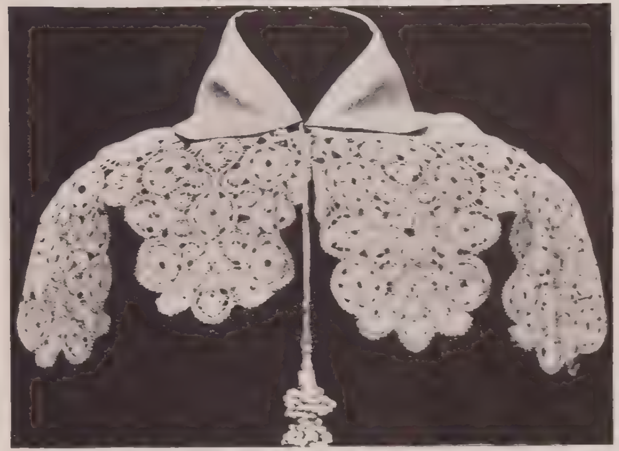

FIG. 10.—SCALLOPPED COLLAR OF TAPE-LIKE PILLOW-MADE LACE.

Possibly of English early 17th-century work. Its texture is typical of a development in pillow-lace-making later than that of the lower edge of "merletti a piombini" in Pl. II. fig. 3.

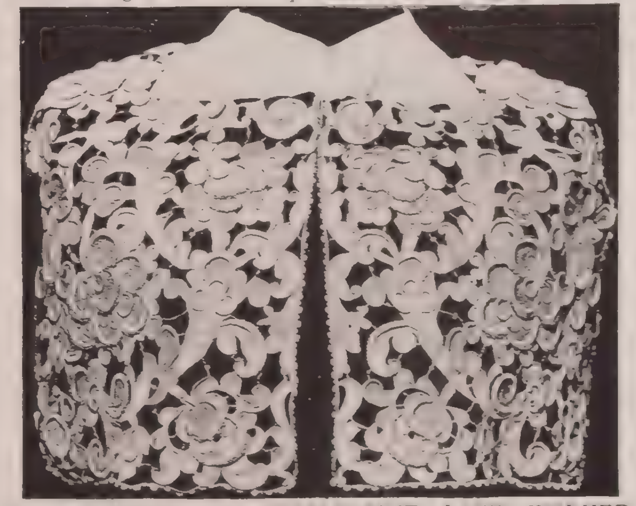

FIG. 12.—JABOT OF NEEDLEPOINT LACE WORKED PARTLY IN RELIEF, AND USUALLY KNOWN AS "GROS POINT DE VENISE."

Middle of 17th century. Conventional scrolling stems with offshooting pseudo-blossoms and leafs are specially characteristic.

LACE

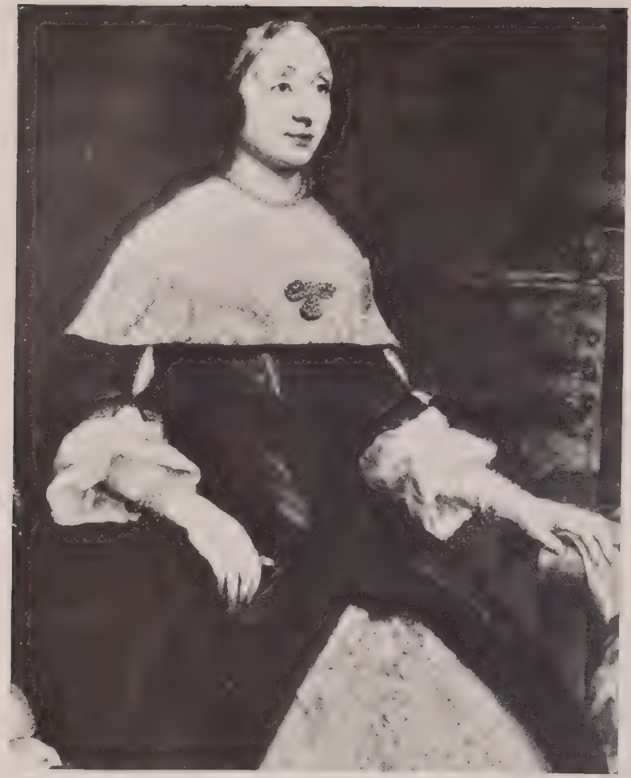

FIG. 13.—MME VERBIEST, WEARING PILLOW-MADE LACE *À RÉSEAU*.

From the family group by GONZALES COQUER. Buckingham Palace. About 1664.

(By permission of Messrs Braun, Clement & Co., Dornach (Alsace), and Paris.)

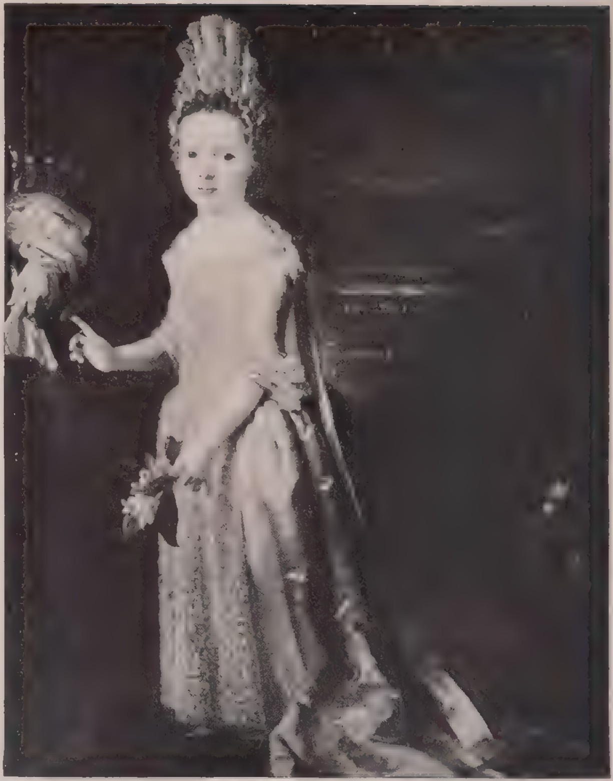

FIG. 15.—PRINCESS MARIA TERESA STUART, WEARING A FLOUNCE OR TABLIER OF LACE SIMILAR TO THAT IN FIG. 17. Dated 1695.

From a group by LARGILLIERE. National Portrait Gallery.

(Photo by Emery Walker.)

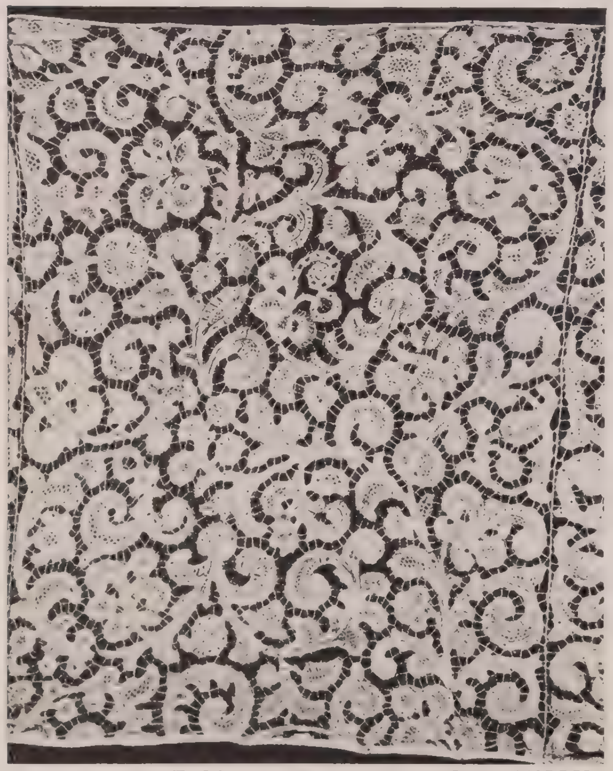

FIG. 14.—PIECE OF PILLOW-MADE LACE USUALLY KNOWN AS "POINT DE FLANDRES À BRIDES."

Of the middle of the 17th century, the designs for which were often adaptations from those made for such needlepoint lace as that of the Jabot in fig. 12.

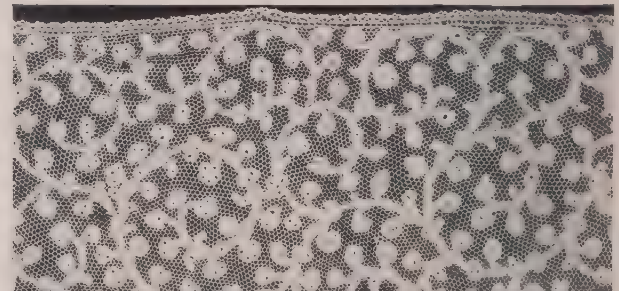

FIG. 16.—FLOUNCE OF PILLOW-MADE LACE *À RÉSEAU*.

Flemish, of the middle of the 17th century. This lace is usually thought to be the earliest type of "Point d'Angleterre" in contradistinction to the "Point de Flandres" (fig. 14).

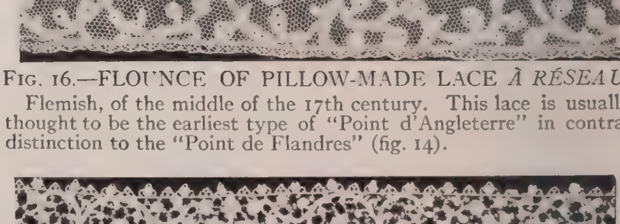

FIG 17.—VERY DELICATE NEEDLEPOINT LACE WITH CLUSTERS OF SMALL RELIEF WORK.

Venetian, middle of the 17th century, and often called "rose-point lace," and sometimes "Point de Neige."

in Kinsale, Newry, Crossmaglen and elsewhere. The demand from France for Irish crochet is now far beyond the supply, a condition which leads not only to the rapid repetition by Irish workers of old patterns, but tends also to a gradual debasement of both texture and ornament. Attempts have been made to counteract this tendency, with some success, as the specimens of Irish crochet in figs. 25, 26 and 27 indicate.

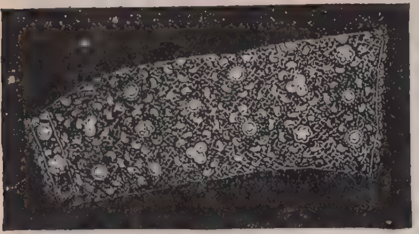

FIG. 27.—Lady's Sleeve of Irish Crochet Lace.

An appreciable amount of pillow-made lace is annually supplied from Devonshire, Buckinghamshire, Bedfordshire and Northampton, but it is bought almost wholly for home use. The English laces are made almost entirely in accordance with the precedents of the 19th century—that is to say, in definite lengths and widths, as for borders, insertions and flounces, although large shaped articles, such as panels for dresses, long sleeves complete skirts, jackets, blouses, and fancifully shaped collars of considerable dimensions have of late been freely made elsewhere. To make such things entirely of lace necessitates many modifications in the ordinary methods; the English lace-workers are slow to adapt their work in the manner requisite, and hence are far behind in the race to respond to the fashionable demand. No countries succeed so well in promptly answering the variable call of fashion as France and Belgium.

As regards trade in lace, America probably buys more from Belgium than from France; France and England come next as purchasers of nearly equal quantities, after which come Russia and Italy.

The greatest amount of lace now made is that which issues from machines in England, France and Germany. The total number of persons employed in the lace industry in England in 1871 was 49,370, and in 1901 about 34,929, of whom not more than 5000 made lace by hand.

The early history[1] of the lace-making machine coincides with that of the stocking frame, that machine having been adapted about the year 1768 for producing open-looped fabrics which had a net-like appearance. About 1786 frames for making point nets by machinery first appear at Mansfield and later at Ashbourne and Nottingham and soon afterwards modifications were introduced into such frames in order to make varieties of meshes in the point nets which were classed as figured nets. In 1808 and 1809 John Heathcoat of Nottingham obtained patents for machines for making bobbin net with a simpler and more readily produced mesh than that of the point net just mentioned. For at least thirty years thousands of women had been employed in and about Nottingham in the embroidery of simple ornament on net. In 1813 John Leavers began to improve the figured net weaving machines above mentioned, and from these the lace-making machines in use at the present time were developed. But it was the application of the celebrated Jacquard apparatus to such machines that enabled manufacturers to produce all sorts of patterns in thread-work in imitation of the patterns for hand-made lace. A French machine called the "dentellière" was devised (see *La Nature* for the 3rd of March 1881), and the patterns produced by it were of plaited threads. The expense, however, attending the production of plaited lace by the "dentellière" is as great as that of pillow lace made by the hand, and so the machine has not succeeded for ordinary trade purposes. More successful results have been secured by the new patent circular lace machine of Messrs. Birkin & Co. of Nottingham, the productions of which, all of simple design, cannot be distinguished from hand-made pillow lace of the same style (see figs. 57, 58, 59).

Before dealing with technical details in processes of making lace whether by hand or by the machine, the component parts of different makes of lace may be considered. These are governed by the ornaments or patterns, which may be so designed, as they were in the earlier laces, that the different component parts may touch one another without any intervening ground-work. But as a wish arose to vary the effect of the details in a pattern ground-works were gradually developed and at first consisted of links or ties between the substantial parts of the pattern. The bars or ties were succeeded by grounds of meshes, like nets. Sometimes the substantial parts of a pattern were outlined with a single thread or by a strongly marked raised edge of buttonhole-stitched or of plaited work. Minute fanciful devices were then introduced to enrich various portions of the pattern. Some of the heavier needle-made laces resemble low relief carving in ivory, and the edges of the relief portions are often decorated with clusters of small loops. For the most part all this elaboration was brought to a high pitch of variety and finish by French designers and workers; and French terms are more usual in speaking of details in laces. Thus the solid part of the pattern is called the *toilé* or clothing, the links or ties are called *brides*, the meshed grounds are called *réseaux*, the outline to the edges of a pattern is called *cordonnet* or *brodé*, the insertions of fanciful devices *modes*, the little loops *picots*. These terms are applicable to the various portions of laces made with the needle, on the pillow or by the machine.

The sequence of patterns in lace (which may be verified upon referring to figs. 1 to 23) is roughly as follows. From about 1540 to 1590 they were composed of geometric forms set within squares, or of crossed and radiating line devices, resulting in a very open fabric, stiff and almost wiry in effect, without *brides* or *réseaux*. From 1590 may be dated the introduction into patterns of very conventional floral and even human and animal forms and slender scrolls, rendered in a tape-like texture, held together by *brides*. To the period from 1620 to 1670 belongs the development of long continuous scroll patterns with *réseaux* and *brides*, accompanied in the case of needle-made laces with an elaboration of details, *e.g. cordonnet* with massings of *picots*. Much of these laces enriched with fillings or *modes* was made at this time. From 1650 to 1700 the scroll patterns gave way to arrangements of detached ornamental details (as in Pl. VI. fig. 22): and about 1700 to 1760 more important schemes or designs were made (as in Pl. fig. 19, and in fig. 24 in text), into which were introduced naturalistic renderings of garlands, flowers, birds, trophies, architectural ornament and human figures. Grounds composed entirely of varieties of *modes* as in the case of the *réseau rosacé* (Pl. V. fig. 21) were sometimes made then. From 1760 to 1800 small details consisting of bouquets, sprays of flowers, single flowers, leaves, buds, spots and such like were adopted, and sprinkled over meshed grounds, and the character of the texture was gauzy and filmy (as in figs. 40 and 42). Since that time variants of the foregoing styles of pattern and textures have been used according to the bent of fashion in favour of simple or complex ornamentation, or of stiff, compact or filmy textures.

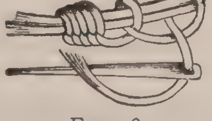

FIG. 28.

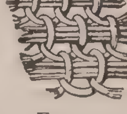

FIG. 29.

Needlepoint Lace.—The way in which the early Venetian "punto in aria" was made corresponds with that in which needlepoint lace is now worked. The pattern is first drawn upon a piece of parchment. The parchment is then stitched to two pieces of linen. Upon the leading lines drawn on the parchment a thread is laid, and fastened through to the parchment and linen by means of stitches, thus constructing a skeleton thread pattern (see left-hand part of fig. 30). Those portions which are to be represented as the "clothing" or *toilé* are usually worked as indicated in the enlarged diagram (fig. 29), and then edged as a rule with buttonhole stitching (fig. 28). Between these *toilé* portions of the pattern are worked ties (*brides*) or meshes (*réseaux*), and thus the various parts united into one fabric are wrought on to the face of the parchment pattern and reproducing it (see right-hand part of fig. 30). A knife is passed between the two pieces of linen at the back of the parchment, cutting the stitches which have passed through the parchment and linen, and so releasing the lace itself from its pattern parchment. In the earlier stages, the lace was made in lengths to serve as insertions (*passements*) and also in vandykes (*dentelles*) to serve as edgings. Later on insertions and vandykes were made in one piece. All of such were at first of a geometric style of pattern (Pl. figs. 3-5 and 6).

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[1] See Felkin's *Machine-wrought Hosiery and Lace Manufactures.*

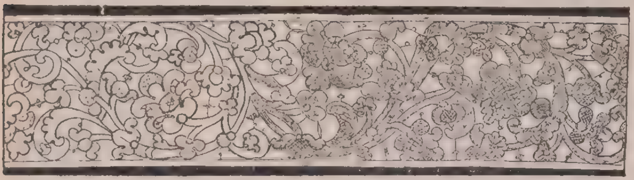

FIG. 30.—Parchment Pattern showing work in progress: the more complete lace is on the right half of the pattern.

Following closely upon them came the freer style of design already mentioned, without and then with links or ties—*brides*—interspersed between the various details of the patterns (Pl. II. fig. 7), which were of flat tapelike texture. In elaborate specimens of this flat point lace some lace workers occasionally used gold thread with the white thread. These flat laces (" Punto in Aria ") are also called " flat Venetian point." About 1640 " rose (raised) point " laces began to be made (Pl. III. fig. 12). They were done in relief and those of bold design with stronger reliefs are called " gros point de Venise." Lace of this latter class was used for altar cloths, flounces, *jabots* or neckcloths which hung beneath the chin over the breast (Pl. III. fig. 11), as well as for trimming the turned-over tops of jack boots. *Tabliers* and ladies' aprons were also made of such lace. In these no regular ground was introduced. All sorts of minute embellishments, like little knots, stars and loops or *picots*, were worked on to the irregularly arranged *brides* or ties holding the main patterns together, and the more dainty of these raised laces (Pl. fig. 17) exemplify the most subtle uses to which the buttonhole stitch appears capable of being put in making ornaments. But about 1660 came laces with *brides* or ties arranged in a honeycomb reticulation or regular ground. To them succeeded lace in which the compact relief gave place to daintier and lighter material combined with a ground of meshes or *réseau*. The needle-made meshes were sometimes of single and sometimes of double threads. A diagram is given of an ordinary method of making such meshes (fig. 31). At the end of the 17th century the lightest of the Venetian needlepoint laces were made; and this class which was of the filmiest texture is usually known as " point de Venise à réseau " (Pl. V. fig. 20*a*). It was contemporary with the needle-made French laces of Alençon and Argentan[1] that became famous towards the latter part of the 17th century (Pl. V. fig. 20*b*). " Point d'Argentan " has been thought to be especially distinguished on account of its delicate honeycomb ground of hexagonally arranged *brides* (fig. 32), a peculiarity already referred to in certain antecedent Venetian point laces. Often intermixed with this hexagonal *brides* ground is the fine-meshed ground or *réseau* (fig. 20*b*), which has been held to be distinctive of " point d'Alençon." But the styles of patterns and the methods of working them, with rich variety of insertions or *modes*, with the *brodé* or *cordonnet* of raised buttonhole stitched edging, are alike in Argentan and Alençon needle-made laces (Pl. V. fig. 20*b* and fig. 32). Besides the hexagonal *brides* ground and the ground of meshes another variety of grounding (*réseau rosacé*) was used in certain Alençon designs. This ground consisted of buttonhole-stitched skeleton hexagons within each of which was worked a small hexagon of *toilé* connected with the outer surrounding hexagon by means of six little ties or *brides* (Pl. V. fig. 21). Lace with this particular ground has been called " Argentella," and some writers have thought that it was a specialty of Genoese or Venetian work. But the character of the work and the style of the floral patterns are those of Alençon laces. The industry at Argentan was virtually an offshoot of that nurtured at Alençon, where " lacis," " cut work " and " vélin " (work on parchment) had been made for years before the well-developed needle-made " point d'Alençon " came into vogue under the favouring patronage of the state-aided lace company mentioned as having been formed in 1665.

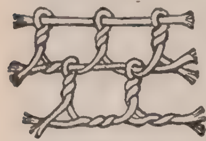

FIG. 31.

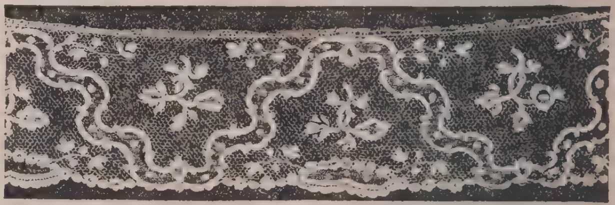

FIG. 32.—Border of Needlepoint Lace made in France about 1740–1750, the clear hexagonal mesh ground, which is compactly stitched, being usually regarded as characteristic of the point de France made at Argentan.

Madame Despierre in her *Histoire du point d'Alençon* gives an interesting and trustworthy account of the industry.

In Belgium, Brussels has acquired some celebrity for needle-made laces. These, however, are chiefly in imitation of those made at Alençon, but the *toilé* is of less compact texture and sharpness in definition of pattern. Brussels needlepoint lace is often worked with meshed grounds made on a pillow, and a plain thread is used as a *cordonnet* for their patterns instead of a thread overcast with buttonhole stitches as in the French needlepoint laces. Note the bright sharp outline to the various ornamental details in Pl. V. fig. 20*b*.

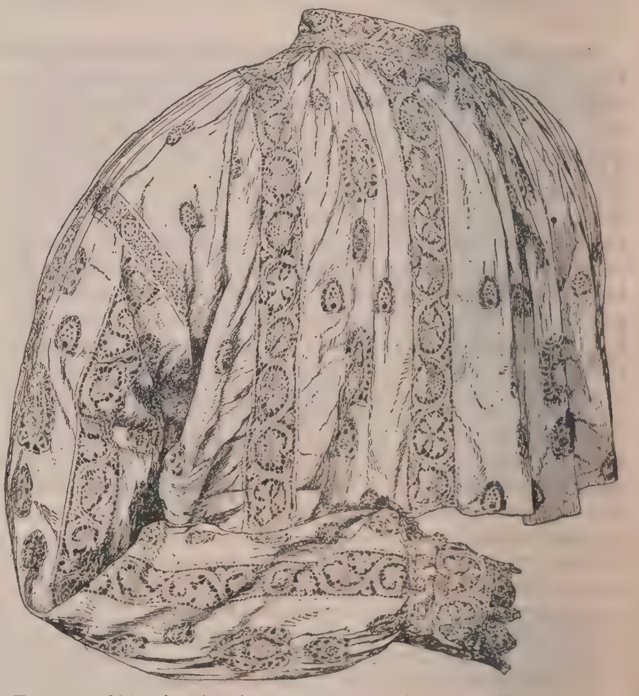

FIG. 33.—Shirt decorated with Insertions of Flat Needlepoint Lace. (English, 17th century. Victoria and Albert Museum.)

Needlepoint lace has also been occasionally produced in

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[1] After 1650 the lace-workers at Alençon and its neighbourhood produced work of a daintier kind than that which was being made by the Venetians. As a rule the hexagonal *bride* grounds of Alençon laces are smaller than similar details in Venetian laces. The average size of a diagonal taken from angle to angle in an Alençon (or so-called Argentan) hexagon was about one-sixth of an inch, and each side of the hexagon was about one-tenth of an inch. An idea of the minuteness of the work can be formed from the fact that a side of a hexagon would be overcast with some nine or ten buttonhole stitches.

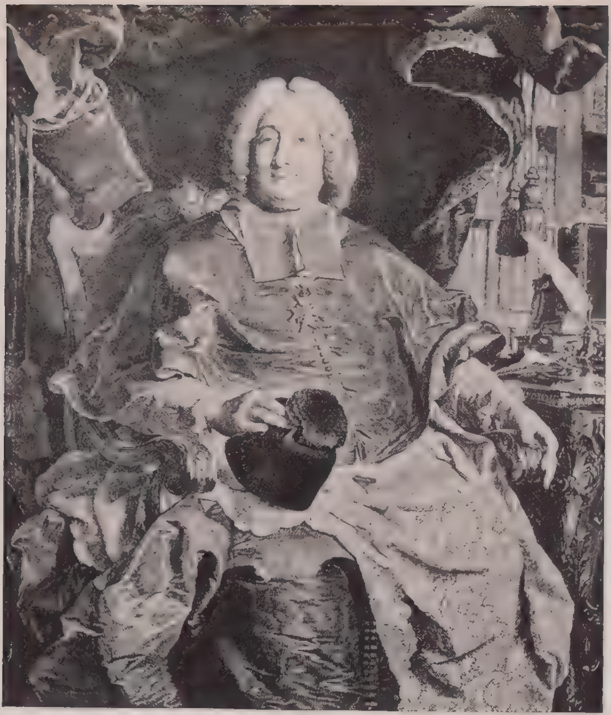


FIG. 18.—CHARLES GASPARD GUILLAUME DE VINTIMILLE, WEARING LACE SIMILAR IN STYLE OF DESIGN SHOWN IN FIG. 19. About 1730.

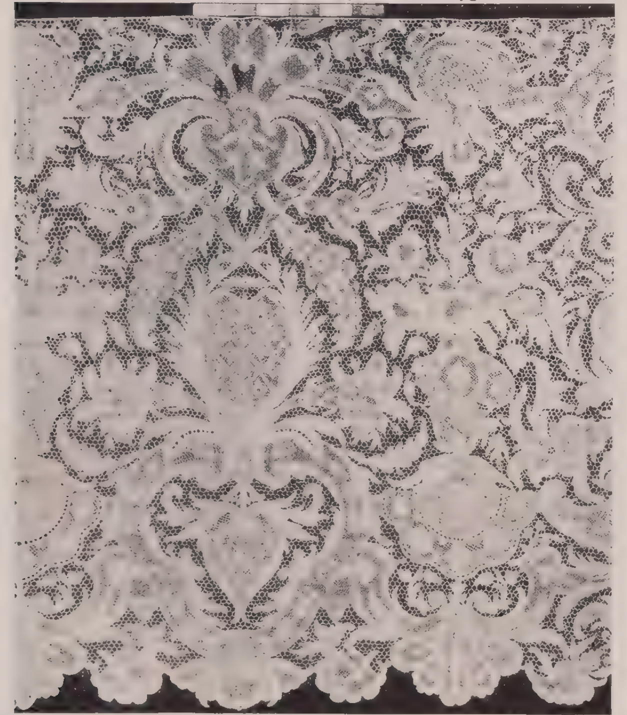
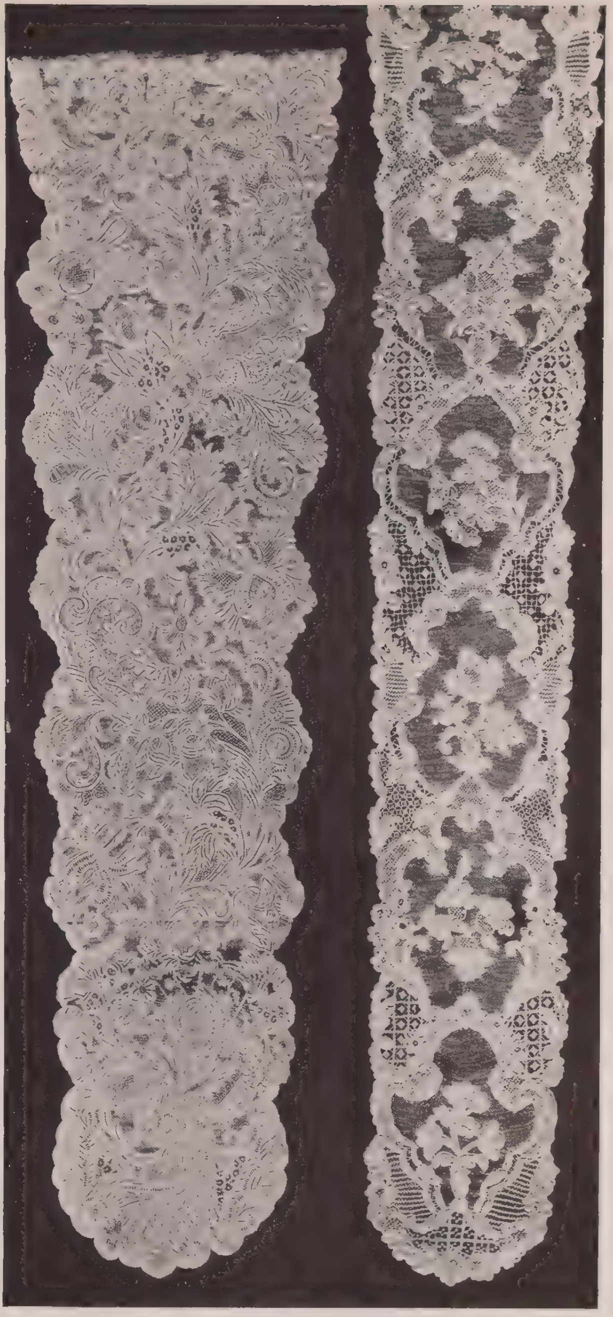


FIG. 19.—PORTION OF FLOUNCE, NEEDLEPOINT LACE COPIED AT THE BURANO LACE SCHOOL FROM THE ORIGINAL OF THE SO-CALLED "POINT DE VENISE À BRIDES PICOTÉES."

17th century. Formerly belonging to Pope Clement XIII., but now the property of the queen of Italy. The design and work, however, are indistinguishable from those of important flounces of "Point de France." The pattern consists of repetitions of two vertically-arranged groups of fantastic pine-apples and vases with flowers, intermixed with bold rococo bands and large leaf devices. The hexagonal meshes of the ground, although similar to the Venetian "brides picotées," are much akin to the button-hole stitched ground of "Point d'Argentan." (Victoria and Albert Museum.)



A FIG. 20. B

A.—A LAPPET OF "POINT DE VENISE À RÉSEAU."

The conventional character of the pseudo-leaf and floral forms contrasts with that of the realistic designs of contemporary French laces. Italian. Early 18th century.

B.—A LAPPET OF FINE "POINT D'ALENÇON."

Louis XV. period. The variety of the fillings of geometric design is particularly remarkable in this specimen, as is the button-hole stitched cordonnat or outline to the various ornamental forms.

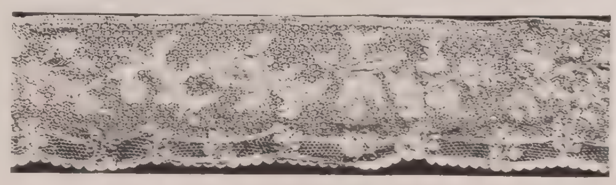


FIG. 21.—BORDER OF FRENCH NEEDLEPOINT LACE, WITH GROUND OF "RÉSEAU ROSACÉ." 18th century.

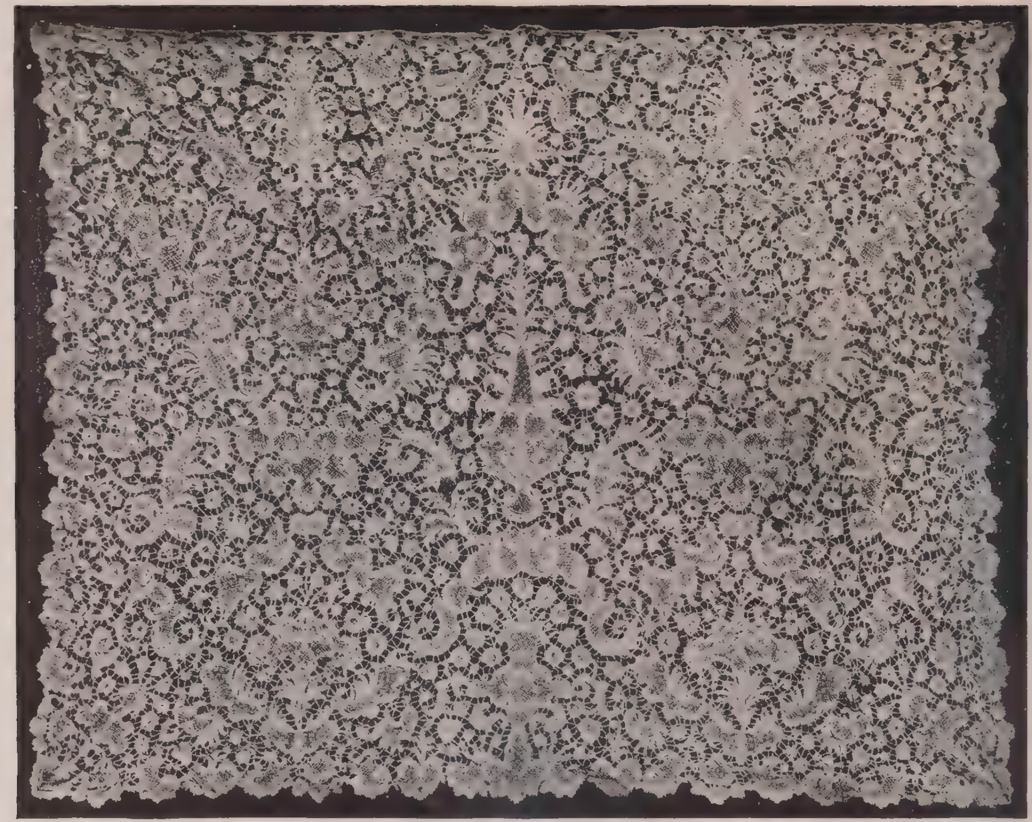


FIG. 22.—JABOT OR CRAVAT OF PILLOW-MADE LACE. Brussels. Late 17th century. (Victoria and Albert Museum.)

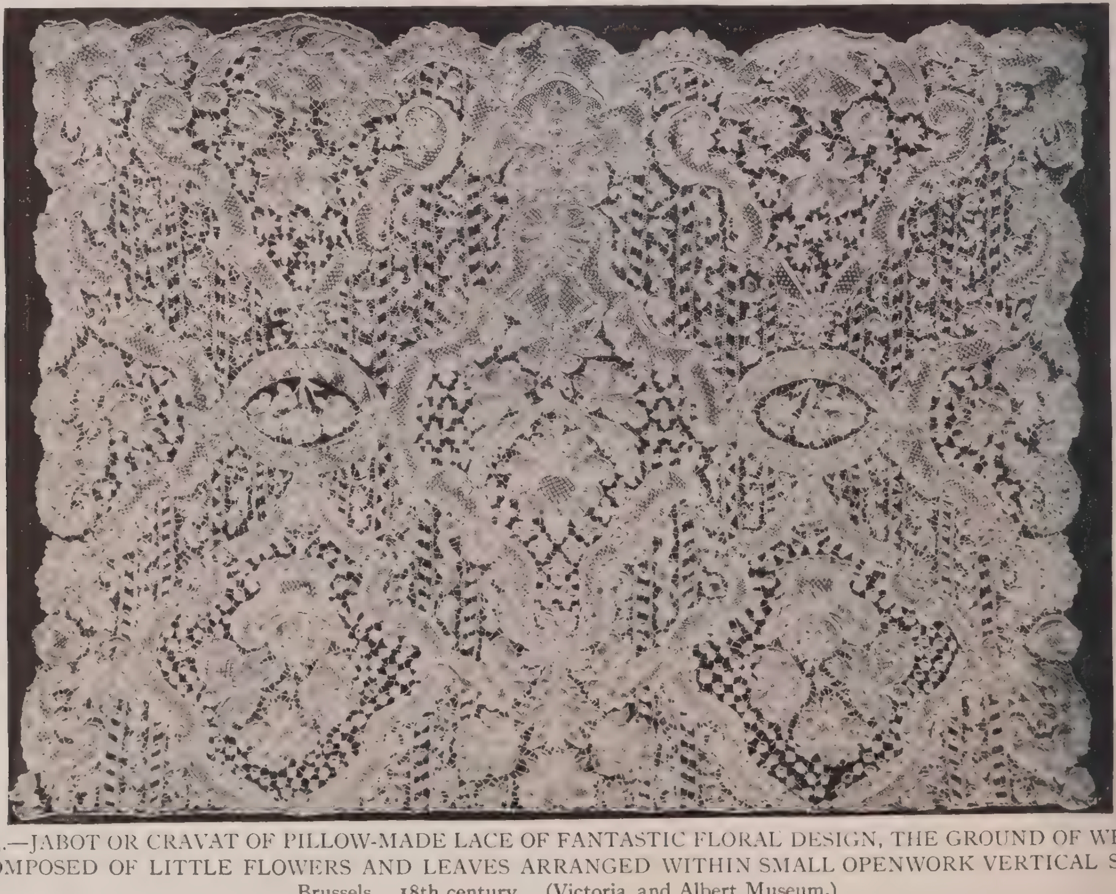


FIG. 23.—JABOT OR CRAVAT OF PILLOW-MADE LACE OF FANTASTIC FLORAL DESIGN, THE GROUND OF WHICH IS COMPOSED OF LITTLE FLOWERS AND LEAVES ARRANGED WITHIN SMALL OPENWORK VERTICAL STRIPS. Brussels. 18th century. (Victoria and Albert Museum.)

England. Whilst the character of its design in the early 17th century was rather more primitive, as a rule, than that of the contemporary Italian, the method of its workmanship is virtually the same and an interesting specimen of English needle-made lace inset into an early 17th-century shirt is illustrated in fig. 33. Specimens of needle-made work done by English school children may be met with in samplers of the 17th and 18th centuries. Needlepoint lace is successfully made at Youghal, Kenmare and New Ross in Ireland, where of late years attention has been given to the study of designs for it. The lace-making school at Burano near Venice produces hand-made laces which are, to a great extent, careful reproductions of the more celebrated classes of point laces, such as "punto in aria," "rose point de Venise," "point de Venise à réseau," "point d'Alençon," "point d'Argentan" and others. Some good needlepoint lace is made in Bohemia and elsewhere in the Austrian empire.

Pillow-made Lace.—Pillow-made lace is built upon no substructure corresponding with a skeleton thread pattern such as is used for needlepoint lace, but is the representation of a pattern obtained by twisting and plaiting threads.

These patterns were never so strictly geometric in style as those adopted for the earliest point lace making from the antecedent cut linen and drawn thread embroideries. Curved forms, almost at the outset of pillow lace, seem to have been found easy of execution (see lower border, Pl. II. fig. 3); its texture was more lissom and less crisp and wiry in appearance than that of contemporary needle-made lace. The early twisted and plaited thread laces, which had the appearance of small cords merging into one another, were soon succeeded by laces of similar make but with flattened and broader lines more like fine braids or tapes (Pl. I. fig. 2, and Pl. fig. 10). But pillow laces of this tapey character must not be confused with laces in which actual tape or braid is used. That peculiar class of lace-work does not arise until after the beginning of the 17th century when the weaving of tape is said to have commenced in Flanders. In England this sort of tape-lace dates no farther back than 1747, when two Dutchmen named Lanfort were invited by an English firm to set up tape looms in Manchester.

The process by which lace is made on the pillow is roughly and briefly as follows. A pattern is first drawn upon a piece of paper or parchment. It is then pricked with holes by a skilled "pattern pricker," who determines where the principal pins shall be stuck for guiding the threads. This pricked pattern is then fastened to the pillow. The pillow or cushion varies in shape in different countries. Some lace-makers use a circular pad, backed with a flat board, in order that it may be placed upon a table and easily moved. Other lace-workers use a well-stuffed round pillow or short bolster, flattened at the two ends, so that they may hold it conveniently on their laps. From the upper part of pillow with the pattern fastened on it hang the threads from the bobbins. The bobbin threads thus hang across the pattern. Fig. 34 shows the commencement, for instance, of a double set of three-thread plaitings. The compact portion in a pillow lace has a woven appearance (fig. 35).

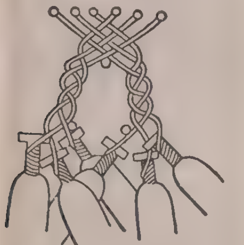


FIG. 34.—Diagram showing six Bobbins in use.

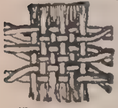


FIG. 35.

About the middle of the 17th century pillow lace of formal scroll patterns somewhat in imitation of those for point lace was made, chiefly in Flanders. The earlier of these had grounds of ties or *brides* and was often called "point de Flandres" (Pl. fig. 14) in contradistinction to scroll patterns with a mesh ground, which were called "point d'Angleterre" (Pl. fig. 16). Into Spain and France much lace from Venice and Flanders was imported as well as into England, where from the 16th century the manufacture of the simple pattern "bone lace" by peasants in the midland and southern counties was still being carried on. In Charles II.'s time its manufacture was threatened with extinction by the preference given to the more artistic and finer Flemish laces. The importation of the latter was accordingly prohibited. Dealers in Flemish lace sought to evade the prohibitions by calling certain of their laces "point d'Angleterre," and smuggling them into England. But smuggling was made so difficult that English dealers were glad to obtain the services of Flemish lace-makers and to induce them to settle in England. It is from some such cause that the better 17th- and 18th-century English pillow laces bear resemblance to pillow laces of Brussels, of Mechlin and of Valenciennes.

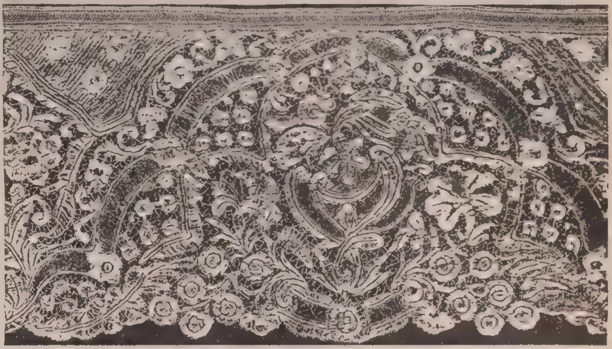


FIG. 36.—Border of English Pillow-made (Devonshire) Lace in the style of a Brussels design of the middle of the 18th century.

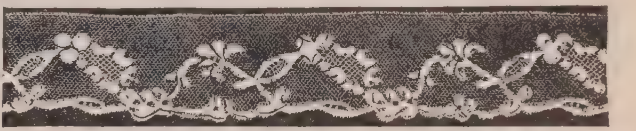


FIG. 37.—Border of English (Bucks. or Beds.) Pillow-made Lace in the style of a Mechlin design of the latter part of the 18th century.

As skill in the European lace-making developed soon after the middle of the 17th century, patterns and particular plaitings came to be identified with certain localities. Mechlin, for instance, enjoyed a high reputation for her productions. The chief technical features of this pillow lace lie in the plaiting of the meshes, and the outlining of the clothing or *toilé* with a thread *cordonnet*. The ordinary Mechlin mesh is hexagonal in shape. Four of the sides are of double twisted threads, two are of four threads plaited three times (fig. 39).

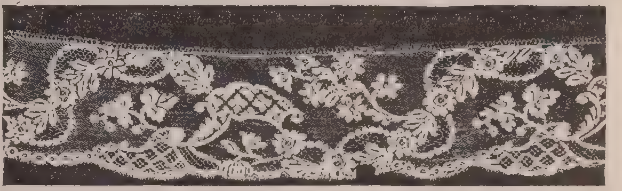


FIG. 38.—Border of Pillow-made Lace, Mechlin, from a design similar to such as was used for point d'Alençon of the Louis XV. period.

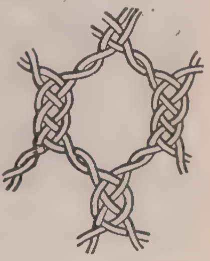


FIG. 39.—Mechlin Mesh.

In Brussels pillow lace, which has greater variety of design, the mesh is also hexagonal; but in contrast with the Mechlin mesh whilst four of its sides are of double-twisted threads the other two are of four threads plaited four times (fig. 41). The finer specimens of Brussels lace are remarkable for the fidelity and grace with which the botanical forms in many of its patterns are rendered (Pl. VI. fig. 23). These are mainly reproductions or adaptations of designs for point d'Alençon, and the soft quality imparted to them in the texture of pillow-made lace contrasts with the harder and more crisp appearance in needlepoint lace. An example of dainty Brussels pillow lace is given in fig. 42. In the Brussels pillow lace a delicate modelling effect

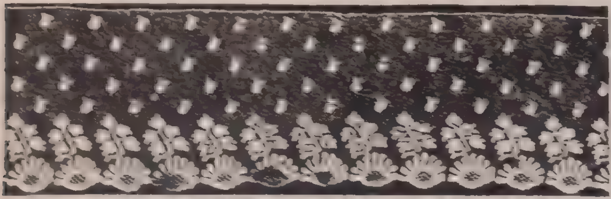


FIG. 40.—Border of Pillow-made Lace, Mechlin, end of the 18th century.

is often imparted to the close textures of the flowers by means of pressing them with a bone instrument which gives concave shapes to petals and leaves, the edges of which consist in part of slightly raised *cordonnet* of compact plaited work.

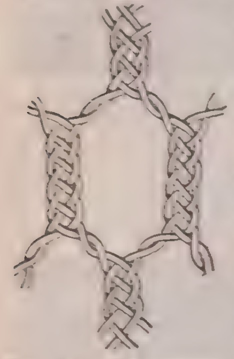


FIG. 41.—Enlargement of Brussels Mesh.

Honiton pillow lace resembles Brussels lace, but in most of the English pillow laces (Devonshire, Buckinghamshire, Bedfordshire) the *réseau* is of a simple character (fig. 43). As a rule, English lace is made with a rather coarser thread than that used in the older Flemish laces. In real Flemish Valenciennes lace there are no twisted sides to the mesh; all are closely plaited (fig. 44) and as a rule the shape of the mesh is diamond but without the openings as shown in fig. 44. No outline or *cordonnet* to define the pattern is used in Valenciennes lace (see fig. 45). Much lace of the Valenciennes type (fig. 50) is made at Ypres. Besides these distinctive classes of pillow-made laces there are others in which equal care in plaiting and twisting threads is displayed, though the character of the design is comparatively simple, as for instance in ordinary pillow laces from Italy, from the Auvergne, from Buckinghamshire, or rude and primitive as in laces from Crete, southern Spain and Russia. Pillow lace-making in Crete is now said to be extinct. The laces were made chiefly of silk. The patterns in many specimens are outlined with one, two or three bright-coloured silken threads. Uniformity in simple character of design may also be observed in many Italian, Spanish, Bohemian, Swedish and Russian pillow laces (see the lower edge of fig. 46).

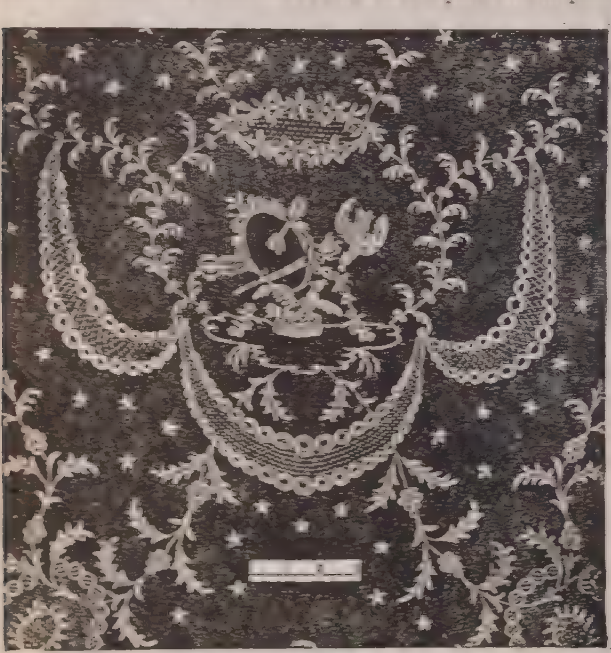


FIG. 42.—Portion of a Wedding Veil, 7 ft. 6 in. × 6 ft. 6 in., of Pillow-made Lace, Brussels, late 18th century. The design consists of light leafy garlands of orange blossoms and other flowers daintily festooned. Little feathery sprays and stars are powdered over the ground, which is of Brussels vrai réseau. In the centre upon a more open ground of pillow-made hexagonal brides is a group of two birds, one flying towards the other which appears ready to take wing from its nest (an oval frame containing two hearts pierced by an arrow, and a flaming torch). Throughout this veil is a profusion of pillow workings of various modes, the [illegible], &c. The ornamental devices are partly applied and partly worked into the ground (Victoria and Albert Museum).

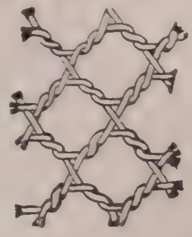


FIG. 43.

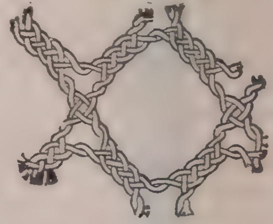


FIG. 44.

Guipure.—This name is often applied to needlepoint and pillow laces in which the ground consists of ties or *brides*, but it more properly designates a kind of lace or "passementerie," made with gimp of fine wires whipped round with silk, and with cotton thread. An earlier kind of gimp was formed with "Cartisane," a little strip of thin parchment or vellum covered with silk, gold or silver thread. These stiff gimp threads, formed into a pattern, were held together by stitches worked with the needle. Gold and silver thread laces have been usually made on the pillow, though gold thread has been used with fine effect in 17th-century Italian needlepoint laces.

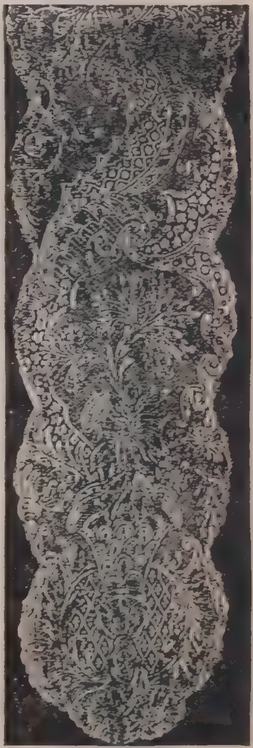


FIG. 45.—Lappet of delicate Pillow-made Lace, Valenciennes, about 1750. The peculiarity of Valenciennes lace is the filmy cambric-like texture and the absence of any cordonnet to define the separate parts of the ornament such as is used in needlepoint lace of Alençon, and in pillow Mechlin and Brussels lace.

Machine-made Lace.—We have already seen that a technical peculiarity in making needlepoint lace is that a single thread and needle are alone used to form the pattern, and that the buttonhole stitch and other loopings which can be worked by means of a needle and thread mark a distinction between lace made in this manner and lace made on the pillow. For the process of pillow lace making a series of threads are in constant employment, plaited and twisted the one with another. A buttonhole stitch is not producible by it. The Leavers lace machine does not make either a buttonhole stitch or a plait. An essential principle of this machine-made work is that the threads are twisted together as in stocking net. The Leavers lace machine is that generally in use at Nottingham and Calais. French ingenuity has developed improvements in this machine whereby laces of delicate thread are made; but as fast as France makes an improvement England follows with another, and both countries virtually maintain an equal position in this branch of industry. The number of threads brought into operation in a Leavers machine is regulated by the pattern to be produced, the threads being of two sorts, beam or warp threads and bobbin or weft threads. Upwards of 8880 are sometimes used, sixty pieces of lace being made simultaneously, each piece requiring 148 threads—100 beam threads and 48 bobbin threads. The ends of both sets of threads are fixed to a cylinder upon which as the manufacture proceeds the lace becomes wound.

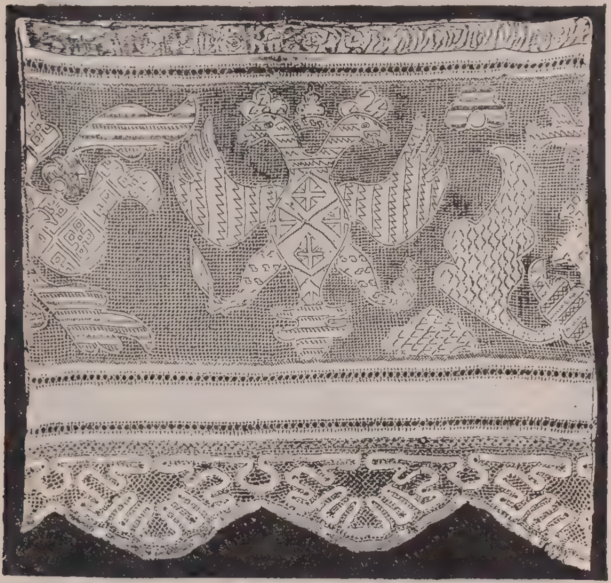


FIG. 46.—Border to a Cloth. The wide part bearing the double-headed eagle of Russia is of drawn thread embroidery: the scalloped edging is of Russian pillow-made lace, though the style of its pattern is often seen in pillow laces made by peasants in Danubian provinces as well as in the south of Spain.

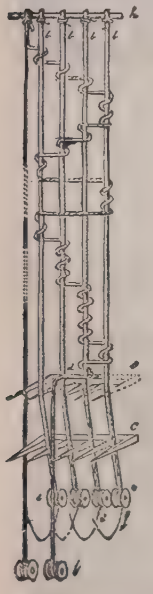


FIG. 47.

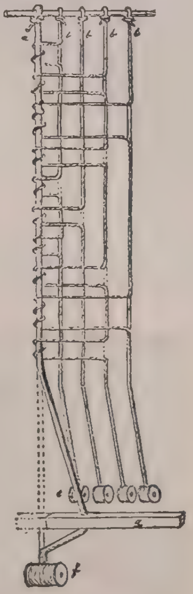


FIG. 48.

The supply of the beam or warp threads is held upon reels, and that of the bobbins or weft threads is held in bobbins. The beam or warp thread reels are arranged in frames or trays beneath the stage, above which and between it and the cylinder the twisting of the bobbin or weft with beam or warp threads takes place. The bobbins containing the bobbin or weft threads are flattened in shape so as to pass conveniently between the stretched beam or warp threads. Each bobbin can contain about 120 yds. of thread. By most ingenious mechanism varying degrees of tension can be imparted to warp and weft threads as required. As the bobbins or weft threads pass like pendulums between the warp threads the latter are made to oscillate, thus causing them to become twisted with the bobbin threads. As the twistings take place, combs passing through both warp and weft threads compress the twistings. Thus the texture of the clothing or *toilé* in machine-made lace may generally be detected by its ribbed appearance, due to the compressed twisted threads. Figs. 47 and 48 are intended to show effects obtained by varying the tensions of weft and warp threads. For instance, if the weft, as threads *b*, *b*, *b*, *b* in fig. 47, be tight and the warp thread slack, the warp thread *a* will be twisted upon the weft threads. But if the warp thread *a* be tight and the weft threads *b*, *b*, *b*, *b*, be slack, as in fig. 48, then the weft threads will be twisted on the warp thread. At the same time the twisting in both these cases arises from the conjunction of movements given to the two sets of threads, namely, an oscillation or movement from side to side of the beam or warp threads, and the swinging or pendulum-like movement of the bobbin or weft threads between the warp threads. Fig. 49 is a diagram of a sectional elevation of a lace machine representing its more essential parts. E is the cylinder or beam upon which the lace is rolled as made, and upon which the ends of both warp and weft threads are fastened at starting. Beneath are *w*, *w*, *w*, a series of trays or beams, one above the other, containing the reels of the supplies of warp threads; *c*, *c* represent the slide bars for the passage of the bobbin *b* with its thread from *k* to *k*, the landing bars, one on each side of the rank of warp threads; *s*, *t* are the combs which take it in turns to press together the twistings as they are made. The combs come away clear from the threads as soon as they have pressed them together and fall into positions ready

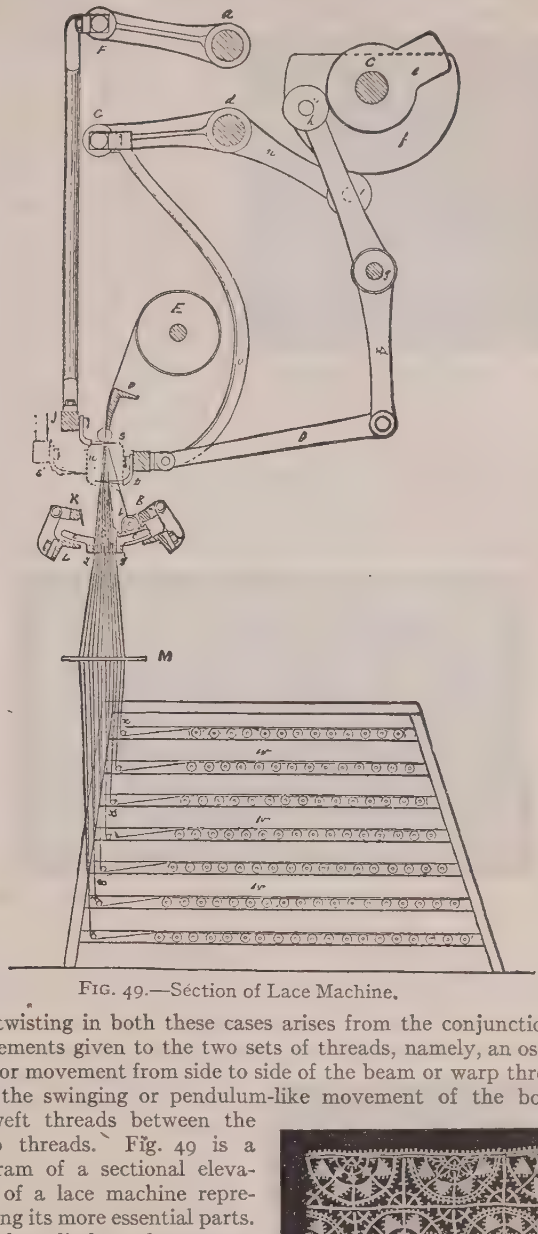


FIG. 49.—Section of Lace Machine.

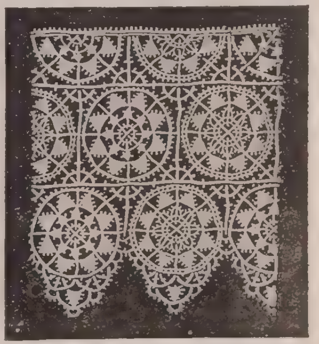


FIG. 50.—Machine-made Lace in imitation of 16th-century Needlepoint "Reticella" Lace.

to perform their pressing operations again. The contrivances for giving each thread a particular tension and movement at a certain time are connected with an adaptation of the Jacquard system of pierced cards. The machine lace pattern drafter has to calculate how many holes shall be punched in a card, and to determine the position of such holes. Each hole regulates the mechanism for giving movement to a thread. Fig. 54 displays a piece of hand-made Valenciennes (Ypres) lace and fig. 55 a corresponding piece woven by the machine. The latter shows the advantage that can be gained by using very fine gauge machines, thus enabling a very close imitation of the real lace to be made by securing a very open and clear *réseau* or net, such as would be made on a coarse machine, and at the same time to keep the pattern fine and solid and standing out well from the net, as is the case with the real lace, which cannot be done by using a coarse gauge machine. In this example the machine used is a 16 point (that is 32 carriages to the inch), and the ground is made half gauge, that is 8 point, and the weaving is made the full gauge of the machine, that is 16 point. Fig. 56 gives other examples of hand- and machine-made Valenciennes lace. The machine-made lace (*b*) imitating the real (*a*) is made on a 14-point machine (that is 28 carriages to the inch), the ground being 7 point and the pattern being full gauge or 14 point. Although the principle in these examples of machine work is exactly the same, in so far that they use half gauge net and full gauge clothing to produce the contrast as mentioned above, the fabrication of these two examples is quite different, that in fig. 55 being an example of tight bobbins or weft, and slack warp threads as shown in fig. 47. Whereas the example in fig. 56 is made with slack bobbins or weft threads and tight warp threads as in fig. 48. In fig. 57 is a piece of hand-made lace of stout thread, very similar to much Cluny lace made in the Auvergne and to the Buckinghamshire "Maltese" lace. Close to it are specimens of lace (figs. 58 and 59) made by the new patent circular lace machine of Messrs Birkin of Nottingham. This machine although very slow in production actually reproduces the real lace, at a cost slightly below that of the hand-made lace. In another branch of lace-making by machinery, mechanical ingenuity, combined with chemical treatment, has led to surprising results (figs. 53 and 50). Swiss, German and other manufacturers use machines in which a principle of the sewing-machine is involved. A fine silken tissue is thereby enriched with an elaborately raised cotton or thread embroidery. The whole fabric is then treated with chemical mordants which, whilst dissolving the silky web, do not attack the cotton or thread embroidery. A relief embroidery possessing the appearance of hand-made raised needlepoint lace is thus produced.

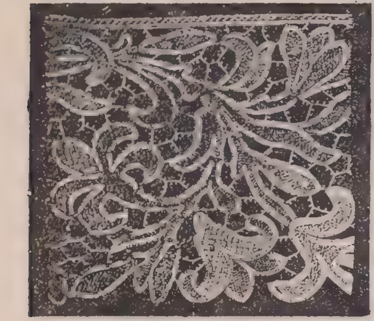


Fig. 51.—Border of Machine-made Lace in the style of 17th-century Pillow Guipure Lace.

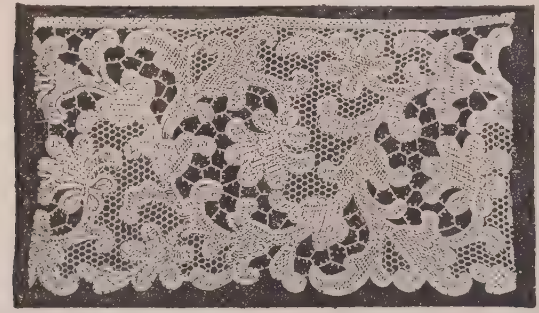


Fig. 52.—Border of Machine-made Lace in imitation of 17th-century Pillow Lace.

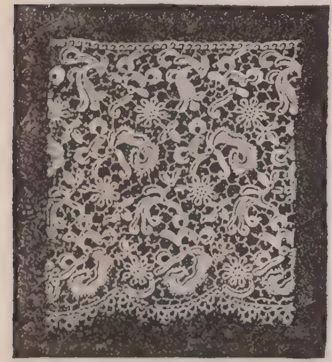


Fig. 53.—Machine-made Trimming Border in imitation of Irish Crochet Lace.

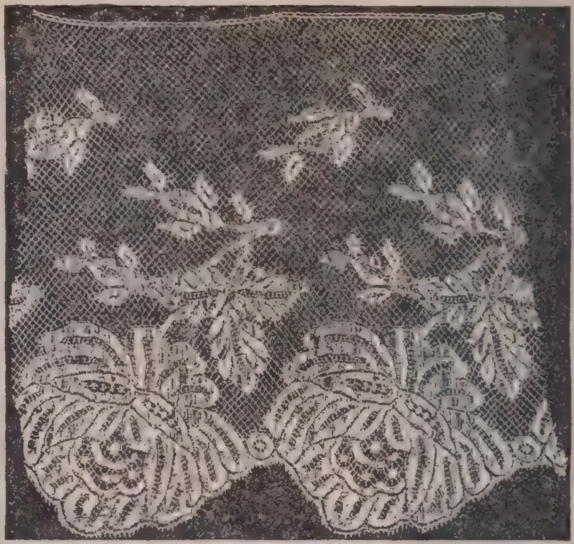


Fig. 54.—A Piece of Hand-made Pillow Lace, Belgian (Ypres), 20th century. (The machine imitation is given in fig. 55.)

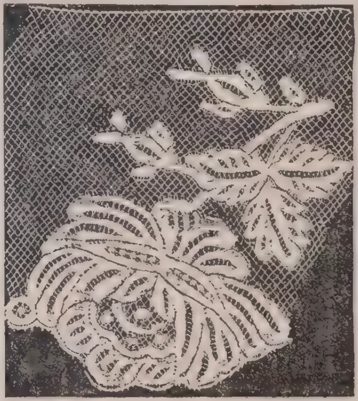


Fig. 55.—Machine-made Lace in imitation of the Hand-made Specimen of fig. 54. (Nottingham, 20th century.)

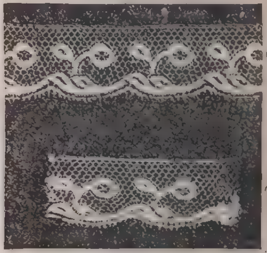


Fig. 56.—Small Borders (*a*) Hand-made and (*b*) Machine-made Lace Valenciennes. (Nottingham, 20th century.)

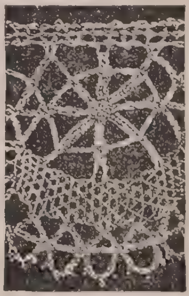


Fig. 57.—Specimen of Hand-made Pillow Lace.

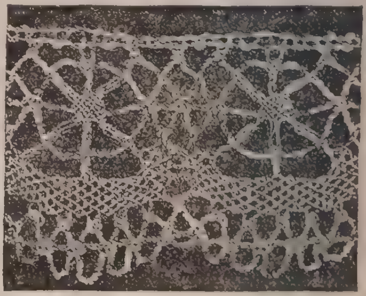


Fig. 58.—Specimen of Machine-made Lace in which the twisting and plaiting of the threads are identical with those of the hand-made specimen of fig. 57. (Nottingham, 20th century.)

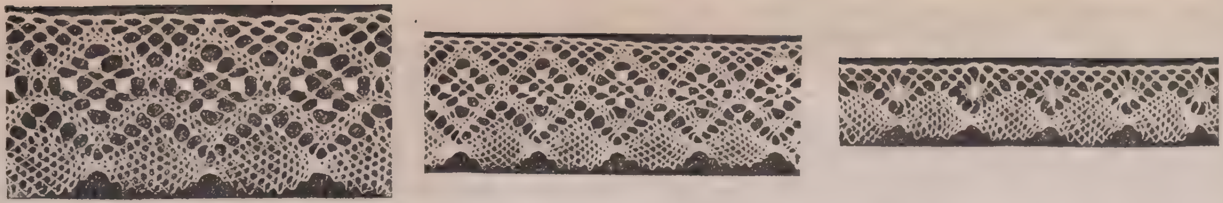


FIG. 59.—Specimens of Machine-made Torchon Lace, in the same manner as such lace is made on the pillow by hand. (Nottingham, 20th century.)

Figs. 60 and 61 give some idea of the high quality to which this admirable counterfeit has been brought.

Collections of hand-made lace chiefly exist in museums and technical institutions, as for instance the Victoria and Albert Museum in London, the Musée des Arts Décoratifs in Paris, and museums at Lyons, Nuremberg, Berlin, Turin and elsewhere. In such places the opportunity is presented of tracing in chronological sequence the stages of pattern and texture development.

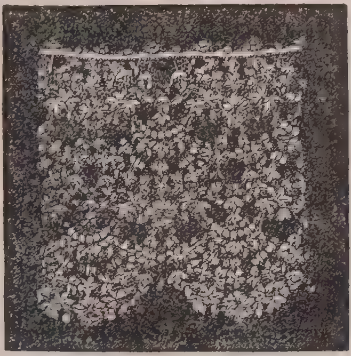


FIG. 60.—Machine-made Lace of Modern Design.

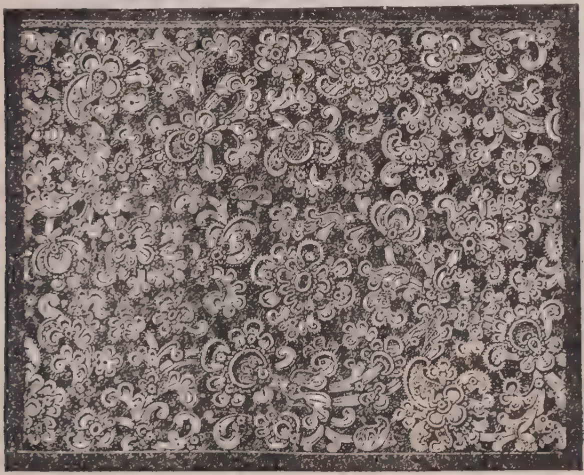


FIG. 61.—Machine-made Lace in imitation of 17th-century Needlepoint Lace, " Gros point de Venise."

Literature.—The literature of the art of lace-making is considerable. The series of 16th- and 17th-century lace pattern-books, of which the more important are perhaps those by F. Vinciolo (Paris, 1587), Cesare Vecellio (Venice, 1592), and Isabetta Catanea Parasole (Venice, 1600), not to mention several kindred works of earlier and later date published in Germany and the Netherlands, supplies a large field for exploration. Signor Ongania of Venice published a limited number of facsimiles of the majority of such works. M. Alvin of Brussels issued a brochure in 1863 upon these patterns, and in the same year the marquis Girolamo d'Adda contributed two bibliographical essays upon the same subject to the *Gazette des Beaux-Arts* (vol. xv. p. 342 seq., and vol. xvii. p. 421 seq.). In 1864 Cavaliere A. Merli wrote a pamphlet (with illustrations) entitled *Origine ed uso delle trine a filo di rete*; Mons F. de Fertiault compiled a brief and rather fanciful *Histoire de la dentelle* in 1843, in which he reproduced statements to be found in Diderot's *Encyclopédie*, subsequently quoted by Roland de la Platière. The first *Report of the Department of Practical Art* (1853) contains a " Report on Cotton Print Works and Lace-Making " by Octavius Hudson, and in the first *Report of the Department of Science and Art* are some " Observations on Lace." Reports upon the International Exhibitions of 1851 (London) and 1867 (Paris), by M. Aubry, Mrs Palliser and others contain information concerning lace-making. The most important work first issued upon the history of lace-making is that by Mrs Bury Palliser (*History of Lace*, 1869). In this work the history is treated rather from an antiquarian than a technical point of view; and wardrobe accounts, inventories, state papers, fashionable journals, diaries, plays, poems, have been laid under contribution with surprising diligence. A new edition published in 1902 presents the work as entirely revised, rewritten and enlarged under the editorship of M. Jourdain and Alice Dryden. In 1875 the Arundel Society brought out *Ancient Needlepoint and Pillow Lace*, a folio volume of permanently printed photographs taken from some of the finest specimens of ancient lace collected for the International Exhibition of 1874. These were accompanied by a brief history of lace, written from the technical aspect of the art, by Alan S. Cole. At the same time appeared a bulky imperial 4to volume by Seguin, entitled *La Dentelle*, illustrated with wood-cuts and fifty photo-typographical plates. Seguin divides his work into four sections. The first is devoted to a sketch of the origin of laces; the second deals with pillow laces, bibliography of lace and a review of sumptuary edicts; the third relates to needlemade lace; and the fourth contains an account of places where lace has been and is made, remarks upon commerce in lace, and upon the industry of lace makers. Without sufficient conclusive evidence Seguin accords to France the palm for having excelled in producing practically all the richer sorts of laces, notwithstanding that both before and since the publication of his otherwise valuable work, many types of them have been identified as being Italian in origin. Descriptive catalogues are issued of the lace collections at South Kensington Museum, at the Science and Art Museum, Dublin, and at the Industrial Museum, Nuremberg. In 1881 a series of four Cantor Lectures on the art of lace-making were delivered before the Society of Arts by Alan S. Cole.

A Technical History of the Manufacture of Venetian Laces, by G. M. Urbani de Gheltof, with plates, was translated by Lady Layard, and published at Venice by Signor Ongania. The *History of Machine-wrought Hosiery and Lace Manufacture* (London, 1867), by Felkin, has already been referred to. There is also a technological essay upon lace made by machinery, with diagrams of lace stitches and patterns (*Technologische Studien im sächsischen Erzgebirge*, Leipzig, 1878), by Hugo Fischer. In 1886 the Libraire Renouard, Paris, published a *History of Point d'Alençon*, written by Madame G. Despierres, which gives a close and interesting account of the industry, together with a list, compiled from local records, of makers and dealers from 1602 onwards.—*Embroidery and Lace: their manufacture and history from the remotest antiquity to the present day*, by Ernest Lefebure, lace-maker and administrator of the École des Arts Décoratifs, translated and enlarged with notes by Alan S. Cole, was published in London in 1888. It is a well-illustrated handbook for amateurs, collectors and general readers.—Irish laces made from modern designs are illustrated in a *Renascence of the Irish Art of Lace-making*, published in 1888 (London).—*Anciennes Dentelles belges formant la collection de feue madame Augusta Baronne Liedts et données au Musée de Grunthuis à Bruges*, published at Antwerp in 1889, consists of a folio volume containing upwards of 181 phototypes—many full size—of fine specimens of lace. The ascriptions of country and date of origin are occasionally inaccurate, on account of a too obvious desire to credit Bruges with being the birthplace of all sorts of lace-work, much of which shown in this work is distinctly Italian in style.—The *Encyclopaedia of Needlework*, by Thérèse de Dillmont-Dornach (Alsace, 1891), is a detailed guide to several kinds of embroidery, knitting, crochet, tatting, netting and most of the essential stitches for needlepoint lace. It is well illustrated with wood-cuts and process blocks.—An exhaustive history of Russian lace-making is given in *La Dentelle russe*, by Madame Sophie Davidoff, published at Leipzig, 1895. Russian lace is principally pillow-work with rather heavy thread, and upwards of eighty specimens are reproduced by photo-lithography in this book.

A short account of the best-known varieties of *Point and Pillow Lace*, by A. M. S. (London, 1899), is illustrated with typical specimens of Italian, Flemish, French and English laces, as well as with magnified details of lace, enabling any one to identify the plaits, the twists and loops of threads in the actual making of the fabric.—*L'Industrie* *des tulles et dentelles mécaniques dans le Pas de Calais, 1815–1900*, by Henri Hénon (Paris, 1900), is an important volume of over 600 pages of letterpress, interspersed with abundant process blocks of the several kinds of machine nets and laces made at Calais since 1815. It opens with a short account of the Arras hand-made laces, the production of which is now almost extinct. The book was sold for the benefit of a public subscription towards the erection of a statue in Calais to Jacquard, the inventor of the apparatus by means of which all figured textile fabrics are manufactured. It is of some interest to note that machine net and lace-making at Calais owe their origin to Englishmen, amongst whom "le sieur R. Webster arrivé à St Pierre-les-Calais en Décembre, 1816, venant d'Angleterre, est l'un des premiers qui ont établi dans la communauté une fabrique de tulles," &c. *Lace-making in the Midlands: Past and Present*, by C. C. Channer and M. E. Roberts (London, 1900) upon the lace-making industry in Buckinghamshire, Bedforshire and Northamptonshire contains many illustrations of laces made in these counties from the 17th century to the present time. *Musée rétrospectif. Dentelles à l'exposition universelle internationale de 1900 à Paris. Rapport de Mons. E. Lefebvre* contains several good illustrations, especially of important specimens of Point de France of the 17th and 18th centuries. *Le Point de France et les autres dentelliers au XVII*^{e} *et au XVIII*^{e} *siècles*, by Madame Laurence de Laprade (Paris, 1905), brings together much hitherto scattered information throwing light upon operations in many localities in France where the industry has been carried on for considerable periods. The book is well and usefully illustrated.

See also *Irische Spitzen* (30 half-tone plates), with a short historical introduction by Alan S. Cole (Stuttgart, 1902); *Pillow Lace*, a practical handbook by Elizabeth Mincoff and Margaret S. Marriage (London, 1907); *The Art of Bobbin Lace*, a practical text-book of workmanship, &c., by Louisa Tebbs (London, 1907); *Antiche trine italiane*, by Elisa Ricci (Bergamo, 1908), well illustrated; *Seven Centuries of Lace*, by Mrs John Hungerford Pollen (London and New York, 1908), very fully illustrated. (A. S. C.)

LACE-BARK TREE, a native of Jamaica, known botanically as *Lagetta lintearia*, from its native name lagetto. The inner bark consists of numerous concentric layers of interlacing fibres resembling in appearance lace. Collars and other articles of apparel have been made of the fibre, which is also used in the manufacture of whips, &c. The tree belongs to the natural order Thymelaeaceae, and is grown in hothouses in Britain.

LACEDAEMON, in historical times an alternative name of Laconia (*q.v.*). Homer uses only the former, and in some passages seems to denote by it the Achaean citadel, the Therapnae of later times, in contrast to the lower town Sparta (G. Gilbert, *Studien zur altspartanischen Geschichte*, Göttingen, 1872, p. 34 foll.). It is described by the epithets *κοίλη* (hollow) and *κητώεσσα* (spacious or hollow), and is probably connected etymologically with λάκκος, *lacus*, any hollow place. Lacedaemon is now the name of a separate department, which had in 1907 a population of 87,106.

LACÉPÈDE, BERNARD GERMAIN ÉTIENNE DE LA VILLE, Comte de (1756–1825), French naturalist, was born at Agen in Guienne on the 26th of December 1756. His education was carefully conducted by his father, and the early perusal of Buffon's *Natural History* awakened his interest in that branch of study, which absorbed his chief attention. His leisure he devoted to music, in which, besides becoming a good performer on the piano and organ, he acquired considerable mastery of composition, two of his operas (which were never published) meeting with the high approval of Gluck; in 1781–1785 he also brought out in two volumes his *Poëtique de la musique*. Meantime he wrote two treaties, *Essai sur l'électricité* (1781) and *Physique générale et particulière* (1782–1784), which gained him the friendship of Buffon, who in 1785 appointed him sub-demonstrator in the Jardin du Roi, and proposed to him to become the continuator of his *Histoire naturelle*. This continuation was published under the titles *Histoire des quadrupèdes ovipares et des serpents* (2 vols., 1788–1789) and *Histoire naturelle des reptiles* (1789). After the Revolution Lacépède became a member of the legislative assembly, but during the Reign of Terror he left Paris, his life having become endangered by his disapproval of the massacres. When the Jardin du Roi was reorganized as the Jardin des Plantes, Lacépède was appointed to the chair allocated to the study of reptiles and fishes. In 1798 he published the first volume of *Histoire naturelle des poissons*, the fifth volume appearing in 1803; and in 1804 appeared his *Histoire des cétacés*. From this period till his death the part he took in politics prevented him making any further contribution of importance to science. In 1799 he became a senator, in 1801 president of the senate, in 1803 grand chancellor of the legion of honour, in 1804 minister of state, and at the Restoration in 1819 he was created a peer of France. He died at Épinay on the 6th of October 1825. During the latter part of his life he wrote *Histoire générale physique et civile de l'Europe*, published posthumously in 18 vols., 1826.

A collected edition of his works on natural history was published in 1826.

LACEWING-FLY, the name given to neuropterous insects of the families *Hemerobiidae* and *Chrysopidae*, related to the ant-lions, scorpion-flies, &c., with long filiform antennae, longish bodies and two pairs of large similar richly veined wings. The larvae are short grubs beset with hair-tufts and tubercles. They feed upon *Aphidae* or "green fly" and cover themselves with the emptied skins of their prey. Lacewing-flies of the genus *Chrysopa* are commonly called golden-eye flies.

LA CHAISE, FRANÇOIS DE (1624–1709), father confessor of Louis XIV., was born at the château of Aix in Forey on the 25th of August 1624, being the son of Georges d'Aix, seigneur de la Chaise, and of Renée de Rochefort. On his mother's side he was a grandnephew of Père Coton, the confessor of Henry IV. He became a novice of the Society of Jesus before completing his studies at the university of Lyons, where, after taking the final vows, he lectured on philosophy to students attracted by his fame from all parts of France. Through the influence of Camille de Villeroy, archbishop of Lyons, Père de la Chaise was nominated in 1674 confessor of Louis XIV., who intrusted him during the lifetime of Harlay de Champvallon, archbishop of Paris, with the administration of the ecclesiastical patronage of the crown. The confessor united his influence with that of Madame de Maintenon to induce the king to abandon his liaison with Madame de Montespan. More than once at Easter he is said to have had a convenient illness which dispensed him from granting absolution to Louis XIV. With the fall of Madame de Montespan and the ascendancy of Madame de Maintenon his influence vastly increased. The marriage between Louis XIV. and Madame de Maintenon was celebrated in his presence at Versailles, but there is no reason for supposing that the subsequent coolness between him and Madame de Maintenon arose from his insistence on secrecy in this matter. During the long strife over the temporalities of the Gallican Church between Louis XIV. and Innocent XI. Père de la Chaise supported the royal prerogative, though he used his influence at Rome to conciliate the papal authorities. He must be held largely responsible for the revocation of the Edict of Nantes, but not for the brutal measures applied against the Protestants. He exercised a moderating influence on Louis XIV.'s zeal against the Jansenists, and Saint-Simon, who was opposed to him in most matters, does full justice to his humane and honourable character. Père de la Chaise had a lasting and unalterable affection for Fénelon, which remained unchanged by the papal condemnation of the *Maximes*. In spite of failing faculties he continued his duties as confessor to Louis XIV. to the end of his long life. He died on the 20th of January 1709. The cemetery of Père-la-Chaise in Paris stands on property acquired by the Jesuits in 1826, and not, as is often stated, on property personally granted to him.

See R. Chantelauze, *Le Père de la Chaize. Études d'histoire religieuse* (Paris and Lyons, 1859).

LA CHAISE-DIEU, a town of central France, in the department of Haute Loire, 29 m. N.N.W. of Le Puy by rail. Pop. (1906) 1203. The town, which is situated among fir and pine woods, 3500 ft. above the sea, preserves remains of its ramparts and some houses of the 14th and 15th centuries, but owes its celebrity to a church, which, after the cathedral of Clermont-Ferrand, is the most remarkable Gothic building in Auvergne. The west façade, approached by a flight of steps, is flanked by two massive towers. The nave and aisles are of equal height and are separated from the choir by a stone rood screen. The choir, terminating in an apse with radiating chapel, contains the fine tomb and statue of Clement VI., carved stalls and some admirable Flemish tapestries of the early 16th century. There is a ruined cloister on the south side. The church, which dates from the 14th century, was built at the expense of Pope Clement VI., and belonged to a powerful Benedictine abbey founded in 1043. There are spacious monastic buildings of the 18th century. The abbey was formerly defended by fortifications, the chief survival of which is a lofty rectangular keep to the south of the choir. Trade in timber and the making of lace chiefly occupy the inhabitants of the town.

LA CHALOTAIS, LOUIS RENÉ DE CARADEUC DE (1701–1785), French jurist, was born at Rennes, on the 6th of March 1701. He was for 60 years procureur général at the parliament of Brittany. He was an ardent opponent of the Jesuits; drew up in 1761 for the parliament a memoir on the constitutions of the Order, which did much to secure its suppression in France; and in 1763 published a remarkable "Essay on National Education," in which he proposed a programme of scientific studies as a substitute for those taught by the Jesuits. The same year began the conflict between the Estates of Brittany and the governor of the province, the duc d'Aiguillon (*q.v.*). The Estates refused to vote the extraordinary imposts demanded by the governor in the name of the king. La Chalotais was the personal enemy of d'Aiguillon, who had served him an ill turn with the king, and when the parliament of Brittany sided with the Estates, he took the lead in its opposition. The parliament forbade by decrees the levy of imposts to which the Estates had not consented. The king annulling these decrees, all the members of the parliament but twelve resigned (October 1764 to May 1765). The government considered La Chalotais one of the authors of this affair. At this time the secretary of state who administered the affairs of the province, Louis Philypeaux, duc de la Vrillière, comte de Saint-Florentin (1705–1777), received two anonymous and abusive letters. La Chalotais was suspected of having written them, and three experts in handwriting declared that they were by him. The government therefore arrested him, his son and four other members of the parliament. The arrest made a great sensation. There was much talk of "despotism." Voltaire stated that the procureur général, in his prison of Saint Malo, was reduced, for lack of ink, to write his defence with a toothpick dipped in vinegar—which was apparently pure legend; but public opinion all over France was strongly aroused against the government. On the 16th of November 1765 a commission of judges was named to take charge of the trial. La Chalotais maintained that the trial was illegal; being procureur général he claimed the right to be judged by the parliament of Rennes, or failing this by the parliament of Bordeaux, according to the custom of the province. The judges did not dare to pronounce a condemnation on the evidence of experts in handwriting, and at the end of a year, things remained where they were at the first. Louis XV. then decided on a sovereign act, and brought the affair before his council, which without further formality decided to send the accused into exile. That expedient but increased the popular agitation; *philosophes*, members of the parliament, patriot Bretons and Jansenists all declared that La Chalotais was the victim of the personal hatred of the duc d'Aiguillon and of the Jesuits. The government at last gave way, and consented to recall the members of the parliament of Brittany who had resigned. This parliament, when it met again, after the formal accusation of the duc d'Aiguillon, demanded the recall of La Chalotais. This was accorded in 1775, and La Chalotais was allowed to transmit his office to his son. In this affair public opinion showed itself stronger than the absolutism of the king. The opposition to the royal power gained largely through it, and it may be regarded as one of the preludes to the revolution of 1789. La Chalotais, who was personally a violent, haughty and unsympathetic character, died at Rennes on the 12th of July 1785.

See, besides the *Comptes-Rendus des Constitutions des Jésuites* and the *Essai d'éducation nationale*, the *Mémoires de la Chalotais* (3 vols., 1766–1767). Two works containing detailed bibliographies are Marion, *La Bretagne et le duc d'Aiguillon* (Paris, 1893), and B. Pocquet, *Le Duc d'Aiguillon et La Chalotais* (Paris, 1901). See also a controversy between these two authors in the *Bulletin critique* for 1902.

LA CHARITÉ, a town of central France in the department of Nièvre, on the right bank of the Loire, 17 m. N.N.W. of Nevers on the Paris-Lyon-Méditerranée railway. Pop. (1906) 3990. La Charité possesses the remains of a fine Romanesque basilica, the church of Sainte-Croix, dating from the 11th and early 12th centuries. The plan consists of a nave, rebuilt at the end of the 17th century, transept and choir with ambulatory and side chapels. Surmounting the transept is an octagonal tower of one story, and a square Romanesque tower of much beauty flanks the main portal. There are ruins of the ramparts, which date from the 14th century. The manufacture of hosiery, boots and shoes, files and iron goods, lime and cement and woollen and other fabrics are among the industries; trade is chiefly in wood and iron.

La Charité owes its celebrity to its priory, which was founded in the 8th century and reorganized as a dependency of the abbey of Cluny in 1052. It became the parent of many priories and monasteries, some of them in England and Italy. The possession of the town was hotly contested during the wars of religion of the 16th century, at the end of which its fortifications were dismantled.

LA CHAUSSÉE, PIERRE CLAUDE NIVELLE DE (1692–1754), French dramatist, was born in Paris in 1692. In 1731 he published an *Épître à Clio*, a didactic poem in defence of Lériget de la Faye in his dispute with Antoine Houdart de la Motte, who had maintained that verse was useless in tragedy. La Chaussée was forty years old before he produced his first play, *La Fausse Antipathie* (1734). His second play, *Le Préjugé à la mode* (1735) turns on the fear of incurring ridicule felt by a man in love with his own wife, a prejudice dispelled in France, according to La Harpe, by La Chaussée's comedy. *L'École des amis* (1737) followed, and, after an unsuccessful attempt at tragedy in *Maximinien*, he returned to comedy in *Mélanide* (1741). In *Mélanide* the type known as *comédie larmoyante* is fully developed. Comedy was no longer to provoke laughter, but tears. The innovation consisted in destroying the sharp distinction then existing between tragedy and comedy in French literature. Indications of this change had been already offered in the work of Marivaux, and La Chaussée's plays led naturally to the domestic drama of Diderot and of Sedaine. The new method found bitter enemies. Alexis Piron nicknames the author "*le Révérend Père Chaussée*," and ridiculed him in one of his most famous epigrams. Voltaire maintained that the *comédie larmoyante* was a proof of the inability of the author to produce either of the recognized kinds of drama, though he himself produced a play of similar character in *L'Enfant prodigue*. The hostility of the critics did not prevent the public from shedding tears nightly over the sorrows of La Chaussée's heroine. *L'École des mères* (1744) and *La Gouvernante* (1747) form, with those already mentioned, the best of his work. The strict moral aims pursued by La Chaussée in his plays seem hardly consistent with his private preferences. He frequented the same gay society as did the comte de Caylus and contributed to the *Recueils de ces messieurs*. La Chaussée died on the 14th of May 1754. Villemain said of his style that he wrote prosaic verses with purity, while Voltaire, usually an adverse critic of his work, said he was "*un des premiers après ceux qui ont du génie.*"

For the *comédie larmoyante* see G. Lanson, *Nivelle de la Chaussée et la comédie larmoyante* (1887).

LACHES (from Anglo-French *lachesse*, negligence, from *lasche*, modern *lâche*, unloosed, slack), a term for slackness or negligence, used particularly in law to signify negligence on the part of a person in doing that which he is by law bound to do, or unreasonable lapse of time in asserting a right, seeking relief, or claiming a privilege. Laches is frequently a bar to a remedy which might have been had if prosecuted in proper time. Statutes of limitation specify the time within which various classes of actions may be brought. Apart from statutes of limitation courts of equity will often refuse relief to those who have allowed unreasonable time to elapse in seeking it, on the principle *vigilantibus ac non dormientibus jura subveniunt.*

LACHINE, an incorporated town in Jacques Cartier county, Quebec, Canada, 8 m. W. of Montreal, on Lake St Louis, an expansion of the St Lawrence river, and at the upper end of the Lachine canal. Pop. (1901) 5561. It is a station on the Grand Trunk railway and a port of call for steamers plying between Montreal and the Great Lakes. It is a favourite summer resort for the people of Montreal. It was named in 1669 in mockery of its then owner, Robert Cavelier de la Salle (1643–1687), who dreamed of a westward passage to China. In 1689 it was the scene of a terrible massacre of the French by the Iroquois.

LACHISH, a town of great importance in S. Palestine, often mentioned in the Tell el-Amarna tablets. It was destroyed by Joshua for joining the league against the Gibeonites (Joshua x. 31-33) and assigned to the tribe of Judah (xv. 39). Rehoboam fortified it (2 Chron. xi. 9). King Amaziah having fled hither, was here murdered by conspirators (2 Kings xiv. 19). Sennacherib here conducted a campaign (2 Kings xviii. 13) during which Hezekiah endeavoured to make terms with him: the campaign is commemorated by bas-reliefs found in Nineveh, now in the British Museum (see G. Smith's *History of Sennacherib*, p. 69). It was one of the last cities that resisted Nebuchadnezzar (Jer. xxxiv. 7). The meaning of Micah's denunciation (i. 13) of the city is unknown. The *Onomasticon* places it 7 m. from Eleutheropolis on the S. road, which agrees with the generally received identification, Tell el-Ḥesi, an important mound excavated for the Palestine Exploration Fund by Petrie and Bliss, 1890–1893. The name is preserved in a small Roman site in the neighbourhood, Umm Lakis, which probably represents a later dwelling-place of the descendants of the ancient inhabitants of the city.

See W. M. Flinders Petrie, *Tell el-Hesy*, and F. J. Bliss, *A Mound of many Cities*, both published by the Palestine Exploration Fund. (R A. S. M.)

LACHMANN, KARL KONRAD FRIEDRICH WILHELM (1793–1851), German philologist and critic, was born at Brunswick on the 4th of March 1793. He studied at Leipzig and Göttingen, devoting himself mainly to philological studies. In 1815 he joined the Prussian army as a volunteer *chasseur* and accompanied his detachment to Paris, but did not encounter the enemy. In 1816 he became an assistant master in the Friedrich Werder gymnasium at Berlin, and a *privat-docent* at the university. The same summer he became one of the principal masters in the Friedrichs-Gymnasium of Königsberg, where he assisted his colleague, the Germanist Friedrich Karl Köpke (1785–1865) with his edition of Rudolf von Ems' *Barlaam und Josaphat* (1818), and also assisted his friend in a contemplated edition of the works of Walther von der Vogelweide. In January 1818 he became professor extraordinarius of classical philology in the university of Königsberg, and at the same time began to lecture on Old German grammar and the Middle High German poets. He devoted himself during the following seven years to an extraordinarily minute study of those subjects, and in 1824 obtained leave of absence in order that he might search the libraries of middle and south Germany for further materials. In 1825 Lachmann was nominated extraordinary professor of classical and German philology in the university of Berlin (ordinary professor 1827); and in 1830 he was admitted a member of the Academy of Sciences. The remainder of his laborious and fruitful life as an author and a teacher was uneventful. He died on the 13th of March 1851.

Lachmann, who was the translator of the first volume of P. E. Müller's *Sagabibliothek des skandinavischen Altertums* (1816), is a figure of considerable importance in the history of German philology (see Rudolf von Raumer, *Geschichte der germanischen Philologie*, 1870). In his "Habilitationsschrift" *Über die ursprüngliche Gestalt des Gedichts der Nibelunge Not* (1816), and still more in his review of Hagen's *Nibelungen* and Benecke's *Bonerius*, contributed in 1817 to the *Jenaische Literaturzeitung* he had already laid down the rules of textual criticism and elucidated the phonetic and metrical principles of Middle High German in a manner which marked a distinct advance in that branch of investigation. The rigidly scientific character of his method becomes increasingly apparent in the *Auswahl aus den hochdeutschen Dichtern des dreizehnten Jahrhunderts* (1820), in the edition of Hartmann's *Iwein* (1827), in those of Walther von der Vogelweide (1827) and Wolfram von Eschenbach (1833), in the papers "Über das Hildebrandslied," "Über althochdeutsche Betonung und Verskunst," "Über den Eingang des Parzivals," and "Über drei Bruchstücke niederrheinischer Gedichte" published in the *Abhandlungen* of the Berlin Academy, and in *Der Nibelunge Not und die Klage* (1826, 11th ed., 1892), which was followed by a critical commentary in 1836. Lachmann's *Betrachtungen über Homer's Ilias*, first published in the *Abhandlungen* of the Berlin Academy in 1837 and 1841, in which he sought to show that the *Iliad* consists of sixteen independent "lays" variously enlarged and interpolated, have had considerable influence on modern Homeric criticism (see HOMER), although his views are no longer accepted. His smaller edition of the New Testament appeared in 1831, 3rd ed. 1846; the larger, in two volumes, in 1842–1850. The plan of Lachmann's edition, explained by himself in the *Stud. u. Krit.* of 1830, is a modification of the unaccomplished project of Bentley. It seeks to restore the most ancient reading current in Eastern MSS., using the consent of the Latin authorities (Old Latin and Greek Western Uncials) as the main proof of antiquity of a reading where the oldest Eastern authorities differ. Besides *Propertius* (1816), Lachmann edited *Catullus* (1829); *Tibullus* (1829); *Genesius* (1834); *Terentianus Maurus* (1836); *Babrius* (1845); *Avianus* (1845); *Gaius* (1841–1842); the *Agrimensores Romani* (1848–1852); *Lucilius* (edited after his death by Vahlen, 1876); and *Lucretius* (1850). The last, which was the main occupation of the closing years of his life, from 1845, was perhaps his greatest achievement, and has been characterized by Munro as "a work which will be a landmark for scholars as long as the Latin language continues to be studied." Lachmann also translated Shakespeare's sonnets (1820) and *Macbeth* (1829).

See M. Hertz, *Karl Lachmann, eine Biographie* (1851), where a full list of Lachmann's works is given; F. Leo, *Rede zur Säcularfeier K. Lachmanns* (1893); J. Grimm, biography in *Kleine Schriften*; W. Scherer in *Allgemeine deutsche Biographie*, xvii., and J. E. Sandys, *Hist. of Classical Scholarship*, iii. (1908), pp. 127-131.

LACINIUM, PROMUNTURIUM (mod. Capo delle Colonne), 7 m S.E. of Crotona (mod. Cotrone); the easternmost point of Bruttii (mod. Calabria). On the cape still stands a single column of the temple erected to Hera Lacinia, which is said to have been fairly complete in the 16th century, but to have been destroyed to build the episcopal palace at Cotrone. It is a Doric column with capital, about 27 ft. in height. Remains of marble roof-tiles have been seen on the spot (Livy xlii. 3) and architectural fragments were excavated in 1886–1887 by the Archaeological Institute of America. The sculptures found were mostly buried again, but a few fragments, some decorative terra-cottas and a dedicatory inscription to Hera of the 6th century B.C., in private possession at Cotrone, are described by F. von Duhn in *Notizie degli scavi*, 1897, 343 seq. The date of the erection of the temple may be given as 480–440 B.C.; it is not recorded by any ancient writer.

See R. Koldewey and O. Puchstein, *Die griechischen Tempel in Unteritalien und Sicilien* (Berlin 1899, 41).

LA CIOTAT, a coast town of south-eastern France in the department of Bouches-du-Rhône, on the west shore of the Bay of La Ciotat, 26 m. S.E. of Marseilles by rail. Pop. (1906) 10,562. The port is easily accessible and well sheltered. The large shipbuilding yards and repairing docks of the Messageries Maritimes Company give employment to between 2000 and 3000 workmen. Fishing and an active coasting trade are carried on; the town is frequented for sea-bathing. La Ciotat was in ancient times the port of the neighbouring town of *Citharista* (now the village of Ceyreste).

LA CLOCHE, JAMES DE ["Prince James Stuart"] (1644 ?–1669), a character who was brought into the history of England by Lord Acton in 1862 (*Home and Foreign Review*, i. 146–174: "The Secret History of Charles II."). From information discovered by Father Boero in the archives of the Jesuits in Rome, Lord Acton averred that Charles II., when a lad at Jersey, had a natural son, James. The evidence follows. On the 2nd of April 1668, as the register of the Jesuit House of Novices at Rome attests, "there entered Jacobus de la Cloche." His baggage was exiguous, his attire was clerical. He is described as "from the island of Jersey, under the king of England, aged 24." He possessed two documents in French, purporting to have been written by Charles II. at Whitehall, on the 25th of

September 1665, and on the 7th of February 1667. In both Charles acknowledges James to be his natural son, he styles him "James de la Cloche de Bourg du Jersey," and avers that to recognize him publicly "would imperil the peace of the kingdoms"—why is not apparent. A third certificate of birth, in Latin, undated, was from Christina of Sweden, who declares that James, previously a Protestant, has been received into the church of Rome at Hamburg (where in 1667–1668 she was residing) on the 29th of July 1667. The next paper purports to be a letter from Charles II. of August 3/13 to Oliva, general of the Jesuits. The king writes, in French, that he has long wished to be secretly received into the church. He therefore desires that James, his son by a young lady "of the highest quality," and born to him when he was about sixteen, should be ordained a priest, come to England and receive him. Charles alludes to previous attempts of his own to be secretly admitted (1662). James must be sent secretly to London at once, and Oliva must say nothing to Christina of Sweden (then meditating a journey to Rome), and must never write to Charles except when James carries the letter. Charles next writes on August 29/September 9. He is most anxious that Christina should not meet James; if she knows Charles's design of changing his creed she will not keep it secret, and Charles will infallibly lose his life. With this letter there is another, written when the first had been sealed. Charles insists that James must not be accompanied, as novices were, when travelling, by a Jesuit *socius* or guardian. Charles's wife and mother have just heard that this is the rule, but the rule must be broken. James, who is to travel as "Henri de Rohan," must not come by way of France. Oliva will supply him with funds. On the back of this letter Oliva has written the draft of his brief reply to Charles (from Leghorn, October 14, 1668). He merely says that the bearer, a French gentleman (James spoke only French), will inform the king that his orders have been executed. Besides these two letters is one from Charles to James, of date August 4/14. It is addressed to "Le Prince Stuart," though none of Charles's bastards was allowed to bear the Stuart name. James is told that he may desert the clerical profession if he pleases. In that case "you may claim higher titles from us than the duke of Monmouth." (There was no higher title save prince of Wales!) If Charles and his brother, the duke of York, die childless, "the kingdoms belong to you, and parliament cannot legally oppose you, unless as, at present, they can only elect Protestant kings." This letter ought to have opened the eyes of Lord Acton and other historians who accept the myth of James de la Cloche. Charles knew that the crown of England was not elective, that there was no Exclusion Act, and that there were legal heirs if he and his brother died without issue. The last letter of Charles is dated November 18/28, and purports to have been brought from England to Oliva by James de la Cloche on his return to Rome. It reveals the fact that Oliva, despite Charles's orders, did send James by way of France, with a *socius* or guardian whom he was to pick up in France on his return to England. Charles says that James is to communicate certain matters to Oliva, and come back at once. Oliva is to give James all the money he needs, and Charles will later make an ample donation to the Jesuits. He acknowledges a debt to Oliva of £800, to be paid in six months. The reader will remark that the king has never paid a penny to James or to Oliva, and that Oliva has never communicated directly with Charles. The truth is that all of Charles's letters are forgeries. This is certain because in all he writes frequently as if his mother, Henrietta Maria, were in London, and constantly in company with him. Now she had left England for France in 1665, and to England she never returned. As the letters—including that to "Prince Stuart"—are all forged, it is clear that de la Cloche was an impostor. His aim had been to get money from Oliva, and to pretend to travel to England, meaning to enjoy himself. He did not quite succeed, for Oliva sent a *socius* with him into France. His precautions to avoid a meeting with Christina of Sweden were necessary. She knew no more of him than did Charles, and would have exposed him.

The name of James de la Cloche appears no more in documents. He reached Rome in December 1668, and in January a person calling himself "Prince James Stuart" appears in Naples, accompanied by a *socius* styling himself a French knight of Malta. Both are on their way to England, but Prince James falls ill and stays in Naples, while his companion departs. The knight of Malta may be a Jesuit. In Naples, Prince James marries a girl of no position, and is arrested on suspicion of being a coiner. To his confessors (he had two in succession) he says that he is a son of Charles II. Our sources are the despatches of Kent, the English agent at Naples, and the *Lettere*, vol. iii., of Vincenzo Armanni (1674), who had his information from one of the confessors of the "Prince." The viceroy of Naples communicated with Charles II., who disowned the impostor; Prince James, however, was released, and died at Naples in August 1669, leaving a wild will, in which he claims for his son, still unborn, the "apanage" of Monmouth or Wales, "which it is usual to bestow on natural sons of the king." The son lived till about 1750, a penniless pretender, and writer of begging letters.

It is needless to pursue Lord Acton's conjectures about later mysterious appearances of James de la Cloche at the court of Charles, or to discuss the legend that his mother was a lady of Jersey—or a sister of Charles! The Jersey myths may be found in *The Man of the Mask* (1908), by Monsignor Barnes, who argued that James was the man in the iron mask (see IRON MASK). Later Monsignor Barnes, who had observed that the letter of Charles to Prince James Stuart is a forgery, noticed the impossibility that Charles, in 1668, should constantly write of his mother as resident in London, which she left for ever in 1665.

Who de la Cloche really was it is impossible to discover, but he was a bold and successful swindler, who took in, not only the general of the Jesuits, but Lord Acton and a generation of guileless historians. (A. L.)

LA CONDAMINE, CHARLES MARIE DE (1701–1774), French geographer and mathematician, was born at Paris on the 28th of January 1701. He was trained for the military profession, but turned his attention to science and geographical exploration. After taking part in a scientific expedition in the Levant (1731), he became a member with Louis Godin and Pierre Bouguer of the expedition sent to Peru in 1735 to determine the length of a degree of the meridian in the neighbourhood of the equator. His associations with his principals were unhappy; the expedition was beset by many difficulties, and finally La Condamine separated from the rest and made his way from Quito down the Amazon, ultimately reaching Cayenne. His was the first scientific exploration of the Amazon. He returned to Paris in 1744 and published the results of his measurements and travels with a map of the Amazon in *Mém. de l'académie des sciences*, 1745 (English translation 1745–1747). On a visit to Rome La Condamine made careful measurements of the ancient buildings with a view to a precise determination of the length of the Roman foot. The journal of his voyage to South America was published in Paris in 1751. He also wrote in favour of inoculation, and on various other subjects, mainly connected with his work in South America. He died at Paris on the 4th of February 1774.

LACONIA (Gr. Λακωνική), the ancient name of the south-eastern district of the Peloponnese, of which Sparta was the capital. It has an area of some 1,048,000 acres, slightly greater than that of Somersetshire, and consists of three well-marked zones running N. and S. The valley of the Eurotas, which occupies the centre, is bounded W. by the chain of Taygetus (mod. Pentedaktylon, 7900 ft.), which starts from the Arcadian mountains on the N., and at its southern extremity forms the promontory of Taenarum (Cape Matapan). The eastern portion of Laconia consists of a far more broken range of hill country, rising in Mt. Parnon to a height of 6365 ft. and terminating in the headland of Malea. The range of Taygetus is well watered and was in ancient times covered with forests which afforded excellent hunting to the Spartans, while it had also large iron mines and quarries of an inferior bluish marble, as well as of the famous *rosso antico* of Taenarum. Far poorer are the slopes of

Parnon, consisting for the most part of barren limestone uplands scantily watered. The Eurotas valley, however, is fertile, and produces at the present day maize, olives, oranges and mulberries in great abundance. Laconia has no rivers of importance except the Eurotas and its largest tributary the Oenus (mod. Kelefína). The coast, expecially on the east, is rugged and dangerous. Laconia has few good harbours, nor are there any islands lying off its shores with the exception of Cythera (Cerigo), S. of Cape Malea. The most important towns, besides Sparta and Gythium, were Bryseae, Amyclae and Pharis in the Eurotas plain, Pellana and Belbina on the upper Eurotas, Sellasia on the Oenus, Caryaè on the Arcadian frontier, Prasiae, Zarax and Epidaurus Limera on the east coast, Geronthrae on the slopes of Parnon, Boeae, Asopus, Helos, Las and Teuthrone on the Laconian Gulf, and Hippola, Messa and Oetylus on the Messenian Gulf.

The earliest inhabitants of Laconia, according to tradition, were the autochthonous Leleges (*q.v.*). Minyan immigrants then settled at various places on the coast and even appear to have penetrated into the interior and to have founded Amyclae. Phoenician traders, too, visited the shores of the Laconian Gulf, and there are indications of trade at a very early period between Laconia and Crete, *e.g.* a number of blocks of green Laconian porphyry from the quarries at Croceae have been found in the palace of Minos at Cnossus. In the Homeric poems Laconia appears as the realm of an Achaean prince, Menelaus, whose capital was perhaps Therapne on the left bank of the Eurotas, S.E. of Sparta; the Achaean conquerors, however, probably contented themselves with a suzerainty over Laconia and part of Messenia (*q.v.*) and were too few to occupy the whole land. The Achaean kingdom fell before the incoming Dorians, and throughout the classical period the history of Laconia is that of its capital Sparta (*q.v.*). In 195 B.C. the Laconian coast towns were freed from Spartan rule by the Roman general T. Quinctius Flamininus, and became members of the Achaean League. When this was dissolved in 146 B.C., they remained independent under the title of the "Confederation of the Lacedaemonians" or "of the Free-Laconians" (*κοινὸν τῶν Λακεδαιμονίων* or Ἐλευθερολακώνων), the supreme officer of which was a *στρατηγός* (general) assisted by a *ταμίας* (treasurer). Augustus seems to have reorganized the league in some way, for Pausanias (iii. 21, 6) speaks of him as its founder. Of the twenty-four cities which originally composed the league, only eighteen remained as members by the reign of Hadrian (see ACHAEAN LEAGUE). In A.D. 395 a Gothic horde under Alaric devastated Laconia, and subsequently it was overrun by large bands of Slavic immigrants. Throughout the middle ages it was the scene of vigorous struggles between Slavs, Byzantines, Franks, Turks and Venetians, the chief memorials of which are the ruined strongholds of Mistra near Sparta, Geráki (anc. Geronthrae) and Monemvasia, "the Gibraltar of Greece," on the east coast, and Passava near Gythium. A prominent part in the War of Independence was played by the Maniates or Mainotes, the inhabitants of the rugged peninsula formed by the southern part of Taygetus. They had all along maintained a virtual independence of the Turks and until quite recently retained their medieval customs, living in fortified towers and practising the vendetta or blood-feud.

The district has been divided into two departments (nomes), Lacedaemon and Laconia, with their capitals at Sparta and Gythium respectively. Pop. of Laconia (1907) 61,522.

Archaeology.—Until 1904 archaeological research in Laconia was carried on only sporadically. Besides the excavations undertaken at Sparta, Gythium and Vaphio (*q.v.*), the most important were those at the Apollo sanctuary of Amyclae carried out by C. Tsountas in 1890 (Ἐφημ. ἀρχαιολ. 1892, 1 ff.) and in 1904 by A. Furtwängler. At Kampos, on the western side of Taygetus, a small domed tomb of the "Mycenean" age was excavated in 1890 and yielded two leaden statuettes of great interest, while at Arkina a similar tomb of poor construction was unearthed in the previous year. Important inscriptions were found at Geronthrae (Geráki), notably five long fragments of the *Edictum Diocletiani*, and elsewhere. In 1904 the British Archaeological school at Athens undertook a systematic investigation of the ancient and medieval remains in Laconia. The results, of which the most important are summarized in the article SPARTA, are published in the British School *Annual*, x. ff. The acropolis of Geronthrae, a hero-shrine at Angelona in the south-eastern highlands, and the sanctuary of Ino-Pasiphae at Thalamae have also been investigated.

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(M. N. T.)

LACONIA, a city and the county-seat of Belknap county, New Hampshire, U.S.A., on both sides of the Winnepesaukee river, 28 m. N.N.E. of Concord. Pop. (1900) 8042 (1770 foreign-born); (1910) 10,183. Laconia is served by two divisions of the Boston & Maine railway, which has a very handsome granite passenger station (1892) and repair shops here. It is pleasantly situated in the lake district of central New Hampshire, and in the summer season Lake Winnisquam on the S. and W. and Lake Winnepesaukee on the N.E. attract many visitors. The city covers an area of 24·65 sq. m. (5·47 sq. m. annexed since 1890). Within the city limits, and about 6 m. from its centre, are the grounds of the Winnepesaukee Camp-Meeting Association, and the camping place for the annual reunions of the New Hampshire Veterans of the Civil War, both at The Weirs, the northernmost point in the territory claimed by colonial Massachusetts; about 2 m. from the centre of Laconia is Lakeport (pop. 1900, 2137), which, like The Weirs, is a summer resort and a ward in the city of Laconia. Among the public institutions are the State School for Feeble-minded Children, a cottage hospital and the Laconia Public Library, lodged in the Gale Memorial Library building (1903). Another fine building is the Congregational Church (1906). The New Hampshire State Fish Hatchery is in Laconia. Water-power is furnished by the river. In 1905 Laconia ranked first among the cities of the state in the manufacture of hosiery and knit goods, and the value of these products for the year was 48·4% of the total value of the city's factory product; among its other manufactures are yarn, knitting machines, needles, sashes and blinds, axles, paper boxes, boats, gas and gasolene engines, and freight, passenger and electric cars. The total value of the factory products increased from $2,152,379 in 1900 to $3,096,878 in 1905, or 43·9%. The portion of the city N. of the river, formerly known as Meredith Bridge, was set apart from the township of Meredith and incorporated as a township under the name of Laconia in 1855; a section S. of the river was taken from the township of Gilford in 1874; and Lakeport was added in 1893, when Laconia was chartered as a city. The name Laconia was first applied in New England to the region granted in 1629 to Mason and Gorges (see MASON, JOHN).

LACONICUM (*i.e.* Spartan, *sc. balneum*, bath), the dry sweating room of the Roman thermae, contiguous to the caldarium or hot room. The name was given to it as being the only form of warm bath that the Spartans admitted. The laconicum was usually a circular room with niches in the axes of the diagonals and was covered by a conical roof with a circular opening at the top, according to Vitruvius (v. 10), "from which a brazen shield is suspended by chains, capable of being so lowered and raised as to regulate the temperature." The walls of the laconicum were plastered with marble stucco and polished, and the conical roof covered with plaster and painted blue with gold stars. Sometimes, as in the old baths at Pompeii, the laconicum was provided in an apse at one end of the caldarium, but as a rule it was a separate room raised to a higher temperature and had no bath in it. In addition to the hypocaust under the floor the wall was lined with flue tiles. The largest laconicum, about 75 ft. in diameter, was that built by Agrippa in his thermae on the south side of the Pantheon, and is referred to by Cassius (liii. 23), who states that, in addition to other works, "he constructed the hot bath chamber which he called the Laconicum Gymnasium." All traces of this building are lost; but in the additions made to the thermae of Agrippa by Septimius Severus another laconicum was built farther south, portions of which still exist in the so-called Arco di Giambella.

LACORDAIRE, JEAN BAPTISTE HENRI (1802–1861), French ecclesiastic and orator, was born at Recey-sur-Ource, Côte d'Or, on the 12th of March 1802. He was the second of a family of four, the eldest of whom, Jean Théodore (1801–1870), travelled a great deal in his youth, and was afterwards professor of comparative anatomy at Liége. For several years Lacordaire studied at Dijon, showing a marked talent for rhetoric; this led him to the pursuit of law, and in the local debates of the advocates he attained a high celebrity. At Paris he thought of going on the stage, but was induced to finish his legal training and began to practise as an advocate (1817–1824). Meanwhile Lamennais had published his *Essai sur l'Indifférence*,—a passionate plea for Christianity and in particular for Roman Catholicism as necessary for the social progress of mankind. Lacordaire read, and his ardent and believing nature, weary of the theological negations of the Encyclopaedists, was convinced. In 1823 he became a theological student at the seminary of Saint Sulpice; four years later he was ordained and became almoner of the college Henri IV. He was called from it to co-operate with Lamennais in the editorship of *L'Avenir*, a journal established to advocate the union of the democratic principle with ultramontanism. Lacordaire strove to show that Catholicism was not bound up with the idea of dynasty, and definitely allied it with a well-defined liberty, equality and fraternity. But the new propagandism was denounced from Rome in an encyclical. In the meantime Lacordaire and Montalembert, believing that, under the charter of 1830, they were entitled to liberty of instruction, opened an independent free school. It was closed in two days, and the teachers fined before the court of peers. These reverses Lacordaire accepted with quiet dignity; but they brought his relationship with Lamennais to a close. He now began the course of Christian *conférences* at the Collége Stanislas, which attracted the art and intellect of Paris; thence he went to Nôtre Dame, and for two years his sermons were the delight of the capital. His presence was dignified, his voice capable of indefinite modulation, and his gestures animated and attractive. He still preached the gospel of the people's sovereignty in civil life and the pope's supremacy in religion, but brought to his propagandism the full resources of a mind familiar with philosophy, history and literature, and indeed led the reaction against Voltairean scepticism. He was asked to edit the *Univers*, and to take a chair in the university of Louvain, but he declined both appointments, and in 1838 set out for Rome, revolving a great scheme for christianizing France by restoring the old order of St Dominic. At Rome he donned the habit of the preaching friar and joined the monastery of Minerva. His *Mémoire pour le rétablissement en France de l'ordre des frères prêcheurs* was then prepared and dedicated to his country; at the same time he collected the materials for the life of St Dominic. When he returned to France in 1841 he resumed his preaching at Nôtre Dame, but he had small success in re-establishing the order of which he ever afterwards called himself monk. His funeral orations are the most notable in their kind of any delivered during his time, those devoted to Marshal Drouet and Daniel O'Connell being especially marked by point and clearness. He next thought that his presence in the National Assembly would be of use to his cause; but being rebuked by his ecclesiastical superiors for declaring himself a republican, he resigned his seat ten days after his election. In 1850 he went back to Rome and was made provincial of the order, and for four years laboured to make the Dominicans a religious power. In 1854 he retired to Sorrèze to become director of a private lyceum, and remained there until he died on the 22nd of November 1861. He had been elected to the Academy in the preceding year.

The best edition of Lacordaire's works is the *Œuvres complètes* (6 vols., Paris, 1872–1873), published by C. Poussielgue, which contains, besides the *Conférences*, the exquisitely written, but uncritical, *Vie de Saint Dominique* and the beautiful *Lettres à un jeune homme sur la vie chrétienne*. For a complete list of his published correspondence see L. Petit de Julleville's *Histoire de la langue et de la littérature française*, vii. 598.

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LACQUER, or LACKER, a general term for coloured and frequently opaque varnishes applied to certain metallic objects and to wood. The term is derived from the resin lac, which substance is the basis of lacquers properly so called. Technically, among Western nations, lacquering is restricted to the coating of polished metals or metallic surfaces, such as brass, pewter and tin, with prepared varnishes which will give them a golden, bronze-like or other lustre as desired. Throughout the East Indies the lacquering of wooden surfaces is universally practised, large articles of household furniture, as well as small boxes, trays, toys and papier-mâché objects, being decorated with bright-coloured and variegated lacquer. The lacquer used in the East is, in general, variously coloured sealing-wax, applied, smoothed and polished in a heated condition; and by various devices intricate marbled, streaked and mottled designs are produced. Quite distinct from these, and from all other forms of lacquer, is the lacquer work of Japan, for which see JAPAN, § *Art*.

LACRETELLE, PIERRE LOUIS DE (1751–1824), French politician and writer, was born at Metz on the 9th of October 1751. He practised as a barrister in Paris; and under the Revolution was elected as a *député suppléant* in the Constituent Assembly, and later as deputy in the Legislative Assembly. He belonged to the moderate party known as the "Feuillants," but after the 10th of August 1792 he ceased to take part in public life. In 1803 he became a member of the Institute, taking the place of La Harpe. Under the Restoration he was one of the chief editors of the *Minerve française*; he wrote also an essay, *Sur le* 18 *Brumaire* (1799), some *Fragments politiques et littéraires* (1817), and a treatise *Des partis politiques et des factions de la prétendue aristocratie d'aujourd'hui* (1819).

His younger brother, JEAN CHARLES DOMINIQUE DE LACRETELLE, called Lacretelle *le jeune* (1766–1855), historian and journalist, was also born at Metz on the 3rd of September 1766. He was called to Paris by his brother in 1787, and during the Revolution belonged, like him, to the party of the *Feuillants*. He was for some time secretary to the duc de la Rochefoucauld-Liancourt, the celebrated philanthropist, and afterwards joined the staff of the *Journal de Paris*, then managed by Suard, and where he had as colleagues André Chénier and Antoine Roucher. He made no attempt to hide his monarchist sympathies, and this, together with the way in which he reported the trial and death of Louis XVI., brought him in peril of his life; to avoid this danger he enlisted in the army, but after Thermidor he returned to Paris and to his newspaper work. He was involved in the royalist movement of the 13th Vendémiaire, and condemned to deportation after the 18th Fructidor; but, thanks to powerful influence, he was left "forgotten" in prison till after the 18th Brumaire, when he was set at liberty by Fouché. Under the Empire he was appointed a professor of history in the *Faculté des lettres* of Paris (1809), and elected as a member of the Académie française (1811). In 1827 he was prime mover in the protest made by the French Academy against the minister Peyronnet's law on the press, which led to the failure of that measure, but this step cost him, as it did Villemain, his post as *censeur royal.* Under Louis Philippe he devoted himself entirely to his teaching and literary work. In 1848 he retired to Mâcon; but there, as in Paris, he was the centre of a brilliant circle, for he was a wonderful *causeur*, and an equally good listener, and had many interesting experiences to recall. He died on the 26th of March 1855. His son Pierre Henri (1815–1899) was a humorous writer and politician of purely contemporary interest.

J. C. Lacretelle's chief work is a series of histories of the 18th century, the Revolution and its sequel: *Précis historique de la Révolution française*, appended to the history of Rabaud St Étienne, and partly written in the prison of La Force (5 vols., 1801–1806); *Histoire de France pendant le XVIII^e siècle* (6 vols., 1808); *Histoire de l'Assemblée Constituante* (2 vols., 1821); *L'Assemblée Législative* (1822); *La Convention Nationale* (3 vols., 1824–1825); *Histoire de France depuis la restauration* (1829–1835); *Histoire du consulat et de l'empire* (4 vols., 1846). The author was a moderate and fair-minded man, but possessed neither great powers of style, nor striking historical insight, nor the special historian's power of writing minute accuracy of detail with breadth of view. Carlyle's sarcastic remark on Lacretelle's history of the Revolution, that it "exists, but does not profit much," is partly true of all his books. He had been an eyewitness of and an actor in the events which he describes, but his testimony must be accepted with caution.

LACROIX, ANTOINE FRANÇOIS ALFRED (1863–), French mineralogist and geologist, was born at Mâcon, Saône et Loire, on the 4th of February 1863. He took the degree of D. ès Sc. in Paris, 1889. In 1893 he was appointed professor of mineralogy at the *Jardin des Plantes*, Paris, and in 1896 director of the mineralogical laboratory in the *École des Hautes Études*. He paid especial attention to minerals connected with volcanic phenomena and igneous rocks, to the effects of metamorphism, and to mineral veins, in various parts of the world, notably in the Pyrenees. In his numerous contributions to scientific journals he dealt with the mineralogy and petrology of Madagascar, and published an elaborate and exhaustive volume on the eruptions in Martinique, *La Montagne Pelée et ses éruptions* (1904). He also issued an important work entitled *Mineralogie de la France et de ses Colonies* (1893–1898), and other works in conjunction with A. Michel Lévy. He was elected member of the Académie des sciences in 1904.

LACROIX, PAUL (1806–1884), French author and journalist, was born in Paris on the 27th of April 1806, the son of a novelist. He is best known under his pseudonym of P. L. Jacob, *bibliophile*, or "Bibliophile Jacob," suggested by the constant interest he took in public libraries and books generally. Lacroix was an extremely prolific and varied writer. Over twenty historical romances alone came from his pen, and he also wrote a variety of serious historical works, including a history of Napoleon III., and the life and times of the Tsar Nicholas I. of Russia. He was the joint author with Ferdinand Séré of a five-volume work, *Le Moyen Âge et La Renaissance* (1847), a standard work on the manners, customs and dress of those times, the chief merit of which lies in the great number of illustrations it contains. He also wrote many monographs on phases of the history of culture. Over the signature Pierre Dufour was published an exhaustive *Histoire de la Prostitution* (1851–1852), which has always been attributed to Lacroix. His works on bibliography were also extremely numerous. In 1885 he was appointed librarian of the Arsenal Library, Paris. He died in Paris on the 16th of October 1884.

LACROMA (Serbo-Croatian *Lokrum*), a small island in the Adriatic Sea, forming part of the Austrian kingdom of Dalmatia, and lying less than half a mile south of Ragusa. Though barely 1¼ m. in length, Lacroma is remarkable for the beauty of its subtropical vegetation. It was a favourite resort of the archduke Maximilian, afterwards emperor of Mexico (1832–1867), who restored the château and park; and of the Austrian crown prince Rudolph (1857–1889). It contains an 11th-century Benedictine monastery; and the remains of a church, said by a very doubtful local tradition to have been founded by Richard I. of England (1157–1199), form part of the imperial château.

See *Lacroma*, an illustrated descriptive work by the crown princess Stéphanie (afterwards Countess Lónyay)(Vienna, 1892).

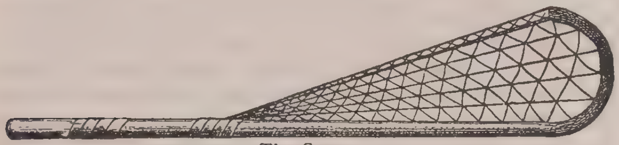
LA CROSSE, a city and the county-seat of La Crosse county, Wisconsin, U.S.A., about 180 m. W.N.W. of Milwaukee, and about 120 m. S.E. of St Paul, Minnesota, on the E. bank of the Mississippi river, at the mouth of the Black and of the La Crosse rivers. Pop. (1900) 28,895; (1910 census) 30,417. Of the total population in 1900, 7222 were foreign-born, 3130 being German and 2023 Norwegian, and 17,555 were of foreign-parentage (both parents foreign-born), including 7853 of German parentage, 4422 of Norwegian parentage, and 1062 of Bohemian parentage. La Crosse is served by the Chicago & North Western, the Chicago, Milwaukee & St Paul, the Chicago, Burlington & Quincy, the La Crosse & South Eastern, and the Green Bay & Western railways, and by river steamboat lines on the Mississippi. The river is crossed here by a railway bridge (C.M. & St P.) and wagon bridge. The city is situated on a prairie, extending back from the river about 2½ m. to bluffs, from which fine views may be obtained. Among the city's buildings and institutions are the Federal Building (1886–1887), the County Court House (1902–1903), the Public Library (with more than 20,000 volumes), the City Hall (1891), the High School Building (1905–1906), the St Francis, La Crosse and Lutheran hospitals, a Young Men's Christian Association Building, a Young Women's Christian Association Building, a U.S. Weather Station (1907), and a U.S. Fish Station (1905). La Crosse is the seat of a state Normal School (1909). Among the city's parks are Pettibone (an island in the Mississippi), Riverside, Burns, Fair Ground and Myrick. The city is the see of a Roman Catholic bishop. La Crosse is an important lumber and grain market, and is the principal wholesale distributing centre for a large territory in S.W. Wisconsin, N. Iowa and Minnesota. Proximity to both pine and hardwood forests early made it one of the most important lumber manufacturing places in the North-west; but this industry has now been displaced by other manufactures. The city has grain elevators, flour mills (the value of flour and grist mill products in 1905 was $2,166,116), and breweries (product value in 1905, $1,440,659). Other important manufactures are agricultural implements ($542,425 in 1905), lumber and planing mill products, leather, woollen, knit and rubber goods, tobacco, cigars and cigarettes, carriages, foundry and machine-shop products, copper and iron products, cooperage, pearl buttons, brooms and brushes. The total value of the factory product in 1905 was $8,139,432, as against $7,676,581 in 1900. The city owns and operates its water-works system, the wagon bridge (1890–1891) across the Mississippi, and a toll road (2½ m. long) to the village of La Crescent, Minn.

Father Hennepin and du Lhut visited or passed the site of La Crosse as early as 1680, but it is possible that adventurous *coureurs-des-bois* preceded them. The first permanent settlement was made in 1841, and La Crosse was made the county-seat in 1855 and was chartered as a city in 1856.

LACROSSE, the national ball game of Canada. It derives its name from the resemblance of its chief implement used, the curved netted stick, to a bishop's crozier. It was borrowed from the Indian tribes of North America. In the old days, according to Catlin, the warriors of two tribes in their war-paint would form the sides, often 800 or 1000 strong. The goals were placed from 500 yds. to ½ m. apart with practically no side boundaries. A solemn dance preceded the game, after which the ball was tossed into the air and the two sides rushed to catch it on "crosses," similar to those now in use. The medicine-men acted as umpires, and the squaws urged on the men by beating them with switches. The game attracted much attention from the early French settlers in Canada. In 1763, after Canada had become British, the game was used by the aborigines to carry out an ingenious piece of treachery. On the 4th of June, when the garrison of Fort Michilimackinac (now Mackinac) was celebrating the king's birthday, it was invited by the Ottawas, under their chief Pontiac, to witness a game of "baggataway" (lacrosse). The players gradually worked their way close to the gates, when, throwing aside their crosses and seizing their tomahawks which the squaws suddenly produced from under their blankets, they rushed into the fort and massacred all the inmates except a few Frenchmen.

The game found favour among the British settlers, but it was not until 1867, the year in which Canada became a Dominion, that G. W. Beers, a prominent player, suggested that Lacrosse should be recognized as the national game, and the National Lacrosse Association of Canada was formed. From that time the game has flourished vigorously in Canada and to a less extent in the United States. In 1868 an English Lacrosse Association was formed, but, although a team of Indians visited the United Kingdom in 1867, it was not until sometime later that the game became at all popular in Great Britain. Its progress was much encouraged by visits of teams representing the Toronto Lacrosse Club in 1888 and 1902, the methods of the Canadians and their wonderful "short-passing" exciting much admiration. In 1907 the Capitals of Ottawa visited England, playing six matches, all of which were won by the Canadians. The match North *v.* South has been played annually in England since 1882. A county championship was inaugurated in 1905. A North of England League, embracing ten clubs, began playing league matches in 1897; and a match between the universities of Oxford and Cambridge has been played annually since 1903. A match between England and Ireland was played annually from 1881 to 1904.

Implements of the Game.—The ball is made of indiarubber sponge, weighs between 4¼ and 4½ oz., and measures 8 to 8½ in. in circumference. The "crosse" is formed of a light staff of hickory wood, the top being bent to form a kind of hook, from the tip of which a thong is drawn and made fast to the shaft about 2 ft. from the other end. The oval triangle thus formed is covered with a network of gut or rawhide, loose enough to hold the ball but not to form a bag. At no part must the crosse measure more than 12 in. in breadth, and no metal must be used in its manufacture. It may be of any length to suit the player. The goals are set up not less than 100 nor more than 150 yds. apart, the goal-posts being 6 ft. high and the same distance apart. They are set up in the middle of the "goal-crease," a space of 12 ft. square marked with chalk. A net extends from the top rail and sides of the posts back to a point 6 ft. behind the middle of the line between the posts. Boundaries are agreed upon by the captains. Shoes may have indiarubber soles, but must be without spikes.


The Crosse.

The Game.—The object of the game is to send the ball, by means of the crosse, through the enemy's goal-posts as many times as possible during the two periods of play, precisely as in football and hockey. There are twelve players on each side. In every position save that of goal there are two men, one of each side, whose duties are to "mark" and neutralize each other's efforts. The game is opened by the act of "facing," in which the two centres, each with his left shoulder towards his opponents' goal, hold their crosses, wood downwards, on the ground, the ball being placed between them. When the signal is given the centres draw their crosses sharply inwards in order to gain possession of the ball. The ball may be kicked or struck with the crosse, as at hockey, but the goal-keeper alone may handle it, and then only to block and not to throw it. Although the ball may be thrown with the crosse for a long distance—220 yds. is about the limit—long throws are seldom tried, it being generally more advantageous for a player to run with the ball resting on the crosse, until he can pass it to a member of his side who proceeds with the attack, either by running, passing to another, or trying to throw the ball through the opponents' goal. The crosse, usually held in both hands, is made to retain the ball by an ingenious rocking motion only acquired by practice. As there is no "off-side" in Lacrosse, a player may pass the ball to the front, side or rear. No charging is allowed, but one player may interfere with another by standing directly in front of him ("body-check"), though without holding, tripping or striking with the crosse. No one may interfere with a player who is not in possession of the ball. Fouls are penalized either by the suspension of the offender until a goal has been scored or until the end of the game; or by allowing the side offended against a "free position." When a "free position" is awarded each player must stand in the position where he is, excepting the goal-keeper who may get back to his goal, and any opponent who may be nearer the player getting the ball than 5 yds.; this player must retire to that distance from the one who has been given the "free position," who then proceeds with the game as he likes when the referee says "play." This penalty may not be carried out nearer than 10 yds. from the goal. If the ball crosses a boundary the referee calls "stand," and all players stop where they are, the ball being then "faced" not less than 4 yds. within the boundary line by the two nearest players.

See the official publications of the English Lacrosse Union; and *Lacrosse* by W. C. Schmeisser, in Spalding's "Athletic Library." Also *Manners, Customs and Condition of the North American Indians*, by George Catlin.

LA CRUZ, RAMÓN DE (1731–1794), Spanish dramatist, was born at Madrid on the 28th of March 1731. He was a clerk in the ministry of finance, and is the author of three hundred *sainetes*, little farcical sketches of city life, written to be played between the acts of a longer play. He published a selection in ten volumes (Madrid, 1786–1791), and died on the 5th of March 1794. The best of his pieces, such as *Las Tertulias de Madrid*, are delightful specimens of satiric observation.

See E. Cotardo y Mori, *Don Ramón de la Cruz y sus obras* (Madrid, 1899); C. Cambronero, *Sainetes inéditos existentes en la Biblioteca Municipal de Madrid* (Madrid, 1900).

LACRYMATORY (from Lat. *lacrima*, a tear), a class of small vessels of terra-cotta, or, more frequently, of glass, found in Roman and late Greek tombs, and supposed to have been bottles into which mourners dropped their tears. They contained unguents, and to the use of unguents at funeral ceremonies the finding of so many of these vessels in tombs is due. They are shaped like a spindle, or a flask with a long small neck and a body in the form of a bulb.

LACTANTIUS FIRMIANUS (*c.* 260–*c.* 340), also called Lucius Caelius (or Caecilius) Lactantius Firmianus, was a Christian writer who from the beauty of his style has been called the "Christian Cicero." His history is very obscure. He was born of heathen parents in Africa about 260, and became a pupil of Arnobius, whom he far excelled in style though his knowledge of the Scriptures was equally slight. About 290 he went to Nicomedia in Bithynia while Diocletian was emperor, to teach rhetoric, but found little work to do in that Greek-speaking city. In middle age he became a convert to Christianity, and about 306 he went to Gaul (Trèves) on the invitation of Constantine the Great, and became tutor to his eldest son, Crispus. He probably died about 340.

Lactantius' chief work, *Divinarum Institutionum Libri Septem*, is an "apology" for and an introduction to Christianity, written in exquisite Latin, but displaying such ignorance as to have incurred the charge of favouring the Arian and Manichaean heresies. It seems to have been begun in Nicomedia about 304 and finished in Gaul before 311. Two long eulogistic addresses and most of the brief apostrophes to the emperor are from a later hand, which has added some dualistic touches. The seven books of the institutions have separate titles given to them either by the author or by a later editor. The first, *De Falsa Religione*, and the second, *De Origine Erroris*, attack the polytheism of heathendom, show the unity of the God of creation and providence, and try to explain how men have been corrupted by demons. The third book, *De Falsa Sapientia*, describes and criticizes the various systems of prevalent philosophy. The fourth book, *De Vera Sapientia et Religione*, insists upon the inseparable union of true wisdom and true religion, and maintains that this union is made real in the person of Christ. The fifth book, *De Justitia*, maintains that true righteousness is not to be found apart from Christianity, and that it springs from piety which consists in the knowledge of God. The sixth book, *De Vero Cultu*, describes the true worship of God, which is righteousness, and consists chiefly in the exercise of Christian love towards God and man. The seventh book, *De Vita Beata*, discusses, among a variety of subjects, the chief good, immortality, the second advent and the resurrection. Jerome states that Lactantius wrote an epitome of these *Institutions*, and such a work, which may well be authentic, was discovered in MS. in the royal library at Turin in 1711 by C. M. Pfaff.

Besides the *Institutions* Lactantius wrote several treatises: (1) *De Ira Dei*, addressed to one Donatus and directed against the Epicurean philosophy. (2) *De Opificio Dei sive de Formatione Hominis*, his earliest work, and one which reveals very little Christian influence. He exhorts a former pupil, Demetrianus, not to be led astray by wealth from virtue; and he demonstrates the providence of God from the adaptability and beauty of the human body. (3) A celebrated incendiary treatise, *De Mortibus Persecutorum*, which describes God's judgments on the persecutors of his church from Nero to Diocletian, and has served as a model for numberless writings. *De Mort. Persecut.* is not in the earlier editions of Lactantius; it was discovered and printed by Baluze in 1679. Many critics ascribe it to an unknown Lucius Caecilius; there are certainly serious differences of grammar, style and temper between it and the writings already mentioned. It was probably composed in Nicomedia, *c.* 315. Jerome speaks of Lactantius as a poet, and several poems have been attributed to him:—*De Ave Phoenice* (which Harnack thinks makes use of 1 Clement), *De Passione Domini* and *De Resurrectione* (*Domini*) or *De Pascha ad Felicem Episcopum.* The first of these may belong to Lactantius's heathen days, the second is a product of the Renaissance (*c.* 1500), the third was written by Venantius Fortunatus in the 6th century.

Editions: O. F. Fritzsche in E. G. Gersdorf's *Bibl. patr. eccl.* x., xi. (Leipzig, 1842–1844); Migne, *Patr. Lat.* vi., vii.; S. Brandt and G. Laubmann in the Vienna *Corpus Script. Eccles. Lat.* xix., xxvii. 1 and 2 (1890–93–97). Translation: W. Fletcher in *Ante-Nicene Fathers*, vii. Literature: the German histories of early Christian literature, by A. Harnack, O. Bardenhewer, A. Ebert, A. Ehrhard, G. Kruger's *Early Chr. Lit.* p. 307 and Hauck-Herzog's *Realencyk.* vol. xi., give guides to the copious literature on the subject.

LACTIC ACID (hydroxypropionic acid), $C_3H_6O_3$. Two lactic acids are known, differing from each other in the position occupied by the hydroxyl group in the molecule; they are known respectively as α-hydroxypropionic acid (fermentation or inactive lactic acid), $CH_3 \cdot CH(OH) \cdot CO_2H$, and β-hydroxypropionic acid (hydracrylic acid), (*q.v.*), $CH_2(OH) \cdot CH_2 \cdot CO_2H$. Although on structural grounds there should be only two hydroxypropionic acids, as a matter of fact four lactic acids are known. The third isomer (sarcolactic acid) is found in meat extract (J. v. Liebig), and may be prepared by the action of *Penicillium glaucum* on a solution of ordinary ammonium lactate. It is identical with α-hydroxypropionic acid in almost every respect, except with regard to its physical properties. The fourth isomer, formed by the action of *Bacillus laevo-lacti* on cane-sugar, resembles sarcolactic acid in every respect, except in its action on polarized light (see STEREOISOMERISM).

Fermentation, or *ethylidene lactic acid*, was isolated by K. W. Scheele (*Trans. Stockholm Acad.* 1780) from sour milk (Lat. *lac, lactis*, milk, whence the name). About twenty-four years later Bouillon Lagrange, and independently A. F. de Fourcroy and L. N. Vauquelin, maintained that Scheele's new acid was nothing but impure acetic acid. This notion was combated by J. Berzelius, and finally refuted (in 1832) by J. v. Liebig and E. Mitscherlich, who, by the elementary analyses of lactates, proved the existence of this acid as a distinct compound. It may be prepared by the lactic fermentation of starches, sugars, gums, &c., the sugar being dissolved in water and acidified by a small quantity of tartaric acid and then fermented by the addition of sour milk, with a little putrid cheese. Zinc carbonate is added to the mixture (to neutralize the acid formed), which is kept warm for some days and well stirred. On boiling and filtering the product, zinc lactate crystallizes out of the solution. The acid may also be synthesized by the decomposition of alanine (α-aminopropionic acid) by nitrous acid (K. Strecker, *Ann.*, 1850, 75, p. 27); by the oxidation of propylene glycol (A. Wurtz); by boiling α-chlorpropionic acid with caustic alkalis, or with silver oxide and water; by the reduction of pyruvic acid with sodium amalgam; or from acetaldehyde by the cyanhydrin reaction (J. Wislicenus, *Ann.*, 1863, 128, p. 13)

$$CH_3 \cdot CHO \longrightarrow CH_3 \cdot CH(OH) \cdot CN \longrightarrow CH_3 \cdot CH(OH) \cdot CO_2H.$$

It forms a colourless syrup, of specific gravity 1·2485 (15°/4°), and decomposes on distillation under ordinary atmospheric pressure; but at very low pressures (about 1 mm.) it distils at about 85° C., and then sets to a crystalline solid, which melts at about 18° C. It possesses the properties both of an acid and of an alcohol. When heated with dilute sulphuric acid to 130° C., under pressure, it is resolved into formic acid and acetaldehyde. Chromic acid oxidizes it to acetic acid and carbon dioxide; potassium permanganate oxidizes it to pyruvic acid; nitric acid to oxalic acid, and a mixture of manganese dioxide and sulphuric acid to acetaldehyde and carbon dioxide. Hydrobromic acid converts it into α-brompropionic acid, and hydriodic acid into propionic acid.

Lactide, $O<\begin{matrix}CH(CH_3) \cdot CO\\CO \cdot CH(CH_3)\end{matrix}>O$, a crystalline solid, of melting-point 124° C., is one of the products obtained by the distillation of lactic acid.

LACTONES, the cyclic esters of hydroxy acids, resulting from the internal elimination of water between the hydroxyl and carboxyl groups, this reaction taking place when the hydroxy acid is liberated from its salts by a mineral acid. The α and β-hydroxy acids do not form lactones, the tendency for lactone formation appearing first with the γ-hydroxy acids, thus γ-hydroxybutyric acid, $CH_2OH \cdot CH_2 \cdot CH_2 \cdot CO_2H$, yields γ-butyrolactone, $\overline{CH_2 \cdot CH_2 \cdot CH_2 \cdot CO \cdot O}$. These compounds may also be prepared by the distillation of the γ-halogen fatty acids, or by the action of alkaline carbonates on these acids, or from βγ-or γδ-unsaturated acids by digestion with hydrobromic acid or dilute sulphuric acid. The lactones are mostly liquids which are readily soluble in alcohol, ether and water. On boiling with water, they are partially reconverted into the hydroxy acids. They are easily saponified by the caustic alkalis.

On the behaviour of lactones with ammonia, see H. Meyer, *Monatshefte*, 1899, 20, p. 717; and with phenylhydrazine and hydrazine hydrate, see R. Meyer, *Ber.*, 1893, 26, p. 1273; L. Gattermann, *Ber.*, 1899, 32, p. 1133, E. Fischer, *Ber.*, 1889, 22, p. 1889.

γ-Butyrolactone is a liquid which boils at 206° C. It is miscible with water in all proportions and is volatile in steam. *γ-valerolactone*, $\overline{CH_3 \cdot CH \cdot CH_2 \cdot CH_2 \cdot CO \cdot O}$, is a liquid which boils at 207-208° C. *δ-lactones* are also known, and may be prepared by distilling the δ-chlor acids.

LA CUEVA, JUAN DE (1550?–1609?), Spanish dramatist and poet, was born at Seville, and towards 1579 began writing for the stage. His plays, fourteen in number, were published in 1588, and are the earliest manifestations of the dramatic methods developed by Lope de Vega. Abandoning the Senecan model hitherto universal in Spain, Cueva took for his themes matters of national legend, historic tradition, recent victories and the actualities of contemporary life: this amalgam of epical and realistic elements, and the introduction of a great variety of metres, prepared the way for the Spanish romantic drama of the 17th century. A peculiar interest attaches to *El Infamador*, a play in which the character of Leucino anticipates the classic type of Don Juan. As an initiative force, Cueva is a figure of great historical importance; his epic poem, *La Conquista de Bética* (1603), shows his weakness as an artist. The last work to which his name is attached is the *Ejemplar poético* (1609), and he is believed to have died shortly after its publication.

See the editions of *Saco de Roma* and *El Infamador*, by E. de Ochoa, in the *Tesoro del teatro español* (Paris, 1838), vol. i. pp. 251-285; and of *Ejemplar poético*, by J. J. López de Sedano, in the *Parnaso español*, vol. viii. pp. 1-68; also E. Walberg, "Juan de la Cueva et son Ejemplar poético" in the *Acta Universitatis Lundensis* (Lund, 1904), vol. xxix.; "Poèmes inédits de Juan de la Cueva (Viaje de Sannio,)" edited by F. A. Wulff, in the *Acta Universitatis Lundensis* (Lund, 1886–1887), vol. xxiii.; F. A. Wulff, "De la rimas de Juan de la Cueva, Primera Parte" in the *Homenaje á Menéndez y Pelayo* (Madrid, 1899), vol. ii. pp. 143-148. (J. F.-K.)

LACUNAR, the Latin name in architecture for a panelled or coffered ceiling or soffit. The word is derived from *lacuna*, a cavity or hollow, a blank, hiatus or gap. The panels or coffers of a ceiling are by Vitruvius called *lacunaria*.

LACUZON (O. Fr. *la cuzon*, disturbance), the name given to the Franc-Comtois leader CLAUDE PROST (1607–1681), who was born at Longchaumois (department of Jura) on the 17th of June 1607. He gained his first military experience when the French invaded Burgundy in 1636, harrying the French troops from the castles of Montaigu and St Laurent-la-Roche, and devastating the frontier districts of Bresse and Bugey with fire and sword (1640–1642). In the first invasion of Franche-Comté by Louis XIV. in 1668 Lacuzon was unable to make any effective resistance, but he played an important part in Louis's second invasion. In 1673 he defended Salins for some time; after the capitulation of the town he took refuge in Italy. He died at Milan on the 21st of December 1681.

LACY, FRANZ MORITZ, Count (1725–1801), Austrian field marshal, was born at St Petersburg on the 21st of October 1725. His father, Peter, Count Lacy, was a distinguished Russian soldier, who belonged to an Irish family, and had followed the fortunes of the exiled James II. Franz Moritz was educated in Germany for a military career, and entered the Austrian service. He served in Italy, Bohemia, Silesia and the Netherlands during the War of the Austrian Succession, was twice wounded, and by the end of the war was a lieut.-colonel. At the age of twenty-five he became full colonel and chief of an infantry regiment. In 1756 with the opening of the Seven Years' War he was again on active service, and in the first battle (Lobositz) he distinguished himself so much that he was at once promoted major-general. He received his third wound on this occasion and his fourth at the battle of Prague in 1757. Later in 1757 Lacy bore a conspicuous part in the great victory of Breslau, and at Leuthen, where he received his fifth wound, he covered the retreat of the defeated army. Soon after this began his association with Field-Marshal Daun, the new generalissimo of the empress's forces, and these two commanders, powerfully assisted later by the genius of Loudon, made head against Frederick the Great for the remainder of the war. A general staff was created, and Lacy, a lieutenant field-marshal at thirty-two, was made chief of staff (quartermaster-general) to Daun. That their cautiousness often degenerated into timidity may be admitted—Leuthen and many other bitter defeats had taught the Austrians to respect their great opponent—but they showed at any rate that, having resolved to wear out the enemy by Fabian methods, they were strong enough to persist in their resolve to the end. Thus for some years the life of Lacy, as of Daun and Loudon, is the story of the war against Prussia (see Seven Years' War). After Hochkirch (October 15, 1758) Lacy received the grand cross of the Maria Theresa order. In 1759 both Daun and Lacy fell into disfavour for failing to win victories, and Lacy owed his promotion to Feldzeugmeister only to the fact that Loudon had just received this rank for the brilliant conduct of his detachment at Kunersdorf. His responsibilities told heavily on Lacy in the ensuing campaigns, and his capacity for supreme command was doubted even by Daun, who refused to give him the command when he himself was wounded at the battle of Torgau.

After the peace of Hubertusburg a new sphere of activity was opened, in which Lacy's special gifts had the greatest scope. Maria Theresa having placed her son, the emperor Joseph II., at the head of Austrian military affairs, Lacy was made a field-marshal, and given the task of reforming and administering the army (1766). He framed new regulations for each arm, a new code of military law, a good supply system. As the result of his work the Austrian army was more numerous, far better equipped, and cheaper than it had ever been before. Joseph soon became very intimate with his military adviser, but this did not prevent his mother, after she became estranged from the young emperor, from giving Lacy her full confidence. His activities were not confined to the army. He was in sympathy with Joseph's innovations, and was regarded by Maria Theresa as a prime mover in the scheme for the partition of Poland. But his self-imposed work broke down Lacy's health, and in 1773, in spite of the remonstrances of Maria Theresa and of the emperor, he laid down all his offices and went to southern France. On returning he was still unable to resume office, though as an unofficial adviser in political and military matters he was far from idle. In the brief and uneventful War of the Bavarian Succession, Lacy and Loudon were the chief Austrian commanders against the king of Prussia, and when Joseph II. at Maria Theresa's death, became the sovereign of the Austrian dominions as well as emperor, Lacy remained his most trusted friend. More serious than the War of the Bavarian Succession was the Turkish war which presently broke out. Lacy was now old and worn out, and his tenure of command therein was not marked by any greater measure of success than in the case of the other Austrian generals. His active career was at an end, although he continued his effective interest in the affairs of the state and the army throughout the reign of Joseph's successor, Leopold I. His last years were spent in retirement at his castle of Neuwaldegg near Vienna. He died at Vienna on the 24th of November 1801.

See memoir by A. v. Arneth in *Allgemeine deutsche Biographie* (Leipzig, 1883).

LACY, HARRIETTE DEBORAH (1807–1874), English actress, was born in London, the daughter of a tradesman named Taylor. Her first appearance on the stage was at Bath in 1827 as Julia in *The Rivals*, and she was immediately given leading parts there in both comedy and tragedy. Her first London appearance was in 1830 as Nina, in Dimond's *Carnival of Naples*. Her Rosalind, Aspatia (to Macready's Melantius) in *The Bridal*, and Lady Teazle to the Charles Surface of Walter Lacy (1809–1898)—to whom she was married in 1839—confirmed her position and popularity. She was the original Helen in *The Hunchback* (1832), and also created Nell Gwynne in Jerrold's play of that name, and the heroine in his *Housekeeper*. She was considered the first Ophelia of her day. She retired in 1848.

LACY, MICHAEL ROPHINO (1795–1867), Irish musician, son of a merchant, was born at Bilbao and appeared there in public as a violinist in 1801. He was sent to study in Paris under Kreutzer, and soon began a successful career, being known as "*Le Petit Espagnol.*" He played in London for some years after 1805, and then became an actor, but in 1818 resumed the musical profession, and in 1820 became leader of the ballet at the King's theatre, London. He composed or adapted from other composers a number of operas and an oratorio, *The Israelites in Egypt*. He died in London on the 20th of September 1867.

LACYDES OF CYRENE, Greek philosopher, was head of the Academy at Athens in succession to Arcesilaus about 241 B.C. Though some regard him as the founder of the New Academy, the testimony of antiquity is that he adhered in general to the theory of Arcesilaus, and, therefore, that he belonged to the Middle Academy. He lectured in a garden called the Lacydeum, which was presented to him by Attalus I. of Pergamum, and for twenty-six years maintained the traditions of the Academy. He is said to have written treatises, but nothing survives. Before his death he voluntarily resigned his position to his pupils, Euander and Telecles. Apart from a number of anecdotes distinguished rather for sarcastic humour than for probability, Lacydes exists for us as a man of refined character, a hard worker and an accomplished orator. According to Athenaeus (x. 438) and Diogenes Laërtius (iv. 60) he died from excessive drinking, but the story is discredited by the eulogy of Eusebius (*Praep. Ev.* xiv. 7), that he was in all things moderate.

See Cicero, *Acad.* ii. 6; and Aelian, *V.H.* ii. 41; also articles Academy, Arcesilaus, Carneades.

LADAKH AND BALTISTAN, a province of Kashmir, India. The name Ladak, commonly but less correctly spelt Ladakh, and sometimes Ladag, belongs primarily to the broad valley of the upper Indus in West Tibet, but includes several surrounding districts in political connexion with it; the present limits are between 75° 40′ and 80° 30′ E., and between 32° 25′ and 36° N. It is bounded N. by the Kuenlun range and the slopes of the Karakoram, N.W. and W. by the dependency of Baltistan or Little Tibet, S.W. by Kashmir proper, S. by British Himalayan territory, and E. by the Tibetan provinces of Ngari and Rudok. The whole region lies very high, the valleys of Rupshu in the south-east being 15,000 ft., and the Indus near Leh 11,000 ft., while the average height of the surrounding ranges is 19,000 ft. The proportion of arable and even possible pasture land to barren rock and gravel is very small. Pop., including Baltistan (1901)

165,992, of whom 30,216 in Ladakh proper are Buddhists, whereas the Baltis have adopted the Shiah form of Islam.

The natural features of the country may be best explained by reference to two native terms, under one or other of which every part is included; viz. *changtang*, *i.e.* "northern, or high plain," where the amount of level ground is considerable, and *rong*, *i.e.* "deep valley," where the contrary condition prevails. The former predominates in the east, diminishing gradually westwards. There, although the vast alluvial deposits which once filled the valley to a remarkably uniform height of about 15,000 ft. have left their traces on the mountain sides, they have undergone immense denudation, and their débris now forms secondary deposits, flat bottoms or shelving slopes, the only spots available for cultivation or pasture. These masses of alluvium are often either metamorphosed to a subcrystalline rock still showing the composition of the strata, or simply consolidated by lime.

Grand scenery is exceptional, for the valleys are confined, and from the higher points the view is generally of a confused mass of brown or yellow hills, absolutely barren, and of no great apparent height. The parallelism characteristic of the Himalayan ranges continues here, the direction being north-west and south-east. A central range divides the Indus valley, here 4 to 8 m. wide, from that of its north branch the Shyok, which with its fertile tributary valley of Nubra is again bounded on the north by the Karakoram. This central ridge is mostly syenitic gneiss, and north-east from it are found, successively, Silurian slates, Carboniferous shales and Triassic limestones, the gneiss recurring at the Turkestan frontier. The Indus lies along the line which separates the crystalline rocks from the Eocene sandstones and shales of the lower range of hills on the left bank, the lofty mountains behind them consisting of parallel bands of rocks from Silurian to Cretaceous.

Several lakes in the east districts at about 14,000 ft. have been of much greater extent, and connected with the river systems of the country, but they are now mostly without outlet, saline, and in process of desiccation.

Leh is the capital of Ladakh, and the road to Leh from Srinagar lies up the lovely Sind valley to the sources of the river at the Zoji La Pass (11,300 ft.) in the Zaskar range. This is the range which, skirting the southern edge of the upland plains of Deosai in Baltistan, divides them from the valley of Kashmir, and then continues to Nanga Parbat (26,620 ft.) and beyond that mountain stretches to the north of Swat and Bajour. To the south-east it is an unbroken chain till it merges into the line of snowy peaks seen from Simla and the plains of India—the range which reaches past Chini to the famous peaks of Gangotri, Nandadevi and Nampa. It is the most central and conspicuous range in the Himalaya. The Zoji La, which curves from the head of the Sind valley on to the bleak uplands of Dras (where lies the road to the trough of the Indus and Leh), is, in spite of its altitude, a pass on which little snow lies; but for local accumulations, it would be open all the year round. It affords a typical instance of that cutting-back process by which a river-head may erode a channel through a watershed into the plateau behind, there being no steep fall towards the Indus on the northern side of the range. From the Zoji La the road continues by easy gradients, following the line of the Dras drainage, to the Indus, when it turns up the valley to Leh. From Leh there are many routes into Tibet, the best known being that from the Indus valley to the Tibetan plateau, by the Chang La, to Lake Pangkong and Rudok (14,000 ft.). Rudok occupies a forward position on the western Tibetan border analogous to that of Leh in Kashmir. The chief trade route to Lhasa from Leh, however, follows the line offered by the valleys of the Indus and the Brahmaputra (or Tsanpo), crossing the divide between these rivers north of Lake Manasarowar.

The observatory at Leh is the most elevated observatory in Asia. "The atmosphere of the Indus valley is remarkably clear and transparent, and the heat of the sun is very great. There is generally a difference of more than 60° between the reading of the exposed sun thermometer *in vacuo* and the air temperature in the shade, and this difference has occasionally exceeded 90° . . . . The mean annual temperature at Leh is 40°, that of the coldest months (January and February) only 18° and 19°, but it rises rapidly from February to July, in which month it reaches 62° with a mean diurnal maximum of 80° both in that month and August, and an average difference of 29° or 30° between the early morning and afternoon. The mean highest temperature of the year is 90°, varying between 84° and 93° in the twelve years previous to 1893. On the other hand, in the winter the minimum thermometer falls occasionally below 0°, and in 1878 reached as low as 17° below zero. The extreme range of recorded temperature is therefore not less than 110°. The air is as dry as Quetta, and rather more uniformly so. . . . The amount of rain and snow is insignificant. The average rain (and snow) fall is only 2·7 in. in the year."[1] The winds are generally light, and depend on the local direction of the valleys. At Leh, which stands at the entrance of the valley leading to the Kardang Pass, the most common directions are between south and west in the daytime and summer, and from north-east in the night, especially in the later months of the year. In January and February the air is generally calm, and April and May are the most windy months of the year.

Vegetation is confined to valleys and sheltered spots, where a stunted growth of tamarisk and *Myricaria*, *Hippophae* and *Elaeagnus*, furze, and the roots of *burtsi*, a salsolaceous plant, supply the traveller with much-needed firewood. The trees are the pencil cedar (*Juniperus excelsa*), the poplar and willow (both extensively planted, the latter sometimes wild), apple, mulberry, apricot and walnut. Irrigation is skilfully managed, the principal products being wheat, a beardless variety of barley called *grim*, millet, buckwheat, pease, beans and turnips. Lucerne and prangos (an umbelliferous plant) are used as fodder.

Among domestic animals are the famous shawl goat, two kinds of sheep, of which the larger (*huniya*) is used for carrying burdens, and is a principal source of wealth, the yak and the dso, a valuable hybrid between the yak and common cow. Among wild animals are the kiang or wild ass, ibex, several kinds of wild sheep, antelope (*Pantholops*), marmot, hare and other Tibetan fauna.

The present value of the trade between British India and Tibet passing through Ladakh is inconsiderable. Ladakh, however, is improving in its trade prospects apart from Tibet. It is curious that both Ladakh and Tibet import a considerable amount of treasure, for on the borders of western Tibet and within a radius of 100 or 200 m. of Leh there centres a gold-mining industry which apparently only requires scientific development to render it enormously productive. Here the surface soil has been for many centuries washed for gold by bands of Tibetan miners, who never work deeper than 20 to 50 ft., and whose methods of washing are of the crudest description. They work in winter, chiefly because of the binding power of frost on the friable soil, suffering great hardships and obtaining but a poor return for their labour. But the remoteness of Ladakh and its extreme altitude still continue to bar the way to substantial progress, though its central position naturally entitles it to be a great trade mart.

The adjoining territory of Baltistan forms the west extremity of Tibet, whose natural limits here are the Indus from its abrupt southward bend in 74° 45′ E., and the mountains to the north and west, separating a comparatively peaceful Tibetan population from the fiercer Aryan tribes beyond. Mahommedan writers about the 16th century speak of Baltistan as "Little Tibet," and of Ladakh as "Great Tibet," thus ignoring the really Great Tibet altogether. The Balti call Gilgit "a Tibet," and Dr Leitner says that the Chilasi call themselves Bot or Tibetans; but, although these districts may have been overrun by the Tibetans, or have received rulers of that race, the ethnological frontier coincides with the geographical one given. Baltistan is a mass of lofty mountains, the prevailing formation being gneiss. In the north is the Baltoro glacier, the largest out of the arctic regions, 35 m. long, contained between two ridges whose highest peaks to the south are 25,000 and to the north 28,265 ft. The Indus, as in Lower Ladakh, runs in a narrow gorge, widening for nearly 20 m. after receiving the Shyok. The capital, Skardu, a scattered collection of houses, stands here, perched on a rock 7250 ft. above the sea. The house roofs are flat, occupied only in part by a second story, the remaining space being devoted to drying apricots, the chief staple of the main valley, which supports little cultivation. But the rapid slope westwards is seen generally in the vegetation. Birch, plane, spruce and *Pinus excelsa* appear; the fruits are finer, including pomegranate, pear, peach, vine and melon, and where irrigation is available, as in the North Shigar, and at the deltas of the tributary valleys, the crops are more luxuriant and varied.

History.—The earliest notice of Ladakh is by the Chinese pilgrim Fa-hien, A.D. 400, who, travelling in search of a purer faith, found Buddhism flourishing there, the only novelty to him being the prayer-cylinder, the efficacy of which he declares is incredible. Ladakh formed part of the Tibetan empire until its disruption in the 10th century, and since then has continued ecclesiastically subject, and sometimes tributary, to Lhasa. Its inaccessibility saved it from any Mussulman invasion until 1531, when Sultan Said of Kashgar marched an army across the Karakoram, one division fighting its way into Kashmir and wintering there. Next year they invaded eastern Tibet, where nearly all perished from the effects of the climate.

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[1] H. F. Blandford, *Climate and Weather of India* (London, 1889).

Early in the 17th century Ladakh was invaded by its Mahommedan neighbours of Baltistan, who plundered and destroyed the temples and monasteries; and again, in 1685–1688, by the Sokpa, who were expelled only by the aid of the lieutenant of Aurangzeb in Kashmir, Ladakh thereafter becoming tributary. The gyalpo or king then made a nominal profession of Islam, and allowed a mosque to be founded at Leh, and the Kashmiris have ever since addressed his successors by a Mahommedan title. When the Sikhs took Kashmir, Ladakh, dreading their approach, offered allegiance to Great Britain. It was, however, conquered and annexed in 1834–1841 by Gulab Singh of Jammu—the unwarlike Ladakhis, even with nature fighting on their side, and against indifferent generalship, being no match for the Dogra troops. These next turned their arms successfully against the Baltis (who in the 18th century were subject to the Mogul), and were then tempted to revive the claims of Ladakh to the Chinese provinces of Rudok and Ngari. This, however, brought down an army from Lhasa, and after a three days' fight the Indian force was almost annihilated—chiefly indeed by frostbite and other sufferings, for the battle was fought in mid-winter, 15,000 ft. above the sea. The Chinese then marched on Leh, but were soon driven out again, and peace was finally made on the basis of the old frontier. The widespread prestige of China is illustrated by the fact that tribute, though disguised as a present, is paid to her, for Ladakh, by the maharaja of Kashmir.

The principal works to be consulted are F. Drew, *The Jummoo and Kashmir Territories*; Cunningham, *Ladak*; Major J. Biddulph, *The Tribes of the Hindoo Koosh*; Ramsay, *Western Tibet*; Godwin-Austen, "The Mountain Systems of the Himalaya," vol. vi., *Proc. R.G.S.* (1884); W. Lawrence, *The Valley of Kashmir* (1895); H. F. Blandford, *The Climate and Weather of India* (1889). (T. H. H.*)

LADD, GEORGE TRUMBULL (1842–), American philosopher, was born in Painesville, Lake county, Ohio, on the 19th of January 1842. He graduated at Western Reserve College in 1864 and at Andover Theological Seminary in 1869; preached in Edinburg, Ohio, in 1869–1871, and in the Spring Street Congregational Church of Milwaukee in 1871–1879; and was professor of philosophy at Bowdoin College in 1879–1881, and Clark professor of metaphysics and moral philosophy at Yale from 1881 till 1901, when he took charge of the graduate department of philosophy and psychology; he became professor emeritus in 1905. In 1879–1882 he lectured on theology at Andover Theological Seminary, and in 1883 at Harvard, where in 1895–1896 he conducted a graduate seminary in ethics. He lectured in Japan in 1892, 1899 (when he also visited the universities of India) and 1906–1907. He was much influenced by Lotze, whose *Outlines of Philosophy* he translated (6 vols., 1877), and was one of the first to introduce (1879) the study of experimental psychology into America, the Yale psychological laboratory being founded by him.

PUBLICATIONS.—*The Principles of Church Polity* (1882); *The Doctrine of Sacred Scripture* (1884); *What is the Bible?* (1888); *Essays on the Higher Education* (1899), defending the "old" (Yale) system against the Harvard or "new" education, as praised by George H. Palmer; *Elements of Physiological Psychology* (1889, rewritten as *Outlines of Physiological Psychology*, in 1890); *Primer of Psychology* (1894); *Psychology, Descriptive and Explanatory* (1894); and *Outlines of Descriptive Psychology* (1898); in a "system of philosophy," *Philosophy of the Mind* (1891); *Philosophy of Knowledge* (1897); *A Theory of Reality* (1899); *Philosophy of Conduct* (1902); and *Philosophy of Religion* (2 vols., 1905); *In Korea with Marquis Ito* (1908); and *Knowledge, Life and Reality* (1909).

LADDER, (O. Eng. *hlaeder*; of Teutonic origin, cf. Dutch *leer*, Ger. *Leiter*; the ultimate origin is in the root seen in "lean," Gr. *κλῖμαξ*), a set of steps or "rungs" between two supports to enable one to get up and down; usually made of wood and sometimes of metal or rope. Ladders are generally movable, and differ from a staircase also in having only treads and no "risers." The term "Jacob's ladder," taken from the dream of Jacob in the Bible, is applied to a rope ladder with wooden steps used at sea to go aloft, and to a common garden plant of the genus *Polemonium* on account of the ladder-like formation of the leaves. The flower known in England as Solomon's seal is in some countries called the "ladder of heaven."

LADING (from "to lade," O. Eng. *hladan*, to put cargo on board; cf. "load"), **BILL OF,** the document given as receipt by the master of a merchant vessel to the consignor of goods, as a guarantee for their safe delivery to the consignee. (See AFFREIGHTMENT.)

LADISLAUS [I.], Saint (1040–1095), king of Hungary, the son of Béla I., king of Hungary, and the Polish princess Richeza, was born in Poland, whither his father had sought refuge, but was recalled by his elder brother Andrew I. to Hungary (1047) and brought up there. He succeeded to the throne on the death of his uncle Geza in 1077, as the eldest member of the royal family, and speedily won for himself a reputation scarcely inferior to that of Stephen I., by nationalizing Christianity and laying the foundations of Hungary's political greatness. Instinctively recognizing that Germany was the natural enemy of the Magyars, Ladislaus formed a close alliance with the pope and all the other enemies of the emperor Henry IV., including the anti-emperor Rudolph of Swabia and his chief supporter Welf, duke of Bavaria, whose daughter Adelaide he married. She bore him one son and three daughters, one of whom, Piriska, married the Byzantine emperor John Comnenus. The collapse of the German emperor in his struggle with the pope left Ladislaus free to extend his dominions towards the south, and colonize and Christianize the wildernesses of Transylvania and the lower Danube. Hungary was still semi-savage, and her native barbarians were being perpetually recruited from the hordes of Pechenegs, Kumanians and other races which swept over her during the 11th century. Ladislaus himself had fought valiantly in his youth against the Pechenegs, and to defend the land against the Kumanians, who now occupied Moldavia and Wallachia as far as the Alt, he built the fortresses of Turnu-Severin and Gyula Fehérvár. He also planted in Transylvania the Szeklers, the supposed remnant of the ancient Magyars from beyond the Dnieper, and founded the bishoprics of Nagy-Várad, or Gross-Wardein, and of Agram, as fresh foci of Catholicism in south Hungary and the hitherto uncultivated districts between the Drave and the Save. He subsequently conquered Croatia, though here his authority was questioned by the pope, the Venetian republic and the Greek emperor. Ladislaus died suddenly in 1095 when about to take part in the first Crusade. No other Hungarian king was so generally beloved. The whole nation mourned for him for three years, and regarded him as a saint long before his canonization. A whole cycle of legends is associated with his name.

See J. Babik, *Life of St Ladislaus* (Hung.) (Eger, 1892); György Pray, *Dissertatio de St Ladislao* (Pressburg, 1774); Antál Gánóczy, *Diss. hist. crit. de St Ladislao* (Vienna, 1775). (R. N. B.)

LADISLAUS IV., The Kumanian (1262–1290), king of Hungary, was the son of Stephen V., whom he succeeded in 1272. From his tenth year, when he was kidnapped from his father's court by the rebellious vassals, till his assassination eighteen years later, his whole life, with one bright interval of military glory was unrelieved tragedy. His minority, 1272–1277, was an alternation of palace revolutions and civil wars, in the course of which his brave Kumanian mother Elizabeth barely contrived to keep the upper hand. In this terrible school Ladislaus matured precociously. At fifteen he was a man, resolute, spirited, enterprising, with the germs of many talents and virtues, but rough, reckless and very imperfectly educated. He was married betimes to Elizabeth of Anjou, who had been brought up at the Hungarian court. The marriage was a purely political one, arranged by his father and a section of the Hungarian magnates to counterpoise hostile German and Czech influences. During the earlier part of his reign, Ladislaus obsequiously followed the direction of the Neapolitan court in foreign affairs. In Hungary itself a large party was in favour of the Germans, but the civil wars which raged between the two factions from 1276 to 1278 did not prevent Ladislaus, at the head of 20,000 Magyars and Kumanians, from co-operating with Rudolph of Habsburg in the great battle of Durnkrüt (August 26th, 1278), which destroyed, once for all, the empire of the Přemyslidae. A month later a papal legate arrived in Hungary to inquire into the conduct of the king, who was accused by his neighbours, and many of his own subjects, of adopting the ways of his Kumanian kinsfolk and thereby undermining Christianity. Ladislaus was not really a pagan, or he would not have devoted his share of the spoil of Durnkrüt to the building of the Franciscan church at Pressburg, nor would he have venerated as he did his aunt St Margaret. Political enmity was largely responsible for the movement against him, yet the result of a very careful investigation (1279–1281) by Philip, bishop of Fermo, more than justified many of the accusations brought against Ladislaus. He clearly preferred the society of the semi-heathen Kumanians to that of the Christians; wore, and made his court wear, Kumanian dress; surrounded himself with Kumanian concubines, and neglected and ill-used his ill-favoured Neapolitan consort. He was finally compelled to take up arms against his Kumanian friends, whom he routed at Hodmézö (May 1282) with fearful loss; but, previously to this, he had arrested the legate, whom he subsequently attempted to starve into submission, and his conduct generally was regarded as so unsatisfactory that, after repeated warnings, the Holy See resolved to supersede him by his Angevin kinsfolk, whom he had also alienated, and on the 8th of August 1288 Pope Nicholas IV. proclaimed a crusade against him. For the next two years all Hungary was convulsed by a horrible civil war, during which the unhappy young king, who fought for his heritage to the last with desperate valour, was driven from one end of his kingdom to the other like a hunted beast. On the 25th of December 1289 he issued a manifesto to the lesser gentry, a large portion of whom sided with him, urging them to continue the struggle against the magnates and their foreign supporters; but on the 10th of July 1290 he was murdered in his camp at Korosszeg by the Kumanians, who never forgave him for deserting them.

See Karoly Szabó, *Ladislaus the Cumanian* (Hung.), (Budapest, 1886); and Acsády, *History of the Hungarian Realm*, i. 2 (Budapest, 1903). The latter is, however, too favourable to Ladislaus.
(R. N. B.)

LADISLAUS V. (1440–1457), king of Hungary and Bohemia, the only son of Albert, king of Hungary, and Elizabeth, daughter of the emperor Sigismund, was born at Komárom on the 22nd of February 1440, four months after his father's death, and was hence called Ladislaus Posthumus. The estates of Hungary had already elected Wladislaus III. of Poland their king, but Ladislaus's mother caused the holy crown to be stolen from its guardians at Visegrad, and compelled the primate to crown the infant king at Székesfejérvár on the 15th of May 1440; whereupon, for safety's sake, she placed the child beneath the guardianship of his uncle the emperor Frederick III. On the death of Wladislaus III. (Nov. 10th, 1444), Ladislaus V. was elected king by the Hungarian estates, though not without considerable opposition, and a deputation was sent to Vienna to induce the emperor to surrender the child and the holy crown; but it was not till 1452 that Frederick was compelled to relinquish both. The child was then transferred to the pernicious guardianship of his maternal grandfather Ulrich Cillei, who corrupted him soul and body and inspired him with a jealous hatred of the Hunyadis. On the 28th of October 1453 he was crowned king of Bohemia, and henceforth spent most of his time at Prague and Vienna. He remained supinely indifferent to the Turkish peril; at the instigation of Cillei did his best to hinder the defensive preparations of the great Hunyadi, and fled from the country on the tidings of the siege of Belgrade. On the death of Hunyadi he made Cillei governor of Hungary at the diet of Futtak (October 1456), and when that traitor paid with his life for his murderous attempt on Laszló Hunyadi at Belgrade, Ladislaus procured the decapitation of young Hunyadi (16th of March 1457), after a mock trial which raised such a storm in Hungary that the king fled to Prague, where he died suddenly (Nov. 23rd, 1457), while making preparations for his marriage with Magdalena, daughter of Charles VII. of France. He is supposed to have been poisoned by his political opponents in Bohemia.

See F. Palacky, *Zeugenverhör über den Tod König Ladislaus von Ungarn u. Böhmen* (Prague, 1856); Ignacz Acsády, *History of the Hungarian State* (Hung.), vol. i. (Budapest, 1903).

LA DIXMERIE, NICOLAS BRICAIRE DE (*c.* 1730–1791), French man of letters, was born at Lamothe (Haute-Marne). While still young he removed to Paris, where the rest of his life was spent in literary activity. He died on the 26th of November 1791. His numerous works include *Contes philosophiques et moraux* (1765), *Les Deux Âges du goût et du génie sous Louis XIV. et sous Louis XV.* (1769), a parallel and contrast, in which the decision is given in favour of the latter; *L'Espagne littéraire* (1774); *Éloge de Voltaire* (1779) and *Éloge de Montaigne* (1781).

LADO ENCLAVE, a region of the upper Nile formerly administered by the Congo Free State, but since 1910 a province of the Anglo-Egyptian Sudan. It has an area of about 15,000 sq. m., and a population estimated at 250,000 and consisting of Bari, Madi, Kuku and other Nilotic Negroes. The enclave is bounded S.E. by the north-west shores of Albert Nyanza—as far south as the port of Mahagi—E. by the western bank of the Nile (Bahr-el-Jebel) to the point where the river is intersected by 5° 30′ N., which parallel forms its northern frontier from the Nile westward to 30° E. This meridian forms the west frontier to 4° N., the frontier thence being the Nile-Congo watershed to the point nearest to Mahagi and from that point direct to Albert Nyanza.

The country is a moderately elevated plateau sloping northward from the higher ground marking the Congo-Nile watershed. The plains are mostly covered with bush, with stretches of forest in the northern districts. Traversing the plateau are two parallel mountainous chains having a general north to south direction. One chain, the Kuku Mountains (average height 2000 ft.), approaches close to the Nile and presents, as seen from the river, several apparently isolated peaks. At other places these mountains form precipices which stretch in a continuous line like a huge wall. From Dufile in 3° 34′ N. to below the Bedden Rapids in 4° 40′ N. the bed of the Nile is much obstructed and the river throughout this reach is unnavigable (see Nile). Below the Bedden Rapids rises the conical hill of Rejaf, and north of that point the Nile valley becomes flat. Ranges of hill, however, are visible farther westwards, and a little north of 5° N. is Jebel Lado, a conspicuous mountain 2500 ft. high and some 12 m. distant from the Nile. It has given its name to the district, being the first hill seen from the Nile in the ascent of some 1000 m. from Khartum. On the river at Rejaf, at Lado, and at Kiro, 28 m. N. of Lado, are government stations and trading establishments. The western chain of hills has loftier peaks than those of Kuku, Jebel Loka being about 3000 ft. high. This western chain forms a secondary watershed separating the basin of the Yei, a large river, some 400 m. in length, which runs almost due north to join the Nile, from the other streams of the enclave, which have an easterly or north-easterly direction and join the Nile, after comparatively short courses.

The northern part of the district was first visited by Europeans in 1841–1842, when the Nile was ascended by an expedition despatched by Mehemet Ali to the foot of the rapids at Bedden. The neighbouring posts of Gondokoro, on the east bank of the Nile, and Lado, soon became stations of the Khartum ivory and slave traders. After the discovery of Albert Nyanza by Sir Samuel Baker in 1864, the whole country was overrun by Arabs, Levantines, Turks and others, whose chief occupation was slave raiding. The region was claimed as part of the Egyptian Sudan, but it was not until the arrival of Sir Samuel Baker at Gondokoro in 1870 as governor of the equatorial provinces, that any effective control of the slave traders was attempted. Baker was succeeded by General C. G. Gordon, who established a separate administration for the Bahr-el-Ghazal. In 1878 Emin Pasha became governor of the Equatorial Province, a term henceforth confined to the region adjoining the main Nile above the Sobat confluence, and the region south of the Bahr-el-Ghazal province. (The whole of the Lado Enclave thus formed part of Emin's old province.) Emin made his headquarters at Lado, whence he was driven in 1885 by the Mahdists. He then removed to Wadelai, a station farther south, but in 1889 the pasha, to whose aid H. M. Stanley had conducted an expedition from the Congo, evacuated the country and with Stanley made his way to the east coast. While the Mahdists remained in possession at Rejaf, Great Britain in virtue of her position in Uganda claimed the upper Nile region as within the British sphere; a claim admitted by Germany in 1890. In February 1894 the union jack was hoisted at Wadelai, while in May of the same year Great Britain granted to Leopold II., as sovereign of the Congo State, a lease of large areas lying west of the upper Nile inclusive of the Bahr-el-Ghazal and Fashoda. Pressed however by France, Leopold II. agreed to occupy only that part of the leased area east of 30° E. and south of 5° 30′ N., and in this manner the actual limits of the Lado Enclave, as it was thereafter called, were fixed. Congo State forces had penetrated to the Nile valley as early as 1891, but it was not until 1897, when on the 17th of February Commandant Chaltin inflicted a decisive defeat on the Mahdists at Rejaf, that their occupation of the Lado Enclave was assured. After the withdrawal of the French from Fashoda, Leopold II. revived (1899) his claim to the whole of the area, leased to him in 1894. In this claim he was unsuccessful, and the lease, by a new agreement made with Great Britain in 1906, was annulled (see AFRICA, § 5). The king however retained the enclave, with the stipulation that six months after the termination of his reign it should be handed over to the Anglo-Sudanese government (see *Treaty Series*, No. 4, 1906).

See *Le Mouvement géographique* (Brussels) *passim*, and especially articles in the 1910 issues.

LADOGA (formerly NEVO), a lake of northern Russia, between 59° 56′ and 61° 46′ N., and 29° 53′ and 32° 50′ E., surrounded by the governments of St Petersburg and Olonets, and of Viborg in Finland. It has the form of a quadrilateral, elongated from N.W. to S.E. Its eastern and southern shores are flat and marshy, the north-western craggy and fringed by numerous small rocky islands, the largest of which are Valamo and Konnevitz, together having an area of 14 sq. m. Ladoga is 7000 sq. m. in area, that is, thirty-one times as large as the Lake of Geneva; but, its depth being less, it contains only nineteen times as much water as the Swiss lake. The greatest depth, 730 ft., is in a trough in the north-western part, the average depth not exceeding 250 to 350 ft. The level of Lake Ladoga is 55 ft. above the Gulf of Finland, but it rises and falls about 7 ft., according to atmospheric conditions, a phenomenon very similar to the *seiches* of the Lake of Geneva being observed in connexion with this.

The western and eastern shores consist of boulder clay, as well as a narrow strip on the southern shore, south of which runs a ridge of crags of Silurian sandstones. The hills of the north-western shore afford a variety of granites and crystalline slates of the Laurentian system, whilst Valamo island is made up of a rock which Russian geologists describe as orthoclastic hypersthenite. The granite and marble of Serdobol, and the sandstone of Putilovo, are much used for buildings at St Petersburg; copper and tin from the Pitkäranta mine are exported.

No fewer than seventy rivers enter Ladoga, pouring into it the waters of numberless smaller lakes which lie at higher levels round it. The Volkhov, which conveys the waters of Lake Ilmen, is the largest; Lake Onega discharges its waters by the Svir; and the Saima system of lakes of eastern Finland contributes the Vuoxen and Taipale rivers; the Syas brings the waters from the smaller lakes and marshes of the Valdai plateau. Ladoga discharges its surplus water by means of the Neva, which flows from its south-western corner into the Gulf of Finland, rolling down its broad channel 104,000 cubic ft. of water per second.

The water of Ladoga is very pure and cold; in May the surface temperature does not exceed 36° Fahr., and even in August it reaches only 50° and 53°, the average yearly temperature of the air at Valamo being 36·8°. The lake begins to freeze in October, but it is only about the end of December that it is frozen in its deeper parts; and it remains ice-bound until the end of March, though broad icefields continue to float in the middle of the lake until broken up by gales. Only a small part of the Ladoga ice is discharged by the Neva; but it is enough to produce in the middle of June a return of cold in the northern capital. The thickness of the ice does not exceed 3 or 4 ft.; but during the alternations of cold and warm weather, with strong gales, in winter, stacks of ice, 70 and 80 ft. high, are raised on the shores and on the icefields. The water is in continuous rotatory motion, being carried along the western shore from north to south, and along the eastern from south to north. The vegetation on the shores is poor; immense forests, which formerly covered them, are now mostly destroyed. But the fauna of the lake is somewhat rich; a species of seal which inhabits its waters, as well as several species of arctic crustaceans, recall its former connexion with the Arctic Ocean. The sweet water *Diatomaceae* which are found in great variety in the ooze of the deepest parts of the lake also have an arctic character.

Fishing is very extensively carried on. Navigation, which is practicable for only one hundred and eighty days in the year, is rather difficult owing to fogs and gales, which are often accompanied, even in April and September, with snow-storms. The prevailing winds blow from N.W. and S.W.; N.E. winds cause the water to rise in the south-western part, sometimes 3 to 5 ft. Steamers ply regularly in two directions from St Petersburg—to the monasteries of Konnevitz and Valamo, and to the mouth of the Svir, whence they go up that river to Lake Onega and Petrozavodsk; and small vessels transport timber, firewood, planks, iron, kaolin, granite, marble, fish, hay and various small wares from the northern shore to Schlüsselburg, and thence to St Petersburg. Navigation on the lake being too dangerous for small craft, canals with an aggregate length of 104 m. were dug in 1718–1731, and others in 1861–1886 having an aggregate length of 101 m. along its southern shore, uniting with the Neva at Schlüsselburg the mouths of the rivers Volkhov, Syas and Svir, all links in the elaborate system of canals which connect the upper Volga with the Gulf of Finland.

The population (35,000) on the shores of the lake is sparse, and the towns—Schlüsselburg (5285 inhabitants in 1897); New Ladoga (4144); Kexholm (1325) and Serdobol—are small. The monasteries of Valamo, founded in 992, on the island of the same name, and Konnevskiy, on Konnevitz island, founded in 1393, are visited every year by many thousands of pilgrims. (P. A. K.; J. T. BE.)

LADY (O. Eng. *hlǽfdige*, Mid. Eng. *láfdi*, *lāvedi*; the first part of the word is *hláf*, loaf, bread, as in the corresponding *hláford*, lord; the second part is usually taken to be from the root *dig-*, to knead, seen also in "dough"; the sense development from bread-kneader, bread-maker, to the ordinary meaning, though not clearly to be traced historically, may be illustrated by that of "lord"), a term of which the main applications are two, (1) as the correlative of "lord" (*q.v.*) in certain of the usages of that word, (2) as the correlative of "gentleman" (*q.v.*). The primary meaning of mistress of a household is, if not obsolete, in present usage only a vulgarism. The special use of the word as a title of the Virgin Mary, usually "Our Lady," represents the Lat. *Domina Nostra*. In Lady Day and Lady Chapel the word is properly a genitive, representing the O. Eng. *hlǽfdigan*. As a title of nobility the uses of "lady" are mainly paralleled by those of "lord." It is thus a less formal alternative to the full title giving the specific rank, of marchioness, countess, viscountess or baroness, whether as the title of the husband's rank by right or courtesy, or as the lady's title in her own right. In the case of the younger sons of a duke or marquess, who by courtesy have lord prefixed to their Christian and family name, the wife is known by the husband's Christian and family name with Lady prefixed, *e.g.* Lady John B.; the daughters of dukes, marquesses and earls are by courtesy Ladies; here that title is prefixed to the Christian and family name of the lady, *e.g.* Lady Mary B., and this is preserved if the lady marry a commoner, *e.g.* Mr and Lady Mary C. "Lady" is also the customary title of the wife of a baronet or knight; the proper title, now only used in legal documents or on sepulchral monuments, is "dame" (*q.v.*); in the latter case the usage is to prefix Dame to the Christian name of the wife followed by the surname of the husband, thus Dame Eleanor B., but in the former, Lady with the surname of the husband only, Sir A. and Lady B. During the 15th and 16th centuries "princesses" or daughters of the blood royal were usually known by their Christian names with "the Lady" prefixed, *e.g.* the Lady Elizabeth.

While "lord" has retained its original application as a title of nobility or rank without extension, an example which has been followed in Spanish usage by "don," "lady" has been extended in meaning to be the feminine correlative of "gentleman" throughout its sense developments, and in this is paralleled by *Dame* in German, *madame* in French, *donna* in Spanish, &c. It is the general word for any woman of a certain social position (see GENTLEMAN).

LADYBANK, a police burgh of Fifeshire, Scotland, 5½ m. S.W. of Cupar by the North British railway, ½ m. from the left bank of the Eden. Pop. (1901) 1340. Besides having a station on the main line to Dundee, it is also connected with Perth and Kinross and is a railway junction of some importance and possesses a locomotive depot. It is an industrial centre, linen weaving, coal mining and malting being the principal industries. KETTLE, a village 1 m. S., has prehistoric barrows and a fort. At COLLESSIE, 2½ m. N. by W., a standing stone, a mound and traces of ancient camps exist, while urns and coins have been found. Between the parishes of Collessie and Monimail the boundary line takes the form of a crescent known as the Bow of Fife. MONIMAIL contains the Mount, the residence of Sir David Lindsay the poet (1490–1555). Its lofty site is now marked by a clump of trees. Here, too, is the Doric pillar, 100 ft. high, raised to the memory of John Hope, 4th earl of Hopetoun. Melville House, the seat of the earls of Leven, lies amidst beautiful woods.

LADYBRAND, a town of the Orange Free State, 80 m. E. of Bloemfontein by rail. Another railway connects it with Natal via Harrismith. Pop. (1904) 3862, of whom 2334 were whites. The town is pleasantly situated at the foot of a flat-topped hill (the Platberg), about 4 m. W. of the Caledon river, which separates the province from Basutoland. Ladybrand is the centre of a rich arable district, has a large wheat market and is also a health resort, the climate, owing to the proximity of the Maluti Mountains, being bracing even during the summer months (November–March). Coal and petroleum are found in the neighbourhood. It is named after the wife of Sir. J. H. Brand, president of the Orange Free State.

LADY-CHAPEL, the chapel dedicated to the Blessed Virgin and attached to churches of large size. Generally the chapel was built eastward of the high altar and formed a projection from the main building, as in Winchester, Salisbury, Exeter, Wells, St Albans, Chichester, Peterborough and Norwich cathedrals,—in the two latter cases now destroyed. The earliest Lady-chapel built was that in the Saxon cathedral of Canterbury; this was transfered in the rebuilding by Archbishop Lanfranc to the west end of the nave, and again shifted in 1450 to the chapel on the east side of the north transept. The Lady-chapel at Ely cathedral is a distinct building attached to the north transept; at Rochester the Lady-chapel is west of the south transept. Probably the largest Lady-chapel was that built by Henry III. in 1220 at Westminster Abbey, which was 30 ft. wide, much in excess of any foreign example, and extended to the end of the site now occupied by Henry VII.'s chapel. Among other notable English examples of Lady-chapels are those at Ottery-St-Mary, Thetford, Bury St Edmund's, Wimborne, Christchurch, Hampshire; in Compton Church, Surrey, and Compton Martin, Somersetshire, and Darenth, Kent, it was built over the chancel. At Croyland Abbey there were two Lady-chapels. Lady-chapels exist in most of the French cathedrals and churches, where they form part of the chevet; in Belgium they were not introduced before the 14th century; in some cases they are of the same size as the other chapels of the chevet, but in others, probably rebuilt at a later period, they became much more important features, and in Italy and Spain during the Renaissance period constitute some of its best examples.

LADY DAY, originally the name for all the days in the church calendar marking any event in the Virgin Mary's life, but now restricted to the feast of the Annunciation, held on the 25th of March in each year. Lady Day was in medieval and later times the beginning of the legal year in England. In 1752 this was altered to the 1st of January, but the 25th of March remains one of the Quarter Days; though in some parts old Lady Day, on the 6th of April, is still the date for rent paying. See ANNUNCIATION.

LADYSMITH, a town of Natal, 189 m. N.W. of Durban by rail, on the left bank of the Klip tributary of the Tugela. Pop. (1904) 5568, of whom 2269 were whites. It lies 3284 ft. above the sea and is encircled by hills, while the Drakensberg are some 30 m. distant to the N.W. Ladysmith is the trading centre of northern Natal, and is the chief railway junction in the province, the main line from the south dividing here. One line crosses Van Reenen's pass into the Orange Free State, the other runs northwards to the Transvaal. There are extensive railway workshops. Among the public buildings are the Anglican church and the town hall. The church contains tablets with the names of 3200 men who perished in the defence and relief of the town in the South African War (see below), while the clock tower of the town hall, partially destroyed by a Boer shell, is kept in its damaged condition.

Ladysmith, founded in 1851, is named after Juana, Lady Smith, wife of Sir Harry Smith, then governor of Cape Colony. It stands near the site of the camp of the Dutch farmers who in 1848 assembled for the purpose of trekking across the Drakensberg. Here they were visited by Sir Harry Smith, who induced the majority of the farmers to remain in Natal. The growth of the town, at first slow, increased with the opening of the railway from Durban in 1886 and the subsequent extension of the line to Johannesburg.

In the first and most critical stage of the South African War of 1899–1902 (see TRANSVAAL) Ladysmith was the centre of the struggle. During the British concentration on the town there were fought the actions of Talana (or Dundee) on the 20th, Elandslaagte on the 21st and Rietfontein on the 24th of October 1899. On the 30th of October the British sustained a serious defeat in the general action of Lombard's Kop or Farquhar's Farm, and Sir George White decided to hold the town, which had been fortified, against investment and siege until he was relieved directly or indirectly by Sir Redvers Buller's advance. The greater portion of Buller's available troops were despatched to Natal in November, with a view to the direct relief of Ladysmith, which meantime the Boers had closely invested. His first attempt was repelled on the 15th of December in the battle of Colenso, his second on the 24th of January 1900 by the successful Boer counterstroke against Spion Kop, and his third was abandoned without serious fighting (Vaalkranz, Feb. 5). But two or three days after Vaalkranz, almost simultaneously with Lord Roberts's advance on Bloemfontein Sir Redvers Buller resumed the offensive in the hills to the east of Colenso, which he gradually cleared of the enemy, and although he was checked after reaching the Tugela below Colenso (Feb. 24) he was finally successful in carrying the Boer positions (Pieter's Hill) on the 27th and relieving Ladysmith, which during these long and anxious months (Nov. 1–Feb. 28) had suffered very severely from want of food, and on one occasion (Caesar's Camp, Jan. 6, 1900) had only with heavy losses and great difficulty repelled a powerful Boer assault. The garrison displayed its unbroken resolution on the last day of the investment by setting on foot a mobile column, composed of all men who were not too enfeebled to march out, in order to harass the Boer retreat. This expedition was however countermanded by Buller.

LAELIUS, the name of a Roman plebeian family, probably settled at Tibur (Tivoli). The chief members were:—

GAIUS LAELIUS, general and statesman, was a friend of the elder Scipio, whom he accompanied on his Spanish campaign (210–206 B.C.). In Scipio's consulship (205), Laelius went with him to Sicily, whence he conducted an expedition to Africa. In 203 he defeated the Massaesylian prince Syphax, who, breaking his alliance with Scipio, had joined the Carthaginians, and at Zama (202) rendered considerable service in command of the cavalry. In 197 he was plebeian aedile and in 196 praetor of Sicily. As consul in 190 he was employed in organizing the recently conquered territory in Cisalpine Gaul. Placentia and Cremona were repeopled, and a new colony founded at Bononia.

He is last heard of in 170 as ambassador to Transalpine Gaul. Though little is known of his personal qualities, his intimacy with Scipio is proof that he must have been a man of some importance. Silius Italicus (*Punica*, xv. 450) describes him as a man of great endowments, an eloquent orator and a brave soldier.

See Index to Livy; Polybius x. 3. 9, 39, xi. 32, xiv. 4. 8, xv. 9. 12, 14; Appian, *Hisp.* 25-29; Cicero, *Philippica*, xi. 7.

His son, Gaius Laelius, is known chiefly as the friend of the younger Scipio, and as one of the speakers in Cicero's *De senectute*, *De amicitia* (or *Laelius*) and *De Republica*. He was surnamed *Sapiens* ("the wise"), either from his scholarly tastes or because, when tribune, he "prudently" withdrew his proposal (151 B.C.) for the relief of the farmers by distributions of land, when he saw that it was likely to bring about disturbances. In the third Punic War (147) he accompanied Scipio to Africa, and distinguished himself at the capture of the Cothon, the military harbour of Carthage. In 145 he carried on operations with moderate success against Viriathus in Spain; in 140 he was elected consul. During the Gracchan period, as a staunch supporter of Scipio and the aristocracy, Laelius became obnoxious to the democrats. He was associated with P. Popillius Laenas in the prosecution of those who had supported Tiberius Gracchus, and in 131 opposed the bill brought forward by C. Papirius Carbo to render legal the election of a tribune to a second year of office. The attempts of his enemies, however, failed to shake his reputation. He was a highly accomplished man and belonged to the so-called "Scipionic circle." He studied philosophy under the Stoics Diogenes Babylonius and Panaetius of Rhodes; he was a poet, and the plays of Terence, by reason of their elegance of diction, were sometimes attributed to him. With Scipio he was mainly instrumental in introducing the study of the Greek language and literature into Rome. He was a gifted orator, though his refined eloquence was perhaps less suited to the forum than to the senate. He delivered speeches *De Collegiis* (145) against the proposal of the tribune C. Licinius Crassus to deprive the priestly colleges of their right of co-optation and to transfer the power of election to the people; *Pro Publicanis* (139), on behalf of the farmers of the revenue; against the proposal of Carbo noticed above; *Pro Se*, a speech in his own defence, delivered in answer to Carbo and Gracchus; funeral orations, amongst them two on his friend Scipio. Much information is given concerning him in Cicero, who compares him to Socrates.

See Index to Cicero; Plutarch, *Tib. Gracchus*, 8; Appian, *Punica*, 126; Horace, *Sat.* ii. 1. 72; Quintilian, *Instit.* xii. 10. 10; Suetonius, *Vita Terentii*; Terence, *Adelphi*, Prol. 15, with the commentators.

LAENAS, the name of a plebeian family in ancient Rome, notorious for cruelty and arrogance. The two most famous of the name[1] are:—

Gaius Popillius Laenas, consul in 172 B.C. He was sent to Greece in 174 to allay the general disaffection, but met with little success. He took part in the war against Perseus, king of Macedonia (Livy xliii. 17, 22). When Antiochus Epiphanes, king of Syria, invaded Egypt, Laenas was sent to arrest his progress. Meeting him near Alexandria, he handed him the decree of the senate, demanding the evacuation of Egypt. Antiochus having asked time for consideration, Laenas drew a circle round him with his staff, and told him he must give an answer before he stepped out of it. Antiochus thereupon submitted (Livy xlv. 12; Polybius xxix. 11; Cicero, *Philippica*, viii. 8; Vell. Pat. i. 10).

Publius Popillius Laenas, son of the preceding. When consul in 132 B.C. he incurred the hatred of the democrats by his harsh measures as head of a special commission appointed to take measures against the accomplices of Tiberius Gracchus. In 123 Gaius Gracchus brought in a bill prohibiting all such commissions, and declared that, in accordance with the old laws of appeal, a magistrate who pronounced sentence of death against a citizen, without the people's assent, should be guilty of high treason. It is not known whether the bill contained a retrospective clause against Laenas, but he left Rome and sentence of banishment from Italy was pronounced against him. After the restoration of the aristocracy the enactments against him were cancelled, and he was recalled (121).

See Cicero, *Brutus*, 25. 34, and *De domo sua*, 31; Vell. Pat. ii. 7; Plutarch, *C. Gracchus*, 4.

LAER (or Laar), **PIETER VAN** (1613–*c.* 1675), Dutch painter, was born at Laaren in Holland. The influence of a long stay in Rome begun at an early age is seen in his landscape and backgrounds, but in his subjects he remained true to the Dutch tradition, choosing generally lively scenes from peasant life, as markets, feasts, bowling scenes, farriers' shops, robbers, hunting scenes and peasants with cattle. From this taste, or from his personal deformity, he was nicknamed Bamboccio by the Italians. On his return to Holland about 1639, he lived chiefly at Amsterdam and Haarlem, in which latter city he died in 1674 or 1675. His pictures are marked by skilful composition and good drawing; he was especially careful in perspective. His colouring, according to Crowe, is "generally of a warm, brownish tone, sometimes very clear, but oftener heavy, and his execution broad and spirited." Certain etched plates are also attributed to him.

LAESTRYGONES, a mythical race of giants and cannibals. According to the *Odyssey* (x. 80) they dwelt in the farthest north, where the nights were so short that the shepherd who was driving out his flock met another driving it in. This feature of the tale contains some hint of the long nightless summer in the Arctic regions, which perhaps reached the Greeks through the merchants who fetched amber from the Baltic coasts. Odysseus in his wanderings arrived at the coast inhabited by the Laestrygones, and escaped with only one ship, the rest being sunk by the giants with masses of rock. Their chief city was Telepylus, founded by a former king Lamus, their ruler at that time being Antiphates. This is a purely fanciful name, but Lamus takes us into a religious world where we can trace the origin of the legend, and observe the god of an older religion becoming the subject of fairy tales (see Lamia) in a later period.

The later Greeks placed the country of the Laestrygones in Sicily, to the south of Aetna, near Leontini; but Horace (*Odes*, iii. 16. 34) and other Latin authors speak of them as living in southern Latium, near Formiae, which was supposed to have been founded by Lamus.

LAETUS, JULIUS POMPONIUS [Giulio Pomponio Leto], (1425–1498), Italian humanist, was born at Salerno. He studied at Rome under Laurentius Valla, whom he succeeded (1457) as professor of eloquence in the Gymnasium Romanum. About this time he founded an academy, the members of which adopted Greek and Latin names, met on the Quirinal to discuss classical questions and celebrated the birthday of Romulus. Its constitution resembled that of an ancient priestly college, and Laetus was styled pontifex maximus. The pope (Paul II.) viewed these proceedings with suspicion, as savouring of paganism, heresy and republicanism. In 1468 twenty of the academicians were arrested during the carnival; Laetus, who had taken refuge in Venice, was sent back to Rome, imprisoned and put to the torture, but refused to plead guilty to the charges of infidelity and immorality. For want of evidence, he was acquitted and allowed to resume his professorial duties; but it was forbidden to utter the name of the academy even in jest. Sixtus IV. permitted the resumption of its meetings, which continued to be held till the sack of Rome (1527) by Constable Bourbon during the papacy of Clement VII. Laetus continued to teach in Rome until his death on the 9th of June 1498. As a teacher, Laetus, who has been called the first head of a philological school, was extraordinarily successful; in his own words, like Socrates and Christ, he expected to live on in the person of his pupils, amongst whom were many of the most famous scholars of the period. His works, written in pure and simple Latin, were published in a collected form (*Opera Pomponii Laeti varia*, 1521). They contain treatises on the Roman magistrates, priests and lawyers, and a compendium of Roman history from the death of the younger Gordian to the time of Justin III. Laetus also wrote commentaries on classical authors, and promoted the publication of the editio princeps of Virgil at Rome in 1469.

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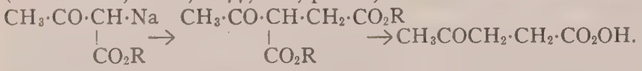
[1] The name is said by Cicero to be derived from *laena*, the sacerdotal cloak carried by Marcus Popillius (consul 359) when he went to the forum to quell a popular rising.

See *The Life of Leto* by Sabellicus (Strassburg, 1510); G. Voigt, *Die Wiederbelebung des klassischen Alterthums*, ii.; F. Gregorovius, *Geschichte der Stadt Rom im Mittelalter*, vii. (1894), p. 576, for an account of the academy; Sandys, *History of Classical Scholarship* (1908), ii. 92.

LAEVIUS (? *c.* 80 B.C.), a Latin poet of whom practically nothing is known. The earliest reference to him is perhaps in Suetonius (*De grammaticis*, 3), though it is not certain that the Laevius Milissus there referred to is the same person. Definite references do not occur before the 2nd century (Fronto, *Ep. ad M. Caes.* i. 3; Aulus Gellius, *Noct. Att.* ii. 24, xii. 10, xix. 9; Apuleius, *De magia*, 30; Porphyrion, *Ad Horat. carm.* iii. 1, 2). Some sixty miscellaneous lines are preserved (see Bährens, *Fragm. poët. rom.* pp. 287-293), from which it is difficult to see how ancient critics could have regarded him as the master of Ovid or Catullus. Gellius and Ausonius state that he composed an *Erotopaegnia*, and in other sources he is credited with *Adonis*, *Alcestis*, *Centauri*, *Helena*, *Ino*, *Protesilaudamia*, *Sirenocirca*, *Phoenix*, which may, however, be only the parts of the *Erotopaegnia*. They were not serious poems, but light and often licentious skits on the heroic myths.

See O. Ribbeck, *Geschichte der römischen Dichtung*, i.; H. de la Ville de Mirmont, *Étude biographique et littéraire sur le poète Laevius* (Paris, 1900), with critical ed. of the fragments, and remarks on vocabulary and syntax; A. Weichert, *Poëtarum latinorum reliquiae* (Leipzig, 1830); M. Schanz, *Geschichte der römischen Litteratur* (2nd ed.), pt. i. p. 163; W. Teuffel, *Hist. of Roman Literature* (Eng. tr.), § 150, 4; a convenient summary in F. Plessis, *La Poésie latine* (1909), pp. 139-142.

LAEVULINIC ACID (β-acetopropionic acid), $C_5H_8O_3$ or $CH_3CO{\cdot}CH_2{\cdot}CH_2{\cdot}CO_2H$, a ketonic acid prepared from laevulose, inulin, starch, &c., by boiling them with dilute hydrochloric or sulphuric acids. It may be synthesized by condensing sodium acetoacetate with monochloracetic ester, the acetosuccinic ester produced being then hydrolysed with dilute hydrochloric acid (M. Conrad, *Ann.*, 1877, 188, p. 222).



$$\underset{\displaystyle CO_2R}{CH_3{\cdot}CO{\cdot}\overset{}{CH}{\cdot}Na} \rightarrow \underset{\displaystyle CO_2R}{CH_3{\cdot}CO{\cdot}CH}{\cdot}CH_2{\cdot}CO_2R \rightarrow CH_3COCH_2{\cdot}CH_2{\cdot}CO_2OH.$$

It may also be prepared by heating the anhydride of γ-methyloxyglutaric acid with concentrated sulphuric acid, and by oxidation of methyl heptenone and of geraniol. It crystallizes in plates, which melt at 32·5-33° C. and boil at 148-149° (15 mm.) (A. Michael, *Jour. prak. Chem.*, 1891 [2], 44, p. 114). It is readily soluble in alcohol, ether and water. The acid, when distilled slowly, is decomposed and yields α and β-angelica lactones. When heated with hydriodic acid and phosphorus, it yields *n*-valeric acid; and with iodine and caustic soda solution it gives iodoform, even in the cold. With hydroxylamine it yields an oxime, which by the action of concentrated sulphuric acid rearranges itself to N-methylsuccinimide $[CH_2{\cdot}CO]_2N{\cdot}CH_3$.

LA FARGE, JOHN (1835–1910), American artist, was born in New York, on the 31st of March 1835, of French parentage. He received instruction in drawing from his grandfather, Binsse de St Victor, a painter of miniatures; studied law and architecture; entered the atelier of Thomas Couture in Paris, where he remained a short time, giving especial attention to the study and copying of old masters at the Louvre; and began by making illustrations to the poets (1859). An intimacy with the artist William M. Hunt had a strong influence on him, the two working together at Newport, Rhode Island. La Farge painted landscape, still life and figure alike in the early sixties. But from 1866 on he was for some time incapacitated for work, and when he regained strength he did some decorative work for Trinity church, Boston, in 1876, and turned his attention to stained glass, becoming president of the Society of Mural Painters. Some of his important commissions include windows for St Thomas's church (1877), St Peter's church, the Paulist church, the Brick church (1882), the churches of the Incarnation (1885) and the Ascension (1887), New York; Trinity church, Buffalo, and the "Battle Window" in Memorial Hall at Harvard; ceilings and windows for the house of Cornelius Vanderbilt, windows for the houses of W. H. Vanderbilt and D. O. Mills, and panels for the house of Whitelaw Reid, New York; panels for the Congressional Library, Washington; Bowdoin College, the Capitol at St Paul, Minn., besides designs for many stained glass windows. He was also a prolific painter in oil and water colour, the latter seen notably in some watercolour sketches, the result of a voyage in the South Seas, shown in 1895. His influence on American art was powerfully exhibited in such men as Augustus St Gaudens, Wilton Lockwood, Francis Lathrop and John Humphreys Johnston. He became president of the Society of American Artists, a member of the National Academy of Design in 1869; an officer of the Legion of Honour of France; and received many medals and decorations. He published *Considerations on Painting* (New York, 1895), *Hokŭsai: A Talk about Hoksŭai* (New York, 1897), and *An Artist's Letters from Japan* (New York, 1897).

See Cecilia Waern, *John La Farge, Artist and Writer* (London, 1896, No. 26 of *The Portfolio*).

LA FARINA, GIUSEPPE (1815–1863), Italian author and politician, was born at Messina. On account of the part he took in the insurrection of 1837 he had to leave Sicily, but returning in 1839 he conducted various newspapers of liberal tendencies, until his efforts were completely interdicted, when he removed to Florence. In 1840 he had published *Messina ed i suoi monumenti*, and after his removal to Florence he brought out *La Germania coi suoi monumenti* (1842), *L' Italia coi suoi monumenti* (1842), *La Svizzera storica ed artistica* (1842–1843), *La China*, 4 vols. (1843–1847), and *Storia d' Italia*, 7 vols. (1846–1854). In 1847 he established at Florence a democratic journal, *L'Alba*, in the interests of Italian freedom and unity, but on the outbreak of the revolution in Sicily in 1848 he returned thither and was elected deputy and member of the committee of war. In August of that year he was appointed minister of public instruction and later of war and marine. After vigorously conducting a campaign against the Bourbon troops, he was forced into exile, and repaired to France in 1849. In 1850 he published his *Storia documentata della Rivoluzione Siciliana del 1848–1849*, and in 1851–1852 his *Storia d' Italia dal 1815 al 1848*, in 6 vols. He returned to Italy in 1854 and settled at Turin, and in 1856 he founded the *Piccolo Corriere d' Italia*, an organ which had great influence in propagating the political sentiments of the Società Nazionale Italiana, of which he ultimately was chosen president. With Daniele Manin (*q.v.*), one of the founders of that society, he advocated the unity of Italy under Victor Emmanuel even before Cavour, with whom at one time he had daily interviews, and organized the emigration of volunteers from all parts of Italy into the Piedmontese army. He also negotiated an interview between Cavour and Garibaldi, with the result that the latter was appointed commander of the Cacciatori delle Alpi in the war of 1859. Later he supported Garibaldi's expedition to Sicily, where he himself went soon after the occupation of Palermo, but he failed to bring about the immediate annexation of the island to Piedmont as Cavour wished. In 1860 he was chosen a member of the first Italian parliament and was subsequently made councillor of state. He died on the 5th of September 1863.

See A. Franchi, *Epistolario di Giuseppe La Farina* (2 vols., 1869) and L. Carpi, *Il Risorgimento Italiano*, vol. i. (Milan, 1884).

LA FAYETTE, GILBERT MOTIER DE (1380–1462), marshal of France, was brought up at the court of Louis II., 3rd duke of Bourbon. He served under Marshal Boucicaut in Italy, and on his return to France after the evacuation of Genoa in 1409 became seneschal of the Bourbonnais. In the English wars he was with John I., 4th duke of Bourbon, at the capture of Soubise in 1413, and of Compiègne in 1415. The duke then made him lieutenant-general in Languedoc and Guienne. He failed to defend Caen and Falaise in the interest of the dauphin (afterwards Charles VII.) against Henry V. in 1417 and 1418, but in the latter year he held Lyons for some time against Jean sans Peur, duke of Burgundy. A series of successes over the English and Burgundians on the Loire was rewarded in 1420 with the government of Dauphiny and the office of marshal of France. La Fayette commanded the Franco-Scottish troops at the battle of Baugé (1422), though he did not, as has been sometimes stated, slay Thomas, duke of Clarence, with his own hand. In 1424 he was taken prisoner by the English at Verneuil, but was released shortly afterwards, and fought with Joan of Arc at Orleans and Patay in 1429. The marshal had become a member of the grand council of Charles VII., and with the exception of a short disgrace about 1430, due to the ill-will of Georges de la Trémouille, he retained the royal favour all his life. He took an active part in the army reform initiated by Charles VII., and the establishment of military posts for the suppression of brigandage. His last campaign was against the English in Normandy in 1449. He died on the 23rd of February 1462. His line was continued by Gilbert IV. de La Fayette, son of his second marriage with Jeanne de Joyeuse.

LA FAYETTE, LOUISE DE (*c.* 1616–1665), was one of the fourteen children of John, comte de La Fayette, and Marguerite de Bourbon-Busset. Louise became maid of honour to Anne of Austria, and Richelieu sought to attract the attention of Louis XIII. to her in the hope that she might counterbalance the influence exercised over him by Marie de Hautefort. The affair did not turn out as the minister wished. The king did indeed make her the confidante of his affairs and of his resentment against the cardinal, but she, far from repeating his confidences to the minister, set herself to encourage the king in his resistance to Richelieu's dominion. She refused, nevertheless, to become Louis's mistress, and after taking leave of the king in Anne of Austria's presence retired to the convent of the Filles de Sainte-Marie in 1637. Here she was repeatedly visited by Louis, with whom she maintained a correspondence. Richelieu intercepted the letters, and by omissions and falsifications succeeded in destroying their mutual confidence. The cessation of their intercourse was regretted by the queen, who had been reconciled with her husband through the influence of Louise. At the time of her death in January 1665 Mlle de La Fayette was superior of a convent of her order which she had founded at Chaillot.

See *Mémoires de Madame de Motteville*; Victor Cousin, *Madame de Hautefort* (Paris, 1868); L'Abbé Sorin, *Louise-Angèle de La Fayette* (Paris, 1893).

LA FAYETTE, MARIE JOSEPH PAUL YVES ROCH GILBERT DU MOTIER, Marquis de (1757–1834), was born at the château of Chavaniac in Auvergne, France, on the 6th of September 1757. His father[1] was killed at Minden in 1759, and his mother and his grandfather died in 1770, and thus at the age of thirteen he was left an orphan with a princely fortune. He married at sixteen Marie Adrienne Françoise de Noailles (d. 1807), daughter of the duc d'Ayen and granddaughter of the duc de Noailles, then one of the most influential families in the kingdom. La Fayette chose to follow the career of his father, and entered the Guards.

La Fayette was nineteen and a captain of dragoons when the English colonies in America proclaimed their independence. "At the first news of this quarrel," he afterwards wrote in his memoirs, "my heart was enrolled in it." The count de Broglie, whom he consulted, discouraged his zeal for the cause of liberty. Finding his purpose unchangeable, however, he presented the young enthusiast to Johann Kalb, who was also seeking service in America, and through Silas Deane, American agent in Paris, an arrangement was concluded, on the 7th of December 1776, by which La Fayette was to enter the American service as major-general. At this moment the news arrived of grave disasters to the American arms. La Fayette's friends again advised him to abandon his purpose. Even the American envoys, Franklin and Arthur Lee, who had superseded Deane, withheld further encouragement and the king himself forbade his leaving. At the instance of the British ambassador at Versailles orders were issued to seize the ship La Fayette was fitting out at Bordeaux, and La Fayette himself was arrested. But the ship was sent from Bordeaux to a neighbouring port in Spain, La Fayette escaped from custody in disguise, and before a second *lettre de cachet* could reach him he was afloat with eleven chosen companions. Though two British cruisers had been sent in pursuit of him, he landed safely near Georgetown, S.C., after a tedious voyage of nearly two months, and hastened to Philadelphia, then the seat of government of the colonies.

When this lad of nineteen, with the command of only what little English he had been able to pick up on his voyage, presented himself to Congress with Deane's authority to demand a commission of the highest rank after the commander-in-chief, his reception was a little chilly. Deane's contracts were so numerous, and for officers of such high rank, that it was impossible for Congress to ratify them without injustice to Americans who had become entitled by their service to promotion. La Fayette appreciated the situation as soon as it was explained to him, and immediately expressed his desire to serve in the American army upon two conditions—that he should receive no pay, and that he should act as a volunteer. These terms were so different from those made by other foreigners, they had been attended with such substantial sacrifices, and they promised such important indirect advantages, that Congress passed a resolution, on the 31st of July 1777, "that his services be accepted, and that, in consideration of his zeal, illustrious family and connexions, he have the rank and commission of major-general of the United States." Next day La Fayette met Washington, whose lifelong friend he became. Congress intended his appointment as purely honorary, and the question of giving him a command was left entirely to Washington's discretion. His first battle was Brandywine (*q.v.*) on the 11th of September 1777, where he showed courage and activity and received a wound. Shortly afterwards he secured what he most desired, the command of a division—the immediate result of a communication from Washington to Congress of November 1, 1777, in which he said:—

> "The marquis de La Fayette is extremely solicitous of having a command equal to his rank. I do not know in what light Congress will view the matter, but it appears to me, from a consideration of his illustrious and important connexions, the attachment which he has manifested for our cause, and the consequences which his return in disgust might produce, that it will be advisable to gratify his wishes, and the more so as several gentlemen from France who came over under some assurances have gone back disappointed in their expectations. His conduct with respect to them stands in a favourable point of view—having interested himself to remove their uneasiness and urged the impropriety of their making any unfavourable representations upon their arrival at home. Besides, he is sensible, discreet in his manners, has made great proficiency in our language, and from the disposition he discovered at the battle of Brandywine possesses a large share of bravery and military ardour."

Of La Fayette's military career in the United States there is not much to be said. Though the commander of a division, he never had many troops in his charge, and whatever military talents he possessed were not of the kind which appeared to conspicuous advantage on the theatre to which his wealth and family influence rather than his soldierly gifts had called him. In the first months of 1778 he commanded troops detailed for the projected expedition against Canada. His retreat from Barren Hill (May 28, 1778) was commended as masterly; and he fought at the battle of Monmouth (June 28,) and received from Congress a formal recognition of his services in the Rhode Island expedition (August 1778).

The treaties of commerce and defensive alliance, signed by the insurgents and France on the 6th of February 1778, were promptly followed by a declaration of war by England against the latter, and La Fayette asked leave to revisit France and to consult his king as to the further direction of his services. This leave was readily granted; it was not difficult for Washington to replace the major-general, but it was impossible to find another equally competent, influential and devoted champion of the American cause near the court of Louis XVI. In fact, he went on a mission rather than a visit. He embarked on the 11th of January 1779, was received with enthusiasm, and was made a colonel in the French cavalry. On the 4th of March following Franklin wrote to the president of Congress: "The marquis de La Fayette. . . is infinitely esteemed and beloved here, and I am persuaded will do everything in his power to merit a continuance of the same affection from America." He won the confidence of Vergennes.

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[1] The family of La Fayette, to the cadet branch of which he belonged, received its name from an estate in Aix, Auvergne, which belonged in the 13th century to the Motier family.

La Fayette was absent from America about six months, and his return was the occasion of a complimentary resolution of Congress. From April until October 1781 he was charged with the defence of Virginia, in which Washington gave him the credit of doing all that was possible with the forces at his disposal; and he showed his zeal by borrowing money on his own account to provide his soldiers with necessaries. The battle of Yorktown, in which La Fayette bore an honourable if not a distinguished part, was the last of the war, and terminated his military career in the United States. He immediately obtained leave to return to France, where it was supposed he might be useful in negotiations for a general peace. He was also occupied in the preparations for a combined French and Spanish expedition against some of the British West India Islands, of which he had been appointed chief of staff, and a formidable fleet assembled at Cadiz, but the armistice signed on the 20th of January 1783 between the belligerents put a stop to the expedition. He had been promoted (1781) to the rank of *maréchal de camp* (major-general) in the French army, and he received every token of regard from his sovereign and his countrymen. He visited the United States again in 1784, and remained some five months as the guest of the nation.

La Fayette did not appear again prominently in public life until 1787, though he did good service to the French Protestants, and became actively interested in plans to abolish slavery. In 1787 he took his seat in the Assembly of Notables. He demanded, and he alone signed the demand, that the king convoke the states-general, thus becoming a leader in the French Revolution. He showed Liberal tendencies both in that assembly and after its dispersal, and in 1788 was deprived, in consequence, of his active command. In 1789 La Fayette was elected to the states-general, and took a prominent part in its proceedings. He was chosen vice-president of the National Assembly, and on the 11th of July 1789 presented a declaration of rights, modelled on Jefferson's Declaration of Independence in 1776. On the 15th of July, the second day of the new régime, La Fayette was chosen by acclamation colonel-general of the new National Guard of Paris. He also proposed the combination of the colours of Paris, red and blue, and the royal white, into the famous tricolour cockade of modern France (July 17). For the succeeding three years, until the end of the constitutional monarchy in 1792, his history is largely the history of France. His life was beset with very great responsibility and perils, for he was ever the minister of humanity and order among a frenzied people who had come to regard order and humanity as phases of treason. He rescued the queen from the hands of the populace on the 5th and 6th of October 1789, saved many humbler victims who had been condemned to death, and he risked his life in many unsuccessful attempts to rescue others. Before this, disgusted with enormities which he was powerless to prevent, he had resigned his commission; but so impossible was it to replace him that he was induced to resume it. In the Constituent Assembly he pleaded for the abolition of arbitrary imprisonment, for religious tolerance, for popular representation, for the establishment of trial by jury, for the gradual emancipation of slaves, for the freedom of the press, for the abolition of titles of nobility, and the suppression of privileged orders. In February 1790 he refused the supreme command of the National Guard of the kingdom. In May he founded the "Society of 1789" which afterwards became the Feuillants Club. He took a prominent part in the celebration of July 14, 1790, the first anniversary of the destruction of the Bastille. After suppressing an *émeute* in April 1791 he again resigned his commission, and was again compelled to retain it. He was the friend of liberty as well as of order, and when Louis XVI. fled to Varennes he issued orders to stop him. Shortly afterwards he was made lieutenant-general in the army. He commanded the troops in the suppression of another *émeute*, on the occasion of the proclamation of the constitution (September 18, 1791), after which, feeling that his task was done, he retired into private life. This did not prevent his friends from proposing him for the mayoralty of Paris in opposition to Pétion.

When, in December 1791, three armies were formed on the western frontier to attack Austria, La Fayette was placed in command of one of them. But events moved faster than La Fayette's moderate and humane republicanism, and seeing that the lives of the king and queen were each day more and more in danger, he definitely opposed himself to the further advance of the Jacobin party, intending eventually to use his army for the restoration of a limited monarchy. On the 19th of August 1792 the Assembly declared him a traitor. He was compelled to take refuge in the neutral territory of Liége, whence as one of the prime movers in the Revolution he was taken and held as a prisoner of state for five years, first in Prussian and afterwards in Austrian prisons, in spite of the intercession of America and the pleadings of his wife. Napoleon, however, though he had a low opinion of his capacities, stipulated in the treaty of Campo Formio (1797) for La Fayette's release. He was not allowed to return to France by the Directory. He returned in 1799; in 1802 voted against the life consulate of Napoleon; and in 1804 he voted against the imperial title. He lived in retirement during the First Empire, but returned to public affairs under the First Restoration and took some part in the political events of the Hundred Days. From 1818 to 1824 he was deputy for the Sarthe, speaking and voting always on the Liberal side, and even becoming a *carbonaro*. He then revisited America (July 1824–September 1825) where he was overwhelmed with popular applause and voted the sum of $200,000 and a township of land. From 1825 to his death he sat in the Chamber of Deputies for Meaux. During the revolution of 1830 he again took command of the National Guard and pursued the same line of conduct, with equal want of success, as in the first revolution. In 1834 he made his last speech—on behalf of Polish political refugees. He died at Paris on the 20th of May 1834. In 1876 in the city of New York a monument was erected to him, and in 1883 another was erected at Puy.

Few men have owed more of their success and usefulness to their family rank than La Fayette, and still fewer have abused it less. He never achieved distinction in the field, and his political career proved him to be incapable of ruling a great national movement; but he had strong convictions which always impelled him to study the interests of humanity, and a pertinacity in maintaining them, which, in all the strange vicissitudes of his eventful life, secured him a very unusual measure of public respect. No citizen of a foreign country has ever had so many and such warm admirers in America, nor does any statesman in France appear to have ever possessed uninterruptedly for so many years so large a measure of popular influence and respect. He had what Jefferson called a "canine appetite" for popularity and fame, but in him the appetite only seemed to make him more anxious to merit the fame which he enjoyed. He was brave to rashness; and he never shrank from danger or responsibility if he saw the way open to spare life or suffering, to protect the defenceless, to sustain the law and preserve order.

His son, GEORGES WASHINGTON MOTIER DE LA FAYETTE (1779–1849), entered the army and was aide-de-camp to General Grouchy through the Austrian, Prussian and Polish (1805–07) campaigns. Napoleon's distrust of his father rendering promotion improbable, Georges de La Fayette retired into private life in 1807 until the Restoration, when he entered the Chamber of Representatives and voted consistently on the Liberal side. He was away from Paris during the revolution of July 1830, but he took an active part in the "campaign of the banquets," which led up to that of 1848. He died in December of the next year. His son, OSCAR THOMAS GILBERT MOTIER DE LA FAYETTE (1815–1881), was educated at the École Polytechnique, and served as an artillery officer in Algeria. He entered the Chamber of Representatives in 1846 and voted, like his father, with the extreme Left. After the revolution of 1848 he received a post in the provisional government, and as a member of the Constituent Assembly he became secretary of the war committee. After the dissolution of the Legislative Assembly in 1851, he retired from public life, but emerged on the establishment of the third republic, becoming a life senator in 1875. His brother Edmond Motier de La Fayette (1818–1890) shared his political opinions. He was one of the secretaries of the Constituent Assembly, and a member of the senate from 1876 to 1888.

See *Mémoires historiques et pièces authentiques sur M. de La Fayette pour servir à l'histoire des révolutions* (Paris, An II., 1793–1794); B. Sarrans, *La Fayette et la Révolution de 1830, histoire des choses et des hommes de Juillet* (Paris, 1834); *Mémoires, correspondances et manuscrits de La Fayette*, published by his family (6 vols., Paris, 1837–1838); Regnault Warin, *Mémoires pour servir à la vie du général La Fayette* (Paris, 1824); A. Bardoux, *La jeunesse de La Fayette* (Paris, 1892); *Les Dernières années de La Fayette* (Paris, 1893); E. Charavaray, *Le Général La Fayette* (Paris, 1895); A. Levasseur, *La Fayette en Amérique 1824* (Paris, 1829); J. Cloquet, *Souvenirs de la vie privée du général La Fayette* (Paris, 1836); Max Büdinger, *La Fayette in Oesterreich* (Vienna, 1898); and M. M. Crawford, *The Wife of Lafayette* (1908); Bayard Tuckerman, *Life of Lafayette* (New York, 1889); Charlemagne Tower, *The Marquis de La Fayette in the American Revolution* (Philadelphia, 1895).

LA FAYETTE, MARIE-MADELEINE PIOCHE DE LA VERGNE, Comtesse de (1634–1692), French novelist, was baptized in Paris, on the 18th of March 1634. Her father, Marc Pioche de la Vergne, commandant of Havre, died when she was sixteen, and her mother seems to have been more occupied with her own than her daughter's interests. Mme de la Vergne married in 1651 the chevalier de Sévigné, and Marie thus became connected with Mme de Sévigné, who was destined to be a lifelong friend. She studied Greek, Latin and Italian, and inspired in one of her tutors, Gilles de Ménage, an enthusiastic admiration which he expressed in verse in three or four languages. Marie married in 1655 François Motier, comte de La Fayette. They lived on the count's estates in Auvergne, according to her own account (in a letter to Ménage) quite happily; but after the birth of her two sons her husband disappeared so effectually that it was long supposed that he died about 1660, though he really lived until 1683. Mme de La Fayette had returned to Paris, and about 1665 contracted an intimacy with the duc de la Rochefoucauld, then engaged on his *Maximes*. The constancy and affection that marked this liaison on both sides justified it in the eyes of society, and when in 1680 La Rochefoucauld died Mme de La Fayette received the sincerest sympathy. Her first novel, *La Princesse de Montpensier*, was published anonymously in 1662; *Zayde* appeared in 1670 under the name of J. R. de Segrais; and in 1678 her masterpiece, *La Princesse de Clèves*, also under the name of Segrais. The history of the modern novel of sentiment begins with the *Princesse de Clèves*. The interminable pages of Mlle de Scudéry with the *Précieuses* and their admirers masquerading as Persians or ancient Romans had already been discredited by the burlesques of Paul Scarron and Antoine Furetière. It remained for Mme de La Fayette to achieve the more difficult task of substituting something more satisfactory than the disconnected episodes of the *roman comique*. This she accomplished in a story offering in its shortness and simplicity a complete contrast to the extravagant and lengthy romances of the time. The interest of the story depends not on incident but on the characters of the personages. They act in a perfectly reasonable way and their motives are analysed with the finest discrimination. No doubt the semi-autobiographical character of the material partially explains Mme de La Fayette's refusal to acknowledge the book. Contemporary critics, even Mme de Sévigné amongst them, found fault with the avowal made by Mme de Clèves to her husband. In answer to these criticisms, which her anonymity prevented her from answering directly, Mme de La Fayette wrote her last novel, the *Comtesse de Tende*.

The character of her work and her history have combined to give an impression of melancholy and sweetness that only represents one side of her character, for a correspondence brought to light comparatively recently showed her as the acute diplomatic agent of Jeanne de Nemours, duchess of Savoy, at the court of Louis XIV. She had from her early days also been intimate with Henrietta of England, duchess of Orleans, under whose immediate direction she wrote her *Histoire de Madame Henriette d'Angleterre*, which only appeared in 1720. She wrote memoirs of the reign of Louis XIV., which, with the exception of two chapters, for the years 1688 and 1689 (published at Amsterdam, 1731), were lost through her son's carelessness. Madame de La Fayette died on the 25th of May 1692.

See Sainte-Beuve, *Portraits de femmes*; the comte d'Haussonville, *Madame de La Fayette* (1891), in the series of *Grands écrivains français*; M. de Lescure's notice prefixed to an edition of the *Princesse de Clèves* (1881); and a critical edition of the historical memoirs by Eugène Asse (1890). See also L. Rea, *Marie Madeleine, comtesse de La Fayette* (1908).

LAFAYETTE, a city and the county-seat of Tippecanoe county, Indiana, U.S.A., situated at the former head of navigation on the Wabash river, about 64 m. N.W. of Indianapolis. Pop. (1900) 18,116, of whom 2266 were foreign-born; (1910 census) 20,081. It is served by the Chicago, Indianapolis & Louisville, the Cleveland, Cincinnati, Chicago & St Louis, the Lake Erie & Western, and the Wabash railways, and by the Terre Haute, Indianapolis & Eastern (electric), and the Fort Wayne & Wabash Valley (electric) railways. The river is not now navigable at this point. Lafayette is in the valley of the Wabash river, which is sunk below the normal level of the plain, the surrounding heights being the walls of the Wabash basin. The city has an excellent system of public schools, a good public library, two hospitals, the Wabash Valley Sanitarium (Seventh Day Adventist), St Anthony's Home for old people and two orphan asylums. It is the seat of Purdue University, a co-educational, technical and agricultural institution, opened in 1874 and named in honour of John Purdue (1802–1876), who gave it $150,000. This university is under state control, and received the proceeds of the Federal agricultural college grant of 1862 and of the second Morrill Act of 1890; in connexion with it there is an agricultural experiment station. It had in 1908–1909 180 instructors, 1900 students, and a library of 25,000 volumes and pamphlets. Just outside the city is the State Soldiers' Home, where provision is also made for the wives and widows of soldiers; in 1908 it contained 553 men and 700 women. The city lies in the heart of a rich agricultural region, and is an important market for grain, produce and horses. Among its manufactures are beer, foundry and machine shop products (the Chicago, Indianapolis & Louisville railway has shops here), straw board, telephone apparatus, paper, wagons, packed meats, canned goods, flour and carpets; the value of the factory product increased from $3,514,276 in 1900 to $4,631,415 in 1905, or 31·8%. The municipality owns its water works.

Lafayette is about 5 m. N.E. of the site of the ancient Wea (Miami) Indian village known as Ouiatanon, where the French established a post about 1720. The French garrison gave way to the English about 1760; the stockade fort was destroyed during the conspiracy of Pontiac, and was never rebuilt. The head-quarters of Tecumseh and his brother, the "Prophet," were established 7 m. N. of Lafayette near the mouth of the Tippecanoe river, and the settlement there was known as the "Prophet's Town." Near this place, and near the site of the present village of Battle Ground (where the Indiana Methodists now have a summer encampment and a camp meeting in August), was fought on the 7th of November 1811 the battle of Tippecanoe, in which the Indians were decisively defeated by Governor William Henry Harrison, the whites losing 188 in killed and wounded and the Indians about an equal number. The battle ground is owned by the state; in 1907 the state legislature and the United States Congress each appropriated $12,500 for a monument, which took the form of a granite shaft 90 ft. high. The first American settlers on the site of Lafayette appeared about 1820, and the town was laid out in 1825, but for many years its growth was slow. The completion of the Wabash and Erie canal marked a new era in its development, and in 1854 Lafayette was incorporated.

LA FERTÉ, the name of a number of localities in France, differentiated by agnomens. La Ferté Imbault (department of Loir-et-Cher) was in the possession of Jacques d'Étampes (1590–1668), marshal of France and ambassador in England, who was known as the marquis of La Ferté Imbault. La Ferté Nabert (the modern La Ferté Saint Aubin, department of Loiret) was acquired in the 16th century by the house of Saint Nectaire (corrupted to Senneterre), and erected into a duchy in the peerage of France (*duché-pairie*) in 1665 for Henri de Saint Nectaire, marshal of France. It was called La Ferté Lowendal after it had been acquired by Marshal Lowendal in 1748.

LA FERTÉ-BERNARD, a town of western France, in the department of Sarthe, on the Huisne, 27 m. N.E. of Le Mans, on the railway from Paris to that town. Pop. (1906) 4358. La Ferté carries on cloth manufacture and flour-milling and has trade in horses and cattle. Its church of Notre Dame has a choir (16th century) with graceful apse-chapels of Renaissance architecture and remarkable windows of the same period; the remainder of the church is in the Flamboyant Gothic style. The town hall occupies the superstructure and flanking towers of a fortified gateway of the 15th century.

La Ferté-Bernard owes its origin and name to a stronghold (*fermeté*) built about the 11th century and afterwards held by the family of Bernard. In 1424 it did not succumb to the English troops till after a four months' siege. It belonged in the 16th century to the family of Guise and supported the League, but was captured by the royal forces in 1590.

LA FERTÉ-MILON, a town of northern France in the department of Aisne on the Ourcq, 47 m. W. by S. of Reims by rail. Pop. (1906) 1563. The town has imposing remains comprising one side flanked by four towers of an unfinished castle built about the beginning of the 15th century by Louis of Orleans, brother of Charles VI. The churches of St Nicholas and Notre-Dame, chiefly of the 16th century, both contain fine old stained glass. Jean Racine, the poet, was born in the town, and a statue by David d'Augers has been erected to him.

LAFFITTE, JACQUES (1767–1844), French banker and politician, was born at Bayonne on the 24th of October 1767, one of the ten children of a carpenter. He became clerk in the banking house of Perregaux in Paris, was made a partner in the business in 1800, and in 1804 succeeded Perregaux as head of the firm. The house of Perregaux, Laffitte et Cie. became one of the greatest in Europe, and Laffitte became regent (1809), then governor (1814) of the Bank of France and president of the Chamber of Commerce (1814). He raised large sums of money for the provisional government in 1814 and for Louis XVIII. during the Hundred Days, and it was with him that Napoleon deposited five million francs in gold before leaving France for the last time. Rather than permit the government to appropriate the money from the Bank he supplied two million from his own pocket for the arrears of the imperial troops after Waterloo. He was returned by the department of the Seine to the Chamber of Deputies in 1816, and took his seat on the Left. He spoke chiefly on financial questions; his known Liberal views did not prevent Louis XVIII. from insisting on his inclusion on the commission on the public finances. In 1818 he saved Paris from a financial crisis by buying a large amount of stock, but next year, in consequence of his heated defence of the liberty of the press and the electoral law of 1867, the governorship of the Bank was taken from him. One of the earliest and most determined of the partisans of a constitutional monarchy under the duke of Orleans, he was deputy for Bayonne in July 1830, when his house in Paris became the headquarters of the revolutionary party. When Charles X., after retracting the hated ordinances, sent the comte d'Argout[1] to Laffitte to negotiate a change of ministry, the banker replied, "It is too late. There is no longer a Charles X.," and it was he who secured the nomination of Louis Philippe as lieutenant-general of the kingdom. On the 3rd of August he became president of the Chamber of Deputies, and on the 9th he received in this capacity Louis Philippe's oath to the new constitution. The clamour of the Paris mob for the death of the imprisoned ministers of Charles X., which in October culminated in riots, induced the more moderate members of the government—including Guizot, the duc de Broglie and Casimir-Périer—to hand over the administration to a ministry which, possessing the confidence of the revolutionary Parisians, should be in a better position to save the ministers from their fury. On the 5th of November, accordingly, Laffitte became minister-president of a government pledged to progress (*mouvement*), holding at the same time the portfolio of finance. The government was torn between the necessity for preserving order and the no less pressing necessity (for the moment) of conciliating the Parisian populace; with the result that it succeeded in doing neither one nor the other. The impeached ministers were, indeed, saved by the courage of the Chamber of Peers and the attitude of the National Guard; but their safety was bought at the price of Laffitte's popularity. His policy of a French intervention in favour of the Italian revolutionists, by which he might have regained his popularity, was thwarted by the diplomatic policy of Louis Philippe. The resignation of Lafayette and Dupont de l'Eure still further undermined the government, which, incapable even of keeping order in the streets of Paris, ended by being discredited with all parties. At length Louis Philippe, anxious to free himself from the hampering control of the agents of his fortune, thought it safe to parade his want of confidence in the man who had made him king. Thereupon, in March 1831, Laffitte resigned, begging pardon of God and man for the part he had played in raising Louis Philippe to the throne. He left office politically and financially a ruined man. His affairs were wound up in 1836, and next year he created a credit bank, which prospered as long as he lived, but failed in 1848. He died in Paris on the 26th of May 1844.

See P. Thureau-Dangin, *La Monarchie de Juillet* (vol. i. 1884).

LAFFITTE, PIERRE (1823–1903), French Positivist, was born on the 21st of February 1823 at Béguey (Gironde). Residing at Paris as a teacher of mathematics, he became a disciple of Comte, who appointed him his literary executor. On the schism of the Positivist body which followed Comte's death, he was recognized as head of the section which accepted the full Comtian doctrine; the other section adhering to Littré, who rejected the religion of humanity as inconsistent with the materialism of Comte's earlier period. From 1853 Laffitte delivered Positivist lectures in the room formerly occupied by Comte in the rue Monsieur le Prince. He published *Les Grands Types de l'humanité* (1875) and *Cours de philosophie première* (1889). In 1893 he was appointed to the new chair founded at the Collège de France for the exposition of the general history of science, and it was largely due to his inspiration that a statue to Comte was erected in the Place de la Sorbonne in 1902. He died on the 4th of January 1903.

LA FLÈCHE, a town of western France, capital of an arrondissement in the department of Sarthe on the Loire, 31 m. S.S.W. of Le Mans by rail. Pop. (1906) town 7800; commune 10,663. The chief interest of the town lies in the Prytanée, a famous school for the sons of officers, originally a college founded for the Jesuits in 1607 by Henry IV. The buildings, including a fine chapel, were erected from 1620 to 1653 and are surrounded by a park. A bronze statue of Henry IV. stands in the market-place. La Flèche is the seat of a sub-prefect and of a tribunal of first instance, and carries on tanning, flour-milling, and the manufacture of paper, starch, wooden shoes and gloves. It is an agricultural market.

The lords of La Flèche became counts of Maine about 1100, but the lordship became separate from the county and passed in the 16th century to the family of Bourbon and thus to Henry IV.

LAFONT, PIERRE CHÉRI (1797–1873), French actor, was born at Bordeaux on the 15th of May 1797. Abandoning his profession as assistant ship's doctor in the navy, he went to Paris to study singing and acting. He had some experience at a small theatre, and was preparing to appear at the Opéra Comique when the director of the Vaudeville offered him an engagement. Here he made his *début* in 1821 in *La Somnambule*, and his good looks and excellent voice soon brought him into public favour. After several years at the Nouveautés and the Vaudeville, on the burning of the latter in 1838 he went to England, and married, at Gretna Green, Jenny Colon, from whom he was soon divorced. On his return to Paris he joined the Variétés, where he acted for fifteen years in such plays as *Le Chevalier de Saint Georges*, *Le Lion empaillé*, *Une dernière conquête*, &c. Another engagement at the Vaudeville followed, and one at the Gaiété, and he ended his brilliant career at the Gymnase in the part of the noble father in such plays as *Les Vieux Garçons* and *Nos bons villageois.* He died in Paris on the 19th of April 1873.

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[1] Apollinaire Antoine Maurice, comte d'Argout (1782–1858), afterwards reconciled to the July monarchy, and a member of the Laffitte, Casimir-Périer and Thiers cabinets.

LA FONTAINE, JEAN DE (1621–1695), French poet, was born at Château Thierry in Champagne, probably on the 8th of July 1621. His father was Charles de La Fontaine, "maître des eaux et forêts"—a kind of deputy-ranger—of the duchy of Château Thierry; his mother was Françoise Pidoux. On both sides his family was of the highest provincial middle class, but was not noble; his father was also fairly wealthy. Jean, the eldest child, was educated at the *collège* (grammar-school) of Reims, and at the end of his school days he entered the Oratory in May 1641, and the seminary of Saint-Magloire in October of the same year; but a very short sojourn proved to him that he had mistaken his vocation. He then apparently studied law, and is said to have been admitted as *avocat*, though there does not seem to be actual proof of this. He was, however, settled in life, or at least might have been so, somewhat early. In 1647 his father resigned his rangership in his favour, and arranged a marriage for him with Marie Héricart, a girl of sixteen, who brought him twenty thousand livres, and expectations. She seems to have been both handsome and intelligent, but the two did not get on well together. There appears to be absolutely no ground for the vague scandal as to her conduct, which was, for the most part long afterwards, raised by gossips or personal enemies of La Fontaine. All that is positively said against her is that she was a negligent housewife and an inveterate novel reader; La Fontaine himself was constantly away from home, was certainly not strict in point of conjugal fidelity, and was so bad a man of business that his affairs became involved in hopeless difficulty, and a *séparation de biens* had to take place in 1658. This was a perfectly amicable transaction for the benefit of the family; by degrees, however, the pair, still without any actual quarrel, ceased to live together, and for the greater part of the last forty years of La Fontaine's life he lived in Paris while his wife dwelt at Château Thierry, which, however, he frequently visited. One son was born to them in 1653, and was educated and taken care of wholly by his mother.

Even in the earlier years of his marriage La Fontaine seems to have been much at Paris, but it was not till about 1656 that he became a regular visitor to the capital. The duties of his office, which were only occasional, were compatible with this non-residence. It was not till he was past thirty that his literary career began. The reading of Malherbe, it is said, first awoke poetical fancies in him, but for some time he attempted nothing but trifles in the fashion of the time—epigrams, ballades, rondeaux, &c. His first serious work was a translation or adaptation of the *Eunuchus* of Terence (1654). At this time the Maecenas of French letters was the Superintendant Fouquet, to whom La Fontaine was introduced by Jacques Jannart, a connexion of his wife's. Few people who paid their court to Fouquet went away empty-handed, and La Fontaine soon received a pension of 1000 livres (1659), on the easy terms of a copy of verses for each quarter's receipt. He began too a medley of prose and poetry, entitled *Le Songe de Vaux*, on Fouquet's famous country house. It was about this time that his wife's property had to be separately secured to her, and he seems by degrees to have had to sell everything of his own; but, as he never lacked powerful and generous patrons, this was of small importance to him. In the same year he wrote a ballad, *Les Rieurs du Beau-Richard*, and this was followed by many small pieces of occasional poetry addressed to various personages from the king downwards. Fouquet soon incurred the royal displeasure, but La Fontaine, like most of his literary protégés, was not unfaithful to him, the well-known elegy *Pleurez, nymphes de Vaux*, being by no means the only proof of his devotion. Indeed it is thought not improbable that a journey to Limoges in 1663 in company with Jannart, and of which we have an account written to his wife, was not wholly spontaneous, as it certainly was not on Jannart's part. Just at this time his affairs did not look promising. His father and himself had assumed the title of esquire, to which they were not strictly entitled, and, some old edicts on the subject having been put in force, an informer procured a sentence against the poet fining him 2000 livres. He found, however, a new protector in the duke and still more in the duchess of Bouillon, his feudal superiors at Château Thierry, and nothing more is heard of the fine. Some of La Fontaine's liveliest verses are addressed to the duchess, Anne Mancini, the youngest of Mazarin's nieces, and it is even probable that the taste of the duke and duchess for Ariosto had something to do with the writing of his first work of real importance, the first book of the *Contes*, which appeared in 1664. He was then forty-three years old, and his previous printed productions had been comparatively trivial, though much of his work was handed about in manuscript long before it was regularly published. It was about this time that the quartette of the Rue du Vieux Colombier, so famous in French literary history, was formed. It consisted of La Fontaine, Racine, Boileau and Molière, the last of whom was almost of the same age as La Fontaine, the other two considerably younger. Chapelle was also a kind of outsider in the coterie. There are many anecdotes, some pretty obviously apocryphal, about these meetings. The most characteristic is perhaps that which asserts that a copy of Chapelain's unlucky *Pucelle* always lay on the table, a certain number of lines of which was the appointed punishment for offences against the company. The coterie furnished under feigned names the personages of La Fontaine's version of the Cupid and Psyche story, which, however, with *Adonis*, was not printed till 1669. Meanwhile the poet continued to find friends. In 1664 he was regularly commissioned and sworn in as gentleman to the duchess dowager of Orleans, and was installed in the Luxembourg. He still retained his rangership, and in 1666 we have something like a reprimand from Colbert suggesting that he should look into some malpractices at Château Thierry. In the same year appeared the second book of the *Contes*, and in 1668 the first six books of the *Fables*, with more of both kinds in 1671. In this latter year a curious instance of the docility with which the poet lent himself to any influence was afforded by his officiating, at the instance of the Port-Royalists, as editor of a volume of sacred poetry dedicated to the prince de Conti. A year afterwards his situation, which had for some time been decidedly flourishing, showed signs of changing very much for the worse. The duchess of Orleans died, and he apparently had to give up his rangership, probably selling it to pay debts. But there was always a providence for La Fontaine. Madame de la Sablière, a woman of great beauty, of considerable intellectual power and of high character, invited him to make his home in her house, where he lived for some twenty years. He seems to have had no trouble whatever about his affairs thenceforward; and could devote himself to his two different lines of poetry, as well as to that of theatrical composition.

In 1682 he was, at more than sixty years of age, recognized as one of the first men of letters of France. Madame de Sévigné, one of the soundest literary critics of the time, and by no means given to praise mere novelties, had spoken of his second collection of *Fables* published in the winter of 1678 as divine; and it is pretty certain that this was the general opinion. It was not unreasonable, therefore, that he should present himself to the Academy, and, though the subjects of his *Contes* were scarcely calculated to propitiate that decorous assembly, while his attachment to Fouquet and to more than one representative of the old Frondeur party made him suspect to Colbert and the king, most of the members were his personal friends. He was first proposed in 1682, but was rejected for Dangeau. The next year Colbert died and La Fontaine was again nominated. Boileau was also a candidate, but the first ballot gave the fabulist sixteen votes against seven only for the critic. The king, whose assent was necessary, not merely for election but for a second ballot in case of the failure of an absolute majority, was ill-pleased, and the election was left pending. Another vacancy occurred, however, some months later, and to this Boileau was elected. The king hastened to approve the choice effusively, adding, "Vous pouvez incessamment recevoir La Fontaine, il a promis d'être sage." His admission was indirectly the cause of the only serious literary quarrel of his life. A dispute took place between the Academy and one of its members, Antoine Furetière, on the subject of the latter's French dictionary, which was decided to be a breach of the Academy's corporate privileges. Furetière, a man of no small ability, bitterly assailed those whom he considered to be his enemies, and among them La Fontaine, whose unlucky *Contes* made him peculiarly vulnerable, his second collection of these tales having been the subject of a police condemnation. The death of the author of the *Roman Bourgeois*, however, put an end to this quarrel. Shortly afterwards La Fontaine had a share in a still more famous affair, the celebrated Ancient-and-Modern squabble in which Boileau and Perrault were the chiefs, and in which La Fontaine (though he had been specially singled out by Perrault for favourable comparison with Aesop and Phaedrus) took the Ancient side. About the same time (1685–1687) he made the acquaintance of the last of his many hosts and protectors, Monsieur and Madame d'Hervart, and fell in love with a certain Madame Ulrich, a lady of some position but of doubtful character. This acquaintance was accompanied by a great familiarity with Vendôme, Chaulieu and the rest of the libertine coterie of the Temple; but, though Madame de la Sablière had long given herself up almost entirely to good works and religious exercises, La Fontaine continued an inmate of her house until her death in 1693. What followed is told in one of the best known of the many stories bearing on his childlike nature. Hervart on hearing of the death, had set out at once to find La Fontaine. He met him in the street in great sorrow, and begged him to make his home at his house. "J'y allais" was La Fontaine's answer. He had already undergone the process of conversion during a severe illness the year before. An energetic young priest, M. Poucet, had brought him, not indeed to understand, but to acknowledge the impropriety of the *Contes*, and it is said that the destruction of a new play of some merit was demanded and submitted to as a proof of repentance. A pleasant story is told of the young duke of Burgundy, Fénelon's pupil, who was then only eleven years old, sending 50 louis to La Fontaine as a present of his own motion. But, though La Fontaine recovered for the time, he was broken by age and infirmity, and his new hosts had to nurse rather than to entertain him, which they did very carefully and kindly. He did a little more work, completing his *Fables* among other things; but he did not survive Madame de la Sablière much more than two years, dying on the 13th of April 1695, at the age of seventy-three. He was buried in the cemetery of the Holy Innocents. His wife survived him nearly fifteen years.

The curious personal character of La Fontaine, like that of some other men of letters, has been enshrined in a kind of legend by literary tradition. At an early age his absence of mind and indifference to business gave a subject to Tallemant des Réaux. His later contemporaries helped to swell the tale, and the 18th century finally accepted it, including the anecdotes of his meeting his son, being told who he was, and remarking, "Ah, yes, I thought I had seen him somewhere!" of his insisting on fighting a duel with a supposed admirer of his wife, and then imploring him to visit at his house just as before; of his going into company with his stockings wrong side out, &c., with, for a contrast, those of his awkwardness and silence, if not positive rudeness, in company. It ought to be remembered, as a comment on the unfavourable description by La Bruyère, that La Fontaine was a special friend and ally of Benserade, La Bruyère's chief literary enemy. But after all deductions much will remain, especially when it is remembered that one of the chief authorities for these anecdotes is Louis Racine, a man who possessed intelligence and moral worth, and who received them from his father, La Fontaine's attached friend for more than thirty years. Perhaps the best worth recording of all these stories is one of the Vieux Colombier quartette, which tells how Molière, while Racine and Boileau were exercising their wits upon "le bonhomme" or "le bon" (by both which titles La Fontaine was familiarly known), remarked to a bystander, "Nos beaux esprits ont beau faire, ils n'effaceront pas le bonhomme." They have not.

The works of La Fontaine, the total bulk of which is considerable, fall no less naturally than traditionally into three divisions, the *Fables*, the *Contes* and the miscellaneous works. Of these the first may be said to be known universally, the second to be known to all lovers of French literature, the third to be with a few exceptions practically forgotten. This distribution of the judgment of posterity is as usual just in the main, but not wholly. There are excellent things in the *Œuvres Diverses*, but their excellence is only occasional, and it is not at the best equal to that of the *Fables* or the *Contes*. It was thought by contemporary judges who were both competent and friendly that La Fontaine attempted too many styles, and there is something in the criticism. His dramatic efforts are especially weak. The best pieces usually published under his name—*Ragotin*, *Le Florentin*, *La Coupe enchantée*, were originally fathered not by him but by Champmeslé, the husband of the famous actress who captivated Racine and Charles de Sévigné. His avowed work was chiefly in the form of opera, a form of no great value at its best. *Psyche* has all the advantages of its charming story and of La Fontaine's style, but it is perhaps principally interesting nowadays because of the framework of personal conversation already alluded to. The mingled prose and verse of the *Songe de Vaux* is not uninteresting, but its best things, such as the description of night—

> "Laissant tomber les fleurs et ne les semant pas,"

which has enchanted French critics, are little more than conceits, though as in this case sometimes very beautiful conceits. The elegies, the epistles, the epigrams, the ballades, contain many things which would be very creditable to a minor poet or a writer of vers de société, but even if they be taken according to the wise rule of modern criticism, each in its kind, and judged simply according to their rank in that kind, they fall far below the merits of the two great collections of verse narratives which have assured La Fontaine's immortality.

Between the actual literary merits of the two there is not much to choose, but the change of manners and the altered standard of literary decency have thrown the *Contes* into the shade. These tales are identical in general character with those which amused Europe from the days of the early *fabliau* writers. Light love, the misfortunes of husbands, the cunning of wives, the breach of their vows by ecclesiastics, constitute the staple of their subject. In some respects La Fontaine is the best of such tale-tellers, while he is certainly the latest who deserves such excuse as may be claimed by a writer who does not choose indecent subjects from a deliberate knowledge that they are considered indecent, and with a deliberate desire to pander to a vicious taste. No one who followed him in the style can claim this excuse; he can, and the way in which contemporaries of stainless virtue such as Madame de Sévigné speak of his work shows that, though the new public opinion was growing up, it was not finally accepted. In the *Contes* La Fontaine for the most part attempts little originality of theme. He takes his stories (varying them, it is true, in detail not a little) from Boccaccio, from Marguerite, from the *Cent Nouvelles Nouvelles*, &c. He applies to them his marvellous power of easy sparkling narration, and his hardly less marvellous faculty of saying more or less outrageous things in the most polite and gentlemanly manner. These *Contes* have indeed certain drawbacks. They are not penetrated by the half-pagan ardour for physical beauty and the delights of sense which animates and excuses the early Italian Renaissance. They have not the subtle mixture of passion and sensuality, of poetry and appetite, which distinguishes the work of Marguerite and of the Pléiade. They are emphatically *contes pour rire*, a genuine expression of the *esprit gaulois* of the fabliau writers and of Rabelais, destitute of the grossness of envelope which had formerly covered that spirit. A comparison of "La Fiancée du roi de Garbe" with its original in Boccaccio (especially if the reader takes M. Émile Montégut's admirable essay as a commentary) will illustrate better than anything else what they have and what they have not. Some writers have pleaded hard for the admission of actual passion of the poetical sort in such pieces as "La Courtisane amoureuse," but as a whole it must be admitted to be absent.

The *Fables*, with hardly less animation and narrative art than the *Contes*, are free from disadvantages (according to modern notions) of subject, and exhibit the versatility and fecundity of the author's talent perhaps even more fully. La Fontaine had many predecessors in the fable and especially in the beast fable. In his first issue, comprising what are now called the first six books, he adhered to the path of these predecessors with some closeness; but in the later collections he allowed himself far more liberty, and it is in these parts that his genius is most fully manifested. The boldness of the politics is as much to be considered as the ingenuity of the moralizing, as the intimate knowledge of human nature displayed in the substance of the narratives, or as the artistic mastery shown in their form. It has sometimes been objected that the view of human character which La Fontaine expresses is unduly dark, and resembles too much that of La Rochefoucauld, for whom the poet certainly had a profound admiration. The discussion of this point would lead us too far here. It may only be said that satire (and La Fontaine is eminently a satirist) necessarily concerns itself with the darker rather than with the lighter shades. Indeed the objection has become pretty nearly obsolete with the obsolescence of what may be called the sentimental-ethical school of criticism. Its last overt expression was made by Lamartine, excellently answered by Sainte-Beuve. Exception has also been taken to the *Fables* on more purely literary, but hardly less purely arbitrary grounds by Lessing. Perhaps the best criticism ever passed upon La Fontaine's *Fables* is that of Silvestre de Sacy, to the effect that they supply three several delights to three several ages: the child rejoices in the freshness and vividness of the story, the eager student of literature in the consummate art with which it is told, the experienced man of the world in the subtle reflections on character and life which it conveys. Nor has any one, with the exception of a few paradoxers like Rousseau and a few sentimentalists like Lamartine, denied that the moral tone of the whole is as fresh and healthy as its literary interest is vivid. The book has therefore naturally become the standard reading book of French both at home and abroad, a position which it shares in verse with the *Télémaque* of Fénelon in prose. It is no small testimony to its merit that not even this use or misuse has interfered with its popularity.

The general literary character of La Fontaine is, with allowance made for the difference of subject, visible equally in the *Fables* and in the *Contes*. Perhaps one of the hardest sayings in French literature for an English student is the dictum of Joubert to the effect that "*Il y a dans La Fontaine une plénitude de poésie qu'on ne trouve nulle part dans les autres auteurs français.*" The difficulty arises from the ambiguity of the terms. For inventiveness of fancy and for diligent observation of the rules of art La Fontaine deserves, if not the first, almost the first place among French poets. In his hands the oldest story becomes novel, the most hackneyed moral piquant, the most commonplace details fresh and appropriate. As to the second point there has not been such unanimous agreement. It used to be considered that La Fontaine's ceaseless diversity of metre, his archaisms, his licences in rhyme and orthography, were merely ingenious devices for the sake of easy writing, intended to evade the trammels of the stately couplet and *rimes difficiles* enjoined by Boileau. Lamartine in the attack already mentioned affects contempt of the "vers boiteux, disloqués, inégaux, sans symmétrie ni dans l'oreille ni sur la page." This opinion may be said to have been finally exploded by the most accurate metrical critic and one of the most skilful metrical practitioners that France has ever had, Théodore de Banville; and it is only surprising that it should ever have been entertained by any professional maker of verse. La Fontaine's irregularities are strictly regulated, his cadences carefully arranged, and the whole effect may be said to be (though, of course, in a light and tripping measure instead of a stately one) similar to that of the stanzas of the English pindaric ode in the hands of Dryden or Collins. There is therefore nothing against La Fontaine on the score of invention and nothing on the score of art. But something more, at least according to English standards, is wanted to make up a "plenitude of poesy," and this something more La Fontaine seldom or never exhibits. In words used by Joubert himself elsewhere, he never "transports." The faculty of transporting is possessed and used in very different manners by different poets. In some it takes the form of passion, in some of half mystical enthusiasm for nature, in some of commanding eloquence, in some of moral fervour. La Fontaine has none of these things: he is always amusing, always sensible, always clever, sometimes even affecting, but at the same time always more or less prosaic, were it not for his admirable versification. He is not a great poet, perhaps not even a great humorist; but he is the most admirable teller of light tales in verse that has ever existed in any time or country; and he has established in his verse-tale a model which is never likely to be surpassed.

La Fontaine did not during his life issue any complete edition of his works, nor even of the two greatest and most important divisions of them. The most remarkable of his separate publications have already been noticed. Others were the *Poëme de la captivité de St Malc* (1673), one of the pieces inspired by the Port-Royalists, the *Poëme du Quinquina* (1692), a piece of task work also, though of a very different kind, and a number of pieces published either in small pamphlets or with the works of other men. Among the latter may be singled out the pieces published by the poet with the works of his friend Maucroix (1685). The year after his death some posthumous works appeared, and some years after his son's death the scattered poems, letters, &c., with the addition of some unpublished work bought from the family in manuscript, were carefully edited and published as *Œuvres diverses* (1729). During the 18th century two of the most magnificent illustrated editions ever published of any poet reproduced the two chief works of La Fontaine. The *Fables* were illustrated by Oudry (1755–1759), the *Contes* by Eisen (1762). This latter under the title of "Edition des Fermiers-Généraux" fetches a high price. During the first thirty years of the 19th century Walckenaer, a great student of French 17th-century classics, published for the house of Didot three successive editions of La Fontaine, the last (1826–1827) being perhaps entitled to the rank of the standard edition, as his *Histoire de la vie et des ouvrages de La Fontaine* is the standard biography and bibliography. The later editions of M. Marty-Laveaux in the *Bibliothèque elzévirienne*, A. Pauly in the *Collection des classiques françaises* of M. Lemerre and L. Moland in that of M. Garnier supply in different forms all that can be wished. The second is the handsomest, the third, which is complete, perhaps the most generally useful. Editions, selections, translations, &c., of the *Fables*, especially for school use, are innumerable; but an illustrated edition published by the *Librairie des Bibliophiles* (1874) deserves to be mentioned as not unworthy of its 18th-century predecessors. The works of M. Grouchy, *Documents inédits sur La Fontaine* (1893); of G. Lafenestre, *Jean de La Fontaine* (1895); and of Émile Faguet, *Jean de La Fontaine* (1900), should be mentioned. (G. Sa.)

LAFONTAINE, SIR LOUIS HIPPOLYTE, Bart. (1807–1864), Canadian statesman and judge, third son of Antoine Ménard LaFontaine (1772–1813) and Marie-J-Fontaine Bienvenue, was born at Boucherville in the province of Quebec on the 4th of October 1807. LaFontaine was educated at the Collège de Montréal under the direction of the Sulpicians, and was called to the bar of the province of Lower Canada on the 18th of August 1829. He married firstly Adèle, daughter of A. Berthelot of Quebec; and, secondly, Jane, daughter of Charles Morrison, of Berthier, by whom he had two sons. In 1830 he was elected a member of the House of Assembly for the county of Terrebonne, and became an ardent supporter of Louis Joseph Papineau in opposing the administration of the governor-in-chief, which led to the rebellion of 1837. LaFontaine, however, did not approve the violent methods of his leader, and after the hostilities at Saint Denis he presented a petition to Lord Gosford requesting him to summon the assembly and to adopt measures to stem the revolutionary course of events in Lower Canada. The rebellion broke out afresh in the autumn of 1838; the constitution of 1791 was suspended; LaFontaine was imprisoned for a brief period; and Papineau, who favoured annexation by the United States, was in exile. At this crisis in Lower Canada the French Canadians turned to LaFontaine as their leader, and under his direction maintained their opposition to the special council, composed of nominees of the crown. In 1839 Lord Sydenham, the governor-general, offered the solicitor generalship to LaFontaine, which he refused; and after the Union of 1841 LaFontaine was defeated in the county of Terrebonne through the governor's influence. During the next year he obtained a seat in the assembly of the province of Canada, and on the death of Sydenham he was called by Sir Charles Bagot to form an administration with Robert Baldwin. The ministry resigned in November 1843, as a protest against the actions of Lord Metcalfe, who had succeeded Bagot. In 1848 LaFontaine formed a new administration with Baldwin, and remained in office until 1851, when he retired from public life. It was during the ministry of LaFontaine-Baldwin that the Amnesty Bill was passed, which occasioned grave riots in Montreal, personal violence to Lord Elgin and the destruction of the parliament buildings. After the death of Sir James Stuart in 1853 LaFontaine was appointed chief justice of Lower Canada and president of the seigneurial court, which settled the vexed question of land tenure in Canada; and in 1854 he was created a baronet. He died at Montreal on the 26th of February 1864.

LaFontaine was well versed in constitutional history and French law; he reasoned closely and presented his conclusions with directness. He was upright in his conduct, sincerely attached to the traditions of his race, and laboured conscientiously to establish responsible government in Canada. His principal works are: *L'Analyse de l'ordonnance du conseil spécial sur les bureaux d'hypothèques* (Montreal, 1842); *Observations sur les questions seigneuriales* (Montreal, 1854); see *LaFontaine*, by A. DeCelles (Toronto, 1906). (A. G. D.)

LAFOSSE, CHARLES DE (1640–1716), French painter, was born in Paris. He was one of the most noted and least servile pupils of Le Brun, under whose direction he shared in the chief of the great decorative works undertaken in the reign of Louis XIV. Leaving France in 1662, he spent two years in Rome and three in Venice, and the influence of his prolonged studies of Veronese is evident in his "Finding of Moses" (Louvre), and in his "Rape of Proserpine" (Louvre), which he presented to the Royal Academy as his diploma picture in 1673. He was at once named assistant professor, and in 1674 the full responsibilities of the office devolved on him, but his engagements did not prevent his accepting in 1689 the invitation of Lord Montagu to decorate Montagu House. He visited London twice, remaining on the second occasion—together with Rousseau and Monnoyer—more than two years. William III. vainly strove to detain him in England by the proposal that he should decorate Hampton Court, for Le Brun was dead, and Mansart pressed Lafosse to return to Paris to take in hand the cupola of the Invalides. The decorations of Montagu House are destroyed, those of Versailles are restored, and the dome of the Invalides (engraved, Picart and Cochin) is now the only work existing which gives a full measure of his talent. During his latter years Lafosse executed many other important decorations in public buildings and private houses, notably in that of Crozat, under whose roof he died on the 13th of December 1716.

LAGARDE, PAUL ANTON DE (1827–1891), German biblical scholar and orientalist, was born at Berlin on the 2nd of November 1827. His real name was Bötticher, Lagarde being his mother's name. At Berlin (1844–1846) and Halle (1846–1847) he studied theology, philosophy and oriental languages. In 1852 his studies took him to London and Paris. In 1854 he became a teacher at a Berlin public school, but this did not interrupt his biblical studies. He edited the *Didascalia apostolorum syriace* (1854), and other Syriac texts collected in the British Museum and in Paris. In 1866 he received three years' leave of absence to collect fresh materials, and in 1869 succeeded Heinrich Ewald as professor of oriental languages at Göttingen. Like Ewald, Lagarde was an active worker in a variety of subjects and languages; but his chief aim, the elucidation of the Bible, was almost always kept in view. He edited the Aramaic translation (known as the Targum) of the Prophets according to the Codex Reuchlinianus preserved at Carlsruhe, *Prophetae chaldaice* (1872), the *Hagiographa chaldaice* (1874), an Arabic translation of the Gospels, *Die vier Evangelien, arabisch aus der Wiener Handschrift herausgegeben* (1864), a Syriac translation of the Old Testament Apocrypha, *Libri V. T. apocryphi syriace* (1861), a Coptic translation of the Pentateuch, *Der Pentateuch koptisch* (1867), and a part of the Lucianic text of the Septuagint, which he was able to reconstruct from manuscripts for nearly half the Old Testament. He devoted himself ardently to oriental scholarship, and published *Zur Urgeschichte der Armenier* (1854) and *Armenische Studien* (1877). He was also a student of Persian, publishing *Isaias persice* (1883) and *Persische Studien* (1884). He followed up his Coptic studies with *Aegyptiaca* (1883), and published many minor contributions to the study of oriental languages in *Gesammelte Abhandlungen* (1866), *Symmicta* (i. 1877, ii. 1880), *Semitica* (i. 1878, ii. 1879), *Orientalia* (1879–1880) and *Mittheilungen* (1884). Mention should also be made of the valuable *Onomastica sacra* (1870; 2nd ed., 1887). Lagarde also took some part in politics. He belonged to the Prussian Conservative party, and was a violent anti-Semite. The bitterness which he felt appeared in his writings. He died at Göttingen on the 22nd of December 1891.

See the article in Herzog-Hauck, *Realencyklopädie*; and cf. Anna de Lagarde, *Paul de Lagarde* (1894).

LAGASH, or Sirpurla, one of the oldest centres of Sumerian civilization in Babylonia. It is represented by a rather low, long line of ruin mounds, along the dry bed of an ancient canal, some 3 m. E. of the Shatt-el-Haï and a little less than 10 m. N. of the modern Turkish town of Shatra. These ruins were discovered in 1877 by Ernest de Sarzec, at that time French consul at Basra, who was allowed, by the Montefich chief, Nasir Pasha, the first Wali-Pasha, or governor-general, of Basra, to excavate at his pleasure in the territories subject to that official. At the outset on his own account, and later as a representative of the French government, under a Turkish firman, de Sarzec continued excavations at this site, with various intermissions, until his death in 1901, after which the work was continued under the supervision of the Commandant Cros. The principal excavations were made in two larger mounds, one of which proved to be the site of the temple, E-Ninnu, the shrine of the patron god of Lagash, Nin-girsu or Ninib. This temple had been razed and a fortress built upon its ruins, in the Greek or Seleucid period, some of the bricks found bearing the inscription in Aramaic and Greek of a certain Hadad-nadin-akhe, king of a small Babylonian kingdom. It was beneath this fortress that the numerous statues of Gudea were found, which constitute the gem of the Babylonian collections at the Louvre. These had been decapitated and otherwise mutilated, and thrown into the foundations of the new fortress. From this stratum came also various fragments of bas reliefs of high artistic excellence. The excavations in the other larger mound resulted in the discovery of the remains of buildings containing objects of all sorts in bronze and stone, dating from the earliest Sumerian period onward, and enabling us to trace the art history of Babylonia to a date some hundreds of years before the time of Gudea. Apparently this mound had been occupied largely by store houses, in which were stored not only grain, figs, &c., but also vessels, weapons, sculptures and every possible object connected with the use and administration of palace and temple. In a small outlying mound de Sarzec discovered the archives of the temple, about 30,000 inscribed clay tablets, containing the business records, and revealing with extraordinary minuteness the administration of an ancient Babylonian temple, the character of its property, the method of farming its lands, herding its flocks, and its commercial and industrial dealings and enterprises; for an ancient Babylonian temple was a great industrial, commercial, agricultural and stock-raising establishment. Unfortunately, before these archives could be removed, the galleries containing them were rifled by the Arabs, and large numbers of the tablets were sold to antiquity dealers, by whom they have been scattered all over Europe and America. From the inscriptions found at Tello, it appears that Lagash was a city of great importance in the Sumerian period, some time probably in the 4th millennium B.C. It was at that time ruled by independent kings, Ur-Nina and his successors, who were engaged in contests with the Elamites on the east and the kings of Kengi and Kish on the north. With the Semitic conquest it lost its independence, its rulers becoming *patesis*, dependent rulers, under Sargon and his successors; but it still remained Sumerian and continued to be a city of much importance, and, above all, a centre of artistic development. Indeed, it was in this period and under the immediately succeeding supremacy of the kings of Ur, Ur-Gur and Dungi, that it reached its highest artistic development. At this period, also, under its *patesis*, Ur-bau and Gudea, Lagash had extensive commercial communications with distant realms. According to his own records, Gudea brought cedars from the Amanus and Lebanon mountains in Syria, diorite or dolorite from eastern Arabia, copper and gold from central and southern Arabia and from Sinai, while his armies, presumably under his over-lord, Ur-Gur, were engaged in battles in Elam on the east. His was especially the era of artistic development. Some of the earlier works of Ur-Nina, En-anna-tum, Entemena and others, before the Semitic conquest, are also extremely interesting, especially the famous stele of the vultures and a great silver vase ornamented with what may be called the coat of arms of Lagash, a lion-headed eagle with wings outspread, grasping a lion in each talon. After the time of Gudea, Lagash seems to have lost its importance; at least we know nothing more about it until the construction of the Seleucid fortress mentioned, when it seems to have become part of the Greek kingdom of Characene. The objects found at Tello are the most valuable art treasures up to this time discovered in Babylonia.

See E. de Sarzec, *Découvertes en Chaldée* (1887 foll.).

(J. P. Pe.)

LAGHMAN, a district of Afghanistan, in the province of Jalalabad, between Jalalabad and Kabul, on the northern side of the Peshawar road, one of the richest and most fertile tracts in Afghanistan. It is the valley of the Kabul river between the Tagao and the Kunar and merges on the north into Kafiristan. The inhabitants, Ghilzais and Tajiks, are supposed to be the cleverest business people in the country. Sugar, cotton and rice are exported to Kabul. The Laghman route between Kabul and India crossing the Kunar river into the Mohmand country is the route followed by Alexander the Great and Baber; but it has now been supplanted by the Khyber.

LAGOON (Fr. *lagune,* Lat. *lacuna,* a pool), a term applied to (1) a sheet of salt or brackish water near the sea, (2) a sheet of fresh water of no great depth or extent, (3) the expanse of smooth water enclosed by an atoll. Sea lagoons are formed only where the shores are low and protected from wave action. Under these conditions a bar may be raised above sea-level or a spit may grow until its end touches the land. The enclosed shallow water is then isolated in a wide stretch, the seaward banks broaden, and the lagoon becomes a permanent area of still shallow water with peculiar faunal features. In the old lake plains of Australia there are occasional wide and shallow depressions where water collects permanently. Large numbers of aquatic birds, black swans, wild duck, teal, migrant spoon-bills or pelicans, resort to these fresh-water lagoons.

LAGOS, the western province of Southern Nigeria, a British colony and protectorate in West Africa. The province consists of three divisions: (1) the coast region, including Lagos Island, being the former colony of Lagos; (2) small native states adjacent to the colony; and (3) the Yoruba country, farther inland. The total area is some 27,000 sq. m., or about the size of Scotland. The province is bounded S. by the Gulf of Guinea, (from 2° 46′ 55″ to 4° 30′ E.); W. by the French colony of Dahomey; N. and E. by other provinces of Nigeria.

Physical Features.—The coast is low, marshy and malarious, and all along the shore the great Atlantic billows cause a dangerous surf. Behind the coast-line stretches a series of lagoons, in which are small islands, that of Lagos having an area of 3¾ sq. m. Beyond the lagoons and mangrove swamps is a broad zone of dense primeval forest—" the bush "—which completely separates the arable lands from the coast lagoons. The water-parting of the streams flowing north to the Niger, and south to the Gulf of Guinea, is the main physical feature. The general level of Yorubaland is under 2000 ft. But towards the east, about the upper course of the river Oshun, the elevation is higher. Southward from the divide the land, which is intersected by the nearly parallel courses of the rivers Ogun, Omi, Oshun, Oni and Oluwa, falls in continuous undulations to the coast, the open cultivated ground gradually giving place to forest tracts, where the most characteristic tree is the oil-palm. Flowering trees, certain kinds of rubber vines, and shrubs are plentiful. In the northern regions the shea-butter tree is found. The fauna resembles that of the other regions of the Guinea coast, but large game is becoming scarce. Leopards, antelopes and monkeys are common, and alligators infest the rivers.

The lagoons, lying between the outer surf-beaten beach and the inner shore line, form a navigable highway of still waters, many miles in extent. They are almost entirely free from rock, though they are often shallow, with numerous mud banks. The most extensive are Lekki in the east, and Ikoradu (Lagos) in the west. At its N.W. extremity the Lagos lagoon receives the Ogun, the largest river in Yorubaland, whose current is strong enough to keep the seaward channel open throughout the year. Hence the importance of the port of Lagos, which lies in smooth water at the northern end of this channel. The outer entrance is obstructed by a dangerous sand bar.

Climate and Health.—The climate is unhealthy, especially for Europeans. The rainfall has not been ascertained in the interior. In the northern districts it is probably considerably less than at Lagos, where it is about 70 in. a year. The variation is, however, very great. In 1901 the rainfall was 112 in., in 1902 but 47, these figures being respectively the highest and lowest recorded in a period of seventeen years. The mean temperature at Lagos is 82·5° F., the range being from 68° to 91°. At certain seasons sudden heavy squalls of wind and rain that last for a few hours are common. The hurricane and typhoon are unknown. The principal diseases are malarial fever, smallpox, rheumatism, peripheral neuritis, dysentery, chest diseases and guinea-worm. Fever not unfrequently assumes the dangerous form known as "black-water fever." The frequency of smallpox is being much diminished outside the larger towns in the interior, in which vaccination is neglected. The absence of plague, yellow fever, cholera, typhoid fever and scarlatina is noteworthy. A mild form of yaws is endemic.

Inhabitants.—The population is estimated at 1,750,000. The Yoruba people, a Negro race divided into many tribes, form the majority of the inhabitants. Notwithstanding their political feuds and their proved capacity as fighting men, the Yoruba are distinguished above all the surrounding races for their generally peaceful disposition, industry, friendliness, courtesy and hospitality towards strangers. They are also intensely patriotic. Physically they resemble closely their Ewe and Dahomey neighbours, but are of somewhat lighter complexion, taller and of less pronounced Negro features. They exhibit high administrative ability, possess a marked capacity for trade, and have made remarkable progress in the industrial arts. The different tribes are distinguished by tattoo markings, usually some simple pattern of two or more parallel lines, disposed horizontally or vertically on the cheeks or other parts of the face. The feeling for religion is deeply implanted among the Yoruba. The majority are pagans, or dominated by pagan beliefs, but Islam has made great progress since the cessation of the Fula wars, while Protestant and Roman Catholic missions have been at work since 1848 at Abeokuta, Oyo, Ibadan and other large towns. Samuel Crowther, the first Negro bishop in the Anglican church, who was distinguished as an explorer, geographer and linguist, was a native of Yorubaland, rescued (1822) by the English from slavery and educated at Sierra Leone (see YORUBAS).

Towns.—Besides Lagos (*q.v.*), pop. about 50,000, the chief towns in the colony proper are Epe, pop. 16,000, on the northern side of the lagoons, and Badagry (a notorious place during the slave-trade period) and Lekki, both on the coast. Inland the chief towns are Abeokuta (*q.v.*), pop. about 60,000, and Ibadan (*q.v.*), pop. estimated at 150,000.

Agriculture and Trade.—The chief wealth of the country consists in forest produce, the staple industries being the collection of palm-kernels and palm oil. Besides the oil-palm forests large areas are covered with timber trees, the wood chiefly cut for commercial purposes being a kind of mahogany. The destruction of immature trees and the fluctuations in price render this a very uncertain trade. The rubber industry was started in 1894, and in 1896 the rubber exported was valued at £347,000. In 1899, owing to reckless methods of tapping the vines, 75% of the rubber plants died. Precautions were then taken to preserve the remainder and allow young plants to grow. The collection of rubber recommenced in 1904 and the industry again became one of importance. A considerable area is devoted to cocoa plantations, all owned by native cultivators. Coffee and tobacco of good quality are cultivated and shea-butter is largely used as an illuminant. The Yoruba country is the greatest agricultural centre in West Africa. For home consumption the Yoruba grow yams, maize and millet, the chief articles of food, cassava, sweet potatoes, sesame and beans. Model farms have been established for experimental culture and for the tuition of the natives. A palatable wine is obtained from the *Raphia vinifera* and native beers are also brewed. Imported spirits are largely consumed. There are no manufactures on a large scale save the making of "country cloths" (from cotton grown, spun and woven in the country) and mats. Pottery and agricultural implements are made, and tanning, dyeing and forging practised in the towns, and along the rivers and lagoons boats and canoes are built. Fishing is extensively engaged in, the fish being dried and sent up country. Except iron there are no valuable minerals in the country.

The cotton plant from which the "country cloths" are made is native to the country, the soil of which is capable of producing the very finest grades of cotton. The Egba branch of the Yoruba have always grown the plant. In 1869 the cotton exported was valued at £76,957, but owing to low prices the natives ceased to grow cotton for export, so that in 1879 the value of exported cotton was only £526. In 1902 planting for export was recommenced by the Egba on scientific lines, and was started in the Abeokuta district with encouraging results.

The Yoruba profess to be unable to alienate land in perpetuity, but native custom does not preclude leasing, and land concessions have been taken up by Europeans on long leases. Some concessions are only for cutting and removing timber; others permit of cultivation. The northern parts of the protectorate are specially suitable for stock raising and poultry culture.

The chief exports are palm-kernels, palm-oil, timber, rubber and cocoa. Palm-kernels alone constitute more than a half in value of the total exports, and with palm-oil over three-fourths.

The trade in these products is practically confined to Great Britain and Germany, the share of the first-named being 25% to Germany's 75%. Minor exports are coffee, "country cloths," maize, shea-butter and ivory.

Cotton goods are the most important of the imports, spirits coming next, followed by building material, haberdashery and hardware and tobacco. Over 90% of the cotton goods are imported from Great Britain, whilst nearly the same proportion of the spirit imports come from Germany. Nearly all the liquors consist of "Trade Spirits," chiefly gin, rum and a concoction called "alcohol," introduced (1901) to meet the growing taste of the people for stronger liquor. This stuff contained 90% of pure alcohol and sometimes over 4% of fusel oil. To hinder the sale of this noxious compound legislation was passed in 1903 prohibiting the import of liquor containing more than ½% of fusel oil, whilst the states of Abeokuta and Ibadan prohibited the importation of liquor stronger than proof. The total trade of the country in 1905 was valued at £2,224,754, the imports slightly exceeding the exports. There is a large transit trade with Dahomey.

Communications.—Lagos is well supplied with means of communication. A 3 ft. 6 in. gauge railway starts from Iddo Island, and extends past Abeokuta, 64 m. from Lagos, Ibadan (123 m.), Oshogbo (175 m.), to Illorin (247 m.) in Northern Nigeria, whence the line is continued to Jebba and Zunguru (see NIGERIA). Abeokuta is served by a branch line, 1½m. long, from Aro on the main line. Railway bridges connect Iddo Island both with the mainland and with Lagos Island (see LAGOS, town). This line was begun in 1896 and opened to Ibadan in 1901. In 1905 the building of the section Ibadan-Illorin was undertaken. The railway was built by the government and cost about £7000 per mile. The lagoons offer convenient channels for numerous small craft, which, with the exception of steam-launches, are almost entirely native-built canoes. Branch steamers run between the Forcados mouth of the Niger and Lagos, and also between Lagos and Porto Novo, in French territory, and do a large transit trade. Various roads through the bush have been made by the government. There is telegraphic communication with Europe, Northern Nigeria and South Africa, and steamships ply regularly between Lagos and Liverpool, and Lagos and Hamburg (see LAGOS, town).

Administration, Justice, Education, &c.—The small part of the province which constitutes "the colony of Southern Nigeria" is governed as a crown colony. Elsewhere the native governments are retained, the chiefs and councils of elders receiving the advice and support of British commissioners. There is also an advisory native central council which meets at Lagos. The great majority of the civil servants are natives of the country, some of whom have been educated in England. The legal status of slavery is not recognized by the law courts and dealing in slaves is suppressed. As an institution slavery is dying out, and only exists in a domestic form.

The cost of administration is met, mainly, by customs, largely derived from the duties on imported spirits. From the railways, a government monopoly, a considerable net profit is earned. Expenditure is mainly under the heads of railway administration, other public works, military and police, health, and education. The revenue increased in the ten years 1895–1905 from £142,049 to £410,250. In the same period the expenditure rose from £144,484 to £354,254.

The defence of the province is entrusted to the Lagos battalion of the West African Frontier Force, a body under the control of the Colonial Office in London and composed of Hausa (four-fifths) and Yoruba. It is officered from the British army.

The judicial system in the colony proper is based on that of England. The colonial supreme court, by agreement with the rulers of Abeokuta, Ibadan and other states in the protectorate, tries, with the aid of native assessors, all cases of importance in those countries. Other cases are tried by mixed courts, or, where Yoruba alone are concerned, by native courts.

There is a government board of education which maintains a few schools and supervises those voluntarily established. These are chiefly those of various missionary societies, who, besides primary schools, have a few secondary schools. The Mahommedans have their own schools. Grants from public funds are made to the voluntary schools. Considerable attention is paid to manual training, the laws of health and the teaching of English, which is spoken by about one-fourth of the native population.

History.—Lagos Island was so named by the Portuguese explorers of the 15th century, because of the numerous lagoons or lakes on this part of the coast. The Portuguese, and after them the French, had settlements here at various points. In the 18th century Lagos Lagoon became the chief resort of slavers frequenting the Bight of Benin, this portion of the Gulf of Guinea becoming known pre-eminently as the Slave Coast. British traders established themselves at Badagry, 40 m. W. of Lagos, where in 1851 they were attacked by Kosoko, the Yoruba king of Lagos Island. As a result a British naval force seized Lagos after a sharp fight and deposed the king, placing his cousin, Akitoye, on the throne. A treaty was concluded under which Akitoye bound himself to put down the slave trade. This treaty was not adhered to, and in 1861 Akitoye's son and successor, King Docemo, was induced to give up his territorial jurisdiction and accept a pension of 1200 bags of cowries, afterwards commuted to £1000 a year, which pension he drew until his death in 1885. Immediately after the proclamation of the British annexation, a steady current of immigration from the mainland set in, and a flourishing town arose on Lagos Island. Iddo Island was acquired at the same time as Lagos Island, and from 1862 to 1894 various additions by purchase or cession were made to the colony. In 1879 the small kingdom of Kotonu was placed under British protection. Kotonu lies south and east of the Denham Lagoon (see DAHOMEY). In 1889 it was exchanged with the French for the kingdom of Pokra which is to the north of Badagry. In the early years of the colony Sir John Glover, R.N., who was twice governor (1864–1866 and 1871–1872), did much pioneer work and earned the confidence of the natives to a remarkable degree. Later Sir C. A. Moloney (governor 1886–1890) opened up relations with the Yoruba and other tribes in the hinterland. He despatched two commissioners whose duty it was to conclude commercial treaties and use British influence to put a stop to intertribal fighting and the closing of the trade routes. In 1892 the Jebu, who acted as middlemen between the colony and the Yoruba, closed several trade routes. An expedition sent against them resulted in their subjugation and the annexation of part of their country. An order in council issued in 1899 extended the protectorate over Yorubaland. The tribes of the hinterland have largely welcomed the British protectorate and military expeditions have been few and unimportant. (For the history of the Yoruba states see YORUBAS.)

Lagos was made a separate government in 1863; in 1866 it was placed in political dependence upon Sierra Leone; in 1874 it became (politically) an integral part of the Gold Coast Colony, whilst in 1886 it was again made a separate government, administered as a crown colony. In Sir William Macgregor, M.D., formerly administrator of British New Guinea, governor 1899–1904, the colony found an enlightened ruler. He inaugurated the railway system, and drew much closer the friendly ties between the British and the tribes of the protectorate. Meantime, since 1884, the whole of the Niger delta, lying immediately east of Lagos, as well as the Hausa states and Bornu, had been acquired by Great Britain. Unification of the British possessions in Nigeria being desirable, the delta regions and Lagos were formed in 1906 into one government (see NIGERIA).

See C. P. Lucas, *Historical Geography of the British Colonies*, vol. iii. *West Africa* (Oxford, 1896); the annual *Reports* issued by the Colonial Office, London; A. B. Ellis, *The Yoruba-speaking Peoples* (London, 1894); Lady Glover, *The Life of Sir John Hawley Glover* (London, 1897). Consult also the works cited under NIGERIA and DAHOMEY.

LAGOS, a seaport of West Africa, capital of the British colony and protectorate of Southern Nigeria, in 6° 26′ N., 3° 23′ E. on an island in a lagoon named Lagos also. Between Lagos and the mainland is Iddo Island. An iron bridge for road and railway traffic 2600 ft. long connects Lagos and Iddo Islands, and another iron bridge, 917 ft. long, joins Iddo Island to the mainland. The town lies but a foot or two above sea-level. The principal buildings are a large government house, the law courts, the memorial hall erected to commemorate the services of Sir John Glover, used for public meetings and entertainments, an elaborate club-house provided from public funds, and the police quarters. There are many substantial villas that serve as quarters for the officers of the civil service, as well as numerous solidly-built handsome private buildings. The streets are well kept; the town is supplied with electric light, and there is a good water service. The chief stores and depôts for goods are all on the banks of the lagoon. The swamps of which originally Lagos Island entirely consisted have been reclaimed. In connexion with this work a canal, 25 ft. wide, has been cut right through the island and a sea-wall built round its western half. There is a commodious public hospital, of the cottage type, on a good site. There is a racecourse, which also serves as a general public recreation ground. Shifting banks of sand form a bar at the sea entrance of the lagoon. Extensive works were undertaken in 1908 with a view to making Lagos an open port. A mole has been built at the eastern entrance to the harbour and dredgers are at work on the bar, which can be crossed by vessels drawing 13 ft. Large ocean-going steamers anchor not less than 2 m. from land, and goods and passengers are there transhipped into smaller steamers for Lagos. Heavy cargo is carried by the large steamers to Forcados, 200 m. farther down the coast, transhipped there into branch boats, and taken via the lagoons to Lagos. The port is 4279 m. from Liverpool, 1203 from Freetown, Sierra Leone (the nearest safe port westward), and 315 from Cape Coast.

The inhabitants, about 50,000, include, besides the native tribes, Sierra Leonis, Fanti, Krumen and the descendants of some 6000 Brazilian *emancipados* who were settled here in the early days of British rule. The Europeans number about 400. Rather more than half the populace are Moslems.

LAGOS, a seaport of southern Portugal, in the district of Faro (formerly the province of Algarve); on the Atlantic Ocean, and on the estuary of the small river Lagos, here spanned by a fine stone bridge. Pop. (1900) 8291. The city is defended by fortifications erected in the 17th century. It is supplied with water by an aqueduct 800 yds. long. The harbour is deep, capacious, and completely sheltered on the north and west; it is frequently visited by the British Channel fleet. Vines and figs are extensively cultivated in the neighbourhood, and Lagos is the centre of important sardine and tunny fisheries. Its trade is chiefly carried on by small coasting vessels, as there is no railway. Lagos is on or near the site of the Roman *Lacobriga*. Since the 15th century it has held the formal rank and title of city. Cape St Vincent, the ancient *Promontorium Sacrum*, and the south-western extremity of the kingdom, is 22 m. W. It is famous for its connexion with Prince Henry (*q.v.*), the Navigator, who here founded the town of Sagres in 1421; and for several British naval victories, the most celebrated of which was won in 1797 by Admiral Jervis (afterwards Earl St Vincent) over a larger Spanish squadron. In 1759 Admiral Boscawen defeated a French fleet off Lagos. The great earthquake of 1755 destroyed a large part of the city.

LA GRÂCE, or LES GRÂCES, a game invented in France during the first quarter of the 19th century and called there *le jeu des Grâces*. It is played with two light sticks about 16 in. long and a wicker ring, which is projected into the air by placing it over the sticks crossed and then separating them rapidly. The ring is caught upon the stick of another player and thrown back, the object being to prevent it from falling to the ground.

LA GRAND' COMBE, a town of southern France, in the department of Gard on the Gardon, 39 m. N.N.W. of Nîmes by rail. Pop. (1906) town, 6406; commune, 11,292. There are extensive coal mines in the vicinity.

LAGRANGE, JOSEPH LOUIS (1736–1813), French mathematician, was born at Turin, on the 25th of January 1736. He was of French extraction, his great grandfather, a cavalry captain, having passed from the service of France to that of Sardinia, and settled in Turin under Emmanuel II. His father, Joseph Louis Lagrange, married Maria Theresa Gros, only daughter of a rich physician at Cambiano, and had by her eleven children, of whom only the eldest (the subject of this notice) and the youngest survived infancy. His emoluments as treasurer at war, together with his wife's fortune, provided him with ample means, which he lost by rash speculations, a circumstance regarded by his son as the prelude to his own good fortune; for had he been rich, he used to say, he might never have known mathematics.

The genius of Lagrange did not at once take its true bent. His earliest tastes were literary rather than scientific, and he learned the rudiments of geometry during his first year at the college of Turin, without difficulty, but without distinction. The perusal of a tract by Halley (*Phil. Trans.* xviii. 960) roused his enthusiasm for the analytical method, of which he was destined to develop the utmost capabilities. He now entered, unaided save by his own unerring tact and vivid apprehension, upon a course of study which, in two years, placed him on a level with the greatest of his contemporaries. At the age of nineteen he communicated to Leonhard Euler his idea of a general method of dealing with "isoperimetrical" problems, known later as the Calculus of Variations. It was eagerly welcomed by the Berlin mathematician, who had the generosity to withhold from publication his own further researches on the subject, until his youthful correspondent should have had time to complete and opportunity to claim the invention. This prosperous opening gave the key-note to Lagrange's career. Appointed, in 1754, professor of geometry in the royal school of artillery, he formed with some of his pupils—for the most part his seniors—friendships based on community of scientific ardour. With the aid of the marquis de Saluces and the anatomist G. F. Cigna, he founded in 1758 a society which became the Turin Academy of Sciences. The first volume of its memoirs, published in the following year, contained a paper by Lagrange entitled *Recherches sur la nature et la propagation du son*, in which the power of his analysis and his address in its application were equally conspicuous. He made his first appearance in public as the critic of Newton, and the arbiter between d'Alembert and Euler. By considering only the particles of air found in a right line, he reduced the problem of the propagation of sound to the solution of the same partial differential equations that include the motions of vibrating strings, and demonstrated the insufficiency of the methods employed by both his great contemporaries in dealing with the latter subject. He further treated in a masterly manner of echoes and the mixture of sounds, and explained the phenomenon of grave harmonics as due to the occurrence of beats so rapid as to generate a musical note. This was followed, in the second volume of the *Miscellanea Taurinensia* (1762) by his "Essai d'une nouvelle méthode pour déterminer les maxima et les minima des formules intégrales indéfinies," together with the application of this important development of analysis to the solution of several dynamical problems, as well as to the demonstration of the mechanical principle of "least action." The essential point in his advance on Euler's mode of investigating curves of maximum or minimum consisted in his purely analytical conception of the subject. He not only freed it from all trammels of geometrical construction, but by the introduction of the symbol δ gave it the efficacy of a new calculus. He is thus justly regarded as the inventor of the "method of variations"—a name supplied by Euler in 1766.

By these performances Lagrange found himself, at the age of twenty-six, on the summit of European fame. Such a height had not been reached without cost. Intense application during early youth had weakened a constitution never robust, and led to accesses of feverish exaltation culminating, in the spring of 1761, in an attack of bilious hypochondria, which permanently lowered the tone of his nervous system. Rest and exercise, however, temporarily restored his health, and he gave proof of the undiminished vigour of his powers by carrying off, in 1764, the prize offered by the Paris Academy of Sciences for the best essay on the libration of the moon. His treatise was remarkable, not only as offering a satisfactory explanation of the coincidence between the lunar periods of rotation and revolution, but as containing the first employment of his radical formula of mechanics, obtained by combining with the principle of d'Alembert that of virtual velocities. His success encouraged the Academy to propose, in 1766, as a theme for competition, the hitherto unattempted theory of the Jovian system. The prize was again awarded to Lagrange; and he earned the same distinction with essays on the problem of three bodies in 1772, on the secular equation of the moon in 1774, and in 1778 on the theory of cometary perturbations.

He had in the meantime gratified a long felt desire by a visit to Paris, where he enjoyed the stimulating delight of conversing with such mathematicians as A. C. Clairault, d'Alembert, Condorcet and the Abbé Marie. Illness prevented him from visiting London. The post of director of the mathematical department of the Berlin Academy (of which he had been a member since 1759) becoming vacant by the removal of Euler to St Petersburg, the latter and d'Alembert united to recommend Lagrange as his successor. Euler's eulogium was enhanced by his desire to quit Berlin, d'Alembert's by his dread of a royal command to repair thither; and the result was that an invitation, conveying the wish of the "greatest king in Europe" to have the "greatest mathematician" at his court, was sent to Turin. On the 6th of November 1766, Lagrange was installed in his new position, with a salary of 6000 francs, ample leisure for scientific research, and royal favour sufficient to secure him respect without exciting envy. The national jealousy of foreigners, was at first a source of annoyance to him; but such prejudices were gradually disarmed by the inoffensiveness of his demeanour. We are told that the universal example of his colleagues, rather than any desire for female society, impelled him to matrimony; his choice being a lady of the Conti family, who, by his request, joined him at Berlin. Soon after marriage his wife was attacked by a lingering illness, to which she succumbed, Lagrange devoting all his time, and a considerable store of medical knowledge, to her care.

The long series of memoirs—some of them complete treatises of great moment in the history of science—communicated by Lagrange to the Berlin Academy between the years 1767 and 1787 were not the only fruits of his exile. His *Mécanique analytique*, in which his genius most fully displayed itself, was produced during the same period. This great work was the perfect realization of a design conceived by the author almost in boyhood, and clearly sketched in his first published essay.[1] Its scope may be briefly described as the reduction of the theory of mechanics to certain general formulae, from the simple development of which should be derived the equations necessary for the solution of each separate problem.[2] From the fundamental principle of virtual velocities, which thus acquired a new significance, Lagrange deduced, with the aid of the calculus of variations, the whole system of mechanical truths, by processes so elegant, lucid and harmonious as to constitute, in Sir William Hamilton's words, "a kind of scientific poem." This unification of method was one of matter also. By his mode of regarding a liquid as a material system characterized by the unshackled mobility of its minutest parts, the separation between the mechanics of matter in different forms of aggregation finally disappeared, and the fundamental equation of forces was for the first time extended to hydrostatics and hydrodynamics.[3] Thus a universal science of matter and motion was derived, by an unbroken sequence of deduction, from one radical principle; and analytical mechanics assumed the clear and complete form of logical perfection which it now wears.

A publisher having with some difficulty been found, the book appeared at Paris in 1788 under the supervision of A. M. Legendre. But before that time Lagrange himself was on the spot. After the death of Frederick the Great, his presence was competed for by the courts of France, Spain and Naples, and a residence in Berlin having ceased to possess any attraction for him, he removed to Paris in 1787. Marie Antoinette warmly patronized him. He was lodged in the Louvre, received the grant of an income equal to that he had hitherto enjoyed, and, with the title of "veteran pensioner" in lieu of that of "foreign associate" (conferred in 1772), the right of voting at the deliberations of the Academy. In the midst of these distinctions, a profound melancholy seized upon him. His mathematical enthusiasm was for the time completely quenched, and during two years the printed volume of his *Mécanique*, which he had seen only in manuscript, lay unopened beside him. He relieved his dejection with miscellaneous studies, especially with that of chemistry, which, in the new form given to it by Lavoisier, he found "aisée comme l'algèbre." The Revolution roused him once more to activity and cheerfulness. Curiosity impelled him to remain and watch the progress of such a novel phenomenon; but curiosity was changed into dismay as the terrific character of the phenomenon unfolded itself. He now bitterly regretted his temerity in braving the danger. "Tu l'as voulu" he would repeat self-reproachfully. Even from revolutionary tribunals, however, the name of Lagrange uniformly commanded respect. His pension was continued by the National Assembly, and he was partially indemnified for the depreciation of the currency by remunerative appointments. Nominated president of the Academical commission for the reform of weights and measures, his services were retained when its "purification" by the Jacobins removed his most distinguished colleagues. He again sat on the commission of 1799 for the construction of the metric system, and by his zealous advocacy of the decimal principle largely contributed to its adoption.

Meanwhile, on the 31st of May 1792 he married Mademoiselle Lemonnier, daughter of the astronomer of that name, a young and beautiful girl, whose devotion ignored disparity of years, and formed the one tie with life which Lagrange found it hard to break. He had no children by either marriage. Although specially exempted from the operation of the decree of October 1793, imposing banishment on foreign residents, he took alarm at the fate of J. S. Bailly and A. L. Lavoisier, and prepared to resume his former situation in Berlin. His design was frustrated by the establishment of and his official connexion with the École Normale, and the École Polytechnique. The former institution had an ephemeral existence; but amongst the benefits derived from the foundation of the École Polytechnique one of the greatest, it has been observed,[4] was the restoration of Lagrange to mathematics. The remembrance of his teachings was long treasured by such of his auditors—amongst whom were J. B. J. Delambre and S. F. Lacroix—as were capable of appreciating them. In expounding the principles of the differential calculus, he started, as it were, from the level of his pupils, and ascended with them by almost insensible gradations from elementary to abstruse conceptions. He seemed, not a professor amongst students, but a learner amongst learners; pauses for thought alternated with luminous exposition; invention accompanied demonstration; and thus originated his *Théorie des fonctions analytiques* (Paris, 1797). The leading idea of this work was contained in a paper published in the *Berlin Memoirs* for 1772.[5] Its object was the elimination of the, to some minds, unsatisfactory conception of the infinite from the metaphysics of the higher mathematics, and the substitution for the differential and integral calculus of an analogous method depending wholly on the serial development of algebraical functions. By means of this "calculus of derived functions" Lagrange hoped to give to the solution of all analytical problems the utmost "rigour of the demonstrations of the ancients";[6] but it cannot be said that the attempt was successful. The validity of his fundamental position was impaired by the absence of a well-constituted theory of series; the notation employed was inconvenient, and was abandoned by its inventor in the second edition of his *Mécanique*; while his scruples as to the admission into analytical investigations of the idea of limits or vanishing ratios have long since been laid aside as idle. Nowhere, however, were the keenness and clearness of his intellect more conspicuous than in this brilliant effort, which, if it failed in its immediate object, was highly effective in secondary results. His purely abstract mode of regarding functions, apart from any mechanical or geometrical considerations, led the way to a new and sharply characterized development of the higher analysis in the hands of A. Cauchy, C. G. Jacobi, and others.[7] The *Théorie des fonctions* is divided into three parts, of which the first explains the general doctrine of functions, the second deals with its application to geometry, and the third with its bearings on mechanics.

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[1] *Œuvres*, i. 15.

[2] *Méc. An.*, Advertisement to 1st ed.

[3] E. Dühring, *Kritische Gesch. der Mechanik*, 220, 367; Lagrange, *Méc. An.* i. 166-172, 3rd ed.

[4] Notice by J. Delambre, *Œuvres de Lagrange*, i. p. xlii.

[5] *Œuvres*, iii. 441.

[6] *Théorie des fonctions*, p. 6.

[7] H. Suter, *Geschichte der math. Wiss.* ii. 222-223.

On the establishment of the Institute, Lagrange was placed at the head of the section of geometry; he was one of the first members of the Bureau des Longitudes; and his name appeared in 1791 on the list of foreign members of the Royal Society. On the annexation of Piedmont to France in 1796, a touching compliment was paid to him in the person of his aged father. By direction of Talleyrand, then minister for foreign affairs, the French commissary repaired in state to the old man's residence in Turin, to congratulate him on the merits of his son, whom they declared "to have done honour to mankind by his genius, and whom Piedmont was proud to have produced, and France to possess." Bonaparte, who styled him "la haute pyramide des sciences mathématiques," loaded him with personal favours and official distinctions. He became a senator, a count of the empire, a grand officer of the legion of honour, and just before his death received the grand cross of the order of réunion.

The preparation of a new edition of his *Mécanique* exhausted his already failing powers. Frequent fainting fits gave presage of a speedy end, and on the 8th of April 1813 he had a final interview with his friends B. Lacépède, G. Monge and J. A. Chaptal. He spoke with the utmost calm of his approaching death; "c'est une dernière fonction," he said, "qui n'est ni pénible ni désagréable." He nevertheless looked forward to a future meeting, when he promised to complete the autobiographical details which weakness obliged him to interrupt. They remained untold, for he died two days later on the 10th of April, and was buried in the Pantheon, the funeral oration being pronounced by Laplace and Lacépède.

Amongst the brilliant group of mathematicians whose magnanimous rivalry contributed to accomplish the task of generalization and deduction reserved for the 18th century, Lagrange occupies an eminent place. It is indeed by no means easy to distinguish and apportion the respective merits of the competitors. This is especially the case between Lagrange and Euler on the one side, and between Lagrange and Laplace on the other. The calculus of variations lay undeveloped in Euler's mode of treating isoperimetrical problems. The fruitful method, again, of the variation of elements was introduced by Euler, but adopted and perfected by Lagrange, who first recognized its supreme importance to the analytical investigation of the planetary movements. Finally, of the grand series of researches by which the stability of the solar system was ascertained, the glory must be almost equally divided between Lagrange and Laplace. In analytical invention, and mastery over the calculus, the Turin mathematician was admittedly unrivalled. Laplace owned that he had despaired of effecting the integration of the differential equations relative to secular inequalities until Lagrange showed him the way. But Laplace unquestionably surpassed his rival in practical sagacity and the intuition of physical truth. Lagrange saw in the problems of nature so many occasions for analytical triumphs; Laplace regarded analytical triumphs as the means of solving the problems of nature. One mind seemed the complement of the other; and both, united in honourable rivalry, formed an instrument of unexampled perfection for the investigation of the celestial machinery. What may be called Lagrange's first period of research into planetary perturbations extended from 1774 to 1784 (see ASTRONOMY: *History*). The notable group of treatises communicated, 1781–1784, to the Berlin Academy was designed, but did not prove to be his final contribution to the theory of the planets. After an interval of twenty-four years the subject, re-opened by S. D. Poisson in a paper read on the 20th of June 1808, was once more attacked by Lagrange with all his pristine vigour and fertility of invention. Resuming the inquiry into the invariability of mean motions, Poisson carried the approximation, with Lagrange's formulae, as far as the squares of the disturbing forces, hitherto neglected, with the same result as to the stability of the system. He had not attempted to include in his calculations the orbital variations of the disturbing bodies; but Lagrange, by the happy artifice of transferring the origin of coordinates from the centre of the sun to the centre of gravity of the sun and planets, obtained a simplification of the formulae, by which the same analysis was rendered equally applicable to each of the planets severally. It deserves to be recorded as one of the numerous coincidences of discovery that Laplace, on being made acquainted by Lagrange with his new method, produced analogous expressions, to which his independent researches had led him. The final achievement of Lagrange in this direction was the extension of the method of the variation of arbitrary constants, successfully used by him in the investigation of periodical as well as of secular inequalities, to any system whatever of mutually interacting bodies.[1] "Not without astonishment," even to himself, regard being had to the great generality of the differential equations, he reached a result so wide as to include, as a particular case, the solution of the planetary problem recently obtained by him. He proposed to apply the same principles to the calculation of the disturbances produced in the rotation of the planets by external action on their equatorial protuberances, but was anticipated by Poisson, who gave formulae for the variation of the elements of rotation strictly corresponding with those found by Lagrange for the variation of the elements of revolution. The revision of the *Mécanique analytique* was undertaken mainly for the purpose of embodying in it these new methods and final results, but was interrupted, when two-thirds completed, by the death of its author.

In the advancement of almost every branch of pure mathematics Lagrange took a conspicuous part. The calculus of variations is indissolubly associated with his name. In the theory of numbers he furnished solutions of many of P. Fermat's theorems, and added some of his own. In algebra he discovered the method of approximating to the real roots of an equation by means of continued fractions, and imagined a general process of solving algebraical equations of every degree. The method indeed fails for equations of an order above the fourth, because it then involves the solution of an equation of higher dimensions than they proposed. Yet it possesses the great and characteristic merit of generalizing the solutions of his predecessors, exhibiting them all as modifications of one principle. To Lagrange, perhaps more than to any other, the theory of differential equations is indebted for its position as a science, rather than a collection of ingenious artifices for the solution of particular problems. To the calculus of finite differences he contributed the beautiful formula of interpolation which bears his name; although substantially the same result seems to have been previously obtained by Euler. But it was in the application to mechanical questions of the instrument which he thus helped to form that his singular merit lay. It was his just boast to have transformed mechanics (defined by him as a "geometry of four dimensions") into a branch of analysis, and to have exhibited the so-called mechanical "principles" as simple results of the calculus. The method of "generalized coordinates," as it is now called, by which he attained this result, is the most brilliant achievement of the analytical method. Instead of following the motion of each individual part of a material system, he showed that, if we determine its configuration by a sufficient number of variables, whose number is that of the degrees of freedom to move (there being as many equations as the system has degrees of freedom), the kinetic and potential energies of the system can be expressed in terms of these, and the differential equations of motion thence deduced by simple differentiation. Besides this most important contribution to the general fabric of dynamical science, we owe to Lagrange several minor theorems of great elegance,—among which may be mentioned his theorem that the kinetic energy imparted by given impulses to a material system under given constraints is a maximum. To this entire branch of knowledge, in short, he successfully imparted that character of generality and completeness towards which his labours invariably tended.

His share in the gigantic task of verifying the Newtonian theory would alone suffice to immortalize his name. His co-operation was indeed more indispensable than at first sight appears. Much as was done *by* him, what was done *through* him was still more important. Some of his brilliant rival's most conspicuous discoveries were implicitly contained in his writings, and wanted but one step for completion. But that one step, from the abstract to the concrete, was precisely that which the character of Lagrange's mind indisposed him to make. As notable instances may be mentioned Laplace's discoveries relating to the velocity of sound and the secular acceleration of the moon, both of which were led close up to by Lagrange's analytical demonstrations. In the *Berlin Memoirs* for 1778 and 1783 Lagrange gave the first direct and theoretically perfect method of determining cometary orbits. It has not indeed proved practically available; but his system of calculating cometary perturbations by means of "mechanical quadratures" has formed the starting-point of all subsequent researches on the subject. His determination[2] of maximum and minimum values for the slowly varying planetary eccentricities was the earliest attempt to deal with the problem. Without a more accurate knowledge of the masses of the planets than was then possessed a satisfactory solution was impossible; but the upper limits assigned by him agreed closely with those obtained later by U. J. J. Leverrier.[3] As a mathematical writer Lagrange has perhaps never been surpassed. His treatises are not only storehouses of ingenious methods, but models of symmetrical form. The clearness, elegance and originality of his mode of presentation give lucidity to what is obscure, novelty to what is familiar, and simplicity to what is abstruse. His genius was one of generalization and abstraction; and the aspirations of the time towards unity and perfection received, by his serene labours, an embodiment denied to them in the troubled world of politics.

BIBLIOGRAPHY.—Lagrange's numerous scattered memoirs have been collected and published in seven 4to volumes, under the title

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[1] *Œuvres*, vi. 771.

[2] *Œuvres*, v. 211 seq.

[3] Grant, *History of Physical Astronomy*, p. 117.

Œuvres de Lagrange, publiées sous les soins de M. J. A. Serret (Paris, 1867–1877). The first, second and third sections of this publication comprise respectively the papers communicated by him to the Academies of Sciences of Turin, Berlin and Paris; the fourth includes his miscellaneous contributions to other scientific collections, together with his additions to Euler's *Algebra*, and his *Leçons élémentaires* at the École Normale in 1795. Delambre's notice of his life, extracted from the *Mém. de l'Institut*, 1812, is prefixed to the first volume. Besides the separate works already named are *Résolution des équations numériques* (1798, 2nd ed., 1808, 3rd ed., 1826), and *Leçons sur le calcul des fonctions* (1805, 2nd ed., 1806), designed as a commentary and supplement to the first part of the *Théorie des fonctions*. The first volume of the enlarged edition of the *Mécanique* appeared in 1811, the second, of which the revision was completed by MM Prony and Binet, in 1815. A third edition, in 2 vols., 4to, was issued in 1853–1855, and a second of the *Théorie des fonctions* in 1813.

See also J. J. Virey and Potel, *Précis historique* (1813); Th. Thomson's *Annals of Philosophy* (1813–1820), vols. ii. and iv.; H. Suter, *Geschichte der math. Wiss.* (1873); E. Dühring, *Kritische Gesch. der allgemeinen Principien der Mechanik* (1877, 2nd ed.); A. Gautier, *Essai historique sur le problème des trois corps* (1817); R. Grant, *History of Physical Astronomy*, &c.; Pietro Cossali, *Éloge* (Padua, 1813); L. Martini, *Cenni biográfici* (1840); *Moniteur du 26 Février* (1814); W. Whewell, *Hist. of the Inductive Sciences*, ii. *passim*; J. Clerk Maxwell, *Electricity and Magnetism*, ii. 184; A. Berry, *Short Hist. of Astr.*, p. 313; J. S. Bailly, *Hist. de l'astr. moderne*, iii. 156, 185, 232; J. C. Poggendorff, *Biog. Lit. Handwörterbuch*. (A. M. C.)

LAGRANGE-CHANCEL [Chancel], **FRANÇOIS JOSEPH** (1677–1758), French dramatist and satirist, was born at Périgueux on the 1st of January 1677. He was an extremely precocious boy, and at Bordeaux, where he was educated, he produced a play when he was nine years old. Five years later his mother took him to Paris, where he found a patron in the princesse de Conti, to whom he dedicated his tragedy of *Jugurtha* or, as it was called later, *Adherbal* (1694). Racine had given him advice and was present at the first performance, although he had long lived in complete retirement. Other plays followed: *Oreste et Pylade* (1697), *Méléagre* (1699), *Amasis* (1701), and *Ino et Mélicerte* (1715). Lagrange hardly realized the high hopes raised by his precocity, although his only serious rival on the tragic stage was Campistron, but he obtained high favour at court, becoming *maître d'hôtel* to the duchess of Orleans. This prosperity ended with the publication in 1720 of his *Philippiques*, odes accusing the regent, Philip, duke of Orleans, of the most odious crimes. He might have escaped the consequences of this libel but for the bitter enmity of a former patron, the duc de La Force. Lagrange found sanctuary at Avignon, but was enticed beyond the boundary of the papal jurisdiction, when he was arrested and sent as a prisoner to the isles of Sainte Marguerite. He contrived, however, to escape to Sardinia and thence to Spain and Holland, where he produced his fourth and fifth *Philippiques*. On the death of the Regent he was able to return to France. He was part author of a *Histoire de Périgord* left unfinished, and made a further contribution to history, or perhaps, more exactly, to romance, in a letter to Élie Fréron on the identity of the Man with the Iron Mask. Lagrange's family life was embittered by a long lawsuit against his son. He died at Périgueux at the end of December 1758.

He had collected his own works (5 vols., 1758) some months before his death. His most famous work, the *Philippiques*, was edited by M. de Lescure in 1858, and a sixth philippic by M. Diancourt in 1886.

LA GRANJA, or San Ildefonso, a summer palace of the kings of Spain; on the south-eastern border of the province of Segovia, and on the western slopes of the Sierra de Guadarrama, 7 m. by road S.E. of the city of Segovia. The royal estate is 3905 ft. above sea-level. The scenery of this region, especially in the gorge of the river Lozoya, with its granite rocks, its dense forest of pines, firs and birches, and its red-tiled farms, more nearly resembles the highlands of northern Europe than any other part of Spain. La Granja has an almost alpine climate, with a clear, cool atmosphere and abundant sunshine. Above the palace rise the wooded summits of the Guadarrama, culminating in the peak of Peñalara (7891 ft.); in front of it the wide plains of Segovia extend northwards. The village of San Ildefonso, the oldest part of the estate, was founded in 1450 by Henry IV., who built a hunting lodge and chapel here. In 1477 the chapel was presented by Ferdinand and Isabella to the monks of the Parral, a neighbouring Hieronymite monastery. The original *granja* (*i.e.* grange or farm), established by the monks, was purchased in 1719 by Philip V., after the destruction of his summer palace at Valsain, the ancient *Vallis Sapinorum*, 2 m. S. Philip determined to convert the estate into a second Versailles. The palace was built between 1721 and 1723. Its façade is fronted by a colonnade in which the pillars reach to the roof. The state apartments contain some valuable 18th-century furniture, but the famous collection of sculptures was removed to Madrid in 1836, and is preserved there in the Museo del Prado. At La Granja it is represented by facsimiles in plaster. The collegiate church adjoining the palace dates from 1724, and contains the tombs of Philip V. and his consort Isabella Farnese. An artificial lake called El Mar, 4095 ft. above sea-level, irrigates the gardens, which are imitated from those of Versailles, and supplies water for the fountains. These, despite the antiquated and sometimes tasteless style of their ornamentation, are probably the finest in the world; it is noteworthy that, owing to the high level of the lake, no pumps or other mechanism are needed to supply pressure. There are twenty-six fountains besides lakes and waterfalls. Among the most remarkable are the group of "Perseus, Andromeda and the Sea-Monster," which sends up a jet of water 110 ft. high, the "Fame," which reaches 125 ft., and the very elaborate "Baths of Diana." It is of the last that Philip V. is said to have remarked, "It has cost me three millions and amused me three minutes." Most of the fountains were made by order of Queen Isabella in 1727, during the king's absence. The glass factory of San Ildefonso was founded by Charles III.

It was in La Granja that Philip V. resigned the crown to his son in January 1724, to resume it after his son's death seven months later; that the treaties of 1777, 1778, 1796 and 1800 were signed (see Spain: *History*); that Ferdinand VII. summoned Don Carlos to the throne in 1832, but was induced to alter the succession in favour of his own infant daughter Isabella, thus involving Spain in civil war; and that in 1836 a military revolt compelled the Queen-regent Christina to restore the constitution of 1812.

LAGRENÉE, LOUIS JEAN FRANÇOIS (1724–1805), French painter, was a pupil of Carle Vanloo. Born at Paris on the 30th of December 1724, in 1755 he became a member of the Royal Academy, presenting as his diploma picture the "Rape of Deianira" (Louvre). He visited St Petersburg at the call of the empress Elizabeth, and on his return was named in 1781 director of the French Academy at Rome; he there painted the "Indian Widow," one of his best-known works. In 1804 Napoleon conferred on him the cross of the legion of honour, and on the 19th of June 1805 he died in the Louvre, of which he was honorary keeper.

LA GUAIRA, or La Guayra (sometimes Laguaira, &c.), a town and port of Venezuela, in the Federal district, 23 m. by rail and 6½ m. in a direct line N. of Carácas. Pop. (1904, estimate) 14,000. It is situated between a precipitous mountain side and a broad, semicircular indentation of the coast line which forms the roadstead of the port. The anchorage was long considered one of the most dangerous on the Caribbean coast, and landing was attended with much danger. The harbour has been improved by the construction of a concrete breakwater running out from the eastern shore line 2044 ft., built up from an extreme depth of 46 ft. or from an average depth of 29½ ft., and rising 19½ ft. above sea-level. This encloses an area of 76½ acres, having an average depth of nearly 28 ft. The harbour is further improved by 1870 ft. of concrete quays and 1397 ft. of retaining sea-wall, with several piers (three covered) projecting into deep water. These works were executed by a British company, known as the La Guaira Harbour Corporation, Ltd., and were completed in 1891 at a cost of about one million sterling. The concession is for 99 years and the additional charges which the company is authorized to impose are necessarily heavy. These improvements and the restrictions placed upon the direct trade between West Indian ports and the Orinoco have greatly increased the foreign trade of La Guaira, which in 1903 was 52% of that of the four *puertos habilitados* of the republic. The shipping entries of that year numbered 217, of which 203 entered with general cargo and 14 with coal exclusively. The exports included 152,625 bags coffee, 114,947 bags cacao and 152,891 hides. For 1905–1906 the imports at La Guaira were valued officially at £767,365 and the exports at £663,708. The city stands on sloping ground stretching along the circular coast line with a varying width of 130 to 330 ft. and having the appearance of an amphitheatre. The port improvements added 18 acres of reclaimed land to La Guaira's area, and the removal of old shore batteries likewise increased its available breadth. In this narrow space is built the town, composed in great part of small, roughly-made cabins, and narrow, badly-paved streets, but with good business houses on its principal street. From the mountain side, reddish-brown in colour and bare of vegetation, the solar heat is reflected with tremendous force, the mean annual temperature being 84° F. The seaside towns of Maiquetia, 2 m. W. and Macuto, 3 m. E., which have better climatic and sanitary conditions and are connected by a narrow-gauge railway, are the residences of many of the wealthier merchants of La Guaira.

La Guaira was founded in 1588, was sacked by filibusters under Amias Preston in 1595, and by the French under Grammont in 1680, was destroyed by the great earthquake of the 26th of March 1812, and suffered severely in the war for independence. In 1903, pending the settlement of claims of Great Britain, Germany and Italy against Venezuela, La Guaira was blockaded by a British-German-Italian fleet.

LA GUÉRONNIÈRE, LOUIS ÉTIENNE ARTHUR DUBREUIL HÉLION, Vicomte de (1816–1875), French politician, was the scion of a noble Poitevin family. Although by birth and education attached to Legitimist principles, he became closely associated with Lamartine, to whose organ, *Le Bien Public*, he was a principal contributor. After the stoppage of this paper he wrote for *La Presse*, and in 1850 edited *Le Pays*. A character sketch of Louis Napoleon in this journal caused differences with Lamartine, and La Guéronnière became more and more closely identified with the policy of the prince president. Under the Empire he was a member of the council of state (1853), senator (1861), ambassador at Brussels (1868), and at Constantinople (1870), and grand officer of the legion of honour (1866). He died in Paris on the 23rd of December 1875. Besides his *Études et portraits politiques contemporains* (1856) his most important works are those on the foreign policy of the Empire: *La France, Rome et Italie* (1851), *L'Abandon de Rome* (1862), *De la politique intérieure et extérieure de la France* (1862).

His elder brother, Alfred Dubreuil Hélion, Comte de La Guéronnière (1810–1884), who remained faithful to the Legitimist party, was also a well-known writer and journalist. He was consistent in his opposition to the July Monarchy and the Empire, but in a series of books on the crisis of 1870–1871 showed a more favourable attitude to the Republic.

LAGUERRE, JEAN HENRI GEORGES (1858–), French lawyer and politician, was born in Paris on the 24th of June 1858. Called to the bar in 1879, he distinguished himself by brilliant pleadings in favour of socialist and anarchist leaders, defending Prince Kropotkine at Lyons in 1883, Louise Michel in the same year; and in 1886, with A. Millerand as colleague he defended Ernest Roche and Duc Quercy, the instigators of the Decazeville strike. His strictures on the *procureur de la République* on this occasion being declared libellous he was suspended for six months and in 1890 he again incurred suspension for an attack on the attorney-general, Quesnay de Beaurepaire. He also pleaded in the greatest criminal cases of his time, though from 1893 onwards exclusively in the provinces, his exclusion from the Parisian bar having been secured on the pretext of his connexion with *La Presse*. He entered the Chamber of Deputies for Apt in 1883 as a representative of the extreme revisionist programme, and was one of the leaders of the Boulangist agitation. He had formerly written for Georges Clemenceau's organ *La Justice*, but when Clemenceau refused to impose any shibboleth on the radical party he became director of *La Presse*. He rallied to the republican party in May 1891, some months before General Boulanger's suicide. He was not re-elected to the Chamber in 1893. Laguerre was an excellent lecturer on the revolutionary period of French history, concerning which he had collected many valuable and rare documents. He interested himself in the fate of the "Little Dauphin" (Louis XVII.), whose supposed remains, buried at Ste Marguerite, he proved to be those of a boy of fourteen.

LAGUNA, or La Laguna, an episcopal city and formerly the capital of the island of Teneriffe, in the Spanish archipelago of the Canary Islands. Pop. (1900) 13,074. Laguna is 4 m. N. by W. of Santa Cruz, in a plain 1800 ft. above sea-level, surrounded by mountains. Snow is unknown here, and the mean annual temperature exceeds 63° F.; but the rainfall is very heavy, and in winter the plain is sometimes flooded. The humidity of the atmosphere, combined with the warm climate and rich volcanic soil, renders the district exceptionally fertile; wheat, wine and tobacco, oranges and other fruits, are produced in abundance. Laguna is the favourite summer residence of the wealthier inhabitants of Santa Cruz. Besides the cathedral, the city contains several picturesque convents, now secularized, a fine modern town hall, hospitals, a large public library and some ancient palaces of the Spanish nobility. Even the modern buildings have often an appearance of antiquity, owing to the decay caused by damp, and the luxuriant growth of climbing plants.

LA HARPE, JEAN FRANÇOIS DE (1739–1803), French critic, was born in Paris of poor parents on the 20th of November 1739. His father, who signed himself Delharpe, was a descendant of a noble family originally of Vaud. Left an orphan at the age of nine, La Harpe was taken care of for six months by the sisters of charity, and his education was provided for by a scholarship at the Collège d'Harcourt. When nineteen he was imprisoned for some months on the charge of having written a satire against his protectors at the college. La Harpe always denied his guilt, but this culminating misfortune of an early life spent entirely in the position of a dependent had possibly something to do with the bitterness he evinced in later life. In 1763 his tragedy of *Warwick* was played before the court. This, his first play, was perhaps the best he ever wrote. The many authors whom he afterwards offended were always able to observe that the critic's own plays did not reach the standard of excellence he set up. *Timoléon* (1764), *Pharamond* (1765) and *Gustave Wasa* (1766) were failures. *Mélanie* was a better play, but was never represented. The success of *Warwick* led to a correspondence with Voltaire, who conceived a high opinion of La Harpe, even allowing him to correct his verses. In 1764 La Harpe married the daughter of a coffee house keeper. This marriage, which proved very unhappy and was dissolved, did not improve his position. They were very poor, and for some time were guests of Voltaire at Ferney. When, after Voltaire's death, La Harpe in his praise of the philosopher ventured on some reasonable, but rather ill-timed, criticism of individual works, he was accused of treachery to one who had been his constant friend. In 1768 he returned from Ferney to Paris, where he began to write for the *Mercure*. He was a born fighter and had small mercy on the authors whose work he handled. But he was himself violently attacked, and suffered under many epigrams, especially those of Lebrun-Pindare. No more striking proof of the general hostility can be given than his reception (1776) at the Academy, which Sainte-Beuve calls his "execution." Marmontel, who received him, used the occasion to eulogize La Harpe's predecessor, Charles Pierre Colardeau, especially for his pacific, modest and indulgent disposition. The speech was punctuated by the applause of the audience, who chose to regard it as a series of sarcasms on the new member. Eventually La Harpe was compelled to resign from the *Mercure*, which he had edited from 1770. On the stage he produced *Les Barmécides* (1778), *Philoctète*, *Jeanne de Naples* (1781), *Les Brames* (1783), *Coriolan* (1784), *Virginie* (1786). In 1786 he began a course of literature at the newly-established Lycée. In these lectures, published as the *Cours de littérature ancienne et moderne*, La Harpe is at his best, for he found a standpoint more or less independent of contemporary polemics. He is said to be inexact in dealing with the ancients, and he had only a superficial knowledge of the middle ages, but he is excellent in his analysis of 17th-century writers. Sainte-Beuve found in him the best critic of the French school of tragedy, which reached its perfection in Racine. La Harpe was a disciple of the "*philosophes*"; he supported the extreme party through the excesses of 1792 and 1793. In 1793 he edited the *Mercure de France* which adhered blindly to the revolutionary leaders. But in April 1794 he was nevertheless seized as a "suspect." In prison he underwent a spiritual crisis which he described in convincing language, and he emerged an ardent Catholic and a reactionist in politics. When he resumed his chair at the Lycée, he attacked his former friends in politics and literature. He was imprudent enough to begin the publication (1801–1807) of his *Correspondance littéraire* (1774–1791) with the grand-duke, afterwards the emperor Paul of Russia. In these letters he surpassed the brutalities of the *Mercure*. He contracted a second marriage, which was dissolved after a few weeks by his wife. He died on the 11th of February 1803 in Paris, leaving in his will an incongruous exhortation to his fellow countrymen to maintain peace and concord. Among his posthumous works was a *Prophêtie de Cazotte* which Sainte-Beuve pronounces his best work. It is a sombre description of a dinner-party of notables long before the Revolution, when Jacques Cazotte is made to prophesy the frightful fates awaiting the various individuals of the company.

Among his works not already mentioned are:—*Commentaire sur Racine* (1795–1796), published in 1807; *Commentaire sur le théâtre de Voltaire* of earlier date (published posthumously in 1814), and an epic poem *La Religion* (1814). His *Cours de littérature* has been often reprinted. To the edition of 1825–1826 is prefixed a notice by Pierre Daunou. See also Sainte-Beuve, *Causeries du lundi*, vol. v.; G. Peignot, *Recherches historiques, bibliographiques et littéraires . . . sur La Harpe* (1820).

LAHIRE, LAURENT DE (1606–1656), French painter, was born at Paris on the 27th of February 1606. He became a pupil of Lallemand, studied the works of Primaticcio at Fontainebleau, but never visited Italy, and belongs wholly to that transition period which preceded the school of Simon Vouet. His picture of Nicolas V. opening the crypt in which he discovers the corpse of St Francis of Assisi standing (Louvre) was executed in 1630 for the Capuchins of the Marais; it shows a gravity and sobriety of character which marked Lahire's best work, and seems not to have been without influence on Le Sueur. The Louvre contains eight other works, and paintings by Lahire are in the museums of Strasburg, Rouen and Le Mans. His drawings, of which the British Museum possesses a fine example, "Presentation of the Virgin in the Temple," are treated as seriously as his paintings, and sometimes show simplicity and dignity of effect. The example of the Capuchins, for whom he executed several other works in Paris, Rouen and Fécamp, was followed by the goldsmiths' company, for whom he produced in 1635 "St Peter healing the Sick" (Louvre) and the "Conversion of St Paul" in 1637. In 1646, with eleven other artists, he founded the French Royal Academy of Painting and Sculpture. Richelieu called Lahire to the Palais Royal; Chancellor Séguier, Tallemant de Réaux and many others entrusted him with important works of decoration; for the Gobelins he designed a series of large compositions. Lahire painted also a great number of portraits, and in 1654 united in one work for the town-hall of Paris those of the principal dignitaries of the municipality. He died on the 28th of December 1656.

LAHN, a river of Germany, a right-bank tributary of the Rhine. Its source is on the Jagdberg, a summit of the Rothaar Mountains, in the cellar of a house (Lahnhof), at an elevation of 1975 ft. It flows at first eastward and then southward to Giessen, then turns south-westward and with a winding course reaches the Rhine between the towns of Oberlahnstein and Niederlahnstein. Its valley, the lower part of which divides the Taunus hills from the Westerwald, is often very narrow and picturesque; among the towns and sites of interest on its banks are Marburg and Giessen with their universities, Wetzlar with its cathedral, Runkel with its castle, Limburg with its cathedral, the castles of Schaumburg, Balduinstein, Laurenburg, Langenau, Burgstein and Nassau, and the well-known health resort of Ems. The Lahn is about 135 m. long; it is navigable from its mouth to Giessen, and is partly canalized. A railway follows the valley practically throughout. In 1796 there were here several encounters between the French under General Jourdan and the troops of the archduke Johan, which resulted in the retreat of the French across the Rhine.

LAHNDA (properly *Lahndā* or *Lahindā*, western, or *Lahndē-dī bōlī*, the language of the West), an Indo-Aryan language spoken in the western Punjab. In 1901 the number of speakers was 3,337,917. Its eastern boundary is very indefinite as the language gradually merges into the Panjabi immediately to the east, but it is conventionally taken as the river Chenab from the Kashmir frontier to the town of Ramnagar, and thence as a straight line to the south-west corner of the district of Montgomery. Lahnda is also spoken in the north of the state of Bahawalpur and of the province of Sind, in which latter locality it is known as Siraiki. Its western boundary is, roughly speaking, the river Indus, across which the language of the Afghan population is Pashto (Pushtu), while the Hindu settlers still speak Lahnda. In the Derajat, however, Lahnda is the principal language of all classes in the plains west of the river.

Lahnda is also known as Western Panjabi and as Jatki, or the language of the Jats, who form the bulk of the population whose mother-tongue it is. In the Derajat it is called Hindko or the language of Hindus. In 1819 the Serampur missionaries published a Lahnda version of the New Testament. They called the language Uchchī, from the important town of Uch near the confluence of the Jhelam and the Chenab. This name is commonly met with in old writings. It has numerous dialects, which fall into two main groups, a northern and a southern, the speakers of which are separated by the Salt Range. The principal varieties of the northern group are Hindki (the same in meaning as Hindko) and Pōthwārī. In the southern group the most important are Khētrānī, Multānī, and the dialect of Shahpur. The language possesses no literature.

Lahnda belongs to the north-western group of the outer band of Indo-Aryan languages (*q.v.*), the other members being Kashmiri (*q.v.*) and Sindhi, with both of which it is closely connected. See Sindhi; also Hindostani. (G. A. Gr.)

LA HOGUE, BATTLE OF, the name now given to a series of encounters which took place from the 19th to the 23rd (O.S.) of May 1692, between an allied British and Dutch fleet and a French force, on the northern and eastern sides of the Cotentin in Normandy. A body of French troops, and a number of Jacobite exiles, had been collected in the Cotentin. The government of Louis XIV. prepared a naval armament to cover their passage across the Channel. This force was to have been composed of the French ships at Brest commanded by the count of Tourville, and of a squadron which was to have joined him from Toulon. But the Toulon ships were scattered by a gale, and the combination was not effected. The count of Tourville, who had put to sea to meet them, had with him only 45 or 47 ships of the line. Yet when the reinforcement failed to join him, he steered up Channel to meet the allies, who were known to be in strength. On the 15th of May the British fleet of 63 sail of the line, under command of Edward Russell, afterwards earl of Orford, was joined at St Helens by the Dutch squadron of 36 sail under Admiral van Allemonde. The apparent rashness of the French admiral in seeking an encounter with very superior numbers is explained by the existence of a general belief that many British captains were discontented, and would pass over from the service of the government established by the Revolution of 1688 to their exiled king, James II. It is said that Tourville had orders from Louis XIV. to attack in any case, but the story is of doubtful authority. The British government, aware of the Jacobite intrigues in its fleet, and of the prevalence of discontent, took the bold course of appealing to the loyalty and patriotism of its officers. At a meeting of the flag-officers on board the "Britannia," Russell's flag-ship, on the 15th of May, they protested their loyalty, and the whole allied fleet put to sea on the 18th. On the 19th of May, when Cape Barfleur, the north-eastern point of the Cotentin, was 21 m. S.W. of them, they sighted Tourville, who was then 20 m. to the north of Cape La Hague, the north-western extremity of the peninsula, which must not be confounded with La Houque, or La Hogue, the place at which the fighting ended. The allies were formed in a line from S.S.W. to N.N.E. heading towards the English coast, the Dutch forming the White or van division, while the Red or centre division under Russell, and the Blue or rear under Sir John Ashby, were wholly composed of British ships. The wind was from the S.W. and the weather hazy. Tourville bore down and attacked about mid-day, directing his main assault on the centre of the allies, but telling off some ships to watch the van and rear of his enemy. As this first encounter took place off Cape Barfleur, the battle was formerly often called by the name. On the centre, where Tourville was directly opposed to Russell, the fighting was severe. The British flag-ship the "Britannia" (100), and the French, the "Soleil Royal" (100), were both completely crippled. After several hours of conflict, the French admiral, seeing himself outnumbered, and that the allies could outflank him and pass through the necessarily wide intervals in his extended line, drew off without the loss of a ship. The wind now fell and the haze became a fog. Till the 23rd, the two fleets remained off the north coast of the Cotentin, drifting west with the ebb tide or east with the flood, save when they anchored. During the night of the 19th/20th some British ships became entangled, in the fog, with the French, and drifted through them on the tide, with loss. On the 23rd both fleets were near La Hague. About half the French, under D'Amfreville, rounded the cape, and fled to St Malo through the dangerous passage known as the Race of Alderney (le Ras Blanchard). The others were unable to get round the cape before the flood tide set in, and were carried to the eastward. Tourville now transferred his own flag, and left his captains free to save themselves as they best could. He left the "Soleil Royal," and sent her with two others to Cherbourg, where they were destroyed by Sir Ralph Delaval. The others now ran round Cape Barfleur, and sought refuge on the east side of the Cotentin at the anchorage of La Houque, called by the English La Hogue, where the troops destined for the invasion were encamped. Here 13 of them were burnt by Sir George Rooke, in the presence of the French generals and of the exiled king James II. From the name of the place where the last blow was struck, the battle has come to be known by the name of La Hogue.

Sufficient accounts of the battle may be found in Lediard's *Naval History* (London, 1735), and for the French side in Tronde's *Batailles navales de la France* (Paris, 1867). The escape of D'Amfreville's squadron is the subject of Browning's poem "Hervé Riel."

(D. H.)

LAHORE, an ancient city of British India, the capital of the Punjab, which gives its name to a district and division. It lies in 31° 35′ N. and 74° 20′ E. near the left bank of the River Ravi, 1706 ft. above the sea, and 1252 m. by rail from Calcutta. It is thus in about the same latitude as Cairo, but owing to its inland position is considerably hotter than that city, being one of the hottest places in India in the summer time. In the cold season the climate is pleasantly cool and bright. The native city is walled, about $1\frac{1}{4}$ m. in length W. to E. and about $\frac{3}{4}$ m. in breadth N. to S. Its site has been occupied from early times, and much of it stands high above the level of the surrounding country, raised on the remains of a succession of former habitations. Some old buildings, which have been preserved, stand now below the present surface of the ground. This is well seen in the mosque now called Masjid Niwin (or sunken) built in 1560, the mosque of Mullah Rahmat, 7 ft. below, and the Shivali, a very old Hindu temple, about 12 ft. below the surrounding ground. Hindu tradition traces the origin of Lahore to Loh or Lava, son of Rama, the hero of the *Ramayana*. The absence of mention of Lahore by Alexander's historians, and the fact that coins of the Graeco-Bactrian kings are not found among the ruins, lead to the belief that it was not a place of any importance during the earliest period of Indian history. On the other hand, Hsüan Tsang, the Chinese Buddhist, notices the city in his *Itinerary* (A.D. 630); and it seems probable, therefore, that Lahore first rose into prominence between the 1st and 7th centuries A.D. Governed originally by a family of Chauhan Rajputs, a branch of the house of Ajmere, Lahore fell successively under the dominion of the Ghazni and Ghori sultans, who made it the capital of their Indian conquests, and adorned it with numerous buildings, almost all now in ruins. But it was under the Mogul empire that Lahore reached its greatest size and magnificence. The reigns of Humayun, Akbar, Jahangir, Shah Jahan and Aurangzeb form the golden period in the annals and architecture of the city. Akbar enlarged and repaired the fort, and surrounded the town with a wall, portions of which remain, built into the modern work of Ranjit Singh. Lahore formed the capital of the Sikh empire of that monarch. At the end of the second Sikh War, with the rest of the Punjab, it came under the British dominion.

The architecture of Lahore cannot compare with that of Delhi. Jahangir in 1622–1627 erected the Khwabgah or "sleeping-place," a fine palace much defaced by the Sikhs but to some extent restored in modern times; the Moti Masjid or "pearl mosque" in the fort, used by Ranjit Singh and afterwards by the British as a treasure-house; and also the tomb of Anarkali, used formerly as the station church and now as a library. Shah Jahan erected a palace and other buildings near the Khwabgah, including the beautiful pavilion called the Naulakha from its cost of nine lakhs, which was inlaid with precious stones. The mosque of Wazir Khan (1634) provides the finest example of *kashi* or encaustic tile work. Aurangzeb's Jama Masjid, or "great mosque," is a huge bare building, stiff in design, and lacking the detailed ornament typical of buildings at Delhi. The buildings of Ranjit Singh, especially his mausoleum, are common and meretricious in style. He was, moreover, responsible for much of the despoiling of the earlier buildings. The streets of the native city are narrow and tortuous, and are best seen from the back of an elephant. Two of the chief features of Lahore lie outside its walls at Shahdara and Shalamar Gardens respectively. Shahdara, which contains the tomb of the emperor Jahangir, lies across the Ravi some 6 m. N. of the city. It consists of a splendid marble cenotaph surrounded by a grove of trees and gardens. The Shalamar Gardens, which were laid out in A.D. 1637 by Shah Jahan, lie 6 m. E. of the city. They are somewhat neglected except on festive occasions, when the fountains are playing and the trees are lit up by lamps at night.

The modern city of Lahore, which contained a population of 202,964 in 1901, may be divided into four parts: the native city, already described; the civil station or European quarter, known as Donald Town; the Anarkali bazaar, a suburb S. of the city wall; and the cantonment, formerly called Mian Mir. The main street of the civil station is a portion of the grand trunk road from Calcutta to Peshawar, locally known as the Mall. The chief modern buildings along this road, west to east, are the Lahore museum, containing a fine collection of Graeco-Buddhist sculptures, found by General Cunningham in the Yusufzai country, and arranged by Mr Lockwood Kipling, a former curator of the museum; the cathedral, begun by Bishop French, in Early English style, and consecrated in 1887; the Lawrence Gardens and Montgomery Halls, surrounded by a garden that forms the chief meeting-place of Europeans in the afternoon; and opposite this government house, the official residence of the lieutenant-governor of the Punjab; next to this is the Punjab club for military men and civilians. Three miles beyond is the Lahore cantonment, where the garrison is stationed, except a company of British infantry, which occupies the fort. It is the headquarters of the 3rd division of the northern army. Lahore is an important junction on the North-Western railway system, but has little local trade or manufacture. The chief industries are silk goods, gold and silver lace, metal work and carpets which are made in the Lahore gaol. There are also cotton mills, flour mills, an ice-factory, and several factories for mineral waters, oils, soap, leather goods, &c. Lahore is an important educational centre. Here are the Punjab University with five colleges, medical and law colleges, a central training college, the Aitchison Chiefs' College for the sons of native noblemen, and a number of other high schools and technical and special schools.

The District of Lahore has an area of 3704 sq. m., and its population in 1901 was 1,162,109, consisting chiefly of Punjabi Mahommedans with a large admixture of Hindus and Sikhs. In the north-west the district includes a large part of the barren Rechna Doab, while south of the Ravi is a desolate alluvial tract, liable to floods. The Manjha plateau, however, between the Ravi and the Beas, has been rendered fertile by the Bari Doab canal. The principal crops are wheat, pulse, millets, maize, oil-seeds and cotton. There are numerous factories for ginning and pressing cotton. Irrigation is provided by the main line of the Bari Doab canal and its branches, and by inundation-cuts from the Sutlej. The district is crossed in several directions by lines of the North-Western railway. Lahore, Kasur, Chunian and Raiwind are the chief trade centres.

The Division of Lahore extends along the right bank of the Sutlej from the Himalayas to Multan. It comprises the six districts of Sialkot, Gujranwala, Montgomery, Lahore, Amritsar and Gurdaspur. Total area, 17,154 sq. m.; pop. (1901) 5,598,463. The commissioner for the division also exercises political control over the hill state of Chamba. The common language of the rural population and of artisans is Punjabi; while Urdu or Hindustani is spoken by the educated classes. So far from the seaboard, the range between extremes of winter and summer temperature in the sub-tropics is great. The mean temperature in the shade in June is about 92° F., in January about 50°. In midsummer the thermometer sometimes rises to 115° in the shade, and remains on some occasions as high as 105° throughout the night. In winter the morning temperature is sometimes as low as 20°. The rainfall is uncertain, ranging from 8 in. to 25, with an average of 15 in. The country as a whole is parched and arid, and greatly dependent on irrigation.

LA HOZ Y MOTA, JUAN CLAUDIO DE (1630?–1710?), Spanish dramatist, was born in Madrid. He became a knight of Santiago in 1653, and soon afterwards succeeded his father as *regidor* of Burgos. In 1665 he was nominated to an important post at the Treasury, and in his later years acted as official censor of the Madrid theatres. On the 13th of August 1709 he signed his play entitled *Josef, salvador de Egipto*, and is presumed to have died in the following year. Hoz is not remarkable for originality of conception, but his recasts of plays by earlier writers are distinguished by an adroitness which accounts for the esteem in which he was held by his contemporaries. *El Montañés Juan Pascal* and *El castigo de la miseria*, reprinted in the *Biblioteca de Autores Españoles*, give a just idea of his adaptable talent.

LAHR, a town in the grand-duchy of Baden, on the Schutter, about 9 m. S. of Offenburg, and on the railway Dinglingen-Lahr. Pop. (1900) 13,577. One of the busiest towns in Baden, it carries on manufactures of tobacco and cigars, woollen goods, chicory, leather, pasteboard, hats and numerous other articles, has considerable trade in wine, while among its other industries are printing and lithography. Lahr first appears as a town in 1278, and after several vicissitudes it passed wholly to Baden in 1803.

See Stein, *Geschichte und Beschreibung der Stadt Lahr* (Lahr, 1827); and Sütterlin, *Lahr und seine Umgebung* (Lahr, 1904).

LAIBACH (Slovenian, *Ljubljana*), capital of the Austrian duchy of Carniola, 237 m. S.S.W. of Vienna by rail. Pop. (1900) 36,547, mostly Slovene. It is situated on the Laibach, near its influx into the Save, and consists of the town proper and eight suburbs. Laibach is an episcopal see, and possesses a cathedral in the Italian style, several beautiful churches, a town hall in Renaissance style and a castle, built in the 15th century, on the Schlossberg, an eminence which commands the town. Laibach is the principal centre of the national Slovenian movement, and it contains a Slovene theatre and several societies for the promotion of science and literature in the native tongue. The Slovenian language is in general official use, and the municipal administration is purely Slovenian. The industries include manufactures of pottery, bricks, oil, linen and woollen cloth, fire-hose and paper.

Laibach is supposed to occupy the site of the ancient Emona or Aemona, founded by the emperor Augustus in 34 B.C. It was besieged by Alaric in 400, and in 451 it was desolated by the Huns. In 900 Laibach suffered much from the Magyars, who were, however, defeated there in 914. In the 12th century the town passed into the hands of the dukes of Carinthia; in 1270 it was taken by Ottocar of Bohemia; and in 1277 it came under the Habsburgs. In the early part of the 15th century the town was several times besieged by the Turks. The bishopric was founded in 1461. On the 17th of March 1797 and again on the 3rd of June 1809 Laibach was taken by the French, and from 1809 to 1813 it became the seat of their general government of the Illyrian provinces. From 1816 to 1849 Laibach was the capital of the kingdom of Illyria. The town is also historically known from the congress of Laibach, which assembled here in 1821 (see below). Laibach suffered severely on the 14th of April 1895 from an earthquake.

Congress or Conference of Laibach.—Before the break-up of the conference of Troppau (*q.v.*), it had been decided to adjourn it till the following January, and to invite the attendance of the king of Naples, Laibach being chosen as the place of meeting. Castlereagh, in the name of Great Britain, had cordially approved this invitation, as "implying negotiation" and therefore as a retreat from the position taken up in the Troppau Protocol. Before leaving Troppau, however, the three autocratic powers, Russia, Austria and Prussia, had issued, on the 8th of December 1820, a circular letter, in which they reiterated the principles of the Protocol, *i.e.* the right and duty of the powers responsible for the peace of Europe to intervene to suppress any revolutionary movement by which they might conceive that peace to be endangered (Hertslet, No. 105). Against this view Castlereagh once more protested in a circular despatch of the 19th of January 1821, in which he clearly differentiated between the objectionable general principles advanced by the three powers, and the particular case of the unrest in Italy, the immediate concern not of Europe at large, but of Austria and of any other Italian powers which might consider themselves endangered (Hertslet, No. 107).

The conference opened on the 26th of January 1821, and its constitution emphasized the divergences revealed in the above circulars. The emperors of Russia and Austria were present in person, and with them were Counts Nesselrode and Capo d'Istria, Metternich and Baron Vincent; Prussia and France were represented by plenipotentiaries. But Great Britain, on the ground that she had no immediate interest in the Italian question, was represented only by Lord Stewart, the ambassador at Vienna, who was not armed with full powers, his mission being to watch the proceedings and to see that nothing was done beyond or in violation of the treaties. Of the Italian princes, Ferdinand of Naples and the duke of Modena came in person; the rest were represented by plenipotentiaries.

It was soon clear that a more or less open breach between Great Britain and the other powers was inevitable. Metternich was anxious to secure an apparent unanimity of the powers to back the Austrian intervention in Naples, and every device was used to entrap the English representative into subscribing a formula which would have seemed to commit Great Britain to the principles of the other allies. When these devices failed, attempts were made unsuccessfully to exclude Lord Stewart from the conferences on the ground of defective powers. Finally he was forced to an open protest, which he caused to be inscribed on the journals, but the action of Capo d'Istria in reading to the assembled Italian ministers, who were by no means reconciled to the large claims implied in the Austrian intervention, a declaration in which as the result of the "intimate union established by solemn acts between all the European powers" the Russian emperor offered to the allies "the aid of his arms, should new revolutions threaten new dangers," an attempt to revive that idea of a "universal union" based on the Holy Alliance (*q.v.*) against which Great Britain had consistently protested.

The objections of Great Britain were, however, not so much to an Austrian intervention in Naples as to the far-reaching principles by which it was sought to justify it. King Ferdinand had been invited to Laibach, according to the circular of the

8th of December, in order that he might be free to act as "mediator between his erring peoples and the states whose tranquillity they threatened." The cynical use he made of his "freedom" to repudiate obligations solemnly contracted is described elsewhere (see NAPLES, *History*). The result of this action was the Neapolitan declaration of war and the occupation of Naples by Austria, with the sanction of the congress. This was preceded, on the 10th of March, by the revolt of the garrison of Alessandria and the military revolution in Piedmont, which in its turn was suppressed, as a result of negotiations at Laibach, by Austrian troops. It was at Laibach, too, that, on the 19th of March, the emperor Alexander received the news of Ypsilanti's invasion of the Danubian principalities, which heralded the outbreak of the War of Greek Independence, and from Laibach Capo d'Istria addressed to the Greek leader the tsar's repudiation of his action.

The conference closed on the 12th of May, on which date Russia, Austria and Prussia issued a declaration (Hertslet, No. 108) "to proclaim to the world the principles which guided them" in coming "to the assistance of subdued peoples," a declaration which once more affirmed the principles of the Troppau Protocol. In this lay the European significance of the Laibach conference, of which the activities had been mainly confined to Italy. The issue of the declaration without the signatures of the representatives of Great Britain and France proclaimed the disunion of the alliance, within which—to use Lord Stewart's words—there existed "a triple understanding which bound the parties to carry forward their own views in spite of any difference of opinion between them and the two great constitutional governments."

No separate history of the congress exists, but innumerable references are to be found in general histories and in memoirs, correspondence, &c., of the time. See Sir E. Hertslet, *Map of Europe* (London, 1875); Castlereagh, *Correspondence*; Metternich, *Memoirs*; N. Bianchi, *Storia documentata della diplomazia Europea in Italia* (8 vols., Turin, 1865–1872); Gentz's correspondence (see GENTZ, F. VON). Valuable unpublished correspondence is preserved at the Record Office in the volumes marked F. O., Austria, Lord Stewart, January to February 1821, and March to September 1821. (W. A. P.)

LAIDLAW, WILLIAM (1780–1845), friend and amanuensis of Sir Walter Scott, was born at Blackhouse, Selkirkshire, on the 19th of November 1780, the son of a sheep farmer. After an elementary education in Peebles he returned to work upon his father's farm. James Hogg, the shepherd poet, who was employed at Blackhouse for some years, became Laidlaw's friend and appreciative critic. Together they assisted Scott by supplying material for his *Border Minstrelsy*, and Laidlaw, after two failures as a farmer in Midlothian and Peebleshire, became Scott's steward at Abbotsford. He also acted as Scott's amanuensis at different times, taking down a large part of *The Bride of Lammermoor*, *The Legend of Montrose* and *Ivanhoe* from the author's dictation. He died at Contin near Dingwall, Ross-shire, on the 18th of May 1845. Of his poetry, little is known except *Lucy's Flittin'* in Hogg's *Forest Minstrel*.

LAING, ALEXANDER GORDON (1793–1826), Scottish explorer, the first European to reach Timbuktu, was born at Edinburgh on the 27th of December 1793. He was educated by his father, William Laing, a private teacher of classics, and at Edinburgh University. In 1811 he went to Barbados as clerk to his maternal uncle Colonel (afterwards General) Gabriel Gordon. Through General Sir George Beckwith, governor of Barbados, he obtained an ensigncy in the York Light Infantry. He was employed in the West Indies, and in 1822 was promoted to a company in the Royal African Corps. In that year, while with his regiment at Sierra Leone, he was sent by the governor, Sir Charles MacCarthy, to the Mandingo country, with the double object of opening up commerce and endeavouring to abolish the slave trade in that region. Later in the same year Laing visited Falaba, the capital of the Sulima country, and ascertained the source of the Rokell. He endeavoured to reach the source of the Niger, but was stopped by the natives. He was, however, enabled to fix it with approximate accuracy. He took an active part in the Ashanti War of 1823–24, and was sent home with the despatches containing the news of the death in action of Sir Charles MacCarthy. Henry, 3rd Earl Bathurst, then secretary for the colonies, instructed Captain Laing to undertake a journey, via Tripoli and Timbuktu, to further elucidate the hydrography of the Niger basin. Laing left England in February 1825, and at Tripoli on the 14th of July following he married Emma Warrington, daughter of the British consul. Two days later, leaving his bride behind, he started to cross the Sahara, being accompanied by a sheikh who was subsequently accused of planning his murder. Ghadames was reached, by an indirect route, in October 1825, and in December Laing was in the Tuat territory, where he was well received by the Tuareg. On the 10th of January 1826 he left Tuat, and made for Timbuktu across the desert of Tanezroft. Letters from him written in May and July following told of sufferings from fever and the plundering of his caravan by Tuareg, Laing being wounded in twenty-four places in the fighting. Another letter dated from Timbuktu on the 21st of September announced his arrival in that city on the preceding 18th of August, and the insecurity of his position owing to the hostility of the Fula chieftain Bello, then ruling the city. He added that he intended leaving Timbuktu in three days' time. No further news was received from the traveller. From native information it was ascertained that he left Timbuktu on the day he had planned and was murdered on the night of the 26th of September 1826. His papers were never recovered, though it is believed that they were secretly brought to Tripoli in 1828. In 1903 the French government placed a tablet bearing the name of the explorer and the date of his visit on the house occupied by him during his thirty-eight days' stay in Timbuktu.

While in England in 1824 Laing prepared a narrative of his earlier journeys, which was published in 1825 and entitled *Travels in the Timannee, Kooranko and Soolima Countries, in Western Africa*.

LAING, DAVID (1793–1878), Scottish antiquary, the son of William Laing, a bookseller in Edinburgh, was born in that city on the 20th of April 1793. Educated at the Canongate Grammar School, when fourteen he was apprenticed to his father. Shortly after the death of the latter in 1837, Laing was elected to the librarianship of the Signet Library, which post he retained till his death. Apart from an extraordinary general bibliographical knowledge, Laing was best known as a lifelong student of the literary and artistic history of Scotland. He published no original volumes, but contented himself with editing the works of others. Of these, the chief are—*Dunbar's Works* (2 vols., 1834), with a supplement added in 1865; *Robert Baillie's Letters and Journals* (3 vols., 1841–1842); *John Knox's Works* (6 vols., 1846–1864); *Poems and Fables of Robert Henryson* (1865); *Andrew of Wyntoun's Orygynale Cronykil of Scotland* (3 vols., 1872–1879); *Sir David Lyndsay's Poetical Works* (3 vols., 1879). Laing was for more than fifty years a member of the Society of Antiquaries of Scotland, and he contributed upwards of a hundred separate papers to their *Proceedings*. He was also for more than forty years secretary to the Bannatyne Club, many of the publications of which were edited by him. He was struck with paralysis in 1878 while in the Signet Library, and it is related that, on recovering consciousness, he looked about and asked if a proof of Wyntoun had been sent from the printers. He died a few days afterwards, on the 18th of October, in his eighty-sixth year. His library was sold by auction, and realized £16,137. To the university of Edinburgh he bequeathed his collection of MSS.

See the Biographical Memoir prefixed to *Select Remains of Ancient, Popular and Romance Poetry of Scotland*, edited by John Small (Edinburgh, 1885); also T. G. Stevenson, *Notices of David Laing with List of his Publications, &c.* (privately printed 1878).

LAING, MALCOLM (1762–1818), Scottish historian, son of Robert Laing, and elder brother of Samuel Laing the elder, was born on his paternal estate on the Mainland of Orkney. Having studied at the grammar school of Kirkwall and at Edinburgh University, he was called to the Scotch bar in 1785, but devoted his time mainly to historical studies. In 1793 he completed the sixth and last volume of Robert Henry's *History of Great Britain*, the portion which he wrote being in its strongly liberal tone at variance with the preceding part of the work; and in 1802 he published his *History of Scotland from the Union of the Crowns to the Union of the Kingdoms*, a work showing considerable research. Attached to the *History* was a dissertation on the Gowrie conspiracy, and another on the supposed authenticity of Ossian's poems. In another dissertation, prefixed to a second and corrected edition of the *History* published in 1804, Laing endeavoured to prove that Mary, queen of Scots, wrote the Casket Letters, and was partly responsible for the murder of Lord Darnley. In the same year he edited the *Life and Historie of King James VI.*, and in 1805 brought out in two volumes an edition of Ossian's poems. Laing, who was a friend of Charles James Fox, was member of parliament for Orkney and Shetland from 1807 to 1812. He died on the 6th of November 1818.

LAING, SAMUEL (1810–1897), British author and railway administrator, was born at Edinburgh on the 12th of December 1810. He was the nephew of Malcolm Laing, the historian of Scotland; and his father, Samuel Laing (1780–1868), was also a well-known author, whose books on Norway and Sweden attracted much attention. Samuel Laing the younger entered St John's College, Cambridge, in 1827, and after graduating as second wrangler and Smith's prizeman, was elected a fellow, and remained at Cambridge temporarily as a coach. He was called to the bar in 1837, and became private secretary to Mr Labouchere (afterwards Lord Taunton), the president of the Board of Trade. In 1842 he was made secretary to the railway department, and retained this post till 1847. He had by then become an authority on railway working, and had been a member of the Dalhousie Railway Commission; it was at his suggestion that the "parliamentary" rate of a penny a mile was instituted. In 1848 he was appointed chairman and managing director of the London, Brighton & South Coast Railway, and his business faculty showed itself in the largely increased prosperity of the line. He also became chairman (1852) of the Crystal Palace Company, but retired from both posts in 1855. In 1852 he entered parliament as a Liberal for Wick, and after losing his seat in 1857, was re-elected in 1859, in which year he was appointed financial secretary to the Treasury; in 1860 he was made finance minister in India. On returning from India, he was re-elected to parliament for Wick in 1865. He was defeated in 1868, but in 1873 he was returned for Orkney and Shetland, and retained his seat till 1885. Meanwhile he had been reappointed chairman of the Brighton line in 1867, and continued in that post till 1894, being generally recognized as an admirable administrator. He was also chairman of the Railway Debenture Trust and the Railway Share Trust. In later life he became well known as an author, his *Modern Science and Modern Thought* (1885), *Problems of the Future* (1889) and *Human Origins* (1892) being widely read, not only by reason of the writer's influential position, experience of affairs and clear style, but also through their popular and at the same time well-informed treatment of the scientific problems of the day. Laing died at Sydenham on the 6th of August 1897.

LAING'S [or LANG'S] **NEK,** a pass through the Drakensberg, South Africa, immediately north of Majuba (*q.v.*), at an elevation of 5400 to 6000 ft. It is the lowest part of a ridge which slopes from Majuba to the Buffalo river, and before the opening of the railway in 1891 the road over the nek was the main artery of communication between Durban and Pretoria. The railway pierces the nek by a tunnel 2213 ft. long. When the Boers rose in revolt in December 1880 they occupied Laing's Nek to oppose the entry of British reinforcements into the Transvaal. On the 28th of January 1881 a small British force endeavoured to drive the Boers from the pass, but was forced to retire.

LAIRD, MACGREGOR (1808–1861), Scottish merchant, pioneer of British trade on the Niger, was born at Greenock in 1808, the younger son of William Laird, founder of the Birkenhead firm of shipbuilders of that name. In 1831 Laird and certain Liverpool merchants formed a company for the commercial development of the Niger regions, the lower course of the Niger having been made known that year by Richard and John Lander. In 1832 the company despatched two small ships to the Niger, one, the "Alburkah," a paddle-wheel steamer of 55 tons designed by Laird, being the first iron vessel to make an ocean voyage. Macgregor Laird went with the expedition, which was led by Richard Lander and numbered forty-eight Europeans, of whom all but nine died from fever or, in the case of Lander, from wounds. Laird went up the Niger to the confluence of the Benue (then called the Shary or Tchadda), which he was the first white man to ascend. He did not go far up the river but formed an accurate idea as to its source and course. The expedition returned to Liverpool in 1834, Laird and Surgeon R. A. K. Oldfield being the only surviving officers besides Captain (then Lieut.) William Allen, R.N., who accompanied the expedition by order of the Admiralty to survey the river. Laird and Oldfield published in 1837 in two volumes the *Narrative of an Expedition into the Interior of Africa by the River Niger . . . in 1832, 1833, 1834.* Commercially the expedition had been unsuccessful, but Laird had gained experience invaluable to his successors. He never returned to Africa but henceforth devoted himself largely to the development of trade with West Africa and especially to the opening up of the countries now forming the British protectorates of Nigeria. One of his principal reasons for so doing was his belief that this method was the best means of stopping the slave trade and raising the social condition of the Africans. In 1854 he sent out at his own charges, but with the support of the British government, a small steamer, the "Pleiad," which under W. B. Baikie made so successful a voyage that Laird induced the government to sign contracts for annual trading trips by steamers specially built for navigation of the Niger and Benue. Various stations were founded on the Niger, and though government support was withdrawn after the death of Laird and Baikie, British traders continued to frequent the river, which Laird had opened up with little or no personal advantage. Laird's interests were not, however, wholly African. In 1837 he was one of the promoters of a company formed to run steamships between England and New York, and in 1838 the "Sirius," sent out by this company, was the first ship to cross the Atlantic from Europe entirely under steam. Laird died in London on the 9th of January 1861.

His elder brother, JOHN LAIRD (1805–1874), was one of the first to use iron in the construction of ships; in 1829 he made an iron lighter of 60 tons which was used on canals and lakes in Ireland; in 1834 he built the paddle steamer "John Randolph" for Savannah, U.S.A., stated to be the first iron ship seen in America. For the East India Company he built in 1839 the first iron vessel carrying guns and he was also the designer of the famous "Birkenhead." A Conservative in politics, he represented Birkenhead in the House of Commons from 1861 to his death.

LAÏS, the name of two Greek courtesans, generally distinguished as follows. (1) The elder, a native of Corinth, born *c.* 480 B.C., was famous for her greed and hardheartedness, which gained her the nickname of *Axinē* (the axe). Among her lovers were the philosophers Aristippus and Diogenes, and Eubatas (or Aristoteles) of Cyrene, a famous runner. In her old age she became a drunkard. Her grave was shown in the Craneion near Corinth, surmounted by a lioness tearing a ram. (2) The younger, daughter of Timandra the mistress of Alcibiades, born at Hyccara in Sicily *c.* 420 B.C., taken to Corinth during the Sicilian expedition. The painter Apelles, who saw her drawing water from the fountain of Peirene, was struck by her beauty, and took her as a model. Having followed a handsome Thessalian to his native land, she was slain in the temple of Aphrodite by women who were jealous of her beauty. Many anecdotes are told of a Laïs by Athenaeus, Aelian, Pausanias, and she forms the subject of many epigrams in the Greek Anthology; but, owing to the similarity of names, there is considerable uncertainty to whom they refer. The name itself, like Phryne, was used as a general term for a courtesan.

See F. Jacobs, *Vermischte Schriften*, iv. (1830).

LAISANT, CHARLES ANNE (1841–), French politician, was born at Nantes on the 1st of November 1841, and was educated at the École Polytechnique as a military engineer.

He defended the fort of Issy at the siege of Paris, and served in Corsica and in Algeria in 1873. In 1876 he resigned his commission to enter the Chamber as deputy for Nantes in the republican interest, and in 1879 he became director of the *Petit Parisien*. For alleged libel on General Courtot de Cissey in this paper he was heavily fined. In the Chamber he spoke chiefly on army questions; and was chairman of a commission appointed to consider army legislation, resigning in 1887 on the refusal of the Chamber to sanction the abolition of exemptions of any kind. He then became an adherent of the revisionist policy of General Boulanger and a member of the League of Patriots. He was elected Boulangist deputy for the 18th Parisian arrondissement in 1889. He did not seek re-election in 1893, but devoted himself thenceforward to mathematics, helping to make known in France the theories of Giusto Bellavitis. He was attached to the staff of the École Polytechnique, and in 1903–1904 was president of the French Association for the Advancement of Science.

In addition to his political pamphlets *Pourquoi et comment je suis Boulangiste* (1887) and *L'Anarchie bourgeoise* (1887), he published mathematical works, among them *Introduction à l'étude des quarternions* (1881) and *Théorie et applications des équipollences* (1887).

LAI-YANG, a city in the Chinese province of Shan-tung, in 37° N., 120° 55′ E., about the middle of the eastern peninsula, on the highway running south from Chi-fu to Kin-Kia or Tingtsu harbour. It is surrounded by well-kept walls of great antiquity, and its main streets are spanned by large *pailous* or monumental arches, some dating from the time of the emperor Tai-ting-ti of the Yuan dynasty (1324). There are extensive suburbs both to the north and south, and the total population is estimated at 50,000. The so-called Ailanthus silk produced by *Saturnia cynthia* is woven at Lai-yang into a strong fabric; and the manufacture of the peculiar kind of wax obtained from the la-shu or wax-tree insect is largely carried on in the vicinity.

LAKANAL, JOSEPH (1762–1845), French politician, was born at Serres (Ariège) on the 14th of July 1762. His name, originally Lacanal, was altered to distinguish him from his Royalist brothers. He joined one of the teaching congregations, and for fourteen years taught in their schools. When elected by his native department to the Convention in 1792 he was acting as vicar to his uncle Bernard Font (1723–1800), the constitutional bishop of Pamiers. In the Convention he held apart from the various party sections, although he voted for the death of Louis XVI. He rendered great service to the Revolution by his practical knowledge of education. He became a member of the Committee of Public Instruction early in 1793, and after carrying many useful decrees on the preservation of national monuments, on the military schools, on the reorganization of the Museum of Natural History and other matters, he brought forward on the 26th of June his *Projet d'éducation nationale* (printed at the Imprimerie Nationale), which proposed to lay the burden or primary education on the public funds, but to leave secondary education to private enterprise. Provision was also made for public festivals, and a central commission was to be entrusted with educational questions. The scheme, in the main the work of Sieyès, was refused by the Convention, who submitted the whole question to a special commission of six, which under the influence of Robespierre adopted a report by Michel le Peletier de Saint Fargeau shortly before his tragic death. Lakanal, who was a member of the commission, now began to work for the organization of higher education, and abandoning the principle of his *Projet* advocated the establishment of state-aided schools for primary, secondary and university education. In October 1793 he was sent by the Convention to the south-western departments and did not return to Paris until after the revolution of Thermidor. He now became president of the Education Committee and promptly abolished the system which had had Robespierre's support. He drew up schemes for departmental normal schools, for primary schools (reviving in substance the *Projet*) and central schools. He presently acquiesced in the supersession of his own system, but continued his educational reports after his election to the Council of the Five Hundred. In 1799 he was sent by the Directory to organize the defence of the four departments on the left bank of the Rhine threatened by invasion. Under the Consulate he resumed his professional work, and after Waterloo retired to America, where he became president of the university of Louisiana. He returned to France in 1834, and shortly afterwards, in spite of his advanced age, married a second time. He died in Paris on the 14th of February 1845; his widow survived till 1881. Lakanal was an original member of the Institute of France. He published in 1838 an *Exposé sommaire des travaux de Joseph Lakanal*.

His *éloge* at the Academy of Moral and Political Science, of which he was a member, was pronounced by the comte de Rémusat (February 16, 1845), and a *Notice historique* by F. A. M. Mignet was read on the 2nd of May 1857. See also notices by Émile Darnaud (Paris, 1874), "Marcus" (Paris, 1879), P. Legendre in *Hommes de la révolution* (Paris, 1882), E. Guillon, *Lakanal et l'instruction publique* (Paris, 1881). For details of the reports submitted by him to the government see M. Tourneux, "Histoire de l'instruction publique, actes et déliberations de la convention, &c." in *Bibliog. de l'hist. de Paris* (vol. iii., 1900); also A. Robert and G. Cougny, *Dictionnaire des parlementaires* (vol. ii., 1890).

LAKE, GERARD LAKE, 1ST VISCOUNT (1744–1808), British general, was born on the 27th of July 1744. He entered the foot guards in 1758, becoming lieutenant (captain in the army) 1762, captain (lieut.-colonel) in 1776, major 1784, and lieut.-colonel in 1792, by which time he was a general officer in the army. He served with his regiment in Germany in 1760–1762 and with a composite battalion in the Yorktown campaign of 1781. After this he was equerry to the prince of Wales, afterwards George IV. In 1790 he became a major-general, and in 1793 was appointed to command the Guards Brigade in the duke of York's army in Flanders. He was in command at the brilliant affair of Lincelles, on the 18th of August 1793, and served on the continent (except for a short time when seriously ill) until April 1794. He had now sold his lieut.-colonelcy in the guards, and had become colonel of the 53rd foot and governor of Limerick. In 1797 he was promoted lieut.-general. In the following year the Irish rebellion broke out. Lake, who was then serving in Ireland, succeeded Sir Ralph Abercromby in command of the troops in April 1798, issued a proclamation ordering the surrender of all arms by the civil population of Ulster, and on the 21st of June routed the rebels at Vinegar Hill (near Enniscorthy, Co. Wexford). He exercised great, but perhaps not unjustified, severity towards all rebels found in arms. Lord Cornwallis now assumed the chief command in Ireland, and in August sent Lake to oppose the French expedition which landed at Killala Bay. On the 29th of the same month Lake arrived at Castlebar, but only in time to witness the disgraceful rout of the troops under General Hely-Hutchinson (afterwards 2nd earl of Donoughmore); but he retrieved this disaster by compelling the surrender of the French at Ballinamuck, near Cloone, on the 8th of September. In 1799 Lake returned to England, and soon afterwards obtained the command in chief in India. He took over his duties at Calcutta in July 1801, and applied himself to the improvement of the Indian army, especially in the direction of making all arms, infantry, cavalry and artillery, more mobile and more manageable. In 1802 he was made a full general.

On the outbreak of war with the Mahratta confederacy in 1803 General Lake took the field against Sindhia, and within two months defeated the Mahrattas at Coel, stormed Aligahr, took Delhi and Agra, and won the great victory of Laswari (November 1st, 1803), where the power of Sindhia was completely broken, with the loss of thirty-one disciplined battalions, trained and officered by Frenchmen, and 426 pieces of ordnance. This defeat, followed a few days later by Major-General Arthur Wellesley's victory at Argaum, compelled Sindhia to come to terms, and a treaty with him was signed in December 1803. Operations were, however, continued against his confederate, Holkar, who, on the 17th of November 1804, was defeated by Lake at Farrukhabad. But the fortress of Bhurtpore held out against four assaults early in 1805, and Cornwallis, who succeeded Wellesley as governor-general in July of that year—superseding Lake at the same time as commander-in-chief—determined to put an end to the war. But after the death of Cornwallis in October of the same year, Lake pursued Holkar into the Punjab and compelled him to surrender at Amritsar in December 1805. Wellesley in a despatch attributed much of the success of the war to Lake's "matchless energy, ability and valour." For his services Lake received the thanks of parliament, and was rewarded by a peerage in September 1804. At the conclusion of the war he returned to England, and in 1807 he was created a viscount. He represented Aylesbury in the House of Commons from 1790 to 1802, and he also was brought into the Irish parliament by the government as member for Armagh in 1799 to vote for the Union. He died in London on the 20th of February 1808.

See H. Pearse, *Memoir of the Life and Services of Viscount Lake* (London, 1908); G. B. Malleson, *Decisive Battles of India* (1883); J. Grant Duff, *History of the Mahrattas* (1873); short memoir in *From Cromwell to Wellington*, ed. Spenser Wilkinson.

LAKE. Professor Forel of Switzerland, the founder of the science of limnology (Gr. λίμνη, a lake), defines a lake (Lat. *lacus*) as a mass of still water situated in a depression of the ground, without direct communication with the sea. The term is sometimes applied to widened parts of rivers, and sometimes to bodies of water which lie along sea-coasts, even at sea-level and in direct communication with the sea. The terms *pond*, *tarn*, *loch* and *mere* are applied to smaller lakes according to size and position. Some lakes are so large that an observer cannot see low objects situated on the opposite shore, owing to the lake-surface assuming the general curvature of the earth's surface. Lakes are nearly universally distributed, but are more abundant in high than in low latitudes. They are abundant in mountainous regions, especially in those which have been recently glaciated. They are frequent along rivers which have low gradients and wide flats, where they are clearly connected with the changing channel of the river. Low lands in proximity to the sea, especially in wet climates, have numerous lakes, as, for instance, Florida. Lakes may be either fresh or salt, according to the nature of the climate, some being much more salt than the sea itself. They occur in all altitudes; Lake Titicaca in South America is 12,500 ft. above sea-level, and Yellowstone Lake in the United States is 7741 ft. above the sea; on the other hand, the surface of the Caspian Sea is 86 ft., the Sea of Tiberias 682 ft. and the Dead Sea 1292 ft. below the level of the ocean.

The primary source of lake water is atmospheric precipitation, which may reach the lakes through rain, melting ice and snow, springs, rivers and immediate run-off from the land-surfaces. The surface of the earth, with which we are directly in touch, is composed of lithosphere, hydrosphere and atmosphere, and these interpenetrate. Lakes, rivers, the water-vapour of the atmosphere and the water of hydration of the lithosphere, must all be regarded as outlying portions of the hydrosphere, which is chiefly made up of the great oceans. Lakes may be compared to oceanic islands. Just as an oceanic island presents many peculiarities in its rocks, soil, fauna and flora, due to its isolation from the larger terrestrial masses, so does a lake present peculiarities and an individuality in its physical, chemical and biological features, owing to its position and separation from the waters of the great oceans.

Origin of Lakes.—From the geological point of view, lakes may be arranged into three groups: (A) Rock-Basins, (B) Barrier-Basins and (C) Organic Basins.

A. ROCK-BASINS have been formed in several ways:—

1. *By slow movements of the earth's crust*, during the formation of mountains; the Lake of Geneva in Switzerland and the Lake of Annecy in France are due to the subsidence or warping of part of the Alps; on the other hand, Lakes Stefanie, Rudolf, Albert Nyanza, Tanganyika and Nyasa in Africa, and the Dead Sea in Asia Minor, are all believed to lie in a great rift or sunken valley.

2. *By Volcanic Agencies.*—Crater-lakes formed on the sites of dormant volcanoes may be from a few yards to several miles in width, have generally a circular form, and are often without visible outlet. Excellent examples of such lakes are to be seen in the province of Rome (Italy) and in the central plateau of France, where M. Delebecque found the Lake of Issarlès 329 ft. in depth. The most splendid crater-lake is found on the summit of the Cascade range of Southern Oregon (U.S.A.). This lake is 2000 ft. in depth.

3. *By Subsidence due to Subterranean Channels and Caves in Limestone Rocks.*—When the roofs of great limestone caves or underground lakes fall in, they produce at the surface what are called *limestone sinks*. Lakes similar to these are also found in regions abounding in rock-salt deposits; the Jura range offers many such lakes.

4. *By Glacier Erosion.*—A. C. Ramsay has shown that innumerable lakes of the northern hemisphere do not lie in fissures produced by underground disturbances, nor in areas of subsidence, nor in synclinal folds of strata, but are the results of glacial erosion. Many flat alluvial plains above gorges in Switzerland, as well as in the Highlands of Scotland, were, without doubt, what Sir Archibald Geikie calls glen-lakes, or true rock-basins, which have been filled up by sand and mud brought into them by their tributary streams.

B. BARRIER-BASINS.—These may be due to the following causes:—

1. *A landslip* often occurs in mountainous regions, where strata, dipping towards the valley, rest on soft layers; the hard rocks slip into the valley after heavy rains, damming back the drainage, which then forms a barrier-basin. Many small lakes high up in the Alps and Pyrenees are formed by a river being dammed back in this way.

2. *By a Glacier.*—In Alaska, in Scandinavia and in the Alps a glacier often bars the mouth of a tributary valley, the stream flowing therein is dammed back, and a lake is thus formed. The best-known lake of this kind is the Märjelen Lake in the Alps, near the great Aletsch Glacier. Lake Castain in Alaska is barred by the Malaspina Glacier; it is 2 or 3 m. long and 1 m. in width when at its highest level; it discharges through a tunnel 9 m. in length beneath the ice-sheet. The famous parallel roads of Glen Roy in Scotland are successive terraces formed along the shores of a glacial lake during the waning glacial epoch. Lake Agassiz, which during the glacial period occupied the valley of the Red River, and of which the present Lake Winnipeg is a remnant, was formed by an ice-dam along the margin of two great ice-sheets. It is estimated to have been 700 m. in length, and to have covered an area of 110,000 sq. m., thus exceeding the total area of the five great North American lakes: Superior (31,200), Michigan (22,450), Huron with Georgian Bay (23,800), Erie (9960) and Ontario (7240).

3. *By the Lateral Moraine of an Actual Glacier.*—These lakes sometimes occur in the Alps of Central Europe and in the Pyrenees Mountains.

4. *By the Frontal Moraine of an Ancient Glacier.*—The barrier in this case consists of the last moraine left by the retreating glacier. Such lakes are abundant in the northern hemisphere, especially in Scotland and the Alps.

5. *By Irregular Deposition of Glacial Drift.*—After the retreat of continental glaciers great masses of glacial drift are left on the land-surfaces, but, on account of the manner in which these masses were deposited, they abound in depressions that become filled with water. Often these lakes are without visible outlets, the water frequently percolating through the glacial drift. These lakes are so numerous in the north-eastern part of North America that one can trace the southern boundary of the great ice-sheet by following the southern limit of the lake-strewn region, where lakes may be counted by tens of thousands, varying from the size of a tarn to that of the great Laurentian lakes above mentioned.

6. *By Sand drifted into Dunes.*—It is a well-known fact that sand may travel across a country for several miles in the direction of the prevailing winds. When these sand-dunes obstruct a valley a lake may be formed. A good example of such a lake is found in Moses Lake in the state of Washington; but the sand-dunes may also fill up or submerge river-valleys and lakes, for instance, in the Sahara, where the Shotts are like vast lakes in the early morning, and in the afternoon, when much evaporation has taken place, like vast plains of white salt.

7. *By Alluvial Matter deposited by Lateral Streams.*—If the current of a main river be not powerful enough to sweep away detrital matter brought down by a lateral stream, a dam is formed causing a lake. These lakes are frequently met with in the narrow valleys of the Highlands of Scotland.

8. *By Flows of Lava.*—Lakes of this kind are met with in volcanic regions.

C. ORGANIC BASINS.—In the vast tundras that skirt the Arctic Ocean in both the old and the new world, a great number of frozen ponds and lakes are met with, surrounded by banks of vegetation. Snow-banks are generally accumulated every season at the same spots. During summer the growth of the tundra vegetation is very rapid, and the snow-drifts that last longest are surrounded by luxuriant vegetation. When such accumulations of snow finally melt, the vegetation on the place they occupied is much less than along their borders. Year after year such places become more and more depressed, comparatively to the general surface, where vegetable growth is more abundant, and thus give origin to lakes.

It is well known that in coral-reef regions small bays are cut off from the ocean by the growth of corals, and thus ultimately fresh-water basins are formed.

Life History of Lakes.—From the time of its formation a lake is destined to disappear. The historical period has not been long enough to enable man to have watched the birth, life and death of any single lake of considerable size, still by studying the various stages of development a fairly good idea of the course they run can be obtained.

In humid regions two processes tend to the extinction of a lake, viz. the deposition of detrital matter in the lake, and the lowering of the lake by the cutting action of the outlet stream on the barrier. These outgoing streams, however, being very pure and clear, all detrital matter having been deposited in the lake, have less eroding power than inflowing streams. One of the best examples of the action of the filling-up process is presented by Lochs Doine, Voil and Lubnaig in the Callander district of Scotland. In post-glacial times these three lochs formed, without doubt, one continuous sheet of water, which subsequently became divided into three different basins by the deposition of sediment. Loch Doine has been separated from Loch Voil by alluvial cones laid down by two opposite streams. At the head of Loch Doine there is an alluvial flat that stretches for 1½ m., formed by the Lochlarig river and its tributaries. The long stretch of alluvium that separates Loch Voil from Loch Lubnaig has been laid down by Calair Burn in Glen Buckie, by the Kirkton Burn at Balquhidder, and by various streams on both sides of Strathyre. Loch Lubnaig once extended to a point ¾ m. beyond its present outlet, the level of the loch being lowered about 20 ft. by the denuding action of the river Leny on its rocky barrier.

In arid regions, where the rainfall is often less than 10 ins. in the year, the action of winds in the transport of sand and dust is more in evidence than that of rivers, and the effects of evaporation greater than of precipitation. Salt and bitter lakes prevail in these regions. Many salt lakes, such as the Dead Sea and the Great Salt Lake, are descended from fresh-water ancestors, while others, like the Caspian and Aral Seas, are isolated portions of the ocean. Lakes of the first group have usually become salt through a decrease in the rainfall of the region in which they occur. The water begins to get salt when the evaporation from the lake exceeds the inflow. The inflowing waters bring in a small amount of saline and alkaline matter, which becomes more and more concentrated as the evaporation increases. In lakes of the second group the waters were salt at the outset. If inflow exceeds evaporation they become fresher, and may ultimately become quite fresh. If the evaporation exceeds the inflow they diminish in size, and their waters become more and more salt and bitter. The first lake which occupied the basin of the Great Salt Lake of Utah appears to have been fresh, then with a change of climate to have become a salt lake. Another change of climate taking place, the level of the lake rose until it overflowed, the outlet being by the Snake river; the lake then became fresh. This expanded lake has been called Lake Bonneville, which covered an area of about 17,000 sq. m. Another change of climate in the direction of aridity reduced the level of the lake below the level of the outlet, the waters became gradually salt, and the former great fresh-water lake has been reduced gradually to the relatively small Great Salt Lake of the present day. The sites of extinct salt lakes yield salt in commercial quantities.

The Water of Lakes.—(*a*) *Composition.*—It is interesting to compare the quantity of solid matter in, and the chemical composition of, the water of fresh and salt lakes:—

	Total Solids by Evaporation expressed in Grams per Litre.
Great Salt Lake (Russell)	238·12
Lake of Geneva (Delebecque)	0·1775

The following analysis of a sample of the water of the Great Salt Lake (Utah, U.S.A.) is given by I. C. Russell:—

	Grams per Litre.	Probable Combination.	
Na . . .	75·825	NaCl . . .	192·860
K . . .	3·925	K_2SO_4 . . .	8·756
Li . . .	0·021	Li_2SO_4 . .	0·166
Mg . . .	4·844	$MgCl_2$ . . .	15·044
Ca . . .	2·424	$MgSO_4$ . .	5·216
Cl . . .	128·278	$CaSO_4$ . .	8·240
SO_3 . . .	12·522	$Fe_2O_3+Al_2O_3$.	0·004
O in sulphates .	2·494	SiO_2 . . .	0·018
$Fe_2O_3+Al_2O_3$.	0·004	Surplus SO_3 .	0·051
SiO_2 . . .	0·018		
Bo_2O_3 . . .	trace		
Br_3 . .	faint trace		

The following analyses of the waters of other salt lakes are given by Mr J. Y. Buchanan (Art. "Lake," *Ency. Brit.*, 9th Ed.), an analysis of sea-water from the Suez Canal being added for comparison:—

	Koko-nor.	Aral Sea.	Caspian Sea.		Urmia Sea.	Dead Sea.	Lake Van.	Suez Canal, Ismailia.
			Open.	Karabugas.				
Specific Gravity	1·00907		1·01106	1·26217	1·17500	..	1·01800	1·03898
Percentage of Salt . . .	1·11	1·09	1·30	28·5	22·28	22·13	1·73	5·1
Name of Salt.	Grams of Salt per 1000 Grams of Water.							
Bicarbonate of Lime . . .	0·6804	0·2185	0·1123	..	..	..	..	0·0072
,, Iron . . .	0·0053	..	0·0014	..	..	..	..	0·0069
,, Magnesia . .	0·6598	..	..	..	..	..	0·4031	..
Carbonate of Soda . .	..	..	..	..	..	..	5·3976	..
Phosphate of Lime . . .	0·0028	..	0·0021	..	..	..	..	0·0029
Sulphate of Lime . . .	..	1·3499	0·9004	..	0·7570	0·8600	..	1·8593
,, Magnesia . .	0·9324	2·9799	3·0855	61·9350	13·5460	..	0·2595	3·2231
,, Soda . . .	1·7241	..	..	..	..	..	2·5673	..
,, Potash . . .	..	..	..	..	..	..	0·5363	..
Chloride of Sodium . . .	6·9008	6·2356	8·1163	83·2840	192·4100	76·5000	8·0500	40·4336
,, Potassium . .	0·2209	0·1145	0·1339	9·9560	..	23·3000	..	0·6231
,, Rubidium . .	0·0055	..	0·0034	0·2510	..	..	..	0·0265
,, Magnesium . .	..	0·0003	0·6115	129·3770	15·4610	95·6000	..	4·7632
,, Calcium . . .	..	..	..	..	0·5990	22·4500	..	..
Bromide of Magnesium . .	0·0045	..	0·0081	0·1930	..	2·3100	..	0·0779
Silica	0·0098	..	0·0024	..	..	0·2400	0·0761	0·0027
Total Solid Matter	11·1463	10·8987	12·9773	284·9960	222·7730	221·2600	17·2899	51·0264

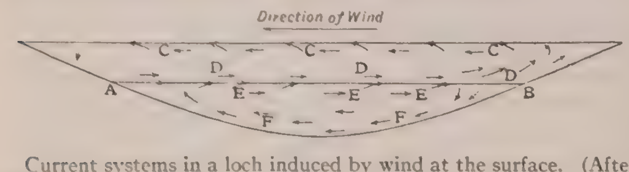
This table embraces examples of several types of salt lakes. In the Koko-nor, Aral and open Caspian Seas we have examples of the moderately salt, non-saturated waters. In the Karabugas, a branch gulf of the Caspian, Urmia and the Dead Seas we have examples of saturated waters containing principally chlorides. Lake Van is an example of the alkaline seas which also occur in Egypt, Hungary and other countries. Their peculiarity consists in the quantity of carbonate of soda dissolved in their waters, which is collected by the inhabitants for domestic and commercial purposes.

The following analyses by Dr Bourcart give an idea of the chemical composition of the water of fresh-water lakes in grams per litre:—

	Tanay.	Bleu.	Märjelen.	St Gothard.
SiO_2	0·003	0·0042	0·0014	0·0008
$Fe_2O_3+Al_2O_3$.	0·0012	0·0006	0·0008	trace
NaCl	0·0017	..	..	..
Na_2SO_4 . . .	0·0011	0·0038	0·0031	0·00085
Na_2CO_3 . . .	..	..	..	0·00128
K_2SO_4 . . .	0·0021	0·0028	0·0044	..
K_2CO_3 . . .	..	..	0·0003	0·00130
$MgSO_4$ . . .	0·006	0·0305	..	..
$MgCO_3$ . . .	0·0046	0·0158	0·0008	0·00015
$CaSO_4$ . . .	..	..	..	..
$CaCO_3$ . . .	0·107	0·1189	0·0061	0·00178
MnO	0·001	..	..	..

(*b*) *Movements and Temperature of Lake-Waters.*—(1) In addition to the rise and fall of the surface-level of lakes due to rainfall and evaporation, there is a transference of water due to the action of wind which results in raising the level at the end to which the wind is blowing. In addition to the well-known progressive waves there are also stationary waves or "seiches" which are less apparent. A seiche is a standing oscillation of a lake, usually in the direction of the longest diameter, but occasionally transverse. In a motion of this kind every particle of the water of the lake oscillates synchronously with every other, the periods and phases being the same for all, and the orbits similar but of different dimensions and not similarly situated. Seiches were first discovered in 1730 by Fatio de Duillier, a well-known Swiss engineer, and were first systematically studied by Professor Forel in the Lake of Geneva. Large numbers of observations have been made by various observers in lakes in many parts of the world. Henry observed a fifteen-hour seiche in Lake Erie, which is 396 kilometres in length, and Endros recorded a seiche of fourteen seconds in a small pond only 111 metres in length. Although these waves cause periodical rising and falling of the water-level, they are generally inconspicuous, and can only be recorded by a registering apparatus, a limnograph. Standard work has been done in the study of seiches by the Lake Survey of Scotland under the immediate direction of Professor Chrystal, who has given much attention to the hydrodynamical theories of the phenomenon. Seiches are probably due to several factors acting together or separately, such as sudden variations of atmospheric pressure, changes in the strength or direction of the wind. Explanations such as lunar attraction and earthquakes have been shown to be untenable as a general cause of seiches.

2. *The water temperature of lakes* may change with the season from place to place and from layer to layer; these changes are brought about by insolation, by terrestrial radiation, by contract with the atmosphere, by rain, by the inflow of rivers and other factors, but the most important of all these are insolation and terrestrial radiation. Fresh water has its greatest density at a temperature of 39·2° F., so that water both above and below this temperature floats to the surface, and this physical fact largely determines the water stratification in a lake. In salt lakes the maximum density point is much lower, and does not come into play. In the tropical type of fresh-water lake the temperature is always higher than 39° F., and the temperature decreases as the depth increases. In the polar type the temperature is always lower than 39° F., and the temperature increases from the surface downwards. In the temperate type the distribution of temperature in winter resembles the polar type, and in summer the tropical type. In Loch Ness and other deep Scottish lochs the temperature in March and April is 41° to 42° F., and is then nearly uniform from top to bottom. As the sun comes north, and the mean air temperature begins to be higher than the surface temperature, the surface waters gain heat, and this heating goes on till the month of August. About this time the mean air temperature falls below the surface temperature, and the loch begins to part with its heat by radiation and conduction. The temperature of the deeper layers beyond 300 ft. is only slightly affected throughout the whole year. In the autumn the waters of the loch are divided into two compartments, the upper having a temperature from 49° to 55° F., the deeper a temperature from 41° to 45°. Between these lies the discontinuity-layer (*Sprungschicht* of the Germans), where there is a rapid fall of temperature within a very short distance. In August this discontinuity-layer is well marked, and lies at a depth of about 150 ft.; as the season advances this layer gradually sinks deeper, and the layer of uniform temperature above it increases in depth, and slowly loses heat, until finally the whole loch assumes a nearly uniform temperature. Many years ago Sir John Murray showed by means of temperature observations the manner in which large bodies of water were transferred from the windward to the leeward end of a loch, and subsequent observations seem to show that, before the discontinuity-layer makes its appearance, the currents produced by winds are distributed through the whole mass of the loch. When, however, this layer appears, the loch is divided into two current-systems, as shown in the following diagram:—



Current systems in a loch induced by wind at the surface. (After Wedderburn.)

AB, Discontinuity layer.
C, Surface current.
D, Primary return current.
E, Secondary surface current.
F, Secondary return current.

Another effect of the separation of the loch into two compartments by the surface of discontinuity is to render possible the temperature-seiche. The surface-current produced by the wind transfers a large quantity of warm water to the lee end of the loch, with the result that the surface of discontinuity is deeper at the lee than at the windward end. When the wind ceases, a temperature-seiche is started, just as an ordinary seiche is started in a basin of water which has been tilted. This temperature-seiche has been studied experimentally and rendered visible by superimposing a layer of paraffin on a layer of water.

Wedderburn estimates the quantity of heat that enters Loch Ness and is given out again during the year to be approximately sufficient to raise about 30,000 million gallons of water from freezing-point to boiling-point. Lakes thus modify the climate of the region in which they occur, both by increasing its humidity and by decreasing its range of temperature. They cool and moisten the atmosphere by evaporation during summer, and when they freeze in winter a vast amount of latent heat is liberated, and moderates the fall of temperature.

Lakes act as reservoirs for water, and so tend to restrain floods, and to promote regularity of flow. They become sources of mechanical power, and as their waters are purified by allowing the sediment which enters them to settle, they become valuable sources of water-supply for towns and cities. In temperate regions small and shallow lakes are likely to freeze all over in winter, but deep lakes in similar regions do not generally freeze, owing to the fact that the low temperature of the air does not continue long enough to cool down the entire body of water to the maximum density point. Deep lakes are thus the best sources of water-supply for cities, for in summer they supply relatively cool water and in winter relatively warm water. Besides, the number of organisms in deep lakes is less than in small shallow lakes, in which there is a much higher temperature in summer, and consequently much greater organic growth. The deposits, which are formed along the shores and on the floors of lakes, depend on the geological structure and nature of the adjacent shores.

Biology.—Compared with the waters of the ocean those of lakes may safely be said to contain relatively few animals and plants. Whole groups of organisms—the Echinoderms, for instance—are unrepresented. In the oceans there is a much greater uniformity in the physical and chemical conditions than obtains in lakes. In lakes the temperature varies widely. To underground lakes light does not penetrate, and in these some of the organisms may be blind, for example, the blind crayfish (*Cambarus pellucidus*) and the blind fish (*Amblyopsis spelaeus*) of the Kentucky caves. The majority of lakes are fresh, while some are so salt that no organisms have been found in them. The peaty matter in other lakes is so abundant that light does not penetrate to any great depth, and the humic acids in solution prevent the development of some species. Indeed, every lake has an individuality of its own, depending upon climate, size, nature of the bottom, chemical composition and connexion with other lakes. While the ocean contains many families and genera not represented in lakes, almost every genus in lakes is represented in the ocean.

The vertebrates, insects and flowering plants inhabiting lakes vary much according to latitude, and are comparatively well known to zoologists and botanists. The micro-fauna and flora have only recently been studied in detail, and we cannot yet be said to know much about tropical lakes in this respect. Mr James Murray, who has studied the Scottish lakes, records in over 400 Scottish lochs 724 species (the fauna including 447 species, all invertebrates, and the flora comprising 277 species) belonging to the following groups; the list must not be regarded as in any way complete:—

Fauna.		*Flora.*	
Mollusca	7 species	Phanerogamia	65 species
Hydrachnida	17 ,,	Equisetaceae	1 ,,
Tardigrada	30 ,,	Selaginellaceae	1 ,,
Insecta	7 ,,	Characeae	6 ,,
Crustacea	78 ,,	Musci	18 ,,
Bryozoa	7 ,,	Hepaticae	2 ,,
Worms	25 ,,	Florideae	2 ,,
Rotifera	181 ,,	Chlorophyceae	142 ,,
Gastrotricha	2 ,,	Bacillariaceae	26 ,,
Coelenterata	1 ,,	Myxophyceae	10 ,,
Porifera	1 ,,	Peridiniaceae	4 ,,
Protozoa	91 ,,		
	447 ,,		277 ,,

These organisms are found along the shores, in the deep waters, and in the surface waters of the lakes.

The *littoral region* is the most populous part of lakes; the existence of a rooted vegetation is only possible there, and this in turn supports a rich littoral fauna. The greater heat of the water along the margins also favours growth. The great majority of the species in Scottish lochs are met with in this region. Insect larvae of many kinds are found under stones or among weeds. Most of the Cladocera, and the

Copepoda of the genus *Cyclops*, and the Harpacticidae are only found in this region. Water-mites, nearly all the Rotifers, Gastrotricha, Tardigrada and Molluscs are found here, and Rhizopods are abundant. A large number of the littoral species in Loch Ness extends down to a depth of about 300 ft.

The abyssal region, in Scottish lochs, lies, as a rule, deeper than 300 ft., and in this deep region a well-marked association of animals appears in the muds on the bottom, but none of them are peculiar to it: they all extend into the littoral zone, from which they were originally derived. In Loch Ness the following sparse population was recorded:—

1 Mollusc:	*Pisidium pusillum* (Gmel).
3 Crustacea:	*Cyclops viridis*, Jurine. *Candona candida* (Müll). *Cypria ophthalmica*, Jurine.
3 Worms:	*Stylodrilus gabreteae*, Vejd. Oligochaete, not determined. *Automolos morgiensis* (Du Plessis).
1 Insect:	*Chironomus* (larva).
Infusoria:	Several, ectoparasites on *Pisidium* and *Cyclops*, not determined.

In addition, the following were found casually at great depths in Loch Ness: *Hydra*, *Limnaea peregra*, *Proales daphnicola* and *Lynceus affinis*.

The pelagic region of the Scottish lakes is occupied by numerous microscopic organisms, belonging to the Zooplankton and Phytoplankton. Of the former group 30 species belonging to the Crustacea, Rotifera and Protozoa were recorded in Loch Ness. Belonging to the second group 150 species were recorded, of which 120 were Desmids. Some of these species of plankton organisms are almost universal in the Scottish lochs, while others are quite local. Some of the species occur all the year through, while others have only been recorded in summer or in winter. The great development of Algae in the surface waters, called "flowering of the water" (*Wasserblüthe*), was observed in August in Loch Lomond; a distinct "flowering," due to Chlorophyceae, has been observed in shallow lochs as early as July. It is most common in August and September, but has also been observed in winter.

The plankton animals which are dominant or common, both over Scotland and the rest of Europe, are:—

Diaptomus gracilis.
Daphnia hyalina.
Diaphanosoma brachyurum.
Leptodora kindtii.
Conochilus unicornis.
Asplanchna priodonta.
Polyarthra platyptera.
Anuraea cochlearis.
Notholca longispina.
Ceratium hirundinella.
Asterionella.

All of these, according to Dr Lund, belong to the general plankton association of the European plain, or are even cosmopolitan.

The Scottish plankton on the whole differs from the plankton of the central European plateau, and from the cosmopolitan fresh-water plankton, in the extraordinary richness of the Phytoplankton in species of Desmids, in the conspicuous arctic element among the Crustacea, in the absence or comparative rarity of the species commonest in the general European plankton. Another peculiarity is the local distribution of some of the Crustacea and many of the Desmids.

The derivation of the whole lacustrine population of the Scottish lochs does not seem to present any difficulty. The abyssal forms have been traced to the littoral zone without any perceptible modifications. The plankton organisms are a mingling of European and arctic species. The cosmopolitan species may enter the lochs by ordinary migration. It is probable that if the whole plankton could be annihilated, it would be replaced by ordinary migration within a few years. The eggs and spores of many species can be dried up without injury, and may be carried through the air as dust from one lake to another; others, which would not bear desiccation, might be carried in mud adhering to the feet of aquatic birds and in various other ways. The arctic species may be survivors from a period when arctic conditions prevailed over a great part of Europe. What are known as "relicts" of a marine fauna have not been found in the Scottish fresh-water lochs.

It is somewhat remarkable that none of the organisms living in fresh-water lochs has been observed to exhibit the phenomenon of phosphorescence, although similar organisms in the salt-water lochs a few miles distant exhibit brilliant phosphorescence. At similar depths in the sea-lochs there is usually a great abundance of life when compared with that found in fresh-water lochs.

Length, Depth, Area and Volume of Lakes.—In the following table will be found the length, depth, area and volume of some of the principal lakes of the world.[1] Sir John Murray estimates the volume of water in the 560 Scottish lochs recently surveyed at 7 cub. m., and the approximate volume of water in all the lakes of the world at about 2000 cub. m., so that this last number is but a small fraction of the volume of the ocean, which he previously estimated at 324 million cub. m. It may be recalled that the total rainfall on the land of the globe is estimated at 29,350 cub. m., and the total discharge from the rivers of the globe at 6524 cub. m.

British Lakes

	Length in Miles.	Depth in Feet.		Area in sq. m.	Volume in million cub. ft.
I. *England*—		Max.	Mean.		
Windermere	10·50	219	78·5	5·69	12,250
Ullswater	7·35	205	83	3·44	7,870
Wastwater	3·00	258	134·5	1·12	4,128
Coniston Water	5·41	184	79	1·89	4,000
Crummock Water	2·50	144	87·5	0·97	2,343
Ennerdale Water	2·40	148	62	1·12	1,978
Bassenthwaite Water	3·83	70	18	2·06	1,023
Derwentwater	2·87	72	18	2·06	1,010
Haweswater	2·33	103	39·5	0·54	589
Buttermere	1·26	94	54·5	0·36	537
II. *Wales*—					
Llyn Cawlyd	1·62	222	109·1	0·18	941
Llyn Cwellyn	1·20	122	74·1	0·35	713
Llyn Padarn	2·00	94	52·4	0·43	632
Llyn Llydaw	1·11	190	77·4	0·19	409
Llyn Peris	1·10	114	63·9	0·19	344
Llyn Dulyn	0·31	189	104·2	0·05	156
III. *Scotland*—					
Ness	24·23	754	433·02	21·78	263,162
Lomond	22·64	623	121·29	27·45	92,805
Morar	11·68	1017	284·00	10·30	81,482
Tay	14·55	508	199·08	10·19	56,550
Awe	25·47	307	104·95	14·85	43,451
Maree	13·46	367	125·30	11·03	38,539
Lochy	9·78	531	228·95	5·91	37,726
Rannoch	9·70	440	167·46	7·37	34,387
Shiel	17·40	420	132·73	7·56	27,986
Arkaig	12·00	359	152·71	6·24	26,573
Earn	6·46	287	137·83	3·91	14,421
Treig	5·10	436	207·37	2·41	13,907
Shin	17·22	162	51·04	8·70	12,380
Fannich	6·92	282	108·76	3·60	10,920
Assynt	6·36	282	101·10	3·10	8,731
Quoich	6·95	281	104·60	2·86	8,345
Glass	4·03	365	159·07	1·86	8,265
Fionn (Carnmore)	5·76	144	57·79	3·52	5,667
Laggan	7·04	174	67·68	2·97	5,601
Loyal	4·46	217	65·21	2·55	4,628
IV. *Ireland*—					
Neagh	17	102	40	153	161,000
Erne (Lower)	24	226	43	43	62,000
Erne (Upper)	13	89	10	15	5,000
Corrib	27	152	30	68	59,000
Mask	10	191	52	35	55,000
Derg	24	119	30	49	47,000

European Continental Lakes

	Length in Miles.	Depth in Feet.		Area in sq. m.	Volume in million cub. ft.
		Max.	Mean.		
Ladoga	125	732	300	7000	43,200,000
Onega	145	740	200	3800	21,000,000
Vener	93	292	108	2149	6,357,000
Geneva	45	1015	506	225	3,175,000
Vetter	68	413	128	733	2,543,000
Mjösen	57	1483	. .	139	2,882,000
Garda	38	1124	446	143	1,766,000
Constance	42	827	295	208	1,711,000
Ochrida	19	942	479	105	1,391,000
Maggiore	42	1220	574	82	1,310,000
Como	30	1345	513	56	794,000
Hornafvan	7	1391	253	93	777,000

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[1] Divergence between certain of these figures and those quoted elsewhere in this work may be accounted for by the slightly different results arrived at by various authorities.

AFRICAN LAKES

	Length in Miles.	Depth in Feet.		Area in sq. m.	Volume in million cub. ft.
		Max.	Mean.		
Victoria Nyanza	200	240	. .	26,200	5,800,000
Nyasa . . .	350	2580	. .	14,200	396,000,000
Tanganyika . .	420	2100	. .	12,700	283,000,000

ASIATIC LAKES

	Length in Miles.	Depth in Feet.		Area in sq. m.	Volume in million cub. ft.
		Max.	Mean.		
Aral . . .	265	222	52	24,400	43,600,000
Baikal . . .	330	5413	. .	11,580	274,000,000
Balkash . . .	323	33	. .	7,000	4,880,000
Urmia . . .	80	50	15	1,750	732,000

AMERICAN LAKES

	Length in Miles.	Depth in Feet.		Area in sq. m.	Volume in million cub. ft.
		Max.	Mean.		
Superior . . .	412	1008	475	31,200	413,000,000
Huron . . .	263	730	250	23,800	166,000,000
Michigan . .	335	870	325	22,450	203,000,000
Erie	240	210	70	9,960	19,500,000
Ontario . . .	190	738	300	7,240	61,000,000
Titicaca . . .	120	924	347	3,200	30,900,000

NEW ZEALAND LAKES

	Length in Miles	Depth in Feet.		Area in sq. m.	Volume in million cub. ft.
		Max.	Mean.		
Taupo . . .	25	534	367	238·0	2,435,000
Wakatipu . .	49	1242	707	112·3	2,205,000
Manapouri . .	19	1458	328	56·0	512,000
Rotorua . . .	7·5	120	39	31·6	34,000
Waikarimoana .	7·25	846	397	14·7	166,000
Wairaumoana .	5·25	375	175	6·1	30,000
Rotoiti . . .	10·7	230	69	14·2	27,000

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LAKE CHARLES, a city of Louisiana, U.S.A., capital of Calcasieu Parish, 30 m. from the Gulf of Mexico and about 218 m. (by rail) W. of New Orleans. Pop. (1889) 838, (1890) 3442, (1900) 6680 (2407 negroes); (1910) 11,449. It is served by the Louisiana & Texas (Southern Pacific System), the St Louis, Watkins & Gulf, the Louisiana & Pacific and the Kansas City Southern railways. The city is charmingly situated on the shore of Lake Charles, and on the Calcasieu river, which with some dredging can be made navigable for large vessels for 132 m. from the Gulf. It is a winter resort. Among the principal buildings are a Carnegie library, the city hall, the Government building, the court house, St Patrick's sanatorium, the masonic temple and the Elks' club. Lake Charles is in the prairie region of southern Louisiana, to the N. of which, covering a large part of the state, are magnificent forests of long-leaf pine, and lesser lowland growths of oak, ash, magnolia, cypress and other valuable timber. The Watkins railway extending to the N.E. and the Kansas City Southern extending to the N.W. have opened up the very best of the forest. The country to the S. and W. is largely given over to rice culture. Lake Charles is the chief centre of lumber manufacture in the state, and has rice mills, car shops and an important trade in wool. Ten miles W. are sulphur mines (product in 1907 about 362,000 tons), which with those of Sicily produce a large part of the total product of the world. Jennings, about 34 m. to the E., is the centre of oil fields, once very productive but now of diminishing importance. Welsh, 23 m. E., is the centre of a newer field; and others lie to the N. Lake Charles was settled about 1852, largely by people from Iowa and neighbouring states, was incorporated as a town in 1857 under the name of Charleston and again in 1867 under its present name, and was chartered as a city in 1886. The city suffered severely by fire in April 1910.

LAKE CITY, a town and the county-seat of Columbia county, Florida, U.S.A., 59 m. by rail W. by S. of Jacksonville. Pop. (1900) 4013, of whom 2159 were negroes; (1905) 6509; (1910) 5032. Lake City is served by the Atlantic Coast Line, the Seaboard Air Line and the Georgia Southern & Florida railways. There are ten small lakes in the neighbourhood, and the town is a winter and health resort. It is the seat of Columbia College (Baptist, 1907); the Florida Agricultural College was opened here in 1883, became the university of Florida in 1903, and in 1905 was abolished by the Buckman Law. Vegetables and fruits grown for the northern markets, sea-island cotton and tobacco are important products of the surrounding country, and Lake City has some trade in cotton, lumber, phosphates and turpentine. The town was first settled about 1826 as Alligator; it was incorporated in 1854; adopted the present name in 1859; and in 1901, with an enlarged area, was re-incorporated.

LAKE DISTRICT, in England, a district containing all the principal English lakes, and variously termed the Lake Country, Lakeland and "the Lakes." It falls within the north-western counties of Cumberland, Westmorland and Lancashire (Furness district), about one-half being within the first of these. Although celebrated far outside the confines of Great Britain as a district of remarkable and strongly individual physical beauty, its area is only some 700 sq. m., a circle with radius of 15 m. from the central point covering practically the whole. Within this circle, besides the largest lake, Windermere, is the highest point in England, Scafell Pike; yet Windermere is but 10½ m. in length, and covers an area of 5·69 sq. m., while Scafell Pike is only 3210 ft. in height. But the lakes show a wonderful variety of character, from open expanse and steep rock-bound shores to picturesque island-groups and soft wooded banks; while the mountains have always a remarkable dignity, less from the profile of their summits than from the bold sweeping lines of their flanks, unbroken by vegetation, and often culminating in sheer cliffs or crags. At their feet, the flat green valley floors of the higher elevations give place in the lower parts to lovely woods. The streams are swift and clear, and numerous small waterfalls are characteristic of the district. To the north, west and south, a flat coastal belt, bordering the Irish Sea, with its inlets Morecambe Bay and Solway Firth, and broadest in the north, marks off the Lake District, while to the east the valleys of the Eden and the Lune divide it from the Pennine mountain system. Geologically, too, it is individual. Its centre is of volcanic rocks, complex in character, while the Coal-measures and New Red Sandstone appear round the edges. The district as a whole is grooved by a main depression, running from north to south along the valleys of St John, Thirlmere, Grasmere and Windermere, surmounting a pass (Dunmail Raise) of only 783 ft.; while a secondary depression, in the same direction, runs along Derwentwater, Borrowdale, Wasdale and Wastwater, but here Sty Head Pass, between Borrowdale and Wasdale, rises to 1600 ft. The centre of the 15-m. radius lies on the lesser heights between Langstrath and Dunmail Raise, which may, however, be the crown of an ancient dome of rocks, "the dissected skeleton of which, worn by the warfare of air and rain and ice, now alone remains" (Dr H. R. Mill, "Bathymetrical Survey of the English Lakes," *Geographical Journal*, vi. 48). The principal features of the district may be indicated by following this circle round from north, by west, south and east.

The river Derwent (*q.v.*), rising in the tarns and "gills" or "ghylls" (small streams running in deeply-grooved clefts) north of Sty Head Pass and the Scafell mass flows north through the wooded Borrowdale and forms Derwentwater and Bassenthwaite. These two lakes are in a class apart from all the rest, being broader for their length, and quite shallow (about 18 ft. average and 70 ft. maximum), as distinct from the long, narrow and deep troughs occupied by the other chief lakes, which average from 40 to 135 ft. deep. Derwentwater (*q.v.*), studded with many islands, is perhaps the most beautiful of all. Borrowdale is joined on the east by the bare wild dale of Langstrath, and the Greta joins the Derwent immediately below Derwentwater; the town of Keswick lying near the junction. Derwentwater and Bassenthwaite occupy a single depression, a flat alluvial plain separating them. From Seatoller in Borrowdale a road traverses Honister Pass (1100 ft.), whence it descends westward, beneath the majestic Honister Crags, where green slate is quarried, into the valley containing Buttermere (94 ft. max. depth) and Crummock Water (144 ft.), drained by the Cocker. Between this and the Derwent valley the principal height is Grasmoor (2791 ft.); southward a steep narrow ridge (High Style, 2643) divides it from Ennerdale, containing Ennerdale Water (148 ft. max. depth), which is fed by the Liza and drained by the Ehen. A splendid range separates this dale from Wasdale and its tributary Mosedale, including Great Gable (2949 ft.), Pillar (2927), with the precipitous Pillar Rock on the Ennerdale flank and Steeple (2746). Wasdale Head, between Gable and the Scafell range, is peculiarly grand, with dark grey screes and black crags frowning above its narrow bottom. On this side of Gable is the fine detached rock, Napes Needle. Wastwater, 3 m. in length, is the deepest lake of all (258 ft.), its floor, like those of Windermere and Ullswater, sinking below sea-level. Its east shore consists of a great range of screes. East of Wasdale lies the range of Scafell (*q.v.*), its chief points being Scafell (3162 ft.), Scafell Pike (3210), Lingmell (2649) and Great End (2984), while the line is continued over Esk Hause Pass (2490) along a fine line of heights (Bow Fell, 2960; Crinkle Crags, 2816), to embrace the head of Eskdale. The line then descends to Wrynose Pass (1270 ft.), from which the Duddon runs south through a vale of peculiar richness in its lower parts; while the range continues south to culminate in the Old Man of Coniston (2633) with the splendid Dow Crags above Goats Water. The pleasant vale of Yewdale drains south to Coniston Lake (5½ m. long, 184 ft. max. depth), east of which a lower, well-wooded tract, containing two beautiful lesser lakes, Tarn Hows and Esthwaite Water, extends to Windermere (*q.v.*). This lake collects waters by the Brathay from Langdale, the head of which, between Bow Fell and Langdale Pikes (2401 ft.), is very fine; and by the Rothay from Dunmail Raise and the small lakes of Grasmere and Rydal Water, embowered in woods. East of the Rothay valley and Thirlmere lies the mountain mass including Helvellyn (3118 ft.), Fairfield (2863) and other points, with magnificent crags at several places on the eastern side towards Grisedale and Patterdale. These dales drain to Ullswater (205 ft. max., second to Windermere in area), and so north-east to the Eden. To the east and south-east lies the ridge named High Street (2663 ft.), from the Roman road still traceable from south to north along its summit, and sloping east again to the sequestered Hawes Water (103 ft. max.), a curiously shaped lake nearly divided by the delta of the Measand Beck. There remains the Thirlmere valley. Thirlmere itself was raised in level, and adapted by means of a dam at the north end, as a reservoir for the water-supply of Manchester in 1890–1894. It drains north by St John's Vale into the Greta, north of which again rises a mountain-group of which the chief summits are Saddleback or Blencathra (2847 ft.) and the graceful peak of Skiddaw (3054). The most noteworthy waterfalls are—Scale Force (Dano-Norwegian *fors*, *foss*), besides Crummock, Lodore near Derwentwater, Dungeon Gill Force, beside Langdale, Dalegarth Force in Eskdale, Aira near Ullswater, sung by Wordsworth, Stock Gill Force and Rydal Falls near Ambleside.

The principal centres in the Lake District are Keswick (Derwentwater), Ambleside, Bowness, Windermere and Lakeside (Windermere), Coniston and Boot (Eskdale), all of which, except Ambleside and Bowness (which nearly joins Windermere) are accessible by rail. The considerable village of Grasmere lies beautifully at the head of the lake of that name; and above Esthwaite is the small town of Hawkshead, with an ancient church, and picturesque houses curiously built on the hill-slope and sometimes spanning the streets. There are regular steamer services on Windermere and Ullswater. Coaches and cars traverse the main roads during the summer, but many of the finest dales and passes are accessible only on foot or by ponies. All the mountains offer easy routes to pedestrians, but some of them, as Scafell, Pillar, Gable (Napes Needle), Pavey Ark above Langdale and Dow Crags near Coniston, also afford ascents for experienced climbers.

This mountainous district, having the sea to the west, records an unusually heavy rainfall. Near Seathwaite, below Styhead Pass, the largest annual rainfall in the British Isles is recorded, the average (1870–1899) being 133·53 in., while 173·7 was measured in 1903 and 243·98 in. in 1872. At Keswick the annual mean is 60·02, at Grasmere about 80 ins. The months of maximum rainfall at Seathwaite are November, December and January and September.

Fish taken in the lakes include perch, pike, char and trout in Windermere, Ennerdale, Bassenthwaite, Derwentwater, &c., and the gwyniad or fresh-water herring in Ullswater. The industries of the Lake District include slate quarrying and some lead and zinc mining, and weaving, bobbin-making and pencil-making.

Setting aside London and Edinburgh, no locality in the British Isles is so intimately associated with the history of English literature as the Lake District. In point of time the poet whose name is first connected with the region is Gray, who wrote a journal of his tour in 1769. But it was Wordsworth, a native of Cumberland, born on the outskirts of the Lake District itself, who really made it a Mecca for lovers of English poetry. Out of his long life of eighty years, sixty were spent amid its lakes and mountains, first as a schoolboy at Hawkshead, and afterwards as a resident at Grasmere (1799–1813) and Rydal Mount (1813–1850). In the churchyard of Grasmere the poet and his wife lie buried; and very near to them are the remains of Hartley Coleridge (son of the poet), who himself lived many years at Keswick, Ambleside and Grasmere. Southey, the friend of Wordsworth, was a resident of Keswick for forty years (1803–1843), and was buried in Crosthwaite churchyard. Samuel Taylor Coleridge lived some time at Keswick, and also with the Wordsworths at Grasmere. From 1807 to 1815 Christopher North (John Wilson) was settled at Windermere. De Quincey spent the greater part of the years 1809 to 1828 at Grasmere, in the first cottage which Wordsworth had inhabited. Ambleside, or its environs, was also the place of residence of Dr Arnold (of Rugby), who spent there the vacations of the last ten years of his life; and of Harriet Martineau, who built herself a house there in 1845. At Keswick Mrs Lynn Linton was born in 1822. Brantwood, a house beside Coniston Lake, was the home of Ruskin during the last years of his life. In addition to these residents or natives of the locality, Shelley, Scott, Nathaniel Hawthorne, Clough, Crabb Robinson, Carlyle, Keats, Tennyson, Matthew Arnold, Mrs Hemans, Gerald Massey and others of less reputation made longer or shorter visits, or were bound by ties of friendship with the poets already mentioned. The Vale of St John, near Keswick, recalls Scott's *Bridal of Triermain*. But there is a deeper connexion than this between the Lake District and English letters. German literature tells of several literary schools, or groups of writers animated by the same ideas, and working in the spirit of the same principles and by the same poetic methods. The most notable instance—indeed it is almost the only instance—of the kind in English literature is the Lake School of Poets. Of this school the acknowledged head and founder was Wordsworth, and the tenets it professed are those laid down by the poet himself in the famous preface to the edition of *The Lyrical Ballads* which he published in 1800. Wordsworth's theories of poetry—the objects best suited for poetic treatment, the characteristics of such treatment and the choice of diction suitable for the purpose—may be said to have grown out of the soil and substance of the lakes and mountains, and out of the homely lives of the people, of Cumberland and Westmoreland.

See CUMBERLAND, LANCASHIRE, WESTMORLAND. The following is a selection from the literature of the subject: Harriet Martineau, *The English Lakes* (Windermere, 1858); Mrs Lynn Linton, *The Lake Country* (London, 1864); E. Waugh, *Rambles in the Lake Country* (1861) and *In the Lake Country* (1880); W. Knight, *Through the Wordsworth Country* (London, 1890); H. D. Rawnsley, *Literary Associations of the English Lakes* (2 vols., Glasgow, 1894) and *Life and Nature of the English Lakes* (Glasgow, 1899); Stopford Brooke, *Dove Cottage, Wordsworth's Home from 1800 to 1808*; A. G. Bradley, *The Lake District, its Highways and Byeways* (London, 1901); Sir John Harwood, *History of the Thirlmere Water Scheme* (1895); for mountain-climbing, Col. J. Brown, *Mountain Ascents in Westmorland and Cumberland* (London, 1888); Haskett-Smith, *Climbing in the British Isles*, part. i.; Owen G. Jones, *Rock-climbing in the English Lake District*, 2nd ed. by W. M. Crook (Keswick, 1900).

LAKE DWELLINGS, the term employed in archaeology for habitations constructed, not on the dry land, but within the margins of lakes or creeks at some distance from the shore.

The villages of the Guajiros in the Gulf of Maracaibo are described by Goering as composed of houses with low sloping roofs perched on lofty piles and connected with each other by bridges of planks. Each house consisted of two apartments; the floor was formed of split stems of trees set close together and covered with mats; they were reached from the shore by dug-out canoes poled over the shallow waters, and a notched tree trunk served as a ladder. The custom is also common in the estuaries of the Orinoco and Amazon. A similar system prevails in New Guinea. Dumont d'Urville describes four such villages in the Bay of Dorei, containing from eight to fifteen blocks or clusters of houses, each block separately built on piles, and consisting of a row of distinct dwellings. C. D. Cameron describes three villages thus built on piles in Lake Mohrya, or Moria, in Central Africa, the motive here being to prevent surprise by bands of slave-catchers. Similar constructions have been described by travellers, among the Dyaks of Borneo, in Celebes, in the Caroline Islands, on the Gold Coast of Africa, and in other places.

Hippocrates, writing in the 5th century B.C., says of the people of the Phasis that their country is hot and marshy and subject to frequent inundations, and that they live in houses of timber and reeds constructed in the midst of the waters, and use boats of a single tree trunk. Herodotus, writing also in the 5th century B.C., describes the people of Lake Prasias as living in houses constructed on platforms supported on piles in the middle of the lake, which are approached from the land by a single narrow bridge. Abulfeda the geographer, writing in the 13th century, notices the fact that part of the Apamaean Lake was inhabited by Christian fishermen who lived on the lake in wooden huts built on piles, and Sir John Lubbock (Lord Avebury) mentions that the Rumelian fishermen on Lake Prasias "still inhabit wooden cottages built over the water, as in the time of Herodotus."

The records of the wars in Ireland in the 16th century show that the petty chieftains of that time had their defensive strongholds constructed in the "freshwater lochs" of the country, and there is record evidence of a similar system in the western parts of Scotland. The archaeological researches of the past fifty years have shown that such artificial constructions in lakes were used as defensive dwellings by the Celtic people from an early period to medieval times (see CRANNOG). Similar researches have also established the fact that in prehistoric times nearly all the lakes of Switzerland, and many in the adjoining countries —in Savoy and the north of Italy, in Austria and Hungary and in Mecklenburg and Pomerania—were peopled, so to speak, by lake-dwelling communities, living in villages constructed on platforms supported by piles at varying distances from the shores. The principal groups are those in the Lakes of Bourget, Geneva, Neuchâtel, Bienne, Zürich and Constance lying to the north of the Alps, and in the Lakes Maggiore, Varese, Iseo and Garda lying to the south of that mountain range. Many smaller lakes, however, contain them, and they are also found in peat moors on the sites of ancient lakes now drained or silted up, as at Laibach in Carniola. In some of the larger lakes the number of settlements has been very great. Fifty are enumerated in the Lake of Neuchâtel, thirty-two in the Lake of Constance, twenty-four in the Lake of Geneva, and twenty in the Lake of Bienne. The site of the lake dwelling of Wangen, in the Untersee, Lake of Constance, forms a parallelogram more than 700 paces in length by about 120 paces in breadth. The settlement at Morges, one of the largest in the Lake of Geneva, is 1200 ft. long by 150 ft. in breadth. The settlement of Sutz, one of the largest in the Lake of Bienne, extends over six acres, and was connected with the shore by a gangway nearly 100 yds. long and about 40 ft. wide.

The substructure which supported the platforms on which the dwellings were placed was most frequently of piles driven into the bottom of the lake. Less frequently it consisted of a stack of brushwood or fascines built up from the bottom and strengthened by stakes penetrating the mass so as to keep it from spreading. When piles were used they were the rough stems of trees of a length proportioned to the depth of the water, sharpened sometimes by fire and at other times chopped to a point by hatchets. On their level tops the beams supporting the platforms were laid and fastened by wooden pins, or inserted in mortices cut in the heads of the piles. In some cases the whole construction was further steadied and strengthened by cross beams, notched into the piles below the supports of the platform. The platform itself was usually composed of rough layers of unbarked stems, but occasionally it was formed of boards split from larger stems. When the mud was too soft to afford foothold for the piles they were mortised into a framework of tree trunks placed horizontally on the bottom of the lake. On the other hand, when the bottom was rocky so that the piles could not be driven, they were steadied at their bases by being enveloped in a mound of loose stones, in the manner in which the foundations of piers and breakwaters are now constructed. In cases where piles have not been used, as at Niederwil and Wauwyl, the substructure is a mass of fascines or faggots laid parallel and crosswise upon one another with intervening layers of brushwood or of clay and gravel, a few piles here and there being fixed throughout the mass to serve as guides or stays. At Niederwil the platform was formed of split boards, many of which were 2 ft. broad and 2 or 3 in. in thickness.

On these substructures were the huts composing the settlement; for the peculiarity of these lake dwellings is that they were pile villages, or clusters of huts occupying a common platform. The huts themselves were quadrilateral in form. The size of each dwelling is in some cases marked by boards resting edgeways on the platform, like the skirting boards over the flooring of the rooms in a modern house. The walls, which were supported by posts, or by piles of greater length, were formed of wattle-work, coated with clay. The floors were of clay, and in each floor there was a hearth constructed of flat slabs of stone. The roofs were thatched with bark, straw, reeds or rushes. As the superstructures are mostly gone, there is no evidence as to the position and form of the doorways, or the size, number and position of the windows, if there were any. In one case, at Schussenried, the house, which was of an oblong quadrangular form, about 33 by 23 ft., was divided into two rooms by a partition. The outer room, which was the smaller of the two, was entered by a doorway 3 ft. in width facing the south. The access to the inner room was by a similar door through the partition. The walls were formed of split tree-trunks set upright and plastered with clay; and the flooring of similar timbers bedded in clay. In other cases the remains of the gangways or bridges connecting the settlements with the shore have been discovered, but often the village appears to have been accessible only by canoes. Several of these single-tree canoes have been found, one of which is 43 ft. in length and 4 ft. 4 in. in its greatest width. It is impossible to estimate with any degree of certainty the number of separate dwellings of which any of these villages may have consisted, but at Niederwil they stood almost contiguously on the platform, the space between them not exceeding 3 ft. in width. The size of the huts also varied considerably. At Niederwil they were 20 ft. long and 12 ft. wide, while at Robenhausen they were about 27 ft. long by about 22 ft. wide.

The character of the relics shows that in some cases the settlements have been the dwellings of a people using no materials but stone, bone and wood for their implements, ornaments and weapons; in others, of a people using bronze as well as stone and bone; and in others again the occasional use of iron is disclosed. But, though the character of the relics is thus changed, there is no corresponding change in the construction and arrangements of the dwellings. The settlement in the Lake of Moosseedorf, near Bern, affords the most perfect example of a lake dwelling of the Stone age. It was a parallelogram 70 ft. long by 50 ft. wide, supported on piles, and having a gangway built on faggots connecting it with the land. The superstructure had been destroyed by fire. The implements found in the relic bed under it were axe-heads of stone, with their haftings of stag's horn and wood; a flint saw, set in a handle of fir wood and fastened with asphalt; flint flakes and arrow-heads; harpoons of stag's horn with barbs; awls, needles, chisels, fish-hooks and other implements of bone; a comb of yew wood 5 in. long; and a skate made out of the leg bone of a horse. The pottery consisted chiefly of roughly-made vessels, some of which were of large size, others had holes under the rims for suspension, and many were covered with soot, the result of their use as culinary vessels. Burnt wheat, barley and linseed, with many varieties of seeds and fruits, were plentifully mingled with the bones of the stag, the ox, the swine, the sheep and the goat, representing the ordinary food of the inhabitants, while remains of the beaver, the fox, the hare, the dog, the bear, the horse, the elk and the bison were also found.

The settlement of Robenhausen, in the moor which was formerly the bed of the ancient Lake of Pfäffikon, seems to have continued in occupation after the introduction of bronze. The site covers nearly 3 acres, and is estimated to have contained 100,000 piles. In some parts three distinct successions of inhabited platforms have been traced. The first had been destroyed by fire. It is represented at the bottom of the lake by a layer of charcoal mixed with implements of stone and bone and other relics highly carbonized. The second is represented above the bottom by a series of piles with burnt heads, and in the bottom by a layer of charcoal mixed with corn, apples, cloth, bones, pottery and implements of stone and bone, separated from the first layer of charcoal by 3 ft. of peaty sediment intermixed with relics of the occupation of the platform. The piles of the third settlement do not reach down to the shell marl, but are fixed in the layers representing the first and second settlements. They are formed of split oak trunks, while those of the two first settlements are round stems chiefly of soft wood. The huts of this last settlement appear to have had cattle stalls between them, the droppings and litter forming heaps at the lake bottom. The bones of the animals consumed as food at this station were found in such numbers that 5 tons were collected in the construction of a watercourse which crossed the site. Among the wooden objects recovered from the relic beds were tubs, plates, ladles and spoons, a flail for threshing corn, a last for stretching shoes of hide, celt handles, clubs, long-bows of yew, floats and implements of fishing and a dug-out canoe 12 ft. long. No spindle-whorls were found, but there were many varieties of cloth, platted and woven, bundles of yarn and balls of string. Among the tools of bone and stag's horn were awls, needles, harpoons, scraping tools and haftings for stone axe-heads. The implements of stone were chiefly axe-heads and arrow-heads. Of clay and earthenware there were many varieties of domestic dishes, cups and pipkins, and crucibles or melting pots made of clay and horse dung and still retaining the drossy coating of the melted bronze.

The settlement of Auvernier in the Lake of Neuchatel is one of the richest and most considerable stations of the Bronze age. It has yielded four bronze swords, ten socketed spear-heads, forty celts or axe-heads and sickles, fifty knives, twenty socketed chisels, four hammers and an anvil, sixty rings for the arms and legs, several highly ornate torques or twisted neck rings, and upwards of two hundred hair pins of various sizes up to 16 in. in length, some having spherical heads in which plates of gold were set. Moulds for sickles, lance-heads and bracelets were found cut in stone or made in baked clay. From four to five hundred vessels of pottery finely made and elegantly shaped are indicated by the fragments recovered from the relic bed. The Lac de Bourget, in Savoy, has eight settlements, all of the Bronze age. These have yielded upwards of 4000 implements, weapons and ornaments of bronze, among which were a large proportion of moulds and founders' materials. A few stone implements suggest the transition from stone to bronze; and the occasional occurrence of iron weapons and pottery of Gallo-Roman origin indicates the survival of some of the settlements to Roman times.

The relative antiquity of the earlier settlements of the Stone and Bronze ages is not capable of being deduced from existing evidence. "We may venture to place them," says Dr F. Keller, "in an age when iron and bronze had been long known, but had not come into our districts in such plenty as to be used for the common purposes of household life, at a time when amber had already taken its place as an ornament and had become an object of traffic." It is now considered that the people who erected the lake dwellings of Central Europe were also the people who were spread over the mainland. The forms and the ornamentation of the implements and weapons of stone and bronze found in the lake dwellings are the same as those of the implements and weapons in these materials found in the soil of the adjacent regions, and both groups must therefore be ascribed to the industry of one and the same people. Whether dwelling on the land or dwelling in the lake, they have exhibited so many indications of capacity, intelligence, industry and social organization that they cannot be considered as presenting, even in their Stone age, a very low condition of culture or civilization. Their axes were made of tough stones, sawn from the block and ground to the fitting shape. They were fixed by the butt in a socket of stag's horn, mortised into a handle of wood. Their knives and saws of flint were mounted in wooden handles and fixed with asphalt. They made and used an endless variety of bone tools. Their pottery, though roughly finished, is well made, the vessels often of large size and capable of standing the fire as cooking utensils. For domestic dishes they also made wooden tubs, plates, spoons, ladles and the like. The industries of spinning and weaving were largely practised. They made nets and fishing lines, and used canoes. They practised agriculture, cultivating several varieties of wheat and barley, besides millet and flax. They kept horses, cattle, sheep, goats and swine. Their clothing was partly of linen and partly of woollen fabrics and the skins of their beasts. Their food was nutritious and varied, their dwellings neither unhealthy nor incommodious. They lived in the security and comfort obtained by social organization, and were apparently intelligent, industrious and progressive communities.

There is no indication of an abrupt change from the use of stone to the use of metal such as might have occurred had the knowledge of copper and bronze, and the methods of working them, been introduced through the conquest of the original inhabitants by an alien race of superior culture and civilization. The improved cultural conditions become apparent in the multiplication of the varieties of tools, weapons and ornaments made possible by the more adaptable qualities of the new material; and that the development of the Bronze age culture in the lake dwellings followed the same course as in the surrounding regions where the people dwelt on the dry land is evident from the correspondence of the types of implements, weapons, ornaments and utensils common to both these conditions of life.

Other classes of prehistoric pile-structures akin to the lake dwellings are the Terremare of Italy and the Terpen of Holland. Both of these are settlements of wooden huts erected on piles, not over the water, but on flat land subject to inundations. The terremare (so named from the marly soil of which they are composed) appear as mounds, sometimes of very considerable extent, which when dug into disclose the remains and relic beds of the ancient settlements. They are most abundant in the plains of northern Italy traversed by the Po and its tributaries, though similar constructions have been found in Hungary in the valley of the Theiss. These pile-villages were often surrounded by an earthen rampart within which the huts were erected in more or less regular order. Many of them present evidence of having been more than once destroyed by fire and reconstructed, while others show one or more reconstructions at higher levels on the same site. The contents of the relic beds indicate that they belong for the most part to the age of bronze, although in some cases they may be referred to the latter part of the Stone age. Their inhabitants practised agriculture and kept the common domestic animals, while their tools, weapons and ornaments were mainly of similar character to those of the contemporary lake dwellers of the adjoining regions. Some of the Italian terremare show quadrangular constructions made like the modern log houses, of undressed tree trunks superposed longitudinally and overlapping at the ends, as at Castione in the province of Parma. A similar mode of construction is found in the pile-village on the banks of the Save, near Donja Dolina in Bosnia, described in 1904 by Dr Truhelka. Here the larger houses had platforms in front of them forming terraces at different levels descending towards the river. There was a cemetery adjacent to the village in which both unburnt and cremated interments occurred, the former predominating. From the general character of the relics this settlement appeared to belong to the early Iron age. The Terpen of Holland appear as mounds somewhat similar to those of the terremare, and were also pile structures, on low or marshy lands subject to inundations from the sea. Unlike the terremare and the lake dwellings they do not seem to belong to the prehistoric ages, but yield indications of occupation in post-Roman and medieval times.

AUTHORITIES.—The materials for the investigation of this singular phase of prehistoric life were first collected and systematized by Dr Ferdinand Keller (1800–1881), of Zürich, and printed in *Mittheilungen der Antiquarischen Gesellschaft in Zürich*, vols. ix.-xxii., 4to (1855–1886). The substance of these reports has been issued as a separate work in England, *The Lake Dwellings of Switzerland and other parts of Europe*, by Dr Ferdinand Keller, translated and arranged by John Edward Lee, 2nd ed. (2 vols. 8vo, London, 1878). Other works on the same subject are Frédéric Troyon, *Habitations lacustres des temps anciens et modernes* (Lausanne, 1860); E. Desor, *Les Palafittes ou constructions lacustres du lac de Neuchâtel* (Paris, 1865); E. Desor and L. Favre, *Le Bel Âge du bronze lacustre en Suisse* (Paris, 1874); A. Perrin, *Étude préhistorique sur la Savoie spécialement à l' époque lacustre* (*Les Palafittes du lac de Bourget*, Paris, 1870); Ernest Chantre, *Les Palafittes ou constructions lacustres du lac de Paladru* (Chambery, 1871); Bartolomeo Gastaldi, *Lake Habitations and prehistoric Remains in the Turbaries and Marl-beds of Northern and Central Italy*, translated by C. H. Chambers (London, 1865); Sir John Lubbock (Lord Avebury), *Prehistoric Times* (4th ed., London, 1878); Robert Munro, *The Lake-Dwellings of Europe* (London, 1890), with a bibliography of the subject. (J. AN.)

LAKE GENEVA, a city of Walworth county, Wisconsin, U.S.A., 65 m. N.W. of Chicago. Pop. (1900) 2585, of whom 468 were foreign-born; (1905) 3449; (1910) 3079. It is served by the Chicago & Northwestern railway. The city is picturesquely situated on the shores of Lake Geneva (9 m. long and 1½ to 3 m. wide), a beautiful body of remarkably clear water, fed by springs, and encircled by rolling hills covered with thick groves of hardwood trees. The region is famous as a summer resort, particularly for Chicago people. The city is the seat of Oakwood Sanitarium, and at Williams Bay, 6 m. distant, is the Yerkes Observatory of the University of Chicago. Dairying is the most important industrial interest. The first settlement on Lake Geneva was made about 1833. The city was chartered in 1893.

LAKE OF THE WOODS, a lake in the south-west of the province of Ontario, Canada, bordering west on the province of Manitoba, and south on the state of Minnesota. It is of extremely irregular shape, and contains many islands. Its length is 70 m., breadth 10 to 50 m., area 1500 sq. m. It lies in the centre of the Laurentian region between Lakes Winnipeg and Superior, and an area of 36,000 sq. m. drains to it. It collects the waters of many rivers, the chief being Rainy river from the east, draining Rainy Lake. By the Winnipeg river on the north-east it discharges into Lake Winnipeg. At its source Winnipeg river is 1057 ft. above the sea, and drops 347 ft. in its course of 165 m. The scenery both on and around the lake is exceedingly beautiful, and the islands are largely occupied by the summer residences of city merchants. Kenora, a flourishing town at the source of the Winnipeg river, is the centre of the numerous lumbering and mining enterprises of the vicinity.

LAKE PLACID, a village in Essex county, New York, U.S.A., on the W. shore of Mirror Lake, near the S. end of Lake Placid, about 42 m. N.W. of Ticonderoga. Pop. (1905) 1514; (1910) 1682. The village is served by the Delaware & Hudson railway. The region is one of the most attractive in the Adirondacks, and is a much frequented summer resort. There are four good golf courses here, and the village has a well-built club house, called the "Neighborhood House." The village lies on the narrow strip of land (about ⅓ m.) between Mirror Lake (about 1 m. long, N. and S., and ⅓ m. wide), and Lake Placid, about 5 m. long (N.N.E. by S.S.W.), and about 1½ m. (maximum) broad; its altitude is 1864 ft. The lake is roughly divided, from N. to S. by three islands—Moose, the largest, and Hawk, both privately owned, and Buck—and is a beautiful sheet of water in a picturesque setting of forests and heavily wooded hills and mountains. Among the principal peaks in the vicinity are Whiteface Mountain (4871 ft.), about 3 m. N.W. of the N. end of the lake; McKenzie Mountain (3872 ft.), about 1 m. to the W., and Pulpit Mountain (2658 ft.), on the E. shore. The summit of Whiteface Mountain commands a fine view, with Gothic (4738 ft.), Saddleback (4530 ft.), Basin (4825 ft.), Marcy (5344 ft.), and McIntyre (5210 ft.) mountains about 10 m. to the S. and Lake Champlain to the E., and to the N.E. may be seen, on clear days, the spires of Montreal. In the valleys E. and S. are the headwaters of the famous Ausable river. About 2 m. E. of the village, at North Elba, is the grave of the abolitionist, John Brown, with its huge boulder monument, and near it is another monument which bears the names of the 20 persons who bought the John Brown farm and gave it to the state. The railway to the village was completed in 1893. The village was incorporated in 1900.

LAKEWOOD, a village of Ocean county, New Jersey, U.S.A., in the township of Lakewood, 59 m. S. by W. of New York city, and 8 m. from the coast, on the Central Railroad of New Jersey. Pop. (1900) of the township, including the village, 3094; (1905) 4265; (1910) 5149. Lakewood is a fashionable health and winter resort, and is situated in the midst of a pine forest, with two small lakes, and many charming walks and drives. In the village there are a number of fine residences, large hotels, a library and a hospital. The winter temperature is 10-12° F. warmer than in New York. The township of Lakewood was incorporated in 1892.

LAKH (from the Sans. *laksha*, one hundred thousand), a term used in British India, in a colloquial sense to signify a lakh of rupees (written 1,00,000), which at the face value of the rupee would be worth £10,000, but now is worth only £6666. The term is also largely used in trade returns. A hundred lakhs make a crore.

LAKHIMPUR, a district of British India in the extreme east of the province of Eastern Bengal and Assam. Area, 4529 sq. m. It lies along both banks of the Brahmaputra for about 400 m.; it is bounded N. by the Daphla, Miri, Abor and Mishmi hills, E. by the Mishmi and Kachin hills, S. by the watershed of the Patkai range and the Lohit branch of the Brahmaputra, and W. by the districts of Darrang and Sibsagar. The Brahmaputra is navigable for steamers in all seasons as far as Dibrugarh, in the rainy season as far as Sadiya; its navigable tributaries within the district are the Subansiri, Dibru and Dihing. The deputy-commissioner in charge exercises political control over numerous tribes beyond the inner surveyed border. The most important of these tribes are the Miris, Abors, Mishmis, Khamtis, Kachins and Nagas. In 1901 the population was 371,396, an increase of 46 % in the decade. The district has enjoyed remarkable and continuous prosperity. At each successive census the percentage of increase has been over 40, the present population being more than three times as great as that of 1872. This increase is chiefly due to the numerous tea gardens and to the coal mines and other enterprises of the Assam Railways and Trading Company. Lakhimpur was the first district into which tea cultivation was introduced by the government, and the Assam Company began operations here in 1840. The railway, known as the Dibru-Sadiya line, runs from Dibrugarh to Makum, with two branches to Talap and Margherita, and has been connected across the hills with the Assam-Bengal railway. The coal is of excellent quality, and is exported by river as far as Calcutta. The chief oil-wells are at Digboi. The oil is refined at Margherita, producing a good quality of kerosene oil and first-class paraffin, with wax and other by-products. The company also manufactures bricks and pipes of various kinds. Another industry is cutting timber, for the manufacture of tea-chests, &c.

Lakhimpur figures largely in the annals of Assam as the region where successive invaders from the east first reached the Brahmaputra. The Bara Bhuiyas, originally from the western provinces of India, were driven out by the Chutias (a Shan race), and these in their turn gave place to their more powerful brethren, the Ahoms, in the 13th century. The Burmese, who had ruined the native kingdoms, at the end of the 18th century, were in 1825 expelled by the British, who placed the southern part of the country, together with Sibsagar under the rule of Raja Purandhar Singh; but it was not till 1838 that the whole was taken under direct British administration. The headquarters are at Dibrugarh.

See *Lakhimpur District Gazetteer* (Calcutta, 1905).

LAKSHMI (Sans. for "mark," "sign," generally used in composition with *punya*, "prosperous"; hence "good sign," "good fortune"), in Hindu mythology, the wife of Vishnu worshipped as the goddess of love, beauty and prosperity. She has many other names, the chief being *Loka mata* ("mother of the world"), *Padma* ("the lotus"), *Padma laya* ("she who dwells on a lotus") and *Jaladhija* ("the ocean-born"). She is represented as of a bright golden colour and seated on a lotus. She is said to have been born from the sea of milk when it was churned from ambrosia. Many quaint myths surround her birth. In the Rig Veda her name does not occur as a goddess.

LALAING, JACQUES DE (*c.* 1420–1453), Flemish knight, was originally in the service of the duke of Cleves and afterwards in that of the duke of Burgundy, Philip III., the Good, gaining great renown by his prowess in the tiltyard. The duke of Burgundy entrusted him with embassies to the pope and the king of France (1451), and subsequently sent him to put down the revolt of the inhabitants of Ghent, in which expedition he was killed. His biography, *Le Livre des faits de messire Jacques de Lalaing*, which has been published several times, is mainly the work of the Burgundian herald and chronicler Jean le Fèvre, better known as *Toison d'or*; the Flemish historiographer Georges Chastellain and the herald Charolais also took part in its compilation.

LALANDE, JOSEPH JÉRÔME LEFRANÇAIS DE (1732–1807), French astronomer, was born at Bourg (department of Ain), on the 11th of July 1732. His parents sent him to Paris to study law; but the accident of lodging in the Hôtel Cluny, where J. N. Delisle had his observatory, drew him to astronomy, and he became the zealous and favoured pupil of both Delisle and Pierre Lemonnier. He, however, completed his legal studies, and was about to return to Bourg to practise there as an advocate, when Lemonnier obtained permission to send him to Berlin, to make observations on the lunar parallax in concert with those of N. L. Lacaille at the Cape of Good Hope. The successful execution of his task procured for him, before he was twenty-one, admission to the Academy of Berlin, and the post of adjunct astronomer to that of Paris. He now devoted himself to the improvement of the planetary theory, publishing in 1759 a corrected edition of Halley's tables, with a history of the celebrated comet whose return in that year he had aided Clairault to calculate. In 1762 J. N. Delisle resigned in his favour the chair of astronomy in the Collège de France, the duties of which were discharged by Lalande for forty-six years. His house became an astronomical seminary, and amongst his pupils were J. B. J. Delambre, G. Piazzi, P. Mechain, and his own nephew Michel Lalande. By his publications in connexion with the transit of 1769 he won great and, in a measure, deserved fame. But his love of notoriety and impetuous temper compromised the respect due to his scientific zeal, though these faults were partially balanced by his generosity and benevolence. He died on the 4th of April 1807.

Although his investigations were conducted with diligence rather than genius, the career of Lalande must be regarded as of eminent service to astronomy. As a lecturer and writer he gave to the science unexampled popularity; his planetary tables, into which he introduced corrections for mutual perturbations, were the best available up to the end of the 18th century; and the Lalande prize, instituted by him in 1802 for the chief astronomical performance of each year, still testifies to his enthusiasm for his favourite pursuit. Amongst his voluminous works are *Traité d'astronomie* (2 vols., 1764; enlarged edition, 4 vols., 1771–1781; 3rd ed., 3 vols., 1792); *Histoire céleste française* (1801), giving the places of 50,000 stars; *Bibliographie astronomique* (1803), with a history of astronomy from 1781 to 1802; *Astronomie des dames* (1785); *Abrégé de navigation* (1793); *Voyage d'un françois en Italie* (1769), a valuable record of his travels in 1765–1766. He communicated above one hundred and fifty papers to the Paris Academy of Sciences, edited the *Connoissance des temps* (1759–1774), and again (1794–1807), and wrote the concluding 2 vols. of the 2nd edition of Montucla's *Histoire des mathématiques* (1802).

See *Mémoires de l'Institut*, t. viii. (1807) (J. B. J. Delambre); Delambre, *Hist. de l'astr. au XVIII*^{e} *siècle*, p. 547; *Magazin encyclopédique*, ii. 288 (1810) (Mme de Salm); J. S. Bailly, *Hist. de l'astr. moderne*, t. iii. (ed. 1785); J. Mädler, *Geschichte der Himmelskunde*, ii. 141; R. Wolf, *Gesch. der Astronomie*; J. J. Lalande, *Bibl. astr.* p. 428; J. C. Poggendorff, *Biog. Lit. Handwörterbuch*; M. Marie, *Hist. des sciences*, ix. 35.

LALÍN, a town of north-western Spain, in the province of Pontevedra. Pop. (1900) 16,238. Lalín is the centre of the trade in agricultural products of the fertile highlands between the Deza and Arnego rivers. The local industries are tanning and the manufacture of paper. Near Lalín are the ruins of the Gothic abbey of Carboeiro.

LA LINEA, or La Linea de la Concepcion, a town of Spain, in the province of Cadiz, between Gibraltar and San Roque. Pop. (1900) 31,802. La Linea, which derives its name from the *line* or boundary dividing Spanish territory from the district of Gibraltar, is a town of comparatively modern date and was formerly looked upon as a suburb of San Roque. It is now a distinct frontier post and headquarters of the Spanish commandant of the lines of Gibraltar. The fortifications erected here in the 16th century were dismantled by the British in 1810, to prevent the landing of French invaders, and all the existing buildings are modern. They include barracks, casinos, a theatre and a bull-ring, much frequented by the inhabitants and garrison of Gibraltar. La Linea has some trade in cereals, fruit and vegetables; it is the residence of large numbers of labourers employed in Gibraltar.

LALITPUR, a town of British India, in Jhansi district, United Provinces. Pop. (1901) 11,560. It has a station on the Great Indian Peninsula railway, and a large trade in oil-seeds, hides and *ghi*. It contains several beautiful Hindu and Jain temples. It was formerly the headquarters of a district of the same name, which was incorporated with that of Jhansi in 1891. The Bundela chiefs of Lalitpur were among those who most eagerly joined the Mutiny, and it was only after a severe struggle that the district was pacified.

LALLY, THOMAS ARTHUR, Comte de, Baron de Tollendal (1702–1766), French general, was born at Romans, Dauphiné, in January 1702, being the son of Sir Gerard O'Lally, an Irish Jacobite who married a French lady of noble family, from whom the son inherited his titles. Entering the French army in 1721 he served in the war of 1734 against Austria; he was present at Dettingen (1743), and commanded the regiment de Lally in the famous Irish brigade at Fontenoy (May 1745). He was made a brigadier on the field by Louis XV. He had previously been mixed up in several Jacobite plots, and in 1745 accompanied Charles Edward to Scotland, serving as aide-de-camp at the battle of Falkirk (January 1746). Escaping to France, he served with Marshal Saxe in the Low Countries, and at the capture of Maestricht (1748) was made a *maréchal de camp*. When war broke out with England in 1756 Lally was given the command of a French expedition to India. He reached Pondicherry in April 1758, and at the outset met with some trifling military success. He was a man of courage and a capable general; but his pride and ferocity made him disliked by his officers and hated by his soldiers, while he regarded the natives as slaves, despised their assistance, and trampled on their traditions of caste. In consequence everything went wrong with him. He was unsuccessful in an attack on Tanjore, and had to retire from the siege of Madras (1758) owing to the timely arrival of the British fleet. He was defeated by Sir Eyre Coote at Wandiwash (1760), and besieged in Pondicherry and forced to capitulate (1761). He was sent as a prisoner of war to England. While in London, he heard that he was accused in France of treachery, and insisted, against advice, on returning on parole to stand his trial. He was kept prisoner for nearly two years before the trial began; then, after many painful delays, he was sentenced to death (May 6, 1766), and three days later beheaded. Louis XV. tried to throw the responsibility for what was undoubtedly a judicial murder on his ministers and the public, but his policy needed a scapegoat, and he was probably well content not to exercise his authority to save an almost friendless foreigner.

See G. B. Malleson, *The Career of Count Lally* (1865); "Z's" (the marquis de Lally-Tollendal) article in the *Biographie Michaud*; and Voltaire's *Œuvres complètes*. The legal documents are preserved in the Bibliothèque Nationale.

LALLY-TOLLENDAL, TROPHIME GÉRARD, Marquis de (1751–1830), was born at Paris on the 5th of March 1751. He was the legitimized son of the comte de Lally and only discovered the secret of his birth on the day of his father's execution, when he resolved to devote himself to clearing his father's memory. He was supported by Voltaire, and in 1778 succeeded in persuading Louis XVI. to annul the decree which had sentenced the comte de Lally; but the parlement of Rouen, to which the case was referred back, in 1784 again decided in favour of Lally's guilt. The case was retried by other courts, but Lally's innocence was never fully admitted by the French judges. In 1779 Lally-Tollendal bought the office of *Grand bailli* of Étampes, and in 1789 was a deputy to the states-general for the *noblesse* of Paris. He played some part in the early stages of the Revolution, but was too conservative to be in sympathy with all even of its earlier developments. He threw himself into opposition to the "tyranny" of Mirabeau, and condemned the epidemic of renunciation which in the session of the 4th of August 1789 destroyed the traditional institutions of France. Later in the year he emigrated to England. During the trial of Louis XVI. by the National Convention (1793) he offered to defend the king, but was not allowed to return to France. He did not return till the time of the Consulate. Louis XVIII. created him a peer of France, and in 1816 he became a member of the French Academy. From that time until his death, on the 11th of March 1830, he devoted himself to philanthropic work, especially identifying himself with prison reform.

See his *Plaidoyer pour Louis XVI.* (London, 1793); Lally-Tollendal was also in part responsible for the *Mémoires*, attributed to Joseph Weber, concerning Marie Antoinette (1804); he further edited the article on his father in the *Biographie Michaud*; see also Arnault, *Discours prononcé aux funerailles de M. le marquis de Lally-Tollendal le 13 mars 1830* (Paris); Gauthier de Brecy, *Nécrologie de M. le marquis de Lally-Tollendal* (Paris, undated); Voltaire, *Œuvres complètes* (Paris, 1889), in which see the analytical table of contents, vol. ii.

LALO, EDOUARD (1823–1892), French composer, was born at Lille, on the 27th of January 1823. He began his musical studies at the conservatoire at Lille, and in Paris attended the violin classes of Habeneck. For several years Lalo led a modest and retired existence, playing the viola in the quartet party organized by Armingaud and Jacquard, and in composing chamber music. His early works include two trios, a quartet, and several pieces for violin and pianoforte. In 1867 he took part in an operatic competition, an opera from his pen, entitled *Fiesque*, obtaining the third place out of forty-three. This work was accepted for production at the Paris Opéra, but delays occurred, and nothing was done. *Fiesque* was next offered to the Théâtre de la Monnaie, Brussels, and was about to be produced there when the manager became bankrupt. Thus, when nearly fifty years of age, Lalo found himself in difficulties. *Fiesque* was never performed, but the composer published the pianoforte score, and eventually employed some of the music in other works. After the Franco-German war French composers found their opportunity in the concert-room. Lalo was one of these, and during the succeeding ten years several interesting works from his pen were produced, among them a sonata for violoncello, a "divertissement" for orchestra, a violin concerto and the *Symphonie Espagnole* for violin and orchestra, one of his best-known compositions. In the meanwhile he had written a second opera, *Le Roi d'Ys*, which he hoped would be produced at the Opéra. The administration offered him the "scenario" of a ballet instead. Lalo was obliged to be content with this, and set to work with so much energy that he fell ill, the last scenes of the ballet being orchestrated by Gounod. *Namouna*, the ballet in question, was produced at the Opéra in 1882. Six years later, on the 7th of May 1888, *Le Roi d'Ys* was brought out at the Opéra Comique, and Lalo was at last enabled to taste the sweets of success. Unfortunately, fame came to him too late in life. A pianoforte concerto and the music to *Néron*, a pantomimic piece played at the Hippodrome in 1891, were his last two works. He had begun a new opera, but had only written the first act when, on the 23rd of April 1892, he died. This opera, *La Jacquerie*, was finished by Arthur Coquard, and was produced in 1895 at Monte Carlo, Aix-les-Bains and finally in Paris. Lalo had distinct originality, discernible in his employment of curious rhythmic devices. His music is ever ingenious and brilliantly effective.

LA MADDALENA, an island 2½ m. from the N.E. coast of Sardinia. Pop. (1901) 8361. Napoleon bombarded it in 1793 without success, and Nelson made it his headquarters for some time. It is now an important naval station of the Italian fleet, the anchorage being good, and is strongly fortified. A bridge and an embankment connect it with Caprera. It appears to have been inhabited in Roman times.

LĀMĀISM, a system of doctrine partly religious, partly political. Religiously it is the corrupt form of Buddhism prevalent in Tibet and Mongolia. It stands in a relationship to primitive Buddhism similar to that in which Roman Catholicism, so long as the temporal power of the pope was still in existence, stood to primitive Christianity. The ethical and metaphysical ideas most conspicuous in the doctrines of Lāmāism are not confined to the highlands of central Asia, they are accepted in great measure also in Japan and China. It is the union of these ideas with a hierarchical system, and with the temporal sovereignty of the head of that system in Tibet, which constitutes what is distinctively understood by the term Lāmāism. Lāmāism has acquired a special interest to the student of comparative history through the instructive parallel which its history presents to that of the Church of Rome.

The "Great Vehicle."

The central point of primitive Buddhism was the doctrine of "Arahatship"—a system of ethical and mental self-culture, in which deliverance was found from all the mysteries and sorrows of life in a change of heart to be reached here on earth. This doctrine seems to have been held very nearly in its original purity from the time when it was propounded by Gotama in the 6th century B.C. to the period in which northern India was conquered by the Huns about the commencement of the Christian era. Soon after that time there arose a school of Buddhist teachers who called their doctrine the "Great Vehicle." It was not in any contradiction to the older doctrine, which they contemptuously called the "Little Vehicle," but included it all, and was based upon it. The distinguishing characteristic of the newer school was the importance which it attached to "Bodhisatship." The older school had taught that Gotama, who had propounded the doctrine of Arahatship, was a Buddha, that only a Buddha is capable of discovering that doctrine, and that a Buddha is a man who by self-denying efforts, continued through many hundreds of different births, has acquired the so-called *Ten Pāramitās* or cardinal virtues in such perfection that he is able, when sin and ignorance have gained the upper hand throughout the world, to save the human race from impending ruin. But until the process of perfection has been completed, until the moment when at last the sage, sitting under the Wisdom tree acquires that particular insight or wisdom which is called Enlightenment or Buddhahood, he is still only a Bodhisat. The link of connexion between the various Bodhisats in the future Buddha's successive births is not a soul which is transferred from body to body, but the *karma*, or character, which each successive Bodhisat inherits from his predecessors in the long chain of existences. Now the older school also held, in the first place, that, when a man had, in this life, attained to Arahatship, his karma would not pass on to any other individual in another life—or in other words, that after Arahatship there would be no rebirth; and, secondly, that four thousand years after the Buddha had proclaimed the *Dhamma* or doctrine of Arahatship, his teaching would have died away, and another Buddha would be required to bring mankind once more to a knowledge of the truth. The leaders of the Great Vehicle urged their followers to seek to attain, not so much to Arahatship, which would involve only their own salvation, but to Bodhisatship, by the attainment of which they would be conferring the blessings of the Dhamma upon countless multitudes in the long ages of the future. By thus laying stress upon Bodhisatship, rather than upon Arahatship, the new school, though they doubtless merely thought themselves to be carrying the older orthodox doctrines to their logical conclusion, were really changing the central point of

Buddhism, and were altering the direction of their mental vision. It was of no avail that they adhered in other respects in the main to the older teaching, that they professed to hold to the same ethical system, that they adhered, except in a few unimportant details, to the old regulations of the order of the Buddhist mendicant recluses. The ancient books, preserved in the *Pāli Pitakas*, being mainly occupied with the details of Arahatship, lost their exclusive value in the eyes of those whose attention was being directed to the details of Bodhisatship. And the opinion that every leader in their religious circles, every teacher distinguished among them for his sanctity of life, or for his extensive learning, was a Bodhisat, who might have and who probably had inherited the karma of some great teacher of old, opened the door to a flood of superstitious fancies.

It is worthy of note that the new school found its earliest professors and its greatest expounders in a part of India outside the districts to which the personal influence of Gotama and of his immediate followers had been confined. The home of early Buddhism was round about Kosala and Magadha; in the district, that is to say, north and south of the Ganges between where Allahabad now lies on the west and Rajgir on the east. The home of the Great Vehicle was, at first, in the countries farther to the north and west. Buddhism arose in countries where Sanskrit was never more than a learned tongue, and where the exclusive claims of the Brahmins had never been universally admitted. The Great Vehicle arose in the very stronghold of Brahminism, and among a people to whom Sanskrit, like Latin in the middle ages in Europe, was the literary *lingua franca.* The new literature therefore, which the new movement called forth, was written, and has been preserved, in Sanskrit—its principal books of *Dharma*, or doctrine, being the following nine: (1) *Prajñā-pāramitā*; (2) *Gaṇḍa-vyūha*; (3) *Daśa-bhūmīś-vara*; (4) *Samādhi-rāja*; (5) *Lankāvatāra*; (6) *Saddharma-puṇḍarīka*; (7) *Tathāgata-guhyaka*; (8) *Lalita-vistara*; (9) *Suvarṇa-prabhāsa.* The date of none of these works is known with any certainty, but it is highly improbable that any one of them is older than the 6th century after the death of Gotama. Copies of all of them were brought to Europe by Mr B. H. Hodgson, and other copies have been received since then; but only one of them has as yet been published in Europe (the *Lalita Vistara*, edited by Lofmann), and only two have been translated into any European language. These are the *Lalita Vistara*, translated into French, through the Tibetan, by M. Foucaux, and the *Saddharma Puṇḍarīka*, translated into English by Professor Kern. The former is legendary work, partly in verse, on the life of Gotama, the historical Buddha; and the latter, also partly in verse, is devoted to proving the essential identity of the Great and the Little Vehicles, and the equal authenticity of both as doctrines enunciated by the master himself.

Of the authors of these nine works, as of all the older Buddhist works with one or two exceptions, nothing has been ascertained. The founder of the system of the Great Vehicle is, however, often referred to under the name of Nāgārjuna, whose probable date is about A.D. 200.

Together with Nāgārjuna, other early teachers of the Great Vehicle whose names are known are Vasumitra, Vasubandhu, Āryadeva, Dharmapāla and Guṇamati—all of whom were looked upon as Bodhisats. As the newer school did not venture so far as to claim as Bodhisats the disciples stated in the older books to have been the contemporaries of Gotama (they being precisely the persons known as Arahats), they attempted to give the appearance of age to the Bodhisat theory by representing the Buddha as being surrounded, not only by his human companions the Arahats, but also by fabulous beings, whom they represented as the Bodhisats existing at that time. In the opening words of each Mahāyāna treatise a list is given of such Bodhisats, who were beginning, together with the historical Bodhisats, to occupy a position in the Buddhist church of those times similar to that occupied by the saints in the corresponding period of the history of Christianity in the Church of Rome. And these lists of fabulous Bodhisats have now a distinct historical importance. For they grow in length in the later works; and it is often possible by comparing them one with another to fix, not the date, but the comparative age of the books in which they occur. Thus it is a fair inference to draw from the shortness of the list in the opening words of the *Lalita Vistara*, as compared with that in the first sections of the *Saddharma Puṇḍarīka*, that the latter work is much the younger of the two, a conclusion supported also by other considerations.

Among the Bodhisats mentioned in the *Saddharma Puṇḍarīka*, and not mentioned in the *Lalita Vistara*, as attendant on the Buddha are Manju-śrī and Avalokiteśvara. That these saints were already acknowledged by the followers of the Great Vehicle at the beginning of the 5th century is clear from the fact that Fa Hien, who visited India about that time, says that "men of the Great Vehicle" were then worshipping them at Mathura, not far from Delhi (F. H., chap. xvi.). These were supposed to be celestial beings who, inspired by love of the human race, had taken the so-called Great Resolve to become future Buddhas, and who therefore descended from heaven when the actual Buddha was on earth, to pay reverence to him, and to learn of him. The belief in them probably arose out of the doctrine of the older school, which did not deny the existence of the various creations of previous mythology and speculation, but allowed of their actual existence as spiritual beings, and only deprived them of all power over the lives of men, and declared them to be temporary beings liable, like men, to sin and ignorance, and requiring, like men, the salvation of Arahatship. Among them the later Buddhists seem to have placed their numerous Bodhisats; and to have paid especial reverence to Manju-śrī as the personification of wisdom, and to Avalokiteśwara as the personification of overruling love. The former was afterwards identified with the mythical first Buddhist missionary, who is supposed to have introduced civilization into Tibet about two hundred and fifty years after the death of the Buddha.

The five mystic trinities.

The way was now open to a rapid fall from the simplicity of early Buddhism, in which men's attention was directed to the various parts of the system of self-culture, to a belief in a whole pantheon of saints or angels, which appealed more strongly to the half-civilized races among whom the Great Vehicle was now professed. A theory sprang up which was supposed to explain the marvellous powers of the Buddhas by representing them as only the outward appearance, the reflection, as it were, or emanation, of ethereal Buddhas dwelling in the skies. These were called *Dhyāni Buddhas*, and their number was supposed to be, like that of the Buddhas, innumerable. Only five of them, however, occupied any space in the speculative world in which the ideas of the later Buddhists had now begun to move. But, being Buddhas, they were supposed to have their Bodhisats; and thus out of the five last Buddhas of the earlier teaching there grew up five mystic trinities, each group consisting of one of these five Buddhas, his prototype in heaven the Dhyāni Buddha, and his celestial Bodhisat. Among these hypothetical beings, the creations of a sickly scholasticism, hollow abstractions without life or reality, the particular trinity in which the historical Gotama was assigned a subordinate place naturally occupied the most exalted rank. Amitābha, the Dhyāni-Buddha of this trinity, soon began to fill the largest place in the minds of the new school; and Avalokiteśwara, his Bodhisat, was looked upon with a reverence somewhat less than his former glory. It is needless to add that, under the overpowering influence of these vain imaginations, the earnest moral teachings of Gotama became more and more hidden from view. The imaginary saints grew and flourished. Each new creation, each new step in the theory, demanded another, until the whole sky was filled with forgeries of the brain, and the nobler and simpler lessons of the founder of the religion were hidden beneath the glittering stream of metaphysical subtleties.

Still worse results followed on the change of the earlier point of view. The acute minds of the Buddhist pandits, no longer occupied with the practical lessons of Arahatship, turned their

Amitābha, who occupies the higher place in the mythology of the Great Vehicle, would be superior to the latter, as the spiritual representative of Avalokiteśvara. But practically the Dalai Lāma, owing to his position in the capital,[1] has the political supremacy, and is actually called the *Gyalpo Rinpotshe*, "the glorious king"—his companion being content with the title *Pantshen Rinpotshe*, "the glorious teacher." When either of them dies it is necessary for the other to ascertain in whose body the celestial being whose outward form has been dissolved has been pleased again to incarnate himself. For that purpose the names of all male children born just after the death of the deceased Great Lāma are laid before his survivor. He chooses three out of the whole number; their names are thrown into a golden casket provided for that purpose by a former emperor of China. The Chutuktus, or abbots of the great monasteries, then assemble, and after a week of prayer, the lots are drawn in their presence and in presence of the surviving Great Lāma and of the Chinese political resident. The child whose name is first drawn is the future Great Lāma; the other two receive each of them 500 pieces of silver. The Chutuktus just mentioned correspond in many respects to the Roman cardinals. Like the Great Lāmas, they bear the title of Rinpotshe or Glorious, and are looked upon as incarnations of one or other of the celestial Bodhisats of the Great Vehicle mythology. Their number varies from ten to a hundred; and it is uncertain whether the honour is inherent in the abbacy of certain of the greatest cloisters, or whether the Dalai Lāma exercises the right of choosing them. Under these high officials of the Tibetan hierarchy there come the Chubil Khāns, who fill the post of abbot to the lesser monasteries, and are also incarnations. Their number is very large; there are few monasteries in Tibet or in Mongolia which do not claim to possess one of these living Buddhas. Besides these mystical persons there are in the Tibetan church other ranks and degrees, corresponding to the deacon, full priest, dean and doctor of divinity in the West. At the great yearly festival at Lhasa they make in the cathedral an imposing array, not much less magnificent than that of the clergy in Rome; for the ancient simplicity of dress has disappeared in the growing differences of rank, and each division of the spiritual army is distinguished in Tibet, as in the West, by a special uniform. The political authority of the Dalai Lāma is confined to Tibet itself, but he is the acknowledged head also of the Buddhist church throughout Mongolia and China. He has no supremacy over his co-religionists in Japan, and even in China there are many Buddhists who are not practically under his control or influence.

The best work on Lāmāism is still Köppen's *Die Lamaische Hierarchie und Kirche* (Berlin, 1859). See also Bushell, "The Early History of Tibet," in the *Journal of the Royal Asiatic Society*, 1879–1880, vol. xii.; Sanang Setzen's *History of the East Mongols* (in Mongolian, translated into German by J. Schmidt, *Geschichte der Ost-Mongolen*); "Analyse du Kandjur," by M. Léon Feer, in *Annales du Musée Gaimet* (1881); Schott, *Ueber den Buddhismus in Hoch-Asien*; Gutzlaff, *Geschichte des Chinesischen Reiches*; Huc and Gabet, *Souvenirs d'un voyage dans la Tartarie, le Tibet, et la Chine* (Paris, 1858); Pallas's *Sammlung historischer Nachrichten über die Mongolischen Völkerschaften*; Bābu Sarat Chunder Das's "Contributions on the Religion and History of Tibet," in the *Journal of the Bengal Asiatic Society*, 1881; L. A. Waddell, *The Buddhism of Tibet* (London, 1895); A. H. Francke, *History of Western Tibet* (London, 1907); A. Grünwedel, *Mythologie des Buddhismus in Tibet und der Mongolei* (Berlin, 1900). (T. W. R. D.)

LAMALOU-LES-BAINS, a watering-place of southern France in the department of Hérault, 53½ m. W. of Montpellier by rail, in a valley of the southern Cévennes. Pop. (1906) 720. The waters, which are both hot and cold, are used in cases of rheumatism, sciatica, locomotor ataxy and nervous maladies.

LAMA-MIAO, or DOLON-NOR, a city of the province of Chih-li, China, 150 m. N. of Peking, in a barren sandy plain watered by the Urtingol, a tributary of the Shang-tu-ko. The town proper, almost exclusively occupied by Chinese, is about a mile in length by half a mile in breadth, has narrow and dirty streets, and contains a population of about 26,000. Unlike the ordinary Chinese town of the same rank, it is not walled. A busy trade is carried on between the Chinese and the Mongolians, who bring in their cattle, sheep, camels, hides and wool to barter for tea, tobacco, cotton and silk. At some distance from the Chinese town lies the Mongolian quarter, with two groups of lama temples and villages occupied by about 2300 priests. Dr Williamson (*Journeys in North China*, 1870) described the chief temple as a huge oblong building with an interior not unlike a Gothic church. Lama-miao is the seat of a manufactory of bronze idols and other articles of ritual, which find their way to all parts of Mongolia and Tibet. The craftsmen work in their own houses.

LAMAR, LUCIUS QUINTUS CINCINNATUS (1825–1893), American statesman and judge, was born at the old "Lamar Homestead," in Putnam county, Georgia, on the 17th of September 1825. His father, Lucius Q. C. Lamar (1797–1834), was an able lawyer, a judge of the superior court of Georgia, and the compiler of the *Laws of Georgia from 1810 to 1819* (1821). In 1845 young Lamar graduated from Emory College (Oxford, Ga.), and in 1847 was admitted to the bar. In 1849 he removed to Oxford, Mississippi, and in 1850–1852 was adjunct professor of mathematics in the state university. In 1852 he removed to Covington, Ga., to practise law, and in 1853 was elected a member of the Georgia House of Representatives. In 1855 he returned to Mississippi, and two years later became a member of the National House of Representatives, where he served until December 1860, when he withdrew to become a candidate for election to the "secession" convention of Mississippi. He was elected to the convention, and drafted for it the Mississippi ordinance of secession. In the summer of 1860 he had accepted an appointment to the chair of ethics and metaphysics in the university of Mississippi, but, having been appointed a lieutenant-colonel in the Confederate Army in the spring of 1861, he resigned his professorship. The colonel of his regiment (Nineteenth Mississippi) was killed early in the battle of Williamsburg, on the 5th of May 1862, and the command then fell to Lamar, but in October he resigned from the army. In November 1862 he was appointed by President Jefferson Davis special commissioner of the Confederacy to Russia; but he did not proceed farther than Paris, and his mission was soon terminated by the refusal of the Confederate Senate to confirm his appointment. In 1866 he was again appointed to the chair of ethics and metaphysics in the university of Mississippi, and in the next year was transferred to the chair of law, but in 1870, Republicans having become trustees of the university upon the readmission of the state into the Union, he resigned. From 1873 to 1877 he was again a Democratic representative in Congress; from 1877 to 1885 he was a United States senator; from 1885 to January 1888 he was secretary of the interior; and from 1888 until his death at Macon, Ga., on the 23rd of January 1893, he was an associate justice of the Supreme Court of the United States. In Congress Lamar fought the silver and greenback craze and argued forcibly against the protective tariff; in the department of the interior he introduced various reforms; and on the Supreme Court bench his dissenting opinion in the *Neagle Case* (based upon a denial that certain powers belonging to Congress, but not exercised, were by implication vested in the department of justice) is famous. But he is perhaps best known for the part he took after the Civil War in helping to effect a reconciliation between the North and the South. During the early secession movement he strove to arouse the white people of the South from their indifference, declaring that secession alone could save them from a doom similar to that of the former whites of San Domingo. He probably never changed his convictions as to the righteousness of the "lost cause"; but he accepted the result of the war as a final settlement of the differences leading to it, and strove to restore the South in the Union, and to effect the reunion of the nation in feeling as well as in government. This is in part seen from such speeches as his eulogy on Charles Sumner (27th of April 1874), his leadership in reorganizing the Democratic party of his own state, and his counsels of peace in the disputed presidential election of 1876.

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[1] This statement, representing the substantial and historical position, is retained, in spite of the crises of March 1910, when the Dalai Lāma took refuge from the Chinese in India, and of 1904, when the British expedition occupied Lhasa and the Dalai Lāma fled to China (see TIBET).

See Edward Mayes, *Lucius Q. C. Lamar: His Life, Times and Speeches* (Nashville, Tenn., 1896).

LAMARCK, JEAN BAPTISTE PIERRE ANTOINE DE MONET, CHEVALIER DE (1744–1829), French naturalist, was born on the 1st of August 1744, at Bazantin, a village of Picardy. He was an eleventh child; and his father, lord of the manor and of old family, but of limited means, having placed three sons in the army, destined this one for the church, and sent him to the Jesuits at Amiens, where he continued till his father's death. After this he would remain with the Jesuits no longer, and, not yet seventeen years of age, started for the seat of war at Bergen-op-Zoom, before which place one of his brothers had already been killed. Mounted on an old horse, with a boy from the village as attendant, and furnished by a lady with a letter of introduction to a colonel, he reached his destination on the evening before a battle. Next morning the colonel found that the new and very diminutive volunteer had posted himself in the front rank of a body of grenadiers, and could not be induced to quit the position. In the battle, the company which he had joined became exposed to the fire of the enemy's artillery, and in the confusion of retreat was forgotten. All the officers and subalterns were killed, and not more than fourteen men were left, when the oldest grenadiers seeing there were no more French in sight proposed to the young volunteer so soon become commandant to withdraw his men. This he refused to do without orders. These at last arrived; and for his bravery he was made an officer on the spot, and soon after was named to a lieutenancy.

After the peace, the regiment was sent to Monaco. There one of his comrades playfully lifted him by the head, and to this it was imputed that he was seized with disease of the glands of the neck, so severe as to put a stop to his military career. He went to Paris and began the study of medicine, supporting himself by working in a banker's office He early became interested in meteorology and in physical and chemical speculations of a chimerical kind, but happily threw his main strength into botany, and in 1778 published his *Flore française*, a work in which by a dichotomous system of contrasting characters he enabled the student with facility to determine species. This work, which went through several editions and long kept the field, gained for its author immediate popularity as well as admission to the Academy of Sciences.

In 1781 and 1782, under the title of botanist to the king, an appointment obtained for him by Buffon, whose son accompanied him, he travelled through various countries of Europe, extending his knowledge of natural history; and on his return he began those elaborate contributions to botany on which his reputation in that science principally rests, namely, the *Dictionnaire de Botanique* and the *Illustrations de Genres*, voluminous works contributed to the *Encyclopédie Méthodique* (1785). In 1793, in consequence of changes in the organization of the natural history department at the Jardin du Roi, where he had held a botanical appointment since 1788, Lamarck was presented to a zoological chair, and called on to lecture on the *Insecta* and *Vermes* of Linnaeus, the animals for which he introduced the term *Invertebrata.* Thus driven, comparatively late in life, to devote his principal attention to zoology instead of botany, he had the misfortune soon after to suffer from impaired vision; and the malady resulted subsequently in total blindness. Yet his greatest zoological work, the *Histoire naturelle des animaux sans vertèbres*, was published from 1815 to 1822, with the assistance, in the last two volumes, of his eldest daughter and of P. A. Latreille (1762–1833). A volume of plates of the fossil shells of the neighbourhood of Paris was collected in 1823 from his memoirs in the *Annales des Muséums*. He died on the 18th of December 1829.

The character of Lamarck as a naturalist is remarkable alike for its excellences and its defects. His excellences were width of scope, fertility of ideas and a pre-eminent faculty of precise description, arising not only from a singularly terse style, but from a clear insight into both the distinctive features and the resemblances of forms. That part of his zoological work which constitutes his solid claim to the highest honour as a zoologist is to be found in his extensive and detailed labours in the departments of living and fossil *Invertebrata*. His endeavours at classification of the great groups were necessarily defective on account of the imperfect knowledge possessed in his time in regard to many of them, *e.g.* echinoderms, ascidians and intestinal worms; yet they are not without interest, particularly on account of the comprehensive attempt to unite in one great division as *Articulata* all those groups that appeared to present a segmented construction. Moreover, Lamarck was the first to distinguish vertebrate from invertebrate animals by the presence of a vertebral column, and among the Invertebrata to found the groups *Crustacea*, *Arachnida* and *Annelida*. In 1785 (*Hist. del'Acad.*) he evinced his appreciation of the necessity of natural orders in botany by an attempt at the classification of plants, interesting, though crude and falling immeasurably short of the system which grew in the hands of his intimate friend A. L. de Jussieu. The problem of taxonomy has never been put more philosophically than he subsequently put it in his *Animaux sans vertèbres*: "What arrangement must be given to the general distribution of animals to make it conformable to the order of nature in the production of these beings?"

The most prominent defect in Lamarck must be admitted to have been want of control in speculation. Doubtless the speculative tendency furnished a powerful incentive to work, but it outran the legitimate deductions from observation, and led him into the production of volumes of worthless chemistry without experimental basis, as well as into spending much time on fruitless meteorological predictions. His *Annuaires Météorologiques* were published yearly from 1800 to 1810, and were not discontinued until after an unnecessarily public and brutal tirade from Napoleon, administered on the occasion of being presented with one of his works on natural history.

To the general reader the name of Lamarck is chiefly interesting on account of his theory of the origin of life and of the diversities of animal forms. The idea, which appears to have been favoured by Buffon before him, that species were not through all time unalterable, and that the more complex might have been developed from pre-existent simpler forms, became with Lamarck a belief or, as he imagined, a demonstration. Spontaneous generation, he considered, might be easily conceived as resulting from such agencies as heat and electricity causing in small gelatinous bodies an utricular structure, and inducing a "singular tension," a kind of "éréthisme" or "orgasme"; and, having thus accounted for the first appearance of life, he explained the whole organization of animals and formation of different organs by four laws (introduction to his *Histoire naturelle des animaux sans vertèbres*, 1815):—

1. "Life by its proper forces tends continually to increase the volume of every body possessing it, and to enlarge its parts, up to a limit which it brings about.
2. "The production of a new organ in an animal body results from the supervention of a new want (*besoin*) continuing to make itself felt, and a new movement which this want gives birth to and encourages.
3. "The development of organs and their force of action are constantly in ratio to the employment of these organs.
4. "All which has been acquired, laid down, or changed in the organization of individuals in the course of their life is conserved by generation and transmitted to the new individuals which proceed from those which have undergone those changes."

The second law is often referred to as Lamarck's hypothesis of the evolution of organs in animals by appetence or longing, although he does not teach that the animal's desires affect its conformation directly, but that altered wants lead to altered habits, which result in the formation of new organs as well as in modification, growth or dwindling of those previously existing. Thus, he suggests that, ruminants being pursued by carnivora, their legs have grown slender; and, their legs being only fit for support, while their jaws are weak, they have made attack with the crown of the head, and the determination of fluids thither has led to the growth of horns. So also the stretching of the giraffe's neck to reach the foliage he supposes to have led to its elongation; and the kangaroo, sitting upright to support the young in its pouch, he imagines to have had its fore-limbs dwarfed by disuse, and its hind legs and tail exaggerated by using them in leaping. The fourth law expresses the inheritance of acquired characters, which is denied by August Weismann and his followers. For a more detailed account of Lamarck's place in the history of the doctrine of evolution, see EVOLUTION.

LA MARGHERITA, CLEMENTE SOLARO, COUNT DEL (1792–1869), Piedmontese statesman, was born at Mondovi. He studied law at Siena and Turin, but Piedmont was at that time under French domination, and being devoted to the house of Savoy he refused to take his degree, as this proceeding would have obliged him to recognize the authority of the usurper; after the restoration of the Sardinian kingdom, however, he graduated. In 1816 he entered the diplomatic service. Later he returned to Turin, and succeeded in gaining the confidence and esteem of King Charles Albert, who in 1835 appointed him minister of foreign affairs. A fervent Roman Catholic, devoted to the pope and to the Jesuits, friendly to Austria and firmly attached to the principles of autocracy, he strongly opposed every attempt at political innovation, and was in consequence bitterly hated by the liberals. When the popular agitation in favour of constitutional reform first broke out the king felt obliged to dispense with La Margherita's services, although he had conducted public affairs with considerable ability and absolute loyalty, even upholding the dignity of the kingdom in the face of the arrogant attitude of the cabinet of Vienna. He expounded his political creed and his policy as minister to Charles Albert (from February 1835 to October 1847) in his *Memorandum storico-politico*, published in 1851, a document of great interest for the study of the conditions of Piedmont and Italy at that time. In 1853 he was elected deputy for San Quirico, but he persisted in regarding his mandate as derived from the royal authority rather than as an emanation of the popular will. As leader of the Clerical Right in the parliament he strongly opposed Cavour's policy, which was eventually to lead to Italian unity, and on the establishment of the kingdom of Italy he retired from public life.

LA MARMORA, ALFONSO FERRERO (1804–1878), Italian general and statesman, was born at Turin on the 18th of November 1804. He entered the Sardinian army in 1823, and was a captain in March 1848, when he gained distinction and the rank of major at the siege of Peschiera. On the 5th of August 1848 he liberated Charles Albert, king of Sardinia, from the Milan revolutionaries, and in October was promoted general and appointed minister of war. After suppressing the revolt of Genoa in 1849, he again assumed in November 1849 the portfolio of war, which, save during the period of his command of the Crimean expedition, he retained until 1859. Having reconstructed the Piedmontese army, he took part in the war of 1859 against Austria; and in July of that year succeeded Cavour in the premiership. In 1860 he was sent to Berlin and St Petersburg to arrange for the recognition of the kingdom of Italy, and subsequently he held the offices of governor of Milan and royal lieutenant at Naples, until, in September 1864, he succeeded Minghetti as premier. In this capacity he modified the scope of the September Convention by a note in which he claimed for Italy full freedom of action in respect of national aspirations to the possession of Rome, a document of which Visconti Venosta afterwards took advantage when justifying the Italian occupation of Rome in 1870. In April 1866 La Marmora concluded an alliance with Prussia against Austria, and, on the outbreak of war in June, took command of an army corps, but was defeated at Custozza on the 23rd of June. Accused of treason by his fellow-countrymen, and of duplicity by the Prussians, he eventually published in defence of his tactics (1873) a series of documents entitled *Un po' più di luce sugli eventi dell' anno 1866* (More light on the events of 1866) a step which caused irritation in Germany, and exposed him to the charge of having violated state secrets. Meanwhile he had been sent to Paris in 1867 to oppose the French expedition to Rome, and in 1870, after the occupation of Rome by the Italians, had been appointed lieutenant-royal of the new capital. He died at Florence on the 5th of January 1878. La Marmora's writings include *Un episodio del risorgimento italiano* (Florence, 1875); and *I segreti di stato nel governo constituzionale* (Florence, 1877).

See G. Massani, *Il generale Alfonso La Marmora* (Milan, 1880).

LAMARTINE, ALPHONSE MARIE LOUIS DE PRAT DE (1790–1869), French poet, historian and statesman, was born at Mâcon on the 21st of October 1790. The order of his surnames is a controversial matter, and they are sometimes reversed. The family of Lamartine was good, and the title of Prat was taken from an estate in Franche Comté. His father was imprisoned during the Terror, and only released owing to the events of the 9th Thermidor. Lamartine's early education was received from his mother. He was sent to school at Lyons in 1805, but not being happy there was transferred to the care of the Pères de la Foi at Belley, where he remained until 1809. For some time afterwards he lived at home, reading romantic and poetical literature, but in 1811 he set out for Italy, where he seems to have sojourned nearly two years. His family having been steady royalists, he entered the Gardes du corps at the return of the Bourbons, and during the Hundred Days he sought refuge first in Switzerland and then at Aix-en-Savoie, where he fell in love, with abundant results of the poetical kind. After Waterloo he returned to Paris. In 1818–1819 he revisited Switzerland, Savoy and Italy, the death of his beloved affording him new subjects for verse. After some difficulties he had his first book, the *Méditations, poétiques et religieuses*, published (1820). It was exceedingly popular, and helped him to make a position. He had left the army for some time; he now entered the diplomatic service and was appointed secretary to the embassy at Naples. On his way to his post he married, in 1823, at Geneva a young English lady, Marianne Birch, who had both money and beauty, and in the same year his *Nouvelles méditations poétiques* appeared.

In 1824 he was transferred to Florence, where he remained five years. His *Last Canto of Childe Harold* appeared in 1825, and he had to fight a duel (in which he was wounded) with an Italian officer, Colonel Pepe, in consequence of a phrase in it. Charles X., on whose coronation he wrote a poem, gave him the order of the Legion of Honour. The *Harmonies poétiques et religieuses* appeared in 1829, when he had left Florence. Having refused an appointment in Paris under the Polignac ministry, he went on a special mission to Prince Leopold of Saxe-Coburg. In the same year he was elected to the Academy. Lamartine was in Switzerland, not in Paris, at the time of the Revolution of July, and, though he put forth a pamphlet on "Rational Policy," he did not at that crisis take any active part in politics, refusing, however, to continue his diplomatic services under the new government. In 1832 he set out with his wife and daughter for Palestine, having been unsuccessful in his candidature for a seat in the chamber. His daughter Julia died at Beirut, and before long he received the news of his election by a constituency (Bergues) in the department of the Nord. He returned through Turkey and Germany, and made his first speech shortly after the beginning of 1834. Thereafter he spoke constantly, and acquired considerable reputation as an orator,—bringing out, moreover, many books in prose and verse. His Eastern travels (*Voyage en Orient*) appeared in 1835, his *Chute d'un ange* and *Jocelyn* in 1837, and his *Recueillements*, the last remarkable volume of his poetry, in 1839. As the reign of Louis Philippe went on, Lamartine, who had previously been a liberal royalist, something after the fashion of Chateaubriand, became more and more democratic in his opinions. He set about his greatest prose work, the *Histoire des Girondins*, which at first appeared periodically, and was published as a whole in 1847. Like many other French histories, it was a pamphlet as well as a chronicle, and the subjects of Lamartine's pen became his models in politics.

At the revolution of February Lamartine was one of the first to declare for a provisional government, and became a member of it, with the post of minister for foreign affairs. He was elected for the new constituent assembly in ten different departments, and was chosen one of the five members of the Executive Committee. For a few months indeed Lamartine, from being a distinguished man of letters, an official of inferior rank in diplomacy, and an eloquent but unpractical speaker in parliament, became one of the foremost men in Europe. His inexperience in the routine work of government, the utterly unpractical nature of his colleagues, and the turbulence of the Parisian mob, proved fatal to his chances. He gave some proofs of statesmanlike ability, and his eloquence was repeatedly called into requisition to pacify the Parisians. But no one can permanently carry on the government of a great country by speeches from the balcony of a house in the capital, and Lamartine found himself in a dilemma. So long as he held aloof from Ledru-Rollin and the more radical of his colleagues, the disunion resulting weakened the government; as soon as he effected an approximation to them the middle classes fell off from him. The quelling of the insurrection of the 15th of May was his last successful act. A month later the renewal of active disturbances brought on the fighting of June, and Lamartine's influence was extinguished in favour of Cavaignac. Moreover, his chance of renewed political pre-eminence was gone. He had been tried and found wanting, having neither the virtues nor the vices of his situation. In January 1849, though he was nominated for the presidency, only a few thousand votes were given to him, and three months later he was not even elected to the Legislative Assembly.

The remaining story of Lamartine's life is somewhat melancholy. He had never been a rich man, nor had he been a saving one, and during his period of popularity and office he had incurred great expenses. He now set to work to repair his fortune by unremitting literary labour. He brought out in the *Presse* (1849) a series of *Confidences*, and somewhat later a kind of autobiography, entitled *Raphael*. He wrote several historical works of more or less importance, the *History of the Revolution of 1848*, *The History of the Restoration*, *The History of Turkey*, *The History of Russia*, besides a large number of small biographical and miscellaneous works. In 1858 a subscription was opened for his benefit. Two years afterwards, following the example of Chateaubriand, he supervised an elaborate edition of his own works in forty-one volumes. This occupied five years, and while he was engaged on it his wife died (1863). He was now over seventy; his powers had deserted him, and even if they had not the public taste had entirely changed. His efforts had not succeeded in placing him in a position of independence; and at last, in 1867, the government of the Empire (from which he had perforce stood aloof, though he never considered it necessary to adopt the active protesting attitude of Edgar Quinet and Victor Hugo) came to his assistance, a vote of £20,000 being proposed in April of that year for his benefit by Émile Ollivier. This was creditable to both parties, for Lamartine, both as a distinguished man of letters and as a past servant of the state, had every claim to the bounty of his country. But he was reproached for accepting it by the extreme republicans and irreconcilables. He did not enjoy it long, dying on the 28th of February 1869.

As a statesman Lamartine was placed during his brief tenure of office in a position from which it would have been almost impossible for any man, who was not prepared and able to play the dictator, to emerge with credit. At no time in history were unpractical crotchets so rife in the heads of men as in 1848. But Lamartine could hardly have guided the ship of state safely even in much calmer weather. He was amiable and even estimable, the chief fault of his character being vanity and an incurable tendency towards theatrical effect, which makes his travels, memoirs and other personal records as well as his historical works radically untrustworthy. Nor does it appear that he had any settled political ideas. He did good by moderating the revolutionary and destructive ardour of the Parisian populace in 1848; but he had been perhaps more responsible than any other single person for bringing about the events of that year by the vague and frothy republican declamation of his *Histoire des Girondins*.

More must be said of his literary position. Lamartine had the advantage of coming at a time when the literary field, at least in the departments of belles lettres, was almost empty. The feeble school of descriptive writers, epic poets of the extreme decadence, fabulists and miscellaneous verse-makers, which the Empire had nourished could satisfy no one. Madame de Staël was dead; Chateaubriand, though alive, was something of a classic, and had not effected a full revolution. Lamartine did not himself go the complete length of the Romantic revival, but he went far in that direction. He availed himself of the reviving interest in legitimism and Catholicism which was represented by Bonald and Joseph de Maistre, of the nature worship of Rousseau and Bernardin de Saint Pierre, of the sentimentalism of Madame de Staël, of the medievalism and the romance of Chateaubriand and Scott, of the *maladie du siècle* of Chateaubriand and Byron. Perhaps if his matter be very closely analysed it will be found that he added hardly anything of his own. But if the parts of the mixture were like other things the mixture itself was not. It seemed indeed to the immediate generation so original that tradition has it that the *Méditations* were refused by a publisher because they were in none of the accepted styles. They appeared when Lamartine was nearly thirty years old. The best of them, and the best thing that Lamartine ever did, is the famous *Lac*, describing his return to the little mountain tarn of Le Bourget after the death of his mistress, with whom he had visited it in other days. The verse is exquisitely harmonious, the sentiments conventional but refined and delicate, the imagery well chosen and gracefully expressed. There is an unquestionable want of vigour, but to readers of that day the want of vigour was entirely compensated by the presence of freshness and grace. Lamartine's chief misfortune in poetry was not only that his note was a somewhat weak one, but that he could strike but one. The four volumes of the *Méditations*, the *Harmonies* and the *Recueillements*, which contained the prime of his verse, are perhaps the most monotonous reading to be found anywhere in work of equal bulk by a poet of equal talent. They contain nothing but meditative lyrical pieces, almost any one of which is typical of the whole, though there is considerable variation of merit. The two narrative poems which succeeded the early lyrics, *Jocelyn* and the *Chute d'un ange*, were, according to Lamartine's original plan, parts of a vast "Epic of the Ages," some further fragments of which survive. *Jocelyn* had at one time more popularity in England than most French verse. *La Chute d'un ange*, in which the Byronic influence is more obvious than in any other of Lamartine's works, and in which some have also seen that of Alfred de Vigny, is more ambitious in theme, and less regulated by scrupulous conditions of delicacy in handling, than most of its author's poetry. It does, however, little more than prove that such audacities were not for him.

As a prose writer Lamartine was very fertile. His characteristics in his prose fiction and descriptive work are not very different from those of his poetry. He is always and everywhere sentimental, though very frequently, as in his shorter prose tales (*The Stone Mason of Saint-Point*, *Graziella*, &c.), he is graceful as well as sentimental. In his histories the effect is worse. It has been hinted that Lamartine's personal narratives are doubtfully trustworthy; with regard to his Eastern travels some of the episodes were stigmatized as mere inventions. In his histories proper the special motive for embellishment disappears, but the habit of inaccuracy remains. As an historian he belongs exclusively to the rhetorical school as distinguished from the philosophical on the one hand and the documentary on the other.

It is not surprising when these characteristics of Lamartine's work are appreciated to find that his fame declined with singular rapidity in France. As a poet he had lost his reputation many years before he died. He was entirely eclipsed by the brilliant and vigorous school who succeeded him with Victor Hugo at their head. His power of initiative in poetry was very small, and the range of poetic ground which he could cover strictly limited. He could only carry the picturesque sentimentalism of Rousseau, Bernardin de Saint Pierre and Chateaubriand a little farther, and clothe it in language and verse a little less antiquated than that of Chênedollé and Millevoye. He has been said to be a French Cowper, and the parallel holds good in respect of versification and of his relative position to the more daringly innovating school that followed, though not in respect of individual peculiarities. Lamartine in short occupied a kind of half-way house between the 18th century and the Romantic movement, and he never got any farther. When Matthew Arnold questioned his importance in conversation with Sainte-Beuve, the answer was, "He is important to *us*," and it was a true answer; but the limitation is obvious. In more recent years, however, efforts have been made by Brunetière and others to remove it. The usual revolution of critical as of other taste, the oblivion of personal and political unpopularity, and above all the reaction against Hugo and the extreme Romantics, have been the main agents in this. Lamartine has been extolled as a pattern of combined passion and restraint, as a model of nobility of sentiment, and as a harmonizer of pure French classicism in taste and expression with much, if not all, the better part of Romanticism itself. These oscillations of opinion are frequent, if not universal, and it is only after more than one or two swings that the pendulum remains at the perpendicular. The above remarks are an attempt to correct extravagance in either direction. But it is difficult to believe that Lamartine can ever permanently take rank among the first order of poets.

The edition mentioned is the most complete one of Lamartine, but there are many issues of his separate works. After his death some poems and *Mémoires inédits* of his youth were published, and also two volumes of correspondence, while in 1893 Mlle V. de Lamartine added a volume of *Lettres* to him. The change of views above referred to may be studied in the detached articles of MM. Brunetière, Faguet, Lemaître, &c., and in the more substantive work of Ch. de Pomairols, *Lamartine* (1889); E. Deschanel, *Lamartine* (1893); E. Zyrowski, *Lamartine* (1896); and perhaps best of all in the Preface to Emile Legouis' Clarendon Press edition of *Jocelyn* (1906), where a vigorous effort is made to combat the idea of Lamartine's sentimentality and femininity as a poet. (G. Sa.)

LAMB, CHARLES (1775–1834), English essayist and critic, was born in Crown Office Row, Inner Temple, London, on the 10th of February 1775. His father, John Lamb, a Lincolnshire man, who filled the situation of clerk and servant-companion to Samuel Salt, a member of parliament and one of the benchers of the Inner Temple, was successful in obtaining for Charles, the youngest of three surviving children, a presentation to Christ's Hospital, where the boy remained from his eighth to his fifteenth year (1782–1789). Here he had for a schoolfellow Samuel Taylor Coleridge, his senior by rather more than two years, and a close and tender friendship began which lasted for the rest of the lives of both. When the time came for leaving school, where he had learned some Greek and acquired considerable facility in Latin composition, Lamb, after a brief stay at home (probably spent, as his school holidays had often been, over old English authors in Salt's library) was condemned to the labours of the desk—"an inconquerable impediment" in his speech disqualifying him for the clerical profession, which, as the school exhibitions were usually only given to those preparing for the church, thus deprived him of the only means by which he could have obtained a university education. For a short time he was in the office of Joseph Paice, a London merchant, and then for twenty-three weeks, until the 8th of February 1792, he held a small post in the Examiner's Office of the South Sea House, where his brother John was established, a period which, although his age was but sixteen, was to provide him nearly thirty years later with materials for the first of the *Essays of Elia*. On the 5th of April 1792, he entered the Accountant's Office in the East India House, where during the next three and thirty years the hundred official folios of what he used to call his true "works" were produced.

Of the years 1792–1795 we know little. At the end of 1794 he saw much of Coleridge and joined him in writing sonnets in the *Morning Post*, addressed to eminent persons: early in 1795 he met Southey and was much in the company of James White, whom he probably helped in the composition of the *Original Letters of Sir John Falstaff*; and at the end of the year for a short time he became so unhinged mentally as to necessitate confinement in an asylum. The cause, it is probable, was an unsuccessful love affair with Ann Simmons, the Hertfordshire maiden to whom his first sonnets are addressed, whom he would have seen when on his visits as a youth to Blakesware House, near Widford, the country home of the Plumer family, of which Lamb's grandmother, Mary Field, was for many years, until her death in 1792, sole custodian.

It was in the late summer of 1796 that a dreadful calamity came upon the Lambs, which seemed to blight all Lamb's prospects in the very morning of life. On the 22nd of September his sister Mary, "worn down to a state of extreme nervous misery by attention to needlework by day and to her mother at night," was suddenly seized with acute mania, in which she stabbed her mother to the heart. The calm self-mastery and loving self-renunciation which Charles Lamb, by constitution excitable, nervous and self-mistrustful, displayed at this crisis in his own history and in that of those nearest him, will ever give him an imperishable claim to the reverence and affection of all who are capable of appreciating the heroisms of common life. With the help of friends he succeeded in obtaining his sister's release from the life-long restraint to which she would otherwise have been doomed, on the express condition that he himself should undertake the responsibility for her safe keeping. It proved no light charge: for though no one was capable of affording a more intelligent or affectionate companionship than Mary Lamb during her periods of health, there was ever present the apprehension of the recurrence of her malady; and when from time to time the premonitory symptoms had become unmistakable, there was no alternative but her removal, which took place in quietness and tears. How deeply the whole course of Lamb's domestic life must have been affected by his singular loyalty as a brother needs not to be pointed out.

Lamb's first appearance as an author was made in the year of the great tragedy of his life (1796), when there were published in the volume of *Poems on Various Subjects* by Coleridge four sonnets by "Mr Charles Lamb of the India House." In the following year he contributed, with Charles Lloyd, a pupil of Coleridge, some pieces in blank verse to the second edition of Coleridge's *Poems*. In 1797 his short summer holiday was spent with Coleridge at Nether Stowey, where he met the Wordsworths, William and Dorothy, and established a friendship with both which only his own death terminated. In 1798, under the influence of Henry Mackenzie's novel *Julie de Roubigné*, he published a short and pathetic prose tale entitled *Rosamund Gray*, in which it is possible to trace beneath disguised conditions references to the misfortunes of the author's own family, and many personal touches; and in the same year he joined Lloyd in a volume of *Blank Verse*, to which Lamb contributed poems occasioned by the death of his mother and his aunt Sarah Lamb, among them being his best-known lyric, "The Old Familiar Faces." In this year, 1798, he achieved the unexpected publicity of an attack by the *Anti-Jacobin* upon him as an associate of Coleridge and Southey (to whose *Annual Anthology* he had contributed) in their Jacobin machinations. In 1799, on the death of her father, Mary Lamb came to live again with her brother, their home then being in Pentonville; but it was not until 1800 that they really settled together, their first independent joint home being at Mitre Court Buildings in the Temple, where they lived until 1809. At the end of 1801, or beginning of 1802, appeared Lamb's first play *John Woodvil*, on which he set great store, a slight dramatic piece written in the style of the earlier Elizabethan period and containing some genuine poetry and happy delineation of the gentler emotions, but as a whole deficient in plot, vigour and character; it was held up to ridicule by the *Edinburgh Review* as a specimen of the rudest condition of the drama, a work by "a man of the age of Thespis." The dramatic spirit, however, was not thus easily quenched in Lamb, and his next effort was a farce, *Mr H——*, the point of which lay in the hero's anxiety to conceal his name "Hogsflesh"; but it did not survive the first night of its appearance at Drury Lane, in December 1806. Its author bore the failure with rare equanimity and good humour—even to joining in the hissing—and soon struck into new and more successful fields of literary exertion. Before, however, passing to these it should be mentioned that he made various efforts to earn money by journalism, partly by humorous articles, partly as dramatic critic, but chiefly as a contributor of sarcastic or funny paragraphs, "sparing neither man nor woman," in the *Morning Post*, principally in 1803.

In 1807 appeared *Tales founded on the Plays of Shakespeare*, written by Charles and Mary Lamb, in which Charles was responsible for the tragedies and Mary for the comedies; and in 1808, *Specimens of English Dramatic Poets who lived about the time of Shakespeare*, with short but felicitous critical notes. It was this work which laid the foundation of Lamb's reputation as a critic, for it was filled with imaginative understanding of the old playwrights, and a warm, discerning and novel appreciation of their great merits. In the same year, 1808, Mary Lamb, assisted by her brother, published *Poetry for Children*, and a collection of short school-girl tales under the title *Mrs Leicester's School*; and to the same date belongs *The Adventures of Ulysses*, designed by Lamb as a companion to *The Adventures of Telemachus*. In 1810 began to appear Leigh Hunt's quarterly periodical, *The Reflector*, in which Lamb published much (including the fine essays on the tragedies of Shakespeare and on Hogarth) that subsequently appeared in the first collective edition of his *Works*, which he put forth in 1818.

Between 1811, when *The Reflector* ceased, and 1820, he wrote almost nothing. In these years we may imagine him at his most social period, playing much whist and entertaining his friends on Wednesday or Thursday nights; meanwhile gathering that reputation as a conversationalist or inspirer of conversation in others, which Hazlitt, who was at one time one of Lamb's closest friends, has done so much to celebrate. When in 1818 appeared the *Works* in two volumes, it may be that Lamb considered his literary career over. Before coming to 1820, and an event which was in reality to be the beginning of that career as it is generally known—the establishment of the *London Magazine*—it should be recorded that in the summer of 1819 Lamb, with his sister's full consent, proposed marriage to Fanny Kelly, the actress, who was then in her thirtieth year. Miss Kelly could not accept, giving as one reason her devotion to her mother. Lamb bore the rebuff with characteristic humour and fortitude.

The establishment of the *London Magazine* in 1820 stimulated Lamb to the production of a series of new essays (the *Essays of Elia*) which may be said to form the chief corner-stone in the small but classic temple of his fame. The first of these, as it fell out, was a description of the old South Sea House, with which Lamb happened to have associated the name of a "gay light-hearted foreigner" called Elia, who was a clerk in the days of his service there. The pseudonym adopted on this occasion was retained for the subsequent contributions, which appeared collectively in a volume of essays called *Elia*, in 1823. After a career of five years the *London Magazine* came to an end; and about the same period Lamb's long connexion with the India House terminated, a pension of £450 (£441 net) having been assigned to him. The increased leisure, however, for which he had long sighed, did not prove favourable to literary production, which henceforth was limited to a few trifling contributions to the *New Monthly* and other serials, and the excavation of gems from the mass of dramatic literature bequeathed to the British Museum by David Garrick, which Lamb laboriously read through in 1827, an occupation which supplied him for a time with the regular hours of work he missed so much. The malady of his sister, which continued to increase with ever shortening intervals of relief, broke in painfully on his lettered ease and comfort; and it is unfortunately impossible to ignore the deteriorating effects of an over-free indulgence in the use of alcohol, and, in early life, tobacco, on a temperament such as his. His removal on account of his sister to the quiet of the country at Enfield, by tending to withdraw him from the stimulating society of the large circle of literary friends who had helped to make his weekly or monthly "at homes" so remarkable, doubtless also tended to intensify his listlessness and helplessness. One of the brightest elements in the closing years of his life was the friendship and companionship of Emma Isola, whom he and his sister had adopted, and whose marriage in 1833 to Edward Moxon, the publisher, though a source of unselfish joy to Lamb, left him more than ever alone. While living at Edmonton, whither he had moved in 1833 so that his sister might have the continual care of Mr and Mrs Walden, who were accustomed to patients of weak intellect, Lamb was overtaken by an attack of erysipelas brought on by an accidental fall as he was walking on the London road. After a few days' illness he died on the 27th of December, 1834. The sudden death of one so widely known, admired and beloved, fell on the public as well as on his own attached circle with all the poignancy of a personal calamity and a private grief. His memory wanted no tribute that affection could bestow, and Wordsworth commemorated in simple and solemn verse the genius, virtues and fraternal devotion of his early friend.

Charles Lamb is entitled to a place as an essayist beside Montaigne, Sir Thomas Browne, Steele and Addison. He unites many of the characteristics of each of these writers—refined and exquisite humour, a genuine and cordial vein of pleasantry and heart-touching pathos. His fancy is distinguished by great delicacy and tenderness; and even his conceits are imbued with human feeling and passion. He had an extreme and almost exclusive partiality for earlier prose writers, particularly for Fuller, Browne and Burton, as well as for the dramatists of Shakespeare's time; and the care with which he studied them is apparent in all he ever wrote. It shines out conspicuously in his style, which has an antique air and is redolent of the peculiarities of the 17th century. Its quaintness has subjected the author to the charge of affectation, but there is nothing really affected in his writings. His style is not so much an imitation as a reflexion of the older writers; for in spirit he made himself their contemporary. A confirmed habit of studying them in preference to modern literature had made something of their style natural to him; and long experience had rendered it not only easy and familiar but habitual. It was not a masquerade dress he wore, but the costume which showed the man to most advantage. With thought and meaning often profound, though clothed in simple language, every sentence of his essays is pregnant.

He played a considerable part in reviving the dramatic writers of the Shakesperian age; for he preceded Gifford and others in wiping the dust of ages from their works. In his brief comments on each specimen he displays exquisite powers of discrimination: his discernment of the true meaning of his author is almost infallible. His work was a departure in criticism. Former editors had supplied textual criticism and alternative readings: Lamb's object was to show how our ancestors felt when they placed themselves by the power of imagination in trying situations, in the conflicts of duty or passion or the strife of contending duties; what sorts of loves and enmities theirs were.

As a poet Lamb is not entitled to so high a place as that which can be claimed for him as essayist and critic. His dependence on Elizabethan models is here also manifest, but in such a way as to bring into all the greater prominence his native deficiency in "the accomplishment of verse." Yet it is impossible, once having read, ever to forget the tenderness and grace of such poems as "Hester," "The Old Familiar Faces," and the lines "On an infant dying as soon as born" or the quaint humour of "A Farewell to Tobacco." As a letter writer Lamb ranks very high, and when in a nonsensical mood there is none to touch him.

Editions and memoirs of Lamb are numerous. The *Letters*, with a sketch of his life by Sir Thomas Noon Talfourd, appeared in 1837; the *Final Memorials of Charles Lamb* by the same hand, after Mary Lamb's death, in 1848; Barry Cornwall's *Charles Lamb: A Memoir*, in 1866. Mr P. Fitzgerald's *Charles Lamb: his Friends, his Haunts and his Books* (1866); W. Carew Hazlitt's *Mary and Charles Lamb* (1874). Mr Fitzgerald and Mr Hazlitt have also both edited the *Letters*, and Mr Fitzgerald brought Talfourd to date with an edition of Lamb's works in 1870–1876. Later and fuller editions are those of Canon Ainger in 12 volumes, Mr Macdonald in 12 volumes and Mr E. V. Lucas in 7 volumes, to which in 1905 was added *The Life of Charles Lamb*, in 2 volumes. (E. V. L.)

LAMB (a word common to Teutonic languages; cf. Ger. *Lamm*), the young of sheep. The Paschal Lamb or Agnus Dei is used as a symbol of Jesus Christ, the Lamb of God (John i. 29), and "lamb," like "flock," is often used figuratively of the members of a Christian church or community, with an allusion to Jesus' charge to Peter (John xxi. 15). The "lamb and flag" is an heraldic emblem, the dexter fore-leg of the lamb supporting a staff bearing a banner charged with the St George's cross. This was one of the crests of the Knights Templars, used on seals as early as 1241; it was adopted as a badge or crest by the Middle Temple, the Inner Temple using another crest of the Templars, the winged horse or Pegasus. The old Tangier regiment, now the Queen's Royal West Surrey Regiment, bore a Paschal Lamb as its badge. From their colonel, Percy Kirke (*q.v.*), they were known as Kirke's Lambs. The exaggerated reputation of the regiment for brutality, both in Tangier and in England after Sedgmoor, lent irony to the nickname.

LAMBALLE, MARIE THÉRÈSE LOUISE OF SAVOY-CARIGNANO, PRINCESSE DE (1749–1792), fourth daughter of Louis Victor of Carignano (d. 1774) (great-grandfather of King Charles Albert of Sardinia), and of Christine Henriette of Hesse-Rheinfels-Rothenburg, was born at Turin on the 8th of September 1749. In 1767 she was married to Louis Alexandre Stanislaus de Bourbon, prince of Lamballe, son of the duke of Penthièvre, a grandson of Louis XIV.'s natural son the count of Toulouse. Her husband dying the following year, she retired with her father-in-law to Rambouillet, where she lived until the marriage of the dauphin, when she returned to court. Marie Antoinette, charmed by her gentle and naïve manners, singled her out for a companion and confidante. The impetuous character of the dauphiness found in Madame de Lamballe that submissive temperament which yields to force of environment, and the two became fast friends. After her accession Marie Antoinette, in spite of the king's opposition, had her appointed superintendent of the royal household. Between 1776 and 1785 the comtesse de Polignac succeeded in supplanting her; but when the queen tired of the avarice of the Polignacs, she turned again to Madame de Lamballe. From 1785 to the Revolution she was Marie Antoinette's closest friend and the pliant instrument of her caprices. She came with the queen to the Tuileries and as her salon served as a meeting-place for the queen and the members of the Assembly whom she wished to gain over, the people believed her to be the soul of all the intrigues. After a visit to England in 1791 to appeal for help for the royal family she made her will and returned to the Tuileries, where she continued her services to the queen until the 10th of August, when she shared her imprisonment in the Temple. On the 19th of August she was transferred to La Force, and having refused to take the oath against the monarchy, she was on the 3rd of September delivered over to the fury of the populace, after which her head was placed on a pike and carried before the windows of the queen.

See George Bertin, *Madame de Lamballe* (Paris, 1888); Austin Dobson, *Four Frenchwomen* (1890); B. C. Hardy, *Princesse de Lamballe* (1908); Comte de Lescure, *La Princesse de Lamballe . . . d'après des documents inédits* (1864); some letters of the princess published by Ch. Schmidt in *La Révolution française* (vol. xxxix., 1900); L. Lambeau, *Essais sur la mort de madame la princesse de Lamballe* (1902); Sir F. Montefiore, *The Princesse de Lamballe* (1896). *The Secret Memoirs of the Royal Family of France . . . now first published from the Journal, Letters and Conversations of the Princesse de Lamballe* (London, 2 vols., 1826) have since appeared in various editions in English and in French. They are attributed to Catherine Hyde, Marchioness Govion-Broglio-Solari, and are apocryphal.

LAMBALLE, a town of north-western France, in the department of Côtes-du-Nord, on the Gouessant 13 m. E.S.E. of St Brieuc by rail. Pop. (1906) 4347. Crowning the eminence on which the town is built is a beautiful Gothic church (13th and 14th centuries), once the chapel of the castle of the counts of Penthièvre. La Noue, the famous Huguenot leader, was mortally wounded in 1591 in the siege of the castle, which was dismantled in 1626 by Richelieu. Of the other buildings, the church of St Martin (11th, 15th and 16th centuries) is the chief. Lamballe has an important *haras* (depot for stallions) and carries on trade in grain, tanning and leather-dressing; earthenware is manufactured in the environs. Lamballe was the capital of the territory of the counts of Penthièvre, who in 1569 were made dukes.

LAMBAYEQUE, a coast department of northern Peru, bounded N. by Piura, E. and S. by Cajamarca and Libertad. Area, 4614 sq. m. Pop. (1906 estimate) 93,070. It belongs to the arid region of the coast, and is settled along the river valleys where irrigation is possible. It is one of the chief sugar-producing departments of Peru, and in some valleys, especially near Ferreñafe, rice is largely produced. Four railways connect its principal producing centres with the small ports of Eten and Pimentel, viz.: Eten to Ferreñafe, 27 m.; Eten to Cayalti, 23 m.; Pimentel to Lambayeque, 15 m.; and Chiclayo to Pátapo, 15 m. The principal towns are Chiclayo, the departmental capital, with a population (1906 estimate) of 10,500, Ferreñafe 6000, and Lambayeque 4500.

LAMBEAUX, JEF (JOSEPH MARIE THOMAS), (1852–1908), Belgian sculptor, was born at Antwerp. He studied at the Antwerp Academy of Fine Arts, and was a pupil of Jean Geefs. His first work, "War," was exhibited in 1871, and was followed by a long series of humorous groups, including "Children dancing," "Say 'Good Morning,'" "The Lucky Number" and "An Accident" (1875). He then went to Paris, where he executed for the Belgian salons "The Beggar" and "The Blind Pauper," and produced "The Kiss" (1881), generally regarded as his masterpiece. After visiting Italy, where he was much impressed by the works of Jean Bologne, he showed a strong predilection for effects of force and motion. Other notable works are his fountain at Antwerp (1886), "Robbing the Eagle's Eyrie" (1890), "Drunkenness" (1893), "The Triumph of Woman," "The Bitten Faun" (which created a great stir at the Exposition Universelle at Liége in 1905), and "The Human Passions," a colossal marble bas-relief, elaborated from a sketch exhibited in 1889. Of his numerous busts may be mentioned those of Hendrik Conscience, and of Charles Bals, the burgomaster of Brussels. He died on the 6th of June 1908.

LAMBERMONT, AUGUSTE, BARON (1819–1905), Belgian statesman, was born at Dion-le-Val in Brabant on the 25th of March 1819. He came of a family of small farmer proprietors, who had held land during three centuries. He was intended for the priesthood and entered the seminary of Floreffe, but his energies claimed a more active sphere. He left the monastery for Louvain University. Here he studied law, and also prepared himself for the military examinations. At that juncture the first Carlist war broke out, and Lambermont hastened to the scene of action. His services were accepted (April 1838) and he was entrusted with the command of two small cannon. He also acted as A.D.C. to Colonel Durando. He greatly distinguished himself, and for his intrepidity on one occasion he was decorated with the Cross of the highest military Order of St Ferdinand. Returning to Belgium he entered the Ministry for Foreign Affairs in 1842. He served in this department sixty-three years. He was closely associated with several of the most important questions in Belgian history during the last half of the 19th century—notably the freeing of the Scheldt. He was one of the very first Belgians to see the importance of developing the trade of their country, and at his own request he was attached to the commercial branch of the foreign office. The tolls imposed by the Dutch on navigation on the Scheldt strangled Belgian trade, for Antwerp was the only port of the country. The Dutch had the right to make this levy under treaties going back to the treaty of Munster in 1648, and they clung to it still more tenaciously after Belgium separated herself in 1830–1831 from the united kingdom of the Netherlands—the London conference in 1839 fixing the toll payable to Holland at 1·50 florins (3s.) per ton. From 1856 to 1863 Lambermont devoted most of his energies to the removal of this impediment. In 1856 he drew up a plan of action, and he prosecuted it with untiring perseverance until he saw it embodied in an international convention seven years later. Twenty-one powers and states attended a conference held on the question at Brussels in 1863, and on the 15th of July the treaty freeing the Scheldt was signed. For this achievement Lambermont was made a baron. Among other important conferences in which Lambermont took a leading part were those of Brussels (1874) on the usages of war, Berlin (1884–1885) on Africa and the Congo region, and Brussels (1890) on Central African Affairs and the Slave Trade. He was joint reporter with Baron de Courcel of the Berlin conference in 1884–1885, and on several occasions he was chosen as arbitrator by one or other of the great European powers. But his great achievement was the freeing of the Scheldt, and in token of its gratitude the city of Antwerp erected a fine monument to his memory. He died on the 7th of March 1905.

LAMBERT, DANIEL (1770–1809), an Englishman famous for his great size, was born near Leicester on the 13th of March 1770, the son of the keeper of the jail, to which post he succeeded in 1791. About this time his size and weight increased enormously, and though he had led an active and athletic life he weighed in 1793 thirty-two stone (448 lb). In 1806 he resolved to profit by his notoriety, and resigning his office went up to London and exhibited himself. He died on the 21st of July 1809, and at the time measured 5 ft. 11 in. in height and weighed 52¾ stone (739 lb). His waistcoat, now in the Kings Lynn Museum, measures 102 in. round the waist. His coffin contained 112 ft. of elm and was built on wheels. His name has been used as a synonym for immensity. George Meredith describes London as the "Daniel Lambert of cities," and Herbert Spencer uses the phrase "a Daniel Lambert of learning." His enormous proportions were depicted on a number of tavern signs, but the best portrait of him, a large mezzotint, is preserved at the British Museum in Lyson's *Collectanea*.

LAMBERT, FRANCIS (*c* 1486–1530), Protestant reformer, was the son of a papal official at Avignon, where he was born between 1485 and 1487. At the age of 15 he entered the Franciscan monastery at Avignon, and after 1517 he was an itinerant preacher, travelling through France, Italy and Switzerland. His study of the Scriptures shook his faith in Roman Catholic theology, and by 1522 he had abandoned his order, and became known to the leaders of the Reformation in Switzerland and Germany. He did not, however, identify himself either with Zwinglianism or Lutheranism; he disputed with Zwingli at Zurich in 1522, and then made his way to Eisenach and Wittenberg, where he married in 1523. He returned to Strassburg in 1524, being anxious to spread the doctrines of the Reformation among the French-speaking population of the neighbourhood. By the Germans he was distrusted, and in 1526 his activities were prohibited by the city of Strassburg. He was, however, befriended by Jacob Sturm, who recommended him to the Landgraf Philip of Hesse, the most liberal of the German reforming princes. With Philip's encouragement he drafted that scheme of ecclesiastical reform for which he is famous. Its basis was essentially democratic and congregational, though it provided for the government of the whole church by means of a synod. Pastors were to be elected by the congregation, and the whole system of canon-law was repudiated. This scheme was submitted by Philip to a synod at Homburg; but Luther intervened and persuaded the Landgraf to abandon it. It was far too democratic to commend itself to the Lutherans, who had by this time bound the Lutheran cause to the support of princes rather than to that of the people. Philip continued to favour Lambert, who was appointed professor and head of the theological faculty in the Landgraf's new university of Marburg. Patrick Hamilton (*q.v.*), the Scottish martyr, was one of his pupils; and it was at Lambert's instigation that Hamilton composed his *Loci communes*, or *Patrick's Pleas* as they were popularly called in Scotland. Lambert was also one of the divines who took part in the great conference of Marburg in 1529; he had long wavered between the Lutheran and the Zwinglian view of the Lord's Supper, but at this conference he definitely adopted the Zwinglian view. He died of the plague on the 18th of April 1530, and was buried at Marburg.

A catalogue of Lambert's writings is given in Haag's *La France protestante*. See also lives of Lambert by Baum (Strassburg, 1840); F. W. Hessencamp (Elberfeld, 1860), Stieve (Breslau, 1867) and Louis Ruffet (Paris, 1873); Lorimer, *Life of Patrick Hamilton* (1857); A. L. Richter, *Die evangelischen Kirchenordnungen des 16. Jahrh.* (Weimar, 1846); Hessencamp, *Hessische Kirchenordnungen im Zeitalter der Reformation*; Philip of Hesse's *Correspondence with Bucer*, ed. M. Lenz; Lindsay, *Hist. Reformation; Allgemeine deutsche Biographie.* (A. F. P.)

LAMBERT, JOHANN HEINRICH (1728–1777), German physicist, mathematician and astronomer, was born at Mulhausen, Alsace, on the 26th of August 1728. He was the son of a tailor; and the slight elementary instruction he obtained at the free school of his native town was supplemented by his own private reading. He became book-keeper at Montbéliard ironworks, and subsequently (1745) secretary to Professor Iselin, the editor of a newspaper at Basel, who three years later recommended him as private tutor to the family of Count A. von Salis of Coire. Coming thus into virtual possession of a good library, Lambert had peculiar opportunities for improving himself in his literary and scientific studies. In 1759, after completing with his pupils a tour of two years' duration through Göttingen, Utrecht, Paris, Marseilles and Turin, he resigned his tutorship and settled at Augsburg. Munich, Erlangen, Coire and Leipzig became for brief successive intervals his home. In 1764 he removed to Berlin, where he received many favours at the hand of Frederick the Great and was elected a member of the Royal Academy of Sciences of Berlin, and in 1774 edited the Berlin *Ephemeris*. He died of consumption on the 25th of September 1777. His publications show him to have been a man of original and active mind with a singular facility in applying mathematics to practical questions.

His mathematical discoveries were extended and overshadowed by his contemporaries. His development of the equation $x^m+px=q$ in an infinite series was extended by Leonhard Euler, and particularly by Joseph Louis Lagrange. In 1761 he proved the irrationality of π; a simpler proof was given somewhat later by Legendre. The introduction of hyperbolic functions into trigonometry was also due to him. His geometrical discoveries are of great value, his *Die freie Perspective* (1759–1774) being a work of great merit. Astronomy was also enriched by his investigations, and he was led to several remarkable theorems on conics which bear his name. The most important are: (1) To express the time of describing an elliptic arc under the Newtonian law of gravitation in terms of the focal distances of the initial and final points, and the length of the chord joining them. (2) A theorem relating to the apparent curvature of the geocentric path of a comet.

Lambert's most important work, *Pyrometrie* (Berlin, 1779), is a systematic treatise on heat, containing the records and full discussion of many of his own experiments. Worthy of special notice also are *Photometria* (Augsburg, 1760), *Insigniores orbitae cometarum proprietates* (Augsburg, 1761), and *Beiträge zum Gebrauche der Mathematik und deren Anwendung* (4 vols., Berlin, 1765–1772).

The *Memoirs* of the Berlin Academy from 1761 to 1784 contain many of his papers, which treat of such subjects as resistance of fluids, magnetism, comets, probabilities, the problem of three bodies, meteorology, &c. In the *Acta Helvetica* (1752–1760) and in the *Nova acta erudita* (1763–1769) several of his contributions appear. In Bode's *Jahrbuch* (1776–1780) he discusses nutation, aberration of light, Saturn's rings and comets; in the *Nova acta Helvetica* (1787) he has a long paper "Sur le son des corps élastiques," in Bernoulli and Hindenburg's *Magazin* (1787–1788) he treats of the roots of equation and of parallel lines; and in Hindenburg's *Archiv* (1798–1799) he writes on optics and perspective. Many of these pieces were published posthumously. Recognized as among the first mathematicians of his day, he was also widely known for the universality and depth of his philological and philosophical knowledge. The most valuable of his logical and philosophical memoirs were published collectively in 2 vols. (1782).

See Huber's *Lambert nach seinem Leben und Wirken*; M. Chasles, *Geschichte der Geometrie*; and Baensch, *Lamberts Philosophie und seine Stellung zu Kant* (1902).

LAMBERT [*alias* NICHOLSON], **JOHN** (d. 1538), English Protestant martyr, was born at Norwich and educated at Cambridge, where he graduated B.A. and was admitted in 1521 a fellow of Queen's College on the nomination of Catherine of Aragon. After acting for some years as a "mass-priest," his views were unsettled by the arguments of Bilney and Arthur; and episcopal persecution compelled him, according to his own account, to assume the name Lambert instead of Nicholson. He likewise removed to Antwerp, where he became chaplain to the English factory, and formed a friendship with Frith and Tyndale. Returning to England in 1531, he came under the notice of Archbishop Warham, who questioned him closely on his religious beliefs. Warham's death in August 1532 relieved Lambert from immediate danger, and he earned a living for some years by teaching Latin and Greek near the Stocks Market in London. The duke of Norfolk and other reactionaries accused him of heresy in 1536, but reforming tendencies were still in the ascendant, and Lambert escaped. In 1538, however, the reaction had begun, and Lambert was its first victim. He singled himself out for persecution by denying the Real Presence: and Henry VIII., who had just rejected the Lutheran proposals for a theological union, was in no mood to tolerate worse heresies. Lambert had challenged some views expressed by Dr John Taylor, afterwards bishop of Lincoln; and Cranmer as archbishop condemned Lambert's opinions. He appealed to the king as supreme head of the Church, and on the 16th of November Henry heard the case in person before a large assembly of spiritual and temporal peers. For five hours Lambert disputed with the king and ten bishops; and then, as he boldly denied that the Eucharist was the body of Christ, he was condemned to death by Cromwell as vicegerent. Henry's condescension and patience produced a great impression on his Catholic subjects; but Cromwell is said by Foxe to have asked Lambert's pardon before his execution, and Cranmer eventually adopted the views he condemned in Lambert. Lambert was burnt at Smithfield on the 22nd of November.

See *Letters and Papers of Henry VIII.*; Foxe's *Acts and Monuments*; Froude, *History*; Dixon, *Church History*; Gairdner, *Lollardy and the Reformation*, *Dict. of Nat. Biog.* and authorities there cited. (A. F. P.)

LAMBERT, JOHN (1619–1694), English general in the Great Rebellion, was born at Calton Hall, Kirkby Malham, in the West Riding of Yorkshire. His family was of ancient lineage, and long settled in the county. He studied law, but did not make it his profession. In 1639 he married Frances, daughter of Sir William Lister. At the opening of the Civil War he took up arms for the parliament, and in September 1642 was appointed a captain of horse in the army commanded by Ferdinando, Lord Fairfax. A year later he had become colonel of a regiment of horse, and he distinguished himself at the siege of Hull in October, 1643. Early in 1644 he did good service at the battles of Nantwich and Bradford. At Marston Moor Lambert's own regiment was routed by the charge of Goring's horse; but he cut his way through with a few troops and joined Cromwell on the other side of the field. When the New Model army was formed in the beginning of 1645, Colonel Lambert was appointed to succeed Fairfax in command of the northern forces. General Poyntz, however, soon replaced him, and under this officer he served in the Yorkshire campaign of 1645, receiving a wound before Pontefract. In 1646 he was given a regiment in the New Model, serving with Fairfax in the west of England, and he was a commissioner, with Cromwell and others, for the surrender of Oxford in the same year. "It is evident," says C. H. Firth (*Dict. Nat. Biog.*), "that he was from the first regarded as an officer of exceptional capacity and specially selected for semi-political employments."

When the quarrel between the army and the parliament began, Lambert threw himself warmly into the army's cause. He assisted Ireton in drawing up the several addresses and remonstrances issued by the army, both men having had some experience in the law, and being "of a subtle and working brain." Early in August 1647 Lambert was sent by Fairfax as major-general to take charge of the forces in the northern counties. His wise and just managing of affairs in those parts is commended by Whitelocke. He suppressed a mutiny among his troops, kept strict discipline and hunted down the moss-troopers who infested the moorland country.

When the Scottish army under the marquis of Hamilton invaded England in the summer of 1648, Lambert was engaged in suppressing the Royalist rising in his district. The arrival of the Scots obliged him to retreat; but Lambert displayed the greatest energy and did not cease to harass the invaders till Cromwell came up from Wales and with him destroyed the Scottish army in the three days' fighting from Preston to Warrington. After the battle Lambert's cavalry headed the chase, pursuing the defeated army *à outrance*, and finally surrounded it at Uttoxeter, where Hamilton surrendered to Lambert on the 25th of August. He then led the advance of Cromwell's army into Scotland, where he was left in charge on Cromwell's return. From December 1648 to March 1649 he was engaged in the siege of Pontefract Castle; Lambert was thus absent from London at the time of Pride's Purge and the trial and execution of the king.

When Cromwell was appointed to the command of the war in Scotland (July 1650), Lambert went with him as major-general and second in command. He was wounded at Musselburgh, but returned to the front in time to take a conspicuous share in the victory of Dunbar. He himself defeated the "Protesters" or "Western Whigs" at Hamilton, on the 1st of December 1650. In July 1651 he was sent into Fife to get in the rear and flank of the Scottish army near Falkirk, and force them to decisive action by cutting off their supplies. This mission, in the course of which Lambert won an important victory at Inverkeithing, was executed with entire success, whereupon Charles II., as Lambert had foreseen, made for England. For the events of the Worcester campaign, which quickly followed, see GREAT REBELLION. Lambert's part in the general plan was carried out most brilliantly, and in the crowning victory of Worcester he commanded the right wing of the English army, and had his horse shot under him. Parliament now conferred on him a grant of lands in Scotland worth £1000 per annum.

In October 1651 Lambert was made a commissioner to settle the affairs of Scotland, and on the death of Ireton he was appointed lord deputy of Ireland (January 1652). He accepted the office with pleasure, and made magnificent preparations; parliament, however, soon afterwards reconstituted the Irish administration and Lambert refused to accept office on the new terms. Henceforward he began to oppose the Rump. In the council of officers he headed the party desiring representative government, as opposed to Harrison who favoured a selected oligarchy of "God-fearing" men, but both hated what remained of the Long parliament, and joined in urging Cromwell to dissolve it by force. At the same time Lambert was consulted by the parliamentary leaders as to the possibility of dismissing Cromwell from his command, and on the 15th of March 1653 Cromwell refused to see him, speaking of him contemptuously as "bottomless Lambert." On the 20th of April, however, Lambert accompanied Cromwell when he dismissed the council of state, on the same day as the forcible expulsion of the parliament. Lambert now favoured the formation of a small executive council, to be followed by an elective parliament whose powers should be limited by a written instrument of government. Being at this time the ruling spirit in the council of state, and the idol of the army, there were some who looked on him as a possible rival of Cromwell for the chief executive power, while the royalists for a short time had hopes of his support. He was invited, with Cromwell, Harrison and Desborough, to sit in the nominated parliament of 1653; and when the unpopularity of that assembly increased, Cromwell drew nearer to Lambert. In November 1653 Lambert presided over a meeting of officers, when the question of constitutional settlement was discussed, and a proposal made for the forcible expulsion of the nominated parliament. On the 1st of December he urged Cromwell to assume the title of king, which the latter refused. On the 12th the parliament resigned its powers into Cromwell's hands, and on the 13th Lambert obtained the consent of the officers to the Instrument of Government (*q.v.*), in the framing of which he had taken a leading part. He was one of the seven officers nominated to seats in the council created by the Instrument. In the foreign policy of the protectorate he was the most clamorous of those who called for alliance with Spain and war with France in 1653, and he firmly withstood Cromwell's design for an expedition to the West Indies.

In the debates in parliament on the Instrument of Government in 1654 Lambert proposed that the office of protector should be made hereditary, but was defeated by a majority which included members of Cromwell's family. In the parliament of this year, and again in 1656, Lord Lambert, as he was now styled, sat as member for the West Riding. He was one of the major-generals appointed in August 1655 to command the militia in the ten districts into which it was proposed to divide England, and who were to be responsible for the maintenance of order and the administration of the law in their several districts. Lambert took a prominent part in the committee of council which drew up instructions to the major-generals, and he was probably the originator, and certainly the organizer, of the system of police which these officers were to control. Gardiner conjectures that it was through divergence of opinion between the protector and Lambert in connexion with these "instructions" that the estrangement between the two men began. At all events, although Lambert had himself at an earlier date requested Cromwell to take the royal dignity, when the proposal to declare Oliver king was started in parliament (February 1657) he at once declared strongly against it. A hundred officers headed by Fleetwood and Lambert waited on the protector, and begged him to put a stop to the proceedings. Lambert was not convinced by Cromwell's arguments, and their complete estrangement, personal as well as political, followed. On his refusal to take the oath of allegiance to the protector, Lambert was deprived of his commissions, receiving, however, a pension of

£2000 a year. He retired to his garden at Wimbledon, and appeared no more in public during Oliver Cromwell's lifetime; but shortly before his death Cromwell sought a reconciliation, and Lambert and his wife visited him at Whitehall.

When Richard Cromwell was proclaimed protector his chief difficulty lay with the army, over which he exercised no effective control. Lambert, though holding no military commission, was the most popular of the old Cromwellian generals with the rank and file of the army, and it was very generally believed that he would instal himself in Oliver's seat of power. Richard's adherents tried to conciliate him, and the royalist leaders made overtures to him, even proposing that Charles II. should marry Lambert's daughter. Lambert at first gave a lukewarm support to Richard Cromwell, and took no part in the intrigues of the officers at Fleetwood's residence, Wallingford House. He was a member of the parliament which met in January 1659, and when it was dissolved in April under compulsion of Fleetwood and Desborough, he was restored to his commands. He headed the deputation to Lenthall in May inviting the return of the Rump, which led to the tame retirement of Richard Cromwell into obscurity; and he was appointed a member of the committee of safety and of the council of state. When the parliament, desirous of controlling the power of the army, withheld from Fleetwood the right of nominating officers, Lambert was named one of a council of seven charged with this duty. The parliament's evident distrust of the soldiers caused much discontent in the army; while the entire absence of real authority encouraged the royalists to make overt attempts to restore Charles II., the most serious of which, under Sir George Booth and the earl of Derby, was crushed by Lambert near Chester on the 19th of August. He promoted a petition from his army that Fleetwood might be made lord-general and himself major-general. The republican party in the House took offence. The Commons (October 12th, 1659) cashiered Lambert and other officers, and retained Fleetwood as chief of a military council under the authority of the speaker. On the next day Lambert caused the doors of the House to be shut and the members kept out. On the 26th a "committee of safety" was appointed, of which he was a member. He was also appointed major-general of all the forces in England and Scotland, Fleetwood being general. Lambert was now sent with a large force to meet Monk, who was in command of the English forces in Scotland, and either negotiate with him or force him to terms. Monk, however, set his army in motion southward. Lambert's army began to melt away, and he was kept in suspense by Monk till his whole army fell from him and he returned to London almost alone. Monk marched to London unopposed. The "excluded" Presbyterian members were recalled. Lambert was sent to the Tower (March 3rd, 1660), from which he escaped a month later. He tried to rekindle the civil war in favour of the Commonwealth, but was speedily recaptured and sent back to the Tower (April 24th). On the Restoration he was exempted from danger of life by an address of both Houses to the king, but the next parliament (1662) charged him with high treason. Thenceforward for the rest of his life Lambert remained in custody in Guernsey. He died in 1694.

Lambert would have left a better name in history if he had been a cavalier. His genial, ardent and excitable nature, easily raised and easily depressed, was more akin to the royalist than to the puritan spirit. Vain and sometimes overbearing, as well as ambitious, he believed that Cromwell could not stand without him; and when Cromwell was dead, he imagined himself entitled and fitted to succeed him. Yet his ambition was less selfish than that of Monk. Lambert is accused of no ill faith, no want of generosity, no cold and calculating policy. As a soldier he was far more than a fighting general and possessed many of the qualities of a great general. He was, moreover, an able writer and speaker, and an accomplished negotiator and took pleasure in quiet and domestic pursuits. He learnt his love of gardening from Lord Fairfax, who was also his master in the art of war. He painted flowers, besides cultivating them, and incurred the blame of Mrs Hutchinson by "dressing his flowers in his garden and working at the needle with his wife and his maids." He made no special profession of religion; but no imputation is cast upon his moral character by his detractors. It has been said that he became a Roman Catholic before his death.

LAMBERT OF HERSFELD (d. *c.* 1088), German chronicler, was probably a Thuringian by birth and became a monk in the Benedictine abbey of Hersfeld in 1058. As he was ordained priest at Aschaffenburg he is sometimes called Lambert of Aschaffenburg, or Schafnaburg. He made a pilgrimage to the Holy Land, and visited various monasteries of his order; but he is famous as the author of some *Annales*. From the creation of the world until about 1040 these *Annales* are a jejune copy of other annals, but from 1040 to their conclusion in 1077 they are interesting for the history of Germany and the papacy. The important events during the earlier part of the reign of the emperor Henry IV., including the visit to Canossa and the battle of Hohenburg, are vividly described. Their tone is hostile to Henry IV. and friendly to the papacy; their Latin style is excellent. The *Annales* were first published in 1525 and are printed in the *Monumenta Germaniae historica*, Bände iii. and v. (Hanover and Berlin, 1826 fol.). Formerly Lambert's reputation for accuracy and impartiality was very high, but both qualities have been somewhat discredited.

Lambert is also regarded as the author of the *Historia Hersfeldensis*, the extant fragments of which are published in Band v. of the *Monumenta* of a *Vita Lulli*, Lullus, archbishop of Mainz, being the founder of the abbey of Hersfeld; and of a *Carmen de bello Saxonico*. His *Opera* have been edited with an introduction by O. Holder-Egger (Hanover, 1894).

See H. Delbrück, *Über die Glaubwürdigkeit Lamberts von Hersfeld* (Bonn, 1873); A. Eigenbrodt, *Lampert von Hersfeld und die neuere Quellenforschung* (Cassel, 1896); L. von Ranke, *Zur Kritik frankisch-deutscher Reichsannalisten* (Berlin, 1854); W. Wattenbach, *Deutschlands Geschichtsquellen* Band ii. (Berlin, 1906) and A. Potthast, *Bibliotheca Historica* (Berlin, 1896).

LAMBESSA, the ancient Lambaesa, a village of Algeria, in the arrondissement of Batna and department of Constantine, 7 m. S.E. of Batna and 17 W. of Timgad. The modern village, the centre of an agricultural colony founded in 1848, is noteworthy for its great convict establishment (built about 1850). The remains of the Roman town, and more especially of the Roman camp, in spite of wanton vandalism, are among the most interesting ruins in northern Africa. They are now preserved by the *Service des Monuments historiques* and excavations have resulted in many interesting discoveries. The ruins are situated on the lower terraces of the Jebel Aures, and consist of triumphal arches (one to Septimius Severus, another to Commodus), temples, aqueducts, vestiges of an amphitheatre, baths and an immense quantity of masonry belonging to private houses. To the north and east lie extensive cemeteries with the stones standing in their original alignments; to the west is a similar area, from which, however, the stones have been largely removed for building the modern village. Of the temple of Aesculapius only one column is standing, though in the middle of the 19th century its façade was entire. The capitol or temple dedicated to Jupiter, Juno and Minerva, which has been cleared of débris, has a portico with eight columns. On level ground about two-thirds of a mile from the centre of the ancient town stands the camp, its site now partly occupied by the penitentiary and its gardens. It measures 1640 ft. N. to S. by 1476 ft. E. to W., and in the middle rise the ruins of a building commonly called, but incorrectly, the praetorium. This noble building, which dates from A.D. 268, is 92 ft. long by 66 ft. broad and 49 ft. high; its southern façade has a splendid peristyle half the height of the wall, consisting of a front row of massive Ionic columns and an engaged row of Corinthian pilasters. Behind this building (which was roofed), is a large court giving access to other buildings, one being the arsenal. In it have been found many thousands of projectiles. To the S.E. are the remains of the baths. The ruins of both city and camp have yielded many inscriptions (Renier edited 1500, and there are 4185 in the *Corpus Inscr. Lat.* vol. viii.); and, though a very large proportion are epitaphs of the barest kind, the more important pieces supply an outline of the history of the place. Over 2500 inscriptions relating to the camp have been deciphered. In a museum in the village are objects of antiquity discovered in the vicinity. Besides inscriptions, statues, &c., are some fine mosaics found in 1905 near the arch of Septimius Severus. The statues include those of Aesculapius and Hygieia, taken from the temple of Aesculapius.

Lambaesa was a military foundation. The camp of the third legion (Legio III. Augusta), to which it owes its origin, appears to have been established between A.D. 123 and 129, in the time of Hadrian, whose address to his soldiers was found inscribed on a pillar in a second camp to the west of the great camp still extant. By 166 mention is made of the decurions of a vicus, 10 curiae of which are known by name; and the vicus became a municipium probably at the time when it was made the capital of the newly founded province of Numidia. The legion was removed by Gordianus, but restored by Valerianus and Gallienus; and its final departure did not take place till after 392. The town soon afterwards declined. It never became the seat of a bishop, and no Christian inscriptions have been found among the ruins.

About 2 m. S. of Lambessa are the ruins of Markuna, the ancient Verecunda, including two triumphal arches.

See S. Gsell, *Les Monuments antiques de l'Algérie* (Paris, 1901) and *L'Algérie dans l'antiquité* (Algiers, 1903); L. Renier, *Inscriptions romaines de l'Algérie* (Paris, 1855); Gustav Wilmann, "Die röm. Lagerstadt Afrikas," in *Commentationes phil. in honorem Th. Mommseni* (Berlin, 1877); Sir L. Playfair, *Travels in the Footsteps of Bruce* (London, 1877); A. Graham, *Roman Africa* (London, 1902).

LAMBETH, a southern metropolitan borough of London, England, bounded N.W. by the river Thames, N.E. by Southwark, E. by Camberwell and W. by Wandsworth and Battersea, and extending S. to the boundary of the county of London. Pop. (1901) 301,895. The name is commonly confined to the northern part of the borough, bordering the river; but the principal districts included are Kennington and Vauxhall (north central), Brixton (central) and part of Norwood (south). Four road-bridges cross the Thames within the limits of the borough, namely Waterloo, Westminster, Lambeth and Vauxhall, of which the first, a fine stone structure, dates from 1817, and is the oldest Thames bridge standing within the county of London. The main thoroughfare runs S. from Westminster Bridge Road as Kennington Road, continuing as Brixton Road and Brixton Hill, Clapham Road branching S.W. from it at Kennington. Several thoroughfares also converge upon Vauxhall Bridge, and from a point near this down to Westminster Bridge the river is bordered by the fine Albert Embankment.

Early records present the name *Lamb-hythe* in various forms. The suffix is common along the river in the meaning of a haven, but the prefix is less clear; a Saxon word signifying mud is suggested. Brixton and Kennington are mentioned in Domesday; and in Vauxhall is concealed the name of Falkes de Breauté, an unscrupulous adventurer of the time of John and Henry III. exiled in 1225. The manor of North Lambeth was given to the bishopric of Rochester in the time of Edward the Confessor, and the bishops had a house here till the 16th century. They did not, however, retain the manor beyond the close of the 12th century, when it was acquired by the see of Canterbury. The palace of the archbishops is still here, and forms, with the parish church, a picturesque group of buildings, lying close to the river opposite the majestic Houses of Parliament, and to some extent joining with them to make of this reach of the Thames one of the finest prospects in London. The oldest part of the palace remaining is the Early English chapel. The so-called Lollard's Tower, which retains evidence of its use as a prison, dates *c.* 1440. There is a fine Tudor gatehouse of brick, and the hall is dated 1663. The portion now inhabited by the archbishops was erected in 1834 and fronts a spacious quadrangle. Among the portraits of the archbishops here are examples by Holbein, Van Dyck, Hogarth and Reynolds. There is a valuable library. The church of St Mary was rebuilt *c.* 1850, though the ancient monuments preserved give it an appearance of antiquity. Here are tombs of some of the archbishops, including Bancroft (d. 1610), and of the two Tradescants, collectors, and a memorial to Elias Ashmole, whose name is preserved in the Ashmolean Museum at Oxford University, to which he presented the collections of his friend the younger Tradescant (d. 1662). In the present Westminster Bridge Road was a circus, well known in the later 18th and early 19th centuries as Astley's, and near Vauxhall Bridge were the celebrated Vauxhall Gardens.

The principal modern pleasure grounds are Kennington Park (20 acres), and Brockwell Park (127 acres) south of Brixton, and near the southern end of Kennington Road is Kennington Oval, the ground of the Surrey County Cricket Club, the scene of its home matches and of other important fixtures. Among institutions the principal is St Thomas' Hospital, the extensive buildings of which front the Albert Embankment. The original foundation dated from 1213, was situated in Southwark, and was connected with the priory of Bermondsey. The existing buildings, subsequently enlarged, were opened in 1871, are divided into a series of blocks, and include a medical school. Other hospitals are the Royal, for children and women, Waterloo Road, the Lying-in Hospital, York Road, and the South-western fever hospital in Stockwell. There are technical institutes in Brixton and Norwood; and on Brixton Hill is Brixton Prison. In the northern part of the borough are numerous factories, including the great Doulton pottery works. The parliamentary borough of Lambeth has four divisions, North, Kennington, Brixton and Norwood, each returning one member. The borough council consists of a mayor, 10 aldermen and 60 councillors. Area, 4080·4 acres.

LAMBETH CONFERENCES, the name given to the periodical assemblies of bishops of the Anglican Communion (Pan-Anglican synods), which since 1867 have met at Lambeth Palace, the London residence of the archbishop of Canterbury. The idea of these meetings was first suggested in a letter to the archbishop of Canterbury by Bishop Hopkins of Vermont in 1851, but the immediate impulse came from the colonial Church in Canada. In 1865 the synod of that province, in an urgent letter to the archbishop of Canterbury (Dr Longley), represented the unsettlement of members of the Canadian Church caused by recent legal decisions of the Privy Council, and their alarm lest the revived action of Convocation "should leave us governed by canons different from those in force in England and Ireland, and thus cause us to drift into the status of an independent branch of the Catholic Church." They therefore requested him to call a "national synod of the bishops of the Anglican Church at home and abroad," to meet under his leadership. After consulting both houses of the Convocation of Canterbury, Archbishop Longley assented, and convened all the bishops of the Anglican Communion (then 144 in number) to meet at Lambeth in 1867. Many Anglican bishops (amongst them the archbishop of York and most of his suffragans) felt so doubtful as to the wisdom of such an assembly that they refused to attend it, and Dean Stanley declined to allow Westminster Abbey to be used for the closing service, giving as his reasons the partial character of the assembly, uncertainty as to the effect of its measures and "the presence of prelates not belonging to our Church." Archbishop Longley said in his opening address, however, that they had no desire to assume "the functions of a general synod of all the churches in full communion with the Church of England," but merely to "discuss matters of practical interest, and pronounce what we deem expedient in resolutions which may serve as safe guides to future action." Experience has shown how valuable and wise this course was. The resolutions of the Lambeth Conferences have never been regarded as synodical decrees, but their weight has increased with each conference. Apprehensions such as those which possessed the mind of Dean Stanley have long passed away.

Seventy-six bishops accepted the primate's invitation to the first conference, which met at Lambeth on the 24th of September 1867, and sat for four days, the sessions being in private. The archbishop opened the conference with an address: deliberation followed; committees were appointed to report on special questions; resolutions were adopted, and an encyclical letter was addressed to the faithful of the Anglican Communion. Each of the subsequent conferences has been first received in Canterbury cathedral and addressed by the archbishop from the chair of St Augustine. It has then met at Lambeth, and after sitting for five days for deliberation upon the fixed subjects and appointment of committees, has adjourned, to meet again at the end of a fortnight and sit for five days more, to receive reports, adopt resolutions and to put forth the encyclical letter.

I. *First Conference* (September 24-28, 1867), convened and presided over by Archbishop Longley. The proposed order of subjects was entirely altered in view of the Colenso case, for which urgency was claimed; and most of the time was spent in discussing it. Of the thirteen resolutions adopted by the conference, two have direct reference to this case; the rest have to do with the creation of new sees and missionary jurisdictions, commendatory letters, and a "voluntary spiritual tribunal" in cases of doctrine and the due subordination of synods. The reports of the committees were not ready, and were carried forward to the conference of 1878.

II. *Second Conference* (July 2-27, 1878), convened and presided over by Archbishop Tait. On this occasion no hesitation appears to have been felt; 100 bishops were present, and the opening sermon was preached by the archbishop of York. The reports of the five special committees (based in part upon those of the committee of 1867) were embodied in the encyclical letter, viz. on the best mode of maintaining union, voluntary boards of arbitration, missionary bishops and missionaries, continental chaplains and the report of a committee on difficulties submitted to the conference.

III. *Third Conference* (July 3-27, 1888), convened and presided over by Archbishop Benson; 145 bishops present; the chief subject of consideration being the position of communities which do not possess the historic episcopate. In addition to the encyclical letter, nineteen resolutions were put forth, and the reports of twelve special committees are appended upon which they are based, the subjects being intemperance, purity, divorce, polygamy, observance of Sunday, socialism, care of emigrants, mutual relations of dioceses of the Anglican Communion, home reunion, Scandinavian Church, Old Catholics, &c., Eastern Churches, standards of doctrine and worship. Perhaps the most important of these is the famous "Lambeth Quadrilateral," which laid down a fourfold basis for home reunion—the Holy Scriptures, the Apostles' and Nicene creeds, the two sacraments ordained by Christ himself and the historic episcopate.

IV. *Fourth Conference* (July 5-31, 1897), convened by Archbishop Benson, presided over by Archbishop Temple; 194 bishops present. One of the chief subjects for consideration was the creation of a "tribunal of reference"; but the resolutions on this subject were withdrawn, owing, it is said, to the opposition of the American bishops, and a more general resolution in favour of a "consultative body" was substituted. The encyclical letter is accompanied by sixty-three resolutions (which include careful provision for provincial organization and the extension of the title "archbishop" to all metropolitans, a "thankful recognition of the revival of brotherhoods and sisterhoods, and of the office of deaconess," and a desire to promote friendly relations with the Eastern Churches and the various Old Catholic bodies), and the reports of the eleven committees are subjoined.

V. *Fifth Conference* (July 6-August 5, 1908), convened by Archbishop Randall Davidson, who presided; 241 bishops were present. The chief subjects of discussion were: the relations of faith and modern thought, the supply and training of the clergy, education, foreign missions, revision and "enrichment" of the Prayer-Book, the relation of the Church to "ministries of healing" (Christian Science, &c.), the questions of marriage and divorce, organization of the Anglican Church, reunion with other Churches. The results of the deliberations were embodied in seventy-eight resolutions, which were appended to the encyclical issued, in the name of the conference, by the Archbishop of Canterbury on the 8th of August.

The fifth Lambeth conference, following as it did close on the great Pan-Anglican congress, is remarkable mainly as a proof of the growth of the influence and many-sided activity of the Anglican Church, and as a conspicuous manifestation of her characteristic principles. Of the seventy-eight resolutions none is in any sense epoch-making, and their spirit is that of the traditional Anglican *via media*. In general they are characterized by a firm adherence to the fundamental articles of Catholic orthodoxy, tempered by a tolerant attitude towards those not of "the household of the faith." The report of the committee on faith and modern thought is "a faithful attempt to show how the claim of our Lord Jesus Christ, which the Church is set to present to each generation, may, under the characteristic conditions of our time, best command allegiance." On the question of education (Res. 11-19) the conference reaffirmed strongly the necessity for definite Christian teaching in schools, "secular systems" being condemned as "educationally as well as morally unsound, since they fail to co-ordinate the training of the whole nature of the child" (Res. 11). The resolutions on questions affecting foreign missions (20-26) deal with *e.g.* the overlapping of episcopal jurisdictions (22) and the establishment of Churches on lines of race or colour, which is condemned (20). The resolutions on questions of marriage and divorce (37-43) reaffirm the traditional attitude of the Church; it is, however, interesting to note that the resolution (40) deprecating the remarriage in church of the innocent party to a divorce was carried only by eighty-seven votes to eighty-four. In resolutions 44 to 53 the conference deals with the duty of the Church towards modern democratic ideals and social problems; affirms the responsibility of investors for the character and conditions of the concerns in which their money is placed (49); "while frankly acknowledging the moral gains sometimes won by war" strongly supports the extension of international arbitration (52); and emphasizes the duty of a stricter observance of Sunday (53). On the question of reunion, the ideal of corporate unity was reaffirmed (58). It was decided to send a deputation of bishops with a letter of greeting to the national council of the Russian Church about to be assembled (60) and certain conditions were laid down for intercommunion with certain of the Churches of the Orthodox Eastern Communion (62) and the "ancient separated Churches of the East" (63-65). Resolution 67 warned Anglicans from contracting marriages, under actual conditions, with Roman Catholics. By resolution 68 the conference stated its desire to "maintain and strengthen the friendly relations" between the Churches of the Anglican Communion and "the ancient Church of Holland" (Jansenist, see Utrecht) and the old Catholic Churches; and resolutions 70-73 made elaborate provisions for a projected corporate union between the Anglican Church and the *Unitas Fratrum* (Moravian Brethren). As to "home reunion," however, it was made perfectly clear that this would only be possible "on lines suggested by such precedents as those of 1610," *i.e.* by the Presbyterian Churches accepting the episcopal model. So far as the organization of the Anglican Church is concerned, the most important outcome of the conference was the reconstruction of the Central Consultative Body on representative lines (54-56); this body to consist of the archbishop of Canterbury and seventeen bishops appointed by the various Churches of the Anglican Communion throughout the world. A notable feature of the conference was the presence of the Swedish bishop of Kalmar, who presented a letter from the archbishop of Upsala, as a tentative advance towards closer relations between the Anglican Church and the Evangelical Church of Sweden.

See Archbishop R. T. Davidson, *The Lambeth Conferences of 1867, 1878 and 1888* (London, 1896); *Conference of Bishops of the Anglican Communion, Encyclical Letter*, &c. (London, 1897 and 1908).

LAMBINUS, DIONYSIUS, the Latinized name of Denis Lambin (1520–1572), French classical scholar, born at Montreuil-sur-mer in Picardy. Having devoted several years to classical studies during a residence in Italy, he was invited to Paris in 1650 to fill the professorship of Latin in the Collège de France, which he soon afterwards exchanged for that of Greek. His lectures were frequently interrupted by his ill-health and the religious disturbances of the time. His death (September 1572) is said to have been caused by his apprehension that he might share the fate of his friend Peter Ramus (Pierre de la Ramée), who had been killed in the massacre of St Bartholomew. Lambinus was one of the greatest scholars of his age, and his editions of classical authors are still useful. In textual criticism he was a conservative, but by no means a slavish one; indeed, his opponents accused him of rashness in emendation. His chief defect is that he refers vaguely to his MSS. without specifying the source of his readings, so that their relative importance cannot be estimated. But his commentaries, with their wealth of illustration and parallel passages, are a mine of information. In the opinion of the best scholars, he preserved the happy mean in his annotations, although his own countrymen have coined the word *lambiner* to express trifling and diffuseness.

His chief editions are: Horace (1561); Lucretius (1564), on which see H. A. J. Munro's preface to his edition; Cicero (1566); Cornelius Nepos (1569); Demosthenes (1570), completing the unfinished work of Guillaume Morel; Plautus (1576).

See Peter Lazer, *De Dionysio Lambino narratio*, printed in Orelli's *Onomasticon Tullianum* (i. 1836), and *Trium disertissimorum virorum praefationes ac epistolae familiares aliquot: Mureti, Lambini, Regii* (Paris, 1579); also Sandys, *Hist. of Classical Scholarship* (1908, ii. 188), and A. Horawitz in Ersch and Gruber's *Allgemeine Encyclopädie*.

LAMBOURN, a market town in the Newbury parliamentary division of Berkshire, England, 65 m. W. of London, the terminus of the Lambourn Valley light railway from Newbury. Pop. (1901) 2071. It lies high up the narrow valley of the Lambourn, a tributary of the Kennet famous for its trout-fishing, among the Berkshire Downs. The church of St Michael is cruciform and principally late Norman, but has numerous additions of later periods and has been considerably altered by modern restoration. The inmates of an almshouse founded by John Estbury, *c.* 1500, by his desire still hold service daily at his tomb in the church. A Perpendicular market-cross stands without the church. The town has agricultural trade, but its chief importance is derived from large training stables in the neighbourhood. To the north of the town is a large group of *tumuli* known as the Seven Barrows, ascertained by excavation to be a British burial-place.

LAMECH (לֶמֶךְ), the biblical patriarch, appears in each of the antediluvian genealogies, Gen. iv. 16-24 J., and Gen. v. P. In the former he is a descendant of Cain, and through his sons the author of primitive civilization; in the latter he is the father of Noah. But it is now generally held that these two genealogies are variant adaptations of the Babylonian list of primitive kings (see Enoch). It is doubtful whether Lamech is to be identified with the name of any one of these kings; he may have been introduced into the genealogy from another tradition.

In the older narrative in Gen. iv. Lamech's family are the originators of various advances in civilization; he himself is the first to marry more than one wife, 'Adah ("ornament," perhaps specially "dawn") and Zillah ("shadow"). He has three sons Jabal, Jubal, and Tubal, the last-named qualified by the addition of Cain (= "smith"[1]). The assonance of these names is probably intentional, cf. the brothers Hasan and Hosein of early Mahommedan history. Jabal institutes the life of nomadic shepherds, Jubal is the inventor of music, Tubal-Cain the first smith. Jabal and Jubal may be forms of a root used in Hebrew and Phoenician for ram and ram's horn (*i.e.* trumpet), and underlying our "jubilee." Tubal may be the eponymous ancestor of the people of that name mentioned in Ezekiel in connexion with "vessels of bronze."[2] All three names are sometimes derived from יבל in the sense of offspring, so that they would be three different words for "son," and there are numerous other theories as to their etymology. Lamech has also a daughter Naamah ("gracious," "pleasant," "comely"; cf. No'mân, a name of the deity Adonis). This narrative clearly intends to account for the origin of these various arts as they existed in the narrator's time; it is not likely that he thought of these discoveries as separated from his own age by a universal flood; nor does the tone of the narrative suggest that the primitive tradition thought of these pioneers of civilization as members of an accursed family. Probably the passage was originally independent of the document which told of Cain and Abel and of the Flood; Jabal may be a variant of Abel. An ancient poem is connected with this genealogy:

"Adah and Zillah, hear my voice;
Ye wives of Lamech, give ear unto my speech.
I slay a man for a wound,
A young man for a stroke;
For Cain's vengeance is sevenfold,
But Lamech's seventy-fold and seven."

In view of the connexion, the poem is interpreted as expressing Lamech's exultation at the advantage he expects to derive from Tubal-Cain's new inventions; the worker in bronze will forge for him new and formidable weapons, so that he will be able to take signal vengeance for the least injury. But the poem probably had originally nothing to do with the genealogy. It may have been a piece of folk-song celebrating the prowess of the tribe of Lamech; or it may have had some relation to a story of Cain and Abel in which Cain was a hero and not a villain.

The genealogy in Gen. v. belongs to the Priestly Code, *c.* 450 B.C., and may be due to a revision of ancient tradition in the light of Babylonian archaeology. It is noteworthy that according to the numbers in the Samaritan MSS. Lamech dies in the year of the Flood.

The origin of the name Lamech and its original meaning are doubtful. It was probably the name of a tribe or deity, or both. According to C. J. Ball,[3] Lamech is an adaptation of the Babylonian *Lamga*, a title of Sin the moon god, and synonymous with *Ubara* in the name Ubara-Tutu, the Otiartes of Berossus, who is the ninth of the ten primitive Babylonian kings, and the father of the hero of the Babylonian flood story, just as Lamech is the ninth patriarch, and the father of Noah. Spurrell[4] states that Lamech cannot be explained from the Hebrew, but may possibly be connected with the Arabic *yalmakun*, "a strong young man."

Outside of Genesis, Lamech is only mentioned in the Bible in 1 Chron. i. 3, Luke iii. 36. Later Jewish tradition expanded and interpreted the story in its usual fashion. (W. H. Be.)

LAMEGO, a city of northern Portugal, in the district of Vizeu and formerly included in the province of Beira; 6 m. by road S. of the river Douro and 42 m. E. of Oporto. Pop. (1900) 9471. The nearest railway station is Peso da Regoa, on the opposite side of the Douro and on the Barca d'Alva-Oporto railway. Lamego is an ancient and picturesque city, in the midst of a beautiful mountain region. Its principal buildings are the 14th-century Gothic cathedral, Moorish citadel, Roman baths and a church which occupies the site of a mosque, and, though intrinsically commonplace, is celebrated in Portugal as the seat of the legendary cortes of 1143 or 1144 (see Portugal, *History*). The principal industries are viticulture and the rearing of swine, which furnish the so-called "Lisbon hams." Lamego was a Moorish frontier fortress of some importance in the 9th and 10th centuries. It was captured in 1057 by Ferdinand I. of Castile and Leon.

LAMELLIBRANCHIA (Lat. *lamella*, a small or thin plate, and Gr. *βράγχια*, gills), the fourth of the five classes of animals constituting the phylum Mollusca (*q.v.*). The Lamellibranchia are mainly characterized by the rudimentary condition of the head, and the retention of the primitive bilateral symmetry, the latter feature being accentuated by the lateral compression of the body and the development of the shell as two bilaterally symmetrical plates or valves covering each one side of the animal. The foot is commonly a simple cylindrical or ploughshare-shaped organ, used for boring in sand and mud, and more rarely presents a crawling disk similar to that of Gastropoda; in some forms it is aborted. The paired ctenidia are very greatly developed right and left of the elongated body, and form the most prominent organ of the group. Their function is chiefly not respiratory but nutritive, since it is by the currents produced by their ciliated surface that food-particles are brought to the feebly-developed mouth and buccal cavity.

The Lamellibranchia present as a whole a somewhat uniform structure. The chief points in which they vary are—(1) in the structure of the ctenidia or branchial plates; (2) in the presence of one or of two chief muscles, the fibres of which run across the animal's body from one valve of the shell to the other (adductors); (3) in the greater or less elaboration of the posterior portion of the mantle-skirt so as to form a pair of tubes, by one of which water is introduced into the sub-pallial chamber, whilst by the other it is expelled; (4) in the perfect or deficient symmetry of the two valves of the shell and the connected soft parts, as compared with one another; (5) in the development of the foot as a disk-like crawling organ (*Arca, Nucula, Pectunculus, Trigonia, Lepton, Galeomma*), as a simple plough-like or tongue-shaped organ (*Unionidae*, &c.), as a re-curved saltatory organ (*Cardium*, &c.), as a long burrowing cylinder (*Solenidae*, &c.), or its partial (Mytilacea) or even complete abortion (Ostraeacea).

The essential Molluscan organs are, with these exceptions, uniformly well developed. The mantle-skirt is always long, and hides the rest of the animal from view, its dependent margins meeting in the middle line below the ventral surface when the animal is retracted; it is, as it were, slit in the median line before and behind so as to form two flaps, a right and a left; on these the right and the left calcareous valves of the shell are borne respectively, connected by an uncalcified part of the shell called the ligament. In many embryo Lamellibranchs a centro-dorsal primitive shell-gland or follicle has been detected. The mouth lies in the median line anteriorly, the anus in the median line posteriorly.

Both ctenidia, right and left, are invariably present, the axis of each taking origin from the side of the body as in the schematic archi-Mollusc (see fig. 15). A pair of renal tubes opening right and left, rather far forward on the sides of the body, are always present. Each opens by its internal extremity into the pericardium. A pair of genital apertures, connected by genital ducts with the paired gonads, are found right and left near the nephridial pores, except in a few cases where the genital duct joins that of the renal organ (*Spondylus*). The sexes are often, but not always, distinct. No accessory glands or copulatory organs are ever present in Lamellibranchs. The ctenidia often act as brood-pouches.

A dorsal contractile heart, with symmetrical right and left auricles receiving aerated blood from the ctenidia and mantle-skirt, is present, being unequally developed only in those few forms which are inequivalve. The typical pericardium is well developed. It, as in other Mollusca, is not a blood-space but develops from the coelom, and it communicates with the exterior by the pair of renal tubes. As in Cephalopoda (and possibly other Mollusca) water can be introduced through the nephridia into this space. The alimentary canal keeps very nearly to the median vertical plane whilst exhibiting a number of flexures and loopings in this plane. A pair of large glandular outgrowths, the so-called "liver" or great digestive gland, exists as in other Molluscs. A pair of pedal otocysts, and a pair of osphradia at the base of the gills, appear to be always present. A typical nervous system is present (fig. 19), consisting of a cerebro-pleural ganglion-pair, united by connectives to a pedal ganglion-pair and a visceral ganglion-pair (parieto-splanchnic).

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[1] The text of Gen. iv. 22 is partly corrupt; and it is possible that the text used by the Septuagint did not contain Cain.

[2] Gen. x. 2, Ezek. xxvii. 13.

[3] *Genesis*, in Haupt's *Sacred Books of the Old Testament* on iv. 19, cf. also the notes on 20-22, for Lamech's family. The identification of Lamech with *Lamga* is also suggested by Sayce, *Expository Times*, vii. 367. Cf. also Cheyne, "Cainites" in *Encyc. Biblica*.

[4] *Notes on the Hebrew Text of Genesis, in loco.*

A pyloric caecum connected with the stomach is commonly found, containing a tough flexible cylinder of transparent cartilaginous appearance, called the "crystalline style" (*Mactra*). In many Lamellibranchs a gland is found on the hinder surface of the foot in the mid line, which secretes a substance which sets into the form of threads—the so-called "byssus"—by means of which the animal can fix itself. Sometimes this gland is found in the young and not in the adult (*Anodonta*, *Unio*, *Cyclas*). In some Lamellibranchs (*Pecten*, *Spondylus*, *Pholas*, *Mactra*, *Tellina*, *Pectunculus*, *Galeomma*, &c.), although cephalic eyes are generally absent, special eyes are developed on the free margin of the mantle-skirt, apparently by the modification of tentacles commonly found there. There are no pores in the foot or elsewhere in Lamellibranchia by which water can pass into and out of the vascular system, as formerly asserted.

The Lamellibranchia live chiefly in the sea, some in fresh waters. A very few have the power of swimming by opening and shutting the valves of the shell (*Pecten*, *Lima*); most can crawl slowly or burrow rapidly; others are, when adult, permanently fixed to stones or rocks either by the shell or the byssus. In development some Lamellibranchia pass through a free-swimming trochosphere stage with preoral ciliated band; other fresh-water forms which carry the young in brood-pouches formed by the ctenidia have suppressed this larval phase.

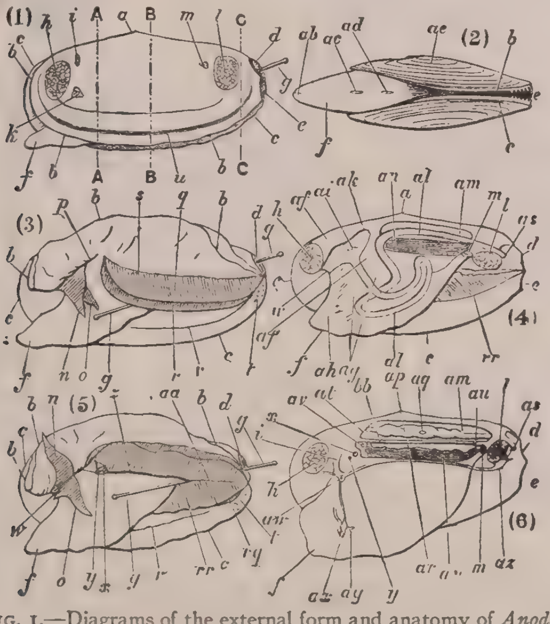


FIG. 1.—Diagrams of the external form and anatomy of *Anodonta cygnea*, the Pond-Mussel; in figures 1, 3, 4, 5, 6 the animal is seen from the left side, the centro-dorsal region uppermost. (1) Animal removed from its shell, a probe *g* passed into the sub-pallial chamber through the excurrent siphonal notch. (2) View from the ventral surface of an Anodon with its foot expanded and issuing from between the gaping shells. (3) The left mantle-flap reflected upwards so as to expose the sides of the body. (4) Diagrammatic section of Anodon to show the course of the alimentary canal. (5) The two gill-plates of the left side reflected upwards so as to expose the fissure between foot and gill where the probe *g* passes. (6) Diagram to show the positions of the nerve-ganglia, heart and nephridia.

Letters in all the figures as follows:

a, Centro-dorsal area.
b, Margin of the left mantle-flap.
c, Margin of the right mantle-flap.
d, Excurrent siphonal notch of the mantle margin.
e, Incurrent siphonal notch of the mantle margin.
f, Foot.
g, Probe passed into the superior division of the sub-pallial chamber through the excurrent siphonal notch, and issuing by the side of the foot into the inferior division of the sub-pallial chamber.
h, Anterior (pallial) adductor muscle of the shells.
i, Anterior retractor muscle of the foot.
k, Protractor muscle of the foot.
l, Posterior (pedal) adductor muscle of the shells.
m, Posterior retractor muscle of the foot.
n, Anterior labial tentacle.
o, Posterior labial tentacle.
p, Base-line of origin of the reflected mantle-flap from the side of the body.
q, Left external gill-plate.
r, Left internal gill-plate.
rr, Inner lamella of the right inner gill-plate.
rg, Right outer gill-plate.
s, Line of concrescence of the outer lamella of the left outer gill-plate with the left mantle-flap.
t, Pallial tentacles.
u, The thickened muscular pallial margin which adheres to the shell and forms the pallial line of the left side.
v, That of the right side.
w, The mouth.
x, Aperture of the left organ of Bojanus (nephridium) exposed by cutting the attachment of the inner lamella of the inner gill-plate.
y, Aperture of the genital duct.
z, Fissure between the free edge of the inner lamella of the inner gill-plate and the side of the foot, through which the probe *g* passes into the upper division of the sub-pallial space.
aa, Line of concrescence of the inner lamella of the right inner gill-plate with the inner lamella of the left inner gill-plate.
ab, *ac*, *ad*, Three pit-like depressions in the median line of the foot supposed by some writers to be pores admitting water into the vascular system.
ae, Left shell valve.
af, Space occupied by liver.
ag, Space occupied by gonad.
ah, Muscular substance of the foot.
ai, Duct of the liver on the wall of the stomach.
ak, Stomach.
al, Rectum traversing the ventricle of the heart.
am, Pericardium.
an, Glandular portion of the left nephridium.
ap, Ventricle of the heart.
aq, Aperture by which the left auricle joins the ventricle.
ar, Non-glandular portion of the left nephridium.
as, Anus.
at, Pore leading from the pericardium into the glandular sac of the left nephridium.
au, Pore leading from the glandular into the non-glandular portion of the left nephridium.
av, Internal pore leading from the non-glandular portion of the left nephridium to the external pore *x*.
aw, Left cerebro-pleuro-visceral ganglion.
ax, Left pedal ganglion.
ay, Left otocyst.
az, Left olfactory ganglion (parieto-splanchnic).
bb, Floor of the pericardium separating that space from the non-glandular portion of the nephridia.

As an example of the organization of a Lamellibranch, we shall review the structure of the common pond-mussel or swan mussel (*Anodonta cygnea*), comparing it with other Lamellibranchia.

The swan-mussel has superficially a perfectly developed bilateral symmetry. The left side of the animal is seen as when removed from its shell in fig. 1 (1). The valves of the shell have been removed by severing their adhesions to the muscular areae *h*, *i*, *k*, *l*, *m*, *u*. The free edge of the left half of the mantle-skirt *b* is represented as a little contracted in order to show the exactly similar free edge of the right half of the mantle-skirt *c*. These edges are not attached to, although they touch, one another; each flap (right or left) can be freely thrown back in the way carried out in fig. 1 (3) for that of the left side. This is not always the case with Lamellibranchs; there is in the group a tendency for the corresponding edges of the mantle-skirt to fuse together by concrescence, and so to form a more or less completely closed bag, as in the Scaphopoda (*Dentalium*). In this way the notches *d*, *e* of the hinder part of the mantle-skirt of *Anodonta* are in the siphonate forms converted into two separate holes, the edges of the mantle being elsewhere fused together along this hinder margin. Further than this, the part of the mantle-skirt bounding the two holes is frequently drawn out so as to form a pair of tubes which project from the shell (figs. 8, 29). In such Lamellibranchs as the oysters, scallops and many others which have the edges of the mantle-skirt quite free, there are numerous tentacles upon those edges.

In *Anodonta* these pallial tentacles are confined to a small area surrounding the inferior siphonal notch (fig. 1 [3], *t*). When the edges of the mantle ventral to the inhalant orifice are united, an anterior aperture is left for the protrusion of the foot, and thus there are three pallial apertures altogether, and species in this condition are called "Tripora." This is the usual condition in the Eulamellibranchia and Septibranchia. When the pedal aperture is small and far forward there may be a fourth aperture in the region of the fusion behind the pedal aperture. This occurs in *Solen*, and such forms are called "Quadrifora."

The centro-dorsal point *a* of the animal of *Anodonta* (fig. 1 [1]) is called the umbonal area; the great anterior muscular surface *h* is that of the anterior adductor muscle, the posterior similar surface *i* is that of the posterior adductor muscle; the long line of attachment *u* is the simple "pallial muscle,"—a thickened ridge which is seen to run parallel to the margin of the mantle-skirt in this Lamellibranch. In siphonate forms the pallial muscle is not simple, but is indented posteriorly by a sinus formed by the muscles which retract the siphons.

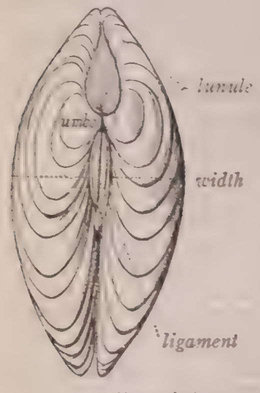


FIG. 2.—View of the two Valves of the Shell of *Cytherea* (one of the Sinupalliate Isomya), from the dorsal aspect.

It is the approximate equality in the size of the anterior and posterior adductor muscles which led to the name Isomya for the group to which *Anodonta* belongs. The hinder adductor muscle is always large in Lamellibranchs, but the anterior adductor may be very small (Heteromya), or absent altogether (Monomya). The anterior adductor muscle is in front of the mouth and alimentary tract altogether, and must be regarded as a special and peculiar development of the median anterior part of the mantle-flap. The posterior adductor is ventral and anterior to the anus. The former classification based on these differences in the adductor muscles is now abandoned, having proved to be an unnatural one. A single family may include isomyarian, anisomyarian and monomyarian forms, and the latter in development pass through stages in which they resemble the first two. In fact all Lamellibranchs begin with a condition in which there is only one adductor, and that not the posterior but the anterior. This is called the protomonomyarian stage. Then the posterior adductor develops, and becomes equal to the anterior, and finally in some cases the anterior becomes smaller or disappears. The single adductor muscle of the Monomya is separated by a difference of fibre into two portions, but neither of these can be regarded as possibly representing the anterior adductor of the other Lamellibranchs. One of these portions is more ligamentous and serves to keep the two shells constantly attached to one another, whilst the more fleshy portion serves to close the shell rapidly when it has been gaping.

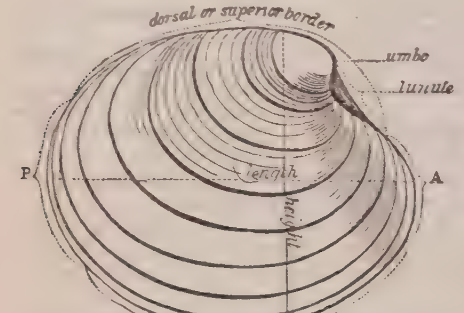


FIG. 3.—Right Valve of the same Shell from the Outer Face.

In removing the valves of the shell from an *Anodonta*, it is necessary not only to cut through the muscular attachments of the body-wall to the shell but to sever also a strong elastic ligament, or spring resembling india-rubber, joining the two shells about the umbonal area. The shell of *Anodonta* does not present these parts in the most strongly marked condition, and accordingly our figures (figs. 2, 3, 4) represent the valves of the sinupalliate genus *Cytherea*. The corresponding parts are recognizable in *Anodonta*. Referring to the figures (2, 3) for an explanation of terms applicable to the parts of the valve and the markings on its inner surface—corresponding to the muscular areas already noted on the surface of the animal's body—we must specially note here the position of that denticulated thickening of the dorsal margin of the valve which is called the hinge (fig. 4). By this hinge one valve is closely fitted to the other. Below this hinge each shell becomes concave, above it each shell rises a little to form the umbo, and it is into this ridge-like upgrowth of each valve that the elastic ligament or spring is fixed (fig. 4). As shown in the diagram (fig. 5) representing a transverse section of the two valves of a Lamellibranch, the two shells form a double lever, of which the toothed-hinge is the fulcrum. The adductor muscles placed in the concavity of the shells act upon the long arms of the lever at a mechanical advantage; their contraction keeps the shells shut, and stretches the ligament or spring *h*. On the other hand, the ligament *h* acts upon the short arm formed by the umbonal ridge of the shells; whenever the adductors relax, the elastic substance of the ligament contracts, and the shells gape. It is on this account that the valves of a dead Lamellibranch always gape; the elastic ligament is no longer counteracted by the effort of the adductors. The state of closure of the valves of the shell is not, therefore, one of rest; when it is at rest—that is, when there is no muscular effort—the valves of a Lamellibranch are slightly gaping, and are closed by the action of the adductors when the animal is disturbed. The ligament is simple in *Anodonta*; in many Lamellibranchs it is separated into two layers, an outer and an inner (thicker and denser). That the condition of gaping of the shell-valves is essential to the life of the Lamellibranch appears from the fact that food to nourish it, water to aerate its blood, and spermatozoa to fertilize its eggs, are all introduced into this gaping chamber by currents of water, set going by the highly-developed ctenidia. The current of water enters into the sub-pallial space at the spot marked *e* in fig. 1 (1), and, after passing as far forward as the mouth *w* in fig. 1 (5), takes an outward course and leaves the sub-pallial space by the upper notch *d*. The notches are known in *Anodonta* as the afferent and efferent siphonal notches respectively, and correspond to the long tube-like afferent inferior and efferent superior "siphons" formed by the mantle in many other Lamellibranchs (fig. 8).

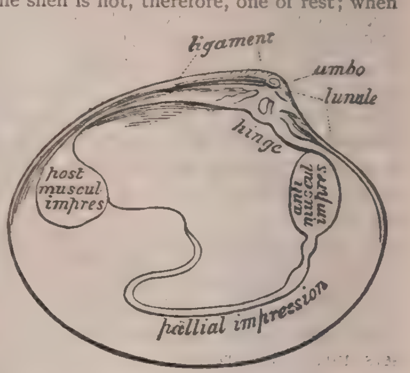


FIG. 4.—Left Valve of the same Shell from the Inner Face. (Figs. 2, 3, 4 from Owen.)

Whilst the valves of the shell are equal in *Anodonta* we find in many Lamellibranchs (*Ostraea*, *Chama*, *Corbula*, &c.) one valve larger, and the other smaller and sometimes flat, whilst the larger shell may be fixed to rock or to stones (*Ostraea*, &c.). A further variation consists in the development of additional shelly plates upon the dorsal line between the two large valves (*Pholadidae*). In *Pholas dactylus* we find a pair of umbonal plates, a dors-umbonal plate and a dorsal plate. It is to be remembered that the whole of the cuticular hard product produced on the dorsal surface and on the mantle-flaps is to be regarded as the "shell," of which a median band-like area, the ligament, usually remains uncalcified, so as to result in the production of two valves united by the elastic ligament. But the shelly substance does not always in boring forms adhere to this form after its first growth. In *Aspergillum* the whole of the tubular mantle area secretes a continuous shelly tube, although in the young condition two valves were present. These are seen (fig. 7) set in the firm substance of the adult tubular shell, which has even replaced the ligament, so that the tube is complete. In *Teredo* a similar tube is formed as the animal elongates (boring in wood), the original shell-valves not adhering to it but remaining movable and provided with a special muscular apparatus in place of a ligament. In the shell of Lamellibranchs three distinct layers can be distinguished: an external chitinous, non-calcified layer, the periostracum; a middle layer composed of calcareous prisms perpendicular to the surface, the prismatic layer; and an internal layer composed of laminae parallel to the surface, the nacreous layer. The last is secreted by the whole surface of the mantle except the border, and additions to its thickness continue to be made through life. The periostracum is produced by the extreme edge of the mantle border, the prismatic layer by the part of the border within the edge. These two layers, therefore, when once formed cannot increase in thickness; as the mantle grows in extent its border passes beyond the formed parts of the two outer layers, and the latter are covered internally by a deposit of nacreous matter. Special deposits of the nacreous matter around foreign bodies form pearls, the foreign nucleus being usually of parasitic origin (see PEARL).

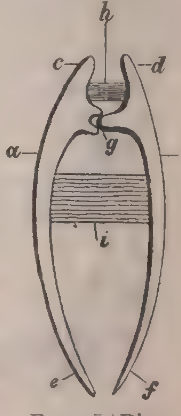


FIG. 5.—Diagram of a section of a Lamellibranch's shells, ligament and adductor muscle. *a*, *b*, right and left valves of the shell; *c*, *d*, the umbones or short arms of the lever; *e*, *f*, the long arms of the lever; *g*, the hinge; *h*, the ligament; *i*, the adductor muscle.

Let us now examine the organs which lie beneath the mantle-skirt of *Anodonta*, and are bathed by the current of water which circulates through it. This can be done by lifting up and throwing back the left half of the mantle-skirt as is represented in fig. 1 (3). We thus expose the plough-like foot (*f*), the two left labial tentacles, and the two left gill-plates or left ctenidium. In fig. 1 (5), one of the labial tentacles *n* is also thrown back to show the mouth *w*, and the two left gill-plates are reflected to show the gill-plates of the right side (*rr*, *rq*) projecting behind the foot, the inner or median plate of each side being united by concrescence to its fellow of the opposite side along a continuous line (*aa*). The left inner gill-plate is also snipped to show the subjacent orifices of the left renal organ *x*, and of the genital gland (testis or ovary) *y*. The foot thus exposed in *Anodonta* is a simple muscular tongue-like organ. It can be protruded between the flaps of the mantle (fig. 1 [1] [2]) so as to issue from the shell, and by its action the *Anodonta* can slowly crawl or burrow in soft mud or sand. Other Lamellibranchs may have a larger foot relatively than has *Anodonta*. In *Arca* it has a sole-like surface. In *Arca* too and many others it carries a byssus-forming gland and a byssus-cementing gland. In the cockles, in *Cardium* and in *Trigonia*, it is capable of a sudden stroke, which causes the animal to jump when out of the water, in the latter genus to a height of four feet. In *Mytilus* the foot is reduced to little more than a tubercle carrying the apertures of these glands. In the oyster it is absent altogether.

FIG. 6.—Shell of *Aspergillum vaginiferum*. (From Owen.)

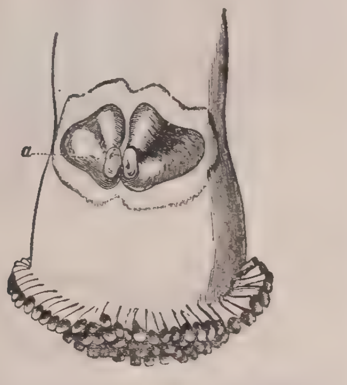


FIG. 7.—Shell of *Aspergillum vaginiferum* to show the original valves *a*, now embedded in a continuous calcification of tubular form. (From Owen.)

The labial tentacles or palps of *Anodonta* (*n*, *o* in fig. 1 [3], [5]) are highly vascular flat processes richly supplied with nerves. The left anterior tentacle (seen in the figure) is joined at its base in front of the mouth (*w*) to the right anterior tentacle, and similarly the left (*o*) and right posterior tentacles are joined behind the mouth. Those of *Arca* (*i*, *k* in fig. 9) show this relation to the mouth (*a*). These organs are characteristic of all Lamellibranchs; they do not vary except in size, being sometimes drawn out to streamer-like dimensions. Their appearance and position suggest that they are in some way related morphologically to the gill-plates, the anterior labial tentacle being a continuation of the outer gill-plate, and the posterior a continuation of the inner gill-plate. There is no embryological evidence to support this suggested connexion, and, as will appear immediately, the history of the gill-plates in various forms of Lamellibranchs does not directly favour it. The palps are really derived from part of the velar area of the larva.

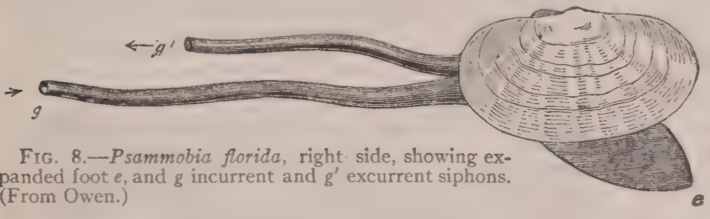


FIG. 8.—*Psammobia florida*, right side, showing expanded foot *e*, and *g* incurrent and *g'* excurrent siphons. (From Owen.)

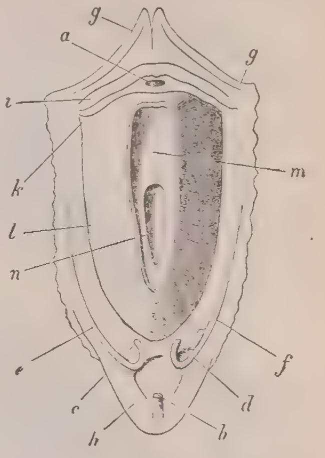


FIG. 9.—View from the ventral (pedal) aspect of the animal of *Arca noae*, the mantle-flap and gill-filaments having been cut away. (Lankester.)

a,	Mouth.
b,	Anus.
c,	Free spirally turned extremity of the gill-axis or ctenidial axis of the right side.
d,	Do. of the left side.
e, *f*,	Anterior portions of these axes fused by concrescence to the wall of the body.
g,	Anterior adductor muscle.
h,	Posterior adductor.
i,	Anterior labial tentacle.
k,	Posterior labial tentacle.
l,	Base line of the foot.
m,	Sole of the foot.
n,	Callosity.

The gill-plates have a structure very different from that of the labial tentacles, and one which in *Anodonta* is singularly complicated as compared with the condition presented by these organs in some other Lamellibranchs, and with what must have been their original condition in the ancestors of the whole series of living Lamellibranchia. The phenomenon of "concrescence" which we have already had to note as showing itself so importantly in regard to the free edges of the mantle-skirt and the formation of the siphons, is what, above all things, has complicated the structure of the Lamellibranch ctenidium. Our present knowledge of the interesting series of modifications through which the Lamellibranch gill-plates have developed to their most complicated form is due to R. H. Peck, K. Mitsukûri and W. G. Ridewood. The Molluscan ctenidium is typically a plume-like structure, consisting of a vascular axis, on each side of which is set a row of numerous lamelliform or filamentous processes. These processes are hollow, and receive the venous blood from, and return it again aerated into, the hollow axis, in which an afferent and an efferent blood-vessel may be differentiated. In the genus *Nucula* (fig. 10) we have an example of a Lamellibranch retaining this plume-like form of gill. In the Arcacea (*e.g. Arca* and *Pectunculus*) the lateral processes which are set on the axis of the ctenidium are not lamellae, but are slightly flattened, very long tubes or hollow filaments. These filaments are so fine and are set so closely together that they appear to form a continuous membrane until examined with a lens. The microscope shows that the neighbouring filaments are held together by patches of cilia, called "ciliated junctions," which interlock with one another just as two brushes may be made to do. In fig. 11, A a portion of four filaments of a ctenidium of the sea-mussel (*Mytilus*) is represented, having precisely the same structure as those of *Arca*. The filaments of the gill (ctenidium) of *Mytilus* and *Arca* thus form two closely set rows which depend from the axis of the gill like two parallel plates. Further, their structure is profoundly modified by the curious condition of the free ends of the depending filaments. These are actually reflected at a sharp angle—doubled on themselves in fact—and thus form an additional row of filaments (see fig. 11 B). Consequently, each primitive filament has a descending and an ascending ramus, and instead of each row forming a simple plate, the plate is double, consisting of a descending and an ascending lamella. As the axis of the ctenidium lies by the side of the body, and is very frequently connate with the body, as so often happens in Gastropods also, we find it convenient to speak of the two plate-like structures formed on each ctenidial axis as the outer and the inner gill-plate; each of these is composed of two lamellae, an outer (the reflected) and an adaxial in the case of the outer gill-plate, and an adaxial and an inner (the reflected) in the case of the inner gill-plate. This is the condition seen in *Arca* and *Mytilus*, the so-called plates dividing upon the slightest touch into their constituent filaments, which are but loosely conjoined by their "ciliated junctions." Complications follow upon this in other forms. Even in *Mytilus* and *Arca* a connexion is here and there formed between the ascending and descending rami of a filament by hollow extensible outgrowths called "interlamellar junctions" (*il. j* in B, fig. 11). Nevertheless the filament is a complete tube formed of chitinous substance and clothed externally by ciliated epithelium, internally by endothelium and lacunar tissue—a form of connective tissue—as shown in fig. 11, C Now let us suppose as happens in the genus *Dreissensia*—a genus not far removed from *Mytilus*—that the ciliated inter-filamentar junctions (fig. 12) give place to solid permanent inter-filamentar junctions, so that the filaments are converted, as it were, into a trellis-work. Then let us suppose that the inter-lamellar junctions already noted in *Mytilus* become very numerous, large and irregular; by them the two trellis-works of filaments would be united so as to leave only a sponge-like set of spaces between them. Within the trabeculae of the sponge-work blood circulates, and between the trabeculae the water passes, having entered by the apertures left in the trellis-work formed by the united gill-filaments (fig. 14). The larger the intralamellar spongy growth becomes, the more do the original gill-filaments lose the character of blood-holding tubes, and tend to become dense elastic rods for the simple purpose of supporting the spongy growth. This is seen both in the section of *Dreissensia* gill (fig. 12) and in those of *Anodonta* (fig. 13, A,B,C). In the drawing of *Dreissensia* the individual filaments *f,f,f* are cut across in one lamella at the horizon of an inter-filamentar junction, in the other (lower in the figure) at a point where they are free. The chitinous substance *ch* is observed to be greatly thickened as compared with what it is in fig. 11, C, tending in fact to obliterate altogether the lumen of the filament. And in *Anodonta* (fig. 13, C) this obliteration is effected. In *Anodonta*, besides being thickened, the skeletal substance of the filament develops a specially dense, rod-like body on each side of each filament. Although the structure of the ctenidium is thus highly complicated in *Anodonta*, it is yet more so in some of the siphonate genera of Lamellibranchs. The filaments take on a secondary grouping, the surface of the lamella being thrown into a series of half-cylindrical ridges, each consisting of ten or twenty filaments; a filament of much greater strength and thickness than the others may be placed between each pair of groups. In *Anodonta*, as in many other Lamellibranchs, the ova and hatched embryos are carried for a time in the ctenidia or gill apparatus, and in this particular case the space between the two lamellae of the outer gill-plate is that which serves to receive the ova (fig. 13, A). The young are nourished by a substance formed by the cells which cover the spongy inter-lamellar outgrowths.

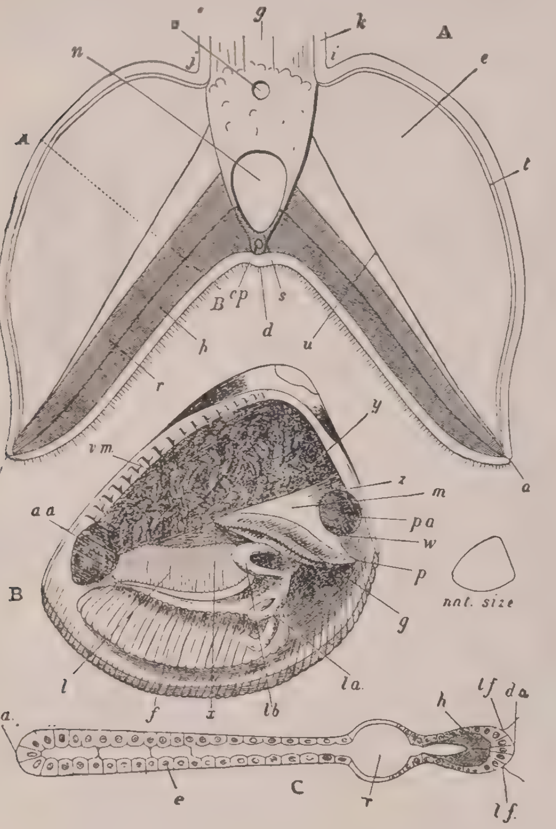


FIG. 10.—Structure of the Ctenidia of *Nucula*. (After Mitsukuri.) See also fig. 2.

A. Section across the axis of a ctenidium with a pair of plates — flattened and shortened filaments—attached.
i,j,k,g Are placed on or near the membrane which attaches the axis of the ctenidium to the side of the body.
a,b, Free extremities of the plates (filaments).
d, Mid-line of the inferior border.
e, Surface of the plate.
t, Its upper border.
h, Chitinous lining of the plate.
r, Dilated blood-space.
u, Fibrous tract.
o, Upper blood-vessel of the axis.
n, Lower blood-vessel of the axis.
s, Chitinous framework of the axis.
cp, Canal in the same.
A, B, Line along which the cross-section C of the plate is taken.
B. Animal of a male *Nucula proxima*, Say, as seen when the left valve of the shell and the left half of the mantle-skirt are removed.
a,a, Anterior adductor muscle.
p.a, Posterior adductor muscle.
v.m, Visceral mass.
f, Foot.
g, Gill.
l, Labial Tentacle.
l.a, Filamentous appendage of the labial tentacle.
lb, Hood-like appendage of the labial tentacle.
m, Membrane suspending the gill and attached to the body along the line *x, y, z, w*.
p, Posterior end of the gill (ctenidium).
C. Section across one of the gill-plates (*A, B*, in A) comparable with fig. 11 C.
i.a, Outer border.
d.a, Axial border.
l.f, Latero-frontal epithelium.
e, Epithelium of general surface.
r, Dilated blood-space.
h, Chitinous lining (compare A).

Other points in the modification of the typical ctenidium must be noted in order to understand the ctenidium of *Anodonta*. The axis of each ctenidium, right and left, starts from a point well forward near the labial tentacles, but it is at first only a ridge, and does not project as a free cylindrical axis until the back part of the foot is reached. This is difficult to see in *Anodonta*, but if the mantle-skirt be entirely cleared away, and if the dependent lamellae which spring from the ctenidial axis be carefully cropped so as to leave the axis itself intact, we obtain the form shown in fig. 15, where *g* and *h* are respectively the left and the right ctenidial axes projecting freely beyond the body. In *Arca* this can be seen with far less trouble, for the filaments are more easily removed than are the consolidated lamellae formed by the filaments of *Anodonta*, and in *Arca* the free axes of the ctenidia are large and firm in texture (fig. 9, *c,d*).

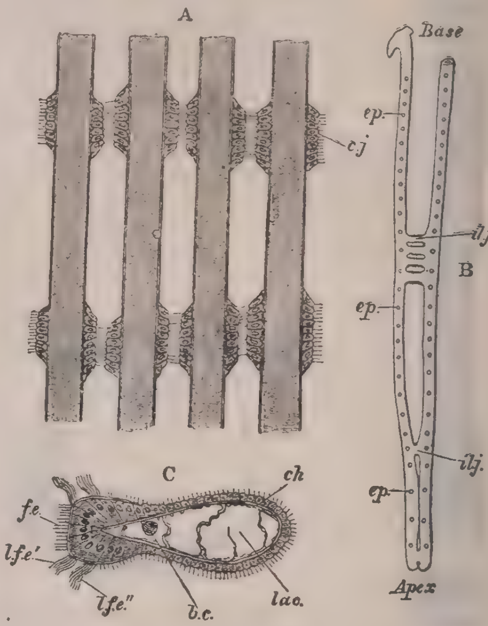


FIG. 11.—Filaments of the Ctenidium of *Mytilus edulis*. (After R. H. Peck.)

A, Part of four filaments seen from the outer face in order to show the ciliated junctions *c.j*.

B, Diagram of the posterior face of a single complete filament with descending ramus and ascending ramus ending in a hook-like process; *ep.,ep.*, the ciliated junctions; *il,j.*, inter-lamellar junction.

C, Transverse section of a filament taken so as to cut neither a ciliated junction nor an inter-lamellar junction. *f.e.*, Frontal epithelium; *l.f.e'.*, *l.f.e''.*, the two rows of latero-frontal epithelial cells with long cilia; *ch*, chitinous tubular lining of the filament; *lac.*, blood lacuna traversed by a few processes of connective tissue cells; *b.c.*, blood-corpuscle.

If we were to make a vertical section across the long axis of a Lamellibranch which had the axis of its ctenidium free from its origin onwards, we should find such relations as are shown in the diagram fig. 16, A. The gill axis *d* is seen lying in the sub-pallial chamber between the foot *b* and the mantle *c*. From it depend the gill-filaments or lamellae—formed by united filaments—drawn as black lines *f*. On the left side these lamellae are represented as having only a small reflected growth, on the right side the reflected ramus or lamella is complete (*fr* and *er*). The actual condition in *Anodonta* at the region where the gills begin anteriorly is shown in fig. 16, B. The axis of the ctenidium is seen to be adherent to, or fused by concrescence with, the body-wall, and moreover on each side the outer lamella of the outer gill-plate is fused to the mantle, whilst the inner lamella of the inner gill-plate is fused to the foot. If we take another section nearer the hinder margin of the foot, we get the arrangement

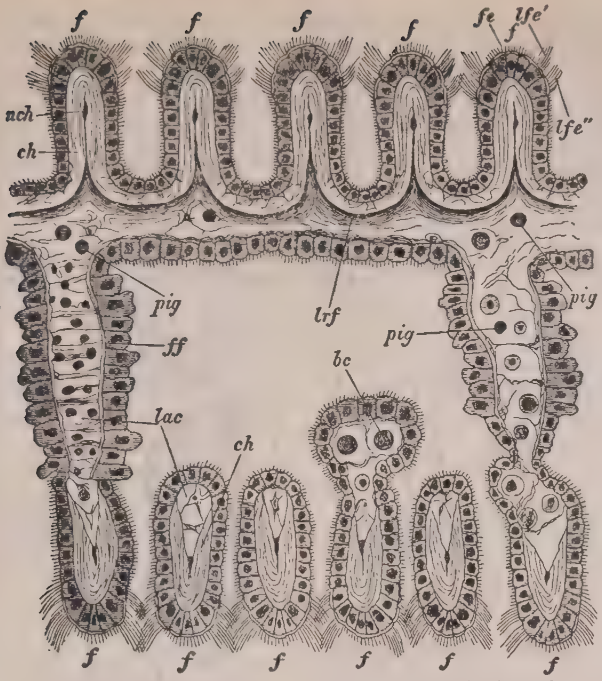


FIG. 12.—Transverse Section of the Outer Gill-plate of *Dreissensia polymorpha*. (After R. H. Peck.)

f,	Constituent gill-filaments.
ff,	Fibrous sub-epidermic tissue.
ch,	Chitonous substance of the filaments.
nch,	Cells related to the chitonous substance.
lac,	Lacunar tissue.
pig,	Pigment-cells.
bc,	Blood-corpuscles.
fe,	Frontal epithelium.
lfe', *lfe"*,	Two rows of latero-frontal epithelial cells with long cilia.
lrf,	Fibrous, possibly muscular, substance of the inter-filamentar junctions.

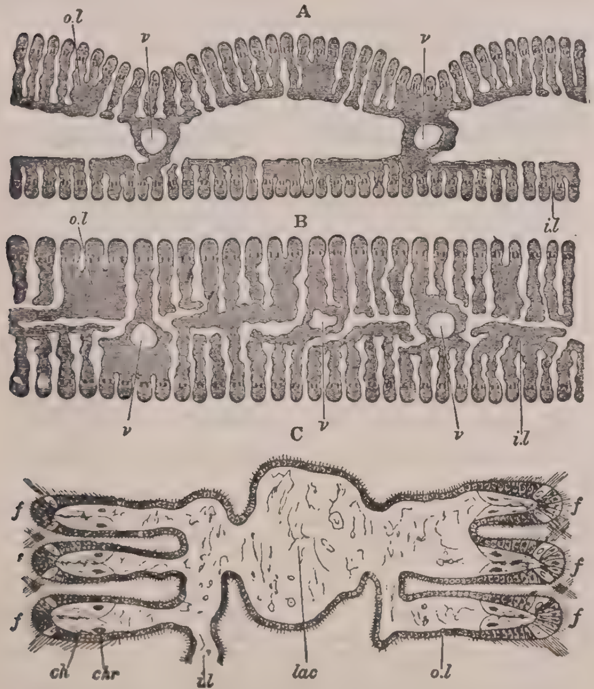


FIG. 13.—Transverse Sections of Gill-plates of *Anodonta*. (After R. H. Peck.)

A,	Outer gill-plate.
B,	Inner gill-plate.
C,	A portion of B more highly [magnified.
o.l,	Outer lamella.
i.l,	Inner lamella.
v,	Blood-vessel.
f,	Constituent filaments.
lac,	Lacunar tissue.
ch,	Chitonous substance of the filament.
chr,	Chitonous rod embedded in the softer substance *ch*.

shown diagrammatically in fig. 16, C, and more correctly in fig. 17. In this region the inner lamellae of the inner gill-plates are no longer affixed to the foot Passing still farther back behind the foot, we find in *Anodonta* the condition shown in the section D, fig. 16. The axes *i* are now free; the outer lamellae of the outer gill-plates (*er*) still adhere by concrescence to the mantle-skirt, whilst the inner lamellae of the inner gill-plates meet one another and fuse by concrescence at *g*. In the lateral view of the animal with reflected mantle-skirt and gill-plates, the line of concrescence of the inner lamellae of the inner gill-plates is readily seen; it is marked *aa* in fig. 1 (5). In the same figure the free part of the inner lamella of the inner gill-plate resting on the foot is marked *z*, whilst the attached part—the most anterior—has been snipped with scissors so as to show the genital and nephridial apertures *x* and *y*. The concrescence, then, of the free edge of the reflected lamellae of the gill-plates of Anodon is very extensive. It is important, because such a concrescence is by no means universal, and does not occur, for example, in *Mytilus* or in *Arca*; further, because when its occurrence is once appreciated, the reduction of the gill-plates of *Anodonta* to the plume-type of the simplest ctenidium presents no difficulty; and, lastly, it has importance in reference to its physiological significance. The mechanical result of the concrescence of the outer lamellae to the mantle-flap, and of the inner lamellae to one another as shown in section D, fig. 16, is that the sub-pallial space is divided into two spaces by a horizontal septum. The upper space (*i*) communicates with the outer world

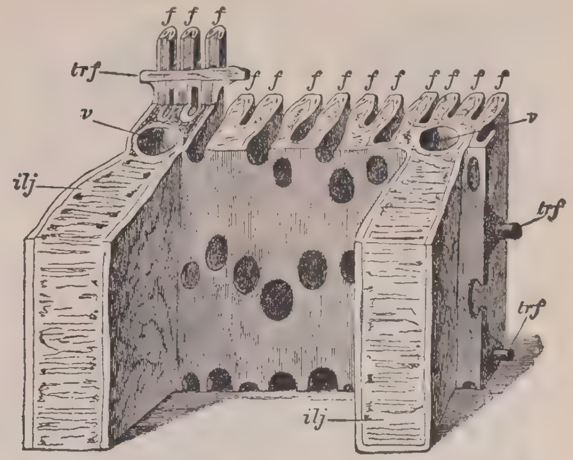


FIG. 14.—Gill-lamellae of *Anodonta*. (After R. H. Peck.)

Diagram of a block cut from the outer lamella of the outer gill-plate and seen from the inter-lamellar surface. *f*, Constituent filaments; *trf*, fibrous tissue of the transverse inter-filamentar junctions; *v*, blood-vessel *ilj*, Inter-lamellar junction. The series of oval holes on the back of the lamella are the water-pores which open between the filaments in irregular rows separated horizontally by the transverse inter-filmentar junctions.

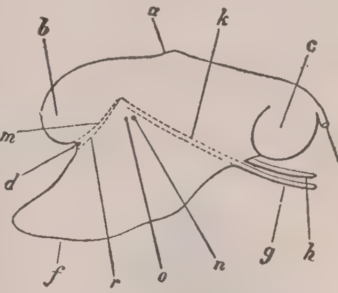


FIG. 15.—Diagram of a view from the left side of the animal of *Anodonta cygnaea*, from which the mantle-skirt, the labial tentacles and the gill-filaments have been entirely removed so as to show the relations of the axis of the gill-plumes or ctenidia *g*, *h*. (Original.)

a,	Centro-dorsal area.
b,	Anterior adductor muscle.
c,	Posterior adductor muscle.
d,	Mouth.
e,	Anus.
f,	Foot.
g,	Free portion of the axis of left ctenidium.
h,	Axis of right ctenidium.
k,	Portion of the axis of the left ctenidium which is fused with the base of the foot, the two dotted lines indicating the origins of the two rows of gill-filaments.
m,	Line of origin of the anterior labial tentacle.
n,	Nephridial aperture.
o,	Genital aperture.
r,	Line of origin of the posterior labial tentacle.

by the excurrent or superior siphonal notch of the mantle (fig. 1, *d*); the lower space communicates by the lower siphonal notch (*e* in fig. 1). The only communication between the two spaces, excepting through the trellis-work of the gill-plates, is by the slit (*z* in fig. 1 (5)) left by the non-concrescence of a part of the inner lamella of the inner gill-plate with the foot. A probe (*g*) is introduced through this slit-like passage, and it is seen to pass out by the excurrent siphonal notch. It is through this passage, or indirectly through the pores of the gill-plates, that the water introduced into the lower sub-pallial space must pass on its way to the excurrent siphonal notch. Such a subdivision of the pallial chamber, and direction of the currents set up within it do not exist in a number of Lamellibranchs which have the gill-lamellae comparatively free (*Mytilus*, *Arca*, *Trigonia*, &c.), and it is in these forms that there is least modification by concrescence of the primary filamentous elements of the lamellae.

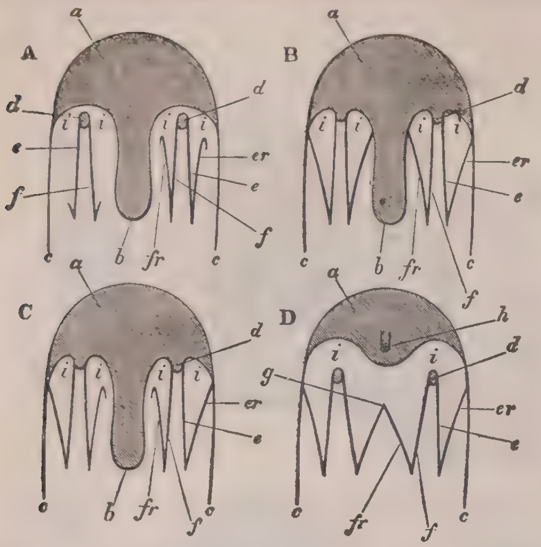


FIG. 16.—Diagrams of Transverse Sections of a Lamellibranch to show the Adhesion, by Concrescence, of the Gill-Lamellae to the Mantle-flaps, to the foot and to one another. (Lankester.)

A, Shows two conditions with free gill-axis.
B, Condition at foremost region in *Anodonta*.
C, Hind region of foot in *Anodonta*.
D, Region altogether posterior to the foot in *Anodonta*.
a, Visceral mass.
b, Foot.
c, Mantle flap.
d, Axis of gill or ctenidium.
e, Adaxial lamella of outer gill-plate.
er, Reflected lamella of outer gill-plate.
f, Adaxial lamella of inner gill-plate.
fr, Reflected lamella of inner gill-plate.
g, Line of concrescence of the reflected lamellae of the two inner gill-plates.
h, Rectum.
i, Supra-branchial space of the sub-pallial chamber.

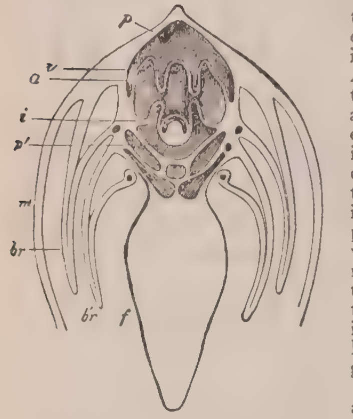


FIG. 17.—Vertical Section through an *Anodonta*, about the mid-region of the Foot.
m, Mantle-flap.
br, Outer, *b'r'*, inner gill-plate—each composed of two lamellae.
f, Foot.
v, Ventricle of the heart.
a, Auricle.
p, *p'*, Pericardial cavity.
i, Intestine.

In the 9th edition of this Encyclopaedia Professor (Sir) E. R. Lankester suggested that these differences of gill-structure would furnish characters of classificatory value, and this suggestion has been followed out by Dr Paul Pelseneer in the classification now generally adopted.

The alimentary canal of *Anodonta* is shown in fig. 1 (4). The mouth is placed between the anterior adductor and the foot; the anus opens on a median papilla overlying the posterior adductor, and discharges into the superior pallial chamber along which the excurrent stream passes. The coil of the intestine in *Anodonta* is similar to that of other Lamellibranchs. The rectum traverses the pericardium, and has the ventricle of the heart wrapped, as it were, around it. This is not an unusual arrangement in Lamellibranchs, and a similar disposition occurs in some Gastropoda (*Haliotis*). A pair of ducts (*ai*) lead from the first enlargement of the alimentary tract called stomach into a pair of large digestive glands, the so-called liver, the branches of which are closely packed in this region (*af*). The food of the *Anodonta*, as of other Lamellibranchs, consists of microscopic animal and vegetable organisms, brought to the mouth by the stream which sets into the sub-pallial chamber at the lower siphonal notch (*e* in fig. 1). Probably a straining of water from solid particles is effected by the lattice-work of the ctenidia or gill-plates.

The heart of *Anodonta* consists of a median ventricle embracing the rectum (fig. 18, A), and giving off an anterior and a posterior artery, and of two auricles which open into the ventricle by orifices protected by valves.

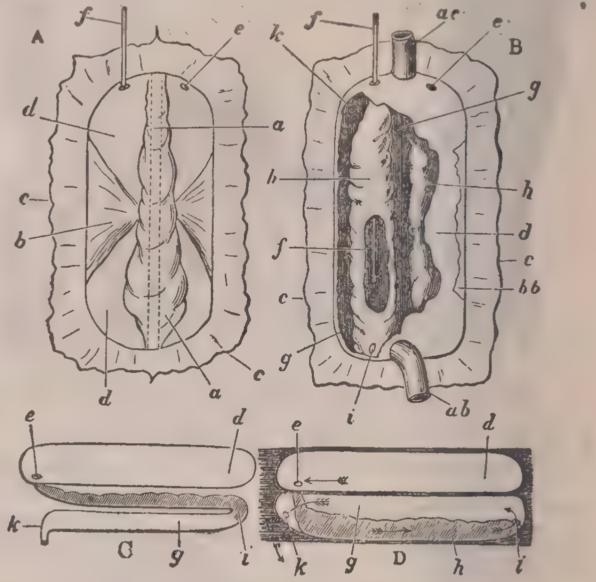


FIG. 18.—Diagrams showing the Relations of Pericardium and Nephridia in a Lamellibranch such as *Anodonta*.

A, Pericardium opened dorsally so as to expose the heart and the floor of the pericardial chamber *d*.
B, Heart removed and floor of the pericardium cut away on the left side so as to open the non-glandular sac of the nephridium, exposing the glandular sac *b*, which is also cut into so as to show the probe *f*.
C, Ideal pericardium and nephridium viewed laterally.
D, Lateral view showing the actual relation of the glandular and non-glandular sacs of the nephridium. The arrows indicate the course of fluid from the pericardium outwards.
a, Ventricle of the heart.
b, Auricle.
bb, Cut remnant of the auricle.
c, Dorsal wall of the pericardium cut and reflected.
e, Reno-pericardial orifice.
f, Probe introduced into the left reno-pericardial orifice.
g, Non-glandular sac of the left nephridium.
h, Glandular sac of the left nephridium.
i, Pore leading from the glandular into the non-glandular sac of the left nephridium.
k, Pore leading from the non-glandular sac to the exterior.
ac, Anterior.
ab, Posterior, cut remnants of the intestine and ventricle.

The blood is colourless, and has colourless amoeboid corpuscles floating in it. In *Ceratisolen legumen*, various species of *Arca* and a few other species the blood is crimson, owing to the presence of corpuscles impregnated with haemoglobin. In *Anodonta* the blood is driven by the ventricle through the arteries into vessel-like spaces, which soon become irregular lacunae surrounding the viscera, but in parts—*e.g.* the labial tentacles and walls of the gut—very fine vessels with endothelial cell-lining are found. The blood makes its way by large veins to a venous sinus which lies in the middle line below the heart, having the paired renal organs (nephridia) placed between it and that organ. Hence it passes through the vessels of the glandular walls of the nephridia right and left into the gill-lamellae, whence it returns through many openings into the widely-stretched auricles. In the filaments of the gill of Protobranchia and many Filibranchia the tubular cavity is divided by a more or less complete fibrous septum into two channels, for an afferent and efferent blood-current. The ventricle and auricles of *Anodonta* lie in a pericardium which is clothed with a pavement endothelium (*d*, fig. 18).

It does not contain blood or communicate directly with the blood-system; this isolation of the pericardium we have noted already in Gastropods and Cephalopods. A good case for the examination of the question as to whether blood enters the pericardium of Lamellibranchs, or escapes from the foot, or by the renal organs when the animal suddenly contracts, is furnished by the *Ceratisolen legumen*, which has red blood-corpuscles. According to observations made by Penrose on an uninjured *Ceratisolen legumen*, no red corpuscles are to be seen in the pericardial space, although the heart is filled with them, and no such corpuscles are ever discharged by the animal when it is irritated.

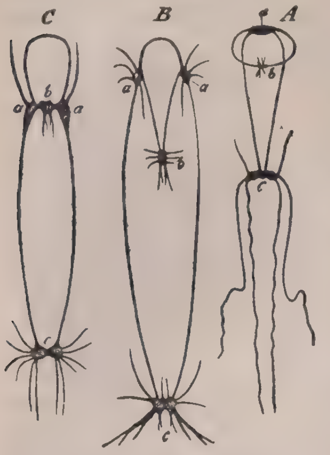


FIG. 19.—Nerve-ganglia and Cords of three Lamellibranchs. (From Gegenbaur.)

A, Of *Teredo.*
B, Of *Anodonta.*
C, Of *Pecten.*
a, Cerebral ganglion-pair (=cerebro-pleuro-visceral).
b, Pedal ganglion-pair.
c, Olfactory (osphradial) ganglion-pair.

The pair of renal organs of *Anodonta*, called in Lamellibranchs the organs of Bojanus, lie below the membranous floor of the pericardium, and open into it by two well-marked apertures (*e* and *f* in fig. 18). Each nephridium, after being bent upon itself as shown in fig. 18, C, D, opens to the exterior by a pore placed at the point marked *x* in fig. 1 (5) (6). One half of each nephridium is of a dark-green colour and glandular (*h* in fig. 18). This opens into the reflected portion which overlies it as shown in the diagram fig. 18, D, *i*; the latter has non-glandular walls, and opens by the pore *k* to the exterior. The renal organs may be more ramified in other Lamellibranchs than they are in *Anodonta*. In some they are difficult to discover. That of the common oyster was described by Hoek. Each nephridium in the oyster is a pyriform sac, which communicates by a narrow canal with the urino-genital groove placed to the front of the great adductor muscle; by a second narrow canal it communicates with the pericardium. From all parts of the pyriform sac narrow stalk-like tubes are given off, ending in abundant widely-spread branching glandular caeca, which form the essential renal secreting apparatus. The genital duct opens by a pore into the urino-genital groove of the oyster (the same arrangement being repeated on each side of the body) close to but distinct from the aperture of the nephridial canal. Hence, except for the formation of a urino-genital groove, the apertures are placed as they are in *Anodonta*. Previously to Hoek's discovery a brown-coloured investment of the auricles of the heart of the oyster had been supposed to represent the nephridia in a rudimentary state. This investment, which occurs also in many Filibranchia, forms the pericardial glands, comparable to the pericardial accessory glandular growths of Cephalopoda. In *Unionidae* and several other forms the pericardial glands are extended into diverticula of the pericardium which penetrate the mantle and constitute the organ of Heber. The glands secrete hippuric acid which passes from the pericardium into the renal organs.

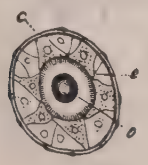


FIG. 20.—Otocyst of *Cyclas*. (From Gegenbaur.)

c, Capsule.
e, Ciliated cells lining the same.
o, Otolith.

Nervous System and Sense-Organs.—In *Anodonta* there are three well-developed pairs of nerve ganglia (fig. 19, B, and fig. 1 (6)). An anterior pair, lying one on each side of the mouth (fig. 19, B, *a*) and connected in front of it by a commissure, are the representatives of the cerebral and pleural ganglia of the typical Mollusc, which are not here differentiated as they are in Gastropods. A pair placed close together in the foot (fig. 19, B, *b*, and fig. 1 (6), *ax*) are the typical pedal ganglia; they are joined to the cerebropleural ganglia by connectives.

Posteriorly beneath the posterior adductors, and covered only by a thin layer of elongated epidermal cells, are the visceral ganglia. United with these ganglia on the outer sides are the osphradial ganglia, above which the epithelium is modified to form a pair of sense-organs, corresponding to the osphradia of other Molluscs. In some Lamellibranchs the osphradial ganglia receive nerve-fibres, not from the visceral ganglia, but from the cerebral ganglia along the visceral commissure. Formerly the posterior pair of ganglia were identified as simply the osphradial ganglia, and the anterior pair as the cerebral, pleural and visceral ganglia united into a single pair. But it has since been discovered that in the Protobranchia the cerebral ganglia and the pleural are distinct, each giving origin to its own connective which runs to the pedal ganglion. The cerebro-pedal and pleuro-pedal connectives, however, in these cases are only separate in the initial parts of their course, and unite together for the lower half of their length, or for nearly the whole length. Moreover, in many forms, in which in the adult condition there is only a single pair of anterior ganglia and a single pedal connective, a pleural ganglion distinct from the cerebral has been recognized in the course of development. There is, however, no evidence of the union of a visceral pair with the cerebro-pleural.

The sense-organs of *Anodonta* other than the osphradia consist of a pair of otocysts attached to the pedal ganglia (fig. 1 (6), *ay*). The otocysts of *Cyclas* are peculiarly favourable for study on account of the transparency of the small foot in which they lie, and may be taken as typical of those of Lamellibranchs generally. The structure of one is exhibited in fig. 20. A single otolith is present as in the veliger embryos of Opisthobranchia. In Filibranchia and many Protobranchia the otocyst (or statocyst) contains numerous particles (otoconia). The organs are developed as invaginations of the epidermis of the foot, and in the majority of the Protobranchia the orifice of invagination remains open throughout life; this is also the case in *Mytilus* including the common mussel.

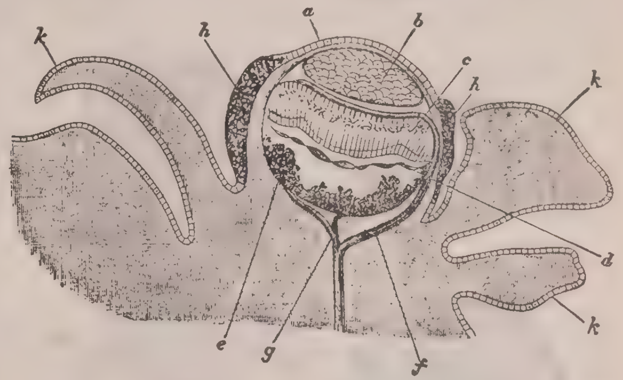


FIG. 21.—Pallial Eye of *Spondylus*. (From Hickson.)

a, Prae-corneal epithelium.
b, Cellular lens.
c, Retinal body.
d, Tapetum.
e, Pigment.
f, Retinal nerve.
g, Complementary nerve.
h, Epithelial cells filled with pigment.
k, Tentacle.

Anodonta has no eyes of any sort, and the tentacles on the mantle edge are limited to its posterior border. This deficiency is very usual in the class; at the same time, many Lamellibranchs have tentacles on the edge of the mantle supplied by a pair of large well-developed nerves, which are given off from the cerebro-pleural ganglion-pair, and very frequently some of these tentacles have undergone a special metamorphosis converting them into highly-organized eyes. Such eyes on the mantle-edge are found in *Pecten*, *Spondylus*, *Lima*, *Pinna*, *Pectunculus*, *Modiola*, *Cardium*, *Tellina*, *Mactra*, *Venus*, *Solen*, *Pholas* and *Galeomma*. They are totally distinct from the cephalic eyes of typical Mollusca, and have a different structure and historical development. They have originated not as pits but as tentacles. They agree with the dorsal eyes of *Oncidium* (Pulmonata) in the curious fact that the optic nerve penetrates the capsule of the eye and passes in front of the retinal body (fig. 21), so that its fibres join the anterior faces of the nerve-end cells as in Vertebrates, instead of their posterior faces as in the cephalic eyes of Mollusca and Arthropoda; moreover, the lens is not a cuticular product but a cellular structure, which, again, is a feature of agreement with the Vertebrate

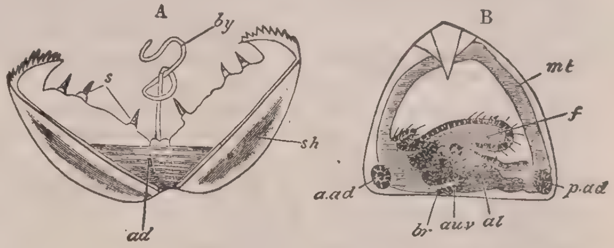


FIG. 22.—Two Stages in the Development of *Anodonta*. (From Balfour.) Both figures represent the glochidium stage.

A, When free swimming, shows the two dentigerous valves widely open.
B, A later stage, after fixture to the fin of a fish.
sh, Shell.
ad, Adductor muscle.
s, Teeth of the shell.
by, Byssus.
a.ad, Anterior adductor.
p.ad, Posterior adductor.
mt, Mantle-flap.
f, Foot.
br, Branchial filaments.
au.v, Otocyst.
al, Alimentary canal.

eye. It must, however, be distinctly borne in mind that there is a fundamental difference between the eye of Vertebrates and of all other groups in the fact that in the Vertebrata the retinal body is itself a part of the central nervous system, and not a separate modification of the epidermis—myelonic as opposed to epidermic. The structure of the reputed eyes of several of the above-named genera has not been carefully examined. In *Pecten* and *Spondylus*, however, they have been fully studied (see fig. 21, and explanation). Rudimentary cephalic eyes occur in the *Mytilidae* and in *Avicula* at the base of the first filament of the inner gill, each consisting of a pigmented epithelial fossa containing a cuticular lens. In the *Arcidae* the pallial eyes are compound or faceted somewhat like those of Arthropods.

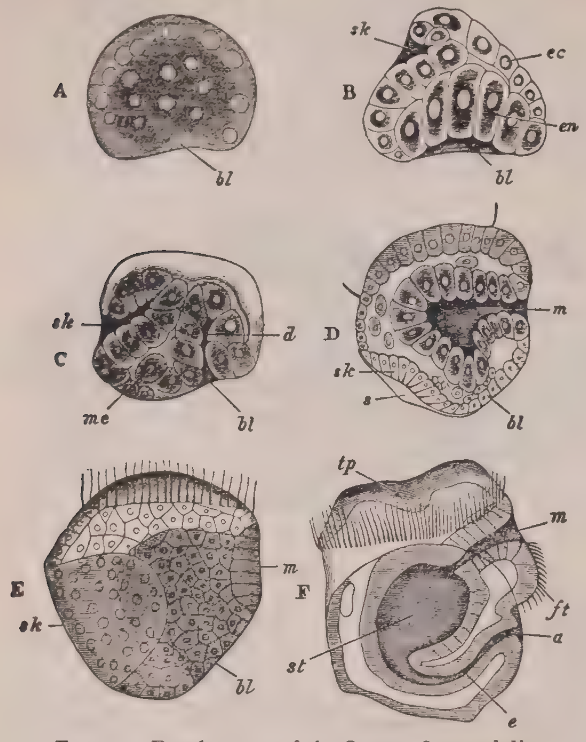


FIG. 23.—Development of the Oyster, *Ostrea edulis*. (Modified from Horst.)

A, Blastula stage (one-cell-layered sac), with commencing invagination of the wall of the sac at *bl*, the blastopore.
B, Optical section of a somewhat later stage, in which a second invagination has begun—namely, that of the shell-gland *sk*.
bl, Blastopore.
en, Invaginated endoderm (wall of the future arch-enteron).
ec, Ectoderm.
C, Similar optical section at a little later stage. The invagination connected with the blastopore is now more contracted, *d*; and cells, *me*, forming the mesoblast from which the cœlom and muscular and skeleto-trophic tissues develop, are separated.
D, Similar section of a later stage. The blastopore, *bl*, has closed; the anus will subsequently perforate the corresponding area. A new aperture, *m*, the mouth, has eaten its way into the invaginated endodermal sac, and the cells pushed in with it constitute the stomodaeum. The shell-gland, *sk*, is flattened out, and a delicate shell, *s*, appears on its surface. The ciliated velar ring is cut in the section, as shown by the two projecting cilia on the upper part of the figure. The embryo is now a Trochosphere.
E, Surface view of an embryo at a period almost identical with that of D.
F, Later embryo seen as a transparent object.
m, Mouth.
ft, Foot.
a, Anus.
e, Intestine.
st, Stomach.
tp, Velar area of the prostomium. The extent of the shell and commencing upgrowth of the mantle-skirt is indicated by a line forming a curve from *a* to F.

N.B.—In this development, as in that of *Pisidium* (fig. 25), no part of the blastopore persists either as mouth or as anus, but the aperture closes—the pedicle of invagination, or narrow neck of the invaginated arch-enteron, becoming the intestine. The mouth and the anus are formed as independent in-pushings, the mouth with stomodaeum first, and the short anal proctodaeum much later. This interpretation of the appearances is contrary to that of Horst, from whom our drawings of the oyster's development are taken. The account given by the American William K. Brooks differs greatly as to matter of fact from that of Horst, and appears to be erroneous in some respects.

Generative Organs.—The gonads of *Anodonta* are placed in distinct male and female individuals. In some Lamellibranchs—for instance, the European Oyster and the *Pisidium pusillum*—the sexes are united in the same individual; but here, as in most hermaphrodite animals, the two sexual elements are not ripe in the same individual at the same moment. It has been conclusively shown that the *Ostrea edulis* does not fertilize itself. The American Oyster (*O. virginiana*) and the Portuguese Oyster (*O. angulata*) have the sexes separate, and fertilization is effected in the open water after the discharge of the ova and the spermatozoa from the females and males respectively. In the *Ostrea edulis* fertilization of the eggs is effected at the moment of their escape from the uro-genital groove, or even before, by means of spermatozoa drawn into the sub-pallial chamber by the incurrent ciliary stream, and the embryos pass through the early stages of development whilst entangled between the gill-lamellae of the female parent (fig. 23). In *Anodonta* the eggs pass into the space between the two lamellae of the outer gill-plate, and are there fertilized, and advance whilst still in this position to the glochidium phase of development (fig. 22). They may be found here in thousands in the summer and autumn months. The gonads themselves are extremely simple arborescent glands which open to the exterior by two simple ducts, one right and one left, continuous with the tubular branches of the gonads. In the most primitive Lamellibranchs there is no separate generative aperture but the gonads discharge into the renal cavity, as in *Patella* among Gastropods. This is the case in the Protobranchia, *e.g. Solenomya*, in which the gonad opens into the reno-pericardial duct. But the generative products do not pass through the whole length of the renal tube: there is a direct opening from the pericardial end of the tube to the distal end, and the ova or sperms pass through this. In *Arca*, in *Anomiidae* and in *Pectinidae* the gonad opens into the external part of the renal tube. The next stage of modification is seen in *Ostraea*, *Cyclas* and some *Lucinidae*, in which the generative and renal ducts open into a cloacal slit on the surface of the body. In *Mytilus* the two apertures are on a common papilla, in other cases the two apertures are as in *Anodonta*. The Anatinacea and *Poromya* among the Septibranchia are, however, peculiar in having two genital apertures on each side, one male and one female. These forms are hermaphrodite, with an ovary and testis completely separate from each other on each side of the body, each having its own duct and aperture.

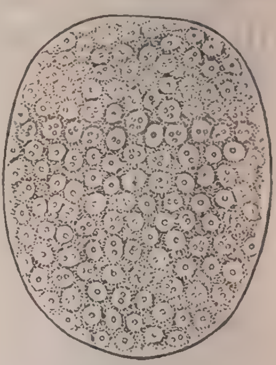


FIG. 24.—Embryo of *Pisidium pusillum* in the diblastula stage, surface view (after Lankester). The embryo has increased in size by accumulation of liquid between the outer and the invaginated cells. The blastopore has closed.

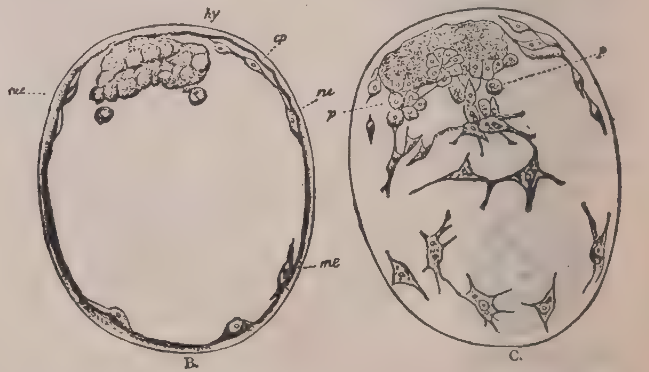


FIG. 25.—B, Same embryo as fig. 24, in optical median section, showing the invaginated cells *hy* which form the arch-enteron, and the mesoblastic cells *me* which are budded off from the surface of the mass *hy*, and apply themselves to the inner surface of the epiblastic cell-layer *ep*. C, The same embryo focused so as to show the mesoblastic cells which immediately underlie the outer cell-layer.

The development of *Anodonta* is remarkable for the curious larval form known as *glochidium* (fig. 22). The glochidium quits the gill-pouch of its parent and swims by alternate opening and shutting of the valves of its shell, as do adult *Pecten* and *Lima*, trailing at the same time a long byssus thread. This byssus is not homologous with that of other Lamellibranchs, but originates from a single glandular epithelial cell embedded in the tissues on the dorsal anterior side of the adductor muscle. By this it is brought into contact with the fin of a fish, such as perch, stickleback or others, and effects a hold thereon by means of the toothed edge of its shells. Here it becomes encysted, and is nourished by the exudations of the fish. It remains in this condition for a period of two to six weeks, and during this time the permanent organs are developed from the cells of two symmetrical cavities behind the adductor muscle. The early larva of *Anodonta* is not unlike the trochosphere of other Lamellibranchs, but the mouth is wanting. The glochidium is formed by the precocious development of the anterior adductor and the retardation of all the other organs except the shell. Other Lamellibranchs exhibit either a trochosphere larva which becomes a veliger differing only from the Gastropod's and Pteropod's veliger in having bilateral shell-calcifications instead of a single central one; or, like *Anodonta*, they may develop within the gill-plates of the mother, though without presenting such a specialized larva as the glochidium. An example of the former is seen in the development of the European oyster, to the figure of which and its explanation the reader is specially referred (fig. 23). An example of the latter is seen in a common little freshwater bivalve, the *Pisidium pusillum*, which has been studied by Lankester. The gastrula is formed in this case by invagination. The embryonic cells continue to divide, and form an oval vesicle containing liquid (fig. 24); within this, at one pole, is seen the mass of invaginated cells (fig. 25, *hy*). These invaginated cells are the archenteron; they proliferate and give off branching cells, which apply themselves (fig. 25, C) to the inner face of the vesicle, thus forming the mesoblast. The outer single layer of cells which constitutes the surface of the vesicle is the ectoderm or epiblast. The little mass of hypoblast or enteric cell-mass now enlarges, but remains connected with the cicatrix of the blastopore or orifice of invagination by a stalk, the rectal peduncle. The enteron itself becomes bilobed and is joined by a new invagination, that of the mouth and stomodaeum. The mesoblast multiplies its cells, which become partly muscular and partly skeleto-trophic. Centro-dorsally now appears the embyronic shell-gland. The pharynx or stomodaeum is still small, the foot not yet prominent. A later stage is seen in fig. 26, where the pharynx is widely open and the foot prominent. No ciliated velum or pre-oral (cephalic) lobe ever develops. The shell-gland disappears, the mantle-skirt is raised as a ridge, the paired shell-valves are secreted, the anus opens by a proctodaeal ingrowth into the rectal peduncle, and the rudiments of the gills (*br*) and of the renal organs (B) appear (fig. 26, lateral view), and thus the chief organs and general form of the adult are acquired. Later changes consist in the growth of the shell-valves over the whole area of the mantle-flaps, and in the multiplication of the gill-filaments and their consolidation to form gill-plates. It is important to note that the gill-filaments are formed one by one *posteriorly*. The labial tentacles are formed late. In the allied genus *Cyclas*, a byssus gland is formed in the foot and subsequently disappears, but no such gland occurs in *Pisidium*.

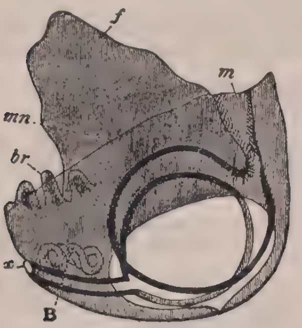
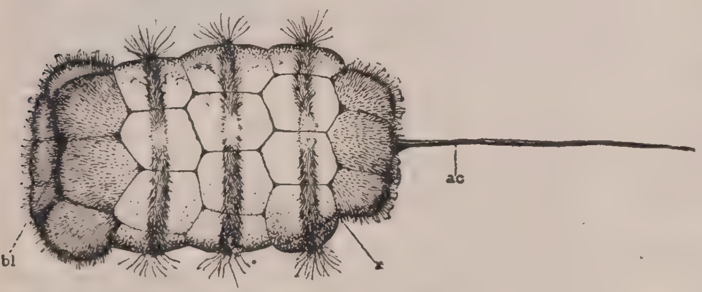


FIG. 26.—Diagram of Embryo of *Pisidium*. The unshaded area gives the position of the shell-valve. (After Lankester.)

m, Mouth.
x, Anus.
f, Foot.
br, Branchial filaments.
mn, Margin of the mantle-skirt.
B, Organ of Bojanus.



After Drew, in Lankester's *Treatise on Zoology*. (A. & C. Black.)

FIG. 27.—Surface view of a forty-five hour embryo of *Yoldia limatula*. *a.c*, Apical cilia. *bl*, Blastopore. *x*, Depression where the cells that form the cerebral ganglia come to the surface.

An extraordinary modification of the veliger occurs in the development of *Nucula* and *Yoldia* and probably other members of the same families. After the formation of the gastrula by epibole the larva becomes enclosed by an ectodermic test covering the whole of the original surface of the body, including the shell-gland, and leaving only a small opening at the posterior end in which the stomodaeum and proctodaeum are formed. In *Yoldia* and *Nucula proxima* the test consists of five rows of flattened cells, the three median rows bearing circlets of long cilia. At the anterior end of the test is the apical plate from the centre of which projects a long flagellum as in many other Lamellibranch larvae. In *Nucula delphinodonta* the test is uniformly covered with short cilia, and there is no flagellum. When the larval development is completed the test is cast off, its cells breaking apart and falling to pieces leaving the young animal with a well-developed shell exposed and the internal organs in an advanced state. The test is really a ciliated velum developed in the normal position at the apical pole but reflected backwards in such a way as to cover the original ectoderm except at the posterior end. In *Yoldia* and *Nucula proxima* the ova are set free in the water and the test-larvae are free-swimming, but in *Nucula delphinodonta* the female forms a thin-walled egg-case of mucus attached to the posterior end of the shell and in communication with the pallial chamber; in this case the eggs develop and the test-larva is enclosed. A similar modification of the velum occurs in *Dentalium* and in *Myzomenia* among the Amphineura.

CLASSIFICATION OF LAMELLIBRANCHIA

The classification originally based on the structure of the gills by P. Pelseneer included five orders, viz.: the Protobranchia in which the gill-filaments are flattened and not reflected; the Filibranchia in which the filaments are long and reflected, with non-vascular junctions; the Pseudo-lamellibranchia in which the gill-lamellae are vertically folded, the interfilamentar and interlamellar junctions being vascular or non-vascular; the Eulamellibranchia in which the interfilamentar and interlamellar junctions are vascular; and lastly the Septibranchia in which the gills are reduced to a horizontal partition. The Pseudolamellibranchia included the oyster, scallop and their allies which formerly constituted the order Monomyaria, having only a single large adductor muscle or in addition a very small anterior adductor. The researches of W. G. Ridewood have shown that in gill-structure the Pectinacea agree with the Filibranchia and the Ostraeacea with the Eulamellibranchia, and accordingly the order Pseudolamellibranchia is now suppressed and its members divided between the two other orders mentioned. The four orders now retained exhibit successive stages in the modification of the ctenidia by reflection and concrescence of the filament, but other organs, such as the heart, adductors, renal organs, may not show corresponding stages. On the contrary considerable differences in these organs may occur within any single order. The Protobranchia, however, possess several primitive characters besides that of the branchiae. In them the foot has a flat ventral surface used for creeping, as in Gastropods, the byssus gland is but slightly developed, the pleural ganglia are distinct, there is a relic of the pharyngeal cavity, in some forms with a pair of glandular sacs, the gonads retain their primitive connexion with the renal cavities, and the otocysts are open.

Order I. PROTOBRANCHIA

In addition to the characters given above, it may be noted that the mantle is provided with a hypobranchial gland on the outer side of each gill, the auricles are muscular, the kidneys are glandular through their whole length, the sexes are separate.

Fam. 1. *Solenomyidae*.—One row of branchial filaments is directed dorsally, the other ventrally; the mantle has a long postero-ventral suture and a single posterior aperture; the labial palps of each side are fused together; shell elongate; hinge without teeth; periostracum thick. *Solenomya*.

Fam. 2. *Nuculidae*.—Labial palps free, very broad, and provided with a posterior appendage; branchial filaments transverse; shell has an angular dorsal border; mantle open along its whole border. *Nucula*. *Acila*. *Pronucula*.

Fam. 3. *Ledidae*.—Like the *Nuculidae*, but mantle has two posterior sutures and two united siphons. *Leda*. *Yoldia*. *Malletia*.

Fam. 4. *Ctenodontidae.*—Extinct; Silurian.

The fossil group Palaeoconcha is connected with the Protobranchia through the *Solenomyidae.* It contains the following extinct families.

Fam. 1. *Praecardiidae.*—Shell equivalve with hinge dentition as in *Arca. Praecardium*; Silurian and Devonian.

Fam. 2. *Antipleuridae.*—Shell inequivalve. *Antipleura*; Silurian.

Fam. 3. *Cardiolidae.*—Shell equivalve and ventricose; hinge without teeth. *Cardiola*; Silurian and Devonian.

Fam. 4. *Grammysiidae.*—Shell thin, equivalve, oval or elongate; hinge without teeth. *Grammysia*; Silurian and Devonian. *Protomya*; Devonian. *Cardiomorpha*; Silurian to Carboniferous.

Fam. 5. *Vlastidae.*—Shell very inequivalve; hinge without teeth. *Vlasta*; Silurian.

Fam. 6. *Solenopsidae.*—Shell equivalve, greatly elongated, umbones very far forward. *Solenopsis*; Devonian to Trias.

Order II. Filibranchia

Gill-filament ventrally directed and reflected, connected by ciliated junctions. Foot generally provided with a highly developed byssogenous apparatus.

Sub-order I.—*Anomiacea.*

Very asymmetrical, with a single large posterior adductor. The heart is not contained in the pericardium, lies dorsad of the rectum and gives off a single aorta anteriorly. The reflected borders of the inner gill-plates of either side are fused together in the middle line. The gonads open into the kidneys and the right gonad extends into the mantle. Shell thin; animal fixed.

Fam. 1. *Anomiidae.*—Foot small; inferior (right) valve of adult perforated to allow passage of the byssus. *Anomia*; byssus large and calcified; British. *Placuna*; byssus atrophied in adult. *Hypotrema. Carolia. Ephippium. Placunanomia.*

Sub-order II.—*Arcacea.*

Symmetrical; mantle open throughout its extent; generally with well developed anterior and posterior adductors. The heart lies in the pericardium and gives off two aortae. Gills without interlamellar junctions. Renal and genital apertures separate.

Fam. 1. *Arcidae.*—Borders of the mantle bear compound pallial eyes. The labial palps are direct continuations of the lips. Hinge pliodont, that is to say, it has numerous teeth on either side of the umbones and the teeth are perpendicular to the edge. *Arca*; foot byssiferous; British. *Pectunculus*; foot without byssus; British. *Scaphula*; freshwater; India. *Argina. Bathyarca. Barbatia. Senilia. Anadara. Adacnarca.*

Fam. 2. *Parallelodontidae.*—Shell as in *Arca*, but the posterior hinge teeth elongated and parallel to the cardinal border. *Cucullaea*; recent and fossil from the Jurassic. All the other genera are fossil: *Parallelodon*; Devonian to Tertiary. *Carbonaria*; Carboniferous, &c.

Fam. 3. *Limopsidae.*—Shell orbicular, hinge curved, ligament longer transversely than antero-posteriorly; foot elongate, pointed anteriorly and posteriorly. *Limopsis. Trinacria*; Tertiary.

Fam. 4. *Philobryidae.*—Shell thin, very inequilateral, anterior part atrophied, umbones projecting. *Philobrya.*

Fam. 5. *Cyrtodontidae.*—Extinct; shell equivalve and inequilateral, short, convex. *Cyrtodonta*; Silurian and Devonian. *Cypricardites*, Silurian. *Vanuxemia*; Silurian.

Fam. 6. *Trigoniidae.*—Shell thick; foot elongated, pointed in front and behind, ventral border sharp; byssus absent. *Trigonia*; shell sub-triangular, umbones directed backwards. This genus was very abundant in the Secondary epoch, especially in Jurassic seas. There are six living species, all in Australian seas. Living specimens were first discovered in 1827. *Schizodus*; Permian. *Myophoria*; Trias.

Fam. 7. *Lyrodesmidae.*—Extinct; shell inequilateral, posterior side shorter; hinge short, teeth in form of a fan. *Lyrodesma*; Silurian.

Sub-order III.—*Mytilacea.*

Symmetrical, the anterior adductor small or absent. Heart gives off only an anterior aorta. Surface of gills smooth, gill-filaments all similar, with interlamellar junctions. Gonads generally extend into mantle and open at sides of kidneys. Foot linguiform and byssiferous.

Fam. 1. *Mytilidae.*—Shell inequilateral, anterior end short; hinge without teeth; ligament external. Mantle has a posterior suture. Cephalic eyes present. *Mytilus*; British. *Modiola*; British. *Lithodomus. Modiolaria*; British. *Crenella. Stavelia. Dacrydium. Myrina. Idas. Septifer.*

Fam. 2. *Modiolopsidae.*—Extinct; Silurian to Cretaceous; adductor muscles sub-equal. *Modiolopsis.—Modiomorpha. Myoconcha.*

Fam. 3. *Pernidae.*—Shell very inequilateral; ligament subdivided; mantle open throughout; anterior adductor absent. *Perna. Crenatula*; inhabits sponges. *Bakewellia. Gervilleia*; Trias to Eocene. *Odontoperna*; Trias. *Inoceramus*; Jurassic to Cretaceous.

Sub-order IV.—*Pectinacea.*

Monomyarian, with open mantle. Gills folded and the filaments at summits and bases of the folds are different from the others. Gonads contained in the visceral mass and generally open into renal cavities. Foot usually rudimentary.

Fam. 1. *Vulsellidae.*—Shell high; hinge toothless; foot without byssus. *Vulsella.*

Fam. 2. *Aviculidae.*—Shell very inequilateral; cardinal border straight with two auriculae, the posterior the longer. Foot with a very stout byssus. Gills fused to the mantle. *Avicula*; British. *Meleagrina.* Pearls are obtained from a species of this genus in the Persian Gulf, Indian Ocean, &c. *Malleus.* Several extinct genera.

Fam. 3. *Prasinidae.*—Shell inequilateral, with anterior umbones and prominent anterior auricula; cardinal border arched. *Prasina.*

Fam. 4. *Pterineidae.*—Extinct; Palaeozoic.

Fam. 5. *Lunulicardiidae.*—Extinct; Silurian and Devonian.

Fam. 6. *Conocardiidae.*—Extinct; Silurian to Carboniferous.

Fam. 7. *Ambonychiidae.*—Extinct; Silurian and Devonian. The last two families are dimyarian, with small anterior adductor.

Fam. 8. *Myalinidae.*—Extinct; Silurian to Cretaceous; adductors sub-equal.

Fam. 9. *Amussiidae.*—Shell orbicular, smooth externally with radiating costae internally. Gills without interlamellar junctions. *Amussium.*

Fam. 10. *Spondylidae.*—Shell very inequivalve, fixed by the right valve which is the larger. No byssus. *Spondylus*; shell with spiny ribs, adherent by the spines. *Plicatula.*

Fam. 11. *Pectinidae.*—Shell with radiating ribs; dorsal border with two auriculae. Foot byssiferous. Mantle borders with well developed eyes. *Pecten*; shell orbicular, with equal auriculae; without a byssal sinus; British. *Chlamys*; anterior auricula the larger and with a byssal sinus; British. *Pedum. Hinnites. Pseudamussium. Camptonectes. Hyalopecten*; abyssal.

Sub-order V.—*Dimyacea.*

Dimyarian, with orbicular and almost equilateral shell; adherent; hinge without teeth and ligament internal. Gills with free non-reflected filaments.

Fam. *Dimyidae.*—Characters of the sub-order. *Dimya*; recent in abyssal depths and fossil since the Jurassic.

Order III. Eulamellibranchia

Edges of the mantle generally united by one or two sutures. Two adductors usually present. Branchial filaments united by vascular interfilamentar junctions and vascular interlamellar junctions; the latter contain the afferent vessels. The gonads always have their own proper external apertures.

Sub-order I.—*Ostraeacea.*

Monomyarian or with a very small anterior adductor. Mantle open; foot rather small; branchiae folded; shell inequivalve.

Fam. 1. *Limidae.*—Shell with auriculae. Foot digitiform, with byssus. Borders of mantle with long and numerous tentacles. Gills not united with mantle. *Lima*; members of this genus form a nest by means of the byssus, or swim by clapping the valves of the shell together. *Limaea.*

Fam. 2. *Ostraeidae.*—Foot much reduced and without byssus. Heart usually on the ventral side of the rectum. Gills fused to the mantle. Shell irregular, fixed in the young by the left and larger valve. *Ostraea*; foot absent in the adult; edible and cultivated; some species, as the British *O. edulis*, are hermaphrodite.

Fam. 3. *Eligmidae.*—Extinct; Jurassic.

Fam. 4. *Pinnidae.*—Shell elongated, truncated and gaping posteriorly. Dimyarian, with a very small anterior adductor. Foot with byssus. *Pinna*; British. *Cyrtopinna. Aviculopinna*; fossil, Carboniferous and Permian. *Pinnigena*; Jurassic and Cretaceous. *Atrina*; fossil and recent, from Carboniferous to present day.

Sub-order II.—*Submytilacea.*

Mantle only slightly closed; usually there is only a single suture. Siphons absent or very short. Gills smooth. Nearly always dimyarian. Shell equivalve, with an external ligament.

Fam. 1. *Dreissensiidae.*—Shell elongated; hinge without teeth; summits of valves with an internal septum. Siphons short. *Dreissensia*; lives in fresh water, but originated from the Caspian Sea; introduced into England about 1824.

Fam. 2. *Modiolarcidae.*—Foot with a plantar surface; the two branchial plates serve as incubatory pouches. *Modiolarca.*

Fam. 3. *Astartidae.*—Shell concentrically striated; foot elongate, without byssus. *Astarte*; British. *Woodia. Opis*; Secondary. *Prosocoelus*; Devonian.

Fam. 4. *Crassatellidae.*—Shell thick, with concentric striae, ligament external; foot short. *Crassatella. Cuna.*

Fam. 5. *Carditidae.*—Shell thick, with radiating costae; foot carinated, often byssiferous. *Cardita. Thecalia. Milneria. Venericardia.*

Fam. 6. *Condylocardiidae.*—Like *Carditidae*, but with an external ligament. *Condylocardia. Carditella. Carditopsis.*

Fam. 7. *Cyprinidae.*—Mantle open in front, with two pallial sutures; external gill-plates smaller than the internal. *Cyprina*; British. *Cypricardia. Pleurophorus*; Devonian to Trias. *Anisocardia*; Jurassic to Tertiary. *Veniella*; Cretaceous to Tertiary.

Fam. 8. *Isocardiidae.*—Mantle largely closed, pedal orifice small; gill-plates of equal size; shell globular, with prominent and coiled umbones. *Isocardia*; British.

Fam. 9. *Callocardiidae.*—Siphons present; external gill-plate smaller than the internal; umbones not prominent. *Callocardia*; abyssal.

Fam. 10. *Lucinidae.*—Labial palps very small; gills without an external plate. *Lucina*; British. *Montacuta*; British. *Cryptodon.*

Fam. 11. *Corbidae.*—Shell thick, with denticulated borders; anal aperture with valve but no siphon; foot elongated and pointed. *Corbis. Gonodon*; Trias and Jurassic. *Mutiella*; Upper Cretaceous.

Fam. 12. *Ungulinidae.*—Foot greatly elongated, vermiform, ending in a glandular enlargement. *Ungulina. Diplodonta*; British. *Axinus*; British.

Fam. 13. *Cyrenellidae.*—Two elongated, united, non-retractile siphons; freshwater. *Cyrenella. Joanisiella.*

Fam. 14. *Tancrediidae.*—Shell elongate, sub-triangular. Extinct. *Tancredia*; Trias to Cretaceous. *Meekia*; Cretaceous.

Fam. 15. *Unicardiidae.*—Shell sub-orbicular, nearly equilateral, with concentric striae. Extinct, Carboniferous to Cretaceous. *Unicardium. Scaldia. Pseudedmondia.*

Fam. 16. *Leptonidae.*—Shell thin; no siphons; foot long and byssiferous; marine; hermaphrodite and incubatory. *Kellya*; British. *Lepton*; commensal with the Crustacean *Gebia*; British. *Erycina*; Tertiary. *Pythina. Scacchia. Sportella. Cyamium.*

Fam. 17. *Galeommidae.*—Mantle reflected over shell; shell thin, gaping; adductors much reduced. *Galeomma*; British. *Scintilla. Hindsiella. Ephippodonta*; commensal with shrimp *Axius*. The three following genera with an internal shell probably belong to this family:—*Chlamydoconcha. Scioberetia*; commensal with a Spatangid. *Entovalva*; parasitic in *Synapta.*

Fam. 18. *Kellyellidae.*—Shell ovoid; anal aperture with very short siphon; foot elongated. *Kellyella. Turtonia*; British. *Allopagus*; Eocene. *Lutetia*; Eocene.

Fam. 19. *Cyrenidae.*—Two siphons, more or less united, with papillose orifices; pallial line with a sinus; freshwater. *Cyrena. Corbicula. Batissa. Velorita. Galatea. Fischeria.*

Fam. 20. *Cycladidae.*—One siphon or two free siphons with simple orifices; pallial line simple; hermaphrodite, embryos incubated in external gill-plate; freshwater, *Cyclas*; British. *Pisidium*; British.

Fam. 21. *Rangiidae.*—Two short siphons; shell with prominent umbones and internal ligament. *Rangia*; brackish water, Florida.

Fam. 22. *Cardiniidae.*—Shell elongated, inequilateral. Extinct. *Cardinia*; Trias and Jurassic. *Anthracosia*; Carboniferous and Permian. *Anoplophora*; Trias. *Pachycardia*; Trias.

Fam. 23. *Megalodontidae.*—Shell inequilateral, thick; posterior adductor impression on a myophorous apophysis. Extinct. *Megalodon*; Devonian to Jurassic. *Pachyrisma*; Trias and Jurassic. *Durga*; Jurassic. *Dicerocardium*; Jurassic.

Fam. 24. *Unionidae.*—Shell equilateral; mantle with a single pallial suture and no siphons; freshwater; larva a glochidium. *Unio*; British. *Anodonta*; British. *Pseudodon. Quadrula. Arconaia. Monocondylea. Solenaia. Mycetopus.*

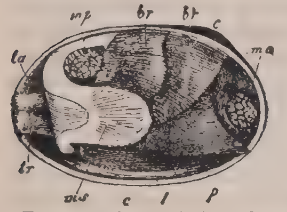


FIG. 28.—Lateral view of a *Mactra*, the right valve of the shell and right mantle-flap removed, and the siphons retracted. (From Gegenbaur.)

br, br', Outer and inner gill-plates.
t, Labial tentacle.
ta, tr, Upper and lower siphons
ms, Siphonal muscle of the mantle-flap.
ma, Anterior adductor muscle.
mp, Posterior adductor muscle.
p, Foot.
c, Umbo.

Fam. 25. *Mutelidae.*—Differs from *Unionidae* in having two pallial sutures; freshwater. *Mutela. Pliodon. Spatha. Iridina. Hyria. Castalia. Aplodon. Plagiodon.*

Fam. 26. *Aetheriidae.*—Shell irregular, generally fixed in the adult; foot absent; freshwater. *Aetheria. Mulleria. Bartlettia.*

Sub-order III.—*Tellinacea.*

Mantle not extensively closed; two pallial sutures and two well-developed siphons. Gills smooth. Foot compressed and elongated. Labial palps very large. Dimyarian; pallial line with a deep sinus.

Fam. 1. *Tellinidae.*—External gill-plate directed upwards; siphons separate and elongated; foot with byssus; palps very large; ligament external. *Tellina*; British. *Gastrana*; British. *Capsa. Macoma.*

Fam. 2. *Scrobiculariidae.*—External gill-plates directed upwards; siphons separate and excessively long; foot without byssus. *Scrobicularia*; estuarine; British. *Syndosmya*; British. *Cumingia.*

Fam. 3. *Donacidae.*—External gill-plate directed ventrally; siphons separate, of moderate length, anal siphon the longer. *Donax*; British. *Iphigeneia.*

Fam. 4. *Mesodesmatidae.*—External gill-plate directed ventrally; siphons separate and equal. *Mesodesma. Ervilia*; British.

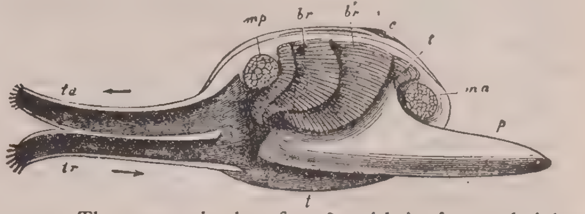


FIG. 29.—The same animal as fig. 28, with its foot and siphons expanded. Letters as in fig. 28. (From Gegenbaur.)

Fam. 5. *Cardiliidae.*—Shell very high and short; dimyarian; posterior adductor impression on a prominent apophysis. *Cardilia.*

Fam. 6. *Mactridae.*—External gill-plate directed ventrally; siphons united, invested by a chitinous sheath; foot long, bent at an angle, without byssus. *Mactra*; British (figs. 28, 29). *Mulinia. Harvella. Raeta. Eastonia. Heterocardia. Vanganella.*

Sub-order IV.—*Veneracea.*

Two pallial sutures, siphons somewhat elongated and partially or wholly united. Gills slightly folded. A bulb on the posterior aorta. Ligament external.

Fam. 1. *Veneridae.*—Foot well developed; pallial sinus shallow or absent. *Venus*; British. *Dosinia*; British. *Tapes*; British. *Cyclina. Lucinopsis*; British. *Meretrix. Circe*; British. *Venerupis.*

Fam. 2. *Petricolidae.*—Boring forms with a reduced foot; shell elongated, with deep pallial sinus. *Petricola. P. pholadiformis*, originally an inhabitant of the coast of the United States, has been acclimatized for some years in the North Sea.

Fam. 3. *Glaucomyidae.*—Siphons very long and united; foot small; shell thin, with deep pallial sinus; fresh or brackish water. *Glaucomya. Tanysiphon.*

Sub-order V.—*Cardiacea.*

Two pallial sutures. Siphons generally short. Foot cylindrical, more or less elongated, byssogenous. Gills much folded. Shell equivalve, with radiating costae and external ligament.

Fam. 1. *Cardiidae.*—Mantle slightly closed; siphons very short, surrounded by papillae which often bear eyes; foot very long, geniculated; pallial line without sinus; two adductors, *Cardium*; British. *Pseudo-kellya. Byssocardium*; Eocene. *Lithocardium*; Eocene.

Fam. 2. *Limnocardiidae.*—Siphons very long, united throughout; shell gaping; two adductors; brackish waters. *Limnocardium*; Caspian Sea and fossil from the Tertiary. *Archicardium*; Tertiary.

Fam. 3. *Tridacnidae.*—Mantle closed to a considerable extent; apertures distant from each other; no siphons; a single adductor; shell thick. *Tridacna. Hippopus.*

Sub-order VI.—*Chamacea.*

Asymmetrical, inequivalve, fixed, with extensive pallial sutures; no siphons. Two adductors. Foot reduced and without byssus. Shell thick, without pallial sinus.

Fam. 1. *Chamidae.*—Shell with sub-equal valves and prominent umbones more or less spirally coiled; ligament external. *Chama. Diceras*; Jurassic. *Requienia*; Cretaceous. *Matheronia*; Cretaceous.

Fam. 2. *Caprinidae.*—Shell inequivalve; fixed valve spiral or conical; free valve coiled or spiral; Cretaceous. *Caprina. Caprotina. Caprinula*, &c.

Fam. 3. *Monopleuridae.*—Shell very inequivalve; fixed valve conical or spiral; free valve operculiform; Cretaceous. *Monopleuron. Baylea.* The two following families, together known as Rudistae, are closely allied to the preceding; they are extinct marine forms from Secondary deposits. They were fixed by the conical elongated right valve; the free left valve is not spiral, and is furnished with prominent apophyses to which the adductors were attached.

Fam. 4. *Radiolitidae.*—Shell conical or biconvex, without canals in the external layer. *Radiolites. Biradiolites.*

Fam. 5. *Hippuritidae.*—Fixed valve long, cylindro-conical, with three longitudinal furrows which correspond internally to two pillars for support of the siphons. *Hippurites. Arnaudia.*

Sub-order VII.—*Myacea.*

Mantle closed to a considerable extent; siphons well developed; gills much folded and frequently prolonged into the branchial siphon. Foot compressed and generally byssiferous. Shell gaping, with a pallial sinus.

Fam. 1. *Psammobiidae.*—Siphons very long and quite separate; foot large; shell oval, elongated, ligament external. *Psammobia*; British. *Sanguinolaria. Asaphis. Elizia. Solenotellina.*

Fam. 2. *Myidae.*—Siphons united for the greater part of their length, and with a circlet of tentacles near their extremities; foot reduced; shell gaping; ligament internal. *Mya*; British. *Sphenia*; British. *Tugonia. Platyodon. Cryptomya.*

Fam. 3. *Corbulidae.*—Shell sub-trigonal, inequivalve; pallial sinus shallow; siphons short, united, completely retractile; foot large, pointed, often byssiferous. *Corbulomya. Paramya. Erodona* and *Himella* are fluviatile forms from South America.

Fam. 4. *Lutrariidae.*—Mantle extensively closed; a fourth pallial aperture behind the foot; siphons long and united; shell elongated, a spoon-shaped projection for the ligament on each valve. *Lutraria*; British. *Tresus. Standella.*

Fam. 5. *Solenidae.*—Elongated burrowing forms; foot cylindrical, powerful, without byssus; shell long, truncated and gaping at each end. *Solenocurtus*; British. *Tagelus*; estuarine. *Ceratisolen*; British. *Cultellus*; British. *Siliqua. Solen*; British. *Ensis*; British.

Fam. 6. *Saxicavidae.*—Mantle extensively closed, with a small pedal orifice; siphons long, united, covered by a chitinous sheath; gills prolonged into the branchial siphon; foot small; shell gaping. *Saxicava*; British. *Glycimeris. Cyrtodaria.*

Fam 7. *Gastrochaenidae.*—Shell thin, gaping widely at the posterior end; anterior adductor much reduced; mantle extensively closed; siphons long, united. *Gastrochaena*; British. *Fistulana.*

Sub-order VIII.—*Adesmacea.*

Ligament wanting; shell gaping, with a styloid apophysis in the umbonal cavities. Gills prolonged into the branchial siphon. Mantle largely closed, siphons long, united. Foot short, truncated, discoid, without byssus.

Fam. 1. *Pholadidae.*—Shell containing all the organs; heart traversed by the rectum; two aortae. Shell with a pallial sinus; dorsal region protected by accessory plates. *Pholas*; British. *Pholadidea*; British. *Jouannetia. Xylophaga*; British. *Martesia.*

Fam. 2. *Teredinidae.*—Shell globular, covering only a small portion of the vermiform body; heart on ventral side of rectum; a single aorta; siphons long, united and furnished with two posterior calcareous "pallets." *Teredo*; British. *Xylotrya.*

Sub-order IX.—*Anatinacea.*

Hermaphrodite, the ovaries and testes distinct, with separate apertures. Foot rather small. Mantle frequently presents a fourth orifice. External gill-plate directed dorsally and without reflected lamella. Hinge without teeth.

Fam. 1. *Thracidae.*—Mantle with a fourth aperture; siphons long, quite separate, completely retractile and invertible. *Thracia*; British. *Asthenothaerus.*

Fam. 2. *Periplomidae.*—Siphons separate, naked, completely retractile but not invertible. *Periploma. Cochlodesma. Tyleria.*

Fam. 3. *Anatinidae.*—Siphons long, united, covered by a chitinous sheath, not completely retractile. *Anatina. Plectomya*; Jurassic and Cretaceous.

Fam. 4. *Pholadomyidae.*—Mantle with fourth aperture; siphons very long, completely united, naked, incompletely retractile; foot small, with posterior appendage. *Pholadomya.*

Fam. 5. *Arcomyidae.*—Extinct; Secondary and Tertiary. *Arcomya. Goniomya.*

Fam. 6. *Pholadellidae.*—Extinct; Palaeozoic. *Pholadella. Phytimya. Allorisma.*

Fam. 7. *Pleuromyidae.*—Extinct; Secondary. *Pleuromya. Gresslya. Ceromya.*

Fam. 8. *Pandoridae.*—Shell thin, inequivalve, free; ligament internal; siphons very short. *Pandora*; British. *Coelodon. Clidiophora.*

Fam. 9. *Myochamidae.*—Shell very inequivalve, solid, with a pallial sinus; siphons short; foot small. *Myochama. Myodora.*

Fam. 10. *Chamostraeidae.*—A fourth pallial aperture present; pedal aperture small; siphons very short and separate; shell fixed by the right valve, irregular. *Chamostraea.*

Fam. 11. *Clavagellidae.*—Pedal aperture very small, foot rudimentary; valves continued backwards into a calcareous tube secreted by the siphons. *Clavagella. Brechites* (*Aspergillum*).

Fam. 12. *Lyonsiidae.*—Foot byssiferous; siphons short, invertible. *Lyonsia*; British. *Entodesma. Mytilimeria.*

Fam. 13. *Verticordiidae.*—Siphons short, gills papillose; foot small; shell globular. Many species abyssal. *Verticordia. Euciroa. Lyonsiella. Halicardia.*

Order IV. SEPTIBRANCHIA

Gills have lost their respiratory function, and are transformed into a muscular septum on each side between mantle and foot. All marine, live at considerable depths, and are carnivorous.

Fam. 1. *Poromyidae.*—Siphons short and separate; branchial siphon with a large valve; branchial septum bears two groups of orifices on either side; hermaphrodite. *Poromya*; British. *Dermatomya. Liopistha*; Cretaceous.

Fam. 2. *Cetoconchidae.*—Branchial septum with three groups of orifices on each side; siphons short, separate, branchial siphon with a valve. *Cetoconcha* (*Silenia*).

Fam. 3. *Cuspidariidae.*—Branchial septum with four or five pairs of very narrow symmetrical orifices; siphons long, united, their extremities surrounded by tentacles; sexes separate. *Cuspidaria*; British.

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LAMENNAIS, HUGUES FÉLICITÉ ROBERT DE (1782–1854), French priest, and philosophical and political writer, was born at Saint Malo, in Brittany, on the 19th of June 1782. He was the son of a shipowner of Saint Malo ennobled by Louis XVI. for public services, and was intended by his father to follow mercantile pursuits. He spent long hours in the library of an uncle, devouring the writings of Rousseau, Pascal and others. He thereby acquired a vast and varied, though superficial, erudition, which determined his subsequent career. Of a sickly and sensitive nature, and impressed by the horrors of the French Revolution, his mind was early seized with a morbid view of life, and this temper characterized him throughout all his changes of opinion and circumstance. He was at first inclined towards rationalistic views, but partly through the influence of his brother Jean Marie (1775–1861), partly as a result of his philosophical and historical studies, he felt belief to be indispensable to action and saw in religion the most powerful leaven of the community. He gave utterance to these convictions in the *Réflexions sur l'état de l'église en France pendant le* $18^{\text{ième}}$ *siècle et sur sa situation actuelle*, published anonymously in Paris in 1808. Napoleon's police seized the book as dangerously ideological, with its eager recommendation of religious revival and active clerical organization, but it awoke the ultramontane spirit which has since played so great a part in the politics of churches and of states.

As a rest from political strife, Lamennais devoted most of the following year to a translation, in exquisite French, of the *Speculum Monachorum* of Ludovicus Blosius (Louis de Blois) which he entitled *Le Guide spirituel* (1809). In 1811 he received the tonsure and shortly afterwards became professor of mathematics in an ecclesiastical college founded by his brother at Saint Malo. Soon after Napoleon had concluded the Concordat with Pius VII. he published, in conjunction with his brother, *De la tradition de l'église sur l'institution des évêques* (1814), a writing occasioned by the emperor's nomination of Cardinal Maury to the archbishopric of Paris, in which he strongly condemned the Gallican principle which allowed bishops to be created irrespective of the pope's sanction. He was in Paris at the first Bourbon restoration in 1814, which he hailed with satisfaction, less as a monarchist than as a strenuous apostle of religious regeneration. Dreading the *Cent Jours*, he escaped to London, where he obtained a meagre livelihood by giving French lessons in a school founded by the abbé Jules Carron for French émigrés;

he also became tutor at the house of Lady Jerningham, whose first impression of him as an imbecile changed into friendship. On the final overthrow of Napoleon in 1815 he returned to Paris, and in the following year, with many misgivings as to his calling, he yielded to his brother's and Carron's advice, and was ordained priest by the bishop of Rennes.

The first volume of his great work, *Essai sur l'indifférence en matière de religion*, appeared in 1817 (Eng. trans. by Lord Stanley of Alderley, London, 1898), and affected Europe like a spell, investing, in the words of Lacordaire, a humble priest with all the authority once enjoyed by Bossuet. Lamennais denounced toleration, and advocated a Catholic restoration to belief. The right of private judgment, introduced by Descartes and Leibnitz into philosophy and science, by Luther into religion and by Rousseau and the Encyclopaedists into politics and society, had, he contended, terminated in practical atheism and spiritual death. Ecclesiastical authority, founded on the absolute revelation delivered to the Jewish people, but supported by the universal tradition of all nations, he proclaimed to be the sole hope of regenerating the European communities. Three more volumes (Paris, 1818–1824) followed, and met with a mixed reception from the Gallican bishops and monarchists, but with the enthusiastic adhesion of the younger clergy. The work was examined by three Roman theologians, and received the formal approval of Leo XII. Lamennais visited Rome at the pope's request, and was offered a place in the Sacred College, which he refused. On his return to France he took a prominent part in political work, and together with Chateaubriand, the vicomte de Villèle, was a regular contributor to the *Conservateur*, but when Villèle became the chief of the supporters of absolute monarchy, Lamennais withdrew his support and started two rival organs, *Le Drapeau blanc* and *Le Mêmorial catholique*. Various other minor works, together with *De la religion considérée dans ses rapports avec l'ordre civil et politique* (2 vols., 1825–1826), kept his name before the public.

He retired to La Chênaie and gathered round him a host of brilliant disciples, including C. de Montalembert, Lacordaire and Maurice de Guérin, his object being to form an organized body of opinion to persuade the French clergy and laity to throw off the yoke of the state connexion. With Rome at his back, as he thought, he adopted a frank and bold attitude in denouncing the liberties of the Gallican church. His health broke down and he went to the Pyrenees to recruit. On his return to La Chênaie in 1827 he had another dangerous illness, which powerfully impressed him with the thought that he had only been dragged back to life to be the instrument of Providence. *Les Progrès de la révolution et de la guerre contre l'église* (1828) marked Lamennais's complete renunciation of royalist principles, and henceforward he dreamt of the advent of a theocratic democracy. To give effect to these views he founded *L'Avenir*, the first number of which appeared on the 16th of October 1830, with the motto "God and Liberty." From the first the paper was aggressively democratic; it demanded rights of local administration, an enlarged suffrage, universal freedom of conscience, freedom of instruction, of meeting, and of the press. Methods of worship were to be criticized, improved or abolished in absolute submission to the spiritual, not to the temporal authority. With the help of Montalembert, he founded the *Agence générale pour la défense de la liberté religieuse*, which became a far-reaching organization, it had agents all over the land who noted any violations of religious freedom and reported them to headquarters. As a result, *L'Avenir's* career was stormy, and the opposition of the Conservative bishops checked its circulation; Lamennais, Montalembert and Lacordaire resolved to suspend it for a while, and they set out to Rome in November 1831 to obtain the approval of Gregory XVI. The "pilgrims of liberty" were, after much opposition, received in audience by the pope, but only on the condition that the object which brought them to Rome should not be mentioned. This was a bitter disappointment to such earnest ultramontanes, who received, a few days after the audience, a letter from Cardinal Pacca, advising their departure from Rome and suggesting that the Holy See, whilst admitting the justice of their intentions, would like the matter left open for the present. Lacordaire and Montalembert obeyed; Lamennais, however, remained in Rome, but his last hope vanished with the issue of Gregory's letter to the Polish bishops, in which the Polish patriots were reproved and the tsar was affirmed to be their lawful sovereign. He then "shook the dust of Rome from off his feet." At Munich, in 1832, he received the encyclical *Mirari vos*, condemning his policy; as a result *L'Avenir* ceased and the *Agence* was dissolved.

Lamennais, with his two lieutenants, submitted, and deeply wounded, retired to La Chênaie. His genius and prophetic insight had turned the entire Catholic church against him, and those for whom he had fought so long were the fiercest of his opponents. The famous *Paroles d'un croyant*, published in 1834 through the intermediary of Sainte-Beuve, marks Lamennais's severance from the church. "A book, small in size, but immense in its perversity," was Gregory's criticism in a new encyclical letter. A tractate of aphorisms, it has the vigour of a Hebrew prophecy and contains the choicest gems of poetic feeling lost in a whirlwind of exaggerations and distorted views of kings and rulers. The work had an extraordinary circulation and was translated into many European languages. It is now forgotten as a whole, but the beautiful appeals to love and human brotherhood are still reprinted in every hand-book of French literature.

Henceforth Lamennais was the apostle of the people alone. *Les Affaires de Rome, des maux de l'église et de la société* (1837) came from old habit of religious discussions rather than from his real mind of 1837; or at most it was but a last word. *Le Livre du peuple* (1837), *De l'esclavage moderne* (1839), *Politique à l'usage du peuple* (1839), three volumes of articles from the journal of the extreme democracy, *Le Monde*, are titles of works which show that he had arrived among the missionaries of liberty, equality and fraternity, and he soon got a share of their martyrdom. *Le Pays et le gouvernement* (1840) caused him a year's imprisonment. He struggled through difficulties of lost friendships, limited means and personal illnesses, faithful to the last to his hardly won dogma of the sovereignty of the people, and, to judge by his contribution to Louis Blanc's *Revue du progrès* was ready for something like communism. He was named president of the "Société de la solidarité républicaine," which counted half a million adherents in fifteen days. The Revolution of 1848 had his sympathies, and he started *Le Peuple constituant*; however, he was compelled to stop it on the 10th of July, complaining that silence was for the poor, but again he was at the head of *La Révolution démocratique et sociale*, which also succumbed. In the constituent assembly he sat on the left till the *coupe d'état* of Napoleon III. in 1851 put an end to all hopes of popular freedom. While deputy he drew up a constitution, but it was rejected as too radical. Thereafter a translation of Dante chiefly occupied him till his death, which took place in Paris on the 27th of February 1854. He refused to be reconciled to the church, and was buried according to his own directions at Père La Chaise without funeral rites, being mourned by a countless concourse of democratic and literary admirers.

During the most difficult time of his republican period he found solace for his intellect in the composition of *Une voix de prison*, written during his imprisonment in a similar strain to *Les paroles d'un croyant*. This is an interesting contribution to the literature of captivity; it was published in Paris in 1846. He also wrote *Esquisse de philosophie* (1840). Of the four volumes of this work the third, which is an exposition of art as a development from the aspirations and necessities of the temple, stands pre-eminent, and remains the best evidence of his thinking power and brilliant style.

There are two so-called *Œuvres complètes de Lamennais*, the first in 10 volumes (Paris, 1836–1837), and the other in 10 volumes (Paris, 1844); both these are very incomplete and only contain the works mentioned above. The most noteworthy of his writings subsequently published are: *Amschaspands et Darvands* (1843), *Le Deuil de la Pologne* (1846), *Mélanges philosophiques et politiques* (1856), *Les Évangiles* (1846) and *La Divine Comédie*, these latter being translations of the Gospels and of Dante.

Part of his voluminous correspondence has also appeared. The most interesting volumes are the following: *Correspondance de F. de Lamennais*, edited by E. D. Forgues (2 vols., 1855–1858), *Œuvres inédites de F. Lamennais*, edited by Ange Blaize (2 vols., 1866); *Correspondance inédite entre Lamennais et le baron de Vitrolles*, edited by E. D. Forgues (1819–1853); *Confidences de Lamennais, lettres inédites de 1821 à 1848*, edited by A. du Bois de la Villerabel (1886); *Lamennais d'après des documents inédits*, by Alfred Roussel (Rennes, 2 vols., 1892); *Lamennais intime, d'après une correspondance inédite*, by A. Roussel (Rennes, 1897); *Un Lamennais inconnu*, edited by A. Laveille (1898); *Lettres de Lamennais à Montalembert*, edited by E. D. Forgues (1898); and many other letters published in the *Revue bleue*, *Revue britannique*, &c.

A list of lives or studies on Lamennais would fill several columns. The following may be mentioned. A Blaize, *Essai biographique sur M de Lamennais* (1858); E. D. Forgues, *Notes et souvenirs* (1859); F. Brunetière, *Nouveaux essais sur la littérature contemporaine* (1893); E. Faguet, *Politiques et moralistes*, ii. (1898); P. Janet, *La Philosophie de Lamennais* (1890); P. Mercier, S.J., *Lamennais d'après sa correspondance et les travaux les plus récents* (1893); A. Mollien et F. Duine, *Lamennais, sa vie et ses idées*; *Pages choisies* (Lyons 1898); The Hon. W. Gibson, *The Abbé de Lammenais and the Liberal Catholic Movement in France* (London, 1896); E. Renan *Essais de morale et de critique* (1857); E. Schérer, *Mélanges de critique religieuse* (1859); G. E. Spuller, *Lamennais. étude d'histoire et de politique religieuse* (1892); Mgr. Ricard, *L'école menaisienne* (1882), and Sainte-Beuve, *Portraits contemporains*, tome i. (1832), and *Nouveaux Lundis*, tome i. p. 22; tome xi. p. 347.

LAMENTATIONS (*Lamentations of Jeremiah*), a book of the Old Testament. In Hebrew MSS. and editions this little collection of liturgical poems is entitled איכה *Ah how!*, the first word of ch. i. (and chs. ii., iv.); cf. the books of the Pentateuch, and the Babylonian Epic of Creation (a far older example). In the Septuagint it is called Θρῆνοι, "Funeral-songs" or "Dirges," the usual rendering of Heb. קינה (Am. v. 1; Jer. vii. 29; 2 Sam. i. 17), which is, in fact, the name in the Talmud (*Baba Bathra* 15*a*) and other Jewish writings; and it was known as such to the Fathers (Jerome, *Cinoth*). The Septuagint (B) introduces the book thus: "And it came to pass, after Israel was taken captive and Jerusalem laid waste, Jeremiah sat weeping, and lamented with this lamentation over Jerusalem, and said . . .," a notice which may have related originally to the first poem only. Some Septuagint MSS., and the Syriac and other versions, have the fuller title *Lamentations of Jeremiah*. In the Hebrew Bible Lamentations is placed among the *Cetubim* or Hagiographa, usually as the middle book of the five *Megilloth* or Ferial Rolls (Canticles, Ruth, Lamentations, Ecclesiastes, Esther) according to the order of the days on which they are read in the Synagogue, Lamentations being read on the 9th of Ab (6th of August), when the destruction of the Temple is commemorated (*Mass. Sopherim* 18). But the Septuagint appends the book to Jeremiah (*Baruch* intervening), just as it adds Ruth to Judges; thus making the number of the books of the Hebrew Canon the same as that of the letters of the Hebrew alphabet, viz. twenty-two (so Jos. c. Ap. i. 8), instead of the Synagogal twenty-four (see *Baba Bathra* 14*b*).

External features and poetical structure.—These poems exhibit a peculiar metre, the so-called "limping verse," of which Am. v. 2 is a good instance:

"She is fállen, to ríse no móre—
Maid Ísraël!
Left lórn upón her lánd—
none raísing hér!"

A longer line, with three accented syllables, is followed by a shorter with two. Chs. i.-iii. consist of stanzas of three such couplets each; chs. iv. and v. of two like Am. v. 2. This metre came in time to be distinctive of elegy. The text of Lamentations, however, so often deviates from it, that we can only affirm the *tendency* of the poet to cast his couplets into this type (Driver). Some anomalies, both of metre and of sense, may be removed by judicious emendation; and many lines become smooth enough, if we assume a crasis of open vowels of the same class, or a diphthongal pronunciation of others, or contraction or silence of certain suffixes as in Syriac. The oldest elegiac utterances are not couched in this metre; *e.g.* David's (2 Sam. iii. 33 f. Abner; *ib.* i. 19-27 Saul and Jonathan). Yet the refrain of the latter, *'Eik nâf 'lu gibborîm*, "Ah how are heroes fallen!" agrees with our longer line. The remote ancestor of this Hebrew metre may be recognized in the Babylonian epic of Gilgamesh, written at least a thousand years earlier:—

Ea-báni íbri kuṭáni | *Nímru sha çéri*
"Eabani, my friend, my little brother! | Leopard of the Wild!"

and again:—

Kíki lúskut | *Kíki luqúl-ma*
Îbri shá arámmu | *Itémi ṭiṭṭish*
"How shall I be dumb? | How shall I bewail?
The friend whom I love | Is turned to clay!"

Like a few of the Psalms, Lamentations i.-iv. are alphabetical acrostics. Each poem contains twenty-two stanzas, corresponding to the twenty-two letters of the Hebrew alphabet; and each stanza begins with its proper letter. (In ch. iii. each of the three couplets in a stanza begins with the same letter, so that the alphabet is repeated thrice: cf. Psalm cxix. for an eight-fold repetition.) The alphabet of Lamentations ii. iii. iv. varies from the usual order of the letters by placing *Pe* before *Ain*. The same was doubtless the case in ch. i. also until some scribe altered it. He went no further, because the sense forbade it in the other instances. The variation may have been one of local use, either in Judea or in Babylonia; or the author may have had some fanciful reason for the transposition, such as, for example, that *Pe* following *Samech* (ספ) might suggest the word ספדו, "Wail ye!" (2 Sam. iii. 31). Although the oldest Hebrew elegies are not alphabetic acrostics, it is a curious fact that the word הֲיָרֵךְ, "Was he a coward?" (Sc. לבו; Is. vii. 4), is formed by the initial letters of the four lines on Abner (om. ו, line 3); and the initials of the verses of David's great elegy are הא המשכ אצא, which may be read as a sentence meaning, perhaps, "Lo, I the Avenger" (cf. Deut. xxxii. 41, 43) "will go forth!"; or the first two letters (ה'א') may stand for הוי אחי, "Alas, my brother!" (Jer. xxii. 18; cf. xxxiv. 5). In cryptic fashion the poet thus registers a vow of vengeance on the Philistines. Both kinds of acrostic occur side by side in the Psalms. Psalm cx., an acrostic of the same kind as David's elegy, is followed by Psalms cxi. cxii., which are alphabetical acrostics, like the Lamentations. Such artifices are not in themselves greater clogs on poetic expression than the excessive alliteration of old Saxon verse or the strict rhymes of modern lyrics. (Alliteration, both initial and internal, is common in Lamentations.)

As the final piece, ch. v. may have suffered more in transmission than those which precede it—even to the extent of losing the acrostic form (like some of the Psalms and Nahum i.), besides half of its stanzas. If we divide the chapter into quatrains, like ch. iv., we notice several vestiges of an acrostic. The *Aleph* stanza (verses 7, 8) still precedes the *Beth* (verses 9, 10), and the *Ain* is still quite clear (verses 17, 18; cf. i. 16). Transposing verses 5, 6, and correcting their text, we see that the *Jod* stanza (verses 3, 4) precedes the *Lamed* (verses 6, 5), *Caph* having disappeared between them. With this clue, we may rearrange the other quatrains in alphabetical sequence, each according to its initial letter. We thus get a broken series of eleven stanzas, beginning with the letters א (verses 7, 8), ב (9, 10), ה (21, 22), ו (19, cf. Psalm cii. 13; and 20), ז (1, 2), ח (13, חורים; 14), י (3, 4), ל (6, לצרים; 5, על . . . הכבידו), נ (11, 12), ע (17, 18), and ש (15, 16), successively. An internal connexion will now be apparent in all the stanzas.

General subject and outline of contents.—The theme of Lamentations is the final siege and fall of Jerusalem (586 B.C.), and the attendant and subsequent miseries of the Jewish people.

In ch. i. we have a vivid picture of the distress of Zion, after all is over. The poet does not describe the events of the siege, nor the horrors of the capture, but the painful experience of subjection and tyranny which followed. Neither this nor ch. ii. is strictly a "dirge." Zion is not dead. She is personified as a widowed princess, bereaved and desolate, sitting amid the ruins of her former joys, and brooding over her calamities. From verse 11*c* to the end (except verse 17) she herself is the speaker:—

"O come, ye travellers all!
Behold and see
If grief there be like mine!"

She images her sorrows under a variety of metaphors (cf. ch. iii. 1-18); ascribing all her woes to Yahweh's righteous wrath, provoked by her sins, and crying for vengeance on the malicious rivals who had rejoiced at her overthrow.

The text has suffered much. Verse 5*c* read: בשבי (v. 18), "into captivity," צרים (v. 7), "adversaries." For verse 7, see Budde, V. 14: נשקר, read נקשר, "was bound." Verse 19*c* read: כי בקשו אכל להשיב נפש ולא מצאו "For they sought food to restore life, and found it not:" cf. Septuagint; and verses 11, 16. Verse 20: the incongruous כי מרו מריתי, "For I grievously rebelled," should be נכמרו רחמי, "My inwards burn"; Hos. xi. 8. Verses 21 f.: "All my foes heard, rejoiced That IT" (cf. Psalm ix. 13), "Thou didst. Bring Thou" (הָבֵא אַת־), "the Day Thou hast proclaimed; Let them become like me! Let the time" (עת; see Septuagint) "of their calamity come!"

Chapter ii.—"Ah how in wrath the Lord | Beclouds Bath-Sion!" The poet laments Yahweh's anger as the true cause which destroyed city and kingdom, suspended feast and Sabbath, rejected altar and sanctuary. He mentions the uproar of the victors in the Temple; the dismantling of the walls; the exile of king and princes (verses 1-9). He recalls the mourning in the doomed city; the children dying of hunger in the streets; the prophets deluding the people with vain hopes. Passers-by jeered at the fallen city; and all her enemies triumphed over her (verses 10-17). Sion is urged to cry to the Lord in protest against His pitiless work (verses 18-22).

Here too emendation is necessary. Verse 4*a*: הציב חצו, "He fixed His arrow," sc. on the string (Septuagint, *ἐστερέωσεν*); cf. Psalm xi. 2. Add at the end כלה (את) אפו, "He spent His anger:" see iv. 11; Ezek. vii. 8, xx. 8, 21. Verse 6: ויפרץ גדר משכנו, "And He broke down the wall of His dwelling-place" (Septuagint *τὸ σκήνωμα αὐτοῦ*; cf. Psalm lxxxiv. 7*f*., where מעד follows, as here). Is. v. 5; Psalms lxxx. 13, lxxxix. 41. Perhaps ויהרס, verses 2, 17. But Septuagint *καὶ διεπέτασεν* = ויפרש (i. 13, 17) = ויפרס (iv. 4) or even ויפרץ. Verse 9, perhaps: "He sunk (טִבַּע) her gates in the ground,—He shattered her bars; He made her king and her princes wander (אִבַּד, Jer. xxiii. 1)—Among the nations without Torah" (cf. Ezek. vii. 26 f.). Verse 18: "Cry much" (רַבַּת; or bitterly, מר, Zeph. i. 14) "unto the Lord, O Virgin Daughter of Zion!" Verse 19 is metrically redundant, and the last clauses do not agree with what follows. "For the life of thy children" was altered from "for what He hath done to thee" (על שעולל לך); and then the rest was added. The uniform gloom of this, the most dirge-like of all the pieces, is unrelieved by a single ray of hope, even the hope of vengeance; cf. chapters i. iii. iv. *ad fin.*

Chapter iii.—Here the nation is personified as a man (cf. Hos. xi. 1), who laments his own calamities. In view of i. 12-22, ii. 20-22, this is hardly a serious deviation from the strict form of elegy (*Klagelied*). Budde makes much of "the close external connexion with ch. ii." The truth is that the break is as great as between any two of these poems. Chapter ii. ends with a mother's lament over her slaughtered children; chapter iii. makes an entirely new beginning, with its abruptly independent "I am the Man!" The suppression of the Divine Name is intentional. Israel durst not breathe it, until compelled by the climax, verse 18: cf. Am. vi. 10. Contrast its frequency afterwards, when ground of hope is found in the Divine pity and purpose (verses 22-40), and when the contrite nation turns to its God in prayer (verses 55-66). The spiritual aspect of things is now the main topic. The poet deals less with incident, and more with the moral significance of the nation's sufferings. It is the religious culmination of the book. His poem is rather lyrical than narrative, which may account for some obscurities in the connexion of thought; but his alphabetic scheme proves that he *designed* twenty-two stanzas, not sixty-six detached couplets. There is something arresting in that bold "I am the Man"; and the lyrical intensity, the religious depth and beauty of the whole, may well blind us to occasional ruggedness of metre and language, abrupt transitions from figure to figure and other alleged blemishes, some of which may not have seemed such to the poet's contemporaries (*e.g.* the repetition of the acrostic word, far more frequent in Psalm cxix.); and some disappear on revision of the text.

Verse 5, perhaps: "He swallowed me up" (Jer. li. 34) "and begirt my head" (Septuagint) "with gloom" (אפלה Is. lviii. 10, cf. verse 6, yet cf. also תלאה, Neh. ix. 32). Verse 14: "all my people," rather *all peoples* (Heb. MSS. and Syr.). Verse 16*b*, rd. הפלישני, "He made me bore" (*i.e.* grovel) "in the ashes:" cf. Jer. vi. 26; Ezek. xxvii. 30. Verse 17*a* should be: ויזנח לעולם נפשי "And He cast off my soul for ever:" see verse 31; Psalm lxxxviii. 15. Verse 26: "It is good *to wait*" (לחתיל) "*in silence*" (דומם Is. xlvii. 5); or "It is good *that he wait and be silent*" (כי יֹחִיל וְדָמַם; cf. verse 27). Verse 31, add נפשו, "his soul." The verse is a reply to 17*a*. Verses 34-36 render: "To crush under His feet . . . Adonai *purposed* not" (Gen. xx. 10; Psalm lxvi. 18). Verse 39, חי (Gen. v. 5; or חיה Neh. ix. 29) is the necessary second verb: "Why doth a mortal complain?" (or "What . . . lament? "). "Doth a man live by his sins? ": Man "lives by" righteousness (Ezek. xxxiii. 19). For the wording, cf. Psalm lxxxix. 49. Verse 43*a*: "Thou didst encompass with" (rg. סבותה; Hos. xii. 1) "anger and pursue us." Syntax as verse 66*a*. Verse 49, rd. תפוגה (cf. ii. 18 also). Verse 51: "Mine eye did hurt to herself" (לנפשה), "By weeping over my people:" Verse 48: ch. i. 16; Jer. xxxi. 15. Verse 52: "They quelled my life in the pit" (Sheol; Psalms xxx. 4, lxxxviii. 4, 7; verse 55); "They *brought me down to Abaddon*" (הרידוני אבדון; cf. Psalm lxxxviii. 12). Verse 58: "O plead, Lord, the cause of my soul! O redeem my life!"; cf. Psalm cxix. 154. If the prayer for vengeance begins here, Budde's "deep division in the middle of an acrostic letter-group" vanishes. Verse 59, rd. עותי, "my perverting;" inf. pi. c. suff. obj.; cf. verse 36. Verse 61*b* repeated by mistake from 60*b*. Perhaps: "Wherewith they dogged my steps:" שחרפו עקבתי: Psalm lxxxix. 51 f. Verse 63, rd. קומם, as usual, and נגינתם, as in verse 14 and Job xxx. 9. Verse 65: "Thou wilt give them madness" (cf. Arab. *gunûn*; *magnûn*, mad) "of heart; Thou wilt curse and consume them!" (תאר תכלם).

Chapter iv. "Ah, how doth gold grow dim,—
The finest ore change hue!"

The poet shows how famine and the sword desolated Zion (verses 1-10). All was Yahweh's work; a wonder to the heathen world, but accounted for by the crimes of prophets and priests (Jer. xxiii. 11, 14, xxvi. 8, 20 ff., xxix. 21-23), who, like Cain, became homeless wanderers and outcasts (verses 11-16). Vainly did the besieged watch for succours from Egypt (Jer. xxxvii. 5 ff.); and even the last forlorn hope, the flight of "Yahweh's Anointed," King Zedekiah, was doomed to fail (verses 17-20; Jer. xxxix. 4 ff). Edom rejoiced in her ruin (Ezek. xxv. 12; xxxv. 15; Obad.; Psalm cxxxvii. 7); but Zion's sin is now atoned for (cf. Is. xl. 2), and she may look forward to the judgment of her foe (verses 21-22).

Verse 6*d*, perhaps: "And their ruin tarried not" (ולא יָחֵל פירם); cf. Pro. xxiv. 22. Verse 7*d*: "Their body" (rd. גויתם) "was a sapphire:" see Ct. v. 14; Dn. x. 6. Verse 9: "Happier were the slain of the sword Than the slain of famine! For they" (Septuagint om.), "they passed away" (הלכו Septuagint; Psalm xxxix. 14) "with a stab" (Ju. ix. 54; Is. xiii. 15; Jer. li. 4). "Suddenly, in the field" (פתאם בש'; Jer. xiv. 18). Verse 13, add היא after נביאיה; cf. Ju. xiv. 4; Jer. xxii. 16. Verse 17*c*.: "While we watched" (Septuagint). "continually:" בצפותנו צפו. Verse 18: "Our steps were curbed" (צרו MSS.; see Pro. iv. 12; Job xviii. 7) "from walking In our open places" (before the city gates: Neh. viii. 1, 3); "The completion of our days drew nigh" (קרב יום מלאות ימינו; cf. Lev. viii. 33; Job xx. 22), "For our end was come" (Ezek. vii. 2, 6, &c.). Verse 21, Septuagint om. Uz (dittogr. ?); "Settler in the Land!" (*i.e.* of Judah; cf. Ezek. xxxv. 10, xxxvi. 5. Perhaps יורשתי הא' "Seizer of the Land").

Chapter v.—A sorrowful supplication, in which the speakers deplore, not the fall of Jerusalem, but their own state of galling dependence and hopeless poverty. They are still suffering for the sins of their fathers, who perished in the catastrophe (verse 7). They are at the mercy of "servants" (verse 8; cf. 2 Kings xxv. 24; Neh. v. 15: "Yea, even their 'boys' lorded it over the people"), under a tyranny of pashas of the worst type (verses 11 f.). The soil is owned by aliens; and the Jews have to buy their water and firewood (verses 2, 4; cf. Neh. ix. 36 f.). While busy harvesting, they are exposed to the raids of the Bedouins (verse 9). Jackals prowl among the ruins of Zion (verse 18; cf. Neh. iv. 3). And this condition of things has already lasted a very long time (verse 20).

Verses 5 f. transpose and read: "To adversaries" (לצרים) "we submitted, Saying" (לאמור), "'We shall be satisfied with bread'" (cf. Jer. xlii. 14); "The yoke of our neck they made heavy" (Neh. v. 15: הכבידו על העם); "We toil, and no rest is allowed us." Verse 13: "Nobles endured to grind, And princes staggered under logs" (חורים for בחורים, which belongs to verse 14; שרים for נערים. Eccl. x. 7; Is. xxxiv. 12; Neh. iv. 14;

v. 7; vi. 17). Verse 19, "But Thou . . ." Psalm cii. 13 (ו fell out after preceding ו, verse 18). Verse 22, omit אם; dittogr. of following מא.

Authorship and date.—The tradition of Jeremiah's authorship cannot be traced higher than the Septuagint version. The prefatory note there may come from a Hebrew MS., but perhaps refers to chapter i. only ("Jeremiah sang *this dirge*"). The idea that Lamentations was originally appended to Jeremiah in the Hebrew Canon, as it is in the old versions, and was afterwards separated from it and added to the other Megilloth for the liturgical convenience of the Synagogue, rests on the fact that Josephus (Ap. i. 1, 8) and, following him, Jerome and Origen reckon 22 books, taking Ruth with Judges and Lamentations with Jeremiah; whereas the ordinary Jewish reckoning gives 24 books, as in our Hebrew Bibles. There is no evidence that this artificial reckoning according to the number of letters in the Hebrew alphabet was ever much more than a fanciful suggestion. Even in the Septuagint the existing order may not be original. It appears likely that Lamentations was not translated by the same hand as Jeremiah (Nöldeke) Unlike the latter, the Septuagint Lamentations sticks closely to the Massoretic text. The two books can hardly have been united from the first. On the strength of 2 Chron. xxxv. 25, some ancient writers (*e.g.* Jerome *ad* Zech. xii. 11) held that Jeremiah composed Lamentations. When, however, Josephus (Ant. x. 5, 1) states that Jeremiah wrote an elegy on Josiah still extant in his day, he may be merely quoting a little too much of Chron. *loc. cit.*; and it is obvious that he need not mean our book (see Whiston's note). It is urged, indeed, that the author of Chronicles could not have imagined a prophet to have sympathized with such a king as Zedekiah so warmly as is implied by Lamentations iv. 20; and, therefore, he must have connected the passage with Josiah, the last of the good kings. However that may have been, the Chronicler neither says that Jeremiah wrote *all* the elegies comprised in *The Qinoth*, nor does he imply that the entire collection consisted of only five pieces. Rather, the contrary; for he implies that *The Qinoth* contained not only Jeremiah's single dirge on Josiah, but also the elegies of "all the singing men and singing women," from the time of Josiah's death (608) down to his own day (3rd century). The untimely fate of Josiah became a stock allusion in dirges. It is not meant that for three centuries the dirge-writers had nothing else to sing of; much less, that they sang of the fall of Jerusalem (presupposed by our book) before its occurrence. Upon the whole, it does not seem probable, either that the Chronicler mistook Lamentations iv. for Jeremiah's dirge on Josiah, or that the book he calls *The Qinoth* was identical with our Qinoth. Later writers misunderstood him, because—on the ground of certain obtrusive similarities between Jeremiah and Lamentations (see Driver, L.O.T. p. 433 f.), and the supposed reference in Lamentations iii. 53 ff. to Jeremiah xxxviii. 6 ff., as well as the fact that Jeremiah was the one well-known inspired writer who had lived through the siege of Jerusalem—they naturally enough ascribed this little book to the prophet. It is certainly true that the same emotional temperament, dissolving in tears at the spectacle of the country's woes, and expressing itself to a great extent in the same or similar language, is noticeable in the author(s) of Lamentations i.-iv. and in Jeremiah. And both refer these woes to the same cause, viz. the sins of the nation, and particularly of its prophets and priests.

This, however, is not enough to prove identity of authorship; and the following considerations militate strongly against the tradition. (i.) The language and style of Lamentations are in general very unlike those of Jeremiah (see the details in Nägelsbach and Löhr); whatever allowance may be made for conventional differences in the phraseology of elegiac poetry and prophetic prose, even of a more or less lyrical cast. (ii.) Lamentations i.-iv. show a knowledge of Ezekiel (cf. Lamentations ii. 4*c*; Ez. xx. 8, 21; Lam. ii. 14; Ez. xii. 24; xiii. 10, 14; Lam. ii. 15; Ez. xxvii. 3; xxviii. 12; Lam. iv. 20; Ez. xix. 4, 8) and of Is. xl.-lxvi. (Lam. i. 10, מחמדים; Is. lxiv. 10; Lam. i. 15; Is. lxiii. 2; Lam. ii. 1; Is. lxvi. 1; Lam. ii. 2*c*; Is. xliii. 28; Lam. ii. 13 *the 3 verbs*; Is. xl. 18, 25; Lam. ii. 15*c*; Is. lx. 15*b*; Lam. iii. 26 דומם; Is. xlvii. 5; Lam. iii. 30; Is. i. 6; Lam. iv. 14; Is. lix. 3, 10; Lam. iv. 15; Is. lii. 11; Lam. iv. 17*c*; Is. xlv. 20; Lam. iv. 22; Is. xl. 2). Jeremiah does not quote Ezekiel; and he could hardly have quoted writings of the age of Cyrus. (iii.) The coincidences of language between Lamentations and certain late Psalms, such as Psalms lxix., lxxiv., lxxx., lxxxviii., lxxxix., cxix., are numerous and significant, at least as a general indication of date. (iv.) The point of view of Lamentations sometimes differs from that of the prophet. This need not be the case in i. 21 f. where the context shows that the "enemies" are not the Chaldeans, but Judah's ill neighbours, Edom, Ammon, Moab and the rest (cf. iv. 21 f.; iii. 59-66 may refer to the same foes). Ch. ii. 9*c* may refer to popular prophecy ("*her* prophets"; cf. verse 14), which would naturally be silenced by the overwhelming falsification of its comfortable predictions (iv. 14 ff.; cf. Jer. xiv. 13; Ezek. vii. 26 f.; Psalm lxxiv. 9). But though Jeremiah was by no means disloyal (Jer. xxxiv. 4 f.), he would hardly have spoken of Zedekiah in the terms of Lam. iv. 20; and the prophet never looked to Egypt for help, as the poet of iv. 17 appears to have done. It must be admitted that Lamentations exhibits, upon the whole, "a poet (more) in sympathy with the old life of the nation, whose attitude towards the temple and the king is far more popular than Jeremiah's" (W. Robertson Smith); cf. i. 4, 10, 19, ii. 6, 7, 20*c*. (v.) While we find in Lamentations some things that we should not have expected from Jeremiah, we miss other things characteristic of the prophet. There is no trace of his confident faith in the restoration of both Israel and Judah (Jer. iii. 14-18, xxiii. 3-8, xxx.-xxxiii.), nor of his unique doctrine of the New Covenant (Jer. xxxi. 31-34), as a ground of hope and consolation for Zion. The only hope expressed in Lamentations i. is the hope of Divine vengeance on Judah's malicious rivals (i. 21 f.); and even this is wanting from ch. ii. Chapter iii. finds comfort in the thought of Yahweh's unfailing mercy; but ends with a louder cry for vengeance. Chapter iv. suggests neither hope nor consolation, until the end, where we have an assurance that Zion's punishment is complete, and she will not again be exiled (iv. 21 f.). The last word is woe for Edom. In chapter v. we have a prayer for restoration: "Make us return, O Yahweh, and we shall return!" (*i.e.* to our pristine state). Had Jeremiah been the author, we should have expected something more positive and definitely prophetic in tone and spirit. (The author of chapter iii. seems to have felt this. It was apparently written in view of chapter ii. as a kind of religious counterpoise to its burden of despair, which it first takes up, verses 1-20. and then dissipates, verses 21 ff.). (vi.) It seems almost superfluous to add that, in the brief and troubled story of the prophet's life after the fall of the city Jer. xxxix.-xliv.), it is difficult to specify an occasion when he may be supposed to have enjoyed the necessary leisure and quiet for the composition of these elaborate and carefully constructed pieces, in a style so remote from his ordinary freedom and spontaneity of utterance. And if at the very end of his stormy career he really found time and inclination to write anything of this nature, we may wonder why it was not included in the considerable and somewhat miscellaneous volume of his works, or at least mentioned in the chapters which relate to his public activity after the catastrophe.

Budde's date, 550 B.C., might not be too early for chapter v., if it stood alone. But it was evidently written as the close of the book, and perhaps to complete the number of five divisions, after the model of the Pentateuch; which would bring it below the date of Ezra (457 B.C.). And this date is supported by internal indications. The Divine forgetfulness has already lasted a very long time since the catastrophe ("for ever," verse 20); which seems to imply the lapse of much more than thirty-six years (cf. Zech. i. 12). The hill of Zion is still a deserted site haunted by jackals, as it was when Nehemiah arrived, 445 B.C. (Neh. i. 3, ii. 3, 13, 17, iv. 3). And the conditions, political and economic, seem to agree with what is told us by Nehemiah of the state of things which he found, and which prevailed before his coming: cf. esp. Neh. v. 2-5 with Lamentations

v. 2, 10, and Neh. v. 15 with Lamentations v. 5, 8. There is nothing in chapter i. which Nehemiah himself might not have written, had he been a poet (cf. Neh. i. 4). The narrative of Neh. xiii. throws light on verse 10; and there are many coincidences of language, *e.g.* "The Province" (of Judea), Neh. i. 3, cf. verse 1; "adversaries" (צרים), of Judah's hostile neighbours, verse 7, Neh. iv. 11; "made my strength stumble," verse 14, cf. Neh. iv. 4 (Heb.); the prayers, verses 21 f., Neh. iv. 4 f. (Heb. iii. 36 f.), are similar. The memory of what is told in Neh. iv. 5 (11), Ezra iv. 23 f., v. 5, may perhaps have suggested the peculiar term משבת, *stoppage*, *arrest*, verse 7. With verse 3 "Judah migrated from oppression; From greatness of servitude; She settled among the nations, Without finding a resting-place," cf. Neh. v. 18 end, Jer. xl. 11 f. The "remnant of the captivity" (Neh. i. 2 f.) became much attenuated (cf. verse 4), because all who could escape from the galling tyranny of the foreigner left the country (cf. verse 6). Verses 11, 19 (dearth of food), 20 (danger in the field, starvation in the house) agree curiously with Neh. v. 6, 9 f.

Chapters ii. and iv. can hardly be dated earlier than the beginning of the Persian period. They might then have been written by one who, as a young man of sixteen or twenty, had witnessed the terrible scenes of fifty years before. If, however, as is generally recognized, these poems are not the spontaneous and unstudied outpourings of passionate grief, but compositions of calculated art and studied effects, written for a purpose, it is obvious that they need not be contemporary. A poet of a later generation might have sung of the great drama in this fashion. The chief incidents and episodes would be deeply graven in the popular memory; and it is the poet's function to make the past live again. There is much metaphor (i. 13-15, ii. 1-4, iii. 1-18, iv. 1 ff.), and little detail beyond the horrors usual in long sieges (see Deut. xxviii. 52 ff.; 2 Kings vi. 28 f.) Acquaintance with the existing literature and the popular reminiscences of the last days of Jerusalem would supply an ample foundation for all that we find in these poems.

LITERATURE.—The older literature is fully given by Nägelsbach in Lange's *Bibelwerk A.T.* xv. (1868, Eng. trans., 1871, p. 17). Among commentaries may be noticed those of Kalkar (in Latin) (1836); O. Thenius in *Kurzgefasstes Exeg. Handbuch* (1855), who ascribes chapters ii. and iv. to Jeremiah (comp. K. Budde in *Z.A.T.W.*, 1882, p. 45); Vaihinger (1857); Neumann (1858); H. Ewald in his *Dichter*, vol. i. pt. ii. (2nd ed., 1866); Engelhardt (1867); Nägelsbach, *op. cit.* (1868); E. Gerlach, *Die Klagelied. Jer.* (1868); A. Kamphausen in Bunsen's *Bibelwerk* iii. (1868); C. F. Keil (1872) (Eng. trans., 1874); Payne Smith in *The Speaker's Commentary*; Reuss, *La Bible: poésie lyrique* (1879); T. K. Cheyne, at end of "Jeremiah," *Pulpit Commentary* (1883–1885); E. H. Plumptre, in Ellicott's *O.T. for English Readers* (1884); S. Oettli in Strack-Zöckler's *Kurzgef. Komm. A.T.* vii. (1889); M. Löhr (1891) and again *Handkommentar zum A.T.* (1893); F. Baethgen *ap.* Kautzsch, *Die Heilige Schrift d. A.T.* (1894); W. F. Adeney, *Expositor's Bible* (1895); S. Minocchi, *Le Lamentazioni di Geremia* (Rome, 1897); and K. Budde, "Fünf Megillot," in *Kurzer Hd.-Comm. zum A.T.* (1898).

For textual and literary criticism see also Houbigant, *Notae Criticae*, ii. 477-483 (1777); E. H. Rodhe, *Num Jeremias Threnos scripserit quaestiones* (Lundae, 1871); F. Montet, *Étude sur le livre des Lamentations* (Geneva, 1875); G. Bickell, *Carmina V. T. metrice*, 112-120 (1882), and *Wiener Zeitschrift für Kunde des Morgenlandes*, viii. 101 ff. (1894) (cf. also his *Dichtungen der Hebräer*, i. 87-108, 1882); Merkel, *Über das A.T. Buch der Klagelieder* (Halle, 1889); J. Dyserinck, *Theologisch Tijdschrift*, xxvi. 359 ff. (1892); S. A. Fries, "Parallele zwischen Thr. iv., v. und der Makkabäerzeit," *Z.A.T.W.*, xiii. 110 ff. (1893) (chaps. iv. v. Maccabean; i.-iii. Jeremiah's); and on the other side Löhr, *Z.A.T.W.* xiv. 51 ff. (1894); *id. ib.*, p. 31 ff., *Der Sprachgebrauch des Buches der Klagelieder*; and Löhr, "Threni iii. und die jeremianische Autorschaft des Buches der Klagelieder," *Z.A.T.W.*, xxiv. 1 ff. (1904).

On the prosody, see (besides the works of Bickell and Dyserinck) K. Budde, "Das hebräische Klagelied," *Z.A.T.W.*, ii. 1 ff. (1882), iii. 299 ff. (1883), xi. 234 ff. (1891), xii. 31 ff. 261 ff. (1892); *Preussische Jahrbücher*, lxxiii. 461 ff. (1893); and C. J. Ball, "The Metrical Structure of Qinoth," *P.S.B.A.* (March 1887). (The writer was then unacquainted with Budde's previous labours.)

The following may also be consulted, Nöldeke, *Die A.T. Literatur*, pp. 142-148 (1868); Seinecke, *Gesch. des Volkes Israel*, ii. 29 ff. (1884); Stade, *Gesch.* p. 701, n. 1 (1887); Smend in *Z.A.T.W.* (1888), p. 62 f.; Steinthal, "Die Klagelieder Jer." in *Bibel und Rel.-philosophie*, 16-33 (1890); Driver, *L.O.T.* (1891), p. 428, "The Lamentations"; and Cheyne's article "Lamentations (Book)," in *Enc. Bibl.* iii. (C. J. B.*)

LAMETH, ALEXANDRE THÉODORE VICTOR, COMTE DE (1760–1829), French soldier and politician, was born in Paris on the 20th of October 1760. He served in the American War of Independence under Rochambeau, and in 1789 was sent as deputy to the States General by the nobles of the *bailliage* of Péronne. In the Constituent Assembly he formed with Barnave and Adrien Duport a sort of association called the "Triumvirate," which controlled a group of about forty deputies forming the advanced left of the Assembly. He presented a famous report in the Constituent Assembly on the organization of the army, but is better known by his eloquent speech on the 28th of February 1791, at the Jacobin Club, against Mirabeau, whose relations with the court were beginning to be suspected, and who was a personal enemy of Lameth. However, after the flight of the king to Varennes, Lameth became reconciled with the court. He served in the army as *maréchal-de-camp* under Luckner and Lafayette, but was accused of treason on the 15th of August 1792, fled the country, and was imprisoned by the Austrians. After his release he engaged in commerce at Hamburg with his brother Charles and the duc d'Aiguillon, and did not return to France until the Consulate. Under the Empire he was made prefect successively in several departments, and in 1810 was created a baron. In 1814 he attached himself to the Bourbons, and under the Restoration was appointed prefect of Somme, deputy for Seine-Inférieure and finally deputy for Seine-et-Oise, in which capacity he was a leader of the Liberal opposition. He died in Paris on the 18th of March 1829. He was the author of an important *History of the Constituent Assembly* (Paris, 2 vols., 1828–1829).

Of his two brothers, THÉODORE LAMETH (1756–1854) served in the American war, sat in the Legislative Assembly as deputy from the department of Jura, and became *maréchal-de-camp*; and CHARLES MALO FRANÇOIS LAMETH (1757–1832), who also served in America, was deputy to the States General of 1789, but emigrated early in the Revolution, returned to France under the Consulate, and was appointed governor of Würzburg under the Empire. Like Alexandre, Charles joined the Bourbons, succeeding Alexandre as deputy in 1829.

See F. A. Aulard, *Les Orateurs de l'Assemblée Constituante* (Paris, 1905); also M. Tourneux, *Bibliog. de l'histoire de Paris* (vol. iv., 1906, *s.v.* "Lameth").

LAMETTRIE, JULIEN OFFRAY DE (1709–1751), French physician and philosopher, the earliest of the materialistic writers of the Illumination, was born at St Malo on the 25th of December 1709. After studying theology in the Jansenist schools for some years, he suddenly decided to adopt the profession of medicine. In 1733 he went to Leiden to study under Boerhaave, and in 1742 returned to Paris, where he obtained the appointment of surgeon to the guards. During an attack of fever he made observations on himself with reference to the action of quickened circulation upon thought, which led him to the conclusion that psychical phenomena were to be accounted for as the effects of organic changes in the brain and nervous system. This conclusion he worked out in his earliest philosophical work, the *Histoire naturelle de l'âme*, which appeared about 1745. So great was the outcry caused by its publication that Lamettrie was forced to take refuge in Leiden, where he developed his doctrines still more boldly and completely, and with great originality, in *L'Homme machine* (Eng. trans., London, 1750; ed. with introd. and notes, J. Assézat, 1865), and *L'Homme plante*, treatises based upon principles of the most consistently materialistic character. The ethics of these principles were worked out in *Discours sur le bonheur*, *La Volupté*, and *L'Art de jouir*, in which the end of life is found in the pleasures of the senses, and virtue is reduced to self-love. Atheism is the only means of ensuring the happiness of the world, which has been rendered impossible by the wars brought about by theologians. The soul is only the thinking part of the body, and with the body it passes away. When death comes, the farce is over (*la farce est jouée*), therefore let us take our pleasure while we can. Lamettrie has been called "the Aristippus of modern materialism." So strong was the feeling against him that in 1748 he was compelled to quit Holland for Berlin, where Frederick the Great not only allowed him to practise as a physician, but appointed him court reader. He died on the 11th of November 1751. His collected *Œuvres philosophiques* appeared after his death in several editions, published in London, Berlin and Amsterdam respectively.

The chief authority for his life is the *Éloge* written by Frederick the Great (printed in Assézat's ed. of *Homme machine*). In modern times Lamettrie has been judged less severely; see F. A. Lange, *Geschichte des Materialismus* (Eng. trans. by E. C. Thomas, ii. 1880); Nérée Quépat (*i.e.* René Paquet), *La Mettrie, sa vie et ses œuvres* (1873, with complete history of his works); J. E. Poritzky, *J. O. de Lamettrie, Sein Leben und seine Werke* (1900); F. Picavet, "La Mettrie et la critique allemande," in *Compte rendu des séances de l'Acad. des Sciences morales et politiques*, xxxii. (1889), a reply to German rehabilitations of Lamettrie.

LAMIA, in Greek mythology, queen of Libya. She was beloved by Zeus, and when Hera robbed her of her children out of jealousy, she killed every child she could get into her power (Diod. Sic. xx. 41; Schol. Aristophanes, *Pax*, 757). Hence Lamia came to mean a female bogey or demon, whose name was used by Greek mothers to frighten their children; from the Greek she passed into Roman demonology. She was represented with a woman's face and a serpent's tail. She was also known as a sort of fiend, the prototype of the modern vampire, who in the form of a beautiful woman enticed young men to her embraces, in order that she might feed on their life and heart's blood. In this form she appears in Goethe's *Die Braut von Corinth*, and Keats's *Lamia*. The name Lamia is clearly the feminine form of Lamus, king of the Laestrygones (*q.v.*). At some early period, or in some districts, Lamus and Lamia (both, according to some accounts, children of Poseidon) were worshipped as gods; but the names did not attain general currency. Their history is remarkably like that of the malignant class of demons in Germanic and Celtic folk-lore. Both names occur in the geographical nomenclature of Greece and Asia Minor; and it is probable that the deities belong to that religion which spread from Asia Minor over Thrace into Greece.

LAMMAS (O. Eng. *hlammaesse*, *hlafmaesse*, from *hlaf*, loaf, and *maesse*, mass, "loaf-mass"), originally in England the festival of the wheat harvest celebrated on the 1st of August, O.S. It was one of the old quarter-days, being equivalent to midsummer, the others being Martinmas, equivalent to Michaelmas, Candlemas (Christmas) and Whitsuntide (Easter). Some rents are still payable in England at Lammastide, and in Scotland it is generally observed, but on the 12th of August, since the alteration of the calendar in George II.'s reign. Its name was in allusion to the custom that each worshipper should present in the church a loaf made of the new wheat as an offering of the first-fruits.

A relic of the old "open-field" system of agriculture survives in the so-called "Lammas Lands." These were lands enclosed and held in severalty during the growing of corn and grass and thrown open to pasturage during the rest of the year for those who had common rights. These commoners might be the several owners, the inhabitants of a parish, freemen of a borough, tenants of a manor, &c. The opening of the fields by throwing down the fences took place on Lammas Day (12th of August) for corn-lands and on Old Midsummer Day (6th of July) for grass. They remained open until the following Lady Day. Thus, in law, "lammas lands" belong to the several owners in fee-simple subject for half the year to the rights of pasturage of other people (*Baylis* v. *Tyssen-Amherst*, 1877, 6 Ch. D., 50).

See further F. Seebohm, *The English Village Community*; C. I. Elton, *Commons and Waste Lands*; P. Vinogradoff, *Villainage in England*.

LÄMMERGEYER (Ger. *Lämmergeier*, *Lamm*, lamb, and *Geier*, vulture), or bearded vulture, the *Falco barbatus* of Linnaeus and the *Gypaetus barbatus* of modern ornithologists, one of the grandest birds-of-prey of the Palaearctic region—inhabiting lofty mountain chains from Portugal to the borders of China, though within historic times it has been exterminated in several of its ancient haunts. Its northern range in Europe does not seem to have extended farther than the southern frontier of Bavaria, or the neighbourhood of Salzburg;[1] but in Asia it formerly reached a higher latitude, having been found even so lately as 1830 in the Amur region where, according to G. F. Radde (*Beitr. Kenntn. Russ. Reichs*, xxiii. p. 467), it has now left but its name. It is not uncommon on many parts of the Himalayas, where it breeds; and on the mountains of Kumaon and the Punjab, and is the "golden eagle" of most Anglo-Indians. It is found also in Persia, Palestine, Crete and Greece, the Italian Alps, Sicily, Sardinia and Mauritania.

In some external characters the lämmergeyer is intermediate between the families *Vulturidae* and *Falconidae*, and the opinion of systematists has from time to time varied as to its proper position. It is now generally agreed, however, that it is more closely allied with the eagles than with the vultures, and the sub-family *Gypaëtinae* of the *Falconidae* has been formed to contain it.

The whole length of the bird is from 43 to 46 in., of which, however, about 20 are due to the long cuneiform tail, while the pointed wings measure more than 30 in. from the carpal joint to the tip. The top of the head is white, bounded by black, which, beginning in stiff bristly feathers turned forwards over the base of the beak, proceeds on either side of the face in a well-defined band to the eye, where it bifurcates into two narrow stripes, of which the upper one passes above and beyond that feature till just in front of the scalp it suddenly turns upwards across the head and meets the corresponding stripe from the opposite side, enclosing the white forehead already mentioned, while the lower stripe extends beneath the eye about as far backwards and then suddenly stops. A tuft of black, bristly feathers projects beardlike from the base of the mandible, and gives the bird one of its commonest epithets in many languages. The rest of the head, the neck, throat and lower parts generally are clothed with lanceolate feathers of a pale tawny colour—sometimes so pale as to be nearly white beneath; while the scapulars, back and wing-coverts generally, are of a glossy greyish-black, most of the feathers having a white shaft and a median tawny line. The quill-feathers, both of the wings and tail, are of a dark blackish-grey. The irides are of a light orange, and the sclerotic tunics—equivalent to the "white of the eye" in most animals—which in few birds are visible, are in this very conspicuous and of a bright scarlet, giving it an air of great ferocity. In the young of the year the whole head, neck and throat are clothed in dull black, and most of the feathers of the mantle and wing-coverts are broadly tipped and mesially streaked with tawny or lightish-grey.

The lämmergeyer breeds early in the year. The nest is of large size, built of sticks, lined with soft material and placed on a ledge of rock—a spot being chosen, and often occupied for many years, which is nearly always difficult of access. Here in the month of February a single egg is usually laid. This is more than 3 in. in length by nearly 2½ in breadth, of a pale but lively brownish-orange. The young when in the nest are clad in down of a dirty white, varied with grey on the head and neck, and with ochraceous in the iliac region.

There is much discrepancy as to the ordinary food of the lämmergeyer, some observers maintaining that it lives almost entirely on carrion, offal and even ordure; but there is no question of its frequently taking living prey, and it is reasonable to suppose that this bird, like so many others, is not everywhere uniform in its habits. Its name shows it to be the reputed enemy of shepherds, and it is in some measure owing to their hostility that it has been exterminated in so many parts of its European range. But the lämmergeyer has also a great partiality for bones, which when small enough it swallows. When they are too large, it is said to soar with them to a great height and drop them on a rock or stone that they may be broken into pieces of convenient size. Hence its name ossifrage,[2] by which the

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[1] See a paper by Dr Girtanner on this bird in Switzerland (*Verhandl. St-Gall. naturw. Gesellschaft*, 1869–1870, pp. 147–244).

[2] Among other crimes attributed to the species is that, according to Pliny (*Hist. Nat.* x. cap. 3), of having caused the death of the poet Aeschylus, by dropping a tortoise on his bald head! In the

Hebrew *Peres* is rightly translated in the Authorized Version of the Bible (Lev. xi. 13; Deut. xiv. 12)—a word corrupted into osprey, and applied to a bird which has no habit of the kind.

The lämmergeyer of north-eastern and south Africa is specifically distinct, and is known as *Gypaetus meridionalis* or *G. nudipes*. In habits it resembles the northern bird, from which it differs in little more than wanting the black stripe below the eye and having the lower part of the tarsus bare of feathers. It is the "golden eagle" of Bruce's *Travels*, and has been beautifully figured by Joseph Wolf in E. Rüppell's *Syst. Übers. der Vögel Nord-Ost-Afrika's* (Taf. 1). (A. N.)

LAMOIGNON, a French family, which takes its name from Lamoignon, a place said to have been in its possession since the 13th century. One of its several branches is that of Lamoignon de Malesherbes. Several of the Lamoignons have played important parts in the history of France and the family has been specially distinguished in the legal profession. GUILLAUME DE LAMOIGNON (1617–1677), attained eminence as a lawyer and became president of the parlement of Paris in 1658. First on the popular, and later on the royalist side during the Fronde, he presided at the earlier sittings of the trial of Fouquet, whom he regarded as innocent, and he was associated with Colbert, whom he was able more than once to thwart. Lamoignon tried to simplify the laws of France and sought the society of men of letters like Boileau and Racine. Having received rich rewards for his public services, he died in Paris on the 10th of December 1677. Guillaume's second son, NICOLAS DE LAMOIGNON (1648–1724), took the surname of Basville. Following his hereditary calling he filled many public offices, serving as intendant of Montauban, of Pau, of Poitiers and of Languedoc before his retirement in 1718. His administration of Languedoc was chiefly remarkable for vigorous measures against the Camisards and other Protestants, but in other directions his work in the south of France was more beneficent, as, following the example of Colbert, he encouraged agriculture and industry generally and did something towards improving the means of communication. He wrote a *Mémoire*, which contains much interesting information about his public work. This was published at Amsterdam in 1724. Lamoignon, who is called by Saint Simon, "the king and tyrant of Languedoc," died in Paris on the 17th of May 1724. CHRÉTIEN FRANÇOIS DE LAMOIGNON (1735–1789) entered public life at an early age and was an actor in the troubles which heralded the Revolution. First on the side of the parlement and later on that of the king he was one of the assistants of Loménie de Brienne, whose unpopularity and fall he shared. He committed suicide on the 15th of May 1789.

LAMONT, JOHANN VON (1805–1879), Scottish-German astronomer and magnetician, was born at Braemar, Aberdeenshire, on the 13th of December 1805. He was sent at the age of twelve to be educated at the Scottish monastery in Regensburg, and apparently never afterwards returned to his native country. His strong bent for scientific studies was recognized by the head of the monastery, P. Deasson, on whose recommendation he was admitted in 1827 to the then new observatory of Bogenhausen (near Munich), where he worked under J. Soldner. After the death of his chief in 1835 he was, on H. C. Schumacher's recommendation, appointed to succeed him as director of the observatory. In 1852 he became professor of astronomy at the university of Munich, and held both these posts till his death, which took place on the 6th of August 1879. Lamont was a member of the academies of Brussels, Upsala and Prague, of the Royal Society of Edinburgh, of the Cambridge Philosophical Society and of many other learned corporations. Among his contributions to astronomy may be noted his eleven zone-catalogues of 34,674 stars, his measurements, in 1836–1837, of nebulae and clusters, and his determination of the mass of Uranus from observations of its satellites (*Mem. Astron. Soc.* xi. 51, 1838). A magnetic observatory was equipped at Bogenhausen in 1840 through his initiative; he executed comprehensive magnetic surveys 1849–1858; announced the magnetic decennial period in 1850, and his discovery of earth-currents in 1862. His *Handbuch des Erdmagnetismus* (Berlin, 1849) is a standard work on the subject.

See *Allgemeine Deutsche Biographie* (S. Günther); V. J. Schrift, *Astr. Gesellschaft*, xv. 60; *Monthly Notices Roy. Astr. Society*, xl. 203; *Nature*, xx. 425; *Quart. Journal Meteor. Society*, vi. 72; *Proceedings Roy. Society of Edinburgh*, x. 358; *The Times* (12 Aug., 1879); Sir F. Ronalds's *Cat. of Books relating to Electricity and Magnetism*, pp. 281-283; *Royal Society's Cat. of Scientific Papers*, vols. iii. vii.

LAMORICIÈRE, CHRISTOPHE LÉON LOUIS JUCHAULT DE (1806–1865), French general, was born at Nantes on the 11th of September 1806, and entered the Engineers in 1828. He served in the Algerian campaigns from 1830 onwards, and by 1840 he had risen to the grade of *maréchal-de-camp* (major-general). Three years later he was made a general of division. He was one of the most distinguished and efficient of Bugeaud's generals, rendered special service at Isly (August 14, 1844), acted temporarily as governor-general of Algeria, and finally effected the capture of Abd el-Kader in 1847. Lamoricière took some part in the political events of 1848, both as a member of the Chamber of Deputies and as a military commander. Under the régime of General Cavaignac he was for a time minister of war. From 1848 to 1851 Lamoricière was one of the most conspicuous opponents of the policy of Louis Napoleon, and at the *coup d'état* of the 2nd of December 1851 he was arrested and exiled. He refused to give in his allegiance to the emperor Napoleon III., and in 1860 accepted the command of the papal army, which he led in the Italian campaign of 1860. On the 18th of September of that year he was severely defeated by the Italian army at Castelfidardo. His last years were spent in complete retirement in France (he had been allowed to return in 1857), and he died at Prouzel (Somme) on the 11th of September 1865.

See E. Keller, *Le Général de Lamoricière* (Paris, 1873).

LA MOTHE LE VAYER, FRANÇOIS DE (1588–1672), French writer, was born in Paris of a noble family of Maine. His father was an *avocat* at the parlement of Paris and author of a curious treatise on the functions of ambassadors, entitled *Legatus, seu De legatorum privilegiis, officio et munere libellus* (1579) and illustrated mainly from ancient history. François succeeded his father at the parlement, but gave up his post about 1647 and devoted himself to travel and *belles lettres*. His *Considérations sur l'éloquence française* (1638) procured him admission to the Academy, and his *De l'instruction de Mgr. le Dauphin* (1640) attracted the attention of Richelieu. In 1649 Anne of Austria entrusted him with the education of her second son and subsequently with the completion of Louis XIV.'s education, which had been very much neglected. The outcome of his pedagogic labours was a series of books comprising the *Géographie*, *Rhétorique*, *Morale*, *Économique*, *Politique*, *Logique*, and *Physique du prince* (1651–1658). The king rewarded his tutor by appointing him historiographer of France and councillor of state. La Mothe Le Vayer died in Paris. Modest, sceptical, and occasionally obscene in his Latin pieces and in his verses, he made himself a *persona grata* at the French court, where libertinism in ideas and morals was hailed with relish. Besides his educational works, he wrote *Jugement sur les anciens et principaux historiens grecs et latins* (1646); a treatise entitled *Du peu de certitude qu'il y a en histoire* (1668), which in a sense marks the beginning of historical criticism in France; and sceptical *Dialogues*, published posthumously under the pseudonym of Orosius Tubero. An incomplete edition of his works was published at Dresden in 1756–1759.

See Bayle, *Dictionnaire critique*, article "Vayer"; L. Étienne, *Essai sur La Mothe Le Vayer* (Paris, 1849).

LA MOTTE, ANTOINE HOUDAR DE (1672–1731), French author, was born in Paris on the 18th of January 1672. In 1693 his comedy *Les Originaux* proved a complete failure, which so depressed the author that he contemplated joining the Trappists, but four years later he again began writing operas and ballets, *e.g. L'Europe galante* (1697), and tragedies, one of

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Atlas range the food of this bird is said to consist chiefly of the *Testudo mauritanica*, which "it carries to some height in the air, and lets fall on a stone to break the shell" (*Ibis*, 1859, p. 177). It was the ἅρπη and φήνη of Greek classical writers.

which, *Inès de Castro* (1723), was produced with immense success at the Théâtre Français. He was a champion of the moderns in the revived controversy of the ancients and moderns. Madame Dacier had published (1699) a translation of the *Iliad*, and La Motte, who knew no Greek, made a translation (1714) in verse founded on her work. The nature of his work may be judged from his own expression: "I have taken the liberty to change what I thought disagreeable in it." He defended the moderns in the *Discours sur Homère* prefixed to his translation, and in his *Réflexions sur la critique* (1716). Apart from the merits of the controversy, it was conducted on La Motte's side with a wit and politeness which compared very favourably with his opponent's methods. He was elected to the Academy in 1710, and soon after became blind. La Motte carried on a correspondence with the duchesse du Maine, and was the friend of Fontenelle. He had the same freedom from prejudice, the same inquiring mind as the latter, and it is on the excellent prose in which his views are expressed that his reputation rests. He died in Paris on the 26th of December 1731.

His *Œuvres du théâtre* (2 vols.) appeared in 1730, and his *Œuvres* (10 vols.) in 1754. See A. H. Rigault, *Histoire de la querelle des anciens et des modernes* (1859).

LAMOUREUX, CHARLES (1834–1899), French conductor and violinist, was born at Bordeaux on the 28th of September 1834. He studied at the Pau Conservatoire, was engaged as violinist at the Opéra, and in 1864 organized a series of concerts devoted to chamber music. Having journeyed to England and assisted at a Handel festival, he thought he would attempt something similar in Paris. At his own expense he founded the "Société de l'Harmonie Sacrée," and in 1873 conducted the first performance in Paris of Handel's *Messiah*. He also gave performances of Bach's *St Matthew Passion*, Handel's *Judas Maccabaeus*, Gounod's *Gallia*, and Massenet's *Eve*. In 1875 he conducted the festival given at Rouen to celebrate the centenary of Boïeldieu. The following year he became *chef d'orchestre* at the Opéra Comique. In 1881 he founded the famous concerts associated with his name, which contributed so much to popularize Wagner's music in Paris. The performances of detached pieces taken from the German master's works did not, however, satisfy him, and he matured the project to produce *Lohengrin*, which at that time had not been heard in Paris. For this purpose he took the Eden Theatre, and on the 3rd of May 1887 he conducted the first performance of Wagner's opera in the French capital. Owing to the opposition of the Chauvinists, the performance was not repeated; but it doubtless prepared the way for the production of the same masterpiece at the Paris Opéra a few years later. Lamoureux was successively second *chef d'orchestre* at the Conservatoire, first *chef d'orchestre* at the Opéra Comique, and twice first *chef d'orchestre* at the Opéra. He visited London on several occasions, and gave successful concerts at the Queen's Hall. Lamoureux died at Paris on the 21st of December 1899. *Tristan und Isolde* had been at last heard in Paris, owing to his initiative and under his direction. After conducting one of the performances of this masterpiece he was taken ill and succumbed in a few days, having had the consolation before his death of witnessing the triumph of the cause he had so courageously championed.

LAMP (from Gr. λαμπάς, a torch, λάμπειν, to shine), the general term for an apparatus in which some combustible substance, generally for illuminating purposes, is held. Lamps are usually associated with lighting, though the term is also employed in connexion with heating (*e.g.* spirit-lamp); and as now employed for oil, gas and electric light, they are dealt with in the article on LIGHTING. From the artistic point of view, in modern times, their variety precludes detailed reference here; but their archaeological history deserves a fuller account.

Ancient Lamps.—Though Athenaeus states (xv. 700) that the lamp (λύχνος) was not an ancient invention in Greece, it had come into general use there for domestic purposes by the 4th century B.C., and no doubt had long before been employed for temples or other places where a permanent light was required in room of the torch of Homeric times. Herodotus (ii. 62) sees nothing strange in the "festival of lamps," Lychnokaie, which was held at Sais in Egypt, except in the vast number of them. Each was filled with oil so as to burn the whole night. Again he speaks of evening as the time of lamps (περὶ λύχνων, vii. 215). Still, the scarcity of lamps in a style anything like that of an early period, compared with the immense number of them from the late Greek and Roman age, seems to justify the remark of Athenaeus. The commonest sort of domestic lamps were of terra-cotta and of the shape seen in figs. 1 and 2 with a spout or nozzle (μυκτήρ) in which the wick (θρυαλλίς) burned, a round hole on the top to pour in oil by, and a handle to carry the lamp with. A lamp with two or more spouts was δίμυξος, τρίμυξος, &c., but these terms would not apply strictly to the large class of lamps with numerous holes for wicks but without nozzles.

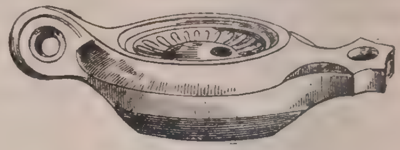

FIG. 1.

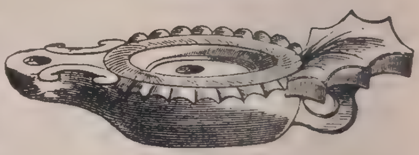

FIG. 2.

Decoration was confined to the front of the handle, or more commonly to the circular space on the top of the lamp, and it consisted almost always of a design in relief, taken from mythology or legend, from objects of daily life or scenes such as displays of gladiators or chariot races, from animals and the chase. A lamp in the British Museum has a view of the interior of a Roman circus with spectators looking on at a chariot race. In other cases the lamp is made altogether of a fantastic shape, as in the form of an animal, a bull's head, or a human foot. Naturally colour was excluded from the ornamentation except in the form of a red or black glaze, which would resist the heat. The typical form of hand lamp (figs. 1, 2) is a combination of the flatness necessary for carrying steady and remaining steady when set down, with the roundness evolved from the working in clay and characteristic of vessels in that material. In the bronze lamps this same type is retained, though the roundness was less in keeping with metal. Fanciful shapes are equally common in bronze. The standard form of handle consists of a ring for the forefinger and above it a kind of palmette for the thumb. Instead of the palmette is sometimes a crescent, no doubt in allusion to the moon. It would only be with bronze lamps that the cover protecting the flame from the wind could be used, as was the case out of doors in Athens. Such a lamp was in fact a lantern. Apparently it was to the lantern that the Greek word *lampas*, a torch, was first transferred, probably from a custom of having guards to protect the torches also. Afterwards it came to be employed for the lamp itself (λύχνος, *lucerna*). When Juvenal (*Sat.* iii. 277) speaks of the *aenea lampas*, he may mean a torch with a bronze handle, but more probably either a lamp or a lantern. Lamps used for suspension were mostly of bronze, and in such cases the decoration was on the under part, so as to be seen from below. Of this the best example is the lamp at Cortona, found there in

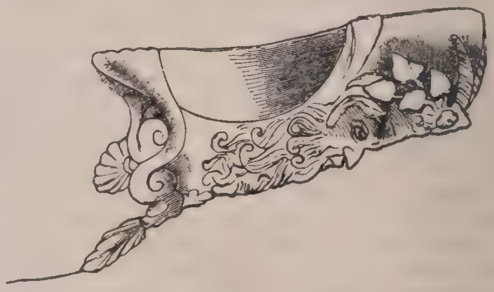

FIG. 3.

1840 (engraved, *Monumenti d. inst. arch.* iii. pls. 41, 42, and in Dennis, *Cities and Cemeteries of Etruria*, 2nd ed. ii. p. 403). It is set round with sixteen nozzles ornamented alternately with a siren and a satyr playing on a double flute. Between each pair of nozzles is a head of a river god, and on the bottom of the lamp is a large mask of Medusa, surrounded by bands of animals. These designs are in relief, and the workmanship, which appears to belong to the beginning of the 5th century B.C., justifies the esteem in which Etruscan lamps were held in antiquity (Athenaeus xv. 700). Of a later but still excellent style is a bronze lamp in the British Museum found in the baths of Julian in Paris (figs. 3, 4, 5). The chain is attached by means of two dolphins very artistically combined. Under the nozzles are heads of Pan (fig. 3); and from the sides project the foreparts of lions (fig. 5). To what extent lamps may have been used in temples is unknown. Probably the Erechtheum on the acropolis of Athens was an exception in having a gold one kept burning day and night, just as this lamp itself must have been an exception in its artistic merits. It was the work of the sculptor Callimachus, and was made apparently for the newly rebuilt temple a little before 400 B.C. When once filled with oil and lit it burned continuously for a whole year. The wick was of a fine flax called Carpasian (now understood to have been a kind of cotton), which proved to be the least combustible of all flax (Pausanias i. 26. 7). Above the lamp a palm tree of bronze rose to the roof for the purpose of carrying off the fumes. But how this was managed it is not easy to determine unless the palm be supposed to have been inverted and to have hung above the lamp spread out like a reflector, for which purpose the polished bronze would have served fairly well. The stem if left hollow would collect the fumes and carry them out through the roof. This lamp was refilled on exactly the same day each year, so that there seems to have been an idea of measuring time by it, such as may also have been the case in regard to the lamp stand (λύχνειον) capable of holding as many lamps as there were days of the year, which Dionysius the Sicilian tyrant placed in the Prytaneum of Tarentum. At Pharae in Achaia there was in the market-place an oracular statue of Hermes with a marble altar before it to which bronze lamps were attached by means of lead. Whoever desired to consult the statue went there in the evening and first filled the lamps and lit them, placing also a bronze coin on the altar. A similar custom prevailed at the oracle of Apis in Egypt (Pausanias vii. 22. 2). At Argos he speaks of a chasm into which it was a custom continued to his time to let down burning lamps, with some reference to the goddess of the lower world, Persephone (ii. 22. 4). At Cnidus a large number of terra-cotta lamps were found crowded in one place a little distance below the surface, and it was conjectured that there must have been there some statue or altar at which it had been a custom to leave lamps burning at night (Newton, *Discoveries at Halicarnassus, &c.*, ii. 394). These lamps are of terra-cotta, but with little ornamentation, and so like each other in workmanship that they must all have come from one pottery, and may have been all brought to the spot where they were found on one occasion, probably the funeral of a person with many friends, or the celebration of a festival in his honour, such as the *parentalia* among the Romans, to maintain which it was a common custom to bequeath property. For example, a marble slab in the British Museum has a Latin inscription describing the property which had been left to provide among other things that a lighted lamp with incense on it should be placed at the tomb of the deceased on the kalends, nones and ides of each month (*Mus. Marbles*, v. pl. 8, fig. 2). For birthday presents terra-cotta lamps appear to have been frequently employed, the device generally being that of two figures of victory holding between them a disk inscribed with a good wish for the new year: ANNV NOV FAVSTV FELIX. This is the inscription on a lamp in the British Museum, which besides the victories has among other symbols a disk with the head of Janus. As the torch gave way to the lamp in fact, so also it gave way in mythology. In the earlier myths, as in that of Demeter, it is a torch with which she goes forth to search for her daughter, but in the late myth of Cupid and Psyche it is an oil lamp which Psyche carries, and from which to her grief a drop of hot oil falls on Cupid and awakes him. Terra-cotta lamps have very frequently the name of the maker stamped on the foot. Clay moulds from which the lamps were made exist in considerable numbers. (A. S. M.)

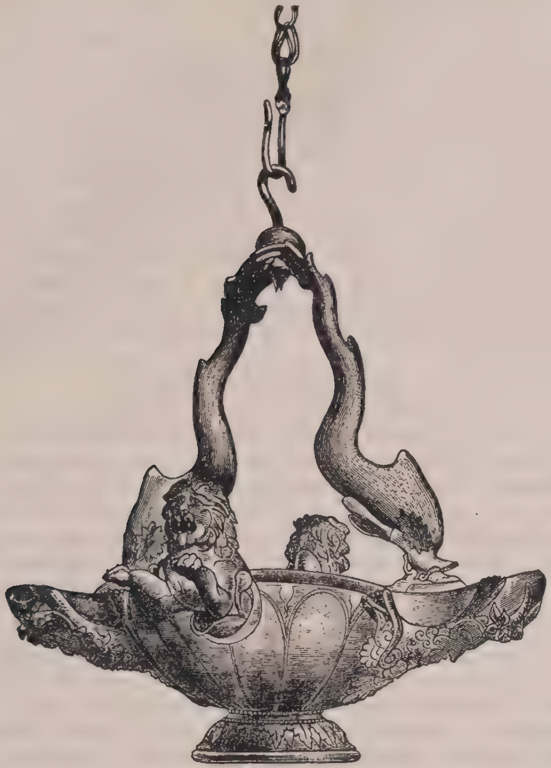

FIG. 4.—Bronze Lamp in British Museum.

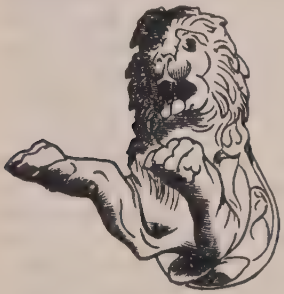

FIG. 5.

LAMP-BLACK, a deep black pigment consisting of carbon in a very fine state of division, obtained by the imperfect combustion of highly carbonaceous substances. It is manufactured from scraps of resin and pitch refuse and inferior oils and fats, and other similar combustible bodies rich in carbon, the finest lamp-black being procured by the combustion of oils obtained in coal-tar distillation (see COAL-TAR). Lamp-black is extensively used in the manufacture of printing ink, as a pigment for oil painting and also for "ebonizing" cabinet work, and in the waxing and lacquering of leather. It is the principal constituent of China ink.

LAMPEDUSA, a small island in the Mediterranean, belonging to the province of Girgenti, from which it is about 112 m. S.S.W. Pop. (1901, with Linosa—see below) 2276. Its greatest length is about 7 m., its greatest width about 2 m.; the highest point is 400 ft. above sea-level. Geologically it belongs to Africa, being situated on the edge of the submarine platform which extends along the east coast of Tunisia, from which (at Mahadia) it is 90 m. distant eastwards. The soil is calcareous; it was covered with scrub (chiefly the wild olive) until comparatively recent times, but this has been cut, and the rock is now bare. The valleys are, however, fairly fertile. On the south, near the only village, is the harbour, which has been dredged to a depth of 13 ft. and is a good one for torpedo boats and small craft. The island was, as remains of hut foundations show, inhabited in prehistoric times. Punic tombs and Roman buildings also exist near the harbour. The island is the Lopadusa of Strabo, and the Lipadosa of Ariosto's *Orlando Furioso*, the scene of the landing of Roger of Sicily and of his conversion by the hermit. A thousand slaves were taken from its population in 1553. In 1436 it was given by Alfonso of Aragon to Don Giovanni de Caro, baron of Montechiaro. In 1661, Ferdinand Tommasi, its then owner, received the title of prince from Charles II. of Spain. In 1737 the earl of Sandwich found only one inhabitant upon it; in 1760 some French settlers established themselves there. Catherine II. of Russia proposed to buy it as a Russian naval station, and the British government thought of doing the same if Napoleon had succeeded in seizing Malta. In 1800 a part of it was leased to Salvatore Gatt of Malta, who in 1810 sublet part of it to Alessandro Fernandez. In 1843 onwards Ferdinand II. of Naples established a colony there. There is now an Italian penal colony for *domicilio coatto*, with some 400 convicts (see B. Sanvisente, *L'Isola di Lampedusa eretta a colonia*, Naples, 1849). Eight miles W. is the islet of Lampione. Linosa, some 30 m. to the N.N.E., measures about 2 by 2 m., and is entirely volcanic; its highest point is 610 ft. above sea-level. Pop. (1901) about 200. It has landing-places on the S. and W., and is more fertile than Lampedusa; but it suffers from the lack of springs. Sanvisente says the water in Lampedusa is good. A few fragments of undoubtedly Roman pottery and some Roman coins have been found there, but the cisterns and the ruins of houses are probably of later date (P. Calcara, *Descrizione dell' isola di Linosa*, Palermo, 1851, 29). (T. As.)

LAMPERTHEIM, a town in the grand-duchy of Hesse-Darmstadt, 8 m. N. from Mannheim by the railway to Frankfort-on-Main via Biblis, and at the junction of lines to Worms and Weinheim. It contains a Roman Catholic church and a fine Evangelical church, and has chemical and cigar factories. Pop. (1900) 8020.

LAMPETER (*Llanbedr-pont-Stephan*), a market town, municipal borough and assize town of Cardiganshire, Wales, on the right bank of the Teifi, here crossed by an ancient stone bridge. Pop. (1901) 1722. Lampeter is a station on the so-called Manchester-and-Milford branch line of the Great Western railway. Though of ancient origin, the town is entirely modern in appearance, its most conspicuous object being the Gothic buildings of St David's College, founded in 1822, which cover a large area and contain a valuable library of English, Welsh and foreign works (see UNIVERSITIES). The modernized parish church of St Peter, or Pedr, contains some old monuments of the Lloyd family. North of the town are the park and mansion of Falcondale, the seat of the Harford family.

The name of Llanbedr-pont-Stephan goes to prove the early foundation of the place by St Pedr, a Celtic missionary of the 6th century, while one Stephen was the original builder of the bridge over the Teifi. As an important outpost in the upper valley of the Teifi, Lampeter possessed a castle, which was demolished by Owen Gwynedd in the 12th century. In 1188 the town was visited by Archbishop Baldwin on his way from Cardigan to Strata-Florida Abbey, and the Crusade was vigorously preached at this spot. Lampeter was first imcorporated under Edward II., but the earliest known charter dates from the reign of Henry VI., whereby the principal officer of the town, a portreeve, was to be appointed annually at the court-leet of the manor. The town was subsequently governed under a confirmatory charter of 1814, but in 1884 a new charter was obtained, whereby the corporation was empowered to consist of a mayor, 4 aldermen and 12 councillors. Although only a small agricultural centre, Lampeter has since 1886 become the assize town of Cardiganshire owing to its convenient position. Until the Redistribution Act of 1885 Lampeter formed one of the group of boroughs comprising the Cardigan parliamentary district.

LAMPOON, a virulent satire either in prose or verse; the idea of injustice and unscrupulousness seems to be essential to its definition. Although in its use the word is properly and almost exclusively English, the derivation appears to be French. Littré derives it from a term of Parisian argot, *lamper*, to drink greedily, in great mouthfuls. This word appears to have begun to be prevalent in the middle of the 17th century, and Furetière has preserved a fragment from a popular song, which says:—

> Jacques fuyant de Dublin
> Dit à Lauzun, son cousin,
> "Prenez soin de ma couronne,
> J'aurai soin de ma personne,
> Lampons! lampons!"

—that is to say, let us drink heavily, and begone dull care. Scarron speaks of a wild troop, singing *leridas* and *lampons*. There is, also, a rare French verb, *lamponner*, to attack with ridicule, used earlier in the 17th century by Brantôme. In its English form, lampoon, the word is used by Evelyn in 1645, "Here they still paste up their drolling lampoons and scurrilous papers," and soon after it is a verb,—"suppose we lampooned all the pretty women in Town." Both of these forms, the noun and the verb, have been preserved ever since in English, without modification, for violent and reckless literary censure. Tom Brown (1663–1704) was a past master in the art of lampooning, and some of his attacks on the celebrities of his age have a certain vigour. When Dryden became a Roman Catholic, Brown wrote:—

> Traitor to God and rebel to thy pen,
> Priest-ridden Poet, perjured son of Ben,
> If ever thou prove honest, then the nation
> May modestly believe in transubstantiation.

Several of the heroes of the *Dunciad*, and in particular John Oldmixon (1673–1742), were charged without unfairness with being professional lampooners. The coarse diatribes which were published by Richard Savage (1697–1743), mainly against Lady Macclesfield, were nothing more nor less than lampoons, and the word may with almost equal justice be employed to describe the coarser and more personal portions of the satires of Churchill. As a rule, however, the lampoon possessed no poetical graces, and in its very nature was usually anonymous. The notorious *Essay on Woman* (1764) of John Wilkes was a lampoon, and was successfully proceeded against as an obscene libel. The progress of civilization and the discipline of the law made it more and more impossible for private malice to take the form of baseless and scurrilous attack, and the lampoon, in its open shape, died of public decency in the 18th century. Malice, especially in an anonymous form, and passing in manuscript from hand to hand, has continued, however, to make use of this very unlovely form of literature. It has constantly reappeared at times of political disturbance, and the French have seldom failed to exercise their wicked wit upon their unpopular rulers. See also PASQUINADE. (E. G.)

LAMPREY, a fish belonging to the family *Petromyzontidae* (from πέτρος and μύζω, literally, stone-suckers), which with the hag-fishes or *Myxinidae* forms a distinct subclass of fishes, the *Cyclostomata*, distinguished by the low organization of their skeleton, which is cartilaginous, without vertebral segmentation, without ribs or real jaws, and without limbs. The lampreys are readily recognized by their long, eel-like, scaleless body, terminating anteriorly in the circular, suctorial mouth characteristic of the whole sub-class. On each side, behind the head, there is a row of seven branchial openings, through which the water is conveyed to and from the gills. By means of their mouth they fasten to stones, boats, &c., as well as to other fishes, their object being to obtain a resting-place on the former, whilst they attach themselves to the latter to derive nourishment from them. The inner surface of their cup-shaped mouth is armed with pointed teeth, with which they perforate the integuments of the fish attacked, scraping off particles of the flesh and sucking the blood. Mackerel, cod, pollack and flat-fishes are the kinds most frequently attacked by them in the sea; of river-fish the migratory *Salmonidae* and the shad are sometimes found with the marks of the teeth of the lamprey, or with the fish actually attached to them. About fifteen species are known from the coasts and rivers of the temperate regions of the northern and southern hemispheres. In Great Britain and Europe generally three species occur, viz. the large spotted sea-lamprey (*Petromyzon marinus*), the river-lamprey or lampern (*P. fluviatilis*), and the small lampern or "pride" or "sand-piper" (*P. branchialis*). The first two are migratory, entering rivers in the spring to spawn; of the river-lamprey, however, specimens are met with in fresh water all the year round. In North America about ten species of lamprey occur, while in South America and Australasia still others are found. Lampreys, especially the sea-lamprey, are esteemed as food, formerly more so than at present; but their flesh is not easy of digestion. Henry I. of England is said to have fallen a victim to this, his favourite dish. The species of greatest use is the river-lamprey, which as bait is preferred to all others in the cod and turbot fisheries of the North Sea. Yarrell states that formerly the Thames alone supplied from 1,000,000 to 1,200,000 lamperns annually, but their number has so much fallen off that, for instance, in 1876 only 40,000 were sold to the cod-fishers. That year, however, was an unusually bad year; the lamperns, from their scarcity, fetched £8, 10s. a thousand, whilst in ordinary years £5 is considered a fair price. The season for catching lamperns closes in the Thames about the middle of March. The origin of the name lamprey is obscure; it is an adaptation of Fr. *lamproie*, Med. Lat. *lampreda*; this has been taken as a variant of another Med. Lat. form *Lampetra*, which occurs in ichthyological works of the middle ages; the derivation from *lambere petras*, to lick stones, is a specimen of etymological ingenuity. The development of lampreys has received much attention on the part of naturalists, since Aug. Müller discovered that they undergo a metamorphosis, and that the minute worm-like lamperns previously known under the name of *Ammocoetes*, and abundant in the sand and mud of many streams, were nothing but the undeveloped young of the river-lampreys and small lamperns. See CYCLOSTOMATA.

LAMPROPHYRES (from Gr. λαμπρός, bright, and the terminal part of the word porphyry, meaning rocks containing bright porphyritic crystals), a group of rocks containing phenocrysts, usually of biotite and hornblende (with bright cleavage surfaces), often also of olivine and augite, but not of felspar. They are thus distinguished from the porphyries and porphyrites in which the felspar has crystallized in two generations. They are essentially "dike rocks," occurring as dikes and thin sills, and are also found as marginal facies of plutonic intrusions. They furnish a good example of the correlation which often exists between petrographical types and their mode of occurrence, showing the importance of physical conditions in determining the mineralogical and structural characters of rocks. They are usually dark in colour, owing to the abundance of ferro-magnesian silicates, of relatively high specific gravity and liable to decomposition. For these reasons they have been defined as a *melanocrate* series (rich in the dark minerals); and they are often accompanied by a complementary *leucocrate* series (rich in the white minerals felspar and quartz) such as aplites, porphyries and felsites. Both have been produced by differentiation of a parent magma, and if the two complementary sets of rocks could be mixed in the right proportions, it is presumed that a mass of similar chemical composition to the parent magma would be produced.

Both in the hand specimens and in microscopic slides of lamprophyric rocks biotite and hornblende are usually conspicuous. Though black by reflected light they are brown by transmitted light and highly pleochroic. In some cases they are yellow-brown, in other cases chestnut-brown and reddish brown; in the same rock the two minerals have strikingly similar colour and pleochroism. Augite, when it occurs, is sometimes green, at other times purple. Felspar is restricted to the ground mass; quartz occurs sometimes but is scarce. Although porphyritic structure is almost universal, it is sometimes not very marked. The large biotites and hornblendes are not sharply distinct from those of intermediate size, which in turn graduate into the small crystals of the same minerals in the ground mass. As a rule all the ingredients have rather perfect crystalline forms (except quartz), hence these rocks have been called "panidiomorphic." In many lamprophyres the pale quartz and felspathic ingredients tend to occur in rounded spots, or *ocelli*, in which there has been progressive crystallization from the margins towards the centre. These spots may consist of radiate or brush-like felspars (with some mica and hornblende) or of quartz and felspar. A central area of quartz or of analcite probably represents an original miarolitic cavity infilled at a later period.

There are two great groups of lamprophyres differing in composition while retaining the general features of the class. One of these accompanies intrusions of granite and diorite and includes the minettes, kersantites, vogesites and spessartites. The other is found in association with nepheline syenites, essexites and teschenites, and is exemplified by camptonites, monchiquites and alnoites. The complementary facies of the first group is the aplites, porphyrites and felsites; that of the second group includes bostonites, tinguaites and other rocks.

The *granito-dioritic-lamprophyres* (the first of these two groups) are found in many districts where granites and diorites occur, *e.g.* the Scottish Highlands and Southern Uplands, the Lake district, Ireland, the Vosges, Black Forest, Harz, &c. As a rule they do not proceed directly from the granite, but form separate dikes which may be later than, and consequently may cut, the granites and diorites. In other districts where granites are abundant no rocks of this class are known. It is rare to find only one member of the group present, but minettes, vogesites, kersantites, &c., all appear and there are usually transitional forms. For this reason these rock species must not be regarded as sharply distinct from one another. The group as a whole is a well-characterized one and shows few transitions to porphyries, porphyrites and other dike types; its subdivisions, however, tend to merge into one another and especially when they are weathered are hard to differentiate. The presence or absence of the four dominant minerals, orthoclase, plagioclase, biotite and hornblende, determines the species. Minettes contain biotite and orthoclase; kersantites, biotite and plagioclase. Vogesites contain hornblende and orthoclase; spessartites, hornblende and plagioclase. Each variety of lamprophyre may and often does contain all four minerals but is named according to the two which preponderate. These rocks contain also iron oxides (usually titaniferous), apatite, sometimes sphene, augite and olivine. The hornblende and biotite are brown or greenish brown, and as a rule their crystals even when small are very perfect and give the micro-sections an easily recognizable character. Green hornblende occurs in some of these rocks. The augite builds eumorphic crystals of pale green colour, often zonal and readily weathering. Olivine in the fresh state is rare; it forms rounded, corroded grains; in many cases it is decomposed to green or colourless hornblende in radiating nests (pilite). The plagioclase occurs as small rectangular crystals; orthoclase may have similar shapes or may be fibrous and grouped in sheaflike aggregates which are narrow in the middle and spread out towards both ends. If quartz is present it is the last product of crystallization and the only mineral devoid of idiomorphism; it fills up the spaces between the other ingredients of the rock. As all lamprophyres are prone to alteration by weathering a great abundance of secondary minerals is usually found in them; the principal are calcite and other carbonates, limonite, chlorite, quartz and kaolin.

Ocellar structure is common; the ocelli consist mainly of orthoclase and quartz, and may be a quarter of an inch in diameter. Another feature of these rocks is the presence of large foreign crystals or xenocrysts of felspar and of quartz. Their forms are rounded, indicating partial resorption by the solvent action of the lamprophyric magma; and the quartz may be surrounded by corrosion borders of minerals such as augite and hornblende produced where the magma is attacking the crystal. These crystals are of doubtful origin; they are often of considerable size and may be conspicuous in hand-specimens of the rocks. It is supposed that they did not crystallize in the lamprophyre dike but in some way were caught up by it. Other enclosures, more certainly of foreign origin, are often seen, such as quartzite, schists, garnetiferous rocks, granite, &c. These may be baked and altered or in other cases partly dissolved. Cordierite may be formed either in the enclosure or in the lamprophyre, where it takes the shape of hexagonal prisms which in polarized light break up into six sectors, triangular in shape, diverging from the centre of the crystal.

The second group of lamprophyric dike rocks (*the camptonite, monchiquite, alnoite series*) is much less common than those above described. As a rule they occur together, and there are transitions between the different sub-groups as in the granito-dioritic lamprophyres. In Sweden, Brazil, Portugal, Norway, the north of Scotland, Bohemia, Arkansas and other places this assemblage of rock types has been met with, always presenting nearly identical features. In most cases, though not in all, they have a close association with nepheline or leucite syenites and similar rocks rich in alkalies. This indicates a genetic affinity like that which exists between the granites and the minettes, &c., and further proof of this connexion is furnished by the occasional occurrence in those lamprophyres of leucite, haüyne and other felspathoid minerals.

The camptonites (called after Campton, New Hampshire) are dark brown, nearly black rocks often with large hornblende phenocrysts. Their essential minerals in thin section are hornblende of a strong reddish-brown colour; augite purple, pleochroic and rich in titanium, olivine and plagioclase felspar. They have the porphyritic and panidiomorphic structures described in the rocks of the previous group, and like them also have an ocellar character, often very conspicuous under the microscope. The accessory minerals are biotite, apatite, iron oxides and analcite. They decompose readily and are then filled with carbonates. Many of these rocks prove on analysis to be exceedingly rich in titanium; they may contain 4 or 5% of titanium dioxide.

The monchiquites (called after the Serra de Monchique, Portugal) are fine-grained and devoid of felspar. Their essential constituents are olivine and purplish augite. Brown hornblende, like that of the camptonites, occurs in many of them. An interstitial substance is present, which may sometimes be a brown glass, but at other times is colourless and is believed by some petrographers to be primary crystalline analcite. They would define the monchiquites as rocks consisting of olivine, augite and analcite; others regard the analcite as secondary, and consider the base as essentially glassy. Some monchiquites contain haüyne; while in others small leucites are found. Ocellar structure is occasionally present, though less marked than in the camptonites. A special group of monchiquites rich in deep brown biotite has been called fourchites (after the Fourche Mountains, Arkansas).

The alnoites (called after the island of Alnö in Norway) are rare rocks found in Norway, Montreal and other parts of North America and in the north of Scotland. They contain olivine, augite, brown biotite and melilite. They are free from felspar, and contain very low percentages of silica.

The chemical composition of some of these rocks will be indicated by the analyses of certain well-known examples.

	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O
I.[1]	52·70	1·71	15·07	8·41	...	7·23	5·33	3·12	4·81
II.	52·12	1·20	13·52	2·56	4·53	6·36	5·78	2·34	5·36
III.	45·15	...	15·39	2·76	5·64	6·38	8·83	2·67	2·77
IV.	54·67	...	12·68	11·68	2·13	6·11	4·96	3·85	3·65
V.	41·96	4·15	15·36	3·27	9·89	5·01	9·47	5·15	0·19
VI.	43·74	2·80	14·82	2·40	7·52	6·98	10·81	3·06	2·90
VII.	29·25	2·54	8·80	3·92	5·42	17·66	17·86	0·77	2·45

In addition to the oxides given these rocks contain small quantities of water (combined and hygroscopic), CO_2, S, MnO, P_2O_5, Ca_2O_3, &c.

(J. S. F.)

LAMPSACUS, an ancient Greek colony in Mysia, Asia Minor, known as Pityusa or Pityussa before its colonization by Ionian Greeks from Phocaea and Miletus, was situated on the Hellespont, opposite Callipolis (Gallipoli) in Thrace. It possessed a good harbour; and the neighbourhood was famous for its wine, so that, having fallen into the hands of the Persians during the Ionian revolt, it was assigned by Artaxerxes I. to Themistocles to provide him with wine, as Percote did with meat and Magnesia with bread. After the battle of Mycale (479 B.C.), Lampsacus joined the Athenians, but, having revolted from them in 411, was reduced by force. It was defended in 196 B.C. against Antiochus the Great of Syria, after which its inhabitants were received as allies of Rome. Lampsacus was the chief seat of the worship of Priapus, a gross nature-god closely connected with the culture of the vine. The ancient name is preserved in that of the modern village of Lapsaki, but the Greek town possibly lay at Chardak immediately opposite Gallipoli.

See A. L. Castellan, *Lettres sur la Morée, l'Hellespont, &c.* (Paris, 1820); Choiseul Gouffier, *Voyage pittoresque dans l'empire ottoman* (1842).

LAMPSTAND, a pillar, tripod or figure extending to the floor for supporting or holding a lamp. The lampstand (*lampadère*) is probably of French origin; it appears to have been in use in France before the end of the 17th century.

LANARK, a royal, municipal and police burgh, and county town of Lanarkshire, Scotland, standing on high ground about half a mile from the right bank of the Clyde, 31 m. S.E. of Glasgow by the Caledonian railway. Pop. (1901) 6440. It is a favourite holiday resort, being the point from which the falls of the Clyde are usually visited. The principal buildings are the town hall, the county buildings, the assembly rooms, occupying the site of an old Franciscan monastery, three hospitals, a convalescent home, the Smyllum orphanage and the Queen Victoria Jubilee fountain. The industries include cotton-spinning, weaving, nail-making and oilworks, and there are frequent markets for cattle and sheep. Lanark is a place of considerable antiquity. Kenneth II. held a parliament here in 978, and it was sometimes the residence of the Scottish kings, one of whom, William the Lion (d. 1214), granted it a charter. Several of the earlier exploits of William Wallace were achieved in the neighbourhood. He burned the town and slew the English sheriff William Hezelrig. About 1 m. N.W. are Cartland Craigs, where Mouse Water runs through a precipitous red sandstone ravine, the sides of which are about 400 ft. high. The stream is crossed by a bridge of single span, supposed to be Roman, and by a three-arched bridge, designed by Thomas Telford and erected in 1823. On the right bank, near this bridge, is the cave in which Wallace concealed himself after killing Hezelrig and which still bears his name. Lanark was the centre of much activity in the days of the Covenanters. William Lithgow (1582–1645), the traveller, William Smellie (1697–1763), the obstetrician and Gavin Hamilton (1730–1797), the painter, were born at Lanark. The town is one of the Falkirk district group of parliamentary burghs, the other constituents being Airdrie, Hamilton, Falkirk and Linlithgow.

New Lanark (pop. 795), 1 m. S., is famous in connexion with the socialist experiments of Robert Owen. The village was founded by David Dale (1739–1806) in 1785, with the support of Sir Richard Arkwright, inventor of the spinning-frame, who thought the spot might be made the Manchester of Scotland. In ten years four cotton mills were running, employing nearly 1400 hands. They were sold in 1799 to a Manchester company, who appointed Owen manager. In the same year he married Dale's daughter. For many years the mills were successfully conducted, but friction ultimately arose and Owen retired in 1828. The mills, however, are still carried on.

There are several interesting places near Lanark. Braxfield, on the Clyde, gave the title of Lord Braxfield to Robert Macqueen (1722–1799), who was born in the mansion and acquired on the bench the character of the Scottish Jeffreys. Robert Baillie, the patriot who was executed for conscience' sake (1684), belonged to Jerviswood, an estate on the Mouse. Lee House, the home of the Lockharts, is 3 m. N.W. The old castle was largely rebuilt in the 19th century. It contains some fine tapestry and portraits, and the Lee Penny—familiar to readers of Sir Walter Scott's *Talisman*—which was brought from Palestine in the 14th century by the Crusading knight, Sir Simon Lockhart. It is described as a cornelian encased in a silver coin. Craignethan Castle on the Nethan, a left-hand tributary joining the Clyde at Crossford, is said to be the original of the "Tillietudlem" of Scott's *Old Mortality*.

LANARKSHIRE, a south-western county of Scotland, bounded N. by the shires of Dumbarton and Stirling, E. by Linlithgowshire, Mid-Lothian and Peeblesshire, S. by Dumfriesshire and W. by the counties of Ayr, Renfrew and Dumbarton. Its area is 879 sq. m. (562,821 acres). It may be described as embracing the valley of the Clyde; and, in addition to the gradual descent from the high land in the south, it is also characterized by a gentle slope towards both banks of the river. The shire is divided into three wards, the Upper, comprising all the southern section, or more than half the whole area (over 330,000 acres); the Middle, with Hamilton for its chief town, covering fully 190,000 acres; and the Lower, occupying the northern area of about 40,000 acres. The surface falls gradually from the uplands in the south to the Firth of Clyde. The highest hills are nearly all on or close to the borders of Peeblesshire and Dumfriesshire, and include Culter Fell (2454 ft.) and Lowther Hill (2377). The loftiest heights exclusively belonging to Lanarkshire are Green Lowther (2403), Tinto (2335), Ballencleuch Law (2267), Rodger Law (2257), Dun Law (2216), Shiel Dod (2190), Dungrain Law (2186) and Comb Law (2107). The principal rivers are the Clyde and its head waters and affluents (on the right, the Medwin, Mouse, South Calder, North

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[1] I. Minette (Weiler, Alsace). II. Kersantite (Neubrunn, Thuringia). III. Vogesite (Castle Mountain, Montana). IV. Spessartite (Waldmichael, Spessart). V. Camptonite (Campton Falls). VI. Monchiquite (Ria do Ouro, Serra de Tingua). VII. Alnöite (Alnö, Sweden).

Calder and Kelvin; on the left, the Douglas, Nethan, Avon, Rotten Calder and Cart). There are no lochs of considerable size, the few sheets of water in the north—Woodend Reservoir, Bishop Loch, Hogganfield Loch, Woodend Loch, Lochend Loch—mainly feeding the Monkland and the Forth and Clyde Canals. The most famous natural features are the Falls of Clyde at Bonnington, Corra, Dundaff and Stonebyres.

Geology.—The southern upland portion is built up of Silurian and Ordovician rocks; the northern lower-lying tracts are formed of Carboniferous and Old Red Sandstone rocks. Ordovician strata cross the county from S.W. to N.E. in a belt 5-7 m. in breadth which is brought up by a fault against the Old Red and the Silurian on the northern side. This fault runs by Lamington, Roberton and Crawfordjohn. The Ordovician rocks lie in a synclinal fold with beds of Caradoc age in the centre flanked by graptolitic shales, grits and conglomerates, including among the last-named the local "Haggis-rock"; the well-known lead mines of Leadhills are worked in these formations. Silurian shales and sandstones, &c., extend south of the Ordovician belt to the county boundary; and again, on the northern side of the Ordovician belt two small tracts appear through the Old Red Sandstone on the crests of anticlinal folds. The Old Red Sandstone covers an irregular tract north of the Ordovician belt; a lower division consisting of sandstone, conglomerates and mud-stones is the most extensively developed; above this is found a series of contemporaneous porphyrites and melaphyres, conformable upon the lower division in the west of the county but are not so in the east. An upper series of sandstones and grits is seen for a short distance west of Lamington. Lanark stands on the Old Red Sandstone and the Falls of Clyde occur in the same rocks. Economically the most important geological feature is the coal basin of the Glasgow district. The axis of this basin lies in a N.E.-S.W. direction; in the central part, including Glasgow, Airdrie, Motherwell, Wishaw, Carluke, lie the coal-measures, consisting of sandstones, shales, marls and fireclays with seams of coal and ironstone. There are eleven beds of workable coal, the more important seams being the Ell, Main, Splint, Pyotshaw and Virtuewell. Underlying the coal-measures is the Millstone Grit seen on the northern side between Glenboig and Hogganfield—here the fireclays of Garnkirk, Gartcosh and Glenboig are worked—and on the south and south-east of the coal-measures, but not on the western side, because it is there cut out by a fault. Beneath the last-named formation comes the Carboniferous Limestone series with thin coals and ironstones, and again beneath this is the Calciferous Sandstone series which in the south-east consists of sandstones, shales, &c., but in the west the greater part of the series is composed of interbedded volcanic rocks—porphyrites and melaphyres. It will be observed that in general the younger formations lie nearer the centre of the basin and the older ones crop out around them. Besides the volcanic rocks mentioned there are intrusive basalts in the Carboniferous rocks like that in the neighbourhood of Shotts, and the smaller masses at Hogganfield near Glasgow and elsewhere. Volcanic necks are found in the Carluke and Kilcadzow districts, marking the vents of former volcanoes and several dikes of Tertiary age traverse the older rocks. An intrusion of pink felsite in early Old Red times has been the cause of Tinto Hill. Evidences of the Glacial period are abundant in the form of kames and other deposits of gravel, sand and boulder clay. The ice in flowing northward and southward from the higher ground took an easterly direction when it reached the lower ground. In the lower reaches of the Clyde the remains of old beaches at 25, 50 and 100 ft. above the present sea-level are to be observed.

Climate and Agriculture.—The rainfall averages 42 in. annually, being higher in the hill country and lower towards the north. The temperature for the year averages 48° F., for January 38° and for July 59°. The area under grain has shown a downward tendency since 1880. Oats is the principal crop, but barley and wheat are also grown. Potatoes and turnips are raised on a large scale. In the Lower Ward market-gardening has increased considerably, and the quantity of vegetables, grapes and tomatoes reared under glass has reached great proportions. An ancient industry in the vale of the Clyde for many miles below Lanark is the cultivation of fruit, several of the orchards being said to date from the time of Bede. The apples and pears are of good repute. There has been a remarkable extension in the culture of strawberries, hundreds of acres being laid down in beds. The sheep walks in the upper and middle wards are heavily stocked and the herds of cattle are extensive, the favoured breeds being Ayrshire and a cross between this and "improved Lanark." Dairy-farming flourishes, the cheeses of Carnwath and Lesmahagow being in steady demand. Clydesdale draught-horses are of high class. They are supposed to have been bred from Flanders horses imported early in the 18th century by the 5th duke of Hamilton. Most of the horses are kept for agricultural work, but a considerable number of unbroken horses and mares are maintained for stock. Pigs are numerous, being extensively reared by the miners. The largest farms are situated in the Upper Ward, but the general holding runs from 50 to 100 acres. More than 21,000 acres are under wood.

Other Industries.—The leading industries are those in connexion with the rich and extensive coal and iron field to the east and south-east of Glasgow; the shipbuilding at Govan and Partick and in Glasgow harbour; the textiles at Airdrie, Blantyre, Hamilton, Lanark, New Lanark, Rutherglen and Glasgow; engineering at Cambuslang, Carluke, Coatbridge, Kinning Park, Motherwell and Wishaw, and the varied and flourishing manufactures centred in and around Glasgow.

Communications.—In the north of the county, where population is most dense and the mineral field exceptionally rich, railway facilities are highly developed, there being for 10 or 12 m. around Glasgow quite a network of lines. The Caledonian Railway Company's main line to the south runs through the whole length of the shire, sending off branches at several points, especially at Carstairs Junction. The North British Railway Company serves various towns in the lower and middle wards and its lines to Edinburgh cross the north-western corner and the north of the county. Only in the immediate neighbourhood of Glasgow does the Glasgow and South Western system compete for Lanarkshire traffic, though it combines with the Caledonian to work the Mid-Lanarkshire and Ayrshire railway. The Monkland Canal in the far north and the Forth and Clyde Canal in the north and north-west carry a considerable amount of goods, and before the days of railways afforded one of the principal means of communication between east and west.

Population and Administration.—The population amounted in 1891 to 1,105,899 and in 1901 to 1,339,327, or 1523 persons to the sq. m. Thus though only tenth in point of extent, it is much the most populous county in Scotland, containing within its bounds nearly one-third of the population of the country. In 1901 there were 104 persons speaking Gaelic only, and 26,905 speaking Gaelic and English. The chief towns, with populations in 1901, apart from Glasgow, are Airdrie (22,288), Cambuslang (12,252), Coatbridge (36,991), Govan (82,174), Hamilton (32,775), Kinning Park (13,852), Larkhall (11,879), Motherwell (30,418), Partick (54,298), Rutherglen (17,220), Shettleston (12,154), Wishaw (20,873). Among smaller towns are Bellshill, Carluke, Holytown, Lanark, Stonefield, Tollcross and Uddingston; and Lesmahagow and East Kilbride are populous villages and mining centres. The county is divided into six parliamentary divisions:—North-east, North-west, Mid and South Lanark, Govan and Partick each returning one member. The royal burghs are Glasgow, Lanark and Rutherglen; the municipal and police burghs Airdrie, Biggar, Coatbridge, Glasgow, Govan, Hamilton, Kinning Park, Lanark, Motherwell, Partick, Rutherglen and Wishaw. Glasgow returns seven members to Parliament; Airdrie, Hamilton and Lanark belong to the Falkirk group and Rutherglen to the Kilmarnock group of parliamentary burghs. Lanarkshire is a sheriffdom, whose sheriff-principal is confined to his judicial duties in the county, and he has eight substitutes, five of whom sit constantly in Glasgow, and one each at Airdrie, Hamilton and Lanark. The shire is under school-board jurisdiction, many schools earning grants for higher education. For advanced education, besides the university and many other institutions in Glasgow there are a high school in Hamilton, and technical schools at Coatbridge and Wishaw. The county council expends the "residue" grant in supporting lectures and classes in agriculture and agricultural chemistry, mining, dairying, cookery, laundry work, nursery and poultry-keeping, in paying fees and railway fares and providing bursaries for technical students, and in subsidizing science and art and technical classes in day and evening schools. A director of technical education is maintained by the council. Lanark, Motherwell and Biggar entrust their shares of the grant to the county council, and Coatbridge and Airdrie themselves subsidize science and art and evening classes and continuation schools.

History.—At an early period Lanarkshire was inhabited by a Celtic tribe, the Damnonii, whose territory was divided by the wall of Antoninus between the Forth and Clyde (remains of which are found in the parish of Cadder), but who were never wholly subjugated by the Romans. Traces of their fortifications, mounds and circles exist, while stone axes, bronze celts, querns and urns belonging to their age are occasionally unearthed. Of the Romans there are traces in the camp on Beattock summit near Elvanfoot, in the fine bridge over the Mouse near Lanark, in the road to the south of Strathaven, in the wall already mentioned and in the coins and other relics that have been dug up. After their departure the country which included Lanarkshire formed part of the kingdom of Strathclyde, which, in the 7th century, was subdued by Northumbrian Saxons, when great numbers of the Celts migrated into Wales. The county once embraced a portion of Renfrewshire, but this was disjoined in the time of Robert III. The shire was then divided into two wards, the Over (with Lanark as its chief town) and the Nether (with Rutherglen as its capital). The present division into three wards was not effected till the 18th century. Independently of Glasgow, Lanarkshire has not borne any part continuously in the general history of Scotland, but has been the scene of several exciting episodes. Many of Wallace's daring deeds were performed in the county, Queen Mary met her fate at Langside (1568) and the Covenanters received constant support from the people, defeating Claverhouse at Drumclog (1679), but suffering defeat themselves at Bothwell Brig (1679).

See W. Hamilton, *Description of the Sheriffdoms of Lanark and Renfrew*, Maitland Club (1831); C. V. Irving and A. Murray, *The Upper Ward of Lanarkshire* (Glasgow, 1864); *The Clydesdale Stud Book* (Glasgow); W. A. Cowan, *History of Lanark* (Lanark, 1867); *Extracts from the Records of the Burgh of Lanark* (Glasgow, 1893).

LANCASHIRE, a north-western county of England, bounded N.E. by Westmorland, E. by Yorkshire, S. by Cheshire, W. by the Irish Sea and N.W. by Cumberland. The area is 1880·2 sq. m., the county being the sixth in size in England. The coast is generally flat, and broken by great inlets, with wide expanses of sandy foreshore at low tide. The chief inlets, from N. to S., are—the estuary of the river Duddon, which, with the river itself, separates the county from Cumberland; Morecambe Bay; and the estuaries of the Ribble and the Mersey. Morecambe Bay receives the rivers Crake and Leven in a common estuary, and the Kent from Westmorland; while the Lune and the Wyre discharge into Lancaster Bay, which is only partially separated from Morecambe Bay by the promontory of Red Nab. Morecambe Bay also detaches from the rest of the county the district of Furness (*q.v.*), extending westward to the Duddon, and having off its coast the island of Walney, 8 m. in length, and several small isles within the strait between Walney and the mainland. The principal seaside resorts and watering-places, from S. to N., are Southport, Lytham, St Anne's-on-the-Sea, Blackpool, Fleetwood and Morecambe; while at the head of Morecambe Bay are several pleasant villages frequented by visitors, such as Arnside and Grange. Of the rivers the Mersey (*q.v.*), separating the county from Cheshire, is the principal, and receives from Lancashire the Irwell, Sankey and other small streams. The Ribble, which rises in the mountains of the West Riding of Yorkshire, forms for a few miles the boundary with that county, and then flows S.W. to Preston, receiving the Hodder from the N. and the Calder and Darwen from the S. Lancashire has a share in two of the English districts most famous for their scenery, but does not include the finest part of either. Furness, entirely hilly except for a narrow coastal tract, extends N. to include the southern part of the Lake District (*q.v.*); it contains Coniston Lake and borders Windermere, which are drained respectively by the Leven and Crake, with some smaller lakes and such mountains as the Old Man and Wetherlam. Another elevated district, forming part of a mountainous chain stretching from the Scottish border, covered by the name of Pennine uplands in its broader application, runs along the whole eastern boundary of the main portion of the county, and to the south of the Ribble occupies more than half the area, stretching west nearly to Liverpool. The moorlands in the southern district are generally bleak and covered with heather. Towards the north the scenery is frequently beautiful, the green rounded elevated ridges being separated by pleasant cultivated valleys variegated by woods and watered by rivers. None of the summits of the range within Lancashire attains an elevation of 2000 ft., the highest being Blackstone Edge (1323 ft.), Pendle Hill (1831 ft.) and Boulsworth Hill (1700 ft.).

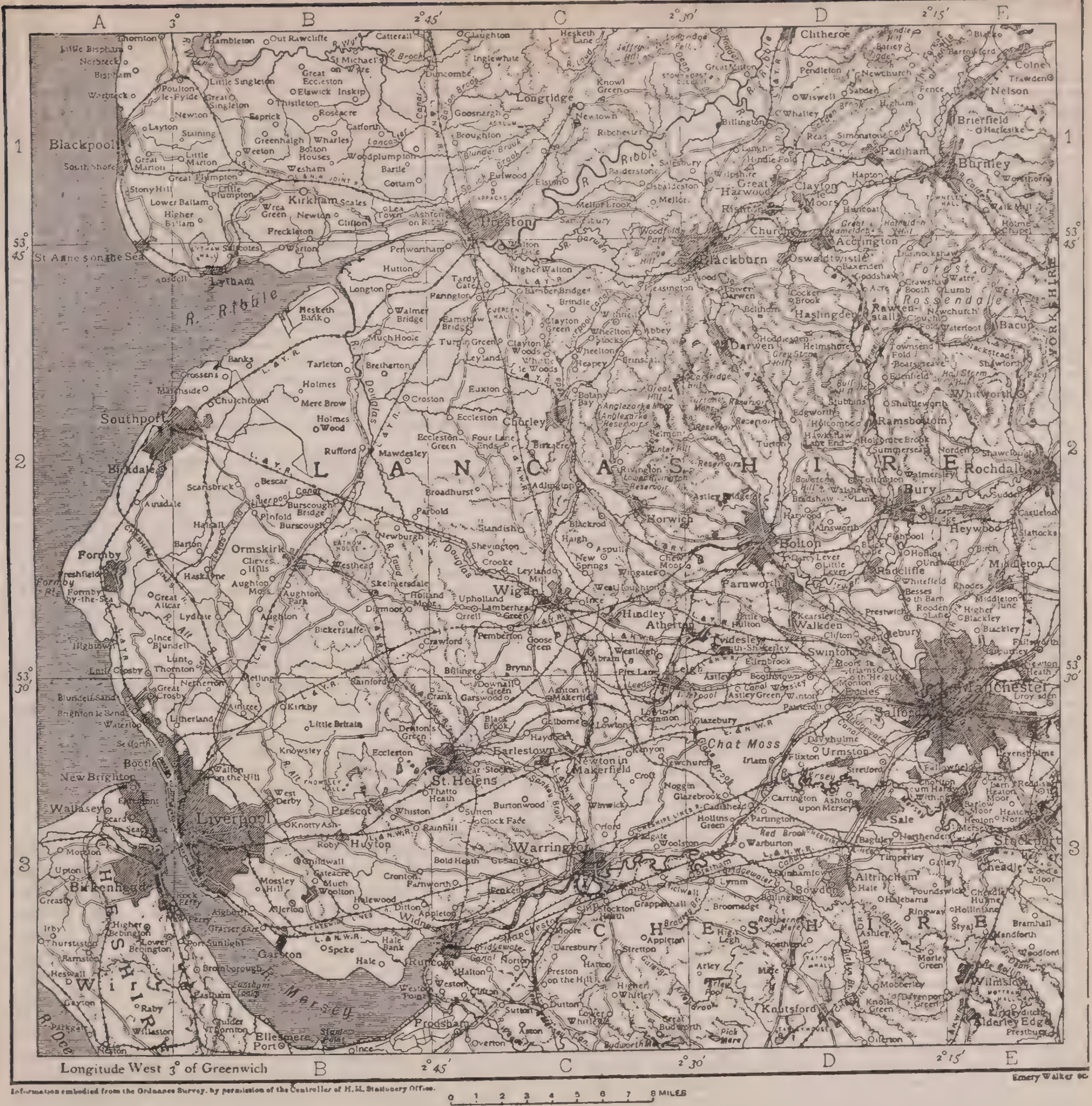
Along the sea-coast from the Mersey to Lancaster there is a continuous plain formerly occupied by peat mosses, many of which have been reclaimed. The largest is Chat Moss between Liverpool and Manchester. In some instances these mosses have exhibited the phenomenon of a moving bog. A large district in the north belonging to the duchy of Lancaster was at one time occupied by forests, but these have wholly disappeared, though their existence is recalled in nomenclature, as in the Forest of Rossendale, near the Yorkshire boundary somewhat south of the centre.

Geology.—The greater part of Lancashire, the central and eastern portions, is occupied by Carboniferous rocks; a broad belt of Triassic strata fringes the west and south; while most of the detached northern portion is made up of Silurian and Ordovician formations. The Carboniferous system includes the great coal-field in which are gathered all the principal manufacturing towns, Colne, Burnley, Blackburn, Chorley, Wigan, Bolton, Preston, Oldham, Rochdale and Manchester. In the centre of the coal-field is an elevated moorland tract formed of the grits and shales of the Millstone Grit series. Part of the small coal-field of Ingleton also lies within the county. Between these two coal basins there is a moderately hilly district in which grits and black shales predominate, with a broad tract of limestone and shales which are well exposed in the quarries at Clitheroe and at Longridge, Chipping, Whalley and Downham. The limestone again appears in the north at Bolton-le-Sands, Burton-in-Kendall, Grange, Ulverston and Dalton-in-Furness. Large pockets of rich iron ore are worked in the limestone in the Furness district. The belt of Trias includes the Bunter sandstone and conglomerate, which ranges from Barrow-in-Furness, through Garstang, Preston, Ormskirk, Liverpool, Warrington and Salford; and Keuper marls, which underlie the surface between the Bunter outcrop and the sea. On the coast there is a considerable development of blown sand between Blackpool and Lytham and between Southport and Seaforth. North of Broughton-in-Furness, Ulverston and Cartmel are the Silurian rocks around Lakes Windermere and Coniston Water, including the Coniston grits and flags and the Brathay flags. These rocks are bounded by the Ordovician Coniston limestone, ranging north-east and south-west, and the volcanic series of Borrowdale. A good deal of the solid geology is obscured in many places by glacial drift, boulder clay and sands.

The available coal supply of Lancashire has been estimated at about five thousand millions of tons. In 1852 the amount raised was 8,225,000 tons; in 1899 it was 24,387,475 tons. In the production of coal Lancashire vies with Yorkshire, but each is about one-third below Durham. There are also raised in large quantities—fireclay, limestone, sandstone, slate and salt, which is also obtained from brine. The red hematitic iron obtained in the Furness district is very valuable, but is liable to decrease. The district also produces a fine blue slate. Metals, excepting iron, are unimportant.

Climate and Agriculture.—The climate in the hilly districts is frequently cold, but in the more sheltered parts lying to the south and west it is mild and genial. From its westerly situation and the attraction of the hills there is a high rainfall in the hilly districts (*e.g.* at Bolton the average is 58·71 in.), while the average for the other districts is about 35. The soil after reclamation and drainage is fertile; but, as it is for the most part a strong clayey loam it requires a large amount of labour. In some districts it is more of a peaty nature, and in the Old Red Sandstone districts of the Mersey there is a tract of light sandy loam, easily worked, and well adapted for wheat and potatoes. In many districts the ground has been rendered unfit for agricultural operations by the rubbish from coal-pits. A low proportion (about seven-tenths) of the total area is under cultivation, and of this nearly three-fourths is in permanent pasture, cows being largely kept for the supply of milk to the towns, while in the uplands many sheep are reared. In addition to the cultivated area, about 92,000 acres are under hill pasturage. A gradual increase is noticeable in the acreage under oats, which occupy more than seven-tenths of the area under grain crops, and in that under wheat, to the exclusion of the cultivation of barley. Of green crops the potato is the chief.

Industries and Trade.—South Lancashire is the principal seat of the cotton manufacture in the world, the trade centring upon Manchester, Oldham and the neighbouring densely populated district. It employs upwards of 400,000 operatives. The worsted, woollen and silk manufactures, flax, hemp and jute industries, though of less importance, employ considerable numbers. Non-textile factories employ about 385,000 hands. The manufacture of machines, appliances, conveyances, tools, &c., are very important, especially in supplying the needs of the immense weaving and spinning industries. For the same purpose there is a large branch of industry in the manufacture of bobbins from the wood grown in the northern districts of the county. Of industries principally confined to certain definite centres there may be mentioned—the manufacture of iron and steel at Barrow-in-Furness, a town of remarkably rapid growth since the middle of the 19th century; the great glass works at St Helens; the watch-making works at Prescot and the leather works at Warrington. Printing, bleaching and dyeing works, paper and chemical works, india-rubber and tobacco manufactures are among the chief of the other resources of this great industrial region. Besides the port of Liverpool, of world-wide importance, the principal ports are Manchester, brought into communication with the sea by the Manchester Ship Canal opened in 1894, Barrow-in-Furness and Fleetwood, while Preston and Lancaster have docks and a considerable shipping trade by the rivers Lune and Ribble respectively. The sea fisheries, for which Fleetwood and Liverpool are the chief ports, are of considerable value.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Colne
Accrington
Blackburn
Darwen
Haslingden
Bacup
Rochdale
Bury
Bolton
Chorley
Horwich
Heywood
Middleton
Lytham
St Annes on the Sea
R. Ribble
Southport
Birkdale
Formby
Ormskirk
Wigan
Hindley
Atherton
Leigh
St. Helens
Earlestown
Newton in Makerfield
Chat Moss
Salford
Manchester
Stockport
Sale
Altrincham
Knutsford
Wilmslow
Alderley Edge
Warrington
Widnes
Runcorn
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Information embodied from the Ordnance Survey, by permission of the Controller of H.M. Stationery Office.

Communications.—Apart from the Manchester Ship Canal, canal-traffic plays an important part in the industrial region. In 1760 the Sankey canal, 10 m. long, the first canal opened in Britain (apart from very early works), was constructed to carry coal from St Helens to Liverpool. Shortly afterwards the duke of Bridgewater projected the great canal from Manchester across the Irwell to Worsley, completed in 1761 and bearing the name of its originator. The Leeds and Liverpool canal, begun in 1770, connects Liverpool and other important towns with Leeds by a circuitous route of 130 m. The other principal canals are the Rochdale, the Manchester (to Huddersfield) and the Lancaster, connecting Preston and Kendal. A short canal connects Ulverston with Morecambe Bay. A network of railways covers the industrial region. The main line of the London and North Western railway enters the county at Warrington, and runs north through Wigan, Preston, Lancaster and Carnforth. It also serves Liverpool and Manchester, providing the shortest route to each of these cities from London, and shares with the Lancashire and Yorkshire company joint lines to Southport, to Blackpool and to Fleetwood, whence there is regular steamship communication with Belfast. The Lancashire and Yorkshire line serves practically all the important centres as far north as Preston and Fleetwood. All the northern trunk lines from London have services to Manchester and Liverpool. The Cheshire Lines system, worked by a committee of the Great Northern, Great Central and Midland companies, links their systems with the South Lancashire district generally, and maintains lines between Liverpool and Manchester, both these cities with Southport, and numerous branches. Branches of the Midland railway from its main line in Yorkshire serve Lancaster, Morecambe, and Heysham and Carnforth, where connexion is made with the Furness railway to Ulverston, Barrow, Lake Side, Coniston, &c.

Population and Administration.—The area of the ancient county is 1,203,365 acres. Its population in 1801 was 673,486; in 1891, 3,926,760; and in 1901, 4,406,409. The area of the administrative county is 1,196,753 acres. The distribution of the industrial population may be best appreciated by showing the parliamentary divisions, parliamentary, county and municipal boroughs and urban districts as placed among the four divisions of the ancient county. In the case of urban districts the name of the great town to which each is near or adjacent follows where necessary. The figures show population in 1901.

Northern Division.—This embraces almost all the county N. of the Ribble, including Furness, and a small area S. of the Ribble estuary. It is considerably the largest of the divisions. *Parliamentary divisions*, from N. to S.—North Lonsdale, Lancaster, Blackpool, Chorley. *Parliamentary, county and municipal boroughs*—Barrow-in-Furness (57,586; one member); Preston (112,989; two members). *Municipal boroughs*—Blackpool (county borough; 47,348), Chorley (26,852), Lancaster (40,329; county town), Morecambe (11,798). *Urban districts*—Adlington (4523; Chorley), Bispham-with-Norbreck (Blackpool), Carnforth (3040; Lancaster), Croston (2102; Chorley), Dalton-in-Furness (13,020), Fleetwood (12,082), Fulwood (5238; Preston), Grange (1993), Heysham (3381; Morecambe), Kirkham (3693; Preston), Leyland (6865; Chorley), Longridge (4304; Preston), Lytham (7185), Poulon-le-Fylde (2223; Blackpool), Preesall-with-Hackinsall (1423; Fleetwood), St Anne's-on-the-Sea (6838, a watering-place between Blackpool and Lytham), Thornton (3108; Fleetwood), Ulverston (10,064, in Furness), Withnell (3349; Chorley).

North-Eastern-Division.—This lies E. of Preston, and is the smallest of the four. *Parliamentary divisions*—Accrington, Clitheroe, Darwen, Rossendale. *Parliamentary, county and municipal boroughs*—Blackburn (127,626; two members); Burnley (97,043; one member). *Municipal boroughs*—Accrington (43,122), Bacup (22,505), Clitheroe (11,414), Colne (23,000), Darwen (38,212), Haslingden (18,543, extending into South-Eastern division), Nelson (32,816), Rawtenstall (31,053). *Urban districts*—Barrowford (4959; Colne), Brierfield (7288; Burnley), Church (6463; Accrington), Clayton-le-Moors (8153; Accrington), Great Harwood (12,015; Blackburn), Oswaldtwistle (14,192; Blackburn), Padiham (12,205; Burnley), Rishton (7031; Blackburn), Trawden (2641; Colne), Walton-le-Dale (11,271; Preston).

South-Western Division.—This division represents roughly a quadrant with radius of 20 m. drawn from Liverpool. *Parliamentary divisions*—Bootle, Ince, Leigh, Newton, Ormskirk, Southport, Widnes. *Parliamentary boroughs*—the city and county and municipal borough of Liverpool (684,958; nine members); the county and municipal boroughs of St Helens (84,410; one member); Wigan (60,764; one member), Warrington (64,242; a part only of the parliamentary borough is in this county). *Municipal boroughs*—Bootle (58,566), Leigh (40,001), Southport (county borough; 48,083), Widnes (28,580). *Urban districts*—Abram (6306; Wigan), Allerton (1101; Liverpool), Ashton-in-Makerfield (18,687), Atherton (16,211), Billinge (4232; Wigan), Birkdale (14,197; Southport), Childwall (219; Liverpool), Formby (6060), Golborne (6789; St Helens), Great Crosby (7555; Liverpool), Haydock (8575; St Helens), Hindley (23,504; Wigan), Huyton-with-Roby (4661; St Helens), Ince-in-Makerfield (21,262), Lathom-and-Burscough (7113; Ormskirk), Litherland (10,592; Liverpool), Little Crosby (563; Liverpool), Little Woolton (1091; Liverpool), Much Woolton (4731; Liverpool), Newton-in-Makerfield (16,699), Ormskirk (6857), Orrell (5436; Wigan), Prescot (7855; St Helens), Rainford (3359; St Helens), Skelmersdale (5699; Ormskirk), Standish-with-Langtree (6303; Wigan), Tyldesley-with-Shakerley (14,843), Upholland (4773; Wigan), Waterloo-with-Seaforth (23,102; Liverpool).

South-Eastern Division.—This is of about the same area as the South-Western division, and it constitutes the heart of the industrial region. *Parliamentary divisions*—Eccles, Gorton, Heywood, Middleton, Prestwich, Radcliffe-cum-Farnworth, Stretford, Westhoughton. *Parliamentary boroughs*—the city and county of a city of Manchester (543,872; six members); with which should be correlated the adjoining county and municipal borough of Salford (220,957; three members), also the county and municipal boroughs of Bolton (168,215; two members), Bury (58,029; one member), Rochdale (83,114; one member), Oldham (137,246; two members), and the municipal borough of Ashton-under-Lyne (43,890). Part only of the last parliamentary borough is within the county, and this division also contains part of the parliamentary boroughs of Stalybridge and Stockport. *Municipal boroughs*—Eccles (34,369), Heywood (25,458), Middleton (25,178), Mossley (13,452). *Urban districts*—Aspull (8388; Wigan), Audenshaw (7216; Ashton-under-Lyne), Blackrod (3875; Wigan), Chadderton (24,892; Oldham), Crompton (13,427; Oldham), Denton (14,934; Ashton-under-Lyne), Droylsden (11,087; Manchester), Failsworth (14,152; Manchester), Farnworth (25,925; Bolton), Gorton (26,564; Manchester), Heaton Norris (9474; Stockport). Horwich (15,084; Bolton), Hurst (7145; Ashton-under-Lyne), Irlam (4335; Eccles), Kearsley (9218; Bolton), Lees (3621; Oldham), Levenshulme (11,485; Manchester), Littleborough (11,166; Rochdale), Little Hulton (7294; Bolton), Little Lever (5119; Bolton), Milnrow (8241; Rochdale), Norden (3907; Rochdale), Prestwich (12,839; Manchester), Radcliffe (25,368; Bury), Ramsbottom (15,920; Bury), Royton (14,881; Oldham), Stretford (30,436; Manchester), Swinton-and-Pendlebury (27,005; Manchester), Tottington (6118; Bury), Turton (12,355; Bolton), Urmston (6594; Manchester), Wardle (4427; Rochdale), Westhoughton (14,377; Bolton), Whitefield or Stand (6588; Bury), Whitworth (9578; Rochdale), Worsley (12,462; Eccles).

Lancashire is one of the counties palatine. It is attached to the duchy of Lancaster, a crown office, and retains the chancery court for the county palatine. The chancery of the duchy of Lancaster was once a court of appeal for the chancery of the county palatine, but now even its jurisdiction in regard to the estates of the duchy is merely nominal. The chancery of the county palatine has concurrent jurisdiction with the High Court of Chancery in all matters of equity within the county palatine, and independent jurisdiction in regard to a variety of other matters. The county palatine comprises six hundreds.

Lancashire is in the northern circuit, and assizes are held at Lancaster for the north, and at Liverpool and Manchester for the south of the county. There is one court of quarter sessions, and the county is divided into 33 petty sessional divisions. The boroughs of Blackburn, Bolton, Burnley, Liverpool, Manchester, Oldham, Salford and Wigan have separate commissions of the peace and courts of quarter sessions; and those of Accrington, Ashton-under-Lyne, Barrow-in-Furness, Blackpool, Bolton, Bury, Clitheroe, Colne, Darwen, Eccles, Heywood, Lancaster, Middleton, Mossley, Nelson, Preston, Rochdale, St Helens, Southport and Warrington have separate commissions of the peace only. There are 430 civil parishes. Lancashire is mainly in the diocese of Manchester, but parts are in those of Liverpool, Carlisle, Ripon, Chester and Wakefield. There are 787 ecclesiastical parishes or districts wholly or in part within the county.

Manchester and Liverpool are each seats of a university and of other important educational institutions. Within the bounds of the county there are many denominational colleges, and near Clitheroe is the famous Roman Catholic college of Stonyhurst. There is a day training college for schoolmasters in connexion with University College, Liverpool, and a day training college for both schoolmasters and schoolmistresses in connexion with Owens College, Manchester. At Edgehill, Liverpool, there is a residential training college for schoolmistresses which takes day pupils, at Liverpool a residential Roman Catholic training college for schoolmasters, and at Warrington a residential training college (Chester, Manchester and Liverpool diocesan) for schoolmistresses.

History.—The district afterwards known as Lancashire was after the departure of the Romans for many years apparently little better than a waste. It was not until the victory of Æthelfrith, king of Deira, near Chester in 613 cut off the Britons of Wales from those of Lancashire and Cumberland that even Lancashire south of the Ribble was conquered. The part north of the Ribble was not absorbed in the Northumbrian kingdom till the reign of Ecgfrith (670–685). Of the details of this long struggle we know nothing, but to the stubborn resistance made by the British leaders are due the legends of Arthur; and of the twelve great battles he is supposed to have fought against the English, four are traditionally, though probably erroneously, said to have taken place on the river Douglas near Wigan. In the long struggle for supremacy between Mercia and Northumbria, the country between the Mersey and Ribble was sometimes under one, sometimes under the other kingdom. During the 9th century Lancashire was constantly invaded by the Danes, and after the peace of Wedmore (878) it was included in the Danish kingdom of Northumbria. The *A.S. Chronicle* records the reconquest of the district between the Ribble and Mersey in 923 by the English king, when it appears to have been severed from the kingdom of Northumbria and united to Mercia, but the districts north of the Ribble now comprised in the county belonged to Northumbria until its incorporation with the kingdom of England. The names on the Lancashire coast ending in *by*, such as Crosby, Formby, Roby, Kirkby, Derby, show where the Danish settlements were thickest. William the Conqueror gave the lands between the Ribble and Mersey, and Amounderness to Roger de Poictou, but at the time of Domesday Book these had passed out of his hand and belonged to the king.

The name Lancashire does not appear in Domesday; the lands between the Ribble and Mersey were included in Cheshire and those north of the Ribble in Yorkshire. Roger de Poictou soon regained his lands, and Rufus added to his possessions the rest of Lonsdale south of the Sands, of which he already held a part; and as he had the Furness fells as well, he owned all that is now known as Lancashire. In 1102 he finally forfeited all his lands, which Henry I. held till, in 1118, he created the honour of Lancaster by incorporating with Roger's forfeited lands certain escheated manors in the counties of Nottingham, Derby and Lincoln, and certain royal manors, and bestowed it upon his nephew Stephen, afterwards king. During Stephen's reign the history of the honour presents certain difficulties, for David of Scotland held the lands north of the Ribble for a time, and in 1147 the earl of Chester held the district between the Ribble and Mersey. Henry II. gave the whole honour to William, Stephen's son, but in 1164 it came again into the king's hands until 1189, when Richard I. granted it to his brother John. In 1194, owing to John's rebellion, it was confiscated and the honour remained with the crown till 1267. In 1229, however, all the crown demesne between the Ribble and Mersey was granted to Ranulf, earl of Chester, and on his death in 1232 came to William Ferrers, earl of Derby, in right of his wife Agnes, sister and co-heir of Ranulf. The Ferrers held it till 1266, when it was confiscated owing to the earl's rebellion. In 1267 Henry III. granted the honour and county and all the royal demesne therein to his son Edmund, who was created earl of Lancaster. His son, Earl Thomas, married the heiress of Henry de Lacy, earl of Lincoln, and thus obtained the great estates belonging to the de Lacys in Lancashire. On the death of Henry, the first duke of Lancaster, in 1361, the estates, title and honour fell to John of Gaunt in right of his wife Blanche, the duke's elder daughter, and by the accession of Henry IV., John of Gaunt's only son, to the throne, the duchy and honour became merged in the crown.

The county of Lancaster is first mentioned in 1169 as contributing 100 marks to the Royal Exchequer for defaults and fines. The creation of the honour decided the boundaries, throwing into it Furness and Cartmel, which geographically belong to Westmorland; Lonsdale and Amounderness, which in Domesday had been surveyed under Yorkshire; and the land between the Ribble and Mersey. In Domesday this district south of the Ribble was divided into the six hundreds of West Derby, Newton, Warrington, Blackburn, Salford and Leyland, but before Henry II.'s reign the hundreds of Warrington and Newton were absorbed in that of West Derby. Neither Amounderness nor Lonsdale was called a hundred in Domesday, but soon after that time the former was treated as a hundred. Ecclesiastically the whole of the county originally belonged to the diocese of York, but after the reconquest of the district between the Ribble and Mersey in 923 this part was placed under the bishop of Lichfield in the archdeaconry of Chester, which was subdivided into the rural deaneries of Manchester, Warrington and Leyland. Up to 1541 the district north of the Ribble belonged to the archdeaconry of Richmond in the diocese of York, and was subdivided into the rural deaneries of Amounderness, Lonsdale and Coupland. In 1541 the diocese of Chester was created, including all Lancashire, which was divided into two archdeaconries: Chester, comprising the rural deaneries of Manchester, Warrington and Blackburn, and Richmond, comprising the deaneries of Amounderness, Furness, Lonsdale and Kendal. In 1847 the diocese of Manchester was created, which included all Lancashire except parts of West Derby, which still belonged to the diocese of Chester, and Furness and Cartmel, which were added to Carlisle in 1856. In 1878 by the creation of the diocese of Liverpool the south-eastern part of the county was subtracted from the Manchester diocese.

No shire court was ever held for the county, but as a duchy and county palatine it has its own special courts. It may have enjoyed palatine jurisdiction under Earl Morcar before the Conquest, but these privileges, if ever exercised, remained in abeyance till 1351, when Henry, duke of Lancaster, received power to have a chancery in the county of Lancaster and to issue writs therefrom under his own seal, as well touching pleas of the crown as any other relating to the common laws, and to have all *Jura Regalia* belonging to a county palatine. In 1377 the county was erected into a palatinate for John of Gaunt's life, and in 1396 these rights of jurisdiction were extended and settled in perpetuity on the dukes of Lancaster. The county palatine courts consist of a chancery which dates back at least to 1376, a court of common pleas, the jurisdiction of which was transferred in 1873 by the Judicature Act to the high court of justice, and a court of criminal jurisdiction which in no way differs from the king's ordinary court. In 1407 the duchy court of Lancaster was created, in which all questions of revenue and dignities affecting the duchy possessions are settled. The chancery of the duchy has been for years practically obsolete. The duchy and county palatine each has its own seal. The office of chancellor of the duchy and county palatine dates back to 1351.

Lancashire is famed for the number of old and important county families living within its borders. The most intimately connected with the history of the county are the Stanleys, whose chief seat is Knowsley Hall. Sir John Stanley early in the 15th century married the heiress of Lathom and thus obtained possession of Lathom and Knowsley. In 1456 the head of the family was created a peer by the title of Baron Stanley and in 1485 raised to the earldom of Derby. The Molyneuxes of Sephton and Croxteth are probably descended from William de Molines, who came to England with William the Conqueror, and is on the roll of Battle Abbey. Roger de Poictou gave him the manor of Sephton, and Richard de Molyneux who held the estate under Henry II. is undoubtedly an ancestor of the family. In 1628 Sir Richard Molyneux was advanced to the peerage of Ireland by the title of Viscount Maryborough, and in 1771 Charles, Lord Maryborough, became earl of Sefton in the peerage of Ireland. His son was created a peer of the United Kingdom as Baron Sefton of Croxteth. The Bootle Wilbrahams, earls of Lathom, are, it is said, descended from John Botyll of Melling, who was alive in 1421, and from the Wilbrahams of Cheshire, who date back at least to Henry III.'s reign. In 1755 the two families intermarried. In 1828 the title of Baron Skelmersdale was bestowed on the head of the family and in 1880 that of earl of Lathom. The Gerards of Bryn are said to be descended from an old Tuscan family, one of whom came to England in Edward the Confessor's time, and whose son is mentioned in Domesday. Bryn came into this family by marriage early in the 14th century. Sir Thomas Gerard was created a baronet by James I. in 1611, and in 1876 a peerage was conferred on Sir Robert Gerard. The Gerards of Ince were a collateral branch. The Lindsays, earls of Crawford and Balcarres, are representative on the female side of the Bradshaighs of Haigh Hall, who are said to be of Saxon origin. Other great Lancashire families are the Hoghtons of Hoghton Tower, dating back to the 12th century, the Blundells of Ince Blundell, who are said to have held the manor since the 12th century, now represented by the Weld-Blundells, the Tyldesleys of Tyldesley, now extinct, and the Butlers of Bewsey, barons of Warrington, of whom the last male heir died in 1586.

At the close of the 12th and during the 13th century there was a considerable advance in the importance of the towns; in 1199 Lancaster became a borough, in 1207 Liverpool, in 1230 Salford, in 1246 Wigan, and in 1301 Manchester. The Scottish wars were a great drain to the county, not only because the north part was subject to frequent invasions, as in 1322, but because some of the best blood was taken for these wars. In 1297 Lancashire raised 1000 men, and at the battle of Falkirk (1298) 1000 Lancashire soldiers were in the vanguard, led by Henry de Lacy, earl of Lincoln. In 1349 the county was visited by the Black Death and a record exists of its ravages in Amounderness. In ten parishes between September 1349 and January 1350, 13,180 persons perished. At Preston 3000 died, at Lancaster 3000, at Garstang 2000 and at Kirkham 3000. From the effects of this plague Lancashire was apparently slow to recover; its boroughs ceased to return members early in the 14th century and trade had not yet made any great advance. The drain of the Wars of the Roses on the county must also have been heavy, although none of the battles was fought within its borders; Lord Stanley's force of 5000 raised in Lancashire and Cheshire virtually decided the battle of Bosworth Field. The poverty of the county is shown by the fact that out of £40,000 granted in 1504 by parliament to the king, Lancashire's share was only £318. At the battle of Flodden (1513) the Lancashire archers led by Sir Edward Stanley almost totally destroyed the Highlanders on the right Scottish wing and greatly contributed to the victory. Under the Tudors the county prospered; the parliamentary boroughs once more began to return members, the towns increased in size, many halls were built by the gentry and trade increased.

In 1617 James I. visited Lancashire, and in consequence of a petition presented to him at Hoghton, complaining of the restrictions imposed upon Sunday amusements, he issued in 1618 the famous *Book of Sports*. Another of James's works, the *Daemonologie*, is closely connected with the gross superstitions concerning witches which were specially prevalent in Lancashire. The great centre of this witchcraft was Pendle Forest, in the parish of Whalley, and in 1612 twelve persons from Pendle and eight from Samlesbury were tried for witchcraft, nine of whom were hanged. In 1633 another batch of seventeen witches from Pendle were tried and all sentenced to be executed, but the king pardoned them. This was the last important case of witchcraft in Lancashire.

In the assessment of ship money in 1636 the county was put down for £1000, towards which Wigan was to raise £50, Preston £40, Lancaster £30, and Liverpool £25, and these figures compared with the assessments of £140 on Hull and £200 on Leeds show the comparative unimportance of the Lancashire boroughs. On the eve of the Great Rebellion in 1641 parliament resolved to take command of the militia, and Lord Strange, Lord Derby's eldest son, was removed from the lord lieutenancy. On the whole, the county was Royalist, and the moving spirit among the Royalists was Lord Strange, who became Lord Derby in 1642. Manchester was the headquarters of the Parliamentarians, and was besieged by Lord Derby in September 1642 for seven days, but not taken. Lord Derby himself took up his headquarters at Warrington and garrisoned Wigan. At the opening of 1643 Sir Thomas Fairfax made Manchester his headquarters. Early in February the Parliamentarians from Manchester successfully assaulted Preston, which was strongly Royalist; thence the Parliamentarians marched to Hoghton Tower, which they took, and within a few days captured Lancaster. On the Royalist side Lord Derby made an unsuccessful attack on Bolton from Wigan. In March a large Spanish ship, laden with ammunition for the use of parliament, was driven by a storm on Rossall Point and seized by the Royalists; Lord Derby ordered the ship to be burned, but the parliament forces from Preston succeeded in carrying off some of the guns to Lancaster castle. In March Lord Derby captured the town of Lancaster but not the castle, and marching to Preston regained it for the king, but was repulsed in an attack on Bolton. In April Wigan, one of the chief Royalist strongholds in the county, was taken by the parliament forces, who also again captured Lancaster, and the guns from the Spanish ship were moved for use against Warrington, which was obliged to surrender in May after a week's siege. Lord Derby also failed in an attempt on Liverpool, and the tide of war had clearly turned against the Royalists in Lancashire. In June Lord Derby went to the Isle of Man, which was threatened by the king's enemies. Soon after, the Parliamentarians captured Hornby castle, and only two strongholds, Thurland castle and Lathom house, remained in Royalist hands. In the summer, after a seven weeks' siege by Colonel Alexander Rigby, Thurland castle surrendered and was demolished. In February 1644 the Parliamentarians, under Colonel Rigby, Colonel Ashton and Colonel Moore, besieged Lathom house, the one refuge left to the Royalists, which was bravely defended by Lord Derby's heroic wife, Charlotte de la Trémoille. The siege lasted nearly four months and was raised on the approach of Prince Rupert, who marched to Bolton and was joined on his arrival outside the town by Lord Derby. Bolton was carried by storm; Rupert ordered that no quarter should be given, and it is usually said at least 1500 of the garrison were slain. Prince Rupert advanced without delay to Liverpool, which was defended by Colonel Moore, and took it after a siege of three weeks. After the battle of Marston Moor Prince Rupert again appeared in Lancashire and small engagements took place at Ormskirk, Upholland and Preston; in November Liverpool surrendered to the Parliamentarians. Lathom house was again the only strong place in Lancashire left to the Royalists, and in December 1645 after a five months' siege it was compelled to surrender through lack of provisions, and was almost entirely destroyed. For the moment the war in Lancashire was over. In 1648, however, the Royalist forces under the duke of Hamilton and Sir Marmaduke Langdale marched through Lancaster to Preston, hoping to reach Manchester; but near Preston were defeated by Cromwell in person. The remnant retreated through Wigan towards Warrington, and after being again defeated at Winwick surrendered at Warrington. In 1651 Charles II. advanced through Lancaster, Preston and Chorley on his southward march, and Lord Derby after gathering forces was on his way to meet him when he was defeated at Wigan. In 1658, after Cromwell's death, a Royalist rebellion was raised in which Lancashire took a prominent part, but it was quickly suppressed. During the Rebellion of 1715 Manchester was the chief centre of Roman Catholic and High Church Toryism. On the 7th of November the Scottish army entered Lancaster, where the Pretender was proclaimed king, and advanced to Preston, at which place a considerable body of Roman Catholics joined it. The rebels remained at Preston a few days, apparently unaware of the advance of the government troops, until General Wills from Manchester and General Carpenter from Lancaster surrounded the town, and on the 13th of November the town and the rebel garrison surrendered. Several of the rebels were hanged at Preston, Wigan, Lancaster and other places. In 1745 Prince Charles Edward passed through the county and was joined by about 200 adherents, called the Manchester regiment and placed under the command of Colonel Townley, who was afterwards executed.

The first industry established in Lancashire was that of wool, and with the founding of Furness abbey in 1127 wool farming on a large scale began here, but the bulk of the wool grown was exported, not worked up in England. In 1282, however, there was a mill for fulling or bleaching wool in Manchester, and by the middle of the 16th century there was quite a flourishing trade in worsted goods. In an act of 1552 Manchester "rugs and frizes" are specially mentioned, and in 1566 another act regulated the fees of the aulnager who was to have his deputies at Manchester, Rochdale, Bolton, Blackburn and Bury; the duty of the aulnagers was to prevent "cottons frizes and rugs" from being sold unsealed, but it must be noted that by cottons is not meant what we now understand by the word, but woollen goods. The 17th century saw the birth of the class of clothiers, who purchased the wool in large quantities or kept their own sheep, and delivered it to weavers who worked it up into cloth in their houses and returned it to the employers. The earliest mention of the manufacture of real cotton goods is in 1641, when Manchester made fustians, vermilions and dimities, but the industry did not develop to any extent until after the invention of the fly shuttle by John Kay in 1733, of the spinning jenny by James Hargreaves of Blackburn in 1765, of the water frame throstle by Richard Arkwright of Bolton in 1769, and of the mule by Samuel Crompton of Hall-in-the-Wood near Bolton in 1779. So rapid was the development of the cotton manufacture that in 1787 there were over forty cotton mills in Lancashire, all worked by water power. In 1789, however, steam was applied to the industry in Manchester, and in 1790 in Bolton a cotton mill was worked by steam. The increase in the import of raw cotton from 3,870,000 ℔ in 1769 to 1,083,600,000 in 1860 shows the growth of the industry. The rapid growth was accompanied with intermittent periods of depression, which in 1819 in particular led to the formation of various political societies and to the Blanketeers' Meeting and the Peterloo Massacre. During the American Civil War the five years' cotton famine caused untold misery in the county, but public and private relief mitigated the evils, and one good result was the introduction of machinery capable of dealing with the shorter staple of Indian cotton, thus rendering the trade less dependent for its supplies on America.

During the 18th century the only town where maritime trade increased was Liverpool, where in the last decade about 4500 ships arrived annually of a tonnage about one-fifth that of the London shipping. The prosperity of Liverpool was closely bound up with the slave trade, and about one-fourth of its ships were employed in this business. With the increase of trade the means of communication improved. In 1758 the duke of Bridgewater began the Bridgewater canal from Worsley to Salford and across the Irwell to Manchester, and before the end of the century the county was intersected by canals. In 1830 the first railway in England was opened between Manchester and Liverpool, and other railways rapidly followed.

The first recorded instance of parliamentary representation in Lancashire was in 1295, when two knights were returned for the county and two burgesses each for the boroughs of Lancaster, Preston, Wigan and Liverpool. The sheriff added to this return "There is no city in the county of Lancaster." The boroughs were, however, excused one after another from parliamentary representation, which was felt as a burden owing to the compulsory payment of the members' wages. Lancaster ceased to send members in 1331 after making nineteen returns, but renewed its privileges in 1529; from 1529 to 1547 there are no parliamentary returns, but from 1547 to 1867 Lancaster continued to return two members. Preston similarly was excused after 1331, after making eleven returns, but in 1529 and from 1547 onwards returned two members. Liverpool and Wigan sent members in 1295 and 1307, but not again till 1547. To the writ issued in 1362 the sheriff in his return says: "There is not any City or Borough in this County from which citizens or burgesses ought or are accustomed to come as this Writ requires." In 1559 Clitheroe and Newton-le-Willows first sent two members. Thus in all Lancashire returned fourteen members, and, with a brief exception during the Commonwealth, this continued to be the parliamentary representation till 1832. By the Reform Act of 1832 Lancashire was assigned four members, two for the northern and two for the southern division. Lancaster, Preston, Wigan and Liverpool continued to send two members, Clitheroe returned one and Newton was disfranchised. The following new boroughs were created: Manchester, Bolton, Blackburn, Oldham, returning two members each; Ashton-under-Lyne, Bury, Rochdale, Salford and Warrington, one each. In 1861 a third member was given to South Lancashire and in 1867 the county was divided into four constituencies, to each of which four members were assigned; since 1885 the county returns twenty-three members. The boroughs returned from 1867 to 1885 twenty-five members, and since 1885 thirty-four.

Antiquities.—The Cistercian abbey of Furness (*q.v.*) is one of the finest and most extensive ecclesiastical ruins in England. Whalley abbey, first founded at Stanlawe in Cheshire in 1178, and removed in 1296, belonged to the same order. There was a priory of Black Canons at Burscough, founded in the time of Richard I., one at Conishead dating from Henry II.'s reign, and one at Lancaster. A convent of Augustinian friars was founded at Cartmel in 1188, and one at Warrington about 1280. There are some remains of the Benedictine priory of Upholland, changed from a college of secular priests in 1318; and the same order had a priory at Lancaster founded in 1094, a cell at Lytham, of the reign of Richard I., and a priory at Penwortham, founded shortly after the time of the Conqueror. The Premonstratensians had Cockersand abbey, changed in 1190 from a hospital founded in the reign of Henry II., of which the chapter-house remains. At Kersal, near Manchester, there was a cell of Cluniac monks founded in the reign of John, while at Lancaster there were convents of Dominicans and Franciscans, and at Preston a priory of Grey Friars built by Edmund, earl of Lancaster, son of Henry III.

Besides the churches mentioned under the several towns, the more interesting are those of Aldingham, Norman doorway; Aughton; Cartmel priory church (see FURNESS); Hawkshead; Heysham, Norman with traces of earlier date; Hoole; Huyton; Kirkby, rebuilt, with very ancient font; Kirkby Ireleth, late Perpendicular, with Norman doorway; Leyland; Melling (in Lonsdale), Perpendicular, with stained-glass windows; Middleton, rebuilt in 1524, but containing part of the Norman church and several monuments; Ormskirk, Perpendicular with traces of Norman, having two towers, one of which is detached and surmounted by a spire; Overton, with Norman doorway; Radcliffe, Norman; Sefton, Perpendicular, with fine brass and recumbent figures of the Molyneux family, also a screen exquisitely carved; Stidd, near Ribchester, Norman arch and old monuments; Tunstall, late Perpendicular; Upholland priory church, Early English, with low massy tower; Urswick, Norman, with embattled tower and several old monuments; Walton-on-the-hill, anciently the parish church of Liverpool; Walton-le-Dale; Warton, with old font; Whalley abbey church, Decorated and Perpendicular, with Runic stone monuments.

The principal old castles are those of Lancaster; Dalton, a small rude tower occupying the site of an older building; two towers of Gleaston castle, built by the lords of Aldingham in the 14th century; the ruins of Greenhalgh castle, built by the first earl of Derby, and demolished after a siege by order of parliament in 1649; the ruins of Fouldrey in Piel Island near the entrance to Barrow harbour, erected in the reign of Edward III., now most dilapidated. There are many old timber houses and mansions of interest, as well as numerous modern seats.

See *Victoria History of Lancashire* (1906–1907); E. Baines, *The History of the County Palatine and Duchy of Lancaster* (1888); H. Fishwick, *A History of Lancashire* (1894); W. D. Pink and A. B. Beavan, *The Parliamentary Representation of Lancashire* (1889).

LANCASTER, HOUSE OF. The name House of Lancaster is commonly used to designate the line of English kings immediately descended from John of Gaunt, the fourth son of Edward III. But the history of the family and of the title goes back to the reign of Henry III., who created his second son, Edmund, earl of Lancaster in 1267. This Edmund received in his own day the surname of Crouchback, not, as was afterwards supposed, from a personal deformity, but from having worn a cross upon his back in token of a crusading vow. He is not a person of much importance in history except in relation to a strange theory raised in a later age about his birth, which we shall notice presently. His son Thomas, who inherited the title, took the lead among the nobles of Edward II.'s time in opposition to Piers Gaveston and the Despensers, and was beheaded for treason at Pontefract. At the commencement of the following reign his attainder was reversed and his brother Henry restored to the earldom; and Henry being appointed guardian to the young king Edward III., assisted him to throw off the yoke of Mortimer. On this Henry's death in 1345 he was succeeded by a son of the same name, sometimes known as Henry Tort-Col or Wryneck, a very valiant commander in the French wars, whom the king advanced to the dignity of a duke. Only one duke had been created in England before, and that was fourteen years previously, when the king's son Edward, the Black Prince, was made duke of Cornwall. This Henry Wryneck died in 1361 without heir male. His second daughter, Blanche, became the wife of John of Gaunt, who thus succeeded to the duke's inheritance in her right; and on the 13th of November 1362, when King Edward attained the age of fifty, John was created duke of Lancaster, his elder brother, Lionel, being at the same time created duke of Clarence. It was from these two dukes that the rival houses of Lancaster and York derived their respective claims to the crown. As Clarence was King Edward's third son, while John of Gaunt was his fourth, in ordinary course on the failure of the elder line the issue of Clarence should have taken precedence of that of Lancaster in the succession. But the rights of Clarence were conveyed in the first instance to an only daughter, and the ambition and policy of the house of Lancaster, profiting by advantageous circumstances, enabled them not only to gain possession of the throne but to maintain themselves in it for three generations before they were dispossessed by the representatives of the elder brother.

As for John of Gaunt himself, it can hardly be said that this sort of politic wisdom is very conspicuous in him. His ambition was generally more manifest than his discretion; but fortune favoured his ambition, even as to himself, somewhat beyond expectation, and still more in his posterity. Before the death of his father he had become the greatest subject in England, his three elder brothers having all died before him. He had even added to his other dignities the title of king of Castile, having married, after his first wife's death, the daughter of Peter the Cruel. The title, however, was an empty one, the throne of Castile being actually in the possession of Henry of Trastamara, whom the English had vainly endeavoured to set aside. His military and naval enterprises were for the most part disastrous failures, and in England he was exceedingly unpopular. Nevertheless, during the later years of his father's reign the weakness of the king and the declining health of the Black Prince threw the government very much into his hands. He even aimed, or was suspected of aiming, at the succession to the crown; but in this hope he was disappointed by the action of the Good Parliament a year before Edward's death, in which it was settled that Richard the son of the Black Prince should be king after his grandfather. Nevertheless the suspicion with which he was regarded was not altogether quieted when Richard came to the throne, a boy in the eleventh year of his age. The duke himself complained in parliament of the way he was spoken of out of doors, and at the outbreak of Wat Tyler's insurrection the peasants stopped pilgrims on the road to Canterbury and made them swear never to accept a king of the name of John. On gaining possession of London they burnt his magnificent palace of the Savoy. Richard found a convenient way to get rid of John of Gaunt by sending him to Castile to make good his barren title, and on this expedition he was away three years. He succeeded so far as to make a treaty with his rival, King John, son of Henry of Trastamara, for the succession, by virtue of which his daughter Catherine became the wife of Henry III. of Castile some years later. After his return the king seems to have regarded him with greater favour, created him duke of Aquitaine, and employed him in repeated embassies to France, which at length resulted in a treaty of peace, and Richard's marriage to the French king's daughter.

Another marked incident of his public life was the support which he gave on one occasion to the Reformer Wycliffe. How far this was due to religious and how far to political considerations may be a question; but not only John of Gaunt but his immediate descendants, the three kings of the house of Lancaster, all took deep interest in the religious movements of the times. A reaction against Lollardy, however, had already begun in the days of Henry IV., and both he and his son felt obliged to discountenance opinions which were believed to be politically and theologically dangerous.

Accusations had been made against John of Gaunt more than once during the earlier part of Richard II.'s reign of entertaining designs to supplant his nephew on the throne. But these Richard never seems to have wholly credited, and during his three years' absence his younger brother, Thomas of Woodstock, duke of Gloucester, showed himself a far more dangerous intriguer. Five confederate lords with Gloucester at their head took up arms against the king's favourite ministers, and the Wonderful Parliament put to death without remorse almost every agent of his former administration who had not fled the country. Gloucester even contemplated the dethronement of the king, but found that in this matter he could not rely on the support of his associates, one of whom was Henry, earl of Derby, the duke of Lancaster's son. Richard soon afterwards, by declaring himself of age, shook off his uncle's control, and within ten years the acts of the Wonderful Parliament were reversed by a parliament no less arbitrary. Gloucester and his allies were then brought to account; but the earl of Derby and Thomas Mowbray, earl of Nottingham, were taken into favour as having opposed the more violent proceedings of their associates. As if to show his entire confidence in both these noblemen, the king created the former duke of Hereford and the latter duke of Norfolk. But within three months from this time the one duke accused the other of treason, and the truth of the charge, after much consideration, was referred to trial by battle according to the laws of chivalry. But when the combat was about to commence it was interrupted by the king, who, to preserve the peace of the kingdom, decreed by his own mere authority that the duke of Hereford should be banished for ten years—a term immediately afterwards reduced to five—and the duke of Norfolk for life.

This arbitrary sentence was obeyed in the first instance by both parties, and Norfolk never returned. But Henry, duke of Hereford, whose milder sentence was doubtless owing to the fact that he was the popular favourite, came back within a year, having been furnished with a very fair pretext for doing so by a new act of injustice on the part of Richard. His father, John of Gaunt, had died in the interval, and the king, troubled with a rebellion in Ireland, and sorely in want of money, had seized the duchy of Lancaster as forfeited property. Henry at once sailed for England, and landing in Yorkshire while King Richard was in Ireland, gave out that he came only to recover his inheritance. He at once received the support of the northern lords, and as he marched southwards the whole kingdom was soon practically at his command. Richard, by the time he had recrossed the channel to Wales, discovered that his cause was lost. He was conveyed from Chester to London, and forced to execute a deed by which he resigned his crown. This was recited in parliament, and he was formally deposed. The duke of Lancaster then claimed the kingdom as due to himself by virtue of his descent from Henry III.

The claim which he put forward involved, to all appearance, a strange falsification of history, for it seemed to rest upon the supposition that Edmund of Lancaster, and not Edward I., was the eldest son of Henry III. A story had gone about, even in the days of John of Gaunt, who, if we may trust the rhymer John Hardyng (*Chronicle*, pp. 290, 291), had got it inserted in chronicles deposited in various monasteries, that this Edmund, surnamed Crouchback, was really hump-backed, and that he was set aside in favour of his younger brother Edward on account of his deformity. No chronicle, however, is known to exist which actually states that Edmund Crouchback was thus set aside; and in point of fact he had no deformity at all, while Edward was six years his senior. Hardyng's testimony is, moreover, suspicious as reflecting the prejudices of the Percys after they had turned against Henry IV., for Hardyng himself expressly says that the earl of Northumberland was the source of his information (see note, p. 353 of his *Chronicle*). But a statement in the continuation of the chronicle called the *Eulogium* (vol. iii. pp. 369, 370) corroborates Hardyng to some extent; for we are told that John of Gaunt had once desired in parliament that his son should be recognized on this flimsy plea as heir to the crown; and when Roger Mortimer, earl of March, denied the story and insisted on his own claim as descended from Lionel, duke of Clarence, Richard imposed silence on both parties. However this may be, it is certain that this story, though not directly asserted to be true, was indirectly pointed at by Henry when he put forward his claim, and no one was then bold enough to challenge it.

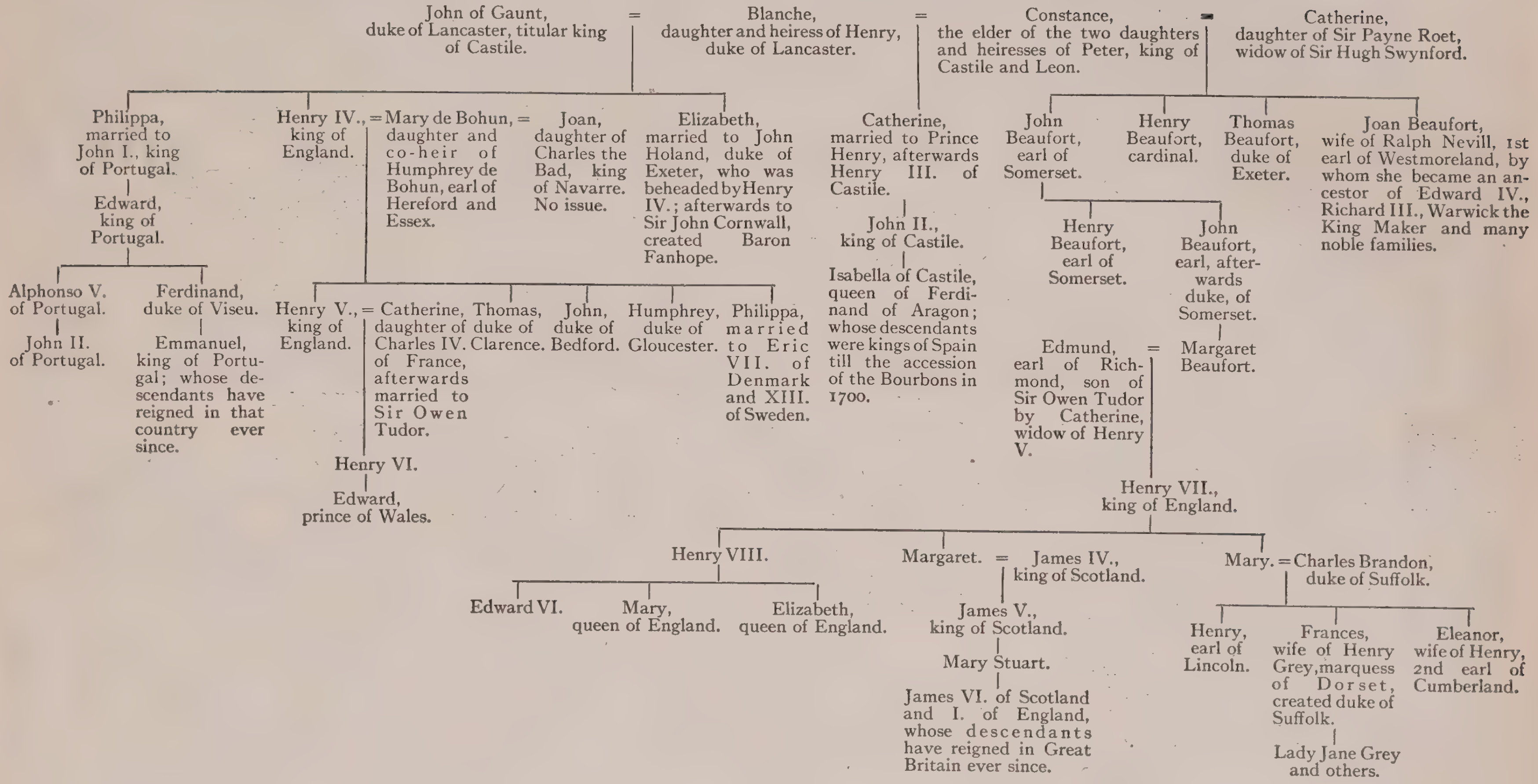
This was partly due, no doubt, to the fact that the true lineal heir after Richard was then a child, Edmund, who had just succeeded his father as earl of March. Another circumstance was unfavourable to the house of Mortimer—that it derived its title through a woman. No case precisely similar had as yet arisen, and, notwithstanding the precedent of Henry II., it might be doubted whether succession through a female was favoured by the constitution. If not, Henry could say with truth that he was the direct heir of his grandfather, Edward III. If, on the other hand, succession through females was valid, he could trace his descent through his mother from Henry III. by a very illustrious line of ancestors. And, in the words by which he formally made his claim, he ventured to say no more than that he was descended from the king last mentioned "by right line of the blood." In what particular way that "right line" was to be traced he did not venture to indicate.

A brief epitome of the reigns of the three successive kings belonging to the house of Lancaster (Henry IV., V. and VI.) will be found elsewhere. With the death of Henry VI. the direct male line of John of Gaunt became extinct. But by his daughters he became the ancestor of more than one line of foreign kings, while his descendants by his third wife, Catherine Swynford, conveyed the crown of England to the house of Tudor. It is true that his children by this lady were born before he married her; but they were made legitimate by act of parliament, and, though Henry IV. in confirming the privilege thus granted to them endeavoured to debar them from the succession to the crown, it is now ascertained that there was no such reservation in the original act, and the title claimed by Henry VII. was probably better than he himself supposed.

We show on the following page a pedigree of the royal and illustrious houses that traced their descent from John of Gaunt. (J. Ga.)

LANCASTER, HENRY, Earl of (*c.* 1281–1345), was the second son of Edmund, earl of Lancaster (d. 1296), and consequently a grandson of Henry III. During his early days he took part in campaigns in Flanders, Scotland and Wales, but was quite overshadowed by his elder brother Thomas (see below). In 1324, two years after Thomas had lost his life for opposing the king, Henry was made earl of Leicester by his cousin, Edward II., but he was not able to secure the titles and estates of Lancaster to which he was heir, and he showed openly that his sympathies were with his dead brother. When Queen Isabella took up arms against her husband in 1326 she was joined at once by the earl, who took a leading part in the proceedings against the king and his favourites, the Despensers, being Edward's gaoler at Kenilworth castle. Edward III. being now on the throne, Leicester secured the earldom of Lancaster and his brother's lands, becoming also steward of England; he knighted the young king and was the foremost

TABLE OF THE PRINCIPAL DESCENDANTS OF JOHN OF GAUNT.


John of Gaunt, duke of Lancaster, titular king of Castile.
=
Blanche, daughter and heiress of Henry, duke of Lancaster.
=
Constance, the elder of the two daughters and heiresses of Peter, king of Castile and Leon.
=
Catherine, daughter of Sir Payne Roet, widow of Sir Hugh Swynford.
Philippa, married to John I., king of Portugal.
Edward, king of Portugal.
Alphonso V. of Portugal.
John II. of Portugal.
Ferdinand, duke of Viseu.
Emmanuel, king of Portugal; whose descendants have reigned in that country ever since.
Henry IV., king of England.
=
Mary de Bohun, daughter and co-heir of Humphrey de Bohun, earl of Hereford and Essex.
=
Joan, daughter of Charles the Bad, king of Navarre. No issue.
Elizabeth, married to John Holand, duke of Exeter, who was beheaded by Henry IV.; afterwards to Sir John Cornwall, created Baron Fanhope.
Henry V., king of England.
=
Catherine, daughter of Charles IV. of France, afterwards married to Sir Owen Tudor.
Henry VI.
Edward, prince of Wales.
Thomas, duke of Clarence.
John, duke of Bedford.
Humphrey, duke of Gloucester.
Philippa, married to Eric VII. of Denmark and XIII. of Sweden.
Catherine, married to Prince Henry, afterwards Henry III. of Castile.
John II., king of Castile.
Isabella of Castile, queen of Ferdinand of Aragon; whose descendants were kings of Spain till the accession of the Bourbons in 1700.
John Beaufort, earl of Somerset.
Henry Beaufort, earl of Somerset.
John Beaufort, earl, afterwards duke, of Somerset.
Margaret Beaufort.
Edmund, earl of Richmond, son of Sir Owen Tudor by Catherine, widow of Henry V.
=
Henry VII., king of England.
Henry Beaufort, cardinal.
Thomas Beaufort, duke of Exeter.
Joan Beaufort, wife of Ralph Nevill, 1st earl of Westmoreland, by whom she became an ancestor of Edward IV., Richard III., Warwick the King Maker and many noble families.
Henry VIII.
Edward VI.
Mary, queen of England.
Elizabeth, queen of England.
Margaret.
=
James IV., king of Scotland.
James V., king of Scotland.
Mary Stuart.
James VI. of Scotland and I. of England, whose descendants have reigned in Great Britain ever since.
Mary.
=
Charles Brandon, duke of Suffolk.
Henry, earl of Lincoln.
Frances, wife of Henry Grey, marquess of Dorset, created duke of Suffolk.
Lady Jane Grey and others.
Eleanor, wife of Henry, 2nd earl of Cumberland.

member of the royal council, but he was soon at variance with Isabella and her paramour, Roger Mortimer, and was practically deprived of his power. In 1328 his attempt to overthrow Mortimer failed, and he quietly made his peace with the king; a second essay against Mortimer was more successful. About this time Lancaster became blind; he retired from public life and died on the 22nd of September 1345.

His son and successor, **Henry**, 1st duke of Lancaster (*c.* 1300–1361), was a soldier of unusual distinction. Probably from his birthplace in Monmouthshire he was called Henry of Grosmont. He fought in the naval fight off Sluys and in the one off Winchelsea in 1350; he led armies into Scotland, Gascony and Normandy, his exploits in Gascony in 1345 and 1346 being especially successful; he served frequently under Edward III. himself; and he may be fairly described as one of the most brilliant and capable of the English warriors during the earlier part of the Hundred Years' War. During a brief respite from the king's service he led a force into Prussia and he was often employed on diplomatic business. In 1354 he was at Avignon negotiating with Pope Innocent VI., who wished to make peace between England and France, and one of his last acts was to assist in arranging the details of the treaty of Brétigny in 1360. In 1337 he was made earl of Derby; in 1345 he succeeded to his father's earldoms of Lancaster and Leicester; in 1349 he was created earl of Lincoln, and in 1351 he was made duke of Lancaster. He was steward of England and one of the original knights of the order of the garter. He died at Leicester on the 13th of March 1361. He left no sons; one of his daughters, Maud (d. 1362), married William V., count of Holland, a son of the emperor Louis the Bavarian, and the other, Blanche (d. 1369), married Edward III.'s son, John of Gaunt, who obtained his father-in-law's titles and estates.

LANCASTER, SIR JAMES (fl. 1591–1618), English navigator and statesman, one of the foremost pioneers of the British Indian trade and empire. In early life he fought and traded in Portugal. On the 10th of April 1591 he started from Plymouth, with Raymond and Foxcroft, on his first great voyage to the East Indies; this fleet of three ships is the earliest of English oversea Indian expeditions. Reaching Table Bay (1st of August 1591), and losing one ship off Cape Corrientes on the 12th of September, the squadron rested and refitted at Zanzibar (February 1592), rounded Cape Comorin in May following, and was off the Malay Peninsula in June. Crossing later to Ceylon, the crews insisted on returning home; the voyage back was disastrous; only twenty-five officers and men reappeared in England in 1594. Lancaster himself reached Rye on the 24th of May 1594; in the same year he led a military expedition against Pernambuco, without much success; but his Indian voyage, like Ralph Fitch's overland explorations and trading, was an important factor in the foundation of the East India Company. In 1600 he was given command of the company's first fleet (which sailed from Torbay towards the end of April 1601); he was also accredited as Queen Elizabeth's special envoy to various Eastern potentates. Going by the Cape of Good Hope (1st of November 1601) Lancaster visited the Nicobars (from the 9th of April 1602), Achin and other parts of Sumatra (from the 5th of June 1602), and Bantam in Java; an alliance was concluded with Achin, a factory established at Bantam and a commercial mission despatched to the Moluccas. The return voyage (20th of February to 11th of September 1603) was speedy and prosperous, and Lancaster (whose success both in trade and in diplomacy had been brilliant) was rewarded with knighthood (October 1603). He continued to be one of the chief directors of the East India Company till his death in May 1618; most of the voyages of the early Stuart time both to India and in search of the North-West passage were undertaken under his advice and direction; Lancaster Sound, on the north-west of Baffin's Bay (in 74° 20′ N.), was named by William Baffin after Sir James (July 1616).

See Hakluyt, *Principal Navigations*, vol. ii. pt. ii. pp. 102-110, vol. iii. pp. 708-715 (1599); Purchas, *Pilgrims*, vol. i. pt. ii. pp. 147-164; also *The Voyages of Sir James Lancaster . . . to the East Indies . . .*, ed. Sir Clements Markham, Hakluyt Soc. (1877), *Calendars of State Papers, East Indies*. The original journals of Lancaster's voyage of 1601–1603 have disappeared, and here we have only Purchas to go on.

LANCASTER, JOHN OF GAUNT, Duke of (1340–1399), fourth son of Edward III. and Queen Philippa, was born in March 1340 at Ghent, whence his name. On the 29th of September 1342 he was made earl of Richmond; as a child he was present at the sea fight with the Spaniards in August 1350, but his first military service was in 1355, when he was knighted. On the 19th of May 1359 he married his cousin Blanche, daughter and ultimately sole heiress of Henry, duke of Lancaster. In her right he became earl of Lancaster in 1361, and next year was created duke. His marriage made him the greatest lord in England, but for some time he took no prominent part in public affairs. In 1366 he joined his eldest brother, Edward the Black Prince, in Aquitaine, and in the year after led a strong contingent to share in the campaign in support of Pedro the Cruel of Castile. With this began the connexion with Spain, which was to have so great an influence on his after-life. John fought in the van at Najera on the 3rd of April 1367, when the English victory restored Pedro to his throne. He returned home at the end of the year. Pedro proved false to his English allies, and was finally overthrown and killed by his rival, Henry of Trastamara, in 1369. The disastrous Spanish enterprise led directly to renewed war between France and England. In August 1369 John had command of an army which invaded northern France without success. In the following year he went again to Aquitaine, and was present with the Black Prince at the sack of Limoges. Edward's health was broken down, and he soon after went home, leaving John as his lieutenant. For a year John maintained the war at his own cost, but whilst in Aquitaine a greater prospect was opened to him. The duchess Blanche had died in the autumn of 1369 and now John married Constance (d. 1394), the elder daughter of Pedro the Cruel, and in her right assumed the title of king of Castile and Leon. For sixteen years the pursuit of his kingdom was the chief object of John's ambition. No doubt he hoped to achieve his end, when he commanded the great army which invaded France in 1373. But the French would not give battle, and though John marched from Calais right through Champagne, Burgundy and Auvergne, it was with disastrous results; only a shattered remnant of the host reached Bordeaux.

The Spanish scheme had to wait, and when John got back to England he was soon absorbed in domestic politics. The king was prematurely old, the Black Prince's health was broken. John, in spite of the unpopularity of his ill-success, was forced into the foremost place. As head of the court party he had to bear the brunt of the attack on the administration made by the Good Parliament in 1376. It was not perhaps altogether just, and John was embittered by reflections on his loyalty. As soon as the parliament was dissolved he had its proceedings reversed, and next year secured a more subservient assembly. There came, however, a new development. The duke's politics were opposed by the chief ecclesiastics, and in resisting them he had made use of Wycliffe. With Wycliffe's religious opinions he had no sympathy. Nevertheless when the bishops arraigned the reformer for heresy John would not abandon him. The conflict over the trial led to a violent quarrel with the Londoners, and a riot in the city during which John was in danger of his life from the angry citizens. The situation was entirely altered by the death of Edward III. on the 21st of June. Though his enemies had accused him of aiming at the throne, John was without any taint of disloyalty. In his nephew's interests he accepted a compromise, disclaimed before parliament the truth of the malicious rumours against him, and was reconciled formally with his opponents. Though he took his proper place in the ceremonies at Richard's coronation, he showed a tactful moderation by withdrawing for a time from any share in the government. However, in the summer of 1378, he commanded in an attack on St Malo, which through no fault of his failed. To add to this misfortune, during his absence some of his supporters violated the sanctuary at Westminster. He vindicated himself somewhat bitterly in a parliament at Gloucester, but still avoiding a prominent part in the government, accepted the command on the Scottish border. He was there engaged when his palace of the Savoy in London was burnt during the peasants' revolt in June 1381. Wild reports that even the government had declared him a traitor made him seek refuge in Scotland. Richard had, however, denounced the calumnies, and at once recalled his uncle.

John's self-restraint had strengthened his position, and he began again to think of his Spanish scheme. He urged its undertaking in parliament in 1382, but nearer troubles were more urgent, and John himself was wanted on the Scottish border. There he sought to arrange peace, but against his will was forced into an unfortunate campaign in 1384. His ill-success renewed his unpopularity, and the court favourites of Richard II. intrigued against him. They were probably responsible for the allegation, made by a Carmelite, called Latemar, that John was conspiring against his nephew. Though Richard at first believed it, the matter was disposed of by the friar's death. However, the court party soon after concocted a fresh plot for the duke's destruction; John boldly denounced his traducers, and the quarrel was appeased by the intervention of the king's mother. The intrigue still continued, and broke out again during the Scottish campaign in 1385. John was not the man to be forced into treason to his family, but the impossibility of the position at home made his foreign ambitions more feasible.

The victory of John of Portugal over the king of Castile at Aljubarrota, won with English help, offered an opportunity. In July 1386 John left England with a strong force to win his Spanish throne. He landed at Corunna, and during the autumn conquered Galicia. Juan, who had succeeded his father Henry as king of Castile, offered a compromise by marriage. John of Gaunt refused, hoping for greater success with the help of the king of Portugal, who now married the duke's eldest daughter Philippa. In the spring the allies invaded Castile. They could achieve no success, and sickness ruined the English army. The conquests of the previous year were lost, and when Juan renewed his offers, John of Gaunt agreed to surrender his claims to his daughter by Constance of Castile, who was to marry Juan's heir. After some delay the peace was concluded at Bayonne in 1388. The next eighteen months were spent by John as lieutenant of Aquitaine, and it was not till November 1389 that he returned to England. By his absence he had avoided implication in the troubles at home. Richard, still insecure of his own position, welcomed his uncle, and early in the following year marked his favour by creating him duke of Aquitaine. John on his part was glad to support the king's government; during four years he exercised his influence in favour of pacification at home, and abroad was chiefly responsible for the conclusion of a truce with France. Then in 1395 he went to take up the government of his duchy; thanks chiefly to his lavish expenditure his administration was not unsuccessful, but the Gascons had from the first objected to government except by the crown, and secured his recall within less than a year. Almost immediately after his return John married as his third wife Catherine Swynford; Constance of Castile had died in 1394. Catherine had been his mistress for many years, and his children by her, who bore the name of Beaufort, were now legitimated. In this and in other matters Richard found it politic to conciliate him. But though John presided at the trial of the earl of Arundel in September 1397, he took no active part in affairs. The exile of his son Henry in 1398 was a blow from which he did not recover. He died on the 3rd of February 1399, and was buried at St Paul's near the high altar.

John was neither a great soldier nor a statesman, but he was a chivalrous knight and loyal to what he believed were the interests of his family. In spite of opportunities and provocations he never lent himself to treason. He deserves credit for his protection of Wycliffe, though he had no sympathy with his religious or political opinions. He was also the patron of Chaucer, whose *Boke of the Duchesse* was a lament for Blanche of Lancaster.

The chief original sources for John's life are Froissart, the maliciously hostile *Chronicon Angliae* (1328–1388), and the eulogistic *Chronicle* of Henry Knighton (both the latter in the Rolls Series). But fuller information is to be found in the excellent biography by S. Armytage-Smith, published in 1904. For his descendants see the table under LANCASTER, HOUSE OF. (C. L. K.)

LANCASTER, JOSEPH (1778–1838), English educationist, was born in Southwark in 1778, the son of a Chelsea pensioner. He had few opportunities of regular instruction, but he very early showed unusual seriousness and desire for learning. At sixteen he looked forward to the dissenting ministry; but soon after his religious views altered, and he attached himself to the Society of Friends, with which he remained associated for many years, until long afterwards he was disowned by that body. At the age of twenty he began to gather a few poor children under his father's roof, and to give them the rudiments of instruction, without a fee, except in cases in which the parent was willing to pay a trifle. Soon a thousand children were assembled in the Borough Road; and, the attention of the duke of Bedford, Mr Whitbread, and others having been directed to his efforts, he was provided with means for building a schoolroom and supplying needful materials. The main features of his plan were the employment of older scholars as monitors, and an elaborate system of mechanical drill, by means of which these young teachers were made to impart the rudiments of reading, writing and arithmetic to large numbers at the same time. The material appliances for teaching were very scanty—a few leaves torn out of spelling-books and pasted on boards, some slates and a desk spread with sand, on which the children wrote with their fingers. The order and cheerfulness of the school and the military precision of the children's movements began to attract much public observation at a time when the education of the poor was almost entirely neglected. Lancaster inspired his young monitors with fondness for their work and with pride in the institution of which they formed a part. As these youths became more trustworthy, he found himself at leisure to accept invitations to expound what he called "his system" by lectures in various towns. In this way many new schools were established, and placed under the care of young men whom he had trained. In a memorable interview with George III., Lancaster was encouraged by the expression of the king's wish that every poor child in his dominions should be taught to read the Bible. Royal patronage brought in its train resources, fame and public responsibility, which proved to be beyond Lancaster's own powers to sustain or control. He was vain, reckless and improvident. In 1808 a few noblemen and gentlemen paid his debts, became his trustees and founded the society at first called the Royal Lancasterian Institution, but afterwards more widely known as the British and Foreign School Society. The trustees soon found that Lancaster was impatient of control, and that his wild impulses and heedless extravagance made it impossible to work with him. He quarrelled with the committee, set up a private school at Tooting, became bankrupt, and in 1818 emigrated to America. There he met at first a warm reception, gave several courses of lectures which were well attended, and wrote to friends at home letters full of enthusiasm. But his fame was short-lived. The miseries of debt and disappointment were aggravated by sickness, and he settled for a time in the warmer climate of Carácas. He afterwards visited St Thomas and Santa Cruz, and at length returned to New York, the corporation of which city made him a public grant of 500 dollars in pity for the misfortunes which had by this time reduced him to lamentable poverty. He afterwards visited Canada, where he gave lectures at Montreal, and was encouraged to open a school which enjoyed an ephemeral success, but was soon abandoned. A small annuity provided by his friends in England was his only means of support. He formed a plan for returning home and giving a new impetus to his "system," by which he declared it would be possible "to teach ten thousand children in different schools, not knowing their letters, all to read fluently in three weeks to three months." But these visions were never realized. He was run over by a carriage in the streets of New York on the 24th of October 1838, and died in a few hours.

As one of the two rival inventors of what was called the "monitorial" or "mutual" method of instruction, Lancaster's name was prominent for many years in educational controversy. Dr Andrew Bell (*q.v.*) had in 1797 published an account of his experiments in teaching; and Lancaster in his first pamphlet, published in 1803, frankly acknowledges his debt to Bell for some useful hints. The two worked independently, but Lancaster was the first to apply the system of monitorial teaching on a large scale. As an economical experiment his school at the Borough Road was a signal success. He had one thousand scholars under discipline, and taught them to read, write and work simple sums at a yearly cost of less than 5s. a head. His tract *Improvements in Education* described the gradation of ranks, the system of signals and orders, the functions of the monitors, the method of counting and of spelling and the curious devices he adopted for punishing offenders. Bell's educational aims were humbler, as he feared to "elevate above their station those who were doomed to the drudgery of daily labour," and therefore did not desire to teach even writing and ciphering to the lower classes. The main difference between them was that the system of the one was adopted by ecclesiastics and Conservatives,—the "National Society for the Education of the Poor in the principles of the Established Church" having been founded in 1811 for its propagation; while Lancaster's method was patronized by the *Edinburgh Review*, by Whig statesmen, by a few liberal Churchmen and by Nonconformists generally. It was the design of Lancaster and his friends to make national education Christian, but not sectarian,—to cause the Scriptures to be read, explained and reverenced in the schools, without seeking by catechisms or otherwise to attract the children to any particular church or sect. This principle was at first vehemently denounced as deistic and mischievous, and as especially hostile to the Established Church. To do them justice, it must be owned that the rival claims and merits of Bell and Lancaster were urged with more passion and unfairness by their friends than by themselves. Yet neither is entitled to hold a very high place among the world's teachers. Bell was cold, shrewd and self-seeking. Lancaster had more enthusiasm, a genuine and abounding love for children, and some ingenuity in devising plans both for teaching and governing. But he was shiftless, wayward and unmethodical, and incapable of sustained and high-principled personal effort. His writings were not numerous. They consist mainly of short pamphlets descriptive of the successes he attained at the Borough Road. His last publication, *An Epitome of the Chief Events and Transactions of my Own Life*, appeared in America in 1833, and is characterized, even more strongly than his former writings, by looseness and incoherency of style, by egotism and by a curious incapacity for judging fairly the motives either of his friends or his foes. We have since come to believe that intelligent teaching requires skill and previous training, and that even the humblest rudiments are not to be well taught by those who have only just acquired them for themselves, or to be attained by mere mechanical drill. But in the early stages of national education the monitorial method served a valuable purpose. It brought large numbers of hitherto neglected children under discipline, and gave them elementary instruction at a very cheap rate. Moreover, the little monitors were often found to make up in brightness, tractability and energy for their lack of experience, and to teach the arts of reading, writing and computing with surprising success. And one cardinal principle of Bell and Lancaster is of prime importance. They regarded a school, not merely as a place to which individual pupils should come for guidance from teachers, but as an organized community whose members have much to learn from each other. They sought to place their scholars from the first in helpful mutual relations, and to make them feel the need of common efforts towards the attainment of common ends. (J. G. F.)

LANCASTER, THOMAS, Earl of (*c.* 1277–1322), was the eldest son of Edmund, earl of Lancaster and titular king of Sicily, and a grandson of the English king, Henry III.; while he was related to the royal house of France both through his mother, Blanche, a granddaughter of Louis VIII., and his step-sister, Jeanne, queen of Navarre, the wife of Philip IV. A minor when Earl Edmund died in 1296, Thomas received his father's earldoms of Lancaster and Leicester in 1298, but did not become prominent in English affairs until after the accession of his cousin, Edward II., in July 1307. Having married Alice (d. 1348), daughter and heiress of Henry Lacy, earl of Lincoln, and added the earldom of Derby to those which he already held, he was marked out both by his wealth and position as the leader of the barons in their resistance to the new king. With his associates he produced the banishment of the royal favourite, Piers Gaveston, in 1308; compelled Edward in 1310 to surrender his power to a committee of "ordainers," among whom he himself was numbered; and took up arms when Gaveston returned to England in January 1312. Lancaster, who had just obtained the earldoms of Lincoln and Salisbury on the death of his father-in-law in 1311, drove the king and his favourite from Newcastle to Scarborough, and was present at the execution of Gaveston in June 1312. After lengthy efforts at mediation, he made his submission and received a full pardon from Edward in October 1313; but he refused to accompany the king on his march into Scotland, which ended at Bannockburn, and took advantage of the English disaster to wrest the control of affairs from the hands of Edward. In 1315 he took command of the forces raised to fight the Scots, and was soon appointed to the "chief place in the council," while his supporters filled the great offices of state, but his rule was as feeble as that of the monarch whom he had superseded. Quarrelling with some of the barons, he neglected both the government and the defence of the kingdom, and in 1317 began a private war with John, Earl Warrenne, who had assisted his countess to escape from her husband. The capture of Berwick by the Scots, however, in April 1318 led to a second reconciliation with Edward. A formal treaty, made in the following August, having been ratified by parliament, the king and earl opened the siege of Berwick; but there was no cohesion between their troops, and the undertaking was quickly abandoned. On several occasions Lancaster was suspected of intriguing with the Scots, and it is significant that his lands were spared when Robert Bruce ravaged the north of England. He refused to attend the councils or to take any part in the government until 1321, when the Despensers were banished, and war broke out again between himself and the king. Having conducted some military operations against Lancaster's friends on the Welsh marches, Edward led his troops against the earl, who gradually fell back from Burton-on-Trent to Pontefract. Continuing this movement, Lancaster reached Boroughbridge, where he was met by another body of royalists under Sir Andrew Harclay. After a skirmish he was deserted by his troops, and was obliged to surrender. Taken to his own castle at Pontefract, where the king was, he was condemned to death as a rebel and a traitor, and was beheaded near the town on the 22nd of March 1322. He left no children.

Although a coarse, selfish and violent man, without any of the attributes of a statesman, Lancaster won a great reputation for patriotism; and his memory was long cherished, especially in the north of England, as that of a defender of popular liberties. Over a hundred years after his death miracles were said to have been worked at his tomb at Pontefract; thousands visited his effigy in St Paul's Cathedral, London, and it was even proposed to make him a saint.

See *Chronicles of the Reigns of Edward I. and Edward II.*, edited with introduction by W. Stubbs (London, 1882–1883); and W. Stubbs, *Constitutional History*, vol. ii. (Oxford, 1896).

LANCASTER, a market town and municipal borough, river port, and the county town of Lancashire, England, in the Lancaster parliamentary division, 230 m. N.W. by N. from London by the London & North-Western railway (Castle Station); served also by a branch of the Midland railway (Green Ayre station). Pop. (1891) 33,256, (1901) 40,329. It lies at the head of the estuary of the river Lune, mainly on its south bank, 7 m. from the sea. The site slopes sharply up to an eminence crowned by the castle and the church of St Mary. Fine views over the rich valley and Morecambe Bay to the west are commanded from the summit. St Mary's church was originally attached by Roger de Poictou to his Benedictine priory founded at the close of the 11th century. It contains some fine Early English work in the nave arcade, but is of Perpendicular workmanship in general appearance, while the tower dates from 1759. There are some beautiful Decorated oak stalls in the chancel, brought probably from Cockersand or Furness Abbey.

The castle occupies the site of a Roman *castrum*. The Saxon foundations of a yet older structure remain, and the tower at the south-west corner is supposed to have been erected during the reign of Hadrian. The Dungeon Tower, also supposed to be of Roman origin, was taken down in 1818. The greater part of the old portion of the present structure was built by Roger de Poictou, who utilized some of the Roman towers and the old walls. In 1322 much damage was done to the castle by Robert

Bruce, whose attack it successfully resisted, but it was restored and strengthened by John of Gaunt, who added the greater part of the Gateway Tower as well as a turret on the keep or Lungess Tower, which on that account has been named "John o' Gaunt's Chair." During the Civil War the castle was captured by Cromwell. Shortly after this it was put to public use, and now, largely modernized, contains the assize courts and gaol. Its appearance, with massive buildings surrounding a quadrangle, is picturesque and dignified. Without the walls is a pleasant terrace walk. Other buildings include several handsome modern churches and chapels (notably the Roman Catholic church); the Storey Institute with art gallery, technical and art schools, museum and library, presented to the borough by Sir Thomas Storey in 1887; Palatine Hall, Ripley hospital (an endowed school for the children of residents in Lancaster and the neighbourhood), the asylum, the Royal Lancaster infirmary and an observatory in the Williamson Park. A new town hall, presented by Lord Ashton in 1909, is a handsome classical building from designs of E. W. Mountford. The Ashton Memorial in Williamson Park, commemorating members of the Ashton family, is a lofty domed structure. The grammar school occupies modern buildings, but its foundation dates from the close of the 15th century, and in its former Jacobean house near the church William Whewell and Sir Richard Owen were educated. A horseshoe inserted in the pavement at Horseshoe Corner in the town, and renewed from time to time, is said to mark the place where a shoe was cast by John of Gaunt's horse.

The chief industries are cotton-spinning, cabinet-making, oil cloth-making, railway wagon-building and engineering. Glasson Dock, 5 m. down the Lune, with a graving dock, is accessible to vessels of 600 tons. The Kendal and Lancaster canal reaches the town by an aqueduct over the Lune, which is also crossed by a handsome bridge dated 1788. The town has further connexion by canal with Preston. The corporation consists of a mayor, 8 aldermen and 24 councillors. Area, 3506 acres.

History.—Lancaster (Lone-caster or Lunecastrum) was an important Roman station, and traces of the Roman fortification wall remain. The Danes left few memorials of their occupation, and the Runic Cross found here, once supposed to be Danish, is now conclusively proved to be Anglo-Saxon. At the Conquest, the place, reduced in size and with its Roman castrum almost in ruins, became a possession of Roger de Poictou, who founded or enlarged the present castle on the old site. The town and castle had a somewhat chequered ownership till in 1266 they were granted by Henry III. to his son Edmund, first earl of Lancaster, and continued to be a part of the duchy of Lancaster till the present time. A town gathered around the castle, and in 1193 John, earl of Mertoun, afterwards king, granted it a charter, and another in 1199 after his accession. Under these charters the burgesses claimed the right of electing a mayor, of holding a yearly fair at Michaelmas and a weekly market on Saturday. Henry III. in 1226 confirmed the charter of 1199; in 1291 the style of the corporation is first mentioned as *Ballivus et communitas burgi*, and Edward III.'s confirmation and extension (1362) is issued to the mayor, bailiffs and commonalty. Edward III.'s charter was confirmed by Richard II. (1389), Henry IV. (1400), Henry V. (1421), Henry VII. (1488) and Elizabeth (1563). James I. (1604) and Charles II. (1665 and 1685) ratified, with certain additions, all previous charters, and again in 1819 a similar confirmation was issued. John of Gaunt in 1362 obtained a charter for the exclusive right of holding the sessions of pleas for the county in Lancaster itself, and up to 1873 the duchy appointed a chief justice and a puisne justice for the court of common pleas at Lancaster. In 1322 the Scots burnt the town, the castle alone escaping; the town was rebuilt but removed from its original position on the hill to the slope and foot. Again in 1389, after the battle of Otterburn, it was destroyed by the same enemy. At the outbreak of the Great Rebellion the burgesses sided with the king, and the town and castle were captured in February 1643 by the Parliamentarians. In March 1643 Lord Derby assaulted and took the town with great slaughter, but the castle remained in the hands of the Parliamentarians. In May and June of the same year the castle was again besieged in vain, and in 1648 the Royalists under Sir Thomas Tyldesley once more fruitlessly besieged it. During the rebellion of 1715 the northern rebels occupied Lancaster for two days and several of them were later executed here. During the 1745 rebellion Prince Charles Edward's army passed through the town in its southward march and again in its retreat, but the inhabitants stood firm for the Hanoverians.

Two chartered markets are held weekly on Wednesday and Saturday and three annual fairs in April, July and October. A merchant gild existed here, which was ratified by Edward III.'s charter (1362), and in 1688 six trade companies were incorporated. The chief manufactures used to be sailcloth, cabinet furniture, candles and cordage. The borough returned two members to parliament from 1295 to 1331 and again from some time in Henry VIII.'s reign before 1529 till 1867, when it was merged in the Lancaster division of north Lancashire. A church existed here, probably on the site of the parish church of St Mary's, in Anglo-Saxon times, but the present church dates from the early 15th century. An act of parliament was passed in 1792 to make the canal from Kendal through Lancaster and Preston, which is carried over the Lune about a mile above Lancaster by a splendid aqueduct.

See Fleury, *Time-Honoured Lancaster* (1891); E. Baines, *History of Lancashire* (1888).

LANCASTER, a city and the county-seat of Fairfield county, Ohio, U.S.A., on the Hocking river (non-navigable), about 32 m. S.E. of Columbus. Pop. (1900) 8991, of whom 442 were foreign-born and 212 were negroes; (1910 census) 13,093. Lancaster is served by the Hocking Valley, the Columbus & Southern and the Cincinnati & Muskingum Valley (Pennsylvania Lines) railways, and by the electric line of the Scioto Valley Traction Company, which connects it with Columbus. Near the centre of the city is Mt. Pleasant, which rises nearly 200 ft. above the surrounding plain and about which cluster many Indian legends; with 70 acres of woodland and fields surrounding it, this has been given to the city for a park. On another hill is the county court house. Lancaster has a public library and a children's home; and 6 m. distant is the State Industrial School for Boys. The manufactures include boots and shoes, glass and agricultural implements. The total value of the city's factory product in 1905 was $4,159,410, being an increase of 118·3% over that of 1900. Lancaster is the trade centre of a fertile agricultural region, has good transportation facilities, and is near the Hocking Valley and Sunday Creek Valley coal-fields; its commercial and industrial importance increased greatly, after 1900, through the development of the neighbouring natural gas fields and, after 1907–1908, through the discovery of petroleum near the city. Good sandstone is quarried in the vicinity. The municipality owns and operates its waterworks and natural gas plant. Lancaster was founded in 1800 by Ebenezer Zane (1747–1811), who received a section of land here as part compensation for opening a road, known as "Zane's Trace," from Wheeling, West Virginia, to Limestone (now Maysville), Kentucky. Some of the early settlers were from Lancaster, Pennsylvania, whence the name. Lancaster was incorporated as a village in 1831 and twenty years later became a city of the third class.

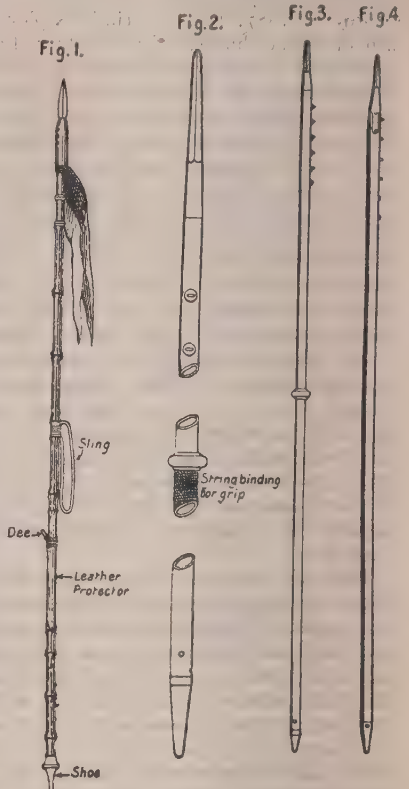
LANCASTER, a city and the county-seat of Lancaster county, Pennsylvania, U.S.A., on the Conestoga river, 68 m. W. of Philadelphia. Pop. (1900) 41,459, of whom 3492 were foreign-born and 777 were negroes; (1910 census) 47,227. It is served by the Pennsylvania, the Philadelphia & Reading and the Lancaster, Oxford & Southern railways, and by tramways of the Conestoga Traction Company, which had in 1909 a mileage of 152 m. Lancaster has a fine county court house, a soldiers' monument about 43 ft. in height, two fine hospitals, the Thaddeus Stevens Industrial School (for orphans), a children's home, the Mechanics' Library, and the Library of the Lancaster Historical Society. It is the seat of Franklin and Marshall College (Reformed Church), of the affiliated Franklin and Marshall Academy, and of the Theological Seminary of the Reformed Church, conducted in connexion with the college. The college was founded in 1852 by the consolidation of Franklin College, founded at Lancaster in 1787, and Marshall College, founded at Mercersburg in 1836, both of which had earned a high standing among the educational institutions of Pennsylvania. Franklin College was named in honour of Benjamin Franklin, an early patron; Marshall College was founded by the Reformed Church and was named in honour of John Marshall. The Theological Seminary was opened in 1825 at Carlisle, Pa., and was removed to York, Pa., in 1829, to Mercersburg, Pa., in 1837 and to Lancaster in 1871; in 1831 it was chartered by the Pennsylvania legislature. Among its teachers have been John W. Nevin and Philip Schaff, whose names, and that of the seminary, are associated with the so-called "Mercersburg Theology." At Millersville, 4 m. S.W. of Lancaster, is the Second Pennsylvania State Normal School. At Lancaster are the graves of General John F. Reynolds, who was born here; Thaddeus Stevens, who lived here after 1842; and President James Buchanan, who lived for many years on an estate, "Wheatland," near the city and is buried in the Woodward Hill Cemetery. The city is in a productive tobacco and grain region, and has a large tobacco trade and important manufactures. The value of the city's factory products increased from $12,750,429 in 1900 to $14,647,681 in 1905, or 14·9 %. In 1905 the principal products were umbrellas and canes (valued at $2,782,879), cigars and cigarettes ($1,951,971), and foundry and machine-shop products ($1,036,526). Lancaster county has long been one of the richest agricultural counties in the United States, its annual products being valued at about $10,000,000; in 1906 the value of the tobacco crop was about $3,225,000, and there were 824 manufactories of cigars in the county.

Lancaster was settled about 1717 by English Quakers and Germans, was laid out as a town in 1730, incorporated as a borough in 1742, and chartered as a city in 1818. An important treaty with the Iroquois Indians was negotiated here by the governor of Pennsylvania and by commissioners from Maryland and Virginia in June 1744. Some of General Burgoyne's troops, surrendered at Saratoga, were confined here after the autumn of 1780. The Continental Congress sat here on the 27th of September 1777 after being driven from Philadelphia by the British; and subsequently, after the organization of the Federal government, Lancaster was one of the places seriously considered when a national capital was to be chosen. From 1799 to 1812 Lancaster was the capital of Pennsylvania.

LANCE, a form of spear used by cavalry (see SPEAR). The use of the lance, dying away on the decay of chivalry and the introduction of pistol-armed cavalry, was revived by the Polish and Cossack cavalry who fought against Charles XII. and Frederick the Great. It was not until Napoleon's time, however, that lancer regiments appeared in any great numbers on European battlefields. The effective use of the weapon—long before called by Montecucculi the "queen of weapons"—by Napoleon's lancers at Waterloo led to its introduction into the British service, and except for a short period after the South African War, in which it was condemned as an anachronism, it has shared, or rather contested, with the sword the premier place amongst cavalry arms. In Great Britain and other countries lances are carried by the front rank of cavalry, except light cavalry, regiments, as well as by lancer regiments. In Germany, since 1889, the *whole* of the cavalry has been armed with the lance. In Russia, on the other hand, line cavalry being, until recently, considered as a sort of mounted infantry or dragoons, the lance was restricted to the Cossacks, and in Austria it enjoys less favour than in Germany. Altogether there are few questions of armament or military detail more freely disputed, in the present day as in the past, than this of sword *versus* lance.

The lances used in the British service are of two kinds, those with ash and those with bamboo staves. The latter are much preferred and are generally used, the "male" bamboo being peculiarly tough and elastic. The lance is provided with a sling, through which the trooper passes his right arm when the lance is carried slung, the point of the steel shoe fitting into a bucket attached to the right stirrup. A small "dee" loop is also provided, by which the lance can be attached to the saddle when the trooper dismounts. The small flag is removed on service. The head is of the best steel. The Germans, doubtless owing to difficulty in obtaining bamboos, or ash in large quantity straight enough in the grain over a considerable length, for lance staves, have adopted a stave of steel tubing as well as one of pine (figs. 2, 3 and 4).

As to the question of the relative efficiency of the lance and the sword as the principal arm for cavalry, it is alleged that the former is heavy and fatiguing to carry, conspicuous, and much in the way when reconnoitring in close country, working through woods and the like; that, when unslung ready for the charge, it is awkward to handle, and may be positively dangerous if a horse becomes restive and the rider has to use both hands on the reins; that unless the thrust be delivered at full speed, it is easily parried; and, lastly, that in the *mêlée*, when the trooper has not room to use his lance, he will be helpless until he either throws it away or slings it, and can draw his sword. While admitting the last-mentioned objection, those who favour the lance contend that success in the first shock of contact is all-important, and that this success the lancer will certainly obtain, owing to his long reach enabling him to deliver a blow before the swordsman can retaliate, while, when the *mêlée* commences, the rear rank will come to the assistance of the front rank. Further, it is claimed that the power of delivering the first blow gives confidence to the young soldier; that the appearance of a lancer regiment, preceded as it were by a hedge of steel, has an immense moral effect; that in single combat a lancer, with room to turn, can always defeat an opponent armed with a sword; and, lastly, that in pursuit a lancer is terrible to an enemy, whether the latter be mounted or on foot. As in the case of the perennial argument whether a sword should be designed mainly for cutting or thrusting, it is unlikely that the dispute as to the merits of the lance over the sword will ever be definitely settled, since so many other factors — horsemanship, the training of the horse, the skill and courage of the adversary—determine the trooper's success quite as much as the weapon he happens to wield. The following passage from *Cavalry: its History and Tactics* (London, 1853), by Captain Nolan, explains how the lance gained popularity in Austria:—"In the last Hungarian war (1848–49) the Hungarian Hussars were . . . generally successful against the Austrian heavy cavalry—cuirassiers and dragoons; but when they met the Polish Lancers, the finest regiments of light horse in the Austrian service, distinguished for their discipline, good riding, and, above all, for their *esprit de corps* and gallantry in action, against those the Hungarians were not successful, and at once attributed this to the lances of their opponents. The Austrians then extolled the lance above the sword, and armed all their light cavalry regiments with it."



TYPES OF BRITISH AND GERMAN LANCES.

FIG. 1 is the British bamboo lance; figs. 2 and 3 the German steel tubular lance, and fig. 4 the German pine-wood lance. The full length of the German lance is 11 ft. 9 in., that of the Cossacks 9 ft. 10 in., that of the Austrian lancers 8 ft. 8 in., and the French lance 11 ft. The British lance is 9 ft. long. The weight of a lance varies but slightly. The steel-staved lance weighs 4 lb, the bamboo 4½.

The lancer regiments in the British service are the 5th, the 9th, the 12th, the 16th, the 17th and the 21st. All these were converted at different dates from hussars and light dragoons, the last-named in 1896. The typical lancer uniform is a light-fitting short-skirted tunic with a double-breasted front, called the plastron, of a different colour, a girdle, and a flat-topped lancer "cap," adapted from the Polish czapka (see UNIFORMS: *Naval and Military*). The British lancers, with the exception of the 16th, who wear scarlet with blue facings, are clad in blue, the 5th, 9th and 12th having scarlet facings and green, black and red plumes respectively, the 17th (famous as the "death or glory boys" and wearing a skull and crossbones badge) white facings and white plume, and the 21st light-blue facings and plume.

LANCELOT (Lancelot du Lac, or Lancelot of the Lake), a famous figure in the Arthurian cycle of romances. To the great majority of English readers the name of no knight of King Arthur's court is so familiar as is that of Sir Lancelot. The mention of Arthur and the Round Table at once brings him to mind as the most valiant member of that brotherhood and the secret lover of the Queen. Lancelot, however, is not an original member of the cycle, and the development of his story is still a source of considerable perplexity to the critic.

Briefly summarized, the outline of his career, as given in the German *Lanzelet* and the French prose *Lancelot*, is as follows: Lancelot was the only child of King Ban of Benoic and his queen Helaine. While yet an infant, his father was driven from his kingdom, either by a revolt of his subjects, caused by his own harshness (*Lanzelet*), or by the action of his enemy Claudas de la Deserte (*Lancelot*). King and queen fly, carrying the child with them, and while the wife is tending her husband, who dies of a broken heart on his flight, the infant is carried off by a friendly water-fairy, the Lady of the Lake, who brings the boy up in her mysterious kingdom. In the German poem this is a veritable "Isle of Maidens," where no man ever enters, and where it is perpetual spring. In the prose *Lancelot*, on the other hand, the Lake is but a mirage, and the Lady's court does not lack its complement of gallant knights; moreover the boy has the companionship of his cousins, Lionel and Bohort, who, like himself, have been driven from their kingdom by Claudas. When he reaches the customary age (which appears to be fifteen), the young Lancelot, suitably equipped, is sent out into the world. In both versions his name and parentage are concealed, in the *Lanzelet* he is genuinely ignorant of both; here too his lack of all knightly accomplishments (not unnatural when we remember he has here been brought up entirely by women) and his inability to handle a steed are insisted upon. Here he rides forth in search of what adventure may bring. In the prose *Lancelot* his education is complete, he knows his name and parentage, though for some unexplained reason he keeps both secret, and he goes with a fitting escort and equipment to Arthur's court to demand knighthood. The subsequent adventures differ widely: in the *Lanzelet* he ultimately reconquers his kingdom, and, with his wife Iblis, reigns over it in peace, both living to see their children's children, and dying on the same day, in good old fairy-tale fashion. In fact, the whole of the *Lanzelet* has much more the character of a fairy or folk-tale than that of a knightly romance.

In the prose version, Lancelot, from his first appearance at court, conceives a passion for the queen, who is very considerably his senior, his birth taking place some time after her marriage to Arthur. This infatuation colours all his later career. He frees her from imprisonment in the castle of Meleagant, who has carried her off against her will—(a similar adventure is related in *Lanzelet*, where the abductor is Valerîn, and Lanzelet is not the rescuer)—and, although he recovers his kingdom from Claudas, he prefers to remain a simple knight of Arthur's court, bestowing the lands on his cousins and half-brother Hector. Tricked into a liaison with the Fisher King's daughter Elaine, he becomes the father of Galahad, the Grail winner, and, as a result of the queen's jealous anger at his relations with the lady, goes mad, and remains an exile from the court for some years. He takes part, fruitlessly, in the Grail quest, only being vouchsafed a fleeting glimpse of the sacred Vessel, which, however, is sufficient to cast him into unconsciousness, in which he remains for as many days as he has spent years in sin. Finally, his relations with Guenevere are revealed to Arthur by the sons of King Lot, Gawain, however, taking no part in the disclosure. Surprised together, Lancelot escapes, and the queen is condemned to be burnt alive. As the sentence is about to be carried into execution Lancelot and his kinsmen come to her rescue, but in the fight that ensues many of Arthur's knights, including three of Gawain's brothers, are slain. Thus converted into an enemy, Gawain urges his uncle to make war on Lancelot, and there follows a desperate struggle between Arthur and the race of Ban. This is interrupted by the tidings of Mordred's treachery, and Lancelot, taking no part in the last fatal conflict, outlives both king and queen, and the downfall of the Round Table. Finally, retiring to a hermitage, he ends his days in the odour of sanctity.

The process whereby the independent hero of the *Lanzelet* (who, though his mother is Arthur's sister, has but the slightest connexion with the British king), the faithful husband of Iblis, became converted into the principal ornament of Arthur's court, and the devoted lover of the queen, is by no means easy to follow, nor do other works of the cycle explain the transformation. In the pseudo-chronicles, the *Historia* of Geoffrey and the translations by Wace and Layamon, Lancelot does not appear at all; the queen's lover, whose guilty passion is fully returned, is Mordred. Chrétien de Troyes' treatment of him is contradictory; in the *Erec*, his earliest extant poem, Lancelot's name appears as third on the list of the knights of Arthur's court. (It is well, however, to bear in mind the possibility of later addition or alteration in such lists.) In *Cligés* he again ranks as third, being overthrown by the hero of the poem. In *Le Chevalier de la Charrette*, however, which followed *Cligés*, we find Lancelot alike as leading knight of the court and lover of the queen, in fact, precisely in the position he occupies in the prose romance, where, indeed, the section dealing with this adventure is, as Gaston Paris clearly proved, an almost literal adaptation of Chrétien's poem. The subject of the poem is the rescue of the queen from her abductor Meleagant; and what makes the matter more perplexing is that Chrétien handles the situation as one with which his hearers are already familiar; it is Lancelot, and not Arthur or another, to whom the office of rescuer naturally belongs. After this it is surprising to find that in his next poem, *Le Chevalier au Lion*, Lancelot is once, and only once, casually referred to, and that in a passing reference to his rescue of the queen. In the *Perceval*, Chrétien's last work, he does not appear at all, and yet much of the action passes at Arthur's court.

In the continuations added at various times to Chrétien's unfinished work the rôle assigned to Lancelot is equally modest. Among the fifteen knights selected by Arthur to accompany him to Chastel Orguellous he only ranks ninth. In the version of the *Luite Tristran* inserted by Gerbert in his *Perceval*, he is publicly overthrown and shamed by Tristan. Nowhere is he treated with anything approaching the importance assigned to him in the prose versions. Welsh tradition does not know him; early Italian records, which have preserved the names of Arthur and Gawain, have no reference to Lancelot; among the group of Arthurian knights figured on the architrave of the north doorway of Modena cathedral (a work of the 12th century) he finds no place; the real cause for his apparently sudden and triumphant rise to popularity is extremely difficult to determine. What appears the most probable solution is that which regards Lancelot as the hero of an independent and widely diffused folk-tale, which, owing to certain special circumstances, was brought into contact with, and incorporated in, the Arthurian tradition. This much has been proved certain of the adventures recounted in the *Lanzelet*; the theft of an infant by a water-fairy; the appearance of the hero three consecutive days, in three different disguises, at a tournament; the rescue of a queen, or princess, from an Other-World prison, all belong to one well-known and widely-spread folk-tale, variants of which are found in almost every land, and of which numerous examples have been collected alike by M. Cosquin in his *Contes Lorrains*, and by Mr J. F. Campbell in his *Tales of the West Highlands*.

The story of the loves of Lancelot and Guenevere, as related by Chrétien, has about it nothing spontaneous and genuine; in no way can it be compared with the story of Tristan and Iseult. It is the exposition of a relation governed by artificial and arbitrary rules, to which the principal actors in the drama must perforce conform. Chrétien states that he composed the poem (which he left to be completed by Godefroi de Leigni) at the request of the countess Marie of Champagne, who provided him with *matière et san*. Marie was the daughter of Louis VII. of France and of Eleanor of Aquitaine, subsequently wife of

Henry II. of Anjou and England. It is a matter of history that both mother and daughter were active agents in fostering that view of the social relations of the sexes which found its most famous expression in the "Courts of Love," and which was responsible for the dictum that love between husband and wife was impossible. The logical conclusion appears to be that the *Charrette* poem is a "*Tendenz-Schrift*," composed under certain special conditions, in response to a special demand. The story of *Tristan and Iseult*, immensely popular as it was, was too genuine—(shall we say too crude?)—to satisfy the taste of the court for which Chrétien was writing. Moreover, the Arthurian story was the popular story of the day, and Tristan did not belong to the magic circle, though he was ultimately introduced, somewhat clumsily, it must be admitted, within its bounds. The Arthurian cycle must have its own love-tale; Guenevere, the leading lady of that cycle, could not be behind the courtly ladies of the day and lack a lover; one had to be found for her. Lancelot, already popular hero of a tale in which an adventure parallel to that of the *Charrette* figured prominently, was pressed into the service, Modred, Guenevere's earlier lover, being too unsympathetic a character; moreover, Modred was required for the final rôle of traitor.

But to whom is the story to be assigned? Here we must distinguish between the *Lancelot* proper and the *Lancelot-Guenevere* versions; so far as the latter are concerned, we cannot get behind the version of Chrétien,—nowhere, prior to the composition of the *Chevalier de la Charrette* is there any evidence of the existence of such a story. Yet Chrétien does not claim to have invented the situation. Did it spring from the fertile brain of some court lady, Marie, or another? The authorship of the *Lancelot* proper, on the other hand, is invariably ascribed to Walter Map (see Map), the chancellor of Henry II., but so also are the majority of the Arthurian prose Romances. The trend of modern critical opinion is towards accepting Map as the author of a *Lancelot* romance, which formed the basis for later developments, and there is a growing tendency to identify this hypothetical original *Lancelot* with the source of the German *Lanzelet*. The author, Ulrich von Zatzikhoven, tells us that he translated his poem from a French (*welsches*) book in the possession of Hugo de Morville, one of the English hostages, who, in 1194, replaced Richard Cœur de Lion in the prison of Leopold of Austria. Further evidence on the point is, unfortunately, not at present forthcoming. To the student of the original texts Lancelot is an infinitely less interesting hero than Gawain, Perceval or Tristan, each of whom possesses a well-marked personality, and is the centre of what we may call individual adventures. Saving and excepting the incident of his being stolen and brought up by a water-fairy (from a *Lai* relating which adventure the whole story probably started), there is absolutely nothing in Lancelot's character or career to distinguish him from any other romantic hero of the period. The language of the prose *Lancelot* is good, easy and graceful, but the adventures lack originality and interest, and the situations repeat themselves in a most wearisome manner. English readers, who know the story only through the medium of Malory's noble prose and Tennyson's melodious verse, carry away an impression entirely foreign to that produced by a study of the original literature. The *Lancelot* story, in its rise and development, belongs exclusively to the later stage of Arthurian romance; it was a story for the court, not for the folk, and it lacks alike the dramatic force and human appeal of the genuine "popular" tale.

The prose *Lancelot* was frequently printed; J. C. Brunet chronicles editions of 1488, 1494, 1513, 1520 and 1533—of this last date there are two, one published by Jehan Petit, the other by Philippe Lenoire, this last by far the better, being printed from a much fuller manuscript. There is no critical edition, and the only version available for the general reader is the modernized and abridged text published by Paulin Paris in vols. iii. to v. of *Romans de la Table Ronde*. A Dutch verse translation of the 13th century was published by M. W. J. A. Jonckbloet in 1850, under the title of *Roman van Lanceloet*. This only begins with what Paulin Paris terms the *Agravain* section, all the part previous to Guenevere's rescue from Meleagant having been lost; but the text is an excellent one, agreeing closely with the Lenoire edition of 1533. The Books devoted by Malory to Lancelot are also drawn from this latter section of the romance; there is no sign that the English translator had any of the earlier part before him. Malory's version of the *Charrette* adventure differs in many respects from any other extant form, and the source of this special section of his work is still a question of debate among scholars. The text at his disposal, especially in the *Queste* section, must have been closely akin to that used by the Dutch translator and the compiler of Lenoire, 1533. Unfortunately, Dr Sommer, in his study on the *Sources of Malory*, omitted to consult these texts, with the result that the sections dealing with *Lancelot* and *Queste* urgently require revision.

Bibliography.—*Lanzelet* (ed. Hahn, 1845, out of print and extremely difficult to obtain). Chrétien's poem has been published by Professor Wendelin Foerster, in his edition of the works of that poet, *Der Karrenritter* (1899). A Dutch version of a short episodic poem, *Lancelot et le cerf au pied blanc* will be found in M. Jonckbloet's volume, and a discussion of this and other *Lancelot* poems, by Gaston Paris, is contained in vol. xxx. of *Histoire littéraire de la France*. For critical studies on the subject cf. Gaston Paris's articles in *Romania*, vols. x. and xii.; Wechssler, *Die verschiedenen Redaktionen des Graal-Lancelot Cycklus*; J. L. Weston, *The Legend of Sir Lancelot du Lac* (Grimm Library, vol. xii.); and *The Three Days' Tournament* (Grimm Library, vol. xv.) an appendix to the previous vol. (J. L. W.)

LANCET (from Fr. *lancette*, dim. of *lance*, lance), the name given to a surgical instrument, with a narrow two-edged blade and a lance-shaped point, used for opening abscesses, &c. The term is applied, in architecture, to a form of the pointed arch, and to a window of which the head is a lancet-arch.

LANCEWOOD, a straight-grained, tough, light elastic wood obtained from the West Indies and Guiana. It is brought into commerce in the form of taper poles of about 20 ft. in length and from 6 to 8 in. in diameter at the thickest end. Lancewood is used by carriage-builders for shafts; but since the practice of employing curved shafts has come largely into use it is not in so great demand as formerly. The smaller wood is used for whip-handles, for the tops of fishing-rods, and for various minor purposes where even-grained elastic wood is a desideratum. The wood is obtained from two members of the natural order Anonaceae. The black lancewood or carisiri of Guiana (*Guatteria virgata*) grows to a height of 50 ft., is of remarkably slender form, and seldom yields wood more than 8 in. diameter. The yellow lancewood tree (*Duguetia quitarensis*, yari-yari, of Guiana) is of similar dimensions, found in tolerable abundance throughout Guiana, and used by the Indians for arrow-points, as well as for spars, beams, &c.

LAN-CHOW-FU, the chief town of the Chinese province of Kan-suh, and one of the most important cities of the interior part of the empire, on the right bank of the Hwang-ho. The population is estimated at 175,000. The houses, with very few exceptions, are built of wood, but the streets are paved with blocks of granite and marble. Silks, wood-carvings, silver and jade ornaments, tin and copper wares, fruits and tobacco are the chief articles of the local trade. Tobacco is very extensively cultivated in the vicinity.

LANCIANO (anc. *Anxanum*), a town and episcopal see of the Abruzzi, Italy, in the province of Chieti, situated on three hills, 984 ft. above sea-level, about 8 m. from the Adriatic coast and 12 m. S.E. of Chieti. Pop. (1901) 7642 (town), 18,316 (commune). It has a railway station on the coast railway, 19 m. S.E. of Castellammare Adriatico. It has broad, regular streets, and several fine buildings. The cathedral, an imposing structure with a fine clock-tower of 1619, is built upon bridges of brickwork, dating perhaps from the Roman period (though the inscription attributing the work to Diocletian is a forgery), that span the gorge of the Feltrino, and is dedicated to S. Maria del Ponte, Our Lady of the Bridge. The Gothic church of S. Maria Maggiore dates from 1227 and has a fine façade, with a portal of 1317 by a local sculptor. The processional cross by the silversmith Nicola di Guardiagrele (1422) is very beautiful. In S. Nicola is a fine reliquary of 1445 by Nicola di Francavilla. The church of the Annunziata has a good rose window of 1362. The industries of the town, famous in the middle ages, have declined. Anxanum belonged originally to the tribe of the Frentani and later became a *municipium*. It lay on the ancient highroad, which abandoned the coast at Ortona 10 m. to the N. and returned to it at Histonium (Vasto). Remains of a Roman theatre exist under the bishop's palace.

See V. Bindi, *Monumenti degli Abruzzi* (Naples, 1889, 690 sqq.), and for discoveries in the neighbourhood see A. de Nino in *Notizie degli scavi* (1884), 431. (T. As.)

LANCRET, NICOLAS (1660–1743), French painter, was born in Paris on the 22nd of January 1660, and became a brilliant depicter of light comedy which reflected the tastes and manners of French society under the regent Orleans. His first master was Pierre d'Ulin, but his acquaintance with and admiration for Watteau induced him to leave d'Ulin for Gillot, whose pupil Watteau had been. Two pictures painted by Lancret and exhibited on the Place Dauphine had a great success, which laid the foundation of his fortune, and, it is said, estranged Watteau, who had been complimented as their author. Lancret's work cannot now, however, be taken for that of Watteau, for both in drawing and in painting his touch, although intelligent, is dry, hard and wanting in that quality which distinguished his great model; these characteristics are due possibly in part to the fact that he had been for some time in training under an engraver. The number of his paintings (of which over eighty have been engraved) is immense; he executed a few portraits and attempted historical composition, but his favourite subjects were balls, fairs, village weddings, &c. The British Museum possesses an admirable series of studies by Lancret in red chalk, and the National Gallery, London, shows four paintings—the "Four Ages of Man" (engraved by Desplaces and l'Armessin), cited by d'Argenville amongst the principal works of Lancret. In 1719 he was received as Academician, and became councillor in 1735; in 1741 he married a grandchild of Boursault, author of *Aesop at Court*. He died on the 14th of September 1743.

See d'Argenville, *Vies des peintres*; and Ballot de Sovot, *Éloge de M. Lancret* (1743, new ed. 1874).

LAND, the general term for that part of the earth's surface which is solid and dry as opposed to sea or water. The word is common to Teutonic languages, mainly in the same form and with essentially the same meaning. The Celtic cognate forms are Irish *lann*, Welsh *llan*, an enclosure, also in the sense of "church," and so of constant occurrence in Welsh place-names, Cornish *lan* and Breton *lann*, health, which has given the French *lande*, an expanse or tract of sandy waste ground. The ultimate root is unknown. From its primary meaning have developed naturally the various uses of the word, for a tract of ground or country viewed either as a political, geographical or ethnographical division of the earth, as property owned by the public or state or by a private individual, or as the rural as opposed to the urban or the cultivated as opposed to the built on part of the country; of particular meanings may be mentioned that of a building divided into tenements or flats, the divisions being known as "houses," a Scottish usage, and also that of a division of a ploughed field marked by the irrigating channels, hence transferred to the smooth parts of the bore of a rifle between the grooves of the rifling.

For the physical geography of the land, as the solid portion of the earth's surface, see GEOGRAPHY. For land as the subject of cultivation see AGRICULTURE and SOIL, also RECLAMATION OF LAND. For the history of the holding or tenure of land see VILLAGE COMMUNITIES and FEUDALISM; a particular form of land tenure is dealt with under MÉTAYAGE. The article AGRARIAN LAWS deals with the disposal of the public land (*Ager publicus*) in Ancient Rome, and further information with regard to the part played by the land question in Roman history will be found under ROME: § *History*. The legal side of the private ownership of land is treated under REAL PROPERTY and CONVEYANCING (see also LANDLORD AND TENANT, and LAND REGISTRATION).

LANDAU, a town in the Bavarian Palatinate, on the Queich, lying under the eastern slope of the Hardt Mountains, 32 m. by rail S.W. from Mannheim, at the junction of lines to Neustadt an der Hardt, Weissenburg and Saarbrücken. Pop. (1905) 17,165. Among its buildings are the Gothic Evangelical church, dating from 1285; the chapel of St Catherine built in 1344; the church of the former Augustinian monastery, dating from 1405; and the Augustinian monastery itself, founded in 1276 and now converted into a brewery. There are manufactures of cigars, beer, hats, watches, furniture and machines, and a trade in wine, fruit and cereals. Large cattle-markets are held here. Landau was founded in 1224, becoming an imperial city fifty years later. This dignity was soon lost, as in 1317 it passed to the bishopric of Spires and in 1331 to the Palatinate, recovering its former position in 1511. Captured eight times during the Thirty Years' War the town was ceded to France by the treaty of Westphalia in 1648, although with certain ill-defined reservations. In 1679 Louis XIV. definitely took possession of Landau. Its fortifications were greatly strengthened; nevertheless it was twice taken by the Imperialists and twice recovered by the French during the Spanish Succession War. In 1815 it was given to Austria and in the following year to Bavaria. The fortifications were finally dismantled in 1871.

The town is commonly supposed to have given its name to the four-wheeled carriage, with an adjustable divided top for use either open or closed, known as a "landau" (Ger. *Landauer*). But this derivation is doubtful, the origin of the name being also ascribed to that of an English carriage-builder, Landow, who introduced this form of equipage.

See E. Heuser, *Die Belagerungen von Landau in den Jahren 1702 und 1703* (Landau, 1894); Lehmann, *Geschichte der ehemaligen freien Reichsstadt Landau* (1851); and Jost, *Interessante Daten aus der 600 jährigen Geschichte der Stadt Landau* (Landau, 1879).

LANDECK, a town and spa in the Prussian province of Silesia, on the Biele, 73 m. by rail S. of Breslau and close to the Austrian frontier. Pop. (1905) 3,481. It is situated at an altitude of 1400 ft. It has manufactures of gloves. Landeck is visited by nearly 10,000 people annually on account of its warm sulphur baths, which have been known since the 13th century. In the neighbourhood are the ruins of the castle of Karpenstein.

See Langner, *Bad Landeck* (Glatz, 1872); Schütze, *Die Thermen von Landeck* (Berlin, 1895); Wehse, *Bad Landeck* (Breslau, 1886); Joseph, *Die Thermen von Landeck* (Berlin, 1887), and Patschovsky, *Führer durch Bad Landeck und Umgebung* (Schweidnitz, 1902).

LANDEN, JOHN (1719–1790), English mathematician, was born at Peakirk near Peterborough in Northamptonshire on the 23rd of January 1719, and died on the 15th of January 1790 at Milton in the same county. He lived a very retired life, and saw little or nothing of society; when he did mingle in it, his dogmatism and pugnacity caused him to be generally shunned. In 1762 he was appointed agent to the Earl Fitzwilliam, and held that office to within two years of his death. He was first known as a mathematician by his essays in the *Ladies' Diary* for 1744. In 1766 he was elected a fellow of the Royal Society. He was well acquainted with the works of the mathematicians of his own time, and has been called the "English d'Alembert." In his *Discourse* on the "Residual Analysis," he proposes to avoid the metaphysical difficulties of the method of fluxions by a purely algebraical method. The idea may be compared with that of Joseph Louis Lagrange's *Calcul des Fonctions*. His memoir (1775) on the rotatory motion of a body contains (as the author was aware) conclusions at variance with those arrived at by Jean le Rond, d'Alembert and Leonhard Euler in their researches on the same subject. He reproduces and further develops and defends his own views in his *Mathematical Memoirs*, and in his paper in the *Philosophical Transactions* for 1785. But Landen's capital discovery is that of the theorem known by his name (obtained in its complete form in the memoir of 1775, and reproduced in the first volume of the *Mathematical Memoirs*) for the expression of the arc of an hyperbola in terms of two elliptic arcs. His researches on elliptic functions are of considerable elegance, but their great merit lies in the stimulating effect which they had on later mathematicians. He also showed that the roots of a cubic equation can be derived by means of the infinitesimal calculus.

The list of his writings is as follows:—*Ladies' Diary*, various communications (1744–1760); papers in the *Phil. Trans.* (1754, 1760, 1768, 1771, 1775, 1777, 1785); *Mathematical Lucubrations* (1755); *A Discourse concerning the Residual Analysis* (1758); *The Residual Analysis*, book i. (1764); *Animadversions on Dr Stewart's Method of computing the Sun's Distance from the Earth* (1771); *Mathematical Memoirs* (1780, 1789).

LANDEN, a town in the province of Liége, Belgium, an important junction for lines of railway from Limburg, Liége and Louvain. Pop. (1904) 2874. It is the birthplace of the first Pippin, distinguished as Pippin of Landen from his grandson Pippin of Herstal. In 1693 the French under Marshal Luxemburg defeated here the Anglo-Dutch army under William III. This battle is also called Neerwinden from a village 3 m. W. of Landen. Here in 1793 the Austrians under Frederick of Saxe-Coburg and Clerfayt defeated the French under Dumouriez.

LANDER, RICHARD LEMON (1804–1834) and **JOHN** (1807–1839), English explorers of the Niger, were natives of Cornwall, sons of an innkeeper at Truro. At the age of eleven Richard went to the West Indies in the service of a merchant. Returning to England after an absence of three years he took service with various wealthy families, with whom he travelled on the continent. In 1823–1824 he accompanied Major (afterwards General Sir) W. M. Colebrooke, on a tour through Cape Colony. In 1825 Richard offered his services to Hugh Clapperton, then preparing for his second expedition to West Africa. He was Clapperton's devoted servant and companion in this expedition, and on Clapperton's death near Sokoto in April 1827 Richard Lander, after visiting Kano and other parts of the Hausa states, returned to the Guinea coast through Yoruba bringing with him Clapperton's journal. To this on its publication (1829) was added *The Journal of Richard Lander from Kano to the Coast*, and in the next year Lander published another account of the expedition entitled *Records of Captain Clapperton's Last Expedition to Africa . . . with the subsequent Adventures of the Author*. To this narrative he prefixed an autobiographical note. Richard Lander, though without any scientific attainments, had exhibited such capacity for exploration that the British government decided to send him out to determine the course of the lower Niger. In the expedition he was accompanied by his brother John, by trade a printer, and better educated than Richard, who went as an unsalaried volunteer. Leaving England in January 1830, the brothers landed at Badagry on the Guinea coast on the 22nd of March. They then travelled by the route previously taken by Clapperton to Bussa on the right bank of the Niger, reached on the 17th of June. Thence they ascended the river for about 100 m. Going back to Bussa the travellers began, on the 20th of September, the descent of the river, not knowing whither it would lead them. They journeyed in canoes accompanied by a few negroes, their only scientific instrument a common compass. They discovered the Benue river, ascertaining when passing its confluence, by paddling against its stream, that their course was not in that direction. At the beginning of the delta they were captured by the Ibos, from whom they were ransomed by "King Boy" of Brass Town; by him they were taken to the Nun mouth of the river, whence a passage was obtained to Fernando Po, reached on the 1st of December. The Landers were thus able to lay down with approximate correctness the lower course of the Niger—a matter till then as much in dispute as was the question of the Nile sources. In the attack by the Ibos the Landers lost many of their records, but they published a narrative of their discoveries in 1832, in three small volumes—*Journal of an Expedition to Explore the Course and Termination of the Niger*. In recognition of his services the Royal Geographical Society—formed two years previously—granted Richard Lander in 1832 the royal medal, he being the first recipient of such an award. In the same year Richard went to Africa again as leader of an expedition organized by Macgregor Laird and other Liverpool merchants to open up trade on the Niger and to found a commercial settlement at the junction of the Benue with the main stream. The expedition encountered many difficulties, suffered great mortality from fever, and was not able to reach Bussa. Lander made several journeys up and down stream, and while going up the river in a canoe was attacked by the natives on the 20th of January 1834 at a spot about 84 m. above the Nun mouth, and wounded by a musket ball in the thigh. He was removed to Fernando Po, where he died on the 6th of February. John Lander, who on his return to England in 1831 obtained a situation at the London customs house, died on the 16th of November 1839 of a disease contracted in Africa.

See, besides the books mentioned, the *Narrative* of the Niger expedition of 1832–1834, published in 1837 by Macgregor Laird and R. A. K. Oldfield.

LANDES, a department in the south-west of France, formed in 1790 of portions of the ancient provinces of Guyenne (Landes, Condomios Chalosse), Gascony and Béarn, and bounded N. by Gironde, E. by Lot-et-Garonne and Gers, S. by Basses Pyrenées, and W. (for 68 m.) by the Bay of Biscay. Pop. (1906) 293,397. Its area, 3615 sq. m., is second only to that of the department of Gironde. The department takes its name from the *Landes*, which occupy three-quarters of its surface, or practically the whole region north of the Adour, the chief river of the department. They are separated from the sea by a belt of dunes fringed on the east by a chain of lakes. South of the Adour lies the Chalosse—a hilly region, intersected by the Gabas, Luy and Gave de Pau, left-hand tributaries of the Adour, which descend from the Pyrenees. On the right the Adour is joined by the Midouze, formed by the junction of the Douze and the Midou. The climate of Landes is the Girondine, which prevails from the Loire to the Pyrenees. Snow is almost unknown, the spring is rainy, the summer warm and stormy. The prevailing wind is the south-west, and the mean temperature of the year is 53° F., the thermometer hardly ever rising above 82° or falling below 14°. The annual rainfall in the south of the department in the neighbourhood of the sea reaches 55 in., but diminishes by more than half towards the north-east.

The fertility of La Chalosse is counterbalanced by the comparative poorness of the soil of the Landes, and small though the population is, the department does not produce wheat enough for its own consumption. The chief cereal is maize; next in importance are rye, wheat and millet. Of vegetables, the bean is most cultivated. The vine is grown in the Chalosse, sheep are numerous, and the "Landes" breed of horses is well known. Forests, chiefly composed of pines, occupy more than half the department, and their exploitation forms the chief industry. The resin of the maritime pine furnishes by distillation essence of turpentine, and from the residue are obtained various qualities of resin, which serve to make varnish, tapers, sealing-wax and lubricants. Tar, and an excellent charcoal for smelting purposes, are also obtained from the pine-wood. The department has several mineral springs, the most important being those of Dax, which were frequented in the time of the Romans, and of Eugénie-les-Bains and Préchacq. The cultivation of the cork tree is also important. There are salt-workings and stone quarries. There are several iron-works in the department; those at Le Boucau, at the mouth of the Adour, are the most important. There are also saw-mills, distilleries, flour-mills, brick and tile works and potteries. Exports include resinous products, pine-timber, metal, brandy; leading imports are grain, coal, iron, millinery and furniture. In its long extent of coast the department has no considerable port. Opposite Cape Breton, however, where the Adour formerly entered the sea, there is, close to land, a deep channel where there is safe anchorage. It was from this once important harbour of Capbreton that the discoverers of the Canadian island of that name set out. Landes includes three arrondissements (Mont-de-Marsan, Dax and St Sever), 28 cantons and 334 communes.

Mont-de-Marsan is the capital of the department, which comes within the circumscription of the appeal court of Pau, the académie (educational division) of Bordeaux and the archbishopric of Auch, and forms part of the region of the 18th army corps. It is served by the Southern railway; there is some navigation on the Adour, but that upon the other rivers is of little importance. Mont-de-Marsan, Dax, St Sever and Aire-sur-l'Adour, the most noteworthy towns, receive separate notice. Hagetmau has a church built over a Romanesque crypt, the roof of which is supported on columns with elaborately-carved capitals. Sorde has an interesting abbey-church of the 13th and 14th centuries.

LANDES, an extensive natural region of south-western France, known more strictly as the Landes de Gascogne. It has an area of 5400 sq. m., and occupies three-quarters of the department of Landes, half of that of Gironde, and some 175,000 acres of Lot-et-Garonne. The Landes, formerly a vast tract of moorland and marsh, now consist chiefly of fields and forests of pines. They form a plateau, shaped like a triangle, the base of which is the Atlantic coast while the apex is situated slightly west of Nérac (Lot-et-Garonne). Its limits are, on the S. the river Adour; on the E. the hills of Armagnac, Eauzan, Condomois, Agenais and Bazadais; and on the N.E. the Garonne, the hills of Médoc and the Gironde. The height of the plateau ranges in general from 130 to 260 ft.; the highest altitude (498 ft.) is found in the east near Baudignan (department of Landes), from which point there is a gradual slope towards north, south, east and west. The soil is naturally sterile. It is composed of fine sand resting on a subsoil of tufa (*alios*) impermeable by water; for three-quarters of the year, consequently, the waters, settling on the almost level surface and unable to filter through, used to transform the country into unwholesome swamps, which the Landesats could only traverse on stilts. About the middle of the 18th century an engineer, François Chambrelent, instituted a scheme of draining and planting to remedy these evils. As a result about 1600 m. of ditches have been dug which carry off superficial water either to streams or to the lakes which fringe the landes on the west, and over 1,600,000 acres have been planted with maritime pines and oaks. The coast, for a breadth of about 4 m., and over an area of about 225,000 acres, is bordered by dunes, in ranges parallel to the shore, and from 100 to 300 ft. in height. Driven by the west wind, which is most frequent in these parts, the dunes were slowly advancing year by year towards the east, burying the cultivated lands and even the houses. Nicolas Thomas Brémontier, towards the end of the 18th century, devised the plan of arresting this scourge by planting the dunes with maritime pines. Upwards of 210,000 acres have been thus treated. In the south-west, cork trees take the place of the pines. To prevent the formation of fresh dunes, a "dune littorale" has been formed by means of a palisade. This barrier, from 20 to 30 ft. high, presents an obstacle which the sand cannot cross. On the eastern side of the dunes is a series of lakes (Hourtin et Carcans, Lacanau, Cazau or Sanguinet, Biscarrosse, Aureilhan, St Julien, Léon and Soustons) separated from the sea by the heaping up of the sand. The salt water has escaped by defiltration, and they are now quite fresh. The Basin of Arcachon, which lies midway between the lakes of Lacanau and Cazau, still communicates with the ocean, the current of the Leyre which flows into it having sufficient force to keep a passage open.

LANDESHUT, a town in the Prussian province of Silesia, at the north foot of the Riesengebirge, and on the river Bober, 65 m. S.W. of Breslau by rail. Pop. (1905) 9000. Its main industries are flax-spinning, linen-weaving and manufactures of cloth, shoes and beer. The town dates from the 13th century, being originally a fortress built for protection against the Bohemians. There the Prussians defeated the Austrians in May 1745, and in June 1760 the Prussians were routed by a greatly superior force of Austrians.

See Perschke, *Beschreibung und Geschichte der Stadt Landeshut* (Breslau, 1829).

LANDGRAVE (Ger. *Landgraf*, from *Land*, "a country" and *Graf*, "count"), a German title of nobility surviving from the times of the Holy Roman Empire. It originally signified a count of more than usual power or dignity, and in some cases implied sovereignty. The title is now rare; it is borne by the former sovereign of Hesse-Homburg, now incorporated in Prussia, the heads of the various branches of the house of Hesse, and by a branch of the family of Fürstenberg. In other cases the title of landgrave is borne by German sovereigns as a subsidiary title; *e.g.* the grand-duke of Saxe-Weimar is landgrave of Thuringia.

LANDLORD AND TENANT. In *Roman Law*, the relationship of landlord and tenant arose from the contract of letting and hiring (*locatio conductio*), and existed also with special incidents, under the forms of tenure known as *emphyteusis*—the long lease of Roman law—and *precarium*, or tenancy at will (see ROMAN LAW).

Law of England.—The law of England—and the laws of Scotland and Ireland agree with it on this point—recognizes no absolute private ownership of land. The absolute and ultimate owner of all land is the crown, and the highest interest that a subject can hold therein—viz. an estate in fee simple—is only a tenancy. But this aspect of the law, under which the landlord, other than the crown, is himself always a tenant, falls beyond the scope of the present article, which is restricted to those holdings that arise from the hiring and leasing of land.

The legal relationship of landlord and tenant is constituted by a lease, or an agreement for a lease, by assignment, by attornment and by estoppel. And first of a lease and an agreement for a lease.

Leases.

All kinds of interests and property, whether corporeal, such as lands or buildings, or incorporeal, such as rights of common or of way, may be let. The Benefices Act 1898, however, now prohibits the grant of a lease of an advowson. Titles of honour, offices of trust or relating to the administration of justice, and pensions granted by the crown for military services are also inalienable. Generally speaking, any person may grant or take a lease. But there are a number of common-law and statutory qualifications and exceptions. A lease by or to an infant is voidable at his option. But extensive powers of leasing the property of infants have been created by the Settled Estates Act 1877 and the Settled Land Act 1882. A person of unsound mind can grant or take a lease if he is capable of contracting. Leases may be made on behalf of lunatics subject to the jurisdiction in lunacy under the provisions of the Lunacy Act 1890 and the Settled Land Act 1882. A married woman can lease her "separate property" apart from or under the Married Women's Property Acts, as if she were a single woman (*feme sole*). As regards other property, the concurrence of her husband is generally necessary. An alien was, at common law, incapable of being either a lessor or a lessee. But this disqualification is removed by the Naturalization Act 1870. The right to deal with the property of a convict while he is undergoing sentence (but not while he is out of prison on leave) is, by the Forfeiture Act 1870, vested in his administrator. Leases by or to corporations must be by deed under their common seal, and the leasing powers of ecclesiastical corporations in particular are subject to complicated statutory restrictions which cannot here be examined (see Phillimore, *Eccl. Law*, 2nd ed., p. 1281). Powers of granting building and other leases have been conferred by modern legislation on municipal corporations and other local authorites.

A person having an interest in land can, in general, create a valid interest only to the extent of that interest. Thus a tenant for years, or even from year to year only, may stand in his turn as landlord to another tenant. If he profess, however, to create a tenancy for a period longer than that to which his own interest extends, he does not thereby give to his tenant an interest available against the reversioner or remainder man. The subtenant's interest will expire with the interest of the person who created it. But as between the subtenant and his immediate lessor the subtenancy will be good, and should the interest of the lessor become greater than it was when the subtenancy was created the subtenant will have the benefit of it. On his side, again, the subtenant, by accepting that position, is estopped from denying that his lessor's title (whatever it be) is good. There are also special rules of law with reference to leases by persons having only a limited interest in the property leased, *e.g.* a tenant for life under the Settled Land Acts, or a mortgagor or mortgagee.

The Letting.—To constitute the relationship of landlord and tenant in the mode under consideration, it is necessary not only that there should be parties capable of entering into the contract, but that there should be a letting, as distinct from a mere agreement to let, and that the right conveyed should be a right to the exclusive possession of the subject of the letting and not a simple licence to use it. Whether a particular instrument is a lease, or an agreement for a lease, or a bare licence, is a question the answer to which depends to a large extent on the circumstances of individual cases; and the only general rule is that in a lease there must be an expression of intention on the part of the lessor to convey, and of the lessee to accept, the exclusive possession of the thing let for the prescribed term and on the prescribed conditions. The landlord must not part with the whole of his interest, since, if he does so, the instrument is not a lease but an assignment. Where a tenant enters under an agreement for a lease and pays rent, the agreement will be regarded as a lease from year to year; and if the agreement is one of which specific performance would be decreed (*i.e.* if it contains a complete contract between the parties and satisfies the provisions—to be noted immediately—of the Statute of Frauds, and if, in all the circumstances, its enforcement is just and equitable), the lessee is treated as having a lease for the term fixed in the agreement from the time that he took possession under it, just as if a valid lease had been executed. At common law a lease for a term of years (other than a lease by a corporation) might be made by parol. But under the Statute of Frauds (1677), ss., 1, 2) leases, except those the term of which does not exceed three years, and in which the reserved rent is equal to two-thirds at least of the improved value of the premises, were required to be in writing signed by the parties or their lawfully authorized agents; and, under the Real Property Act 1845, a lease required by law to be in writing is void unless made by deed. The Statute of Frauds also prohibits an action from being brought upon any agreement for a lease, for any term, unless such agreement is in writing and signed by the party to be charged therewith or by some agent lawfully authorized by him.

Forms of Tenancy.—The following are the principal forms of tenancy: (i.) *Tenancy for Life.*—A lease for life must be made by deed, and the term may be the life of the lessee and the life or lives of some other person or persons, and in the latter case either for their joint lives or for the life of the survivor; also for the lives of the lessee himself and of some other person or persons, and this constitutes a single estate. A tenant for life under a settlement has extensive powers of leasing under the Settled Land Act 1882. He may lease the settled land, or any part of it, for any time not exceeding (*a*) in the case of a building lease, 99 years; (*b*) in the case of a mining lease, 60 years, (*c*) in the case of any other lease, 21 years. He may also grant either a lease of the surface of settled land, reserving the mines and minerals, or a lease of the minerals without the surface. A lease under the Settled Land Act 1882 must be by deed and must be made to take effect in possession not later than 12 months after its date; the best rent that can reasonably be obtained must be reserved and the lease must contain a covenant by the lessee for payment of the rent, and a condition of re-entry on non-payment within a specified time not exceeding 30 days. (ii.) *Tenancy for Years, i.e.* for a term of years.—This tenancy is created by an express contract between the parties and never by implication, as in the case of tenancy from year to year and tenancy at will. Here the tenancy ends on the expiry of the prescribed term, without notice to quit or any other formality. (iii.) *Tenancy from Year to Year.*—This tenancy may be created by express agreement between the parties, or by implication as, *e.g.* where a person enters and pays rent under a lease for years, void either by law or by statute, or without any actual lease or agreement, or holds over after the determination of a lease whether for years or otherwise. In the absence of express agreement or custom or statutory provision (such as is made by the Agricultural Holdings Act 1883), a tenancy from year to year is determinable on half a year's notice expiring at the end of some current year of the tenancy. Where there is no express stipulation creating a yearly tenancy, if the parties have contracted that the tenant may be dispossessed by a notice given at any time, effect will be given to this provision. The common law doctrine of a six months' notice being required to terminate a tenancy from year to year of a corporeal hereditament, does not apply to an incorporeal hereditament such as a right to shoot. (iv.) *Tenancies for Shorter Periods.*—Closely associated with tenancies from year to year are various other tenancies for shorter periods than a year—weekly, monthly or quarterly. Questions of considerable importance frequently arise as to the notice necessary to terminate tenancies of this character. The issue is one of fact; the date at which the rent is payable is a material circumstance, but it may be said generally that a week's notice should be given to determine a weekly tenancy, a month's to determine a monthly tenancy, and a quarter's to determine a quarterly tenancy. It is chiefly in connexion with the letting of lodgings, flats, &c., that tenancies of this class arise (see FLATS, LODGER AND LODGINGS). (v.) *Tenancy at Will.*—A tenancy at will is one which endures at the will of the parties only, *i.e.* at the will of both, for if a demise be made to hold at the will of the lessor, the law implies that it is at the will of the lessee also and vice versa. Any signification of a desire to terminate the tenancy, whether expressed as "notice" or not, will bring it to an end. This form of tenancy, like tenancy from year to year, may be treated either by express contract or by implication, as where premises are occupied with the consent of the owner, but without any express or implied agreement as to the duration of the tenancy, or where a house is lent rent free by one person to another. A tenancy at will is determined by either party alienating his interest as soon as such alienation comes to the knowledge of the other. (vi.) *Tenancy at Sufferance.*—A tenant who comes into possession by a lawful demise, but "holds over" or continues in possession after his estate is ended, is said to be a "tenant at sufferance." Properly speaking, tenancy at sufferance is not a tenancy at all, inasmuch as if the landlord acquiesces in it, it becomes a tenancy at will; and it is to be regarded merely as a legal fiction which prevented the rightful owner from treating the tenant as a trespasser until he had himself made an actual entry on or had brought an action to recover the land. The Distress for Rent Act 1737, however, enables a landlord to recover double rent from a tenant who holds over after having himself given notice to quit; while another statute in the reign of George II.—the Landlord and Tenant Act 1730—makes a tenant who holds over after receiving a notice from his landlord liable to the extent of double the value of the premises. There is no tenancy by sufferance against the crown.

Form of a Lease.—The component parts of a lease are the parties, the recitals (when necessary) setting out such matters as the title of the lessor; the demise or actual letting (the word "demise" is ordinarily used, but any term indicating an express intention to make a present letting is sufficient); the parcels in which the extent of the premises demised is stated; the *habendum* (which defines the commencement and the term of the lease), the *reddendum* or reservation of rent, and the covenants and conditions. The Conveyancing Act 1881 provides that, as regards conveyances subsequent to 1881, unless a contrary intention is expressed, a lease of "land" is to be deemed to include all buildings, fixtures, easements, &c., appertaining to it; and, if there are houses or other buildings on the land demised, all out-houses, erections, &c., are to pass with the lease of the land. Rights which the landlord desires to retain over the lands let are excepted or reserved. Sporting rights will pass to the lessee unless reserved (see GAME LAWS). A grant or reservation of mines in general terms confers, or reserves, a right to work the mines, subject to the obligation of leaving a reasonable support to the surface as it exists at the time of the grant or reservation. It is not necessary that a lease should be dated. In the absence of a date, it will take effect from the day of delivery.

Covenants in Leases.—These may be roughly divided into four groups: (i.) *Implied Covenants.*—A covenant is said to be implied when it is raised by implication of law without any express provision being made for it in the lease. Thus a lessee is under an implied obligation to treat the premises demised in a tenant-like or "husband-like" manner, and again, where in a lease by deed the word "demise" is used, the lessor probably covenants impliedly for his own title and for the quiet enjoyment of the premises by the lessee. (ii.) "*Usual*" *Covenants.*—Where an agreement for a lease specifies only such essential conditions as the payment of rent, and either mentions no other terms, or provides that the lease shall contain the "usual" covenants, the parties are entitled to have inserted in the lease made in pursuance of the agreement such other provisions as are "usual" in leases of property of the same character, and in the same district, not being provisions tending to abridge or qualify the legal incidents of the estate intended to be granted to the lessee. The question what covenants are "usual" is a question of fact. A covenant by the lessor, limited to his own acts and those of persons claiming under or through him, for the "quiet enjoyment" by the lessee of the demised premises, and covenants by the lessee to pay rent, to pay taxes, except such as fall upon the landlord, to keep the premises in repair, and to allow the landlord to enter and view the condition of the premises may be taken as typical instances of "usual" covenants. Covenants by the lessee to build and repair, not to assign or underlet without license, or to insure, or not to carry on a particular trade on the premises leased, have been held not to be "usual." Where the agreement provides for the insertion in the lease of "proper" covenants, such covenants only are pointed at as are calculated to secure the full effect of the contract, and a covenant against assignment or under-letting would not ordinarily be included. (iii.) *The Covenants running with the Land.*—A covenant is said to "run with the land" when the rights and duties which it creates are not merely personal to the immediate parties (in which case a covenant is said to be "collateral"), but pass also to their assignees. At common law, it was said that covenants "ran with the land" but not with the reversion, the assignee of the reversion not having the rights of the original lessor. But the assignees of both parties were placed on the same footing by a statute of Henry VIII. (1540). A covenant "runs with the land" if it relates either to a thing *in esse*, which is part and parcel of the demise, *e.g.* the payment of rent, the repair of houses or fixtures or machinery already built or set up, or to a thing not *in esse* at the time of the demise, but touching the land, provided that the word "assigns" is used in the covenant. All implied covenants run with the land. As instances of "collateral" covenants, we may take a covenant by a lessor to give the lessee a right of pre-emption over a piece of land adjoining the subject of the demise, or in the case of a lease of a beer-shop, not to keep any similar shop within a prescribed distance from the premises demised, or a covenant by a lessee to pay rates on premises not demised. A covenant not to assign without the lessor's assent runs with the land and applies to a re-assignment to the original lessee. (iv.) *Restrictive Covenants.*—These may be subdivided into two classes—covenants not to assign or underlet without the lessor's consent (it may be noted that such consent must be applied for even if, under the covenant, it cannot be withheld); and covenants in restraint of trade, *e.g.* not to use the demised premises for certain trading purposes, and in the case of "tied houses" a covenant by the lessees to purchase all beer required from the lessors.

In addition a lease frequently contains covenants for renewal of the lease at the option of the lessee, and for repairs or insurance against damage by fire by the lessee. Leases frequently contain a covenant by the lessee to bear and pay rates, taxes, assessments and other "impositions" or "charges," or "duties" or "outgoings," or "burdens" (except property tax) imposed upon the demised premises during the term. Considerable difficulty has arisen as to the scope of the terms "impositions," "charges," "duties," "outgoings," "burdens." The words, "rates, taxes, assessments" point to payments of a periodical or recurring character. Are the latter words in such covenants limited to payments of this kind, or do they include single and definite payments demanded, for example, by a local authority, acting under statutory powers, for improvements of a permanent kind affecting the premises demised? The decisions on the point are numerous and difficult to reconcile, but the main test is whether, on the true construction of the particular covenant, the lessee has undertaken to indemnify the landlord against payments of all kinds. The stronger current of modern authority is in favour of the landlords and not in favour of restricting the meaning of covenants of this class. It may be added that, if a lessee covenants to pay rates and taxes, no demand by the collector apparently is necessary to constitute a breach of the covenant; where a rate is duly made and published it is the duty of the parties assessed to seek out the collector and pay it.

Mutual Rights and Liabilities of Landlord and Tenant.—These are to a large extent regulated by the covenants of the lease. (i.) The landlord generally covenants—and, in the absence of such a proviso, a covenant will be implied from the fact of letting—that the tenant shall have quiet enjoyment of the premises for the time agreed upon. This obligation makes the landlord responsible for any lawful eviction of the tenant during the term, but not for wrongful eviction unless he is himself the wrongdoer or has expressly made himself responsible for evictions of all kinds. It may be noted here that at common law no lease for years is complete till actual entry has been made by the lessee. Till then, he has only a right of entry or *interesse termini.* (ii.) The tenant, on his part, is presumed to undertake to use the property in a reasonable manner, according to the purposes for which it was let, and to do reasonable repairs.

Repairs. A landlord is not presumed to have undertaken to put the premises in repair, nor to execute repairs. But the respective obligations of parties where repairs are, as they always are in leases for years, the subject of express covenant, may vary indefinitely. The obligation is generally imposed upon the tenant to keep the premises in "good condition" or "tenantable repair." The amount and quality of the repairs necessary to fulfil the covenant are always relative to the age, class and condition of the premises at the time of the lease. A tenant is not responsible, under such a covenant, for deterioration due to diminution in value caused by lapse of time or by the elements. Where there is an unqualified covenant to repair, and the premises during the tenancy are burnt down, or destroyed by some other inevitable calamity, the tenant is bound to rebuild and restore them at his own expense, even although the landlord has taken out a policy on his own account and been paid by the insurance company in respect of it. A covenant to keep in repair requires the tenant to put the premises in repair if they are out of it, and to maintain them in that condition up to and at the end of the tenancy. A breach of the covenant to repair gives the landlord an action for damages which will be measured by the estimated injury to the reversion if the action be brought during the tenancy, and by the sum necessary to execute the repairs, if the action be brought later. (iii.) The improper user of the premises to the injury of the reversioner is *waste* (*q.v.*). (iv.) Covenants by the tenants to insure the premises and keep them insured are also common; and if the premises are left uninsured for the smallest portion of the term, though there is no damage by fire, the covenant is broken. (v.) Covenants to bear and pay rates and taxes have been discussed above. (vi.) As to the tenant's obligation to pay rent, see Rent.

Assignment, Attornment, Estoppel.—The relationship of landlord and tenant may be altered either voluntarily, by the act of the parties, or involuntarily, by the operation of law, and may also be dissolved. The principal mode of voluntary alteration is an assignment either by the tenant of his term or by the landlord of his reversion. An assignment which creates the relationship of landlord and tenant between the lessor or lessee and the assignee, must be by deed, but the acceptance by a landlord of rent from a tenant under an invalid assignment may create an implied tenancy from year to year; and similarly payment of rent by a tenant may amount to an acknowledgment of his landlord's title. This is one form of tenancy by estoppel. The principle of all tenancies of this kind is that something has been done by the party estopped, amounting to an admission which he cannot be allowed to contradict. "Attornment," or the agreement by a tenant to become tenant to a new landlord, is a term now often used to indicate an acknowledgment of the existence of the relationship of landlord and tenant. It may be noted that it is still common to insert in mortgage deeds what is called an "attornment clause," by which the mortgagor "attorns" tenant to the mortgagee, and the latter thereupon acquires a power of distress as an additional security. If the lands assigned are situated in Middlesex or Yorkshire, the assignment should be registered under the Middlesex Registry or Yorkshire Registries Acts, as the case may be; and similar provision is now made for the registration by an assignee of his title under the Land Transfer Acts 1875 and 1897.

Underlease.—Another form of alteration in a contract of tenancy is an under-lease, which differs from assignment in this—that the lessor parts with a portion of his estate instead of, as in assignment, with the whole of it. There is no privity of contract between an underlessee and the superior landlord, but the latter can enforce against the former restrictive covenants of which he had notice; it is the duty of the underlessee to inform himself as to the covenants of the original lease, and, if he enters and takes possession, he will be considered to have had full notice of, and will be bound by, these covenants.

Bankruptcy, Death.—The contract of tenancy may also be altered by operation of law. If a tenant become bankrupt, his interest passes to his trustee in bankruptcy—unless, as is frequently the case, the lease makes the occurrence of that contingency determine the lease. So, on the death of a tenant, his interest passes to his legal representatives.

Dissolution of Tenancy.—Tenancy is dissolved by the expiry of the term for which it was created, or by forfeiture of the tenant's interest on the ground of the breach of some condition by the tenant and re-entry by the landlord. A breach of condition may, however, be waived by the landlord, and the legislature has made provision for the relief of the tenant from the consequences of such breaches in certain cases. Relief from forfeiture and rights of re-entry are now regulated chiefly by the Conveyancing Acts 1881 and 1882. Under these acts a right of re-entry or forfeiture is not to be enforceable unless and until the lessor has served on the lessee a written notice specifying the breach of covenant or condition complained of, and requiring him to remedy it or make compensation, and this demand has not within a reasonable time been complied with; and when a lessor is proceeding to enforce such a right the court may, if it think fit, grant relief to the lessee. A forfeiture is also waived if the landlord elects not to take advantage of it—and shows his election either expressly or impliedly by some act, which acknowledges the continuance of the tenancy, *e.g.* by the acceptance of, or even by an absolute and unqualified demand for, rent, which has accrued due since the forfeiture, by bringing an action for such rent, or by distraining for rent whether due before or after the forfeiture.

A tenancy may also be determined by merger, *i.e.* where a greater and a less estate coincide and meet in one and the same person, without any intermediate estate, as, for instance, when a tenant for years obtains the fee simple. There may also be a surrender, either voluntary or by operation of law, which will determine a tenancy, as, for example, when a tenant is party to some act, the validity of which he is legally estopped from denying and which would not have been valid had the tenancy continued to exist.

The land, on the expiration of the tenancy, becomes at common law the absolute property of the landlord, no matter how it may have been altered or improved during the occupation. In certain cases, however, the law has discriminated between the contending claims of landlord and tenant. (1) In respect of *fixtures* (which may be shortly defined as movables so affixed to the soil as to become part thereof), the tenant may sometimes remove them, *e.g.* when they have been brought on the premises for the purpose of being used in business (see Fixtures). (2) In respect of *emblements*, *i.e.* the profits of sown land, a tenant may be entitled to these whose term comes to an end by the happening of an uncertain contingency (see Emblements). (3) A similar right is very generally recognized by custom in tenants whose term expires in the ordinary way. The custom of the district, in the absence of stipulations between the parties, would be imported into their contract—the tenant going out on the same conditions as he came in. Such customary tenant right only arises at the expiration of the lease, and on the substantial performance of the covenants; and is forfeited if the tenant abandons his tenancy during the term. Tenant right is assignable, and will pass under an assignment of "all the estate and interest" of the outgoing tenant in the farm. But, with the exceptions noted, the land in its improved condition passes over at common law to the landlord. The tenant may have added to its value by buildings, by labour applied to the land, or by the use of fertilizing manures, but, whatever be the amount of the additional value, he is not entitled to any compensation whatever. This again is a matter which the parties may, if they please, regulate for themselves.

The law as to *Ejectment* is dealt with under that heading.

Statutory Provisions.—Reference may be made, in conclusion, to a few modern statutes which have affected the law of landlord and tenant. The Agricultural Holdings Act 1908 (which repeals the Agricultural Holdings Acts of 1883, 1900 and 1906) gives to the agricultural tenant a right to compensation for (i.) certain specified improvements made by him with the landlord's previous consent in writing; and (ii.) certain other classes of improvements although the landlord's consent has not been obtained. As examples of class (i.) may be mentioned—erection or enlargement of buildings, laying down of permanent pasture, making of gardens or fences, planting of hops, embankments and sluices; as examples of (ii.)—chalking of land, clay burning, application to land of purchased artificial or purchased manure, except they have been made for the purpose of making provision to protect the holding from injury or deterioration. In the case of proposed drainage improvements, notice in writing must be given to the landlord, who may then execute the improvements himself and charge the tenant with interest not exceeding 5% per annum on the outlay, or such annual instalments, payable for a period of twenty-five years, and recoverable as rent, as will repay the outlay, with interest at the rate of 3% a year. Under s. 11 of the act a tenant is entitled to compensation for disturbance, when he is compelled to quit without good and sufficient cause, and for reasons inconsistent with good estate management. An agricultural tenant may not contract himself out of his statutory right to compensation, but "contracting out" is apparently not prohibited with regard to the right given him by the acts of 1883 and 1900 to remove fixtures which he has erected and for which he is not otherwise entitled to compensation, after reasonable notice to the landlord, unless the latter elects to purchase such fixtures at a valuation. The Agricultural Holdings Act 1906 conferred upon every tenant (with slight exceptions) entire freedom of cropping and of disposal of produce, notwithstanding any custom of the county or explicit agreement to the contrary. (See further the articles Ejectment, Fixtures, Rent.) The Small Holdings and Allotments Act 1908, which repealed previous acts of 1887, 1890 and 1907, deals, on terms similar to those of the Agricultural Holdings Act 1908, with small holdings and allotments (the expression "small holding" meaning an agricultural holding which exceeds one acre, and either does not exceed fifty acres, or, if exceeding fifty acres, is at the date of sale or letting of an annual value for the purposes of income tax not exceeding fifty pounds; the expression "allotment" includes a field garden). Section 47 of the act gives the tenant the same rights to compensation as if his holding had been a holding under the Agricultural Holdings Act 1908 (*vide supra*). Compensation was given to market gardeners for unexhausted improvements by the Market Gardeners' Compensation Act 1895 and by the Agricultural Holdings Act 1906 for improvements effected before the commencement of that act on a holding cultivated to the knowledge of the landlord as a market garden, if the landlord had not dissented in writing to the improvements. The important sections of these acts were incorporated in the Agricultural Holdings Act 1908, s. 42.

Scots Law.—The original lease in Scots law took the form of a grant by the proprietor or lessor. But, with advancing civilization and the consequent increase in the number of the conditions to be imposed on both parties, leases became mutual contracts, bilateral in form. The law of Scotland as to landlord and tenant may be considered under two main heads:—I. *Ordinary Leases, Common Law and Statutory*; II. *Building or Long Leases.*

I. *Ordinary Leases, Common Law and Statutory.*—A verbal lease for a year is good. Such a lease for more than a year is not effectual even for a year, except where the lessee has taken possession. At common law, while a lease was binding on the grantor and his heirs, it was not good against "singular successors," *i.e.* persons acquiring by purchase or adjudication, and the lessee was liable to be ejected by such persons, unless (a precaution usually taken) sasine of the subjects demised was expressly conferred on him by the lease. To obviate this difficulty, the Scots Act 1449, c. 18, made possession of the subjects of the lease equivalent to sasine. This enactment applies to leases of agricultural subjects, houses, mills, fisheries and whatever is *fundo annexum*; provided that (*a*) the lease, when for more than one year, must be in writing, (*b*) it must be definite as to subject, rent (which may consist of money, grain or services, if the *reddendum* is not illusory) and term of duration, (*c*) possession must follow on the lease. Special powers of granting leases are conferred by statute on trustees. (Trusts [Scotland] Act 1867, s. 2), *curatores bonis* (Judicial Factors [Scotland] Act 1889) and heirs of entail (cf. Entail Act 1882, ss. 5, 6, 8, 9). The requisites of the statutory leases, last mentioned, are similar to those imposed in England upon tenants for life by the Settled Land Acts (*v. sup.* p. 3). The rent stipulated for must not be illusory, and must fairly represent the value of the subjects leased, and the term of the lease must not be excessive (as to rent generally, see Rent). A life-renter can only grant a lease that is effectual during the subsistence of the life-rent. There is practically no limitation, but the will of the parties, as to the persons to whom a lease may be granted. A lease granted to a tenant by name will pass, on his death during the subsistence of the term to his heir-at-law, even if the lease contains no destination to heirs. The rights and obligations of the lessor and the tenant (*e.g.* as to the use of the produce, the payment of rent, the quiet possession of the subjects demised, and as to the payment of rates and taxes) are similar to those existing under English law. An agricultural lease does not, apart from stipulation, confer any right to kill game, other than hares and rabbits (as to which, see the Ground Game Act 1880, and Game Laws) or any right of fishing. A tenant is not entitled, without the landlord's consent, to change the character of the subjects demised, and, except under an agricultural lease, he is bound to quit the premises on the expiration of the lease. In the case of urban leases, however, ejectment (*q.v.*)—called in Scots Law "removing"—will not be authorized unless the tenant received 40 days' warning before the term of removal. In the absence of such notice, the parties are held, if there be nothing in their conduct or in the lease inconsistent with this presumption, to renew their agreement in all its terms, and so on from year to year till due notice is given. This is called "tacit relocation." A lease may be transmitted (i.) by "assignation," intimated to the landlord, and followed by possession on the part of the assignee; (ii.) by sub-lease—the effect of which is equivalent to that of under-lease in English law; (iii.) by succession, as of the heir of a tenant; (iv.) in the case of agricultural holdings, by bequest (Agricultural Holdings [Scotland] Act 1883, s. 29). A lease terminates (i.) by the expiration of its term or by advantage being taken by the party in whose favour it is stipulated, of a "break" in the term; (ii.) by the occurrence of an "irritancy" of ground of forfeiture, either conventional, or statutory, *e.g.* where a tenant's rent is in arrear, or he fails to remove on the expiry of his lease (Act of Sederunt, 14th of Dec. 1756: Agricultural Holdings Act 1883, s. 27); (iii.) by the bankruptcy or insolvency of the tenant, at the landlord's option, if it is so stipulated in the lease; (iv.) by the destruction, *e.g.* by fire, of the subject leased, unless the landlord is bound to restore it. Complete destruction of the subject leased, *e.g.* where a house is burnt down, or a farm is reduced to "sterility" by flood or hurricane, discharges the tenant from the obligation to pay rent. The effect of partial destruction has given rise to some uncertainty. "The distinction seems to be that if the destruction be permanent, though partial, the failure of the subject let will give relief by entitling the tenant to renounce the lease, unless a deduction shall be allowed, but that if it be merely temporary or occasional, it will not entitle the tenant to relief" (Bell's *Prin.* s. 1208). Agricultural leases usually contain special provisions as to the order of cropping, the proper stocking of the farm, and the rights of the incoming and outgoing tenant with regard to the waygoing crop. Where the rent is in money, it is generally payable at Whitsunday and Martinmas—the two "legal terms." Sometimes the term of payment is *before* the crop is reaped, sometimes *after*. "The terms thus stipulated are called 'the conventional terms'; the rent payable by anticipation being called 'forehand rent,' that which is payable after the crop is reaped, 'back rent.' Where the rent is in grain, or otherwise payable in produce, it is to be satisfied from the produce of the farm, if there be any. If there be none the tenant is bound and entitled to deliver fair marketable grain of the same kind." (Bell's *Principles*, ss. 1204, 1205). The general rule with regard to "waygoing crops" on arable farms is that the tenant is entitled to reap the crop sown before the term of removal (whether or not that be the natural termination of the lease), the right of exclusive possession being his during seed time. But he is not entitled to the use of the barns in threshing, &c., the corn.

The Agricultural Holdings (Scotland) Acts 1883 and 1900, already referred to incidentally, contain provisions—similar to those of the English acts—as to a tenant's right to compensation for unexhausted improvements, removal for non-payment of rent, notice to quit at the termination of a tenancy, and a tenant's property in fixtures. The Crofters' Holdings (Scotland) Acts 1886, 1887 and 1888, confer on "crofters" special rights. A crofter is defined as "a tenant of a holding"—being arable or pasture land, or partly arable and partly pasture land—"from year to year who resides on his holding, the annual rent of which does not exceed £30 in money, and which is situated in a 'crofting parish.'" Nearly all the parishes in Argyll, Inverness, Ross, Cromarty, Sutherland, Caithness and Orkney and Shetland answer to this description. The crofter enjoys a perpetual tenure subject to the fulfilment of certain conditions as to payment of rent, non-assignment of tenancy, &c., and to defeasance at his own option on giving one year's notice to the landlord. A Crofters' Commission constituted under the acts has power to fix fair rents, and the crofter on renunciation of his tenancy or removal from his holding is entitled to compensation for permanent improvements. The Small Holdings Act 1892 applies to Scotland.

Under the law of Scotland down to 1880, a landlord had as security for rent due on an agricultural lease a "hypothec"—*i.e.* a preferential right over ordinary creditors, and extending, subject to certain limitations, over the whole stock and crop of the tenant. This right was enforceable by sequestration and sale. It was abolished in 1880 as regards all leases entered into after the 11th of November 1881, where the land demised exceeded two acres in extent, and the landlord was left to remedies akin to ejectment (Hypothec Abolition, Scotland, Act 1880).

II. *Building or Long Leases.*—Under these leases, the term of which is usually 99 and sometimes 999 years, the tenant is to a certain extent in the position of a fee simple proprietor, except that his right is terminable, and that he can only exercise such rights of ownership as are conferred on him either by statute or by the terms of his lease. Extensive powers of entering into such leases have been given by statute to trustees subject to the authority of the Court (Trusts [Scotland] Act 1867, s. 3) and to heirs of entail (Entail Acts 1840, 1849, 1882). Where long leases are "probative," *i.e.* holograph or duly tested, do not exceed 31 years, or, except as regards leases of mines and minerals, and of lands held by burgage tenure, relate to an extent of land exceeding 50 acres, and contain provisions for renewal, they may be recorded for publication in the *Register of Sasines*, and such publication has the effect of possession (Registration of Leases [Scotland] Act 1857).

Ireland.—The law of landlord and tenant was originally substantially the same as that described for England is. But the modern Land Acts have readjusted the relation between landlords and tenants, while the Land Purchase Acts have aimed at abolishing those relations by enabling the tenant to become the owner of his holding. The way was paved for these changes by the existence in Ulster of a local custom having virtually the force of law, which had two main features—fixity of tenure, and free right of sale by the tenant of his interest. These principles, with the addition of that of fair rents settled by judicial means, were gradually established by the Land Acts of 1870 and subsequent years, and the whole system was remodelled by the Land Purchase Acts (see IRELAND).

United States.—The law of landlord and tenant in the United States is in its principles similar to those of English law. It is only possible to indicate, by way of example, some of the points of similarity. The relationship of landlord and tenant is created, altered and dissolved in the same way, and the rights and duties of parties are substantially identical. A lease must contain, either in itself or by clear reference, all the terms of a complete contract—the names of the parties, description of the property let, the rent (see RENT) and the conditions. The date is not essential. That is a matter of identification as to time only. In Pennsylvania, parol evidence of the date is allowed. The general American doctrine is that where the contract is contained in separate writings they must connect themselves by reference, and that parol evidence is not admissible to connect them. The English doctrine that a verbal lease may be specifically enforced if there has been part performance by the person seeking the remedy has been fully adopted in nearly all the American states. The law as to the rights and obligations of assignees and sub-lessees and as to surrender is the same as in England. Forfeiture only renders a lease void as regards the lessee; it may be waived by the lessor, and acceptance by the landlord of rent due after forfeiture, with notice of such forfeiture, amounts to waiver. Where there is a lease for a certain period, no notice to quit is necessary. In uncertain tenancies there must be reasonable notice—*i.e.* at common law six months generally. The notice necessary to determine a monthly or weekly tenancy is generally a month or a week (see further under LODGER; LODGINGS). In the United States, as in England, the covenant for quiet enjoyment only extends, so far as relates to the acts of third parties, to lawful acts of disturbance in the enjoyment of the subject agreed to be let.

Laws of other Countries.—It is impossible here to deal with the systems of land tenure in force in other countries. Only the question of the legal relations between landlord and tenant can be touched upon. In France, the Code Civil recognizes two such relationships, the letting to hire of houses (*bail à loyer*) and the letting to farm of rural properties (*bail à ferme*). To a certain extent, both forms of tenancy are governed by the same rules. The letting may be either written or verbal. But a verbal lease presents this disadvantage that, if it is unperformed and one of the parties denies its existence, it cannot be proved by witnesses. The party who denies the letting can only be put to his oath (Arts. 1714-1715). It may further be noted that in the case of a verbal lease, notice to quit is regulated by the custom of the place (Art. 1736). The tenant or farmer has the right of underletting or assigning his lease, in the absence of prohibiting stipulation (Art. 1717). The lessor is bound by the nature of his contract and without the need of any particular stipulation (i.) to deliver to the lessee the thing hired in a good state of repair; (ii.) to maintain it in a state to serve the purpose for which it has been hired; (iii.) to secure to the lessee peaceable enjoyment during the continuance of the lease (Arts. 1719-1720). He is bound to warrant the lessee against, and to indemnify him for, any loss arising from any faults or defects in the thing hired which prevent its use, even though he was not aware of them at the time of the lease (Art. 1721). If during the continuance of the letting, the thing hired is entirely destroyed by accident, the lease is cancelled. In case of partial destruction, the lessee may, according to circumstances, demand either a diminution of the price, or the cancellation of the lease. In neither case is there ground for damages (Art. 1722). The lessor cannot, during the lease, change the form of the thing hired (Art. 1723). The lessee is bound, on his side (i.) to use the thing hired like a good head of a household (*bon père de famille*), in accordance with the express or presumed purpose of the hiring; (ii.) to pay the price of the hiring at the times agreed (Art. 1728). On breach of the former obligation, the lease may be judicially cancelled (Art. 1729). As to the consequences of breach of the latter, see RENT. If a statement of the condition of the property (*état des lieux*) has been prepared, the lessee must give it up such as he received it according to the statement, except what has perished or decayed by age or by means of *force majeure* (Art. 1730). In the absence of an *état des lieux*, the lessee is presumed to have received the thing hired in a good state of tenantable repair, and must so yield it up, saving proof to the contrary (Art. 1731). He is liable for injuries or losses happening during his enjoyment, unless he prove that they have taken place without his fault (Art. 1732); in particular, for loss by fire unless he show that the fire happened by accident, *force majeure*, or defect of construction, or through communication from a neighbouring house (Art. 1733). The lessee is liable for injuries and losses happening by the act of persons belonging to his house or of his sub-tenants (Art. 1735). A lease terminates (i.) at the expiration of the prescribed term (Art. 1737)—if at that period the lessee remains and is left in possession, there is, in the case of written leases, a tacit renewal (*tacite reconduction*) of the lease as a verbal lease (Arts. 1738-1739); (ii.) by the loss of the thing hired and by the default of the lessor or lessee in the fulfilment of their respective obligations (Art. 1741), but (iii.) not by the death either of the lessor or of the lessee (1742). The conditions of EJECTMENT are stated under that heading. The special rules (Arts. 1752-1762) relative to the hire of houses are touched upon in LODGER AND LODGINGS. It only remains here to refer to those applicable to leases to farm. The lessee is bound to stock the farm with the cattle and implements necessary for its husbandry (Art. 1766), and to stack in the places appointed for the purpose in the lease (Art. 1767). A lessee, who farms on condition of dividing the produce with the lessor, can only underlet or assign if he is expressly empowered to do so by the lease (Art. 1763). The lessee must give notice to the lessor of any acts of usurpation committed on the property (Art. 1768). If at least half of the harvest in any year is destroyed by accident, the lessee (*a*) in the case of a lease for several years, obtains, at the end of his lease, a refund of rent, by way of indemnity, unless he has been indemnified by preceding harvests; (*b*) in the case of a lease for a year only, may secure a proportional abatement of the current rent. No refund is payable if the produce was severed before the accident, unless the lessor was entitled to a portion of it, when he must bear his share of the loss, provided the lessee was not *in mora* as regards the delivery of the lessor's portion. The lessee has no right to a refund when the cause of damage was existing and known at the date of the lease (Arts. 1769-1771). Liability for loss by "accidents" may be thrown on the lessee by express stipulation (Art. 1772). "Accidents" here mean ordinary accidents only, such as hail, lightning or frost, and the lessee will not be answerable for loss caused by extraordinary accidents such as war or floods, unless he has been made liable for all accidents, foreseen or unforeseen (Art. 1773). A verbal lease is deemed to be for the term necessary to enable the lessee to gather in all the produce, thus for a year in the case of a meadow or vineyard; in the case of lands leased in tillage, where they are divided into shifts or seasons, for as many years as there are shifts (Art. 1774). The outgoing must leave for the incoming tenant convenient housing and other facilities for the labours of the year following; the incoming must procure for the outgoing tenant conveniences for the consumption of his fodder and for the harvests remaining to be got in. In either case the custom of the place is to be followed (Art. 1777). The outgoing tenant must leave the straw and manure of the year, if he received them at the beginning of his lease, and even where he has not so received them, the owner may retain them according to valuation (Art. 1778). A word must be added as to letting by cheptel (*bail à cheptel*)—a contract by which one of the parties gives to the other a stock of cattle to keep under conditions agreed on between them (Art. 1800). There are several varieties of the contract, (i.) simple cheptel (*cheptel simple*) in which the whole stock is supplied by the lessor—the lessee taking half the profit and bearing half the loss (Art. 1804); (ii.) cheptel by moiety (*cheptel à moitié*)—here each of the contracting parties furnishes half of the stock, which remains common for profit or loss (Art. 1818); (iii.) cheptel given to a farmer (*fermier*) or participating cultivator (*colon partiaire*)—in the cheptel given to the farmer (also called *cheptel de fer*) stock of a value equal to the estimated price of the stock given must be left at the expiry of the lease (Art. 1821); cheptel given to the participating cultivator resembles simple cheptel, except in points of detail (Arts. 1827-1830); (iv.) the term "cheptel" is also improperly applied to a contract by which cattle are given to be housed and fed—here the lessor retains the ownership, but has only the profit of the calves (Art. 1831).

The French system just described is in force in its entirety in Belgium (Code Civil, Arts. 1713 et seq.) and has been followed to some extent in Italy (Civil Code, Arts. 1568 et seq.), Spain (Civil Code, Arts. 1542 et seq.), and Portugal (Civil Code, Arts. 1268 et seq., 1595 et seq.). In all these countries there are varieties of emphyteutic tenure; and in Italy the mezzadria or metayer system (see Civil Code, Arts. 1647 et seq.) exists. The German Civil Code adopts the distinction between *bail à loyer* (Miehl, Arts. 535 et seq.) and *bail à ferme* (Pacht, Arts. 581 et seq.). Dutch law also (Civil Code, Arts. 1583 et seq.) is similar to the French.

The Indian law of landlord and tenant is described in the article INDIAN LAW. The laws of the various British colonies on the subject are too numerous and too different to be dealt with here. In Mauritius, the provisions of the Code Civil are in force without modification. In Quebec (Civil Code, Arts. 1605 et seq.) and St Lucia (Civil Code, Arts. 1512 et seq.) they have been reproduced by the local law. In many of the colonies, parts of the English law of landlord and tenant, common law and statutory, have been introduced by local enactments (cf. British Guiana, Ord. 4 of 1846; Jamaica, 1 Vict. c. 26). In others (*e.g.* Victoria, Landlord and Tenant Act 1890, No. 1108; Ontario, Rev. Stats. 1897, c. 170) consolidating statutes have been passed.

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LANDON, CHARLES PAUL (1760–1826), French painter and art-author, was born at Nonant in 1760. He entered the studio of Regnault, and won the first prize of the Academy in 1792. After his return from Italy, disturbed by the Revolution, he seems to have abandoned painting for letters, but he began to exhibit in 1795, and continued to do so at various intervals up to 1814. His "Leda" obtained an award of merit in 1801, and is now in the Louvre. His "Mother's Lesson," "Paul and Virginia Bathing," and "Daedalus and Icarus" have been engraved; but his works on painting and painters, which reach nearly one hundred volumes, form his chief title to be remembered. In spite of a complete want of critical accuracy, an extreme carelessness in the biographical details, and the feebleness of the line engravings by which they are illustrated, Landon's *Annales du Musée*, in 33 vols., form a vast repertory of compositions by masters of every age and school of permanent value. Landon also published *Lives of Celebrated Painters*, in 22 vols.; *An Historical Description of Paris*, 2 vols.; a *Description of London*, with 42 plates; and descriptions of the Luxembourg, of the Giustiniani collection, and of the gallery of the duchesse de Berry. He died at Paris in 1826.

LANDON, LETITIA ELIZABETH (1802–1838), English poet and novelist, better known by her initials L. E. L. than as Miss Landon or Mrs Maclean, was descended from an old Herefordshire family, and was born at Chelsea on the 14th of August 1802. She went to a school in Chelsea where Miss Mitford also received her education. Her father, an army agent, amassed a large property, which he lost by speculation shortly before his death. About 1815 the Landons made the acquaintance of William Jerdan, and Letitia began her contributions to the *Literary Gazette* and to various Christmas annuals. She also published some volumes of verse, which soon won for her a wide literary fame. The gentle melancholy and romantic sentiment her writings embodied suited the taste of the period, and would in any case have secured her the sympathy and approval of a wide class of readers. She displays richness of fancy and aptness of language, but her work suffered from hasty production, and has not stood the test of time. The large sums she earned by her literary labours were expended on the support of her family. An engagement to John Forster, it is said, was broken off through the intervention of scandalmongers. In June 1838 she married George Maclean, governor of the Gold Coast, but she only survived her marriage, which proved to be very unhappy, by a few months. She died on the 15th of October 1838 at Cape Coast from an overdose of prussic acid, which, it is supposed, was taken accidentally.

For some time L. E. L. was joint editor of the *Literary Gazette*. Her first volume of poetry appeared in 1820 under the title *The Fate of Adelaide*, and was followed by other collections of verses with similar titles. She also wrote several novels, of which the best is *Ethel Churchill* (1837). Various editions of her *Poetical Works* have been published since her death, one in 1880 with an introductory memoir by W. B. Scott. *The Life and Literary Remains of Letitia Elizabeth Landon*, by Laman Blanchard, appeared in 1841, and a second edition in 1855.

LANDOR, WALTER SAVAGE (1775–1864), English writer, eldest son of Walter Landor and his wife Elizabeth Savage, was born at Warwick on the 30th of January 1775. [He was sent to Rugby school, but was removed at the headmaster's request and studied privately with Mr Langley, vicar of Ashbourne. In 1793 he entered Trinity College, Cambridge. He adopted republican principles and in 1794 fired a gun at the windows of a Tory for whom he had an aversion. He was rusticated for a year, and, although the authorities were willing to condone the offence, he refused to return. The affair led to a quarrel with his father in which Landor expressed his intention of leaving home for ever. He was, however, reconciled with his family through the efforts of his friend Dorothea Lyttelton. He entered no profession, but his father allowed him £150 a year, and he was free to live at home or not as he pleased.]

In 1795 appeared in a small volume, divided into three books, *The Poems of Walter Savage Landor*, and, in pamphlet form of nineteen pages, an anonymous *Moral Epistle, respectfully dedicated to Earl Stanhope*. No poet at the age of twenty ever had more vigour of style and fluency of verse; nor perhaps has any ever shown such masterly command of epigram and satire, made vivid and vital by the purest enthusiasm and most generous indignation. Three years later appeared the first edition of the first great work which was to inscribe his name for ever among the great names in English poetry. The second edition of *Gebir* appeared in 1803, with a text corrected of grave errors and improved by magnificent additions. About the same time the whole poem was also published in a Latin form, which for might and melody of line, for power and perfection of language, must always dispute the palm of precedence with the English version. [His father's death in 1805 put him in possession of an independent fortune. Landor settled in Bath. Here in 1808 he met Southey, and the mutual appreciation of the two poets led to a warm friendship.] In 1808, under an impulse not less heroic than that which was afterwards to lead Byron to a glorious death in redemption of Greece and his own good fame, Landor, then aged thirty-three, left England for Spain as a volunteer to serve in the national army against Napoleon at the head of a regiment raised and supported at his sole expense. After some three months' campaigning came the affair of Cintra and its disasters; "his troop," in the words of his biographer, "dispersed or melted away, and he came back to England in as great a hurry as he had left it," but bringing with him the honourable recollection of a brave design unselfishly attempted, and the material in his memory for the sublimest poem published in our language, between the last masterpiece of Milton and the first masterpiece of Shelley—one equally worthy to stand unchallenged beside either for poetic perfection as well as moral majesty—the lofty tragedy of *Count Julian*, which appeared in 1812, without the name of its author. No comparable work is to be found in English poetry between the date of *Samson Agonistes* and the date of *Prometheus Unbound*; and with both these great works it has some points of greatness in common. The superhuman isolation of agony and endurance which encircles and exalts the hero is in each case expressed with equally appropriate magnificence of effect. The style of *Count Julian*, if somewhat deficient in dramatic ease and the fluency of natural dialogue, has such might and purity and majesty of speech as elsewhere we find only in Milton so long and so steadily sustained.

In May 1811 Landor had suddenly married Miss Julia Thuillier, with whose looks he had fallen in love at first sight in a ball-room at Bath; and in June they settled for a while at Llanthony Abbey in Monmouthshire, from whence he was worried in three years' time by the combined vexation of neighbours and tenants, lawyers and lords-lieutenant; not before much toil and money had been nobly wasted on attempts to improve the sterility of the land, to relieve the wretchedness and raise the condition of the peasantry. He left England for France at first, but after a brief residence at Tours took up his abode for three years at Como; "and three more wandering years he passed," says his biographer, "between Pisa and Pistoja, before he pitched his tent in Florence in 1821."

In 1835 he had an unfortunate difference with his wife which ended in a complete separation. In 1824 appeared the first series of his *Imaginary Conversations*, in 1826 "the second edition, corrected and enlarged"; a supplementary third volume was added in 1828; and in 1829 the second series was given to the world. Not until 1846 was a fresh instalment added, in the second volume of his collected and selected works. During the interval he had published his three other most famous and greatest books in prose: *The Citation and Examination of William Shakespeare* (1834), *Pericles and Aspasia* (1836), *The Pentameron* (1837). To the last of these was originally appended *The Pentalogia*, containing five of the very finest among his shorter studies in dramatic poetry. In 1847 he published his most important Latin work, *Poemata et inscriptiones*, comprising, with large additions, the main contents of two former volumes of idyllic, satiric, elegiac and lyric verse; and in the same golden year of his poetic life appeared the very crown and flower of its manifold labours, the *Hellenics of Walter Savage Landor*, enlarged and completed. Twelve years later this book was re-issued, with additions of more or less value, with alterations generally to be regretted, and with omissions invariably to be deplored. In 1853 he put forth *The Last Fruit off an Old Tree*, containing fresh conversations, critical and controversial essays, miscellaneous epigrams, lyrics and occasional poems of various kind and merit, closing with *Five Scenes* on the martyrdom of Beatrice Cenci, unsurpassed even by their author himself for noble and heroic pathos, for subtle and genial, tragic and profound, ardent and compassionate insight into character, with consummate mastery of dramatic and spiritual truth. In 1856 he published *Antony and Octavius—Scenes for the Study*, twelve consecutive poems in dialogue which alone would suffice to place him high among the few great masters of historic drama.

In 1858 appeared a metrical miscellany bearing the title of *Dry Sticks Fagoted by W. S. Landor*, and containing among other things graver and lighter certain epigrammatic and satirical attacks which reinvolved him in the troubles of an action for libel; and in July of the same year he returned for the last six years of his life to Italy, which he had left for England in 1835. [He was advised to make over his property to his family, on whom he was now dependent. They appear to have refused to make him an allowance unless he returned to England. By the exertions of Robert Browning an allowance was secured. Browning settled him first at Siena and then at Florence.] Embittered and distracted by domestic dissensions, if brightened and relieved by the affection and veneration of friends and strangers, this final period of his troubled and splendid career came at last to a quiet end on the 17th of September 1864. In the preceding year he had published a last volume of *Heroic Idyls, with Additional Poems*, English and Latin,—the better part of them well worthy to be indeed the "last fruit" of a genius which after a life of eighty-eight years had lost nothing of its majestic and pathetic power, its exquisite and exalted loveliness.

A complete list of Landor's writings, published or privately printed, in English, Latin and Italian, including pamphlets, fly-sheets and occasional newspaper correspondence on political or literary questions, it would be difficult to give anywhere and impossible to give here. From nineteen almost to ninety his intellectual and literary activity was indefatigably incessant; but, herein at least like Charles Lamb, whose cordial admiration he so cordially returned, he could not write a note of three lines which did not bear the mark of his "Roman hand" in its matchless and inimitable command of a style at once the most powerful and the purest of his age. The one charge which can ever seriously be brought and maintained against it is that of such occasional obscurity or difficulty as may arise from excessive strictness in condensation of phrase and expurgation of matter not always superfluous, and sometimes almost indispensable. His English prose and his Latin verse are perhaps more frequently and more gravely liable to this charge than either his English verse or his Latin prose. At times it is well-nigh impossible for an eye less keen and swift, a scholarship less exquisite and ready than his own, to catch the precise direction and follow the perfect course of his rapid thought and radiant utterance. This apparently studious pursuit and preference of the most terse and elliptic expression which could be found for anything he might have to say could not but occasionally make even so sovereign a master of two great languages appear "dark with excess of light"; but from no former master of either tongue in prose or verse was ever the quality of real obscurity, of loose and nebulous incertitude, more utterly alien or more naturally remote. There is nothing of cloud or fog about the path on which he leads us; but we feel now and then the want of a bridge or a handrail; we have to leap from point to point of narrative or argument without the usual help of a connecting plank. Even in his dramatic works, where least of all it should have been found, this lack of visible connexion or sequence in details of thought or action is too often a source of sensible perplexity. In his noble trilogy on the history of Giovanna queen of Naples it is sometimes actually difficult to realize on a first reading what has happened or is happening, or how, or why, or by what agency—a defect alone sufficient, but unhappily sufficient in itself, to explain the too general ignorance of a work so rich in subtle and noble treatment of character, so sure and strong in its grasp and rendering of "high actions and high passions," so rich in humour and in pathos, so royally serene in its commanding power upon the tragic mainsprings of terror and of pity. As a poet, he may be said on the whole to stand midway between Byron and Shelley—about as far above the former as below the latter. If we except Catullus and Simonides, it might be hard to match and it would be impossible to overmatch the flawless and blameless yet living and breathing beauty of his most perfect elegies, epigrams or epitaphs. As truly as prettily was he likened by Leigh Hunt "to a stormy mountain pine which should produce lilies." His passionate compassion, his bitter and burning pity for all wrongs endured in all the world, found only their natural and inevitable outlet in his lifelong defence or advocacy of tyrannicide as the last resource of baffled justice, the last discharge of heroic duty. His tender and ardent love of children, of animals and of flowers makes fragrant alike the pages of his writing and the records of his life. He was as surely the most gentle and generous as the most headstrong and hot-headed of heroes or of men. Nor ever was any man's best work more thoroughly imbued and informed with evidence of his noblest qualities. His loyalty and liberality of heart were as inexhaustible as his bounty and beneficence of hand. Praise and encouragement, deserved or undeserved, came yet more readily to his lips than challenge or defiance. Reviled and ridiculed by Lord Byron, he retorted on the offender living less readily and less warmly than he lamented and extolled him dead. On the noble dramatic works of his brother Robert he lavished a magnificence of sympathetic praise which his utmost self-estimate would never have exacted for his own. Age and the lapse of time could neither heighten nor lessen the fulness of this rich and ready generosity. To the poets of his own and of the next generation he was not readier to do honour than to those of a later growth, and not seldom of deserts far lower and far lesser claims than theirs. That he was not unconscious of his own, and avowed it with the frank simplicity of nobler times, is not more evident or more certain than that in comparison with his friends and fellows he was liable rather to undervalue than to overrate himself. He was a classic, and no formalist; the wide range of his just and loyal admiration had room for a genius so far from classical as Blake's. Nor in his own highest mood or method of creative as of critical work was he a classic only, in any narrow or exclusive sense of the term. On either side, immediately or hardly below his mighty masterpiece of *Pericles and Aspasia*, stand the two scarcely less beautiful and vivid studies of medieval Italy and Shakespearean England. The very finest flower of his immortal dialogues is probably to be found in the single volume comprising only "Imaginary Conversations of Greeks and Romans"; his utmost command of passion and pathos may be tested by its transcendent success in the distilled and concentrated tragedy of *Tiberius and Vipsania*, where for once he shows a quality more proper to romantic than classical imagination—the subtle and sublime and terrible power to enter the dark vestibule of distraction, to throw the whole force of his fancy, the whole fire of his spirit, into the "shadowing passion" (as Shakespeare calls it) of gradually imminent insanity. Yet, if this and all other studies from ancient history or legend could be subtracted from the volume of his work, enough would be left whereon to rest the foundation of a fame which time could not sensibly impair.

(A. C. S.)

Bibliography.—See *The Works and Life of Walter Savage Landor* (8 vols., 1846), the life being the work of John Forster. Another edition of his works (1891–1893), edited by C. G. Crump, comprises *Imaginary Conversations, Poems, Dialogues in Verse and Epigrams* and *The Longer Prose Works*. His *Letters and other Unpublished Writings* were edited by Mr Stephen Wheeler (1897). There are many volumes of selections from his works, notably one (1882) for the "Golden Treasury" series, edited by Sidney Colvin, who also contributed the monograph on *Landor* (1881) in the "English Men of Letters" series. A bibliography of his works, many of which are very rare, is included in Sir Leslie Stephen's article on Landor in the *Dictionary of National Biography* (vol. xxxii., 1892). (M. Br.)

LANDOUR, a hill station and sanatorium in India, in Dehra Dun district of the United Provinces, adjoining Mussoorie. Pop. (1901) 1720, rising to 3700 in the hot season. Since 1827 it has been a convalescent station for European troops, with a school for their children.

LAND REGISTRATION, a legal process connected with the transfer of landed property, comprising two forms—registration of deeds and registration of title, which may be best described as a species of machinery for assisting a purchaser or mortgagee in his inquiries as to his vendor's or mortgagor's title previously to completing his dealing, and for securing his own position afterwards. The expediency of making inquiry into the vendor's title before completing a purchase of land (and the case of a mortgage is precisely similar) is obvious. In the case of goods possession may ordinarily be relied on as proof of full ownership; in the case of land, the person in ostensible possession is very seldom the owner, being usually only a tenant, paying rent to someone else. Even the person to whom the rent is paid is in many cases—probably, in England, in most cases—not the full owner, but only a life owner, or a trustee, whose powers of disposing of the property are of a strictly limited nature. Again, goods are very seldom the subject of a mortgage, whereas land has from time immemorial been the frequent subject of this class of transaction. Evidently, therefore, some sort of inquiry is necessary to enable a purchaser to obtain certainty that the land for which he pays full price is not subject to an unknown mortgage or charge which, if left undiscovered, might afterwards deprive him of a large part or even the whole of its value. Again, the probability of serious consequences to the purchaser ensuing from a mistake as to title is infinitely greater in the case of land than in the case of goods. Before the rightful owner can recover misappropriated goods, he has to find out where they are. This is usually a matter of considerable difficulty. By the time they have reached the hands of a *bonâ fide* purchaser all chance of their recovery by the true owner is practically at an end. But with land the case is far otherwise. A dispossessed rightful owner never has any difficulty in tracing his property, for it is immovable. All he has to do is to bring an action for ejectment against the person in possession. For these reasons, among others, any attempt to deal with land on the simple and unsuspecting principles which obtain in regard to goods would be fraught with grave risks.

Apart from very early and primitive social conditions, there appear to be only two ways in which the required certainty as to title to land can be obtained. Either the purchaser must satisfy himself, by an exhaustive scrutiny and review of all the deeds, wills, marriages, heirships and other documents and events by which the property has been conveyed, mortgaged, leased, devised or transmitted during a considerable period of time, that no loophole exists whereby an adverse claim can enter or be made good—this is called the system of private investigation of title—or the government must keep an authoritative list or register of the properties within its jurisdiction, together with the names of the owners and particulars of the encumbrances in each case, and must protect purchasers and others dealing with land, on the faith of this register, from all adverse claims. This second system is called Registration of Title. To these two alternatives may perhaps be added a third, of very recent growth—Insurance of Title. This is largely used in the United States. But it is in reality only a phase of the system of private investigation. The insurance company investigates the title, and charges the purchaser a premium to cover the expense and the risk of error. Registration of deeds is an adjunct of the system of private investigation, and, except in England, is a practically invariable feature of it. It consists in the establishment of public offices in which all documents affecting land are to be recorded—partly to preserve them in a readily accessible place, partly to prevent the possibility of any material deed or document being dishonestly concealed by a vendor. Where registration is effected by depositing a full copy of the deed, it also renders the subsequent falsification of the original document dangerous. Registration of deeds does not (except perhaps to a certain extent indirectly) cheapen or simplify the process of investigation—the formalities at the registry add something to the trouble and cost incurred—but it prevents the particular classes of fraud mentioned.

The history of land registration follows, as a general rule, a fairly uniform course of development. In very early times, and in small and simple communities, the difficulty afterwards found in establishing title to land does not arise, owing to the primitive habit of attaching ceremony and publicity to all dealings. The parties meet on the land, with witnesses; symbolical acts (such as handing over a piece of earth, or the bough of a tree) are performed; and a set form of words is spoken, expressive of the intention to convey. By this means the ownership of each estate in the community becomes to a certain extent a matter of common knowledge, rendering fraud and mistake difficult. But this method leaves a good deal to be desired in point of security. Witnesses die, and memory is uncertain; and one of the earliest improvements consists in the establishment of a sort of public record kept by the magistrate, lord or other local authority, containing a series of contemporary notes of the effect of the various transactions that take place. This book becomes the general title-deed of the whole community, and as long as transactions remain simple, and not too numerous, the results appear to be satisfactory. Of this character are the Manorial Court Rolls, which were in the middle ages the great authorities on title, both in England and on the continent. The entries in them in early times were made in a very few words. The date, the names of the parties, the name or short verbal description of the land, the nature of the transaction, are all that appear. In the land registry at Vienna there is a continuous series of registers of this kind going back to 1368, in Prague to 1377, in Munich to 1440. No doubt there are extant (though in a less easily accessible form) manorial records in England of equal or greater antiquity. This may be considered the first stage in the history of Land Registration. It can hardly be said to be in active operation at the present day in any civilized country—in the sense in which that term is usually understood. Where dealings become more numerous and complicated, written instruments are required to express the intentions of the parties, and afterwards to supply evidence of the landowner's title. It appears, too, that as a general rule the public books already described continue to be used, notwithstanding this change; only (as would be expected) the entries in them, once plain and simple, either grow into full copies of the long and intricate deeds, or consist of mere notes stating that such and such deeds have been executed, leaving the persons interested to inquire for the originals, in whose custody soever they may be found. This system, which may be regarded as the second stage in the history of land registration, is called Registration of Deeds. It prevails in France, Belgium, parts of Switzerland, in Italy, Spain, India, in almost all the British colonies (except Australasia and Canada), in most of the states of the American Union, in the South American republics, in Scotland and Ireland, and in the English counties of Yorkshire and Middlesex. Where it exists, there is generally a law to the effect that in case of dispute a registered deed shall prevail over an unregistered one. The practical effect is that a purchaser can, by searching the register, find out exactly what deeds he ought to inquire for, and receives an assurance that if, after completion, he registers his own conveyance, no other deeds—even if they exist—will prevail against him.

The expenses and delays, not to mention the occasional actual losses of property through fraud or mistake, attendant on the system of making every purchaser responsible for the due examination of his vendor's title—whether or not assisted by registration of deeds—have induced several governments to establish the more perfect system of Registration of Title, which consists in collecting the transactions affecting each separate estate under a separate head, keeping an accurate account of the parcels of which each such estate is composed, and summarizing authoritatively, as each fresh transaction occurs, the subsisting rights of all parties in relation to the land itself. This system prevails in Germany, Austria, Hungary, parts of Switzerland, the Australasian colonies, nearly the whole of Canada, some of the states of the American Union, to a certain extent in Ireland, and is in course of establishment in England and Wales. The Register consists of three portions:— (1) The description of the land, usually, but not necessarily, accompanied by a reference to a map; (2) the ownership, giving the name and address of the person who can sell and dispose of the land; and (3) the encumbrances, in their order of priority, and the names of the persons for the time being entitled to them. When any fresh transaction takes place the instrument effecting it is produced, and the proper alterations in, or additions to, the register are made: if it be a sale, the name of the vendor is cancelled from the register, and that of the purchaser is entered instead; if it be a mortgage, it is added to the list of encumbrances; if a discharge, the encumbrance discharged is cancelled; if it is a sale of part of the land, the original description is modified or the plan is marked to show the piece conveyed, while a new description or plan is made and a new register is opened for the detached parcel. In the English and Australian registries a "land certificate" is also issued to the landowner containing copies of the register and of the plan. This certificate takes the place more or less of the old documents of title. On a sale, the process is as follows: The vendor first of all produces to the purchaser his land certificate, or gives him the number of his title and an authority to inspect the register. In Austria and in some colonial registries this is not necessary, the register being open to public inspection, which in England is not the case. The purchaser, on inspecting this, can easily see for himself whether the land he wishes to buy is comprised in the registered description or plan, whether the vendor's name appears on the register as the owner of the land, and whether there are any encumbrances or other burdens registered as affecting it. If there are encumbrances, the register states their amount and who are entitled to them. The purchaser then usually[1] prepares a conveyance or transfer of the land (generally in a short printed form issued by the registry), and the vendor executes it in exchange for the purchase money. If there are mortgages, he pays them off to the persons named in the register as their owners, and they concur in a discharge. He then presents the executed instruments at the registry, and is entered as owner of the land instead of the vendor, the mortgages, if any, being cancelled. Where "land certificates" are used (as in England and Australia), a new land certificate is issued to the purchaser showing the existing state of the register and containing a copy of the registered plan of the land. The above is only a brief outline of the processes employed. For further information as to practical details reference may be made to the treatises mentioned at the end of this article.

England and Wales.—The first attempt to introduce general registration of conveyances appears to have been made by the Statute of Enrolments, passed in the 27th year of Henry VIII. But this was soon found to be capable of evasion, and it became a dead letter. A Registration Act applying to the counties of Lancaster, Chester and Durham was passed in Queen Elizabeth's reign, but failed for want of providing the necessary machinery for its observance. The subject reappeared in several bills during the Commonwealth, but these failed to pass, owing, it would seem, to the objection of landowners to publicity. In 1669 a committee of the House of Lords reported that one cause of the depreciation of landed property was the uncertainty of titles, and proposed registration of deeds as a remedy, but nothing was done.

During the next thirty years numerous pamphlets for and against a general registry were published. In 1704 the first Deed Registry Act was passed, applying to the West Riding of Yorkshire. In 1707 the system was extended to the East Riding, and in 1708 to Middlesex. These Middlesex and Yorkshire registries (modified considerably in practice, but not seriously in principle, by the Yorkshire Registries Acts 1884, 1885, and Land Registry [Middlesex Deeds] Act 1891) remain in operation, and are greatly valued by the smaller proprietors and mortgagees, owing to the security against fraud which they provide at a trifling cost. The selection of these counties seems capricious: its probable explanation is that in them trade was flourishing, and the fortunes made were frequently invested in land, and a protection against secret encumbrances was most in demand. In 1728 and 1732 Surrey and Derby petitioned, unsuccessfully, for local registries. In 1735 the North Riding Deed Registry Act was passed. In 1739 a General Registry bill passed the Commons, but did not reach the Lords. Next year the Lords passed a similar bill, but it did not reach the Commons. In 1759 a General Registry bill was thrown out by a majority of one. In 1784 Northumberland unsuccessfully petitioned for a local registry. After this the subject went almost out of sight till the Real Property Commission of 1828. They reported in 1830 in favour of a general register of deeds, but though several bills were introduced, none were passed. In 1846 a committee of the House of Lords reported that the marketable value of real property was seriously diminished by the tedious and expensive process of the transfer of land, and that a registry of title to all real property was essential to the success of any attempt to simplify the system of conveyancing. In 1850 a Royal Commission reported in favour of a general register of deeds, and in 1851 Lord Campbell introduced a bill accordingly, but it was opposed, and was dropped. In 1853 Lord Cranworth introduced a bill, which passed the Lords but not the Commons.

Hitherto only registration of deeds had been considered, but in 1854 a new Royal Commission was appointed, which reported in 1857 in favour of a register of title. The scheme they recommended was substantially embodied in a bill introduced in 1859 by Lord Cairns—then Solicitor-General—but a dissolution stopped its progress. In 1862 Lord Westbury had the satisfaction of carrying the first act for registration of title. This act enabled any landowner to register an indefeasible title on production of strict proof. The proof required was to be such as the court of chancery would force an unwilling purchaser to accept. Only a few hundred titles were registered under this act, and in 1868 a Royal Commission was appointed to inquire into the causes of its failure. They reported in 1870, making various suggestions of detail, and especially adverting to the great expense caused by the strictness of the official investigation of title before a property could be admitted to the register. In the same year Lord Hatherley introduced a Transfer of Land Bill, but it was not proceeded with. In 1873 Lord Selborne introduced a Land Titles and Transfer Bill, following more or less the recommendations of the report of 1870, proposing for the first time compulsory registration of title upon every next sale after a prescribed date. Lord Cairns again introduced this bill (with some modifications) in 1874, but it had to be dropped. In 1875 Lord Cairns's Land Transfer Act of that year was passed, which was much the same as the former bill, but without compulsion. This act had no better success in the way of voluntary general adoption than the act of 1862, but as its adoption has since been made compulsory, its provisions are important. Its most noticeable feature, from a practical point of view, is the additional prominence given to an expedient called "Possessory" registration (which also existed under another name in Lord Westbury's Act), whereby is removed the great initial difficulty of placing titles on the register in the first instance. Two sorts of registration were established, "Absolute" and "Possessory." The effect of an absolute registration was immediately to destroy all claims adverse to the registered title. But this was only to be granted on a regular investigation of title, which, though not so strict as under the former act, yet necessarily involved time and cost. Possessory registration, however, was to be granted to any one who could show a prima facie title—a quick and cheap process. But the effect of such registration would not be immediately felt. It would not destroy existing adverse claims. It would only prevent new difficulties from arising. In course of time such a title would be practically as good as an absolute one. In 1885 the duke of Marlborough introduced a bill for a registry of titles, and in the following vacation Lord Davey wrote three letters to *The Times* advocating the same thing on the general lines afterwards adopted.[2] In 1887 Lord Halsbury, by introducing his Land Transfer Bill, commenced a struggle with the opponents of reform, which, after ten years of almost continuous effort, resulted in the passing of his act of 1897, establishing compulsory registration of title. Lord Halsbury introduced bills in 1887, 1888 and 1889. Lord Herschell, who succeeded him after the change of government, introduced bills in 1893, 1894 and 1895, these last three being unanimously passed by the House of Lords on every occasion. The bill of 1895 reached committee in the Commons, but was stopped by the dissolution of parliament. In 1897 Lord Halsbury (who had returned to the woolsack) again introduced the same bill with certain modifications which caused the Incorporated Law Society to withdraw its opposition in the House of Commons, and the act was finally passed on the last day of the session. Under it the Privy Council has power to issue orders declaring that on a certain date registration of title is to be compulsory on sale in a given district. The effect of such an order is to oblige every purchaser of land in the district after that date to register a "possessory title," immediately after his purchase. The compulsory provisions of the act extend to freeholds and (by a rule afterwards made) to leaseholds having forty years to run. No order except the first can be made, save on the request of a county council. The first order was made in July 1898. It embraced the whole administrative county of London (including the City of London), proceeding gradually by groups of parishes. Under this order upwards of 122,000 titles had been registered by 1908, representing a value exceeding one hundred millions sterling.

Under the operation of this act, at the expense of a slightly increased cost on all transactions during a few years, persons dealing with land in the county will ultimately experience great relief in the matter both of cost and of delay. The costs of a sale (including professional assistance, if required) will ultimately be for the vendor about one-fifth, and for the purchaser (at the most usual values) less than half, of the present expenses. The delay will be no more than in dealings with stock. Mortgagees will also be protected from risks of fraud, which at present are very appreciable, and of which the Redgrave and Richards cases are recent examples. Further particulars of the practical operation of the acts will be found in the Registrar's Reports of 1902 and 1906, embracing the period from 1899 to 1905 inclusive, with comments on the general position, suggestions for future legislation, &c. In the autumn of 1908 a Royal Commission under the chairmanship of Lord St Aldwyn, was appointed to inquire into the working of the Land Transfer Acts. The evidence given before them in October, November and December 1908 comprised a general exposition by the registrar of the origin and history of the acts, and the principles of their working, and suggestions for amendments in certain details. It also comprised the experience of several landowners and others, who had found the acts highly beneficial, and who had carried through a large number of dealings under absolute titles, without professional help, very quickly, and at a greatly reduced cost.

Scotland.—In Scotland registration of *deeds* was established by an act of 1617, which remained unaltered till 1845. There are also acts of 1868 and 1874. The registry is in Edinburgh. Deeds are registered almost invariably by full copy. The deeds are indexed according to properties—each property having a separate number and folio called a "search sheet," on which all deeds affecting it are referred to. About 40,000 deeds are registered annually. The consequence of the existence of this register is to render fraud in title absolutely unknown. Forty years is the usual period investigated. The investigation can, if desired, be made from the records in the registry alone. The fees are trifling, but suffice to pay the expenses of the office, which employs between 70 and 80 permanent officers in addition to temporary assistants. The total costs of conveyancing amount, roughly speaking, to between 1 and 2% on the purchase money, and are equally shared between vendor and purchaser. In 1906 a royal commission was appointed, with Lord Dunedin as chairman, to inquire into the expediency of instituting in Scotland a system of registration of title.

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[1] In Prussia all conveyances are verbal, made in person or by attorney before the registrar, who forthwith notes them in his books.

[2] This summary is an abridgement (with permission) of pp. 7 to 26 of Mr R. Burnet Morris's book referred to at the end of this article.

Australia and New Zealand.—These states now furnish the most conspicuous examples in the British empire of the success of registration of *title*. But prior to the year 1857 they had only registration of *deeds*, and the expense, delay and confusion resulting from the frequent dealings appear to have been a crying evil. Sir Robert Torrens, then registrar of deeds in South Australia, drew up and carried an act establishing a register of title similar to the shipping register. The act rapidly became popular, and was adopted (with variations) in all the other Australasian states in the years 1861, 1862, 1870 and 1874. Consolidating and amending acts have since been passed in most of these states. Only absolute title is registered. All land granted by government, after the passing of the several acts, is placed on the register compulsorily. But voluntary applications are also made in very large numbers. It is said ordinary purchasers will not buy land unless the vendor first registers the title. The fees are very low—£1 to £3 is a usual maximum—though in some states, *e.g.* Victoria, the fees rise indefinitely, *ad valorem*, at a rate of about 10s. per £1000. Insurance funds are established to provide compensation for errors. At a recent date they amounted to over £400,000, while only £14,600 odd had been paid in claims. All the registries pay their own expenses. Bankers and men of business generally are warm in their appreciation of the acts, which are popularly called Torrens Acts, after their originator, who, though not a lawyer, originated and carried through this important and difficult legal work.

Canada.—Registration of *title* was introduced in Vancouver Island in 1861, was extended to the rest of British Columbia in 1870, and was in 1885 adopted by Ontario, Manitoba and the North-West Territories. Only Quebec, Nova Scotia, New Brunswick and Prince Edward Island retain the old English system, plus registration of deeds. The three provinces which have adopted registration of title have adopted it in somewhat different forms. In British Columbia it is similar to Lord Westbury's Act of 1862. The North-West Territories follow closely the Torrens Acts. The Ontario Act is almost a transcript of Lord Cairns's Act of 1875. The fees are very low, seldom exceeding a few shillings, but all expenses of the office are paid from this source. The Ontario registry has five district offices, as well as the central one at Toronto. This is apparently the only colonial registry not open to public inspection.

Other British Colonies.—In the other British colonies private investigation of title, plus registration of deeds, is the prevailing system, but registration of title has been introduced in one or two instances.

Germany and Austria-Hungary.—By far the most important examples of registration of *title* at present existing—because they show how the system works when applied to large European communities, with all the intricacies and complications of modern civilized life—are to be found in Germany and Austria-Hungary. In some parts of these countries registration of title has been established for several centuries—notably in Bohemia; in most parts it has existed for the greater part of the 19th century; in some districts, again, notably Tirol and the Rhine Provinces, it is still in course of introduction. In all cases it appears to have been preceded by a system of deed registration, which materially facilitated its introduction. In some cases, Prussia, for instance, the former registers were kept in such a way as to amount in themselves to little short of a registry of title. Very low scales of fees suffice to pay all official expenses. In Prussia the fees for registering sales begin at 5d. for a value of £1; at £20 the fee is 2s 7d.; at £100 it is 7s. 3d.; at £1000 it is £1, 10s.; at £5000, £4, 5s., and so on. In case of error, the officials are personally liable; failing these, the state. Other states are very similar. In 1894, 1,159,995 transactions were registered in Prussia. In 1893, 938,708 were registered in Austria. Some idea of the extent to which small holdings prevail in these countries may be gathered from the fact that 36% of the sales and mortgages in Austria were for under £8, 6s. 8d. value—74% were for under £50. Owing to the ease and simplicity of the registers, it is not always necessary to employ professional help. When such help is required, the fees are low. In Vienna £1 is a very usual fee for the purchaser's lawyer. £10 is seldom reached. In Germany the register is private. In Austria it is open to public inspection. In these registers may be found examples of large estates in the country with numerous charges and encumbrances and dealings therewith; peasants' properties, in numerous scattered parcels, acquired and disposed of at different times, and variously mortgaged; town and suburban properties, flats, small farms, rights to light and air, rights of way, family settlements, and dealings of all sorts—inheritances and wills, partitions, bankruptcies, mortgages, and a great variety of dealings therewith. The Continental systems are usually administered locally in districts, about 20 to 30 m. across, attached to the local law courts. In Baden and Württemberg every parish (commune) has its own registry. All ordinary dealings are transacted with the greatest expedition. Security is absolute.[1]

The United States.—Up to a late date the ordinary English system, with registration of *deeds*, was universal in the United States. The registries appear to go back practically to the original settlement of the country. Registration is by full copy. It is said that in the large towns the name indexes were often much overgrown owing to the want of subdivision into smaller areas corresponding to the parishes into which the Middlesex and Yorkshire indexes are divided. In the New York registry not many years ago 25,000 deeds were registered annually. At the same time 35,000 were registered in Middlesex. Complaints are made by American lawyers of want of accuracy in the indexes also. In 1890 an act was passed in New York for splitting the indexes into "blocks," which is believed to have given much relief. The average time and cost of an examination of title, as estimated by a committee of the Bar Association of New York in 1887, was about thirty days and 150 dollars (about £30). A later State Commission in Illinois estimates the law costs of a sale there at about 25 dollars (£5); the time may run into many months. Allusion has already been made to the insurance of title companies. The rates of insurance are substantial, *e.g.* 65 dollars (£13) on the first 3000 dollars (£600), and 5 dollars (£1) on each additional 1000 dollars (£200). This would amount to £20 on £2000 value, £110 on £20,000, £510 on £100,000. The guarantee given is very ample, and may be renewed to subsequent owners at one-third of the fee. Registration of title has lately been introduced, on a voluntary basis, into the states of California, Oregon, Illinois, Massachusetts, Minnesota and Colorado, and also into Hawaii and the Philippines.

France.—In France registration of *deeds* is universal. Sales, mortgages, gifts and successions; easements, leases of over eighteen years, and transactions affecting the land to the extent of three years' rent may lose priority if not registered. Wills need not be registered. Mortgages must be re-registered every ten years. Purchase deeds are registered by filing full copies. Registries are established in all the considerable towns. The duty on sales amounts to the high figure of about 6½% on the value. Part of this is allocated to registration, in addition to which a fixed fee of one franc, and stationers' charges averaging 6 francs are also chargeable. The title can usually be fully investigated from the documents in the registry. Official searches for mortgages are commonly resorted to, at a cost of about 5 francs. Under the monarchy the land system was practically copyhold tenure, but greater validity was attached to the Court Rolls than was the case in England. The present system was established by a law of 1790 after the abolition of seigniorial institutions in 1789. This was modified by the Code Napoleon, and further perfected by a law of 1855. The average value of transactions in France is very small. Probably at the present time four-fifths of the properties are of under £25 value. The costs of a sale for 200 francs (£8) would be about as follows: Duty, 13 fr.; Notary (1%), 2 fr.; expenses, 12 fr.—total 27 fr. A sale for 1000 fr. (£40) would cost about 110 fr. Taking all values, the cost of conveyance and duty reaches the high figure of 10% in the general run of transactions. The vendor as a rule has no costs. Indefeasible title is not obtainable, but frauds are almost unknown. A day or two usually suffices for all formalities. On large sales a further process known as the "purge" is undergone, which requires a few weeks and more expense, in order to guard against possible claims against which the deed registries afford no protection, such as dowries of wives, claims under guardianships, &c. A commission (Commission Extraparlementaire du Cadastre), appointed in 1891 to consider the revision of the government cadastral maps (which are in very serious arrear) and the establishment of registration of title, collected, in nine volumes of Comptes Rendus, a great mass of most interesting particulars relating to land questions in France, and in 1905 reported in favour of the general establishment of a register of title, with a draft of the necessary enactment.

Authorities.—A very complete list of some 114 English publications from 1653 to 1895 will be found in R. Burnet Morris, *Land Registration* (1895); Parliamentary Publications: *Second Report of the Real Property Commissioners* (1831); *Report of the Registration and Conveyancing Commission* (1850); *Report of the Registration of Title Commission* (1857); *Report of the Land Transfer Commission* (1870); *Reports on Registration of Title in Australasian Colonies* (1871 and 1881); *Report on Registration of Title in Germany and Austria-Hungary* (1896); *The Registrar's Reports of 1902 and 1906 on the Formation of a Register in London*; *Royal Commission on the Land Transfer Acts, Minutes of Evidence* (1909). General reviews of land registration in the British Isles, the Colonies, and in foreign countries: R. Burnet Morris, as above, and C. F. Brickdale, *Land Transfer in Various Countries* (1894). Books on practice: England—Brickdale and Sheldon, *The Land Transfer Acts* (2nd ed., 1905); Cherry and Marigold, *The Land Tranfer Acts* (1898); Hay, *Land Registration under the Land Transfer Acts* (1904); *Land Transfer*, &c. (1901); C. F. Brickdale, *Registration in Middlesex* (1892). Australia—*The Australian Torrens System*; Hogg, *The Transfer of Land Act 1890*

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[1] Full information as to the German and Austrian systems is to be found in a Parliamentary Report of 1896 (C.—8139) on the subject.

(Melbourne). Prussia—Oberneck, *Die Preussischen Grundbuchgesetze* (Berlin). Austria—*Das allgemeine Grundbuchsgesetz*, &c. (Vienna); Bartsch, *Das Oesterreichische allgemeine Grundbuchsgesetz in seiner practischen Anwendung* (Vienna). Saxony—Siegmann, *Sächsische Hypothekenrecht* (Leipzig). Statistics—*Oesterreichische Statistik* (*Grundbuchs-ämter*) (Vienna, annually). (C. F.-Br.)

LANDSBERG AM LECH, a town in the kingdom of Bavaria, on the river Lech, 38 m. by rail W. by S. of Munich. Pop. (1905) 6505. It has eight Roman Catholic churches, among them the Liebfrauen Kirche dating from 1498, several monasteries, and a fine medieval town-hall, with frescoes by Karl von Piloty and a painting by Hubert von Herkomer. Here also are a fine gateway, the Bayer-Tor, an agricultural and other schools. Brewing, tanning and the manufacture of agricultural machinery are among the principal industries.

See Schober, *Landsberg am Lech und Umgebung* (1902); and Zwerger, *Geschichte Landsbergs* (1889).

LANDSBERG-AN-DER-WARTHE, a town in the Prussian province of Brandenburg, at the confluence of the Warthe and the Kladow, 80 m. N.E. of Berlin by rail. Pop. (1905) 36,934. It has important engine and boiler works and iron-foundries; there are also manufactures of tobacco, cloth, carriages, wools, spirits, jute products and leather. An active trade is carried on in wood, cattle and the produce of the surrounding country. Landsberg obtained civic privileges in 1257, and later was besieged by the Poles and then by the Hussites.

See R. Eckert, *Geschichte von Landsberg-Warthe* (1890).

LANDSBERG BEI HALLE, a town in Prussia on the Strengbach, on the railway from Berlin to Weissenfels. Pop. (1905) 1770. Its industries include quarrying and malting, and the manufacture of sugar and machinery. Landsberg was the capital of a small margraviate of this name, ruled in the 12th century by a certain Dietrich, who built the town. Later it belonged to Meissen and to Saxony, passing to Prussia in 1814.

LANDSEER, SIR EDWIN HENRY (1802–1873), English painter, third son of John Landseer, A.R.A., a well-known engraver and writer on art, was born at 71 Queen Anne Street East (afterwards 33 Foley Street), London, on March 7th 1802. His mother was Miss Potts, who sat to Sir Joshua Reynolds as the reaper with a sheaf of corn on her head, in "Macklin's Family Picture," or "The Gleaners."[1] Edwin Henry Landseer began his artistic education under his father so successfully that in his fifth year he drew fairly well, and was familiar with animal character and passion. Drawings of his, at South Kensington, dated by his father, attest that he drew excellently at eight years of age; at ten he was an admirable draughtsman and his work shows considerable sense of humour. At thirteen he drew a majestic St Bernard dog so finely that his brother Thomas engraved and published the work. At this date (1815) he sent two pictures to the Royal Academy, and was described in the catalogue as "Master E. Landseer, 33 Foley Street." Youth forbade his being reckoned among practising artists, and caused him to be considered as the "Honorary Exhibitor" of "No. 443, Portrait of a Mule," and "No. 584, Portraits of a Pointer Bitch and Puppy." Adopting the advice of B. R. Haydon, he studied the Elgin Marbles, the animals in the Tower of London and Exeter 'Change, and dissected every animal whose carcass he could obtain. In 1816 Landseer was admitted a student of the Royal Academy schools. In 1817 he sent to the Academy a portrait of "Old Brutus," a much-favoured dog, which, as well as its son, another Brutus, often appeared in his later pictures. Even at this date Landseer enjoyed considerable reputation, and had more work than he could readily perform, his renown having been zealously fostered by his father in James Elmes's *Annals of the Fine Arts.* At the Academy he was a diligent student and a favourite of Henry Fuseli's, who would look about the crowded antique school and ask, "Where is my curly-headed dog-boy?" Although his pictures sold easily from the first, the prices he received at this time were comparatively small. In 1818 Landseer sent to the Society of Painters in Oil and Water Colours, which then held its exhibitions in Spring Gardens, his picture of "Fighting Dogs getting Wind." The sale of this work to Sir George Beaumont vastly enhanced the fame of the painter, who soon became "the fashion." This picture illustrates the prime strength of Landseer's earlier style. Unlike the productions of his later life, it displays not an iota of sentiment. Perfectly drawn, solidly and minutely finished, and carefully composed, its execution attested the skill acquired during ten years' studies from nature. Between 1818 and 1825 Landseer did a great deal of work, but on the whole gained little besides facility of technical expression, a greater zest for humour and a larger style. The work of this stage ended with the production of the painting called "The Cat's Paw," which was sent to the British Institution in 1824, and made an enormous sensation. The price obtained for this picture, £100, enabled Landseer to set up for himself in the house No. 1 St John's Wood Road, where he lived nearly fifty years and in which he died. During this period Landseer's principal pictures were "The Cat Disturbed"; "Alpine Mastiffs reanimating a Distressed Traveller," a famous work engraved by his father; "The Ratcatchers"; "Pointers to be"; "The Larder Invaded"; and "Neptune," the head and shoulders of a Newfoundland dog. In 1824 Landseer and C. R. Leslie made a journey to the Highlands—a momentous visit for the former, who thenceforward rarely failed annually to repeat it in search of studies and subjects.

In 1826 Landseer was elected an A.R.A. In 1827 appeared "The Monkey who has seen the World," a picture which marked the growth of a taste for humorous subjects in the mind of the painter that had been evoked by the success of the "Cat's Paw." "Taking a Buck" (1825) was the painter's first Scottish picture. Its execution marked a change in his style which, in increase of largeness, was a great improvement. In other respects, however, there was a decrease of solid qualities; indeed, finish, searching modelling, and elaborate draughtsmanship rarely appeared in Landseer's work after 1823. The subject, as such, soon after this time became a very distinct element in his pictures; ultimately it dominated, and in effect the artist enjoyed a greater degree of popularity than technical judgment justified, so that later criticism has put Landseer's position in art much lower than the place he once occupied. Sentiment gave new charm to his works, which had previously depended on the expression of animal passion and character, and the exhibition of noble qualities of draughtsmanship. Sentimentality ruled in not a few pictures of later dates, and *quasi*-human humour, or pathos, superseded that masculine animalism which rioted in its energy, and enabled the artist to rival Snyders, if not Velazquez, as a painter of beasts. After "High Life" and "Low Life," now in the Tate Gallery, London, Landseer's dogs, and even his lions and birds, were sometimes more than half civilized. It was not that these later pictures were less true to nature than their forerunners, but the models were chosen from different grades of animal society. As Landseer prospered he kept finer company, and his new patrons did not care about rat-catching and dog-fighting, however vigorously and learnedly those subjects might be depicted. It cannot be said that the world lost much when, in exchange for the "Cat Disturbed" and "Fighting Dogs getting Wind," came "Jack in Office," "The Old Shepherd's Chief Mourner," and "The Swannery invaded by Eagles," three pictures which are types of as many diverse moods of Landseer's art, and each a noble one.

Landseer was elected a Royal Academician in 1831. "Chevy Chase" (1826), which is at Woburn, "The Highland Whisky Still" (1829), "High Life" (1829) and "Low Life" (1829), besides other important works, had appeared in the interval. Landseer had by this time attained such amazing mastery that he painted "Spaniel and Rabbit" in two hours and a half, and "Rabbits," which was at the British Institution, in three-quarters of an hour; and the fine dog-picture "Odin" (1836) was the work of one sitting, *i.e.* painted within twelve hours. But perhaps the most wonderful instance of his rapid but sure and dexterous brush-handling was "The Cavalier's Pets" (1845), the picture of two King Charles's spaniels in the National Gallery, which was executed in two days. Another remarkable feat consisted in drawing, simultaneously, a stag's head with one hand and a head of a horse with the other. "Harvest in the Highlands," and that masterpiece of humour, "Jack in Office," were exhibited in 1833. In 1834 a noble work of sentiment was given to the world in "Suspense," which is now at South Kensington, and shows a dog watching at the closed door of his wounded master. Many think this to be Landseer's finest work, others prefer "The Old Shepherd's Chief Mourner" (1837). The over-praised and unfortunate "Bolton Abbey in the Olden Time," a group of portraits in character, was also shown in 1834, and was the first picture for which the painter received £400. A few years later he sold "Peace" and "War" for £1500, and for the copyrights alone obtained £6000. In 1881 "Man proposes, God Disposes" (1864) was resold for 6300 guineas, and a cartoon of "The Chase" (1866) fetched 5000 guineas. "A Distinguished Member of the Humane Society," a dog reclining on a quay wall (1838), was succeeded by "Dignity and Impudence" (1839). The "Lion Dog of Malta," and "Laying down the Law" appeared in 1840. In 1842 was finished the capital "Highland Shepherd's Home" (Sheepshanks Gift), together with the beautiful "Eos," a portrait of Prince Albert's most graceful of greyhounds, to which Thomas Landseer added an ineffable charm and solidity not in the painting. The "Rout of Comus" was painted in the summerhouse of Buckingham Palace garden in 1843. The "Challenge" was accompanied (1844) by "Shoeing the Bay Mare" (Bell Gift), and followed by "Peace" and "War," and the "Stag at Bay" (1846). "Alexander and Diogenes," and a "Random Shot," a dead kid lying in the snow, came forth in 1848. In 1850 Landseer received a national commission to paint in the Houses of Parliament three subjects connected with the chase. Although they would have been worth three times as much money, the House of Commons refused to grant £1500 for these pictures, and the matter fell through, more to the artist's profit than the nation's gain. The famous "Monarch of the Glen" (1851) was one of these subjects. "Night" and "Morning," romantic and pathetic deer subjects, came in due order (1853). For "The Sanctuary" (1842) the Fine Arts jury of experts awarded to the artist the great gold medal of the Exposition Universelle, Paris, 1855.

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[1] John Landseer died February 29, 1852, aged ninety-one (or eighty-three, according to Cosmo Monkhouse). Sir Edwin's eldest brother Thomas, an A.R.A. and a famous engraver, whose interpretations of his junior's pictures have made them known throughout the world, was born in 1795, and died January 20, 1880. Charles Landseer, R.A., and Keeper of the Royal Academy, the second brother, was born in 1799, and died July 22, 1879. John Landseer's brother Henry was a painter of some reputation, who emigrated to Australia.

The "Dialogue at Waterloo" (1850), which he afterwards regarded with strong disapproval, showed how Landseer, like nearly all English artists of original power and considerable fertility, owed nothing to French or Italian training. In the same year he received the honour of knighthood. Next came "Geneva" (1851), "Titania and Bottom" (1851), which comprises a charming queen of the fairies, and the "Deer Pass" (1852), followed by "The Children of the Mist" (1853), "Saved" (1856), "Braemar," a noble stag, "Rough and Ready," and "Uncle Tom and his Wife for Sale" (1857). "The Maid and the Magpie" (1858), the extraordinarily large cartoon called "Deer Browsing" (1857), "The Twa Dogs" (1858), and one or two minor paintings were equal to any previously produced by the artist. Nevertheless, signs of failing health were remarked in "Doubtful Crumbs" and a "Kind Star" (1859). The immense and profoundly dramatic picture called "A Flood in the Highlands" (1860) more than reinstated the painter before the public, but friends still saw ground for uneasiness. Extreme nervous excitability manifested itself in many ways, and in the choice (1864) of the dreadful subject of "Man Proposes, God Disposes," bears clumsily clambering among relics of Sir John Franklin's party, there was occult pathos, which some of the artist's intimates suspected, but did not avow. In 1862 and 1863 Landseer produced nothing; but "A Piper and a Pair of Nutcrackers" (1864) revealed his old power. He declined the presidentship of the Royal Academy in 1865, in succession to Sir Charles Eastlake. In 1867 the four lions which he had modelled for the base of the Nelson Monument in Trafalgar Square, London, were unveiled, and with "The Swannery invaded by Eagles" (1869) he achieved his last triumph. After four years more, full of suffering, mainly of broken art and shattered mental powers, Sir Edwin Landseer died on the 1st of October 1873, and was buried, ten days later, in St Paul's Cathedral. Those who would see the full strength of Landseer's brush should examine his sketches and the like in the Victoria and Albert Museum and similar works. In these he shows himself endowed with the strength of Paul Potter.

See Algernon Graves's *Catalogue of the Works of the late Sir Edwin Landseer*, R.A. (London, n.d.); Frederic G. Stephens's *Sir Edwin Landseer* (1880); W. Cosmo Monkhouse's *The Studies of Sir Edwin Landseer, R.A., with a History of his Art-Life* (London, n.d.); W. P Frith's *My Autobiography and Reminiscences* (1887); Vernon Heath's *Recollections* (1892); and James A. Manson's "Sir Edwin Landseer, R.A.," *The Makers of British Art* (London, 1902).

LAND'S END, a promontory of Cornwall, forming the western most point of England. It is a fine headland of granite, pierced by a natural arch, on a coast renowned for its cliff scenery. Dangerous reefs lie off the point, and one group a mile from the mainland is marked by the Longships Lighthouse, in 50° 4′ N. 5° 43′ W. The Land's End is the westernmost of the granite masses which rise at intervals through Cornwall from Dartmoor. The phenomenon of a raised beach may be seen here, but indications of a submerged forest have also been discovered in the neighbourhood.

LANDSHUT, a town in the kingdom of Bavaria, on the right bank of the Isar, 40 m. N.E. of Munich on the main line of railway to Regensburg. Pop. (1905) 24,217. Landshut is still a quaint, picturesque place; it consists of an old and a new town and of four suburbs, one part of it lying on an island in the Isar. It contains a fine street, the Altstadt, and several interesting medieval buildings. Among its eleven churches the most noteworthy are those of St Martin, with a tower 432 ft. high, of St Jodocus, and of the Holy Ghost, or the Hospital church, all three begun before 1410. The former Dominican convent, founded in 1271, once the seat of the university, is now used as public offices. The post-office, formerly the meeting-house of the Estates, a building adorned with old frescoes; the royal palace, which contains some very fine Renaissance work; and the town-hall, built in 1446 and restored in 1860, are also noteworthy. The town has monuments to the Bavarian king, Maximilian II., and to other famous men; it contains a botanical garden and a public park. On a hill overlooking Landshut is the castle of Trausnitz, called also Burg Landshut, formerly a stronghold of the dukes of Lower Bavaria, whose burial-place was at Seligenthal also near the town. The original building was erected early in the 13th century, but the chapel, the oldest part now existing, dates from the 14th century. The upper part of the castle has been made habitable. The industries of Landshut are not important; they include brewing, tanning and spinning, and the manufacture of tobacco and cloth. Market gardening and an extensive trade in grain are also carried on.

Landshut was founded about 1204, and from 1255 to 1503 it was the principal residence of the dukes of Lower Bavaria and of their successors, the dukes of Bavaria-Landshut. During the Thirty Years' War it was captured several times by the Swedes and in the 18th century by the Austrians. In April 1809 Napoleon defeated the Austrians here and the town was stormed by his troops. From 1800 to 1826 the university, formerly at Ingolstadt and now at Munich, was located at Landshut. Owing to the three helmets which form its arms the town is sometimes called "Dreihelm Stadt."

See Staudenraus, *Chronik der Stadt Landshut*, (Landshut 1832); Wiesend, *Topographische Geschichte von Landshut* (Landshut, 1858); Rosenthal, *Zur Rechtsgeschichte der Städte Landshut und Straubing* (Würzberg, 1883); Kalcher, *Führer durch Landshut* (Landshut, 1887); Haack, *Die gotische Architektur und Plastik der Stadt Landshut* (Munich, 1894); and *Geschichte der Stadt Landshut* (Landshut, 1835).

LANDSKNECHT, a German mercenary foot-soldier of the 16th century. The name (German for "man of the plains") was given to mark the contrast between the force of these soldiers, formed by the emperor Maximilian I. about the end of the 15th century, and the Swiss, the "men of the mountains," at that time the typical mercenary infantry of Europe. After the battles of Marignan and Pavia, where the military reputation of the Swiss had been broken, the Swabian *landsknechte* came to be considered the best fighting troops in Europe. Though primarily a German force and always the mainstay of imperial armies, they served in organized bodies as mercenaries elsewhere in Europe; in France they fought for the League and for the Protestants indiscriminately. In fact *landsknecht*, and more particularly its French corruption *lansquenet*, became in western Europe a general term for mercenary foot-soldiers. It is owing to the *lange Spiesse* (long pike or lance), the typical weapon with which they were armed, that the corrupted French form, as well as a German form, *lanzknecht*, and an English "lance-knight" came into use.

The landsknechts were raised by colonels (*Oberst*), to whom the emperor issued recruiting commissions corresponding to the English "indents"; they were organized in regiments made up of a colonel, lieut.-colonel and regimental staff, with a varying number of companies, "colours" (*Fähnlein*), commanded by captains (*Hauptmann*); subaltern officers were lieutenants and ensigns (*Fähnrich*). In thus defining the titles and duties of each rank, and in almost every detail of regimental customs and organization, discipline and interior economy, the landsknechts may be considered as the founders of the modern military system on a regimental basis (see further ARMY).

LANDSKRONA, a seaport of Sweden, on the east side of the Sound, 15 m. N.E. of Copenhagen. Pop. (1900) 14,399. The harbour is excellent, giving a depth of 35 ft., with 15 ft. beside the quays. The town is among the first twelve manufacturing centres of Sweden in value of output, the principal industries being tanning and sugar manufacture and refining from beetroot. On the little island of Hven, immediately opposite the town, Tycho Brahe built his famous subterranean observatory of Uranienborg in the second half of the 16th century. Landskrona, originally called Landora or Landör, owed its first importance to King Erik XIII., who introduced a body of Carmelite monks from Germany in 1410, and bestowed on the place the privileges of a town. During the wars of the 16th and 17th centuries it played too conspicuous a part for its own prosperity. On the 24th of July 1677 a great naval battle was fought in the neighbourhood in which the Swedes defeated the Danes.

LANDSTURM, the German equivalent of the *levée en masse*, or general levy of all men capable of bearing arms and not included in the other regularly organized forces, standing army or its second line formations, of Continental nations.

LANDWEHR, a German word meaning "defence of the country"; but the term as applied to an insurrectional militia is very ancient, and "lantveri" are mentioned in *Baluzii Capitularia*, as quoted in Hallam's *Middle Ages*, i. 262, 10th ed. The landwehr in Prussia was first formed by a royal edict of the 17th of March 1813, which called up all men capable of bearing arms between the ages of eighteen and forty-five, and not serving in the regular army, for the defence of the country. After the peace of 1815 this force was made an integral part of the Prussian army, each brigade being composed of one line and one landwehr regiment. This, however, retarded the mobilization and diminished the value of the first line, and by the re-organization of 1859 the landwehr troops were relegated to the second line. In Austria the landwehr is a totally different organization. It is in reality a *cadre* force existing alongside the regular army, and to it are handed over such recruits as, for want of vacancies, cannot be placed in the latter. In Switzerland the landwehr is a second line force, in which all citizens serve for twelve years, after passing twelve in the "Auszug" or field army.

LANE, EDWARD WILLIAM (1801–1876), English Arabic scholar, son of Dr Theophilus Lane, prebendary of Hereford, was born on the 17th of September 1801. He was educated at Bath and Hereford grammar schools, where he showed marked mathematical ability, and was designed for Cambridge and the church, but this purpose was abandoned, and for some time he studied the art of engraving. Failure of health compelled him to throw aside the burin, and in 1825 he started for Egypt, where he spent three years, twice ascended the Nile, proceeding as far as the second cataract, and composed a complete description of Egypt, with a portfolio of one hundred and one drawings. This work was never published, but the account of the modern Egyptians, which formed a part of it, was accepted for separate publication by the Society for the Diffusion of Useful Knowledge. To perfect this work Lane again visited Egypt in 1833–1835, residing mainly in Cairo, but retiring to Luxor during the plague of 1835. Lane took up his residence in the Mahommedan quarter, and under the name of Mansur Effendi lived the life of an Egyptian scholar. He was fortunate in the time when he took up his work, for Cairo had not then become a modern city, and he was thus able to describe aspects of Arabian life that no longer exist there. Perfected by the additional observations collected during these years, the *Modern Egyptians* appeared in 1836, and at once took the place which it has never lost as the best description of Eastern life and an Eastern country ever written. It was followed from 1838 to 1840 by a translation of the *Arabian Nights*, with notes and illustrations, designed to make the book a sort of encyclopaedia of Eastern manners. The translation itself is an admirable proof of scholarship, but is characterized by a somewhat stilted mannerism, which is not equally appropriate to all parts of the motley-coloured original. The character of some of the tales and the tedious repetitions of the same theme in the Arabic collection induced Lane to leave considerable parts of the work untranslated. The value of his version is increased by the exhaustive notes on Mahommedan life and customs. In 1840 Lane married a Greek lady. A useful volume of *Selections from the Kur-ān* was published in 1843, but before it passed through the press Lane was again in Egypt, where he spent seven years (1842–1849) collecting materials for a great Arabic lexicon, which the munificence of Lord Prudhoe (afterwards duke of Northumberland) enabled him to undertake. The most important of the materials amassed during this sojourn (in which he was accompanied by his wife and by his sister, Mrs Poole, authoress of the *Englishwoman in Egypt*, with her two sons, afterwards well known in Eastern letters) was a copy in 24 thick quarto volumes of Sheikh Murtadā's great lexicon, the *Tāj el 'Arūs*, which, though itself a compilation, is so extensive and exact that it formed the main basis of Lane's subsequent work. The author, who lived in Egypt in the 18th century, used more than a hundred sources, interweaving what he learned from them with the *al-Qāmūs* of Fairūzābādī in the form of a commentary. By far the larger part of this commentary was derived from the *Lisān el 'Arab* of Ibn Mokarram, a work of the 13th century, which Lane was also able to use while in Cairo.

Returning to England in 1849, Lane devoted the remaining twenty-seven years of his life to digesting and translating his Arabic material in the form of a great thesaurus of the lexicographical knowledge of the Arabs. In spite of weak health he continued this arduous task with unflagging diligence till a few days before his death at Worthing on the 10th of August 1876. Five parts appeared during his lifetime (1863–1874), and three posthumous parts were afterwards edited from his papers by S. Lane-Poole. Even in its imperfect state the *Lexicon* is an enduring monument, the completeness and finished scholarship with which it is executed making each article an exhaustive monograph. Two essays, the one on Arabic lexicography and the other on Arabic pronunciation, contributed to the magazine of the German Oriental Society, complete the record of Lane's publications. His scholarship was recognized by many learned European societies. He was a member of the German Oriental Society, a correspondent of the French Institute, &c. In 1863 he was awarded a small civil list pension, which was after his death continued to his widow. Lane was not an original mind; his powers were those of observation, industry and sound judgment. His personal character was elevated and pure, his strong sense of religious and moral duty being of the type that characterized the best circles of English evangelicalism in the early part of the 19th century.

A Memoir, by his grand-nephew, S. Lane-Poole, was prefixed to part vi. of the *Lexicon*. It was published separately in 1877.

LANE, GEORGE MARTIN (1823–1897), American scholar, was born at Charlestown, Massachusetts, on the 24th of December 1823. He graduated in 1846 at Harvard, and in 1847–1851 studied at the universities of Berlin, Bonn, Heidelberg and Göttingen. In 1851 he received his doctor's degree at Göttingen for his dissertation *Smyrnaeorum Res Gestae et Antiquitates*, and on his return to America he was appointed University Professor of Latin in Harvard College. From 1869 until 1894, when he resigned and became professor emeritus, he was Pope Professor of Latin in the same institution. His *Latin Pronunciation*, which led to the rejection of the English method of Latin pronunciation in the United States, was published in 1871. He died on the 30th of June 1897. His *Latin Grammar*, completed and published by Professor M. H. Morgan in the following year, is of high value. Lane's assistance in the preparation of Harper's Latin lexicons was also invaluable. English light verse he wrote with humour and fluency, and his song *Jonah* and the *Ballad of the Lone Fishball* were famous.

LANE, JAMES HENRY (1814–1866), American soldier and politician, was born at Lawrenceburg, Indiana, on the 22nd of June 1814. He was the son of Amos Lane (1778–1849), a political leader in Indiana, a member of the Indiana House of Representatives in 1816–1818 (speaker in 1817–1818), in 1821–1822 and in 1839–1840, and from 1833 to 1837 a Democratic representative in Congress. The son received a common school education, studied law and in 1840 was admitted to the bar. In the Mexican War he served as a colonel under General Taylor, and then commanded the Fifth Indiana regiment (which he had raised) in the Southern Campaign under General Scott. Lane was lieutenant-governor of Indiana from 1849 to 1853, and from 1853 to 1855 was a Democratic representative in Congress. His vote in favour of the Kansas-Nebraska Bill ruined his political future in his own state, and he emigrated in 1855 to the Territory of Kansas, probably as an agent of Stephen A. Douglas to organize the Democratic party there. He soon joined the Free State forces, however, was a member of the first general Free State convention at Big Springs in September 1855, and wrote its "platform," which deprecated abolitionism and urged the exclusion of negroes from the Territory; and he presided over the Topeka Constitutional Convention, composed of Free State men, in the autumn of 1855. Lane was second in command of the forces in Lawrence during the "Wakarusa War"; and in the spring of 1856 was elected a United States senator under the Topeka Constitution, the validity of which, however, and therefore the validity of his election, Congress refused to recognize. In May 1856, with George Washington Deitzler (1826–1884), Dr Charles Robinson, and other Free State leaders, he was indicted for treason; but he escaped from Kansas, made a tour of the northern cities, and by his fiery oratory aroused great enthusiasm in behalf of the Free State movement in Kansas. Returning to the Territory with John Brown in August 1856, he took an active part in the domestic feuds of 1856–1857. After Kansas became a state, Lane was elected in 1861 to the United States Senate as a Republican. Immediately on reaching Washington he organized a company to guard the President; and in August 1861, having gained the ear of the Federal authorities and become intimate with President Lincoln, he went to Kansas with vague military powers, and exercised them in spite of the protests of the governor and the regular departmental commanders. During the autumn, with a brigade of 1500 men, he conducted a devastating campaign on the Missouri border, and in July 1862 he was appointed commissioner of recruiting for Kansas, a position in which he rendered faithful service, though he frequently came into conflict with the state authorities. At this time he planned a chimerical "great Southern expedition" against New Mexico, but this came to nothing. In 1864 he laboured earnestly for the re-election of Lincoln. When President Johnson quarrelled with the Radical Republicans, Lane deserted the latter and defended the Executive. Angered by his defection, certain senators accused him of being implicated in Indian contracts of a fraudulent character; and in a fit of depression following this accusation he took his own life, dying near Fort Leavenworth, Kansas, on the 11th of July 1866, ten days after he had shot himself in the head. Ambitious, unscrupulous, rash and impulsive, and generally regarded by his contemporaries as an unsafe leader, Lane was a man of great energy and personal magnetism, and possessed oratorical powers of a high order.

See the article by L. W. Spring entitled "The Career of a Kansas Politician," in vol. iv. (October 1898) of the *American Historical Review*; and for the commoner view, which makes him not a coward as does Spring, but a "grim chieftain" and a hero, see John Speer, *Life of Gen. James H. Lane, "The Saviour of Kansas,"* (Garden City, Kansas, 1896).

Senator Lane should not be confused with James Henry Lane (1833–1907), who served on the Confederate side during the Civil War, attaining the rank of brigadier-general in 1862, and after the war was professor of natural philosophy and military tactics in the Virginia Agricultural and Mechanical College from 1872 to 1880, and professor of civil engineering and drawing in the Alabama Polytechnic Institute from 1882 until his death.

LANESSAN, JEAN MARIE ANTOINE DE (1843–), French statesman and naturalist, was born at Sainte-André de Cubzac (Gironde) on the 13th of July 1843. He entered the navy in 1862, serving on the East African and Cochin-China stations in the medical department until the Franco-German War, when he resigned and volunteered for the army medical service. He now completed his studies, taking his doctorate in 1872. Elected to the Municipal Council of Paris in 1879, he declared in favour of communal autonomy and joined with Henri Rochefort in demanding the erection of a monument to the Communards; but after his election to the Chamber of Deputies for the 5th arrondissement of Paris in 1881 he gradually veered from the extreme Radical party to the Republican Union, and identified himself with the cause of colonial expansion. A government mission to the French colonies in 1886–1887, in connexion with the approaching Paris exhibition, gave him the opportunity of studying colonial questions, on which, after his return, he published three works: *La Tunisie* (Paris, 1887); *L'Expansion coloniale de la France* (*ib.*, 1888), *L'Indo-Chine française* (*ib.*, 1889). In 1891 he was made civil and military governor of French Indo-China, where his administration, which involved him in open rupture with Admiral Fournier, was severely criticized. Nevertheless he consolidated French influence in Annam and Cambodia, and secured a large accession of territory on the Mekong river from the kingdom of Siam. He was recalled in 1894, and published an apology for his administration (*La Colonisation française en Indo-Chine*) in the following year. In the Waldeck-Rousseau cabinet of 1899 to 1902 he was minister of marine, and in 1901 he secured the passage of a naval programme intended to raise the French navy during the next six years to a level befitting the place of France among the great powers. At the general election of 1906 he was not re-elected. He was political director of the *Siècle*, and president of the French Colonization Society, and wrote, besides the books already mentioned, various works on political and biological questions.

LANFRANC (d. 1089), archbishop of Canterbury, was a Lombard by extraction. He was born in the early years of the 11th century at Pavia, where his father, Hanbald, held the rank of a magistrate. Lanfranc was trained in the legal studies for which northern Italy was then becoming famous, and acquired such proficiency that tradition links him with Irnerius of Bologna as a pioneer in the renaissance of Roman law. Though designed for a public career Lanfranc had the tastes of a student. After his father's death he crossed the Alps to found a school in France; but in a short while he decided that Normandy would afford him a better field. About 1039 he became the master of the cathedral school at Avranches, where he taught for three years with conspicuous success. But in 1142 he embraced the monastic profession in the newly founded house of Bec. Until 1145 he lived at Bec in absolute seclusion. He was then persuaded by Abbot Herluin to open a school in the monastery. From the first he was celebrated (*totius Latinitatis magister*). His pupils were drawn not only from France and Normandy, but also from Gascony, Flanders, Germany and Italy. Many of them afterwards attained high positions in the Church; one, Anselm of Badagio, became pope under the title of Alexander II. In this way Lanfranc set the seal of intellectual activity on the reform movement of which Bec was the centre. The favourite subjects of his lectures were logic and dogmatic theology. He was therefore naturally invited to defend the doctrine of transubstantiation against the attacks of Berengar of Tours. He took up the task with the greatest zeal, although Berengar had been his personal friend; he was the protagonist of orthodoxy at the councils of Vercelli (1050), Tours (1054) and Rome (1059). To his influence we may attribute the desertion of Berengar's cause by Hildebrand and the more broad-minded of the cardinals. Our knowledge of Lanfranc's polemics is chiefly derived from the tract *De corpore et sanguine Domini* which he wrote many years later (after 1079) when Berengar had been finally condemned. Though betraying no signs of metaphysical ability, his work was regarded as conclusive and became a text-book in the schools. It is the most important of the works attributed to Lanfranc; which, considering his reputation, are slight and disappointing.

In the midst of his scholastic and controversial activities Lanfranc became a political force. While merely a prior of Bec he led the opposition to the uncanonical marriage of Duke William with Matilda of Flanders (1053) and carried matters so far that he incurred a sentence of exile. But the quarrel was settled when he was on the point of departure, and he undertook the difficult task of obtaining the pope's approval of the marriage. In this he was successful at the same council which witnessed his third victory over Berengar (1059), and he thus acquired a lasting claim on William's gratitude. In 1066 he became the first abbot of St Stephen's at Caen, a house which the duke had been enjoined to found as a penance for his disobedience to the Holy See. Henceforward Lanfranc exercised a perceptible influence on his master's policy. William adopted the Cluniac programme of ecclesiastical reform, and obtained the support of Rome for his English expedition by assuming the attitude of a crusader against schism and corruption. It was Alexander II., the former pupil of Lanfranc, who gave the Norman Conquest the papal benediction—a notable advantage to William at the moment, but subsequently the cause of serious embarrassments.

Naturally, when the see of Rouen next fell vacant (1067), the thoughts of the electors turned to Lanfranc. But he declined the honour, and he was nominated to the English primacy as soon as Stigand had been canonically deposed (1070). The new archbishop at once began a policy of reorganization and reform. His first difficulties were with Thomas of Bayeux, archbishop-elect of York, who asserted that his see was independent of Canterbury and claimed jurisdiction over the greater part of midland England. Lanfranc, during a visit which he paid the pope for the purpose of receiving his pallium, obtained an order from Alexander that the disputed points should be settled by a council of the English Church. This was held at Winchester in 1072. Thanks to a skilful use of forged documents, the primate carried the council's verdict upon every point. Even if he were not the author of the forgeries he can scarcely have been the dupe of his own partisans. But the political dangers to be apprehended from the disruption of the English Church were sufficiently serious to palliate the fraud. This was not the only occasion on which Lanfranc allowed his judgment to be warped by considerations of expediency. Although the school of Bec was firmly attached to the doctrine of papal sovereignty, he still assisted William in maintaining the independence of the English Church; and appears at one time to have favoured the idea of maintaining a neutral attitude on the subject of the quarrels between papacy and empire. In the domestic affairs of England the archbishop showed more spiritual zeal. His grand aim was to extricate the Church from the fetters of the state and of secular interests. He was a generous patron of monasticism. He endeavoured to enforce celibacy upon the secular clergy. He obtained the king's permission to deal with the affairs of the Church in synods which met apart from the Great Council, and were exclusively composed of ecclesiastics. Nor can we doubt that it was his influence which shaped the famous ordinance separating the ecclesiastical from the secular courts (*c.* 1076). But even in such questions he allowed some weight to political considerations and the wishes of his sovereign. He acknowledged the royal right to veto the legislation of national synods. In the cases of Odo of Bayeux (1082) and of William of St Calais, bishop of Durham (1088), he used his legal ingenuity to justify the trial of bishops before a lay tribunal. He accelerated the process of substituting Normans for Englishmen in all preferments of importance; and although his nominees were usually respectable, it cannot be said that all of them were better than the men whom they superseded. For this admixture of secular with spiritual aims there was considerable excuse. By long tradition the primate was entitled to a leading position in the king's councils; and the interests of the Church demanded that Lanfranc should use his power in a manner not displeasing to the king. On several occasions when William I. was absent from England Lanfranc acted as his vicegerent; he then had opportunities of realizing the close connexion between religious and secular affairs.

Lanfranc's greatest political service to the Conqueror was rendered in 1075, when he detected and foiled the conspiracy which had been formed by the earls of Norfolk and Hereford. But this was not the only occasion on which he turned to good account his influence with the native English. Although he regarded them as an inferior race he was just and honourable towards their leaders. He interceded for Waltheof's life and to the last spoke of the earl as an innocent sufferer for the crimes of others; he lived on terms of friendship with Bishop Wulfstan. On the death of the Conqueror (1087) he secured the succession for William Rufus, in spite of the discontent of the Anglo-Norman baronage; and in 1088 his exhortations induced the English militia to fight on the side of the new sovereign against Odo of Bayeux and the other partisans of Duke Robert. He exacted promises of just government from Rufus, and was not afraid to remonstrate when the promises were disregarded. So long as he lived he was a check upon the worst propensities of the king's administration. But his restraining hand was too soon removed. In 1089 he was stricken with fever and he died on the 24th of May amidst universal lamentations. Notwithstanding some obvious moral and intellectual defects, he was the most eminent and the most disinterested of those who had co-operated with William I. in riveting Norman rule upon the English Church and people. As a statesman he did something to uphold the traditional ideal of his office; as a primate he elevated the standards of clerical discipline and education. Conceived in the Hildebrandine spirit, his reforms led by a natural sequence to strained relations between Church and State; the equilibrium which he established was unstable, and depended too much upon his personal influence with the Conqueror. But of all the Hildebrandine statesmen who applied their teacher's ideas within the sphere of a particular national church he was the most successful.

The chief authority is the *Vita Lanfranci* by Milo Crispin, who was precentor at Bec and died in 1149. Milo drew largely upon the *Vita Herluini*, composed by Gilbert Crispin, abbot of Westminster. The *Chronicon Beccensis abbatiae*, a 14th-century compilation, should also be consulted. The first edition of these two sources, and of Lanfranc's writings, is that of L. d'Achery, *Beati Lanfranci opera omnia* (Paris, 1648). Another edition, slightly enlarged, is that of J. A. Giles, *Lanfranci opera* (2 vols., Oxford, 1844). The correspondence between Lanfranc and Gregory VII. is given in the *Monumenta Gregoriana* (ed. P. Jaffé, Berlin, 1865). Of modern works A. Charma's *Lanfranc* (Paris, 1849), H. Boehmer's *Die Fälschungen Erzbischof Lanfranks von Canterbury* (Leipzig, 1902), and the same author's *Kirche und Staat in England und in der Normandie* (Leipzig, 1899) are useful. See also the authorities cited in the articles on WILLIAM I. and WILLIAM II. (H. W. C. D.)

LANFREY, PIERRE (1828–1877), French historian and politician, was born at Chambéry (Savoie) on the 26th of October

1828. His father had been one of Napoleon's officers. The son studied philosophy and history in Paris and wrote historical works of an anti-clerical and rationalizing tendency. These included *L'Église et les philosophes ou XVIII*^{e} *siècle* (1855; new edition, with a notice of the author by E. de Pressensé, 1879); *Essai sur la révolution française* (1858); *Histoire politique des papes* (1860); *Lettres d'Evérard* (1860), a novel in the form of letters; *Le Rétablissement de la Pologne* (1863). His *magnum opus* was his *Histoire de Napoléon I*^{er} (5 vols., 1867–1875 and 1886; Eng. trans., 4 vols., 1871–1879), which ceased unfortunately at the end of 1811 with the preparations for the Russian campaign of 1812. This book, based on the emperor's correspondence published in 1858–1870, attempted the destruction of the legends which had grown up around his subject, and sought by a critical examination of the documents to explain the motives of his policy. In his desire to controvert current misconceptions and exaggerations of Napoleon's abilities Lanfrey unduly minimized his military and administrative genius. A stanch republican, he was elected to the National Assembly in 1871, became ambassador at Bern (1871–1873), and life senator in 1875. He died at Pau on the 15th of November 1877.

His *Œuvres complètes* were published in 12 vols. (1879 seq.), and his *Correspondance* in 2 vols. (1885).

LANG, ANDREW (1844–), British man of letters, was born on the 31st of March 1844, at Selkirk, Scotland. He was educated at the Edinburgh Academy, St Andrews University and at Balliol College, Oxford, where he took a first class in the final classical schools in 1868, becoming a fellow and subsequently honorary fellow of Merton College. As a journalist, poet, critic and historian, he soon made a reputation as one of the ablest and most versatile writers of the day. His first publication was a volume of metrical experiments, *The Ballads and Lyrics of Old France* (1872), and this was followed at intervals by other volumes of dainty verse, *xxii. Ballades in Blue China* (1880, enlarged edition, 1888), *Ballads and Verses Vain* (1884), selected by Mr Austin Dobson; *Rhymes à la Mode* (1884), *Grass of Parnassus* (1888), *Ban and Arrière Ban* (1894), *New Collected Rhymes* (1905). He collaborated with S. H. Butcher in a prose translation (1879) of the *Odyssey*, and with E. Myers and Walter Leaf in a prose version (1883) of the *Iliad*, both of them remarkable for accurate scholarship and excellence of style. As a Homeric scholar, of conservative views, he took a high rank. His *Homer and the Epic* appeared in 1893; a new prose translation of *The Homeric Hymns* in 1899, with essays literary and mythological, in which parallels to the Greek myths are given from the traditions of savage races; and his *Homer and his Age* in 1906. His purely journalistic activity was from the first of a varied description, ranging from sparkling "leaders" for the *Daily News* to miscellaneous articles for the *Morning Post*, and for many years he was literary editor of *Longman's Magazine*; no critic was in more request, whether for occasional articles and introductions to new editions or as editor of dainty reprints. To the study of Scottish history Mr Lang brought a scholarly care for detail, a piquant literary style, and a gift for disentangling complicated questions. The *Mystery of Mary Stuart* (1901, new and revised ed., 1904) was a consideration of the fresh light thrown on Mary's history by the Lennox MSS. in the University library, Cambridge, strengthening her case by restating the perfidy of her accusers. He also wrote monographs on *The Portraits and Jewels of Mary Stuart* (1906) and *James VI. and the Gowrie Mystery* (1902). The somewhat unfavourable view of John Knox presented in his book *John Knox and the Reformation* (1905) aroused considerable controversy. He gave new information about the continental career of the Young Pretender in *Pickle the Spy* (1897), an account of Alastair Ruadh Macdonell, whom he identified with Pickle, a notorious Hanoverian spy. This was followed in 1898 by *The Companions of Pickle*, and in 1900 by a monograph on *Prince Charles Edward*. In 1900 he began a *History of Scotland from the Roman Occupation*, the fourth volume of which (1907) brought Scottish history down to 1746. *The Valet's Tragedy* (1903), which takes its title from an essay on the "Man with the Iron Mask," (see IRON MASK), collects twelve papers on historical mysteries, and *A Monk of Fife* (1896) is a fictitious narrative purporting to be written by a young Scot in France in 1429–1431. Mr Lang's versatility was also shown in his valuable works on folk-lore and on primitive religion. The earliest of these works was *Custom and Myth* (1884); in *Myth, Literature and Religion* (2 vols., 1887, French trans., 1896) he explained the irrational elements of mythology as survivals from earlier savagery; in *The Making of Religion* (an idealization of savage animism) he maintained the existence of high spiritual ideas among savage races, and instituted comparisons between savage practices and the occult phenomena among civilized races; he dealt with the origins of totemism (*q.v.*) in *Social Origins*, printed (1903) together with J. J. Atkinson's *Primal Law*. He was one of the founders of the study of "Psychical Research," and his other writings on anthropology include *The Book of Dreams and Ghosts* (1897), *Magic and Religion* (1901) and *The Secret of the Totem* (1905). He carried the humour and sub-acidity of discrimination which marked his criticism of fellow folk-lorists into the discussion of purely literary subjects in his *Books and Bookmen* (1886), *Letters to Dead Authors* (1886), *Letters on Literature* (1889), &c. His *Blue Fairy Tale Book* (1889), beautifully produced and illustrated, was followed annually at Christmas by a book of fairy tales and romances drawn from many sources. He edited *The Poems and Songs of Robert Burns* (1896), and was responsible for the *Life and Letters* (1897) of J. G. Lockhart, and *The Life, Letters and Diaries* (1890) of Sir Stafford Northcote, first earl of Iddesleigh.

LANG, KARL HEINRICH, RITTER VON (1764–1835), German historian, was born on the 7th of June 1764 at Balgheim, near Nördlingen. From the first he was greatly attracted towards historical studies, and this was shown when he began to attend the gymnasium of Oettingen, and in 1782, when he went to the university of Altdorf, near Nuremberg. At the same time he studied jurisprudence, and in 1782 became a government clerk at Oettingen. About the same period began his activities as a journalist and publicist. But Lang did not long remain an official. He was of a restless, changeable character, which constantly involved him in personal quarrels, though he was equally quick to retire from them. In 1788 he obtained a position as private tutor in Hungary, and in 1789 became private secretary to Baron von Bühler, the envoy of Württemberg at Vienna. This led to further travels and to his entering the service of the prince of Oettingen-Wallerstein. In 1792 Lang again betook himself to a university, this time to Göttingen. Here he came under the influence of the historian, Ludwig Timotheus Spittler, from whom, as also from Johannes von Müller and Friedrich Schlegel, his historical studies received a fresh impulse. At intervals from 1793 to 1801 Lang was closely connected with the Prussian statesman Hardenberg, who employed him as his private secretary and archivist, and in 1797 he was present with Hardenberg at the congress of Rastadt as secretary to the legation. He was occupied chiefly with affairs of the principalities of Anspach and Bayreuth, newly acquired by Prussia, and especially in the settlement of disputes with Bavaria as to their boundaries.

When in 1805 the principalities became part of Bavaria, Lang entered the Bavarian service (1806), was ennobled in 1808 and from 1810 to 1817 held the office of archivist in Munich. He again devoted himself with great enthusiasm to historical studies, which naturally dealt chiefly with Bavarian history. He evolved the theory, among other things, that the boundaries of the old counties or *pagi* (*Gaue*) were identical with those of the dioceses. This theory was combated in later days, and caused great confusion in the province of historical geography. For the rest, Lang did great service to the study of the history of Bavaria, especially by bringing fresh material from the archives to bear upon it. He also kept up his activity as a publicist, in 1814 defending in a detailed and somewhat biassed pamphlet the policy of the minister Montgelas, and he undertook critical studies in the history of the Jesuits. In 1817 Lang retired from active life, and until his death, which took place on the 26th of March 1835, lived chiefly in Ansbach.

Lang is best known through his *Memoiren*, which appeared at Brunswick in two parts in 1842, and were republished in 1881 in a second edition. They contain much of interest for the history of the period, but have to be used with the greatest caution on account of their pronounced tendency to satire. Lang's character, as can be gathered especially from a consideration of his behaviour at Munich, is darkened by many shadows. He did not scruple, for instance, to strike out of the lists of witnesses to medieval charters, before publishing them, the names of families which he disliked.

Of his very numerous literary productions the following may be mentioned: *Beiträge zur Kenntnis der natürlichen und politischen Verfassung des oettingischen Vaterlandes* (1786); *Ein Votum über den Wucher von einem Manne sine voto* (1791); *Historische Entwicklung der deutschen Steuerverfassungen* (1793); *Historische Prüfung des vermeintlichen Alters der deutschen Landstände* (1796); *Neuere Geschichte des Fürstentums Bayreuth (1486–1603)* (1798–1811); *Tabellen über Flächeninhalt &c. und bevorstehende Verluste der deutschen Reichsstände.* (On the occasion of the congress of Rastadt, 1798); *Der Minister Graf von Montgelas* (1814); *Geschichte der Jesuiten in Bayern* (1819); and *Bayerns Gauen* (Nuremberg, 1830).

See K. Th. v. Heigel, *Augsburger allgemeine Zeitung* for 1878, p. 1969 et seq., 1986 et seq. (Beilage of the 14th and 15th of May); F. Muncker, in *Allgemeine deutsche Biographie*, vol. xvii. (1883); F. X. v. Wegele, *Geschichte der deutschen Historiographie* (1885). (J. Hn.)

LANGDELL, CHRISTOPHER COLUMBUS (1826–1906), American jurist, was born in New Boston, Hillsborough county, New Hampshire, on the 22nd of May 1826, of English and Scotch-Irish ancestry. He studied at Phillips Exeter Academy in 1845–1848, at Harvard College in 1848–1850 and in the Harvard Law School in 1851–1854. He practised law in 1854–1870 in New York City, but he was almost unknown when, in January 1870, he was appointed Dane professor of law (and soon afterwards Dean of the Law Faculty) of Harvard University, to succeed Theophilus Parsons, to whose *Treatise on the Law of Contracts* (1853) he had contributed as a student. He resigned the deanship in 1895, in 1900 became Dane professor emeritus, and on the 6th of July 1906 died in Cambridge. He received the degree of LL.D. in 1875; in 1903 a chair in the law school was named in his honour; and after his death one of the school's buildings was named Langdell Hall. He made the Harvard Law School a success by remodelling its administration and by introducing the "case" system of instruction.

Langdell wrote *Selection of Cases on the Law of Contracts* (1870, the first book used in the "case" system; enlarged, 1877); *Cases on Sales* (1872); *Summary of Equity Pleading* (1877, 2nd ed., 1883); *Cases in Equity Pleading* (1883); and *Brief Survey of Equity Jurisdiction* (1905).

LANGDON, JOHN (1741–1819), American statesman, was born in Portsmouth, New Hampshire, on the 25th of June 1741. After an apprenticeship in a counting-house, he led a seafaring life for several years, and became a shipowner and merchant. In December 1774, as a militia captain he assisted in the capture of Fort William and Mary at New Castle, New Hampshire, one of the first overt acts of the American colonists against the property of the crown. He was elected to the House of Representatives of the last Royal Assembly of New Hampshire and then to the second Continental Congress in 1775, and was a member of the first Naval Committee of the latter, but he resigned in 1776, and in June 1776 became Congress's agent of prizes in New Hampshire and in 1778 continental (naval) agent of Congress in this state, where he supervised the building of John Paul Jones's "Ranger" (completed in June 1777), the "America," launched in 1782, and other vessels. He was a judge of the New Hampshire Court of Common Pleas in 1776–1777, a member (and speaker) of the New Hampshire House of Representatives from 1776 until 1782, a member of the state Constitutional Convention of 1778 and of the state Senate in 1784–1785, and in 1783–1784 was again a member of Congress. He contributed largely to raise troops in 1777 to meet Burgoyne; and he served as a captain at Bennington and at Saratoga. He was president of New Hampshire in 1785–1786 and in 1788–1789; a member of the Federal Constitutional Convention in 1787, where he voted against granting to Congress the power of issuing paper money; a member of the state convention which ratified the Federal Constitution for New Hampshire; a member of the United States Senate in 1789–1801, and its president *pro tem.* during the first Congress and the second session of the second Congress; a member of the New Hampshire House of Representatives in 1801–1805 and its speaker in 1803–1805; and governor of the state in 1805–1809 and in 1810–1812. He received nine electoral votes for the vice-presidency in 1808, and in 1812 was an elector on the Madison ticket. He died in Portsmouth on the 18th of September 1819. He was an able leader during the Revolutionary period, when his wealth and social position were of great assistance to the patriot party. In the later years of his life in New Hampshire he was the most prominent of the local Republican leaders and built up his party by partisan appointments. He refused the naval portfolio in Jefferson's cabinet.

His elder brother, Woodbury Langdon (1739–1805), was a delegate to the Continental Congress in 1779–1780, a member of the executive council of New Hampshire in 1781–1784, judge of the Supreme Court of the state in 1782 and in 1786–1790 (although he had had no legal training), and a state senator in 1784–1785.

Alfred Langdon Elwyn has edited *Letters by Washington, Adams, Jefferson and Others, Written During and After the Revolution, to John Langdon of New Hampshire* (Philadelphia, 1880), a book of great interest and value. See a biographical sketch of John Langdon by Charles R. Corning in the *New England Magazine*, vol. xxii. (Boston, 1897).

LANGE, ANNE FRANÇOISE ELIZABETH (1772–1816), French actress, was born in Genoa on the 17th of September 1772, the daughter of a musician and an actress at the Comédie Italienne. She made her first appearance on the stage at Tours in 1787 and a successful début at the Comédie Française in 1788 in *L'Écossaise* and *L'Oracle*. She followed Talma and the others in 1791 to the Rue Richelieu, but returned after a few months to the Comédie Française. Here her talent and beauty gave her an enormous success in François de Neuchâteau's *Pamela*, the performance of which brought upon the theatre the vials of wrath of the Committee of Safety. With the author and the other members of the caste, she was arrested and imprisoned. After the 9th Thermidor she rejoined her comrades at the Feydeau, but retired on the 16th of December 1797, reappearing only for a few performances in 1807. She had, meantime, married the son of a rich Belgian named Simons. She died on the 25th of May 1816.

LANGE, ERNST PHILIPP KARL (1813–1899), German novelist, who wrote under the pseudonym *Philipp Galen*, was born at Potsdam on the 21st of December 1813. He studied medicine at Berlin (1835–1840), and on taking his degree, in 1840, entered the Prussian army as surgeon. In this capacity he saw service in the Schleswig-Holstein campaign of 1849. He settled at Bielefeld as medical practitioner and here issued his first novel, *Der Inselkönig* (1852, 3rd ed., 1858), which enjoyed considerable popularity. In Bielefeld he continued to work at his profession and to write, until his retirement, with the rank of *Oberstabsarzt* (surgeon-general) to Potsdam in 1878; there he died on the 20th of February 1899. Lange's novels are distinguished by local colouring and pretty, though not powerful, descriptions of manners and customs. He particularly favoured scenes of English life, though he had never been in that country, and on the whole he succeeded well in his descriptions. Chief among his novels are, *Der Irre von St James* (1853, 5th ed., 1871), and *Emery Glandon* (3rd ed., Leip., 1865), while of those dealing with the Schleswig-Holstein campaign *Andreas Burns* (1856) and *Die Tochter des Diplomaten* (1865) commanded considerable attention.

His *Gesammelte Schriften* appeared in 36 vols. (1857–1866).

LANGE, FRIEDRICH ALBERT (1828–1875), German philosopher and sociologist, was born on the 28th of September 1828, at Wald, near Solingen, the son of the theologian, J. P. Lange (*q.v.*). He was educated at Duisburg, Zürich and Bonn, where he distinguished himself by gymnastics as much as by study. In 1852 he became schoolmaster at Cologne; in 1855 *privatdozent* in philosophy at Bonn; in 1858 schoolmaster at Duisburg, resigning when the government forbade schoolmasters to take part in political agitation. Lange then entered on a career of militant journalism in the cause of political and social reform. He was also prominent in the affairs of his town, yet found leisure to write most of his best-known books, *Die Leibesübungen* (1863), *Die Arbeiterfrage* (1865, 5th ed. 1894), *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart* (1866; 7th ed. with biographical sketch by H. Cohen, 1902; Eng. trans., E. C. Thomas, 1877), and *J. S. Mill's Ansichten über die sociale Frage* (1866). In 1866, discouraged by affairs in Germany, he moved to Winterthur, near Zürich, to become connected with the democratic newspaper, *Winterthurer Landbote.* In 1869 he was *Privatdozent* at Zürich, and next year professor. The strong French sympathies of the Swiss in the Franco-German War led to his speedy resignation. Thenceforward he gave up politics. In 1872 he accepted a professorship at Marburg. Unhappily, his vigorous frame was already stricken with disease, and, after a lingering illness, he died at Marburg, on the 23rd of November 1875, diligent to the end. His *Logische Studien* was published by H. Cohen in 1877 (2nd ed., 1894). His main work, the *Geschichte des Materialismus*, which is brilliantly written, with wide scientific knowledge and more sympathy with English thought than is usual in Germany, is rather a didactic exposition of principles than a history in the proper sense. Adopting the Kantian standpoint that we can know nothing but phenomena, Lange maintains that neither materialism nor any other metaphysical system has a valid claim to ultimate truth. For empirical phenomenal knowledge, however, which is all that man can look for, materialism with its exact scientific methods has done most valuable service. Ideal metaphysics, though they fail of the inner truth of things, have a value as the embodiment of high aspirations, in the same way as poetry and religion. In Lange's *Logische Studien*, which attempts a reconstruction of formal logic, the leading idea is that reasoning has validity in so far as it can be represented in terms of space. His *Arbeiterfrage* advocates an ill-defined form of socialism. It protests against contemporary industrial selfishness, and against the organization of industry on the Darwinian principle of struggle for existence.

See O. A. Ellissen, *F. A. Lange* (Leipzig, 1891), and in *Monatsch. d. Comeniusgesell.* iii., 1894, 210 ff.; H. Cohen in *Preuss. Jahrb.* xxvii., 1876, 353 ff.; Vaihinger, *Hartmann, Dühring und Lange* (Iserlohn, 1876); J. M. Bösch, *F. A. Lange und sein Standpunkt d. Ideals* (Frauenfeld, 1890); H. Braun, *F. A. Lange, als Socialökonom* (Halle, 1881). (H. St.)

LANGE, JOHANN PETER (1802–1884), German Protestant theologian, was of peasant origin and was born at Sonneborn near Elberfeld on the 10th of April 1802. He studied theology at Bonn (from 1822) under K. I. Nitzsch and G. C. F. Lücke, held several pastorates, and eventually (1854) settled at Bonn as professor of theology in succession to Isaac A. Dorner, becoming also in 1860 counsellor to the consistory. He died on the 9th of July 1884. Lange has been called the poetical theologian *par excellence*: "It has been said of him that his thoughts succeed each other in such rapid and agitated waves that all calm reflection and all rational distinction become, in a manner, drowned" (F. Lichtenberger). As a dogmatic writer he belonged to the school of Schleiermacher. His *Christliche Dogmatik* (3 vols., 1849–1852, new edition, 1870) "contains many fruitful and suggestive thoughts, which, however, are hidden under such a mass of bold figures and strange fancies, and suffer so much from want of clearness of presentation, that they did not produce any lasting effect" (Otto Pfleiderer).

His other works include *Das Leben Jesu* (3 vols., 1844–1847), *Das apostolische Zeitalter* (2 vols., 1853–1854), *Grundriss der theologischen Enzyklopädie* (1877), *Grundriss der christlichen Ethik* (1878), and *Grundriss der Bibelkunde* (1881). In 1857 he undertook with other scholars a *Theologisch-homiletisches Bibelwerk*, to which he contributed commentaries on the first four books of the Pentateuch, Haggai, Zechariah, Malachi, Matthew, Mark, Revelation. The *Bibelwerk* has been translated, enlarged and revised under the general editorship of Dr Philip Schaff.

LANGEAIS, a town of west-central France in the department of Indre-et-Loire, on the right bank of the Loire, 16 m. W.S.W. of Tours by rail. Pop. (1906) town, 1755; commune, 3550. Langeais has a church of the 11th, 12th and 15th centuries but is chiefly interesting for the possession of a large château built soon after the middle of the 15th century by Jean Bourré, minister of Louis XI. Here the marriage of Charles VIII. and Anne of Brittany took place in 1491. In the park are the ruins of a keep of late 10th-century architecture, built by Fulk Nerra, count of Anjou.

LANGEN, JOSEPH (1837–1901), German theologian, was born at Cologne on the 3rd of June 1837. He studied at Bonn, was ordained priest in 1859, was nominated professor extraordinary at the university of Bonn in 1864, and a professor in ordinary of the exegesis of the New Testament in 1867—an office which he held till his death. He was one of the able band of professors who in 1870 supported Döllinger in his resistance to the Vatican decrees, and was excommunicated with Ignaz v. Döllinger, Johann Huber, Johann Friedrich, Franz Heinrich Reusch, Joseph Hubert Reinkens and others, for refusing to accept them. In 1878, in consequence of the permission given to priests to marry, he ceased to identify himself with the Old Catholic movement, although he was not reconciled with the Roman Catholic Church. Langen was more celebrated as a writer than as a speaker. His first work was an inquiry into the authorship of the Commentary on St Paul's Epistles and the Treatise on Biblical Questions, ascribed to Ambrose and Augustine respectively. In 1868 he published an *Introduction to the New Testament*, a work of which a second edition was called for in 1873. He also published works on the *Last Days of the Life of Jesus*, on *Judaism in the Time of Christ*, on *John of Damascus* (1879) and an *Examination of the Vatican Dogma in the Light of Patristic Exegesis of the New Testament.* But he is chiefly famous for his *History of the Church of Rome to the Pontificate of Innocent III.* (4 vols., 1881–1893), a work of sound scholarship, based directly upon the authorities, the most important sources being woven carefully into the text. He also contributed largely to the *Internationale theologische Zeitschrift*, a review started in 1893 by the Old Catholics to promote the union of National Churches on the basis of the councils of the Undivided Church, and admitting articles in German, French and English. Among other subjects, he wrote on the School of Hierotheus, on Romish falsifications of the Greek Fathers, on Leo XIII., on Liberal Ultramontanism, on the Papal Teaching in regard to Morals, on Vincentius of Lerins and he carried on a controversy with Professor Willibald Beyschlag, of the German Evangelical Church, on the respective merits of Protestantism and Old Catholicism regarded as a basis for teaching the Christian faith. An attack of apoplexy put an end to his activity as a teacher and hastened his death, which occurred in July 1901. (J. J. L.*)

LANGENBECK, BERNHARD RUDOLF KONRAD VON (1810–1887), German surgeon, was born at Horneburg on the 9th of November 1810, and received his medical education at Göttingen, where he took his doctor's degree in 1835 with a thesis on the structure of the retina. After a visit to France and England, he returned to Göttingen as *Privatdozent*, and in 1842 became professor of surgery and director of the Friedrichs Hospital at Kiel. Six years later he succeeded J. F. Dieffenbach (1794–1847) as director of the Clinical Institute for Surgery and Ophthalmology at Berlin, and remained there till 1882, when failing health obliged him to retire. He died at Wiesbaden on the 30th of September 1887. Langenbeck was a bold and skilful operator, but was disinclined to resort to operation while other means afforded a prospect of success. He devoted particular attention to military surgery, and was a great authority in the treatment of gunshot wounds. Besides acting as general field-surgeon of the army in the war with Denmark in 1848, he saw active service in 1864, 1866, and again in the Franco-German campaign of 1870–71. He was in Orleans at the end of 1870, after the city had been taken by the Prussians, and was unwearied in his attentions, whether as operator or consultant, to wounded men with whom every public building was packed. He also utilized the opportunities for instruction that thus arose, and the "Militär-Aerztliche Gesellschaft," which met twice a week for some months, and in the discussions of which every surgeon in the city was invited to take part, irrespective of nationality, was mainly formed by his energy and enthusiasm. He was ennobled for his services in the Danish War of 1864.

LANGENSALZA, a town in the Prussian province of Saxony, on the Salza, about 20 m. N. W. from Erfurt. Pop. (1905) 12,545. Near it are the remains of the old Benedictine monastery of Homburg or Hohenburg, where the emperor Henry IV. defeated the Saxons in 1075. The manufacture of cloth is the chief industry; lace, starch, machines, cigars and chemicals are also produced, while spinning, dyeing, brewing and printing are carried on. There is a sulphur bath in the neighbourhood, situated in a pleasant park, in which there are monuments to those who fell in the war of 1866. Langensalza became a town in 1211 and was afterwards part of the electorate of Saxony. In 1815 it came into the possession of Prussia. It is remarkable in history as the scene of three battles: (1) the victory of the Prussians and English over the imperial army on the 15th of February 1761; (2) that of the Prussians over the Bavarians on the 17th of April 1813; and (3) the engagement on the 27th of June 1866 between the Prussians and the Hanoverians, in which the latter, though victorious in the field, were compelled to lay down their arms on the arrival of overwhelming Prussian reinforcements.

See Göschel, *Chronik der Stadt Langensalza* (Langensalza, 1818–1842); G. and H. Schütz, *Chronik der Stadt Langensalza* (Langensalza, 1901); and Gutbier, *Schwefelbad Langensalza* (Langensalza, 1900).

LANGHAM, SIMON (d. 1376), archbishop of Canterbury and cardinal, was born at Langham in Rutland, becoming a monk in the abbey of St Peter at Westminster, and later prior and then abbot of this house. In 1360 he was made treasurer of England and in 1361 he became bishop of Ely; he was appointed chancellor of England in 1363 and was chosen archbishop of Canterbury in 1366. Perhaps the most interesting incident in his primacy was when he drove the secular clergy from their college of Canterbury Hall, Oxford, and filled their places with monks. The expelled head of the seculars was a certain John de Wiclif, who has been identified with the great reformer Wycliffe. Notwithstanding the part Langham as chancellor had taken in the anti-papal measures of 1365 and 1366 he was made a cardinal by Pope Urban V. in 1368. This step lost him the favour of Edward III., and two months later he resigned his archbishopric and went to Avignon. He was soon allowed to hold other although less exalted positions in England, and in 1374 he was elected archbishop of Canterbury for the second time; but he withdrew his claim and died at Avignon on the 22nd of July 1376. Langham's tomb is the oldest monument to an ecclesiastic in Westminster Abbey; he left the residue of his estate—a large sum of money—to the abbey, and has been called its second founder.

LANGHOLM, a burgh of barony and police burgh of Dumfriesshire, Scotland. Pop. (1901) 3142. It is situated on both sides of the Esk, 16 m. N.E. of Annan, the terminus of a branch line connecting with the North British railway system at Riddings Junction. The Esk is crossed by a three-arched stone bridge, uniting the old town on the left bank with the new on the right, and a suspension bridge. Ewes Water, which falls into the river, is spanned by a two-arched bridge, 1 m. N. of the town. The public buildings include the town hall—a substantial edifice with a tower rising in three tiers from the body of the structure, the Telford library, and the Hope hospital for aged poor. Already famous for its plaids and blankets, the prosperity of the burgh advanced when it took up the manufacture of tweeds. Distilling, brewing, dyeing and tanning are also important industries. The Esk and Liddel being favourite fishing streams, Langholm is the headquarters of the association which protects the rights of anglers. About 1 m. to the N.W. stands Langholm Lodge, a seat of the duke of Buccleuch, and some 4 m. S.E. is Gilnockie Tower, the peel-house that belonged to Johnny Armstrong, the freebooter, who was executed by order of James V. in 1530.

LANGHORNE, JOHN (1735–1779), English poet and translator of Plutarch, was born at Kirkby Stephen, Westmorland. He at first supported himself as a private tutor and schoolmaster, and, having taken orders, was appointed (1766) to the rectory of Blagdon, Somerset, where he died on the 1st of April 1779. His poems (original and translations), and sentimental tales, are now forgotten, but his translation of Plutarch's *Lives* (1770), in which he had the co-operation of his elder brother William (1721–1772), is not yet superseded. It is far less vigorous than Sir Thomas North's version (translated from Amyot) but is free from its inaccuracies. His poems were published in 1804 by his son, J. T. Langhorne, with a memoir of the author; they will also be found in R. Anderson's *Poets of Great Britain*, xi. (1794) and A. Chalmers's *English Poets*, xvi. (1810), with memoir. Of his poems, *The Country Justice*, a plea for the neglected poor, and *The Fables of Flora*, were the most successful; of his prose writings, *The Correspondence between Theodosius and Constantia*, founded on a well-known story in the *Spectator* (No. 164).

LANGIEWICZ, MARYAN (1827–1887), Polish patriot, was born at Krotoszyn, in the province of Posen, on the 5th of August 1827, his father being the local doctor. Langiewicz was educated at Posen, Breslau and Prague, and was compelled to earn his daily bread by giving lectures. He subsequently entered the Prussian *Landwehr* and served for a year in the royal guard. In 1860 he migrated to Paris and was for a time professor in the high school founded there by Mieroslawski. The same year he took part in Garibaldi's Neapolitan campaign, and was then a professor in the military school at Cuneo till the establishment was closed. In 1862 he entered into communication with the central Polish committee at Warsaw, and on the outbreak of the insurrection of the 22nd of January 1863, took the command of the armed bands. He defeated the Russians at Wachock and Slupia (February), capturing 1000 muskets and 8 cannon. This victory drew hundreds of young recruits to his standard, till at last he had 12,000 men at his disposal. On the 23rd of February he again defeated the Russians, at Malogoszcza, and captured 500 muskets and 2 cannon. On the 10th of March he proclaimed himself dictator and attempted to form a regular government; but either he had insufficient organizing talent, or had not time enough to carry out his plans, and after a fresh series of engagements his army was almost annihilated at Zagosc (18th of March), whereupon he took refuge in Austrian territory and was interned at Tarnow. He was subsequently transferred to the fortress of Josephstadt, from which he was released in 1865. He then lived at Solothurn as a citizen of the Swiss Republic, and subsequently entered the Turkish service as Langie Bey. He died at Constantinople on the 11th of May 1887.

See Boleslaw Limanowski, *The National Insurrection of 1863–64* (Pol.) (Lemberg, 1900); Paolo Mazzoleni, *I Bergamaschi in Polonia nel 1863* (Bergamo, 1893); W. H. Bavink, *De Poolsche opstand 1863*, &c. (Haarlem, 1864).

LANGLAND, WILLIAM (*c.* 1332–*c.* 1400), the supposed English poet, generally regarded until recently as the single author of the remarkable 14th-century poem *Piers the Plowman.* Its full title is—*The Vision of William concerning Piers the Plowman, together with Vita de Do-wel, Do-bet, et Do-best, secundum Wit et Resoun*; usually given in Latin as *Visio Willelmi de Petro Plowman, &c.*; the whole work being sometimes briefly described as *Liber de Petro Plowman.* We know nothing of William Langland except from the supposed evidence of the MSS. of the poem and the text itself, and it will be convenient first to give a brief general description of them.

The poem exists in three forms. If we denote these by the names of A-text (or Vernon), B-text (or Crowley), and C-text (or Whitaker), we find, of the first, ten MSS., of the second fourteen, and of the third seventeen, besides seven others of a mixed type. It will be seen that we thus have abundance of material, a circumstance which proves the great popularity of the poem in former times. Owing to the frequent expressions which indicate a desire for reformation in religion, it was, in the time of Edward VI., considered worthy of being printed. Three impressions of the B-text were printed by Robert Crowley in 1550; and one of these was badly reprinted by Owen Rogers in 1561. In 1813 the best MS. of the C-text was printed by Dr E. Whitaker. In 1842 Mr Thomas Wright printed an edition from an excellent

MS. of the B-text in the library of Trinity College, Cambridge (2nd ed., 1856, new ed., 1895). A complete edition of all three texts was printed for the Early English Text Society as edited by the Rev. W. W. Skeat, with the addition of *Richard the Redeless*, and containing full notes to all three texts, with a glossary and indexes, in 1867–1885. The Clarendon Press edition, by the same editor, appeared in 1886.

The A-text contains a prologue and 12 passus or cantos (i.-iv.; the vision of the Lady Meed; v.-viii., the vision of Piers the Plowman; ix.-xii., the vision of Do-wel, Do-bet and Do-best), with 2567 lines. The B-text is much longer, containing 7242 lines, with additional passus following after xi. of A, the earlier passus being altered in various respects. The C-text, with 7357 lines, is a revision of B.

The general contents of the poem may be gathered from a brief description of the C-text. This is divided into twenty-three passus, nominally comprising four parts, called respectively Visio de Petro Plowman, Visio de Do-wel, Visio de Do-bet and Visio de Do-best. Here *Do-bet* signifies "do better" in modern English; the explanation of the names being that he who does a kind action *does well*, he who teaches others to act kindly *does better*, whilst he who combines both practice and theory, both doing good himself and teaching others to do the same, *does best*. But the visions by no means closely correspond to these descriptions; and Skeat divides the whole into a set of eleven visions, which may be thus enumerated: (1) Vision of the Field Full of Folk, of Holy Church, and of the Lady Meed (passus i.-v.); (2) Vision of the Seven Deadly Sins, and of Piers the Plowman (pass. vi.-x.); (3) Wit, Study, Clergy and Scripture (pass. xi., xii.); (4) Fortune, Nature, Recklessness and Reason (pass. xiii., xiv.); (5) Vision of Imaginative (pass. xv.); (6) Conscience, Patience and Activa-Vita (pass. xvi., xvii.); (7) Free-will and the Tree of Charity (pass. xviii., xix.); (8) Faith, Hope and Charity (pass. xx.); (9) The Triumph of Piers the Plowman, *i.e.* the Crucifixion, Burial and Resurrection of Jesus Christ (pass. xxi.); (10) The Vision of Grace (pass. xxii.); (11) The Vision of Antichrist (pass. xxiii.).

The bare outline of the C-text gives little idea of the real nature of the poem. The author's object, as Skeat describes it, was to "afford himself opportunities (of which he has amply availed himself) for describing the life and manners of the poorer classes; for inveighing against clerical abuses and the rapacity of the friars; for representing the miseries caused by the great pestilences then prevalent and by the hasty and ill-advised marriages consequent thereupon; and for denouncing lazy workmen and sham beggars, the corruption and bribery then too common in the law courts, and all the numerous forms of falsehood which are at all time the fit subjects for satire and indignant exposure. In describing, for example, the seven deadly sins, he gives so exact a description of Glutton and Sloth that the reader feels them to be no mere abstractions, but drawn from the life; and it becomes hardly more difficult to realize Glutton than it is to realize Sir John Falstaff. The numerous allegorical personages so frequently introduced, such as Scripture, Clergy, Conscience, Patience and the like, are all mouthpieces of the author himself, uttering for the most part his own sentiments, but sometimes speaking in accordance with the character which each is supposed to represent. The theological disquisitions which are occasionally introduced are somewhat dull and tedious, but the earnestness of the author's purpose and his energy of language tend to relieve them, and there are not many passages which might have been omitted without loss. The poem is essentially one of those which improve on a second reading, and as a linguistic monument it is of very high value. Mere extracts from the poem, even if rather numerous and of some length, fail to give a fair idea of it. The whole deserves, and will repay, a careful study; indeed, there are not many single works from which a student of English literature and of the English language may derive more substantial benefit.

"The metre is alliterative, and destitute of final rhyme. It is not very regular, as the author's earnestness led him to use the fittest words rather than those which merely served the purpose of rhythm. The chief rule is that, in general, the same letter or combination of letters should begin *three* stressed syllables in the same line, as, for example, in the line which may be modernized thus: 'Of all *m*anner of *m*en, the *m*ean and the rich.' Sometimes there are but *two* such rhyme-letters, as: '*M*ight of the commons *m*ade him to reign.' Sometimes there are *four*, as: 'In a *s*ummer *s*eason, when *s*oft was the *s*un.' There is invariably a pause, more or less distinct, in the middle of each line" (*Ency. Brit.*, 9th ed., art. LANGLAND).

The traditional view, accepted by such great authorities as Skeat and Jusserand, that a single author—and that author Langland—was responsible for the whole poem, in all its versions, has been so recently disputed that it seems best to state it in Skeat's own words, before giving briefly the alternative view, which propounds a theory of composite authorship, denying any real existence to "William Langland." The account of the single-author theory is repeated from Professor Skeat's article in the 9th edition of this work, slightly revised by him in 1905 for this edition.

"The author's name is not quite certain, and the facts concerning his life are few and scanty. As to his Christian name we are sure, from various allusions in the poem itself, and the title *Visio Willelmi*, &c., in many MSS.; so that we may at once reject the suggestion that his name may have been Robert. In no less than three MSS. [of the C-text; one not later than 1427] occurs the following colophon: 'Explicit visio Willelmi W. de Petro le Plowman.' What is here meant by W. it is difficult to conjecture; but it is just possible that it may represent Wychwood (of which more presently), or Wigornensis, *i.e.* of Worcester. As to the surname, we find the note that 'Robert or William Langland made pers ploughman,' in a handwriting of the 15th century, on the fly-leaf of a MS. copy [of the B-text] formerly belonging to Lord Ashburnham, and now in the British Museum; and in a Dublin MS. [of the C-text] is the note [in a 15th-century hand]: 'Memorandum, quod Stacy de Rokayle, pater Willielmi de Langlond, qui Stacius fuit generosus et morabatur in Schiptone-under-Whicwode, tenens domini le Spenser in comitatu Oxon., qui predictus Willielmus fecit librum qui vocatur Perys Ploughman.' There is no trace of any Langland family in the midland counties, while the Langley family were wardens of Wychwood forest in Oxfordshire between the years 1278 and 1362; but this consideration can hardly set aside the above statement. According to Bale, our author was born at Cleobury Mortimer, which is quite consistent with the supposition that his father may have removed from that place to Shipton in Oxfordshire, as there seems to have been a real connexion between the families in those places.

"The internal evidence concerning the author is fuller and more satisfactory. By piecing together the various hints concerning himself which the poet gives us, we may compile the following account. His name was William (and probably Langland), and he was born about 1332, perhaps at Cleobury Mortimer in Shropshire. His father, who was doubtless a franklin or farmer, and his other friends put him to school, made a 'clerk' or scholar of him, and taught him what Holy Writ meant. In 1362, at the age of about thirty, he found himself wandering upon the Malvern hills, and fell asleep beside a stream, and saw in a vision a field full of folk, *i.e.* this present world, and many other remarkable sights which he duly records. From this supposed circumstance he named his poem *The Vision of William*, though it is really a succession of visions, since he mentions several occasions on which he awoke, and afterwards again fell asleep; and he even tells us of some adventures which befel him in his waking moments. In some of these visions there is no mention of Piers the Plowman, but in others he describes him as being the coming reformer who was to remedy all abuses, and restore the world to a right condition. It is remarkable that his conception of this reformer changes from time to time, and becomes more exalted as the poem advances. At first he is no more than a ploughman, one of the true and honest labourers who are the salt of the earth; but at last he is identified with the great reformer who has come already, the regenerator of the world in the person of Jesus Christ; in the author's own phrase—'Petrus est Christus.' If this be borne in mind, it will not be possible to make the mistake into which so many have fallen, of speaking of Piers the Plowman as being the author, not the subject, of the poem. The author once alludes to the nickname of Long Will bestowed upon him from his tallness of stature—just as the poet Gascoigne was familiarly called Long George. Though there is mention of the Malvern hills more than once near the beginning of the poem, it is abundantly clear that the poet lived for 'many years in Cornhill (London), with his wife Kitte and his daughter Calote.' He seems to have come to London soon after the date of the first commencement of his work, and to have long continued there. He describes himself as being a tall man, one who was loath to reverence lords or ladies or persons in gay apparel, and not deigning to say 'God save you' to the sergeants whom he met in the street, insomuch that many people took him to be a fool. He was very poor, wore long robes, and had a shaven crown, having received the clerical tonsure. But he seems only to have taken minor orders, and earned a precarious living by singing the *placebo*, *dirige* and seven psalms for the good of men's souls. The fact that he was married may explain why he never rose in the church. But he had another source of livelihood in his ability to write out legal documents, and he was extremely familiar with the law courts at Westminster. His leisure time must have been entirely occupied with his poem, which was essentially the work of his lifetime. He was not satisfied with rewriting it once, but he actually re-wrote it twice; and from the abundance of the MSS. which still exist we can see its development from the earliest draught (A-text), written about 1362, to its latest form (C-text), written about 1393.[1]

"In 1399, just before the deposition of Richard II., appeared a poem addressed to the king, who is designated as 'Richard the Redeless,' *i.e.* devoid of counsel. This poem, occurring in only one MS. [of the B-text] in which it is incomplete, breaking off abruptly in the middle of a page, may safely be attributed to Langland, who was then in Bristol. As he was at that time about sixty-seven years of age, we may be sure that he did not long survive the accession of Henry IV. It may here be observed that the well-known poem entitled *Pierce Ploughman's Crede*, though excellently written, is certainly an imitation by another hand; for the Pierce Ploughman of the *Crede* is very different in conception from the subject of 'William's Vision.'"

On the other hand, the view taken by Professor J. M. Manly, of Chicago, which has recently obtained increasing acceptance among scholars, is that the early popularity of the *Piers Plowman* poems has resulted in "the confusion of what is really the work of five different men," and that Langland himself is "a mythical author." The argument for the distinction in authorship rests on internal evidence, and on analysis of the style, diction and "visualizing" quality within the different texts. Whereas Skeat, regarding the three texts as due to the same author, gives most attention to the later versions, and considers B the intermediate form, as on the whole the best, Manly recognizes in A the real poet, and lays special stress on the importance of attention to the A-text, and particularly pass. i.-viii. In this A-text the two first visions are regarded as by a single author of genius, but the third is assigned to a continuator who tried to imitate him, the whole conclusion of the 12th passus being, moreover, by a third author, whose name, John But, is in fact given towards the end, but in a way leading Skeat only to credit him with a few lines. The same process of analysis leads to crediting the B-text and the C-text to separate and different authors, B working over the three visions of the A-text and making additions of his own, while C again worked over the B-text. The supposed references to the original author A, introduced by B and C, are then to be taken as part of the fiction. Who were the five authors? That question is left unsolved. John But, according to Professor Manly, was "doubtless a scribe" or "a minstrel." B, C and the continuator of A "seem to have been clerics, and, from their criticisms of monks and friars, to have been of the secular clergy," C being "a better scholar than either the continuator of A or B." A, who "exempts from his satire no order of society except monks," may have been himself a monk, but "as he exhibits no special technical knowledge or interests" he "may have been a layman." As regards Richard the Redeless, Professor Manly attributes this to another imitator; he regards identity of authorship as out of the question, in consequences of differences in style and thought, apart altogether from the conclusion as to the authorship of *Piers the Plowman*.

See the editions already referred to: *The Deposition of Richard II.*, ed. T. Wright (Camden Society), which is the same poem as *Richard the Redeless*; Warton, *Hist. of Eng. Poetry*; Rev. H. H. Milman, *Hist. of Latin Christianity*; G. P. Marsh, *Lectures on English*; H. Morley, *English Writers*; B. ten Brink, *Early English Literature*; J. J. Jusserand, *Observations sur la vision de P. P.* (Paris, 1879); *Les Anglais au moyen âge: L'Épopée mystique de William Langland* (1893, Eng. trans. *Piers Plowman*, revised and enlarged by another 1894); J. M. Manly in *Cambridge Hist. of English Lit.*, vol. ii. and bibliography. A long and careful summary of the whole poem is given in Morley's *English Writers*, and is repeated in his *Illustrations of English Religion*, ch. iii.

LANGLEY, SAMUEL PIERPONT (1834–1906), American physicist and astronomer, was born at Roxbury, Boston, Massachusetts, on the 22nd of August 1834. After acting for a short time as assistant in Harvard College Observatory, he was appointed assistant professor of mathematics in the U.S. Naval Academy in 1866, and in the following year became director of the Allegheny Observatory at Pittsburg, a position which he held until his selection in 1887 as secretary of the Smithsonian Institution at Washington. His name is especially associated with two main branches of investigation—aeronautics, and the exploration of the infra-red portions of the solar spectrum. The study of the latter he took up as a result of the publication in 1871 of an energy-curve of the spectrum by S. I. Lamansky. The imperfections of the thermopile, with which he began his work, led him, about 1880, to the invention of the bolometer, an instrument of extraordinary delicacy, which in its most refined form is believed to be capable of detecting a change of temperature amounting to less than one-hundred-millionth of a degree Centigrade. Depending on the fact that the electrical conductivity of a metallic conductor is decreased by heat, it consists of two strips of platinum, arranged to form the two arms of a Wheatstone bridge; one strip being exposed to a source of radiation from which the other is shielded, the heat causes a change in the resistance of one arm, the balance of the bridge is destroyed, and a deflection is marked on the galvanometer. The platinum strips are exceedingly minute, being in some cases only $\frac{1}{250}$ in. in width, and less than one-tenth of that amount in thickness. By the aid of this instrument, Langley, working on Mount Whitney, 12,000 ft. above sea-level, discovered in 1881 an entirely unsuspected extension of the invisible infra-red rays, which he called the "new spectrum." The importance of his achievement may be judged from the fact that, while the visible spectrum includes rays having wave-lengths of from about 0·4 μ to 0·76 μ, and no invisible heat-rays were known before 1881 having a wave-length greater than 1·8 μ, he detected rays having a wave-length of 5·3 μ. In addition, taking advantage of the accuracy with which the bolometer can determine the position of a source of heat by which it is affected, he mapped out in this infra-red spectrum over 700 dark lines or bands resembling the Fraunhofer lines of the visible spectrum, with a probable accuracy equal to that of refined astronomical observations. In aeronautics he succeeded in demonstrating the practicability of mechanical flight. He first undertook a preliminary inquiry into the principles upon which flight depends, and established at Allegheny a huge "whirling table," the revolving arm of which could be driven by a steam-engine at any circumferential speed up to 70 m. an hour. The construction of a flying machine was next attempted. The first difficulty was to make it sufficiently light in relation to the power its machinery could develop; and several machines were built in which trials were made of steam, and of compressed air and carbonic acid gas as motive agents. About 1893 a satisfactory machine was ready, and a new series of troubles had to be faced, for it had to be launched at a certain initial speed, and in the face of any wind that might be blowing. To enable these conditions to be fulfilled, as well as to ensure that the machine, when it fell, should fall on water, the experiments were carried out on the Potomac river, some 30 m. below Washington. It was not till the autumn of 1894 that an efficient launching apparatus was devised, and then the wings were found not to be strong enough to bear the pressures to which they were subjected. Various other delays and mishaps followed, but ultimately, on the 6th of May 1896, a successful flight was made. On that day an aerodrome, weighing about 30 ℔ and about 16 ft. in length, with wings measuring between 12 and 13 ft. from tip to tip, twice sustained itself in the air for 1½ minutes (the full time for which it was supplied with fuel and water), and traversed on each occasion a distance of over half a mile, falling gently into the water when the engines stopped. Later in the same year, on the 28th of November, a similar aerodrome flew about three-quarters of a mile, attaining a speed of 30 m. an hour. In 1903 he experimented with an aerodrome capable of carrying a man, but repeated accidents prevented it from being launched, and finally through lack of funds the experiments had to be abandoned without the machine ever having been free in the air (see also FLIGHT AND FLYING). Langley died on the 27th of February 1906.

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[1] According to Jusserand, 1398.

LANGLOIS, HIPPOLYTE (1839–), French general, was born at Besançon in 1839, and, after passing through the École Polytechnique, was appointed to the artillery as sub-lieutenant in 1858, attaining the rank of captain in 1866. He served in the army of Metz in the war of 1870. Eight years later he became major, in 1887 lieutenant-colonel and in 1888 colonel. At this time he was appointed professor of artillery at the École de Guerre, and in this post he devoted himself to working out the tactical principles of the employment of field artillery under the new conditions of armament of which he foresaw the advent. The public result of his work was the great treatise *L'Artillerie de campagne* (1891–1892), which may still be regarded as the classic of the arm. In 1894 he became general of brigade, and in 1898 general of division. For two years after this he was the commandant of the École de Guerre at the time that the modern French strategical and tactical "doctrine" was being developed and taught. He was, however, regarded as a leader as well as a theorist, and in 1901 he was selected to command the XX. Army Corps on the German frontier, popularly called the "iron" corps. In 1902 he became a member of the Conseil supérieur de la Guerre, consisting of senior generals marked out for the higher commands in war. He retired from the active list in 1904 on reaching the age limit, and devoted himself with the greatest energy to critical military literature. In 1907 he began the publication of a monthly journal of military art and history, the *Revue militaire générale*. The most important of his other works are *Enseignements de deux guerres recentes* and *Conséquences tactiques du progrès de l'armement*.

LANGPORT, a market town in the eastern parliamentary division of Somersetshire, England, 13½ m. E. of Taunton by the Great Western railway. Pop. (1901) 890. It lies on the right (east) bank of the river Parret, near the point where that river debouches from the hills on to the plain through which it flows to the Bristol Channel. The main street leads up a slope from the river to the fine Perpendicular church of All Saints. Close to this an archway crosses the road, bearing a Perpendicular building known as the hanging chapel. After serving this purpose it housed first the grammar-school (founded 1675), then the Quekett museum, named after John Thomas Quekett (1815–1861) the histologist, a native of the town, whose father was master of the school. The hanging chapel afterwards became a masonic hall. Not far distant is the church of Huish Episcopi, with one of the finest of the Perpendicular towers for which Somersetshire is noted. Langport has a considerable general and agricultural trade.

Langport (*Llongborth, Langeberga, Langeport*) owed its origin to its defensible position on a hill, and its growth to its facilities for trade on the chief river of Somerset. It occupies the site of the British town of Llongborth, and was important during the Roman occupation. It was a royal borough in Saxon times, and in 1086 had 34 resident burgesses. The first charter, given by Elizabeth in 1562, recognized that Langport was a borough of great antiquity, which had enjoyed considerable privileges, being governed by a portreve. It was incorporated by James I. in 1617, but the corporation was abolished in 1883. Langport was represented in parliament in 1304 and 1306. The charter of 1562 granted three annual fairs to Langport, on the 28th of June, the 11th of November and the second Monday in Lent. One fair only is now held, on the 3rd of September, which is a horse and cattle fair. A Saturday market was held under the grant of 1562, but in the 19th century the market day was changed to Tuesday.

LANGREO, a town of northern Spain, in the province of Oviedo, in very hilly country, on the left bank of the river Nalon, and on a branch railway from Oviedo to Labiana. Pop. (1900) 18,714. In the neighbourhood large quantities of wheat, hemp, fruit and cider are produced; and there are important coal and iron mines, foundries, and factories for the manufacture of coarse cloth.

LANGRES, a town of eastern France, capital of an arrondissement in the department of Haute-Marne, 22 m. S.S.E. of Chaumont on the eastern railway to Belfort. Pop. (1906) town, 6663; commune, 9803. Langres stands at a height of some 1550 ft. on a jutting promontory of the tableland known as the plateau de Langres, and overlooks eastward and westward respectively the valleys of the Marne and its tributary the Bonnelle. From the cathedral tower and the ramparts which surround the town there is an extensive view over the valley of the Marne, the Vosges and the Côte d'Or, and in clear weather Mt Blanc (160 m. distant) is visible. The cathedral of St Mammès, for the most part in the Transitional style of the 12th century, has a west front in the Graeco-Roman style of the 18th century and a fine Renaissance chapel. The church of St Martin (13th, 15th and 18th centuries) possesses a figure of Christ of the 16th century, one of the finest wood carvings known. The ramparts are protected by several towers, most of which date from the 16th century. The Gallo-Roman gate, one of four entrances in the Roman period, is preserved, but is walled up. The Porte des Moulins (17th century) is the most interesting of the other gates. The town possesses a museum rich in Gallo-Roman antiquities, a picture gallery and an important library. The birth of Denis Diderot here is commemorated by a statue. Langres is the seat of a bishop and a sub-prefect, and has tribunals of first instance and of commerce, a higher ecclesiastical seminary and communal colleges for both sexes. It manufactures well-known cutlery and grind-stones. Trade is in grain and other farm-produce, live stock, wine, &c.

Langres, the ancient *Andematunum*, was capital of the *Lingones*. Under Roman rule it was at first to some extent autonomous, but was reduced to the rank of colony after the revolt of the chief Sabinus in A.D. 71. The bishopric was founded about 200 and in the middle ages its holders became peers of the realm and enjoyed the temporal power in the town. In 301 the Alemanni were defeated at Langres by the Romans, but in the next century it was burnt by the Vandals and by Attila.

The "plateau of Langres" appears frequently in the military history of the 18th and 19th centuries as a dominant strategic point, though its importance as such has appealed chiefly to the advocates of wars of positions and passive defence. The modern fortifications of Langres, which serves as a second line fortress, consist of (*a*) Fort St Menge or Ligniville on high ground above the confluence of the Marne and the Neuilly brook, about 5 m. N. by W. of the town; (*b*) the west front, comprising Humes battery (2¼ m. N.W. of Langres), Fort de la Pointe de Diamant, and the redoubts of Perrancey, Le Fays and Noidant (the last 4 m. S.W. of the town), overlooking the deep valley of the Mouche brook (this front was attacked in the mock siege of August 1907); (*c*) the south front, comprising Fort de la Bonnelle or Décrès (2 m. S.S.W. of the town), a small work commanding the Chalon-Langres road, Le Mont and Le Pailly batteries, Fort Vercingetorix, the last, 5 m. S.W. of the place, standing on a steep and narrow spur of the main plateau, and in second line the old fort de la Marnotte, and the large bastioned citadel (the town enceinte is "déclassée"); (*d*) the east front, marked by Forts Montlandon and Plesnoy at the north and south ends respectively of a long steep ridge, 6 m. E. of Langres, the bridges over the Marne leading to these works being commanded by Fort Peigney.

a work about half a mile east of the town; (*e*) Fort Dampierre, 8 m. N.E. of the town, which commands all the main approaches from the north, and completes the circle by crossing its fire with that of Fort St Menge.

LANGTOFT, PETER (d. *c.* 1307), English chronicler, took his name from the village of Langtoft in Yorkshire, and was a canon of the Augustinian priory in Bridlington. His name is also given as Langetoft and Langetost. He wrote in French verse a *Chronicle* dealing with the history of England from the earliest times to the death of Edward I. in 1307. It consists of three parts and contains about 9000 rhyming verses. The earlier part of the *Chronicle* is taken from Geoffrey of Monmouth and other writers; for the period dealing with the reign of Edward I. Langtoft is a contemporary and valuable authority, especially for affairs in the north of England and in Scotland. Langtoft's *Chronicle* seems to have enjoyed considerable popularity in the north, and the latter part of it was translated into English by Robert Mannyng, sometimes called Robert of Brunne, about 1330. It has been edited for the Rolls Series by T. Wright (1866–1868).

See Wright's preface, and also O. Preussner, *Robert Mannyng of Brunne's Übersetzung von Pierre de Langtofts Chronicle und ihr Verhältniss zum Originale* (Breslau, 1891).

LANGTON, JOHN (d. 1337), chancellor of England and bishop of Chichester, was a clerk in the royal chancery, and became chancellor in 1292. He obtained several ecclesiastical appointments, but owing to the resistance of Pope Boniface VIII. he failed to secure the bishopric of Ely in 1298, although he was supported by Edward I. and visited Rome to attain his end. Resigning his office as chancellor in 1302, he was chosen bishop of Chichester in 1305, and again became chancellor shortly after the accession of Edward II. in 1307. Langton was one of the "ordainers" elected in 1310, and it was probably his connexion with this body that led to his losing the office of chancellor about this time. He continued, however, to take part in public affairs; mediating between the king and Earl Thomas of Lancaster in 1318, and attempting to do so between Edward and his rebellious barons in 1321. He died in June or July 1337. Langton built the chapterhouse at Chichester, and was a benefactor of the university of Oxford.

LANGTON, STEPHEN (d. 1228), cardinal and archbishop of Canterbury, was the son of English parents; but the date and place of his birth are unknown. Since he became early in his career a prebendary of York, and since his brother Simon (d. 1248) was elected[1] to that see in 1215, we may suppose the family to have been of northern extraction. Stephen, however, migrated to Paris, and having graduated in that university became one of its most celebrated theologians. This was probably the time when he composed his voluminous commentaries (many of which still exist in manuscript) and divided the Bible into chapters. At Paris also he contracted the friendship with Lothar of Segni, the future Innocent III., which played so important a part in shaping his career. Upon becoming pope, Innocent summoned Langton to Rome, and in 1206 designated him as cardinal-priest of S. Chrysogonus. Immediately afterwards Langton was drawn into the vortex of English politics.

Archbishop Hubert Walter had died in 1205, and the election of his successor had raised thorny questions. The suffragans of Canterbury claimed a share in choosing the new primate, although that right had been exclusively reserved to the monks of Canterbury by a papal privilege; and John supported the bishops since they were prepared to give their votes for his candidate, John de Gray, bishop of Norwich. A party of the younger monks, to evade the double pressure of the king and bishops, secretly elected their sub-prior Reginald and sent him to Rome for confirmation. The plot leaked out; the rest of the monks were induced to elect John de Gray, and he too was despatched to Rome. After hearing the case Innocent declared both elections void; and with John's consent ordered that a new election should be made in his presence by the representatives of the monks. The latter, having confessed that they had given John a secret pledge to elect none but the bishop of Norwich, were released from the promise by Innocent; and at his suggestion elected Stephen Langton, who was consecrated by the pope on the 17th of June 1207. On hearing the news the king banished the monks of Canterbury and lodged a protest with the pope, in which he threatened to prevent any English appeals from being brought to Rome. Innocent replied by laying England under an interdict (March 1208), and excommunicating the king (November 1209). As John still remained obstinate, the pope at length invited the French king Philip Augustus to enter England and depose him. It was this threat which forced John to sue for a reconciliation; and the first condition exacted was that he should acknowledge Langton as archbishop. During these years Langton had been residing at Pontigny, formerly the refuge of Becket. He had addressed to the English people a dignified protest against the king's conduct, and had at last pressed the pope to take extreme measures. But he had consistently adopted towards John as conciliatory an attitude as his duty to the church would allow, and had more than once entered upon negotiations for a peaceful compromise. Immediately after entering England (July 1213) he showed his desire for peace by absolving the king. But, unlike the pope, he gave ear to the popular cry for redress of political grievances; and persisted in associating with the baronial opposition, even after he was ordered by Innocent to excommunicate them as disturbers of the peace. Langton encouraged the barons to formulate their demands, and is said to have suggested that they should take their stand upon the charter of Henry I. It is uncertain what further share he took in drafting Magna Carta. At Runnymede he appeared as a commissioner on the king's side, and his influence must therefore be sought in those clauses of the Charter which differ from the original petitions of the barons. Of these the most striking is that which confirms the "liberties" of the church; and this is chiefly remarkable for its moderation.

Soon after the issue of the charter the archbishop left England to attend the Fourth Lateran Council. At the moment of his departure he was suspended by the representatives of Innocent for not enforcing the papal censures against the barons. Innocent confirmed the sentence, which remained in force for two years. During this time the archbishop resided at Rome. He was allowed to return in 1218, after the deaths of Innocent and John. From that date till his death he was a tower of strength to the royal party. Through his influence Pandulf was recalled to Rome (1221) and Honorius III. promised that no legate should be sent to reside in England during the archbishop's lifetime. In 1222, in a synod held at Oseney, he promulgated a set of Constitutions still recognized as forming a part of the law of the English Church. Beyond this little is recorded of his latter years. He died on the 9th of July 1228, and was buried in Canterbury Cathedral, where his tomb, unless tradition errs, may still be seen.

The authorities are mainly those for the reign of John. No contemporary biography has come down to us. Some letters, by Langton and others, relating to the quarrel over his election are preserved in a Canterbury Chronicle (ed. W. Stubbs in the "Rolls" edition of *Gervase of Canterbury*, vol. ii.). There are many references to him in the correspondence of Innocent III. (Migne's *Patrologia Latina*, vols. ccxiv.-ccxvii.). Of modern works see F. Hurter, *Geschichte Papst Innocenz III.* (Hamburg, 1841–1844); W. F. Hook, *Lives of the Archbishops of Canterbury* (London, 1860–1876), and W. Stubbs's preface to the second volume of *Walter of Coventry* ("Rolls" ed.), which devotes special attention to Langton. The MSS. of Langton's writings are noticed in J. Bale's *Index Britanniae scriptorum* (ed. R. L. Poole, 1902); his Constitutions are printed in D. Wilkin's *Concilia*, vol. ii. (London, 1737). (H. W. C. D.)

Another English prelate who bore the name of Langton was Thomas Langton, bishop of Winchester, chaplain to Edward IV. In 1483 he was chosen bishop of St Davids; in 1485 he was made bishop of Salisbury and provost of Queen's College, Oxford, and he became bishop of Winchester in 1493. In 1501 he was elected archbishop of Canterbury, but he died on the 27th of January 1501, before his election had been confirmed.

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[1] Pope Innocent, however, would not confirm this election, and the disappointed candidate threw himself into the contest between the English barons on the one side and King John and the pope on the other. Later Simon made peace with Henry III. and was appointed archdeacon of Canterbury; he was consulted by Pope Gregory IX. and was sent to France on diplomatic business by Henry III.

LANGTON, WALTER (d. 1321), bishop of Lichfield and treasurer of England, was probably a native of Langton West in Leicestershire. Appointed a clerk in the royal chancery, he became a favourite servant of Edward I., taking part in the suit over the succession to the Scottish throne in 1292, and visiting France more than once on diplomatic business. He obtained several ecclesiastical preferments, became treasurer in 1295, and in 1296 bishop of Lichfield. Having become unpopular, the barons in 1301 vainly asked Edward to dismiss him; about the same time he was accused of murder, adultery and simony. Suspended from his office, he went to Rome to be tried before Pope Boniface VIII., who referred the case to Winchelsea, archbishop of Canterbury; the archbishop, although Langton's lifelong enemy, found him innocent, and this sentence was confirmed by Boniface in 1303. Throughout these difficulties, and also during a quarrel with the prince of Wales, afterwards Edward II., the treasurer was loyally supported by the king. Visiting Pope Clement V. on royal business in 1305, Langton appears to have persuaded Clement to suspend Winchelsea; after his return to England he was the chief adviser of Edward I., who had already appointed him the principal executor of his will. His position, however, was changed by the king's death in July 1307. The accession of Edward II. and the return of Langton's enemy, Piers Gaveston, were quickly followed by the arrest of the bishop and his removal from office. His lands, together with a great hoard of movable wealth, were seized, and he was accused of misappropriation and venality. In spite of the intercession of Clement V. and even of the restored archbishop, Winchelsea, who was anxious to uphold the privileges of his order, Langton, accused again by the barons in 1309, remained in prison after Edward's surrender to the "ordainers" in 1310. He was released in January 1312 and again became treasurer; but he was disliked by the "ordainers," who forbade him to discharge the duties of his office. Excommunicated by Winchelsea, he appealed to the pope, visited him at Avignon, and returned to England after the archbishop's death in May 1313. He was a member of the royal council from this time until his dismissal at the request of parliament in 1315. He died in November 1321, and was buried in Lichfield cathedral, which was improved and enriched at his expense. Langton appears to have been no relation of his contemporary, John Langton, bishop of Chichester.

LANGTRY, LILLIE (1852–), English actress, was the daughter of the Rev. W. C. le Breton, dean of Jersey, and married in 1874 Edward Langtry (d. 1897). For many years she was famous as one of the most beautiful women in England. It was not till 1881 that she definitely went on the stage, appearing from that time under her own management both in London and in America. In 1899 she married Sir Hugo de Bathe, Bart.

LANGUAGE (adapted from the Fr. *langage*, from *langue*, tongue, Lat. *lingua*), the whole body of words and combinations of words as used in common by a nation, people or race, for the purpose of expressing or communicating their thoughts; also, more widely, the power of expressing thought by verbal utterance. See generally under PHILOLOGY, PHONETICS, VOICE, WRITING, GRAMMAR, &c.; and the articles on the various languages, or under headings of countries and races.

LANGUEDOC, one of the old provinces of France, the name of which dates from the end of the 13th century. In 1290 it was used to refer to the country in whose tongue (*langue*) the word for "yes" was *oc*, as opposed to the centre and north of France, the *langue d'oil* (the *oui* of to-day). Territorially Languedoc varied considerably in extent, but in general from 1360 until the French Revolution it included the territory of the following departments of modern France: part of Tarn et Garonne, Tarn, most of Haute-Garonne, Ariège, Aude, Pyrénées-Orientales, Hérault, Gard, Lozère, part of Ardèche and Haute-Loire. The country had no natural geographical unity. Stretching over the Cevennes into the valleys of the upper Loire on the north and into that of the upper Garonne on the west, it reached the Pyrenees on the south and the rolling hills along the Rhone on the east. Its unity was entirely a political creation, but none the less real, as it was the great state of the Midi, the representative of its culture and, to some degree, the defence of its peculiar civilization. Its climate, especially in Hérault (Montpellier), is especially delightful in spring and early summer, and the scenery still holds enough ruined remains of Roman and feudal times to recall the romance and the tragedy of its history.

Although the name is of comparatively late medieval origin, the history of Languedoc, which had little in common with that of northern France, begins with the Roman occupation. Toulouse was an important place as early as 119 B.C.; the next year Narbonne, the seaport, became a Roman colony. By the time of Julius Caesar the country was sufficiently Romanized to furnish him with men and money, and though at first involved in the civil wars which followed, it prospered under Roman rule as perhaps no other part of the empire did. While it corresponded exactly to no administrative division of the Roman empire, it was approximately the territory included in *Gallia Narbonensis*, one of the seventeen provinces into which the empire was divided at the death of Augustus. It was rich and flourishing, crowded with great and densely populated towns, Nîmes, Narbonne, Béziers, Toulouse; with schools of rhetoric and poetry still vigorous in the 5th century; theatres, amphitheatres and splendid temples. In the 5th century this high culture was an open prize for the barbarians; and after the passing of the Vandals, Suebi and Visigoths into Spain, the Visigoths returned under Wallia, who made his capital at Toulouse in 419. This was the foundation of the Visigothic kingdom which Clovis dismembered in 507, leaving the Visigoths only Septimania—the country of seven cities, Narbonne, Carcassonne, Elne, Béziers, Maguelonne, Lodève and Agde—that is, very nearly the area occupied later by the province of Languedoc. At the council of Narbonne in 589 five races are mentioned as living in the province, Visigoths, Romans, Jews—of whom there were a great many—Syrians and Greeks. The repulse of the Arabs by Charles Martel in 732 opened up the country for the Frankish conquest, which was completed by 768. Under the Carolingians Septimania became part of the kingdom of Aquitaine, but became a separate duchy in 817.

Until the opening of the 13th century there is no unity in the history of Languedoc, the great houses of Toulouse and Carcassonne and the swarm of warlike counts and barons practically ignoring the distant king of France, and maintaining a chronic state of civil war. The feudal régime did not become at all universal in the district, as it tended to become in the north of France. Allodial tenures survived in sufficient numbers to constitute a considerable class of non-vassal subjects of the king, with whose authority they were little troubled. By the end of the 11th century the house of the counts of Toulouse began to play the predominant rôle; but their court had been famous almost a century before for its love of art and literature and its extravagance in dress and fashions, all of which denoted its wealth. Constance, wife of King Robert II. and daughter of the count of Toulouse, gave great offence to the monks by her following of gallant gentlemen. They owed their tastes, not only to their Roman blood, and the survival of their old love for rhetoric and poetry, but also to their intercourse with the Mahommedans, their neighbours and enemies, and their friends when they were not fighting. Under Raymond of Saint Gilles, at the end of the 11th century, the county of Toulouse began its great career, but Raymond's ambition to become an Oriental prince, which led him—and the hundred thousand men who, according to the chroniclers, followed him—away on the first crusade, left a troubled heritage to his sons Bertrand and Alphonse Jourdain. The latter successfully beat off William IX., duke of Aquitaine, and won from the count of Barcelona that part of Provence between the Drôme and the Durance. The reign of Alphonse lasted from 1109 to 1148. By the opening of the 13th century the sovereignty of the counts of Toulouse was recognized through about half of Provence, and they held the rich cities of the most cultured and wealthiest portion of France, cities which had a high degree of local independence. Their local governments, with their consuls at the head, show, at least in name, the influence of Roman ideas. It is still an open question how much of their autonomy had remained untouched by the barbarian invasions from the Roman period. The citizens of these free cities were in continual intercourse with Saracens of Palestine and Moors of Spain; they had never entirely abandoned pagan customs; their poetry—the poetry of the troubadours—taught them the joys of life rather than the fear of death, the licence of their chivalry with its courts of love led to the other extreme of asceticism in such as were of religious temperament; all things combined to make Languedoc the proper soil for heresy. The Church never had the hold upon the country that it had in the north, the people of the Midi were always lukewarm in the faith; there was no noteworthy ecclesiastical literature in Languedoc from the end of the Carolingian period until after the Albigensian crusade, no theological centre like Paris, Bec or Laon. Yet Languedoc furnished the most heroic martyrs for the ascetic Manichaean creed. The era of heresy began with the preaching of Peter de Brueys and his follower, Henry of Lausanne, who emptied the churches and taught contempt for the clergy. Saint Bernard himself was able to make but temporary headway against this rebellion from a sacramental and institutionalized Christianity. In the first decade of the 13th century came the inevitable conflict. The whole county of Toulouse, with its fiefs of Narbonne, Béziers, Foix, Montpellier and Quercy, was in open and scornful secession from the Catholic Church, and the suppression of this Manichaean or Cathar religion was the end of the brilliant culture of Languedoc. (See ALBIGENSES, CATHARS, INQUISITION.) The crusade against the Albigenses, as the Cathars were locally termed, in 1209, resulted in the union to the crown of France in 1229 of all the country from Carcassonne to the Rhone, thus dividing Languedoc into two. The western part left to Raymond VII., by the treaty of 1229, included the Agenais, Quercy, Rouergue, the Toulousain and southern Albigeois. He had as well the Venaissin across the Rhone. From 1229 to his death in 1249 Raymond VII. worked tirelessly to bring back prosperity to his ruined country, encouraging the foundation of new cities, and attempting to gain reconciliation with the Church. He left only a daughter, Jeanne, who was married to Alphonse of Poitiers. Alphonse, a sincere Catholic, upheld the Inquisition, but, although ruling the country from Paris, maintained peace. Jeanne died without heirs four days after her husband, upon their return from the crusade in Africa, in 1271, and although she attempted by will to prevent the reversion of her lands to the crown, they were promptly seized by King Philip III., who used the opposition of Roger Bernard, count of Foix, as an excuse to appear with a formidable army, which had little to do to secure entire submission. Thus the county of Toulouse passed to the crown, though Philip III. turned over the Agenais to Edward I. of England in 1279. In 1274 he ceded the county of Venaissin to Pope Gregory X., the papacy having claimed it, without legal grounds, since the Albigensian crusade (see AVIGNON).

Such was the fate of the reduced county of Toulouse. At the division of Languedoc in 1229 Louis IX. was given all the country from Carcassonne to the Rhone. This royal Languedoc was at first subject to much trickery on the part of northern speculators and government officials. In 1248 Louis IX. sent royal *enquêteurs*, much like Charlemagne's *missi dominici*, to correct all abuses, especially to inquire concerning peculation by royal agents. On the basis of their investigations the king issued royal edicts in 1254 and 1259 which organized the administration of the province. Two *sénéchaussées* were created—one at Nîmes, the other at Carcassonne—each with its lesser divisions of *vigueries* and *bailliages*. During the reign of Philip III. the *enquêteurs* were busily employed securing justice for the conquered, preventing the seizure of lands, and in 1279 a supreme court of justice was established at Toulouse. In 1302 Philip IV. convoked the estates of Languedoc, but in the century which followed they were less an instrument for self-government than one for securing money, thus aiding the *enquêteurs*, who during the Hundred Years' War became mere revenue hunters for the king. In 1355 the Black Prince led a savage plundering raid across the country to Narbonne. After the battle of Poitiers, Languedoc supported the count of Armagnac, but there was no enthusiasm for a national cause. Under Charles V., Louis of Anjou, the king's brother, was governor of Languedoc, and while an active opponent of the English, he drained the country of money. But his extortions were surpassed by those of another brother, the duc de Berry, after the death of Charles V. In 1382 and 1383 the infuriated peasantry, abetted by some nobles, rose in a rebellion— known as the Tuchins—which was put down with frightful butchery, while still greater sums were demanded from the impoverished country. In the anarchy which followed brigandage increased. Redress did not come until 1420, when the dauphin, afterwards Charles VII., came to Languedoc and reformed the administration. Then the country he saved furnished him with the means for driving out the English in the north. For the first time, in the climax of its miseries, Languedoc was genuinely united to France. But Charles VII. was not able to drive out the brigands, and it was not until after the English were expelled in 1453 that Languedoc had even comparative peace. Charles VII. united Comminges to the crown; Louis XI. Roussillon and Cerdagne, both of which were ceded to Aragon by Charles VIII. as the price of its neutrality during his expedition into Italy. From the reign of Louis XI. until 1523 the governorship of Languedoc was held by the house of Bourbon. After the treason of the constable Bourbon it was held by the Montmorency family with but slight interruption until 1632.

The Reformation found Languedoc orthodox. Persecution had succeeded. The Inquisition had had no victims since 1340, and the cities which had been centres of heresy were now strongly orthodox. Toulouse was one of the most fanatically orthodox cities in Europe, and remained so in Voltaire's day. But Calvinism gained ground rapidly in the other parts of Languedoc, and by 1560 the majority of the population was Protestant. It was, however, partly a political protest against the misrule of the Guises. The open conflict came in 1561, and from that until the edict of Nantes (1598) there was intermittent civil war, accompanied with iconoclasm on the one hand, massacres on the other and ravages on both.

The main figure in this period is that of Henri de Montmorency, seigneur de Damville, later duc de Montmorency, governor of the province from 1563, who was, at first, hostile to the Protestants, then from 1574 to 1577, as leader of the "*Politiques*," an advocate of compromise. But peace was hardly ever established, although there was a yearly truce for the ploughing. By the edict of Nantes, the Protestants were given ten places of safety in Languedoc; but civil strife did not come to an end, even under Henry IV. In 1620 the Protestants in Languedoc rose under Henri, duc de Rohan (1579–1638), who for two years defied the power of Louis XIII. When Louis took Montpellier in 1622, he attempted to reconcile the Calvinists by bribes of money and office, and left Montauban as a city of refuge. Richelieu's extinction of Huguenotism is less the history of Languedoc than of the Huguenots (*q.v.*). By 1629 Protestantism was crushed in the Midi as a political force. Then followed the tragic episode of the rebellion of Henri II., duc de Montmorency, son of the old governor of Languedoc. As a result, Languedoc lost its old provincial privilege of self-assessment until 1649, and was placed under the governorship of Marshal Schomberg. During Louis XIV.'s reign Languedoc prospered until the revocation of the edict of Nantes. Industries and agriculture were encouraged, roads and bridges were built, and the great canal giving a water route from the Atlantic to the Mediterranean increased the trade of its cities. Colbert especially encouraged its manufactures. The religious persecutions which accompanied the revocation of the edict of Nantes bore hardest on Languedoc, and resulted in a guerilla warfare known as the rebellion of the Camisards (*q.v.*). On the eve of the Revolution some of the brightest scenes of contentment and prosperity which surprised

Arthur Young, the English traveller in France, were those of the grape harvests in Languedoc vineyards.

In 1790 Languedoc disappeared from the map of France, with the other old provinces; and the departments mentioned took its place. But the peculiar characteristics of the men of the Midi remain as clearly distinct from those of the north as the Scottish type is distinct from the English. The "peaceful insurrection" of the Languedoc vine-growers in the summer of 1907 revealed to the astonished Parisians the same spirit of independence as had underlain the resistance to Simon de Montfort and Richelieu.

The one monumental history of Languedoc is that of the Benedictines, Dom Claude Devic and Dom J. J. Vaissete, *Histoire générale de la province de Languedoc* (5 vols., Paris, 1730–1745). This has been re-edited, and continued and increased by the addition of important monographs, to 15 volumes (Toulouse, 1872–1892). It is the great library of sources, critical apparatus and bibliographies concerning Languedoc, and carries the history up to 1790. The fine article "Languedoc" in *La Grande Encyclopédie* is by A. Molinier, perhaps the greatest modern authority on Languedoc. (J. T. S.*)

LANGUET, HUBERT (1518–1581), French Huguenot writer and diplomat, was born at Vitteaux in Burgundy, of which town his father was governor. He received his early education from a distinguished Hellenist, Jean Perelle, and displayed remarkable ability in Greek and Latin. He studied law, theology and science at the university of Poitiers from 1536 to 1539; then, after some travel, attended the universities of Bologna and Padua, receiving the doctorate from the latter in 1548. At Bologna he read Melanchthon's *Loci communes theologiae* and was so impressed by it that in 1549 he went to Wittenberg to see the author, and shortly afterwards became a Protestant. He made his headquarters at Wittenberg until the death of Melanchthon in 1560, although during that period, as well as throughout the rest of his life, he travelled extensively in France, Italy, Spain, Germany, Sweden, and even Finland and Lapland. In 1557 he declined the invitation of Gustavus I. to enter the service of Sweden, but two years later accepted a similar invitation of Augustus I., elector of Saxony. He showed great ability in diplomacy, particularly in organizing the Protestants. He represented the elector at the French court from 1561 to 1572 except when the religious and political troubles in France occasionally compelled him temporarily to withdraw. He performed many minor diplomatic missions for the elector, and in 1567 accompanied him to the siege of Gotha. He delivered a violent harangue before Charles IX. of France in 1570 on behalf of the Protestant princes, and escaped death on St Bartholomew's Day (1572) only through the intervention of Jean de Morvilliers, the moderate and influential bishop of Orleans. He represented the elector of Saxony at the imperial court from 1573 to 1577. Financial embarrassment and disgust at the Protestant controversies in which he was forced to participate caused him to seek recall from the imperial court. His request being granted, Languet spent the last years of his life mainly in the Low Countries, and though nominally still in the service of the elector, he undertook a mission to England for John Casimir of Bavaria and was a valuable adviser to William the Silent, prince of Orange. Languet died at Antwerp on the 30th of September 1581.

His correspondence is important for the history of the 16th century. Three hundred and twenty-nine letters to Augustus of Saxony dating from the 17th of November 1565 to the 8th of September 1581, and one hundred and eleven letters to the chancellor Mordeisen dating from November 1559 to the summer of 1565, are preserved in MS. in the Saxon archives, and were published by Ludovicus at Halle in 1699 under the title *Arcana seculi decimi sexti*. One hundred and eight letters to Camerarius were published at Groningen in 1646 under the title *Langueti Epistolae ad Joach. Camerarium, patrem et filium*; and ninety-six to his great friend Sir Philip Sidney, dating from the 22nd of April 1573 to the 28th of October 1580, appeared at Frankfort in 1633 and have been translated into English by S. A. Pears (London, 1845). The *Historica Descriptio* of the siege and capture of Gotha appeared in 1568 and has been translated into French and German. The authorship of the work by which Languet is best known has been disputed. It is entitled *Vindiciae contra tyrannos, sive de principis in populum populique in principem legitima potestate, Stephano Junio Bruto Celta auctore*, and is thought to have been published at Basel (1579) although it bears the imprint of Edinburgh. It has been attributed to Beza, Hotman, Casaubon and Duplessis-Mornay, by divers writers on various grounds—to the last-named on the very respectable authority of Grotius. The authorship of Languet was supported by Peter Bayle (for reasons stated in the form of a supplement to the *Dictionnaire*) and confirmed by practically all later writers. The work has been frequently reprinted, the Leipzig edition (1846) containing a life of Languet by Treitschke. A French translation appeared in 1581 and an English translation in 1689. The work upholds the doctrine of resistance, but affirms that resistance must come from properly constituted authorities and objects to anything which savours of anabaptism or other extreme views. The *Apologie ou défence du très illustre Prince Guillaume contre le ban et l'édit du roi d'Espagne* (Leiden, 1581) is sometimes attributed to Languet. There seems little doubt, however, that it was really the work of the prince himself, with the help either of Languet (Groen van Prinsterer, *Archives*) or of Pierre de Villiers (Motley, *Rise of the Dutch Republic*; and Blok, *History of the People of the Netherlands*).

See Ph. de la Mare, *Vie d'Hubert Languet* (Halle, 1700); E. and E. Haag, *La France protestante*; H. Chevreul, *Hubert Languet* (Paris, 1852); J. Blasel, *Hubert Languet* (Breslau, 1872); O. Scholz, *Hubert Languet als kursächsischer Berichterstatter u. Gesandter in Frankreich während 1560–1572* (Halle, 1875); G. Touchard, *De politica Huberti Langueti* (Paris, 1898). There is a good article on Languet by P. Tschackert in Hauck's *Real-Encyklopädie*, 3rd ed., xi. 274-280.

LANGUR, one of the two Hindu names (the other being *hanuman*) of the sacred Indian monkey scientifically known as *Semnopithecus entellus*, and hence sometimes called the entellus monkey. A prodigiously long tail, beetling eyebrows with long black hairs, black ears, face, feet and hands, and a general greyish-brown colour of the fur are the distinctive characteristics of the langur. These monkeys roam at will in the bazaars of Hindu cities, where they help themselves freely from the stores of the grain-dealers, and they are kept in numbers at the great temple in Benares. In a zoological sense the term is extended to embrace all the monkeys of the Asiatic genus *Semnopithecus*, which includes a large number of species, ranging from Ceylon, India and Kashmir to southern China and the Malay countries as far east as Borneo and Sumatra. These monkeys are characterized by their lank bodies, long slender limbs and tail, well-developed thumbs, absence of cheek-pouches, and complex stomachs. They feed on leaves and young shoots. (R. L.*)

LANG VON WELLENBURG, MATTHÄUS (1469–1540), German statesman and ecclesiastic, was the son of a burgher of Augsburg. He afterwards assumed the name of Wellenburg from a castle that came into his possession. After studying at Ingolstadt, Vienna and Tübingen he entered the service of the emperor Frederick III. and quickly made his way to the front. He was also one of the most trusted advisers of Frederick's son and successor Maximilian I., and his services were rewarded in 1500 with the provostship of the cathedral at Augsburg and in the following year with the bishopric of Gurk. In 1511 he was made a cardinal by Pope Julius II., and in 1514 he became coadjutor to the archbishop of Salzburg, whom he succeeded in 1519. He also received the bishopric of Cartagena in Murcia in 1521, and that of Albano in 1535. Lang's adherence to the older faith, together with his pride and arrogance, made him very unpopular in his diocese of Salzburg; in 1523 he was involved in a serious struggle with his subjects, and in 1525, during the Peasants' War, he had again to fight hard to hold his own. He was one of the chief ministers of Charles V.; he played an important part in the tangled international negotiations of his time; and he was always loyal to his imperial masters. Not without reason has he been compared with Cardinal Wolsey. He died on the 30th of March 1540.

LANIER, SIDNEY (1842–1881), American poet, was born at Macon, Georgia, on the 3rd of February 1842. He was of Huguenot descent on his father's side, and of Scottish and Virginian on his mother's. From childhood he was passionately fond of music. His subsequent mastery of the flute helped to support him and greatly increased his reputation. At the age of fourteen he entered Oglethorpe College, where, after graduating with distinction, he held a tutorship. He enlisted in the Confederate army in April 1861, serving first in Virginia, and finding opportunities to continue his studies. After the Seven Days' battles around Richmond, he was transferred to the signal service.

About this time the first symptoms of consumption appeared. He subsequently served in a blockade-runner, but his vessel was captured, and he was confined for five months in a Federal prison, his flute proving the best of companions. Exchanged early in 1865, he started home on foot, arriving in a state of exhaustion that led to a severe illness. In 1867 he visited New York in connexion with his novel *Tiger Lilies*—an immature work, dealing in part with his war experiences, and now difficult to obtain. Later in the same year he took charge of a country school in Alabama, and was married to Miss Mary Day of his native town. The next year he returned to Macon in low health, and began to study and practise law with his father. In 1872 he went to Texas for his health, but was forced to return, and he secured an engagement as first flute in the Peabody concerts at Baltimore (December 1873). He wrote a guide-book to Florida (1876), and tales for boys from Froissart, Malory, the Mabinogion and Percy's *Reliques* (1878–1882). He now made congenial friends, such as Bayard Taylor, his reputation gradually increased, and he was enabled to study music and literature, especially Anglo-Saxon poetry. In 1876 he wrote his ambitious cantata for the Centennial Exhibition, and brought his family north. A small volume of verse appeared in the next year. In 1879 he was made lecturer on English literature at Johns Hopkins University. His lectures became the basis of his *Science of English Verse* (1880)—his most important prose work, and an admirable discussion of the relations of music and poetry—and also of his *English Novel* (New York, 1883), which, devoted largely to George Eliot, is suggestive, but one-sided. Work had to be abandoned on account of growing feebleness, and in the spring of 1881 he was carried to Lynn, North Carolina, to try camp life, and died there on the 7th of September. Since his death his fame has grown steadily and greatly, an enlarged and final edition (1884) of his poems, prepared by his wife, his *Letters, 1866–1881* (1899), and several volumes of miscellaneous prose having assisted in keeping his name before the public. A posthumous work on *Shakspere and his Forerunners* (London, 2 vols., 1902) was edited by H. W. Lanier. Among his more noteworthy poems are "Corn," "The Revenge of Hamish," "Song of the Chattahoochee" and "The Marshes of Glynn." By some his genius is regarded as musical rather than poetic, and his style is considered hectic; by others he is held to be one of the most original and most talented of modern American poets. He is considered the leading writer of the New South, the greatest Southern poet since Poe, and a man of heroic and exquisite character.

See a "Memorial," by William Hayes Ward, prefixed to the *Poems* (1884); *Letters of Sidney Lanier 1866–1881* (1899), edited by H. W. Lanier and Mrs Sidney Lanier; E. Mims, *Sidney Lanier* (1905). There is a bibliography of Lanier's scattered writings in *Select Poems* (New York, 1896; Toronto, 1900) edited by Morgan Callaway.

(W. P. T.)

LANJUINAIS, JEAN DENIS, Comte (1753–1827), French politician, was born at Rennes (Ille-et-Vilaine) on the 12th of March 1753. After a brilliant college career, which made him doctor of laws and a qualified barrister at nineteen, he was appointed counsel to the Breton estates and in 1775 professor of ecclesiastical law at Rennes. At this period he wrote two important works which, owing to the distracted state of public affairs, remained unpublished, *Institutiones juris ecclesiastici* and *Praelectiones juris ecclesiastici*. He had begun his career at the bar by pleading against the feudal *droit du colombier*, and when he was sent by his fellow-citizens to the states-general of 1789 he demanded the abolition of nobility and the substitution of the title of king of the French and the Navarrese for king of France and Navarre, and helped to establish the civil constitution of the clergy. Returned to the Convention in September 1792 he developed moderate, even reactionary views, becoming one of the fiercest opponents of the Mountain, though he never wavered in his support of republican principles. He refused to vote for the death of Louis XVI., alleging that the nation had no right to despatch a vanquished prisoner. His daily attacks on the Mountain resulted, on the 15th of April 1793, in a demand by the commune for his exclusion from the assembly, but, undaunted, when the Parisian populace invaded the Chamber on the 2nd of June, Lanjuinais renewed his defiance of the victorious party. Placed under arrest with the Girondins, he escaped to Rennes where he drew up a pamphlet denouncing the constitution of 1793 under the curious title *Le Dernier Crime de Lanjuinais* (Rennes, 1793). Pursued by J. B. Carrier, who was sent to stamp out resistance in the west, he lay hidden until some time after the revolution of Thermidor (July 1794), but he was re-admitted to the Convention on the 8th of March 1795. He maintained his liberal and independent attitude in the Conseil des Anciens, the Senate and the Chamber of Peers, being president of the upper house during the Hundred Days. Together with G. J. B. Target, J. E. M. Portalis and others he founded under the empire an academy of legislation in Paris, himself lecturing on Roman law. Closely associated with oriental scholars, and a keen student of oriental religions, he entered the Academy of Inscriptions in 1808. After the Bourbon restoration Lanjuinais consistently defended the principles of constitutional monarchy, but most of his time was given to religious and political subjects. Besides many contributions to periodical literature he wrote, among other works, *Constitutions de la nation française* (1819); *Appréciation du projet de loi relatif aux trois concordats* (1806, 6th ed. 1827), in defence of Gallicanism; and *Études biographiques et littéraires sur Antoine Arnauld, P. Nicole et Jacques Necker* (1823). He died in Paris on the 13th of January 1827.

His son, Victor Ambroise, Vicomte de Lanjuinais (1802–1869), was also a politician, becoming a deputy in 1838. His interests lay chiefly in financial questions and in 1849 he became minister of commerce and agriculture in the cabinet of Odilon Barrot. He wrote a *Notice historique sur la vie et les ouvrages du comte de Lanjuinais*, which was prefixed to an edition of his father's *Œuvres* (4 vols., 1832).

For the life of the comte de Lanjuinais see also A. Robert and G. Cougny, *Dictionnaire des parlementaires*, vol. ii. (1890); and F. A. Aulard, *Les Orateurs de la Législative et de la Convention* (Paris, 1885–1886). For a bibliography of his works see J. M. Quérard, *La France littéraire*, vol. iii. (1829).

LANMAN, CHARLES ROCKWELL (1850–), American Sanskrit scholar, was born in Norwich, Connecticut, on the 8th of July 1850. He graduated at Yale in 1871, was a graduate student there (1871–1873) under James Hadley and W. D. Whitney, and in Germany (1873–1876) studied Sanskrit under Weber and Roth and philology under Georg Curtius and Leskien. He was professor of Sanskrit at Johns Hopkins University in 1876–1880 and subsequently at Harvard University. In 1889 he travelled in India and bought for Harvard University Sanskrit and Prākrit books and manuscripts, which, with those subsequently bequeathed to the university by Fitzedward Hall, make the most valuable collection of its kind in America, and made possible the *Harvard Oriental Series*, edited by Professor Lanman. In 1879–1884 he was secretary and editor of the *Transactions*, and in 1889–1890 president of the American Philological Association, and in 1884–1894 he was corresponding secretary of the American Oriental Society, in 1897–1907 vice-president, and in 1907–1908 president. In the *Harvard Oriental Series* he translated (vol. iv.) into English Rājaçekhara's Karpūra-Mañjarī (1900), a Prākrit drama, and (vols. vii. and viii.) revised and edited Whitney's translation of, and notes on, the *Atharva-Veda Samhitā* (2 vols., 1905); he published *A Sanskrit Reader, with Vocabulary and Notes* (2 vols., 1884–1888); and he wrote on early Hindu pantheism and contributed the section on Brahmanism to *Messages of the World's Religions*.

LANNES, JEAN, duke of Montebello (1769–1809), marshal of France, was born at Lectoure (Gers) on the 11th of April 1769. He was the son of a livery stables keeper, and was apprenticed to a dyer. He had had little education, but his great strength and proficiency in all manly sports caused him in 1792 to be elected sergeant-major of the battalion of volunteers of Gers, which he had joined on the breaking out of war between Spain and the French republic. He served through the campaigns in the Pyrenees in 1793 and 1794, and rose by distinguished conduct to the rank of *chef de brigade*. However, in 1795, on the reform of the army introduced by the Thermidorians, he was dismissed from his rank. He re-enlisted as a simple volunteer in the army of Italy, and in the famous campaign of 1796 he again fought his way up to high rank, being eventually made a general of brigade by Bonaparte. He was distinguished in every battle, and was wounded at Arcola. He was chosen by Bonaparte to accompany him to Egypt as commander of one of Kléber's brigades, in which capacity he greatly distinguished himself, especially on the retreat from Syria. He went with Bonaparte to France, assisted at the 18th Brumaire, and was appointed general of division, and commandant of the consular guard. He commanded the advanced guard in the crossing of the Alps in 1800, was instrumental in winning the battle of Montebello, from which he afterwards took his title, and bore the brunt of the battle of Marengo. In 1801 Napoleon sent him as ambassador to Portugal. Opinions differ as to his merits in this capacity; Napoleon never made such use of him again. On the establishment of the empire he was created a marshal of France, and commanded once more the advanced guard of a great French army in the campaign of Austerlitz. At Austerlitz he had the left of the Grand Army. In the 1806–07 campaign he was at his best, commanding his corps with the greatest credit in the march through the Thuringian Forest, the action of Saalfeld (which is studied as a model to-day at the French Staff College) and the battle of Jena. His leadership of the advanced guard at Friedland was even more conspicuous. He was now to be tried as a commander-in-chief, for Napoleon took him to Spain in 1808, and gave him a detached wing of the army, with which he won a victory over Castaños at Tudela on November 22. In January 1809 he was sent to attempt the capture of Saragossa, and by February 21, after one of the most stubborn defences in history, was in possession of the place. Napoleon then created him duc de Montebello, and in 1809, for the last time, gave him command of the advanced guard. He took part in the engagements around Eckmühl and the advance on Vienna. With his corps he led the French army across the Danube, and bore the brunt, with Masséna, of the terrible battle of Aspern-Essling (*q.v.*). On the 22nd of May he had to retreat. During the retreat Lannes exposed himself as usual to the hottest fire, and received a mortal wound, to which he succumbed at Vienna on the 31st of May. As he was being carried from the field to Vienna he met the emperor hurrying to the front. It was reported that the dying man reproached Napoleon for his ambition, but this rests on little evidence save the fact that Lannes was the most blunt and outspoken of all Napoleon's marshals. He was one of the few men for whom the emperor felt a real and deep affection, and at this their last meeting Napoleon gave way to a passionate burst of grief, even in the midst of the battle. His eldest son was made a peer of France by Louis XVIII.

Lannes ranks with Davout and Masséna as the ablest of all Napoleon's marshals, and consciously or unconsciously was the best exponent of the emperor's method of making war. Hence his constant employment in tasks requiring the utmost resolution and daring, and more especially when the emperor's combinations depended upon the vigour and self-sacrifice of a detachment or fraction of the army. It was thus with Lannes at Friedland and at Aspern as it was with Davout at Austerlitz and Auerstädt, and Napoleon's estimate of his subordinates' capacities can almost exactly be judged by the frequency with which he used them to prepare the way for his own shattering blow. Routine generals with the usual military virtue, or careful and exact troop leaders like Soult and Macdonald, Napoleon kept under his own hand for the final assault which he himself launched, but the long hours of preparatory fighting against odds of two to one, which alone made the final blow possible, he entrusted only to men of extraordinary courage and high capacity for command. In his own words, he found Lannes a pigmy, and lost him a giant. Lannes's place in his affections was never filled.

See R. Périn, *Vie militaire de Jean Lannes* (Paris, 1809).

LANNION, a town of north-western France, capital of an arrondissement in the department of Côtes-du-Nord, on the right bank of the Léguer, 45 m. W.N.W. of St Brieuc by rail. Pop. (1906) 5336. Lannion is 5 m. in direct line from the mouth of the Léguer; its port does a small trade (exports of agricultural produce, imports of wine, salt, timber, &c.), and there is an active fishing industry. The town contains many houses of the 15th and 16th centuries and other old buildings, the chief of which is the church of St Jean-du-Baly (16th and 17th centuries). On an eminence close to Lannion is the church of Brélevenez of the 12th century, restored in the 15th or 16th century; it has an interesting 16th-century Holy Sepulchre.

Some 6 m. S.E. of the town are the imposing ruins of the château of Tonquédec (*c.* 1400) styled the "Pierrefonds of Brittany," and there are other buildings of antiquarian interest in the vicinity. The coast north of Lannion at Trégastel and Ploumanac presents curious rock formations.

Lannion is the seat of a subprefect and has a tribunal of first instance and a communal college. Its industries include saw-milling, tanning and the manufacture of farm implements. The town was taken in 1346 by the English; it was defended against them by Geoffroy de Pontblanc whose valour is commemorated by a cross close to the spot where he was slain.

LANNOY, GUILLEBERT DE (1386–1462), Flemish diplomatist, was chamberlain to the duke of Burgundy, governor of the fort of Sluys, and a knight of the Golden Fleece. He discharged several diplomatic missions in France, England, Prussia, Poland and Lithuania, and was one of the negotiators of the treaty of Troyes (1420). In 1421 he was sent by Henry V. of England to Palestine to inquire into the possibility of reviving the kingdom of Jerusalem, and wrote an account of his travels, *Les Pèlerinages de Surye et de Egipte*, which was published in 1826 and again in 1842.

LANOLIN (Lat. *lana*, wool, and *oleum*, oil), the commercial name of the preparation styled *adeps lanae hydrosus* in the British Pharmacopoeia, and which consists of 7 oz. of neutral wool-fat (*adeps lanae*) mixed with 3 fluid oz. of water. The wool-fat is obtained by purification of the "brown grease," "recovered grease" or dégras extracted from raw sheep's wool in the process of preparing it for the spinner. It is a translucent unctuous substance which has the property of taking up large quantities of water and forming emulsions which are very slow to separate into their constituents. Owing to the ease with which it penetrates the skin, wool-fat both in the anhydrous form and as lanolin, sometimes mixed with such substances as vaseline or fatty oils, is largely employed as a basis for ointments. It is slightly antiseptic and does not become rancid.

LA NOUE, FRANÇOIS DE (1531–1591), called Bras-de-Fer, one of the Huguenot captains of the 16th century, was born near Nantes in 1531, of an ancient Breton family. He served in Italy under Marshal Brissac, and in the first Huguenot war, but his first great exploit was the capture of Orleans at the head of only fifteen cavaliers in 1567, during the second war. At the battle of Jarnac in March 1569 he commanded the rearguard, and at Moncontour in the following October he was taken prisoner; but he was exchanged in time to resume the governorship of Poitou, and to inflict a signal defeat on the royalist troops before Rochefort. At the siege of Fontenay (1570) his left arm was shattered by a bullet; but a mechanic of Rochelle made him an iron arm (hence his sobriquet) with a hook for holding his reins. When peace was made in France in the same year, La Noue carried his sword against the Spaniards in the Netherlands, but was taken at the recapture of Mons by the Spanish in 1572. Permitted to return to France, he was commissioned by Charles IX., after the massacre of St Bartholomew, to reconcile the inhabitants of La Rochelle, the great stronghold of the Huguenots, to the king. But the Rochellois were too much alarmed to come to terms; and La Noue, perceiving that war was imminent, and knowing that his post was on the Huguenot side, gave up his royal commission, and from 1574 till 1578 acted as general of La Rochelle. When peace was again concluded La Noue once more went to aid the Protestants of the Low Countries. He took several towns and captured Count Egmont in 1580; but a few weeks afterwards he fell into the hands of the Spaniards. Thrust into a loathsome prison at Limburg, La Noue, the admiration of all, of whatever faith, for his gallantry, honour and purity of character, was kept confined for five years by a powerful nation, whose reluctance to set him free is one of the sincerest tributes to his reputation. It was in captivity that he wrote his celebrated *Discours politiques et militaires*, a work which was published at Basel in 1587 [republished at La Rochelle 1590, Frankfurt on Main (in German) 1592 and 1612, and London (in English) 1597] and had an immense influence on the soldiers of all nations. The abiding value of La Noue's "Discourses" lies in the fact that he wrote of war as a human drama, before it had been elaborated and codified. At length, in June 1585, La Noue was exchanged for Egmont and other prisoners of consideration, while a heavy ransom and a pledge not to bear arms against his Catholic majesty were also exacted from him. Till 1589 La Noue took no part in public matters, but in that year he joined Henry of Navarre against the Leaguers. He was present at both sieges of Paris, at Ivry and other battles. At the siege of Lamballe in Brittany he received a wound of which he died at Moncontour on the 4th of August 1591.

He wrote, besides the Discourses, *Déclaration pour prise d'armes et la défense de Sedan et Jamets* (1588); *Observations sur l'histoire de Guicciardini* (2 vols., 1592); and notes on *Plutarch's Lives*. His *Correspondance* was published in 1854. See *La Vie de François, seigneur de La Noue*, by Moyse Amirault (Leiden, 1661); Brantôme's *Vies des Capitaines français*; C. Vincen's *Les Héros de la Réforme. Fr. de La Noue* (1875); and Hauser, *François de La Noue* (Paris, 1892).

LANSDOWNE, WILLIAM PETTY FITZMAURICE, 1st Marquess of (1737–1805), British statesman, better known under his earlier title of earl of Shelburne, was born at Dublin on the 20th of May 1737. He was a descendant of the lords of Kerry (dating from 1181), and his grandfather Thomas Fitzmaurice, who was created earl of Kerry (1723), married the daughter of Sir William Petty (*q.v.*). On the death without issue of Sir William Petty's sons, the first earls of Shelburne, the estates passed to his nephew John Fitzmaurice (advanced in 1753 to the earldom of Shelburne), who in 1751 took the additional name of Petty. His son William spent his childhood "in the remotest parts of the south of Ireland," and, according to his own account, when he entered Christ Church, Oxford, in 1755, he had both "everything to learn and everything to unlearn." From a tutor whom he describes as "narrow-minded" he received advantageous guidance in his studies, but he attributes his improvement in manners and in knowledge of the world chiefly to the fact that, as was his "fate through life," he fell in "with clever but unpopular connexions." Shortly after leaving the university he served in Wolfe's regiment during the Seven Years' War, and so distinguished himself at Minden and Kloster-Kampen that he was raised to the rank of colonel and appointed aide-de-camp to the king (1760). Being thus brought into near communication with Lord Bute, he was in 1761 employed by that nobleman to negotiate for the support of Henry Fox, Lord Holland. He was returned to the House of Commons as member for Wycombe, but in 1761 he succeeded his father as earl of Shelburne in the Irish peerage, and Baron Wycombe in the peerage of Great Britain (created 1760). Though he declined to take office under Bute he undertook negotiations to induce C. J. Fox to gain the consent of the Commons to the peace of 1763. Fox affirmed that he had been duped, and, although Shelburne always asserted that he had acted in thorough good faith, Bute spoke of the affair as a "pious fraud." Shelburne joined the Grenville ministry in 1763 as president of the Board of Trade, but, failing in his efforts to replace Pitt in the cabinet, he in a few months resigned office. Having moreover on account of his support of Pitt on the question of Wilkes's expulsion from the House of Commons incurred the displeasure of the king, he retired for a time to his estate. After Pitt's return to power in 1766 he became secretary of state, but during Pitt's illness his conciliatory policy towards America was completely thwarted by his colleagues and the king, and in 1768 he was dismissed from office. In 1782 he consented to take office under the marquess of Rockingham on condition that the king would recognize the United States. On the death of Lord Rockingham in the same year he became premier; but the secession of Fox and his supporters led to the famous coalition of Fox with North, which caused his resignation in the following February, his fall being perhaps hastened by his plans for the reform of the public service. He had also in contemplation a bill to promote free commercial intercourse between England and the United States. When Pitt acceded to office in 1784, Shelburne, instead of receiving a place in the cabinet, was created marquess of Lansdowne. Though giving a general support to the policy of Pitt, he from this time ceased to take an active part in public affairs. He died on the 7th of May 1805. During his lifetime he was blamed for insincerity and duplicity, and he incurred the deepest unpopularity, but the accusations came chiefly from those who were dissatisfied with his preference of principles to party, and if he had had a more unscrupulous regard to his personal ambition, his career as a statesman would have had more outward success. He was cynical in his estimates of character, but no statesman of his time possessed more enlightened political views, while his friendship with those of his contemporaries eminent in science and literature must be allowed considerable weight in qualifying our estimate of the moral defects with which he has been credited. He was twice married, first to Lady Sophia (1745–1771), daughter of John Carteret, Earl Granville, through whom he obtained the Lansdowne estates near Bath, and secondly to Lady Louisa (1755–1789), daughter of John Fitzpatrick, 1st earl of Upper Ossory. John Henry Petty Fitzmaurice (1765–1809), his son by the first marriage, succeeded as 2nd marquess, after having sat in the House of Commons for twenty years as member for Chipping Wycombe.

Henry Petty Fitzmaurice, 3rd marquess of Lansdowne (1780–1863), son of the 1st marquess by his second marriage, was born on the 2nd of July 1780 and educated at Edinburgh University and at Trinity College, Cambridge. He entered the House of Commons in 1802 as member for the family borough of Calne and quickly showed his mettle as a politician. In February 1806, as Lord Henry Petty, he became chancellor of the exchequer in the ministry of "All the Talents," being at this time member for the university of Cambridge, but he lost both his seat and his office in 1807. In 1809 he became marquess of Lansdowne; and in the House of Lords and in society he continued to play an active part as one of the Whig leaders. His chief interest was perhaps in the question of Roman Catholic emancipation, a cause which he consistently championed, but he sympathized also with the advocates of the abolition of the slave-trade and with the cause of popular education. Lansdowne, who had succeeded his cousin, Francis Thomas Fitzmaurice, as 4th earl of Kerry in 1818, took office with Canning in May 1827 and was secretary for home affairs from July of that year until January 1828; he was lord president of the council under Earl Grey and then under Lord Melbourne from November 1830 to August 1841, with the exception of the few months in 1835 when Sir Robert Peel was prime minister. He held the same office during the whole of Lord John Russell's ministry (1846–1852), and, having declined to become prime minister, sat in the cabinets of Lord Aberdeen and of Lord Palmerston, but without office. In 1857 he refused the offer of a dukedom, and he died on the 31st of January 1863. Lansdowne's social influence and political moderation made him one of the most powerful Whig statesmen of the time; he was frequently consulted by Queen Victoria on matters of moment, and his long official experience made his counsel invaluable to his party. He married Louisa (1785–1851), daughter of the 2nd earl of Ilchester, and was succeeded by his son Henry, the 4th marquess (1816–1866). The latter, who was member of parliament for Calne for twenty years and chairman of the Great Western railway, married for his second wife Emily (1819–1895), daughter of the comte de Flahaut de la Billarderie, a lady who became Baroness Nairne in her own right in 1867. By her he had two sons, the 5th marquess and Lord Edmond Fitzmaurice (Baron Fitzmaurice of Leigh).

Henry Charles Keith Petty Fitzmaurice, 5th marquess of Lansdowne (b. 1845), was educated at Balliol, Oxford, where he became one of Jowett's favourite pupils. In 1869 he married the daughter of the 1st duke of Abercorn. As a member of the Liberal party he was a lord of the treasury (1869–1872), under-secretary of war (1872–1874), and under-secretary of India (1880); in 1883 he was appointed governor-general of Canada, and from 1888 to 1893 he was viceroy of India. He joined the Liberal Unionist party when Mr Gladstone proposed home rule for Ireland, and on returning to England became one of its most influential leaders. He was secretary of state for war from 1895 to 1900, and foreign secretary from 1900 to 1906, becoming leader of the Unionist party in the House of Lords on Lord Salisbury's death.

His brother EDMOND GEORGE FITZMAURICE, Baron Fitzmaurice (b. 1846), was educated at Trinity, Cambridge, where he took a first class in classics. Unlike Lord Lansdowne, he remained a Liberal in politics and followed Mr Gladstone in his home rule policy. As Lord Edmond Fitzmaurice he entered the House of Commons in 1868, and was under-secretary for foreign affairs from 1882 to 1885. He then had no seat in parliament till 1898, when he was elected for the Cricklade division of Wilts, and retiring in 1905, he was created Baron Fitzmaurice of Leigh in 1906, and made under-secretary for foreign affairs in Sir Henry Campbell-Bannerman's ministry. In 1908 he became chancellor of the duchy of Lancaster and a member of the Liberal cabinet, but resigned his post in 1909. He devoted much time to literary work, and was the author of excellent biographies of the 1st marquess, of Sir William Petty (1895), and of Lord Granville (1905), under whom he had served at the foreign office.

For the 1st marquess, see Lord Fitzmaurice, *Life of William, Earl of Shelburne* (3 vols., London, 1875–1876).

LANSDOWNE, a hill cantonment in India, in Garhwal district of the United Provinces, about 6000 ft. above the sea, 19 m. by cart road from the station of Kotdwara on the Oudh and Rohilkhand railway. Pop. (1901) 3943. The cantonment, founded in 1887, extends for more than 3 m. through pine and oak forests, and can accommodate three Gurkha battalions.

LANSING, the capital of Michigan, U.S.A., in Ingham county, at the confluence of the Grand and Cedar rivers, about 85 m. W.N.W. of Detroit and about 64 m. E.S.E. of Grand Rapids. Pop. (1900) 16,485, of whom 2397 were foreign-born; (1910 census) 31,229. It is served by the Michigan Central, the Lake Shore & Michigan Southern, the Grand Trunk and the Père Marquette railways, and by interurban electric lines. The Grand river on its way through the city makes a horse-shoe bend round a moderately elevated plateau; this is the commercial centre of the city, and here, in a square covering 10 acres, is the State Capitol, erected in 1873–1878 and containing the State library. On the opposite side of the river, farther N., and also extending across the southern portion of the city, are districts devoted largely to manufacturing. Lansing has a public library and a city hospital. About 3 m. E. of the city, at East Lansing, is the State Agricultural College (coeducational), the oldest agricultural college in the United States, which was provided for by the state constitution of 1850, was organized in 1855 and opened in 1857. Its engineering course was begun in 1885; a course in home economics for women was established in 1896; and a forestry course was opened in 1902. In connexion with the college there is an agricultural experiment station. Lansing is the seat of the Michigan School for the Blind, and of the State Industrial School for Boys, formerly the Reform School. The city has abundant water-power and is an important manufacturing centre. The value of the factory products increased from $2,942,306 in 1900 to $6,887,415 in 1904, or 134·1%. The municipality owns and operates the water-works and the electric-lighting plant. The place was selected as the site for the capital in 1847, when it was still covered with forests, and growth was slow until 1862, when the railways began to reach it. Lansing was chartered as a city in 1859 and rechartered in 1893.

LANSING MAN, the term applied by American ethnologists to certain human remains discovered in 1902 during the digging of a cellar near Lansing, Kansas, and by some authorities believed to represent a prehistoric type of man. They include a skull and several large adult bones and a child's jaw. They were found beneath 20 ft. of undisturbed silt, in a position indicating intentional burial. The skull is preserved in the U. S. National Museum at Washington. It is similar in shape to those of historic Indians of the region. Its ethnological value as indicating the existence of man on the Missouri in the glacial period is very doubtful, it being impossible accurately to determine the age of the deposits.

See *Handbook of American Indians* (Washington, 1907).

LANSQUENET, the French corrupted form of the German *Landsknecht* (*q.v.*), a mercenary foot-soldier of the 16th century. It is also the name of a card game said to have been introduced into France by the *Landsknechte*. The pack of 52 cards is cut by the player at the dealer's right. The dealer lays the two first cards face upwards on the table to his left; the third he places in front of him and the fourth, or *réjouissance* card, in the middle of the table. The players, usually called (except in the case of the dealer) *punters*, stake any sum within the agreed limit upon this réjouissance card; the dealer, who is also the banker, covers the bets and then turns up the next card. If this fails to match any of the cards already exposed, it is laid beside the réjouissance card and then punters may stake upon it. Other cards not matching are treated in the same manner. When a card is turned which matches the réjouissance card, the banker wins everything staked on it, and in like manner he wins what is staked on any card (save his own) that is matched by the card turned. The banker pays all stakes, and the deal is over as soon as a card appears that matches his own; excepting that should the two cards originally placed at his left both be matched before his own, he is then entitled to a second deal. In France matching means winning, not losing, as in Great Britain. There are other variations of play on the continent of Europe.

LANTARA, SIMON MATHURIN (1729–1778), French landscape painter, was born at Oncy on the 24th of March 1729. His father was a weaver, and he himself began life as a herdboy; but, having attracted the notice of Gille de Reumont, a son of his master, he was placed under a painter at Versailles. Endowed with great facility and real talent, his powers found ready recognition; but he found the constraint of a regular life and the society of educated people unbearably tiresome; and as long as the proceeds of the last sale lasted he lived careless of the future in the company of obscure workmen. Rich amateurs more than once attracted him to their houses, only to find that in ease and high living Lantara could produce nothing. He died in Paris on the 22nd of December 1778. His works, now much prized, are not numerous; the Louvre has one landscape, "Morning," signed and dated 1761. Bernard, Joseph Vernet, and others are said to have added figures to his landscapes and sea-pieces. Engravings after Lantara will be found in the works of Lebas, Piquenot, Duret, Mouchy and others. In 1809 a comedy called *Lantara, or the Painter in the Pothouse*, was brought out at the Vaudeville with great success.

See E. Bellier de la Chavignerie, *Recherches sur le peintre Lantara* (Paris, 1852).

LANTERN (an adaptation of the Fr. *lanterne* from Lat. *lanterna* or *laterna*, supposed to be from Gr. λαμπτήρ, a torch or lamp, λάμπειν, to shine, cf. "lamp"; the 16th- and 17th-century form "lanthorn" is due to a mistaken derivation from "horn," as a material frequently used in the making of lanterns), a metal case filled in with some transparent material, and used for holding a light and protecting it from rain or wind. The appliance is of two kinds—the hanging lantern and the hand lantern—both of which are ancient. At Pompeii and Herculaneum have been discovered two cylindrical bronze lanterns, with ornamented pillars, to which chains are attached for carrying or hanging the lantern. Plates of horn surrounded the bronze lamp within, and the cover at the top can be removed for lighting and for the escape of smoke. The hanging lantern for lighting rooms was composed of ornamental metal work, of which iron and brass were perhaps most frequently used. Silver, and even gold, were, however, sometimes employed, and the artificers in metal of the 17th and 18th centuries produced much exceedingly artistic work of this kind. Oriental lanterns in open-work bronze were often very beautiful. The early lantern had sides of horn, talc, bladder or oiled paper, and the primitive shape remains in the common square stable lantern with straight glass sides, to carry a candle. The hand lantern was usually a much more modest appliance than the hanging lantern, although in great houses it was sometimes richly worked and decorated. As glass grew cheaper it gradually ousted all other materials, but the horn lantern which was already ancient in the 13th century was still being used in the early part of the 19th. By the end of the 18th century lanterns in rooms had been superseded by the candlestick. The collapsible paper lanterns of China and Japan, usually known as Chinese lanterns, are globular or cylindrical in shape, and the paper is pleated and when not in use folds flat. For illuminative and decorative purposes they are coloured with patterns of flowers, &c. The lanterns carried by the ordinary foot passenger are made of oiled paper. In China the "Feast of Lanterns" takes place early in the New Year and lasts for four days. In Japan the festival of Bon is sometimes known as the "feast of lanterns." It is then that the spirits of the dead ancestors return to the household altar. The festival takes place in July. The "bull's-eye" lantern has a convex lens which concentrates the light and allows it to be thrown in the shape of a diverging cone. The "dark lantern" has a shutter or slide arrangement by which the light can be shut off at will. Ships' lanterns are used as masthead or other signal lights. On Trajan's column is a representation of a heavy poop-lantern on a ship. The ships' lanterns of the 16th and 17th centuries were highly ornamental, especially when placed on the poop. At the Armeria Real in Madrid is a collection of these 16th-century ships' lanterns. The protected cages which contain the lights used in lighthouses are also known as "lanterns" (see LIGHTHOUSES).

In architecture a lantern is primarily a framework of timber, with windows all round, to admit ample light, placed on the top of a roof. In a broader sense, it is applied to those portions of buildings which are largely perforated with windows, and more especially to the upper part of the towers of cathedrals and churches, as in the octagon of Ely cathedral, or the tower of Boston church, Lincolnshire. The term is also applied to the entire church, as in the case of Bath Abbey church, which was called the "lantern of England," from the number of its windows, and St John's Priory at Kilkenny, the "lantern of Ireland," on account of the window on the south side of the choir which was 54 ft. long. In the Renaissance style the lantern was looked upon as a decorative feature surmounting the dome, as in St Peter's, Rome, the Invalides, Paris, and St Paul's, London.

Magic or Optical Lantern.

The magic or optical lantern is an instrument for projecting on a white wall or screen largely magnified representations of transparent pictures painted or photographed on glass, or of objects—crystals, animals, &c.—carried on glass slides or in glass vessels. If the light traverses the object, the projection is said to be diascopic, if by reflected light, episcopic.

The invention of the magic lantern is usually attributed to Athanasius Kircher, who described it in the first edition (1646) of his *Ars magna lucis et umbrae*, but it is very probably of earlier discovery. For a long period the magic lantern was used chiefly to exhibit comic pictures, or in the hands of so-called wizards to summon up ghosts and perform other tricks, astonishing to those ignorant of the simple optical principles employed. Within recent years, however, the optical lantern has been greatly improved in construction, and its use widely extended. By its means finely executed photographs on glass can be shown greatly magnified to large audiences, thus saving the trouble and expense of preparing large diagrams. When suitably constructed, it can be used in the form of a microscope to exhibit on a screen the forms and movements of minute living organisms, or to show to an audience delicate physical and chemical experiments which could otherwise be seen only by a few at a time Another application of the optical lantern is found in the cinematograph (*q.v.*).

The optical lantern, in its simpler forms, consists of the following parts: (1) the lantern body, (2) a source of light, (3) an optical system for projecting the images. The lantern body is a rectangular casing usually made of Russian iron, but sometimes covered with wood (which must be protected by asbestos at parts liable to damage by heat), provided with the openings necessary to the insertion of the source of light, windows for viewing the same, a chimney for conveying away the products of combustion, fittings to carry the slides and the optical system. In the earlier and simpler lanterns, oil lamps were commonly used, and in the toy forms either an oil flame or an ordinary gas jet is still employed. Natural petroleum burnt in a specially constructed lamp by means of two or three parallel wicks set edgeways to the lenses was employed in the sciopticon, an improved lantern invented in America which gave well-defined pictures 6 to 10 ft. in diameter. The Argand gas burner also found application. A great improvement attended the introduction of lime-light, *i.e.* the light emitted by a block of lime made incandescent by an impinging oxyhydrogen or oxygen-coal-gas flame, and the readiness with which hydrogen and oxygen can be prepared and rendered available by compression in steel cylinders and the increased commercial supply of coal-gas greatly popularized these illuminants. Many improvements have been made on the original apparatus. The lime-cylinders are specially prepared to withstand better the disintegrating effects of the flame, and are mounted on a rotating pin in order that fresh surfaces may be brought into play. Cones of zirconia are also used in the same way; or a thorium mantle in conjunction with alcohol vapour may be employed. Two types of burner are in use: (1) the "blow-through jet," in which the oxygen is forced through the jet of the burning gas (this is the safest type), and (2) where the gases are mixed before combustion (this is the more dangerous but also the more powerful type). Ether burners are also in use. In one type the oxygen supply is divided into two streams, one of which passes through a chamber containing cotton wool soaked with ether, and then rejoins the undiverted stream at the jet. The application of the incandescent gas mantle is limited by the intensity of the heat emitted and the large area of the source. Of electrical illuminants the platinum and carbon filament lamps are not much used, the Nernst lamp (in which the preliminary heating is effected by a spirit lamp and not by an auxiliary coil) being preferred. But the arc light is undoubtedly the best illuminant for use in the projecting lantern. The actual size of the source is comparatively small, and hence it is necessary to mount the carbons so that the arc remains at one point on the axis of the optical system. It is also advisable to set back the carbons relatively to one another and to tilt them, so that the brightest part of the "crater" faces the lens.

Optical System.—In the ordinary (or vertically) projecting lantern the rays are transmitted through a lens termed the "condenser," then through the object, and finally through another lens termed the "objective." In the horizontally projecting types the light, after passing through the condenser, is reflected vertically by a plane mirror inclined at 45° to the direction of the light; it then traverses another lens, then the object, then the objective, and is finally projected horizontally by a plane mirror inclined at 45°, or by a right angled glass prism, the hypothenuse face of which is silvered. In episcopic projection, the light, having traversed the condenser, is reflected on to the object, placed horizontally, by an inclined mirror. The rays reflecting the object then traverse the objective, and are then projected horizontally by a mirror or prism. This device inverts the object; a convenient remedy is to place an erecting prism before the lens. The object of the condenser is to collect as much light as possible from the source, and pass it through the object in a uniform beam. For this purpose the condenser should subtend as large an angle as possible at the source of light. To secure this, it should be tolerably large, and its distance from the light, that is, its focal length, small. Since effective single lenses of large diameter are necessarily of long focus, a really good condenser of considerable diameter and yet of short focus must be a combination of two or more lenses. It is essential that the condenser be white and limpid and free from defects or striae.

In the earlier lanterns, as still in the cheaper forms, only a single plano-convex lens or bull's-eye was employed as a condenser. A good compound condenser for ordinary work is that proposed by Herschel, consisting of a biconvex lens and a meniscus mounted together with the concave side of the meniscus next the light. Other types employ two plano-convex lenses, the curved surfaces nearly in contact; or a concavo-convex and a plano-convex lens. Or it may be a triple combination, the object always being to increase the aperture. The focus must not be so short as to bring the lens too near the light, and render it liable to crack from the intense heat. In some lanterns this is guarded against by placing a plate of thin glass between the condenser and the light. If the source of light be broad, an iris diaphragm may be introduced so as to eliminate inequalities in illumination.

The function of the objective is to produce a magnified inverted image of the picture on the screen. In toy lanterns it is a simple double-convex lens of short focus. This, however, can only produce a small picture, and that not very distinct at the edges. The best objective is the portrait combination lens usually of the Petzval type as used in ordinary photographic cameras. These are carefully corrected both for spherical and chromatic aberration, which is absolutely essential in the objective, although not so necessary in the condenser.

Objects.—The commonest objects used for exhibiting with the optical lantern are named "slides" and consist of pictures printed on transparent surfaces. Solid objects mounted on glass after the ordinary manner of mounting microscopic objects are also possible of exhibition, and hollow glass tanks containing organisms or substances undergoing some alteration are also available for use with the lantern. If it be necessary to eliminate the heat rays, which may act deleteriously on the object, a vessel is introduced containing either water or a 5% solution of ferric chloride. In the ordinary slide the pictures are painted with transparent water or oil colours, or photographed on pieces of glass. If parts of the picture are to be movable, two disks of glass are employed, the one movable in front of the other, the fixed part of the picture being painted on the fixed disk and the movable part on the other. By means of a lever the latter disk is moved in its own plane; and in this way a cow, for instance, can be represented drinking, or a donkey cutting amusing capers. In the chromatrope slide two circular disks of glass are placed face to face, each containing a design radiating from the centre, and painted with brilliant transparent colours. By a small pinion gearing in toothed wheels or endless bands the disks are made to move in opposite directions in their own plane. The effect produced is a singularly beautiful change of design and colour. In astronomical slides the motions of the heavenly bodies, eclipses, the phases of the moon or the like are similarly represented by mechanical means.

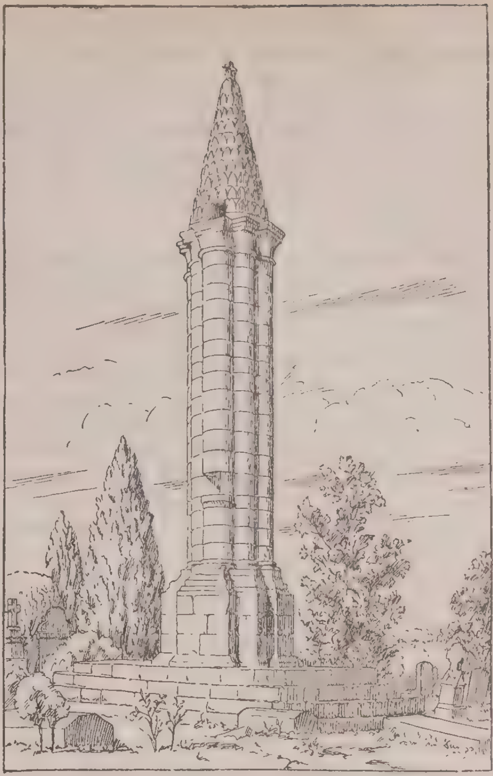
Dissolving Views.—For this purpose two magic lanterns are necessary, arranged either side by side or the one on the top of the other. The fronts of the lanterns are slightly inclined to each other so as to make the illuminated disks on the screen due to each lantern coincide. By means of a pair of thin metallic shutters terminating in comb-like teeth, and movable by a rack or lever, the light from either lantern can be gradually cut off at the same time that the light from the other is allowed gradually to fall on the screen. In this way one view appears to melt or dissolve into another. This arrangement was first adopted by Childe in 1811.

Phantasmagoria.—In this arrangement the pictures on the screen appear gradually to increase or diminish in size and brightness. To effect this a semi-transparent screen of cotton or other material is used, the lantern being behind and the audience in front. The lantern is mounted on wheels so that it can be rapidly moved up to or withdrawn from the screen; and an automatic arrangement is provided whereby simultaneously with this the objective is made to approach or recede from the slide so as to focus the picture on the screen in any position of the lantern. In this way a very small picture appears gradually to grow to enormous dimensions.

See L. Wright, *Optical Projection* (1891); E. Trutat, *Traité des Projections* (Paris, 1897 and 1901); P. E. Liesegang, *Die Projektions-Kunst* (Leipzig, 1909).

LANTERN-FLY, the name given to insects belonging to the homopterous division of the Hemiptera, and referable to the genus *Fulgora* and allied forms. They are mostly of large size, with a superficial resemblance to lepidoptera due to their brilliant and varied coloration. Characteristic of the group is the presence on the front of the head of a hollow process, simulating a snout, which is sometimes inflated and as large as the rest of the insect, sometimes elongated, narrow and apically upturned. It was believed, mainly on the authority of Marie Sibylle de Mérian, that this process, the so-called "lantern," was luminous at night. Linnaeus adopted the statement without question and made use of a number of specific names, such as *lanternaria*, *phosphorea*, *candelaria*, &c., to illustrate the supposed fact, and thus aided in disseminating a belief which subsequent observations have failed to establish and which is now generally rejected.

LANTERNS OF THE DEAD, the architectural name for the small towers in stone, found chiefly in the centre and west of France, pierced with small openings at the top, where a light was exhibited at night to indicate the position of a cemetery. These towers were usually circular, with a small entrance in the lower part giving access to the interior, so as to raise the lamps by a pulley to the required height. One of the most perfect in France is that at Cellefrouin (Charente), which consists of a series of eight attached semicircular shafts, raised on a pedestal, and is crowned with a conical roof decorated with fir cones; it has only one aperture, towards the main road. Other examples exist at Ciron (Indre) and Antigny (Vienne).



Lantern of the Dead at Cellefrouin (Charente).

LANTHANUM [symbol La, atomic weight 139·0 (O=16)] one of the metals of the cerium group of rare earths. Its name is derived from the Gr. λανθάνειν, to lie hidden. It was first isolated in 1839 by C. G. Mosander from the "cerium" of J. Berzelius. It is found in the minerals gadolinite, cerite, samarskite and fergusonite, and is usually obtained from cerite. For details of the complex process for the separation of the lanthanum salts from cerite, see R. Bunsen (*Pogg. Ann.*, 1875, 155, p. 377); P. T. Cleve (*Bull. de la soc. chim.*, 1874, 21, p. 196); and A. v. Welsbach (*Monats. f. Chem.*, 1884, 5, p. 508). The metal was obtained by Mosander on heating its chloride with potassium, and by W. F. Hillebrand and T. Norton (*Pogg. Ann.*, 1875, 156, p. 466) on electrolysis of the fused chloride, while C. Winkler (*Ber.*, 1890, 23, p. 78) prepared it by heating the oxide with a mixture of magnesium and magnesia. Muthmann and Weiss (*Ann.*, 1904, 331, p. 1) obtained it by electrolysing the anhydrous chloride. It may be readily hammered, but cannot be drawn. Its specific gravity is 6·1545, and it melts at 810°. It decomposes cold water slowly, but hot water violently. It burns in air, and also in chlorine and bromine, and is readily oxidized by nitric acid.

Lanthanum oxide, La_2O_3, is a white powder obtained by burning the metal in oxygen, or by ignition of the carbonate, nitrate or sulphate. It combines with water with evolution of heat, and on heating with magnesium powder in an atmosphere of hydrogen forms a hydride of probable composition La_2H_3 (C. Winkler, *Ber.* 1891, 24, p. 890). *Lanthanum hydroxide*, $La(OH)_3$, is a white amorphous powder formed by precipitating lanthanum salts by potassium hydroxide. It decomposes ammonium salts. *Lanthanum chloride*, $LaCl_3$, is obtained in the anhydrous condition by heating lanthanum ammonium chloride or, according to C. Matignon (*Compt. rend.*, 1905, 40, p. 1181), by the action of chlorine or hydrochloric acid on the residue obtained by evaporating the oxide with hydrochloric acid. It forms a deliquescent crystalline mass. By evaporation of a solution of lanthanum oxide in hydrochloric acid to the consistency of a syrup, and allowing the solution to stand, large colourless crystals of a hydrated chloride of the composition $2LaCl_3 \cdot 15H_2O$ are obtained. *Lanthanum sulphide*, La_2S_3, is a yellow powder, obtained when the oxide is heated in the vapour of carbon bisulphide. It is decomposed by water, with evolution of sulphuretted hydrogen. *Lanthanum sulphate*, $La_2(SO_4)_3 \cdot 9H_2O$, forms six-sided prisms, isomorphous with those of the corresponding cerium salt. By careful heating it may be made to yield the anhydrous salt. *Lanthanum nitrate*, $La(NO_3)_3 \cdot 6H_2O$, is obtained by dissolving the oxide in nitric acid. It crystallizes in plates, and is soluble in water and alcohol. *Lanthanum carbide*, LaC_2, is prepared by heating the oxide with carbon in the electric furnace (H. Moissan, *Compt. rend.*, 1896, 123, p. 148). It is decomposed by water with the formation of acetylene, methane, ethylene, &c. *Lanthanum carbonate*, $La_2CO_3 \cdot 8H_2O$, occurs as the rare mineral lanthanite, forming greyish-white, pink or yellowish rhombic prisms. The atomic weight of lanthanum has been determined by B. Brauner (*Proc. Chem. Soc.*, 1901, 17, p. 63) by ignition of lanthanum sulphate at 500° C., the value obtained being 139 (O = 16).

LANUVIUM (more frequently *Lanivium* in imperial times, mod. *Civita Lavinia*), an ancient city of Latium, some 19 m. S.E. of Rome, a little S.W. of the Via Appia. It was situated on an isolated hill projecting S. from the main mass of the Alban Hills and commanding an extensive view over the low country between it and the sea. It was one of the members of the Latin League, and remained independent until conquered by Rome in 338 B.C. At first it did not enjoy the right of Roman citizenship but acquired it later; and even in imperial times its chief magistrate and municipal council kept the titles of *dictator* and *senatus* respectively. It was especially famous for its rich and much venerated temple of Juno Sospes, from which Octavian borrowed money in 31 B.C., and the possessions of which extended as far as the sea-coast (T. Ashby in *Mélanges de l'école française*, 1905, 203). It possessed many other temples, restored by Antoninus Pius, who was born close by, as was also Commodus. Remains of the ancient theatre and of the city walls exist in the modern village, and above it is an area surrounded by a portico, in *opus reticulatum*, upon the north side of which is a rectangular building in *opus quadratum*, probably connected with the temple of Juno. Here archaic decorative terra-cottas were discovered in excavations carried on by Lord Savile. The acropolis of the primitive city was probably on the highest point above the temple to the north. The neighbourhood, which is now covered with vineyards, contains remains of many Roman villas, one of which is traditionally attributed to Antoninus Pius.

See *Notizie degli Scavi, passim.* (T. As.)

LANZA, DOMENICO GIOVANNI GIUSEPPE MARIA (1810–1882), Italian politician, was born at Casale, Piedmont, on the 15th of February 1810. He studied medicine at Turin, and practised for some years in his native place. He was one of the promoters of the agrarian association in Turin, and took an active part in the rising of 1848. He was elected to the Piedmontese parliament in that year, and attached himself to the party of Cavour, devoting his attention chiefly to questions of economy and finance. He became minister of public instruction in 1855 in the cabinet of Cavour, and in 1858 minister of finance. He followed Cavour into his temporary retirement in July 1859 after the peace of Villafranca, and for a year (1860–1861) was president of the Chamber. He was minister of the interior (1864–1865) in the La Marmora cabinet, and arranged the transference of the capital to Florence. He maintained a resolute opposition to the financial policy of Menabrea, who resigned when Lanza was a second time elected, in 1869, president of the Chamber. Lanza formed a new cabinet in which he was himself minister of the interior. With Quintino Sella as minister of finance he sought to reorganize Italian finance, and resigned office when Sella's projects were rejected in 1873. His cabinet had seen the accomplishment of Italian unity and the installation of an Italian government in Rome. He died in Rome on the 9th of March 1882.

See Enrico Tavallini, *La Vita ed i tempi di Giovanni Lanza* (2 vols., Turin and Naples, 1887).

LANZAROTE, an island in the Atlantic Ocean, forming part of the Spanish archipelago of the Canary Islands (*q.v.*). Pop. (1900) 17,546; area, 326 sq. m. Lanzarote, the most easterly of the Canaries, has a length of 31 m. and a breadth varying from 5 to 10 m. It is naked and mountainous, bearing everywhere marks of its volcanic origin. Montaña Blanca, the highest point (2000 ft.), is cultivated to the summit. In 1730 the appearance of half the island was altered by a volcanic outburst. A violent earthquake preceded the catastrophe, by which nine villages were destroyed. In 1825 another volcanic eruption took place accompanied by earthquakes, and two hills were thrown up. The port of Naos on the south-east of the island affords safe anchorage. It is protected by two forts. A short distance inland is the town of Arrecife (pop. 3082). The climate is hot and dry. There is only a single spring of fresh water on the island, and that in a position difficult of access. From the total failure of water the inhabitants were once compelled to abandon the island. Dromedaries are used as beasts of burden. Teguise (pop. 3786), on the north-west coast, is the residence of the local authorities. A strait about 6 m. in width separates Lanzarote from Fuerteventura.

Graciosa, a small uninhabited island, is divided from the north-eastern extremity of Lanzarote by a channel 1 m. in width, which affords a capacious and safe harbour for large ships; but basaltic cliffs, 1500 ft. high, prevent intercourse with the inhabited part of Lanzarote. A few persons reside on the little island Allegranza, a mass of lava and cinders ejected at various times from a now extinct volcano, the crater of which has still a well-defined edge.

LANZI, LUIGI (1732–1810), Italian archaeologist, was born in 1732 and educated as a priest. In 1773 he was appointed keeper of the galleries of Florence, and thereafter studied Italian painting and Etruscan antiquities and language. In the one field his labours are represented by his *Storia Pittorica della Italia*, the first portion of which, containing the Florentine, Sienese, Roman and Neapolitan schools, appeared in 1792, the rest in 1796. The work is translated by Roscoe. In archaeology his great achievement was *Saggio di lingua Etrusca* (1789), followed by *Saggio delle lingue Ital. antiche* (1806). In his memoir on the so-called Etruscan vases (*Dei vasi antichi dipinti volgarmente chiamati Etruschi*, 1806) Lanzi rightly perceived their Greek origin and characters. What was true of the antiquities would be true also, he argued, of the Etruscan language, and the object of the *Saggio di lingua Etrusca* was to prove that this language must be related to that of the neighbouring peoples—Romans, Umbrians, Oscans and Greeks. He was allied with E. Q. Visconti in his great but never accomplished plan of illustrating antiquity altogether from existing literature and monuments. His notices of ancient sculpture and its various styles appeared as an appendix to the *Saggio di lingua Etrusca*, and arose out of his minute study of the treasures then added to the Florentine collection from the Villa Medici. The abuse he met with from later writers on the Etruscan language led Corssen (*Sprache der Etrusker*, i. p. vi.) to protest in the name of his real services to philology and archaeology. Among his other productions was an edition of Hesiod's *Works and Days*, with valuable notes, and a translation in *terza rima*. Begun in 1785, it was recast and completed in 1808. The list of his works closes with his *Opere sacre*, a series of treatises on spiritual subjects. Lanzi died on the 30th of March 1810. He was buried in the church of the Santa Croce at Florence by the side of Michelangelo.

LAOAG, a town, port for coasting vessels, and capital of the province of Ilocos Norte, Luzon, Philippine Islands, on the Laoag river, about 5 m. from its mouth, and in the N.W. part of the island. Pop. (1903) 34,454; in 1903, after the census had been taken, the municipality of San Nicolás (pop. 1903, 10,880) was added to Laoag. Laoag is on an extensive coast plain, behind which is a picturesque range of hills; it is well built and is noted for its fine climate, the name "Laoag" signifying "clear." It is especially well equipped for handling rice, which is shipped in large quantities; Indian corn, tobacco and sugar are also shipped. Cotton is grown in the vicinity, and is woven by the women into fabrics, which find a ready sale among the pagan tribes of the mountains. The language is Ilocano.

LAOCOON, in Greek legend a brother of Anchises, who had been a priest of Apollo, but having profaned the temple of the god he and his two sons were attacked by serpents while preparing to sacrifice a bull at the altar of Poseidon, in whose service Laocoon was then acting as priest. An additional motive for his punishment consisted in his having warned the Trojans against the wooden horse left by the Greeks. But, whatever his crime may have been, the punishment stands out even among the tragedies of Greek legend as marked by its horror—particularly so as it comes to us in Virgil (*Aeneid*, ii. 199 sq.), and as it is represented in the marble group, the Laocoon, in the Vatican. In the oldest existing version of the legend—that of Arctinus of Miletus, which has so far been preserved in the excerpts of Proclus—the calamity is lessened by the fact that only one of the two sons is killed; and this, as has been pointed out (*Arch. Zeitung*, 1879, p. 167), agrees with the interpretation which Goethe in his *Propylaea* had put on the marble group without reference to the literary tradition. He says: "The younger son struggles and is powerless, and is alarmed; the father struggles ineffectively, indeed his efforts only increase the opposition; the elder son is least of all injured, he feels neither anguish nor pain, but he is horrified at what he sees happening to his father, and he screams while he pushes the coils of the serpent off from his legs. He is thus an observer, witness, and participant in the incident, and the work is then complete." Again, "the gradation of the incident is this: the father has become powerless among the coils of the serpent; the younger son has still strength for resistance but is wounded; the elder has a prospect of escape." Lessing, on the other hand, maintained the view that the marble group illustrated the version of the legend given by Virgil, with such differences as were necessary from the different limits of representation imposed on the arts of sculpture and of poetry. These limits required a new definition, and this he undertook in his still famous work, *Laokoon* (see the edition of Hugo Blümner, Berlin, 1876, in which the subsequent criticism is collected). The date of the Laocoon being now fixed (see Agesander) to 40–20 B.C., there can be no question of copying Virgil. The group represents the extreme of a pathetic tendency in sculpture (see Greek Art, Plate I. fig. 52).

LAODICEA, the name of at least eight cities, founded or renovated in the later Hellenic period. Most of them were founded by the Seleucid kings of Syria. Seleucus, founder of the dynasty, is said by Appian to have named five cities after his mother Laodice. Thus in the immense realm of the Seleucidae from the Aegean Sea to the borders of India we find cities called Laodicea, as also Seleucia (*q.v.*). So long as Greek civilization held its ground, these were the commercial and social centres. The chief are Laodicea *ad Lycum* (see below); *Combusta* on the borders of Phrygia, Lycaonia and Pisidia; a third in Pontus; a fourth, *ad mare*, on the coast of Syria; a fifth, *ad Libanum*, beside the Lebanon mountains; and three others in the far east—Media, Persia and the lower Tigris valley. In the latter countries Greek civilization was short-lived, and the last three cities disappeared; the other five continued great throughout the Greek and Roman period, and the second, third and fourth retain to the present day the ancient name under the pronunciation Ladik, Ladikiyeh or Latakia (*q.v.*).

Laodicea ad Lycum (mod. *Denizli*, *q.v.*) was founded probably by Antiochus II. Theos (261–46 B.C.), and named after his wife Laodice. Its site is close to the station of Gonjeli on the Anatolian railway. Here was one of the oldest homes of Christianity and the seat of one of the seven churches of the Apocalypse. Pliny states (v. 29) that the town was called in older times Diospolis and Rhoas; but at an early period Colossae, a few miles to the east, and Hierapolis, 6 m. to the north, were the great cities of the neighbourhood, and Laodicea was of no importance till the Seleucid foundation (Strabo, p. 578). A favourable site was found on some low hills of alluvial formation, about 2 m. S. of the river Lycus (Churuk Su) and 9 m. E. of the confluence of the Lycus and Maeander. The great trade route from the Euphrates and the interior passed to it through Apamea. There it forked, one branch going down the Maeander valley to Magnesia and thence north to Ephesus, a distance of about 90 m., and the other branch crossing the mountains by an easy pass to Philadelphia and the Hermus valley, Sardis, Thyatira and at last Pergamum. St Paul (Col. iv. 15) alludes to the situation of Laodicea beside Colossae and Hierapolis; and the order in which the last five churches of the Apocalypse are enumerated (Rev. i. 11) is explained by their position on the road just described. Placed in this situation, in the centre of a very fertile district, Laodicea became a rich city. It was famous for its money transactions (Cic. *Ad Fam.* ii. 17, iii. 5), and for the beautiful soft wool grown by the sheep of the country (Strabo 578). Both points are referred to in the message to the church (Rev. iii. 17, 18).

Little is known of the history of the town. It suffered greatly from a siege in the Mithradatic war, but soon recovered its prosperity under the Roman empire. The Zeus of Laodicea, with the curious epithet Azeus or Azeis, is a frequent symbol on the city coins. He is represented standing, holding in the extended right hand an eagle, in the left a spear, the *hasta pura*. Not far from the city was the temple of Men Karou, with a great medical school; while Laodicea itself produced some famous Sceptic philosophers, and gave origin to the royal family of Polemon and Zenon, whose curious history has been illustrated in recent times (W. H. Waddington, *Mélanges de Numism.* ser. ii.; Th. Mommsen, *Ephem. Epigraph.* i. and ii.; M. G. Rayet, *Milet et le Golfe Latmique*, chap. v.). The city fell finally into decay in the frontier wars with the Turkish invaders. Its ruins are of wide extent, but not of great beauty or interest; there is no doubt, however, that much has been buried beneath the surface by the frequent earthquakes to which the district is exposed (Strabo 580; Tac. *Ann.* xiv. 27).

See W. M. Ramsay, *Cities and Bishoprics of Phrygia*, i.-ii. (1895); *Letters to the Seven Churches* (1904); and the beautiful drawings of Cockerell in the *Antiquities of Ionia*, vol. iii. pl. 47-51. (A. H. S.)

LAODICEA, SYNOD OF, held at Laodicea ad Lycum in Phrygia, some time between 343 and 381 (so Hefele; but Baronius argues for 314, and others for a date as late as 399), adopted sixty canons, chiefly disciplinary, which were declared ecumenical by the council of Chalcedon, 451. The most significant canons are those directly affecting the clergy, wherein the clergy appear as a privileged class, far above the laity, but with sharply differentiated and carefully graded orders within itself. For example, the priests are not to be chosen by the people; penitents are not to be present at ordinations (lest they should hear the failings of candidates discussed); bishops are to be appointed by the metropolitan and his suffragan; sub-deacons may not distribute the elements of the Eucharist; clerics are forbidden to leave a diocese without the bishop's permission. Other canons treat of intercourse with heretics, admission of penitent heretics, baptism, fasts, Lent, angel-worship (forbidden as idolatrous) and the canonical books, from which the Apocrypha and Revelation are wanting.

See Mansi ii. 563-614; Hardouin i. 777-792; Hefele, 2nd ed., i. 746-777 (Eng. trans. ii. 295-325). (T. F. C.)

LAOMEDON, in Greek legend, son of Ilus, king of Troy and father of Podarces (Priam). The gods Apollo and Poseidon served him for hire, Apollo tending his herds, while Poseidon built the walls of Troy. When Laomedon refused to pay the reward agreed upon, Apollo visited the land with a pestilence, and Poseidon sent up a monster from the sea, which ravaged the land. According to the oracle, the wrath of Poseidon could only be appeased by the sacrifice of one of the king's daughters. The lot fell upon Hesione, who was chained to a rock to await the monster's coming. Heracles, on his way back from the land of the Amazons, offered to slay the monster and release Hesione, on condition that he should receive the wonderful horses presented by Zeus to Tros, the father of Ganymede, to console him for the loss of his son. Again Laomedon broke his word; whereupon Heracles returned with a band of warriors, attacked Troy, and slew Laomedon and all his sons except Priam. According to Diodorus Siculus, Laomedon aggravated his offence by imprisoning Iphiclus and Telamon, who had been sent by Heracles to demand the surrender of the horses. Laomedon was buried near the Scaean gate, and it was said that so long as his grave remained undisturbed, so long would the walls of Troy remain impregnable.

See Homer, *Iliad*, v. 265, 640, vii. 452, xxi. 443; Apollodorus ii. 5. 9 and 6. 4; Diod. Sic. iv. 32, 42, 49; Hyginus, *Fab.* 89; Horace, *Odes* iii. 3, 22; Ovid, *Metam.* xi. 194.

LAON, a town of northern France, capital of the department of Aisne, 87 m. N.E. of Paris on the Northern railway. Pop. (1906), town, 9787, commune (including troops) 15,288. It is situated on an isolated ridge, forming two sides of a triangle, which rises some 330 ft. above the surrounding plain and the little river of Ardon. The suburbs of St Marcel and Vaux extend along the foot of the ridge to the north. From the railway station, situated in the plain to the north, a straight staircase of several hundred steps leads to the gate of the town, and all the roads connecting Laon with the surrounding district are cut in zigzags on the steep slopes, which are crowned by promenades on the site of the old ramparts. The 13th-century gates of Ardon, Chenizelles and Soissons, the latter in a state of ruin, have been preserved. At the eastern extremity of the ridge rises the citadel; at its apex is the parade-ground of St Martin, and at the southern end stands the ancient abbey of St Vincent. The deep depression between the arms of the ridge, known as the Cuve St Vincent, has its slopes covered with trees, vegetable gardens and vineyards. From the promenade along the line of the ramparts there is an extensive view northward beyond St Quentin, westward to the forest of St Gobain, and southward over the wooded hills of the Laonnais and Soissonnais.

The cathedral of Laon (see ARCHITECTURE, Romanesque and Gothic Architecture in France) is one of the most important creations of the art of the 12th and 13th centuries. It took the place of the old cathedral, burned at the beginning of the communal struggles mentioned below. The building is cruciform, and the choir terminates in a straight wall instead of in an apse. Of the six towers flanking the façades, only four are complete to the height of the base of the spires, two at the west front with hugh figures of oxen beneath the arcades of their upper portion, and one at each end of the transept. A square central tower forms a lantern within the church. The west front, with three porches, the centre one surmounted by a fine rose window, ranks next to that of Notre-Dame at Paris in purity. The cathedral has stained glass of the 13th century and a choir grille of the 18th century. The chapter-house and the cloister contain beautiful specimens of the architecture of the beginning of the 13th century. The old episcopal palace, contiguous to the cathedral, is now used as a court-house. The front, flanked by turrets, is pierced by great pointed windows. There is also a Gothic cloister and an old chapel of two storeys, of a date anterior to the cathedral. The church of St Martin dates from the middle of the 12th century. The old abbey buildings of the same foundation are now used as the hospital. The museum of Laon had collections of sculpture and painting. In its garden there is a chapel of the Templars belonging to the 12th century. The church of the suburb of Vaux near the railway station dates from the 11th and 12th centuries. Numerous cellars of two or three storeys have taken the place of the old quarries in the hill-side. Laon forms with La Fère and Reims a triangle of important fortresses. Its fortifications consist of an inner line of works on the eminence of Laon itself, and two groups of detached forts, one some 2½ m. S.E. about the village of Bruyères, the other about 3 m. W.S.W., near Laniscourt. To the S.S.W. forts Malmaison and Condé connect Laon with the Aisne and with Reims.

Laon is the seat of a prefect and a court of assizes, and possesses a tribunal of first instance, a lycée for boys, a college for girls, a school of agriculture and training colleges. Sugar-making and metal-founding are carried on, but neither industry nor trade, which is in grain and wine, are of much importance.

The hilly district of Laon (Laudunum) has always had some strategic importance. In the time of Caesar there was a Gallic village where the Remi (inhabitants of the country round Reims) had to meet the onset of the confederated Belgae. Whatever may have been the precise locality of that battlefield, Laon was fortified by the Romans, and successively checked the invasions of the Franks, Burgundians, Vandals, Alani and Huns. St Remigius, the archbishop of Reims who baptized Clovis, was born in the Laonnais, and it was he who, at the end of the 5th century, instituted the bishopric of the town. Thenceforward Laon was one of the principal towns of the kingdom of the Franks, and the possession of it was often disputed. Charles the Bald had enriched its church with the gift of very numerous domains. After the fall of the Carolingians Laon took the part of Charles of Lorraine, their heir, and Hugh Capet only succeeded in making himself master of the town by the connivance of the bishop, who, in return for this service, was made second ecclesiastical peer of the kingdom. Early in the 12th century the communes of France set about emancipating themselves, and the history of the commune of Laon is one of the richest and most varied. The citizens had profited by a temporary absence of Bishop Gaudry to secure from his representatives a communal charter, but he, on his return, purchased from the king of France the revocation of this document, and recommenced his oppressions. The consequence was a revolt, in which the episcopal palace was burnt and the bishop and several of his partisans were put to death. The fire spread to the cathedral, and reduced it to ashes. Uneasy at the result of their victory, the rioters went into hiding outside the town, which was anew pillaged by the people of the neighbourhood, eager to avenge the death of their bishop. The king alternately interfered in favour of the bishop and of the inhabitants till 1239. After that date the liberties of Laon were no more contested till 1331, when the commune was abolished. During the Hundred Years' War it was attacked and taken by the Burgundians, who gave it up to the English, to be retaken by the French after the consecration of Charles VII. Under the League Laon took the part of the Leaguers, and was taken by Henry IV. During the campaign of 1814 Napoleon tried in vain to dislodge Blücher from it. In 1870 an engineer blew up the powder magazine of the citadel at the moment when the German troops were entering the town. Many lives were lost; and the cathedral and the old episcopal palace were damaged. At the Revolution Laon permanently lost its rank as a bishopric.

LAOS, a territory of French Indo-China, bounded N. by the Chinese province of Yun-nan, W. by the British Shan states and Siam, S. by Cambodia and Annam, E. by Annam and N.E. by Tongking. Northern Laos is traversed by the Mekong (*q.v.*) which from Chieng-Khan to a point below Stung-Treng forms the boundary between Laos (on the left bank) and Siam and Cambodia (on the right). French Laos constitutes a strip of territory between 700 and 800 m. in length with an average breadth of 155 m., an approximate area of 88,780 sq. m., and a population of about 550,000. Its northern region between the Mekong and Tongking is covered by a tangle of mountain chains clothed with dense forests and traversed by the Nam-Hou, the Nam-Ta and other tributaries of the Mekong. The culminating point exceeds 6500 ft. in height. South of this is the extensive wooded plateau of Tran-Ninh with an average altitude of between 3000 and 5000 ft. Towards the 18th degree of latitude this mountain system narrows into a range running parallel to and closely approaching the coast of the China Sea as it descends south. The boundary between Laos and Annam follows the crest-line of this range, several peaks of which exceed 6500 ft. (Pu-Atwat, over 8000 ft.). On the west its ramifications extend to the Mekong enclosing wide plains watered by the affluents of that river.

Laos is inhabited by a mixed population falling into three main groups—the Thais (including the Laotions (see below)); various aboriginal peoples classed as Khas; and the inhabitants of neighbouring countries, *e.g.* China, Annam, Cambodia, Siam, Burma, &c.

Laos has a rainy season lasting from June to October and corresponding to the S.W. monsoon and a dry season coinciding with the N.E. monsoon and lasting from November to May. Both in northern and southern Laos the heat during April and May is excessive, the thermometer reaching 104° F. and averaging 95° F. With the beginning of the rains the heat becomes more tolerable. December, January and February are cool months, the temperature in south Laos (south of 19°) averaging 77°, in north Laos from 50° to 53°. The plateau of Tran-Ninh and, in the south, that of the Bolovens are distinguished by the wholesomeness of their climate.

The forests contain bamboo and many valuable woods amongst which only the teak of north Laos and rattan are exploited to any extent; other forest products are rubber, stick lac, gum, benjamin, cardamoms, &c. Rice and maize, and cotton, indigo, tobacco, sugar-cane and cardamoms are among the cultivated plants. Elephants are numerous and the forests are inhabited by tigers, panthers, bears, deer and buffalo. Hunting and fishing are leading occupations of the inhabitants. Many species of monkeys, as well as peacocks, pheasants and woodcock are found, and the reptiles include crocodiles, turtles, pythons and cobras.

Scarcity of labour and difficulty of communication hinder the working of the gold, tin, copper, argentiferous lead, precious stones and other minerals of the country and the industries in general are of a primitive kind and satisfy only local needs.

The buffalo, the ox, the horse and the elephant are domesticated, and these together with cardamoms, rice, tobacco and the products of the forests form the bulk of the exports. Swine are reared, their flesh forming an important article of diet. Imports are inconsiderable, comprising chiefly cotton fabrics, garments and articles for domestic use. Trade is chiefly in the hands of the Chinese and is carried on for the most part with Siam. The Mekong is the chief artery of transit; elsewhere communication is afforded by tracks sometimes passable only for pedestrians. Luang-Prabang (*q.v.*) is the principal commercial town. Before the French occupation of Laos, it was split up into small principalities (*muongs*) of which the chief was that of Vien-Tiane. Vien-Tiane was destroyed in 1828 by the Siamese who annexed the territory. In 1893 they made it over to the French, who grouped the *muongs* into provinces. Of these there are twelve each administered by a French commissioner and, under his surveillance, by native officials elected by the people from amongst the members of an hereditary nobility. At the head of the administration there is a resident-superior stationed at Savannaket. Up till 1896 Laos had no special budget, but was administered by Cochin-China, Annam and Tongking. The budget for 1899 showed receipts £78,988 and expenditure £77,417. For 1904 the budget figures were, receipts £82,942, expenditure £76,344. The chief sources of revenue are the direct taxes (£15,606 in 1904), especially the poll-tax, and the contribution from the general budget of Indo-China (£54,090 in 1904). The chief items of expenditure in 1904 were Government house, &c., £22,558, transport, £19,191, native guard, £17,327.

See M. J. F. Garnier, *Voyage d'exploration en Indo-Chine* (Paris, 1873); C. Gosselin, *Le Laos et le protectorat français* (Paris, 1900); L. de Reinach, *Le Laos* (Paris, 1902) and *Notes sur le Laos* (Paris, 1906); and bibliography under INDO-CHINA, FRENCH.

LAOS, or LAOTIONS, an important division of the widespread Thai or Shan race found throughout Indo-China from 28° N. and the sources of the Irrawaddy as far as Cambodia and 7° N. in the Malay Peninsula. This Thai family includes the Shans proper, and the Siamese. The name Lao, which appears to mean simply "man," is the collective Siamese term for all the Thai peoples subject to Siam, while Shan, said to be of Chinese origin, is the collective Burmese term for those subject to Burma. Lao is therefore rather a political than an ethnical title, and the people cordially dislike the name, insisting on their right to be called Thai. Owing to the different circumstances which have attended their migrations, the Thai peoples have attained to varying degrees of civilization. The Lao, who descended from the mountain districts of Yunnan, Szechuen and Kweichow to the highland plains of upper Indo-China, and drove the wilder Kha peoples whom they found in possession into the hills, mostly adopted Buddhism, and formed small settled communities or states in which laws were easy, taxes light and a very fair degree of comfort was attained. There are two main divisions, the Lao Pong Dam ("Black Paunch Laos"), so-called from their habit of tattooing the body from the waist to the knees, and the Lao Pong Kao ("White Paunch Laos") who do not tattoo. Lao tattooing is of a most elaborate kind. The Lao Pong Dam now form the western branch of the Lao family, inhabiting the Siamese Lao states of Chieng Mai Lapaun, 'Tern Pre and Nan, and reaching as far south as 17° N. Various influences have contributed to making the Lao the pleasant, easy-going, idle fellow that he is. The result is that practically all the trade of these states is in the hands of Bangkok Chinese firms, of a certain number of European houses and others, while most of the manual labour connected with the teak industry is done by Ka Mus, who migrate in large numbers from the left bank of the Mekong. The Lao Pong Kao, or eastern branch, appear to have migrated southwards by the more easterly route of the Nam-u and the Mekong valley. In contradistinction to the Lao Pong Dam, who have derived their written language from the Burmese character, the eastern race has retained what appears to be the early form of the present Siamese writing, from which it differs little. They formed important settlements at various points on the Mekong, notably Luang Prabang, Wieng Chan (Vien-Tiane) Ubon and Bassac; and, heading inland as far as Korat on the one side and the Annamite watershed in the east, they drove out the less civilized Kha peoples, and even the Cambodians, as the Lao Pong Dam did on the west. Vien-Tiane during the 18th century was the most powerful of the Lao principalities, and was feared and respected throughout Indo-China. It was destroyed by the Siamese in 1828. The inhabitants, in accordance with the Indo-Chinese custom of the day, were transported to Lower Siam. The Lao Pong Kao below 18° N. are a less merry and less vivacious people, and are for the most part shorter and more thick-set than those of Luang Prabang and the north. If possible, they are as a race lazier than the western Lao, as they are certainly more musical. The "khen," or mouth organ, which is universal among them, is the sweetest-toned of eastern instruments.

After 1828 the Laos became entirely subject to Siam, and were governed partly by khiao, or native hereditary princes, partly by mandarins directly nominated by the Bangkok authorities. The khiao were invested by a gold dish, betel-box, spittoon and teapot, which were sent from Bangkok and returned at their death or deposition. Of all the khiao the most powerful was the prince of Ubon (15° N., 105° E.), whose jurisdiction extended nearly from Bassac on the Mekong northwards to the great southern bend of that river. Nearly all the Laos country is now divided between France and Siam, and only a few tribes retain a nominal independence.

The many contradictory accounts of the Laos are due to the fact that the race has become much mixed with the aboriginal inhabitants. The half-castes sprung from alliances with the wild tribes of Caucasic stock present every variety between that type and the Mongolian. But the pure Laos are still distinguished by the high cheek-bones, small flat nose, oblique eyes, wide mouth, black lank hair, sparse beard, and yellow complexion of the Thai and other branches of the Mongol family. In disposition the Laos are an apathetic, peace-loving, pleasant-mannered race. Though the women have to work, they are free and well treated, and polygamy is rare. The Laos are very superstitious, believe in wer-wolves, and that all diseases are caused by evil spirits. Their chief food is rice and fish. Men, women and children all smoke tobacco. The civilized Laos were long addicted to slave-hunting, not only with the sanction but even with the co-operation of their rulers, the Lao mandarins heading regular expeditions against the wilder tribes.

Closely allied with the Lao are a number of tribes found throughout the hill regions of the upper Mekong, between Yunnan and Kwangsi in China and the upper waters of the Menam in Siam. They have all within recent times been partakers in the general movement towards the south-west from the highland districts of southern China, which has produced so many recruits for the peopling of the Indo-Chinese peninsula. Of this group of people, among whom may be named the Yao, Yao Yin, Lanten, Meo, Musur (or Muhso) and Kaw, perhaps the best known and most like the Lao are the Lu—both names meaning originally "man"—who have in many cases adopted a form of Buddhism (flavoured strongly by their natural respect for local spirits as well as tattooing) and other relatively civilized customs, and have forsaken their wandering life among the hills for a more settled village existence. Hardy, simple and industrious, fond of music, kind-hearted, and with a strangely artistic taste in dress, these people possess in a wonderful degree the secret of cheerful contentment.

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LÂO-TSZE, or LAOU-TSZE, the designation of the Chinese author of the celebrated treatise called *Tâo Teh King*, and the reputed founder of the religion called *Tâoism*. The Chinese characters composing the designation may mean either "the Old Son," which commonly assumes with foreigners the form of "the Old Boy," or "the Old Philosopher." The latter significance is attached to them by Dr Chalmers in his translation of the treatise published in 1868 under the title of *The Speculations on Metaphysics, Polity and Morality of "the Old Philosopher," Lâo-tsze.* The former is derived from a fabulous account of Lâo-tsze in the *Shăn Hsien Chwan*, "The Account of Spirits and Immortals," of Ko Hung in the 4th century A.D. According to this, his mother, after a supernatural conception, carried him in her womb sixty-two years (or seventy-two, or eighty-one—ten years more or fewer are of little importance in such a case), so that, when he was born at last, his hair was white as with age, and people might well call him "the old boy." The other meaning of the designation rests on better authority. We find it in the *Kiâ Yü*, or "Narratives of the Confucian School," compiled in the 3rd century A.D. from documents said to have been preserved among the descendants of Confucius, and also in the brief history of Lâo-tsze given in the historical records of Sze-ma Ch'ien (about 100 B.C.). In the latter instance the designation is used by Confucius, and possibly it originated with him. It should be regarded more as an epithet of respect than of years, and is equivalent to "the Venerable Philosopher."

All that Ch'ien tells us about Lâo-tsze goes into small compass. His surname was Lî, and his name Urh. He was a native of the state of Ch'û, and was born in a hamlet not far from the present prefectural city of Kwei-te in Ho-nan province. He was one of the recorders or historiographers at the court of Chow, his special department being the charge of the whole or a portion of the royal library. He must thus have been able to make himself acquainted with the history of his country. Ch'ien does not mention the year of his birth, which is often said, though on what Chinese authority does not appear, to have taken place in the third year of King Phing, corresponding to 604 B.C. That date cannot be far from the truth. That he was contemporary with Confucius is established by the concurrent testimony of the *Lî Kî* and the *Kiâ Yü* on the Confucian side, and of Chwang-tsze and Sze-ma Ch'ien on the Tâoist. The two men whose influence has been so great on all the subsequent generations of the Chinese people—Kung-tsze (Confucius) and Lâo-tsze—had at least one interview, in 517 B.C., when the former was in his thirty-fifth year. The conversation between them was interesting. Lâo was in a mocking mood; Kung appears to the greater advantage. If it be true that Confucius, when he was fifty-one years old, visited Lâo-tsze as Chwang-tsze says (in the *Thien Yun*, the fourteenth of his treatises), to ask about the *Tâo*, they must have had more than one interview. Dr Chalmers, however, has pointed out that both Chwang-tsze and Lieh-tsze (a still earlier Tâoist writer) produce Confucius in their writings, as the lords of the Philistines did the captive Samson on their festive occasions, "to make sport for them." Their testimony is valueless as to any matter of fact. There may have been several meetings between the two in 517 B.C., but we have no evidence that they were together in the same place after that time. Ch'ien adds:—"Lâo-tsze cultivated the *Tâo* and virtue, his chief aim in his studies being how to keep himself concealed and unknown. He resided at (the capital of) Chow; but after a long time, seeing the decay of the dynasty, he left it, and went away to the Gate (leading from the royal domain into the regions beyond—at the entrance of the pass of Han-kû, in the north-west of Ho-nan). Yin Hsî, the warden of the Gate, said to him, 'You are about to withdraw yourself out of sight; I pray you to compose for me a book (before you go).' On this Lâo-tsze made a writing, setting forth his views on the *tâo* and virtue, in two sections, containing more than 5000 characters. He then went away, and it is not known where he died." The historian then mentions the names of two other men whom some regarded as the true Lâo-tsze. One of them was a Lâo Lâi, a contemporary of Confucius, who wrote fifteen treatises (or sections) on the practices of the school of *Tâo*. Subjoined to the notice of him is the remark that Lâo-tsze was more than one hundred and sixty years old, or, as some say, more than two hundred, because by the cultivation of the *Tâo* he nourished his longevity. The other was "a grand historiographer" of Chow, called Tan, one hundred and twenty-nine (? one hundred and nineteen) years after the death of Confucius. The introduction of these disjointed notices detracts from the verisimilitude of the whole narrative in which they occur.

Finally, Ch'ien states that "Lâo-tsze was a superior man, who liked to keep in obscurity," traces the line of his posterity down to the 2nd century B.C., and concludes with this important statement:—"Those who attach themselves to the doctrine of Lâo-tsze condemn that of the literati, and the literati on their part condemn Lâo-tsze, thus verifying the saying, 'Parties whose principles are different cannot take counsel together.' Lî Urh taught that transformation follows, as a matter of course, the doing nothing (to bring it about), and rectification ensues in the same way from being pure and still."

Accepting the *Tâo Teh King* as the veritable work of Lâo-tsze, we may now examine its contents. Consisting of not more than between five and six thousand characters, it is but a short treatise—not half the size of the Gospel of St Mark. The nature of the subject, however, the want of any progress of thought or of logical connexion between its different parts, and the condensed style, with the mystic tendencies and poetical temperament of the author, make its meaning extraordinarily obscure. Divided at first into two parts, it has subsequently and conveniently been subdivided into chapters. One of the oldest, and the most common, of these arrangements makes the chapters eighty-two.

Supposed harmony with Biblical teaching.

Some Roman Catholic missionaries, two centuries ago, fancied that they found a wonderful harmony between many passages and the teaching of the Bible. Montucci of Berlin ventured to say in 1808: "Many things about a Triune God are so clearly expressed that no one who has read this book can doubt that the mystery of the Holy Trinity was revealed to the Chinese five centuries before the coming of Jesus Christ." Even Rémusat, the first occupant of a Chinese chair in Europe, published at Paris in 1823 his *Mémoire sur la vie et les opinions de Lâo-tsze*, to vindicate the view that the Hebrew name Yahweh was phonetically represented in the fourteenth chapter by Chinese characters. These fancies were exploded by Stanislas Julien, when he issued in 1842 his translation of the whole treatise as *Le Livre de la voie et de la vertu*.

The most important thing is to determine what we are to understand by the *Tâo*, for *Teh* is merely its outcome, especially in man, and is rightly translated by "virtue." Julien translated *Tâo* by "la voie." Chalmers leaves it untranslated. "No English word," he says (p. xi.), "is its exact equivalent. Three terms suggest themselves—the way, reason and the word; but they are all liable to objection. Were we guided by etymology, 'the way' would come nearest the original, and in one or two passages the idea of a way seems to be in the term; but this is too materialistic to serve the purpose of a translation. 'Reason,' again, seems to be more like a quality or attribute of some conscious being than *Tâo* is. I would translate it by 'the Word,' in the sense of the Logos, but this would be like settling the question which I wish to leave open, viz. what resemblance there is between the Logos of the New Testament and this Chinese Tâo." Later Sinologues in China have employed "nature" as our best analogue of the term. Thus Watters (*Lâo-tsze, A Study in Chinese Philosophy*, p. 45) says:—"In the *Tâo Teh King* the originator of the universe is referred to under the names Non-Existence, Existence, Nature (*Tâo*) and various designations—all which, however, represent one idea in various manifestations. It is in all cases Nature (*Tâo*) which is meant." This view has been skilfully worked out; but it only hides the scope of "the Venerable Philosopher." "Nature" cannot be accepted as a *translation* of *Tâo*. That character was, primarily, the symbol of a way, road or path; and then, figuratively, it was used, as we also use *way*, in the senses of means and method—the *course* that we pursue in passing from one thing or concept to another as its end or result. It is the name of a quality. Sir Robert Douglas has well said (*Confucianism and Tâoism*, p. 189): "If we were compelled to adopt a single word to represent the *Tâo* of Lâo-tsze, we should prefer the sense in which it is used by Confucius, 'the way,' that is, μέθοδος."

The doctrine of "the way."

What, then, was the quality which Lâo-tsze had in view, and which he thought of as the *Tâo*—there in the library of Chow, at the pass of the valley of Han, and where he met the end of his life beyond the limits of the civilized state? It was the simplicity of spontaneity, action (which might be called non-action) without motive, free from all selfish purpose, resting in nothing but its own accomplishment. This is found in the phenomena of the material world. "All things spring up without a word spoken, and grow without a claim for their production. They go through their processes without any display of pride in them; and the results are realized without any assumption of ownership. It is owing to the absence of such assumption that the results and their processes do not disappear" (chap. ii.). It only needs the same quality in the arrangements and measures of government to make society beautiful and happy. "A government conducted by sages would free the hearts of the people from inordinate desires, fill their bellies, keep their ambitions feeble and strengthen their bones. They would constantly keep the people without knowledge and free from desires; and, where there were those who had knowledge, they would have them so that they would not dare to put it in practice" (chap. iii.). A corresponding course observed by individual man in his government of himself becoming again "as a little child" (chaps. x. and xxviii.) will have corresponding results. "His constant virtue will be complete, and he will return to the primitive simplicity" (chap. xxviii.).

Such is the subject matter of the *Tâo Teh King*—the operation of this method or *Tâo*, "without striving or crying," in nature, in society and in the individual. Much that is very beautiful and practical is inculcated in connexion with its working in the individual character. The writer seems to feel that he cannot say enough on the virtue of humility (chap. viii., &c.). There were three things which he prized and held fast—gentle compassion, economy and the not presuming to take precedence in the world (chap. lxvii.). His teaching rises to its highest point in chap. lxiii.:— "It is the way of *Tâo* not to act from any personal motive, to conduct affairs without feeling the trouble of them, to taste without being aware of the flavour, to account the great as small and the small as great, to recompense injury with kindness." This last and noblest characteristic of the *Tâo*, the requiting "good for evil," is not touched on again in the treatise; but we know that it excited general attention at the time, and was the subject of conversation between Confucius and his disciples (*Confucian Analects*, xiv. 36).

What is said in the *Tâo* on government is not, all of it, so satisfactory. The writer shows, indeed, the benevolence of his heart. He seems to condemn the infliction of capital punishment (chaps. lxxiii. and lxxiv.), and he deplores the practice of war (chap. lxix.); but he had no sympathy with the progress of society or with the culture and arts of life. He says (chap. lxv.):—"Those who anciently were skilful in practising the *Tâo* did not use it to enlighten the people; their object rather was to keep them simple. The difficulty in governing the people arises from their having too much knowledge, and therefore he who tries to govern a state by wisdom is a scourge to it, while he who does not try to govern thereby is a blessing." The last chapter but one is the following:— "In a small state with a few inhabitants, I would so order it that the people, though supplied with all kinds of implements, would not (care to) use them; I would give them cause to look on death as a most grievous thing, while yet they would not go away to a distance to escape from it. Though they had boats and carriages, they should have no occasion to ride in them. Though they had buff-coats and sharp weapons, they should not don or use them. I would make them return to the use of knotted cords (instead of written characters). They should think their coarse food sweet, their plain clothing beautiful, their poor houses places of rest and their common simple ways sources of enjoyment. There should be a neighbouring state within sight, and the sound of the fowls and dogs should be heard from it to us without interruption, but I would make the people to old age, even to death, have no intercourse with it."

On reading these sentiments, we must judge of Lâo-tsze that, with all his power of thought, he was only a dreamer. But thus far there is no difficulty arising from his language in regard to the *Tâo*. It is simply a quality, descriptive of the style of character and action, which the individual should seek to attain in himself, and the ruler to impress on his administration. The language about the *Tâo* in nature is by no means so clear. While Sir Robert Douglas says that "the way" would be the best translation of *Tâo*, he immediately adds:— "But *Tâo* is more than the way. It is the way and the way-goer. It is an eternal road; along it all beings and things walk; but no being made it, for it is being itself; it is everything, and nothing and the cause and effect of all. All things originate from *Tâo*, conform to *Tâo* and to *Tâo* at last they return."

The Tâo and the Deity.

Some of these representations require modification; but no thoughtful reader of the treatise can fail to be often puzzled by what is said on the point in hand. Julien, indeed, says with truth (p. xiii.) that "it is impossible to take *Tâo* for the primordial Reason, for the sublime Intelligence, which has created and governs the world"; but many of Lâo-tsze's statements are unthinkable if there be not behind the *Tâo* the unexpressed recognition of a personal creator and ruler. Granted that he does not affirm positively the existence of such a Being, yet certainly he does not deny it, and his language even implies it. It has been said, indeed, that he denies it, and we are referred in proof to the fourth chapter:— "*Tâo* is like the emptiness of a vessel; and the use of it, we may say, must be free from all self-sufficiency. How deep and mysterious it is, as if it were the author of all things! We should make our sharpness blunt, and unravel the complications of things; we should attemper our brightness, and assimilate ourselves to the obscurity caused by dust. How still and clear is *Tâo*, a phantasm with the semblance of permanence! I do not know whose son it is. It might appear to have been before God (*Ti*)."

The reader will not overlook the cautious and dubious manner in which the predicates of *Tâo* are stated in this remarkable passage. The author does not say that it was before God, but that "it might appear" to have been so. Nowhere else in his treatise does the nature of *Tâo* as a method or style of action come out more clearly. It has no positive existence of itself; it is but like the emptiness of a vessel, and the manifestation of it by men requires that they endeavour to free themselves from all self-sufficiency. Whence came it? It does not shock Lâo-tsze to suppose that it had a father, but he cannot tell whose son it is. And, as the feeling of its mysteriousness grows on him, he ventures to say that "it might appear to have been before God."

There is here no denial but express recognition of the existence of God, so far as it is implied in the name *Tî*, which is the personal name for the concept of heaven as the ruling power, by means of which the fathers of the Chinese people rose in prehistoric time to the idea of God. Again and again Lâo-tsze speaks of heaven just as "we do when we mean thereby the Deity who presides over heaven and earth." These last words are taken from Watters (p. 81); and, though he adds, "We must not forget that this heaven is inferior and subsequent to the mysterious *Tâo*, and was in fact produced by it," it has been shown how rash and unwarranted is the ascription of such a sentiment to "the Venerable Philosopher." He makes the *Tâo* prior to heaven and earth, which is a phrase denoting what we often call "nature," but he does not make it prior to heaven in the higher and immaterial usage of that name. The last sentence of his treatise is:— "It is the *Tâo*—the way—of Heaven to benefit and not injure; it is the *Tâo*—the way—of the sage to do and not strive."

Since Julien laid the *Tâo Teh King* fairly open to Western readers in 1842, there has been a tendency to overestimate rather than to underestimate its value as a scheme of thought and a discipline for the individual and society. There are in it lessons of unsurpassed value, such as the inculcation of simplicity, humility and self-abnegation, and especially the brief enunciation of the divine duty of returning good for ill; but there are also the regretful representations of a primitive society when men were ignorant of the rudiments of culture, and the longings for its return.

When it was thought that the treatise made known the doctrine of the Trinity, and even gave a phonetic representation of the Hebrew name for God, it was natural, even necessary, to believe that its author had had communication with more western parts of Asia, and there was much speculation about visits to India and Judaea, and even to Greece. The necessity for assuming such travels has passed away. If we can receive Sze-mâ Ch'ien's histories as trustworthy, Lâo-tsze might have heard, in the states of Chow and among the wild tribes adjacent to them, views about society and government very like his own. Ch'ien relates how an envoy came in 624 B.C.—twenty years before the date assigned to the birth of Lâo-tsze—to the court of Duke Mû of Ch'in, sent by the king of some rude hordes on the west. The duke told him of the histories poems, codes of rites, music and laws which they had in the middle states, while yet rebellion and disorder were of frequent occurrence, and asked how good order was secured among the wild people, who had none of those appliances. The envoy smiled, and replied that the troubles of China were occasioned by those very things of which the duke vaunted, and that there had been a gradual degeneration in the condition of its states, as their professed civilization had increased, ever since the days of the ancient sage, Hwang Tî, whereas in the land he came from, where there was nothing but the primitive simplicity, their princes showed a pure virtue in their treatment of the people, who responded to them with loyalty and good faith. "The government of a state," said he in conclusion, "is like a man's ruling his own single person. He rules it, and does not know how he does so; and this was indeed the method of the sages." Lâo-tsze did not need to go further afield to find all that he has said about government.

The Tâoism of to-day.

We have confined ourselves to the Tâoism of the *Tâo Teh King* without touching on the religion Tâoism now existing in China, but which did not take shape until more than five hundred years after the death of Lâo-tsze, though he now occupies the second place in its trinity of "The three Pure or Holy Ones." There is hardly a word in his treatise that savours either of superstition or religion. In the works of Lieh-tsze and Chwang-tsze, his earliest followers of note, we find abundance of grotesque superstitions; but their beliefs (if indeed we can say that they had beliefs) had not become embodied in any religious institutions. When we come to the Ch'in dynasty (221–206 B.C.), we meet with a Tâoism in the shape of a search for the fairy islands of the eastern sea, where the herb of immortality might be gathered. In the 1st century A.D. a magician, called Chang Tâo-ling, comes before us as the chief professor and controller of this Tâoism, preparing in retirement "the pill" which renewed his youth, supreme over all spirits, and destroying millions of demons by a stroke of his pencil. He left his books, talismans and charms, with his sword and seal, to his descendants, and one of them, professing to be animated by his soul, dwells on the Lung-hû mountain in Kiang-si, the acknowledged head or pope of Tâoism. But even then the system was not yet a religion, with temples or monasteries, liturgies and forms of public worship. It borrowed all these from Buddhism, which first obtained public recognition in China between A.D. 65 and 70, though at least a couple of centuries passed before it could be said to have free course in the country.

Even still, with the form of a religion, Tâoism is in reality a conglomeration of base and dangerous superstitions. Alchemy, geomancy and spiritualism have dwelt and dwell under its shadow. Each of its "three Holy Ones" has the title of *Thien Tsun*, "the Heavenly and Honoured," taken from Buddhism, and also of *Shang Tî* or God, taken from the old religion of the country. The most popular deity, however, is not one of them, but has the title of *Yü Wang Shang Tî*, "God, the Perfect King." But it would take long to tell of all its "celestial gods," "great gods," "divine rulers" and others. It has been doubted whether Lâo-tsze acknowledged the existence of God at all, but modern Tâoism is a system of the wildest polytheism. The science and religion of the West meet from it a most determined opposition. The "Venerable Philosopher" himself would not have welcomed them; but he ought not to bear the obloquy of being the founder of the Tâoist religion. (J. LE.)

LA PAZ, a western department of Bolivia, bounded N. by the national territories of Caupolican and El Beni, E. by El Beni and Cochabamba, S. by Cochabamba and Oruro and W. by Chile and Peru. Pop. (1900) 445,616, the majority of whom are Indians. Area 53,777 sq. m. The department belongs to the great Bolivian plateau, and its greater part to the cold, bleak, *puna* climatic region. The Cordillera Real crosses it N.W. to S.E. and culminates in the snow-crowned summits of Sorata and Illimani. The west of the department includes a part of the Titicaca basin with about half of the lake. This elevated plateau region is partially barren and inhospitable, its short, cold summers permitting the production of little besides potatoes, quinoa (*Chenopodium quinoa*) and barley, with a little Indian corn and wheat in favoured localities. Some attention is given to the rearing of llamas, and a few cattle, sheep and mules are to be seen south of Lake Titicaca. There is a considerable Indian population in this region, living chiefly in small hamlets on the products of their own industry. In the lower valleys of the eastern slopes, where climatic conditions range from temperate to tropical, wheat, Indian corn, oats and the fruits and vegetables of the temperate zone are cultivated. Farther down, coffee, cacao, coca, rice, sugar cane, tobacco, oranges, bananas and other tropical fruits are grown, and the forests yield cinchona bark and rubber. The mineral wealth of La Paz includes gold, silver, tin, copper and bismuth. Tin and copper are the most important of these, the principal tin mines being in the vicinity of the capital and known under the names of Huayna-Potosi, Milluni and Chocoltaga. The chief copper mines are the famous Corocoro group, about 75 m. S.S.E. of Lake Titicaca by the Desaguadero river, the principal means of transport. The output of the Corocoro mines, which also includes gold and silver, finds its way to market by boat and rail to Mollendo, and by pack animals to Tacna and rail to Arica. There are no roads in La Paz worthy of the name except the 5 m. between the capital and the "Alto," though stage-coach communication with Oruro and Chililaya has been maintained by the national government. The railway opened in 1905 between Guaqui and La Paz (54 m.) superseded the latter of these stage lines, and a railway is planned from Viacha to Oruro to supersede the other. The capital of the department is the national capital La Paz. Corocoro, near the Desaguadero river, about 75 m. S.S.E. of Lake Titicaca and 13,353 ft. above sea-level, has an estimated population (1906) of 15,000, chiefly Aymará Indians.

LA PAZ (officially LA PAZ DE AYACUCHO), the capital of Bolivia since 1898, the see of a bishopric created in 1605 and capital of the department of La Paz, on the Rio de la Paz or Rio Chuquiapo, 42 m. S.E. of Lake Titicaca (port of Chililaya) in 16° 30′ S., 68° W. Pop. (1900) 54,713, (1906, estimate) 67,235. The city is built in a deeply-eroded valley of the Cordillera Real which is believed to have formed an outlet of Lake Titicaca, and at this point descends sharply to the S.E., the river making a great bend southward and then flowing northward to the Beni. The valley is about 10 m. long and 3 m. wide, and is singularly barren and forbidding. Its precipitous sides, deeply gullied by torrential rains and diversely coloured by mineral ores, rise 1500 ft. above the city to the margin of the great plateau surrounding Lake Titicaca, and above these are the snow-capped summits of Illimani and other giants of the Bolivian Cordillera. Below, the valley is fertile and covered with vegetation, first of the temperate and then of the tropical zone. The elevation of La Paz is 12,120 ft. above sea-level, which places it within the *puna* climatic region, in which the summers are short and cold. The mean annual temperature is a little above the *puna* average, which is 54° F., the extremes ranging from 19° to 75°. Pneumonia and bronchial complaints are common, but consumption is said to be rare. The surface of the valley is very uneven, rising sharply from the river on both sides, and the transverse streets of the city are steep and irregular. At its south-eastern extremity is the Alameda, a handsome public promenade with parallel rows of exotic trees, shrubs and flowers, which are maintained with no small effort in so inhospitable a climate. The trees which seem to thrive best are the willow and eucalyptus. The streets are generally narrow and roughly paved, and there are numerous bridges across the river and its many small tributaries. The dwellings of the poorer classes are commonly built with mud walls and covered with tiles, but stone and brick are used for the better structures. The cathedral, which was begun in the 17th century when the mines of Potosi were at the height of their productiveness, was never finished because of the revolutions and the comparative poverty of the city under the republic. It faces the Plaza Mayor and is distinguished for the finely-carved stonework of its façade. Facing the same plaza are the government offices and legislative chambers. Other notable edifices and institutions are the old university of San Andrés, the San Francisco church, a national college, a seminary, a good public library and a museum rich in relics of the Inca and colonial periods. La Paz is an important commercial centre, being connected with the Pacific coast by the Peruvian railway from Mollendo to Puno (via Arequipa), and a Bolivian extension from Guaqui to the Alto de La Paz (Heights of La Paz)—the two lines being connected by a steamship service across Lake Titicaca. An electric railway 5 m. long connects the Alto de La Paz with the city, 1493 ft. below. This route is 496 m. long, and is expensive because of trans-shipments and the cost of handling cargo at Mollendo. The vicinity of La Paz abounds with mineral wealth; most important are the tin deposits of Huayna-Potosi, Milluni and Chocoltaga. The La Paz valley is auriferous, and since the foundation of the city gold has been taken from the soil washed down from the mountain sides.

La Paz was founded in 1548 by Alonzo de Mendoza on the site of an Indian village called Chuquiapu. It was called the Pueblo Nuevo de Nuestra Señora de la Paz in commemoration of the reconciliation between Pizarro and Almagro, and soon became an important colony. At the close of the war of independence (1825) it was rechristened La Paz de Ayacucho, in honour of the last decisive battle of that protracted struggle. It was made one of the four capitals of the republic, but the revolution of 1898 permanently established the seat of government here because of its accessibility, wealth, trade and political influence.

LA PÉROUSE, JEAN-FRANÇOIS DE GALAUP, Comte de (1741–*c.* 1788), French navigator, was born near Albi, on the 22nd of August 1741. His family name was Galaup, and La Pérouse or La Peyrouse was an addition adopted by himself from a small family estate near Albi. As a lad of eighteen he was wounded and made prisoner on board the "Formidable" when it was captured by Admiral Hawke in 1759; and during the war with England between 1778 and 1783 he served with distinction in various parts of the world, more particularly on the eastern coasts of Canada and in Hudson's Bay, where he captured Forts Prince of Wales and York (August 8th and 21st, 1782). In 1785 (August 1st) he sailed from Brest in command of the French government expedition of two vessels ("La Boussole" under La Pérouse himself, and "L'Astrolabe," under de Langle) for the discovery of the North-West Passage, vainly essayed by Cook on his last voyage, from the Pacific side. He was also charged with the further exploration of the north-west coasts of America, and the north-east coasts of Asia, of the China and Japan seas, the Solomon Islands and Australia; and he was ordered to collect information as to the whale fishery in the southern oceans and as to the fur trade in North America. He reached Mount St Elias, on the coast of Alaska, on the 23rd of June 1786. After six weeks, marked by various small discoveries, he was driven from these regions by bad weather; and after visiting the Hawaiian Islands, and discovering Necker Island (November 5th, 1786), he crossed over to Asia (Macao, January 3rd, 1787). Thence he passed to the Philippines, and so to the coasts of Japan, Korea and "Chinese Tartary," where his best results were gained. Touching at Quelpart, he reached De Castries Bay, near the modern Vladivostok, on the 28th of July 1787; and on the 2nd of August following discovered the strait, still named after him, between Sakhalin and the Northern Island of Japan. On the 7th of September he put in at Petropavlovsk in Kamchatka, where he was well received by special order of the Russian empress, Catherine II.; thence he sent home Lesseps, overland, with the journals, notes, plans and maps recording the work of the expedition. He left Avacha Bay on the 29th of September, and arrived at Mauna in the Samoan group on the 8th of December; here de Langle and ten of the crew of the "Astrolabe" were murdered. He quitted Samoa on the 14th of December, touched at the Friendly Islands and Norfolk Island and arrived in Botany Bay on the 26th of January 1788. From this place, where he interchanged courtesies with some of the English pioneers in Australia, he wrote his last letter to the French Ministry of Marine (February 7th). After this no more was heard of him and his squadron till in 1826 Captain Peter Dillon found the wreckage of what must have been the "Boussole" and the "Astrolabe" on the reefs of Vanikoro, an island to the north of the New Hebrides. In 1828 Dumont d'Urville visited the scene of the disaster and erected a monument (March 14th).

See Milet Mureau, *Voyage de la Pérouse autour du monde* (Paris, 1797) 4 vols.; Gérard, *Vies . . . des . . . marins français* (Paris, 1825), 197-200; Peter Dillon, *Narrative . . . of a Voyage in the South Seas for the Discovery of the Fate of La Pérouse* (London, 1829), 2 vols.; Dumont d'Urville, *Voyage pittoresque autour du monde*; Quoy and Paul Gaimard, *Voyage de . . . l'Astrolabe*; Domeny de Rienzi, *Océanie*; Van Tenac, *Histoire général de la marine*, iv. 258-264; *Moniteur universel*, 13th of February 1847.

LAPIDARY, and **GEM CUTTING** (Lat. *lapidarius*, *lapis*, a stone). The earliest examples of gem cutting and carving known (see also Gem) are the ancient engraved seals, which are of two principal types, the cylindrical or "rolling" seals of Babylonia and Assyria, suggested by a joint of the bamboo or the central whorl of a conch-like shell, and the peculiar scarabaeoid seals of Egypt. Recent researches make it appear that both these types were in use as far back as 4500 B.C., though with some variations. The jewels of Queen Zer, and other jewels consisting of cut turquoise, lapis lazuli and amethyst, found by the French mission, date from 4777 B.C. to 4515 B.C. Until about 2500 B.C., the cylinder seals bore almost wholly animal designs; then cuneiform inscriptions were added. In the 6th century B.C., the scarabaeoid type was introduced from Egypt, while the rolling seals began to give place to a new form, that of a tall cone. These, in a century or two, were gradually shortened; the hole by which they were suspended was enlarged until it could admit the finger, and in time they passed into the familiar form of seal-rings. This later type, which prevailed for a long period, usually bore Persian or Sassanian inscriptions. The scarabaeoid seals were worn as rings in Egypt apparently from the earliest times.

The most ancient of the cylinder seals were cut at first from shell, then largely from opaque stones such as diorite and serpentine. After 2500 B.C., varieties of chalcedony and milky quartz were employed, translucent and richly coloured; sometimes even rock crystal, and also frequently a beautiful compact haematite. Amazone stone, amethyst and fossil coral were used, but no specimen is believed to be known of ruby, sapphire, emerald, diamond, tourmaline or spinel.

The date of about 500 B.C. marks the beginning of a period of great artistic taste and skill in gem carving, which extended throughout the ancient civilized world, and lasted until the 3rd or 4th century A.D. Prior to this period, all the work appears to have been done by hand with a sapphire point, or else with a bow-drill; thenceforward the wheel came to be largely employed. The Greek cutters, in their best period, the 5th and 6th centuries B.C., knew the use of disks and drills, but preferred the sapphire point for their finest work, and continued to use it for two or three hundred years. Engraving by the bow-drill was introduced in Assyrian and Babylonian work as early as perhaps 3000 B.C., the earlier carving being all done with the sapphire point, which was secured in a handle for convenient application. This handwork demanded the utmost skill and delicacy of touch in the artist. The bow-drill consisted of a similar point fastened in the end of a stick, which could be rotated by means of a horizontal cross-bar attached at each end to a string wound around the stick; as the cross-bar was moved up and down, the stick was made to rotate alternately in opposite directions. This has been a frequent device for such purposes among many peoples, both ancient and modern, civilized and uncivilized. The point used by hand, and the bow-drill, were afterwards variously combined in executing such work. Another modification was the substitution for the point, in either process, of a hollow tube or drill, probably in most cases the joint of a hollow reed, whereby very accurate circles could be made, as also crescent figures and the like. This process, used with fine hard sand, has also been widely employed among many peoples. It may perhaps have been suggested by the boring of other shells by carnivorous molluscs of the *Murex* type, examples of which may be picked up on any sea-beach. It is possible that the cylinder seals were drilled in this way out of larger pieces by means of a hollow reed or bamboo, the cylinder being left as the core.

The Egyptian scarabs were an early and very characteristic type of seal cutting. The Greek gem cutters modified them by adding Greek and Etruscan symbols and talismanic signs; many of them also worked in Egypt and for Egyptians. Phoenician work shows a mixture of Assyrian and Egyptian designs; and Cypriote seals, principally on the agate gems, are known that are referred to the 9th century B.C.

Scarabs are sometimes found that have been sliced in two, and the new flat faces thus produced carved with later inscriptions and set in rings. This secondary work is of many kinds. An Assyrian cylinder in the Metropolitan Museum, New York, referred to 3000 B.C., bears such a cutting of Mediterranean character, of the 2nd or 3rd century B.C. In the early Christian era, also, many Greek and Roman gems were recut with Gnostic and other peculiar and obscure devices.

In the later Roman period, the 3rd and 4th centuries, a great decline in the art is seen—so great that Castellani terms it "the idiotic age." Numbers of gems of this kind have been found together, as though they were the product of a single manufacturer, carved in the crudest manner, both in design and execution. Yet remarkable results are sometimes produced in these by a few touches of the drill, which under the glass appear very crude but nevertheless yield strong effects. The same thing may be seen now in many of the Japanese sketches and lacquer designs, where a whole landscape is depicted, or rather suggested, by a few simple but powerful strokes. It is now thought that some of these seals may be of earlier origin than has been supposed, and also that they may have been worn by the poorer classes, who could not afford the more finished work. They must have been made by the hundred thousand. The decline of the art went on until in the Byzantine period, especially the 6th century, it had reached a very low point. Most of the gems of this period show drill-work of poor quality, although hand-work is occasionally seen.

With the Renaissance, the art of gem carving revived, and the engravers from that time and onward have produced results that equal the best Greek and Roman work; copies of ancient gem carvings made by some of the 18th-century masters are only distinguishable from true antiques by experts of great proficiency. It is in fact extremely difficult to judge positively as to the age of engraved gems. The materials of which they are made are hard and resistant to any change through time, and there are many ingenious devices for producing the appearances usually believed to indicate great age, such as slightly dulled or scratched surfaces and the like. There are also the gems with secondary carving, already alluded to, and the ancient gems that have been partially recut by modern engravers for the purpose of fraudulently enhancing their price. All these elements enter into the problem and make it an almost hopeless one for any but a person of great experience in the study of such objects; and even he may not be able in all cases to decide.

Until the 14th century, almost all the gems were cut *en cabochon*—that is, smoothly rounded, as carbuncles and opals are still—or else in the form of beads drilled from both sides for suspension or attachment, the two perforations often meeting but imperfectly. These latter may be of Asiatic origin, brought into Europe by commerce during the Crusades. Some of the finest gems in the Austrian, Russian and German crowns are stones of this perforated or bead type. An approach, or transition, to the modern facetting is seen in a style of cutting often used for rock-crystal in the 10th and 11th centuries: an oval cabochon was polished flat, and the sides of the dome were also trimmed flat, with a rounded back, and the upper side with a ridge in the centre, tapering off to the girdle of the stone below.

The plane facetted cutting is altogether modern; and hence the pictures which represent the breastplate of the ancient Jewish high-priest as set with facetted stones are wholly imaginary and probably incorrect, as we have no exact knowledge of the forms of the gems. The Orientals polish gems in all sorts of irregular, rounded shapes, according to the form of the piece as found, and with the one object of preserving as much of its original size and colour as possible. The greatest ingenuity is used to make a speck of colour, as in a sapphire, tone up an entire gem, by cutting it so that there is a point of high colour at the lower side of the gem.

In later times a few facets are sometimes cut upon a generally rounded stone. The *cabochon* method is still used for opaque or translucent stones, as opal, moonstone, turquoise, carbuncle, &c.; but for transparent gems the facetted cutting is almost always employed, on account of its fine effect in producing brilliancy, by reflection or refraction of light from the under side of the gem. Occasionally the ancients used natural crystals with polished faces, or perhaps at times polished these to some extent artificially. This use of crystals was frequent with prisms of emerald, which were drilled and suspended as drops. Those the French call "primes d'émeraudes." These were often natural crystals from Zaborah, Egypt or the Tirol Mountains, drilled through the height of the prism, and with little or no polishing. In rare instances perfect and brilliant crystals may now be seen mounted as gems.

The modern method is that of numerous facets, geometrically disposed to bring out the beauty of light and colour to the best advantage. This is done at the sacrifice of material, often to the extent of half the stone or even more—the opposite of the Oriental idea. There are various forms of such cutting, but three are specially employed, known as the brilliant, the rose and the table-cut. The last, generally made from cleavage pieces, usually square or oblong, with a single facet or edge on each side, and occasionally four or more facets on the lower side of the stone, is used chiefly for emeralds, rubies and sapphires; the two former for diamonds in particular. The brilliant is essentially a low, double cone, its top truncated to form a large flat eight-sided face called the table, and its basal apex also truncated by a very small face known as the *culette* or *cullet.* The upper and lower slopes are cut into a series of triangular facets, 32 above the girdle, in four rows of eight, and 24 below, in three rows, making 56 facets in all. The rose form is used for diamonds not thick enough to cut as brilliants; it is flat below and has 12 to 24, or sometimes 32, triangular facets above, in three rows, meeting in a point. Stones thus cut are also known as "roses couronnées"; others with fewer facets, twelve or even six, are called "roses d'Anvers," and are a specialty, as their name implies, at Antwerp. These, however, are only cut from very thin or shallow stones. None of the rose-cut diamonds is equal in beauty to the brilliants. There are several other forms, among which are the "briolette," "marquise," oval and pear-shaped stones, &c., but they are of minor importance. The pear-shaped brilliant is a facetted ball or drop, being a brilliant in style of cutting, although the form of the gem is elongated or drop-shaped. The "marquise" or "navette" form is an elliptical brilliant of varying width in proportion to its length. The "rondelle" form consists of flat, circular gems with smooth sides pierced, like shallow beads, with facetted edges, and is sometimes used between pearls, or gem beads, and in the coloured gems, such as rubies, sapphires, emeralds, &c. The mitred gems fitted to a gauge are much used and are closely set together, forming a continuous line of colour.

Modern gem cutting and engraving are done by means of the lathe, which can be made to revolve with extreme rapidity, carrying a point or small disk of soft iron, with diamond-dust and oil. The disks vary in diameter from that of a pin-head to a quarter of an inch. Better than the lathe, also, is the S. S. White dental engine, which the present writer was the first to suggest for this use. The flexibility and sensitiveness of this machine enables it to respond to the touch of the artist and to impart a personal quality to his work not possible with the mechanical action of the lathe, and more like the hand-work with the sapphire point. The diamond-dust and oil, thus applied, will carve any stone softer than the diamond itself with comparative ease.

We may now review some of the special forms of cutting and working gems and ornamental stones that have been developed in Europe since the period of the Renaissance.

Garnets (*q.v.*) have been used and worked from remote antiquity; but in modern times the cutting of them has been carried on chiefly in Bohemia, in the region around Merowitz and Dlaskowitch. The stones occur in a trap rock, and are weathered out by its decomposition and gathered from gravels and beds of streams. They are of the rich red variety known as pyrope (*q.v.*), or Bohemian garnet; it is generally valued as a gem-stone. Such are the so-called "Cape rubies," of South Africa, found in considerable quantity in German East Africa, and the beautiful garnets known as the "Arizona rubies." Garnets are so abundant in Bohemia as to constitute an important industry, employing some five hundred miners, an equal number of cutters and as many as three thousand dealers. Extensive garnet cutting is also done in India, especially at Jeypore, where there are large works employing natives who have been taught by Europeans. The Indian garnets, however, are mostly of another variety, the almandine (*q.v.*); it is equally rich in colour, though inclining more to a violet cast than the pyrope, and can be obtained in larger pieces. The ancient garnets, from Etruscan and Byzantine remains, some of which are flat plates set in gold, or carved with mythological designs, were probably obtained from India or perhaps from the remarkable locality for large masses of garnet in German East Africa. Many are cut with the portraits of Sassanian kings with their characteristic pearl earrings. The East Indians carve small dishes out of a single garnet.

The carving of elegant objects from transparent quartz, or rock crystal, has been carried on since the 16th century, first in Italy, by the greatest masters of the time, and afterwards in Prague, under Rudolph II., until the Thirty Years' War, when the industry was wiped out. Splendid examples of this work are in the important museums of Europe. Many of these are reproduced now in Vienna, and fine examples are included in some American museums. Among them are rock-crystal dishes several inches across, beautifully engraved in intaglio and mounted in silver with gems. Other varieties of quartz minerals, such as agate, jasper, &c., and other ornamental stones of similar hardness, are likewise wrought into all manner of art objects. Caskets, vases, ewers, coupés and animal and other fanciful forms, are familiar in these opaque and semi-transparent stones, either carved out of single masses or made of separate pieces united with gold, silver or enamel in the most artistic manner. Cellini, and other masters in the 16th and 17th centuries, vied with each other in such work.

The greatest development of agate (*q.v.*), however, has been seen in Germany, at Waldkirch in Breisgau, and especially at Idar and Oberstein on the Nahe, in Oldenburg. The industry began in the 14th century, at the neighbouring town of Freiburg, but was transferred to Waldkirch, where it is still carried on, employing about 120 men and women, the number of workmen having increased nearly threefold since the middle of the 19th century. The Idar and Oberstein industry was founded somewhat later, but is much more extensive. Mills run by water-power line the Nahe river for over 30 m., from above Kreuznach to below Idar, and gave employment in 1908 to some 5000 people—1625 lapidaries, 160 drillers, 100 engravers, 2900 cutters, &c., besides 300 jewellers and 300 dealers. The industry began here in consequence of the abundance of agates in the amygdaloid rocks of the vicinity; and it is probable that many of the Cinque Cento gems, and perhaps even some of the Roman ones, were obtained in this region. By the middle of the 18th century the best material was about exhausted, but the industry had become so firmly established that it has been kept up and increased by importing agates. In 1540 there were only three mills; in 1740, twenty-five; in 1840, fifty; in 1870, one hundred and eighty-four. Agents and prospectors are sent all over the world to procure agates and other ornamental stones, and enormous quantities are brought there and stored. The chief source of agate supply has been in Uruguay, but much has been brought from other distant lands. It was estimated that fifty thousand tons were stored at Salto in Uruguay at one time.

The grinding is done on large, horizontal wheels like grindstones, some 6 ft. in diameter and one-fourth as thick, run by water-wheels. The faces of some of these grindstones are made with grooves of different sizes so that round objects or convex surfaces can be ground very easily and rapidly. An agate ball or marble, for instance, is made from a piece broken to about the right size and held in one of these semicircular grooves until one-half of it is shaped, and then turned over and the other half ground in the same way. The polishing is done on wooden wheels, with tripoli found in the vicinity; any carving or ornamentation is then put on with a wheel-edge or a drill by skilled workmen.

In the United States the Drake Company at Sioux Falls, South Dakota, has done cutting and polishing in hard materials on a grand scale. It is here, and here only, that the agatized wood from Chalcedony Park, Arizona, has been cut and polished, large sections of tree-trunks having been made into table-tops and columns of wonderful beauty, with a polish like that of a mirror.

Much of the finest lapidary work, both on a large and a small scale, is done in Russia. Catherine II. sought to develop the precious stone resources of the Ural region, and sent thither two Italian lapidaries. This led to the founding of an industry which now employs at least a thousand people. The work is done either at the great imperial lapidary establishment at Ekaterinburg, or in the vicinity of the mines by lapidary masters, as they are called, each of whom has his peculiar style. The products are sold to dealers at the great Russian fairs at Nizhniy Novgorod, Moscow and Ekaterinburg. The imperial works at the last-named place have command of an immense water-power, and are on such a scale that great masses of hard stones can be worked as marble is in other countries. Much of the machinery is primitive, but the applications are ingenious and the results unsurpassed anywhere. The work done is of several classes, ranging from the largest and most massive to the smallest and most delicate. There is (1) the cutting of facetted gems, as topaz, aquamarine, amethyst, &c., from the mines of the Ural, and of other gem-stones also; this is largely done by means of the cadrans, a small machine held in the hand, by which the angle of the facets can be adjusted readily when once the stone has been set, and which produces work of great beauty and accuracy. Then there is (2) a vast variety of ornamental objects, large and small, some weighing 2000 ℔ and over, and requiring years to complete; they are made from the opaque minerals of the Ural and Siberia—malachite, rhodonite, lapis-lazuli, aventurine and jasper. A peculiar type of work is (3) the production of beautiful groups of fruit, flowers and leaves, in stones selected to match exactly the colour of each object represented. These are chosen with great care and skill, somewhat as in the Florentine mosaics, not to produce a flat inlaid picture, however, but a perfect reproduction of form, size and colour. These groups are carved and polished from hard stones, whereas the Florentine mosaic work includes many substances that are much softer, as glass, shell, &c.

Enormous masses of material are brought to these works; the supply of rhodonite, jade, jaspers of various colours, &c., sometimes amounting to hundreds of tons. One mass of Kalkansky jasper weighed nearly 9 tons, and a mass of rhodonite above 50 tons; the latter required a week of sledging, with ninety horses, to bring it from the quarry, only 14 m. from the works. About seventy-five men are employed, at twenty-five roubles a month (£2, 11s. 6d.), and ten boys, who earn from two to ten roubles (4s. to £1). A training school is connected with the works, where over fifty boys are pupils; on graduating they may remain as government lapidaries or set up on their own account.

There are two other great Russian imperial establishments of the same kind. One of these, founded by Catherine II., is at Peterhof, a short distance from the capital; it is a large building fitted up with imperial elegance. Here are made all the designs and models for the work done at Ekaterinburg; these are returned and strictly preserved. In the Peterhof works are to be seen the largest and most remarkable achievements of the lapidarian art, vases and pedestals and columns of immense size, made from the hardest and most elegant stones, often requiring the labour of years for their completion. The third great establishment is at Kolyvan, in Siberia, bearing a like relation to the minerals and gem-stones of the Altai region that the works of Ekaterinburg do to the Ural. The three establishments are conducted at large expense, from the private revenue of the tsar. The Russian emperors have always taken special interest in lapidary work, and the products of these establishments have made that country famous throughout the world. The immense monolithic columns of the Hermitage and of St Isaac's Cathedral, of polished granite and other hard and elegant stones, are among the triumphs of modern architectural work; and the Alexander column at St Petersburg is a single polished shaft, 13 ft. in diameter and 82 ft. in height, of the red Finland granite.

The finest lapidary work of modern France is done at Moulin la Vacherie Saint Simon, Seine-et-Marne, where some seventy-five of the most skilful artisans are engaged. The products are all manner of ornamental objects of every variety of beautiful stone, all finished with absolute perfection of detail. Columns and other ornaments of porphyry and the like, of ancient workmanship, are brought hither from Egypt and elsewhere, and recut into smaller objects for modern artistic tastes. Here, too, are made spheres of transparent quartz—"crystal balls"—up to 6 in. in diameter, the material for which is obtained in Madagascar.

A few words may be said, by way of comparison and contrast, about the lapidary art of Japan and China, especially in relation to the crystal balls, now reproduced in France and elsewhere. The tools are the simplest, and there is no machinery; but the lack of it is made up by time and patience, and by hereditary pride, as a Japanese artisan can often trace back his art through many generations continuously. To make a quartz ball, a large crystal or mass is chipped or broken into available shape, and then the piece is trimmed into a spherical form with a small steel hammer. The polishing is effected by grinding with emery and garnet-powder and plenty of water, in semi-cylindrical pieces of cast iron, of sizes varying with that of the ball to be ground, which is kept constantly turning as it is rubbed. Small balls are fixed in the end of a bamboo tube, which the worker continually revolves. The final brilliant polish is given by the hand, with rouge-powder (haematite). This process is evidently very slow, and only the cheapness of labour prevents the cost from being too great.

The spheres are now made quite freely but very differently in France, Germany and the United States. They are ground in semicircular grooves in a large horizontal wheel of hard stone, such as is used for grinding garnets at Oberstein and Idar, or else by gradually revolving them on a lathe and fitting them into hollow cylinders. Plenty of water must be used, to prevent heating and cracking. The polishing is effected on a wooden wheel with tripoli. Work of this kind is now done in the United States, in the production of the spheres and carved ornaments of rock-crystal, that is equal to any in the world. But most of the material for these supposed Japanese balls now comes from Brazil or Madagascar, and the work is done in Germany or France.

The cutting of amber is a special branch of lapidary work developed along the Baltic coast of Germany, where amber is chiefly obtained. The amber traffic dates back to prehistoric times; but the cutting industry in northern Europe cannot be definitely traced further back than the 14th century, when gilds of amber-workers were known at Bruges and Lübeck. Fine carving was also done at Königsberg as early as 1399. The latter city and Danzig have become the chief seats of the amber industry, and the business has increased immensely within a recent period. Articles are made there, not only for all the civilized world, but for exportation to half-civilized and even barbarous nations, in great variety of shapes, styles and colours

Diamond Cutting.—On account of its extreme hardness, the treatment of the diamond in preparation for use in jewelry constitutes a separate and special branch of the lapidary's art. Any valuable gem must first be trimmed, cleaved or sawed into suitable shape and size, then cut into the desired form, and finally polished upon the faces which have been cut. The stages in diamond working are, therefore, (1) cleavage or division; (2) cutting; (3) polishing; but in point of fact there are four processes, as the setting of the stone for cutting is a somewhat distinct branch, and the workers are classed in four groups—cleavers, setters, cutters and polishers.

1. *Cleaving or Dividing.*—Diamonds are always found as crystals, usually octahedral in form, though often irregular or distorted. The problem involved in each case is twofold: (1) to obtain the largest perfect stone possible, and (2) to remove any portions containing flaws or defects. These ends are generally met by cleaving the crystal, *i.e.* causing it to split along certain natural planes of structural weakness, which are parallel with the faces of the octahedron. This process requires the utmost judgment, care and skill on the part of the operator, as any error would cause great loss of valuable material; hence expert cleavers command very high wages. The stone is first examined closely, to determine the directions of the cleavage planes, which are recognizable only by an expert. The cleaver then cuts a narrow notch at the place selected, with another diamond having a sharp point; a rather dull iron or steel edge is then laid on this line, and a smart blow struck upon it. If all has been skilfully done, the diamond divides at once in the direction desired. De Boot in 1609 mentions knowing some one who could part a diamond like mica or talc. In this process, each of the diamonds is fixed in cement on the end of a stick or handle, so that they can be held firmly while one is applied to the other.

When the stone is large and very valuable, the cleaving is a most critical process. Wollaston in 1790 made many favourable transactions by buying very poor-looking flawed stones and cleaving off the good parts. In the case of the immense Excelsior diamond of 971 carats, which was divided at Amsterdam in 1904, and made into ten splendid stones, the most elaborate study extending over two months was given to the work beforehand, and many models were made of the very irregular stone and divided in different ways to determine those most advantageous. This process was in 1908 applied to the most remarkable piece of work of the kind ever undertaken—the cutting of the gigantic Cullinan diamond of $3025\frac{3}{4}$ English carats. The stone was taken to Amsterdam to be treated by the old-fashioned hand method, with innumerable precautions of every kind at every step, and the cutting was successfully accomplished after nine months' work (see *The Times*, Nov. 10, 1908). The two principal stones obtained (see Diamond), one a pendeloque or drop brilliant, and the other a square brilliant, were given 72 and 64 facets respectively (exclusive of the table and cullet) instead of the normal 56.

This process of cleavage is the old-established one, still used to a large extent, especially at Amsterdam. But a different method has recently been introduced, that of sawing,[1] which is now generally employed in Antwerp. The stone is placed in a small metal receptacle which is filled with melted aluminium; thus embedded securely, with only the part to be cut exposed, it is pressed firmly against the edge of a metallic disk or thin wheel, 4 or 5 in. in diameter, made of copper, iron or phosphor bronze, which is charged with diamond dust and oil, and made to revolve with great velocity. This machine was announced as an American invention, but the form now principally employed at Antwerp was invented by a Belgian diamond cutter in the United States, and is similar to slitting wheels used by gem cutters for centuries. Two patents were taken out, however, by different parties, with some distinctions of method. The process is much slower than hand-cleavage, but greatly diminishes the loss of material involved. It is claimed that not only can flaws or defective portions be thus easily taken off, but that any well-formed crystal of the usual octahedral shape (known in the trade as "six-point") can be divided in half very perfectly at the "girdle," making two stones, in each of which the sawed face can be used with advantage to form the "table" of a brilliant. By another method the stone is sawed at a tangent with the octahedron, and then each half into three pieces; for this Wood method a total saving of 5% is claimed. Occasionally the finest material is only a small spot in a large mass of impure material, and this is taken out by most skilful cleaving.

After the cleaving or sawing, however, the diamond is rarely yet in a form for cutting the facets, and requires considerable shaping. This rough "blocking-out" of the final form it is to assume, by removing irregularities and making it symmetrical, is called "brutage." Well-shaped and flawless crystals, indeed may not require to be cleaved, and then the brutage is the first process. Here again, the old hand methods are beginning to give place to mechanism. In either case two diamonds are taken, each fixed in cement on the end of a handle or support, and are rubbed one against the other until the irregularities are ground away and the general shape desired is attained. The old method was to do this by hand—an extremely tedious and laborious process. The machine method, invented about 1885 and first used by Field and Morse of Boston, is now used at Antwerp exclusively. In this, one diamond is fixed at the centre of a rotating apparatus, and the other, on an arm or handle, is placed so as to press steadily against the other stone at the proper angle. The rotating diamond thus becomes rounded and smoothed; the other one is then put in its place at the centre and their mutual action reversed.

At Amsterdam a hand-process is employed, which lies between the cleavage and the brutage. This consists in cutting or trimming away angles and irregularities all over the stone by means of a sharp-edged or pointed diamond, both being mounted in cement on pear-shaped handles for firm holding. This work is largely done by women. In all these processes the dust and fragments are caught and carefully saved.

2. *Cutting and Setting.*—The next process is that of cutting the facets; but an intervening step is the fixing or "setting" of the stone for that purpose. This is done by embedding it in a fusible alloy, melting at 440° Fahr., in a little cup-shaped depression on the end of a handle, the whole being called a "dop." Only the portion to be ground off is left exposed; and two such mounted diamonds are then rubbed against each other until a face is produced. This is the work of the cutter; it is very laborious, and requires great care and skill. The hands must be protected with leather gloves. The powder produced is carefully saved, as in the former processes, for use in the final polishing. When one face has been produced, the alloy is softened by heating, and the stone re-set for grinding another surface; and as this process is necessary for every face cut, it must be repeated many times for each stone. An improved dop has lately been devised in which the diamond is held by a system of claws so that all this heating and resetting can, it is claimed, be obviated, and the cutting completed with only two changes.

3. *Polishing.*—The faces having thus been cut, the last stage is the polishing. This is done upon horizontal iron wheels called "skaifs," made to rotate up to 2500 revolutions per minute. The diamond-powder saved in the former operations, and also made by crushing very inferior diamonds, here comes into use as the only material for polishing. It is applied with oil, and the stones are fixed in a "dop" in much the same way as in the cutting process. Again, the utmost skill and watchfulness are necessary, as the angles of the faces must be mathematically exact, in order to yield the best effects by refraction and reflection of light, and their sizes must be accurately regulated to preserve the symmetry of the stone. In this process, also,

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[1] *The Universal Magazine of Knowledge and Pleasure* for 1749 states that diamond dust, "well ground and diluted with water and vinegar, is used in the sawing of diamonds, which is done with an iron or brass wire, as fine as a hair."—Ed.

the old hand method is already replaced in part by an improved device whereby the diamond is held by adjustable claws, on a base that can be rotated, so as to apply it in any desired position. By this means the time and trouble of repeated re-setting in the dop are saved, as well as the liability to injury from the heating and cooling; the services of special "setters" are also made needless.

The rapid development of mechanical devices for the several stages of diamond cutting has already greatly influenced the art. A very interesting comparison was brought out in the thirteenth report of the American Commissioner of Labour, as to the aspects and relations of hand-work and machinery in this branch of industry. It appeared from the data gathered that the advantage lay with machinery as to time and with hand-work as to cost, in the ratios respectively of 1 to 3·38 and 1·76 to 1. In other words, about half the gain in time is lost by increased expense in the use of machine methods. A great many devices and applications have been developed within the last few years, owing to the immense increase in the production of diamonds from the South African mines, and their consequent widespread use.

History of Diamond Cutting.—The East Indian diamonds, many of which are doubtless very ancient, were polished in the usual Oriental fashion by merely rounding off the angles. Among church jewels in Europe are a few diamonds of unknown age and source, cut four-sided, with a table above and a pyramid below. Several cut diamonds are recorded among the treasures of Louis of Anjou in the third quarter of the 14th century. But the first definite accounts of diamond polishing are early in the century following, when one Hermann became noted for such work in Paris. The modern method of "brilliant" cutting, however, is generally ascribed to Louis de Berquem, of Bruges, who in 1475 cut several celebrated diamonds sent to him by Charles the Bold, duke of Burgundy. He taught this process to many pupils, who afterwards settled in Antwerp and Amsterdam, which have been the chief centres of diamond cutting ever since. Peruzzi was the artist who worked out the theory of the well-proportioned brilliant of 58 facets. Some very fine work was done early in London also, but most of the workmen were Jews, who, being objectionable in England, finally betook themselves to Amsterdam and Antwerp. Efforts have been lately made to re-establish the art in London, where, as the great diamond mart of the world, it should peculiarly belong.

The same unwise policy was even more marked in Portugal. That nation had its colonial possessions in India, following the voyages and discoveries of Da Gama, and thus became the chief importer of diamonds into Europe. Early in the 18th century, also, the diamond-mines were discovered in Brazil, which was then likewise a Portuguese possession; thus the whole diamond product of the world came to Portugal, and there was naturally developed in Lisbon an active industry of cutting and polishing diamonds. But in time the Jews were forced away, and went to Holland and Belgium, where diamond cutting has been concentrated since the middle of the 18th century.

It is of interest to trace the recent endeavours to establish diamond cutting in the United States. The pioneer in this movement was Henry D. Morse of Boston, associated with James W. Yerrington of New York. He opened a diamond-cutting establishment about 1860 and carried it on for some years, training a number of young men and women, who became the best cutters in the country. But the chief importance of his work lay in its superior quality. So long had it been a monopoly of the Dutch and Belgians that it was declining into a mere mechanical trade. Morse studied the diamond scientifically and taught his pupils how important mathematical exactitude in cutting was to the beauty and value of the gem. He thus attained a perfection rarely seen before, and gave a great stimulus to the art. Shops were opened in London as well, in consequence of Morse's success; and many valuable diamonds were recut in the United States after his work became known. This fact in turn reacted upon the cutter abroad, especially in France and Switzerland; and thus the general standard of the art was greatly advanced.

Diamond cutting in the United States is now a well-established industry. From 1882 to 1885 a number of American jewelers undertook such work, but for various reasons it was not found practicable then. Ten years later, however, there were fifteen firms engaged in diamond cutting, giving employment to nearly 150 men in the various processes involved. In the year 1894 a number of European diamond workers came over; some foreign capital became engaged; and a rapid development of diamond cutting took place. This movement was caused by the low tariff on uncut diamonds as compared with that on cut stones. It went so far as to be felt seriously abroad; but in a year or two it declined, owing partly to strikes and partly to legal questions as to the application of some of the tariff provisions. At the close of 1895, however, there were still some fourteen establishments in and near New York, employing about 500 men. Since then the industry has gradually developed. Many of the European diamond workers who came over to America remained and carried on their art; and the movement then begun has become permanent. New York is now recognized as one of the chief diamond-cutting centres; there are some 500 cutters, and the quality of work done is fully equal, if not superior, to any in the Old World. So well is this fact established that American-cut diamonds are exported and sold in Europe to a considerable and an increasing extent.

In the Brazilian diamond region of Minas Geraes an industry of cutting has grown up since 1875. Small mills are run by water power, and the machinery, as well as the methods, are from Holland. This Brazilian diamond work is done both well and cheaply, and supplies the local market.

The leading position in diamond working still belongs to Amsterdam, where the number of persons engaged in the industry has trebled since about 1875, in consequence of the enormous increase in the world's supply of diamonds. The number now amounts to 15,000, about one-third of whom are actual cleavers, cutters, polishers, &c. The number of cutting establishments in Amsterdam is about seventy, containing some 7000 mills.

Antwerp comes next with about half as many mills and a total of some 4500 persons engaged in all departments, including about seventy women. These are distributed among thirty-five or forty establishments. A majority of the workers are Belgians, but there are many Dutch, Poles and Austro-Hungarians, principally Jews. Among these numerous employees there is much opportunity for dishonesty, and but little surveillance, actual or possible; yet losses from this cause are almost unknown. The wages paid are good, averaging from £2, 9s. 6d. to £2, 17s. 6d. a week. Sorters receive from 28s. to £2; cutters from £2, 9s. 6d to £3, 6s., and cleavers from £3, 14s. upwards.

With the recent introduction of electricity in diamond cutting there has been a revolution in that industry. Whereas formerly wheels were made to revolve by steam, they are now placed in direct connexion with electric motors, although there is not a motor to each machine. The saws for slitting the diamond can thus be made to revolve much more rapidly, and there is a cleanliness and a speed about the work never before attained. (G. F. K.)

LAPILLI (pl. of Ital. *lapillo*, from Lat. *lapillus*, dim. of *lapis*, a stone), a name applied to small fragments of lava ejected from a volcano. They are generally subangular in shape and vesicular in structure, varying in size from a pea to a walnut. In the Neapolitan dialect the word becomes *rapilli*—a form sometimes used by English writers on volcanoes. (See VOLCANOES.)

LAPIS LAZULI, or azure stone,[1] a mineral substance valued for decorative purposes in consequence of the fine blue colour which it usually presents. It appears to have been the sapphire of ancient writers: thus Theophrastus describes the *σάπφειρος* as being spotted with gold-dust, a description quite inappropriate to modern sapphire, but fully applicable to lapis lazuli, for this stone frequently contains disseminated particles of iron-pyrites of gold-like appearance. Pliny, too, refers to the *sapphirus* as a stone sprinkled with specks of gold; and possibly an allusion to the same character may be found in Job xxviii. 6. The Hebrew *sappir*, denoting a stone in the High Priest's breastplate, was probably lapis lazuli, as acknowledged in the Revised Version of the Bible. With the ancient Egyptians lapis lazuli was a favourite stone for amulets and ornaments such as scarabs; it was also used to a limited extent by the Assyrians and Babylonians for cylinder seals. It has been suggested that the Egyptians obtained it from Persia in exchange for their emeralds. When the lapis lazuli contains pyrites, the brilliant spots in the deep blue matrix invite comparison with the stars in the firmament. The stone seems to have been sometimes called by ancient writers *κύανος*. It was a favourite material with the Italians of the *Cinquecento* for vases, small busts and other ornaments. Magnificent examples of the decorative use of lapis lazuli are to be seen in St Petersburg, notably in the columns of St Isaac's cathedral. The beautiful blue colour of lapis lazuli led to its employment, when ground and levigated, as a valuable pigment known as ultramarine (*q.v.*), a substance now practically displaced by a chemical product (artificial ultramarine).

Lapis lazuli occurs usually in compact masses, with a finely granular structure; and occasionally, but only as a great rarity, it presents the form of the rhombic dodecahedron. Its specific gravity is 2·38 to 2·45, and its hardness about 5·5, so that being comparatively soft it tends, when polished, to lose its lustre rather readily. The colour is generally a fine azure or rich Berlin blue, but some varieties exhibit green, violet and even red tints, or may be altogether colourless. The colour is sometimes improved by heating the stone. Under artificial illumination the dark-blue stones may appear almost black. The mineral is opaque, with only slight translucency at thin edges.

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[1] The Med. Gr. λαζούριον, Med. Lat. *lazurius* or *lazulus*, as the names of this mineral substance, were adaptations of the Arab. *al-lazward*, Pers. *lājward*, blue colour, lapis lazuli. The same word appears in Med. Lat. as *azura*, whence O.F. *azur*, Eng. "azure," blue, particularly used of that colour in heraldry (*q.v.*) and represented conventionally in black and white by horizontal lines.

Analyses of lapis lazuli show considerable variation in composition, and this led long ago to doubt as to its homogeneity. This doubt was confirmed by the microscopic studies of L. H. Fischer, F. Zirkel and H. P. J. Vogelsang, who found that sections showed bluish particles in a white matrix; but it was reserved for Professor W. C. Brögger and H. Bäckström, of Christiania, to separate the several constituents and subject them to analysis, thus demonstrating the true constitution of lapis lazuli, and proving that it is a rock rather than a definite mineral species. The essential part of most lapis lazuli is a blue mineral allied to sodalite and crystallized in the cubic system, which Brögger distinguishes as lazurite, but this is intimately associated with a closely related mineral which has long been known as haüyne, or haüynite. The lazurite, sometimes regarded as true lapis lazuli, is a sulphur-bearing sodium and aluminium silicate, having the formula: $Na_4(NaS_3Al)\,Al_2(SiO_4)_3$. As the lazurite and the haüynite seem to occur in molecular intermixture, various kinds of lapis lazuli are formed; and it has been proposed to distinguish some of them as lazurite-lapis and haüyne-lapis, according as one or the other mineral prevails. The lazurite of lapis lazuli is to be carefully distinguished from lazulite, an aluminium-magnesium phosphate, related to turquoise. In addition to the blue cubic minerals in lapis lazuli, the following minerals have also been found: a non-ferriferous diopside, an amphibole called, from the Russian mineralogist, koksharovite, orthoclase, plagioclase, a muscovite-like mica, apatite, titanite, zircon, calcite and pyrite. The calcite seems to form in some cases a great part of the lapis; and the pyrite, which may occur in patches, is often altered to limonite.

Lapis lazuli usually occurs in crystalline limestone, and seems to be a product of contact metamorphism. It is recorded from Persia, Tartary, Tibet and China, but many of the localities are vague and some doubtful. The best known and probably the most important locality is in Badakshan. There it occurs in limestone, in the valley of the river Kokcha, a tributary to the Oxus, south of Firgamu. The mines were visited by Marco Polo in 1271, by J. B. Fraser in 1825, and by Captain John Wood in 1837–1838. The rock is split by aid of fire. Three varieties of the lapis lazuli are recognized by the miners: *nili* of indigo-blue colour, *asmani* sky-blue, and *sabzi* of green tint. Another locality for lapis lazuli is in Siberia near the western extremity of Lake Baikal, where it occurs in limestone at its contact with granite. Fine masses of lapis lazuli occur in the Andes, in the vicinity of Ovalle, Chile. In Europe lapis lazuli is found as a rarity in the peperino of Latium, near Rome, and in the ejected blocks of Monte Somma, Vesuvius. (F. W. R.*)

LAPITHAE, a mythical race, whose home was in Thessaly in the valley of the Peneus. The genealogies make them a kindred race with the Centaurs, their king Peirithoüs being the son, and the Centaurs the grandchildren (or sons) of Ixion. The best-known legends with which they are connected are those of Ixion (*q.v.*) and the battle with the Centaurs (*q.v.*). A well-known Lapith was Caeneus, said to have been originally a girl named Caenis, the favourite of Poseidon, who changed her into a man and made her invulnerable (Ovid, *Metam.* xii. 146 ff). In the Centaur battle, having been crushed by rocks and trunks of trees, he was changed into a bird; or he disappeared into the depths of the earth unharmed. According to some, the Lapithae are representatives of the giants of fable, or spirits of the storm; according to others, they are a semi-legendary, semi-historical race, like the Myrmidons and other Thessalian tribes. The Greek sculptors of the school of Pheidias conceived of the battle of the Lapithae and Centaurs as a struggle between mankind and mischievous monsters, and symbolical of the great conflict between the Greeks and Persians. Sidney Colvin (*Journ. Hellen. Stud.* i. 64) explains it as a contest of the physical powers of nature, and the mythical expression of the terrible effects of swollen waters.

LA PLACE (Lat. *Placaeus*), **JOSUÉ DE** (1606?–1665), French Protestant divine, was born in Brittany. He studied and afterwards taught philosophy at Saumur. In 1625 he became pastor of the Reformed Church at Nantes, and in 1632 was appointed professor of theology at Saumur, where he had as his colleagues, appointed at the same time, Moses Amyraut and Louis Cappell. In 1640 he published a work, *Theses theologicae de statu hominis lapsi ante gratiam*, which was looked upon with some suspicion as containing liberal ideas about the doctrine of original sin. The view that the original sin of Adam was not imputed to his descendants was condemned at the synod of Charenton (1645), without special reference being made to La Place, whose position perhaps was not quite clear. As a matter of fact La Place distinguished between a direct and indirect imputation, and after his death his views, as well as those of Amyraut, were rejected in the *Formula consensus* of 1675. He died on the 17th of August 1665.

La Place's defence was published with the title *Disputationes academicae* (3 vols., 1649–1651; and again in 1665); his work *De imputatione primi peccati Adami* in 1655. A collected edition of his works appeared at Franeker in 1699, and at Aubencit in 1702.

LAPLACE, PIERRE SIMON, Marquis de (1749–1827), French mathematician and astronomer, was born at Beaumont-en-Auge in Normandy, on the 28th of March 1749. His father was a small farmer, and he owed his education to the interest excited by his lively parts in some persons of position. His first distinctions are said to have been gained in theological controversy, but at an early age he became mathematical teacher in the military school of Beaumont, the classes of which he had attended as an extern. He was not more than eighteen when, armed with letters of recommendation, he approached J. B. d'Alembert, then at the height of his fame, in the hope of finding a career in Paris. The letters remained unnoticed, but Laplace was not crushed by the rebuff. He wrote to the great geometer a letter on the principles of mechanics, which evoked an immediate and enthusiastic response. "You," said d'Alembert to him, "needed no introduction; you have recommended yourself; my support is your due." He accordingly obtained for him an appointment as professor of mathematics in the École Militaire of Paris, and continued zealously to forward his interests.

Laplace had not yet completed his twenty-fourth year when he entered upon the course of discovery which earned him the title of "the Newton of France." Having in his first published paper[1] shown his mastery of analysis, he proceeded to apply its resources to the great outstanding problems in celestial mechanics. Of these the most conspicuous was offered by the opposite inequalities of Jupiter and Saturn, which the emulous efforts of L. Euler and J. L. Lagrange had failed to bring within the bounds of theory. The discordance of their results incited Laplace to a searching examination of the whole subject of planetary perturbations, and his maiden effort was rewarded with a discovery which constituted, when developed and completely demonstrated by his own further labours and those of his illustrious rival Lagrange, the most important advance made in physical astronomy since the time of Newton. In a paper read before the Academy of Sciences, on the 10th of February 1773 (*Mém. présentés par divers savans*, tom. vii., 1776), Laplace announced his celebrated conclusion of the invariability of planetary mean motions, carrying the proof as far as the cubes of the eccentricities and inclinations. This was the first and most important step in the establishment of the stability of the solar system. It was followed by a series of profound investigations, in which Lagrange and Laplace alternately surpassed and supplemented each other in assigning limits of variation to the several elements of the planetary orbits. The analytical tournament closed with the communication to the Academy by Laplace, in 1787, of an entire group of remarkable discoveries. It would be difficult, in the whole range of scientific literature, to point to a memoir of equal brilliancy with that published (divided into three parts) in the volumes of the Academy for 1784, 1785 and 1786. The long-sought cause of the "great inequality" of Jupiter and Saturn was found in the near approach to commensurability of their mean motions; it was demonstrated in two elegant theorems, independently of any except the most general considerations as to mass, that the mutual action of the planets could never largely affect the eccentricities and inclinations of their orbits; and the singular peculiarities detected by him in the Jovian system were expressed in the so-called "laws of Laplace." He completed the theory of these bodies in a treatise published among the Paris *Memoirs* for 1788 and 1789; and the striking superiority of the tables computed by J. B. J. Delambre from the data there supplied marked the profit derived from the investigation by practical astronomy. The year 1787 was rendered further memorable by Laplace's announcement on the 19th of November (*Memoirs*, 1786), of the dependence of lunar acceleration upon the secular changes in the eccentricity of the earth's orbit. The last apparent anomaly, and the last threat of instability, thus disappeared from the solar system.

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[1] "Recherches sur le calcul intégral," *Mélanges de la Soc. Roy. de Turin* (1766–1769).

With these brilliant performances the first period of Laplace's scientific career may be said to have closed. If he ceased to make striking discoveries in celestial mechanics, it was rather their subject-matter than his powers that failed. The general working of the great machine was now laid bare, and it needed a further advance of knowledge to bring a fresh set of problems within reach of investigation. The time had come when the results obtained in the development and application of the law of gravitation by three generations of illustrious mathematicians might be presented from a single point of view. To this task the second period of Laplace's activity was devoted. As a monument of mathematical genius applied to the celestial revolutions, the *Mécanique céleste* ranks second only to the *Principia* of Newton.

The declared aim of the author [1] was to offer a complete solution of the great mechanical problem presented by the solar system, and to bring theory to coincide so closely with observation that empirical equations should no longer find a place in astronomical tables. His success in both respects fell little short of his lofty ideal. The first part of the work (2 vols. 4to, Paris, 1799) contains methods for calculating the movements of translation and rotation of the heavenly bodies, for determining their figures, and resolving tidal problems; the second, especially dedicated to the improvement of tables, exhibits in the third and fourth volumes (1802 and 1805) the application of these formulae; while a fifth volume, published in three instalments, 1823–1825, comprises the results of Laplace's latest researches, together with a valuable history of progress in each separate branch of his subject. In the delicate task of apportioning his own large share of merit, he certainly does not err on the side of modesty; but it would perhaps be as difficult to produce an instance of injustice, as of generosity in his estimate of others. Far more serious blame attaches to his all but total suppression in the body of the work—and the fault pervades the whole of his writings—of the names of his predecessors and contemporaries. Theorems and formulae are appropriated wholesale without acknowledgment, and a production which may be described as the organized result of a century of patient toil presents itself to the world as the offspring of a single brain. The *Mécanique céleste* is, even to those most conversant with analytical methods, by no means easy reading. J. B. Biot, who assisted in the correction of its proof sheets, remarked that it would have extended, had the demonstrations been fully developed, to eight or ten instead of five volumes; and he saw at times the author himself obliged to devote an hour's labour to recovering the dropped links in the chain of reasoning covered by the recurring formula. "Il est aisé à voir." [2]

The *Exposition du système du monde* (Paris, 1796) has been styled by Arago "the *Mécanique céleste* disembarrassed of its analytical paraphernalia." Conclusions are not merely stated in it, but the methods pursued for their attainment are indicated. It has the strength of an analytical treatise, the charm of a popular dissertation. The style is lucid and masterly, and the summary of astronomical history with which it terminates has been reckoned one of the masterpieces of the language. To this linguistic excellence the writer owed the place accorded to him in 1816 in the Academy, of which institution he became president in the following year. The famous "nebular hypothesis" of Laplace made its appearance in the *Système du monde*. Although relegated to a note (vii.), and propounded "Avec la défiance que doit inspirer tout ce qui n'est point un résultat de l'observation ou du calcul," it is plain, from the complacency with which he recurred to it [3] at a later date, that he regarded the speculation with considerable interest. That it formed the starting-point, and largely prescribed the course of thought on the subject of planetary origin is due to the simplicity of its assumptions, and the clearness of the mechanical principles involved, rather than to any cogent evidence of its truth. It is curious that Laplace, while bestowing more attention than they deserved on the crude conjectures of Buffon, seems to have been unaware that he had been, to some extent, anticipated by Kant, who had put forward in 1755, in his *Allgemeine Naturgeschichte*, a true though defective nebular cosmogony.

The career of Laplace was one of scarcely interrupted prosperity. Admitted to the Academy of Sciences as an associate in 1773, he became a member in 1785, having, about a year previously, succeeded E. Bezout as examiner to the royal artillery. During an access of revolutionary suspicion, he was removed from the commission of weights and measures; but the slight was quickly effaced by new honours. He was one of the first members, and became president of the Bureau of Longitudes, took a prominent place at the Institute (founded in 1796), professed analysis at the École Normale, and aided in the organization of the decimal system. The publication of the *Mécanique céleste* gained him world-wide celebrity, and his name appeared on the lists of the principal scientific associations of Europe, including the Royal Society. But scientific distinctions by no means satisfied his ambition. He aspired to the rôle of a politician, and has left a memorable example of genius degraded to servility for the sake of a riband and a title. The ardour of his republican principles gave place, after the 18th Brumaire, to devotion towards the first consul, a sentiment promptly rewarded with the post of minister of the interior. His incapacity for affairs was, however, so flagrant that it became necessary to supersede him at the end of six weeks, when Lucien Bonaparte became his successor. "He brought into the administration," said Napoleon, "the spirit of the infinitesimals." His failure was consoled by elevation to the senate, of which body he became chancellor in September 1803. He was at the same time named grand officer of the Legion of Honour, and obtained in 1813 the same rank in the new order of Reunion. The title of count he had acquired on the creation of the empire. Nevertheless he cheerfully gave his voice in 1814 for the dethronement of his patron, and his "suppleness" merited a seat in the chamber of peers, and, in 1817, the dignity of a marquisate. The memory of these tergiversations is perpetuated in his writings. The first edition of the *Système du monde* was inscribed to the Council of Five Hundred; to the third volume of the *Mécanique céleste* (1802) was prefixed the declaration that, of all the truths contained in the work, that most precious to the author was the expression of his gratitude and devotion towards the "pacificator of Europe"; upon which noteworthy protestation the suppression in the editions of the *Théorie des probabilités* subsequent to the restoration, of the original dedication to the emperor formed a fitting commentary.

During the later years of his life, Laplace lived much at Arcueil, where he had a country-place adjoining that of his friend C. L. Berthollet. With his co-operation the Société d'Arcueil was formed, and he occasionally contributed to its *Memoirs*. In this peaceful retirement he pursued his studies with unabated ardour, and received with uniform courtesy distinguished visitors from all parts of the world. Here, too, he died, attended by his physician, Dr Majendie, and his mathematical coadjutor, Alexis Bouvard, on the 5th of March 1827. His last words were: "Ce que nous connaissons est peu de chose, ce que nous ignorons est immense."

Expressions occur in Laplace's private letters inconsistent with the atheistical opinions he is commonly believed to have held. His character, notwithstanding the egotism by which it was disfigured, had an amiable and engaging side. Young men of science found in him an active benefactor. His relations with these "adopted children of his thought" possessed a singular charm of affectionate simplicity; their intellectual progress and material interests were objects of equal solicitude to him, and he demanded in return only diligence in the pursuit of knowledge. Biot relates that, when he himself was beginning his career, Laplace introduced him at the Institute for the purpose of explaining his supposed discovery of equations of mixed differences, and afterwards showed him, under a strict pledge of secrecy, the papers, then yellow with age, in which he had long before obtained the same results. This instance of abnegation is the more worthy of record that it formed a marked exception to Laplace's usual course. Between him and A. M. Legendre there was a feeling of "more than coldness," owing to his appropriation, with scant acknowledgment, of the fruits of the other's labours; and Dr Thomas Young counted himself, rightly or wrongly, amongst the number of those similarly aggrieved by him. With Lagrange, on the other hand, he always remained on the best of terms. Laplace left a son, Charles Emile Pierre Joseph Laplace (1789–1874), who succeeded to his title, and rose to the rank of general in the artillery.

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[1] "Plan de l'Ouvrage," *Œuvres*, tom. i. p 1.

[2] *Journal des savants* (1850).

[3] *Méc. cél.*, tom. v. p. 346.

It might be said that Laplace was a great mathematician by the original structure of his mind, and became a great discoverer through the sentiment which animated it. The regulated enthusiasm with which he regarded the system of nature was with him from first to last. It can be traced in his earliest essay, and it dictated the ravings of his final illness. By it his extraordinary analytical powers became strictly subordinated to physical investigations. To this lofty quality of intellect he added a rare sagacity in perceiving analogies, and in detecting the new truths that lay concealed in his formulae, and a tenacity of mental grip, by which problems, once seized, were held fast, year after year, until they yielded up their solutions. In every branch of physical astronomy, accordingly, deep traces of his work are visible. "He would have completed the science of the skies," Baron Fourier remarked, "had the science been capable of completion."

It may be added that he first examined the conditions of stability of the system formed by Saturn's rings, pointed out the necessity for their rotation, and fixed for it a period ($10^{h}\ 33^{m}$) virtually identical with that established by the observations of Herschel; that he detected the existence in the solar system of an invariable plane such that the sum of the products of the planetary masses by the projections upon it of the areas described by their radii vectores in a given time is a maximum; and made notable advances in the theory of astronomical refraction (*Méc. cél.* tom. iv. p. 258), besides constructing satisfactory formulae for the barometrical determination of heights (*Méc. cél.* tom. iv. p. 324). His removal of the considerable discrepancy between the actual and Newtonian velocities of sound,[1] by taking into account the increase of elasticity due to the heat of compression, would alone have sufficed to illustrate a lesser name. Molecular physics also attracted his notice, and he announced in 1824 his purpose of treating the subject in a separate work. With A. Lavoisier he made an important series of experiments on specific heat (1782–1784), in the course of which the "ice calorimeter" was invented; and they contributed jointly to the *Memoirs* of the Academy (1781) a paper on the development of electricity by evaporation. Laplace was, moreover, the first to offer a complete analysis of capillary action based upon a definite hypothesis—that of forces "sensible only at insensible distances"; and he made strenuous but unsuccessful efforts to explain the phenomena of light on an identical principle. It was a favourite idea of his that chemical affinity and capillary attraction would eventually be included under the same law, and it was perhaps because of its recalcitrance to this cherished generalization that the undulatory theory of light was distasteful to him.

The investigation of the figure of equilibrium of a rotating fluid mass engaged the persistent attention of Laplace. His first memoir was communicated to the Academy in 1773, when he was only twenty-four, his last in 1817, when he was sixty-eight. The results of his many papers on this subject—characterized by him as "un des points les plus intéressans du système du monde"—are embodied in the *Mécanique céleste*, and furnish one of the most remarkable proofs of his analytical genius. C. Maclaurin, Legendre and d'Alembert had furnished partial solutions of the problem, confining their attention to the possible figures which would satisfy the conditions of equilibrium. Laplace treated the subject from the point of view of the gradual aggregation and cooling of a mass of matter, and demonstrated that the form which such a mass would ultimately assume must be an ellipsoid of revolution whose equator was determined by the primitive plane of maximum areas.

The related subject of the attraction of spheroids was also signally promoted by him. Legendre, in 1783, extended Maclaurin's theorem concerning ellipsoids of revolution to the case of any spheroid of revolution where the attracted point, instead of being limited to the axis or equator, occupied any position in space; and Laplace, in his treatise *Théorie du mouvement et de la figure elliptique des planètes* (published in 1784), effected a still further generalization by proving, what had been suspected by Legendre, that the theorem was equally true for any confocal ellipsoids. Finally, in a celebrated memoir, *Théorie des attractions des sphéroides et de la figure des planètes*, published in 1785 among the Paris *Memoirs* for the year 1782, although written after the treatise of 1784, Laplace treated exhaustively the general problem of the attraction of any spheroid upon a particle situated outside or upon its surface.

These researches derive additional importance from having introduced two powerful engines of analysis for the treatment of physical problems, Laplace's coefficients and the potential function. By his discovery that the attracting force in any direction of a mass upon a particle could be obtained by the direct process of differentiating a single function, Laplace laid the foundations of the mathematical sciences of heat, electricity and magnetism. The expressions designated by Dr Whewell, Laplace's coefficients (see SPHERICAL HARMONICS) were definitely introduced in the memoir of 1785 on attractions above referred to. In the figure of the earth, the theory of attractions, and the sciences of electricity and magnetism this powerful calculus occupies a prominent place. C. F. Gauss in particular employed it in the calculation of the magnetic potential of the earth, and it received new light from Clerk Maxwell's interpretation of harmonics with reference to poles on the sphere.

Laplace nowhere displayed the massiveness of his genius more conspicuously than in the theory of probabilities. The science which B. Pascal and P. de Fermat had initiated he brought very nearly to perfection; but the demonstrations are so involved, and the omissions in the chain of reasoning so frequent, that the *Théorie analytique* (1812) is to the best mathematicians a work requiring most arduous study. The theory of probabilities, which Laplace described as common sense expressed in mathematical language, engaged his attention from its importance in physics and astronomy; and he applied his theory, not only to the ordinary problems of chances, but also to the inquiry into the causes of phenomena, vital statistics and future events.

The device known as the method of least squares, for reducing numerous equations of condition to the number of unknown quantities to be determined, had been adopted as a practically convenient rule by Gauss and Legendre; but Laplace first treated it as a problem in probabilities, and proved by an intricate and difficult course of reasoning that it was also the most advantageous, the mean of the probabilities of error in the determination of the elements being thereby reduced to a minimum.

Laplace published in 1779 the method of generating functions, the foundation of his theory of probabilities, and the first part of his *Théorie analytique* is devoted to the exposition of its principles, which in their simplest form consist in treating the successive values of any function as the coefficients in the expansion of another function with reference to a different variable. The latter is therefore called the generating function of the former. A *direct* and an *inverse* calculus is thus created, the object of the former being to determine the coefficients from the generating function, of the latter to discover the generating function from the coefficients. The one is a problem of interpolation, the other a step towards the solution of an equation in finite differences. The method, however, is now obsolete owing to the more extended facilities afforded by the calculus of operations.

The first formal proof of Lagrange's theorem for the development in a series of an implicit function was furnished by Laplace, who gave to it an extended generality. He also showed that every equation of an even degree must have at least one real quadratic factor, reduced the solution of linear differential equations to definite integrals, and furnished an elegant method by which the linear partial differential equation of the second order might be solved. He was also the first to consider the difficult problems involved in equations of mixed differences, and to prove that an equation in finite differences of the first degree and the second order might always be converted into a continued fraction.

In 1842, the works of Laplace being nearly out of print, his widow was about to sell a farm to procure funds for a new impression, when the government of Louis Philippe took the matter in hand. A grant of 40,000 francs having been obtained from the chamber, a national edition was issued in seven 4to vols., bearing the title *Œuvres de Laplace* (1843–1847). The *Mécanique céleste* with its four supplements occupies the first 5 vols., the 6th contains the *Système du monde*, and the 7th the *Th. des probabilités*, to which the more popular *Essai philosophique* forms an introduction. Of the four supplements added by the author (1816–1825) he tells us that the problems in the last were contributed by his son. An enumeration of Laplace's memoirs and papers (about one hundred in number) is rendered superfluous by their embodiment in his principal works. The *Th. des prob.* was first published in 1812, the *Essai* in 1814; and both works as well as the *Système du monde* went through repeated editions. An English version of the *Essai* appeared in New York in 1902. Laplace's first separate work, *Théorie du mouvement et de la figure elliptique des planètes* (1784), was published at the expense of President Bochard de Saron. The *Précis de l'histoire de l'astronomie* (1821), formed the fifth book of the 5th edition of the *Système du monde.* An English translation, with copious elucidatory notes, of the first 4 vols. of the *Mécanique céleste*, by N. Bowditch, was published at Boston, U.S. (1829–1839), in 4 vols. 4to.; a compendium of certain portions of the same work by Mrs Somerville appeared in 1831, and a German version of the first 2 vols. by Burckhardt at Berlin in 1801. English translations of the *Système du monde* by J. Pond and H. H. Harte were published, the first in 1809, the second in 1830. An edition entitled *Les Œuvres complètes de Laplace* (1878), &c., which is to include all his memoirs as well as his separate works, is in course of publication under the auspices of the Academy of Sciences. The thirteenth 4to volume was issued in 1904. Some of Laplace's results in the theory of probabilities are simplified in S. F. Lacroix's *Traité élémentaire du calcul des probabilités* and De Morgan's *Essay*, published in Lardner's *Cabinet Cyclopaedia.* For the history of the subject see *A History of the Mathematical Theory of Probability*, by Isaac Todhunter (1865). Laplace's treatise on specific heat was published in German in 1892 as No. 40 of W. Ostwald's *Klassiker der exacten Wissenschaften.*

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[1] *Annales de chimie et de physique* (1816), tom. iii. p. 238.

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LAPLAND, or LAPPLAND, a name used to indicate the region of northern Europe inhabited by the Lapps, though not applied to any administrative district. It covers in Norway the division (*amter*) of Finmarken and the higher inland parts of Tromsö and Nordland; in Russian territory the western part of the government of Archangel as far as the White Sea and the northern part of the Finnish district of Uleåborg; and in Sweden the inland and northern parts of the old province of Norrland, roughly coincident with the districts (*län*) of Norbotten and Vesterbotten, and divided into five divisions—Torne Lappmark, Lule Lappmark, Pite Lappmark, Lycksele Lappmark and Åsele Lappmark. The Norwegian portion is thus insignificant; of the Russian only a little lies south of the Arctic circle, and the whole is less accessible and more sparsely populated than the Swedish, the southern boundary of which may be taken arbitrarily at about 64° N., though scattered families of Lapps occur much farther south, even in the Hardanger Fjeld in Norway.

The Scandinavian portion of Lapland presents the usual characteristics of the mountain plateau of that peninsula—on the west side the bold headlands and fjords, deeply-grooved valleys and glaciers of Norway, on the east the long mountain lakes and great lake-fed rivers of Sweden. Russian Lapland is broadly similar to the lower-lying parts of Swedish Lapland, but the great lakes are more generally distributed, and the valleys are less direct. The country is low and gently undulating, broken by detached hills and ridges not exceeding in elevation 2500 ft. In the uplands of Swedish Lapland, and to some extent in Russian Lapland, the lakes afford the principal means of communication; it is almost impossible to cross the forests from valley to valley without a native guide. In Sweden the few farms of the Swedes who inhabit the region are on the lake shores, and the traveller must be rowed from one to another in the typical boats of the district, pointed at bow and stern, unusually low amidships, and propelled by short sculls or paddles. Sailing is hardly ever practised, and squalls on the lakes are often dangerous to the rowing-boats. On a few of the lakes wood-fired steam-launches are used in connexion with the timber trade, which is considerable, as practically the whole region is forested. Between the lakes all journeying is made on foot. The heads of the Swedish valleys are connected with the Norwegian fjords by passes generally traversed only by tracks; though from the head of the Ume a driving road crosses to Mo on Ranen Fjord. Each principal valley has a considerable village at or near the tail of the lake-chain, up to which a road runs along the valley. The village consists of wooden cottages with an inn (*gästgifvaregård*), a church, and frequently a collection of huts without windows, closed in summer, but inhabited by the Lapps when they come down from the mountains to the winter fairs. Sometimes there is another church and small settlement in the upper valley, to which, once or twice in a summer, the Lapps come from great distances to attend service. To these, too, they sometimes bring their dead for burial, bearing them if necessary on a journey of many days. Though Lapland gives little scope for husbandry, a bad summer being commonly followed by a winter famine, it is richly furnished with much that is serviceable to man. There are copper-mines at the mountain of Sulitelma, and the iron deposits in Norrland are among the most extensive in the world. Their working is facilitated by the railway from Stockholm to Gellivara, Kirunavara and Narvik on the Norwegian coast, which also connects them with the port of Luleå on the Gulf of Bothnia. The supply of timber (pine, fir, spruce and birch) is unlimited. Though fruit-trees will not bear there is an abundance of edible berries; the rivers and lakes abound with trout, perch, pike and other fish, and in the lower waters with salmon; and the cod, herring, halibut and Greenland shark in the northern seas attract numerous Norwegian and Russian fishermen.

The climate is thoroughly Arctic. In the northern parts unbroken daylight in summer and darkness in winter last from two to three months each; and through the greater part of the country the sun does not rise at mid-winter or set at midsummer. In December and January in the far north there is little more daylight than a cold glimmer of dawn; by February, however, there are some hours of daylight; in March the heat of the sun is beginning to modify the cold, and now and in April the birds of passage begin to appear. In April the snow is melting from the branches; spring comes in May; spring flowers are in blossom, and grain is sown. At the end of this month or in June the ice is breaking up on the lakes, woods rush into leaf, and the unbroken daylight of the northern summer soon sets in. July is quite warm; the great rivers come down full from the melting snows in the mountains. August is a rainy month, the time of harvest; night-frosts may begin already about the middle of the month. All preparations for winter are made during September and October, and full winter has set in by November.

The Lapps.—The Lapps (Swed. *Lappar*; Russian *Lopari*; Norw. *Finner*) call their country *Sabme* or *Same*, and themselves *Samelats*—names almost identical with those employed by the Finns for their country and race, and probably connected with a root signifying "dark." Lapp is almost certainly a nickname imposed by foreigners, although some of the Lapps apply it contemptuously to those of their countrymen whom they think to be less civilized than themselves.[1]

In Sweden and Finland the Lapps are usually divided into fisher, mountain and forest Lapps. In Sweden the first class includes many impoverished mountain Lapps. As described by Laestadius (1827–1832), their condition was very miserable; but since his time matters have improved. The principal colony has its summer quarters on the Stora-Lule Lake, possesses good boats and nets, and, besides catching and drying fish, makes money by the shooting of wild fowl and the gathering of eggs. When he has acquired a little means it is not unusual for the fisher to settle down and reclaim a bit of land. The mountain and forest Lapps are the true representatives of the race. In the wandering life of the mountain Lapp his autumn residence, on the borders of the forest district, may be considered as the central point; it is there that he erects his *njalla*, a small wooden storehouse raised high above the ground by one or more piles. About the beginning of November he begins to wander south or east into the forest land, and in the winter he may visit, not only such places as Jokkmokk and Arjepluog, but even Gefle, Upsala or Stockholm. About the beginning of May he is back at his njalla, but as soon as the weather grows warm he pushes up to the mountains, and there throughout the summer pastures his herds and prepares his store of cheese. By autumn or October he is busy at his njalla killing the surplus reindeer bulls and curing meat for the winter. From the mountain Lapp the forest (or, as he used to be called, the spruce-fir) Lapp is mainly distinguished by the narrower limits within which he pursues his nomadic life. He never wanders outside of a certain district, in which he possesses hereditary rights, and maintains a series of camping-grounds which he visits in regular rotation. In May or April he lets his reindeer loose, to wander as they please; but immediately after midsummer, when the mosquitoes become troublesome, he goes to collect them. Catching a single deer and belling it, he drives it through the wood; the other deer, whose instinct leads them to gather into herds for mutual protection against the mosquitoes, are attracted by the sound. Should the summer be very cool and the mosquitoes few, the Lapp finds it next to impossible to bring the creatures together. About the end of August they are again let loose, but they are once more collected in October, the forest Lapp during winter pursuing the same course of life as the mountain Lapp.

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[1] The most probable etymology is the Finnish *lappu*, and in this case the meaning would be the "land's end folk."

In Norway there are three classes—the sea Lapps, the river Lapps and the mountain Lapps, the first two settled, the third nomadic. The mountain Lapps have a rather ruder and harder life than the same class in Sweden. About Christmas those of Kautokeino and Karasjok are usually settled in the neighbourhood of the churches; in summer they visit the coast, and in autumn they return inland. Previous to 1852, when they were forbidden by imperial decree, they were wont in winter to move south across the Russian frontiers. It is seldom possible for them to remain more than three or four days in one spot. Flesh is their favourite, in winter almost their only food, though they also use reindeer milk, cheese and rye or barley cakes. The sea Lapps are in some respects hardly to be distinguished from the other coast dwellers of Finmark. Their food consists mainly of cooked fish. The river Lapps, many of whom, however, are descendants of Finns proper, breed cattle, attempt a little tillage and entrust their reindeer to the care of mountain Lapps.

In Finland there are comparatively few Laplanders, and the great bulk of them belong to the fisher class. Many are settled in the neighbourhood of the Enare Lake. In the spring they go down to the Norwegian coast and take part in the sea fisheries, returning to the lake about midsummer. Formerly they found the capture of wild reindeer a profitable occupation, using for this purpose a palisaded avenue gradually narrowing towards a pitfall.

The Russian Lapps are also for the most part fishers, as is natural in a district with such an extent of coast and such a number of lakes, not to mention the advantage which the fisher has over the reindeer keeper in connexion with the many fasts of the Greek Church. They maintain a half nomadic life, very few having become settlers in the Russian villages. It is usual to distinguish them according to the district of the coast which they frequent, as Murman (Murmanski) and Terian (Terski) Lapps. A separate tribe, the Filmans, *i.e* Finnmans, wander about the Pazyets, Motov and Pechenga tundras, and retain the peculiar dialect and the Lutheran creed which they owe to a former connexion with Sweden. They were formerly known as the "twice and thrice tributary" Lapps, because they paid to two or even three states—Russia, Denmark and Sweden.

The Lapps within the historical period have considerably recruited themselves from neighbouring races. Shortness of stature[1] is their most obvious characteristic, though in regard to this much exaggeration has prevailed. Düben found an average of 4·9 ft. for males and a little less for females; Mantegazza, who made a number of anthropological observations in Norway in 1879, gives 5 ft. and 4·75 ft., respectively (*Archivio per l'antrop.*, 1880). Individuals much above or much below the average are rare. The body is usually of fair proportions, but the legs are rather short, and in many cases somewhat bandy. Dark, swarthy, yellow, copper-coloured are all adjectives employed to describe their complexion—the truth being that their habits of life do not conduce either to the preservation or display of the natural colour of their skin, and that some of them are really fair, and others, perhaps the majority, really dark. The colour of the hair ranges from blonde and reddish to a bluish or greyish black; the eyes are black, hazel, blue or grey. The shape of the skull is the most striking peculiarity of the Lapp. He is the most brachycephalous type of man in Europe, perhaps in the world.[2] According to Virchow, the women in width of face are more Mongolian in type than the men, but neither in men nor women does the opening of the eye show any true obliquity. In children the eye is large, open and round. The nose is always low and broad, more markedly retroussé among the females than the males. Wrinkled and puckered by exposure to the weather, the faces even of the younger Lapps assume an appearance of old age. The muscular system is usually well developed, but there is deficiency of fatty tissue, which affects the features (particularly by giving relative prominence to the eyes) and the general character of the skin. The thinness of the skin, indeed, can but rarely be paralleled among other Europeans. Among the Lapps, as among other lower races, the index is shorter than the ring finger.

The Lapps are a quiet, inoffensive people. Crimes of violence are almost unknown, and the only common breach of law is the killing of tame reindeer belonging to other owners. In Russia, however, they have a bad reputation for lying and general untrustworthiness, and drunkenness is well-nigh a universal vice. In Scandinavia laws have been directed against the importation of intoxicating liquors into the Lapp country since 1723.

Superficially at least the great bulk of the Lapps have been Christianized—those of the Scandinavian countries being Protestants, those of Russia members of the Greek Church. Although the first attempt to convert the Lapps to Christianity seems to have been made in the 11th century, the worship of heathen idols was carried on openly in Swedish Lappmark as late as 1687, and secretly in Norway down to the first quarter of the 18th century, while the practices of heathen rites survived into the 19th century, if indeed they are extinct even yet. Lapp graves, prepared in the heathen manner, have been discovered in upper Namdal (Norway), belonging to the years 1820 and 1826. In education the Scandinavian Lapps are far ahead of their Russian brethren, to whom reading and writing are arts as unfamiliar as they were to their pagan ancestors. The general manner of life is patriarchal. The father of the family has complete authority over all its affairs; and on his death this authority passes to the eldest son. Parents are free to disinherit their children; and, if a son separates from the family without his father's permission, he receives no share of the property except a gun and his wife's dowry.[3]

The Lapps are of necessity conservative in most of their habits, many of which can hardly have altered since the first taming of the reindeer. But the strong current of mercantile enterprise has carried a few important products of southern civilization into their huts. The lines in which James Thomson describes their simple life—

> The reindeer form their riches: these their tents,
> Their robes, their beds, and all their homely wealth
> Supply; their wholesome fare and cheerful cups—

are still applicable in the main to the mountain Lapps; but even they have learned to use coffee as an ordinary beverage and to wear stout Norwegian cloth (*vadmal*).

Linguistically the Lapps belong to the Finno-Ugrian group (*q.v.*); the similarity of their speech to Finnish is evident though

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[1] Hence they have been supposed by many to be the originals of the "little folk" of Scandinavian legend.

[2] Bertillon found in one instance a cephalic index of 94. The average obtained by Pruner Bey was 84·7, by Virchow 82·5.

[3] A valuable paper by Ephimenko, on "The Legal Customs of the Lapps, especially in Russian Lapland," appeared in vol. viii. of the *Mem. of Russ. Geog. Soc.*, Ethnog. Section, 1878.

Language.

the phonetics are different and more complicated. It is broken up into very distinct and even mutually unintelligible dialects, the origin of several of which is, however, easily found in the political and social dismemberment of the people. Düben distinguishes four leading dialects; but a much greater number are recognizable. In Russian Lapland alone there are three, due to the influence of Norwegian, Karelian and Russian (Lönnrot, *Acta Soc. Sci. Fennicae*, vol. iv.). "The Lapps," says Castren, "have had the misfortune to come into close contact with foreign races while their language was yet in its tenderest infancy, and consequently it has not only adopted an endless number of foreign words, but in many grammatical aspects fashioned itself after foreign models." That it began at a very early period to enrich itself with Scandinavian words is shown by the use it still makes of forms belonging to a linguistic stage older even than that of Icelandic. Düben has subjected the vocabulary to a very interesting analysis for the purpose of discovering what stage of culture the people had reached before their contact with the Norse. Agricultural terms, the names of the metals and the word for smith are all of Scandinavian origin, and the words for "taming" and "milk" would suggest that the southern strangers taught the Lapps how to turn the reindeer to full account. The important place, however, which this creature must always have held in their estimation is evident from the existence of more than three hundred native words in connexion with reindeer.

The Lapp tongue was long ago reduced to writing by the missionaries; but very little has been printed in it except school-books and religious works. A number of popular tales and songs, indeed, have been taken down from the lips of the people. The songs are similar to those of the Finns, and a process of mutual borrowing seems to have gone on. In one of the saga-like pieces—Pishan-Peshan's son—there seems to be a mention of the Baikal Lake, and possibly also of the Altai Mountains. The story of Njavvisena, daughter of the Sun, is full of quaint folk-lore about the taming of the reindeer. Giants, as well as a blind or one-eyed monster, are frequently introduced, and the Aesopic fable is not without its representatives. Many of the Lapps are able to speak one or even two of the neighbouring tongues.

Witchcraft.

The reputation of the Laplanders for skill in magic and divination is of very early date, and in Finland is not yet extinct. When Erik Blood-axe, son of Harold Haarfager, visited Bjarmaland in 922, he found Gunhild, daughter of Asur Tote, living among the Lapps, to whom she had been sent by her father for the purpose of being trained in witchcraft; and Ivan the Terrible of Russia sent for magicians from Lapland to explain the cause of the appearance of a comet. One of the powers with which they were formerly credited was that of raising winds. "They tye three knottes," says old Richard Eden, "on a strynge hangyng at a whyp. When they lose one of these they rayse tollerable wynds. When they lose an other the wynde is more vehement; but by losing the thyrd they rayse playne tempestes as in old tyme they were accustomed to rayse thunder and lyghtnyng" (*Hist. of Trauayle*, 1577). Though we are familiar in English with allusions to "Lapland witches," it appears that the art, according to native custom, was in the hands of the men. During his divination the wizard fell into a state of trance or ecstasy, his soul being held to run at large to pursue its inquiries. Great use was made of a curious divining-drum, oval in shape and made of wood, 1 to 4 ft. in length. Over the upper surface was stretched a white-dressed reindeer skin, and at the corners (so to speak) hung a variety of charms—tufts of wool, bones, teeth, claws, &c. The area was divided into several spaces, often into three, one for the celestial gods, one for the terrestrial and one for man. A variety of figures and conventional signs were drawn in the several compartments: the sun, for instance, is frequently represented by a square and a stroke from each corner, Thor by two hammers placed crosswise; and in the more modern specimens symbols for Christ, the Virgin, and the Holy Ghost are introduced. An *arpa* or divining-rod was laid on a definite spot, the drum beaten by a hammer, and conclusions drawn from the position taken up by the arpa. Any Lapp who had attained to manhood could in ordinary circumstances consult the drum for himself, but in matters of unusual moment the professional wizard (*naid, noide* or *noaide*) had to be called in.

History.—The Lapps have a dim tradition that their ancestors lived in a far eastern land, and they tell rude stories of conflicts with Norsemen and Karelians. But no answer can be obtained from them in regard to their early distribution and movements. It has been maintained that they were formerly spread over the whole of the Scandinavian peninsula, and they have even been considered the remnants of that primeval race of cave-dwellers which hunted the reindeer over the snow-fields of central and western Europe. But much of the evidence adduced for these theories is highly questionable. The contents of the so-called Lapps' graves found in various parts of Scandinavia are often sufficient in themselves to show that the appellation must be a misnomer, and the syllable Lap or Lapp found in many names of places can often be proved to have no connnexion with the Lapps.[1] They occupied their present territory when they are first mentioned in history. According to Düben the name first occurs in the 13th century—in the *Fundinn Noregr*, composed about 1200, in Saxo Grammaticus, and in a papal bull of date 1230; but the people are probably to be identified with those Finns of Tacitus whom he describes as wild hunters with skins for clothing and rude huts as only means of shelter, and certainly with the Skrithiphinoi of Procopius (*Goth.* ii. 15), the Scritobini of Paulus Warnefridus, and the Scridifinni of the geographer of Ravenna. Some of the details given by Procopius, in regard for instance to the treatment of infants, show that his informant was acquainted with certain characteristic customs of the Lapps.

In the 9th century the Norsemen from Norway began to treat their feeble northern neighbours as a subject race. The wealth of Ottar, "northmost of the northmen," whose narrative has been preserved by King Alfred, consisted mainly of six hundred of those "deer they call hrenas" and in tribute paid by the natives; and the Eigils saga tells how Brynjulf Bjargulfson had his right to collect contributions from the Finns (*i.e.* the Lapps) recognized by Harold Haarfager. So much value was attached to this source of wealth that as early as 1050 strangers were excluded from the fur-trade of Finmark, and a kind of coast-guard prevented their intrusion. Meantime the Karelians were pressing on the eastern Lapps, and in the course of the 11th century the rulers of Novgorod began to treat them as the Norsemen had treated their western brethren. The ground-swell of the Tatar invasion drove the Karelians westward in the 13th century, and for many years even Finmark was so unsettled that the Norsemen received no tribute from the Lapps. At length in 1326 a treaty was concluded between Norway and Russia by which the supremacy of the Norwegians over the Lapps was recognized as far east as Voljo beyond Kandalax on the White Sea, and the supremacy of the Russians over the Karelians as far as Lyngen and the Målself. The relations of the Lapps to their more powerful neighbours were complicated by the rivalry of the different Scandinavian kingdoms. After the disruption of the Calmar Union (1523) Sweden began to assert its rights with vigour, and in 1595 the treaty of Teusina between Sweden and Russia decreed "that the Lapps who dwell in the woods between eastern Bothnia and Varanger shall pay their dues to the king of Sweden." It was in vain that Christian IV. of Denmark visited Kola and exacted homage in 1599, and every year sent messengers to protest against the collection of his tribute by the Swedes (a custom which continued down to 1806). Charles of Sweden took the title of "king of the Kajans and Lapps," and left no means untried to establish his power over all Scandinavian Lapland. By the peace of Knäröd (1613) Gustavus Adolphus gave up the Swedish claim to Finmark; and in 1751 mutual renunciations brought the relations of Swedish and Norwegian (Danish) Lapland to their present position. Meanwhile Russian influence had been spreading westward; and in 1809, when Alexander I. finally obtained the cession of Finland, he also added to his dominions the whole of Finnish Lapland to the east of the Muonio and the Köngämä. It may be interesting to mention that Lapps, armed with bows and arrows, were attached to certain regiments of Gustavus Adolphus in Germany during the Thirty Years' War.

The Lapps have had the ordinary fate of a subject and defenceless people; they have been utilized with little regard to their own interest or inclinations. The example set by the early Norwegians was followed by the Swedes: a peculiar class of adventurers known as the Birkarlians (from *Bjark* or *Birk*, "trade") began in the 13th century to farm the Lapps, and, receiving very extensive privileges from the kings, grew to great wealth and influence. In 1606 there were twenty-two Birkarlians in Tornio, seventeen in Lule, sixteen in Pite, and sixty-six in Ume Lappmark. They are regularly spoken of as having or owning Lapps, whom they dispose of as any other piece of property. In Russian Lapland matters followed much the same course. The very institutions of the Solovets monastery, intended by St Tryphon for the benefit of the poor neglected pagans, turned out the occasion of much injustice towards them. By a charter of Ivan Vasilivitch (November 1556), the monks are declared masters of the Lapps of the Motoff and Petchenga districts, and they soon sought to extend their control over those not legally assigned to them (Ephimenko). Other monasteries were gifted with similar proprietary rights; and the supplication of the patriarch Nikon to Alexis Mikhaelovitch, for example, shows clearly the oppression to which the Lapps were subjected.

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[1] The view that the Lapps at one time occupied the whole of the Scandinavian peninsula, and have during the course of centuries been driven back by the Swedes and Norwegians is disproved by the recent investigations of Yngvar Nielsen, K. B. Wiklund and others. The fact is, the Lapps are increasing in numbers, as well as pushing their way farther and farther south. In the beginning of the 16th century their southern border-line in Norway ran on the upper side of 64° N. In 1890 they forced their way to the head of the Hardanger Fjord in 60° N. In Sweden the presence of Lapps as far south as Jämtland (or Jemtland) is first mentioned in 1564. In 1881 they pushed on into the north of Dalecarlia, about 61° 45′N.

It is long, however, since these abuses were abolished; and in Scandinavia more especially the Lapps of the present day enjoy the advantages resulting from a large amount of philanthropic legislation on the part of their rulers. There seems to be no fear of their becoming extinct, except it may be by gradual amalgamation with their more powerful neighbours. In Norway the total number of Lapps was 20,786 in 1891, and in Sweden in 1904 it was officially estimated that there were 7000. Add to these some 3000 for Russian Lapland, and the total Lapp population approximates to 30,000. In Sweden the Lapps are gradually abandoning their nomadic habits and becoming merged in the Swedish population. The majority of the Norwegian Lapps lead a semi-nomadic existence; but the number of inveterate nomads can scarcely reach 1500 at the present day. In Sweden there are about 3500 nomads.

AUTHORITIES.—G. von Düben, *Om Lappland och Lapparne* (Stockholm, 1873), with list of over 200 authorities; C. Rabot, "La Laponie suédoise d'après les récentes explorations de MM. Svenonius et Hamberg," *La Géographie*, Soc. Géog. de Paris VII. (1903); S. Passarge, *Fahrten in Schweden, besonders in Nordschweden und Lappland* (Berlin, 1897); Bayard Taylor, *Northern Travel* (London, 1858); E. Rae, *The White Sea Peninsula* (London, 1882), and *Land of the North Wind* (London, 1875); P. B. du Chaillu, *Land of the Midnight Sun* (London, 1881); S. Tromholt, *Under the Rays of the Aurora Borealis* (London, 1885); Y. Nielsen, *Det Norske geogr. Selskabs Aarbog* (1891); H. H. Reusch, *Folk og natur i Finmarken* (1895); K. B. Wicklund, *De Svenska nomadlapparnas flyttningar till Norge i älore och nyare tid* (Upsala, 1908); see also SWEDEN. Among older works may be mentioned Scheffer, *Lapponia* (Frankfurt, 1673, English trans. Oxford, 1674); Regnard, *Voyage de Laponie*, English version in Pinkerton's *Voyages*, vol. i.; Leem, *Beskrivelse over Finmarkens Lapper* (Copenhagen, 1767), in Danish and Latin; see also Pinkerton, *loc. cit.*; Sir A. de C. Brooke, *A Winter in Lapland* (London, 1827); Laestadius, *Journal* (1831).

As to the language, J. A. Friis, professor of Lapp in the university of Christiania, has published *Lappiske Sprogprover: en samling lapp. eventyr, ordsprog, og gåder* (Christiania, 1856), and *Lappisk mythologi eventyr og folkesagn* (Christiania, 1871). See also G. Donner, *Lieder der Lappen* (Helsingfors, 1876); Poestion, *Lappländische Märchen*, &c. (Vienna, 1885). Grammars of the Lapp tongue have been published by Fjellström (1738), Leem (1748), Rask (1832), Stockfleth (1840); lexicons by Fjellström (1703), Leem (1768–1781), Lindahl (1780), Stockfleth (1852). Among more recent works may be mentioned a dictionary (1885), by J. A. Friis; a reader, with German translations (1888), by J. Qvigstad; a dictionary (1890) and two grammars (1891 and 1897) of the Luleå dialect, and a chrestomathy of Norwegian Lappish (1894), by K. B. Wiklund; a dictionary of Russian Lappish, or the Kola dialect (1891), by A. Genetz; readers of different dialects (1885–1896), by J. Halász; and a grammar of Norwegian Lappish (1882), by S. Nielsen; further, a comparative study of Lappish and Finnish by Qvigstad in the *Acts of the Finnish Academy of Science*, vol. xii., 1883; the same author's *Nordische Lehnwörter im Lappischen* (1893); Wiklund, *Entwurf einer urlappischen Lautlehre* (1896); see also various articles by these writers, Paasonen and others in the *Journal de la Société Finno-Ougrienne* and the *Finnisch-Ugrische Forschungen*; Qvigstad and Wiklund, *Bibliographie der lappischen Literatur* (1900).

The older literature on the Lapps received a notable addition by the discovery in 1896, among the letters of Linnaeus preserved in the British Museum, of a MS. diary of a journey made in 1695 to the north of Swedish Lappmark by Olof Rudbeck the younger. On missionary work see Stockfleth, *Dagbog over mine missions Reiser* (1860); E. Haller, *Svenska Kyrkans mission i Lappmarken* (1896). It was not until 1840 that the New Testament was translated into Norwegian Lappish, and not until 1895 that the entire Bible was printed in the same dialect. In the Russian dialect of Lappish there exist only two versions of St Matthew's gospel.

LA PLATA, a city of Argentina and capital of the province of Buenos Aires, 5 m. inland from the port of Ensenada, or La Plata, and about 31 m. S.E. of the city of Buenos Aires, with which it is connected by rail. Pop. (1895) 45,609; (1907, estimate) 84,000. La Plata was founded in 1882, two years after Buenos Aires had been constituted a federal district and made the national capital. This necessitated the selection of another provincial capital, which resulted in the choice of an open plain near the former port of Ensenada de Barragán, on which a city was laid out after the plan of Washington. The streets are so wide that they seem out of proportion to the low brick buildings. The principal public buildings, constructed of brick and stucco, are the government-house, assembly building, treasury, municipal hall, cathedral, courts of justice, police headquarters, provincial museum and railway station. The museum, originally presented by Dr Moreno, has become one of the most important in South America, its palaeontological and anthropological collections being unique. There are also a university, national college, public library, astronomical observatory, several churches, two hospitals and two theatres. A noteworthy public park is formed by a large plantation of eucalyptus trees, which have grown to a great height and present an imposing appearance on the level, treeless plain. Electricity is in general use for public and private lighting, and tramways are laid down in the principal streets and extend eastward to the port. The harbour of the port of La Plata consists of a large artificial basin, 1450 yds. long by 150 yds. wide, with approaches, in addition to the old port of Ensenada, which are capable of receiving the largest vessels that can navigate the La Plata estuary. Up to the opening of the new port works of Buenos Aires a large part of the ocean-going traffic of Buenos Aires passed through the port of La Plata. It has good railway connexions with the interior, and exports cattle and agricultural produce.

LAPORTE, ROLAND (1675–1704), Camisard leader, better known as "Roland," was born at Mas Soubeyran (Gard) in a cottage which has become the property of the Société de l'Histoire du Protestantisme français, and which contains relics of the hero. He was a nephew of Laporte, the Camisard leader who was hunted down and shot in October 1702, and he himself became the leader of a band of a thousand men which he formed into a disciplined army with magazines, arsenals and hospitals. For daring in action and rapidity of movement he was second only to Cavalier. These two leaders in 1702 secured entrance to the town of Sauve under the pretence of being royal officers, burnt the church and carried off provisions and ammunition for their forces. Roland, who called himself "general of the children of God," terrorized the country between Nîmes and Alais, burning churches and houses, and slaying those suspected of hostility against the Huguenots, though without personally taking any part of the spoil. Cavalier was already in negotiation with Marshal Villars when Roland cut to pieces a Catholic regiment at Fontmorte in May 1704. He refused to lay down his arms without definite assurance of the restoration of the privileges accorded by the Edict of Nantes. Villars then sought to negotiate, offering Roland the command of a regiment on foreign service and liberty of conscience, though not the free exercise of their religion, for his co-religionists. This parley had no results, but Roland was betrayed to his enemies, and on the 14th of August 1704 was shot while defending himself against his captors. The five officers who were with him surrendered, and were broken on the wheel at Nîmes. Roland's death put an end to the effective resistance of the Cévenols.

See A. Court, *Histoire des troubles des Cévennes* (Villefranche, 1760); H. M. Baird, *The Huguenots and the revocation of the Edict of Nantes* (2 vols., London, 1895), and other literature dealing with the Camisards.

LA PORTE, a city and the county seat of La Porte county, Indiana, U.S.A., 12 m. S. of Lake Michigan and about 60 m. S.E. of Chicago. Pop. (1890) 7126; (1900) 7113 (1403 foreign-born); (1910) 10,525. It is served by the Lake Erie & Western, the Lake Shore & Michigan Southern, the Père Marquette, the Chicago, South Bend & Northern Indiana (electric), and the Chicago-New York Electric Air Line railways. La Porte lies in the midst of a fertile agricultural region, and the shipment of farm and orchard products is one of its chief industries. There are also numerous manufactures. La Porte's situation in the heart of a region of beautiful lakes (including Clear, Pine and Stone lakes) has given it a considerable reputation as a summer resort. The lakes furnish a large supply of clear ice, which is shipped to the Chicago markets. La Porte was settled in 1830, laid out in 1833, incorporated as a town in 1835, and first chartered as a city in 1852.

LAPPA, an island directly opposite the inner harbour of Macao, the distance across being from 1 to 1½ m. It is a station of the Chinese imperial maritime customs which collects duties on vessels trading between China and the Portuguese colony of Macao. The arrangement is altogether abnormal, and was consented to by the Portuguese government in 1887 to assist the Chinese authorities in the suppression of opium smuggling. A similar arrangement prevails at the British colony of Hong-Kong, where the Chinese customs station is Kowloon. In both cases the customs stations levy duties on vessels entering and leaving the foreign port in lieu of levying them, as ought to be done, on entering or leaving a Chinese port.

LAPPARENT, ALBERT AUGUSTE COCHON DE (1839–1908), French geologist, was born at Bourges on the 30th of December 1839. After studying at the École Polytechnique from 1858 to 1860 he became *ingénieur au corps des mines*, and took part in drawing up the geological map of France; and in 1875 he was appointed professor of geology and mineralogy at the Catholic Institute, Paris. In 1879 he prepared an important memoir for the geological survey of France on *Le Pays de Bray*, a subject on which he had already published several memoirs, and in 1880 he served as president of the French Geological Society. In 1881–1883 he published his *Traité de géologie* (5th ed., 1905), the best European text-book of stratigraphical geology. His other works include *Cours de minéralogie* (1884, 3rd ed., 1899), *La Formation des combustibles minéraux* (1886), *Le Niveau de la mer et ses variations* (1886), *Les Tremblements de terre* (1887), *La Géologie en chemin de fer* (1888), *Précis de minéralogie* (1888), *Le Siècle du fer* (1890), *Les Anciens Glaciers* (1893), *Leçons de géographie physique* (1896), *Notions générales sur l'écorce terrestre* (1897), *Le Globe terrestre* (1899), and *Science et apologétique* (1905). With Achille Delesse he was for many years editor of the *Révue de géologie* and contributed to the *Extraits de géologie*, and he joined with A. Potier in the geological surveys undertaken in connexion with the Channel Tunnel proposals. He died in Paris on the 5th of May 1908.

LAPPENBERG, JOHANN MARTIN (1794–1865), German historian, was born on the 30th of July 1794 at Hamburg, where his father, Valentin Anton Lappenberg (1759–1819), held an official position. He studied medicine, and afterwards history, at Edinburgh. He continued to study history in London, and at Berlin and Göttingen, graduating as doctor of laws at Göttingen in 1816. In 1820 he was sent by the Hamburg senate as resident minister to the Prussian court. In 1823 he became keeper of the Hamburg archives; an office in which he had the fullest opportunities for the laborious and critical research work upon which his reputation as an historian rests. He retained this post until 1863, when a serious affection of the eyes compelled him to resign. In 1850 he represented Hamburg in the German parliament at Frankfort, and his death took place at Hamburg on the 28th of November 1865. Lappenberg's most important work is his *Geschichte von England*, which deals with the history of England from the earliest times to 1154, and was published in two volumes at Hamburg in 1834–1837. It has been translated into English by B. Thorpe as *History of England under the Anglo-Saxon Kings* (London 1845, and again 1881), and *History of England under the Norman Kings* (Oxford, 1857), and has been continued in three additional volumes from 1154 to 1509 by R. Pauli. His other works deal mainly with the history of Hamburg, and include *Hamburgische Chroniken in Niedersächsischer Sprache* (Hamburg, 1852–1861); *Geschichtsquellen des Erzstiftes und der Stadt Bremen* (Bremen, 1841); *Hamburgisches Urkundenbuch* (Hamburg, 1842); *Urkundliche Geschichte des Hansischen Stahlhofes zu London* (Hamburg, 1851); *Hamburgische Rechtsalterthümer* (Hamburg, 1845); and *Urkundliche Geschichte des Ursprunges der deutschen Hanse* (Hamburg, 1830), a continuation of the work of G. F. Sartorius. For the *Monumenta Germaniae historica* he edited the *Chronicon* of Thietmar of Merseburg, the *Gesta Hammenburgensis ecclesiae pontificum* of Adam of Bremen and the *Chronica Slavorum* of Helmold, with its continuation by Arnold of Lübeck. Lappenberg, who was a member of numerous learned societies in Europe, wrote many other historical works.

See E. H. Meyer, *Johann Martin Lappenberg* (Hamburg, 1867); and R. Pauli in the *Allgemeine deutsche Biographie*, Band xvii. (Leipzig, 1883).

LAPRADE, PIERRE MARTIN VICTOR RICHARD DE (1812–1883), known as Victor de Laprade, French poet and critic, was born on the 13th of January 1812 at Montbrison, in the department of the Loire. He came of a modest provincial family. After completing his studies at Lyons, he produced in 1839 a small volume of religious verse, *Les Parfums de Madeleine*. This was followed in 1840 by *La Colère de Jésus*, in 1841 by the religious fantasy of *Psyché*, and in 1844 by *Odes et poèmes*. In 1845 Laprade visited Italy on a mission of literary research, and in 1847 he was appointed professor of French literature at Lyons. The French Academy, by a single vote, preferred Émile Augier at the election in 1857, but in the following year Laprade was chosen to fill the chair of Alfred de Musset. In 1861 he was removed from his post at Lyons owing to the publication of a political satire in verse (*Les Muses d'État*), and in 1871 took his seat in the National Assembly on the benches of the Right. He died on the 13th of December 1883. A statue has been raised by his fellow-townsmen at Montbrison. Besides those named above, Laprade's poetical works include *Poèmes évangéliques* (1852), *Idylles héroïques* (1858), *Les Voix de silence* (1864), *Pernette* (1868), *Poèmes civiles* (1873), *Le Livre d'un père* (1877), *Varia* and *Livre des adieux* (1878–1879). In prose he published, in 1840, *Des habitudes intellectuelles de l'avocat*. *Questions d'art et de morale* appeared in 1861, succeeded by *Le Sentiment de la nature, avant le Christianisme* in 1866, and *Chez les modernes* in 1868, *Éducation libérale* in 1873. The material for these books had in some cases been printed earlier, after delivery as a lecture. He also contributed articles to the *Revue des deux mondes* and the *Revue de Paris*. No writer represents more perfectly than Laprade the admirable genius of French provincial life, its homely simplicity, its culture, its piety and its sober patriotism. As a poet he belongs to the school of Chateaubriand and Lamartine. Devoted to the best classical models, inspired by a sense of the ideal, and by worship of nature as revealing the divine—gifted, too, with a full faculty of expression—he lacked only fire and passion in the equipment of a romantic poet. But the want of these, and the pressure of a certain chilly facility and of a too conscious philosophizing have prevented him from reaching the first rank, or from even attaining the popularity due to his high place in the second. Only in his patriotic verse did he shake himself clear from these trammels. Speaking generally, he possessed some of the qualities, and many of the defects, of the English Lake School. Laprade's prose criticisms must be ranked high. Apart from his classical and metaphysical studies, he was widely read in the literatures of Europe, and built upon the groundwork of a naturally correct taste. His dislike of irony and scepticism probably led him to underrate the product of the 18th century, and there are signs of a too fastidious dread of Philistinism. But a constant love of the best, a joy in nature and a lofty patriotism are not less evident than in his poetry. Few writers of any nation have fixed their minds so steadily on whatsoever things are pure, and lovely and of good report.

See also Edmond Biré, *Victor de Laprade, sa vie et ses œuvres*. (C.)

LAPSE (Lat. *lapsus*, a slip or departure), in law, a term used in several senses. (1) In ecclesiastical law, when a patron has neglected to present to a void benefice within six months next after the avoidance, the right of presentation is said to lapse. In such case the patronage or right of presentation devolves from the neglectful patron to the bishop as ordinary, to the metropolitan as superior and to the sovereign as patron paramount. (2) The failure of a testamentary disposition in favour of any person, by reason of the decease of its object in the testator's lifetime, is termed a lapse. See Legacy, Will.

LAPWING (O.Eng. *hleápewince*= "one who turns about in running or flight"),[1] a bird, the *Tringa vanellus* of Linnaeus and the *Vanellus vulgaris* or *V. cristatus* of modern ornithologists.

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[1] Skeat, *Etym. Dict.* (1898), *s.v.* Caxton in 1481 has "lapwynches" (*Reynard the Fox*, cap. 27). The first part of the word is from *hleápan*, to leap; the second part is "wink" (O.H.G. *winchan*, Ger. *wanken*, to waver). Popular etymology has given the word its present form, as if it meant "wing-flapper," from "lap," a fold or flap of a garment.

In the temperate parts of the Old World this species is perhaps the most abundant of the plovers, *Charadriidae*, breeding in almost every suitable place from Ireland to Japan—the majority migrating towards winter to southern countries, as the Punjab, Egypt and Barbary—though in the British Islands some are always found at that season. As a straggler it has occurred within the Arctic Circle (as on the Varanger Fjord in Norway), as well as in Iceland and even Greenland; while it not unfrequently appears in Madeira and the Azores. Conspicuous as the strongly contrasted colours of its plumage and its very peculiar flight make it, it is remarkable that it maintains its ground when so many of its allies have been almost exterminated, for the lapwing is the object perhaps of greater persecution than any other European bird that is not a plunderer. Its eggs are the well-known "plovers' eggs" of commerce,[1] and the bird, wary and wild at other times of the year, in the breeding-season becomes easily approachable, and is shot to be sold in the markets for "golden plover." Its growing scarcity in Great Britain was very perceptible until the various acts for the protection of wild birds were passed. It is now abundant and is of service both for the market and to agriculture. What seems to be the secret of the lapwing holding its position is the adaptability of its nature to various kinds of localities. It will find sustenance equally on the driest of soils as on the fattest pastures; upland and fen, arable and moorland, are alike to it, provided only the ground be open enough. The wailing cry[2] and the frantic gestures of the cock bird in the breeding-season will tell any passer-by that a nest or brood is near; but, unless he knows how to look for it, nothing save mere chance will enable him to find it. The nest is a slight hollow in the ground, wonderfully inconspicuous even when deepened, as is usually the case, by incubation, and the black-spotted olive eggs (four in number) are almost invisible to the careless or untrained eye. The young when first hatched are clothed with mottled down, so as closely to resemble a stone, and to be overlooked as they squat motionless on the approach of danger. At a distance the plumage of the adult appears to be white and black in about equal proportions, the latter predominating above; but on closer examination nearly all the seeming black is found to be a bottle-green gleaming with purple and copper; the tail-coverts, both above and below, are of a bright bay colour, seldom visible in flight. The crest consists of six or eight narrow and elongated feathers, turned slightly upwards at the end, and is usually carried in a horizontal position, extending in the cock beyond the middle of the back; but it is capable of being erected so as to become nearly vertical. Frequenting parts of the open country so very divergent in character, and as remarkable for the peculiarity of its flight as for that of its cry, the lapwing is far more often observed in nearly all parts of the British Islands than any other of the group Limicolae. The peculiarity of its flight seems due to the wide and rounded wings it possesses, the steady and ordinarily somewhat slow flapping of which impels the body at each stroke with a manifest though easy jerk. Yet on occasion, as when performing its migrations, or even its almost daily transits from one feeding-ground to another, and still more when being pursued by a falcon, the speed with which it moves through the air is very considerable. On the ground this bird runs nimbly, and is nearly always engaged in searching for its food, which is wholly animal.

Allied to the lapwing are several forms that have been placed by ornithologists in the genera *Hoplopterus*, *Chettusia*, *Lobivanellus*, *Defilippia*. In some of them the hind toe, which has already ceased to have any function in the lapwing, is wholly wanting. In others the wings are armed with a tubercle or even a sharp spur on the carpus. Few have any occipital crest, but several have the face ornamented by the outgrowth of a fleshy lobe or lobes. With the exception of North America, they are found in most parts of the world, but perhaps the greater number in Africa. Europe has three species—*Hoplopterus spinosus*, the spur-winged plover, and *Chettusia gregaria* and *C. leucura*; but the first and last are only stragglers from Africa and Asia. (A. N.)

LAPWORTH, CHARLES (1842–), English geologist, was born at Faringdon in Berkshire on the 30th of September 1842. He was educated partly in the village of Buckland in the same county, and afterwards in the training college at Culham, near Oxford (1862–1864). He was then appointed master in a school connected with the Episcopal church at Galashiels, where he remained eleven years. Geology came to absorb all his leisure time, and he commenced to investigate the Silurian rocks of the Southern Uplands, and to study the graptolites and other fossils which mark horizons in the great series of Lower Palaeozoic rocks. His first paper on the Lower Silurian rocks of Galashiels was published in 1870, and from that date onwards he continued to enrich our knowledge of the southern uplands of Scotland until the publication by the Geological Society of his masterly papers on *The Moffat Series* (1878) and *The Girvan Succession* (1882). Meanwhile in 1875 he became an assistant master in the Madras College, St Andrews, and in 1881 professor of geology and mineralogy (afterwards geology and physiography) in the Mason College, now University of Birmingham. In 1882 he started work in the Durness-Eriboll district of the Scottish Highlands, and made out the true succession of the rocks, and interpreted the complicated structure which had baffled most of the previous observers. His results were published in "The Secret of the Highlands" (*Geol. Mag.*, 1883). His subsequent work includes papers on the Cambrian rocks of Nuneaton and the Ordovician rocks of Shropshire. The term Ordovician was introduced by him in 1879 for the strata between the base of the Lower Llandovery formation and that of the Lower Arenig; and it was intended to settle the confusion arising from the use by some writers of Lower Silurian and by others of Upper Cambrian for the same set of rocks. The term Ordovician is now generally adopted. Professor Lapworth was elected F.R.S. in 1888, he received a royal medal in 1891, and was awarded the Wollaston medal by the Geological Society in 1899. He was president of the Geological Society, 1902–1904. His *Intermediate Text-book of Geology* was published in 1899.

See article, with portrait and bibliography, in *Geol. Mag.* (July 1901).

LAR, a city of Persia, capital of Laristan, in 27° 30′ N., 53° 58′ E., 180 m. from Shiraz and 75 from the coast at Bander Lingah. It stands at the foot of a mountain range in an extensive plain covered with palm trees, and was once a flourishing place, but a large portion is in ruins, and the population which early in the 18th century numbered 50,000 is reduced to 8000. There are still some good buildings, of which the most prominent are the old bazaar consisting of four arcades each 180 ft. long, 14 broad and 22 high, radiating from a domed centre 30 ft. high, an old stone mosque and many cisterns. The crest of a steep limestone hill immediately behind the town and rising 150 ft. above the plain is crowned by the ruins of a castle formerly deemed impregnable. Just below the castle is a well sunk 200 ft. in the rock. The tower-flanked mud wall which surrounds the town is for the most part in ruins.

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[1] There is a prevalent belief that many of the eggs sold as "plovers'" are those of rooks, but no notion can be more absurd, since the appearance of the two is wholly unlike. Those of the redshank, of the golden plover (to a small extent), and enormous numbers of those of the black-headed gull, and in certain places of some of the terns are, however, sold as lapwings', having a certain similarity of shell to the latter, and a difference of flavour only to be detected by a fine palate.

[2] This sounds like *pee-weet*, with some variety of intonation. Hence the names peewit, peaseweep and teuchit, commonly applied in some parts of Britain to this bird—though the first is that by which one of the smaller gulls, *Larus ridibundus* (see GULL), is known in the districts it frequents. In Sweden *Vipa*, in Germany *Kiebitz*, in Holland *Kiewiet*, and in France *Dixhuit*, are names of the lapwing, given to it from its usual cry. Other English names are green plover and hornpie—the latter from its long hornlike crest and pied plumage. The lapwing's conspicuous crest seems to have been the cause of a common blunder among English writers of the middle ages, who translated the Latin word *Upupa*, property hoopoe, by lapwing, as being the crested bird with which they were best acquainted. In like manner other writers of the same or an earlier period latinized lapwing by *Egrettides* (plural), and rendered that again into English as egrets—the tuft of feathers misleading them also. The word *Vanellus* is from *vannus*, the fan used for winnowing corn, and refers to the audible beating of the bird's wings.

LARA, western state of Venezuela, lying in the angle formed by the parting of the N. and N.E. ranges of the Cordillera de Mérida and extending N.E. with converging frontiers to the Caribbean. Pop. (1905 estimate) 272,252. The greater part of its surface is mountainous, with elevated fertile valleys which have a temperate climate. The Tocuyo river rises in the S.W. angle of the state and flows N.E. to the Caribbean with a total length of 287 m. A narrow-gauge railway, the "South-western," owned by British capitalists, runs from the port of Tucacas 55 m. S.W. to Barquisimeto by way of the Aroa copper-mining district. Lara produces wheat and other cereals, coffee, sugar, tobacco, neat cattle, sheep and various mineral ores, including silver, copper, iron, lead, bismuth and antimony. The capital, Barquisimeto, is one of the largest and most progressive of the inland cities of Venezuela. Carora is also prominent as a commercial centre. Tocuyo (pop. in 1891, 15,383), 40 m. S.W. of Barquisimeto, is an important commercial and mining town, over 2000 ft. above sea-level, in the midst of a rich agricultural and pastoral region. Yaritagua (pop. about 12,000), 20 m. E. of Barquisimeto, and 1026 ft. above the sea, is known for its cigar manufactories.

LARAISH (*El Araish*), a port in northern Morocco on the Atlantic coast in 35° 13′ N., 6° 9′ W., 43 m. by sea S. by W. of Tangier, picturesquely situated on the left bank of the estuary of the Wad Lekkus. Pop. 6000 to 7000. The river, being fairly deep inside the bar, made this a favourite port for the Salli rovers to winter in, but the quantity of alluvial soil brought down threatens to close the port. The town is well situated for defence, its walls are in fair condition, and it has ten forts, all supplied with old-fashioned guns. Traces of the Spanish occupation from 1610–1689 are to be seen in the towers whose names are given by Tissot as those of St Stephen, St James and that of the Jews, with the Castle of Our Lady of Europe, now the kasbah or citadel. The most remarkable feature of Laraish is its fine large market-place inside the town with a low colonnade in front of very small shops. The streets, though narrow and steep, are generally paved. Its chief exports are oranges, millet, dra and other cereals, goat-hair and skins, sheepskins, wool and fullers' earth. The wool goes chiefly to Marseilles. The annual value of the trade is from £400,000 to £500,000.

In 1780 all the Europeans in Laraish were expelled by Mohammed XVI., although in 1786 the monopoly of its trade had been granted to Holland, even its export of wheat. In 1787 the Moors were still building pirate vessels here, the timber for which came from the neighbouring forest of M'amora. Not far from the town are the remains of what is believed to be a Phoenician city, Shammish, mentioned by Idrisi, who makes no allusion to Laraish. It is not, however, improbable from a passage in Scylax that the site of the present town was occupied by a Libyan settlement. Tradition also connects Laraish with the garden of the Hesperides, *'Arāsi* being the Arabic for "pleasure-gardens," and the "golden apples" perhaps the familiar oranges.

LARAMIE, a city and the county-seat of Albany county, Wyoming, U.S.A., on the Laramie river, 57 m. by rail N.W. of Cheyenne. Pop. (1900) 8207, of whom 1280 were foreign-born; (1905) 7601; (1910) 8237. It is served by the Union Pacific and the Laramie, Hahn's Peak & Pacific railways, the latter extending from Laramie to Centennial (30 m.). The city is situated on the Laramie Plains, at an elevation of 7165 ft., and is hemmed in on three sides by picturesque mountains. It has a public library, a United States Government building and hospitals, and is the seat of the university of Wyoming and of a Protestant Episcopal missionary bishopric. There is a state fish hatchery in the vicinity. The university (part of the public school system of the state) was founded in 1886, was opened in 1887, and embraces a College of Liberal Arts and Graduate School, a Normal School, a College of Agriculture and the Mechanic Arts, an Agricultural Experiment Station (established by a Federal appropriation), a College of Engineering, a School of Music, a Preparatory School and a Summer School. Laramie is a supply and distributing centre for a live-stock raising and mining region—particularly coal mining, though gold, silver, copper and iron are also found. The Union Pacific Railroad Company has machine shops, repair shops and rolling mills at Laramie, and, a short distance S. of the city, ice-houses and a tie-preserving plant. The manufactures include glass, leather, flour, plaster and pressed brick, the brick being made from shale obtained in the vicinity. The municipality owns and operates the water-works; the water is obtained from large springs about 2½ m. distant. Laramie was settled in 1868, by people largely from New England, Michigan, Wisconsin and Iowa, and was named in honour of Jacques Laramie, a French fur trader. It was first chartered as a city in 1868 by the legislature of Dakota, and was rechartered by the legislature of Wyoming in 1873.

LARBERT, a parish and town of Stirlingshire, Scotland. Pop. of parish (1901) 6500, of town, 1442. The town is situated on the Carron, 8 m. S. by E. of Stirling by the North British and Caledonian railways, the junction being an important station for traffic from the south by the West Coast route. Coal-mining is the chief industry. The principal buildings are the church, finely placed overlooking the river, the Stirling district asylum and the Scottish National Institution for imbecile children. In the churchyard is a monument to James Bruce, the Abyssinian traveller, who was born and died at Kinnaird House, 2½ m. N.E. Two m. N. by W. are the ruins of Torwood Castle and the remains of Torwood forest, to which Sir William Wallace retired after his defeat at Falkirk (1298). Near "Wallace's oak," in which the patriot concealed himself, Donald Cargill (1619–1681), the Covenanter, excommunicated Charles II. and James, duke of York, in 1680. The fragment of an old round building is said to be the relic of one of the very few "brochs," or round towers, found in the Lowlands.

LARCENY (an adaptation of Fr. *larcin*, O. Fr. *larrecin*, from Lat. *latrocinium*, theft, *latio*, robber), the unlawful taking and carrying away of things personal, with intent to deprive the rightful owner of the same. The term *theft*, sometimes used as a synonym of larceny, is in reality a broader term, applying to all cases of depriving another of his property whether by removing or withholding it, and includes larceny, robbery, cheating, embezzlement, breach of trust, &c.

Larceny is, in modern legal systems, universally treated as a crime, but the conception of it as a crime is not one belonging to the earliest stage of law. To its latest period Roman law regarded larceny or theft (*furtum*) as a delict *prima facie* pursued by a civil remedy—the *actio furti* for a penalty, the *vindicatio* or *condictio* for the stolen property itself or its value. In later times, a criminal remedy to meet the graver crimes gradually grew up by the side of the civil, and in the time of Justinian the criminal remedy, where it existed, took precedence of the civil (*Cod.* iii. 8. 4). But to the last criminal proceedings could only be taken in serious cases, *e.g.* against stealers of cattle (*abigei*) or the clothes of bathers (*balnearii*). The punishment was death, banishment, or labour in the mines or on public works. In the main the Roman law coincides with the English law. The definition as given in the *Institutes* (iv. 1. 1) is "furtum est contrectatio rei fraudulosa, vel ipsius rei, vel etiam ejus usus possessionisve," to which the *Digest* (xlvii. 2. 1, 3) adds "lucri faciendi gratia." The earliest English definition, that of Bracton (150*b*), runs thus: "furtum est secundum leges contrectatio rei alienae fraudulenta cum animo furandi invito illo domino cujus res illa fuerit." Bracton omits the "lucri faciendi gratia" of the Roman definition, because in English law the motive is immaterial,[1] and the "usus ejus possessionisve," because the definition includes an intent to deprive the owner of his property permanently. The "animo furandi" and "invito domino" of Bracton's definition are expansions for the sake of greater clearness. They seem to have been implied in Roman law. *Furtum* is on the whole a more comprehensive term than larceny. This difference no doubt arises from the tendency to extend the bounds of a delict and to limit the bounds of a crime. Thus it was *furtum* (but it would not be theft at English common law) to use a deposit of pledge contrary to the wishes of the owner, to retain goods found, or to steal a human being, such as a slave or *filius familias* (a special form of *furtum* called *plagium*). The latter would be in English law an abduction under certain circumstances but not a theft. One of two married persons could not commit *furtum* as against the other, but larceny may be so committed in England since the Married Women's Property Act 1882. As a *furtum* was merely a delict, the *obligatio ex delicto* could be extinguished by agreement between the parties; this cannot be done in England. In another direction English law is more considerate of the rights of third parties than was Roman. The thief can give a good title to stolen goods; in Roman law he could not do so, except in the single case of a *hereditas* acquired by *usucapio*. The development of the law of *furtum* at Rome is historically interesting, for even in its latest period is found a relic of one of the most primitive theories of law adopted by courts of justice: "They took as their guide the measure of vengeance likely to be exacted by an aggrieved person under the circumstances of the case" (Maine, *Ancient Law*, ch. x.). This explains the reason of the division of *furtum* into *manifestum* and *nec manifestum*. The manifest thief was one taken red-handed—"taken with the manner," in the language of old English law. The Twelve Tables denounced the punishment of death against the manifest thief, for that would be the penalty demanded by the indignant owner in whose place the judge stood. The severity of this penalty was afterwards mitigated by the praetor, who substituted for it the payment of quadruple the value of the thing stolen. The same penalty was also given by the praetor in case of theft from a fire or a wreck, or of prevention of search. The Twelve Tables mulcted the non-manifest thief in double the value of the thing stolen. The actions for penalties were in addition to the action for the stolen goods themselves or their value. The quadruple and double penalties still remain in the legislation of Justinian. The search for stolen goods, as it existed in the time of Gaius, was a survival of a period when the injured person was, as in the case of summons (*in jus vocatio*), his own executive officer. Such a search, by the Twelve Tables, might be conducted in the house of the supposed thief by the owner in person, naked except for a cincture, and carrying a platter in his hand, safeguards apparently against any possibility of his making a false charge by depositing some of his own property on his neighbour's premises. This mode of search became obsolete before the time of Justinian. Robbery (*bona vi rapta*) was violence added to *furtum*. By the *actio vi bonorum raptorum* quadruple the value could be recovered if the action were brought within a year, only the value if brought after the expiration of a year. The quadruple value included the stolen thing itself, so that the penalty was in effect only a triple one. It was inclusive, and not cumulative, as in *furtum*.

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[1] Thus destruction of a letter by a servant, with a view of suppressing inquiries into his or her character, makes the servant guilty of larceny in English law.

In England theft or larceny appears to have been very early regarded by legislators as a matter calling for special attention. The pre-Conquest compilations of laws are full of provisions on the subject. The earlier laws appear to regard it as a delict which may be compounded for by payment. Considerable distinctions of person are made, both in regard to the owner and the thief. Thus, by the laws of Æthelberht, if a freeman stole from the king he was to restore ninefold, if from a freeman or from a dwelling, threefold. If a theow stole, he had only to make a twofold reparation. In the laws of Alfred ordinary theft was still only civil, but he who stole in a church was punished by the loss of his hand. The laws of Ina named as the penalty death or redemption according to the wer-gild of the thief. By the same laws the thief might be slain if he fled or resisted. Gradually the severity of the punishment increased. By the laws of Æthelstan death in a very cruel form was inflicted. At a later date the *Leges Henrici Primi* placed a thief in the king's mercy, and his lands were forfeited. Putting out the eyes and other kinds of mutilation were sometimes the punishment. The principle of severity continued down to the 19th century, and until 1827 theft or larceny of certain kinds remained capital. Both before and after the Conquest local jurisdiction over thieves was a common franchise of lords of manors, attended with some of the advantages of modern summary jurisdiction.

Under the common law larceny was a felony. It was affected by numerous statutes, the main object of legislation being to bring within the law of larceny offences which were not larcenies at common law, either because they were thefts of things of which there could be no larceny at common law, *e.g.* beasts *ferae naturae*, title deeds or choses in action, or because the common law regarded them merely as delicts for which the remedy was by civil action, *e.g.* fraudulent breaches of trust. The earliest act in the statutes of the realm dealing with larceny appears to be the *Carta Forestae* of 1225, by which fine or imprisonment was inflicted for stealing the king's deer. The next act appears to be the statute of Westminster the First (1275), dealing again with stealing deer. It seems as though the beginning of legislation on the subject was for the purpose of protecting the chases and parks of the king and the nobility. A very large number of the old acts are named in the repealing act of 1827. An act of the same date removed the old distinction between grand and petit larceny.[1] The former was theft of goods above the value of twelve pence, in the house of the owner, not from the person, or by night, and was a capital crime. It was petit larceny where the value was twelve pence or under, the punishment being imprisonment or whipping. The gradual depreciation in the value of money afforded good ground for Sir Henry Spelman's sarcasm that, while everything else became dearer, the life of man became continually cheaper. The distinction between grand and petit larceny first appears in statute law in the Statute of Westminster the First, c. 15, but it was not created for the first time by that statute. It is found in some of the pre-Conquest codes, as that of Æthelstan, and it is recognized in the *Leges Henrici Primi*. A distinction between simple and compound larceny is still found in the books. The latter is larceny accompanied by circumstances of aggravation, as that it is in a dwelling-house or from the person. The law of larceny is now contained chiefly in the Larceny Act 1861 (which extends to England and Ireland), a comprehensive enactment including larceny, embezzlement, fraud by bailees, agents, bankers, factors, and trustees, sacrilege, burglary, housebreaking, robbery, obtaining money by threats or by false pretences, and receiving stolen goods, and prescribing procedure, both civil and criminal. There are, however, other acts in force dealing with special cases of larceny, such as an act of Henry VIII. as to stealing the goods of the king, and the Game, Post-Office and Merchant Shipping Acts. There are separate acts providing for larceny by a partner of partnership property, and by a husband or wife of the property of the other (Married Women's Property Act 1882). Proceedings against persons subject to naval or military law depend upon the Naval Discipline Act 1866 and the Army Act 1881. There are several acts, both before and after 1861, directing how the property is to be laid in indictments for stealing the goods of counties, friendly societies, trades unions, &c. The principal conditions which must exist in order to constitute larceny are these: (1) there must be an actual taking into the possession of the thief, though the smallest removal is sufficient; (2) there must be an intent to deprive the owner of his property for an indefinite period, and to assume the entire dominion over it, an intent often described in Bracton's words as *animus furandi*; (3) this intent must exist at the time of taking; (4) the thing taken must be one capable of larceny either at common law or by statute. One or two cases falling under the law of larceny are of special interest. It was held more than once that a servant taking corn to feed his master's horses, but without any intention of applying it for his own benefit, was guilty of larceny. To remedy this hardship, the Misappropriation of Servants Act 1863 was passed to declare such an act not to be felony. The case of appropriation of goods which have been found has led to some difficulty. It now seems to be the law that in order to constitute a larceny of lost goods there must be a felonious intent at the time of finding, that is, an intent to deprive the owner of them, coupled with reasonable means at the same time of knowing the owner. The mere retention of the goods when the owner has become known to the finder does not make the retention criminal. Larceny of money may be committed when the money is paid by mistake, if the prisoner took it *animo furandi*. In two noteworthy cases the question was argued before a very full court for crown cases reserved, and in each case there was a striking difference of opinion. In *R.* v. *Middleton*, 1873, L.R. 2 C.C.R., 38, the prisoner, a depositor in a post-office savings bank, received by the mistake of the clerk a larger sum that he was entitled to. The jury found that he had the *animus furandi* at the time of taking the money, and that he knew it to be the money of the postmaster-general. The majority of the court held it to be larceny. In a case in 1885 (*R.* v. *Ashwell*, L.R. 16 Q.B.D. 190), where the prosecutor gave the prisoner a sovereign believing it to be a shilling, and the prisoner took it under that belief, but afterwards discovered its value and retained it, the court was equally divided as to whether the prisoner was guilty of larceny at common law, but held that he was not guilty of larceny as a bailee. Legislation has considerably affected the procedure in prosecutions for larceny. The inconveniences of the common law rules of interpretation of indictments led to certain amendments of the law, now contained in the Larceny Act, for the purpose of avoiding the frequent failures of justice owing to the strictness with which indictments were construed. Three larcenies of property of the same person within six months may now be charged in one indictment. On an indictment for larceny the prisoner may be found guilty of embezzlement, and *vice versa*; and if the prisoner be indicted for obtaining goods by false pretences, and the offence turn out to be larceny, he is not entitled to be acquitted of the misdemeanour. A count for receiving may be joined with the count for stealing. In many cases it is unnecessary to allege or prove ownership of the property the subject of the indictment. The act also contains numerous provisions as to venue and the apprehension of offenders. In another direction the powers of courts of Summary Jurisdiction (*q.v.*) have been extended, in the case of charges of larceny, embezzlement and receiving stolen goods, against children and young persons and against adults pleading guilty or waiving their right to trial by jury. The maximum punishment for larceny is fourteen years' penal servitude, but this can only be inflicted in certain exceptional cases, such as horse or cattle stealing and larceny by a servant or a person in the service of the crown or the police. The extreme punishment for simple larceny after a previous conviction for felony is ten years' penal servitude. Whipping may be part of the sentence on boys under sixteen.

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[1] This provision was most unnecessarily repeated in the Larceny Act of 1861.

Scotland.—A vast number of acts of the Scottish parliament dealt with larceny. The general policy of the acts was to make larceny what was not larceny at common law, *e.g.* stealing fruit, dogs, hawks or deer, and to extend the remedies, *e.g.* by giving the justiciar authority throughout the kingdom, by making the master in the case of theft by the servant liable to give the latter up to justice, or by allowing the use of firearms against thieves. The general result of legislation in England and Scotland has been to assimilate the law of larceny in both kingdoms. As a rule, what would be larceny in one would be larceny in the other.

United States.—The law depends almost entirely upon state legislation, and is in general accordance with that of England. The only acts of Congress bearing on the subject deal with larceny in the army and navy, and with larceny and receiving on the high seas or in any place under the exclusive jurisdiction of the United States, *e.g.* Alaska.

Alaska.—Stealing any goods, chattels, government note, bank note, or other thing in action, books of account, &c., is larceny: punishment, imprisonment for not less than one nor more than ten years if the property stolen is in value over $35. Larceny in any dwelling-house, warehouse, steamship, church, &c., is punishable by imprisonment for not less than one nor more than seven years. Larceny of a horse, mule, ass, bull, steer, cow or reindeer is punishable by imprisonment for not less than one nor more than fifteen years. Wilfully altering or defacing marks or brands on such animals is larceny (Pen. Code Alaska, § 45, 1899).

Arizona.—Appropriating property found without due inquiry for the owner is larceny (Penal Code, § 442). "Dogs are property and of the value of *one dollar each* within the meaning of the terms 'property' and 'value' as used in this chapter" (*id.* § 448). Property includes a passage ticket though never issued. Persons stealing property in another state or county, or who receive it knowing it to be stolen and bring it into Arizona, may be convicted and punished as if the offence was committed there (*id.* § 454). Stealing gas or water from a main is a misdemeanour.

Iowa.—It is larceny to steal electricity, gas or water from wires, meters or mains (L. 1903, ch. 132).

New York.—Larceny as defined by § 528 of the Penal Code includes also embezzlement, obtaining property by false pretences, and felonious breach of trust (*People* v. *Dumar*, 106 N.Y. 508), but the method of proof required to establish these offences has not been changed. Grand larceny in the *first degree* is (*a*) stealing property of any value in the night time; (*b*) of $25 in value or more at night from a dwelling house, vessel or railway car; (*c*) of the value of more than $500 in any manner; in the *second degree* (*a*) stealing in any manner property of the value of over $25 and under $500; (*b*) taking from the person property of any value; (*c*) stealing any record of a court or other record filed with any public officer. Every other larceny is petit larceny. "Value" of any stock, bond or security having a market value is the amount of money due thereon or what, in any contingency, might be collected thereon; of any passenger ticket the price it is usually sold at. The value of anything else not fixed by statute is its market value. Grand larceny, in the first degree, is punishable by imprisonment not exceeding ten years; in the second degree, not exceeding five years. Petit larceny is a misdemeanour (Penal Code, §§ 530-535). Bringing stolen goods into the state knowing them to be stolen is punishable as larceny within the state (*id.* § 540). A "pay ticket" for removing a load of snow may be the subject of larceny and its value the amount to be paid on it. (*People* v. *Fletcher* [1906] 110 App. D. 231).

Kansas.—The owner of goods who takes them from a railroad company with intent to defeat its lien for transportation charges is guilty of larceny. (*Atchison Co.* v. *Hinsdell* [1907] 90 Pac. Rep. 800).

Massachusetts.—Larceny includes embezzlement and obtaining money by false pretences. (Rev. L. 1902, ch. 218, § 40.) The failing to restore to or to notify the owner of property removed from premises on fire is larceny (*id.* ch. 208, § 22). It is larceny to purchase property (payment for which is to be made on or before delivery) by means of a false pretence as to means or ability to pay, provided such pretence is signed by the person to be charged. Indictment for stealing a will need not contain an allegation of value (*id.* § 29). A person convicted either as accessory or principal of three distinct larcenies shall be adjudged "a common and notorious thief" and may be imprisoned for not more than twenty years (*id.* 31). On second conviction for larceny of a bicycle, the thief may be imprisoned for not more than five years. Larceny of things annexed to realty is punishable as if it were a larceny of personal property (*id.* §§ 33, 35).

Ohio.—Stealing "anything of value" is larceny (Bates Stats. § 6856). Tapping gas pipes is punishable by fine or imprisonment for not more than thirty days. Stealing timber having "timber dealers'" trade mark, or removing it from a stream, is punishable by a fine of not less than $20.

Utah.—It is grand larceny to alter the mark or brand on an animal (L. 1905, ch. 38).

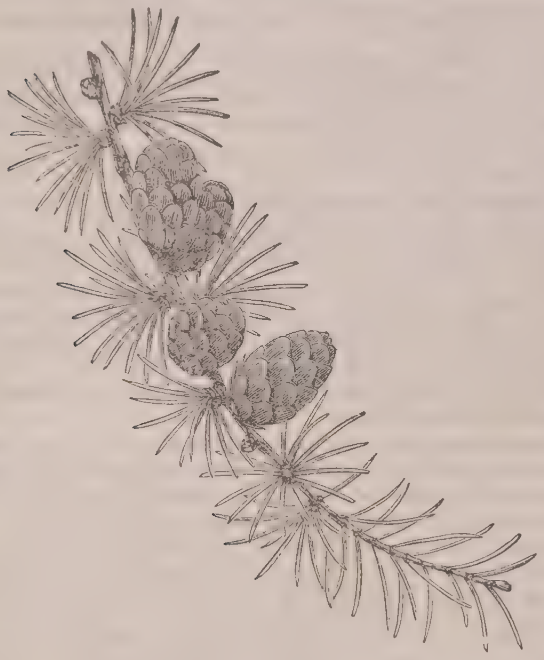
Wyoming.—For branding or altering or defacing the brand on cattle with intent to steal, the penalty is imprisonment for not more than five years. It is larceny for a bailee to convert with intent to steal goods left with or found by him (Rev. Stats. §§ 4986, 4989).

Washington.—A horse not branded, but under Code § 6861 an "outlaw," the owner being unknown, can be the subject of a larceny, having been held to be property of the state. (*State* v. *Eddy* [1907], 90 Pac. Rep. 641). For the third offence of such a larceny the penalty is imprisonment for *life* (L. 1903, ch. 86).

See also EMBEZZLEMENT; CHEATING; FALSE PRETENCES; ROBBERY; STOLEN GOODS.

LARCH (from the Ger. *Lärche*, M.H.G. *Lerche*, Lat. *larix*), a name applied to a small group of coniferous trees, of which the common larch of Europe is taken as the type. The members of the genus *Larix* are distinguished from the firs, with which they were formerly placed, by their deciduous leaves, scattered singly, as in *Abies*, on the young shoots of the season, but on all older branchlets growing in whorl-like tufts, each surrounding the extremity of a rudimentary or abortive branch; they differ from cedars (*Cedrus*), which also have the fascicles of leaves on arrested branchlets, not only in the deciduous leaves, but in the cones, the scales of which are thinner towards the apex, and are persistent, remaining attached long after the seeds are discharged. The trees of the genus are closely allied in botanic features, as well as in general appearance, so that it is sometimes difficult to assign to them determinate specific characters, and the limit between species and variety is not always very accurately defined. Nearly all are natives of Europe, or the northern plains and mountain ranges of Asia and North America, though one (*Larix Griffithii*) occurs only on the Himalayas.

The common larch (*L. europaea*) is, when grown in perfection, a stately tree with tall erect trunk, gradually tapering from root to summit, and horizontal branches springing at irregular intervals from the stem, and in old trees often becoming more or less drooping, but rising again towards the extremities; the branchlets or side shoots, very slender and pendulous, are pretty thickly studded with the spurs each bearing a fascicle of thirty or more narrow linear leaves, of a peculiar bright light green when they first appear in the spring, but becoming of a deeper hue when mature. The yellow stamen-bearing flowers are in sessile, nearly spherical catkins; the fertile ones vary in colour, from red or purple to greenish-white, in different varieties; the erect cones, which remain long on the branches, are above an inch in length and oblong-ovate in shape, with reddish-brown scales somewhat waved on the edges, the lower bracts usually rather longer than the scales. The tree flowers in April or May, and the winged seeds are shed the following autumn. When standing in an open space, the larch grows of a nearly conical shape, with the lower branches almost reaching the ground, while those above gradually diminish in length towards the top of the trunk, presenting a very symmetrical form; but in dense woods the lower parts become bare of foliage, as with the firs under similar circumstances. When springing up among rocks or on ledges, the stem sometimes becomes much curved, and, with its spreading boughs and pendent branchlets, often forms a striking and picturesque object in alpine passes and steep ravines. In the prevalent European varieties the bark is reddish-grey, and rather rough and scarred in old trees, which are often much lichen-covered. The trunk attains a height of from 80 to 140 ft., with a diameter of from 3 to 5 ft. near the ground, but in close woods is comparatively slender in proportion to its altitude. The larch abounds on the Alps of Switzerland, on which it flourishes at an elevation of 5000 ft., and also on those of Tirol and Savoy, on the Carpathians, and in most of the hill regions of central Europe; it is not wild on the Apennine chain, or the Pyrenees, and in the wild state is unknown in the Spanish peninsula. It forms extensive woods in Russia, but does not extend to Scandinavia, where its absence is somewhat remarkable, as the tree grows freely in Norway and Sweden where planted, and even multiplies itself by self-sown seed, according to F. C. Schübeler, in the neighbourhood of Trondhjem. In the north-eastern parts of Russia, in the country towards the Petchora river, and on the Ural, a peculiar variety prevails, regarded by some as a distinct species (*L. sibirica*); this form is abundant nearly throughout Siberia, extending to the Pacific coast of Kamchatka and the hills of the Amur region. The Siberian larch has smooth grey bark and smaller cones, approaching in shape somewhat to those of the American hackmatack; it seems even hardier than the Alpine tree, growing up to latitude 68°, but, as the inclement climate of the polar shores is neared, dwindling down to a dwarf and even trailing bush.



Branchlet of Larch (*Larix europaea*).

The larch, from its lofty straight trunk and the high quality of its wood, is one of the most important of coniferous trees; its growth is extremely rapid, the stem attaining a large size in from sixty to eighty years, while the tree yields good useful timber at forty or fifty; it forms firm heartwood at an early age, and the sapwood is less perishable than that of the firs, rendering it more valuable in the young state.

The wood of large trees is compact in texture, in the best varieties of a deep reddish colour varying to brownish-yellow, but apt to be lighter in tint, and less hard in grain, when grown in rich soils or in low sheltered situations. It is remarkably tough, resisting a rending strain better than any of the fir or pine woods in common use, though not as elastic as some; properly seasoned, it is as little liable to shrink as to split; the boughs being small compared to the trunk, the timber is more free from large knots, and the small knots remain firm and undecayed. The only drawback to these good qualities is a certain liability to warp and bend, unless very carefully seasoned; for this purpose it is recommended to be left floating in water for a year after felling, and then allowed some months to dry slowly and completely before sawing up the logs; barking the trunk in winter while the tree is standing, and leaving it in that state till the next year, has been often advised with the larch as with other timber, but the practical inconveniences of the plan have prevented its adoption on any large scale. When well prepared for use, larch is one of the most durable of coniferous woods. Its strength and toughness render it valuable for naval purposes, to which it is largely applied; its freedom from any tendency to split adapts it for clinker-built boats. It is much employed for house-building; most of the picturesque log-houses in Vaud and the adjacent cantons are built of squared larch trunks, and derive their fine brown tint from the hardened resin that slowly exudes from the wood after long exposure to the summer sun; the wooden shingles, that in Switzerland supply the place of tiles, are also frequently of larch. In Germany it is much used by the cooper as well as the carpenter, while the form of the trunk admirably adapts it for all purposes for which long straight timber is needed. It answers well for fence-posts and river piles; many of the foundations of Venice rest upon larch, the lasting qualities of which were well known and appreciated, not only in medieval times, but in the days of Vitruvius and Pliny. The harder and darker varieties are used in the construction of cheap solid furniture, being fine in grain and taking polish better than many more costly woods. A peculiarity of larch wood is the difficulty with which it is ignited, although so resinous; and, coated with a thin layer of plaster, beams and pillars of larch might probably be found to justify Caesar's epithet "igni impenetrabile lignum"; even the small branches are not easily kept alight, and a larch fire in the open needs considerable care. Yet the forests of larch in Siberia often suffer from conflagration. When these fires occur while the trees are full of sap, a curious mucilaginous matter is exuded from the half-burnt stems; when dry it is of pale reddish colour, like some of the coarser kinds of gum-arabic, and is soluble in water, the solution resembling gum-water, in place of which it is sometimes used; considerable quantities are collected and sold as "Orenburg gum"; in Siberia and Russia it is occasionally employed as a semi-medicinal food, being esteemed an antiscorbutic. For burning in close stoves and furnaces, larch makes tolerably good fuel, its value being estimated by Hartig as only one-fifth less than that of beech; the charcoal is compact, and is in demand for iron-smelting and other metallurgic uses in some parts of Europe.

In the trunk of the larch, especially when growing in climates where the sun is powerful in summer, a fine clear turpentine exists in great abundance; in Savoy and the south of Switzerland, it is collected for sale, though not in such quantity as formerly, when, being taken to Venice for shipment, it was known in commerce as "Venice turpentine." Old trees are selected, from the bark of which it is observed to ooze in the early summer; holes are bored in the trunk, somewhat inclined upward towards the centre of the stem, in which, between the layers of wood, the turpentine is said to collect in small lacunae; wooden gutters placed in these holes convey the viscous fluid into little wooden pails hung on the end of each gutter; the secretion flows slowly all through the summer months, and a tree in proper condition yields from 6 to 8 ℔ a year, and will continue to give an annual supply for thirty or forty years, being, however, rendered quite useless for timber by subjection to this process. In Tirol, a single hole is made near the root of the tree in the spring; this is stopped with a plug, and the turpentine is removed by a scoop in the autumn; but each tree yields only from a few ounces to $\frac{1}{2}$ ℔ by this process. Real larch turpentine is a thick tenacious fluid, of a deep yellow colour, and nearly transparent; it does not harden by time; it contains 15% of the essential oil of turpentine, also resin, succinic, pinic and sylvic acids, and a bitter extractive matter. According to Pereira, much sold under the name of Venice turpentine is a mixture of common resin and oil of turpentine. On the French Alps a sweet exudation is found on the small branchlets of young larches in June and July, resembling manna in taste and laxative properties, and known as *Manna de Briançon* or *Manna Brigantina*; it occurs in small whitish irregular granular masses, which are removed in the morning before they are too much dried by the sun; this manna seems to differ little in composition from the sap of the tree, which also contains *mannite*; its cathartic powers are weaker than those of the manna of the manna ash (*Fraximus ornus*), but it is employed in France for the same purposes.

The bark of the larch is largely used in some countries for tanning; it is taken from the trunk only, being stripped from the trees when felled; its value is about equal to that of birch bark; but, according to the experience of British tanners, it is scarcely half as strong as that of the oak. The soft inner bark is occasionally used in Siberia as a ferment, by hunters and others, being boiled and mixed with rye-meal, and buried in the snow for a short time, when it is employed as a substitute for other leaven, and in making the sour liquor called "quass." In Germany a fungus (*Polyporus Laricis*) grows on the roots and stems of decaying larches, which was formerly in esteem as a drastic purgative. The young shoots of the larch are sometimes given in Switzerland as fodder to cattle.

The larch, though mentioned by Parkinson in 1629 as "nursed up" by a few "lovers of variety" as a rare exotic, does not seem to have been much grown in England till early in the 18th century. In Scotland the date of its introduction is a disputed point, but it seems to have been planted at Dunkeld by the 2nd duke of Athole in 1727, and about thirteen or fourteen years later considerable plantations were made at that place, the commencement of one of the largest planting experiments on record; it is estimated that 14 million larches were planted on the Athole estates between that date and 1826. The cultivation of the tree rapidly spread, and the larch has become a conspicuous feature of the scenery in many parts of Scotland. It grows as rapidly and attains as large a size in British habitats suited to it as in its home on the Alps, and often produces equally good timber. The larch of Europe is essentially a mountain tree, and requires not only free air above, but a certain moderate amount of moisture in the soil beneath, with, at the same time, perfect drainage, to bring the timber to perfection. Where there is complete freedom from stagnant water in the ground, and abundant room for the spread of its branches to light and air, the larch will flourish in a great variety of soils, stiff clays, wet or mossy peat, and moist alluvium being the chief exceptions; in its native localities it seems partial to the debris of primitive and metamorphic rocks, but is occasionally found growing luxuriantly on calcareous subsoils; in Switzerland it attains the largest size, and forms the best timber, on the northern declivities of the mountains; but in Scotland a southern aspect appears most favourable.

The best variety for culture in Britain is that with red female flowers; the light-flowered kinds are said to produce inferior wood; and the Siberian larch does not grow in Scotland nearly as fast as the Alpine tree. The larch is raised from seed in immense numbers in British nurseries; that obtained from Germany is preferred, being more perfectly ripened than the cones of home growth usually are. The seeds are sown in April, on rich ground, which should not be too highly manured; the young larches are planted out when two years old, or sometimes transferred to a nursery bed to attain a larger size; but, like all conifers, they succeed best when planted young; on the mountains, the seedlings are usually put into a mere slit made in the ground by a spade with a triangular blade, the place being first cleared of any heath, bracken, or tall herbage that might smother the young tree; the plants should be from 3 to 4 ft. apart, or even more, according to the growth intended before thinning, which should be begun as soon as the boughs begin to overspread much; little or no pruning is needed beyond the careful removal of dead branches. The larch is said not to succeed on arable land, especially where corn has been grown, but experience does not seem to support this view; that against the previous occupation of the ground by Scotch fir or Norway spruce is probably better founded, and, where timber is the object, it should not be planted with other conifers. On the Grampians and neighbouring hills the larch will flourish at a greater elevation than the pine, and will grow up to an altitude of 1700 or even 1800 ft.; but it attains its full size on lower slopes. In very dry and bleak localities, the Scotch fir will probably be more successful up to 900 ft. above the sea, the limit of the luxuriant growth of that hardy conifer in Britain; and in moist valleys or on imperfectly drained acclivities Norway spruce is more suitable. The growth of the larch while young is exceedingly rapid; in the south of England it will often attain a height of 25 ft. in the first ten years, while in favourable localities it will grow upwards of 80 ft. in half a century or less; one at Dunkeld felled sixty years after planting was 110 ft. high; but usually the tree does not increase so rapidly after the first thirty of forty years. Some larches in Scotland rival in size the most gigantic specimens standing in their native woods; a tree at Dalwick, Peeblesshire, attained 5 ft. in diameter; one at Glenarbuck, near the Clyde, grew above 140 ft. high, with a circumference of 13 ft. The annual increase in girth is often considerable even in large trees; the fine larch near the abbey of Dunkeld figured by Strutt in his *Sylva Britannica* increased 2½ ft. between 1796 and 1825, its measurement at the latter date being 13 ft., with a height of 97½ ft.

In the south of England, the larch is much planted for the supply of hop-poles, though in parts of Kent and Sussex poles formed of Spanish chestnut are regarded as still more lasting. In plantations made with this object, the seedlings are placed very close (from 1½ to 2 ft. apart), and either cut down all at once, when the required height is attained or thinned out, leaving the remainder to gain a greater length; the land is always well trenched before planting. The best month for larch planting, whether for poles or timber, is November; larches are sometimes planted in the spring, but the practice cannot be commended. as the sap flows early, and, if a dry period follows, the growth is sure to be checked. The thinnings of the larch woods in the Highlands are in demand for railway sleepers, scaffold poles, and mining timber, and are applied to a variety of agricultural purposes. The tree generally succeeds on the Welsh hills.

The young seedlings are sometimes nibbled by the hare and rabbit; and on parts of the highland hills both bark and shoots are eaten in the winter by the roe-deer; larch woods should always be fenced in to keep out the hill-cattle, which will browse upon the shoots in spring. The "woolly aphis," "American blight," or "larch blight" (*Eriosoma laricis*) often attacks the trees in close valleys, but rarely spreads much unless other unhealthy conditions are present. The larch suffers from several diseases caused by fungi; the most important is the larch-canker caused by the parasitism of *Peziza Willkommii*. The spores germinate on a damp surface and enter the cortex through small cracks or wounds in the protecting layer. The fungus-mycelium will go on growing indefinitely in the cambium layer, thus killing and destroying a larger area year by year. The most effective method of treatment is to cut out the diseased branch or patch as early as possible. Another disease which is sometimes confused with that caused by the *Peziza* is "heart-rot"; it occasionally attacks larches only ten years old or less, but is more common when the trees have acquired a considerable size, sometimes spreading in a short time through a whole plantation. The trees for a considerable period show little sign of unhealthiness, but eventually the stem begins to swell somewhat near the root, and the whole tree gradually goes off as the disease advances; when cut down, the trunk is found to be decayed at the centre, the "rot" usually commencing near the ground. Trees of good size are thus rendered nearly worthless, often showing little sign of unhealthiness till felled. Great difference of opinion exists among foresters as to the cause of this destructive malady; but it is probably the direct result of unsuitable soil, especially soil containing insufficient nourishment.

Considerable quantities of larch timber are imported into Britain for use in the dockyards, in addition to the large home supply. The quality varies much, as well as the colour and density; an Italian sample in the museum at Kew (of a very dark red tint) weighs about 24½ ℔ to the cub. ft., while a Polish specimen, of equally deep hue, is 44 ℔ 1 oz. to the same measurement.

For the landscape gardener, the larch is a valuable aid in the formation of park and pleasure ground; but it is never seen to such advantage as when hanging over some tumbling burn or rocky pass among the mountains. A variety with very pendent boughs, known as the "drooping" larch var. *pendula*, is occasionally met with in gardens.

The bark of the larch has been introduced into pharmacy, being given, generally in the form of an alcoholic tincture, in chronic bronchitic affections and internal haemorrhages. It contains, in addition to tannin, a peculiar principle called *larixin*, which may be obtained in a pure state by distillation from a concentrated infusion of the bark; it is a colourless substance in long crystals, with a bitter and astringent taste, and a faint acid reaction; hence some term it *larixinic acid*.

The European larch has long been introduced into the United States, where, in suitable localities, it flourishes as luxuriantly as in Britain. Plantations have been made in America with an economic view, the tree growing much faster, and producing good timber at an earlier age than the native hackmatack (or tamarack), while the wood is less ponderous, and therefore more generally applicable.

The genus is represented in the eastern parts of North America by the hackmatack (*L. americana*), of which there are several varieties, two so well marked that they are by some botanists considered specifically distinct. In one (*L. microcarpa*) the cones are very small, rarely exceeding ½ in. in length, of a roundish-oblong shape; the scales are very few in number, crimson in the young state, reddish-brown when ripe; the tree much resembles the European larch in general appearance but is of more slender growth; its trunk is seldom more than 2 ft. in diameter and rarely above 80 ft. high; this form is the red larch, the *épinette rouge* of the French Canadians. The black larch (*L. pendula*) has rather larger cones, of an oblong shape, about ¾ in. long, purplish or green in the immature state, and dark brown when ripe, the scales somewhat more numerous, the bracts all shorter than the scales. The bark is dark bluish-grey, smoother than in the red larch, on the trunk and lower boughs often glossy; the branches are more or less pendulous and very slender.

The red larch grows usually on higher and drier ground, ranging from the Virginian mountains to the shores of Hudson Bay; the black larch is found often on moist land, and even in swamps. The hackmatack is one of the most valuable timber trees of America; it is in great demand in the ports of the St Lawrence for shipbuilding. It is far more durable than any of the oaks of that region, is heavy and close-grained, and much stronger, as well as more lasting, than that of the pines and firs of Canada. In many parts all the finer trees have been cut down, but large woods of it still exist in the less accessible districts; it abounds especially near Lake St John, Quebec, and in Newfoundland is the prevalent tree in some of the forest tracts; it is likewise common in Maine and Vermont. In the timber and building yards the "red" hackmatack is the kind preferred, the produce, probably, of *L. microcarpa*; the "grey" is less esteemed; but the varieties from which these woods are obtained cannot always be traced with certainty. Several fine specimens of the red larch exist in English parks, but its growth is much slower than that of *L. europaea*; the more pendulous forms of *L. pendula* are elegant trees for the garden. The hackmatacks might perhaps be grown with advantage in places too wet for the common larch.

In western America a larch (*L. occidentalis*) occurs more nearly resembling *L. europaea*. The leaves are short, thicker and more rigid than in any of the other larches; the cones are much larger than those of the hackmatacks, egg-shaped or oval in outline; the scales are of a fine red in the immature state, the bracts green and extending far beyond the scales in a rigid leaf-like point. The bark of the trunk has the same reddish tint as that of the common larch of Europe. It is the largest of all larches and one of the most useful timber trees of North America. Some of the trees are 250 ft. high and 6 to 8 ft. in diameter. The wood is the hardest and strongest of all the American conifers; it is durable and adapted for construction work or household furniture.

LARCHER, PIERRE HENRI (1726–1812), French classical scholar and archaeologist, was born at Dijon on the 12th of October 1726. Originally intended for the law, he abandoned it for the classics. His (anonymous) translation of Chariton's *Chaereas and Callirrhoë* (1763) marked him as an excellent Greek scholar. His attack upon Voltaire's *Philosophie de l'historie* (published under the name of l'Abbé Bazin) created considerable interest at the time. His archaeological and mythological *Mémoire sur Vénus* (1775), which has been ranked with similar works of Heyne and Winckelmann, gained him admission to the Académie des Inscriptions (1778). After the imperial university was founded, he was appointed professor of Greek literature (1809) with Boissonade as his assistant. He died on the 22nd of December 1812. Larcher's best work was his translation of Herodotus (1786, new ed. by L. Humbert, 1880) on the preparation of which he had spent fifteen years. The translation itself, though correct, is dull, but the commentary (translated into English, London, 1829, new ed. 1844, by W. D. Cooley) dealing with historical, geographical and chronological questions, and enriched by a wealth of illustration from ancient and modern authors, is not without value.

See J. F. Boissonade, *Notice sur la vie et les écrits de P. L.* (1813); F. A. Wolf, *Literarische Analecten*, i. 205; D. A. Wyttenbach, *Philomathia*, iii. (1817).

LARCIUS (less accurately LARTIUS), **TITUS**, probably surnamed FLAVUS, a member of an Etruscan family (cf. Lars Tolumnius, Lars Porsena) early settled in Rome. When consul in 501 B.C. he was chosen dictator (the title and office being then introduced for the first time) to command against the thirty Latin cities, which had sworn to reinstate Tarquin in Rome. Other authorities put the appointment three years later, when the plebeians refused to serve against the Latins until they had been released from the burden of their debts. He opposed harsh measures against the Latins, and also interested himself in the improvement of the lot of the plebeians. His brother, Spurius, is associated with Horatius Cocles in the defence of the Sublician bridge against the Etruscans.

See Livy ii. 10, 18, 21, 29; Dion. Halic. v. 50-77, vi. 37; Cicero, *De Re Publica*, ii. 32.

LARD (Fr. *lard*, from Lat. *laridum*, bacon fat, related to Gr. λαρινός fat, λαρός dainty or sweet), the melted and strained fat of the common hog. Properly it is prepared from the "leaf" or fat of the bowel and kidneys, but in commerce the term as applied to products which include fat obtained from other parts of the animal and sometimes containing no "leaf" at all. Lard of various grades is made in enormous quantities by the great pork-packing houses at Chicago and elsewhere in America. "Neutral lard" is prepared at a temperature of 40°–50° C. from freshly killed hogs; the finest quality, used for making oleomargarine, is got from the leaf, while the second, employed by biscuit and pastry bakers, is obtained from the fat of the back. Steam heat is utilized in extracting inferior qualities, such as "choice lard" and "prime steam lard," the source of the latter being any fat portion of the animal. Lard is a pure white fat of a butter-like consistence; its specific gravity is about 0·93, its solidifying point about 27°–30° C., and its melting point 35°–45° C. It contains about 60% of olein and 40% of palmitin and stearin. Adulteration is common, the substances used including "stearin" both of beef and of mutton, and vegetable oils such as cotton seed oil: indeed, mixtures have been sold as lard that contain nothing but such adulterants. In the pharmacopoeia lard figures as *adeps* and is employed as a basis for ointments. Benzoated lard, used for the same purpose, is prepared by heating lard with 3% of powdered benzoin for two hours; it keeps better than ordinary lard, but has slightly irritant properties.

Lard oil is the limpid, clear, colourless oil expressed by hydraulic pressure and gentle heat from lard; it is employed for burning and for lubrication. Of the solid residue, lard "stearine," the best qualities are utilized for making oleomargarine, the inferior ones in the manufacture of candles.

See J. Lewkowitsch, *Oils, Fats and Waxes* (London, 1909).

LARDNER, DIONYSIUS (1793–1859), Irish scientific writer, was born at Dublin on the 3rd of April 1793. His father, a solicitor, wished his son to follow the same calling. After some years of uncongenial desk work, Lardner entered Trinity College, Dublin, and graduated B.A. in 1817. In 1828 he became professor of natural philosophy and astronomy at University College, London, a position he held till 1840, when he eloped with a married lady, and had to leave the country. After a lecturing tour through the principal cities of the United States, which realized £40,000, he returned to Europe in 1845. He settled at Paris, and resided there till within a few months of his death, which took place at Naples on the 29th of April 1859.

Though lacking in originality or brilliancy, Lardner showed himself to be a successful popularizer of science. He was the author of numerous mathematical and physical treatises on such subjects as algebraic geometry (1823), the differential and integral calculus (1825), the steam engine (1828), besides hand-books on various departments of natural philosophy (1854–1856); but it is as the editor of *Lardner's Cabinet Cyclopaedia* (1830–1844) that he is best remembered. To this scientific library of 134 volumes many of the ablest savants of the day contributed, Lardner himself being the author of the treatises on arithmetic, geometry, heat, hydrostatics and pneumatics, mechanics (in conjunction with Henry Kater) and electricity (in conjunction with C. V. Walker). The *Cabinet Library* (12 vols., 1830–1832) and the *Museum of Science and Art* (12 vols., 1854–1856) are his other chief undertakings. A few original papers appear in the Royal Irish Academy's *Transactions* (1824), in the Royal Society's *Proceedings* (1831–1836) and in the Astronomical Society's *Monthly Notices* (1852–1853); and two *Reports* to the British Association on railway constants (1838, 1841) are from his pen.

LARDNER, NATHANIEL (1684–1768), English theologian, was born at Hawkhurst, Kent. After studying for the Presbyterian ministry in London, and also at Utrecht and Leiden, he took licence as a preacher in 1709, but was not successful. In 1713 he entered the family of a lady of rank as tutor and domestic chaplain, where he remained until 1721. In 1724 he was appointed to deliver the Tuesday evening lecture in the Presbyterian chapel, Old Jewry, London, and in 1729 he became assistant minister to the Presbyterian congregation in Crutched Friars. He was given the degree of D.D. by Marischal College, Aberdeen, in 1745. He died at Hawkhurst on the 24th of July 1768.

An anonymous volume of *Memoirs* appeared in 1769; and a life by Andrew Kippis is prefixed to the edition of the *Works* of Lardner, published in 11 vols., 8vo in 1788, in 4 vols. 4to in 1817, and 10 vols. 8vo in 1827. The full title of his principal work—a work which, though now out of date, entitles its author to be regarded as the founder of modern critical research in the field of early Christian literature—is *The Credibility of the Gospel History; or the Principal Facts of the New Testament confirmed by Passages of Ancient Authors.*

who were contemporary with our Saviour or his Apostles, or lived near their time. Part i., in 2 vols. 8vo, appeared in 1727; the publication of part ii., in 12 vols. 8vo, began in 1733 and ended in 1755. In 1730 there was a second edition of part i., and the *Additions and Alterations* were also published separately. A *Supplement*, otherwise entitled *A History of the Apostles and Evangelists, Writers of the New Testament*, was added in 3 vols. (1756–1757), and reprinted in 1760. Other works by Lardner are *A Large Collection of Ancient Jewish and Heathen Testimonies to the Truth of the Christian Revelation, with Notes and Observations* (4 vols., 4to, 1764–1767); *The History of the Heretics of the two first Centuries after Christ*, published posthumously in 1780 and a considerable number of occasional sermons.

LAREDO, a city and the county-seat of Webb county, Texas, U.S.A., and a sub-port of entry, on the Rio Grande opposite Nuevo Laredo, Mexico, and 150 m. S. of San Antonio. Pop. (1900) 13,429, of whom 6882 were foreign-born (mostly Mexicans) and 82 negroes; (1910 census) 14,855. It is served by the International & Great Northern, the National of Mexico, the Texas Mexican and the Rio Grande & Eagle Pass railways, and is connected by bridges with Nuevo Laredo. Among the principal buildings are the U.S. Government Building, the City Hall and the County Court House; and the city's institutions include the Laredo Seminary (1882) for boys and girls, the Mercy Hospital, the National Railroad of Mexico Hospital and an Ursuline Convent. Loma Vista Park (65 acres) is a pleasure resort, and immediately W. of Laredo on the Rio Grande is Fort McIntosh (formerly Camp Crawford), a United States military post. Laredo is a jobbing centre for trade between the United States and Mexico, and is a sub-port of entry in the Corpus Christi Customs District. It is situated in a good farming and cattle-raising region, irrigated by water from the Rio Grande. The principal crop is Bermuda onions; in 1909 it was estimated that 1500 acres in the vicinity were devoted to this crop, the average yield per acre being about 20,000 ℔. There are coal mines about 25 m. above Laredo on the Rio Grande, and natural gas was discovered about 28 m. E. in 1908. The manufacture of bricks is an important industry. Laredo was named from the seaport in Spain, and was founded in 1767 as a Mexican town; it originally included what is now Nuevo Laredo, Mexico, and was long the only Mexican town on the left bank of the river. It was captured in 1846 by a force of Texas Rangers, and in 1847 was occupied by U.S. troops under General Lamar. In 1852 it was chartered as a city of Texas.

LA RÉOLE, a town of south-western France, capital of an arrondissement in the department of Gironde, on the right bank of the Gironde, 38 m. S.E. of Bordeaux by rail. Pop. (1906) 3469. La Réole grew up round a monastery founded in the 7th or 8th century, which was reformed in the 11th century and took the name of *Regula*, whence that of the town. A church of the end of the 12th century and some of the buildings (18th century) are left. There is also a town hall of the 12th and 14th centuries. The town fortifications were dismantled by order of Richelieu, but remains dating from the 12th and 14th centuries are to be seen, as well as a ruined château built by Henry II. of England. La Réole has a sub-prefecture, a tribunal of first instance, a communal college and an agricultural school. The town is the centre of the district in which the well-known breed of Bazadais cattle is reared. It is an agricultural market and carries on trade in the wine of the region together with liqueur distillery and the manufacture of casks, rope, brooms, &c.

LARES (older form *Lases*), Roman tutelary deities. The word is generally supposed to mean "lords," and identified with Etruscan *larth*, *lar*; but this is by no means certain. The attempt to harmonize the Stoic demonology with Roman religion led to the Lares being compared with the Greek "heroes" during the period of Greco-Roman culture, and the word is frequently translated ἥρωες. In the later period of the republic they are confounded with the Penates (and other deities), though the distinction between them was probably more sharply marked in earlier times. They were originally gods of the cultivated fields, worshipped by each household where its allotment joined those of others (see below). The distinction between public and private Lares existed from early times. The latter were worshipped in the house by the family alone, and the household Lar (*familiaris*) was conceived of as the centre-point of the family and of the family cult. The word itself (in the singular) came to be used in the general sense of "home." It is certain that originally each household had only one Lar; the plural was at first only used to include other classes of Lares, and only gradually, after the time of Cicero, ousted the singular. The image of the Lar, made of wood, stone or metal, sometimes even of silver, stood in its special shrine (*lararium*), which in early times was in the atrium, but was afterwards transferred to other parts of the house, when the family hearth was removed from the atrium. In some of the Pompeian houses the *lararium* was represented by a niche only, containing the image of the *lar*. It was usually a youthful figure, dressed in a short, high-girt tunic, holding in one hand a *rhyton* (drinking-horn), in the other a *patera* (cup). Under the Empire we find usually two of these, one on each side of the central figure of the Genius of the head of the household, sometimes of Vesta the hearth-deity. The whole group was called indifferently Lares or Penates. A prayer was said to the Lar every morning, and at each meal offerings of food and drink were set before him; a portion of these was placed on the hearth and afterwards shaken into the fire. Special sacrifices were offered on the kalends, nones, and ides of every month, and on the occasion of important family events. Such events were the birthday of the head of the household; the assumption of the *toga virilis* by a son; the festival of the Caristia in memory of deceased members of the household; recovery from illness; the entry of a young bride into the house for the first time; return home after a long absence. On these occasions the Lares were crowned with garlands, and offerings of cakes and honey, wine and incense, but especially swine, were laid before them. Their worship persisted throughout the pagan period, although its character changed considerably in later times. The emperor Alexander Severus had images of Abraham, Christ and Alexander the Great among his household Lares.

The public Lares belonged to the state religion. Amongst these must be included, at least after the time of Augustus, the *Lares compitales*. Originally two in number, mythologically the sons of Mercurius and Lara (or Larunda), they were the presiding deities of the cross-roads (*compita*), where they had their special chapels. It has been maintained by some that they are the twin brothers so frequent in early religions, the Romulus and Remus of the Roman foundation legends. Their sphere of influence included not only the cross-roads, but the whole neighbouring district of the town and country in which they were situated. They had a special annual festival, called Compitalia, to which public games were added some time during the republican period. When the colleges of freedmen and slaves, who assisted the presidents of the festival, were abolished by Julius Caesar, it fell into disuse. Its importance was revived by Augustus, who added to these Lares his own Genius, the religious personification of the empire.

The state itself had its own Lares, called *praestites*, the protecting patrons and guardians of the city. They had a temple and altar on the Via Sacra, near the Palatine, and were represented on coins as young men wearing the chlamys, carrying lances, seated, with a dog, the emblem of watchfulness, at their feet. Mention may also be made of the *Lares grundules*, whose worship was connected with the white sow of Alba Longa and its thirty young (the epithet has been connected with *grunnire*, to grunt): the *viales*, who protected travellers; the *hostilii*, who kept off the enemies of the state; the *permarini*, connected with the sea, to whom L. Aemilius Regillus, after a naval victory over Antiochus (190 B.C.), vowed a temple in the Campus Martius, which was dedicated by M. Aemilius Lepidus the censor in 179.

The old view that the Lares were the deified ancestors of the family has been rejected lately by Wissowa, who holds that the Lar was originally the protecting spirit of a man's lot of arable land, with a shrine at the *compitum*, *i.e.* the spot where the path bounding his arable met that of another holding; and thence found his way into the house.

In addition to the manuals of Marquardt and Preller-Jordan, and Roscher's *Lexikon der Mythologie*, see A. de Marchi, *Il Culto privato di Roma antica* (1896–1903), p. 28 foll.; G. Wissowa, *Religion und Kultus der Römer* (1902), p. 148 foll.; *Archiv für Religionswissenschaft* (1904, p. 42 foll.) and W. Warde Fowler in the same periodical (1906, p. 529).

LA RÉVELLIÈRE-LÉPEAUX, LOUIS MARIE DE (1753–1824), French politician, member of the Directory, the son of J. B. de la Révellière, was born at Montaign (Vendée), on the 24th of August 1753. The name of Lépeaux he adopted from a small property belonging to his family, and he was known locally as M. de Lépeaux. He studied law at Angers and Paris, being called to the bar in 1775. A deputy to the states-general in 1789, he returned at the close of the session to Angers, where with his school-friends J. B. Leclerc and Urbain René Pilastre he sat on the council of Maine-et-Loire, and had to deal with the first Vendéen outbreaks. In 1792 he was returned by the department to the Convention, and on the 19th of November he proposed the famous decree by which France offered protection to foreign nations in their struggle for liberty. Although La Révellière-Lépeaux voted for the death of Louis XVI., he was not in general agreement with the extremists. Proscribed with the Girondins in 1793 he was in hiding until the revolution of 9·10 Thermidor (27th and 28th of July 1794). After serving on the commission to prepare the initiation of the new constitution he became in July 1795 president of the Assembly, and shortly afterwards a member of the Committee of Public Safety. His name stood first on the list of directors elected, and he became president of the Directory. Of his colleagues he was in alliance with Jean François Rewbell and to a less degree with Barras, but the greatest of his fellow-directors, Lazare Carnot, was the object of his undying hatred. His policy was marked by a bitter hostility to the Christian religion, which he proposed to supplant as a civilizing agent by theophilanthropy, a new religion invented by the English deist David Williams. The credit of the *coup d'état* of 18 Fructidor (4th of September 1797), by which the allied directors made themselves supreme, La Révellière arrogated to himself in his *Mémoires*, which in this as in other matters must be read with caution. Compelled to resign by the revolution of 30 Prairial (18th of June 1799) he lived in retirement in the country, and even after his return to Paris ten years later took no part in public affairs. He died on the 27th of March 1824.

The *Mémoires* of La Révellière-Lépeaux were edited by R. D. D'Angers (Paris, 3 vols., 1895). See also E. Charavay, *La Révellière-Lépeaux et ses mémoires* (1895) and A. Meynier, *Un Représentant de la bourgeoisie angevine* (1905).

LARGENTIÈRE, a town of south-eastern France, capital of an arrondissement in the department of Ardèche, in the narrow valley of the Ligne, 29 m. S.W. of Privas by road. Pop. (1906) 1690. A church of the 12th, 13th and 15th centuries and the old castle of the bishops of Viviers, lords of Largentière, now used as a hospital, are the chief buildings. The town is the seat of a sub-prefect and of a tribunal of first instance; and has silk-mills, and carries on silk-spinning, wine-growing and trade in fruit and silk. It owes its name to silver-mines worked in the vicinity in the middle ages.

LARGILLIÈRE, NICOLAS (1656–1746), French painter, was born at Paris on the 20th of October 1656. His father, a merchant, took him to Antwerp at the age of three, and while a lad he spent nearly two years in London. The attempt to turn his attention to business having failed, he entered, some time after his return to Antwerp, the studio of Goubeau, quitting this at the age of eighteen to seek his fortune in England, where he was befriended by Lely, who employed him for four years at Windsor. His skill attracted the notice of Charles II., who wished to retain him in his service, but the fury aroused against Roman Catholics by the Rye House Plot alarmed Largillière, and he went to Paris, where he was well received by Le Brun and Van der Meulen. In spite of his Flemish training, his reputation, especially as a portrait-painter, was soon established; his brilliant colour and lively touch attracted all the celebrities of the day—actresses, public men and popular preachers flocking to his studio. Huet, bishop of Avranches, Cardinal de Noailles, the Duclos and President Lambert, with his beautiful wife and daughter, are amongst his most noted subjects. It is said that James II. recalled Largillière to England on his accession to the throne in 1685, that he declined the office of keeper of the royal collections, but that, during a short stay in London, he painted portraits of the king, the queen and the prince of Wales. This last is impossible, as the birth of the prince did not take place till 1688; the three portraits, therefore, painted by Largillière of the prince in his youth must all have been executed in Paris, to which city he returned some time before March 1686, when he was received by the Academy as a member, and presented as his diploma picture the fine portrait of Le Brun, now in the Louvre. He was received as an historical painter; but, although he occasionally produced works of that class ("Crucifixion," engraved by Roettiers), and also treated subjects of still life, it was in historical portraits that he excelled. Horace Walpole states that he left in London those of Pierre van der Meulen and of Sybrecht. Several of his works are at Versailles. The church of St Étienne du Mont at Paris contains the finest example of Largillière's work when dealing with large groups of figures; it is an *ex voto* offered by the city to St Geneviève, painted in 1694, and containing portraits of all the leading officers of the municipality. Largillière passed through every post of honour in the Academy, until in 1743 he was made chancellor. He died on the 20th of March 1746. Jean Baptiste Oudry was the most distinguished of his pupils. Largillière's work found skilful interpreters in Van Schuppen, Edelinck, Desplaces, Drevet, Pitou and other engravers.

LARGS, a police burgh and watering place of Ayrshire, Scotland. Pop. (1901) 3246. It is situated 43 m. W. by S. of Glasgow by the Glasgow & South-Western railway. Its fine beach and dry, bracing climate have attracted many wealthy residents, and the number of summer visitors is also large. The public buildings include the Clark hospital, the Victoria infirmary convalescent home and the Stevenson institute and mechanics' library. Skelmorlie Aisle, the sole relic of the old parish church of St Columba, was converted into a mausoleum in 1636. Near it a mound covers remains, possibly those of the Norwegians who fell in the battle (1263) between Alexander III. and Haco, king of Norway. The harbour is used mainly by Clyde passenger steamers and yachtsmen. From the quay a broad esplanade has been constructed northwards round the bay, and there is an excellent golf course. Kelburne Castle, 2 m. S., a seat of the earl of Glasgow, stands in romantic scenery. FAIRLIE, 3 m. S., another seaside resort, with a station on the Glasgow & South-Western railway, is the connecting-point for Millport on Great Cumbrae. Once a fishing village, it has acquired a great reputation for its yachts.

LARGUS, SCRIBONIUS, court physician to the emperor Claudius. About A.D. 47, at the request of Gaius Julius Callistus, the emperor's freedman, he drew up a list of 271 prescriptions (*Compositiones*), most of them his own, although he acknowledged his indebtedness to his tutors, to friends and to the writings of eminent physicians. Certain old wives' remedies are also included. The work has no pretensions to style, and contains many colloquialisms. The greater part of it was transferred without acknowledgment to the work of Marcellus Empiricus (*c.* 410), *De Medicamentis Empiricis, Physicis, et Rationabilibus*, which is of great value for the correction of the text of Largus.

See the edition of the *Compositiones* by G. Helmreich (Teubner series, 1887).

LARINO (anc. *Larinum*) a town and episcopal see of the Molise (province of Campobasso), Italy, 32 m. N.E. of Campobasso by rail (20 m. direct), 984 ft. above sea-level. Pop. (1901) 7044. The cathedral, completed in 1319, has a good Gothic façade; the interior has to some extent been spoilt by later restoration. The campanile rests upon a Gothic arch erected in 1451. The Palazzo Comunale has a courtyard of the 16th century. That the ancient town (which is close to the modern) existed before the Roman supremacy had extended so far is proved by the coins. It lay in the 2nd Augustan region (Apulia), but the people belonged to the Frentani by race. Its strong position gave it importance in the military history of Italy from the Hannibalic wars onwards. The town was a *municipium*, situated on the main road to the S.E., which left the coast at Histonium (Vasto) and ran from Larinum E. to Sipontum. From Larinum a branch road ran to Bovianum Vetus. Remains of its city walls, of its amphitheatre and also of baths, &c., exist, and it did not cease to be inhabited until after the earthquake of 1300, when the modern city was established. Cluentius, the client of Cicero, who delivered a speech in his favour, was a native of Larinum, his father having been praetor of the allied forces in the Social War. (T. As.)

LARISSA (Turk. *Yeni Shehr*, "new town"), the most important town of Thessaly, situated in a rich agricultural district on the right bank of the Salambria (Peneios, Peneus, Peneius), about 35 m. N.W. of Volo, with which it is connected by rail. Pop. (1889) 13,610, (1907) 18,001. Till 1881 it was the seat of a pasha in the vilayet of Jannina; it is now the capital of the Greek province and the seat of a nomarch. Its long subjection to Turkey has left little trace of antiquity, and the most striking features in the general view are the minarets of the disused mosques (only four are now in use) and the Mahommedan burying-grounds. It was formerly a Turkish military centre and most of the people were of Turkish blood. In the outskirts is a village of Africans from the Sudan—a curious remnant of the forces collected by Ali Pasha. The manufactures include Turkish leather, cotton, silk and tobacco; trade and industry, however, are far from prosperous, though improving owing to the immigration of the Greek commercial element. Fevers and agues are prevalent owing to bad drainage and the overflowing of the river; and the death-rate is higher than the birth-rate. A considerable portion of the Turkish population emigrated in 1881; a further exodus took place in 1898. The department of Larissa had in 1907 a population of 95,066.

Larissa, written Larisa on ancient coins and inscriptions, is near the site of the Homeric Argissa. It appears in early times, when Thessaly was mainly governed by a few aristocratic families, as an important city under the rule of the Aleuadae, whose authority extended over the whole district of Pelasgiotis. This powerful family possessed for many generations before 369 B.C. the privilege of furnishing the Tagus, or generalissimo, of the combined Thessalian forces. The principal rivals of the Aleuadae were the Scopadae of Crannon, the remains of which (called by the Turks *Old Larissa*) are about 14 m. to the S.W. The inhabitants sided with Athens during the Peloponnesian War, and during the Roman invasion their city was of considerable importance. Since the 5th century it has been the seat of an archbishop, who has now fifteen suffragans. Larissa was the headquarters of Ali Pasha during the Greek War of Independence, and of the crown prince Constantine during the Greco-Turkish War; the flight of the Greek army from this place to Pharsala took place on the 23rd of April 1897. Notices of some ancient inscriptions found at Larissa are given by Miller in *Mélanges philologiques* (Paris, 1880); several sepulchral reliefs were found in the neighbourhood in 1882. A few traces of the ancient acropolis and theatre are still visible.

The name Larissa was common to many "Pelasgian" towns, and apparently signified a fortified city or *burg*, such as the citadel of Argos. Another town of the name in Thessaly was Larissa Cremaste, surnamed Pelasgia (Strabo ix. p. 440), situated on the slope of Mt. Othrys. (J. D. B.)

LĀRISTĀN, a sub-province of the province of Fars in Persia, bounded E. and N.E. by Kerman and S. by the Persian Gulf. It lies between 26° 30′ and 28° 25′ N. and between 52° 30′ and 55° 30′ E. and has an extreme breadth and length of 120 and 210 m. respectively, with an area of about 20,000 sq. m. Pop. about 90,000. Laristan consists mainly of mountain ranges in the north and east, and of arid plains varied with rocky hills and sandy valleys stretching thence to the coast. In the highlands, where some fertile upland tracts produce corn, dates and other fruits, the climate is genial, but elsewhere it is extremely sultry, and on the low-lying coast lands malarious. Good water is everywhere so scarce that but for the rain preserved in cisterns the country would be mostly uninhabitable. Many cisterns are infested with Guinea worm (*filaria medinensis*, Gm.). The coast is chiefly occupied by Arab tribes who were virtually independent, paying merely a nominal tribute to the shah's government until 1898. They reside in small towns and mud forts scattered along the coast. The people of the interior are mostly of the old Iranian stock, and there are also a few nomads of the Turkish Bahārlū tribe which came to Persia in the 11th century when the province was subdued by a Turkish chief. Laristan remained an independent state under a Turkish ruler until 1602, when Shah Ibrahim Khan was deposed and put to death by Shah 'Abbas the Great. The province is subdivided into eight districts: (1) Lar, the capital and environs, with 34 villages; (2) Bikhah Ihsham with 11; (3) Bikhah Fal with 10; (4) Jehangiriyeh with 30; (5) Shibkuh with 36; (6) Fumistan with 13; (7) Kauristan with 4; (8) Mazayijan with 6 villages. Lingah, with its principal place Bander Lingah and 11 villages. formerly a part of Laristan, is now included in the "Persian Gulf Ports," a separate administrative division. Laristan is famous for the condiment called *māhiābeh* (fish-jelly), a compound of pounded small sprat-like fish, salt, mustard, nutmeg, cloves and other spices, used as a relish with nearly all foods.

LARIVEY, PIERRE (*c.* 1550–1612), French dramatist, of Italian origin, was the son of one of the Giunta, the famous printers of Florence and Venice. The family was established at Troyes and had taken the name of Larivey or L'Arrivey, by way of translation from *giunto*. Pierre Larivey appears to have cast horoscopes, and to have acted as clerk to the chapter of the church of St Étienne, of which he eventually became a canon. He has no claim to be the originator of French comedy. The *Corrivaux* of Jean de la Taille dates from 1562, but Larivey naturalized the Italian comedy of intrigue in France. He adapted, rather than translated, twelve Italian comedies into French prose. The first volume of the *Comédies facétieuses* appeared in 1579, and the second in 1611. Only nine in all were printed.[1] The licence of the manners depicted in these plays is matched by the coarseness of the expression. Larivey's merit lies in the use of popular language in dialogue, which often rises to real excellence, and was not without influence on Molière and Regnard. Molière's *L'Avare* owes something to the scene in Larivey's masterpiece, *Les Esprits*, where Séverin laments the loss of his purse, and the opening scene of the piece seems to have suggested Regnard's *Retour imprévu*. It is uncertain whether Larivey's plays were represented, though they were evidently written for the stage. In any case prose comedy gained very little ground in popular favour before the time of Molière. Larivey was the author of many translations, varying in subject from the *Facétieuses nuits* (1573) of Straparola to the *Humanité de Jésus-Christ* (1604) from Pietro Aretino.

LARK (O. Eng. *láwerce*, Ger. *Lerche*, Dan. *Laerke*, Dutch *Leeuwerik*), a bird's name used in a rather general sense, the specific meaning being signified by a prefix, as skylark, titlark, woodlark. It seems to be nearly conterminous with the Latin *Alauda* as used by older authors; and, though this was to some extent limited by Linnaeus, several of the species included by him under the genus he so designated have long since been referred elsewhere. By Englishmen the word lark, used without qualification, almost invariably means the skylark, *Alauda arvensis*, which, as the best-known and most widely spread species throughout Europe, has been invariably considered the type of the genus. Of all birds it holds unquestionably the foremost place in English literature. It is one of the most favourite cage birds, as it will live for many years in captivity, and, except in the season of moult, will pour forth its thrilling song many times in an hour for weeks or months together. The skylark is probably the most plentiful of the class in western Europe. Not only does it frequent almost all unwooded districts in that quarter of the globe, but, unlike most birds, its numbers increase with the spread of agricultural improvement. Nesting chiefly in the growing corn, its eggs and young are protected in a great measure from molestation; and, as each pair of birds will rear several broods in the season, their produce on the average may be set down as at least quadrupling the original stock—the eggs in each nest varying from five to three. Young larks leave their birthplace as soon as they can shift for themselves. When the stubbles are cleared, old and young congregate in flocks.

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[1] *Le Laquais*, from the *Ragazzo* of Ludovico Dolce; *La Veuve*, from the *Vedova* of Nicolo Buonaparte; *Les Esprits*, from the *Aridosio* of Lorenzino de Medicis; *Le Morfondu*, from the *Gelosia* of Antonio Grazzini; *Les Jaloux*, from the *Gelosi* of Vincent Gabbiani; and *Les Escolliers*, from the *Cecca* of Girolamo Razzi, in the first volume; and in the second, *Constance*, from the *Costanza* of Razzi; *Le Fidèle*, from the *Fedele* of Luigi Pasqualigo; and *Les Tromperies*, from the *Inganni* of N. Secchi.

In Great Britain in the autumn they give place to others coming from more northerly districts, and then as winter succeeds in great part vanish, leaving but a tithe of the numbers previously present. On the approach of severe weather great flocks arrive from the continent of Europe. On the east coast of both Scotland and England this immigration has been noticed as occurring in a constant stream for as many as three days in succession. Farther inland the birds are observed "in numbers simply incalculable," and "in countless hundreds." In these migrations enormous numbers are netted for the markets, but the rate of reproduction is so rapid, and the conditions of life so favourable in Europe that there is no reason to fear any serious diminution in the numbers of the species.

The skylark's range extends across the Old World from the Faeroe to the Kurile Islands. In winter it occurs in North China, Nepal, the Punjab, Persia, Palestine, Lower Egypt and Barbary. It sometimes strays to Madeira, and has been killed in Bermuda, though its unassisted appearance there is doubtful. It has been successfully introduced on Long Island, in the state of New York, into Hawaii and into New Zealand—in which latter it has become as troublesome a denizen as are some other subjects upon which acclimatization societies have exercised their activity.

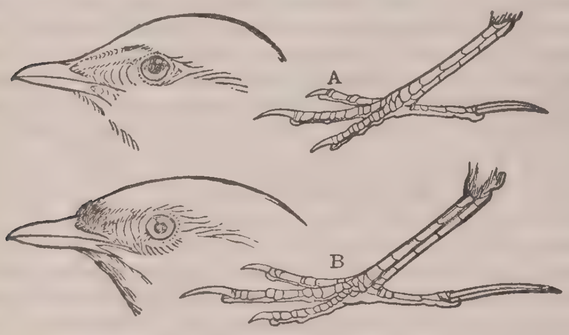

Fig. 1.—A, *Alauda agrestis*; B, *Alauda arvensis*.

Allied to the skylark a considerable number of species have been described, of which perhaps a dozen may be deemed valid, besides a supposed local race, *Alauda agrestis*, the difference between which and the normal bird is shown in the annexed woodcut (fig. 1), kindly lent to this work by H. E. Dresser, in whose *Birds of Europe* it is described at length. These are found in various parts of Africa and Asia.

The woodlark, *Lullula arborea*, is a much more local and, therefore, a far less numerous bird than the skylark, from which it may be easily distinguished by its finer bill, shorter tail, more spotted breast and light superciliary stripe. Though not actually inhabiting woods, as its common name might imply, it is seldom found far from trees. Its song wants the variety and power of the skylark's, but has a resonant sweetness peculiarly its own. The bird, however, requires much care in captivity. It has by no means so wide a range as the skylark, and perhaps the most eastern locality recorded for it is Erzerum, while its appearance in Egypt and even in Algeria must be accounted rare.

Not far removed from the foregoing is a group of larks characterized by a larger crest, a stronger and more curved bill, a rufous lining to the wings, and some other minor features. This group has been generally termed *Galerita*, and has for its type the crested lark, the *Alauda cristata* of Linnaeus, a bird common enough in parts of France and some other countries of the European continent, and one which has been obtained several times in the British Islands. Many of the birds of this group frequent the borders if not the interior of deserts, and such as do so exhibit a more or less pale coloration, whereby they are assimilated in hue to that of their haunts. The same characteristic may be observed in several other groups—especially those known as belonging to the genera *Calandrella*, *Ammomanes* and *Certhilauda*, some species of which are of a light sandy or cream colour. The genus last named is of very peculiar appearance, presenting in some respects an extraordinary resemblance to the hoopoes, so much so that the first specimen described was referred to the genus *Upupa*, and named *U. alaudipes*. The resemblance, however, is merely one of analogy.

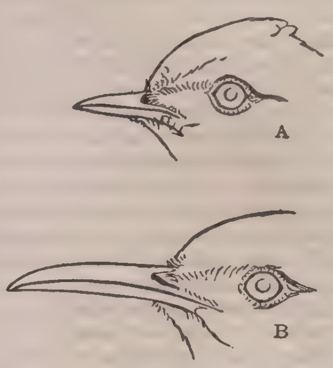

Fig. 2.—A, *Lullula arborea*; B, *Certhilauda*.

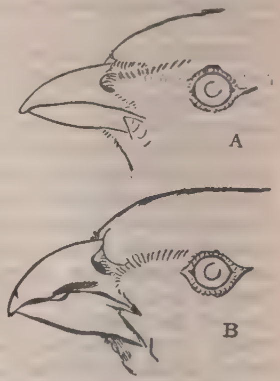

Fig. 3.—A, *Melanocorypha calandra*; B, *Rhamphocorys clot-bey*.

There is, however, abundant evidence of the susceptibility of the Alaudine structure to modification from external circumstances—in other words, of its plasticity; and perhaps no homogeneous group of *Passeres* could be found which better displays the working of natural selection. Almost every character that among Passerine birds is accounted most sure is in the larks found subject to modification. The form of the bill varies in an extraordinary degree. In the woodlark (fig. 2, A), already noticed, it is almost as slender as a warbler's; in *Ammomanes* it is short; in *Certhilauda* (fig. 2, B) it is elongated and curved; in *Pyrrhulauda* and *Melanocorypha* (fig. 3, A) it is stout and finchlike; while in *Rhamphocorys* (fig. 3, B) it is exaggerated to an extent that surpasses almost any Fringilline form, exceeding in its development that found in some members of the perplexing genus *Paradoxornis*, and even presenting a resemblance to the same feature in the far-distant *Anastomus*—the tomia of the maxilla not meeting those of the mandibula along their whole length, but leaving an open space between them. The hind claw, generally greatly elongated in larks, is in *Calandrella* (fig. 4) and some other genera reduced to a very moderate size. The wings exhibit almost every modification, from the almost entire abortion of the first primary in the skylark to its considerable development (fig. 5), and from tertials and scapulars of ordinary length to the extreme elongation found in the *Motacillidae* and almost in certain *Limicolae*. The most constant character indeed of the *Alaudidae* would seem to be that afforded by the *podotheca* or covering of the tarsus, which is scutellate behind as well as in front, but a character easily overlooked.[1]

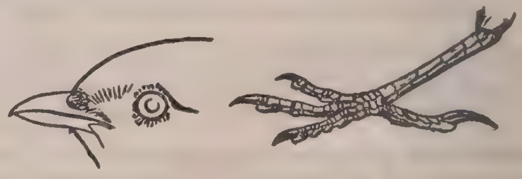

Fig. 4.—*Calandrella brachydactyla*.

In the Old World larks are found in most parts of the

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[1] By assigning far too great an importance to this superficial character (in comparison with others), C. J. Sundevall (*Tentamen*, pp. 53-63) was induced to array the larks, hoopoes and several other heterogeneous groups in one "series," to which he applied the name of *Scutelliplantares*.

Palaearctic, Ethiopian and Indian regions; but only one genus, *Mirafra*, inhabits Australia, where it is represented by, so far as is ascertained, a single species, *M. horsfieldi*; and there is no true lark indigenous to New Zealand. In the New World there is also only one genus, *Otocorys*, where it is represented by many races, some of which closely approach the Old World shore-lark, *O. alpestris*. The shore-lark is in Europe a native of only the extreme north, but is very common near the shores of the Varanger Fjord, and likewise breeds on mountain-tops farther south-west, though still well within the Arctic circle. The mellow tone of its call-note has obtained for it in Lapland a name signifying "bell-bird," and the song of the cock is lively, though not very loud. The bird trustfully resorts to the neighbourhood of houses, and even enters the villages of East Finmark in search of its food. It produces at least two broods in the season, and towards autumn migrates to lower latitudes in large flocks. These have been observed in winter on the east coast of Great Britain, and the species instead of being regarded, as it once was, in the light of an accidental visitor to the United Kingdom, must now be deemed an almost regular visitor, though in very varying numbers. The observations on its habits made by Audubon in Labrador have long been known, and often reprinted. Other congeners of this bird are the *O. penicillata* of south-eastern Europe, Palestine and central Asia—to which are referred by H. E. Dresser (*B. Europe*, iv. 401) several other forms originally described as distinct. All these birds, which have been termed horned larks, from the tuft of elongated black feathers growing on each side of the head, form a little group easily recognized by their peculiar coloration, which calls to mind some of the ringed plovers, *Aegialitis*.

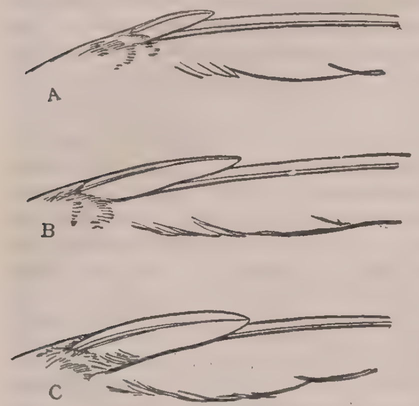

FIG. 5.—A, *Alauda arborea*; B, *Certhilauda*; C, *Melanocorypha calandra*.

The name of lark is also frequently applied to many birds which do not belong to the *Alaudidae* as now understood. The mud-lark, rock-lark, tit-lark and tree-lark are pipits (*q.v.*). The grasshopper-lark is one of the aquatic warblers (*q.v.*), while the so-called meadow-lark of America is an Icterus (*q.v.*). Sand-lark and sea-lark are likewise names often given to some of the smaller members of the *Limicolae*. Of the true larks, *Alaudidae*, there may be perhaps about one hundred species, and it is believed to be a physiological character of the family that they moult but once in the year, while the pipits, which in general appearance much resemble them, undergo a double moult, as do others of the *Motacillidae*, to which they are most nearly allied. (A. N.)

LARKHALL, a mining and manufacturing town of Lanarkshire, Scotland, near the left bank of the Clyde, 1 m. S.E. of Glasgow by the Caledonian railway. Pop. (1901) 11,879. The highest bridge in Scotland has been thrown across the river Avon, which flows close by. Brick-making is carried on at several of the adjoining collieries. Other industries include bleaching, silk-weaving, fire-clay and enamelling works, and a sanitary appliances factory. The town has a public hall and baths.

LARKHANA, a town and district of British India, in Sind, Bombay. The town is on a canal not far from the Indus, and has a station on the North-Western railway, 281 m. N. by E. of Karachi. It is pleasantly situated in a fertile locality, and is well laid out with wide streets and spacious gardens. It is a centre of trade, with manufactures of cotton, silk, leather, metal-ware and paper. Pop. (1901) 14,543.

The DISTRICT OF LARKHANA, lying along the right bank of the Indus, was formed out of portions of Sukkur and Karachi districts in 1901, and has an area of 5091 sq. m.; pop. (1901) 656,083, showing an increase of 10% in the decade. Its western part is mountainous, but the remainder is a plain of alluvium watered by canals and well cultivated, being the most fertile part of Sind. The staple grain-crops are rice, wheat and millets, which are exported, together with wool, cotton and other agricultural produce. Cotton cloth, carpets, salt and leather goods are manufactured, and dyeing is an important industry. The district is served by the North-Western railway.

LARKSPUR, in botany, the popular name for species of *Delphinium*, a genus of hardy herbaceous plants belonging to the natural order Ranunculaceae (*q.v.*). They are of erect branching habit, with the flowers in terminal racemes, often of considerable length. Blue is the predominating colour, but purple, pink, yellow (*D. Zalil* or *sulphureum*), scarlet (*D. cardinale*) and white also occur; the "spur" is produced by the elongation of the upper sepal. The field or rocket larkspur (*D. Ajacis*), the branching larkspur (*D. consolida*), *D. cardiopetalum* and their varieties, are charming annuals; height about 18 in. The spotted larkspur (*D. requienii*) and a few others are biennials. The perennial larkspurs, however, are the most gorgeous of the family. There are numerous species of this group, natives of the old and new worlds, and a great number of varieties, raised chiefly from *D. exaltatum*, *D. formosum* and *D. grandiflorum*. Members of this group vary from 2 ft. to 6 ft. in height.

The larkspurs are of easy cultivation, either in beds or herbaceous borders; the soil should be deeply dug and manured. The annual varieties are best sown early in April, where they are intended to flower, and suitably thinned out as growth is made. The perennial kinds are increased by the division of existing plants in spring, or by cuttings taken in spring or autumn and rooted in pots in cold frames. The varieties cannot be perpetuated with certainty by seed. Seed is the most popular means, however, of raising larkspurs in the majority of gardens, and is suitable for all ordinary purposes; it should be sown as soon as gathered, preferably in rows in nursery beds, and the young plants transplanted when ready. They should be fit for the borders in the spring of the following year, and if strong, should be planted in groups about 3 ft. apart. Delphiniums require exposure to light and air. Given plenty of space in a rich soil, the plants rarely require to be staked except in windy localities.

LARNACA, LARNICA or LARNECA (anc. *Citium*, Turk. *Tuzla*), a town of the island of Cyprus, at the head of a bay on the south coast, 23 m. S.S.E. from Nicosia. Pop. (1901) 7964. It is the principal port of the island, exporting barley, wheat, cotton, raisins, oranges, lemons and gypsum. There is an iron pier 450 ft. long, but vessels anchor in the bay in from 16 to 70 ft. of water. Larnaca occupies the site of the ancient *Citium*, but the citadel of the ancient city was used to fill up the ancient harbour in 1879. The modern and principal residential part of the town is called Scala. Mycenaean tombs and other antiquities have been found (see CYPRUS).

LA ROCHE, a small town in the Belgian Ardennes, noticeable for its antiquity and its picturesque situation. Pop. (1904) 2065. Its name is derived from its position on a rock commanding the river Ourthe, which meanders round the little place, and skirts the rock on which are the interesting ruins of the old castle of the 11th century. This is supposed to have been the site of a hunting box of Pippin, and certainly the counts of La Roche held it in fief from his descendants, the Carolingian rulers. In the 12th century they sold it to the counts of Luxemburg. In the 16th and 17th centuries the French and Imperialists frequently fought in its neighbourhood, and at Tenneville, not far distant, is shown the tomb of an English officer named Barnewall killed in one of these encounters in 1692. La Roche is famous as a tourist centre on account of its fine sylvan scenery. Among the local curiosities is the Diable-Château, a freak of nature, being the apparent replica of a medieval castle. La

Roche is connected by steam tramway with Melreux, a station on the main line from Marloie to Liége.

LA ROCHEFOUCAULD, the name of an old French family which is derived from a castle[1] in the province of Angoumois (department of Charente), which was in its possession in the 11th century. François de La Rochefoucauld (1494–1517), godson of King Francis I., was made count in 1515. At the time of the wars of religion the family fought for the Protestant cause. François (1588–1650) was created duke and peer of France by Louis XIII. in 1622. His son François was the author of the *Maxims*, and the son of the latter acquired for his house the estates of La Roche-Guyon and Liancourt by his marriage with Jeanne Charlotte du Plessis-Liancourt. Alexandre, duc de La Rochefoucauld (d. 1762), left two daughters, who married into the Roye branch of the family. Of the numerous branches of the family the most famous are those of Roucy, Roye, Bayers, Doudeauville, Randan and Estissac, which all furnished distinguished statesmen and soldiers.

LA ROCHEFOUCAULD, FRANÇOIS DE (1613–1680), the greatest maxim writer of France, one of her best memoir writers, and perhaps the most complete and accomplished representative of her ancient nobility, was born at Paris in the Rue des Petits Champs on the 15th of September 1613. The author of the *Maxims*, who during the lifetime of his father (see above) and part of his own most stirring years bore the title of prince de Marcillac, was somewhat neglected in the matter of education, at least of the scholastic kind; but he joined the army before he was sixteen, and almost immediately began to make a figure in public life. He had been nominally married a year before to Andrée de Vivonne, who seems to have been an affectionate wife, while not a breath of scandal touches her—two points in which La Rochefoucauld was perhaps more fortunate than he deserved. For some years Marcillac continued to take part in the annual campaigns, where he displayed the utmost bravery, though he never obtained credit for much military skill. Then he passed under the spell of Madame de Chevreuse, the first of three celebrated women who successively influenced his life. Through Madame de Chevreuse he became attached to the queen, Anne of Austria, and in one of her quarrels with Richelieu and her husband a wild scheme seems to have been formed, according to which Marcillac was to carry her off to Brussels on a pillion. These caballings against Richelieu, however, had no more serious results (an eight days' experience of the Bastille excepted) than occasional exiles, that is to say, orders to retire to his father's estates. After the death of the great minister (1642), opportunity seemed to be favourable to the vague ambition which then animated half the nobility of France. Marcillac became one of the so-called *importants*, and took an active part in reconciling the queen and Condé in a league against Gaston of Orleans. But the growing credit of Mazarin came in his way, and the *liaison* in which about this time (1645) he became entangled with the beautiful duchess of Longueville made him irrevocably a Frondeur. He was a conspicuous figure in the siege of Paris, fought desperately in the desultory engagements which were constantly taking place, and was severely wounded at the siege of Mardyke. In the second Fronde Marcillac followed the fortunes of Condé, and the death of his father, which happened at the time (1650), gave rise to a characteristic incident. The nobility of the province gathered to the funeral, and the new duke de La Rochefoucauld took the opportunity of persuading them to follow him in an attempt on the royalist garrison of Saumur, which, however, was not successful. We have no space to follow La Rochefoucauld through the tortuous cabals and negotiations of the later Fronde; it is sufficient to say that he was always brave and generally unlucky. His run of bad fortune reached its climax in the battle of the Faubourg Saint Antoine (1652), where he was shot through the head, and it was thought that he would lose the sight of both eyes. It was nearly a year before he recovered, and then he found himself at his country seat of Verteuil, with no result of twenty years' fighting and intriguing except impaired health, a seriously embarrassed fortune, and some cause for bearing a grudge against almost every party and man of importance in the state. He spent some years in this retirement, and he was fortunate enough (thanks chiefly to the fidelity of Gourville, who had been in his service, and who, passing into the service of Mazarin and of Condé, had acquired both wealth and influence) to be able to repair in some measure the breaches in his fortune. He did not, however, return to court life much before Mazarin's death, when Louis XIV. was on the eve of assuming absolute power, and the turbulent aristocratic anarchy of the Fronde was a thing utterly of the past.

Somewhat earlier, La Rochefoucauld had taken his place in the salon of Madame de Sablé, a member of the old Rambouillet coterie, and the founder of a kind of successor to it. It was known that he, like almost all his more prominent contemporaries, had spent his solitude in writing memoirs, while the special literary employment of the Sablé salon was the fabrication of *Sentences* and *Maxims*. In 1662, however, more trouble than reputation, and not a little of both, was given to him by a surreptitious publication of his memoirs, or what purported to be his memoirs, by the Elzevirs. Many of his old friends were deeply wounded, and he hastened to deny flatly the authenticity of the publication, a denial which (as it seems, without any reason) was not very generally accepted. Three years later (1665) he published, though without his name, the still more famous *Maxims*, which at once established him high among the men of letters of the time. About the same date began the friendship with Madame de la Fayette, which lasted till the end of his life. The glimpses which we have of him henceforward are chiefly derived from the letters of Madame de Sévigné, and, though they show him suffering agonies from gout, are on the whole pleasant. He had a circle of devoted friends; he was recognized as a moralist and man of letters of the first rank; he might have entered the Academy for the asking; and in the altered measure of the times his son, the prince de Marcillac, to whom some time before his death he resigned his titles and honours, enjoyed a considerable position at court. Above all, La Rochefoucauld was generally recognized by his contemporaries from the king downward as a type of the older noblesse as it was before the sun of the great monarch dimmed its brilliant qualities. This position he has retained until the present day. He died at Paris on the 17th of March 1680, of the disease which had so long tormented him.

La Rochefoucauld's character, if considered without the prejudice which a dislike to his ethical views has sometimes occasioned, is thoroughly respectable and even amiable. Like almost all his contemporaries, he saw in politics little more than a chessboard where the people at large were but pawns. The weight of testimony, however, inclines to the conclusion that he was unusually scrupulous in his conduct, and that his comparative ill-success in the struggle arose more from this scrupulousness than from anything else. He has been charged with irresolution, and there is some ground for admitting the charge so far as to pronounce him one of those the keenness of whose intellect, together with their apprehension of both sides of a question, interferes with their capacity as men of action. But there is no ground whatever for the view which represents the *Maxims* as the mere outcome of the spite of a disappointed intriguer, disappointed through his own want of skill rather than of fortune.

His importance as a social and historical figure is, however, far inferior to his importance in literature. His work in this respect consists of three parts—letters, *Memoirs* and the *Maxims*. His letters exceed one hundred in number, and are biographically valuable, besides displaying not a few of his literary characteristics; but they need not further detain us. The *Memoirs*, when they are read in their proper form, yield in literary merit, in interest, and in value to no memoirs of the time, not even to those of Retz, between whom and La Rochefoucauld there was a strange mixture of enmity and esteem which resulted in a couple of most characteristic "portraits." But their history is unique in its strangeness. It has been said that a pirated edition appeared in Holland, and this, despite the author's protest, continued to be reprinted for some thirty years. It has been now proved to be a mere cento of the work of half a dozen different men, scarcely a third of which is La Rochefoucauld's, and which could only have been possible at a time when it was the habit of persons who frequented literary society to copy pell-mell in commonplace books the MS. compositions of their friends and others. Some years after La Rochefoucauld's death a new recension appeared, somewhat less incorrect than the former, but still largely adulterated, and this held its ground for more than a century. Only in 1817 did anything like a genuine edition (even then by no means perfect) appear. The *Maxims*, however, had no such fate. The author re-edited them frequently during his life, with alterations and additions; a few were added after his death, and it is usual now to print the whole of them, at whatever time they appeared, together. Thus taken, they amount to about seven hundred in number, in hardly any case exceeding half a page in length, and more frequently confined to two or three lines. The view of conduct which they illustrate is usually and not quite incorrectly summed up in the words "everything is reducible to the motive of self-interest." But though not absolutely incorrect, the phrase is misleading. The *Maxims* are in no respect mere deductions from or applications of any such general theory. They are on the contrary independent judgments on different relations of life, different affections of the human mind, and so forth, from which, taken together, the general view may be deduced or rather composed. Sentimental moralists have protested loudly against this view, yet it is easier to declaim against it in general than to find a flaw in the several parts of which it is made up. With a few exceptions La Rochefoucauld's maxims represent the matured result of the reflection of a man deeply versed in the business and pleasures of the world, and possessed of an extraordinarily fine and acute intellect, on the conduct and motives which have guided himself and his fellows. There is as little trace in them of personal spite as of *forfanterie de vice*. But the astonishing excellence of the literary medium in which they are conveyed is even more remarkable than the general soundness of their ethical import. In uniting the four qualities of brevity, clearness, fulness of meaning and point, La Rochefoucauld has no rival. His *Maxims* are never mere epigrams; they are never platitudes; they are never dark sayings. He has packed them so full of meaning that it would be impossible to pack them closer, yet there is no undue compression; he has sharpened their point to the utmost, yet there is no loss of substance. The comparison which occurs most frequently, and which is perhaps on the whole the justest, is that of a bronze medallion, and it applies to the matter no less than to the form. Nothing is left unfinished, yet none of the workmanship is finical. The sentiment, far from being merely hard, as the sentimentalists pretend, has a vein of melancholy poetry running through it which calls to mind the traditions of La Rochefoucauld's devotion to the romances of chivalry. The maxims are never shallow; each is the text for a whole sermon of application and corollary which any one of thought and experience can write. Add to all this that the language in which they are written is French, still at almost its greatest strength, and chastened but as yet not emasculated by the reforming influence of the 17th century, and it is not necessary to say more. To the literary critic no less than to the man of the world La Rochefoucauld ranks among the scanty number of pocket-books to be read and re-read with ever new admiration, instruction and delight.

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[1] The castle was largely rebuilt in the reign of Francis I., and is one of the finest specimens of the Renaissance architecture in France.

The editions of La Rochefoucauld's *Maxims* (as the full title runs, *Réflexions ou sentences et maximes morales*) published in his lifetime bear the dates 1665 (*editio princeps*), 1666, 1671, 1675, 1678. An important edition which appeared after his death in 1693 may rank almost with these. As long as the *Memoirs* remained in the state above described, no edition of them need be mentioned, and none of the complete works was possible. The previous more or less complete editions are all superseded by that of MM Gilbert and Gourdault (1868–1883), in the series of "Grands Écrivains de la France," 3 vols. There are still some puzzles as to the text; but this edition supplies all available material in regard to them. The handsomest separate edition of the *Maxims* is the so-called *Édition des bibliophiles* (1870); but cheap and handy issues are plentiful. See the English version by G. H. Powell (1903). Nearly all the great French critics of the 19th century have dealt more or less with La Rochefoucauld: the chief recent monograph on him is that of J. Bourdeau in the *Grands écrivains français* (1893). (G. Sa.)

LA ROCHEFOUCAULD-LIANCOURT, FRANÇOIS ALEXANDRE FRÉDÉRIC, Duc de (1747–1827), French social reformer, was born at La Roche Guyon on the 11th of January 1747, the son of François Armand de La Rochefoucauld, duc d'Estissac, grand master of the royal wardrobe. The duc de Liancourt became an officer of carbineers, and married at seventeen. A visit to England seems to have suggested the establishment of a model farm at Liancourt, where he reared cattle imported from England and Switzerland. He also set up spinning machines on his estate, and founded a school of arts and crafts for the sons of soldiers, which became in 1788 the École des Enfants de la Patrie under royal protection. Elected to the states-general of 1789 he sought in vain to support the cause of royalty while furthering the social reforms he had at heart. On the 12th of July, two days before the fall of the Bastille, he warned Louis XVI. of the state of affairs in Paris, and met his exclamation that there was a revolt with the answer, "*Non, sire, c'est une révolution.*" On the 18th of July he became president of the Assembly. Established in command of a military division in Normandy, he offered Louis a refuge in Rouen, and, failing in this effort, assisted him with a large sum of money. After the events of the 10th of August 1792 he fled to England, where he was the guest of Arthur Young, and thence passed to America. After the assassination of his cousin, Louis-Alexandre, duc de La Rochefoucauld d'Enville, at Gisors on the 14th of September 1792 he assumed the title of duc de La Rochefoucauld. He returned to Paris in 1799, but received small favour from Napoleon. At the Restoration he entered the House of Peers, but Louis XVIII. refused to reinstate him as master of the wardrobe, although his father had paid 400,000 francs for the honour. Successive governments, revolutionary and otherwise, recognized the value of his institutions at Liancourt, and he was for twenty-three years government inspector of his school of arts and crafts, which had been removed to Châlons. He was one of the first promoters of vaccination in France; he established a dispensary in Paris, and he was an active member of the central boards of administration for hospitals, prisons and agriculture. His opposition to the government in the House of Peers led to his removal in 1823 from the honorary positions he held, while the vaccination committee, of which he was president, was suppressed. The academies of science and of medicine admitted him to their membership by way of protest. Official hostility pursued him even after his death (27th of March 1827), for the old pupils of his school were charged by the military at his funeral. His works, chiefly on economic questions, include books on the English system of taxation, poor-relief and education.

His eldest son, François, duc de La Rochefoucauld (1765–1848), succeeded his father in the House of Peers. The second, Alexandre, comte de La Rochefoucauld (1767–1841), married a San Domingo heiress allied to the Beauharnais family. Mme de La Rochefoucauld became dame d'honneur to the empress Josephine, and their eldest daughter married a brother-in-law of Pauline Bonaparte, Princess Borghese. La Rochefoucauld became ambassador successively to Vienna (1805) and to the Hague (1808–1810), where he negotiated the union of Holland with France. During the "Hundred Days" he was made a peer of France. He subsequently devoted himself to philanthropic work, and in 1822 became deputy to the Chamber and sat with the constitutional royalists. He was again raised to the peerage in 1831.

The third son, Frédéric Gaétan, marquis de La Rochefoucauld-Liancourt (1779–1863), was a zealous philanthropist and a partisan of constitutional monarchy. He took no part in politics after 1848. The marquis wrote on social questions, notably on prison administration; he edited the works of La Rochefoucauld, and the memoirs of Condorcet; and he was the author of some vaudevilles, tragedies and poems.

LA ROCHEJACQUELEIN, DE, the name of an ancient French family of La Vendée, celebrated for its devotion to the throne during and after the Revolution. Its original name was Duverger, derived from a fief near Bressuire in Poitou, and its pedigree is traceable to the 13th century. In 1505 Gui Duverger married Renée, heiress of Jacques Lemartin, seigneur de La Rochejacquelein, whose name he assumed. His grandson, Louis Duverger, seigneur de La Rochejacquelein, was a devoted adherent of Henry II., and was badly wounded at the battle of Arques; other members of the family were also distinguished soldiers, and the seigniory was raised to a countship and marquisate in reward for their services.

At the outbreak of the Revolution the chief of the family was Henri Louis Auguste, marquis de La Rochejacquelein, *maréchal de camp* in the royal army, who had three sons named after himself—Henri, Louis and Auguste. The marquis fled abroad with his second son Louis at the time of the emigration of the nobles. He entered the service of Great Britain, and died in San Domingo in 1802.

Henri, comte de La Rochejacquelein, born at Dubertien, near Châtillon, sur Sèvres, on the 20th of August 1772, did not emigrate with his father. He served in the constitutional guard of the king, and remained in Paris till the execution of Louis XVI. He then took refuge with the marquis de Lescure on his own estates in Poitou. When the anti-clerical policy of the revolutionary powers provoked the rising of the peasantry of La Vendée, he put himself at the head of the men of his neighbourhood, and came rapidly to the front among the gentlemen whom the peasants took for leaders. In spite of his youth and his reluctance to assume the responsibility, he was chosen as commander-in-chief after the defeat of the Vendéans by the republicans at Cholet. His brilliant personal courage, his amiability and his loyalty to the cause make him a very attractive figure, but a commander-in-chief of the Vendéans, who came and went as they pleased, had little real power or opportunity to display the qualities of a general. The comte de La Rochejacquelein had in fact to obey his army, and could only display his personal valour in action. He could not avert the mistaken policy which led to the rout at Le Mans, and was finally shot in an obscure skirmish at Nouaillé on the 4th of March 1794.

Louis, marquis de La Rochejacquelein, the younger brother of Henri, accompanied his father in the emigration, served in the army of Condé, and entered the service of England in America. He returned to France during the Consulate, and in 1801 married the marquise de Lescure, widow of his brother's friend, who was mortally wounded at Cholet. Marie Louise Victoire de Donnissan, born at Versailles on the 25th of October 1772, belonged to a court family and was the god-daughter of Mme Victoire, daughter of Louis XV. At the age of seventeen she married the marquis de Lescure, whom she accompanied in the war of La Vendée. After his death she went through various adventures recorded in her memoirs, first published at Bordeaux in 1815. They are of extreme interest, and give a remarkable picture of the war and the fortunes of the royalists. She saved much of her own property and her first husband's, when a conciliatory policy was adopted after the fall of the Terrorists. After her second marriage she lived with her husband on her estates, both refusing all offers to take service with Napoleon. In 1814 they took an active part in the royalist movement in and about Bordeaux. In 1815 the marquis endeavoured to bring about another Vendéan rising for the king, and was shot in a skirmish with the Imperialist forces at the Pont des Marthes on the 4th of June 1815. The marquis died at Orleans in 1857.

Their eldest son, Henri Auguste Georges, marquis de La Rochejacquelein, born at Château Citran in the Gironde on the 28th of September 1805, was educated as a soldier, served in Spain in 1822, and as a volunteer in the Russo-Turkish War of 1828. During the reign of Louis Philippe he adhered to the legitimist policy of his family, but he became reconciled to the government of Napoleon III. and was mainly known as a clerical orator and philanthropist. He died on the 7th of January 1867.

His son and successor, Julien Marie Gaston, born at Chartres on the 27th of March 1833, was an active legitimist deputy in the Assembly chosen at the close of the German War of 1870–1871. He was a strong opponent of Thiers, and continued to contest constituencies as a legitimist with varying fortunes till his death in 1897.

Authorities.—*Henri de La Rochejacquelein et la guerre de la Vendée d'après des documents inédits* (Niort, 1890); A. F. Nettement, *Vie de Mme la Marquise de La Rochejacquelein* (Paris, 1876). The *Memoirs* of the marquise were translated into English by Sir Walter Scott, and issued as a volume of "Constable's Miscellany" (Edinburgh, 1827).

LA ROCHELLE, a seaport of western France, capital of the department of Charente-Inférieure, 90 m. S. by E. of Nantes on the railway to Bordeaux. Pop. (1906) town 24,524, commune 33,858. La Rochelle is situated on the Atlantic coast on an inlet opening off the great bay in which lie the islands of Ré and Oléron. Its fortifications, constructed by Vauban, have a circuit of 3½ m. with seven gates. Towards the sea are three towers, of which the oldest (1384) is that of St Nicholas. The apartment in the first storey was formerly used as a chapel. The Chain Tower, built towards the end of the 14th century, is so called from the chain which guarded the harbour at this point; the entrance to the tidal basin was at one time spanned by a great pointed arch between the two towers. The lantern tower (1445–1476), seven storeys high, is surmounted by a lofty spire and was once used as a lighthouse. Of the ancient gateways only one has been preserved in its entirety, that of the "Grosse Horloge," a huge square tower of the 14th or 15th century, the corner turrets of which have been surmounted with trophies since 1746. The cathedral of La Rochelle (St Louis or St Bartholomew) is a heavy Grecian building (1742–1762) with a dome above the transept, erected on the site of the old church of St Bartholomew, destroyed in the 16th century and now represented by a solitary tower dating from the 14th century. Externally the town-house is in the Gothic style of the latter years of the 15th century and has the appearance of a fortress, though its severity is much relieved by the beautiful carving of the two entrances, of the machicolations and of the two belfries. The buildings looking into the inner court are in the Renaissance style (16th and early 17th centuries) and contain several fine apartments. In the old episcopal palace (which was in turn the residence of Sully, the prince of Condé, Louis XIII., and Anne of Austria, and the scene of the marriage of Alphonso VI. of Portugal with a princess of Savoy) accommodation has been provided for a library, a collection of records and a museum of art and antiquities. Other buildings of note are an arsenal with an artillery museum, a large hospital, a special Protestant hospital, a military hospital and a lunatic asylum for the department. In the botanical gardens there are museums of natural history. Medieval and Renaissance houses give a peculiar character to certain districts: several have French, Latin or Greek inscriptions of a moral or religious turn and in general of Protestant origin. Of these old houses the most interesting is one built in the midddle of the 16th century and wrongly known as that of Henry II. The parade-ground, which forms the principal public square, occupies the site of the castle demolished in 1590. Some of the streets have side-arcades; the public wells are fed from a large reservoir in the Champ de Mars; and among the promenades are the Cours des Dames with the statue of Admiral Duperré, and outside the Charruyer Park on the west front of the ramparts, and the Mail, a beautiful piece of greensward. In this direction are the sea-bathing establishments.

La Rochelle is the seat of a bishopric and a prefect, and has tribunals of first instance and of commerce, a chamber of commerce and a branch of the Bank of France; its educational establishments include an ecclesiastical seminary, a lycée and a training college for girls. Ship-building, saw-milling and the manufacture of briquettes and chemicals, sardine and tunny-preserving and petroleum-refining are among the industries. The rearing of oysters and mussels and the exploitation of salt marshes is carried on in the vicinity.

The inlet of La Rochelle is protected by a stone mole constructed by Richelieu and visible at low tide. The harbour, one of the safest on the coast, is entered by a channel 2730 yds. long, and comprises an outer harbour opening on the one hand into a floating basin, on the other into a tidal basin with another floating basin adjoining it. Behind the tidal basin is the Maubec reservoir, the waters of which, along with those of the Marans canal, help to scour the port and navigable channel. Some 200 sailing ships are engaged in the fisheries, and the fish market of La Rochelle is the most important on the west coast. The harbour is, however, inaccessible to the largest vessels, for the accommodation of which the port of La Pallice, inaugurated in 1891, was created. Lying about 3 m. W.S.W. of La Rochelle, this port opens into the bay opposite the eastern extremity of the island of Ré. It was artificially excavated and affords safe anchorage in all weathers. The outer port, protected by two jetties, has an area of 29 acres and a depth of $16\frac{1}{2}$ ft. below lowest tide-level. At the extremity of the breakwater is a wharf where ships may discharge without entering the basin. A lock connects with the inner basin, which has an area of 27 acres, with 5900 ft. of quayage, a minimum depth of 28 ft., and depths of $29\frac{1}{2}$ ft. and 36 ft. at high, neap and spring tides. Connected with the basin are two graving docks. La Pallice has regular communication with South America by the vessels of the Pacific Steam Navigation Company and by those of other companies with London, America, West Africa, Egypt and the Far East. The port has petroleum refineries and chemical manure works.

In 1906 there entered the port of La Rochelle, including the dock of La Pallice, 441 vessels with a tonnage of 629,038, and cleared 468 vessels with a tonnage of 664,861 (of which 235 of 241,146 tons cleared with ballast). These figures do not include vessels entering from, or clearing for, other ports in France. The imports (value, £1,276,000 in 1900 as compared with £1,578,000 in 1907) include coal and patent fuel, superphosphates, natural phosphates, nitrate of soda, pyrites, building-timber, wines and alcohol, pitch, dried codfish, petroleum, jute, wood-pulp. Exports (value, £1,294,000 in 1900; £1,979,000 in 1907) include wine and brandy, fancy goods, woven goods, garments, skins, coal and briquettes, furniture, potatoes.

La Rochelle existed at the close of the 10th century under the name of Rupella. It belonged to the barony of Châtelaillon, which was annexed by the duke of Aquitaine and succeeded Châtelaillon as chief town in Aunis. In 1199 it received a communal charter from Eleanor, duchess of Guienne, and it was in its harbour that John Lackland disembarked when he came to try to recover the domains seized by Philip Augustus. Captured by Louis VIII. in 1224, it was restored to the English in 1360 by the treaty of Brétigny, but it shook off the yoke of the foreigner when Du Guesclin recovered Saintonge. During the 14th, 15th and 16th centuries La Rochelle, then an almost independent commune, was one of the great maritime cities of France. From its harbour in 1402 Jean de Béthencourt set out for the conquest of the Canaries, and its seamen were the first to turn to account the discovery of the new world. The salt-tax provoked a rebellion at Rochelle which Francis I. repressed in person; in 1568 the town secured exemption by the payment of a large sum. At the Reformation La Rochelle early became one of the chief centres of Calvinism, and during the religious wars it armed privateers which preyed on Catholic vessels in the Channel and on the high seas. In 1571 a synod of the Protestant churches of France was held within its walls under the presidency of Beza for the purpose of drawing up a confession of faith. After the massacre of St Bartholomew, La Rochelle held out for six and a half months against the Catholic army, which was ultimately obliged to raise the siege after losing more than 20,000 men. The peace of the 24th of June 1573, signed by the people of La Rochelle in the name of all the Protestant party, granted the Calvinists full liberty of worship in several places of safety. Under Henry IV. the town remained quiet, but under Louis XIII. it put itself again at the head of the Huguenot party. Its vessels blockaded the mouth of the Gironde and stopped the commerce of Bordeaux, and also seized the islands of Ré and Oléron and several vessels of the royal fleet. Richelieu then resolved to subdue the town once for all. In spite of the assistance rendered by the English troops under Buckingham and in spite of the fierce energy of their mayor Guiton, the people of La Rochelle were obliged to capitulate after a year's siege (October 1628). During this investment Richelieu raised the celebrated mole which cut off the town from the open sea. La Rochelle then became the principal port for the trade between France and the colony of Canada. But the revocation of the Edict of Nantes (1685) deprived it of some thousands of its most industrious inhabitants, and the loss of Canada by France completed for the time the ruin of its commerce. Its privateers, however, maintained a vigorous struggle with the English during the republic and the empire.

See P. Suzanne, *La Rochelle pittoresque* (La Rochelle, 1903), and E. Couneau, *La Rochelle disparue* (La Rochelle, 1904).

LA ROCHE-SUR-YON, a town of western France, capital of the department of Vendée, on an eminence on the right bank of the Yon, 48 m. S. of Nantes on the railway to Bordeaux. Pop. (1906) town 10,666, commune 13,685. The castle of La Roche, which probably existed before the time of the crusades, and was frequently attacked or taken in the Hundred Years' War and in the wars of religion, was finally dismantled under Louis XIII. When Napoleon in 1804 made this place, then of no importance, the chief town of a department, the stones from its ruins were employed in the erection of the administrative buildings, which, being all produced at once after a regular plan, have a monotonous effect. The equestrian statue of Napoleon I. in an immense square overlooking the rest of the town; the statue of General Travot, who was engaged in the "pacification" of La Vendée; the museum, with several paintings by P. Baudry, a native artist, of whom there is a statue in the town, are the only objects of interest. Napoleon-Vendée and Bourbon-Vendée, the names borne by the town according to the dominance of either dynasty, gave place to the original name after the revolution of 1870. The town is the seat of a prefect and a court of assizes, and has a tribunal of first instance, a chamber of commerce, a branch of the Bank of France, a lycée for boys and training colleges for both sexes. It is a market for farm-produce, horses and cattle, and has flour-mills. The dog fairs of La Roche are well known.

LAROMIGUIÈRE, PIERRE (1756–1837), French philosopher, was born at Livignac on the 3rd of November 1756, and died on the 12th of August 1837 in Paris. As professor of philosophy at Toulouse he was unsuccessful and incurred the censure of the parliament by a thesis on the rights of property in connexion with taxation. Subsequently he came to Paris, where he was appointed professor of logic in the École Normale and lectured in the Prytanée. In 1799 he was made a member of the Tribunate, and in 1833 of the Academy of Moral and Political Science. In 1793 he published *Projet d'élêments de metaphysique*, a work characterized by lucidity and excellence of style. He wrote also two *Mémoires*, read before the Institute, *Les Paradoxes de Condillac* (1805) and *Leçons de philosophie* (1815–1818). Laromiguière's philosophy is interesting as a revolt against the extreme physiological psychology of the natural scientists, such as Cabanis. He distinguished between those psychological phenomena which can be traced directly to purely physical causes, and the actions of the soul which originate from within itself. Psychology was not for him a branch of physiology, nor on the other hand did he give to his theory an abstruse metaphysical basis. A pupil of Condillac and indebted for much of his ideology to Destutt de Tracy, he attached a fuller importance to Attention as a psychic faculty. Attention provides the facts, Comparison groups and combines them, while Reason systematizes and explains. The soul is active in its choice, *i.e.* is endowed with free-will, and is, therefore, immortal. For natural science as a method of discovery he had no respect. He held that its judgments are, at the best, statements of identity, and that its so-called discoveries are merely the reiteration, in a new form, of previous truisms. Laromiguière was not the first to develop these views; he owed much to Condillac, Destutt de Tracy and Cabanis. But, owing to the accuracy of his language and the purity of his style, his works had great influence, especially over Armand Marrast, Cardaillac and Cousin. A lecture of his in the École Normale impressed Cousin so strongly that he at once devoted himself to the study of philosophy. Jouffroy and Taine agree in describing him as one of the great thinkers of the 19th century.

See Damiron, *Essai sur la philosophie en France au XIX^e siècle*; Biran, *Examen des leçons de philosophie*; Victor Cousin, *De Methodo sive de Analysi*; Daunou, *Notice sur Laromiguière*; H. Taine, *Les Philosophes classiques du XIX^e siècle*; Gatien Arnoult, *Étude sur Laromiguière*; Compayré, *Notice sur Laromiguière*; Ferraz, *Spiritualisme et Libéralisme*; F. Ficavet, *Les Idéologues.*

LARRA, MARIANO JOSÉ DE (1809–1837), Spanish satirist, was born at Madrid in 1809. His father served as a regimental doctor in the French army, and was compelled to leave the

Peninsula with his family in 1812. In 1817 Larra returned to Spain, knowing less Spanish than French. His nature was disorderly, his education was imperfect, and, after futile attempts to obtain a degree in medicine or law, he made an imprudent marriage at the age of twenty, broke with his relatives and became a journalist. On the 27th of April 1831 he produced his first play, *No más mostrador*, based on two pieces by Scribe and Dieulafoy. Though wanting in originality, it is brilliantly written, and held the stage for many years. On the 24th of September 1834 he produced *Macias*, a play based on his own historical novel, *El Doncel de Don Enrique el Doliente* (1834). The drama and novel are interesting as experiments, but Larra was essentially a journalist, and the increased liberty of the press after the death of Ferdinand VII. gave his caustic talent an ampler field. He was already famous under the pseudonyms of "Juan Pérez de Munguía" and "Figaro" which he used in *El Pobrecito Hablador* and *La Revista Española* respectively. Madrid laughed at his grim humour; ministers feared his vitriolic pen and courted him assiduously; he was elected as deputy for Ávila, and a great career seemed to lie before him. But the era of military *pronunciamientos* ruined his personal prospects and patriotic plans. His writing took on a more sombre tinge; domestic troubles increased his pessimism, and, in consequence of a disastrous love-affair, he committed suicide on the 13th of February 1837. Larra lived long enough to prove himself the greatest prose-writer that Spain can boast during the 19th century. He wrote at great speed with the constant fear of the censor before his eyes, but no sign of haste is discernible in his work, and the dexterity with which he aims his venomous shafts is amazing. His political instinct, his abundance of ideas and his forcible, mordant style would have given him a foremost position at any time and in any country; in Spain, and in his own period, they placed him beyond all rivalry. (J. F.-K.)

LARSA (Biblical *Ellasar*, Gen. xiv. 1), an important city of ancient Babylonia, the site of the worship of the sun-god, Shamash, represented by the ancient ruin mound of Senkereh (Senkera). It lay 15 m. S.E. of the ruin mounds of Warka (anc. *Erech*), near the east bank of the Shatt-en-Nil canal. Larsa is mentioned in Babylonian inscriptions as early as the time of Ur-Gur, 2700 or 2800 B.C., who built or restored the *ziggurat* (stage-tower) of E-Babbar, the temple of Shamash. Politically it came into special prominence at the time of the Elamite conquest, when it was made the centre of Elamite dominion in Babylonia, perhaps as a special check upon the neighbouring Erech, which had played a prominent part in the resistance to the Elamites. At the time of Khammurabi's successful struggle with the Elamite conquerors it was ruled by an Elamite king named Eriaku, the Arioch of the Bible, called Rim-Sin by his Semitic subjects. It finally lost its independence under Samsu-iluna, son of Khammurabi, *c.* 1900 B.C., and from that time until the close of the Babylonian period it was a subject city of Babylon. Loftus conducted excavations at this site in 1854. He describes the ruins as consisting of a low, circular platform, about 4½ m. in circumference, rising gradually from the level of the plain to a central mound 70 ft. high. This represents the ancient *ziggurat* of the temple of Shamash, which was in part explored by Loftus. From the inscriptions found there it appears that, besides the kings already mentioned, Khammurabi, Burna-buriash (buryas) and the great Nebuchadrezzar restored or rebuilt the temple of Shamash. The excavations at Senkereh were peculiarly successful in the discovery of inscribed remains, consisting of clay tablets, chiefly contracts, but including also an important mathematical tablet and a number of tablets of a description almost peculiar to Senkereh, exhibiting in bas-relief scenes of everyday life. Loftus found also the remains of an ancient Babylonian cemetery. From the ruins it would appear that Senkereh ceased to be inhabited at or soon after the Persian conquest.

See W. K. Loftus, *Chaldaea and Susiana* (1857). (J. P. Pe.)

LARTET, EDOUARD (1801–1871), French archaeologist, was born in 1801 near Castelnau-Barbarens, department of Gers, France, where his family had lived for more than five hundred years. He was educated for the law at Auch and Toulouse, but having private means elected to devote himself to science. The then recent work of Cuvier on fossil mammalia encouraged Lartet in excavations which led in 1834 to his first discovery of fossil remains in the neighbourhood of Auch. Thenceforward he devoted his whole time to a systematic examination of the French caves, his first publication on the subject being *The Antiquity of Man in Western Europe* (1860), followed in 1861 by *New Researches on the Coexistence of Man and of the Great Fossil Mammifers characteristic of the Last Geological Period*. In this paper he made public the results of his discoveries in the cave of Aurignac, where evidence existed of the contemporaneous existence of man and extinct mammals. In his work in the Périgord district Lartet had the aid of Henry Christy (*q.v.*). The first account of their joint researches appeared in a paper descriptive of the Dordogne caves and contents, published in *Revue archéologique* (1864). The important discoveries in the Madeleine cave and elsewhere were published by Lartet and Christy under the title *Reliquiae Aquitanicae*, the first part appearing in 1865. Christy died before the completion of the work, but Lartet continued it until his breakdown in health in 1870. The most modest and one of the most illustrious of the founders of modern palaeontology, Lartet's work had previously been publicly recognized by his nomination as an officer of the Legion of Honour; and in 1848 he had had the offer of a political post. In 1857 he had been elected a foreign member of the Geological Society of London, and a few weeks before his death he had been made professor of palaeontology at the museum of the Jardin des Plantes. He died at Seissan in January 1871.

LARVAL FORMS, in biology. As is explained in the article on Embryology (*q.v.*), development and life are coextensive, and it is impossible to point to any period in the life of an organism when the developmental changes cease. Nevertheless it is customary to speak of development as though it were confined to the early period of life, during which the important changes occur by which the uninucleated zygote acquires the form characteristic of the species. Using the word in this restricted sense, it is pointed out in the same article that the developmental period frequently presents two phases, the embryonic and the larval. During the embryonic phase the development occurs under protection, either within the egg envelopes, or within the maternal body, or in a brood pouch. At the end of this phase the young organism becomes free and uses, as a rule, its own mouth and digestive organs. If this happens before it has approximately acquired the adult form, it is called a larva (Lat. *larva*, ghost, spectre, mask), and the subsequent development by which the adult form is acquired constitutes the larval phase. In such forms the life-cycle is divided into three phases, the embryonic, the larval and the adult. The transition between the first two of these is always abrupt; whereas the second and third, except in cases in which a metamorphosis occurs (see METAMORPHOSIS), graduate into one another, and it is not possible to say when the larval stage ends and the adult begins. This is only what would be expected when it is remembered that the developmental changes never cease. It might be held that the presence of functional reproductive organs, or the possibility of rapidly acquiring them, marks off the adult phase of life from the larval. But this test sometimes fails. In certain of the Ctenophora there is a double sexual life; the larva becomes sexually mature and lays eggs, which are fertilized and develop; it then loses its generative organs and develops into the adult, which again develops reproductive organs (*dissogony*; see Chun, *Die Ctenophoren des Golfes von Neapel*, 1880). In certain Amphibia the larva may develop sexual organs and breed (axolotl), but in this case (*neoteny*) it is doubtful whether further development may occur in the larva. A very similar phenomenon is found in certain insect larvae (*Cecidomyia*), but in this case ova alone are produced and develop parthenogenetically (paedogenesis). Again in certain Trematoda larval stages known as the sporocyst and redia produce ova which have the power of developing unfertilized; in this case the larva probably has not the power of continuing its development. It is very generally held by philosophers that the end of life is reproduction, and there is much to be said for this view; but, granting its truth, it is difficult to see why the capacity for reproduction should so generally be confined to the later stages of life. We know by more than one instance that it is possible for the larva to reproduce by sexual generation; why should not the phenomenon be more common? It is impossible in the present state of our knowledge to answer this question.

The conclusion, then, that we reach is that the larval phase of life graduates into the later phases, and that it is impossible to characterize it with precision, as we can the embryonic phase. Nevertheless great importance has been attached, in certain cases, to the forms assumed by the young organism when it breaks loose from its embryonic bonds. It has been widely held that the study of larvae is of greater importance in determining genetic affinity than the study of adults. What justification is there for this view? The phase of life, chosen for the ordinary anatomical and physiological studies and labelled as the adult phase, is merely one of the large number of stages of structure through which the organism passes during its free life. In animals with a well-marked larval phase, by far the greater number of the stages of structure are included in the larval period, for the developmental changes are more numerous and take place with greater rapidity at the beginning of life than in its later periods. As each of the larval stages is equal in value for the purposes of our study to the adult phase, it clearly follows that, if there is anything in the view that the anatomical study of organisms is of importance in determining their mutual relations, the study of the organism in its various larval stages must have a greater importance than the study of the single and arbitrarily selected stage of life called the adult.

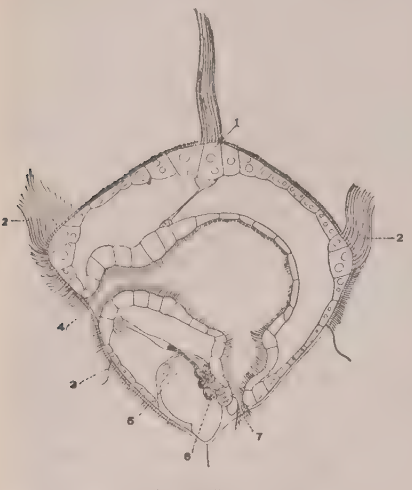
The importance, then, of the study of larval forms is admitted, but before proceeding to it this question may be asked: What is the meaning of the larval phase? Obviously this is part of a larger problem: Why does an organism, as soon as it is established at the fertilization of the ovum, enter upon a cycle of transformations which never cease until death puts an end to them? It is impossible to give any other answer to this question than this, viz. that it is a property of living matter to react in a remarkable way to external forces without undergoing destruction. As is explained in EMBRYOLOGY, development consists of an orderly interaction between the organism and its environment. The action of the environment produces certain morphological changes in the organism. These changes enable the organism to move into a new environment, which in its turn produces further structural changes in the organism. These in their turn enable, indeed necessitate, the organism to move again into a new environment, and so the process continues until the end of the life-cycle. The essential condition of success in this process is that the organism should always shift into the environment to which its new structure is suited, any failure in this leading to impairment of the organism. In most cases the shifting of the environment is a very gradual process, and the morphological changes in connexion with each step of it are but slight. In some cases, however, jumps are made, and whenever such jumps occur we get the morphological phenomenon termed metamorphosis. It would be foreign to our purpose to consider this question further here, but before leaving it we may suggest, if we cannot answer, one further question. Has the duration and complexity of the life-cycle expanded or contracted since organisms first appeared on the earth? According to the current view, the life-cycle is continually being shortened at one end by the abbreviation of embryonic development and by the absorption of larval stages into the embryonic period, and lengthened at the other by the evolutionary creation of new adult phases. What was the condition of the earliest organisms? Had they the property of reacting to external forces to the same extent and in the same orderly manner that organisms have to-day?

For the purpose of obtaining light upon the genetic affinities of an organism, a larval stage has as much importance as has the adult stage. According to the current views of naturalists, which are largely a product of Darwinism, it has its counterpart, as has the adult stage, in the ancestral form from which the living organism has been derived by descent with modification. Just as the adult phase of the living form differs owing to evolutionary modification from the adult phase of the ancestor, so each larval phase will differ for the same reason from the corresponding larval phase in the ancestral life-history. Inasmuch as the organism is variable at every stage of its existence, and is exposed to the action of natural selection, there is no reason why it should escape modification at any stage. But, as the characters of the ancestor are unknown, it is impossible to ascertain what the modification has been, and the determination of which of the characters of its descendant (whether larval or adult) are new and which ancient must be conjectural. It has been customary of late years to distinguish in larvae those characters which are supposed to have been recently acquired as *caenogenetic*, the ancient characters being termed *palingenetic*. These terms, if they have any value, are applicable with equal force to adults, but they are cumbrous, and the absence of any satisfactory test which enables us to distinguish between a character which is ancestral and one which has been recently acquired renders their utility very doubtful. Just as the adult may be supposed, on evolution doctrine, to be derived from an ancestral adult, so the various larval stages may be supposed to have been derived from the corresponding larval stage of the hypothetical ancestor. If we admit organic evolution at all, we may perhaps go so far, but we are not in a position to go further, and to assert that each larval stage is representative of and, so to speak, derived from some adult stage in the remote past, when the organism progressed no further in its life-cycle than the stage of structure revealed by such a larval form. We may perhaps have a right to take up this position, but it is of no advantage to us to do so, because it leads us into the realm of pure fancy. Moreover, it assumes that an answer can be given to the question asked above—has the life-cycle of organisms contracted or expanded as the result of evolution? This question has not been satisfactorily answered. Indeed we may go further and say that naturalists have answered it in different ways according to the class of facts they were contemplating at the moment. If we are to consider larvae at all from the evolution point of view, we must treat them as being representative of ancestral larvae from which they have been derived by descent with modification; and we must leave open the question whether and to what extent the first organisms themselves passed through a complicated life-cycle.

From the above considerations it is not surprising to find that the larvae of different members of any group resemble each other to the same kind of degree as do the adults, and that the larvae of allied groups resemble one another more closely than do the larvae of remote groups, and finally that a study of larvae does in some cases reveal affinities which would not have been evident from a study of adults alone. Though it is impossible to give here an account of the larval forms of the animal kingdom, we may illustrate these points, which are facts of fundamental importance in the study of larvae, by a reference to specific cases.

The two great groups, Annelida and Mollusca, which by their adult structure present considerable affinity with one another, agree in possessing a very similar larval form, known as the *trochosphere* or *trochophore*.

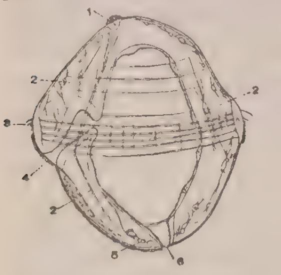
A typical trochosphere larva (figs. 1, 2) possesses a small, transparent body divided into a large preoral lobe and a small postoral region. The mouth (4) is on the ventral surface at the junction of the preoral lobe with the hinder part of the body, and there is an anus (7) at the hind end. Connecting the two is a curved alimentary canal which is frequently divided into oesophagus, stomach and intestine. There is a preoral circlet of powerful cilia, called the "velum" (2), which encircles the body just anterior to the mouth and marks off the preoral lobe, and there is very generally a second ring of cilia immediately behind the mouth (3). At the anterior end of the preoral lobe is a nervous thickening of the ectoderm called the apical plate (1). This usually carries a tuft of long cilia or sensory hairs, and sometimes rudimentary visual organs. Mesoblastic bands are present, proceeding a short distance forwards from the anus on each side of the middle ventral line (6), and at the anterior end of each of these structures is a tube (5) which more or less branches internally and opens on the ventral surface. The branches of this tube end internally in peculiar cells containing a flame-shaped flagellum and floating in the so-called body cavity, into which, however, they do not open. These are the primitive kidneys. The body cavity, which is a space between the ectoderm and alimentary canal, is not lined by mesoderm and is traversed by a few muscular fibres. Such a larva is found, almost as described, in many Chaetopods (fig. 1), in *Echiurus* (fig. 2), in many Gastropods (fig. 3), and Lamellibranchiates (fig. 4). This typical structure of the larva is often departed from, and the molluscan trochosphere can be distinguished from the annelidan by the possession of a rudiment at least of the shell-gland and foot (figs. 3 and 4); but in all cases in which the young leaves the egg at an early stage of development it has a form which can be referred without much difficulty to the trochosphere type just described. A larva similar to the trochosphere in some features, particularly in possessing a preoral ring of cilia and an apical plate, is found in the Polyzoa, and in adult Rotifera, which latter, in their ciliary ring and excretory organs, present some resemblance to the trochosphere, and are sometimes described as permanent adult trochospheres. But in these phases the resemblance to the typical forms is not nearly so close as it is in the case of the larva of Annelida and Mollusca.



After V. Drasche in *Beiträge zur Entwickelung der Polychaeten, Entwickelung von Pomatoceros.*

Fig. 1.—Trochosphere Larva of the Chaetopod *Pomatoceros trigueter*, L. (Osmic acid preparation.)

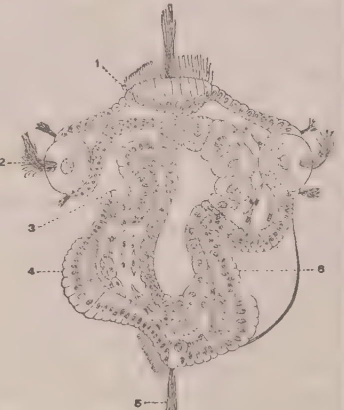
1. The apical plate.
2. Long cilia of preoral band (velum).
3. Long cilia of postoral band.
4. Mouth.
5. Excretory organ.
6. Mesoblastic band.
7. Anus.



After Hatschek, "Echiurus" in Claus's *Arbeiten aus dem zoolog. Institut der Wien.*

Fig. 2.—Young Trochosphere Larva of the Gephyrean *Echiurus*, seen in optical section.

1. Apical plate.
2. Muscle-bands.
3. Preoral band of cilia (velum).
4. Mouth.
5. Mesoblastic band.
6. Anus.



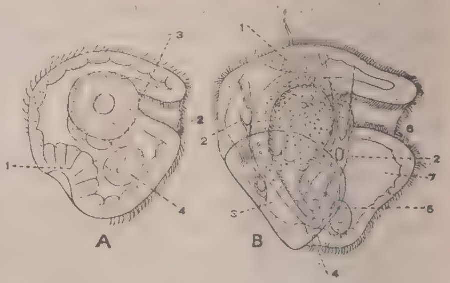
After Patten, "Patella" in Claus's *Arbeiten aus dem zoolog. Institut der Wien.*

Fig. 3.—Larva of the Gastropod *Patella*, seen in longitudinal vertical section.

1. Apical plate.
2. Cilia of preoral circlet (velum).
3. Mouth.
4. Foot.
5. Anal tuft of cilia.
6. Shell-gland covered by shell.

In the Echinodermata there are two distinct larval forms which cannot be brought into relation with one another. The one of these is found in the Asteroids, Ophiuroids, Echinoids and Holothuroids; the other in the Crinoids.

The first is, in its most primitive form, a small transparent creature, with a mouth and anus and a postoral longitudinal ciliated band (fig. 5, A). In Asteroids the band of cilia becomes divided in such a way as to give rise to two bands, the one preoral, encircling the preoral lobe, and the other remaining postoral (fig. 5, B). In the other groups the band remains single and longitudinal. In all cases the edges of the body carrying the ciliary bands become sinuous (fig 6) and sometimes prolonged into arms (figs. 7-9), and each of the four groups has its own type of larva. In Asteroids, in which the band divides, the larva is known as the bipinnaria (fig. 7); in Holothurians it is called the auricularia (fig. 6); in Echinoids and Ophiuroids, in which the arms are well marked, it is known as the pluteus, the echinopluteus (fig. 9) and ophiopluteus (fig. 8) respectively.



After Hatschek on "Teredo" in Claus's *Arbeiten aus dem zoolog. Institut der Wien.*

Fig. 4.—A, Embryo, and B, Young Trochosphere Larva of the Lamellibranch *Teredo*.

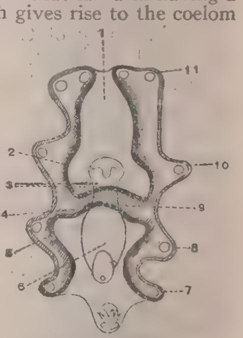
In A the shell-gland (1) and the mouth (2) and the rudiment of the enteron (3) are shown; (4) primitive mesoderm cells.

In B the shell-gland has flattened out and the shell is formed. 1, Apical plate; 2, muscles; 3, shell; 4, anal invagination; 5, mesoblast; 6, mouth; 7, foot.

The cilia of the preoral and postoral bands are not clearly differentiated at this stage.

All these forms were obviously distinct but as obviously modifications of a common type and related to one another. They present certain remarkable structural features which differentiate them from other larval types except the tornaria larvae of the Enteropneusta. They possess an alimentary canal with a mouth and anus as does the trochosphere, but they differ altogether from that larva in having a diverticulum of the alimentary canal which gives rise to the coelom and to a considerable part of the mesoblast. Further, they are without an apical plate with its tuft of sensory hairs.

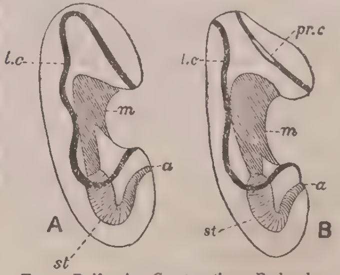
In Crinoids the type is different (fig. 10), and might belong to a different phylum. The body is opaque, and encircled by five ciliary bands, and is without either mouth, anus or arms, and there is a tuft of cilia on the preoral lobe. A resemblance to the other Echinoderm larvae is found in the fact that coelomic diverticula of the enteron are present.



After J. Müller.

Fig. 6.—*Auricularia stelligera*, ventral view, somewhat diagrammatic. The larva of a Holothurian.

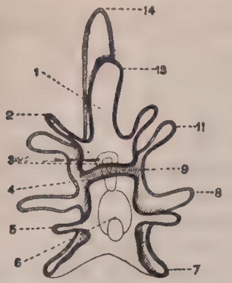
1. Frontal area.
2. Preoral arm.
3. Anterior transverse portion of ciliary band.
4. Posterior transverse portion of same.
5. Postoral arm.
6. Anal area.
7. Posterior lateral arm.
8. Posterior dorsal arm.
9. Oral depression.
10. Middle dorsal arm.
11. Anterior dorsal arm.
12. Anterior lateral arm.
13. Ventral median arm.
14. Dorsal median arm.
15. Unpaired posterior arm.



From Balfour's *Comparative Embryology.* by permission of Macmillan & Co., Ltd.

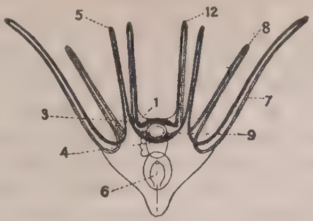
Fig. 5.—Diagrams of side views of two young Echinoderm Larvae, showing the course of the ciliary bands. A, auricularia larva of a Holothurian; B, bipinnaria larva of an Asteroid; *a*, anus; *l.c*, in A primitive longitudinal ciliary band, in B postoral longitudinal ciliary band; *m*, mouth; *pr.c*, preoral ciliary band; *st*, stomach.

The larvae of two other groups present certain resemblances to the typical Echinoderm larvae. The one of these is the tornaria larva of the Enteropneusta (fig. 11), which recalls Echinoderms in the possession of two ciliary bands, the one preoral and the other postoral and partly longitudinal, and in the presence of gut diverticula which give rise to the coelom; but, like the trochosphere, it possesses an apical plate with sensory organs on the preoral lobe. The resemblance of the tornaria to the bipinnaria is so close that, taking into consideration certain additional resemblances in the arrangement of the coelomic vesicles which arise from the original gut diverticulum, it is impossible to resist the conclusion that there is affinity between the Echinoderm and Enteropneust phyla. Here we have a case like that of the Tunicata in which an affinity which is not evident from a study of the adult alone is revealed by a study of the young form. The other larva which recalls the Echinoderm type is the Actinotrocha of *Phoronis* (fig. 12), but the resemblance is not nearly so close, being confined to the presence of a postoral longitudinal band of cilia which is prolonged into arm-like processes.



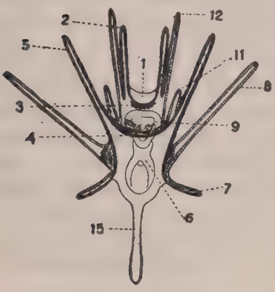
After J. Müller.

FIG. 7.—*Bipinnaria elegans*, the Larva of a Star-fish. Description and lettering as in fig. 6.



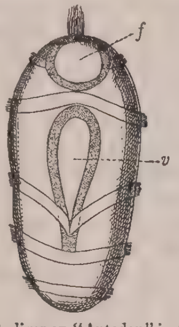
After J. Müller.

FIG. 8.—*Ophiopluteus bimaculatus*, the Larva of an Ophiurid. Description and lettering as in fig. 6.



After J. Müller.

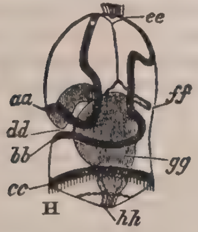
FIG. 9.—*Echinopluteus*, the Larva of a Spatangid. Description and lettering as in fig. 6.



After Seeliger on "Antedon" in Spengel's *Zoologische Jahrbücher.*

FIG. 10.—A free-swimming Larva of Antedon, ventral view. It has an apical tuft of cilia, five ciliated bands, and a depression—the vestibular depression—on its ventral surface. *v*, Vestibular depression; *f*, adhesive pit.

The following groups have larvae which cannot be related to other larvae: the Porifera, Coelenterata, Turbellaria and Nemertea, Brachiopoda, Myriapoda, Insecta, Crustacea, Tunicata. We may shortly notice the larvae of the two latter.



After Metschnikoff.

FIG. 11.—Tornaria Larva of an Enteropneust, side view.
ee, Apical plate.
aa, Preoral ciliary band.
bb, Postoral ciliary band.
dd, Mouth.
ff, Anterior coelomic vesicle and pore.
gg, Alimentary canal.
hh, Anus.

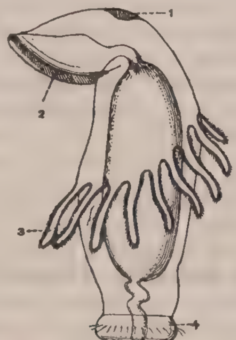


FIG. 12.—Actinotrocha Larva of *Phoronis*, side view. (Modified after Benham.)
1. Apical plate.
2. Mouth.
3. Postoral ciliary band and arms.
4. Perianal ciliary band.

In the Crustacea the larvae are highly peculiar and share, in a striking manner, certain of the important features of specialization presented by the adult, viz. the presence of a strong cuticle and of articulated appendages and the absence of cilia. They are remarkable among larvae for the number of stages which they pass through in attaining the adult state. However numerous these may be, they almost always have, when first set free from the egg, one of two forms, that of the *nauplius* (fig. 13, A) or that of the *zoaea* (fig. 13, B). The nauplius is found throughout the group and is the more important of the two; the zoaea is confined to the higher members, in some of which it merely forms a stage through which the larva, hatched as a nauplius, passes in its gradual development. The nauplius larva is of classic interest because its occurrence has enabled zoologists to determine with precision the position in the animal kingdom of a group, the Cirripedia, which was placed by the illustrious Cuvier among the Mollusca.

In the Tunicata the remarkable tadpole larva, the structure and development of which was first elucidated by the great Russian naturalist, A. Kowalevsky, possesses a similar interest to that of the nauplius larva of Cirripeds, and of the tornaria larva of the Enteropneusta, in that it pointed the way to the recognition of the affinities of the Tunicata, affinities which were entirely unsuspected till they were revealed by a study of the larvae.

With regard to the occurrence of larvae, three general statements may be made. (1) They are always associated with a small egg in which the amount of food yolk is not sufficient to enable the animal to complete its development in the embryonic state. (2) A free-swimming larva is usually found in cases in which the adult is attached to foreign objects. (3) A larval stage is, as a rule, associated with internal parasitism of the adult. The object gained by the occurrence of a larva in the two last cases is to enable the species to distribute itself over as wide an area as possible. It may further be asserted that land and fresh-water animals develop without a larval stage much more frequently than marine forms. This is probably partly due to the fact that the conditions of land and fresh-water life are not so favourable for the spread of a species over a wide area by means of simply-organized larvae as are those of marine life, and partly to the fact that, in the case of fresh-water forms at any rate, a feebly-swimming larva would be in danger of being swept out to sea by currents.

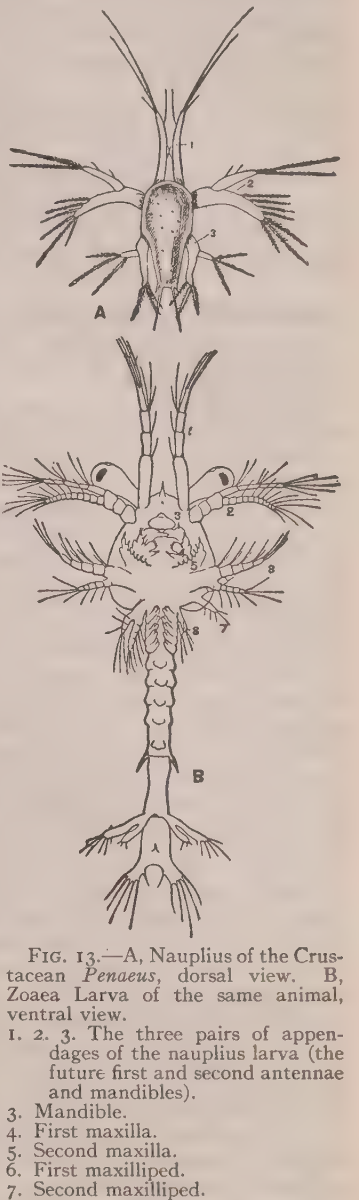


FIG. 13.—A, Nauplius of the Crustacean *Penaeus*, dorsal view. B, Zoaea Larva of the same animal, ventral view.
1. 2. 3. The three pairs of appendages of the nauplius larva (the future first and second antennae and mandibles).
3. Mandible.
4. First maxilla.
5. Second maxilla.
6. First maxilliped.
7. Second maxilliped.
8. Third maxilliped.

1. The association of larvae with small eggs. This is a true statement as far as it goes, but in some cases small eggs do not give rise to larvae, some special form of nutriment being provided by the parent, *e.g.* Mammalia, in which there is a uterine nutrition by means of a placenta; some Gastropoda (*e.g. Helix waltoni, Bulimus*), in which, though the ovum is not specially large, it floats in a large quantity of albumen at the expense of which the development is completed; some Lamellibranchiata (*Cyclas*, &c.), Echinodermata (many *Ophiurids*, &c.), &c., in which development takes place in a brood

pouch. In the majority of cases, however, in which there is a small amount of food yolk and no special arrangements for parental care, a larva is formed. No better group than the Mollusca can be taken to illustrate this point, for in them we find every kind of development from the completely embryonic development of the Cephalopoda, with their large heavily-yolked eggs, to the development of most marine Lamellibranchiata and many Gastropoda, in which the embryonic period is short and there is a long larval development. The Mollusca are further specially interesting for showing very clearly cases in which, though the young are born or hatched fully developed, the larval stages are passed through in the egg, and the larval organs (*e.g.* velum) are developed but without function (*e.g. Paludina, Cyclas, Onchidium*). As already mentioned, the larval form of the Mollusca is the trochosphere.

2. Free-swimming larvae are usually formed when the adult is fixed. We need only refer to the cases of the Cirripedia with their well-marked nauplius and cypris larvae, to *Phoronis* with its remarkable *actinotrocha*, to the Crinoidea, Polyzoa, &c. There are a few exceptions to this rule, *e.g.* the Molgulidae amongst the fixed Tunicata, *Tubularia, Myriothela*, &c., among the Hydrozoa.

3. Internal parasites generally have a stage which may be called larval, in which they are transferred either by active or passive migration to a new host. In most Nematoda, some Cestoda, and in Trematoda this larva leads a free life; but in some nematodes (*Trichina*) and some cestodes the larva does not become free.

(A. Se.*)

LARYNGITIS, an inflammation of the mucus of the *larynx*. There are three chief varieties: *acute, chronic*, and *oedematous*. The larynx is also liable to attacks of inflammation in connexion with tubercle or syphilis.

Acute Laryngitis may be produced by an independent catarrh, or by one extending either from the nasal or the bronchial mucous membrane into that of the larynx. The causes are various, "catching cold" being the most common. Excessive use of the voice either in speaking or singing sometimes gives rise to it. The inhalation of irritating particles, vapours, &c., and swallowing very hot fluids or corrosive poisons are well-recognized causes. It may also occur in connexion with diseases, notably measles and influenza. As a result of the inflammation there is a general swelling of the parts about the larynx and the epiglottis, the result being a narrowing of the channel for the entrance of the air, and to this the chief dangers are due. The symptoms vary with the intensity of the attack; there is first a sense of tickling, then of heat, dryness, and pain in the throat, with some difficulty in swallowing. There is a dry cough, with expectoration later; phonation becomes painful, while the voice is husky, and may be completely lost. In children there is some dyspnoea. In favourable cases, which form the majority, the attack tends to abate in a few days, but the inflammation may become of the oedematous variety, and death may occur suddenly from an asphyxial paroxysm. Many cases of acute laryngitis are so slight as to make themselves known only by hoarseness and the character of the cough, nevertheless in every instance the attack demands serious attention. The diagnosis is not, in adults, a matter of much difficulty, especially if an examination is made with the laryngoscope; in children, however, it is more difficult, and the question of diphtheria must not be lost sight of. The treatment is, first and foremost, rest; no talking must be allowed. The patient should be kept in bed, in a room at an even temperature, and the air saturated with moisture. An ice-bag round the throat gives much relief, while internally diaphoretics may be given, and a full dose of Dover's powder if there be much pain or cough.

Chronic Laryngitis usually occurs as a result of repeated attacks of the acute form. It is extremely common in people who habitually over-use the voice, and is the cause of the hoarse voice one associates with street sellers. The constant inhalation of irritating vapours, such as tobacco smoke, may also cause it. There is usually little or no pain, only the unpleasant sensation of tickling in the larynx, with a constant desire to cough. The changes in the mucous membrane are more permanent than in the acute variety, and there nearly always accompanies this a chronic alteration of the membrane of the pharynx (*granular pharyngitis*). The treatment consists in stopping the cause, where known, *e.g.* the smoking or shouting. Careful examination should be made to see if there is any nasal obstruction, and the larynx should be treated locally with suitable astringents, by means of a brush, spray or insufflation. Overheated and ill-ventilated rooms must be avoided, as entrance into them immediately aggravates the trouble and causes a paroxysm of coughing.

Oedematous Laryngitis is a very fatal condition, which may occur, though rarely, as a sequence of acute laryngitis. It is far more commonly seen in syphilitic and tubercular conditions of the larynx, in kidney disease, in certain fevers, and in cases of cellulitis of the neck. The larynx is also one of the sites of *Angeioneurotic oedema*. In this form of laryngitis there are all the symptoms of acute laryngitis, but on a very much exaggerated scale. The dyspnoea, accompanied by marked stridor, may arise and reach a dangerous condition within the space of an hour, and demand the most prompt treatment. On examination the mucous membrane round the epiglottis is seen to be enormously swollen. The treatment is ice round the throat and internally, scarification of the swollen parts, and should that not relieve the asphyxial symptoms, tracheotomy must be performed immediately.

Tubercular Laryngitis is practically always associated with phthisis. The mucous membrane is invaded by the tubercles, which first form small masses. These later break down and ulcerate; the ulceration then spreads up and down, causing an immense amount of destruction. The first indication is hoarseness, or, in certain forms, pain on swallowing. The cough is, as a rule, a late symptom. A sudden oedema may bring about a rapid fatal termination. The general treatment is the same as that advised for phthisis; locally, the affected parts may be removed by one or a series of operations, generally under local anaesthesia, or they may be treated with some destructive agent such as lactic acid. The pain on swallowing can be best alleviated by painting with a weak solution of cocaine. The condition is a very grave one; the prognosis depends largely on the associated pulmonary infection—if that be extensive, a very small amount of laryngeal mischief resists treatment, while, if the case be the contrary, a very extensive mischief may be successfully dealt with.

Syphilitic Laryngitis.—Invasion of the larynx in syphilis is very common. It may occur in both stages of the disease and in the inherited form. In the secondary stage the damage is superficial, and the symptoms those of a slight acute laryngitis. The injury in the tertiary stage is much more serious, the deeper structures are invaded with the formation of deep ulcers, which may when they heal form strong cicatrices, which produce a narrowing of the air-passage which may eventually require surgical interference. Occasionally a fatal oedema may arise. The treatment consists of administering constitutional remedies, local treatment being of comparatively slight importance.

Paroxysmal Laryngitis, or *Laryngismus stridulus*, is a nervous affection of the larynx that occurs in infants. It appears to be associated with adenoids. The disease consists of a reflex spasm of the glottis, which causes a complete blocking of the air-passages. The attacks, which are recurrent, cause acute asphyxiation. They may cease for no obvious reason, or one may prove fatal. The whole attack is of such short duration that the infant has either recovered or succumbed before assistance can be called. After an attack, careful examination should be made, and the adenoids, if present, removed by operation.

LA SABLIÈRE, MARGUERITE DE (*c.* 1640–1693), friend and patron of La Fontaine, was the wife of Antoine Rambouillet, sieur de la Sablière (1624–1679), a Protestant financier entrusted with the administration of the royal estates, her maiden name being Marguerite Hessein. She received an excellent education in Latin, mathematics, physics and anatomy from the best scholars of her time, and her house became a meeting-place for poets, scientists and men of letters, no less than for brilliant members of the court of Louis XIV. About 1673 Mme de la Sablière received into her house La Fontaine, whom for twenty years she relieved of every kind of material anxiety. Another friend and inmate of the house was the traveller and physician François Bernier, whose abridgment of the works of Gassendi was written for Mme de la Sablière. The abbé Chaulieu and his fellow-poet, Charles Auguste, marquis de La Fare, were among her most intimate associates. La Fare sold his commission in the army to be able to spend his time with her. This liaison, which seems to have been the only serious passion of her life, was broken in 1679. La Fare was seduced from his allegiance, according to Mme de Sévigné by his love of play, but to this must be added a new passion for the actress La Champmeslé. Mme de la Sablière thenceforward gave more and more attention to good works, much of her time being spent in the hospital for incurables. Her husband's death in the same year increased her serious tendencies, and she was presently converted to Roman Catholicism. She died in Paris on the 8th of January 1693.

LA SALE (or La Salle), **ANTOINE DE** (*c.* 1388–1462?), French writer, was born in Provence, probably at Arles. He was a natural son of Bernard de la Salle,[1] a famous soldier of fortune, who served many masters, among others the Angevin dukes. In 1402 Antoine entered the court of Anjou, probably as a page, and in 1407 he was at Messina with Duke Louis II., who had gone there to enforce his claim to the kingdom of Sicily. The next years he perhaps spent in Brabant, for he was present at two tournaments given at Brussels and Ghent. With other gentlemen from Brabant, whose names he has preserved, he took part in the expedition of 1415 against the Moors, organized by John I. of Portugal. In 1420 he accompanied Louis III. on another expedition to Naples, making in that year an excursion from Norcia to the Monte della Sibilla, and the neighbouring Lake of Pilate. The story of his adventures on this occasion, and an account, with some sceptical comments, of the local legends regarding Pilate, and the Sibyl's grotto,[2] form the most interesting chapter of *La Salade*, which is further adorned with a map of the ascent from Montemonaco. La Sale probably returned with Louis III. of Anjou, who was also comte de Provence, in 1426 to Provence, where he was acting as *viguier* of Arles in 1429. In 1434 René, Louis's successor, made La Sale tutor to his son Jean d'Anjou, duc de Calabre, to whom he dedicated, between the years 1438 and 1447, his *La Salade*, which is a text-book of the studies necessary for a prince. The primary intention of the title is no doubt the play on his own name, but he explains it on the ground of the miscellaneous character of the book—a salad is composed "of many good herbs." In 1439 he was again in Italy in charge of the castle of Capua, with the duc de Calabre and his young wife, Marie de Bourbon, when the place was besieged by the king of Aragon. René abandoned Naples in 1442, and Antoine no doubt returned to France about the same time. His advice was sought at the tournaments which celebrated the marriage of the unfortunate Margaret of Anjou at Nancy in 1445; and in 1446, at a similar display at Saumur, he was one of the umpires. La Sale's pupil was now twenty years of age, and, after forty years' service of the house of Anjou, La Sale left it to become tutor to the sons of Louis de Luxembourg, comte de Saint Pol, who took him to Flanders and presented him at the court of Philippe le Bon, duke of Burgundy. For his new pupils he wrote at Châtelet-sur-Oise, in 1451, a moral work entitled *La Salle*.

He was nearly seventy years of age when he wrote the work that has made him famous, *L'Hystoire et plaisante cronicque du petit Jehan de Saintré et de la jeune dame des Belles-Cousines, Sans autre nom nommer*, dedicated to his former pupil, Jean de Calabre. An *envoi* in MS. 10,057 (nouv. acq. fr.) in the Bibliothèque Nationale, Paris, states that it was completed at Châtelet on the 6th of March 1455 (*i.e.* 1456). La Sale also announces an intention, never fulfilled, apparently, of writing a romance of *Paris et Vienne*. The MSS. of *Petit Jehan de Saintré* usually contain in addition *Floridam et Elvide*, translated by Rasse de Brunhamel from the Latin of Nicolas de Clamange, and dedicated to La Sale; also *Addiction extraite des Cronicques de Flandres*, of which only a few lines are original. Brunhamel says in his dedication that La Sale had delighted to write honourable histories from the time of his "florie jeunesse," which confirms a reasonable inference from the style of *Petit Jehan de Saintré* that its author was no novice in the art of romance-writing. The *Réconfort à Madame de Neufville*, a consolatory epistle including two stories of parental fortitude, was written at Vendeuil-sur-Oise about 1458, and in 1459 La Sale produced his treatise *Des anciens tournois et faictz d'armes* and the *Journée d'Onneur et de Prouesse*. He followed his patron to Genappe in Brabant when the Dauphin (afterwards Louis XI.) took refuge at the Burgundian court.

La Sale is generally accepted as the author of one of the most famous satires in the French language, *Les Quinze Joyes de mariage*, because his name has been disengaged from an acrostic at the end of the Rouen MS. He is also supposed to have been the "acteur" in the collection of licentious stories supposed to be narrated by various persons at the court of Philippe le Bon, and entitled the *Cent Nouvelles Nouvelles*. One only of the stories is given in his name, but he is credited with the compilation of the whole, for which Louis XI. was long held responsible. A completed copy of this was presented to the Duke of Burgundy at Dijon in 1462. If then La Sale was the author, he probably was still living; otherwise the last mention of him is in 1461.

Petit Jehan de Saintré gives, at the point when the traditions of chivalry were fast disappearing, an account of the education of an ideal knight and rules for his conduct under many different circumstances. When Petit Jehan, aged thirteen, is persuaded by the Dame des Belles-Cousines to accept her as his lady, she gives him systematic instruction in religion, courtesy, chivalry and the arts of success. She materially advances his career until Saintré becomes an accomplished knight, the fame of whose prowess spreads throughout Europe. This section of the romance—apparently didactic in intention—fits in with the author's other works of edification. But in the second part this virtuous lady falls a victim to a vulgar intrigue with Damp Abbé. One of La Sale's commentators, M. Joseph Nève, ingeniously maintains that the last section is simply to show how the hero, after passing through the other grades of education, learns at last by experience to arm himself against coquetry. The book may, however, be fairly regarded as satirizing the whole theory of "courteous" love, by the simple method of fastening a repulsive conclusion on an ideal case. The contention that the *fabliau*-like ending of a romance begun in idyllic fashion was due to the corrupt influences of the Dauphin's exiled court, is inadmissible, for the last page was written when the prince arrived in Brabant in 1456. That it is an anti-clerical satire seems unlikely. The profession of the seducer is not necessarily chosen from that point of view. The language of the book is not disfigured by coarseness of any kind, but, if the brutal ending was the expression of the writer's real views, there is little difficulty in accepting him as the author of the *Quinze Joyes de mariage* and the *Cent Nouvelles Nouvelles*.—Both these are masterpieces in their way and exhibit a much greater dramatic power and grasp of dialogue than does *Petit Jehan*. Some light is thrown on the romance by the circumstances of the duc de Calabre, to whom it was dedicated. His wife, Marie de Bourbon, was one of the "Belles-Cousines" who contended for the favour of Jacques or Jacquet de Lalaing in the *Livre des faits de Jacques Lalaing* which forms the chief source of the early exploits of Petit Jehan.

The incongruities of La Sale's aims appear in his method of construction. The hero is not imaginary. Jehan de Saintré flourished in the Hundred Years' War, was taken prisoner after Poitiers, with the elder Boucicaut, and was employed in negotiating the treaty of Bretigny. Froissart mentioned him as "le meilleur et le plus vaillant chevalier de France." His exploits as related in the romance are, however, founded on those of Jacques de Lalaing (*c.* 1422–1453), who was brought up at the Burgundian court, and became such a famous knight that he excited the rivalry of the "Belles-Cousines," Marie de Bourbon and Marie de Clèves, duchesse d'Orléans. Lalaing's exploits are related by more than one chronicler, but M. Gustave Raynaud thinks that the *Livre des faits de Jacques de Lalaing*, published among the works of Georges Chastelain, to which textual parallels may be found in *Petit Jehan*, should also be attributed to La Sale, who in that case undertook two accounts of the same hero, one historical and the other fictitious. To complicate matters, he drew, for the later exploits of Petit Jehan, on the *Livres des faits de Jean Boucicaut*, which gives the history of the younger Boucicaut. The atmosphere of the book is not the rough realities of the English wars in which the real Saintré figured but that of the courts to which La Sale was accustomed.

The title of *Les Quinze Joyes de mariage* is, with a profanity characteristic of the time, borrowed from a popular litany, *Les Quinze Joies de Notre Dame*, and each chapter terminates with a liturgical refrain voicing the miseries of marriage. Evidence in favour of La Sale's authorship is brought forward by M. E. Gossart (*Bibliophile belge*, 1871, pp. 83-7), who quotes from his didactic treatise of *La Salle* a passage paraphrased from St Jerome's treatise against Jovinian which contains the chief elements of the satire. Gaston Paris (*Revue de Paris*, Dec. 1897) expressed an opinion that to find anything like the malicious penetration by which La Sale divines the most intimate details of married life, and the painful exactness of the description, it is necessary to travel as far as Balzac. The theme itself was common enough in the middle ages in France, but the dialogue of the *Quinze Joyes* is unusually natural and pregnant. Each of the fifteen vignettes is perfect in its kind. There is no redundance. The diffuseness of romance is replaced by the methods of the writers of the *fabliaux*.

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[1] For his career, see Paul Durrieu, *Les Gascons en Italie* (Auch, 1885, pp. 107-71).

[2] For the legend of the Sibyl current in Italy at the time, given by La Sale, and its inter-relation with the Tannhäuser story, see W. Soederhjelm, "A. de la Salle et la légende de Tannhäuser" in *Mémoires de la soc. néo-philologique d'Helsingfors* (1897, vol. ii.); and Gaston Paris, "Le Paradis de la Reine Sibylle," and "La Légende du Tannhäuser," in the *Revue de Paris* (Dec. 1897 and March 1898).

In the *Cent Nouvelles Nouvelles* the Italian *novella* is naturalized in France. The book is módelled on the *Decameron* of Boccaccio, and owes something to the Latin *Facetiae* of the contemporary scholar Poggio; but the stories are rarely borrowed, and in cases where the *Nouvelles* have Italian parallels they appear to be independent variants. In most cases the general immorality of the conception is matched by the grossness of the details, but the ninety-eighth story narrates what appears to be a genuine tragedy, and is of an entirely different nature from the other *contes*. It is another version of the story of Floridam et Elvide already mentioned.

Not content with allowing these achievements to La Sale, some critics have proposed to ascribe to him also the farce of *Maître Pathelin*.

The best editions of La Sale's undoubted and reputed works are:—*Petit Jehan de Saintré* by J. M. Guichard (1843); *Les Cent Nouvelles Nouvelles* by Thomas Wright (Bibl. elzévérienne, 1858); *Les Quinze Joyes de mariage* by P. Jannet (Bibl. elzév., 1857). *La Salade* was printed more than once during the 16th century. *La Salle* was never printed. For its contents see E. Gossart in the *Bibliophile belge* (1871, pp. 77 et seq.). See also the authorities quoted above, and Joseph Nève, *Antoine de la Salle, sa vie et ses ouvrages . . . suivi du Réconfort de Madame de Fresne . . . et de fragments et documents inédits* (1903), who argues for the rejection of *Les Quinze Joyes* and the *Cent Nouvelles Nouvelles* from La Sale's works; Pietro Toldo, *Contributo allo studio della novella francese del XV e XVI secolo* (1895), and a review of it by Gaston Paris in the *Journal des Savants* (May 1895); L. Stern, "Versuch über Antoine de la Salle," in *Archiv für das Studium der neueren Sprachen*, vol. xlvi.; and G. Raynaud, "Un Nouveau Manuscrit du Petit Jehan de Saintré," in *Romania*, vol. xxxi. (M. Br.)

LASALLE, ANTOINE CHEVALIER LOUIS COLLINET, Count (1775–1809), French soldier, belonged to a noble family in Lorraine. His grandfather was Abraham Fabert, marshal of France. Entering the French army at the age of eleven, he had reached the rank of lieutenant when the Revolution broke out. As an aristocrat, he lost his commission, but he enlisted in the ranks, where his desperate bravery and innate power of command soon distinguished him. By 1795 he had won back his grade, and was serving as a staff-officer in the army of Italy. On one occasion, at Vicenza, he rivalled Seydlitz's feat of leaping his horse over the parapet of a bridge to avoid capture, and, later, in Egypt, he saved Davout's life in action. By 1800 he had become colonel, and in one combat in that year he had two horses killed under him, and broke seven swords. Five years later, having attained the rank of general of brigade, he was present with his brigade of light cavalry at Austerlitz. In the pursuit after Jena in 1806, though he had but 600 hussars and not one piece of artillery with him, he terrified the commandant of the strong fortress of Stettin into surrender, a feat rarely equalled save by that of Cromwell on Bletchingdon House. Made general of division for this exploit, he was next in the Polish campaign, and at Heilsberg saved the life of Murat, grand duke of Berg. When the Peninsular War began, Lasalle was sent out with one of the cavalry divisions, and at Medina de Rio Seco, Gamonal and Medellin broke every body of troops which he charged. A year later, at the head of one of the cavalry divisions of the *Grande Armée* he took part in the Austrian war. At Wagram he was killed at the head of his men. With the possible exception of Curély, who was in 1809 still unknown, Napoleon never possessed a better leader of light horse. Wild and irregular in his private life, Lasalle was far more than a *beau sabreur*. To talent and experience he added that power of feeling the pulse of the battle which is the true gift of a great leader. A statue of him was erected in Lunéville in 1893. His remains were brought from Austria to the Invalides in 1891.

LA SALLE, RENÉ ROBERT CAVELIER, Sieur de (1643–1687), French explorer in North America, was born at Rouen on the 22nd of November 1643. He taught for a time in a school (probably Jesuit) in France, and seems to have forfeited his claim to his father's estate by his connexion with the Jesuits. In 1666 he became a settler in Canada, whither his brother, a Sulpician abbé, had preceded him. From the Seminary of St Sulpice in Montreal La Salle received a grant on the St Lawrence about 8 m. above Montreal, where he built a stockade and established a fur-trading post. In 1669 he sold this post (partly to the Sulpicians who had granted it to him) to raise funds for an expedition to China[1] by way of the Ohio,[2] which he supposed, from the reports of the Indians, to flow into the Pacific. He passed up the St Lawrence and through Lake Ontario to a Seneca village on the Genesee river; thence with an Iroquois guide he crossed the mouth of the Niagara (where he heard the noise of the distant falls) to Ganastogue, an Iroquois colony at the head of Lake Ontario, where he met Louis Joliet and received from him a map of parts of the Great Lakes. La Salle's missionary comrades now gave up the quest for China to preach among the Indians. La Salle discovered the Ohio river, descended it at least as far as the site of Louisville, Kentucky, and possibly, though not probably, to its junction with the Mississippi, and in 1669–1670, abandoned by his few followers, made his way back to Lake Erie. Apparently he passed through Lake Erie, Lake Huron and Lake Michigan, and some way down the Illinois river. Little is known of these explorations, for his journals are lost, and the description of his travels rests only on the testimony of the anonymous author of a *Histoire de M. de la Salle*. Before 1673 La Salle had returned to Montreal. Becoming convinced, after the explorations of Marquette and Joliet in 1673, that the Mississippi flowed into the Gulf of Mexico, he conceived a vast project for exploring that river to its mouth and extending the French power to the lower Mississippi Valley. He secured the support of Count Frontenac, then governor of Canada, and in 1674 and 1677 visited France, obtaining from Louis XIV. on his first visit a patent of nobility and a grant of lands about Fort Frontenac, on the site of the present Kingston, Ontario, and on his second visit a patent empowering him to explore the West at his own expense, and giving him the buffalo-hide monopoly. Late in the year 1678, at the head of a small party, he started from Fort Frontenac. He established a post above Niagara Falls, where he spent the winter, and where, his vessel having been wrecked, he built a larger ship, the "Griffon," in which he sailed up the Great Lakes to Green Bay (Lake Michigan), where he arrived in September 1679. Sending back the "Griffon" freighted with furs, by which he hoped to satisfy the claims of his creditors, he proceeded to the Illinois river, and near what is now Peoria, Illinois, built a fort, which he called Fort Crèvecœur. Thence he detached Father Hennepin, with one companion, to explore the Illinois to its mouth, and, leaving his lieutenant, Henri de Tonty (*c.* 1650–*c.* 1702),[3] with about fifteen men, at Fort Crèvecœur, he returned by land, afoot, to Canada to obtain needed supplies, discovering the fate of the "Griffon" (which proved to have been lost), thwarting the intrigues of his enemies and appeasing his creditors. In July 1680 news reached him at Fort Frontenac that nearly all Tonty's men had deserted, after destroying or appropriating most of the supplies; and that twelve of them were on their way to kill him as the surest means of escaping punishment.

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[1] The name La Chine was sarcastically applied to La Salle's settlement on the St Lawrence.

[2] The Iroquois seem to have used the name Ohio for the Mississippi, or at least for its lower part; and this circumstance makes the story of La Salle's exploration peculiarly difficult to disentangle.

[3] Tonty (or Tonti), an Italian, born at Gaeta, was La Salle's principal lieutenant, and was the equal of his chief in intrepidity. Before his association with La Salle he had engaged in military service in Europe, during which he had lost a hand. He accompanied La Salle to the mouth of the Mississippi, and was in command of Fort St Louis from the time of its erection until 1702, except during his journeys down the Mississippi in search of his chief. In 1702 he joined d'Iberville in lower Louisiana, and soon after was despatched on a mission to the Chickasaw Indians. This is the last authentic trace of him.

These he met and captured or killed. He then returned to the Illinois, to find the country devastated by the Iroquois, and his post abandoned. He formed a league of the Western Indians to fight the Iroquois, then went to Michilimackinac, where he found Tonty, proceeded again to Fort Frontenac to obtain supplies and organize his expedition anew, and returned in December 1681 to the Illinois. Passing down the Illinois to the Mississippi, which he reached in February 1682, he floated down that stream to its mouth, which he reached on the 9th of April, and, erecting there a monument and a cross, took formal possession in the name of Louis XIV., in whose honour he gave the name "Louisiana" to the region. He then returned to Michilimackinac, whence, with Tonty, he went again to the Illinois and established a fort, Fort St Louis, probably on Starved Rock (near the present Ottawa, Illinois), around which nearly 20,000 Indians (Illinois, Miamis and others seeking protection from the Iroquois) had been gathered. La Salle then went to Quebec, and La Barre, who had succeeded Frontenac, being unfriendly to him, again visited France (1684), where he succeeded in interesting the king in a scheme to establish a fort at the mouth of the Mississippi and to seize the Spanish posts in the vicinity. On the 24th of July 1684, with four vessels under the command of himself and Captain Beaujeu, a naval officer, he sailed from La Rochelle. Mistaking, it appears, the inlets of Matagorda Bay (which La Salle called St Louis's Bay) in the present state of Texas, for the mouth of an arm of the Mississippi, he landed there, and Beaujeu, soon afterwards returned to France. The expedition had met with various misfortunes; one vessel had been captured by the Spaniards and another had been wrecked; and throughout La Salle and Beaujeu had failed to work in harmony. Soon finding that he was not at the mouth of the Mississippi, La Salle established a settlement and built a fort, Fort St Louis, on the Lavaca (he called it La Vache) river, and leaving there the greater part of his force, from October 1685 to March 1686 he vainly sought for the Mississippi. He also made two attempts to reach the Illinois country and Canada, and during the second, after two months of fruitless wanderings, he was assassinated, on the 19th of March 1687, by several of his followers, near the Trinity river in the present Texas.

His colony on the Lavaca, after suffering terribly from privation and disease and being attacked by the Indians, was finally broken up, and a force of Spaniards sent against it in 1689 found nothing but dead bodies and a dismantled fort; the few survivors having become domesticated in the Indian villages near by. Some writers, notably J. G. Shea, maintain that La Salle never intended to fortify the mouth of the Mississippi, but was instructed to establish an advanced post near the Spanish possessions, where he was to await a powerful expedition under a renegade Spaniard, Peñalosa, with whom he was to co-operate in expelling the Spaniards from this part of the continent.[1]

La Salle was one of the greatest of the explorers in North America. Besides discovering the Ohio and probably the Illinois, he was the first to follow the Mississippi from its upper course to its mouth and thus to establish the connexion between the discoveries of Radisson, Joliet and Marquette in the north with those of De Soto in the south. He was stern, indomitable and full of resource.

The best accounts of La Salle's explorations may be found in Francis Parkman's *La Salle and the Discovery of the Great West* (Boston, 1879; later revised editions), in Justin Winsor's *Cartier to Frontenac* (Boston, 1894), and in J. G. Shea's *Discovery and Exploration of the Mississippi Valley* (New York, 1852); see also P. Chesnel, *Histoire de Cavelier de La Salle, explorations et conquête du bassin du Mississippi* (Paris, 1901). Of the early narratives see Louis Hennepin, *Description de la Louisiane* (1683); Joutel, *Journal historique du dernier voyage que feu M. de la Salle fit dans le Golfe de Mexique, &c.* (Paris, 1713); and Henri de Tonty, *Derniers Découvertes dans l'Amérique septentrionale de M. de La Salle* (Paris, 1697). Original narratives may be found, translated into English, in *The Journeys of René Robert Cavelier, Sieur de La Salle, as related by his Faithful Lieutenant, Henri de Tonty, &c.* (2 vols., New York, 1905), edited by I. J. Cox; in Benjamin F. French's *Historical Collections of Louisiana* (6 series, New York, 1846–1853), and in Shea's *Early Voyages Up and Down the Mississippi* (Albany, 1861); and an immense collection of documents relating to La Salle may be found in Pierre Margry's *Découvertes et établissements des Français dans l'ouest et dans le sud de l'Amérique septentrionale, 1614–1754; Mémoires et documents originaux recueillis et publiés* (6 vols., Paris, 1875–1886), especially in vol. ii. (C. C. W.)

LA SALLE, ST JEAN BAPTISTE DE (1651–1719), founder of the order of Christian Brothers, was born at Reims. The son of a rich lawyer, his father's influence early secured him a canonry in the cathedral; there he established a school, where free elementary instruction was given to poor children. The enterprise soon broadened in scope; a band of enthusiastic assistants gathered round him; he resolved to resign his canonry, and devote himself entirely to education. His assistants were organized into a community, which gradually rooted itself all over France; and a training-school for teachers, the Collège de Saint-Yon, was set up at Rouen. In 1725, six years after the founder's death, the society was recognized by the pope, under the official title of "Brothers of the Christian Schools"; its members took the usual monastic vows, but did not aspire to the priesthood. During the first hundred years of its existence its activities were mainly confined to France; during the 19th century it spread to most of the countries of western Europe, and has been markedly successful in the United States. When La Salle was canonized in 1900, the total number of brothers was estimated at 15,000. Although the order has been chiefly concerned with elementary schools, it undertakes most branches of secondary and technical education; and it has served as a model for other societies, in Ireland and elsewhere, slightly differing in character from the original institute.

LA SALLE, a city of La Salle county, Illinois, U.S.A., on the Illinois river, near the head of navigation, 99 m. S.W. of Chicago. Pop. (1900) 10,446, of whom 3471 were foreign-born; (1910 census) 11,537. The city is served by the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, and the Illinois Central railways, and by the Illinois & Michigan Canal, of which La Salle is the western terminus. The city has a public library. The principal industries are the smelting of zinc and the manufacture of cement, rolled zinc, bricks, sulphuric acid and clocks; in 1905 the city's factory products were valued at $3,158,173. In the vicinity large quantities of coal are mined, for which the city is an important shipping point. The municipality owns and operates the waterworks and the electric lighting plant. The first settlement was made here in 1830; and the place which was named in honour of the explorer, René Robert Cavelier, Sieur de La Salle, was chartered as a city in 1852 and rechartered in 1876.

LASAULX, ARNOLD CONSTANTIN PETER FRANZ VON (1839–1886), German mineralogist and petrographer, was born at Castellaun near Coblenz on the 14th of June 1839. He was educated at Berlin, where he took his Ph. D. in 1868. In 1875 he became professor of mineralogy at Breslau, and in 1880 professor of mineralogy and geology at Bonn. He was distinguished for his researches on minerals and on crystallography, and he was one of the earlier workers on microscopic petrography. He described in 1878 the eruptive rocks of the district of Saar and Moselle. In 1880 he edited *Der Aetna* from the MSS. of Dr W. Sartorius von Waltershausen, the results of observations made between the years 1834–1869. He was author of *Elemente der Petrographie* (1875), *Einführung in die Gesteinslehre* (1885), and *Précis de pétrographie* (1887). He died at Bonn on the 25th of January 1886.

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[1] Although La Salle and Don Diego de Peñalosa (1624–1687) presented to the French government independent plans for an expedition against the Spaniards and Peñalosa afterwards proposed their co-operation, there is no substantial evidence that this project was adopted. Parkman is of the opinion that La Salle proposed his expedition against the Spaniards in the hope that the conclusion of peace between France and Spain would prevent its execution and that he might then use the aid he had thus received in establishing a fortified commercial colony at the mouth of the Mississippi. See E. T. Miller, "The Connection of Peñalosa with the La Salle Expedition," in the *Quarterly* of the Texas State Historical Association, vol. v. (Austin, Tex., 1902).

LASCAR, the name in common use for all oriental, and especially Indian, sailors, which has been adopted in England into the Merchant Shipping Acts, though without any definition. It is derived from the Persian *lashkar* = army, or camp, in which sense it is still used in India, *e.g.* Lashkar, originally the camp, now the permanent capital, of Sindhia at Gwalior. It would seem to have been applied by the Portuguese, first to an inferior class of men in military service (cf. "gun-lascars"), and then to sailors as early as the 17th century. The form *askari* on the east coast of Africa, equivalent to "sepoy," comes from the Arabic *ʽaskar* = army, which is believed to be itself taken from the Persian.

LASCARIS, CONSTANTINE (d. 1493 or 1500), Greek scholar and grammarian, one of the promoters of the revival of Greek learning in Italy, was born at Constantinople. He was a member of the noble Bithynian family, which had furnished three emperors of Nicaea during the 13th century. After the fall of Constantinople in 1453, he took refuge first in Corfu and then in Italy, where Francesco Sforza, duke of Milan, appointed him Greek tutor to his daughter. Here was published his *Grammatica Graeca, sive compendium octo orationis partium*, remarkable as being the first book entirely in Greek issued from the printing press. After leaving Milan, Lascaris taught in Rome under the patronage of Cardinal Bessarion, and in Naples, whither he had been summoned by Ferdinand I. to deliver a course of lectures on Greece. Ultimately, on the invitation of the inhabitants, he settled in Messina, Sicily, where he continued to teach publicly until his death. Among his numerous pupils here was Pietro Bembo. Lascaris bequeathed his library of valuable MSS. to the senate of Messina; the collection was afterwards carried to Spain and lodged in the Escurial.

The *Grammatica*, which has often been reprinted, is the only work of value produced by Lascaris. Some of his letters are given by J. Iriarte in the *Regiae Bibliothecae Matritensis codices Graeci manuscripti*, i. (Madrid, 1769). His name is known to modern readers in the romance of A. F. Villemain, *Lascaris, ou les Grecs du quinzième siècle* (1825). See also J. E. Sandys, *Hist. Class. Schol.*, ed. 2, vol. ii. (1908), pp. 76 foll.

LASCARIS, JOANNES [JOHN], or JANUS (*c.* 1445–1535), Greek scholar, probably the younger brother of Constantine Lascaris, surnamed Rhyndacenus from the river Rhyndacus in Bithynia, his native province. After the fall of Constantinople he was taken to the Peloponnese, thence to Crete, and ultimately found refuge in Florence at the court of Lorenzo de' Medici, whose intermediary he was with the sultan Bayezid II. in the purchase of Greek MSS. for the Medicean library. On the expulsion of the Medici from Florence, at the invitation of Charles VIII. of France, Lascaris removed to Paris (1495), where he gave public instruction in Greek. By Louis XII. he was several times employed on public missions, amongst others to Venice (1503–1508), and in 1515 he appears to have accepted the invitation of Leo X. to take charge of the Greek college he had founded at Rome. We afterwards (1518) find Lascaris employed along with Budaeus (Budé) by Francis I. in the formation of the royal library at Fontainebleau, and also again sent in the service of the French crown to Venice. He died at Rome, whither he had been summoned by Pope Paul III., in 1535. Among his pupils was Musurus.

Amongst other works, Lascaris edited or wrote: *Anthologia epigrammatum Graecorum* (1494), in which he ascribed the collection of the Anthology to Agathias, not to Planudes; *Didymi Alexandrini scholia in Iliadem* (1517); Porphyrius of Tyre's *Homericarum quaestionum liber* (1518); *De veris Graecarum litterarum formis ac causis apud antiquos* (Paris, 1556). See H. Hody, *De Graecis illustribus* (London, 1742); W. Roscoe, *Life of Leo X*. ii. (1846); C. F. Börner, *De doctis hominibus Graecis* (Leipzig, 1750); A. Horawitz in Ersch & Gruber's *Allgemeine Encyclopädie*; J. E. Sandys, *Hist. Class. Schol.*, ed. 2, vols. ii. (1908), p. 78.

LAS CASAS, BARTOLOMÉ DE (1474–1566), for some time bishop of Chiapa in Mexico, and known to posterity as "The Apostle of the Indies," was a native of Seville. His father, one of the companions of Columbus in the voyage which resulted in the discovery of the New World, sent him to Salamanca, where he graduated. In 1498 he accompanied his father in an expedition under Columbus to the West Indies, and in 1502 he went with Nicolás de Ovando, the governor, to Hayti, where in 1510 he was admitted to holy orders, being the first priest ordained in the American colonies. In 1511 he passed over to Cuba to take part in the work of "population and pacification," and in 1513 or 1514 he witnessed and vainly endeavoured to check the massacre of Indians at Caonao. Soon afterwards there was assigned to him and his friend Renteria a large village in the neighbourhood of Zagua, with a number of Indians attached to it in what was known as *repartimiento* (allotment); like the rest of his countrymen he made the most of this opportunity for growing rich, but occasionally celebrated mass and preached. Soon, however, having become convinced of the injustice connected with the *repartimiento* system, he began to preach against it, at the same time giving up his own slaves. With the consent of his partner he resolved to go to Spain on behalf of the oppressed natives, and the result of his representations was that in 1516 Cardinal Jimenes caused a commission to be sent out for the reform of abuses, Las Casas himself, with the title of "protector of the Indians," being appointed to advise and report on them. This commission had not been long at San Domingo before Las Casas perceived the indifference of his coadjutors to the cause which he himself had at heart, and July 1517 found him again in Spain, where he developed his scheme for the complete liberation of the Indians—a scheme which not only included facilities for emigration from Spain, but was intended to give to each Spanish resident in the colonies the right of importing twelve negro slaves. The emigration movement proved a failure, and Las Casas lived long enough to express his shame for having been so slow to see that Africans were as much entitled to freedom as were the natives of the New World. Overwhelmed with disappointment, he retired to the Dominican monastery in Haiti; he joined the order in 1522 and devoted eight years to study. About 1530 he appears to have revisited the Spanish court, but on what precise errand is not known; the confusion concerning this period of his life extends to the time when, after visits to Mexico, Nicaragua, Peru and Guatemala, he undertook an expedition in 1537 into Tuzulutlan, the inhabitants of which were, chiefly through his tact, peaceably converted to Christianity, mass being celebrated for the first time amongst them in the newly founded town of Rabinal in 1538. In 1539 Las Casas was sent to Spain to obtain Dominican recruits, and through Loaysa, general of the order, and confessor of Charles V., he was successful in obtaining royal orders and letters favouring his enterprise. During this stay in Europe, which lasted more than four years, he visited Germany to see the emperor; he also (1542) wrote his *Veynte Razones*, in defence of the liberties of the Indians and the *Brevisima Relacion de la Destruycion des las Indias occidentales*, the latter of which was published some twelve years later. In 1543 he refused the Mexican bishopric of Cuzco, but was prevailed upon to accept that of Chiapa, for which he sailed in 1544. Thwarted at every point by the officials, and outraged by his countrymen in his attempt to carry out the new laws which his humanity had procured, he returned to Spain and resigned his dignity (1547). In 1550 he met Sepúlveda in public debate on the theses drawn from the recently published *Apologia pro libro de justis belli causis*, in which the latter had maintained the lawfulness of waging unprovoked war upon the natives of the New World. The course of the discussion may be traced in the account of the *Disputa* contained in the *Obras* (1552). In 1565 Las Casas successfully remonstrated with Philip II. against the financial project for selling the reversion of the *encomiendas*—a project which would have involved the Indians in hopeless bondage. In July of the following year he died at Madrid, whither he had gone to urge (and with success) the necessity of restoring a court of justice which had been suppressed in Guatemala. His *Historia de las Indias* was not published till 1875–1876.

Sir Arthur Helps' *Life of Las Casas* (London, 1868) has not been superseded; but see also F. A. MacNutt, *Bartholomew de Las Casas* (1909).

LAS CASES, EMMANUEL AUGUSTIN DIEUDONNÉ MARIN JOSEPH, Marquis (1766–1842), French official, was born at the castle of Las Cases near Revel in Languedoc. He was educated at the military schools of Vendôme and Paris; he entered the navy and took part in various engagements of the years 1781–1782. The outbreak of the Revolution in 1789 caused him to "emigrate," and he spent some years in Germany and England, sharing in the disastrous Quiberon expedition (1795). He was one of the few survivors and returned to London, where he lived in poverty. He returned to France during the Consulate with other royalists who rallied to the side of Napoleon, and stated afterwards to the emperor that he was "conquered by his glory." Not until 1810 did he receive much notice from Napoleon, who then made him a chamberlain and created him a count of the empire (he was marquis by hereditary right). After the first abdication of the emperor (11th of April 1814), Las Cases retired to England, but returned to serve Napoleon during the Hundred Days. The second abdication opened up for Las Cases the most noteworthy part of his career. He withdrew with the ex-emperor and a few other trusty followers to Rochefort; and it was Las Cases who first proposed and strongly urged the emperor to throw himself on the generosity of the British nation. Las Cases made the first overtures to Captain Maitland of H.M.S. "Bellerophon", and received a guarded reply, the nature of which he afterwards misrepresented. Las Cases accompanied the ex-emperor to St Helena and acted informally but very assiduously as his secretary, taking down numerous notes of his conversations which thereafter took form in the famous *Mémorial de Ste Hélène*. The limits of this article preclude an attempt at assessing the value of this work. It should be read with great caution, as the compiler did not scruple to insert his own thoughts and to colour the expressions of his master. In some cases he misstated facts and even fabricated documents. It is far less trustworthy than the record penned by Gourgaud in his *Journal*. Disliked by Montholon and Gourgaud, Las Cases seems to have sought an opportunity to leave the island when he had accumulated sufficient literary material. However that may be, he infringed the British regulations in such a way as to lead to his expulsion by the governor, Sir Hudson Lowe (November, 1816). He was sent first to the Cape of Good Hope and thence to Europe, but was not at first allowed by the government of Louis XVIII. to enter France. He resided at Brussels; but, gaining permission to come to Paris after the death of Napoleon, he took up his residence there, published the *Mémorial*, and soon gained an enormous sum from it. He died in 1842 at Passy.

See *Mémoires de E. A. D., comte de Las Cases* (Brussels, 1818); *Mémorial de Ste Hélène* (4 vols., London and Paris, 1823; often republished and translated); *Suite au mémorial de Ste Hélène, ou observations critiques, &c.* (2 vols., Paris, 1824), anonymous, but known to be by Grille and Musset-Pathay. See too Gourgaud, Montholon, and Lowe, Sir Hudson. (J. Hl. R.)

LASHIO, the headquarters of the superintendent, northern Shan States, Burma, situated in 22° 56′ N. and 97° 45′ E. at an altitude of 3100 ft., on a low spur overlooking the valley of the Nam Yao. It is the present terminus of the Mandalay-Kun Lông railway and of the government cart road from Mandalay, from which it is 178 m. distant. It consists of the European station, with court house and quarters for the civil officers; the military police post, the headquarters of the Lashio battalion of military police; the native station, in which the various nationalities, Shans, Burmans, Hindus and Mahommedans, are divided into separate quarters, with reserves for government servants and for the temporary residences of the five sawbwas of the northern Shan States; and a bazaar. Under Burmese rule Lashio was also the centre of authority for the northern Shan States, but the Burmese post in the valley was close to the Nam Yao, in an old Chinese fortified camp. The Lashio valley was formerly very populous; but a rebellion, started by the sawbwa of Hsenwi, about ten years before the British occupation, ruined it, and it is only slowly approaching the prosperity it formerly enjoyed; pop. (1901) 2565. The annual rainfall averages 54 in. The average maximum temperature is 80·5° and the average minimum 55·5°.

LASKER, EDUARD (1829–1884), German publicist, was born on the 14th of October 1829, at Jarotschin, a village in Posen, being the son of a Jewish tradesman. He attended the gymnasium, and afterwards the university of Breslau. In 1848, after the outbreak of the revolution, he went to Vienna and entered the students' legion which took so prominent a part in the disturbances; he fought against the imperial troops during the siege of the city in October. He then continued his legal studies at Breslau and Berlin, and after a visit of three years to England, then the model state for German liberals, entered the Prussian judicial service. In 1870 he left the government service, and in 1873 was appointed to an administrative post in the service of the city of Berlin. He had been brought to the notice of the political world by some articles he wrote from 1861 to 1864, which were afterwards published under the title *Zur Verfassungsgeschichte Preussens* (Leipzig, 1874), and in 1865 he was elected member for one of the divisions of Berlin in the Prussian parliament. He joined the radical or *Fortschritts* party, and in 1867 was also elected to the German parliament, but he helped to form the national liberal party, and in consequence lost his seat in Berlin, which remained faithful to the radicals; after this he represented Magdeburg and Frankfort-on-Main in the Prussian, and Meiningen in the German, parliament. He threw himself with great energy into his parliamentary duties, and quickly became one of its most popular and most influential members. An optimist and idealist, he joined to a fervent belief in liberty an equal enthusiasm for German unity and the idea of the German state. His motion that Baden should be included in the North German Confederation in January 1870 caused much embarrassment to Bismarck, but was not without effect in hastening the crisis of 1870. His great work, however, was the share he took in the judicial reform during the ten years 1867–1877. To him more than to any other single individual is due the great codification of the law. While he again and again was able to compel the government to withdraw or amend proposals which seemed dangerous to liberty, he opposed those liberals who, unable to obtain all the concessions which they called for, refused to vote for the new laws as a whole. A speech made by Lasker on the 7th of February 1873, in which he attacked the management of the Pomeranian railway, caused a great sensation, and his exposure of the financial mismanagement brought about the fall of Hermann Wagener, one of Bismarck's most trusted assistants. By this action he caused, however, some embarrassment to his party. This is generally regarded as the beginning of the reaction against economic liberalism by which he and his party were to be deprived of their influence. He refused to follow Bismarck in his financial and economic policy after 1878; always unsympathetic to the chancellor, he was now selected for his most bitter attacks. Between the radicals and socialists on the one side and the government on the other, like many of his friends, he was unable to maintain himself. In 1879 he lost his seat in the Prussian parliament; he joined the *Sezession*, but was ill at ease in his new position. Broken in health and spirits by the incessant labours of the time when he did "half the work of the Reichstag," he went in 1883 for a tour in America, and died suddenly in New York on the 5th of January 1884.

Lasker's death was the occasion of a curious episode, which caused much discussion at the time. The American House of Representatives adopted a motion of regret, and added to it these words: "That his loss is not alone to be mourned by the people of his native land, where his firm and constant exposition of, and devotion to, free and liberal ideas have materially advanced the social, political and economic conditions of these people, but by the lovers of liberty throughout the world." This motion was sent through the American minister at Berlin to the German foreign office, with a request that it might be communicated to the president of the Reichstag. It was to ask Bismarck officially to communicate a resolution in which a foreign parliament expressed an opinion in German affairs exactly opposed to that which the emperor at his advice had always followed. Bismarck therefore refused to communicate the resolution, and returned it through the German minister at Washington.

Among Lasker's writings may be mentioned: *Zur Geschichte der parlamentarischen Entwickelung Preussens* (Leipzig, 1873), *Die Zukunft des Deutschen Reichs* (Leipzig, 1877) and *Wege und Ziele der*

Kulturentwickelung (Leipzig, 1881). After his death his *Fünfzehn Jahre parlamentarischer Geschichte 1866–1880* appeared edited by W. Cahn (Berlin, 1902). See also L. Bamberger, *Eduard Lasker, Gedenkrede* (Leipzig, 1884); A. Wolff, *Zur Erinnerung an Eduard Lasker* (Berlin, 1884); Freund, *Einiges über Eduard Lasker* (Leipzig, 1885); and *Eduard Lasker, seine Biographie und letzte öffentliche Rede*, by various writers (Stuttgart, 1884). (J. W. He.)

LASKI, the name of a noble and powerful Polish family, is taken from the town of Lask, the seat of their lordship.

Jan Laski, the elder (1456–1531), Polish statesman and ecclesiastic, appears to have been largely self-taught and to have owed everything to the remarkable mental alertness which was hereditary in the Laski family. He took orders betimes, and in 1495 was secretary to the Polish chancellor Zawisza Kurozwecki, in which position he acquired both influence and experience. The aged chancellor entrusted the sharp-witted young ecclesiastic with the conduct of several important missions. Twice, in 1495 and again in 1500, he was sent to Rome, and once on a special embassy to Flanders, of which he has left an account. On these occasions he had the opportunity of displaying diplomatic talent of a high order. On the accession to the Polish throne in 1501 of the indolent Alexander, who had little knowledge of Polish affairs and chiefly resided in Lithuania, Laski was appointed by the senate the king's secretary, in which capacity he successfully opposed the growing separatist tendencies of the grand-duchy and maintained the influence of Catholicism, now seriously threatened there by the Muscovite propaganda. So struck was the king by his ability that on the death of the Polish chancellor in 1503 he passed over the vice-chancellor Macics Dzewicki and confided the great seal to Laski. As chancellor Laski supported the *szlachta*, or country-gentlemen, against the lower orders, going so far as to pass an edict excluding henceforth all plebeians from the higher benefices of the church. Nevertheless he approved himself such an excellent public servant that the new king, Sigismund I., made him one of his chief counsellors. In 1511 the chancellor, who ecclesiastically was still only a canon of Cracow, obtained the coveted dignity of archbishop of Gnesen which carried with it the primacy of the Polish church. In the long negotiations with the restive and semi-rebellious Teutonic Order, Laski rendered Sigismund most important political services, proposing as a solution of the question that Sigismund should be elected grand master, while he, Laski, should surrender the primacy to the new candidate of the knights, Albert of Brandenburg, a solution which would have been far more profitable to Poland than the ultimate settlement of 1525. In 1513 Laski was sent to the Lateran council, convened by Pope Julius II., to plead the cause of Poland against the knights, where both as an orator and as a diplomatist he brilliantly distinguished himself. This mission was equally profitable to his country and himself, and he succeeded in obtaining from the pope for the archbishops of Gnesen the title of *legati nati*. In his old age Laski's partiality for his nephew, Hieronymus, led him to support the candidature of John Zapolya, the protégé of the Turks, for the Hungarian crown so vehemently against the Habsburgs that Clement VII. excommunicated him, and the shock of this disgrace was the cause of his sudden death in 1531. Of his numerous works the most noteworthy are his collection of Polish statutes entitled: *Statuta provinciae gnesnensis antiqua, &c.* (Cracow, 1525–1528) and *De Ruthenorum nationibus eorumque erroribus*, printed at Nuremberg.

See Heinrich R. von Zeissberg, *Joh. Laski, Erzbischof in Gnesen* (Vienna, 1874); and Jan Korytkowski, *Jan Laski, Archbishop of Gnesen* (Gnesen, 1880).

Hieronymus Jaroslaw Laski (1496–1542), Polish diplomatist, nephew of Archbishop Laski, was successively palatine of Inowroclaw and of Sieradia. His first important mission was to Paris in 1524, ostensibly to contract an anti-Turkish league with the French king, but really to bring about a matrimonial alliance between the dauphin, afterwards Henry II., and the daughter of King Sigismund I., a project which failed through no fault of Laski's. The collapse of the Hungarian monarchy at Mohacs (1526) first opened up a wider career to Laski's adventurous activity. Contrary to the wishes of his own sovereign, Sigismund I., whose pro-Austrian policy he detested, Laski entered the service of John Zapolya, the Magyar competitor for the Hungarian throne, thereby seriously compromising Poland both with the emperor and the pope. Zapolya despatched him on an embassy to Paris, Copenhagen and Munich for help, but on his return he found his patron a refugee in Transylvania, whither he had retired after his defeat by the German king Ferdinand I. at Tokay in 1527. In his extremity Zapolya placed himself under the protection of the sultan, Laski being sent to Constantinople as his intermediary. On his way thither he was attacked and robbed of everything, including his credentials and the rich presents without which no negotiations were deemed possible at the Porte. But Laski was nothing if not audacious. Proceeding on his way to the Turkish capital empty-handed, he nevertheless succeeded in gaining the confidence of Gritti, the favourite of the grand vizier, and ultimately persuaded the sultan to befriend Zapolya and to proclaim him king of Hungary. He went still further, and without the slightest authority for his action concluded a ten years' truce between his old master King Sigismund of Poland and the Porte. He then returned to Hungary at the head of 10,000 men, with whose aid he enabled Zapolya to re-establish his position and defeat Ferdinand at Saros-Patak. He was rewarded with the countship of Zips and the governor-generalship of Transylvania. But his influence excited the jealousy of the Magyars, and Zapolya was persuaded to imprison him. On being released by the interposition of the Polish grand hetman, Tarnowski, he became the most violent opponent of Zapolya. Shortly after his return to Poland, Laski died suddenly at Cracow, probably poisoned by one of his innumerable enemies.

See Alexander Hirschberg, *Hieronymus Laski* (Pol.) (Lemberg, 1888).

Jan Laski, the younger (1499–1560), also known as *Johannes a Lasco*, Polish reformer, son of Jaroslaw (d. 1523) voivode of Sieradia and nephew of the famous Archbishop Laski. During his academical course abroad he made the acquaintance of Zwingli and Erasmus and returned to Poland in 1526 saturated with the new doctrines. Nevertheless he took orders, and owing to the influence of his uncle obtained the bishopric of Veszprem in Hungary from King John Zapolya, besides holding a canonry of Cracow and the office of royal secretary. In 1531 he resigned all his benefices rather than give up a woman whom he had secretly married, and having incurred general reprobation and the lasting displeasure of his uncle the archbishop, he fled to Germany, where ultimately (1543) he adopted the Augsburg Confession. For the next thirteen years Laski was a wandering apostle of the new doctrines. He was successively superintendent at Emden and in Friesland, passed from thence to London where he became a member of the so-called *ecclesia peregrinorum*, a congregation of foreign Protestants exiled in consequence of the Augsburg Interim of 1548 and, on being expelled by Queen Mary, took refuge first in Denmark and subsequently at Frankfort-on-Main, where he was greatly esteemed. From Frankfort he addressed three letters (printed at Basel) to King Sigismund, Augustus, and the Polish gentry and people, urging the conversion of Poland to Protestantism. In 1556, during the brief triumph of the anti-catholics, he returned to his native land, took part in the synod of Brzesc, and published a number of polemical works, the most noteworthy of which were *Forma ac ratio tota ecclesiastici ministerii in peregrinorum Ecclesiae instituta* (Pinczow, 1560), and in Polish, *History of the Cruel Persecution of the Church of God in 1567*, republished in his *Opera*, edited by A. Kuyper at Amsterdam in 1866. He died at Pinczow in January 1560 and was buried with great pomp by the Polish Protestants, who also struck a medal in his honour. Twice married, he left two sons and two daughters. His nephew (?) Albert Laski, who visited England in 1583, wasted a fortune in aid of Dr Dee's craze for the "philosopher's stone." Laski's writings are important for the organization of the *ecclesia peregrinorum*, and he was concerned in the Polish version of the Bible, not published till 1563.

See H. Dalton, *Johannes a Lasco* (1881), English version of the earlier portion by J. Evans (1886); Bartels, *Johannes a Lasco* (1860); Harboe, *Schicksale des Johannes a Lasco* (1758); R. Wallace, *Antitrinitarian Biography* (1850); Bonet-Maury, *Early Sources of Eng. Unit. Christianity* (1884); W. A. J. Archbold in *Dict. Nat. Biog.* (1892) under "Laski," George Pascal, *Jean de Lasco* (Paris, 1894); *Life* in Polish by Antoni Walewski (Warsaw, 1872); and Juljan Bukowski, *History of the Reformation in Poland* (Pol.) (Cracow, 1883). (R. N. B.)

LAS PALMAS, the capital of the Spanish island of Grand Canary, in the Canary archipelago, and of an administrative district which also comprises the islands of Lanzarote and Fuerteventura; on the east coast, in 28° 7′ N. and 5° 24′ W. Pop. (1900) 44,517. Las Palmas is the largest city in the Canary Islands, of which it was the capital until 1833. It is the seat of a court of appeal, of a brigadier, who commands the military forces in the district, of a civil lieutenant-governor, who is independent of the governor-general except in connexion with elections and municipal administration, and of a bishop, who is subordinate to the archbishop of Seville. The palms from which the city derives its name are still characteristic of the fertile valley which it occupies. Las Palmas is built on both banks of a small river, and although parts of it date from the 16th century, it is on the whole a clean and modern city, well drained, and supplied with pure water, conveyed by an aqueduct from the highlands of the interior. Its principal buildings include a handsome cathedral, founded in the 16th century but only completed in the 19th, a theatre, a museum, an academy of art, and several hospitals and good schools. The modern development of Las Palmas is largely due to the foreign merchants, and especially to the British who control the greater portion of the local commerce. La Luz, the port, is connected with Las Palmas by a railway 4 m. long; it is a free port and harbour of refuge, officially considered the third in importance of Spanish ports, but actually the first in the matter of tonnage. It is strongly fortified. The harbour, protected by the promontory of La Isleta, which is connected with the mainland by a narrow bar of sand, can accommodate the largest ships, and affords secure anchorage in all weathers. Ships can discharge at the breakwater (1257 yds. long) or at the Santa Catalina mole, constructed in 1883–1902. The minimum depth of water alongside the quays is 4½ ft. There are floating water-tanks, numerous lighters, titan and other cranes, repairing workshops, and very large supplies of coal afloat and ashore. La Luz is one of the principal Atlantic coaling stations, and the coal-trade is entirely in British hands. Other important industries are shipbuilding, fishing, and the manufacture of glass, leather and hats. The chief exports are fruit, vegetables, sugar, wine and cochineal; coal, iron, cement, timber, petroleum, manure, textiles and provisions are the chief imports. (See also CANARY ISLANDS.)

LASSALLE, FERDINAND (1825–1864), German socialist, was born at Breslau on the 11th of April 1825, of Jewish extraction. His father, a prosperous merchant in Breslau, intended Ferdinand for a business career, and sent him to the commercial school at Leipzig; but the boy got himself transferred to the university, first at Breslau, and afterwards at Berlin. His favourite studies were philology and philosophy; he became an ardent Hegelian. Having completed his university studies in 1845, he began to write a work on Heraclitus from the Hegelian point of view; but it was soon interrupted by more stirring interests, and did not see the light for many years. It was in Berlin, towards the end of 1845, that he met the lady with whom his life was to be associated in so remarkable a way, the Countess Hatzfeldt. She had been separated from her husband for many years, and was at feud with him on questions of property and the custody of their children. Lassalle attached himself to the cause of the countess, whom he believed to have been outrageously wronged, made special study of law, and, after bringing the case before thirty-six tribunals, reduced the powerful count to a compromise on terms most favourable to his client. The process, which lasted ten years, gave rise to not a little scandal, especially that of the *Cassettengeschichte*, which pursued Lassalle all the rest of his life. This "affair of the casket" arose out of an attempt by the countess's friends to get possession of a bond for a large life annuity settled by the count on his mistress, a Baroness Meyendorf, to the prejudice of the countess and her children. Two of Lassalle's comrades succeeded in carrying off the casket, which contained the lady's jewels, from the baroness's room at an hotel in Cologne. They were prosecuted for theft, one of them being condemned to six months' imprisonment. Lassalle, accused of moral complicity, was acquitted on appeal. He was not so fortunate in 1849, when he underwent a year's durance for resistance to the authorities of Düsseldorf during the troubles of that stormy period. But going to prison was a familiar experience in Lassalle's life. Till 1859 Lassalle resided mostly in the Rhine country, prosecuting the suit of the countess, finishing the work on Heraclitus, which was not published till 1858, taking little part in political agitation, but ever a helpful friend of the working men. He was not allowed to live in Berlin because of his connexion with the disturbances of '48. In 1859, however, he entered the city disguised as a carter, and, through the influence of Humboldt with the king, got permission to stay there. The same year he published a remarkable pamphlet on the *Italian War and the Mission of Prussia*, in which he warned his countrymen against going to the rescue of Austria in her war with France. He pointed out that if France drove Austria out of Italy she might annex Savoy, but could not prevent the restoration of Italian unity under Victor Emmanuel. France was doing the work of Germany by weakening Austria; Prussia should form an alliance with France to drive out Austria and make herself supreme in Germany. After their realization by Bismarck these ideas have become sufficiently commonplace; but they were nowise obvious when thus published by Lassalle. In 1861 he published a great work in two volumes, *System der erworbenen Rechte* (*System of Acquired Rights*).

Now began the short-lived activity which was to give him an historical significance. It was early in 1862, when the struggle of Bismarck with the Prussian liberals was already begun. Lassalle, a democrat of the most advanced type, saw that an opportunity had come for asserting a third great cause—that of the working men—which would outflank the liberalism of the middle classes, and might even command the sympathy of the government. His political programme was, however, entirely subordinate to the social, that of bettering the condition of the working classes, for which he believed the schemes of Schulze-Delitzsch were utterly inadequate. Lassalle flung himself into the career of agitator with his accustomed vigour. His worst difficulties were with the working men themselves, among whom he met the most discouraging apathy. His mission as organizer and emancipator of the working class lasted only two years and a half. In that period he issued about twenty separate publications, most of them speeches and pamphlets, but one of them, that against Schulze-Delitzsch, a considerable treatise, and all full of keen and vigorous thought. He founded the "Allgemeiner Deutscher Arbeiterverein," was its president and almost single-handed champion, conducted its affairs, and carried on a vast correspondence, not to mention about a dozen state prosecutions in which he was during that period involved. Berlin, Leipzig, Frankfort and the industrial centres on the Rhine were the chief scenes of his activity. His greatest success was on the Rhine, where in the summers of 1863 and 1864 his travels as missionary of the new gospel resembled a triumphal procession. The agitation was growing rapidly, but he had achieved little substantial success when a most unworthy death closed his career.

While posing as the messiah of the poor, Lassalle was a man of decidedly fashionable and luxurious habits. His suppers were well known as among the most exquisite in Berlin. It was the most piquant feature of his life that he, one of the gilded youth, a connoisseur in wines, and a learned man to boot, had become agitator and the champion of the working man. In one of the literary and fashionable circles of Berlin he had met a Fräulein von Dönniges, for whom he at once felt a passion, which was ardently reciprocated. In the summer of 1864 he met her again on the Rigi, when they resolved to marry. She was a young lady of twenty, decidedly unconventional and original in character, but the daughter of a Bavarian diplomatist then resident at Geneva, who would have nothing to do with Lassalle. The lady was imprisoned in her own room, and soon, apparently under the influence of very questionable pressure, renounced Lassalle in favour of another admirer, a Wallachian, Count von Racowitza. Lassalle sent a challenge both to the lady's father and her betrothed, which was accepted by the latter. At the Carouge, a suburb of Geneva, the meeting took place on the morning of August 28, 1864, when Lassalle was mortally wounded, and he died on the 31st of August. In spite of such a foolish ending, his funeral was that of a martyr, and by many of his adherents he has been regarded since with feelings almost of religious devotion.

Lassalle did not lay claim to any special originality as a socialistic thinker, nor did he publish any systematic statement of his views. Yet his leading ideas are sufficiently clear and simple. Like a true Hegelian he saw three stages in the development of labour: the ancient and feudal period, which, through the subjection of the labourer, sought solidarity without freedom; the reign of capital and the middle classes, established in 1789, which sought freedom by destroying solidarity; and the new era, beginning in 1848, which would reconcile solidarity with freedom by introducing the principle of association. It was the basis and starting-point of his opinions that, under the empire of capital and so long as the working man was merely a receiver of wages, no improvement in his condition could be expected. This position he founded on the law of wages formulated by Ricardo, and accepted by all the leading economists, that wages are controlled by the ordinary relations of supply and demand, that a rise in wages leads to an increase in the labouring population, which, by increasing the supply of labour, is followed by a corresponding fall of wages. Thus population increases or decreases in fixed relation to the rise or fall of wages. The condition of the working man will never permanently rise above the mere standard of living required for his subsistence, and the continued supply of his kind. Lassalle held that the co-operative schemes of Schulze-Delitzsch on the principle of "self-help" were utterly inadequate, for the obvious reason that the working classes were destitute of capital. The struggle of the working man helping himself with his empty pockets against the capitalists he compared to a battle with teeth and nails against modern artillery. In short, Lassalle accepted the orthodox political economy to show that the inevitable operation of its laws left no hope for the working classes, and that no remedy could be found but by abolishing the conditions in which these laws had their validity—in other words, by abolishing the present relations of labour and capital altogether. And this could only be done by the productive association of the working men with money provided by the state. And he held that such association should be the voluntary act of the working men, the government merely reserving the right to examine the books of the various societies. All the arrangements should be carried out according to the rules of business usually followed in such transactions. But how move the government to grant such a loan? Simply by introducing (direct) universal suffrage. The working men were an overwhelming majority; they were the state, and should control the government. The aim of Lassalle, then, was to organize the working classes into a great political power, which in the way thus indicated, by peaceful resolute agitation, without violence or insurrection, might attain the goal of productive association. In this way the fourth estate would be emancipated from the despotism of the capitalist, and a great step taken in the solution of the great "social question."

It will be seen that the net result of Lassalle's life was to produce a European scandal, and to originate a socialistic movement in Germany, which, at the election of 1903, returned to the Reichstag eighty-one members and polled 3,010,771 votes, and at the election of 1907 returned forty-three members and polled 3,258,968 votes. (The diminution in the number of members returned in 1907 was due mostly to combination among the different political groups.) This result, great as it was, would hardly have been commensurate with his ambition, which was boundless. In the heyday of his passion for Fräulein von Dönniges, his dream was to be enthroned as the president of the German republic with her seated at his side. With his energy, ability and gift of dominating and organizing, he might indeed have done a great deal. Bismarck coquetted with him as the representative of a force that might help him to combat the Prussian liberals; in 1878, in a speech before the Reichstag, he spoke of him with deep respect, as a man of the greatest amiability and ability from whom much could be learned. Even Bishop Ketteler of Mainz had declared his sympathy for the cause he advocated.

Lassalle's *Die Philosophie Herakleitos des Dunklen von Ephesos* (Berlin, 1858), and the *System der erworbenen Rechte* (Leipzig, 1861) are both marked by great learning and intellectual power. But of far more historical interest are the speeches and pamphlets connected with his socialistic agitation, of which the most important are—*Ueber Verfassungswesen*; *Arbeiterprogramm*; *Offenes Antwortschreiben*; *Zur Arbeiterfrage*; *Arbeiterlesebuch*; *Herr Bastiat-Schulze von Delitzsch, oder Kapital und Arbeit*. His drama, *Franz von Sickingen*, published in 1859, is a work of no poetic value. His *Collected Works* were issued at Leipzig in 1899–1901.

The best biography of Lassalle is H. Oncken's *Lassalle* (Stuttgart, 1904); another excellent work on his life and writings is George Brandes's Danish work, *Ferdinand Lassalle* (German translation, 4th ed., Leipzig, 1900). See also A. Aaberg, *Ferdinand Lassalle* (Leipzig, 1883); C. v. Plener, *Lassalle* (Leipzig, 1884); G. Meyer, *Lassalle als Sozialökonom* (Berlin, 1894); Brandt, *F. Lassalles sozialökonomische Anschauungen und praktische Vorschläge* (Jena, 1895); Seillière, *Études sur Ferdinand Lassalle* (Paris, 1897); E. Bernstein, *Ferd. Lassalle und seine Bedeutung für die Arbeiterklasse* (Berlin, 1904). There is a considerable literature on his love affair and death; the most notable books are: *Meine Beziehungen zu F. Lassalle*, by Helene von Racowitza, a very strange book; *Enthüllungen über das tragische Lebensende F. Lassalle's* by B. Becker; *Im Anschluss an die Memoiren der H. von Racowitza*, by A. Kutschbach, and George Meredith's *Tragic Comedians* (1880). (T. K.)

LASSEN, CHRISTIAN (1800–1876), German orientalist, was born on the 22nd of October 1800, at Bergen in Norway. Having received his earliest university education at Christiania, he went to Germany, and continued his studies at Heidelberg and Bonn. In the latter university Lassen acquired a sound knowledge of Sanskrit. He next spent three years in Paris and London, engaged in copying and collating MSS., and collecting materials for future research, especially in reference to the Hindu drama and philosophy. During this period he published, jointly with E. Burnouf, his first work, *Essai sur le Pâli* (Paris, 1826). On his return to Bonn he studied Arabic, and took the degree of Ph.D., his dissertation discussing the Arabic notices of the geography of the Punjab (*Commentatio geographica atque historica de Pentapotamia Indica*, Bonn, 1827). Soon after he was admitted *Privatdozent*, and in 1830 was appointed extraordinary and in 1840 ordinary professor of Old Indian language and literature. In spite of a tempting offer from Copenhagen, in 1841, Lassen remained faithful to the university of his adoption to the end of his life. He died at Bonn on the 8th of May 1876, having been affected with almost total blindness for many years. As early as 1864 he was relieved of the duty of lecturing.

In 1829–1831 he brought out, in conjunction with August W. von Schlegel, a critical annotated edition of the *Hitopadeśa*. The appearance of this edition marks the starting-point of the critical study of Sanskrit literature. At the same time Lassen assisted von Schlegel in editing and translating the first two cantos of the epic *Rāmāyaṇa* (1829–1838). In 1832 he brought out the text of the first act of Bhavabhūti's drama, *Mālatīmādhava*, and a complete edition, with a Latin translation, of the *Sānkhya-kārikā*. In 1837 followed his edition and translation of Jayadeva's charming lyrical drama, *Gītagovinda* and his *Institutiones linguae Pracriticae*. His *Anthologia Sanscritica*, which came out the following year (new ed. by Johann Gildemeister, 1868), contained several hitherto unpublished texts, and did much to stimulate the study of Sanskrit in German universities. In 1846 Lassen brought out an improved edition of Schlegel's text and translation of the "Bhagavadgītā." He did not confine himself to the study of Indian languages, but acted likewise as a scientific pioneer in other fields of philological inquiry. In his *Beiträge zur Deutung der Eugubinischen Tafeln* (1833) he prepared the way for the correct interpretation of the Umbrian inscriptions; and the *Zeitschrift für die Kunde des Morgenlandes* (7 vols., 1837–1850), started and largely conducted by him, contains, among other valuable papers from his pen, grammatical sketches of the Beluchi and Brahui languages, and an essay on the Lycian inscriptions.

Soon after the appearance of Burnouf's *Commentaire sur le Yaçna* (1833), Lassen also directed his attention to the Zend, and to Iranian studies generally; and in *Die altpersischen Keilinschriften von Persepolis* (1836) he first made known the true character of the Old Persian cuneiform inscriptions, thereby anticipating, by one month, Burnouf's *Mémoire* on the same subject, while Sir Henry Rawlinson's famous memoir on the Behistun inscription, though drawn up in Persia, independently of contemporaneous European research, at about the same time, did not reach the Royal Asiatic Society until three years later. Subsequently Lassen published, in the sixth volume of his journal (1845), a collection of all the Old Persian cuneiform inscriptions known up to that date. He also was the first scholar in Europe who took up, with signal success, the decipherment of the newly-discovered Bactrian coins, which furnished him the materials for *Zur Geschichte der griechischen und indo-skythischen Könige in Bakterien, Kabul, und Indien* (1838). He contemplated bringing out a critical edition of the *Vendidad*; but, after publishing the first five fargards (1852), he felt that his whole energies were required for the successful accomplishment of the great undertaking of his life—his *Indische Altertumskunde*. In this work—completed in four volumes, published respectively in 1847 (2nd ed., 1867), 1849 (2nd ed., 1874), 1858 and 1861—which forms one of the greatest monuments of untiring industry and critical scholarship, everything that could be gathered from native and foreign sources, relative to the political, social and intellectual development of India, from the earliest times down to the Mahommedan invasion, was worked up by him into a connected historical account.

LASSEN, EDUARD (1830–1904), Belgian musical composer, was born in Copenhagen, but was taken as a child to Brussels and educated at the Brussels Conservatoire. He won the *prix de Rome* in 1851, and went for a long tour in Germany and Italy. He settled at Weimar, where in 1861 he succeeded Liszt as conductor of the opera, and he died there on the 15th of January 1904. Besides many well-known songs, he wrote operas—*Landgraf Ludwig's Brautfahrt* (1857), *Frauenlob* (1861), *Le Captif* (1868)—instrumental music to dramas, notably to Goethe's *Faust* (1876), two symphonies and various choral works.

LASSO (Lassus), **ORLANDO** (*c.* 1530–1594), Belgian musical composer, whose real name was probably Roland Delattre, was born at Mons, in Hainault, probably not much earlier than 1532, the date given by the epitaph printed at the end of the volumes of the *Magnum opus musicum*; though already in the 16th century the opinions of his biographers were divided between the years 1520 and 1530. Much is reported, but very little known, of his connexions and his early career. The discrepancy as to the date of his birth appears also in connexion with his appointment at the church of St John Lateran in Rome. If he was born in 1530 or 1532 he could not have obtained that appointment in 1541. What is certain is that his first book of madrigals was published in Venice in 1555, and that in the same year he speaks of himself in the preface of Italian and French songs and Latin motets as if he had recently come from Rome. He seems to have visited England in 1554 and to have been introduced to Cardinal Pole, to whom an adulatory motet appears in 1556. (This is not, as might hastily be supposed, a confusion resulting from the fact that the ambassador from Ferdinand, king of the Romans, Don Pedro de Lasso, attended the marriage of Philip and Mary in England in the same year.) His first book of motets appeared at Antwerp in 1556, containing the motet in honour of Cardinal Pole. The style of Orlando had already begun to purify itself from the speculative and chaotic elements that led Burney, who seems to have known only his earlier works, to call him "a dwarf on stilts" as compared with Palestrina. But where he is orthodox he is as yet stiff, and his secular compositions are, so far, better than his more serious efforts.

In 1557, if not before, he was invited by Albrecht IV., duke of Bavaria, to go to Munich. The duke was a most intelligent patron of all the fine arts, a notable athlete, and a man of strict principles. Munich from henceforth never ceased to be Orlando's home; though he sometimes paid long visits to Italy and France, whether in response to royal invitations or with projects of his own. In 1558 he made a very happy marriage by which he had four sons and two daughters. The four sons all became good musicians, and we owe an inestimable debt to the pious industry of the two eldest sons, who (under the patronage of Duke Maximilian I., the second successor of Orlando's master) published the enormous collection of Orlando's Latin motets known as the *Magnum opus musicum.*

Probably no composer has ever had more ideal circumstances for artistic inspiration and expression than had Orlando. His duty was to make music all day and every day, and to make it according to his own taste. Nothing was too good, too severe or too new for the duke. Church music was not more in demand than secular. Instrumental music, which in the 16th century had hardly any independent existence, accompanied the meals of the court; and Orlando would rise from dessert to sing trios and quartets with picked voices. The daily prayers included a full mass with polyphonic music. This amazing state of things becomes more intelligible and less alarming when we consider that 16th-century music was no sooner written than it could be performed. With such material as Orlando had at his disposal, musical performance was as unattended by expense and tedious preliminaries as a game of billiards in a good billiard room. Not even Haydn's position at Esterhaz can have enabled him, as has been said, to "ring the bell" for musicians to come and try a new orchestral effect with such ease as that with which Orlando could produce his work at Munich. His fame soon became world-wide, and every contemporary authority is full of the acclamation with which Orlando was greeted wherever his travels took him.

Very soon, with this rapid means of acquiring experience, Orlando's style became as pure as Palestrina's; while he always retained his originality and versatility. His relations to the literary culture of the time are intimate and fascinating; and during his stay at the court of France in 1571 he became a friend of the poet Ronsard. In 1579 Duke Albrecht died. Orlando's salary had already been guaranteed to him for life, so that his outward circumstances did not change, and the new duke was very kind to him. But the loss of his master was a great grief and seems to have checked his activity for some time. In 1589, after the publication of six Masses, ending with a beautiful *Missa pro defunctis*, his strength began to fail; and a sudden serious illness left him alarmingly depressed and inactive until his death on the 14th of June 1594.

If Palestrina represents the supreme height attained by 16th-century music, Orlando represents the whole century. It is impossible to exaggerate the range and variety of his style, so long as we recognise the limits of 16th-century musical language. Even critics to whom this language is unfamiliar cannot fail to notice the glaring differences between Orlando's numerous types of art, though such critics may believe all those types to be equally crude and archaic. The swiftness of Orlando's intellectual and artistic development is astonishing. His first four volumes of madrigals show a very intermittent sense of beauty. Many a number in them is one compact mass of the fashionable harsh play upon the "false relation" between twin major and minor chords, which is usually believed to be the unenviable distinction of the English madrigal style from that of the Italians. It must be confessed that in the Italian madrigal (as distinguished from the *villanella* and other light forms), Orlando never attained complete certainty of touch, though some of his later madrigals are indeed glorious. But in his French chansons, many of which are settings of the poems of his friend Ronsard, his wit and lightness of touch are unfailing. In setting other French poems he is sometimes unfortunately most witty where the words are most gross, for he is as free from modern scruples as any of his Elizabethan contemporaries. In 1562, when the Council of Trent was censuring the abuses of Flemish church music, Orlando had already purified his ecclesiastical style; though he did not go so far as to Italianize it in order to oblige those modern critics who are unwilling to believe that anything appreciably unlike Palestrina can be legitimate. At the same time Orlando's Masses are not among his greatest works. This is possibly partly due to the fact that the proportions of a musical Mass are at the mercy of the local practice of the liturgy; and that perhaps the uses of the court at Munich were not quite so favourable to broadly designed proportion (not length) as the uses of Rome. Differences which might cramp the 16th-century composer need not amount to anything that would draw down the censure of ecclesiastical authorities. Be this as it may, Orlando's other church music is always markedly different from Palestrina's, and often fully as sublime. It is also in many ways far more modern in resource. We frequently come upon things like the *Justorum animae* [Magnum Opus, No. 260 (301)] which in their way are as overpoweringly touching as, for example, the Benedictus of Beethoven's *Mass in D* or the soprano solo in Brahms's *Deutsches Requiem.*

No one has approached Orlando in the ingenuity, quaintness and humour of his tone-painting. He sometimes descends to extremely elaborate musical puns, carrying farther than any other composer since the dark ages the absurd device of setting syllables that happened to coincide with the *sol-fa* system to the corresponding *sol-fa* notes. But in the most absurd of such cases he evidently enjoys twisting these notes into a theme of pregnant musical meaning. The quaintest instance is the motet *Quid estis pusillanimes* [Magnum Opus, No. 92 (69)] where extra *sol-fa* syllables are introduced into the text to make a good theme in combination with the syllables already there by accident! (*An nescitis Justitiae Ut Sol* [*Fa Mi*] *Re Laxatas* *habenas possit denuo cohibere*?). The significance of these euphuistic jokes is that they always make good music in Orlando's hands. There is musical fun even in his voluminous parody of the stammering style of word-setting in the burlesque motet *S.U.Su. PER. per. super F.L.U.*, which gets through one verse of a psalm in fifteen minutes.

When it was a question of purely musical high spirits Orlando was unrivalled; and his setting of Walter de Mape's *Fertur in conviviis* (given in the *Magnum opus* with a stupid moral derangement of the text), and most of his French chansons, are among the most deeply humorous music in the world.

But it is in the tests of the sublime that Orlando shows himself one of the greatest minds that ever found expression in art. Nothing sublime was too unfamiliar to frighten him into repressing his quaint fancy, though he early repressed all that thwarted his musical nature. His *Penitential Psalms* stand with Josquin's *Miserere* and Palestrina's first book of *Lamentations* as artistic monuments of 16th-century penitential religion, just as Bach's *Matthew Passion* stands alone among such monuments in later art. Yet the passage (quoted by Sir Hubert Parry in vol. 3 of the *Oxford History of Music*) "Nolite fieri sicut mulus" is one among many traits which are ingeniously and grotesquely descriptive without losing harmony with the austere profundity of the huge works in which they occur. It is impossible to read any large quantity of Orlando's mature music without feeling that a mind like his would in modern times have covered a wider field of mature art than any one classical or modern composer known to us. Yet we cannot say that anything has been lost by his belonging to the 16th century. His music, if only from its peculiar technique of crossing parts and unexpected intervals, is exceptionally difficult to read; and hence intelligent conducting and performance of it is rare. But its impressiveness is beyond dispute; and there are many things which, like the *Justorum animae* cannot even be read, much less heard, without emotion.

Orlando's works as shown by the plan of Messrs Breitkopf & Härtel's complete critical edition (begun in 1894) comprise: (1) the *Magnum opus musicum*, a posthumous collection containing Latin pieces for from two to twelve voices, 516 in number (or, counting by single movements, over 700). Not all of these are to the original texts. The *Magnum opus* fills eleven volumes. (2) Five volumes of madrigals, containing six books, and a large number of single madrigals, and about half a volume of lighter Italian songs (villanellas, &c.). (3) Three volumes (not four as in the prospectus) of French *chansons*. (4) Two volumes of German four-part and five-part *Lieder*. (5) Serial church music: three volumes, containing *Lessons from the Book of Job* (two settings). *Passion according to St Matthew* (*i.e.* like the Passions of Victoria and Soriano, a setting of the words of the crowds and of the disciples); *Lamentations* of Jeremiah; *Morning Lessons*; the *Officia* printed in the third volume of the *Patroncinium* (a publication suggested and supported by Orlando's patrons and containing eight entire volumes of his works); the Seven Penitential Psalms; German Psalms and *Prophetiae Sibyllarum*, (6) one hundred *Magnificats* (*Jubilus B. M. Virginis*) 3 vols., (7) eight volumes of Masses, (8) two volumes of Latin songs not in the *Magnum opus*, (9) five volumes of unpublished works.

(D. F. T.)

LASSO (Span. *lazo*, snare, ultimately from Lat. *laqueus*, cf. "lace"), a rope 60 to 100 ft. in length with a slip-noose at one end, used in the Spanish and Portuguese parts of America and in the western United States for catching wild horses and cattle. It is now less employed in South America than in the vast grazing country west of the Mississippi river, where the herders, called locally cow-boys or cow-punchers, are provided with it. When not in use, the lasso, called *rope* in the West, is coiled at the right of the saddle in front of the rider. When an animal is to be caught the herder, galloping after it, swings the coiled lasso round his head and casts it straight forward in such a manner that the noose settles over the head or round the legs of the quarry, when it is speedily brought into submission. A shorter rope called *lariat* (Span. *la reata*) is used to picket horses.

LAST. 1. (A syncopated form of "latest," the superlative of O.E. *laét*, late), an adjective applied to the conclusion of anything, all that remains after everything else has gone, or that which has just occurred. In theology the "four last things" denote the final scenes of Death, Judgment, Heaven and Hell; the "last day" means the Day of Judgment (see ESCHATOLOGY).

2. (O.E. *lást*, footstep; the word appears in many Teutonic languages, meaning foot, footstep, track, &c.; it is usually referred to a Teutonic root *lais*, cognate with Lat. *lira*, a furrow; from this root, used figuratively, came "learn" and "lore"), originally a footstep, trace or track, now only used of the model of a foot in wood on which a shoemaker makes boots and shoes; hence the proverb "let the cobbler stick to his last," "*ne sutor ultra crepidam*."

3. (O.E. *hlaest*; the work is connected with the root seen in "lade," and is used in German and Dutch of a weight; it is also seen in "ballast"), a commercial weight or measure of quantity, varying according to the commodity and locality; originally applied to the load of goods carried by the boat or wagon used in carrying any particular commodity in any particular locality, it is now chiefly used as a weight for fish, a "last" of herrings being equal to from 10,000 to 12,000 fish. The German *Last*= 4000 ℔, and this is frequently taken as the nominal weight of an English "last." A "last" of wool = 12 sacks, and of beer = 12 barrels.

LASUS, Greek lyric poet, of Hermione in Argolis, flourished about 510 B.C. A member of the literary and artistic circle of the Peisistratidae, he was the instructor of Pindar in music and poetry and the rival of Simonides. The dithyramb (of which he was sometimes considered the actual inventor) was developed by him, by the aid of various changes in music and rhythm, into an artistically constructed choral song, with an accompaniment of several flutes. It became more artificial and mimetic in character, and its range of subjects was no longer confined to the adventures of Dionysus. Lasus further increased its popularity by introducing prize contests for the best poem of the kind. His over-refinement is shown by his avoidance of the letter *sigma* (on account of its hissing sound) in several of his poems, of one of which (a hymn to Demeter of Hermione) a few lines have been preserved in Athenaeus (xiv. 624 E). Lasus was also the author of the first theoretical treatise on music.

See Suïdas *s.v.*; Aristophanes, *Wasps*, 1410, *Birds*, 1403 and schol.; Plutarch, *De Musica*, xxix.; Müller and Donaldson, *Hist. of Greek Literature*, i. 284; G. H. Bode, *Geschichte der hellenischen Dichtkunst*, ii. pt. 2, p. 111; F. W. Schneidewin, *De Laso Hermionensi Comment.* (Göttingen, 1842); Fragm. in Bergk, *Poet. Lyr.*

LAS VEGAS, a city and the county-seat of San Miguel county, New Mexico, U.S.A., in the north central part of New Mexico, on the Gallinas river, and 83 m. by rail E. of Santa Fé. Though usually designated as a single municipality, Las Vegas consists of two distinct corporations, the old town on the W. bank of the river and the city proper on the E. bank. Pop. of the city (1890) 2385; (1900) 3552 (340 being foreign-born and 116 negroes); (1910) 3755. According to local estimates, the combined population of the city and the old town in 1908 was 10,000. Las Vegas is served by the Atchison, Topeka & Santa Fé railway, and is its division headquarters in New Mexico. The city lies in a valley at the foot of the main range of the Rocky Mountains, and is about 6400 ft. above the sea. There are high peaks to the W. and within a short distance of the city much beautiful mountain scenery, especially along the "Scenic Route," a highway from Las Vegas to Santa Fé, traversing the Las Vegas canyon and the Pecos Valley forest reserve. The country E. of the city consists of level plains. The small amount of rainfall, the great elevation and the southern latitude give the region a dry and rarified air, and Las Vegas is a noted health resort. Six miles distant, and connected with the city by rail, are the Las Vegas Hot Springs. The old town on the W. bank of the Gallinas river retains many features of a Mexican village, with low adobe houses facing narrow and crooked streets. Its inhabitants are largely of Spanish-American descent. The part on the E. bank or city proper is thoroughly modern, with well-graded streets, many of them bordered with trees. The most important public institutions are the New Mexico insane asylum, the New Mexico normal university (chartered 1893, opened 1898), the county court house (in the old town), the academy of the Immaculate Conception, conducted by the Sisters of Loretto, Saint Anthony's sanatorium, maintained by the Sisters of Charity, La Salle institute, conducted by the Christian Brothers, a Presbyterian mission school and a Methodist manual training and commercial school. There are railway machine-shops, and various manufactories. Las Vegas lies in the centre of an extensive grazing region, has large stockyards and annually ships great quantities of wool. Three of the local newspapers are published in Spanish. Las Vegas was founded in 1835, under the government of the Mexican Republic. On the 15th of August 1846, during the war between Mexico and the United States, Gen. Stephen W. Kearny entered the town, and its alcalde took the oath of allegiance to the United States. There was but little progress or development until the arrival of the railway in 1879. In 1888 the part east of the river was incorporated as a town under the name of East Las Vegas, and in 1896 it was chartered as the city of Las Vegas. The old Las Vegas, west of the river, was incorporated as a town in 1903.

LASWARI, one of the decisive battles of India. It was fought on the 1st of November 1803 between the British under General Lake, and the Mahratta troops of Sindia, consisting of the remnant of Perron's battalions. Laswari is a village in the state of Alwar some 80 m. S. of Delhi, and here Lake overtook the enemy and attacked them with his cavalry before the infantry arrived. The result was indecisive, but when the infantry came up there ensued one of the most evenly contested battles ever fought between the British and the natives of India, which ended in a complete victory for the British.

LATACUNGA (LLACTACUNGA, or, in local parlance, TACUNGA), a plateau town of Ecuador, capital of the province of Léon, 46 m. S. of Quito, near the confluence of the Alagues and Cutuchi to form the Patate, the headstream of the Pastaza. Pop. (1900, estimate) 12,000, largely Indian. Latacunga stands on the old road between Guayaquil and Quito and has a station on the railway between those cities. It is 9141 ft. above sea-level; and its climate is cold and unpleasant, owing to the winds from the neighbouring snowclad heights, and the barren, pumice-covered table-land on which it stands. Cotopaxi is only 25 m. distant, and the town has suffered repeatedly from eruptions. Founded in 1534, it was four times destroyed by earthquakes between 1698 and 1798. The neighbouring ruins of an older native town are said to date from the Incas.

LA TAILLE, JEAN DE (*c.* 1540–1608), French poet and dramatist, was born at Bondaroy. He studied the humanities in Paris under Muret, and law at Orleans under Anne de Bourg. He began his career as a Huguenot, but afterwards adopted a mild Catholicism. He was wounded at the battle of Arnay-le Duc in 1570, and retired to his estate at Bondaroy, where he wrote a political pamphlet entitled *Histoire abrégée des singeries de la ligue*, often published with the *Satire Ménippée*. His chief poem is a satire on the follies of court life, *Le Courtisan retiré*; he also wrote a political poem, *Le Prince nécessaire*. But his fame rests on his achievements in drama. In 1572 appeared the tragedy of *Saül le furieux*, with a preface on *L'Art de la tragédie*. Like Jodelle, Grévin, La Péruse and their followers, he wrote, not for the general public to which the mysteries and farces had addressed themselves, but for the limited audience of a lettered aristocracy. He therefore depreciated the native drama and insisted on the Senecan model. In his preface La Taille enunciates the unities of place, time and action; he maintains that each act should have a unity of its own and that the scenes composing it should be continuous; he objects to deaths on the stage on the ground that the representation is unconvincing, and he requires as subject of the tragedy an incident really terrible, developed, if possible, by elaborate intrigue. He criticizes *e.g.* the subject of the sacrifice of Abraham, chosen by Théodore de Bèze for his tragedy (1551), as unsuitable because "pity and terror" are evoked from the spectators without real cause. If in *Saül le furieux* he did not completely carry out his own convictions he developed his principal character with great ability. A second tragedy, *La Famine ou les Gabéonites* (1573), is inferior in construction, but is redeemed by the character of Rizpah. He was also the author of two comedies, *Le Négromant* and *Les Corrivaux*, both written apparently by 1562 but not published until 1573. *Les Corrivaux* is remarkable for its colloquial prose dialogue, which foreshadows the excellence of later French comedy.

His brother, JACQUES DE LA TAILLE (1542–1562), composed a number of tragedies, of which *La Mort de Daire* and *La Mort d'Alexandre* (both published in 1573) are the chief. He is best known by his *Manière de faire des vers en français comme en grec et en latin*, an attempt to regulate French verse by quantity. He died of plague at the age of 20. His *Poésies diverses* were published in 1572.

The works of Jean de la Taille were edited by René de Maulde (4 vols., 1878–1882). See also É. Faguet, *La Tragédie française au XVI.ᵉ siècle* (1883).

LATAKIA (anc. *Laodicea*), the chief town of a sanjak in the Beirut vilayet of Syria, situated on the coast, opposite the island of Cyprus. The oldest name of the town, according to Philo Herennius, was Ράμιθα or Λευκὴ ἀκτή; it received that of Laodicea (*ad mare*) from Seleucus Nicator, who refounded it in honour of his mother as one of the four "sister" cities of the Syrian Tetrapolis (Antioch, Seleucia, Apamea, Laodicea). In the Roman period it was favoured by Caesar, and took the name of Julia; and, though it suffered severely when the fugitive Dolabella stood his last siege within its walls (43 B.C.), Strabo describes it as a flourishing port, which supplied, from the vineyards on the mountains, the greater part of the wine imported to Alexandria. The town received the privileges of an Italian colony from Severus, for taking his part against Antioch in the struggle with Niger. Laodicea was the seat of an ancient bishopric, and even had some claim to metropolitan rights. At the time of the crusades, "Liche," as Jacques de Vitry says it was popularly called, was a wealthy city. It fell to Tancred with Antioch in 1102, and was recovered by Saladin in 1188. A Christian settlement was afterwards permitted to establish itself in the town, and to protect itself by fortifications; but it was expelled by Sultan Kalaʽūn and the defences destroyed. By the 16th century Laodicea had sunk very low; the revival in the beginning of the 17th was due to the new trade in tobacco. The town has several times been almost destroyed by earthquakes—in 1170, 1287 and 1822.

The people are chiefly employed in tobacco cultivation, silk and oil culture, poultry rearing and the sponge fishery. There is a large export of eggs to Alexandria; but the wealth of the place depends most on the famous "Latakia" tobacco, grown in the plain behind the town and on the Ansarieh hills. There are three main varieties, of which the worst is dark in colour and strong in flavour; the best, grown in the districts of Diryus and Amamareh, is light and aromatic, and is exported mainly to Alexandria; but much goes also to Constantinople, Cyprus and direct to Europe. After the construction of a road through Jebel Ansarieh to Hamah, Latakia drew a good deal of traffic from upper Syria; but the Hamah-Homs railway has now diverted much of this again. The products of the surrounding district, however, cause the town to increase steadily, and it is a regular port of call for the main Levantine lines of steamers. The only notable object of antiquity is a triumphal arch, probably of the early 3rd century, in the S.E. quarter of the modern town. Latakia and its neighbourhood formerly produced a very beautiful type of rug, examples of which are highly prized. (D. G. H.)

LATEEN (the Anglicized form of Fr. *latine*, *i.e. voile latine*, Latin sail, so-called as the chief form of rig in the Mediterranean), a certain kind of triangular sail, having a long yard by which it is suspended to the mast. A "lateener" is a vessel rigged with a lateen sail and yard. This rig was formerly much used, and is still the typical sail of the *felucca* of the Mediterranean, and *dhow* of the Arabian Sea.

LA TÈNE (Lat. *tenuis*, shallow), the site of a lake-dwelling at the north end of Lake Neuchâtel, between Marin and Préfargier. According to some, it was originally a Helvetic *oppidum*; according to others, a Gallic commercial settlement. R. Forrer distinguishes an older semi-military, and a younger civilian settlement, the former a Gallic customs station, the latter, which may be compared to the *canabae* of the Roman camps, containing the booths and taverns used by soldiers and sailors. He also considers the older station to have been, not as usually supposed, Helvetic, but pre- or proto-Helvetic, the character of which changed with the advance of the Helvetii into Switzerland (*c.* 110–100 B.C.). La Tène has given its name to a period of culture (*c.* 500 B.C.–A.D. 100), the phase of the Iron age succeeding the Hallstatt phase, not as being its starting-point, but because the finds are the best known of their kind. The latter are divided into early (*c.* 500–250 B.C.), middle (250–100 B.C.) and late (100 B.C.–A.D. 100), and chiefly belong to the middle period. They are mostly of iron, and consist of swords, spear-heads, axes, scythes and knives, which exhibit a remarkable agreement with the description of the weapons of the southern Celts given by Diodorus Siculus. There are also brooches, bronze kettles, torques, small bronze ear-rings with little glass pearls of various colours, belt-hooks and pins for fastening articles of clothing. The La Tène culture made its way through France across to England, where it has received the name of "late Celtic"; a remarkable find has been made at Aylesford in Kent.

See F. Keller, *Lake Dwellings of Switzerland*, vi. (Eng. trans., 1878); V. Gross, *La Tène un* oppidum *helvète* (1886); E. Vouga, *Les Helvètes à La Tène* (1886); P. Reinecke, *Zur Kenntnis der la Tène Denkmäler der Zone nordwärts der Alpen* (Mainzer Festschrift, 1902); R. Forrer, *Reallexikon der prähistorischen . . . Altertümer* (1907), where many illustrations are given.

LATERAN COUNCILS, the ecclesiastical councils or synods held at Rome in the Lateran basilica which was dedicated to Christ under the title of Salvator, and further called the basilica of Constantine or the church of John the Baptist. Ranking as a papal cathedral, this became a much-favoured place of assembly for ecclesiastical councils both in antiquity (313, 487) and more especially during the middle ages. Among these numerous synods the most prominent are those which the tradition of the Roman Catholic church has classed as ecumenical councils.

1. The first Lateran council (the ninth ecumenical) was opened by Pope Calixtus II. on the 18th of March 1123; its primary object being to confirm the concordat of Worms, and so close the conflict on the question of investiture (*q.v.*). In addition to this, canons were enacted against simony and the marriage of priests; while resolutions were passed in favour of the crusaders, of pilgrims to Rome and in the interests of the truce of God. More than three hundred bishops are reported to have been present.

For the resolutions see *Monumenta Germaniae*, Leges, iv., i. 574-576 (1893); Mansi, *Collectio Conciliorum*, xxi. p. 281 sq.; Hefele, *Conciliengeschichte*, v. 378-384 (ed. 2, 1886).

2. The second Lateran, and tenth ecumenical, council was held by Pope Innocent II. in April 1139, and was attended by close on a thousand clerics. Its immediate task was to neutralize the after-effects of the schism, which had only been terminated in the previous year by the death of Anacletus II. (d. 25th January 1138). All consecrations received at his hands were declared invalid, his adherents were deposed, and King Roger of Sicily was excommunicated. Arnold of Brescia, too, was removed from office and banished from Italy.

Resolutions, *ap.* Mansi, *op. cit.* xxi., 525 sq.; Hefele, *Conciliengeschichte*, v. 438-445 (ed. 2).

3. At the third Lateran council (eleventh ecumenical), which met in March 1179 under Pope Alexander III., the clergy present again numbered about one thousand. The council formed a sequel to the peace of Venice (1177), which marked the close of the struggle between the papacy and the emperor Frederick I. Barbarossa; its main object being to repair the direct or indirect injuries which the schism had inflicted on the life of the church and to display to Christendom the power of the see of Rome. Among the enactments of the council, the most important concerned the appointment to the papal throne (Canon 1), the electoral law of 1059 being supplemented by a further provision declaring a two-thirds majority to be requisite for the validity of the cardinals' choice. Of the participation of the Roman clergy and populace, or of the imperial ratification, there was no longer any question. Another resolution, of importance for the history of the treatment of heresy, was the canon which decreed that armed force should be employed against the Cathari in southern France, that their goods were liable to confiscation and their persons to enslavement by the princes, and that all who took up weapons against them should receive a two years' remission of their penance and be placed—like the crusaders—under the direct protection of the church.

Resolutions, *ap.* Mansi, *op. cit.* xxii. 212 sq.; Hefele, *Conciliengeschichte*, v. 710-719 (ed. 2).

4. The fourth Lateran council (twelfth ecumenical), convened by Pope Innocent III. in 1215, was the most brilliant and the most numerously attended of all, and marks the culminating point of a pontificate which itself represents the zenith attained by the medieval papacy. Prelates assembled from every country in Christendom, and with them the deputies of numerous princes. The total included 412 bishops, with 800 priors and abbots, besides the representatives of absent prelates and a number of inferior clerics. The seventy decrees of the council begin with a confession of faith directed against the Cathari and Waldenses, which is significant if only for the mention of a transubstantiation of the elements in the Lord's Supper. A series of resolutions provided in detail for the organized suppression of heresy and for the institution of the episcopal inquisition (Canon 3). On every Christian, of either sex, arrived at years of discretion, the duty was imposed of confessing at least once annually and of receiving the Eucharist at least at Easter (Canon 21). Enactments were also passed touching procedure in the ecclesiastical courts, the creation of new monastic orders, appointments to offices in the church, marriage-law, conventual discipline, the veneration of relics, pilgrimages and intercourse with Jews and Saracens. Finally, a great crusade was resolved upon, to defray the expenses of which it was determined that the clergy should lay aside one-twentieth—the pope and the cardinals one-tenth—of their revenues for the next three years; while the crusaders were to be held free of all burdens during the period of their absence.

Resolutions, *ap.* Mansi, *op. cit.* xxii. 953 sq.; Hefele, *Conciliengeschichte*, v. 872-905 (ed. 2). See also INNOCENT III.

5. The fifth Lateran council (eighteenth ecumenical) was convened by Pope Julius II. and continued by Leo X. It met from the 3rd of May 1512 to the 16th of March 1517, and was the last great council anterior to the Reformation. The change in the government of the church, the rival council of Pisa, the ecclesiastical and political dissensions within and without the council, and the lack of disinterestedness on the part of its members, all combined to frustrate the hopes which its convocation had awakened. Its resolutions comprised the rejection of the pragmatic sanction, the proclamation of the pope's superiority over the council, and the renewal of the bull *Unam sanctam* of Boniface VIII. The theory that it is possible for a thing to be theologically true and philosophically false, and the doctrine of the mortality of the human soul, were both repudiated; while a three years' tithe on all church property was set apart to provide funds for a war against the Turks.

See Hardouin, *Coll. Conc.* ix. 1570 sq.; Hefele-Hergenröther, *Conciliengeschichte*, viii. 454 sq.; (1887). Cf. bibliography under LEO X. (C. M.)

LATERITE (Lat. *later*, a brick), in petrology, a red or brown superficial deposit of clay or earth which gathers on the surface of rocks and has been produced by their decomposition; it is very common in tropical regions. In consistency it is generally soft and friable, but hard masses, nodules and bands often occur in it. These are usually rich in iron. The superficial layers of laterite deposits are often indurated and smooth black or dark-brown crusts occur where the clays have long been exposed to a dry atmosphere; in other cases the soft clays are full of hard nodules, and in general the laterite is perforated by tubules, sometimes with veins of different composition and appearance from the main mass. The depth of the laterite beds varies up to 30 or 40 ft., the deeper layers often being soft when the surface is hard or stony; the transition to fresh, sound rock below may be very sudden. That laterite is merely rotted crystalline rock is proved by its often preserving the structures, veins and even the outlines of the minerals of the parent mass below; the felspars and other components of granite gneiss having evidently been converted *in situ* into a soft argillaceous material.

Laterite occurs in practically every tropical region of the earth, and is very abundant in Ceylon, India, Burma, Central and West Africa, Central America, &c. It is especially well developed where the underlying rock is crystalline and felspathic (as granite gneiss, syenite and diorite), but occurs also on basalts in the Deccan and in other places, and is found even on mica schist, sandstone and quartzite, though in such cases it tends to be more sandy than argillaceous. Many varieties have been recognized. In India a calcareous laterite with large concretionary blocks of carbonate of lime is called kankar (kunkar), and has been much used in building bridges, &c., because it serves as a hydraulic cement. In some districts (*e.g.* W. Indies) similar types of laterite have been called "puzzuolana" and are also used as mortar and cement. Kankar is also known and worked in British East Africa. The clay called cabook in Ceylon is essentially a variety of laterite. Common laterite contains very little lime, and it seems that in districts which have an excessive rainfall that component may be dissolved out by percolating water, while kankar, or calcareous laterite, is formed in districts which have a smaller rainfall. In India also a distinction is made between "high-level" and "low-level" laterites. The former are found at all elevations up to 5000 ft. and more, and are the products of the decomposition of rock *in situ*; they are often fine-grained and sometimes have a very well-marked concretionary structure. These laterites are subject to removal by running water, and are thus carried to lower grounds forming transported or "low-level" laterites. The finer particles tend to be carried away into the rivers, while the sand is left behind and with it much of the heavy iron oxides. In such situations the laterites are sandy and ferruginous, with a smaller proportion of clay, and are not intimately connected with the rocks on which they lie. On steep slopes laterite also may creep or slip when soaked with rain, and if exposed in sections on roadsides or river banks has a bedded appearance, the stratification being parallel to the surface of the ground.

Chemical and microscopical investigations show that laterite is not a clay like those which are so familiar in temperate regions; it does not consist of hydrous silicate of alumina, but is a mechanical mixture of fine grains of quartz with minute scales of hydrates of alumina. The latter are easily soluble in acid while clay is not, and after treating laterite with acids the alumina and iron leave the silica as a residue in the form of quartz. The alumina seems to be combined with variable proportions of water, probably as the minerals hydrargillite, diaspore and gibbsite, while the iron occurs as goethite, turgite, limonite, haematite. As already remarked, there is a tendency for the superficial layers to become hard, probably by a loss of the water contained in these aluminous minerals. These chemical changes may be the cause of the frequent concretionary structure and veining in the laterite. The great abundance of alumina in some varieties of laterite is a consequence of the removal of the fine particles of gibbsite, &c., from the quartz by the action of gentle currents of water. We may also point out the essential chemical similarity between laterite and the seams of bauxite which occur, for example, in the north of Ireland as reddish clays between flows of Tertiary basalt. The bauxite is rich in alumina combined with water, and is used as an ore of aluminium. It is often very ferruginous. Similar deposits occur at Vogelsberg in Germany, and we may infer that the bauxite beds are layers of laterite produced by sub-aerial decomposition in the same manner as the thick laterite deposits which are now in course of formation in the plateau basalts of the Deccan in India.

The conditions under which laterite are formed include, first, a high seasonal temperature, for it occurs only in tropical districts and in plains or mountains up to about 5000 ft. in height; secondly, a heavy rainfall, with well-marked alternation of wet and dry seasons (in arid countries laterite is seldom seen, and where the rainfall is moderate the laterite is often calcareous); third, the presence of rocks containing aluminous minerals such as felspar, augite, hornblende and mica. On pure limestones such as coral rocks and on quartzites laterite deposits do not originate except where the material has been transported.

Many hypotheses have been advanced to account for the essential difference between lateritization and the weathering processes exhibited by rocks in temperate and arctic climates. In the tropics the rank growth of vegetation produces large amounts of humus and carbonic acid which greatly promote rock decomposition; igneous and crystalline rocks of all kinds are deeply covered under rich dark soils, so that in tropical forests the underlying rocks are rarely to be seen. In the warm soil nitrification proceeds rapidly and bacteria of many kinds flourish. It has also been argued that the frequent thunderstorms produce much nitric acid in the atmosphere and that this may be a cause of lateritization, but it is certainly not a necessary factor, as beds of laterite occur in oceanic islands lying in regions of the ocean where lightning is rarely seen. Sir Thomas Holland has brought forward the suggestion that the development of laterite may depend on the presence in the soil of bacteria which are able to decompose silicate of alumina into quartz and hydrates of alumina. The restricted distribution of laterite deposits might then be due to the inhibiting effect of low temperatures on the reproduction of these organisms. This very ingenious hypothesis has not yet received the experimental confirmation which seems necessary before it can be regarded as established. Malcolm Maclaren, rejecting the bacterial theory, directs special attention to the alternate saturation of the soil with rain water in the wet season and desiccation in the subsequent drought. The laterite beds are porous, in fact they are traversed by innumerable tubules which are often lined with deposits of iron oxide and aluminous minerals. We may be certain that, as in all soils during dry weather, there is an ascent of water by capillary action towards the surface, where it is gradually dissipated by evaporation. The soil water brings with it mineral matter in solution, which is deposited in the upper part of the beds. If the alumina be at one time in a soluble condition it will be drawn upwards and concentrated near the surface. This process explains many peculiarities of laterites, such as their porous and slaggy structure, which is often so marked that they have been mistaken for slaggy volcanic rocks. The concretionary structure is undoubtedly due to chemical rearrangements, among which the escape of water is probably one of the most important; and many writers have recognized that the hard ferruginous crust, like the induration which many soft laterites undergo when dug up and exposed to the air, is the result of desiccation and exposure to the hot sun of tropical countries. The brecciated structure which many laterites show may be produced by great expansion of the mass consequent on absorption of water after heavy rains, followed by contraction during the subsequent dry season.

Laterites are not of much economic use. They usually form a poor soil, full of hard concretionary lumps and very unfertile because the potash and phosphates have been removed in solution, while only alumina, iron and silica are left behind. They are used as clays for puddling, for making tiles, and as a mortar in rough work. Kankar has filled an important part as a cement in many large engineering works in India. Where the iron concretions have been washed out by rains or by artificial treatment (often in the form of small shot-like pellets) they serve as an iron ore in parts of India and Africa. Attempts are being made to utilize laterite as an ore of aluminium, a purpose for which some varieties seem well adapted. There are also deposits of manganese associated with some laterites in India which may ultimately be valuable as mineral ores. (J. S. F.)

LATH (O. Eng. *laett*, Mid. Eng. *lappe*, a form possibly due to the Welsh *llath*; the word appears in many Teutonic languages, cf. Dutch *lat*, Ger. *Latte*, and has passed into Romanic, cf. Ital. *latta*, Fr. *latte*), a thin flat strip of wood or other material used in building to form a base or groundwork for plaster, or for tiles, slates or other covering for roofs. Such strips of wood are employed to form lattice-work, or for the bars of venetian blinds or shutters. A "lattice" (O. Fr. *lattis*) is an interlaced structure of laths fastened together so as to form a screen with diamond-shaped or square interstices. Such a screen was used, as it still is in the East, as a shutter for a window admitting air rather than light; it was hence used of the window closed by such a screen. In modern usage the term is applied to a window with diamond-shaped panes set in lead-work. A window with a lattice painted red was formerly a common inn-sign (cf. Shakespeare, *2 Hen. IV.* ii. 2. 86); frequently the window was dispensed with, and the sign remained painted on a board.

LATHE. (1) A mechanical appliance in which material is held and rotated against a tool for cutting, scraping, polishing or other purpose (see TOOLS). This word is of obscure origin. It may be a modified form of "lath," for in an early form of lathe the rotation is given by a treadle or spring lath attached to the ceiling. The *New English Dictionary* points out a possible source of the word in Dan. *lad*, meaning apparently a supporting framework, found in the name of the turning-lathe, *drejelad*, and also in *savelad*, saw-bench, *vaeverlad*, loom, &c. (2) One of five, formerly six, districts containing three or more hundreds, into which the county of Kent was divided. Though the division survives, it no longer serves any administrative purpose. It was formerly a judicial division, the court of the lathe being superior to that of the hundred. In this it differs from the rape (*q.v.*) of Sussex, which was a geographical rather than an administrative division. In O. Eng. the word was *laēð*, the origin of which is doubtful. The *New English Dictionary* considers it almost certainly identical with O. Norse *lad*, landed possessions, territory, with a possible association in meaning with such words as *leið*, court, *mótlaeaða*, attendance at a meeting or moot, or with Mod. Dan. *laegd*, a division of the country for military purposes.

LATHROP, FRANCIS (1849–1909), American artist, was born at sea, near the Hawaiian Islands, on the 22nd of June 1849, being the great-grandson of Samuel Holden Parsons, and the son of George Alfred Lathrop (1819–1877), who for some time was United States consul at Honolulu. He was a pupil of T. C. Farrar (1838–1891) in New York, and studied at the Royal academy of Dresden. In 1870–1873 he was in England, studying under Ford Madox Brown and Burne-Jones, and working in the school of William Morris, where he devoted particular attention to stained glass. Returning to America in 1873, he became known as an illustrator, painted portraits, designed stained glass, and subsequently confined himself to decorative work. He designed the chancel of Trinity church, Boston, and decorated the interior of Bowdoin college chapel, at Brunswick, Maine, and several churches in New York. The Marquand memorial window, Princeton chapel, is an example of his work in stained glass. His latest work was a series of medallions for the building of the Hispanic-American society in New York. He was one of the charter members of the Society of American Artists, and became an associate of the National Academy of Design, New York, of which also William L. Lathrop (b. 1859) an artist who is to be distinguished from him, became a member in 1907. He died at Woodcliff, New Jersey, on the 18th of October 1909.

His younger brother, GEORGE PARSONS LATHROP (1851–1898), born near Honolulu on the 25th of August 1851, took up literature as a profession. He was an assistant editor of the *Atlantic Monthly* in 1875–1877, and editor of the Boston *Courier* in 1877–1879. He was one of the founders (1883) of the American copyright league, was prominent in the movement for Roman Catholic summer schools, and wrote several novels, some verse and critical essays. He was the author of *A Study of Nathaniel Hawthorne* (1876), and edited the standard edition (Boston, 1883) of Hawthorne's works. In 1871 he married in London the second daughter of Nathaniel Hawthorne—Rose Hawthorne Lathrop (b. 1851). After his death Mrs Lathrop devoted herself entirely to charity. She was instrumental in establishing (1896) and subsequently conducted St Rose's free home for cancer in New York City. In 1900 she joined the Dominican order, taking the name of Mother Mary Alphonsa and becoming superioress of the Dominican community of the third order; and she established in 1901 and subsequently conducted this order's Rosary Hill home (for cancerous patients) at Hawthorne, N.Y. She published a volume of poems (1888); *Memories of Hawthorne* (1897); and, with her husband, *A Story of Courage: Annals of the Georgetown Convent of the Visitation of the Blessed Virgin Mary* (1894).

LATIMER, HUGH (*c.* 1490–1555), English bishop, and one of the chief promoters of the Reformation in England, was born at Thurcaston, Leicestershire. He was the son of a yeoman, who rented a farm "of three or four pounds by year at the uttermost." Of this farm he "tilled as much as kept half a dozen men," retaining also grass for a hundred sheep and thirty cattle. The year of Latimer's birth is not definitely known. In the *Life* by Gilpin it is given as 1470, a palpable error, and possibly a misprint for 1490.[1] Foxe states that at "the age of fourteen years he was sent to the university of Cambridge," and as he was elected fellow of Clare in 1509, his year of entrance was in all likelihood 1505. Latimer himself also, in mentioning his conversion from Romanism about 1523, says that it took place after he was thirty years of age. According to Foxe, Latimer went to school "at the age of four or thereabout." The purpose of his parents was to train him up "in the knowledge of all good literature," but his father "was as diligent to teach him to shoot as any other thing." As the yeomen of England were then in comparatively easy circumstances, the practice of sending their sons to the universities was quite usual; indeed Latimer mentions that in the reign of Edward VI., on account of the increase of rents, the universities had begun wonderfully to decay. He graduated B.A. in 1510 and M.A. in 1514. Before the latter date he had taken holy orders. While a student he was not unaccustomed "to make good cheer and be merry," but at the same time he was a punctilious observer of the minutest rites of his faith and "as obstinate a Papist as any in England." So keen was his opposition to the new learning that his oration on the occasion of taking his degree of bachelor of divinity was devoted to an attack on the opinions of Melanchthon. It was this sermon that determined his friend Thomas Bilney to go to Latimer's study, and ask him "for God's sake to hear his confession," the result being that "from that time forward he began to smell the word of God, and forsook the school doctors and such fooleries." Soon his discourses exercised a potent influence on learned and unlearned alike; and, although he restricted himself, as indeed was principally his custom through life, to the inculcation of practical righteousness, and the censure of clamant abuses, a rumour of his heretical tendencies reached the bishop of Ely, who resolved to become unexpectedly one of his audience. Latimer, on seeing him enter the church, boldly changed his theme to a portrayal of Christ as the pattern priest and bishop. The points of comparison were, of course, deeply distasteful to the prelate, who, though he professed his "obligations for the good admonition he had received," informed the preacher that he "smelt somewhat of the pan." Latimer was prohibited from preaching in the university or in any pulpits of the diocese, and on his occupying the pulpit of the Augustinian monastery, which enjoyed immunity from episcopal control, he was summoned to answer for his opinions before Wolsey, who, however, was so sensible of the value of such discourses that he gave him special licence to preach throughout England.

At this time Protestant opinions were being disseminated in England chiefly by the surreptitious circulation of the works of Wycliffe, and especially of his translations of the New Testament. The new leaven had begun to communicate its subtle influence to the universities, but was working chiefly in secret and even to a great extent unconsciously to those affected by it, for many were in profound ignorance of the ultimate tendency of their own opinions. This was perhaps, as regards England, the most critical conjuncture in the history of the Reformation, both on this account and on account of the position in which Henry VIII. then stood related to it. In no small degree its ultimate fate seemed also to be placed in the hands of Latimer. In 1526 the imprudent zeal of Robert Barnes had resulted in an ignominious recantation, and in 1527 Bilney, Latimer's most trusted coadjutor, incurred the displeasure of Wolsey, and did humiliating penance for his offences. Latimer, however, besides possessing sagacity, quick insight into character, and a ready and formidable wit which thoroughly disconcerted and confused his opponents, had naturally a distaste for mere theological discussion, and the truths he was in the habit of inculcating could scarcely be controverted, although, as he stated them, they were diametrically contradictory of prevailing errors both in

[1] The only reasons for assigning an earlier date are that he was commonly known as "old Hugh Latimer," and that Bernher, his Swiss servant, states incidentally that he was "above threescore and seven years" in the reign of Edward VI. Bad health and anxieties probably made him look older than his years, but under Edward VI. his powers as an orator were in full vigour, and he was at his book winter and summer at two o'clock in the morning.

doctrine and practice. In December 1529 he preached his two "sermons on the cards," which awakened a turbulent controversy in the university, and his opponents, finding that they were unable to cope with the dexterity and keenness of his satire, would undoubtedly have succeeded in getting him silenced by force, had it not been reported to the king that Latimer "favoured his cause," that is, the cause of the divorce. While, therefore, both parties were imperatively commanded to refrain from further dispute, Latimer was invited to preach before Henry in the Lent of 1530. The king was so pleased with the sermon that after it "he did most familiarly talk with him in a gallery." Of the special regard which Henry seemed to have conceived for him Latimer took advantage to pen the famous letter on the free circulation of the Bible, an address remarkable, not only for what Froude justly calls "its almost unexampled grandeur," but for its striking repudiation of the aid of temporal weapons to defend the faith, "for God," he says, "will not have it defended by man or man's power, but by His Word only, by which He hath evermore defended it, and that by a way far above man's power and reason." Though the appeal was without effect on the immediate policy of Henry, he could not have been displeased with its tone, for shortly afterwards he appointed Latimer one of the royal chaplains. In times so "out of joint" Latimer soon became "weary of the court," and it was with a sense of relief that he accepted the living of West Kington, or West Kineton, Wiltshire, conferred on him by the king in 1531. Harassed by severe bodily ailments, encompassed by a raging tumult of religious conflict and persecution, and aware that the faint hopes of better times which seemed to gild the horizon of the future might be utterly darkened by a failure either in the constancy of his courage or in his discernment and discretion, he exerted his eloquence with unabating energy in the furtherance of the cause he had at heart. At last a sermon he was persuaded to preach in London exasperated John Stokesley, bishop of the diocese, and seemed to furnish that fervent persecutor with an opportunity to overthrow the most dangerous champion of the new opinions. Bilney, of whom Latimer wrote, "if such as he shall die evil, what shall become of me?" perished at the stake in the autumn of 1531, and in January following Latimer was summoned to answer before the bishops in the consistory. After a tedious and captious examination, he was in March brought before convocation, and, on refusing to subscribe certain articles, was excommunicated and imprisoned; but through the interference of the king he was finally released after he had voluntarily signified his acceptance of all the articles except two, and confessed that he had erred not only "in discretion but in doctrine." If in this confession he to some extent tampered with his conscience, there is every reason to believe that his culpable timidity was occasioned, not by personal fear, but by anxiety lest by his death he should hinder instead of promoting the cause of truth. After the consecration of Cranmer to the archbishopric of Canterbury in 1533 Latimer's position was completely altered. A commission appointed to inquire into the disturbances caused by his preaching in Bristol severely censured the conduct of his opponents; and, when the bishop prohibited him from preaching in his diocese, he obtained from Cranmer a special licence to preach throughout the province of Canterbury. In 1534 Henry formally repudiated the authority of the pope, and from this time Latimer was the chief co-operator with Cranmer and Cromwell in advising the king regarding the series of legislative measures which rendered that repudiation complete and irrevocable.

It was, however, the preaching of Latimer more than the edicts of Henry that established the principles of the Reformation in the minds and hearts of the people; and from his preaching the movement received its chief colour and complexion. The sermons of Latimer possess a combination of qualities which constitute them unique examples of that species of literature. It is possible to learn from them more regarding the social and political condition of the period than perhaps from any other source, for they abound, not only in exposures of religious abuses, and of the prevailing corruptions of society, but in references to many varieties of social injustice and unwise customs, in racy sketches of character, and in vivid pictures of special features of the time, occasionally illustrated by interesting incidents in his own life. The homely terseness of his style, his abounding humour—rough, cheery and playful, but irresistible in its simplicity, and occasionally displaying sudden and dangerous barbs of satire—his avoidance of dogmatic subtleties, his noble advocacy of practical righteousness, his bold and open denunciation of the oppression practised by the powerful, his scathing diatribes against ecclesiastical hypocrisy, the transparent honesty of his fervent zeal, tempered by sagacious moderation—these are the qualities which not only rendered his influence so paramount in his lifetime, but have transmitted his memory to posterity as perhaps that of the one among his contemporaries most worthy of our interest and admiration.

In September 1535 Latimer was consecrated bishop of Worcester. While holding this office he was selected to officiate as preacher when the friar, John Forest, whom he vainly endeavoured to move to submission, was burned at the stake for denying the royal supremacy. In 1539, being opposed to the "act of the six articles," Latimer resigned his bishopric, learning from Cromwell that this was the wish of the king. It would appear that on this point he was deceived, but as he now declined to accept the articles he was confined within the precincts of the palace of the bishop of Chichester. After the attainder of Cromwell little is known of Latimer until 1546, when, on account of his connexion with the preacher Edward Crome, he was summoned before the council at Greenwich, and committed to the Tower of London. Henry died before his final trial could take place, and the general pardon at the accession of Edward VI. procured him his liberty. He declined to resume his see, notwithstanding the special request of the Commons, but in January 1548 again began to preach, and with more effectiveness than ever, crowds thronging to listen to him both in London and in the country. Shortly after the accession of Mary in 1553 a summons was sent to Latimer to appear before the council at Westminster. Though he might have escaped by flight, and though he knew, as he quaintly remarked, that "Smithfield already groaned for him," he at once joyfully obeyed. The pursuivant, he said, was "a welcome messenger." The hardships of his imprisonment, and the long disputations at Oxford, told severely on his health, but he endured all with unbroken cheerfulness. On the 16th of October 1555 he and Ridley were led to the stake at Oxford. Never was man more free than Latimer from the taint of fanaticism or less dominated by "vainglory," but the motives which now inspired his courage not only placed him beyond the influence of fear, but enabled him to taste in dying an ineffable thrill of victorious achievement. Ridley he greeted with the words, "Be of good comfort, Master Ridley, and play the man; we shall this day light such a candle by God's grace in England as (I trust) shall never be put out." He "received the flame as it were embracing it. After he had stroked his face with his hands, and (as it were) bathed them a little in the fire, he soon died (as it appeared) with very little pain or none."

Two volumes of Latimer's sermons were published in 1549. A complete edition of his works, edited by G. E. Corrie for the Parker Society, appeared in two volumes (1844–1845). His *Sermon on the Ploughers* and *Seven Sermons preached before Edward VI.* were reprinted by E. Arber (1869). The chief contemporary authorities for his life are his own *Sermons*, John Stow's *Chronicle* and Foxe's *Book of Martyrs*. In addition to memoirs prefixed to editions of his sermons, there are lives of Latimer by R. Demaus (1869, new and revised ed. 1881), and by R. M. and A. J. Carlyle (1899). (T. F. H.)

LATINA, VIA, an ancient highroad of Italy, leading S.E. from Rome. It was probably one of the oldest of Roman roads, leading to the pass of Algidus, so important in the early military history of Rome; and it must have preceded the Via Appia as a route to Campania, inasmuch as the Latin colony at Cales was founded in 334 B.C. and must have been accessible from Rome by road, whereas the Via Appia was only made twenty-two years later. It follows, too, a far more natural line of communication, without the engineering difficulties which the Via Appia had to encounter. As a through route it no doubt preceded the Via Labicana (see LABICANA, VIA), though the latter may have been preferred in later times. After their junction, the Via Latina continued to follow the valley of the Trerus (Sacco), following the line taken by the modern railway to Naples, and passing below the Hernican hill-towns, Anagnia, Ferentinum, Frusino, &c. At Fregellae it crossed the Liris, and then passed through Aquinum and Casinum, both of them comparatively low-lying towns. It then entered the interval between the Apennines and the volcanic group of Rocca Monfina, and the original road, instead of traversing it, turned abruptly N.E. over the mountains to Venafrum, thus giving a direct communication with the interior of Samnium by roads to Aesernia and Telesia. In later times, however, there was in all probability a short cut by Rufrae along the line taken by the modern highroad and railway. The two lines rejoined near the present railway station of Caianello and the road ran to Teanum and Cales, and so to Casilinum, where was the crossing of the Volturnus and the junction with the Via Appia. The distance from Rome to Casilinum was 129 m. by the Via Appia, 135 m. by the old Via Latina through Venafrum, 126 m. by the short cut by Rufrae. Considerable remains of the road exist in the neighbourhood of Rome; for the first 40 m., as far as Compitum Anagninum, it is not followed by any modern road; while farther on in its course it is in the main identical with the modern highroad.

See T. Ashby in *Papers of the British School at Rome* iv. 1 sq., v. 1 sq. (T. As.)

LATINI, BRUNETTO (*c.* 1210–*c.* 1294), Italian philosopher and scholar, was born in Florence, and belonged to the Guelph party. After the disaster of Montaperti he took refuge for some years (1261–1268) in France, but in 1269 returned to Tuscany and for some twenty years held successive high offices. Giovanni Villani says that "he was a great philosopher and a consummate master of rhetoric, not only in knowing how to speak well, but how to write well. . . . He both began and directed the growth of the Florentines, both in making them ready in speaking well and in knowing how to guide and direct our republic according to the rules of politics." He was the author of various works in prose and verse. While in France he wrote in French his prose *Trésor*, a summary of the encyclopaedic knowledge of the day (translated into Italian as *Tesoro* by Bono Giamboni in the 13th century), and in Italian his poem *Tesoretto*, rhymed couplets in heptasyllabic metre, a sort of abridgment put in allegorical form, the earliest Italian didactic verse. He is famous as the friend and counsellor of Dante (see *Inferno*, xv. 82-87).

For the *Trésor* see P. Chabville's edition (1863); for the *Tesoro*, Gaiter's edition (1878); for the *Tesoretto*, B. Wiese's study in *Zeitschrift für romanische Philologie*, vii. See also the biographical and critical accounts of Brunetto Latini by Thoe Sundby (1884), and Marchesini (1887 and 1890).

LATIN LANGUAGE. 1. *Earliest Records of its Area.*—Latin was the language spoken in Rome and in the plain of Latium in the 6th or 7th century B.C.—the earliest period from which we have any contemporary record of its existence. But it is as yet impossible to determine either, on the one hand, whether the archaic inscription of Praeneste (see below), which is assigned with great probability to that epoch, represents exactly the language then spoken in Rome; or, on the other, over how much larger an area of the Italian peninsula, or even of the lands to the north and west, the same language may at that date have extended. In the 5th century B.C. we find its limits within the peninsula fixed on the north-west and south-west by Etruscan (see ETRURIA: *Language*); on the east, south-east, and probably north and north-east, by Safine (Sabine) dialects (of the Marsi, Paeligni, Samnites, Sabini and Picenum, *qq.v.*); but on the north we have no direct record of Sabine speech, nor of any non-Latinian tongue nearer than Tuder and Asculum or earlier than the 4th century B.C. (see UMBRIA, IGUVIUM, PICENUM). We know however, both from tradition and from the archaeological data, that the Safine tribes were in the 5th century B.C. migrating, or at least sending off swarms of their younger folk, farther and farther southward into the peninsula. Of the languages they were then displacing we have no explicit record save in the case of Etruscan in Campania, but it may be reasonably inferred from the evidence of place-names and tribal names, combined with that of the Faliscan inscriptions, that before the Safine invasion some idiom, not remote from Latin, was spoken by the pre-Etruscan tribes down the length of the west coast (see FALISCI; VOLSCI; also ROME: *History*; LIGURIA; SICULI).

2. *Earliest Roman Inscriptions.*—At Rome, at all events, it is clear from the unwavering voice of tradition that Latin was spoken from the beginning of the city. Of the earliest Latin inscriptions found in Rome which were known in 1909, the oldest, the so-called "Forum inscription," can hardly be referred with confidence to an earlier century than the 5th; the later, the well-known *Duenos* (=later Latin *bonus*) inscription, certainly belongs to the 4th; both of these are briefly described below (§§ 40, 41). At this date we have probably the period of the narrowest extension of Latin; non-Latin idioms were spoken in Etruria, Umbria, Picenum and in the Marsian and Volscian hills. But almost directly the area begins to expand again, and after the war with Pyrrhus the Roman arms had planted the language of Rome in her military colonies throughout the peninsula. When we come to the 3rd century B.C. the Latin inscriptions begin to be more numerous, and in them (*e.g.* the oldest epitaphs of the Scipio family) the language is very little removed from what it was in the time of Plautus.

3. *The Italic Group of Languages.*—For the characteristics and affinities of the dialects that have just been mentioned, see the article ITALY: *Ancient Languages and Peoples*, and to the separate articles on the tribes. Here it is well to point out that the only one of these languages which is not akin to Latin is Etruscan; on the other hand, the only one very closely resembling Latin is Faliscan, which with it forms what we may call the Latinian dialect of the Italic group of the Indo-European family of languages. Since, however, we have a far more complete knowledge of Latin than of any other member of the Italic group, this is the most convenient place in which to state briefly the very little than can be said as yet to have been ascertained as to the general relations of Italic to its sister groups. Here, as in many kindred questions, the work of Paul Kretschmer of Vienna (*Einleitung in die Geschichte der griechischen Sprache*, Göttingen, 1896) marked an important epoch in the historical aspects of linguistic study, as the first scientific attempt to interpret critically the different kinds of evidence which the Indo-European languages give us, not in vocabulary merely, but in phonology, morphology, and especially in their mutual borrowings, and to combine it with the non-linguistic data of tradition and archaeology. A certain number of the results so obtained have met with general acceptance and may be briefly treated here. It is, however, extremely dangerous to draw merely from linguistic kinship deductions as to racial identity, or even as to an original contiguity of habitation. Close resemblances in any two languages, especially those in their inner structure (morphology), may be due to identity of race, or to long neighbourhood in the earliest period of their development; but they may also be caused by temporary neighbourhood (for a longer or shorter period), brought about by migrations at a later epoch (or epochs). A particular change in sound or usage may spread over a whole chain of dialects and be in the end exhibited alike by them all, although the time at which it first began was long after their special and distinctive characteristics had become clearly marked. For example, the limitation of the word-accent to the last three syllables of a word in Latin and Oscan (see below)—a phenomenon which has left deep marks on all the Romance languages—demonstrably grew up between the 5th and 2nd centuries B.C.; and it is a permissible conjecture that it started from the influence of the Greek colonies in Italy (especially Cumae and Naples), in whose language the same limitation (although with an accent whose actual character was probably more largely musical) had been established some centuries sooner.

4. *Position of the Italic Group.*—The Italic group, then, when compared with the other seven main "families" of Indo-

European speech, in respect of their most significant differences, ranges itself thus:

(i.) *Back-palatal and Velar Sounds.*—In point of its treatment of the Indo-European back-palatal and velar sounds, it belongs to the western or *centum* group, the name of which is, of course, taken from Latin; that is to say, like German, Celtic and Greek, it did not sibilate original *k* and *g*, which in Indo-Iranian, Armenian, Slavonic and Albanian have been converted into various types of sibilants (Ind.-Eur.* *km̥tom*=Lat. *centum*, Gr. (ἑ)-κατόν, Welsh *cant*, Eng. *hund-(red)*, but Sans. *śatam*, Zend *satəm*); but, on the other hand, in company with just the same three western groups, and in contrast to the eastern, the Italic languages labialized the original velars (Ind.-Eur. * *qod*=Lat. *quod*, Osc. *pod*, Gr. ποδ-(απός), Welsh *pwy*, Eng. *what*, but Sans. *kás*, "who?").

(ii.) *Indo-European Aspirates.*—Like Greek and Sanskrit, but in contrast to all the other groups (even to Zend and Armenian), the Italic group largely preserves a distinction between the Indo-European *mediae aspiratae* and *mediae* (*e.g.* between Ind.-Eur. *dh* and *d*, the former when initial becoming initially regularly Lat. *f* as in Lat. *fēc-ī* [cf. Umb. *feia*, "*faciat*"], beside Gr. ἔ-θηκ-α [cf. Sans. *da-dhā-ti*, "he places"], the latter simply *d* as in *domus*, Gr. δόμος). But the *aspiratae*, even where thus distinctly treated in Italic, became fricatives, not pure aspirates, a character which they only retained in Greek and Sanskrit.

(iii.) *Indo-European ŏ.*—With Greek and Celtic, Latin preserved the Indo-European *ŏ*, which in the more northerly groups (Germanic, Balto-Slavonic), and also in Indo-Iranian, and, curiously, in Messapian, was confused with *ă*. The name for olive-oil, which spread with the use of this commodity from Greek (ἔλαιϝον) to Italic speakers and thence to the north, becoming by regular changes (see below) in Latin first **ólaivom*, then **óleivom*, and then taken into Gothic and becoming *alēv*, leaving its parent form to change further (not later than 100 B.C.) in Latin to *oleum*, is a particularly important example, because (*a*) of the chronological limits which are implied, however roughly, in the process just described, and (*b*) of the close association in time of the change of *o* to *a* with the earlier stages of the "sound-shifting" (of the Indo-European plosives and aspirates) in German; see Kretschmer, *Einleit.* p. 116, and the authorities he cites.

(iv.) *Accentuation.*—One marked innovation common to the western groups as compared with what Greek and Sanskrit show to have been an earlier feature of the Indo-European parent speech was the development of a strong expiratory (sometimes called stress) accent upon the first syllable of all words. This appears early in the history of Italic, Celtic, Lettish (probably, and at a still later period) in Germanic, though at a period later than the beginning of the "sound-shifting." This extinguished the complex system of Indo-European accentuation, which is directly reflected in Sanskrit, and was itself replaced in Latin and Oscan by another system already mentioned, but not in Latin till it had produced marked effects upon the language (*e.g.* the degradation of the vowels in compounds as in *cōnficio* from *cón-facio*, *inclūdo* from *ín-claudo*). This curious wave of accentual change (first pointed out by Dieterich, *Kuhn's Zeitschrift*, i., and later by Thurneysen, *Revue celtique*, vi. 312, *Rheinisches Museum*, xliii. 349) needs and deserves to be more closely investigated from a chronological standpoint. At present it is not clear how far it was a really connected process in all the languages. (See further Kretschmer, *op. cit.* p. 115, K. Brugmann, *Kurze vergleichende Grammatik* (1902–1904), p. 57, and their citations, especially Meyer-Lübke, *Die Betonung im Gallischen* (1901).)

To these larger affinities may be added some important points in which the Italic group shows marked resemblances to other groups.

5. *Italic and Celtic.*—It is now universally admitted that the Celtic languages stand in a much closer relation than any other group to the Italic. It may even be doubted whether there was any real frontier-line at all between the two groups before the Etruscan invasion of Italy (see ETRURIA: *Language*; LIGURIA). The number of morphological innovations on the Indo-European system which the two groups share, and which are almost if not wholly peculiar to them, is particularly striking. Of these the chief are the following.

(i.) Extension of the abstract-noun stems in *-ti-* (like Greek φάτις with Attic βάσις, &c.) by an *-n-* suffix, as in Lat. *mentio* (stem *menti-ōn-*)=Ir. *(er-)mitiu* (stem *miti-n-*), contrasted with the same word without the *n*-suffix in Sans. *mati-*, Lat. *mens*, Ind.-Eur. **mn̥-ti-*. A similar extension (shared also by Gothic) appears in Lat. *iuventū-t-*, O. Ir. *óitiu* (stem *oitiūt-*) beside the simple *-tu-* in nouns like *senātus*.

(ii.) Superlative formation in *-is-m̥mo-* as in Lat. *aegerrimus* for **aegr-ism̥mos*, Gallic Οὐξισάμη the name of a town meaning "the highest."

(iii.) Genitive singular of the *o*-stems (second declension) in *-ī* Lat. *agri*, O. Ir. (Ogam inscriptions) *magi*, "of a son."

(iv.) Passive and deponent formation in *-r*, Lat. *sequitur*=Ir. *sechedar*, "he follows." The originally active meaning of this curious *-r* suffix was first pointed out by Zimmer (*Kuhn's Zeitschrift*, 1888, xxx. 224), who thus explained the use of the accusative pronouns with these "passive" forms in Celtic; Ir. *-m-berar*, "I am carried," literally "folk carry me"; Umb. *pir ferar*, literally *ignem feratur*, though as *pir* is a neuter word (=Gr. πῦρ) this example was not so convincing. But within a twelvemonth of the appearance of Zimmer's article, an Oscan inscription (Conway, *Camb. Philol. Society's Proceedings*, 1890, p. 16, and *Italic Dialects*, p. 113) was discovered containing the phrase *ůltiumam (iůvilam) sakrafír*, "ultimam (imaginem) consecraverint" (or "ultima consecretur") which demonstrated the nature of the suffix in Italic also. This originally active meaning of the *-r* form (in the third person singular passive) is the cause of the remarkable fondness for the "impersonal" use of the passive in Latin (*e.g.*, *itur in antiquam silvam*, instead of *eunt*), which was naturally extended to all tenses of the passive (*ventum est*, &c.), so soon as its origin was forgotten. Fuller details of the development will be found in Conway, *op. cit.* p. 561, and the authorities there cited (very little is added by K. Brugmann, *Kurze vergl. Gramm.* 1904, p. 596).

(v.) Formation of the perfect passive from the *-to-* past participle, Lat. *monitus* (*est*), &c., Ir. *léic-the*, "he was left," *ro-léiced*, "he has been left." In Latin the participle maintains its distinct adjectival character; in Irish (J. Strachan, *Old Irish Paradigms*, 1905, p. 50) it has sunk into a purely verbal form, just as the perfect participles in *-us* in Umbrian have been absorbed into the future perfect in *-ust* (*entelust*, "intenderit"; *benust*, "venerit") with its impersonal passive or third plural active *-us(s)so* (probably standing for *-ussor*) as in *benuso*, "ventum erit" (or "venerint").

To these must be further added some striking peculiarities in phonology.

(vi.) Assimilation of *p* to a *qᵘ̯* in a following syllable as in Lat. *quinque*=Ir. *cóic*, compared with Sans. *pánca*, Gr. πέντε, Eng. *five*, Ind.-Eur. **penqe*.

(vii.) Finally—and perhaps this parallelism is the most important of all from the historical standpoint—both Italic and Celtic are divided into two sub-families which differ, and differ in the same way, in their treatment of the Ind.-Eur. velar tenuis *q*. In both halves of each group it was labialized to some extent; in one half of each group it was labialized so far as to become *p*. This is the great line of cleavage (i.) between Latinian (Lat. *quod*, *quandō*, *quinque*; Falisc. *cuando*) and Osco-Umbrian, better called Safine (Osc. *pod*, Umb. *panū-* [for **pandō*], Osc.-Umb. *pompe-*, "five," in Osc. *půmperias* "nonae," Umb. *pumpeḍia-*, "fifth day of the month"); and (ii.) between Goidelic (Gaelic) (O. Ir. *cóic*, "five," *maq*, "son"; modern Irish and Scotch *Mac* as in *MacPherson*) and Brythonic (Britannic) (Welsh *pump*, "five," *Ap* for *map*, as in *Powel* for *Ap Howel*).

The same distinction appears elsewhere; Germanic belongs, broadly described, to the *q*-group, and Greek, broadly described, to the *p*-group. The ethnological bearing of the distinction within Italy is considered in the articles SABINI and VOLSCI; but the wider questions which the facts suggest have as yet been only scantily discussed; see the references for the "Sequanian" dialect of Gallic (in the inscription of Coligny, whose language preserves *q*) in the article CELTS: *Language*.

From these primitive affinities we must clearly distinguish the numerous words taken into Latin from the Celts of north Italy within the historic period; for these see especially an interesting study by J. Zwicker, *De vocabulis et rebus Gallicis sive Transpadanis apud Vergilium* (Leipzig dissertation, 1905).

6. *Greek and Italic.*—We have seen above (§ 4, i., ii., iii.) certain broad characteristics which the Greek and the Italic groups of language have in common. The old question of the degree of their affinity may be briefly noticed. There are deep-seated differences in morphology, phonology and vocabulary between the two languages—such as (*a*) the loss of the forms of the ablative in Greek and of the middle voice in Latin; (*b*) the decay of the fricatives (*s*, *v*, *i̯*) in Greek and the cavalier treatment of the aspirates in Latin; and (*c*) the almost total discrepancy of the vocabularies of law and religion in the two languages—which altogether forbid the assumption that the two groups can ever have been completely identical after their first dialectic separation from the parent language. On the other hand, in the first early periods of that dialectic development in the Indo-European family, the precursors of Greek and Italic cannot have been separated by any very wide boundary. To this primitive neighbourhood may be referred such peculiarities as (*a*) the genitive plural feminine ending in *-āsōm* (Gr. -άων, later in various dialects -έων, -ῶν, -ᾶν; cf. Osc. *egmazum* "rerum"; Lat. *mensarum*, with *-r-* from *-s-*), (*b*) the feminine gender of many nouns of the *-o-* declension, cf. Gr. ἡ ὁδὸς, Lat. *haec fāgus*; and some important and ancient syntactical features, especially in the uses of the cases (*e.g.* (*c*) the genitive of price) of the (*d*) infinitive and of the (*e*) participles passive (though in

each case the forms differ widely in the two groups), and perhaps (*f*) of the dependent moods (though here again the forms have been vigorously reshaped in Italic). These syntactic parallels, which are hardly noticed by Kretschmer in his otherwise careful discussion (*Einleit.* p. 155 seq.), serve to confirm his general conclusion which has been here adopted; because syntactic peculiarities have a long life and may survive not merely complete revolutions in morphology, but even a complete change in the speaker's language, *e.g.* such Celticisms in Irish-English as "What are you after doing?" for "What have you done?" or in Welsh-English as "whatever" for "anyhow." A few isolated correspondences in vocabulary, as in *remus* from **ret-s-mo-*, with ἐρετμός and in a few plant-names (*e.g.* πράσον and *porrum*), cannot disturb the general conclusion, though no doubt they have some historical significance, if it could be determined.

7. *Indo-Iranian and Italo-Celtic.*—Only a brief reference can here be made to the striking list of resemblances between the Indo-Iranian and Italo-Celtic groups, especially in vocabulary, which Kretschmer has collected (*ibid.* pp. 126-144). The most striking of these are *rēx*, O. Ir. *rīg-*, Sans. *rāj-*, and the political meaning of the same root in the corresponding verb in both languages (contrast *regere* with the merely physical meaning of Gr. ὀρέγνυμι); Lat. *flāmen* (for **flag-men*) exactly = Sans. *brahman-* (neuter), meaning probably "sacrificing," "worshipping," and then "priesthood," "priest," from the Ind.-Eur. root **bhelgh-*, "blaze," "make to blaze"; *rēs*, *rem* exactly = Sans. *rās*, *rām* in declension and especially in meaning; and *Ārio-*, "noble," in Gallic *Ariomanus*, &c., = Sans. *ārya-*, "noble" (whence "Aryan"). So *argentum* exactly = Sans. *rajata-*, Zend *erezata-*; contrast the different (though morphologically kindred) suffix in Gr. ἄργυρος. Some forty-two other Latin or Celtic words (among them *crēdere*, *caesariēs*, *probus*, *castus* (cf. Osc. *kasit*, Lat. *caret*, Sans. *šiṣṭa-*), *Volcānus*, *Neptūnus*, *ensis*, *erus*, *pruina*, *rūs*, *novācula*) have precise Sanskrit or Iranian equivalents, and none so near in any other of the eight groups of languages. Finally the use of an *-r* suffix in the third plural is common to both Italo-Celtic (see above) and Indo-Iranian. These things clearly point to a fairly close, and probably in part political, intercourse between the two communities of speakers at some early epoch. A shorter, but interesting, list of correspondences in vocabulary with Balto-Slavonic (*e.g.* the words *mentīri*, *rōs*, *ignis* have close equivalents in Balto-Slavonic) suggests that at the same period the precursor of this dialect too was a not remote neighbour.

8. *Date of the Separation of the Italic Group.*— The date at which the Italic group of languages began to have (so far as it had at all) a separate development of its own is at present only a matter of conjecture. But the combination of archaeological and linguistic research which has already begun can have no more interesting object than the approximate determination of this date (or group of dates); for it will give us a point of cardinal importance in the early history of Europe. The only consideration which can here be offered as a starting-point for the inquiry is the chronological relation of the Etruscan invasion, which is probably referable to the 12th century B.C. (see ETRURIA), to the two strata of Indo-European population—the -CO- folk (*Falisci*, *Marruci*, *Volsci*, *Hernici* and others), to whom the Tuscan invaders owe the names *Etrusci* and *Tusci*, and the -NO- folk, who, on the West coast, in the centre and south of Italy, appear at a distinctly later epoch, in some places (as in the Bruttian peninsula, see BRUTTII) only at the beginning of our historical record. If the view of Latin as mainly the tongue of the -CO- folk prove to be correct (see ROME: *History*; ITALY: *Ancient Languages and Peoples*; SABINI; VOLSCI) we must regard it (*a*) as the southern or earlier half of the Italic group, firmly rooted in Italy in the 12th century B.C., but (*b*) by no means yet isolated from contact with the northern or later half; such is at least the suggestion of the striking peculiarities in morphology which it shares with not merely Oscan and Umbrian, but also, as we have seen, with Celtic. The progress in time of this isolation ought before long to be traced with some approach to certainty.

THE HISTORY OF LATIN

9. We may now proceed to notice the chief changes that arose in Latin after the (more or less) complete separation of the Italic group whenever it came about. The contrasted features of Oscan and Umbrian, to some of which, for special reasons, occasional reference will be here made, are fully described under OSCA LINGUA and IGUVIUM respectively.

It is rarely possible to fix with any precision the date at which a particular change began or was completed, and the most serviceable form for this conspectus of the development will be to present, under the heads of Phonology, Morphology and Syntax, the chief characteristics of Ciceronian Latin which we know to have been developed after Latin became a separate language. Which of these changes, if any, can be assigned to a particular period will be seen as we proceed. But it should be remembered that an enormous increase of exact knowledge has accrued from the scientific methods of research introduced by A. Leskien and K. Brugmann in 1879, and finally established by Brugmann's great *Grundriss* in 1886, and that only a brief enumeration can be here attempted. For adequate study reference must be made to the fuller treatises quoted, and especially to the sections bearing on Latin in K. Brugmann's *Kurze vergleichende Grammatik* (1902).

I. PHONOLOGY

10. *The Latin Accent.*—It will be convenient to begin with some account of the most important discovery made since the application of scientific method to the study of Latin, for, though it is not strictly a part of phonology, it is wrapped up with much of the development both of the sounds and, by consequence, of the inflexions. It has long been observed (as we have seen § 4, iv. above) that the restriction of the word-accent in Latin to the last three syllables of the word, and its attachment to a long syllable in the penult, were certainly not its earliest traceable condition; between this, the classical system, and the comparative freedom with which the word-accent was placed in pro-ethnic Indo-European, there had intervened a period of first-syllable accentuation to which were due many of the characteristic contractions of Oscan and Umbrian, and in Latin the degradation of the vowels in such forms as *accentus* from *ad+cantus* or *praecipitem* from *prae+caput-* (§ 19 below). R. von Planta (*Osk.-Umbr. Grammatik*, 1893, i. p. 594) pointed out that in Oscan also, by the 3rd century B.C., this first-syllable-accent had probably given way to a system which limited the word-accent in some such way as in classical Latin. But it remained for C. Exon, in a brilliant article (*Hermathena* (1906), xiv. 117, seq.), to deduce from the more precise stages of the change (which had been gradually noted, see *e.g.* F. Skutsch in Kroll's *Altertumswissenschaft in letzten Vierteljahrhundert*, 1905) their actual effect on the language.

11. *Accent in Time of Plautus.*—The rules which have been established for the position of the accent in the time of Plautus are these:

- (i.) The quantity of the final syllable had no effect on accent.
- (ii.) If the penult was long, it bore the accent (*amābā́mus*).
- (iii.) If the penult was short, then
  - (*a*) if the ante-penult was long, it bore the accent (*amā́bimus*);
  - (*b*) if the ante-penult was short, then
    - (i.) if the ante-ante-penult was long, the accent was on the ante-penult (*amīcítia*); but
    - (ii.) if the ante-ante-penult was also short, it bore the accent (*cólumine*, *puéritia*).

Exon's Laws of Syncope.—With these facts are now linked what may be called Exon's Laws, viz:—

In pre-Plautine Latin in all words or word-groups of four or more syllables whose chief accent is on one long syllable, a short unaccented medial vowel was syncopated; thus **quínquedecem* became **quínqdecem* and thence *quíndecim* (for the *-im* see § 19), **súps-emere* became **súpsmere* and that *sūmere* (on *-psm- v. inf.*) **súrregere*, **surregḗmus*, and the like became *surgere*, *surgḗmus*, and the rest of the paradigm followed; so probably *validḗ bonus* became *valdḗ bonus*, *exterā́ viam* became *extrā́ viam*; so **supo-téndo* became *subtendo* (pronounced *sup-tendo*), **āridḗre*, **avidḗre* (from *āridus*, *avidus*) became *ārdḗre*, *audḗre*. But the influence of cognate forms often interfered; *posterī-diē* became *postrīdiē*, but in *posterṓrum*, *posterā́rum* the short syllable was restored by the influence of the tri-syllabic cases, *pósterus*, *pósterī*, &c., to which the law did not apply. Conversely, the nom. **ā́ridor* (more correctly at this period **āridōs*), which would not have been contracted, followed the form of *ārdṓrem* (from **āridṓrem*), *ārdḗre*, &c.

The same change produced the monosyllabic forms *nec*, *ac*, *neu*, *seu*, from *neque*, &c., before consonants, since they had no accent of their own, but were always pronounced in one breath with the following word, *neque tántum* becoming *nec tantum*, and the like. So in Plautus (and probably always in spoken Latin) the words *nemp(e)*, *ind(e)*, *quipp(e)*, *ill(e)*, are regularly monosyllables.

12. *Syncope of Final Syllables.*—It is possible that the frequent but far from universal syncope of final syllables in Latin (especially before *-s*, as in *mēns*, which represents both Gr. μένος and Sans. *matís* = Ind.-Eur. *mn̥tís*, Eng. *mind*) is due also to this law operating on such combinations as *bona mēns* and the like, but this has not yet been clearly shown. In any case the effects of any such phonetic change have been very greatly modified by analogical changes. The Oscan and Umbrian syncope of short vowels before final *s* seems to be an independent change, at all events in its detailed working. The outbreak of the unconscious affection of slurring final syllables may have been contemporaneous.

13. *In post-Plautine Latin* words accented on the ante-antepenult:—

(i.) suffered syncope in the short syllable following the accented syllable (*bálincae* became *bálneae*, *púeritia* became *puértia* (Horace), *cólumine*, *tégimine*, &c., became *cúlmine*, *tégmine*, &c., beside the trisyllabic *cólumen*, *tégimen*) unless

(ii.) that short vowel was *e* or *i*, followed by another vowel (as in *párietem*, *múlierem*, *Púteoli*), when, instead of contraction, the accent shifted to the penult, which at a later stage of the language became lengthened, *pariétem* giving Ital. *parète*, Fr. *paroi*, *Puteóli* giving Ital. *Pozzuòli*.

The restriction of the accent to the last three syllables was completed by these changes, which did away with all the cases in which it had stood on the fourth syllable.

14. *The Law of the Brevis Brevians.*—Next must be mentioned another great phonetic change, also dependent upon accent, which had come about before the time of Plautus, the law long known to students as the *Brevis Brevians*, which may be stated as follows (Exon, *Hermathena* (1903), xii. 491, following Skutsch in, *e.g.*, Vollmöller's *Jahresbericht für romanische Sprachwissenschaft*, i. 33): a syllable long by nature or position, and preceded by a short syllable, was itself shortened if the word-accent fell immediately before or immediately after it—that is, on the preceding short syllable or on the next following syllable. The sequence of syllables need not be in the same word, but must be as closely connected in utterance as if it were. Thus *mŏ́dō* became *mŏ́dŏ*, *vŏlūptā́tēm* became *vŏlŭ(p)tā́tem*, *quĭ́d ēst?* became *quid ĕst?* either the *s* or the *t* or both being but faintly pronounced.

It is clear that a great number of flexional syllables so shortened would have their quantity immediately restored by the analogy of the same inflexion occurring in words not of this particular shape; thus, for instance, the long vowel of *ắmā* and the like is due to that in other verbs (*pulsā*, *agitā*) not of iambic shape. So ablatives like *modō*, *sonō* get back their *-ō*, while in particles like *modo*, "only," *quōmodo*, "how," the shortened form remains. Conversely, the shortening of the final *-a* in the nom. sing. fem. of the *a*-declension (contrast *lūnă* with Gr. χωρᾱ́) was probably partly due to the influence of common forms like *eă*, *bonă*, *mală*, which had come under the law.

15. *Effect on Verb Inflexion.*—These processes had far-reaching effects on Latin inflexion. The chief of these was the creation of the type of conjugation known as the *capio*-class. All these verbs were originally inflected like *audio*, but the accident of their short root-syllable (in such early forms as **fúgīs*, **fugītū́rus*, **fugīsḗtis*, &c., becoming later *fúgĭs*, *fugĭtū́rus*, *fugĕrḗtis*) brought great parts of their paradigm under this law, and the rest followed suit; but true forms like *fugīre*, *cupīre*, *morīri*, never altogether died out of the spoken language. St Augustine, for instance, confessed in 387 A.D. (*Epist.* iii. 5, quoted by Exon, *Hermathena* (1901), xi. 383,) that he does not know whether *cupi* or *cupiri* is the pass. inf. of *cupio*. Hence we have Ital. *fuggīre*, *morīre*, Fr. *fuir*, *mourir*. (See further on this conjugation, C. Exon, *l.c.*, and F. Skutsch, *Archiv für lat. Lexicographie*, xii. 210, two papers which were written independently.)

16. The question has been raised how far the true phonetic shortening appears in Plautus, produced not by word-accent but by metrical ictus—*e.g.* whether the reading is to be trusted in such lines as *Amph.* 761, which gives us *dedisse* as the first foot (tribrach) of a trochaic line "because the metrical ictus fell on the syllable *ded-*"—but this remarkable theory cannot be discussed here. See the articles cited and also F. Skutsch, *Forschungen zu Latein. Grammatik und Metrik*, i. (1892); C. Exon, *Hermathena* (1903) xii. p. 492, W. M. Lindsay, *Captivi* (1900), appendix,

In the history of the vowels and diphthongs in Latin we must distinguish the changes which came about independently of accent and those produced by the preponderance of accent in another syllable.

17. *Vowel Changes independent of Accent.*—In the former category the following are those of chief importance:—

(i.) *ĭ* became *ĕ* (*a*) when final, as in *ant-e* beside Gr. ἀντί, *trīste* besides *trīsti-s*, contrasted with *e.g.*, the Greek neuter ἴδρι (the final *-e* of the infinitive—*regere*, &c.—is the *-ĭ* of the locative, just as in the so-called ablatives *genere*, &c.); (*b*) before *-r-* which has arisen from *-s-*, as in *cineris* beside *cinis*, *cinisculus*; *serō* beside Gr. ἵ(σ)ημι (Ind.-Eur. **si-sēmi*, a reduplicated non-thematic present).

(ii.) Final *ŏ* became *ĕ*; imperative *sequere* = Gr. ἕπε(σ)ο; Lat. *ille* may contain the old pronoun **so*, "he," Gr. ὁ, Sans. *sa* (otherwise Skutsch, *Glotta*, i. Hefte 2-3).

(iii.) *el* became *ol* when followed by any sound save *e*, *i* or *l*, as in *volō*, *volt* beside *velle*; *colō* beside Gr. τέλλομαι, πολεῖν, Att. τέλος; *colōnus* for **quelōnus*, beside *inquilīnus* for **en-quēlenus*.

(iv.) *e* became *i* (i.) before a nasal followed by a palatal or velar consonant (*tingo*, Gr. τέγγω; *in-cipio* from **en-capio*); (ii.) under certain conditions not yet precisely defined, one of which was *i̯* in a following syllable (*nihil*, *nisi*, *initium*). From these forms *in-* spread and banished *en-*, the earlier form.

(v.) The "neutral vowel" ("schwa Indo-Germanicum") which arose in pro-ethnic Indo-European from the reduction of long *ā*, *ē* or *ō* in unaccented syllables (as in the *-tós* participles of such roots as *stā-*, *dhē-*, *dō-*, **stətós*, **dhətós*, **dətós*) became *a* in Latin (*status con-ditus* [from **con-dhatos*], *datus*), and it is the same sound which is represented by *a* in most of the forms of *dō* (*damus*, *dabō*, &c.).

(vi.) When a long vowel came to stand before another vowel in the same word through loss of *i̯* or *u̯*, it was always shortened; thus the *-eō* of intransitive verbs like *candeō*, *caleō* is for *-ēi̯ō* (where the *ē* is identical with the η in Gr. ἐφάνην, ἐμάνην) and was thus confused with the causative *-ei̯ō* (as in *moneō*, "I make to think," &c.), where the short *e* is original. So *audīuī* became **audīī* and thence *audĭī* (the form *audīwi* would have disappeared altogether but for being restored from *audīveram*, &c.; conversely *audieram* is formed from *audĭī*). In certain cases the vowels contracted, as in *trēs*, *partēs*, &c. with *-ēs* from *ei̯es*, **amō* from *amā(i̯)ō*.

18. *Of the Diphthongs.*

Changes of the diphthongs independent of accent.

(vii.) *eu* became *ou* in pro-ethnic Italic, Lat. *novus*: Gr. νέος, Lat. *novem*, Umb. *nuviper* (*i.e.* *noviper*, "usque ad noviens": Gr. (ἐν-)νέα; in unaccented syllables this *-ov-* sank to *-u(v)-* as in *dēnuō* from *dē novō*, *suus* (which is rarely anything but an enclitic word), Old Lat. *sovos*: Gr. ἐ(F)ός.

(viii.) *ou*, whether original or from *eu*, when in one syllable became *-ū-*, probably about 200 B.C., as in *dūcō*, Old Lat. *doucō*, Goth. *tiuhan*, Eng. *tow*, Ind.-Eur. **deucō*.

(ix.) *ei* became *ī* (as in *dīcō*, Old Lat. *deico*: Gr. δείκ-νυμι, *fīdo*: Gr. πείθομαι, Ind.-Eur. **bheidhō*) just before the time of Lucilius, who prescribes the spellings *puerei* (nom. plur.) but *puerī* (gen. sing.), which indicates that the two forms were pronounced alike in his time, but that the traditional distinction in spelling had been more or less preserved. But after his time, since the sound of *ei* was merely that of *ī*, *ei* is continually used merely to denote a long *ī*, even where, as in *faxeis* for *faxīs*, there never had been any diphthongal sound at all.

(x.) In rustic Latin (Volscian and Sabine) *au* became *ō* as in the vulgar terms *explōdere*, *plōstrum*. Hence arose interesting doublets of meaning;—*lautus* (the Roman form), "elegant," but *lōtus*, "washed"; *haustus*, "draught," but *hōstus* (Cato), "the season's yield of fruit."

(xi.) *oi* became *oe* and thence *ū* some time after Plautus, as in *ūnus*, Old Lat. *oenus*: Gr. οἰνή "ace." In Plautus the forms have nearly all been modernized, save in special cases, *e.g.* in *Trin.* i. 1, 2, *immoene facinus*, "a thankless task," has not been changed to *immune* because that meaning had died out of the adjective so that *immune facinus* would have made nonsense; but at the end of the same line *utile* has replaced *oetile*. Similarly in a small group of words the old form was preserved through their frequent use in legal or religious documents where tradition was strictly preserved—*poena*, *foedus* (neut.), *foedus* (adj.), "ill-omened." So the archaic and poetical *moenia*, "ramparts," beside the true classical form *mūnia*, "duties"; the historic *Poeni* beside the living and frequently used *Pūnicum* (*bellum*)—an example which demonstrates conclusively (*pace* Sommer) that the variation between *ū* and *oe* is not due to any difference in the surrounding sounds.

(xii.) *ai* became *ae* and this in rustic and later Latin (2nd or 3rd century A.D.) simple *ē*, though of an open quality—Gr. αἶθος, αἴθω, Lat. *aedēs* (originally "the place for the fire"); the country forms of *haedus*, *praetor* were *edus*, *pretor* (Varro, *Ling. Lat.* v. 97, Lindsay, *Lat. Lang.* p. 44).

19. *Vowels and Diphthongs in unaccented Syllables.*—The changes of the short vowels and of the diphthongs in unaccented syllables are too numerous and complex to be set forth here. Some took place under the first-syllable system of accent, some later (§§ 9, 10). Typical examples are *pepErci* from **péparcai* and *ónustus* from **ónostos* (before two consonants); *concIno* from **cóncano* and *hospIlIs* from **hóstipotes*, *legImus* beside Gr. λέγομεν (before one consonant); *SicUli* from **Siceloi* (before a thick *l*, see § 17, 3); *dilIgIt* from **dísleget* (contrast, however, the preservation of the second *e* in *neglEgIt*); *occUpat* from **opcapat* (contrast *accipit* with *i* in the following syllable); the varying spelling in *monumentum* and *monimentum*, *maxumus* and *maximus*, points to an intermediate sound (*ü*) between *u* and *i* (cf. Quint. i. 4. 8, reading *optumum* and *optimum* [not *opimum*] with W. M. Lindsay, *Latin Language* §§ 14, 16, seq.), which could not be correctly represented in spelling; this difference may, however, be due merely to the effect of differences in the neighbouring sounds, an effect greatly obscured by analogical influences.

Inscriptions of the 4th or 3rd century, B.C. which show original *-es* and *-os* in final syllables (*e.g.* *Venerēs*, gen. sing., *nāvebos* abl. pl.) compared with the usual forms in *-is*, *-us* a century later, give us roughly the date of these changes. But final *-os*, *-om*, remained after *-u-* (and *v*) down to 50 B.C. as in *servos*.

20. Special mention should be made of the change of *-rĭ-* and *-ro-* to *-er-* (*incertus* from **encritos*; *ager*, *ācer* from **agros*, **ācris*; the

feminine *ācris* was restored in Latin (though not in North Oscan) by the analogy of other adjectives, like *tristis*, while the masculine *ācer* was protected by the parallel masculine forms of the -*o*- declension, like *tener*, *niger* [from **teneros*, **nigros*]).

21. Long vowels generally remained unchanged, as in *compāgo*, *condōno*.

22. Of the diphthongs, *ai* and *oi* both sank to *ei*, and with original *ei* further to *ī*, in unaccented syllables, as in *Achivi* from Gr. Ἀχαιϝοί, *olīvom*, earlier **oleivom* (borrowed into Gothic and there becoming *alēv*) from Gr. ἔλαιϝον. This gives us interesting chronological data, since the *el*- must have changed to *ol*- (§ 16. 3) before the change of -*ai*- to -*ei*-, and that before the change of the accent from the first syllable to the penultimate (§ 9); and the borrowing took place after -*ai*- had become -*ei*-, but before -*eivom* had become -*eum*, as it regularly did before the time of Plautus.

But cases of *ai*, *ae*, which arose later than the change to *ei*, *ī*, were unaffected by it; thus the nom. plur. of the first declension originally ended in -*ās* (as in Oscan), but was changed at some period before Plautus to -*ae* by the influence of the pronominal nom. plur. ending -*ae* in *quae? hae*, &c., which was accented in these monosyllables and had therefore been preserved. The history of the -*ae* of the dative, genitive and locative is hardly yet clear (see Exon, *Hermathena* (1905), xiii. 555; K. Brugmann, *Grundriss*, 1st ed. ii. 571, 601).

The diphthongs *au*, *ou* in unaccented syllables sank to -*u*-, as in *inclūdō* beside *claudō*; the form *clūdō*, taken from the compounds, superseded *claudo* altogether after Cicero's time. So *cūdō*, taken from *incūdō*, *excūdō*, banished the older **caudō*, "I cut, strike," with which is probably connected *cauda*, "the striking member, tail," and from which comes *caussa*, "a cutting, decision, legal case," whose -*ss*- shows that it is derived from a root ending in a dental (see §25 (*b*) below and Conway, *Verner's Law in Italy*, p. 72).

Consonants.—Passing now to the chief changes of the consonants we may notice the following points:—

23. Consonant *i* (wrongly written *j*; there is no *g*-sound in the letter), conveniently written *i̯* by phoneticians,

(i.) was lost between vowels, as in *trēs* for **trei̯es*, &c. (§ 17. 6);

(ii.) in combination: -*mi̯*- became -*ni*-, as in *veniō*, from Ind.-Eur. *gᵘ̯ *m̥i̯o*, "I come," Sans. *gam*-, Eng. *come*; -*ni̯*- probably (under certain conditions at least) became -*nd*-, as in *tendō* beside Gr. τείνω, *fendō* = Gr. θείνω, and in the gerundive stem -*endus*, -*undus*, probably for -*eni̯os*, -*oni̯os*; cf. the Sanskrit gerundive in -*an-īya-s*; -*gi̯*-, -*di̯*- became -*i̯*- as in *māior* from **mag-ior*, *pēior* from **ped-ior*;

(iii.) otherwise -*i̯*- after a consonant became generally syllabic (-*ii̯*-), as in *capiō* (trisyllabic) beside Goth. *hafya*.

24. Consonant *u* (formerly represented by English *v*), conveniently written *u̯*,

(i.) was lost between similar vowels when the first was accented, as in *audīui*, which became *audiī* (§ 17 [6]), but not in *amāuī*, nor in *avārus*.

(ii.) in combination: *du̯*- became *b*, as in *bonus*, *bellum*, O. Lat. *du̯onus*, **du̯ellum* (though the poets finding this written form in old literary sources treated it as trisyllabic); *pu̯*-, *fu̯*-, *bu̯*-, lost the *u̯*, as in *ap-erio*, *op-erio* beside Lith. -*veriu*, "I open," Osc. *veru*, "gate," and in the verbal endings -*bam*, -*bō*, from -*bhu̯-ām*, -*bhu̯ō* (with the root of Lat. *fui*), and *fīo*, *du-bius*, *super-bus*, *vasta-bundus*, &c., from the same; -*su̯*- between vowels (at least when the second was accented) disappeared (see below § 25 (*a*), iv.), as in *pruīna* for *prusuīna*, cf. Eng. *fros-t*, Sans. *pruṣvā*, "hoar-frost." Contrast *Minérva* from an earlier **menes-u̯ā*, *su̯e*-, *su̯o*-, both became *so*-, as in *sorōr*(*em*) beside Sans. *svasār-am*, Ger. *schwes-t-er*, Eng. *sister*, *sordēs*, beside O. Ger. *swart-s*, mod. *schwarz*. -*u̯o*- in final syllables became -*u*-, as in *cum* from *quom*, *parum* from *paru̯om*; but in the declensional forms -*u̯u*- was commonly restored by the analogy of the other cases, thus (*a*) *seru̯os seru̯om*, *seru̯ī* became (*b*) **serus*, **serum*, **seru̯ī*, but finally (*c*) *seru̯us*, *seru̯um*, *seru̯i*.

(iii.) In the 2nd century A.D., Lat. *v* (*i.e.* *u̯*) had become a voiced labio-dental fricative, like Eng. *v*; and the voiced labial plosive *b* had broken down (at least in certain positions) into the same sound; hence they are frequently confused as in spellings like *vene* for *bene*, *Bictorinus* for *Victorinus*.

25. (*a*) Latin *s*

(i.) became *r* between vowels between 450 and 350 B.C. (for the date see R. S. Conway, *Verner's Law in Italy*, pp. 61-64), as in *āra*, beside O. Lat. *āsa*, *generis* from **geneses*, Gr. γένεος; *eram*, *erō* for **esām*, **esō*, and so in the verbal endings -*erām*, -*erō*, -*erim*. But a considerable number of words came into Latin, partly from neighbouring dialects, with -*s*- between vowels, after 350 B.C., when the change ceased, and so show -*s*-, as *rosa* (probably from S. Oscan for **rodi̯a* "rose-bush" cf. Gr. ῥόδον), *cāseus*, "cheese," *miser*, a term of abuse, beside Gr. μυσαρός (probably also borrowed from south Italy), and many more, especially the participles in -*sus* (*fūsus*), where the -*s*- was -*ss*- at the time of the change of -*s*- to -*r*- (so in *causa*, see above). All attempts to explain the retention of the -*s*- otherwise must be said to have failed (*e.g.* the theory of accentual difference in *Verner's Law in Italy*, or that of dissimilation, given by Brugmann, *Kurze vergl. Gram.* p. 242).

(ii.) *sr* became *þr* (= Eng. *thr* in *throw*) in pro-ethnic Italic, and this became initially *fr*- as in *frīgus*, Gr. ῥῖγος (Ind.-Eur. **srīgos*), but medially -*br*-, as in *funebris*, from *funus*, stem *funes*-.

(iii.) -*rs*-, *ls*- became -*rr*-, -*ll*-, as in *ferre*, *velle*, for **fer-se*, **vel-se* (cf. *es-se*).

(iv.) Before *m*, *n*, *l*, and *v*, -*s*- vanished, having previously caused the loss of any preceding plosive or -*n*-, and the preceding vowel, if short, was lengthened as in

prīmus from **prismos*, Paelig. *prismu*, "prima," beside *pris-cus*.

iūmentum from O. Lat. *iouxmentum*, older **ieugsmentom*; cf. Gr. ζεῦγμα, ζύγον, Lat. *iugum*, *iungo*.

lūna from **leucsnā*-, Praenest, *losna*, Zend *raoχsna*-; cf. Gr. λεῦκος, "white-ness" neut. *e.g.* λευκός, "white," Lat. *lūceō*.

tēlum from **tēns-lom* or **tends-lom*, *trānāre* from **trāns-nāre*.

sēvirī from **sex-virī*, *ēvehō* from **ex-vehō*, and so *ē-mittō*, *ē-lūdō*, *ē-numerō*, and from these forms arose the proposition *ē* instead of *ex*.

(v.) Similarly -*sd*- became -*d*-, as in *īdem* from *is-dem*.

(vi.) Before *n*-, *m*-, *l*-, initially *s*- disappeared, as in *nūbo* beside Old Church Slavonic *snubiti*, "to love, pay court to"; *mīror* beside Sans. *smáyatē*, "laughs," Eng. *smi-le*; *lūbricus* beside Goth. *sliupan*, Eng. *slip*.

(*b*) Latin -*ss*- arose from an original -*t* + *t*-, -*d* +*t*-, -*dh* +*t*- (except before -*r*), as in *missus*, earlier **mit-tos*; *tōnsus*, earlier **tond-tos*, but *tonstrīx* from **tond-trīx*. After long vowels this -*ss*- became a single -*s*- some time before Cicero (who wrote *caussa* [see above], *divissio*, &c., but probably only pronounced them with -*s*-, since the -*ss*- came to be written single directly after his time).

26. Of the Indo-European velars the breathed *q* was usually preserved in Latin with a labial addition of -*u̯*- (as in *sequor*, Gr. ἕπομαι, Goth. *saihvan*, Eng. *see*; *quod*, Gr. ποδ-(απός), Eng. *what*); but the voiced gᵘ̯ remained (as -*gu*-) only after -*n*- (*unguo* beside Ir. *imb*, "butter") and (as *g*) before *r*, *l*, and *u* (as in *gravis*, Gr. βαρύς; *glans*, Gr. βάλανος; *legūmen*, Gr. λοβός, λεβινθος). Elsewhere it became *v*, as in *veniō* (see § 23, ii.), *nūdus* from **novedos*, Eng. *naked*. Hence *bōs* (Sans. *gāus*, Eng. *cow*) must be regarded as a farmer's word borrowed from one of the country dialects (*e.g.* Sabine); the pure Latin would be **vōs*, and its oblique cases, *e.g.* acc. **vovem*, would be inconveniently close in sound to the word for sheep *ovem*.

27. The treatment of the Indo-European voiced aspirates (*bh dh*, *ĝh*, *gh*) in Latin is one of the most marked characteristics of the language, which separates it from all the other Italic dialects, since the fricative sounds, which represented the Indo-European aspirates in pro-ethnic Italic, remained fricatives medially if they remained at all in that position in Oscan and Umbrian, whereas in Latin they were nearly always changed into voiced explosives. Thus—

Ind.-Eur. *bh*: initially Lat. *f*- (*ferō*; Gr. φέρω).
medially Lat. -*b*- (*tibi*; Umb. *tefe*; Sans. *tubhy*-(*am*), "to thee"; the same suffix in Gr. βίη-φι, &c.).

Ind.-Eur. *dh*: initially Lat. *f*- (*fa-c-ere*, *fē-c-ī*; Gr. θετός (instead of *θατός), ἔθη-κα).
medially -*d*- (*medius*; Osc. *mefio*-; Gr. μέσσος, μέσος from *μεθi̯ος); except after *u* (*iubēre* beside *iussus* for **i̯udh-tos*; Sans. *yódhati*, "rouses to battle"); before *l* (*stabulum*, but Umb. *staflo*-, with the suffix of Gr. στέργηθρον, &c.); before or after *r* (*verbum*: Umb. *verfale*: Eng. *word*. Lat. *glaber* [v. inf].: Ger. *glatt*: Eng. *glad*).

Ind.-Eur. *ĝh*: initially *h*- (*humī*: Gr. χαμαί); except before -*u*- (*fundo*: Gr. χέ(ϝ)ω, χύτρα).
medially -*h*- (*veho*: Gr. ἔχω, ὄχος; cf. Eng. *wagon*); except after -*n*- (*fingere*: Osc. *feiho*-, "wall": Gr. θιγγάνω: Ind.-Eur. *dheiĝh*-, *dhinĝh*-); and before *l* (*fīg*(*u*)*lus*, from the same root).

Ind.-Eur *gᵘ̯h*: initially *f*- (*formus* and *furnus*, "oven", Gr. θερμός, θέρμη, cf. Ligurian *Bormiō*, "a place with hot springs," *Bormanus*, "a god of hot springs"; *fendō*: Gr. θείνω, φόνος, πρόσ-φατος).
medially *v*, -*gu*- or -*g*- just as Ind.-Eur. gᵘ̯ (*ninguere*, *nivem* beside Gr. νίφα, νείφει; *frāgrāre* beside Gr. ὀσφραίνομαι [ὀσ- for *ods*-, cf. Lat. *odor*], a reduplicated verb from a root gᵘ̯*hrā*-).

For the "non-labializing velars" (*Hostis*, *conGius*, *Glaber*) reference must be made to the fuller accounts in the handbooks.

28. AUTHORITIES.—This summary account of the chief points in Latin phonology may serve as an introduction to its principles, and give some insight into the phonetic character of the language. For systematic study reference must be made to the standard books, Karl Brugmann, *Grundriss der vergleichenden Grammatik der Indo-Germanischen Sprachen* (vol. i., *Lautlehre*, 2nd ed. Strassburg, 1897; Eng. trans. of ed. 1 by Joseph Wright, Strassburg, 1888) and his *Kurze vergleichende Grammatik* (Strassburg, 1902); these contain still by far the best accounts of Latin; Max Niederman, *Précis de phonétique du Latin* (Paris, 1906), a very convenient handbook, excellently planned; F. Sommer, *Lateinische Laut- und Flexionslehre* (Heidelberg, 1902), containing many new conjectures; W. M. Lindsay, *The Latin Language* (Oxford, 1894), translated into German (with corrections) by Nohl (Leipzig, 1897), a most valuable collection of material, especially from the ancient grammarians, but not always accurate in phonology; F. Stolz, vol. i. of a joint *Historische Grammatik d. lat. Sprache* by Blase, Landgraf, Stolz and others (Leipzig, 1894); Neue-Wagener, *Formenlehre d. lat. Sprache* (3 vols., 3rd ed.

Leipzig, 1888, foll.); H. J. Roby's *Latin Grammar* (from Plautus to Suetonius; London, 7th ed., 1896) contains a masterly collection of material, especially in morphology, which is still of great value. W. G. Hale and C. D. Buck's *Latin Grammar* (Boston, 1903), though on a smaller scale, is of very great importance, as it contains the fruit of much independent research on the part of both authors; in the difficult questions of orthography it was, as late as 1907, the only safe guide.

II. MORPHOLOGY

In morphology the following are the most characteristic Latin innovations:—

29. *In nouns.*

(i.) The complete loss of the dual number, save for a survival in the dialect of Praeneste (*C.I.L.* xiv. 2891, = Conway, *Ital. Dial.* p. 285, where *Q. k. Cestio Q. f.* seems to be nom. dual); so *C.I.L.* xi. 6706_6, T. C. Vomanio, see W. Schulze, *Lat. Eigennamen*, p. 117.

(ii.) The introduction of new forms in the gen. sing. of the -*o*- stems (*dominī*), of the -*ā*- stems (*mēnsae*) and in the nom. plural of the same two declensions; innovations mostly derived from the pronominal declension.

(iii.) The development of an adverbial formation out of what was either an instrumental or a locative of the -*o*- stems, as in *longē*. And here may be added the other adverbial developments, in -*m* (*palam, sensim*) probably accusative, and -*iter*, which is simply the accusative of *iter*, "way," crystallized, as is shown especially by the fact that though in the end it attached itself particularly to adjectives of the third declension (*molliter*), it appears also from adjectives of the second declension whose meaning made their combination with *iter* especially natural, such as *longiter, firmiter, largiter* (cf. English *straightway, longways*). The only objections to this derivation which had any real weight (see F. Skutsch, *De nominibus no- suffixi ope formatis*, 1890, pp. 4-7) have been removed by Exon's Law (§ 11), which supplies a clear reason why the contracted type *constanter* arose in and was felt to be proper to Participial adverbs, while *firmiter* and the like set the type for those formed from adjectives.

(iv.) The development of the so-called fifth declension by a re-adjustment of the declension of the nouns formed with the suffix -*iē*-: *ia*- (which appears, for instance, in all the Greek feminine participles, and in a more abstract sense in words like *māteriēs*) to match the inflexion of two old root-nouns *rēs* and *diēs*, the stems of which were originally *rēį*- (Sans. *rās, rāyas*, cf. Lat. *reor*) and *diēu̯*-.

(v.) The disuse of the -*ti*- suffix in an abstract sense. The great number of nouns which Latin inherited formed with this suffix were either (1) marked as abstract by the addition of the further suffix -*ōn*- (as in *natio* beside the Gr. γνῆσι-ος, &c.) or else (2) confined to a concrete sense; thus *vectis*, properly "a carrying, lifting," came to mean "pole, lever"; *ratis*, properly a "reckoning, devising," came to mean "an (improvised) raft" (contrast *ratiō*); *postis*, a "placing," came to mean "post."

(vi.) The confusion of the consonantal stems with stems ending in -*ĭ*-. This was probably due very largely to the forms assumed through phonetic changes by the gen. sing. and the nom. and acc. plural. Thus at say 300 B.C. the inflexions probably were:

	conson. stem	-*ĭ*- stem
Nom. plur.	**rēg-ĕs*	*host-ēs*
Acc. plur.	*rēg-ēs*	*host-īs*

The confusing difference of signification of the long -*ēs* ending led to a levelling of these and other forms in the two paradigms.

(vii.) The disuse of the *u* declension (Gr. ἡδύς, στάχυς) in adjectives; this group in Latin, thanks to its feminine form (Sans. fem. *svādvī*, "sweet"), was transferred to the *i* declension (*suavis, gravis, levis, dulcis*).

30. *In verbs.*

(i.) The disuse of the distinction between the personal endings of primary and secondary tenses, the -*t* and -*nt*, for instance, being used for the third person singular and plural respectively in all tenses and moods of the active. This change was completed after the archaic period, since we find in the oldest inscriptions -*d* regularly used in the third person singular of past tenses, *e.g. deded, feced* in place of the later *dedit, fecit*; and since in Oscan the distinction was preserved to the end, both in singular and plural, *e.g. faamat* (perhaps meaning "auctionatur"), but *deded* ("dedit"). It is commonly assumed from the evidence of Greek and Sanskrit (Gr. ἔστι, Sans. *asti* beside Lat. *est*) that the primary endings in Latin have lost a final -*i*, partly or wholly by some phonetic change.

(ii.) The non-thematic conjugation is almost wholly lost, surviving only in a few forms of very common use, *est*, "is"; *ēst*, "eats"; *volt*, "wills," &c.

(iii.) The complete fusion of the aorist and perfect forms, and in the same tense the fusion of active and middle endings; thus *tutudī*, earlier **tutudai*, is a true middle perfect; *dīxī* is an *s* aorist with the same ending attached; *dīxit* is an aorist active; *tutudisti* is a conflation of perfect and aorist with a middle personal ending.

(iv.) The development of perfects in -*ui̯* and -*vī*, derived partly from true perfects of roots ending in *v* or *u*, *e.g. mōvī rui̯*. For the origin of *monuī* see Exon, *Hermathena* (1901), xi. 396 sq.

(v.) The complete fusion of conjunctive and optative into a single mood, the subjunctive; *regam*, &c., are conjunctive forms, whereas *rexerim, rexissem* are certainly and *regerem* most probably optative; the origin of *amem* and the like is still doubtful. Notice, however, that true conjunctive forms were often used as futures, *regēs, reget*, &c., and also the simple thematic conjunctive in forms like *erō, rexerō*, &c.

(vi.) The development of the future in -*bo* and imperfect in -*bam* by compounding some form of the verb, possibly the Present Participle with forms from the root of *fuī*, **amans-fuo* becoming *amabō*, **amans-fu̯ām* becoming *amābam* at a very early period of Latin; see F. Skutsch, *Atti d. Congresso Storico Intern.* (1903), vol. ii. p. 191.

(vii.) We have already noticed the rise of the passive in -*r* (§ 5 (d)). Observe, however, that several middle forms have been pressed into the service, partly because the -*r*- in them which had come from -*s*- seemed to give them a passive colour (*legere* = Gr. λέγε(σ)ο, Attic λέγου). The interesting forms in -*minī* are a confusion of two distinct inflexions, namely, an old infinitive in -*menai*, used for the imperative, and the participial -*menoi*, masculine, -*menai*, feminine, used with the verb "to be" in place of the ordinary inflexions. Since these forms had all come to have the same shape, through phonetic change, their meanings were fused; the imperative forms being restricted to the plural, and the participial forms being restricted to the second person.

31. *Past Participle Passive.*—Next should be mentioned the great development in the use of the participle in -*tos* (*factus, fusus*, &c.), This participle was taken with *sum* to form the perfect tenses of the passive, in which, thanks partly to the fusion of perfect and aorist active, a past aorist sense was also evolved. This reacted on the participle itself giving it a prevailingly past colour, but its originally timeless use survives in many places, *e.g.* in the participle *ratus*, which has as a rule no past sense, and more definitely still in such passages as Vergil, *Georg.* i. 206 (*vectis*), *Aen.* vi. 22 (*ductis*), both of which passages demand a present sense. It is to be noticed also that in the earliest Latin, as in Greek and Sanskrit, the *passive* meaning, though the commonest, is not universal. Many traces of this survive in classical Latin, of which the chief are

1. The active meaning of deponent participles, in spite of the fact that some of them (*e.g. adeptus, ēmēnsus, expertus*) have also a passive sense, and
2. The familiar use of these participles by the Augustan poets with an accusative attached (*galeam indutus, traiectus lora*). Here no doubt the use of the Greek middle influenced the Latin poets, but no doubt they thought also that they were reviving an old Latin idiom.

32. *Future Participle.*—Finally may be mentioned together (*a*) the development of the future participle active (in -*ūrus*, never so freely used as the other participles, being rare in the ablative absolute even in Tacitus) from an old infinitive in -*ūrum* ("scio inimicos meos hoc dicturum," C. Gracchus (and others) *apud* Gell. 1. 7, and Priscian ix. 864 (p. 475 Keil), which arose from combining the dative or locative of the verbal noun in -*tu* with an old infinitive *esom* "esse" which survives in Oscan, **dictu esom* becoming *dicturum*. This was discovered by J. P. Postgate (*Class. Review*, v. 301, and *Idg. Forschungen* iv. 252). (*b*) From the same infinitival accusative with the post-position -*dō*, meaning "to," "for," "in" (cf. *quandō* for **quam-do*, and Eng. *to*, Germ. *zu*) was formed the so-called gerund *agen-dō*, "for doing," "in doing," which was taken for a Case, and so gave rise to the accusative and genitive in -*dum* and -*dī*. The form in -*dō* still lives in Italian as an indeclinable present participle. The modal and purposive meanings of -*dō* appear in the uses of the gerund.

The authorities giving a fuller account of Latin morphology are the same as those cited in § 28 above, save that the reader must consult the second volume of Brugmann's *Grundriss*, which in the English translation (by Conway and Rouse, Strassburg, 1890–1896) is divided into volumes ii, iii. and iv.; and that Niedermann does not deal with morphology.

III. SYNTAX

The chief innovations of syntax developed in Latin may now be briefly noted.

33. *In nouns.*

(i.) Latin restricted the various Cases to more sharply defined uses than either Greek or Sanskrit; the free use of the internal accusative in Greek (*e.g.* ἁβρὸν βαίνειν, τυφλὸς τὰ ὦτα) is strange to Latin, save in poetical imitations of Greek; and so is the freedom of the Sanskrit instrumental, which often covers meanings expressed in Latin by *cum, ab, inter.*

(ii.) The syncretism of the so-called ablative case, which combines the uses of (*a*) the true ablative which ended in -*d* (O. Lat. *praidād*); (*b*) the instrumental sociative (plural forms like *dominīs*, the ending being that of Sans. *çivāiş*); and (*c*) the locative (*noct-e*, "at night"; *itiner-e*, "on the road," with the ending of Greek ἐλπίδ-ι). The so-called absolute construction is mainly derived from the second of these, since it is regularly attached fairly closely to the subject of the clause in which it stands, and when accompanied by a passive participle most commonly denotes an action performed by that subject. But the other two sources cannot be altogether excluded (*orto sole*, "starting from sunrise"; *campo patente*, "on, in sight of, the open plain").

34. *In verbs.*

(i.) The rich development and fine discrimination of the uses of the subjunctive mood, especially (*a*) in indirect questions (based on direct deliberative questions and not fully developed by the time of Plautus, who constantly writes such phrases as *dic quis es* for the Ciceronian *dic quis sis*); (*b*) after the relative of essential definition (*non is sum qui negem*) and the circumstantial *cum* (" at such a time as that "). The two uses (*a*) and (*b*) with (*c*) the common Purpose and Consequence-clauses spring from the " prospective " or " anticipatory " meaning of the mood. (*d*) Observe further its use in subordinate oblique clauses (*irascitur quod abierim*, " he is angry because, *as he asserts*, I went away "). This and all the uses of the mood in oratio obliqua are derived partly from (*a*) and (*b*) and partly from the (*e*) Unreal Jussive of past time (*Non illi argentum redderem? Non redderes*, " Ought I not to have returned the money to him?" " You certainly ought not to have," or, more literally, " You were not to ").

On this interesting chapter of Latin syntax see W.G.Hale's " Cum-constructions " (*Cornell University Studies in Classical Philology*, No. 1, 1887–1889), and *The Anticipatory Subjunctive* (Chicago, 1894).

(ii.) The complex system of oratio obliqua with the sequence of tenses (on the growth of the latter see Conway, *Livy II.*, Appendix ii., Cambridge, 1901).

(iii.) The curious construction of the gerundive (*ad capiendam urbem*), originally a present (and future?) passive participle, but restricted in its use by being linked with the so-called gerund (see § 32,*b*). The use, but probably not the restriction, appears in Oscan and Umbrian.

(iv.) The favourite use of the impersonal passive has already been mentioned (§ 5, iv.).

35. The chief authorities for the study of Latin syntax are: Brugmann's *Kurze vergl. Grammatik*, vol. ii. (see § 28); Landgraf's *Historische lat. Syntax* (vol. ii. of the joint *Hist. Gram.*, see § 28); Hale and Buck's *Latin Grammar* (see § 28); Draeger's *Historische lat. Syntax*, 2 vols. (2nd ed., Leipzig, 1878–1881), useful but not always trustworthy; the Latin sections in Delbrück's *Vergleichende Syntax*, being the third volume of Brugmann's *Grundriss* (§ 28).

IV. Importation of Greek Words

36. It is convenient, before proceeding to describe the development of the language in its various epochs, to notice briefly the debt of its vocabulary to Greek, since it affords an indication of the steadily increasing influence of Greek life and literature upon the growth of the younger idiom. Corssen (*Lat. Aussprache*, ii. 814) pointed out four different stages in the process, and though they are by no means sharply divided in time, they do correspond to different degrees and kinds of intercourse.

(*a*) The first represents the period of the early intercourse of Rome with the Greek states, especially with the colonies in the south of Italy and Sicily. To this stage belong many names of nations, countries and towns, as *Siculi*, *Tarentum*, *Graeci*, *Achivi*, *Poenus*; and also names of weights and measures, articles of industry and terms connected with navigation, as *mina*, *talentum*, *purpura*, *patina*, *ancora*, *aplustre*, *nausea*. Words like *amurca*, *scutula*, *pessulus*, *balineum*, *tarpessita* represent familiarity with Greek customs and bear equally the mark of naturalization. To these may be added names of gods or heroes, like *Apollo*, *Pollux* and perhaps *Hercules*. These all became naturalized Latin words and were modified by the phonetic changes which took place in the Latin language after they had come into it (cf. §§ 9-27 *supra*). (*b*) The second stage was probably the result of the closer intercourse resulting from the conquest of southern Italy, and the wars in Sicily, and of the contemporary introduction of imitations of Greek literature into Rome, with its numerous references to Greek life and culture. It is marked by the free use of hybrid forms, whether made by the addition of Latin suffixes to Greek stems as *ballistārius*, *hēpatārius*, *subbasilicānus*, *sȳcophantiōsus*, *cōmissārī* or of Greek suffixes to Latin stems as *plāgipatidas*, *pernōnides*; or by derivation, as *thermopōtāre*, *supparasītāri*; or by composition as *ineuschēmē*, *thyrsigerae*, *flagritribae*, *scrophipascī*. The character of many of these words shows that the comic poets who coined them must have been able to calculate upon a fair knowledge of colloquial Greek on the part of a considerable portion of their audience. The most remarkable instance of this is supplied by the burlesque lines in Plautus (*Pers.* 702 seq.), where Sagaristio describes himself as

> Vaniloquidorus, Virginisvendonides,
> Nugipiloquides, Argentumexterebronides,
> Tedigniloquides, Nummosexpalponides,
> Quodsemelarripides, Nunquameripides.

During this period Greek words are still generally inflected according to the Latin usage.

(*c*) But with Accius (see below) begins a third stage, in which the Greek inflexion is frequently preserved, *e.g. Hectora*, *Oresten*, *Cithaeron*; and from this time forward the practice wavers. Cicero generally prefers the Latin case-endings, defending, *e.g.*, *Piraeeum* as against *Piraeea* (*ad Att.* vii. 3, 7), but not without some fluctuation, while Varro takes the opposite side, and prefers *poëmasin* to the Ciceronian *poëmatis*. By this time also *y* and *z* were introduced, and the representation of the Greek aspirates by *th*, *ph*, *ch*, so that words newly borrowed from the Greek could be more faithfully reproduced. This is equally true whatever was the precise nature of the sound which at that period the Greek aspirates had reached in their secular process of change from pure aspirates (as in Eng. *ant-hill*, &c.) to fricatives (like Eng. *th* in *thin*). (See Arnold and Conway, *The Restored Pronunciation of Greek and Latin*, 4th ed., Cambridge, 1908, p. 21.)

(*d*) A fourth stage is marked by the practice of the Augustan poets, who, especially when writing in imitation of Greek originals, freely use the Greek inflexions, such as *Arcadĕs*, *Tethȳ*, *Aegida*, *Echūs*, &c. Horace probably always used the Latin form in his *Satires* and *Epistles*, the Greek in his Odes. Later prose writers for the most part followed the example of his *Odes*. It must be added, however, in regard to these literary borrowings that it is not quite clear whether in this fourth class, and even in the unmodified forms in the preceding class, the words had really any living use in spoken Latin.

V. Pronunciation

This appears the proper place for a rapid survey of the pronunciation[1] of the Latin language, as spoken in its best days.

37. Consonants.—(i.) *Back palatal.* Breathed plosive *c*, pronounced always as *k* (except that in some early inscriptions—probably none much later, if at all later, than 300 B.C.—the character is used also for *g*) until about the 7th century after Christ. *K* went out of use at an early period, except in a few old abbreviations for words in which it had stood before *a*, *e.g.*, *kal.* for *kalendae*. *Q*, always followed by the consonantal *u*, except in a few old inscriptions, in which it is used for *c* before the vowel *u*, *e.g. pequnia*. *X*, an abbreviation for *cs*; *xs* is, however, sometimes found. Voiced plosive *g*, pronounced as in English *gone*, but never as in English *gem* before about the 6th century after Christ. Aspirate *h*, the rough breathing as in English.

(ii.) *Palatal.*—The consonantal *i*, like the English *y*; it is only in late inscriptions that we find, in spellings like *Zanuario*, *Giove*, any definite indication of a pronunciation like the English *j*. The precise date of the change is difficult to determine (see Lindsay's *Latin Lang.* p. 49), especially as we may, in isolated cases, have before us merely a dialectic variation; see Paeligni.

(iii.) *Lingual.*—*r* as in English, but probably produced more with the point of the tongue. *l* similarly more dental than in English. *s* always breathed (as Eng. *cĕ* in *ice*). *z*, which is only found in the transcription of Greek words in and after the time of Cicero, as *dz* or *zz*.

(iv.) *Dental.*—Breathed, *t* as in English. Voiced, *d* as in English; but by the end of the 4th century *di* before a vowel was pronounced like our *j* (cf. *diurnal* and *journal*). Nasal, *n* as in English; but also (like the English *n*) a guttural nasal (*ng*) before a guttural. Apparently it was very lightly pronounced, and easily fell away before *s*.

(v.) *Labial.*—Breathed, *p* as in English. Voiced, *b* as in English; but occasionally in inscriptions of the later empire *v* is written for *b*, showing that in some cases *b* had already acquired the fricative sound of the contemporary *β* (see § 24, iii.). *b* before a sharp *s* was pronounced *p*, *e.g.* in *urbs*. Nasal, *m* as in English, but very slightly pronounced at the end of a word. Spirant, *v* like the *ou* in French *oui*, but later approximating to the *w* heard in some parts of Germany, Ed. Sievers, *Grundzüge d. Phonetik*, ed. 4, p. 117, *i.e.* a labial *v*, not (like the English *v*) a labio-dental *v*.

(vi.) *Labio-dental.*—Breathed fricative, *f* as in English.

38. Vowels.—*ā*, *ū*, *ī*, as the English *ah*, *oo*, *ee*; *ō*, a sound coming nearer to Eng. *aw* than to Eng. *ō*; *ē* a close Italian *ē*, nearly as the *a* of Eng. *mate*, *ée* of Fr. *passée*. The short sound of the vowels was not always identical in quality with the long sound. *ă* was pronounced as in the French *chatte*, *ŭ* nearly as in Eng. *pull*, *ĭ* nearly as in *pit*, *ŏ* as in *dot*, *ĕ* nearly as in *pet*. The diphthongs were produced by pronouncing in rapid succession the vowels of which they were composed, according to the above scheme. This gives, *au* somewhat broader than *ou* in *house*; *eu* like *ow* in the " Yankee " pronunciation of *town*; *ae* like the vowel in *hat* lengthened, with perhaps somewhat more approximation to the *i* in *wine*; *oe*, a diphthongal sound approximating to Eng. *oi*; *ui*, as the French *oui*.

To this it should be added that the Classical Association, acting on the advice of a committee of Latin scholars, has recommended for the diphthongs *ae* and *oe* the pronunciation of English *i* (really *ai*) in *wine* and *oi* in *boil*, sounds which they undoubtedly had in the time of Plautus and probably much later, and which for practical use in teaching have been proved far the best.

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[1] The grounds for this pronunciation will be found best stated in Postgate, *How to pronounce Latin* (1907), Arnold and Conway, *The Restored Pronunciation of Greek and Latin* (4th ed., Cambridge, 1908); and in the grammars enumerated in § 28 above, especially the preface to vol. i. of Roby's *Grammar*. The chief points about *c* may be briefly given as a specimen of the kind of evidence. (1) In some words the letter following *c* varies in a manner which makes it impossible to believe that the pronunciation of the *c* depended upon this, *e.g. decumus* and *decimus*, *dīc* from Plaut. *dīce*; (2) if *c* was pronounced before *e* and *i* otherwise than before *a*, *o* and *u*, it is hard to see why *k* should not have been retained for the latter use; (3) no ancient writer gives any hint of a varying pronunciation of *c*; (4) a Greek *κ* is always transliterated by *c*, and *c* by *κ*; (5) Latin words containing *c* borrowed by Gothic and early High German are always spelt with *k*; (6) the varying pronunciations of *ce*, *ci* in the Romance languages are inexplicable except as derived independently from an original *ke*, *ki*.

VI. The Language as recorded

39. Passing now to a survey of the condition of the language at various epochs and in the different authors, we find the earliest monument of it yet discovered in a donative inscription on a fibula or brooch found in a tomb of the 7th century B.C. at Praeneste. It runs "Manios med fhefhaked Numasioi," *i.e.* "Manios made me for Numasios." The use of *f* (*fh*) to denote the sound of Latin *f* supplied the explanation of the change of the symbol *f* from its Greek value (=Eng. *w*) to its Latin value *f*, and shows the Chalcidian Greek alphabet in process of adaptation to the needs of Latin (see Writing). The reduplicated perfect, its 3rd sing. ending *-ed*, the dative masculine in *-oi* (this is one of the only two recorded examples in Latin), the *-s-* between vowels (§ 25, 1), and the *-a-* in what was then (see §§ 9, 10) certainly an unaccented syllable and the accusative *med*, are all interesting marks of antiquity.[1]

40. The next oldest fragment of continuous Latin is furnished by a vessel dug up in the valley between the Quirinal and the Viminal early in 1880. The vessel is of a dark brown clay, and consists of three small round pots, the sides of which are connected together. All round this vessel runs an inscription, in three clauses, two nearly continuous, the third written below; the writing is from right to left, and is still clearly legible; the characters include one sign not belonging to the later Latin alphabet, namely ꟼ for R, while the M has five strokes and the Q has the form of a Koppa.

The inscription is as follows:—

"iovesat deivos qoi med mitat, nei ted endo cosmis virco sied, asted noisi opetoitesiai pacari vois.
dvenos med feced en manom einom duenoi ne med malo statod."

The general style of the writing and the phonetic peculiarities make it fairly certain that this work must have been produced not later than 300 B.C. Some points in its interpretation are still open to doubt,[2] but the probable interpretation is—

"Deos iurat ille (*or* iurant illi) qui me mittat (*or* mittant) ne in te Virgo (*i.e.* Proserpina) comis sit, nisi quidem optimo (?) Theseae (?) pacari vis. Duenos me fecit contra Manum, Dueno autem ne per me malum stato (=imputetur, imponatur)."

"He (or they) who dispatch me binds the gods (by his offering) that Proserpine shall not be kind to thee unless thou wilt make terms with (or "for") Opetos Thesias (?). Duenos made me against Manus, but let no evil fall to Duenos on my account."

41. Between these two inscriptions lies in point of date the famous stele discovered in the Forum in 1899 (G. Boni, *Notiz. d. scavi*, May 1899). The upper half had been cut off in order to make way for a new pavement or black stone blocks (known to archaeologists as the *niger lapis*) on the site of the comitium, just to the north-east of the Forum in front of the Senate House. The inscription was written lengthwise along the (pyramidal) stele from foot to apex, but with the alternate lines in reverse directions, and one line not on the full face of any one of the four sides, but up a roughly-flattened fifth side made by slightly broadening one of the angles. No single sentence is complete and the mutilated fragments have given rise to a whole literature of conjectural "restorations."

R. S. Conway examined it *in situ* in company with F. Skutsch in 1903 (cf. his article in Vollmöller's *Jahresbericht*, vi. 453), and the only words that can be regarded as reasonably certain are *regei* (*regi*) on face 2, *kalatorem* and *iouxmenta* on face 3, and *iouestod* (*iusto*) on face 4.[3] The date may be said to be fixed by the variation of the sign for *m* between ⊢⊣ and ꟿ (with ɑ for *r*) and other alphabetic indications which suggest the 5th century B.C. It has been suggested also that the reason for the destruction of the stele and the repavement may have been either (1) the pollution of the comitium by the Gallic invasion of 390 B.C., all traces of which, on their departure, could be best removed by a repaving; or (2) perhaps more probably, the Augustan restorations (Studniczka, *Jahresheft d. Österr. Institut*, 1903, vi. 129 ff.). (R. S. C.)

42. Of the earlier long inscriptions the most important would be the *Columna Rostrata*, or column of Gaius Duilius (*q.v.*), erected to commemorate his victory over the Carthaginians in 260 B.C., but for the extent to which it has suffered from the hands of restorers. The shape of the letters plainly shows that the inscription, as we have it, was cut in the time of the empire. Hence Ritschl and Mommsen pointed out that the language was modified at the same time, and that, although many archaisms have been retained, some were falsely introduced, and others replaced by more modern forms The most noteworthy features in it are—C always written for G (Ceset=*gessit*), single for double consonants (*clases-classes*), *d* retained in the ablative (*e.g.*, *in altod marid*), *o* for *u* in inflexions (*primos*, *exfociont*=*exfugiunt*), *e* for *i* (*navebos*=*navibus*, *exemet*=*exemit*); of these the first is probably an affected archaism, G having been introduced some time before the assumed date of the inscription. On the other hand, we have *praeda* where we should have expected *praida*; no final consonants are dropped; and the forms *-es*, *-eis* and *-is* for the accusative plural are interchanged capriciously. The doubts hence arising preclude the possibility of using it with confidence as evidence for the state of the language in the 3rd century B.C.

43. Of unquestionable genuineness and the greatest value are the *Scipionum Elogia*, inscribed on stone coffins, found in the monument of the Scipios outside the Capene gate (*C.I.L.*[1] i. 32). The earliest of the family whose epitaph has been preserved is L. Cornelius Scipio Barbatus (consul 298 B.C.), the latest C. Cornelius Scipio Hispanus (praetor in 139 B.C.); but there are good reasons for believing with Ritschl that the epitaph of the first was not contemporary, but was somewhat later than that of his son (consul 259 B.C.). This last may therefore be taken as the earliest specimen of any length of Latin and it was written at Rome; it runs as follows:—

honcoino . ploirume . cosentiont . r[*omai*]
duonoro . optumo . fuise . uiro [*virorum*]
luciom . scipione . filios . barbati
co]nsol . censor . aidilis . hic . fuet a [*pud vos*]
he]c . cepit . corsica . aleriaque . urbe[*m*]
de]det . tempestatebus. aide . mereto[*d votam*].

The archaisms in this inscription are—(1) the retention of *o* for *u* in the inflexion of both nouns and verbs; (2) the diphthongs *oi* (=later *u*) and *ai* (=later *ae*); (3) *-et* for *-it*, *hec* for *hic*, and *-ebus* for *-ibus*; (4) *duon-* for *bon*; and (5) the dropping of a final *m* in every case except in *Luciom*, a variation which is a marked characteristic of the language of this period.

44. The oldest specimen of the Latin language preserved to us in any literary source is to be found in two fragments of the Carmina Saliaria (Varro, *De ling. Lat.* vii. 26, 27), and one in Terentianus Scaurus, but they are unfortunately so corrupt as to give us little real information (see B. Maurenbrecher, *Carminum Saliarium reliquiae*, Leipzig, 1894; G. Hempl, *American Philol. Assoc. Transactions*, xxxi., 1900, 184). Rather better evidence is supplied in the *Carmen Fratrum Arvalium*, which was found in 1778 engraved on one of the numerous tablets recording the transactions of the college of the Arval brothers, dug up on the site of their grove by the Tiber, 5 m. from the city of Rome; but this also has been so corrupted in its oral tradition that even its general meaning is by no means clear (*C.I.L.*[1] i. 28; Jordan, *Krit. Beiträge*, pp. 203-211).

45. The text of the Twelve Tables (451–450 B.C.), if preserved in its integrity, would have been invaluable as a record of antique Latin; but it is known to us only in quotations. R. Schoell, whose edition and commentary (Leipzig, 1866) is the most complete, notes the following traces, among others, of an archaic syntax: (1) both the subject and the object of the verb are often left to be understood from the context, *e.g. ni it antestamino, igitur, em capito*; (2) the imperative is used even for permissions, "si volet, plus dato," "if he choose, he may give him more"; (3) the subjunctive is apparently never used in conditional,

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[1] The inscription was first published by Helbig and Dümmler in *Mittheilungen des deutschen archäol. Inst. Rom.* ii. 40; since in *C.I.L.* xiv. 4123 and Conway, *Italic Dial.* 280, where other references will be found.

[2] This inscription was first published by Dressel, *Annali dell' Inst. Archeol. Romano* (1880), p. 158, and since then by a multitude of commentators. The view of the inscription as a curse, translating a Greek cursing-formula, which has been generally adopted, was first put forward by R. S. Conway in the *American Journal of Philology*, x. (1889), 453; see further his commentary *Italic Dialects*, p. 329, and since then G. Hempl, *Trans. Amer. Philol. Assoc.* xxxiii. (1902), 150, whose interpretation of *iouesat*=*iurat* and *Opetoi Tesiai* has been here adopted, and who gives other references.

[3] The most important writings upon it are those of Domenico Comparetti, *Iscriz. arcaica del Foro Romano* (Florence-Rome, 1900); Hülsen, *Berl. philolog. Wochenschrift* (1899), No. 40; and Thurneysen, *Rheinisches Museum* (Neue Folge), iii. 2. Prof. G. Tropea gives a *Cronaca della discussione* in a series of very useful articles in the *Rivista di storia antica* (Messina, 1900 and 1901). Skutsch's article already cited puts the trustworthy results in an exceedingly brief compass.

only in final sentences, but the future perfect is common; (4) the connexion between sentences is of the simplest kind, and conjunctions are rare. There are, of course, numerous isolated archaisms of form and meaning, such as *calvitur*, *pacunt*, *endo*, *escit*. Later and less elaborate editions are contained in *Fontes Iuris Romani*, by Bruns-Mommsen-Gradenwitz (1892); and P. Girard, *Textes de droit romain* (1895).

46. Turning now to the language of literature we may group the Latin authors as follows:—[1]

I. *Ante-Classical* (240–80 B.C.).—Naevius (? 269–204), Plautus (254–184), Ennius (239–169), Cato the Elder (234–149), Terentius (? 195–159), Pacuvius (220–132), Accius (170–94), Lucilius (? 168–103).

II. *Classical—Golden Age* (80 B.C.–A.D. 14).—Varro (116–28), Cicero (106–44), Lucretius (99–55), Caesar (102–44), Catullus (87–? 47), Sallust (86–34), Virgil (70–19), Horace (65–8), Propertius (? 50– ?), Tibullus (? 54–? 18), Ovid (43 B.C.–A.D. 18), Livy (59 B.C.–A.D. 18).

III. *Classical—Silver Age* (A.D. 14–180).—Velleius (? 19 B.C.–? A.D. 31), M. Seneca (d. *c.* A.D. 30), Persius (34–62), Petronius (d. 66), Lucan (39–65), L. Seneca (d. A.D. 65), Plinius major (23–A.D. 79), Martial (40–101), Quintilian (42–118), Pliny the Younger (61–? 113), Tacitus (? 60–? 118), Juvenal (? 47–? 138), Suetonius (75–160), Fronto (*c.* 90–170).

47. *Naevius and Plautus.*—In Naevius we find archaisms proportionally much more numerous than in Plautus, especially in the retention of the original length of vowels, and early forms of inflexion, such as the genitive in *-as* and the ablative in *-d*. The number of archaic words preserved is perhaps due to the fact that so large a proportion of his fragments have been preserved only by the grammarians, who cited them for the express purpose of explaining these.

Of the language of Plautus important features have already been mentioned (§§ 10–16); for its more general characteristics see PLAUTUS.

48. *Ennius.*—The language of Ennius deserves especial study because of the immense influence which he exerted in fixing the literary style. He first established the rule that in hexameter verse all vowels followed by two consonants (except in the case of a mute and a liquid), or a double consonant, must be treated as lengthened by position. The number of varying quantities is also much diminished, and the elision of final *-m* becomes the rule, though not without exceptions. On the other hand he very commonly retains the original length of verbal terminations (*essēt*, *faciēt*) and of nominatives in *or* and *a*, and elides final *s* before an initial consonant. In declension he never uses *-ae* as the genitive, but *-ai* or *-as*; the older and shorter form of the gen. plur. is *-um* in common; obsolete forms of pronouns are used, as *mis*, *olli*, *sum* (=eum), *sas*, *sos*, *sapsa*; and in verbal inflexion there are old forms like *morīmur* (§ 15), *fūimus* (§ 17, vi.), *potestur* (cf. § 5, iv.). Some experiments in the way of tmesis (*saxo* cere *comminuit*-brum) and apocope (*divum domus altisonum* cael, *replet te laetificum* gau) were happily regarded as failures, and never came into real use. His syntax is simple and straightforward, with the occasional pleonasms of a rude style, and conjunctions are comparatively rare. From this time forward the literary language of Rome parted company with the popular dialect. Even to the classical writers Latin was in a certain sense a dead language. Its vocabulary was not identical with that of ordinary life. Now and again a writer would lend new vigour to his style by phrases and constructions drawn from homely speech. But on the whole, and in ever-increasing measure, the language of literature was the language of the schools, adapted to foreign models. The genuine current of Italian speech is almost lost to view with Plautus and Terence, and reappears clearly only in the semi-barbarous products of the early Romance literature.

49. *Pacuvius, Accius and Lucilius.*—Pacuvius is noteworthy especially for his attempt to introduce a free use of compounds after the fashion of the Greek, which were felt in the classical times to be unsuited to the genius of the Latin language, Quintilian censures severely his line—

> Nerei repandirostrum incurvicervicum pecus.

Accius, though probably the greatest of the Roman tragedians, is only preserved in comparatively unimportant fragments. We know that he paid much attention to grammar and orthography; and his language is much more finished than that of Ennius. It shows no marked archaisms of form, unless the infinitive in *-ier* is to be accounted as such.

Lucilius furnishes a specimen of the language of the period, free from the restraints of tragic diction and the imitation of Greek originals. Unfortunately the greater part of his fragments are preserved only by a grammarian whose text is exceptionally corrupt; but they leave no doubt as to the justice of the criticism passed by Horace on his careless and "muddy" diction. The *urbanitas* which is with one accord conceded to him by ancient critics seems to indicate that his style was free from the taint of provincial Latinity, and it may be regarded as reproducing the language of educated circles in ordinary life; the numerous Graecisms and Greek quotations with which it abounds show the familiarity of his readers with the Greek language and literature. Varro ascribes to him the *gracile genus dicendi*, the distinguishing features of which were *venustas* and *subtilitas*. Hence it appears that his numerous archaisms were regarded as in no way inconsistent with grace and precision of diction. But it may be remembered that Varro was himself something of an archaizer, and also that the grammarians' quotations may bring this aspect too much into prominence. Lucilius shares with the comic poets the use of many plebeian expressions, the love for diminutives, abstract terms and words of abuse; but occasionally he borrows from the more elevated style of Ennius forms like *simitu* (=simul), *noenu* (=non), *facul* (=facile), and the genitive in *-āī*, and he ridicules the contemporary tragedians for their *zetematia*, their high-flown diction and *sesquipedalia verba*, which make the characters talk "not like men but like portents, flying winged snakes." In his ninth book he discusses questions of grammar, and gives some interesting facts as to the tendencies of the language. For instance, when he ridicules a *praetor urbanus* for calling himself *pretor*, we see already the intrusion of the rustic degradation of *ae* into *e*, which afterwards became universal. He shows a great command of technical language, and (partly owing to the nature of the fragments) ἅπαξ λεγόμενα are very numerous.

50. *Cato.*—The treatise of Cato the elder, *De re rustica*, would have afforded invaluable material, but it has unfortunately come down to us in a text greatly modernized, which is more of interest from the point of view of literature than of language. We find in it, however, instances of the accusative with *uti*, of the old imperative *praefamino* and of the fut. sub. *servassis*, *prohibessis* and such interesting subjunctive constructions as *dato bubus bibant omnibus*, "give all the oxen (water) to drink."

51. *Growth of Latin Prose.*—It is unfortunately impossible to trace the growth of Latin prose diction through its several stages with the same clearness as in the case of poetry. The fragments of the earlier Latin prose writers are too scanty for us to be able to say with certainty when and how a formed prose style was created. But the impulse to it was undoubtedly given in the habitual practice of oratory. The earliest orators, like Cato, were distinguished for strong common sense, biting wit and vigorous language, rather than for any graces of style; and probably personal *auctoritas* was of far more account than rhetoric both in the law courts and in the assemblies of the people. The first public speaker, according to Cicero, who aimed at a polished style and elaborate periods was M. Aemilius Lepidus Porcina, in the middle of the 2nd century B.C.[2] On his model the Gracchi and Carbo fashioned themselves, and, if we may judge from the fragments of the orations of C. Gracchus which are preserved, there were few traces of archaism remaining. A more perfect example of the *urbanitas* at which good speakers aimed was supplied by a famous speech of C. Fannius against C. Gracchus,

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[1] For further information see special articles on these authors, and LATIN LITERATURE.

[2] Cicero also refers to certain *scripta dulcissima* of the son of Scipio Africanus Maior, which must have possessed some merits of style.

which Cicero considered the best oration of the time. No small part of the *urbanitas* consisted in a correct urban pronunciation; and the standard of this was found in the language of the women of the upper classes, such as Laelia and Cornelia.

In the earliest continuous prose work which remains to us the four books *De Rhetorica ad Herennium*, we find the language already almost indistinguishable from that of Cicero. There has been much discussion as to the authorship of this work, now commonly, without very convincing reasons, ascribed to Q. Cornificius; but, among the numerous arguments which prove that it cannot have been the work of Cicero, none has been adduced of any importance drawn from the character of the language. It is worth while noticing that not only is the style in itself perfectly finished, but the treatment of the subject of style, *elocutio* (iv. 12. 17), shows the pains which had already been given to the question. The writer lays down three chief requisites—(1) *elegantia*, (2) *compositio* and (3) *dignitas*. Under the first come *Latinitas*, a due avoidance of solecisms and barbarisms, and *explanatio*, clearness, the employment of familiar and appropriate expressions. The second demands a proper arrangement; hiatus, alliteration, rhyme, the repetition or displacement of words, and too long sentences are all to be eschewed. Dignity depends upon the selection of language and of sentiments.

52. *Characteristics of Latin Prose.*—Hence we see that by the time of Cicero Latin prose was fully developed. We may, therefore, pause here to notice the characteristic qualities of the language at its most perfect stage. The Latin critics were themselves fully conscious of the broad distinction in character between their own language and the Greek. Seneca dwells upon the stately and dignified movement of the Latin period, and uses for Cicero the happy epithet of *gradarius*. He allows to the Greeks *gratia*, but claims *potentia* for his own countrymen. Quintilian (xii. 10. 27 seq.) concedes to Greek more euphony and variety both of vocalization and of accent; he admits that Latin words are harsher in sound, and often less happily adapted to the expression of varying shades of meaning. But he too claims "power" as the distinguishing mark of his own language. Feeble thought may be carried off by the exquisite harmony and subtleness of Greek diction; his countrymen must aim at fulness and weight of ideas if they are not to be beaten off the field. The Greek authors are like lightly moving skiffs; the Romans spread wider sails and are wafted by stronger breezes; hence the deeper waters suit them. It is not that the Latin language fails to respond to the calls made upon it. Lucretius and Cicero concur, it is true, in complaints of the poverty of their native language; but this was only because they had had no predecessors in the task of adapting it to philosophic utterance; and the long life of Latin technical terms like *qualitas*, *species*, *genus*, *ratio*, shows how well the need was met when it arose. H. A. J. Munro has said admirably of this very period:—

> "The living Latin for all the higher forms of composition, both prose and verse, was a far nobler language than the living Greek. During the long period of Grecian pre-eminence and literary glory, from Homer to Demosthenes, all the manifold forms of poetry and prose which were invented one after the other were brought to such exquisite perfection that their beauty of form and grace of language were never afterwards rivalled by Latin or any other people. But hardly had Demosthenes and Aristotle ceased to live when that Attic which had been gradually formed into such a noble instrument of thought in the hands of Aristophanes, Euripides, Plato and the orators, and had superseded for general use all the other dialects, became at the same time the language of the civilized world and was stricken with a mortal decay. . . . Epicurus, who was born in the same year as Menander, writes a harsh jargon that does not deserve to be called a style; and others of whose writings anything is left entire or in fragments, historians and philosophers alike, Polybius, Chrysippus, Philodemus, are little if any better. When Cicero deigns to translate any of their sentences, see what grace and life he instils into their clumsily expressed thoughts, how satisfying to the ear and taste are the periods of Livy when he is putting into Latin the heavy and uncouth clauses of Polybius! This may explain what Cicero means when at one time he gives to Greek the preference over Latin, at another to Latin over Greek; in reading Sophocles or Plato he could acknowledge their unrivalled excellence; in translating Panaetius or Philodemus he would feel his own immeasurable superiority."

The greater number of long syllables, combined with the paucity of diphthongs and the consequent monotony of vocalization, and the uniformity of the accent, lent a weight and dignity of movement to the language which well suited the national *gravitas.* The precision of grammatical rules and the entire absence of dialectic forms from the written literature contributed to maintain the character of unity which marked the Roman republic as compared with the multiplicity of Greek states. It was remarked by Francis Bacon that artistic and imaginative nations indulge freely in verbal compounds, practical nations in simple concrete terms. In this respect, too, Latin contrasts with Greek. The attempts made by some of the earlier poets to indulge in novel compounds was felt to be out of harmony with the genius of the language. Composition, though necessarily employed, was kept within narrow limits, and the words thus produced have a sharply defined meaning, wholly unlike the poetical vagueness of some of the Greek compounds. The vocabulary of the language, though receiving accessions from time to time in accordance with practical needs, was rarely enriched by the products of a spontaneous creativeness. In literature the taste of the educated town circles gave the law; and these, trained in the study of the Greek masters of style, required something which should reproduce for them the harmony of the Greek period. Happily the orators who gave form to Latin prose were able to meet the demand without departing from the spirit of their own language.[1]

53. *Cicero and Caesar.*—To Cicero especially the Romans owed the realization of what was possible to their language in the way of artistic finish of style. He represents a protest at one and the same time against the inroads of the *plebeius sermo*, vulgarized by the constant influx of non-Italian provincials into Rome, and the "jargon of spurious and partial culture" in vogue among the Roman pupils of the Asiatic rhetoricians. His essential service was to have caught the tone and style of the true Roman *urbanitas*, and to have fixed it in extensive and widely read speeches and treatises as the final model of classical prose. The influence of Caesar was wholly in the same direction. His cardinal principle was that every new-fangled and affected expression, from whatever quarter it might come, should be avoided by the writer, as rocks by the mariner. His own style for straightforward simplicity and purity has never been surpassed; and it is not without full reason that Cicero and Caesar are regarded as the models of classical prose. But, while they fixed the type of the best Latin, they did not and could not alter its essential character. In subtlety, in suggestiveness, in many-sided grace and versatility, it remained far inferior to the Greek. But for dignity and force, for cadence and rhythm, for clearness and precision, the best Latin prose remains unrivalled.

It is needless to dwell upon the grammar or vocabulary of Cicero. His language is universally taken as the normal type of Latin; and, as hitherto the history of the language has been traced by marking differences from his usage, so the same method may be followed for what remains.

54. *Varro*, "the most learned of the ancients," a friend and contemporary of Cicero, seems to have rejected the periodic rhythmical style of Cicero, and to have fallen back upon a more archaic structure. Mommsen says of one passage "the clauses of the sentence are arranged on the thread of the relative like dead thrushes on a string." But, in spite (some would say, because) of his old-fashioned tendencies, his language shows great vigour and spirit. In his Menippean satires he intentionally made free use of plebeian expressions, while rising at times to a real grace and showing often fresh humour. His treatise *De Re Rustica*, in the form of a dialogue, is the most agreeable of his works, and where the nature of his subject allows it there is

[1] The study of the rhythm of the *Clausulae*, *i.e.* of the last dozen (or half-dozen) syllables of a period in different Latin authors, has been remarkably developed in the last three years, and is of the highest importance for the criticism of Latin prose. It is only possible to refer to Th. Zielinski's *Das Clauselgesetz in Cicero's Reden* (St. Petersburg, 1904), reviewed by A. C. Clark in *Classical Review*, 1905, p. 164, and to F. Skutsch's important comments in Vollmöller's *Jahresberichten über die Fortschritte der romanischen Philologie* (1905) and *Glotta* (i. 1908, esp. p. 413), also to A. C. Clark's *Fontes Prosae Numerosae* (Oxford, 1909), *The Cursus in Mediaeval and Vulgar Latin* (*ibid.* 1910), and article CICERO.

much vivacity and dramatic picturesqueness, although the precepts are necessarily given in a terse and abrupt form. His sentences are as a rule co-ordinated, with but few connecting links; his diction contains many antiquated or unique words.

55. *Sallust.*—In Sallust, a younger contemporary of Cicero, we have the earliest complete specimen of historical narrative. It is probably due to his subject-matter, at least in part, that his style is marked by frequent archaisms; but something must be ascribed to intentional imitation of the earlier chroniclers, which led him to be called *priscorum Catonisque verborum ineruditissimus fur*. His archaisms consist partly of words and phrases used in a sense for which we have only early authorities, *e.g. cum animo habere*, &c., *animos tollere*, *bene factum*, *consultor*, *prosapia*, *dolus*, *venenum*, *obsequela*, *inquies*, *sallere*, *occipere*, *collibeo*, and the like, where we may notice especially the fondness for frequentatives, which he shares with the early comedy; partly in inflections which were growing obsolete, such as *senati*, *solui*, *comperior* (dep.), *neglegisset*, *vis* (acc. pl.) *nequitur*. In syntax his constructions are for the most part those of the contemporary writers.

56. *Lucretius* is largely archaic in his style. We find *im* for *eum*, *endo* for *in*, *illae*, *ullae*, *unae* and *aliae* as genitives, *alid* for *aliud*, *rabies* as a genitive by the side of genitives in *-ai*, ablatives in *-i* like *colli*, *orbi*, *parti*, nominatives in *s* for *r*, like *colos*, *vapos*, *humos*. In verbs there are *scatit*, *fulgit*, *quaesit*, *confluxet*=*confluxisset*, *recesse*=*recessisse*, *induiacere* for *inicere*; simple forms like *fligere*, *lacere*, *cedere*, *stinguere* for the more usual compounds, the infinitive passive in *-ier*, and archaic forms from *esse* like *siet*, *escit*, *fuat*. Sometimes he indulges in tmesis which reminds us of Ennius: *inque pediri*, *disque supata*, *ordia prima*. But this archaic tinge is adopted only for poetical purposes, and as a proof of his devotion to the earlier masters of his art; it does not affect the general substance of his style, which is of the freshest and most vigorous stamp. But the purity of his idiom is not gained by any slavish adherence to a recognized vocabulary: he coins words freely; Munro has noted more than a hundred ἅπαξ λεγόμενα, or words which he alone among good writers uses. Many of these are formed on familiar models, such as compounds and frequentatives; others are directly borrowed from the Greek apparently with a view to sweetness of rhythm (ii. 412, v. 334, 505); others again (forty or more in number) are compounds of a kind which the classical language refused to adopt, such as *silvifragus*, *terriloquus*, *perterricrepus*. He represents not so much a stage in the history of the language as a protest against the tendencies fashionable in his own time. But his influence was deep upon Virgil, and through him upon all subsequent Latin literature.

57. *Catullus* gives us the type of the language of the cultivated circles, lifted into poetry by the simple directness with which it is used to express emotion. In his heroic and elegiac poems he did not escape the influence of the Alexandrian school, and his genius is ill suited for long-continued flights; but in his lyrical poems his language is altogether perfect. As Macaulay says: "No Latin writer is so Greek. The simplicity, the pathos, the perfect grace, which I find in the great Athenian models are all in Catullus, and in him alone of the Romans." The language of these poems comes nearest perhaps to that of Cicero's more intimate letters. It is full of colloquial idioms and familiar language, of the diminutives of affection or of playfulness. Greek words are rare, especially in the lyrics, and those which are employed are only such as had come to be current coin. Archaisms are but sparingly introduced; but for metrical reasons he has four instances of the inf. pass., in *-ier*, and several contracted forms; we find also *alis* and *alid*, *uni* (gen.), and the antiquated *tetuli* and *recepso*. There are traces of the popular language in the shortened imperatives *cavĕ* and *manĕ*, in the analytic perfect *paratam habes*, and in the use of *unus* approaching that of the indefinite article.

58. *Horace.*—The poets of the Augustan age mark the opening of a new chapter in the history of the Latin language. The influence of Horace was less than that of his friend and contemporary Virgil; for Horace worked in a field of his own, and, although Statius imitated his lyrics, and Persius and Juvenal, especially the former, his satires, on the whole there are few traces of any deep marks left by him on the language of later writers. In his *Satires* and *Epistles* the diction is that of the contemporary *urbanitas*, differing hardly at all from that of Cicero in his epistles and dialogues. The occasional archaisms, such as the syncope in *erepsemus*, *evasse*, *surrexe*, the infinitives in *-ier*, and the genitives *deum*, *divum*, may be explained as still conversationally allowable, though ceasing to be current in literature; and a similar explanation may account for plebeian terms, *e.g. balatro*, *blatero*, *giarrio*, *mutto*, *vappa*, *caldus*, *soldus*, *surpite*, for the numerous diminutives, and for such pronouns, adverbs, conjunctions and turns of expression as were common in prose, but not found, or found but rarely, in elevated poetry. Greek words are used sparingly, not with the licence which he censures in Lucilius, and in his hexameters are framed according to Latin rules. In the *Odes*, on the other hand, the language is much more precisely limited. There are practically no archaisms (*spargier* in Carm. iv. 11. 8 is a doubtful exception), or plebeian expressions; Greek inflections are employed, but not with the licence of Catullus; there are no datives in *ĭ* or *sĭn* like *Tethyĭ* or *Dryasin*; Greek constructions are fairly numerous, *e.g.* the genitive with verbs like *regnare*, *abstinere*, *desinere*, and with adjectives, as *integer vitae*, the so-called Greek accusative, the dative with verbs of contest, like *luctari*, *decertare*, the transitive use of many intransitive verbs in the past participle, as *regnatus*, *triumphatus*; and finally there is a "prolative" use of the infinitive after verbs and adjectives, where prose would have employed other constructions, which, though not limited to Horace, is more common with him than with other poets. Compounds are very sparingly employed, and apparently only when sanctioned by authority. His own innovations in vocabulary are not numerous. About eighty ἅπαξ λεγόμενα have been noted. Like Virgil, he shows his exquisite skill in the use of language rather in the selection from already existing stores, than in the creation of new resources: *tantum series iuncturaque pollet*. But both his diction and his syntax left much less marked traces upon succeeding writers than did those of either Virgil or Ovid.

59. *Virgil.*—In Virgil the Latin language reached its full maturity. What Cicero was to the period, Virgil was to the hexameter; indeed the changes that he wrought were still more marked, inasmuch as the language of verse admits of greater subtlety and finish than even the most artistic prose. For the straightforward idiomatic simplicity of Lucretius and Catullus he substituted a most exact and felicitous diction, rich with the suggestion of the most varied sources of inspiration. Sometimes it is a phrase of Homer's "conveyed" literally with happy boldness, sometimes it is a line of Ennius, or again some artistic Sophoclean combination. Virgil was equally familiar with the great Greek models of style and with the earlier Latin poets. This learning, guided by an unerring sense of fitness and harmony, enabled him to give to his diction a music which recalls at once the fullest tones of the Greek lyre and the lofty strains of the most genuinely national song. His love of antiquarianism in language has often been noticed, but it never passes into pedantry. His vocabulary and constructions are often such as would have conveyed to his contemporaries a grateful flavour of the past, but they would never have been unintelligible. Forms like *iusso*, *olle* or *admittier* can have delayed no one.

In the details of syntax it is difficult to notice any peculiarly Virgilian points, for the reason that his language, like that of Cicero, became the canon, departures from which were accounted irregularities. But we may notice as favourite constructions a free use of oblique cases in the place of the more definite construction with prepositions usual in prose, *e.g. it clamor caelo*, *flet noctem*, *rivis currentia vina*, *bacchatam iugis Naxon*, and many similar phrases; the employment of some substantives as adjectives, like *venator canis*, and vice versa, as *plurimus volitans*; a proleptic use of adjectives, as *tristia torquebit*; idioms involving *ille*, *atque*, *deinde*, *haud*, *quin*, *vix*, and the frequent occurrence of passive verbs in their earlier reflexive sense, as *induor*, *velor*, *pascor*.

60. *Livy.*—In the singularly varied and beautiful style of Livy we find Latin prose in rich maturity. To a training in the rhetorical schools, and perhaps professional experience as a teacher of rhetoric, he added a thorough familiarity with contemporary poetry and with the Greek language; and these attainments have all deeply coloured his language. It is probable that the variety of style naturally suggested by the wide range of his subject matter was increased by a half-unconscious adoption of the phrases and constructions of the different authorities whom he followed in different parts of his work; and the industry of German critics has gone far to demonstrate a conclusion likely enough in itself. Hence perhaps comes the fairly long list of archaisms, especially in formulae (cf. Kühnast, *Liv. Synt.* pp. 14-18). These are, however, purely isolated phenomena, which do not affect the general tone. It is different with the poetical constructions and Graecisms, which appear on every page. Of the latter we find numerous instances in the use of the cases, *e.g.* in genitives like *via praedae omissae*, *oppidum Antiochiae*, *aequum campi*; in datives like *quibusdam volentibus erat*; in accusatives like *iurare calumniam*, *certare multam*; an especially frequent use of transitive verbs absolutely; and the constant omission of the reflexive pronoun as the subject of an infinitive in reported speech. To the same source must be assigned the very frequent pregnant construction with prepositions, an attraction of relatives, and the great extension of the employment of relative adverbs of place instead of relative pronouns, *e.g. quo = in quem.* Among his poetical characteristics we may place the extensive list of words which are found for the first time in his works and in those of Virgil or Ovid, and perhaps his common use of concrete words for collective, *e.g. eques* for *equitatus*, of abstract terms such as *remigium*, *servitia*, *robora*, and of frequentative verbs, to say nothing of poetical phrases like *haec ubi dicta dedit*, *adversum montium*, &c. Indications of the extended use of the subjunctive, which he shares with contemporary writers, especially poets, are found in the construction of *ante quam*, *post quam* with this mood, even when there is no underlying notion of anticipation, of *donec*, and of *cum* meaning "whenever." On the other hand, *forsitan* and *quamvis*, as in the poets, are used with the indicative in forgetfulness of their original force. Among his individual peculiarities may be noticed the large number of verbal nouns in *-tus* (for which Cicero prefers forms in *-tio*) and in *-tor*, and the extensive use of the past passive participle to replace an abstract substantive, *e.g. ex dictatorio imperio concusso.* In the arrangement of words Livy is much more free than any previous prose writer, aiming, like the poets, at the most effective order. His periods are constructed with less regularity than those of Cicero, but they gain at least as much in variety and energy as they lose in uniformity of rhythm and artistic finish. His style cannot be more fitly described than in the language of Quintilian, who speaks of his *mira iucunditas* and *lactea ubertas*.

61. *Propertius.*—The language of Propertius is too distinctly his own to call for detailed examination here. It cannot be taken as a specimen of the great current of the Latin language; it is rather a tributary springing from a source apart, tinging to some slight extent the stream into which it pours itself, but soon ceasing to affect it in any perceptible fashion. "His obscurity, his indirectness and his incoherence" (to adopt the words of J. P. Postgate) were too much out of harmony with the Latin taste for him to be regarded as in any sense representative; sometimes he seems to be hardly writing Latin at all. Partly from his own strikingly independent genius, partly from his profound and not always judicious study of the Alexandrian writers, his poems abound in phrases and constructions which are without a parallel in Latin poetry. His archaisms and Graecisms, both in diction and in syntax, are very numerous; but frequently there is a freedom in the use of cases and prepositions which can only be due to bold and independent innovations. His style well deserves a careful study for its own sake (cf. J. P. Postgate's *Introduction*, pp. lvii.-cxxv.); but it is of comparatively little significance in the history of the language.

62. *Ovid.*—The brief and few poems of Tibullus supply only what is given much more fully in the works of Ovid. In these we have the language recognized as that best fitted for poetry by the fashionable circles in the later years of Augustus. The style of Ovid bears many traces of the imitation of Virgil, Horace and Propertius, but it is not less deeply affected by the rhetoric of the schools. His never-failing fertility of fancy and command of diction often lead him into a diffuseness which mars the effect of his best works; according to Quintilian it was only in his (lost) tragedy of *Medea* that he showed what real excellence he might have reached if he had chosen to control his natural powers. His influence on later poets was largely for evil; if he taught them smoothness of versification and polish of language, he also co-operated powerfully with the practice of recitation to lead them to aim at rhetorical point and striking turns of expression, instead of a firm grasp of a subject as a whole, and due subordination of the several parts to the general impression. Ovid's own influence on language was not great; he took the diction of poetry as he found it, formed by the labours of his predecessors; the conflict between the archaistic and the Graecizing schools was already settled in favour of the latter; and all that he did was to accept the generally accepted models as supplying the material in moulding which his luxuriant fancy could have free play. He has no deviations from classical syntax but those which were coming into fashion in his time (*e.g. forsitan* and *quamvis* with the indic., the dative of the agent with passive verbs, the ablative for the accusative of time, the infinitive after adjectives like *certus*, *aptus*, &c.), and but few peculiarities in his vocabulary. It is only in the letters from the Pontus that laxities of construction are detected, which show that the purity of his Latin was impaired by his residence away from Rome, and perhaps by increasing carelessness of composition.

63. *The Latin of Daily Life.*—While the leading writers of the Ciceronian and Augustan eras enable us to trace the gradual development of the Latin language to its utmost finish as an instrument of literary expression, there are some less important authors who supply valuable evidence of the character of the *sermo plebeius*. Among them may be placed the authors of the *Bellum Africanum* and the *Bellum Hispaniense* appended to Caesar's Commentaries. These are not only far inferior to the exquisite *urbanitas* of Caesar's own writings; they are much rougher in style even than the less polished *Bellum Alexandrinum* and *De Bello Gallico Liber VIII.*, which are now with justice ascribed to Hirtius. There is sufficient difference between the two to justify us in assuming two different authors; but both freely employ words and constructions which are at once antiquated and vulgar. The writer of the *Bellum Alexandrinum* uses a larger number of diminutives within his short treatise than Caesar in nearly ten times the space; *postquam* and *ubi* are used with the pluperfect subjunctive; there are numerous forms unknown to the best Latin, like *tristimonia*, *exporrigere*, *cruciabiliter* and *convulnero*; *potior* is followed by the accusative, a simple relative by the subjunctive. There is also a very common use of the pluperfect for the imperfect, which seems a mark of this *plebeius sermo* (Nipperdey, *Quaest. Caes.* pp. 13-30).

Another example of what we may call the Latin of business life is supplied by Vitruvius. Besides the obscurity of many of his technical expressions, there is a roughness and looseness in his language, far removed from a literary style; he shares the incorrect use of the pluperfect, and uses plebeian forms like *calefaciuntur*, *faciliter*, *expertiones* and such careless phrases as *rogavit Archimedem uti in se sumeret sibi de eo cogitationem.* At a somewhat later stage we have, not merely plebeian, but also provincial Latin represented in the *Satyricon* of Petronius. The narrative and the poems which are introduced into it are written in a style distinguished only by the ordinary peculiarities of silver Latinity; but in the numerous conversations the distinctions of language appropriate to the various speakers are accurately preserved; and we have in the talk of the slaves and provincials a perfect storehouse of words and constructions of the greatest linguistic value. Among the unclassical forms and constructions may be noticed masculines like *fatus*, *vinus*, *balneus*, *ferículus* and *lactem* (for *lac*), *striga* for *strix*, *gaudimonium* and *tristimonium*, *sanguen*, *manducare*, *nutricare*, *molestare*, *nesapius* (*sapius* = Fr. *sage*), *rostrum* (= *os*), *ipsimus* (= master), *scordalias*, *baro*, and numerous diminutives like *camella*, *audaculus*, *potiuncula*.

savunculum, *offla*, *peduclus*, *corcillum*, with constructions such as *maledicere* and *persuadere* with the accusative, and *adiutare* with the dative, and the deponent forms *pudeatur* and *ridetur*. Of especial interest for the Romance languages are *astrum* (*désastre*), *berbex* (*brébis*), *botellus* (*boyau*), *improperare*, *muttus*, *naufragare*.

Suetonius (*Aug.* c. 87) gives an interesting selection of plebeian words employed in conversation by Augustus, who for the rest was something of a purist in his written utterances: *ponit assidue et pro stulto baceolum, et pro pullo pulleiaceum, et pro cerrito vacerrosum, et vapide se habere pro male, et betizare pro languere, quod vulgo lachanizare dicitur.*

The inscriptions, especially those of Pompeii, supply abundant evidence of the corruptions both of forms and of pronunciation common among the vulgar. It is not easy always to determine whether a mutilated form is evidence of a letter omitted in pronunciation, or only in writing; but it is clear that the ordinary man habitually dropped final *m*, *s*, and *t*, omitted *n* before *s*, and pronounced *ĭ* like *ĕ*. There are already signs of the decay of *ae* to *e*, which later on became almost universal. The additions to our vocabulary are slight and unimportant (cf. *Corpus Inscr. Lat.* iv., with Zangemeister's *Indices*).

64. To turn to the language of literature. In the dark days of Tiberius and the two succeeding emperors a paralysis seemed to have come upon prose and poetry alike. With the one exception of oratory, literature had long been the utterance of a narrow circle, not the expression of the energies of national life; and now, while all free speech in the popular assemblies was silenced, the nobles were living under a suspicious despotism, which, whatever the advantage which it brought to the poorer classes and to the provincials, was to them a reign of terror. It is no wonder that the fifty years after the accession of Tiberius are a blank as regards all higher literature. Velleius Paterculus, Valerius Maximus, Celsus and Phaedrus give specimens of the Latin of the time, but the style of no one of these, classical for the most part in vocabulary, but occasionally approaching the later usages in syntax, calls for special analysis. The elder Seneca in his collection of *suasoriae* and *controversiae* supplies examples of the barren quibblings by which the young Romans were trained in the rhetorical schools. A course of instruction, which may have been of service when its end was efficiency in active public life, though even then not without its serious drawbacks, as is shown by Cicero in his treatise *De Oratore*, became seriously injurious when its object was merely idle display. Prose came to be overloaded with ornament, and borrowed too often the language, though not the genius, of poetry; while poetry in its turn, partly owing to the fashion of recitation, became a string of rhetorical points.

65. *Seneca, Persius and Lucan.*—In the writers of Nero's age there are already plain indications of the evil effects of the rhetorical schools upon language as well as literature. The leading man of letters was undoubtedly Seneca the younger, "the Ovid of prose"; and his style set the model which it became the fashion to imitate. But it could not commend itself to the judgment of sound critics like Quintilian, who held firmly to the great masters of an earlier time. He admits its brilliance, and the fertility of its pointed reflections, but charges the author justly with want of self-restraint, jerkiness, frequent repetitions and tawdry tricks of rhetoric. Seneca was the worst of models, and pleased by his very faults. In his tragedies the rhetorical elaboration of the style only serves to bring into prominence the frigidity and frequent bad taste of the matter. But his diction is on the whole fairly classical; he is, in the words of Muretus, *vetusti sermonis diligentior quam quidam inepte fastidiosi suspicantur*. In Persius there is a constant straining after rhetorical effect, which fills his verses with harsh and obscure expressions. The careful choice of diction by which his master Horace makes every word tell is exaggerated into an endeavour to gain force and freshness by the most contorted phrases. The sin of allusiveness is fostered by the fashion of the day for epigram, till his lines are barely intelligible after repeated reading. Conington happily suggested that this style was assumed only for satiric purposes, and pointed out that when not writing satire Persius was as simple and unaffected as Horace himself. This view, while it relieves Persius of much of the censure which has been directed against his want of judgment, makes him all the more typical a representative of this stage of silver Latinity. In his contemporary Lucan we have another example of the faults of a style especially attractive to the young, handled by a youth of brilliant but ill-disciplined powers. The *Pharsalia* abounds in spirited rhetoric, in striking epigram, in high sounding declamation; but there are no flights of sustained imagination, no ripe wisdom, no self-control in avoiding the exaggerated or the repulsive, no mature philosophy of life or human destiny. Of all the Latin poets he is the least Virgilian. It has been said of him that he corrupted the style of poetry, not less than Seneca that of prose.

66. *Pliny, Quintilian, Frontinus.*—In the elder Pliny the same tendencies are seen occasionally breaking out in the midst of the prosaic and inartistic form in which he gives out the stores of his cumbrous erudition. Wherever he attempts a loftier tone than that of the mere compiler, he falls into the tricks of Seneca. The nature of his encyclopaedic subject matter naturally makes his vocabulary very extensive; but in syntax and general tone of language he does not differ materially from contemporary writers. Quintilian is of interest especially for the sound judgment which led him to a true appreciation of the writers of Rome's golden age. He set himself strenuously to resist the tawdry rhetoric fashionable in his own time, and to hold up before his pupils purer and loftier models. His own criticisms are marked by excellent taste, and often by great happiness of expression, which is pointed without being unduly epigrammatic. But his own style did not escape, as indeed it hardly could, the influences of his time; and in many small points his language falls short of classical purity. There is more approach to the simplicity of the best models in Frontinus, who furnishes a striking proof that it was rather the corruption of literary taste than any serious change in the language of ordinary cultivated men to which the prevalent style was due. Writing on practical matters—the art of war and the water-supply of Rome—he goes straight to the point without rhetorical flourishes; and the ornaments of style which he occasionally introduces serve to embellish but not to distort his thought.

67. *The Flavian Age.*—The epic poets of the Flavian age present a striking contrast to the writers of the Claudian period. As a strained originality was the cardinal fault of the one school, so a tame and slavish following of authority is the mark of the other. The general *correctness* of this period may perhaps be ascribed (with Merivale) partly to the political conditions, partly to the establishment of professional schools. Teachers like Quintilian must have done much to repress extravagance of thought and language; but they could not kindle the spark of genius. Valerius Flaccus, Silius Italicus and Papinius Statius are all correct in diction and in rhythm, and abound in learning; but their inspiration is drawn from books and not from nature or the heart; details are elaborated to the injury of the impression of the whole; every line is laboured, and overcharged with epigrammatic rhetoric. Statius shows by far the greatest natural ability and freshness; but he attempts to fill a broad canvas with drawing and colouring suited only to a miniature. Juvenal exemplifies the tendencies of the language of his time, as moulded by a singularly powerful mind. A careful study of the earlier poets, especially Virgil and Lucan, has kept his language up to a high standard of purity. His style is eminently rhetorical; but it is rhetoric of real power. The concise brevity by which it is marked seems to have been the result of a deliberate attempt to mould his natural diffuseness into the form recognized as most appropriate for satire. In his verses we notice a few metrical peculiarities which represent the pronunciation of his age, especially the shortening of the final *-o* in verbs, but as a rule they conform to the Virgilian standard. In Martial the tendency of this period to witty epigram finds its most perfect embodiment, combined with finished versification.

68. *Pliny the Younger and Tacitus.*—The typical prose-writers of this time are Pliny the younger and Tacitus. Some features of the style of Tacitus are peculiar to himself; but on the whole the following statement represents the tendencies shared in greater or less degree by all the writers of this period. The gains lie mainly in the direction of a more varied and occasionally

more effective syntax; its most striking defect is a lack of harmony in the periods, of arrangements in words, of variety in particles arising from the loose connexion of sentences The vocabulary is extended, but there are losses as well as gains. Quintilian's remarks are fully borne out by the evidence of extant authorities: on the one hand, *quid quod nihil iam proprium placet, dum parum creditur disertum, quod et alius dixisset* (viii. *prooem.* 24); *a corruptissimo quoque poetarum figuras seu translationes mutuamur*; *tum demum ingeniosi scilicet, si ad intelligendos nos opus sit ingenio* (*ib.* 25); *sordet omne quod natura dictavit* (*ib.* 26); on the other hand, *nunc utique, cum haec exercitatio procul a veritate seiuncta laboret incredibili verborum fastidio, ac sibi magnam partem sermonis absciderit* (viii. 3, 23), *multa cotidie ab antiquis ficta moriuntur* (*ib.* 6, 32). A writer like Suetonius therefore did good service in introducing into his writings terms and phrases borrowed, not from the rhetoricians, but from the usage of daily life.

69. In the vocabulary of Tacitus there are to be noted:—

1. Words borrowed (consciously or unconsciously) from the classical poets, especially Virgil, occurring for the most part also in contemporary prose. Of these Dräger gives a list of ninety-five (*Syntax und Stil des Tacitus*, p. 96).

2. Words occurring only, or for the first time, in Tacitus. These are for the most part new formations or compounds from stems already in use, especially verbal substantives in *-tor* and *-sor*, *-tus* and *-sus*, *-tura* and *-mentum*, with new frequentatives.

3. Words used with a meaning (*a*) not found in earlier prose, but sometimes borrowed from the poets, *e.g. componere*, "to bury"; *scriptura*, "a writing"; *ferratus* "armed with a sword"; (*b*) peculiar to later writers, *e.g. numerosus*, "numerous"; *famosus*, "famous"; *decollare*, "to behead"; *imputare*, "to take credit for," &c.; (*c*) restricted to Tacitus himself, *e.g. dispergere*=*divolgare*.

Generally speaking, Tacitus likes to use a simple verb instead of a compound one, after the fashion of the poets, employs a pluperfect for a perfect, and (like Livy and sometimes Caesar) aims at vividness and variety by retaining the present and perfect subjunctive in indirect speech even after historical tenses. Collective words are followed by a plural far more commonly than in Cicero. The ellipse of a verb is more frequent. The use of the cases approximates to that of the poets, and is even more free. The accusative of limitation is common in Tacitus, though never found in Quintilian. Compound verbs are frequently followed by the accusative where the dative might have been expected; and the Virgilian construction of an accusative with middle and passive verbs is not unusual. The dative of purpose and the dative with a substantive in place of a genitive are more common with Tacitus than with any writer. The ablative of separation is used without a preposition, even with names of countries and with common nouns; the ablative of place is employed similarly without a preposition; the ablative of time has sometimes the force of duration; the instrumental ablative is employed even of persons. A large extension is given to the use of the quantitative genitive after neuter adjectives and pronouns, and even adverbs, and to the genitive with active participles; and the genitive of relation after adjectives is (probably by a Graecism) very freely employed. In regard to prepositions, there are special uses of *citra*, *erga*, *iuxta* and *tenus* to be noted, and a frequent tendency to interchange the use of a preposition with that of a simple case in corresponding clauses. In subordinate sentences *quod* is used for "the fact that," and sometimes approaches the later use of "that"; the infinitive follows many verbs and adjectives that do not admit of this construction in classical prose; the accusative and infinitive are used after negative expressions of doubt, and even in modal and hypothetical clauses.

Like Livy, the writers of this time freely employ the subjunctive of repeated action with a relative, and extend its use to relative conjunctions, which he does not. In clauses of comparison and proportion there is frequently an ellipse of a verb (with *nihil aliud quam*, *ut*, *tanquam*); *tanquam*, *quasi* and *velut* are used to imply not comparison but alleged reason; *quin* and *quominus* are interchanged at pleasure. *Quamquam* and *quamvis* are commonly followed by the subjunctive, even when denoting facts. The free use of the genitive and dative of the gerundive to denote purpose is common in Tacitus, the former being almost limited to him. Livy's practice in the use of participles is extended even beyond the limits to which he restricts it. It has been calculated that where Caesar uses five participial clauses, Livy has sixteen, Tacitus twenty-four.

In his compressed brevity Tacitus may be said to be individual; but in the poetical colouring of his diction, in the rhetorical cast of his sentences, and in his love for picturesqueness and variety he is a true representative of his time.

70. *Suetonius.*—The language of Suetonius is of interest as giving a specimen of silver Latinity almost entirely free from personal idiosyncrasies; his expressions are regular and straightforward, clear and business-like; and, while in grammar he does not attain to classical purity, he is comparatively free from rhetorical affectations.

71. *The African Latinity.*—A new era commences with the accession of Hadrian (117). As the preceding half century had been marked by the influence of Spanish Latinity (the Senecas, Lucan, Martial, Quintilian), so in this the African style was paramount. This is the period of affected archaisms and pedantic learning, combined at times with a reckless love of innovation and experiment, resulting in the creation of a large number of new formations and in the adoption of much of the plebeian dialect. Fronto and Apuleius mark a strong reaction against the culture of the preceding century, and for evil far more than for good the chain of literary tradition was broken. The language which had been unduly refined and elaborated now relapsed into a tasteless and confused patch-work, without either harmony or brilliance of colouring. In the case of the former the subject matter is no set-off against the inferiority of the style. He deliberately attempts to go back to the obsolete diction of writers like Cato and Ennius. We find compounds like *altipendulus*, *nudiustertianus*, *tolutiloquentia*, diminutives such as *matercella*, *anulla*, *passercula*, *studiolum*, forms like *congarrire*, *disconcinnus*, *pedetemptius*, *desiderantissimus* (passive), *conticinium*; *gaudeo*, *oboedio* and *perfungor* are used with an accusative, *modestus* with a genitive. On the other hand he actually attempts to revive the form *asa* for *ara*. In Apuleius the archaic element is only one element in the queer mixture which constitutes his style, and it probably was not intended to give the tone to the whole. Poetical and prosaic phrases, Graecisms, solecisms, jingling assonances, quotations and coinages apparently on the spur of the moment, all appear in this wonderful medley. There are found such extraordinary genitives as *sitire beatitudinis*, *cenae pignerarer*, *incoram omnium*, *foras corporis*, sometimes heaped one upon another as *fluxos vestium Arsacidas et frugum pauperes Ityraeos et odorum divites Arabas*. Diminutives are coined with reckless freedom, *e.g. diutule*, *longule*, *mundule amicta et altiuscule sub ipsas papillas succinctula*. He confesses himself that he is writing in a language not familiar to him: *In urbe Latia advena studiorum Quiritium indigenam sermonem aerumnabili labore, nullo magistro praeeunte, aggressus excolui*; and the general impression of his style fully bears out his confession. Melanchthon is hardly too severe when he says that Apuleius brays like his own ass. The language of Aulus Gellius is much superior in purity; but still it abounds in rare and archaic words, *e.g. edulcare*, *recentari*, *aeruscator*, and in meaningless frequentatives like *solitavisse*. He has some admirable remarks on the pedantry of those who delighted in obsolete expressions (xi. 7) such as *apluda*, *flocus* and *bovinator*; but his practice falls far short of his theory.

72. *The Lawyers.*—The style of the eminent lawyers of this period, foremost among whom is Gaius, deserves especial notice as showing well one of the characteristic excellences of the Latin language. It is for the most part dry and unadorned, and in syntax departs occasionally from classical usages, but it is clear, terse and exact. Technical terms may cause difficulty to the ordinary reader, but their meaning is always precisely defined; new compounds are employed whenever the subject requires them, but the capacities of the language rise to the demands made upon it; and the conceptions of jurisprudence have never been more adequately expressed than by the great Romanist jurists. (A. S. W.; R. S. C.)

For the subsequent history of the language see ROMANCE LANGUAGES.

LATIN LITERATURE. The germs of an indigenous literature had existed at an early period in Rome and in the country districts of Italy, and they have an importance as indicating natural wants in the Italian race, which were ultimately satisfied by regular literary forms. The art of writing was first employed in the service of the state and of religion for books of ritual, treaties with other states, the laws of the Twelve Tables and the like. An approach to literature was made in the *Annales Maximi*, records of private families, funeral orations and inscriptions on busts and tombs such as those of the Scipios in the Appian Way. In the satisfaction they afforded to the commemorative and patriotic instincts they anticipated an office afterwards performed by the national epics and the works of regular historians. A still nearer approach to literature was probably made in oratory, as we learn from Cicero that the famous speech delivered by Appius Claudius Caecus against concluding peace with Pyrrhus (280 B.C.) was extant in his time. Appius also published a collection of moral maxims and reflections in verse. No other name associated with any form of literature belonging to the pre-literary age has been preserved by tradition.

But it was rather in the chants and litanies of the ancient religion, such as those of the Salii and the Fratres Arvales, and the dirges for the dead (*neniae*), and in certain extemporaneous effusions, that some germs of a native poetry might have been detected; and finally in the use of Saturnian verse, a metre of pure native origin, which by its rapid and lively movement gave expression to the vivacity and quick apprehension of the Italian race. This metre was employed in ritual hymns, which seem to have assumed definite shapes out of the exclamations of a primitive priesthood engaged in a rude ceremonial dance. It was also used by a class of bards or itinerant soothsayers known by the name of *vates*, of whom the most famous was one Marcius, and in the "Fescennine verses," as sung at harvest-homes and weddings, which gave expression to the coarse gaiety of the people and to their strong tendency to personal raillery and satiric comment. The metre was also employed in commemorative poems, accompanied with music, which were sung at funeral banquets in celebration of the exploits and virtues of distinguished men. These had their origin in the same impulse which ultimately found its full gratification in Roman history, Roman epic poetry, and that form of Roman oratory known as *laudationes*, and in some of the *Odes* of Horace. The latest and probably the most important of these rude and inchoate forms was that of dramatic *saturae* (medleys), put together without any regular plot and consisting apparently of contests of wit and satiric invective, and perhaps of comments on current events, accompanied with music (Livy vii. 2). These have a real bearing on the subsequent development of Latin literature. They prepared the mind of the people for the reception of regular comedy. They may have contributed to the formation of the style of comedy which appears at the very outset much more mature than that of serious poetry, tragic or epic. They gave the name and some of the characteristics to that special literary product of the Roman soil, the *satura*, addressed to readers, not to spectators, which ultimately was developed into pure poetic satire in Lucilius, Horace, Persius and Juvenal, into the prose and verse miscellany of Varro, and into something approaching the prose novel in Petronius.

First Period: from 240 to about 80 B.C.

Livius Andronicus.

The historical event which brought about the greatest change in the intellectual condition of the Romans, and thereby exercised a decisive influence on the whole course of human culture, was the capture of Tarentum in 272. After the capture many Greek slaves were brought to Rome, and among them the young Livius Andronicus (*c.* 284–204), who was employed in teaching Greek in the family of his master, a member of the Livian gens. From that time to learn Greek became a regular part of the education of a Roman noble. The capture of Tarentum was followed by the complete Romanizing of all southern Italy. Soon after came the first Punic war, the principal scene of which was Sicily, where, from common hostility to the Carthaginian, Greek and Roman were brought into friendly relations, and the Roman armies must have become familiar with the spectacles and performances of the Greek theatre. In the year after the war (240), when the armies had returned and the people were at leisure to enjoy the fruits of victory, Livius Andronicus substituted at one of the public festivals a regular drama, translated or adapted from the Greek, for the musical medleys (*saturae*) hitherto in use. From this time dramatic performances became a regular accompaniment of the public games, and came more and more to encroach on the older kinds of amusement, such as the chariot races. The dramatic work of Livius was mainly of educative value. The same may be said of his translation of the *Odyssey*, which was still used as a school-book in the days of Horace, and the religious hymn which he was called upon to compose in 207 had no high literary pretensions. He was, however, the first to familiarize the Romans with the forms of the Greek drama and the Greek epic, and thus to determine the main lines which Latin literature followed for more than a century afterwards.

Naevius.

His immediate successor, Cn. Naevius (d. *c.* 200 B.C.), was not, like Livius, a Greek, but either a Roman citizen or, more probably, a Campanian who enjoyed the limited citizenship of a Latin and who had served in the Roman army in the first Punic war. His first appearance as a dramatic author was in 235. He adapted both tragedies and comedies from the Greek, but the bent of his genius, the tastes of his audience, and the condition of the language developed through the active intercourse and business of life, gave a greater impulse to comedy than to tragedy. Naevius tried to use the theatre, as it had been used by the writers of the Old Comedy of Athens, for the purposes of political warfare, and thus seems to have anticipated by a century the part played by Lucilius. But his attacks upon the Roman aristocracy, especially the Metelli, were resented by their objects; and Naevius, after being imprisoned, had to retire in his old age into banishment. He was not only the first in point of time, and according to ancient testimony one of the first in point of merit, among the comic poets of Rome, and in spirit, though not in form, the earliest of the line of Roman satirists, but he was also the oldest of the national poets. Besides celebrating the success of M. Claudius Marcellus in 222 over the Gauls in a play called *Clastidium*, he gave the first specimen of the *fabula praetexta* in his *Alimonium Romuli et Remi*, based on the most national of all Roman traditions. Still more important service was rendered by him in his long Saturnian poem on the first Punic war, in which he not only told the story of contemporary events but gave shape to the legend of the settlement of Aeneas in Latium,—the theme ultimately adopted for the great national epic of Rome.

Plautus.

His younger contemporary T. Maccius Plautus (*c.* 254–184) was the greatest comic dramatist of Rome. He lived and wrote only to amuse his contemporaries, and thus, although more popular in his lifetime and more fortunate than any of the older authors in the ultimate survival of a large number of his works, he is less than any of the great writers of Rome in sympathy with either the serious or the caustic spirit in Latin literature. Yet he is the one extant witness to the humour and vivacity of the Italian temperament at a stage between its early rudeness and rigidity and its subsequent degeneracy.

Ennius.

Thus far Latin literature, of which the predominant characteristics are dignity, gravity and fervour of feeling, seemed likely to become a mere vehicle of amusement adapted to all classes of the people in their holiday mood. But a new spirit, which henceforth became predominant, appeared in the time of Plautus. Latin literature ceased to be in close sympathy with the popular spirit, either politically or as a form of amusement, but became the expression of the ideas, sentiment and culture of the aristocratic governing class. It was by Q. Ennius (239–169) of Rudiae in Messapia, that a new direction was given to Latin literature. Deriving from his birthplace the culture, literary and philosophical, of Magna Graecia, and having gained the friendship of the greatest of the Romans living in that great age, he was of all the early writers most fitted to be the medium of conciliation between the serious genius of ancient Greece and the serious genius of Rome. Alone among the older writers he was endowed with the gifts of a poetical imagination and animated with enthusiasm for a great ideal.

First among his special services to Latin literature was the fresh impulse which he gave to tragedy. He turned the eyes of his contemporaries from the commonplace social humours of later Greek life to the contemplation of the heroic age. But he did not thereby denationalize the Roman drama. He animated the heroes of early Greece with the martial spirit of Roman soldiers and the ideal magnanimity and sagacity of Roman senators, and imparted weight and dignity to the language and verse in which their sentiments and thoughts were expressed. Although Rome wanted creative force to add a great series of tragic dramas to the literature of the world, yet the spirit of elevation and moral authority breathed into tragedy by Ennius passed into the ethical and didactic writings and the oratory of a later time.

Another work was the *Saturae*, written in various metres, but chiefly in the trochaic tetrameter. He thus became the inventor of a new form of literature; and, if in his hands the *satura* was rude and indeterminate in its scope, it became a vehicle by which to address a reading public on matters of the day, or on the materials of his wide reading, in a style not far removed from the language of common life. His greatest work, which made the Romans regard him as the father of their literature, was his epic poem, in eighteen books, the *Annales*, in which the record of the whole career of Rome was unrolled with idealizing enthusiasm and realistic detail. The idea which inspired Ennius was ultimately realized in both the national epic of Virgil and the national history of Livy. And the metrical vehicle which he conceived as the only one adequate to his great theme was a rude experiment, which was ultimately developed into the stately Virgilian hexameter. Even as a grammarian he performed an important service to the literary language of Rome, by fixing its prosody and arresting the tendency to decay in its final syllables. Although of his writings only fragments remain, these fragments are enough, along with what we know of him from ancient testimony, to justify us in regarding him as the most important among the makers of Latin literature before the age of Cicero.

Cato.

There is still one other name belonging partly to this, partly to the next generation, to be added to those of the men of original force of mind and character who created Latin literature, that of M. Porcius Cato the Censor (234–149), the younger contemporary of Ennius, whom he brought to Rome. More than Naevius and Plautus he represented the pure native element in that literature, the mind and character of Latium, the plebeian pugnacity, which was one of the great forces in the Roman state. His lack of imagination and his narrow patriotism made him the natural leader of the reaction against the new Hellenic culture. He strove to make literature ancillary to politics and to objects of practical utility, and thus started prose literature on the chief lines that it afterwards followed. Through his industry and vigorous understanding he gave a great impulse to the creation of Roman oratory, history and systematic didactic writing. He was one of the first to publish his speeches and thus to bring them into the domain of literature. Cicero, who speaks of 150 of these speeches as extant in his day, praises them for their acuteness, their wit, their conciseness. He speaks with emphasis of the impressiveness of Cato's eulogy and the satiric bitterness of his invective.

Cato was the first historical writer of Rome to use his native tongue. His *Origines*, the work of his old age, was written with that thoroughly Roman conception of history which regarded actions and events solely as they affected the continuous and progressive life of a state. Cato felt that the record of Roman glory could not be isolated from the story of the other Italian communities, which, after fighting against Rome for their own independence, shared with her the task of conquering the world. To the wider national sympathies which stimulated the researches of the old censor into the legendary history of the Italian towns we owe some of the most truly national parts of Virgil's *Aeneid*.

Terence.

Lucilius.

In Naevius, Plautus, Ennius and Cato are represented the contending forces which strove for ascendancy in determining what was to be the character of the new literature. The work, begun by them, was carried on by younger contemporaries and successors; by Statius Caecilius (*c.*220–168), an Insubrian Gaul, in comedy; in tragedy by M. Pacuvius (*c.*220–132), the nephew of Ennius, called by Cicero the greatest of Roman tragedians; and, in the following generation, by L. Accius (*c.*170–86), who was more usually placed in this position. The impulse given to oratory by Cato, Ser. Sulpicius Galba and others, and along with it the development of prose composition, went on with increased momentum till the age of Cicero. But the interval between the death of Ennius (169) and the beginning of Cicero's career, while one of progressive advance in the appreciation of literary form and style, was much less distinguished by original force than the time immediately before and after the end of the second Punic war. The one complete survival of the generation after the death of Ennius, the comedy of P. Terentius Afer or Terence (*c.* 185–159), exemplifies the gain in literary accomplishment and the loss in literary freedom. Terence has nothing Roman or Italian except his pure and idiomatic Latinity. His Athenian elegance affords the strongest contrast to the Italian rudeness of Cato's *De Re Rustica*. By looking at them together we understand how much the comedy of Terence was able to do to refine and humanize the manners of Rome, but at the same time what a solvent it was of the discipline and ideas of the old republic. What makes Terence an important witness of the culture of his time is that he wrote from the centre of the Scipionic circle, in which what was most humane and liberal in Roman statesmanship was combined with the appreciation of what was most vital in the Greek thought and literature of the time. The comedies of Terence may therefore be held to give some indication of the tastes of Scipio, Laelius and their friends in their youth. The influence of Panaetius and Polybius was more adapted to their maturity, when they led the state in war, statesmanship and oratory, and when the humaner teaching of Stoicism began to enlarge the sympathies of Roman jurists. But in the last years during which this circle kept together a new spirit appeared in Roman politics and a new power in Roman literature,—the revolutionary spirit evoked by the Gracchi in opposition to the long-continued ascendancy of the senate, and the new power of Roman satire, which was exercised impartially and unsparingly against both the excesses of the revolutionary spirit and the arrogance and incompetence of the extreme party among the nobles. Roman satire, though in form a legitimate development of the indigenous dramatic *satura* through the written *satura* of Ennius and Pacuvius, is really a birth of this time, and its author was the youngest of those admitted into the intimacy of the Scipionic circle, C. Lucilius of Suessa Aurunca (*c.* 180–103). Among the writers before the age of Cicero he alone deserves to be named with Naevius, Plautus Ennius and Cato as a great originative force in literature. For about thirty years the most important event in Roman literature was the production of the satires of Lucilius, in which the politics, morals, society and letters of the time were criticized with the utmost freedom and pungency, and his own personality was brought immediately and familiarly before his contemporaries. The years that intervened between his death and the beginning of the Ciceronian age are singularly barren in works of original value. But in one direction there was some novelty. The tragic writers had occasionally taken their subjects from Roman life (*fabulae praetextae*), and in comedy we find the corresponding *togatae* of Lucius Afranius and others, in which comedy, while assuming a Roman dress, did not assume the virtue of a Roman matron.

General results from 130 to 80

The general results of the last fifty years of the first period (130 to 80) may be thus summed up. In poetry we have the satires of Lucilius, the tragedies of Accius and of a few successors among the Roman aristocracy, who thus exemplified the affinity of the Roman stage to Roman oratory; various annalistic poems intended to serve as continuations of the great poem of Ennius; minor poems of an epigrammatic and erotic character, unimportant anticipations of the Alexandrian tendency operative in the following period; works of criticism in trochaic tetrameters by Porcius Licinus and others, forming part of the critical and grammatical movement which almost from the first accompanied the creative movement in Latin literature, and which may be regarded as rude precursors of the didactic epistles that Horace devoted to literary criticism.

The only extant prose work which may be assigned to the end of this period is the treatise on rhetoric known by the title *Ad Herennium* (*c.* 84) a work indicative of the attention bestowed on prose style and rhetorical studies during the last century of the republic, and which may be regarded as a precursor of the oratorical treatises of Cicero and of the work of Quintilian. But the great literary product of this period was oratory, developed indeed with the aid of these rhetorical studies, but itself the immediate outcome of the imperial interests, the legal conflicts, and the political passions of that time of agitation. The speakers and writers of a later age looked back on Scipio and Laelius, the Gracchi and their contemporaries, L. Crassus and M. Antonius, as masters of their art.

Oratory.

History.

In history, regarded as a great branch of prose literature, it is not probable that much was accomplished, although, with the advance of oratory and grammatical studies, there must have been not only greater fluency of composition but the beginning of a richer and more ornate style. Yet Cicero denies to Rome the existence, before his own time, of any adequate historical literature. Nevertheless it was by the work of a number of Roman chroniclers during this period that the materials of early Roman history were systematized, and the record of the state, as it was finally given to the world in the artistic work of Livy, was extracted from the early annals, state documents and private memorials, combined into a coherent unity, and supplemented by invention and reflection. Amongst these chroniclers may be mentioned L. Calpurnius Piso Frugi (consul 133, censor 108), C. Sempronius Tuditanus (consul 129), Cn. Gellius, C. Fannius (consul 122), L. Coelius Antipater, who wrote a narrative of the second Punic war about 120, and Sempronius Asellio, who wrote a history of his own times, have a better claim to be considered historians. There were also special works on antiquities and contemporary memoirs, and autobiographies such as those of M. Aemilius Scaurus, the elder, Q. Lutatius Catulus (consul 102 B.C.), and P. Rutilius Rufus, which formed the sources of future historians. (See further ANNALES, and ROME: *History, Ancient*, § "Authorities.")

Summary of the period.

Although the artistic product of the first period of Latin literature which has reached us in a complete shape is limited to the comedies of Plautus and Terence, the influence of the lost literature in determining the spirit, form and style of the eras of more perfect accomplishment which followed is unmistakable. While humour and vivacity characterize the earlier, and urbanity of tone the later development of comedy, the tendency of serious literature had been in the main practical, ethical, commemorative and satirical. The higher poetical imagination had appeared only in Ennius, and had been called forth in him by sympathy with the grandeur of the national life and the great personal qualities of its representative men. Some of the chief motives of the later poetry, *e.g.* the pleasures and sorrows of private life, had as yet found scarcely any expression in Latin literature. The fittest metrical vehicle for epic, didactic, and satiric poetry had been discovered, but its movement was as yet rude and inharmonious. The idiom of ordinary life and social intercourse and the more fervid and elevated diction of oratorical prose had made great progress, but the language of imagination and poetical feeling was, if vivid and impressive in isolated expressions, still incapable of being wrought into consecutive passages of artistic composition. The influences of Greek literature to which Latin literature owed its birth had not as yet spread beyond Rome and Latium. The Sabellian races of central and eastern Italy and the Italo-Celtic and Venetian races of the north, in whom the poetic susceptibility of Italy was most manifest two generations later, were not, until after the Social war, sufficiently in sympathy with Rome, and were probably not as yet sufficiently educated to induce them to contribute their share to the national literature. Hence the end of the Social war, and of the Civil war, which arose out of it, is most clearly a determining factor in Roman literature, and may most appropriately be taken as marking the end of one period and the beginning of another.

Second Period: from 80 to 42 B.C.

The last age of the republic coincides with the first half of the Golden age of Roman literature. It is generally known as the Ciceronian age from the name of its greatest literary representative, whose activity as a speaker and writer was unremitting during nearly the whole period. It is the age of purest excellence in prose, and of a new birth of poetry, characterized rather by great original force and artistic promise than by perfect accomplishment. The five chief representatives of this age who still hold their rank among the great classical writers are Cicero, Caesar and Sallust in prose, Lucretius and Catullus in verse. The works of other prose writers, Varro and Cornelius Nepos, have been partially preserved; but these writers have no claim to rank with those already mentioned as creators and masters of literary style. Although literature had not as yet become a trade or profession, an educated reading public already existed, and books and intellectual intercourse filled a large part of the leisure of men actively engaged in affairs. Even oratory was intended quite as much for readers as for the audiences to which it was immediately addressed; and some of the greatest speeches which have come down from that great age of orators were never delivered at all, but were published as manifestoes after the event with the view of influencing educated opinion, and as works of art with the view of giving pleasure to educated taste.

Cicero.

Thus the speeches of M. Tullius Cicero (106–43) belong to the domain of literature quite as much as to that of forensic or political oratory. And, although Demosthenes is a master of style unrivalled even by Cicero, the literary interest of most of Cicero's speeches is stronger than that of the great mass of Greek oratory. It is urged with justice that the greater part of Cicero's *Defence of Archias* was irrelevant to the issue and would not have been listened to by a Greek court of justice or a modern jury. But it was fortunate for the interests of literature that a court of educated Romans could be influenced by the considerations there submitted to them. In this way a question of the most temporary interest, concerning an individual of no particular eminence or importance, has produced one of the most impressive vindications of literature ever spoken or written. Oratory at Rome assumed a new type from being cultivated as an art which endeavoured to produce persuasion not so much by intellectual conviction as by appeal to general human sympathies. In oratory, as in every other intellectual province, the Greeks had a truer sense of the limits and conditions of their art. But command over form is only one element in the making of an orator or poet. The largeness and dignity of the matter with which he has to deal are at least as important. The Roman oratory of the law courts had to deal not with petty questions of disputed property, of fraud, or violence, but with great imperial questions, with matters affecting the well-being of large provinces and the honour and safety of the republic; and no man ever lived who, in these respects, was better fitted than Cicero to be the representative of the type of oratory demanded by the condition of the later republic. To his great artistic accomplishment, perfected by practice and elaborate study, to the power of his patriotic, his moral, and personal sympathies, and his passionate emotional nature, must be added his vivid imagination and the rich and copious stream of his language, in which he had no rival among Roman writers or speakers. It has been said that Roman poetry has produced few, if any, great types of character. But the Verres, Catiline, Antony of Cicero are living and permanent types. The story told in the *Pro Cluentio* may be true or false, but the picture of provincial crime which it presents is vividly dramatic. Had we only known Cicero in his speeches we should have ranked him with Demosthenes as one who had realized the highest literary ideal. We should think of him also as the creator and master of Latin style—and, moreover, not only as a great orator but as a just and appreciative critic of oratory. But to his services to Roman oratory we have to add his services not indeed to philosophy but to the literature of philosophy. Though not a philosopher he is an admirable interpreter of those branches of philosophy which are fitted for practical application, and he presents us with the results of Greek reflection vivified by his own human sympathies and his large experience of men. In giving a model of the style in which human interest can best be imparted to abstract discussions, he used his great oratorical gift and art to persuade the world to accept the most hopeful opinions on human destiny and the principles of conduct most conducive to elevation and integrity of character.

The *Letters* of Cicero are thoroughly natural—*colloquia absentium amicorum*, to use his own phrase. Cicero's letters to Atticus, and to the friends with whom he was completely at his ease, are the most sincere and immediate expression of the thought and feeling of the moment. They let us into the secret of his most serious thoughts and cares, and they give a natural outlet to his vivacity of observation, his wit and humour, his kindliness of nature. It shows how flexible an instrument Latin prose had become in his hand, when it could do justice at once to the ample and vehement volume of his oratory, to the calmer and more rhythmical movement of his philosophical meditation, and to the natural interchange of thought and feeling in the everyday intercourse of life.

Caesar.

Among the many rival orators of the age the most eminent were Quintus Hortensius Ortalus and C. Julius Caesar. The former was the leading representative of the Asiatic or florid style of oratory, and, like other members of the aristocracy, such as C. Memmius and L. Manlius Torquatus, and like Q. Catulus in the preceding generation, was a kind of dilettante poet and a precursor of the poetry of pleasure, which attained such prominence in the elegiac poets of the Augustan age. Of C. Julius Caesar (102–44) as an orator we can judge only by his reputation and by the testimony of his great rival and adversary Cicero; but we are able to appreciate the special praise of perfect taste in the use of language attributed to him.[1] In his *Commentaries*, by laying aside the ornaments of oratory, he created the most admirable style of prose narrative, the style which presents interesting events in their sequence of time and dependence on the will of the actor, rapidly and vividly, with scarcely any colouring of personal or moral feeling, any oratorical passion, any pictorial illustration. While he shows the persuasive art of an orator by presenting the subjugation of Gaul and his own action in the Civil War in the light most favourable to his claim to rule the Roman world, he is entirely free from the Roman fashion of self-laudation or disparagement of an adversary. The character of the man reveals itself especially in a perfect simplicity of style, the result of the clearest intelligence and the strongest sense of personal dignity. He avoids not only every unusual but every superfluous word; and, although no writing can be more free from rhetorical colouring, yet there may from time to time be detected a glow of sympathy, like the glow of generous passion in Thucydides, the more effective from the reserve with which it betrays itself whenever he is called on to record any act of personal heroism or of devotion to military duty.

Sallust.

In the simplicity of his style, the directness of his narrative, the entire absence of any didactic tendency, Caesar presents a marked contrast to another prose writer of that age—the historian C. Sallustius Crispus or Sallust (*c.* 87–36). Like Varro, he survived Cicero by some years, but the tone and spirit in which his works are written assign him to the republican era. He was the first of the purely artistic historians, as distinct from the annalists and the writers of personal memoirs. He imitated the Greek historians in taking particular actions—the *Jugurthan War* and the *Catilinarian Conspiracy*—as the subjects of artistic treatment. He wrote also a continuous work, *Historiae*, treating of the events of the twelve years following the death of Sulla, of which only fragments are preserved. His two extant works are more valuable as artistic studies of the rival parties in the state and of personal character than as trustworthy narratives of facts. His style aims at effectiveness by pregnant expression, sententiousness, archaism. He produces the impression of caring more for the manner of saying a thing than for its truth. Yet he has great value as a painter of historical portraits, some of them those of his contemporaries, and as an author who had been a political partisan and had taken some part in making history before undertaking to write it; and he gives us, from the popular side, the views of a contemporary on the politics of the time. Of the other historians, or rather annalists, who belong to this period, such as Q. Claudius Quadrigarius, Q. Valerius Antias, and C. Licinius Macer, the father of Calvus, we have only fragments remaining.

Varro.

The period was also remarkable for the production of works which we should class as technical or scientific rather than literary. The activity of one of these writers was so great that he is entitled to a separate mention. This was M. Terentius Varro, the most learned not only of the Romans but of the Greeks, as he has been called. The list of Varro's writings includes over seventy treatises and more than six hundred books dealing with topics of every conceivable kind. His *Menippeae Saturae*, miscellanies in prose and verse, of which unfortunately only fragments are left, was a work of singular literary interest.

Lucretius.

Since the *Annals* of Ennius no great and original poem had appeared. The powerful poetical force which for half a century continued to be the strongest force in literature, and which created masterpieces of art and genius, first revealed itself in the latter part of the Ciceronian age. The conditions which enabled the poetic genius of Italy to come to maturity in the person of T. Lucretius Carus (96–55) were entire seclusion from public life and absorption in the ideal pleasures of contemplation and artistic production. This isolation from the familiar ways of his contemporaries, while it was, according to tradition and the internal evidence of his poem, destructive to his spirit's health, resulted in a work of genius, unique in character, which still stands forth as the greatest philosophical poem in any language. In the form of his poem he followed a Greek original; and the stuff out of which the texture of his philosophical argument is framed was derived from Greek science; but all that is of deep human and poetical meaning in the poem is his own. While we recognize in the *De Rerum Natura* some of the most powerful poetry in any language and feel that few poets have penetrated with such passionate sincerity and courage into the secret of nature and some of the deeper truths of human life, we must acknowledge that, as compared with the great didactic poem of Virgil, it is crude and unformed in artistic design, and often rough and unequal in artistic execution. Yet, apart altogether from its independent value, by his speculative power and enthusiasm, by his revelation of the life and spectacle of nature, by the fresh creativeness of his diction and the elevated movement of his rhythm, Lucretius exercised a more powerful influence than any other on the art of his more perfect successors.

Catullus.

While the imaginative and emotional side of Roman poetry was so powerfully represented by Lucretius, attention was directed to its artistic side by a younger generation, who moulded themselves in a great degree on Alexandrian models. Such were Valerius Cato also a distinguished literary critic, and C. Licinius Calvus, an eminent orator. Of this small group of poets one only has survived, fortunately the man of most genius among them, the bosom-friend of Calvus, C. Valerius Catullus (84–54). He too was a new force in Roman literature. He was a provincial by birth, although early brought into intimate relations with members of the great Roman families. The subjects of his best art are taken immediately from his own life—his loves, his friendships, his travels, his animosities, personal and political. His most original contribution to the substance of Roman literature was that he first shaped into poetry the experience of his own heart, as it had been shaped by Alcaeus and Sappho in the early days of Greek poetry. No poet has surpassed him in the power of vitally reproducing the pleasure and pain of the passing hour, not recalled by idealizing reflection as in Horace, nor overlaid with mythological ornament as in Propertius, but in all the keenness of immediate impression. He also introduced into Roman literature that personal as distinct from political or social satire which appears later in the *Epodes* of Horace and the *Epigrams* of Martial. He anticipated Ovid in recalling the stories of Greek mythology to a second poetical life. His greatest contribution to poetic art consisted in the perfection which he attained in the phalaecian, the pure iambic, and the scazon metres, and in the ease and grace with which he used the language of familiar intercourse, as distinct from that of the creative imagination, of the *rostra*, and of the schools, to give at once a lifelike and an artistic expression to his feelings. He has the interest of being the last poet of the free republic. In his life and in his art he was the precursor of those poets who used their genius as the interpreter and minister of pleasure; but he rises above them in the spirit of personal independence, in his affection for his friends, in his keen enjoyment of natural and simple pleasures, and in his power of giving vital expression to these feelings.

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[1] *Latine loqui elegantissime.*

Third Period: Augustan Age, 42 B.C. to A.D. 17.

Influence of imperial institutions.

The poetic impulse and culture communicated to Roman literature in the last years of the republic passed on without any break of continuity into the literature of the succeeding age. One or two of the circle of Catullus survived into that age; but an entirely new spirit came over the literature of the new period, and it is by new men, educated indeed under the same literary influences, but living in an altered world and belonging originally to a different order in the state, that the new spirit was expressed. The literature of the later republic reflects the sympathies and prejudices of an aristocratic class, sharing in the conduct of national affairs and living on terms of equality with one another; that of the Augustan age, first in its early serious enthusiasm, and then in the licence and levity of its later development, represents the hopes and aspirations with which the new monarchy was ushered into the world, and the pursuit of pleasure and amusement, which becomes the chief interest of a class cut off from the higher energies of practical life, and moving in the refining and enervating atmosphere of an imperial court. The great inspiring influence of the new literature was the enthusiasm produced first by the hope and afterwards by the fulfilment of the restoration of peace, order, national glory, under the rule of Augustus. All that the age longed for seemed to be embodied in a man who had both in his own person and by inheritance the natural spell which sways the imagination of the world. The sentiment of hero-worship was at all times strong in the Romans, and no one was ever the object of more sincere as well as simulated hero-worship than Augustus. It was not, however, by his equals in station that the first feeling was likely to be entertained. The earliest to give expression to it was Virgil; but the spell was soon acknowledged by the colder and more worldly-wise Horace. The disgust aroused by the anti-national policy of Antony, and the danger to the empire which was averted by the result of the battle of Actium, combined with the confidence inspired by the new ruler to reconcile the great families as well as the great body of the people to the new order of things.

While the establishment of the empire produced a revival of national and imperial feeling, it suppressed all independent political thought and action. Hence the two great forms of prose literature which drew their nourishment from the struggles of political life, oratory and contemporary history, were arrested in their development. The main course of literature was thus for a time diverted into poetry. That poetry in its most elevated form aimed at being the organ of the new empire and of realizing the national ideals of life and character under its auspices; and in carrying out this aim it sought to recall the great memories of the past. It became also the organ of the pleasures and interests of private life, the chief motives of which were the love of nature and the passion of love. It sought also to make the art and poetry of Greece live a new artistic life. Satire, debarred from comment on political action, turned to social and individual life, and combined with the newly-developed taste for ethical analysis and reflection introduced by Cicero. One great work had still to be done in prose—a retrospect of the past history of the state from an idealizing and romanticizing point of view. For that work the Augustan age, as the end of one great cycle of events and the beginning of another, was eminently suited, and a writer who, by his gifts of imagination and sympathy, was perhaps better fitted than any other man of antiquity for the task, and who through the whole of this period lived a life of literary leisure, was found to do justice to the subject.

Although the age did not afford free scope and stimulus to individual energy and enterprise, it furnished more material and social advantages for the peaceful cultivation of letters. The new influence of patronage, which in other times has chilled the genial current of literature, become, in the person of Maecenas, the medium through which literature and the imperial policy were brought into union. Poetry thus acquired the tone of the world, kept in close connexion with the chief source of national life, while it was cultivated to the highest pitch of artistic perfection under the most favourable conditions of leisure and freedom from the distractions and anxieties of life.

Virgil.

The earliest in the order of time of the poets who adorn this age—P. Vergilius Maro or Virgil (70–19)—is also the greatest in genius, the most richly cultivated, and the most perfect in art. He is the idealizing poet of the hopes and aspirations and of the purer and happier life of which the age seemed to contain the promise. He elevates the present by associating it with the past and future of the world, and sanctifies it by seeing in it the fulfilment of a divine purpose. Virgil is the true representative poet of Rome and Italy, of national glory and of the beauty of nature, the artist in whom all the efforts of the past were made perfect, and the unapproachable standard of excellence to future times. While more richly endowed with sensibility to all native influences, he was more deeply imbued than any of his contemporaries with the poetry, the thought and the learning of Greece. The earliest efforts of his art (the *Eclogues*) reproduce the cadences, the diction and the pastoral fancies of Theocritus; but even in these imitative poems of his youth Virgil shows a perfect mastery of his materials. The Latin hexameter, which in Ennius and Lucretius was the organ of the more dignified and majestic emotions, became in his hands the most perfect measure in which the softer and more luxurious sentiment of nature has been expressed. The sentiment of Italian scenery and the love which the Italian peasant has for the familiar sights and sounds of his home found a voice which never can pass away.

In the *Georgics* we are struck by the great advance in the originality and self-dependence of the artist, in the mature perfection of his workmanship, in the deepening and strengthening of all his sympathies and convictions. His genius still works under forms prescribed by Greek art, and under the disadvantage of having a practical and utilitarian aim imposed on it. But he has ever in form so far surpassed his originals that he alone has gained for the pure didactic poem a place among the highest forms of serious poetry, while he has so transmuted his material that, without violation of truth, he has made the whole poem alive with poetic feeling. The homeliest details of the farmer's work are transfigured through the poet's love of nature; through his religious feeling and his pious sympathy with the sanctities of human affection; through his patriotic sympathy with the national greatness; and through the rich allusiveness of his art to everything in poetry and legend which can illustrate and glorify his theme.

In the *Eclogues* and *Georgics* Virgil is the idealizing poet of the old simple and hardy life of Italy, as the imagination could conceive of it in an altered world. In the *Aeneid* he is the idealizing poet of national glory, as manifested in the person of Augustus. The epic of national life, vividly conceived but rudely executed by Ennius, was perfected in the years that followed the decisive victory at Actium. To do justice to his idea Virgil enters into rivalry with a greater poet than those whom he had equalled or surpassed in his previous works. And, though he cannot unroll before us the page of heroic action with the power and majesty of Homer, yet by the sympathy with which he realizes the idea of Rome, and by the power with which he has used the details of tradition, of local scenes, of religious usage, to embody it, he has built up in the form of an epic poem the most enduring and the most artistically constructed monument of national grandeur.

Horace.

The second great poet of the time—Q. Horatius Flaccus or Horace (68–8) is both the realist and the idealist of his age. If we want to know the actual lives, manners and ways of thinking of the Romans of the generation succeeding the overthrow of the republic it is in the *Satires* and partially in the *Epistles* of Horace that we shall find them. If we ask what that time provided to stir the fancy and move the mood of imaginative reflection, it is in the lyrical poems of Horace that we shall find the most varied and trustworthy answer. His literary activity extends over about thirty years and naturally divides itself into three periods, each marked by a distinct character. The first—extending from about 40 to 29—is that of the *Epodes* and *Satires*. In the former he imitates the Greek poet Archilochus, but takes his subjects from the men, women and incidents of the day. Personality is the essence of his *Epodes*; in the *Satires* it is used merely as illustrative of general tendencies. In the *Satires* we find realistic pictures of social life, and the conduct and opinions of the world submitted to the standard of good feeling and common sense. The style of the *Epodes* is pointed and epigrammatic, that of the *Satires* natural and familiar. The hexameter no longer, as in Lucilius, moves awkwardly as if in fetters, but, like the language of Terence, of Catullus in his lighter pieces, of Cicero in his letters to Atticus, adapts itself to the everyday intercourse of life. The next period is the meridian of his genius, the time of his greatest lyrical inspiration, which he himself associates with the peace and leisure secured to him by his Sabine farm. The life of pleasure which he had lived in his youth comes back to him, not as it was in its actual distractions and disappointments, but in the idealizing light of meditative retrospect. He had not only become reconciled to the new order of things, but was moved by his intimate friendship with Maecenas to aid in raising the world to sympathy with the imperial rule through the medium of his lyrical inspiration, as Virgil had through the glory of his epic art. With the completion of the three books of *Odes* he cast aside for a time the office of the *vates*, and resumed that of the critical spectator of human life, but in the spirit of a moralist rather than a satirist. He feels the increasing languor of the time as well as the languor of advancing years, and seeks to encourage younger men to take up the rôle of lyrical poetry, while he devotes himself to the contemplation of the true art of living. Self-culture rather than the fulfilment of public or social duty, as in the moral teaching of Cicero, is the aim of his teaching; and in this we recognize the influence of the empire in throwing the individual back on himself. As Cicero tones down his oratory in his moral treatises, so Horace tones down the fervour of his lyrical utterances in his *Epistles*, and thus produces a style combining the ease of the best epistolary style with the grace and concentration of poetry—the style, as it has been called, of "idealized common sense," that of the *urbanus* and cultivated man of the world who is also in his hours of inspiration a genuine poet. In the last ten years of his life Horace resumed his lyrical function for a time, under pressure of the imperial command, and produced some of the most exquisite and mature products of his art. But his chief activity is devoted to criticism. He first vindicates the claims of his own age to literary pre-eminence, and then seeks to stimulate the younger writers of the day to what he regarded as the manlier forms of poetry, and especially to the tragic drama, which seemed for a short time to give promise of an artistic revival.

But the poetry of the latter half of the Augustan age destined to survive did not follow the lines either of lyrical or of dramatic art marked out by Horace. The latest form of poetry adopted from Greece and destined to gain and permanently to hold the ear of the world was the *elegy*. From the time of Mimnermus this form seems to have presented itself as the most natural vehicle for the poetry of pleasure in an age of luxury, refinement and incipient decay. Its facile flow and rhythm seem to adapt it to the expression and illustration of personal feeling. It goes to the mind of the reader through a medium of sentiment rather than of continuous thought or imaginative illustration. The greatest masters of this kind of poetry are the elegiac poets of the Augustan age—Tibullus, Propertius and Ovid.

Tibullus.

Of the ill-fated C. Cornelius Gallus, their predecessor, we have but a single pentameter remaining. Of the three Tibullus (*c.* 54–19) is the most refined and tender. As the poet of love he gives utterance to the pensive melancholy rather than to the pleasures associated with it. In his sympathy with the life and beliefs of the country people he shows an affinity both to the idyllic spirit and to the piety of Virgil. There is something, too, in his fastidious refinement and in his shrinking from the rough contact of life that reminds us of the English poet Gray.

Propertius.

A poet of more strength and more powerful imagination, but of less refinement in his life and less exquisite taste in his art, is Sextus Propertius (*c.* 50–*c.* 15). His youth was a more stormy one than that of Tibullus, and was passed, not like his, among the "healthy woods" of his country estate, but amid all the licence of the capital. His passion for Cynthia, the theme of his most finished poetry, is second only in interest to that of Catullus for Lesbia; and Cynthia in her fascination and caprices seems a more real and intelligible personage than the idealized object first of the idolatry and afterwards of the malediction of Catullus. Propertius is a less accomplished artist and a less equably pleasing writer than either Tibullus or Ovid, but he shows more power of dealing gravely with a great or tragic situation than either of them, and his diction and rhythm give frequent proof of a concentrated force of conception and a corresponding movement of imaginative feeling which remind us of Lucretius.

Ovid.

The most facile and brilliant of the elegiac poets and the least serious in tone and spirit is P. Ovidius Naso or Ovid (43 B.C.–A.D. 18). As an amatory poet he is the poet of pleasure and intrigue rather than of tender sentiment or absorbing passion. Though he treated his subject in relation to himself with more levity and irony than real feeling, yet by his sparkling wit and fancy he created a literature of sentiment and adventure adapted to amuse the idle and luxurious society of which the elder Julia was the centre. His power of continuous narrative is best seen in the *Metamorphoses*, written in hexameters to which he has imparted a rapidity and precision of movement more suited to romantic and picturesque narrative than the weighty self-restrained verse of Virgil. In his *Fasti* he treats a subject of national interest; it is not, however, through the strength of Roman sentiment but through the power of vividly conceiving and narrating stories of strong human interest that the poem lives. In his latest works—the *Tristia* and *Ex Ponto*—he imparts the interest of personal confessions to the record of a unique experience. Latin poetry is more rich in the expression of personal feeling than of dramatic realism. In Ovid we have both. We know him in the intense liveliness of his feeling and the human weakness of his nature more intimately than any other writer of antiquity, except perhaps Cicero. As Virgil marks the point of maturest excellence in poetic diction and rhythm, Ovid marks that of the greatest facility.

Livy.

The Augustan age was one of those great eras in the world like the era succeeding the Persian War in Greece, the Elizabethan age in England, and the beginning of the 19th century in Europe, in which what seems a new spring of national and individual life calls out an idealizing retrospect of the past. As the present seems full of new life, the past seems rich in glory and the future in hope. The past of Rome had always a peculiar fascination for Roman writers. Virgil in a supreme degree, and Horace, Propertius and Ovid in a less degree, had expressed in their poetry the romance of the past. But it was in the great historical work of T. Livius or Livy (59 B.C.–A.D. 17) that the record of the national life received its most systematic exposition. Its execution was the work of a life prolonged through the languor and dissolution following so soon upon the promise of the new era, during which time the past became glorified by contrast with the disheartening aspect of the present. The value of the work consists not in any power of critical investigation or weighing of historical evidence but in the intense sympathy of the writer with the national ideal, and the vivid imagination with which under the influence of this sympathy he gives life to the events and personages, the wars and political struggles, of times remote from his own. He makes us feel more than any one the majesty of the Roman state, of its great magistracies, and of the august council by which its policy was guided. And, while he makes the words *senatus populusque Romanus* full of significance for all times, no one realizes with more enthusiasm all that is implied in the words *imperium Romanum*, and the great military qualities of head and heart by which that empire was acquired and maintained. The vast scale on which the work was conceived and the thoroughness of artistic execution with which the details are finished are characteristically Roman. The prose style of Rome, as a vehicle for the continuous narration of events coloured by a rich and picturesque imagination and instinct with dignified emotion, attained its perfection in Livy.

Fourth Period: The Silver Age, from A.D. 17 to about 130.

Characteristics of post-Augustan age.

For more than a century after the death of Augustus Roman literature continues to flow in the old channels. Though drawing from the provinces, Rome remains the centre of the literary movement. The characteristics of the great writers are essentially national, not provincial nor cosmopolitan. In prose the old forms—oratory, history, the epistle, treatises or dialogues on ethical and literary questions—continue to be cultivated. Scientific and practical subjects, such as natural history, architecture, medicine, agriculture, are treated in more elaborate literary style. The old Roman *satura* is developed into something like the modern prose novel. In the various provinces of poetry, while there is little novelty or inspiration, there is abundance of industry and ambitious effort. The national love of works of large compass shows itself in the production of long epic poems, both of the historic and of the imitative Alexandrian type. The imitative and rhetorical tastes of Rome showed themselves in the composition of exotic tragedies, as remote in spirit and character from Greek as from Roman life, of which the only extant specimens are those attributed to the younger Seneca. The composition of didactic, lyrical and elegiac poetry also was the accomplishment and pastime of an educated dilettante class, the only extant specimens of any interest being some of the *Silvae* of Statius. The only voice with which the poet of this age can express himself with force and sincerity is that of satire and satiric epigram. We find now only imitative echoes of the old music created by Virgil and others, as in Statius, or powerful declamation, as in Lucan and Juvenal. There is a deterioration in the diction as well as in the music of poetry. The elaborate literary culture of the Augustan age has done something to impair the native force of the Latin idiom. The language of literature, in the most elaborate kind of prose as well as poetry, loses all ring of popular speech. The old oratorical tastes and aptitudes find their outlet in public recitations and the practice of declamation. Forced and distorted expression, exaggerated emphasis, point and antithesis, an affected prettiness, are studied with the view of gaining the applause of audiences who thronged the lecture and recitation rooms in search of temporary excitement. Education is more widely diffused, but is less thorough, less leisurely in its method, derived less than before from the purer sources of culture. The precocious immaturity of Lucan's career affords a marked contrast to the long preparation of Virgil and Horace for their high office. Although there are some works of this so-called Silver Age of considerable and one at least of supreme interest, from the insight they afford into the experience of a century of organized despotism and its effect on the spiritual life of the ancient world, it cannot be doubted that the steady literary decline which characterized the last centuries of paganism was beginning before the death of Ovid and Livy.

The influences which had inspired republican and Augustan literature were the artistic impulse derived from a familiarity with the great works of Greek genius, becoming more intimate with every new generation, the spell of Rome over the imagination of the kindred Italian races, the charm of Italy, and the vivid sensibility of the Italian temperament. These influences were certainly much less operative in the first century of the empire. The imitative impulse, which had much of the character of a creative impulse, and had resulted in the appropriation of the forms of poetry suited to the Roman and Italian character and of the metres suited to the genius of the Latin language, no longer stimulated to artistic effort. The great sources of Greek poetry were no longer regarded, as they were by Lucretius and Virgil, as sacred, untasted springs, to be approached in a spirit of enthusiasm tempered with reverence. We have the testimony of two men of shrewd common sense and masculine understanding—Martial and Juvenal—to the stale and lifeless character of the art of the Silver Age, which sought to reproduce in the form of epics, tragedies and elegies the bright fancies of the Greek mythology.

The idea of Rome, owing to the antagonism between the policy of the government and the sympathies of the class by which literature was favoured and cultivated, could no longer be an inspiring motive, as it had been in the literature of the republic and of the Augustan age. The spirit of Rome appears only as animating the protest of Lucan, the satire of Persius and Juvenal, the sombre picture which Tacitus paints of the annals of the empire. Oratory is no longer an independent voice appealing to sentiments of Roman dignity, but the weapon of the "informers" (*delatores*), wielded for their own advancement and the destruction of that class which, even in their degeneracy, retained most sympathy with the national traditions. Roman history was no longer a record of national glory, stimulating the patriotism and flattering the pride of all Roman citizens, but a personal eulogy or a personal invective, according as servility to a present or hatred of a recent ruler was the motive which animated it.

The charm of Italian scenes still remained the same, but the fresh and inspiring feeling of nature gave place to the mere sensuous gratification derived from the luxurious and artificial beauty of the country villa. The idealizing poetry of passion, which found a genuine voice in Catullus and the elegiac poets, could not prolong itself through the exhausting licence of successive generations. The vigorous vitality which gives interest to the personality of Catullus, Propertius and Ovid no longer characterizes their successors. The pathos of natural affection is occasionally recognized in Statius and more rarely in Martial, but it has not the depth of tenderness found in Lucretius and Virgil. The wealth and luxury of successive generations, the monotonous routine of life, the separation of the educated class from the higher work of the world, have produced their enervating and paralysing effect on the mainsprings of poetic and imaginative feeling.

New literary elements.

New elements, however, appear in the literature of this period. As the result of the severance from the active interests of life, a new interest is awakened in the inner life of the individual. The immorality of Roman society not only affords abundant material to the satirist, but deepens the consciousness of moral evil in purer and more thoughtful minds. To these causes we attribute the pathological observation of Seneca and Tacitus, the new sense of purity in Persius called out by contrast with the impurity around him, the glowing if somewhat sensational exaggeration of Juvenal, the vivid characterization of Martial. The literature of no time presents so powerfully the contrast between moral good and evil. In this respect it is truly representative of the life of the age. Another new element is the influence of a new race. In the two preceding periods the rapid diffusion of literary culture following the Social War and the first Civil War was seen to awaken into new life the elements of original genius in Italy and Cisalpine Gaul. In the first century of the empire a similar result was produced by the diffusion of that culture in the Latinized districts of Spain. The fervid temperament of a fresh and vigorous race, which received the Latin discipline just as Latium had two or three centuries previously received the Greek discipline, revealed itself in the writings of the Senecas, Lucan, Quintilian, Martial and others, who in their own time added literary distinction to the Spanish towns from which they came. The new extraneous element introduced into Roman literature draws into greater prominence the characteristics of the last great representatives of the genuine Roman and Italian spirit—the historian Tacitus and the satirist Juvenal.

On the whole this century shows, in form, language and substance, the signs of literary decay. But it is still capable of producing men of original force; it still maintains the traditions of a happier time; it is still alive to the value of literary culture, and endeavours by minute attention to style to produce new effects. Though it was not one of the great eras in the annals of literature, yet the century which produced Martial, Juvenal and Tacitus cannot be pronounced barren in literary originality, nor that which produced Seneca and Quintilian devoid of culture and literary taste.

This fourth period is itself subdivided into three divisions: (1) from the accession of Tiberius to the death of Nero, 68—the most important part of it being the Neronian age, 54 to 68; (2) the Flavian era, from the death of Nero to the death of Domitian, 96; (3) the reigns of Nerva and Trajan and part of the reign of Hadrian.

Period from Tiberius to Nero.

1. For a generation after the death of Augustus no new original literary force appeared. The later poetry of the Augustan age had ended in trifling dilettantism, for the continuance of which the atmosphere of the court was no longer favourable. The class by which literature was encouraged had become both enervated and terrorized. The most remarkable poetical product of the time is the long-neglected astrological poem of Manilius which was written at the beginning of Tiberius's reign. Its vigour and originality have had scanty justice done to them owing to the difficulty of the subject-matter and the style, and the corruptions which still disfigure its text. Very different has been the fate of the *Fables* of Phaedrus. This slight work of a Macedonian freedman, destitute of national significance and representative in its morality only of the spirit of cosmopolitan individualism, owes its vogue to its easy Latinity and popular subject-matter. Of the prose writers C. Velleius Paterculus, the historian, and Valerius Maximus, the collector of anecdotes, are the most important. A. Cornelius Celsus composed a series of technical handbooks, one of which, upon medicine, has survived. Its purity of style and the fact that it was long a standard work entitle it to a mention here. The traditional culture was still, however, maintained, and the age was rich in grammarians and rhetoricians. The new profession of the *delator* must have given a stimulus to oratory. A high ideal of culture, literary as well as practical, was realized in Germanicus, which seems to have been transmitted to his daughter Agrippina, whose patronage of Seneca had important results in the next generation. The reign of Claudius was a time in which antiquarian learning, grammatical studies, and jurisprudence were cultivated, but no important additions were made to literature. A fresh impulse was given to letters on the accession of Nero, and this was partly due to the theatrical and artistic tastes of the young emperor. Four writers of the Neronian age still possess considerable interest,—L. Annaeus Seneca, M. Annaeus Lucanus, A. Persius Flaccus and Petronius Arbiter. The first three represent the spirit of their age by exhibiting the power of the Stoic philosophy as a moral, political and religious force; the last is the most cynical exponent of the depravity of the time. Seneca (*c.* 5 B.C.–A.D. 65) is less than Persius a pure Stoic, and more of a moralist and pathological observer of man's inner life. He makes the commonplaces of a cosmopolitan philosophy interesting by his abundant illustration drawn from the private and social life of his contemporaries. He has knowledge of the world, the suppleness of a courtier, Spanish vivacity, and the *ingenium amoenum* attributed to him by Tacitus, the fruit of which is sometimes seen in the "honeyed phrases" mentioned by Petronius—pure aspirations combined with inconsistency of purpose—the inconsistency of one who tries to make the best of two worlds, the ideal inner life and the successful real life in the atmosphere of a most corrupt court. The *Pharsalia* of Lucan (39–65), with Cato as its hero, is essentially a Stoic manifesto of the opposition. It is written with the force and fervour of extreme youth and with the literary ambition of a race as yet new to the discipline of intellectual culture, and is characterized by rhetorical rather than poetical imagination. The six short *Satires* of Persius (34–62) are the purest product of Stoicism—a Stoicism that had found in a contemporary, Thrasea, a more rational and practical hero than Cato. But no important writer of antiquity has less literary charm than Persius. In avoiding the literary conceits and fopperies which he satirizes he has recourse to the most unnatural contortions of expression. Of hardly greater length are the seven eclogues of T. Calpurnius Siculus, written at the beginning of the reign of Nero, which are not without grace and facility of diction. Of the works of the time that which from a human point of view is perhaps the most detestable in ancient literature has the most genuine literary quality, the fragment of a prose novel—the *Satyricon*—of Petronius (d. 66). It is most sincere in its representation, least artificial in diction, most penetrating in its satire, most just in its criticism of art and style.

Age of Domitian.

2. A greater sobriety of tone was introduced both into life and literature with the accession of Vespasian. The time was, however, characterized rather by good sense and industry than by original genius. Under Vespasian C. Plinius Secundus, or Pliny the elder (compiler of the *Natural History*, an encyclopaedic treatise, 23–79), is the most important prose writer, and C. Valerius Flaccus Setinus Balbus, author of the *Argonautica* (d. *c.* 90), the most important among the writers of poetry. The reign of Domitian, although it silenced the more independent spirits of the time, Tacitus and Juvenal, witnessed more important contributions to Roman literature than any age since the Augustan,—among them the *Institutes* of Quintilian, the *Punic War* of Silius Italicus, the epics and the *Silvae* of Statius, and the *Epigrams* of Martial. M. Fabius Quintilianus, or Quintilian (*c.* 35–95), is brought forward by Juvenal as a unique instance of a thoroughly successful man of letters, of one not belonging by birth to the rich or official class, who had risen to wealth and honours through literature. He was well adapted to his time by his good sense and sobriety of judgment. His criticism is just and true rather than subtle or ingenious, and has thus stood the test of the judgment of after-times. The poem of Ti. Catius Silius Italicus (25–101) is a proof of the industry and literary ambition of members of the rich official class. Of the epic poets of the Silver Age P. Papinius Statius (*c.* 45–96) shows the greatest technical skill and the richest pictorial fancy in the execution of detail; but his epics have no true inspiring motive, and, although the recitation of the *Thebaid* could attract and charm an audience in the days of Juvenal, it really belongs to the class of poems so unsparingly condemned both by him and Martial. In the *Silvae*, though many of them have little root in the deeper feelings of human nature, we find occasionally more than in any poetry after the Augustan age something of the purer charm and pathos of life. But it is not in the *Silvae*, nor in the epics and tragedies of the time, nor in the cultivated criticism of Quintilian that the age of Domitian lives for us. It is in the *Epigrams* of M. Valerius Martialis or Martial (*c.* 41–104) that we have a true image of the average sensual frivolous life of Rome at the end of the 1st century, seen through a medium of wit and humour, but undistorted by the exaggeration which moral indignation and the love of effect add to the representation of Juvenal. Martial represents his age in his *Epigrams*, as Horace does his in his *Satires* and *Odes*, with more variety and incisive force in his sketches, though with much less poetic charm and serious meaning. We know the daily life, the familiar personages, the outward aspect of Rome in the age of Domitian

better than at any other period of Roman history, and this knowledge we owe to Martial.

Period of Nerva, Trajan and Hadrian.

3. But it was under Nerva and Trajan that the greatest and most truly representative works of the empire were written. The *Annals* and *Histories* of Cornelius Tacitus (54–119), with the supplementary *Life of Agricola* and the *Germania*, and the *Satires* of D. Iunius Iuvenalis or Juvenal (*c.* 47–130), sum up for posterity the moral experience of the Roman world from the accession of Tiberius to the death of Domitian. The generous scorn and pathos of the historian acting on extraordinary gifts of imaginative insight and characterization, and the fierce indignation of the satirist finding its vent in exaggerating realism, doubtless to some extent warped their impressions; nevertheless their works are the last voices expressive of the freedom and manly virtue of the ancient world. In them alone among the writers of the empire the spirit of the Roman republic seems to revive. The *Letters* of C. Plinius Caecilius Secundus or Pliny the Younger (61-*c.* 115), though they do not contradict the representation of Tacitus and Juvenal regarded as an exposure of the political degradation and moral corruption of prominent individuals and classes, do much to modify the pervadingly tragic and sombre character of their representation.

With the death of Juvenal, the most important part of whose activity falls in the reign of Trajan, Latin literature as an original and national expression of the experience, character, and sentiment of the Roman state and empire, and as one of the great literatures of the world, may be considered closed.

Later Writers.

What remains to describe is little but death and decay. Poetry died first; the paucity of writings in verse is matched by their insignificance. For two centuries after Juvenal there are no names but those of Q. Serenus Sammonicus, with his pharmacopoeia in verse (*c.* 225), and M. Aurelius Olympius Nemesianus, who wrote a few feeble eclogues and (283) a dull piece on the training of dogs for the chase. Towards the middle of the 4th century we have Decimus Magnus Ausonius, a professor of Bordeaux and afterwards consul (379), whose style is as little like that of classical poetry as is his prosody. His *Mosella*, a detailed description of the river Moselle, is the least unattractive of his works A little better is his contemporary, Rufius Festus Avienus, who made some free translations of astronomical and geographical poems in Greek. A generation later, in what might be called the expiring effort of Latin poetry, appeared two writers of much greater merit. The first is Claudius Claudianus (*c.* 400), a native of Alexandria and the court poet of the emperor Honorius and his minister Stilicho. Claudian may be properly styled the last of the poets of Rome. He breathes the old national spirit, and his mastery of classical idiom and versification is for his age extraordinary. Something of the same may be seen in Rutilius Namatianus, a Gaul by birth, who wrote in 416 a description of his voyage from the capital to his native land, which contains the most glowing eulogy of Rome ever penned by an ancient hand. Of the Christian "poets" only Aurelius Prudentius Clemens (*c.* 348–410) need be mentioned. He was well read in the ancient literature; but the task of embodying the Christian spirit in the classical form was one far beyond his powers.

Claudian.

Suetonius.

The vitality of the prose literature was not much greater though its complete extinction was from the nature of the case impossible. The most important writer in the age succeeding Juvenal was the biographer C. Suetonius Tranquillus (*c.* 75–160), whose work is more valuable for its matter than its manner. His style is simple and direct, but has hardly any other merit. A little later the rise of M. Cornelius Fronto (*c.* 100–175), a native of Cirta, marks the beginning of an African influence. Fronto, a distinguished orator and intimate friend of the emperor M. Aurelius, broke away from the traditional Latin of the Silver and Golden ages, and took as his models the pre-classical authors. The reaction was shortlived; but the same affectation of antiquity is seen in the writings of Apuleius, also an African, who lived a little later than Fronto and was a man of much greater natural parts. In his *Metamorphoses*, which were based upon a Greek original, he takes the wonderful story of the adventures of Lucius of Madaura, and interweaves the famous legend of Cupid and Psyche. His bizarre and mystical style has a strange fascination for the reader; but there is nothing Roman or Italian about it. Two epitomists of previous histories may be mentioned: Justinus (of uncertain date) who abridged the history of Pompeius Trogus, an Augustan writer; and P. Annius Florus, who wrote in the reign of Hadrian a rhetorical sketch based upon Livy. The *Historia Augusta*, which includes the lives of the emperors from Hadrian to Numerianus (117–284), is the work of six writers, four of whom wrote under Diocletian and two under Constantine. It is a collection of personal memoirs of little historical importance, and marked by puerility and poverty of style. Ammianus Marcellinus (*c.* 330–400) had a higher conception of the historian's function. His narrative of the years 353–378 (all that now remains) is honest and straightforward, but his diction is awkward and obscure. The last pagan prose writer who need be mentioned is Q. Aurelius Symmachus (*c.* 350–410), the author of some speeches and a collection of letters. All the art of his ornate and courtly periods cannot disguise the fact that there was nothing now for paganism to say.

Apuleius.

Christian writers.

It is in Christian writers alone that we find the vigour of life. The earliest work of Christian apologetics is the *Octavius* of Minucius Felix, a contemporary of Fronto. It is written in pure Latin and is strongly tinged by classical influences. Quite different is the work of "the fierce Tertullian," Q. Septimius Florens Tertullianus (*c.* 150–230), a native of Carthage, the most vigorous of the Latin champions of the new faith. His style shows the African revolt of which we have already spoken, and in its medley of archaisms, Graecisms and Hebraisms reveals the strength of the disintegrating forces at work upon the Latin language. A more commanding figure is that of Aurelius Augustinus or St Augustine (354–430), bishop of Hippo, who for comprehensiveness and dialectical power stands out in the same way as Hieronymus or St Jerome (*c.* 331 or 340–420), a native of Stridon in Dalmatia, does for many-sided learning and scholarship.

Grammarians.

The decline of literature proper was attended by an increased output of grammatical and critical studies. From the time of L. Aelius Stilo Praeconinus, who was the teacher of Varro and Cicero, much interest had been taken in literary and linguistic problems at Rome. Varro under the republic, and M. Verrius Flaccus in the Augustan age, had busied themselves with lexicography and etymology. The grammarian M. Valerius Probus (*c.* A.D. 60) was the first critical editor of Latin texts. In the next century we have Velius Longus's treatise *De Orthographia*, and then a much more important work, the *Noctes Atticae* of Aulus Gellius, and (*c.* 200) a treatise in verse by Terentianus, an African, upon Latin pronunciation, prosody and metre. Somewhat later are the commentators on Terence and Horace, Helenius Acro and Pomponius Porphyrio. The tradition was continued in the 4th century by Nonius Marcellus and C. Marius Victorinus, both Africans; Aelius Donatus, the grammarian and commentator on Terence and Virgil, Flavius Sosipater Charisius and Diomedes, and Servius, the author of a valuable commentary on Virgil. Ambrosius Macrobius Theodosius (*c.* 400) wrote a treatise on Cicero's *Somnium Scipionis* and seven books of miscellanies (*Saturnalia*); and Martianus Capella (*c.* 430), a native of Africa, published a compendium of the seven liberal arts, written in a mixture of prose and verse, with some literary pretensions. The last grammarian who need be named is the most widely known of all, the celebrated Priscianus, who published his text-book at Constantinople probably in the middle of the 5th century.

In jurisprudence, which may be regarded as one of the outlying regions of literature, Roman genius had had some of its greatest triumphs, and, if we take account of the "codes," was active to the end. The most distinguished of the early jurists (whose works are lost) were Q. Mucius Scaevola, who died in 82 B.C., and following him Ser. Sulpicius Rufus, who died in 43 B.C.

Jurists. In the Augustan age M. Antistius Labeo and C. Ateius Capito headed two opposing schools in jurisprudence, Labeo being an advocate of method and reform, and Capito being a conservative and empiricist. The strife, which reflects the controversy between the "analogists" and the "anomalists" in philology, continued long after their death. Salvius Julianus was entrusted by Hadrian with the task of reducing into shape the immense mass of law which had grown up in the edicts of successive praetors—thus taking the first step towards a code. Sex. Pomponius, a contemporary, wrote an important legal manual of which fragments are preserved. The most celebrated handbook, however, is the *Institutiones* of Gaius, who lived under Antonius Pius—a model of what such treatises should be. The most eminent of all the Roman jurists was Aemilius Papinianus, the intimate friend of Septimius Severus; of his works only fragments remain. Other considerable writers were the prolific Domitius Ulpianus (*c.* 215) and Julius Paulus, his contemporary. The last juristical writer of note was Herennius Modestinus (*c.* 240). But though the line of great lawyers had ceased, the effects of their work remained and are clearly visible long after in the "codes"—the code of Theodosius (438) and the still more famous code of Justinian (529 and 533), with which is associated the name of Tribonianus.

BIBLIOGRAPHY.—The most full and satisfactory modern account of Latin literature is M. Schanz's *Geschichte der römischen Litteratur.* The best in English is the translation by C. C. Warr of W. S. Teuffel and L. Schwabe's *History of Roman Literature.* J. W. Mackail's short *History of Latin Literature* is full of excellent literary and aesthetic criticisms on the writers. C. Lamarre's *Histoire de la littérature latine* (1901, with specimens) only deals with the writers of the republic. W. Y. Sellar's *Roman Poets of the Republic and Poets of the Augustan Age,* and R. Y. Tyrrell's *Lectures on Latin Poetry,* will also be found of service. A concise account of the various Latin writers and their works, together with bibliographies, is given in J. E. B. Mayor's *Bibliographical Clue to Latin Literature* (1879), which is based on a German work by E. Hübner. See also the separate bibliographies to the articles on individual writers.

(W. Y. S.; J. P. P.)

LATINUS, in Roman legend, king of the aborigines in Latium, and eponymous hero of the Latin race. In Hesiod (*Theogony,* 1013) he is the son of Odysseus and Circe, and ruler of the Tyrsenians; in Virgil, the son of Faunus and the nymph Marica, a national genealogy being substituted for the Hesiodic, which probably originated from a Greek source. Latinus was a shadowy personality, invented to explain the origin of Rome and its relations with Latium, and only obtained importance in later times through his legendary connexion with Aeneas and the foundation of Rome. According to Virgil (*Aeneid,* vii.-xii.), Aeneas, on landing at the mouth of the Tiber, was welcomed by Latinus, the peaceful ruler whose seat of government was Laurentum, and ultimately married his daughter Lavinia.

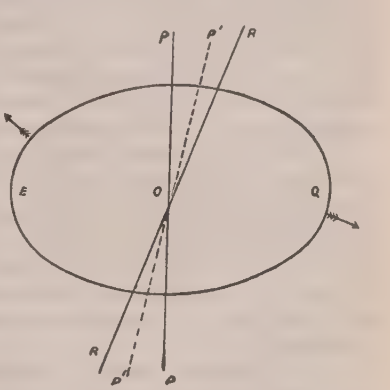
Other accounts of Latinus, differing considerably in detail, are to be found in the fragments of Cato's *Origines* (in Servius's commentary on Virgil) and in Dionysius of Halicarnassus; see further authorities in the article by J. A. Hild, in Daremberg and Saglio, *Dictionnaire des antiquités.*

LATITUDE (Lat. *latitudo, latus,* broad), a word meaning breadth or width, hence, figuratively, freedom from restriction, but more generally used in the geographical and astronomical sense here treated. The latitude of a point on the earth's surface is its angular distance from the equator, measured on the curved surface of the earth. The direct measure of this distance being impracticable, it has to be determined by astronomical observations. As thus determined it is the angle between the direction of the plumb-line at the place and the plane of the equator. This is identical with the angle between the horizontal planes at the place and at the equator, and also with the elevation of the celestial pole above the horizon (see ASTRONOMY). Latitude thus determined by the plumb-line is termed *astronomical.* The *geocentric latitude* of a place is the angle which the line from the earth's centre to the place makes with the plane of the equator. *Geographical latitude,* which is used in mapping, is based on the supposition that the earth is an elliptic spheroid of known compression, and is the angle which the normal to this spheroid makes with the equator. It differs from the astronomical latitude only in being corrected for local deviation of the plumb-line.

The latitude of a celestial object is the angle which the line drawn from some fixed point of reference to the object makes with the plane of the ecliptic.

Variability of Terrestrial Latitudes.—The latitude of a point on the earth's surface, as above defined, is measured from the equator. The latter is defined by the condition that its plane makes a right angle with the earth's axis of rotation. It follows that if the points in which this axis intersects the earth's surface, *i.e.* the poles of the earth, change their positions on the earth's surface, the position of the equator will also change, and therefore the latitudes of places will change also. About the end of the 19th century research showed that there actually was a very minute but measurable periodic change of this kind. The north and south poles, instead of being fixed points on the earth's surface, wander round within a circle about 50 ft. in diameter. The result is a variability of terrestrial latitudes generally.

To show the cause of this motion, let BQ represent a section of an oblate spheroid through its shortest axis, PP. We may consider this spheroid to be that of the earth, the ellipticity being greatly exaggerated. If set in rotation around its axis of figure PP, it will continue to rotate around that axis for an indefinite time. But if, instead of rotating around PP, it rotates around some other axis, RR, making a small angle, POR, with the axis of figure PP; then, it has been known since the time of Euler that the axis of rotation RR, if referred to the spheroid regarded as fixed, will gradually rotate round the axis of figure PP in a period defined in the following way:—If we put C = the moment of momentum of the spheroid around the axis of figure, and A = the corresponding moment around an axis passing through the equator EQ, then, calling one day the period of rotation of the spheroid, the axis RR will make a revolution around PP in a number of days represented by the fraction C/(C−A). In the case of the earth, this ratio is 1/0·0032813 or 305. It follows that the period in question is 305 days.



Up to 1890 the most careful observations and researches failed to establish the periodicity of such a rotation, though there was strong evidence of a variation of latitude. Then S. C. Chandler, from an elaborate discussion of a great number of observations, showed that there was really a variation of the latitude of the points of observation; but, instead of the period being 305 days, it was about 428 days. At first sight this period seemed to be inconsistent with dynamical theory. But a defect was soon found in the latter, the correction of which reconciled the divergence. In deriving a period of 305 days the earth is regarded as an absolutely rigid body, and no account is taken either of its elasticity or of the mobility of the ocean. A study of the figure will show that the centrifugal force round the axis RR will act on the equatorial protuberance of the rotating earth so as to make it tend in the direction of the arrows. A slight deformation of the earth will thus result; and the axis of figure of the distorted spheroid will no longer be PP, but a line P′P′ between PP and RR. As the latter moves round, P′P′ will continually follow it through the incessant change of figure produced by the change in the direction of the centrifugal force. Now the rate of motion of RR is determined by the actual figure at the moment. It is therefore less than the motion in an absolutely rigid spheroid in the proportion RP′: RP. It is found that, even though the earth were no more elastic than steel, its yielding combined with the mobility of the ocean would make this ratio about 2 : 3, resulting in an increase of the period by one-half, making it about 457 days. Thus this small flexibility is even greater than that necessary to the reconciliation of observation with theory, and the earth is shown to be more rigid than steel—a conclusion long since announced by Kelvin for other reasons.

Chandler afterwards made an important addition to the subject by showing that the motion was represented by the superposition of two harmonic terms, the first having a period of about 430 days, the other of one year. The result of this superposition is a seven-year period, which makes 6 periods of the 428-day term ($428^d \times 6 = 2568^d = 7$ years, nearly), and 7 periods of the annual term. Near one phase of this combined period the two component motions nearly annul each other, so that the variation is then small, while at the opposite phase, 3 to 4 years later, the two motions are in the same direction and the range of variation is at its maximum. The coefficient of the 428-day term seems to be between 0·12″ and 0·16″; that of the annual term between 0·06″ and 0·11″. Recent observations give smaller values of both than those made between 1890 and 1900, and there is no reason to suppose either to be constant.

The present state of the theory may be summed up as follows:—

1. The fourteen-month term is an immediate result of the fact that the axes of rotation and figure of the earth do not strictly coincide, but make with each other a small angle of which the mean value is about 0·15″. If the earth remained invariable, without any motion of matter on its surface, the result of this non-coincidence would be the revolution of the one pole round the other in a circle of radius 0·15″, or about 15 ft., in a period of about 429 days. This revolution is called the *Eulerian motion*, after the mathematician who discovered it. But owing to meteorological causes the motion in question is subject to annual changes. These changes arise from two causes—the one statical, the other dynamical.

2. The statical causes are deposits of snow or ice slowly changing the position of the pole of figure of the earth. For example, a deposit of snow in Siberia would bring the equator of figure of the earth a little nearer to Siberia and throw the pole a little way from it, while a deposit on the American continent would have the opposite effect. Owing to the approximate symmetry of the American and Asiatic continents it does not seem likely that the inequality of snowfall would produce an appreciable effect.

3. The dynamical causes are atmospheric and oceanic currents. Were these currents invariable their only effect would be that the Eulerian motion would not take place exactly round the mean pole of figure, but round a point slightly separated from it. But, as a matter of fact, they are subject to an annual variation. Hence the motion of the pole of rotation is also subject to a similar variation. The annual term in the latitude is thus accounted for.

Besides Chandler, Albrecht of Berlin has investigated the motion of the pole P. The methods of the two astronomers are in some points different. Chandler has constructed empirical formulae representing the motion, with the results already given, while Albrecht has determined the motion of the pole from observation simply, without trying to represent it either by a formula or by theory. It is noteworthy that the difference between Albrecht's numerical results and Chandler's formulae is generally less than 0·05″.

When the fluctuation in the position of the pole was fully confirmed, its importance in astronomy and geodesy led the International Geodetic Association to establish a series of stations round the globe, as nearly as possible on the same parallel of latitude, for the purpose of observing the fluctuation with a greater degree of precision than could be attained by the miscellaneous observations before available. The same stars were to be observed from month to month at each station with zenith-telescopes of similar approved construction. This secures a double observation of each component of the polar motion, from which most of the systematic errors are eliminated. The principal stations are: Carloforte, Italy; Mizusawa, Japan; Gaithersburg, Maryland; and Ukiah, California, all nearly on the same parallel of latitude, 39° 8′.

The fluctuations derived from this international work during the last seven years deviate but slightly from Chandler's formulae though they show a markedly smaller value of the annual term. In consequence, the change in the amplitude of the fluctuation through the seven-year period is not so well marked as before 1900.

Chandler's investigations are found in a series of papers published in the *Astronomical Journal*, vols. xi. to xv. and xviii. Newcomb's explanation of the lengthening of the Eulerian period is found in the *Monthly Notices of the Royal Astronomical Society* for March 1892. Later volumes of the *Astronomical Journal* contain discussions of the causes which may produce the annual fluctuation. An elaborate mathematical discussion of the theory is by Vito Volterra: "Sulla teoria dei movimenti del Polo terrestre" in the *Astronomische Nachrichten*, vol. 138; also, more fully in his memoir "Sur la théorie des variations des latitudes," *Acta Mathematica*, vol. xxii. The results of the international observations are discussed from time to time by Albrecht in the publications of the International Geodetic Association, and in the *Astronomische Nachrichten* (see also EARTH, FIGURE OF). (S. N.)

LATIUM,[1] in ancient geography, the name given to the portion of central Italy which was bounded on the N.W. by Etruria, on the S.W. by the Tyrrhenian Sea, on the S.E. by Campania, on the E. by Samnium and on the N.E. by the mountainous district inhabited by the Sabini, Aequi and Marsi. The name was, however, applied very differently at different times. Latium originally means the land of the Latini, and in this sense, which alone is in use historically, it was a tract of limited extent; but after the overthrow of the Latin confederacy, when the neighbouring tribes of the Rutuli, Hernici, Volsci and Aurunci, as well as the Latini properly so called, were reduced to the condition of subjects and citizens of Rome, the name of Latium was extended to comprise them all. It thus denoted the whole country from the Tiber to the mouth of the Savo, and just included the Mons Massicus, though the boundary was not very precisely fixed (see below). The change thus introduced, though already manifest in the composition of the Latin league (see below) was not formally established till the reign of Augustus, who formed of this larger Latium and Campania taken together the first region of Italy; but it is already recognized by Strabo (v. 3. 2. p. 228), as well as by Pliny, who terms the additional territory thus incorporated *Latium Adjectum*, while he designates the original Latium, extending from the Tiber to Circeii, as *Latium Antiquum*.

1. LATIUM ANTIQUUM consisted principally of an extensive plain, now known as the Campagna di Roma, bounded towards the interior by the Apennines, which rise very abruptly from the plains to a height of between 4000 and 5000 ft. Several of the Latin cities, including Tibur and Praeneste, were situated on the terrace-like underfalls of these mountains,[2] while Cora, Norba and Setia were placed in like manner on the slopes of the Volscian mountains (Monti Lepini), a rugged and lofty limestone range, which runs parallel to the main mass of the Apennines, being separated from them, however, by the valley of the Trerus (Sacco), and forms a continuous barrier from there to Terracina. No volcanic eruptions are known to have taken place in these mountains within the historic period, though Livy sometimes speaks of it "raining stones in the Alban hills" (i. 31, xxxv. 9—on the latter occasion it even did so on the Aventine). It is asserted, too, that some of the earliest tombs of the necropolis of Alba Longa (*q.v.*) were found beneath a stratum of peperino. Earthquakes (not of a violent character within recent centuries, though the ruin of the Colosseum is probably to be ascribed to this cause) are not unknown even at the present day in Rome and in the Alban Hills, and a seismograph has been established at Rocca di Papa. The surface is by no means a uniform plain, but is a broad undulating tract, furrowed throughout by numerous depressions, with precipitous banks, serving as water-courses, though rarely traversed by any considerable stream. As the general level of the plain rises gradually, though almost imperceptibly, to the foot of the Apennines, these channels by degrees assume the character of ravines of a formidable description.

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[1] *Latium*, from the same root as *lătus*, side; *later*, brick; *πλατύς*, flat; Sans. *prath*: not connected with *lātus*, wide.

[2] In the time of Augustus the boundary of Latium extended as far E. as Treba (Trevi), 12 m. S.E. of Sublaqueum (Subiaco).

Geology. Four main periods may be distinguished in the geological history of Rome and the surrounding district. The hills on the right bank of the Tiber culminating in Monte Mario (455 ft.) belong to the first of these, being of the Pliocene formation; they consist of a lower bluish-grey clay and an upper group of yellow sands and gravels. This clay since Roman times has supplied the material for brick-making, and the valleys which now separate the different summits (Janiculum, Vatican, Monte Mario) are in considerable measure artificial. On the left bank this clay has been reached at a lower level, at the foot of the Pincian Hill, while in the Campagna it has been found to extend below the later volcanic formations. The latter may be divided into two groups, corresponding to the second and third periods. In the second period volcanic activity occurred at the bottom of the Pliocene sea, and the tufa, which extends over the whole Campagna to a thickness of 300 ft. or more, was formed. At the same time, hot springs, containing abundant carbonate of lime in solution, produced deposits of travertine at various points. In the third, after the Campagna, by a great general uplift, had become a land surface, volcanic energy found an outlet in comparatively few large craters, which emitted streams of hard lava as well as fragmentary materials, the latter forming sperone (*lapis Gabinus*) and peperino (*lapis Albanus*), while upon one of the former, which runs from the Alban Hills to within 2 m. of Rome, the Via Appia was carried. The two main areas near Rome are formed by the group of craters on the north (Bracciano, Bolsena, &c.) and the Alban Hills on the south, the latter consisting of one great crater with a base about 12 m. in diameter, in the centre of which a smaller crater was later on built up (the basin is now known as the Campo di Annibale) with several lateral vents (the Lake of Albano, the Lake of Nemi, &c.). The Alban Mount (Monte Cavo) is almost the highest point on the rim of the inner crater, while Mount Algidus and Tusculum are on the outer ring wall of the larger (earlier) crater.

The fourth period is that in which the various subaërial agencies of abrasion, and especially the streams which drain the mountain chain of the Apennines, have produced the present features of the Campagna, a plain furrowed by gullies and ravines. The communities which inhabited the detached hills and projecting ridges which later on formed the city of Rome were in a specially favourable position. These hills (especially the Palatine, the site of the original settlement) with their naturally steep sides, partly surrounded at the base by marshes and situated not far from the confluence of the Anio with the Tiber, possessed natural advantages not shared by the other primitive settlements of the district; and their proximity to one another rendered it easy to bring them into a larger whole. The volcanic materials available in Rome and its neighbourhood were especially useful in building. The tufa, sperone and peperino were easy to quarry, and could be employed by those who possessed comparatively elementary tools, while travertine, which came into use later, was an excellent building stone, and the lava (*selce*) served for paving stones and as material for concrete. The strength of the renowned Roman concrete is largely due to the use of pozzolana (see PUTEOLI), which also is found in plenty in the Campagna.

Between the volcanic tract of the Campagna and the sea there is a broad strip of sandy plain, evidently formed merely by the accumulation of sand from the sea, and constituting a barren tract, still covered almost entirely with wood as it was in ancient times, except for the almost uninterrupted line of villas along the ancient coastline, which is now marked by a line of sandhills, some ½ m. or more inland (see LAVINIUM, TIBER). This long belt of sandy shore extends without a break for a distance of above 30 m. from the mouth of the Tiber to the promontory of Antium (Porto d'Anzio), a low rocky headland, projecting out into the sea, and forming the only considerable angle in this line of coast. Thence again a low sandy shore of similar character, but with extensive shore lagoons which served in Roman times and serve still for fish-breeding, extends for about 24 m. to the foot of the Monte Circeo (*Circeius Mons*, *q.v.*). The region of the Pomptine Marshes (*q.v.*) occupies almost the whole tract between the sandy belt on the sea-shore and the Volscian mountains, extending from the southern foot of the Alban Hills below Velletri to the sea near Terracina.

Drainage. The district sloping down from Velletri to the dead level of the Pontine (Pomptine) Marshes has not, like the western and northern slopes of the Alban Hills, drainage towards the Tiber. The subsoil too is differently formed: the surface consists of very absorbent materials, then comes a stratum of less permeable tufa or peperino (sometimes clay is present), and below that again more permeable materials. In ancient, and probably pre-Roman, times this district was drained by an elaborate system of *cuniculi*, small drainage tunnels, about 5 ft. high and 2 ft. wide, which ran, not at the bottom of the valleys, where there were sometimes streams already, and where, in any case, erosion would have broken through their roofs, but along their slopes, through the less permeable tufa, their object being to drain the hills on each side of the valleys. They had probably much to do with the relative healthiness of this district in early times. Some of them have been observed to be earlier in date than the Via Appia (312 B.C.). They were studied in detail by R. de la Blanchère. When they fell into desuetude, malaria gained the upper hand, the lack of drainage providing breeding-places for the malarial mosquito. Remains of similar drainage channels exist in many parts of the Campagna Romana and of southern Etruria at points where the natural drainage was not sufficient, and especially in cultivated or inhabited hills (though it was not necessary here, as in the neighbourhood of Velletri, to create a drainage system, as streams and rivers were already present as natural collectors) and streams very frequently pass through them at the present day. The drainage channels which were dug for the various crater lakes in the neighbourhood of Rome are also interesting in this regard. That of the Alban Lake is the most famous; but all the other crater lakes are similarly provided. As the drainage by *cuniculi* removed the moisture in the subsoil, so the drainage of the lakes by *emissaria*, outlet channels at a low level, prevented the permeable strata below the tufa from becoming impregnated with moisture which they would otherwise have derived from the lakes of the Alban Hills. The slopes below Velletri, on the other hand, derive much of their moisture from the space between the inner and outer ring of the Alban volcano, which it was impossible to drain: and this in turn receives much moisture from the basin of the extinct inner crater.[1]

Prehistoric remains. Numerous isolated palaeolithic objects of the Mousterian type have been found in the neighbourhood of Rome in the quaternary gravels of the Tiber and Anio; but no certain traces of the neolithic period have come to light, as the many flint implements found sporadically round Rome probably belong to the period which succeeded neolithic (called by Italian archaeologists the eneolithic period) inasmuch as both stone and metal (not, however, bronze, but copper) were in use.[2] At Sgurgola, in the valley of the Sacco, a skeleton was found in a rock-cut tomb of this period which still bears traces of painting with cinnabar. A similar rock-cut tomb was found at Mandela, in the Anio valley. Both are outside the limits of the Campagna in the narrower sense; but similar tombs were found (though less accurately observed) in travertine quarries between Rome and Tivoli. Objects of the Bronze age too have only been found sporadically. The earliest cemeteries and hut foundations of the Alban Hills belong to the Iron age, and cemeteries and objects of a similar character have been found in Rome itself and in southern Etruria, especially the characteristic hut-urns. The objects found in these cemeteries show close affinity with those found in the terremare of Emilia, these last being of earlier date, and hence Pigorini and Helbig consider that the Latini were close descendants of the inhabitants of the terremare. On the other hand, the ossuaries of the Villanova type, while they occur as far south as Veii and Caere, have never so far been found on the left bank of the Tiber, in Latium proper (see L. Pigorini in *Rendiconti dei Lincei*, ser. v. vol. xvi., 1907, p. 676, and xviii., 1909). We thus have at the beginning of the Iron age two distinct currents of civilization in central Italy, the Latin and that of Villanova. As to the dates to which these are to be attributed, there is not as yet complete accord, *e.g.* some archaeologists assign to the 11th, others (and with far better reasons) to the 8th century B.C., the earliest tombs of the Alban necropolis and the coeval tombs of the necropolis recently discovered in the Forum at Rome. In this last necropolis cremation seems slightly to precede inhumation in date.

For the prehistoric period see *Bullettino di paleontologia Italiana*, *passim*, B. Modestov, *Introduction à l'histoire romaine* (Paris, 1907), and T. E. Peet, *The Stone and Bronze Ages in Italy* (Oxford, 1909).

Latin League. It is uncertain to what extent reliance can be placed upon the traditional accounts of the gradual spread of the supremacy of Rome in Latium, and the question cannot be discussed here.[3] The list of the thirty communities belonging to the Latin league, given by Dionysius of Halicarnassus

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[1] See R. de la Blanchère in Daremberg and Saglio, *Dictionnaire des antiquités*, s.vv. *Cuniculus*, *Emissarium*, and the same author's *Chapitre d'histoire pontine* (Paris, 1889).

[2] See G. A. Colini in *Bullettino di palentologia Italiana*, xxxi. (1905).

[3] The most important results will be found stated at the outset of the articles ROME: *History* (the chief being that the Plebeians of Rome probably consisted of Latins and the Patricians of Sabines), LIGURIA, SICULI and ARICIA. For the Etruscan dominion in the Latin plain see ETRURIA. Special mention may here be made of one or two points of importance. The legends represent the Latins of the historical period as a fusion of different races, Ligures, Veneti and Siculi among them; the story of the alliance of the Trojan settler Aeneas with the daughter of Latinus, king of the aborigines, and the consequent enmity of the Rutulian prince Turnus, well known to readers of Virgil, is thoroughly typical of the reflection of these distant ethnical phenomena in the surviving traditions. In view of the historical significance of the NO- ethnicon (see SABINI) it is important to observe that the original form of the ethnic adjective no doubt appears in the title of *Juppiter Latiaris* (not *Latinus*); and that Virgil's description of the descent of the noble Drances at Latinus's court (Aen. xi. 340)—*genus huic materna superbum Nobilitas dabat, incertum de patre ferebat*—indicates a very different system of family ties from the famous *patria potestas* and agnation of the Patrician and Sabine clans. (R. S. C.)

(v. 61), is, however, of great importance. It is considered by Th. Mommsen (*Roman History*, i. 448) that it dates from about the year 370 B.C., to which period belong the closing of the confederacy, no fresh communities being afterwards admitted to it, and the consequent fixing of the boundaries of Latium. The list is as follows: Ardeates, Aricini, Bovillani,[1] Bubentani, Cabani, Carventani, Circeiates, Coriolani, Corbintes, Corni (probably Corani), Fortinei (?), Gabini, Laurentini, Lavinates, Labicani, Lanuvini, Nomentani, Norbani, Praenestini, Pedani, Querquetulani, Satricani, Scaptini, Setini, Tellenii, Tiburtini, Tolerini, Tusculani, Veliterni.

These communities may be briefly described according to their geographical arrangement. Laurentum and Lavinium, names so conspicuous in the legendary history of Aeneas, were situated in the sandy strip near the sea-coast—the former only 8 m. S.E. of Ostia, which was from the first merely the port of Rome, and never figured as an independent city. Farther S.E. again lay Ardea, the ancient capital of the Rutuli, and some distance beyond that Antium, situated on the sea-coast, which does not occur in the list of Dionysius, and is, in the early annals of Rome, called a Volscian town—even their chief city. On the southern underfalls of the Alban mountains, commanding the plain at the foot, stood Lanuvium and Velitrae; Aricia rose on a neighbouring hill, and Corioli was probably situated on the lower slopes. The village of the Cabani (probably identical with the Cabenses) is possibly to be sought on the site of the modern Rocca di Papa, N. of Monte Cavo. The more important city of Tusculum occupied one of the northern summits of the same group; while opposite to it, in a commanding situation on a lofty offshoot of the Apennines, rose Praeneste, now Palestrina. Bola and Pedum were probably in the same neighbourhood, Labici on an outlying summit (Monte Compatri) of the Alban Hills below Tusculum, and Corbio (probably at Rocca Priora) on a rocky summit east of the same city. Tibur (Tivoli) occupied a height commanding the outlet of the river Anio. Corniculum, farther west, stood on the summit of one of three conical hills that rise abruptly out of the plain at the distance of a few miles from Monte Gennaro, the nearest of the Apennines, and which were thence known as the Montes Corniculani. Nomentum was a few miles farther north, between the Apennines and the Tiber, and close to the Sabine frontier. The boundary between the two nations was indeed in this part very fluctuating. Nearly in the centre of the plain of the Campagna stood Gabii; Bovillae was also in the plain, but close to the Appian Way, where it begins to ascend the Alban Hills. Several other cities—Tellenae, Scaptia and Querquetulum—mentioned in the list of Dionysius were probably situated in the Campagna, but the site cannot be determined. Satricum, on the other hand, was certainly south of the Alban Hills, between Velitrae and Antium; while Cora, Norba and Setia (all of which retain their ancient names with little modification) crowned the rocky heights which form advanced posts from the Volscian mountains towards the Pontine Marshes. Carventum possibly occupied the site of Rocca Massima N. of Cori, and Tolerium was very likely at Valmontone in the valley of the Sacco (anc. Trerus or Tolerus). The cities of the Bubentani and Fortinei are quite unknown.

A considerable number of the Latin cities had before 370 B.C. either been utterly destroyed or reduced to subjection by Rome, and had thus lost their independent existence. Such were Antemnae and Caenina, both of them situated within a few miles of Rome to the N., the conquest of which was ascribed to Romulus; Fidenae, about 5 m. N. of the city, and close to the Tiber; and Crustumerium, in the hilly tract farther north towards the Sabine frontier. Suessa Pometia also, on the borders of the Pontine Marshes, to which it was said to have given name, was a city of importance, the destruction of which was ascribed to Tarquinius Superbus. In any case it had disappeared before 370 B.C., as it does not occur in the list of the Latin league attributable to that date. It is probably to be sought between Velletri and Cisterna. But by far the most important of these extinct cities was Alba, on the lake to which it gave its name, which was, according to universally received tradition, the parent of Rome, as well as of numerous other cities within the limits of Latium, including Gabii, Fidenae, Collatia, Nomentum and other well-known towns. Whether or not this tradition deserves to rank as historical, it appears certain that at a still earlier period there existed a confederacy of thirty towns, of which Alba was the supreme head. A list of those who were wont to participate in the sacrifices on the Alban Mount is given us by Pliny (*N.H.* iii. 5. 69) under the name of *populi albenses*, which includes only six or at most eight of those found in the list of Dionysius;[2] and these for the most part among the more obscure and least known of the names given by him. Many of the rest are unknown; while the more powerful cities of Aricia, Lanuvium and Tusculum, though situated immediately on the Alban Hills, are not included, and appear to have maintained a wholly independent position. This earlier league was doubtless broken up by the fall of Alba; it was probably the increasing power of the Volsci and Aequi that led to the formation of the later league, including all the more powerful cities of Latium, as well as to the alliance concluded by them with the Romans in the consulship of Spurius Cassius (493 B.C.). Other cities of the Latin league had already (according to the traditional dates) received Latin colonies—Velitrae (494 B.C.), Norba (492), Ardea (442), Labici (418), Circei (393), Satricum (385), Setia (382).

The cities of the Latin league continued to hold general meetings or assemblies from time to time at the grove of the Aqua Ferentina, a sanctuary at the foot of the Alban Hills, perhaps in a valley below Marino, while they had also a common place of worship on the summit of the Alban Mount (Monte Cavo), where stood the celebrated temple of Jupiter Latiaris. The participation in the annual sacrifices at this sanctuary was regarded as typical of a Latin city (hence the name "prisci Latini" given to the participating peoples); and they continued to be celebrated long after the Latins had lost their independence and been incorporated in the Roman state.[3]

Roman supremacy.

We are on firmer ground in dealing with the spread of the supremacy of Rome in Latium when we take account of the foundation of new colonies and of the formation of new tribes, processes which as a rule go together. The information that we have as to the districts in which the sixteen earliest clans (*tribus rusticae*)[4] were settled shows us that, except along the Tiber, Rome's dominion extended hardly more than 5 m. beyond the city gates (Mommsen, *History of Rome*, i. 58). Thus, towards the N. and E. we find the towns of Antemnae, Fidenae, Caenina and Gabii;[5] on the S.E., towards Alba, the boundary of Roman territory was at the Fossae Cluiliae, 5 m. from Rome, where Coriolanus encamped (Livy ii. 39), and, on the S., towards Laurentum at the 6th mile, where sacrifice to Terminus was made (Ovid, *Fasti*, ii. 681): the Ambarvalia too were celebrated even in Strabo's day (v. 3. 3. p. 230) at a place called Φῆστοι between the 5th and 6th mile. The identification (cf. Hülsen in Pauly-Wissowa, *Realencyclopädie*, vi. 2223) of this locality with the grove of the Arval brothers at the 5th mile of the Via Portuensis, to the W. of Rome, and of the Ambarvalia with the festival celebrated by this brotherhood in May of each year, is now generally accepted. But Roman sway must either from the first, or very soon, have extended to Ostia, the port of Rome at the mouth of the Tiber: and it was as the emporium of Latium that Rome acquired her first importance.[6]

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[1] The MSS. read βοϊλλανῶν or βοϊλανῶν: the Latin translation has Bolanorum. It is difficult to say which is to be preferred. The list gives only twenty-nine names, and Mommsen proposes to insert Signini.

[2] Albani, Aesolani (probably E. of Tibur), Accienses, Abolani, Bubetani, Bolani, Cusuetani (Carventani ?), Coriolani, Fidenates, Foreti (Fortinei ?), Hortenses (near Corbio), Latinienses (near Rome itself), Longani, Manates, Macrales, Munienses (Castrimoenienses ?), Numinienses, Olliculani, Octulani, Pedani, Poletaurini, Querquetulani, Sicani, Sisolenses, Tolerienses, Tutienses (not, one would think, connected with the small stream called Tutia at the 6th mile of the Via Salaria; Liv. xxvi. 11), Vimitellari, Velienses, Venetulani, Vitellenses (not far from Corbio).

[3] To an earlier stage of the Latin league, perhaps to about 430 B.C. (Mommsen, *op. cit.* 445 n. 2) belongs the dedication of the grove of Diana by a *dictator Latinus*, in the name of the people of Tusculum, Aricia, Lanuvium, Laurentum, Cora, Tibur, Suessa Pometia and Ardea.

[4] Of the *gentes* from which these tribes took their names, six entirely disappeared in later days, while the other ten can be traced as patrician—a proof that the patricians were not noble families in origin (Mommsen, *Römische Forschungen*, i. 106). For the tribes see W. Kubitschek, *De Romanarum tribuum origine* (Vienna, 1882).

[5] We have various traces of the early antagonism to Gabii, *e.g.* the opposition between *ager Romanus* and *ager Gabinus* in the augural law.

[6] For the early extension of Roman territory towards the sea, cf. Festus, p. 213, Müll., *s.v.* "Pectuscum:" *Pectuscum Palati dicta est ea regio urbis, quam Romulus obversam posuit, ea parte, in qua plurimum erat agri Romani ad mare versus et qua mollissime adibatur Urbo, cum Etruscorum agrum a Romano Tiberis discluderet, ceterae vicinae civitates colles aliquos haberent oppositos.*

The primitive tribes.

The boundary of the *Ager Romanus antiquus* towards the north-west is similarly fixed by the festival of the Robigalia at the 5th milestone of the Via Clodia. Within this area fall the districts inhabited by the earliest tribes, so far as these are known to us. The *tribus Romilia* was settled on the right bank of the Tiber near the sanctuary of the Arvales, the *Galeria* perhaps a little farther west on the lower course of the stream now known as Galera, and the *Fabia* perhaps on the Cremera towards Veii. We know that the *pagus Lemonius* was on the Via Latina, and that the *tribus Pupinia* dwelt between Tusculum and the city, while the territory of the *Papiria* possibly lay nearer Tusculum, as it was to this tribe that the Roman citizens in Tusculum belonged in later days. It is possible that the *Camilia* was situated in the direction of Tibur, inasmuch as this town was afterwards enrolled in this tribe. The *tribus Claudia*, probably the last of the 16 older *tribus rusticae*, was according to tradition founded in 504 B.C. Its territory lay beyond the Anio, between Fidenae and Ficulea (Liv. ii. 16; Dion. Hal. v. 40). The locality of the *pagi* round which the other tribes were grouped is not known to us.

Road system.

With the earliest extensions of the Roman territory coincided the first beginnings of the Roman road system. The road to Ostia may have existed from the first: but after the Latin communities on the lower Anio had fallen under the dominion of Rome, we may well believe that the first portion of the Via Salaria, leading to Antemnae, Fidenae (the fall of which is placed by tradition in 428 B.C.) and Crustumerium, came into existence. The formation (according to the traditional dating in 495 or 471 B.C.) of the *tribus Clustumina* (the only one of the earlier twenty-one tribes which bears a local name) is both a consequence of an extension of territory and of the establishment of the assembly of the plebs by tribes, for which an inequality of the total number of divisions was desirable (Mommsen, *History of Rome*, i. 360). The correlative of the Via Salaria was the Via Campana, so called because it led past the grove of the Arvales along the right bank of the Tiber to the Campus Salinarum Romanarum,[1] the salt marshes, from which the Via Salaria took its name, inasmuch as it was the route by which Sabine traders came from the interior to fetch the salt. To this period would also belong the Via Ficulensis, leading to Ficulea, and afterwards prolonged to Nomentum, and the Via Collatina, which led to Collatia. Gabii became Roman in fairly early times, though at what period is uncertain, and with its subjugation must have originated the Via Gabina, afterwards prolonged to Praeneste. The Via Latina too must be of very early origin; and tradition places the foundation of the Latin colony at Signia (to which it led) as early as 495 B.C. Not long after the capture of Fidenae, the main outpost of Veii, the chief city itself fell (396 B.C.) and a road (still traceable) was probably made thither. There was also probably a road to Caere in early times, inasmuch as we hear of the flight of the Vestals thither in 389 B.C. The origin of the rest of the roads is no doubt to be connected with the gradual establishment of the Latin league. We find that while the later (long distance) roads bear as a rule the name of their constructor, all the short distance roads on the left bank of the Tiber bear the names of towns which belonged to the league—Nomentum, Tibur, Praeneste, Labici, Ardea, Laurentum—while Ficulea and Collatia do not appear. The Via Pedana, leading to Pedum, is known to us only from an inscription (*Bull. Soc. Antiquaires de France*, 1905, p. 177) discovered in Tunisia in 1905, and may be of much later origin; it was a branch of the Via Praenestina.

There must too have been a road, along the line of the later Via Appia, to Bovillae, Aricia, Lanuvium and Velitrae, going thence to Cora, Norba and Setia along the foot of the Volscian Mountains; while nameless roads, which can still be traced, led direct from Rome to Satricum and to Lavinium.

We can trace the advance of the Roman supremacy with greater ease after 387 B.C., inasmuch as from this year (adopting the traditional dating for what it is worth) until 299 B.C. every accession of territory is marked by the foundation of a group of new tribes; the limit of 35 in all was reached in the latter year. In 387, after the departure of the Gauls, southern Etruria was conquered, and four new tribes were formed: *Arnensis* (probably derived from Aro, mod. Arrone—though the ancient name does not occur in literature—the stream which forms the outlet to the lake of Bracciano, anc. *Lacus Sabatinus*),[2] *Sabatina* (called after this lake), *Stellatina* (named from the Campus Stellatinus, near Capena; cf. Festus p. 343 Müll.) and *Tromentina* (which, Festus tells us, was so called from the Campus Tromentus, the situation of which we do not know). Four years later were founded the Latin colonies of Sutrium and Nepet. In 358 B.C. Roman preponderance in the Pomptine territory was shown by the formation of the *tribus Pomptina* and *Publilia*, while in 338 and 329 respectively Antium and Tarracina became colonies of Roman citizens, the former having been founded as a Latin colony in 494 B.C.

After the dissolution of the Latin league which followed upon the defeat of the united forces of the Samnites and of those Latin and Volscian cities which had revolted against Rome, two new tribes, *Maecia* and *Scaptia*,[3] were created in 332 B.C. in connexion with the distribution of the newly acquired lands (Mommsen, *History*, i. 462). A further advance in the same direction ending in the capture of Privernum in 329 B.C. is marked by the establishment in 318 B.C. of the *tribus Oufentina* (from the river Ufens which runs below Setia, mod. *Sezze*, and Privernum, mod. *Piperno*, and the *tribus Falerna* (in the Ager Falernus), while the foundation of the colonies of Cales (334) and Fregellae (328) secured the newly won south Volscian and Campanian territories and led no doubt to a prolongation of the Via Latina. The moment had now come for the pushing forward of another line of communication, which had no doubt reached Tarracina in 329 B.C. but was now definitely constructed (*munita*) as a permanent military highway as far as Capua in 312 B.C. by Appius Claudius, after whom it was named. To him no doubt is due the direct line of road through the Pontine Marshes from Velitrae to Terracina. Its construction may fairly be taken to mark the period at which the roads of which we have spoken, hitherto probably mere tracks, began to be transformed into real highways. In the same year (312) the colony of Interamna Lirenas was founded, while Luceria, Suessa (Aurunca) and Saticula had been established a year or two previously. Sora followed nine years later. In 299 B.C. further successes led to the establishment of two new tribes—the *Teretina* in the upper valley of the Trerus (Sacco) and the *Aniensis*, in the upper valley of the Anio—while to about the same time we must attribute the construction of two new military roads, both secured by fortresses. The southern road, the Via Valeria led to Carsioli and Alba Fucens (founded as Latin colonies respectively in 298 and 303 B.C.), and the northern (afterwards the Via Flaminia[4]) to Narnia (founded as a Latin colony in 299 B.C.). There is little doubt that the formation of the *tribus Quirina* (deriving its name possibly from the town of Cures) and the *tribus Velina* (from the river Velinus, which forms the well-known waterfalls near Terni) is to be connected with the construction of the latter high road, though its date is not certainly known. The further history of Roman supremacy in Italy will be found in the article ROME: *History*. We notice, however, that the continual warfare in which the Roman state was engaged led to the decadence of the free population of Latium, and that the extension of the empire of Rome was fatal to the prosperity of the territory which immediately surrounded the city.[5]

Causes of depopulation.

What had previously, it seems, been a well-peopled region, with peasant proprietors, kept healthy by careful drainage, became in the 4th and 3rd centuries B.C. a district consisting in large measure of huge estates (*latifundia*) owned by the Roman aristocracy, cultivated by gangs of slaves. This led to the disappearance of the agricultural population, to a decline in public safety, and to the spread of malaria in many parts; indeed, it is quite possible that it was not introduced into Latium before the 4th century B.C. The evil increased in the later period of the Republic, and many of the old towns of Latium sank into a very decayed condition; with this the continual competition of the provinces as sources of food-supply no doubt had a good deal to do. Cicero speaks of Gabii, Labici and Bovillae as places that had fallen into abject poverty, while Horace refers to Gabii and Fidenae as mere "deserted villages," and Strabo as "once fortified towns, but now villages, belonging to private individuals." Many of the smaller places mentioned in the list of Dionysius, or the early wars of the Romans, had altogether ceased to exist, but the statement of Pliny that fifty-three communities (*populi*) had thus perished within the boundaries of Old Latium is perhaps exaggerated. By the end of the Republic a good many parts of Latium were infected, and Rome itself was highly malarious in the warm months (see W. H. S. Jones in *Annals of Archaeology and Anthropology*, ii. 97, Liverpool, 1909). The emperors Claudius, Nerva and Trajan turned their attention to the district, and under their example and exhortation the Roman aristocracy erected numerous villas within its boundaries, and used them at least for summer residences. During the 2nd century the Campagna seems to have entered on a new era of prosperity. The system of roads radiating in all directions from Rome (see ITALY: *History*, § B) belonged to a much earlier period; but they were connected by a network of crossroads (now mostly abandoned, while the main lines are still almost all in use) leading to the very numerous villas with which the Campagna was strewn (even in districts which till recently were devastated by malaria), and which seem in large measure to belong to this period. Some of these are of enormous extent, *e.g.* the villa of the Quintilii on the Via Appia, that known as Setta Bassi on the Via Latina, and that of Hadrian near Tibur, the largest of all.

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[1] The ancient name is known from an inscription discovered in 1888.

[2] So Kubitschek in Pauly-Wissowa, *Realencyclopädie*, ii. 1204.

[3] Festus tells us (p. 136 Müll.) that the Maecia derived its name "a quodam castro." Scaptia was the only member of the Latin league that gave its name to a tribe.

[4] See FLAMINIA, VIA and VALERIA, VIA.

[5] L. Caetani indeed (*Nineteenth Century and After*, 1908) attributes the economic decadence of the Roman Campagna to the existence of free trade throughout the Roman empire.

When the land tax was introduced into Italy in 292, the first region of Augustus obtained the name of *provincia Campania*. Later on the name Latium entirely disappeared, and the name Campania extended as far as Veii and the Via Aurelia, whence the medieval and modern name Campagna di Roma. The donation made by Constantine to various churches of Rome of numerous estates belonging to the *patrimonium Caesaris* in the neighbourhood of Rome was of great historical importance, as being the origin of the territorial dominion of the papacy. His example was followed by others, so that the church property in the Campagna soon became considerable; and, owing to the immunities and privileges which it enjoyed, a certain revival of prosperity ensued. The invasions of the barbarian hordes did great harm, but the formation of centres (*domuscultae*) in the 8th and 9th centuries was a fact of great importance: the inhabitants, indeed, formed the medieval militia of the papacy. Smaller centres (the *colonia*—often formed in the remains of an ancient villa—the *curtis* or *curia*, the *castrum*, the *casale*) grew up later. We may note that, owing to the growth of the temporal power of the popes, there was never a *dux Romae* dependent on the exarchate of Ravenna, similar to those established by Narses in the other districts of Italy.

Under the commune.

The papal influence was also retained by means of the suburban bishoprics, which took their rise as early as the 4th and 5th centuries. The rise of the democratic commune of Rome[1] about 1143 and of the various trade corporations which we already find in the early 11th century led to struggles with the papacy; the commune of Rome made various attempts to exercise supremacy in the Campagna and levied various taxes from the 12th century until the 15th. The commune also tried to restrict the power of the barons, who, in the 13th century especially, though we find them feudatories of the holy see from the 10th century onwards, threatened to become masters of the whole territory, which is still dotted over with the baronial castles and lofty solitary towers of the rival families of Rome—Orsini, Colonna, Savelli, Conti, Caetani—who ruthlessly destroyed the remains of earlier edifices to obtain materials for their own, and whose castles, often placed upon the high roads, thus following a strategic line to a stronghold in the country, did not contribute to the undisturbed security of traffic upon them, but rather led to their abandonment. On a list of the inhabited centres of the Campagna of the 14th century with the amount of salt (which was a monopoly of the commune of Rome) consumed by each, Tomassetti bases an estimate of the population: this was about equal to that of our own times, but differently distributed, some of the smaller centres having disappeared at the expense of the towns. Several of the popes, as Sixtus IV. and Julius III., made unsuccessful attempts to improve the condition of the Campagna, the former making a serious attempt to revive agriculture as against pasture, while in the latter part of the 16th century a line of watch-towers was erected along the coast. In the Renaissance, it is true, falls the erection of many fine villas in the neighbourhood of Rome—not only in the hills round the Campagna, but even in certain places in the lower ground, *e.g.* those of Julius II. at La Magliana and of Cardinal Trivulzio at Salone,—and these continued to be frequented until the end of the 18th century, when the French Revolution dealt a fatal blow to the prosperity of the Roman nobility. The 17th and 18th centuries, however, mark the worst period of depopulation in the more malarious parts of the Campagna, which seems to have begun in the 15th century, though we hear of malaria throughout the middle ages. The most healthy portions of the territory are in the north and east, embracing the slopes of the Apennines which are watered by the Teverone and Sacco; and the most pestilential is the stretch between the Monti Lepini and the sea. The Pontine Marshes (*q.v.*) included in the latter division, were drained, according to the plan of Bolognini, by Pius VI., who restored the ancient Via Appia to traffic; but though they have returned to pasture and cultivation, their insalubrity is still notorious.

Modern conditions.

The soil in many parts is very fertile and springs are plentiful and abundant: the water is in some cases sulphureous or ferruginous. In summer, indeed, the vast expanse is little better than an arid steppe; but in the winter it furnishes abundant pasture to flocks of sheep from the Apennines and herds of silver-grey oxen and shaggy black horses, and sheep passing in the summer to the mountain pastures. A certain amount of horse-breeding is done, and the government has, as elsewhere in Italy, a certain number of stallions. Efforts have been made since 1882 to cure the waterlogged condition of the marshy grounds. The methods employed have been three—(i.) the cutting of drainage channels and clearing the marshes by pumping, the method principally employed; (ii.) the system of warping, *i.e.* directing a river so that it may deposit its sedimentary matter in the lower-lying parts, thus levelling them up and consolidating them, and then leading the water away again by drainage; (iii.) the planting of firs and eucalyptus trees, *e.g.* at Tre Fontane and elsewhere. These efforts have not been without success, though it cannot be affirmed that the malarial Campagna is anything like healthy yet. The regulation of the rivers, more especially of the Tiber, is probably the most efficient method for coping with the problem. Since 1884 the Italian Government have been systematically enclosing, pumping dry and generally draining the marshes of the Agro Romano, that is, the tracts around Ostia; the Isola Sacra, at the mouth of the Tiber; and Maccarese. Of the whole of the Campagna less than one-tenth comes annually under the plough. In its picturesque desolation, contrasting so strongly with its prosperity in Roman times, immediately surrounding a city of over half a million inhabitants, and with lofty mountains in view from all parts of it, it is one of the most interesting districts in the world, and has a peculiar and indefinable charm. The modern province of Rome (forming the *compartimento* of Lazio) includes also considerable mountain districts, extending as far N.W. as the Lake of Bolsena, and being divided on the N.E. from Umbria by the Tiber, while on the E. it includes a considerable part of the Sabine mountains and Apennines. The ancient district of the Hernicans, of which Alatri is regarded as the centre, is known as the Ciociaria, from a kind of sandals (*cioce*) worn by the peasants. On the S.E. too a considerable proportion of the group of the Lepini belongs to the province. The land is for the most part let by the proprietors to *mercanti di Campagna*, who employ a subordinate class of factors (*fattori*) to manage their affairs on the spot.

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[1] The commune of Rome as such seems to have been in existence in 999 at least.

Malaria.

The recent discovery that the malaria which has hitherto rendered parts of the Campagna almost uninhabitable during the summer is propagated by the mosquito (*Anopheles claviger*) marks a new epoch; the most diverse theories as to its origin had hitherto been propounded, but it is now possible to combat it on a definite plan, by draining the marshes, protecting the houses by fine mosquito-proof wire netting (for *Anopheles* is not active by day), improving the water supply, &c., while for those who have fever, quinine (now sold cheaply by the state) is a great specific. A great improvement is already apparent; and a law carried in 1903 for the *Bonifica dell' Agro Romano* compels the proprietors within a radius of some 6 m. of Rome to cultivate their lands in a more productive way than has often hitherto been the case, exemption from taxes for ten years and loans at 2½% from the government being granted to those who carry on improvements, and those who refuse being expropriated compulsorily. The government further resolved to open roads and schools and provide twelve additional doctors. Much is done in contending against malaria by the Italian Red Cross Society. In 1900 31% of the inhabitants of the Agro Romano had been fever-stricken; since then the figure has rapidly decreased (5·1% in 1905).

Produce.

The wheat crop in 1906 in the Agro Romano was 8,108,500 bushels, the Indian corn 3,314,000 bushels, the wine 12,100,000 gallons and the olive oil 1,980,000 gallons,—these last two from the hill districts. The wine production had declined by one-half from the previous year, exportation having fallen off in the whole country. 1907, however, was a year of great overproduction all over Italy. The wine of the Alban hills is famous in modern as in ancient times, but will not as a rule bear exportation. The forests of the Alban hills and near the coast produce much charcoal and light timber, while the Sabine and Volscian hills have been largely deforested and are now bare limestone rocks. Much of the labour in the winter and spring is furnished by peasants who come down from the Volscian and Hernican mountains, and from Abruzzi, and occupy sometimes caves, but more often the straw or wicker huts which are so characteristic a feature of the Campagna. The fixed population of the Campagna in the narrower sense (as distinct from the hills) is less than 1000. Emigration to America, especially from the Volscian and Hernican towns, is now considerable.

2. Latium Novum or Adjectum, as it is termed by Pliny, comprised the territories occupied in earlier times by the Volsci and Hernici. It was for the most part a rugged and mountainous country, extending at the back of Latium proper, from the frontier of the Sabines to the sea-coast between Terracina and Sinuessa. But it was not separated from the adjacent territories by any natural frontier or physical boundaries, and it is only by the enumeration of the towns in Pliny according to the division of Italy by Augustus that we can determine its limits. It included the Hernican cities of Anagnia, Ferentinum, Alatrium and Verulae—a group of mountain strongholds on the north side of the valley of the Trerus (Sacco); together with the Volscian cities on the south of the same valley, and in that of the Liris, the whole of which, with the exception of its extreme upper end, was included in the Volscian territory. Here were situated Signia, Frusino, Fabrateria, Fregellae, Sora, Arpinum, Atina, Aquinum, Casinum and Interamna; Anxur (Terracina) was the only seaport that properly belonged to the Volscians, the coast from thence to the mouth of the Liris being included in the territory of the Aurunci, or Ausones as they were termed by Greek writers, who possessed the maritime towns of Fundi, Formiae, Caieta and Minturnae, together with Suessa in the interior, which had replaced their more ancient capital of Aurunca. Sinuessa, on the sea-coast between the Liris (Garigliano) and the Vulturnus, at the foot of the Monte Massico, was the last town in Latium according to the official use of the term and was sometimes assigned to Campania, while Suessa was more assigned to Latium. On the other hand, as Nissen points out (*Italische Landeskunde*, ii. 554), the Pons Campanus, by which the Via Appia crossed the Savo some 9 m. S.E. of Sinuessa, indicates by its name the position of the old Campanian frontier. In the interior the boundary fell between Casinum and Teanum Sidicinum, at about the 100th milestone of the Via Latina—a fact which led later to the jurisdiction of the Roman courts being extended on every side to the 100th mile from the city, and to this being the limit beyond which banishment from Rome was considered to begin.

Though the Apennines comprised within the boundaries of Latium do not rise to a height approaching that of the loftiest summits of the central range, they attain to a considerable altitude, and form steep and rugged mountain masses from 4000 to 5000 ft. high. They are traversed by three principal valleys: (1) that of the Anio, now called Teverone, which descends from above Subiaco to Tivoli, where it enters the plain of the Campagna; (2) that of the Trerus (Sacco), which has its source below Palestrina (Praeneste), and flows through a comparatively broad valley that separates the main mass of the Apennines from the Volscian mountains or Monti Lepini, till it joins the Liris below Ceprano; (3) that of the Liris (Garigliano), which enters the confines of New Latium about 20 m. from its source, flows past the town of Sora, and has a very tortuous course from thence to the sea at Minturnae; its lower valley is for the most part of considerable width, and forms a fertile tract of considerable extent, bordered on both sides by hills covered with vines, olives and fruit trees, and thickly studded with towns and villages.

It may be observed that, long after the Latins had ceased to exist as a separate people we meet in Roman writers with the phrase of *nomen Latinum*, used not in an ethnical but a purely political sense, to designate the inhabitants of all those cities on which the Romans had conferred "Latin rights" (*jus Latinum*)—an inferior form of the Roman franchise, which had been granted in the first instance to certain cities of the Latins, when they became subjects of Rome, and was afterwards bestowed upon many other cities of Italy, especially the so-called Latin colonies. At a later period the same privileges were extended to places in other countries also—as for instance to most of the cities in Sicily and Spain. All persons enjoying these rights were termed in legal phraseology *Latini* or *Latinae conditionis*.

Authorities.—For the topography of Latium, and the local history of its more important cities, the reader may consult Sir W. Gell's *Topography of Rome and its Vicinity* (2nd ed., 1 vol., London, 1846); A. Nibby, *Analisi storico-topografico-antiquaria della carta dei dintorni di Roma* (3 vols., 2nd ed., 1848); J. Westphal, *Die römische Kampagne* (Berlin, 1829); A. Bormann, *Alt-lateinische Chorographie und Städte-Geschichte* (Halle, 1852); M. Zoeller, *Latium und Rom* (Leipzig, 1878); R. Burn's *Rome and the Campagna* (London, 1871); H. Dessau, *Corp. Inscr. Lat.* v. xiv. (Berlin, 1887) (Latium); Th. Mommsen, *Corp. Inscr. Lat.* vol. x. pp. 498-675 (Berlin, 1883); G. Tomassetti, "Della Campagna Romana nel medio evo," published in the *Archivio della Società Romana di Storia Patria* (Rome, 1874–1907), and separately (a work dealing with the medieval history and topography of the Campagna in great detail, containing also valuable notices of the classical period); by the same author, *La Campagna romana* (Rome, 1910 foll.); R. A. Lanciani, "I Comentari di Frontino intorno agli acquedotti," *Memorie dei Lincei* (Rome, 1880), serie iii. vol. v. p. 215 sqq. (and separately), also many articles, and *Wanderings in the Roman Campagna* (London, 1909); E. Abbate, *Guida della provincia di Roma* (Rome, 1894, 2 vols.); H. Nissen, *Italische Landeskunde*, ii. (Berlin, 1902), 557 sqq.; T. Ashby, "The Classical Topography of the Roman Campagna," in *Papers of the British School at Rome*, i. iii.-v. (London, 1902 foll.). (T. As.)

LATONA (Lat. form of Gr. Λητώ, Leto), daughter of Coeus and Phoebe, mother of Apollo and Artemis. The chief seats of her legend are Delos and Delphi, and the generally accepted tradition is a union of the legends of these two places. Leto, pregnant by Zeus, seeks for a place of refuge to be delivered. After long wandering she reaches the barren isle of Delos, which, according to Pindar (Frag. 87, 88), was a wandering rock borne about by the waves till it was fixed to the bottom of the sea for the birth of Apollo and Artemis. In the oldest forms of the legend Hera is not mentioned; but afterwards the wanderings of Leto are ascribed to the jealousy of that goddess, enraged at her amour with Zeus. The foundation of Delphi follows immediately on the birth of the god; and on the sacred way between Tempe and Delphi the giant Tityus offers violence to Leto, and is immediately slain by the arrows of Apollo and Artemis (*Odyssey*, xi. 576-581; Apollodorus i. 4). Such are the main facts of the Leto legend in its common literary form, which is due especially to the two Homeric hymns to Apollo. But Leto is a real goddess, not a mere mythological figure. The honour paid to her in Delphi and Delos might be explained as part of the cult of her son Apollo; but temples to her existed in Argos, in Mantineia and in Xanthus in Lycia; her sacred grove was on the coast of Crete. In Lycia graves are frequently placed under her protection, and she is also known as a goddess of fertility and as κουροτρόφος. It is to be observed that she appears far more conspicuously in the Apolline myths than in those which grew round the great centres of Artemis worship, the reason being that the idea of Apollo and Artemis as twins is one of later growth on Greek soil. Lycia, one of the chief seats of the cult of Apollo, where most frequent traces are found of the worship of Leto as the great goddess, was probably the earlier home of her religion.

In Greek art Leto usually appears carrying her children in her arms, pursued by the dragon sent by the jealous Hera, which is slain by the infant Apollo; in vase paintings especially she is often represented with Apollo and Artemis. The statue of Leto in the Letoön at Argos was the work of Praxiteles.

LATOUCHE, HYACINTHE JOSEPH ALEXANDRE THABAUD DE [known as HENRI] (1785–1851), French poet and novelist, was born at La Châtre (Indre) on the 2nd of February 1785. Among his works may be distinguished his comedies: *Projets de sagesse* (1811), and, in collaboration with Émile Deschamps, *Selmours de Florian* (1818), which ran for a hundred nights; also *La Reine d'Espagne* (1831), which proved too indecent for the public taste; a novel, *Fragoletta: Naples et Paris en 1799* (1829), which attained a success of notoriety; *La Vallée aux coups* (1833), a volume of prose essays and verse; and two volumes of poems, *Les Adieux* (1843) and *Les Agrestes* (1844). Latouche's chief claim to remembrance is that he revealed to the world the genius of André Chénier, then only known to a limited few. The remains of the poet's work had passed from the hands of Daunou to Latouche, who had sufficient critical insight instantly to recognize their value. In editing the first selection of Chénier's poems (1819) he made some trifling emendations, but did not, as Béranger afterwards asserted, make radical and unnecessary changes. Latouche was guilty of more than one literary fraud. He caused a licentious story of his own to be attributed to the duchesse de Duras, the irreproachable author of *Ourika*. He made many enemies by malicious attacks on his contemporaries. The *Constitutionnel* was suppressed in 1817 by the government for an obscure political allusion in an article by Latouche. He then undertook the management of the *Mercure du XIXᵉ siècle*, and began a bitter warfare against the monarchy. After 1830 he edited the *Figaro*, and spared neither the liberal politicians nor the romanticists who triumphed under the monarchy of July. In his turn he was violently attacked by Gustave Planche in the *Revue des deux mondes* for November 1831. But it must be remembered to the credit of Latouche that he did much to encourage George Sand at the beginning of her career. The last twenty years of his life were spent in retirement at Aulnay, where he died on the 9th of March 1851.

Sainte-Beuve, in the *Causeries du lundi*, vol. 3, gives a not too sympathetic portrait of Latouche. See also George Sand in the *Siècle* for the 18th, 19th and 20th of July 1851.

LA TOUR, MAURICE QUENTIN DE (1704–1788), French pastellist, was born at St Quentin on the 5th of September 1704. After leaving Picardy for Paris in 1727 he entered the studio of Spoède—an upright man, but a poor master, rector of the academy of St Luke, who still continued, in the teeth of the Royal Academy, the traditions of the old gild of the master painters of Paris. This possibly contributed to the adoption by La Tour of a line of work foreign to that imposed by an academical training; for pastels, though occasionally used, were not a principal and distinct branch of work until 1720, when Rosalba Carriera brought them into fashion with the Parisian world. In 1737 La Tour exhibited the first of that splendid series of a hundred and fifty portraits which formed the glory of the Salon for the succeeding thirty-seven years. In 1746 he was received into the academy; and in 1751, the following year to that in which he received the title of painter to the king, he was promoted by that body to the grade of councillor. His work had the rare merit of satisfying at once both the taste of his fashionable models and the judgment of his brother artists. His art, consummate of its kind, achieved the task of flattering his sitters, whilst hiding that flattery behind the just and striking likeness which, says Pierre Jean Mariette, he hardly ever missed. His portraits of Rousseau, of Voltaire, of Louis XV., of his queen, of the dauphin and dauphiness, are at once documents and masterpieces unsurpassed except by his life-size portrait of Madame de Pompadour, which, exhibited at the Salon of 1755, became the chief ornament of the cabinet of pastels in the Louvre. The museum of St Quentin also possesses a magnificent collection of works which at his death were in his own hands. La Tour retired to St Quentin at the age of 80, and there he died on the 18th of February 1788. The riches amassed during his long life were freely bestowed by him in great part before his death; he founded prizes at the school of fine arts in Paris and for the town of Amiens, and endowed St Quentin with a great number of useful and charitable institutions. He never married, but lived on terms of warm affection with his brother (who survived him, and left to the town the drawings now in the museum); and his relations to Mlle Marie Fel (1713–1789), the celebrated singer, were distinguished by a strength and depth of feeling not common to the loves of the 18th century.

See, in addition to the general works on French art, C. Desmeze, *M. Q. de La Tour, peintre du roi* (1854); Champfleury, *Les Peintres de Laon et de St Quentin* (1855); and "La Tour" in the *Collection des artistes célèbres* (1886); E. and J. de Goncourt, *La Tour* (1867); Guiffrey and M. Tourneux, *Correspondance inédite de M. G. de la Tour* (1885); Tourneux, *La Tour, biographie critique* (1904); and Patoux, *L'Œuvre de M. Quentin de la Tour au musée de St Quentin* (St Quentin, 1882).

LA TOUR D'AUVERGNE, THÉOPHILE MALO (1743–1800), French soldier, was born at Carhaix in Brittany on the 23rd of December 1743, the son of an advocate named Corret. His desire for a military career being strongly marked, he was enabled, by the not uncommon device of producing a certificate of nobility signed by his friends, first to be nominally enlisted in the Maison du Roi, and soon afterwards to receive a commission in the line, under the name of Corret de Kerbaufret. Four years after joining, in 1771, he assumed by leave of the duke of Bouillon the surname of La Tour d'Auvergne, being in fact descended from an illegitimate half-brother of the great Turenne. Many years of routine service with his regiment were broken only by his participation as a volunteer in the duc de Crillon's Franco-Spanish expedition to Minorca in 1781. This led to an offer of promotion into the Spanish army, but he refused to change his allegiance. In 1748 he was promoted captain, and in 1791 he received the cross of St Louis. In the early part of the Revolution his patriotism was still more conspicuously displayed in his resolute opposition to the proposals of many of his brother officers in the Angoumois regiment to emigrate rather than to swear to the constitution. In 1792 his lifelong interest in numismatics and questions of language was shown by a work which he published on the Bretons. At this time he was serving under Montesquiou in the Alps, and although there was only outpost fighting he distinguished himself by his courage and audacity, qualities which were displayed in more serious fighting in the Pyrenees the next year. He declined well-earned promotion to colonel, and, being broken in health and compelled, owing to the loss of his teeth, to live on milk, he left the army in 1795. On his return by sea to Brittany he was captured by the English and held prisoner for two years. When released, he settled at Passy and published *Origines gauloises*, but in 1797, on the appeal of an old friend whose son had been taken as a conscript, he volunteered as the youth's substitute, and served on the Rhine (1797) and in Switzerland (1798–1799) as a captain. In recognition of his singular bravery and modesty Carnot obtained a decree from the first consul naming La Tour d'Auvergne "first grenadier of France" (27th of April 1800). This led him to volunteer again, and he was killed in action at Oberhausen, near Donauwörth, on the 27th of June 1800.

La Tour d'Auvergne's almost legendary courage had captivated the imagination of the French soldier, and his memory was not suffered to die. It was customary for the French troops and their allies of the Rhine Confederation under Napoleon to march at attention when passing his burial-place on the battlefield. His heart was long carried by the grenadier company of his regiment, the 46th; after being in the possession of Garibaldi for many years, it was finally deposited in the keeping of the city of Paris in 1883. But the most striking tribute to his memory is paid to-day as it was by order of the first consul in 1800. "His name is to be kept on the pay list and roll of his company. It will be called at all parades and a non-commissioned officer will reply, *Mort au champ d'honneur*." This custom, with little variation, is still observed in the 46th regiment on all occasions when the colour is taken on parade.

LATREILLE, PIERRE ANDRÉ (1762–1833), French naturalist, was born in humble circumstances at Brives-la-Gaillarde (Corrèze), on the 20th of November 1762. In 1778 he entered the collège Lemoine at Paris, and on his admission to priestly orders in 1786 he retired to Brives, where he devoted all the leisure which the discharge of his professional duties allowed to the study of entomology. In 1788 he returned to Paris and found means of making himself known to the leading naturalists there. His "Mémoire sur les mutilles découvertes en France," contributed to the *Proceedings* of the Society of Natural History in Paris, procured for him admission to that body. At the Revolution he was compelled to quit Paris, and as a priest of conservative sympathies suffered considerable hardship, being imprisoned for some time at Bordeaux. His *Précis des caractères génériques des insectes, disposés dans un ordre naturel*, appeared at Brives in 1796. In 1798 he became a corresponding member of the Institute, and at the same time was entrusted with the task of arranging the entomological collection at the recently organized Muséum d'Histoire Naturelle (Jardin des Plantes); in 1814 he succeeded G. A. Olivier as member of the Académie des Sciences, and in 1821 he was made a chevalier of the Legion of Honour. For some time he acted as professor of zoology in the veterinary school at Alfort near Paris, and in 1830, when the chair of zoology of invertebrates at the Muséum was divided after the death of Lamarck, Latreille was appointed professor of zoology of crustaceans, arachnids and insects, the chair of molluscs, worms and zoophytes being assigned to H. M. D. de Blainville. "On me donne du pain quand je n'ai plus de dents," said Latreille, who was then in his sixty-eighth year. He died in Paris on the 6th of February 1833.

In addition to the works already mentioned, the numerous works of Latreille include: *Histoire naturelle générale et particulière des crustacés et insectes* (14 vols., 1802–1805), forming part of C. N. S. Sonnini's edition of Buffon; *Genera crustaceorum et insectorum, secundum ordinem naturalem in familias disposita* (4 vols., 1806–1807); *Considérations générales sur l'ordre naturel des animaux composant les classes des crustacés, des arachnides, et des insectes* (1810); *Familles naturelles du règne animal, exposées succinctement et dans un ordre analytique* (1825); *Cours d'entomologie* (of which only the first volume appeared, 1831); the whole of the section "Crustacés, Arachnides, Insectes," in G. Cuvier's *Règne animal*; besides many papers in the *Annales du Muséum*, the *Encyclopédie méthodique*, the *Dictionnaire classique d'histoire naturelle* and elsewhere.

LA TRÉMOILLE, an old French family which derives its name from a village (the modern La Trimouille) in the department of Vienne. The family has been known since the middle of the 11th century, and since the 14th century its members have been conspicuous in French history. Guy, sire de la Trémoille, standard-bearer of France, was taken prisoner at the battle of Nicopolis (1396), and Georges, the favourite of King Charles VII., was captured at Agincourt (1415). Louis (2), called the *chevalier sans reproche*, defeated and captured the duke of Orleans at the battle of Saint-Aubin-du-Cormier (1488), distinguished himself in the wars in Italy, and was killed at Pavia (1525). In 1521 François (2) acquired a claim on the kingdom of Naples by his marriage with Anne de Laval, daughter of Charlotte of Aragon. Louis (3) became duke of Thouars in 1563, and his son Claude turned Protestant, was created a peer of France in 1595, and married a daughter of William the Silent in 1598. To this family belonged the lines of the counts of Joigny, the marquises of Royan and counts of Olonne, and the marquises and dukes of Noirmoutier.

LATROBE, CHARLES JOSEPH (1801–1875), Australian governor, was born in London on the 20th of March 1801. The Latrobes were of Huguenot extraction, and belonged to the Moravian community, of which the father and grandfather of C. J. Latrobe were ministers. His father, Christian Ignatius Latrobe (1758–1836), a musician of some note, did good service in the direction of popularizing classical music in England by his *Selection of Sacred Music from the Works of the most Eminent Composers of Germany and Italy* (6 vols., 1806–1825). C. J. Latrobe was an excellent mountaineer, and made some important ascents in Switzerland in 1824–1826. In 1832 he went to America with Count Albert Pourtales, and in 1834 crossed the prairies from New Orleans to Mexico with Washington Irving. In 1837 he was invested with a government commission in the West Indies, and two years later was made superintendent of the Port Philip district of New South Wales. When Port Philip was erected into a separate colony as Victoria in 1851, Latrobe became lieutenant-governor. The discovery of gold in that year attracted enormous numbers of immigrants annually. Latrobe discharged the difficult duties of government at this critical period with tact and success. He retired in 1854, became C. B. in 1858 and died in London on the 2nd of December 1875. Beside some volumes of travel he published a volume of poems, *The Solace of Song* (1837).

See *Brief Notices of the Latrobe Family* (1864), a privately printed translation of an article revised by members of the family in the Moravian *Brüderbote* (November 1864).

LATTEN (from O. Fr. *laton*, mod. Fr. *laiton*, possibly connected with Span. *lata*, Ital. *latta*, a lath), a mixed metal like brass, composed of copper and zinc, generally made in thin sheets, and used especially for monumental brasses and effigies. A fine example is in the screen of Henry VII.'s tomb in Westminster Abbey. There are three forms of latten, "black latten," unpolished and rolled, "shaven latten," of extreme thinness, and "roll latten," of the thickness either of black or shaven latten, but with both sides polished.

LATTICE LEAF PLANT, in botany, the common name for *Ouvirandra fenestralis*, an aquatic monocotyledonous plant belonging to the small natural order Aponogetonaceae and a native of Madagascar. It has a singular appearance from the structure of the leaves, which are oblong in shape, from 6 to 18 in. long and from 2 to 4 in. broad; they spread horizontally beneath the surface of the water, and are reduced to little more than a lattice-like network of veins. The tuberculate roots are edible. The plant is grown in cultivation as a stove-aquatic.

LATUDE, JEAN HENRI, often called DANRY or MASERS DE LATUDE (1725–1805), prisoner of the Bastille, was born at Montagnac in Gascony on the 23rd of March 1725. He received a military education and went to Paris in 1748 to study mathematics. He led a dissipated life and endeavoured to curry favour with the marquise de Pompadour by secretly sending her a box of poison and then informing her of the supposed plot against her life. The ruse was discovered, and Mme de Pompadour, not appreciating the humour of the situation, had Latude put in the Bastille on the 1st of May 1749. He was later transferred to Vincennes, whence he escaped in 1750. Retaken and reimprisoned in the Bastille, he made a second brief escape in 1756. He was transferred to Vincennes in 1764, and the next year made a third escape and was a third time recaptured. He was put in a madhouse by Malesherbes in 1775, and discharged in 1777 on condition that he should retire to his native town. He remained in Paris and was again imprisoned. A certain Mme Legros became interested in him through chance reading of one of his memoirs, and, by a vigorous agitation in his behalf, secured his definite release in 1784. He exploited his long captivity with considerable ability, posing as a brave officer, a son of the marquis de la Tude, and a victim of Pompadour's intrigues. He was extolled and pensioned during the Revolution, and in 1793 the convention compelled the heirs of Mme de Pompadour to pay him 60,000 francs damages. He died in obscurity at Paris on the 1st of January 1805.

The principal work of Latude is the account of his imprisonment, written in collaboration with an advocate named Thiéry, and entitled *Le Despotisme dévoilé, ou Mémoires de Henri Masers de la Tude, détenu pendant trente-cinq ans dans les diverses prisons d'état* (Amsterdam, 1787, ed. Paris, 1889). An Eng. trans. of a portion was published in 1787. The work is full of lies and misrepresentations, but had great vogue at the time of the French Revolution. Latude also wrote essays on all sorts of subjects.

See J. F. Barrière, *Mémoires de Linguet et de Latude* (1884); G. Bertin, *Notice* in edition of the *Mémoires* (1889); F. Funck-Brentano, "Latude," in the *Revue des deux mondes* (1st October 1889).

LATUKA, a tribe of negroid stock inhabiting the mountainous country E. of Gondokoro on the upper Nile. They have received a tinge of Hamitic blood from the Galla people, and have high foreheads, large eyes, straight noses and thick but not pouting lips. They are believed by Sir H. H. Johnston to be the original and purest type of the great Masai people, and are assimilated to the Nilotic negro races in customs. Like their neighbours the Bari and Shilluk tribes, they despise clothing, though the important chiefs have adopted Arab attire. Their country is fertile, and they cultivate tobacco, durra and other crops. Their villages are numerous, and some are of considerable size. Tarangole, for instance, on the Khor Kohs, has upwards of three thousand huts, and sheds for many thousands of cattle. The Latuka are industrious and especially noted for skill as smiths. Emin Pasha stated that the lion was so little dreaded by the Latuka that on one being caught in a leopard trap they hastily set it free.

LAUBAN, a town of Germany in the Prussian province of Silesia, is situated in a picturesque valley, at the junction of the lines of railway from Görlitz and Sorau, 16 m. E. of the former. Pop. (1905) 14,624. Lauban has a Roman Catholic and two Evangelical churches, a town hall, dating from 1541, a conventual house of the order of St Magdalene, dating from the 14th century, a municipal library and museum, two hospitals, an orphanage and several schools. Its industrial establishments comprise tobacco, yarn, thread, linen and woollen cloth manufactories, bleaching and dyeing works, breweries and oil and flour mills.

Lauban was founded in the 10th and fortified in the 13th century; in 1427 and 1431 it was devastated by the Hussites, and in 1640 by the Swedes. In 1761 it was the headquarters of Frederick the Great, and in 1815 it was the last Saxon town that made its submission to Prussia.

See Berkel, *Geschichte der Stadt Lauban* (Lauban, 1896).

LAUBE, HEINRICH (1806–1884), German dramatist, novelist and theatre-director, was born at Sprottau in Silesia on the 18th of September 1806. He studied theology at Halle and Breslau (1826–1829), and settled in Leipzig in 1832. Here he at once came into prominence with his political essays, collected under the title *Das neue Jahrhundert*, in two parts—*Polen* (1833) and *Politische Briefe* (1833)—and with the novel *Das junge Europa*, in three parts—*Die Poeten, Die Krieger, Die Bürger*—(1833–1837). These writings, in which, after the fashion of Heinrich Heine and Ludwig Börne, he severely criticized the political régime in Germany, together with the part he played in the literary movement known as *Das junge Deutschland*, led to his being subjected to police surveillance and his works confiscated. On his return, in 1834, from a journey to Italy, undertaken in the company of Karl Gutzkow, Laube was expelled from Saxony and imprisoned for nine months in Berlin. In 1836 he married the widow of Professor Hänel of Leipzig; almost immediately afterwards he suffered a year's imprisonment for his revolutionary sympathies. In 1839 he again settled in Leipzig and began a literary activity as a playwright. Chief among his earlier productions are the tragedies *Monaldeschi* (1845) and *Struensee* (1847); the comedies *Rokoko, oder die alten Herren* (1846); *Gottsched und Gellert* (1847); and *Die Karlsschüler* (1847), of which the youthful Schiller is the hero. In 1848 Laube was elected to the national assembly at Frankfort-on-Main for the district of Elbogen, but resigned in the spring of 1849, when he was appointed artistic director of the Hofburg theatre in Vienna. This office he held until 1867, and in this period fall his finest dramatic productions, notably the tragedies *Graf Essex* (1856) and *Montrose* (1859), and his historical romance *Der deutsche Krieg* (1865–1866, 9 vols.), which graphically pictures a period in the Thirty Years' War. In 1869 he became director of the Leipzig Stadttheater, but returned to Vienna in 1870, where in 1872 he was placed at the head of the new Stadttheater; with the exception of a short interval he managed this theatre with brilliant success until his retirement from public life in 1880. He has left a valuable record of his work in Vienna and Leipzig in the three volumes *Das Burgtheater* (1868), *Das norddeutsche Theater* (1872) and *Das Wiener Stadttheater* (1875). His pen was still active after his retirement, and in the five years preceding his death, which took place at Vienna on the 1st of August 1884, he wrote the romances and novels *Die Böhminger* (1880), *Louison* (1881), *Der Schatten-Wilhelm* (1883), and published an interesting volume of reminiscences, *Erinnerungen, 1841–1881* (1882). Laube's dramas are not remarkable for originality or for poetical beauty; their real and great merit lies in their stage-craft. As a theatre-manager he has had no equal in Germany, and his services in this capacity have assured him a more lasting name in German literary history than his writings.

His *Gesammelte Schriften* (excluding his dramas) were published in 16 vols. (1875–1882); his *Dramatische Werke* in 13 vols. (1845–1875); a popular edition of the latter in 12 vols. (1880–1892). An edition of Laube's *Ausgewählte Werke* in 10 vols. appeared in 1906 with an introduction by H. H. Houben. See also J. Proelss, *Das junge Deutschland* (1892); and H. Bulthaupt, *Dramaturgie des Schauspiels* (vol. iii., 6th ed., 1901).

L'AUBESPINE, a French family which sprang from Claude de l'Aubespine, a lawyer of Orleans and bailiff of the abbey of St Euverte in the beginning of the 16th century, and rapidly acquired distinction in offices connected with the law. Sebastien de l'Aubespine (d. 1582), abbot of Bassefontaine, bishop of Vannes and afterwards of Limoges, fulfilled important diplomatic missions in Germany, Hungary, England, the Low Countries and Switzerland under Francis I. and his successors. Claude (*c.* 1500–1567), baron of Châteauneuf-sur-Cher, Sebastien's brother, was a secretary of finance; he had charge of negotiations with England in 1555 and 1559, and was several times commissioned to treat with the Huguenots in the king's name. His son Guillaume was a councillor of state and ambassador to England. Charles de l'Aubespine (1580–1653) was ambassador to Germany, the Low Countries, Venice and England, besides twice holding the office of keeper of the seals of France, from 1630 to 1633, and from 1650 to 1651. The family fell into poor circumstances and became extinct in the 19th century. (M.P.*)

LAUCHSTÄDT, a town of Germany in the province of Prussian Saxony, on the Laucha, 6 m. N.W. of Merseburg by the railway to Schafstädt. Pop. (1905) 2034. It contains an Evangelical church, a theatre, a hydropathic establishment and several educational institutions, among which is an agricultural school affiliated to the university of Halle. Its industries include malting, vinegar-making and brewing. Lauchstädt was a popular watering-place in the 18th century, the dukes of Saxe-Merseburg often making it their summer residence. From 1789 to 1811 the Weimar court theatrical company gave performances here of the plays of Schiller and Goethe, an attraction which greatly contributed to the well-being of the town.

See Maak, *Das Goethetheater in Lauchstädt* (Lauchstädt, 1905); and Nasemann, *Bad Lauchstädt* (Halle, 1885).

LAUD, WILLIAM (1573–1645), English archbishop, only son of William Laud, a clothier, was born at Reading on the 7th of October 1573. He was educated at Reading free school, matriculated at St John's college, Oxford, in 1589, gained a scholarship in 1590, a fellowship in 1593, and graduated B.A. in 1594, proceeding to D.D. in 1608. In 1601 he took orders, in 1603 becoming chaplain to Charles Blount, earl of Devonshire. Laud early took up a position of antagonism to the Calvinistic party in the church, and in 1604 was reproved by the authorities for maintaining in his thesis for the degree of B.D. "that there could be no true church without bishops," and again in 1606 for advocating "popish" opinions in a sermon at St Mary's. If high-church doctrines, however, met with opposition at Oxford, they were relished elsewhere, and Laud obtained rapid advancement. In 1607 he was made vicar of Stanford in Northamptonshire, and in 1608 he became chaplain to Bishop Neile, who in 1610 presented him to the living of Cuxton, when he resigned his fellowship. In 1611, in spite of the influence of Archbishop Abbot and Lord Chancellor Ellesmere, Laud was made president of St John's, and in 1614 obtained in addition the prebend of Buckden, in 1615 the archdeaconry of Huntingdon, and in 1616 the deanery of Gloucester. Here he repaired the fabric and changed the position of the communion table, a matter which aroused great religious controversy, from the centre of the choir to the east end, by a characteristic tactless exercise of power offending the bishop, who henceforth refused to enter the cathedral. In 1617 he went with the king to Scotland, and aroused hostility by wearing the surplice. In 1621 he became bishop of St David's, when he resigned the presidentship of St John's.

In April 1622 Laud, by the king's orders, took part in a controversy with Percy, a Jesuit, known as Fisher, the aim of which was to prevent the conversion of the countess of Buckingham, the favourite's mother, to Romanism, and his opinions expressed on that occasion show considerable breadth and comprehension. While refusing to acknowledge the Roman Church as *the* true church, he allowed it to be *a* true church and a branch of the Catholic body, at the same time emphasizing the perils of knowingly associating with error; and with regard to the English Church he denied that the acceptance of all its articles was necessary. The foundation of belief was the Bible, not any one branch of the Catholic church arrogating to itself infallibility, and when dispute on matters of faith arose, "a lawful and free council, determining according to Scripture, is the best judge on earth." A close and somewhat strange intimacy, considering the difference in the characters and ideals of the two men, between Laud and Buckingham now began, and proved the chief instrument of Laud's advancement. The opportunity came with the old king's death in 1625, for James, with all his pedantry, was too wise and cautious to embark in Laud's rash undertakings, and had already shown a prudent moderation, after setting up bishops in Scotland, in going no further in opposition to the religious feelings of the people. On the accession of Charles, Laud's ambitious activities were allowed free scope. A list of the clergy was immediately prepared by him for the king, in which each name was labelled with an O or a P, distinguishing the Orthodox to be promoted from the Puritans to be suppressed. Laud defended Richard Montague, who had aroused the wrath of the parliament by his pamphlet against Calvinism. His influence soon extended into the domain of the state. He supported the king's prerogative throughout the conflict with the parliament, preached in favour of it before Charles's second parliament in 1626, and assisted in Buckingham's defence. In 1626 he was nominated bishop of Bath and Wells, and in July 1628 bishop of London. On the 12th of April 1629 he was made chancellor of Oxford University.

In the patronage of learning and in the exercise of authority over the morals and education of youth Laud was in his proper sphere, many valuable reforms at Oxford being due to his activity, including the codification of the statutes, the statute by which public examinations were rendered obligatory for university degrees, and the ordinance for the election of proctors, the revival of the college system, of moral and religious discipline and order, and of academic dress. He founded or endowed various professorships, including those of Hebrew and Arabic, and the office of public orator, encouraged English and foreign scholars, such as Voss, Selden and Jeremy Taylor, founded the university printing press, procuring in 1633 the royal patent for Oxford, and obtained for the Bodleian library over 1300 MSS., adding a new wing to the building to contain his gifts. His rule at Oxford was marked by a great increase in the number of students. In his own college he erected the new buildings, and was its second founder. Of his chancellorship he himself wrote a history, and the Laudian tradition long remained the great standard of order and good government in the university. Elsewhere he showed his liberality and his zeal for reform. He was an active visitor of Eton and Winchester, and endowed the grammar school at Reading, where he was himself educated. In London he procured funds for the restoration of the dilapidated cathedral of St Paul's.

He was far less great as a ruler in the state, showing as a judge a tyrannical spirit both in the star chamber and high-commission court, threatening Felton, the assassin of Buckingham, with the rack, and showing special activity in procuring a cruel sentence in the former court against Alexander Leighton in June 1630 and against Henry Sherfield in 1634. His power was greatly increased after his return from Scotland, whither he had accompanied the king, by his promotion to the archbishopric of Canterbury in August 1633. "As for the state indeed," he wrote to Wentworth on this occasion, "I am for *Thorough*." In 1636 the privy council decided in his favour his claim of jurisdiction as visitor over both universities. Soon afterwards he was placed on the commission of the treasury and on the committee of the privy council for foreign affairs. He was all-powerful both in church and state. He proceeded to impose by authority the religious ceremonies and usages to which he attached so much importance. His vicar-general, Sir Nathaniel Brent, went through the dioceses of his province, noting every dilapidation and every irregularity. The pulpit was no longer to be the chief feature in the church, but the communion table. The Puritan lecturers were suppressed. He showed great hostility to the Puritan sabbath and supported the reissue of the *Book of Sports*, especially odious to that party, and severely reprimanded Chief Justice Richardson for his interference with the Somerset wakes. He insisted on the use of the prayer-book among the English soldiers in the service of Holland, and forced strict conformity on the church of the merchant adventurers at Delft, endeavouring even to reach the colonists in New England. He tried to compel the Dutch and French refugees in England to unite with the Church of England, advising double taxation and other forms of persecution. In 1634 the justices of the peace were ordered to enter houses to search for persons holding conventicles and bring them before the commissioners. He took pleasure in displaying his power over the great, and in punishing them in the spiritual courts for moral offences. In 1637 he took part in the sentence of the star chamber on Prynne, Bastwick and Burton, and in the same year in the prosecution of Bishop Williams. He urged Strafford in Ireland to carry out the same reforms and severities.

He was now to extend his ecclesiastical system to Scotland, where during his visits the appearance of the churches had greatly displeased him. The new prayer-book and canons were drawn up by the Scottish bishops with his assistance and enforced in the country, and, though not officially connected with the work, he was rightly regarded as its real author. The attack not only on the national religion, but on the national independence of Scotland, proved to be the point at which the system, already strained, broke and collapsed. Laud continued to support Strafford's and the king's arbitrary measures to the last, and spoke in favour of the vigorous continuation of the war on Strafford's side in the memorable meeting of the committee of eight on the 5th of May 1640, and for the employment of any means for carrying it on. "Tried all ways," so ran the notes of his speech, "and refused all ways. By the law of God and man you should have subsistence and lawful to take it." Though at first opposed to the sitting of convocation, after the dissolution of parliament, as an independent body, on account of the opposition it would arouse, he yet caused to be passed in it the new canons which both enforced his ecclesiastical system and assisted the king's divine right, resistance to his power entailing "damnation." Laud's infatuated policy could go no further, and the *etcetera* oath, according to which whole classes of men were to be forced to swear perpetual allegiance to the "government of this church by archbishops, bishops, deans and archdeacons, &c.," was long remembered and derided. His power now quickly abandoned him. He was attacked and reviled as the chief author of the troubles on all sides. In October he was ordered by Charles to suspend the *etcetera* oath. The same month, when the high commission court was sacked by the mob, he was unable to persuade the star chamber to punish the offenders. On the 18th of December he was impeached by the Long Parliament, and on the 1st of March imprisoned in the tower. On the 12th of May, at Strafford's request, the archbishop appeared at the window of his cell to give him his blessing on his way to execution, and fainted as he passed by. For some time he was left unnoticed in confinement. On the 31st of May 1643, however, Prynne received orders from the parliament to search his papers, and published a mutilated edition of his diary. The articles of impeachment were sent up to the Lords in October, the trial beginning on the 12th of March 1644, but the attempt to bring his conduct under a charge of high treason proving hopeless, an attainder was substituted and sent up to the Lords on the 22nd of November. In these proceedings there was no semblance of respect for law or justice, the Lords yielding (4th of January 1645) to the menaces of the Commons, who arrogated to themselves the right to declare any crimes they pleased high treason. Laud now tendered the king's pardon, which had been granted to him in April 1643. This was rejected, and it was with some difficulty that his petition to be executed with the axe, instead of undergoing the ordinary brutal punishment for high treason, was granted. He suffered death on the 10th of January on Tower Hill, asserting his innocence of any offence known to the law, repudiating the charge of "popery," and declaring that he had always lived in the Protestant Church of England. He was buried in the chancel of All Hallows, Barking, whence his body was removed on the 24th of July 1663 to the chapel of St John's College, Oxford.

Laud never married. He is described by Fuller as "low of stature, little in bulk, cheerful in countenance (wherein gravity and quickness were all compounded), of a sharp and piercing eye, clear judgment and (abating the influence of age) firm memory." His personality, on account of the sharp religious antagonisms with which his name is inevitably associated, has rarely been judged with impartiality. His severities were the result of a narrow mind and not of a vindictive spirit, and their number has certainly been exaggerated. His career was distinguished by uprightness, by piety, by a devotion to duty, by courage and consistency. In particular it is clear that the charge of partiality for Rome is unfounded. At the same time the circumstances of the period, the fact that various schemes of union with Rome were abroad, that the missions of Panzani and later of Conn were gathering into the Church of Rome numbers of members of the Church of England who, like Laud himself, were dissatisfied with the Puritan bias which then characterized it, the incident mentioned by Laud himself of his being twice offered the cardinalate, the movement carried on at the court in favour of Romanism, and the fact that Laud's changes in ritual, however clearly defined and restricted in his own intention, all tended towards Roman practice, fully warranted the suspicions and fears of his contemporaries. Laud's complete neglect of the national sentiment, in his belief that the exercise of mere power was sufficient to suppress it, is a principal proof of his total lack of true statesmanship. The hostility to "innovations in religion," it is generally allowed, was a far stronger incentive to the rebellion against the arbitrary power of the crown, than even the violation of constitutional liberties; and to Laud, therefore, more than to Strafford, to Buckingham, or even perhaps to Charles himself, is especially due the responsibility for the catastrophe. He held fast to the great idea of the catholicity of the English Church, to that conception of it which regards it as a branch of the whole Christian church, and emphasizes its historical continuity and identity from the time of the apostles, but here again his policy was at fault; for his despotic administration not only excited and exaggerated the tendencies to separatism and independentism which finally prevailed, but excluded large bodies of faithful churchmen from communion with their church and from their country. The emigration to Massachusetts in 1629, which continued in a stream till 1640, was not composed of separatists but of episcopalians. Thus what Laud grasped with one hand he destroyed with the other.

Passing to the more indirect influence of Laud on his times, we can observe a narrowness of mind and aim which separates him from a man of such high imagination and idealism as Strafford, however closely identified their policies may have been for the moment. The chief feature of Laud's administration is attention to countless details, to the most trivial of which he attached excessive importance, and which are uninspired by any great underlying principle. His view was always essentially material. The one element in the church which to him was all essential was its visibility. This was the source of his intense dislike of the Puritan and Nonconformist conception of the church, which afforded no tangible or definite form. Hence the necessity for outward conformity, and the importance attached to ritual and ceremony, unity in which must be established at all costs, in contrast to dogma and doctrine, in which he showed himself lenient and large-minded, winning over Hales by friendly discussion, and encouraging the publication of Chillingworth's *Religion of Protestants*. He was not a bigot, but a martinet. The external form was with him the essential feature of religion, preceding the spiritual conception, and in Laud's opinion being the real foundation of it. In his last words on the scaffold he alludes to the dangers and slanders he had endured labouring to keep an uniformity in the external service of God; and Bacon's conception of a spiritual union founded on variety and liberty was one completely beyond his comprehension.

This narrow materialism was the true cause of his fatal influence both in church and state. In his own character it produced the somewhat blunted moral sense which led to the few incidents in his career which need moral defence, his performance of the marriage ceremony between his first patron Lord Devonshire and the latter's mistress, the divorced wife of Lord Rich, an act completely at variance with his principles; his strange intimacy with Buckingham; his love of power and place. Indistinguishable from his personal ambition was his passion for the aggrandisement of the church and its predominance in the state. He was greatly delighted at the foolish appointment of Bishop Juxon as lord treasurer in 1636. "No churchman had it," he cries exultingly, "since Henry VII.'s time, . . . and now if the church will not hold up themselves under God, I can do no more." Spiritual influence, in Laud's opinion, was not enough for the church. The church as the guide of the nation in duty and godliness, even extending its activity into state affairs as a mediator and a moderator, was not sufficient. Its power must be material and visible, embodied in great places of secular administration and enthroned in high offices of state. Thus the church, descending into the political arena, became identified with the doctrines of one political party in the state—doctrines odious to the majority of the nation—and at the same time became associated with acts of violence and injustice, losing at once its influence and its reputation. Equally disastrous to the state was the identification of the king's administration with one party in the church, and that with the party in an immense minority not only in the nation but even among the clergy themselves.

Bibliography.—All Laud's works are to be found in the *Library of Anglo-Catholic Theology* (7 vols.), including his sermons (of no great merit), letters, history of the chancellorship, history of his troubles and trial, and his remarkable diary, the MSS. of the last two works being the property of St John's College. Various modern opinions of Laud's career can be studied in T. Longueville's *Life of Laud, by a Romish Recusant* (1894); *Congregational Union Jubilee Lectures*, vol. i. (1882); J. B. Mozley's *Essay on Laud*; *Archbishop Laud*, by A. C. Benson (1887); *Wm. Laud*, by W. H. Hutton (1895); *Archbishop Laud Commemoration*, ed. by W. F. Collins (lectures, bibliography, catalogue of exhibits, 1895); Hook's *Lives of the Archbishops of Canterbury*; and H. Bell, *Archbishop Laud and Priestly Government* (1907). (P. C. Y.)

LAUD (Lat. *laus*), a term meaning praise, now rarely found in this sense except in poetry or hymns. Lauds is the name for the second of the offices of the canonical hours in the Roman breviary, so called from the three *laudes* or psalms of praise, cxlviii.-cl. which form part of the service (see Breviary and Hours, Canonical).

LAUDANUM, originally the name given by Paracelsus to a famous medical preparation of his own composed of gold, pearls, &c. (*Opera*, 1658, i. 492/2), but containing opium as its chief ingredient. The term is now only used for the alcoholic tincture of opium (*q.v.*). The name was either invented by Paracelsus from Lat. *laudare* to praise, or was a corrupted form of "ladanum" (Gr. *λήδανον*, from Pers. *ladan*), a resinous juice or gum obtained from various kinds of the *Cistus* shrub, formerly used medicinally in external applications and as a stomachic, but now only in perfumery and in making fumigating pastilles, &c.

LAUDER, SIR THOMAS DICK, Bart. (1784–1848), Scottish author, only son of Sir Andrew Lauder, 6th baronet, was born at Edinburgh in 1784. He succeeded to the baronetcy in 1820. His first contribution to *Blackwood's Magazine* in 1817, entitled

"Simon Roy, Gardener at Dunphail," was by some ascribed to Sir Walter Scott. His paper (1818) on "The Parallel Roads of Glenroy," printed in vol. ix. of the *Transactions of the Royal Society of Edinburgh*, first drew attention to the phenomenon in question. In 1825 and 1827 he published two romances, *Lochandhu* and the *Wolf of Badenoch*. He became a frequent contributor to *Blackwood* and also to *Tait's Magazine*, and in 1830 he published *An Account of the Great Floods of August 1829 in the Province of Moray and adjoining Districts*. Subsequent works were *Highland Rambles, with Long Tales to Shorten the Way* (2 vols. 8vo, 1837), *Legendary Tales of the Highlands* (3 vols. 12mo, 1841), *Tour round the Coasts of Scotland* (1842) and *Memorial of the Royal Progress in Scotland* (1843). Vol. i. of a *Miscellany of Natural History*, published in 1833, was also partly prepared by Lauder. He was a Liberal, and took an active interest in politics; he held the office of secretary to the Board of Scottish Manufactures. He died on the 29th of May 1848. An unfinished series of papers, written for *Tait's Magazine* shortly before his death, was published under the title *Scottish Rivers*, with a preface by John Brown, M.D., in 1874.

LAUDER, WILLIAM (d. 1771), Scottish literary forger, was born in the latter part of the 17th century, and was educated at Edinburgh university, where he graduated in 1695. He applied unsuccessfully for the post of professor of humanity there, in succession to Adam Watt, whose assistant he had been for a time, and also for the keepership of the university library. He was a good scholar, and in 1739, published *Poetarum Scotorum Musae Sacrae*, a collection of poems by various writers, mostly paraphrased from the Bible. In 1742 Lauder came to London. In 1747 he wrote an article for the *Gentleman's Magazine* to prove that Milton's *Paradise Lost* was largely a plagiarism from the *Adamus Exul* (1601) of Hugo Grotius, the *Sarcotis* (1654) of J. Masen (Masenius, 1606–1681), and the *Poemata Sacra* (1633) of Andrew Ramsay (1574–1659). Lauder expounded his case in a series of articles, and in a book (1753) increased the list of plundered authors to nearly a hundred. But his success was short-lived. Several scholars, who had independently studied the alleged sources of Milton's inspiration, proved conclusively that Lauder had not only garbled most of his quotations, but had even inserted amongst them extracts from a Latin rendering of *Paradise Lost*. This led to his exposure, and he was obliged to write a complete confession at the dictation of his former friend Samuel Johnson. After several vain endeavours to clear his character he emigrated to Barbadoes, where he died in 1771.

LAUDER, a royal and police burgh of Berwickshire, Scotland. Pop. (1901) 719. It is situated on the Leader, 29 m. S.E. of Edinburgh by the North British railway's branch line from Fountainhall, of which it is the terminus. The burgh is said to date from the reign of William the Lion (1165–1214); its charter was granted in 1502. In 1482 James III. with his court and army rested here on the way to raise the siege of Berwick. While the nobles were in the church considering grievances, Robert Cochrane, recently created earl of Mar, one of the king's favourites, whose "removal" was at the very moment under discussion, demanded admittance. Archibald Douglas, earl of Angus, opened the door and seized Mar, who was forthwith dragged to Lauder Bridge and there, along with six other obnoxious favourites, hanged in sight of his royal master. It was in connexion with this exploit that Angus acquired the nickname of "Bell-the-cat." The public buildings include a town-hall and a library. The parish church was built in 1673 by the earl of Lauderdale, in exchange for the older edifice, the site of which was required for the enlargement of Thirlestane castle, which, originally a fortress, was then remodelled for a residence. The town is a favourite with anglers.

LAUDERDALE, JOHN MAITLAND, DUKE OF (1616–1682), eldest surviving son of John Maitland, 2nd Lord Maitland of Thirlestane (d. 1645), who was created earl of Lauderdale in 1624, and of Lady Isabel Seton, daughter of Alexander, earl of Dunfermline, and great-grandson of Sir Richard Maitland (*q.v.*), the poet, a member of an ancient family of Berwickshire, was born on the 24th of May 1616, at Lethington. He began public life as a zealous adherent of the Presbyterian cause, took the covenant, sat as an elder in the assembly at St Andrews in July 1643, and was sent to England as a commissioner for the covenant in August, and to attend the Westminster assembly in November. In February 1644 he was a member of the committee of both kingdoms, and on the 20th of November was one of the commissioners appointed to treat with the king at Uxbridge, when he made efforts to persuade Charles to agree to the establishment of Presbyterianism. In 1645 he advised Charles to reject the proposals of the Independents, and in 1647 approved of the king's surrender to the Scots. At this period Lauderdale veered round completely to the king's cause, had several interviews with him, and engaged in various projects for his restoration, offering the aid of the Scots, on the condition of Charles's consent to the establishment of Presbyterianism, and on the 26th of December he obtained from Charles at Carisbrooke "the engagement" by which Presbyterianism was to be established for three years, schismatics were to be suppressed, and the acts of the Scottish parliament ratified, the king in addition promising to admit the Scottish nobles into public employment in England and to reside frequently in Scotland. Returning to Scotland, in the spring of 1648, Lauderdale joined the party of Hamilton in alliance with the English royalists. Their defeat at Preston postponed the arrival of the prince of Wales. but Lauderdale had an interview with the prince in the Downs in August, and from this period obtained supreme influence over the future king. He persuaded him later to accept the invitation. to Scotland from the Argyll faction, accompanied him thither in 1650 and in the expedition into England, and was taken prisoner at Worcester in 1651, remaining in confinement till March 1660. He joined Charles in May 1660 at Breda, and, in spite of the opposition of Clarendon and Monk, was appointed secretary of state. From this time onwards he kept his hold upon the king, was lodged at Whitehall, was "never from the king's ear nor council,"[1] and maintained his position against his numerous adversaries by a crafty dexterity in dealing with men, a fearless unscrupulousness, and a robust strength of will, which overcame all opposition. Though a man of considerable learning and intellectual attainment, his character was exceptionally and grossly licentious, and his base and ignoble career was henceforward unrelieved by a single redeeming feature. He abandoned Argyll to his fate, permitted, if he did not assist in, the restoration of episcopacy in Scotland, and after triumphing over all his opponents in Scotland drew into his own hands the whole administration of that kingdom, and proceeded to impose upon it the absolute supremacy of the crown in church and state, restoring the nomination of the lords of the articles to the king and initiating severe measures against the Covenanters. In 1669 he was able to boast with truth that "the king is now master here in all causes and over all persons."

His own power was now at its height, and his position as the favourite of Charles, controlled by no considerations of patriotism or statesmanship, and completely independent of the English parliament, recalled the worst scandals and abuses of the Stuart administration before the Civil War. He was a member of the cabal ministry, but took little part in English affairs, and was not entrusted with the first secret treaty of Dover, but gave personal support to Charles in his degrading demands for pensions from Louis XIV. On the 2nd of May 1672 he was created duke of Lauderdale and earl of March, and on the 3rd of June knight of the garter. In 1673, on the resignation of James in consequence of the Test Act, he was appointed a commissioner for the admiralty. In October he visited Scotland to suppress the dissenters and obtain money for the Dutch War, and the intrigues organized by Shaftesbury against his power in his absence, and the attacks made upon him in the House of Commons in January 1674 and April 1675, were alike rendered futile by the steady support of Charles and James. On the 25th of June 1674 he was created earl of Guilford and Baron Petersham in the peerage of England. His ferocious measures having failed to suppress the conventicles in Scotland, he summoned to his aid in 1677 a band of Highlanders, who were sent into the western country. In consequence, a large party of Scottish nobles came to London, made common cause with the English country faction, and compelled Charles to order the disbandment of the marauders. In May 1678 another demand by the Commons for Lauderdale's removal was thrown out by court influence by one vote. He maintained his triumphs almost to the end. In Scotland, which he visited immediately after this victory in parliament, he overbore all opposition to the king's demands for money. Another address for his removal from the Commons in England was suppressed by the dissolution of parliament on the 26th of May 1679, and a renewed attack upon him, by the Scottish party and Shaftesbury's faction combined, also failed. On the 22nd of June 1679 the last attempt of the unfortunate Covenanters was suppressed at Bothwell Brig. In 1680, however, failing health obliged Lauderdale to resign the place and power for which he had so long successfully struggled. His vote given for the execution of Lord Stafford on the 29th of November is said also to have incurred the displeasure of James. In 1682 he was stripped of all his offices, and he died in August. Lauderdale married (1) Lady Anne Home, daughter of the 1st earl of Home, by whom he had one daughter; and (2) Lady Elizabeth Murray, daughter of the 1st earl of Dysart and widow of Sir Lionel Tollemache. He left no male issue, consequently his dukedom and his English titles became extinct, but he was succeeded in the earldom by his brother Charles (see below).

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[1] Pepys's *Diary*, 2nd of March 1664.

See *Lauderdale Papers Add. MSS.* in Brit. Mus., 30 vols., a small selection of which, entitled *The Lauderdale Papers*, were edited by Osmond Airy for the Camden Society in 1884–1885; *Hamilton Papers* published by the same society; "Lauderdale Correspondence with Archbishop Sharp," *Scottish Hist. Soc. Publications*, vol. 15 (1893); Burnet's *Lives of the Hamiltons* and *History of his Own Time*; R. Baillie's *Letters*; S. R. Gardiner's *Hist. of the Civil War and of the Commonwealth*; Clarendon's *Hist. of the Rebellion*; and the *Quarterly Review*, clvii. 407. Several speeches of Lauderdale are extant. (P. C. Y.)

Earls of Lauderdale.

Charles Maitland, 3rd earl of Lauderdale (d. 1691), became an ordinary lord of session as Lord Halton in 1669, afterwards assisting his brother, the duke, in the management of public business in Scotland. His eldest son, Richard (1653–1695), became the 4th earl. As Lord Maitland he was lord-justice-general from 1681 to 1684; he was an adherent of James II. and after fighting at the battle of the Boyne he was an exile in France until his death. This earl made a verse translation of Virgil (published 1737). He left no sons, and his brother John (*c*, 1655–1710) became the 5th earl. John, a supporter of William III. and of the union of England and Scotland, was succeeded by his son Charles (*c.* 1688–1744), who was the grandfather of James, the 8th earl.

James Maitland, 8th earl of Lauderdale (1759–1839), was a member of parliament from 1780 until August 1789 when he succeeded his father in the earldom. In the House of Commons he took an active part in debate, and in the House of Lords, where he was a representative peer for Scotland, he was prominent as an opponent of the policy of Pitt and the English government with regard to France, a country he had visited in 1792. In 1806 he was made a peer of the United Kingdom as Baron Lauderdale of Thirlestane and for a short time he was keeper of the great seal of Scotland. By this time the earl, who had helped to found the Society of the Friends of the People in 1792, had somewhat modified his political views; this process was continued, and after acting as the leader of the Whigs in Scotland, Lauderdale became a Tory and voted against the Reform Bill of 1832. He died on the 13th of September 1839. He wrote an *Inquiry into the Nature and Origin of Public Wealth* (1804 and 1819), a work which has been translated into French and Italian and which produced a controversy between the author and Lord Brougham; *The Depreciation of the Paper-currency of Great Britain Proved* (1812); and other writings of a similar nature. He was succeeded by his sons James (1784–1860) and Anthony (1785–1863) as 9th and 10th earls. Anthony, a naval officer, died unmarried in March 1863, when his barony of the United Kingdom became extinct, but his Scottish earldom devolved upon a cousin, Thomas Maitland (1803–1878), a grandson of the 7th earl, who became 11th earl of Lauderdale. Thomas, who was an admiral of the fleet, died without sons, and the title passed to Charles Barclay-Maitland (1822–1884), a descendant of the 6th earl. When Charles died unmarried, another of the 6th earl's descendants, Frederick Henry Maitland (b. 1840), became 13th earl of Lauderdale.

The earls of Lauderdale are hereditary standard bearers for Scotland.

LAUENBURG, a duchy of Germany, formerly belonging with Holstein to Denmark, but from 1865 to Prussia, and now included in the Prussian province of Schleswig-Holstein. It lies on the right bank of the Elbe, is bounded by the territories of Hamburg, Lübeck, Mecklenburg-Strelitz and the province of Hanover, and comprises an area of 453 sq. m. The surface is a slightly undulating plain. The soil, chiefly alluvial, though in some places arenaceous, is generally fertile and well cultivated, but a great portion is covered with forests, interspersed with lakes. By means of the Stecknitz canal, the Elbe, the principal river, is connected with the Trave. The chief agricultural products are timber, fruit, grain, hemp, flax and vegetables. Cattle-breeding affords employment for many of the inhabitants. The railroad from Hamburg to Berlin traverses the country. The capital is Ratzeburg, and there are two other towns, Mölln and Lauenburg.

The earliest inhabitants of Lauenburg were a Slav tribe, the Polabes, who were gradually replaced by colonists from Saxony. About the middle of the 12th century the country was subdued by the duke of Saxony, Henry the Lion, who founded a bishopric at Ratzeburg, and after Henry's fall in 1180 it formed part of the smaller duchy of Saxony, which was governed by Duke Bernhard. In 1203 it was conquered by Waldemar II., king of Denmark, but in 1227 it reverted to Albert, a son of its former duke. When Albert died in 1260 Saxony was divided. Lauenburg, or Saxe-Lauenburg, as it is generally called, became a separate duchy ruled by his son John, and had its own lines of dukes for over 400 years, one of them, Magnus I. (d. 1543), being responsible for the introduction of the reformed teaching into the land. The reigning family, however, became extinct when Duke Julius Francis died in September 1689, and there were at least eight claimants for his duchy, chief among them being John George III., elector of Saxony, and George William, duke of Brunswick-Lüneburg-Celle, the ancestors of both these princes having made treaties of mutual succession with former dukes of Saxe-Lauenburg. Both entered the country, but George William proved himself the stronger and occupied Ratzeburg; having paid a substantial sum of money to the elector, he was recognized by the inhabitants as their duke. When he died three years later Lauenburg passed to his nephew, George Louis, elector of Hanover, afterwards king of Great Britain as George I., whose rights were recognized by the emperor Charles VI. in 1728. In 1803 the duchy was occupied by the French, and in 1810 it was incorporated with France. It reverted to Hanover after the battle of Leipzig in 1813, and in 1816 was ceded to Prussia, the greater part of it being at once transferred by her to Denmark in exchange for Swedish Pomerania. In 1848, when Prussia made war on Denmark, Lauenburg was occupied at her own request by some Hanoverian troops, and was then administered for three years under the authority of the German confederation, being restored to Denmark in 1851. Definitely incorporated with this country in 1853, it experienced another change of fortune after the short war of 1864 between Denmark on the one side and Prussia and Austria on the other, as by the peace of Vienna (30th of October 1864) it was ceded with Schleswig and Holstein to the two German powers. By the convention of Gastein (14th of August 1865) Austria surrendered her claim to Prussia in return for the payment of nearly £300,000 and in September 1865 King William I. took formal possession of the duchy. Lauenburg entered the North German confederation in 1866 and the new German empire in 1870. It retained its constitution and its special privileges until the 1st of July 1876, when it was incorporated with the kingdom of Prussia. In 1890 Prince Bismarck received the title of duke of Lauenburg.

See P. von Kobbe, *Geschichte und Landesbeschreibung des Herzogtums Lauenburg* (Altona, 1836-1837); Duve, *Mitteilungen zur Kunde der Staatsgeschichte Lauenburgs* (Ratzeburg, 1852–1857), and the *Archiv des Vereins für die Geschichte des Herzogtums Lauenburg* (Ratzeburg, 1884 seq.).

LAUFF, JOSEF (1855–), German poet and dramatist, was born at Cologne on the 16th of November 1855, the son of a jurist. He was educated at Münster in Westphalia, and entering the army served as a lieutenant of artillery at Thorn and subsequently at Cologne, where he attained the rank of captain in 1890. In 1898 he was summoned by the German emperor, William II., to Wiesbaden, being at the same time promoted to major's rank, in order that he might devote his great dramatic talents to the royal theatre. His literary career began with the epic poems *Jan van Calker, ein Malerlied vom Niederrhein* (1887, 3rd ed., 1892) and *Der Helfensteiner, ein Sang aus dem Bauernkriege* (3rd ed., 1896). These were followed by *Die Overstolzin* (5th ed., 1900), *Herodias* (2nd ed., 1898) and the *Geislerin* (4th ed., 1902). He also wrote the novels *Die Hexe* (6th ed., 1900), *Regina coeli* (a story of the fall of the Dutch Republic) (7th ed., 1904), *Die Hauptmannsfrau* (8th ed., 1903) and *Marie Verwahnen* (1903). But he is best known as a dramatist. Beginning with the tragedy *Ignez de Castro* (1894), he proceeded to dramatize the great monarchs of his country, and, in a Hohenzollern tetralogy, issued *Der Burggraf* (1897, 6th ed. 1900) and *Der Eisenzahn* (1900), to be followed by *Der grosse Kurfürst* (The Great Elector) and *Friedrich der Grosse* (Frederick the Great).

See A. Schroeter, *Josef Lauff, Ein litterarisches Zeitbild* (1899), and B. Sturm, *Josef Lauff* (1903).

LAUGHTER, the visible and audible expression of mirth, pleasure or the sense of the ridiculous by movements of the facial muscles and inarticulate sounds (see COMEDY, PLAY and HUMOUR). The O. Eng. *hleahtor* is formed from *hleahhan*, to laugh, a common Teutonic word; cf. Ger. *lachen*, Goth. *hlahjan*, Icel. *hlaeja*, &c. These are in origin echoic or imitative words, to be referred to a Teut. base *hlah-*, Indo-Eur. *kark-*, to make a noise; Skeat (*Etym. Dict.*, 1898) connects ultimately Gr. *κλώσσειν*, to cluck like a hen, *κράζειν*, to croak, &c. A gentle and inaudible form of laughter expressed by a movement of the lips and by the eyes is a "smile." This is a comparatively late word in English, and is due to Scandinavian influence; cf. Swed. *smila*; it is ultimately connected with Lat. *mirari*, to wonder, and probably with Gr. *μεῖδος*.

LAUMONT, FRANÇOIS PIERRE NICHOLAS GILLET DE (1747–1834), French mineralogist, was born in Paris on the 28th of May 1747. He was educated at a military school and served in the army from 1772–1784, when he was appointed inspector of mines. His attention in his leisure time was wholly given to mineralogy, and he assisted in organizing the new École des Mines in Paris. He was author of numerous mineralogical papers in the *Journal* and *Annales des Mines*. The mineral laumontite was named after him by Haüy. He died in Paris on the 1st of June 1834.

LAUNCESTON, a market town and municipal borough in the Launceston parliamentary division of Cornwall, England, 35½ m. N.W. of Plymouth, on branches of the Great Western and the London & South-Western railways. Pop. (1901) 4053. It lies in a hilly district by and above the river Kensey, an affluent of the Tamar, the houses standing picturesquely on the southern slope of the narrow valley, with the keep of the ancient castle crowning the summit. On the northern slope lies the parish of St Stephen. The castle, the ruins of which are in part of Norman date, was the seat of the earls of Cornwall, and was frequently besieged during the civil wars of the 17th century. In 1656 George Fox the Quaker was imprisoned in the north-east tower for disturbing the peace at St Ives by distributing tracts. Fragments of the old town walls and the south gateway, of the Decorated period, are standing. The church of St Mary Magdalen, built of granite, and richly ornamented without, was erected early in the 16th century, but possesses a detached tower dated 1380. A fine Norman doorway, now appearing as the entrance to a hotel, is preserved from an Augustinian priory founded in the reign of Henry I. The parish church of St Stephen is Early English, and later, with a Perpendicular tower. The trade of Launceston is chiefly agricultural, but there are tanneries and iron foundries. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 2189 acres.

A silver penny of Æthelred II. witnesses to the fact that the privilege of coining money was exercised by Launceston (Dunheved, Lanscaveton, Lanstone) more than half a century before the Norman conquest. At the time of the Domesday survey the canons of St Stephen held Launceston, and the count of Mortain held Dunheved. The number of families settled on the former is not given, but attention is called to the market which had been removed thence by the count to the neighbouring castle of Dunheved, which had two mills, one villein and thirteen bordars. A spot more favoured by nature could not have been chosen either for settlement or for defence than the rich lands near the confluence of the Kensey and Tamar, out of which there rises abruptly the gigantic mound upon which the castle is built. It is not known when the canons settled here nor whether the count's castle, then newly erected, replaced some earlier fortification. Reginald, earl of Cornwall (1140–1175), granted to the canons rights of jurisdiction in all their lands and exemption from suit of court in the shire and hundred courts. Richard (1225-1272), king of the Romans, constituted Dunheved a free borough, and granted to the burgesses freedom from pontage, stallage and suillage, liberty to elect their own reeves, exemption from all pleas outside the borough except pleas of the crown, and a site for a gild-hall. The farm of the borough was fixed at 100s. payable to the earl, 65s. to the prior and 100s. 10d. to the lepers of St Leonard's. In 1205 the market which had been held on Sunday was changed to Thursday. An inquisition held in 1383 discloses two markets, a merchant gild, pillory and tumbrel. In 1555 Dunheved, otherwise Launceston, received a charter of incorporation, the common council to consist of a mayor, 8 aldermen and a recorder. By its provisions the borough was governed until 1835. The parliamentary franchise which had been conferred in 1294 was confined to the corporation and a number of free burgesses. In 1832 Launceston was shorn of one of its members, and in 1885 merged in the county. Separated from it by a small bridge over the Kensey lies the hamlet of Newport which, from 1547 until 1832, also returned two members. These were swept away when the Reform Bill became law. Launceston was the assize town until Earl Richard, having built a palace at Restormel, removed the assize to Lostwithiel. In 1386 Launceston regained the privilege by royal charter. From 1715 until 1837, eleven years only excepted, the assize was held alternately here and at Bodmin. Since that time Bodmin has enjoyed the distinction. Launceston has never had a staple industry. The manufacture of serge was considerable early in the 19th century. Its market on Saturdays is well attended, and an ancient fair on the Feast of St Thomas is among those which survive.

See A. F. Robbins, *Launceston Past and Present.*

LAUNCESTON, the second city of Tasmania, in the county of Cornwall, on the river Tamar, 40 m. from the N. coast of the island, and 133 m. by rail N. by W. of Hobart. The city lies amid surroundings of great natural beauty in a valley enclosed by lofty hills. Cora Linn, about 6 m. distant, a deep gorge of the North Esk river, the Punch Bowl and Cataract Gorge, over which the South Esk falls in a magnificent cascade, joining the North Esk to form the Tamar, are spots famed throughout the Australian commonwealth for their romantic beauty. The city is the commercial capital of northern Tasmania, the river Tamar being navigable up to the town for vessels of 4000 tons. The larger ships lie in midstream and discharge into lighters, while vessels of 2000 tons can berth alongside the wharves on to which the railway runs. Launceston is a well-planned, pleasant town, lighted by electricity, with numerous parks and squares and many fine buildings. The post office, the custom house, the post office savings bank and the Launceston bank form an attractive group; the town hall is used exclusively for civic purposes, public meetings and social functions being held in an elegant building called the Albert hall. There are also a good art gallery, a theatre and a number of fine churches, one of which, the Anglican church of St John, dates from 1824. The city, which attained that rank in 1889, has two attractive suburbs, Invermay and Trevallyn; it has a racecourse at Mowbray 2 m. distant, and is the centre and port of an important fruit-growing district. Pop. of the city proper (1901) 18,022, of the city and suburbs 21,180.

LAUNCH. (1) A verb meaning originally to hurl, discharge a missile or other object, also to rush or shoot out suddenly or rapidly. It is particularly used of the setting afloat a vessel from the stocks on which she has been built. The word is an adaptation of O. Fr. *lancher*, *lancier*, to hurl, throw, Lat. *lanceare*, from *lancea*, a lance or spear. (2) The name of a particular type of boat, usually applied to one of the largest size of ships' boats, or to a large boat moved by electricity, steam or other power. The word is an adaptation of the Span. *lancha*, pinnace, which is usually connected with *lanchara*, the Portuguese name, common in 16th and 17th century histories, for a fast-moving small vessel. This word is of Malay origin and is derived from *lanchār*, quick, speedy.

LAUNDRY, a place or establishment where soiled linen, &c., is washed. The word is a contraction of an earlier form *lavendry*, from Lat. *lavanda*, things to be washed, *lavare*, to wash. "Launder," a similar contraction of *lavender*, was one (of either sex) who washes linen; from its use as a verb came the form "launderer," employed as both masculine and feminine in America, and the feminine form "laundress," which is also applied to a female caretaker of chambers in the Inns of Court, London.

Laundry-work has become an important industry, organized on a scale which requires elaborate mechanical plant very different from the simple appliances that once sufficed for domestic needs. For the actual cleansing of the articles, instead of being rubbed by the hand or trodden by the foot of the washer-woman, or stirred and beaten with a "dolly" in the wash-tub, they are very commonly treated in rotary washing machines driven by power. These machines consist of an outer casing containing an inner horizontal cylindrical cage, in which the clothes are placed. By the rotation of this cage, which is reversed by automatic gearing every few turns, they are rubbed and tumbled on each other in the soap and water which is contained in the outer casing and enters the inner cylinder through perforations. The outer casing is provided with inlet valves for hot and cold water, and with discharge valves; and often also arrangements are made for the admission of steam under pressure, so that the contents can be boiled. Thus the operations of washing, boiling, rinsing and blueing (this last being the addition of a blue colouring matter to mask the yellow tint and thus give the linen the appearance of whiteness) can be performed without removing the articles from the machine. For drying, the old methods of wringing by hand, or by machines in which the clothes were squeezed between rollers of wood or india-rubber, have been largely superseded by "hydro-extractors" or "centrifugals." In these the wet garments are placed in a perforated cage or basket, supported on vertical bearings, which is rotated at a high speed (1000 to 1500 times a minute) and in a short time as much as 85% of the moisture may thus be removed. The drying is often completed in an apartment through which dry air is forced by fans. In the process of finishing linen the old-fashioned laundress made use of the mangle, about the only piece of mechanism at her disposal. In the box-mangle the articles were pressed on a flat surface by rollers which were weighted with a box full of stones, moved to and fro by a rack and pinion. In a later and less cumbrous form of the machine they were passed between wooden rollers or "bowls" held close together by weighted levers. An important advance was marked by the introduction of machines which not only smooth and press the linen like the mangle, but also give it the glazed finish obtained by hot ironing. Machines of this kind are essentially the same as the calenders used in paper and textile manufacture. They are made in a great variety of forms, to enable them to deal with articles of different shapes, but they may be described generally as consisting either of a polished metal roller, heated by steam or gas, which works against a blanketted or felted surface in the form of another roller or a flat table, or, as in the Decoudun type, of a felted metal roller rotating against a heated concave bed of polished metal. In cases where hand-ironing is resorted to, time is economized by the employment of irons which are continuously heated by gas or electricity.

LA UNION, a seaport and the capital of the department of La Union, Salvador, 144 m. E.S.E. of San Salvador. Pop. (1905) about 4000. La Union is situated at the foot of a lofty volcano, variously known as Conchagua, Pinos and Meanguera, and on a broad indentation in the western shore of Fonseca Bay. Its harbour, the best in the republic, is secure in all weathers and affords good anchorage to large ships. La Union is the port of shipment for the exports of San Miguel and other centres of production in eastern Salvador.

LA UNION, a town of eastern Spain in the province of Murcia, 5 m. by rail E. of Cartagena and close to the Mediterranean Sea. Pop. (1900) 30,275, of whom little more than half inhabit the town itself. The rest are scattered among the numerous metal works and mines of iron, manganese, calamine, sulphur and lead, which are included within the municipal boundaries. La Union is quite a modern town, having sprung up in the second half of the 19th century. It has good modern municipal buildings, schools, hospital, town hall and large factories.

LAURAHÜTTE, a village of Germany, in the Prussian province of Silesia, 5 m. S.E. of Beuthen, on the railway Tarnowitz-Emanuelsegen. It has an Evangelical and a Roman Catholic church, but is especially noteworthy for its huge iron works, which employ about 6000 hands. Pop. (1900) 13,571.

LAUREATE (Lat. *laureatus*, from *laurea*, the laurel tree). The laurel, in ancient Greece, was sacred to Apollo, and as such was used to form a crown or wreath of honour for poets and heroes; and this usage has been widespread. The word "laureate" or "laureated" thus came in English to signify eminent, or associated with glory, literary or military. "Laureate letters" in old times meant the despatches announcing a victory; and the epithet was given, even officially (*e.g.* to John Skelton) by universities, to distinguished poets. The name of "bacca-laureate" for the university degree of bachelor shows a confusion with a supposed etymology from Lat. *bacca lauri* (the laurel berry), which though incorrect (see BACHELOR) involves the same idea. From the more general use of the term "poet laureate" arose its restriction in England to the office of the poet attached to the royal household, first held by Ben Jonson, for whom the position was, in its essentials, created by Charles I. in 1617. (Jonson's appointment does not seem to have been formally made as poet-laureate, but his position was equivalent to that). The office was really a development of the practice of earlier times, when minstrels and versifiers were part of the retinue of the King; it is recorded that Richard Cœur de Lion had a *versificator regis* (Gulielmus Peregrinus), and Henry III. had a versificator (Master Henry); in the 15th century John Kay, also a "versifier," described himself as Edward IV.'s "humble poet laureate." Moreover, the crown had shown its patronage in various ways; Chaucer had been given a pension and a perquisite of wine by Edward III., and Spenser a pension by Queen Elizabeth. W. Hamilton classes Chaucer, Gower, Kay, Andrew Bernard, Skelton, Robert Whittington, Richard Edwards, Spenser and Samuel Daniel, as "volunteer Laureates." Sir William Davenant succeeded Jonson in 1638, and the title of poet laureate was conferred by letters patent on Dryden in 1670, two years after Davenant's death, coupled with a pension of £300 and a butt of Canary wine. The post then became a regular institution, though the emoluments varied, Dryden's successors being T. Shadwell (who originated annual birthday and New Year odes), Nahum Tate, Nicholas Rowe, Laurence Eusden, Colley Cibber, William Whitehead, Thomas Warton, H. J. Pye, Southey, Wordsworth, Tennyson and, four years after Tennyson's death, Alfred Austin. The office took on a new lustre from the personal distinction of Southey, Wordsworth and Tennyson; it had fallen into contempt before Southey, and on Tennyson's death there was a considerable feeling that no possible successor was acceptable (William Morris and Swinburne being hardly court poets). Eventually, however, the undesirability of breaking with tradition for temporary reasons, and thus severing the one official link between literature and the state, prevailed over the protests against following Tennyson by any one of inferior genius. It may be noted that abolition was similarly advocated when Warton and Wordsworth died.

The poet laureate, being a court official, was considered responsible for producing formal and appropriate verses on birthdays and state occasions; but his activity in this respect has varied, according to circumstances, and the custom ceased to be obligatory after Pye's death. Wordsworth stipulated, before accepting the honour, that no formal effusions from him should be considered a necessity; but Tennyson was generally happy in his numerous poems of this class. The emoluments of the post have varied; Ben Jonson first received a pension of 100 marks, and later an annual "terse of Canary wine." To Pye an allowance of £27 was made instead of the wine. Tennyson drew £72 a year from the lord chamberlain's department, and £27 from the lord steward's in lieu of the "butt of sack."

See Walter Hamilton's *Poets Laureate of England* (1879), and his contributions to *Notes and Queries* (Feb. 4, 1893).

LAUREL. At least four shrubs or small trees are called by this name in Great Britain, viz. the common or cherry laurel (*Prunus Laurocerasus*), the Portugal laurel (*P. lusitanica*), the bay or sweet laurel (*Laurus nobilis*) and the spurge laurel (*Daphne Laureola*). The first two belong to the rose family (*Rosaceae*), to the section *Cerasus* (to which also belongs the cherry) of the genus *Prunus*.

The common laurel is a native of the woody and sub-alpine regions of the Caucasus, of the mountains of northern Persia, of north-western Asia Minor and of the Crimea. It was received into Europe in 1576, and flowered for the first time in 1583. Ray in 1688 relates that it was first brought from Trebizonde to Constantinople, thence to Italy, France, Germany and England. Parkinson in his *Paradisus* records it as growing in a garden at Highgate in 1629; and in Johnson's edition of Gerard's *Herbal* (1633) it is recorded that the plant "is now got into many of our choice English gardens, where it is well respected for the beauty of the leaues and their lasting or continuall greennesse" (see Loudon's *Arboretum*, ii. 717). The leaves of this plant are rather large, broadly lance-shaped and of a leathery consistence, the margin being somewhat serrated. They are remarkable for their poisonous properties, giving off the odour of bitter almonds when bruised; the vapour thus issuing is sufficient to kill small insects by the prussic acid which it contains. The leaves when cut up finely and distilled yield oil of bitter almonds and hydrocyanic (prussic) acid. Sweetmeats, custards, cream, &c., are often flavoured with laurel-leaf water, as it imparts the same flavour as bitter almonds; but it should be used sparingly, as it is a dangerous poison, having several times proved fatal. The first case occurred in 1731, which induced a careful investigation to be made of its nature; Schrader in 1802 discovered it to contain hydrocyanic acid. The effects of the distilled laurel-leaf water on living vegetables is to destroy them like ordinary prussic acid; while a few drops act on animals as a powerful poison. It was introduced into the British pharmacopoeia in 1839, but is generally superseded by the use of prussic acid. The *aqua laurocerasi*, or cherry laurel water, is now standardized to contain 0·1% of hydrocyanic acid. It must not be given in doses larger than 2 drachms. It contains benzole hydrate, which is antiseptic, and is therefore suitable for hypodermic injection; but the drug is of inconsistent strength, owing to the volatility of prussic acid.

The following varieties of the common laurel are in cultivation: the Caucasian (*Prunus Laurocerasus*, var. *caucasica*), which is hardier and bears very rich dark-green glossy foliage; the Versailles laurel (var. *latifolia*), which has larger leaves; the Colchican (var. *colchica*), which is a dwarf-spreading bush with narrow sharply serrated pale-green leaves. There is also the variety *rotundifolia* with short broad leaves, the Grecian with narrow leaves and the Alexandrian with very small leaves.

The Portugal laurel is a native of Portugal and Madeira. It was introduced into England about the year 1648, when it was cultivated in the Oxford Botanic Gardens. During the first half of the 18th century this plant, the common laurel and the holly were almost the only hardy evergreen shrubs procurable in British nurseries. They are all three tender about Paris, and consequently much less seen in the neighbourhood of that city than in England, where they stand the ordinary winters but not very severe ones. There is a variety (*myrtifolia*) of compact habit with smaller narrow leaves, also a variegated variety.

The evergreen glossy foliage of the common and Portugal laurels render them well adapted for shrubberies, while the racemes of white flowers are not devoid of beauty. The former often ripens its insipid drupes, but the Portugal rarely does so. It appears to be less able to accommodate itself to the English climate, as the wood does not usually "ripen" so satisfactorily. Hence it is rather more liable to be cut by the frost. It is grown in the open air in the southern United States.

The bay or sweet laurel (*Laurus nobilis*) belongs to the family Lauraceae, which contains sassafras, benzoin, camphor and other trees remarkable for their aromatic properties. It is a large evergreen shrub, sometimes reaching the height of 60 ft., but rarely assuming a truly tree-like character. The leaves are smaller than those of the preceding laurels, possessing an aromatic and slightly bitter flavour, and are quite devoid of the poisonous properties of the cherry laurel. The small yellowish-green flowers are produced in axillary clusters, are male or female, and consist of a simple 4-leaved perianth which encloses nine stamens in the male, the anthers of which dehisce by valves which lift upwards as in the common barberry, and carry glandular processes at the base of the filament. The fruit consists of a succulent berry surrounded by the persistent base of the perianth. The bay laurel is a native of Italy, Greece and North Africa, and is abundantly grown in the British Isles as an evergreen shrub, as it stands most winters. The date of its introduction is unknown, but must have been previous to 1562, as it is mentioned in Turner's *Herbal* published in that year. A full description also occurs in Gerard's *Herball* (1597, p. 1222). It was used for strewing the floors of houses of distinguished persons in the reign of Elizabeth. Several varieties have been cultivated, differing in the character of their foliage, as the *undulata* or wave-leafed, *salicifolia* or willow-leafed, the variegated, the broad-leafed and the curled; there is also the double-flowered variety. The bay laurel was carried to North America by the early colonists.

This laurel is generally held to be the *Daphne* of the ancients, though Lindley, following Gerard (*Herball*, 1597, p. 761), asserted that the Greek *Daphne* was *Ruscus racemosus*. Among the Greeks the laurel was sacred to Apollo, especially in connexion with Tempe, in whose laurel groves the god himself obtained purification from the blood of the Python. This legend was dramatically represented at the Pythian festival once in eight years, a boy fleeing from Delphi to Tempe, and after a time being led back with song, crowned and adorned with laurel. Similar δαφνηφορίαι were known elsewhere in Greece. Apollo, himself purified, was the author of purification and atonement to other penitents, and the laurel was the symbol of this power, which came to be generally associated with his person and sanctuaries. The relation of Apollo to the laurel was expressed in the legend of Daphne (*q.v.*). The victors in the Pythian games were crowned with the laurels of Apollo, and thus the laurel became the symbol of triumph in Rome as well as in Greece. As Apollo was the god of poets, the *Laurea Apollinaris* naturally belonged to poetic merit (see Laureate). The various prerogatives of the laurel among the ancients are collected by Pliny (*Hist. Nat.* xv. 30). It was a sign of truce, like the olive branch; letters announcing victory and the arms of the victorious soldiery were garnished with it; it was thought that lightning could not strike it, and the emperor Tiberius always wore a laurel wreath during thunderstorms. From its association with the divine power of purification and protection, it was often set before the door of Greek houses, and among the Romans it was the guardian of the gates of the Caesars (Ovid, *Met.* i. 562 sq.). The laurel worn by Augustus and his successors had a miraculous history: the laurel grove at the imperial villa by the ninth milestone on the Flaminian way sprang from a shoot sent from heaven to Livia Drusilla (Sueton. *Galba*, i.). Like the olive, the laurel was forbidden to profane use. It was employed in divination; the crackling of its leaves in the sacred flame was a good omen (Tibull. ii. 5. 81), and their silence unlucky (Propert. ii. 21); and the leaves when chewed excited a prophetic afflatus (δαφνηφάγοι, cf. Tibull. ii. 5. 63). There is a poem enumerating the ancient virtues of the laurel by J. Passeratius (1594).

The last of the plants mentioned above under the name of laurel is the so-called spurge laurel (*Daphne Laureola*). This and one other species (*D. Mezereum*), the mezereon, are the sole representatives of the family Thymelaeaceae in Great Britain. The spurge laurel is a small evergreen shrub, with alternate somewhat lanceolate leaves with entire margins. The green flowers are produced in early spring, and form drooping clusters at the base of the leaves. The calyx is four-cleft, and carries eight stamens in two circles of four each within the tube. The pistil forms a berry, green at first, but finally black. The mezereon differs in blossoming before the leaves are produced, while the flowers are lilac instead of green. The bark furnishes the drug *Cortex Mezerei*, for which that of the spurge laurel is often substituted. Both are powerfully acrid, but the latter is less so than the bark of mezereon. It is now only used as an ingredient of the *liquor sarsae compositus concentratus*. Of other species in cultivation there are *D. Fortunei* from China, which has lilac flowers; *D. pontica*, a native of Asia Minor; *D. alpina*, from the Italian Alps; *D. collina*, south European; and *D. Cneorum*, the garland flower or trailing daphne, the handsomest of the hardy species.

See Hemsley's *Handbook of Hardy Trees, &c.*

LAURENS, HENRY (1724–1792), American statesman, was born in Charleston, South Carolina, on the 24th of February 1724, of Huguenot ancestry. When sixteen he became a clerk in a counting-house in London, and later engaged in commercial pursuits with great success at Charleston until 1771, when he retired from active business. He spent the next three years travelling in Europe and superintending the education of his sons in England. In spite of his strong attachment to England, and although he had defended the Stamp Act, in 1774, in the hope of averting war, he united with thirty-seven other Americans in a petition to parliament against the passing of the Boston Port Bill. Becoming convinced that a peaceful settlement was impracticable, he returned to Charleston at the close of 1774, and there allied himself with the conservative element of the Whig party. He was soon made president of the South Carolina council of safety, and in 1776 vice-president of the state; in the same year he was sent as a delegate from South Carolina to the general continental congress at Philadelphia, of which body he was president from November 1777 until December 1778. In August 1780 he started on a mission to negotiate on behalf of congress a loan of ten million dollars in Holland; but he was captured on the 3rd of September off the Banks of Newfoundland by the British frigate "Vestal," taken to London and closely imprisoned in the Tower. His papers were found to contain a sketch of a treaty between the United States and Holland projected by William Lee, in the service of Congress, and Jan de Neufville, acting on behalf of Mynheer Van Berckel, pensionary of Amsterdam, and this discovery eventually led to war between Great Britain and the United Provinces. During his imprisonment his health became greatly impaired. On the 31st of December 1781 he was released on parole, and he was finally exchanged for Cornwallis. In June 1782 he was appointed one of the American commissioners for negotiating peace with Great Britain, but he did not reach Paris until the 28th of November 1782, only two days before the preliminaries of peace were signed by himself, John Adams, Franklin and Jay. On the day of signing, however, he procured the insertion of a clause prohibiting the British from "carrying away any negroes or other property of American inhabitants"; and this subsequently led to considerable friction between the British and American governments. On account of failing health he did not remain for the signing of the definitive treaty, but returned to Charleston, where he died on the 8th of December 1792.

His son, JOHN LAURENS (1754–1782), American revolutionary officer, was born at Charleston, South Carolina, on the 28th of October 1754. He was educated in England, and on his return to America in 1777, in the height of the revolutionary struggle, he joined Washington's staff. He soon gained his commander's confidence, which he reciprocated with the most devoted attachment, and was entrusted with the delicate duties of a confidential secretary, which he performed with much tact and skill. He was present in all Washington's battles, from Brandywine to Yorktown, and his gallantry on every occasion has gained him the title of "the Bayard of the Revolution." Laurens displayed bravery even to rashness in the storming of the Chew mansion at Germantown; at Monmouth, where he saved Washington's life, and was himself severely wounded; and at Coosahatchie, where, with a handful of men, he defended a pass against a large English force under General Augustine Prevost, and was again wounded. He fought a duel against General Charles Lee, and wounded him, on account of that officer's disrespectful conduct towards Washington. Laurens distinguished himself further at Savannah, and at the siege of Charleston in 1780. After the capture of Charleston by the English, he rejoined Washington, and was selected by him as a special envoy to appeal to the king of France for supplies for the relief of the American armies, which had been brought by prolonged service and scanty pay to the verge of dissolution. The more active co-operation of the French fleets with the land forces in Virginia, which was one result of his mission, brought about the disaster of Cornwallis at Yorktown. Laurens lost no time in rejoining the army, and at Yorktown was at the head of an American storming party which captured an advanced redoubt. Laurens was designated with the vicomte de Noailles to arrange the terms of the surrender, which virtually ended the war, although desultory skirmishing, especially in the South, attended the months of delay before peace was formally concluded. In one of these trifling affairs on the 27th of August 1782, on the Combahee river, Laurens exposed himself needlessly and was killed. Washington lamented deeply the death of Laurens, saying of him, "He had not a fault that I could discover, unless it were intrepidity bordering upon rashness."

The most valuable of Henry Laurens's papers and pamphlets including the important "Narrative of the Capture of Henry Laurens, of his Confinement in the Tower of London, &c., 1780, 1781, 1782," in vol. i. (Charleston, 1857) of the Society's *Collections*, have been published by the South Carolina Historical Society. John Laurens's military correspondence, with a brief memoir by W. G. Simms, was privately printed by the Bradford Club, New York, in 1867.

LAURENT, FRANÇOIS (1810–1887), Belgian historian and jurisconsult, was born at Luxemburg on the 8th of July 1810. He held a high appointment in the ministry of justice for some time before he became professor of civil law in the university of Ghent in 1836. His advocacy of liberal and anti-clerical principles both from his chair and in the press made him bitter enemies, but he retained his position until his death on the 11th of February 1887. He treated the relations of church and state in *L'Église et l'état* (Brussels, 3 vols., 1858–1862; new and revised edition, 1865), and the same subject occupied a large proportion of the eighteen volumes of his chief historical work, *Études sur l'histoire de l'humanité* (Ghent and Brussels, 1855–1870), which aroused considerable interest beyond the boundaries of Belgium. His fame as a lawyer rests on his authoritative exposition of the Code Napoléon in his *Principes de droit civil* (Brussels, 33 vols., 1869–1878), and his *Droit civil international* (Brussels, 8 vols., 1880–1881). He was charged in 1879 by the minister of justice with the preparation of a report on the proposed revision of the civil code. Besides his anti-clerical pamphlets his minor writings include much discussion of social questions, of the organization of savings banks, asylums, &c., and he founded the *Société Callier* for the encouragement of thrift among the working classes. With Gustave Callier, whose funeral in 1863 was made the occasion of a display of clerical intolerance, Laurent had much in common, and the efforts of the society were directed to the continuation of Callier's philanthropic schemes.

For a complete list of his works, see G. Koninck, *Bibliographie nationale* (Brussels, vol. ii., 1892).

LAURENTINA, VIA, an ancient road of Italy, leading southwards from Rome. The question of the nomenclature of the group of roads between the Via Ardeatina and the Via Ostiensis is somewhat difficult, and much depends on the view taken as to the site of Laurentum. It seems probable, however, that the Via Laurentina proper is that which led out of the Porta Ardeatina of the Aurelian wall and went direct to Tor Paterno, while the road branching from the Via Ostiensis at the third mile, and leading past Decimo to Lavinium (Pratica), which crosses the other road at right angles not far from its destination (the Laurentina there running S.W. and that to Lavinium S.E.) may for convenience be called Lavinatis, though this name does not occur in ancient times. On this latter road, beyond Decimo, two milestones, one of Tiberius, the other of Maxentius, each bearing the number 11, have been found; and farther on, at Capocotta, traces of ancient buildings, and an important sepulchral inscription of a Jewish ruler of a synagogue have come to light. That the Via Laurentina was near the Via Ardeatina is clear from the fact that the same contractor was responsible for both roads. Laurentum was also accessible by a branch from the Via Ostiensis at the eighth mile (at Malafede) leading past Castel Porziano, the royal hunting-lodge, which is identical with the ancient Ager Solonius (in which, Festus tells us, was situated the Pomonal or sacred grove of Pomona) and which later belonged to Marius.

See R. Lanciani in articles quoted under Lavinium. (T. As.)

LAURENTIUS, PAUL (1554–1624), Lutheran divine, was born on the 30th of March 1554 at Ober Wierau, where his father, of the same names, was pastor. From a school at Zwickau he entered (1573) the university of Leipzig, graduating in 1577. In 1578 he became rector of the Martin school at Halberstadt; in 1583 he was appointed town's preacher at Plauen-im-Vogtland, and in 1586 superintendent at Oelnitz. On the 20th of October 1595 he took his doctorate in theology at Jena, his thesis on the *Symbolum Athanasii* (1597), gaining him similar honours at Wittenberg and Leipzig. He was promoted (1605) to be pastor and superintendent at Dresden, and transferred (1616) to the superintendence at Meissen, where he died on the 24th of February 1624. His works consist chiefly of commentaries and expository discourses on prophetic books of the Old Testament, parts of the Psalter, the Lord's Prayer and the history of the Passion. In two orations he compared Luther to Elijah. Besides theological works he was the author of a *Spicilegium Gnomonologicum* (1612).

The main authority is C. Schlegel, the historian of the Dresden superintendents (1698), summarized by H. W. Rotermund, in the additions (1810) to Jöcher, *Gelehrten-Lexicon* (1750). (A. Go.*)

LAURIA (Luria or Loria) **ROGER DE** (d. 1305), admiral of Aragon and Sicily, was the most prominent figure in the naval war which arose directly from the Sicilian Vespers. Nothing is really known of his life before he was named admiral in 1283. His father was a supporter of the Hohenstaufen, and his mother came to Spain with Costanza, the daughter of Manfred of Beneventum, when she married Peter, the eldest son and heir of James the Conqueror of Aragon. According to one account Bella of Lauria, the admiral's mother, had been the foster mother of Costanza. Roger, who accompanied his mother, was bred at the court of Aragon and endowed with lands in the newly conquered kingdom of Valencia. When the misrule of Charles of Anjou's French followers had produced the famous revolt known as the Sicilian Vespers in 1282, Roger de Lauria accompanied King Peter III. of Aragon on the expedition which under the cover of an attack on the Moorish kingdom of Tunis was designed to be an attempt to obtain possession of all or at least part of the Hohenstaufen dominions in Naples and Sicily which the king claimed by right of his wife as the heiress of Manfred. In 1283, when the island had put itself under the protection of Peter III. and had crowned him king, he gave the command of his fleet to Roger de Lauria. The commission speaks of him in the most laudatory terms, but makes no reference to previous military services.

From this time forward till the peace of Calatabellota in 1303, Roger de Lauria was the ever victorious leader of fleets in the service of Aragon, both in the waters of southern Italy and on the coast of Catalonia. In the year of his appointment he defeated a French naval force in the service of Charles of Anjou, off Malta. The main object before him was to repel the efforts of the Angevine party to reconquer Sicily and then to carry the war into their dominions in Naples. Although Roger de Lauria did incidental fighting on shore, he was as much a naval officer as any modern admiral, and his victories were won by good manœuvring and by discipline. The Catalan squadron, on which the Sicilian was moulded, was in a state of high and intelligent efficiency. Its chiefs relied not on merely boarding, and the use of the sword, as the French forces of Charles of Anjou did, but on the use of the ram, and of the powerful cross-bows used by the Catalans either by hand or, in case of the larger ones, mounted on the bulwarks, with great skill. The conflict was in fact the equivalent on the water of the battles between the English bowmen and the disorderly chivalry of France in the Hundred Years' War. In 1284 Roger defeated the Angevine fleet in the Bay of Naples, taking prisoner the heir to the kingdom, Charles of Salerno, who remained a prisoner in the hands of the Aragonese in Sicily, and later in Spain, for years. In 1285 he fought on the coast of Catalonia one of the most brilliant campaigns in all naval history. The French king Philippe le Hardi had invaded Catalonia with a large army to which the pope gave the character of crusaders, in order to support his cousin of Anjou in his conflict with the Aragonese. The king, Peter III., had offended his nobles by his vigorous exercise of the royal authority and received little support from them, but the outrages perpetrated by the French invaders raised the towns and country against them. The invaders advanced slowly, taking the obstinately defended towns one by one, and relying on the co-operation of a large number of allies, who were stationed in squadrons along the coast, and who brought stores and provisions from Narbonne and Aigues Mortes. They relied in fact wholly on their fleet for their existence. A successful blow struck at that would force them to retreat. King Peter was compelled to risk Sicily for a time, and he recalled Roger de Lauria from Palermo to the coast of Catalonia. The admiral reached Barcelona on the 24th of August, and was informed of the disposition of the French. He saw that if he could break the centre of their line of squadrons, stretched as it was so far that its general superiority of numbers was lost in the attempt to occupy the whole of the coast, he could then dispose of the extremities in detail. On the night of the 9th of September he fell on the central squadron of the French fleet near the Hormigas. The Catalan and Sicilian squadrons doubled on the end of the enemies' line, and by a vigorous employment of the ram, as well as by the destructive shower of bolts from the cross-bows, which cleared the decks of the French, gained a complete victory. The defeat of the enemy was followed, as usually in medieval naval wars, by a wholesale massacre. Roger then made for Rosas, and tempted out the French squadron stationed there by approaching under French colours. In the open it was beaten in its turn. The result was the capture of the town, and of the stores collected there by King Philippe for the support of his army. Within a short time he was forced to retreat amid sufferings from hunger, and the incessant attacks of the Catalan mountaineers, by which his army was nearly annihilated. This campaign, which was followed up by destructive attacks on the French coast, saved Catalonia from the invaders, and completely ruined the French naval power for the time being. No medieval admiral of any nation displayed an equal combination of intellect and energy, and none of modern times has surpassed it. The work had been so effectually done on the coast of Catalonia that Roger de Lauria was able to return to Sicily, and resume his command in the struggle of Aragonese and Angevine to gain, or to hold, the possession of Naples.

He maintained his reputation and was uniformly successful in his battles at sea, but they were not always fought for the defence of Sicily. The death of Peter III. in 1286 and of his eldest son Alphonso in the following year caused a division among the members of the house of Aragon. The new king, James, would have given up Sicily to the Angevine line with which he made peace and alliance, but his younger brother Fadrique accepted the crown offered him by the Sicilians, and fought for his own hand against both the Angevines and his senior. King James tried to force him to submission without success. Roger de Lauria adhered for a time to Fadrique, but his arrogant temper made him an intolerable supporter, and he appears, moreover, to have thought that he was bound to obey the king of Aragon. His large estates in Valencia gave him a strong reason for not offending that sovereign. He therefore left Fadrique, who confiscated his estates in Sicily and put one of his nephews to death as a traitor. For this Roger de Lauria took a ferocious revenge in two successive victories at sea over the Sicilians. When the war, which had become a ravening of wild beasts, was at last ended by the peace of Calatabellota, Roger de Lauria retired to Valencia, where he died on the 2nd of January 1305, and was buried, by his express orders, in the church of Santas Creus, a now deserted monastery of the Cistercians, at the feet of his old master Peter III. In his ferocity, and his combination of loyalty to his feudal lord with utter want of scruple to all other men, Roger belonged to his age. As a captain he was far above his contemporaries and his successors for many generations.

Signor Amari's *Guerra del Vespro Siciliano* gives a general picture of these wars, but the portrait of Roger de Lauria must be sought in the *Chronicle* of the Catalan Ramon de Muntaner who knew him and was formed in his school. There is a very fair and well "documented" account of the masterly campaign of 1285 in Charles de la Roncière's *Histoire de la marine française*, i. 189-217. (D. H.)

LAURIA, or Loria, a city of Basilicata, Italy, in the province of Potenza, situated near the borders of Calabria, 7½ m. by road S. of Lagonegro. Pop. (1901) 10,470. It is a walled town on the steep side of a hill with another portion in the plain below, 1821 ft. above sea-level. The castle was the birthplace of Ruggiero di Loria, the great Italian admiral of the 13th century. It was destroyed by the French under Masséna in 1806.

LAURIER, SIR WILFRID (1841–), Canadian statesman, was born on the 20th of November 1841, at St Lin in the province of Quebec. The child of French Roman Catholic parents, he attended the elementary school of his native parish and for eight or nine months was a pupil of the Protestant elementary school at New Glasgow in order to learn English; his association with the Presbyterian family with whom he lived during this period had a permanent influence on his mind. At twelve years of age he entered L'Assomption college, and was there for seven years. The college, like all the secondary schools in Quebec then available for Roman Catholics, was under direct ecclesiastical control. On leaving it he entered a law office at Montreal and took the law course at McGill University. At graduation he delivered the valedictory address for his class. This, like so many of his later utterances, closed with an appeal for sympathy and union between the French and English races as the secret of the future of Canada. He began to practise law in Montreal, but owing to ill-health soon removed to Athabaska, where he opened a law office and undertook also to edit *Le Défricheur*, a newspaper then on the eve of collapse. At Athabaska, the seat of one of the superior courts of Quebec, the population of the district was fairly divided between French- and English-speaking people, and Laurier's career was undoubtedly influenced by his constant association with English-speaking people and his intimate acquaintance with their views and aspirations.

While at Montreal he had joined the Institut Canadien, a literary and scientific society which, owing to its liberal discussions and the fact that certain books upon its shelves were on the *Index expurgatorius*, was finally condemned by the Roman Catholic authorities. *Le Défricheur* was an organ of extreme French sentiment, opposed to confederation, and also under ecclesiastical censure. One of its few surviving copies contains an article by Laurier opposing confederation as a scheme designed in the interest of the English colonies in North America, and certain to prove the tomb of the French race and the ruin of Lower Canada. The Liberals of Quebec under the leadership of Sir Antoine Dorion were hostile to confederation, or at least to the terms of union agreed upon at the Quebec conference, and Laurier in editorials and speeches maintained the position of Dorion and his allies. He was elected to the Quebec legislature in 1871, and his first speech in the provincial assembly excited great interest, on account of its literary qualities and the attractive manner and logical method of the speaker. He was not less successful in the Dominion House of Commons, to which he was elected in 1874. During his first two years in the federal parliament his chief speeches were made in defence of Riel and the French halfbreeds who were concerned in the Red River rebellion, and on fiscal questions. Sir John Macdonald, then in opposition, had committed his party to a protectionist policy, and Laurier, notwithstanding that the Liberal party stood for a low tariff avowed himself to be "a moderate protectionist." He declared that if he were in Great Britain he would be a free trader, but that free trade or protection must be applied according to the necessities of a country, and that which protection necessarily involved taxation it was the price a young and vigorous nation must pay for its development. But the Liberal government, to which Laurier was admitted as minister of inland revenue in 1877, made only a slight increase in duties, raising the general tariff from 15% to 17½%; and against the political judgment of Alexander Mackenzie, Sir Richard Cartwright, George Brown, Laurier and other of the more influential leaders of the party, it adhered to a low tariff platform. In the bye-election which followed Laurier's admission to the cabinet he was defeated—the only personal defeat he ever sustained; but a few weeks later he was returned for Quebec East, a constituency which he held thenceforth by enormous majorities. In 1878 his party went out of office and Sir John Macdonald entered upon a long term of power, with protection as the chief feature of his policy, to which was afterwards added the construction of the Canadian Pacific railway.

After the defeat of the Mackenzie government, Laurier sat in Parliament as the leader of the Quebec Liberals and first lieutenant to the Hon. Edward Blake, who succeeded Mackenzie in the leadership of the party. He was associated with Blake in his sustained opposition to high tariff, and to the Conservative plan for the construction of the Canadian Pacific railway, and was a conspicuous figure in the long struggle between Sir John Macdonald and the leaders of the Liberal party to settle the territorial limits of the province of Ontario and the legislative rights of the provinces under the constitution. He was forced also to maintain a long conflict with the ultramontane element of the Roman Catholic church in Quebec, which for many years had a close working alliance with the Conservative politicians of the province and even employed spiritual coercion in order to detach votes from the Liberal party. Notwithstanding that Quebec was almost solidly Roman Catholic the Rouges sternly resisted clerical pressure; they appealed to the courts and had certain elections voided on the ground of undue clerical influence, and at length persuaded the pope to send out a delegate to Canada, through whose inquiry into the circumstances the abuses were checked and the zeal of the ultramontanes restrained.

In 1887, upon the resignation of Blake on the ground of ill-health, Laurier became leader of the Liberal party, although he and many of the more influential men in the party doubted the wisdom of the proceeding. He was the first French Canadian to lead a federal party in Canada since confederation. Apart from the natural fear that he would arouse prejudice in the English-speaking provinces, the second Riel rebellion was then still fresh in the public mind, and the fierce nationalist agitation which Riel's execution had excited in Quebec had hardly subsided. Laurier could hardly have come to the leadership at a more inopportune moment, and probably he would not have accepted the office at all if he had not believed that Blake could be persuaded to resume the leadership when his health was restored. But from the first he won great popularity even in the English-speaking provinces, and showed unusual capacity for leadership. His party was beaten in the first general election held after he became leader (1891), but even with its policy of unrestricted reciprocity with the United States, and with Sir John Macdonald still at the head of the Conservative party, it was beaten by only a small majority. Five years later, with unrestricted reciprocity relegated to the background, and with a platform which demanded tariff revision so adjusted as not to endanger established interests, and which opposed the federal measure designed to restore in Manitoba the separate or Roman Catholic schools which the provincial government had abolished, Laurier carried the country, and in July 1896 he was called by Lord Aberdeen, then governor-general, to form a government.

He was the first French-Canadian to occupy the office of premier; and his personal supremacy was shown by his long continuance in power. During the years from 1896 to 1910, he came to hold a position within the British Empire which was in its way unique, and in this period he had seen Canadian prosperity advance progressively by leaps and bounds. The chief features of his administration were the fiscal preference of 33⅓% in favour of goods imported into Canada from Great Britain, the despatch of Canadian contingents to South Africa during the Boer war, the contract with the Grand Trunk railway for the construction of a second transcontinental road from ocean to ocean, the assumption by Canada of the imperial fortresses at Halifax and Esquimault, the appointment of a federal railway commission with power to regulate freight charges, express rates and telephone rates, and the relations between competing companies, the reduction of the postal rate to Great Britain from 5 cents to 2 cents and of the domestic rate from 3 cents to 2 cents, a substantial contribution to the Pacific cable, a practical and courageous policy of settlement and development in the Western territories, the division of the North-West territories into the provinces of Alberta and Saskatchewan and the enactment of the legislation necessary to give them provincial status, and finally (1910), a tariff arrangement with the United States, which, if not all that Canada might claim in the way of reciprocity, showed how entirely the course of events had changed the balance of commercial interests in North America.

Laurier made his first visit to Great Britain on the occasion of Queen Victoria's diamond jubilee (1897), when he received the grand cross of the Bath; he then secured the denunciation of the Belgian and German treaties and thus obtained for the colonies the right to make preferential trade arrangements with the mother country. His personality made a powerful impression in Great Britain and also in France, which he visited before his return to Canada. His strong facial resemblance both to Lord Beaconsfield and to Sir John Macdonald marked him out in the public eye, and he captured attention by his charm of manner, fine command of scholarly English and genuine eloquence. Some of his speeches in Great Britain, coming as they did from a French-Canadian, and revealing delicate appreciation of British sentiment and thorough comprehension of the genius of British institutions, excited great interest and enthusiasm, while one or two impassioned speeches in the Canadian parliament during the Boer war profoundly influenced opinion in Canada and had a pronounced effect throughout the empire.

A skilful party-leader, Laurier kept from the first not only the affection of his political friends but the respect of his opponents; while enforcing the orderly conduct of public business, he was careful as first minister to maintain the dignity of parliament. In office he proved more of an opportunist than his career in opposition would have indicated, but his political courage and personal integrity remained beyond suspicion. His jealousy for the political autonomy of Canada was noticeable in his attitude at the Colonial conference held at the time of King Edward's coronation, and marked all his diplomatic dealings with the mother country. But he strove for sympathetic relations between Canadian and imperial authorities, and favoured general legislative and fiscal co-operation between the two countries. He strove also for good relations between the two races in Canada, and between Canada and the United States. Although he was classed in Canada as a Liberal, his tendencies would in England have been considered strongly conservative; an individualist rather than a collectivist, he opposed the intrusion of the state into the sphere of private enterprise, and showed no sympathy with the movement for state operation of railways, telegraphs and telephones, or with any kindred proposal looking to the extension of the obligations of the central government.

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LAURISTON, JACQUES ALEXANDRE BERNARD LAW, MARQUIS DE (1768–1828), French soldier and diplomatist, was the son of Jacques François Law de Lauriston (1724–1785), a general officer in the French army, and was born at Pondicherry on the 1st of February 1768. He obtained his first commission about 1786, served with the artillery and on the staff in the earlier Revolutionary campaigns, and became brigadier of artillery in 1795. Resigning in 1796, he was brought back into the service in 1800 as aide-de-camp to Napoleon, with whom as a cadet Lauriston had been on friendly terms. In the years immediately preceding the first empire Lauriston was successively director of the Le Fère artillery school and special envoy to Denmark, and he was selected to convey to England the ratification of the peace of Amiens (1802). In 1805, having risen to the rank of general of division, he took part in the war against Austria. He occupied Venice and Ragusa in 1806, was made governor-general of Venice in 1807, took part in the Erfurt negotiations of 1808, was made a count, served with the emperor in Spain in 1808–1809 and held commands under the viceroy Eugène Beauharnais in the Italian campaign and the advance to Vienna in the same year. At the battle of Wagram he commanded the guard artillery in the famous "artillery preparation" which decided the battle. In 1811 he was made ambassador to Russia; in 1812 he held a command in the *Grande Armée* and won distinction by his firmness in covering the retreat from Moscow. He commanded the V. army corps at Lützen and Bautzen and the V. and XI. in the autumn campaign, falling into the hands of the enemy in the disastrous retreat from Leipzig. He was held a prisoner of war until the fall of the empire, and then joined Louis XVIII., to whom he remained faithful in the Hundred Days. His reward was a seat in the house of peers and a command in the royal guard. In 1817 he was created marquis and in 1823 marshal of France. During the Spanish War he commanded the corps which besieged and took Pamplona. He died at Paris on the 12th of June 1828.

LAURIUM (*Λαύριον*, mod. ERGASTIRI), a mining town in Attica, Greece, famous for the silver mines which were one of the chief sources of revenue of the Athenian state, and were employed for coinage. After the battle of Marathon, Themistocles persuaded the Athenians to devote the revenue derived from the mines to shipbuilding, and thus laid the foundation of the Athenian naval power, and made possible the victory of Salamis. The mines, which were the property of the state, were usually farmed out for a certain fixed sum and a percentage on the working; slave labour was exclusively employed. Towards the end of the 5th century the output was diminished, partly owing to the Spartan occupation of Decelea. But the mines continued to be worked, though Strabo records that in his time the tailings were being worked over, and Pausanias speaks of the mines as a thing of the past. The ancient workings, consisting of shafts and galleries for excavating the ore, and pans and other arrangements for extracting the metal, may still be seen. The mines are still worked at the present day by French and Greek companies, but mainly for lead, manganese and cadmium. The population of the modern town was 10,007 in 1907.

See E. Ardaillon, "Les Mines du Laurion dans l'antiquité," No. lxxvii. of the *Bibliothèque des écoles françaises d'Athènes et de Rome.*

LAURIUM, a village of Houghton county, Michigan, U.S.A., near the centre of Keweenaw peninsula, the northern extremity of the state. Pop. (1890) 1159; (1900) 5643, of whom 2286 were foreign-born; (1904) 7653; (1910) 8537. It is served by the Mineral Range and the Mohawk and Copper Range railways. It is in one of the most productive copper districts in the United States, and copper mining is its chief industry. Immediately W. of Laurium is the famous Calumet and Hecla mine. The village was formerly named Calumet, and was incorporated under that name in 1889, but in 1895 its name was changed by the legislature to Laurium, in allusion to the mineral wealth of Laurium in Greece. The name Calumet is now applied to the post office in the village of Red Jacket (incorporated 1875; pop. 1900, 4668; 1904, 3784; 1910, 4211), W. of the Calumet and Hecla mine; and Laurium, the mining property and Red Jacket are all in the township of Calumet (pop. 1904, state census, 28,587).

LAURUSTINUS, in botany, the popular name of a common hardy evergreen garden shrub known botanically as *Viburnum Tinus*, with rather dark-green ovate leaves in pairs and flat-topped clusters (or corymbs) of white flowers, which are rose-coloured before expansion, and appear very early in the year. It is a native of the Mediterranean region, and was in cultivation in Britain at the end of the 16th century. *Viburnum* belongs to the natural order Caprifoliaceae and includes the common wayfaring tree (*V. Lantana*) and the guelder rose (*V. Opulus*).

LAURVIK, LARVIK or LAURVIG, a seaport of Norway, in Jarlsberg and Laurvik *amt* (county), at the head of a short fjord near the mouth of the Laagen river, 98 m. S.S.W. of Christiania by the Skien railway. Pop. (1900) 10,664. It has various industries, including saw and planing mills, shipbuilding, glass-works and factories for wood-pulp, barrels and potato flour; and an active trade in exporting timber, ice, wood-pulp and granite, chiefly to Great Britain, and in importing from the same country coal and salt. The port has a depth of 18 to 24 ft. beside the quays. Four miles south is Fredriksvaern, formerly a station of the Norwegian fleet and the seat of a naval academy. Laurviks Bad is a favourite spa, with mineral and sulphur springs and mud-baths.

LAUSANNE, the capital of the Swiss canton of Vaud. It is the junction of the railway lines from Geneva, from Brieg and the Simplon, from Fribourg and Bern, and from Vallorbe (for Paris). A funicular railway connects the upper town with the central railway station and with Ouchy, the port of Lausanne on the lake of Geneva. Lausanne takes its name from the Flon stream flowing through it, which was formerly called Laus (water). The older or upper portion of the town is built on the crest and slopes of five hillocks and in the hollows between them, all forming part of the Jorat range. It has a picturesque appearance from the surface of the lake, above which the cathedral rises some 500 ft., while from the town there is a fine view across the lake towards the mountains of Savoy and of the Valais. The quaint characteristics of the hilly site of the old town have largely been destroyed by modern improvements, which began in 1836 and were not quite completed in 1910. The Grand Pont, designed by the cantonal engineer, Adrien Pichard (1790–1841), was built 1839–1844, while the Barre tunnel was pierced 1851–1855 and the bridge of Chauderon was built in 1905. The valleys and lower portions of the town were gradually filled up so as to form a series of squares, of which those of Riponne and of St François are the finest, the latter now being the real centre of the town. The railways were built between 1856 and 1862, while the opening of the Simplon tunnel (1906) greatly increased the commercial importance of Lausanne, which is now on the great international highway from Paris to Milan. From 1896 onwards a well-planned set of tramways within the town was constructed. The town is still rapidly extending, especially towards the south and west. Since the days of Gibbon (resident here for three periods, 1753–1758, 1763–1764 and 1783–1793), whose praises of the town have been often repeated, Lausanne has become a favourite place of residence for foreigners (including many English), who are especially attracted by the excellent establishments for secondary and higher education. Hence in 1900 there were 9501 foreign residents (of whom 628 were British subjects) out of a total population of 46,732 inhabitants; in 1905 it was reckoned that these numbers had risen respectively to 10,625, 818 and 53,577. In 1709 it is said that the inhabitants numbered but 7432 and 9965 in 1803, while the numbers were 20,515 in 1860 and 33,340 in 1888. Of the population in 1900 the great majority was French-speaking (only 6627 German-speaking and 3146 Italian-speaking) and Protestant (9364 Romanists and 473 Jews).

The principal building is the cathedral church (now Protestant) of Notre Dame, which with the castle occupies the highest position. It is the finest medieval ecclesiastical building in Switzerland. Earlier buildings were more or less completely destroyed by fire, but the present edifice was consecrated in 1275 by Pope Gregory X. in the presence of the emperor Rudolf of Habsburg. It was sacked after the Bernese conquest (1536) and the introduction of Protestantism, but many ancient tapestries and other precious objects are still preserved in the Historical Museum at Bern. The church was well restored at great cost from 1873 onwards, as it is the great pride of the citizens. Close by is the castle, built in the early 15th century by the bishops, later the residence of the Bernese bailiffs and now the seat of the various branches of the administration of the canton of Vaud. Near both is the splendid Palais de Rumine (on the Place de la Riponne), opened in 1906 and now housing the university as well as the cantonal library, the cantonal picture gallery (or Musée Arlaud, founded 1841) and the cantonal collections of archaeology, natural history, &c. The university was raised to that rank in 1890, but, as an academy, dates from 1537. Among its former teachers may be mentioned Theodore Beza, Conrad Gesner, J. P. de Crousaz, Charles Monnard, Alexandre Vinet, Eugène Rambert, Juste Olivier and several members of the Secretan family. On the Montbenon heights to the south-west of the cathedral group is the federal palace of justice, the seat (since 1886) of the federal court of justice, which, erected by the federal constitution of 29th May 1874, was fixed at Lausanne by a federal resolution of 26th June 1874. The house, La Grotte, which Gibbon inhabited 1783–1793, and on the terrace of which he completed (1787) his famous history, was demolished in 1896 to make room for the new post office that stands on the Place St François. The asylum for the blind was mainly founded (1845) by the generosity of W. Haldimand, an Englishman of Swiss descent. The first book printed in Lausanne was the missal of the cathedral church (1493), while the *Gazette de Lausanne* (founded 1798) took that name in 1804. Lausanne has been the birthplace of many distinguished men, such as Benjamin Constant, the Secretans, Vinet and Rambert. It is the seat of many benevolent, scientific and literary societies and establishments.

The original town (mentioned in the Antonine Itinerary) was on the shore of the lake, near Vidy, south-west of the present city. It was burnt in the 4th century by the Alamanni. Some of the inhabitants took refuge in the hills above and there founded a new town, which acquired more importance when Bishop Marius about 590 chose it as his see city (perhaps transferring it from Avenches). Here rose the cathedral church, the bishop's palace, &c. Across the Flon was a Burgundian settlement, later known as the Bourg, while to the west was a third colony around the church of St Laurent. These three elements joined together to form the present city. The bishops obtained little by little great temporal powers (the diocese extended to the left bank of the Aar) and riches, becoming in 1125 princes of the empire, while their chapter was recruited only from the noblest families. But in 1368 the bishop was forced to recognize various liberties and customs that had been gradually won by the citizens, the *Plaid Général* of that year showing that there was already some kind of municipal government, save for the *cité*, which was not united with the *ville inférieure* or the other four *quartiers* (Bourg, St Laurent, La Palud and Le Pont) in 1481. In 1525 the city made an alliance with Bern and Fribourg. But in 1536 the territory of the bishop (as well as the Savoyard barony of Vaud) was forcibly conquered by the Bernese, who at once introduced Protestantism. The Bernese occupation lasted till 1798, though in 1723 an attempt was made to put an end to it by Major Davel, who lost his life in consequence. In 1798 Lausanne became a simple prefecture of the canton Léman of the Helvetic republic. But in 1803, on the creation of the canton of Vaud by the Act of Mediation, it became its capital. The bishop of Lausanne resided after 1663 at Fribourg, while from 1821 onwards he added " and of Geneva " to his title.

Besides the general works dealing with the canton of Vaud (*q.v.*), the following books refer specially to Lausanne: A. Bernus, *L'Imprimerie à Lausanne et à Morges jusqu'à la fin du 16ième siècle* (Lausanne, 1904); M. Besson, *Recherches sur les origines des évêchés de Genève, Lausanne, Sion* (Fribourg, 1906); A. Bonnard, " Lausanne au 18ième siècle," in the work entitled *Chez nos aïeux* (Lausanne, 1902); E. Dupraz, *La Cathédrale de Lausanne . . . étude historique* (Lausanne, 1906); E. Gibbon, *Autobiography and Letters* (3 vols., 1896); F. Gingins and F. Forel, *Documents concernant l'ancien évêché de Lausanne*, 2 parts (Lausanne, 1846–1847); J. H. Lewis and F. Gribble, *Lausanne* (1909); E. van Muyden and others, *Lausanne à travers les âges* (Lausanne, 1906); Meredith Read, *Historic Studies in Vaud, Berne and Savoy* (2 vols., 1897); M. Schmitt, *Mémoires hist. sur le diocèse de Lausanne* (2 vols., Fribourg, 1859); J. Stammler (afterwards bishop of Lausanne), *Le Trésor de la cathédrale de Lausanne* (Lausanne, 1902; trans. of a German book of 1894).

(W. A. B. C.)

LAUTREC, ODET DE FOIX, VICOMTE DE (1485–1528), French soldier. The branch of the viscounts of Lautrec originated with Pierre, the grandson of Archambaud de Grailly, captal de Buch, who came into possession of the county of Foix in 1401. Odet de Foix and his two brothers, the seigneur de Lescun and the seigneur de l'Esparre or Asparros, served Francis I. as captains; and the influence of their sister, Françoise de Châteaubriant, who became the king' mistress, gained them high offices. In 1515 Lautrec took part in the campaign of Marignano. In 1516 he received the government of the Milanese, and by his severity made the French domination insupportable. In 1521 he succeeded in defending the duchy against the Spanish army, but in 1522 he was completely defeated at the battle of the Bicocca, and was forced to evacuate the Milanese. The mutiny of his Swiss troops had compelled him, against his wish, to engage in the battle. Created marshal of France, he received again, in 1527, the command of the army of Italy, occupied the Milanese, and was then sent to undertake the conquest of the kingdom of Naples. The defection of Andrea Doria and the plague which broke out in the French camp brought on a fresh disaster. Lautrec himself caught the infection, and died on the 15th of August 1528. He had the reputation of a gallant and able soldier, but this reputation scarcely seems to be justified by the facts; though he was always badly used by fortune.

There is abundant MS. correspondence in the Bibliothèque Nationale, Paris. See the Works of Brantôme (Coll. Société d'Histoire de France, vol. iii., 1867); *Memoirs* of Martin du Bellay (Coll. Michaud and Poujoulat, vol. v., 1838).

LAUZUN, ANTONIN NOMPAR DE CAUMONT, MARQUIS DE PUYGUILHEM, DUC DE (1632–1723), French courtier and soldier, was the son of Gabriel, comte de Lauzun, and his wife Charlotte, daughter of the duc de La Force. He was brought up with the children of his kinsman, the maréchal de Gramont, of whom the comte de Guiche became the lover of Henrietta of England, duchess of Orleans, while Catherine Charlotte, afterwards princess of Monaco, was the object of the one passion of Lauzun's life. He entered the army, and served under Turenne, also his kinsman, and in 1655 succeeded his father as commander of the *cent gentilshommes de la maison du roi.* Puyguilhem (or Péguilin, as contemporaries simplified his name) rapidly rose in Louis XIV.'s favour, became colonel of the royal regiment of dragoons, and was gazetted *maréchal de camp.* He and Mme de Monaco belonged to the coterie of the young duchess of Orleans. His rough wit and skill in practical jokes pleased Louis XIV., but his jealousy and violence were the causes of his undoing. He prevented a meeting between Louis XIV. and Mme de Monaco, and it was jealousy in this matter, rather than hostility to Louise de la Vallière, which led him to promote Mme de Montespan's intrigues with the king. He asked this lady to secure for him the post of grand-master of the artillery, and on Louis's refusal to give him the appointment he turned his back on the king, broke his sword, and swore that never again would he serve a monarch who had broken his word. The result was a short sojourn in the Bastille, but he soon returned to his functions of court buffoon. Meanwhile, the duchess of Montpensier (La Grande Mademoiselle) had fallen in love with the little man, whose ugliness seems to have exercised a certain fascination over many women. He naturally encouraged one of the greatest heiresses in Europe, and the wedding was fixed for the 20th of December 1670, when on the 18th Louis sent for his cousin and forbade the marriage. Mme de Montespan had never forgiven his fury when she failed to procure the grand-mastership of the artillery, and now, with Louvois, secured his arrest. He was removed in November 1671 from the Bastille to Pignerol, where excessive precautions were taken to ensure his safety. He was eventually allowed free intercourse with Fouquet, but before that time he managed to find a way through the chimney into Fouquet's room, and on another occasion succeeded in reaching the courtyard in safety. Another fellow-prisoner, from communication with whom he was supposed to be rigorously excluded, was Eustache Dauger (see IRON MASK).

It was now intimated to Mademoiselle that Lauzun's restoration to liberty depended on her immediate settlement of the principality of Dombes, the county of Eu and the duchy of Aumale—three properties assigned by her to Lauzun—on the little duc de Maine, eldest son of Louis XIV. and Mme de Montespan. She gave way, but Lauzun, even after ten years of imprisonment, refused to sign the documents, when he was brought to Bourbon for the purpose. A short term of imprisonment at Chalon-sur-Sâone made him change his mind, but when he was set free Louis XIV. was still set against the marriage, which is supposed to have taken place secretly (see MONTPENSIER). Married or not, Lauzun was openly courting Fouquet's daughter, whom he had seen at Pignerol. He was to be restored to his place at court, and to marry Mlle Fouquet, who, however, became Mme d'Uzès in 1683. In 1685 Lauzun went to England to seek his fortune under James II., whom he had served as duke of York in Flanders. He rapidly gained great influence at the English court. In 1688 he was again in England, and arranged the flight of Mary of Modena and the infant prince, whom he accompanied to Calais, where he received strict instructions from Louis to bring them " on any pretext " to Vincennes. In the late autumn of 1689 he was put in command of the expedition fitted out at Brest for service in Ireland, and he sailed in the following year. Lauzun was honest, a quality not too common in James II.'s officials in Ireland, but had no experience of the field, and he blindly followed Richard Talbot, earl of Tyrconnel. After the battle of the Boyne they fled to Limerick, and thence to the west, leaving Patrick Sarsfield to show a brave front. In September they sailed for France, and on their arrival at Versailles Lauzun found that his failure had destroyed any prospect of a return of Louis XIV.'s favour. Mademoiselle died in 1693, and two years later Lauzun married Geneviève de Durfort, a child of fourteen, daughter of the maréchal de Lorges. Mary of Modena, through whose interest Lauzun secured his dukedom, retained her faith in him, and it was he who in 1715, more than a quarter of a century after the flight from Whitehall, brought her the news of the disaster of Sheriffmuir. Lauzun died on the 19th of November 1723. The duchy fell to his nephew, Armand de Gontaut, comte de Biron.

See the letters of Mme de Sévigné, the memoirs of Saint-Simon, who was Lauzun's wife's brother-in-law; also J. Lair, *Nicolas Fouquet*, vol. ii. (1890); Martin Hailes, *Mary of Modena* (1905), and M. F. Sandars, *Lauzun, Courtier and Adventurer* (1908).

LAVA, an Italian word (from Lat. *lavare*, to wash) applied to the liquid products of volcanic activity. Streams of rainwater, formed by condensation of exhaled steam often mingled with volcanic ashes so as to produce mud, are known as *lava d'acqua*, whilst the streams of molten matter are called *lava di fuoco.* The term lava is applied by geologists to all matter of volcanic origin, which is, or has been, in a molten state. The magma, or molten lava in the interior of the earth, may be regarded as a mutual solution of various mineral silicates, charged with highly-heated vapour, sometimes to the extent of supersaturation. According to the proportion of silica, the lava is distinguished as " acid " or " basic." The basic lavas are usually darker and denser than lavas of acid type, and when fused they tend to flow to great distances, and may thus form far-spreading sheets, whilst the acid lavas, being more viscous, rapidly consolidate after extrusion. The lava is emitted from the volcanic vent at a high temperature, but on exposure to the air it rapidly consolidates superficially, forming a crust which in many cases is soon broken up by the continued flow of the subjacent liquid lava, so that the surface becomes rugged with clinkers. J. D. Dana introduced the term "aa" for this rough kind of lava-stream, whilst he applied the term "pahoehoe" to those flows which have a smooth surface, or are simply wrinkled and ropy; these terms being used in this sense in Hawaii, in relation to the local lavas. The different kinds of lava are more fully described in the article Volcano.

LAVABO (Lat. "I will wash"; the Fr. equivalent is *lavoir*), in ecclesiastical usage, the term for the washing of the priests' hands, at the celebration of the Mass, at the offertory. The words of Psalm xxvi. 6, *Lavabo inter innocentes manus meas*, are said during the rite. The word is also used for the basin employed in the ritual washing, and also for the lavatories, generally erected in the cloisters of monasteries. Those at Gloucester, Norwich and Lincoln are best known. A very curious example at Fontenay, surrounding a pillar, is given by Viollet-le-Duc. In general the lavabo is a sort of trough; in some places it has an almery for towels, &c.

LAVAGNA, a seaport of Liguria, Italy, in the province of Genoa, from which it is 25½ m. S.E. by rail. Pop. (1901) 7005. It has a small shipbuilding trade, and exports great quantities of slate (*lavagna*, taking its name from the town). It also has a large cotton-mill. It was the seat of the Fieschi family, independent counts, who, at the end of the 12th century, were obliged to recognize the supremacy of Genoa. Sinibaldo Fieschi became Pope Innocent IV. (1243–1254), and Hadrian V. (1276) was also a Fieschi.

LAVAL, ANDRÉ DE, SEIGNEUR DE LOHÉAC (*c.* 1408–1485), French soldier. In 1423 he served in the French army against England, and in 1428 was taken prisoner by John Talbot, 1st earl of Shrewsbury, after the capitulation of Laval, which he was defending. After paying his ransom he was present with Joan of Arc at the siege of Orleans, at the battle of Patay, and at the coronation of Charles VII. He was made admiral of France in 1437 and marshal in 1439. He served Charles VII. faithfully in all his wars, even against the dauphin (1456), and when the latter became king as Louis XI., Laval was dismissed from the marshal's office. After the War of the Public Weal he was restored to favour, and recovered the marshal's bâton, the king also granting him the offices of lieutenant-general to the government of Paris and governor of Picardy, and conferring upon him the collar of the order of St Michael. In 1472 Laval was successful in resisting the attacks of Charles the Bold, duke of Burgundy, on Beauvais.

LAVAL, a town of north-western France, capital of the department of Mayenne, on the Mayenne river, 188 m. W.S.W. of Paris by rail. Pop. (1906) 24,874. On the right bank of the river stands the old feudal city, with its ancient castle and its irregularly built houses whose slate roofs and pointed gables peep from the groves of trees which clothe the hill. On the left bank the regularly built new town extends far into the plain. The river, here 80 yds. broad, is crossed by the handsome railway viaduct, a beautiful stone bridge called Pont Neuf, and the Pont Vieux with three pointed arches, built in the 16th century. There is communication by steamer as far as Angers. Laval may justly claim to be one of the loveliest of French towns. Its most curious and interesting monument is the sombre old castle of the counts (now a prison) with a donjon of the 12th century, the roof of which presents a fine example of the timber-work superseded afterwards by stone machicolation. The "new castle," dating partly from the Renaissance, serves as court-house. Laval possesses several churches of different periods: in that of the Trinity, which serves as the cathedral, the transept and nave are of the 12th century while the choir is of the 16th; St Vénérand (15th century) has good stained glass; Notre-Dame des Cordeliers, which dates from the end of the 14th century or the beginning of the 15th, has some fine marble altars. Half-a-mile below the Pont Vieux is the beautiful 12th-century church of Avenières, with an ornamental spire of 1534. The finest remaining relic of the ancient fortifications is the Beucheresse gate near the cathedral. The narrow streets around the castle are bordered by many old houses of the 15th and 16th century, chief among which is that known as the "Maison du Grand Veneur." There are an art-museum, a museum of natural history and archaeology and a library. The town is embellished by fine promenades, at the entrance of one of which, facing the mairie, stands the statue of the celebrated surgeon Ambroise Paré (1517–1590). Laval is the seat of a prefect, a bishopric created in 1855, and a court of assizes, and has tribunals of first instance and of commerce, a chamber of commerce, a board of trade-arbitrators, training colleges, an ecclesiastical seminary and a lycée for boys. The principal industry of the town is the cloth manufacture, introduced from Flanders in the 14th century. The production of fabrics of linen, of cotton or of mixtures of both, occupies some 10,000 hands in the town and suburbs. Among the numerous other industries are metal-founding, flour-milling, tanning, dyeing, the making of boots and shoes, and the sawing of the marble quarried in the vicinity. There is trade in grain.

Laval is not known to have existed before the 9th century. It was taken by John Talbot, earl of Shrewsbury, in 1428, changed hands several times during the wars of the League, and played an important part at the end of the 18th century in the war of La Vendée.

Seigneurs and Counts of Laval. The castle of Laval was founded at the beginning of the 11th century by a lord of the name of Guy, and remained in the possession of his male descendants until the 13th century. In 1218 the lordship passed to the house of Montmorency by the marriage of Emma, daughter of Guy VI. of Laval, to Mathieu de Montmorency, the hero of the battle of Bouvines. Of this union was born Guy VII. seigneur of Laval, the ancestor of the second house of Laval. Anne of Laval (d. 1466), the heiress of the second family, married John de Montfort, who took the name of Guy (XIII.) of Laval. At Charles VII.'s coronation (1429) Guy XIV., who was afterwards son-in-law of John V., duke of Brittany, and father-in-law of King René of Anjou, was created count of Laval, and the countship remained in the possession of Guy's male descendants until 1547. After the Montforts, the countship of Laval passed by inheritance to the families of Rieux and Sainte Maure, to the Colignys, and finally to the La Trémoilles, who held it until the Revolution.

See Bertrand de Broussillon, *La Maison de Laval* (3 vols., 1895–1900).

LA VALLIÈRE, LOUISE FRANÇOISE DE (1644–1710), mistress of Louis XIV., was born at Tours on the 6th of August 1644, the daughter of an officer, Laurent de la Baume le Blanc, who took the name of La Vallière from a small property near Amboise. Laurent de la Vallière died in 1651; his widow, who soon married again, joined the court of Gaston d'Orléans at Blois. Louise was brought up with the younger princesses, the step-sisters of La Grande Mademoiselle. After Gaston's death his widow moved with her daughters to the palace of the Luxembourg in Paris, and with them went Louise, who was now a girl of sixteen. Through the influence of a distant kinswoman, Mme de Choisy, she was named maid of honour to Henrietta of England, who was about her own age and had just married Philip of Orleans, the king's brother. Henrietta joined the court at Fontainebleau, and was soon on the friendliest terms with her brother-in-law, so friendly indeed that there was some scandal, to avoid which it was determined that Louis should pay marked attentions elsewhere. The person selected was Madame's maid of honour, Louise. She had been only two months in Fontainebleau before she became the king's mistress. The affair, begun on Louis's part as a blind, immediately developed into real passion on both sides. It was Louis's first serious attachment, and Louise was an innocent, religious-minded girl, who brought neither coquetry nor self-interest to their relation, which was sedulously concealed. Nicolas Fouquet's curiosity in the matter was one of the causes of his disgrace. In February 1662 there was a storm when Louise refused to tell her lover the relations between Madame (Henrietta) and the comte de Guiche. She fled to an obscure convent at Chaillot, where Louis rapidly followed her. Her enemies, chief of whom was Olympe Mancini, comtesse de Soissons, Mazarin's niece, sought her downfall by bringing her liaison to the ears of Queen Maria Theresa. She was presently removed from the service of Madame, and established in a small building in the Palais Royal, where in December 1663 she gave birth to a son Charles, who was given in charge to two faithful servants of Colbert. Concealment was practically abandoned after her return to court, and within a week of Anne of Austria's death in January 1666, La Vallière appeared at mass side by side with Maria Theresa. But her favour was already waning. She had given birth to a second child in January 1665, but both children were dead before the autumn of 1666. A daughter born at Vincennes in October 1666, who received the name of Marie Anne and was known as Mlle de Blois, was publicly recognized by Louis as his daughter in letters-patent making the mother a duchess in May 1667 and conferring on her the estate of Vaujours. In October of that year she bore a son, but by this time her place in Louis's affections was definitely usurped by Athénaïs de Montespan (*q.v.*), who had long been plotting against her. She was compelled to remain at court as the king's official mistress, and even to share Mme de Montespan's apartments at the Tuileries. She made an attempt at escape in 1671, when she fled to the convent of Ste Marie de Chaillot, only to be compelled to return. In 1674 she was finally permitted to enter the Carmelite convent in the Rue d'Enfer. She took the final vows a year later, when Bossuet pronounced the allocution.

Her daughter married Armand de Bourbon, prince of Conti, in 1680. The count of Vermandois, her youngest born, died on his first campaign at Courtrai in 1683.

La Vallière's *Réflexions sur la miséricorde de Dieu*, written after her retreat, were printed by Lequeux in 1767, and in 1860 *Réflexions, lettres et sermons*, by M. P. Clement (2 vols.). Some apocryphal *Mémoires* appeared in 1829, and the *Lettres de Mme la duchesse de la Vallière* (1767) are a corrupt version of her correspondence with the maréchal de Bellefonds. Of modern works on the subject see Arsène Houssaye, *Mlle de la Vallière et Mme de Montespan* (1860); Jules Lair, *Louise de la Vallière* (3rd ed., 1902, Eng. trans., 1908); and C. Bonnet, *Documents inédits sur Mme de la Vallière* (1904).

LAVATER, JOHANN KASPAR (1741–1801), German poet and physiognomist, was born at Zürich on the 15th of November 1741. He was educated at the gymnasium of his native town, where J. J. Bodmer and J. J. Breitinger were among his teachers. When barely one-and-twenty he greatly distinguished himself by denouncing, in conjunction with his friend, the painter H. Fuseli, an iniquitous magistrate, who was compelled to make restitution of his ill-gotten gains. In 1769 Lavater took orders, and officiated till his death as deacon or pastor in various churches in his native city. His oratorical fervour and genuine depth of conviction gave him great personal influence; he was extensively consulted as a casuist, and was welcomed with demonstrative enthusiasm in his numerous journeys through Germany. His mystical writings were also widely popular. Scarcely a trace of this influence has remained, and Lavater's name would be forgotten but for his work on physiognomy, *Physiognomische Fragmente zur Beförderung der Menschenkenntnis und Menschenliebe* (1775–1778). The fame even of this book, which found enthusiastic admirers in France and England, as well as in Germany, rests to a great extent upon the handsome style of publication and the accompanying illustrations. It left, however, the study of physiognomy (*q.v.*), as desultory and unscientific as it found it. As a poet, Lavater published *Christliche Lieder* (1776–1780) and two epics, *Jesus Messias* (1780) and *Joseph von Arimathia* (1794), in the style of Klopstock. More important and characteristic of the religious temperament of Lavater's age are his introspective *Aussichten in die Ewigkeit* (4 vols., 1768–1778); *Geheimes Tagebuch von einem Beobachter seiner selbst* (2 vols., 1772–1773) and *Pontius Pilatus, oder der Mensch in allen Gestalten* (4 vols., 1782–1785). From 1774 on, Goethe was intimately acquainted with Lavater, but at a later period he became estranged from him, somewhat abruptly accusing him of superstition and hypocrisy. Lavater had a mystic's indifference to historical Christianity, and, although esteemed by himself and others a champion of orthodoxy, was in fact only an antagonist of rationalism. During the later years of his life his influence waned, and he incurred ridicule by some exhibitions of vanity. He redeemed himself by his patriotic conduct during the French occupation of Switzerland, which brought about his tragical death. On the taking of Zürich by the French in 1799, Lavater, while endeavouring to appease the soldiery, was shot through the body by an infuriated grenadier; he died after long sufferings borne with great fortitude, on the 2nd of January 1801.

Lavater himself published two collections of his writings, *Vermischte Schriften* (2 vols., 1774–1781), and *Kleinere prosaische Schriften* (3 vols., 1784–1785). His *Nachgelassene Schriften* were edited by G. Gessner (5 vols., 1801–1802); *Sämtliche Werke* (but only poems) (6 vols., 1836–1838); *Ausgewählte Schriften* (8 vols., 1841–1844). See G. Gessner, *Lavaters Lebensbeschreibung* (3 vols., 1802–1803); U. Hegner, *Beiträge zur Kenntnis Lavaters* (1836); F. W. Bodemann, *Lavater nach seinem Leben, Lehren und Wirken* (1856; 2nd ed., 1877); F. Muncker, *J. K. Lavater* (1883); H. Waser, *J. K. Lavater nach Hegners Aufzeichnungen* (1894); *J. K. Lavater, Denkschrift zum 100. Todestag* (1902).

LAVAUR, a town of south-western France, capital of an arrondissement in the department of Tarn, 37 m. S.E. of Montauban by rail. Pop. (1906), town 4069; commune 6388. Lavaur stands on the left bank of the Agout, which is here crossed by a railway-bridge and a fine stone bridge of the late 18th century. From 1317 till the Revolution Lavaur was the seat of a bishopric, and there is a cathedral dating from the 13th, 14th and 15th centuries, with an octagonal bell-tower; a second smaller square tower contains a *jaquemart* (a statue which strikes the hours with a hammer) of the 16th century. In the bishop's garden is the statue of Emmanuel Augustin, marquis de Las Cases, one of the companions of Napoleon at St Helena. The town carries on distilling and flour-milling and the manufacture of brushes, plaster and wooden shoes. There are a subprefecture and tribunal of first instance. Lavaur was taken in 1211 by Simon de Montfort during the wars of the Albigenses, and several times during the religious wars of the 16th century.

LAVEDAN, HENRI LÉON ÉMILE (1859–), French dramatist and man of letters, was born at Orleans, the son of Hubert Léon Lavedan, a well-known Catholic and liberal journalist. He contributed to various Parisian papers a series of witty tales and dialogues of Parisian life, many of which were collected in volume form. In 1891 he produced at the Théâtre Français *Une Famille*, followed at the Vaudeville in 1894 by *Le Prince d'Aurec*, a satire on the nobility, afterwards re-named *Les Descendants*. Later brilliant and witty pieces were *Les Deux noblesses* (1897), *Catherine* (1897), *Le Nouveau jeu* (1898), *Le Vieux marcheur* (1899), *Le Marquis de Priola* (1902), and *Varennes* (1904), written in collaboration with G. Lenôtre. He had a great success with *Le Duel* (Comédie Française, 1905), a powerful psychological study of the relations of two brothers. Lavedan was admitted to the French Academy in 1898.

LAVELEYE, ÉMILE LOUIS VICTOR DE (1822–1892), Belgian economist, was born at Bruges on the 5th of April 1822, and educated there and at the Collège Stanislas in Paris, a celebrated establishment in the hands of the Oratorians. He continued his studies at the Catholic university of Louvain and afterwards at Ghent, where he came under the influence of François Huet, the philosopher and Christian Socialist. In 1844 he won a prize with an essay on the language and literature of Provence. In 1847 he published *L'Histoire des rois francs*, and in 1861 a French version of the *Nibelungen*, but though he never lost his interest in literature and history, his most important work was in the domain of economics. He was one of a group of young lawyers, doctors and critics, all old pupils of Huet, who met once a week to discuss social and economic questions, and was thus led to publish his views on these subjects. In 1859 some articles by him in the *Revue des deux mondes* laid the foundation of his reputation as an economist. In 1864 he was elected to the chair of political economy at the state university of Liége. Here he wrote his most important works: *La Russie et l'Autriche depuis Sadowa* (1870), *Essai sur les formes de gouvernement dans les sociétés modernes* (1872), *Des Causes actuelles de guerre en Europe et de l'arbitrage* and *De la propriété et de ses formes primitives* (1874), dedicated to the memory of John Stuart Mill and François Huet. He died at Doyon, near Liége, on the 3rd of January 1892. Laveleye's name is particularly connected with bimetallism and primitive property, and he took a special interest in the revival and preservation of small nationalities. But his activity included the whole realm of political science, political economy, monetary questions, international law, foreign and Belgian politics, questions of education, religion and morality, travel and literature. He had the art of popularizing even the most technical subjects, owing to the clearness of his view and his firm grasp of the matter in hand. He was especially attracted to England, where he thought he saw many of his ideals of social, political and religious progress realized. He was a frequent contributor to the English newspapers and leading reviews. The most widely circulated of his works was a pamphlet on *Le Parti clérical en Belgique*, of which 2,000,000 copies were circulated in ten languages.

LAVENDER, botanically *Lavandula*, a genus of the natural order Labiatae distinguished by an ovate tubular calyx, a two-lipped corolla, of which the upper lip has two and the lower three lobes, and four stamens bent downwards.

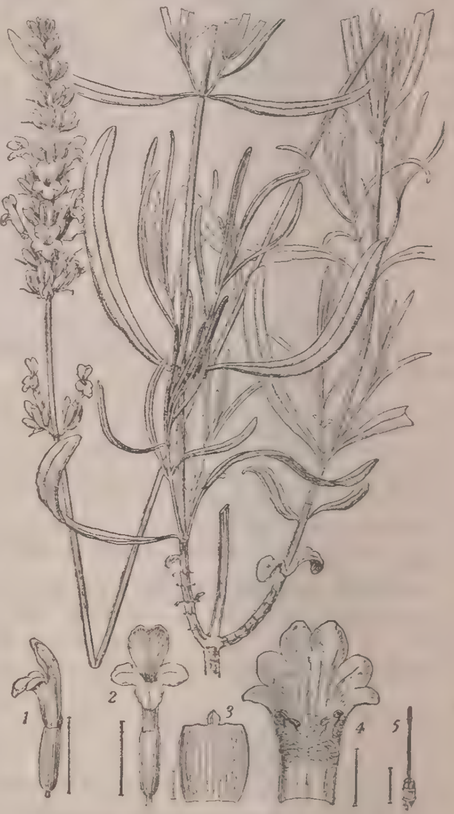
The plant to which the name of lavender is commonly applied, *Lavandula vera*, is a native of the mountainous districts of the countries bordering on the western half of the Mediterranean, extending from the eastern coast of Spain to Calabria and northern Africa, growing in some places at a height of 4500 ft. above the sea-level, and preferring stony declivities in open sunny situations. It is cultivated in the open air as far north as Norway and Livonia. Lavender forms an evergreen undershrub about 2 ft. high, with greyish-green hoary linear leaves, rolled under at the edges when young; the branches are erect and give a bushy appearance to the plant. The flowers are borne on a terminal spike at the summit of a long naked stalk, the spike being composed of 6–10 dense clusters in the axils of small, brownish, rhomboidal, tapering, opposite bracts, the clusters being more widely separated towards the base of the spike. The calyx is tubular, contracted towards the mouth, marked with 13 ribs and 5-toothed, the posterior tooth being the largest. The corolla is of a pale violet colour, but darker on its inner surface, tubular, two-lipped, the upper lip with two and the lower with three lobes. Both corolla and calyx are covered with stellate hairs, amongst which are imbedded shining oil glands to which the fragrance of the plant is due. The leaves and flowers of lavender are said to have been used by the ancients to perfume their baths; hence the Med. Lat. name *Lavandula* or *Lavendula* is supposed to have been derived from *lavare*, to wash. This derivation is considered doubtful and a connexion has been suggested with Lat. *livere*, to be of a bluish, pale or livid colour.

Although *L. Stoechas* was well known to the ancients, no allusion unquestionably referring to *L. vera* has been found in the writings of classical authors, the earliest mention of the latter plant being in the 12th century by the abbess Hildegard, who lived near Bingen on the Rhine. Under the name of *llafant* or *llafantly* it was known to the Welsh physicians as a medicine in the 13th century. The dried flowers have long been used in England, the United States and other countries for perfuming linen, and the characteristic cry of "Lavender! sweet lavender!" was still to be heard in London streets at the beginning of the 20th century. In England lavender is cultivated chiefly for the distillation of its essential oil, of which it yields on an average $1\frac{1}{2}\%$ when freed from the stalks, but in the south of Europe the flowers form an object of trade, being exported to the Barbary states, Turkey and America.

In Great Britain lavender is grown in the parishes of Mitcham, Carshalton and Beddington in Surrey, and in Hertfordshire in the parish of Hitchin. The most suitable soil seems to be a sandy loam with a calcareous substratum, and the most favourable position a sunny slope in localities elevated above the level of fogs, where the plant is not in danger of early frost and is freely exposed to air and light. At Hitchin lavender is said to have been grown as early as 1568, but as a commercial speculation its cultivation dates back only to 1823. The plants at present in cultivation do not produce seed, and the propagation is always made by slips or by dividing the roots. The latter plan has only been followed since 1860, when a large number of lavender plants were killed by a severe frost. Since that date the plants have been subject to the attack of a fungus, in consequence of which the price of the oil has been considerably enhanced.

The flowers are collected in the beginning of August, and taken direct to the still. The yield of oil depends in great measure upon the weather. After a wet and dull June and July the yield is sometimes only half as much as when the weather has been bright and sunshiny. From 12 to 30 ℔ of oil per acre is the average amount obtained. The oil contained in the stem has a more rank odour and is less volatile than that of the flowers; consequently the portion that distils over after the first hour and a half is collected separately.

The finest oil is obtained by the distillation of the flowers, without the stalks, but the labour spent upon this adds about 10s. per ℔ to the expense of the oil, and the same end is practically attained by fractional distillation. The oil mellows by keeping three years, after which it deteriorates unless mixed with alcohol; it is also improved by redistillation. Oil of lavender is distilled from the wild plants in Piedmont and the South of France, especially in the villages about Mont Ventoux near Avignon, and in those some leagues west of Montpellier. The best French oil realizes scarcely one-sixth of the price of the English oil. Cheaper varieties are made by distilling the entire plant.



Lavender (*Lavandula vera*).
1. Flower, side view.
2. Flower, front view.
3. Calyx opened and spread flat.
4. Corolla opened and spread flat.
5. Pistil.

Oil of lavender is a mobile liquid having a specific gravity from 0·85 to 0·89. Its chief constituents are linalool acetate, which also occurs in oil of bergamot, and linalool, $C_{10}H_{17}OH$, an alcohol derived by oxidation from myrcene, $C_{10}H_{16}$, which is one of the terpenes. The dose is $\frac{1}{2}$-3 minims. The British pharmacopeia contains a spiritus lavandulae, dose 5-20 minims: and a compound tincture, dose $\frac{1}{2}$-1 drachm. This is contained in liquor arsenicalis, and its characteristic odour may thus be of great practical importance, medico-legally and otherwise. The pharmacology of oil of lavender is simply that of an exceptionally pleasant and mild volatile oil. It is largely used as a carminative and as a colouring and flavouring agent. Its adulteration with alcohol may be detected by chloride of calcium dissolving in it and forming a separate layer of liquid at the bottom of the vessel. Glycerine acts in the same way. If it contain turpentine it will not dissolve in three volumes of alcohol, in which quantity the pure oil is perfectly soluble.

Lavender flowers were formerly considered good for "all disorders of the head and nerves"; a spirit prepared with them was known under the name of palsy drops.

Lavender water consists of a solution of the volatile oil in spirit of wine with the addition of the essences of musk, rose, bergamot and ambergris, but is very rarely prepared by distillation of the flowers with spirit.

In the climate of New York lavender is scarcely hardy, but in the vicinity of Philadelphia considerable quantities are grown for the market. In American gardens sweet basil (*Ocimum basilicum*) is frequently called lavender.

Lavandula Spica, a species which differs from *L. vera* chiefly in its smaller size, more crowded leaves and linear bracts, is also used for the distillation of an essential oil, which is known in England as oil of spike and in France under the name of *essence d'aspic*. It is used in painting on porcelain and in veterinary medicine. The oil as met with in commerce is less fragrant than that of *L. vera*—probably because the whole plant is distilled, for the flowers of the two species are scarcely distinguishable in fragrance. *L. Spica* does not extend so far north, nor ascend the mountains beyond 2000 ft. It cannot be cultivated in Britain except in sheltered situations. A nearly allied species, *L. lanata*, a native of Spain, with broader leaves, is also very fragrant, but does not appear to be distilled for oil.

Lavandula Stoechas, a species extending from the Canaries to Asia Minor, is distinguished from the above plants by its blackish purple flowers, and shortly stalked spikes crowned by conspicuous purplish sterile bracts. The flowers were official in the London pharmacopoeia as late as 1746. They are still used by the Arabs as an expectorant and antispasmodic. The Stoechades (now called the isles of Hyères near Toulon) owed their name to the abundance of the plant growing there.

Other species of lavender are known, some of which extend as far east as to India. A few which differ from the above in having divided leaves, as *L. dentata*, *L. abrotanoides*, *L. multifolia*, *L. pinnata* and *L. viridis*, have been cultivated in greenhouses, &c., in England.

Sea lavender is a name applied in England to several species of *Statice*, a genus of littoral plants belonging to the order *Plumbagineae*. Lavender cotton is a species of the genus *Santolina*, small, yellow-flowered, evergreen undershrubs of the Composite order.

LAVERDY, CLÉMENT CHARLES FRANÇOIS DE (1723–1793), French statesman, was a member of the parlement of Paris when the case against the Jesuits came before that body in August 1761. He demanded the suppression of the order and thus acquired popularity. Louis XV. named him controller-general of the finances in December 1763, but the burden was great and Laverdy knew nothing of finance. Three months after his nomination he forbade anything of any kind whatever to be printed concerning his administration, thus refusing advice as well as censure. He used all sorts of expedients, sometimes dishonest, to replenish the treasury, and was even accused of having himself profited from the commerce in wheat. A court intrigue led to his sudden dismissal on the 1st of October 1768. Henceforward he lived in retirement until, during the Revolution, he was involved in the charges against the financiers of the old régime. The Revolutionary tribunal condemned him to death, and he was guillotined on the 24th of November 1793.

See A. Jobez, *La France sous Louis XV* (1869).

LAVERNA, an old Italian divinity, originally one of the spirits of the underworld. A cup found in an Etruscan tomb bears the inscription "Lavernai Pocolom," and in a fragment of Septimius Serenus Laverna is expressly mentioned in connexion with the *di inferi*. By an easy transition, she came to be regarded as the protectress of thieves, whose operations were associated with darkness. She had an altar on the Aventine hill, near the gate called after her Lavernalis, and a grove on the Via Salaria. Her aid was invoked by thieves to enable them to carry out their plans successfully without forfeiting their reputation for piety and honesty (Horace, *Ep.* i. 16, 60). Many explanations have been given of the name: (1) from *latere* (Schol. on Horace, who gives *laternio* as another form of *lavernio* or robber); (2) from *lavare* (Acron on Horace, according to whom thieves were called *lavatores*, perhaps referring to bath thieves); (3) from *levare* (cf. shop-lifters). Modern etymologists connect it with *lu-crum*, and explain it as meaning the goddess of gain.

LAVERY, JOHN (1857–), British painter, was born in Belfast, and received his art training in Glasgow, London and Paris. He was elected associate of the Royal Scottish Academy in 1892 and academician in 1896, having won a considerable reputation as a painter of portraits and figure subjects, and as a facile and vigorous executant. He became also vice-president of the International Society of sculptors, painters and gravers. Many of his paintings have been acquired for public collections, and he is represented in the National Galleries at Brussels, Berlin and Edinburgh, in the Carnegie Institute at Pittsburg, the Philadelphia Gallery, the New South Wales Gallery, the Modern Gallery, Venice, the Pinakothek, Munich, the Glasgow Corporation Gallery, and the Luxembourg.

LAVIGERIE, CHARLES MARTIAL ALLEMAND (1825–1892), French divine, cardinal archbishop of Carthage and Algiers and primate of Africa, was born at Bayonne on the 31st of October 1825, and was educated at St Sulpice, Paris. He was ordained priest in 1849, and was professor of ecclesiastical history at the Sorbonne from 1854 to 1856. In 1856 he accepted the direction of the schools of the East, and was thus for the first time brought into contact with the Mahommedan world. "C'est là," he wrote, "que j'ai connu enfin ma vocation." Activity in missionary work, especially in alleviating the distresses of the victims of the Druses, soon brought him prominently into notice; he was made a chevalier of the Legion of Honour, and in October 1861, shortly after his return to Europe, was appointed French auditor at Rome. Two years later he was raised to the see of Nancy, where he remained for four years, during which the diocese became one of the best administered in France. While bishop of Nancy he met Marshal MacMahon, then governor-general of Algeria, who in 1866 offered him the see of Algiers, just raised to an archbishopric. Lavigerie landed in Africa on the 11th of May 1868, when the great famine was already making itself felt, and he began in November to collect the orphans into villages. This action, however, did not meet with the approval of MacMahon, who feared that the Arabs would resent it as an infraction of the religious peace, and thought that the Mahommedan church, being a state institution in Algeria, ought to be protected from proselytism; so it was intimated to the prelate that his sole duty was to minister to the colonists. Lavigerie, however, continued his self-imposed task, refused the archbishopric of Lyons, which was offered to him by the emperor, and won his point. Contact with the natives during the famine caused Lavigerie to entertain exaggerated hopes for their general conversion, and his enthusiasm was such that he offered to resign his archbishopric in order to devote himself entirely to the missions. Pius IX. refused this, but granted him a coadjutor, and placed the whole of equatorial Africa under his charge. In 1870 Lavigerie warmly supported papal infallibility. In 1871 he was twice a candidate for the National Assembly, but was defeated. In 1874 he founded the Sahara and Sudan mission, and sent missionaries to Tunis, Tripoli, East Africa and the Congo. The order of African missionaries thus founded, for which Lavigerie himself drew up the rule, has since become famous as the *Pères Blancs*. From 1881 to 1884 his activity in Tunisia so raised the prestige of France that it drew from Gambetta the celebrated declaration, *L'Anticléricalisme n'est pas un article d'exportation*, and led to the exemption of Algeria from the application of the decrees concerning the religious orders. On the 27th of March 1882 the dignity of cardinal was conferred upon Lavigerie, but the great object of his ambition was to restore the see of St Cyprian; and in that also he was successful, for by a bull of 10th November 1884 the metropolitan see of Carthage was re-erected, and Lavigerie received the pallium on the 25th of January 1885. The later years of his life were spent in ardent anti-slavery propaganda, and his eloquence moved large audiences in London, as well as in Paris, Brussels and other parts of the continent. He hoped, by organizing a fraternity of armed laymen as pioneers, to restore fertility to the Sahara; but this community did not succeed, and was dissolved before his death. In 1890 Lavigerie appeared in the new character of a politician, and arranged with Pope Leo XIII. to make an attempt to reconcile the church with the republic. He invited the officers of the Mediterranean squadron to lunch at Algiers, and, practically renouncing his monarchical sympathies, to which he clung as long as the comte de Chambord was alive, expressed his support of the republic, and emphasized it by having the Marseillaise played by a band of his *Pères Blancs*. The further steps in this evolution emanated from the pope, and Lavigerie, whose health now began to fail, receded comparatively into the background. He died at Algiers on the 26th of November 1892. (G. F. B.)

LA VILLEMARQUÉ, THÉODORE CLAUDE HENRI, Vicomte Hersart de (1815–1895), French philologist and man of letters, was born at Keransker, near Quimperlé, on the 6th of July 1815. He was descended from an old Breton family, which counted among its members a Hersart who had followed Saint Louis to the Crusade, and another who was a companion in arms of Du Guesclin. La Villemarqué devoted himself to the elucidation of the monuments of Breton literature. Introduced in 1851 by Jacob Grimm as correspondent to the Academy of Berlin, he became in 1858 a member of the Academy of Inscriptions. His works include: *Contes populaires des anciens Bretons* (1842), to which was prefixed an essay on the origin of the romances of the Round Table; *Essai sur l'histoire de la langue bretonne* (1837); *Poèmes des bardes bretons du sixième siècle* (1850); *La Légende celtique en Irelande, en Cambrie et en Bretagne* (1859). The popular Breton songs published by him in 1839 as *Barzas Breis* were considerably retouched. La Villemarqué's work has been superseded by the work of later scholars, but he has the merit of having done much to arouse popular interest in his subject. He died at Keransker on the 8th of December 1895.

On the subject of the doubtful authenticity of *Barzas Breis*, see Luzel's Preface to his *Chansons populaires de la Basse-Bretagne*, and, for a list of works on the subject, the *Revue Celtique* (vol. v.).

LAVINIUM, an ancient town of Latium, on the so-called Via Lavinatis (see Laurentina, Via), 19 m. S. of Rome, the modern Pratica, situated 300 ft. above sea-level and 2½ m. N.E. from the sea-coast. Its foundation is attributed to Aeneas (whereas Laurentum was the primitive city of King Latinus), who named it after his wife Lavinia. It is rarely mentioned in Roman history and often confused with Lanuvium or Lanivium in the text both of authors and of inscriptions. The custom by which the consuls and praetors or dictators sacrificed on the Alban Mount and at Lavinium to the Penates and to Vesta, before they entered upon office or departed for their province, seems to have been one of great antiquity. There is no trace of its having continued into imperial times, but the cults of Lavinium were kept up, largely by the imperial appointment of honorary non-resident citizens to hold the priesthoods. The citizens of Lavinium were known under the empire as Laurentes Lavinates, and the place itself at a late period as Laurolavinium. It was deserted or forgotten not long after the time of Theodosius.

Lavinium was preceded by a more ancient town, Laurentum, the city of Latinus (Verg. *Aen.* viii.); of this the site is uncertain, but it is probably to be sought at the modern Tor Paterno, close to the sea-coast and 5 m. N. by W. of Lavinium. Here the name of Laurentum is preserved by the modern name Pantan di Lauro. Even in ancient times it was famous for its groves of bay-trees (*laurus*) from which its name was perhaps derived, and which in imperial times gave the villas of its territory a name for salubrity, so that both Vitellius and Commodus resorted there. The exact date of the abandonment of the town itself and the incorporation of its territory with that of Lavinium is uncertain, but it may be placed in the latter part of the republic. Under the empire a portion of it must have been imperial domain and forest. We hear of an imperial procurator in charge of the elephants at Laurentum; and the imperial villa may perhaps be identified with the extensive ruins at Tor Paterno itself. The remains of numerous other villas lie along the ancient coast-line (which was half a mile inland of the modern, being now marked by a row of sand-hills, and was followed by the Via Severiana), both north-west and south-east of Tor Paterno: they extended as a fact in an almost unbroken line along the low sandy coast—now entirely deserted and largely occupied by the low scrub which serves as cover for the wild boars of the king of Italy's preserves—from the mouth of the Tiber to Antium, and thence again to Astura; but there are no traces of any buildings previous to the imperial period. In one of these villas, excavated by the king of Italy in 1906, was found a fine replica of the famous discobolus of Myron. The plan of the building is interesting, as it diverges entirely from the normal type and adapts itself to the site. Some way to the N.W. was situated the village of Vicus Augustanus Laurentium, taking its name probably from Augustus himself, and probably identical with the village mentioned by Pliny the younger as separated by only one villa from his own. This village was brought to light by excavation in 1874, and its forum and curia are still visible. The remains of the villa of Pliny, too, were excavated in 1713 and in 1802–1819, and it is noteworthy that the place bears the name Villa di Pino (*sic*) on the staff map; how old the name is, is uncertain. It is impossible without further excavation to reconcile the remains—mainly of substructions—with the elaborate description of his villa given by Pliny (cf. H. Winnefeld in *Jahrbuch des Instituts*, 1891, 200 seq.).

The site of the ancient Lavinium, no less than 300 ft. above sea-level and 2½ m. inland, is far healthier than the low-lying Laurentum, where, except in the immediate vicinity of the coast, malaria must have been a dreadful scourge. It possesses considerable natural strength, and consists of a small hill, the original acropolis, occupied by the modern castle and the village surrounding it, and a larger one, now given over to cultivation, where the city stood. On the former there are now no traces of antiquity, but on the latter are scanty remains of the city walls, in small blocks of the grey-green tufa (*cappellaccio*) which is used in the earliest buildings of Rome, and traces of the streets. The necropolis, too, has been discovered, but not systematically excavated; but objects of the first Iron age, including a sword of Aegean type (thus confirming the tradition), have been found; also remains of a building with Doric columns of an archaistic type, remains of later buildings in brick, and inscriptions, some of them of considerable interest.

See R. Lanciani in *Monumenti dei Lincei*, xiii. (1903), 133 seq.; xvi. (1906), 241 seq. (T. As.)

LAVISSE, ERNEST (1842–), French historian, was born at Nouvion-en-Thiérache, Aisne, on the 17th of December 1842. In 1865 he obtained a fellowship in history, and in 1875 became a doctor of letters; he was appointed *maître de conférence* (1876) at the école normale supérieure, succeeding Fustel de Coulanges, and then professor of modern history at the Sorbonne (1888), in the place of Henri Wallon. He was an eloquent professor and very fond of young people, and played an important part in the revival of higher studies in France after 1871. His knowledge of pedagogy was displayed in his public lectures and his addresses, in his private lessons, where he taught a small number of pupils the historical method, and in his books, where he wrote *ad probandum* at least as much as *ad narrandum:* class-books, collections of articles, intermingled with personal reminiscences (*Questions d'enseignement national*, 1885; *Études et étudiants*, 1890; *À propos de nos écoles*, 1895), rough historical sketches (*Vue générale de l'histoire politique de l'Europe*, 1890), &c. Even his works of learning, written without a trace of pedantry, are remarkable for their lucidity and vividness.

After the Franco-Prussian War Lavisse studied the development of Prussia and wrote *Étude sur l'une des origines de la monarchie prussienne, ou la Marche de Brandebourg sous la dynastie ascanienne*, which was his thesis for his doctor's degree in 1875, and *Études sur l'histoire de la Prusse* (1879). In connexion with his study of the Holy Roman Empire, and the cause of its decline, he wrote a number of articles which were published in the *Revue des Deux Mondes*; and he wrote *Trois empereurs d'Allemagne* (1888), *La Jeunesse du grand Frédéric* (1891) and *Frédéric II. avant son avènement* (1893) when studying the modern German empire and the grounds for its strength. With his friend Alfred Rambaud he conceived the plan of *L'Histoire générale du IV^e siècle jusqu'à nos jours*, to which, however, he contributed nothing. He edited the *Histoire de France depuis les origines jusqu'à la Révolution* (1901–), in which he carefully revised the work of his numerous assistants, reserving the greatest part of the reign of Louis XIV. for himself. This section occupies the whole of volume vii. It is a remarkable piece of work, and the sketch of absolute government in France during this period has never before been traced with an equal amount of insight and brilliance. Lavisse was admitted to the Académie Française on the death of Admiral Jurien de la Gravière in 1892, and after the death of James Darmesteter became editor of the *Revue de Paris*. He is, however, chiefly a master of pedagogy. When the école normale was joined to the university of Paris, Lavisse was appointed director of the new organization, which he had helped more than any one to bring about.

LAVOISIER, ANTOINE LAURENT (1743–1794), French chemist, was born in Paris on the 26th of August 1743. His father, an *avocat au parlement*, gave him an excellent education at the collège Mazarin, and encouraged his taste for natural science; and he studied mathematics and astronomy with N. L. de Lacaille, chemistry with the elder Rouelle and botany with Bernard de Jussieu. In 1766 he received a gold medal from the Academy of Sciences for an essay on the best means of lighting a large town; and among his early work were papers on the analysis of gypsum, on thunder, on the aurora and on congelation, and a refutation of the prevalent belief that water by repeated distillation is converted into earth. He also assisted J. E. Guettard (1715–1786) in preparing his mineralogical atlas of France. In 1768, recognized as a man who had both the ability and the means for a scientific career, he was nominated *adjoint chimiste* to the Academy, and in that capacity made numerous reports on the most diverse subjects, from the theory of colours to water-supply and from invalid chairs to mesmerism and the divining rod. The same year he obtained the position of *adjoint* to Baudon, one of the farmers-general of the revenue, subsequently becoming a full titular member of the body. This was the first of a series of posts in which his administrative abilities found full scope. Appointed *régisseur des poudres* in 1775, he not only abolished the vexatious search for saltpetre in the cellars of private houses, but increased the production of the salt and improved the manufacture of gunpowder. In 1785 he was nominated to the committee on agriculture, and as its secretary drew up reports and instructions on the cultivation of various crops, and promulgated schemes for the establishment of experimental agricultural stations, the distribution of agricultural implements and the adjustment of rights of pasturage. Seven years before he had started a model farm at Fréchine, where he demonstrated the advantages of scientific methods of cultivation and of the introduction of good breeds of cattle and sheep. Chosen a member of the provincial assembly of Orleans in 1787, he busied himself with plans for the improvement of the social and economic conditions of the community by means of savings banks, insurance societies, canals, workhouses, &c.; and he showed the sincerity of his philanthropical work by advancing money out of his own pocket, without interest, to the towns of Blois and Romorantin, for the purchase of barley during the famine of 1788. Attached in this same year to the *caisse d'escompte*, he presented the report of its operations to the national assembly in 1789, and as commissary of the treasury in 1791 he established a system of accounts of unexampled punctuality. He was also asked by the national assembly to draw up a new scheme of taxation in connexion with which he produced a report *De la richesse territoriale de la France*, and he was further associated with committees on hygiene, coinage, the casting of cannon, &c., and was secretary and treasurer of the commission appointed in 1790 to secure uniformity of weights and measures.

In 1791, when Lavoisier was in the middle of all this official activity, the suppression of the farmers-general marked the beginning of troubles which brought about his death. His membership of that body was alone sufficient to make him an object of suspicion; his administration at the *régie des poudres* was attacked; and Marat accused him in the *Ami du Peuple* of putting Paris in prison and of stopping the circulation of air in the city by the *mur d'octroi* erected at his suggestion in 1787. The Academy, of which as treasurer at the time he was a conspicuous member, was regarded by the convention with no friendly eyes as being tainted with "incivism," and in the spring of 1792 A. F. Fourcroy endeavoured to persuade it to purge itself of suspected members. The attempt was unsuccessful, but in August of the same year Lavoisier had to leave his house and laboratory at the Arsenal, and in November the Academy was forbidden until further orders to fill up the vacancies in its numbers. Next year, on the 1st of August, the convention passed a decree for the uniformity of weights and measures, and requested the Academy to take measures for carrying it out, but a week later Fourcroy persuaded the same convention to suppress the Academy together with other literary societies *patentées et dotées* by the nation. In November it ordered the arrest of the ex-farmers-general, and on the advice of the committee of public instruction, of which Guyton de Morveau and Fourcroy were members, the names of Lavoisier and others were struck off from the commission of weights and measures. The fate of the ex-farmers-general was sealed on the 2nd of May 1794, when, on the proposal of Antoine Dupin, one of their former officials, the convention sent them for trial by the Revolutionary tribunal. Within a week Lavoisier and 27 others were condemned to death. A petition in his favour addressed to Coffinhal, the president of the tribunal, is said to have been met with the reply *La République n'a pas besoin de savants*, and on the 8th of the month Lavoisier and his companions were guillotined at the Place de la Révolution. He died fourth, and was preceded by his colleague Jacques Paulze, whose daughter he had married in 1771. "*Il ne leur a fallu*," Lagrange remarked, "*qu'un moment pour faire tomber cette tête, et cent années peut-être ne suffiront pas pour en reproduire une semblable.*"

Lavoisier's name is indissolubly associated with the overthrow of the phlogistic doctrine that had dominated the development of chemistry for over a century, and with the establishment of the foundations upon which the modern science reposes. "He discovered," says Justus von Liebig (*Letters on Chemistry*, No. 3), "no new body, no new property, no natural phenomenon previously unknown; but all the facts established by him were the necessary consequences of the labours of those who preceded him. His merit, his immortal glory, consists in this—that he infused into the body of the science a new spirit; but all the members of that body were already in existence, and rightly joined together." Realizing that the total weight of all the products of a chemical reaction must be exactly equal to the total weight of the reacting substances, he made the balance the *ultima ratio* of the laboratory, and he was able to draw correct inferences from his weighings because, unlike many of the phlogistonists, he looked upon heat as imponderable. It was by weighing that in 1770 he proved that water is not converted into earth by distillation, for he showed that the total weight of a sealed glass vessel and the water it contained remained constant, however long the water was boiled, but that the glass vessel lost weight to an extent equal to the weight of earth produced, his inference being that the earth came from the glass, not from the water. On the 1st of November 1772 he deposited with the Academy a sealed note which stated that sulphur and phosphorus when burnt increased in weight because they absorbed "air," while the metallic lead formed from litharge by reduction with charcoal weighed less than the original litharge because it had lost "air." The exact nature of the airs concerned in the processes he did not explain until after the preparation of "dephlogisticated air" (oxygen) by Priestley in 1774. Then, perceiving that in combustion and the calcination of metals only a portion of a given volume of common air was used up, he concluded that Priestley's new air, *air éminemment pur*, was what was absorbed by burning phosphorus, &c., "non-vital air," azote, or nitrogen remaining behind. The gas given off in the reduction of metallic calces by charcoal he at first supposed to be merely that contained in the calx, but he soon came to understand that it was a product formed by the union of the charcoal with the "dephlogisticated air" in the calx. In a memoir presented to the Academy in 1777, but not published till 1782, he assigned to dephlogisticated air the name oxygen, or "acid-producer," on the supposition that all acids were formed by its union with a simple, usually non-metallic, body; and having verified this notion for phosphorus, sulphur, charcoal, &c., and even extended it to the vegetable acids, he naturally asked himself what was formed by the combustion of "inflammable air" (hydrogen). This problem he had attacked in 1774, and in subsequent years he made various attempts to discover the acid which, under the influence of his oxygen theory, he expected would be formed. It was not till the 25th of June 1783 that in conjunction with Laplace he announced to the Academy that water was the product formed by the combination of hydrogen and oxygen, but by that time he had been anticipated by Cavendish, to whose prior work, however, as to that of several other investigators in other matters, it is to be regretted that he did not render due acknowledgment. But a knowledge of the composition of water enabled him to storm the last defences of the phlogistonists. Hydrogen they held to be the phlogiston of metals, and they supported this view by pointing out that it was liberated when metals were dissolved in acids. Considerations of weight had long prevented Lavoisier from accepting this doctrine, but he was now able to explain the process fully, showing that the hydrogen evolved did not come from the metal itself, but was one product of the decomposition of the water of the dilute acid, the other product, oxygen, combining with the metal to form an oxide which in turn united with the acid. A little later this same knowledge led him to the beginnings of quantitative organic analysis. Knowing that the water produced by the combustion of alcohol was not pre-existent in that substance but was formed by the combination of its hydrogen with the oxygen of the air, he burnt alcohol and other combustible organic substances, such as wax and oil, in a known volume of oxygen, and, from the weight of the water and carbon dioxide produced and his knowledge of their composition, was able to calculate the amounts of carbon, hydrogen and oxygen present in the substance.

Up to about this time Lavoisier's work, mainly quantitative in character, had appealed most strongly to physicists, but it now began to win conviction from chemists also. C. L. Berthollet, L. B. Guyton de Morveau and A. F. Fourcroy, his collaborators in the reformed system of chemical terminology set forth in 1787 in the *Méthode de momenclature chimique*, were among the earliest French converts, and they were followed by M. H. Klaproth and the German Academy, and by most English chemists except Cavendish, who rather suspended his judgment, and Priestley, who stubbornly clung to the opposite view. Indeed, though the partisans of phlogiston did not surrender without a struggle, the history of science scarcely presents a second instance of a change so fundamental accomplished with such ease. The spread of Lavoisier's doctrines was greatly facilitated by the defined and logical form in which he presented them in his *Traité élémentaire de chimie* (*présenté dans un ordre nouveau et d'après les découvertes modernes*) (1789). The list of simple substances contained in the first volume of this work includes light and caloric with oxygen, azote and hydrogen. Under the head of "oxidable or acidifiable" substances, the combination of which with oxygen yielded acids, were placed sulphur, phosphorus, carbon, and the muriatic, fluoric and boracic radicles. The metals, which by combination with oxygen became oxides, were antimony, silver, arsenic, bismuth, cobalt, copper, tin, iron, manganese, mercury, molybdenum, nickel, gold, platinum, lead, tungsten and zinc; and the "simple earthy salifiable substances" were lime, baryta, magnesia, alumina and silica. The simple nature of the alkalies Lavoisier considered so doubtful that he did not class them as elements, which he conceived as substances which could not be further decomposed by any known process of analysis—*les molécules simples et indivisibles qui composent les corps*. The union of any two of the elements gave rise to binary compounds, such as oxides, acids, sulphides, &c. A substance containing three elements was a binary compound of the second order; thus salts, the most important compounds of this class, were formed by the union of acids and oxides, iron sulphate, for instance, being a compound of iron oxide with sulphuric acid.

In addition to his purely chemical work, Lavoisier, mostly in conjunction with Laplace, devoted considerable attention to physical problems, especially those connected with heat. The two carried out some of the earliest thermochemical investigations, devised apparatus for measuring linear and cubical expansions, and employed a modification of Joseph Black's ice calorimeter in a series of determinations of specific heats. Regarding heat (*matière de feu* or *fluide igné*) as a peculiar kind of imponderable matter, Lavoisier held that the three states of aggregation—solid, liquid and gas—were modes of matter, each depending on the amount of *matière de feu* with which the ponderable substances concerned were interpenetrated and combined; and this view enabled him correctly to anticipate that gases would be reduced to liquids and solids by the influence of cold and pressure. He also worked at fermentation, respiration and animal heat, looking upon the processes concerned as essentially chemical in nature. A paper discovered many years after his death showed that he had anticipated later thinkers in explaining the cyclical process of animal and vegetable life, for he pointed out that plants derive their food from the air, from water, and in general from the mineral kingdom, and animals in turn feed on plants or on other animals fed by plants, while the materials thus taken up by plants and animals are restored to the mineral kingdom by the breaking-down processes of fermentation, putrefaction and combustion.

A complete edition of the writings of Lavoisier, *Œuvres de Lavoisier, publiées par les soins du ministre de l'instruction publique*, was issued at Paris in six volumes from 1864–1893. This publication comprises his *Opuscules physiques et chimiques* (1774), many memoirs from the Academy volumes, and numerous letters, notes and reports relating to the various matters on which he was engaged. At the time of his death he was preparing an edition of his collected works, and the portions ready for the press were published in two volumes as *Mémoires de chimie* in 1805 by his widow (in that year married to Count Rumford), who had drawn and engraved the plates in his *Traité élémentaire de chimie* (1789).

See E. Grimaux, *Lavoisier 1743–1794, d'après sa correspondance, ses manuscripts*, &c. (1888), which gives a list of his works; P. E. M. Berthelot, *La Révolution chimique*: *Lavoisier* (1890), which contains an analysis of and extracts from his laboratory notebooks.

LA VOISIN. CATHERINE MONVOISIN, known as "La Voisin" (d. 1680), French sorceress, whose maiden name was Catherine Deshayes, was one of the chief personages in the famous *affaire des poisons*, which disgraced the reign of Louis XIV. Her husband, Monvoisin, was an unsuccessful jeweller, and she practised chiromancy and face-reading to retrieve their fortunes. She gradually added the practice of witchcraft, in which she had the help of a renegade priest, Étienne Guibourg, whose part was the celebration of the "black mass," an abominable parody in which the host was compounded of the blood of a little child mixed with horrible ingredients. She practised medicine, especially midwifery, procured abortion and provided love powders and poisons. Her chief accomplice was one of her lovers, the magician Lesage, whose real name was Adam Cœuret. The great ladies of Paris flocked to La Voisin, who accumulated enormous wealth. Among her clients were Olympe Mancini, comtesse de Soissons, who sought the death of the king's mistress, Louise de la Vallière; Mme de Montespan, Mme de Gramont (*la belle* Hamilton) and others. The bones of toads, the teeth of moles, cantharides, iron filings, human blood and human dust were among the ingredients of the love powders concocted by La Voisin. Her knowledge of poisons was not apparently so thorough as that of less well-known sorcerers, or it would be difficult to account for La Vallière's immunity. The art of poisoning had become a regular science. The death of Henrietta, duchess of Orleans, was attributed, falsely it is true, to poison, and the crimes of Marie Madeleine de Brinvilliers (executed in 1676) and her accomplices were still fresh in the public mind. In April 1679 a commission appointed to inquire into the subject and to prosecute the offenders met for the first time. Its proceedings, including some suppressed in the official records, are preserved in the notes of one of the official *rapporteurs*, Gabriel Nicolas de la Reynie. The revelation of the treacherous intention of Mme de Montespan to poison Louis XIV. and of other crimes, planned by personages who could not be attacked without scandal which touched the throne, caused Louis XIV. to close the *chambre ardente*, as the court was called, on the 1st of October 1680. It was reopened on the 19th of May 1681 and sat until the 21st of July 1682. Many of the culprits escaped through private influence. Among these were Marie Anne Mancini, duchesse de Bouillon, who had sought to get rid of her husband in order to marry the duke of Vendôme, though Louis XIV. banished her to Nérac. Mme de Montespan was not openly disgraced, because the preservation of Louis's own dignity was essential, and some hundred prisoners, among them the infamous Guibourg and Lesage, escaped the scaffold through the suppression of evidence insisted on by Louis XIV. and Louvois. Some of these were imprisoned in various fortresses, with instructions from Louvois to the respective commandants to flog them if they sought to impart what they knew. Some innocent persons were imprisoned for life because they had knowledge of the facts. La Voisin herself was executed at an early stage of the proceedings, on the 20th of February 1680, after a perfunctory application of torture. The authorities had every reason to avoid further revelations. Thirty-five other prisoners were executed; five were sent to the galleys and twenty-three were banished. Their crimes had furnished one of the most extraordinary trials known to history.

See F. Ravaisson, *Archives de la Bastille*, vols. iv.-vii. (1870–1874); the notes of La Reynie, preserved in the Bibliothèque Nationale; F. Funck-Brentano, *Le Drame des poisons* (1899); A. Masson, *La Sorcellerie et la science des poisons au XVII^{e} siècle* (1904). Sardou made the affair a background for his *Affaire des poisons* (1907). There is a portrait of La Voisin by Antoine Coypel, which has been often reproduced.

LAW, JOHN (1671–1729), Scots economist, best known as the originator of the "Mississippi scheme," was born at Edinburgh in April 1671. His father, a goldsmith and banker, bought shortly before his death, which took place in his son's youth, the lands of Lauriston near Edinburgh. John lived at home till he was twenty, and then went to London. He had already studied mathematics, and the theory of commerce and political economy, with much interest; but he was known rather as fop than scholar. In London he gambled, drank and flirted till in April 1694 a love intrigue resulted in a duel with Beau Wilson in Bloomsbury Square. Law killed his antagonist, and was condemned to death. His life was spared, but he was detained in prison. He found means to escape to Holland, then the greatest commercial country in Europe. Here he observed with close attention the practical working of banking and financial business, and conceived the first ideas of his celebrated "system." After a few years spent in foreign travel, he returned to Scotland, then exhausted and enraged by the failure of the Darien expedition (1695–1701). He propounded plans for the relief of his country in a work[1] entitled *Money and Trade Considered, with a Proposal for supplying the Nation with Money* (1705). This attracted some notice, but had no practical effect, and Law again betook himself to travel. He visited Brussels, Paris, Vienna, Genoa, Rome, making large sums by gambling and speculation, and spending them lavishly. He was in Paris in 1708, and made some proposals to the government as to their financial difficulties, but Louis XIV. declined to treat with a "Huguenot," and d'Argenson, chief of the police, had Law expelled as a suspicious character. He had, however, become intimately acquainted with the duke of Orleans, and when in 1715 that prince became regent, Law at once returned to Paris.

The extravagant expenditure of the late monarch had plunged the kingdom into apparently inextricable financial confusion. The debt was 3000 million livres, the estimated annual expenditure, exclusive of interest payments, 148 million livres, and the income about the same. The advisability of declaring a national bankruptcy was seriously discussed, and though this plan was rejected, measures hardly less violent were carried. By a *visa*, or examination of the state liabilities by a committee with full powers of quashing claims, the debt was reduced nearly a half, the coin in circulation was ordered to be called in and reissued at the rate of 120 for 100—a measure by which foreign coiners profited greatly, and a chamber of justice was established to punish speculators, to whom the difficulties of the state were ascribed. These measures had so little success that the *billets d'état* which were issued as part security for the new debt at once sank 75% below their nominal value. At this crisis Law unfolded a vast scheme to the perplexed regent. A royal bank was to manage the trade and currency of the kingdom, to collect the taxes, and to free the country from debt. The council of finance, then under the duc de Noailles, opposed the plan, but the regent allowed Law to take some tentative steps. By an edict of 2nd May 1716, a private institution called *La Banque générale*, and managed by Law, was founded. The capital was 6 million livres, divided into 1200 shares of 5000 livres, payable in four instalments, one-fourth in cash, three-fourths in *billets d'état*. It was to perform the ordinary functions of a bank, and had power to issue notes payable at sight in the weight and value of the money mentioned at day of issue. The bank was a great and immediate success. By providing for the absorption of part of the state paper it raised the credit of the government. The notes were a most desirable medium of exchange, for they had the element of fixity of value, which, owing to the arbitrary mint decrees of the government, was wanting in the coin of the realm. They proved the most convenient instruments of remittance between the capital and the provinces, and they thus developed the industries of the latter. The rate of interest, previously enormous and uncertain, fell first to 6 and then to 4%; and when another decree (10th April 1717) ordered collectors of taxes to receive notes as payments, and to change them for coin at request, the bank so rose in favour that it soon had a note-issue of 60 million livres. Law now gained the full confidence of the regent, and was allowed to proceed with the development of the "system."

The trade of the region about the Mississippi had been granted to a speculator named Crozat. He found the undertaking too large, and was glad to give it up. By a decree of August 1717 Law was allowed to establish the *Compagnie de la Louisiane ou d'Occident*, and to endow it with privileges practically amounting to sovereignty over the most fertile region of North America. The capital was 100 million livres divided into 200,000 shares of 500 livres. The payments were to be one-fourth in coin and three-fourths in *billets d'état*. On these last the government was to pay 3 million livres interest yearly to the company. As the state paper was depreciated the shares fell much below par. The rapid rise of Law had made him many enemies, and they took advantage of this to attack the system. D'Argenson, now head of the council of finance, with the brothers Paris of Grenoble, famous tax farmers of the day, formed what was called the "anti-system." The farming of the taxes was let to them, under an assumed name, for 48½ million livres yearly. A company was formed, the exact counterpart of the Mississippi company. The capital was the same, divided in the same manner, but the payments were to be entirely in money. The returns from the public revenue were sure; those from the Mississippi scheme were not. Hence the shares of the latter were for some time out of favour. Law proceeded unmoved with the development of his plans. On the 4th of December 1718 the bank became a government institution under the name of *La Banque royale*. Law was director, and the king guaranteed the notes. The shareholders were repaid in coin, and, to widen the influence of the new institution, the transport of money between towns where it had branches was forbidden. The paper-issue now reached 110 millions. Law had such confidence in the success of his plans that he agreed to take over shares in the Mississippi company at par at a near date. The shares began rapidly to rise. The next move was to unite the companies *Des Indes Orientales* and *De Chine*, founded in 1664 and 1713 respectively, but now dwindled away to a shadow, to his company. The united association, *La Compagnie des Indes*, had a practical monopoly of the foreign trade of France. These proceedings necessitated the creation of new capital to the nominal amount of 25 million livres. The payment was spread over 20 months. Every holder of four original shares (*mères*) could purchase one of the new shares (*filles*) at a premium of 50 livres. All these 500-livre shares rapidly rose to 750, or 50% above par. Law now turned his attention to obtaining additional powers within France itself. On the 25th of July 1719 an edict was issued granting the company for nine years the management of the mint and the coin-issue. For this privilege the company paid 5 million livres, and the money was raised by a new issue of shares of the nominal value of 500 livres, but with a premium of other 500. The list was only open for twenty days, and it was necessary to present four *mères* and one *fille* in order to obtain one of the new shares (*petites filles*). At the same time two dividends per annum of 6% each were promised. Again there was an attempt to ruin the bank by the commonplace expedient of making a run on it for coin; but the conspirators had to meet absolute power managed with fearlessness and skill. An edict appeared reducing, at a given date, the value of money, and those who had withdrawn coin from the bank hastened again to exchange it for the more stable notes. Public confidence in Law was increased, and he was enabled rapidly to proceed with the completion of the system. A decree of 27th August 1719 deprived the rival company of the farming of the revenue, and gave it to the *Compagnie des Indes* for nine years in return for an annual payment of 52 million livres. Thus at one blow the "anti-system" was crushed. One thing yet remained; Law proposed to take over the national debt, and manage it on terms advantageous to the state. The mode of transfer was this. The debt was over 1500 million livres. Notes were to be issued to that amount, and with these the state creditors must be paid in a certain order. Shares were to be issued at intervals corresponding to the payments, and it was expected that the notes would be used in buying them. The government was to pay 3% for the loan. It had formerly been bound to pay 80 millions, it would now pay under 50, a clear gain of over 30. As the shares of the company were almost the only medium for investment, the transfer would be surely effected. The creditors would now look to the government payments and the commercial gains of the company for their annual returns. Indeed the creditors were often not able to procure the shares, for each succeeding issue was immediately seized upon, though the 500-livre share was now issued at a premium of 4500 livres. After the third issue, on the 2nd of October, the shares immediately resold at 8000 livres in the Rue Quincampoix, then used as a bourse. They went on rapidly rising as new privileges were still granted to the company. Law had now more than regal power. The exiled Stuarts paid him court; the proudest aristocracy in Europe humbled themselves before him; and his liberality made him the idol of the populace. After, as a necessary preliminary, becoming a Catholic, he was made controller-general of the finances in place of d'Argenson. Finally, in February 1720, the bank was in name as well as in reality united to the company.

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[1] A work entitled *Proposals and Reasons for constituting a Council of Trade in Scotland* was published anonymously at Edinburgh in 1701. It was republished at Glasgow in 1751 with Law's name attached; but several references in the state papers of the time mention William Paterson (1658–1719), founder of the Bank of England, as the author of the plan therein propounded. Even if Law had nothing to do with the composition of the work, he must have read it and been influenced by it. This may explain how it contains the germs of many of the developments of the "system." Certainly the suggestion of a central board, to manage great commercial undertakings, to furnish occupation for the poor, to encourage mining, fishing and manufactures, and to bring about a reduction in the rate of interest, was largely realized in the Mississippi scheme. See Bannister's *Life of William Paterson* (ed. 1858), and *Writings of William Paterson* (2nd ed., 3 vols., 1859).

The system was now complete; but it had already begun to decay. In December 1719 it was at its height. The shares had then amounted to 20,000 livres, forty times their nominal price. A sort of madness possessed the nation. Men sold their all and hastened to Paris to speculate. The population of the capital was increased by an enormous influx of provincials and foreigners. Trade received a vast though unnatural impulse. Everybody seemed to be getting richer, no one poorer. Those who could still reflect saw that this prosperity was not real. The whole issue of shares at the extreme market-price valued 12,000 million livres. It would require 600 million annual revenue to give a 5% dividend on this. Now, the whole income of the company as yet was hardly sufficient to pay 5% on the original capital of 1677 million livres. The receipts from the taxes, &c., could be precisely calculated, and it would be many years before the commercial undertakings of the company—with which only some trifling beginning had been made—would yield any considerable return. People began to sell their shares, and to buy coin, houses, land—anything that had a stable element of value in it. There was a rapid fall in the shares, a rapid rise in all kinds of property, and consequently a rapid depreciation of the paper money. Law met these new tendencies by a succession of the most violent edicts. The notes were to bear a premium over specie. Coin was only to be used in small payments, and only a small amount was to be kept in the possession of private parties. The use of diamonds, the fabrication of gold and silver plate, was forbidden. A dividend of 40 % on the original capital was promised. By several ingenious but fallaciously reasoned pamphlets Law endeavoured to restore public confidence. The shares still fell. At last, on the 5th of March 1720, an edict appeared fixing their price at 9000 livres, and ordering the bank to buy and sell them at that price. The fall now was transferred to the notes, of which there were soon over 2500 million livres in circulation. A large proportion of the coined money was removed from the kingdom. Prices rose enormously. There was everywhere distress and complete financial confusion. Law became an object of popular hatred. He lost his court influence, and was obliged to consent to a decree (21st May 1720) by which the notes and consequently the shares were reduced to half their nominal value. This created such a commotion that its promoters were forced to recall it, but the mischief was done. What confidence could there be in the depreciated paper after such a measure? Law was removed from his office, and his enemies proceeded to demolish the "system." A vast number of shares had been deposited in the bank. These were destroyed. The notes were reconverted into government debt, but there was first a *visa* which reduced that debt to the same size as before it was taken over by the company. The rate of interest was lowered, and the government now only pledged itself to pay 37 instead of 80 millions annually. Finally the bank was abolished, and the company reduced to a mere trading association. By November the "system" had disappeared. With these last measures Law, it may well be believed, had nothing to do. He left France secretly in December 1720, resumed his wandering life, and died at Venice, poor and forgotten, on the 21st of March 1729.

Of Law's writings the most important for the comprehension of the "system" is his *Money and Trade Considered*. In this work he says that national power and wealth consist in numbers of people, and magazines of home and foreign goods. These depend on trade, and that on money, of which a greater quantity employs more people; but credit, if the credit have a circulation, has all the beneficial effects of money. To create and increase instruments of credit is the function of a bank. Let such be created then, and let its notes be only given in return for land sold or pledged. Such a currency would supply the nation with abundance of money; and it would have many advantages, which Law points out in detail, over silver. The bank or commission was to be a government institution, and its profits were to be spent in encouraging the export and manufacture of the nation. A very evident error lies at the root of the "system." Money is not the result but the cause of wealth, he thought. To increase it then must be beneficial, and the best way is by a properly secured paper currency. This is the motive force; but it is to be applied in a particular way. Law had a profound belief in the omnipotence of government. He saw the evils of minor monopolies, and of private farming of taxes. He proposed to centre foreign trade and internal finance in one huge monopoly managed by the state for the people, and carrying on business through a plentiful supply of paper money. He did not see that trade and commerce are best left to private enterprise, and that such a scheme would simply result in the profits of speculators and favourites. The "system" was never so far developed as to exhibit its inherent faults. The madness of speculators ruined the plan when only its foundations were laid. One part indeed might have been saved. The bank was not necessarily bound to the company, and had its note-issue been retrenched it might have become a permanent institution. As Thiers points out, the edict of the 5th of March 1720, which made the shares convertible into notes, ruined the bank without saving the company. The shares had risen to an unnatural height, and they should have been allowed to fall to their natural level. Perhaps Law felt this to be impossible. He had friends at court whose interests were involved in the shares, and he had enemies eager for his overthrow. It was necessary to succeed completely or not at all; so Law, a gambler to the core, risked and lost everything. Notwithstanding the faults of the "system," its author was a financial genius of the first order. He had the errors of his time; but he propounded many truths as to the nature of currency and banking then unknown to his contemporaries. The marvellous skill which he displayed in adapting the theory of the "system" to the actual condition of things in France, and in carrying out the various financial transactions rendered necessary by its development, is absolutely without parallel. His profound self-confidence and belief in the truth of his own theories were the reasons alike of his success and his ruin. He never hesitated to employ the whole force of a despotic government for the definite ends which he saw before him. He left France poorer than he entered it, yet he was not perceptibly changed by his sudden transitions of fortune. Montesquieu visited him at Venice after his fall, and has left a description of him touched with a certain pathos. Law, he tells us, was still the same in character, perpetually planning and scheming, and, though in poverty, revolving vast projects to restore himself to power, and France to commercial prosperity.

The fullest account of the Mississippi scheme is that of Thiers, *Law et son système des finances* (1826, American trans. 1859). See also Heymann, *Law und sein System* (1853); Pierre Bonnassieux, *Les Grandes Compagnies de commerce* (1892); S. Alexi, *John Law und sein System* (1885); E. Levasseur, *Recherches historiques sur le système de Law* (1854); and Jobez, *Une Préface au socialisme, ou le système de Law et la chasse aux capitalistes* (1848). Full biographical details are given in Wood's *Life of Law* (Edinburgh, 1824). All Law's later writings are to be found in Daire, *Collection des principaux économistes*, vol. i. (1843). Other works on Law are: A. W. Wiston-Glynn, *John Law of Lauriston* (1908); P. A. Cachut, *The Financier Law, his Scheme and Times* (1856); A. Macf. Davis, *An Historical Study of Law's System* (Boston, 1887); A. Beljame, *La Prononciation du nom de Jean Law le financier* (1891). See also E. A. Benians in *Camb. Mod. Hist.* vi. 6 (1909). For minor notices see Poole's *Index to Periodicals.* There is a portrait of Law by A. S. Belle in the National Portrait Gallery, London. (F. WA.)

LAW, WILLIAM (1686–1761), English divine, was born at King's Cliffe, Northamptonshire. In 1705 he entered as a sizar at Emmanuel College, Cambridge; in 1711 he was elected fellow of his college and was ordained. He resided at Cambridge, teaching and taking occasional duty until the accession of George I., when his conscience forbade him to take the oaths of allegiance to the new government and of abjuration of the Stuarts. His Jacobitism had already been betrayed in a tripos speech which brought him into trouble; and he was now deprived of his fellowship and became a non-juror. For the next few years he is said to have been a curate in London. By 1727 he was domiciled with Edward Gibbon (1666–1736) at Putney as tutor to his son Edward, father of the historian, who says that Law became "the much honoured friend and spiritual director of the whole family." In the same year he accompanied his pupil to Cambridge, and resided with him as governor, in term time, for the next four years. His pupil then went abroad, but Law was left at Putney, where he remained in Gibbon's house for more than ten years, acting as a religious guide not only to the family but to a number of earnest-minded folk who came to consult him. The most eminent of these were the two brothers John and Charles Wesley, John Byrom the poet, George Cheyne the physician and Archibald Hutcheson, M.P. for Hastings. The household was dispersed in 1737. Law was parted from his friends, and in 1740 retired to King's Cliffe, where he had inherited from his father a house and a small property. There he was presently joined by two ladies: Mrs Hutcheson, the rich widow of his old friend, who recommended her on his death-bed to place herself under Law's spiritual guidance, and Miss Hester Gibbon, sister to his late pupil. This curious trio lived for twenty-one years a life wholly given to devotion, study and charity, until the death of Law on the 9th of April 1761.

Law was a busy writer under three heads:—

1. *Controversy.*—In this field he had no contemporary peer save perhaps Richard Bentley. The first of his controversial works was *Three Letters to the Bishop of Bangor* (1717), which were considered by friend and foe alike as one of the most powerful contributions to the Bangorian controversy on the high church side. Thomas Sherlock declared that "Mr Law was a writer so considerable that he knew but one good reason why his lordship did not answer him." Law's next controversial work was *Remarks on Mandeville's Fable of the Bees* (1723), in which he vindicates morality on the highest grounds; for pure style, caustic wit and lucid argument this work is remarkable; it was enthusiastically praised by John Sterling, and republished by F. D. Maurice. Law's *Case of Reason* (1732), in answer to Tindal's *Christianity as old as the Creation* is to a great extent an anticipation of Bishop Butler's famous argument in the *Analogy.* In this work Law shows himself at least the equal of the ablest champion of Deism. His *Letters to a Lady inclined to enter the Church of Rome* are excellent specimens of the attitude of a high Anglican towards Romanism. His controversial writings have not received due recognition, partly because they were opposed to the drift of his times, partly because of his success in other fields.

2. *Practical Divinity.*—The *Serious Call to a Devout and Holy Life* (1728), together with its predecessor, *A Treatise of Christian Perfection* (1726), deeply influenced the chief actors in the great Evangelical revival. The Wesleys, George Whitefield, Henry Venn, Thomas Scott and Thomas Adam all express their deep obligation to the author. The *Serious Call* affected others quite as deeply. Samuel Johnson, Gibbon, Lord Lyttelton and Bishop Horne all spoke enthusiastically of its merits; and it is still the only work by which its author is popularly known. It has high merits of style, being lucid and pointed to a degree. In a tract entitled *The Absolute Unlawfulness of Stage Entertainments* (1726) Law was tempted by the corruptions of the stage of the period to use unreasonable language, and incurred some effective criticism from John Dennis in *The Stage Defended.*

3. *Mysticism.*—Though the least popular, by far the most interesting, original and suggestive of all Law's works are those which he wrote in his later years, after he had become an enthusiastic admirer (not a disciple) of Jacob Boehme, the Teutonic theosophist. From his earliest years he had been deeply impressed with the piety, beauty and thoughtfulness of the writings of the Christian mystics, but it was not till after his accidental meeting with the works of Boehme, about 1734, that pronounced mysticism appeared in his works. Law's mystic tendencies divorced him from the practical-minded Wesley, but in spite of occasional wild fancies the books are worth reading. They are *A Demonstration of the Gross and Fundamental Errors of a late Book called a "Plain Account, &c., of the Lord's Supper"* (1737); *The Grounds and Reasons of the Christian Regeneration* (1739); *An Appeal to all that Doubt and Disbelieve the Truths of Revelation* (1740); *An Earnest and Serious Answer to Dr Trapp's Sermon on being Righteous Overmuch* (1740); *The Spirit of Prayer* (1749, 1752); *The Way to Divine Knowledge* (1752); *The Spirit of Love* (1752, 1754); *A Short but Sufficient Confutation of Dr Warburton's Projected Defence (as he calls it) of Christianity in his "Divine Legation of Moses"* (1757); *A Series of Letters* (1760); a *Dialogue between a Methodist and a Churchman* (1760); and *An Humble, Earnest and Affectionate Address to the Clergy* (1761).

Richard Tighe wrote a short account of Law's life in 1813. See also Christopher Walton, *Notes and Materials for a Complete Biography of W. Law* (1848); Sir Leslie Stephen, *English Thought in the 18th century*, and in the *Dict. Nat. Biog.* (xxxii. 236); W. H. Lecky, *History of England in the 18th Century*; C. J. Abbey, *The English Church in the 18th Century*; and J. H. Overton, *William Law, Nonjuror and Mystic* (1881).

LAW (O. Eng. *lagu*, M. Eng. *lawe*; from an old Teutonic root *lag*, "lie," what lies fixed or evenly; cf. Lat. *lex*, Fr. *loi*), a word used in English in two main senses—(1) as a rule prescribed by authority for human action, and (2) in scientific and philosophic phraseology, as a uniform order of sequence (*e.g.* "laws" of motion). In the first sense the word is used either in the abstract, for jurisprudence generally or for a state of things in which the laws of a country are duly observed ("law and order"), or in the concrete for some particular rule or body of rules. It is usual to distinguish further between "law" and "equity" (*q.v.*). The scientific and philosophic usage has grown out of an early conception of jurisprudence, and is really metaphorical, derived from the phrase "natural law" or "law of nature," which presumed that commands were laid on matter by God (see T. E. Holland, *Elements of Jurisprudence*, ch. ii.). The adjective "legal" is only used in the first sense, never in the second. In the case of the "moral law" (see ETHICS) the term is employed somewhat ambiguously because of its connexion with both meanings. There is also an Old English use of the word "law" in a more or less sporting sense ("to give law" or "allow so much law"), meaning a start or fair allowance in time or distance. Presumably this originated simply in the liberty-loving Briton's respect for proper legal procedure; instead of the brute exercise of tyrannous force he demanded "law," or a fair opportunity and trial. But it may simply be an extension of the meaning of "right," or of the sense of "leave" which is found in early uses of the French *loi*.

In this work the laws or uniformities of the physical universe are dealt with in the articles on the various sciences. The general principles of law in the legal sense are discussed under JURISPRUDENCE. What may be described as "national systems" of law are dealt with historically and generally under ENGLISH LAW, AMERICAN LAW, ROMAN LAW, GREEK LAW, MAHOMMEDAN LAW, INDIAN LAW, &c. Certain broad divisions of law are treated under CONSTITUTION AND CONSTITUTIONAL LAW, CANON LAW, CIVIL LAW, COMMON LAW, CRIMINAL LAW, ECCLESIASTICAL LAW, EQUITY, INTERNATIONAL LAW, MILITARY LAW, &c. And the particular laws of different countries on special subjects are stated under the headings for those subjects (BANKRUPTCY, &c.). For courts (*q.v.*) of law, and procedure, see JURISPRUDENCE, APPEAL, TRIAL, KING'S BENCH, &c.

AUTHORITIES.—The various legal articles have bibliographies attached, but it may be convenient here to mention such general works on law, apart from the science of jurisprudence, as (for English law) Lord Halsbury's *Laws of England* (vol. i., 1907), *The Encyclopaedia of the Laws of England*, ed. Wood Renton (1907), Stephen's *Commentaries on the Laws of England* (1908), Brett's *Commentaries on the present Laws of England* (1896), Broom's *Commentaries on the Common Law* (1896) and Brodie-Innes's *Comparative Principles of the Laws of England and Scotland* (vol. i., 1903); and, for America, Bouvier's *Law Dictionary*, and Kent's *Commentaries on American Law*.

LAWES, HENRY (1595–1662), English musician, was born at Dinton in Wiltshire in December 1595, and received his musical education from John Cooper, better known under his Italian pseudonym Giovanni Coperario (d. 1627), a famous composer of the day. In 1626 he was received as one of the gentlemen of the chapel royal, which place he held till the Commonwealth put a stop to church music. But even during that songless time Lawes continued his work as a composer, and the famous collection of his vocal pieces, *Ayres and Dialogues for One, Two and Three Voyces*, was published in 1653, being followed by two other books under the same title in 1655 and 1658 respectively. When in 1660 the king returned, Lawes once more entered the royal chapel, and composed an anthem for the coronation of Charles II. He died on the 21st of October 1662, and was buried in Westminster Abbey. Lawes's name has become known beyond musical circles by his friendship with Milton, whose *Comus* he supplied with incidental music for the performance of the masque in 1634. The poet in return immortalized his friend in the famous sonnet in which Milton, with a musical perception not common amongst poets, exactly indicates the great merit of Lawes. His careful attention to the words of the poet, the manner in which his music seems to grow from those words, the perfect coincidence of the musical with the metrical accent, all put Lawes's songs on a level with those of Schumann or Liszt or any modern composer. At the same time he is by no means wanting in genuine melodic invention, and his concerted music shows the learned contrapuntist.

LAWES, SIR JOHN BENNET, BART. (1814–1900), English agriculturist, was born at Rothamsted on the 28th of December 1814. Even before leaving Oxford, where he matriculated in 1832, he had begun to interest himself in growing various medicinal plants on the Rothamsted estates, which he inherited on his father's death in 1822. About 1837 he began to experiment on the effects of various manures on plants growing in pots, and a year or two later the experiments were extended to crops in the field. One immediate consequence was that in 1842 he patented a manure formed by treating phosphates with sulphuric acid, and thus initiated the artificial manure industry. In the succeeding year he enlisted the services of Sir J. H. Gilbert, with whom he carried on for more than half a century those experiments in raising crops and feeding animals which have rendered Rothamsted famous in the eyes of scientific agriculturists all over the world (see AGRICULTURE). In 1854 he was elected a Fellow of the Royal Society, which in 1867 bestowed a Royal medal on Lawes and Gilbert jointly, and in 1882 he was created a baronet. In the year before his death, which happened on the 31st of August 1900, he took measures to ensure the continued existence of the Rothamsted experimental farm by setting aside £100,000 for that purpose and constituting the Lawes Agricultural Trust, composed of four members from the Royal Society, two from the Royal Agricultural Society, one each from the Chemical and Linnaean Societies, and the owner of Rothamsted mansion-house for the time being.

LAW MERCHANT or LEX MERCATORIA, originally a body of rules and principles relating to merchants and mercantile transactions, laid down by merchants themselves for the purpose of regulating their dealings. It was composed of such usages and customs as were common to merchants and traders in all parts of Europe, varied slightly in different localities by special peculiarities. The law merchant owed its origin to the fact that the civil law was not sufficiently responsive to the growing demands of commerce, as well as to the fact that trade in pre-medieval times was practically in the hands of those who might be termed cosmopolitan merchants, who wanted a prompt and effective jurisdiction. It was administered for the most part in special courts, such as those of the gilds in Italy, or the fair courts of Germany and France, or as in England, in courts of the staple or piepowder (see also SEA LAWS). The history of the law merchant in England is divided into three stages: the first prior to the time of Coke, when it was a special kind of law—as distinct from the common law—administered in special courts for a special class of the community (*i.e.* the mercantile); the second stage was one of transition, the law merchant being administered in the common law courts, but as a body of customs, to be proved as a fact in each individual case of doubt; the third stage, which has continued to the present day, dates from the presidency over the king's bench of Lord Mansfield (*q.v.*), under whom it was moulded into the mercantile law of to-day. To the law merchant modern English law owes the fundamental principles in the law of partnership, negotiable instruments and trade marks.

See G. Malynes, *Consuetudo vel lex mercatoria* (London, 1622); W. Mitchell, *The Early History of the Law Merchant* (Cambridge, 1904); J. W. Smith, *Mercantile Law* (ed. Hart and Simey, 1905).

LAWN, a very thin fabric made from level linen or cotton yarns. It is used for light dresses and trimmings, also for handkerchiefs. The terms lawn and cambric (*q.v.*) are often intended to indicate the same fabric. The word "lawn" was formerly derived from the French name for the fabric *linon*, from *lin*, flax, linen, but Skeat (*Etym. Dict.*, 1898, Addenda) and A. Thomas (*Romania*, xxix. 182, 1900) have shown that the real source of the word is to be found in the name of the French town Laon. Skeat quotes from Palsgrave, *Les claircissement de la langue Françoÿse* (1530), showing that the early name of the fabric was *Laune lynen*. An early form of the word was "laund," probably due to an adaptation to "laund," lawn, glade or clearing in a forest, now used of a closely-mown expanse of grass in a garden, park, &c. (see GRASS and HORTICULTURE). This word comes from O. Fr. *launde*, mod. *lande*, wild, heathy or sandy ground, covered with scrub or brushwood, a word of Celtic origin; cf. Irish and Breton *lann*, heathy ground, also enclosure, land; Welsh *llan*, enclosure. It is cognate with "land," common to Teutonic languages. In the original sense of clearing in a forest, glade, Lat. *saltus*, "lawn," still survives in the New Forest, where it is used of the feeding-places of cattle.

LAWN-TENNIS, a game played with racquet and ball on a court traversed by a net, but without enclosing walls. It is a modern adaptation of the ancient game of tennis (*q.v.*), with which it is identical as regards the scoring of the game and "set." Lawn-tennis is essentially a summer game, played in the open air, either on courts marked with whitewash on close-cut grass like a cricket pitch, or on asphalt, cinders, gravel, wood, earth or other substance which can be so prepared as to afford a firm, level and smooth surface. In winter, however, the game is often played on the floor of gymnasiums, drill sheds or other buildings, when it is called "covered-court lawn-tennis";

but there is no difference in the game itself corresponding to these varieties of court.

The lawn-tennis court for the single-handed game, one player against one ("singles"), is shown in fig. 1, and that for the four-handed game ("doubles") in fig. 2. The net stretched across the middle of the court is attached to the tops of two posts which stand 3 ft. outside the court on each side. The height of the net is 3 ft. 6 in. at the posts and 3 ft. at the centre. The court is bisected longitudinally by the half-court-line, which, however, is marked only between the two service-lines and at the points of junction with the base-lines. The divisions of the court on each side of the half-court-line are called respectively the right-hand and left-hand courts; and the portion of these divisions between the service-lines and the net are the right-hand service-court and left-hand service-court respectively. The balls, which are made of hollow india-rubber, tightly covered with white flannel, are 2½ in. in diameter, and from 1⅞ to 2 oz. in weight. The racquets (fig. 3), for which there are no regulation dimensions, are broader and lighter than those used in tennis.

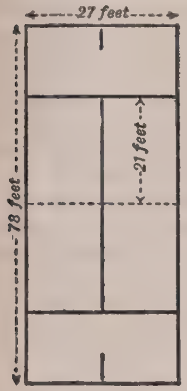

FIG. 1.

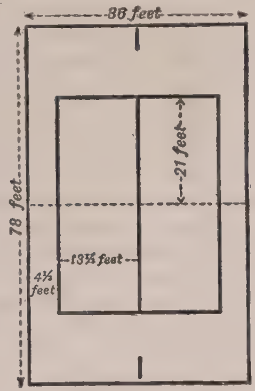

FIG. 2.

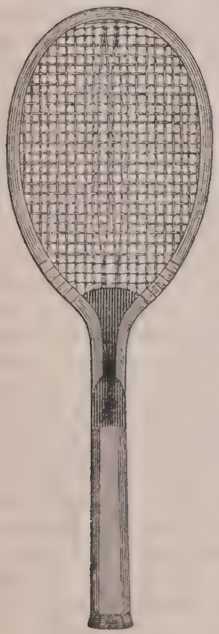

FIG. 3.

Before play begins, a racquet is spun as in tennis, and the winner of the spin elects either to take first service or to take choice of courts. If he takes choice of courts, he and his partner (if the game be doubles) take their position on the selected side of the net, one stationing himself in the right-hand court and the other in the left, which positions are retained throughout the set. If the winner of the spin takes choice of courts, his opponent has first service; and vice versa. The players change sides of the net at the end of the first, third and every subsequent alternate game, and at the end of each set; but they may agree not to change during any set except the last. Service is delivered by each player in turn, who retains it for one game irrespective of the winning or losing of points. In doubles the partner of the server in the first game serves in the third, and the partner of the server in the second game serves in the fourth; the same order being preserved till the end of the set; but each pair of partners decide for themselves before their first turn of service which of the two shall serve first. The server delivers the service from the right- and left-hand courts alternately, beginning in each of his service games from the right-hand court, even though odds be given or owed; he must stand behind (*i.e.* farther from the net than) the base-line, and must serve the ball so that it drops in the opponent's service-court diagonally opposite to the court served from, or upon one of the lines enclosing that service-court. If in a serve, otherwise good, the ball touches the net, it is a "let" whether the serve be "taken" or not by striker-out; a "let" does not annul a previous "fault." (For the meaning of "let," "rest," "striker-out" and other technical terms used in the game, see TENNIS and RACQUETS.) The serve is a fault (1) if it be not delivered by the server from the proper court, and from behind the base-line; (2) if the ball drops into the net or out-of-court, or into any part of the court other than the proper service-court. The striker-out cannot, as in racquets, "take," and thereby condone, a fault. When a fault has been served, the server must serve again from the same court, unless it was a fault because served from the wrong court, in which case the server crosses to the proper court before serving again. Two consecutive faults score a point against the side of the server. Lawn-tennis differs from tennis and racquets in that the service may not be taken on the volley by striker-out. After the serve has been returned the play proceeds until the "rest" (or "rally") ends by one side or the other failing to make a "good return"; a good return in lawn-tennis meaning a stroke by which the ball, having been hit with the racquet before its second bound, is sent over the net, even if it touches the net, so as to fall within the limits of the court on the opposite side. A point is scored by the player, or side, whose opponent fails to return the serve or to make a good return in the rest. A player also loses a point if the ball when in play touches him or his partner, or their clothes; or if he or his racquet touches the net or any of its supports while the ball is in play; or if he leaps over the net to avoid touching it; or if he volley the ball before it has passed the net.

For him who would excel in lawn-tennis a strong fast service is hardly less necessary than a heavily "cut" service to the tennis player and the racquet player. High overhand service, by which alone any great pace can be obtained, was first perfected by the brothers Renshaw between 1880 and 1890, and is now universal even among players far below the first rank. The service in vogue among the best players in America, and from this circumstance known as the "American service," has less pace than the English but is "cut" in such a way that it swerves in the air and "drags" off the ground, the advantage being that it gives the server more time to "run in" after his serve, so as to volley his opponent's return from a position within a yard or two of the net. Both in singles and doubles the best players often make it their aim to get up comparatively near the net as soon as possible, whether they are serving or receiving the serve, the object being to volley the ball whenever possible before it begins to fall. The server's partner, in doubles, stands about a yard and a half from the net, and rather nearer the side-line than the half-court-line; the receiver of the service, not being allowed to volley the serve, must take his stand according to the nature of the service, which, if very fast, will require him to stand outside the base-line; the receiver's partner usually stands between the net and the service-line. All four players, if the rest lasts beyond a stroke or two, are generally found nearer to the net than the service-lines; and the game, assuming the players to be of the championship class, consists chiefly of rapid low volleying, varied by attempts on one side or the other to place the ball out of the opponents' reach by "lobbing" it over their heads into the back part of the court. Good "lobbing" demands great skill, to avoid on the one hand sending the ball out of court beyond the base-line, and on the other allowing it to drop short enough for the adversary to kill it with a "smashing" volley. Of "lobbing" it has been laid down by the brothers Doherty that "the higher it is the better, so long as the length is good"; and as regards returning lobs the same authorities say, "you must get them if you can before they drop, for it is usually fatal to let them drop when playing against a good pair." The reason for this is that if the lob be allowed to drop before being returned, so much time is given to the striker of it to gain position that he is almost certain to be able to kill the return, unless the lob be returned by an equally good and very high lob, dropping within a foot or so of the base-line in the opposite court, a stroke that requires the utmost accuracy of strength to accomplish safely. The game in the hands of first-class players consists largely in manœuvring for favourable position in the court while driving the opponent into a less favourable position on his side of the net; the player who gains the advantage of position in this way being generally able to finish the rest by a smashing volley impossible to return. Ability to play this "smash" stroke is essential to strong lawn-tennis. "To be good overhead," say the Dohertys, "is the sign of a first-class player, even if a few have managed to get on without it." The smash stroke is played very much in the same way as the overhand service, except that it is not from a defined position of known distance from the net; and therefore when making it the player must realize almost instinctively what his precise position is in relation to the net and the side-lines, for it is of the last importance that he should not take his eye off the ball "even for the hundredth part of a second." By drawing the racquet across the ball at the moment of impact spin may be imparted to it as in tennis, or as "side" is imparted to a billiard ball, and the direction of this spin and the consequent behaviour of the ball after the stroke may be greatly varied by a skilful player. Perhaps the most generally useful form of spin, though by no means the only one commonly used, is that known as "top" or "lift," a vertical rotatory motion of the ball in the same direction as its flight, which is imparted to it by an upward draw of the racquet at the moment of making the stroke, and the effect of which is to make it drop more suddenly than it would ordinarily do, and in an unexpected curve. A drive made with plenty of "top" can be hit much harder than would otherwise be possible without sending the ball out of court, and it is therefore extensively employed by the best players. While the volleying game is almost universally the practice of first-class players—A. W. Gore, M. J. G. Ritchie and S. H. Smith being almost alone among those of championship rank in modern days to use the volley comparatively little—its difficulty places it beyond the reach of the less skilful. In lawn-tennis as played at the ordinary country house or local club the real "smash" of a Renshaw or a Doherty is seldom to be seen, and the high lob is almost equally rare. Players of moderate calibre are content to take the ball on the bound and to return it with some pace along the side-lines or across the court, with the aim of placing it as artfully as possible beyond the reach of the adversary; and if now and again they venture to imitate a stroke employed with killing effect at Wimbledon, they think themselves fortunate if they occasionally succeed in making it without disaster to themselves.

Before 1890 the method of handicapping at lawn-tennis was the same as in tennis so far as it was applicable to a game played in an open court. In 1890 bisques were abolished, and in 1894 an elaborate system was introduced by which fractional parts of "fifteen" could be conceded by way of handicap, in accordance with tables inserted in the laws of the game. The system is a development of the tennis handicapping by which a finer graduation of odds may be given. "One-sixth of fifteen" is one stroke given in every six games of a set; and similarly two-sixths, three-sixths, four-sixths and five-sixths of fifteen, are respectively two, three, four and five strokes given in every six games of a set; the particular game in the set in which the stroke in each case must be given being specified in the tables.

History.—Lawn-tennis cannot be said to have existed prior to the year 1874. It is, indeed, true that outdoor games based on tennis were from time to time improvised by lovers of that game who found themselves out of reach of a tennis-court. Lord Arthur Hervey, sometime bishop of Bath and Wells, had thus devised a game which he and his friends played on the lawn of his rectory in Suffolk; and even so early as the end of the 18th century "field tennis" was mentioned by the *Sporting Magazine* as a game that rivalled the popularity of cricket. But, however much or little this game may have resembled lawn-tennis, it had long ceased to exist; and even to be remembered, when in 1874 Major Wingfield took out a patent for a game called Sphairistike, which the specification described as "a new and improved portable court for playing the ancient game of tennis." The court for this game was wider at the base-lines than at the net, giving the whole court the shape of an hour-glass; one side of the net only was divided into service-courts, service being always delivered from a fixed mark in the centre of the opposite court; and from the net-posts side-nets were fixed which tapered down to the ground at about the middle of the side-lines, thus enclosing nearly half the courts on each side of the net. The possibilities of Sphairistike were quickly perceived; and under the new name of lawn-tennis its popularity grew so quickly that in 1875 a meeting of those interested in the game was held at Lord's cricket-ground, where a committee of the Marylebone Club (M.C.C.) was appointed to draw up a code of rules. The hour-glass shape of the court was retained by this code (issued in May 1875), and the scoring of the game followed in the main the racquets instead of the tennis model. It was at the suggestion of J. M. Heathcote, the amateur tennis champion, that balls covered with white flannel were substituted for the uncovered balls used at first. In 1875, through the influence of Henry Jones ("Cavendish"), lawn-tennis was included in the programme of the All England Croquet Club, which in 1877 became the All England Croquet and Lawn-Tennis Club, on whose ground at Wimbledon the All England championships have been annually played since that date. In the same year, in anticipation of the first championship meeting, the club appointed a committee consisting of Henry Jones, Julian Marshall and C. G. Heathcote to revise the M.C.C. code of rules; the result of their labours being the introduction of the tennis in place of the racquets scoring, the substitution of a rectangular for the "hour-glass" court, and the enactment of the modern rule as regards the "fault." The height of the net, which under the M.C.C. rules had been 4 ft. in the centre, was reduced to 3 ft. 3 in.; and regulations as to the size and weight of the ball were also made. Some controversy had already taken place in the columns of the *Field* as to whether volleying the ball, at all events within a certain distance of the net, should not be prohibited. Spencer Gore, the first to win the championship in 1877, used the volley with great skill and judgment, and in principle anticipated the tactics afterwards brought to perfection by the Renshaws, which aimed at forcing the adversary back to the base-line and killing his return with a volley from a position near the net. P. F. Hadow, champion in 1878, showed how the volley might be defeated by skilful use of the lob; but the question of placing some check on the volley continued to be agitated among lovers of the game. The rapidly growing popularity of lawn-tennis was proved in 1879 by the inauguration at Oxford of the four-handed championship, and at Dublin of the Irish championship, and by the fact that there were forty-five competitors for the All England single championship at Wimbledon, won by J. T. Hartley, a player who chiefly relied on the accuracy of his return without frequent resort to the volley. It was in the autumn of the same year, in a tournament at Cheltenham, that W. Renshaw made his first successful appearance in public. The year 1880 saw the foundation of the Northern Lawn-Tennis Association, whose tournaments have long been regarded as inferior in importance only to the championship meetings at Wimbledon and Dublin, and a revision of the rules which substantially made them what they have ever since remained. This year is also memorable for the first championship doubles won by the twin brothers William and Ernest Renshaw, a success which the former followed up by winning the Irish championship, beating among others H. F. Lawford for the first time.

The Renshaws had already developed the volleying game at the net, and had shown what could be done with the "smash" stroke (which became known by their name as the "Renshaw smash"), but their service had not as yet become very severe. In 1881 the distinctive features of their style were more marked, and the brothers first established firmly the supremacy which they maintained almost without interruption for the next eight years. In the doubles they discarded the older tactics of one partner standing back and the other near the net; the two Renshaws stood about the same level, just inside the service-line, and from there volleyed with relentless severity and with an accuracy never before equalled, and seldom if ever since; while their service also acquired an immense increase of pace. Their chief rival, and the leading exponent of the non-volleying game for several years, was H. F. Lawford. After a year or two it became evident that neither the volleying tactics of Renshaw nor the strong back play of Lawford would be adopted to the exclusion of the other, and both players began to combine the two styles. Thus the permanent features of lawn-tennis may be said to have been firmly established by about the year 1885; and the players who have since then come to the front have for the most part followed the principles laid down by the Renshaws and Lawford. One of the greatest performances at lawn-tennis was in the championship competition in 1886 when W. Renshaw beat Lawford a love set in 9½ minutes. The longest rest in first-class lawn-tennis occurred in a match between Lawford and E. Lubbock in 1880, when eighty-one strokes were played. Among players in the first class who were contemporaries of the Renshaws, mention should be made of E. de S. Browne, a powerful imitator of the Renshaw style; C. W. Grinstead, R. T. Richardson, V. Goold (who played under the *nom de plume* "St Leger"), J. T. Hartley, E. W. Lewis, E. L. Williams, H. Grove and W. J. Hamilton; while among the most prominent lady players of the period were Miss M. Langrishe, Miss Bradley, Miss Maud Watson, Miss L. Dod, Miss Martin and Miss Bingley (afterwards Mrs Hillyard). In 1888 the Lawn-Tennis Association was established; and the All England Mixed Doubles Championship (four-handed matches for ladies and gentlemen in partnership) was added to the existing annual competitions. Since 1881 lawn-tennis matches between Oxford and Cambridge universities have been played annually; and almost every county in England, besides Scotland, Wales and districts such as "Midland Counties," "South of England," &c., have their own championship meetings. Tournaments are also played in winter at Nice, Monte Carlo and other Mediterranean resorts where most of the competitors are English visitors.

The results of the All England championships have been as follows:—

Year.	Gentlemen's Singles.	Year.	Gentlemen's Singles.
1877	S. W. Gore	1894	J. Pim
1878	P. F. Hadow	1895	W. Baddeley
1879	J. T. Hartley	1896	H. S. Mahony
1880	J. T. Hartley	1897	R. F. Doherty
1881	W. Renshaw	1898	R. F. Doherty
1882	W. Renshaw	1899	R. F. Doherty
1883	W. Renshaw	1900	R. F. Doherty
1884	W. Renshaw	1901	A. W. Gore
1885	W. Renshaw	1902	H. L. Doherty
1886	W. Renshaw	1903	H. L. Doherty
1887	H. F. Lawford	1904	H. L. Doherty
1888	E. Renshaw	1905	H. L. Doherty
1889	W. Renshaw	1906	H. L. Doherty
1890	W. J. Hamilton	1907	N. E. Brookes
1891	W. Baddeley	1908	A. W. Gore
1892	W. Baddeley	1909	A. W. Gore
1893	J. Pim	1910	A. F. Wilding

Year.	Gentlemen's Doubles.		
1879	L. R. Erskine	and	H. F. Lawford
1880	W. Renshaw	,,	E. Renshaw
1881	W. Renshaw	,,	E. Renshaw
1882	J. T. Hartley	,,	R. T. Richardson
1883	C. W. Grinstead	,,	C. E. Welldon
1884	W. Renshaw	,,	E. Renshaw
1885	W. Renshaw	,,	E. Renshaw
1886	W. Renshaw	,,	E. Renshaw
1887	P. B. Lyon	,,	H. W. W. Wilberforce
1888	W. Renshaw	,,	E. Renshaw
1889	W. Renshaw	,,	E. Renshaw
1890	J. Pim	,,	F. O. Stoker
1891	W. Baddeley	,,	H. Baddeley
1892	H. S. Barlow	,,	E. W. Lewis
1893	J. Pim	,,	F. O. Stoker
1894	W. Baddeley	,,	H. Baddeley
1895	W. Baddeley	,,	H. Baddeley
1896	W. Baddeley	,,	H. Baddeley
1897	R. F. Doherty	,,	H. L. Doherty
1898	R. F. Doherty	,,	H. L. Doherty
1899	R. F. Doherty	,,	H. L. Doherty
1900	R. F. Doherty	,,	H. L. Doherty
1901	R. F. Doherty	,,	H. L. Doherty
1902	S. H. Smith	,,	F. L. Riseley
1903	R. F. Doherty	,,	H. L. Doherty
1904	R. F. Doherty	,,	H. L. Doherty
1905	R. F. Doherty	,,	H. L. Doherty
1906	S. H. Smith	,,	F. L. Riseley
1907	N. E. Brookes	,,	A. F. Wilding
1908	M. J. G. Ritchie	,,	A. F. Wilding
1909	A. W. Gore	,,	H. Roper Barrett
1910	M. J. G. Ritchie	,,	A. F. Wilding

Year.	Ladies' Singles.	Year.	Ladies' Singles.
1884	Miss M. Watson	1898	Miss C. Cooper
1885	Miss M. Watson	1899	Mrs Hillyard
1886	Miss Bingley	1900	Mrs Hillyard
1887	Miss Dod	1901	Mrs Sterry (Miss C. Cooper)
1888	Miss Dod	1902	Miss M. E. Robb
1889	Mrs Hillyard (Miss Bingley)	1903	Miss D. K. Douglass
1890	Miss Rice	1904	Miss D. K. Douglass
1891	Miss Dod	1905	Miss M. Sutton
1892	Miss Dod	1906	Miss D. K. Douglass
1893	Miss Dod	1907	Miss M. Sutton
1894	Mrs Hillyard	1908	Mrs Sterry
1895	Miss C. Cooper	1909	Miss D. Boothby
1896	Miss C. Cooper	1910	Mrs Lambert Chambers (Miss Douglass)
1897	Mrs Hillyard		

Year.	Ladies' and Gentlemen's Doubles.		
1888	E. Renshaw	and	Mrs Hillyard
1889	J. C. Kay	,,	Miss Dod
1890	J. Baldwin	,,	Miss K. Hill
1891	J. C. Kay	,,	Miss Jackson
1892	A. Dod	,,	Miss Dod
1893	W. Baddeley	,,	Mrs Hillyard
1894	H. S. Mahony	,,	Miss C. Cooper
1895	H. S. Mahony	and	Miss C. Cooper
1896	H. S. Mahony	,,	Miss C. Cooper
1897	H. S. Mahony	,,	Miss C. Cooper
1898	H. S. Mahony	,,	Miss C. Cooper
1899	C. H. L. Cazelet	,,	Miss Robb
1900	H. L. Doherty	,,	Miss C. Cooper
1901	S. H. Smith	,,	Miss Martin
1902	S. H. Smith	,,	Miss Martin
1903	F. L. Riseley	,,	Miss D. K. Douglass
1904	S. H. Smith	,,	Miss E. W. Thompson
1905	S. H. Smith	,,	Miss E. W. Thompson
1906	F. L. Riseley	,,	Miss D. K. Douglass
1907	N. E. Brookes	,,	Mrs Hillyard
1908	A. F. Wilding	,,	Mrs Lambert Chambers (Miss D. K. Douglass)
1909	H. Roper Barrett	,,	Miss Morton
1910	S. N. Doust	,,	Mrs Lambert Chambers

In the United States lawn-tennis was played at Nahant, near Boston, within a year of its invention in England, Dr James Dwight and the brothers F. R. and R. D. Sears being mainly instrumental in making it known to their countrymen. In 1881 at a meeting in New York of representatives of thirty-three clubs the United States National Lawn-Tennis Association was formed; and the adoption of the English rules put an end to the absence of uniformity in the size of the ball and height of the net which had hindered the progress of the game. The association decided to hold matches for championship of the United States at Newport, Rhode Island; and, by a curious coincidence, in the same year in which W. Renshaw first won the English championship, R. D. Sears won the first American championship by playing a volleying game at the net which entirely disconcerted his opponents, and he successfully defended his title for the next six years, winning the doubles throughout the same period in partnership with Dwight. In 1887, Sears being unable to play through ill-health, the championship went to H. W. Slocum. Other prominent players of the period were the brothers C. M. and J. S. Clark, who in 1883 came to England and were decisively beaten at Wimbledon by the two Renshaws. To a later generation belong the strongest single players, M. D. Whitman, Holcombe Ward, W. A. Larned and Karl Behr. Holcombe Ward and Dwight Davis, who have the credit of introducing the peculiar "American twist service," were an exceedingly strong pair in doubles; but after winning the American doubles championship for three years in succession, they were defeated in 1902 by the English brothers R. F. and H. L. Doherty. The championship singles in 1904 and 1905 was won by H. Ward and B. C. Wright, the latter being one of the finest players America has produced; and these two in partnership won the doubles for three years in succession, until they were displaced by F. B. Alexander and H. H. Hackett, who in their turn held the doubles championship for a like period. In 1909 two young Californians, Long and McLoughlin, unexpectedly came to the front, and, although beaten in the final round for the championship doubles, they represented the United States in the contest for the Davis cup (see below) in Australia in that year; McLoughlin having acquired a service of extraordinary power and a smashing stroke with a reverse spin which was sufficient by itself to place him in the highest rank of lawn-tennis players.

Winners of United States Championships.

Year.	Gentlemen's Singles.	Year.	Gentlemen's Singles.
1881	R. D. Sears	1896	R. D. Wrenn
1882	R. D. Sears	1897	R. D. Wrenn
1883	R. D. Sears	1898	M. D. Whitman
1884	R. D. Sears	1899	M. D. Whitman
1885	R. D. Sears	1900	M. D. Whitman
1886	R. D. Sears	1901	W. A. Larned
1887	R. D. Sears	1902	W. A. Larned
1888	H. W. Slocum	1903	H. L. Doherty
1889	H. W. Slocum	1904	H. Ward
1890	O. S. Campbell	1905	B. C. Wright
1891	O. S. Campbell	1906	W. J. Clothier
1892	O. S. Campbell	1907	W. A. Larned
1893	R. D. Wrenn	1908	W. A. Larned
1894	R. D. Wrenn	1909	W. A. Larned
1895	F. H. Hovey	1910	W. A. Larned

Year.	Gentlemen's Doubles.		
1882	J. Dwight	and	R. D. Sears
1883	J. Dwight	„	R. D. Sears
1884	J. Dwight	„	R. D. Sears
1885	J. S. Clark	„	R. D. Sears
1886	J. Dwight	„	R. D. Sears
1887	J. Dwight	„	R. D. Sears
1888	V. G. Hall	„	O. S. Campbell
1889	H. W. Slocum	„	H. A. Taylor
1890	V. G. Hall	„	C. Hobart
1891	O. S. Campbell	„	R. P. Huntingdon
1892	O. S. Campbell	„	R. P. Huntingdon
1893	C. Hobart	„	F. H. Hovey
1894	C. Hobart	„	F. H. Hovey
1895	R. D. Wrenn	„	M. G. Chase
1896	C. B. Neel	„	S. R. Neel
1897	L. E. Ware	„	G. P. Sheldon
1898	L. E. Ware	„	G. P. Sheldon
1899	D. F. Davis	„	H. Ward
1900	D. F. Davis	„	H. Ward
1901	D. F. Davis	„	H. Ward
1902	R. F. Doherty	„	H. L. Doherty
1903	R. F. Doherty	„	H. L. Doherty
1904	H. Ward	„	B. C. Wright
1905	H. Ward	„	B. C. Wright
1906	H. Ward	„	B. C. Wright
1907	F. B. Alexander	„	H. H. Hackett
1908	F. B. Alexander	„	H. H. Hackett
1909	F. B. Alexander	„	H. H Hackett
1910	F. B. Alexander	„	H. H. Hackett

Year.	Ladies' Singles.
1890	Miss E. C. Roosevelt
1891	Miss Mabel E. Cahill
1892	Miss Mabel E. Cahill
1893	Miss Aline M. Terry
1894	Miss Helen R. Helwig
1895	Miss J. P. Atkinson
1896	Miss Elizabeth H. Moore
1897	Miss J. P. Atkinson
1898	Miss J. P. Atkinson
1899	Miss Marion Jones
1900	Miss Myrtle McAteer
1901	Miss Elizabeth H. Moore
1902	Miss Marion Jones
1903	Miss Elizabeth H. Moore
1904	Miss May Sutton
1905	Miss Elizabeth H. Moore
1906	Miss Helen H. Homans
1907	Miss Evelyn Sears
1908	Mrs Barger Wallach
1909	Miss Hazel Hotchkiss
1910	Miss Hazel Hotchkiss

Year.	Ladies' and Gentlemen's Doubles.		
1894	E. P. Fischer	and	Miss J. P. Atkinson
1895	E. P. Fischer	„	Miss J. P. Atkinson
1896	E. P. Fischer	„	Miss J. P. Atkinson
1897	D. L. Magruder	„	Miss Laura Henson
1898	E. P. Fischer	„	Miss Carrie Neely
1899	A. L. Hoskins	„	Miss Edith Rastall
1900	Alfred Codman	„	Miss M. Hunnewell
1901	R. D. Little	„	Miss Marion Jones
1902	W. C. Grant	„	Miss E. H. Moore
1903	Harry Allen	„	Miss Chapman
1904	W. C. Grant	„	Miss E. H. Moore
1905	Clarence Hobart	„	Mrs Clarence Hobart
1906	E. B. Dewhurst	„	Miss Coffin
1907	W. F. Johnson	„	Miss Sayres
1908	N. W. Niles	„	Miss E. Rotch
1909	W. F. Johnson	„	Miss H. Hotchkiss
1910	J. R. Carpenter	„	Miss H. Hotchkiss

In 1900 an international challenge cup was presented by the American D. F. Davis, to be competed for in the country of the holders. In the summer of that year a British team, consisting of A. W. Gore, E. D. Black and H. R. Barrett, challenged for the cup but were defeated by the Americans, Whitman, Larned, Davis and Ward. In 1902 a more representative British team, the two Dohertys and Pim, were again defeated by the same representatives of the United States; but in the following year the Dohertys brought the Davis cup to England by beating Larned and the brothers Wrenn at Longwood. In 1904 the cup was played for at Wimbledon, when representatives of Belgium, Austria and France entered, but failed to defeat the Dohertys and F. L. Riseley, who represented Great Britain. In 1905 the entries included France, Austria, Australasia, Belgium and the United States; in 1906 the same countries, except Belgium, competed; but in both years the British players withstood the attack. In 1907, however, when the contest was confined to England, the United States and Australasia, the latter was successful in winning the cup, which was then for the first time taken to the colonies, where it was retained in the following year when the Australians N. E. Brookes and A. F. Wilding defeated the representatives of the United States, who had previously beaten the English challengers in America. In 1909 England was not represented in the competition, and the Australians again retained the cup, beating the Americans McLoughlin and Long both in singles and doubles.

See "The Badminton Library," *Tennis: Lawn-Tennis: Racquets: Fives*, new and revised edition (1903); R. F. and H. L. Doherty, *On Lawn-Tennis* (1903); E. H. Miles, *Lessons in Lawn-Tennis* (1899); E. de Nanteuil, *La Paume et le lawn-tennis* (1898); J. Dwight, "Form in Lawn-Tennis," in *Scribner's Magazine*, vol. vi.; A. Wallis Myers, *The Complete Lawn-Tennis Player* (1908). (R. J. M.)

LAWRENCE (LAURENTIUS, LORENZO), **ST,** Christian martyr, whose name appears in the canon of the mass, and whose festival is on the 10th of August. The basilica reared over his tomb at Rome is still visited by pilgrims. His legend is very popular. Deacon of the pope (St) Sixtus (Xystus) II., he was called upon by the judge to bring forth the treasures of the church which had been committed to his keeping. He thereupon produced the church's poor people. Seeing his bishop, Sixtus, being led to punishment, he cried: "Father! whither goest thou without thy son? Holy priest! whither goest thou without thy deacon?" Sixtus prophesied that Lawrence would follow him in three days. The prophecy was fulfilled, and Lawrence was sentenced to be burnt alive on a gridiron. In the midst of his torments he addressed the judge ironically with the words: *Assum est, versa et manduca* ("I am roasted enough on this side; turn me round, and eat"). All these details of the well-known legend are already related by St Ambrose (*De Offic.* i. 41, ii. 28). The punishment of the gridiron and the speech of the martyr are probably a reminiscence of the Phrygian martyrs, as related by Socrates (iii. 15) and Sozomen (v. 11). But the fact of the martyrdom is unquestionable. The date is usually put at the persecution of Valerian in 258.

The cult of St Lawrence has spread throughout Christendom, and there are numerous churches dedicated to him, especially in England, where 228 have been counted. The Escurial was built in honour of St Lawrence by Philip II. of Spain, in memory of the battle of St Quentin, which was won in 1557 on the day of the martyr's festival. The meteorites which appear annually on or about the 10th of August are popularly known as "the tears of St Lawrence."

See *Acta sanctorum*, Augusti ii. 485-532; P. Franchi de' Cavalieri, *S. Lorenzo e il supplicio della graticola* (Rome, 1900); *Analecta Bollandiana*, xix. 452 and 453; Fr. Arnold-Forster, *Studies in Church Dedications or England's Patron Saints*, i. 508-515, iii. 18, 389-390 (1899). (H. De.)

LAWRENCE, AMOS (1786–1852), American merchant and philanthropist, was born in Groton, Massachusetts, U.S.A., on the 22nd of April 1786, a descendant of John Lawrence of Wisset, Suffolk, England, who was one of the first settlers of Groton. Leaving Groton academy (founded by his father, Samuel Lawrence, and others) in 1799, he became a clerk in a country store in Groton, whence after his apprenticeship he went, with $20 in his pocket, to Boston and there set up in business for himself in December 1807. In the next year he took into his employ his brother, Abbott (see below), whom he made his partner in 1814, the firm name being at first A. & A. Lawrence, and afterwards A. & A. Lawrence & Co. In 1831 when his health failed, Amos Lawrence retired from active business, and Abbott Lawrence was thereafter the head of the firm. The firm became the greatest American mercantile house of the day, was successful even in the hard times of 1812–1815, afterwards engaged particularly in selling woollen and cotton goods on commission, and did much for the establishment of the cotton textile industry in New England: in 1830 by coming to the aid of the financially distressed mills of Lowell, Massachusetts, where in that year the Suffolk, Tremont and Lawrence companies were established, and where Luther Lawrence, the eldest brother, represented the firm's interests; and in 1845–1847 by establishing and building up Lawrence, Massachusetts, named in honour of Abbott Lawrence, who was a director of the Essex company, which controlled the water power of Lawrence, and afterwards was president of the Atlantic Cotton Mills and Pacific Mills there. In 1842 Amos Lawrence decided not to allow his property to increase any further, and in the last eleven years of his life he spent in charity at least $525,000, a large sum in those days. He gave to Williams college, to Bowdoin college, to the Bangor theological seminary, to Wabash college, to Kenyon college and to Groton academy, which was re-named Lawrence academy in honour of the family, and especially in recognition of the gifts of William Lawrence, Amos's brother; to the Boston children's infirmary, which he established, and ($10,000) to the Bunker Hill monument fund; and, besides, he gave to many good causes on a smaller scale, taking especial delight in giving books, occasionally from a bundle of books in his sleigh or carriage as he drove. He died in Boston on the 31st of December 1852.

See *Extracts from the Diary and Correspondence of the late Amos Lawrence, with a Brief Account of Some Incidents in his Life* (Boston, 1856), edited by his son William R. Lawrence.

His brother, ABBOTT LAWRENCE (1792–1855), was born in Groton, Massachusetts, on the 16th of December 1792. Besides being a partner in the firm established by his brother, and long its head, he promoted various New England railways, notably the Boston & Albany. He was a Whig representative in Congress in 1835–1837 and in 1839–1840 (resigning in September 1840 because of ill-health); and in 1842 was one of the commissioners for Massachusetts, who with commissioners from Maine and with Daniel Webster, secretary of state and plenipotentiary of the United States, settled with Lord Ashburton, the British plenipotentiary, the question of the north-eastern boundary. In 1842 he was presiding officer in the Massachusetts Whig convention; he broke with President Tyler, tacitly rebuked Daniel Webster for remaining in Tyler's cabinet after his colleagues had resigned, and recommended Henry Clay and John Davis as the nominees of the Whig party in 1844—an action that aroused Webster to make his famous Faneuil Hall address. In 1848 Lawrence was a prominent candidate for the Whig nomination for the vice-presidency, but was defeated by Webster's followers. He refused the portfolios of the navy and of the interior in President Taylor's cabinet, and in 1849–1852 was United States minister to Great Britain, where he was greatly aided by his wealth and his generous hospitality. He was an ardent protectionist, and represented Massachusetts at the Harrisburg convention in 1827. He died in Boston on the 18th of August 1855, leaving as his greatest memorial the Lawrence scientific school of Harvard university, which he had established by a gift of $50,000 in 1847 and to which he bequeathed another $50,000; in 1907–1908 this school was practically abolished as a distinct department of the university. He made large gifts to the Boston public library, and he left $50,000 for the erection of model lodging-houses, thus carrying on the work of an Association for building model lodging-houses for the poor, organized in Boston in 1857.

See Hamilton A. Hill, *Memoir of Abbott Lawrence* (Boston, 1884). Randolph Anders' *Der Weg zum Glück, oder die Kunst Millionär zu werden* (Berlin, 1856) is a pretended translation of moral maxims from a supposititious manuscript bequeathed to Abbott Lawrence by a rich uncle.

LAWRENCE, AMOS ADAMS (1814–1886), American philanthropist, son of Amos Lawrence, was born in Groton, Massachusetts, U.S.A., on the 31st of July 1814. He graduated at Harvard in 1835, went into business in Lowell, and in 1837 established in Boston his own counting-house, which from 1843 to 1858 was the firm of Lawrence & Mason, and which was a selling agent for the Cocheco mills of Dover, New Hampshire, and for other textile factories. Lawrence established a hosiery and knitting mill at Ipswich—the first of importance in the country—and was a director in many large corporations. He was greatly interested in the claims of Eleazer Williams of Green Bay, Wisconsin, and through loans to this "lost dauphin" came into possession of much land in Wisconsin; in 1849 he founded at Appleton, Wisconsin, a school named in his honour Lawrence university (now Lawrence college). He also contributed to funds for the colonization of free negroes in Liberia. In 1854 he became treasurer of the Massachusetts Emigrant Aid Company (reorganized in 1855 as the New England Emigrant Aid Company), which sent 1300 settlers to Kansas, where the city of Lawrence was named in his honour. He contributed personally for the famous Sharp rifles, which, packed as "books" and "primers," were shipped to Kansas and afterwards came into the hands of John Brown, who had been a *protégé* of Lawrence. During the contest in Kansas, Lawrence wrote frequently to President Pierce (his mother's nephew) in behalf of the free-state settlers; and when John Brown was arrested he appealed to the governor of Virginia to secure for him a lawful trial. On Robinson and others in Kansas he repeatedly urged the necessity of offering no armed resistance to the Federal government; and he deplored Brown's fanaticism. In 1858 and in 1860 he was the Whig candidate for governor of Massachusetts. Till the very outbreak of the Civil War he was a "law and order" man, and he did his best to secure the adoption of the Crittenden compromise; but he took an active part in drilling troops, and in 1862 he raised a battalion of cavalry which became the 2nd Massachusetts Regiment of Cavalry, of which Charles Russell Lowell was colonel. Lawrence was a member of the Protestant Episcopal Church and built (1873–1880) Lawrence hall, Cambridge, for the Episcopal theological school, of which he was treasurer. In 1857–1862 he was treasurer of Harvard college, and in 1879–1885 was an overseer. He died in Nahant, Mass., on the 22nd of August 1886.

See William Lawrence, *Life of Amos A. Lawrence, with Extracts from his Diary and Correspondence* (Boston, 1888).

His son, WILLIAM LAWRENCE (1850–), graduated in 1871 at Harvard, and in 1875 at the Episcopal theological school, where, after being rector of Grace Church, Lawrence, Mass., in 1876–1884, he was professor of homiletics and natural theology in 1884–1893 and dean in 1888–1893. In 1893 he succeeded Phillips Brooks as Protestant Episcopal bishop of Massachusetts. He wrote *A Life of Roger Wolcott, Governor of Massachusetts* (1902).

LAWRENCE, GEORGE ALFRED (1827–1876), English novelist, was born at Braxted, Essex, on the 25th of March 1827, and was educated at Rugby and at Balliol college, Oxford. He was called to the bar at the Inner Temple in 1852, but soon abandoned the law for literature. In 1857 he published, anonymously, his first novel, *Guy Livingstone, or Thorough*. The book achieved a very large sale, and had nine or ten successors of a similar type, the best perhaps being *Sword and Gown* (1859). Lawrence may be regarded as the originator in English fiction of the *beau sabreur* type of hero, great in sport and love and war. He died at Edinburgh on the 23rd of September 1876.

LAWRENCE, SIR HENRY MONTGOMERY (1806–1857), British soldier and statesman in India, brother of the 1st Lord Lawrence (*q.v.*), was born at Matara, Ceylon, on the 28th of June 1806. He inherited his father's stern devotion to duty and Celtic impulsiveness, tempered by his mother's gentleness and power of organization. Early in 1823 he joined the Bengal Artillery at the Calcutta suburb of Dum Dum, where also Henry Havelock was stationed about the same time. The two officers pursued a very similar career, and developed the same Puritan character up to the time that both died at Lucknow in 1857. In the first Burmese War Henry Lawrence and his battery formed part of the Chittagong column which General Morrison led over the jungle-covered hills of Arakan, till fever decimated the officers and men, and Lawrence found himself at home again, wasted by a disease which never left him. On his return to India with his younger brother John in 1829 he was appointed revenue surveyor by Lord William Bentinck. At Gorakhpur the wonderful personal influence which radiated from the young officer formed a school of attached friends and subordinates who were always eager to serve under him. After some years spent in camp, during which he had married his cousin Honoria Marshall, and had surveyed every village in four districts, each larger than Yorkshire, he was recalled to a brigade by the outbreak of the first Afghan War towards the close of 1838. As assistant to Sir George Clerk, he now added to his knowledge of the people political experience in the management of the district of Ferozepore; and when disaster came he was sent to Peshawar in order to push up supports for the relief of Sale and the garrison of Jalalabad. The war had been begun under the tripartite treaty signed at Lahore on the 20th of June 1838. But the Sikhs were slow to play their part after the calamities in Afghanistan. No one but Henry Lawrence could manage the disorderly contingent which they reluctantly supplied to Pollock's avenging army in 1842. He helped to force the Khyber Pass on the 5th of April, playing his guns from the heights, for 8 and 20 m. In recognition of his services Lord Ellenborough appointed him to the charge of the valley of Dehra Dun and its hill stations, Mussoorie and Landour, where he first formed the idea of asylums for the children of European soldiers. After a month's experience there it was discovered that the appointment was the legal right of the civil service, and he was transferred, as assistant to the envoy at Lahore, to Umballa, where he reduced to order the lapsed territory of Kaithal. Soon he received the office of resident at the protected court of Nepal, where, assisted by his wife, he began a series of contributions to the *Calcutta Review*, a selected volume of which forms an Anglo-Indian classic. There, too, he elaborated his plans which resulted in the erection and endowment of the noblest philanthropic establishments in the East—the Lawrence military asylums at Sanawar (on the road to Simla), at Murree in the Punjab, at Mount Abu in Rajputana, and at Lovedale on the Madras Nilgiris. From 1844 to his death he devoted all his income, above a modest pittance for his children, to this and other forms of charity.

The *Review* articles led the new governor-general, Lord Hardinge, to summon Lawrence to his side during the first Sikh War; and not these articles only. He had published the results of his experience of Sikh rule and soldiering in a vivid work, the *Adventures of an Officer in the Service of Ranjit Singh* (1845), in which he vainly attempted to disguise his own personality and exploits. After the doubtful triumphs of Moodkee and Ferozshah Lawrence was summoned from Nepal to take the place of Major George Broadfoot, who had fallen. Aliwal came; then the guns of Sobraon chased the demoralized Sikhs across the Sutlej. All through the smoke Lawrence was at the side of the governor-general. He gave his voice, not for the rescue of the people from anarchy by annexation, but for the reconstruction of the Sikh government, and was himself appointed resident at Lahore, with power "over every department and to any extent" as president of the council of regency till the maharaja Dhuleep Singh should come of age. Soon disgusted by the "venal and selfish durbar" who formed his Sikh colleagues, he summoned to his side assistants like Nicholson, James Abbott and Edwardes, till they all did too much for the people, as he regretfully confessed. But "my chief confidence was in my brother John, . . . who gave me always such help as only a brother could." Wearied out he went home with Lord Hardinge, and was made K.C.B., when the second Sikh War summoned him back at the end of 1848 to see the whole edifice of Sikh "reconstruction" collapse. It fell to Lord Dalhousie to proclaim the Punjab up to the Khyber British territory on the 29th of March 1849. But still another compromise was tried. As the best man to reconcile the Sikh chiefs to the inevitable, Henry Lawrence was made president of the new board of administration with charge of the political duties, and his brother John was entrusted with the finances. John could not find the revenue necessary for the rapid civilization of the new province so long as Henry would, for political reasons, insist on granting life pensions and alienating large estates to the needy remnants of Ranjit Singh's court. Lord Dalhousie delicately but firmly removed Sir Henry Lawrence to the charge of the great nobles of Rajputana, and installed John as chief commissioner. If resentment burned in Henry's heart, it was not against his younger brother, who would fain have retired. To him he said, "If you preserve the peace of the country and make the people high and low happy, I shall have no regrets that I vacated the field for you."

In the comparative rest of Rajputana he once more took up the pen as an army reformer. In March and September 1856 he published two articles, called forth by conversations with Lord Dalhousie at Calcutta, whither he had gone as the hero of a public banquet. The governor-general had vainly warned the home authorities against reducing below 40,000 the British garrison of India even for the Crimean War, and had sought to improve the position of the sepoys. Lawrence pointed out the latent causes of mutiny, and uttered warnings to be too soon justified. In March 1857 he yielded to Lord Canning's request that he should then take the helm at Lucknow, but it was too late. In ten days his magic rule put down administrative difficulties indeed, as he had done at Lahore. But what could even he effect with only 700 European soldiers, when the epidemic spread after the Meerut outbreak of mutiny on the 10th of May? In one week he had completed those preparations which made the defence of the Lucknow residency for ever memorable. Amid the deepening gloom Lord Canning ever wrote home of him as "a tower of strength," and he was appointed provisional governor-general. On the 30th of May mutiny burst forth in Oudh, and he was ready. On the 29th of June, pressed by fretful colleagues, and wasted by unceasing toil, he led 336 British soldiers with 11 guns and 220 natives out of Chinhat to reconnoitre the insurgents, when the natives joined the enemy and the residency was besieged. On the 2nd of July, as he lay exhausted by the day's work and the terrific heat in an exposed room, a shell struck him, and in forty-eight hours he was no more. A baronetcy was conferred on his son. A marble statue was placed in St Paul's as the national memorial of one who has been declared to be the noblest man that has lived and died for the good of India.

His biography was begun by Sir Herbert Edwardes, and completed (2 vols. 1872) by Herman Merivale. See also J. J. McLeod Innes, *Sir Henry Lawrence* ("Rulers of India" series), 1898.

LAWRENCE, JOHN LAIRD MAIR LAWRENCE, 1st Baron (1811–1879), viceroy and governor-general of India, was born at Richmond, Yorkshire, on the 24th of March 1811. His father, Colonel Alexander Lawrence, volunteered for the forlorn hope at Seringapatam in presence of Baird and of Wellington, whose friend he became. His mother, Letitia Knox, was a collateral descendant of John Knox. To this couple were born twelve children, of whom three became famous in India, Sir George St Patrick, Sir Henry (*q.v.*) and Lord Lawrence. Irish Protestants, the boys were trained at Foyle college, Derry, and at Clifton, and received Indian appointments from their mother's cousin, John Hudleston, who had been the friend of Schwartz in Tanjore. In 1829, when only seventeen, John Lawrence landed at Calcutta as a civilian; he mastered the Persian language at the college of Fort William, and was sent to Delhi, on his own application, as assistant to the collector. The position was the most dangerous and difficult to which a Bengal civilian could be appointed at that time. The titular court of the pensioner who represented the Great Mogul was the centre of that disaffection and sensuality which found their opportunity in 1857. A Mussulman rabble filled the city. The district around, stretching from the desert of Rajputana to the Jumna, was slowly recovering from the anarchy to which Lord Lake had given the first blow. When not administering justice in the city courts or under the village tree, John Lawrence was scouring the country after the marauding Meos and Mahommedan freebooters. His keen insight and sleepless energy at once detected the murderer of his official superior, William Fraser, in 1835, in the person of Shams-uddin Khan, the nawab of Loharu, whose father had been raised to the principality by Lake, and the assassin was executed. The first twenty years, from 1829 to 1849, during which John Lawrence acted as the magistrate and land revenue collector of the most turbulent and backward portion of the Indian empire as it then was, formed the period of the reforms of Lord William Bentinck. To what became the lieutenant-governorship of the North-Western (now part of the United) Provinces Lord Wellesley had promised the same permanent settlement of the land-tax which Lord Cornwallis had made with the large landholders or zemindars of Bengal. The court of directors, going to the opposite extreme, had sanctioned leases for only five years, so that agricultural progress was arrested. In 1833 Merttins Bird and James Thomason introduced the system of thirty years' leases based on a careful survey of every estate by trained civilians, and on the mapping of every village holding by native subordinates. These two revenue officers created a school of enthusiastic economists who rapidly registered and assessed an area as large as that of Great Britain, with a rural population of twenty-three millions. Of that school John Lawrence proved the most ardent and the most renowned. Intermitting his work at Delhi, he became land revenue settlement officer in the district of Etawah, and there began, by buying out or getting rid of the talukdars, to realize the ideal which he did much to create throughout the rest of his career—a country "thickly cultivated by a fat contented yeomanry, each man riding his own horse, sitting under his own fig-tree, and enjoying his rude family comforts." This and a quiet persistent hostility to the oppression of the people by their chiefs formed the two features of his administrative policy throughout life.

It was fortunate for the British power that, when the first Sikh War broke out, John Lawrence was still collector of Delhi. The critical engagements at Ferozeshah, following Moodkee, and hardly redeemed by Aliwal, left the British army somewhat exhausted at the gate of the Punjab, in front of the Sikh entrenchments on the Sutlej. For the first seven weeks of 1846 there poured into camp, day by day, the supplies and munitions of war which this one man raised and pushed forward, with all the influence acquired during fifteen years of an iron yet sympathetic rule in the land between the Jumna and the Sutlej. The crowning victory of Sobraon was the result, and at thirty-five Lawrence became commissioner of the Jullundur Doab, the fertile belt of hill and dale stretching from the Sutlej north to the Indus. The still youthful civilian did for the newly annexed territory what he had long before accomplished in and around Delhi. He restored it to order, without one regular soldier. By the fascination of his personal influence he organized levies of the Sikhs who had just been defeated, led them now against a chief in the upper hills and now to storm the fort of a raja in the lower, till he so welded the people into a loyal mass that he was ready to repeat the service of 1846 when, three years after, the second Sikh War ended in the conversion of the Punjab up to Peshawar into a British province.

Lord Dalhousie had to devise a government for a warlike population now numbering twenty-three millions, and covering an area little less than that of the United Kingdom. The first results were not hopeful; and it was not till John Lawrence became chief commissioner, and stood alone face to face with the chiefs and people and ring fence of still untamed border tribes, that there became possible the most successful experiment in the art of civilizing turbulent millions which history presents. The province was mapped out into districts, now numbering thirty-two, in addition to thirty-six tributary states, small and great. To each the thirty years' leases of the north-west settlement were applied, after a patient survey and assessment by skilled officials ever in the saddle or the tent. The revenue was raised on principles so fair to the peasantry that Ranjit Singh's exactions were reduced by a fourth, while agricultural improvements were encouraged. For the first time in its history since the earliest Aryan settlers had been overwhelmed by successive waves of invaders, the soil of the Punjab came to have a marketable value, which every year of British rule has increased. A stalwart police was organized; roads were cut through every district, and canals were constructed. Commerce followed on increasing cultivation and communications, courts brought justice to every man's door, and crime hid its head. The adventurous and warlike spirits, Sikh and Mahommedan, found a career in the new force of irregulars directed by the chief commissioner himself, while the Afghan, Dost Mahommed, kept within his own fastnesses, and the long extent of frontier at the foot of the passes was patrolled.

Seven years of such work prepared the lately hostile and always anarchic Punjab under such a pilot as John Lawrence not only to weather the storm of 1857 but to lead the older provinces into port. On the 12th of May the news of the tragedies at Meerut and Delhi reached him at Rawalpindi. The position was critical in the last degree, for of 50,000 native soldiers 38,000 were Hindustanis of the very class that had mutinied elsewhere, and the British troops were few and scattered. For five days the fate of the Punjab hung upon a thread, for the question was, "Could the 12,000 Punjabis be trusted and the 38,000 Hindustanis be disarmed?" Not an hour was lost in beginning the disarming at Lahore; and, as one by one the Hindustani corps succumbed to the epidemic of mutiny, the sepoys were deported or disappeared, or swelled the military rabble in and around the city of Delhi. The remembrance of the ten years' war which had closed only in 1849, a bountiful harvest, the old love of battle, the offer of good pay, but, above all, the personality of Lawrence and his officers, raised the Punjabi force into a new army of 59,000 men, and induced the non-combatant classes to subscribe to a 6% loan. Delhi was invested, but for three months the rebel city did not fall. Under John Nicholson, Lawrence sent on still more men to the siege, till every available European and faithful native soldier was there, while a movable column swept the country, and the border was kept by an improvised militia. At length, when even in the Punjab confidence became doubt, and doubt distrust, and that was passing into disaffection, John Lawrence was ready to consider whether we should not give up the Peshawar valley to the Afghans as a last resource, and send its garrison to recruit the force around Delhi. Another week and that alternative must have been faced. But on the 20th of September the city and palace of Delhi were again in British hands, and the chief commissioner and his officers united in ascribing "to the Lord our God all the praise due for nerving the hearts of our statesmen and the arms of our soldiers." As Sir John Lawrence, Bart., G.C.B., with the thanks of parliament, the gratitude of his country, and a life pension of £2000 a year in addition to his ordinary pension of £1000, the "saviour of India" returned home in 1859. After guarding the interests of India and its people as a member of the secretary of state's council, he was sent out again in 1864 as viceroy and governor-general on the death of Lord Elgin. If no great crisis enabled Lawrence to increase his reputation, his five years' administration of the whole Indian empire was worthy of the ruler of the Punjab. His foreign policy has become a subject of imperial interest, his name being associated with the "close border" as opposed to the "forward" policy; while his internal administration was remarkable for financial prudence, a jealous regard for the good of the masses of the people and of the British soldiers, and a generous interest in education, especially in its Christian aspects.

When in 1854 Dost Mahommed, weakened by the antagonism of his brothers in Kandahar, and by the interference of Persia, sent his son to Peshawar to make a treaty, Sir John Lawrence was opposed to any entangling relation with the Afghans after the experience of 1838–1842, but he obeyed Lord Dalhousie so far as to sign a treaty of perpetual peace and friendship. His ruling idea, the fruit of long and sad experience, was that *de facto* powers only should be recognized beyond the frontier. When in 1863 Dost Mahommed's death let loose the factions of Afghanistan he acted on this policy to such an extent that he recognized both the sons, Afzul Khan and Shere Ali, at different times, and the latter fully only when he had made himself master of all his father's kingdom. The steady advance of Russia from the north, notwithstanding the Gortchakov circular of 1864, led to severe criticism of this cautious "buffer" policy which he justified under the term of "masterly inactivity." But he was ready to receive Shere Ali in conference, and to aid him in consolidating his power after it had been established and maintained for a time, when his term of office came to an end and it fell to Lord Mayo, his successor, to hold the Umballa conference in 1869. When, nine years after, the second Afghan War was precipitated, the retired viceroy gave the last days of his life to an unsparing exposure, in the House of Lords and in the press, of a policy which he had striven to prevent in its inception, and which he did not cease to denounce in its course and consequences.

On his final return to England early in 1869, after forty years' service in and for India, "the great proconsul of our English Christian empire" was created Baron Lawrence of the Punjab, and of Grately, Hants. He assumed the same arms and crest as those of his brother Henry, with a Pathan and a Sikh trooper as supporters, and took as his motto "Be ready," his brother's being "Never give in." For ten years he gave himself to the work of the London school board, of which he was the first chairman, and of the Church missionary society. Towards the end his eyesight failed, and on the 27th of June 1879 he died at the age of sixty-eight. He was buried in the nave of Westminster Abbey, beside Clyde, Outram and Livingstone. He had married the daughter of the Rev. Richard Hamilton, Harriette-Katherine, who survived him, and he was succeeded as 2nd baron by his eldest son, John Hamilton Lawrence (b. 1846).

See Bosworth Smith, *Life of Lord Lawrence* (1885); Sir Charles Aitchison, *Lord Lawrence* ("Rulers of India" series, 1892); L. J. Trotter, *Lord Lawrence* (1880); and F. M. Holmes, *Four Heroes of India*.

LAWRENCE, STRINGER (1697–1775), English soldier, was born at Hereford on the 6th of March 1697. He seems to have entered the army in 1727 and served in Gibraltar and Flanders, subsequently taking part in the battle of Culloden. In 1748, with the rank of major and the reputation of an experienced soldier, he went out to India to command the East India Company's troops. Dupleix's schemes for the French conquest of southern India were on the point of taking effect, and not long after his arrival at Fort St David, Stringer Lawrence was actively engaged. He successfully foiled an attempted French surprise at Cuddalore, but subsequently was captured by a French cavalry patrol at Ariancopang near Pondicherry and kept prisoner till the peace of Aix-la-Chapelle. In 1749 he was in command at the capture of Devicota. On this occasion Clive served under him and a life-long friendship began. On one occasion, when Clive had become famous, he honoured the creator of the Indian army by refusing to accept a sword of honour unless one was voted to Lawrence also. In 1750 Lawrence returned to England, but in 1752 he was back in India. Here he found Clive in command of a force intended for the relief of Trichinopoly. As senior officer Lawrence took over the command, but was careful to allow Clive every credit for his share in the subsequent operations, which included the relief of Trichinopoly and the surrender of the entire French besieging force. In 1752 with an inferior force he defeated the French at Bahur (Behoor) and in 1753 again relieved Trichinopoly. For the next seventeen months he fought a series of actions in defence of this place, finally arranging a three months' armistice, which was afterwards converted into a conditional treaty. He had commanded in chief up to the arrival of the first detachment of regular forces of the crown. In 1757 he served in the operations against Wandiwash, and in 1758–1759 was in command of Fort St George during the siege by the French under Lally. In 1759 failing health compelled him to return to England. He resumed his command in 1761 as major-general and commander-in-chief. Clive supplemented his old friend's inconsiderable income by settling on him an annuity of £500 a year. In 1765 he presided over the board charged with arranging the reorganization of the Madras army, and he finally retired the following year. He died in London on the 10th of January 1775. The East India Company erected a monument to his memory in Westminster Abbey.

See Biddulph, *Stringer Lawrence* (1901).

LAWRENCE, SIR THOMAS (1769–1830), English painter, was born at Bristol on the 4th of May 1769. His father was an innkeeper, first at Bristol and afterwards at Devizes, and at the age of six Thomas was already shown off to the guests of the Black Boar as an infant prodigy who could sketch their likenesses and declaim speeches from Milton. In 1779 the elder Lawrence had to leave Devizes, having failed in business, and the precocious talent of the son, who had gained a sort of reputation along the Bath road, became the support of the family. His debut as a crayon portrait painter was made at Oxford, where he was well patronized, and in 1782 the family settled in Bath, where the young artist soon found himself fully employed in taking crayon likenesses of the fashionables of the place at a guinea or a guinea and a half a head. In 1784 he gained the prize and silver-gilt palette of the Society of Arts for a crayon drawing after Raphael's "Transfiguration," and presently beginning to paint in oil. Throwing aside the idea of going on the stage which he had for a short time entertained, he came to London in 1787, was kindly received by Reynolds, and entered as a student at the Royal Academy. He began to exhibit almost immediately, and his reputation increased so rapidly that he became an associate of the Academy in 1791. The death of Sir Joshua in 1792 opened the way to further successes. He was at once appointed painter to the Dilettanti society, and principal painter to the king in room of Reynolds. In 1794 he was a Royal Academician, and he became the fashionable portrait painter of the age, having as his sitters all the rank, fashion and talent of England, and ultimately most of the crowned heads of Europe. In 1815 he was knighted; in 1818 he went to Aix-la-Chapelle to paint the sovereigns and diplomatists gathered there, and visited Vienna and Rome, everywhere receiving flattering marks of distinction from princes, due as much to his courtly manners as to his merits as an artist. After eighteen months he returned to England, and on the very day of his arrival was chosen president of the Academy in room of West, who had died a few days before. This office he held from 1820 to his death on the 7th of January 1830. He was never married.

Sir Thomas Lawrence had all the qualities of personal manner and artistic style necessary to make a fashionable painter, and among English portrait painters he takes a high place, though not as high as that given to him in his lifetime. His more ambitious works, in the classical style, such as his once celebrated "Satan," are practically forgotten.

The best display of Lawrence's work is in the Waterloo Gallery of Windsor, a collection of much historical interest. "Master Lambton," painted for Lord Durham at the price of 600 guineas, is regarded as one of his best portraits, and a fine head in the National Gallery, London, shows his power to advantage. The *Life and Correspondence of Sir T. Lawrence*, by D. E. Williams, appeared in 1831.

LAWRENCE, a city and the county-seat of Douglas county, Kansas, U.S.A., situated on both banks of the Kansas river, about 40 m. W. of Kansas City. Pop. (1890) 9997, (1900) 10,862, of whom 2032 were negroes, (1910 census) 12,374. It is served by the Atchison, Topeka & Santa Fe and the Union Pacific railways, both having tributary lines extending N. and S. Lawrence is surrounded by a good farming region, and is itself a thriving educational and commercial centre. Its site slopes up from the plateau that borders the river to the heights above, from which there is a view of rare beauty. Among the city's principal public buildings are the court house and the Y.M.C.A. building. The university of Kansas, situated on Mount Oread, overlooking the city, was first opened in 1866, and in 1907–1908 had a faculty of 105 and 2063 students, including 702 women (see Kansas). Just S. of the city of Lawrence is Haskell institute (1884), one of the largest Indian schools in the country, maintained for children of the tribal Indians by the national government. In 1907 the school had 813 students, of whom 313 were girls; it has an academic department, a business school and courses in domestic science, in farming, dairying and gardening, and in masonry, carpentry, painting, blacksmithing, waggon-making, shoemaking, steam-fitting, printing and other trades. Among the city's manufactures are flour and grist mill products, pianos and cement plaster. Lawrence, named in honour of Amos A. Lawrence, was founded by agents of the Massachusetts Emigrant Aid Company in July 1854, and during the Territorial period was the political centre of the free-state cause and the principal point against which the assaults of the pro-slavery party were directed. It was first known as Wakarusa, from the creek by which it lies. A town association was organized in September 1854 before any Territorial government had been established. In the next month some pro-slavery men presented claims to a part of the land, projected a rival town to be called Excelsior on the same site, and threatened violence; but when Lawrence had organized its "regulators" the pro-slavery men retired and later agreed to a compromise by which the town site was limited to 640 acres. In December 1855 occurred the "Wakarusa war." A free-state man having been murdered for his opinions, a friend who threatened retaliation was arrested by the pro-slavery sheriff, S. J. Jones; he was rescued and taken to Lawrence; the city disclaimed complicity, but Jones persuaded Governor Wilson Shannon that there was rebellion, and Shannon authorized a posse; Missouri responded, and a pro-slavery force marched on Lawrence. The governor found that Lawrence had not resisted and would not resist the service of writs; by a written "agreement" with the free-state leaders he therefore withdrew his sanction from the Missourians and averted battle. The retreating Missourians committed some homicides. It was during this "war" that John Brown first took up arms with the free-state men. Preparations for another attack continued, particularly after Sheriff Jones, while serving writs in Lawrence, was wounded. On the 21st of May 1856, at the head of several hundred Missourians, he occupied the city without resistance, destroyed its printing offices and the free-state headquarters and pillaged private houses. In 1855 and again in 1857 the pro-slavery Territorial legislature passed an Act giving Lawrence a charter, but the people of Lawrence would not recognize that "bogus" government, and on the 13th of July 1857, after an application to the Topeka free-state legislature for a charter had been denied, adopted a city charter of their own. Governor Walker proclaimed this rebellion against the United States, appeared before the town in command of 400 United States dragoons and declared it under martial law; as perfect order prevailed, and there was no overt resistance to Territorial law, the troops were withdrawn after a few weeks by order of President Buchanan, and in February 1858 the legislature passed an Act legalizing the city charter of July 1857. On the 21st of August 1863 William C. Quantrell and some 400 mounted Missouri bushrangers surprised the sleeping town and murdered 150 citizens. The city's arms were in storage and no resistance was possible. This was the most distressing episode in all the turbulence of territorial days and border warfare in Kansas. A monument erected in 1895 commemorates the dead. After the free-state men gained control of the Territorial legislature in 1857 the legislature regularly adjourned from Lecompton, the legal capital, to Lawrence, which was practically the capital until the choice of Topeka under the Wyandotte constitution. The first railway to reach Lawrence was the Union Pacific in 1864.

See F. W. Blackmar, "The Annals of an Historic Town," in the *Annual Report* of the American Historical Association for 1893 (Washington, 1894).

LAWRENCE, a city, and one of the three county-seats (Salem and Newburyport are the others) of Essex county, Massachusetts, U.S.A., on both sides of the Merrimac river, about 30 m. from its mouth and about 26 m. N.N.W. of Boston. Pop. (1890) 44,654, (1900) 62,559, of whom 28,577 were foreign-born (7058 being Irish, 6999 French Canadians, 5131 English, 2465 German, 1683 English Canadian), and (1910 census) 85,892. It is served by the Boston & Maine railroad and by electric railways to Andover, Boston, Lowell, Haverhill and Salem, Massachusetts, and to Nashua and Salem, New Hampshire. The city's area of 6·54 sq. m. is about equally divided by the Merrimac, which is here crossed by a great stone dam 900 ft. long, and, with a fall of 28 ft., supplies about 12,000 horsepower. Water from the river is carried to factories by a canal on each side of the river and parallel to it; the first canal was built on the north side in 1845–1847 and is 1 m. long; the canal on the south side is about ¾ m. long, and was built several years later. There are large and well-kept public parks, a common (17 acres) with a soldiers' monument, a free public library, with more than 50,000 volumes in 1907, a city hall, county and municipal court-houses, a county gaol and house of correction, a county industrial school and a state armoury.

The value of the city's factory product was $48,036,593 in 1905, $41,741,980 in 1900. The manufacture of textiles is the most important industry; in 1905 the city produced worsteds valued at $30,926,964 and cotton goods worth $5,745,611, the worsted product being greater than that of any other American city. The Wood worsted mill here is said to be the largest single mill in the world. The history of Lawrence is largely the history of its textile mills. The town was formed in 1845 from parts of Andover (S. of the Merrimac) and of Methuen (N. of the river), and it was incorporated as a town in 1847, being named in honour of Abbott Lawrence, a director of the Essex company, organized in 1845 (on the same day as the formation of the town) for the control of the water power and for the construction of the great dam across the Merrimac. The Bay State woollen mills, which in 1858 became the Washington mills, and the Atlantic cotton mills were both chartered in 1846. The Pacific mills (1853) introduced from England in 1854 Lister combs for worsted manufacture; and the Washington mills soon afterward began to make worsted dress goods. Worsted cloths for men's wear seem to have been made first about 1870 at nearly the same time in the Washington mills here, in the Hockanum mills of Rockville, Connecticut, and in Wanskuck mills, Providence, Rhode Island. The Pemberton mills, built in 1853, collapsed and afterwards took fire on the 10th of January 1860; 90 were killed and hundreds severely injured. Lawrence was chartered as a city in 1853, and annexed a small part of Methuen in 1854 and parts of Andover and North Andover in 1879.

See H. A. Wadsworth, *History of Lawrence, Massachusetts* (Lawrence, 1880).

LAWRENCEBURG, a city and the county-seat of Dearborn county, Indiana, U.S.A., on the Ohio river, in the S.E. part of the state, 22 m. (by rail) W. of Cincinnati. Pop. (1890) 4284, (1900) 4326 (413 foreign-born); (1910) 3930. Lawrenceburg is served by the Baltimore & Ohio South-Western and the Cleveland, Cincinnati, Chicago & St Louis railways, by the Cincinnati, Lawrenceburg & Aurora electric street railroad, and by river packets to Louisville and Cincinnati. The city lies along the river and on higher land rising 100 ft. above river-level. It formerly had an important river trade with New Orleans, beginning about 1820 and growing in volume after the city became the terminus of the Whitewater canal, begun in 1836. The place was laid out in 1802. In 1846 an "old" and a "new" settlement were united, and Lawrenceburg was chartered as a city. Lawrenceburg was the birthplace of James B. Eads, the famous engineer, and of John Coit Spooner (b. 1843), a prominent Republican member of the United States Senate from Wisconsin in 1885–1891 and in 1897–1907; and the Presbyterian Church of Lawrenceburg was the first charge (1837–1839) of Henry Ward Beecher.

LAWSON, CECIL GORDON (1851–1882), English landscape painter, was the youngest son of William Lawson of Edinburgh, esteemed as a portrait painter. His mother also was known for her flower pieces. He was born near Shrewsbury on the 3rd of December 1851. Two of his brothers (one of them, Malcolm, a clever musician and song-writer) were trained as artists, and Cecil was from childhood devoted to art with the intensity of a serious nature. Soon after his birth the Lawsons moved to London. Lawson's first works were studies of fruit, flowers, &c., in the manner of W. Hunt; followed by riverside Chelsea subjects. His first exhibit at the Royal Academy (1870) was "Cheyne Walk," and in 1871 he sent two other Chelsea subjects. These gained full recognition from fellow-artists, if not from the public. Among his friends were now numbered Fred Walker, G. J. Pinwell and their associates. Following them, he made a certain number of drawings for wood-engraving. Lawson's Chelsea pictures had been painted in somewhat low and sombre tones; in the "Hymn to Spring" of 1872 (rejected by the Academy) he turned to a more joyous play of colour, helped by work in more romantic scenes in North Wales and Ireland. Early in 1874 he made a short tour in Holland, Belgium and Paris; and in the summer he painted his large "Hop Gardens of England." This was much praised at the Academy of 1876. But Lawson's triumph was with the great luxuriant canvas "The Minister's Garden," exhibited in 1878 at the Grosvenor Gallery, and now in the Manchester Art Gallery. This was followed by several works conceived in a new and tragic mood. His health began to fail, but he worked on. He married in 1879 the daughter of Birnie Philip, and settled at Haslemere. His later subjects are from this neighbourhood (the most famous being "The August Moon," now in the National Gallery of British Art) or from Yorkshire. Towards the end of 1881 he went to the Riviera, returned in the spring, and died at Haslemere on the 10th of June 1882. Lawson may be said to have restored to English landscape the tradition of Gainsborough, Crome and Constable, infused with an imaginative intensity of his own. Among English landscape painters of the latter part of the 19th century his is in many respects the most interesting name.

See E. W. Gosse, *Cecil Lawson, a Memoir* (1883); Heseltine Owen, "In Memoriam: Cecil Gordon Lawson," *Magazine of Art* (1894). (L. B.)

LAWSON, SIR JOHN (d. 1665), British sailor, was born at Scarborough. Joining the parliamentary navy in 1642, he accompanied Penn to the Mediterranean in 1650, where he served for some time. In 1652 he served under Blake in the Dutch War and was present at the first action in the Downs and the battle of the Kentish Knock. At Portland, early in 1653, he was vice-admiral of the red, and his ship was severely handled. Lawson took part in the battles of June and July in the following summer. In 1654–1655 he commanded in the North Sea and the Channel. Appointed in January 1655–1656 as Blake's second-in-command, Lawson was a few weeks later summarily dismissed from his command, probably for political reasons. He was a Republican and Anabaptist, and therefore an enemy to Cromwell. It is not improbable that like Penn and others he was detected in correspondence with the exiled Charles II., who certainly hoped for his support. In 1657, along with Harrison and others, he was arrested and, for a short time, imprisoned for conspiring against Cromwell. Afterwards he lived at Scarborough until the fall of Richard Cromwell's government. During the troubled months which succeeded that event Lawson, flying his flag as admiral of the Channel fleet, played a marked political rôle. His ships escorted Charles to England, and he was soon afterwards knighted. Sent out in 1661 with Montagu, earl of Sandwich, to the Mediterranean, Lawson conducted a series of campaigns against the piratical states of the Algerian coast. Thence summoned to a command in the Dutch War, he was mortally wounded at Lowestoft. He died on the 29th of June 1665.

See Charnock, *Biographia navalis*, i. 20; Campbell, *Lives of the Admirals*, ii. 251; Penn, *Life of Sir William Penn*; Pepys, *Diary*.

LAWSON, SIR WILFRID, Bart. (1829–1906), English politician and temperance leader, son of the 1st baronet (d. 1867), was born on the 4th of September 1829. He was always an enthusiast in the cause of total abstinence, and in parliament, to which he was first elected in 1859 for Carlisle, he became its leading spokesman. In 1864 he first introduced his Permissive Bill, giving to a two-thirds majority in any district a veto upon the granting of licences for the sale of intoxicating liquors; and though this principle failed to be embodied in any act, he had the satisfaction of seeing a resolution on its lines accepted by a majority in the House of Commons in 1880, 1881 and 1883. He lost his seat for Carlisle in 1865, but in 1868 was again returned as a supporter of Mr Gladstone, and was member till 1885; though defeated for the new Cockermouth division of Cumberland in 1885, he won that seat in 1886, and he held it till the election of 1900, when his violent opposition to the Boer War caused his defeat, but in 1903 he was returned for the Camborne division of Cornwall and at the general election of 1906 was once more elected for his old constituency in Cumberland. During all these years he was the champion of the United Kingdom Alliance (founded 1853), of which he became president. An extreme Radical, he also supported disestablishment, abolition of the House of Lords, and disarmament. Though violent in the expression of his opinions, Sir Wilfrid Lawson remained very popular for his own sake both in and out of the House of Commons; he became well known for his humorous vein, his faculty for composing topical doggerel being often exercised on questions of the day. He died on the 1st of July 1906.

LAY, a word of several meanings. Apart from obsolete and dialectical usages, such as the East Anglian word meaning "pond," possibly cognate with Lat. *lacus*, pool or lake, or its use in weaving for the batten of a loom, where it is a variant form of "lath," the chief uses are as follows: (1) A song or, more accurately, a short poem, lyrical or narrative, which could be sung or accompanied by music; such were the romances sung by minstrels. Such an expression as the "Lay of the Nibelungen" is due to mistaken association of the word with Ger. *Lied*, song, which appears in Anglo-Saxon as *léoð*. "Lay" comes from O. Fr. *lai*, of which the derivation is doubtful. The *New English Dictionary* rejects Celtic origins sometimes put forward, such as Ir. *laoidh*, Welsh *llais*, and takes O. Mid. and High Ger. *leich* as the probable source. (2) "Non-clerical" or "unlearned." In this sense "lay" comes directly from Fr. *lai* (*laïque*, the learned form nearer to the Latin, is now used) from Lat. *laicus*, Gr. λαϊκός, of or belonging to the people (λαός, Attic λεώς). The word is now specially applied to persons who are not in orders, and more widely to those who do not belong to other learned professions, particularly the law and medicine. The *New English Dictionary* quotes two examples from versions of the Bible. In the Douai version of 1 Sam. xxi. 4, Ahimelech tells David that he has "no lay bread at hand but only holy bread"; here the Authorized Version has "common bread," the Vulgate *laicos panes*. In Coverdale's version of Acts iv. 13, the high priest and his kindred marvel at Peter and John as being "unlearned and lay people"; the Authorized Version has "unlearned and ignorant men." In a cathedral of the Church of England "lay clerks" and "lay vicars" sing such portions of the service as may be performed by laymen and clergy in minor orders. "Lay readers" are persons who are granted a commission by the bishop to perform certain religious duties in a particular parish. The commission remains in force until it is revoked by the bishop or his successors, or till there is a new incumbent in the parish, when it has to be renewed. In a religious order a "lay brother" is freed from duties at religious services performed by the other members, and from their studies, but is bound by vows of obedience and chastity and serves the order by manual labour. For "lay impropriator" see Appropriation, and for "lay rector" see Rector and Tithes; see further Laymen, Houses of. (3) "Lay" as a verb means "to make to lie down," "to place upon the ground," &c. The past tense is "laid"; it is vulgarly confused with the verb "to lie," of which the past is "lay." The common root of both "lie" and "lay" is represented by O. Teut. *leg*; cf. Dutch *leggen*, Ger. *legen*, and Eng. "ledge."[1] (4) "Lay-figure" is the name commonly given to articulated figures of human beings or animals, made of wood, papier-maché or other materials; draped and posed, such figures serve as models for artists (see Models, Artists). The word has no connexion with "to lay," to place in position, but is an adaptation of the word "layman," commonly used with this meaning in the 18th century. This was adapted from Dutch *leeman* (the older form is *ledenman*) and meant an "articulated or jointed man" from *led*, now *lid*, a joint; cf. Ger. *Gliedermann*.

LAYA, JEAN LOUIS (1761–1833), French dramatist, was born in Paris on the 4th of December 1761 and died in August 1833. He wrote his first comedy in collaboration with Gabriel M. J. B. Legouvé in 1785, but the piece, though accepted by the Comédie Française, was never represented. In 1789 he produced a plea for religious toleration in the form of a five-act tragedy in verse, *Jean Calas*; the injustice of the disgrace cast on a family by the crime of one of its members formed the theme of *Les Dangers de l'opinion* (1790); but it is by his *Ami des lois* (1793) that Laya is remembered. This energetic protest against mob-rule, with its scarcely veiled characterizations of Robespierre as Nomophage and of Marat as Duricrâne, was an act of the highest courage, for the play was produced at the Théâtre Français (temporarily Théâtre de la Nation) only nineteen days before the execution of Louis XVI. Ten days after its first production the piece was prohibited by the commune, but the public demanded its representation; the mayor of Paris was compelled to appeal to the convention, and the piece was played while some 30,000 Parisians guarded the hall. Laya went into hiding, and several persons convicted of having a copy of the obnoxious play in their possession were guillotined. At the end of the Terror Laya returned to Paris. In 1813 he replaced Delille in the Paris chair of literary history and French poetry; he was admitted to the Academy in 1817. Laya produced in 1797 *Les Deux Stuarts*, and in 1799 *Falkland*, the title-rôle of which provided Talma with one of his finest opportunities. Laya's works, which chiefly owe their interest to the circumstances attending their production, were collected in 1836–1837.

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[1] The verb "to lie," to speak falsely, to tell a falsehood, is in O. Eng. *léogan*; it appears in most Teutonic languages, *e.g.* Dutch *lugen*, Ger. *lügen*.

See *Notice biographique sur J. L. Laya* (1833); Ch. Nodier, *Discours de réception*, 26th December 1833); Welschinger, *Théâtre de la révolution* (1880).

LAYAMON, early English poet, was the author of a chronicle of Britain entitled *Brut*, a paraphrase of the *Brut d'Angleterre* by Wace, a native of Jersey, who is also known as the author of the *Roman de Rou*. The excellent edition of Layamon by Sir F. Madden (Society of Antiquaries, London, 1847) should be consulted. All that is known concerning Layamon is derived from two extant MSS., which present texts that often vary considerably, and it is necessary to understand their comparative value before any conclusions can be drawn. The older text (here called the A-text) lies very near the original text, which is unfortunately lost, though it now and then omits lines which are absolutely necessary to the sense. The later text (here called the B-text) represents a later recension of the original version by another writer who frequently omits couplets, and alters the language by the substitution of better-known words for such as seemed to be obsolescent; *e.g. harme* (harm) in place of *balewe* (bale), and *dead* in place of *feie* (fated to die, or dead). Hence little reliance can be placed on the B-text, its chief merit being that it sometimes preserves couplets which seem to have been accidentally omitted in A; besides which, it affords a valuable commentary on the original version.

We learn from the brief prologue that Layamon was a priest among the people, and was the son of Leovenath (a late spelling of A.-S. Leofnoth); also, that he lived at Ernley, at a noble church on Severn bank, close by Radstone. This is certainly Areley Regis, or Areley Kings, close by Redstone rock and ferry, 1 m. to the S. of Stourport in Worcestershire. The B-text turns Layamon into the later form Laweman, *i.e.* Law-man, correctly answering to Chaucer's "Man of Lawe," though here apparently used as a mere name. It also turns Leovenath into Leuca, *i.e.* Leofeca, a diminutive of Leofa, which is itself a pet-name for Leofnoth; so that there is no real contradiction. But it absurdly substitutes "with the good knight," which is practically meaningless, for "at a noble church."

We know no more about Layamon except that he was a great lover of books; and that he procured three books in particular which he prized above others, "turning over the leaves, and beholding them lovingly." These were: the English book that St Beda made; another in Latin that St Albin and St Austin made; whilst the third was made by a French clerk named Wace, who (in 1155) gave a copy to the noble Eleanor, who was queen of the high king Henry (*i.e.* Henry II.).

The first of these really means the Anglo-Saxon translation of Beda's *Ecclesiastical History*, which begins with the words: "Ic Beda, Cristes theow," *i.e.* "I, Beda, Christ's servant." The second is a strange description of the original of the translation, *i.e.* Albinus Beda's own Latin book, the second paragraph of which begins with the words: "Auctor ante omnes atque adiutor opusculi huius Albinus Abba reverentissimus vir per omnia doctissimus extitit"; which Layamon evidently misunderstood. As to the share of St Augustine in this work, see Book I., chapters 23-34, and Book II., chapters 1 and 2, which are practically all concerned with him and occupy more than a tenth of the whole work. The third book was Wace's poem, *Brut d'Angleterre*. But we find that although Layamon had ready access to all three of these works, he soon settled down to the translation of the third, without troubling much about the others. His chief obligation to Beda is for the well-known story about Pope Gregory and the English captives at Rome; see Layamon, vol. iii. 180.

It is impossible to enter here upon a discussion of the numerous points of interest which a proper examination of this vast and important work would present to any careful inquirer. Only a few bare results can be here enumerated. The A-text may be dated about 1205, and the B-text (practically by another writer) about 1275. Both texts, the former especially, are remarkably free from admixture with words of French origin; the lists that have been given hitherto are inexact, but it may be said that the number of French words in the A-text can hardly exceed 100, or in the B-text 160. Layamon's work is largely original; Wace's *Brut* contains 15,300 lines, and Layamon's 32,240 lines of a similar length; and many of Layamon's additions to Wace are notable, such as his story "regarding the fairy elves at Arthur's birth, and his transportation by them after death in a boat to Avalon, the abode of Argante, their queen"; see Sir F. Madden's pref. p. xv. Wace's *Brut* is almost wholly a translation of the Latin chronicle concerning the early history of Britain by Geoffrey of Monmouth, who said that he obtained his materials from a manuscript written in Welsh. The name Brut is the French form of Brutus, who was the fabulous grandson of Ascanius, and great-grandson of Aeneas of Troy, the hero of Virgil's *Aeneid*. After many adventures, this Brutus arrived in England, founded Troynovant or New Troy (better known as London), and was the progenitor of a long line of British kings, among whom were Locrine, Bladud, Leir, Gorboduc, Ferrex and Porrex, Lud, Cymbeline, Constantine, Vortigern, Uther and Arthur; and from this mythical Brutus the name Brut was transferred so as to denote the entire chronicle of this British history. Layamon gives the whole story, from the time of Brutus to that of Cadwalader, who may be identified with the Caedwalla of the *Anglo-Saxon Chronicle*, baptized by Pope Sergius in the year 688. Both texts of Layamon are in a south-western dialect; the A-text in particular shows the Wessex dialect of earlier times (commonly called Anglo-Saxon) in a much later form, and we can hardly doubt that the author, as he intimates, could read the old version of Beda intelligently. The remarks upon the B-text in Sir F. Madden's preface are not to the point; the peculiar spellings to which he refers (such as *same* for *shame*) are by no means due to any confusion with the Northumbrian dialect, but rather to the usual vagaries of a scribe who knew French better than English, and had some difficulty in acquiring the English pronunciation and in representing it accurately. At the same time, he was not strong in English grammar, and was apt to confuse the plural form with the singular in the tenses of verbs; and this is the simple explanation of most of the examples of so-called "nunnation" in this poem (such as the use of *wolden* for *wolde*), which only existed in writing and must not be seriously considered as representing real spoken sounds. The full proof of this would occupy too much space; but it should be noticed that, in many instances, "this pleonastic *n* has been struck out or erased by a second hand." In other instances it has escaped notice, and that is all that need be said. The peculiar metre of the poem has been sufficiently treated by J. Schipper. An abstract of the poem has been given by Henry Morley; and good general criticisms of it by B. ten Brink and others.

See *Layamon's Brut, or a Chronicle of Britain; a Poetical Semi-Saxon Paraphrase of the Brut of Wace;*...by Sir F. Madden (1847); B. ten Brink, *Early English Literature*, trans. by H.M.Kennedy (in Bohn's Standard Library, 1885); H Morley, *English Writers*, vol. iii. (1888); J. Schipper, *Englische Metrik*, i. (Bonn, 1882), E. Guest, *A History of English Rhythms* (new ed. by W. W. Skeat, 1882). Article "Layamon," in the *Dict. Nat. Biog.*; *Six Old English Chronicles*, including Gildas, Nennius and Geoffrey of Monmouth (in Bohn's Antiquarian Library); *Le Roux de Lincy, Le Roman de Brut, par Wace, avec un commentaire et des notes* (Rouen, 1836–1838), E. Mätzner, *Altenglische Sprachproben* (Berlin, 1867). (W. W. S.)

LAYARD, SIR AUSTEN HENRY (1817–1894), British author and diplomatist, the excavator of Nineveh, was born in Paris on the 5th of March 1817. The Layards were of Huguenot descent. His father, Henry P. J. Layard, of the Ceylon Civil Service, was the son of Charles Peter Layard, dean of Bristol, and grandson of Daniel Peter Layard, the physician. Through his mother, a daughter of Nathaniel Austen, banker, of Ramsgate, he inherited Spanish blood. This strain of cosmopolitanism must have been greatly strengthened by the circumstances of his education. Much of his boyhood was spent in Italy, where he received part of his schooling, and acquired a taste for the fine arts and a love of travel; but he was at school also in England, France and Switzerland. After spending nearly six years in the office of his uncle, Benjamin Austen, a solicitor, he was tempted to leave England for Ceylon by the prospect of obtaining an appointment in the civil service, and he started in 1839 with the intention of making an overland journey across Asia. After wandering for many months, chiefly in Persia, and having abandoned his intention of proceeding to Ceylon, he returned in 1842 to Constantinople, where he made the acquaintance of Sir Stratford Canning, the British ambassador, who employed him in various unofficial diplomatic missions in European Turkey. In 1845, encouraged and assisted by Canning, Layard left Constantinople to make those explorations among the ruins of Assyria with which his name is chiefly associated. This expedition was in fulfilment of a design which he had formed, when, during his former travels in the East, his curiosity had been greatly excited by the ruins of Nimrud on the Tigris, and by the great mound of Kuyunjik, near Mosul, already partly excavated by Botta. Layard remained in the neighbourhood of Mosul, carrying on excavations at Kuyunjik and Nimrud, and investigating the condition of various tribes, until 1847; and, returning to England in 1848, published *Nineveh and its Remains: with an Account of a Visit to the Chaldaean Christians of Kurdistan, and the Yezidis, or Devil-worshippers; and an Inquiry into the Manners and Arts of the Ancient Assyrians* (2 vols., 1848–1849). To illustrate the antiquities described in this work he published a large folio volume of *Illustrations of the Monuments of Nineveh* (1849). After spending a few months in England, and receiving the degree of D.C.L. from the university of Oxford, Layard returned to Constantinople as attaché to the British embassy, and, in August 1849, started on a second expedition, in the course of which he extended his investigations to the ruins of Babylon and the mounds of southern Mesopotamia. His record of this expedition, *Discoveries in the Ruins of Nineveh and Babylon*, which was illustrated by another folio volume, called *A Second Series of the Monuments of Nineveh*, was published in 1853. During these expeditions, often in circumstances of great difficulty, Layard despatched to England the splendid specimens which now form the greater part of the collection of Assyrian antiquities in the British Museum. Apart from the archaeological value of his work in identifying Kuyunjik as the site of Nineveh, and in providing a great mass of materials for scholars to work upon, these two books of Layard's are among the best-written books of travel in the language.

Layard now turned to politics. Elected as a Liberal member for Aylesbury in 1852, he was for a few weeks under-secretary for foreign affairs, but afterwards freely criticized the government, especially in connexion with army administration. He was present in the Crimea during the war, and was a member of the committee appointed to inquire into the conduct of the expedition. In 1855 he refused from Lord Palmerston an office not connected with foreign affairs, was elected lord rector of Aberdeen university, and on 15th June moved a resolution in the House of Commons (defeated by a large majority) declaring that in public appointments merit had been sacrificed to private influence and an adherence to routine. After being defeated at Aylesbury in 1857, he visited India to investigate the causes of the Mutiny. He unsuccessfully contested York in 1859, but was elected for Southwark in 1860, and from 1861 to 1866 was under-secretary for foreign affairs in the successive administrations of Lord Palmerston and Lord John Russell. In 1866 he was appointed a trustee of the British Museum, and in 1868 chief commissioner of works in W. E. Gladstone's government and a member of the Privy Council. He retired from parliament in 1869, on being sent as envoy extraordinary to Madrid. In 1877 he was appointed by Lord Beaconsfield ambassador at Constantinople, where he remained until Gladstone's return to power in 1880, when he finally retired from public life. In 1878, on the occasion of the Berlin conference, he received the grand cross of the Bath. Layard's political life was somewhat stormy. His manner was brusque, and his advocacy of the causes which he had at heart, though always perfectly sincere, was vehement to the point sometimes of recklessness. Layard retired to Venice, where he devoted much of his time to collecting pictures of the Venetian school, and to writing on Italian art. On this subject he was a disciple of his friend G. Morelli, whose views he embodied in his revision of F. Kugler's *Handbook of Painting, Italian Schools* (1887). He wrote also an introduction to Miss Ffoulkes's translation of Morelli's *Italian Painters* (1892–1893), and edited that part of Murray's *Handbook of Rome* (1894) which deals with pictures. In 1887 he published, from notes taken at the time, a record of his first journey to the East, entitled *Early Adventures in Persia, Susiana and Babylonia*. An abbreviation of this work, which as a book of travel is even more delightful than its predecessors, was published in 1894, shortly after the author's death, with a brief introductory notice by Lord Aberdare. Layard also from time to time contributed papers to various learned societies, including the Huguenot Society, of which he was first president. He died in London on the 5th of July 1894. (A. Gl.)

LAYMEN, HOUSES OF, deliberative assemblies of the laity of the Church of England, one for the province of Canterbury, and the other for the province of York. That of Canterbury was formed in 1886, and that of York shortly afterwards. They are merely consultative bodies, and the primary intention of their foundation was to associate the laity in the deliberations of convocation. They have no legal status. The members are elected by the various diocesan conferences, which are in turn elected by the laity of their respective parishes or rural deaneries. Ten members are appointed for the diocese of London, six for each of the dioceses of Winchester, Rochester, Lichfield and Worcester; and four for each of the remaining dioceses. The president of each house has the discretionary power of appointing additional laymen, not exceeding ten in number.

LAYNEZ (or Lainez), **DIEGO** (1512–1565), the second general of the Society of Jesus, was born in Castile, and after studying at Alcala joined Ignatius of Loyola in Paris, being one of the six who with Loyola in August 1534 took the vow of missionary work in Palestine in the Montmartre church. This plan fell through, and Laynez became professor of scholastic theology at Sapienza. After the order had been definitely established (1540) Laynez was sent to Germany. He was one of the pope's theologians at the council of Trent (*q.v.*), where he played a weighty and decisive part. When Loyola died in 1556 Laynez acted as vicar of the society, and two years later became general. Before his death at Rome, on the 19th of January 1565, he had immensely strengthened the despotic constitution of the order and developed its educational activities (see Jesuits).

His *Disputationes Tridentinae* were published in 2 volumes in 1886. Lives by Michel d'Esne (Douai, 1597) and Pet. Ribadeneira (Madrid, 1592; Lat. trans. by A. Schott, Antwerp, 1598). See also H. Müller, *Les Origines de la Compagnie de Jésus: Ignace et Lainez* (1898).

LAZAR, one afflicted with the disease of leprosy (*q.v.*). The term is an adaptation in medieval Latin of the name of Lazarus (*q.v.*), in Luke xvi. 20, who was supposed to be a leper. The word was not confined to persons suffering from leprosy; thus Caxton (*The Life of Charles the Great*, 37), "there atte laste were guarysshed and heled viij lazars of the palesey."

Lazaretto or Lazar-House is a hospital for the reception of poor persons suffering from the plague, leprosy or other infectious or contagious diseases. A peculiar use of "lazaretto" is found in the application of the term, now obsolete, to a place in the after-part of a merchant vessel for the storage of provisions, &c.

Lazzarone, a name now often applied generally to beggars, is an Italian term, particularly used of the poorest class of Neapolitans, who, without any fixed abode, live by odd jobs and fishing, but chiefly by begging.

LAZARITES (Lazarists or Lazarians), the popular names of the "Congregation of Priests of the Mission" in the Roman Catholic Church. It had its origin in the successful mission to the common people conducted by St Vincent de Paul (*q.v.*) and five other priests on the estates of the Gondi family. More immediately it dates from 1624, when the little community acquired a permanent settlement in the collège des Bons Enfans in Paris. Archiepiscopal recognition was obtained in 1626; by a papal bull of the 12th of January 1632, the society was constituted a congregation, with St Vincent de Paul at its head. About the same time the canons regular of St Victor handed over to the congregation the priory of St Lazarus (formerly a lazar-house) in Paris, whence the name of Lazarites or Lazarists. Within a few years they had acquired another house in Paris and set up other establishments throughout France; missions were also sent to Italy (1638), Tunis (1643), Algiers and Ireland (1646), Madagascar (1648) and Poland (1651). A fresh bull of Alexander VII. in April 1655 further confirmed the society; this was followed by a brief in September of the same year, regulating its constitution. The rules then adopted, which were framed on the model of those of the Jesuits, were published at Paris in 1668 under the title *Regulae seu constitutiones communes congregationis missionis*. The special objects contemplated were the religious instruction of the lower classes, the training of the clergy and foreign missions. During the French Revolution the congregation was suppressed and St Lazare plundered by the mob; it was restored by Napoleon in 1804 at the desire of Pius VII., abolished by him in 1809 in consequence of a quarrel with the pope, and again restored in 1816. The Lazarites were expelled from Italy in 1871 and from Germany in 1873. The Lazarite province of Poland was singularly prosperous; at the date of its suppression in 1796 it possessed thirty-five establishments. The order was permitted to return in 1816, but is now extinct there. In Madagascar it had a mission from 1648 till 1674. In 1783 Lazarites were appointed to take the place of the Jesuits in the Levantine and Chinese missions; they still have some footing in China, and in 1874 their establishments throughout the Turkish empire numbered sixteen. In addition, they established branches in Persia, Abyssinia, Mexico, the South American republics, Portugal, Spain and Russia, some of which have been suppressed. In the same year they had fourteen establishments in the United States of America. The total number of Lazarites throughout the world is computed at about 3000. Amongst distinguished members of the congregation may be mentioned: P. Collet (1693–1770), writer on theology and ethics; J. de la Grive (1689–1757), geographer; E. Boré (d. 1878), orientalist; P. Bertholon (1689–1757), physician; and Armand David, Chinese missionary and traveller.

See *Regulae seu constitutiones communes congregationis missionis* (Paris, 1668); *Mémoires de la congrégation de la mission* (1863); *Congrégation de la mission. Répertoire historique* (1900); *Notices bibliographiques sur les écrivains de la congrégation de la mission* (Angoulême, 1878); P. Hélyot, *Dict. des ordres religieux*, viii. 64-77; M. Heimbrecher, *Die Orden und Kongregationen der katholischen Kirche*, ii. (1897); C. Stork in Wetzer and Welte's *Kirchenlexikon* (Catholic), vii.; E. Bougaud, *History of St Vincent de Paul* (1908).

LAZARUS (a contracted form of the Heb. name Eleazar, "God has helped," Gr. Λάζαρος), a name which occurs in the New Testament in two connexions.

1. Lazarus of Bethany, brother of Martha and Mary. The story that he died and after four days was raised from the dead is told by John (xi., xii.) only, and is not mentioned by the Synoptists. By many this is regarded as the greatest of Christ's miracles. It produced a great effect upon many Jews; the *Acta Pilati* says that Pilate trembled when he heard of it, and, according to Bayle's *Dictionary*, Spinoza declared that if he were persuaded of its truth he would become a Christian. The story has been attacked more vigorously than any other portion of the Fourth Gospel, mainly on two grounds, (i.) the fact that, in spite of its striking character, it is omitted by the Synoptists, and (ii.) its unique significance. The personality of Lazarus in John's account, his relation to Martha and Mary, and the possibility that John reconstructed the story by the aid of inferences from the story of the supper in Luke x. 40, and that of the anointing of Christ in Bethany given by Mark and Matthew, are among the chief problems. The controversy has given rise to a great mass of literature, discussions of which will be found in the lives of Christ, the biblical encyclopaedias and the commentaries on St John.

2. Lazarus is also the name given by Luke (xvi. 20) to the beggar in the parable known as that of "Lazarus and Dives,"[1] illustrating the misuse of wealth. There is little doubt that the name is introduced simply as part of the parable, and not with any idea of identifying the beggar with Lazarus of Bethany. It is curious, not only that Luke's story does not appear in the other gospels, but also that in no other of Christ's parables is a name given to the central character. Hence it was in early times thought that the story was historical, not allegorical (see Lazar).

LAZARUS, EMMA (1849–1887), American Jewish poetess, was born in New York. When the Civil War broke out she was soon inspired to lyric expression. Her first book (1867) included poems and translations which she wrote between the ages of fourteen and seventeen. As yet her models were classic and romantic. At the age of twenty-one she published *Admetus and other Poems* (1871). *Admetus* is inscribed to Emerson, who greatly influenced her, and with whom she maintained a regular correspondence for several years. She led a retired life, and had a modest conception of her own powers. Much of her next work appeared in *Lippincott's Magazine*, but in 1874 she published a prose romance (*Alide*) based on Goethe's autobiography, and received a generous letter of admiration from Turgeniev. Two years later she visited Concord and made the acquaintance of the Emerson circle, and while there read the proof-sheets of her tragedy *The Spagnoletto*. In 1881 she published her excellent translations of Heine's poems. Meanwhile events were occurring which appealed to her Jewish sympathies and gave a new turn to her feeling. The Russian massacres of 1880–1881 were a trumpet-call to her. So far her Judaism had been latent. She belonged to the oldest Jewish congregation of New York, but she had not for some years taken a personal part in the observances of the synagogue. But from this time she took up the cause of her race, and "her verse rang out as it had never rung before, a clarion note, calling a people to heroic action and unity; to the consciousness and fulfilment of a grand destiny." Her poems, "The Crowing of the Red Cock" and "The Banner of the Jew" (1882) stirred the Jewish consciousness and helped to produce the new Zionism (*q.v.*). She now wrote another drama, the *Dance to Death*, the scene of which is laid in Nordhausen in the 14th century; it is based on the accusation brought against the Jews of poisoning the wells and thus causing the Black Death. The *Dance to Death* was included (with some translations of medieval Hebrew poems) in *Songs of a Semite* (1882), which she dedicated to George Eliot. In 1885 she visited Europe. She devoted much of the short remainder of her life to the cause of Jewish nationalism. In 1887 appeared *By the waters of Babylon*, which consists of a series of "prose poems," full of prophetic fire. She died in New York on the 19th of November 1887. A sonnet by Emma Lazarus is engraved on a memorial tablet on the colossal Bartholdi statue of Liberty, New York.

See article in the *Century Magazine*, New Series, xiv. 875 (portrait p. 803), afterwards prefixed as a *Memoir* to the collected edition of *The poems of Emma Lazarus* (2 vols., 1889). (I. A.)

LAZARUS, HENRY (1815–1895), British clarinettist, was born in London on the 1st of January 1815, and was a pupil of Blizard, bandmaster of the Royal Military Asylum, Chelsea, and subsequently of Charles Godfrey, senior, bandmaster of the Coldstream Guards. He made his first appearance as a soloist at a concert of Mme Dulcken's, in April 1838, and in that year he was appointed as second clarinet to the Sacred Harmonic Society. From Willman's death in 1840 Lazarus was principal clarinet at the opera, and all the chief festivals and orchestral concerts. His beautiful tone, excellent phrasing and accurate execution were greatly admired. He was professor of the clarinet at the Royal Academy of Music from 1854 until within a short time of his death, and was appointed to teach his instrument at the Military School of Music, Kneller Hall, in 1858. His last public appearance was at a concert for his benefit in St James's Hall, in June 1892, and he died on the 6th of March 1895.

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[1] The English Bible does not use Lat. *Dives* (rich) as a proper name, saying merely "a certain rich man." The idea that Dives was a proper name arose from the Vulgate *quidam dives*, whence it became a conventional name for a rich man.

LAZARUS, MORITZ (1824–1903), German philosopher, was born on the 15th of September 1824 at Filehne, Posen. The son of a rabbinical scholar, he was educated in Hebrew literature and history, and subsequently in law and philosophy at the university of Berlin. From 1860 to 1866 he was professor in the university of Berne, and subsequently returned to Berlin as professor of philosophy in the kriegsakademie (1868) and later in the university of Berlin (1873). On the occasion of his seventieth birthday he was honoured with the title of *Geheimrath*. The fundamental principle of his philosophy was that truth must be sought not in metaphysical or a priori abstractions but in psychological investigation, and further that this investigation cannot confine itself successfully to the individual consciousness, but must be devoted primarily to society as a whole. The psychologist must study mankind from the historical or comparative standpoint, analysing the elements which constitute the fabric of society, with its customs, its conventions and the main tendencies of its evolution. This *Völkerpsychologie* (folk- or comparative psychology) is one of the chief developments of the Herbartian theory of philosophy; it is a protest not only against the so-called scientific standpoint of natural philosophers, but also against the individualism of the positivists. In support of his theory he founded, in combination with H. Steinthal, the *Zeitschrift für Völkerpsychologie und Sprachwissenschaft* (1859). His own contributions to this periodical were numerous and important. His chief work was *Das Leben der Seele* (Berlin, 1855–1857; 3rd edition, 1883). Other philosophical works were:—*Ueber den Ursprung der Sitten* (1860 and 1867), *Ueber die Ideen in der Geschichte* (1865 and 1872); *Zur Lehre von den Sinnestäuschungen* (1867); *Ideale Fragen* (1875 and 1885), *Erziehung und Geschichte* (1881); *Unser Standpunkt* (1881); *Ueber die Reize des Spiels* (1883). Apart from the great interest of his philosophical work, Lazarus was pre-eminent among the Jews of the so-called Semitic domination in Germany. Like Heine, Auerbach and Steinthal, he rose superior to the narrower ideals of the German Jews, and took a leading place in German literature and thought. He protested against the violent anti-Semitism of the time, and, in spite of the moderate tone of his publications, drew upon himself unqualified censure. He wrote in this connexion a number of articles collected in 1887 under the title *Treu und Frei. Reden und Vorträge über Juden und Judenthum.* In 1869 and 1871 he was president of the first and second Jewish Synods at Leipzig and Augsburg.

See R. Flint, *The Philosophy of History in Europe*; M. Brasch, *Gesammelte Essays und Characterköpfe zur neuen Philos. und Literatur*; E. Berliner, *Lazarus und die öffentliche Meinung*; M. Brasch, "Der Begründer de Völkerpsychologie," in *Nord et Sud* (September 1894).

LAZARUS, ST, ORDER OF, a religious and military order founded in Jerusalem about the middle of the 12th century. Its primary object was the tending of the sick, especially lepers, of whom Lazarus (see LAZAR) was regarded as the patron. From the 13th century, the order made its way into various countries of Europe—Sicily, Lower Italy and Germany (Thuringia); but its chief centre of activity was France, where Louis IX. (1253) gave the members the lands of Boigny near Orleans and a building at the gates of Paris, which they turned into a lazar-house for the use of the lepers of the city. A papal confirmation was obtained from Alexander IV. in 1255. The knights were one hundred in number, and possessed the right of marrying and receiving pensions charged on ecclesiastical benefices. An eight-pointed cross was the insignia of both the French and Italian orders. The gradual disappearance of leprosy combined with other causes to secularize the order more and more. In Savoy in 1572 it was merged by Gregory XIII. (at the instance of Emanuel Philibert, duke of Savoy) in the order of St Maurice (see KNIGHTHOOD AND CHIVALRY: *Orders of Knighthood, Italy*). The chief task of this branch was the defence of the Catholic faith, especially against the Protestantism of Geneva. It continued to exist till the second half of the 19th century. In 1608 it was in France united by Henry IV. with the order of Notre-Dame du Mont-Carmel. It was treated with especial favour by Louis XIV., and the most brilliant period of its existence was from 1673 to 1691, under the marquis de Louvois. From that time it began to decay. It was abolished at the Revolution, reintroduced during the Restoration, and formally abolished by a state decree of 1830.

See L. Mainbourg, *Hist. des croisades* (1682; Eng. trans. by Nalson, 1686); P. Hélyot, *Hist. des ordres monastiques* (1714), pp. 257, 386; J. G. Uhlhorn, *Die christliche Liebesthätigkeit im Mittelalter* (Stuttgart, 1884); articles in Herzog-Hauck's *Realencyklopädie für protestantische Theologie*, xi. (1902) and Wetzer and Welte's (Catholic) *Kirchenlexikon*, vii. (1891).

LEA, HENRY CHARLES (1825–1909), American historian, was born at Philadelphia on the 19th of September 1825. His father was a publisher, whom in 1843 he joined in business, and he retained his connexion with the firm till 1880. Weak health, however, caused him from early days to devote himself to research, mainly on church history in the later middle ages, and his literary reputation rests on the important books he produced on this subject. These are: *Superstition and Force* (Philadelphia, 1866, new ed. 1892); *Historical Sketch of Sacerdotal Celibacy* (Philadelphia, 1867); *History of the Inquisition of the Middle Ages* (New York, 1888); *Chapters from the religious history of Spain connected with the Inquisition* (Philadelphia, 1890); *History of auricular Confession and Indulgences in the Latin Church* (3 vols., London, 1896); *The Moriscos of Spain* (Philadelphia, 1901), and *History of the Inquisition of Spain* (4 vols., New York and London, 1906–1907). He also edited a *Formulary of the Papal Penitentiary in the 13th century* (Philadelphia, 1892), and in 1908 was published his *Inquisition in the Spanish Dependencies.* As an authority on the Inquisition he stood in the highest rank of modern historians, and distinctions were conferred on him by the universities of Harvard, Princeton, Pennsylvania, Giessen and Moscow. He died at Philadelphia on the 24th of October 1909.

LEAD (pronounced *leed*), a city of Lawrence county, South Dakota, U.S.A., situated in the Black Hills, at an altitude of about 5300 ft., 3m. S.W. of Deadwood. Pop. (1890) 2581, (1900) 6210, of whom 2145 were foreign-born, (1905) 8217, (1910) 8392. In 1905 it was second in population among the cities of the state. It is served by the Chicago, Burlington & Quincy, the Chicago & North-Western, and the Chicago, Milwaukee & St Paul railways. Lead has a hospital, the Hearst Free Library and the Hearst Free Kindergarten, and is the see of a Roman Catholic bishopric. It is the centre of the mining interests of the Black Hills, and the Homestake Gold Mine here contains perhaps the largest and most easily worked mass of low-grade ore and one of the largest mining plants (1000 stamps) in the world; it has also three cyanide mills. From 1878 to 1906 the value of the gold taken from this mine amounted to about $58,000,000, and the net value of the product of 1906 alone was approximately $5,313,516. For two months in the spring of 1907 the mine was rendered idle by a fire (March 25), which was so severe that it was necessary to flood the entire mine. Mining tools and gold jewelry are manufactured. The first settlement was made here by mining prospectors in July 1876. Lead was chartered as a city in 1890 and became a city of the first class in 1904.

LEAD, a metallic chemical element; its symbol is Pb (from the Lat. *plumbum*), and atomic weight 207·10 (O=16). This metal was known to the ancients, and is mentioned in the Old Testament. The Romans used it largely, as it is still used, for the making of water pipes, and soldered these with an alloy of lead and tin. Pliny treats of these two metals as *plumbum nigrum* and *plumbum album* respectively, which seems to show that at his time they were looked upon as being only two varieties of the same species. In regard to the ancients' knowledge of lead compounds, we may state that the substance described by Dioscorides as μολυβδαίνα was undoubtedly litharge, that Pliny uses the word minium in its present sense of red lead, and that white lead was well known to Geber in the 8th century. The alchemists designated it by the sign of Saturn ♄.

Occurrence.—Metallic lead occurs in nature but very rarely and then only in minute amount. The chief lead ores are galena and cerussite; of minor importance are anglesite, pyromorphite and mimetesite (*qq.v.*). Galena (*q.v.*), the principal lead ore, has a world-wide distribution, and is always contaminated with silver sulphide, the proportion of noble metal varying from about 0·01 or less to 0·3%, and in rare cases coming up to ½ or 1%. Fine-grained galena is usually richer in silver than the coarse-grained. Galena occurs in veins in the Cambrian clay-slate, accompanied by copper and iron pyrites, zinc-blende, quartz, calc-spar, iron-spar, &c.; also in beds or nests within sandstones and rudimentary limestones, and in a great many other geological formations. It is pretty widely diffused throughout the earth's crust. The principal English lead mines are in Derbyshire; but there are also mines at Allandale and other parts of western Northumberland, at Alston Moor and other parts of Cumberland, in the western parts of Durham, in Swaledale and Arkendale and other parts of Yorkshire, in Salop, in Cornwall, in the Mendip Hills in Somersetshire, and in the Isle of Man. The Welsh mines are chiefly in Flint, Cardigan and Montgomery shires; the Scottish in Dumfries, Lanark and Argyll; and the Irish in Wicklow, Waterford and Down. Of continental mines we may mention those in Saxony and in the Harz, Germany; those of Carinthia, Austria; and especially those of the southern provinces of Spain. It is widely distributed in the United States, and occurs in Mexico and Brazil; it is found in Tunisia and Algeria, in the Altai Mountains and India, and in New South Wales, Queensland, and in Tasmania.

The native carbonate or cerussite (*q.v.*) occasionally occurs in the pure form, but more frequently in a state of intimate intermixture with clay ("lead earth," *Bleierde*), limestone, iron oxides, &c. (as in the ores of Nevada and Colorado), and sometimes also with coal ("black lead ore"). All native carbonate of lead seems to be derived from what was originally galena, which is always present in it as an admixture. This ore, metallurgically, was not reckoned of much value, until immense quantities of it were discovered in Nevada and in Colorado (U.S.). The Nevada mines are mostly grouped around the city of Eureka, where the ore occurs in "pockets" disseminated at random through limestone. The crude ore contains about 30% lead and 0·2 to 0·3% silver. The Colorado lead district is in the Rocky Mountains, a few miles from the source of the Arkansas river. It forms gigantic deposits of almost constant thickness, embedded between a floor of limestone and a roof of porphyry. Stephens's discovery of the ore in 1877 was the making of the city of Leadville, which, in 1878, within a year of its foundation, had over 10,000 inhabitants. The Leadville ore contains from 24 to 42% lead and 0·1 to 2% silver. In Nevada and Colorado the ore is worked chiefly for the sake of the silver. Deposits are also worked at Broken Hill, New South Wales.

Anglesite, or lead sulphate, $PbSO_4$, is poor in silver, and is only exceptionally mined by itself; it occurs in quantity in France, Spain, Sardinia and Australia. Of other lead minerals we may mention the basic sulphate lanarkite, $PbO \cdot PbSO_4$; leadhillite, $PbSO_4 \cdot 3PbCO_3$; the basic chlorides matlockite, $PbO \cdot PbCl_2$, and mendipite, $PbCl_2 \cdot 2PbO$; the chloro-phosphate pyromorphite, $PbCl_2 \cdot 3Pb_3(PO_4)_2$, the chloro-arsenate mimetesite, $PbCl_2 \cdot 3Pb_3(AsO_4)_2$; the molybdate wulfenite, $PbMoO_4$; the chromate crocoite or crocoisite, $PbCrO_4$; the tungstate stolzite, $PbWO_4$.

Production.—At the beginning of the 19th century the bulk of the world's supply of lead was obtained from England and Spain, the former contributing about 17,000 tons and the latter 10,000 tons annually. Germany, Austria, Hungary, France, Russia and the United States began to rank as producers during the second and third decades; Belgium entered in about 1840; Italy in the 'sixties; Mexico, Canada, Japan and Greece in the 'eighties; while Australia assumed importance in 1888 with a production of about 18,000 tons, although it had contributed small and varying amounts for many preceding decades. In 1850 England headed the list of producers with about 66,000 tons; this amount had declined in 1872 to 61,000 tons. Since this date, it has, on the whole, diminished, although large outputs occurred in isolated years, for instance, a production of 40,000 tons in 1893 was followed by 60,000 tons in 1896 and 40,000 in 1897. The output in 1900 was 35,000 tons, and in 1905, 25,000 tons. Spain ranked second in 1850 with about 47,000 tons; this was increased in 1863, 1876 and in 1888 to 84,000, 127,000 and 187,000 tons respectively; but the maximum outputs mentioned were preceded and succeeded by periods of depression. In 1900 the production was 176,000 tons, and in 1905, 179,000 tons. The United States, which ranked third with a production of 20,000 tons in 1850, maintained this annual yield, until 1870, when it began to increase; the United States now ranks as the chief producer; in 1900 the output was 253,000 tons, and in 1905, 319,744 tons. Germany has likewise made headway; an output of 12,000 tons in 1850 being increased to 120,000 tons in 1900 and to 152,590 in 1905. This country now ranks third, having passed England in 1873. Mexico increased its production from 18,000 tons in 1883 to 83,000 tons in 1900 and about 88,000 tons in 1905. The Australian production of 18,000 tons in 1888 was increased to 58,000 tons in 1891, a value maintained until 1893, when a depression set in, only 21,000 tons being produced in 1897; prosperity then returned, and in 1898 the yield was 68,000 tons, and in 1905, 120,000 tons. Canada became important in 1895 with a production of 10,000 tons; this increased to 28,654 tons in 1900; and in 1905 the yield was 25,391 tons. Italy has been a fairly steady producer; the output in 1896 was 20,000 tons, and in 1905, 25,000 tons.

Metallurgy.

The extraction of the metal from pure (or nearly pure) galena is the simplest of all metallurgical operations. The ore is roasted (*i.e.* heated in the presence of atmospheric oxygen) until all the sulphur is burned away and the lead left. This simple statement, however, correctly formulates only the final result. The first effect of the roasting is the elimination of sulphur as sulphur-dioxide, with formation of oxide and sulphate of lead. In practice this oxidation process is continued until the whole of the oxygen is as nearly as possible equal in weight to the sulphur present as sulphide or as sulphate, *i.e.* in the ratio $S : O_2$. The heat is then raised in (relative) absence of air, when the two elements named unite into sulphur-dioxide, while a regulus of molten lead remains. Lead ores are smelted in the reverberatory furnace, the ore-hearth, and the blast-furnace. The use of the first two is restricted, as they are suited only for galena ores or mixtures of galena and carbonate, which contain not less than 58% lead and not more than 4% silica; further, ores to be treated in the ore-hearth should run low in or be free from silver, as the loss in the fumes is excessive. In the blast-furnace all lead ores are successfully smelted. Blast-furnace treatment has therefore become more general than any other.

Three types of reverberatory practice are in vogue—the English, Carinthian and Silesian. In Wales and the south of England the process is conducted in a reverberatory furnace, the sole of which is paved with slags from previous operations, and has a depression in the middle where the metal formed collects to be let off by a tap-hole. The dressed ore is introduced through a "hopper" at the top, and exposed to a moderate oxidizing flame until a certain proportion of ore is oxidized, openings at the side enabling the workmen to stir up the ore so as to constantly renew the surface exposed to the air. At this stage as a rule some rich slags of a former operation are added and a quantity of quicklime is incorporated, the chief object of which is to diminish the fluidity of the mass in the next stage, which consists in this, that, with closed air-holes, the heat is raised so as to cause the oxide and sulphate on the one hand and the sulphide on the other to reduce each other to metal. The lead produced runs into the hollow and is tapped off. The roasting process is then resumed, to be followed by another reduction, and so on.

A similar process is used in Carinthia; only the furnaces are smaller and of a somewhat different form. They are long and narrow; the sole is plane, but slopes from the fire-bridge towards the flue, so that the metal runs to the latter end to collect in pots placed *outside* the furnace. In Carinthia the oxidizing process from the first is pushed on so far that metallic lead begins to show, and the oxygen introduced predominates over the sulphur left. The mass is then stirred to liberate the lead, which is removed as *Rührblei*. Charcoal is now added, and the heat urged on to obtain *Pressblei*, an inferior metal formed partly by the action of the charcoal on the oxide of lead. The fuel used is fir-wood.

The Silesian furnace has an oblong hearth sloping from the fire-bridge to the flue-bridge. This causes the lead to collect at the coolest part of the hearth, whence it is tapped, &c., as in the English furnace. While by the English and Carinthian processes as much lead as possible is extracted in the furnace, with the Silesian method a very low temperature is used, thus taking out about one-half of the lead and leaving very rich slags (50% lead) to be smelted in the blast-furnace, the ultimate result being a very much higher yield than by either of the other processes. The loss in lead by the combined reverberatory and blast-furnace treatment is only 3·2%.

In Cumberland, Northumberland, Durham and latterly the United States, the reverberatory furnace is used only for roasting the ore, and the oxidized ore is then reduced by fusion in a low, square blast-furnace (a "Scottish hearth furnace") lined with cast iron, as is also the inclined sole-plate which is made to project beyond the furnace, the outside portion (the "work-stone") being provided with grooves guiding any molten metal that may be placed on the "stone" into a cast iron pot; the "tuyère" for the introduction of the wind was, in the earlier types, about half way down the furnace.

As a preliminary to the melting process, the "browse" left in the preceding operation (half-fused and imperfectly reduced ore) is introduced with some peat and coal, and heated with the help of the blast. It is then raked out on the work-stone and divided into a very poor "grey" slag which is put aside, and a richer portion, which goes back into the furnace. Some of the roasted ore is strewed upon it, and, after a quarter of an hour's working, the whole is taken out on the work-stone, where the lead produced runs off. The "browse," after removal of the "grey" slag, is reintroduced, ore added, and, after a quarter of an hour's heating, the mass again placed on the work-stone, &c.

In the more recent form of the hearth process the blocks of cast iron forming the sides and back of the Scottish furnace are now generally replaced in the United States by water-cooled shells (water-jackets) of cast iron. In this way continuous working has been rendered possible, whereas formerly operations had to be stopped every twelve or fifteen hours to allow the over-heated blocks and furnace to cool down. A later improvement (which somewhat changes the mode of working) is that by Moffett. While he also prevents interruption of the operation by means of water-jackets, he uses hot-blast, and produces, besides metallic lead, large volumes of lead fumes which are drawn off by fans through long cooling tubes, and then forced through suspended bags which filter off the dust, called "blue powder." Thus, a mixture of lead sulphate (45%) and oxide (44%) with some sulphide (8%), zinc and carbonaceous matter, is agglomerated by a heap-roast and then smelted in a slag-eye furnace with grey slag from the ore-hearth. The furnace has, in addition to the usual tuyères near the bottom, a second set near the throat in order to effect a complete oxidation of all combustible matter. Much fume is thus produced. This is drawn off, cooled and filtered, and forms a white paint of good body, consisting of about 65% lead sulphate, 26% lead oxide, 6% zinc oxide and 3% other substances. Thus in the Moffett method it is immaterial whether metal or fume is produced, as in either case it is saved and the price is about the same.

In smelting at once in the same blast-furnace ores of different character, the old use of separate processes of precipitation, roasting and reduction, and general reduction prevailing in the Harz Mountains, Freiberg and other places, to suit local conditions, has been abandoned. Ores are smelted raw if the fall of matte (metallic sulphide) does not exceed 5%; otherwise they are subjected to a preliminary oxidizing roast to expel the sulphur, unless they run too high in silver, say 100 oz. to the ton, when they are smelted raw. The leading reverberatory furnace for roasting lead-bearing sulphide ores has a level hearth 14-16 ft. wide and 60-80 ft. long. It puts through 9-12 tons of ore in twenty-four hours, reducing the percentage of sulphur to 2-4%, and requires four to six men and about 2 tons of coal. In many instances it has been replaced by mechanical furnaces, which are now common in roasting sulphide copper ores (see SULPHURIC ACID). A modern blast-furnace is oblong in horizontal section and about 24 ft. high from furnace floor to feed floor. The shaft, resting upon arches supported by four cast iron columns about 9 ft. high, is usually of brick, red brick on the outside, fire-brick on the inside; sometimes it is made of wrought iron water-jackets. The smelting zone always has a bosh and a contracted tuyère section. It is enclosed by water-jackets, which are usually cast iron, sometimes mild steel. The hearth always has an Arents siphon tap. This is an inclined channel running through the side-wall, beginning near the bottom of the crucible and ending at the top of the hearth, where it is enlarged into a basin. The crucible and the channel form the two limbs of an inverted siphon. While the furnace is running the crucible and channel remain filled with lead; all the lead reduced to the metallic state in smelting collects in the crucible, and rising in the channel, overflows into the basin, whence it is removed. The slag and matte formed float upon the lead in the crucible and are tapped, usually together, at intervals into slag-pots, where the heavy matter settles on the bottom and the light slag on the top. When cold they are readily separated by a blow from a hammer. The following table gives the dimensions of some well-known American lead-furnaces.

Lead Blast-Furnace.

Locality.	Year.	Tuyère Section.	Height, Tuyère to Throat.
		In.	Ft.
Leadville, Colorado . .	1880	33×84	14
Denver ,, . .	1880	36×100	17
Durango ,, . .	1882	36×96	12·6
Denver ,, . .	1892	42×100	16
Leadville, ,, . .	1892	42×120	18
Salt Lake City, Utah .	1895	45×140	20

A furnace, 42 by 120 in. at the tuyères, with a working height of 17-20 ft., will put through in twenty-four hours, with twelve men, 12% coke and 2 ℔ blast-pressure, 85-100 tons average charge, *i.e.* one that is a medium coarse, contains 12-15% lead, not over 5% zinc, and makes under 5% matte. In making up a charge, the ores and fluxes, whose chemical compositions have been determined, are mixed so as to form out of the components not to be reduced to the metallic or sulphide state, typical slags (silicates of ferrous and calcium oxides, incidentally of aluminium oxide, which have been found to do successful work). Such slags contain SiO_2 = 30-33%, Fe(Mn)O = 27-50%, Ca(Mg, Ba)O = 12-28%, and retain less than 1% lead and 1 oz. silver to the ton. The leading products of the blast-furnace are argentiferous lead (base bullion), matte, slag and flue-dust (fine particles of charge and volatilized metal carried out of the furnace by the ascending gas current). The base bullion (assaying 300 ± oz. per ton) is desilverized (see below); the matte (Pb = 8-12%, Cu = 3-4%, Ag = $\frac{1}{3}$-$\frac{1}{5}$ of the assay-value of the base bullion, rest Fe and S) is roasted and resmelted, when part of the argentiferous lead is recovered as base bullion, while the rest remains with the copper, which becomes concentrated in a copper-matte (60% copper) to be worked up by separate processes. The slag is a waste product, and the flue-dust, collected by special devices in dust-chambers, is briquetted by machinery, with lime as a bond, and then resmelted with the ore-charge. The yield in lead is over 90%, in silver over 97% and in gold 100%. The cost of smelting a ton of ore in Colorado in a single furnace, 42 by 120 in. at the tuyères, is about $3.

Refining.

The lead produced in the reverberatory furnace and the ore-hearth is of a higher grade than that produced in the blast-furnace, as the ores treated are purer and richer, and the reducing action is less powerful. The following analysis of blast-furnace lead of Freiberg, Saxony, is from an exceptionally impure lead: Pb = 95·088, Ag = 0·470, Bi = 0·019, Cu = 0·225, As = 1·826, Sb = 0·958, Sn = 1·354, Fe = 0·007, Zn = 0·002, S = 0·051. Of the impurities, most of the copper, nickel and copper, considerable arsenic, some antimony and small amounts of silver are removed by liquation. The lead is melted down slowly, when the impurities separate in the form of a scum (dross), which is easily removed. The purification by liquation is assisted by poling the lead when it is below redness. A stick of green wood is forced into it, and the vapours and gases set free expose new surfaces to the air, which at this temperature has only a mildly oxidizing effect. The pole, the use of which is awkward, has been replaced by dry stream, which has a similar effect. To remove tin, arsenic and antimony, the lead has to be brought up to a bright-red heat, when the air has a strongly oxidizing effect. Tin is removed mainly as a powdery mixture of stannate of lead and lead oxide, arsenic and antimony as a slagged mixture of arsenate and antimonate of lead and lead oxide. They are readily withdrawn from the surface of the lead, and are worked up into antimony (arsenic)—tin-lead and antimony-lead alloys. Liquation, if not followed by poling, is carried on as a rule in a reverberatory furnace with an oblong, slightly trough-shaped inclined hearth; if the lead is to be poled it is usually melted down in a cast-iron kettle. If the lead is to be liquated and then brought to a bright-red heat, both operations are carried on in the same reverberatory furnace. This has an oblong, dish-shaped hearth of acid or basic fire-brick built into a wrought-iron pan, which rests on transverse rails supported by longitudinal walls. The lead is melted down at a low temperature and drossed. The temperature is then raised, and the scum which forms on the surface is withdrawn until pure litharge forms, which only takes place after all the tin, arsenic and antimony have been eliminated.

Desilverizing.

Silver is extracted from lead by means of the process of cupellation. Formerly all argentiferous lead had to be cupelled, and the resulting litharge then reduced to metallic lead. In 1833 Pattinson invented his process by means of which practically all the silver is concentrated in 13% of the original lead to be cupelled, while the rest becomes market lead. In 1842 Karsten discovered that lead could be desilverized by means of zinc. His invention, however, only took practical form in 1850–1852 through the researches of Parkes, who showed how the zinc-silver-lead alloy formed could be worked and the desilverized lead freed from the zinc it had taken up. In the Parkes process only 5% of the original lead need be cupelled. Thus, while cupellation still furnishes the only means for the final separation of lead and silver, it has become an auxiliary process to the two methods of concentration given. Of these the Pattinson process has become subordinate to the Parkes process, as it is more expensive and leaves more silver and impurities in the market lead. It holds its own, however, when base bullion contains bismuth in appreciable amounts, as in the Pattinson process bismuth follows the lead to be cupelled, while in the Parkes process it remains with the desilverized lead which goes to market, and lead of commerce should contain little bismuth. At Freiberg, Saxony, the two processes have been combined. The base bullion is imperfectly Pattinsonized, giving lead rich in silver and bismuth, which is cupelled, and lead low in silver, and especially so in bismuth, which is further desilverized by the Parkes process.

The effect of the two processes on the purity of the market lead is clearly shown by the two following analyses by Hampe, which represent lead from Lautenthal in the Harz Mountains, where the Parkes process replaced that of Pattinson, the ores and smelting process remaining practically the same:—

Process.	Pb.	Cu.	Sb.	As.	Bi.	Ag.	Fe.	Zn.	Ni.
Pattinson . .	99·966200	0·015000	1·010000	none	0·000600	0·002200	0·004000	0·001000	1·001000
Parkes . .	99·983139	0·001413	0·005698	none	0·005487	0·000460	0·002289	0·000834	0·000680

Cupelling.

The reverberatory furnace commonly used for cupelling goes by the name of the English cupelling furnace. It is oblong, and has a fixed roof and a movable iron hearth (test). Formerly the test was lined with bone-ash; at present the hearth material is a mixture of crushed limestone and clay (3:1) or Portland cement, either alone or mixed with crushed fire-brick; in a few instances the lining has been made of burnt magnesite. In the beginning of the operation enough argentiferous lead is charged to fill the cavity of the test. After it has been melted down and brought to a red heat, the blast, admitted at the back, oxidizes the lead and drives the litharge formed towards the front, where it is run off. At the same time small bars of argentiferous lead, inserted at the back, are slowly pushed forward, so that in melting down they may replace the oxidized lead. Thus the level of the lead is kept approximately constant, and the silver becomes concentrated in the lead. In large works the silver-lead alloy is removed when it contains 60-80 % silver, and the cupellation of the rich bullion from several concentration furnaces is finished in a second furnace. At the same time the silver is brought to the required degree of fineness, usually by the use of nitre. In small works the cupellation is finished in one furnace, and the resulting low-grade silver fined in a plumbago crucible, either by overheating in the presence of air, or by the addition of silver sulphate to the melted silver, when air or sulphur trioxide and oxygen oxidize the impurities. The lead charged contains about 1·5 % lead if it comes from a Pattinson plant, from 5-10 % if from a Parkes plant. In a test 7 ft. by 4 ft. 10 in. and 4 in. deep, about 6 tons of lead are cupelled in twenty-four hours. A furnace is served by three men, working in eight-hour shifts, and requires about 2 tons of coal, which corresponds to about 110 gallons reduced oil, air being used as atomizer. The loss in lead is about 5 %. The latest cupelling furnaces have the general form of a reverberatory copper-smelting furnace. The working door through which the litharge is run off lies under the flue which carries off the products of combustion and the lead fumes, the lead is charged and the blast is admitted near the fire-bridge.

Pattinson process.

In the *Pattinson* process the argentiferous lead is melted down in the central cast iron kettle of a series 8-15, placed one next to the other, each having a capacity of 9-15 tons and a separate fire-place. The crystals of impoverished lead which fall to the bottom, upon coaling the charge, are taken out with a skimmer and discharged into the neighbouring kettle (say to the right) until about two-thirds of the original charge has been removed; then the liquid enriched lead is ladled into the kettle on the opposite side. To the kettle, two-thirds full of crystals of lead, is now added lead of the same tenor in silver, the whole is liquefied, and the cooling, crystallizing, skimming and ladling are repeated. The same is done with the kettle one-third filled with liquid lead, and so on until the first kettle contains market lead, the last cupelling lead. The intervening kettles contain leads with silver contents ranging from above market to below cupelling lead. The original Pattinson process has been in many cases replaced by the Luce-Rozan process (1870), which does away with arduous labour and attains a more satisfactory crystallization. The plant consists of two tilting oval metal pans (capacity 7 tons), one cylindrical crystallizing pot (capacity 22 tons), with two discharging spouts and one steam inlet opening, two lead moulds (capacity 3½ tons), and a steam crane. Pans and pot are heated from separate fire-places. Supposing the pot to be filled with melted lead to be treated, the fire is withdrawn beneath and steam introduced. This cools and stirs the lead when crystals begin to form. As soon as two-thirds of the lead has separated in the form of crystals, the steam is shut off and the liquid lead drained off through the two spouts into the moulds. The fire underneath the pot is again started, the crystals are liquefied, and one of the two pans, filled with melted lead, is tilted by means of the crane and its contents poured into the pot. In the meantime the lead in the moulds, which has solidified, is removed with the crane and stacked to one side, until its turn comes to be raised and charged into one of the pans. The crystallization proper lasts one hour, the working of a charge four hours, six charges being run in twenty-four hours.

Parkes process.

It is absolutely necessary for the success of the *Parkes* process that the zinc and lead should contain only a small amount of impurity. The spelter used must therefore be of a good grade, and the lead is usually first refined in a reverberatory furnace (the softening furnace). The capacity of the furnace must be 10 % greater than that of the kettle into which the softened lead is tapped, as the dross and skimmings formed amount to about 10 % of the weight of the lead charged. The kettle is spherical, and is suspended over a fire-place by a broad rim resting on a wall; it is usually of cast iron. Most kettles at present hold 30 tons of lead; some, however, have double that capacity. When zinc is placed on the lead (heated to above the melting-point of zinc), liquefied and brought into intimate contact with the lead by stirring, gold, copper, silver and lead will combine with the zinc in the order given. By beginning with a small amount of zinc, all the gold and copper and some silver and lead will be alloyed with the zinc to a so-called gold—or copper—crust, and the residual lead saturated with zinc. By removing from the surface of the lead this first crust and working it up separately (liquating, retorting and cupelling), doré silver is obtained. By the second addition of zinc most of the silver will be collected in a saturated zinc-silver-lead crust, which, when worked up, gives fine silver. A third addition becomes necessary to remove the rest of the silver, when the lead will assay only 0·1 oz. silver per ton. As this complete desilverization is only possible by the use of an excess of zinc, the unsaturated zinc-silver-lead alloy is put aside to form part of the second zincking of the next following charge. In skimming the crust from the surface of the lead some unalloyed lead is also drawn off, and has to be separated by an additional operation (liquation), as, running lower in silver than the crust, it would otherwise reduce its silver content and increase the amount of lead to be cupelled. A zincking takes 5-6 hours; 1·5-2·5 % zinc is required for desilverizing. The liquated zinc-silver-lead crust contains 5-10 % silver, 30-40 % zinc and 65-50 % lead. Before it can be cupelled it has to be freed from most of the zinc, which is accomplished by distilling in a retort made of a mixture similar to that of the plumbago crucible. The retort is pear-shaped, and holds 1000-1500 ℔ of charge, consisting of liquated crust mixed with 1-3 % of charcoal. The condenser commonly used is an old retort. The distillation of 1000 ℔ charge lasts 5-6 hours, requires 500-600 ℔ coke or 30± gallons reduced oil, and yields about 10 % metallic zinc and 1 % blue powder—a mixture of finely-divided metallic zinc and zinc oxide. About 60 % of the zinc used in desilverizing is recovered in a form to be used again. One man serves 2-4 retorts. The desilverized lead, which retains 0·6-0·7 % zinc, has to be refined before it is suited for industrial use. The operation is carried on in a reverberatory furnace or in a kettle. In the reverberatory furnace, similar to the one used in softening, the lead is brought to a bright-red heat and air allowed to have free access. The zinc and some lead are oxidized; part of the zinc passes off with the fumes, part is dissolved by the litharge, forming a melted mixture which is skimmed off and reduced in a blast-furnace or a reverberatory smelting furnace. In the kettle covered with a hood the zinc is oxidized by means of dry steam, and incidentally some lead by the air which cannot be completely excluded. A yellowish powdery mixture of zinc and lead oxides collects on the lead; it is skimmed off and sold as paint. From the reverberatory furnace or the kettle the refined lead is siphoned off into a storage (market) kettle after it has cooled somewhat, and from this it is siphoned off into moulds placed in a semicircle on the floor. In the process the yield in metal, based upon the charge in the kettle, is lead 99 %, silver 100+ %, gold 98-100 %. The plus-silver is due to the fact that in assaying the base bullion by cupellation, the silver lost by volatilization and cupel-absorption is neglected. In the United States the cost of desilverizing a ton base bullion is about $6.

Properties of Lead.—Pure lead is a feebly lustrous bluish-white metal, endowed with a characteristically high degree of softness and plasticity, and almost entirely devoid of elasticity. Its breaking strain is very small: a wire $\frac{1}{10}$th in. thick is ruptured by a charge of about 30 ℔. The specific gravity is 11·352 for ingot, and from 11·354 to 11·365 for sheet lead (water of 4°C. = 1). The expansion of unit-length from 0° C. to 100° C. is ·002948 (Fizeau). The conductivity for heat (Wiedemann and Franz) or electricity is 8·5, that of silver being taken as 100. It melts at 327·7° C. (H. L. Callendar); at a bright-red heat it perceptibly vapourizes, and boils at a temperature between 1450° and 1600°. The specific heat is ·0314 (Regnault). Lead exposed to ordinary air is rapidly tarnished, but the thin dark film formed is very slow in increasing. When kept fused in the presence of air lead readily takes up oxygen, with the formation at first of a dark-coloured scum, and then of monoxide PbO, the rate of oxidation increasing with the temperature.

Water when absolutely pure has no action on lead, but in the presence of air the lead is quickly attacked, with formation of the hydrate, $Pb(OH)_2$, which is appreciably soluble in water forming an alkaline liquid. When carbonic acid is present the dissolved oxide is soon precipitated as basic carbonate, so that the corrosion of the lead becomes continuous. Since all soluble lead compounds are strong cumulative poisons, danger is involved in using lead cisterns or pipes in the distribution of *pure* waters. The word "pure" is emphasized because experience shows that the presence in a water of even small proportions of calcium bicarbonate or sulphate prevents its action on lead. All impurities do not act in a similar way. Ammonium nitrate and nitrite, for instance, intensify the action of a water on lead. Even pure waters, however, such as that of Loch Katrine (which forms the Glasgow supply), act so slowly, at least on such lead pipes as have already been in use for some time, that there is no danger in using short lead service pipes even for them, if the taps are being constantly used. Lead cisterns must be unhesitatingly condemned.

The presence of carbonic acid in a water does not affect its action on lead. Aqueous non-oxidizing acids generally have little or no action on lead in the absence of air. Dilute sulphuric acid (say an acid of 20% H_2SO_4 or less) has no action on lead even when air is present, nor on boiling. Strong acid does act, the more so the greater its concentration and the higher its temperature. Pure lead is far more readily corroded than a metal contaminated with 1% or even less of antimony or copper. Boiling concentrated sulphuric acid converts lead into sulphate, with evolution of sulphur dioxide. Dilute nitric acid readily dissolves the metal, with formation of nitrate $Pb(NO_3)_2$.

Lead Alloys.—Lead unites readily with almost all other metals; hence, and on account of its being used for the extraction of (for instance) silver, its alchemistic name of *saturnus.* Of the alloys the following may be named:—

With Antimony.—Lead contaminated with small proportions of antimony is more highly proof against sulphuric acid than the pure metal. An alloy of 83 parts of lead and 17 of antimony is used as type metal; other proportions are used, however, and other metals added besides antimony (*e.g.* tin, bismuth) to give the alloy certain properties.

Arsenic renders lead harder. An alloy made by addition of about $\frac{1}{56}$th of arsenic has been used for making shot.

Bismuth and Antimony.—An alloy consisting of 9 parts of lead, 2 of antimony and 2 of bismuth is used for stereotype plates.

Bismuth and Tin.—These triple alloys are noted for their low fusing points. An alloy of 5 of lead, 8 of bismuth and 3 of tin fuses at 94·4° C., *i.e.* below the boiling-point of water (Rose's metal). An alloy of 15 parts of bismuth, 8 of lead, 4 of tin and 3 of cadmium (Wood's alloy) melts below 70° C.

Tin unites with lead in any proportion with slight expansion, the alloy fusing at a lower temperature than either component. It is used largely for soldering.

"Pewter" (*q.v.*) may be said to be substantially an alloy of the same two metals, but small quantities of copper, antimony and zinc are frequently added.

Compounds of Lead.

Lead generally functions as a divalent element of distinctly metallic character, yielding a definite series of salts derived from the oxide PbO. At the same time, however, it forms a number of compounds in which it is most decidedly tetravalent; and thus it shows relations to carbon, silicon, germanium and tin.

Oxides.—Lead combines with oxygen to form five oxides, viz. Pb_2O, PbO, PbO_2, Pb_2O_3 and Pb_3O_4. The *suboxide*, Pb_2O, is the first product of the oxidation of lead, and is also obtained as a black powder by heating lead oxalate to 300° out of contact with air. It ignites when heated in air with the formation of the monoxide; dilute acids convert it into metallic lead and lead monoxide, the latter dissolving in the acid. The *monoxide*, PbO, occurs in nature as the mineral *lead ochre*. This oxide is produced by heating lead in contact with air and removing the film of oxide as formed. It is manufactured in two forms, known as "massicot" and "litharge." The former is produced at temperatures below, the latter at temperatures above the fusing-point of the oxide. The liquid litharge when allowed to cool solidifies into a hard stone-like mass, which, however, when left to itself, soon crumbles up into a heap of resplendent dark yellow scales known as "flake litharge." "Buff" or "levigated litharge" is prepared by grinding the larger pieces under water. Litharge is much used for the preparation of lead salts, for the manufacture of oil varnishes, of certain cements, and of lead plaster, and for other purposes. Massicot is the raw material for the manufacture of "red lead" or "minium."

Lead monoxide is dimorphous, occurring as cubical dodecahedra and as rhombic octahedra. Its specific gravity is about 9; it is sparingly soluble in water, but readily dissolves in acids and molten alkalis. A yellow and red modification have been described (*Zeit. anorg. Chem.*, 1906, 50, p. 265). The corresponding *hydrate*, $Pb(OH)_2$, is obtained as a white crystalline precipitate by adding ammonia to a solution of lead nitrate or acetate. It dissolves in an excess of alkali to form *plumbites* of the general formula $Pb(OM)_2$. It absorbs carbon dioxide from the air when moist. A hydrated oxide, $2PbO \cdot H_2O$, is obtained when a solution of the monoxide in potash is treated with carbon dioxide.

Lead dioxide, PbO_2, also known as "puce oxide," occurs in nature as the mineral plattnerite, and may be most conveniently prepared by heating mixed solutions of lead acetate and bleaching powder until the original precipitate blackens. The solution is filtered, the precipitate well washed, and, generally, is put up in the form of a paste in well-closed vessels. It is also obtained by passing chlorine into a suspension of lead oxide or carbonate, or of magnesia and lead sulphate, in water; or by treating the sesquioxide or red oxide with nitric acid. The formation of lead dioxide by the electrolysis of a lead solution, the anode being a lead plate coated with lead oxide or sulphate and the cathode a lead plate, is the fundamental principle of the storage cell (see ACCUMULATOR). Heating or exposure to sunlight reduces it to the red oxide; it fires when ground with sulphur, and oxidizes ammonia to nitric acid, with the simultaneous formation of ammonium nitrate. It oxidizes a manganese salt (free from chlorine) in the presence of nitric acid to a permanganate; this is a very delicate test for manganese. It forms crystallizable salts with potassium and calcium hydrates, and functions as a weak acid forming salts named plumbates. The Kassner process for the manufacture of oxygen depends upon the formation of calcium plumbate, Ca_2PbO_4, by heating a mixture of lime and litharge in a current of air, decomposing this substance into calcium carbonate and lead dioxide by heating in a current of carbon dioxide, and then decomposing these compounds with the evolution of carbon dioxide and oxygen by raising the temperature. *Plumbic acid*, $PbO(OH)_2$, is obtained as a bluish-black, lustrous body of electrolysing an alkaline solution of lead sodium tartrate.

Tetravalent Lead.—If a suspension of lead dichloride in hydrochloric acid be treated with chlorine gas, a solution of lead tetrachloride is obtained; by adding ammonium chloride ammonium plumbichloride, $(NH_4)_2PbCl_6$, is precipitated, which on treatment with strong sulphuric acid yields *lead tetrachloride*, $PbCl_4$, as a translucent, yellow, highly refractive liquid. It freezes at −15° to a yellowish crystalline mass; on heating it loses chlorine and forms lead dichloride. With water it forms a hydrate, and ultimately decomposes into lead dioxide and hydrochloric acid. It combines with alkaline chlorides—potassium, rubidium and caesium—to form crystalline *plumbichlorides*; it also forms a crystalline compound with quinoline. By dissolving red lead, Pb_3O_4, in glacial acetic acid and crystallizing the filtrate, colourless monoclinic prisms of lead tetracetate, $Pb(C_2H_3O_2)_4$, are obtained. This salt gives the corresponding chloride and fluoride with hydrochloric and hydrofluoric acids, and the phosphate, $Pb(HPO_4)_2$, with phosphoric acid.

These salts are like those of tin; and the resemblance to this metal is clearly enhanced by the study of the alkyl compounds. Here compounds of divalent lead have not yet been obtained; by acting with zinc ethide on lead chloride, *lead tetraethide*, $Pb(C_2H_3)_4$, is obtained, with the separation of metallic lead.

Lead sesquioxide, Pb_2O_3, is obtained as a reddish-yellow amorphous powder by carefully adding sodium hypochlorite to a cold potash solution of lead oxide, or by adding very dilute ammonia to a solution of red lead in acetic acid. It is decomposed by acids into a mixture of lead monoxide and dioxide, and may thus be regarded as lead metaplumbate; $PbPbO_3$. *Red lead* or *triplumbic tetroxide*, Pb_3O_4, is a scarlet crystalline powder of specific gravity 8·6-9·1, obtained by roasting very finely divided pure massicot or lead carbonate; the brightness of the colour depends in a great measure on the roasting. Pliny mentions it under the name of *minium*, but it was confused with cinnabar and the red arsenic sulphide; Dioscorides mentions its preparation from white lead or lead carbonate. On heating it assumes a finer colour, but then turns violet and finally black; regaining, however, its original colour on cooling. On ignition, it loses oxygen and forms litharge. Commercial red lead is frequently contaminated with this oxide, which may, however, be removed by repeated digestion with lead acetate. Its common adulterants are iron oxides, powdered barytes and brick dust. Acids decompose it into lead dioxide and monoxide, and the latter may or may not dissolve to form a salt; red lead may, therefore, be regarded as *lead orthoplumbate*, Pb_2PbO_4. It is chiefly used as a pigment and in the manufacture of flint glass.

Lead chloride, $PbCl_2$, occurs in nature as the mineral cotunnite, which crystallizes in the rhombic system, and is found in the neighbourhood of volcanic craters. It is artificially obtained by adding hydrochloric acid to a solution of lead salt, as a white precipitate, little soluble in cold water, less so in dilute hydrochloric acid, more so in the strong acid, and readily soluble in hot water, from which on cooling, the excess of dissolved salt separates out in silky rhombic needles. It melts at 485° and solidifies on cooling to a translucent, horn-like mass; an early name for it was *plumbum corneum*, horn lead. A basic chloride, $Pb(OH)Cl$, was introduced in 1849 by Pattinson as a substitute for white lead. Powdered galena is dissolved in hot hydrochloric acid, the solution allowed to cool and the deposit of impure lead chloride washed with cold water to remove iron and copper. The residue is then dissolved in hot water, filtered, and the clear solution is mixed with very thin milk of lime so adjusted that it takes out one-half of the chlorine of the $PbCl_2$. The oxychloride comes down as an amorphous white precipitate. Another oxychloride, $PbCl_2 \cdot 7PbO$, known as "Cassel yellow," was prepared by Vauquelin by fusing pure oxide, PbO, with one-tenth of its weight of sal ammoniac. "Turner's yellow" or "patent yellow" is another artificially prepared oxychloride, used as a pigment. Mendipite and matlockite are mineral oxychlorides.

Lead fluoride, PbF_2, is a white powder obtained by precipitating a lead salt with a soluble fluoride; it is sparingly soluble in water but readily dissolves in hydrochloric and nitric acids. A chlorofluoride, $PbClF$, is obtained by adding sodium fluoride to a solution of lead chloride. Lead bromide, $PbBr_2$, a white solid, and lead iodide, PbI_2, a yellow solid, are prepared by precipitating a lead salt with a soluble bromide or iodide; they resemble the chloride in solubility.

Lead carbonate, $PbCO_3$, occurs in nature as the mineral cerussite (*q.v.*). It is produced by the addition of a solution of lead salt to an excess of ammonium carbonate, as an almost insoluble white precipitate. Of greater practical importance is a basic carbonate, substantially $2PbCO_3 \cdot Pb(OH)_2$, largely used as a white pigment under the name of "white lead." This pigment is of great antiquity; Theophrastus called it *ψιμύθιον*, and prepared it by acting on lead with vinegar, and Pliny, who called it *cerussa*, obtained it by dissolving lead in vinegar and evaporating to dryness. It thus appears that white lead and sugar of lead were undifferentiated. Geber gave the preparation in a correct form, and T. O. Bergman proved its composition. This pigment is manufactured by several methods. In the old Dutch method, pieces of sheet lead are suspended in stoneware pots so as to occupy the upper two-thirds of the vessels. A little vinegar is poured into each pot; they are then covered with plates of sheet lead, buried in horse-dung or spent tanner's bark, and left to themselves for a considerable time. By the action of the acetic acid and atmospheric oxygen, the lead is converted superficially into a basic acetate, which is at once decomposed by the carbon dioxide, with formation of white lead and acetic acid, which latter then acts *de novo*. After a month or so the plates are converted to a more or less considerable depth into crusts of white lead. These are knocked off, ground up with water, freed from metal-particles by elutriation, and the paste of white lead is allowed to set and dry in small conical forms. The German method differs from the Dutch inasmuch as the lead is suspended in a large chamber heated by ordinary means, and there exposed to the simultaneous action of vapour of aqueous acetic acid and of carbon dioxide. Another process depends upon the formation of lead chloride by grinding together litharge with salt and water, and then treating the alkaline fluid with carbon dioxide until it is neutral. White lead is an earthy, amorphous powder. The inferior varieties of commercial "white lead" are produced by mixing the genuine article with more or less of finely powdered heavy spar or occasionally zinc-white (ZnO). Venetian white, Hamburg white and Dutch white are mixtures of one part of white lead with one, two and three parts of barium sulphate respectively.

Lead sulphide, PbS, occurs in nature as the mineral galena (*q.v.*), and constitutes the most valuable ore of lead. It may be artificially prepared by leading sulphur vapour over lead, by fusing litharge with sulphur, or, as a black precipitate, by passing sulphuretted hydrogen into a solution of a lead salt. It dissolves in strong nitric acid with the formation of the nitrate and sulphate, and also in hot concentrated hydrochloric acid.

Lead sulphate, $PbSO_4$, occurs in nature as the mineral anglesite (*q.v.*), and may be prepared by the addition of sulphuric acid to solutions of lead salts, as a white precipitate almost insoluble in water (1 in 21,739), less soluble still in dilute sulphuric acid (1 in 36,504) and insoluble in alcohol. Ammonium sulphide blackens it, and it is soluble in solution of ammonium acetate, which distinguishes it from barium sulphate. Strong sulphuric acid dissolves it, forming an acid salt, $Pb(HSO_4)_2$, which is hydrolysed by adding water, the normal sulphate being precipitated; hence the milkiness exhibited by samples of oil of vitriol on dilution.

Lead nitrate, $Pb(NO_3)_2$, is obtained by dissolving the metal or oxide in aqueous nitric acid; it forms white crystals, difficultly soluble in cold water, readily in hot water and almost insoluble in strong nitric acid. It was mentioned by Libavius, who named it *calx plumb dulcis*. It is decomposed by heat into oxide, nitrogen peroxide and oxygen; and is used for the manufacture of fusees and other deflagrating compounds, and also for preparing mordants in the dyeing and calico-printing industries. Basic nitrates, *e.g.* $Pb(NO_3)OH$, $Pb_3O(OH)_2(NO_3)_2$, $Pb_3O_2(OH)NO_3$, &c., have been described.

Lead Phosphates.—The normal ortho-phosphate, $Pb_3(PO_4)_2$, is a white precipitate obtained by adding sodium phosphate to lead acetate; the acid phosphate, $PbHPO_4$, is produced by precipitating a boiling solution of lead nitrate with phosphoric acid; the pyrophosphate and meta-phosphate are similar white precipitates.

Lead Borates.—By fusing litharge with boron trioxide, glasses of a composition varying with the proportions of the mixture are obtained; some of these are used in the manufacture of glass. The borate, $Pb_2B_6O_{11} \cdot 4H_2O$, is obtained as a white precipitate by adding borax to a lead salt; this on heating with strong ammonia gives $PbB_2O_4 \cdot H_2 \cdot O$, which, in turn, when boiled with a solution of boric acid, gives $PbB_4O_7 \cdot 4H_2O$.

Lead silicates are obtained as glasses by fusing litharge with silica; they play a considerable part in the manufacture of the lead glasses (see GLASS).

Lead chromate, $PbCrO_4$, is prepared industrially as a yellow pigment, chrome yellow, by precipitating sugar of lead solution with potassium bichromate. The beautiful yellow precipitate is little soluble in dilute nitric acid, but soluble in caustic potash. The vermilion-like pigment which occurs in commerce as "chrome-red" is a basic chromate, Pb_2CrO_5, prepared by treating recently precipitated normal chromate with a properly adjusted proportion of caustic soda, or by boiling it with normal (yellow) potassium chromate.

Lead acetate, $Pb(C_2H_3O_2)_2 \cdot 3H_2O$ (called "sugar" of lead, on account of its sweetish taste), is manufactured by dissolving massicot in aqueous acetic acid. It forms colourless transparent crystals, soluble in one and a half parts of cold water and in eight parts of alcohol, which on exposure to ordinary air become opaque through absorption of carbonic acid, which forms a crust of basic carbonate. An aqueous solution readily dissolves lead oxide, with formation of a strongly alkaline solution containing basic acetates (*Acetum Plumbi* or *Saturni*). When carbon dioxide is passed into this solution the whole of the added oxide, and even part of the oxide of the normal salt, is precipitated as a basic carbonate chemically similar, but not quite equivalent as a pigment, to white lead.

Analysis.—When mixed with sodium carbonate and heated on charcoal in the reducing flame lead salts yield malleable globules of metal and a yellow oxide-ring. Solutions of lead salts (colourless in the absence of coloured acids) are characterized by their behaviour to hydrochloric acid, sulphuric acid and potassium chromate. But the most delicate precipitant for lead is sulphuretted hydrogen, which produces a black precipitate of lead sulphide, insoluble in cold dilute nitric acid, less so in cold hydrochloric, and easily decomposed by hot hydrochloric acid with formation of the characteristic chloride. The atomic weight, determined by G. P. Baxter and J. H. Wilson (*J. Amer. Chem. Soc.*, 1908, 30, p. 187) by analysing the chloride, is 270·190 ($O=16$).

Pharmacology and Therapeutics.

The metal itself is not used in medicine. The chief pharmacopoeial salts are: (1) *Plumbi oxidum* (lead oxide), litharge. It is not used internally, but from it is made *Emplastrum Plumbi* (diachylon plaster), which is an oleate of lead and is contained in emplastrum hydrargeri, emplastrum plumbi iodidi, emplastrum resinae, emplastrum saponis. (2) *Plumbi Acetas* (sugar of lead), dose 1 to 5 grains. From this salt are made the following preparations: (*a*) *Pilula Plumbi cum Opio*, the strength of the opium in it being 1 in 8, dose 2 to 4 grains; (*b*) *Suppositoria Plumbi composita*, containing lead acetate, opium and oil of theobroma, there being one grain of opium in each suppository; (*c*) *Unguentum Plumbi Acetatis*; (*d*) *Liquor Plumbi Subacetatis Fortior*, Goulard's extract, strength 24% of the subacetate; this again has a sub-preparation, the *Liquor Plumbi Subacetatis Dilutis*, called Goulard's water or Goulard's lotion, containing 1 part in 80 of the strong extract; (*e*) *Glycerinum Plumbi Subacetatis*, from which is made the *Unguentum Glycerini Plumbi Subacetatis*. (3) *Plumbi Carbonas*, white lead, a mixture of the carbonate and the hydrate, a heavy white powder insoluble in water; it is not used internally, but from it is made *Unguentum Plumbi Carbonatis*, strength 1 in 10 parts of paraffin ointment. (4) *Plumbi Iodidium*, a heavy bright yellow powder not used internally. From it are made (*a*) *Emplastrum Plumbi Iodidi*, and (*b*) *Unguentum Plumbi Iodidi*. The strength of each is 1 in 10.

Applied externally lead salts have practically no action upon the unbroken skin, but applied to sores, ulcers or any exposed mucous membranes they coagulate the albumen in the tissues themselves and contract the small vessels. They are very astringent, haemostatic and sedative; the strong solution of the subacetate is powerfully caustic and is rarely used undiluted. Lead salts are applied as lotions in conditions where a sedative astringent effect is desired, as in weeping eczema; in many varieties of chronic ulceration; and as an injection for various inflammatory discharges from the vagina, ear and urethra, the Liquor Plumbi Subacetatis Dilutum being the one employed. The sedative effect of lead lotion in pruritus is well known. Internally lead has an astringent action on the mucous membranes, causing a sensation of dryness; the dilute solution of the subacetate forms an effective gargle in tonsillitis. The chief use of the preparations of lead, however, is as an astringent in acute diarrhoea, particularly if ulceration be present, when it is usefully given in combination with opium in the form of the Pilula Plumbi cum Opio. It is useful in haemorrhage from a gastric ulcer or in haemorrhage from the intestine. Lead salts usually produce constipation, and lead is an active ecbolic. Lead is said to enter the blood as an albuminate in which form it is deposited in the tissues. As a rule the soluble salts if taken in sufficient quantities produce acute poisoning, and the insoluble salts chronic plumbism. The symptoms of acute poisoning are pain and diarrhoea, owing to the setting up of an active gastro-enteritis, the foeces being black (due to the formation of a sulphide of lead), thirst, cramps in the legs and muscular twitchings, with torpor, collapse, convulsions and coma. The treatment is the prompt use of emetics, or the stomach should be washed out, and large doses of sodium or magnesium sulphate given in order to form an insoluble sulphate. Stimulants, warmth and opium may be required. For an account of chronic plumbism see LEAD POISONING.

AUTHORITIES.—For the history of lead see W. H. Pulsifer, *Notes for a History of Lead* (1888); B. Neumann, *Die Metalle* (1904); A. Rossing, *Geschichte der Metalle* (1901). For the chemistry see H. Roscoe and C. Schorlemmer, *Treatise on Inorganic Chemistry*, vol. ii. (1897); H. Moissan, *Traité de chimie minerale*; O. Dammer, *Handbuch der anorganischen Chemie*. For the metallurgy see J. Percy, *The Metallurgy of Lead* (London, 1870); H. F. Collins, *The Metallurgy of Lead and Silver* (London, 1899), part i. "Lead"; H. O. Hofmann, *The Metallurgy of Lead* (6th ed., New York, 1901); W. R. Ingalls, *Lead Smelting and Refining* (1906); A. G. Betts, *Lead Refining by Electrolysis* (1908); M. Eissler, *The Metallurgy of Argentiferous Silver*. *The Mineral Industry*, begun in 1892, annually records the progress made in lead smelting.

LEADER, BENJAMIN WILLIAMS (1831–), English painter, the son of E. Leader Williams, an engineer, received his art education first at the Worcester School of Design and later in the schools of the Royal Academy. He began to exhibit at the Academy in 1854, was elected A.R.A. in 1883 and R.A. in 1898, and became exceedingly popular as a painter of landscape. His subjects are attractive and skilfully composed. He was awarded a gold medal at the Paris Exhibition in 1889, and was made a knight of the Legion of Honour. One of his pictures, "The Valley of the Llugwy," is in the National Gallery of British Art.

See *The Life and Work of B. W. Leader, R.A.*, by Lewis Lusk, *Art Journal* Office (1901).

LEADHILLITE, a rare mineral consisting of basic lead sulphatocarbonate, $Pb_4SO_4(CO_3)_2(OH)_2$. Crystals have usually the form of six-sided plates (fig. 1) or sometimes of acute rhombohedra (fig. 2); they have a perfect basal cleavage (parallel to P in fig. 1) on which the lustre is strongly pearly; they are usually white and translucent. The hardness is 2·5 and the sp. gr. 6·26-6·44. The crystallographic and optical characters point to the existence of three distinct kinds of leadhillite, which are, however, identical in external appearance and may even occur intergrown together in the same crystal: (*a*) monoclinic with an optic axial angle of 20°; (*b*) rhombohedral (fig. 2) and optically uniaxial; (*c*) orthorhombic (fig. 1) with an optic axial angle of 72¾°. The first of these is the more common kind, and the second has long been known under the name susannite. The fact that the published analyses of leadhillite vary somewhat from the formula given above suggests that these three kinds may also be chemically distinct.

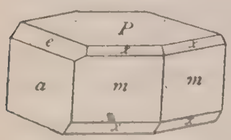


FIG. 1.

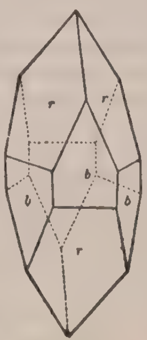


FIG. 2.

Leadhillite is a mineral of secondary origin, occurring with cerussite, anglesite, &c., in the oxidized portions of lead-bearing lodes; it has also been found in weathered lead slags left by the Romans. It has been found most abundantly in the Susanna mine at Leadhills in Scotland (hence the names leadhillite and susannite). Good crystals have also been found at Red Gill in Cumberland and at Granby in Missouri. Crystals from Sardinia have been called maxite. (L. J. S.)

LEADHILLS, a village of Lanarkshire, Scotland, 5¾ m. W.S.W. of Elvanfoot station on the Caledonian Railway Company's main line from Glasgow to the south. Pop. (1901) 835. It is the highest village in Scotland, lying 1301 ft. above sea-level, near the source of Glengonner Water, an affluent of the Clyde. It is served by a light railway. Lead and silver have been mined here and at Wanlockhead, 1½ m. S.W., for many centuries —according to some authorities even in Roman days. Gold was discovered in the reign of James IV., but though it is said then to have provided employment for 300 persons, its mining has long ceased to be profitable. The village is neat and well built, and contains a masonic hall and library, the latter founded by the miners about the middle of the 18th century. Allan Ramsay, the poet, and William Symington (1763–1831), one of the earliest adaptors of the steam engine to the purposes of navigation, were born at Leadhills.

LEAD POISONING, or PLUMBISM, a "disease of occupations," which is itself the cause of organic disease, particularly of the nervous and urinary systems. The workpeople affected are principally those engaged in potteries where lead-glaze is used; but other industries in which health is similarly affected are file-making, house-painting and glazing, glass-making, copper-working, coach-making, plumbing and gasfitting, printing, cutlery, and generally those occupations in which lead is concerned.

The symptoms of chronic lead poisoning vary within very wide limits, from colic and constipation up to total blindness, paralysis, convulsions and death. They are thus described by Dr J. T. Arlidge (*Diseases of Occupations*):—

> The poison finds its way gradually into the whole mass of the circulating blood, and exerts its effects mainly on the nervous system, paralysing nerve-force and with it muscular power. Its victims become of a sallow-waxy hue; the functions of the stomach and bowels are deranged, appetite fails and painful colic with constipation supervenes. The loss of power is generally shown first in the fingers, hands and wrists, and the condition known as "wrist-drop" soon follows, rendering the victim useless for work. The palsy will extend to the shoulders, and after no long time to the legs also. Other organs frequently involved are the kidneys, the tissue of which becomes permanently damaged; whilst the sight is weakened or even lost.

Dr M'Aldowie, senior physician to the North Staffordshire Infirmary, has stated that "in the pottery trade lead is very slow in producing serious effects compared with certain other industries." In his experience the average period of working in lead before serious lesions manifest themselves is 18 years for females and 22½ years for males. But some individuals fall victims to the worst forms of plumbism after a few months' or even weeks' exposure to the danger. Young persons are more readily affected than those of mature age, and women more than men. In addition, there seems to be an element of personal susceptibility, the nature of which is not understood. Some persons "work in the lead" for twenty, forty or fifty years without the slightest ill effects; others have attacks whenever they are brought into contact with it. Possibly the difference is due to the general state of health; robust persons resist the poison successfully, those with impoverished blood and feeble constitution are mastered by it. Lead enters the body chiefly through the nose and mouth, being inspired in the form of dust or swallowed with food eaten with unwashed hands. It is very apt to get under the nails, and is possibly absorbed in this way through the skin. Personal care and cleanliness are therefore of the greatest importance. A factory surgeon of great experience in the English Potteries has stated that seventeen out of twenty cases of lead-poisoning in the china and earthenware industry are due to carelessness (*The Times*, 8th October 1898).

The Home Office in England has from time to time made special rules for workshops and workpeople, with the object of minimizing or preventing the occurrence of lead-poisoning; and in 1895 notification of cases was made compulsory. The health of workpeople in the Potteries was the subject of a special inquiry by a scientific committee in 1893. The committee stated that "the general truth that the potteries occupation is one fraught with injury to health and life is beyond dispute," and that "the ill effects of the trade are referable to two chief causes—namely, dust and the poison of lead." Of these the inhalation of clay and flint dust was the more important. It led to bronchitis, pulmonary tuberculosis and pneumonia, which were the most prevalent disorders among potters, and responsible for 70% of the mortality. That from lead the committee did not attempt to estimate, but they found that plumbism was less prevalent than in past times, and expressed the opinion "that a large part of the mortality from lead poisoning is avoidable; although it must always be borne in mind that no arrangements or rules, with regard to the work itself, can entirely obviate the effects of the poison to which workers are exposed, because so much depends upon the individual and the observance of personal care and cleanliness." They recommended the adoption of certain special rules in the workshops, with the objects of protecting young persons from the lead, of minimizing the evils of dust, and of promoting cleanliness, particularly in regard to meals. Some of these recommendations were adopted and applied with good results. With regard to the suggestion that "only leadless glazes should be used on earthenware," they did not "see any immediate prospect of such glazes becoming universally applicable to pottery manufacture," and therefore turned their attention to the question of "fritting" the lead.

It may be explained that lead is used in china and earthenware to give the external glaze which renders the naturally porous ware watertight. Both "white" and "red" lead are used. The lead is added to other ingredients, which have been "fritted" or fused together and then ground very fine in water, making a thick creamy liquid into which the articles are dipped. After dipping the glaze dries quickly, and on being "fired" in the kiln it becomes fused by the heat into the familiar glassy surface. In the manufacture of ware with enamelled colours, glaze is mixed with the pigment to form a flux, and such colours are used either moist or in the form of a dry powder. "Fritting" the lead means mixing it with the other ingredients of the glaze beforehand and fusing them all together under great heat into a kind of rough glass, which is then ground to make the glaze. Treated in this way the lead combines with the other ingredients and becomes less soluble, and therefore less dangerous, than when added afterwards in the raw state. The committee (1893) thought it "reasonable to suppose that the fritting of lead might ultimately be found universally practicable," but declared that though fritting "no doubt diminishes the danger of lead-poisoning," they "could not regard all fritts as equally innocuous."

In the annual report of the chief inspector of factories for 1897, it was stated that there had been "material improvement in dust conditions" in the potting industry, but "of lead-poisoning unfortunately the same could not be said, the number of grave cases reported, and particularly cases of blindness, having ominously increased of late." This appears to have been largely due to the erroneous inclusion among potting processes of "litho-transfer making," a colour industry in which girls are employed. New special rules were imposed in 1899 prohibiting the employment of persons under fifteen in the dangerous processes, ordering a monthly examination of all women and young persons working in lead by the certifying surgeon, with power to suspend those showing symptoms of poisoning, and providing for the more effectual removal of dust and the better enforcement of cleanliness. At the same time a scientific inquiry was ordered into the practicability of dispensing with lead in glazes or of substituting fritted compounds for the raw carbonate. The scientific experts reported in 1899, recommending that the use of raw lead should be absolutely prohibited, and expressing the opinion that the greater amount of earthenware could be successfully glazed without any lead. These views were in advance of the opinions held by practical potters, and met with a good deal of opposition. By certain manufacturers considerable progress had been made in diminishing the use of raw lead and towards the discovery of satisfactory leadless glazes; but it is a long step from individual experiments to the wholesale compulsory revolution of the processes of manufacture in so large and varied an industry, and in the face of foreign competitors hampered by no such regulations. The materials used by each manufacturer have been arrived at by a long process of experience, and they are such as to suit the particular goods he supplies for his particular market. It is therefore difficult to apply a uniform rule without jeopardizing the prosperity of the industry, which supports a population of 250,000 in the Potteries alone. However, the bulk of the manufacturers agreed to give up the use of raw lead, and to fritt all their glazes in future, time being allowed to effect the change of process; but they declined to be bound to any particular composition of glaze for the reasons indicated.

In 1901 the Home Office brought forward a new set of special rules. Most of these were framed to strengthen the provisions for securing cleanliness, removing dust, &c., and were accepted with a few modifications. But the question of making even more stringent regulations, even to the extent of making the use of lead-glaze illegal altogether, was still agitated; and in 1906 the Home Office again appointed an expert committee to reinvestigate the subject. They reported in 1910, and made various recommendations in detail for strengthening the existing regulations; but while encouraging the use of leadless glaze in certain sorts of common ceramic ware, they pointed out that, without the use of lead, certain other sorts could either not be made at all or only at a cost or sacrifice of quality which would entail the loss of important markets.

In 1908 Dr Collis made an inquiry into the increase of plumbism in connexion with the smelting of metals, and he considered the increase in the cases of poisoning reported to be due to the third schedule of the Workmen's Compensation Act, (1) by causing the prevalence of pre-existing plumbism to come to light, (2) by the tendency this fostered to replace men suspected of lead impregnation by new hands amongst whom the incidence is necessarily greater.

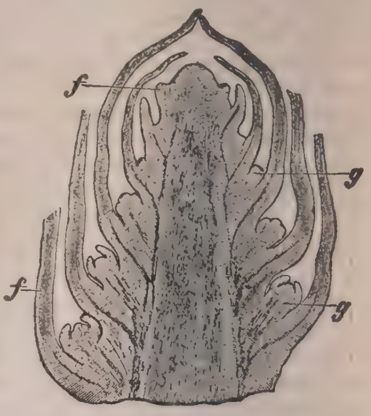
LEADVILLE, a city and the county seat of Lake county, Colorado, U.S.A., one of the highest (mean elevation *c.* 10,150 ft.) and most celebrated mining "camps" of the world. Pop. (1900) 12,455, of whom 3802 were foreign-born; (1910 census) 7508. It is served by the Denver & Rio Grande, the Colorado & Southern and the Colorado Midland railways. It lies amid towering mountains on a terrace of the western flank of the Mosquito Range at the head of the valley of the Arkansas river, where the river cuts the valley between the Mosquito and the Sawatch (Saguache) ranges. Among the peaks in the immediate environs are Mt. Massive (14,424 ft., the highest in the state) and Elbert Peak (14,421 ft.). There is a United States fish hatchery at the foot of Mt. Massive. In the spring of 1860 placer gold was discovered in California Gulch, and by July 1860 Oro City had probably 10,000 inhabitants. In five years the total yield was more than $5,000,000; then it diminished, and Oro City shrank to a few hundred inhabitants. This settlement was within the present limits of Leadville. In 1876 the output of the mines was about $20,000. During sixteen years "heavy sands" and great boulders that obstructed the placer fields had been moved thoughtlessly to one side. These boulders were from enormous lead carbonate deposits extremely rich in silver. The discovery of these deposits was made on the hills at the edge of Leadville. The first building was erected in June 1877; in December there were several hundred miners, in January the town was organized and named; at the end of 1879 there were, it is said, 35,000 inhabitants. Leadville was already a chartered city, with the usual organization and all public facilities. In 1880 it was reached by the Denver & Rio Grande railway. In early years Leadville was one of the most turbulent, picturesque and in all ways extraordinary, of the mining camps of the West. The value of the output from 1879 to 1889 totalled $147,834,186, including one-fifth of the silver production and a third of the lead consumption of the country. The decline in the price of silver, culminating with the closing of the India mints and the repeal of the Sherman Law in 1893, threatened Leadville's future. But the source of the gold of the old placers was found in 1892. From that year to 1899 the gold product rose from $262,692 to $2,183,332. From 1879 to 1900 the camp yielded $250,000,000 (as compared with $48,000,000 of gold and silver in five years from the Comstock, Nevada, lode; and $60,000,000 and 225,000 tons of lead, in fourteen years, from the Eureka, Nevada, mines). Before 1898 the production of zinc was unimportant, but in 1906 it was more valuable than that of silver and gold combined. This increased output is a result of the establishment of concentrating mills, in which the zinc content is raised from 18 or 20% in the raw ores to 25 or 45% in the concentrates. In 1904, per ton of Lake county ore, zinc was valued at $6.93, silver at $4.16, lead at $3.85, gold at $1.77 and copper at $.66. The copper mined at Leadville amounted to about one-third the total mined in the state in 1906. Iron and manganese have been produced here, and in 1906 Leadville was the only place in the United States known to have produced bismuth. There were two famous labour strikes in the "diggings" in 1879 and 1896. The latter attracted national attention; it lasted from the 19th of June 1896 to the 9th of March 1897, when the miners, being practically starved out, declared the strike off. There had been a riot on the 21st of September 1896 and militia guarded the mines for months afterwards. In January 1897 the mines on Carbonate Hill were flooded after the removal of their pumps. This strike closed many mines, which were not opened for several years. Leadville stocks are never on the exchange, and "flotation" and "promotion" have been almost unknown.

The ores of the Leadville District occur in a blue limestone formation overlaid by porphyry, and are in the form of heavy sulphides, containing copper, gold, silver, lead and zinc; oxides containing iron, manganese and small amounts of silver and lead; and siliceous ores, containing much silver and a little lead and gold. The best grade of ores usually consists of a mixture of sulphides, with some native gold. Nowhere have more wonderful advances in mining been apparent—in the size and character of furnaces and pumps; the development of local smelter supplies; the fall in the cost of coal, of explosives and other mine supplies; the development of railways and diminution of freight expenses; and the general improvement of economic and scientific methods—than at Leadville since 1880. The increase of output more than doubled from 1890 to 1900, and many ores once far too low in grade for working now yield sure profits. The Leadville smelters in 1900 had a capacity of 35,000 tons monthly; about as much more local ore being treated at Denver, Pueblo and other places.

See S. F. Emmons, *Geology and Mining Industry of Leadville, Colorado*, monograph United States Geological Survey, vol. 12 (1886), and with J. D. Irving, *The Downtown District of Leadville, Colorado*, Bulletin 320, United States Geological Survey (1907), particularly for the discussion of the origin of the ores of the region.

LEAF (O. Eng. *lêaf*, cf. Dutch *loof*, Ger. *Laub*, Swed. *löf*, &c.; possibly to be referred to the root seen in Gr. λέπειν, to peel, strip), the name given in popular language to all the green expanded organs borne upon an axis, and so applied to similar objects, such as a thin sheet of metal, a hinged flap of a table, the page of a book, &c. Investigation has shown that many other parts of a plant which externally appear very different from ordinary leaves are, in their essential particulars, very similar to them, and are in fact their morphological equivalents. Such are the scales of a bulb, and the various parts of the flower, and assuming that the structure ordinarily termed a leaf is the typical form, these other structures were designated changed or metamorphosed leaves, a somewhat misleading interpretation. All structures morphologically equivalent with the leaf are now included under the general term *phyllome* (leaf-structure).

Leaves are produced as lateral outgrowths of the stem in definite succession below the apex. This character, common to all leaves, distinguishes them from other organs. In the higher plants we can easily recognize the distinction between stem and leaf. Amongst the lower plants, however, it is found that a demarcation into stem and leaf is impossible, but that there is a structure which partakes of the characters of both—such is a *thallus*. The leaves always arise from the outer portion of the primary meristem of the plant, and the tissues of the leaf are continuous with those of the stem. Every leaf originates as a simple cellular papilla (fig 1), which consists of a development from the cortical layers covered by epidermis; and as growth proceeds, the fibro-vascular bundles of the stem are continued outwards, and finally expand and terminate in the leaf. The increase in length of the leaf by growth at the apex is usually of a limited nature. In some ferns, however, there seems to be a provision for indefinite terminal growth, while in others this growth is periodically interrupted. It not unfrequently happens, especially amongst Monocotyledons, that after growth at the apex has ceased, it is continued at the base of the leaf, and in this way the length may be much increased. Amongst Dicotyledons this is very rare. In all cases the dimensions of the leaf are enlarged by interstitial growth of its parts.



From Strasburger's *Lehrbuch der Botanik* by permission of Gustav Fischer.

Fig. 1.—Apex of a shoot showing origin of leaves: *f*, leaf rudiment; *g*, rudiment of an axillary bud.

Structure of leaves.

The simplest leaf is found in some mosses, where it consists of a single layer of cells. The typical foliage leaf consists of several layers, and amongst vascular plants is distinguishable into an outer layer (*epidermis*) and a central tissue (*parenchyma*) with fibro-vascular bundles distributed through it.

The *epidermis* (fig. 2, *es*, *ei*), composed of cells more or less compressed, has usually a different structure and aspect on the two surfaces of the leaf. The cells of the epidermis are very closely united laterally and contain no green colouring matter (chlorophyll) except in the pair of cells—guard-cells—which bound the stomata. The outer wall, especially of the upper epidermis, has a tough outer layer or cuticle which renders it impervious to water. The epidermis is continuous except where stomata or spaces bounded by specialized cells communicate with intercellular spaces in the interior of the leaf. It is chiefly on the epidermis of the lower surface (fig. 2, *ei*) that stomata, *st*, are produced, and it is there also that hairs, *p*, usually occur. The lower epidermis is often of a dull or pale-green colour, soft and easily detached. The upper epidermis is frequently smooth and shining, and sometimes becomes very hard and dense. Many tropical plants present on the upper surface of their leaves several layers of compressed cells beneath the epidermis which serve for storage of water and are known as aqueous tissue. In leaves which float upon the surface of the water, as those of the water-lily, the upper epidermis alone possesses stomata.

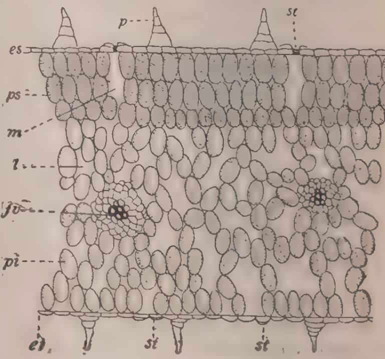


Fig. 2.—Section of a Melon leaf, perpendicular to the surface.

es, Upper epidermis.
ei, Lower epidermis.
p, Hairs.
st, Stomata.
ps, Upper (palisade) layers of parenchymatous cells.
pi, Lower (spongy) layers of parenchymatous cells.
m, Air-spaces connected with stomata.
l, Air-spaces between the loose cells in the spongy parenchyma.
fv, Bundles of fibro-vascular tissue.

The *parenchyma* of the leaf is the cellular tissue enclosed within the epidermis and surrounding the vessels (fig. 2, *ps*, *pi*). It is known as *mesophyll*, and is formed of two distinct series of cells, each containing the green chlorophyll-granules, but differing in form and arrangement. Below the epidermis of the upper side of the leaf there are one or two layers of cells, elongated at right angles to the leaf surface (fig. 2, *ps*), and applied so closely to each other as to leave only small intercellular spaces, except where stomata happen to be present (fig. 2, *m*); they form the palisade tissue. On the other side of the leaf the cells are irregular, often branched, and are arranged more or less horizontally (fig. 2, *pi*), leaving air-spaces between them, *l*, which communicate with stomata; on this account the tissue has received the name of spongy. In leaves having a very firm texture, as those of Coniferae and Cycadaceae, the cells of the parenchyma immediately beneath the epidermis are very much thickened and elongated in a direction parallel to the surface of the leaf, so as to be fibre-like. These constitute a hypodermal layer, beneath which the chlorophyll cells of the parenchyma are densely packed together, and are elongated in a direction vertical to the surface of the leaf, forming the palisade tissue. The form and arrangement of the cells, however, depend much on the nature of the plant, and its exposure to light and air. Sometimes the arrangement of the cells on both sides of the leaf is similar, as occurs in leaves which have their edges presented to the sky. In very succulent plants the cells form a compact mass, and those in the centre are often colourless. In some cases the cellular tissue is deficient at certain points, giving rise to distinct holes in the leaf, as in *Monstera Adansonii.* The fibro-vascular system in the leaf constitutes the *venation.* The fibro-vascular bundles from the stem bend out into the leaf, and are there arranged in a definite manner. In *skeleton leaves*, or leaves in which the parenchyma is removed, this arrangement is well seen. In some leaves, as in the barberry, the veins are hardened, producing spines without any parenchyma. The hardening of the extremities of the fibro-vascular tissue is the cause of the spiny margin of many leaves, such as the holly, of the sharp-pointed leaves of madder, and of mucronate leaves, or those having a blunt end with a hard projection in the centre.

The form and arrangement of the parts of a typical foliage leaf are intimately associated with the part played by the leaf in the life of the plant. The flat surface is spread to allow the maximum amount of sunlight to fall upon it, as it is by the absorption of energy from the sun's rays by means of the chlorophyll contained in the cells of the leaf that the building up of plant food is rendered possible; this process is known as photo-synthesis; the first stage is the combination of carbon dioxide, absorbed from the air taken in through the stomata into the living cells of the leaf, with water which is brought into the leaf by the wood-vessels. The wood-vessels form part of the fibro-vascular bundles or veins of the leaf and are continuous throughout the leaf-stalk and stem with the root by which water is absorbed from the soil. The palisade layers of the mesophyll contain the larger number of chlorophyll grains (or corpuscles) while the absorption of carbon dioxide is carried on chiefly through the lower epidermis which is generally much richer in stomata. The water taken up by the root from the soil contains nitrogenous and mineral salts which combine with the first product of photo-synthesis—a carbohydrate—to form more complicated nitrogen-containing food substances of a proteid nature; these are then distributed by other elements of the vascular bundles (the *phloem*) through the leaf to the stem and so throughout the plant to wherever growth or development is going on. A large proportion of the water which ascends to the leaf acts merely as a carrier for the other raw food materials and is got rid of from the leaf in the form of water vapour through the stomata—this process is known as *transpiration.* Hence the extended surface of the leaf exposing a large area to light and air is eminently adapted for the carrying out of the process of photo-synthesis and transpiration. The arrangement of the leaves on the stem and branches (see *Phyllotaxy*, below) is such as to prevent the upper leaves shading the lower, and the shape of the leaf serves towards the same end—the disposition of leaves on a branch or stem is often seen to form a "mosaic," each leaf fitting into the space between neighbouring leaves and the branch on which they are borne without overlapping.

Submerged leaves, or leaves which are developed under water, differ in structure from aerial leaves. They have usually no fibro-vascular system, but consist of a congeries of cells, which sometimes become elongated and compressed so as to resemble veins. They have a layer of compact cells on their surface, but no true epidermis, and no stomata. Their internal structure consists of cells, disposed irregularly, and sometimes leaving spaces which are filled with air for the purpose of floating the leaf. When exposed to the air these leaves easily part with their moisture, and become shrivelled and dry. In some cases there is only a network of filament-like cells, the spaces between which are not filled with parenchyma, giving a skeleton appearance to the leaf, as in *Ouvirandra fenestralis* (Lattice plant).

A leaf, whether aerial or submerged, generally consists of a flat expanded portion, called the *blade*, or *lamina*, of a narrower portion called the *petiole* or *stalk*, and sometimes of a portion at the base of the petiole, which forms a *sheath* or *vagina* (fig. 5, *s*), or is developed in the form of outgrowths, called *stipules* (fig. 24, *s*). All these portions are not always present. The sheathing or stipulary portion is frequently wanting. When a leaf has a distinct stalk it is *petiolate*; when it has none, it is *sessile*, and if in this case it embraces the stem it is said to be *amplexicaul.* The part of the leaf next the petiole or the axis is the *base*, while the opposite extremity is the *apex.* The leaf is usually flattened and expanded horizontally, *i.e.* at right angles to the longitudinal axis of the shoot, so that the upper face is directed towards the heavens, and the lower towards the earth. In some cases leaves, as in Iris, or leaf-like petioles, as in Australian acacias and eucalypti, have their plane of expansion parallel to the axis of the shoot, there is then no distinction into an upper and a lower face, but the two sides are developed alike; or the leaf may have a cylindrical or polyhedral form, as in mesembryanthemum. The upper angle formed between the leaf and the stem is called its *axil*; it is there that leaf-buds are normally developed. The leaf is sometimes articulated with the stem, and when it falls off a *scar* remains; at other times it is continuous with it, and then decays, while still attached to the axis. In their early state all leaves are continuous with the stem, and it is only in their after growth that articulations are formed. When leaves fall off annually they are called *deciduous*; when they remain for two or more years they are *persistent*, and the plant is *evergreen.* The laminar portion of a leaf is occasionally articulated with the petiole, as in the orange, and a joint at times exists between the vaginal or stipulary portion and the petiole.

Venation.

The arrangement of the fibro-vascular system in the lamina constitutes the *venation* or *nervation.* In an ordinary leaf, as that of the elm, there is observed a large central vein running from the base to the apex of the leaf, this is the *midrib* (fig. 3); it gives off veins laterally (*primary veins*). A leaf with only a single midrib is said to be *unicostate* and the venation is described as pinnate or feather-veined. In some cases, as sycamore or castor oil (fig. 4), in place of there being only a single midrib there are several large veins (*ribs*) of nearly equal size, which diverge from the point where the blade joins the petiole or stem, giving off lateral veins. The leaf in this case is *multicostate* and the venation palmate. The primary veins give off secondary veins, and these in their turn give off tertiary veins, and so on until a complete network of vessels is produced, and those veins usually project on the under surface of the leaf. To a distribution of veins such as this the name of *reticulated* or *netted* venation has been applied. In the leaves of some plants there exists a midrib with large veins running nearly parallel to it from the base to the apex of the lamina, as in grasses (fig. 5); or with veins diverging from the base of the lamina in more or less

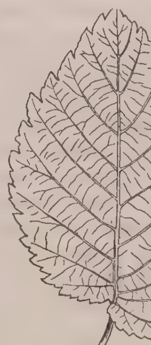


FIG. 3.—Leaf of Elm (*Ulmus*). Reticulated venation; primary veins going to the margin, which is serrated. Leaf unequal at the base.

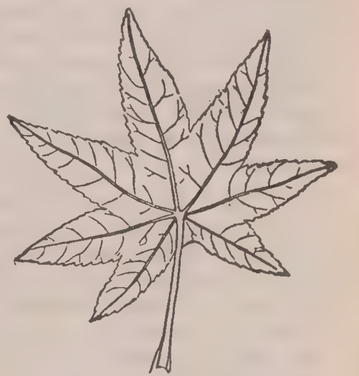


FIG. 4.—Multicostate leaf of Castor-oil plant (*Ricinus communis*). It is palmately-cleft, and exhibits seven lobes at the margin. The petiole is inserted a little above the base, and hence the leaf is called peltate or shield-like.

parallel lines, as in fan palms (fig. 6), or with veins coming off from it throughout its whole course, and running parallel to each other in a straight or curved direction towards the margin of the leaf, as in plantain and banana. In these cases the veins are often united by cross veinlets, which do not, however, form an angular network. Such leaves are said to be *parallel-veined*. The leaves of Monocotyledons have generally this kind of venation, while reticulated venation most usually occurs amongst Dicotyledons. Some plants, which in most points of their structure are monocotyledonous, yet have reticulated venation; as in *Smilax* and *Dioscorea*. In vascular acotyledonous plants there is frequently a tendency to fork exhibited by the fibro-vascular bundles in the leaf; and when this is the case we have *fork-veined* leaves. This is well seen in many ferns. The distribution of the system of vessels in the leaf is usually easily traced, but in the case of succulent plants, as *Hoya*, agave, stonecrop and mesembryanthemum, the veins are obscure. The function of the veins which consist of vessels and fibres is to form a rigid framework for the leaf and to conduct liquids.

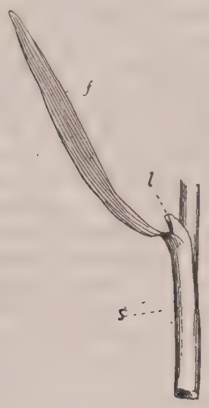


FIG. 5.—Stem of a Grass (*Poa*) with leaf. The sheaths ending in a process *l*, called a ligule; the blade of the leaf, *f*.

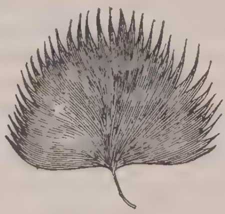


FIG. 6.—Leaf of a Fan Palm (*Chamaerops*), showing the veins running from the base to the margin, and not forming an angular network.

In all plants, except Thallophytes, leaves are present at some period of their existence. In *Cuscuta* (Dodder) (*q.v.*), however, we have an exception. The forms assumed by leaves vary much, not only in different plants, but in the same plant. It is only amongst the lower classes of plants—Mosses, Characeae, &c.—that all the leaves on a plant are similar. As we pass up the scale of plant life we find them becoming more and more variable. The structures in ordinary language designated as leaves are considered so *par excellence*, and they are frequently spoken of as *foliage leaves*. In relation to their production on the stem we may observe that when they are small they are always produced in great number, and as they increase in size their number diminishes correspondingly. The cellular process from the axis which develops into a leaf is simple and undivided; it rarely remains so, but in progress of growth becomes segmented in various ways, either longitudinally or laterally, or in both ways. By longitudinal segmentation we have a leaf formed consisting of sheath, stalk and blade; or one or other of these may be absent, and thus stalked, sessile, sheathing, &c., leaves are produced. Lateral segmentation affects the lamina, producing indentations, lobings or fissuring of its margins. In this way two marked forms of leaf are produced—(1) *Simple* form, in which the segmentation, however deeply it extends into the lamina, does not separate portions of the lamina which become articulated with the midrib or petiole; and (2) *Compound* form, where portions of the lamina are separated as detached *leaflets*, which become articulated with the midrib or petiole. In both simple and compound leaves, according to the amount of segmentation and the mode of development of the parenchyma and direction of the fibro-vascular bundles, many forms are produced.

Simple leaves.

Simple Leaves.—When the parenchyma is developed symmetrically on each side of the midrib or stalk, the leaf is *equal*; if otherwise, the leaf is *unequal* or *oblique* (fig. 3). If the margins are even and present no divisions, the leaf is *entire* (fig. 7); if there are slight projections which are more or less pointed, the leaf is *dentate* or toothed; when the projections lie regularly over each other, like the teeth of a saw, the leaf is *serrate* (fig. 3); when they are rounded the leaf is *crenate*. If the divisions extend more deeply into the lamina than the margin, the leaf receives different names according to the nature of the segments; thus, when the divisions extend about half-way down (fig. 8), it is *cleft*; when the divisions extend nearly to the base or to the midrib the leaf is *partite*.

If these divisions take place in a simple *feather-veined* leaf it becomes either *pinnatifid* (fig. 9), when the segments extend to about the middle, or *pinnatipartite*, when the divisions extend nearly to the midrib. These primary divisions may be again subdivided in a similar manner, and thus a feather-veined leaf will become *bipinnatifid* or *bipinnatipartite*; still further subdivisions give origin to *tripinnatifid* and *laciniated* leaves. The same kinds of divisions taking place in a simple leaf with palmate or *radiating* venation, give origin to *lobed*, *cleft* and *partite* forms. The name *palmate* or *palmatifid* (fig. 4) is the general term applied to leaves with radiating venation, in which there are several lobes united by a broad expansion of parenchyma, like the palm of the hand, as in the sycamore, castor-oil plant, &c. The divisions of leaves with radiating venation may extend to near the base of the leaf, and the names *bipartite*, *tripartite*, *quinquepartite*, &c., are given according as the partitions are two, three, five or more. The term *dissected* is applied to leaves with radiating venation, having numerous narrow divisions, as in *Geranium dissectum*.

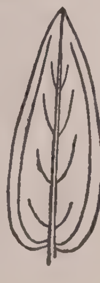


FIG. 7.

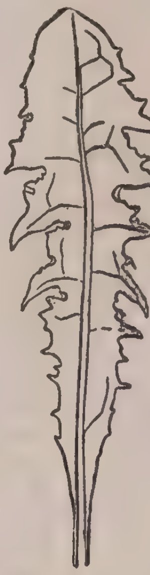


FIG. 8.

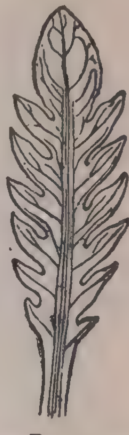


FIG. 9.

FIG. 7.—Ovate acute leaf of *Coriara myrtifolia*. Besides the midrib there are two intra-marginal ribs which converge to the apex. The leaf is therefore tricostate.

FIG. 8.—Runcinate leaf of Dandelion. It is a pinnatifid leaf, with the divisions pointing towards the petiole and a large triangular apex.

FIG. 9.—Pinnatifid leaf of *Valeriana dioica*.

When in a radiating leaf there are three primary partitions, and the two lateral lobes are again cleft, as in hellebore (fig. 11), the leaf is called *pedate* or *pedatifid*, from a fancied resemblance to the claw of a bird. In all the instances already alluded to the leaves have been considered as flat expansions, in which the ribs or veins spread out on the same plane with the stalk. In some cases, however, the veins spread at right angles to the stalk, forming a *peltate* leaf as in Indian cress (fig. 12).

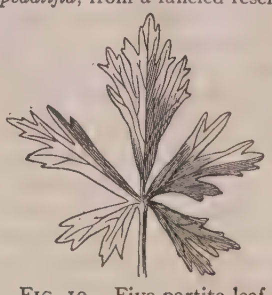


FIG. 10.—Five-partite leaf of Aconite.

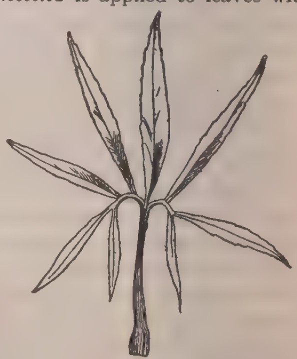


FIG. 11.—Pedate leaf of Stinking Hellebore (*Helleborus foetidus*). The venation is radiating. It is a palmately-partite leaf, in which the lateral lobes are deeply divided. When the leaf hangs down it resembles the foot of a bird, and hence the name.

The form of the leaf shows a very great variety ranging from the narrow *linear* form with parallel sides, as in grasses or the needle-like leaves of pines and firs to more or less rounded or *orbicular*—descriptions of these will be found in works on descriptive botany—a few examples are illustrated here (figs. 7, 13, 14, 15). The apex also varies considerably, being rounded, or *obtuse*, sharp or *acute* (fig. 7), notched (fig. 15), &c. Similarly the shape of the base may vary, when rounded lobes are formed, as in dog-violet, the leaf is *cordate* or heart-shaped; or kidney-shaped or *reniform* (fig. 16), when the apex is rounded as in ground ivy. When the lobes are prolonged downwards and are acute, the leaf is *sagittate* (fig. 17); when they proceed at right angles, as in *Rumex Acetosella*, the leaf is *hastate* or halbert-shaped. When a simple leaf is divided at the base into two leaf-like appendages, it is called *auriculate*. When the development of parenchyma is such that it more than fills up the spaces between the veins, the margins become *wavy*, *crisp* or *undulated*, as in *Rumex crispus* and *Rheum undulatum*. By cultivation the cellular tissue is often much increased, giving rise to the *curled* leaves of greens, savoys, cresses, lettuce, &c.

Compound leaves.

Compound leaves are those in which the divisions extend to the midrib or petiole, and the separated portions become each articulated with it, and receive the name of *leaflets*. The midrib, or petiole, has thus the appearance of a branch with separate leaves attached to it, but it is considered properly as one leaf, because in its earliest state it arises from the axis as a single piece, and its subsequent divisions in the form of leaflets are all in one plane. The leaflets are either sessile (fig. 18) or have stalks, called *petiolules* (fig. 19). Compound leaves are pinnate (fig. 19) or palmate (fig. 18) according to the arrangement of leaflets. When a pinnate leaf ends in a pair of pinnae it is *equally* or *abruptly pinnate* (paripinnate); when there is a single terminal leaflet (fig. 19), the leaf is *unequally pinnate* (imparipinnate); when the leaflets or pinnae are placed alternately on either side of the midrib, and not directly opposite to each other, the leaf is *alternately pinnate*; and when the pinnae are of different sizes, the leaf is *interruptedly pinnate*. When the division is carried into the second degree, and the pinnae of a compound leaf are themselves pinnately compound, a bipinnate leaf is formed.

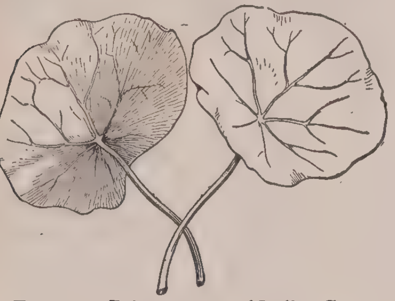


FIG. 12.—Peltate leaves of Indian Cress (*Tropaeolum majus*).

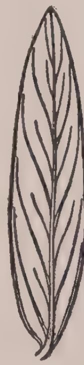


FIG. 13.—Lanceolate leaf of a species of Senna.

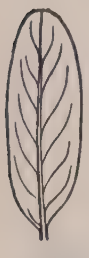


FIG. 14.

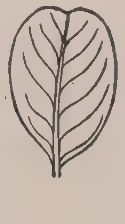


FIG. 15.

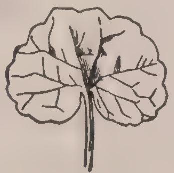


FIG. 16.

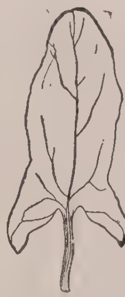


FIG. 17.

FIG. 14.—Oblong leaf of a species of Senna.

FIG. 15.—Emarginate leaf of a species of Senna. The leaf in its contour is somewhat obovate, or inversely egg-shaped, and its base is oblique.

FIG. 16.—Reniform leaf of *Nepeta Glechoma*, margin crenate.

FIG. 17.—Sagittate leaf of Convolvulus.

Petiole.

The *petiole* or leaf-stalk is the part which unites the limb or blade of the leaf to the stem. It is absent in *sessile* leaves, and this is also frequently the case when a sheath is present, as in grasses (fig. 5). It consists of the fibro-vascular bundles with a varying amount of cellular tissue. When the vascular bundles reach the base of the lamina they separate and spread out in various ways, as already described under venation. The lower part of the petiole is often swollen (fig. 20, *p*), forming the *pulvinus*, formed of cellular tissue, the cells of which exhibit the phenomenon of irritability. In *Mimosa pudica* (fig. 20) a sensitiveness is located in the pulvinus which upon irritation induces a depression of the whole bipinnate leaf, a similar property exists in the pulvini at the base of the leaflets which fold upwards. The petiole varies in length, being usually shorter than the lamina, but sometimes much longer. In some palms it is 15 or 20 ft. long, and is so firm as to be used for poles or walking-sticks. In general, the petiole is more or less rounded in its form, the upper surface being flattened or grooved. Sometimes it is compressed laterally, as in the aspen, and to this peculiarity the trembling of the leaves of this tree is due. In aquatic plants the leafstalk is sometimes distended with air, as in *Pontederia* and *Trapa*, so as to float the leaf. At other times it is *winged*, and is either leafy, as in the orange (fig. 21, *p*), lemon and *Dionaea*, or pitcher-like, as in *Sarracenia* (fig. 22). In some Australian acacias, and in some species of *Oxalis* and *Bupleurum*, the petiole is flattened in a vertical direction, the vascular bundles separating immediately after quitting the stem and running nearly parallel from base to apex. This kind of petiole (fig. 23, *p*) has been called a *phyllode*. In these plants the laminae or blades of the leaves are pinnate or bipinnate, and are produced at the extremities of the phyllodes in a horizontal direction; but in many instances they are not developed, and the phyllode serves the purpose of a leaf. These phyllodes, by their vertical position and their peculiar form, give a remarkable aspect to vegetation. On the same acacia there occur leaves with the petiole and lamina perfect; others having the petiole slightly expanded or winged, and the lamina imperfectly developed; and others in which there is no lamina, and the petiole becomes large and broad. Some petioles are long, slender and sensitive to contact, and function as tendrils by means of which the plant climbs; as in the nasturtiums (*Tropaeolum*), clematis and others; and in compound leaves the midrib and some of the leaflets may similarly be transformed into tendrils, as in the pea and vetch.

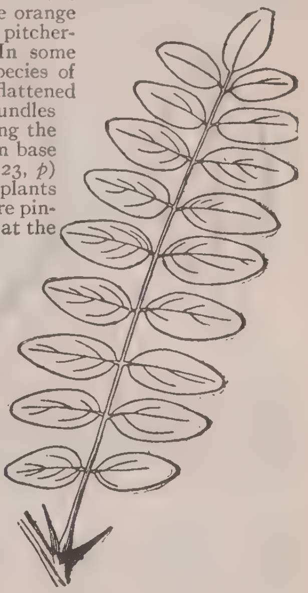


FIG. 19.—Imparipinnate (unequally pinnate) leaf of Robinia. There are nine pairs of shortly-stalked leaflets (foliola, pinnae), and an odd one at the extremity. At the base of the leaf the spiny stipules are seen.

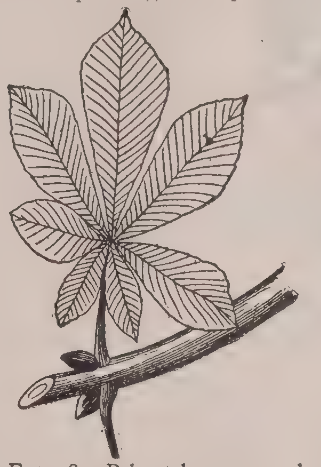


FIG. 18.—Palmately compound leaf of the Horse-chestnut (*Aesculus Hippocastanum*).

Leaf base.

The leaf base is often developed as a *sheath* (*vagina*), which embraces the whole or part of the circumference of the stem (fig. 5). This sheath is comparatively rare in dicotyledons, but is seen in umbelliferous plants. It is much more common amongst monocotyledons. In sedges the sheath forms a complete investment of the stem, whilst in grasses it is split on one side. In the latter plants there is also a membranous outgrowth, the *ligule*, at right angles to the median plane of the leaf from the point where the sheath passes into the lamina, there being no petiole (fig. 5, *l*).

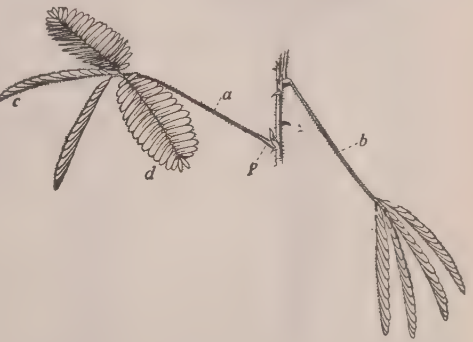


FIG. 20.—Branch and leaves of the Sensitive plant (*Mimosa pudica*), showing the petiole in its erect state, *a*, and in its depressed state, *b*; also the leaflets closed, *c*, and the leaflets expanded, *d*. Irritability resides in the pulvinus, *p*.

In leaves in which no sheath is produced we not infrequently find small foliar organs, *stipules*, at the base of the petiole (fig. 24, *s*). The stipules are generally two in number, and they are important as supplying characters in certain natural orders. Thus they occur in the pea and bean family, in rosaceous plants and the family Rubiaceae. They are not common in dicotyledons with opposite leaves. Plants having stipules are called *stipulate*; those having none are *exstipulate*. Stipules may be large or small, entire or divided, deciduous or persistent. They are not usually of the same form as the ordinary foliage leaves of the plant, from which they are distinguished by their lateral position at the base of the petiole. In the pansy (fig. 24) the true leaves are stalked and crenate, while the stipules *s* are large, sessile and pinnatifid. In *Lathyrus Aphaca* and some other plants the true pinnate leaves are abortive, the petiole forms a tendril, and the stipules alone are developed, performing the office of leaves. When stipulate leaves are opposite to each other, at the same height on the stem, it occasionally happens that the stipules on the two sides unite wholly or partially, so as to form an *interpetiolary* or *interfoliar* stipule, as in members of the family Rubiaceae. In the case of alternate leaves, the stipules at the base of each leaf are sometimes united to the petiole and to each other, so as to form an *adnate, adherent* or *petiolary* stipule, as in the rose, or an *axillary* stipule, as in *Houttuynia cordata*. In other instances the stipules unite together on the side of the stem opposite the leaf forming an *ocrea*, as in the dock family (fig. 25).

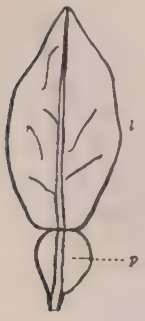


Fig. 21.—Leaf of Orange (*Citrus Aurantium*), showing a winged leafy petiole *p*, which is articulated to the lamina *l*.

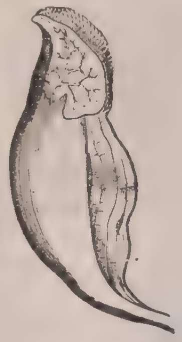


Fig. 22.—Pitcher (*ascidium*) of a species of Side-saddle plant (*Sarracenia purpurea*). The pitcher is formed from the petiole, which is prolonged.

In the development of the leaf the stipules frequently play a most important part. They begin to be formed after the origin of the leaves, but grow much more rapidly than the leaves, and in this way they arch over the young leaves and form protective chambers wherein the parts of the leaf may develop. In the figs, magnolia and pondweeds they are very large and completely envelop the young leaf-bud. The stipules are sometimes so minute as to be scarcely distinguishable without the aid of a lens, and so fugacious as to be visible only in the very young state of the leaf. They may assume a hard and spiny character, as in *Robinia Pseudacacia* (fig. 19), or may be cirrose, as in *Smilax*, where each stipule is represented by a tendril. At the base of the leaflets of a compound leaf, small stipules (*stipels*) are occasionally produced.

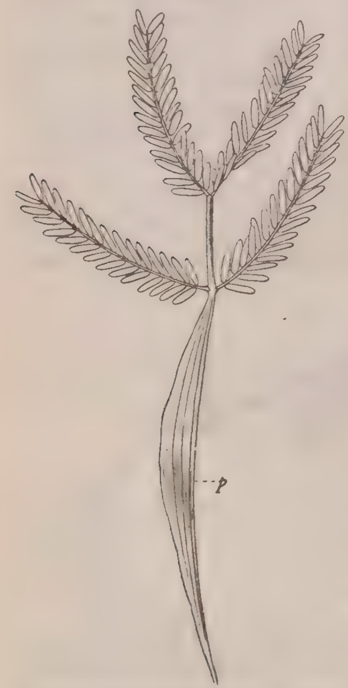


Fig. 23.—Leaf of an Acacia (*Acacia heterophylla*), showing a flattened leaf-like petiole *p*, called a phyllode, with straight venation, and a bipinnate lamina.

Modifications.

Variations in the structure and forms of leaves and leaf-stalks are produced by the increased development of cellular tissue, by the abortion or degeneration of parts, by the multiplication or repetition of parts and by adhesion. When cellular tissue is developed to a great extent, leaves become succulent and occasionally assume a crisp or curled appearance. Such changes take place naturally, but they are often increased by the art of the gardener, and the object of many horticultural operations is to increase the bulk and succulence of leaves. It is in this way that cabbages and savoys are rendered more delicate and nutritious. By a deficiency in development of parenchyma and an increase in the mechanical tissue, leaves are liable to become hardened and spinescent. The leaves of barberry and of some species of *Astragalus*, and the stipules of the false acacia (*Robinia*) are spiny. To the same cause is due the spiny margin of the holly-leaf. When two lobes at the base of a leaf are prolonged beyond the stem and unite (fig. 26), the leaf is *perfoliate*, the stem appearing to pass through it, as in *Bupleurum perfoliatum* and *Chlora perfoliata*; when two leaves unite by their bases they become *connate* (fig. 27), as in *Lonicera Caprifolium*; and when leaves adhere to the stem, forming a sort of winged or leafy appendage, they are *decurrent*, as in thistles. The formation of peltate leaves has been traced to the union of the lobes of a cleft leaf. In the leaf of the *Victoria regia* the transformation may be traced during germination. The first leaves produced by the young plant are linear, the second are sagittate and hastate, the third are rounded-cordate and the next are orbicular. The cleft indicating the union of the lobes remains in the large leaves. The parts of the leaf are frequently transformed into *tendrils*, with the view of enabling the plants to twine round others for support. In Leguminous plants (the pea tribe) the pinnae are frequently modified to form tendrils, as in *Lathyrus Aphaca*, in which the stipules perform the function of true leaves. In *Flagellaria indica, Gloriosa superba* and others, the midrib of the leaf ends in a tendril. In *Smilax* there are two stipulary tendrils.

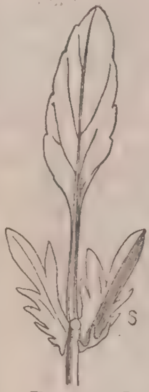


Fig. 24.—Leaf of Pansy. *s*, Stipules.

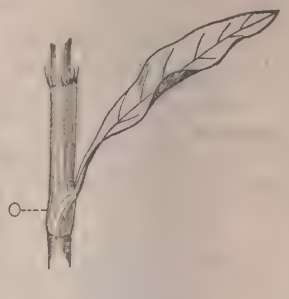


Fig. 25.—Leaf of Polygonum, with part of stem. *o*, Ocrea.

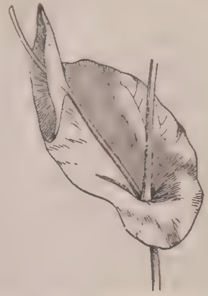


Fig. 26.—Perfoliate leaf of a species of Hare's-ear (*Bupleurum rotundifolium*). The two lobes at the base of the leaf are united, so that the stalk appears to come through the leaf.

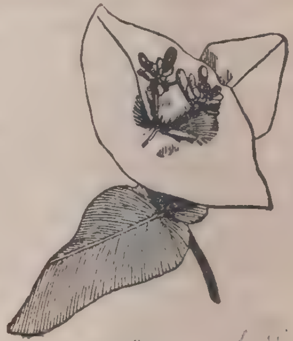


Fig. 27.—Connate leaves of a species of Honeysuckle (*Lonicera Caprifolium*). Two leaves are united by their bases.

The vascular bundles and cellular tissue are sometimes developed in such a way as to form a circle, with a hollow in the centre, and thus give rise to what are called *fistular* or hollow leaves, as in the onion, and to *ascidia* or *pitchers*. Pitchers are formed either by petioles or by laminae, and they are composed of one or more leaves. In *Sarracenia* (fig. 22) and *Heliamphora* the pitcher is composed of the petiole of the leaf. In the pitcher plant, *Nepenthes*, the pitcher is a modification of the lamina, the petiole often plays the part of a tendril, while the leaf base is flat and leaf-like (fig. 28).

In *Utricularia* bladder-like sacs are formed by a modification of leaflets on the submerged leaves.

In some cases the leaves are reduced to mere *scales—cataphyllary* leaves; they are produced abundantly upon underground shoots. In parasites (*Lathraea, Orobanche*) and in plants growing on decaying vegetable matter (*saprophytes*), in which no chlorophyll is formed, these scales are the only leaves produced. In *Pinus* the only leaves produced on the main stem and the lateral shoots are scales, the acicular leaves of the tree growing from axillary shoots. In *Cycas* whorls of scales alternate with large pinnate leaves. In many plants, as already noticed, phyllodia or stipules perform the function of leaves. The production of leaf-buds from

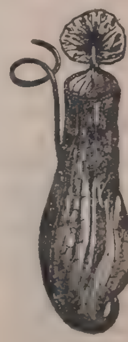


Fig. 28.—Pitcher of a species of pitcher-plant (*Nepenthes distillatoria*).

leaves sometimes occurs as in *Bryophyllum*, and many plants of the order Gesneraceae. The leaf of Venus's fly-trap (*Dionaea muscipula*) when cut off and placed in damp moss, with a pan of water underneath and a bell-glass for a cover, has produced buds from which young plants were obtained. Some species of saxifrage and of ferns also produce buds on their leaves and fronds. In *Nymphaea micrantha* buds appear at the upper part of the petiole.

Phyllotaxis.

Leaves occupy various positions on the stem and branches, and have received different names according to their situation. Thus leaves arising from the crown of the root, as in the primrose, are called *radical*; those on the stem are *cauline*; on flower-stalks, *floral* leaves (see FLOWER). The first leaves developed are known as seed leaves or *cotyledons*. The arrangement of the leaves on the axis and its appendages is called *phyllotaxis*.

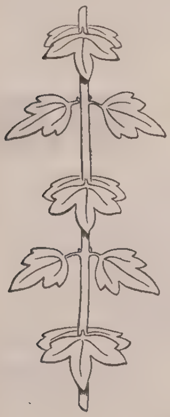


FIG. 29.—A stem with opposite leaves. The pairs are placed at right angles alternately, or in what is called a decussate manner. In the lowest pair one leaf is in front and the other at the back; in the second pair the leaves are placed laterally, and so on.

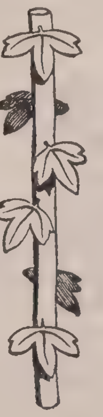


FIG. 30.—A stem with alternate leaves, arranged in a pentastichous or quincuncial manner. The sixth leaf is directly above the first, and commences the second cycle. The fraction of the circumference of the stem expressing the divergence of the leaves is two-fifths.

In their arrangement leaves follow a definite order. The points on the stem at which leaves appear are called nodes; the part of the stem between the nodes is the *internode*. When two leaves are produced at the same node, one on each side of the stem or axis, and at the same level, they are *opposite* (fig. 29); when more than two are produced they are *verticillate*, and the circle of leaves is then called a *verticil* or *whorl*. When leaves are opposite, each successive pair may be placed at right angles to the pair immediately preceding. They are then said to *decussate*, following thus a law of alternation (fig. 29). The same occurs in the verticillate arrangement, the leaves of each whorl rarely being *superposed* on those of the whorl next to it, but usually alternating so that each leaf in a whorl occupies the space between two leaves of the whorl next to it. There are considerable irregularities, however, in this respect, and the number of leaves in different whorls is not always uniform, as may be seen in *Lysimachia vulgaris*. When a single leaf is produced at a node, and the nodes are separated so that each leaf is placed at a different height on the stem, the leaves are *alternate* (fig. 30). A plane passing through the point of insertion of the leaf in the node, dividing the leaf into similar halves, is the median plane of the leaf; and when the leaves are arranged alternately on an axis so that their median planes coincide they form a straight row or *orthostichy*. On every axis there are usually two or more orthostichies. In fig. 31, leaf 1 arises from a node *n*; leaf 2 is separated from it by an internode *m*, and is placed to the right or left; while leaf 3 is situated directly above leaf 1. In this case, then, there are two orthostichies, and the arrangement is said to be *distichous*. When the fourth leaf is directly above the first, the arrangement is *tristichous*. The same arrangement continues throughout the branch, so that in the latter case the 7th leaf is above the 4th, the 10th above the 7th; also the 5th above the 2nd, the 6th above the 3rd and so on. The size of the angle between the median planes of two consecutive leaves in an alternate arrangement is their *divergence*; and it is expressed in fractions of the circumference of the axis which is supposed to be a circle. In a regularly-formed straight branch covered with leaves, if a thread is passed from one to the other, turning always in the same direction, a spiral is described, and a certain number of leaves and of complete turns occur before reaching the leaf directly above that from which the enumeration commenced. If this arrangement is expressed by a fraction, the numerator of which indicates the number of turns, and the denominator the number of internodes in the spiral cycle, the fraction will be found to represent the angle of divergence of the consecutive leaves on the axis. Thus, in fig. 32, *a*, *b*, the cycle consists of five leaves, the 6th leaf being placed vertically over the 1st, the 7th over the 2nd and so on; while the number of turns between the 1st and 6th leaf is two; hence this arrangement is indicated by the fraction $\frac{2}{5}$. In other words, the distance or divergence between the first and second leaf, expressed in parts of a circle, is $\frac{2}{5}$ of a circle or $360° \times \frac{2}{5} = 144°$. In fig. 31, *a*, *b*, the spiral is $\frac{1}{2}$, *i.e.* one turn and two leaves; the third leaf being placed vertically over the first, and the divergence between the first and second leaf being one-half the circumference of a circle, $360° \times \frac{1}{2} = 180°$. Again, in a tristichous arrangement the number is $\frac{1}{3}$, or one turn and three leaves, the angular divergence being 120°.

By this means we have a convenient mode of expressing on paper the exact position of the leaves upon an axis. And in many cases such a mode of expression is of excellent service in enabling us readily to understand the relations of the leaves. The divergences may also be represented diagrammatically on a horizontal projection of the vertical axis, as in fig. 33. Here the outermost circle represents a section of that portion of the axis bearing the lowest leaf, the innermost represents the highest. The broad dark lines represent the leaves, and they are numbered according to their age and position. It will be seen at once that the leaves are arranged in orthostichies marked I.-V., and that these divide the circumference into five equal portions. But the divergence between leaf 1 and leaf 2 is equal to $\frac{2}{5}$ths of the circumference, and the same is the case between 2 and 3, 3 and 4, &c. The divergence, then, is $\frac{2}{5}$, and from this we learn that, starting from any leaf on the axis, we must pass twice round the stem in a spiral through five leaves before reaching one directly over that with which we started. The line which, winding round an axis either to the right or to the left, passes through the points of insertion of all the leaves on the axis is termed the *genetic* or *generating spiral*; and that margin of each leaf which is towards the direction from which the spiral proceeds is the *kathodic* side, the other margin facing the point whither the spiral passes being the *anodic* side.

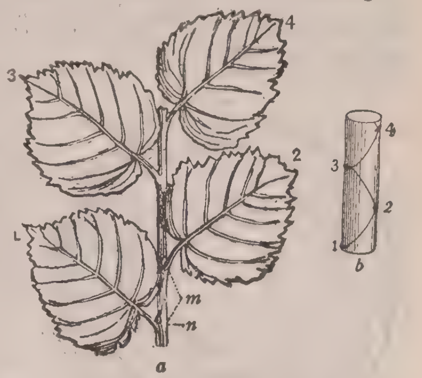


FIG. 31.—Portion of a branch of a Lime tree, with four leaves arranged in a distichous manner, or in two rows. *a*, The branch with the leaves numbered in their order, *n* being the node and *m* the internode; *b* is a magnified representation of the branch, showing the points of insertion of the leaves and their spiral arrangement, which is expressed by the fraction $\frac{1}{2}$, or one turn of the spiral for two internodes.

In cases where the internodes are very short and the leaves are closely applied to each other, as in the house-leek, it is difficult to trace the *generating spiral*. Thus, in fig. 34 there are thirteen leaves which are numbered in their order, and five turns of the spiral marked by circles in the centre ($\frac{5}{13}$ indicating the arrangement); but this could not be detected at once. So also in fir cones (fig. 35), which are composed of scales or modified leaves, the generating spiral cannot be determined easily. But in such cases a series of *secondary spirals* or *parastichies* are seen running parallel with each other both right and left, which to a certain extent conceal the genetic spiral.

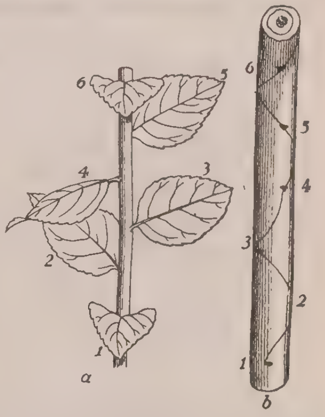


FIG. 32.—Part of a branch of a Cherry with six leaves, the sixth being placed vertically over the first, after two turns of the spiral. This is expressed by two-fifths. *a*, The branch, with the leaves numbered in order; *b*, a magnified representation of the branch, showing the points of insertion of the leaves and their spiral arrangement.

The spiral is not always constant throughout the whole length of an axis. The angle of divergence may alter either abruptly or gradually, and the phyllotaxis thus becomes very complicated. This change may be brought about by arrest of development, by increased development of parts or by a torsion of the axis. The former are exemplified in many Crassulaceae and aloes. The latter is seen well in the screw-pine (*Pandanus*). In the bud of the screw-pine the leaves are arranged in three orthostichies with the phyllotaxis $\frac{1}{3}$, but by torsion the developed leaves become arranged in three strong spiral rows running round the stem. These causes of change in phyllotaxis are also well exemplified in the alteration of an opposite or verticillate arrangement to an alternate, and vice versa; thus the effect of interruption of growth, in causing alternate leaves to become opposite and verticillate, can be distinctly shown in *Rhododendron ponticum*. The primitive or generating spiral may pass either from right to left or from left to right. It sometimes follows a different direction in the branches from that pursued in the stem. When it follows the same course in the stem and branches, they are *homodromous*; when the direction differs, they are *heterodromous.* In different species of the same genus the phyllotaxis frequently varies.

All modifications of leaves follow the same laws of arrangement as true leaves—a fact which is of importance in a morphological point of view. In dicotyledonous plants the first leaves produced (the cotyledons) are opposite. This arrangement often continues during the life of the plant, but at other times it changes, passing into distichous and spiral forms. Some tribes of plants are distinguished by their opposite or verticillate, others by their alternate, leaves. Labiate plants have decussate leaves, while Boraginaceae have alternate leaves, and Tiliaceae usually have distichous leaves; Rubiaceae have opposite leaves. Such arrangements as $\frac{2}{5}$, $\frac{3}{8}$, $\frac{5}{13}$ and $\frac{8}{21}$ are common in Dicotyledons. The first of these, called a *quincunx*, is met with in the apple, pear and cherry (fig. 32); the second, in the bay, holly, *Plantago media*; the third, in the cones of *Picea alba* (fig. 35); and the fourth in those of the silver fir. In monocotyledonous plants there is only one seed-leaf or cotyledon, and hence the arrangement is at first alternate; and it generally continues so more or less, rarely being verticillate. Such arrangements as $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{2}{5}$ are common in Monocotyledons, as in grasses, sedges and lilies. It has been found in general that, while the number 5 occurs in the phyllotaxis of Dicotyledons, 3 is common in that of Monocotyledons.

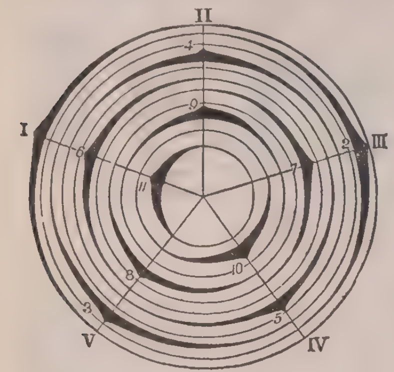


FIG. 33.—Diagram of a phyllotaxis represented by the fraction $\frac{2}{5}$.

In the axil of previously formed leaves leaf-buds arise. These leaf-buds contain the rudiments of a shoot, and consist of leaves covering a growing point. The buds of trees of temperate climates, which lie dormant during the winter, are protected by scale leaves. These scales or protective appendages of the bud consist either of the altered laminae or of the enlarged petiolary sheath, or of stipules, as in the fig and magnolia, or of one or two of these parts combined. These are often of a coarse nature, serving a temporary purpose, and then falling off when the leaf is expanded. They are frequently covered with a resinous matter, as in balsam-poplar and horse-chestnut, or by a thick downy covering as in the willow. In plants of warm climates the buds have often no protective appendages, and are then said to be *naked*.

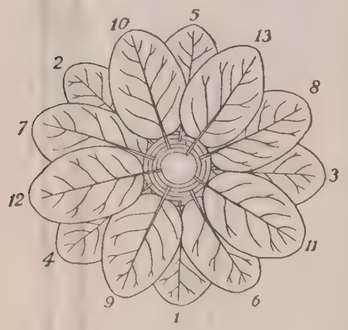


FIG. 34.—Cycle of thirteen leaves placed closely together so as to form a rosette, as in *Sempervivum.* A is the very short axis to which the leaves are attached. The leaves are numbered in their order, from below upwards. The circles in the centre indicate the five turns of the spiral, and show the insertion of each of the leaves. The divergence is expressed by the fraction $\frac{5}{13}$ths.

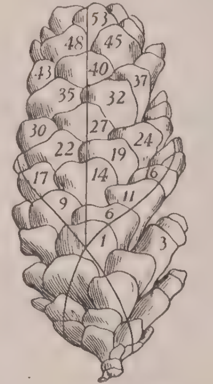
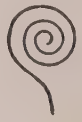


FIG. 35.—Cone of *Picea alba* with the scales or modified leaves numbered in the order of their arrangement on the axis of the cone. The lines indicate a rectilinear series of scales and two lateral secondary spirals, one turning from left to right, the other from right to left.

The arrangement of the leaves in the bud is termed *vernation* or *prefoliation.* In considering vernation we must take into account both the manner in which each individual leaf is folded and also the arrangement of the leaves in relation to each other. These vary in different plants, but in each species they follow a regular law. The leaves in the bud are either placed simply in apposition, as in the mistletoe, or they are folded or rolled up longitudinally or laterally, giving rise to different kinds of vernation, as delineated in figs. 36 to 45, where the folded or curved lines represent the leaves, the thickened part being the midrib. The leaf taken individually is either folded longitudinally from apex to base, as in the tulip-tree, and called *reclinate* or *replicate*; or rolled up in a circular manner from apex to base, as in ferns (fig. 36), and called *circinate*; or folded laterally, *conduplicate* (fig. 37), as in oak; or it has several folds like a fan, *plicate* or *plaited* (fig. 38), as in vine and sycamore, and in leaves with radiating vernation, where the ribs mark the foldings; or it is rolled upon itself, *convolute* (fig. 39), as in banana and apricot; or its edges are rolled inwards, *involute* (fig. 40), as in violet; or outwards, *revolute* (fig. 41), as in rosemary. The different divisions of a cut leaf may be folded or rolled up separately, as in ferns, while the entire leaf may have either the same or a different kind of vernation. The leaves have a definite relation to each other in the bud, being either opposite, alternate or verticillate; and thus different kinds of vernation are produced. Sometimes they are nearly in a circle at the same level, remaining flat or only slightly convex externally, and placed so as to touch each other by their edges, thus giving rise to *valvate* vernation. At other times they are at different levels, and are applied over each other, so as to be *imbricated*, as in lilac, and in the outer scales of sycamore; and occasionally the margin of one leaf overlaps that of another, while it in its turn is overlapped by a third, so as to be *twisted*, *spiral* or *contortive.* When leaves are applied to each other face to face, without being folded or rolled together, they are *appressed.* When the leaves are more completely folded they either touch at their extremities and are *accumbent* or *opposite* (fig. 42), or are folded inwards by their margin and become *induplicate*; or a conduplicate leaf covers another similarly folded, which in turn covers a third, and thus the vernation is *equitant* (fig. 43), as in privet; or conduplicate leaves are placed so that the half of the one covers the half of another, and thus they become *half-equitant* or *obvolute* (fig. 44), as in sage. When in the case of convolute leaves one leaf is rolled up within the other, it is *supervolute* (fig. 45). The scales of a bud sometimes exhibit one kind of vernation and the leaves another. The same modes of arrangement occur in the flower-buds.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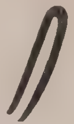
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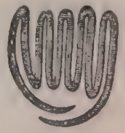
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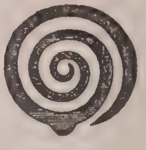
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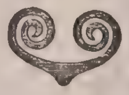
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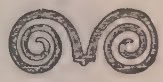
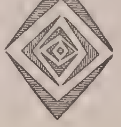


FIG. 41.

FIG. 36.—Circinate vernation.
FIG. 37.—Transverse section of a conduplicate leaf.
FIG. 38.—Transverse section of a plicate or plaited leaf.
FIG. 39.—Transverse section of a convolute leaf.
FIG. 40.—Transverse section of an involute leaf.
FIG. 41.—Transverse section of a revolute leaf.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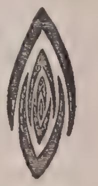
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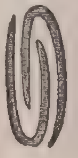
FIG. 44.

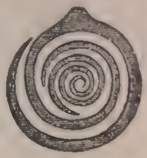
FIG. 45.

FIG. 42.—Transverse section of a bud, in which the leaves are arranged in an accumbent manner.

FIG. 43.—Transverse section of a bud, in which the leaves are arranged in an equitant manner.

FIG. 44.—Transverse section of a bud, showing two leaves folded in an obvolute manner. Each is conduplicate, and one embraces the edge of the other.

FIG. 45.—Transverse section of a bud, showing two leaves arranged in a supervolute manner.

Leaves, after performing their functions for a certain time, wither and die. In doing so they frequently change colour, and hence arise the beautiful and varied tints of the autumnal foliage. This change of colour is chiefly occasioned by the diminished circulation in the leaves, and the higher degree of oxidation to which their chlorophyll has been submitted.

Leaves which are articulated with the stem, as in the walnut and horse-chestnut, fall and leave a scar, while those which are continuous with it remain attached for some time after they have lost their vitality. Most of the trees of Great Britain have deciduous leaves, their duration not extending over more than a few months, while in trees of warm climates the leaves often remain for two or more years. In tropical countries, however, many trees lose their leaves in the dry season. The period of defoliation varies in different countries according to the nature of their climate. Trees which are called evergreen, as pines and evergreen-oak, are always deprived of a certain number of leaves at intervals, sufficient being left, however, to preserve their green appearance. The cause of the fall of the leaf in cold climates seems to be deficiency of light and heat in winter, which causes a cessation in the functions of the cells of the leaf. The fall is directly caused by the formation of a layer of tissue across the base of the leaf-stalk; the cells of this layer separate from one another and the leaf remains attached only by the fibres of the veins until it becomes finally detached by the wind or frost. Before its fall the leaf has become dry owing to loss of water and the removal of the protoplasm and food substances to the stem for use next season; the red and yellow colouring matters are products of decomposition of the chlorophyll. Inorganic and other waste matters are stored in the leaf-tissue and thus got rid of by the plant. The leaf scar is protected by a corky change (suberization) in the walls of the exposed cells. (A. B. R.)

LEAF-INSECT, the name given to orthopterous insects of the family Phasmidae, referred to the single genus *Phyllium* and characterized by the presence of lateral laminae upon the legs and abdomen, which, in association with an abundance of green colouring-matter, impart a broad and leaf-like appearance to the whole insect. In the female this deceptive resemblance is enhanced by the large size and foliaceous form of the front wings which, when at rest edge to edge on the abdomen, forcibly suggest in their neuration the midrib and costae of an ordinary leaf. In this sex the posterior wings are reduced and functionless so far as flight is concerned; in the male they are ample, membranous and functional, while the anterior wings are small and not leaf-like. The freshly hatched young are reddish in colour; but turn green after feeding for a short time upon leaves. Before death a specimen has been observed to pass through the various hues of a decaying leaf, and the spectrum of the green colouring matter does not differ from that of the chlorophyll of living leaves. Since leaf-insects are purely vegetable feeders and not predaceous like mantids, it is probable that their resemblance to leaves is solely for purposes of concealment from enemies. Their egg capsules are similarly protected by their likeness to various seeds. Leaf-insects range from India to the Seychelles on the one side, and to the Fiji Islands on the other. (R. I. P.)

LEAGUE. 1. (Through Fr. *ligue*, Ital. *liga*, from Lat. *ligare*, to bind), an agreement entered into by two or more parties for mutual protection or joint attack, or for the furtherance of some common object, also the body thus joined or "leagued" together. The name has been given to numerous confederations, such as the Achaean League (*q.v.*), the confederation of the ancient cities of Achaia, and especially to the various holy leagues (*ligues saintes*), of which the better known are those formed by Pope Julius II. against Venice in 1508, often known as the League of Cambrai, and against France in 1511. "The League," in French history, is that of the Catholics headed by the Guises to preserve the Catholic religion against the Huguenots and prevent the accession of Henry of Navarre to the throne (see FRANCE: *History*). "The Solemn League and Covenant" was the agreement for the establishment of Presbyterianism in both countries entered into by England and Scotland in 1643 (see COVENANTERS). Of commercial leagues the most famous is that of the Hanse towns, known as the Hanseatic League (*q.v.*). The word has been adopted by political associations, such as the Anti-Corn Law League, the Irish Land League, the Primrose League and the United Irish League, and by numerous social organizations. "League" has also been applied to a special form of competition in athletics, especially in Association football. In this system clubs "league" together in a competition, each playing every other member of the association twice, and the order of merit is decided by the points gained during the season, a win counting two and a draw one.

2. (From the late Lat. *leuga*, or *leuca*, said to be a Gallic word; the mod. Fr. *lieue* comes from the O. Fr. *liue*; the Gaelic *leac*, meaning a flat stone posted as a mark of distance on a road, has been suggested as the origin), a measure of distance, probably never in regular use in England, and now only in poetical or rhetorical language. It was the Celtic as opposed to the Teutonic unit, and was used in France, Spain, Portugal and Italy. In all the countries it varies with different localities, and the ancient distance has never been fixed. The kilometric league of France is fixed at four kilometres. The nautical league is equal to three nautical miles.

LEAKE, WILLIAM MARTIN (1777–1860), British antiquarian and topographer, was born in London on the 14th of January 1777. After completing his education at the Royal Military Academy, Woolwich, and spending four years in the West Indies as lieutenant of marine artillery, he was sent by the government to Constantinople to instruct the Turks in this branch of the service. A journey through Asia Minor in 1800 to join the British fleet at Cyprus inspired him with an interest in antiquarian topography. In 1801, after travelling across the desert with the Turkish army to Egypt, he was, on the expulsion of the French, employed in surveying the valley of the Nile as far as the cataracts; but having sailed with the ship engaged to convey the Elgin marbles from Athens to England, he lost all his maps and observations when the vessel foundered off Cerigo. Shortly after his arrival in England he was sent out to survey the coast of Albania and the Morea, with the view of assisting the Turks against attacks of the French from Italy, and of this he took advantage to form a valuable collection of coins and inscriptions and to explore ancient sites. In 1807, war having broken out between Turkey and England, he was made prisoner at Salonica; but, obtaining his release the same year, he was sent on a diplomatic mission to Ali Pasha of Iannina, whose confidence he completely won, and with whom he remained for more than a year as British representative. In 1810 he was granted a yearly sum of £600 for his services in Turkey. In 1815 he retired from the army, in which he held the rank of colonel, devoting the remainder of his life to topographical and antiquarian studies, the results of which were given to the world in the following volumes: *Topography of Athens* (1821); *Journal of a Tour in Asia Minor* (1824); *Travels in the Morea* (1830), and a supplement, *Peloponnesiaca* (1846); *Travels in Northern Greece* (1835); and *Numismata Hellenica* (1854), followed by a supplement in 1859. A characteristic of the researches of Leake was their comprehensive minuteness, which was greatly aided by his mastery of technical details. His *Topography of Athens*, the first attempt at a scientific treatment of the subject, is still authoritative in regard to many important points (see ATHENS). He died at Brighton on the 6th of January 1860. The marbles collected by him in Greece were presented to the British Museum; his bronzes, vases, gems and coins were purchased by the university of Cambridge after his death, and are now in the Fitzwilliam Museum. He was elected F.R.S. and F.R.G.S., received the honorary D.C.L. at Oxford (1816), and was a member of the Berlin Academy of Sciences and correspondent of the Institute of France.

See *Memoir* by J. H. Marsden (1864); the *Architect* for the 7th of October 1876; E. Curtius in the *Preussische Jahrbücher* (Sept., 1876); J. E. Sandys, *Hist. of Classical Scholarship*, iii. (1908), p. 442.

LEAMINGTON, a municipal borough and health resort of Warwickshire, England, on the river Leam near its junction with the Avon, 98 m. N.W. from London, served by the Great Western and London & North Western railways. Pop. (1901) 26,888. The parliamentary boroughs of Leamington and Warwick were joined into one constituency in 1885, returning one member. The centres of the towns are 2 m. apart, Warwick lying to the west, but they are united by the intermediate parish of New Milverton. There are three saline springs, and the principal pump-rooms, baths and pleasant gardens lie on the right bank of the river. The chief public buildings are the town hall (1884), containing a free library and school of art; and the Theatre Royal and assembly room. The parish church of All Saints is modernized, and the other churches are entirely modern. The S. Warwickshire hospital and Midland Counties Home for incurables are here. Leamington High School is an important school for girls. There is a municipal technical school. Industries include iron foundries and brickworks. The town lies in a well-wooded and picturesque country, within a few miles of such interesting towns as Warwick, Kenilworth, Coventry and Stratford-on-Avon. It is a favourite hunting centre, and, as a health resort, attracts not only visitors but residents. The town is governed by a mayor, 8 aldermen, and 24 councillors. Area, 2817 acres.

Leamington was a village of no importance until about 1786, when baths were first erected, though the springs were noticed by Camden, writing about 1586. The population in 1811 was only 543. The town was incorporated in 1875. The name in former use was Leamington Priors, in distinction from Leamington Hastings, a village on the upper Leam. By royal licence granted in 1838 it was called Royal Leamington Spa.

LÉANDRE, CHARLES LUCIEN (1862–), French caricaturist and painter, was born at Champsecret (Orne), and studied painting under Bin and Cabanel. From 1887 he figured among the exhibitors of the Salon, where he showed numerous portraits and genre pictures, but his popular fame is due to his comic drawings and caricatures. The series of the "Gotha des souverains," published in *Le Rire*, placed him in the front rank of modern caricaturists. Besides his contributions to *Le Rire*, *Le Figaro* and other comic journals, he published a series of albums: *Nocturnes*, *Le Musée des souverains*, and *Paris et la province*. Léandre produced admirable work in lithography, and designed many memorable posters, such as the "Yvette Guilbert." "Les nouveaux mariés," "Joseph Prudhomme," "Les Lutteurs," and "La Femme au chien." He was created a knight of the Legion of Honour.

LEAP-YEAR (more properly known as *bissextile*), the name given to the year containing 366 days. The astronomers of Julius Caesar, 46 B.C., settled the solar year at 365 days 6 hours. These hours were set aside and at the end of four years made a day which was added to the fourth year. The English name for the bissextile year is an allusion to the result of the interposition of the extra day; for after the 29th of February a date "leaps over" the day of the week on which it would fall in ordinary years. Thus a birthday on the 10th of June, a Monday, will in the next year, if a leap-year, be on the 10th of June, a Wednesday. Of the origin of the custom for women to woo, not be wooed, during leap-year no satisfactory explanation has ever been offered. In 1288 a law was enacted in Scotland that "it is statut and ordaint that during the rein of hir maist blissit Megeste, for ilk yeare knowne as lepe yeare, ilk mayden ladye of bothe highe and lowe estait shall hae liberte to bespeke ye man she likes, albeit he refuses to taik hir to be his lawful wyfe, he shall be mulcted in ye sum ane pundis or less, as his estait may be; except and awis gif he can make it appeare that he is betrothit ane ither woman he then shall be free." A few years later a like law was passed in France, and in the 15th century the custom was legalized in Genoa and Florence.

LEAR, EDWARD (1812–1888), English artist and humorist, was born in London on the 12th of May 1812. His earliest drawings were ornithological. When he was twenty years old he published a brilliantly coloured selection of the rarer Psittacidae. Its power attracted the attention of the 13th earl of Derby, who employed Lear to draw his Knowsley menagerie. He became a permanent favourite with the Stanley family; and Edward, 15th earl, was the child for whose amusement the first *Book of Nonsense* was composed. From birds Lear turned to landscape, his earlier efforts in which recall the manner of J. D. Harding; but he quickly acquired a more individual style. About 1837 he set up a studio at Rome, where he lived for ten years, with summer tours in Italy and Sicily, and occasional visits to England. During this period he began to publish his *Illustrated Journals of a Landscape Painter*: charmingly written reminiscences of wandering, which ultimately embraced Calabria, the Abruzzi, Albania, Corsica, &c. From 1848–1849 he explored Greece, Constantinople, the Ionian Islands, Lower Egypt, the wildest recesses of Albania, and the desert of Sinai. He returned to London, but the climate did not suit him. In 1854–1855 he wintered on the Nile, and migrated successively to Corfu, Malta and Rome, finally building himself a villa at San Remo. From Corfu Lear visited Mount Athos, Syria, Palestine, and Petra; and when over sixty, by the assistance of Lord Northbrook, then Govenor-General, he saw the cities and scenery of greatest interest within a large area of India. From first to last he was, in whatever circumstances of difficulty or ill-health, an indomitable traveller. Before visiting new lands he studied their geography and literature, and then went straight for the mark; and wherever he went he drew most indefatigably and most accurately. His sketches are not only the basis of more finished works, but an exhaustive record in themselves. Some defect of technique or eyesight occasionally left his larger oil painting, though nobly conceived, crude or deficient in harmony; but his smaller pictures and more elaborate sketches abound in beauty, delicacy, and truth. Lear modestly called himself a topographical artist; but he included in the term the perfect rendering of all characteristic graces of form, colour, and atmosphere. The last task he set himself was to prepare for popular circulation a set of some 200 drawings, illustrating from his travels the scenic touches of Tennyson's poetry; but he did not live to complete the scheme, dying at San Remo on the 30th of January 1888. Until sobered by age, his conversation was brimful of humorous fun. The paradoxical originality and ostentatiously uneducated draughtsmanship of his numerous nonsense books won him a more universal fame than his serious work. He had a true artist's sympathy with art under all forms, and might have become a skilled musician had he not been a painter. Swainson, the naturalist, praised young Lear's great red and yellow macaw as "equalling any figure ever painted by Audubon in grace of design, perspective, and anatomical accuracy." Murchison, examining his sketches, complimented them as rigorously embodying geological truth. Tennyson's lines "To E.L. on his Travels in Greece," mark the poet's genuine admiration of a cognate spirit in classical art. Ruskin placed the *Book of Nonsense* first in the list of a hundred delectable volumes of contemporary literature, a judgment endorsed by English-speaking children all over the world.

See *Letters of Edward Lear to Chichester Fortescue, Lord Carlingford, and Frances, Countess Waldegrave* (1907), edited by Lady Strachey, with an introduction by Henry Strachey. (F. L.*)

LEASE (derived through the Fr. from the Lat. *laxare*, to loosen), a certain form of tenure, or the contract embodying it, of land, houses, &c.; see LANDLORD AND TENANT.

LEATHER (a word which appears in all Teutonic languages; cf. Ger. *Leder*, Dutch *leer* or *leder*, Swed. *läder*, and in such Celtic forms as Welsh *llader*), an imputrescible substance prepared from the hides or skins of living creatures, both cold and warm blooded, by chemical and mechanical treatment. Skins in the raw and natural moist state are readily putrescible, and are easily disintegrated by bacterial or chemical action, and if dried in this condition become harsh, horny and intractable. The art of the leather manufacturer is principally directed to overcoming the tendency to putrefaction, securing suppleness in the material, rendering it impervious to and unalterable by water, and increasing the strength of the skin and its power to resist wear and tear.

Leather is made by three processes or with three classes of substances. Thus we have (1) tanned leather, in which the hides and skins are combined with tannin or tannic acid; (2) tawed leather, in which the skins are prepared with mineral salts; (3) chamoised (shamoyed) leather, in which the skins are rendered imputrescible by treatment with oils and fats, the decomposition products of which are the actual tanning agents.

Heavy leathers.

Sources and Qualities of Hides and Skins.—The hides used in heavy leather manufacture may be divided into three classes: (1) ox and heifer, (2) cow, (3) bull. Oxen and heifer hides produce the best results, forming a tough, tight, solid leather. Cow hides are thin, the hide itself being fibrous, but still compact, and by reason of its spread or area is used chiefly for dressing purposes in the bag and portmanteau manufacture and work of a similar description. Bull hides are fibrous; they are largely used for heel lifts, and for cheap belting, the thicker hides being used in the iron and steel industry.

A second classification now presents itself, viz. the British home supply, continental (Europe), British colonial, South American, East Indian, Chinese, &c.

In the British home supply there are three chief breeds: (1) Shorthorns (Scotch breed), (2) Herefords (Midland breed), (3) Lowland, or Dutch class. From a tanner's standpoint, the shorthorns are the best hides procurable. The cattle are exposed to a variable climate in the mountainous districts of Scotland, and nature, adapting herself to circumstances, provides them with a thicker and more compact hide; they are well grown, have short necks and small heads. The Hereford class are probably the best English hide; they likewise have small heads and horns, and produce good solid sole leather. The Lowland hides come chiefly from Suffolk, Kent and Surrey; the animals have long legs, long necks and big heads. The hides are usually thin and spready. The hides of the animals killed for the Christmas season are poor. The animals being stall-fed for the beef, the hides become distended, thin and surcharged with fat, which renders them unsuitable for first-class work.

The continental supply may be divided into two classes: (1) Hides from hilly regions, (2) hides from lowlands. All animals subject to strong winds and a wide range of temperatures have a very strong hide, and for this reason those bred in hilly and mountainous districts are best. The hides coming under heading No. 1 are of this class, and include those from the Swiss and Italian Alps, Bavarian Highlands and Pyrenees, also Florence, Oporto and Lisbon hides. They are magnificent hides, thick, tightly-built, and of smooth grain. The butt is long and the legs short. A serious defect in some of these hides is a thick place on the neck caused by the yoke; this part of the hide is absolute waste. Another defect, specially noticeable in Lisbon and Oporto hides, is goad marks on the rump, barbed wire scratches and warbles, caused by the gadfly. Those hides coming under heading No. 2 are Dutch, Rhine valley, Danish, Swedish, Norwegian, Hungarian, &c. The first three hides are very similar; they are spready, poorly grown, and are best used for bag and portmanteau work. Hungarian oxen are immense animals, and supply a very heavy bend. Swedish and Norwegian hides are evenly grown and of good texture; they are well flayed, and used a great deal for manufacturing picker bands, which require an even leather.

New Zealand, Australian and Queensland hides resemble good English. A small quantity of Canadian steers are imported; these are generally branded.

Chinese hides are exported dry, and they have generally suffered more or less from peptonization in the storing and drying; this cannot be detected until they are in the pits, when they fall to pieces.

Anglos are imported as live-stock, and are killed within forty-eight hours. They come to Hull, Birkenhead, Avonmouth and Deptford from various American ports, and usually give a flatter result than English, the general quality depending largely on whether the ship has had a good voyage or not.

Among South American hides, Liebig's slaughter supply the best; they are thoroughly clean and carefully trimmed and flayed. They come to London, Antwerp and Havre, and except for being branded are of first-class quality. Second to the Liebig slaughter come the Uruguay hides.

East Indian hides are known as kips, and are supposed to be, and should be, the hides of yearling cattle. They are now dressed to a large extent in imitation of box calf, being much cheaper. They come from a small breed of ox, and have an extremely tight grain; the leather is not so soft as calf.

Calf-skins are largely supplied by the continent. They are soft and pliant, and have a characteristically fine grain, are tight in texture and quite apart from any other kind of skin.

Light leathers.

The most valuable part of a sheep-skin is the wool, and the value of the pelt is inversely as the value of the wool. Pure Leicester and Norfolk wools are very valuable, and next is the North and South Downs, but the skins, *i.e.* the pelts, of these animals are extremely poor. Devon and Cheviot cross-bred sheep supply a fair pelt, and sometimes these sheep are so many times crossed that it is quite impossible to tell what the skin is. Welsh skins also supply a good tough pelt, though small. Indian and Persian sheep-skins are very goaty, the herds being allowed to roam about together so much. The sheep-skin is the most porous and open-textured skin in existence, as also the most greasy one; it is flabby and soft, with a tight, compact grain, but an extremely loose flesh. Still-born lambs and lambs not over a month old are worth much more than when they have lived for three months; they are used for the manufacture of best kid gloves, and must be milk skins. Once the lambs have taken to grass the skins supply a harsher leather.

The best goat-skins come from the Saxon and Bavarian Highlands, Swiss Alps, Pyrenees, Turkey, Bosnia, Southern Hungary and the Urals. The goats being exposed to all winds yield fine skins. A good number come from Argentina and from Abyssinia, the Cape and other parts of Africa. Of all light leathers the goat has the toughest and tightest grain; it is, therefore, especially liked for fancy work. The grain is rather too bold for glacé work, for which the sheep is largely used.

The seal-skin, used largely for levant work, is the skin of the yellow-hair seal, found in the Northern seas, the Baltic, Norway and Sweden, &c. The skin has a large, bold, brilliant grain, and being a large skin is much used for upholstery and coach work, like the Cape goat. It is quite distinct from the fur seal.

Porpoise hide is really the hide of the white whale; it is dressed for shooting, fishing and hunting boots. Horse hide is dressed for light split and upper work; being so much stall-fed it supplies only a thin, spready leather. The skins of other Equidae, such as the ass, zebra, quagga, &c. are also dressed to some small extent, but are not important sources.

Structure of Skin.—Upon superficial inspection, the hides and skins of all mammalia appear to be unlike each other in general structure, yet, upon closer examination, it is found that the anatomical structure of most skins is so similar that for all practical purposes we may assume that there is no distinction (see SKIN AND EXOSKELETON). But from the practical point of view, as opposed to the anatomical, there are great and very important differences, such as those of texture, thickness, area, &c.; and these differences cause a great divergence in the methods of tanning used, almost necessitating a distinct tannage for nearly every class of hide or skin.

The skins of the lower animals, such as alligators, lizards, fish and snakes, differ to a large extent from those of the mammalia, chiefly in the epidermis, which is much more horny in structure and forms scales.

The skin is divided into two distinct layers: (1) the epidermis or epithelium, *i.e.* the cuticle, (2) the corium derma, or cutis, *i.e.* the true skin. These two layers are not only different in structure, but are also of entirely distinct origin. The epidermis again divides itself into two parts, viz. the "horny layer" or surface skin, and the *rete Malpighi*, named after the Italian anatomist who first drew attention to its existence. The *rete Malpighi* is composed of living, soft, nucleated cells, which multiply by division, and, as they increase, are gradually pushed to the surface of the skin, becoming flatter and drier as they near it, until they reach the surface as dried scales. The epidermis is thus of cellular structure, and more or less horny or waterproof. It must consequently be removed together with the hair, wool or bristles before tannage begins, but as it is very thin compared with the corium, this matters little.

The hair itself does not enter the corium, but is embedded in a sheath of epidermic structure, which is part of and continuous with the epidermis. It is of cellular structure, and the fibrous part is composed of long needle-shaped cells which contain the pigment with which the hair is coloured. Upon removal of the hair some of these cells remain behind and colour the skin, and this colour does not disappear until these cells are removed by scudding. Each hair is supplied with at least two fat or sebaceous glands, which discharge into the orifice of the hair sheath; these glands impart to the hair that natural glossy appearance which is characteristic of good health. The hair bulb (*b*, fig. 1) consists of living nucleated cells, which multiply rapidly, and, like the *rete Malpighi*, cause an upward pressure, getting harder at the same time, thereby lengthening the hair.

The hair papilla (*a*, fig. 1) consists of a globule of the corium or true skin embedded in the hair bulb, which by means of blood-vessels feeds and nourishes the hair. Connected with the lower part of each hair is an oblique muscle known as the arrector or erector pili, seen at *k*, fig. 1; this is an involuntary muscle, and is contracted by sudden cold, heat or shock, with an accompanying tightening of the skin, producing the phenomenon commonly known as "goose flesh." This is the outcome of the contracted muscle pulling on the base of the hair, thereby giving it a tendency to approach the vertical, and producing the simultaneous effect of making the "hair stand on end."

The sudoriferous or sweat glands (R, fig. 1) consist of long spiral-like capillaries, formed from the fibres of the connective tissue of the corium. These glands discharge sometimes directly through the epidermis, but more often into the orifice of the hair-sheath.

The epidermis is separated from the corium by a very important and very fine membrane, termed the "hyaline" or "glassy layer," which constitutes the actual grain surface of a hide or skin. This layer is chemically different from the corium, as if it is torn or scratched during the process of tanning the colour of the underlying parts is much lighter than that of the grain surface.

The corium, unlike the epidermis, is of fibrous, not cellular structure; moreover, the fibres do not multiply among themselves, but are gradually developed as needed from the interfibrillar substance, a semi-soluble gelatinous modification of the true fibre. This interfibrillar substance consequently has no structure, and is prepared at any time on coming into contact with tannin to form amorphous leather, which fills what would in the absence of this substance be interfibrillar spaces. The more of this matter there is present the more completely will the spaces be filled, and the more waterproof will be the leather. An old bull, as is well known, supplies a very poor, soft and spongy leather, simply because the hide lacks interfibrillar substance, which has been sapped up by the body. The fibres are, therefore, separated by interfibrillar spaces, which on contact with water absorb it with avidity by capillary attraction. But a heifer hide or young calf supplies the most tight and waterproof leather known, because the animals are young, and having plenty of nourishment do not require to draw upon and sap the interfibrillar substance with which the skin is full to overflowing.

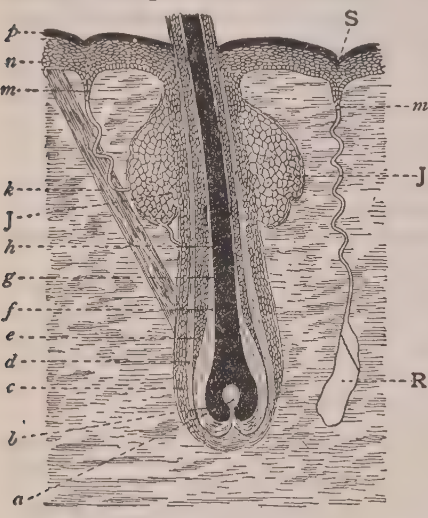

FIG. 1.

a, Hair papilla.
b, Hair bulb.
c, Hair sheath showing epidermic structure.
d, Dermic coat of hair sheath.
e, Outer root sheath.
f, Inner root sheath.
g, Hair cuticle.
h, Hair.
J, Sebaceous glands.
k, Erector pili.
m, Sweat ducts.
n and *p*, Epidermis.
n, Rete Malpighi.
p, Horny layer.
R, Sweat or sudoriferous gland.
S, Opening at sweat duct.

The corium obtains its food from the body by means of lymph ducts, with which it is well supplied. It is also provided with nodules of lymph to nourish the hair, and nodules of grease, which increase in number as they near the flesh side, until the net skin, *panniculus adiposus*, or that which separates the corium from meat proper, is quite full with them.

The corium is coarse in the centre of the skin where the fibres, which are of the kind known as white connective tissue, and which exist in bundles bound together with yellow elastic fibres, are loosely woven, but towards the flesh side they become more compact, and as the hyaline layer is neared the bundles of fibres get finer and finer, and are much more tightly interwoven, until finally, next the grain itself, the fibres no longer exist in bundles, but as individual fibrils lying parallel with the grain. This layer is known as the *pars papillaris*. The bundles of fibre interweave one another in every conceivable direction. The fibrils are extremely minute, and are cemented together with a medium rather more soluble than themselves.

There are only two exceptions to this general structure which need be taken into account. Sheep-skin is especially loosely woven in the centre, so much so that any carelessness in the wet work or sweating process enables one to split the skin in two by tearing. This loosely-woven part is full of fatty nodules, and the skin is generally split at this part, the flesh going for chamois leather and the grain for skivers. The other notable exception is the horse hide, which has a third skin over the loins just above the kidneys, known as the crup; it is very greasy and tight in structure, and is used for making a very waterproof leather for seamen's and fishermen's boots. Pig-skin, perhaps, is rather peculiar, in the fact that the bristles penetrate almost right through the skin.

Tanning Materials.—Tannin or tannic acid is abundantly formed in a very large number of plants, and secreted in such diverse organs and members as the bark, wood, roots, leaves, seed-pods, fruit, &c. The number of tannins which exists has not been determined, nor has the constitution of those which do exist been satisfactorily settled. As used in the tanyard tannin is present both in the free state and combined with colouring matter and accompanied by decomposition products, such as gallic acid or phlobaphenes (anhydrides of the tannins), respectively depending upon the series to which the tannin belongs. In whatever other points they differ, they all have the common property of being powerfully astringent, of forming insoluble compounds with gelatine or gelatinous tissue, of being soluble in water to a greater or lesser extent, and of forming blacks (greenish or bluish) with iron. Pyrogallol tannins give a blue-black coloration or precipitate with ferric salts, and catechol tannins a green-black; and whereas bromine water gives a precipitate with catechol tannins, it does not with pyrogallol tannins. There are two distinctive classes of tannins, viz. catechol and pyrogallol tannins. The materials belonging to the former series are generally much darker in colour than those classified with the latter, and moreover they yield reds, phlobaphenes or tannin anhydrides, which deposit on or in the leather. Pyrogallol tannins include some of the lightest coloured and best materials known, and, speaking generally, the leather produced by them is not so harsh or hard as that produced with catechol tannins. They decompose, yielding ellagic acid (known technically as "bloom") and gallic acid; the former has waterproofing qualities, because it fills the leather, at the same time giving weight.

It has been stated, and perhaps with some truth, that leather cannot be successfully made with catechol tannins alone; pyrogallol tannins, however, yield an excellent leather; but the finest results are obtained by blending the two.

The classification of the chief tanning materials is as follows:—

Pyrogallols.

Myrobalans (*Terminalia Chebula*).
Chestnut wood (*Castanea vesca*).
Divi-divi (*Caesalpinia Coriaria*).
Algarobilla (*Caesalpinia brevifolia*).
Sumach (*Rhus Coriaria*).
Oakwood (*Quercus* family).
Chestnut oak (*Quercus Prinus*).
Galls (*Quercus Infectoria*).
Willow (*Salix arenaria*).

Catechols.

Gambier (*Uncaria Gambir*).
Hemlock (*Abies canadensis*).
Quebracho (*Quebracho Colorado*).
Mangrove or Cutch (*Rhizophora Mangle*).
Mimosa or Golden Wattle (*Acacia Pycnantha*).
Larch (*Larix Europaea*).
Canaigre (*Rumex Hymenosepalum*).
Birch (*Betula alba*).
Cutch Catechu (*Acacia Catechu*).

Subsidiary.

Oakbark (*Quercus Robur*).
Valonia (*Quercus Aegilops*).

Myrobalans are the fruit of an Indian tree. There are several different qualities, the order of which is as follows, the best being placed first: Bhimley, Jubbalpore, Rajpore, Fair Coast Madras and Vingorlas. They are a very light-coloured material, containing from 27 % to 38 % of tannin; they deposit much "bloom," ferment fairly rapidly, supplying acidity, and yield a mellow leather.

Chestnut comes on the market in the form of crude and decolorized liquid extracts, containing about 27 % to 31 % of tannin, and yields a good leather of a light-brown colour.

Oakwood reaches the market in the same form; it is a very similar material, but only contains 24 % to 27 % of tannin, and yields a slightly heavier and darker leather.

Divi-divi is the dried seed pods of an Indian tree containing 40 % to 45 % of tannin, and yielding a white leather; it might be valuable but for the tendency to dangerous fermentation and development of a dark-red colouring matter.

Algarobilla consists of the seeds of an Indian tree, containing about 45 % of tannin, and in general properties is similar to divi-divi, but does not discolour so much upon fermentation.

Sumach is perhaps the best and most useful material known. It is the ground leaves of a Sicilian plant, containing about 28 % of tannin, and yielding a nearly white and very beautiful leather. It is used alone for tanning the best moroccos and finer leather, and being so valuable is much adulterated, the chief adulterant being *Pistacia lentiscus* (Stinko or Lentisco), an inferior and light-coloured catechol tannin. Other but inferior sumachs are also used. There is Venetian sumach (*Rhus cotinus*) and Spanish sumach (*Colpoon compressa*); these are used to some extent in the countries bordering on the Mediterranean. *R. Glabra* and *R. Copallina* are also used in considerable quantities in America, where they are cultivated.

Galls are abnormal growths found upon oaks, and caused by the gall wasp laying eggs in the plant. They are best harvested just before the insect escapes. They contain from 50 % to 60 % of tannin, and are generally used for the commercial supply of tannic acid, and not for tanning purposes.

Gambier, terra japonica or catechu, is the product of a shrub cultivated in Singapore and the Malay Archipelago. It is made by boiling the shrub and allowing the extract to solidify. It is a peculiar material, and may be completely washed out of a leather tanned with it. It mellows exceedingly, and keeps the leather fibre open; it may be said that it only goes in the leather to prepare and make easy the way for other tannins. Block gambier contains from 35% to 40% and cube gambier from 50% to 65% of tannin.

Hemlock generally reaches the market as extract, prepared from the bark of the American tree. It contains about 22% of tannin, has a pine-like odour, but yields a rather dark-coloured red leather.

Quebracho is imported mainly as solid extract, containing 63% to 70% of tannin; it is a harsh, light-red tannage, but darkens rapidly on exposure to light. It is used for freshening up very mellow liquors, but is rather wasteful, as it deposits an enormous amount of its tannin as phlobaphenes.

Mangrove or cutch is a solid extract prepared from the mangrove tree found in the swamps of Borneo and the Straits Settlements; it contains upwards of 60% of a red tannin.

Mimosa is the bark of the Australian golden wattle (*Acacia pycnantha*), and contains from 36% to 50% of tannin. It is a rather harsh tannage, yielding a flesh-coloured leather, and is useful for sharpening liquors. This bark is now successfully cultivated in Natal. The tannin content of this Natal bark is somewhat inferior, but the colour is superior to the Australian product.

Larch bark contains 9% to 10% of light-coloured tannin, and is used especially for tanning Scotch basils.

Canaigre is the air-dried tuberous roots of a Mexican plant, containing 25% to 30% of tannin and about 8% of starch. It yields an orange-coloured leather of considerable weight and firmness. Its cultivation did not pay well enough, so that it is little used.

Cutch, catechu or "dark catechu," is obtained from the wood of Indian acacias, and is not to be confounded with mangrove cutch. It contains 60% of tanning matter and a large proportion of catechin similar to that contained in gambier, but much redder. It is used for dyeing browns and blacks with chrome and iron mordants.

The willow and the white birch barks contain, respectively, 12% to 14% and 2% to 5% of tannin. In combination they are used to produce the famous Russia leather, whose insect-resisting odour is due to the birch bark. In America this leather is imitated with the American black birch bark (*Betula lenta*), and also with the oil obtained from its dry distillation.

In the list of materials two have been placed in a subsidiary class because they are a mixture of catechol and pyrogallol tannin. Oak bark produces the best leather known, proving that a blend of the two classes of tannins gives the best results. It is the bark of the coppice oak, and contains 12% to 14% of a reddish-yellow tannage. Valonia is the acorn cup of the Turkish and Greek oak. The Smyrna or Turkish valonia is best, and contains 32% to 36% of an almost white tannin. Greek valonia is greyer in colour, and contains 26% to 30% of tannin. It yields a tough, firm leather of great weight, due to the rapid deposition of a large amount of bloom.

Grinding and Leaching[1] *Tanning Materials.*—At first sight it would not seem possible that science could direct such a clumsy process as the grinding of tanning materials, and yet even here, the "scientific smashing" of tanning materials may mean the difference between profit and loss to the tanner. In most materials the tannin exists imprisoned in cells, and is also to some extent free, but with this latter condition the science of grinding has nothing to do. If tanning materials are simply broken by a series of clean cuts, only those cells directly on the surfaces of the cuts will be ready to yield their tannin; therefore, if materials are ground by cutting, a proportion of the total tannin is thrown away. Hence it is necessary to bruise, break and otherwise sever the walls of all the cells containing the tannin; so that the machine wanted is one which crushes, twists and cuts the material at the same time, turning it out of uniform size and with little dust.

The apparatus in most common use is built on the same principle as the coffee mill, which consists of a series of segmental cutters; as the bark works down into the smaller cutters of the mill it is twisted and cut in every direction. This is a very good form of mill, but it requires a considerable amount of power and works slowly. The teeth require constant renewal, and should, therefore, be replaceable in rows, not, as in some forms, cast on the bell. The disintegrator is another form of mill, which produces its effect by violent concussion, obtained by the revolution in opposite directions of from four to six large metal arms fitted with projecting spikes inside a drum, the faces of which are also fitted with protruding pieces of metal. The arms make from 2000 to 4000 revolutions per minute. The chief objection to this apparatus is that it forms much dust, which is caught in silken bags fitted to gratings in the drum. The myrobalans crusher, a very useful machine for such materials as myrobalans and valonia, consists of a pair of toothed rollers above and a pair of fluted rollers beneath. The material is dropped upon the toothed rollers first, where it is broken and crushed; then the crushing is finished and any sharp corners rounded off in the fluted rollers.

It must not be thought that now the material is ground it is necessarily ready for leaching. This may or may not be so, depending upon whether the tanner is making light or heavy leathers. If light leathers are being considered, it is ready for immediate leaching, *i.e.* to be infused with water in preparation of a liquor. If heavy leathers are in process of manufacture, he would be a very wasteful tanner who would extract his material raw. It must be borne in mind that when an infusion is made with fresh tanning material, the liquor begins to deposit decomposition products after standing a day or two, and the object of the heavy-leather tanner is to get this material deposited in the leather, to fill the pores, produce weight and make a firm, tough product. With this end in view he dusts his hides with this fresh material in the layers, *i.e.* he spreads a layer between each hide as it is laid down, so that the strong liquors penetrate and deposit in the hides. When most of this power to deposit has been usefully utilized in the layers, then the material (which is now, perhaps, half spent) is leached. The light-leather maker does not want a hard, firm leather, but a soft and pliable product; hence he leaches his material fresh, and does not trouble as to whether the tannin deposits in the pits or not.

Whether fresh or partially spent material is leached, the process is carried out in the same way. There are several methods in vogue; the best method only will be described, viz. the "press leach" system.

The leaching is carried out in a series of six square pits, each holding about 3 to 4 tons of material. The method depends upon the fact that when a weak liquor is forced over a stronger one they do not mix, by reason of the higher specific gravity of the stronger one; the weaker liquor, therefore, by its weight forces the stronger liquor downwards, and as the pit in which it is contained is fitted with a false bottom and side duct running over into the next pit, the stronger liquor is forced upwards through this duct on to the next stronger pit. There the process is repeated, until finally the weak liquor or water, as the case may be, is run off the last vat as a very strong infusion. As a concrete example let us take the six pits shown in the figure.

4	5	6
3	2	1

No. 6 is the last vat, and the liquor, which is very strong, is about to be run off. No. 1 is spent material, over which all six liquors have passed, the present liquor having been pumped on as fresh water. The liquor from No. 6 is run off into the pump well, and liquor No. 1 is pumped over No. 2, thus forcing all liquors one forward and leaving pit No. 1 empty; this pit is now cast and filled with clean fishings and perhaps a little new material, clean water is then pumped on No. 2, which is now the weakest pit, and all liquors are thus forced forward one pit more, making No. 1 the strongest pit. After infusing for some time this is run off to the pump well, and the process repeated. It may be noted that the hotter the water is pumped on the weakest pit, the better will the material be spent, and the nearer the water is to boiling-point the better; in fact, a well-managed tanyard should have the spent tan down to between 1% and 2% of tannin, although this material is frequently thrown away containing up to 10% and sometimes even more. There is a great saving of time and labour in this method, since the liquors are self-adjusting.

Testing Tan Liquors.—The methods by which the tanning value of any substance may be determined are many, but few are at once capable of simple application and minute accuracy. An old method of ascertaining the strength of a tan liquor is by means of a hydrometer standardized against water, and called a barkometer. It consists of a long graduated stem fixed to a hollow bulb, the opposite end of which is weighted. It is placed in the liquor, the weighted end sinks to a certain depth, and the reading is taken on the stem at that point which touches "water mark." The graduations are such that if the specific gravity is multiplied by 1000 and then 1000 is subtracted from the result, the barkometer strength of the liquor is obtained. Thus 1029 specific gravity equals 29° barkometer. This method affords no indication of the amount of tannin present, but is useful to the man who knows his liquors by frequent analysis.

A factor which governs the quality of the leather quite as much as the tannin itself is the acidity of the liquors. It is known that gallic and tannic acids form insoluble calcium salts, and all the other acids present as acetic, propionic, butyric, lactic, formic, &c., form comparatively soluble salts, so that an easy method of determining this important factor is as follows:—

Take a quantity, say 100 c.c., of tan liquor, filter till clear through paper, then pipette 10 c.c. into a small beaker (about 1½ in. diameter), place it on some printed paper and note how clear the print appears through the liquor; now gradually add from a burette a clear solution of saturated lime water until the liquor becomes just cloudy, that is until it just loses its brilliancy. Now read off the number of cubic centimetres required in the graduated stem of the burette, and either read as degrees (counting each c.c. as one degree), to which practice at once gives a useful signification, or calculate out in terms of acetic acid per 100 c.c. of liquor, reckoning saturated lime water as $\frac{1}{20}$ normal.

The methods which deal with the actual testing for tannin itself depend mostly upon one or other of two processes; either the precipitation of the tannin by means of gelatin, or its absorption by means of prepared hide. Sir Humphry Davy was the first to propose a method for analysing tanning materials, and he precipitated the tannin by means of gelatin in the presence of alum, then dried and weighed the precipitate, after washing free from excess of reagents. This method was improved by Stoddart, but cannot lay claim to much accuracy. Warington and Müller again modified the method, but their procedure being tedious and difficult to work could not be regarded as a great advance. Wagner then proposed precipitation by means of the alkaloids, with special regard to cinchonine sulphate in the presence of rosaniline acetate as indicator, but this method also proved useless. After this many metallic precipitants were tried, used gravimetrically and volumetrically, but without success. The weighing of precipitated tannates will never succeed, because the tannins are such a diverse class of substances that each tannin precipitates different quantities of the precipitants, and some materials contain two or three different tannins. Then there are also the difficulties of incomplete precipitation and the precipitation of colouring matter, &c. Among this class of methods may be mentioned Garland's, in which tartar emetic and sal ammoniac were employed. It was improved by Richards and Palmer.

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[1] See LYE.

Another class of methods depends upon the destruction of the tannin by some oxidizing agent, and the estimation of the amount required. Terreil rendered the tannin alkaline, and after agitating it with a known quantity of air, estimated the volume of oxygen absorbed. The method was slow and subject to many sources of error. Commaille oxidized with a known quantity of iodic acid and estimated the excess of iodate. This process also was troublesome, besides oxidizing the gallic acid (as do all the oxidation processes), and entailing a separate estimation of them after the removal of the tannin. Ferdinand Jean (1877) titrated alkaline tannin solution with standard iodine, but the mixture was so dark that the end reaction with starch could not be seen; in addition the gallic acid had again to be estimated. Monier proposed permanganate as an oxidizing agent, and Lowenthal made a very valuable improvement by adding indigo solution to the tannin solution, which controlled the oxidation and acted as indicator. This method also required double titration because of the gallic acid present, the tanning matters being removed from solution by means of gelatin and acidified salt.

The indirect gravimetric hide-powder method first took form about 1886. It was published in *Der Gerber* by Simand and Weiss, other workers being Eitner and Meerkatz. Hammer, Muntz and Ramspacher did some earlier work on similar lines, depending upon the specific gravity of solutions. Professor H. R. Procter perfected this method by packing a bell, similar in shape to a bottomless bottle of about 2 oz. (liq.) capacity, with the hide-powder, and siphoning the tan liquor up through the powder and over into a receiver. This deprives the tan liquor of tannin, and a portion of this non-tannin solution is evaporated to dryness and weighed till constant; similarly a portion of the original solution containing non-tannins and tannins is evaporated and weighed till constant; then the weight of the non-tannins subtracted from the weight of the non-tannins and tannins gives the weight of tannin, which is calculated to percentage on original solutions. This method was adopted as official by the International Association of Leather Trades Chemists until September 1906, when its faults were vividly brought before them by Gordon Parker of London and Bennett of Leeds, working in collaboration, although other but not so complete work had been previously done to the same end. The main faults of the method were that the hide-powder absorbed non-tannins, and therefore registered them as tannins, and the hide-powder was partially soluble. This difficulty has now been overcome to a large extent in the present official method of the I.A.L.T.C.

Meanwhile, Parker and Munro Payne proposed a new method of analysis, the essence of which is as follows:—A definite excess of lime solution is added to a definite quantity of tannin solution and the excess of lime estimated; the tan solution is now deprived of tannin by means of a soluble modification of gelatin, called "collin," and the process is repeated. Thus we get two sets of figures, viz. total absorption and acid absorption (*i.e.* acids other than tan); the latter subtracted from the former gives tannin absorption, and this is calculated out in percentage of original liquor. The method failed theoretically, because a definite molecular weight had to be assumed for tannins which are all different. There are also several other objections, but though, like the hide-powder method, it is quite empirical, it gives exceedingly useful results if the rules for working are strictly adhered to.

The present official method of the I.A.L.T.C. is a modification of the American official method, which is in turn a modification of a method proposed by W. Eitner, of the Vienna Leather Research Station. The hide-powder is very slightly chrome-tanned with a basic solution of chromium chloride, 2 grammes of the latter being used per 100 grammes of hide-powder, and is then washed free from soluble salts and squeezed to contain 70% of moisture, and is ready for use. This preliminary chroming does away with the difficulty of the powder being soluble, by rendering it quite insoluble; it also lessens the tendency to absorb non-tannins. Such a quantity of this wet powder as contains 6·5 grammes of dry hide is now taken, and water is added until this quantity contains exactly 20 grammes of moisture, *i.e.* 26·5 grammes in all; it is then agitated for 15 minutes with 100 c.c. of the prepared tannin solution, which is made up to contain tannin within certain definite limits, in a mechanical rotator, and filtered. Of this non-tannin solution 50 c.c. is then evaporated to dryness. The same thing is done with 50 c.c. of original solution containing non-tannins and tannins, and both residues are weighed. The tannin is thus determined by difference. The method does all that science can do at present. The rules for carrying out the analysis are necessarily very strict. The object in view is that all chemists should get exactly concordant results, and in this the I.A.L.T.C. has succeeded.

The work done by Wood, Trotman, Procter, Parker and others on the alkaloidal precipitation of tannin deserves mention.

Heavy Leathers.—The hides of oxen are received in the tanyard in four different conditions: (1) market or slaughter hides, which, coming direct from the local abattoirs, are soft, moist and covered with dirt and blood; (2) wet salted hides; (3) dry salted hides; (4) sun-dried or "flint" hides—the last three forms being the condition in which the imports of foreign hides are made. The first operation in the tannery is to clean the hides and bring them back as nearly as possible to the flaccid condition in which they left the animal's back. The blood and other matter on market hides must be removed as quickly as possible, the blood being of itself a cause of dark stains and bad grain, and with the other refuse a source of putrefaction. When the hides are sound they are given perhaps two changes of water.

Salted hides need a longer soaking than market hides, as it is not only essential to remove the salt from the hide, but also necessary to plump and soften the fibre which has been partially dehydrated and contracted by the salt. It must also be borne in mind that a 10% solution of salt dissolves hide substance, thereby causing an undesirable loss of weight, and a weak solution prevents plumping, especially when taken into the limes, and may also cause "buckling," which cannot easily be removed in after processes. Dried and dry salted hides require a much longer soaking than any other variety. Dried hides are always uncertain, as they may have putrefied before drying, and also may have been dried at too high a temperature; in the former case they fall to pieces in the limes, and in the latter case it is practically impossible to soak them back, unless putrefactive processes are used, and such are always dangerous and difficult to work because of the Rivers Pollution Acts. Prolonged soaking in cold water dissolves a serious amount of hide substance. Soaking in brine may be advantageous, as it prevents putrefaction to some extent. Caustic soda, sodium sulphide and sulphurous acid may also be advantageously employed on account of their softening and antiseptic action. In treating salted goods, the first wash water should always be rapidly changed, because, as mentioned, strong salt solutions dissolve hide; four changes of water should always be given to these goods.

There are other and mechanical means of softening obstinate material, viz. by stocking. The American hide mill, or double-acting stocks, shown diagrammatically in fig. 2, is a popular piece of apparatus, but the goods should never be subjected to violent mechanical treatment until soft enough to stand it, else severe grain cracking may result. Perhaps the use of sodium sulphide or caustic soda in conjunction with the American wash wheel is the safest method.

Whatever means are used the ultimate object is first to swell and open up the fibres as much as possible, and secondly to remove putrefactive refuse and dirt, which if left in is fixed by the lime in the process of depilation, and causes a dirty buff.

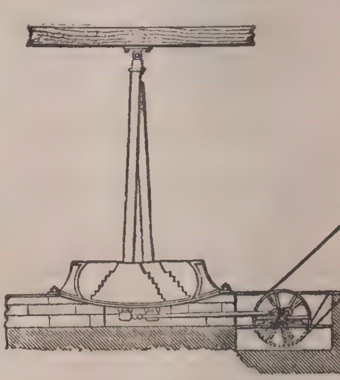

FIG. 2.—Double-acting Stocks.

After being thus brought as nearly as possible into a uniform condition, all hides are treated alike. The first operation to which they are subjected is *depilation*, which removes not only the hair but also the scarf skin or epidermis. When the goods are sent to the limes for depilation they are, first of all, placed in an old lime, highly charged with organic matter and bacteria. It is the common belief that the lime causes the hair to loosen and fall out, but this is not so; in fact, pure lime has the opposite effect of tightening the hair. The real cause of the loosening of the hair is that the bacteria in the old lime creep down the hair, enter the *rete Malpighi* and hair sheath, and attack and decompose the soft cellular structure of the sheath and bulb, also altering the composition of the *rete Malpighi* by means of which the scarf skin adheres to the true skin. These products of the bacterial action are soluble in lime, and immediately dissolve, leaving the scarf skin and hair unbound and in a condition to leave the skin upon scraping. In this first "green" lime the action is mainly this destructive one, but the goods have yet to be made ready to receive the tan liquor, which they must enter in a plump, open and porous condition. Consequently, the "green" lime is followed with two more, the second being less charged with bacteria, and the third being, if not actually a new one, a very near approach to it; in these two limes the bundles of fibre are gradually softened, split up and distended, causing the hide to swell, the interfibrillar substance is rendered soluble and the whole generally made suitable for transference to the tan liquors. The hide itself is only very slightly soluble; if care is taken, the grease is transformed into an insoluble calcium soap, and the hair is hardly acted upon at all.

The time the goods are in the limes and the method of making new limes depends upon the quality of the leather to be turned out. The harder and tougher the leather required the shorter and fresher the liming. For instance, for sole leather where a hard result is required, the time in the limes would be from 8 to 10 days, and a perfectly fresh top lime would be used, with the addition of sodium sulphide to hasten the process. Every tanner uses a different quantity of lime and sulphide, but a good average quantity is 7 ℔ lime per hide and 10-15 ℔ sodium sulphide per pit of 100 hides. The lime is slaked with water and the sulphide mixed in during the slaking; if it is added to the pit when the slaking is finished the greater part of its effect is lost, as it does not then enter into the same chemical combinations with the lime, forming polysulphides, as when it is added during the process of slaking.

For softer and more pliable leathers, such as are required for harness and belting, a "lower" or mellower liming is given, and the time in the limes is increased from 9 to 12 days. Some of the old mellow liquor is added to the fresh lime in the making, so as just to take off the sharpness. It would be made up as for sole leather, but with less sulphide or none at all, and then a dozen buckets of an old lime would be added. For lighter leathers from 3 to 6 weeks' liming is given, and a fresh lime is never used.

"Sweating" as a method of depilation is obsolete in England so far as heavy leathers are concerned. It consists of hanging the goods in a moist warm room until incipient putrefaction sets in. This first attacks the more mucous portions, as the *rete Malpighi*, hair bulb and sheath, and so allows the hair to be removed as before. The method pulls down the hide, and the putrefaction may go too far, with disastrous results, but there is much to recommend it for sheepskins where the wool is the main consideration, the main point being that while lime entirely destroys wool, this process leaves it intact, only loosening the roots. It is consequently still much used.

Another method of fellmongering (dewooling) sheepskins is to paint the flesh side with a cream of lime made with a 10% solution of sodium sulphide and lay the goods in pile flesh to flesh, taking care that none of the solution comes in contact with the wool, which is ready for pulling in from 4 to 8 hours. Although this process may be used for any kind of skin, it is practically only used for sheep, as if any other skin is depilated in this manner all plumping effect is lost. Since this must be obtained in some way, it is an economy of time and material to place the goods in lime in the first instance.

Sometimes, in the commoner classes of sole leather, the hair is removed by painting the hair side with cream of lime and sulphide, or the same effect is produced by drawing the hides through a strong solution of sulphide; this completely destroys the hair, actually taking it into solution. But the hair roots remain embedded in the skin, and for this reason such leather always shows a dirty buff.

Arsenic sulphide (realgar) is slaked with the lime for the production of the finer light leathers, such as glace kid and glove kid. This method produces a very smooth grain (the tendency of sodium sulphide being to make the grain harsh and bold), and is therefore very suitable for the purpose, but it is very expensive.

Sufficient proof of the fact that it is not the lime which causes skins to unhair is found in the process of chemical liming patented by Payne and Pullman. In this process the goods are first treated with caustic soda and then with calcium chloride; in this manner lime is formed in the skin by the reaction of the two salts, but still the hair remains as tight as ever. If this process is to be used for unhairing and liming effect, the goods must be first subjected to a putrid soak to loosen the hair, and afterwards limed. Experiments made by the present writer also prove this theory. A piece of calf skin was subjected to sterilized lime for several months, at the end of which time the hair was as tight as ever; then bacterial influence was introduced, and the skin unhaired in as many days.

After liming it is necessary to unhair the goods. This is done by stretching a hide over a tanner's beam (fig. 3), when with an unhairing knife (*a*, fig. 4) the beamsman partially scrapes and partially shaves off the hair and epidermis. Another workman, a "flesher," removes the flesh or "net skin" (*panniculus adiposus*), a fatty matter from the flesh side of the skin, with the fleshing knife (two-edged), seen in *b*, fig. 4. For these operations several machines have been adapted, working mostly with revolving spiral blades or vibrating cutters, under which the hides pass in a fully extended state. Among these may be mentioned the Leidgen unhairer, which works on a rubber bed, which "gives" with the irregularities of the hide, and the Wilson flesher, consisting of a series of knives attached to a revolving belt, and which also "give" in contact with irregularities.

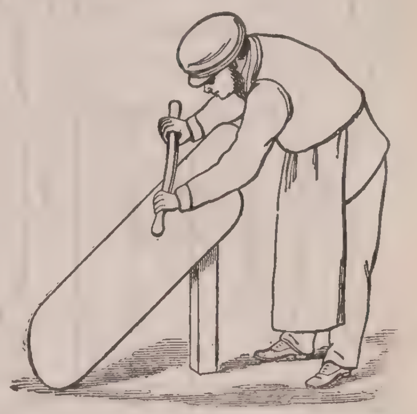

FIG. 3.—Tanner's Beam.

At this stage the hide is divided into several parts, the process being known as "rounding." The object of the division is this: certain parts of the hide termed the "offal" are of less value than the "butt," which consists of the prime part. The grain of the butt is fine and close in texture, whereas the offal grain is loose, coarse and open, and if the offal is placed in the same superior liquors as the butt, being open and porous, it will absorb the best of the tannin first; consequently the offal goes to a set of inferior liquors, often consisting of those through which the butts have passed. The hides are "rounded" with a sharp curved butcher's knife; the divisions are seen in fig. 5. The bellies, cheeks and shoulders constitute the offal, and are tanned separately although the shoulder is not often detached from the butt until the end of the "suspenders," being of slightly better quality than the bellies. The butt is divided into two "bends." This separation is not made until the tanning of the butt is finished, when it is cut in two, and the components sold as "bends," although as often as not the butt is not divided. In America the hides are only split down the ridge of the back, from head to tail, and tanned as hides. Dressing hides are more frequently rounded after tanning, the mode depending on the purpose for which the leather is required.

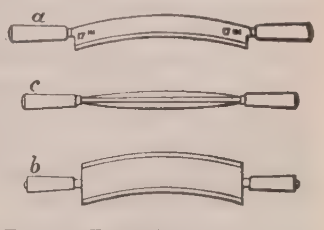

FIG. 4.—Tanner's Knives and Pin.

The next step is to remove as much "scud" and lime as possible, the degree of removal of the latter depending upon the kind of leather to be turned out. "Scudding" consists of working the already unhaired hide over the beam with an unhairing knife with increased pressure, squeezing out the dirt, which is composed of pigment cells, semi-soluble compounds of lime, and hide, hair sacks and soluble hide substance, &c. This exudes as a dirty, milky, viscid liquid, and mechanically brings the lime out with it, but involves a great and undesirable loss of hide substance, heavy leather being sold by weight. This difficulty is now got over by giving the goods an acid bath first, to delime the surface; the acid fixes this soluble hide substance (which is only soluble in alkalies) and hardens it, thus preventing its loss, and the goods may then be scudded clean with safety. The surface of all heavy leathers must be delimed to obtain a good coloured leather, the demand of the present day boot manufacturer; it is also necessary to carry this further with milder leathers than sole, such as harness and belly, &c., as excess of lime causes the leather to crack when finished. Perhaps the best material for this purpose is boracic acid, using about 10 lb per 100 butts, and suspending the goods. This acid yields a characteristic fine grain, and because of its limited solubility cannot be used in excess. Other acids are also used, such as acetic, lactic, formic, hydrochloric, with varying success. Where the water used is very soft, it is only necessary to wash in water for a few hours, when the butts are ready for tanning, but if the water is hard, the lime is fixed in the hide by the bicarbonates it contains, in the form of carbonate, and the result is somewhat disastrous.

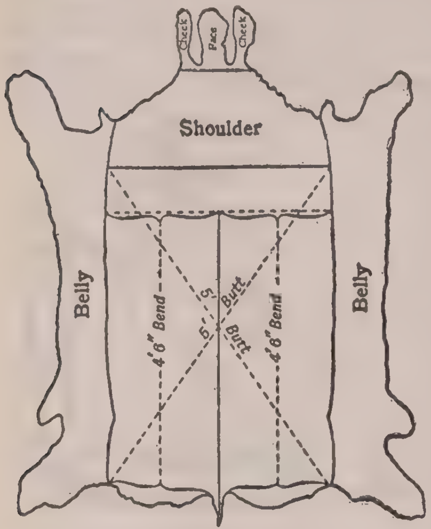

Fig. 5.

After deliming, the butts are scudded, rinsed through water or weak acid, and go off to the tan pits for tanning proper. Any lime which remains is sufficiently removed by the acidity of the early tan liquors.

The actual tanning now begins, and the operations involved may be divided into a series of three: (1) colouring, (2) handling, (3) laying away.

The colouring pits or "suspenders," perhaps a series of eight pits, consist of liquors ranging from 16° to 40° barkometer, which were once the strongest liquors in the yard, but have gradually worked down, having had some hundreds of hides through them; they now contain very little tannin, and consist mainly of developed acids which neutralize the lime, plump the hide, colour it off, and generally prepare it to receive stronger liquors. The goods are suspended in these pits on poles, which are lifted up and down several times a day to ensure the goods taking an even colour; they are moved one pit forward each day into slightly stronger liquors, and take about from 7 to 18 days to get through the suspender stage.

The reason why the goods are suspended at this stage instead of being laid flat is that if the latter course were adopted, the hides would sink and touch one another, and the touch-marks, not being accessible to the tan liquor, would not colour, and uneven colouring would thus result; in addition the weight of the top hides would flatten the lower ones and prevent their plumping, and this condition would be exceedingly difficult to remedy in the after liquors. Another question which might occur to the non-technical reader is, why should not the process be hastened by placing the goods in strong liquors? The reason is simple. Strong tanning solutions have the effect of "drawing the grain" of pelt, *i.e.* contracting the fibres, and causing the leather to assume a very wrinkled appearance which cannot afterwards be remedied; at the same time "case tanning" results, *i.e.* the outside only gets tanned, leaving the centre still raw hide, and once the outside is case-hardened it is impossible for the liquor to penetrate and finish the tanning. This condition being almost irremediable, the leather would thus be rendered useless.

After the "suspenders" the goods are transferred to a series of "handlers" or "floaters," consisting of, perhaps, a dozen pits containing liquors ranging from 30° to 55° barkometer. These liquors contain an appreciable quantity of both tannin and acid, once formed the "lay-aways," and are destined to constitute the "suspenders." In these pits the goods, having been evenly coloured off, are laid flat, handled every day in the "hinder" (weaker) liquors and shifted forward, perhaps every two days, at the tanner's convenience. The "handling" consists of lifting the butts out of the pit by means of a tanner's hook (fig. 6), piling them on the side of the pit to drain, and returning them to the pit, the top butt in the one handler being returned as the bottom in the next. This operation is continued throughout the process, only, as the hides advance, the necessity for frequent handling decreases. The top two handler pits are sometimes converted into "dusters," *i.e.* when the hides have advanced to these pits, as each butt is lowered, a small quantity of tanning material is sprinkled on it.

Fig. 6.—Tanner's Hook (without handle).

Some tanners, now that the hides are set flat, put them in suspension again before laying away; the method has its advantages, but is not general. The goods are generally laid away immediately. The layer liquors consist of leached liquors from the fishings, strengthened with either chestnut or oakwood extract, or a mixture of the two. The first layer is made up to, say, 60° barkometer in this way, and as the hides are laid down they are sprinkled with fresh tanning material, and remain undisturbed for about one week. The second layer is a 70° barkometer liquor, the hides are again sprinkled and allowed to lie for perhaps two weeks. The third may be 80° barkometer and the fourth 90°, the goods being "dusted" as before, and lying undisturbed for perhaps three or four weeks respectively. Some tanners give more layers, and some give less, some more or less time, or greater or lesser strengths of liquor, but this tannage is a typical modern one.

As regards "dusting" material, for mellow leather, mellow materials are required, such as myrobalans being the mellowest and mimosa bark the most astringent of those used in this connexion. For harder leather, as sole leather, a much smaller quantity of myrobalans is used, if any at all, a fair quantity of mimosa bark as a medium, and much valonia, which deposits a large amount of bloom, and is of great astringency. About 3 to 4 cwt. of a judicious mixture is used for each pit, the mellower material predominating in the earlier liquors and the most astringent in the later liquors.

The tanning is now finished, and the goods are handled out of the pits, brushed free from dusting material, washed up in weak liquor, piled and allowed to drip for 2 or 3 days so that the tan may become set.

Finishing.—From this stage the treatment of sole leather differs from that of harness, belting and mellower leathers. As regards the first, it will be found on looking at the dripping pile of leather that each butt is covered with a fawn-coloured deposit, known technically as "bloom"; this disguises the under colour of the leather, just like a coat of paint. The theory of the formation of this bloom is this. Strong solutions of tannin, such as are formed between the hides from dusting materials, are not able to exist for long without decomposition, and consequently the tannin begins to condense, and forms other acids and insoluble anhydrides; this insoluble matter separates in and on the leather, giving weight, firmness, and rendering the leather waterproof. It is known technically as bloom and chemically as ellagic acid.

After dripping, the goods are scoured free from surface bloom in a Wilson scouring machine, and are then ready for bleaching. There are several methods by which this is effected, or, more correctly several materials or mixtures are used, the method of application being the same, viz. the goods are "vatted" (steeped) for some hours in the bleaching mixture at a temperature of 110° F. The mixture may consist of either sumach and a light-coloured chestnut extract made to 110° barkometer, and 110° F., or some bleaching extract made for the purpose, consisting of bisulphited liquid quebracho, which bleaches by reason of the free sulphurous acid it contains. The former method is best (though more expensive), as it removes less weight, and the light shade of colour is more permanent than that obtained by using bisulphited extracts.

After the first vatting the goods are laid up in pile to drip; meanwhile the liquor is again heated, and they are then returned for another twenty-four hours, again removed and allowed to drip for 2 to 3 days, after which they are oiled with cod oil on the grain and hung up in the sheds to dry in the dark. When they have dried to an indiarubber-like condition, they are piled and allowed to heat slightly until a greyish " bloom " rises to the surface, they are then set out and stretched in a Wilson scouring machine; using brass slickers instead of the stone ones used for scouring, " pinned " over by hand (with the three-edged instrument seen in *c*, fig. 4, and known as a " pin ") to remove any bloom not removed by the machine, oiled and dried. When of a damp even colour they are " rolled on " between two heavy rollers like a wringing machine, the pressure being applied from above, hung up in the dark sheds again until the uneven colour so produced has dried in, and then " rolled off " through the same machine, the pressure being applied from below. They are now dried right out, brushed on the grain to produce a slight gloss, and are finished.

As regards the finishing of harness leather, &c., the goods, after thorough dripping for a day or two, are brushed, lightly scoured, washed up in hot sumach and extract to improve the colour, and are again laid up in pile for two days; they are then given a good coat of cod oil, sent to the sheds, and dried right out. Only sufficient scouring is given to clean the goods, the object of the tanner being to leave as much weight in as possible, although all this superfluous tan has to be washed out by the currier before he can proceed.

Currying.—When the goods are dried from the sheds they are purchased by the currier. If, as is often the case, the tanner is his own currier, he does not tan the goods so heavily, or trouble about adding superfluous weight, but otherwise the after processes, the art of the currier, are the same.

Currying consists of working oil and grease into the leather to render it pliable and increase its strength. It was once thought that this was a mere physical effect produced by the oil, but such is not the case. Currying with animal oils is a second tannage in itself; the oils oxidize in the fibres and produce aldehydes, which are well-known tanning agents; and this double tannage renders the leather very strong. Then there is the lubricating effect, a very important physical action so far as the strength of the leather is concerned. Mineral oils are much used, but they do not oxidize to aldehydes, or, for the matter of that, to anything else, as they are not subject to decomposition. They, therefore, produce no second tannage, and their action is merely the physical one of lubrication, and this is only more or less temporary, as, except in the case of the heavier greases, they slowly evaporate. Where animal fats and oils are used, the longer the goods are left in contact with the grease the better and stronger will be the leather.

In the " Einbrennen " process (German for " burning in "), the hides are thoroughly scoured, and when dry are dipped into hot grease, which is then allowed to cool; when it is nearly set the goods are removed and set out. This process is not much used in Great Britain.

In hand-stuffing belting butts the goods are first thoroughly soaked in water to which has been added some soda, and then scoured and stretched by machine. They are then lightly shaved, to take off the loose flesh and thin the neck. The whole of the mechanically deposited tannin is removed by scouring, to make room for the grease, and they are then put into a sumach vat of 40° barkometer to brighten the colour, horsed up to drip, and set out. If any loading, to produce fictitious weight, is to be done, it is done now, by brushing the solution of either epsom salts, barium chloride or glucose, or a mixture, into the flesh, and laying away in pile for some days to allow of absorption, when, perhaps, another coat is given. Whether this is done or not, the goods are hung up until " tempered " (denoting a certain degree of dryness), and then treated with dubbin. This is manufactured by melting down tallow in a steam-jacketed pan, and adding cod oil, the mixture being stirred continually; when quite clear, it is cooled as rapidly as possible by running cold water through the steam pan, the stirring being continued until it has set. The tempered leather having been set out on a glass table, to which the flesh side adheres, is given a thin coat of the dubbin on the grain, turned, set out on the flesh, and given a thick coat of dubbin. Then it is hung up in a wind shed, and as the moisture dries out the grease goes in. After two or three days the goods are " set out in grease " with a brass slicker, given a coat of dubbin on the grain slightly thicker than the first coat, then flesh dubbined, a slightly thinner coat being applied than at first, and stoved at 70° F. The grease which is slicked off when " setting out in grease " is collected and sold. After hanging in the warm stove for 2 or 3 days the butts are laid away in grease for a month; they are then slicked out tight, flesh and grain, and buck tallowed. Hard tallow is first rubbed on the grain, when a slight polish is induced by rubbing with the smoothed rounded edge of a thick slab of glass; they are then hung up in the stove or stretched in frames to dry. A great deal of stuffing is now carried out by drumming the goods in hot hard fats in previously heated drums; and in modern times the tedious process of laying away in grease for a month is either left undone altogether or very considerably shortened.

In the tanning and dressing of the commoner varieties of kips and dried hides, the materials used are of a poorer quality, and the time taken for all processes is cut down, so that whereas the time taken to dress the better class of leather is from 7 to 10 months, and in a few cases more, these cheaper goods are turned out in from 3½ to 5 months.

A considerable quantity of the leather which reaches England, such as East India tanned kips, Australian sides, &c., is bought up and retanned, being sold then as a much better-class leather. The first operation with such goods is to " strip " them of any grease they may contain, and part of their original tannage. This is effectually carried out by first soaking them thoroughly, laying them up to drip, and drumming for half an hour in a weak solution of soda; they are then washed by drumming in plenty of water, the water is run off and replaced by very weak sulphuric acid to neutralize any remaining soda; this is in turn run off and replaced by weak tan liquor, and the goods are so tanned by drumming for some days in a liquor of gradually increasing strength. The liquor is made up as cheaply as possible with plenty of solid quebracho and other cheap extract, which is dried in with, perhaps, glucose, epsom salts, &c. to produce weight. Sometimes a better tannage is given to goods of fair quality, in which they are, perhaps, started in the drum and finished in layers, slightly better materials being used all through, and a longer time taken to complete the tannage.

The tannage of dressing hides for bag and portmanteau work is rather different from the other varieties described, in that the goods, after having had a rather longer liming, are " bated " or " puered."

Bating consists of placing the goods in a wheel or paddle with hen or pigeon excrement, and paddling for from a few hours to 2 or 3 days. In puering, dog manure is used, and this being rather more active, the process does not take so long. This bating or puering is carried out in warm liquors, and the actions involved are several. From a practical point of view the action is the removal of the lime and the solution of the hair sacs and a certain amount of interfibrillar substance. In this way the goods are pulled down to a soft flaccid condition, which allows of the removal of short hair, hair sacs and other filth by scudding with an unhairing knife upon the beam. The lime is partially taken into solution and partially removed mechanically during the scudding. A large quantity of hide substance, semi-soluble and soluble, is lost by being pressed out, but this matters little, as for dressing work, area, and not weight, is the main consideration. Theoretically the action is due to bacteria and bacterial products (organized ferments and enzymes), unorganized ferments or vegetable ferments like the yeast ferment, such as pancreadine, pepsin, &c. and chemicals, such as ammonium and calcium salts and phosphates, all of which are present in the manure. The evolved gases also play their part in the action.

There are several bates upon the market as substitutes for dung bate. A most popular one was the American " Tiffany " bate, made by keeping a weak glue solution warm for some hours and then introducing a piece of blue cheese to start fermentation; when fermenting, glucose was added, and the bate was then ready for work. This and all other bates have been more or less supplanted by " erodin," discovered after years of research by Mr Wood (Nottingham) and Drs Popp and Becker (Vienna). This is an artificial bate, containing the main constituents of the dung bate. It is supplied in the form of a bag of nutrient material for bacteria to thrive on and a bottle of bacterial culture. The nutrient material is dissolved in water and the bacterial culture added, and after allowing the mixture to get working it is ready for use. Many tons of this bate are now being used per annum. Its advantages are: (1) that it is clean, (2) that it is under perfect control, and (3) that stains and bate burns, which so often accompany the dung bate, are absolutely absent. Bate burns are caused by not filtering the dung bate through coarse sacking before use. The accumulation of useless solid matter settles on the skins if they are not kept well in motion, causing excessive action in these places.

After pulling down the goods to a soft, silky condition by bating or puering, it is necessary, after scudding, to plump them up again and bring them into a clean and fit condition for receiving the tan. This is done by "drenching" in a bran drench. A quantity of bran is scalded and allowed to ferment. When the fermentation has reached the proper stage the goods are placed, together with the bran liquor, in a suitable pit or vat, and are allowed to remain until they have risen three times; this rising to the surface is caused by the gaseous products of the fermentation being caught by the skin. The plumping action of the bran is due to the acids produced during fermentation and also in part to the gases, and the cleansing action is due to the mechanical action of the particles of bran rubbing against the grain of the skins. After drenching, the goods are washed free from bran, and are ready for the tanning process.

Drenching, now that all kinds of acids are available, is not so much used for heavy hides as for light skins, it being found much more convenient and cheaper to use acids. In fact, bating and puering are being gradually replaced by acid baths in the case of heavy leathers, the process being carried out as deliming for sole leather, only much more thoroughly in the case of dressing leather.

The tanning of dressing hides, which are not rounded into butts and offal, is briefly as follows. They first enter a series of colouring pits or suspenders, and then a series of handlers, by which time they should be plump and coloured through; in this condition they are split either by means of a union or band-knife splitting machine (fig. 7).

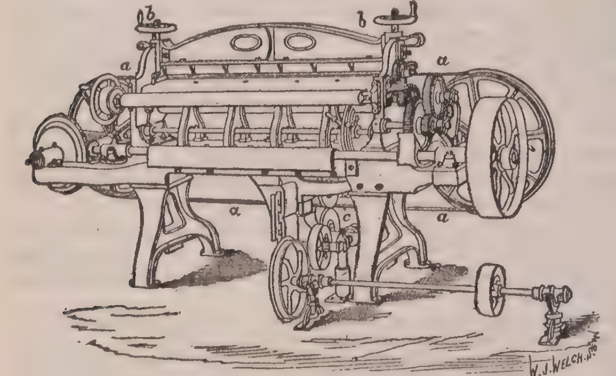

Fig. 7.—Band Knife Splitting Machine.

This latter is the most popular machine, and consists essentially of an endless band knife *a*, which revolves at considerable speed with its cutting edges close to the sides of a pair of rollers through which the leather is fed and pressed against the knife. The lower of these rollers is made of short segments or rings, each separately capable of yielding so as to accommodate itself to the unequal thicknesses of various parts of a hide. The thickness of the leather to be cut is gauged to the utmost minuteness by means of the hand screws *b b* which raise or lower the upper roller. The knife edge of the cutter is kept keen by rubbing against revolving emery wheels *c* as it passes round. So delicately can this machine effect its work that slices of leather uniform throughout and as thin as paper can be easily prepared by it, and by its aid it is quite common to split hides into as many as three useful splits.

The dressing hides are usually split in two. Here we will leave the split (flesh) for a time and continue with the treatment of the grain. After splitting, they enter another series of handlers, are then piled up for a day or two, and thrown into a large drum with sumach mixed to a paste with hot water and a light-coloured extract. They are drummed in this for one hour to brighten and mellow the grain, washed up in tepid liquor, piled for two days, and drummed with cod oil or some other suitable oil or mixture; they are now piled for a day or two to absorb, dried out, flattened on the grain, and flesh folded.

The splits are rinsed up in old sumach liquor and drummed with cheap extracts and adulterants, such as size, glucose, barium chloride, epsom salts, &c. after which they are piled up to drain, dried to a "sammied" condition, rolled to make firm, and dried right out.

In the dressing hide tannage very mellow materials are used. Gambier and myrobalans form the main body of the tannage, together with a little quebracho extract, mimosa bark, sumach and extracts.

Upper Leather.—Under the head of upper leather are included the thin, soft and pliable leathers, which find their principal, but by no means exclusive, application in making the uppers of boots and shoes, which may be taken as a type of a class of leathers. They are made from such skins as East Indian kips, light cow and horse hides, thin split hides; such as those described under dressing leather, but split rather thinner, and calf. The preparatory dressing of such skins and the tanning operations do not differ essentially from those already described. In proportion to the thinness of the skin treated, the processes are more rapidly finished and less complex, the tannage is a little lighter, heavy materials such as valonia being used sparsely if at all. Generally speaking, the goods have a longer and mellower liming and bating, the lime being more thoroughly removed than for the leathers previously described, to produce greater pliability, and everything must tend in this direction. The heavier hides and kips are split as described under dressing leather, and then tanned right out.

Currying of the Lighter Leathers.—The duty of the currier is not solely directed towards heavier leathers; he is also entrusted with the dressing and fitting of the lighter leathers for the shoemaker, coachbuilder, saddler, &c. He has to pare the leather down and reduce inequalities in thickness, to impregnate it with fatty matter in order to render it soft and pliable, and to give it such a surface dressing, colour and finish as will please the eye and suit the purposes of its consumers. The fact that machinery is used by some curriers for nearly every mechanical operation, while others adhere to the manual system, renders it almost impossible to give in brief an outline of operations which will be consistent with any considerable number of curriers.

The following may be taken as a typical modern dressing of waxed calf or waxed kips. The goods are first of all soaked down and brought to a "sammied" condition for shaving. In the better-class leathers hand-shaving is still adhered to, as it is maintained that the drag of the shaving machine on the leather causes the "nap" finish to be coarser. Hand-shaving is carried out on a beam or strong frame of wood, supporting a stout plank faced with lignum vitae, and set vertically, or nearly so. The knife (fig. 8) is a double-edged rectangular blade about 12 in. by 5 in., girded on either side along its whole length and down the centre with two bars 3 in. wide, leaving each blade protruding 1 in. beyond them; it has a straight handle at one end and a cross handle at the other in the plane of the blade. The edges of this knife are first made very keen, and are then turned over so as to form a wire edge, by means of the thicker of the two straight steel tools shown in fig. 9. The wire edge is preserved by drawing the thinner of the two steel tools along the interior angle of the wire edge and then along the outside of the turnover edge. The skin being thrown flesh uppermost over the vertical beam, the shaver presses his body against it, and leaning over the top holds the knife by its two handles almost at right angles to the leather, and proceeds to shave it by a scraping stroke downwards which the wire edge, being set at right angles to the knife and almost parallel with the skin, turns into a cut. The skin is shifted so as to bring all parts under the action of the knife, the shaver frequently passing a fold between his finger to test the progress of his work. After shaving, the goods are thoroughly soaked, allowed to drip, and are ready for "scouring." This operation has for its object the removal of bloom (ellagic acid) and any other superfluous adherent matter. The scouring solution consists of a weak solution of soft soap and borax. This is first well brushed into the flesh of the leather, which is then "sleeked" (slicked) out with a steel slicker shown at S fig. 9. The upper part

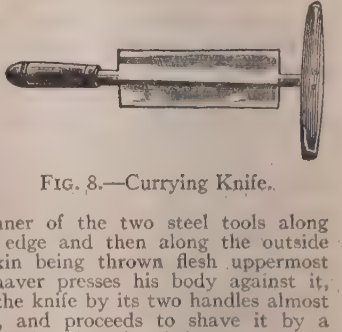

Fig. 8.—Currying Knife.

of the "slicker" is wooden, and into it a steel, stone, brass or vulcanite blade is forced and fastened. The wooden part is grasped in both hands, and the blade is half rubbed and half scraped over the surface of the leather in successive strokes, the angle of the slicker being a continuation of the angle which the thrust out arms of the worker form with the body, perhaps 30° to 45°, with the leather, depending upon the pressure to be applied. The soap and borax solution is continually dashed on the leather to supply a body for the removal of the bloom with the steel slicker. The hide is now turned, and the grain is scoured with a stone slicker and brush, with soap and borax solution, it is then rinsed up, and sent to dry; when sammied, it is "set" *i.e.* the grain is laid smooth with a brass or steel slicker and dried right out. It is now ready for "stuffing," which is invariably done in the drum with a mixture of stearine and "sod" oil, to which is sometimes added cod oil and wool fat; it is then set out on the grain and "canked" on the flesh, the grain side is glassed, and the leather dried right out. The goods are now "rounded," *i.e.* the lighter coloured parts of the grain are damped with a mixture of dubbin and water to bring them to even colour, and are then laid in pile for a few days to mellow, when they are ready for whitening. The goods are damped down and got to the right temper with a weak soap and water solution, and are then "whitened," an operation similar to shaving, carried out with a turned edge slicker. By this means a fine flesh surface is obtained upon which to finish by waxing; after this they are "boarded" with an arm board (R, fig. 9) to bring up the grain, or give a granular appearance to the leather and make it supple, when they may be turned flesh inwards and bruised, a similar operation to graining, essentially to soften and make them pliant. At this stage the goods are known as "finished russet," and are stored until ready for waxing.

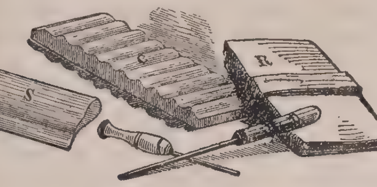

FIG 9.—Currying Apparatus. C, pommel; R, raising board; S, slicker.

For waxing, the first operation is to black the goods. In England this is generally done by hand, but machinery is much more used in the United States. The process consists of well brushing into the flesh side of the skins a black preparation made in one of two ways. The older recipe is a mixture of lampblack, oil and perhaps a little tallow; the newer recipe consists of soap, lampblack, logwood extract and water. Either of these is brushed well into the flesh side, which is then glassed up by means of a thick slab of glass, the smooth rounded edges being used with a slicking motion, and the goods are hung up to dry. When dry they are oiled with cod oil, and are ready for sizing. Goods blacked with soap blacking are sized once, those prepared with oil blacking are sized twice. The size used for soap black skins may consist of a mixture of beeswax, pitch, linseed oil, tallow, soap, glue and logwood extract. For oil blacked skins the "bottom sizing" may be glue, soap, logwood extract and water, after the application of which the goods are dried and the "top sizing" applied; this consists of glue, cod oil, beeswax, tallow, venice turps, black dye and water. The sizings having been applied with a sponge or soft brush, thoroughly rubbed in with a glass slicker, crush marks are removed by padding with a soft leather pad, and the goods, after being dried out, are ready for the market.

In the dressing of waxed grain leathers, such as French calf, satin leather, &c., the preparatory processes are much the same as for waxed leathers described above as far as stuffing, after which the grain is prepared to take the colour by light hand scouring with weak soap and borax solution. The dye is now applied, and so that it may take well on the grain of the greasy leather, a quantity of either soap, turkey red oil or methylated spirit is added to the solution. Acid colours are preferably used, and three coats are given to the dry leather, which is then grained with an arm board, and finished by the application of hard buck tallow to the grain and brushing. The dye or stain may consist of aniline colours for coloured leathers, or, in the case of blacks, consecutive applications of logwood and iron solutions are given.

Finishing dressing Hides for Bag and Portmanteau Work.—The hides as received from the tanner are soaked down, piled to sammy, and shaved, generally by machine, after which they are scoured, as under waxed leather, sumached and hung up to dry; when just damp they are set out with a brass slicker and dried right out. The grain is now filled by applying a solution of either Irish moss, linseed mucilage or any other mucilaginous filling material, and the flesh is sized with a mixture of mucilage and French chalk, after which the goods are brush-stained with an aniline dye, to which has been added linseed mucilage to give it body: two coats are applied to the sammied leather. When the goods have sammied, after the last coat of stain, they are "printed" with a brass roller in a "jigger," or by means of a machine embosser. This process consists of imprinting the grain by pressure from a brass roller, on which the pattern is deeply etched. After printing, the flesh side is sponged with a weak milk solution, lightly glassed and dried, when the grain is sponged with weak linseed mucilage, almost dried, and brushed by machine. The hides are now finished, by the application either of pure buck tallow or of a mixture of carnauba wax and soap; this is rubbed up into a slight gloss with a flannel.

Light Leathers.—So far only the heavier leathers have been dealt with; we will now proceed to discuss lighter calf, goat, sheep, seal, &c.

In tanning light leathers everything must tend towards suppleness and pliability in the finished leather, in contrast to the firmness and solidity required in heavy leathers. Consequently, the liming is longer and mellower; puering, bating or some bacterial substitute always follows; the tannage is much shorter; and mellow materials are used. A deposition of bloom in the goods is not often required, so that very soon after they are struck through they are removed as tanned. The materials largely used are sumach, oak bark, gambier, myrobalans, mimosa bark, willow, birch and larch barks.

As with heavy leathers, so also with light leathers, there are various ways of tanning; and quality has much to do with the elaboration or modification of the methods employed. The tanning of all leathers will be dealt with first, dyeing and finishing operations being treated later.

The vegetable-tanned leather *de luxe* is a bottle-tanned skin. It is superior to every other class of vegetable-tanned leather in every way, but owing to competition not a great deal is now produced, as it is perhaps the most expensive leather ever put on the market. The method of preparation is as follows.

The skins are usually hard and dry when received, so they are at once soaked down, and when sufficiently soft are either milled in the stocks, drummed in a lattice drum (American dash wheel, fig. 10), or "broken down" over the beam by working on the flesh with a blunt unhairing knife. They are next mellow limed (about 3 weeks), sulphide being used if convenient, unhaired and fleshed as described under heavy leathers, and are then ready for puering. This process is carried through at about 80° F., when the goods are worked on the beam, rinsed, drenched in a bran drench, scudded, and are ready for tanning. The skins are now folded down the centre of the back from neck to butt (tail end), flesh outwards, and the edges are tightly stitched all round to form bags, leaving an aperture at one of the shanks for filling; they are now turned grain outwards and filled with strong sumach liquor and some quantity of solid sumach to fill up the interstices and prevent leakage, after which the open shank is tied up, and they are thrown into warm sumach liquor, where they float about like so many pigs, being continually pushed under the surface with a dole. When struck through they are piled on a shelf above the vat, and by their own weight the liquor is forced through the skins. The tannage takes about 24 hours, and when finished the stitching is ripped up, the skins are slicked out, "strained" on frames and dried. "Straining" consists of nailing the skins out on boards in a stretched condition, or the stretching in frames by means of strings laced in the edge of the frame and attached to the edge of the skin.

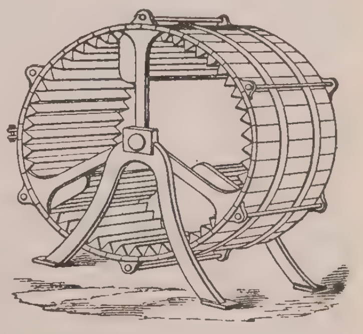

FIG. 10.—Dash Wheel.

The commoner sumach-tanned skins (but still of very good quality) are tanned in paddle wheels, a series of three being most conveniently used in the same manner as the three-pit system of liming, each wheel having three packs of skins through it before being thrown away. This paddling tends to make a bolder grain, as the skins are kept in continual motion, and work over one another. Some manufacturers finish the tannage with a mixture of sumach and oak bark; this treatment yields a less porous product. Others, when the skins are strained and in a semi-dry condition, apply neatsfoot or other oil, or a mixture of glycerine and oil, to the grain to lubricate it and make it more supple; the glycerine mixture is generally used for "chrome" leather, and will be discussed later under that head.

The skins tanned as above are largely dressed as *morocco*. Originally "morocco" was produced by the Moors in southern Spain and Morocco, whence the industry spread to the Levant, Turkey and the Mediterranean coast of Africa generally, where the leather was made from a species of sumach. Peculiarly enough, the dyeing was carried out before the tanning, with Roman alum as "mordant" and kermes, which with the alum produced a fine red colour. Such leather was peculiarly clear in colour, elastic and soft, yet firm and fine in grain and texture, and has long been much prized for bindings, being the material in which most of the artistic work of the 16th-century binders was executed. Now, in addition to the genuine morocco made from goat skins, we have imitation or French moroccos, for which split calf and especially sheep skins are employed, and as the appearance of morocco is the result of the style of graining and finish, which can now be imitated by printing or embossing machines, morocco can be made from all varieties of thin leather.

Great quantities of "Persian" (East India tanned) sheep and goat are now dressed as moroccos and for innumerable other purposes, the method being as follows: The goods are tanned with turwar bark and cassia bark, besides being impregnated with sesame oil, even to the extent of 30%. The first operation is to "strip" them of the oil and original tannage as far as possible, by drumming in a solution of soda; the soap thus formed is got rid of by thoroughly washing the goods, when they are "soured" in a weak bath of sulphuric acid to brighten the colour and remove iron stains, after which they are washed up and re-tanned by drumming in warm sumach, allowing about 4 oz. per skin. They are then slicked out, dried and are ready for dyeing.

The tanning of sheep and lamb skins differs very essentially from the tanning of goat and other leathers, mainly in the preparatory processes. As the wool is completely destroyed by lime, other methods have to be resorted to. The process usually practised is known as "sweating"; this consists of hanging the moist skins up in a warm, badly-ventilated chamber and allowing incipient putrefaction to set in. The chamber is always kept warm and saturated with moisture, either by means of a steam jet or water sprinklers. During the process large quantities of ammoniacal vapours are given off, and after two or three days the skins become slimy to the touch, and the wool slips easily; at this stage the goods are removed, for if the putrefaction goes too far the grain of the skin is irretrievably ruined. The wool is now "pulled" by pullers, who throw it into bins arranged to receive the different qualities; for one pelt may have three different grades of wool on it.

Other methods of dewooling are to paint the flesh with a solution of sodium sulphide, or cream of lime made with a solution of sodium sulphide; in either case the goods are piled flesh to flesh for an hour or so, and care is taken that the dewooling agent does not touch the wool. The pelt is then pulled and rapidly swilled in a stream of running water. The goods are now, in some yards, lightly limed to plump them superficially, by paddling in a milk of lime, and at this stage, or when the goods have been "struck through" with tan liquor, they are "degreased" either by hydraulic pressure or by benzene degreasing. This is to expel the oleaginous or fatty matter with which sheep skins are richly impregnated; the average yield is about 4 oz. per skin. The tannage is carried out in much the same way as for goat skins, the goods being started in old acid bark liquors; the general tannage consists of sumach and bark.

Basils are sheep skins tanned in various ways. English basils are tanned with oak bark, although, as in all other leathers, inferior tannages are now common; Scotch basils are tanned with larch bark, Australian and New Zealand basils with mimosa bark and Turkish basils with galls. The last are the commonest kind of skins imported into Great Britain, and are usually only semi-tanned. *Roans* are sumach-tanned sheep skins.

Skivers are the grain splits of sheep skins, the fleshes of which are finished for chamois leather. The goods are split in the limed state, just as the grains are ready for tanning, and are subsequently treated much as sumach-tanned goat skins, or in any other convenient way; the fleshes, on the other hand, go back into the limes, as it is necessary to get a large quantity of lime into leather which is to be finished as chamois.

Russia Leather was originally a speciality of Russia, where it was made from the hides of young cattle, and dressed either a brownish red or black colour for upper leather, bookbinding, dressing-cases, purses, &c. It is now made throughout Europe and America, the best qualities being obtained from Austria. The empyreumatic odour of the old genuine "Russia" leather was derived from a long-continued contact with willow and the bark of the *white* birch, which contains the odorous betulin oil. Horse hides, calf, goat, sheep skins and even splits are now dressed as "Russia leather," but most of these are of a decidedly inferior quality, and as they are merely treated with birch bark oil to give them something of the odour by which Russia leather is ordinarily recognized, they scarcely deserve the name under which they pass. The present-day genuine Russia leather is tanned like other light leathers, but properly in willow bark, although poplar and spruce fir barks are used. After tanning and setting out the goods are treated with the empyreumatic oil obtained by the dry distillation of birch bark. The red colour commonly seen in Russia leather is now produced by aniline colours, but was originally gained by the application of an infusion of Brazil wood, which was rubbed over the grain with a brush or sponge. Some time ago Russia leather got into disrepute because of its rapid decay; this was owing to its being dyed with a very acid solution of tin salts and cochineal, the acid completely destroying the leather in a year or two. The black leather is obtained by staining with logwood infusion and iron acetate. The leather, if genuine quality, is very watertight and strong, and owing to its impregnation with the empyreumatic oil, it wards off the attacks of insects.

Seal Leathers, &c.—The tannage of seal skins is now an important department of the leather industry of the United Kingdom. The skins form one of the items of the whaling industry which principally centres in Dundee, and at that port, as well as at Hull and Peterhead, they are received in large quantities from the Arctic regions. This skin is that of the white hair seal, and must not be confused with the expensive seal fur obtained from Russian and Japanese waters. These white hair seal skins are light but exceedingly close in texture, yielding a very strong tough leather of large area and fine bold grain, known as *Levant morocco*. The area of the skins renders them suitable for upholstery work, and the flesh splits are dressed in considerable quantity for "japanned" ("patent") leather and "bolsters," which are used to grain other skins on, the raised buff affording a grip on the skin being grained and thus preventing slipping. When the skins arrive in the tanyard (generally lightly salted) they are drummed in old drench liquors until soft, dipped into warm water and "blubbered" with a sharp knife; they are then alternately dipped in warm water and drummed several times to remove fat, after which they are heavily limed, as they are still very greasy, and after unhairing and fleshing they are heavily puered for the same reason. The tannage takes about a month, and is much the same as for other leathers, the skins being split when "struck through."

Alligator leather is now produced to some extent both in the United States and India. The belly and flanks alone are useful. There are no special tanneries or processes for dressing the skins. Layers are not given. The leather is used mostly for small fancy goods, and is much imitated on sheepskin by embossing.

Snake and frog skins are also dressed to some extent, the latter having formed a considerable item in the exports of Japan; they are dressed mostly for cigar cases and pocket books. The general procedure is first to lime the goods and then to remove any scales (in the case of snake skins) by scraping with an unhairing knife on a small beam, after which the skins are bated and tanned in sumach by paddling.

A considerable amount of leather is now produced in Australia from the skins of kangaroo, wallaby and other marsupials. These skins are both tanned and "tawed," the principal tanning agents being mimosa bark, mallet bark and sugar bush, which abound in Australia. The leather produced is of excellent quality, strong and pliable, and rivals in texture and appearance the kid of Europe; but the circumstance that the animals exist only in the wild state renders them a limited and insecure source of leather.

Japan and Enamel Leathers.—Japanning is usually done on flesh splits, whereas enamelling is done on the grain, and if splits are used they are printed and boarded. The leather should be mellow, soft, free from grease, with a firm grain and no inclination to stretch. It is first shaved very smooth, thoroughly scoured with a stone, sumached, washed, slicked out tight and dried; when "sammied," the grain is buffed to remove scratches and oiled, the goods are then whitened or fluffed, and if too hard, bruised by boarding; enamel goods are now grained. The skins are now tightly nailed on boards and any holes patched up with brown paper, so that the japan shall not touch the flesh when the first thick coat of japan or the "daub" is put on. This is applied so thickly that it cannot soak in, with fine-toothed slicker, and then placed in a hot stove for twenty-four hours until quite dry; the coating is then pumiced smooth and the second thinner coat, termed "blanback," is applied. This is dried and pumiced, and a fine coating of japan or copal varnish is finally given. This is dried and cooled, and if the goods are for enamel they are boarded.

English japans sometimes contain light petroleum, but no turps. The secret of successful japanning lies in the age of the oil used; the older the linseed oil is, the better the result. To prepare the ground coat, boil 10 gallons linseed oil for one hour with 2 ℔ litharge at 600° F. to jellify the oil, and then add 2 ℔ prussian blue and boil the whole for half an hour longer. Before application the mixture is thinned with 10 gallons light petroleum. For the second coat, boil 10 gallons linseed oil for 2 hours with 2 ℔ prussian blue and 2 ℔ lampblack; when of a thin jelly consistency thin with 5 gallons of benzine or light petroleum. For the finishing coat, boil 5 gallons of linseed oil for 1 hour, then add 1 ℔ prussian blue, and boil for another hour; thin with 10 gallons petroleum and apply with a brush in a warm room. After drying, the goods are mellowed by exposure to the sun for at least three days.

Tawing.—Wool rugs are, after the preliminary processes, sometimes tanned in oak bark liquors by paddling, but are generally "tawed," that is, dressed with alum and salt, and are therefore more suitably dealt with under that head. Tawing implies that the conversion of skins into leather is carried out by means of a mixture of which the more important constituents are mineral salts, such as alum, chrome and iron, which may or may not be supplemented with fatty and albuminous matter, both animal and vegetable.

As an example of alum tawing, calf kid may be taken as characteristic of the process; glove kid is also treated on similar lines. The goods are prepared for tawing in a manner similar to the preparation of tanned leathers, arsenical limes being used to ensure a fine grain. After being well drenched and washed the goods are ready for the tawing process. On the continent of Europe it is usual for the goods to be thrown into a tub with the tawing paste and trodden with the bare feet, although this old-fashioned method is gradually being driven out, and the drum or tumbler is being used.

The tawing paste consists of a mixture of alum, salt, flour, egg yolk and water; the quantities of each constituent diverge widely, every dresser having his own recipe. The following has been used, but cannot well be classed as typical: For 100 ℔ skin take 9 ℔ alum, 5 ℔ salt, dissolve in water, and mix to a thin paste with from 5 to 13 ℔ flour, using 4 to 6 egg yolks for every pound of flour used. Olive oil is also mixed in sometimes. The skins are drummed or trodden, at intervals, in the warm paste for some hours, removed, allowed to drain, and dried rapidly, damped down or "sammied" and "staked" by drawing them to and fro over a blunt knife fixed in the top of a post, and known as a knee stake; this process softens them very considerably. After staking, the goods are wet back and shaved smooth, either with a moon knife, *i.e.* a circular concave convex knife, the centre of which has been cut out, a piece of wood bridging the cavity forming the grip, or with an ordinary currier's shaving knife; the skins are now ready for dyeing and finishing.

Wool Rug Dressing.—Wool rugs are first thoroughly soaked, well washed and clean-fleshed, scoured well by rubbing into the wool a solution of soft soap and soda, and then leathered by rubbing into the flesh of the wet skins a mixture consisting of three parts of alum and two parts of salt until they are practically dry; they are now piled up over-night, and the mixture is again applied. After the second or third application the goods should be quite leathered. Other methods consist of stretching the skins in frames and painting the flesh with a solution of alum and salt, or, better, with a solution of basic alum and salt, the alum being made basic by the gradual addition of soda until a permanent precipitate is produced.

The goods are now bleached, for even the most vigorous scouring will not remove the yellow tint of the wool, especially at the tips. There are several methods of bleaching, viz. by hydrogen peroxide, following up with a weak vitriol bath; by potassium permanganate, following up with a bath of sulphurous acid; or by fumigating in an air-tight chamber with burning sulphur. The last-named method is the more general; the wet skins are hung in the chamber, an iron pot containing burning sulphur is introduced, and the exposure is continued for several hours.

If the goods are to be finished white, they are now given a vitriol sour, scoured, washed, retanned, dried, and when dry softened by working with a moon knife. If they are to be dyed, they must be prepared for the dye solution by "chloring," which consists of immersion in a cold solution of bleaching powder for some hours, and then souring in vitriol.

The next step is dyeing. If basic dyes are to be used, it is necessary to neutralize the acidity of the skins by careful addition of soda, and to prevent the tips from being dyed a darker colour than the roots. Glauber salts and acetic acid are added to the dye-bath. The tendency of basic colours to rub off may be overcome by passing the goods through a solution of tannin in the form of cutch, sumach, quebracho, &c.; in fact, some of the darker-coloured materials may be used as a ground colour, thus economizing dyestuff and serving two purposes. If acid colours are used, it is necessary to add sulphuric acid to the dye bath, and in either case colours which will strike below 50° C. must be used, as at that temperature alum leather perishes.

After being dyed, the goods are washed up, drained, and if necessary retanned, the glossing finish is then produced by passing them through a weak emulsion or "fat liquor" of oil, soap and water, after which they are dried, softened by working with a moon knife and beating, when they are combed out, and are ready for the market.

Blacks are dyed by immersing the goods alternately in solutions of logwood and iron, or a one-solution method is used, consisting of a mixture of these two, with, in either case, varying additions of lactic acid and sumach, copper salts, potassium bichromate, &c.; the time of immersion varies from hours to days. After striking, the goods are exposed to the air for some hours in order to oxidize to a good black; they are then well scoured, washed, drained, retanned, dried, softened and combed.

Chrome Tanning.—The first chrome tanning process was described by Professor Knapp in 1858 in a paper on "Die Natur und Wesen der Gerberie," but was first brought into commercial prominence by Dr Heinzerling about 1878, and was worked in a most persevering way by the Eglinton Chemical Company, who owned the English patents, though all their efforts failed to produce any lasting effects. Now chrome tanning is almost the most important method of light leather dressing, and has also taken a prominent place in the heavy department, more especially in curried leathers and cases where greater tensile strength is needed. The leather produced is much stronger than any other leather, and will also stand boiling water, whereas vegetable-tanned leather is completely destroyed at 70° C. and alum leather at 50° C.

The theory of chrome tanning is not perfectly understood, but in general terms it consists of a partial chemical combination between the hide fibre and the chrome salts, and a partial mechanical deposition of chromium oxide in and on the fibre. The wet work, or preparation for tanning, may be taken as much the same as for any other leather.

There are two distinct methods of chrome tanning, and several different methods of making the solutions. The "two bath process" consists of treating the skins with a bichromate in which the chromium is in the acidic state, and afterwards reducing it to the basic state by some reducing agent. The exact process is as follows: To prevent wrinkled or "drawn" grain the goods are first paddled for half an hour in a solution of vitriol and salt, when they are piled or "horsed" up over night, and then, without washing, placed in a solution consisting of 7 ℔ of potassium bichromate, 3½ ℔ of hydrochloric acid to each 100 ℔ of pelts, with sufficient water to conveniently paddle in; it is recommended that 5% of salt be added to this mixture. The goods are run in this for about 3 hours, or until struck through, when they are horsed up for some hours, care being taken to cover them up, and are then ready for the reducing bath. This consists of a 14% solution of plain "hypo," or hyposulphite of soda, to which, during the process of reduction, frequent additions of hydrochloric acid are made to free the sulphurous and thiosulphuric acids, which are the active reducing agents. After about 3 hours' immersion, during which time the goods will have changed in colour from bright yellow to bright green, one or two skins are cut in the thickest part, and if the green has struck right through, the pack is removed as tanned, washed up, and allowed to drain.

The "single-bath process" consists of paddling, drumming, or otherwise introducing into the skins a solution of a chrome salt, usually chrome alum, which is already in the basic condition, and therefore does not require reducing. The basic solutions are made as follows: For 100 ℔ of pelts 9 ℔ of chrome alum are dissolved in 9 gallons of water, and 2½ ℔ of washing soda already dissolved in 1 gallon of water are gradually added, with constant stirring. One-third of the solution is added to 80 gallons of water, to which is added 7 ℔ of salt, and the skins are introduced; the other two-thirds are introduced at intervals in two successive portions. Another liquor, used in the same way, is made by dissolving 3 ℔ of potassium bichromate in hot water, adding ½ gallon strong hydrochloric acid and then, gradually, about 1½ ℔ of glucose or grape sugar; this reduces the acidic chrome salt, vigorous effervescence ensuing. The whole is made up to 2 gallons and 5% to 15% of salt is added. In yet another method a chrome alum solution is rendered basic by boiling with "hypo," and after the reaction has ceased the solution is allowed to settle and the clear portion used.

After tanning, which takes from 8 hours to as many, and even more, days, depending upon the method used and the class of skin being dressed, the skins tanned by both methods are treated in a similar manner, and are neutralized by drumming in borax solution, when they are washed free from borax by drumming in warm water, and are ready for dyeing, a process which will be dealt with further on. The goods are sometimes tanned by suspension, but this method is generally reserved for the tanning of the heavier leathers, which are treated in much the same way, the several processes taking longer.

Iron Tannage.—Before leaving mineral tanning, mention may be made of iron tannage, although this has gained no prominent position in commerce. Ferric salts possess powerful tanning properties, and were thoroughly investigated by Professor Knapp, who took out several patents, but the tendency to produce a brittle leather has never been entirely overcome, although it has been greatly modified by the incorporation of organic matter, such as blood, rosin, paraffin, urine, &c. Knapp's basic tanning liquor is made as follows: A strong solution of ferrous sulphate is boiled and then oxidized to the ferric state by the careful addition of nitric acid. Next, to destroy excess of nitric acid, ferrous sulphate is added until effervescence ceases and the resulting clear orange-coloured solution is concentrated to a varnish-like consistency. It does not crystallize or decompose on concentration. The hides or skins are prepared for tanning in the usual way, and then handled or otherwise worked in solutions of the above iron salt, the solutions, which are at first weak, being gradually strengthened.

The tannage occupies from 2 to 8 days, and the goods are then stuffed in a ventilated drum with greases or soap. If the latter is used, an insoluble iron soap is precipitated on the fibres of the leather, which may then be finally impregnated with stearin and paraffin, and finished in the usual manner as described under Curried Leathers. A very fair leather may also be manufactured by using iron alum and salt in the same manner as described under ordinary alum and salt.

Combination Tannages.—Leathers tanned by mixtures or separate baths of both mineral and vegetable tanning agents have now taken an important position in commerce. Such leathers are the Swedish and Danish glove leathers, the United States "dongola leather," and French glazed kid. The usefulness of such a combination will be evident, for while vegetable tanning produces fullness, plumpness and resistance to water, the mineral dressing produces a softness unnatural to vegetable tannages without the use of large quantities of oils and fats. It may also be noted that once a leather has been thoroughly tanned with either mineral or vegetable materials, although it will absorb large quantities of the material which has not been first used, it will retain in the main the characteristics of the tannage first applied. The principle had long been used in the manufacture of such tough and flexible leathers as "green leather," "combing leather" and "picker bands," but was first applied to the manufacture of imitation glazed kid by Kent in America, who, about 1878, discovered the principle of "fatliquoring," and named his product "dongola leather." The discovery of this process revolutionized the manufacture of combination leathers.

The Swedish and Danish glove leathers were first given a dressing of alum and salt, with or without the addition of flour and egg, and were then finished and coloured with vegetable materials, generally with willow bark, although, in cases of scarcity, sumach, oak bark, madder and larch were resorted to. The "green leathers" manufactured in England generally receive about a week's tannage in gambier liquors, and are finished off in hot alum and salt liquors, after which they are dried, have the crystallized salts slicked off, are damped back, and heavily stuffed with moellon, degras or sod oil. Kent, in the manufacture of his dongola leather, used mixed liquors of gambier alum and salt, and when tanned, washed the goods in warm water to remove excess of tanning agent, piled up to samm, and fatliquored. In making alum combinations it must be borne in mind that alum leather will not glaze, and if a glazed finish is required, a fairly heavy vegetable tannage should be first applied. For dull finishes the mineral tannage may advantageously precede the vegetable.

Very excellent chrome combination leather is also manufactured by the application of the above principles, gambier always being in great favour as the vegetable agent. The use of other materials deprives the leather of its stretch, although they may be advantageously used where the latter property is objectionable.

Oil Tanning.—Under the head of oil tanning is included "buff leather," "buck leather," "piano leather," "chamois leather," and to a greater or lesser extent, "Preller's crown or helvetia leather." The process of oil tanning dates back to antiquity, and was known as "shamoying," now spelt "chamoising." Chamoising yields an exceedingly tough, strong and durable leather, and forms an important branch of the leather industry. The theory of the process is the same as the theory of currying, which is nothing more or less than chamoising, viz. the lubrication of the fibres by the oil itself and the aldehyde tanning which takes place, due to the oxidation and decomposition of the esters of the fatty acids contained in the oil. The fact that an aldehyde tannage takes place seems to have been first discovered by Payne and Pullman, who took out a patent in 1898, covering formaldehyde and other aldehydes used in alkaline solutions. Their product, "Kaspine" leather, found considerable application in the way of military accoutrements. Chamois, buff, buck and piano leathers are all manufactured by the same process slightly modified to suit the class of hide used, the last three being heavy leathers, the first light.

As regards the process used for chamois leather, the reader will remember, from the account of the vegetable tannage of sheep skins, that after splitting from the limes, the fleshes were thrown back into the pits for another three weeks' liming (six weeks in all) preparatory to being dressed as chamois leather. It is necessary to lime the goods for oil dressing very thoroughly, and if the grain has not been removed by splitting, as in the case of sheep skins, it is "frized" off with a sharp knife over the beam. The goods are now rinsed, scudded and drenched, dried out until stiff, and stocked in the faller stocks with plenty of cod oil for 2 to 3 hours until they show signs of heating, when they are hung up in a cool shed. This process is repeated several times during a period of from 4 to 6 days, the heat driving the water out of the skins and the oil replacing it. At the end of this time the goods, which will have changed to a brown colour, are hung up and allowed to become as dry as possible, when they are hung in a warm stove for some hours, after which they are piled to heat off, thrown into tepid water and put through a wringing machine. The grease which is recovered from the wringing machine is known commercially as "degras" or "moellon," and fetches a good price, as it is unrivalled for fatliquoring and related processes, such as stuffing, producing a very soft product. They next receive a warm soda lye bath, and are again wrung; this removes more grease, which forms soap with the lye, and is recovered by treatment with vitriol, which decomposes the soap. The grease which floats on top of the liquor is sold under the name of "sod oil." This also is a valuable material for fatliquoring, &c., but not so good as degras.

After being wrung out, the goods are bleached by one of the processes mentioned in the section on wool rug dressing, the permanganate method being in general use in England. In countries where a fine climate prevails the soap bleach or "sun bleach" is adopted; this consists of dipping the goods in soap solution and exposing them to the sun's rays, the process being repeated three or more times as necessary.

The next step is fatliquoring to induce softness, after which they are dried out slowly, staked or "perched" with a moon knife, fluffed on a revolving wheel covered with fine emery to produce the fine "nap" or surface, brushed over with french chalk, fuller's earth or china clay, and finally finished on a very fine emery wheel.

Preller's Helvetia or Crown Leather.—This process of leather manufacture was discovered in 1850 by Theodor Klemm, a cabinetmaker of Württemberg, who being then in poor circumstances, sold his patent to an Englishman named Preller, who manufactured it in Southwark, and adopted a crown as his trade mark. Hence the name "crown" leather. The manufacture then spread through Switzerland and Germany, the product being used in the main for picker straps, belting and purposes where waterproof goods were required, such as hose pipes and military water bags. No taste is imparted to the water by this leather.

The process of manufacture is as follows: The hides are unhaired by short liming, painting with lime and sulphide, or sweating, and cleansed by scudding and washing, after which they are coloured in bark liquors, washed up through clean water, and hung up to dry partially. When in a sammied condition the goods are placed on a table and a thick layer of the tanning paste spread on the flesh side. The tanning paste varies with each manufacturer, but the following is the mixture originally used by Preller: 100 parts flour, 100 parts soft fat or horse tallow, 35 parts butter, 88 parts ox brains, 50 parts milk, 15 parts salt or saltpetre.

The hides are now rolled in bundles, placed in a warm drum and worked for 8 to 10 hours, after which they are removed and hung up until half dry, when the process is repeated. Thus they are tumbled 3 to 4 times, set out flesh and grain, rinsed through tepid water, set out, sammied, and curried by coating with glycerin, oil, tallow and degras. The table grease is now slicked off, and the goods are set out in grease, grained and dried.

Transparent Leather.—Transparent leather is a rather horny product, somewhat like raw hide, and has been used for stitching belts and picker bands. The goods to be dressed are limed, unhaired, very thoroughly delimed with acids, washed in water, scudded and clean-fleshed right to the veins; they are now stretched in frames, clean-fleshed with a moon knife, and brushed with warm water, when several coats of glycerin, to which has been added some antiseptic such as salicylic or picric acid, are applied; the goods are then dried out, and another coat is applied, and when semi-dry they are drummed in a mixture of glycerin, boracic acid, alum and salt, with the addition of a little bichromate of potash to stain them a yellow colour. After drumming for 2 to 3 hours they are removed, washed up, lightly set out, and stretched in frames to dry, when they are ready for cutting into convenient lengths for use.

Parchment.—A certain class of sheep skin known as Hampshires is generally used in the manufacture of this speciality. The skins as received are first very carefully washed to remove all dirt, dewooled, limed for 3 to 4 weeks, they are then cleanly fleshed, unhaired, rinsed up in water, and thickly split, the poorer hides being ultilized for chamois; they are now re-split at the fatty strata so that all fat may be easily removed, and while the grains are dressed as skivers, the fleshes are tied in frames, watered with hot water, scraped and coated on both sides with a cream consisting of whiting, soda and water, after which they are dried out in a hot stove. In the drying the whiting mixture absorbs the grease from the skins; in fact, this method of degreasing is often employed in the manufacture of wool rugs. When dry, both sides of the skins are flooded to remove the whiting, and are then well rubbed over with a flat piece of pumice-stone, swilled, dried, re-pumiced, again swilled, and when sammied are rolled off with a wooden roller and dried out.

Tar and Peat Tanning.—Tar tanning was discovered by a French chemist named Philippi, who started with the idea that, if coal was a decomposition product of forests, it must still necessarily possess the tanning properties originally present in the trees. However far-fetched such an argument may seem, Philippi succeeded in producing a leather from wood and coal tar at a fairly cheap rate, the product being of excellent texture and strength, but rather below the average in the finish, which was inclined to be patchy, showing oily spots. His method consisted of impregnating the goods with refined tar and some organic acid, but the product does not seem to have taken any hold upon the market, and is not much heard of now.

Peat tanning was discovered by Payne, an English chemist, who was also the co-discoverer of the Payne-Pullman formaldehyde tanning process. His peat or humic acid tannage was patented by him about 1905, and is now worked on a commercial scale. The humic acid is first extracted from the peat by means of alkalis, and the hides are treated with this solution, the humic acid being afterwards precipitated in the hides by treatment with some stronger organic or mineral acid.

Dyeing, Staining and Finishing.—These operations are practised almost exclusively on the lighter leathers. Heavy leathers, except coloured and black harness and split hides for bag work, are not often dyed, and their finishing is generally considered to be part of the tannage. In light leathers a great business is done in buying up "crust" stock, *i.e.* rough tanned stock, and then dyeing and finishing to suit the needs and demands of the various markets. The carrying out of these operations is a distinct and separate business from tanning, although where possible the two businesses are carried on in the same works.

Whatever the goods are and whatever their ultimate finish, the first operation, upon receipt by the dyer of the crust stock, is sorting, an operation requiring much skill. The sorter must be familiar with the why and wherefore of all subsequent processes through which the leather must go, so as to judge of the suitability of the various qualities of leather for these processes, and to know where any flaws that may exist will be sufficiently suppressed or hidden to produce a saleable product, or will be rendered entirely unnoticeable. The points to be considered in the sorting are coarseness or fineness of texture, boldness or fineness of grain, colour, flaws including stains and scratches, substance, &c. Light-coloured and flawless goods are parcelled out for fine and delicate shades, those of darker hue and few flaws are parcelled out for the darker shades, such as maroons, greens (sage and olive), dark blues, &c., and those which are so badly stained as to be unsuitable for colours go for blacks. After sorting, the goods are soaked back to a limp condition by immersion in warm water, and are then horsed up to drip, having been given, perhaps, a preliminary slicking out.

Up to this point all goods are treated alike, but the subsequent processes now diverge according to the class of leather being treated and the finish required.

Persian goods for glacés, moroccos, &c., require special preparation for dyeing, being first re-tanned. As received, they are sorted and soaked as above, piled to samm, and shaved. Shaving consists of rendering the flesh side of the skins smooth by shaving off irregularities, the skin, which is supported on a rubber roller actuated by a foot lever, being pressed against a series of spiral blades set on a steel roller, which is caused to revolve rapidly. When shaved, the goods are stripped, washed up, soured, sweetened and re-tanned in sumach, washed up, and slicked out, and are then ready for dyeing.

There are three distinct methods of dyeing, with several minor modifications. Tray dyeing consists of immersing the goods, from 2 to 4 dozen at a time, in two separate piles, in the dye solution at 60° C., contained in a flat wooden tray about 5 ft.×4 ft.×1 ft., and keeping them constantly moving by continually turning them from one pile to the other. The disadvantages of this method are that the bath rapidly cools, thus dyeing rapidly at the beginning and slowly at the termination of the operation; hence a large excess of dye is wasted, much labour is required, and the shades obtained are not so level as those obtained by the other methods. But the goods are under observation the whole time, a very distinct advantage when matching shades, and a white flesh may be preserved. The paddle method of dyeing consists of paddling the goods in a large volume of liquor contained in a semi-circular wooden paddle for from half to three-quarters of an hour. The disadvantages are that the liquor cools fairly rapidly, more dye is wasted than in the tray method, and a white flesh cannot be preserved. But larger packs can be dyed at the one operation, the goods are under observation the whole time, and little labour is required.

The drum method of dyeing is perhaps best, a drum somewhat similar to that used by curriers being preferable. The goods are placed on the shelves inside the dry drum, the lid of which is then fastened on, and the machinery is started; when the drum is revolving at full speed, which should be about 12 to 15 revolutions per minute, the dye solution is added through the hollow axle, and the dyeing continued for half an hour, when, without stopping the drum, if desired, the goods may be fatliquored by running in the fatliquor through the hollow axle. The disadvantages are that the flesh is dyed and the goods cannot be seen. The advantages are that little labour is required, a large pack of skins may be treated, level shades are produced, heat is retained, almost complete exhaustion of the dye-bath is effected, and subsequent processes, such as fatliquoring, may be carried out without stopping the drum.

Of the great number of coal-tar dyes on the market comparatively few can be used in leather manufacture. The four chief classes are: (1) acid dyes; (2) basic or tannin dyes; (3) direct or cotton dyes; (4) mordant (alizarine) dyes.

Acid dyes are not so termed because they have acid characteristics; the name simply denotes that for the development of the full shade of colour it is necessary to add acid to the dye-bath. These dyes are generally sodium salts of sulphonic acids, and need the addition of an acid to free the dye, which is the sulphonic acid Although theoretically any acid (stronger than the sulphonic acid present) will do for this purpose, it is found in practice that only sulphuric and formic acids may be employed, because others, such as acetic, lactic, &c., do not develop the full shade of colour. Acid sodium sulphate may also be successfully used.

Acid colours produce a full level shade without bronzing, and do not accentuate any defects in the leather, such as bad grain, &c. They are also moderately fast to light and rubbing. They are generally applied to leather at a temperature between 50° and 60° C., with an equal weight of sulphuric acid. The quantity of dye used varies, but generally, for goat, persians, &c., from 25 to 30 oz. are used per ten dozen skins, and for calf half as much again, dissolved in such an amount of water as is most convenient according to the method being used. If sodium bisulphate is substituted for sulphuric acid twice as much must be used, and if formic acid three times as much (by weight).

Basic dyes are salts of organic colour bases with hydrochloric or some other suitable acid. Basic colours precipitate the tannins, and thus, because of their affinity for them, dye very rapidly, tending to produce uneven shades, especially if the tannin on the skin is unevenly distributed. They are much more intense in colour than the acid dyes, have a strong tendency to bronze, and accentuate weak and defective grain. They are also precipitated by hard waters, so that the hardness should be first neutralized by the addition of acetic acid, else the precipitated colour lake may produce streakily dyed leather. To prevent rapid dyeing, acetic acid or sodium bisulphate should always be added in small quantity to the dye-bath, preferably the latter, as it prevents bronzing. The most important point about the application of basic dyes to leather is the previous fixation of the tannin on the surface of the leather to prevent its bleeding into the dye-bath and precipitating the dye. All soluble salts of the heavy metals will fix the tannin, but few are applicable, as they form colour lakes, which are generally undesirable. Antimony and titanium salts are generally used, the forms being tartar emetic (antimony potassium tartrate), antimonine (antimony lactate), potassium titanium oxalate, and titanium lactate. The titanium salts are economically used when dyeing browns, as they produce a yellowish-brown shade; it is therefore not necessary to use so much dye. About 2 oz. of tartar emetic and 8 oz. of salt is a convenient quantity for 1 dozen goat skins. The bath is used at 30° to 40° C., and the goods are immersed for about 15 minutes, having been thoroughly washed before being dyed. Iron salts are sometimes used by leather-stainers for saddening (dulling) the shade of colour produced, iron tannate, a black salt, being formed. It is often found economical to "bottom" goods with acid, direct, or other colours, and then finish with basic colours; this procedure forms a colour lake, and colour lakes are always faster to light and rubbing than the colours themselves.

Direct cotton dyes produce shades of great delicacy, and are used for the dyeing of pale and "art" shades. They are applied in neutral or very slightly acid baths, formic and acetic acids being most suitable with the addition of a quantity of sodium chloride or sulphate. After dyeing, the goods are well washed to free from excess of salt. The eosine colours, including erythrosine, phloxine, rose Bengal, &c., are applied in a similar manner, and are specially used for the beautiful fluorescent pink shades they produce; acid and basic colours and mineral acids precipitate them.

The mordant colours, which include the alizarine and anthracene colours, are extremely fast to light, and require a mordant to develop the colour. They are specially applicable to chamois leather, although a few may be used for chrome and alum leathers, and one or two are successfully applied to vegetable-tanned leather without a mordant.

Sulphur or sulphide colours, the first of which to appear were the famous Vidal colours, are applied in sodium sulphide solution, and are most successfully used on chrome leather, as they produce a colour lake with chrome salts, the resulting colour being very fast to light and rubbing. A very serious disadvantage in connexion with them is that they must necessarily be applied in alkaline solution, and the alkali has a disintegrating effect upon the fibre of the leather, which cannot be satisfactorily overcome, although formaldehyde and glycerin mixtures have been patented for the purpose.

The Janus colours are perhaps worth mentioning as possessing both acid and basic characteristics; they precipitate tannin, and are best regarded as basic dyes from a leather-dyer's standpoint.

The goods after dyeing are washed up, slicked out on an inclined glass table, nailed on boards, or hung up by the hind shanks to dry out.

Coal-tar dyes are not much used for the production of blacks, as they do not give such a satisfactory result as logwood with an iron mordant. In the dyeing of blacks the preliminary operation of souring is always omitted and that of sumaching sometimes, but if much tan has been removed it will be found necessary to use sumach, although cutch may be advantageously and cheaply substituted. After shaving, the goods, if to be dressed for "blue backs" (blue-coloured flesh), are dyed as already described, with methyl violet or some other suitable dye; they are then folded down the back and drawn through a hot solution of logwood and fustic extracts, and then rapidly through a weak, cold iron sulphate and copper acetate solution. Immediately afterwards they are rinsed up and either drummed in a little neatsfoot oil or oiled over with a pad, flesh and grain, and dried. When dry the goods are damped back and staked, dried out and re-staked.

After dry-staking, the goods are "seasoned," *i.e.* some suitable mixture is applied to the grain to enable it to take the glaze. The following is typical: 3 quarts logwood liquor, $\frac{1}{2}$ pint bullock's blood, $\frac{1}{2}$ pint milk, $\frac{1}{2}$ gill ammonia, $\frac{1}{2}$ gill orchil and 3 quarts water. This season is brushed well into the grain, and the goods are dried in a warm stove and glazed by machine. The skins are glazed under considerable pressure, a polished glass slab or roller being forced over the surface of the leather in a series of rapid strokes, after which the goods are re-seasoned, re-staked, fluffed, re-glazed, oiled over with a pad, dipped in linseed oil and dried. They are now ready for market. If the goods are to be finished dull they are seasoned with linseed mucilage, casein or milk (many other materials are also used), and rolled, glassed with a polished slab by hand, or ironed with a warm iron.

Coloured glacés are finished in a similar manner to black glacés, dye (instead of logwood and iron) being added to the season, which usually consists of a simple mixture of dye, albumen and milk.

Moroccos and grain leathers are boarded on the flesh side before and after glazing, often being "tooth rolled" between the several operations. Tooth rolling consists of forcing, under pressure, a toothed roller over the grain; this cuts into the leather and helps to produce many grains, which could not be produced naturally by boarding, besides fixing them.

Many artificial grains and patterns are also given to leather by printing and embossing, these processes being carried out by passing the leather between two rollers, the top one upon which the pattern is engraved being generally steam heated. This impresses the pattern upon the grain of the leather.

The above methods will give a very general idea of the processes in vogue for the dressing of goods for fancy work. The dressing of chrome leathers for uppers is different in important particulars.

Chrome Box and Willow Calf.—Willow calf is coloured calf, box calf is dressed black and grained with a "box" grain. A large quantity of kips is now dressed as box calf; these goods are the hides of yearling Indian cattle, and are dressed in an exactly similar manner as calf. After tanning and boraxing to neutralize the acidity of the chrome liquor, the goods are washed up, sammied, shaved, and are ready for mordanting previous to dyeing. Very few dyes will dye chrome leather direct, *i.e.* without mordanting. Sulphide colours are not yet in great demand, nor are the alizarines used as much as they might be. The ordinary acid and basic dyes are more generally employed, and the goods consequently require to be first mordanted. The mordanting is carried out by drumming the goods in a solution containing tannin, and, except for pale shades, some dyewood extract is used; for reds peachwood extract, for browns fustic or gambier, and for dark browns a little logwood is added. For all pale shades sumach is exclusively used. After drumming in the warm tannin infusion for half an hour, if the goods are to be dyed with basic colours the tannin is first fixed by drumming in tartar emetic and salt, or titanium, as previously described; the dyeing is also carried out as described for persians, except that a slightly higher temperature may be maintained. If the goods are to be dyed black they are passed through logwood and iron solutions.

After dyeing and washing up, &c., the goods are fatliquored by placing them in a previously heated drum and drumming them with a mixture known as a "fatliquor," of which the following recipe is typical: Dissolve 3 ℔ of soft soap by boiling with 3 gallons of water, then add 9 ℔ of neatsfoot oil and boil for some minutes; now place the mixture in an emulsifier and emulsify until cooled to 35° C., then add the yolks of 5 fresh eggs and emulsify for a further half hour. The fatliquor is added to the drum at 55° C., and the goods are drummed for half an hour, when all the fatliquor should be absorbed; they are then slicked out and dried. After drying, they are damped back, staked, dried, re-staked and seasoned with materials similar to those used for persians; when dry they are glazed, boarded on the flesh ("grained") from neck to butt and belly to belly to give them the box grain, fluffed, reseasoned, reglazed and regrained.

Finishing of Bag Hides.—The goods are first soaked back, piled to samm, split or shaved, scoured by machine, finished off by hand, washed up and retanned by drumming in warm sumach and extract, after which they are washed up, struck out, hung up to samm, and "set." "Setting" consists of laying the grain flat and smooth by striking out with a steel or sharp brass slicker. They are then dried out, topped with linseed mucilage, and again dried.

This brushing over with linseed mucilage prevents the dye from sinking too far into the leather; gelatine, Irish moss, starch and gums are also used for the same purpose. These materials are also added to the staining solution to thicken it and further prevent its sinking in.

When dry, the goods are stained by applying a $\frac{1}{2}\%$ (usually) solution of a suitable basic dye, thickened with linseed, with a brush. Two men are usually employed on this work; one starts at the right-hand flank and the other at the left-hand shank, and they work towards each other, staining in sections; much skill is needed to obviate markings where the sections overlap. The goods may advantageously be bottomed with an acid dye or a dye-wood extract, and then finished with basic dyes. Whichever method is used, two to three coats are given, drying between each. After the last coat of stain, and while the goods are still in a sammied condition, a mixture of linseed mucilage and French chalk is applied to the flesh and glassed off wet, to give it a white appearance, and then the goods are printed with any of the usual bag grains by machine or hand, and dried out. For a bright finish the season may consist of a solution of 15 parts carnauba wax, 10 parts curd soap and 100 parts water boiled together; this is sponged into the grain, dried and the hides are finished by either glassing or brushing. For a duller finish the grain is simply rubbed over with buck tallow and brushed. Hide bellies for small work are treated in much the same manner.

Glove Leathers.—As these goods were tanned in alum, salt, flour and egg, any undue immersion in water removes the tannage; for this reason they are generally stained like bag hides, one man only being employed on the same skin. The skins are first thoroughly soaked in warm water and then drummed for some minutes in a fresh supply, when they are re-egged to replace that which has been lost. This is best done by drumming them for about $1\frac{1}{2}$ hours in 40 to 50 egg yolks and 5 ℔ of salt for every hundred skins; they are then allowed to be in pile for 24 hours, and are set out on the table ready for mordanting. The mordants universally used are ammonia or alkaline soft soap; 1 in 1000 of the former or a 1% solution of the latter. When the goods have partially dried in, bottoming follows, and usually the natural wood dyestuffs are used for this operation, such as fustic, Brazil wood, peachwood, logwood and turmeric. After application of these colours the goods are sammied and topped with a 1% solution of an acid dye, to which has been added 20% of methylated spirit to prevent frothing with the egg yolk; they are then dried out slowly, staked, pulled in shape, fluffed and brushed by machine. The season, which is sponged on, may consist of 1 part dye, 1 part albumen, 2 parts dextrine and $\frac{1}{4}$ part glycerine, made up to 100 parts with water; when it has been applied, the goods are sammied, brushed and ironed with a warm flat iron such as is used in laundry work.

Bookbinding Leathers.—A committee of the Society of Arts (London) has investigated the question of leather for bookbinding, attention having been drawn to this subject by the rotten and decayed condition often observed in bindings less than fifty years old. This committee engaged in research work extending over several years, and the report in which its results were given was edited for the Society of Arts and the Leathersellers' Company (which also did much important work in connexion with it) by Lord Cobham, chairman of the committee, and Sir Henry Trueman Wood, secretary of the society. The essence of the report, so far as leather manufacture is concerned, is as follows: The goods should be soaked and limed in fresh liquors, and bating and puering should be avoided, weak organic acids or erodine being used; they should also be tanned with pyrogallol tanning materials, and preferably with sumach. In shaving, they should only be necked and backed, *i.e.* only irregularities should be removed, as further shaving has a considerable weakening effect on the fibre. The striking out should not be heavy enough to lay the fibre. In dyeing, acid dyes and a few direct colours only are permissible, and in connexion with the former the use of sulphuric acid is strongly condemned, as it absolutely disintegrates the fibre; the use of formic, acetic and lactic acids is permitted. The use of salts of mineral acids is to be avoided, and in finishing, tight setting out and damp glazing is not to be recommended; oil may be advantageously used.

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LEATHER, ARTIFICIAL. Under the name of artificial leather, or of American leather cloth, large quantities of a material having, more or less, a leather-like surface are used, principally for upholstery purposes, such as the covering of chairs, lining the tops of writing desks and tables, &c. There is considerable diversity in the preparation of such materials. A common variety consists of a web of calico coated with boiled linseed oil mixed with dryers and lamp-black or other pigment. Several coats of this mixture are uniformly spread, smoothed and compressed on the cotton surface by passing it between metal rollers, and when the surface is required to possess a glossy enamel-like appearance, it receives a finishing coat of copal varnish. A grained morocco surface is given to the material by passing it between suitably embossed rollers. Preparations of this kind have a close affinity to cloth waterproofed with indiarubber, and to such manufactures as ordinary waxcloth. An artificial leather which has been patented and proposed for use as soles for boots, &c., is composed of powdered scraps and cuttings of leather mixed with solution of guttapercha dried and compressed. In place of the guttapercha solution, oxidized linseed oil or dissolved resin may be used as the binding medium for the leather powder.

LEATHERHEAD, an urban district in the Epsom parliamentary division of Surrey, England, 18 m. S.S.W. of London, on the London, Brighton & South Coast and the London & South-Western railways. Pop. (1901) 4694. It lies at the foot of the North Downs in the pleasant valley of the river Mole. The church of St Mary and St Nicholas dates from the 14th century. St John's Foundation School, opened in London in 1852, is devoted to the education of sons of poor clergymen. Leatherhead has brick-making and brewing industries, and the district is largely residential.

LEATHES, STANLEY (1830–1900), English divine and Orientalist, was born at Ellesborough, Bucks, on the 21st of March 1830, and was educated at Jesus College, Cambridge, where he graduated B.A. in 1852, M.A. 1853. In 1853 he was the first Tyrwhitt's Hebrew scholar. He was ordained priest in 1857, and after serving several curacies was appointed professor of Hebrew at King's College, London, in 1863. In 1868–1870 he was Boyle lecturer (*The Witness of the Old Testament to Christ*), in 1873 Hulsean lecturer (*The Gospel its Own Witness*), in 1874 Bampton Lecturer (*The Religion of the Christ*) and from 1876 to 1880 Warburtonian lecturer. He was a member of the Old Testament revision committee from 1870 to 1885. In 1876 he was elected prebendary of St Paul's Cathedral, and he was rector of Cliffe-at-Hoo near Gravesend (1880–1889) and of Much Hadham, Hertfordshire (1889–1900). The university of Edinburgh gave him the honorary degree of D.D. in 1878, and his own college made him an honorary fellow in 1885. Besides the lectures noted he published *Studies in Genesis* (1880), *The Foundations of Morality* (1882) and some volumes of sermons. He died in May 1900.

His son, Stanley Mordaunt Leathes (b. 1861), became a fellow of Trinity, Cambridge, and lecturer on history, and was one of the editors of the *Cambridge Modern History*; he was secretary to the Civil Service Commission from 1903 to 1907, when he was appointed a Civil Service Commissioner.

LEAVEN (in Mid. Eng. *levain*, adapted from Fr. *levain*, in same sense, from Lat. *levamen*, which is only found in the sense of alleviation, comfort, *levare*, to lift up), a substance which produces fermentation, particularly in the making of bread, properly a portion of already fermented dough added to other dough for this purpose (see BREAD). The word is used figuratively of any element, influence or agency which effects a subtle or secret change. These figurative usages are mainly due to the comparison of the kingdom of Heaven to leaven in Matt. xiii. 33, and to the warning against the leaven of the Pharisees in Matt. xvi. 6. In the first example the word is used of a good influence, but the more usual significance is that of an evil agency. There was among the Hebrews an association of the idea of fermentation and corruption, which may have been one source of the prohibition of the use of leavened bread in sacrificial offerings. For the usage of unleavened bread at the feasts of the Passover and of Massôth, and the connexion of the two, see PASSOVER.

LEAVENWORTH, a city and the county-seat of Leavenworth county, Kansas, U.S.A., on the W. bank of the Missouri river.

Pop. (1900) 20,735, of whom 3402 were foreign-born and 2925 were negroes; (1910 census) 19,363. It is one of the most important railway centres west of the Missouri river, being served by the Atchison, Topeka & Santa Fé, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Chicago Great Western, the Missouri Pacific, the Union Pacific and the Leavenworth & Topeka railways. The city is laid out regularly in the bottom-lands of the river, and its streets are named after Indian tribes. Rolling hills surround it on three sides. The city has many handsome public buildings, and contains the Cathedral of the Immaculate Conception, Leavenworth being the see of a Roman Catholic bishop. The public institutions include the Kansas State Protective Home (1889) for negroes, an Old Ladies' Rest (1892), St Vincent's Orphans' Asylum (1886, open to all sects) and a Guardian Angels' Home (1889), for negroes—all private charities aided by the state; also St John's Hospital (1879), Cushing Hospital (1893) and Leavenworth Hospital (1900), which are training schools for nurses. There is also a branch of the National Home for Disabled Volunteer Soldiers. In the suburbs there are state and United States penitentiaries. Leavenworth is a trading centre and has various manufactures, the most important being foundry and machine shop and flouring and grist-mill products, and furniture. The city's factory products increased in value from $3,251,460 in 1900 to $4,151,767 in 1905, or 27·7%. There are valuable coal mines in Leavenworth and the immediate vicinity. About 3 m. N. of the city, on a reservation of about 6000 acres, is Fort Leavenworth, an important United States military post, associated with which are a National Cemetery and Service Schools of the U.S. Army (founded in 1881 as the U.S. Infantry and Cavalry School and in 1901 developed into a General Service and Staff College). In 1907 there were three general divisions of these schools: the Army School of the Line, for officers (not below the grade of captain) of the regular army and for militia officers recommended by the governors of their respective states or territories, offering courses in military art, engineering, law and languages; the Army Signal School, also open to regular and militia officers, and having departments of field signalling, signal engineering, topography and languages; and the Army Staff College, in which the students are the highest graduates from the Army School of the Line, and the courses of instruction are included in the departments of military art, engineering, law, languages and care of troops. The course is one year in each school. At Fort Leavenworth there is a colossal bronze statue of General U. S. Grant erected in 1889. A military prison was established at Fort Leavenworth in 1875; it was used as a civil prison from 1895 to 1906, when it was re-established as a military prison. Its inmates were formerly taught various trades, but owing to the opposition of labour organizations this system was discontinued, and the prisoners are now employed in work on the military reservation.

The fort, from which the city took its name, was built in 1827, in the Indian country, by Colonel Henry Leavenworth (1783–1834) of the 3rd Infantry, for the protection of traders plying between the Missouri river and Sante Fé. The town site was claimed by Missourians from Weston in June 1854, Leavenworth thus being the oldest permanent settlement in Kansas; and during the contest in Kansas between the anti-slavery and pro-slavery settlers, it was known as a pro-slavery town. It was first incorporated by the Territorial legislature in 1855; a new charter was obtained in 1881; and in 1908 the city adopted the commission plan of government. On the 3rd of April 1858 a free-state convention adopted the Leavenworth Constitution here; this constitution, which was as radically anti-slavery as the Lecompton Constitution was pro-slavery, was nominally approved by popular vote in May 1858, and was later submitted to Congress, but never came into effect. During the Civil War Leavenworth enjoyed great prosperity, at the expense of more inland towns, partly owing to the proximity of the fort, which gave it immunity from border raids from Missouri and was an important depôt of supplies and a place for mustering troops into and out of the service. Leavenworth was, in Territorial days and until after 1880, the largest and most thriving commercial city of the state, and rivalled Kansas City, Missouri, which, however, finally got the better of it in the struggle for railway facilities.

LEBANON (from Semitic *laban*, "to be white," or "whitish," probably referring not to snow, but to the bare white walls of chalk or limestone which form the characteristic feature of the whole range), in its widest sense is the central mountain mass of Syria, extending for about 100 m. from N.N.E. to S.S.W. It is bounded W. by the sea, N. by the plain Jun Akkar, beyond which rise the mountains of the Ansarieh, and E. by the inland plateau of Syria, mainly steppe-land. To the south Lebanon ends about the point where the river Litany bends westward, and at Banias. A valley narrowing towards its southern end, and now called the Buka‘a, divides the mountainous mass into two great parts. That lying to the west is still called Jebel Libnan; the greater part of the eastern mass now bears the name of the Eastern Mountain (Jebel el-Sharḳi). In Greek the western range was called Libanos, the eastern Antilibanos. The southern extension of the latter, Mount Hermon (*q.v.*), may in many respects be treated as a separate mountain.

Lebanon and Anti-Lebanon have many features in common; in both the southern portion is less arid and barren than the northern, the western valleys better wooded and more fertile than the eastern. In general the main elevations of the two ranges form pairs lying opposite one another; the forms of both ranges are monotonous, but the colouring is splendid, especially when viewed from a distance; when seen close at hand only a few valleys with perennial streams offer pictures of landscape beauty, their rich green contrasting pleasantly with the bare brown and yellow mountain sides. The finest scenery is found in N. Lebanon, in the Maronite districts of Kesrawan and Bsherreh, where the gorges are veritable canyons, and the villages are often very picturesquely situated. The south of the chain is more open and undulating. Anti-Lebanon is the barest and most inhospitable part of the system.

The district west of Lebanon, averaging about 20 m. in breadth, slopes in an intricate series of plateaus and terraces to the Mediterranean. The coast is for the most part abrupt and rocky, often leaving room for only a narrow path along the shore, and when viewed from the sea it does not suggest the extent of country lying between its cliffs and the lofty summits behind. Most of the mountain spurs run from east to west, but in northern Lebanon the prevailing direction of the valleys is north-westerly, and in the south some ridges run parallel with the principal chain. The valleys have for the most part been deeply excavated by mountain streams; the apparently inaccessible heights are crowned by numerous villages, castles or cloisters embosomed among trees. The chief perennial streams, beginning from the north, are the Nahr Akkar, N. Arka, N. el-Barid, N. Kadisha, "the holy river" (the valley of which begins in the immediate neighbourhood of the highest summits, and rapidly descends in a series of great bends till the river reaches the sea at Tripoli), Wadi el-Joz (falling into the sea at Batrun), Wadi Fidar, Nahr Ibrahim (the ancient Adonis, having its source in a recess of the great mountain amphitheatre where the famous sanctuary Apheca, the modern Afka, lay), Nahr el-Kelb (the ancient Lycus), Nahr Beirut (the ancient Magoras, entering the sea at Beirut), Nahr Damur (ancient Tamyras), Nahr el-‘Auwali (the ancient Bostrenus, which in the upper part of its course is joined by the Nahr el-Baruk). The ‘Auwali and the Nahr el-Zaherani, the only other considerable streams before we reach the Litany, flow north-east to south-west, in consequence of the interposition of a ridge subordinate and parallel to the central chain. On the north, where the mountain bears the special name of Jebel Akkar, the main ridge of Lebanon rises gradually from the plain. A number of valleys run to the north and north-east, among them that of the Nahr el-Kebir, the Eleutherus of the ancients, which rises in the Jebel el-Abiaḍ on the eastern slope of Lebanon, and afterwards, skirting the district, flows westward to the sea. South of Jebel el-Abiaḍ, beneath the main ridge, which as a rule falls away suddenly towards the east, occur several small elevated terraces having a southward slope; among these are the Wadi en-Nusur ("vale of eagles"), and the basin of the lake Yammuna, with its intermittent spring Neb‘a el-Arba‘in. Of the streams which descend into the Buka‘a, the Berdani rises in Jebel Sunnin, and enters the plain by a deep and picturesque mountain cleft at Zaḥleh.

The most elevated summits occur in the north, but even these are of very gentle gradient. The "Cedar block" consists of a double line of four and three summits respectively, ranged from north to south, with a deviation of about 35°. Those to the east are ‘Uyun Urghush, Makmal, Muskiyya (or Naba‘ esh-Shemaila) and Ras Zahr el-Kazib; fronting the sea are Ḳarn Sauda or Timarun, Fumm el-Mizab and Zahr el-Ḳandil. The height of Zahr el-Kazib, by barometric measurement, is 10,018 ft.; that of the others does not reach 10,000 ft. South from them is the pass (8351 ft.) which leads from Baalbek to Tripoli; the great mountain amphitheatre on the west side of its summit is remarkable. Farther south is a second group of lofty summits—the snow-capped Sunnin, visible from Beirut; its height is 8482 ft. Between this group and the more southerly Jebel Keniseh (about 6700 ft.) lies the pass (4700 ft.) traversed by the French post road between Beirut and Damascus. Among the bare summits still farther south are the long ridge of Jebel el-Baruk (about 7000 ft.), the Jebel Niha, with the Tauʻamat Niha (about 6100 ft.), near which is a pass to Sidon, and the Jebel Rihan (about 5400 ft.).

The Bukaʻa, the broad valley which separates Lebanon from Anti-Lebanon, is watered by two rivers having their watershed near Baalbek, at an elevation of about 3600 ft., and separated only by a short mile at their sources. That flowing northwards, El-ʻAsi, is the ancient Orontes (*q.v.*); the other is the Litany. In the lower part of its course the latter has scooped out a deep and narrow rocky bed; at Burghuz it is spanned by a great natural bridge. Not far from the point where it suddenly trends to the west lie, immediately above the romantic valley, at an elevation of 1500 ft., the imposing ruins of the old castle Kalʻat esh-Shakif, near one of the passes to Sidon. In its lower part the Litany bears the name of Nahr el-Kasimiya. Neither the Orontes nor the Litany has any important affluent.

The Bukaʻa used to be known as Coelesyria (Strabo. xvi. 2, 21); but that word as employed by the ancients had a much more extensive application. At present its full name is Bukaʻa el-ʻAziz (the dear Bukaʻa), and its northern portion is known as Sahlet Baʻalbek (the plain of Baalbek). The valley is from 4 to 6 m. broad, with an undulating surface.

The Anti-Lebanon chain has been less fully explored than that of Lebanon. Apart from its southern offshoots it is 67 m. long, while its width varies from 16 to 13½ m. It rises from the plain of Hasya-Homs, and in its northern portion is very arid. The range has not so many offshoots as occur on the west side of Lebanon; under its precipitous slopes stretch table-lands and broad plateaus, which, especially on the east side looking towards the steppe, steadily increase in width. Along the western side of northern Anti-Lebanon stretches the Khashaʻa, a rough red region lined with juniper trees, a succession of the hardest limestone crests and ridges, bristling with bare rock and crag that shelter tufts of vegetation, and are divided by a succession of grassy ravines. On the eastern side the parallel valley of ʻAsal el-Ward deserves special mention: the descent towards the plain eastwards, as seen for example at Maʻlula, is singular—first a spacious amphitheatre and then two deep very narrow gorges. Few perennial streams take their rise in Anti-Lebanon; one of the finest and best watered valleys is that of Ḥelbun, the ancient Chalybon, the Helbon of Ezek. xxvii. 18. The highest points of the range, reckoning from the north, are Halimat el-Kabu (8257 ft.), which has a splendid view; the Fatli block, including Talʻat Musa (8721 ft.) and the adjoining Jebel Nebi Baruh (7900 ft.); and a third group near Bludan, in which the most prominent names are Shakif, Akhyar and Abu'l-Hin (8330 ft.). Of the valleys descending westward the first to claim mention is the Wadi Yafufa; a little farther south, lying north and south, is the rich upland valley of Zebedani, where the Barada has its highest sources. Pursuing an easterly course, this stream receives the waters of the romantic ʻAin Fije (which doubles its volume), and bursts out by a rocky gateway upon the plain of Damascus, in the irrigation of which it is the chief agent. It is the Abana of 2 Kings v. 12; the portion of Anti-Lebanon traversed by it was also called by the same name (Canticles iv. 8). From the point where the southerly continuation of Anti-Lebanon begins to take a more westerly direction, a low ridge shoots out towards the south-west, trending farther and farther away from the eastern chain and narrowing the Bukaʻa; upon the eastern side of this ridge lies the elevated valley or hilly stretch known as Wadi et-Teim. In the north, beside ʻAin Faluj, it is connected by a low watershed with the Bukaʻa; from the gorge of the Litany it is separated by the ridge of Jebel eḍ-Ḍahr. At its southern end it contracts and merges into the plain of Banias, thus enclosing Mount Hermon on its north-west and west sides; eastward from the Hasbany branch of the Jordan lies the meadow-land Merj ʻIyun, the ancient Ijon (1 Kings xv. 20).

Vegetation.—The western slope of Lebanon has the common characteristics of the flora of the Mediterranean coast, but the Anti-Lebanon belongs to the poorer region of the steppes, and the Mediterranean species are met with only sporadically along the water-courses. Forest and pasture land do not properly exist: the place of the first is for the most part taken by a low brushwood; grass is not plentiful, and the higher ridges maintain alpine plants only so long as patches of snow continue to lie. The rock walls harbour some rock plants, but many absolutely barren wildernesses of stone occur. (1) On the western slope, to a height of 1600 ft., is the coast region, similar to that of Syria in general and of the south of Asia Minor. Characteristic trees are the locust tree and the stone pine; in *Melia Azedarach* and *Ficus Sycomorus* (Beirut) is an admixture of foreign and partially subtropical elements. The great mass of the vegetation, however, is of the low-growing type (*maquis* or *garrigue* of the western Mediterranean), with small and stiff leaves, and frequently thorny and aromatic, as for example the ilex (*Quercus coccifera*), *Smilax*, *Cistus*, *Lentiscus*, *Calycotome*, &c. (2) Next comes, from 1600 to 6500 ft., the mountain region, which may also be called the forest region, still exhibiting sparse woods and isolated trees wherever shelter, moisture and the inhabitants have permitted their growth. From 1600 to 3200 ft. is a zone of dwarf hard-leaved oaks, amongst which occur the Oriental forms *Fontanesia phillyraeoides*, *Acer syriacum* and the beautiful red-stemmed *Arbutus Andrachne*. Higher up, between 3700 and 4200 ft., a tall pine, *Pinus Brutia*, is characteristic. Between 4200 and 6200 ft. is the region of the two most interesting forest trees of Lebanon, the cypress and the cedar. The former still grows thickly, especially in the valley of the Kadisha; the horizontal is the prevailing variety. In the upper Kadisha valley there is a cedar grove of about three hundred trees, amongst which five are of gigantic size. (See also Cedar.) The cypress and cedar zone exhibits a variety of other leaf-bearing and coniferous trees; of the first may be mentioned several oaks—*Quercus subalpina* (Kotschy), *Q. Cerris* and the hop-hornbeam (*Ostrya*); of the second class the rare Cilician silver fir (*Abies cilicica*) may be noticed. Next come the junipers, sometimes attaining the size of trees (*Juniperus excelsa*, *J. rufescens* and, with fruit as large as plums, *J. drupacea*). But the chief ornament of Lebanon is the *Rhododendron ponticum*, with its brilliant purple flower clusters; a peculiar evergreen, *Vinca libanotica*, also adds beauty to this zone. (3) Into the alpine region (6200 to 10,400 ft.) penetrate a few very stunted oaks (*Quercus subalpina*), the junipers already mentioned and a barberry (*Berberis cretica*), which sometimes spreads into close thickets. Then follow the low, dense, prone, pillow-like dwarf bushes, thorny and grey, common to the Oriental highlands—*Astragalus* and the peculiar *Acantholimon*. They are found to within 300 ft. of the highest summits.

Upon the exposed mountain slopes a species of rhubarb (*Rheum Ribes*) is noticeable, and also a vetch (*Vicia canescens*) excellent for sheep. The spring vegetation, which lasts until July, appears to be rich, especially as regards showy plants, such as *Corydalis*, *Gagea*, *Colchicum*, *Puschkinia*, *Geranium*, *Ornithogalum*, &c. The flora of the highest ridges, along the edges of the snow patches, exhibits no forms related to the northern alpine flora, but suggestions of it are found in a *Draba*, an *Androsace*, an *Alsine* and a violet, occurring, however, only in local species. Upon the highest summits are found *Saponaria Pumilio* (resembling our *Silene acaulis*) and varieties of *Galium*, *Euphorbia*, *Astragalus*, *Veronica*, *Jurinea*, *Festuca*, *Scrophularia*, *Geranium*, *Asphodeline*, *Allium*, *Asperula*; and, on the margins of the snow fields, a *Taraxacum* and *Ranunculus demissus*. The alpine flora of Lebanon thus connects itself directly with the Oriental flora of lower altitudes, and is unrelated to the glacial flora of Europe and northern Asia.

Zoology.—There is nothing of special interest about the fauna of Lebanon. Bears are no longer numerous; the panther and the ounce are met with; the wild hog, hyaena, wolf and fox are by no means rare; jackals and gazelles are very common. The polecat and hedgehog also occur. As a rule there are not many birds, but the eagle and the vulture may occasionally be seen; of eatable kinds partridges and wild pigeons are the most abundant.

Population.—In the following sections the Lebanon proper will alone be considered, without reference to Anti-Lebanon, because the peculiar political status of the former range since 1864 has effectually differentiated it; whereas the Anti-Lebanon still forms an integral part of the Ottoman province of Syria (*q.v.*), and neither its population nor its history is readily distinguishable from those of the surrounding districts.

The total population in the Lebanon proper is about 400,000, and is increasing faster than the development of the province will admit. There is consequently much emigration, the Christian surplus going mainly to Egypt, and to America, the Druses to the latter country and to the Hauran. The emigrants to America, however, usually return after making money, build new houses and settle down. The singularly complex population is composed of Christians, Maronites, and Orthodox Eastern and Uniate; of Moslems, both Sunni and Shiah (Metawali); and of Druses.

(*a*) *Maronites* (*q.v.*) form about three-fifths of the whole and have the north of the Mountain almost to themselves, while even in the south, the old Druse stronghold, they are now numerous. Feudalism is practically extinct among them and with the decline of the Druses, and the great stake they have acquired in agriculture, they have laid aside much of their warlike habit together with their arms. Even their instinct of nationality is being sensibly impaired by their gradual assimilation to the Papal Church, whose agents exercise from Beirut an increasing influence on their ecclesiastical elections and church government. They are strong also in the Bukaʻa, and have colonies in most of the Syrian cities.

(*b*) *Orthodox* Eastern form a little more than one-eighth of the whole, and are strongest in S. Lebanon (Metn and Kurah districts). Syrians by race and Arab-speaking, they are descendants of those "Melkites" who took the side of the Byzantine church in the time of Justinian II. against the Moslems and eventually the Maronites. They are among the most progressive of the Lebanon elements.

(*c*) *Greek Uniate* are less numerous, forming little more than one-twelfth, but are equally progressive. Their headquarters is Zahleh; but they are found also in strength in Metn and Jezzin, where they help to counterbalance Druses. They sympathize with the Maronites against the Orthodox Eastern, and, like both, are of Syrian race, and Arab speech.

(*d*) *Sunnite Moslems* are a weak element, strongest in Shuf and Kurah, and composed largely of Druse renegades and "Druse" families, which, like the Shehab, were of Arab extraction and never conformed to the creed of Hamza.

(*e*) *Shiite Moslems* outnumber the Sunni, and make about one twenty-fifth of the whole. They are called *Metawali* and are strongest in North Lebanon (Kesrawan and Batrun), but found also in the south, in Buka'a and in the coast-towns from Beirut to Acre. They are said to be descendants of Persian tribes; but the fact is very doubtful, and they may be at least as aboriginal as the Maronites, and a remnant of an old Incarnationist population which did not accept Christianity, and kept its heretical Islam free from those influences which modified Druse creed. They own a chief *sheikh*, resident at Jeba'a, and have the reputation, like most heretical communities in the Sunni part of the Moslem world, of being exceedingly fanatical and inhospitable. It is undoubtedly the case that they are suspicious of strangers and defiant of interference. Another small body of Shiites, the *Ismailites* (Assassins (*q.v.*) of the crusading chronicles), also said to be of Persian origin, live about Kadmus at the extreme N. of Lebanon, but outside the limits of the privileged province. They are about 9000 strong.

(*f*) *Druses* (*q.v.*), now barely an eighth of the whole and confined to Shuf and Metn in S. Lebanon, are tending to emigrate or conform to Sunni Islam. Since the establishment of the privileged province they have lost the Ottoman support which used to compensate for their numerical inferiority as compared with the Christians; and they are fast losing also their old habits and distinctiveness. No longer armed or wearing their former singular dress, the remnant of them in Lebanon seems likely ere long to be assimilated to the "Osmanli" Moslems. Their feud with the Maronites, whose accentuation in the middle of the 19th century was largely due to the tergiversations of the ruling Shehab family, now reduced to low estate, is dying away, but they retain something of their old clan feeling and feudal organization, especially in Shuf.

The mixed population, as a whole, displays the usual characteristics of mountaineers, fine physique and vigorous independent spirit; but its ancient truculence has given way before strong government action since the middle 19th century, and the great increase of agricultural pursuits, to which the purely pastoral are now quite secondary. The culture of the mulberry and silk, of tobacco, of the olive and vine, of many kinds of fruits and cereals, has expanded enormously, and the Lebanon is now probably the most productive region in Asiatic Turkey in proportion to its area. It exports largely through Beirut and Saida, using both the French railway which crosses S. Lebanon on its way to Damascus, and the excellent roads and mule-paths made since 1883. Lebanon has thick deposits of lignite coal, but of inferior quality owing to the presence of iron pyrites. The abundant iron is little worked. Manufactures are of small account, the raw material going mostly to the coast; but olive-oil is made, together with various wines, of which the most famous is the *vino d'oro*, a sweet liqueur-like beverage. This wine is not exported in any quantity, as it will not bear a voyage well and is not made to keep. Bee-keeping is general, and there is an export of eggs to Egypt.

History.—The inhabitants of Lebanon have at no time played a conspicuous part in history. There are remains of prehistoric occupation, but we do not even know what races dwelt there in the historical period of antiquity. Probably they belonged chiefly to the Aramaean group of nationalities; the Bible mentions Hivites (Judges iii. 3) and Giblites (Joshua xiii. 5). Lebanon was included within the ideal boundaries of the land of Israel, and the whole region was well known to the Hebrews, by whose poets its many excellences are often praised. How far the Phoenicians had any effective control over it is unknown; the absence of their monuments does not argue much real jurisdiction. Nor apparently did the Greek Seleucid kingdom have much to do with the Mountain. In the Roman period the district of *Phoenice* extended to Lebanon. In the 2nd century, with the inland districts, it constituted a subdivision of the province of Syria, having Emesa (Homs) for its capital. From the time of Diocletian there was a *Phoenice ad Libanum*, with Emesa as capital, as well as a *Phoenice Maritima* of which Tyre was the chief city. Remains of the Roman period occur throughout Lebanon. By the 6th century it was evidently virtually independent again; its Christianization had begun with the immigration of Monothelite sectaries, flying from persecution in the Antioch district and Orontes valley. At all times Lebanon has been a place of refuge for unpopular creeds. Large part of the mountaineers took up Monothelism and initiated the national distinction of the Maronites, which begins to emerge in the history of the 7th century. The sectaries, after helping Justinian II. against the caliph Abdalmalik, turned on the emperor and his Orthodox allies, and were named Mardaites (rebels). Islam now began to penetrate S. Lebanon, chiefly by the immigration of various more or less heretical elements, Kurd, Turkoman, Persian and especially Arab, the latter largely after the break-up of the kingdom of Hira; and early in the 11th century these coalesced into a nationality (see DRUSES) under the congenial influence of the Incarnationist creed brought from Cairo by Ismael Darazi and other emissaries of the caliph Hakim and his vizier Hamza. The subsequent history of Lebanon to the middle of the 19th century will be found under DRUSES and MARONITES, and it need only be stated here that Latin influence began to be felt in N. Lebanon during the Frank period of Antioch and Palestine, the Maronites being inclined to take the part of the crusading princes against the Druses and Moslems; but they were still regarded as heretic Monothelites by Abulfaragius (Bar-Hebraeus) at the end of the 13th century; nor is their effectual reconciliation to Rome much older than 1736, the date of the mission sent by the pope Clement XII., which fixed the actual status of their church. An informal French protection had, however, been exercised over them for some time previously, and with it began the feud of Maronites and Druses, the latter incited and spasmodically supported by Ottoman pashas. The feudal organization of both, the one under the house of Khazin, the other under those of Maan and Shehab successively, was in full force during the 17th and 18th centuries; and it was the break-up of this in the first part of the 19th century which produced the anarchy that culminated after 1840 in the civil war. The Druses renounced their Shehab amirs when Beshir al-Kassim openly joined the Maronites in 1841, and the Maronites definitely revolted from the Khazin in 1858. The events of 1860 led to the formation of the privileged Lebanon province, finally constituted in 1864. It should be added, however, that among the Druses of Shuf, feudalism has tended to re-establish itself, and the power is now divided between the Jumblat and Yezbeki families, a leading member of one of which is almost always Ottoman *kaimakam* of the Druses, and locally called *amir*.

The Lebanon has now been constituted a *sanjak* or *mutessariflik*, dependent directly on the Porte, which acts in this case in consultation with the six great powers. This province extends about 93 m. from N. to S. (from the boundary of the *sanjak* of Tripoli to that of the *caza* of Saida), and has a mean breadth of about 28 m. from one foot of the chain to the other, beginning at the edge of the littoral plain behind Beirut and ending at the W. edge of the Buka'a: but the boundaries are ill-defined, especially on the E. where the original line drawn along the crest of the ridge has not been adhered to, and the mountaineers have encroached on the Buka'a. The Lebanon is under a military governor (*mushir*) who must be a Christian in the service of the sultan, approved by the powers, and has, so far, been chosen from the Roman Catholics owing to the great preponderance of Latin Christians in the province. He resides at Deir al-Kamar, an old seat of the Druse amirs. At first appointed for three years, then for ten, his term has been fixed since 1892 at five years, the longer term having aroused the fear of the Porte, lest a personal domination should become established. Under the governor are seven *kaimakams*, all Christians except a Druse in Shuf, and forty-seven *mudirs*, who all depend on the kaimakams except one in the home district of Deir al-Kamar. A central *mejliss* or Council of twelve members is composed of four Maronites, three Druses, one Turk, two Greeks (Orthodox), one Greek Uniate and one Metawali. This was the original proportion, and it has not been altered in spite of the decline of the Druses and increase of the Maronites. The members are elected by the seven cazas. In each *mudirieh* there is also a local *mejliss*. The old feudal and *mukataji* (see DRUSES) jurisdictions are abolished, *i.e.* they often persist under Ottoman forms, and three courts of First Instance, under the *mejliss*, and superior to the petty courts of the *mudirs* and the village *sheikhs*, administer justice. Judges are appointed by the governor, but *sheikhs* by the villages. Commercial cases, and litigation in which strangers are concerned, are carried to Beirut. The police is recruited locally, and no regular troops appear in the province except on special requisition. The taxes are collected directly, and must meet the needs of the province, before any sum is remitted to the Imperial Treasury. The latter has to make deficits good. Ecclesiastical jurisdiction is exercised only over the clergy, and all rights of asylum are abolished.

This constitution has worked well on the whole, the only serious hitches having been due to the tendency of governors-general and *kaimakams* to attempt to supersede the *mejliss* by autocratic action, and to impair the freedom of elections. The attention of the porte was called to these tendencies in 1892 and again in 1902, on the appointments of new governors. Since the last date there has been no complaint. Nothing now remains of the former French predominance in the Lebanon, except a certain influence exerted by the fact that the railway is French, and by the precedence in ecclesiastical functions still accorded by the Maronites to official representatives of France. In the Lebanon, as in N. Albania, the traditional claim of France to protect Roman Catholics in the Ottoman Empire has been greatly impaired by the non-religious character of the Republic. Like Italy, she is now regarded by Eastern Catholics with distrust as an enemy of the Holy Father.

See DRUSES. Also V. Cuinet, *Syrie, Liban et Palestine* (1896); N. Verney and G. Dambmann, *Puissances étrangères en Syrie*, &c. (1900); G. Young, *Corps de droit ottoman*, vol. i. (1905); G. E. Post, *Flora of Syria*, &c. (1896); M. von Oppenheim, *Vom Mittelmeer*, &c. (1899). (A. So.; D. G. H.)

LEBANON, a city of Saint Clair county, Illinois, U.S.A., on Silver Creek, about 24 m. E. of Saint Louis, Missouri. Pop. (1910) 1907. It is served by the Baltimore & Ohio South-Western railroad and by the East Saint Louis & Suburban Electric line. It is situated on a high tableland. Lebanon is the seat of McKendree College, founded by Methodists in 1828 and one of the oldest colleges in the Mississippi valley. It was called Lebanon Seminary until 1830, when the present name was adopted in honour of William McKendree (1757–1835), known as the "Father of Western Methodism," a great preacher, and a bishop of the Methodist Church in 1808–1835, who had endowed the college with 480 acres of land. In 1835 the college was chartered as the "McKendreean College," but in 1839 the present name was again adopted. There are coal mines and excellent farming lands in the vicinity of Lebanon. Among the city's manufactures are flour, planing-mill products, malt liquors, soda and farming implements. The municipality owns and operates its electric-lighting plant. Lebanon was chartered as a city in 1874.

LEBANON, a city and the county-seat of Lebanon county, Pennsylvania, U.S.A., in the fertile Lebanon Valley, about 25 m. E. by N. of Harrisburg. Pop. (1900) 17,628, of whom 618 were foreign-born, (1910 census) 19,240. It is served by the Philadelphia & Reading, the Cornwall and the Cornwall & Lebanon railways. About 5 m. S. of the city are the Cornwall (magnetite) iron mines, from which about 18,000,000 tons of iron ore were taken between 1740 and 1902, and 804,848 tons in 1906. The ore yields about 46% of iron, and contains about 2·5% of sulphur, the roasting of the ores being necessary—ore-roasting kilns are more extensively used here than in any other place in the country. The area of ore exposed is about 4000 ft. long and 400 to 800 ft. wide, and includes three hills; it has been one of the most productive magnetite deposits in the world. Limestone, brownstone and brick-clay also abound in the vicinity; and besides mines and quarries, the city has extensive manufactories of iron, steel, chains, and nuts and bolts. In 1905 its factory products were valued at $6,978,458. The municipality owns and operates its water-works.

The first settlement in the locality was made about 1730, and twenty years later a town was laid out by one of the landowners, George Steitz, and named Steitztown in his honour. About 1760 the town became known as Lebanon, and under this name it was incorporated as a borough in 1821 and chartered as a city in 1885.

LE BARGY, CHARLES GUSTAVE AUGUSTE (1858–), French actor, was born at La Chapelle (Seine). His talent both as a comedian and a serious actor was soon made evident, and he became a member of the Comédie Française, his chief successes being in such plays as *Le Duel*, *L'Énigme*, *Le Marquis de Priola*, *L'Autre Danger* and *Le Dédale*. His wife, Simone le Bargy *née* Benda, an accomplished actress, made her début at the Gymnase in 1902, and in later years had a great success in *La Rafale* and other plays. In 1910 he had differences with the authorities of the Comédie Française and ceased to be a *sociétaire*.

LE BEAU, CHARLES (1701–1778), French historical writer, was born at Paris on the 15th of October 1701, and was educated at the Collège de Sainte-Barbe and the Collège du Plessis; at the latter he remained as a teacher until he obtained the chair of rhetoric in the Collège des Grassins. In 1748 he was admitted a member of the Academy of Inscriptions, and in 1752 he was nominated professor of eloquence in the Collège de France. From 1755 he held the office of perpetual secretary to the Academy of Inscriptions, in which capacity he edited fifteen volumes (from the 25th to the 39th inclusive) of the *Histoire* of that institution. He died at Paris on the 13th of March 1778.

The only work with which the name of Le Beau continues to be associated is his *Histoire du Bas-Empire, en commençant à Constantin le Grand*, in 22 vols. 12mo (Paris, 1756–1779), being a continuation of C. Rollin's *Histoire Romaine* and J. B. L. Crevier's *Histoire des empereurs*. Its usefulness arises entirely from the fact of its being a faithful résumé of the Byzantine historians, for Le Beau had no originality or artistic power of his own. Five volumes were added by H. P. Ameilhon (1781–1811), which brought the work down to the fall of Constantinople. A later edition, under the care of M. de Saint-Martin and afterwards of Brosset, has had the benefit of careful revision throughout, and has received considerable additions from Oriental sources.

See his "Éloge" in vol. xlii. of the *Histoire de l'Académie des Inscriptions* (1786), pp. 190-207.

LEBEAU, JOSEPH (1794–1865), Belgian statesman, was born at Huy on the 3rd of January 1794. He received his early education from an uncle who was parish priest of Hannut, and became a clerk. By dint of economy he raised money to study law at Liége, and was called to the bar in 1819. At Liége he formed a fast friendship with Charles Rogier and Paul Devaux, in conjunction with whom he founded at Liége in 1824 the *Mathieu Laensbergh*, afterwards *Le politique*, a journal which helped to unite the Catholic party with the Liberals in their opposition to the ministry, without manifesting any open disaffection to the Dutch government. Lebeau had not contemplated the separation of Holland and Belgium, but his hand was forced by the revolution. He was sent by his native district to the National Congress, and became minister of foreign affairs in March 1831 during the interim regency of Surlet de Chokier. By proposing the election of Leopold of Saxe-Coburg as king of the Belgians he secured a benevolent attitude on the part of Great Britain, but the restoration to Holland of part of the duchies of Limburg and Luxemburg provoked a heated opposition to the treaty of London, and Lebeau was accused of treachery to Belgian interests. He resigned the direction of foreign affairs on the accession of King Leopold, but in the next year became minister of justice. He was elected deputy for Brussels in 1833, and retained his seat until 1848. Differences with the king led to his retirement in 1834. He was subsequently governor of the province of Namur (1838), ambassador to the Frankfort diet (1839), and in 1840 he formed a short-lived Liberal ministry. From this time he held no office of state, though he continued his energetic support of liberal and anti-clerical measures. He died at Huy on the 19th of March 1865.

Lebeau published *La Belgique depuis 1847* (Brussels, 4 vols., 1852), *Lettres aux électeurs belges* (8 vols., Brussels, 1853–1856). His *Souvenirs personnels et correspondance diplomatique 1824–1841* (Brussels, 1883), were edited by A. Fréson. See an article by A. Fréson in the *Biographie nationale de Belgique*; and T. Juste, *Joseph Lebeau* (Brussels, 1865).

LEBEL, JEAN (d. 1370), Belgian chronicler, was born near the end of the 13th century. His father, Gilles le Beal des Changes, was an alderman of Liége. Jean entered the church and became a canon of the cathedral church, but he and his brother Henri followed Jean de Beaumont to England in 1327, and took part in the border warfare against the Scots. His will is dated 1369, and his epitaph gives the date of his death as 1370. Nothing more is known of his life, but Jacques de Hemricourt, author of the *Miroir des nobles de Hesbaye*, has left a eulogy of his character, and a description of the magnificence of his attire, his retinue and his hospitality. Hemricourt asserts that he was eighty years old or more when he died. For a long time Jean Lebel (or le Bel) was only known as a chronicler through a reference by Froissart, who quotes him in the prologue of his first book as one of his authorities. A fragment of his work.

in the MS. of Jean d'Outremeuse's *Mireur des istores*, was discovered in 1847; and the whole of his chronicle, preserved in the library of Châlons-sur-Marne, was edited in 1863 by L. Polain. Jean Lebel gives as his reason for writing a desire to replace a certain misleading rhymed chronicle of the wars of Edward III. by a true relation of his enterprises down to the beginning of the Hundred Years' War. In the matter of style Lebel has been placed by some critics on the level of Froissart. His chief merit is his refusal to narrate events unless either he himself or his informant had witnessed them. This scrupulousness in the acceptance of evidence must be set against his limitations. He takes on the whole a similar point of view to Froissart's; he has no concern with national movements or politics; and, writing for the public of chivalry, he preserves no general notion of a campaign, which resolves itself in his narrative into a series of exploits on the part of his heroes. Froissart was considerably indebted to him, and seems to have borrowed from him some of his best-known episodes, such as the death of Robert the Bruce, Edward III. and the countess of Salisbury, and the devotion of the burghers of Calais. The songs and virelais, in the art of writing which he was, according to Hemricourt, an expert, have not come to light.

See L. Polain, *Les Vraies Chroniques de messire Jehan le Bel* (1863); Kervyn de Lettenhove, *Bulletin de la société d'émulation de Bruges*, series ii. vols. vii. and ix.; and H. Pirenne in *Biographie nationale de Belgique*.

LEBER, JEAN MICHEL CONSTANT (1780–1859), French historian and bibliophile, was born at Orléans on the 8th of May 1780. His first work was a poem on Joan of Arc (1804); but he wrote at the same time a *Grammaire général synthétique*, which attracted the attention of J. M. de Gérando, then secretary-general to the ministry of the interior. The latter found him a minor post in his department, which left him leisure for his historical work. He even took him to Italy when Napoleon was trying to organize, after French models, the Roman states which he had taken from the pope in 1809. Leber however did not stay there long, for he considered the attacks on the temporal property of the Holy See to be sacrilegious. On his return to Paris he resumed his administrative work, literary recreations and historical researches. While spending a part of his time writing vaudevilles and comic operas, he began to collect old essays and rare pamphlets by old French historians. His office was preserved to him by the Restoration, and Leber put his literary gifts at the service of the government. When the question of the coronation of Louis XVIII. arose, he wrote, as an answer to Volney, a minute treatise on the *Cérémonies du sacre*, which was published at the time of the coronation of Charles X. Towards the end of Villèle's ministry, when there was a movement of public opinion in favour of extending municipal liberties, he undertook the defence of the threatened system of centralization, and composed, in answer to Raynouard, an *Histoire critique du pouvoir municipal depuis l'origine de la monarchie jusqu'à nos jours* (1828). He also wrote a treatise entitled *De l'état réel de la presse et des pamphlets depuis François I^{er} jusqu'à Louis XIV* (1834), in which he refuted an empty paradox of Charles Nodier, who had tried to prove that the press had never been, and could never be, so free as under the Grand Monarch. A few years later, Leber retired (1839), and sold to the library of Rouen the rich collection of books which he had amassed during thirty years of research. The catalogue he made himself (4 vols., 1839 to 1852). In 1840 he read at the Académie des Inscriptions et Belles-Lettres two dissertations, an "Essai sur l'appréciation de la fortune privée au moyen âge," followed by an "Examen critique des tables de prix du marc d'argent depuis l'époque de Saint Louis"; these essays were included by the Academy in its *Recueil de mémoires présentés par divers savants* (vol. i., 1844), and were also revised and published by Leber (1847). They form his most considerable work, and assure him a position of eminence in the economic history of France. He also rendered good service to historians by the publication of his *Collection des meilleures dissertations, notices et traités relatifs à l'histoire de France* (20 vols., 1826–1840); in the absence of an index, since Leber did not give one, an analytical table of contents is to be found in Alfred Franklin's *Sources de l'histoire de France* (1876, pp. 342 sqq.). In consequence of the revolution of 1848, Leber decided to leave Paris. He retired to his native town, and spent his last years in collecting old engravings. He died at Orléans on the 22nd of December 1859.

In 1832 he had been elected as a member of the *Société des Antiquaires de France*, and in the *Bulletin* of this society (vol. i., 1860) is to be found the most correct and detailed account of his life's works.

LEBEUF, JEAN (1687–1760), French historian, was born on the 7th of March 1687 at Auxerre, where his father, a councillor in the parlement, was *receveur des consignations*. He began his studies in his native town, and continued them in Paris at the Collège Ste Barbe. He soon became known as one of the most cultivated minds of his time. He made himself master of practically every branch of medieval learning, and had a thorough knowledge of the sources and the bibliography of his subject. His learning was not drawn from books only; he was also an archaeologist, and frequently went on expeditions in France, always on foot, in the course of which he examined the monuments of architecture and sculpture, as well as the libraries, and collected a number of notes and sketches. He was in correspondence with all the most learned men of the day. His correspondence with Président Bouhier was published in 1885 by Ernest Petit; his other letters have been edited by the *Société des sciences historiques et naturelles de l'Yonne* (2 vols., 1866–1867). He also wrote numerous articles, and, after his election as a member of the Académie des Inscriptions et Belles-Lettres (1740), a number of *Mémoires* which appeared in the *Recueil* of this society. He died at Paris on the 10th of April 1760. His most important researches had Paris as their subject.

He published first a collection of *Dissertations sur l'histoire civile et ecclésiastique de Paris* (3 vols., 1739–1743), then an *Histoire de la ville et de tout le diocèse de Paris* (15 vols., 1745–1760), which is a mine of information, mostly taken from the original sources. In view of the advance made by scholarship in the 19th century, it was found necessary to publish a second edition. The work of reprinting it was undertaken by H. Cocheris, but was interrupted (1863) before the completion of vol. iv. Adrien Augier resumed the work, giving Lebeuf's text, though correcting the numerous typographical errors of the original edition (5 vols., 1883), and added a sixth volume containing an analytical table of contents. Finally, Fernand Bournon completed the work by a volume of *Rectifications et additions* (1890), worthy to appear side by side with the original work.

The bibliography of Lebeuf's writings is, partly, in various numbers of the *Bibliothèque des écrivains de Bourgogne* (1716–1741). His biography is given by Lebeau in the *Histoire de l'Académie royale des Inscriptions* (xxix., 372, published 1764), and by H. Cocheris, in the preface to his edition.

LE BLANC, NICOLAS (1742–1806), French chemist, was born at Issoudun, Indre, in 1742. He made medicine his profession and in 1780 became surgeon to the duke of Orleans, but he also paid much attention to chemistry. About 1787 he was attracted to the urgent problem of manufacturing carbonate of soda from ordinary sea-salt. The suggestion made in 1789 by Jean Claude de la Métherie (1743–1817), the editor of the *Journal de physique*, that this might be done by calcining with charcoal the sulphate of soda formed from salt by the action of oil of vitriol, did not succeed in practice because the product was almost entirely sulphide of soda, but it gave Le Blanc, as he himself acknowledged, a basis upon which to work. He soon made the crucial discovery—which proved the foundation of the huge industry of artificial alkali manufacture—that the desired end was to be attained by adding a proportion of chalk to the mixture of charcoal and sulphate of soda. Having had the soundness of this method tested by Jean Darcet (1725–1801), the professor of chemistry at the Collège de France, the duke of Orleans in June 1791 agreed to furnish a sum of 200,000 francs for the purpose of exploiting it. In the following September Le Blanc was granted a patent for fifteen years, and shortly afterwards a factory was started at Saint-Denis, near Paris. But it had not long been in operation when the Revolution led to the confiscation of the duke's property, including the factory, and about the same time the Committee of Public Safety called upon all citizens who possessed soda-factories to disclose their situation and capacity and the nature of the methods employed. Le Blanc had no choice but to reveal the secrets of his process, and he had the misfortune to see his factory dismantled and his stocks of raw and finished materials sold. By way of compensation for the loss of his rights, the works were handed back to him in 1800, but all his efforts to obtain money enough to restore them and resume manufacturing on a profitable scale were vain, and, worn out with disappointment, he died by his own hand at Saint-Denis on the 16th of January 1806.

Four years after his death, Michel Jean Jacques Dizê (1764–1852), who had been *préparateur* to Darcet at the time he examined the process and who was subsequently associated with Le Blanc in its exploitation, published in the *Journal de physique* a paper claiming that it was he himself who had first suggested the addition of chalk; but a committee of the French Academy, which reported fully on the question in 1856, came to the conclusion that the merit was entirely Le Blanc's (*Com. rend.*, 1856, p. 553).

LE BLANC, a town of central France, capital of an arrondissement, in the department of Indre, 44 m. W.S.W. of Châteauroux on the Orléans railway between Argenton and Poitiers. Pop. (1906) 4719. The Creuse divides it into a lower and an upper town. The church of St Génitour dates from the 12th, 13th and 15th centuries, and there is an old castle restored in modern times. It is the seat of a subprefect, and has a tribunal of first instance and a communal college. Wool-spinning, and the manufacture of linen goods and edge-tools are among the industries. There is trade in horses and in the agricultural and other products of the surrounding region.

Le Blanc, which is identified with the Roman *Oblincum*, was in the middle ages a lordship belonging to the house of Naillac and a frontier fortress of the province of Berry.

LEBŒUF, EDMOND (1809–1888), marshal of France, was born at Paris on the 5th of November 1809, passed through the École Polytechnique and the school of Metz, and distinguished himself as an artillery officer in Algerian warfare, becoming colonel in 1852. He commanded the artillery of the 1st French corps at the siege of Sebastopol, and was promoted in 1854 to the rank of general of brigade, and in 1857 to that of general of division. In the Italian War of 1859 he commanded the artillery, and by his action at Solferino materially assisted in achieving the victory. In September 1866, having in the meantime become aide-de-camp to Napoleon III., he was despatched to Venetia to hand over that province to Victor Emmanuel. In 1869, on the death of Marshal Niel, General Lebœuf became minister of war, and earned public approbation by his vigorous reorganization of the War Office and the civil departments of the service. In the spring of 1870 he received the marshal's baton. On the declaration of war with Germany Marshal Lebœuf delivered himself in the Corps Législatif of the historic saying, "So ready are we, that if the war lasts two years, not a gaiter button would be found wanting." It may be that he intended this to mean that, given time, the reorganization of the War Office would be perfected through experience, but the result inevitably caused it to be regarded as a mere boast, though it is now known that the administrative confusion on the frontier in July 1870 was far less serious than was supposed at the time. Lebœuf took part in the Lorraine campaign, at first as chief of staff (major-general) of the Army of the Rhine, and afterwards, when Bazaine became commander-in-chief, as chief of the III. corps, which he led in the battles around Metz. He distinguished himself, whenever engaged, by personal bravery and good leadership. Shut up with Bazaine in Metz, on its fall he was confined as a prisoner in Germany. On the conclusion of peace he returned to France and gave evidence before the commission of inquiry into the surrender of that stronghold, when he strongly denounced Bazaine. After this he retired into private life to the Château du Moncel near Argentan, where he died on the 7th of June 1888.

LE BON, JOSEPH (1765–1795), French politician, was born at Arras on the 29th of September 1765. He became a priest in the order of the Oratory, and professor of rhetoric at Beaune. He adopted revolutionary ideas, and became a curé of the Constitutional Church in the department of Pas-de-Calais, where he was later elected as a *député suppléant* to the Convention. He became *maire* of Arras and *administrateur* of Pas-de-Calais, and on the 2nd of July 1793 took his seat in the Convention. He was sent as a representative on missions into the departments of the Somme and Pas-de-Calais, where he showed great severity in dealing with offences against revolutionaries (8th Brumaire, year II. to 22nd Messidor, year II.; *i.e.* 29th October 1793 to 10th July 1794). In consequence, during the reaction which followed the 9th Thermidor (27th July 1794) he was arrested on the 22nd Messidor, year III. (10th July 1795). He was tried before the criminal tribunal of the Somme, condemned to death for abuse of his power during his mission, and executed at Amiens on the 24th Vendémiaire in the year IV. (10th October 1795). Whatever Le Bon's offences, his condemnation was to a great extent due to the violent attacks of one of his political enemies, Armand Guffroy; and it is only just to remember that it was owing to his courage that Cambrai was saved from falling into the hands of the Austrians.

His son, Émile le Bon, published a *Histoire de Joseph le Bon et des tribunaux révolutionnaires d'Arras et de Cambrai* (2nd ed., 2 vols., Arras, 1864).

LEBRIJA, or Lebrixa, a town of southern Spain, in the province of Seville, near the left bank of the Guadalquivir, and on the eastern edge of the marshes known as Las Marismas. Pop. (1900) 10,997. Lebrija is 44 m. S. by W. of Seville, on the Seville-Cadiz railway. Its chief buildings are a ruined Moorish castle and the parish church, an imposing structure in a variety of styles—Moorish, Gothic, Romanesque—dating from the 14th century to the 16th, and containing some early specimens of the carving of Alonso Cano (1601–1667). There are manufactures of bricks, tiles and earthenware, for which clay is found in the neighbourhood; and some trade in grain, wine and oil.

Lebrija is the *Nabrissa* or *Nebrissa*, surnamed *Veneria*, of the Romans; by Silius Italicus (iii. 393), who connects it with the worship of Dionysus, the name is derived from the Greek *νεβρίς* (a "fawn-skin," associated with Dionysiac ritual). *Nebrishah* was a strong and populous place during the period of Moorish domination (from 711); it was taken by St Ferdinand in 1249, but again lost, and became finally subject to the Castilian crown only under Alphonso the Wise in 1264. It was the birthplace of Elio Antonio de Lebrija or Nebrija (1444–1522), better known as Nebrissensis, one of the most important leaders in the revival of learning in Spain, the tutor of Queen Isabella, and a collaborator with Cardinal Jimenes in the preparation of the Complutensian Polyglot (see Alcala de Henares).

LE BRUN, CHARLES (1619–1690), French painter, was born at Paris on the 24th of February 1619, and attracted the notice of Chancellor Séguier, who placed him at the age of eleven in the studio of Vouet. At fifteen he received commissions from Cardinal Richelieu, in the execution of which he displayed an ability which obtained the generous commendations of Poussin, in whose company Le Brun started for Rome in 1642. In Rome he remained four years in the receipt of a pension due to the liberality of the chancellor. On his return to Paris Le Brun found numerous patrons, of whom Superintendent Fouquet was the most important. Employed at Vaux le Vicomte, Le Brun ingratiated himself with Mazarin, then secretly pitting Colbert against Fouquet. Colbert also promptly recognized Le Brun's powers of organization, and attached him to his interests. Together they founded the Academy of Painting and Sculpture (1648), and the Academy of France at Rome (1666), and gave a new development to the industrial arts. In 1660 they established the Gobelins, which at first was a great school for the manufacture, not of tapestries only, but of every class of furniture required in the royal palaces. Commanding the industrial arts through the Gobelins—of which he was director—and the whole artist world through the Academy—in which he successively held every post—Le Brun imprinted his own character on all that was produced in France during his lifetime, and gave a direction to the national tendencies which endured after his death. The nature of his emphatic and pompous talent was in harmony with the taste of the king, who, full of admiration at the decorations designed by Le Brun for his triumphal entry into Paris (1660), commissioned him to execute a series of subjects from the history of Alexander. The first of these, "Alexander and the Family of Darius," so delighted Louis XIV. that he at once ennobled Le Brun (December, 1662), who was also created first painter to his majesty with a pension of 12,000 livres, the same amount as he had yearly received in the service of the magnificent Fouquet. From this date all that was done in the royal palaces was directed by Le Brun. The works of the gallery of Apollo in the Louvre were interrupted in 1677 when he accompanied the king to Flanders (on his return from Lille he painted several compositions in the Château of St Germains), and finally—for they remained unfinished at his death—by the vast labours of Versailles, where he reserved for himself the Halls of War and Peace, the Ambassadors' Staircase, and the Great Gallery, other artists being forced to accept the position of his assistants. At the death of Colbert, Louvois, who succeeded him in the department of public works, showed no favour to Le Brun, and in spite of the king's continued support he felt a bitter change in his position. This contributed to the illness which on the 22nd of February 1690 ended in his death in the Gobelins. Besides his gigantic labours at Versailles and the Louvre, the number of his works for religious corporations and private patrons is enormous. He modelled and engraved with much facility, and, in spite of the heaviness and poverty of drawing and colour, his extraordinary activity and the vigour of his conceptions justify his claim to fame. Nearly all his compositions have been reproduced by celebrated engravers.

LEBRUN, CHARLES FRANÇOIS, duc de Plaisance (1739–1824), French statesman, was born at St-Sauveur-Lendelin (Manche) on the 19th of March 1739, and in 1762 made his first appearance as a lawyer at Paris. He filled the posts successively of *censeur royale* (1766) and of inspector general of the domains of the crown (1768); he was also one of the chief advisers of the chancellor Maupeou, took part in his struggle against the parlements, and shared in his downfall in 1774. He then devoted himself to literature, translating Tasso's *Gerusalemme liberata* (1774), and the *Iliad* (1776). At the outset of the Revolution he foresaw its importance, and in the *Voix du citoyen*, which he published in 1789, predicted the course which events would take. In the Constituent Assembly, where he sat as deputy for Dourdan, he professed liberal views, and was the proposer of various financial laws. He then became president of the directory of Seine-et-Oise, and in 1795 was elected as a deputy to the Council of Ancients. After the *coup d'état* of the 18th Brumaire in the year VIII. (9th November 1799), Lebrun was made third consul. In this capacity he took an active part in the reorganization of finance and of the administration of the departments of France. In 1804 he was appointed arch-treasurer of the empire, and in 805–1806 as governor-general of Liguria effected its annexation to France. He opposed Napoleon's restoration of the noblesse, and in 1808 only reluctantly accepted the title of duc de Plaisance (Piacenza). He was next employed in organizing the departments which were formed in Holland, of which he was governor-general from 1811 to 1813. Although to a certain extent opposed to the despotism of the emperor, he was not in favour of his deposition, though he accepted the *fait accompli* of the Restoration in April 1814. Louis XVIII. made him a peer of France; but during the Hundred Days he accepted from Napoleon the post of Grand Master of the university. On the return of the Bourbons in 1815 he was consequently suspended from the House of Peers, but was recalled in 1819. He died at St Mesmes (Seine-et-Oise) on the 16th of June 1824. He had been made a member of the Académie des Inscriptions et Belles-Lettres in 1803.

See M. de Caumont la Force, *L'Architrésorier Lebrun* (Paris, 1907); M. Marie du Mesnil, *Mémoire sur le prince Le Brun, duc de Plaisance* (Paris, 1828); *Opinions, rapports et choix d'écrits politiques de C. F. Lebrun* (1829), edited, with a biographical notice, by his son Anne-Charles Lebrun.

LEBRUN, PIERRE ANTOINE (1785–1873), French poet, was born in Paris on the 29th of November 1785. An *Ode à la grande armée*, mistaken at the time for the work of Écouchard Lebrun, attracted Napoleon's attention, and secured for the author a pension of 1200 francs. Lebrun's plays, once famous, are now forgotten. They are: *Ulysse* (1814), *Marie Stuart* (1820), which obtained a great success, and *Le Cid d'Andalousie* (1825). Lebrun visited Greece in 1820, and on his return to Paris he published in 1822 an ode on the death of Napoleon which cost him his pension. In 1825 he was the guest of Sir Walter Scott at Abbotsford. The coronation of Charles X. in that year inspired the verses entitled *La Vallée de Champrosay*, which have, perhaps, done more to secure his fame than his more ambitious attempts. In 1828 appeared his most important poem, *La Grèce*, and in the same year he was elected to the Academy. The revolution of 1830 opened up for him a public career; in 1831 he was made director of the Imprimerie Royale, and subsequently filled with distinction other public offices, becoming senator in 1853. He died on the 27th of May 1873.

See Sainte-Beuve, *Portraits contemporains*, vol. ii.

LEBRUN, PONCE DENIS ÉCOUCHARD (1729–1807), French lyric poet, was born in Paris on the 11th of August 1729, in the house of the prince de Conti, to whom his father was valet. Young Lebrun had among his schoolfellows a son of Louis Racine whose disciple he became. In 1755 he published an *Ode sur les désastres de Lisbon.* In 1759 he married Marie Anne de Surcourt, addressed in his *Élégies* as Fanny. To the early years of his marriage belongs his poem *Nature.* His wife suffered much from his violent temper, and when in 1774 she brought an action against him to obtain a separation, she was supported by Lebrun's own mother and sister. He had been *secrétaire des commandements* to the prince de Conti, and on his patron's death was deprived of his occupation. He suffered a further misfortune in the loss of his capital by the bankruptcy of the prince de Guémené. To this period belongs a long poem, the *Veillées des Muses*, which remained unfinished, and his ode to Buffon, which ranks among his best works. Dependent on government pensions he changed his politics with the times. Calonne he compared to the great Sully, and Louis XVI. to Henry IV., but the Terror nevertheless found in him its official poet. He occupied rooms in the Louvre, and fulfilled his obligations by shameless attacks on the unfortunate king and queen. His excellent ode on the *Vengeur* and the *Ode nationale contre Angleterre* on the occasion of the projected invasion of England are in honour of the power of Napoleon. This "versatility" has so much injured Lebrun's reputation that it is difficult to appreciate his real merit. He had a genius for epigram, and the quatrains and dizaines directed against his many enemies have a verve generally lacking in his odes. The one directed against La Harpe is called by Sainte-Beuve the "queen of epigrams." La Harpe has said that the poet, called by his friends, perhaps with a spice of irony, Lebrun-Pindare, had written many fine strophes but not one good ode. The critic exposed mercilessly the obscurities and unlucky images which occur even in the ode to Buffon, and advised the author to imitate the simplicity and energy that adorned Buffon's prose. Lebrun died in Paris on the 31st of August 1807.

His works were published by his friend P. L. Ginguené in 1811. The best of them are included in Prosper Poitevin's "*Petits poètes français*," which forms part of the "*Panthéon littéraire.*"

LE CARON, HENRI (whose real name was THOMAS MILLER BEACH) (1841–1894), British secret service agent, was born at Colchester, on the 26th of September 1841. He was of an adventurous character, and when nineteen years old went to Paris, where he found employment in business connected with America. Infected with the excitement of the American Civil War, he crossed the Atlantic in 1861 and enlisted in the Northern army, taking the name of Henri Le Caron. In 1864 he married a young lady who had helped him to escape from some Confederate marauders; and by the end of the war he rose to be major. In 1865, through a companion in arms named O'Neill, he was brought into contact with Fenianism, and having learnt of the Fenian plot against Canada, he mentioned the designs when writing home to his father. Mr Beach told his local M.P., who in turn told the Home Secretary, and the latter asked Mr Beach to arrange for further information. Le Caron, inspired (as all the evidence shows) by genuinely patriotic feeling, from that time till 1889 acted for the British government as a paid military spy. He was a proficient in medicine, among other qualifications for this post, and he remained for years on intimate terms with the most extreme men in the Fenian organization under all its forms. His services enabled the British government to take measures which led to the fiasco of the Canadian invasion of 1870 and Riel's surrender in 1871, and he supplied full details concerning the various Irish-American associations, in which he himself was a prominent member. He was in the secrets of the "new departure" in 1879–1881, and in the latter year had an interview with Parnell at the House of Commons, when the Irish leader spoke sympathetically of an armed revolution in Ireland. For twenty-five years he lived at Detroit and other places in America, paying occasional visits to Europe, and all the time carrying his life in his hand. The Parnell Commission of 1889 put an end to this. Le Caron was subpoenaed by *The Times*, and in the witness-box the whole story came out, all the efforts of Sir Charles Russell in cross-examination failing to shake his testimony, or to impair the impression of iron tenacity and absolute truthfulness which his bearing conveyed. His career, however, for good or evil, was at an end. He published the story of his life, *Twenty-five Years in the Secret Service*, and it had an immense circulation. But he had to be constantly guarded, his acquaintances were hampered from seeing him, and he was the victim of a painful disease, of which he died on the 1st of April 1894. The report of the Parnell Commission is his monument.

LE CATEAU, or Cateau-Cambrésis, a town of northern France, in the department of Nord, on the Selle, 15 m. E.S.E. of Cambrai by road. Pop. (1906) 10,400. A church of the early 17th century and a town-hall in the Renaissance style are its chief buildings. Its institutions include a board of trade-arbitration and a communal college, and its most important industries are wool-spinning and weaving. Formed by the union of the two villages of Péronne and Vendelgies, under the protection of a castle built by the bishop of Cambrai, Le Cateau became the seat of an abbey in the 11th century. In the 15th it was frequently taken and retaken, and in 1556 it was burned by the French, who in 1559 signed a celebrated treaty with Spain in the town. It was finally ceded to France by the peace of Nijmwegen in 1678.

LECCE (anc. *Lupiae*), a town and archiepiscopal see of Apulia, Italy, capital of the province of Lecce, 24 m. S.E. of Brindisi by rail. Pop. (1906) 35,179. The town is remarkable for the number of buildings of the 17th century, in the rococo style, which it contains; among these are the cathedral of S. Oronzo, and the churches of S. Chiara, S. Croce, S. Domenico, &c., the Seminario, and the Prefettura (the latter contains a museum, with a collection of Greek vases, &c.). Buildings of an earlier period are not numerous, but the fine portal of the Romanesque church of SS. Nicola e Cataldo, built by Tancred in 1180, may be noted. Another old church is S. Maria di Cerrate, near the town. Lecce contains a large government tobacco factory, and is the centre of a fertile agricultural district. To the E. 7½ m. is the small harbour of S. Cataldo, reached by electric tramway. Lecce is quite close to the site of the ancient Lupiae, equidistant (25 m.) from Brundusium and Hydruntum, remains of which are mentioned as existing up to the 15th century. A colony was founded there in Roman times, and Hadrian made a harbour—no doubt at S. Cataldo. Hardly a mile west was Rudiae, the birthplace of the poet Ennius, spoken of by Silius Italicus as worthy of mention for that reason alone. Its site was marked by the now deserted village of Rugge. The name Lycea, or Lycia, begins to appear in the 6th century. The city was for some time held by counts of Norman blood, among whom the most noteworthy is Bohemond, son of Robert Guiscard. It afterwards passed to the Orsini. The rank of provincial capital was bestowed by Ferdinand of Aragon in acknowledgment of the fidelity of Lecce to his cause. (T. As.)

See M. S. Briggs, *In the Heel of Italy* (1910).

LECCO, a town of Lombardy, in the province of Como, 32 m. by rail N. by E. of Milan, and reached by steamer from Como, 673 ft. above sea-level. Pop. (1901) 10,352. It is situated near the southern extremity of the eastern branch of the Lake of Como, which is frequently distinguished as the Lake of Lecco. At Lecco begins the line (run by electricity) to Colico, whence there are branches to Chiavenna and Sondrio; and another line runs to Bergamo. To the south the Adda is crossed by a fine bridge originally constructed in 1335, and rebuilt in 1609 by Fuentes. Lecco, in spite of its antiquity, presents a modern appearance, almost the only old building being its castle, of which a part remains. Its schools are particularly good. Besides iron-works, there are copper-works, brass-foundries, olive-oil mills and a manufacture of wax candles; and silk-spinning, cotton-spinning and wood-carving. In the neighbourhood is the villa of Caleotto, the residence of Alessandro Manzoni, who in his *Promessi Sposi* has left a full description of the district. A statue has been erected to him.

In the 11th century Lecco, previously the seat of a marquisate, was presented to the bishops of Como by Otto II.; but in the 12th century it passed to the archbishops of Milan, and in 1127 it assisted the Milanese in the destruction of Como. During the 13th century it was struggling for its existence with the metropolitan city; and its fate seemed to be sealed when the Visconti drove its inhabitants across the lake to Valmadrera, and forbade them to raise their town from its ashes. But in a few years the people returned; Azzone Visconti made Lecco a strong fortress, and in 1335 united it with the Milanese territory by a bridge across the Adda. During the 15th and 16th centuries the citadel of Lecco was an object of endless contention. In 1647 the town with its territory was made a countship. Morone, Charles V.'s Italian chancellor, was born in Lecco.

See A. L. Apostolo, *Lecco ed il suo territorio* (Lecco, 1855).

LECH (*Licus*), a river of Germany in the kingdom of Bavaria, 177 m. long, with a drainage basin of 2550 sq. m. It rises in the Vorarlberg Alps, at an altitude of 6120 ft. It winds out of the gloomy limestone mountains, flows in a north-north-easterly direction, and enters the plains at Füssen (2580 ft.), where it forms rapids and a fall, then pursues a northerly course past Augsburg, where it receives the Wertach, and joins the Danube from the right just below Donauwörth (1330 ft.). It is not navigable, owing to its torrential character and the gravel beds which choke its channel. More than once great historic events have been decided upon its banks. On the Lechfeld, a stony waste some miles long, between the Lech and the Wertach, the emperor Otto I. defeated the Hungarians in August 955. Tilly, in attempting to defend the passage of the stream at Rain against the forces of Gustavus Adolphus, was fatally wounded, on the 5th of April 1632. The river was formerly the boundary between Bavaria and Swabia.

LE CHAMBON, or Le Chambon-Feugerolles, a town of east-central France in the department of Loire, 7½ m. S.W. of St Étienne by rail, on the Ondaine, a tributary of the Loire. Pop. (1906) town, 7525; commune, 12,011. Coal is mined in the neighbourhood, and there are forges, steel works, manufactures of tools and other iron goods, and silk mills. The feudal castle of Feugerolles on a hill to the south-east dates in part from the 11th century.

Between Le Chambon and St Étienne is La Ricamarie (pop. of town 5289) also of importance for its coal-mines. Many of the galleries of a number of these mines are on fire, probably from spontaneous combustion. According to popular tradition these fires date from the time of the Saracens; more authentically from the 15th century.

LE CHAPELIER, ISAAC RENÉ GUY (1754–1794), French politician, was born at Rennes on the 12th of June 1754, his father being *bâtonnier* of the corporation of lawyers in that town. He entered his father's profession, and had some success as an orator. In 1789 he was elected as a deputy to the States General by the Tiers-État of the *sénéchaussée* of Rennes. He adopted advanced opinions, and was one of the founders of the Breton Club (see Jacobin Club); his influence in the Constituent Assembly was considerable, and on the 3rd of August 1789 he was elected its president. Thus he presided over the Assembly during the important period following the 4th of August; he took an active part in the debates, and was a leading member of the committee which drew up the new constitution; he further presented a report on the liberty of theatres and on literary copyright. He was also conspicuous as opposing Robespierre when he proposed that members of the Constituent Assembly should not be eligible for election to the proposed new Assembly. After the flight of the king to Varennes (20th of June 1792), his opinions became more moderate, and on the 29th of September he brought forward a motion to restrict the action of the clubs. This, together with a visit which he paid to England in 1792 made him suspect, and he was denounced on his return for conspiring with foreign nations. He went into hiding, but was discovered in consequence of a pamphlet which he published to defend himself, arrested and condemned to death by the Revolutionary Tribunal. He was executed at Paris on the 22nd of April 1794.

See A. Aulard, *Les Orateurs de la constituante* (2nd ed., Paris, 1905); R. Kerviler, *Récherches et notices sur les députés de la Bretagne aux états généraux* (2 vols., Rennes, 1888–1889); P. J. Levot, *Biographie bretonne* (2 vols., 1853–1857).

LECHLER, GOTTHARD VICTOR (1811–1888), German Lutheran theologian, was born on the 18th of April 1811 at Kloster Reichenbach in Württemberg. He studied at Tübingen under F. C. Baur, and became in 1858 pastor of the church of St Thomas, professor ordinarius of historical theology and superintendent of the Lutheran church of Leipzig. He died on the 26th of December 1888. A disciple of Neander, he belonged to the extreme right of the school of mediating theologians. He is important as the historian of early Christianity and of the pre-Reformation period. Although F. C. Baur was his teacher, he did not attach himself to the Tübingen school; in reply to the contention that there are traces of a sharp conflict between two parties, Paulinists and Petrinists, he says that "we find variety coupled with agreement, and unity with difference, between Paul and the earlier apostles; we recognize the *one* spirit in the many gifts." His *Das apostolische und das nachapostolische Zeitalter* (1851), which developed out of a prize essay (1849), passed through three editions in Germany (3rd ed., 1885), and was translated into English (2 vols., 1886). The work which in his own opinion was his greatest, *Johann von Wiclif und die Vorgeschichte der Reformation* (2 vols., 1873), appeared in English with the title *John Wiclif and his English Precursors* (1878, new ed., 1884). An earlier work, *Geschichte des engl. Deismus* (1841), is still regarded as a valuable contribution to the study of religious thought in England.

Lechler's other works include *Geschichte der Presbyterial- und Synodal-verfassung* (1854), *Urkundenfunde zur Geschichte des christl. Altertums* (1886), and biographies of Thomas Bradwardine (1862) and Robert Grosseteste (1867). He wrote part of the commentary on the Acts of the Apostles in J. P. Lange's *Bibelwerk*. From 1882 he edited with F. W. Dibelius the *Beiträge zur sächsischen Kirchengeschichte*. *Johannes Hus* (1890) was published after his death.

LECKY, WILLIAM EDWARD HARTPOLE (1838–1903), Irish historian and publicist, was born at Newtown Park, near Dublin, on the 26th of March 1838, being the eldest son of John Hartpole Lecky, whose family had for many generations been landowners in Ireland. He was educated at Kingstown, Armagh, and Cheltenham College, and at Trinity College, Dublin, where he graduated B.A. in 1859 and M.A. in 1863, and where, with a view to becoming a clergyman in the Irish Protestant Church, he went through a course of divinity. In 1860 he published anonymously a small book entitled *The Religious Tendencies of the Age*, but on leaving college he abandoned his first intention and turned to historical work. In 1861 he published *Leaders of Public Opinion in Ireland*, a brief sketch of the lives and work of Swift, Flood, Grattan and O'Connell, which gave decided promise of his later admirable work in the same field. This book, originally published anonymously, was republished in 1871; and the essay on Swift, rewritten and amplified, appeared again in 1897 as an introduction to a new edition of Swift's works. Two learned surveys of certain aspects of history followed: *A History of the Rise and Influence of Rationalism in Europe* (2 vols., 1865), and *A History of European Morals from Augustus to Charlemagne* (2 vols., 1869). Some criticism was aroused by these books, especially by the last named, with its opening dissertation on "the natural history of morals," but both have been generally accepted as acute and suggestive commentaries upon a wide range of facts. Lecky then devoted himself to the chief work of his life, *A History of England during the Eighteenth Century*, vols. i. and ii. of which appeared in 1878, and vols. vii. and viii. (completing the work) in 1890. His object was "to disengage from the great mass of facts those which relate to the permanent forces of the nation, or which indicate some of the more enduring features of national life," and in the carrying out of this task Lecky displays many of the qualities of a great historian. The work is distinguished by the lucidity of its style, but the fulness and extent of the authorities referred to, and, above all, by the judicial impartiality maintained by the author throughout. These qualities are perhaps most conspicuous and most valuable in the chapters which deal with the history of Ireland, and in the cabinet edition of 1892, in 12 vols. (frequently reprinted) this part of the work is separated from the rest, and occupies five volumes under the title of *A History of Ireland in the Eighteenth Century.* A volume of *Poems*, published in 1891, was characterized by a certain frigidity and by occasional lapses into commonplace, objections which may also be fairly urged against much of Lecky's prose-writing. In 1896 he published two volumes entitled *Democracy and Liberty*, in which he considered, with special reference to Great Britain, France and America, some of the tendencies of modern democracies. The somewhat gloomy conclusions at which he arrived provoked much criticism both in Great Britain and America, which was renewed when he published in a new edition (1899) an elaborate and very depreciatory estimate of Gladstone, then recently dead. This work, though essentially different from the author's purely historical writings, has many of their merits, though it was inevitable that other minds should take a different view of the evidence. In *The Map of Life* (1900) he discussed in a popular style some of the ethical problems which arise in everyday life. In 1903 he published a revised and greatly enlarged edition of *Leaders of Public Opinion in Ireland*, in two volumes, from which the essay on Swift was omitted and that on O'Connell was expanded into a complete biography of the great advocate of repeal of the Union. Though always a keen sympathizer with the Irish people in their misfortunes and aspirations, and though he had criticized severely the methods by which the Act of Union was passed, Lecky, who grew up as a moderate Liberal, was from the first strenuously opposed to Gladstone's policy of Home Rule, and in 1895 he was returned to parliament as Unionist member for Dublin University. In 1897 he was made a privy councillor, and among the coronation honours in 1902 he was nominated an original member of the new Order of Merit. His university honours included the degree of LL.D. from Dublin, St Andrews and Glasgow, the degree of D.C.L. from Oxford and the degree of Litt.D. from Cambridge. In 1894 he was elected corresponding member of the Institute of France. He contributed occasionally to periodical literature, and two of his addresses, *The Political Value of History* (1892) and *The Empire, its Value and its Growth* (1893), were published. He died in London on the 22nd of October 1903. He married in 1871 Elizabeth, baroness de Dedem, daughter of baron de Dedem, a general in the Dutch service, but had no children. Mrs Lecky contributed to various reviews a number of articles, chiefly on historical and political subjects. A volume of Lecky's *Historical and Political Essays* was published posthumously (London, 1908).

LE CLERC [Clericus], **JEAN** (1657–1736), French Protestant theologian, was born on the 19th of March 1657 at Geneva, where his father, Stephen Le Clerc, was professor of Greek. The family originally belonged to the neighbourhood of Beauvais in France, and several of its members acquired some name in literature. Jean Le Clerc applied himself to the study of philosophy under J. R. Chouet (1642–1731) the Cartesian, and attended the theological lectures of P. Mestrezat, Franz Turretin and Louis Tronchin (1629–1705). In 1678–1679 he spent some time at Grenoble as tutor in a private family; on his return to Geneva he passed his examinations and received ordination. Soon afterwards he went to Saumur, where in 1679 were published *Liberii de Sancto Amore Epistolae Theologicae* (Irenopoli: Typis Philalethianis), usually attributed to him; they deal with the doctrine of the Trinity, the hypostatic union of the two natures in Jesus Christ, original sin, and the like, in a manner sufficiently far removed from that of the conventional orthodoxy of the period. In 1682 he went to London, where he remained six months, preaching on alternate Sundays in the Walloon church and in the Savoy chapel. Passing to Amsterdam he was introduced to John Locke and to Philip v. Limborch, professor at the Remonstrant college; the acquaintance with Limborch soon ripened into a close friendship, which strengthened his preference for the Remonstrant theology, already favourably known to him by the writings of his grand-uncle, Stephan Curcellaeus (d. 1645) and by those of Simon Episcopius. A last attempt to live at Geneva, made at the request of relatives there, satisfied him that the theological atmosphere was uncongenial, and in 1684 he finally settled at Amsterdam, first as a moderately successful preacher, until ecclesiastical jealousy shut him out from that career, and afterwards as professor of philosophy, belles-lettres and Hebrew in the Remonstrant seminary. This appointment, which he owed to Limborch, he held from 1684, and in 1712 on the death of his friend he was called to occupy the chair of church history also. His suspected Socinianism was the cause, it is said, of his exclusion from the chair of dogmatic theology. Apart from his literary labours, Le Clerc's life at Amsterdam was uneventful. In 1691 he married a daughter of Gregorio Leti. From 1728 onward he was subject to repeated strokes of paralysis, and he died on the 8th of January 1736.

A full catalogue of the publications of Le Clerc will be found, with biographical material, in E. and E. Haag's *France Protestante* (where seventy-three works are enumerated), or in J. G. de Chauffepié's *Dictionnaire.* Only the most important of these can be mentioned here. In 1685 he published *Sentimens de quelques théologiens de Hollande sur l'histoire critique du Vieux Testament composée par le P. Richard Simon*, in which, while pointing out what he believed to be the faults of that author, he undertook to make some positive contributions towards a right understanding of the Bible. Among these last may be noted his argument against the Mosaic authorship of the Pentateuch, his views as to the manner in which the five books were composed, his opinions (singularly free for the time in which he lived) on the subject of inspiration in general, and particularly as to the inspiration of Job, Proverbs, Ecclesiastes, Canticles. Richard Simon's *Réponse* (1686) elicited from Le Clerc a *Défense des sentimens* in the same year, which was followed by a new *Réponse* (1687). In 1692 appeared his *Logica sive Ars Ratiocinandi*, and also *Ontologia et Pneumatologia*; these, with the *Physica* (1695), are incorporated with the *Opera Philosophica*, which have passed through several editions. In 1693 his series of Biblical commentaries began with that on Genesis; the series was not completed until 1731. The portion relating to the New Testament books included the paraphrase and notes of Henry Hammond (1605–1660). Le Clerc's commentary had a great influence in breaking up traditional prejudices and showing the necessity for a more scientific inquiry into the origin and meaning of the biblical books. It was on all sides hotly attacked. His *Ars Critica* appeared in 1696, and, in continuation, *Epistolae Criticae et Ecclesiasticae* in 1700. Le Clerc's new edition of the *Apostolic Fathers* of Johann Cotelerius (1627–1686), published in 1698, marked an advance in the critical study of these documents. But the greatest literary influence of Le Clerc was probably that which he exercised over his contemporaries by means of the serials, or, if one may so call them, reviews, of which he was editor. These were the *Bibliothèque universelle et historique* (Amsterdam, 25 vols. 12 mo., 1686–1693), begun with J. C. de la Croze; the *Bibliothèque choisie* (Amsterdam, 28 vols., 1703–1713); and the *Bibliothèque ancienne et moderne*, (29 vols., 1714–1726).

See Le Clerc's *Parrhasiana ou pensées sur des matières de critique, d'histoire, de morale, et de politique: avec la défense de divers ouvrages de M. L. C. par Théodore Parrhase* (Amsterdam, 1699); and *Vita et opera ad annum MDCCXI., amici ejus opusculum, philosophicis Clerici operibus subjiciendum*, also attributed to himself. The supplement to Hammond's notes was translated into English in 1699, *Parrhasiana, or Thoughts on Several Subjects*, in 1700, the *Harmony of the Gospels* in 1701, and *Twelve Dissertations out of M. Le Clerc's Genesis* in 1696.

LECOCQ, ALEXANDRE CHARLES (1832–), French musical composer, was born in Paris, on the 3rd of June 1832. He was admitted into the Conservatoire in 1849, being already an accomplished pianist. He studied under Bazin, Halévy and Benoist, winning the first prize for harmony in 1850, and the second prize for fugue in 1852. He first gained notice by dividing with Bizet the first prize for an operetta in a competition instituted by Offenbach. His operetta, *Le Docteur miracle*, was performed at the Bouffes Parisiens in 1857. After that he wrote constantly for theatres, but produced nothing worthy of mention until *Fleur de thé* (1868), which ran for more than a hundred nights. *Les Cent vierges* (1872) was favourably received also, but all his previous successes were cast into the shade by *La Fille de Madame Angot* (Paris, 1873; London, 1873), which was performed for 400 nights consecutively, and has since gained and retained enormous popularity. After 1873 Lecocq produced a large number of comic operas, though he never equalled his early triumph in *La Fille de Madame Angot.* Among the best of his pieces are *Giroflé-Girofla* (Paris and London, 1874); *Les Prês Saint-Gervais* (Paris and London, 1874); *La Petite Mariée* (Paris, 1875; London, 1876, revived as *The Scarlet Feather*, 1897); *Le Petit Duc* (Paris, 1878; London, as *The Little Duke*, 1878); *La Petite Mademoiselle* (Paris, 1879; London, 1880); *Le Jour et la Nuit* (Paris, 1881; London, as *Manola*, 1882); *Le Cœur et la main* (Paris, 1882; London, as *Incognita*, 1893); *La Princesse des Canaries* (Paris, 1883; London, as *Pepita*, 1888). In 1899 a ballet by Lecocq, entitled *Le Cygne*, was staged at the Opéra Comique, Paris; and in 1903 *Yetta* was produced at Brussels.

LECOINTE-PUYRAVEAU, MICHEL MATHIEU (1764–1827), French politician, was born at Saint-Maixent (Deux-Sèvres) on the 13th of December 1764. Deputy for his department to the Legislative Assembly in 1792, and to the Convention in the same year, he voted for "the death of the tyrant." His association with the Girondins nearly involved him in their fall, in spite of his vigorous republicanism. He took part in the revolution of Thermidor, but protested against the establishment of the Directory, and continually pressed for severer measures against the *émigrés*, and even their relations who had remained in France. He was secretary and then president of the Council of Five Hundred, and under the Consulate a member of the Tribunate. He took no part in public affairs under the Empire, but was lieutenant-general of police for south-east France during the Hundred Days. After Waterloo he took ship from Toulon, but the ship was driven back by a storm and he narrowly escaped massacre at Marseilles. After six weeks' imprisonment in the Château d'If he returned to Paris, escaping, after the proscription of the regicides, to Brussels, where he died on the 15th of January 1827.

LE CONTE, JOSEPH (1823–1901), American geologist, of Huguenot descent, was born in Liberty county, Georgia, on the 26th of February 1823. He was educated at Franklin College, Georgia, where he graduated (1841); he afterwards studied medicine and received his degree at the New York College of Physicians and Surgeons in 1845. After practising for three or four years at Macon, Georgia, he entered Harvard, and studied natural history under L. Agassiz. An excursion made with Professors J. Hall and Agassiz to the Helderberg mountains of New York developed a keen interest in geology. After graduating at Harvard, Le Conte in 1851 accompanied Agassiz on an expedition to study the Florida reefs. On his return he became professor of natural science in Oglethorpe University, Georgia; and from 1852 to 1856 professor of natural history and geology in Franklin College. From 1857 to 1869 he was professor of chemistry and geology in South Carolina College, and he was then appointed professor of geology and natural history in the university of California, a post which he held until his death. He published a series of papers on monocular and binocular vision, and also on psychology. His chief contributions, however, related to geology, and in all he wrote he was lucid and philosophical. He described the fissure-eruptions in western America, discoursed on earth-crust movements and their causes and on the great features of the earth's surface. As separate works he published *Elements of Geology* (1878, 5th ed. 1889); *Religion and Science* (1874); and *Evolution: its History, its*

Evidences, and its Relation to Religious Thought (1888). He was president of the American Association for the Advancement of Science in 1892, and of the Geological Society of America in 1896. He died in the Yosemite Valley, California, on the 6th of June 1901.

See Obituary by J. J. Stevenson, *Annals of New York Acad. of Sciences*, vol. xiv. (1902), p. 150.

LECONTE DE LISLE, CHARLES MARIE RENÉ (1818–1894), French poet, was born in the island of Réunion on the 22nd of October 1818. His father, an army surgeon, who brought him up with great severity, sent him to travel in the East Indies with a view to preparing him for a commercial life. After this voyage he went to Rennes to complete his education, studying especially Greek, Italian and history. He returned once or twice to Réunion, but in 1846 settled definitely in Paris. His first volume, *La Vénus de Milo*, attracted to him a number of friends many of whom were passionately devoted to classical literature. In 1873 he was made assistant librarian at the Luxembourg; in 1886 he was elected to the Academy in succession to Victor Hugo. His *Poèmes antiques* appeared in 1852; *Poèmes et poésies* in 1854; *Le Chemin de la croix* in 1859; the *Poèmes barbares*, in their first form, in 1862; *Les Erinnyes*, a tragedy after the Greek model, in 1872; for which occasional music was provided by Jules Massenet; the *Poèmes tragiques* in 1884; *L'Apollonide*, another classical tragedy, in 1888; and two posthumous volumes, *Derniers poèmes* in 1899, and *Premières poésies et lettres intimes* in 1902. In addition to his original work in verse, he published a series of admirable prose translations of Theocritus, Homer, Hesiod, Aeschylus, Sophocles, Euripides, Horace. He died at Voisins, near Louveciennes (Seine-et-Oise), on the 18th of July 1894.

In Leconte de Lisle the Parnassian movement seems to crystallize. His verse is clear, sonorous, dignified, deliberate in movement, classically correct in rhythm, full of exotic local colour, of savage names, of realistic rhetoric. It has its own kind of romance, in its "legend of the ages," so different from Hugo's, so much fuller of scholarship and the historic sense, yet with far less of human pity. Coldness cultivated as a kind of artistic distinction seems to turn all his poetry to marble, in spite of the fire at its heart. Most of Leconte de Lisle's poems are little chill epics, in which legend is fossilized. They have the lofty monotony of a single conception of life and of the universe. He sees the world as what Byron called it, "a glorious blunder," and desires only to stand a little apart from the throng, meditating scornfully. Hope, with him, becomes no more than this desperate certainty:—

"Tu te tairas, ô voix sinistre des vivants!"

His only prayer is to Death, "divine Death," that it may gather its children to its breast:—

"Affranchis-nous du temps, du nombre et de l'espace,
Et rends-nous le repos que la vie a troublé!"

The interval which is his he accepts with something of the defiance of his own Cain, refusing to fill it with the triviality of happiness, waiting even upon beauty with a certain inflexible austerity. He listens and watches, throughout the world, for echoes and glimpses of great tragic passions, languid with fire in the East, a tumultuous conflagration in the middle ages, a sombre darkness in the heroic ages of the North. The burning emptiness of the desert attracts him, the inexplicable melancholy of the dogs that bark at the moon; he would interpret the jaguar's dreams, the sleep of the condor. He sees nature with the same wrathful impatience as man, praising it for its destructive energies, its haste to crush out human life before the stars fall into chaos, and the world with them, as one of the least of stars. He sings the "Dies Irae" exultingly; only seeming to desire an end of God as well as of man, universal nothingness. He conceives that he does well to be angry, and this anger is indeed the personal note of his pessimism; but it leaves him somewhat apart from the philosophical poets, too fierce for wisdom and not rapturous enough for poetry. (A. Sy.)

See J. Dornis, *Leconte de Lisle intime* (1895); F. Calmette, *Un Demi-siècle littéraire, Leconte de Lisle et ses amis* (1902); Paul Bourget, *Nouveaux essais de psychologie contemporaine* (1885); F. Brunetière, *L'Évolution de la poésie lyrique en France au XIX^e siècle* (1894); Maurice Spronck, *Les Artistes littéraires* (1889); J. Lemaître, *Les Contemporains* (2nd series, 1886); F. Brunetière, *Nouveaux essais sur la litt. contemp.* (1895).

LE COQ, ROBERT (d. 1373), French bishop, was born at Montdidier, although he belonged to a bourgeois family of Orléans, where he first attended school before coming to Paris. In Paris he became advocate to the parlement (1347); then King John appointed him master of requests, and in 1351, a year during which he received many-other honours, he became bishop of Laon. At the opening of 1354 he was sent with the cardinal of Boulogne, Pierre I., duke of Bourbon, and Jean VI., count of Vendome, to Mantes to treat with Charles the Bad, king of Navarre, who had caused the constable, Charles of Spain, to be assassinated, and from this time dates his connexion with this king. At the meeting of the estates which opened in Paris in October 1356 Le Coq played a leading rôle and was one of the most outspoken of the orators, especially when petitions were presented to the dauphin Charles, denouncing the bad government of the realm and demanding the banishment of the royal councillors. Soon, however, the credit of the estates having gone down, he withdrew to his diocese, but at the request of the bourgeois of Paris he speedily returned. The king of Navarre had succeeded in escaping from prison and had entered Paris, where his party was in the ascendant; and Robert le Coq became the most powerful person in his council. No one dared to contradict him, and he brought into it whom he pleased. He did not scruple to reveal to the king of Navarre secret deliberations, but his fortune soon turned. He ran great danger at the estates of Compiègne in May 1358, where his dismissal was demanded, and he had to flee to St Denis, where Charles the Bad and Etienne Marcel came to find him. After the death of Marcel, he tried, unsuccessfully, to deliver Laon, his episcopal town, to the king of Navarre, and he was excluded from the amnesty promised in the treaty of Calais (1360) by King John to the partisans of Charles the Bad. His temporalities had been seized, and he was obliged to flee from France. In 1363, thanks to the support of the king of Navarre, he was given the bishopric of Calahorra in the kingdom of Aragon, which he administered until his death in 1373.

See L. C. Douët d'Arcq, "Acte d'accusation contre Robert le Coq, évêque de Laon" in *Bibliothèque de l'Ecole des Chartes*, 1st series, t. ii., pp. 350-387; and R. Delachenal, "La Bibliothèque d'un avocat du XIV^e siècle, inventaire estimatif des livres de Robert le Coq," in *Nouvelle revue historique de droit français et étranger* (1887), pp. 524-537.

LECOUVREUR, ADRIENNE (1692–1730), French actress, was born on the 5th of April 1692, at Damery, Marne, the daughter of a hatter, Robert Couvreur. She had an unhappy childhood in Paris. She showed a natural talent for declamation and was instructed by La Grand, *sociétaire* of the Comédie Française, and with his help she obtained a provincial engagement. It was not until 1717, after a long apprenticeship, that she made her Paris début as Electre, in Crébillon's tragedy of that name, and Angélique in Molière's *George Dandin*. Her success was so great that she was immediately received into the Comédie Française, and for thirteen years she was the queen of tragedy there, attaining a popularity never before accorded an actress. She is said to have played no fewer than 1184 times in a hundred rôles, of which she created twenty-two. She owed her success largely to her courage in abandoning the stilted style of elocution of her predecessors for a naturalness of delivery and a touching simplicity of pathos that delighted and moved her public. In Baron, who returned to the stage at the age of sixty-seven, she had an able and powerful coadjutor in changing the stage traditions of generations. The jealousy she aroused was partly due to her social successes, which were many, in spite of the notorious freedom of her manner of life. She was on visiting and dining terms with half the court, and her *salon* was frequented by Voltaire and all the other notables and men of letters. She was the mistress of Maurice de Saxe from 1721, and sold her plate and jewels to supply him with funds for his ill-starred adventures as duke of Courland. By him she had a daughter, her third, who was grandmother of the father of George Sand. Adrienne Lecouvreur died on the 20th of March 1730. She was denied the last rites of the Church, and her remains were refused burial in consecrated ground. Voltaire, in a fine poem on her death, expressed his indignation at the barbarous treatment accorded to the woman whose "friend, admirer, lover" he was.

Her life formed the subject of the well-known tragedy (1849), by Eugène Scribe and Ernest Legouvé.

LE CREUSOT, a town of east-central France in the department of Saône-et-Loire, 55 m. S.W. of Dijon on the Paris-Lyon railway. Pop. (1906), town, 22,535; commune, 33,437. Situated at the foot of lofty hills in a district rich in coal and iron, it has the most extensive iron works in France. The coal bed of Le Creusot was discovered in the 13th century; but it was not till 1774 that the first workshops were founded there. The royal crystal works were transferred from Sèvres to Le Creusot in 1787, but this industry came to an end in 1831. Meanwhile two or three enterprises for the manufacture of metal had ended in failure, and it was only in 1836 that the foundation of iron works by Adolphe and Eugène Schneider definitely inaugurated the industrial prosperity of the place. The works supplied large quantities of war material to the French armies during the Crimean and Franco-German wars. Since that time they have continuously enlarged the scope of their operations, which now embrace the manufacture of steel, armour-plate, guns, ordnance-stores, locomotives, electrical machinery and engineering material of every description. A net-work of railways about 37 m. in length connects the various branches of the works with each other and with the neighbouring Canal du Centre. Special attention is paid to the welfare of the workers who, not including the miners, number about 12,000, and good schools have been established. In 1897 the ordnance-manufacture of the Société des Forges et Chantiers de la Méditerranée at Havre was acquired by the Company, which also has important branches at Chalon-sur-Saône, where ship-building and bridge-construction is carried on, and at Cette (Hérault).

LECTERN (through O. Fr. *leitrun*, from Late Lat. *lectrum*, or *lectrinum*, *legere*, to read; the French equivalent is *lutrin*; Ital. *leggio*; Ger. *Lesepult*), in the furniture of certain Christian churches, a reading-desk, used more especially for the reading of the lessons and in the Anglican Church practically confined to that purpose. In the early Christian Church this was done from the ambo (*q.v.*), but in the 15th century, when the books were often of great size, it became necessary to provide a lectern to hold them. These were either in wood or metal, and many fine examples still exist; one at Detling in wood, in which there are shelves on all four sides to hold books, is perhaps the most elaborate. Brass lecterns, as in the colleges of Oxford and Cambridge, are common; in the usual type the book is supported on the outspread wings of an eagle or pelican, which is raised on a moulded stem, carried on three projecting ledges or feet with lions on them. In the example in Norwich cathedral, the pelican supporting the book stands on a rock enclosed with a rich cresting of Gothic tabernacle work; the central stem or pillar, on which this rests, is supported by miniature projecting buttresses, standing on a moulded base with lions on it.

LECTION, LECTIONARY. The custom of reading the books of Moses in the synagogues on the Sabbath day was a very ancient one in the Jewish Church. The addition of lections (*i.e.* readings) from the prophetic books had been made afterwards and was in existence in our Lord's time, as may be gathered from such passages as St Luke iv. 16-20, xvi. 29. This element in synagogue worship was taken over with others into the Christian divine service, additions being made to it from the writings of the apostles and evangelists. We find traces of such additions within the New Testament itself in such directions as are contained in Col. iv. 16; 1 Thess. v. 27.

From the 2nd century onwards references multiply, though the earlier references do not prove the existence of a fixed lectionary or order of lessons, but rather point the other way. Justin Martyr, describing divine worship in the middle of the 2nd century says: "On the day called Sunday all who live in cities or in the country gather together to one place, and the memoirs of the Apostles, or the writings of the Prophets are read as long as time permits" (*Apol.* i. cap. 67). Tertullian about half a century later makes frequent reference to the reading of Holy Scripture in public worship (*Apol.* 39; *De praescript.* 36; *De amina*, 9).

In the canons of Hippolytus in the first half of the 3rd century we find this direction: "Let presbyters, subdeacons and readers, and all the people assemble daily in the church at time of cock-crow, and betake themselves to prayers, to psalms and to the reading of the Scriptures, according to the command of the Apostles, until I come attend to reading" (canon xxi.).

But there are traces of fixed lessons coming into existence in the course of this century; Origen refers to the book of Job being read in Holy Week (*Commentaries on Job*, lib. i.). Allusions of a similar kind in the 4th century are frequent. John Cassian (*c.* 380) tells us that throughout Egypt the Psalms were divided into groups of twelve, and that after each group there followed two lessons, one from the Old, one from the New Testament (*De caenob. inst.* ii. 4), implying but not absolutely stating that there was a fixed order of such lessons just as there was of the Psalms. St Basil the Great mentions fixed lessons on certain occasions taken from Isaiah, Proverbs, St Matthew and Acts (Hom. xiii. *De bapt.*). From Chrysostom (Hom. lxiii. *in Act.* &c.), and Augustine (Tract. vi. *in Joann.* &c.) we learn that Genesis was read in Lent, Job and Jonah in Passion Week, the Acts of the Apostles in Eastertide, lessons on the Passion on Good Friday and on the Resurrection on Easter Day. In the *Apostolical Constitutions* (ii. 57) the following service is described and enjoined. First come two lessons from the Old Testament by a reader, the whole of the Old Testament being made use of except the books of the Apocrypha. The Psalms of David are then to be sung. Next the Acts of the Apostles and the Epistles of Paul are to be read, and finally the four Gospels by a deacon or a priest. Whether the selections were *ad libitum* or according to a fixed table of lessons we are not informed. Nothing in the shape of a lectionary is extant older than the 8th century, though there is evidence that Claudianus Mamercus made one for the church at Vienne in 450, and that Musaeus made one for the church at Marseilles *c.* 458. The *Liber comitis* formerly attributed to St Jerome must be three, or nearly three, centuries later than that saint, and the Luxeuil lectionary, or *Lectionarium Gallicanum*, which Mabillon attributed to the 7th, cannot be earlier than the 8th century; yet the oldest MSS. of the Gospels have marginal marks, and sometimes actual interpolations, which can only be accounted for as indicating the beginnings and endings of liturgical lessons. The third council of Carthage in 397 forbade anything but Holy Scripture to be read in church; this rule has been adhered to so far as the liturgical epistle and gospel, and occasional additional lessons in the Roman missal are concerned, but in the divine office, on feasts when nine lessons are read at matins, only the first three lessons are taken from Holy Scripture, the next three being taken from the sermons of ecclesiastical writers, and the last three from expositions of the day's gospel; but sometimes the lives or *Passions* of the saints, or of some particular saints, were substituted for any or all of these breviary lessons. (F. E. W.)

LECTISTERNIUM (from Lat. *lectum sternere*, "to spread a couch"; *στρωμναί* in Dion. Halic. xii. 9), in ancient Rome, a propitiatory ceremony, consisting of a meal offered to gods and goddesses, represented by their busts or statues, or by portable figures of wood, with heads of bronze, wax or marble, and covered with drapery. Another suggestion is that the symbols of the gods consisted of bundles of sacred herbs, tied together in the form of a head, covered by a waxen mask so as to resemble a kind of bust (cf. the straw puppets called Argei). These symbols were laid upon a couch (*lectus*), the left arm resting on a cushion (*pulvinus*, whence the couch itself was often called *pulvinar*) in the attitude of reclining. In front of the couch, which was placed in the open street, a meal was set out on a table. It is definitely stated by Livy (v. 13) that the ceremony took place "for the first time" in Rome in the year

399 B.C., after the Sibylline books had been consulted by their keepers and interpreters (*duumviri sacris faciendis*), on the occasion of a pestilence. Three couches were prepared for three pairs of gods—Apollo and Latona, Hercules and Diana, Mercury and Neptune. The feast, which on that occasion lasted for eight (or seven) days, was also celebrated by private individuals; the citizens kept open house, quarrels were forgotten, debtors and prisoners were released, and everything done to banish sorrow. Similar honours were paid to other divinities in subsequent times—Fortuna, Saturnus, Juno Regina of the Aventine, the three Capitoline deities (Jupiter, Juno, Minerva), and in 217, after the defeat of lake Trasimenus, a lectisternium was held for three days to six pairs of gods, corresponding to the twelve great gods of Olympus—Jupiter, Juno, Neptune, Minerva, Mars, Venus, Apollo, Diana, Vulcan, Vesta, Mercury, Ceres. In 205, alarmed by unfavourable prodigies, the Romans were ordered to fetch the Great Mother of the gods from Pessinus in Phrygia; in the following year the image was brought to Rome, and a lectisternium held. In later times, the lectisternium became of constant (even daily) occurrence, and was celebrated in the different temples. Such celebrations must be distinguished from those which were ordered, like the earlier lectisternia, by the Sibylline books in special emergencies. Although undoubtedly offerings of food were made to the gods in very early Roman times on such occasions as the ceremony of *confarreatio*, and the *epulum Jovis* (often confounded with the lectisternium), it is generally agreed that the lectisternia were of Greek origin. In favour of this may be mentioned: the similarity of the Greek θεοξένια, in which, however, the gods played the part of hosts; the gods associated with it were either previously unknown to Roman religion, though often concealed under Roman names, or were provided with a new cult (thus Hercules was not worshipped as at the Ara Maxima, where, according to Servius on *Aeneid*, viii. 176 and Cornelius Balbus, *ap.* Macrobius, *Sat.* iii. 6, a lectisternium was forbidden); the Sibylline books, which decided whether a lectisternium was to be held or not, were of Greek origin; the custom of reclining at meals was Greek. Some, however, assign an Etruscan origin to the ceremony, the Sibylline books themselves being looked upon as old Italian "black books." A probable explanation of the confusion between the lectisternia and genuine old Italian ceremonies is that, as the lectisternia became an almost everyday occurrence in Rome, people forgot their foreign origin and the circumstances in which they were first introduced, and then the word *pulvinar* with its associations was transferred to times in which it had no existence. In imperial times, according to Tacitus (*Annals*, xv. 44), chairs were substituted for couches in the case of goddesses, and the lectisternium in their case became a sellisternium (the reading, however, is not certain). This was in accordance with Roman custom, since in the earliest times all the members of a family sat at meals, and in later times at least the women and children. This is a point of distinction between the original practice at the lectisternium and the epulum Jovis, the goddesses at the latter being provided with chairs, whereas in the lectisternium they reclined. In Christian times the word was used for a feast in memory of the dead (Sidonius Apollinaris, *Epistulae*, iv. 15).

See article by A. Bouché-Leclercq in Daremberg and Saglio, *Dictionnaire des antiquités*; Marquardt, *Römische Staatsverwaltung*, iii. 45, 187 (1885); G. Wissowa, *Religion und Kultus der Römer*, p. 355 seq.; monograph by Wackermann (Hanau, 1888); C. Pascal, *Studii di antichità e mitologia* (1896).

LECTOR, or Reader, a minor office-bearer in the Christian Church. From an early period men have been set apart, under the title of *anagnostae*, *lectores*, or readers, for the purpose of reading Holy Scripture in church. We do not know what the custom of the Church was in the first two centuries, the earliest reference to readers, as an order, occurring in the writings of Tertullian (*De praescript. haeret.* cap. 41); there are frequent allusions to them in the writings of St Cyprian and afterwards. Cornelius, bishop of Rome in A.D. 251–252, in a well-known letter mentions readers among the various church orders then existing at Rome. In the *Apostolic Church Order* (canon 19), mention is made of the qualifications and duties of a reader, but no reference is made to their method of ordination. In the *Apostolic Didascalia* there is recognition of three minor orders of men, subdeacons, readers and singers, in addition to two orders of women, deaconesses and widows. A century later, in the *Apostolic Constitutions*, we find not only a recognition of readers, but also a form of admission provided for them, consisting of the imposition of hands and prayer (lib. viii. cap. 22). In Africa the imposition of hands was not in use, but a Bible was handed to the newly appointed reader with words of commission to read it, followed by a prayer and a benediction (Fourth Council of Carthage, can. 8). This is the ritual of the Roman Church of to-day. With regard to age, the novels of Justinian (No. 123) forbade any one to be admitted to the office of reader under the age of eighteen. (F. E. W.)

LECTOURE, a town of south-western France, capital of an arrondissement in the department of Gers, 21 m. N. of Auch on the Southern railway between that city and Agen. Pop. (1906), town, 2426; commune, 4310. It stands on the right bank of the Gers, overlooking the river from the summit of a steep plateau. The church of St Gervais and St Protais was once a cathedral. The massive tower which flanks it on the north belongs to the 15th century; the rest of the church dates from the 13th, 15th, 16th and 17th centuries. The hôtel de ville, the sous-préfecture and the museum occupy the palace of the former bishops, which was once the property of Marshal Jean Lannes, a native of the town. A recess in the wall of an old house contains the Fontaine de Houndélie, a spring sheltered by a double archway of the 13th century. At the bottom of the hill a church of the 16th century marks the site of the monastery of St Gény. Lectoure has a tribunal of first instance and a communal college. Its industries include distilling, the manufacture of wooden shoes and biscuits, and market gardening; it has trade in grain, cattle. wine and brandy.

Lectoure, capital of the Iberian tribe of the *Lactorates* and for a short time of Novempopulania, became the seat of a bishopric in the 4th century. In the 11th century the counts of Lomagne made it their capital, and on the union of Lomagne with Armagnac, in 1325, it became the capital of the counts of Armagnac. In 1473 Cardinal Jean de Jouffroy besieged the town on behalf of Louis XI. and after its fall put the whole pupulation to the sword. In 1562 it again suffered severely at the hands of the Catholics under Blaise de Montluc.

LEDA, in Greek mythology, daughter of Thestius, king of Aetolia, and Eurythemis (her parentage is variously given). She was the wife of Tyndareus and mother of Castor and Pollux, Clytaemnestra and Helen (see Castor and Pollux). In another account Nemesis was the mother of Helen (*q.v.*) whom Leda adopted as her daughter. This led to the identification of Leda and Nemesis. In the usual later form of the story, Leda herself, having been visited by Zeus in the form of a swan, produced two eggs, from one of which came Helen, from the other Castor and Pollux.

See Apollodorus iii. 10; Hyginus, *Fab.* 77; Homer, *Iliad*, iii. 426, *Od.* xi. 298; Euripides, *Helena*, 17; Isocrates, *Helena*, 59; Ovid, *Heroides*, xvii. 55; Horace, *Ars poetica*, 147; Stasinus in Athenaeus viii. 334 c.; for the representations of Leda and the swan in art, J. A. Overbeck, *Kunstmythologie*, i., and Atlas to the same; also article in Roscher's *Lexikon der Mythologie*.

LE DAIM (or Le Dain), **OLIVIER** (d. 1484), favourite of Louis XI. of France, was born of humble parentage at Thielt near Courtrai in Flanders. Seeking his fortune at Paris, he became court barber and valet to Louis XI., and so ingratiated himself with the king that in 1474 he was ennobled under the title Le Daim and in 1477 made comte de Meulant. In the latter year he was sent to Burgundy to influence the young heiress of Charles the Bold, but he was ridiculed and compelled to leave Ghent. He thereupon seized and held Tournai for the French. Le Daim had considerable talent for intrigue, and, according to his enemies, could always be depended upon to execute the baser designs of the king. He amassed a large fortune, largely by oppression and violence, and was named gentleman-in-waiting, captain of Loches, and governor of Saint-Quentin. He remained in favour until the death of Louis XI., when the rebellious lords were able to avenge the slights and insults they had suffered at the hands of the royal barber. He was arrested on charges, the nature of which is uncertain, tried before the parlement of Paris, and on the 21st of May 1484 hanged at Montfaucon without the knowledge of Charles VIII., who might have heeded his father's request and spared the favourite. Le Daim's property was given to the duke of Orleans.

See the memoirs of the time, especially those of Ph. de Commines (ed. Mandrot, 1901–1903, Eng. trans. in Bohn Library); Robt. Gaguin, *Compendium de origine et gestis Francorum* (Paris, 1586)—it was Gaguin who made the celebrated epigram concerning Le Daim: "Eras judex, lector, et exitium"; De Reiffenberg, *Olivier le Dain* (Brussels, 1829); Delanone, *Le Barbier de Louis XI.* (Paris, 1832); G. Picot, "Procès d'Olivier le Dain," in the *Comptes rendus de l'Académie des sciences morales et politiques*, viii. (1877), 485-537. The memoirs of the time are uniformly hostile to Le Daim.

LEDBURY, a market town in the Ross parliamentary division of Herefordshire, England, 14½ m. E. of Hereford by the Great Western railway, pleasantly situated on the south-western slope of the Malvern Hills. Pop. of urban district (1901) 3259. Cider and agricultural produce are the chief articles of trade, and there are limestone quarries in the neighbouring hills. The town contains many picturesque examples of timbered houses, characteristic of the district, the principal being the Market House (1633) elevated on massive pillars of oak. The fine church of St Michael exhibits all the Gothic styles, the most noteworthy features being the Norman chancel and west door, and the remarkable series of ornate Decorated windows on the north side. Among several charities is the hospital of St Catherine, founded by Foliot, bishop of Hereford, in 1232. Hope End, 2 m. N.E. of Ledbury, was the residence of Elizabeth Barrett Browning during her early life. A clock-tower in the town commemorates her.

Wall Hills Camp, supposed to be of British origin, is the earliest evidence of a settlement near Ledbury (Liedeburge, Lidebury). The manor was given to the see of Hereford in the 11th century; but in 1561–1562 became crown property. As early as 1170–1171 an episcopal castle existed in Ledbury. The town was not incorporated, but was early called a borough; and in 1295 and 1304–1305 returned two members to parliament. A fair on the day of the decollation of John the Baptist was granted to the bishop in 1249. Of fairs which survived in 1792 those of the days of St Philip and St James and St Barnabas were granted in 1584–1585; those held on the Monday before Easter and St Thomas's day were reputed ancient, but not those of the 12th of May, the 22nd of June, the 2nd of October and the 21st of December. Existing fairs are on the second Tuesday in every month and in October. A weekly market, granted to the bishop by Stephen, John and Henry III., was obsolete in 1584–1585, when the present market of Tuesday was authorized. The wool trade was considerable in the 14th century; later Ledbury was inhabited by glovers and clothiers. The town was deeply involved in the operations of the Civil Wars, being occupied both by the royalist leader Prince Rupert and by the Parliamentarian Colonel Birch.

LEDGER (from the English dialect forms *liggen* or *leggen*, to lie or lay; in sense adapted from the Dutch substantive *legger*), properly a book remaining regularly in one place, and so used of the copies of the Scriptures and service books kept in a church. The *New English Dictionary* quotes from Charles Wriothesley's *Chronicle*, 1538 (ed. *Camden Soc.*, 1875, by W. D. Hamilton), "the curates should provide a booke of the bible in Englishe, of the largest volume, to be a lidger in the same church for the parishioners to read on." It is an application of this original meaning that is found in the commercial usage of the term for the principal book of account in a business house (see BOOK-KEEPING). Apart from these applications to various forms of books, the word is used of the horizontal timbers in a scaffold (*q.v.*) lying parallel to the face of a building, which support the "put logs"; of a flat stone to cover a grave; and of a stationary form of tackle and bait in angling. In the form "lieger" the term was formerly frequently applied to a "resident," as distinguished from an "extraordinary" ambassador.

LEDOCHOWSKI, MIECISLAUS JOHANN, COUNT (1822–1902), Polish cardinal, was born on the 29th of October 1822 in Gorki (Russian Poland), and received his early education at the gymnasium and seminary of Warsaw. After finishing his studies at the Jesuit Accademia dei Nobili Ecclesiastici in Rome, which strongly influenced his religious development and his attitude towards church affairs, he was ordained in 1845. From 1856 to 1858 he represented the Roman See in Columbia, but on the outbreak of the Columbian revolution had to return to Rome. In 1861 Pope Pius IX. made him his nuncio at Brussels, and in 1865 he was made archbishop of Gnesen-Posen. His preconization followed on the 8th of January 1866. This date marks the beginning of the second period in Ledochowski's life; for during the Prussian and German *Kulturkampf* he was one of the most declared enemies of the state. It was only during the earliest years of his appointment as archbishop that he entertained a different view, invoking, for instance, an intervention of Prussia in favour of the Roman Church, when it was oppressed by the house of Savoy. On the 12th of December 1870 he presented an effective memorandum on the subject at the headquarters at Versailles. In 1872 the archbishop protested against the demand of the government that religious teaching should be given only in the German language, and in 1873 he addressed a circular letter on this subject to the clergy of his diocese. The government thereupon demanded a statement from the teachers of religion as to whether they intended to obey it or the archbishop, and on their declaring for the archbishop, dismissed them. The count himself was called upon at the end of 1873 to lay aside his office. On his refusing to do so, he was arrested between 3 and 4 o'clock in the morning on the 3rd of February 1874 by Stañdi, the director of police, and taken to the military prison of Ostrowo. The pope made him a cardinal on the 13th of March, but it was not till the 3rd of February 1876 that he was released from prison. Having been expelled from the eastern provinces of Prussia, he betook himself to Cracow, where his presence was made the pretext for anti-Prussian demonstrations. Upon this he was also expelled from Austria, and went to Rome, whence, in spite of his removal from office, which was decreed on the 15th of April 1874, he continued to direct the affairs of his diocese, for which he was on several occasions from 1877 to 1879 condemned *in absentia* by the Prussian government for "usurpation of episcopal rights." It was not till 1885 that Ledochowski resolved to resign his archbishopric, in which he was succeeded by Dinder at the end of the year. Ledochowski's return in 1884 was forbidden by the Prussian government (although the *Kulturkampf* had now abated), on account of his having stirred up anew the Polish nationalist agitation. He passed the closing years of his life in Rome. In 1892 he became prefect of the Congregation of the Propaganda, and he died in Rome on the 22nd of July 1902.

See Ograbiszewski, *Deutschlands Episkopat in Lebensbildern* (1876 and following years); Holtzmann-Zöppfel, *Lexikon für Theologie und Kirchenwesen* (2nd ed., 1888); Vapereau, *Dictionnaire universel des contemporains* (6th ed., 1893); Brück, *Geschichte der katholischen Kirche in Deutschland im neunzehnten Jahrhundert* vol. 4 (1901 and 1908); Lauchert, *Biographisches Jahrbuch*, vol. 7 (1905). (J. HN.)

LEDRU-ROLLIN, ALEXANDRE AUGUSTE (1807–1874), French politician, was the grandson of Nicolas Philippe Ledru, the celebrated quack doctor known as "Comus" under Louis XIV., and was born in a house that was once Scarron's, at Fontenay-aux-Roses (Seine), on the 2nd of February 1807. He had just begun to practise at the Parisian bar before the revolution of July, and was retained for the Republican defence in most of the great political trials of the next ten years. In 1838 he bought for 330,000 francs Desiré Dalloz's place in the Court of Cassation. He was elected deputy for Le Mans in 1841 with hardly a dissentient voice; but for the violence of his electoral speeches he was tried at Angers and sentenced to four months' imprisonment and a fine, against which he appealed successfully on a technical point. He made a rich and romantic marriage in 1843, and in 1846 disposed of his charge at the Court of Cassation to give his time entirely to politics. He was now the recognized leader of the working-men of France. He had more authority in the country than in the Chamber, where the violence of his oratory diminished its effect. He asserted that the fortifications of Paris were directed against liberty, not against foreign invasion, and he stigmatized the law of regency (1842) as an audacious usurpation. Neither from official Liberalism nor from the press did he receive support; even the Republican *National* was opposed to him because of his championship of labour. He therefore founded *La Réforme* in which to advance his propaganda. Between Ledru-Rollin and Odilon Barrot with the other chiefs of the "dynastic Left" there were acute differences, hardly dissimulated even during the temporary alliance which produced the campaign of the banquets. It was the speeches of Ledru-Rollin and Louis Blanc at working-men's banquets in Lille, Dijon and Châlons that really heralded the revolution. Ledru-Rollin prevented the appointment of the duchess of Orleans as regent in 1848. He and Lamartine held the tribune in the Chamber of Deputies until the Parisian populace stopped serious discussion by invading the Chamber. He was minister of the interior in the provisional government, and was also a member of the executive committee[1] appointed by the Constituent Assembly, from which Louis Blanc and the extremists were excluded. At the crisis of the 15th of May he definitely sided with Lamartine and the party of order against the proletariat. Henceforward his position was a difficult one. He never regained his influence with the working classes, who considered they had been betrayed; but to his short ministry belongs the credit of the establishment of a working system of universal suffrage. At the presidential election in December he was put forward as the Socialist candidate, but secured only 370,000 votes. His opposition to the policy of President Louis Napoleon, especially his Roman policy, led to his moving the impeachment of the president and his ministers. The motion was defeated, and next day (June 13, 1849) he headed what he called a peaceful demonstration, and his enemies armed insurrection. He himself escaped to London where he joined the executive of the revolutionary committee of Europe, with Kossuth and Mazzini among his colleagues. He was accused of complicity in an obscure attempt (1857) against the life of Napoleon III., and condemned in his absence to deportation. Émile Ollivier removed the exceptions from the general amnesty in 1870, and Ledru-Rollin returned to France after twenty years of exile. Though elected in 1871 in three departments he refused to sit in the National Assembly, and took no serious part in politics until 1874 when he was returned to the Assembly as member for Vaucluse. He died on the 31st of December of that year.

Under Louis Philippe he made large contributions to French jurisprudence, editing the *Journal du palais, 1791–1837* (27 vols., 1837), and *1837–1847* (17 vols.), with a commentary *Répertoire général de la jurisprudence française* (8 vols., 1843–1848), the introduction to which was written by himself. His later writings were political in character. See *Ledru-Rollin, ses discours et ses écrits politiques* (2 vols., Paris, 1879), edited by his widow.

LEDYARD, JOHN (1751–1789), American traveller, was born in Groton, Connecticut, U.S.A. After vainly trying law and theology, Ledyard adopted a seaman's life, and, coming to London, was engaged as corporal of marines by Captain Cook for his third voyage (1776). On his return (1778) Ledyard had to give up to the Admiralty his copious journals, but afterwards published, from memory, a meagre narrative of his experiences—herein giving the only account of Cook's death by an eye-witness (Hartford, U.S.A., 1783). He continued in the British service till 1782, when he escaped, off Long Island. In 1784 he revisited Europe, to organize an expedition to the American North-West. Having failed in his attempts, he decided to reach his goal by travelling across Europe and Asia. Baffled in his hopes of crossing the Baltic on the ice (Stockholm to Abo), he walked right round from Stockholm to St Petersburg, where he arrived barefoot and penniless (March 1787). Here he made friends with Pallas and others, and accompanied Dr Brown, a Scotch physician in the Russian service, to Siberia. Ledyard left Dr Brown at Barnaul, went on to Tomsk and Irkutsk, visited Lake Baikal, and descended the Lena to Yakutsk (18th of September 1787). With Captain Joseph Billings, whom he had known on Cook's "Resolution," he returned to Irkutsk, where he was arrested, deported to the Polish frontier, and banished from Russia for ever. Reaching London, he was engaged by Sir Joseph Banks and the African Association to explore overland routes from Alexandria to the Niger, but in Cairo he succumbed to a dose of vitriol (17th of January 1789). Though a born explorer, little resulted from his immense but ill-directed activities.

See *Memoirs of the Life and Travels of John Ledyard*, by Jared Sparks (1828).

LEE, ANN (1736–1784), English religious visionary, was born in Manchester, where she was first a factory hand and afterwards a cook. She is remembered by her connexion with the sect known as Shakers (*q.v.*). She died at Watervliet, near Albany, New York.

LEE, ARTHUR (1740–1792), American diplomatist, brother of Richard Henry Lee, was born at Stratford, Westmoreland county, Virginia, on the 20th of December 1740. He was educated at Eton, studied medicine at Edinburgh, practised as a physician in Williamsburg, Virginia, read law at the Temple, London, in 1766–1770, and practised law in London in 1770–1776. He was an intimate of John Wilkes, whom he aided in one of his London campaigns. In 1770–1775 he served as London agent for Massachusetts, second to Benjamin Franklin, whom he succeeded in 1775. At that time he had shown great ability as a pamphleteer, having published in London *The Monitor* (1768), seven essays previously printed in Virginia; *The Political Detection: or the Treachery and Tyranny of Administration, both at Home and Abroad* (1770), signed "Junius Americanus"; and *An Appeal to the Justice and Interests of the People of Great Britain in the Present Disputes with America* (1774), signed "An Old Member of Parliament." In December 1775 the Committee of Secret Correspondence of Congress chose him its European agent principally for the purpose of ascertaining the views of France, Spain, and other European countries regarding the war between the colonies and Great Britain. In October 1776 he was appointed, upon the refusal of Jefferson, on the commission with Franklin and Silas Deane to negotiate a treaty of alliance, amity and commerce with France, and also to negotiate with other European governments. His letters to Congress, in which he expressed his suspicion of Deane's business integrity and criticized his accounts, resulted in Deane's recall; and other letters impaired the confidence of Congress in Franklin, of whom he was especially jealous. Early in 1777 he went to Spain as American commissioner, but received no official recognition, was not permitted to proceed farther than Burgos, and accomplished nothing; until the appointment of Jay, however, he continued to act as commissioner to Spain, held various conferences with the Spanish minister in Paris, and in January 1778 secured a promise of a loan of 3,000,000 livres, only a small part of which (some 170,000 livres) was paid. In June 1777 he went to Berlin, where, as in Spain, he was not officially recognized. Although he had little to do with the negotiations, he signed with Franklin and Deane in February 1778 the treaties between the United States and France. Having become unpopular at the courts of France and Spain, Lee was recalled in 1779, and returned to the United States in September 1780. He was a member of the Virginia House of Delegates in 1781 and a delegate to the Continental Congress in 1782–1785. With Oliver Wolcott and Richard Butler he negotiated a treaty with the Six Nations, signed at Fort Stanwix on the 22nd of October 1784, and with George Clark and Richard Butler a treaty with the Wyandot, Delaware, Chippewa and Ottawa Indians, signed at Ft. McIntosh on the 21st of January 1785. He was a member of the treasury board in 1784–1789. He strongly opposed the constitution, and after its adoption retired to his estate at Urbana, Virginia, where he died on the 12th of December 1792.

See R. H. Lee, *Life of Arthur Lee* (2 vols., Boston, 1829), and C. H. Lee, *A Vindication of Arthur Lee* (Richmond, Virginia, 1894), both partisan. Much of Lee's correspondence is to be found in Wharton's *Revolutionary Diplomatic Correspondence* (Washington, 1889). Eight volumes of Lee's MSS. in the Harvard University Library are described and listed in *Library of Harvard University, Bibliographical Contributions*, No. 8 (Cambridge, 1882).

LEE, FITZHUGH (1835–1905), American cavalry general, was born at Clermont, in Fairfax county, Virginia, on the 19th of November 1835. He was the grandson of "Light Horse Harry" Lee, and the nephew of Robert E. Lee. His father, Sydney Smith Lee, was a fleet captain under Commodore Perry in Japanese waters and rose to the rank of commodore; his mother was a daughter of George Mason. Graduating from West Point in 1856, he was appointed to the 2nd Cavalry, which was commanded by Colonel Albert Sidney Johnston, and in which his uncle, Robert E. Lee, was lieutenant-colonel. As a cavalry subaltern he distinguished himself by his gallant conduct in actions with the Comanches in Texas, and was severely wounded in 1859. In May 1860 he was appointed instructor of cavalry at West Point, but resigned on the secession of Virginia. Lee was at once employed in the organization of the forces of the South, and served at first as a staff officer to General R. S. Ewell, and afterwards, from September 1861, as lieutenant-colonel, and from April 1862 as colonel of the First Virginia Cavalry in the Army of Northern Virginia. He became brigadier-general on General J. E. B. Stuart's recommendation on the 25th of July 1862, and served under that general throughout the Virginian campaigns of 1862 and 1863, becoming major-general on the 3rd of September 1863. He conducted the cavalry action of Beverly Ford (17th March 1863) with skill and success. In the Wilderness and Petersburg campaigns he was constantly employed as a divisional commander under Stuart, and, after Stuart's death, under General Wade Hampton. He took part in Early's campaign against Sheridan in the Shenandoah Valley, and at Winchester (19th Sept. 1864) three horses were shot under him and he was severely wounded. On General Hampton's being sent to assist General Joseph E. Johnston in North Carolina, the command of the whole of General Lee's cavalry devolved upon Fitzhugh Lee early in 1865, but the surrender of Appomattox followed quickly upon the opening of the campaign. Fitzhugh Lee himself led the last charge of the Confederates on the 9th of April that year at Farmville.

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[1] Arago, Garnier-Pagès, Marie, Lamartine, and Ledru-Rollin.

After the war he devoted himself to farming in Stafford county, Virginia, and was conspicuous in his efforts to reconcile the Southern people to the issue of the war, which he regarded as a final settlement of the questions at issue. In 1875 he attended the Bunker Hill centenary at Boston, Mass., and delivered a remarkable address. In 1885 he was a member of the board of visitors of West Point, and from 1886 to 1890 was governor of Virginia. In April 1896 he was appointed by President Cleveland consul-general at Havana, with duties of a diplomatic and military character added to the usual consular business. In this post (in which he was retained by President McKinley) he was from the first called upon to deal with a situation of great difficulty, which culminated with the destruction of the "Maine" (see SPANISH-AMERICAN WAR). Upon the declaration of war between Spain and the United States he re-entered the army. He was one of the three ex-Confederate general officers who were made major-generals of United States Volunteers. Fitzhugh Lee commanded the VII. army corps, but took no part in the actual operations in Cuba. He was military governor of Havana and Pinar del Rio in 1899, subsequently commanded the department of the Missouri, and retired as a brigadier-general U.S. Army in 1901. He died in Washington on the 28th of April 1905. He wrote *Robert E. Lee* (1894) in the "Great Commanders" series, and *Cuba's Struggle Against Spain* (1899).

LEE, GEORGE ALEXANDER (1802–1851), English musician, was born in London, the son of Henry Lee, a pugilist and innkeeper. He became "tiger" to Lord Barrymore, and his singing led to his being educated for the musical profession. After appearing as a tenor at the theatres in Dublin and London, he joined in producing opera at the Tottenham Street theatre in 1829, and afterwards was connected with musical productions at Drury Lane and Covent Garden. He married Mrs Waylett, a popular singer. Lee composed music for a number of plays, and also many songs, including the popular "Come where the Aspens quiver," and for a short time had a music-selling business in the Quadrant. He died on the 8th of October 1851.

LEE, HENRY (1756–1818), American general, called "Light Horse Harry," was born near Dumfries, Virginia, on the 29th of January 1756. His father was first cousin to Richard Henry Lee. With a view to a legal career he graduated (1773) at Princeton, but soon afterwards, on the outbreak of the War of Independence, he became an officer in the patriot forces. He served with great distinction under Washington, and in 1778 was promoted major and given the command of a small irregular corps, with which he won a great reputation as a leader of light troops. His services on the outpost line of the army earned for him the soubriquet of "Light Horse Harry." His greatest exploit was the brilliant surprise of Paulus Hook, N.J., on the 19th of August 1779; for this feat he received a gold medal, a reward given to no other officer below general's rank in the whole war. He was promoted lieutenant-colonel 1780, and sent with a picked corps of dragoons to the southern theatre of war. Here he rendered invaluable services in victory and defeat, notably at Guilford Court House, Camden and Eutaw Springs. He was present at Cornwallis's surrender at Yorktown, and afterwards left the army owing to ill-health. From 1786 to 1788 he was a delegate to the Confederation Congress, and in the last-named year in the Virginia convention he favoured the adoption of the Federal constitution. From 1789 to 1791 he served in the General Assembly, and from 1791 to 1794 was governor of Virginia. In 1794 Washington sent him to help in the suppression of the "Whisky Insurrection" in western Pennsylvania. A new county of Virginia was named after him during his governorship. He was a major-general in 1798–1800. From 1799 to 1801 he served in Congress. He delivered the address on the death of Washington which contained the famous phrase, "first in war, first in peace, and first in the hearts of his countrymen." Soon after the War of 1812 broke out, Lee, while helping to resist the attack of a mob on his friend, A. C. Hanson, editor of the Baltimore *Federal Republican*, which had opposed the war, received grave injuries, from which he never recovered. He died at the house of General Nathanael Greene on Cumberland Island, Georgia, on the 25th of March 1818.

Lee wrote valuable *Memoirs of the War in the Southern Department* (1812; 3rd ed., with memoir by Robert E. Lee, 1869).

LEE, JAMES PRINCE (1804–1869), English divine, was born in London on the 28th of July 1804, and was educated at St Paul's school and at Trinity College, Cambridge, where he displayed exceptional ability as a classical scholar. After taking orders in 1830 he served under Thomas Arnold at Rugby school, and in 1838 was appointed head-master of King Edward's school, Birmingham, where he had among his pupils E. W. Benson, J. B. Lightfoot and B. F. Westcott. In 1848 Lord John Russell nominated him as first bishop of the newly-constituted see of Manchester. His pedagogic manner bore somewhat irksomely on his clergy. He is best remembered for his splendid work in church extension; during his twenty-one years' tenure of the see he consecrated 130 churches. He took a foremost part in founding the Manchester free library, and bequeathed his own valuable collection of books to Owens College. He died on the 24th of December 1869.

A memorial sermon was preached by Archbishop E. W. Benson, and was published with biographical details by J. F. Wickenden and others.

LEE, NATHANIEL (*c.* 1653–1692), English dramatist, son of Dr Richard Lee, a Presbyterian divine, was born probably in 1653. His father was rector of Hatfield, and held many preferments under the Commonwealth. He was chaplain to General Monk, afterwards duke of Albemarle, and after the Restoration he conformed to the Church of England, abjuring his former opinions, especially his approval of Charles I.'s execution. Nathaniel Lee was educated at Westminster school, and at Trinity College, Cambridge, taking his B.A. degree in 1668. Coming to London under the patronage, it is said, of the duke of Buckingham, he tried to earn his living as an actor, but though he was an admirable reader, his acute stage fright made acting impossible. His earliest play, *Nero, Emperor of Rome*, was acted in 1675 at Drury Lane. Two tragedies written in rhymed heroic couplets, in imitation of Dryden, followed in 1676—*Sophonisba, or Hannibal's Overthrow* and *Gloriana, or the Court of Augustus Caesar.* Both are extravagant in design and treatment. Lee made his reputation in 1677 with a blank verse tragedy, *The Rival Queens, or the Death of Alexander the Great.* The play, which treats of the jealousy of Alexander's first wife, Roxana, for his second wife, Statira, was, in spite of much bombast, a favourite on the English stage down to the days of Edmund Kean. *Mithridates, King of Pontus* (acted 1678), *Theodosius, or the Force of Love* (acted 1680), *Caesar Borgia* (acted 1680)—an imitation of the worst blood and thunder Elizabethan tragedies—*Lucius Junius Brutus, Father of His Country* (acted 1681), and *Constantine the Great* (acted 1684) followed. *The Princess of Cleve* (1681) is a gross adaptation of Madame de La Fayette's exquisite novel of that name. *The Massacre of Paris* (published 1690) was written about this time. Lee had given offence at court by his *Lucius Junius Brutus*, which had been suppressed after its third representation for some lines on Tarquin's character that were taken to be a reflection on Charles II. He therefore joined with Dryden, who had already admitted him as a collaborator in an adaptation of *Oedipus*, in *The Duke of Guise* (1683), a play which directly advocated the Tory point of view. In it part of the *Massacre of Paris* was incorporated. Lee was now thirty years of age, and had already achieved a considerable reputation. But he had lived in the dissipated society of the earl of Rochester and his associates, and imitated their excesses. As he grew more disreputable, his patrons neglected him, and in 1684 his mind was completely unhinged. He spent five years in Bethlehem Hospital, and recovered his health. He died in a drunken fit in 1692, and was buried in St Clement Danes, Strand, on the 6th of May.

Lee's *Dramatic Works* were published in 1784. In spite of their extravagance, they contain many passages of great beauty.

LEE, RICHARD HENRY (1732–1794), American statesman and orator, was born at Stratford, in Westmoreland county, Virginia, on the 20th of January 1732, and was one of six distinguished sons of Thomas Lee (d. 1750), a descendant of an old Cavalier family, the first representative of which in America was Richard Lee, who was a member of the privy council, and early in the reign of Charles I. emigrated to Virginia. Richard Henry Lee received an academic education in England, then spent a little time in travel, returned to Virginia in 1752, having come into possession of a fine property left him by his father, and for several years applied himself to varied studies. When twenty-five he was appointed justice of the peace of Westmoreland county, and in the same year was chosen a member of the Virginia House of Burgesses, in which he served from 1758 to 1775. He kept a diffident silence during two sessions, his first speech being in strong opposition to slavery, which he proposed to discourage and eventually to abolish, by imposing a heavy tax on all further importations. He early allied himself with the Patriot or Whig element in Virginia, and in the years immediately preceding the War of Independence was conspicuous as an opponent of the arbitrary measures of the British ministry. In 1768, in a letter to John Dickinson of Pennsylvania, he suggested a private correspondence among the friends of liberty in the different colonies, and in 1773 he became a member of the Virginia Committee of Correspondence.

Lee was one of the delegates from Virginia to the first Continental Congress at Philadelphia in 1774, and prepared the address to the people of British America, and the second address to the people of Great Britain, which are among the most effective papers of the time. In accordance with instructions given by the Virginia House of Burgesses, Lee introduced in Congress, on the 7th of June 1776, the following famous resolutions: (1) "that these united colonies are, and of right ought to be, free and independent states, that they are absolved from all allegiance to the British crown, and that all political connexion between them and the state of Great Britain is, and ought to be, totally dissolved"; (2) "that it is expedient to take the most effectual measures for forming foreign alliances"; and (3) "that a plan of confederation be prepared and transmitted to the respective colonies for their consideration and approbation." After debating the first of these resolutions for three days, Congress resolved that the further consideration of it should be postponed until the 1st of July, but that a committee should be appointed to prepare a declaration of independence. The illness of Lee's wife prevented him from being a member of that committee, but his first resolution was adopted on the 2nd of July, and the Declaration of Independence, prepared principally by Thomas Jefferson, was adopted two days later. Lee was in Congress from 1774 to 1780, and was especially prominent in connexion with foreign affairs. He was a member of the Virginia House of Delegates in 1777, 1780–1784 and 1786–1787; was in Congress again from 1784 to 1787, being president in 1784–1786; and was one of the first United States senators chosen from Virginia after the adoption of the Federal constitution. Though strongly opposed to the adoption of that constitution, owing to what he regarded as its dangerous infringements upon the independent power of the states, he accepted the place of senator in hope of bringing about amendments, and proposed the Tenth Amendment in substantially the form in which it was adopted. He became a warm supporter of Washington's administration, and his prejudices against the constitution were largely removed by its working in practice. He retired from public life in 1792, and died at Chantilly, in Westmoreland county, on the 19th of June 1794.

See the *Life* (Philadelphia, 1825), by his grandson, R. H. Lee; and *Letters* (New York, 1910), edited by J. C. Ballagh.

His brother, **William Lee** (1739–1795), was a diplomatist during the War of Independence. He accompanied his brother, Arthur Lee (*q.v.*), to England in 1766 to engage in mercantile pursuits, joined the Wilkes faction, and in 1775 was elected an alderman of London, then a life-position. In April 1777, however, he received notice of his appointment by the Committee of Secret Correspondence in America to act with Thomas Morris as commercial agent at Nantes. He went to Paris and became involved in his brother's opposition to Franklin and Deane. In May 1777 Congress chose William Lee commissioner to the courts of Vienna and Berlin, but he gained recognition at neither. In September 1778, however, while at Aix-la-Chapelle, he negotiated a plan of a treaty with Jan de Neufville, who represented Van Berckel, pensionary of Amsterdam. It was a copy of this proposed treaty which, on falling into the hands of the British on the capture of Henry Laurens, the duly appointed minister to the Netherlands, led to Great Britain's declaration of war against the Netherlands in December 1780. Lee was recalled from his mission to Vienna and Berlin in June 1779, without being required to return to America. He resigned his post as an alderman of London in January 1780, and returned to Virginia about 1784.

See *Letters of William Lee*, edited by W. C. Ford (Brooklyn, 1891).

Another brother, **Francis Lightfoot Lee** (1734–1797), was a member of the Virginia House of Burgesses in 1770–1775. In 1775–1779 he was a delegate to the Continental Congress, and as such signed the Declaration of Independence. He served on the committee which drafted the Articles of Confederation, and contended that there should be no treaty of peace with Great Britain which did not grant to the United States both the right to the Newfoundland fisheries and the free navigation of the Mississippi. After retiring from Congress he served in 1780–1782 in the Virginia Senate.

LEE, ROBERT EDWARD (1807–1870), American soldier, general in the Confederate States army, was the youngest son of major-general Henry Lee, called "Light Horse Harry." He was born at Stratford, Westmoreland county, Virginia, on the 19th of January 1807, and entered West Point in 1825. Graduating four years later second in his class, he was given a commission in the U.S. Engineer Corps. In 1831 he married Mary, daughter of G. W. P. Custis, the adopted son of Washington and the grandson of Mrs Washington. In 1836 he became first lieutenant, and in 1838 captain. In this rank he took part in the Mexican War, repeatedly winning distinction for conduct and bravery. He received the brevets of major for Cerro Gordo, lieut.-colonel for Contreras-Churubusco and colonel for Chapultepec. After the war he was employed in engineer work at Washington and Baltimore, during which time, as before the war, he resided on the great Arlington estate, near Washington, which had come to him through his wife. In 1852 he was appointed superintendent of West Point, and during his three years here he carried out many important changes in the academy. Under him as cadets were his son G. W. Custis Lee, his nephew, Fitzhugh Lee and J. E. B. Stuart, all of whom became general officers in the Civil War. In 1855 he was appointed as lieut.-colonel to the 2nd Cavalry, commanded by Colonel Sidney Johnston, with whom he served against the Indians of the Texas border In 1859, while at Arlington on leave, he was summoned to command the United States troops sent to deal with the John Brown raid on Harper's Ferry. In March 1861 he was made colonel of the 1st U.S. Cavalry; but his career in the old army ended with the secession of Virginia in the following month. Lee was strongly averse to secession, but felt obliged to conform to the action of his own state. The Federal authorities offered Lee the command of the field army about to invade the South, which he refused. Resigning his commission, he made his way to Richmond and was at once made a major-general in the Virginian forces. A few weeks later he became a brigadier-general (then the highest rank) in the Confederate service.

The military operations with which the great Civil War opened in 1861 were directed by President Davis and General Lee. Lee was personally in charge of the unsuccessful West Virginian operations in the autumn, and, having been made a full general on the 31st of August, during the winter he devoted his experience as an engineer to the fortification and general defence of the Atlantic coast. Thence, when the well-drilled Army of the Potomac was about to descend upon Richmond, he was hurriedly recalled to Richmond. General Johnston was wounded at the battle of Fair Oaks (Seven Pines) on the 31st of May 1862, and General Robert E. Lee was assigned to the command of the famous Army of Northern Virginia which for the next three years "carried the rebellion on its bayonets." Little can be said of Lee's career as a commander-in-chief that is not an integral part of the history of the Civil War. His first success was the "Seven Days' Battle" (*q.v.*) in which he stopped McClellan's advance; this was quickly followed up by the crushing defeat of the Federal army under Pope, the invasion of Maryland and the sanguinary and indecisive battle of the Antietam (*q.v.*). The year ended with another great victory at Fredericksburg (*q.v.*) Chancellorsville (see Wilderness), won against odds of two to one, and the great three days' battle of Gettysburg (*q.v.*), where for the first time fortune turned decisively against the Confederates, were the chief events of 1863. In the autumn Lee fought a war of manœuvre against General Meade. The tremendous struggle of 1864 between Lee and Grant included the battles of the Wilderness (*q.v.*), Spottsylvania, North Anna, Cold Harbor and the long siege of Petersburg (*q.v.*), in which, almost invariably, Lee was locally successful. But the steady pressure of his unrelenting opponent slowly wore down his strength. At last with not more than one man to oppose to Grant's three he was compelled to break out of his Petersburg lines (April 1865). A series of heavy combats revealed his purpose, and Grant pursued the dwindling remnants of Lee's army to the westward. Headed off by the Federal cavalry, and pressed closely in rear by Grant's main body, General Lee had no alternative but to surrender. At Appomattox Court House, on the 9th of April, the career of the Army of Northern Virginia came to an end. Lee's farewell order was issued on the following day, and within a few weeks the Confederacy was at an end. For a few months Lee lived quietly in Powhatan county, making his formal submission to the Federal authorities and urging on his own people acceptance of the new conditions. In August he was offered, and accepted, the presidency of Washington College, Lexington (now Washington and Lee University), a post which he occupied until his death on the 12th of October 1870. He was buried in the college grounds.

For the events of Lee's military career briefly indicated in this notice the reader is referred to the articles American Civil War, &c. By his achievements he won a high place amongst the great generals of history. Though hampered by lack of materials and by political necessities, his strategy was daring always, and he never hesitated to take the gravest risks. On the field of battle he was as energetic in attack as he was constant in defence, and his personal influence over the men whom he led was extraordinary. No student of the American Civil War can fail to notice how the influence of Lee dominated the course of the struggle, and his surpassing ability was never more conspicuously shown than in the last hopeless stages of the contest. The personal history of Lee is lost in the history of the great crisis of America's national life; friends and foes alike acknowledged the purity of his motives, the virtues of his private life, his earnest Christianity and the unrepining loyalty with which he accepted the ruin of his party.

See A. L. Long, *Memoirs of Robert E. Lee* (New York, 1886); Fitzhugh Lee, *General Lee* (New York, 1894, "Great Commanders" series); R. A. Brock, *General Robert E. Lee* (Washington, 1904); R. E. Lee, *Recollections and Letters of General R. E. Lee* (London, 1904); H. A. White, *Lee* ("Heroes of the Nations") (1897); P. A. Bruce, *Robert E. Lee* (1907); T. N. Page, *Lee* (1909); W. H. Taylor, *Four Years with General Lee*; J. W. Jones, *Personal Reminiscences of Robert E. Lee* (1874).

LEE (or Legh) **ROWLAND** (d. 1543), English bishop, belonged to a Northumberland family and was educated at Cambridge. Having entered the Church he obtained several livings owing to the favour of Cardinal Wolsey; after Wolsey's fall he rose high in the esteem of Henry VIII. and of Thomas Cromwell, serving both king and minister in the business of suppressing the monasteries, and he is said to have celebrated Henry's secret marriage with Anne Boleyn in January 1533. Whether this be so or not, Lee took part in preparing for the divorce proceedings against Catherine of Aragon, and in January 1534 he was elected bishop of Coventry and Lichfield, or Chester as the see was often called, taking at his consecration the new oath to the king as head of the English Church and not seeking confirmation from the pope. As bishop he remained in Henry's personal service, endeavouring to establish the legality of his marriage with Anne, until May 1534, when he was appointed lord president of the council in the marches of Wales. At this time the Welsh marches were in a very disorderly condition. Lee acted in a stern and energetic fashion, holding courts, sentencing many offenders to death and overcoming the hostility of the English border lords. After some years of hard and successful work in this capacity, "the last survivor of the old martial prelates, fitter for harness than for bishops' robes, for a court of justice than a court of theology," died at Shrewsbury in June 1543. Many letters from Lee to Cromwell are preserved in the Record Office, London; these throw much light on the bishop's career and on the lawless condition of the Welsh marches in his time.

One of his contemporaries was Edward Lee (*c.* 1482–1544) archbishop of York, famous for his attack on Erasmus, who replied to him in his *Epistolae aliquot eruditorum virorum*. Like Rowland, Edward was useful to Henry VIII. in the matter of the divorce of Catherine of Aragon, and was sent by the king on embassies to the emperor Charles V. and to Pope Clement VII. In 1531 he became archbishop of York, but he came under suspicion as one who disliked the king's new position as head of the English Church. At Pontefract in 1536, during the Pilgrimage of Grace, the archbishop was compelled to join the rebels, but he did not sympathize with the rising and in 1539 he spoke in parliament in favour of the six articles of religion. Lee, who was the last archbishop of York to coin money, died on the 13th of September 1544.

LEE, SIDNEY (1859–), English man of letters, was born in London on the 5th of December 1859. He was educated at the City of London school, and at Balliol College, Oxford, where he graduated in modern history in 1882. In the next year he became assistant-editor of the *Dictionary of National Biography*. In 1890 he was made joint-editor, and on the retirement of Sir Leslie Stephen in 1891 succeeded him as editor. He was himself a voluminous contributor to the work, writing some 800 articles, mainly on Elizabethan authors or statesmen. While he was still at Balliol he wrote two articles on Shakespearian questions, which were printed in the *Gentleman's Magazine*, and in 1884 he published a book on Stratford-on-Avon. His article on Shakespeare in the fifty-first volume (1897) of the *Dictionary of National Biography* formed the basis of his *Life of William Shakespeare* (1898), which reached its fifth edition in 1905. Mr Lee edited in 1902 the Oxford facsimile edition of the first folio of *Shakespeare's Comedies, Histories and Tragedies*, followed in 1902 and 1904 by supplementary volumes giving details of extant copies, and in 1906 by a complete edition of

Shakespeare's *Works*. Besides editions of English classics his works include a *Life of Queen Victoria* (1902), *Great Englishmen of the Sixteenth Century* (1904), based on his Lowell Institute lectures at Boston, Mass., in 1903, and *Shakespeare and the Modern Stage* (1906).

LEE, SOPHIA (1750–1824), English novelist and dramatist, daughter of John Lee (d. 1781), actor and theatrical manager, was born in London. Her first piece, *The Chapter of Accidents*, a one-act-opera based on Diderot's *Père de famille*, was produced by George Colman at the Haymarket Theatre on the 5th of August 1780. The proceeds were spent in establishing a school at Bath, where Miss Lee made a home for her sisters. Her subsequent productions included *The Recess, or a Tale of other Times* (1785), a historical romance; and *Almeyda, Queen of Grenada* (1796), a tragedy in blank verse; she also contributed to her sister's *Canterbury Tales* (1797). She died at her house near Clifton on the 13th of March 1824.

Her sister, Harriet Lee (1757–1851), published in 1786 a novel written in letters, *The Errors of Innocence*. *Clara Lennox* followed in 1797. Her chief work is the *Canterbury Tales* (1797–1805), a series of twelve stories which became very popular. Lord Byron dramatized one of the tales, "Kruitzner," as *Werner, or the Inheritance*. She died at Clifton on the 1st of August 1851.

LEE, STEPHEN DILL (1833–1908), Confederate general in the American Civil War, came of a family distinguished in the history of South Carolina, and was born at Charleston, S.C., on the 22nd of September 1833. Graduating from West Point in 1854, he served for seven years in the United States army and resigned in 1861 on the secession of South Carolina. He was aide de camp to General Beauregard in the attack on Fort Sumter, and captain commanding a light battery in General Johnston's army later in the year 1861. Thereafter, by successive steps, each gained by distinguished conduct on the field of battle, he rose to the rank of brigadier-general in November 1862, being ordered to take command of defences at Vicksburg. He served at this place with great credit until its surrender to General Grant in July 1863, and on becoming a prisoner of war, he was immediately exchanged and promoted major-general. His regimental service had been chiefly with artillery, but he had generally worked with and at times commanded cavalry, and he was now assigned to command the troops of that arm in the south-western theatre of war. After harassing, as far as his limited numbers permitted, the advance of Sherman's column on Meridian, he took General Polk's place as commander of the department of Mississippi. In June 1864, on Hood's promotion to command the Army of Tennessee, S. D. Lee was made a lieutenant-general and assigned to command Hood's old corps in that army. He fought at Atlanta and Jonesboro and in the skirmishing and manœuvring along middle Tennessee which ended in the great crisis of Nashville and the "March to the Sea." Lee's corps accompanied Hood in the bold advance to Nashville, and fought in the battles of Franklin and Nashville, after which, in the rout of the Confederate army Lee kept his troops closed up and well in hand, and for three consecutive days formed the fighting rearguard of the otherwise disintegrated army. Lee was himself wounded, but did not give up the command until an organized rearguard took over the post of danger. On recovery he joined General J. E. Johnston in North Carolina, and he surrendered with Johnston in April 1865. After the war he settled in Mississippi, which was his wife's state and during the greater part of the war his own territorial command, and devoted himself to planting. He was president of the Agricultural and Mechanical College of Mississippi from 1880 to 1899, took some part in state politics and was an active member—at the time of his death commander-in-chief—of the "United Confederate Veterans" society. He died at Vicksburg on the 28th of May 1908.

LEE, a township of Berkshire county, in western Massachusetts, U.S.A. Pop. (1900) 3596; (1905) 3972; (1910) 4106. The township is traversed by the New York, New Haven & Hartford railway, covers an area of 22½ sq. m., and includes the village of Lee, 10 m. S. of Pittsfield, East Lee, adjoining it on the S.E., and South Lee, about 3 m. to the S.W. Lee and South Lee are on, and East Lee is near, the Housatonic river. The eastern part of the township is generally hilly, reaching a maximum altitude of about 2200 ft., and there are two considerable bodies of water—Laurel Lake in the N.W. (partly in Lenox) and Goose Pond, in the S.E. (partly in Tyringham). The region is healthy as well as beautiful, and is much frequented as a summer resort. Memorial Hall was built in memory of the soldiers from Lee who died during the Civil War. The chief manufactures are paper and wire, and from the quarries near the village of Lee is obtained an excellent quality of marble; these quarries furnished the marble for the extension of the Capitol at Washington, for St Patrick's cathedral in New York City and for the Lee High School and the Lee Public Library (1908). Lime is quarried in the township. Lee was formerly a paper-manufacturing place of great importance. The first paper mill in the township was built in South Lee in 1806, and for a time more paper was made in Lee than in any other place in the United States; the Housatonic Mill in Lee was probably the first (1867) in the United States to manufacture paper from wood pulp.

The first settlement within the present township of Lee was made in 1760. The township was formed from parts of Great Barrington and Washington, was incorporated in 1777 and was named in honour of General Charles Lee (1731–1782). In the autumn of 1786 there was an encounter near the village of East Lee between about 250 adherents of Daniel Shays (many of them from Lee township) and a body of state troops under General John Paterson, wherein the Shays contingent paraded a bogus cannon (made of a yarn beam) with such effect that the state troops fled.

See Amory Gale, *History of the Town of Lee* (Lee, 1854), and *Lee, The Centennial Celebration and Centennial History of the Town of Lee* (Springfield, Mass., 1878), compiled by Charles M. Hyde and Alexander Hyde.

LEE. (1) (In O. Eng. *hlêo*; cf. the pronunciation *lew-ward* of "leeward"; the word appears in several Teutonic languages; cf. Dutch *lij*, Dan. *lae*), properly a shelter or protection, chiefly used as a nautical term for that side of a ship, land, &c., which is farthest from the wind, hence a "lee shore," land under the lee of a ship, *i.e.* one on which the wind blows directly and which is unsheltered. A ship is said to make "leeway" when she drifts laterally away from her course. (2) A word now always used in the plural "lees," meaning dregs, sediment, particularly of wine. It comes through the O. Fr. *lie* from a Gaulish Lat. *lia*, and is probably of Celtic origin.

LEECH, JOHN (1817–1864), English caricaturist, was born in London on the 29th of August 1817. His father, a native of Ireland, was the landlord of the London Coffee House on Ludgate Hill, "a man," on the testimony of those who knew him, "of fine culture, a profound Shakespearian, and a thorough gentleman." His mother was descended from the family of the famous Richard Bentley. It was from his father that Leech inherited his skill with the pencil, which he began to use at a very early age. When he was only three, he was discovered by Flaxman, who had called on his parents, seated on his mother's knee, drawing with much gravity. The sculptor pronounced his sketch to be wonderful, adding, "Do not let him be cramped with lessons in drawing; let his genius follow its own bent; he will astonish the world"—an advice which was strictly followed. A mail-coach, done when he was six years old, is already full of surprising vigour and variety in its galloping horses. Leech was educated at Charterhouse, where Thackeray, his lifelong friend, was his schoolfellow, and at sixteen he began to study for the medical profession at St Bartholomew's Hospital, where he won praise for the accuracy and beauty of his anatomical drawings. He was then placed under a Mr Whittle, an eccentric practitioner, the original of "Rawkins" in Albert Smith's *Adventures of Mr Ledbury*, and afterwards under Dr John Cockle; but gradually the true bent of the youth's mind asserted itself, and he drifted into the artistic profession. He was eighteen when his first designs were published, a quarto of four pages, entitled *Etchings and Sketchings by A. Pen, Esq.*, comic character studies from the London streets. Then he drew some political lithographs, did rough sketches for *Bell's Life*, produced an exceedingly popular parody on Mulready's postal envelope, and, on the death of Seymour, applied unsuccessfully to illustrate the *Pickwick Papers*. In 1840 Leech began his contributions to the magazines with a series of etchings in *Bentley's Miscellany*, where Cruikshank had published his splendid plates to *Jack Sheppard* and *Oliver Twist*, and was illustrating *Guy Fawkes* in sadly feebler fashion. In company with the elder master Leech designed for the *Ingoldsby Legends* and *Stanley Thorn*, and till 1847 produced many independent series of etchings. These cannot be ranked with his best work; their technique is exceedingly imperfect; they are rudely bitten, with the light and shade out of relation; and we never feel that they express the artist's individuality, the *Richard Savage* plates, for instance, being strongly reminiscent of Cruikshank, and "The Dance at Stamford Hall" of Hablot Browne. In 1845 Leech illustrated *St Giles and St James* in Douglas Jerrold's newly started *Shilling Magazine*, with plates more vigorous and accomplished than those in *Bentley*, but it is in subjects of a somewhat later date, and especially in those lightly etched and meant to be printed with colour, that we see the artist's best powers with the needle and the acid. Among such of his designs are four charming plates to Dickens's *Christmas Carol* (1844), the broadly humorous etchings in the *Comic History of England* (1847–1848), and the still finer illustrations to the *Comic History of Rome* (1852)—which last, particularly in its minor woodcuts, shows some exquisitely graceful touches, as witness the fair faces that rise from the surging water in "Cloelia and her Companions Escaping from the Etruscan Camp." Among the other etchings which deserve very special reference are those in *Young Master Troublesome or Master Jacky's Holidays*, and the frontispiece to *Hints on Life, or How to Rise in Society* (1845)—a series of minute subjects linked gracefully together by coils of smoke, illustrating the various ranks and conditions of men, one of them—the doctor by his patient's bedside—almost equalling in vivacity and precision the best of Cruikshank's similar scenes. Then in the 'fifties we have the numerous etchings of sporting scenes, contributed, together with woodcuts, to the *Handley Cross* novels.

Turning to Leech's lithographic work, we have, in 1841, the *Portraits of the Children of the Mobility*, an important series dealing with the humorous and pathetic aspects of London street Arabs, which were afterwards so often and so effectively to employ the artist's pencil. Amid all the squalor which they depict, they are full of individual beauties in the delicate or touching expression of a face, in the graceful turn of a limb. The book is scarce in its original form, but in 1875 two reproductions of the outline sketches for the designs were published—a lithographic issue of the whole series, and a finer photographic transcript of six of the subjects, which is more valuable than even the finished illustrations of 1841, in which the added light and shade is frequently spotty and ineffective, and the lining itself has not the freedom which we find in some of Leech's other lithographs, notably in the *Fly Leaves*, published at the *Punch* office, and in the inimitable subject of the nuptial couch of the Caudles, which also appeared, in woodcut form, as a political cartoon, with Mrs Caudle, personated by Brougham, disturbing by untimely loquacity the slumbers of the lord chancellor, whose haggard cheek rests on the woolsack for pillow.

But it was in work for the wood-engravers that Leech was most prolific and individual. Among the earlier of such designs are the illustrations to the *Comic English* and *Latin Grammars* (1840), to *Written Caricatures* (1841), to Hood's *Comic Annual*, (1842), and to Albert Smith's *Wassail Bowl* (1843), subjects mainly of a small vignette size, transcribed with the best skill of such woodcutters as Orrin Smith, and not, like the larger and later *Punch* illustrations, cut at speed by several engravers working at once on the subdivided block. It was in 1841 that Leech's connexion with *Punch* began, a connexion which subsisted till his death on the 29th of October 1864, and resulted in the production of the best-known and most admirable of his designs. His first contribution appeared in the issue of the 7th of August, a full-page illustration—entitled "Foreign Affairs"—of character studies from the neighbourhood of Leicester Square. His cartoons deal at first mainly with social subjects, and are rough and imperfect in execution, but gradually their method gains in power and their subjects become more distinctly political, and by 1849 the artist is strong enough to produce the splendidly humorous national personification which appears in "Disraeli Measuring the British Lion." About 1845 we have the first of that long series of half-page and quarter-page pictures of life and manners, executed with a hand as gentle as it was skilful, containing, as Ruskin has said, "admittedly the finest definition and natural history of the classes of our society, the kindest and subtlest analysis of its foibles, the tenderest flattery of its pretty and well-bred ways," which has yet appeared. In addition to his work for the weekly issue of *Punch*, Leech contributed largely to the *Punch* almanacks and pocket-books, to *Once a Week* from 1859 till 1862, to the *Illustrated London News*, where some of his largest and best sporting scenes appeared, and to innumerable novels and miscellaneous volumes besides, of which it is only necessary to specify *A Little Tour in Ireland* (1859), which is noticeable as showing the artist's treatment of pure landscape, though it also contains some of his daintiest figure-pieces, like that of the wind-blown girl, standing on the summit of a pedestal, with the swifts darting around her and the breadth of sea beyond.

In 1862 Leech appealed to the public with a very successful exhibition of some of the most remarkable of his *Punch* drawings. These were enlarged by a mechanical process, and coloured in oils by the artist himself, with the assistance and under the direction of his friend J. E. Millais.

Leech was a singularly rapid and indefatigable worker. Dean Hole tells us, when he was his guest, "I have known him send off from my house three finished drawings on the wood, designed, traced, and rectified, without much effort as it seemed, between breakfast and dinner." The best technical qualities of Leech's art, his unerring precision, his unfailing vivacity in the use of the line, are seen most clearly in the first sketches for his woodcuts, and in the more finished drawings made on tracing-paper from these first outlines, before the chiaroscuro was added and the designs were transcribed by the engraver. Turning to the mental qualities of his art, it would be a mistaken criticism which ranked him as a comic draughtsman. Like Hogarth he was a true humorist, a student of human life, though he observed humanity mainly in its whimsical aspects,

> "Hitting all he saw with shafts
> With gentle satire, kin to charity,
> That harmed not."

The earnestness and gravity of moral purpose which is so constant a note in the work of Hogarth is indeed far less characteristic of Leech, but there are touches of pathos and of tragedy in such of the *Punch* designs as the "Poor Man's Friend" (1845), and "General Février turned Traitor" (1855), and in "The Queen of the Arena" in the first volume of *Once a Week*, which are sufficient to prove that more solemn powers, for which his daily work afforded no scope, lay dormant in their artist. The purity and manliness of Leech's own character are impressed on his art. We find in it little of the exaggeration and grotesqueness, and none of the fierce political enthusiasm, of which the designs of Gillray are so full. Compared with that of his great contemporary George Cruikshank, his work is restricted both in compass of subject and in artistic dexterity.

Biographies of Leech have been written by John Brown (1882), and Frith (1891); see also "John Leech's Pictures of Life and Character," by Thackeray, *Quarterly Review* (December 1854); letter by John Ruskin, *Arrows of the Chace*, vol. i. p. 161; "Un Humoriste Anglais," by Ernest Chesneau, *Gazette des Beaux Arts* (1875). (J. M. G.)

LEECH, the common name of members of the Hirudinea, a division of Chaetopod worms. It is doubtful whether the medicinal leech, *Hirudo medicinalis*, which is rarer in England than on the continent of Europe, or the horse leech, *Aulastoma gulo*, often confused with it, has the best right to the original possession of this name. But at present the word "leech" is applied to every member of the group Hirudinea, for the general structure and classification of which see CHAETOPODA. There are many genera and species of leeches, the exact definitions of which are still in need of a more complete survey. They occur in all parts of the world and are mostly aquatic, though sometimes terrestrial, in habit. The aquatic forms frequent streams, ponds and marshes, and the sea. The members of this group are always carnivorous or parasitic, and prey upon both vertebrates and invertebrates. In relation to their parasitic habit one or two suckers are always developed, the one at the anterior and the other at the posterior end of the body. In one subdivision of the leeches, the *Gnathobdellidae*, the mouth has three chitinous jaws which produce a triangular bite, though the action has been described as like that of a circular saw. Leeches without biting jaws possess a protrusible proboscis, and generally engulf their prey, as does the horse leech when it attacks earthworms. But some of them are also ectoparasites. The leech has been used in medicine from remote antiquity as a moderate blood-letter; and it is still so used, though more rarely than formerly. As unlicensed blood-letters, certain land-leeches are among the most unpleasant of parasites that can be encountered in a tropical jungle. A species of *Haemadipsa* of Ceylon attaches itself to the passer-by and draws blood with so little irritation that the sufferer is said to be aware of its presence only by the trickling from the wounds produced. Small leeches taken into the mouth with drinking-water may give rise to serious symptoms by attaching themselves to the fauces and neighbouring parts and thence sucking blood. The effects of these parasites have been mistaken for those of disease All leeches are very extensile and can contract the body to a plump, pear-shaped form, or extend it to a long and worm-like shape. They frequently progress after the fashion of a "looper" caterpillar, attaching themselves alternately by the anterior and the posterior sucker. Others swim with eel-like curves through the water, while one land-leech, at any rate, moves in a gliding way like a land Planarian, and leaves, also like the Planarian, a slimy trail behind it. Leeches are usually olive green to brown in colour, darker patches and spots being scattered over a paler ground. The marine parasitic leech *Pontobdella* is of a bright green, as is also the land-leech *Trocheta*.

The term "leech," as an old English synonym for physician, is from a Teutonic root meaning "heal," and is etymologically distinct from the name (O. Eng. *lyce*) of the *Hirudo*, though the use of the one by the other has helped to assimilate the two words. (F. E. B.)

LEEDS, THOMAS OSBORNE, 1st DUKE OF (1631-1712), English statesman, commonly known also by his earlier title of EARL OF DANBY, son of Sir Edward Osborne, Bart., of Kiveton, Yorkshire, was born in 1631. He was great-grandson of Sir Edward Osborne (d. 1591), lord mayor of London, who, according to the accepted account, while apprentice to Sir William Hewett, clothworker and lord mayor in 1559, made the fortunes of the family by leaping from London Bridge into the river and rescuing Anne (d. 1585), the daughter of his employer, whom he afterwards married.[1] Thomas Osborne, the future lord treasurer, succeeded to the baronetcy and estates in Yorkshire on his father's death in 1647, and after unsuccessfully courting his cousin Dorothy Osborne, married Lady Bridget Bertie, daughter of the earl of Lindsey. He was introduced to public life and to court by his neighbour in Yorkshire, George, 2nd duke of Buckingham, was elected M.P. for York in 1665, and gained the "first step in his future rise" by joining Buckingham in his attack on Clarendon in 1667. In 1668 he was appointed joint treasurer of the navy with Sir Thomas Lyttelton, and subsequently sole treasurer. He succeeded Sir William Coventry as commissioner for the state treasury in 1669, and in 1673 was appointed a commissioner for the admiralty. He was created Viscount Osborne in the Scottish peerage on the 2nd of February 1673, and a privy councillor on the 3rd of May. On the 19th of June, on the resignation of Lord Clifford, he was appointed lord treasurer and made Baron Osborne of Kiveton and Viscount Latimer in the peerage of England, while on the 27th of June 1674 he was created earl of Danby, when he surrendered his Scottish peerage of Osborne to his second son Peregrine Osborne. He was appointed the same year lord-lieutenant of the West Riding of Yorkshire, and in 1677 received the Garter.

Danby was a statesman of very different calibre from the leaders of the Cabal ministry, Buckingham and Arlington. His principal aim was no doubt the maintenance and increase of his own influence and party, but his ambition corresponded with definite political views. A member of the old cavalier party, a confidential friend and correspondent of the despotic Lauderdale, he desired to strengthen the executive and the royal authority. At the same time he was a keen partisan of the established church, an enemy of both Roman Catholics and dissenters, and an opponent of all toleration. In 1673 he opposed the Indulgence, supported the Test Act, and spoke against the proposal for giving relief to the dissenters. In June 1675 he signed the paper of advice drawn up by the bishops for the king, urging the rigid enforcement of the laws against the Roman Catholics, their complete banishment from the court, and the suppression of conventicles,[2] and a bill introduced by him imposing special taxes on recusants and subjecting Roman Catholic priests to imprisonment for life was only thrown out as too lenient because it secured offenders from the charge of treason. The same year he introduced a Test Oath by which all holding office or seats in either House of Parliament were to declare resistance to the royal power a crime, and promise to abstain from all attempts to alter the government of either church or state; but this extreme measure of retrograde toryism was successfully opposed by wiser statesmen. The king himself as a Roman Catholic secretly opposed and also doubted the wisdom and practicability of this "thorough" policy of repression. Danby therefore ordered a return from every diocese of the numbers of dissenters, both Romanist and Protestant, in order by a proof of their insignificance to remove the royal scruples.[3] In December 1676 he issued a proclamation for the suppression of coffee-houses because of the "defamation of His Majesty's Government" which took place in them, but this was soon withdrawn. In 1677, to secure Protestantism in case of a Roman Catholic succession, he introduced a bill by which ecclesiastical patronage and the care of the royal children were entrusted to the bishops; but this measure, like the other, was thrown out.

In foreign affairs Danby showed a stronger grasp of essentials. He desired to increase English trade, credit and power abroad. He was a determined enemy both to Roman influence and to French ascendancy. He terminated the war with Holland in 1674, and from that time maintained a friendly correspondence with William; while in 1677, after two years of tedious negotiations, he overcame all obstacles, and in spite of James's opposition, and without the knowledge of Louis XIV., effected the marriage between William and Mary that was the germ of the Revolution and the Act of Settlement. This national policy, however, could only be pursued, and the minister could only maintain himself in power, by acquiescence in the king's personal relations with the king of France settled by the disgraceful Treaty of Dover in 1670, which included Charles's acceptance of a pension, and bound him to a policy exactly opposite to Danby's, one furthering French and Roman ascendancy. Though not a number of the Cabal ministry, and in spite of his own denial, Danby must, it would seem, have known of these relations after becoming lord treasurer. In any case, in 1676, together with Lauderdale alone, he consented to a treaty between Charles and Louis according to which the foreign policy of both kings was to be conducted in union, and Charles received an annual subsidy of £100,000. In 1678 Charles, taking advantage of the growing hostility to France in the nation and parliament, raised his price, and Danby by his directions demanded through Ralph Montagu (afterwards duke of Montagu) six million livres a year (£300,000) for three years. Simultaneously Danby guided through parliament a bill for raising money for a war against France; a league was concluded with Holland, and troops were actually sent there. That Danby, in spite of these compromising transactions, remained in intention faithful to the national interests, appears clearly from the hostility with which he was still regarded by France. In 1676 he is described by Ruvigny to Louis XIV. as intensely antagonistic to France and French interests, and as doing his utmost to prevent the treaty of that year.[1] In 1678, on the rupture of relations between Charles and Louis, a splendid opportunity was afforded Louis of paying off old scores by disclosing Danby's participation in the king's demands for French gold.

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[1] *Chronicles of London Bridge*, by R. Thomson (1827), 313, quoting Stow.

[2] *Cal. of St Pap. Dom.* (1673–1675), p. 449.

[3] Letter of Morley, Bishop of Winchester, to Danby (June 10, 1676). (*Hist. MSS. Com.* xi. Rep. pt. vii. 14.)

Every circumstance now conspired to effect his fall. Although both abroad and at home his policy had generally embodied the wishes of the ascendant party in the state, Danby had never obtained the confidence of the nation. His character inspired no respect, and he could not reckon during the whole of his long career on the support of a single individual. Charles is said to have told him when he made him treasurer that he had only two friends in the world, himself and his own merit.[2] He was described to Pepys on his acquiring office as "one of a broken sort of people that have not much to lose and therefore will venture all," and as "a beggar having £1100 or £1200 a year, but owes above £10,000." His office brought him in £20,000 a year,[3] and he was known to be making large profits by the sale of offices; he maintained his power by corruption and by jealously excluding from office men of high standing and ability. Burnet described him as "the most hated minister that had ever been about the king." Worse men had been less detested, but Danby had none of the amiable virtues which often counteract the odium incurred by serious faults. Evelyn, who knew him intimately from his youth, describes him as "a man of excellent natural parts but nothing of generous or grateful." Shaftesbury, doubtless no friendly witness, speaks of him as an inveterate liar, "proud, ambitious, revengeful, false, prodigal and covetous to the highest degree,"[4] and Burnet supports his unfavourable judgment to a great extent. His corruption, his mean submission to a tyrant wife, his greed, his pale face and lean person, which had succeeded to the handsome features and comeliness of earlier days,[5] were the subject of ridicule, from the witty sneers of Halifax to the coarse jests of the anonymous writers of innumerable lampoons. By his championship of the national policy he had raised up formidable foes abroad without securing a single friend or supporter at home,[6] and his fidelity to the national interests was now, through a very mean and ignoble act of personal spite, to be the occasion of his downfall.

Danby in appointing a new secretary of state had preferred Sir W. Temple, a strong adherent of the anti-French policy, to Montagu. The latter, after a quarrel with the duchess of Cleveland, was dismissed from the king's employment. He immediately went over to the opposition, and in concert with Louis XIV. and Barillon, the French ambassador, by whom he was supplied with a large sum of money, arranged a plan for effecting Danby's ruin. He obtained a seat in parliament; and in spite of Danby's endeavour to seize his papers by an order in council, on the 20th of December 1678 caused two of the incriminating letters written by Danby to him to be read aloud to the House of Commons by the Speaker. The House immediately resolved on Danby's impeachment. At the foot of each of the letters appeared the king's postscripts, "I approve of this letter. C.R.," in his own handwriting; but they were not read by the Speaker, and were entirely neglected in the proceedings against the minister, thus emphasizing the constitutional principle that obedience to the orders of the sovereign can be no bar to an impeachment. He was charged with having encroached to himself royal powers by treating matters of peace and war without the knowledge of the council, with having promoted the raising of a standing army on pretence of a war with France, with having obstructed the assembling of parliament, with corruption and embezzlement in the treasury. Danby, while communicating the "Popish Plot" to the parliament, had from the first expressed his disbelief in the so-called revelations of Titus Oates, and his backwardness in the matter now furnished an additional charge of having "traitorously concealed the plot." He was voted guilty by the Commons; but while the Lords were disputing whether the accused peer should have bail, and whether the charges amounted to more than a misdemeanour, parliament was prorogued on the 30th of December and dissolved three weeks later. In March 1679 a new parliament hostile to Danby was returned, and he was forced to resign the treasurership; but he received a pardon from the king under the Great Seal, and a warrant for a marquessate.[7] His proposed advancement in rank was severely reflected upon in the Lords, Halifax declaring it in the king's presence the recompense of treason, "not to be borne"; and in the Commons his retirement from office by no means appeased his antagonists. The proceedings against him were revived, a committee of privileges deciding on the 19th of March 1679 that the dissolution of parliament was no abatement of an impeachment. A motion was passed for his committal by the Lords, who, as in Clarendon's case, voted his banishment. This was, however, rejected by the Commons, who now passed an act of attainder. Danby had removed to the country, but returned on the 21st of April to avoid the threatened passing by the Lords of the attainder, and was sent to the Tower. In his written defence he now pleaded the king's pardon, but on the 5th of May 1679 it was pronounced illegal by the Commons. This declaration was again repeated by the Commons in 1689 on the occasion of another attack made upon Danby in that year, and was finally embodied in the Act of Settlement in 1701.

The Commons now demanded judgment against the prisoner from the Lords. Further proceedings, however, were stopped by the dissolution of parliament again in July; but for nearly five years Danby remained a prisoner in the Tower. A number of pamphlets asserting the complicity of the fallen minister in the Popish Plot, and even accusing him of the murder of Sir Edmund Berry Godfrey, were published in 1679 and 1680; they were answered by Danby's secretary, Edward Christian, in *Reflections*; and in May 1681 Danby was actually indicted by the Grand Jury of Middlesex for Godfrey's murder on the accusation of Edward FitzHarris. His petition to the king for a trial by his peers on this indictment was refused, and an attempt to prosecute the publishers of the false evidence in the king's bench was unsuccessful. For some time all appeals to the king, to parliament, and to the courts of justice were unavailing; but on the 12th of February 1684 his application to Chief Justice Jeffreys was at last successful, and he was set at liberty on finding bail to the amount of £40,000, to appear in the House of Lords in the following session. He visited the king at court the same day; but took no part in public affairs for the rest of the reign.

After James's accession Danby was discharged from his bail by the Lords on the 19th of May 1685, and the order declaring a dissolution of parliament to be no abatement of an impeachment was reversed. He again took his seat in the Lords as a leader of the moderate Tory party. Though a strong Tory and supporter of the hereditary principle, James's attacks on Protestantism soon drove him into opposition. He was visited by Dykvelt, William of Orange's agent; and in June 1687 he wrote to William assuring him of his support. On the 30th of June 1688 he was one of the seven leaders of the Revolution who signed the invitation to William. In November he occupied York in the prince's interest, returning to London to meet William on the 26th of December. He appears to have thought that William would not claim the crown,[8] and at first supported the theory that the throne having been vacated by James's flight the succession fell as of right to Mary; but as this met with little support, and was rejected both by William and by Mary herself, he voted against the regency and joined with

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[1] *Memoirs of Great Britain and Ireland*, by Sir J. Dalrymple (1773), i. app. 104.

[2] *Letters to Sir Joseph Williamson* (Camden Soc., 1874), i. 64.

[3] Halifax note-book in Devonshire House collection, quoted in Foxcroft's *Life of Halifax*, ii. 63, note.

[4] *Life of Shaftesbury*, by W. D. Christie (1871), ii. 312.

[5] Macky's *Memoirs*, 46; Pepys's *Diary*, viii. 143.

[6] See the description of his position at this time by Sir W. Temple in *Lives of Illustrious Persons* (1714), 40.

[7] Add. MSS. 28094, f. 47.

[8] Boyer's *Annals* (1722), 433.

Halifax and the Commons in declaring the prince and princess joint sovereigns.

Danby had rendered extremely important services to William's cause. On the 20th of April 1689 he was created marquess of Carmarthen and was made lord-lieutenant of the three ridings of Yorkshire. He was, however, still greatly disliked by the Whigs, and William, instead of reinstating him in the lord treasurership, only appointed him president of the council in February 1689. He did not conceal his vexation and disappointment, which were increased by the appointment of Halifax to the office of lord privy seal. The antagonism between the "black" and the "white marquess" (the latter being the nickname given to Carmarthen in allusion to his sickly appearance), which had been forgotten in their common hatred to the French policy and to Rome, revived in all its bitterness. He retired to the country and was seldom present at the council. In June and July new motions were made in parliament for his removal; but notwithstanding his great unpopularity, on the retirement of Halifax in 1690 he again acquired the chief power in the state, which he retained till 1695 by bribery in parliament and by the support of the king and queen. In 1690, during William's absence in Ireland, he was appointed Mary's chief adviser. In 1691, desiring to compromise Halifax, he discredited himself by the patronage of an informer named Fuller, soon proved an impostor. He was absent in 1692 when the Place Bill was thrown out. In 1693 he presided in great state as lord high steward at the trial of Lord Mohun; and on the 4th of May 1694 he was created duke of Leeds.[1] The same year he supported the Triennial Bill, but opposed the new treason bill as weakening the hands of the executive. Meanwhile fresh attacks had been made upon him. He was accused unjustly of Jacobitism. In April 1695 he was impeached once more by the Commons for having received a bribe of 5000 guineas to procure the new charter for the East India Company. In his defence, whilst denying that he had received the money and appealing to his past services, he did not attempt to conceal the fact that according to his experience bribery was an acknowledged and universal custom in public business, and that he himself had been instrumental in obtaining money for others. Meanwhile his servant, who was said to have been the intermediary between the duke and the Company in the transaction, fled the country; and no evidence being obtainable to convict, the proceedings fell to the ground. In May 1695 he had been ordered to discontinue his attendance at the council. He returned in October, but was not included among the lords justices appointed regents during William's absence in this year. In November he was created D.C.L. by the university of Oxford; in December he became a commissioner of trade, and in December 1696 governor of the Royal Fishery Company. He opposed the prosecution of Sir John Fenwick, but supported the action taken by members of both Houses in defence of William's rights in the same year. On the 23rd of April 1698 he entertained the tsar, Peter the Great, at Wimbledon. He had for some time lost the real direction of affairs, and in May 1699 he was compelled to retire from office and from the lord-lieutenancy of Yorkshire.

In Queen Anne's reign, in his old age, he is described as "a gentleman of admirable natural parts, great knowledge and experience in the affairs of his own country, but of no reputation with any party. He hath not been regarded, although he took his place at the council board."[2] The veteran statesman, however, by no means acquiesced in his enforced retirement, and continued to take an active part in politics. As a zealous churchman and Protestant he still possessed a following. In 1705 he supported a motion that the church was in danger, and in 1710 in Sacheverell's case spoke in defence of hereditary right.[3] In November of this year he obtained a renewal of his pension of £3500 a year from the post office which he was holding in 1694,[4] and in 1711 at the age of eighty was a competitor for the office of lord privy seal.[5] His long and eventful career, however, terminated soon afterwards by his death on the 26th of July 1712.

In 1710 the duke had published *Copies and Extracts of some letters written to and from the Earl of Danby . . . in the years 1676, 1677 and 1678*, in defence of his conduct, and this was accompanied by *Memoirs relating to the Impeachment of Thomas, Earl of Danby*. The original letters, however, of Danby to Montagu have now been published (by the Historical MSS. Commission from the MSS. of J. Eliot Hodgkin), and are seen to have been considerably garbled by Danby for the purposes of publication, several passages being obliterated and others altered by his own hand.

See the lives, by Sidney Lee in the *Dict. Nat. Biography* (1895); by T. P. Courtenay in *Lardner's Encyclopaedia*, "Eminent British Statesmen," vol. v. (1850); in Lodge's *Portraits*, vii.; and *Lives and Characters of . . . Illustrious Persons*, by J. le Neve (1714). Further material for his biography exists in *Add. MSS.*, 26040-95 (56 vols., containing his papers); in the *Duke of Leeds MSS. at Hornby Castle*, calendered in *Hist. MSS. Comm.* 11th Rep. pt. vii. pp. 1-43; *MSS. of Earl of Lindsay and J. Eliot Hodgkin*; and *Calendars of State Papers Dom.* See also *Add. MSS. 1894–1899*, Index and Calendar; *Hist. MSS. Comm.* 11th Rep. pt. ii., *House of Lords MSS.*; *Gen. Cat. British Museum* for various pamphlets.

(P. C. Y.)

Later Dukes of Leeds.

The duke's only surviving son, Peregrine (1659–1729), who became 2nd duke of Leeds on his father's death, had been a member of the House of Lords as Baron Osborne since 1690, but he is better known as a naval officer; in this service he attained the rank of a vice-admiral. He died on the 25th of June 1729, when his son Peregrine Hyde (1691–1731) became 3rd duke. The 4th duke was the latter's son Thomas (1713–1789), who was succeeded by his son Francis.

Francis Osborne, 5th duke of Leeds (1751–1799), was born on the 29th of January 1751 and was educated at Westminster school and at Christ Church, Oxford. He was a member of parliament in 1774 and 1775; in 1776 he became a peer as Baron Osborne, and in 1777 lord chamberlain of the queen's household. In the House of Lords he was prominent as a determined foe of the prime minister, Lord North, who, after he had resigned his position as chamberlain, deprived him of the office of lord-lieutenant of the East Riding of Yorkshire in 1780. He regained this, however, two years later. Early in 1783 the marquess of Carmarthen, as he was called, was selected as ambassador to France, but he did not take up this appointment, becoming instead secretary for foreign affairs under William Pitt in December of the same year. As secretary he was little more than a cipher, and he left office in April 1791. Subsequently he took some slight part in politics, and he died in London on the 31st of January 1799. His *Political Memoranda* were edited by Oscar Browning for the Camden Society in 1884, and there are eight volumes of his official correspondence in the British Museum. His first wife was Amelia (1754–1784), daughter of Robert Darcy, 4th earl of Holdernesse, who became Baroness Conyers in her own right in 1778. Their elder son, George William Frederick (1775–1838), succeeded his father as duke of Leeds and his mother as Baron Conyers. These titles were, however, separated when his son, Francis Godolphin Darcy, the 7th Duke (1798–1859), died without sons in May 1859. The barony passed to his nephew, Sackville George Lane-Fox (1827–1888), falling into abeyance on his death in August 1888, and the dukedom passed to his cousin, George Godolphin Osborne (1802–1872), a son of Francis Godolphin Osborne (1777–1850), who was created Baron Godolphin in 1832. In 1895 George's grandson George Godolphin Osborne (b. 1862) became 10th duke of Leeds. The name of Godolphin, which is borne by many of the Osbornes, was introduced into the family through the marriage of the 4th duke with Mary (d. 1764), daughter and co-heiress of Francis Godolphin, 2nd earl of Godolphin, and grand-daughter of the great duke of Marlborough.

LEEDS, a city and municipal county and parliamentary borough in the West Riding of Yorkshire, England, 185 m.

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[1] The title was taken, not from Leeds in Yorkshire, but from Leeds in Kent, 4½ m. from Maidstone, which in the 17th century was a more important place than its Yorkshire namesake.

[2] *Memoirs of Sir John Macky* (Roxburghe Club, 1895), 46.

[3] Boyer's *Annals*, 219, 433.

[4] *Harleian MSS.* 2264, No. 239.

[5] Boyer's *Annals*, 515.

N.N.W. from London. Pop. (1891) 367,505; (1901) 428,968. It is served by the Great Northern railway (Central station), the Midland (Wellington station), North-Eastern and London & North-Western (New station), and Great Central and Lancashire & Yorkshire railways (Central station). It lies nearly in the centre of the Riding, in the valley of the river Aire.

The plan of the city is in no way regular, and the numerous handsome public buildings are distributed among several streets, principally on the north side of the narrow river. The town hall is a fine building in Grecian style, well placed in a square between Park Lane and Great George Street. It is of oblong shape, with a handsome façade over which rises a domed clock-tower. The principal apartment is the Victoria Hall, a richly ornamented chamber measuring 161 ft. in length, 72 in breadth and 75 in height. It was opened in 1858 by Queen Victoria. Immediately adjacent to it are the municipal offices (1884) in Italian style. The Royal Exchange (1872) in Boar Lane is an excellent Perpendicular building. In ecclesiastical architecture Leeds is not rich. The church of St John, however, is an interesting example of the junction of Gothic traditions with Renaissance tendencies in architecture. It dates from 1634 and contains some fine contemporary woodwork. St Peter's parish church occupies an ancient site, and preserves a very early cross from the former building. The church was rebuilt in 1840 at the instance of the vicar, Dr Walter Farquhar Hook (1798–1875), afterwards dean of Chichester, whose work here in a poor and ill-educated parish brought him fame. The church of All Souls (1880) commemorates him. It may be noted that the vicarage of Leeds has in modern times commonly formed a step to the episcopal bench. There are numerous other modern churches and chapels, of which the Unitarian chapel in Park Row is noteworthy. Leeds is the seat of a Roman Catholic bishop, with a pro-cathedral dedicated to St Anne. There is a large free library in the municipal offices, and numerous branch libraries are maintained. The Leeds old library is a private institution founded in 1768 by Dr Priestley, who was then minister of the Unitarian chapel. It occupies a building in Commercial Street. The Philosophical and Literary Society, established in 1820, possesses a handsome building in Park Row, known as the Philosophical Hall, containing a laboratory, scientific library, lecture room, and museum, with excellent natural history, geological and archaeological collections. The City Art Gallery was completed in 1888, and contains a fine permanent collection, while exhibitions are also held. The University, incorporated in 1904, grew out of Yorkshire College, established in 1875 for the purpose of supplying instruction in the arts and sciences which are applicable to the manufactures, engineering, mining and agriculture of the county. In 1887 it became one of the constituent colleges of Victoria University, Manchester, and so remained until its separate incorporation. The existing building was completed in 1885, and contains a hall of residence, a central hall and library, and complete equipments in all departments of instruction. New departments have been opened in extension of the original scheme, such as the medical department (1894). A day training college is a branch of the institution. The Mechanics' Institute (1865) occupies a handsome Italian building in Cookridge Street near the town hall. It comprises a lecture room, library, reading and class rooms; and day and evening classes and an art school are maintained. The grammar school, occupying a Gothic building (1858) at Woodhouse Moor, dates its foundation from 1552. It is largely endowed, and possesses exhibitions tenable at Oxford, Cambridge and Durham universities. There is a large training college for the Wesleyan Methodist ministry in the suburb of Headingley. The Yorkshire Ladies' Council of Education has as its object the promotion of female education, and the instruction of girls and women of the artisan class in domestic economy, &c. The general infirmary in Great George Street is a Gothic building of brick with stone dressings with a highly ornamental exterior by Sir Gilbert Scott, of whose work this is by no means the only good example in Leeds. The city possesses further notable buildings in its market-halls, theatres, clubs, &c.

Among open spaces devoted by the corporation to public use that of Woodhouse Moor is the principal one within the city, but 3 m. N.E. of the centre is Roundhay Park, a tract of 700 acres, beautifully laid out and containing a picturesque lake. In 1889 there came into the possession of the corporation the ground, lying 3 m. up the river from the centre of the city, containing the celebrated ruins of Kirkstall Abbey. The remains of this great foundation, of the middle of the 12th century, are extensive, and so far typical of the usual arrangement of Cistercian houses as to be described under the heading ABBEY. The ruins are carefully preserved, and form a remarkable contrast with the surrounding industrial district. Apart from Kirkstall there are few antiquarian remains in the locality. In Guildford Street, near the town hall, is the Red Hall, where Charles I. lay during his enforced journey under the charge of the army in 1647.

For manufacturing and commercial purposes the situation of Leeds is highly advantageous. It occupies a central position in the railway system of England. It has communication with Liverpool by the Leeds and Liverpool Canal, and with Goole and the Humber by the Aire and Calder Navigation. It is moreover the centre of an important coal and iron district. Though regarded as the capital of the great manufacturing district of the West Riding, Leeds is not in its centre but on its border. Eastward and northward the country is agricultural, but westward and southward lies a mass of manufacturing towns. The characteristic industry is the woollen manufacture. The industry is carried on in a great number of neighbouring townships, but the cloth is commonly finished or dressed in the city itself, this procedure differing from that of the wool manufacturers in Gloucestershire and the west of England, who carry out the entire process in one factory. Formerly much of the business between manufacturer and merchant was transacted in the cloth halls, which formed a kind of market, but merchants now order goods directly from the manufacturers. Artificial silk is important among the textile products. Subsidiary to these leading industries is the production of machine-made clothing, hats and caps. The leather trade of Leeds is the largest in England, though no sole leather is tanned. The supply comes chiefly from British India. Boots and shoes are extensively manufactured. The iron trade in its different branches rivals the woollen trade in wealth, including the casting of metal, and the manufacture of steam engines, steam wagons, steam ploughs, machinery, tools, nails, &c. Leeds was formerly famed for the production of artistic pottery, and specimens of old Leeds ware are highly prized. The industry lapsed about the end of the 18th century, but has been revived in modern times. Minor and less specialized industries are numerous.

The parliamentary borough is divided into five divisions (North, Central, South, East and West), each returning one member. The county borough was created in 1888. Leeds was raised to the rank of a city in 1893. The municipal borough is under a lord mayor (the title was conferred in 1897 on the occasion of Queen Victoria's Diamond Jubilee), 16 aldermen and 48 councillors. Area, 21,572 acres.

Leeds (Loidis, Ledes) is mentioned by Bede as the district where the Northumbrian kings had a royal vill in 627, and where Oswy, king of Northumbria, defeated Penda, king of the Mercians, in 665. Before the Norman Conquest seven thanes held it of Edward the Confessor as seven manors, but William the Conqueror granted the whole to Ilbert de Lacy, and at the time of the Domesday Survey it was held of him by Ralph Paganel, who is said to have raised Leeds castle, possibly on the site of an earlier fortification. In 1207 Maurice Paganel constituted the inhabitants of Leeds free burgesses, granting them the same liberties as Robert de Lacy had granted to Pontefract, including the right of selling burgher land to whom they pleased except to religious houses, and freedom from toll. He also appointed as the chief officer of the town a reeve who was to be chosen by the lord of the manor, the burgesses being " more eligible if only they would pay as much as others for the office." The town was incorporated by Charles I. in 1626 under the title of an alderman, 7 principal burgesses and 24 assistants. A second charter granted by Charles II. in 1661 appointed a mayor, 12 aldermen and 24 assistants, and is still the governing charter of the borough. The woollen manufacture is said to have been introduced into Leeds in the 14th century, and owing to the facilities for trade afforded by its position on the river Aire soon became an important industry. Camden, writing about 1590, says, "Leeds is rendered wealthy by its woollen manufactures," and the incorporation charter of 1626 recites that "the inhabitants have for a long time exercised the art of making cloth." The cloth was then, as it is now, made in the neighbouring villages and only finished and sold in the town. A successful attempt was made in the beginning of the 19th century by Mr William Hirst to introduce goods of a superior quality which were made and finished in his own factory. Other manufacturers followed his example, but their factories are now only used for the finishing process. The worsted trade which was formerly carried on to some extent has now almost disappeared. The spinning of flax by machinery was introduced early in the 19th century by Mr John Marshall, a Holbeck manufacturer, who was one of the first to apply Sir Richard Arkwright's water frame, invented for cotton manufacture, to the spinning of linen yarn. The burgesses were represented in parliament by one member during the Commonwealth, but not again until by the Reform Act of 1832 they were allowed to return two members. In 1867 they were granted an additional member.

See James Wardell, *The Municipal History of the Borough of Leeds* (1846); J. D. Whitaker, *Loidis and Elmete: or an Attempt to illustrate the Districts described in these words by Bede* (1816); D. H. Atkinson, *Ralph Thoresby, the Topographer; his Town (Leeds) and Times* (1885–1887).

LEEK, a market town in the Leek parliamentary division of Staffordshire, England, 157 m. N.W. from London, on the Churnet Valley branch of the North Staffordshire railway. Pop. of urban district (1901) 15,484. The town lies high in a picturesque situation near the head of the river Churnet. The church of St Edward the Confessor is mainly Decorated, and stands in a churchyard commanding a beautiful view from an elevation of some 640 ft. There is here a curious pillar of Danish work ornately carved. An institute contains a free library, lecture hall, art gallery and school of art. A grammar school was established in 1723. In the vicinity are ruins of the Cistercian abbey De la Croix, or Dieulacresse, erected in 1214 by Ralph de Blundevill, earl of Chester. The slight remains are principally embodied in a farm-house. The silk manufacture includes sewing silk, braids, silk buttons, &c. Cloud Hill, rising to 1190 ft. W. of the town, causes a curious phenomenon in the height of summer, the sun sinking behind one flank to reappear beyond the other, and thus appearing to set twice.

Leek (Lee, Leike, Leeke) formed part of the great estates of Ælfgar, earl of Mercia; it escheated to William the Conqueror who held it at the time of the Domesday Survey. Later it passed to the earls Palatine of Chester, remaining in their hands until Ralph de Blundevill, earl of Chester, gave it to the abbey of Dieulacresse, which continued to hold it until its dissolution. The same earl in a charter which he gave to the town (*temp.* John) calls it a borough and grants to his free burgesses various privileges, including freedom from toll throughout Cheshire. These privileges were confirmed by Richard, abbot of Dieulacresse, but the town received no royal charter and failed to establish its burghal position. The Wednesday market which is still held dates from a grant of John to the earl of Chester: in the 17th century it was very considerable. A fair, also granted by John, beginning on the third day before the Translation of Edward the Confessor is still held. The silk manufacture which can be traced to the latter part of the 17th century is thought to have been aided by the settlement in Leek of some Huguenots after the revocation of the Edict of Nantes. In the 17th and 18th centuries the town was famous for its ale. Prince Charles Edward passed through Leek on his march to Derby (1745) and again on his return journey to Scotland. A story in connexion with the Civil Wars is told to explain the expression "Now thus" occurring on the tombstone of a citizen, who by this meaningless answer to all questions sought escape on the plea of insanity.

LEEK, the *Allium Porrum* of botanists, a plant now considered as a mere variety of *Allium Ampeloprasum*, wild leek, produced by cultivation. The plant is probably of Eastern origin, since it was commonly cultivated in Egypt in the time of the Pharaohs, and is so to the present day; while as regards its first appearance in England both Tusser and Gerard—two of the earliest writers on this class of subjects, the former of whom flourished in the early part and the latter in the later part of the 16th century—speak of it as being then commonly cultivated and used.[1] The Romans, it would appear, made great use of the leek for savouring their dishes, as seems proved by the number of recipes for its use referred to by Celsius. Hence it is more than probable that it was brought to England by the Romans. Italy was celebrated for leeks in the time of Pliny (*H.N.* xix. c. 6), according to whom they were brought into great esteem through the emperor Nero, derisively surnamed "Porrophagus," who used to eat them for several days in every month to clear his voice. The leek is very generally cultivated in Great Britain as an esculent, but more especially in Scotland and in Wales, being esteemed as an excellent and wholesome vegetable, with properties very similar to those of the onion, but of a milder character. In America it is not much cultivated except by market gardeners in the neighbourhood of large cities. The whole plant, with the exception of the fibrous roots, is used in soups and stews. The sheathing stalks of the leaves lap over each other, and form a thickish stem-like base, which is blanched, and is the part chiefly preferred. These blanched stems are much employed in French cookery. They form an important ingredient in Scotch winter broth, and particularly in the national dish *cock-a-leekie*, and are also largely used boiled, and served with toasted bread and white sauce, as in the case of asparagus. Leeks are sown in the spring, earlier or later according to the soil and the season, and are planted out for the summer, being dropped into holes made with a stout dibble and left unfilled in order to allow the stems space to swell. When they are thus planted deeply the holes gradually fill up, and the base of the stem becomes blanched and prepared for use, a process aided by drawing up the earth round about the stems as they elongate. The leek is one of the most useful vegetables the cottager can grow, as it will supply him with a large amount of produce during the winter and spring. It is extremely hardy, and presents no difficulty in its cultivation, the chief point, as with all succulent esculents, being that it should be grown quickly upon well-enriched soil. The plant is of biennial duration, flowering the second year, and perishing after perfecting its seeds. The leek is the national symbol or badge of the Welsh, who wear it in their hats on St David's Day. The origin of this custom has received various explanations, all of which are more or less speculative.

LEER, a town and river port in the Prussian province of Hanover, lying in a fertile plain on the right bank of the Leda near its confluence with the Ems, and at the junction of railways to Bremen, Emden and Münster. Pop. (1905) 12,347. The streets are broad, well paved, and adorned with many elegant buildings, among which are Roman Catholic, Lutheran and Calvinist churches, and a new town hall with a tower 165 ft. high. Among its educational establishments are a classical school and a school of navigation. Linen and woollen fabrics, hosiery, paper, cigars, soap, vinegar and earthenware are manufactured, and there are iron-foundries, distilleries, tanneries and shipbuilding yards. Many markets for horses and cattle are held. The transit trade from the regions traversed by the Westphalian and Oldenburg railways is considerable. The principal exports are cattle, horses, cheese, butter, honey, wax, flour, paper, hardware and Westphalian coal. Leer is one of the principal ports for steamboat communication with the North Sea watering-places of Borkum and Norderney. Leer is a very old place, although it only obtained municipal privileges in 1823. Near the town is the Plitenberg, formerly a heathen place of sacrifice.

LEEUWARDEN, the capital of the province of Friesland, Holland, on the canal between Harlingen and Groningen, 33 m. by rail W. of Groningen. Pop (1901) 32,203. It is one of the most prosperous towns in the country. To the name of the Frisian Hague, it is entitled as well by similarity of history as by similarity of appearance. As the Hague grew up round the court of the counts of Holland, so Leeuwarden round the court of the Frisian stadtholders; and, like the Hague, it is an exceptionally clean and attractive town, with parks, pleasure grounds, and drives. The old gates have been somewhat ruthlessly cleared away, and the site of the town walls on the north and west competes with the park called the Prince's Garden as a public pleasure ground. The Prince's Garden was originally laid out by William Frederick of Nassau in 1648, and was presented to the town by King William I. in 1819. The royal palace, which was the seat of the Frisian court from 1603 to 1747, is now the residence of the royal commissioner for Friesland. It was restored in 1816 and contains a portrait gallery of the Frisian stadtholders. The fine mansion called the Kanselary was begun in 1502 as a residence for the chancellor of George of Saxony (1539), governor of Friesland, but was only completed in 1571 and served as a court house until 1811. It was restored at the end of the 19th century to contain the important provincial library and national archives. Other noteworthy buildings are the picturesque weigh-house (1595), the town hall (1715), the provincial courts (1850), and the great church of St Jacob, once the church of the Jacobins, and the largest monastic church in the Netherlands. The splendid tombs of the Frisian stadtholders buried here (Louis of Nassau, Anne of Orange, and others) were destroyed in the revolution 1795. The unfinished tower of Oldehove dates from 1529–1532. The museum of the Frisian Society is of modern foundation and contains a collection of provincial antiquities, including two rooms from Hindeloopen, an ancient village of Friesland, some 16th- and 17th-century portraits, some Frisian works in silver of the 17th and 18th centuries, and a collection of porcelain and faience.

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[1] Tusser, in his verse for the month of March, writes:—

"Now leekes are in season, for pottage ful good,
And spareth the milck cow, and purgeth the blood,
These hauving with peason, for pottage in Lent,
Thou spareth both otemel and bread to be spent."

Leeuwarden is the centre of a flourishing trade, being easily accessible from all parts of the province by road, rail and canal. The chief business is in stock of every kind, dairy and agricultural produce and fresh-water fish, a large quantity of which is exported to France. The industries include boat-building and timber yards, iron-foundries, copper and lead works, furniture, organ, tobacco and other factories, and the manufacture of gold and silver wares. The town is first mentioned in documents of the 13th century.

LEEUWENHOEK, or Leuwenhoek, **ANTHONY VAN** (1632–1723), Dutch microscopist, was born at Delft on the 24th of October 1632. For a short time he was in a merchant's office in Amsterdam, but early devoted himself to the manufacture of microscopes and to the study of the minute structure of organized bodies by their aid. He appears soon to have found that single lenses of very short focus were preferable to the compound microscopes then in use; and it is clear from the discoveries he made with these that they must have been of very excellent quality. His discoveries were for the most part made public in the *Philosophical Transactions* of the Royal Society, to the notice of which body he was introduced by R. de Graaf in 1673, and of which he was elected a fellow in 1680. He was chosen a corresponding member of the Paris Academy of Sciences in 1697. He died at his native place on the 26th of August 1723. Though his researches were not conducted on any definite scientific plan, his powers of careful observation enabled him to make many interesting discoveries in the minute anatomy of man, the higher animals and insects. He confirmed and extended M. Malpighi's demonstration of the blood capillaries in 1668, and six years later he gave the first accurate description of the red blood corpuscles, which he found to be circular in man but oval in frogs and fishes. In 1677 he described and illustrated the spermatozoa in dogs and other animals, though in this discovery Stephen Hamm had anticipated him by a few months; and he investigated the structure of the teeth, crystalline lens, muscle, &c. In 1680 he noticed that yeast consists of minute globular particles, and he described the different structure of the stem in monocotyledonous and dicotyledonous plants.

His researches in the life-history of various of the lower forms of animal life were in opposition to the doctrine that they could be "produced spontaneously, or bred from corruption." Thus he showed that the weevils of granaries, in his time commonly supposed to be bred *from* wheat, as well as *in* it, are grubs hatched from eggs deposited by winged insects. His chapter on the flea, in which he not only describes its structure, but traces out the whole history of its metamorphoses from its first emergence from the egg, is full of interest—not so much for the exactness of his observations, as for its incidental revelation of the extraordinary ignorance then prevalent in regard to the origin and propagation of "this minute and despised creature," which some asserted to be produced from sand, others from dust, others from the dung of pigeons, and others from urine, but which he showed to be "endowed with as great perfection in its kind as any large animal," and proved to breed in the regular way of winged insects. He even noted the fact that the pupa of the flea is sometimes attacked and fed upon by a mite—an observation which suggested the well known lines of Swift. His attention having been drawn to the blighting of the young shoots of fruit-trees, which was commonly attributed to the ants found upon them, he was the first to find the *Aphides* that really do the mischief; and, upon searching into the history of their generation, he observed the young within the bodies of their parents. He carefully studied also the history of the ant and was the first to show that what had been commonly reputed to be "ants' eggs" are really their pupae, containing the perfect insect nearly ready for emersion, whilst the true eggs are far smaller, and give origin to "maggots" or larvae. Of the sea-mussel, again, and other shell-fish, he argued (in reply to a then recent defence of Aristotle's doctrine by F. Buonanni, a learned Jesuit of Rome) that they are not generated out of the mud or sand found on the seashore or the beds of rivers at low water, but from spawn, by the regular course of generation; and he maintained the same to be true of the fresh-water mussel (*Unio*), whose ova he examined so carefully that he saw in them the rotation of the embryo, a phenomenon supposed to have been first discovered long afterwards. In the same spirit he investigated the generation of eels, which were at that time supposed, not only by the ignorant vulgar, but by "respectable and learned men," to be produced from dew without the ordinary process of generation. Not only was he the first discoverer of the rotifers, but he showed "how wonderfully nature has provided for the preservation of their species," by their tolerance of the drying-up of the water they inhabit, and the resistance afforded to the evaporation of the fluids of their bodies by the impermeability of the casing in which they then become enclosed. "We can now easily conceive," he says, "that in all rain-water which is collected from gutters in cisterns, and in all waters exposed to the air, animalcules may be found; for they may be carried thither by the particles of dust blown about by the winds."

Leeuwenhoek's contributions to the *Philosophical Transactions* amounted to one hundred and twelve; he also published twenty-six papers in the *Memoirs of the Paris Academy of Sciences.* Two collections of his works appeared during his life, one in Dutch (Leiden and Delft, 1685–1718), and the other in Latin (*Opera omnia s. Arcana naturae ope exactissimorum microscopiorum selecta*, Leiden, 1715–1722); and a selection from them was translated by S. Hoole and published in English (London, 1798–1781).

LEEWARD ISLANDS, a group in the West Indies. They derive their name from being less exposed to the prevailing N.E. trade wind than the adjacent Windward Islands. They are the most northerly of the Lesser Antilles, and form a curved chain stretching S.W. from Puerto Rico to meet St Lucia, the most northerly of the Windward Islands. They consist of the Virgin Islands, with St Kitts, Antigua, Montserrat, Guadeloupe, Dominica, Martinique and their various dependencies. The Virgin Islands are owned by Great Britain and Denmark, Holland having St Eustatius, with Saba, and part of St Martin. France possesses Guadeloupe, Martinique, St Bartholomew and the remainder of St Martin. The rest of the islands are British, and (with the exception of Sombrero, a small island used only as a lighthouse-station) form, under one governor, a colony divided into five presidencies, namely: Antigua (with Barbuda and Redonda), St Kitts (with Nevis and Anguilla), Dominica, Montserrat and the Virgin Islands. Total pop. (1901) 127,536. There is one federal executive council nominated by the crown, and one federal legislative council—ten nominated and ten elected members. Of the latter, four are chosen by the unofficial members of the local legislative council of Antigua, two by those of Dominica, and four by the non-official members of the local legislative council of St Kitts-Nevis. The federal legislative council meets once annually, usually at St John, Antigua.

LE FANU, JOSEPH SHERIDAN (1814–1873), Irish journalist and author, was born of an old Huguenot family at Dublin on the 28th of August 1814. He entered Trinity College, Dublin, in 1833. At an early age he had given proof of literary talent, and in 1837 he joined the staff of the *Dublin University Magazine*, of which he became later editor and proprietor. In 1837 he produced the Irish ballad *Phaudhrig Croohore*, which was shortly afterwards followed by a second, *Shamus O'Brien*, successfully recited in the United States by Samuel Lover. In 1839 he became proprietor of the *Warder*, a Dublin newspaper, and, after purchasing the *Evening Packet* and a large interest in the *Dublin Evening Mail*, he combined the three papers under the title the *Evening Mail*, a weekly reprint from which was issued as the *Warder*. After the death of his wife in 1858 he lived in retirement, and his best work was produced at this period of his life. He wrote some clever novels, of a sensational order, in which his vigorous imagination and his Irish love of the supernatural have full play. He died in Dublin on the 7th of February 1873. His best-known novels are *The House by the Churchyard* (1863) and *Uncle Silas, a Tale of Bartram Haugh* (1864). *The Purcell Papers*, Irish stories dating from his college days, were edited with a memoir of the author by A. P. Graves in 1880.

LEFEBVRE, PIERRE FRANÇOIS JOSEPH, duke of Danzig (1755–1820), marshal of France, was born at Rouffach in Alsace on the 20th of October 1755. At the outbreak of the Revolution he was a sergeant in the Gardes françaises, and with many of his comrades of this regiment took the popular side. He distinguished himself by bravery and humanity in many of the street fights in Paris, and becoming an officer and again distinguishing himself—this time against foreign invaders—he was made a general of division in 1794. He took part in the Revolutionary Wars from Fleurus to Stokach, always resolute, strictly obedient and calm. At Stokach (1799) he received a severe wound and had to return to France, where he assisted Napoleon during the *coup d'état* of 18 Brumaire. He was one of the first generals of division to be made marshal at the beginning of the First Empire. He commanded the guard infantry at Jena, conducted the siege of Danzig 1806–1807 (from which town he received his title in 1808), commanded a corps in the emperor's campaign of 1808–1809 in Spain, and in 1809 was given the difficult task of commanding the Bavarian contingent, which he led in the containing engagements of Abensberg and Rohr and at the battle of Eckmühl. He commanded the Imperial Guard in Russia, 1812, fought through the last campaign of the Empire, and won fresh glory at Montmirail, Areis-sur-Aube and Champaubert. He was made a peer of France by Louis XVIII. but joined Napoleon during the Hundred Days, and was only amnestied and permitted to resume his seat in the upper chamber in 1819. He died at Paris on the 14th of September 1820. Marshal Lefebvre was a simple soldier, whose qualifications for high rank, great as they were, came from experience and not from native genius. He was incapable of exercising a supreme command, even of leading an important detachment, but he was absolutely trustworthy as a subordinate, as brave as he was experienced, and intensely loyal to his chief. He maintained to the end of his life a rustic simplicity of speech and demeanour. Of his wife (formerly a *blanchisseuse* to the Gardes Françaises) many stories have been told, but in so far as they are to her discredit they seem to be false, she being, like the marshal, a plain "child of the people."

LEFEBVRE, TANNEGUY (TANAQUILLUS FABER) (1615–1672), French classical scholar, was born at Caen. After completing his studies in Paris, he was appointed by Cardinal Richelieu inspector of the printing-press at the Louvre. After Richelieu's death he left Paris, joined the Reformed Church, and in 1651 obtained a professorship at the academy of Saumur, which he filled with great success for nearly twenty years. His increasing ill-health and a certain moral laxity (as shown in his judgment on Sappho) led to a quarrel with the consistory, as a result of which he resigned his professorship. Several universities were eager to obtain his services, and he had accepted a post offered him by the elector palatine at Heidelberg, when he died suddenly on the 12th of September, 1672. One of his children was the famous Madame Dacier. Lefebvre, who was by no means a typical student in dress or manners, was a highly cultivated man and a thorough classical scholar. He brought out editions of various Greek and Latin authors—Longinus, Anacreon and Sappho, Virgil, Horace, Lucretius and many others. His most important original works are: *Les Vies des poètes Grecs* (1665); *Méthode pour commencer les humanités Grecques et Latines* (2nd ed., 1731), of which several English adaptations have appeared; *Epistolae Criticae* (1659).

In addition to the *Mémoires pour . . . la vie de Tanneguy Lefebvre*, by F. Graverol (1686), see the article in the *Nouvelle biographie générale*, based partly on the MS. registers of the Saumur Académie.

LEFEBVRE-DESNOËTTES, CHARLES, COMTE (1773–1822), French cavalry general, joined the army in 1792 and served with the armies of the North, of the Sambre-and-Meuse and Rhine-and-Moselle in the various campaigns of the Revolution. Six years later he had become captain and aide-de-camp to General Bonaparte. At Marengo he won further promotion, and at Austerlitz became colonel, serving also in the Prussian campaigns of 1806–1807. In 1808 he was made general of brigade and created a count of the Empire. Sent with the army into Spain, he conducted the first and unsuccessful siege of Saragossa. The battlefield of Tudela showed his talents to better advantage, but towards the end of 1808 he was taken prisoner in the action of Benavente by the British cavalry under Paget (later Lord Uxbridge, and subsequently Marquis of Anglesey). For over two years he remained a prisoner in England, living on parole at Cheltenham. In 1811 he escaped, and in the invasion of Russia in 1812 was again at the head of his cavalry. In 1813 and 1814 his men distinguished themselves in most of the great battles, especially La Rothière and Montmirail. He joined Napoleon in the Hundred Days and was wounded at Waterloo. For his part in these events he was condemned to death, but he escaped to the United States, and spent the next few years farming in Louisiana. His frequent appeals to Louis XVIII. eventually obtained his permission to return, but the "Albion," the vessel on which he was returning to France, went down off the coast of Ireland with all on board on the 22nd of May 1822.

LE FÈVRE, JEAN (*c.* 1395–1468), Burgundian chronicler and seigneur of Saint Remy, is also known as *Toison d'or* from his long connexion with the order of the Golden Fleece. Of noble birth, he adopted the profession of arms and with other Burgundians fought in the English ranks at Agincourt. In 1430, on the foundation of the order of the Golden Fleece by Philip III. the Good, duke of Burgundy, Le Fèvre was appointed its king of arms and he soon became a very influential person at the Burgundian court. He frequently assisted Philip in conducting negotiations with foreign powers, and he was an arbiter in tournaments and on all questions of chivalry, where his wide knowledge of heraldry was highly useful. He died at Bruges on the 16th of June 1468.

Le Fèvre wrote a *Chronique*, or *Histoire de Charles VI., roy de France*. The greater part of this chronicle is merely a copy of the work of Enguerrand de Monstrelet, but Le Fèvre is an original authority for the years between 1428 and 1436 and makes some valuable additions to our knowledge, especially about the chivalry of the Burgundian court. He is more concise than Monstrelet, but is equally partial to the dukes of Burgundy. The *Chronique* has been edited by F. Morand for the Société de l'histoire de France (Paris, 1876). Le Fèvre is usually regarded as the author of the *Livre des faites de Jacques de Lalaing*.

LEG (a word of Scandinavian origin, from the Old Norwegian *leggr*, cf. Swed. *lägg*, Dan. *laeg*; the O. Eng. word was *sceanca*, shank), the general name for those limbs in animals which support and move the body, and in man for the lower limbs of the body (see ANATOMY, *Superficial and Artistic*; SKELETON, *Appendicular*; MUSCULAR SYSTEM). The word is in common use for many objects which resemble the leg in shape or function. As a slang term, "leg," a shortened form of "blackleg," has been in use since the end of the 18th century for a swindler, especially in connexion with racing or gambling. The term "blackleg" is now also applied by trade-unionists to a workman who, during a strike or lockout, continues working or is brought to take the place of the withdrawn workers.

LEGACY (Lat. *legatum*), in English law, some particular thing or things given or left by a testator in his will, to be paid or performed by his executor or administrator. The word is primarily applicable to gifts of personalty or gifts charged upon real estate; but if there is nothing else to which it can refer it may refer to realty; the proper word, however, for gifts of realty is *devise*.

Legacies may be either specific, general or demonstrative. A *specific legacy* is "something which a testator, identifying it by a sufficient description and manifesting an intention that it should be enjoyed in the state and condition indicated by that description, separates in favour of a particular legatee from the general mass of his personal estate," *e.g.* a gift of "my portrait by X," naming the artist. A *general legacy* is a gift not so distinguished from the general mass of the personal estate, *e.g.* a gift of £100 or of a gold ring. A *demonstrative legacy* partakes of the nature of both the preceding kinds of legacies, *e.g.* a gift of £100 payable out of a named fund is a specific legacy so far as the fund named is available to pay the legacy; after the fund is exhausted the balance of the legacy is a general legacy and recourse must be had to the general estate to satisfy such balance. Sometimes a testator bequeaths two or more legacies to the same person; in such a case it is a question whether the later legacies are in substitution for, or in addition to, the earlier ones. In the latter case they are known as *cumulative*. In each case the intention of the testator is the rule of construction; this can often be gathered from the terms of the will or codicil, but in the absence of such evidence the following rules are followed by the courts. Where the same specific thing is bequeathed twice to the same legatee or where two legacies of equal amount are bequeathed by the same instrument the second bequest is mere repetition; but where legacies of equal amounts are bequeathed by different instruments or of unequal amounts by the same instruments they are considered to be cumulative.

If the estate of the testator is insufficient to satisfy all the legacies these must abate, *i.e.* be reduced rateably; as to this it should be noticed that specific and demonstrative legacies have a prior claim to be paid in full out of the specific fund before general legacies, and that general legacies abate rateably *inter se* in the absence of any provision to the contrary by the testator. Specific legacies are liable to ademption where the specific thing perishes or ceases to belong to the testator, *e.g.* in the instance given above if the testator sells the portrait the legatee will get nothing by virtue of the legacy. As a general rule, legacies given to persons who predecease the testator do not take effect; they are said to lapse. This is so even if the gift be to A and his executors, administrators and assigns, but this is not so if the testator has shown a contrary intention, thus, a gift to A *or* his personal representative will be effective even though A predecease the testator; further, by the Wills Act 1837, devises of estates tail and gifts to a child or other issue of the testator will not lapse if any issue of the legatee survive the testator. Lapsed legacies fall into and form part of the residuary estate. In the absence of any indication to the contrary a legacy becomes due on the day of the death of the testator, though for the convenience of the executor it is not payable till a year after that date; this delay does not prevent the legacy vesting on the testator's death. It frequently happens, however, that a legacy is given payable at a future date; in such a case, if the legatee dies after the testator but prior to the date when the legacy is payable it is necessary to discover whether the legacy was vested or contingent, as in the former case it becomes payable to the legatee's representative; in the latter, it lapses. In this, as in other cases, the test is the intention of the testator as expressed in the will; generally it may be said that a gift "payable" or "to be paid" at a certain fixed time confers a vested interest on the legatee, while a gift to A "at" a fixed time, *e.g.* twenty-one years of age, only confers on A an interest contingent on his attaining the age of twenty-one.

Legacy Duty is a duty charged by the state upon personal property devolving upon the legatees or next of kin of a dead person, either by virtue of his will or upon his intestacy. The duty was first imposed in England in 1780, but the principal act dealing with the subject is the Legacy Duty Act 1796. The principal points as to the duty are these. The duty is charged on personalty only. It is payable only where the person on whose death the property passes was domiciled in the United Kingdom. The rate of duty varies from 1 to 10% according to the relationship between the testator and legatee. As between husband and wife no duty is payable. The duty is payable by the executors and deducted from the legacy unless the testator directs otherwise. Special provisions as to valuation are in force where the gift is of an annuity or is settled on various persons in succession, or the legacy is given in joint tenancy and other cases. In some cases the duty is payable by instalments which carry interest at 3%. In various cases legacies are exempt from duty—the more important are gifts to a member of the royal family, specific legacies under £20 (pecuniary legacies under £20 pay duty), legacies of books, prints, &c., given to a body corporate for preservation, not for sale, and legacies given out of an estate the principal value of which is less than £100. Further, by the Finance Act 1894, payment of the estate duty thereby created absorbs the 1% duty paid by lineal ancestors or descendants of the deceased[1] and the duty on a settled legacy, and, lastly, in the event of estate duty being paid on an estate the total value of which is under £1000, no legacy duty is payable. The legacy duty payable in Ireland is now for all practical purposes assimilated to that in Great Britain. The principal statute in that country is an act of 1814.

LE GALLIENNE, RICHARD (1866–), English poet and critic, was born in Liverpool on the 20th of January 1866. He started life in a business office in Liverpool, but abandoned this to turn author. *My Lady's Sonnets* appeared at Liverpool in 1887, and in 1889 he became for a short time literary secretary to Wilson Barrett. In the same year he published *Volumes in Folio*, *The Book Bills of Narcissus* and *George Meredith: some Characteristics* (new ed., 1900). He joined the staff of the *Star* in 1891, and wrote for various papers over the signature of "Logroller." *English Poems* (1892), *R. L. Stevenson and other Poems* (1895), a paraphrase (1897) of the *Rubáiyát* of Omar Khayyâm, and *Odes from the Divan of Hafiz* (1903), contained some light, graceful verse, but he is best known by the fantastic prose essays and sketches of *Prose Fancies* (2 series, 1894–1896), *Sleeping Beauty and other Prose Fancies* (1900), *The Religion of a Literary Man* (1893), *The Quest of the Golden Girl* (1897), *The Life Romantic* (1901), &c. His first wife, Mildred Lee, died in 1894, and in 1897 he married Julie Norregard, subsequently taking up his residence in the United States. In 1906 he translated, from the Danish, Peter Nansen's *Love's Trilogy*.

LEGARÉ, HUGH SWINTON (1797–1843), American lawyer and statesman, was born in Charleston, South Carolina, on the 2nd of January 1797, of Huguenot and Scotch stock. Partly on account of his inability to share in the amusements of his fellows by reason of a deformity due to vaccine poisoning before he was five (the poison permanently arresting the growth and development of his legs), he was an eager student, and in 1814 he graduated at the College of South Carolina with the highest rank in his class and with a reputation throughout the state for scholarship and eloquence. He studied law for three years in South Carolina, and then spent two years abroad, studying French and Italian in Paris and jurisprudence at Edinburgh. In 1820–1822 and in 1824–1830 he was a member of the South Carolina legislature. In 1827, with Stephen Elliott (1771–1830), the naturalist, he founded the *Southern Review*, of which he was the sole editor after Elliott's death until 1834, when it was discontinued, and to which he contributed articles on law, travel, and modern and classical literature. In 1830–1832 he was attorney-general of South Carolina, and, although a State's Rights man, he strongly opposed nullification. During his term of office he appeared in a case before the United States Supreme Court, where his knowledge of civil law so strongly impressed Edward Livingston, the secretary of state, who was himself an admirer of Roman Law, that he urged Legaré to devote himself to the study of this subject with the hope that he might influence American law toward the spirit and philosophy and even the forms and processes of Roman jurisprudence.

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[1] The Finance Bill 1909–1910 re-imposed this duty, and extended it to husbands and wives as well as descendants and ancestors.

Through Livingston, Legaré was appointed American *chargé d'affaires* at Brussels, where from 1833 to 1836 he perfected himself in civil law and in the German commentaries on civil law. In 1837–1839, as a Union Democrat, he was a member of the national House of Representatives, and there ably opposed Van Buren's financial policy in spite of the enthusiasm in South Carolina for the sub-treasury project. He supported Harrison in the presidential campaign of 1840, and when the cabinet was reconstructed by Tyler in 1841, Legaré was appointed attorney-general of the United States. On the 9th of May 1843 he was appointed secretary of state *ad interim*, after the resignation of Daniel Webster. On the 20th of June 1843 he died suddenly at Boston. His great work, the forcing into common law of the principles of civil law, was unaccomplished; but Story says "he seemed about to accomplish [it]; for his arguments before the Supreme Court were crowded with the principles of the Roman Law, wrought into the texture of the Common Law with great success." As attorney-general he argued the famous cases, the *United States* v. *Miranda*, *Wood* v. *the United States*, and *Jewell* v. *Jewell*.

See *The Writings of Hugh Swinton Legaré* (2 vols., Charleston, S.C., 1846), edited by his sister, Mrs Mary Bullen, who contributed a biographical sketch; and two articles by B. J. Ramage in *The Sewanee Review*, vol. x. (New York, 1902).

LEGAS, one of the Shangalla group of tribes, regarded as among the purest types of the Galla race. They occupy the upper Yabus valley, S.W. Abyssinia, near the Sudan frontier. The Legas are physically distinct from the Negro Shangalla. They are of very light complexion, tall and thin, with narrow hollow-cheeked faces, small heads and high foreheads. The chiefs' families are of more mixed blood, with perceptible Negro strain. The Legas are estimated to number upwards of a hundred thousand, of whom some 20,000 are warriors. They are, however, a peaceful race, kind to their women and slaves, and energetic agriculturists. Formerly independent, they came about 1900 under the sway of Abyssinia. The Legas are pagans, but Mahommedanism has gained many converts among them.

LEGATE, BARTHOLOMEW (*c.* 1575–1612), English fanatic, was born in Essex and became a dealer in cloth. About the beginning of the 17th century he became a preacher among a sect called the "Seekers," and appears to have held unorthodox opinions about the divinity of Jesus Christ. Together with his brother Thomas he was put in prison for heresy in 1611. Thomas died in Newgate gaol, London, but Bartholomew's imprisonment was not a rigorous one. James I. argued with him, and on several occasions he was brought before the Consistory Court of London, but without any definite result. Eventually, after having threatened to bring an action for wrongful imprisonment, Legate was tried before a full Consistory Court in February 1612, was found guilty of heresy, and was delivered to the secular authorities for punishment. Refusing to retract his opinions he was burned to death at Smithfield on the 18th of March 1612. Legate was the last person burned in London for his religious opinions, and Edward Wightman, who was burned at Lichfield in April 1612, was the last to suffer in this way in England.

See T. Fuller, *Church History of Britain* (1655); and S. R. Gardiner, *History of England*, vol. ii. (London, 1904).

LEGATE (Lat. *legatus*, past part. of *legare*, to send as deputy), a title now generally confined to the highest class of diplomatic representatives of the pope, though still occasionally used, in its original Latin sense, of any ambassador or diplomatic agent. According to the *Nova Compilatio Decretalium* of Gregory IX., under the title "De officio legati" the canon law recognizes two sorts of legate, the *legatus natus* and the *legatus datus* or *missus*. The *legatus datus* (*missus*) may be either (1) *delegatus*, or (2) *nuncius apostolicus*, or (3) *legatus a latere* (*lateralis*, *collateralis*). The rights of the *legatus natus*, which included concurrent jurisdiction with that of all the bishops within his province, have been much curtailed since the 16th century; they were altogether suspended in presence of the higher claims of a *legatus a latere*, and the title is now almost quite honorary. It was attached to the see of Canterbury till the Reformation and it still attaches to the sees of Seville, Toledo, Arles, Reims, Lyons, Gran, Prague, Gnesen-Posen, Cologne, Salzburg, among others. The commission of the *legatus delegatus* (generally a member of the local clergy) is of a limited nature, and relates only to some definite piece of work. The *nuncius apostolicus* (who has the privilege of red apparel, a white horse and golden spurs) possesses ordinary jurisdiction within the province to which he has been sent, but his powers otherwise are restricted by the terms of his mandate. The *legatus a latere* (almost invariably a cardinal, though the power can be conferred on other prelates) is in the fullest sense the plenipotentiary representative of the pope, and possesses the high prerogative implied in the words of Gregory VII., "nostra vice quae corrigenda sunt corrigat, quae statuend constituat." He has the power of suspending all the bishops in his province, and no judicial cases are reserved from his judgment. Without special mandate, however, he cannot depose bishops or unite or separate bishoprics. At present *legati a latere* are not sent by the holy see, but diplomatic relations, where they exist, are maintained by means of nuncios, internuncios and other agents.

The history of the office of papal legate is closely involved with that of the papacy itself. If it were proved that papal legates exercised the prerogatives of the primacy in the early councils, it would be one of the strongest points for the Roman Catholic view of the papal history. Thus it is claimed that Hosius of Cordova presided over the council of Nicaea (325) in the name of the pope. But the claim rests on slender evidence, since the first source in which Hosius is referred to as representative of the pope is Gelasius of Cyzicus in the Propontis, who wrote toward the end of the 5th century. It is even open to dispute whether Hosius was president at Nicaea, and though he certainly presided over the council of Sardica in 343, it was probably as representative of the emperors Constans and Constantius, who had summoned the council. Pope Julius I. was represented at Sardica by two presbyters. Yet the fifth canon, which provides for appeal by a bishop to Rome, sanctions the use of embassies *a latere*. If the appellant wishes the pope to send priests from his own household, the pope shall be free to do so, and to furnish them with full authority from himself ("ut de latere suo presbyteros mittat . . . habentes ejus auctoritatem a quo destinati sunt"). The decrees of Sardica, an obscure council, were later confused with those of Nicaea and thus gained weight. In the synod of Ephesus in 431, Pope Celestine I. instructed his representatives to conduct themselves not as disputants but as judges, and Cyril of Alexandria presided not only in his own name but in that of the pope (and of the bishop of Jerusalem). Instances of delegation of the papal authority in various degrees become numerous in the 5th century, especially during the pontificate of Leo I. Thus Leo writes in 444 (*Ep.* 6) to Anastasius of Thessalonica, appointing him his vicar for the province of Illyria; the same arrangement, he informs us, had been made by Pope Siricius in favour of Anysius, the predecessor of Anastasius. Similar vicarial or legatine powers had been conferred in 418 by Zosimus upon Patroclus, bishop of Arles. In 449 Leo was represented at the "Robber Synod," from which his legates hardly escaped with life; at Chalcedon, in 451, they were treated with singular honour, though the imperial commissioners presided. Again, in 453 the same pope writes to the empress Pulcheria, naming Julianus of Cos as his representative in the defence of the interests of orthodoxy and ecclesiastical discipline at Constantinople (*Ep.* 112); the instructions to Julianus are given in *Ep.* 113 ("hanc specialem curam vice mea functus assumas"). The designation of Anastasius as vicar apostolic over Illyria may be said to mark the beginning of the custom of conferring, *ex officio*, the title of *legatus* upon the holders of important sees, who ultimately came to be known as *legati nati*, with the rank of primate; the appointment of Julianus at Constantinople gradually developed into the long permanent office of *apocrisiarius* or *responsalis*. Another sort of delegation is exemplified in Leo's letter to the African bishops (*Ep.* 12), in which he sends Potentius, with instructions to inquire in his name, and to report ("vicem curae nostrae fratri et consacerdoti nostro Potentio delegantes qui de episcopis, quorum culpabilis ferebatur electio, quid veritas haberet inquireret, nobisque omnia fideliter indicaret"). Passing on to the time of Gregory the Great, we find him sending two representatives to Gaul in 599, to suppress simony, and one to Spain in 603. Augustine of Canterbury is sometimes spoken of as legate, but it does not appear that in his case this title was used in any strictly technical sense, although the archbishop of Canterbury afterwards attained the permanent dignity of a *legatus natus*. Boniface, the apostle of Germany, was in like manner constituted, according to Hincmar (*Ep.* 30), a legate of the apostolic see by Popes Gregory II. and Gregory III. According to Hefele (*Conc.* iv. 239), Rodoald of Porto and Zecharias of Anagni, who were sent by Pope Nicolas to Constantinople in 860, were the first actually called *legati a latere*. The policy of Gregory VII. naturally led to a great development of the legatine as distinguished from the ordinary episcopal function. From the creation of the medieval papal monarchy until the close of the middle ages, the papal legate played a most important rôle in national as well as church history. The further definition of his powers proceeded throughout the 12th and 13th centuries. From the 16th century legates *a latere* give way almost entirely to nuncios (*q.v.*).

See P. Hinschius, *Kirchenrecht*, i. 498 ff.; G. Phillips, *Kirchenrecht*, vol. vi. 680 ff.

LEGATION (Lat. *legatio*, a sending or mission), a diplomatic mission of the second rank. The term is also applied to the building in which the minister resides and to the area round it covered by his diplomatic immunities. See DIPLOMACY.

LEGEND (through the French from the med. Lat. *legenda*, things to be read, from *legere*, to read), in its primary meaning the history or life-story of a saint, and so applied to portions of Scripture and selections from the lives of the saints as read at divine service. The statute of 3 and 4 Edward VI. dealing with the abolition of certain books and images (1549), cap. 10, sect. 1, says that "all bookes . . . called processionalles, manuelles, *legends* . . . shall be . . . abolished." The "Golden Legend," or *Aurea Legenda*, was the name given to a book containing lives of the saints and descriptions of festivals, written by Jacobus de Voragine, archbishop of Genoa, in the 13th century. From the original application of the word to stories of the saints containing wonders and miracles, the word came to be applied to a story handed down without any foundation in history, but popularly believed to be true. "Legend" is also used of a writing, inscription, or motto on coins or medals, and in connexion with coats of arms, shields, monuments, &c.

LEGENDRE, ADRIEN MARIE (1752–1833), French mathematician, was born at Paris (or, according to some accounts, at Toulouse) in 1752. He was brought up at Paris, where he completed his studies at the *Collège Mazarin*. His first published writings consist of articles forming part of the *Traité de mécanique* (1774) of the Abbé Marie, who was his professor; Legendre's name, however, is not mentioned. Soon afterwards he was appointed professor of mathematics in the *École Militaire* at Paris, and he was afterwards professor in the *École Normale*. In 1782 he received the prize from the Berlin Academy for his "Dissertation sur la question de balistique," a memoir relating to the paths of projectiles in resisting media. He also, about this time, wrote his "Recherches sur la figure des planètes," published in the *Mémoires* of the French Academy, of which he was elected a member in succession to J. le Rond d'Alembert in 1783. He was also appointed a commissioner for connecting geodetically Paris and Greenwich, his colleagues being P. F. A. Méchain and C. F. Cassini de Thury; General William Roy conducted the operations on behalf of England. The French observations were published in 1792 (*Exposé des opérations faites en France in 1787 pour la jonction des observatoires de Paris et de Greenwich*). During the Revolution, he was one of the three members of the council established to introduce the decimal system, and he was also a member of the commission appointed to determine the length of the metre, for which purpose the calculations, &c., connected with the arc of the meridian from Barcelona to Dunkirk were revised. He was also associated with G. C. F. M. Prony (1755–1839) in the formation of the great French tables of logarithms of numbers, sines, and tangents, and natural sines, called the *Tables du Cadastre*, in which the quadrant was divided centesimally; these tables have never been published (see LOGARITHMS). He was examiner in the *École Polytechnique*, but held few important state offices. He died at Paris on the 10th of January 1833, and the discourse at his grave was pronounced by S. D. Poisson. The last of the three supplements to his *Traité des fonctions elliptiques* was published in 1832, and Poisson in his funeral oration remarked: "M. Legendre a eu cela de commun avec la plupart des géomètres qui l'ont précédé, que ses travaux n'ont fini qu'avec sa vie. Le dernier volume de nos mémoires renferme encore un mémoire de lui, sur une question difficile de la théorie des nombres; et peu de temps avant la maladie qui l'a conduit au tombeau, il se procura les observations les plus récentes des comètes à courtes périodes, dont il allait se servir pour appliquer et perfectionner ses méthodes."

It will be convenient, in giving an account of his writings, to consider them under the different subjects which are especially associated with his name.

Elliptic Functions.—This is the subject with which Legendre's name will always be most closely connected, and his researches upon it extend over a period of more than forty years. His first published writings upon the subject consist of two papers in the *Mémoires de l'Académie Française* for 1786 upon elliptic arcs. In 1792 he presented to the Academy a memoir on elliptic transcendents. The contents of these memoirs are included in the first volume of his *Exercices de calcul intégral* (1811). The third volume (1816) contains the very elaborate and now well-known tables of the elliptic integrals which were calculated by Legendre himself, with an account of the mode of their construction. In 1827 appeared the *Traité des fonctions elliptiques* (2 vols., the first dated 1825, the second 1826); a great part of the first volume agrees very closely with the contents of the *Exercices*; the tables, &c., are given in the second volume. Three supplements, relating to the researches of N. H. Abel and C. G. J. Jacobi, were published in 1828–1832, and form a third volume. Legendre had pursued the subject which would now be called elliptic integrals alone from 1786 to 1827, the results of his labours having been almost entirely neglected by his contemporaries, but his work had scarcely appeared in 1827 when the discoveries which were independently made by the two young and as yet unknown mathematicians Abel and Jacobi placed the subject on a new basis, and revolutionized it completely. The readiness with which Legendre, who was then seventy-six years of age, welcomed these important researches, that quite overshadowed his own, and included them in successive supplements to his work, does the highest honour to him (see FUNCTION).

Eulerian Integrals and Integral Calculus.—The *Exercices de calcul intégral* consist of three volumes, a great portion of the first and the whole of the third being devoted to elliptic functions. The remainder of the first volume relates to the Eulerian integrals and to quadratures. The second volume (1817) relates to the Eulerian integrals, and to various integrals and series, developments, mechanical problems, &c., connected with the integral calculus; this volume contains also a numerical table of the values of the gamma function. The latter portion of the second volume of the *Traité des fonctions elliptiques* (1826) is also devoted to the Eulerian integrals, the table being reproduced. Legendre's researches connected with the "gamma function" are of importance, and are well known; the subject was also treated by K. F. Gauss in his memoir *Disquisitiones generales circa series infinitas* (1816), but in a very different manner. The results given in the second volume of the *Exercices* are of too miscellaneous a character to admit of being briefly described. In 1788 Legendre published a memoir on double integrals, and in 1809 one on definite integrals.

Theory of Numbers.—Legendre's *Théorie des nombres* and Gauss's *Disquisitiones arithmeticae* (1801) are still standard works upon this subject. The first edition of the former appeared in 1798 under the title *Essai sur la théorie des nombres*; there was a second edition in 1808; a first supplement was published in 1816, and a second in 1825. The third edition, under the title *Théorie des nombres*, appeared in 1830 in two volumes. The fourth edition appeared in 1900. To Legendre is due the theorem known as the law of quadratic reciprocity, the most important general result in the science of numbers which has been discovered since the time of P. de Fermat, and which was called by Gauss the "gem of arithmetic." It was first given by Legendre in the *Mémoires* of the Academy for 1785, but the demonstration that accompanied it was incomplete. The symbol (a/p) which is known as Legendre's symbol, and denotes the positive or negative unit which is the remainder when $a^{\frac{1}{2}p(-1)}$ is divided by a prime number p, does not appear in this memoir, but was first used in the *Essai sur la théorie des nombres*. Legendre's formula $x : (\log x - 1{\cdot}08366)$ for the approximate number of forms inferior to a given number x was first given by him also in this work (2nd ed., p. 394) (see NUMBER).

Attractions of Ellipsoids.—Legendre was the author of four important memoirs on this subject. In the first of these, entitled "Recherches sur l'attraction des sphéroides homogènes," published in the *Mémoires* of the Academy for 1785, but communicated to it at an earlier period, Legendre introduces the celebrated expressions which, though frequently called Laplace's coefficients, are more correctly named after Legendre. The definition of the coefficients is that if $(1-2h\cos\phi+h^2)^{-\frac{1}{2}}$ be expanded in ascending powers of h, and if the general term be denoted by P_nh^n, then P_n is of the Legendrian coefficient of the nth order. In this memoir also the function which is now called the potential was, at the suggestion of Laplace, first introduced. Legendre shows that Maclaurin's theorem with respect to confocal ellipsoids is true for any position of the external point when the ellipsoids are solids of revolution. Of this memoir Isaac Todhunter writes: "We may affirm that no single memoir in the history of our subject can rival this in interest and importance. During forty years the resources of analysis, even in the hands of d'Alembert, Lagrange and Laplace, had not carried the theory of the attraction of ellipsoids beyond the point which the geometry of Maclaurin had reached. The introduction of the coefficients now called Laplace's, and their application, commence a new era in mathematical physics." Legendre's second memoir was communicated to the *Académie* in 1784, and relates to the conditions of equilibrium of a mass of rotating fluid in the form of a figure of revolution which does not deviate much from a sphere. The third memoir relates to Laplace's theorem respecting confocal ellipsoids. Of the fourth memoir Todhunter writes: "It occupies an important position in the history of our subject. The most striking addition which is here made to previous researches consists in the treatment of a planet supposed entirely fluid; the general equation for the form of a stratum is given for the first time and discussed. For the first time we have a correct and convenient expression for Laplace's nth coefficient." (See Todhunter's *History of the Mathematical Theories of Attraction and the Figure of the Earth* (1873), the twentieth, twenty-second, twenty-fourth, and twenty-fifth chapters of which contain a full and complete account of Legendre's four memoirs. See also SPHERICAL HARMONICS.)

Geodesy.—Besides the work upon the geodetical operations connecting Paris and Greenwich, of which Legendre was one of the authors, he published in the *Mémoires de l'Académie* for 1787 two papers on trigonometrical operations depending upon the figure of the earth, containing many theorems relating to this subject. The best known of these, which is called Legendre's theorem, is usually given in treatises on spherical trigonometry; by means of it a small spherical triangle may be treated as a plane triangle, certain corrections being applied to the angles. Legendre was also the author of a memoir upon triangles drawn upon a spheroid. Legendre's theorem is a fundamental one in geodesy, and his contributions to the subject are of the greatest importance.

Method of Least Squares.—In 1806 appeared Legendre's *Nouvelles Méthodes pour la détermination des orbites des comètes*, which is memorable as containing the first published suggestion of the method of least squares (see PROBABILITY). In the preface Legendre remarks: "La méthode qui me paroît la plus simple et la plus générale consiste à rendre minimum la somme des quarrés des erreurs, . . . et que j'appelle méthode des moindres quarrés"; and in an appendix in which the application of the method is explained his words are: "De tous les principes qu'on peut proposer pour cet objet, je pense qu'il n'en est pas de plus général, de plus exact, ni d'une application plus facile que celui dont nous avons fait usage dans les recherches précédentes, et qui consiste à rendre minimum la somme des quarrés des erreurs." The method was proposed by Legendre only as a convenient process for treating observations, without reference to the theory of probability. It had, however, been applied by Gauss as early as 1795, and the method was fully explained, and the law of facility for the first time given by him in 1809. Laplace also justified the method by means of the principles of the theory of probability; and this led Legendre to republish the part of his *Nouvelles Méthodes* which related to it in the *Mémoires de l'Académie* for 1810. Thus, although the method of least squares was first formally proposed by Legendre, the theory and algorithm and mathematical foundation of the process are due to Gauss and Laplace. Legendre published two supplements to his *Nouvelles Méthodes* in 1806 and 1820.

The Elements of Geometry.—Legendre's name is most widely known on account of his *Eléments de géometrie*, the most successful of the numerous attempts that have been made to supersede Euclid as a text-book on geometry. It first appeared in 1794, and went through very many editions, and has been translated into almost all languages. An English translation, by Sir David Brewster, from the eleventh French edition, was published in 1823, and is well known in England. The earlier editions did not contain the trigonometry. In one of the notes Legendre gives a proof of the irrationality of π. This had been first proved by J. H. Lambert in the Berlin *Memoirs* for 1768. Legendre's proof is similar in principle to Lambert's, but much simpler. On account of the objections urged against the treatment of parallels in this work, Legendre was induced to publish in 1803 his *Nouvelle Théorie des parallèles.* His *Géométrie* gave rise in England also to a lengthened discussion on the difficult question of the treatment of the theory of parallels.

It will thus be seen that Legendre's works have placed him in the very foremost rank in the widely distinct subjects of elliptic functions, theory of numbers, attractions, and geodesy, and have given him a conspicuous position in connexion with the integral calculus and other branches of mathematics. He published a memoir on the integration of partial differential equations and a few others which have not been noticed above, but they relate to subjects with which his name is not especially associated. A good account of the principal works of Legendre is given in the *Bibliothèque universelle de Genève* for 1833, pp. 45-82.

See Élie de Beaumont, "Memoir de Legendre," translated by C. A. Alexander, *Smithsonian Report* (1874). (J. W. L. G.)

LEGENDRE, LOUIS (1752–1797), French revolutionist, was born at Versailles on the 22nd of May 1752. When the Revolution broke out, he kept a butcher's shop in Paris, in the rue des Boucheries St Germain. He was an ardent supporter of the ideas of the Revolution, a member of the Jacobin Club, and one of the founders of the club of the Cordeliers. In spite of the incorrectness of his diction, he was gifted with a genuine eloquence, and well knew how to carry the populace with him. He was a prominent actor in the taking of the Bastille (14th of July 1789), in the massacre of the Champ de Mars (July 1791), and in the attack on the Tuileries (10th of August 1792). Deputy from Paris to the Convention, he voted for the death of Louis XVI., and was sent on mission to Lyons (27th of February 1793) before the revolt of that town, and was on mission from August to October 1793 in Seine-Inférieure. He was a member of the *Comité de Sûreté Générale*, and contributed to the downfall of the Girondists. When Danton was arrested, Legendre at first defended him, but was soon cowed and withdrew his defence. After the fall of Robespierre, Legendre took part in the reactionary movement, undertook the closing of the Jacobin Club, was elected president of the Convention, and helped to bring about the impeachment of J. B. Carrier, the perpetrator of the *noyades* of Nantes. He was subsequently elected a member of the Council of Ancients, and died on the 13th of December 1797.

See F. A. Aulard, *Les Orateurs de la Législative et de la Convention* (2nd ed., Paris, 1906, 2 vols.); "Correspondance de Legendre" in the *Révolution française* (vol. xl., 1901).

LEGERDEMAIN (Fr. *léger-de-main*, *i.e.* light or sleight of hand), the name given specifically to that form of conjuring in which the performer relies on dexterity of manipulation rather than on mechanical apparatus. See CONJURING.

LEGGE, afterwards BILSON-LEGGE, **HENRY** (1708–1764), English statesman, fourth son of William Legge, 1st earl of Dartmouth (1672–1750), was born on the 29th of May 1708. Educated at Christ Church, Oxford, he became private secretary to Sir Robert Walpole, and in 1739 was appointed secretary of Ireland by the lord-lieutenant, the 3rd duke of Devonshire; being chosen member of parliament for the borough of East Looe in 1740, and for Orford, Suffolk, at the general election in the succeeding year. Legge only shared temporarily in the downfall of Walpole, and became in quick succession surveyor-general of woods and forests, a lord of the admiralty, and a lord of the treasury. In 1748 he was sent as envoy extraordinary to Frederick the Great, and although his conduct in Berlin was sharply censured by George II., he became treasurer of the navy soon after his return to England. In April 1754 he joined the ministry of the duke of Newcastle as chancellor of the exchequer, the king consenting to this appointment although refusing to hold any intercourse with the minister; but Legge shared the elder Pitt's dislike of the policy of paying subsidies to the landgrave of Hesse, and was dismissed from office in November 1755. Twleve months later he returned to his post at the exchequer in the administration of Pitt and the 4th duke of Devonshire, retaining office until April 1757 when he shared both the dismissal and the ensuing popularity of Pitt. When in conjunction with the duke of Newcastle Pitt returned to power in the following July, Legge became chancellor of the exchequer for the third time. He imposed new taxes upon houses and windows, and he appears to have lost to some extent the friendship of Pitt, while the king refused to make him a peer. In 1759 he obtained the sinecure position of surveyor of the petty customs and subsidies in the port of London, and having in consequence to resign his seat in parliament he was chosen one of the members for

Hampshire, a proceeding which greatly incensed the earl of Bute, who desired this seat for one of his friends. Having thus incurred Bute's displeasure Legge was again dismissed from the exchequer in March 1761, but he continued to take part in parliamentary debates until his death at Tunbridge Wells on the 23rd of August 1764. Legge appears to have been a capable financier, but the position of chancellor of the exchequer was not at that time a cabinet office. He took the additional name of Bilson on succeeding to the estates of a relative, Thomas Bettersworth Bilson, in 1754. Pitt called Legge, "the child, and deservedly the favourite child, of the Whigs." Horace Walpole said he was "of a creeping, underhand nature, and aspired to the lion's place by the manœuvre of the mole," but afterwards he spoke in high terms of his talents. Legge married Mary, daughter and heiress of Edward, 4th and last Baron Stawel (d. 1755). This lady, who in 1760 was created Baroness Stawel of Somerton, bore him an only child, Henry Stawel Bilson-Legge (1757–1820), who became Baron Stawel on his mother's death in 1780. When Stawel died without sons his title became extinct. His only daughter, Mary (d. 1864), married John Dutton, 2nd Baron Sherborne.

See John Butler, bishop of Hereford, *Some Account of the Character of the late Rt. Hon. H. Bilson-Legge* (1765); Horace Walpole, *Memoirs of the Reign of George II.* (London, 1847); and *Memoirs of the Reign of George III.*, edited by G. F. R. Barker (London, 1894); W. E. H. Lecky, *History of England*, vol. ii. (London, 1892); and the memoirs and collections of correspondence of the time.

LEGGE, JAMES (1815–1897), British Chinese scholar, was born at Huntly, Aberdeenshire, in 1815, and educated at King's College, Aberdeen. After studying at the Highbury Theological College, London, he went in 1839 as a missionary to the Chinese, but, as China was not yet open to Europeans, he remained at Malacca three years, in charge of the Anglo-Chinese College there. The College was subsequently moved to Hong-Kong, where Legge lived for thirty years. Impressed with the necessity of missionaries being able to comprehend the ideas and culture of the Chinese, he began in 1841 a translation in many volumes of the Chinese classics, a monumental task admirably executed and completed a few years before his death. In 1870 he was made an LL.D. of Aberdeen and in 1884 of Edinburgh University. In 1875 several gentlemen connected with the China trade suggested to the university of Oxford a Chair of Chinese Language and Literature to be occupied by Dr Legge. The university responded liberally, Corpus Christi College contributed the emoluments of a fellowship, and the chair was constituted in 1876. In addition to his other work Legge wrote *The Life and Teaching of Confucius* (1867); *The Life and Teaching of Mencius* (1875); *The Religions of China* (1880); and other books on Chinese literature and religion. He died at Oxford on the 29th of November 1897.

LEGHORN (Ital. *Livorno*, Fr. *Livourne*), a city of Tuscany, Italy, chief town of the province of the same name, which consists of the commune of Leghorn and the islands of Elba and Gorgona. The town is the seat of a bishopric and of a large naval academy—the only one in Italy—and the third largest commercial port in the kingdom, situated on the west coast, 12 m. S.W. of Pisa by rail, 10 ft. above sea-level. Pop. (1901) 78,308 (town), 96,528 (commune). It is built along the seashore upon a healthy and fertile tract of land, which forms, as it were, an oasis in a zone of Maremma. Behind is a range of hills, the most conspicuous of which, the Monte Nero, is crowned by a frequented pilgrimage church and also by villas and hotels, to which a funicular railway runs. The town itself is almost entirely modern. The 16th-century Fortezza Vecchia, guarding the harbour, is picturesque, and there is a good bronze statue of the grand duke Ferdinand I. by Pietro Tacca (1577–1640), a pupil of Giovanni da Bologna. The lofty Torre del Marzocco, erected in 1423 by the Florentines, is fine. The façade of the cathedral was designed by Inigo Jones. The old Protestant cemetery contains the tombs of Tobias Smollett (d. 1771) and Francis Horner (d. 1817). There is also a large synagogue founded in 1581. The exchange, the chamber of commerce and the clearing-house (one of the oldest in the world, dating from 1764) are united under one roof in the Palazzo del Commercio, opened in 1907. Several improvements have been carried out in the city and port, and the place is developing rapidly as an industrial centre. The naval academy, formerly established partly at Naples and partly at Genoa, has been transferred to Leghorn. Some of the navigable canals which connected the harbour with the interior of the city have been either modified or filled up. Several streets have been widened, and a road along the shore has been transformed into a fine and shady promenade. Leghorn is the principal sea-bathing resort in this part of Italy, the season lasting from the end of June to the end of August. A spa for the use of the Acque della Salute has been constructed. Leghorn is on the main line from Pisa to Rome; another line runs to Colle Salvetti. A considerable number of important steamship lines call here. The new rectilinear mole, sanctioned in 1881, has been built out into the sea for a distance of 600 yds. from the old Vegliaia lighthouse, and the docking basin has been lengthened to 490 ft. Inside the breakwater the depth varies from 10 to 26 ft. The total trade of the port increased from £3,853,593 in 1897 to £5,675,285 in 1905 and £7,009,758 in 1906 (the large increase being mainly due to a rise of over £1,000,000 in imports—mainly of coal, building materials and machinery), the average ratio of imports to exports being as three to two. The imports consist principally of machinery, coal, grain, dried fish, tobacco and hides, and the exports of hemp, hides, olive oil, soap, coral, candied fruit, wine, straw hats, boracic acid, mercury, and marble and alabaster. In 1885 the total number of vessels that entered the port was 4281 of 1,434,000 tons; of these, 1251 of 750,000 tons were foreign; 688,000 tons of merchandise were loaded and unloaded. In 1906, after considerable fluctuations during the interval, the total number that entered was 4623 vessels of 2,372,551 tons; of these, 935 of 1,002,119 tons were foreign; British ships representing about half this tonnage. In 1906 the total imports and exports amounted to 1,470,000 tons including coasting trade. A great obstacle to the development of the port is the absence of modern mechanical appliances for loading and unloading vessels, and of quay space and dock accommodation. The older shipyards have been considerably extended, and shipbuilding is actively carried on, especially by the Orlando yard which builds large ships for the Italian navy, while new industries—namely, glass-making and copper and brass-founding, electric power works, a cement factory, porcelain factories, flour-mills, oil-mills, a cotton yarn spinning factory, electric plant works, a ship-breaking yard, a motor-boat yard, &c.—have been established. Other important firms, Tuscan wine-growers, oil-growers, timber traders, colour manufacturers, &c., have their head offices and stores at Leghorn, with a view to export. The former British "factory" here was of great importance for the trade with the Levant, but was closed in 1825. The two villages of Ardenza and Antignano, which form part of the commune, have acquired considerable importance, the former in part for sea-bathing.

The earliest mention of Leghorn occurs in a document of 891, relating to the first church here; in 1017 it is called a castle. In the 13th century the Pisans tried to attract a population to the spot, but it was not till the 14th that Leghorn became a rival of Porto Pisano at the mouth of the Arno, which it was destined ultimately to supplant. It was at Leghorn that Urban V. and Gregory XI. landed on their return from Avignon. When in 1405 the king of France sold Pisa to the Florentines he kept possession of Leghorn; but he afterwards (1407) sold it for 26,000 ducats to the Genoese, and from the Genoese the Florentines purchased it in 1421. In 1496 the city showed its devotion to its new masters by a successful defence against Maximilian and his allies, but it was still a small place; in 1551 there were only 749 inhabitants. With the rise of the Medici came a rapid increase of prosperity; Cosmo, Francis and Ferdinand erected fortifications and harbour works, warehouses and churches, with equal liberality, and the last especially gave a stimulus to trade by inviting "men of the East and the West, Spanish and Portuguese, Greeks, Germans, Italians, Hebrews, Turks, Moors, Armenians, Persians and others," to settle and traffic in the city, as it became in 1606. Declared free and neutral in 1691, Leghorn was permanently invested with these privileges by the Quadruple Alliance in 1718; but in 1796 Napoleon seized all the hostile vessels in its port. It ceased to be a free city by the law of 1867. (T. As.)

LEGION (Lat. *legio*), in early Rome, the levy of citizens marching out *en masse* to war, like the citizen-army of any other primitive state. As Rome came to need more than one army at once and warfare grew more complex, *legio* came to denote a unit of 4000-6000 heavy infantry (including, however, at first some light infantry and at various times a handful of cavalry) who were by political status Roman citizens and were distinct from the "allies," *auxilia*, and other troops of the second class. The legionaries were regarded as the best and most characteristic Roman soldiers, the most trustworthy and truly Roman; they enjoyed better pay and conditions of service than the "auxiliaries." In A.D. 14 (death of Augustus) there were 25 such legions: later, the number was slightly increased; finally about A.D. 290 Diocletian reduced the size and greatly increased the number of the legions. Throughout, the dominant features of the legions were heavy infantry and Roman citizenship. They lost their importance when the Barbarian invasions altered the character of ancient warfare and made cavalry a more important arm than infantry, in the late 3rd and 4th centuries A.D. In the middle ages the word "legion" seems not to have been used as a technical term. In modern times it has been employed for organizations of an unusual or exceptional character, such as a corps of foreign volunteers or mercenaries. See further Roman Army. (F. J. H.)

The term legion has been used to designate regiments or corps of all arms in modern times, perhaps the earliest example of this being the Provincial Legions formed in France by Francis I. (see Infantry). Napoleon, in accordance with this precedent, employed the word to designate the second-line formations which he maintained in France and which supplied the Grande Armée with drafts. The term "Foreign Legion" is often used for irregular volunteer corps of foreign sympathizers raised by states at war, often by smaller states fighting for independence. Unlike most foreign legions the "British Legion" which, raised in Great Britain and commanded by Sir de Lacy Evans (*q.v.*), fought in the Carlist wars, was a regularly enlisted and paid force. The term "foreign legion" is colloquially but incorrectly applied to-day to the *Régiments étrangers* in the French service, which are composed of adventurous spirits of all nationalities and have been employed in many arduous colonial campaigns.

The most famous of the corps that have borne the name of legion in modern times was the King's German Legion (see Beamish's history of the corps). The electorate of Hanover being in 1805 threatened by the French, and no effective resistance being considered possible, the British government wished to take the greater part of the Hanoverian army into its service. But the acceptance by the Hanoverian government of this offer was delayed until too late, and it was only after the French had entered the country and the army as a unit had been disbanded that the formation of the "King's German Regiment," as it was at first called, was begun in England. This enlisted not only ex-Hanoverian soldiers, but other Germans as well, as individuals. Lieut.-Colonel von der Decken and Major Colin Halkett were the officers entrusted with the formation of the new corps, which in January 1805 had become a corps of all arms with the title of King's German Legion. It then consisted of a dragoon and a hussar regiment, five batteries, two light and four line battalions and an engineer section, all these being afterwards increased. Its services included the abortive German expedition of November 1805, the expedition to Copenhagen in 1807, the minor sieges and combats in Sicily 1808–14, the Walcheren expedition of 1809, the expedition to Sweden under Sir John Moore in 1808, and the campaign of 1813 in north Germany. But its title to fame is its part in the Peninsular War, in which from first to last it was an acknowledged *corps d'élite*—its cavalry especially, whose services both on reconnaissance and in battle were of the highest value. The exploit of the two dragoon regiments of the Legion at Garcia Hernandez after the battle of Salamanca, where they charged and broke up two French infantry squares and captured some 1400 prisoners, is one of the most notable incidents in the history of the cavalry arm (see Sir E. Wood's *Achievements of Cavalry*). A general officer of the Legion, Charles Alten (*q.v.*), commanded the British Light Division in the latter part of the war. It should be said that the Legion was rarely engaged as a unit. It was considered rather as a small army of the British type, most of which served abroad by regiments and battalions while a small portion and depot units were at home, the total numbers under arms being about 25,000. In 1815 the period of service of the corps had almost expired when Napoleon returned from Elba, but its members voluntarily offered to prolong their service. It lost heavily at Waterloo, in which Baring's battalion of the light infantry distinguished itself by its gallant defence of La Haye Sainte. The strength of the Legion at the time of its disbandment was 1100 officers and 23,500 men. A short-lived "King's German Legion" was raised by the British government for service in the Crimean War. Certain Hanoverian regiments of the German army to-day represent the units of the Legion and carry Peninsular battle-honours on their standards and colours.

LEGITIM, or Bairn's Part, in Scots law, the legal share of the movable property of a father due on his death to his children. If a father dies leaving a widow and children, the movable property is divided into three equal parts; one-third part is divided equally among all the children who survive, although they may be of different marriages (the issue of predeceased children do not share); another third goes to the widow as her *jus relictae*, and the remaining third, called "dead's part," may be disposed of by the father by will as he pleases. If the father die intestate the dead's part goes to the children as next of kin. Should the father leave no widow, one-half of the movable estate is legitim and one-half dead's part. In claiming legitim, however, credit must be given for any advance made by the father out of his movable estate during his lifetime.

LEGITIMACY, and **LEGITIMATION,** the status derived by individuals in consequence of being born in legal wedlock, and the means by which the same status is given to persons not so born. Under the Roman or civil law a child born before the marriage of the parents was made legitimate by their subsequent marriage. This method of legitimation was accepted by the canon law, by the legal systems of the continent of Europe, of Scotland and of some of the states of the United States. The early Germanic codes, however, did not recognize such legitimation, nor among the Anglo-Saxons had the natural-born child any rights of inheritance, or possibly any right other than that of protection, even when acknowledged by its father. The principle of the civil and canon law was at one time advocated by the clergy of England, but was summarily rejected by the barons at the parliament of Merton in 1236, when they replied *Nolumus leges Angliae mutare.*

English law takes account solely of the fact that marriage precedes the birth of the child; at whatever period the birth happens after the marriage, the offspring is prima facie legitimate. The presumption of law is always in favour of the legitimacy of the child of a married woman, and at one time it was so strong that Sir Edward Coke held that "if the husband be within the four seas, *i.e.* within the jurisdiction of the king of England, and the wife hath issue, no proof shall be admitted to prove the child a bastard unless the husband hath an apparent impossibility of procreation." It is now settled, however, that the presumption of legitimacy may be rebutted by evidence showing non-access on the part of the husband, or any other circumstance showing that the husband could not in the course of nature have been the father of his wife's child. If the husband had access, or the access be not clearly negatived, even though others at the same time were carrying on an illicit intercourse with the wife, a child born under such circumstances is legitimate. If the husband had access intercourse must be presumed, unless there is irresistible evidence to the contrary. Neither husband or wife will be permitted to prove the non-access directly or indirectly. Children born after a divorce *a mensa et thoro* will, however, be presumed to be bastards unless access be proved. A child born so long after the death of a husband that he could not in the ordinary course of nature have been the father is illegitimate. The period of gestation is presumed to be *about* nine calendar months; and if there were any circumstances from which an unusually long or short period of gestation could be inferred, special medical testimony would be required.

A marriage between persons within the prohibited degrees of affinity was before 1835 not void, but only voidable, and the ecclesiastical courts were restrained from bastardizing the issue after the death of either of the parents. Lord

Lyndhurst's act (1835) declared all such existing marriages valid, but all subsequent marriages between persons within the prohibited degrees of consanguinity or affinity were made null and void and the issue illegitimate (see MARRIAGE). By the Legitimacy Declaration Act 1858, application may be made to the Probate, Divorce and Admiralty Court (in Scotland, to the Court of Session by action of declarator) for a declaration of legitimacy and of the validity of a marriage. The status of legitimacy in any country depending upon the fact of the child having been born in wedlock, it may be concluded that any question as to the legitimacy of a child turns either on the validity of the marriage or on whether the child has been born in wedlock.

Legitimation effected by the subsequent marriage of the parents of the illegitimate child is technically known as legitimation *per subsequens matrimonium.* This adoption of the Roman law principle is followed by most of the states of the continent of Europe (with distinctions, of course, as to *certain* illegitimate children, or as to the forms of acknowledgment by the parent or parents), in the Isle of Man, Guernsey, Jersey, Lower Canada, St Lucia, Trinidad, Demerara, Berbice, Cape Colony, Ceylon, Mauritius; it has been adopted in New Zealand (Legitimation Act 1894), South Australia (Legitimation Act 1898, amended 1902), Queensland (Legitimation Act 1899), New South Wales (Legitimation Act 1902), and Victoria (Registration of Births, Deaths and Marriages Act 1903). It is to be noted, however, that in these states the mere fact of the parents marrying does not legitimate the child; indeed, the parents may marry, yet the child remain illegitimate. In order to legitimate the child it is necessary for the father to make application for its registration; in South Australia, the application must be made by both parents; so also in Victoria, if the mother is living, if not, application by the father will suffice. In New Zealand, Queensland and New South Wales, registration may be made at any time after the marriage; in Victoria, within six months from the date of the marriage; in South Australia, by the act of 1898, registration was permissible only within thirty days before or after the marriage, but by the amending act of 1902 it is allowed at any time more than thirty days after the marriage, provided the applicants prove before a magistrate that they are the parents of the child. In all cases the legitimation is retrospective, taking effect from the birth of the child. Legitimation by subsequent marriage exists also in the following states of the American Union: Maine, Pennsylvania, Illinois, Michigan, Iowa, Minnesota, California, Oregon, Nevada, Washington, N. and S. Dakota, Idaho, Montana and New Mexico. In Massachusetts, Vermont, Illinois, Indiana, Wisconsin, Nebraska, Maryland, Virginia, West Virginia, Kentucky, Missouri, Arkansas, Texas, Colorado, Idaho, Wyoming, Georgia, Alabama, Mississippi and Arizona, in addition to the marriage the father must recognize or acknowledge the illegitimate child as his. In New Hampshire, Connecticut and Louisiana both parents must acknowledge the child, either by an authentic act before marriage or by the contract of marriage. In some states (California, Nevada, N. and S. Dakota and Idaho) if the father of an illegitimate child receives it into his house (with the consent of his wife, if married), and treats it as if it were legitimate, it becomes legitimate for all purposes. In other states (N. Carolina, Tennessee, Georgia and New Mexico) the putative father can legitimize the child by process in court. Those states of the United States which have not been mentioned follow the English common law, which also prevails in Ireland, some of the West Indies and part of Canada. In Scotland, on the other hand, the principle of the civil law is followed. In Scotland, bastards could be legitimized in two ways: either by the subsequent intermarriage of the mother of the child with the father, or by letters of legitimation from the sovereign. With respect to the last, however, it is to be observed that letters of legitimation, be their clauses ever so strong, could not enable the bastard to succeed to his natural father; for the sovereign could not, by any prerogative, cut off the private right of third parties. But by a special clause in the letters of legitimation, the sovereign could renounce his right to the bastard's succession, failing legitimate descendants, in favour of him who would have been the bastard's heir had he been born in lawful wedlock, such renunciation encroaching upon no right competent to any third person.

The question remains, how far, if at all, English law recognizes the legitimacy of a person born out of wedlock. Strictly speaking, English law does not recognize any such person as legitimate (though the supreme power of an act of parliament can, of course, confer the rights of legitimacy), but under certain circumstances it will recognize, for purposes of succession to property, a legitimated person as legitimate. The general maxim of law is that the status of legitimacy must be tried by the law of the country where it originates, and where the law of the father's domicile at the time of the child's birth, and of the father's domicile at the time of the subsequent marriage, taken together, legitimize the child, English law will recognize the legitimacy. For purposes of succession to real property, however, legitimacy must be determined by the *lex loci rei sitae*; so that, for example, a legitimized Scotsman would be recognized as legitimate in England, but not legitimate so far as to take lands as heir (*Birtwhistle* v. *Vardill*, 1840). The conflict of laws on the subject yields some curious results. Thus, a domiciled Scotsman had a son born in Scotland and then married the mother in Scotland. The son died possessed of land in England, and it was held that the father could not inherit from the son. On the other hand, where an unmarried woman, domiciled in England died intestate there, it was held that her brother's daughter, born before marriage, but whilst the father was domiciled in Holland, and legitimized by the parents' marriage while they were still domiciled in Holland, was entitled to succeed to the personal property of her aunt (*In re Goodman's Trusts*, 1880). *In re Grey's Trusts* (1892) decided that, where *real estate* was bequeathed to the children of a person domiciled in a foreign country and these children were legitimized by the subsequent marriage in that country of their father with their mother, that they were entitled to share as legitimate children in a devise of English realty. It is to be noted that this decision does not clash with that of *Birtwhistle* v. *Vardill.*

See J. A. Foote, *Private International Law*; A. V. Dicey, *Conflict of Laws*; L. von Bar, *Private International Law*; Story, *Conflict of Laws*; J. Westlake, *International Law.*

LEGITIMISTS (Fr. *légitimistes*, from *légitime*, lawful, legitimate), the name of the party in France which after the revolution of 1830 continued to support the claims of the elder line of the house of Bourbon as the legitimate sovereigns "by divine right." The death of the comte de Chambord in 1883 dissolved the *parti légitimiste*, only an insignificant remnant, known as the *Blancs d'Espagne*, repudiating the act of renunciation of Philip V. of Spain and upholding the rights of the Bourbons of the line of Anjou. The word *légitimiste* was not admitted by the French Academy until 1878; but meanwhile it had spread beyond France, and the English word legitimist is now applied to any supporter of monarchy by hereditary right as against a parliamentary or other title.

LEGNAGO, a fortified town of Venetia, Italy, in the province of Verona, on the Adige, 29 m. by rail E. of Mantua, 52 ft. above sea-level. Pop. (1906) 2731 (town), 17,000 (commune). Legnago is one of the famous Quadrilateral fortresses. The present fortifications were planned and made in 1815, the older defences having been destroyed by Napoleon I. in 1801. The situation is low and unhealthy, but the territory is fertile, rice, cereals and sugar being grown. Legnago is the birthplace of G. B. Cavalcaselle, the art historian (1827–1897). A branch line runs hence to Rovigo.

LEGNANO, a town of Lombardy, Italy, in the province of Milan, 17 m. N.W. of that city by rail, 682 ft. above sea-level. Pop. (1881) 7153, (1901) 18,285. The church of S. Magno, built in the style of Bramante by G. Lampugnano (1504–1529), contains an altar-piece considered one of Luini's best works. There are also remains of a castle of the Visconti. Legnano is the seat of important cotton and silk industries, with machine-shops, boiler-works, and dyeing and printing of woven goods, and thread. Close by, the Lombard League defeated Frederick Barbarossa in 1176; a monument in commemoration of the battle was erected on the field in 1876, while there is another by Butti erected in 1900 in the Piazza Federico Barbarossa.

LEGOUVÉ, GABRIEL JEAN BAPTISTE ERNEST WILFRID (1807–1903), French dramatist, son of the poet Gabriel Legouvé (1764–1812), who wrote a pastoral *La Mort d'Abel* (1793) and a tragedy of *Epicharis et Néron*, was born in Paris on the 5th of February 1807. His mother died in 1810, and almost immediately afterwards his father was removed to a lunatic asylum. The child, however, inherited a considerable fortune, and was carefully educated. Jean Nicolas Bouilly (1763–1842) was his tutor, and early instilled into the young Legouvé a passion for literature, to which the example of his father and of his grandfather, J. B. Legouvé (1729–1783), predisposed him. As early as 1829 he carried away a prize of the French Academy for a poem on the discovery of printing; and in 1832 he published a curious little volume of verses, entitled *Les Morts Bizarres*. In those early days Legouvé brought out a succession of novels, of which *Edith de Falsen* enjoyed a considerable success. In 1847 he began the work by which he is best remembered, his contributions to the development and education of the female mind, by lecturing at the College of France on the moral history of women: these discourses were collected into a volume in 1848, and enjoyed a great success. Legouvé wrote considerably for the stage, and in 1849 he collaborated with A. E. Scribe in *Adrienne Lecouvreur*. In 1855 he brought out his tragedy of *Médée*, the success of which had much to do with his election to the French Academy. He succeeded to the fauteuil of J. A. Ancelot, and was received by Flourens, who dwelt on the plays of Legouvé as his principal claim to consideration. As time passed on, however, he became less prominent as a playwright, and more so as a lecturer and propagandist on woman's rights and the advanced education of children, in both of which directions he was a pioneer in French society. His *La Femme en France au XIX*^{me} *siècle* (1864), reissued, much enlarged, in 1878; his *Messieurs les enfants* (1868), his *Conférences Parisiennes* (1872), his *Nos filles et nos fils* (1877), and his *Une Éducation de jeune fille* (1884) were works of wide-reaching influence in the moral order. In 1886–1887 he published, in two volumes, his *Soixante ans de souvenirs*, an excellent specimen of autobiography. He was raised in 1887 to the highest grade of the Legion of Honour, and held for many years the post of inspector-general of female education in the national schools. Legouvé was always an advocate of physical training. He was long accounted one of the best shots in France, and although, from a conscientious objection, he never fought a duel, he made the art of fencing his lifelong hobby. After the death of Désiré Nisard in 1888, Legouvé became the "father" of the French Academy. He died on the 14th of March 1903.

LEGROS, ALPHONSE (1837–   ), painter and etcher, was born at Dijon on the 8th of May 1837. His father was an accountant, and came from the neighbouring village of Veronnes. Young Legros frequently visited the farms of his relatives, and the peasants and landscapes of that part of France are the subjects of many of his pictures and etchings. He was sent to the art school at Dijon with a view to qualifying for a trade, and was apprenticed to Maître Nicolardo, house decorator and painter of images. In 1851 Legros left for Paris to take another situation; but passing through Lyons he worked for six months as journeyman wall-painter under the decorator Beuchot, who was painting the chapel of Cardinal Bonald in the cathedral. In Paris he studied with Cambon, scene-painter and decorator of theatres, an experience which developed a breadth of touch such as Stanfield and Cox picked up in similar circumstances. At this time he attended the drawing-school of Lecoq de Boisbaudran. In 1855 Legros attended the evening classes of the École des Beaux Arts, and perhaps gained there his love of drawing from the antique, some of the results of which may be seen in the Print Room of the British Museum. He sent two portraits to the Salon of 1857: one was rejected, and formed part of the exhibition of protest organized by Bonvin in his studio; the other, which was accepted, was a profile portrait of his father. This work was presented to the museum at Tours by the artist when his friend Cazin was curator. Champfleury saw the work in the Salon, and sought out the artist to enlist him in the small army of so-called "Realists," comprising (round the noisy glory of Courbet) all those who raised protest against the academical trifles of the degenerate Romantics. In 1859 Legros's "Angelus" was exhibited, the first of those quiet church interiors, with kneeling figures of patient women, by which he is best known as a painter. "Ex Voto," a work of great power and insight, painted in 1861, now in the museum at Dijon, was received by his friends with enthusiasm, but it only obtained a mention at the Salon. Legros came to England in 1863, and in 1864 married Miss Frances Rosetta Hodgson. At first he lived by his etching and teaching. He then became teacher of etching at the South Kensington School of Art, and in 1876 Slade Professor at University College, London. He was naturalized as an Englishman in 1881, and remained at University College seventeen years. His influence there was exerted to encourage a certain distinction, severity and truth of character in the work of his pupils, with a simple technique and a respect for the traditions of the old masters, until then somewhat foreign to English art. He would draw or paint a torso or a head before the students in an hour or even less, so that the attention of the pupils might not be dulled. As students had been known to take weeks and even months over a single drawing, Legros ordered the positions of the casts in the Antique School to be changed once every week. In the painting school he insisted upon a good outline, preserved by a thin rub in of umber, and then the work was to be finished in a single painting, "*premier coup*." Experiments in all varieties of art work were practised; whenever the professor saw a fine example in the museum, or when a process interested him in a workshop, he never rested until he had mastered the technique and his students were trying their 'prentice hands at it. As he had casually picked up the art of etching by watching a comrade in Paris working at a commercial engraving, so he began the making of medals after a walk in the British Museum, studying the masterpieces of Pisanello, and a visit to the Cabinet des Médailles in Paris. Legros considered the traditional journey to Italy a very important part of artistic training, and in order that his students should have the benefit of such study he devoted a part of his salary to augment the income available for a travelling studentship. His later works, after he resigned his professorship in 1892, were more in the free and ardent manner of his early days—imaginative landscapes, castles in Spain, and farms in Burgundy, etchings like the series of "The Triumph of Death," and the sculptured fountains for the gardens of the duke of Portland at Welbeck.

Pictures and drawings by Legros, besides those already mentioned, may be seen in the following galleries and museums: "Amende Honorable," "Dead Christ," bronzes, medals and twenty-two drawings, in the Luxembourg, Paris; "Landscape," "Study of a Head," and portraits of Browning, Burne-Jones, Cassel, Huxley and Marshall, at the Victoria and Albert Museum, Kensington; "Femmes en prière," National Gallery of British Art; "The Tinker," and six other works from the Ionides Collection, bequeathed to South Kensington; "Christening," "Barricade," "The Poor at Meat," two portraits and several drawings and etchings, collection of Lord Carlisle; "Two Priests at the Organ," "Landscape" and etchings, collection of Rev. Stopford Brooke; "Head of a Priest," collection of Mr Vereker Hamilton; "The Weed-burner," some sculpture and a large collection of etchings and drawings, Mr Guy Knowles; "Psyche," collection of Mr L. W. Hodson; "Snow Scene," collection of Mr G. F. Watts, R.A.; thirty-five drawings and etchings, the Print Room, British Museum; "Jacob's Dream" and twelve drawings of the antique, Cambridge; "Saint Jerome," two studies of heads and some drawings, Manchester; "The Pilgrimage" and "Study made before the Class," Liverpool Walker Art Gallery; "Study of Heads," Peel Park Museum, Salford.

See Dr Hans W. Singer, "Alphonse Legros," *Die graphischen Künste* (1898); Léonce Bénédite, "Alphonse Legros," *Revue de l'art* (Paris, 1900); Cosmo Monkhouse, "Professor Legros," *Magazine of Art* (1882). (C. H.*)

LEGUMINOSAE, the second largest family of seed-plants, containing about 430 genera with 7000 species. It belongs to the series Rosales of the Dicotyledons, and contains three well-marked suborders, Papilionatae, Mimosoideae and Caesalpinioideae. The plants are trees, shrubs or herbs of very various habit. The British representatives, all of which belong to the suborder Papilionatae, include a few shrubs, such as *Ulex* (gorse, furze), *Cytisus* (broom) and *Genista*, but the majority, and this applies to the suborder as a whole, are herbs, such as the clovers, *Medicago*, *Melilotus*, &c., sometimes climbing by aid of tendrils which are modified leaf-structures, as in *Lathyrus* and the vetches (*Vicia*). Scarlet runner (*Phaseolus multiflorus*) has a herbaceous twining stem. Woody climbers (lianes) are represented by species of *Bauhinia* (Caesalpinioideae), which with their curiously flattened twisted stems are characteristic features of tropical forests, and *Entada scandens* (Mimosoideae) also common in the tropics; these two suborders, which are confined to the warmer parts of the earth, consist chiefly of trees and shrubs such as *Acacia* and *Mimosa* belonging to the Mimosoideae, and the Judas tree of southern Europe (*Cercis*) and tamarind belonging to the Caesalpinioideae. The so-called acacia of European gardens (*Robinia Pseudacacia*) and laburnum are examples of the tree habit in the Papilionatae. Water plants are rare, but are represented by *Aeschynomene* and *Neptunia*, tropical genera. The roots of many species bear nodular swellings (tubercles), the cells of which contain bacterium-like bodies which have the power of fixing the nitrogen of the atmosphere in such a form as to make it available for plant food. Hence the value of these plants as a crop on poor soil or as a member of a series of rotation of crops, since they enrich the soil by the nitrogen liberated by the decay of their roots or of the whole plant if ploughed in as green manure.

The leaves are alternate in arrangement and generally compound and stipulate. A common form is illustrated by the trefoil or clovers, which have three leaflets springing from a common point (digitately trifoliate); pinnate leaves are also frequent as in laburnum and *Robinia*. In Mimosoideae the leaves are generally bipinnate (figs. 1, 2, 3). Rarely are the leaves simple as in *Bauhinia*. Various departures from the usual leaf-type occur in association with adaptations to different functions or environments. In leaf-climbers, such as pea or vetch, the end of the rachis and one or more pairs of leaflets are changed into tendrils. In gorse the leaf is reduced to a slender spine-like structure, though the leaves of the seedling have one to three leaflets. In many Australian acacias the leaf surface in the adult plant is much reduced, the petiole being at the same time flattened and enlarged (fig. 1), frequently the leaf is reduced to a petiole flattened in the vertical plane; by this means a minimum surface is exposed to the intense sunlight. In the garden pea the stipules are large and foliaceous, replacing the leaflets, which are tendrils; in *Robinia* the stipules are spiny and persist after leaf-fall. In some acacias (*q.v.*) the thorns are hollow, and inhabited by ants as in *A. sphaerocephala*, a central American plant (fig. 2) and others. In some species of *Astragalus*, *Onobrychis* and others, the leaf-stalk persists after the fall of the leaf and becomes hard and spiny.

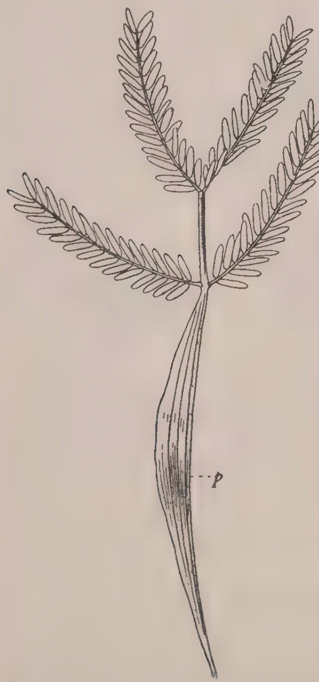
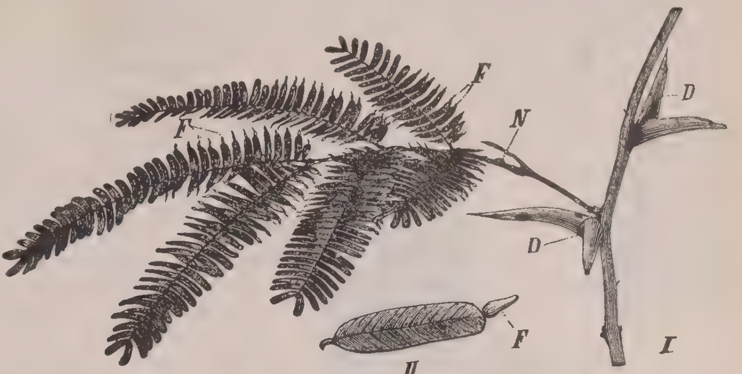


Fig. 1.—Leaf of an Acacia (*A. heterophylla*) showing flattened leaf-like petiole (phyllode), *p*, and bipinnate blade.



From Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

Fig. 2.—*Acacia sphaerocephala*.

I, Leaf and part of stem; *D*, hollow thorns in which the ants live; *F*, food bodies at the apices of the lower pinnules; *N*, nectary on the petiole. (Reduced.) *II*, Single pinnule with food-body, *F*. (Somewhat enlarged.)

Leaf-movements occur in many of the genera. Such are the sleep-movement in the clovers, runner bean (*Phaseolus*), *Robinia* and acacia, where the leaflets assume a vertical position at nightfall. Spontaneous movements are exemplified in the telegraph-plant (*Desmodium gyrans*), native of tropical Asia, where the small lateral leaflets move up and down every few minutes. The sensitive plant (*Mimosa pudica*) is an example of movement in response to contact, the leaves assuming a sleep-position if touched. The seat of the movement is the swollen base of the leaf-stalk, the so-called pulvinus (fig. 3).

The stem of the lianes shows some remarkable deviations from the normal in form and structure. In Papilionatae anomalous secondary thickening arises from the production of new cambium zones outside the original ring (*Mucuna*, *Wistaria*) forming concentric rings or transverse or broader strands; where, as in *Rhyncosia* the successive cambiums are active only at two opposite points, a flat ribbon-like stem is produced. The climbing *Bauhinias* (Caesalpinioideae) have a flattened stem with basin-like undulations; in some growth in thickness is normal, in others new cambium-zones are found concentrically, while in others new and distinct growth-centres, each with its cambium-zone, arise outside the primary zone. The climbing Mimosoideae show no anomalous growth in thickness, but in some cases the stem becomes strongly winged. Gum passages in the pith and medullary rays occur, especially in species of acacia and *Astragalus*; gum-arabic is an exudation from the branches of *Acacia Senegal*, gum-tragacanth from *Astragalus gummifer* and other species. Logwood is the coloured heartwood of *Haematoxylon campechianum*; red sandalwood of *Pterocarpus santalinus*.

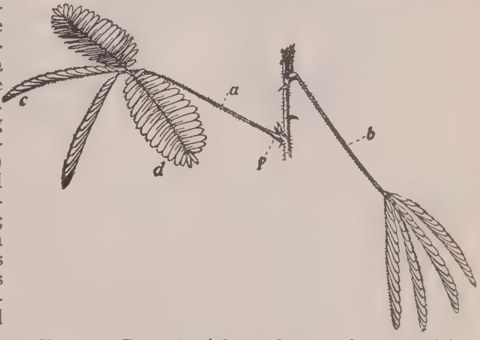


Fig. 3.—Branch with two leaves of the Sensitive Plant (*Mimosa pudica*), showing the petiole in its erect state, *a*, and in its depressed state, *b*; also the leaflets closed, *c*, and the leaflets expanded, *d*; *p*, pulvinus, the seat of the movement of the petiole.

The flowers are arranged in racemose inflorescences, such as the simple raceme (*Laburnum*, *Robinia*), which is condensed to a head in *Trifolium*; in *Acacia* and *Mimosa* the flowers are densely crowded (fig. 4). The flower is characterized by a hypogynous or slightly perigynous arrangement of parts, the anterior position of the odd sepal, the free petals, and the single median carpel with a terminal style, simple stigma and two alternating rows of ovules on the ventral suture of the ovary which faces the back of the flower.

The arrangement of the petals and the number and cohesion of the stamens vary in the three suborders. In Mimosoideae, the smallest of the three, the flower is regular (fig. 4 [3]), and the sepals and petals have a valvate aestivation, and are generally pentamerous, but 3-6-merous flowers also occur. The sepals are more or less united into a cup (fig. 4 [2]), and the petals sometimes cohere at the base. The stamens vary widely in number and cohesion; in *Acacia* (fig. 4) they are indefinite and free, in the tribe *Ingeae*, indefinite and monadelphous, in other tribes as many or twice as many as the petals. Frequently, as in *Mimosa*, the long yellow stamens are the most conspicuous feature of the flower. In Caesalpinioideae (fig. 5) the flowers are zygomorphic in a median plane and generally pentamerous. The sepals are free, or the two upper ones united as in tamarind, and imbricate in aestivation, rarely as in the Judas-tree (fig. 5 [2]), valvate. The corolla shows great variety in form; it is imbricate in aestivation, the posterior petal being innermost. In *Cercis* (fig. 5) it clearly resembles the papilionaceous type; the odd petal stands erect, the median pair are reflexed and wing-like, and the lower pair enclose the essential organs. In *Cassia* all five petals are subequal and spreading; in *Amherstia* the anterior pair are small or absent while the three upper ones are large; in *Krameria*, the anterior pair are represented by glandular scales, and in *Tamarindus* are suppressed. Apetalous flowers occur in *Copaifera* and *Ceratonia*. The stamens, generally ten in number, are free, as in *Cercis* (fig. 5) or more or less united as in *Amherstia*, where the posterior one is free and the rest are united. In tamarind only three stamens are fertile. The largest suborder, Papilionatae, has a flower zygomorphic in the median plane (figs. 6, 7). The five sepals are generally united (figs. 7, 9), and have an ascending imbricate arrangement (fig. 6); the calyx is often two-lipped (fig. 9 [1]). The corolla has five unequal petals with a descending imbricate arrangement; the upper and largest, the standard (*vexillum*), stands erect, the lateral pair, the wings or *alae*, are long-clawed, while the anterior pair cohere to form the keel or *carina*, in which are enclosed the stamens and pistil. The ten stamens are monadelphous as in gorse or broom (fig. 9), or diadelphous as in sweet pea (fig. 8) (the posterior one being free), or almost or quite free; these differences are associated with differences in the methods of pollination. The ten stamens here, as in the last suborder, though arranged in a single whorl, arise in two series, the five opposite the sepals arising first.

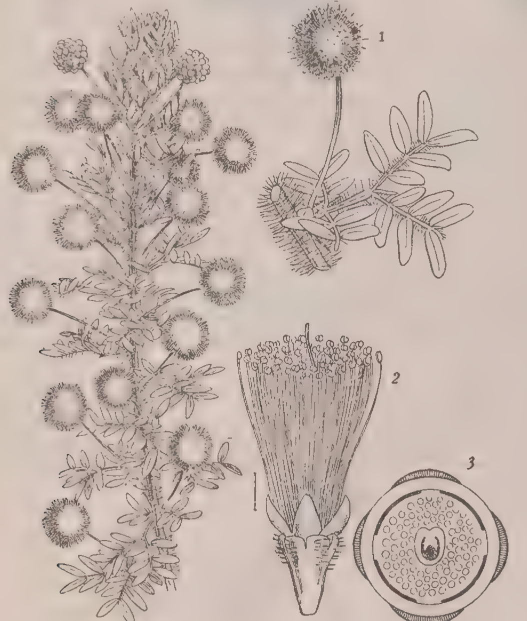


Fig. 4.—*Acacia obscura*, flowering branch about ⅓ natural size.

1, Part of stem with leaf and its subtended inflorescence, about natural size.
2, Flower, much enlarged.
3, Floral diagram of *Acacia latifolia*. (After Eichler.)

The carpel is sometimes stalked and often surrounded at the base by a honey-secreting disk; the style is terminal and in the zygomorphic flowers is often curved and somewhat flattened with a definite back and front. Sometimes as in species of *Trifolium* and *Medicago* the ovules are reduced to one. The pod or legume splits along both sutures (fig. 10) into a pair of membranous, leathery or sometimes fleshy valves, bearing the seeds on the ventral suture. Dehiscence is often explosive, the valves separating elastically and twisting spirally, thus shooting out the seeds, as in gorse, broom and others. In *Desmodium*, *Entada* and others the pod is constricted between each seed, and breaks up into indehiscent one-seeded parts; it is then called a lomentum (fig. 11); in *Astragalus* it is divided by a longitudinal septum.

The pods show a very great variety in form and size. Thus in the clovers they are a small fraction of an inch, while in the common tropical climber *Entada scandens* they are woody structures more than a yard long and several inches wide. They are generally more or less flattened, but sometimes round and rod-like, as in species of *Cassia*, or are spirally coiled as in *Medicago*. Indehiscent one-seeded pods occur in species of clover and in *Medicago*, also in *Dalbergia* and allied genera, where they are winged. In *Colutea*, the bladder-senna of gardens, the pod forms an inflated bladder which bursts under pressure; it often becomes detached and is blown some distance before bursting. An arillar outgrowth is often developed on the funicle, and is sometimes brightly coloured, rendering the seed conspicuous and favouring dissemination by birds; in such cases the seed-coat is hard. In other cases the hard seed-coat itself is bright-coloured as in the scarlet seeds of *Abrus precatorius*, the so-called weather-plant. Animals also act as the agents of distribution in the case of fleshy edible pods containing seeds with a hard smooth testa, which will pass uninjured through the body, as in tamarind and the fruit of the carob-tree (*Ceratonia*). In the ground-nut (*Arachis hypogaea*), *Trifolium subterraneum* and others, the flower-stalks grow downwards after fertilization of the ovules and bury the fruit in the earth. In the suborders Mimosoideae and Papilionatae the embryo fills the seed or a small quantity of endosperm occurs, chiefly round the radicle. In Caesalpinioideae endosperm is absent, or present forming a thin layer round the embryo as in the tribe *Bauhinieae*, or copious and cartilaginous as in the *Cassieae*. The embryo has generally flat leaf-like or fleshy cotyledons with a short radicle.

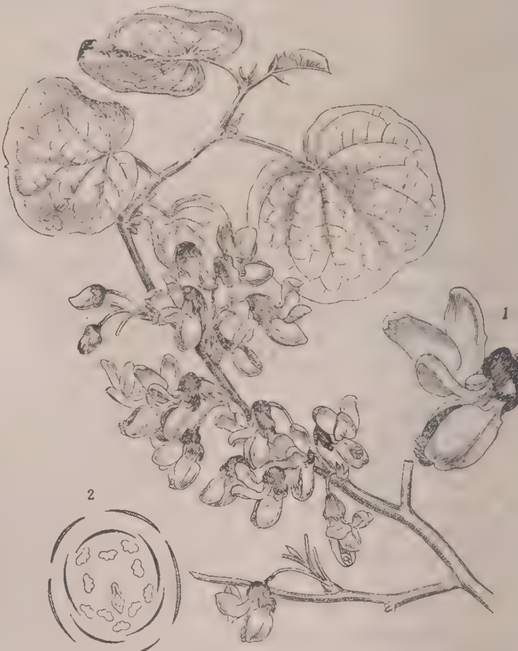


Fig. 5.—Flowering branch of Judas-tree (*Cercis siliquastrum*) reduced. 1, Flower, natural size. 2, Floral diagram.

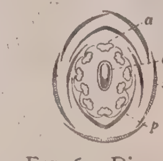


Fig. 6.—Diagram of Flower of Sweet Pea (*Lathyrus*), showing five sepals, *s*, two are superior, one inferior, and two lateral; five petals, *p*, one superior, two inferior, and two lateral; ten stamens in two rows, *a*, and one carpel, *c*.

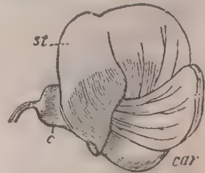


Fig. 7.—Flower of Pea (*Pisum sativum*), showing a papilionaceous corolla, with one petal superior, *st*, the standard (vexillum), two inferior, *car*, the keel (carina), and two lateral, *a*, wings (alae). The calyx is marked *c*.

Insects play an important part in the pollination of the flowers. In the two smaller suborders the stamens and stigma are freely exposed and the conspicuous coloured stamens serve as well as the petals to attract insects; in *Mimosa* and *Acacia* the flowers are crowded in conspicuous heads or spikes. The relation of insects to the flower has been carefully studied in the Papilionatae, chiefly in European species. Where honey is present it is secreted on the inside of the base of the stamens and accumulated in the base of the tube formed by the united filaments round the ovary. It is accessible only to insects with long probosces, such as bees. In these cases the posterior stamen is free, allowing access to the honey. The flowers stand more or less horizontally; the large erect white or coloured standard renders them conspicuous, the wings form a platform on which the insect rests and the keel encloses the stamens and pistil, protecting them from rain and the attacks of unbidden pollen-eating insects. In his book on the fertilization of flowers, Hermann Müller distinguishes four types of papilionaceous flowers according to the way in which the pollen is applied to the bee:

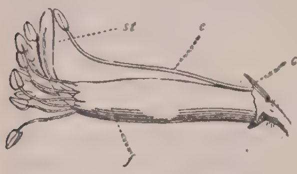


FIG. 8.—Stamens and Pistil of Sweet Pea (*Lathyrus*). The stamens are diadelphous, nine of them being united by their filaments *f*, while the uppermost one (*e*) is free; *st*, stigma, *c*, calyx.

(1) Those in which the stamens and stigma return within the carina and thus admit of repeated visits, such are the clovers, *Melilotus* and laburnum. (2) Explosive flowers where stamens and style are confined within the keel under tension and the pressure of the insect causes their sudden release and the scattering of the pollen, as in broom and *Genista*; these contain no honey but are visited for the sake of the pollen. (3) The piston-mechanism as in bird's-foot trefoil (*Lotus corniculatus*), *Anthyllis*, *Ononis* and *Lupinus*, where the pressure of the bee upon the carina while probing for honey squeezes a narrow ribbon of pollen through the opening at the tip. The pollen has been shed into the cone-like tip of the carina, and the heads of the five outer stamens form a piston beneath it, pushing it out at the tip when pressure is exerted on the keel; a further pressure causes the protrusion of the stigma, which is thus brought in contact with the insect's belly. (4) The style bears a brush of hairs which sweeps small quantities of pollen out of the tip of the carina, as in *Lathyrus*, *Pisum*, *Vicia* and *Phaseolus*.

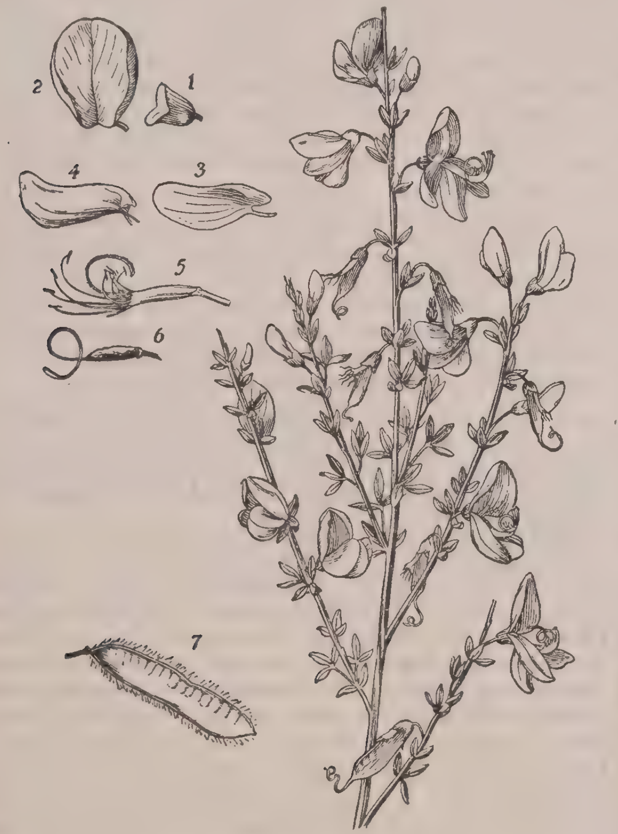
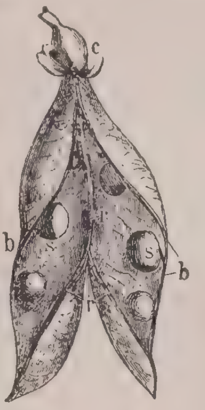


FIG. 9.—Broom (*Cytisus scoparius*). (2-7 slightly reduced.)

1, Calyx. 3, Wing. 5, Monadelphous stamens and style. 6, Pistil.
2, Standard. 4, Keel. 7, Pod.

Leguminosae is a cosmopolitan order, and often affords a characteristic feature of the vegetation. Mimosoideae and Caesalpinioideae are richly developed in the tropical rain forests, where Papilionatae are less conspicuous and mostly herbaceous; in subtropical forests arborescent forms of all three suborders occur. In the temperate regions, tree-forms are rare—thus Mimosoideae are unrepresented in Europe; Caesalpinioideae are represented by species of *Cercis*, *Gymnocladus* and *Gleditschia*; Papilionatae by *Robinia*; but herbaceous Papilionatae abound and penetrate to the limit of growth of seed-plants in arctic and high alpine regions. Shrubs and undershrubs, such as *Ulex*, *Genista*, *Cytisus* are a characteristic feature in Europe and the Mediterranean area. Acacias are an important component of the evergreen bush-vegetation of Australia, together with genera of the tribe *Podalyrieae* of Papilionatae (*Chorizema*, *Oxylobium*, &c.). *Astragalus*, *Oxytropis*, *Hedysarum*, *Onobrychis*, and others are characteristic of the steppe-formations of eastern Europe and western Asia.



From Vines's *Students' Text-Book of Botany*, by permission of Swan, Sonnenschein & Co.

FIG. 10.—Dry dehiscent Fruit. The pod (legume) of the Pea. *r*, The dorsal suture; *b*, the ventral; *c*, calyx; *s*, seeds.

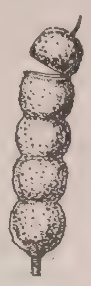


FIG. 11.—Lomentum or lomentaceous legume of a species of *Desmodium*. Each seed is contained in a separate cavity by the folding inwards of the walls of the legume at equal intervals; the legume, when ripe, separates transversely into single-seeded portions or mericarps.

The order is a most important one economically. The seeds, which are rich in starch and proteids, form valuable foods, as in pea, the various beans, vetch, lentil, ground-nut (*Arachis*) and others; seeds of *Arachis* and others yield oils; those of *Physostigma venenosum*, the Calabar ordeal bean, contain a strong poison. Many are useful fodder-plants, as the clovers (*Trifolium*) (*q.v.*), Medicago (*e.g. M. sativa*, lucerne (*q.v.*), or alfalfa); *Melilotus*, *Vicia*, *Onobrychis* (*O. sativa* is sainfoin, *q.v.*); species of *Trifolium*, lupine and others are used as green manure. Many of the tropical trees afford useful timber; *Crotalaria*, *Sesbania*, *Aeschynomene* and others yield fibre; species of *Acacia* and *Astragalus* yield gum; *Copaifera*, *Hymenaea* and others balsams and resins; dyes are obtained from *Genista* (yellow), *Indigofera* (blue) and others; *Haematoxylon campechianum* is logwood; of medicinal value are species of *Cassia* (senna leaves) and *Astragalus*; *Tamarindus indica* is tamarind, *Glycyrrhiza glabra* yields liquorice root. Well-known ornamental trees and shrubs are *Cercis* (*C. siliquastrum* is the Judas-tree), *Gleditschia*, *Genista*, *Cytisus* (broom), *Colutea* (*C. arborescens* is bladder-senna), *Robinia* and *Acacia*; *Wistaria sinensis*, a native of China, is a well-known climbing shrub; *Phaseolus multiflorus* is the scarlet runner; *Lathyrus* (sweet and everlasting peas), *Lupinus*, *Galega* (goat's-rue) and others are herbaceous garden plants. *Ceratonia Siliqua* is the carob-tree of the Mediterranean, the pods of which (algaroba or St John's bread) contain a sweet juicy pulp and are largely used for feeding stock.

The order is well represented in Britain. Thus *Genista tinctoria* is dyers' greenweed, yielding a yellow dye; *G. anglica* is needle furze; other shrubs are *Ulex* (*U. europaeus*, gorse, furze or whin, *U. nanus*, a dwarf species) and *Cytisus scoparius*, broom. Herbaceous plants are *Ononis spinosa* (rest-harrow), *Medicago* (medick), *Melilotus* (melilot), *Trifolium* (the clovers), *Anthyllis Vulneraria* (kidney-vetch), *Lotus corniculatus* (bird's-foot trefoil), *Astragalus* (milk-vetch), *Vicia* (vetch, tare) and *Lathyrus*.

LÈGYA, called by the Shans LAI-HKA, a state in the central division of the southern Shan States of Burma, lying approximately between 20° 15′ and 21° 30′ N. and 97° 50′ and 98° 30′ E., with an area of 1433 sq. m. The population was estimated at 30,000 in 1881. On the downfall of King Thibaw civil war broke out, and reduced the population to a few hundreds. In 1901 it had risen again to 25,811. About seven-ninths of the land under cultivation consists of wet rice cultivation. A certain amount of upland rice is also cultivated, and cotton, sugar-cane and garden produce make up the rest; recently large orange groves have been planted in the west of the state. Laihka, the capital, is noted for its iron-work, both the iron and the implements made being produced at Pang Lōng in the west of the state. This and lacquer-ware are the chief exports, as also a considerable amount of pottery. The imports are chiefly cotton piece-goods and salt. The general character of the state is that of an undulating plateau, with a broad plain near the capital and along the Nam Tēng, which is the chief river, with a general altitude of a little under 3000 ft.

LEH, the capital of Ladakh, India, situated 4 m. from the right bank of the upper Indus 11,500 ft. above the sea, 243 m. from Srinagar and 482 m. from Yarkand. It is the great emporium of the trade which passes between India, Chinese Turkestan and Tibet. Here meet the routes leading from the central Asian khanates, Kashgar, Yarkand, Khotan and Lhasa. The two chief roads from Leh to India pass via Srinagar and through the Kulu valley respectively. Under a commercial treaty with the maharaja of Kashmir, a British officer is deputed to Leh to regulate and control the traders and the traffic, conjointly with the governor appointed by the Kashmir state. Lying upon the western border of Tibet, Leh has formed the starting-point of many an adventurous journey into that country, the best-known route being that called the Janglam, the great trade route to Lhasa and China, passing by the Manasarowar lakes and the Mariam La pass into the valley of the Tsanpo. Pop. (1901) 2079. A Moravian mission has long been established here, with an efficient little hospital. There is also a meteorological observatory, the most elevated in Asia, where the average mean temperature ranges from 19·3° in January to 64·4° in July. The annual rainfall is only 3 in.

LEHMANN, JOHANN GOTTLOB (?–1767), German mineralogist and geologist, was educated at Berlin where he took his degree of doctor of medicine. He became a teacher of mineralogy and mining in that city, and was afterwards (1761) appointed professor of chemistry and director of the imperial museum at St Petersburg. While distinguished for his chemical and mineralogical researches, he may also be regarded as one of the pioneers in geological investigation. Although he accepted the view of a universal deluge, he gave in 1756 careful descriptions of the rocks and stratified formations in Prussia, and introduced the now familiar terms Zechstein and Rothes Todtliegendes (Rothliegende) for subdivisions of the strata since grouped as Permian. His chief observations were published in *Versuch einer Geschichte von Flötz-Gebürgen, betreffend deren Entstehung, Lage, darinne befindliche Metallen, Mineralien und Fossilien* (1756). He died at St Petersburg on the 22nd of January 1767.

LEHMANN, PETER MARTIN ORLA (1810–1870), Danish statesman, was born at Copenhagen on the 15th of May 1810. Although of German extraction his sympathies were with the Danish national party and he contributed to the liberal journal the *Kjöbenhavnsposten* while he was a student of law at the university of Copenhagen, and from 1839 to 1842 edited, with Christian N. David, the *Fädrelandet*. In 1842 he was condemned to three months' imprisonment for a radical speech. He took a considerable part in the demonstrations of 1848, and was regarded as the leader of the "Eiderdänen," that is, of the party which regarded the Eider as the boundary of Denmark, and the duchy of Schleswig as an integral part of the kingdom. He entered the cabinet of Count A. W. Moltke in March 1848, and was employed on diplomatic missions to London and Berlin in connexion with the Schleswig-Holstein question. He was for some months in 1849 a prisoner of the Schleswig-Holsteiners at Gottorp. A member of the Folkething from 1851 to 1853, of the Landsthing from 1854 to 1870, and from 1856 to 1866 of the Reichsrat, he became minister of the interior in 1861 in the cabinet of K. C. Hall, retiring with him in 1863. He died at Copenhagen on the 13th of September 1870. His book *On the Causes of the Misfortunes of Denmark* (1864) went through many editions, and his posthumous works were published in 4 vols., 1872–1874.

See Reinhardt, *Orla Lehmann og hans samtid* (Copenhagen, 1871); J. Clausen, *Af O. Lehmanns Papirer* (Copenhagen, 1903).

LEHNIN, a village and health resort of Germany, in the Prussian province of Brandenburg, situated between two lakes, which are connected by the navigable Emster with the Havel, 12 m. S.W. from Potsdam, and with a station on the main line Berlin-Magdeburg, and a branch line to Grosskreuz. Pop. (1900) 2379. It contains the ruins of a Cistercian monastery called Himmelpfort am See, founded in 1180 and dissolved in 1542; a handsome parish church, formerly the monasterial chapel, restored in 1872–1877; and a fine statue of the emperor Frederick III. Boat-building and saw-milling are the chief industries.

See Heffter, *Geschichte des Klosters Lehnin* (Brandenburg, 1851); and Sello, *Lehnin, Beiträge zur Geschichte von Kloster und Amt* (Berlin, 1881).

The LEHNIN PROPHECY (*Lehninsche Weissagung*, *Vaticinium Lehninense*), a poem in 100 Leonine verses, reputed to be from the pen of a monk, Hermann of Lehnin, who lived about the year 1300, made its appearance about 1690 and caused much controversy. This so-called prophecy bewails the extinction of the Ascanian rulers of Brandenburg and the rise of the Hohenzollern dynasty to power; each successive ruler of the latter house down to the eleventh generation is described, the date of the extinction of the race fixed, and the restoration of the Roman Catholic Church foretold. But as the narrative is only exact in details down to the death of Frederick William, the great elector, in 1688, and as all prophecies of the period subsequent to that time were falsified by events, the poem came to be regarded as a compilation and the date of its authorship placed about the year 1684. Andreas Fromm (d. 1685), rector of St Peter's church in Berlin, an ardent Lutheran, is commonly believed to have been the forger. This cleric, resisting certain measures taken by the great elector against the Lutheran pastors, fled the country in 1668 to avoid prosecution, and having been received at Prague into the Roman Catholic Church was appointed canon of Leitmeritz in Bohemia, where he died. During the earlier part of the 19th century the poem was eagerly scanned by the enemies of the Hohenzollerns, some of whom believed that the race would end with King Frederick William III., the representative of the eleventh generation of the family.

The "Vaticinium" was first published in Lilienthal's *Gelehrtes Preussen* (Königsberg, 1723), and has been many times reprinted. See Boost, *Die Weissagungen des Mönchs Hermann zu Lehnin* (Augsburg, 1848); Hilgenfeld, *Die Lehninische Weissagung* (Leipzig, 1875); Sabell, *Literatur der sogenannten Lehninschen Weissagung* (Heilbronn, 1879) and Kampers, *Die Lehninsche Weissagung über das Haus Hohenzollern* (Münster, 1897).

LEHRS, KARL (1802–1878), German classical scholar, was born at Königsberg on the 2nd of June 1802. He was of Jewish extraction, but in 1822 he embraced Christianity. In 1845 he was appointed professor of ancient Greek philology in Königsberg University, which post he held till his death on the 9th of June 1878. His most important works are: *De Aristarchi Studiis Homericis* (1833, 2nd ed. by A. Ludwich, 1882), which laid a new foundation for Homeric exegesis (on the Aristarchean lines of explaining Homer from the text itself) and textual criticism; *Quaestiones Epicae* (1837); *De Asclepiade Myrleano* (1845); *Herodiani Scripta Tria emendatiora* (1848); *Populäre Aufsätze aus dem Altertum* (1856, 2nd much enlarged ed., 1875), his best-known work; *Horatius Flaccus* (1869), in which, on aesthetic grounds, he rejected many of the odes as spurious; *Die Pindarscholien* (1873). Lehrs was a man of very decided opinions, "one of the most masculine of German scholars"; his enthusiasm for everything Greek led him to adhere firmly to the undivided authorship of the *Iliad*; comparative mythology and the symbolical interpretation of myths he regarded as a species of sacrilege.

See the exhaustive article by L. Friedländer in *Allgemeine Deutsche Biographie*, xviii.; E. Kammer in C. Bursian's *Jahresbericht* (1879); A. Jung, *Zur Erinnerung an Karl Lehrs* (progr. Meseritz, 1880); A. Ludwich edited Lehrs' select correspondence (1894) and his *Kleine Schriften* (1902).

LEIBNITZ (Leibniz), **GOTTFRIED WILHELM** (1646–1716), German philosopher, mathematician and man of affairs, was born on the 1st of July 1646 at Leipzig, where his father was professor of moral philosophy. Though the name Leibniz, Leibnitz or Lubeniecz was originally Slavonic, his ancestors were German, and for three generations had been in the employment of the Saxon government. Young Leibnitz was sent to the Nicolai school at Leipzig, but, from 1652 when his father died, seems to have been for the most part his own teacher. From his father he had acquired a love of historical study. The German books at his command were soon read through, and with the help of two Latin books—the *Thesaurus Chronologicus* of Calvisius and an illustrated edition of Livy—he learned Latin at the age of eight. His father's library was now thrown open to him, to his great joy, with the permission, "Tolle, lege." Before he was twelve he could read Latin easily and had begun Greek; he had also remarkable facility in writing Latin verse. He next turned to the study of logic, attempting already to reform its doctrines, and zealously reading the scholastics and some of the Protestant theologians.

At the age of fifteen, he entered the university of Leipzig as a law student. His first two years were devoted to philosophy under Jakob Thomasius, a Neo-Aristotelian, who is looked upon as having founded the scientific study of the history of philosophy in Germany. It was at this time probably that he first made acquaintance with the modern thinkers who had already revolutionized science and philosophy, Francis Bacon, Cardan and Campanella, Kepler, Galileo and Descartes; and he began to consider the difference between the old and new ways of regarding nature. He resolved to study mathematics. It was not, however, till the summer of 1663, which he spent at Jena under E. Weigel, that he obtained the instructions of a mathematician of repute; nor was the deeper study of mathematics entered upon till his visit to Paris and acquaintance with Huygens many years later.

The next three years he devoted to legal studies, and in 1666 applied for the degree of doctor of law, with a view to obtaining the post of assessor. Being refused on the ground of his youth he left his native town for ever. The doctor's degree refused him there was at once (November 5, 1666) conferred on him at Altdorf—the university town of the free city of Nuremberg—where his brilliant dissertation procured him the immediate offer of a professor's chair. This, however, he declined, having, as he said, "very different things in view."

Leibnitz, not yet twenty-one years of age, was already the author of several remarkable essays. In his bachelor's dissertation *De principio individui* (1663), he defended the nominalistic doctrine that individuality is constituted by the whole entity or essence of a thing; his arithmetical tract *De complexionibus*, published in an extended form under the title *De arte combinatoria* (1666), is an essay towards his life-long project of a reformed symbolism and method of thought; and besides these there are our juridical essays, including the *Nova methodus docendi discendique juris*, written in the intervals of his journey from Leipzig to Altdorf. This last essay is remarkable, not only for the reconstruction it attempted of the *Corpus Juris*, but as containing the first clear recognition of the importance of the historical method in law. Nuremberg was a centre of the Rosicrucians, and Leibnitz, busying himself with writings of the alchemists, soon gained such a knowledge of their tenets that he was supposed to be one of the secret brotherhood, and was even elected their secretary. A more important result of his visit to Nuremberg was his acquaintance with Johann Christian von Boyneburg (1622–1672), formerly first minister to the elector of Mainz, and one of the most distinguished German statesmen of the day. By his advice Leibnitz printed his *Nova methodus* in 1667, dedicated it to the elector, and, going to Mainz, presented it to him in person. It was thus that Leibnitz entered the service of the elector of Mainz, at first as an assistant in the revision of the statute-book, afterwards on more important work.

The policy of the elector, which the pen of Leibnitz was now called upon to promote, was to maintain the security of the German empire, threatened on the west by the aggressive power of France, on the east by Turkey and Russia. Thus when in 1669 the crown of Poland became vacant, it fell to Leibnitz to support the claims of the German candidate, which he did in his first political writing, *Specimen demonstrationum politicarum pro rege Polonorum eligendo*, attempting, under the guise of a Catholic Polish nobleman, to show by mathematical demonstration that it was necessary in the interest of Poland that it should have the count palatine of Neuburg as its king. But neither the diplomatic skill of Boyneburg, who had been sent as plenipotentiary to the election at Warsaw, nor the arguments of Leibnitz were successful, and a Polish prince was elected to fill the vacant throne.

A greater danger threatened Germany in the aggressions of Louis XIV. (see France: *History*). Though Holland was in most immediate danger, the seizure of Lorraine in 1670 showed that Germany too was threatened. It was in this year that Leibnitz wrote his *Thoughts on Public Safety*,[1] in which he urged the formation of a new "Rheinbund" for the protection of Germany, and contended that the states of Europe should employ their power, not against one another, but in the conquest of the non-Christian world, in which Egypt, "one of the best situated lands in the world," would fall to France. The plan thus proposed of averting the threatened attack on Germany by a French expedition to Egypt was discussed with Boyneburg, and obtained the approval of the elector. French relations with Turkey were at the time so strained as to make a breach imminent, and at the close of 1671, about the time when the war with Holland broke out, Louis himself was approached by a letter from Boyneburg and a short memorial from the pen of Leibnitz, who attempted to show that Holland itself, as a mercantile power trading with the East, might be best attacked through Egypt, while nothing would be easier for France or would more largely increase her power than the conquest of Egypt. On February 12, 1672, a request came from the French secretary of state, Simon Arnauld de Pomponne (1618–1699), that Leibnitz should go to Paris. Louis seems still to have kept the matter in view, but never granted Leibnitz the personal interview he desired, while Pomponne wrote, "I have nothing against the plan of a holy war, but such plans, you know, since the days of St Louis, have ceased to be the fashion." Not yet discouraged, Leibnitz wrote a full account of his project for the king,[2] and a summary of the same[3] evidently intended for Boyneburg. But Boyneburg died in December 1672, before the latter could be sent to him. Nor did the former ever reach its destination. The French quarrel with the Porte was made up, and the plan of a French expedition to Egypt disappeared from practical politics till the time of Napoleon. The history of this scheme, and the reason of Leibnitz's journey to Paris, long remained hidden in the archives of the Hanoverian library. It was on his taking possession of Hanover in 1803 that Napoleon learned, through the *Consilium Aegyptiacum*, that the idea of a French conquest of Egypt had been first put forward by a German philosopher. In the same year there was published in London an account of the *Justa dissertatio*[4] of which the British Government had procured a copy in 1799. But it was only with the appearance of the edition of Leibnitz's works begun by Onno Klopp in 1864 that the full history of the scheme was made known.

Leibnitz had other than political ends in view in his visit to France. It was as the centre of literature and science that Paris chiefly attracted him. Political duties never made him lose sight of his philosophical and scientific interests. At Mainz he was still busied with the question of the relation between the old and new methods in philosophy. In a letter to Jakob

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[1] *Bedenken, welchergestalt securitas publica interna et externa und status praesens jetzigen Umständen nach im Reich auf festen Fuss zu stellen.*

[2] *De expeditione Aegyptiaca regi Franciae proponenda justa dissertatio.*

[3] *Consilium Aegyptiacum.*

[4] *A Summary Account of Leibnitz's Memoir addressed to Lewis the Fourteenth*, &c. [edited by Granville Penn], (London, 1803).

Thomasius (1669) he contends that the mechanical explanation of nature by magnitude, figure and motion alone is not inconsistent with the doctrines of Aristotle's *Physics*, in which he finds more truth than in the *Meditations* of Descartes. Yet these qualities of bodies, he argues in 1668 (in an essay published without his knowledge under the title *Confessio naturae contra atheistas*), require an incorporeal principle, or God, for their ultimate explanation. He also wrote at this time a defence of the doctrine of the Trinity against Wissowatius (1669), and an essay on philosophic style, introductory to an edition of the *Antibarbarus* of Nizolius (1670). Clearness and distinctness alone, he says, are what makes a philosophic style, and no language is better suited for this popular exposition than the German. In 1671 he issued a *Hypothesis physica nova*, in which, agreeing with Descartes that corporeal phenomena should be explained from motion, he carried out the mechanical explanation of nature by contending that the original of this motion is a fine aether, similar to light, or rather constituting it, which, penetrating all bodies in the direction of the earth's axis, produces the phenomena of gravity, elasticity, &c. The first part of the essay, on concrete motion, was dedicated to the Royal Society of London, the second, on abstract motion, to the French Academy.

At Paris Leibnitz met with Arnauld, Malebranche and, more important still, with Christian Huygens. This was pre-eminently the period of his mathematical and physical activity. Before leaving Mainz he was able to announce[1] an imposing list of discoveries, and plans for discoveries, arrived at by means of his new logical art, in natural philosophy, mathematics, mechanics, optics, hydrostatics, pneumatics and nautical science, not to speak of new ideas in law, theology and politics. Chief among these discoveries was that of a calculating machine for performing more complicated operations than that of Pascal—multiplying, dividing and extracting roots, as well as adding and subtracting. This machine was exhibited to the Academy of Paris and to the Royal Society of London, and Leibnitz was elected a fellow of the latter society in April 1673.[2] In January of this year he had gone to London as an attaché on a political mission from the elector of Mainz, returning in March to Paris, and while in London had become personally acquainted with Oldenburg, the secretary of the Royal Society, with whom he had already corresponded, with Boyle the chemist and Pell the mathematician. It is from this period that we must date the impulse that directed him anew to mathematics. By Pell he had been referred to Mercator's *Logarithmotechnica* as already containing some numerical observations which Leibnitz had thought original on his own part; and, on his return to Paris, he devoted himself to the study of higher geometry under Huygens, entering almost at once upon the series of investigations which culminated in his discovery of the differential and integral calculus (see Infinitesimal Calculus).

Shortly after his return to Paris in 1673, Leibnitz ceased to be in the Mainz service any more than in name, but in the same year entered the employment of Duke John Frederick of Brunswick-Lüneburg, with whom he had corresponded for some time. In 1676 he removed at the duke's request to Hanover, travelling thither by way of London and Amsterdam. At Amsterdam he saw and conversed with Spinoza, and carried away with him extracts from the latter's unpublished *Ethica*.

For the next forty years, and under three successive princes, Leibnitz was in the service of the Brunswick family, and his headquarters were at Hanover, where he had charge of the ducal library. Leibnitz thus passed into a political atmosphere formed by the dynastic aims of the typical German state (see Hanover; Brunswick). He supported the claim of Hanover to appoint an ambassador at the congress of Nimeguen (1676)[3] to defend the establishment of primogeniture in the Lüneburg branch of the Brunswick family; and, when the proposal was made to raise the duke of Hanover to the electorate, he had to show that this did not interfere with the rights of the duke of Württemberg. In 1692 the duke of Hanover was made elector. Before, and with a view to this, Leibnitz had been employed by him to write the history of the Brunswick-Lüneburg family, and, to collect material for his history, had undertaken a journey through Germany and Italy in 1687–1690, visiting and examining the records in Marburg, Frankfort-on-the-Main, Munich, Vienna (where he remained nine months), Venice, Modena and Rome. At Rome he was offered the custodianship of the Vatican library on condition of his joining the Catholic Church.

About this time, too, his thoughts and energies were partly taken up with the scheme for the reunion of the Catholic and Protestant Churches. At Mainz he had joined in an attempt made by the elector and Boyneburg to bring about a reconciliation, and now, chiefly through the energy and skill of the Catholic Royas de Spinola, and from the spirit of moderation which prevailed among the theologians he met with at Hanover in 1683, it almost seemed as if some agreement might be arrived at. In 1686 Leibnitz wrote his *Systema theologicum*,[4] in which he strove to find common ground for Protestants and Catholics in the details of their creeds. But the English revolution of 1688 interfered with the scheme in Hanover, and it was soon found that the religious difficulties were greater than had at one time appeared. In the letters to Leibnitz from Bossuet, the landgrave of Hessen-Rheinfels, and Madame de Brinon, the aim is obviously to make converts to Catholicism, not to arrive at a compromise with Protestantism, and when it was found that Leibnitz refused to be converted the correspondence ceased. A further scheme of church union in which Leibnitz was engaged, that between the Reformed and Lutheran Churches, met with no better success.

Returning from Italy in 1690, Leibnitz was appointed librarian at Wolfenbüttel by Duke Anton of Brunswick-Wolfenbüttel. Some years afterwards began his connexion with Berlin through his friendship with the electress Sophie Charlotte of Brandenburg and her mother the princess Sophie of Hanover. He was invited to Berlin in 1700, and on the 11th July of that year the academy (Akademie der Wissenschaften) he had planned was founded, with himself as its president for life. In the same year he was made a privy councillor of justice by the elector of Brandenburg. Four years before he had received a like honour from the elector of Hanover, and twelve years afterwards the same distinction was conferred upon him by Peter the Great, to whom he gave a plan for an academy at St Petersburg, carried out after the czar's death. After the death of his royal pupil in 1705 his visits to Berlin became less frequent and less welcome, and in 1711 he was there for the last time. In the following year he undertook his fifth and last journey to Vienna, where he stayed till 1714. An attempt to found an academy of science there was defeated by the opposition of the Jesuits, but he now attained the honour he had coveted of an imperial privy councillorship (1712), and, either at this time or on a previous occasion (1709), was made a baron of the empire (*Reichsfreiherr*). Leibnitz returned to Hanover in September 1714, but found the elector George Louis had already gone to assume the crown of England. Leibnitz would gladly have followed him to London, but was bidden to remain at Hanover and finish his history of Brunswick.

During the last thirty years Leibnitz had been busy with many matters. Mathematics, natural science,[5] philosophy, theology, history jurisprudence, politics (particularly the French wars with Germany, and the question of the Spanish succession), economics and philology, all gained a share of his attention; almost all of them he enriched with original observations.

His genealogical researches in Italy—through which he established the common origin of the families of Brunswick and

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[1] In a letter to the duke of Brunswick-Lüneburg (autumn 1671), *Werke*, ed. Klopp, iii. 253 sq.

[2] He was made a foreign member of the French Academy in 1700.

[3] *Caesarini Furstenerii tractatus de jure suprematus ac legationis principum Germaniae* (Amsterdam, 1677); *Entretiens de Philarète et d'Eugène sur le droit d'ambassade* (Duisb., 1677).

[4] Not published till 1819. It is on this work that the assertion has been founded that Leibnitz was at heart a Catholic—a supposition clearly disproved by his correspondence.

[5] In his *Protogaea* (1691) he developed the notion of the historical genesis of the present condition of the earth's surface. Cf. O. Peschel, *Gesch. d. Erdkunde* (Munich, 1865), pp. 615 sq.

Este—were not only preceded by an immense collection of historical sources, but enabled him to publish materials for a code of international law.[1] The history of Brunswick itself was the last work of his life, and had covered the period from 768 to 1005 when death ended his labours. But the government, in whose service and at whose order the work had been carried out, left it in the archives of the Hanover library till it was published by Pertz in 1843.

It was in the years between 1690 and 1716 that Leibnitz's chief philosophical works were composed, and during the first ten of these years the accounts of his system were, for the most part, preliminary sketches. Indeed, he never gave a full and systematic account of his doctrines. His views have to be gathered from letters to friends, from occasional articles in the *Acta Eruditorum*, the *Journal des Savants*, and other journals, and from one or two more extensive works. It is evident, however, that philosophy had not been entirely neglected in the years in which his pen was almost solely occupied with other matters. A letter to the duke of Brunswick, and another to Arnauld, in 1671, show that he had already reached his new notion of substance; but it is in the correspondence with Antoine Arnauld, between 1686 and 1690, that his fundamental ideas and the reasons for them are for the first time made clear. The appearance of Locke's *Essay* in 1690 induced him (1696) to note down his objections to it, and his own ideas on the same subjects. In 1703–1704 these were worked out in detail and ready for publication, when the death of the author whom they criticized prevented their appearance (first published by Raspe, 1765). In 1710 appeared the only complete and systematic philosophical work of his life-time, *Essais de Théodicée sur la bonté de Dieu, la liberté de l'homme, et l'origine du mal*, originally undertaken at the request of the late queen of Prussia, who had wished a reply to Bayle's opposition of faith and reason. In 1714 he wrote, for Prince Eugene of Savoy, a sketch of his system under the title of *La Monadologie*, and in the same year appeared his *Principes de la nature et de la grâce*. The last few years of his life were perhaps more occupied with correspondence than any others, and, in a philosophical regard, were chiefly notable for the letters, which, through the desire of the new queen of England, he interchanged with Clarke, *sur Dieu, l'âme, l'espace, la durée*.

Leibnitz died on the 14th of November 1716, his closing years enfeebled by disease, harassed by controversy, embittered by neglect; but to the last he preserved the indomitable energy and power of work to which is largely due the position he holds as, more perhaps than any one in modern times, a man of almost universal attainments and almost universal genius. Neither at Berlin, in the academy which he had founded, nor in London, whither his sovereign had gone to rule, was any notice taken of his death. At Hanover, Eckhart, his secretary, was his only mourner; "he was buried," says an eyewitness, "more like a robber than what he really was, the ornament of his country."[2] Only in the French Academy was the loss recognized, and a worthy eulogium devoted to his memory (November 13, 1717). The 200th anniversary of his birth was celebrated in 1846, and in the same year were opened the Königlichsächsische Gesellschaft der Wissenschaften and the Kaiserliche Akademie der Wissenschaften in Leipzig and Vienna respectively. In 1883, a statue was erected to him at Leipzig.

Leibnitz possessed a wonderful power of rapid and continuous work. Even in travelling his time was employed in solving mathematical problems. He is described as moderate in his habits, quick of temper but easily appeased, charitable in his judgments of others, and tolerant of differences of opinion, though impatient of contradiction on small matters. He is also said to have been fond of money to the point of covetousness; he was certainly desirous of honour, and felt keenly the neglect in which his last years were passed.

Philosophy.—The central point in the philosophy of Leibnitz was only arrived at after many advances and corrections in his opinions. This point is his new doctrine of substance (p. 702),[3] and it is through it that unity is given to the succession of occasional writings, scattered over fifty years, in which he explained his views. More inclined to agree than to differ with what he read (p. 425), and borrowing from almost every philosophical system, his own standpoint is yet most closely related to that of Descartes, partly as consequence, partly by way of opposition. Cartesianism, Leibnitz often asserted, is the ante-room of truth, but the ante-room only. Descartes's separation of things into two heterogeneous substances only connected by the omnipotence of God, and the more logical absorption of both by Spinoza into the one divine substance, followed from an erroneous conception of what the true nature of substance is. Substance, the ultimate reality, can only be conceived as force. Hence Leibnitz's metaphysical view of the monads as simple, percipient, self-active beings, the constituent elements of all things, his physical doctrines of the reality and constancy of force at the same time that space, matter and motion are merely phenomenal, and his psychological conception of the continuity and development of consciousness. In the closest connexion with the same stand his logical principles of consistency and sufficient reason, and the method he developed from them, his ethical end of perfection, and his crowning theological conception of the universe as the best possible world, and of God both as its efficient cause and its final harmony.

The ultimate elements of the universe are, according to Leibnitz, individual centres of force or monads. Why they should be individual, and not manifestations of one world-force, he never clearly proves.[4] His doctrine of individuality seems to have been arrived at, not by strict deduction from the nature of force, but rather from the empirical observation that it is by the manifestation of its activity that the separate existence of the individual becomes evident; for his system individuality is as fundamental as activity. "The monads," he says, "are the very atoms of nature —in a word, the elements of things," but, as centres of force, they have neither parts, extension nor figure (p. 705). Hence their distinction from the atoms of Democritus and the materialists. They are metaphysical points or rather spiritual beings whose very nature it is to act. As the bent bow springs back of itself, so the monads naturally pass and are always passing into action without any aid but the absence of opposition (p. 122). Nor do they, like the atoms, act upon one another (p. 680); the action of each excludes that of every other. The activity of each is the result of its own past state, the determinator of its own future (pp. 706, 722). "The monads have no windows by which anything may go in or out" (p. 705).

Further, since all substances are of the nature of force, it follows that—"in imitation of the notion which we have of souls"—they must contain something analogous to feeling and appetite. It is the nature of the monad to represent the many in one, and this is perception, by which external events are mirrored internally (p. 438). Through their own activity the monads mirror the universe (p. 725), but each in its own way and from its own point of view, that is, with a more or less perfect perception (p. 127); for the Cartesians were wrong in ignoring the infinite grades of perception, and identifying it with the reflex cognizance of it which may be called apperception. Every monad is thus a microcosm, the universe in little,[5] and according to the degree of its activity is the distinctness of its representation of the universe (p. 709). Thus Leibnitz, borrowing the Aristotelian term, calls the monads *entelechies*, because they have a certain perfection (τὸ ἐντελές) and sufficiency (αὐτάρκεια) which make them sources of their internal actions and, so to speak, incorporeal automata (p. 706). That the monads are not pure entelechies is shown by the differences amongst them. Excluding all external limitation, they are yet limited by their own nature. All created monads contain a passive element or *materia prima* (pp. 440, 687, 725), in virtue of which their perceptions are more or less confused. As the activity of the monad consists in perception, this is inhibited by the passive principle, so that there arises in the monad an appetite or tendency to overcome the inhibition and become more perceptive, whence follows the change from one perception to another (pp. 706, 714). By the proportion of activity to passivity in it one monad is differentiated from another. The greater the amount of activity or of distinct perceptions the more perfect is the monad; the stronger the element of passivity, the more confused its perceptions, the less perfect is it (p. 709). The soul would be a divinity had it nothing but distinct perceptions (p. 520).

The monad is never without a perception; but, when it has a number of little perceptions with no means of distinction, a state similar to that of being stunned ensues, the *monade nue* being perpetually in this state (p. 707). Between this and the most distinct perception there is room for an infinite diversity of nature among the monads themselves. Thus no one monad is exactly the same as another; for, were it possible that there should be two identical, there would be no sufficient reason why God, who brings them into actual existence, should put one of them at one definite time and place, the other at a different time and place. This is Leibnitz's principle of the *identity of indiscernibles* (pp. 277, 755); by it his early problem as to the principle of individuation is solved by the distinction between genus and individual being abolished, and every individual made *sui generis*. The principle thus established is formulated in Leibnitz's law of continuity, founded, he says, on the doctrine of the mathematical infinite, essential to geometry, and of importance in physics (pp. 104, 105), in accordance with which there is neither vacuum nor break in nature, but "everything takes place by degrees" (p. 392), the different species of creatures rising by insensible steps from the lowest to the most perfect form (p. 312).

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[1] *Codex juris gentium diplomaticus* (1693); *Mantissa codicis juri gentium diplomatici* (1700).

[2] *Memoirs of John Ker of Kersland*. by himself (1726), i. 118.

[3] When not otherwise stated, the references are to Erdmann's edition of the *Opera philosophica*.

[4] See *Considérations sur la doctrine d'un esprit universel* (1702).

[5] Cf. *Opera*, ed. Dutens, II. ii. 20.

As in every monad each succeeding state is the consequence of the preceding, and as it is of the nature of every monad to mirror or represent the universe, it follows (p. 774) that the perceptive content of each monad is in "accord" or correspondence with that of every other (cf. p. 127), though this content is represented with infinitely varying degrees of perfection. This is Leibnitz's famous doctrine of pre-established harmony, in virtue of which the infinitely numerous independent substances of which the world is composed are related to each other and form one universe. It is essential to notice that it proceeds from the very nature of the monads as percipient, self-acting beings, and not from an arbitrary determination of the Deity.

From this harmony of self-determining percipient units Leibnitz has to explain the world of nature and mind. As everything that really exists is of the nature of spiritual or metaphysical points (p. 126), it follows that space and matter in the ordinary sense can only have a phenomenal existence (p. 745), being dependent not on the nature of the monads themselves but on the way in which they are perceived. Considering that several things exist at the same time and in a certain order of coexistence, and mistaking this constant relation for something that exists outside of them, the mind forms the confused perception of space (p. 768). But space and time are merely relative, the former an order of coexistences, the latter of successions (pp. 682, 752). Hence not only the secondary qualities of Descartes and Locke, but their so-called primary qualities as well, are merely phenomenal (p. 445). The monads are really without position or distance from each other; but, as we perceive several simple substances, there is for us an aggregate or extended mass. Body is thus active extension (pp. 110, 111). The unity of the aggregate depends entirely on our perceiving the monads composing it together. There is no such thing as an absolute vacuum or empty space, any more than there are indivisible material units or atoms from which all things are built up (pp. 126, 186, 277). Body, corporeal mass, or, as Leibnitz calls it, to distinguish it from the *materia prima* of which every monad partakes (p. 440), *materia secunda*, is thus only a "phenomenon bene fundatum" (p. 436). It is not a *substantia* but *substantiae* or *substantiatum* (p. 745). While this, however, is the only view consistent with Leibnitz's fundamental principles, and is often clearly stated by himself, he also speaks at other times of the *materia secunda* as itself a composite substance, and of a real metaphysical bond between soul and body. But these expressions occur chiefly in the letters to des Bosses, in which Leibnitz is trying to reconcile his views with the doctrines of the Roman Catholic Church, especially with that of the real presence in the Eucharist, and are usually referred to by him as doctrines of faith or as hypothetical (see especially p. 680). The true *vinculum substantiale* is not the *materia secunda*, which a consistent development of Leibnitz's principles can only regard as phenomenal, but the *materia prima*, through which the monads are individualized and distinguished and their connexion rendered possible. And Leibnitz seems to recognize that the opposite assumption is inconsistent with his cardinal metaphysical view of the monads as the only realities.

From Leibnitz's doctrine of force as the ultimate reality it follows that his view of nature must be throughout dynamical. And though his project of a *dynamic*, or theory of natural philosophy, was never carried out, the outlines of his own theory and his criticism of the mechanical physics of Descartes are known to us. The whole distinction between the two lies in the difference between the mechanical and the dynamical views of nature. Descartes started from the reality of extension as constituting the nature of material substance, and found in magnitude, figure and motion the explanation of the material universe. Leibnitz, too, admitted the mechanical view of nature as giving the laws of corporeal phenomena (p. 438), applying also to everything that takes place in animal organisms,[1] even the human body (p. 777). But, as phenomenal, these laws must find their explanation in metaphysics, and thus in final causes (p. 155). All things, he says (in his *Specimen Dynamicum*), can be explained either by efficient or by final causes. But the latter method is not appropriate to individual occurrences,[2] though it must be applied when the laws of mechanism themselves need explanation (p. 678). For Descartes's doctrine of the constancy of the quantity of motion (*i.e.* momentum) in the world Leibnitz substitutes the principle of the conservation of *vis viva*, and contends that the Cartesian position that motion is measured by velocity should be superseded by the law that moving force (*vis motrix*) is measured by the square of the velocity (pp. 192, 193). The long controversy raised by this criticism was really caused by the ambiguity of the terms employed. The principles held by Descartes and Leibnitz were both correct, though different, and their conflict only apparent. Descartes's principle is now enunciated as the conservation of momentum, that of Leibnitz as the conservation of energy. Leibnitz further criticizes the Cartesian view that the mind can alter the direction of motion though it cannot initiate it, and contends that the quantity of "*vis directiva*," estimated between the same parts, is constant (p. 108)—a position developed in his statical theorem for determining geometrically the resultant of any number of forces acting at a point.

Like the monad, body, which is its analogue, has a passive and an active element. The former is the capacity of resistance, and includes impenetrability and inertia; the latter is active force (pp. 250, 687). Bodies, too, like the monads, are self-contained activities, receiving no impulse from without—it is only by an accommodation to ordinary language that we speak of them as doing so—but moving themselves in harmony with each other (p. 250).

The psychology of Leibnitz is chiefly developed in the *Nouveaux essais sur l'entendement humain*, written in answer to Locke's famous *Essay*, and criticizing it chapter by chapter. In these essays he worked out a theory of the origin and development of knowledge in harmony with his metaphysical views, and thus without Locke's implied assumption of the mutual influence of soul and body. When one monad in an aggregate perceives the others so clearly that they are in comparison with it bare monads (*monades nues*), it is said to be the ruling monad of the aggregate, not because it actually does exert an influence over the rest, but because, being in close correspondence with them, and yet having so much clearer perception, it seems to do so (p. 683). This monad is called the entelechy or soul of the aggregate or body, and as such mirrors the aggregate in the first place and the universe through it (p. 710). Each soul or entelechy is surrounded by an infinite number of monads forming its body (p. 714); soul and body together make a living being, and, as their laws are in perfect harmony—a harmony established between the whole realm of final causes and that of efficient causes (p. 714)—we have the same result as if one influenced the other. This is further explained by Leibnitz in his well-known illustration of the different ways in which two clocks may keep exactly the same time. The machinery of the one may actually move that of the other, or whenever one moves the mechanician may make a similar alteration in the other, or they may have been so perfectly constructed at first as to continue to correspond at every instant without any further influence (pp. 133, 134). The first way represents the common (Locke's) theory of mutual influence, the second the method of the occasionalists, the third that of pre-established harmony. Thus the body does not act on the soul in the production of cognition, nor the soul on the body in the production of motion. The body acts just as if it had no soul, the soul as if it had no body (p. 711). Instead, therefore, of all knowledge coming to us directly or indirectly through the bodily senses, it is all developed by the soul's own activity, and sensuous perception is itself but a confused kind of cognition. Not a certain select class of our ideas only (as Descartes held), but all our ideas, are innate, though only worked up into actual cognition in the development of knowledge (p. 212). To the aphorism made use of by Locke, "Nihil est in intellectu quod non prius fuerit in sensu," must be added the clause, "nisi intellectus ipse" (p. 223). The soul at birth is not comparable to a *tabula rasa*, but rather to an unworked block of marble, the hidden veins of which already determine the form it is to assume in the hands of the sculptor (p. 196). Nor, again, can the soul ever be without perception; for it has no other nature than that of a percipient active being (p. 246). Apparently dreamless sleep is to be accounted for by unconscious perception (p. 223); and it is by such insensible perceptions that Leibnitz explains his doctrine of pre-established harmony (p. 197).

In the human soul perception is developed into thought, and there is thus an infinite though gradual difference between it and the mere monad (p. 464). As all knowledge is implicit in the soul, it follows that its perfection depends on the efficiency of the instrument by which it is developed. Hence the importance, in Leibnitz's system, of the logical principles and method, the consideration of which occupied him at intervals throughout his whole career.

There are two kinds of truths—(1) truths of reasoning, and (2) truths of fact (pp. 83, 99, 707). The former rest on the principle of identity (or contradiction) or of possibility, in virtue of which that is false which contains a contradiction, and that true which is contradictory to the false. The latter rest on the principle of sufficient reason or of reality (*compossibilité*), according to which no fact is true unless there be a sufficient reason why it should be so and not otherwise (agreeing thus with the *principium melioris* or final cause). God alone, the purely active monad, has an *a priori* knowledge of the latter class of truths; they have their source in the human mind only in so far as it mirrors the outer world, *i.e.* in its passivity, whereas the truths of reason have their source in our mind in itself or in its activity.

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[1] The difference between an organic and an inorganic body consists, he says, in this, that the former is a machine even in its smallest parts.

[2] *Opera*, ed. Dutens, iii. 321.

Both kinds of truths fall into two classes, primitive and derivative. The primitive truths of fact are, as Descartes held, those of internal experience, and the derivative truths are inferred from them in accordance with the principle of sufficient reason, by their agreement with our perception of the world as a whole. They are thus reached by probable arguments—a department of logic which Leibnitz was the first to bring into prominence (pp. 84, 164, 168, 169, 343). The primitive truths of reasoning are identical (in later terminology, analytical) propositions, the derivative truths being deduced from them by the principle of contradiction. The part of his logic on which Leibnitz laid the greatest stress was the separation of these rational cognitions into their simplest elements—for he held that the root-notions (*cogitationes primae*) would be found to be few in number (pp. 92, 93)—and the designation of them by universal characters or symbols,[1] composite notions being denoted by the formulae formed by the union of several definite characters, and judgments by the relation of aequipollence among these formulae, so as to reduce the syllogism to a calculus. This is the main idea of Leibnitz's "universal characteristic," never fully worked out by him, which he regarded as one of the greatest discoveries of the age. An incidental result of its adoption would be the introduction of a universal symbolism of thought comparable to the symbolism of mathematics and intelligible in all languages (cf. p. 356). But the great revolution it would effect would chiefly consist in this, that truth and falsehood would be no longer matters of opinion but of correctness or error in calculation[2] (pp. 83, 84, 89, 93). The old Aristotelian analytic is not to be superseded; but it is to be supplemented by this new method, for of itself it is but the ABC of logic.

But the logic of Leibnitz is an art of discovery (p. 85) as well as of proof, and, as such, applies both to the sphere of reasoning and to that of fact. In the former it has by attention to render explicit what is otherwise only implicit, and by the intellect to introduce order into the *a priori* truths of reason, so that one may follow from another and they may constitute together a *monde intellectuel.* To this art of orderly combination Leibnitz attached the greatest importance, and to it one of his earliest writings was devoted. Similarly, in the sphere of experience, it is the business of the art of discovery to find out and classify the primitive facts or data, referring every other fact to them as its sufficient reason, so that new truths of experience may be brought to light.

As the perception of the monad when clarified becomes thought, so the appetite of which all monads partake is raised to will, their spontaneity to freedom, in man (p. 669). The will is an effort or tendency to that which one finds good (p. 251), and is free only in the sense of being exempt from external control[3] (pp. 262, 513, 521), for it must always have a sufficient reason for its action determined by what seems good to it. The end determining the will is pleasure (p. 269), and pleasure is the sense of an increase of perfection (p. 670). A will guided by reason will sacrifice transitory and pursue constant pleasures or happiness, and in this weighing of pleasures consists true wisdom. Leibnitz, like Spinoza, says that freedom consists in following reason, servitude in following the passions (p. 669), and that the passions proceed from confused perceptions (pp. 188, 269). In love one finds joy in the happiness of another; and from love follow justice and law. "Our reason," says Leibnitz,[4] "illumined by the spirit of God, reveals the law of nature," and with it positive law must not conflict. Natural law rises from the strict command to avoid offence, through the maxim of equity which gives to each his due, to that of probity or piety (*honeste vivere*),—the highest ethical perfection,—which presupposes a belief in God, providence and a future life.[5] Moral immortality—not merely the simple continuity which belongs to every monad—comes from God having provided that the changes of matter will not make man lose his individuality (pp. 126, 466).

Leibnitz thus makes the existence of God a postulate of morality as well as necessary for the realization of the monads. It is in the *Théodicée* that his theology is worked out and his view of the universe as the best possible world defended. In it he contends that faith and reason are essentially harmonious (pp. 402, 479), and that nothing can be received as an article of faith which contradicts an eternal truth, though the ordinary physical order may be superseded by a higher.[6]

The ordinary arguments for the being of God are retained by Leibnitz in a modified form (p. 375). Descartes's ontological proof is supplemented by the clause that God as the *ens a se* must either exist or be impossible (pp. 80, 177, 708); in the cosmological proof he passes from the infinite series of finite causes to their sufficient reason which contains all changes in the series necessarily in itself (pp. 147, 708); and he argues teleologically from the existence of harmony among the monads without any mutual influence to God as the author of this harmony (p. 430).

In these proofs Leibnitz seems to have in view an extramundane power to whom the monads owe their reality, though such a conception evidently breaks the continuity and harmony of his system, and can only be externally connected with it. But he also speaks in one place at any rate[7] of God as the "universal harmony"; and the historians Erdmann and Zeller are of opinion that this is the only sense in which his system can be consistently theistic. Yet it would seem that to assume a purely active and therefore perfect monad as the source of all things is in accordance with the principle of continuity and with Leibnitz's conception of the gradation of existences. In this sense he sometimes speaks of God as the first or highest of the monads (p. 678), and of created substances proceeding from Him continually by "fulgurations" (p. 708) or by "a sort of emanation as we produce our thoughts."[8]

The positive properties or perfections of the monads, Leibnitz holds, exist *eminenter*, *i.e.* without the limitation that attaches to created monads (p. 716), in God—their perception as His wisdom or intellect, and their appetite as His absolute will or goodness (p. 654); while the absence of all limitation is the divine independence or power, which again consists in this, that the possibility of things depends on His intellect, their reality on His will (p. 506). The universe in its harmonious order is thus the realization of the divine end, and as such must be the best possible (p. 506). The teleology of Leibnitz becomes necessarily a *Théodicée.* God created a world to manifest and communicate His perfection (p. 524), and, in choosing this world out of the infinite number that exist in the region of ideas (p. 515), was guided by the *principium melioris* (p. 506). With this thoroughgoing optimism Leibnitz has to reconcile the existence of evil in the best of all possible worlds.[9] With this end in view he distinguishes (p. 655) between (1) metaphysical evil or imperfection, which is unconditionally willed by God as essential to created beings; (2) physical evil, such as pain, which is conditionally willed by God as punishment or as a means to greater good (cf. p. 510); and (3) moral evil, in which the great difficulty lies, and which Leibnitz makes various attempts to explain. He says that it was merely permitted not willed by God (p. 655), and, that being obviously no explanation, adds that it was permitted because it was foreseen that the world with evil would nevertheless be better than any other possible world (p. 350). He also speaks of the evil as a mere set-off to the good in the world, which it increases by contrast (p. 149), and at other times reduces moral to metaphysical evil by giving it a merely negative existence, or says that their evil actions are to be referred to men alone, while it is only the power of action that comes from God, and the power of action is good (p. 658).

The great problem of Leibnitz's *Théodicée* thus remains unsolved. The suggestion that evil consists in a mere imperfection, like his idea of the monads proceeding from God by a continual emanation, was too bold and too inconsistent with his immediate apologetic aim to be carried out by him. Had he done so his theory would have transcended the independence of the monads with which it started, and found a deeper unity in the world than that resulting from the somewhat arbitrary assertion that the monads reflect the universe.

The philosophy of Leibnitz, in the more systematic and abstract form it received at the hands of Wolf, ruled the schools of Germany for nearly a century, and largely determined the character of the critical philosophy by which it was superseded. On it Baumgarten laid the foundations of a science of aesthetic. Its treatment of theological questions heralded the German *Aufklärung.* And on many special points—in its physical doctrine of the conservation of force, its psychological hypothesis of unconscious perception, its attempt at a logical symbolism—it has suggested ideas fruitful for the progress of science.

BIBLIOGRAPHY.—(1) Editions: Up to 1900 no attempt had been made to publish the complete works. Several editions existed, but a vast mass of MSS. (letters, &c.) remained only roughly classified in the Hanover library. The chief editions were: (1) L. Dutens (Geneva, 1768), called *Opera Omnia*, but far from complete; (2) G. H. Pertz, *Leibnizens gesammelte Werke* (Berlin, 1843–1863) (1st ser. History, 4 vols.; 2nd ser. Philosophy, vol. i. correspondence with Arnauld, &c., ed. C. L. Grotefend; 3rd ser. Mathematics, 7 vols., ed. C. J. Gerhardt); (3) Foucher de Careil (planned in 20 vols., 7 published, Paris, 1859–1875), the same editor having previously published *Lettres et opuscules inédits de Leibniz* (Paris, 1854–1857); (4) Onno Klopp, *Die Werke von Leibniz gemäss seinem Handschriftlichen Nachlasse in der Königlichen Bibliothek zu Hannover* (1st series, Historico-Political and Political, 10 vols., 1864–1877). The *Œuvres de Leibnitz*, by A. Jacques (2 vols., Paris, 1846) also

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[1] Different symbolic systems were proposed by Leibnitz at different periods; cf. Kvêt, *Leibnitzens Logik* (1857), p. 37.

[2] The places at which Leibnitz anticipated the modern theory of logic mainly due to Boole are pointed out in Mr Venn's *Symbolic Logic* (1881).

[3] Hence the difference of his determinism from that of Spinoza, though Leibnitz too says in one place that "it is difficult enough to distinguish the actions of God from those of the creatures" (*Werke*, ed. Pertz, 2nd ser. vol. i. p. 160).

[4] *Opera omnia*, ed. Dutens, IV. iii. 282.

[5] *Ibid.* IV. iii. 295. Cf. Bluntschli, *Gesch. d. allg. Staatsrechts u. Politik* (1864), pp. 143 sqq.

[6] P. 480; cf. *Werke*, ed. Pertz, 2nd ser. vol. i. pp. 158, 159.

[7] *Werke*, ed. Klopp, iii. 259; cf. *Op. phil.*, p. 716.

[8] *Werke*, ed. Pertz, 2nd ser. vol. i. p. 167.

[9] "Si c'est ici le meilleur des mondes possibles, que sont donc les autres?"—Voltaire, *Candide*, ch. vi.

deserves mention. The philosophical writings had been published by Raspe (Amsterdam and Leipzig, 1765), by J. E. Erdmann, *Leibnitii opera philos. quae extant Latina, Gallica, Germanica, omnia* (Berlin, 1840), by P. Janet (2 vols., Paris, 1866, 2nd ed. 1900), and the fullest by C. J. Gerhardt, *Die Philosophischen Schriften von G. W. Leibniz* (7 vols., 1875–1890); cf. also *Die kleineren philos. wichtigeren Schriften* (trans. with commentary, J. H. von Kirchmann, 1879). The German works had also been partly published separately; G. E. Guhrauer (Berlin, 1838–1840). Of the letters various collections had been published up to 1900, *e.g.*: C. J. Gerhardt (Halle, 1860) and *Der Briefwechsel von G. W. Leibnitz mit Mathematikern* (1899); *Corrispondenza tra L. A. Muratori e G. Leibnitz* (1899); and cf. *Neue Beiträge zum Briefwechsel zwischen D. E. Jablonsky und G. W. Leibnitz* (1899).

In 1900 it was decided by scholars in Berlin and Paris that a really complete edition should be published, and with this object four German and four French critics were entrusted with the preliminary task of correlating the MSS. in the royal library at Hanover. This process resulted in the preparation of the *Kritischer Katalog der Leibnitz-Handschriften zur Vorbereitung der interakademischen Leibnitz-Ausgabe unternommen* (1908), and also in certain other preliminary publications, *e.g.* L. Couturat, *Opuscules et fragments inédits* (1903); E. Gerland, *Leibnizens nachgelassene Schriften physikalischen, mechanischen und technischen Inhalts* (1906); Jean Baruzi, *Leibniz* (1909), containing unedited MSS. and a sketch-biography; cf. the same author's *Leibniz et l'organisation religieuse de la terre* (1907).

Translations.—Of the *Systema Theologicum* (1850, C. W. Russell), of the correspondence with Clarke (1717); *Works*, by G. M. Duncan (New Haven, 1890); of the *Nouveaux Essais*, by A. G. Langley (London, 1894); the *Monadology and other Writings*, by R. Latta (Oxford, 1898).

Biographical.—The materials for the life of Leibnitz, in addition to his own works, are the notes of Eckhart (not published till 1779), the *Éloge* by Fontenelle (read to the French Academy in 1717), the "Eulogium," by Wolf, in the *Acta Eruditorium* for July 1717; and the "Supplementum" to the same by Feller, published in his *Otium Hannoveranum* (Leipzig, 1718). The best biography is that of G. E. Guhrauer, *G. W. Freiherr von Leibnitz* (2 vols., Breslau, 1842; *Nachträge*, Breslau, 1846). A shorter *Life of G. W. von Leibnitz, on the Basis of the German Work of Guhrauer*, has been published by J. M. Mackie (Boston, 1845). More recent works are those of L. Grote, *Leibniz und seine Zeit* (Hanover, 1869); E. Pfleiderer, *Leibniz als Patriot, Staatsmann, und Bildungsträger* (Leipzig, 1870); the slighter volume of F. Kirchner, *G. W. Leibniz: sein Leben und Denken* (Köthen, 1876); Kuno Fischer, vol. iii. in *Gesch. der neuern Philosophie* (4th ed., 1902).

Critical.—The monographs and essays on Leibnitz are too numerous to mention, but reference may be made to Feuerbach, *Darstellung, Entwicklung, und Kritik der Leibnitz'schen Phil.* (2nd ed., Leipzig, 1844); Nourrisson, *La Philosophie de Leibniz* (Paris, 1860); R. Zimmermann, *Leibnitz und Herbart: eine Vergleichung ihrer Monadologieen* (Vienna, 1849); O. Caspari, *Leibniz' Philosophie beleuchtet vom Gesichtspunkt der physikalischen Grundbegriffe von Kraft und Stoff* (Leipzig, 1870); G. Hartenstein, "Locke's Lehre von der menschl. Erk. in Vergl. mit Leibniz's Kritik derselben dargestellt," in the *Abhandl. d. philol.-hist. Cl. d. K. Sächs. Gesells. d. Wiss.*, vol. iv. (Leipzig, 1865); G. Class, *Die metaph. Voraussetzungen des Leibnitzischen Determinismus* (Tübingen, 1874); F. B. Kvêt, *Leibnitzens Logik* (Prague, 1857); the essays on Leibnitz in Trendelenburg's *Beiträge*, vols. ii. and iii. (Berlin, 1855, 1867); L. Neff, *Leibniz als Sprachforscher* (Heidelberg, 1870–1871); J. Schmidt, *Leibniz und Baumgarten* (Halle, 1875); D. Nolen, *La Critique de Kant et la Métaphysique de Leibniz* (Paris, 1875); and the exhaustive work of A. Pichler, *Die Theologie des Leibniz* (Munich, 1869–1870). Among the more recent works are: C. Braig, *Leibniz: sein Leben und die Bedeutung seiner Lehre* (1907); E. Cassirer, *Leibniz' System in seinem wissenschaftlichen Grundlagen* (1902); L. Couturat, *La Logique de Leibniz d'après des documents inédits* (1901); L. Davillé, *Leibniz historien* (1909); Kuno Fischer, *G. W. Leibniz* (1889); R. B. Frenzel, *Der Associationsbegriff bei Leibniz* (1898); R. Herbertz, *Die Lehre vom Unbewussten im System des Leibniz* (1905); H. Hoffmann, *Die Leibniz'sche Religions-philosophie in ihrer geschichtlichen Stellung* (1903); W. Kabitz, *Die Philosophie des jungen Leibniz* (1909), a study of the development of the Leibnitzian system; H. L. Koch, *Materie und Organismus bei Leibniz* (1908); G. Niel, *L'Optimisme de Leibniz* (1888); Bertrand A. W. Russell, *A Critical Exposition of the Philosophy of Leibniz* (1900); F. Schmöger, *Leibniz in seiner Stellung zur tellurischen Physik* (1901); A. Silberstein, *Leibnizens Apriorismus in Verhältnis zu seiner Metaphysik* (1904); Stein, *Leibniz und Spinoza* (1890); F. Thilly, *Leibnizens Streit gegen Locke in Ansehung der angeborenen Ideen* (1891); R. Urbach, *Leibnizens Rechtfertigung des Uebels in der besten Welt* (1901); W. Werckmeister, *Der Leibnizsche Substanzbegriff* (1899); F. G. F. Wernicke, *Leibniz' Lehre von der Freiheit des menschlichen Willens* (1890). (W. R. So.)

LEICESTER, EARLS OF. The first holder of this English earldom belonged to the family of Beaumont, although a certain Saxon named Edgar has been described as the 1st earl of Leicester. Robert de Beaumont (d. 1118) is frequently but erroneously considered to have received the earldom from Henry I., about 1107; he had, however, some authority in the county of Leicester and his son Robert was undoubtedly earl of Leicester in 1131. The 3rd Beaumont earl, another Robert, was also steward of England, a dignity which was attached to the earldom of Leicester from this time until 1399. The earldom reverted to the crown when Robert de Beaumont, the 4th earl, died in January 1204.

In 1207 Simon IV., count of Montfort (*q.v.*), nephew and heir of Earl Robert, was confirmed in the possession of the earldom by King John, but it was forfeited when his son, the famous Simon de Montfort, was attainted and was killed at Evesham in August 1265. Henry III.'s son Edmund, earl of Lancaster, was also earl of Leicester and steward of England, obtaining these offices a few months after Earl Simon's death. Edmund's sons, Thomas and Henry, both earls of Lancaster, and his grandson Henry, duke of Lancaster, in turn held the earldom, which then passed to a son-in-law of Duke Henry, William V., count of Holland (*c.* 1327–1389), and then to another and more celebrated son-in-law, John of Gaunt, duke of Lancaster. When in 1399 Gaunt's son became king as Henry IV. the earldom was merged in the crown.

In 1564 Queen Elizabeth created her favourite, Lord Robert Dudley, earl of Leicester. The new earl was a son of John Dudley, duke of Northumberland; he left no children, or rather none of undoubted legitimacy, and when he died in September 1588 the title became extinct.

In 1618 the earldom of Leicester was revived in favour of Robert Sidney, Viscount Lisle, a nephew of the late earl and a brother of Sir Philip Sidney; it remained in this family until the death of Jocelyn (1682–1743), the 7th earl of this line, in July 1743. Jocelyn left no legitimate children, but a certain John Sidney claimed to be his son and consequently to be 8th earl of Leicester.

In 1744, the year after Jocelyn's death, Thomas Coke, Baron Lovel (*c.* 1695–1759), was made earl of Leicester, but the title became extinct on his death in April 1759. The next family to hold the earldom was that of Townshend, George Townshend (1755–1811) being created earl of Leicester in 1784. In 1807 George succeeded his father as 2nd marquess Townshend, and when his son George Ferrars Townshend, the 3rd marquess (1778–1855), died in December 1855 the earldom again became extinct. Before this date, however, another earldom of Leicester was in existence. This was created in 1837 in favour of Thomas William Coke, who had inherited the estates of his relative Thomas Coke, earl of Leicester. To distinguish his earldom from that held by the Townshends Coke was ennobled as earl of Leicester of Holkham; his son Thomas William Coke (1822–1909) became 2nd earl of Leicester in 1842, and the latter's son Thomas William (b. 1848) became 3rd earl.

See G. E. C(okayne), *Complete Peerage*, vol. v. (1893).

LEICESTER, ROBERT DUDLEY, Earl of (*c.* 1531–1588). This favourite of Queen Elizabeth came of an ambitious family. They were not, indeed, such mere upstarts as their enemies loved to represent them; for Leicester's grandfather—the notorious Edmund Dudley who was one of the chief instruments of Henry VII.'s extortions—was descended from a younger branch of the barons of Dudley. But the love of power was a passion which seems to have increased in them with each succeeding generation, and though the grandfather was beheaded by Henry VIII. for his too devoted services in the preceding reign, the father grew powerful enough in the days of Edward VI. to trouble the succession to the crown. This was that John Dudley, duke of Northumberland, who contrived the marriage of Lady Jane Grey with his own son Guildford Dudley, and involved both her and her husband in a common ruin with himself. Robert Dudley, the subject of this article, was an elder brother of Guildford, and shared at that time in the misfortunes of the whole family. Having taken up arms with them against Queen Mary, he was sent to the Tower, and was sentenced to death; but the queen not only pardoned and restored him to liberty, but appointed him master of the ordnance. On the accession of Elizabeth he was also made master of the horse. He was then, perhaps, about seven-and-twenty, and was evidently rising rapidly in the queen's favour. At an early age he had been married to Amy, daughter of Sir John Robsart. The match had been arranged by his father, who was very studious to provide in this way for the future fortunes of his children, and the wedding was graced by the presence of King Edward. But if it was not a love match, there seems to have been no positive estrangement between the couple. Amy visited her husband in the Tower during his imprisonment; but afterwards when, under the new queen, he was much at court, she lived a good deal apart from him. He visited her, however, at times, in different parts of the country, and his expenses show that he treated her liberally. In September 1560 she was staying at Cumnor Hall in Berkshire, the house of one Anthony Forster, when she met her death under circumstances which certainly aroused suspicions of foul play. It is quite clear that her death had been surmised some time before as a thing that would remove an obstacle to Dudley's marriage with the queen, with whom he stood in so high favour. We may take it, perhaps, from Venetian sources, that she was then in delicate health, while Spanish state papers show further that there were scandalous rumours of a design to poison her; which were all the more propagated by malice after the event. The occurrence, however, was explained as owing to a fall down stairs in which she broke her neck; and the explanation seems perfectly adequate to account for all we know about it. Certain it is that Dudley continued to rise in the queen's favour. She made him a Knight of the Garter, and bestowed on him the castle of Kenilworth, the lordship of Denbigh and other lands of very great value in Warwickshire and in Wales. In September 1564 she created him baron of Denbigh, and immediately afterwards earl of Leicester. In the preceding month, when she visited Cambridge, she at his request addressed the university in Latin. The honours shown him excited jealousy, especially as it was well known that he entertained still more ambitious hopes, which the queen apparently did not altogether discourage. The earl of Sussex, in opposition to him, strongly favoured a match with the archduke Charles of Austria. The court was divided, and, while arguments were set forth on the one side against the queen's marrying a subject, the other party insisted strongly on the disadvantages of a foreign alliance. The queen, however, was so far from being foolishly in love with him that in 1564 she recommended him as a husband for Mary Queen of Scots. But this, it was believed, was only a blind, and it may be doubted how far the proposal was serious. After his creation as earl of Leicester great attention was paid to him both at home and abroad. The university of Oxford made him their chancellor, and Charles IX. of France sent him the order of St Michael. A few years later he formed an ambiguous connexion with the baroness dowager of Sheffield, which was maintained by the lady, if not with truth at least with great plausibility, to have been a valid marriage, though it was concealed from the queen. Her own subsequent conduct, however, went far to discredit her statements; for she married again during Leicester's life, when he, too, had found a new conjugal partner. Long afterwards, in the days of James I., her son, Sir Robert Dudley, a man of extraordinary talents, sought to establish his legitimacy; but his suit was suddenly brought to a stop, the witnesses discredited and the documents connected with it sealed up by an order of the Star Chamber.

In 1575 Queen Elizabeth visited the earl at Kenilworth, where she was entertained for some days with great magnificence. The picturesque account of the event given by Sir Walter Scott has made every one familiar with the general character of the scene. Next year Walter, earl of Essex, died in Ireland, and Leicester's subsequent marriage with his widow again gave rise to very serious imputations against him. For report said that he had had two children by her during her husband's absence in Ireland, and, as the feud between the two earls was notorious, Leicester's many enemies easily suggested that he had poisoned his rival. This marriage, at all events, tended to Leicester's discredit and was kept secret at first; but it was revealed to the queen in 1579 by Simier, an emissary of the duke of Alençon, to whose projected match with Elizabeth the earl seemed to be the principal obstacle. The queen showed great displeasure at the news, and had some thought, it is said, of committing Leicester to the Tower, but was dissuaded from doing so by his rival the earl of Sussex. He had not, indeed, favoured the Alençon marriage, but otherwise he had sought to promote a league with France against Spain. He and Burleigh had listened to proposals from France for the conquest and division of Flanders, and they were in the secret about the capture of Brill. When Alençon actually arrived, indeed, in August 1579, Dudley being in disgrace, showed himself for a time anti-French; but he soon returned to his former policy. He encouraged Drake's piratical expeditions against the Spaniards and had a share in the booty brought home. In February 1582 he, with a number of other noblemen and gentlemen, escorted the duke of Alençon on his return to Antwerp to be invested with the government of the Low Countries. In 1584 he inaugurated an association for the protection of Queen Elizabeth against conspirators. About this time there issued from the press the famous pamphlet, supposed to have been the work of Parsons the Jesuit, entitled *Leicester's Commonwealth*, which was intended to suggest that the English constitution was subverted and the government handed over to one who was at heart an atheist and a traitor, besides being a man of infamous life and morals. The book was ordered to be suppressed by letters from the privy council, in which it was declared that the charges against the earl were to the queen's certain knowledge untrue; nevertheless they produced a very strong impression, and were believed in by some who had no sympathy with Jesuits long after Leicester's death. In 1585 he was appointed commander of an expedition to the Low Countries in aid of the revolted provinces, and sailed with a fleet of fifty ships to Flushing, where he was received with great enthusiasm. In January following he was invested with the government of the provinces, but immediately received a strong reprimand from the queen for taking upon himself a function which she had not authorized. Both he and the states general were obliged to apologize; but the latter protested that they had no intention of giving him absolute control of their affairs, and that it would be extremely dangerous to them to revoke the appointment. Leicester accordingly was allowed to retain his dignity; but the incident was inauspicious, nor did affairs prosper greatly under his management. The most brilliant achievement of the war was the action at Zutphen, in which his nephew Sir Philip Sidney was slain. But complaints were made by the states general of the conduct of the whole campaign. He returned to England for a time, and went back in 1587, when he made an abortive effort to raise the siege of Sluys. Disagreements increasing between him and the states, he was recalled by the queen, from whom he met with a very good reception; and he continued in such favour that in the following summer (the year being that of the Armada, 1588) he was appointed lieutenant-general of the army mustered at Tilbury to resist Spanish invasion. After the crisis was past he was returning homewards from the court to Kenilworth, when he was attacked by a sudden illness and died at his house at Cornbury in Oxfordshire, on the 4th September.

Such are the main facts of Leicester's life. Of his character it is more difficult to speak with confidence, but some features of it are indisputable. Being in person tall and remarkably handsome, he improved these advantages by a very ingratiating manner. A man of no small ability and still more ambition, he was nevertheless vain, and presumed at times upon his influence with the queen to a degree that brought upon him a sharp rebuff. Yet Elizabeth stood by him. That she was ever really in love with him, as modern writers have supposed, is extremely questionable; but she saw in him some valuable qualities which marked him as the fitting recipient of high favours. He was a man of princely tastes, especially in architecture. At court he became latterly the leader of the Puritan party.

and his letters were pervaded by expressions of religious feeling which it is hard to believe were insincere. Of the darker suspicions against him it is enough to say that much was certainly reported beyond the truth; but there remain some facts sufficiently disagreeable, and others, perhaps, sufficiently mysterious, to make a just estimate of the man a rather perplexing problem.

No special biography of Leicester has yet been written except in biographical dictionaries and encyclopaedias. A general account of him will be found in the Memoirs of the Sidneys prefixed to Collins's *Letters and Memorials of State*; but the fullest yet published is Mr Sidney Lee's article in the *Dictionary of National Biography* (London, 1888) where the sources are given. Leicester's career has to be made out from documents and state papers, especially from the Hatfield MSS. and Major Hume's *Calendar* of documents from the Spanish archives bearing on the history of Queen Elizabeth. This last is the most recent source. Of others the principal are Digges's *Compleat Ambassador* (1655), John Nichols's *Progresses of Queen Elizabeth* and the *Leycester Correspondence* edited by J. Bruce for the Camden Society. The death of Dudley's first wife has been a fruitful source of literary controversy. The most recent addition to the evidences, which considerably alters their complexion, will be found in the *English Historical Review*, xiii. 83, giving the full text (in English) of De Quadra's letter of Sept. 11, 1560, on which so much has been built. (J. Ga.)

LEICESTER, ROBERT SIDNEY, Earl of (1563–1626), second son of Sir Henry Sidney (*q.v.*), was born on the 19th of November 1563, and was educated at Christ Church, Oxford, afterwards travelling on the Continent for some years between 1578 and 1583. In 1585 he was elected member of parliament for Glamorganshire; and in the same year he went with his elder brother Sir Philip Sidney (*q.v.*) to the Netherlands, where he served in the war against Spain under his uncle Robert Dudley, earl of Leicester. He was present at the engagement where Sir Philip Sidney was mortally wounded, and remained with his brother till the latter's death in October 1586. After visiting Scotland on a diplomatic mission in 1588, and France on a similar errand in 1593, he returned to the Netherlands in 1596, where he rendered distinguished service in the war for the next two years. He had been appointed governor of Flushing in 1588, and he spent much time there till 1603, when, on the accession of James I., he returned to England. James raised him at once to the peerage as Baron Sidney of Penshurst, and he was appointed chamberlain to the queen consort. In 1605 he was created Viscount Lisle, and in 1618 earl of Leicester, the latter title having become extinct in 1588 on the death of his uncle, whose property he had inherited (see Leicester, Earls of). Leicester was a man of taste and a patron of literature, whose cultured mode of life at his country seat, Penshurst, was celebrated in verse by Ben Jonson. The earl died at Penshurst on the 13th of July 1626. He was twice married; first to Barbara, daughter of John Gamage, a Glamorganshire gentleman; and secondly to Sarah, daughter of William Blount, and widow of Sir Thomas Smythe. By his first wife he had a large family. His eldest son having died unmarried in 1613, Robert, the second son (see below), succeeded to the earldom; one of his daughters married Sir John Hobart, ancestor of the earls of Buckinghamshire.

Robert Sidney, 2nd earl of Leicester of the 1618 creation (1595–1677), was born on the 1st of December 1595, and was educated at Christ Church, Oxford; he was called to the bar in 1618, having already served in the army in the Netherlands during his father's governorship of Flushing, and having entered parliament as member for Wilton in 1614. In 1616 he was given command of an English regiment in the Dutch service; and having succeeded his father as earl of Leicester in 1626, he was employed on diplomatic business in Denmark in 1632, and in France from 1636 to 1641. He was then appointed lord-lieutenant of Ireland in place of the earl of Strafford, but he waited in vain for instructions from the king, and in 1643 he was compelled to resign the office without having set foot in Ireland. He shared the literary and cultivated tastes of his family, without possessing the statesmanship of his uncle Sir Philip Sidney; his character was lacking in decision, and, as commonly befalls men of moderate views in times of acute party strife, he failed to win the confidence of either of the opposing parties. His sincere protestantism offended Laud, without being sufficiently extreme to please the puritans of the parliamentary faction, his fidelity to the king restrained him from any act tainted with rebellion, while his dislike for arbitrary government prevented him giving whole-hearted support to Charles I. When, therefore, the king summoned him to Oxford in November 1642, Leicester's conduct bore the appearance of vacillation, and his loyalty of uncertainty. Accordingly, after his resignation of the lord-lieutenancy of Ireland at the end of 1643, he retired into private life. In 1649 the younger children of the king were for a time committed to his care at Penshurst. He took no part in public affairs during the Commonwealth; and although at the Restoration he took his seat in the House of Lords and was sworn of the privy council, he continued to live for the most part in retirement at Penshurst, where he died on the 2nd of November 1677. Leicester married, in 1616, Dorothy, daughter of Henry Percy, 9th earl of Northumberland, by whom he had fifteen children. Of his nine daughters, the eldest, Dorothy, the "Sacharissa" of the poet Waller, married Robert Spencer, 2nd earl of Sunderland; and Lucy married John Pelham, by whom she was the ancestress of the 18th-century statesmen, Henry Pelham, and Thomas Pelham, duke of Newcastle. Algernon Sidney (*q.v.*), and Henry Sidney, earl of Romney (*q.v.*), were younger sons of the earl.

Leicester's eldest son, Philip, 3rd earl (1619–1698), known for most of his life as Lord Lisle, took a somewhat prominent part during the civil war. Being sent to Ireland in 1642 in command of a regiment of horse, he became lieutenant-general under Ormonde; he strongly favoured the parliamentary cause, and in 1647 he was appointed lord-lieutenant of Ireland by the parliament. Named one of Charles I.'s judges, he refused to take part in the trial; but he afterwards served in Cromwell's Council of State, and sat in the Protector's House of Lords. Lisle stood high in Cromwell's favour, but nevertheless obtained a pardon at the Restoration. He carried on the Sidney family tradition by his patronage of men of letters; and, having succeeded to the earldom on his father's death in 1677, he died in 1698, and was succeeded in the peerage by his son Robert, 4th earl of Leicester (1649–1702), whose mother was Catherine, daughter of William Cecil, 2nd earl of Salisbury.

See *Sydney Papers*, edited by A. Collins (2 vols., London, 1746); *Sydney Papers*, edited by R. W. Blencowe (London, 1825), containing the 2nd earl of Leicester's journal; Lord Clarendon *History of the Rebellion and Civil Wars in England* (8 vols, Oxford, 1826); S. R. Gardiner, *History of the Great Civil War* (3 vols., London, 1886–1891). (R. J. M.)

LEICESTER, THOMAS WILLIAM COKE, Earl of (1754–1842), English agriculturist, known as Coke of Norfolk, was the eldest son of Wenman Roberts, who assumed the name of Coke in 1750. In 1759 Wenman Coke's maternal uncle Thomas Coke, earl of Leicester, died leaving him his estates, subject, however, to the life-interest of his widow, Margaret, Baroness de Clifford in her own right. This lady's death in 1775 was followed by that of Wenman Coke in 1776, when the latter's son, Thomas William, born on the 6th of May 1754, succeeded to his father's estates at Holkham and elsewhere. From 1776 to 1784, from 1790 to 1806, and again from 1807 to 1832 Coke was member of parliament for Norfolk; he was a friend and supporter of Charles James Fox and a sturdy and aggressive Whig, acting upon the maxim taught him by his father "never to trust a Tory." Coke's chief interests, however, were in the country, and his fame is that of an agriculturist. His land around Holkham in Norfolk was poor and neglected, but he introduced many improvements, obtained the best expert advice, and in a few years wheat was grown upon his farms, and the breed of cattle, sheep and pigs greatly improved. It has been said that "his practice is really the basis of every treatise on modern agriculture." Under his direction the rental of the Holkham estate is said to have increased from £2200 to over £20,000 a year. In 1837 Coke was created earl of Leicester of Holkham. Leicester, who was a strong and handsome man and a fine sportsman, died at Longford Hall in Derbyshire on the 30th of June 1842. He was twice married, and Thomas William, his son by his second marriage, succeeded to his earldom.

See A. M. W. Stirling, *Coke of Norfolk and his Friends* (1907).

LEICESTER, a municipal county and parliamentary borough, and the county town of Leicestershire, England; on the river Soar, a southern tributary of the Trent. Pop. (1891) 174,624, (1901) 211,579. It is 99 m. N.N.W. from London by the Midland railway, and is served by the Great Central and branches of the Great Northern and London and North-Western railways, and by the Leicester canal.

This was the Roman *Ratae* (*Ratae Coritanorum*), and Roman remains of high interest are preserved. They include a portion of Roman masonry known as the Jewry Wall; several pavements have been unearthed; and in the museum, among other remains, is a milestone from the Fosse Way, marking a distance of 2 m. from Ratae. St Nicholas church is a good example of early Norman work, in the building of which Roman bricks are used. St Mary de Castro church, with Norman remains, including sedilia, shows rich Early English work in the tower and elsewhere, and has a Decorated spire and later additions. All Saints church has Norman remains. St Martin's is mainly Early English, a fine cruciform structure. St Margaret's, with Early English nave, has extensive additions of beautiful Perpendicular workmanship. North of the town are slight remains of an abbey of Black Canons founded in 1143. There are a number of modern churches. Of the Castle there are parts of the Norman hall, modernized, two gateways and other remains, together with the artificial Mount on which the keep stood. The following public buildings and institutions may be mentioned—municipal buildings (1876), old town hall, formerly the gild-hall of Corpus Christi; market house, free library, opera house and other theatres and museum. The free library has several branches; there are also a valuable old library founded in the 17th century, a permanent library and a literary and philosophical society. Among several hospitals are Trinity hospital, founded in 1331 by Henry Plantagenet, earl of Lancaster and of Leicester, and Wyggeston's hospital (1513). The Wyggeston schools and Queen Elizabeth's grammar school are amalgamated, and include high schools for boys and girls; there are also Newton's greencoat school for boys, and municipal technical and art schools. A memorial clock tower was erected in 1868 to Simon de Montfort and other historical figures connected with the town. The Abbey Park is a beautiful pleasure ground; there are also Victoria Park, St Margaret's Pasture and other grounds. The staple trade is hosiery, an old-established industry; there are also manufactures of elastic webbing, cotton and lace, iron-works, maltings and brick-works. Leicester became a county borough in 1888, and the bounds were extended and constituted one civil parish in 1892. It is a suffragan bishopric in the diocese of Peterborough. The parliamentary borough returns two members. Area, 8586 acres.

The Romano-British town of *Ratae Coritanorum*, on the Fosse Way, was a municipality in A.D. 120–121. Its importance, both commercial and military, was considerable, as is attested by the many remains found here. Leicester (*Ledecestre*, *Legecestria*, *Leyrcestria*) was called a "burh" in 918, and a city in Domesday. Until 874 it was the seat of a bishopric. In 1086 both the king and Hugh de Grantmesnil had much land in Leicester; by 1101 the latter's share had passed to Robert of Meulan, to whom the rest of the town belonged before his death. Leicester thus became the largest mesne borough. Between 1103 and 1118 Robert granted his first charter to the burgesses, confirming their merchant gild. The portmanmote was confirmed by his son. In the 13th century the town developed its own form of government by a mayor and 24 jurats. In 1464 Edward IV. made the mayor and 4 of the council justices of the peace. In 1489 Henry VII. added 48 burgesses to the council for certain purposes, and made it a close body; he granted another charter in 1505. In 1589 Elizabeth incorporated the town, and gave another charter in 1599. James I. granted charters in 1605 and 1610; and Charles I. in 1630. In 1684 the charters were surrendered; a new one granted by James II. was rescinded by proclamation in 1688.

Leicester has been represented in parliament by two members since 1295. It has had a prescriptive market since the 13th century, now held on Wednesday and Saturday. Before 1228–1229 the burgesses had a fair from July 31 to August 14; changes were made in its date, which was fixed in 1360 at September 26 to October 2. It is now held on the second Thursday in October and three following days. In 1473 another fair was granted on April 27 to May 4. It is now held on the second Thursday in May and the three following days. Henry VIII. granted two three-day fairs beginning on December 8 and June 26; the first is now held on the second Friday in December; the second was held in 1888 on the last Tuesday in June. In 1307 Edward III. granted a fair for seventeen days after the feast of the Holy Trinity. This would fall in May or June, and may have merged in other fairs. In 1794 the corporation sanctioned fairs on January 4, June 1, August 1, September 13 and November 2. Other fairs are now held on the second Fridays in March and July and the Saturdays next before Easter and in Easter week. Leicester has been a centre for brewing and the manufacture of woollen goods since the 13th century. Knitting frames for hosiery were introduced about 1680. Boot manufacture became important in the 19th century.

See *Victoria County History, Leicester*; M. Bateson, *Records of Borough of Leicester* (Cambridge, 1899).

LEICESTERSHIRE, a midland county of England, bounded N. by Nottinghamshire, E. by Lincolnshire and Rutland, S.E. by Northamptonshire, S.W. by Warwickshire, and N.W. by Derbyshire, also touching Staffordshire on the W. The area is 823·6 sq. m. The surface of the county is an undulating tableland, the highest eminences being the rugged hills of Charnwood Forest (*q.v.*) in the north-west, one of which, Bardon Hill, has an elevation of 912 ft. The county belongs chiefly to the basin of the Trent, which forms for a short distance its boundary with Derbyshire. The principal tributary of the Trent in Leicestershire is the Soar, from whose old designation the *Leire* the county is said to derive its name, and which rises near Hinckley in the S.E., and forms the boundary with Nottinghamshire for some distance above its junction with the Trent. The Wreak, which, under the name of the Eye, rises on the borders of Rutland, flows S.W. to the Soar. Besides the Soar the other tributaries of the Trent are the Anker, touching the boundary with Warwickshire, the Devon and the Mease. A portion of the county in the S. drains to the Avon, which forms part of the boundary with Northamptonshire, and receives the Swift. The Welland forms for some distance the boundary with Northamptonshire.

Geology.—The oldest rocks in the county belong to the Charnian System, a Pre-Cambrian series of volcanic ashes, grits and slates, into which porphyroid and syenite were afterwards intruded. These rocks emerge from the plain formed by the Keuper Marls of the Triassic System as a group of isolated hills and peaks (known as Charnwood Forest); these are the tops of an old mountain-range, the lower slopes of which are still buried under the surrounding Keuper Marls. West of this district lies the Leicestershire coalfield, where the poor state of development of the Carboniferous Limestone shows that the Charnian rocks formed shoals or islands in the Carboniferous Limestone sea. The Millstone Grit just enters the county to the north of the same region, while the Coal Measures occupy a considerable area round Ashby-de-la-Zouch and contain valuable coal-seams. The rest of the county is almost equally divided between the red Keuper Marls of the Trias on the west and the grey limestones and shales of the Lias on the east. The former were deposited in lagoons into which the land was gradually lowered after a prolonged period of desert conditions. The Rhaetic beds which follow the Keuper mark the incoming of the sea and introduce the fossiliferous Liassic deposits. On the eastern margin of the county a few small outliers of the Inferior Oolite sands and limestones are present. The Glacial Period has left boulder-clay, gravel and erratic blocks scattered over the surface, while later gravels, with remains of mammoth, reindeer, &c., border some of the present streams.

Slates, honestones, setts and roadstone from the Charnian rocks, limestone and cement from the Carboniferous and Lias, and coal from the Coal Measures are the chief mineral products.

Agriculture.—The climate is mild, and, on account of the inland position of the county, and the absence of any very high elevations, the rainfall is very moderate. The soil is of a loamy character, the richest district being that east of the Soar, which is occupied by pasture, while the corn crops are grown chiefly on a lighter soil resting above the Red Sandstone formation. About nine-tenths of the total area is under cultivation. The proportion of pasture land is large and increasing. It is especially rich along the river-banks. Dairy-farming is extensively carried on, the famous Stilton cheese being produced near Melton Mowbray. Cattle are reared in large numbers, while of sheep the New Leicester breed is well known. It was introduced by Robert Bakewell the agriculturist, who was born near Loughborough in 1725. He also improved the breed of horses by the importation of mares from Flanders.

The county is especially famed for fox-hunting, Leicester and Melton Mowbray being favourite centres, while the kennels of the Quorn hunt are located at Quorndon near Mount Sorrel. For this reason Leicestershire is rich in good riding horses.

Other Industries.—Coal is worked in the districts about Moira, Coleorton and Coalville. Limestone is worked in various parts, freestone is plentiful, gypsum is found, and a kind of granite, extensively used for paving, is obtained in the Charnwood district, as at Bardon and Mount Sorrel, and at Sapcote and Stoney Stanton in the south-west. Apart from the mining industries, the staple manufacture of Leicestershire is hosiery, for which the wool is obtained principally from home-bred sheep. Its principal seats are Leicester, Loughborough, Hinckley and Castle Donington. Cotton hose are likewise made, and other industries include the manufacture of boots and shoes, as at Market Harborough, elastic webbing, and bricks, also iron founding. Melton Mowbray gives name to a well-known manufacture of pork pies.

Communications.—The main line of the Midland railway serves Market Harborough, Leicester, and Loughborough, having an important junction at Trent (on that river) for Derby and Nottingham. Branches radiate from Leicester to Melton Mowbray, to Coalville, Ashby-de-la-Zouch, Moira and Burton-upon-Trent, with others through the mining district of the N.W., which is also served by the branch of the London & North-Western railway from Nuneaton to Market Bosworth, Coalville and Loughborough. This company serves Market Harborough from Rugby, and branches of the Great Northern serve Market Harborough, Leicester and Melton Mowbray. The main line of the Great Central railway passes through Lutterworth, Leicester and Loughborough. The principal canals are the Union and Grand Union, with which various branches are connected with the Grand Junction, and the Ashby-de-la-Zouch canal, which joins the Coventry canal at Nuneaton. The Loughborough canal serves that town, connecting with the river Soar.

Population and Administration.—The area of the ancient county is 527,123 acres; pop. (1891) 373,584, (1901) 434,019. The area of the administrative county is 532,788 acres. The county contains six hundreds. The municipal boroughs are: Leicester, the county town and a county borough (pop. 211,579), Loughborough (21,508). The urban districts are: Ashby-de-la-Zouch (4726), Ashby Woulds (2799), Coalville (15,281), Hinckley (11,304), Market Harborough (7735), Melton Mowbray (7454), Quorndon (2173), Shepshed (5293), Thurmaston (1732), Wigston Magna (8404). The county is in the Midland circuit, has one court of quarter sessions, and is divided into 9 petty sessional divisions. The county borough of Leicester has a separate court of quarter sessions and a separate commission of the peace. There are 327 civil parishes. The county is divided into four parliamentary divisions (Eastern or Melton, Mid or Loughborough, Western or Bosworth, Southern or Harborough), each returning one member; and the parliamentary borough of Leicester returns 2 members. The county is in the diocese of Peterborough, with the exception of small parts in those of Southwell and Worcester; and contains 255 ecclesiastical parishes or districts, wholly or in part.

History.—The district which is now Leicestershire was reached in the 6th century by Anglian invaders who, making their way across the Trent, penetrated Charnwood Forest as far as Leicester, the fall of which may be dated at about 556. In 679 the district formed the kingdom of the Middle Angles within the kingdom of Mercia, and on the subdivision of the Mercian see in that year was formed into a separate bishopric having its see at Leicester. In the 9th century the district was subjugated by the Danes, and Leicester became one of the five Danish boroughs. It was recovered by Æthelflaed in 918, but the Northmen regained their supremacy shortly after, and the prevalence of Scandinavian place-names in the county bears evidence of the extent of their settlement.

Leicestershire probably originated as a shire in the 10th century, and at the time of the Domesday Survey was divided into the four wapentakes of Guthlaxton, Framland, Goscote and Gartree. The Leicestershire Survey of the 12th century shows an additional grouping of the vills into small local hundreds, manorial rather than administrative divisions, which have completely disappeared. In the reign of Edward I. the divisions appear as hundreds, and in the reign of Edward III. the additional hundred of Sparkenhoe was formed out of Guthlaxton. Before the 17th century Goscote was divided into East and West Goscote, and since then the hundreds have undergone little change. Until 1566 Leicestershire and Warwickshire had a common sheriff, the shire-court for the former being held at Leicester.

Leicestershire constituted an archdeaconry within the diocese of Lincoln from 1092 until its transference to Peterborough in 1837. In 1291 it comprised the deaneries of Akeley, Leicester (now Christianity), Framland, Gartree, Goscote, Guthlaxton and Sparkenhoe. The deaneries remained unaltered until 1865. Since 1894 they have been as follows: East, South and West Akeley, Christianity, Framland (3 portions), Sparkenhoe (2 portions), Gartree (3 portions), Goscote (2 portions), Guthlaxton (3 portions).

Among the earliest historical events connected with the county were the siege and capture of Leicester by Henry II. in 1173 on the rebellion of the earl of Leicester; the surrender of Leicester to Prince Edward in 1264; and the parliament held at Leicester in 1414. During the Wars of the Roses Leicester was a great Lancastrian stronghold. In 1485 the battle of Bosworth was fought in the county. In the Civil War of the 17th century the greater part of the county favoured the parliament, though the mayor and some members of the corporation of Leicester sided with the king, and in 1642 the citizens of Leicester on a summons from Prince Rupert lent Charles £500. In 1645 Leicester was twice captured by the Royalist forces.

Before the Conquest large estates in Leicestershire were held by Earls Ralf, Morcar, Waltheof and Harold, but the Domesday Survey of 1086 reveals an almost total displacement of English by Norman landholders, only a few estates being retained by Englishmen as under-tenants. The first lay-tenant mentioned in the survey is Robert, count of Meulan, ancestor of the Beaumont family and afterwards earl of Leicester, to whose fief was afterwards annexed the vast holding of Hugh de Grantmesnil, lord high steward of England. Robert de Toeni, another Domesday tenant, founded Belvoir Castle and Priory. The fief of Robert de Buci was bestowed on Richard Basset, founder of Laund Abbey, in the reign of Henry I. Loughborough was an ancient seat of the Despenser family, and Brookesby was the seat of the Villiers and the birthplace of George Villiers, the famous duke of Buckingham. Melton Mowbray was named from its former lords, the Mowbrays, descendants of Nigel de Albini, the founder of Axholme Priory. Lady Jane Grey was born at Bradgate near Leicester, and Bishop Latimer was born at Thurcaston.

The woollen industry flourished in Leicestershire in Norman times, and in 1343 Leicestershire wool was rated at a higher value than that of most other counties. Coal was worked at Coleorton in the early 15th century and at Measham in the 17th century. The famous blue slate of Swithland has been quarried from time immemorial, and the limestone quarry at Barrow-on-Soar is also of very ancient repute, the monks of the abbey of St Mary de Pré formerly enjoying the tithe of its produce. The staple manufacture of the county, that of hosiery, originated in the 17th century, the chief centres being Leicester, Hinckley and Loughborough, and before the development of steam-driven frames in the 19th century hand framework knitting of hose and gloves was carried on in about a hundred villages. Wool-carding was also an extensive industry before 1840.

In 1290 Leicestershire returned two members to parliament, and in 1295 Leicester was also represented by two members. Under the Reform Act of 1832 the county returned four members in two divisions until the Redistribution of Seats Act of 1885, under which it returned four members in four divisions.

Antiquities.—Remains of monastic foundations are slight, though there were a considerable number of these. There are traces of Leicester Abbey and of Gracedieu near Coalville, while at Ulverscroft in Charnwood, where there was an Augustinian priory of the 12th century, there are fine Decorated remains, including a tower. The most noteworthy churches are found in the towns, as at Ashby-de-la-Zouch, Hinckley, Leicester, Loughborough, Lutterworth, Market Bosworth, Market Harborough, and Melton Mowbray (*qq.v.*). The principal old castle is that of Ashby-de-la-Zouch, while at Kirby Muxloe there is a picturesque fortified mansion of Tudor date. There are several good Elizabethan mansions, as that at Laund in the E. of the county. Among modern mansions that of the dukes of Rutland, Belvoir Castle in the extreme N.E., is a massive mansion of the early 19th century, finely placed on the summit of a hill.

See *Victoria County History, Leicestershire*; W. Burton, *Description of Leicestershire* (London, 1622; 2nd ed., Lynn, 1777); John Nicholls, *History and Antiquities of the County of Leicester* (4 vols., London, 1795–1815); John Curtis, *A Topographical History of the County of Leicester* (Ashby-de-la-Zouch, 1831).

LEIDEN or LEYDEN, a city in the province of South Holland, the kingdom of the Netherlands, on the Old Rhine, and a junction station 18 m. by rail S.S.W. of Haarlem. It is connected by steam tramway with Haarlem and The Hague respectively, and with the seaside resorts of Katwyk and Noordwyk. There is also regular steamboat connexion with Katwyk, Noordwyk, Amsterdam and Gouda. The population of Leiden which, it is estimated, reached 100,000 in 1640, had sunk to 30,000 between 1796 and 1811, and in 1904 was 56,044. The two branches of the Rhine which enter Leiden on the east unite in the centre of the town, which is further intersected by numerous small and sombre canals, with tree-bordered quays and old houses. On the south side of the town pleasant gardens extend along the old Singel, or outer canal, and there is a large open space, the Van der Werf Park, named after the burgomaster, Pieter Andriaanszoon van der Werf, who defended the town against the Spaniards in 1574. This open space was formed by the accidental explosion of a powdership in 1807, hundreds of houses being demolished, including that of the Elzevir family of printers. At the junction of the two arms of the Rhine stands the old castle (De Burcht), a circular tower built on an earthen mound. Its origin is unknown, but some connect it with Roman days and others with the Saxon Hengist. Of Leiden's old gateways only two—both dating from the end of the 17th century—are standing. Of the numerous churches the chief are the Hooglandsche Kerk, or the church of St Pancras, built in the 15th century and restored in 1885–1902, containing the monument of Pieter Andriaanszoon van der Werf, and the Pieterskerk (1315) with monuments to Scaliger, Boerhaave and other famous scholars. The most interesting buildings are the town hall (Stadhuis), a fine example of 16th-century Dutch building; the Gemeenlandshuis van Rynland (1596, restored 1878); the weight-house built by Pieter Post (1658); the former court-house, now a military storehouse and the ancient gymnasium (1599) and the so-called city timber-house (Stads Timmerhuis) (1612), both built by Lieven de Key (*c.* 1560–1627).

In spite of a certain industrial activity and the periodical bustle of its cattle and dairy markets, Leiden remains essentially an academic city. The university is a flourishing institution. It was founded by William of Orange in 1575 as a reward for the heroic defence of the previous year, the tradition being that the citizens were offered the choice between a university and a certain exemption from taxes. Originally located in the convent of St Barbara, the university was removed in 1581 to the convent of the White Nuns, the site of which it still occupies, though that building was destroyed in 1616. The presence within half a century of the date of its foundation of such scholars as Justus Lipsius, Joseph Scaliger, Francis Gomarus, Hugo Grotius, Jacobus Arminius, Daniel Heinsius and Guardas Johannes Vossius, at once raised Leiden university to the highest European fame, a position which the learning and reputation of Jacobus Gronovius, Hermann Boerhaave, Tiberius Hemsterhuis and David Ruhnken, among others, enabled it to maintain down to the end of the 18th century. The portraits of many famous professors since the earliest days hang in the university *aula*, one of the most memorable places, as Niebuhr called it, in the history of science. The university library contains upwards of 190,000 volumes and 6000 MSS. and pamphlet portfolios, and is very rich in Oriental and Greek MSS. and old Dutch travels. Among the institutions connected with the university are the national institution for East Indian languages, ethnology and geography; the fine botanical gardens, founded in 1587; the observatory (1860); the natural history museum, with a very complete anatomical cabinet; the museum of antiquities (Museum van Oudheden), with specially valuable Egyptian and Indian departments; a museum of Dutch antiquities from the earliest times; and three ethnographical museums, of which the nucleus was P. F. von Siebold's Japanese collections. The anatomical and pathological laboratories of the university are modern, and the museums of geology and mineralogy have been restored. The university has now five faculties, of which those of law and medicine are the most celebrated, and is attended by about 1200 students.

The municipal museum, founded in 1869 and located in the old cloth-hall (Laeckenhalle) (1640), contains a varied collection of antiquities connected with Leiden, as well as some paintings including works by the elder van Swanenburgh, Cornelius Engelbrechtszoon, Lucas van Leiden and Jan Steen, who were all natives of Leiden. Jan van Goyen, Gabriel Metsu, Gerard Dou and Rembrandt were also natives of this town. There is also a small collection of paintings in the Meermansburg. The Thysian library occupies an old Renaissance building of the year 1655, and is especially rich in legal works and native chronicles. Noteworthy also are the collection of the Society of Dutch Literature (1766); the collections of casts and of engravings; the seamen's training school; the Remonstrant seminary, transferred hither from Amsterdam in 1873; the two hospitals (one of which is private); the house of correction; and the court-house.

Leiden is an ancient town, although it is not the *Lugdunum Batavorum* of the Romans. Its early name was Leithen, and it was governed until 1420 by burgraves, the representatives of the courts of Holland. The most celebrated event in its history is its siege by the Spaniards in 1574. Besieged from May until October, it was at length relieved by the cutting of the dikes, thus enabling ships to carry provisions to the inhabitants of the flooded town. The weaving establishments (mainly broadcloth) of Leiden at the close of the 15th century were very important, and after the expulsion of the Spaniards Leiden cloth, Leiden baize and Leiden camlet were familiar terms. These industries afterwards declined, and in the beginning of the 19th century the baize manufacture was altogether given up. Linen and woollen manufactures are now the most important industries, while there is a considerable transit trade in butter and cheese.

Katwyk, or Katwijk, 6 m. N.W. of Leiden, is a popular seaside resort and fishing village. Close by are the great locks constructed in 1807 by the engineer, F. W. Conrad (d. 1808), through which the Rhine (here called the Katwyk canal) is admitted into the sea at low tide. The shore and the entrance to the canal are strengthened by huge dikes. In 1520 an ancient Roman camp known as the Brittenburg was discovered here. It was square in shape, each side measuring 82 yds., and the remains stood about 10 ft. high. By the middle of the 18th century it had been destroyed and covered by the sea.

See P. J. Blok, *Eine hollandsche stad in de middeleeuwen* (The Hague, 1883); and for the siege see J. L. Motley, *The Rise of the Dutch Republic* (1896).

LEIDY, JOSEPH (1823–1891), American naturalist and palaeontologist, was born in Philadelphia on the 9th of September 1823. He studied mineralogy and botany without an instructor, and graduated in medicine at the university of Pennsylvania in 1844. Continuing his work in anatomy and physiology, he visited Europe in 1848, but both before and after this period of foreign study lectured and taught in American medical colleges. In 1853 he was appointed professor of anatomy in the university of Pennsylvania, paying special attention to comparative anatomy. In 1884 he promoted the establishment in the same institution of the department of biology, of which he became director, and meanwhile taught natural history in Swarthmore College, near Philadelphia. His papers on biology and palaeontology were very numerous, covering both fauna and flora, and ranging from microscopic forms of animal life to the higher vertebrates. He wrote also occasional papers on minerals. He was an active member of the Boston Society of Natural History and of the American Philosophical Society; and was the recipient of various American and foreign degrees and honours. His *Cretaceous Reptiles of the United States* (1865) and *Contributions to the Extinct Vertebrate Fauna of the Western Territories* (1873) were the most important of his larger works; the best known and most widely circulated was an *Elementary Treatise on Human*

Anatomy (1860, afterwards revised in new editions). He died in Philadelphia on the 30th of April 1891.

See Memoir and portrait in *Amer. Geologist,* vol. ix. (Jan. 1892) and Bibliography in vol. viii. (Nov. 1891) and Memoir by H. C. Chapman in *Proc. Acad. Nat. Sc.* (Philadelphia, 1891), p. 342.

LEIF ERICSSON [Leifr Eiriksson] (fl. 999–1000), Scandinavian explorer, of Icelandic family, the first known European discoverer of "Vinland," "Vineland" or "Wineland, the Good," in North America. He was a son of Eric the Red (Eirikr hinn raudi Thorvaldsson), the founder of the earliest Scandinavian settlements—from Iceland—in Greenland (985). In 999 he went from Greenland to the court of King Olaf Tryggvason in Norway, stopping in the Hebrides on the way. On his departure from Norway in 1000, the king commissioned him to proclaim Christianity in Greenland. As on his outward voyage, Leif was again driven far out of his course by contrary weather—this time to lands (in America) "of which he had previously had no knowledge," where "self-sown" wheat grew, and vines, and "mösur" (maple?) wood. Leif took specimens of all these, and sailing away came home safely to his father's home in Brattahlid on Ericsfiord in Greenland. On his voyage from this Vineland to Greenland, Leif rescued some shipwrecked men, and from this, and his discoveries, gained his name of "The Lucky" (*hinn heppni*). On the subsequent expedition of Thorfinn Karlsefni for the further exploration and settlement of the Far Western vine-country, it is recorded that certain Gaels, incredibly fleet of foot, who had been given to Leif by Olaf Tryggvason, and whom Leif had offered to Thorfinn, were put on shore to scout.

Such is the account of the *Saga of Eric the Red*, supported by a number of briefer references in early Icelandic and other literature. The less trustworthy history of the *Flatey Book* makes Biarni Heriulfsson in 985 discover Helluland (Labrador?) as well as other western lands which he does not explore, not even permitting his men to land; while Leif Ericsson follows up Biarni's discoveries, begins the exploration of Helluland, Markland and Vinland, and realizes some of the charms of the last named, where he winters. But this secondary authority (the *Flatey Book* narrative), which till lately formed the basis of all general knowledge as to Vinland, abounds in contradictions and difficulties from which *Eric the Red Saga* is comparatively free. Thus (in *Flatey*) the grapes of Vinland are found in winter and gathered in spring; the man who first finds them, Leif's foster-father Tyrker the German, gets drunk from eating the fruit; and the vines themselves are spoken of as big trees affording timber. Looking at the record in *Eric the Red Saga,* it would seem probable that Leif's Vinland answers to some part of southern Nova Scotia. See Vinland. (As to Helluland and Markland see Thorfinn Karlsefni.)

The MSS. of *Eric the Red's Saga* are Nos. 544 and 557 of the Arne-Magnaean collection in Copenhagen; the MS. of the *Flatey Book*, so called because it was long the property of a family living on Flat Island in Broad Firth (Flatey in Breiðafjord [B-eidafj-d]), on the north-west coast of Iceland, was presented in 1662 to the Royal Library of Denmark, of which it is still one of the chief treasures. These leading narratives are supplemented by Adam of Bremen, *Gesta Hammaburgensis ecclesiae pontificum*, chap. 38 (247 Lappenberg) of book iv. (often separately entitled *Descriptio Insularum Aquilonis*; Adam's is the earliest extant reference to Vinland, *c.* 1070): we have also notices of Vinland in the *Libellus Islandorum* of Ari Frodi (*c.* 1120), the oldest Icelandic historian; in the *Kristni Saga* (repeated in Snorri Sturlason's *Heimskringla*); in *Eyrbyggia Saga* (*c.* 1250); in *Gretti Saga* (*c.* 1290); and in an Icelandic chorography of the 14th century, or earlier, partly derived from the famous traveller Abbot Nicolas of Thing-eyrar (†1159).

See Gustav Storm, "Studies on the Vineland Voyages," in the *Mémoires de la Société royale des Antiquaires du Nord* (Copenhagen, 1888); and *Eiriks Saga Raudha* (Copenhagen, 1891); A. M. Reeves, *Finding of Wineland the Good: the History of the Icelandic Discovery of America* (London, 1890); in this work the original authorities are given in full, with photographic facsimiles, English translations and adequate commentary; Rafn's *Antiquitates Americanae* (Copenhagen, 1837) contains all the sources, but the editor's personal views have in many cases failed to satisfy criticism; the *Flatey* text is printed also by Vigfusson and Unger in *Flateyjar-bok*, vol. i. (Christiania, 1860). There are also translations of *Flatey* and *Red Eric Saga* in Beamish, *Discovery of North America by the Northmen* (Lond., 1841); E. F. Slafter, *Voyages of the Northmen* (Boston, 1877); B. F. de Costa, *Pre-Columbian Discovery of America by the Northmen* (Albany, 1901); and *Original Narratives of Early American History; The Northmen, Columbus and Cabot*, pp. 1-66 (New York, 1906). See also C. Raymond Beazley, *Dawn of Modern Geography* ii. 48-83 (London, 1901); Josef Fischer, *Die Entdeckungen der Normannen in Amerika* (Freiburg i. B., 1902); John Fiske, *Discovery of America*, vol. i.; Juul Dieserud, "Norse Discoveries in America," in the *Bulletin of the American Geographical Society* (February, 1901); G. Vigfusson, *Origines Islandicae* (1905), which strangely expresses a preference for the *Flatey Book* "account of the first sighting of the American continent" by the Norsemen. (C. R. B.)

LEIGH, EDWARD (1602–1671), English Puritan and theologian, was born at Shawell, Leicestershire. He was educated at Magdalen Hall, Oxford, from 1616, and subsequently became a member of the Middle Temple. In 1636 he entered parliament as member for Stafford, and during the Civil War held a colonelcy in the parliamentary army. He has sometimes been confounded with John Ley (1583–1662), and so represented as having sat in the Westminster Assembly. The public career of Leigh terminated with his expulsion from parliament with the rest of the Presbyterian party in 1648. From an early age he had studied theology and produced numerous compilations, the most important being the *Critica Sacra, containing Observations on all the Radices of the Hebrew Words of the Old and the Greek of the New Testament* (1639–1644; new ed., with supplement, 1662), for which the author received the thanks of the Westminster Assembly, to whom it was dedicated. His other works include *Select and Choice Observations concerning the First Twelve Caesars* (1635); *A Treatise of Divinity* (1646–1651); *Annotations upon the New Testament* (1650), of which a Latin translation by Arnold was published at Leipzig in 1732; *A Body of Divinity* (1654); *A Treatise of Religion and Learning* (1656); *Annotations of the Five Poetical Books of the Old Testament* (1657). Leigh died in Staffordshire in June 1671.

LEIGH, a market town and municipal borough in the Leigh parliamentary division of Lancashire, England, 11 m. W. by N. from Manchester by the London & North-Western railway. Pop. (1891) 30,882, (1901) 40,001. The ancient parish church of St Mary the Virgin was, with the exception of the tower, rebuilt in 1873 in the Perpendicular style. The grammar school, the date of whose foundation is unknown, received its principal endowments in 1655, 1662 and 1681. The staple manufactures are silk and cotton; there are also glass works, foundries, breweries, and flour mills, with extensive collieries. Though the neighbourhood is principally an industrial district, several fine old houses are left near Leigh. The town was incorporated in 1899, and the corporation consists of a mayor, 8 aldermen and 24 councillors. Area, 6358 acres.

LEIGHTON, FREDERICK LEIGHTON, Baron (1830–1896), English painter and sculptor, the son of a physician, was born at Scarborough on the 3rd of December 1830. His grandfather, Sir James Leighton, also a physician, was long resident at the court of St Petersburg. Frederick Leighton was taken abroad at a very early age. In 1840 he learnt drawing at Rome under Signor Meli. The family moved to Dresden and Berlin, where he attended classes at the Academy. In 1843 he was sent to school at Frankfort, and in the winter of 1844 accompanied his family to Florence, where his future career as an artist was decided. There he studied under Bezzuoli and Segnolini at the Accademia delle Belle Arti, and attended anatomy classes under Zanetti; but he soon returned to complete his general education at Frankfort, receiving no further direct instruction in art for five years. He went to Brussels in 1848, where he met Wiertz and Gallait, and painted some pictures, including "Cimabue finding Giotto," and a portrait of himself. In 1849 he studied for a few months in Paris, where he copied Titian and Correggio in the Louvre, and then returned to Frankfort, where he settled down to serious art work under Edward Steinle, whose pupil he declared he was "in the fullest sense of the term." Though his artistic training was mainly German, and his master belonged to the same school as Cornelius and Overbeck, he loved Italian art and Italy and the first picture by which he became known to the British public was "Cimabue's Madonna carried in Procession through the

Streets of Florence," which appeared at the Royal Academy in 1855. At this time the works of the Pre-Raphaelites almost absorbed public interest in art—it was the year of Holman Hunt's "Light of the World," and the "Rescue," by Millais. Yet Leighton's picture, painted in quite a different style, created a sensation, and was purchased by Queen Victoria. Although, since his infancy, he had only visited England once (in 1851, when he came to see the Great Exhibition), he was not quite unknown in the cultured and artistic world of London, as he had made many friends during a residence in Rome of some two years or more after he left Frankfort in 1852. Amongst these were Giovanni Costa, Robert Browning, James Knowles, George Mason and Sir Edward Poynter, then a youth, whom he allowed to work in his studio. He also met Thackeray, who wrote from Rome to the young Millais: "Here is a versatile young dog, who will run you close for the presidentship one of these days." During these years he painted several Florentine subjects—"Tybalt and Romeo," "The Death of Brunelleschi," a cartoon of "The Pest in Florence according to Boccaccio," and "The Reconciliation of the Montagues and the Capulets." He now turned his attention to themes of classic legend, which at first he treated in a "Romantic spirit." His next picture, exhibited in 1856, was "The Triumph of Music: Orpheus by the Power of his Art redeems his Wife from Hades." It was not a success, and he did not again exhibit till 1858, when he sent a little picture of "The Fisherman and the Syren" to the Royal Academy, and "Samson and Delilah" to the Society of British Artists in Suffolk Street. In 1858 he visited London and made the acquaintance of the leading Pre-Raphaelites—Rossetti, Holman Hunt and Millais. In the spring of 1859 he was at Capri, always a favourite resort of his, and made many studies from nature, including a very famous drawing of a lemon tree. It was not till 1860 that he settled in London, when he took up his quarters at 2 Orme Square, Bayswater, where he stayed till, in 1866, he moved to his celebrated house in Holland Park Road, with its Arab hall decorated with Damascus tiles. There he lived till his death. He now began to fulfil the promise of his "Cimabue," and by such pictures as "Paolo e Francesca," "The Star of Bethlehem," "Jezebel and Ahab taking Possession of Naboth's Vineyard," "Michael Angelo musing over his Dying Servant," "A Girl feeding Peacocks," and "The Odalisque," all exhibited in 1861–1863, rose rapidly to the head of his profession. The two latter pictures were marked by the rhythm of line and luxury of colour which are among the most constant attributes of his art, and may be regarded as his first dreams of Oriental beauty, with which he afterwards showed so great a sympathy. In 1864 he exhibited "Dante in Exile" (the greatest of his Italian pictures), "Orpheus and Eurydice" and "Golden Hours." In the winter of the same year he was elected an Associate of the Royal Academy. After this the main effort of his life was to realize visions of beauty suggested by classic myth and history. If we add to pictures of this class a few Scriptural subjects, a few Oriental dreams, one or two of tender sentiment like "Wedded" (one of the most popular of his pictures, and well known by not only an engraving, but a statuette modelled by an Italian sculptor), a number of studies of very various types of female beauty, "Teresina," "Biondina," "Bianca," "Moretta," &c., and an occasional portrait, we shall nearly exhaust the two classes into which Lord Leighton's work (as a painter) can be divided.

Amongst the finest of his classical pictures were—"Syracusan Bride leading Wild Beasts in Procession to the Temple of Diana" (1866), "Venus disrobing for the Bath" (1867), "Electra at the Tomb of Agamemnon," and "Helios and Rhodos" (1869), "Hercules wrestling with Death for the Body of Alcestis" (1871), "Clytemnestra" (1874), "The Daphnephoria" (1876), "Nausicaa" (1878), "An Idyll" (1881), two lovers under a spreading oak listening to the piping of a shepherd and gazing on the rich plain below; "Phryne" (1882), a nude figure standing in the sun; "Cymon and Iphigenia" (1884), "Captive Andromache" (1888), now in the Manchester Art Gallery; with the "Last Watch of Hero" (1887), "The Bath of Psyche" (1890), now in the Chantrey Bequest collection; "The Garden of the Hesperides" (1892), "Perseus and Andromeda" and "The Return of Persephone," now in the Leeds Gallery (1891); and "Clytie," his last work (1896). All these pictures are characterized by nobility of conception, by almost perfect draughtsmanship, by colour which, if not of the highest quality, is always original, choice and effective. They often reach distinction and dignity of attitude and gesture, and occasionally, as in the "Hercules and Death," the "Electra" and the "Clytemnestra," a noble intensity of feeling. Perhaps, amidst the great variety of qualities which they possess, none is more universal and more characteristic than a rich elegance, combined with an almost fastidious selection of beautiful forms. It is the super-eminence of these qualities, associated with great decorative skill, that make the splendid pageant of the "Daphnephoria" the most perfect expression of his individual genius. Here we have his composition, his colour, his sense of the joy and movement of life, his love of art and nature at their purest and most spontaneous, and the result is a work without a rival of its kind in the British School.

Leighton was one of the most thorough draughtsmen of his day. His sketches and studies for his pictures are numerous and very highly esteemed. They contain the essence of his conceptions, and much of their spiritual beauty and subtlety of expression was often lost in the elaboration of the finished picture. He seldom succeeded in retaining the freshness of his first idea more completely than in his last picture—"Clytie"—which was left unfinished on his easel. He rarely painted sacred subjects. The most beautiful of his few pictures of this kind was the "David musing on the Housetop" (1865). Others were "Elijah in the Wilderness" (1879), "Elisha raising the Son of the Shunammite" (1881) and a design intended for the decoration of the dome of St Paul's Cathedral, "And the Sea gave up the Dead which were in it" (1892), now in the Tate Gallery, and the terrible "Rizpah" of 1893. His diploma picture was "St Jerome," exhibited in 1869. Besides these pictures of sacred subjects, he made some designs for Dalziel's Bible, which for force of imagination excel the paintings. The finest of these are "Cain and Abel," and "Samson with the Gates of Gaza."

Not so easily to be classed, but among the most individual and beautiful of his pictures, are a few of which the motive was purely aesthetic. Amongst these may specially be noted "The Summer Moon," two Greek girls sleeping on a marble bench, and "The Music Lesson," in which a lovely little girl is seated on her lovely young mother's lap learning to play the lute. With these, as a work produced without any literary suggestion, though very different in feeling, may be associated the "Eastern Slinger scaring Birds in the Harvest-time: Moon-rise" (1875), a nude figure standing on a raised platform in a field of wheat.

Leighton also painted a few portraits, including those of Signor Costa, the Italian landscape painter, Mr F. P. Cockerell, Mrs Sutherland Orr (his sister), Amy, Lady Coleridge, Mrs Stephen Ralli and (the finest of all) Sir Richard Burton, the traveller and Eastern scholar, which was exhibited in 1876 and is now in the National Portrait Gallery.

Like other painters of the day, notably G. F. Watts, Lord Leighton executed a few pieces of sculpture. His "Athlete struggling with a Python" was exhibited at the Royal Academy in 1877, and was purchased for the Chantrey Bequest collection. Another statue, "The Sluggard," of equal merit, was exhibited in 1886; and a charming statuette of a nude figure of a girl looking over her shoulder at a frog, called "Needless Alarms," was completed in the same year, and presented by the artist to Sir John Millais in acknowledgment of the gift by the latter of his picture, "Shelling Peas." He made the beautiful design for the reverse of the Jubilee Medal of 1887. It was also his habit to make sketch models in wax for the figures in his pictures, many of which are in the possession of the Royal Academy. As an illustrator in black and white he also deserves to be remembered, especially for the cuts to Dalziel's Bible, already mentioned, and his illustrations to George Eliot's *Romola*, which appeared in the *Cornhill Magazine*. The latter are full of the spirit of

Florence and the Florentines, and show a keen sense of humour, elsewhere excluded from his work. Of his decorative paintings, the best known are the elegant compositions (in spirit fresco) on the walls of the Victoria and Albert Museum, representing "The Industrial Arts of War and Peace." There, also, is the refined and spirited figure of "Cimabue" in mosaic. In Lyndhurst church are mural decorations to the memory of Mr Pepys Cockerell, illustrating "The Parable of the Wise and Foolish Virgins."

Leighton's life was throughout marked by distinction, artistic and social. Though not tall, he had a fine presence and manners, at once genial and courtly. He was welcomed in all societies, from the palace to the studio. He spoke German, Italian and French, as well as English. He had much taste and love for music, and considerable gifts as an orator of a florid type. His Presidential Discourses (published, London, 1896) were full of elegance and culture. For seven years (1876–1883) he commanded the 20th Middlesex (Artists) Rifle Volunteers, retiring with the rank of honorary colonel, and subsequently receiving the Volunteer Decoration. Yet no social attractions or successes diverted him from his devotion to his profession, the welfare of his brethren in art or of the Royal Academy. As president he was punctilious in the discharge of his duties, ready to give help and encouragement to artists young and old, and his tenure of the office was marked by some wise and liberal reforms. He frequently went abroad, generally to Italy, where he was well known and appreciated. He visited Spain in 1866, Egypt in 1868, when he went up the Nile with Ferdinand de Lesseps in a steamer lent by the Khedive. He was at Damascus for a short time in 1873. It was his custom on all these trips to make little lively sketches of landscape and buildings. These fresh little flowers of his leisure used to decorate the walls of his studio, and at the sale of its contents after his death realized considerable prices. It was when he was in the full tide of his popularity and success, and apparently in the full tide of his personal vigour also, that he was struck with *angina pectoris*. For a long time he struggled bravely with this cruel disease, never omitting except from absolute necessity any of his official duties except during a brief period of rest abroad, which failed to produce the desired effect. His death occurred on the 25th of January 1896.

Leighton was elected an Academician in 1868, and succeeded Sir Francis Grant as President in 1878, when he was knighted. He was created a baronet in 1886, and was raised to the peerage in 1896, a few days before his death. He held honorary degrees at the universities of Oxford, Cambridge, Dublin, Edinburgh and Durham, was an Associate of the Institute of France; a Commander of the Legion of Honour, and of the Order of Leopold. He was a Knight of the Coburg Order, "Dem Verdienste," and of the Prussian Order, "Pour le Mérite," and a member of at least ten foreign Academies. In 1859 he won a medal of the second class at the Paris Salon, and at the Exposition Universelle of 1889 a gold medal. As a sculptor he was awarded a medal of the first class in 1878 and the Grand Prix in 1889.

See *Art Annual* (Mrs A. Lang), 1884; Royal Academy Catalogue, Winter Exhibition, 1897; National Gallery of British Art Catalogue; C. Monkhouse, *British Contemporary Artists* (London, 1899); Ernest Rhys, *Frederick, Lord Leighton* (London, 1898, 1900). (C. Mo.)

LEIGHTON, ROBERT (1611–1684), archbishop of Glasgow, was born, probably in London (others say at Ulishaven, Forfarshire), in 1611, the eldest son of Dr Alexander Leighton, the author of *Zion's Plea against the Prelacie*, whose terrible sufferings for having dared to question the divine right of Episcopacy, under the persecution of Laud, form one of the most disgraceful incidents of the reign of Charles I. Dr Leighton is said to have been of the old family of Ulishaven in Forfarshire. From his earliest childhood, according to Burnet, Robert Leighton was distinguished for his saintly disposition. In his sixteenth year (1627) he was sent to the university of Edinburgh, where, after studying with distinguished success for four years, he took the degree of M.A. in 1631. His father then sent him to travel abroad, and he is understood to have spent several years in France, where he acquired a complete mastery of the French language. While there he passed a good deal of time with relatives at Douai who had become Roman Catholics, and with whom he kept up a correspondence for many years afterwards. Either at this time or on some subsequent visit he had also a good deal of intercourse with members of the Jansenist party. This intercourse contributed to the charity towards those who differed from him in religious opinion, which ever afterwards formed a feature in his character. The exact period of his return to Scotland has not been ascertained; but in 1641 he was ordained Presbyterian minister of Newbattle in Midlothian. In 1652 he resigned his charge and went to reside in Edinburgh. What led him to take this step does not distinctly appear. The account given is that he had little sympathy with the fiery zeal of his brother clergymen on certain political questions, and that this led to severe censures on their part.

Early in 1653 he was appointed principal of the university of Edinburgh, and primarius professor of divinity. In this post he continued for seven or eight years. A considerable number of his Latin prelections and other addresses (published after his death) are remarkable for the purity and elegance of their Latinity, and their subdued and meditative eloquence. They are valuable instructions in the art of living a holy life rather than a body of scientific divinity. Throughout, however, they bear the marks of a deeply learned and accomplished mind, saturated with both classical and patristic reading, and like all his works they breathe the spirit of one who lived very much above the world. His mental temper was too unlike the temper of his time to secure success as a teacher.

In 1661, when Charles II. had resolved to force Episcopacy once more upon Scotland, he fixed upon Leighton for one of his bishops (see SCOTLAND, CHURCH OF). Leighton, living very much out of the world, and being somewhat deficient in what may be called the political sense, was too open to the persuasions used to induce him to enter a sphere for which he instinctively felt he was ill qualified. The Episcopacy which he contemplated was that modified form which had been suggested by Archbishop Ussher, and to which Baxter and many of the best of the English Nonconformists would have readily given their adherence. It is significant that he always refused to be addressed as "my lord," and it is stated that when dining with his clergy on one occasion he wished to seat himself at the foot of the table.

Leighton soon began to discover the sort of men with whom he was to be associated in the episcopate. He travelled with them in the same coach from London towards Scotland, but having become, as he told Burnet, very weary of their company (as he doubted not they were of his), and having found that they intended to make a kind of triumphal entrance into Edinburgh, he left them at Morpeth and retired to the earl of Lothian's at Newbattle. He very soon lost all hope of being able to build up the church by the means which the government had set on foot, and his work, as he confessed to Burnet, "seemed to him a fighting against God." He did, however, what he could, governing his diocese (that of Dunblane) with the utmost mildness, as far as he could, preventing the persecuting measures in active operation elsewhere, and endeavouring to persuade the Presbyterian clergy to come to an accommodation with their Episcopal brethren. After a hopeless struggle of three or four years to induce the government to put a stop to their fierce persecution of the Covenanters, he determined to resign his bishopric, and went up to London in 1665 for this purpose. He so far worked upon the mind of Charles that he promised to enforce the adoption of milder measures, but it does not appear that any material improvement took place. In 1669 Leighton again went to London and made fresh representations on the subject, but little result followed. The slight disposition, however, shown by the government to accommodate matters appears to have inspired Leighton with so much hope that in the following year he agreed, though with a good deal of hesitation, to accept the archbishopric of Glasgow. In this higher sphere he redoubled his efforts with the Presbyterians to bring about some degree of conciliation with Episcopacy, but the only result was to embroil himself with the hot-headed Episcopal party as well as with the Presbyterians. In utter despair, therefore, of being able to be of any further service to the cause of religion, he resigned the archbishopric in 1674 and retired to the house of his widowed sister, Mrs Lightmaker, at Broadhurst in Sussex. Here he spent the remaining ten years, probably the happiest of his life, and died suddenly on a visit to London in 1684.

It is difficult to form a just or at least a full estimate of Leighton's character. He stands almost alone in his age. In some respects he was immeasurably superior both in intellect and in piety to most of the Scottish ecclesiastics of his time; and yet he seems to have had almost no influence in moulding the characters or conduct of his contemporaries. So intense was his absorption in the love of God that little room seems to have been left in his heart for human sympathy or affection. Can it be that there was after all something to repel in his outward manner? Burnet tells us that he had never seen him laugh, and very seldom even smile. In other respects, too, he gives the impression of standing aloof from human interests and ties. It may go for little that he never married, but it was surely a curious idiosyncrasy that he habitually cherished the wish (which was granted him) that he might die in an inn. In fact, holy meditation seems to have been the one absorbing interest of his life. At Dunblane tradition preserved the memory of "the good bishop," silent and companionless, pacing up and down the sloping walk by the river's bank under the beautiful west window of his cathedral. And from a letter of the earl of Lothian to his countess it appears that, whatever other reasons Leighton might have had for resigning his charge at Newbattle, the main object which he had in view was to be left to his own thoughts. It is therefore not very wonderful that he was completely misjudged and even disliked both by the Presbyterian and by the Episcopal party.

It was characteristic of him that he could never be made to understand that anything which he wrote possessed the smallest value. None of his works were published by himself, and it is stated that he left orders that all his MSS. should be destroyed after his death. But fortunately for the world this charge was disregarded. Like all the best writing, it seems to flow without effort; it is the easy unaffected outcome of his saintly nature. Throughout, however, it is the language of a scholar and a man of perfect literary taste; and with all its spirituality of thought there are no mystical raptures, such as are often found mingled with the Scottish practical theology of the 17th century. It was a common reproach against Leighton that he had leanings towards Roman Catholicism, and perhaps this is so far true that he had formed himself in some degree upon the model of some of the saintly persons of that faith, such as Pascal and Thomas à Kempis.

The best account of Leighton's character is that of Bishop Burnet in *Hist. of his Own Times* (1723–1734). No perfectly satisfactory edition of Leighton's works exists. After his death his *Commentary on Peter* and several of his other works were published under the editorship of his friend Dr Fall, and those early editions may be said to be, with some drawbacks, by far the best. His later editors have been possessed by the mania of reducing his good archaic and nervous language to the bald feebleness of modern phraseology. It is unfortunately impossible to exempt from this criticism even the edition, in other respects very valuable and meritorious, published under the superintendence of the Rev. W. West (7 vols., London, 1869–1875); see also volume of selections (with biography) by Dr Blair of Dunblane (1883), who also contributed "Bibliography of Archbishop Leighton" to the *British and Foreign Evangelical Review* (July 1883); Andrew Lang, *History of Scotland* (1902).

(J. T. Br.; D. Mn.)

LEIGHTON BUZZARD, a market town in the southern parliamentary division of Bedfordshire, England, 40 m. N.W. of London by the London & North-Western railway. Pop. of urban district (1901) 6331. It lies in the flat valley of the Ouzel, a tributary of the Ouse, sheltered to east and west by low hills. The river here forms the county boundary with Buckinghamshire. The Grand Junction canal follows its course, and gives the town extensive water-communications. The church of All Saints is cruciform, with central tower and spire. It is mainly Early English, and a fine example of the style; but some of the windows including the nave clerestory, and the beautiful carved wooden roof, are Perpendicular. The west door has good early ironwork; and on one of the tower-arch pillars are some remarkable early carvings of jocular character, one of which represents a man assaulted by a woman with a ladle. The market cross is of the 14th century, much restored, having an open arcade supporting a pinnacle, with flying buttresses. The statues in its niches are modern, but the originals are placed on the exterior of the town hall. Leighton has a considerable agricultural trade, and some industry in straw-plaiting. Across the Ouzel in Buckinghamshire, where Leighton railway station is situated, is the urban district of Linslade (pop. 2157).

LEININGEN, the name of an old German family, whose lands lay principally in Alsace and Lorraine. The first count of Leiningen about whom anything certain is known was a certain Emicho (d. 1117), whose family became extinct in the male line when Count Frederick, a Minnesinger, died about 1220. Frederick's sister, Liutgarde, married Simon, count of Saarbrücken, and Frederick, one of their sons, inheriting the lands of the counts of Leiningen, took their arms and their name. Having increased its possessions the Leiningen family was divided about 1317 into two branches; the elder of these, whose head was a landgrave, died out in 1467. On this event its lands fell to a female, the last landgrave's sister Margaret, wife of Reinhard, lord of Westerburg, and their descendants were known as the family of Leiningen-Westerburg. Later this family was divided into two branches, those of Alt-Leiningen-Westerburg and Neu-Leiningen-Westerburg, both of which are represented to-day.

Meanwhile the younger branch of the Leiningens, known as the family of Leiningen-Dagsburg, was flourishing, and in 1560 this was divided into the lines of Leiningen-Dagsburg-Hartenburg, founded by Count John Philip (d. 1562), and Leiningen-Dagsburg-Heidesheim or Falkenburg, founded by Count Emicho (d. 1593). In 1779 the head of the former line was raised to the rank of a prince of the Empire. In 1801 this family was deprived of its lands on the left bank of the Rhine by France, but in 1803 it received ample compensation for these losses. A few years later its possessions were mediatized, and they are now included mainly in Baden, but partly in Bavaria and in Hesse. A former head of this family, Prince Emich Charles, married Maria Louisa Victoria, princess of Saxe-Coburg; after his death in 1814 the princess married George III.'s son, the duke of Kent, by whom she became the mother of Queen Victoria. In 1910 the head of the family was Prince Emich (b. 1866).

The family of Leiningen-Dagsburg-Heidesheim was divided into three branches, the two senior of which became extinct during the 18th century. At present it is represented by the counts of Leiningen-Guntersblum and Leiningen-Heidesheim, called also Leiningen-Billigheim and Leiningen-Neidenau.

See Brinckmeier, *Genealogische Geschichte des Hauses Leiningen* (Brunswick, 1890–1891).

LEINSTER, a province of Ireland, occupying the middle and south-eastern portion of the island, and extending to the left bank of the Shannon. It includes counties Longford, Westmeath, Meath, Louth, King's County, Kildare, Dublin, Queen's County, Carlow, Wicklow, Kilkenny and Wexford (*q.v.* for topography, &c.). Leinster (*Laighen*) was one of the early Milesian provinces of Ireland. Meath, the modern county of which is included in Leinster, was the name of a separate province created in the 2nd century A.D. The kings of Leinster retained their position until 1171, and their descendants maintained independence within a circumscribed territory as late as the 16th century. In 1170 Richard Strongbow married Aoife, daughter of the last king Diarmid, and thus acquired the nominal right to the kingdom of Leinster. Henry II. confirmed him in powers of jurisdiction equivalent to those of a palatinate. His daughter Isabel married William Marshal, earl of Pembroke. Their five daughters shared the territory of Leinster, which was now divided into five liberties carrying the same extensive privileges as the undivided territory, namely, Carlow, Kilkenny, Wexford, Kildare and Leix. The history of Leinster thereafter passes to the several divisions which were gradually organized into the present counties.

LEIPZIG, a city of Germany, the second town of the kingdom of Saxony in size and the first in commercial importance, 70 m. N.W. of Dresden and 111 m. S.W. of Berlin by rail, and 6 m. from the Prussian frontier. It lies 350 ft. above the sea-level, in a broad and fertile plain, just above the junction of three small rivers, the Pleisse, the Parthe and the Elster, which flow in various branches through or round the town and afterwards.

under the name of the Elster, discharge themselves into the Saale. The climate, though not generally unhealthy, may be inclement in winter and hot in summer.

Leipzig is one of the most enterprising and prosperous of German towns, and in point of trade and industries ranks among German cities immediately after Berlin and Hamburg. It possesses the third largest German university, is the seat of the supreme tribunal of the German empire and the headquarters of the XIX. (Saxon) army corps, and forms one of the most prominent literary and musical centres in Europe. Its general aspect is imposing, owing to the number of new public buildings erected during the last 20 years of the 19th century. It consists of the old, or inner city, surrounded by a wide and pleasant promenade laid out on the site of the old fortifications, and of the very much more extensive inner and outer suburbs. Many thriving suburban villages, such as Reudnitz, Volkmarsdorf, Gohlis, Eutritzsch, Plagwitz and Lindenau, have been incorporated with the city, and with these accretions the population in 1905 amounted to 502,570. On the north-west the town is bordered by the fine public park and woods of the Rosenthal, and on the west by the Johanna Park and by pleasant groves leading along the banks of the Pleisse.

The old town, with its narrow streets and numerous houses of the 16th and 17th centuries, with their high-pitched roofs, preserves much of its quaint medieval aspect. The market square, lying almost in its centre, is of great interest. Upon it the four main business streets, the Grimmaische-, the Peters-, the Hain- and the Katharinen-strassen, converge, and its north side is occupied by the beautiful old Rathaus, a Gothic edifice built by the burgomaster Hieronymus Lotter in 1556, and containing life-size portraits of the Saxon rulers. Superseded by the new Rathaus, it has been restored and accommodates a municipal museum. Behind the market square and the main street lie a labyrinth of narrow streets interconnected by covered courtyards and alleys, with extensive warehouses and cellars. The whole, in the time of the great fairs, when every available place is packed with merchandise and thronged with a motley crowd, presents the semblance of an oriental bazaar. Close to the old Rathaus is Auerbach's *Hof*, built about 1530 and interesting as being immortalized in Goethe's *Faust*. It has a curious old wine vault (Keller) which contains a series of mural paintings of the 16th century, representing the legend on which the play is based. Near by is the picturesque Königshaus, for several centuries the palace of the Saxon monarchs in Leipzig and in which King Frederick Augustus I. was made prisoner by the Allies after the battle of Leipzig in October 1813. At the end of the Petersstrasse, in the south-west corner of the inner town and on the promenade, lay the Pleissenburg, or citadel, modelled, according to tradition, on that of Milan, and built early in the 13th century. Here Luther in 1519 held his momentous disputation. The round tower was long used as an observatory and the building as a barrack. With the exception of the tower, which has been encased and raised to double its former height—to 300 ft.—the citadel has been removed and its site is occupied by the majestic pile of the new Rathaus in Renaissance style, with the tower as its central feature. The business of Leipzig is chiefly concentrated in the inner city, but the headquarters of the book trade lie in the eastern suburb. Between the inner town and the latter lies the magnificent Augustusplatz, one of the most spacious squares in Europe. Upon it, on the side of the inner town and included within it, is the Augusteum, or main building of the university, a handsome edifice containing a splendid hall (1900), lecture rooms and archaeological collections; adjoining it is the Paulinerkirche, the university church. The other sides of the square are occupied by the new theatre, an imposing Renaissance structure, designed by C. F. Langhans, the post office and the museum of sculpture and painting, the latter faced by the Mende fountain. The churches of Leipzig are comparatively uninteresting. The oldest, in its present form, is the Paulinerkirche, built in 1229–1240, and restored in 1900, with a curiously grooved cloister; the largest in the inner town is the Thomaskirche, with a high-pitched roof dating from 1496, and memorable for its association with J. Sebastian Bach, who was organist here. Among others may be mentioned the new Gothic Petrikirche, with a lofty spire, in the south suburb. On the east is the Johanniskirche, round which raged the last conflict in the battle of 1813, when it suffered severely from cannon shot. In it is the tomb of Bach, and outside that of the poet Gellert. Opposite its main entrance is the Reformation monument, with bronze statues of Luther and Melanchthon, by Johann Schilling, unveiled in 1883. In the Johanna Park is the Lutherkirche (1886), and close at hand the Roman Catholic and English churches. To the south-west of the new Rathaus, lying beyond the Pleisse and between it and the Johanna Park, is the new academic quarter. Along the fine thoroughfares, noticeable among which is the Karl Tauchnitz Strasse, are closely grouped many striking buildings. Here is the new Gewandhaus, or Konzerthaus, built in 1880–1884, in which the famous concerts called after its name are given, the old Gewandhaus, or Drapers' Hall, in the inner town having again been devoted to commercial use as a market hall during the fairs. Immediately opposite to it is the new university library, built in 1891, removed hither from the old monasterial buildings behind the Augusteum, and containing some 500,000 volumes and 5000 MSS. Behind that again is the academy of art, one wing of which accommodates the industrial art school; and close beside it are the school of technical arts and the conservatoire of music. Between the university library and the new Gewandhaus stands a monument of Mendelssohn (1892). Immediately to the east of the school of arts rises the grand pile of the supreme tribunal of the German empire, the Reichsgericht, which compares with the Reichstag building in Berlin. It was built in 1888–1895 from plans by Ludwig Hoffmann, and is distinguished for the symmetry and harmony of its proportions. It bears an imposing dome, 225 ft. high, crowned by a bronze figure of Truth by O. Lessing, 18 ft. high. Opposite, on the outer side of the Pleisse, are the district law-courts, large and substantial, though not specially imposing edifices. In the same quarter stands the Grassi Museum (1893–1896) for industrial art and ethnology, and a short distance away are the palatial buildings of the Reichs and Deutsche Banks. Farther east and lying in the centre of the book-trade quarter stand close together the Buchhändlerhaus (booksellers' exchange), the great hall decorated with allegorical pictures by Sascha Schneider, and the Buchgewerbehaus, a museum of the book trade, both handsome red brick edifices in the German Renaissance style, erected in 1886–1890. South-west of these buildings, on the other side of the Johannisthal Park, are clustered the medical institutes and hospitals of the university—the infirmary, clinical and other hospitals, the physico-chemical institute, pathological institute, physiological institute, ophthalmic hospital, pharmacological institute, the schools of anatomy, the chemical laboratory, the zoological institute, the physico-mineralogical institute, the botanical garden and also the veterinary schools, deaf and dumb asylum, agricultural college and astronomical observatory. Among other noteworthy buildings in this quarter must be noted the Johannisstift, an asylum for the relief of the aged poor, with a handsome front and slender spire. On the north side of the inner town and on the promenade are the handsome exchange with library, and the reformed church, a pleasing edifice in late Gothic.

Leipzig has some interesting monuments; the Siegesdenkmal, commemorative of the wars of 1866 and 1870, on the market square, statues of Goethe, Leibnitz, Gellert, J. Sebastian Bach, Robert Schumann, Hahnemann, the homeopathist, and Bismarck. There are also many memorials of the battle of Leipzig, including an obelisk on the Randstädter-Steinweg, on the site of the bridge which was prematurely blown up, when Prince Poniatowski was drowned; a monument of cannon balls collected after the battle; a "relief" to Major Friccius, who stormed the outer Grimma gate; while on the battle plain itself and close to "Napoleonstein," which commemorates Napoleon's position on the last day of the battle, a gigantic obelisk surrounded by a garden has been planned for dedication on the hundredth anniversary of the battle (October 19, 1913).

The University and Education.—The university of Leipzig, founded in 1409 by a secession of four hundred German students from Prague, is one of the most influential universities in the world. It was a few years since the most numerously attended of any university in Germany, but it has since been outstripped by those of Berlin and of Munich. Its large revenues, derived to a great extent from house property in Leipzig and estates in Saxony, enable it, in conjunction with a handsome state subvention, to provide rich endowments for the professorial chairs. To the several faculties also belong various collegiate buildings, notably, to the legal, that of the *Collegium beatae Virginis* in the Petersstrasse, and to the philosophical the *Rothe Haus* on the promenade facing the theatre. The other educational institutions of Leipzig include the Nicolai and Thomas gymnasia, several "Realschulen," a commercial academy (*Handelsschule*), high schools for girls, and a large number of public and private schools of all grades.

Art and Literature.—The city has a large number of literary, scientific and artistic institutions. One of the most important is the museum, which contains about four hundred modern paintings, a large number of casts, a few pieces of original sculpture and a well-arranged collection of drawings and engravings. The collection of the historical society and the ethnographical and art-industrial collections in the Grassi Museum are also of considerable interest. The museum was erected with part of the munificent bequest made to the city by Dominic Grassi in 1881. As a musical centre Leipzig is known all over the world for its excellent conservatorium, founded in 1843 by Mendelssohn. The series of concerts given annually in the Gewandhaus is also of world-wide reputation, and the operatic stage of Leipzig is deservedly ranked among the finest in Germany. There are numerous vocal and orchestral societies, some of which have brought their art to a very high pitch of perfection. The prominence of the publishing interest has attracted to Leipzig a large number of gifted authors, and made it a literary centre of considerable importance. Over five hundred newspapers and periodicals are published here, including several of the most widely circulated in Germany. Intellectual interests of a high order have always characterized, Leipzig, and what Karl von Holtei once said of it is true to-day: "There is only one city in Germany that represents Germany; only a single city where one can forget that he is a Hessian, a Bavarian, a Swabian, a Prussian or a Saxon; only one city where, amid the opulence of the commercial world with which science is so gloriously allied, even the man who possesses nothing but his personality is honoured and esteemed; only one city, in which, despite a few narrownesses, all the advantages of a great, I may say a world-metropolis, are conspicuous! This city is, in my opinion, and in my experience, Leipzig."

Commerce, Fairs.—The outstanding importance of Leipzig as a commercial town is mainly derived from its three great fairs, which annually attract an enormous concourse of merchants from all parts of Europe, and from Persia, Armenia and other Asiatic countries. The most important fairs are held at Easter and Michaelmas, and are said to have been founded as markets about 1170. The smaller New Year's fair was established in 1458. Under the fostering care of the margraves of Meissen, and then of the electors of Saxony they attained great popularity. In 1268 the margrave of Meissen granted a safe-conduct to all frequenters of the fairs, and in 1497 and 1507 the emperor Maximilian I. greatly increased their importance by prohibiting the holding of annual markets at any town within a wide radius of Leipzig. During the Thirty Years' War, the Seven Years' War and the troubles consequent upon the French Revolution, the trade of the Leipzig fairs considerably decreased, but it recovered after the accession of Saxony to the German Customs Union (*Zollverein*) in 1834, and for the next twenty years rapidly and steadily increased. Since then, owing to the greater facilities of communication, the transactions at the fairs have diminished in relative, though they have increased in actual, value. Wares that can be safely purchased by sample appear at the fairs in steadily diminishing quantities, while others, such as hides, furs and leather, which require to be actually examined, show as marked an increase. The value of the sales considerably exceeds £10,000,000 sterling per annum. The principal commodity is furs (chiefly American and Russian), of which about one and a quarter million pounds worth are sold annually; other articles disposed of are leather, hides, wool, cloth, linen and glass. The Leipzig wool-market, held for two days in June, is also important.

In the trades of bookselling and publishing Leipzig occupies a unique position, not only taking the first place in Germany, but even surpassing London and Paris in the number and total value of its sales. There are upwards of nine hundred publishers and booksellers in the town, and about eleven thousand firms in other parts of Europe are represented here. Several hundred booksellers assemble in Leipzig every year, and settle their accounts at their own exchange (*Buchhändler-Börse*). Leipzig also contains about two hundred printing-works, some of great extent, and a corresponding number of type-foundries, binding-shops and other kindred industries.

The book trades give employment to over 15,000 persons, and since 1878 Leipzig has grown into an industrial town of the first rank. The iron and machinery trades employ 4500 persons; the textile industries, cotton and yarn spinning and hosiery, 6000; and the making of scientific and musical instruments, including pianos, 2650. Other industries include the manufacture of artificial flowers, wax-cloth, chemicals, ethereal oils and essences, beer, mineral waters, tobacco and cigars, lace, india-rubber wares, rush-work and paper, the preparation of furs and numerous other branches. These industries are mostly carried on in the suburbs of Plagwitz, Reudnitz, Lindenau, Gohlis, Eutritzsch, Konnewitz and the neighbouring town of Markranstädt.

Communications.—Leipzig lies at the centre of a network of railways giving it direct communication with all the more important cities of Germany. There are six main line railway stations, of which the Dresden and the Magdeburg lie side by side in the north-east corner of the promenade, the Thuringian and Berlin stations further away in the northern suburb; in the eastern is the Eilenburg station (for Breslau and the east) and in the south the Bavarian station. The whole traffic of these stations is to be directed into a vast central station (the largest in the world), lying on the sites of the Dresden, Magdeburg and Thuringian stations. The estimated cost, borne by Prussia, Saxony and the city of Leipzig, is estimated at 6 million pounds sterling. The city has an extensive electric tramway system, bringing all the outlying suburbs into close connexion with the business quarters of the town.

Population.—The population of Leipzig was quintupled within the 19th century, rising from 31,887 in 1801 to 153,988 in 1881, to 455,089 in 1900 and to 502,570 in 1905.

History.—Leipzig owes its origin to a Slav settlement between the Elster and the Pleisse, which was in existence before the year 1000, and its name to the Slav word *lipa*, a lime tree. There was also a German settlement near this spot, probably round a castle erected early in the 10th century by the German king, Henry the Fowler. The district was part of the mark of Merseburg, and the bishops of Merseburg were the lords of extensive areas around the settlements. In the 11th century Leipzig is mentioned as a fortified place and in the 12th it came into the possession of the margrave of Meissen, being granted some municipal privileges by the margrave, Otto the Rich, before 1190. Its favourable situation in the midst of a plain intersected by the principal highways of central Europe, together with the fostering care of its rulers, now began the work of raising Leipzig to the position of a very important commercial town. Its earliest trade was in the salt produced at Halle, and its enterprising inhabitants constructed roads and bridges to lighten the journey of the traders and travellers whose way led to the town. Soon Leipzig was largely used as a depot by the merchants of Nuremberg, who carried on a considerable trade with Poland. Powers of self-government were acquired by the council (*Rat*) of the town, the importance of which was enhanced during the 15th century by several grants of privileges from the emperors. When Saxony was divided in 1485 Leipzig fell to the Albertine, or ducal branch of the family, whose head Duke George gave new rights to the burghers. This duke, however, at whose instigation the famous discussion between Luther and Johann von Eck took place in the Pleissenburg of Leipzig, inflicted some injury upon the town's trade and also upon its university by the harsh treatment which he meted out to the adherents of the new doctrines; but under the rule of his successor, Henry, Leipzig accepted the teaching of the reformers. In 1547 during the war of the league of Schmalkalden the town was besieged by the elector of Saxony, John Frederick I. It was not captured, although its suburbs were destroyed. These and the Pleissenburg were rebuilt by the elector Maurice, who also strengthened the fortifications. Under the elector Augustus I. emigrants from the Netherlands were encouraged to settle in Leipzig and its trade with Hamburg and with England was greatly extended.

During the Thirty Years' War Leipzig suffered six sieges and on four occasions was occupied by hostile troops, being retained by the Swedes as security for the payment of an indemnity from 1648 to 1650. After 1650 its fortifications were strengthened; its finances were put on a better footing; and its trade, especially with England, began again to prosper; important steps being taken with regard to its organization. Towards the end of the 17th century the publishing trade began to increase very rapidly, partly because the severity of the censorship at Frankfort-on-the-Main caused many booksellers to remove to Leipzig. During the Seven Years' War Frederick the Great exacted a heavy contribution from Leipzig, but this did not seriously interfere with its prosperity. In 1784 the fortifications were pulled down. The wars in the first decade of the 19th century were not on the whole unfavourable to the commerce of Leipzig, but in 1813 and 1814, owing to the presence of enormous armies in the neighbourhood, it suffered greatly. Another revival, however, set in after the peace of 1815, and this was aided by the accession of Saxony to the German Zollverein in 1834, and by the opening of the first railway a little later. In 1831 the town was provided with a new constitution, and in 1837 a scheme for the reform of the university was completed. A riot in 1845, the revolutionary movement of 1848 and the Prussian occupation of 1866 were merely passing shadows. In 1879 Leipzig acquired a new importance by becoming the seat of the supreme court of the German empire.

The immediate neighbourhood of Leipzig has been the scene of several battles, two of which are of more than ordinary importance. These are the battles of Breitenfeld, fought on the 17th of September 1631, between the Swedes under Gustavus Adolphus and the imperialists, and the great battle of Leipzig, known in Germany as the Völkerschlacht, fought in October 1813 between Napoleon and the allied forces of Russia, Prussia and Austria.

Towards the middle of the 18th century Leipzig was the seat of the most influential body of literary men in Germany, over whom Johann Christoph Gottsched, like his contemporary, Samuel Johnson, in England, exercised a kind of literary dictatorship. Then, if ever, Leipzig deserved the epithet of a "Paris in miniature" (*Klein Paris*) assigned to it by Goethe in his *Faust*. The young Lessing produced his first play in the Leipzig theatre, and the university counts Goethe, Klopstock, Jean Paul Richter, Fichte and Schelling among its alumni. Schiller and Gellert also resided for a time in Leipzig, and Sebastian Bach and Mendelssohn filled musical posts here. Among the celebrated natives of the town are the philosopher Leibnitz and the composer Wagner.

Authorities.—For the history of Leipzig see E. Hasse, *Die Stadt Leipzig und ihre Umgebung, geographisch und statistisch beschrieben* (Leipzig, 1878); K. Grosse, *Geschichte der Stadt Leipzig* (Leipzig, 1897–1898); Rachel, *Verwaltungsorganisation und Ämterwesen der Stadt Leipzig bis 1627* (Leipzig, 1902); G. Wustmann, *Aus Leipzigs Vergangenheit* (Leipzig, 1898); *Bilderbuch aus der Geschichte der Stadt Leipzig* (Leipzig, 1897); *Leipzig durch drei Jahrhunderte, Atlas zur Geschichte des Leipziger Stadtbildes* (Leipzig, 1891); *Quellen zur Geschichte Leipzigs* (Leipzig, 1889–1895); and *Geschichte der Stadt Leipzig* (Leipzig, 1905); F. Seifert, *Die Reformation in Leipzig* (Leipzig, 1883); G. Buchwald, *Reformationsgeschichte der Stadt Leipzig* (Leipzig, 1900); Geffcken and Tykocinski, *Stiftungsbuch der Stadt Leipzig* (Leipzig, 1905); the *Urkundenbuch der Stadt Leipzig*, edited by C. F. Posern-Klett and Förstemann (Leipzig, 1870–1895); and the *Schriften des Vereins für die Geschichte Leipzigs* (Leipzig, 1872–1904). For other aspects of the town's life see Hirschfeld, *Leipzigs Grossindustrie und Grosshandel* (Leipzig, 1887); Hassert, *Die geographische Lage und Entwickelung Leipzigs* (Leipzig, 1899); Helm, *Heimatkunde von Leipzig* (Leipzig, 1903); E. Friedberg, *Die Universität Leipzig in Vergangenheit und Gegenwart* (Leipzig, 1897); F. Zarncke, *Die Statutenbücher der Universität Leipzig* (Leipzig, 1861); E. Hasse, *Geschichte der Leipziger Messen* (Leipzig, 1885); Tille, *Die Anfänge der hohen Landstrasse* (Gotha, 1906); Biedermann, *Geschichte der Leipziger Kramerinnung* (Leipzig, 1881); and Moltke, *Die Leipziger Kramerinnung im 15 und 16 Jahrhundert* (Leipzig, 1901).

LEIRIA, an episcopal city and the capital of the district of Leiria, formerly included in Estremadura, Portugal; on the river Liz and on the Lisbon-Figueria da Foz railway. Pop. (1900) 4459. The principal buildings of Leiria are the ruined citadel, which dates from 1135, and the cathedral, a small Renaissance building erected in 1571 but modernized in the 18th century. The main square of the city is named after the poet Francisco Rodrigues Lobo, who was born here about 1500. Between Leiria and the Atlantic there are extensive pine woods known as the Pinhal de Leiria, which were planted by King Diniz (1279–1325) with trees imported from the Landes in France, in order to give firmness to the sandy soil. In the neighbourhood there are glass and iron foundries, oil wells and mineral springs. Leiria, the Roman Calippo, was taken from the Moors in 1135 by Alphonso I. (Affonso Henriques). King Diniz made it his capital. In 1466 the first Portuguese printing-press was established here; in 1545 the city was made an episcopal see. The administrative district of Leiria coincides with the north and north-west of the ancient province of Estremadura (*q.v.*); pop. (1900) 238,755; area 1317 sq. m.

LEISLER, JACOB (*c.* 1635–1691), American political agitator, was born probably at Frankfort-on-Main, Germany, about 1635. He went to New Netherland (New York) in 1660, married a wealthy widow, engaged in trade, and soon accumulated a fortune. The English Revolution of 1688 divided the people of New York into two well-defined factions. In general the small shop-keepers, small farmers, sailors, poor traders and artisans were arrayed against the patroons, rich fur-traders, merchants, lawyers and crown officers. The former were led by Leisler, the latter by Peter Schuyler (1657–1724), Nicholas Bayard (*c.* 1644–1707), Stephen van Cortlandt (1643–1700), William Nicolls (1657–1723) and other representatives of the aristocratic Hudson Valley families. The "Leislerians" pretended greater loyalty to the Protestant succession. When news of the imprisonment of Gov. Andros in Massachusetts was received, they took possession on the 31st of May 1689 of Fort James (at the southern end of Manhattan Island), renamed it Fort William and announced their determination to hold it until the arrival of a governor commissioned by the new sovereigns. The aristocrats also favoured the Revolution, but preferred to continue the government under authority from James II. rather than risk the danger of an interregnum. Lieutenant-Governor Francis Nicholson sailed for England on the 24th of June, a committee of safety was organized by the popular party, and Leisler was appointed commander-in-chief. Under authority of a letter from the home government addressed to Nicholson, "or in his absence, to such as for the time being takes care for preserving the peace and administering the laws in His Majesty's province of New York," he assumed the title of lieutenant-governor in December 1689, appointed a council and took charge of the government of the entire province. He summoned the first Intercolonial Congress in America, which met in New York on the 1st of May 1690 to plan concerted action against the French and Indians. Colonel Henry Sloughter was commissioned governor of the province on the 2nd of September 1689 but did not reach New York until the 19th of March 1691. In the meantime Major Richard Ingoldsby and two companies of soldiers had landed (January 28, 1691) and demanded possession of the fort. Leisler refused to surrender it, and after some controversy an attack was made on the 17th of March in which two soldiers were killed and several wounded. When Sloughter arrived two days later Leisler hastened to give over to him the fort and other evidences of authority. He and his son-in-law, Jacob Milborne, were charged with treason for refusing to submit to Ingoldsby, were convicted, and on the 16th of May 1691 were executed. There has been much controversy among historians with regard both to the facts and to the significance of Leisler's brief career as ruler in New York.

See J. R. Brodhead, *History of the State of New York* (vol. 2, New York, 1871). For the documents connected with the controversy see E. B. O'Callaghan, *Documentary History of the State of New York* (vol. 2, Albany, 1850).

LEISNIG, a town in the kingdom of Saxony, prettily situated on the Freiberger Mulde, 7 m. S. of Grimma by the railway from Leipzig to Dresden via Döbeln. Pop. (1905) 8147. On a high rock above the town lies the old castle of Mildenstein, now utilized as administrative offices. The industries include the manufacture of cloth, furniture, boots, buttons, cigars, beer, machinery and chemicals. Leisnig is a place of considerable antiquity. About 1080 it passed into the possession of the counts of Groitzsch, but was purchased in 1157 by the emperor Frederick I., who committed it to the charge of counts. It fell to Meissen in 1365, and later to Saxony.

LEITH, a municipal and police burgh, and seaport, county of Midlothian, Scotland. Pop. (1901) 77,439. It is situated on the south shore of the Firth of Forth, 1½ m. N.N.E. of Edinburgh, of which it is the port and with which it is connected by Leith Walk, practically a continuous street. It has stations on the North British and Caledonian railways, and a branch line (N.B.R.) to Portobello. Lying at the mouth of the Water of Leith, which is crossed by several bridges and divides it into the parishes of North and South Leith, it stretches for 3¼ m. along the shore of the Firth from Seafield in the east to near Granton in the west. There is tramway communication with Edinburgh and Newhaven.

The town is a thriving centre of trade and commerce. St Mary's in Kirkgate, the parish church of South Leith, was founded in 1483, and was originally cruciform but, as restored in 1852, consists of an aisled nave and north-western tower. Here David Lindsay (1531–1613), its minister, James VI.'s chaplain and afterwards bishop of Ross, preached before the king the thanksgiving sermon on the Gowrie conspiracy (1600). John Logan, the hymn-writer and reputed author of "The Ode to the Cuckoo," was minister for thirteen years; and in its graveyard lies the Rev. John Home, author of *Douglas*, a native of Leith. Near it in Constitution Street is St James's Episcopal church (1862–1869), in the Early English style by Sir Gilbert Scott, with an apsidal chancel and a spire 160 ft. high. The parish church of North Leith, in Madeira Street, with a spire 158 ft. high, is one of the best livings in the Established Church of Scotland. St Thomas's, at the head of Shirra Brae, in the Gothic style, was built in 1843 by Sir John Gladstone of Fasque, who—prior to his removal to Liverpool, where his son, W. E. Gladstone, was born—had been a merchant in Leith. The public buildings are wholly modern, the principal being of classic design. They include the custom house (1812) in the Grecian style; Trinity House (1817), also Grecian, containing Sir Henry Raeburn's portrait of Admiral Lord Duncan, David Scott's "Vasco da Gama Rounding the Cape" and other paintings; the markets (1818); the town hall (1828), with an Ionic façade on Constitution Street and a Doric porch on Charlotte Street; the corn exchange (1862) in the Roman style; the assembly rooms; exchange buildings; the public institute (1867) and Victoria public baths (1899). Trinity House was founded in 1555 as a home for old and disabled sailors, but on the decline of its revenues it became the licensing authority for pilots, its humane office being partly fulfilled by the sailors' home, established about 1840 in a building adjoining the Signal Tower, and rehoused in a handsome structure in the Scottish Baronial style in 1883–1884. Other charitable institutions include the hospital, John Watt's hospital and the smallpox hospital. The high school, built in 1806, for many years a familiar object on the west margin of the Links, gave way to the academy, a handsome and commodious structure, to which are drafted senior pupils from the numerous board schools for free education in the higher branches. Here also is accommodated the technical college. Secondary instruction is given also in Craighall Road school. A bronze statue of Robert Burns was unveiled in 1898. Leith Links, one of the homes of golf in Scotland, is a popular resort, on Lochend Road are situated Hawkhill recreation grounds, and Lochend Loch is used for skating and curling. There are small links at Newhaven, and in Trinity are Starbank Park and Cargilfield playing ground. The east pier (1177 yds. long) and the west pier (1041 yds.) are favourite promenades. The waterway between them is the entrance to the harbour. Leith cemetery is situated at Seafield and the Eastern cemetery in Easter Road.

The oldest industry is shipbuilding, which dates from 1313. Here in 1511 James IV. built the "St Michael," "ane verrie monstruous great ship, whilk tuik sae meikle timber that schee waisted all the woodis in Fyfe, except Falkland wood, besides the timber that cam out of Norroway." Other important industries are engineering, sugar-refining (established 1757), meat-preserving, flour-milling, sailcloth-making, soap-boiling, rope and twine-making, tanning, chemical manures-making, wood-sawing, hosiery, biscuit-baking, brewing, distilling and lime-juice making. Of the old trade of glass-making, which began in 1682, scarcely a trace survives. As a distributing centre, Leith occupies a prominent place. It is the headquarters of the whisky business in Great Britain, and stores also large quantities of wine from Spain, Portugal and France. This pre-eminence is due to its excellent dock and harbour accommodation and capacious warehouses. The two old docks (1801–1807) cover 10½ acres; Victoria Dock (1852) 5 acres; Albert Dock (1863–1869) 10¾ acres; Edinburgh Dock (1874–1881) 16⅔ acres; and the New Dock (1892–1901) 60 acres. There are several dry docks, of which the Prince of Wales Graving Dock (1858), the largest, measures 370 ft. by 60 ft. Space can always be had for more dock room by reclaiming the east sands, where in the 17th and 18th centuries Leith Races were held, the theme of a humorous descriptive poem by Robert Fergusson. Apart from coasting trade there are constant sailings to the leading European ports, the United States and the British colonies. In 1908 the tonnage of ships entering the harbour was (including coastwise trade) 1,975,457; that of ships clearing the harbour 1,993,227. The number of vessels registered at the port was 213 (net tonnage 146,799). The value of imports was £12,883,890, of exports £5,377,188. In summer there are frequent excursions to the Bass Rock and the Isle of May, North Berwick, Elie, Aberdour, Alloa and Stirling. Leith Fort, built in North Leith in 1779 for the defence of the harbour, is now the headquarters of the Royal Artillery in Scotland. Leith is the head of a fishery district. The town, which is governed by a provost, bailies and council, unites with Musselburgh and Portobello to send one member to parliament.

Leith figures as Inverleith in the foundation charter of Holyrood Abbey (1128). In 1329 Robert I. granted the harbour to the magistrates of Edinburgh, who did not always use their power wisely. They forbade, for example, the building of streets wide enough to admit a cart, a regulation that accounted for the number of narrow wynds and alleys in the town. Had the overlords been more considerate incorporation with Edinburgh would not have been so bitterly resisted. Several of the quaint bits of ancient Leith yet remain, and the appearance of the shore as it was in the 17th and 18th centuries, and even at a later date, was picturesque in the extreme. During the centuries of strife between Scotland and England its situation exposed the port to attack both by sea and land. At least twice (in 1313 and 1410) its shipping was burned by the English, who also sacked the town in 1544—when the 1st earl of Hertford destroyed the first wooden pier—and 1547. In the troublous times that followed the death of James V., Leith became the stronghold of the Roman Catholic and French party from 1548 to 1560, Mary of Guise, queen regent, not deeming herself secure in Edinburgh. In 1549 the town was walled and fortified by Montalembert, sieur d'Essé, the commander of the French troops, and endured an ineffectual siege in 1560 by the Scots and their English allies. A house in Coalhill is thought to be the "handsome and spacious edifice" erected for her privy council by Mary of Guise. D'Essé's wall, pierced by six gates, was partly dismantled on the death of the queen regent, but although rebuilt in 1571, not a trace of it exists. The old tolbooth, in which William Maitland of Lethington, Queen Mary's secretary, poisoned himself in 1573, to avoid execution for adhering to Mary's cause, was demolished in 1819. Charles I. is said to have received the first tidings of the Irish rebellion while playing golf on the links in 1641. Cromwell in his Scottish campaign built the Citadel in 1650 and the mounds on the links, known as "Giant's Brae" and "Lady Fife's Brae," were thrown up by the Protector as batteries. In 1698 the sailing of the first Darien expedition created great excitement. In 1715 William Mackintosh of Borlum (1662–1743) and his force of Jacobite Highlanders captured the Citadel, of which only the name of Citadel Street and the archway in Couper Street have preserved the memory.

A mile S.E. of the links lies the ancient village of RESTALRIG, the home of the Logans, from whom the superiority of Leith was purchased in 1553 by the queen regent. Sir Robert Logan (d. 1606) was alleged to have been one of the Gowrie conspirators and to have arranged to imprison the king in Fast Castle. This charge, however, was not made until three years after his death, when his bones were exhumed for trial. He was then found guilty of high treason and sentence of forfeiture pronounced; but there is reason to suspect that the whole case was trumped up. The old church escaped demolition at the Reformation and even the fine east window was saved. In the vaults repose Sir Robert and other Logans, besides several of the lords Balmerino, and Lord Brougham's father lies in the kirkyard. The well of St Triduana, which was reputed to possess wonderful curative powers, vanished when the North British railway was constructed.

LEITMERITZ (Czech, *Litoměřice*), a town and episcopal see of Bohemia, 45 m. N. of Prague by rail. Pop. (1900) 13,075, mostly German. It lies on the right bank of the Elbe, which becomes here navigable for steamers and is spanned by an iron bridge 1700 ft. in length. The fine cathedral, founded in 1057, was built in 1671 and contains some valuable paintings. The library of the episcopal palace, built between 1694 and 1701, possesses the oldest maps of Bohemia made in 1518 by Nicolaus Claudianus of Jung-Bunzlau. Of the other churches that of All Saints dates from the 13th century. The town-hall, with its remarkable bell tower, dates from the 15th century. Leitmeritz is situated in the midst of a very fertile country, called the "Bohemian Paradise," which produces great quantities of corn, fruit, hops and wines. The beer brewed here enjoys a high reputation. On the opposite bank of the river, where the Eger discharges itself into the Elbe, lies Theresienstadt (pop. 7046), an important garrison town. It was formerly an important fortress, erected in 1780 by the emperor Joseph II. and named after his mother Maria Theresa, but the fortress was dismantled in 1882.

Leitmeritz was originally the castle of a royal count and is first mentioned, in 993, in the foundation charter of the convent of St Margaret near Prague. In 1248 it received a town charter, and was governed by the laws of Magdeburg until the time of Ferdinand I., having a special court of jurisdiction over all the royal towns where this law obtained. The town reached its highest degree of prosperity under Charles IV., who bestowed upon it large tracts of forest, agricultural land and vineyards. In the Hussite wars, after its capture by the utraquist, Leitmeritz remained true to "the Chalice," shared also in the revolt against Ferdinand I., and suffered in consequence. It was still more unfortunate during the Thirty Years' War, in the course of which most of the Protestant inhabitants left it; the property of the Bohemian refugees being given to German immigrants. The present bishopric was established in 1655.

LEITNER, GOTTLIEB WILHELM (1840–1899), Anglo-Hungarian orientalist, was born at Budapest in 1840. He was the son of a physician, and was educated at Malta Protestant college. At the age of fifteen he acted as an interpreter in the Crimean War. He entered King's College, London, in 1858, and in 1861 was appointed professor of Arabic and Mahommedan law. He became principal of the government college at Lahore in 1864, and there originated the term "Dardistan" for a portion of the mountains on the north-west frontier, which was subsequently recognized to be a purely artificial distinction. He collected much valuable information on Graeco-Buddhist art and the origins of Indian art. He spoke, read and wrote twenty-five languages. He founded an oriental institute at Woking, and for some years edited the *Asiatic Quarterly Review*. He died at Bonn in 1899.

See J. H. Stocqueler, *Life and Labours of Dr Leitner* (1875).

LEITRIM, a county of Ireland in the province of Connaught, bounded N.W. by Donegal Bay, N.E. by Fermanagh, E. by Cavan, S.E. by Longford, S.W. by Roscommon and W. by Sligo. The area is 392,381 acres, or about 613 sq. m. The northern portion of the county consists of an elevated table-land, of which the highest summits belong to the Truskmore Hills, reaching 1712 ft.; with Benbo, 1365 ft. and Lackagh, 1446 ft. In the southern part the country is comparatively level, and is generally richly wooded. The county touches the south coast of Donegal Bay, but the coast-line is only about 3 m. The principal river is the Shannon, which, issuing from Lough Allen, forms the south-western boundary of the county with Roscommon. The Bonnet rises in the north-west and flows to Lough Gill, and the streams of Drones and Duff separate Leitrim from Donegal and Sligo. Besides Lough Allen, which has an area of 8900 acres, the other principal lakes in the county are Lough Macnean, Lough Scur, Lough Garadice and Lough Melvin. The scenery of the north is wild and attractive, while in the neighbourhood of the Shannon it is of great beauty. Lough Melvin and the coast rivers afford rod fishing, the lough being noted for its gillaroo trout.

This varied county has in general a floor of Carboniferous Limestone, which forms finely scarped hills as it reaches the sea in Donegal Bay. The underlying sandstone appears at Lough Melvin, and again on the margin of a Silurian area in the extreme south. The Upper Carboniferous series, dipping gently southward, form mountainous country round Lough Allen, where the name of Slieve Anierin records the abundance of clay-ironstone beneath the coal seams. The sandstones and shales of this series scarp boldly towards the valley of the Bonnet, across which rises, in picturesque contrast, the heather-clad ridge of ancient gneiss which forms, in Benbo, the north-east end of the Ox Mountains. The ironstone was smelted in the upland at Creevelea down to 1859, and the coal is worked in a few thin seams.

The climate is moist and unsuitable for grain crops. On the higher districts the soil is stiff and cold, and, though abounding in stones, retentive of moisture, but in the valleys there are some fertile districts. Lime, marl and similar manures are abundant, and on the coast seaweed is plentiful. The proportion of tillage to pasture is roughly as 1 to 3. Potatoes are grown, but oats, the principal grain crop, are scanty. The live stock consists chiefly of cattle, pigs and poultry. Coarse linens for domestic purposes are manufactured and coarse pottery is also made. The Sligo, Leitrim and Northern Counties railway, connecting Sligo with Enniskillen, crosses the northern part of the county, by way of Manor Hamilton; the Mullingar and Sligo line of the Midland Great Western touches the south-western boundary of the county, with a station at Carrick-on-Shannon; while connecting with this line at Dromod is the Cavan and Leitrim railway to Ballinamore and Arigna, and to Belturbet in county Cavan.

The population (78,618 in 1891; 69,343 in 1901) decreases owing to emigration, the decrease being one of the most serious shown by any Irish county. It includes nearly 90% of Roman Catholics. The only towns are Carrick-on-Shannon (pop. 1118) and Manor Hamilton (993). The county is divided into five baronies. It is within the Connaught circuit, and assizes are held at Carrick-on-Shannon, and quarter sessions at Ballinamore, Carrick-on-Shannon and Manor Hamilton. It is in the Protestant diocese of Kilmore, and the Roman Catholic dioceses of Ardagh and Kilmore. In the Irish House of Commons two members were returned for the county and two for the boroughs of Carrick-on-Shannon and Jamestown, but at the Union the boroughs were disfranchised. The county divisions are termed the North and South, each returning one member.

With the territory which afterwards became the county Cavan, Leitrim formed part of Brenny or Breffny, which was divided into two principalities, of which Leitrim, under the name of Hy Bruin-Brenny, formed the western. Being for a long time in the possession of the O'Rourkes, descendants of Roderick, king of Ireland, it was also called Brenny O'Rourke. This family long maintained its independence; even in 1579, when the other existing counties of Connaught were created, the creation of Leitrim was deferred, and did not take place until 1583. Large confiscations were made in the reigns of Elizabeth and James I., in the Cromwellian period, and after the Revolution of 1688.

There are "druidical" remains near Fenagh and at Letterfyan, and important monastic ruins at Creevelea near the Bonnet, with several antique monuments, and in the parish of Fenagh. There was a flourishing Franciscan friary at Jamestown. The abbeys of Mohill, Annaduff and Drumlease are converted into parish churches. Among the more notable old castles are Manor Hamilton Castle, originally very extensive, but now in ruins, and Castle John on an island in Lough Scur. There is a small village named Leitrim about 4 m. N. of Carrick-on-Shannon, which was once of enough importance to give its name to a barony and to the county, and is said to have been the seat of an early bishopric.

LEIXÕES, a seaport and harbour of refuge of northern Portugal; in 41° 9′ 10″ N., 8° 40′ 35″ W., 3 m. N. of the mouth of the Douro. Leixões is included in the parish of Matozinhos (pop. 1900, 7690) and constitutes the main port of the city of

Oporto (*q.v.*), with which it is connected by an electric tramway. The harbour, of artificial construction, has an area of over 220 acres, and admits vessels of any size, the depth at the entrance being nearly 50 ft. The transference of cargo to and from ships lying in the Leixões basin is effected entirely by means of lighters from Oporto. In addition to wine, &c., from Oporto, large numbers of emigrants to South America are taken on board here. The trade of the port is mainly in British hands, and large numbers of British ships call at Leixões on the voyage between Lisbon and Liverpool, London or Southampton.

LEJEUNE, LOUIS FRANÇOIS, BARON (1776–1848), French general, painter, and lithographer, was born at Versailles. As aide-de-camp to General Berthier he took an active part in many of the Napoleonic campaigns, which he made the subjects of an important series of battle-pictures. The vogue he enjoyed is due to the truth and vigour of his work, which was generally executed from sketches and studies made on the battlefield. When his battle-pictures were shown at the Egyptian Hall in London, a rail had to be put up to protect them from the eager crowds of sightseers. Among his chief works are "The Entry of Charles X. into Paris, 6 June 1825" at Versailles; "Episode of the Prussian War, October 1807" at Douai Museum; "Marengo" (1801); "Lodi," "Thabor," "Aboukir" (1804); "The Pyramids" (1806); "Passage of the Rhine in 1795" (1824), and "Moskawa" (1812). The German campaign of 1806 brought him to Munich, where he visited the workshop of Senefelder, the inventor of lithography. Lejeune was so fascinated by the possibilities of the new method that he then and there made the drawing on stone of his famous "Cossack" (printed by C. and T. Senefelder, 1806). Whilst he was taking his dinner, and with his horses harnessed and waiting to take him back to Paris, one hundred proofs were printed, one of which he subsequently submitted to Napoleon. The introduction of lithography into France was greatly due to the efforts of Lejeune. Many of his battle-pictures were engraved by Coiny and Bovinet.

See Fournier-Sarlovèze, *Le Général Lejeune* (Paris, *Libraire de l'art*).

LEKAIN, the stage name of Henri Louis Cain (1728–1778), French actor, who was born in Paris on the 14th of April 1728, the son of a silversmith. He was educated at the Collège Mazarin, and joined an amateur company of players against which the Comédie Française obtained an injunction. Voltaire supported him for a time and enabled him to act in his private theatre and also before the duchess of Maine. Owing to the hostility of the actors it was only after a struggle of seventeen months that, by the command of Louis XV., he was received at the Comédie Française. His success was immediate. Among his best parts were Herod in *Mariamne*, Nero in *Britannicus* and similar tragic rôles, in spite of the fact that he was short and stout, with irregular and rather common features. His name is connected with a number of important scenic reforms. It was he who had the benches removed on which privileged spectators formerly sat encumbering the stage, Count Lauragais paying for him an excessive indemnity demanded. Lekain also protested against the method of sing-song declamation prevalent, and endeavoured to correct the costuming of the plays, although unable to obtain the historic accuracy at which Talma aimed. He died in Paris on the 8th of February 1778.

His eldest son published his *Mémoires* (1801) with his correspondence with Voltaire, Garrick and others. They were reprinted with a preface by Talma in *Mémoires sur l'art dramatique* (1825).

LELAND, CHARLES GODFREY (1824–1903), American author, son of a merchant, was born at Philadelphia on the 15th of August 1824, and graduated at Princeton in 1845. He afterwards studied at Heidelberg, Munich and Paris. He was in Paris during the revolution of 1848, and took an active part in it. He then returned to Philadelphia, and after being admitted to the bar in 1851, devoted himself to contributing to periodicals, editing various magazines and writing books. At the opening of the Civil War he started at Boston the *Continental Magazine*, which advocated emancipation. In 1868 he became known as the humorous author of *Hans Breitmann's Party and Ballads*, which was followed by other volumes of the same kind, collected in 1871 with the title of *Hans Breitmann's Ballads*. These dialect poems, burlesquing the German American, at once became popular. In 1869 he went to Europe, and till 1880 was occupied, chiefly in London, with literary work; after returning to Philadelphia for six years, he again made his home in Europe, generally at Florence, where he died on the 20th of March 1903. Though his humorous verses were most attractive to the public, Leland was a serious student of folk-lore, particularly of the gipsies, his writings on the latter (*The English Gypsies and their Language*, 1872; *The Gypsies*, 1882; *Gypsy Sorcery and Fortune-telling . . .*, 1891, &c.) being recognized as valuable contributions to the literature of the subject. He was president of the first European folk-lore congress, held in Paris in 1889.

His other publications include *Poetry and Mystery of Dreams* (1855), *Meister Karl's Sketch-book* (1855), *Pictures of Travel* (1856), *Sunshine in Thought* (1862), *Heine's Book of Songs* (1862), *The Music Lesson of Confucius* (1870), *Egyptian Sketch-book* (1873), *Abraham Lincoln* (1879), *The Minor Arts* (1880), *Algonquin Legends of New England* (1884), *Songs of the Sea and Lays of the Land* (1895), *Hans Breitmann in Tyrol* (1895), *One Hundred Profitable Acts* (1897), *Unpublished Legends of Vergil* (1899), *Kuloskap the Master, and other Algonquin Poems* (1903, with J. Dyneley Prince).

See his *Memoirs* (2 vols., 1893), and E. R. Pennell, *C. G. Leland* (1906).

LELAND (LEYLAND or LAYLONDE), **JOHN** (*c.* 1506–1552), English antiquary, was born in London on the 13th of September, probably in 1506. He owed his education at St Paul's school under William Lilly, and at Christ's College, Cambridge, to the kindness of a patron, Thomas Myles. He graduated at Cambridge in 1521, and subsequently studied at All Souls College, Oxford, and in Paris under François Dubois (Sylvius). On his return to England he took holy orders. He had been tutor to Lord Thomas Howard, son of the 3rd duke of Norfolk, and to Francis Hastings, afterwards earl of Huntingdon. Meanwhile his learning had recommended him to Henry VIII., who presented him to the rectory of Peuplingues in the marches of Calais in 1530. He was already librarian and chaplain to the king, and in 1533 he received a novel commission under the great seal as king's antiquary, with power to search for records, manuscripts and relics of antiquity in all the cathedrals, colleges and religious houses of England. Probably from 1534, and definitely from 1536 onwards to 1542, he was engaged on an antiquarian tour through England and Wales. He sought to preserve the MSS. scattered at the dissolution of the monasteries, but his powers did not extend to the actual collection of MSS. Some valuable additions, however, he did procure for the king's library, chiefly from the abbey of St Augustine at Canterbury. He had received a special dispensation permitting him to absent himself from his rectory of Peuplingues in 1536, and on his return from his itinerary he received the rectory of Haseley in Oxfordshire; his support of the church policy of Henry and Cranmer being further rewarded by a canonry and prebend of King's College (now Christ Church), Oxford, and a prebend of Salisbury. In a *Strena Henrico*[1] (pr. 1546), addressed to Henry VIII. in 1545, he proposed to execute from the materials which he had collected in his journeys a topography of England, an account of the adjacent islands, an account of the British nobility, and a great history of the antiquities of the British Isles. He toiled over his papers at his house in the parish of St Michael le Querne, Cheapside, London, but he was not destined to complete these great undertakings, for he was certified insane in March 1550, and died on the 18th of April 1552.

Leland was an exact observer, and a diligent student of local chronicles. The bulk of his work remained in MS. at the time of his death, and various copies were made, one by John Stowe in 1576. After passing through various hands the greater part of

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[1] Re-edited in 1549 by John Bale as *The laboryeuse Journey and Serche of J. Leylande for Englandes Antiquitees geven of him for a Neu Yeares Gifte, &c.*, modern edition by W. A. Copinger (Manchester, 1895).

Leland's MSS. were deposited by William Burton, the historian of Leicestershire, in the Bodleian at Oxford. They had in the meantime been freely used by other antiquaries, notably by John Bale, William Camden and Sir William Dugdale. The account of his journey in England and Wales in eight MS. quarto volumes received its name *The Itinerary of John Leland* from Thomas Burton and was edited by Thomas Hearne (9 vols., Oxford, 1710–1712; other editions in 1745 and 1770). The scattered portions dealing with Wales were re-edited by Miss L. Toulmin Smith in 1907. His other most important work, the *Collectanea*, in four folio MS. volumes, was also published by Hearne (6 vols., Oxford, 1715). His *Commentarii de scriptoribus Britannicis*, which had been used and distorted by his friend John Bale, was edited by Anthony Hall (2 vols., Oxford, 1709). Some of Leland's MSS., which formerly belonged to Sir Robert Cotton, passed into the possession of the British Museum. He was a Latin poet of some merit, his most famous piece being the *Cygnea Cantio* (1545) in honour of Henry VIII. Many of his minor works are included in Hearne's editions of the *Itinerary* and the *Collectanea*.

For accounts of Leland see John Bale, *Catalogus* (1557); Anthony à Wood, *Athenae Oxonienses*; W. Huddesford, *Lives of those eminent Antiquaries John Leland, Thomas Hearne and Anthony à Wood* (Oxford, 1772). A life of Leland, attributed to Edward Burton (*c.* 1750), from the library of Sir Thomas Phillipps, printed in 1896 contains a bibliography. See also the biography by Sidney Lee, in the *Dict. Nat. Biog.*

LELAND, JOHN (1691–1766), English Nonconformist divine, was born at Wigan, Lancashire, and educated in Dublin, where he made such progress that in 1716, without having attended any college or hall, he was appointed first assistant and afterwards sole pastor of a congregation of Presbyterians in New Row. This office he continued to fill until his death on the 16th of January 1766. He received the degree of D.D. from Aberdeen in 1739. His first publication was *A Defence of Christianity* (1733), in reply to Matthew Tindal's *Christianity as old as the Creation*; it was succeeded by his *Divine Authority of the Old and New Testaments asserted* (1738), in answer to *The Moral Philosopher* of Thomas Morgan; in 1741 he published two volumes, in the form of two letters, being *Remarks on* [H. Dodwell's] *Christianity not founded on Argument*; and in 1753 *Reflexions on the late Lord Bolingbroke's Letters on the Study and Use of History*. His *View of the Principal Deistical Writers that have appeared in England* was published in 1754–1756. This is the chief work of Leland—"most worthy, painstaking and commonplace of divines," as Sir Leslie Stephen called him—and in spite of many defects and inconsistencies is indispensable to every student of the deistic movement of the 18th century.

His *Discourses on various Subjects*, with a *Life* prefixed, was published posthumously (4 vols., 1768–1789).

LELAND STANFORD JR. UNIVERSITY, near Palo Alto, California, U.S.A., in the beautiful Santa Clara valley, was founded in 1885 by Leland Stanford[1] (1824–1893), and by his wife Jane Lathrop Stanford (1825–1905), as a memorial to their only child, Leland Stanford, Jr., who died in 1884 in his seventeenth year. The doors were opened in 1891 to 559 students. The university campus consists of Stanford's former Palo Alto farm, which comprises about 9000 acres. From the campus there are charming views of San Francisco Bay, of the Coast Range, particularly of Mount Hamilton some 30 m. E. with the Lick Observatory on its summit, of mountain foothills, and of the magnificent redwood forests toward Santa Cruz.

The buildings, designed originally by H. H. Richardson and completed by his successors, Shepley, Rutan and Coolidge, are of soft buff sandstone in a style adapted from the old California mission (Moorish-Romanesque) architecture, being long and low with wide colonnades, open arches and red tiled roofs. An outer surrounds an inner quadrangle of buildings. The inner quadrangle, about a court which is 586 by 246 ft. and is faced by a continuous open arcade and adorned with large circular beds of tropical plants and flowers, consists of twelve one-storey buildings and a beautiful memorial church. Of the fourteen buildings of the outer quadrangle some are two storeys high. A magnificent memorial arch (100 ft. high), adorned with a frieze designed by John Evans, representing the "Progress of Civilization in America," and forming the main gateway, was destroyed by the earthquake of 1906. Outside the quadrangles are other buildings—a museum of art and archaeology, based on collections made by Leland Stanford, Jr., chemical laboratories, engineering work-shops, dormitories, a mausoleum of the founders, &c. There is a fine arboretum (300 acres) and a cactus garden. The charming views, the grace and harmonious colours of the buildings, and the tropic vegetation make a campus of wonderful beauty. The students in 1907–1908 numbered 1738, of whom 126 were graduates, 99 special students, and 500 women.[2] The university library (with the library of the law department) contained in 1908 about 107,000 volumes. A marine biological laboratory, founded by Timothy Hopkins, is maintained at Pacific Grove on the Bay of Monterey. The university has an endowment from its founders estimated at $30,000,000, including three great estates with 85,000 acres of farm and vineyard lands, and several smaller tracts; but the endowment was very largely in interest-bearing securities, income from which was temporarily cut off in the early years of the university's life by litigation. The founders wished the university "to qualify students for personal success and direct usefulness in life; to promote the public welfare by exercising an influence in behalf of humanity and civilization, teaching the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty and the pursuit of happiness." There are no inflexible entrance requirements as to particular studies except English composition to ensure a degree of mental maturity, the minimum amount of preparation is fixed as that which should be given by four years in a secondary school, leaving to the applicants a wide choice of subjects (35 in 1906) ranging from ancient history to woodworking and machine shop. In the curriculum, liberty perhaps even greater than at Harvard is allowed as to "electives." Work on some one major subject occupies about one-third of the undergraduate course; the remaining two-thirds (or more) is purely elective. The influence of sectarianism and politics is barred from the university by its charter, and by its private origin and private support. At the same time in its policy it is practically a state university of the most liberal type. Instruction is entirely free. The president of the university has the initiative in all appointments and in all matters of general policy. Within the university faculty power lies in an academic council, and, more particularly, in an advisory board of nine professors, elected by the academic council, to which all propositions of the president are submitted. The growth of the university has been steady, and its conduct careful. David Starr Jordan[3] was its first president.

See O. H. Elliot and O. V. Eaton, *Stanford University and thereabouts* (San Francisco, 1896), and the official publications of the university.

LELEGES, the name applied by Greek writers to an early people or peoples of which traces were believed to remain in Greek lands.

1. *In Asia Minor.*—In Homer the Leleges are allies of the Trojans, but they do not occur in the formal catalogue in *Iliad*,

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[1] Stanford was born in Watervliet, New York; studied law in Albany; removed to California in 1852 and went into business at Michigan Bluff, Placer county, whence he removed to Sacramento in 1856; was made president in 1861 of the Central Pacific railroad company, which built the first trans-continental railway line over the Sierra Nevada; was governor of California in 1862–1863, and United States senator in 1885–1893; and was owner of the great Vina farm (55,000 acres) in Tehama county, containing the largest vineyard in the world (13,400 acres), the Gridley tract (22,000 acres) in Butte county, and the Palo Alto breeding farm, which was the home of his famous thoroughbred racers, Electioneer, Arion, Sunol, Palo Alto and Advertiser.

[2] The number of women attending the university as students in any semester is limited by the founding grant to 500.

[3] President Jordan was born in 1851 at Gainesville, New York; was educated at Cornell, where he taught botany for a time; became an assistant to the United States fish commission in 1872; in 1885–1891 was president of the university of Indiana, where from 1879 he had been professor of zoology; and in 1891 was elected president of Leland Stanford Jr. University. An eminent ichthyologist, he wrote, with Barton Warren Evermann (b. 1853), of the United States Bureau of Fisheries, *Fishes of North and Middle America* (4 vols., 1896–1900), and *Food and Game Fishes of North America* (1902); and prepared *A Guide to the Study of Fishes* (1905).

bk. ii., and their habitat is not specified. They are distinguished from the Carians, with whom some later writers confused them; they have a king Altes, and a town Pedasus which was sacked by Achilles. The name Pedasus occurs (i.) near Cyzicus, (ii.) in the Troad on the Satnioeis river, (iii.) in Caria, as well as (iv.) in Messenia. Alcaeus (7th–6th centuries B.C.) calls Antandrus in the Troad Lelegian, but Herodotus (5th century) substitutes Pelasgian (*q.v.*). Gargara in the Troad also counted as Lelegian. Pherecydes (5th century) attributed to Leleges the coast land of Caria from Ephesus to Phocaea, with the islands of Samos and Chios, placing the "true Carians" farther south from Ephesus to Miletus. If this statement be from Pherecydes of Leros (*c.* 480) it has great weight. In the 4th century, however, Philippus of Theangela in south Caria describes Leleges still surviving as serfs of the true Carians, and Strabo, in the 1st century B.C., attributes to the Leleges a well-marked group of deserted forts, tombs and dwellings which ranged (and can still be traced) from the neighbourhood of Theangela and Halicarnassus as far north as Miletus, the southern limit of the "true Carians" of Pherecydes. Plutarch also implies the historic existence of Lelegian serfs at Tralles in the interior.

2. *In Greece and the Aegean.*—A single passage in the Hesiodic catalogue (fr. 136 Kinkel) places Leleges "in Deucalion's time," *i.e.* as a primitive people, in Locris in central Greece. Not until the 4th century B.C. does any other writer place them anywhere west of the Aegean. But the confusion of the Leleges with the Carians (immigrant conquerors akin to Lydians and Mysians, and probably to Phrygians) which first appears in a Cretan legend (quoted by Herodotus, but repudiated, as he says, by the Carians themselves) and is repeated by Callisthenès, Apollodorus and other later writers, led easily to the suggestion of Callisthenes, that Leleges joined the Carians in their (half legendary) raids on the coasts of Greece. Meanwhile other writers from the 4th century onwards claimed to discover them in Boeotia, west Acarnania (Leucas), and later again in Thessaly, Euboea, Megara, Lacedaemon and Messenia. In Messenia they were reputed immigrant founders of Pylos, and were connected with the seafaring Taphians and Teleboans of Homer, and distinguished from the Pelasgians; in Lacedaemon and in Leucas they were believed to be aboriginal. These European Leleges must be interpreted in connexion with the recurrence of place names like Pedasus, Physcus, Larymna and Abae, (*a*) in Caria, and (*b*) in the "Lelegian" parts of Greece; perhaps this is the result of some early migration; perhaps it is also the cause of these Lelegian theories.

Modern speculations (mainly corollaries of Indo-Germanic theory) add little of value to the Greek accounts quoted above. H. Kiepert ("Über den Volksstamm der Leleges," in *Monatsber. Berl. Akad.*, 1861, p. 114) makes the Leleges an aboriginal people akin to Albanians and Illyrians; K. W. Deimling, *Die Leleger* (Leipzig, 1862), starts them in south-west Asia Minor, and brings them thence to Greece (practically the Greek view); G. F. Unger, "Hellas in Thessalien," in *Philologus*, Suppl. ii. (1863), makes them Phoenician, and derives their name from λαλάζειν (cf. the names *βάρβαρος*, *Wälsche*). E. Curtius (*History of Greece*, i.) distinguished a "Lelegian" phase of nascent Aegean culture. Most later writers follow Deimling. For Strabo's "Lelegian" monuments, cf. Paton and Myres, *Journal of Hellenic Studies*, xvi. 188-270. (J. L. M.)

LELEWEL, JOACHIM (1786–1861), Polish historian, geographer and numismatist, was born at Warsaw on the 22nd of March 1786. His family came from Prussia in the early part of the 18th century; his grandfather was appointed physician to the reigning king of Poland, and his father caused himself to be naturalized as a Polish citizen. The original form of the name appears to have been Lölhöffel. Joachim was educated at the university of Vilna, and became in 1807 a teacher in a school at Krzemieniec in Volhynia, in 1814 teacher of history at Vilna, and in 1818 professor and librarian at the university of Warsaw. He returned to Vilna in 1821. His lectures enjoyed great popularity, and enthusiasm felt for him by the students is shown in the beautiful lines addressed to him by Mickiewicz. But this very circumstance made him obnoxious to the Russian government, and at Vilna Novosiltsev was then all-powerful. Lelewel was removed from his professorship in 1824, and returned to Warsaw, where he was elected a deputy to the diet in 1829. He joined the revolutionary movement with more enthusiasm than energy, and though the emperor Nicholas I. distinguished him as one of the most dangerous rebels, did not appear to advantage as a man of action. On the suppression of the rebellion he made his way in disguise to Germany, and subsequently reached Paris in 1831. The government of Louis Philippe ordered him to quit French territory in 1833 at the request of the Russian ambassador. The cause of this expulsion is said to have been his activity in writing revolutionary proclamations. He went to Brussels, where for nearly thirty years he earned a scanty livelihood by his writings. He died on the 29th of May 1861 in Paris, whither he had removed a few days previously.

Lelewel, a man of austere character, simple tastes and the loftiest conception of honour, was a lover of learning for its own sake. His literary activity was enormous, extending from his *Edda Skandinawska* (1807) to his *Géographie des Arabes* (2 vols., Paris, 1851). One of his most important publications was *La Géographie du moyen âge* (5 vols., Brussels, 1852–1857), with an atlas (1849) of fifty plates entirely engraved by himself, for he rightly attached such importance to the accuracy of his maps that he would not allow them to be executed by any one else. His works on Polish history are based on minute and critical study of the documents; they were collected under the title *Polska, dzieje i rzeczy jej rozpatrzywane* (*Poland, her History and Affairs surveyed*), in 20 vols. (Posen, 1853–1876). He intended to write a complete history of Poland on an extensive scale, but never accomplished the task. His method is shown in the little history of Poland, first published at Warsaw in Polish in 1823, under the title *Dzieje Polski*, and afterwards almost rewritten in the *Histoire de Pologne* (2 vols., Paris, 1844). Other works on Polish history which may be especially mentioned are *La Pologne au moyen âge* (3 vols., Posen, 1846–1851), an edition of the *Chronicle of Matthew Cholewa* [1] (1811) and *Ancient Memorials of Polish Legislation* (*Ksiegi ustaw polskich i mazowieckich*). He also wrote on the trade of Carthage, on Pytheas of Marseilles, the geographer, and two important works on numismatics (*La Numismatique du moyen âge*, Paris, 2 vols., 1835; *Études numismatiques*, Brussels, 1840). While employed in the university library of Warsaw he studied bibliography, and the fruits of his labours may be seen in his *Bibliograficznych Ksiag dwoje* (*A Couple of Books on Bibliography*) (2 vols., Vilna, 1823–1826). The characteristics of Lelewel as an historian are great research and power to draw inferences from his facts; his style is too often careless, and his narrative is not picturesque, but his expressions are frequently terse and incisive.

He left valuable materials for a just comprehension of his career in the autobiography (*Adventures while Prosecuting Researches and Inquiries on Polish Matters*) printed in his *Polska.*

LELONG, JACQUES (1665–1721), French bibliographer, was born at Paris on the 19th of April 1665. He was a priest of the Oratory, and was librarian to the establishment of the Order in Paris, where he spent his life in seclusion. He died at Paris on the 13th of August 1721. He first published a *Bibliotheca sacra* (1709), an index of all the editions of the Bible, then a *Bibliothèque historique de la France* (1719), a volume of considerable size, containing 17,487 items to which Lelong sometimes appends useful notes. His work is far from complete. He vainly hoped that his friend and successor Father Desmolets, would continue it; but it was resumed by Charles-Marie Fevret de Fontette, a councillor of the parlement of Dijon, who spent fifteen years of his life and a great deal of money in rewriting the *Bibliothèque historique.* The first two volumes (1768 and 1769) contained as many as 29,143 items. Fevret de Fontette died on the 16th of February 1772, leaving the third volume almost finished. It appeared in 1772, thanks to Barbaud de La Bruyère, who later brought out the 4th and 5th volumes (1775 and 1778).

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[1] *I.e.* the three first books of the *Historia Polonica* of Vincentius (Kadlbek), bishop of Cracow (d. 1223), wrongly ascribed by Lelewel to Matthaeus Cholewa, bishop of Cracow. See Potthast, *Bibliotheca hist. med. aev., s.v.* "Vincentius."

In this new edition the *Bibliothèque historique* is a work of reference of the highest order; it is still of great value.

LELY, SIR PETER (1617–1680) English painter, was born at Soest, Westphalia, in 1617. His father, a military captain and a native of Holland, was originally called van der Vaes; the nickname of Le Lys or Lely, by which he was generally known, was adopted by his son as a surname. After studying for two years under Peter de Grebber, an artist of some note at Haarlem, Lely, induced by the patronage of Charles I. for the fine arts, removed to England in 1641. There he at first painted historical subjects and landscape; he soon became so eminent in his profession as to be employed by Charles to paint his portrait shortly after the death of Vandyck. He afterwards portrayed Cromwell. At the Restoration his genius and agreeable manners won the favour of Charles II., who made him his state-painter, and afterwards knighted him. He formed a famous collection, the best of his time, containing drawings, prints and paintings by the best masters; it sold by auction for no less than £26,000. His great example, however, was Vandyck, whom, in some of his most successful pieces, he almost rivals. Lely's paintings are carefully finished, warm and clear in colouring, and animated in design. The graceful posture of the heads, the delicate rounding of the hands, and the broad folds of the draperies are admired in many of his portraits. The eyes of the ladies are drowsy with languid sentiment, and allegory of a commonplace sort is too freely introduced. His most famous work is a collection of portraits of the ladies of the court of Charles II., known as "the Beauties," formerly at Windsor Castle, and now preserved at Hampton Court Palace. Of his few historical pictures, the best is "Susannah and the Elders," at Burleigh House. His "Jupiter and Europa," in the duke of Devonshire's collection, is also worthy of note. Lely was nearly as famous for crayon work as for oil-painting. Towards the close of his life he often retired to an estate which he had bought at Kew. He died of apoplexy in the Piazza, Covent Garden, London, and was buried in Covent Garden church, where a monument was afterwards erected to his memory. Pepys characterized Lely as "a mighty proud man and full of state." The painter married an English lady of family, and left a son and daughter, who died young. His only disciples were J. Greenhill and J. Buckshorn; he did not, however, allow them to obtain an insight into his special modes of work. (W. M. R.)

LE MAÇON (or Le Masson), **ROBERT** (*c.* 1365–1443), chancellor of France, was born at Château du Loir, Sarthe. He was ennobled in March 1401, and became six years later a councillor of Louis II., duke of Anjou and king of Sicily. A partisan of the house of Orleans, he was appointed chancellor to Isabella of Bavaria on the 29th of January 1414, on the 20th of July commissary of the mint, and in June 1416 chancellor to the count of Ponthieu, afterwards Charles VII. On the 16th of August he bought the barony of Trèves in Anjou, and henceforward bore the title of seigneur of Trèves. When Paris was surprised by the Burgundians on the night of the 29th of May 1418 he assisted Tanguy Duchâtel in saving the dauphin. His devotion to the cause of the latter having brought down on him the wrath of John the Fearless, duke of Burgundy, he was excluded from the political amnesty known as the peace of Saint Maur des Fossés, though he retained his seat on the king's council. He was by the dauphin's side when John the Fearless was murdered at the bridge of Montereau on the 10th of September 1419. He resigned the seals at the beginning of 1422; but he continued to exercise great influence, and in 1426 he effected a reconciliation between the king and the duke of Brittany. Having been captured by Jean de Langeac, seneschal of Auvergne, in August of the same year, he was shut up for three months in the château of Usson. When set at liberty he returned to court, where he staunchly supported Joan of Arc against all the cabals that menaced her. It was he who signed the patent of nobility for the Arc family in December 1429. In 1430 he was once more entrusted with an embassy to Brittany. Having retired from political life in 1436, he died on the 28th of January 1443, and was interred at Trèves, where his epitaph may still be seen.

See C. Bourcier, "Robert le Masson," in the *Revue historique de l'Anjou* (1873); and the *Nouvelle biographie générale*, vol. xxx. (J. V.*)

LE MAIRE DE BELGES, JEAN (1473–*c.* 1525), French poet and historiographer, was born at Bavai in Hainault. He was a nephew of Jean Molinet, and spent some time with him at Valenciennes, where the elder writer held a kind of academy of poetry. Le Maire in his first poems calls himself a disciple of Molinet. In certain aspects he does belong to the school of the *grands rhétoriqueurs*, but his great merit as a poet is that he emancipated himself from the affectations and puerilities of his masters. This independence of the Flemish school he owed in part perhaps to his studies at the university of Paris and to the study of the Italian poets at Lyons, a centre of the French renascence. In 1503 he was attached to the court of Margaret of Austria, duchess of Savoy, afterwards regent of the Netherlands. For this princess he undertook more than one mission to Rome; he became her librarian and a canon of Valenciennes. To her were addressed his most original poems, *Epistres de l'amand verd*, the *amant vert* being a green parrot belonging to his patroness. Le Maire gradually became more French in his sympathies, eventually entering the service of Anne of Brittany. His prose *Illustrations des Gaules et singularitez de Troye* (1510–1512), largely adapted from Benoît de Sainte More, connects the Burgundian royal house with Hector. Le Maire probably died before 1525. Étienne Pasquier, Ronsard and Du Bellay all acknowledged their indebtedness to him. In his love for antiquity, his sense of rhythm, and even the peculiarities of his vocabulary he anticipated the *Pléiade*.

His works were edited in 1882–1885 by J. Stecher, who wrote the article on him in the *Biographie nationale de Belgique*.

LEMAÎTRE, FRANÇOIS ÉLIE JULES (1853–), French critic and dramatist, was born at Vennecy (Loiret) on the 27th of April 1853. He became a professor at the university of Grenoble, but he had already become known by his literary criticisms, and in 1884 he resigned his position to devote himself entirely to literature. He succeeded J. J. Weiss as dramatic critic of the *Journal des Débats*, and subsequently filled the same office on the *Revue des Deux Mondes*. His literary studies were collected under the title of *Les Contemporains* (7 series, 1886–1899), and his dramatic *feuilletons* as *Impressions de théâtre* (10 series, 1888–1898). His sketches of modern authors are interesting for the insight displayed in them, the unexpectedness of the judgments and the gaiety and originality of their expression. He published two volumes of poetry: *Les Médaillons* (1880) and *Petites orientales* (1883); also some volumes of *contes*, among them *En marge des vieux livres* (1905). His plays are: *Révoltée* (1889), *Le député Leveau*, and *Le Mariage blanc* (1891), *Les Rois* (1893), *Le Pardon* and *L'Age difficile* (1895), *La Massière* (1905) and *Bertrade* (1906). He was admitted to the French Academy on the 16th of January 1896. His political views were defined in *La Campagne nationaliste* (1902), lectures delivered in the provinces by him and by G. Cavaignac. He conducted a nationalist campaign in the *Écho de Paris*, and was for some time president of the Ligue de la Patrie Française, but resigned in 1904, and again devoted himself to literature.

LE MANS, a town of north-western France, capital of the department of Sarthe, 77 m. S.W. of Chartres on the railway from Paris to Brest. Pop. (1906) town, 54,907, commune, 65,467. It is situated just above the confluence of the Sarthe and the Huisne, on an elevation rising from the left bank of the Sarthe. Several bridges connect the old town and the new quarters which have sprung up round it with the more extensive quarter of Pré on the right bank. Modern thoroughfares are gradually superseding the winding and narrow streets of old houses; a tunnel connects the Place des Jacobins with the river side. The cathedral, built in the highest part of the town, was originally founded by St Julian, to whom it is dedicated. The nave dates from the 11th and 12th centuries. In the 13th century the choir was enlarged in the grandest and boldest style of that period. The transepts, which are higher than the nave, were rebuilt in the 15th century, and the bell-tower of the south transept, the lower part of which is Romanesque, was rebuilt in the 15th and 16th centuries. Some of the stained glass in the nave, dating from the first half of the 12th century, is the oldest in France; the west window, representing the legend of St Julian, is especially interesting. The south lateral portal (12th century) is richly decorated, and its statuettes exhibit many costumes of the period. The austere simplicity of the older part of the building is in striking contrast with the lavish richness of the ornamentation in the choir, where the stained glass is especially fine. The rose-window (15th century) of the north transept, representing the Last Judgment, contains many historical figures. The cathedral also has curious tapestries and some remarkable tombs, including that of Berengaria, queen of Richard Cœur de Lion. Close to the western wall is a megalithic monument nearly 15 ft. in height. The church of La Couture, which belonged to an old abbey founded in the 7th century by St Bertrand, has a porch of the 13th century with fine statuary; the rest of the building is older. The church of Notre-Dame du Pré, on the right bank of the Sarthe, is Romanesque in style. The hôtel de ville was built in 1756 on the site of the former castle of the counts of Maine; the prefecture (1760) occupies the site of the monastery of La Couture, and contains the library, the communal archives, and natural history and art collections; there is also an archaeological museum. Among the old houses may be mentioned the Hôtel du Grabatoire of the Renaissance, once a hospital for the canons and the so-called house of Queen Berengaria (16th century), meeting place of the historical and archaeological society of Maine. A monument to General Chanzy commemorates the battle of Le Mans (1871). Le Mans is the seat of a bishopric dating from the 3rd century, of a prefect, and of a court of assizes, and headquarters of the IV. army corps. It has also tribunals of first instance and of commerce, a council of trade-arbitrators, a chamber of commerce, a branch of the Bank of France, an exchange, a lycée for boys, training colleges, a higher ecclesiastical seminary and a school of music. The town has a great variety of industries, carried on chiefly in the southern suburb of Pontlieue. The more important are the state manufacture of tobacco, the preparation of preserved vegetables, fish, &c., tanning, hemp-spinning, bell-founding, flour-milling, the founding of copper and other metals, and the manufacture of railway wagons, machinery and engineering material, agricultural implements, rope, cloth and stained glass. The fattening of poultry is an important local industry, and there is trade in cattle, wine, cloth, farm-produce, &c. The town is an important railway centre.

As the capital of the Aulerci Cenomanni, Le Mans was called Suindinum or Vindinum. The Romans built walls round it in the 3rd century, and traces of them are still to be seen close to the left bank of the river near the cathedral. In the same century the town was evangelized by St Julian, who became its first bishop. Ruled at first by his successors—notably St Aldric—Le Mans passed in the middle ages to the counts of Maine (*q.v.*), whose capital and residence it became. About the middle of the 11th century the citizens secured a communal charter, but in 1063 the town was seized by William the Conqueror, who deprived them of their liberties, which were recovered when the countship of Maine had passed to the Plantagenet kings of England. Le Mans was taken by Philip Augustus in 1189, recaptured by John, subsequently confiscated and later ceded to Queen Berengaria, who did much for its prosperity. It was several times besieged in the 15th and 16th centuries. In 1793 it was seized by the Vendeans, who were expelled by the Republican generals Marceau and Westermann after a stubborn battle in the streets. In 1799 it was again occupied by the Chouans.

The battle of Le Mans (10th–12th January 1871) was the culminating point of General Chanzy's fighting retreat into western France after the winter campaign in Beauce and Perche (see Franco-German War). The numerous, but ill-trained and ill-equipped, levies of the French were followed up by Prince Frederick Charles with the German II. Army, now very much weakened but consisting of soldiers who had in six months' active warfare acquired the self-confidence of veterans. The Germans advanced with three army corps in first line and one in reserve. On the 9th of January the centre corps (III.) drove an advanced division of the French from Ardenay (13 m. E. of Le Mans). On the 10th of January Chanzy's main defensive position was approached. Its right wing was east of the Sarthe and 3-5 m. from Le Mans, its centre on the heights of Anvours with the river Huisne behind it, and its left scattered along the western bank of the same river as far as Montfort (12 m. E.N.E. of Le Mans) and thence northward for some miles. On the 10th there was a severe struggle for the villages along the front of the French centre. On the 11th Chanzy attempted a counter-offensive from many points, but owing to the misbehaviour of certain of his rawest levies, the Germans were able to drive him back, and as their cavalry now began to appear beyond his extreme left flank, he retreated in the night of the 11th on Laval, the Germans occupying Le Mans after a brief rearguard fight on the 12th.

LE MARCHANT, JOHN GASPARD (1766–1812), English major-general, was the son of an officer of dragoons, John Le Marchant, a member of an old Guernsey family. After a somewhat wild youth, Le Marchant, who entered the army in 1781, attained the rank of lieutenant-colonel in 1797. Two years before this he had designed a new cavalry sword; and in 1801 his scheme for establishing at High Wycombe and Great Marlow schools for the military instruction of officers was sanctioned by Parliament, and a grant of £30,000 was voted for the "royal military college," the two original departments being afterwards combined and removed to Sandhurst. Le Marchant was the first lieutenant-governor, and during the nine years that he held this appointment he trained many officers who served with distinction under Wellington in the Peninsula. Le Marchant himself was given the command of a cavalry brigade in 1810, and greatly distinguished himself in several actions, being killed at the battle of Salamanca on the 22nd of July 1812, after the charge of his brigade had had an important share in the English victory. He wrote several treatises on cavalry tactics and other military subjects, but few of them were published. By his wife, Mary, daughter of John Carey of Guernsey, Le Marchant had four sons and six daughters.

His second son, Sir Denis le Marchant, Bart. (1795–1874), was educated at Eton and Trinity College, Cambridge, and was called to the bar in 1823. In 1830 he became secretary to Lord Chancellor Brougham, and in the Reform Bill debates made himself exceedingly useful to the ministers. Having been secretary to the board of trade from 1836 to 1841, he was created a baronet in 1841. He entered the House of Commons in 1846, and was under secretary for the home department in the government of Lord John Russell. He was chief clerk of the House of Commons from 1850 to 1871. He published a *Life* of his father in 1841, and began a *Life* of Lord Althorpe which was completed after his death by his son; he also edited Horace Walpole's *Memoirs of the Reign of George III.* (1845). Sir Denis Le Marchant died in London on the 30th of October 1874.

The third son of General Le Marchant, Sir John Gaspard Le Marchant (1803–1874), entered the English army, and saw service in Spain in the Carlist War of 1835–37. He was afterwards lieutenant-governor of Newfoundland (1847–1852) and of Nova Scotia (1852–1857); governor of Malta (1859–1864); commander-in-chief at Madras (1865–1868). He was made K.C.B. in 1865, and died on the 6th of February 1874.

See Sir Denis Le Marchant, *Memoirs of General Le Marchant* (1841); Sir William Napier, *History of the War in the Peninsula* (6 vols., 1828–1840).

LEMBERG (Pol. *Lwów*, Lat. *Leopolis*), the capital of the crownland of Galicia, Austria, 468 m. N.W. of Vienna by rail. Pop. (1900) 159,618, of whom over 80% were Poles, 10% Germans, and 8% Ruthenians; nearly 30% of the population were Jews. According to population Lemberg is the fourth city in the Austrian empire, coming after Vienna, Prague and Trieste. Lemberg is situated on the small river Peltew, an affluent of the Bug, in a valley in the Sarmatian plateau, and is surrounded by hills. It is composed of the inner town and of four suburbs.

The inner town was formerly fortified, but the fortifications were transformed into pleasure grounds in 1811. Lemberg is the residence of Roman Catholic, Greek Catholic and Armenian archbishops, and contains three cathedrals. The Roman Catholic cathedral was finished by Casimir IV. in 1480 in Gothic style; near it is a chapel (1609) remarkable for its architecture and sculpture. The Greek cathedral, built in 1740–1779 in the Basilica style, is situated on a height which dominates the town. The Armenian cathedral was built in 1437 in the Armenian-Byzantine style. The Dominican church, built in 1749 after the model of St Peter's at Rome, contains a monument by Thorvaldsen to the Countess Dunin-Borkowska; the Greek St Nicholas church was built in 1292; and the Roman Catholic St Mary church was built in 1363 by the first German settlers. The town hall (1828–1837) with a tower 250 ft. high is situated in the middle of a square. Also notable are the hall of the estates (1877–1881), the industrial museum, the theatre, the palace of the Roman Catholic archbishop and several educational establishments. There are many beautiful private buildings, broad and well-paved streets, numerous squares and public gardens. At the head of the educational institutions stands the university, founded in 1784 by Joseph II., transformed into a lycée in 1803, and restored and reorganized in 1817. Since 1871 the language of instruction has been Polish, and in 1901 the university had 110 lecturers, and was attended by 2060 students. There are also a polytechnic, gymnasia—for Poles, Ruthenians and Germans respectively—seminaries for priests, training colleges for teachers, and other special and technical schools. In Lemberg is the National Institute founded by Count Ossolinski, which contains a library of books and manuscripts relating chiefly to the history and literature of Poland, valuable antiquarian and scientific collections, and a printing establishment; also the Dzieduszycki museum with collections of natural history and ethnography relating chiefly to Galicia. Industrially and commercially Lemberg is the most important city in Galicia, its industries including the manufacture of machinery and iron wares, matches, stearin candles and naphtha, arrack and liqueurs, chocolate, chicory, leather and plaster of Paris, as well as brewing, corn-milling and brick and tile making. It has important commerce in linen, flax, hemp, wool and seeds, and a considerable transit trade. Of the well-wooded hills which surround Lemberg, the most important is the Franz-Josef-Berg to the N.E., with an altitude of 1310 ft. Several beautiful parks have been laid out on this hill.

Leopolis was founded about 1259 by the Ruthenian prince Leo Danilowicz, who moved here his residence from Halicz in 1270. From Casimir the Great, who captured it in 1340, it received the Magdeburg rights, and for almost two hundred years the public records were kept in German. In 1412 it became the see of a Roman Catholic archbishopric, and from 1432 until 1772 it was the capital of the Polish province of Reussen (*Terra Russia*). During the whole period of Polish supremacy it was a most important city, and after the fall of Constantinople it greatly developed its trade with the East. In 1648 and 1655 it was besieged by the Cossacks, and in 1672 by the Turks. Charles XII. of Sweden captured it in 1704. In 1848 it was bombarded.

LEMERCIER, LOUIS JEAN NÉPOMUCÉNE (1771–1840), French poet and dramatist, was born in Paris on the 21st of April 1771. His father had been intendant successively to the duc de Penthièvre, the comte de Toulouse and the unfortunate princesse de Lamballe, who was the boy's godmother. Lemercier showed great precocity; before he was sixteen his tragedy of *Méléagre* was produced at the *Théâtre Français*. *Clarissa Harlowe* (1792) provoked the criticism that the author was not *assez roué pour peindre les roueries*. *Le Tartufe révolutionnaire*, a parody full of the most audacious political allusions, was suppressed after the fifth representation. In 1795 appeared Lemercier's masterpiece *Agamemnon*, called by Charles Labitte the last great antique tragedy in French literature. It was a great success, but was violently attacked later by Geoffroy who stigmatized it as a bad caricature of Crébillon. *Quatre métamorphoses* (1799) was written to prove that the most indecent subjects might be treated without offence. The *Pinto* (1800) was the result of a wager that no further dramatic innovations were possible after the comedies of Beaumarchais. It is a historical comedy on the subject of the Portuguese revolution of 1640. This play was construed as casting reflections on the first consul, who had hitherto been a firm friend of Lemercier. His extreme freedom of speech finally offended Napoleon, and the quarrel proved disastrous to Lemercier's fortune for the time. None of his subsequent work fulfilled the expectations raised by *Agamemnon*, with the exception perhaps of *Frédégonde et Brunéhaut* (1821). In 1810 he was elected to the Academy, where he consistently opposed the romanticists, refusing to give his vote to Victor Hugo. In spite of this, he has some pretensions to be considered the earliest of the romantic school. His *Christophe Colomb* (1809), advertised on the playbill as a *comédie shakespirienne* (*sic*), represented the interior of a ship, and showed no respect for the unities. Its numerous innovations provoked such violent disturbances in the audience that one person was killed and future representations had to be guarded by the police. Lemercier wrote four long and ambitious epic poems: *Homère*, *Alexandre* (1801), *L'Atlantiade, ou la théogonie newtonienne* (1812) and *Moïse* (1823), as well as an extraordinary *Panhypocrisiade* (1819–1832), a distinctly romantic production in twenty cantos, which has the sub-title *Spectacle infernal du XVI*^{e} *siècle*. In it 16th-century history, with Charles V. and Francis I. as principal personages, is played out on an imaginary stage by demons in the intervals of their sufferings. Lemercier died on the 7th of June 1840 in Paris.

LEMERY, NICOLAS (1645–1715), French chemist, was born at Rouen on the 17th of November 1645. After learning pharmacy in his native town he became a pupil of C. Glaser's in Paris, and then went to Montpellier, where he began to lecture on chemistry. He next established a pharmacy in Paris, still continuing his lectures, but in 1683, being a Calvinist, he was obliged to retire to England. In the following year he returned to France, and turning Catholic in 1686 was able to reopen his shop and resume his lectures. He died in Paris on the 19th of June 1715. Lemery did not concern himself much with theoretical speculations, but holding chemistry to be a demonstrative science, confined himself to the straightforward exposition of facts and experiments. In consequence, his lecture-room was thronged with people of all sorts, anxious to hear a man who shunned the barren obscurities of the alchemists, and did not regard the quest of the philosopher's stone and the elixir of life as the sole end of his science. Of his *Cours de chymie* (1675) he lived to see 13 editions, and for a century it maintained its reputation as a standard work. His other publications included *Pharmacopée universelle* (1697), *Traité universel des drogues simples* (1698), *Traité de l'antimoine* (1707), together with a number of papers contributed to the French Academy, one of which offered a chemical and physical explanation of underground fires, earthquakes, lightning and thunder. He discovered that heat is evolved when iron filings and sulphur are rubbed together to a paste with water, and the artificial *volcan de Lemery* was produced by burying underground a considerable quantity of this mixture, which he regarded as a potent agent in the causation of volcanic action.

His son Louis (1677–1743) was appointed physician at the Hôtel Dieu in 1710, and became demonstrator of chemistry at the Jardin du Roi in 1731. He was the author of a *Traité des aliments* (1702), and of a *Dissertation sur la nature des os* (1704), as well as of a number of papers on chemical topics.

LEMERY, a town of the province of Batangas, Luzon, Philippine Islands, on the Gulf of Balayan and the Pansipit river, opposite Taal (with which it is connected by a bridge), and about 50 m. S. of Manila. Pop. of the municipality (1903) 11,150. It has a fine church and convent. Lemery is situated on a plain in a rich agricultural district, which produces rice, Indian corn, sugar and cotton, and in which horses and cattle are bred. It is also a port for coasting vessels, and has an important trade with various parts of the archipelago. The language is Tagalog.

LEMGO, a town of Germany, in the principality of Lippe, in a broad and fertile plain, 9 m. N. from Detmold and on the railway Hameln-Lage. Pop. (1900) 8840. Its somewhat gloomy aspect, enhanced by the tortuous narrow lanes flanked by gabled houses of the 15th century, has gained for it among countryfolk the sobriquet of the "Witches' nest" (*Hexen-Nest*). It is replete with interest for the antiquarian. It has four Evangelical churches, two with curiously leaning, lead-covered spires; an old town-hall; a gymnasium; and several philanthropic and religious institutions. Among the latter is the Jungfrauenstift, of which a princess of the reigning house of Lippe-Detmold has always been lady superior since 1306. The chief industry of Lemgo is the manufacture of meerschaum pipes, which has attained here a high pitch of excellence; other industries are weaving, brewing and the manufacture of leather and cigars. The town was a member of the Hanseatic league.

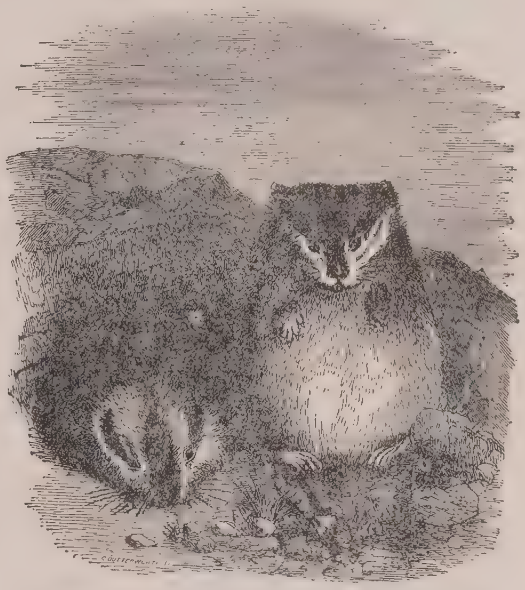
LEMIERRE, ANTOINE MARIN (1733–1793), French dramatist and poet, was born in Paris on the 12th of January 1733. His parents were poor, but Lemierre found a patron in the collector-general of taxes, Dupin, whose secretary he became. Lemierre gained his first success on the stage with *Hypermnestre* (1758); *Térée* (1761) and *Idoménée* (1764) failed on account of the subjects. *Artaxerce*, modelled on Metastasio, and *Guillaume Tell* were produced in 1766; other successful tragedies were *La Veuve de Malabar* (1770) and *Barnavelt* (1784). Lemierre revived *Guillaume Tell* in 1786 with enormous success. After the Revolution he professed great remorse for the production of a play inculcating revolutionary principles, and there is no doubt that the horror of the excesses he witnessed hastened his death, which took place on the 4th of July 1793. He had been admitted to the Academy in 1781. Lemierre published *La Peinture* (1769), based on a Latin poem by the abbé de Marsy, and a poem in six cantos, *Les Fastes, ou les usages de l'année* (1779), an unsatisfactory imitation of Ovid's *Fasti*.

His *Œuvres* (1810) contain a notice of Lemierre by R. Perrin. and his *Œuvres choisies* (1811) one by F. Fayolle.

LEMIRE, JULES AUGUSTE (1853–), French priest and social reformer, was born at Vieux-Berquin (Nord) on the 23rd of April 1853. He was educated at the college of St Francis of Assisi, Hazebrouck, where he subsequently taught philosophy and rhetoric. In 1897 he was elected deputy for Hazebrouck and was returned unopposed at the elections of 1898, 1902 and 1906. He organized a society called *La Ligue du coin de terre et du foyer*, the object of which was to secure, at the expense of the state, a piece of land for every French family desirous of possessing one. The abbé Lemire sat in the chamber of deputies as a conservative republican and Christian Socialist. He protested in 1893 against the action of the Dupuy cabinet in closing the Bourse du Travail, characterizing it as the expression of "a policy of disdain of the workers." In December 1893 he was seriously injured by the bomb thrown by the anarchist Vaillant from the gallery of the chamber.

LEMMING, the native name of a small Scandinavian rodent mammal *Lemmus norvegicus* (or *L. lemmus*), belonging to the mouse tribe, or *Muridae*, and nearly related, especially in the structure of its cheek-teeth, to the voles. Specimens vary considerably in size and colour, but the usual length is about 5 in., and the soft fur yellowish-brown, marked with spots of dark brown and black. It has a short, rounded head, obtuse muzzle, small bead-like eyes, and short rounded ears, nearly concealed by the fur. The tail is very short. The feet are small, each with five claws, those of the fore feet strongest, and fitted for scratching and digging. The usual habitat of lemmings is the high lands or fells of the great central mountain chain of Norway and Sweden, from the southern branches of the Langfjeldene in Christiansand *stift* to the North Cape and the Varangerfjord. South of the Arctic circle they are, under ordinary circumstances, confined to the plateaus covered with dwarf birch and juniper above the conifer-region, though in Tromsö *amt* and in Finmarken they occur in all suitable localities down to the level of the sea. The nest, under a tussock of grass or a stone, is constructed of short dry straws, and usually lined with hair. The number of young in each nest is generally five, sometimes only three occasionally seven or eight, and at least two broods are produced annually. Their food is entirely vegetable, especially grass roots and stalks, shoots of dwarf birch, reindeer lichens and mosses, in search of which they form, in winter, long galleries through the turf or under the snow. They are restless, courageous and pugnacious little animals. When suddenly disturbed, instead of trying to escape they sit upright, with their back against a stone, hissing and showing fight in a determined manner.

The circumstance which has given popular interest to the lemming is that certain districts of the cultivated lands of Norway and Sweden, where in ordinary circumstances they are unknown, are, at uncertain intervals varying from five to twenty or more years, overrun by an army of these little creatures, which steadily and slowly advance, always in the same direction, and regardless of all obstacles, swimming streams and even lakes of several miles in breadth, and committing considerable devastation on their line of march by the quantity of food they consume. In their turn they are pursued and harassed by crowds of beasts and birds of prey, as bears, wolves, foxes, dogs, wild cats, stoats, weasels, eagles, hawks and owls, and never spared by man; even domestic animals, as cattle, goats and reindeer, join in the destruction, stamping them to the ground with their feet, and even eating their bodies. Numbers also die from diseases produced apparently from overcrowding. None returns, and the onward march of the survivors never ceases until they reach the sea, into which they plunge, and swimming onwards in the same direction perish in the waves. These sudden appearances of vast bodies of lemmings, and their singular habit of persistently pursuing the same onward course of migration, have given rise to various speculations, from the ancient belief of the Norwegian peasants, shared by Olaus Magnus, that they fall down from the clouds, to the hypothesis that they are acting in obedience to an instinct inherited from ancient times, and still seeking the congenial home in the submerged Atlantis, to which their ancestors of the Miocene period were wont to resort when driven from their ordinary dwelling-places by crowding or scarcity of food. The principal facts regarding these migrations seem to be as follows. When any combination of circumstances has occasioned an increase of the numbers of the lemmings in their ordinary dwelling-places, impelled by the restless or migratory instinct possessed in a less developed degree by so many of their congeners, a movement takes place at the edge of the elevated plateau, and a migration towards the lower-lying land begins. The whole body moves forward slowly, always advancing in the



The Norwegian Lemming (*Lemmus Norvegicus*).

same general direction in which they originally started, but following more or less the course of the great valleys. They only travel by night; and, staying in congenial places for considerable periods, with unaccustomed abundance of provender, notwithstanding the destructive influences to which they are exposed, they multiply excessively during their journey, having families more numerous and frequent than in their usual homes. The progress may last from one to three years, according to the route taken, and the distance to be traversed until the sea-coast is reached, which in a country so surrounded by water as the Scandinavian peninsula must be the ultimate goal of such a journey. This may be either the Atlantic or the Gulf of Bothnia, according as the migration has commenced from the west or the east side of the central elevated plateau. Those that finally perish in the sea, committing what appears to be a voluntary suicide, are only acting under the same blind impulse which has led them previously to cross shallower pieces of water with safety. In Eastern Europe, Northern Asia and North America the group is represented by the allied *L. obensis*, and in Alaska, by *L. nigripes*; while the circumpolar banded lemming, *Dicrostonyx torquatus*, which turns white in winter, represents a second genus taking its name from the double claws on one of the toes of the forefeet.

For habits of lemmings, see R. Collett, *Myodes lemmus, its habits and migrations in Norway* (Christiania Videnskabs-Selskabs Forhandlinger, 1895). (W. H. F.; R. L.*)

LEMNISCATE (from Gr. λημνίσκος, ribbon), a quartic curve invented by Jacques Bernoulli (*Acta Eruditorum*, 1694) and afterwards investigated by Giulio Carlo Fagnano, who gave its principal properties and applied it to effect the division of a quadrant into $2\cdot2^m$, $3\cdot2^m$ and $5\cdot2^m$ equal parts. Following Archimedes, Fagnano desired the curve to be engraved on his tombstone. The complete analytical treatment was first given by Leonhard Euler. The lemniscate of Bernoulli may be defined as the locus of a point which moves so that the product of its distances from two fixed points is constant and is equal to the square of half the distance between these points. It is therefore a particular form of Cassini's oval (see OVAL). Its cartesian equation, when the line joining the two fixed points is the axis of x and the middle point of this line is the origin, is $(x^2+y^2)^2=2a^2(x^2-y^2)$ and the polar equation is $r^2=2a^2\cos 2\theta$. The curve (fig. 1) consists of two loops symmetrically placed about the coordinate axes. The pedal equation is $r^3=a^2p$, which shows that it is the first positive pedal of a rectangular hyperbola with regard to the centre. It is also the inverse of the same curve for the same point. It is the envelope of circles described on the central radii of an ellipse as diameters. The area of the complete curve is $2a^2$, and the length of any arc may be expressed in the form $\int(1-x^4)^{-\frac{1}{2}}dx$, an elliptic integral sometimes termed the *lemniscatic integral*.

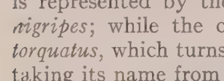


FIG. 1.

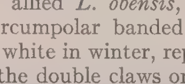


FIG. 2.

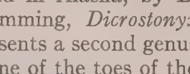


FIG. 3.

The name lemniscate is sometimes given to any crunodal quartic curve having only one real finite branch which is symmetric about the axis. Such curves are given by the equation $x^2-y^2=ax^4+bx^2y^2+cy^4$. If a be greater than b the curve resembles fig. 2 and is sometimes termed the *fishtail-lemniscate*; if a be less than b, the curve resembles fig. 3. The same name is also given to the first positive pedal of any central conic. When the conic is a rectangular hyperbola, the curve is the lemniscate of Bernoulli previously described. The *elliptic lemniscate* has for its equation $(x^2+y^2)^2=a^2x^2+b^2y^2$ or $r^2=a^2\cos^2\theta+b^2\sin^2\theta$ $(a>b)$. The centre is a conjugate point (or acnode) and the curve resembles fig. 4. The *hyperbolic lemniscate* has for its equation $(x^2+y^2)^2=a^2x^2-b^2y^2$ or $r^2=a^2\cos^2\theta-b^2\sin^2\theta$. In this case the centre is a crunode and the curve resembles fig. 5. These curves are instances of unicursal bicircular quartics.

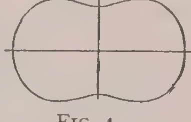


FIG. 4.

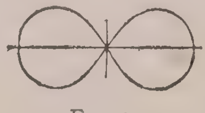


FIG. 5.

LEMNOS (mod. *Limnos*), an island in the northern part of the Aegean Sea. The Italian form of the name, Stalimene, *i.e.* ἐς τὴν Λῆμνον, is not used in the island itself, but is commonly employed in geographical works. The island, which belongs to Turkey, is of considerable size: Pliny says that the coast-line measured $112\frac{1}{2}$ Roman miles, and the area has been estimated at 150 sq. m. Great part is mountainous, but some very fertile valleys exist, to cultivate which 2000 yoke of oxen are employed. The hill-sides afford pasture for 20,000 sheep. No forests exist on the island; all wood is brought from the coast of Rumelia or from Thasos. A few mulberry and fruit trees grow, but no olives. The population is estimated by some as high as 27,000, of whom 2000 are Turks and the rest Greeks, but other authorities doubt whether it reaches more than half this number. The chief towns are Kastro on the western coast, with a population of 4000 Greeks and 800 Turks, and Mudros on the southern coast. Kastro possesses an excellent harbour, and is the seat of all the trade carried on with the island. Greek, English and Dutch consuls or consular agents were formerly stationed there; but the whole trade is now in Greek hands. The archbishops of Lemnos and Ai Strati, a small neighbouring island with 2000 inhabitants, resides in Kastro. In ancient times the island was sacred to Hephaestus, who as the legend tells fell on Lemnos when his father Zeus hurled him headlong out of Olympus. This tale, as well as the name Aethaleia, sometimes applied to it, points to its volcanic character. It is said that fire occasionally blazed forth from Mosychlos, one of its mountains; and Pausanias (viii. 33) relates that a small island called Chryse, off the Lemnian coast, was swallowed up by the sea. All volcanic action is now extinct.

The most famous product of Lemnos is the medicinal earth, which is still used by the natives. At one time it was popular over western Europe under the name *terra sigillata*. This name, like the Gr. Λημνία σφραγίς, is derived from the stamp impressed on each piece of the earth; in ancient times the stamp was the head of Artemis. The Turks now believe that a vase of this earth destroys the effect of any poison drunk from it—a belief which the ancients attached rather to the earth from Cape Kolias in Attica. Galen went to see the digging up of this earth (see Kuhn, *Medic. Gr. Opera*, xii. 172 sq.); on one day in each year a priestess performed the due ceremonies, and a waggon-load of earth was dug out. At the present time the day selected is the 6th of August, the feast of Christ the Saviour. Both the Turkish *hodja* and the Greek priest are present to perform the necessary ceremonies; the whole process takes place before daybreak. The earth is sold by apothecaries in stamped cubical blocks. The hill from which the earth is dug is a dry mound, void of vegetation, beside the village of Kotschinos, and about two hours from the site of Hephaestia. The earth was considered in ancient times a cure for old festering wounds, and for the bite of poisonous snakes.

The name Lemnos is said by Hecataeus (*ap.* Steph. Byz.) to have been a title of Cybele among the Thracians, and the earliest inhabitants are said to have been a Thracian tribe, called by the Greeks Sinties, *i.e.* "the robbers." According to a famous legend the women were all deserted by their husbands, and in revenge murdered every man on the island. From this barbarous act, the expression Lemnian deeds, Λήμνια ἔργα, became proverbial. The Argonauts landing soon after found only women in the island, ruled over by Hypsipyle, daughter of the old king Thoas. From the Argonauts and the Lemnian women were descended the race called Minyae, whose king Euneus, son of Jason and Hypsipyle, sent wine and provisions to the Greeks at Troy. The Minyae were expelled by a Pelasgian tribe who came from Attica. The historical element underlying these traditions is probably that the original Thracian people were gradually brought into communication with the Greeks as navigation began to unite the scattered islands of the Aegean (see JASON); the Thracian inhabitants were barbarians in comparison with the Greek mariners. The worship of Cybele was characteristic of Thrace, whither it spread from Asia Minor at a very early period, and it deserves notice that Hypsipyle and Myrina (the name of one of the chief towns) are Amazon names, which are always connected with Asiatic Cybele-worship. Coming down to a better authenticated period, we find that Lemnos was conquered by Otanes, one of the generals of Darius

Hystaspis; but was soon reconquered by Miltiades, the tyrant of the Thracian Chersonese. Miltiades afterwards returned to Athens, and Lemnos continued an Athenian possession till the Macedonian empire absorbed it. On the vicissitudes of its history in the 3rd century B.C. see Köhler in *Mittheil. Inst. Athen.* i. 261 The Romans declared it free in 197 B.C., but gave it over in 166 to Athens, which retained nominal possession of it till the whole of Greece was made a Roman province. A colony of Attic cleruchs was established by Pericles, and many inscriptions on the island relate to Athenians. After the division of the empire, Lemnos passed under the Byzantine emperors; it shared in the vicissitudes of the eastern provinces, being alternately in the power of Greeks, Italians and Turks, till finally the Turkish sultans became supreme in the Aegean. In 1476 the Venetians successfully defended Kotschinos against a Turkish siege; but in 1657 Kastro was captured by the Turks from the Venetians after a siege of sixty-three days. Kastro was again besieged by the Russians in 1770.

Homer speaks as if there were one town in the island called Lemnos, but in historical times there was no such place. There were two towns, Myrina, now Kastro, and Hephaestia. The latter was the chief town; its coins are found in considerable number, the types being sometimes the Athenian goddess and her owl, sometimes native religious symbols, the caps of the Dioscuri, Apollo, &c. Few coins of Myrina are known. They belong to the period of Attic occupation, and bear Athenian types. A few coins are also known which bear the name, not of either city, but of the whole island. Conze was the first to discover the site of Hephaestia, at a deserted place named Palaeokastro on the east coast. It had once a splendid harbour, which is now filled up. Its situation on the east explains why Miltiades attacked it first when he came from the Chersonese. It surrendered at once, whereas Myrina, with its very strong citadel built on a perpendicular rock, sustained a siege. It is said that the shadow of Mount Athos fell at sunset on a bronze cow in the agora of Myrina. Pliny says that Athos was 87 m. to the north-west; but the real distance is about 40 English miles. One legend localized in Lemnos still requires notice. Philoctetes was left there by the Greeks on their way to Troy; and there he suffered ten years' agony from his wounded foot, until Ulysses and Neoptolemus induced him to accompany them to Troy. He is said by Sophocles to have lived beside Mount Hermaeus, which Aeschylus (*Agam.* 262) makes one of the beacon points to flash the news of Troy's downfall home to Argos.

See Rhode, *Res Lemnicae*; Conze, *Reise auf den Inseln des Thrakischen Meeres* (from which the above-mentioned facts about the present state of the island are taken); also Hunt in Walpole's *Travels*; Belon du Mans, *Observations de plusieurs singularitez*, &c.; Finlay, *Greece under the Romans*; von Hammer, *Gesch. des Osman. Reiches*; *Gött. Gel. Anz.* (1837). The chief references in ancient writers are *Iliad* i. 593, v. 138, xiv. 229, &c.; Herod. iv. 145; Str. pp. 124, 330; Plin. iv. 23, xxxvi. 13.

LEMOINNE, JOHN ÉMILE (1815–1892), French journalist, was born of French parents, in London, on the 17th of October 1815. He was educated first at an English school and then in France. In 1840 he began writing for the *Journal des débats*, on English and other foreign questions, and under the empire he held up to admiration the free institutions of England by contrast with imperial methods. After 1871 he supported Thiers, but his sympathies rather tended towards a liberalized monarchy, until the comte de Chambord's policy made such a development an impossibility, and he then ranged himself with the moderate Republicans. In 1875 Lemoinne was elected to the French Academy, and in 1880 he was nominated a life senator. Distinguished though he was for a real knowledge of England among the French journalists who wrote on foreign affairs, his tone towards English policy greatly changed in later days, and though he never shared the extreme French bitterness against England as regards Egypt, he maintained a critical attitude which served to stimulate French Anglophobia. He was a frequent contributor to the *Revue des deux mondes*, and published several books, the best known of which is his *Études critiques et biographiques* (1862). He died in Paris on the 14th of December 1892.

LEMON, MARK (1809–1870), editor of *Punch*, was born in London on the 30th of November 1809. He had a natural talent for journalism and the stage, and, at twenty-six, retired from less congenial business to devote himself to the writing of plays. More than sixty of his melodramas, operettas and comedies were produced in London. At the same time he contributed to a variety of magazines and newspapers, and founded and edited the *Field*. In 1841 Lemon and Henry Mayhew conceived the idea of a humorous weekly paper to be called *Punch*, and when the first number was issued, in July 1841, were joint-editors and, with the printer and engraver, equal owners. The paper was for some time unsuccessful, Lemon keeping it alive out of the profits of his plays. On the sale of *Punch* Lemon became sole editor for the new proprietors, and it remained under his control until his death, achieving remarkable popularity and influence. Lemon was an actor of ability, a pleasing lecturer and a successful impersonator of Shakespearian characters. He also wrote a host of novelettes and lyrics, over a hundred songs, a few three-volume novels, several Christmas fairy tales and a volume of jests. He died at Crawley, Sussex, on the 23rd of May 1870.

LEMON, the fruit of *Citrus Limonum*, which is regarded by some botanists as a variety of *Citrus medica*. The wild stock of the lemon tree is said to be a native of the valleys of Kumaon and Sikkim in the North-West provinces of India, ascending to a height of 4000 ft., and occurring under several forms. Sir George Watt (*Dictionary of Economic Products of India*, ii. 352) regards the wild plants as wild forms of the lime or citron and considers it highly probable that the wild form of the lemon has not yet been discovered.

The lemon seems to have been unknown to the ancient Greeks and Romans, and to have been introduced by the Arabs into Spain between the 12th and 13th centuries. In 1494 the fruit was cultivated in the Azores, and largely shipped to England, but since 1838 the exportation has ceased. As a cultivated plant the lemon is now met with throughout the Mediterranean region, in Spain and Portugal, in California and Florida, and in almost all tropical and subtropical countries. Like the apple and pear, it varies exceedingly under cultivation. Risso and Poiteau enumerate forty-seven varieties of this fruit, although they maintain as distinct the sweet lime, *C. Limetta*, with eight varieties, and the sweet lemon, *C. Lumia*, with twelve varieties, which differ only in the fruit possessing an insipid instead of an acid juice.

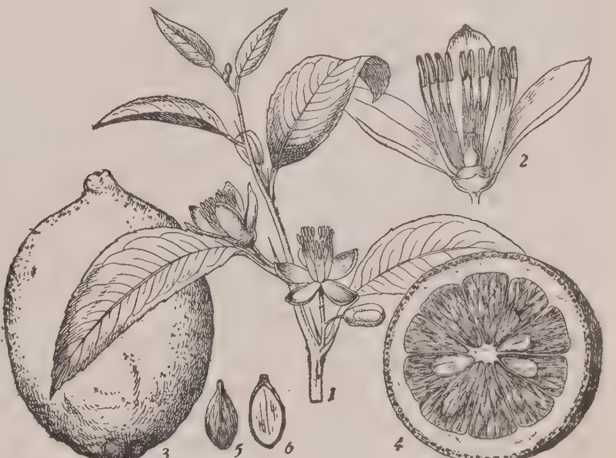


FIG. 1.—Lemon—*Citrus Limonum*.

1, Flowering shoot.
2, Flower with two petals and two bundles of stamens removed; slightly enlarged.
3, Fruit.
4, Same cut across.
5, Seed.
6, Same cut lengthwise.

The lemon is more delicate than the orange, although, according to Humboldt, both require an annual mean temperature of 62° Fahr.

Unlike the orange, which presents a fine close head of deep green foliage, it forms a straggling bush, or small tree, 10 to 12 ft. high, with paler, more scattered leaves, and short angular branches with sharp spines in the axils. The flowers, which possess a sweet odour quite distinct from that of the orange, are in part hermaphrodite and in part unisexual, the outside of the corolla having a purplish hue. The fruit, which is usually crowned with a nipple, consists of an outer rind or peel, the surface of which is more or less rough from the convex oil receptacles imbedded in it, and of a white inner rind, which is spongy and nearly tasteless, the whole of the interior of the fruit being filled with soft parenchymatous tissue, divided into about ten to twelve compartments, each generally containing two or three seeds. The white inner rind varies much in thickness in different kinds, but is never so thick as in the citron. As lemons are much more profitable to grow than oranges, on account of their keeping properties, and from their being less liable to injury during voyages, the cultivation of the lemon is preferred in Italy wherever it will succeed. In damp valleys it is liable like the orange (*q.v.*) to be attacked by a fungus sooty mould, the stem, leaves, and fruit becoming covered with a blackish dust. This is coincident with or subsequent to the attacks of a small oval brown insect, *Chermes hesperidum*. Trees not properly exposed to sunlight and air suffer most severely from these pests. Syringing with resin-wash or milk of lime when the young insects are hatched, and before they have fixed themselves to the plant, is a preventive. Since 1875 this fungoid disease has made great ravages in Sicily among the lemon and citron trees, especially around Catania and Messina. Heritte attributes the prevalence of the disease to the fact that the growers have induced an unnatural degree of fertility in the trees, permitting them to bear enormous crops year after year. This loss of vitality is in some measure met by grafting healthy scions of the lemon on the bitter orange, but trees so grafted do not bear fruit until they are eight or ten years old.

The lemon tree is exceedingly fruitful, a large one in Spain or Sicily ripening as many as three thousand fruits in favourable seasons. In the south of Europe lemons are collected more or less during every month of the year, but in Sicily the chief harvest takes place from the end of October to the end of December, those gathered during the last two months of the year being considered the best for keeping purposes. The fruit is gathered while still green. After collection the finest specimens are picked out and packed in cases, each containing about four hundred and twenty fruits, and also in boxes, three of which are equal to two cases, each lemon being separately packed in paper. The remainder, consisting of ill-shaped or unsound fruits, are reserved for the manufacture of essential oil and juice. The whole of the sound lemons are usually packed in boxes, but those which are not exported immediately are carefully picked over and the unsound ones removed before shipment. The exportation is continued as required until April and May. The large lemons with a rougher rind, which appear in the London market in July and August, are grown at Sorrento near Naples, and are allowed to remain on the trees until ripe.

Candied lemon peel is usually made in England from a larger variety of the lemon cultivated in Sicily on higher ground than the common kind, from which it is distinguished by its thicker rind and larger size. This kind, known as the Spadaforese lemon, is also allowed to remain on the trees until ripe, and when gathered the fruit is cut in half longitudinally and pickled in brine, before being exported in casks. Before candying the lemons are soaked in fresh water to remove the salt. Citrons are also exported from Sicily in the same way, but these are about six times as expensive as lemons, and a comparatively small quantity is shipped. Besides those exported from Messina and Palermo, lemons are also imported into England to a less extent from the Riviera of Genoa, and from Malaga in Spain, the latter being the most esteemed. Of the numerous varieties the wax lemon, the imperial lemon and the Gaeta lemon are considered to be the best. Lemons are also extensively grown in California and Florida.

Lemons of ordinary size contain about 2 oz. of juice, of specific gravity 1·039-1·046, yielding on an average 32·5 to 42·53 grains of citric acid per oz. The amount of this acid, according to Stoddart, varies in different seasons, decreasing in lemons kept from February to July, at first slowly and afterwards rapidly, until at the end of that period it is all split up into glucose and carbonic acid—the specific gravity of the juice being in February 1·046, in May 1·041 and in July 1·027, while the fruit is hardly altered in appearance. It has been stated that lemons may be kept for some months with scarcely perceptible deterioration by varnishing them with an alcoholic solution of shellac—the coating thus formed being easily removed when the fruit is required for household use by gently kneading it in the hands. Besides citric acid, lemon juice contains 3 to 4 % of gum and sugar, albuminoid matters, malic acid and 2·28 % of inorganic salts. Cossa has determined that the ash of dried lemon juice contains 54 % of potash, besides 15 % of phosphoric acid. In the white portion of the peel (in common with other fruits of the genus) a bitter principle called *hesperidin* has been found. It is very slightly soluble in boiling water, but is soluble in dilute alcohol and in alkaline solutions, which it soon turns of a yellow or reddish colour. It is also darkened by tincture of perchloride of iron. Another substance named *lemonin*, crystallizing in lustrous plates, was discovered in 1879 by Palerno and Aglialoro in the seeds, in which it is present in very small quantity, 15,000 grains of seed yielding only 80 grains of it. It differs from hesperidin in dissolving in potash without alteration. It melts at 275° F.

The simplest method of preserving lemon juice in small quantities for medicinal or domestic use is to keep it covered with a layer of olive or almond oil in a closed vessel furnished with a glass tap, by which the clear liquid may be drawn off as required. Lemon juice is largely used on shipboard as a preventive of scurvy. By the Merchant Shipping Act 1867 every British ship going to other countries where lemon or lime juice cannot be obtained was required to take sufficient to give 1 oz. to every member of the crew daily. Of this juice it requires about 13,000 lemons to yield 1 pipe (108 gallons). Sicilian juice in November yields about 9 oz. of crude citric acid per gallon, but only 6 oz. if the fruit is collected in April. The crude juice was formerly exported to England, and was often adulterated with sea-water, but is now almost entirely replaced by lime juice. A concentrated lemon juice for the manufacture of citric acid is prepared in considerable quantities, chiefly at Messina and Palermo, by boiling down the crude juice in copper vessels over an open fire until its specific gravity is about 1·239, seven to ten pipes of raw making only one of concentrated lemon juice. "Lemon juice" for use on shipboard is prepared also from the fruits of limes and Bergamot oranges. It is said to be sometimes adulterated with sulphuric acid on arrival in England.

The lemon used in medicine is described in the British pharmacopoeia as being the fruit of *Citrus medica*, var. Limonum. The preparations of lemon peel are of small importance. From the fresh peel is obtained the *oleum limonis* (dose ½-3 minims), which has the characters of its class. It contains a terpene known as citrene or limonene, which also occurs in orange peel: and citral, the aldehyde of geraniol, which is the chief constituent of oil of roses. Of much importance is the *succus limonis* or lemon juice, 1 oz. of which contains about 40 grains of free citric acid, besides the citrate of potassium (·25 %) and malic acid, free and combined. Ten per cent. of alcohol must be added to lemon juice if it is to be kept. From it are prepared the *syrupus limonis* (dose ½-2 drachms), which consists of sugar, lemon juice and an alcoholic extract of lemon peel, and also citric acid itself. Lemon juice is practically impure citric acid (*q.v.*).

Essence or Essential Oil of Lemon.—The essential oil contained in the rind of the lemon occurs in commerce as a distinct article. It is manufactured chiefly in Sicily, at Reggio in Calabria, and at Mentone and Nice in France. The small and irregularly shaped fruits are employed while still green, in which state the yield of oil is greater than when they are quite ripe. In Sicily and Calabria the oil is extracted in November and December as follows. A workman cuts three longitudinal slices off each lemon, leaving a three-cornered central core having a small portion of rind at the apex and base. These pieces are then divided transversely and cast on one side, and the strips of peel are thrown in another place. Next day the pieces of peel are deprived of their oil by pressing four or five times successively the outer surface of the peel (zest or flavedo) bent into a convex shape, against a flat sponge held in the palm of the left hand and wrapped round the forefinger. The oil vesicles in the rind, which are ruptured more easily in the fresh fruit than in the state in which lemons are imported, yield up their oil to the sponge, which when saturated is squeezed into an earthen vessel furnished with a spout and capable of holding about three pints. After a time the oil separates from the watery liquid which accompanies it, and is then decanted. By this process four hundred fruits yield 9 to 14 oz. of essence. The prisms of pulp are afterwards expressed to obtain lemon juice, and then distilled to obtain the small quantity of volatile oil they contain. At Mentone and Nice a different process is adopted. The lemons are placed in an *écuelle à piquer*, a shallow basin of pewter about 8½ in. in diameter, having a lip for pouring on one side and a closed tube at the bottom about 5 in. long and 1 in. in diameter. A number of stout brass pins stand up about half an inch from the bottom of the vessel. The workman rubs a lemon over these pins, which rupture the oil vesicles, and the oil collects in the tube, which when it becomes full is emptied into another vessel that it may separate from the aqueous liquid mixed with it. When filtered it is known as *Essence de citron au zeste*, or, in the English market, as perfumers' essence of lemon, inferior qualities being distinguished as druggists' essence of lemon. An additional product is obtained by immersing the scarified lemons in warm water and separating the oil which floats off. *Essence de citron distillée* is obtained by rubbing the surface of fresh lemons (or of those which have been submitted to the action of the *écuelle à piquer*) on a coarse grater of tinned iron, and distilling the grated peel. The oil so obtained is colourless, and of inferior fragrance, and is sold at a lower price, while that obtained by the cold processes has a yellow colour and powerful odour.

Essence of lemon is chiefly brought from Messina and Palermo packed in copper bottles holding 25 to 50 kilogrammes or more, and sometimes in tinned bottles of smaller size. It is said to be rarely found in a state of purity in commerce, almost all that comes into the market being diluted with the cheaper distilled oil. This fact may be considered as proved by the price at which the essence of lemon is sold in England, this being less than it costs the manufacturer to make it. When long kept the essence deposits a white greasy stearoptene, apparently identical with the bergaptene obtained from the essential oil of the Bergamot orange. The chief constituent of oil of lemon is the terpene, $C_{10}H_{16}$, boiling at 348°·8 Fahr., which, like oil of turpentine, readily yields crystals of terpin, $C_{10}H_{16}3OH_2$, but differs in yielding the crystalline compound, $C_{10}H_{16}+2Cl$, oil of turpentine forming one having the formula $C_{10}H_{16}+HCl$ Oil of lemons also contains, according to Tilden, another hydrocarbon, $C_{10}H_{16}$, boiling at 3·20° Fahr., a small amount of *cymene*, and a compound acetic ether, $C_2H_3O{\cdot}C_{10}H_{17}O$. The natural essence of lemon not being wholly soluble in rectified spirit of wine, an essence for culinary purposes is sometimes prepared by digesting 6 oz of lemon peel in one pint of pure alcohol of 95%, and, when the rind has become brittle, which takes place in about two and a half hours, powdering it and percolating the alcohol through it This article is known as "lemon flavour."

The name lemon is also applied to some other fruits. The Java lemon is the fruit of *Citrus javanica*, the pear lemon of a variety of *C. Limetta*, and the pearl lemon of *C. margarita*. The fruit of a passion-flower, *Passiflora laurifolia*, is sometimes known as the water-lemon, and that of a Berberidaceous plant, *Podophyllum peltatum*, as the wild lemon. In France and Germany the lemon is known as the citron, and hence much confusion arises concerning the fruits referred to in different works. The essential oil known as oil of cedrat is usually a factitious article instead of being prepared, as its name implies, from the citron (Fr. *cédratier*). An essential oil is also prepared from *C. Lumia*, at Squillace in Calabria, and has an odour like that of Bergamot but less powerful.

The sour lime is *Citrus acida*, generally regarded as a var. (*acida*) of *C. medica*. It is a native of India, ascending to about 4000 ft. in the mountains, and occurring as a small, much-branched thorny bush. The small flowers are white or tinged with pink on the outside; the fruit is small and generally round, with a thin, light green or lemon-yellow bitter rind, and a very sour, somewhat bitter juicy pulp. It is extensively cultivated throughout the West Indies, especially in Dominica, Montserrat and Jamaica, the approximate annual value of the exports from these islands being respectively £45,000, £6000 and £6000. The plants are grown from seed in nurseries and planted out about 200 to the acre. They begin to bear from about the third year, but full crops are not produced until the trees are six or seven years old. The ripe yellow fruit is gathered as it falls. The fruit is bruised by hand in a funnel-shaped vessel known as an *écuelle*, with a hollow stem; by rolling the fruit on a number of points on the side of the funnel the oil cells in the rind are broken and the oil collects in the hollow stem—this is the essential oil or essence of limes. The fruits are then taken to the mill, sorted, washed and passed through rollers and exposed to two squeezings. Two-thirds of the juice is expressed by the first squeezing, is strained at once, done up in puncheons and exported as raw juice. The product of the second squeezing, together with the juice extracted by a subsequent squeezing in a press, is strained and evaporated down to make concentrated juice; ten gallons of the raw juice yield one gallon of the concentrated juice. The raw juice is used for preparations of lime juice cordial, the concentrated for manufactures of citric acid.

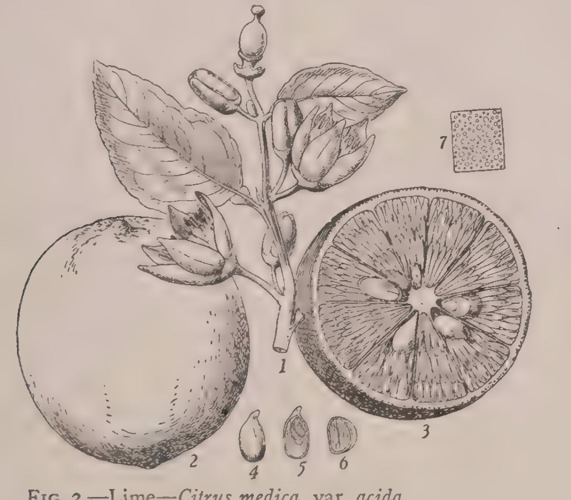


FIG. 2.—Lime—*Citrus medica*, var. *acida*.

1, Flowering shoot.
2, Fruit.
3, Same cut transversely.
4, Seed.
5, Seed cut lengthwise.
6, Seed cut transversely.
7, Superficial view of portion of rind showing oil glands.

On some estates citrate of lime is now manufactured in place of concentrated acid. Distilled oil of limes is prepared by distilling the juice, but its value is low in comparison with the expressed oil obtained by hand as described above. Green limes and pickled limes preserved in brine are largely exported to the United States, and more recently green limes have been exported to the United Kingdom. Limalade or preserved limes is an excellent substitute for marmalade. A spineless form of the lime appeared as a sport in Dominica in 1892, and is now grown there and elsewhere on a commercial scale. A form with seedless fruits has also recently been obtained in Dominica and Trinidad independently. The young leaves of the lime are used for perfuming the water in finger-glasses, a few being placed in the water and bruised before use.

LEMONNIER, ANTOINE LOUIS CAMILLE (1844–), Belgian poet, was born at Ixelles, Brussels, on the 24th of March 1844. He studied law, and then took a clerkship in a government office, which he resigned after three years. Lemonnier inherited Flemish blood from both parents, and with it the animal force and pictorial energy of the Flemish temperament. He published a *Salon de Bruxelles* in 1863, and again in 1866. His early friendships were chiefly with artists; and he wrote art criticisms with recognized discernment. Taking a house in the hills near Namur, he devoted himself to sport, and developed the intimate sympathy with nature which informs his best work. *Nos Flamands* (1869) and *Croquis d'automne* (1870) date from this time. *Paris-Berlin* (1870), a pamphlet pleading the cause of France, and full of the author's horror of war, had a great success. His capacity as a novelist, in the fresh, humorous description of peasant life, was revealed in *Un Coin de village* (1879). In *Un Mâle* (1881) he achieved a different kind of success. It deals with the amours of a poacher and a farmer's daughter, with the forest as a background. Cachaprès, the poacher, seems the very embodiment of the wild life around him. The rejection of *Un Mâle* by the judges for the quinquennial prize of literature in 1883 made Lemonnier the centre of a school, inaugurated at a banquet given in his honour on the 27th of May 1883. *Le Mort* (1882), which describes the remorse of two peasants for a murder they have committed, is a masterpiece in its vivid representation of terror. It was remodelled as a tragedy in five acts (Paris, 1899) by its author. *Ceux de la glèbe* (1889), dedicated to the "children of the soil," was written in 1885. He turned aside from local subjects for some time to produce a series of psychological novels, books of art criticism, &c., of considerable value, but assimilating more closely to French contemporary literature. The most striking of his later novels are: *L'Hystérique* (1885); *Happe-chair* (1886), often compared with Zola's *Germinal*; *Le Possédé* (1890); *La Fin des bourgeois* (1892); *L'Arche, journal d'une maman* (1894), a quiet book, quite different from his usual work; *La Faute de Mme Charvet* (1895); *L'Homme en amour* (1897); and, with a return to Flemish subjects, *Le Vent dans les moulins* (1901); *Petit Homme de Dieu* (1902), and *Comme va le ruisseau* (1903). In 1888 Lemonnier was prosecuted in Paris for offending against public morals by a story in *Gil Blas*, and was condemned to a fine. In a later prosecution at Brussels he was defended by Edmond Picard, and acquitted; and he was arraigned for a third time, at Bruges, for his *Homme en amour*, but again acquitted. He represents his own case in *Les Deux consciences* (1902). *L'Île vierge* (1897) was the first of a trilogy to be called *La Légende de la vie*, which was to trace, under the fortunes of the hero, the pilgrimage of man through sorrow and sacrifice to the conception of the divinity within him. In *Adam et Ève* (1899), and *Au Cœur frais de la forêt* (1900), he preached the return to nature as the salvation not only of the individual but of the community. Among his other more important works are *G. Courbet, et ses œuvres* (1878); *L'Histoire des Beaux-Arts en Belgique 1830–1887* (1887); *En Allemagne* (1888), dealing especially with the Pinakothek at Munich; *La Belgique* (1888), an elaborate descriptive work with many illustrations; *La Vie belge* (1905); and *Alfred Stevens et son œuvre* (1906).

Lemonnier spent much time in Paris, and was one of the early contributors to the *Mercure de France*. He began to write at a time when Belgian letters lacked style; and with much toil, and some initial extravagances, he created a medium for the expression of his ideas. He explained something of the process in a preface contributed to Gustave Abel's *Labeur de la prose* (1902). His prose is magnificent and sonorous, but abounds in neologisms and strange metaphors.

See the *Revue de Belgique* (15th February 1903), which contains the syllabus of a series of lectures on Lemonnier by Edmond Picard, a bibliography of his works, and appreciations by various writers.

LEMONNIER, PIERRE CHARLES (1715–1799), French astronomer, was born on the 23rd of November 1715 in Paris, where his father was professor of philosophy at the collège d'Harcourt. His first recorded observation was made before he was sixteen, and the presentation of an elaborate lunar map procured for him admission to the Academy, on the 21st of April 1736, at the early age of twenty. He was chosen in the same year to accompany P. L. Maupertuis and Alexis Clairault on their geodetical expedition to Lapland. In 1738, shortly after his return, he explained, in a memoir read before the Academy, the advantages of J. Flamsteed's mode of determining right ascensions. His persistent recommendation, in fact, of English methods and instruments contributed effectively to the reform of French practical astronomy, and constituted the most eminent of his services to science. He corresponded with J. Bradley, was the first to represent the effects of nutation in the solar tables, and introduced, in 1741, the use of the transit-instrument at the Paris observatory. He visited England in 1748, and, in company with the earl of Morton and James Short the optician, continued his journey to Scotland, where he observed the annular eclipse of July 25. The liberality of Louis XV., in whose favour he stood high, furnished him with the means of procuring the best instruments, many of them by English makers. Amongst the fruits of his industry may be mentioned a laborious investigation of the disturbances of Jupiter by Saturn, the results of which were employed and confirmed by L. Euler in his prize essay of 1748; a series of lunar observations extending over fifty years; some interesting researches in terrestrial magnetism and atmospheric electricity, in the latter of which he detected a regular diurnal period; and the determination of the places of a great number of stars, including twelve separate observations of Uranus, between 1765 and its discovery as a planet. In his lectures at the collège de France he first publicly expounded the analytical theory of gravitation, and his timely patronage secured the services of J. J. Lalande for astronomy. His temper was irritable, and his hasty utterances exposed him to retorts which he did not readily forgive. Against Lalande, owing to some trifling pique, he closed his doors "during an entire revolution of the moon's nodes." His career was arrested by paralysis late in 1791, and a repetition of the stroke terminated his life. He died at Héril near Bayeux on the 31st of May 1799. By his marriage with Mademoiselle de Cussy he left three daughters, one of whom became the wife of J. L. Lagrange. He was admitted in 1739 to the Royal Society, and was one of the one hundred and forty-four original members of the Institute.

He wrote *Histoire céleste* (1741); *Théorie des comètes* (1743), a translation, with additions of Halley's *Synopsis*; *Institutions astronomiques* (1746), an improved translation of J. Keill's text-book; *Nouveau zodiaque* (1755); *Observations de la lune, du soleil, et des étoiles fixes* (1751–1775); *Lois du magnétisme* (1776–1778), &c.

See J. J. Lalande, *Bibl. astr.*, p. 819 (also in the *Journal des savants* for 1801); F. X. von Zach, *Allgemeine geog. Ephemeriden*, iii. 625; J. S. Bailly, *Hist. de l'astr. moderne*, iii.; J. B. J. Delambre, *Hist. de l'astr. au* $XVIII^e$*. siècle*, p. 179; J. Mädler, *Geschichte der Himmelskunde*, ii. 6; R. Wolf, *Geschichte der Astronomie*, p. 480.

LEMOYNE, JEAN BAPTISTE (1704–1778), French sculptor, was the pupil of his father, Jean Louis Lemoyne, and of Robert le Lorrain. He was a great figure in his day, around whose modest and kindly personality there waged opposing storms of denunciation and applause. Although his disregard of the classic tradition and of the essentials of dignified sculpture, as well as his lack of firmness and of intellectual grasp of the larger principles of his art, lay him open to stringent criticism, de Clarac's charge that he had delivered a mortal blow at sculpture is altogether exaggerated. Lemoyne's more important works have for the most part been destroyed or have disappeared. The equestrian statue of "Louis XV." for the military school, and the composition of "Mignard's daughter, Mme Feuquières, kneeling before her father's bust" (which bust was from the hand of Coysevox) were subjected to the violence by which Bouchardon's equestrian monument of Louis XIV. (*q.v.*) was destroyed. The panels only have been preserved. In his busts evidence of his riotous and florid imagination to a great extent disappears, and we have a remarkable series of important portraits, of which those of women are perhaps the best. Among Lemoyne's leading achievements in this class are "Fontenelle" (at Versailles), "Voltaire," "Latour" (all of 1748), "Duc de la Valière" (Versailles), "Comte de St Florentin," and "Crébillon" (Dijon Museum); "Mlle Chiron" and "Mlle Dangeville," both produced in 1761 and both at the Théâtre Français in Paris, and "Mme de Pompadour," the work of the same year. Of the Pompadour he also executed a statue in the costume of a nymph, very delicate and playful in its air of grace. Lemoyne was perhaps most successful in his training of pupils, one of the leaders of whom was Falconnet.

LEMPRIÈRE, JOHN (*c.* 1765–1824), English classical scholar, was born in Jersey, and educated at Winchester and Pembroke College, Oxford. He is chiefly known for his *Bibliotheca Classica* or *Classical Dictionary* (1788), which, edited by various later scholars, long remained a readable if not very trustworthy reference book in mythology and classical history. In 1792, after holding other scholastic posts, he was appointed to the head-mastership of Abingdon grammar school, and later became the vicar of that parish. While occupying this living, he published a *Universal Biography of Eminent Persons in all Ages and Countries* (1808). In 1809 he succeeded to the head-mastership of Exeter free grammar school. On retiring from this, in consequence of a disagreement with the trustees, he was given the living of Meeth in Devonshire, which, together with that of Newton Petrock, he held till his death in London on the 1st of February 1824.

LEMUR (from Lat. *lemures*, "ghosts"), the name applied by Linnaeus to certain peculiar Malagasy representatives of the order Primates (*q.v.*) which do not come under the designation of either monkeys or apes, and, with allied animals from the same island and tropical Asia and Africa, constitute the sub-order *Prosimiae*, or *Lemuroidea*, the characteristics of which are given in the article just mentioned. The typical lemurs include species like *Lemur mongoz* and *L. catta*, but the English name "lemur" is often taken to include all the members of the sub-order, although the aberrant forms are often conveniently termed "lemuroids." All the Malagasy lemurs, which agree in the structure of the internal ear, are now included in the family *Lemuridae*, confined to Madagascar and the Comoro Islands, which comprises the great majority of the group. The other families are the *Nycticebidae*, common to tropical Asia and Africa, and the *Tarsiidae*, restricted to the Malay countries. In the more typical *Lemuridae* there are two pairs of upper incisor teeth, separated by a gap in the middle line; the premolars may be either two or three, but the molars, as in the lower jaw, are always three on each side. In the lower jaw the incisors and canines are directed straight forwards, and are of small size and nearly similar form; the function of the canine being discharged by the first premolar, which is larger than the other teeth of the same series. With the exception of the second toe of the hind-foot, the digits have well-formed, flattened nails as in the majority of monkeys. In the members of the typical genus *Lemur*, as well as in the allied *Hapalemur* and *Lepidolemur*, none of the toes or fingers are connected by webs, and all have the hind-limbs of moderate length, and the tail long. The maximum number of teeth is 36, there being typically two pairs of incisors and three of premolars in each jaw. In habits some of the species are nocturnal and others diurnal; but all subsist on a mixed diet, which includes birds, reptiles, eggs, insects and fruits. Most are arboreal, but the ring-tailed lemur (*L. catta*) often dwells among rocks. The species of the genus *Lemur* are diurnal, and may be recognized by the length of the muzzle, and the large tufted ears. In some cases, as in the black lemur (*L. macaco*) the two sexes are differently coloured; but in others, especially the ruffed lemur (*L. varius*), there is much individual variation in this respect, scarcely any two being alike. The gentle lemurs (*Hapalemur*) have a rounder head, with smaller ears and a shorter muzzle, and also a bare patch covered with spines on the fore-arm. The sportive lemurs (*Lepidolemur*) are smaller than the typical species of *Lemur*, and the adults generally lose their upper incisors. The head is short and conical, the ears large, round and mostly bare, and the tail shorter than the body. Like the gentle lemurs they are nocturnal. (See Avahi, Aye-Aye, Galago, Indri, Loris, Potto, Sifaka and Tarsier.) (R. L.*)

LENA, a river of Siberia, rising in the Baikal Mountains, on the W. side of Lake Baikal, in 54° 10′ N. and 107° 55′ E. Wheeling round by the S., it describes a semicircle, then flows N.N.E. and N.E., being joined by the Kirenga and the Vitim, both from the right; from 113° E. it flows E.N.E as far as Yakutsk (62° N., 127° 40′ E.), where it enters the lowlands, after being joined by the Olekma, also from the right. From Yakutsk it goes N. until joined by its right-hand affluent the Aldan, which deflects it to the north-west; then, after receiving its most important left-hand tributary, the Vilyui, it makes its way nearly due N. to the Nordenskjöld Sea, a division of the Arctic, disemboguing S.W. of the New Siberian Islands by a delta 10,800 sq. m. in area, and traversed by seven principal branches, the most important being Bylov, farthest east. The total length of the river is estimated at 2860 m. The delta arms sometimes remain blocked with ice the whole year round. At Yakutsk navigation is generally practicable from the middle of May to the end of October, and at Kirensk, at the confluence of the Lena and the Kirenga, from the beginning of May to about the same time. Between these two towns there is during the season regular steamboat communication. The area of the river basin is calculated at 895,500 sq. m. Gold is washed out of the sands of the Vitim and the Olekma, and tusks of the mammoth are dug out of the delta.

See G. W. Melville, *In the Lena Delta* (1885).

LE NAIN, the name of three brothers, Louis, Antoine and Mathieu, who occupy a peculiar position in the history of French art. Although they figure amongst the original members of the French Academy, their works show no trace of the influences which prevailed when that body was founded. Their sober execution and choice of colour recall characteristics of the Spanish school, and when the world of Paris was busy with mythological allegories, and the "heroic deeds" of the king, the three Le Nain devoted themselves chiefly to subjects of humble life such as "Boys Playing Cards," "The Forge," or "The Peasants' Meal." These three paintings are now in the Louvre; various others may be found in local collections, and some fine drawings may be seen in the British Museum; but the Le Nain signature is rare, and is never accompanied by initials which might enable us to distinguish the work of the brothers. Their lives are lost in obscurity; all that can be affirmed is that they were born at Laon in Picardy towards the close of the 16th century. About 1629 they went to Paris; in 1648 the three brothers were received into the Academy, and in the same year both Antoine and Louis died. Mathieu lived on till August 1677; he bore the title of chevalier, and painted many portraits. Mary of Medici and Mazarin were amongst his sitters, but these works seem to have disappeared.

See Champfleury, *Essai sur la vie et l'œuvre des Le Nain* (1850), and *Catalogue des tableaux des Le Nain* (1861).

LENAU, NIKOLAUS, the pseudonym of Nikolaus Franz Niembsch von Strehlenau (1802–1850), Austrian poet, who was born at Csatád near Temesvar in Hungary, on the 15th of August 1802. His father, a government official, died at Budapest in 1807, leaving his children to the care of an affectionate, but jealous and somewhat hysterical, mother, who in 1811 married again. In 1819 the boy went to the university of Vienna; he subsequently studied Hungarian law at Pressburg and then spent the best part of four years in qualifying himself in medicine. But he was unable to settle down to any profession. He had early begun to write verses; and the disposition to sentimental melancholy acquired from his mother, stimulated by love disappointments and by the prevailing fashion of the romantic school of poetry, settled into gloom after his mother's death in 1829. Soon afterwards a legacy from his grandmother enabled him to devote himself wholly to poetry. His first published poems appeared in 1827, in J. G. Seidl's *Aurora*. In 1831 he went to Stuttgart, where he published a volume of *Gedichte* (1832) dedicated to the Swabian poet Gustav Schwab. Here he also made the acquaintance of Uhland, Justinus Kerner, Karl Mayer[1] and others; but his restless spirit longed for change, and he determined to seek for peace and freedom in America. In October 1832 he landed at Baltimore and settled on a homestead in Ohio. But the reality of life in "the primeval forest" fell lamentably short of the ideal he had pictured; he disliked the Americans with their eternal "English lisping of dollars" (*englisches Talergelispel*); and in 1833 he returned to Germany, where the appreciation of his first volume of poems revived his spirits. From now on he lived partly in Stuttgart and partly in Vienna. In 1836 appeared his *Faust*, in which he laid bare his own soul to the world; in 1837, *Savonarola*, an epic in which freedom from political and intellectual tyranny is insisted upon as essential to Christianity. In 1838 appeared his *Neuere Gedichte*, which prove that *Savonarola* had been but the result of a passing exaltation. Of these new poems, some of the finest were inspired by his hopeless passion for Sophie von Löwenthal, the wife of a friend, whose acquaintance he had made in 1833 and who "understood him as no other." In 1842 appeared *Die Albigenser*, and in 1844 he began writing his *Don Juan*, a fragment of which was published after his death. Soon afterwards his never well-balanced mind began to show signs of aberration, and in October 1844 he was placed under restraint. He died in the asylum at Oberdöbling near Vienna on the 22nd of August 1850. Lenau's fame rests mainly upon his shorter poems; even his epics are essentially lyric in quality. He is the greatest modern lyric poet of Austria, and the typical representative in German literature of that pessimistic *Weltschmerz* which, beginning with Byron, reached its culmination in the poetry of Leopardi.

Lenau's *Sämtliche Werke* were published in 4 vols. by A. Grün (1855); but there are several more modern editions, as those by M. Koch in Kürschner's *Deutsche Nationalliteratur*, vols. 154-155 (1888), and by E. Castle (2 vols., 1900). See A. Schurz, *Lenaus Leben, grösstenteils aus des Dichters eigenen Briefen* (1855); L. A. Frankl, *Zu Lenaus Biographie* (1854, 2nd ed., 1885); A. Marchand, *Les Poètes lyriques de l'Autriche* (1881); L. A. Frankl, *Lenaus Tagebuch und Briefe an Sophie Löwenthal* (1891); A. Schlossar, *Lenaus Briefe an die Familie Reinbeck* (1896); L. Roustan, *Lenau et son temps* (1898); E. Castle, *Lenau und die Familie Löwenthal* (1906).

LENBACH, FRANZ VON (1836–1904), German painter, was born at Schrobenhausen, in Bavaria, on the 13th of December 1836. His father was a mason, and the boy was intended to follow his father's trade or be a builder. With this view he was sent to school at Landsberg, and then to the polytechnic at Augsburg. But after seeing Hofner, the animal painter, executing some studies, he made various attempts at painting, which his father's orders interrupted. However, when he had seen the galleries of Augsburg and Munich, he finally obtained his father's permission to become an artist, and worked for a short time in the studio of Gräfle, the painter; after this he devoted much time to copying. Thus he was already accomplished in technique when he became the pupil of Piloty, with whom he set out for Italy in 1858. A few interesting works remain as the outcome of this first journey—"A Peasant seeking Shelter from Bad Weather" (1855), "The Goatherd" (1860, in the Schack Gallery, Munich), and "The Arch of Titus" (in the Palfy collection, Budapest). On returning to Munich, he was at once called to Weimar to take the appointment of professor at the Academy. But he did not hold it long, having made the acquaintance of Count Schack, who commissioned a great number of copies for his collection. Lenbach returned to Italy the same year, and there copied many famous pictures. He set out in 1867 for Spain, where he copied not only the famous pictures by Velasquez in the Prado, but also some landscapes in the museums of Granada and the Alhambra (1868). In the previous year he had exhibited at the great exhibition at Paris several portraits, one of which took a third-class medal. Thereafter he exhibited frequently both at Munich and at Vienna, and in 1900 at the Paris exhibition was awarded a Grand Prix for painting. Lenbach, who died in 1904, painted many of the most remarkable personages of his time.

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[1] Karl Friedrich Hartmann Mayer (1786–1870), poet, and biographer of Uhland, was by profession a lawyer and government official in Württemberg.

See Berlepsch, "Lenbach," *Velhagen und Klasings Monatshefte* (1891); Bégouen, *Les Portraits de Lenbach à l'exposition de Munich* (1899); K. Knackfuss, *Lenbach*, and *Franz von Lenbach Bildnisse* (1900).

LENCLOS, NINON DE (1615–1705), the daughter of a gentleman of good position in Touraine, was born in Paris in November 1615. Her long and eventful life divides into two periods, during the former of which she was the typical Frenchwoman of the gayest and most licentious society of the 17th century, during the latter the recognized leader of the fashion in Paris, and the friend of wits and poets. All that can be pleaded in defence of her earlier life is that she had been educated by her father in epicurean and sensual beliefs, and that she retained throughout the frank demeanour, and disregard of money, which won from Saint Évremond the remark that she was an *honnête homme*. She had a succession of distinguished lovers, among them being Gaspard de Coligny, the marquis d'Éstrées, La Rochefoucauld, Condé and Saint Évremond. Queen Christina of Sweden visited her, and Anne of Austria was powerless against her. After she had continued her career for a preposterous length of time, she settled down to the social leadership of Paris. Among her friends she counted Mme de la Sablière, Mme de la Fayette and Mme de Maintenon. It became the fashion for young men as well as old to throng round her, and the best of all introductions for a young man who wished to make a figure in society was an introduction to Mlle de Lenclos. Her long friendship with Saint Évremond must be briefly noticed. They were of the same age, and had been lovers in their youth, and throughout his long exile the wit seems to have kept a kind remembrance of her. The few really authentic letters of Ninon are those addressed to her old friend, and the letters of both in the last few years of their equally long lives are exceptionally touching, and unique in the polite compliments with which they try to keep off old age. If Ninon owes part of her posthumous fame to Saint Évremond, she owes at least as much to Voltaire, who was presented to her as a promising boy poet by the abbé de Chateauneuf. To him she left 2000 francs to buy books, and his letter on her was the chief authority of many subsequent biographers. Her personal appearance is, according to Sainte-Beuve, best described in *Clélie*, a novel by Mlle de Scudéry, in which she figures as Clarisse. Her distinguishing characteristic was neither beauty nor wit, but high spirits and perfect evenness of temperament.

The letters of Ninon published after her death were, according to Voltaire, all spurious, and the only authentic ones are those to Saint Evremond, which can be best studied in Dauxmesnil's edition of *Saint Évremond*, and his notice on her. Sainte-Beuve has an interesting notice of these letters in the *Causeries du Lundi*, vol. iv. The *Correspondance authentique* was edited by E. Colombey in 1886 See also Helen K. Hayes, *The Real Ninon de l'Enclos* (1908); and Mary C. Rowsell, *Ninon de l'Enclos and her century* (1910).

LENFANT, JACQUES (1661–1728), French Protestant divine, was born at Bazoche in La Beauce on the 13th of April 1661, son of Paul Lenfant, Protestant pastor at Bazoche and afterwards at Châtillon-sur-Loing until the revocation of the edict of Nantes, when he removed to Cassel. After studying at Saumur and Geneva, Lenfant completed his theological course at Heidelberg, where in 1684 he was ordained minister of the French Protestant church, and appointed chaplain to the dowager electress palatine. When the French invaded the Palatinate in 1688 Lenfant withdrew to Berlin, as in a recent book he had vigorously attacked the Jesuits. Here in 1689 he was again appointed one of the ministers of the French Protestant church; this office he continued to hold until his death, ultimately adding to it that of chaplain to the king, with the dignity of *Consistorialrath*. He visited Holland and England in 1707, preached before Queen Anne, and, it is said, was invited to become one of her chaplains. He was the author of many works, chiefly on church history. In search of materials he visited Helmstädt in 1712, and Leipzig in 1715 and 1725. He died at Berlin on the 7th of August 1728.

An exhaustive catalogue of his publications, thirty-two in all, will be found in J. G. de Chauffepié's *Dictionnaire*. See also E. and S. Haag's *France Protestante*. He is now best known by his *Histoire du concile de Constance* (Amsterdam, 1714; 2nd ed., 1728; English trans., 1730). It is of course largely dependent upon the laborious work of Hermann von der Hardt (1660–1746), but has literary merits peculiar to itself, and has been praised on all sides for its fairness. It was followed by *Histoire du concile de Pise* (1724), and (posthumously) by *Histoire de la guerre des Hussites et du concile de Basle* (Amsterdam, 1731; German translation, Vienna, 1783–1784). Lenfant was one of the chief promoters of the *Bibliothèque Germanique*, begun in 1720; and he was associated with Isaac Beausobre (1659–1738) in the preparation of the new French translation of the New Testament with original notes, published at Amsterdam in 1718.

LENKORAN, a town in Russian Transcaucasia, in the government of Baku, stands on the Caspian Sea, at the mouth of a small stream of its own name, and close to a large lagoon. The lighthouse stands in 38° 45′ 38″ N. and 48° 50′ 18″ E. Taken by storm on New Year's day 1813 by the Russians, Lenkoran was in the same year formally surrendered by Persia to Russia by the treaty of Gulistan, along with the khanate of Talysh, of which it was the capital. Pop. (1867) 15,933, (1897) 8768. The fort has been dismantled; and in trade the town is outstripped by Astara, the customs station on the Persian frontier.

The DISTRICT OF LENKORAN (2117 sq. m.) is a thickly wooded mountainous region, shut off from the Persian plateau by the Talysh range (7000-8000 ft. high), and with a narrow marshy strip along the coast. The climate is exceptionally moist and warm (annual rainfall 52·79 in.; mean temperature in summer 75° F., in winter 40°), and fosters the growth of even Indian species of vegetation. The iron tree (*Parrotia persica*), the silk acacia, *Carpinus betulus*, *Quercus iberica*, the box tree and the walnut flourish freely, as well as the sumach, the pomegranate, and the *Gleditschia caspica*. The Bengal tiger is not unfrequently met with, and wild boars are abundant. Of the 131,361 inhabitants in 1897 the Talyshes (35,000) form the aboriginal element, belonging to the Iranian family, and speaking an independently developed language closely related to Persian. They are of middle height and dark complexion, with generally straight nose, small round skull, small sharp chin and large full eyes, which are expressive, however, rather of cunning than intelligence. They live exclusively on rice. In the northern half of the district the Tatar element predominates (40,000) and there are a number of villages occupied by Russian Raskolniks (Nonconformists). Agriculture, bee-keeping, silkworm-rearing and fishing are the principal occupations.

LENNEP, JACOB VAN (1802–1868), Dutch poet and novelist, was born on the 24th of March 1802 at Amsterdam, where his father, David Jacob van Lennep (1774–1853), a scholar and poet, was professor of eloquence and the classical languages in the Athenaeum. Lennep took the degree of doctor of laws at Leiden, and then settled as an advocate in Amsterdam. His first poetical efforts had been translations from Byron, of whom he was an ardent admirer, and in 1826 he published a collection of original *Academische Idyllen*, which had some success. He first attained genuine popularity by the *Nederlandsche Legenden* (2 vols., 1828) which reproduced, after the manner of Sir Walter Scott, some of the more stirring incidents in the early history of his fatherland. His fame was further raised by his patriotic songs at the time of the Belgian revolt, and by his comedies *Het Dorp aan de Grenzen* (1830) and *Het Dorp over de Grenzen* (1831), which also had reference to the political events of 1830. In 1833 he broke new ground with the publication of *De Pleegzoon* (*The Adopted Son*), the first of a series of historical romances in prose, which have acquired for him in Holland a position somewhat analogous to that of Sir Walter Scott in Great Britain. The series included *De Roos van Dekama* (2 vols., 1836), *Onze Voorouders* (5 vols., 1838), *De Lotgevallen van Ferdinand Huyck* (2 vols., 1840), *Elizabeth Musch* (3 vols., 1850), and *De Lotgevallen van Klaasje Zevenster* (5 vols., 1865), several of which have been translated into German and French, and two—*The Rose of Dekama* (1847) and *The Adopted Son* (New York, 1847)—into English. His Dutch history for young people (*Voornaamste Geschiedenissen van Noord-Nederland aan mijne Kindern verhaald*, 4 vols., 1845) is attractively written. Apart from the two comedies already mentioned, Lennep was an indefatigable journalist and literary critic, the author of numerous dramatic pieces, and of an excellent edition of Vondel's works. For some years Lennep held a judicial appointment, and from 1853 to 1856 he was a member of the second chamber, in which he voted with the conservative party. He died at Oosterbeek near Arnheim on the 25th of August 1868.

There is a collective edition of his *Poetische Werken* (13 vols., 1859–1872), and also of his *Romantische Werken* (23 vols., 1855–1872). See also a bibliography by P. Knoll (1869); and Jan ten Brink, *Geschiedenis der Noord-Nederlandsche Letteren in de XIX^e Eeuw* (No. iii.).

LENNEP, a town of Germany, in the Prussian Rhine province, 18 m. E. of Düsseldorf, and 9 m. S. of Barmen by rail, at a height of 1000 ft. above the level of the sea. Pop. (1905) 10,323. It lies in the heart of one of the busiest industrial districts in Germany, and carries on important manufactures of the finer kinds of cloth, wool, yarn and felt, and also of iron and steel goods. It has an Evangelical and a Protestant church, a modern school and a well-equipped hospital. Lennep, which was the residence of the counts of Berg from 1226 to 1300, owes the foundation of its prosperity to an influx of Cologne weavers during the 14th century.

LENNOX, a name given to a large district in Dumbartonshire and Stirlingshire, which was erected into an earldom in the latter half of the 12th century. It embraced the ancient sheriffdom of Dumbarton and nineteen parishes with the whole of the lands round Loch Lomond, formerly Loch Leven, and the river of that name which glides into the estuary of the Clyde at the ancient castle of Dumbarton.

On this river Leven, at Balloch, was the seat of Alwin, first earl of Lennox. It is probable that he was of Celtic descent, but the records are silent as to his part in history; that he was earl at all is only proved from the charters of his son, another Alwin, and he died some time before 1217. The second Alwin was father of ten sons, one of whom founded the clan Macfarlane, famous in the annals of the district, while another was ancestor of Walter of Farlane, who married the heiress of the 6th earl of Lennox. Maldouen, the 3rd earl, eldest of the sons of Alwin the younger, is an historical personage; he was a witness to the treaty between Alexander II., king of Scotland, and his brother-in-law the English king Henry III., at Newcastle in 1237, concerning the much disputed northern counties of England. His grandson, Malcolm, successor to the title, swore fealty to Edward I. in 1296; it was apparently his son, another Malcolm, the 5th earl, who was summoned by Edward to parliament and entrusted with the important post of guarding the fords of the river Forth. But the 5th earl soon after gave his services to the party of Bruce, the cause of that family having been embraced by his father as early as 1292. As a result the English king bestowed the earldom on Sir John Menteith, who was holding it in 1307 while the real earl was with King Robert Bruce in his wanderings in the Lennox country. For his services he was rewarded with a renewal of the earldom and the keeping of Dumbarton Castle; he fell fighting for his country at Halidon Hill in 1333. His son Donald, the 6th earl, an adherent of King David II., left a daughter, Margaret, countess of Lennox, who was married to her kinsman the above-mentioned Walter of Farlane, nearest heir male of the Lennox family.

In 1392, on the marriage of their grand-daughter Isabella, eldest daughter of Duncan, 8th earl, with Sir Murdoch Stewart, afterwards duke of Albany, the earldom was resigned into the hands of the king, who re-granted it to Earl Duncan, with remainder to the heirs male of his body, with remainder to Murdoch and Isabella and the heirs of their bodies begotten between them, with eventual remainder to Earl Duncan's nearest and lawful heirs. In 1424, when Murdoch, then duke of Albany, succeeded in ransoming the poet king James I. from his long English captivity, the aged Earl Duncan went with the Scottish party to Durham. The next year, however, he suffered the fate of Albany, being executed perhaps for no other reason than that he was his father-in-law. The earldom was not forfeited, and the widowed duchess of Albany, now also countess of Lennox, lived secure in her island castle of Inchmurrin on Loch Lomond until her death. Of her four sons, none of whom left legitimate issue, the eldest died in 1421, the two next suffered their father's fate at Stirling, while the youngest had to flee for his life to Ireland. Her daughter Isobel appears to have been the wife of Sir Walter Buchanan of that ilk.

It was from Elizabeth, sister of the countess, that the next holders of the title descended. She was married to Sir John Stewart of Darnley (distinguished in the military history of France as seigneur d'Aubigny), whose immediate ancestor was brother of James, 5th high steward of Scotland. Their grandson, another Sir John Stewart, created a lord of parliament as Lord Darnley, was served heir to his great-grandfather Duncan, earl of Lennox, in 1473, and was designated as earl of Lennox in a charter under the great seal in the same year. Thereafter followed disputes with John of Haldane, whose wife's great-grandmother had been another of the three daughters of Duncan, 8th earl of Lennox, and in her right he contested the succession. Lord Darnley, however, appears to have silenced all opposition and for the last seven years of his life maintained his right to the earldom undisputed. Three of his younger sons were greatly distinguished in the French service, one being captain of Scotsmen-at-arms, another *premier homme d'armes*, and a third *maréchal de France*. Their elder brother Matthew, 2nd earl of this line, fell on Flodden Field, leaving by his wife Elizabeth, daughter of James, earl of Arran, and niece of James III., a son and successor John, who became one of the guardians of James V. and was murdered in 1526. His son Matthew, the 4th earl, played a great part in the intrigues of his time, and by his marriage with Margaret Douglas allied himself to the royal house of England as well as strengthening the ties which bound his family to that of Scotland; because Margaret was the daughter and heir of the 6th earl of Angus by his wife, Margaret Tudor, sister of King Henry VIII. and widow of King James IV. Though his estates were forfeited in 1545, Earl Matthew in 1564 not only had them restored but had the satisfaction of getting his eldest son Henry married to Mary, queen of Scots. The murder of Lord Darnley, now created earl of Rosse, lord of Ardmanoch and duke of Albany, took place in February 1567, and in July his only son James, by Mary's abdication, became king of Scotland. The old earl of Lennox, now grandfather of his sovereign, obtained the regency in 1570, but in the next year was killed in the attack made on the parliament at Stirling, being the third earl in succession to meet with a violent death.

The title was now merged in the crown in the person of

James VI. the next heir, but was soon after granted to the king's uncle Charles, who died in 1576, leaving an only child, the unfortunate Lady Arabella Stewart.

Two years later the title was granted to Robert Stewart, the king's grand-uncle, second son of John, the 3rd earl, but he in 1580 exchanged it for that of earl of March. On the same day the earldom of Lennox was given to Esme Stewart, first cousin of the king and grandson of the 3rd earl, he being son of John Stewart (adopted heir of the maréchal d'Aubigny) and his French wife, Anne de la Queulle. In the following year Esme was created duke of Lennox, earl of Darnley, Lord Aubigny, Tarboulton and Dalkeith, and other favours were heaped upon him, but the earl of Ruthven sent him back to France where he died soon after. His elder son, Ludovic, was thereupon summoned to Scotland by James, who invested him with all his father's honours and estates, and after his accession to the English throne created him Lord Settrington and earl of Richmond (1613), and earl of Newcastle-upon-Tyne and duke of Richmond (1623), all these titles being in the peerage of England. After holding many appointments the 2nd duke died without issue in 1624, being succeeded in his Scottish titles by his brother Esme, who had already been created earl of March and Lord Clifton of Leighton Bromswold in the peerage of England (1619) and was seigneur d'Aubigny in France. Of his sons, Henry succeeded to Aubigny and died young at Venice; Ludovic, seigneur d'Aubigny, entered the Roman Catholic Church and received a cardinal's hat just before his death; while the three other younger sons, George, seigneur d'Aubigny, John and Bernard, were all distinguished as royalists in the Civil War. Each met a soldier's death, George at Edgehill, John at Alresford and Bernard at Rowton Heath. James, the eldest son and 4th duke of Lennox, was created duke of Richmond in 1641, being like his brother a devoted adherent of Charles I.

With the death of his little son Esme, the 5th duke, in 1660, the titles, including that of Richmond, passed to his first cousin Charles, who had already been created Lord Stuart of Newbury and earl of Lichfield, being likewise now seigneur d'Aubigny. Disliked by Charles II., principally because of his marriage with "la belle Stuart"—"the noblest romance and example of a brave lady that ever I read in my life," writes Pepys—he was sent into exile as ambassador to Denmark, where he was drowned in 1672. His wife had had the Lennox estates granted to her for life, but his only sister Katharine, wife of Henry O'Brien, heir apparent of the 7th earl of Thomond, was served heir to him. Her only daughter, the countess of Clarendon, was mother of Theodosia Hyde, ancestress of the present earls of Darnley.

The Lennox dukedom, being to heirs male, now devolved upon Charles II., who bestowed it with the titles of earl of Darnley and Lord Tarbolton upon one of his bastards, Charles Lennox, son of the celebrated duchess of Portsmouth, he having previously been created duke of Richmond, earl of March and Lord Settrington in the peerage of England. The ancient lands of the Lennox title were also granted to him, but these he sold to the duke of Montrose.

His son Charles, who inherited his grandmother's French dukedom of Aubigny, was a soldier of distinction, as were the 3rd and 4th dukes. The wife of the last, Lady Charlotte Gordon, as heir of her brother brought the ancient estates of her family to the Lennoxes; the additional name of Gordon being taken by the 5th duke of Richmond and of Lennox on the death of his uncle, the 5th duke of Gordon. In the next generation further honours were granted to the family in the person of the 6th duke, who was rewarded for his great public services with the titles of duke of Gordon and earl of Kinrara in the peerage of the United Kingdom (1876).

See *Scots Peerage*, vol. v., for excellent accounts of these peerages by the Rev. John Anderson, curator Historical Dept. H.M. Register House; A. Francis Steuart and Francis J. Grant, Rothesay Herald. See also *The Lennox* by William Fraser.

LENNOX, CHARLOTTE (1720–1804), British writer, daughter of Colonel James Ramsay, lieutenant-governor of New York, was born in 1720. She went to London in 1735, and, being left unprovided for at her father's death, she began to earn her living by writing. She made some unsuccessful appearances on the stage and married in 1748. Samuel Johnson had an exaggerated admiration for her. "Three such women," he said, speaking of Elizabeth Carter, Hannah More and Fanny Burney, "are not to be found; I know not where to find a fourth, except Mrs Lennox, who is superior to them all." Her chief works are: *The Female Quixote; or the Adventures of Arabella* (1752), a novel; *Shakespear illustrated; or the novels and histories on which the plays . . . are founded* (1753–1754), in which she argued that Shakespeare had spoiled the stories he borrowed for his plots by interpolating unnecessary intrigues and incidents; *The Life of Harriot Stuart* (1751), a novel; and *The Sister*, a comedy produced at Covent Garden (18th February 1769). This last was withdrawn after the first night, after a stormy reception, due, said Goldsmith, to the fact that its author had abused Shakespeare.

LENNOX, MARGARET, Countess of (1515–1578), daughter of Archibald Douglas, 6th earl of Angus, and Margaret Tudor, daughter of Henry VII. of England and widow of James IV. of Scotland, was born at Harbottle Castle, Northumberland, on the 8th of October 1515. On account of her nearness to the English crown, Lady Margaret Douglas was brought up chiefly at the English court in close association with the Princess Mary, who remained her fast friend throughout life. She was high in Henry VIII.'s favour, but was twice disgraced; first for an attachment to Lord Thomas Howard, who died in the Tower in 1537, and again in 1541 for a similar affair with Sir Charles Howard, brother of Queen Catherine Howard. In 1544 she married a Scottish exile, Matthew Stewart, 4th earl of Lennox (1516–1571), who was regent of Scotland in 1570–1571. During Mary's reign the countess of Lennox had rooms in Westminster Palace; but on Elizabeth's accession she removed to Yorkshire, where her home at Temple Newsam became a centre for Catholic intrigue. By a series of successful manœuvres she married her son Henry Stewart, Lord Darnley, to Mary, queen of Scots. In 1566 she was sent to the Tower, but after the murder of Darnley in 1567 she was released. She was at first loud in her denunciations of Mary, but was eventually reconciled with her daughter-in-law. In 1574 she again aroused Elizabeth's anger by the marriage of her son Charles, earl of Lennox, with Elizabeth Cavendish, daughter of the earl of Shrewsbury. She was sent to the Tower with Lady Shrewsbury, and was only pardoned after her son's death in 1577. Her diplomacy largely contributed to the future succession of her grandson James to the English throne. She died on the 7th of March 1578.

The famous Lennox jewel, made for Lady Lennox as a memento of her husband, was bought by Queen Victoria in 1842.

LENO, DAN, the stage-name of George Galvin (1861–1904), English comedian, who was born at Somers Town, London, in February 1861. His parents were actors, known as Mr and Mrs Johnny Wilde. Dan Leno was trained to be an acrobat, but soon became a dancer, travelling with his brother as "the brothers Leno," and winning the world's championship in clog-dancing at Leeds in 1880. Shortly afterwards he appeared in London at the Oxford, and in 1886–1887 at the Surrey Theatre. In 1888–1889 he was engaged by Sir Augustus Harris to play the Baroness in the *Babes in the Wood*, and from that time he was a principal figure in the Drury Lane pantomimes. He was the wittiest and most popular comedian of his day, and delighted London music-hall audiences by his shop-walker, stores-proprietor, waiter, doctor, beef-eater, bathing attendant, "Mrs Kelly," and other impersonations. In 1900 he engaged to give his entire services to the Pavilion Music Hall, where he received £100 per week. In November 1901 he was summoned to Sandringham to do a "turn" before the king, and was proud from that time to call himself the "king's jester." Dan Leno's generosity endeared him to his profession, and he was the object of much sympathy during the brain failure which recurred during the last eighteen months of his life. He died on the 31st of October 1904.

LENORMANT, FRANÇOIS (1837–1883), French Assyriologist and archaeologist, was born in Paris on the 17th of January 1837. His father, Charles Lenormant, distinguished as an archaeologist, numismatist and Egyptologist, was anxious that his son should follow in his steps. He made him begin Greek at the age of six, and the child responded so well to this precocious scheme of instruction, that when he was only fourteen an essay of his, on the Greek tablets found at Memphis, appeared in the *Revue archéologique*. In 1856 he won the numismatic prize of the Académie des Inscriptions with an essay entitled *Classification des monnaies des Lagides*. In 1862 he became sub-librarian of the Institute. In 1859 he accompanied his father on a journey of exploration to Greece, during which Charles Lenormant succumbed to fever at Athens (24th November). Lenormant returned to Greece three times during the next six years, and gave up all the time he could spare from his official work to archaeological research. These peaceful labours were rudely interrupted by the war of 1870, when Lenormant served with the army and was wounded in the siege of Paris. In 1874 he was appointed professor of archaeology at the National Library, and in the following year he collaborated with Baron de Witte in founding the *Gazette archéologique*. As early as 1867 he had turned his attention to Assyrian studies; he was among the first to recognize in the cuneiform inscriptions the existence of a non-Semitic language, now known as Accadian. Lenormant's knowledge was of encyclopaedic extent, ranging over an immense number of subjects, and at the same time thorough, though somewhat lacking perhaps in the strict accuracy of the modern school. Most of his varied studies were directed towards tracing the origins of the two great civilizations of the ancient world, which were to be sought in Mesopotamia and on the shores of the Mediterranean. He had a perfect passion for exploration. Besides his early expeditions to Greece, he visited the south of Italy three times with this object, and it was while exploring in Calabria that he met with an accident which ended fatally in Paris on the 9th of December 1883, after a long illness. The amount and variety of Lenormant's work is truly amazing when it is remembered that he died at the early age of forty-six. Probably the best known of his books are *Les Origines de l'histoire d'après la Bible*, and his ancient history of the East and account of Chaldean magic. For breadth of view, combined with extraordinary subtlety of intuition, he was probably unrivalled.

LENOX, a township of Berkshire county, Massachusetts, U.S.A. Pop. (1900) 2942, (1905) 3058; (1910) 3060. Area, 19·2 sq. m. The principal village, also named Lenox (or Lenox-on-the-Heights), lies about 2 m. W. of the Housatonic river, at an altitude of about 1000 ft., and about it are high hills—Yokun Seat (2080 ft.), South Mountain (1200 ft.), Bald Head (1583 ft.), and Rattlesnake Hill (1540 ft.). New Lenox and Lenoxdale are other villages in the township. Lenox is a fashionable summer and autumn resort, much frequented by wealthy people from Washington, Newport and New York. There are innumerable lovely walks and drives in the surrounding region, which contains some of the most beautiful country of the Berkshires—hills, lakes, charming intervales and woods. As early as 1835 Lenox began to attract summer residents. In the next decade began the creation of large estates, although the great holdings of the present day, and the villas scattered over the hills, are comparatively recent features. The height of the season is in the autumn, when there are horse-shows, golf, tennis, hunts and other outdoor amusements. The Lenox library (1855) contained about 20,000 volumes in 1908. Lenox was settled about 1750, was included in Richmond township in 1765, and became an independent township in 1767. The names were those of Sir Charles Lennox, third duke of Richmond and of Lennox (1735–1806), one of the staunch friends of the American colonies during the War of Independence. Lenox was the county-seat from 1787 to 1868. It has literary associations with Catherine M. Sedgwick (1789–1867), who passed here the second half of her life; with Nathaniel Hawthorne, whose brief residence here (1850–1851) was marked by the production of the *House of the Seven Gables* and the *Wonder Book*; with Fanny Kemble, a summer resident from 1836–1853; and with Henry Ward Beecher (see his *Star Papers*). Elizabeth (Mrs Charles) Sedgwick, the sister-in-law of Catherine Sedgwick, maintained here from 1828 to 1864 a school for girls, in which Harriet Hosmer, the sculptor, and Maria S. Cummins (1827–1866), the novelist, were educated; and in Lenox academy (1803), a famous classical school (now a public high school) were educated W. L. Yancey, A. H. Stephens, Mark Hopkins and David Davis (1815–1886), a circuit judge of Illinois from 1848 to 1862, a justice (1862–1877) of the United States Supreme Court, a Republican member of the United States Senate from Illinois in 1877–1883, and president of the Senate from the 31st of October 1881, when he succeeded Chester A. Arthur, until the 3rd of March 1883. There is a statue commemorating General John Paterson (1744–1808) a soldier from Lenox in the War of Independence.

See R. de W. Mallary, *Lenox and the Berkshire Highlands* (1902); J. C. Adams, *Nature Studies in Berkshire*; C. F. Warner, *Picturesque Berkshire* (1890); and Katherine M. Abbott, *Old Paths and Legends of the New England Border* (1907).

LENS, a town of Northern France, in the department of Pas-de-Calais, 13 m. N.N.E. of Arras by rail on the Déûle and on the Lens canal. Pop. (1906) 27,692. Lens has important iron and steel foundries, and engineering works and manufactories of steel cables, and occupies a central position in the coalfields of the department. Two and a half miles W.S.W. lies Liévin (pop. 22,070), likewise a centre of the coalfield. In 1648 the neighbourhood of Lens was the scene of a celebrated victory gained by Louis II. of Bourbon, prince of Condé, over the Spaniards.

LENS (from Lat. *lens*, lentil, on account of the similarity of the form of a lens to that of a lentil seed), in optics, an instrument which refracts the luminous rays proceeding from an object in such a manner as to produce an image of the object. It may be regarded as having four principal functions: (1) to produce an image larger than the object, as in the magnifying glass, microscope, &c.; (2) to produce an image smaller than the object, as in the ordinary photographic camera; (3) to convert rays proceeding from a point or other luminous source into a definite pencil, as in light-house lenses, the engraver's globe, &c.; (4) to collect luminous and heating rays into a smaller area, as in the burning glass. A lens made up of two or more lenses cemented together or very close to each other is termed "composite" or "compound"; several lenses arranged in succession at a distance from each other form a "system of lenses," and if the axes be collinear a "centred system." This article is concerned with the general theory of lenses, and more particularly with spherical lenses. For a special part of the theory of lenses see ABERRATION; the instruments in which the lenses occur are treated under their own headings.

The most important type of lens is the spherical lens, which is a piece of transparent material bounded by two spherical surfaces, the boundary at the edge being usually cylindrical or conical. The line joining the centres, C_1, C_2 (fig. 1), of the bounding surfaces is termed the *axis*; the points S_1, S_2, at which the axis intersects the surfaces, are termed the "vertices" of the lens; and the distance between the vertices is termed the "thickness." If the edge be everywhere equidistant from the vertex, the lens is "centred."

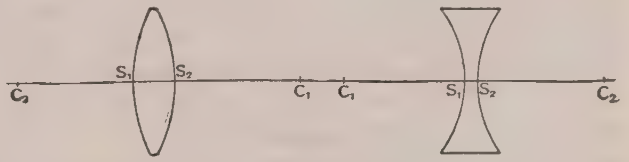


FIG. 1.

Although light is really a wave motion in the aether, it is only necessary, in the investigation of the optical properties of systems of lenses, to trace the rectilinear path of the waves, *i.e.* the direction of the normal to the wave front, and this can be done by purely geometrical methods. It will be assumed that light, so long as it traverses the same medium, always travels in a straight line; and in following out the geometrical theory it will always be assumed that the light travels from left to right; accordingly all distances measured in this direction are positive, while those measured in the opposite direction are negative.

Theory of Optical Representation.—If a pencil of rays, *i.e.* the totality of the rays proceeding from a luminous point, falls on a lens or lens system, a section of the pencil, determined by the dimensions of the system, will be transmitted. The emergent rays will have directions differing from those of the incident rays, the alteration, however, being such that the transmitted rays are convergent in the "image-point," just as the incident rays diverge from the "object-point." With each incident ray is associated an emergent ray; such pairs are termed "conjugate ray pairs." Similarly we define an object-point and its image-point as "conjugate points"; all object-points lie in the "object-space," and all image-points lie in the "image-space."

The laws of optical representations were first deduced in their most general form by E. Abbe, who assumed (1) that an optical representation always exists, and (2) that to every point in the object-space there corresponds a point in the image-space, these points being mutually convertible by straight rays; in other words, with each object-point is associated one, and only one, image-point, and if the object-point be placed at the image-point, the conjugate point is the original object-point. Such a transformation is termed a "collineation," since it transforms points into points and straight lines into straight lines. Prior to Abbe, however, James Clerk Maxwell published, in 1856, a geometrical theory of optical representation, but his methods were unknown to Abbe and to his pupils until O. Eppenstein drew attention to them. Although Maxwell's theory is not so general as Abbe's, it is used here since its methods permit a simple and convenient deduction of the laws.

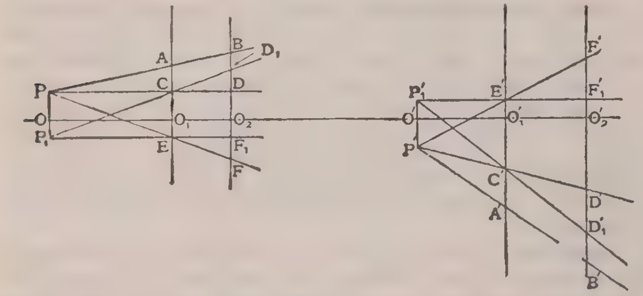


FIG. 2.

Maxwell assumed that two object-planes perpendicular to the axis are represented sharply and similarly in two image-planes also perpendicular to the axis (by "sharply" is meant that the assumed ideal instrument unites all the rays proceeding from an object-point in one of the two planes in its image-point, the rays being generally transmitted by the system). The symmetry of the axis being premised, it is sufficient to deduce laws for a plane containing the axis. In fig. 2 let O_1, O_2 be the two points in which the perpendicular object-planes meet the axis; and since the axis corresponds to itself, the two conjugate points O'_1, O'_2, are at the intersections of the two image-planes with the axis. We denote the four planes by the letters O_1, O_2, and O'_1, O'_2. If two points A, C be taken in the plane O_1, their images are A′, C′ in the plane O_1, and since the planes are represented similarly, we have $O'_1A' : O_1A = O'_1C'_1 : O_1C = \beta_1$ (say), in which β_1 is easily seen to be the *linear magnification* of the plane-pair O_1, O'_1. Similarly, if two points B, D be taken in the plane O_2 and their images B′, D′ in the plane O'_2, we have $O'_2B' : O_2B = O'_2D' : O_2D = \beta_2$ (say), β_2 being the linear magnification of the plane-pair O_2, O'_2. The joins of A and B and of C and D intersect in a point P, and the joins of the conjugate points similarly determine the point P′.

If P′ is the only possible image-point of the object-point P, then the conjugate of every ray passing through P must pass through P′. To prove this, take a third line through P intersecting the planes O_1, O_2 in the points E, F, and by means of the magnifications β_1, β_2 determine the conjugate points E′, F′ in the planes O'_1, O'_2. Since the planes O_1, O_2 are parallel, then AC/AE = BD/BF; and since these planes are represented similarly in O'_1, O'_2, then A′C′/A′E′ = B′D′/B′F′. This proportion is only possible when the straight line E′F′ contains the point P′. Since P was any point whatever, it follows that every point of the object-space is represented in one and only one point in the image-space.

Take a second object-point P_1, vertically under P and defined by the two rays CD_1, and EF_1; the conjugate point P'_1 will be determined by the intersection of the conjugate rays $C'D'_1$ and $E'F'_1$, the points D'_1, F'_1, being readily found from the magnifications β_1, β_2. Since PP_1 is parallel to CE and also to DF, then $DF = D_1F_1$. Since the plane O_2 is similarly represented in O'_2, $D'F' = D'_1F'_1$; this is impossible unless $P'P'_1$ be parallel to C′E′. Therefore every perpendicular object-plane is represented by a perpendicular image-plane.

Let O be the intersection of the line PP_1 with the axis, and let O′ be its conjugate; then it may be shown that a fixed magnification β_3 exists for the planes O and O′. For $PP_1/FF_1 = OO_1/O_1O_2$, $P'P'_1/F'F'_1 = O'O'/O'_1O'_2$, and $F'F'_1 = \beta_2 FF_1$. Eliminating FF_1 and $F'F'_1$ between these ratios, we have $P'P'_1/PP_1\beta_2 = O'O'_1 \cdot O_1O_2/OO_1 . O'_1O'_2$, or $\beta_3 = \beta_2 . O'O'_1 . O_1O_2/OO_1 . O'_1O'_2$, *i.e.* $\beta_3 = \beta_2 \times$ a product of the axial distances.

The determination of the image-point of a given object-point is facilitated by means of the so-called "cardinal points" of the optical system. To determine the image-point O'_1 (fig. 3) corresponding to the object-point O_1, we begin by choosing from the ray pencil proceeding from O_1, the ray parallel with the axis, *i.e.* intersecting the axis at infinity. Since the axis is its own conjugate, the parallel ray through O_1 must intersect the axis after refraction (say at F′). Then F′ is the image-point of an object-point situated at infinity on the axis, and is termed the "second principal focus" (German *der bildseitige Brennpunkt*, the image-side focus). Similarly if O'_4 be on the parallel through O_1 but in the image-space, then the conjugate ray must intersect the axis at a point (say F), which is conjugate with the point at infinity on the axis in the image-space. This point is termed the "first principal focus" (German *der objektseitige Brennpunkt*, the object-side focus).

Let H_1, H'_1 be the intersections of the focal rays through F and F′ with the line $O_1O'_4$. These two points are in the position of object and image, since they are each determined by two pairs of conjugate rays (O_1H_1 being conjugate with H'_1F', and $O'_4H'_1$ with H_1F). It has already been shown that object-planes perpendicular to the axis are represented by image-planes also perpendicular to the axis. Two vertical planes through H_1 and H'_1, are related as object- and image-planes; and if these planes intersect the axis in two points H and H′, these points are named the "principal," or "Gauss points" of the system, H being the "object-side" and H′ the "image-side principal point." The vertical planes containing H and H′ are the "principal planes." It is obvious that conjugate points in these planes are equidistant from the axis; in other words, the magnification β of the pair of planes is unity. An additional characteristic of the principal planes is that the object and image are direct and not inverted. The distances between F and H, and between F′ and H′ are termed the focal lengths; the former may be called the "object-side focal length" and the latter the "image-side focal length." The two focal points and the two principal points constitute the so-called four cardinal points of the system, and with their aid the image of any object can be readily determined.

Equations relating to the Focal Points.—We know that the ray proceeding from the object point O_1, parallel to the axis and intersecting the principal plane H in H_1, passes through H'_1 and F′. Choose from the pencil a second ray which contains F and intersects the principal plane H in H_2; then the conjugate ray must contain points corresponding to F and H_2. The conjugate of F is the point at infinity on the axis, *i.e.* on the ray parallel to the axis. The image of H_2 must be in the plane H′ at the same distance from, and on the same side of, the axis, as in H'_2. The straight line passing through H'_2 parallel to the axis intersects the ray H'_1F' in the point O'_1, which must be the image of O_1. If O be the foot of the perpendicular from O_1 to the axis, then OO_1 is represented by the line $O'O'_1$ also perpendicular to the axis.

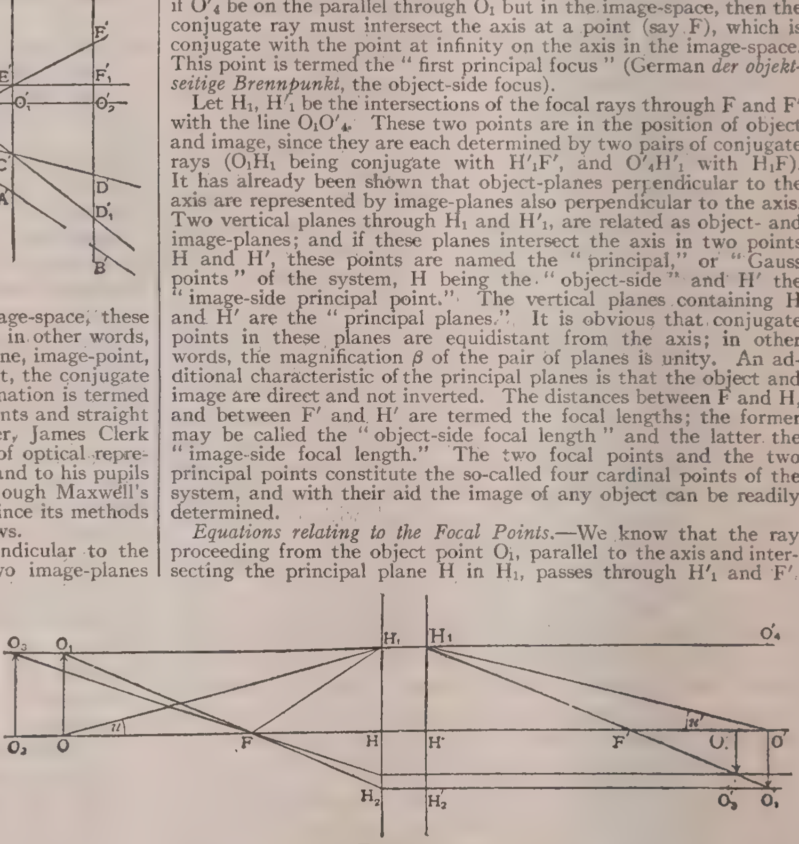


FIG. 3.

This construction is not applicable if the object or image be infinitely distant. For example, if the object OO_1 be at infinity (O being assumed to be on the axis for the sake of simplicity), so that the object appears under a constant angle *w*, we know that the second principal focus is conjugate with the infinitely distant axis-point. If the object is at infinity in a plane perpendicular to the axis, the image must be in the perpendicular plane through the focal point F′ (fig. 4).

The size y' of the image is readily deduced. Of the parallel rays from the object subtending the angle *w*, there is one which passes through the first principal focus F, and intersects the principal plane H in H_1. Its conjugate ray passes through H′ parallel to, and at the same distance from the axis, and intersects the image-side focal plane in O'_1; this point is the image of O_1, and y' is its magnitude. From the figure we have $\tan w = HH_1/FH = y'/f$, or $f = y'/\tan w$; this equation was used by Gauss to define the focal length.

Referring to fig. 3, we have from the similarity of the triangles OO_1F and HH_2F, $HH_2/OO_1 = FH/FO$, or $O'O'_1/OO_1 = FH/FO$. Let y be the magnitude of the object OO_1, y' that of the image $O'O'_1$, x the focal distance FO of the object, and f the object-side focal distance FH; then the above equation may be written $y'/y = f/x$. From the similar triangles $H'_1H'F'$ and $O'_1O'F'$, we obtain $O'O'_1/OO_1 = F'O'/F'H'$. Let x' be the focal distance of the image F′O′, and f' the image-side focal length F′H′; then $y'/y = x'/f'$. The ratio of the size of the image to the size of the object is termed the *lateral magnification*. Denoting this by β, we have

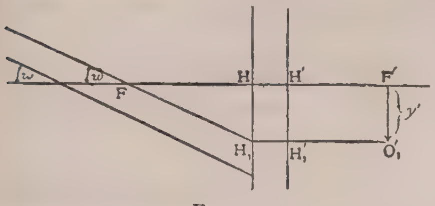


FIG. 4.

$$\beta = y'/y = f/x = x'/f', \qquad (1)$$

and also

$$xx' = ff'. \qquad (2)$$

By differentiating equation (2) we obtain

$$dx' = -(ff'/x^2)dx \text{ or } dx'/dx = -ff'/x^2. \qquad (3)$$

The ratio of the displacement of the image dx' to the displacement of the object dx is the axial magnification, and is denoted by α. Equation (3) gives important information on the displacement of the image when the object is moved. Since f and f' always have contrary signs (as is proved below), the product $-ff'$ is invariably positive, and since x^2 is positive for all values of x, it follows that dx and dx' have the same sign, *i.e.* the object and image always move in the same direction, either both in the direction of the light, or both in the opposite direction. This is shown in fig. 3 by the object O_3O_2 and the image $O'_3O'_2$.

If two conjugate rays be drawn from two conjugate points on the axis, making angles u and u' with the axis, as for example the rays OH_1, $O'H'_1$, in fig. 3, u is termed the "angular aperture for the object," and u' the "angular aperture for the image." The ratio of the tangents of these angles is termed the "convergence" and is denoted by γ, thus $\gamma = \tan u'/\tan u$. Now $\tan u' = H'H'_1/O'H' = H'H'_1/(O'F' + F'H') = H'H'_1/(F'H' - F'O')$. Also $\tan u = HH_1/OH = HH_1/(OF + FH) = HH_1/(FH - FO)$. Consequently $\gamma = (FH - FO)/(F'H' - F'O')$, or, in our previous notation, $\gamma = (f - x)/(f' - x')$.

From equation (1) $f/x = x'/f'$, we obtain by subtracting unity from both sides $(f - x)/x = (x' - f')/f'$, and consequently

$$\frac{f-x}{f'-x'} = -\frac{x}{f'} = -\frac{f}{x'} = \gamma. \qquad (4)$$

From equations (1), (3) and (4), it is seen that a simple relation exists between the lateral magnification, the axial magnification and the convergence, viz. $\alpha\gamma = \beta$.

In addition to the four cardinal points F, H, F′, H′, J. B. Listing, "Beiträge aus physiologischen Optik," *Göttinger Studien* (1845) introduced the so-called "nodal points" (*Knotenpunkte*) of the system, which are the two conjugate points from which the object and image appear under the same angle. In fig. 5 let K be the nodal point from which the object y appears under the same angle as the image y' from the other nodal point K′. Then $OO_1/KO = O'O'_1/K'O'$, or $OO_1/(KF + FO) = O'O'_1/(K'F' + F'O')$, or $OO_1/(FO - FK) = O'O'_1/(F'O' - F'K')$. Calling the focal distances FK and F′K′, X and X′, we have $y/(x - X) = y'/(x' - X')$, and since $y'/y = \beta$, it follows that $1/(x - X) = \beta/(x' - X')$. Replace x' and X′ by the values given in equation (2), and we obtain

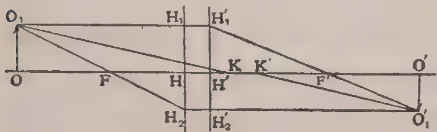


FIG. 5.

$$\frac{1}{x-X} = \beta/\left(\frac{ff'}{x} - \frac{ff'}{X}\right) \text{ or } 1 = -\beta\frac{xX}{ff'}.$$

Since $\beta = f/x = x'/f'$, we have $f' = -X$, $f = -X'$.

These equations show that to determine the nodal points, it is only necessary to measure the focal distance of the second principal focus from the first principal focus, and vice versa. In the special case when the initial and final medium is the same, as for example, a lens in air, we have $f = -f'$, and the nodal points coincide with the principal points of the system; we then speak of the "nodal point property of the principal points," meaning that the object and corresponding image subtend the same angle at the principal points.

Equations Relating to the Principal Points.—It is sometimes desirable to determine the distances of an object and its image, not from the focal points, but from the principal points. Let A (see fig. 3) be the principal point distance of the object and A′ that of the image, we then have

$$A = HO = HF + FO = FO - FH = x - f,$$
$$A' = H'O' = H'F' + F'O' = F'O' - F'H' = x' - f',$$

whence $x = A + f$ and $x' = A' + f'$.

Using $xx' = ff'$, we have $(A + f)(A' + f') = ff'$, which leads to $AA' + Af' + A'f = 0$, or

$$1 + \frac{f'}{A'} + \frac{f}{A} = 0;$$

this becomes in the special case when $f = -f'$,

$$\frac{1}{A'} - \frac{1}{A} = \frac{1}{f}.$$

To express the linear magnification in terms of the principal point distances, we start with equation (4) $(f - x)/(f' - x') = -x/f'$. From this we obtain $A/A' = -x/f'$, or $x = -f'A/A'$; and by using equation (1) we have $\beta = -fA'/f'A$.

In the special case of $f = -f'$, this becomes $\beta = A'/A = y'/y$, from which it follows that the ratio of the dimensions of the object and image is equal to the ratio of the distances of the object and image from the principal points.

The convergence can be determined in terms of A and A′ by substituting $x = -f'A/A'$ in equation (4), when we obtain $\gamma = A/A'$.

Compound Systems.—In discussing the laws relating to compound systems, we assume that the cardinal points of the component systems are known, and also that the combinations are centred, *i.e.* that the axes of the component lenses coincide. If some object be represented by two systems arranged one behind the other, we can regard the systems as co-operating in the formation of the final image.

Let such a system be represented in fig. 6. The two single systems are denoted by the suffixes 1 and 2; for example, F_1 is the first principal focus of the first, and F'_2 the second principal focus of the second system. A ray parallel to the axis at a distance y passes through the second principal focus F'_1 of the first system, intersecting the axis at an angle w'_1. The point F'_1 will be represented in the second system by the point F′, which is therefore conjugate to the point at infinity for the entire system, *i.e.* it is the second principal focus of the compound system. The representation of F'_1 in F′ by the second system leads to the relations $F_2F'_1 = x_2$, and $F'_2F' = x'_2$, whence $x_2x'_2 = f_2f'_2$. Denoting the distance between the adjacent focal planes F'_1, F_2 by Δ, we have $\Delta = F'_1F_2 = -F_2F'_1$, so that $x'_2 = -f_2f'_2/\Delta$. A similar ray parallel to the axis at a distance y proceeding from the image-side will intersect the axis at the focal point F_2; and by finding the image of this point in the first system, we determine the first principal focus of the compound system. Equation (2) gives $x_1x'_1 = f_1f'_1$, and since $x'_1 = F'_1F_2 = \Delta$, we have $x_1 = f_1f'_1/\Delta$ as the distance of the first principal focus F of the compound system from the first principal focus F_1 of the first system.

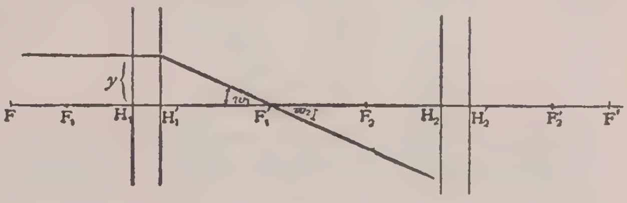


FIG. 6.

To determine the focal lengths f and f' of the compound system and the principal points H and H′, we employ the equations defining the focal lengths, viz. $f = y'/\tan w$, and $f' = y/\tan w'$. From the construction (fig. 6) $\tan w'_1 = y/f'_1$. The variation of the angle w'_1 by the second system is deduced from the equation to the convergence, viz. $\gamma = \tan w'_2/\tan w_2 = -x_2/f'_2 = \Delta/f'_2$, and since $w_2 = w'_1$, we have $\tan w'_2 = (\Delta/f'_2)\tan w'_1$. Since $w' = w'_2$ in our system of notation, we have

$$f' = \frac{y}{\tan w'} = \frac{yf'_2}{\Delta \tan w'_1} = \frac{f'_1 \cdot f'_2}{\Delta}. \qquad (5)$$

By taking a ray proceeding from the image-side we obtain for the first principal focal distance of the combination

$$f = -f_1f_2/\Delta.$$

In the particular case in which $\Delta = 0$, the two focal planes F'_1, F_2 coincide, and the focal lengths f, f' are infinite. Such a system is called a telescopic system, and this condition is realized in a telescope focused for a normal eye.

So far we have assumed that all the rays proceeding from an object-point are exactly united in an image-point after transmission through the ideal system. The question now arises so to how far this assumption is justified for spherical lenses. To investigate this it is simplest to trace the path of a ray through one spherical refracting surface. Let such a surface divide media of refractive indices n and n', the former being to the left. The point where the axis intersects the surface is the vertex S (fig. 7). Denote the distance of the axial object-point O from S by s; the distance from O to the point of incidence P by p; the radius of the spherical surface by r; and the distance OC by c, C being the centre of the sphere. Let u be the angle made by the ray with the axis, and i the angle of incidence, *i.e.* the angle between the ray and the normal to the sphere at the point of incidence. The corresponding quantities in the image-space are denoted by the same letters with a dash. From the triangle O′PC we have $\sin u = (r/c) \sin i$, and from the triangle O′PC we have $\sin u' = (r/c') \sin i'$. By Snell's law we have $n'/n = \sin i / \sin i'$, and also $\phi = u' + i'$. Consequently c' and the position of the image may be found.

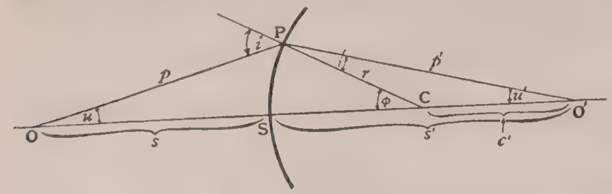


FIG. 7.

To determine whether all the rays proceeding from O are refracted through O′, we investigate the triangle OPO′. We have $p/p' = \sin u' / \sin u$. Substituting for $\sin u$ and $\sin u'$ the values found above, we obtain $p'/p = c' \sin i / c \sin i' = n'c'/nc$. Also $c = \mathrm{OC} = \mathrm{CS} + \mathrm{SO} = -\mathrm{SC} + \mathrm{SO} = s - r$, and similarly $c' = s' - r$. Substituting these values we obtain

$$\frac{p'}{p} = \frac{n'(s'-r)}{n(s-r)}, \text{ or } \frac{n(s-r)}{p} = \frac{n'(s'-r)}{p'}. \qquad (6)$$

To obtain p and p' we use the triangles OPC and O′PC; we have $p^2 = (s-r)^2 + r^2 + 2r(s-r) \cos \phi$, $p'^2 = (s'-r)^2 + r^2 + 2r(s'-r) \cos \phi$. Hence if s, r, n and n' be constant, s' must vary as ϕ varies. The refracted rays therefore do not reunite in a point, and the deflection is termed the spherical aberration (see ABERRATION).

Developing $\cos \phi$ in powers of ϕ, we obtain

$$p^2 = (s-r)^2 + r^2 + 2r(s-r) \left\{ 1 - \frac{\phi^2}{2!} + \frac{\phi^4}{4!} - \frac{\phi^6}{6!} + \dots \right\},$$

and therefore for such values of ϕ for which the second and higher powers may be neglected, we have $p^2 = (s-r)^2 + r^2 + 2r(s-r)$, *i.e.* $p = s$, and similarly $p' = s'$. Equation (6) then becomes $n(s-r)/s = n'(s'-r)/s'$ or

$$\frac{n'}{s'} = \frac{n}{s} + \frac{n'-n}{r}. \qquad (7)$$

This relation shows that in a very small central aperture in which the equation $p = s$ holds, all rays proceeding from an object-point are exactly united in an image-point, and therefore the equations previously deduced are valid for this aperture. K. F. Gauss derived the equations for thin pencils in his *Dioptrische Untersuchungen* (1840) by very elegant methods. More recently the laws relating to systems with finite aperture have been approximately realized, as for example, in well-corrected photographic objectives.

Position of the Cardinal Points of a Lens.—Taking the case of a single spherical refracting surface, and limiting ourselves to the small central aperture, it is seen that the second principal focus F′ is obtained when s is infinitely great. Consequently $s' = -f'$; the difference of sign is obvious, since s' is measured from S, while f' is measured from F′. The focal lengths are directly deducible from equation (7):—

$$f' = -n'r/(n'-n) \qquad (8)$$
$$f = nr/(n'-n). \qquad (9)$$

By joining this simple refracting system with a similar one, so that the second spherical surface limits the medium of refractive index n', we derive the spherical lens. Generally the two spherical surfaces enclose a glass lens, and are bounded on the outside by air of refractive index 1.

The deduction of the cardinal points of a spherical glass lens in air from the relations already proved is readily effected if we regard the lens as a combination of two systems each having one refracting surface, the light passing in the first system from air to glass, and in the second from glass to air. If we know the refractive index of the glass n, the radii r_1, r_2 of the spherical surfaces, and the distances of the two lens-vertices (or the thickness of the lens d) we can determine all the properties of the lens. A biconvex lens is shown in fig. 8. Let F_1 be the first principal focus of the first system of radius r_1, and F_1' the second principal focus; and let S_1 be its vertex. Denote the distance $\mathrm{F}_1 \mathrm{S}_1$ (the first principal focal length) by f_1, and the corresponding distance $\mathrm{F}'_1 \mathrm{S}_1$ by f'_1. Let the corresponding quantities in the second system be denoted by the same letters with the suffix 2.

By equations (8) and (9) we have

$$f_1 = \frac{r_1}{n-1}, \quad f'_1 = -\frac{nr_1}{n-1}, \quad f_2 = -\frac{nr_2}{n-1}, \quad f'_2 = \frac{r_2}{n-1},$$

f_2 having the opposite sign to f_1. Denoting the distance $\mathrm{F}'_1 \mathrm{F}_2$ by Δ, we have $\Delta = \mathrm{F}'_1\mathrm{F}_2 = \mathrm{F}'_1\mathrm{S}_1 + \mathrm{S}_1\mathrm{S}_2 + \mathrm{S}_2\mathrm{F}_2 = \mathrm{F}'_1\mathrm{S}_1 + \mathrm{S}_1\mathrm{S}_2 - \mathrm{F}_2\mathrm{S}_2 = f'_1 + d - f_2$. Substituting for f'_1 and f_2 we obtain

$$\Delta = -\frac{nr_1}{n-1} + d + \frac{nr_2}{n-1}.$$

Writing $\mathrm{R} = \Delta(n-1)$, this relation becomes

$$\mathrm{R} = n(r_2 - r_1) + d(n-1).$$

We have already shown that f (the first principal focal length of a compound system) $= -f_1 f_2/\Delta$. Substituting for f_1, f_2, and Δ the values found above, we obtain

$$f = \frac{r_1 r_2 n}{(n-1)\mathrm{R}} = \frac{r_1 r_2 n}{(n-1)\{n(r_2-r_1) + d(n-1)\}}, \qquad (10)$$

which is equivalent to

$$\frac{1}{f} = (n-1)\left\{\frac{1}{r_1} - \frac{1}{r_2}\right\} + \frac{(n-1)^2 d}{r_1 r_2 n}.$$

If the lens be infinitely thin, *i.e.* if d be zero, we have for the first principal focal length,

$$\frac{1}{f} = (n-1)\left\{\frac{1}{r_1} - \frac{1}{r_2}\right\}.$$

By the same method we obtain for the second principal focal length

$$f' = \frac{f'_1 f'_2}{\Delta} = -\frac{nr_1 r_2}{(n-1)\mathrm{R}} = -f.$$

The reciprocal of the focal length is termed the *power* of the lens and is denoted by ϕ. In formulae involving ϕ it is customary to denote the reciprocal of the radii by the symbol ρ; we thus have $\phi = 1/f$, $\rho = 1/r$. Equation (10) thus becomes

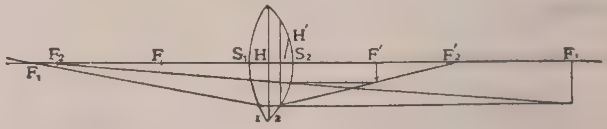


FIG. 8.

$$\phi = (n-1)(\rho_1 - \rho_2) + \frac{(n-1)^2 d \rho_1 \rho_2}{n}.$$

The unit of power employed by spectacle-makers is termed the *diopter* or *dioptric* (see SPECTACLES).

We proceed to determine the distances of the focal points from the vertices of the lens, *i.e.* the distances FS_1 and $\mathrm{F'S}_2$. Since F is represented by the first system in F_2, we have by equation (2)

$$x_1 = \frac{f_1 f'_1}{x'_1} = \frac{f_1 f'_1}{\Delta} = -\frac{nr_1^2}{(n-1)\mathrm{R}},$$

where $x_1 = \mathrm{F}_1\mathrm{F}$, and $x'_1 = \mathrm{F}'_1\mathrm{F}_2 = \Delta$. The distance of the first principal focus from the vertex S, *i.e.* $\mathrm{S}_1\mathrm{F}$, which we denote by s_F is given by $s_\mathrm{F} = \mathrm{S}_1\mathrm{F} = \mathrm{S}_1\mathrm{F}_1 + \mathrm{F}_1\mathrm{F} = -\mathrm{F}_1\mathrm{S}_1 + \mathrm{F}_1\mathrm{F}$. Now $\mathrm{F}_1\mathrm{S}_1$ is the distance from the vertex of the first principal focus of the first system, *i.e.* f_1, and $\mathrm{F}_1\mathrm{F} = x_1$. Substituting these values, we obtain

$$s_\mathrm{F} = -\frac{r_1}{n-1} - \frac{nr_1^2}{(n-1)\mathrm{R}} = -\frac{r_1(nr_1 + \mathrm{R})}{(n-1)\mathrm{R}}.$$

The distance $\mathrm{F}'_2\mathrm{F}'$ or x'_2 is similarly determined by considering F'_1 to be represented by the second system in F′.
We have

$$x'_2 = \frac{f_2 f'_2}{x_2} = -\frac{f_2 f'_2}{\Delta} = \frac{nr_2^2}{(n-1)\mathrm{R}},$$

so that

$$s_\mathrm{F}' = x'_2 - f'_2 = \frac{r_2(nr_2 - \mathrm{R})}{(n-1)\mathrm{R}},$$

where s_F' denotes the distance of the second principal focus from the vertex S_2.

The two focal lengths and the distances of the foci from the vertices being known, the positions of the remaining cardinal points, *i.e.* the principal points H and H′, are readily determined. Let $s_\mathrm{H} = \mathrm{S}_1\mathrm{H}$, *i.e.* the distance of the object-side principal point from the vertex of the first surface, and $s_{\mathrm{H}'} = \mathrm{S}_2\mathrm{H}'$, *i.e.* the distance of the image-side principal point from the vertex of the second surface, then $f = \mathrm{FH} = \mathrm{FS}_1 + \mathrm{S}_1\mathrm{H} = -\mathrm{S}_1\mathrm{F} + \mathrm{S}_1\mathrm{H} = -s_\mathrm{F} + s_\mathrm{H}$; hence $s_H = s_\mathrm{F} + f = -dr_1/\mathrm{R}$. Similarly $s_{\mathrm{H}'} = s_{\mathrm{F}'} + f' = -dr_2/\mathrm{R}$. It is readily seen that the distances s_H and $s_{\mathrm{H}'}$ are in the ratio of the radii r_1 and r_2.

The distance between the two principal planes (the *interstitium*) is deduced very simply. We have $\mathrm{S}_1\mathrm{S}_2 = \mathrm{S}_1\mathrm{H} + \mathrm{HH}' + \mathrm{H}'\mathrm{S}_2$, or $\mathrm{HH}' = \mathrm{S}_1\mathrm{S}_2 - \mathrm{S}_1\mathrm{H} + \mathrm{S}_2\mathrm{H}'$. Substituting, we have

$$\mathrm{HH}' = d - s_\mathrm{H} + s_{\mathrm{H}'} = d(n-1)(r_2 - r_1 + d)/\mathrm{R}.$$

The interstitium becomes zero, or the two principal planes coincide, if $d = r_1 - r_2$.

We have now derived all the properties of the lens in terms of its elements, viz. the refractive index, the radii of the surfaces, and the thickness.

Forms of Lenses.—By varying the signs and relative magnitude of the radii, lenses may be divided into two groups according to their action, and into four groups according to their form.

According to their action, lenses are either collecting, convergent and condensing, or divergent and dispersing; the term positive is sometimes applied to the former, and the term negative to the latter. Convergent lenses transform a parallel pencil into a converging one, and increase the convergence, and diminish the divergence of any pencil. Divergent lenses, on the other hand, transform a parallel pencil into a diverging one, and diminish the convergence, and increase the divergence of any pencil. In convergent lenses the first principal focal distance is positive and the second principal focal distance negative; in divergent lenses the converse holds.

The four forms of lenses are interpretable by means of equation (10).

$$f=\frac{r_1r_2n}{(n-1)\{n(r_2-r_1)+d(n-1)\}}$$

(1) If r_1 be positive and r_2 negative. This type is called biconvex (fig. 9, 1). The first principal focus is in front of the lens, and the second principal focus behind the lens, and the two principal points are inside the lens. The order of the cardinal points is therefore $FS_1HH'S_2F'$. The lens is convergent so long as the thickness is less than $n(r_1-r_2)/(n-1)$. The special case when one of the radii is infinite, in other words, when one of the bounding surfaces is plane is shown in fig. 9, 2. Such a collective lens is termed *plano-convex*. As d increases, F and H move to the right and F′ and H′ to the left. If $d=n(r_1-r_2)/(n-1)$, the focal length is infinite, *i.e.* the lens is *telescopic*. If the thickness be greater than $n(r_1-r_2)/(n-1)$, the lens is dispersive, and the order of the cardinal points is $HFS_1S_2F'H'$.

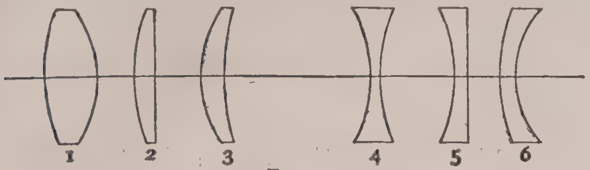


FIG. 9.

(2) If r_1 is negative and r_2 positive. This type is called *biconcave* (fig. 9, 4). Such lenses are dispersive for all thicknesses. If d increases, the radii remaining constant, the focal lengths diminish. It is seen from the equations giving the distances of the cardinal points from the vertices that the first principal focus F is always behind S_1, and the second principal focus F′ always in front of S_2, and that the principal points are within the lens, H′ always following H. If one of the radii becomes infinite, the lens is *plano-concave* (fig. 9, 5).

(3) If the radii are both positive. These lenses are called *convexo-concave*. Two cases occur according as $r_2>r_1$, or $<r_1$. (*a*) If $r_2>r_1$, we obtain the *mensicus* (fig. 9, 3). Such lenses are always collective; and the order of the cardinal points is FHH′F′. Since s_F and s_H are always negative, the object-side cardinal points are always in front of the lens. H′ can take up different positions. Since $s_{H'}=-dr_2/R=-dr_2/\{n(r_2-r_1)+d(n-1)\}$, $s_{H'}$ is greater or less than d, *i.e.* H′ is either in front of or inside the lens, according as $d<\text{or}>\{r_2-n(r_2-r_1)\}/(n-1)$. (*b*) If $r_2<r_1$ the lens is dispersive so long as $d<n(r_1-r_2)/(n-1)$. H is always behind S_1 and H′ behind S_2, since s_H and $s_{H'}$ are always positive. The focus F is always behind S_1 and F′ in front of S_2. If the thickness be small, the order of the cardinal points is F′HH′F; a dispersive lens of this type is shown in fig. 9, 6. As the thickness increases, H, H′ and F move to the right, F more rapidly than H, and H more rapidly than H′; F′, on the other hand, moves to the left. As with biconvex lenses, a telescopic lens, having all the cardinal points at infinity, results when $d=n(r_1-r_2)/(n-1)$. If $d>n(r_1-r_2)/(n-1)$, f is positive and the lens is collective. The cardinal points are in the same order as in the mensicus, viz. FHH′F′; and the relation of the principal points to the vertices is also the same as in the mensicus.

(4) If r_1 and r_2 are both negative. This case is reduced to (3) above, by assuming a change in the direction of the light, or, in other words, by interchanging the object- and image-spaces.

The six forms shown in fig. 9 are all used in optical constructions. It may be stated fairly generally that lenses which are thicker at the middle are collective, while those which are thinnest at the middle are dispersive.

Different Positions of Object and Image.—The principal points are always near the surfaces limiting the lens, and consequently the lens divides the direct pencil containing the axis into two parts. The object can be either in front of or behind the lens as in fig. 10. If the object point be in front of the lens, and if it be realized by rays passing from it, it is called *real*. If, on the other hand, the object be behind the lens, it is called *virtual*; it does not actually exist, and can only be realized as an image.

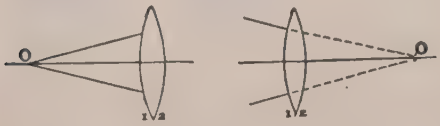


FIG. 10.

When we speak of "object-points," it is always understood that the rays from the object traverse the first surface of the lens before meeting the second. In the same way, images may be either real or virtual. If the image be behind the second surface, it is *real*, and can be intercepted on a screen. If, however, it be in front of the lens, it is visible to an eye placed behind the lens, although the rays do not actually intersect, but only appear to do so, but the image cannot be intercepted on a screen behind the lens. Such an image is said to be *virtual*. These relations are shown in fig. 11.

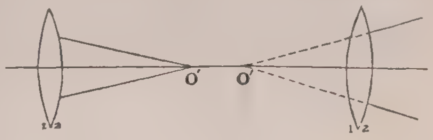


FIG. 11.

By referring to the equations given above, it is seen that a thin convergent lens produces both real and virtual images of real objects, but only a real image of a virtual object, whilst a divergent lens produces a virtual image of a real object and both real and virtual images of a virtual object. The construction of a real image of a real object by a convergent lens is shown in fig. 3; and that of a virtual image of a real object by a divergent lens in fig. 12.

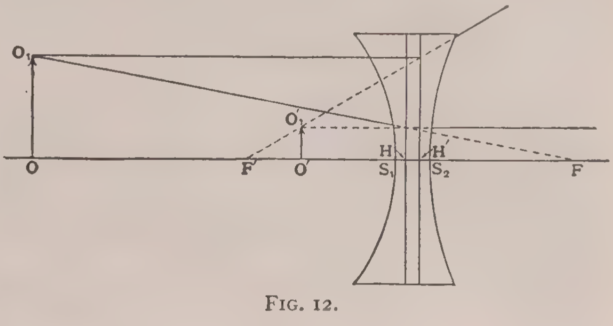


FIG. 12.

The optical centre of a lens is a point such that, for any ray which passes through it, the incident and emergent rays are parallel. The idea of the optical centre was originally due to J. Harris (*Treatise on Optics*, 1775); it is not properly a cardinal point, although it has several interesting properties. In fig. 13, let C_1P_1 and C_2P_2 be two parallel radii of a biconvex lens. Join P_1P_2 and let O_1P_1 and O_2P_2 be incident and emergent rays which have P_1P_2 for the path through the lens. Then if M be the intersection of P_1P_2 with the axis, we have angle C_1P_1M = angle C_2P_2M; these two angles are—for a ray travelling in the direction $O_1P_1P_2O_2$—the angles of emergence and of incidence respectively. From the similar triangles C_2P_2M and C_1P_1M we have

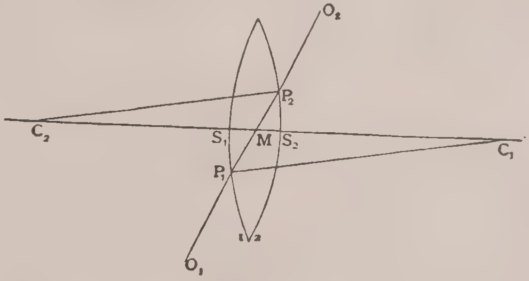


FIG. 13.

$$C_1M:C_2M=C_1P_1:C_2P_2=r_1:r_2. \tag{11}$$

Such rays as P_1P_2 therefore divide the distance C_1C_2 in the ratio of the radii, *i.e.* at the fixed point M, the optical centre. Calling $S_1M=s_1$, $S_2M=s_2$, then $C_1S_1=C_1M+MS_1=C_1M-S_1M$, *i.e.* since $C_1S_1=r_1$, $C_1M=r_1+s_1$, and similarly $C_2M=r_2+s_2$. Also $S_1S_2=S_1M+MS_2=S_1M-S_2M$, *i.e.* $d=s_1-s_2$. Then by using equation (11) we have $s_1=r_1d/(r-r_2)$ and $s_2=r_2d/(r_1-r_2)$, and hence $s_1/s_2=r_1/r_2$. The vertex distances of the optical centre are therefore in the ratio of the radii.

The values of s_1 and s_2 show that the optical centre of a biconvex or biconcave lens is in the interior of the lens, that in a plano-convex or plano-concave lens it is at the vertex of the curved surface, and in a concavo-convex lens outside the lens.

The Wave-theory Derivation of the Focal Length.—The formulae above have been derived by means of geometrical rays. We here give an account of Lord Rayleigh's wave-theory derivation of the focal length of a convex lens in terms of the aperture, thickness and refractive index (*Phil. Mag.* 1879 (5) 8, p. 480; 1885, 20,

p. 354); the argument is based on the principle that the optical distance from object to image is constant.

"Taking the case of a convex lens of glass, let us suppose that parallel rays DA, EC, GB (fig. 14) fall upon the lens ACB, and are collected by it to a focus at F. The points D, E, G, equally distant from ACB, lie upon a front of the wave before it impinges upon the lens. The focus is a point at which the different parts of the wave arrive at the same time, and that such a point can exist depends upon the fact that the propagation is slower in glass than in air. The ray ECF is retarded from having to pass through the thickness (d) of glass by the amount $(n-1)d$. The ray DAF, which traverses only the extreme edge of the lens, is retarded merely on account of the crookedness of its path, and the amount of the retardation is measured by AF–CF. If F is a focus these retardations must be equal, or $AF-CF=(n-1)d$. Now if y be the semi-aperture AC of the lens, and f be the focal length CF, $AF-CF=\sqrt{(f^2+y^2)}-f=\frac{1}{2}y^2/f$ approximately, whence

$$f=\tfrac{1}{2}y^2/(n-1)d. \qquad (12)$$

In the case of plate-glass $(n-1)=\frac{1}{2}$ (nearly), and then the rule (12) may be thus stated: *the semi-aperture is a mean proportional between the focal length and the thickness.* The form (12) is in general the more significant, as well as the more practically useful, but we may, of course, express the thickness in terms of the curvatures and semi-aperture by means of $d=\frac{1}{2}y^2(r_1^{-1}-r_2^{-1})$. In the preceding statement it has been supposed for simplicity that the lens comes to a sharp edge. If this be not the case we must take as the thickness of the lens the difference of the thicknesses at the centre and at the circumference. In this form the statement is applicable to concave lenses, and we see that the focal length is positive when the lens is thickest at the centre, but negative when the lens is thickest at the edge."

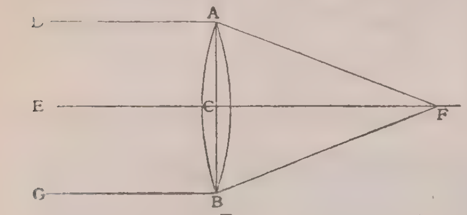


FIG. 14.

Regulation of the Rays.

The geometrical theory of optical instruments can be conveniently divided into four parts: (1) The relations of the positions and sizes of objects and their images (see above); (2) the different aberrations from an ideal image (see ABERRATION); (3) the intensity of radiation in the object- and image-spaces, in other words, the alteration of brightness caused by physical or geometrical influences; and (4) the regulation of the rays (*Strahlenbegrenzung*).

The regulation of rays will here be treated only in systems free from aberration. E. Abbe first gave a connected theory; and M von Rohr has done a great deal towards the elaboration. The Gauss cardinal points make it simple to construct the image of a given object. No account is taken of the size of the system, or whether the rays used for the construction really assist in the reproduction of the image or not. The diverging cones of rays coming from the object-points can only take a certain small part in the production of the image in consequence of the apertures of the lenses, or of diaphragms. It often happens that the rays used for the construction of the image do not pass through the system; the image being formed by quite different rays. If we take a luminous point of the object lying on the axis of the system then an eye introduced at the image-point sees in the instrument several concentric rings, which are either the fittings of the lenses or their images, or the real diaphragms or their images. The innermost and smallest ring is completely lighted, and forms the origin of the cone of rays entering the image-space. Abbe called it the *exit pupil.* Similarly there is a corresponding smallest ring in the object-space which limits the entering cone of rays. This is called the *entrance pupil.* The real diaphragm acting as a limit at any part of the system is called the *aperture-diaphragm.* These diaphragms remain for all practical purposes the same for all points lying on the axis. It sometimes happens that one and the same diaphragm fulfils the functions of the entrance pupil and the aperture-diaphragm or the exit pupil and the aperture-diaphragm.

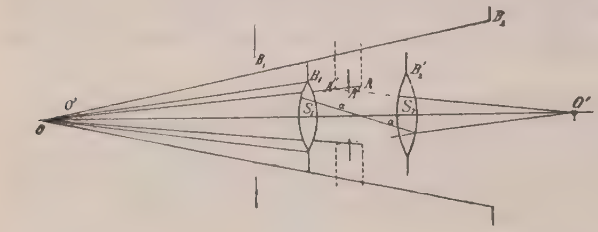


FIG. 15.

Fig. 15 shows the general but simplified case of the different diaphragms which are of importance for the regulation of the rays. S_1, S_2 are two centred systems. A' is a real diaphragm lying between them. B_1 and B'_2 are the fittings of the systems. Then S_1 produces the virtual image A of the diaphragm A' and the image B_2 of the fitting B'_2, whilst the system S_2 makes the virtual image A'' of the diaphragm A' and the virtual image B'_1 of the fitting B_1. The object-point O is reproduced really through the whole system in the point O'. From the object-point O three diaphragms can be seen in the object-space, viz. the fitting B_1, the image of the fitting B_2 and the image A of the diaphragm A' formed by the system S_1. The cone of rays nearest to B_2 is not received to its total extent by the fitting B_1, and the cone which has entered through B_1 is again diminished in its further course, when passing through the diaphragm A', so that the cone of rays really used for producing the image is limited by A, the diaphragm which seen from O appears to be the smallest. A is therefore the entrance pupil. The real diaphragm A' which limits the rays in the centre of the system is the aperture diaphragm. Similarly three diaphragms lying in the image-space are to be seen from the image-point O'—namely B', A'', and B'_2. A'' limits the rays in the image-space, and is therefore the exit pupil. As A is conjugate to the diaphragm A' in the system S_1, and A'' to the same diaphragm A' in the system S_2, the entrance pupil A is conjugate to the exit pupil A'' throughout the instrument. This relation between entrance and exit pupils is general.

The apices of the cones of rays producing the image of points near the axis thus lie in the object-points, and their common base is the entrance pupil. The axis of such a cone, which connects the object point with the centre of the entrance pupil, is called the *principal ray.* Similarly, the principal rays in the image-space join the centre of the exit pupil with the image-points. The centres of the entrance and exit pupils are thus the intersections of the principal rays.

For points lying farther from the axis, the entrance pupil no longer alone limits the rays, the other diaphragms taking part. In fig. 16 only one diaphragm L is present besides the entrance pupil A, and the object-space is divided to a certain extent into four parts. The section M contains all points rendered by a system with a complete aperture; N contains all points rendered by a system with a gradually diminishing aperture; but this diminution does not attain the principal ray passing through the centre C. In the section O are those points rendered by a system with an aperture which gradually decreases to zero. No rays pass from the points of the section P through the system and no image can arise from them.

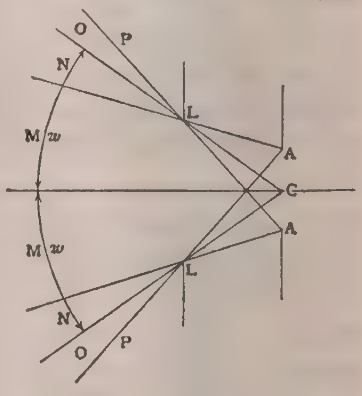


FIG. 16.

The second diaphragm L therefore limits the three-dimensional object-space containing the points which can be rendered by the optical system. From C through this diaphragm L this three-dimensional object-space can be seen as through a window. L is called by M von Rohr the *entrance luke.* If several diaphragms can be seen from C, then the entrance *luke* is the diaphragm which seen from C appears the smallest. In the sections N and O the entrance *luke* also takes part in limiting the cones of rays. This restriction is known as the "vignetting" action of the entrance *luke.* The base of the cone of rays for the points of this section of the object-space is no longer a circle but a two-cornered curve which arises from the object-point by the projection of the entrance *luke* on the entrance pupil. Fig. 17*a* shows the base of such a cone of rays. It often happens that besides the entrance *luke,* another diaphragm acts in a vignetting manner, then the operating aperture of the cone of rays is a curve made up of circular arcs formed out of the entrance pupil and the two projections of the two acting diaphragms (fig. 17*b*).

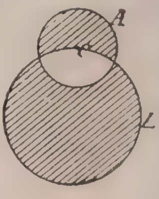


FIG. 17*a*.

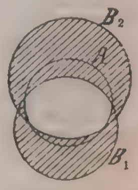


FIG. 17*b*.

If the entrance pupil is narrow, then the section NO, in which the vignetting is increasing, is diminished, and there is really only one division of the section M which can be reproduced, and of the section P which cannot be reproduced. The angle $w+w=2w$, comprising the section which can be reproduced, is called the angle of the field of view on the object-side. The field of view $2w$ retains its importance if the entrance pupil is increased. It then comprises all points reached by principal rays. The same relations apply to the image-space, in which there is an exit *luke*, which, seen from the middle of the exit pupil, appears under the smallest angle. It is the image of the entrance *luke* produced by the whole system. The image-side field of view $2w'$ is the angle comprised by the principal rays reaching the edge of the exit *luke*.

Most optical instruments are used to observe object-reliefs (three-dimensional objects), and generally an image-relief (a three-dimensional image) is conjugate to this object-relief. It is sometimes required, however, to represent by means of an optical instrument the object-relief on a plane or on a ground-glass as in the photographic camera. For simplicity we shall assume the intercepting plane as perpendicular to the axis and shall call it, after von Rohr, the "ground glass plane." All points of the image not lying in this plane produce circular spots (corresponding to the form of the pupils) on it, which are called "circles of confusion." The ground-glass plane (fig. 18) is conjugate to the object-plane E in the object-space, perpendicular to the axis, and called the "plane focused for." All points lying in this plane are reproduced exactly on the ground-glass plane as the points OO. The circle of confusion Z on the plane focused for corresponds to the circle of confusion Z′ on the ground-glass plane. The figure formed on the plane focused for by the cones of rays from all of the object-points of the total object-space directed to the entrance pupil, was called "object-side representation" (*imago*) by M von Rohr. This representation is a central projection. If, for instance, the entrance pupil is imagined so small that only the principal rays pass through, then they project directly, and the intersections of the principal rays represent the projections of the points of the object lying off the plane focused for. The centre of the projection or the perspective centre is the middle point of the entrance pupil C. If the entrance pupil is opened, in place of points, circles of confusion appear, whose size depends upon the size of the entrance pupil and the position of the object-points and the plane focused for. The intersection of the principal ray is the centre of the circle of confusion. The clearness of the representation on the plane focused for is of course diminished by the circles of confusion. This central projection does not at all depend upon the instrument, but is entirely geometrical, arising when the position and the size of the entrance pupil, and the position of the plane focused for have been fixed. The instrument then produces an image on the ground-glass plane of this perspective representation on the plane focused for, and on account of the exact likeness which this image has to the object-side representation it is called the "representation copy." By moving it round an angle of 180°, this representation can be brought into a perspective position to the objects, so that all rays coming from the middle of the entrance pupil and aiming at the object-points, would always meet the corresponding image-points. This representation is accessible to the observer in different ways in different instruments. If the observer desires a perfectly correct perspective impression of the object-relief the distance of the pivot of the eye from the representation copy must be equal to the *n*th part of the distance of the plane focused for from the entrance pupil, if the instrument has produced a *n*th diminution of the object-side representation. The pivot of the eye must coincide with the centre of the perspective, because all images are observed in direct vision. It is known that the pivot of the eye is the point of intersection of all the directions in which one can look. Thus all these points represented by circles of confusion which are less than the angular sharpness of vision appear clear to the eye; the space containing all these object-points, which appear clear to the eye, is called the *depth*. The depth of definition, therefore, is not a special property of the instrument, but depends on the size of the entrance pupil, the position of the plane focused for and on the conditions under which the representation can be observed.

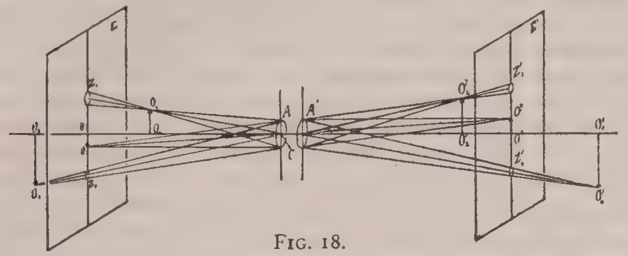
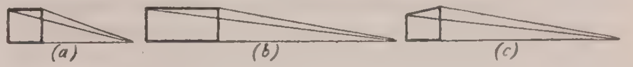


FIG. 18.

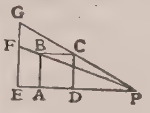
If the distance of the representation from the pivot of the eye be altered from the correct distance already mentioned, the angles of vision under which various objects appear are changed; perspective errors arise, causing an incorrect idea to be given of the depth. A simple case is shown in fig. 19. A cube is the object, and if it is observed as in fig. 19*a* with the representation copy at the correct distance, a correct idea of a cube will be obtained. If, as in figs. 19*b* and 19*c*, the distance is too great, there can be two results. If it is known that the farthest section is just as high as the nearer one then the cube appears exceptionally deepened, like a long parallelepipedon. But if it is known to be as deep as it is high then the eye will see it low at the back and high at the front. The reverse occurs when the distance of observation is too short, the body then appears either too flat, or the nearer sections seem too low in relation to those farther off. These perspective errors can be seen in any telescope. In the telescope ocular the representation copy has to be observed under too large an angle or at too short a distance: all objects therefore appear flattened, or the more distant objects appear too large in comparison with those nearer at hand.



After von Rohr.

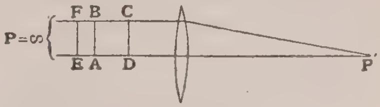
FIG. 19.

From the above the importance of experience will be inferred. But it is not only necessary that the objects themselves be known to the observer but also that they are presented to his eye in the customary manner. This depends upon the way in which the principal rays pass through the system—in other words, upon the special kind of "transmission" of the principal rays. In ordinary vision the pivot of the eye is the centre of the perspective representation which arises on the very distant plane standing perpendicular to the mean direction of sight. In this kind of central projection all objects lying in front of the plane focused for are diminished when projected on this plane, and those lying behind it are magnified. (The distances are always given in the direction of light.) Thus the objects near to the eye appear large and those farther from it appear small. This perspective has been called by M von Rohr[1] "entocentric transmission" (fig. 20). If the entrance pupil of the instrument lies at infinity, then all the principal rays are parallel and the projections of all objects on the plane focused for are exactly as large as the objects themselves. After E. Abbe, this course of rays is called "telecentric transmission" (fig. 21). The exit pupil then lies in the image-side focus of the system. If the perspective centre lies in front of the plane focused for, then the objects lying in front of this plane are magnified and those behind it are diminished. This is just the reverse of perspective representation in ordinary sight, so that the relations of size and the arrangements for space must be quite incorrectly indicated (fig. 22); this representation is called by M von Rohr a "hypercentric transmission." (O. HR.)



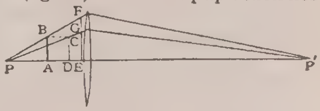
After von Rohr.

FIG. 20.



After von Rohr.

FIG. 21.



After von Rohr.

FIG. 22.

LENT (O. Eng. *lencten*, "spring," M. Eng. *lenten*, *lente*, *lent*; cf. Dut. *lente*, Ger. *Lenz*, "spring," O. H. Ger. *lenzin*, *lengizin*, *lenzo*, probably from the same root as "long" and referring to "the lengthening days"), in the Christian Church, the period of fasting preparatory to the festival of Easter. As this fast falls in the early part of the year, it became confused with the season, and gradually the word Lent, which originally meant spring, was confined to this use. The Latin name for the fast, *Quadragesima* (whence Ital. *quaresima*, Span. *cuaresma* and Fr. *carême*), and its Gr. equivalent *τεσσαρακοστή* (now superseded by the term *ἡ νηστεία* "the fast"), are derived from the Sunday which was the fortieth day before Easter, as *Quinquagesima* and *Sexagesima* are the fiftieth and sixtieth, Quadragesima being until the 7th century the *caput jejunii* or first day of the fast.

The length of this fast and the rigour with which it has been observed have varied greatly at different times and in different countries (see FASTING). In the time of Irenaeus the fast before Easter was very short, but very severe; thus some ate nothing for forty hours between the afternoon of Good Friday and the morning of Easter. This was the only authoritatively prescribed fast known to Tertullian (*De jejunio*, 2, 13, 14; *De oratione*, 18). In Alexandria about the middle of the 3rd century it was already customary to fast during Holy Week; and earlier still the Montanists boasted that they observed a two weeks' fast instead of one. Of the Lenten fast or Quadragesima, the first mention is in the fifth canon of the council of Nicaea (325), and from this time it is frequently referred to, but chiefly as a season of preparation for baptism, of absolution of penitents or of retreat and recollection. In this season fasting played a part, but it was not universally nor rigorously enforced. At Rome, for instance, the whole period of fasting was but three weeks, according to the historian Socrates (*Hist. eccl.* v. 22), these three weeks, in Mgr. Duchesne's opinion, being not continuous but, following the primitive Roman custom, broken by intervals. Gradually, however, the fast as observed in East and West became more rigorously defined. In the East, where after the example of the Church of Antioch the Quadragesima fast had been kept distinct from that of Holy Week, the whole fast came to last for seven weeks, both Saturdays and Sundays (except Holy Saturday) being, however, excluded. In Rome and Alexandria, and even in Jerusalem, Holy Week was included in Lent and the whole fast lasted but six weeks, Saturdays, however, not being exempt. Both at Rome and Constantinople, therefore, the actual fast was but thirty-six days. Some Churches still continued the three weeks' fast, but by the middle of the 5th century most of these divergences had ceased and the usages of Antioch-Constantinople and Rome-Alexandria had become stereotyped in their respective spheres of influence.

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[1] M von Rohr, *Zeitschr. für Sinnesphysiologie* (1907), xli. 408–429.

The thirty-six days, as forming a tenth part of the year and therefore a perfect number, at first found a wide acceptance (so Cassianus, *Coll.* xxi. 30); but the inconsistency of this period with the name Quadragesima, and with the forty days' fast of Christ, came to be noted, and early in the 7th century four days were added, by what pope is unknown, Lent in the West beginning henceforth on Ash Wednesday (*q.v.*). About the same time the cycle of paschal solemnities was extended to the ninth week before Easter by the institution of stational masses for Septuagesima, Sexagesima and Quinquagesima Sundays. At Constantinople, too, three Sundays were added and associated with the Easter festival in the same way as the Sundays in Lent proper. These three Sundays were added in the Greek Church also, and the present custom of keeping an eight weeks' fast (*i.e.* exactly 8×5 days), now universal in the Eastern Church, originated in the 7th century. The Greek Lent begins on the Monday of Sexagesima, with a week of preparatory fasting, known as *τυροφάγια*, or the "butter-week"; the actual fast, however, starts on the Monday of Quinquagesima (Estomihi), this week being known as "the first week of the fast" (*ἑβδομὰς τῶν νηστειῶν*). The period of Lent is still described as "the six weeks of the fast" (*ἓξ ἑβδομάδες τῶν νηστειῶν*), Holy Week (*ἡ ἁγία καὶ μεγάλη ἑβδομάς*) not being reckoned in. The Lenten fast was retained at the Reformation in some of the reformed Churches, and is still observed in the Anglican and Lutheran communions. In England a Lenten fast was first ordered to be observed by Earconberht, king of Kent (640–664). In the middle ages, meat, eggs and milk were forbidden in Lent not only by ecclesiastical but by statute law; and this rule was enforced until the reign of William III. The chief Lenten food from the earliest days was fish, and entries in the royal household accounts of Edward III. show the amount of fish supplied to the king. Herring-pies were a great delicacy. Charters granted to seaports often stipulated that the town should send so many herrings or other fish to the king annually during Lent. How severely strict medieval abstinence was may be gauged from the fact that armies and garrisons were sometimes, in default of dispensations, as in the case of the siege of Orleans in 1429, reduced to starvation for want of Lenten food, though in full possession of meat and other supplies. The battle of the Herrings (February 1429) was fought in order to cover the march of a convoy of Lenten food to the English army besieging Orleans. Dispensations from fasting were, however, given in case of illness.

During the religious confusion of the Reformation, the practice of fasting was generally relaxed and it was found necessary to reassert the obligation of keeping Lent and the other periods and days of abstinence by a series of proclamations and statutes. In these, however, the religious was avowedly subordinate to a political motive, viz. to prevent the ruin of the fisheries, which were the great nursery of English seamen. Thus the statute of 2 and 3 Edward VI., cap. 9 (1549), while inculcating that "due and godly abstinence from flesh is a means to virtue," adds that "by the eating of fish much flesh is saved to the country," and that thereby, too, the fishing trade is encouraged. The statute, however, would not seem to have had much effect; for in spite of a proclamation of Queen Elizabeth in 1560 imposing a fine of £20 for each offence on butchers slaughtering animals during Lent, in 1563 Sir William Cecil, in *Notes upon an Act for the Increase of the Navy*, says that "in old times no flesh at all was eaten on fish days; even the king himself could not have license; which was occasion of eating so much fish as now is eaten in flesh upon fish days." The revolt against fish had ruined the fisheries and driven the fishermen to turn pirates, to the great scandal and detriment of the realm. Accordingly, in the session of 1562–1563, Cecil forced upon an unwilling parliament "a politic ordinance on fish eating," by which the eating of flesh on fast days was made punishable by a fine of three pounds or three months' imprisonment, one meat dish being allowed on Wednesdays on condition that three fish dishes were present on the table. The kind of argument by which Cecil overcame the Protestant temper of the parliament is illustrated by a clause which he had meditated adding to the statute, a draft of which in his own handwriting is preserved: "Because no person should misjudge the intent of the statute," it runs, "which is politicly meant only for the increase of fishermen and mariners, and not for any superstition for choice of meats; whoever shall preach or teach that eating of fish or forbearing of flesh is for the saving of the soul of man, or for the service of God, shall be punished as the spreader of false news" (Dom. MSS., Elizabeth, vol. xxvii.). But in spite of statutes and proclamations, of occasional severities and of the patriotic example of Queen Elizabeth, the practice of fasting fell more and more into disuse. Ostentatious avoidance of a fish-diet became, indeed, one of the outward symbols of militant Protestantism among the Puritans. "I have often noted," writes John Taylor, the water-poet, in his *Jack a Lent* (1620), "that if any superfluous feasting or gormandizing, paunch-cramming assembly do meet, it is so ordered that it must be either in Lent, upon a Friday, or a fasting: for the meat does not relish well except it be sauced with disobedience and comtempt of authority." The government continued to struggle against this spirit of defiance; proclamations of James I. in 1619 and 1625, and of Charles I. in 1627 and 1631, again commanded abstinence from all flesh during Lent, and the High Church movement of the 17th century lent a fresh religious sanction to the official attitude. So late as 1687, James II. issued a proclamation ordering abstention from meat; but, after the Revolution, the Lenten laws fell obsolete, though they remained on the statute-book till repealed by the Statute Law Revision Act 1863. But during the 18th century, though the strict observance of the Lenten fast was generally abandoned, it was still observed and inculcated by the more earnest of the clergy, such as William Law and John Wesley; and the custom of women wearing mourning in Lent, which had been followed by Queen Elizabeth and her court, survived until well into the 19th century. With the growth of the Oxford Movement in the English Church, the practice of observing Lent was revived; and, though no rules for fasting are authoritatively laid down, the duty of abstinence is now very generally inculcated by bishops and clergy, either as a discipline or as an exercise in self-denial. For the more "advanced" Churches, Lenten practice tends to conform to that of the pre-Reformation Church.

Mid-Lent, or the fourth Sunday in Lent, was long known as *Mothering Sunday*, in allusion to the custom for girls in service to be allowed a holiday on that day to visit their parents. They usually took as a present for their mother a small cake known as a *simnel*. In shape it resembled a pork-pie but in materials it was a rich plum-pudding. The word is derived through M. Lat. *simenellus*, *simella*, from Lat. *simila*, wheat flour. In Gloucestershire simnel cakes are still common; and at Usk, Monmouth, the custom of mothering is still scrupulously observed.

LENTHALL, WILLIAM (1591–1662), English parliamentarian, speaker of the House of Commons, second son of William Lenthall, of Lachford, Oxfordshire, a descendent of an old Herefordshire family, was born at Henley-on-Thames in June 1591. He left Oxford without taking a degree in 1609, and was called to the bar at Lincoln's Inn in 1616, becoming a bencher in 1633. He represented Woodstock in the Short Parliament (April 1640), and was chosen by King Charles I. to be speaker of the Long Parliament, which met on the 3rd of November 1640. According to Clarendon, a worse choice could not have been made, for Lenthall was of a "very timorous nature." He was treated with scanty respect in the chair, and seems to have had little control over the proceedings. On the 4th of January 1642, however, when the king entered the House of Commons to seize the five members, Lenthall behaved with great prudence and dignity. Having taken the speaker's chair and looked round in vain to discover the offending members, Charles turned to Lenthall standing below, and demanded of him "whether any of those persons were in the House, whether he saw any of them and where they were." Lenthall fell on his knees and replied: "May it please your Majesty, I have neither eyes to see nor tongue to speak in this place but as the House is pleased to direct me, whose servant I am here." On the outbreak of the great rebellion, Lenthall threw in his lot with the parliament. He had already called attention to the inadequacy of his salary and been granted a sum of £6000 (9th of April 1642); and he was now appointed master of the rolls (22nd of November 1643), and one of the commissioners of the great seal (Oct. 1646–March 1648).

He carried on his duties as speaker without interruption till 1647, when the power of the parliament had been transferred to the army. On the 26th of July a mob invaded the House of Commons and obliged it to rescind the ordinance re-establishing the old parliamentary committee of militia; Lenthall was held in the chair by main force and compelled to put to the vote a resolution inviting the king to London. Threats of worse things came subsequently to Lenthall's ears, and, taking the mace with him, he left London on the 29th to join the army and Fairfax. Lenthall and Manchester, the speaker of the Lords, headed the fugitive members at the review on Hounslow Heath on the 3rd of August, being received by the soldiers "as so many angels sent from heaven for their good." Returning to London with the army, he was installed again by Fairfax in the chair (6th August), and all votes passed during his absence were annulled. He adhered henceforth to the army party, but with a constant bias in favour of the king.

At the Restoration he claimed to have sent money to the king at Oxford, to have provided the queen with comforts and necessaries and to have taken care of the royal children. But he put the question for the king's trial from the chair, and continued to act as speaker after the king's execution. He still continued to use his influence in favour of the royalists, whenever this was possible without imperilling his own interests, and he saved the lives of both the earl of Norwich (8th March 1649) and Sir W. D'Avenant (3rd July 1650) by his casting vote. The removal of the king had left the parliament supreme; and Lenthall as its representative, though holding little real power, was the first man in the state.

His speakership continued till the 20th of April 1653, when the Long Parliament was summarily expelled. Cromwell directed Colonel Harrison, on the refusal of Lenthall to quit the chair, to pull him out—and Lenthall submitted to the show of force. He took no part in politics till the assembling of the first protectorate parliament, on the 3rd of September 1654, in which he sat as member for Oxfordshire. He was again chosen speaker, his former experience and his pliability of character being his chief recommendations. In the second protectorate parliament, summoned by Cromwell on the 17th of September 1656, Lenthall was again chosen member for Oxfordshire, but had some difficulty in obtaining admission, and was not re-elected speaker. He supported Cromwell's administration, and was active in urging the protector to take the title of king. In spite of his services, Lenthall was not included by Cromwell in his new House of Lords, and was much disappointed and crestfallen at his omission. The protector, hearing of his "grievous complaint," sent him a writ, and Lenthall was elated at believing he had secured a peerage. After Cromwell's death, the officers, having determined to recall the "Rump" Parliament, assembled at Lenthall's house at the Rolls (6th May 1659), to desire him to send out the writs. Lenthall, however, had no wish to resume his duties as speaker, preferring the House of Lords, and made various excuses for not complying. Nevertheless, upon the officers threatening to summon the parliament without his aid, and hearing the next morning that several members had assembled, he led the procession to the parliament house. Lenthall was now restored to the position of dignity which he had filled before. He was temporarily made keeper of the new great seal (14th of May). On the 6th of June it was voted that all commissions should be signed by Lenthall and not by the commander-in-chief. His exalted position, however, was not left long unassailed. On the 13th of October Lambert placed soldiers round the House and prevented the members from assembling. Lenthall's coach was stopped as he was entering Palace Yard, the mace was seized and he was obliged to return. The army, however, soon returned to their allegiance to the parliament. On the 24th of December they marched to Lenthall's house, and expressed their sorrow. On the 29th the speaker received the thanks of the reassembled parliament.

Lenthall now turned his attention to bring about the Restoration. He "very violently" opposed the oath abjuring the house of Stuart, now sought to be imposed by the republican faction on the parliament, and absented himself from the House for ten days, to avoid, it was said, any responsibility for the bill. He had been in communication with Monk for some time, and on Monk entering London with his army (3rd February 1660) Lenthall met him in front of Somerset House. On the 6th of February Monk visited the House of Commons, when Lenthall pronounced a speech of thanks. On the 28th of March Lenthall forwarded to the king a paper containing "Heads of Advice." According to Monk, he "was very active for the restoring of His Majesty and performed many services . . . which could not have been soe well effected without his helpe." Lenthall notwithstanding found himself in disgrace at the Restoration. In spite of Monk's recommendation, he was not elected by Oxford University for the Convention Parliament, nor was he allowed by the king, though he had sent him a present of £3000, to remain master of the rolls. On the 11th of June he was included by the House of Commons, in spite of a recommendatory letter from Monk, among the twenty persons excepted from the act of indemnity and subject to penalties not extending to life. In the House of Lords, however, Monk's testimony and intercession were effectual, and Lenthall was only declared incapable of holding for the future any public office. His last public act was a disgraceful one. Unmindful now of the privileges of parliament, he consented to appear as a witness against the regicide Thomas Scot, for words spoken in the House of Commons while Lenthall was in the chair. It was probably after this that he was allowed to present himself at court, and his contemporaries took a malicious glee in telling how "when, with some difficulty, he obtained leave to kiss the king's hand he, out of guilt, fell backward, as he was kneeling."

Lenthall died on the 3rd of September 1662. In his will he desired to be buried without any state and without a monument, "but at the utmost a plain stone with this superscription only, *Vermis sum*, acknowledging myself to be unworthy of the least outward regard in this world and unworthy of any remembrance that hath been so great a sinner." He was held in little honour by his contemporaries, and was universally regarded as a time-server. He was, however, a man of good intentions, strong family affections and considerable ability. Unfortunately he was called by the irony of fate to fill a great office, in which.

governed constantly by fears for his person and estate, he was seduced into a series of unworthy actions. He left one son, Sir John Lenthall, who had descendants. His brother, Sir John Lenthall, who, it was said, had too much influence with him, was notorious for his extortions as keeper of the King's Bench prison.

See C. H. Firth in the *Dict. Nat. Biog.*; Wood (ed. Bliss), *Ath. Oxon.* iii. 603, who gives a list of his printed speeches and letters; Foss, *Lives of the Judges*, vi. 447; and J. A. Manning, *Lives of the Speakers of the House of Commons.* There are numerous references to Lenthall in his official capacity, and letters written by and to him, in the Calendar of State Papers, Domestic Series, and in various MSS. calendared in the Hist. MSS. Commission Series. See also D'Ewes's *Diary*, in the Harleian Collection, British Museum, some extracts from which have been given by J. Forster, *Case of the Five Members*, 233 sq.; and *Notes and Queries*, ser. iii., vii. 45 ("Lenthall's Lamentation"), viii., i. 165, 338, 2, ix., xi. 57.

LENTIL, the seed of *Lens esculenta* (also known as *Ervum Lens*), a small annual of the vetch tribe. The plant varies from 6 to 18 in. in height, and has many long ascending branches. The leaves are alternate, with six pairs of oblong-linear, obtuse, mucronate leaflets. The flowers, two to four in number, are of a pale blue colour, and are borne in the axils of the leaves, on a slender footstalk nearly equalling the leaves in length; they are produced in June or early in July. The pods are about ½ in. long, broadly oblong, slightly inflated, and contain two seeds, which are of the shape of a doubly convex lens, and about ⅙ in. in diameter. There are several cultivated varieties of the plant, differing in size, hairiness and colour of the leaves, flowers and seeds. The last may be more or less compressed in shape, and in colour may vary from yellow or grey to dark brown; they are also sometimes mottled or speckled. In English commerce two kinds of lentils are principally met with, French and Egyptian. The former are usually sold entire, and are of an ash-grey colour externally and of a yellow tint within; the latter are usually sold like split peas, without the seed coat, and consist of the reddish-yellow cotyledons, which are smaller and rounder than those of the French lentil; the seed coat when present is of a dark brown colour. Considerable quantities of lentils are also imported into the United States.

The native country of the lentil is not known. It was probably one of the first plants brought under cultivation by mankind; lentils have been found in the lake dwellings of St Peter's Island, Lake of Bienne, which are of the Bronze age. The name ʽ*adas* (Heb. עדשׁ) appears to be an original Semitic word, and the red pottage of lentils for which Esau sold his birthright (Gen. xxv. 34) was apparently made from the red Egyptian lentil. This lentil is cultivated in one or other variety in India, Persia, Syria, Egypt, Nubia and North Africa, and in Europe, along the coast of the Mediterranean, and as far north as Germany, Holland and France. In Egypt, Syria and other Eastern countries the parched seeds are exposed for sale in shops, and esteemed the best food to carry on long journeys. Lentils form a chief ingredient in the Spanish *puchero*, and are used in a similar way in France and other countries. For this purpose they are usually sold in the shelled state.

The reddish variety of the lentil (*lentillon d'hiver*) is the kind most esteemed in Paris on account of the superior flavour of its smaller seeds. It is sown in autumn either with a cereal crop or alone, and is cultivated chiefly in the north and east of France. The large or common variety, *lentille large blonde*, cultivated in Lorraine and at Gallardon (Eure-et-Loir), and largely in Germany, is the most productive, but is less esteemed. This kind has very small whitish flowers, two or rarely three on a footstalk, and the pods are generally one-seeded, the seeds being of a whitish or cream colour, about ⅜ of an inch broad and ⅛ in. thick. A single plant produces from 100 to 150 pods, which are flattened, about ¾ in. long and ½ in. broad. Another variety, with seeds similar in form and colour to the last, but of much smaller size, is known as the *lentillon de Mars.* It is sown in spring. This variety and the *lentille large* are both sometimes called the *lentille à la reine.* A small variety, *lentille verte du Puy*, cultivated chiefly in the departments of Haute Loire and Cantal, is also grown as a vegetable and for forage. The Egyptian lentil was introduced into Britain in 1820. It has blue flowers. Another species of lentil, *Ervum monanthos*, is grown in France about Orleans and elsewhere under the name of *jarosse* and *jarande.* It is, according to Vilmorin, one of the best kinds of green food to grow on a poor dry sandy soil; on calcareous soil it does not succeed so well. It is usually sown in autumn with a little rye or winter oats, at the rate of a hectolitre to a hectare.

The lentil prefers a light warm sandy soil; on rich land it runs to leaf and produces but few pods. The seeds are sown in March or April or early in May, according to the climate of the country, as they cannot endure night frosts. If for fodder they are sown broadcast, but in drills if the ripe seeds are required. The pods are gathered in August or September, as soon as they begin to turn brown—the plants being pulled up like flax while the foliage is still green, and on a dry day lest the pods split in drying and loss of seed takes place. Lentils keep best in the husk so far as flavour is concerned, and will keep good in this way for two years either for sowing or for food. An acre of ground yields on an average about 11 cwt. of seed and 30 cwt. of straw. The amount and character of the mineral matter requisite in the soil may be judged from the analysis of the ash, which in the seeds has as its chief ingredients—potash 34·6% soda 9·5, lime 6·3, phosphoric acid 36·2, chloride of sodium 7·6, while in the straw the percentages are—potash 10·8, lime 52·3, silica 17·6, phosphoric acid 12·3, chloride of sodium 2·1.

Lentils have attracted considerable notice among vegetarians as a food material, especially for soup. A Hindu proverb says, "Rice is good, but lentils are my life." The husk of the seed is indigestible, and to cook lentils properly requires at least two and a half hours, but they are richer in nutritious matter than almost any other kind of pulse, containing, according to Payen's analysis, 25·2% of nitrogenous matter (legumin), 56% of starch and 2·6% of fatty matter. Fresenius's analysis differs in giving only 35% of starch; Einhoff gives 32·81 of starch and 37·82% of nitrogenous matter. Lentils are more properly the food of the poor in all countries where they are grown, and have often been spurned when better food could be obtained, hence the proverb *Dives factus jam desiit gaudere lente.* The seeds are said to be good for pigeons, or mixed in a ground state with potatoes or barley for fattening pigs. The herbage is highly esteemed as green food for suckling ewes and all kinds of cattle (being said to increase the yield of milk), also for calves and lambs. Haller says that lentils are so flatulent as to kill horses. They were also believed to be the cause of severe scrofulous disorders common in Egypt. This bad reputation may possibly be due to the substitution of the seeds of the bitter vetch or tare lentil, *Ervum Ervilia*, a plant which closely resembles the true lentil in height, habit, flower and pod, but whose seeds are without doubt possessed of deleterious properties—producing weakness or even paralysis of the extremities in horses which have partaken of them. The poisonous principle seems to reside chiefly in the bitter seed coat, and can apparently be removed by steeping in water, since Gerard, speaking of the "bitter vetch" (*E. Ervilia*), says "kine in Asia and in most other countries do eat thereof, being made sweet by steeping in water." The seed of *E. Ervilia* is about the same size and almost exactly of the same reddish-brown colour as that of the Egyptian lentil, and when the seed coat is removed they are both of the same orange red hue, but the former is not so bright as the latter. The shape is the best means of distinguishing the two seeds, that of *E. Ervilia* being obtusely triangular.

Sea-lentil is a name sometimes applied to the gulfweed *Sargassum vulgare.*

LENTULUS, the name of a Roman patrician family of the Cornelian gens, derived from *lentes* ("lentils"), which its oldest members were fond of cultivating (according to Pliny, *Nat. Hist.* xviii. 3, 10). The word *Lentulitas* ("Lentulism"; cf. *Appietas*) is coined by Cicero (*Ad Fam.* iii. 7, 5) to express the attributes of a pronounced aristocrat. The three first of the name were L. Cornelius Lentulus (consul 327 B.C.), Servius Cornelius Lentulus (consul 303) and L. Cornelius Lentulus Caudinus (consul 275). Their connexion with the later Lentuli (especially those of the Ciceronian period) is very obscure and difficult to establish. The following members of the family deserve mention.

Publius Cornelius Lentulus, nicknamed Sura, one of the chief figures in the Catilinarian conspiracy. When accused by Sulla (to whom he had been quaestor in 81 B.C.) of having squandered the public money, he refused to render any account, but insolently held out the calf of his leg (*sura*), on which part of the person boys were punished when they made mistakes in playing ball. He was praetor in 75, governor of Sicily 74, consul 71. In 70, being expelled from the senate with a number of others for immorality, he joined Catiline. Relying upon a Sibylline oracle that three Cornelii should be rulers of Rome, Lentulus regarded himself as the destined successor of Cornelius Sulla and Cornelius Cinna. When Catiline left Rome after Cicero's first speech *In Catilinam*, Lentulus took his place as chief of the conspirators in the city. In conjunction with C. Cornelius Cethegus, he undertook to murder Cicero and set fire to Rome, but the plot failed owing to his timidity and indiscretion. Ambassadors from the Allobroges being at the time in Rome, the bearers of a complaint against the oppressions of provincial governors, Lentulus made overtures to them, with the object of obtaining armed assistance. Pretending to fall in with his views, the ambassadors obtained a written agreement signed by the chief conspirators, and informed Q. Fabius Sanga, their "patron" in Rome, who in his turn acquainted Cicero. The conspirators were arrested and forced to admit their guilt. Lentulus was compelled to abdicate his praetorship, and, as it was feared that there might be an attempt to rescue him, he was put to death in the Tullianum on the 5th of December 63.

See Dio Cassius xxxvii. 30, xlvi. 20; Plutarch, *Cicero*, 17; Sallust, *Catilina*; Cicero, *In Catilinam*, iii., iv.; *Pro Sulla*, 25; also CATILINE.

PUBLIUS CORNELIUS LENTULUS, called SPINTHER from his likeness to an actor of that name, one of the chief adherents of the Pompeian party. In 63 B.C. he was curule aedile, assisted Cicero in the suppression of the Catilinarian conspiracy, and distinguished himself by the splendour of the games he provided. Praetor in 60, he obtained the governorship of Hispania Citerior (59) through the support of Caesar, to whom he was also indebted for his election to the consulship (57). Lentulus played a prominent part in the recall of Cicero from exile, and although a temporary coolness seems to have arisen between them, Cicero speaks of him in most grateful terms. From 56–53 Lentulus was governor of the province of Cilicia (with Cyprus) and during that time was commissioned by the senate to restore Ptolemy XI. Auletes to his kingdom (see PTOLEMIES). The Sibylline books, however, declared that the king must not be restored by force of arms, at the risk of peril to Rome. As a provincial governor, Lentulus appears to have looked after the interests of his subjects, and did not enrich himself at their expense. In spite of his indebtedness to Caesar, Lentulus joined the Pompeians on the outbreak of civil war (49). The generosity with which he was treated by Caesar after the capitulation of Corfinium made him hesitate, but he finally decided in favour of Pompey. After the battle of Pharsalus, Lentulus escaped to Rhodes, where he was at first refused admission, although he subsequently found an asylum there (Cicero, *Ad Att.* xi. 13. 1). According to Aurelius Victor (*De vir. ill.* lxxviii., 9, if the reading be correct), he subsequently fell into Caesar's hands and was put to death.

See Caesar, *Bell. Civ.* i. 15-23, iii. 102; Plutarch, *Pomp.* 49; Valerius Maximus ix. 14, 4; many letters of Cicero, especially *Ad Fam.* i. 1-9.

LUCIUS CORNELIUS LENTULUS, surnamed CRUS or CRUSCELLO (for what reason is unknown), member of the anti-Caesarian party. In 61 B.C. he was the chief accuser of P. Clodius (*q.v.*) in the affair of the festival of Bona Dea. When consul (49) he advised the rejection of all peace terms offered by Caesar, and declared that, if the senate did not at once decide upon opposing him by force of arms, he would act upon his own responsibility. There seems no reason to doubt that Lentulus was mainly inspired by selfish motives, and hoped to find in civil war an opportunity for his own aggrandizement. But in spite of his brave words he fled in haste from Rome as soon as he heard of Caesar's advance, and crossed over to Greece. After Pharsalus, he made his way to Rhodes (but was refused admission), thence, by way of Cyprus, to Egypt. He landed at Pelusium the day after the murder of Pompey, was immediately seized by Ptolemy, imprisoned, and put to death.

See Caesar, *Bell. Civ.* i. 4, iii. 104; Plutarch, *Pompey*, 80.

A full account of the different Cornelii Lentuli, with genealogical table, will be found in Pauly-Wissowa's *Realencyclopädie*, iv. pt. 1, p. 1355 (1900) (s.v. "Cornelius"); see also V. de Vit, *Onomasticon*, ii. 433.

LENZ, JAKOB MICHAEL REINHOLD (1751–1792), German poet, was born at Sesswegen in Livonia, the son of the village pastor, on the 12th of January 1751. He removed with his parents to Dorpat in 1759, and soon began to compose sacred odes, in the manner of Klopstock. In 1768 he entered the university of Königsberg as a student of theology, and in 1771 accompanied, as tutor, two young German nobles, named von Kleist, to Strassburg, where they were to enter the French army. In Strassburg Lenz was received into the literary circle that gathered round Friedrich Rudolf Salzmann (1749–1821) and became acquainted with Goethe, at that time a student at the university. In order to be close to his young pupils, Lenz had to remove to Fort Louis in the neighbourhood, and while here became deeply enamoured of Goethe's friend, Friederike Elisabeth Brion (1752–1813), daughter of the pastor of Sesenheim. Lenz endeavoured, after Goethe's departure from Strassburg, to replace the great poet in her affections, and to her he poured out songs and poems (*Die Liebe auf dem Lande*) which were long attributed to Goethe himself, as was also Lenz's first drama, the comedy, *Der Hofmeister, oder Vorteile der Privaterziehung* (1774). In 1776 he visited Weimar and was most kindly received by the duke; but his rude, overbearing manner and vicious habits led to his expulsion. In 1777 he became insane, and in 1779 was removed from Emmendingen, where J. G. Schlosser (1739–1799), Goethe's brother-in-law, had given him a home, to his native village. Here he lived in great poverty for several years, and then was given, more out of charity than on account of his merits, the appointment of tutor in a pension school near Moscow, where he died on the 24th of May 1792. Lenz, though one of the most talented poets of the *Sturm und Drang* period, presented a strange medley of genius and childishness. His great, though neglected and distorted, abilities found vent in ill-conceived imitations of Shakespeare. His comedies, *Der Hofmeister*; *Der neue Menoza* (1774); *Die Soldaten* (1776); *Die Freunde machen den Philosophen* (1776), though accounted the best of his works, are characterized by unnatural situations and an incongruous mixture of tragedy and comedy.

Lenz's *Gesammelte Schriften* were published by L. Tieck in three volumes (1828); supplementary to these volumes are E. Dorer-Egloff, *J. M. R. Lenz und seine Schriften* (1857) and K. Weinhold, *Dramatischer Nachlass von J. M. R. Lenz* (1884); a selection of Lenz's writings will be found in A. Sauer, *Stürmer und Dränger*, ii.; Kürschner's *Deutsche Nationalliteratur*, vol. lxxx., (1883). See further E. Schmidt, *Lenz und Klinger* (1878); J. Froitzheim, *Lenz und Goethe* (1891); H. Rauch, *Lenz und Shakespeare* (1892); F. Waldmann, *Lenz in Briefen* (1894).

LEO, the name of thirteen popes.

LEO I., who alone of Roman pontiffs shares with Gregory I. the surname of THE GREAT, pope from 440 to 461, was a native of Rome, or, according to a less probable account, of Volterra in Tuscany. Of his family or early life nothing is known; that he was highly cultivated according to the standards of his time is obvious, but it does not appear that he could write Greek, or even that he understood that language. In one of the letters (*Ep.* 104) of Augustine, an acolyte named Leo is mentioned as having been in 418 the bearer of a communication from Sixtus of Rome (afterwards pope) to Aurelius of Carthage against the Pelagians. In 429, when the first unmistakable reference to Pope Leo occurs, he was still only a deacon, but already a man of commanding influence; it was at his suggestion that the *De incarnatione* of the aged Cassianus, having reference to the Nestorian heresy, was composed in that year, and about 431 we find Cyril of Alexandria writing to him that he might prevent the Roman Church from lending its support in any way to the ambitious schemes of Juvenal of Jerusalem. In 440, while Leo was in Gaul, whither he had been sent to compose some differences between Aetius and another general named Albinus, Pope Sixtus III. died. The absent deacon, or rather archdeacon, was unanimously chosen to succeed him, and received consecration on his return six weeks afterwards (September 29). In 443 he began to take measures against the Manichaeans (who since the capture of Carthage by Genseric in 439 had become very numerous at Rome), and in the following year he was able to report to the Italian bishops that some of the heretics had returned to Catholicism, while a large number had been sentenced to perpetual banishment "in accordance with the constitutions of the Christian emperors," and others had fled; in seeking these out the help of the provincial clergy was sought. It was during the earlier years of Leo's pontificate that the events in Gaul occurred which resulted in this triumph over Hilarius of Arles, signalized by the edict of Valentinian III.

(445), denouncing the contumacy of the Gallic bishop, and enacting "that nothing should be done in Gaul, contrary to ancient usage, without the authority of the bishop of Rome, and that the decree of the apostolic see should henceforth be law." In 447 Leo held the correspondence with Turribus of Astorga which led to the condemnation of the Priscillianists by the Spanish national church. In 448 he received with commendation a letter from Eutyches, the Constantinopolitan monk, complaining of the revival of the Nestorian heresy there; and in the following year Eutyches wrote his circular, appealing against the sentence which at the instance of Eusebius of Dorylaeum had been passed against him at a synod held in Constantinople under the presidency of the patriarch Flavian, and asking papal support at the oecumenical council at that time under summons to meet at Ephesus. The result of a correspondence was that Leo by his legates sent to Flavian that famous epistle in which he sets forth with great fulness of detail the doctrine ever since recognized as orthodox regarding the union of the two natures in the one person of Jesus Christ. The events at the "robber" synod at Ephesus belong to general church history rather than to the biography of Leo; his letter, though submitted, was not read by the assembled fathers, and the papal legates had some difficulty in escaping with their lives from the violence of the theologians who, not content with deposing Flavian and Eusebius, shouted for the dividing of those who divided Christ. When the news of the result of this oecumenical council (oecumenical in every circumstance except that it was not presided over by the pope) reached Rome, Leo wrote to Theodosius "with groanings and tears," requesting the emperor to sanction another council, to be held this time, however, in Italy. In this petition he was supported by Valentinian III., by the empress-mother Galla Placidia and by the empress Eudoxia, but the appeal was made in vain. A change, however, was brought about by the accession in the following year of Marcian, who three days after coming to the throne published an edict bringing within the scope of the penal laws against heretics the supporters of the dogmas of Apollinaris and Eutyches. To convoke a synod in which greater orthodoxy might reasonably be expected was in these circumstances no longer difficult, but all Leo's efforts to secure that the meeting should take place on Italian soil were unavailing. When the synod of Chalcedon assembled in 451, the papal legates were treated with great respect, and Leo's former letter to Flavian was adopted by acclamation as formulating the creed of the universal church on the subject of the person of Christ. Among the reasons urged by Leo for holding this council in Italy had been the threatening attitude of the Huns; the dreaded irruption took place in the following year (452). After Aquileia had succumbed to Attila's long siege, the conqueror set out for Rome. Near the confluence of the Mincio and the Po he was met by Leo, whose eloquence persuaded him to turn back. Legend has sought to enhance the impressiveness of the occurrence by an unnecessarily imagined miracle. The pope was less successful with Genseric when the Vandal chief arrived under the walls of Rome in 455, but he secured a promise that there should be no incendiarism or murder, and that three of the oldest basilicas should be exempt from plunder—a promise which seems to have been faithfully observed. Leo died on the 10th of November 461, the liturgical anniversary being the 11th of April. His successor was Hilarius or Hilarus, who had been one of the papal legates at the "robber" synod in 449.

The title of *doctor ecclesiae* was given to Leo by Benedict XIV. As bishop of the diocese of Rome, Leo distinguished himself above all his predecessors by his preaching, to which he devoted himself with great zeal and success. From his short and pithy *Sermones* many of the lessons now to be found in the Roman breviary have been taken. Viewed in conjunction with his voluminous correspondence, the sermons sufficiently explain the secret of his greatness, which chiefly lay in the extraordinary strength and purity of his convictions as to the primacy of the successors of St Peter at a time when the civil and ecclesiastical troubles of the civilized world made men willing enough to submit themselves to any authority whatsoever that could establish its right to exist by courage, honesty and knowledge of affairs.

The works of Leo I. were first collectively edited by Quesnel (Lyons, 1700), and again, on the basis of this, in what is now the standard edition by Ballerini (Venice, 1753–1756). Ninety-three *Sermones* and one hundred and seventy-three *Epistolae* occupy the first volume; the second contains the *Liber Sacramentorum*, usually attributed to Leo, and the *De Vocatione Omnium Gentium*, also ascribed, by Quesnel and others, to him, but more probably the production of a certain Prosper, of whom nothing further is known. The works of Hilary of Arles are appended.

Leo II., pope from August 682 to July 683, was a Sicilian by birth, and succeeded Agatho I. Agatho had been represented at the sixth oecumenical council (that of Constantinople in 681), where Pope Honorius I. was anathematized for his views in the Monothelite controversy as a favourer of heresy, and the only fact of permanent historical interest with regard to Leo is that he wrote once and again in approbation of the decision of the council and in condemnation of Honorius, whom he regarded as one who *profana proditione immaculatam fidem subvertere conatus est.* In their bearing upon the question of papal infallibility these words have excited considerable attention and controversy, and prominence is given to the circumstance that in the Greek text of the letter to the emperor in which the phrase occurs the milder expression παρεχώρησεν (*subverti permisit*) is used for *subvertere conatus est.* This Hefele in his *Conciliengeschichte* (iii. 294) regards as alone expressing the true meaning of Leo. It was during Leo's pontificate that the dependence of the see of Ravenna upon that of Rome was finally settled by imperial edict. Benedict II. succeeded him.

Leo III., whose pontificate (795–816) covered the last eighteen years of the reign of Charlemagne, was a native of Rome, and having been chosen successor of Adrian I. on the 26th of December 795, was consecrated to the office on the following day. His first act was to send to Charles as patrician the standard of Rome along with the keys of the sepulchre of St Peter and of the city; a gracious and condescending letter in reply made it still more clear where all real power at that moment lay. For more than three years his term of office was uneventful; but at the end of that period the feelings of disappointment which had secretly been rankling in the breasts of Paschalis and Campulus, nephews of Adrian I., who had received from him the offices of *primicerius* and *sacellarius* respectively, suddenly manifested themselves in an organized attack upon Leo as he was riding in procession through the city on the day of the Greater Litany (25th April 799); the object of his assailants was, by depriving him of his eyes and tongue, to disqualify him for the papal office, and, although they were unsuccessful in this attempt, he found it necessary to accept the protection of Winegis, the Frankish duke of Spoleto, who came to the rescue. Having vainly requested the presence of Charles in Rome, Leo went beyond the Alps to meet the king at Paderborn; he was received with much ceremony and respect, but his enemies having sent in serious written charges, of which the character is not now known, Charles decided to appoint both the pope and his accusers to appear as parties before him when he should have arrived in Rome. Leo returned in great state to his diocese, and was received with honour; Charles, who did not arrive until November in the following year, lost no time in assuming the office of a judge, and the result of his investigation was the acquittal of the pope, who at the same time, however, was permitted or rather required to clear himself by the oath of compurgation. The coronation of the emperor followed two days afterwards; its effect was to bring out with increased clearness the personally subordinate position of Leo. The decision of the emperor, however, secured for Leo's pontificate an external peace which was only broken after the accession of Louis the Pious. His enemies began to renew their attacks; the violent repression of a conspiracy led to an open rebellion at Rome; serious charges were once more brought against him, when he was overtaken by death in 816. It was under this pontificate that Felix of Urgel, the adoptianist, was anathematized (798) by a

Roman synod. Leo at another synod held in Rome in 810 admitted the dogmatic correctness of the *filoque*, but deprecated its introduction into the creed. On this point, however, the Frankish Church persevered in the course it had already initiated. Leo's successor was Stephen IV.

Leo IV., pope from 847 to 855, was a Roman by birth, and succeeded Sergius II. His pontificate was chiefly distinguished by his efforts to repair the damage done by the Saracens during the reign of his predecessor to various churches of the city, especially those of St Peter and St Paul. It was he who built and fortified the suburb on the right bank of the Tiber still known as the Civitas Leonina. A frightful conflagration, which he is said to have extinguished by his prayers, is the subject of Raphael's great work in the Sala dell' Incendio of the Vatican. He held three synods, one of them (in 850) distinguished by the presence of Louis II., who was crowned emperor on the occasion, but none of them otherwise of importance. The history of the papal struggle with Hincmar of Reims, which began during Leo's pontificate, belongs rather to that of Nicholas I. Benedict III. was Leo's immediate successor.

Leo V., a native of Ardea, was pope for two months in 903 after the death of Benedict IV. He was overthrown and cast into prison by the priest Christopher, who installed himself in his place.

Leo VI. succeeded John X. in 928, and reigned seven months and a few days. He was succeeded by Stephen VIII.

Leo VII., pope from 936 to 939, was preceded by John XI., and followed by Stephen IX.

Leo VIII., pope from 963 to 965, a Roman by birth, held the lay office of *protoscrinius* when he was elected to the papal chair at the instance of Otto the Great by the Roman synod which deposed John XII. in December 963. Having been hurried with unseemly haste through all the intermediate orders, he received consecration two days after his election, which was unacceptable to the people. In February 964, the emperor having withdrawn from the city, Leo found it necessary to seek safety in flight, whereupon he was deposed by a synod held under the presidency of John XII. On the sudden death of the latter, the populace chose Benedict V. as his successor; but Otto, returning and laying siege to the city, compelled their acceptance of Leo. It is usually said that, at the synod which deposed Benedict, Leo conceded to the emperor and his successors as sovereign of Italy full rights of investiture, but the genuineness of the document on which this allegation rests is more than doubtful. Leo VIII. was succeeded by John XIII.

Leo IX., pope from 1049 to 1054, was a native of Upper Alsace, where he was born on the 21st of June 1002. His proper name was Bruno; the family to which he belonged was of noble rank, and through his father he was related to the emperor Conrad II. He was educated at Toul, where he successively became canon and (1026) bishop; in the latter capacity he rendered important political services to his relative Conrad II., and afterwards to Henry III., and at the same time he became widely known as an earnest and reforming ecclesiastic by the zeal he showed in spreading the rule of the order of Cluny. On the death of Damasus II., Bruno was in December 1048, with the concurrence both of the emperor and of the Roman delegates, selected his successor by an assembly at Worms; he stipulated, however, as a condition of his acceptance that he should first proceed to Rome and be canonically elected by the voice of clergy and people. Setting out shortly after Christmas, he had a meeting with abbot Hugo of Cluny at Besançon, where he was joined by the young monk Hildebrand, who afterwards became Pope Gregory VII.; arriving in pilgrim garb at Rome in the following February, he was received with much cordiality, and at his consecration assumed the name of Leo IX. One of his first public acts was to hold the well-known Easter synod of 1049, at which celibacy of the clergy (down to the rank of subdeacon) was anew enjoined, and where he at least succeeded in making clear his own convictions against every kind of simony. The greater part of the year that followed was occupied in one of those progresses through Italy, Germany and France which form a marked feature in Leo's pontificate. After presiding over a synod at Pavia, he joined the emperor Henry III. in Saxony, and accompanied him to Cologne and Aix-la-Chapelle; to Reims he also summoned a meeting of the higher clergy, by which several important reforming decrees were passed. At Mainz also he held a council, at which the Italian and French as well as the German clergy were represented, and ambassadors of the Greek emperor were present; here too simony and the marriage of the clergy were the principal matters dealt with. After his return to Rome he held (29th April 1050) another Easter synod, which was occupied largely with the controversy about the teachings of Berengarius of Tours; in the same year he presided over provincial synods at Salerno, Siponto and Vercelli, and in September revisited Germany, returning to Rome in time for a third Easter synod, at which the question of the reordination of those who had been ordained by simonists was considered. In 1052 he joined the emperor at Pressburg, and vainly sought to secure the submission of the Hungarians; and at Regensburg, Bamberg and Worms the papal presence was marked by various ecclesiastical solemnities. After a fourth Easter synod in 1053 Leo set out against the Normans in the south with an army of Italians and German volunteers, but his forces sustained a total defeat at Astagnum near Civitella (18th June 1053); on going out, however, from the city to meet the enemy he was received with every token of submission, relief from the pressure of his ban was implored and fidelity and homage were sworn. From June 1053 to March 1054 he was nevertheless detained at Benevento in honourable captivity; he did not long survive his return to Rome, where he died on the 19th of April 1054. He was succeeded by Victor II.

Leo X. [Giovanni de' Medici] (1475–1521), pope from the 11th of March 1513 to the 1st of December 1521, was the second son of Lorenzo de' Medici, called the Magnificent, and was born at Florence on the 11th of December 1475. Destined from his birth for the church, he received the tonsure at the age of seven and was soon loaded with rich benefices and preferments. His father prevailed on Innocent VIII. to name him cardinal-deacon of Sta Maria in Dominica in March 1489, although he was not allowed to wear the insignia or share in the deliberations of the college until three years later. Meanwhile he received a careful education at Lorenzo's brilliant humanistic court under such men as Angelo Poliziano, the classical scholar, Pico della Mirandola, the philosopher and theologian, the pious Marsilio Ficino who endeavoured to unite the Platonic cult with Christianity and the poet Bernardo Dovizio Bibbiena. From 1489 to 1491 he studied theology and canon law at Pisa under Filippo Decio and Bartolomeo Sozzini. On the 23rd of March 1492 he was formally admitted into the sacred college and took up his residence at Rome, receiving a letter of advice from his father which ranks among the wisest of its kind. The death of Lorenzo on the 8th of April, however, called the seventeen-year-old cardinal to Florence. He participated in the conclave which followed the death of Innocent VIII. in July 1492 and opposed the election of Cardinal Borgia. He made his home with his elder brother Piero at Florence throughout the agitation of Savonarola and the invasion of Charles VIII. of France, until the uprising of the Florentines and the expulsion of the Medici in November 1494. While Piero found refuge at Venice and Urbino, Cardinal Giovanni travelled in Germany, in the Netherlands and in France. In May 1500 he returned to Rome, where he was received with outward cordiality by Alexander VI., and where he lived for several years immersed in art and literature. In 1503 he welcomed the accession of Julius II. to the pontificate; the death of Piero de' Medici in the same year made Giovanni head of his family. On the 1st of October 1511 he was appointed papal legate of Bologna and the Romagna, and when the Florentine republic declared in favour of the schismatic Pisans Julius II. sent him against his native city at the head of the papal army. This and other attempts to regain political control of Florence were frustrated, until a bloodless revolution permitted the return of the Medici on the 14th of September 1512. Giovanni's younger brother Giuliano was placed at the head of the republic, but the cardinal actually managed the government. Julius II. died in February 1513, and the conclave, after a stormy seven day's session, united on Cardinal de' Medici as the candidate of the younger cardinals. He was ordained to the priesthood on the 15th of March, consecrated bishop on the 17th, and enthroned with the name of Leo X. on the 19th. There is no evidence of simony in the conclave, and Leo's election was hailed with delight by the Romans on account of his reputation for liberality, kindliness and love of peace. Following the example of many of his predecessors, he promptly repudiated his election "capitulation" as an infringement on the divinely bestowed prerogatives of the Holy See.

Many problems confronted Leo X. on his accession. He must preserve the papal conquests which he had inherited from Alexander VI. and Julius II. He must minimize foreign influence, whether French, Spanish or German, in Italy. He must put an end to the Pisan schism and settle the other troubles incident to the French invasion. He must restore the French Church to Catholic unity, abolish the pragmatic sanction of Bourges, and bring to a successful close the Lateran council convoked by his predecessor. He must stay the victorious advance of the Turks. He must quiet the disagreeable wranglings of the German humanists. Other problems connected with his family interests served to complicate the situation and eventually to prevent the successful consummation of many of his plans. At the very time of Leo's accession Louis XII. of France, in alliance with Venice, was making a determined effort to regain the duchy of Milan, and the pope, after fruitless endeavours to maintain peace, joined the league of Mechlin on the 5th of April 1513 with the emperor Maximilian I., Ferdinand I. of Spain and Henry VIII. of England. The French and Venetians were at first successful, but on the 6th of June met overwhelming defeat at Novara. The Venetians continued the struggle until October. On the 19th of December the fifth Lateran council, which had been reopened by Leo in April, ratified the peace with Louis XII. and registered the conclusion of the Pisan schism. While the council was engaged in planning a crusade and in considering the reform of the clergy, a new crisis occurred between the pope and the king of France. Francis I., who succeeded Louis XII. on the 1st of January 1515, was an enthusiastic young prince, dominated by the ambition of recovering Milan and Naples. Leo at once formed a new league with the emperor and the king of Spain, and to ensure English support made Wolsey a cardinal. Francis entered Italy in August and on the 14th of September won the battle of Marignano. The pope in October signed an agreement binding him to withdraw his troops from Parma and Piacenza, which had been previously gained at the expense of the duchy of Milan, on condition of French protection at Rome and Florence. The king of Spain wrote to his ambassador at Rome "that His Holiness had hitherto played a double game and that all his zeal to drive the French from Italy had been only a mask"; this reproach seemed to receive some confirmation when Leo X. held a secret conference with Francis at Bologna in December 1515. The ostensible subjects under consideration were the establishment of peace between France, Venice and the Empire, with a view to an expedition against the Turks, and the ecclesiastical affairs of France. Precisely what was arranged is unknown. During these two or three years of incessant political intrigue and warfare it was not to be expected that the Lateran council should accomplish much. Its three main objects, the peace of Christendom, the crusade and the reform of the church, could be secured only by general agreement among the powers, and Leo or the council failed to secure such agreement. Its most important achievements were the registration at its eleventh sitting (19th December 1516) of the abolition of the pragmatic sanction, which the popes since Pius II. had unanimously condemned, and the confirmation of the concordat between Leo X. and Francis I., which was destined to regulate the relations between the French Church and the Holy See until the Revolution. Leo closed the council on the 16th of March 1517. It had ended the schism, ratified the censorship of books introduced by Alexander VI. and imposed tithes for a war against the Turks. It raised no voice against the primacy of the pope.

The year which marked the close of the Lateran council was also signalized by Leo's unholy war against the duke of Urbino. The pope was naturally proud of his family and had practised nepotism from the outset. His cousin Giulio, who subsequently became Clement VII., he had made the most influential man in the curia, naming him archbishop of Florence, cardinal and vice-chancellor of the Holy See. Leo had intended his younger brother Giuliano and his nephew Lorenzo for brilliant secular careers. He had named them Roman patricians; the latter he had placed in charge of Florence; the former, for whom he planned to carve out a kingdom in central Italy of Parma, Piacenza, Ferrara and Urbino, he had taken with himself to Rome and married to Filiberta of Savoy. The death of Giuliano in March 1516, however, caused the pope to transfer his ambitions to Lorenzo. At the very time (December 1516) that peace between France, Spain, Venice and the Empire seemed to give some promise of a Christendom united against the Turk, Leo was preparing an enterprise as unscrupulous as any of the similar exploits of Cesare Borgia. He obtained 150,000 ducats towards the expenses of the expedition from Henry VIII. of England, in return for which he entered the imperial league of Spain and England against France. The war lasted from February to September 1517 and ended with the expulsion of the duke and the triumph of Lorenzo; but it revived the nefarious policy of Alexander VI., increased brigandage and anarchy in the States of the Church, hindered the preparations for a crusade and wrecked the papal finances. Guicciardini reckoned the cost of the war to Leo at the prodigious sum of 800,000 ducats. The new duke of Urbino was the Lorenzo de' Medici to whom Machiavelli addressed *The Prince*. His marriage in March 1518 was arranged by the pope with Madeleine la Tour d'Auvergne, a royal princess of France, whose daughter was the Catherine de' Medici celebrated in French history. The war of Urbino was further marked by a crisis in the relations between pope and cardinals. The sacred college had grown especially worldly and troublesome since the time of Sixtus IV., and Leo took advantage of a plot of several of its members to poison him, not only to inflict exemplary punishments by executing one and imprisoning several others, but also to make a radical change in the college. On the 3rd of July 1517 he published the names of thirty-one new cardinals, a number almost unprecedented in the history of the papacy. Some of the nominations were excellent, such as Lorenzo Campeggio, Giambattista Pallavicini, Adrian of Utrecht, Cajetan, Cristoforo Numai and Egidio Canisio. The naming of seven members of prominent Roman families, however, reversed the wise policy of his predecessor which had kept the dangerous factions of the city out of the curia. Other promotions were for political or family considerations or to secure money for the war against Urbino. The pope was accused of having exaggerated the conspiracy of the cardinals for purposes of financial gain, but most of such accusations appear to be unsubstantiated.

Leo, meanwhile, felt the need of staying the advance of the warlike sultan, Selim I., who was threatening western Europe, and made elaborate plans for a crusade. A truce was to be proclaimed throughout Christendom; the pope was to be the arbiter of disputes; the emperor and the king of France were to lead the army; England, Spain and Portugal were to furnish the fleet; and the combined forces were to be directed against Constantinople. Papal diplomacy in the interests of peace failed, however; Cardinal Wolsey made England, not the pope, the arbiter between France and the Empire; and much of the money collected for the crusade from tithes and indulgences was spent in other ways. In 1519 Hungary concluded a three years' truce with Selim I., but the succeeding sultan, Suliman the Magnificent, renewed the war in June 1521 and on the 28th of August captured the citadel of Belgrade. The pope was greatly alarmed, and although he was then involved in war with France he sent about 30,000 ducats to the Hungarians. Leo treated the Uniate Greeks with great loyalty, and by bull of the 18th of May 1521 forbade Latin clergy to celebrate mass in Greek churches and Latin bishops to ordain Greek clergy.

These provisions were later strengthened by Clement VII. and Paul III. and went far to settle the chronic disputes between the Latins and Uniate Greeks.

Leo was disturbed throughout his pontificate by heresy and schism. The dispute between Reuchlin and Pfefferkorn relative to the Talmud and other Jewish books was referred to the pope in September 1513. He in turn referred it to the bishops of Spires and Worms, who gave decision in March 1514 in favour of Reuchlin. After the appeal of the inquisitor-general, Hochstraten, and the appearance of the *Epistolae obscurorum virorum*, however, Leo annulled the decision (June 1520) and imposed silence on Reuchlin. The pope had already authorized the extensive grant of indulgences in order to secure funds for the crusade and more particularly for the rebuilding of St Peter's at Rome. Against the attendant abuses the Augustinian monk Martin Luther (*q.v.*) posted (31st October 1517) on the church door at Wittenberg his famous ninety-five theses, which were the signal for widespread revolt against the church. Although Leo did not fully comprehend the import of the movement, he directed (3rd February 1518) the vicar-general of the Augustinians to impose silence on the monks. On the 30th of May Luther sent an explanation of his theses to the pope; on the 7th of August he was cited to appear at Rome. An arrangement was effected, however, whereby that citation was cancelled, and Luther betook himself in October 1518 to Augsburg to meet the papal legate, Cardinal Cajetan, who was attending the imperial diet convened by the emperor Maximilian to impose the tithes for the Turkish war and to elect a king of the Romans; but neither the arguments of the learned cardinal, nor the dogmatic papal bull of the 9th of November to the effect that all Christians must believe in the pope's power to grant indulgences, moved Luther to retract. A year of fruitless negotiation followed, during which the pamphlets of the reformer set all Germany on fire. A papal bull of the 15th of June 1520, which condemned forty-one propositions extracted from Luther's teachings, was taken to Germany by Eck in his capacity of apostolic nuncio, published by him and the legates Alexander and Caracciola, and burned by Luther on the 10th of December at Wittenberg. Leo then formally excommunicated Luther by bull of the 3rd of January 1521; and in a brief directed the emperor to take energetic measures against heresy. On the 26th of May 1521 the emperor signed the edict of the diet of Worms, which placed Luther under the ban of the Empire; on the 21st of the same month Henry VIII. of England sent to Leo his book against Luther on the seven sacraments. The pope, after careful consideration, conferred on the king of England the title "Defender of the Faith" by bull of the 11th of October 1521. Neither the imperial edict nor the work of Henry VIII. stayed the Lutheran movement, and Luther himself, safe in the solitude of the Wartburg, survived Leo X. It was under Leo X. also that the Protestant movement had its beginning in Scandinavia. The pope had repeatedly used the rich northern benefices to reward members of the Roman curia, and towards the close of the year 1516 he sent the grasping and impolitic Arcimboldi as papal nuncio to Denmark to collect money for St Peter's. King Christian II. took advantage of the growing dissatisfaction on the part of the native clergy toward the papal government, and of Arcimboldi's interference in the Swedish revolt, in order to expel the nuncio and summon (1520) Lutheran theologians to Copenhagen. Christian approved a plan by which a formal state church should be established in Denmark, all appeals to Rome should be abolished, and the king and diet should have final jurisdiction in ecclesiastical causes. Leo sent a new nuncio to Copenhagen (1521) in the person of the Minorite Francesco de Potentia, who readily absolved the king and received the rich bishopric of Skara. The pope or his legate, however, took no steps to remove abuses or otherwise reform the Scandinavian churches.

That Leo did not do more to check the tendency toward heresy and schism in Germany and Scandinavia is to be partially explained by the political complications of the time, and by his own preoccupation with schemes of papal and Medicean aggrandizement in Italy. The death of the emperor Maximilian on the 12th of January 1519 had seriously affected the situation. Leo vacillated between the powerful candidates for the succession, allowing it to appear at first that he favoured Francis I. while really working for the election of some minor German prince. He finally accepted Charles I. of Spain as inevitable, and the election of Charles (28th of June 1519) revealed Leo's desertion of his French alliance, a step facilitated by the death at about the same time of Lorenzo de' Medici and his French wife. Leo was now anxious to unite Ferrara, Parma and Piacenza to the States of the Church. An attempt late in 1519 to seize Ferrara failed, and the pope recognized the need of foreign aid. In May 1521 a treaty of alliance was signed at Rome between him and the emperor. Milan and Genoa were to be taken from France and restored to the Empire, and Parma and Piacenza were to be given to the Church on the expulsion of the French. The expense of enlisting 10,000 Swiss was to be borne equally by pope and emperor. Charles took Florence and the Medici family under his protection and promised to punish all enemies of the Catholic faith. Leo agreed to invest Charles with Naples, to crown him emperor, and to aid in a war against Venice. It was provided that England and the Swiss might join the league. Henry VIII. announced his adherence in August. Francis I. had already begun war with Charles in Navarre, and in Italy, too, the French made the first hostile movement (23rd June 1521). Leo at once announced that he would excommunicate the king of France and release his subjects from their allegiance unless Francis laid down his arms and surrendered Parma and Piacenza. The pope lived to hear the joyful news of the capture of Milan from the French and of the occupation by papal troops of the long-coveted provinces (November 1521). Leo X. died on the 1st of December 1521, so suddenly that the last sacraments could not be administered; but the contemporary suspicions of poison were unfounded. His successor was Adrian VI.

Several minor events of Leo's pontificate are worthy of mention. He was particularly friendly with King Emmanuel of Portugal on account of the latter's missionary enterprises in Asia and Africa. His concordat with Florence (1516) guaranteed the free election of the clergy in that city. His constitution of the 1st of March 1519 condemned the king of Spain's claim to refuse the publication of papal bulls. He maintained close relations with Poland because of the Turkish advance and the Polish contest with the Teutonic Knights. His bull of the 1st of July 1519, which regulated the discipline of the Polish Church, was later transformed into a concordat by Clement VII. Leo showed special favours to the Jews and permitted them to erect a Hebrew printing-press at Rome. He approved the formation of the Oratory of Divine Love, a group of pious men at Rome which later became the Theatine Order, and he canonized Francesco di Paola.

As patron of learning Leo X. deserves a prominent place among the popes. He raised the church to a high rank as the friend of whatever seemed to extend knowledge or to refine and embellish life. He made the capital of Christendom the centre of culture. Every Italian artist and man of letters in an age of singular intellectual brilliancy tasted or hoped to taste of his bounty. While yet a cardinal, he had restored the church of Sta Maria in Domnica after Raphael's designs; and as pope he built S. Giovanni on the Via Giulia after designs by Jacopo Sansovino and pressed forward the work on St Peter's and the Vatican under Raphael and Chigi. His constitution of the 5th of November 1513 reformed the Roman university, which had been neglected by Julius II. He restored all its faculties, gave larger salaries to the professors, and summoned distinguished teachers from afar; and, although it never attained to the importance of Padua or Bologna, it nevertheless possessed in 1514 an excellent faculty of eighty-eight professors. Leo called Theodore Lascaris to Rome to give instruction in Greek, and established a Greek printing-press from which the first Greek book printed at Rome appeared in 1515. He made Raphael custodian of the classical antiquities of Rome and the vicinity. The distinguished Latinists Pietro Bembo (1470–1547) and

Jacopo Sadoleto (1477–1547) were papal secretaries, as well as the famous poet Bernardo Accolti (d.1534). Writers of poetry like Vida (1490–1566), Trissino (1478–1550), and Bibbiena (1470–1520), writers of *novelle* like Bandello, and a hundred other *literati* of the time were bishops, or papal scriptors or abbreviators, or in other papal employ. Leo's lively interest in art and literature, to say nothing of his natural liberality, his nepotism, his political ambitions and necessities, and his immoderate personal luxury, exhausted within two years the hard savings of Julius II., and precipitated a financial crisis from which he never emerged and which was a direct cause of most of the calamities of his pontificate. He created many new offices and shamelessly sold them. He sold cardinals' hats. He sold membership in the "Knights of Peter." He borrowed large sums from bankers, curials, princes and Jews. The Venetian ambassador Gradenigo estimated the paying number of offices on Leo's death at 2150, with a capital value of nearly 3,000,000 ducats and a yearly income of 328,000 ducats. Marino Giorgi reckoned the ordinary income of the pope for the year 1517 at about 580,000 ducats, of which 420,000 came from the States of the Church, 100,000 from annates, and 60,000 from the composition tax instituted by Sixtus IV. These sums, together with the considerable amounts accruing from indulgences, jubilees, and special fees, vanished as quickly as they were received. Then the pope resorted to pawning palace furniture, table plate, jewels, even statues of the apostles. Several banking firms and many individual creditors were ruined by the death of the pope.

In the past many conflicting estimates were made of the character and achievements of the pope during whose pontificate Protestantism first took form. More recent studies have served to produce a fairer and more honest opinion of Leo X. A report of the Venetian ambassador Marino Giorgi bearing date of March 1517 indicates some of his predominant characteristics:—"The pope is a good-natured and extremely free-hearted man, who avoids every difficult situation and above all wants peace; he would not undertake a war himself unless his own personal interests were involved; he loves learning; of canon law and literature he possesses remarkable knowledge; he is, moreover, a very excellent musician." Leo was dignified in appearance and elegant in speech, manners and writing. He enjoyed music and the theatre, art and poetry, the masterpieces of the ancients and the wonderful creations of his contemporaries, the spiritual and the witty—life in every form. It is by no means certain that he made the remark often attributed to him, "Let us enjoy the papacy since God has given it to us," but there is little doubt that he was by nature devoid of moral earnestness or deep religious feeling. On the other hand, in spite of his worldliness, Leo was not an unbeliever; he prayed, fasted, and participated in the services of the church with conscientiousness. To the virtues of liberality, charity and clemency he added the Machiavellian qualities of falsehood and shrewdness, so highly esteemed by the princes of his time. Leo was deemed fortunate by his contemporaries, but an incurable malady, wars, enemies, a conspiracy of cardinals, and the loss of all his nearest relations darkened his days; and he failed entirely in his general policy of expelling foreigners from Italy, of restoring peace throughout Europe, and of prosecuting war against the Turks. He failed to recognize the pressing need of reform within the church and the tremendous dangers which threatened the papal monarchy; and he unpardonably neglected the spiritual needs of the time. He was, however, zealous in firmly establishing the political power of the Holy See; he made it unquestionably supreme in Italy; he successfully restored the papal power in France; and he secured a prominent place in the history of culture.

Authorities.—The life of Leo X. was written shortly after his death by Paolo Giovio, bishop of Nocera, who had known him intimately. Other important contemporary sources are the Italian *History* of the Florentine writer Guicciardini, covering the period 1492–1530 (4 vols., Milan, 1884); the reports of the Venetian ambassadors, Marino Giorgi (1517), Marco Minio (1520) and Luigi Gradenigo (1523), in vol. iii. of the 2nd series of *Le Relazioni degli ambasciatori Veneti*, edited by Alberi (Florence, 1846); and the *Diarii* of the Venetian Marino Sanuto (58 vols., 1879–1903). Other materials for the biography are to be found in the incomplete *Regesta* edited by Joseph Cardinal Hergenröther (Freiburg-i-B., 1884 ff.); in the Turin collection of papal bulls (1859, &c.); in *Il Diario di Leone X. dai volumi manoscritti degli archivi Vaticani della S. Sede connote di M. Armellini* (Rome, 1884); and in "Documenti risguardanti Giovanni de' Medici e il pontifice Leone X.," appendix to vol. 1 of the *Archivio storico Italiano* (Florence, 1842).

See L. Pastor, *Geschichte der Päpste im Zeitalter der Renaissance u. der Glaubensspaltung von der Wahl Leos X. bis zum Tode Klemens VII.* part 1 (Freiburg-i.-B., 1906); M. Creighton, *History of the Papacy*, vol. 6 (1901); F. Gregorovius, *Rome in the Middle Ages*, trans. by Mrs G. W. Hamilton, vol. viii., part 1 (1902); L. von Ranke, *History of the Popes*, vol. i., trans. by E. Foster in the Bohn Library; *Histoire de France*, ed. by E. Lavisse, vol. 5, part 1 (1903); Walter Friedensburg, "Ein rotulus familiae Papst Leos X.," in *Quellen u. Forschungen aus italienischen Archiven u. Bibliotheken*, vol. vi. (1904); W. Roscoe, *Life and Pontificate of Leo X.* (6th ed., 2 vols., 1853), a celebrated biography but considerably out of date in spite of the valuable notes of the German and Italian translators, Henke and Bossi; F. S. Nitti, *Leone X. e la sua politica secondo documenti e carteggi inediti* (Florence, 1892); A. Schulte, *Die Fugger in Rom 1405–1523* (2 vols., Leipzig, 1906); and H. M. Vaughan, *The Medici Popes* (1908). (C. H. Ha.)

Leo XI. (Alessandro de' Medici) was elected pope on the 1st of April 1605, at the age of seventy. He had long been archbishop of Florence and nuncio to Tuscany; and was entirely pro-French in his sympathies. He died on the 27th day of his pontificate, and was succeeded by Paul V.

See the contemporary life by Vitorelli, continuator of Ciaconius, *Vitae et res gestae summorum Pontiff. Rom.*; Ranke, *Popes* (Eng. trans., Austin), ii. 330; v. Reumont, *Gesch. der Stadt Rom.* iii. 2, 604; Brosch, *Gesch. des Kirchenstaates* (1880), i. 350.

Leo XII. (Annibale della Genga), pope from 1823 to 1829, was born of a noble family, near Spoleto, on the 22nd of August 1760. Educated at the Accademia dei Nobili ecclesiastici at Rome, he was ordained priest in 1783, and in 1790 attracted favourable attention by a tactful sermon commemorative of the emperor Joseph II. In 1792 Pius VI. made him his private secretary, in 1793 creating him titular archbishop of Tyre and despatching him to Lucerne as nuncio. In 1794 he was transferred to the nunciature at Cologne, but owing to the war had to make his residence in Augsburg. During the dozen or more years he spent in Germany he was entrusted with several honourable and difficult missions, which brought him into contact with the courts of Dresden, Vienna, Munich and Württemberg, as well as with Napoleon. It is, however, charged at one time during this period that his finances were disordered, and his private life not above suspicion. After the abolition of the States of the Church, he was treated by the French as a state prisoner, and lived for some years at the abbey of Monticelli, solacing himself with music and with bird-shooting, pastimes which he did not eschew even after his election as pope. In 1814 he was chosen to carry the pope's congratulations to Louis XVIII.; in 1816 he was created cardinal-priest of Santa Maria Maggiore, and appointed to the see of Sinigaglia, which he resigned in 1818. In 1820 Pius VII. gave him the distinguished post of cardinal vicar. In the conclave of 1823, in spite of the active opposition of France, he was elected pope by the *zelanti* on the 28th of September. His election had been facilitated because he was thought to be on the edge of the grave; but he unexpectedly rallied. His foreign policy, entrusted at first to Della Somaglia and then to the more able Bernetti, moved in general along lines laid down by Consalvi; and he negotiated certain concordats very advantageous to the papacy. Personally most frugal, Leo reduced taxes, made justice less costly, and was able to find money for certain public improvements; yet he left the finances more confused than he had found them, and even the elaborate jubilee of 1825 did not really mend matters. His domestic policy was one of extreme reaction. He condemned the Bible societies, and under Jesuit influence reorganized the educational system. Severe ghetto laws led many of the Jews to emigrate. He hunted down the *Carbonari* and the Freemasons; he took the strongest measures against political agitation in theatres. A well-nigh ubiquitous system of espionage, perhaps most fruitful when directed against official corruption, sapped the foundations of public confidence. Leo, temperamentally stern, hard-working in spite of bodily infirmity, died at Rome on the 10th of February

1829. The news was received by the populace with unconcealed joy. He was succeeded by Pius VIII.

Authorities.—Artaud de Montor, *Histoire du Pape Léon XII.* (2 vols., 1843; by the secretary of the French embassy in Rome); Brück, "Leo XII.," in Wetzer and Welte's *Kirchenlexikon*, vol. vii. (Freiburg, 1891); F. Nippold, *The Papacy in the 19th Century* (New York, 1900), chap. 5; Benrath, "Leo XII.," in Herzog-Hauck, *Realencyklopädie*, vol. xi. (Leipzig, 1902), 390-393, with bibliography; F. Nielsen, *The History of the Papacy in the 19th century* (1906), vol. ii. 1-30; Lady Blennerhassett, in the *Cambridge Modern History*, vol. x. (1907), 151-154. (W. W. R.*)

Leo XIII. (Gioacchino Pecci) (1810–1903), pope from 1878 to 1903, reckoned the 257th successor of St Peter, was born at Carpineto on the 2nd of March 1810. His family was Sienese in origin, and his father, Colonel Domenico Pecci, had served in the army of Napoleon. His mother, Anna Prosperi, is said to have been a descendant of Rienzi, and was a member of the third order of St Francis. He and his elder brother Giuseppe (known as Cardinal Pecci) received their earliest education from the Jesuits at Viterbo, and completed their education in Rome. In the jubilee year 1825 he was selected by his fellow-students at the Collegium Romanum to head a deputation to Pope Leo XII., whose memory he subsequently cherished and whose name he assumed in 1878. Weak health, consequent on over-study, prevented him from obtaining the highest academical honours, but he graduated as doctor in theology at the age of twenty-two, and then entered the Accademia dei Nobili ecclesiastici, a college in which clergy of aristocratic birth are trained for the diplomatic service of the Roman Church. Two years later Gregory XVI. appointed him a domestic prelate, and bestowed on him, by way of apprenticeship, various minor administrative offices. He was ordained priest on the 31st of December 1837, and a few weeks later was made apostolic delegate of the small papal territory of Benevento, where he had to deal with brigands and smugglers, who enjoyed the protection of some of the noble families of the district. His success here led to his appointment in 1841 as delegate of Perugia, which was at that time a centre of anti-papal secret societies. This post he held for eighteen months only, but in that brief period he obtained a reputation as a social and municipal reformer. In 1843 he was sent as nuncio to Brussels, being first consecrated a bishop (19th February), with the title of archbishop of Damietta. During his three years' residence at the Belgian capital he found ample scope for his gifts as a diplomatist in the education controversy then raging, and as mediator between the Jesuits and the Catholic university of Louvain. He gained the esteem of Leopold I., and was presented to Queen Victoria of England and the Prince Consort. He also made the acquaintance of many Englishmen, Archbishop Whately among them. In January 1846, at the request of the magistrates and people of Perugia, he was appointed bishop of that city with the rank of archbishop; but before returning to Italy he spent February in London, and March and April in Paris. On his arrival in Rome he would, at the request of King Leopold, have been created cardinal but for the death of Gregory XVI. Seven years later, 19th December 1853, he received the red hat from Pius IX. Meanwhile, and throughout his long episcopate of thirty-two years, he foreshadowed the zeal and the enlightened policy later to be displayed in the prolonged period of his pontificate, building and restoring many churches, striving to elevate the intellectual as well as the spiritual tone of his clergy, and showing in his pastoral letters an unusual regard for learning and for social reform. His position in Italy was similar to that of Bishop Dupanloup in France; and, as but a moderate supporter of the policy enunciated in the Syllabus, he was not altogether *persona grata* to Pius IX. But he protested energetically against the loss of the pope's temporal power in 1870, against the confiscation of the property of the religious orders, and against the law of civil marriage established by the Italian government, and he refused to welcome Victor Emmanuel in his diocese. Nevertheless, he remained in the comparative obscurity of his episcopal see until the death of Cardinal Antonelli; but in 1877, when the important papal office of *camerlengo* became vacant, Pius IX. appointed to it Cardinal Pecci, who thus returned to reside in Rome, with the prospect of having shortly responsible functions to perform during the vacancy of the Holy See, though the *camerlengo* was traditionally regarded as disqualified by his office from succeeding to the papal throne.

When Pius IX. died (7th February 1878) Cardinal Pecci was elected pope at the subsequent conclave with comparative unanimity, obtaining at the third scrutiny (20th February) forty-four out of sixty-one votes, or more than the requisite two-thirds majority. The conclave was remarkably free from political influences, the attention of Europe being at the time engrossed by the presence of a Russian army at the gates of Constantinople. It was said that the long pontificate of Pius IX. led some of the cardinals to vote for Pecci, since his age (within a few days of sixty-eight) and health warranted the expectation that his reign would be comparatively brief; but he had for years been known as one of the few "papable" cardinals; and although his long seclusion at Perugia had caused his name to be little known outside Italy, there was a general belief that the conclave had selected a man who was a prudent statesman as well as a devout churchman; and Newman (whom he created a cardinal in the year following) is reported to have said, "In the successor of Pius I recognize a depth of thought, a tenderness of heart, a winning simplicity, and a power answering to the name of Leo, which prevent me from lamenting that Pius is no longer here."

The second day after his election Pope Leo XIII. crossed the Tiber *incognito* to his former residence in the Falconieri Palace to collect his papers, returning at once to the Vatican, where he continued to regard himself as "imprisoned" so long as the Italian government occupied the city of Rome. He was crowned in the Sistine Chapel 3rd March 1878, and at once began a reform of the papal household on austere and economic lines which found little favour with the *entourage* of the former pope. To fill posts near his own person he summoned certain of the Perugian clergy who had been trained under his own eye, and from the first he was less accessible than his predecessor had been, either in public or private audience. Externally uneventful as his life henceforth necessarily was, it was marked chiefly by the reception of distinguished personages and of numerous pilgrimages, often on a large scale, from all parts of the world, and by the issue of encyclical letters. The stricter theological training of the Roman Catholic clergy throughout the world on the lines laid down by St Thomas Aquinas was his first care, and to this end he founded in Rome and endowed an academy bearing the great schoolman's name, further devoting about £12,000 to the publication of a new and splendid edition of his works, the idea being that on this basis the later teaching of Catholic theologians and many of the speculations of modern thinkers could best be harmonized and brought into line. The study of Church history was next encouraged, and in August 1883 the pope addressed a letter to Cardinals de Luca, Pitra and Hergenröther, in which he made the remarkable concession that the Vatican archives and library might be placed at the disposal of persons qualified to compile manuals of history. His belief was that the Church would not suffer by the publication of documents. A man of literary taste and culture, familiar with the classics, a facile writer of Latin verses[1] as well as of Ciceronian prose, he was as anxious that the Roman clergy should unite human science and literature with their theological studies as that the laity should be educated in the principles of religion; and to this end he established in Rome a kind of voluntary school board, with members both lay and clerical; and the rivalry of the schools thus founded ultimately obliged the state to include religious teaching in its curriculum. The numerous encyclicals by which the pontificate of Leo XIII. will always be distinguished were prepared and written by himself, but were submitted to the customary revision. The encyclical *Aeterni Patris* (4th August 1879) was written in the defence of the philosophy of St Thomas Aquinas. In later ones, working on the principle that the Christian Church should superintend and direct every form of civil life, he dealt with the Christian constitution of states (*Immortale Dei*, 1st November 1885), with human liberty (*Libertas*, 20th June 1888), and with the condition of the working classes (*Rerum novarum*, 15th May 1891). This last was slightly tinged with modern socialism; it was described as "the social Magna Carta of Catholicism," and it won for Leo the name of "the working-man's pope." Translated into the chief modern languages, many thousands of copies were circulated among the working classes in Catholic countries. Other encyclicals, such as those on Christian marriage (*Arcanum divinae sapientiae*, 10th February 1880), on the Rosary (*Supremi apostolatus officii*, 1st September 1883, and *Superiore anno*, 5th September 1898), and on Freemasonry (*Humanum genus*, 20th April 1884), dealt with subjects on which his predecessor had been accustomed to pronounce allocutions, and were on similar lines. It was the knowledge that in all points of religious faith and practice Leo XIII. stood precisely where Pius IX. had stood that served to render ineffectual others of his encyclicals, in which he dealt earnestly and effectively with matters in which orthodox Protestants had a sympathetic interest with him and might otherwise have lent an ear to his counsels. Such were the letters on the study of Holy Scripture (18th November 1893), and on the reunion of Christendom (20th June 1894). He showed special anxiety for the return of England to the Roman Catholic fold, and addressed a letter *ad Anglos*, dated 14th April 1895. This he followed up by an encyclical on the unity of the Church (*Satis cognitum*, 29th June 1896); and the question of the validity of Anglican ordinations from the Roman Catholic point of view having been raised in Rome by Viscount Halifax, with whom the abbé Louis Duchesne and one or two other French priests were in sympathy, a commission was appointed to consider the subject, and on the 15th of September 1896 a condemnation of the Anglican form as theologically insufficient was issued, and was directed to be taken as final.

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[1] *Leonis XIII. Pont. Maximi carmina*, ed. Brunelli (Udine, 1883); *Leonis XIII. carmina, inscriptiones, numismata*, ed. J. Bach (Cologne, 1903).

The establishment of a diocesan hierarchy in Scotland had been decided upon before the death of Pius IX., but the actual announcement of it was made by Leo XIII. On the 25th of July 1898 he addressed to the Scottish Catholic bishops a letter, in the course of which he said that "many of the Scottish people who do not agree with us in faith sincerely love the name of Christ and strive to ascertain His doctrine and to imitate His most holy example." The Irish and American bishops he summoned to Rome to confer with him on the subjects of Home Rule and of "Americanism" respectively. In India he established a diocesan hierarchy, with seven archbishoprics, the archbishop of Goa taking precedence with the rank of patriarch.

With the government of Italy his general policy was to be as conciliatory as was consistent with his oath as pope never to surrender the "patrimony of St Peter"; but a moderate attitude was rendered difficult by partisans on either side in the press, each of whom claimed to represent his views. In 1879, addressing a congress of Catholic journalists in Rome, he exhorted them to uphold the necessity of the temporal power, and to proclaim to the world that the affairs of Italy would never prosper until it was restored; in 1887 he found it necessary to deprecate the violence with which this doctrine was advocated in certain journals. A similar counsel of moderation was given to the Canadian press in connexion with the Manitoba school question in December 1897. The less conciliatory attitude towards the Italian government was resumed in an encyclical addressed to the Italian clergy (5th August 1898), in which he insisted on the duty of Italian Catholics to abstain from political life while the papacy remained in its "painful, precarious and intolerable position." And in January 1902, reversing the policy which had its inception in the encyclical, *Rerum novarum*, of 1891, and had further been developed ten years later in a letter to the Italian bishops entitled *Graves de communi*, the "Sacred Congregation of Extraordinary Ecclesiastical Affairs" issued instructions concerning "Christian Democracy in Italy," directing that the popular Christian movement, which embraced in its programme a number of social reforms, such as factory laws for children, old-age pensions, a minimum wage in agricultural industries, an eight-hours' day, the revival of trade gilds, and the encouragement of Sunday rest, should divert its attention from all such things as savoured of novelty and devote its energies to the restoration of the temporal power. The reactionary policy thus indicated gave the impression that a similar aim underlay the appointment about the same date of a commission to inquire into Biblical studies; and in other minor matters Leo XIII. disappointed those who had looked to him for certain reforms in the devotional system of the Church. A revision of the breviary, which would have involved the omission of some of the less credible legends, came to nothing, while the recitation of the office in honour of the Santa Casa at Loreto was imposed on all the clergy. The worship of Mary, largely developed during the reign of Pius IX., received further stimulus from Leo; nor did he do anything during his pontificate to correct the superstitions connected with popular beliefs concerning relics and indulgences.

His policy towards all governments outside Italy was to support them wherever they represented social order; and it was with difficulty that he persuaded French Catholics to be united in defence of the republic. The German *Kulturkampf* was ended by his exertions. In 1885 he successfully arbitrated between Germany and Spain in a dispute concerning the Caroline Islands. In Ireland he condemned the "Plan of Campaign" in 1888, but he conciliated the Nationalists by appointing Dr Walsh archbishop of Dublin. His hope that his support of the British government in Ireland would be followed by the establishment of formal diplomatic relations between the court of St James's and the Vatican was disappointed. But the jubilee of Queen Victoria in 1887 and the pope's priestly jubilee a few months later were the occasion of friendly intercourse between Rome and Windsor, Mgr. Ruffo Scilla coming to London as special papal envoy, and the duke of Norfolk being received at the Vatican as the bearer of the congratulations of the queen of England. Similar courtesies were exchanged during the jubilee of 1897, and again in March 1902, when Edward VII. sent the earl of Denbigh to Rome to congratulate Leo XIII. on reaching his ninety-third year and the twenty-fifth year of his pontificate. The visit of Edward VII. to Leo XIII. in April 1903 was a further proof of the friendliness between the English court and the Vatican.

The elevation of Newman to the college of Cardinals in 1879 was regarded with approval throughout the English-speaking world, both on Newman's account and also as evidence that Leo XIII. had a wider horizon than his predecessor; and his similar recognition of two of the most distinguished "inopportunist" members of the Vatican council, Haynald, archbishop of Kalocsa, and Prince Fürstenberg, archbishop of Olmütz, was even more noteworthy. Dupanloup would doubtless have received the same honour had he not died shortly after Leo's accession. Döllinger the pope attempted to reconcile, but failed. He laboured much to bring about the reunion of the Oriental Churches with the see of Rome, establishing Catholic educational centres in Athens and in Constantinople with that end in view. He used his influence with the emperor of Russia, as also with the emperors of China and Japan and with the shah of Persia, to secure the free practice of their religion for Roman Catholics within their respective dominions. Among the canonizations and beatifications of his pontificate that of Sir Thomas More, author of *Utopia*, is memorable. His encyclical issued at Easter 1902, and described by himself as a kind of will, was mainly a reiteration of earlier condemnations of the Reformation, and of modern philosophical systems, which for their atheism and materialism he makes responsible for all existing moral and political disorders. Society, he earnestly pleaded, can only find salvation by a return to Christianity and to the fold of the Roman Catholic Church.

Grave and serious in manner, speaking slowly, but with energetic gestures, simple and abstemious in his life—his daily bill of fare being reckoned as hardly costing a couple of francs—Leo XIII. distributed large sums in charity, and at his own charges placed costly astronomical instruments in the Vatican observatory, providing also accommodation and endowment for a staff of officials. He always showed the greatest interest in science and in literature, and he would have taken a position as a statesman of the first rank had he held office in any secular government. He may be reckoned the most illustrious pope since Benedict XIV., and under him the papacy acquired a prestige unknown since the middle ages. On the 3rd of March 1903 he celebrated his jubilee in St Peter's with more than usual pomp and splendour; he died on the 20th of July following. His successor was Pius X.

See *Scelta di atti episcopali del cardinale G. Pecci* . . . (Rome, 1879); *Leonis XIII. Pont. Max. acta* (17 vols., Rome, 1881–1898); *Sanctissimi Domini N. Leonis XIII. allocutiones, epistolae, &c.* (Bruges and Lille, 1887, &c.); the encyclicals (*Sämtliche Rundschreiben*) with a German translation (6 vols., Freiburg, 1878–1904); *Discorsi del Sommo Pontefice Leone XIII. 1878–1882* (Rome, 1882). There are lives of Leo XIII. by B. O'Reilly (new ed., Chicago, 1903), H. des Houx (pseudonym of Durand Morimbeau) (Paris, 1900), by W. Meynell (1887), by J. McCarthy (1896), by Boyer d'Agen, (*Jeunesse de Léon XIII.* (1896); *La Prélature*, 1900), by M. Spahn (Munich, 1905), by L. K. Goetz (Gotha, 1899), &c. A life of Leo XIII. (4 vols.) was undertaken by F. Marion Crawford, Count Edoardo Soderini and Professor Giuseppe Clementi. (A. W. Hu.; M. Br.)

LEO, the name of six emperors of the East.

Leo I., variously surnamed Thrax, Magnus and Makelles, emperor of the East, 457–474, was born in Thrace about 400. From his position as military tribune he was raised to the throne by the soldiery and recognized both by senate and clergy; his coronation by the patriarch of Constantinople is said to have been the earliest instance of such a ceremony. Leo owed his elevation mainly to Aspar, the commander of the guards, who was debarred by his Arianism from becoming emperor in his own person, but hoped to exercise a virtual autocracy through his former steward and dependant. But Leo, following the traditions of his predecessor Marcian, set himself to curtail the domination of the great nobles and repeatedly acted in defiance of Aspar. Thus he vigorously suppressed the Eutychian heresy in Egypt, and by exchanging his Germanic bodyguard for Isaurians removed the chief basis of Aspar's power. With the help of his generals Anthemius and Anagastus, he repelled invasions of the Huns into Dacia (466 and 468). In 467 Leo had Anthemius elected emperor of the West, and in concert with him equipped an armament of more than 1100 ships and 100,000 men against the pirate empire of the Vandals in Africa. Through the remissness of Leo's brother-in-law Basiliscus, who commanded the expedition, the fleet was surprised by the Vandal king, Genseric, and half of its vessels sunk or burnt (468). This failure was made a pretext by Leo for killing Aspar as a traitor (471), and Aspar's murder served the Goths in turn as an excuse for ravaging Thrace up to the walls of the capital. In 473 the emperor associated with himself his infant grandson, Leo II., who, however, survived him by only a few months. His surnames Magnus (Great) and Makelles (butcher) respectively reflect the attitude of the Orthodox and the Arians towards his religious policy.

See E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, 1896), iv. 29-37; J. B. Bury, *The Later Roman Empire* (1889), i. 227-233.

Leo III. (*c.* 680–740), surnamed The Isaurian, emperor of the East, 717–740. Born about 680 in the Syrian province of Commagene, he rose to distinction in the military service, and under Anastasius II. was invested with the command of the eastern army. In 717 he revolted against the usurper Theodosius III. and, marching upon Constantinople, was elected emperor in his stead. The first year of Leo's reign saw a memorable siege of his capital by the Saracens, who had taken advantage of the civil discord in the Roman empire to bring up a force of 80,000 men to the Bosporus. By his stubborn defence the new ruler wore out the invaders who, after a twelve months' investment, withdrew their forces. An important factor in the victory of the Romans was their use of Greek fire. Having thus preserved the empire from extinction, Leo proceeded to consolidate its administration, which in the previous years of anarchy had become completely disorganized. He secured its frontiers by inviting Slavonic settlers into the depopulated districts and by restoring the army to efficiency; when the Arabs renewed their invasions in 726 and 739 they were decisively beaten. His civil reforms include the abolition of the system of prepaying taxes which had weighed heavily upon the wealthier proprietors, the elevation of the serfs into a class of free tenants, the remodelling of family and of maritime law. These measures, which were embodied in a new code published in 740, met with some opposition on the part of the nobles and higher clergy. But Leo's most striking legislative reforms dealt with religious matters. After an apparently successful attempt to enforce the baptism of all Jews and Montanists in his realm (722), he issued a series of edicts against the worship of images (726–729). This prohibition of a custom which had undoubtedly given rise to grave abuses seems to have been inspired by a genuine desire to improve public morality, and received the support of the official aristocracy and a section of the clergy. But a majority of the theologians and all the monks opposed these measures with uncompromising hostility, and in the western parts of the empire the people refused to obey the edict. A revolt which broke out in Greece, mainly on religious grounds, was crushed by the imperial fleet (727), and two years later, by deposing the patriarch of Constantinople, Leo suppressed the overt opposition of the capital. In Italy the defiant attitude of Popes Gregory II. and III. on behalf of image-worship led to a fierce quarrel with the emperor. The former summoned councils in Rome to anathematize and excommunicate the image-breakers (730, 732); Leo retaliated by transferring southern Italy and Greece from the papal diocese to that of the patriarch. The struggle was accompanied by an armed outbreak in the exarchate of Ravenna (727), which Leo finally endeavoured to subdue by means of a large fleet. But the destruction of the armament by a storm decided the issue against him; his south Italian subjects successfully defied his religious edicts, and the province of Ravenna became detached from the empire. In spite of this partial failure Leo must be reckoned as one of the greatest of the later Roman emperors. By his resolute stand against the Saracens he delivered all eastern Europe from a great danger, and by his thorough-going reforms he not only saved the empire from collapse, but invested it with a stability which enabled it to survive all further shocks for a space of five centuries.

See E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 185 seq., 251 seq. and appendices, vi. 6-12, J. B. Bury, *The Later Roman Empire* (1889), ii. 401-449; K. Schenk, *Kaiser Leo III.* (Halle, 1880), and in *Byzantinische Zeitschrift* (1896), v. 257-301; T. Hodgkin, *Italy and her Invaders* (1892, &c.), bk. vii., chs. 11, 12. See also Iconoclasts.

Leo IV., called Chozar, succeeded his father, Constantine V., as emperor of the East in 775. In 776 he associated his young son, Constantine, with himself in the empire, and suppressed a rising led by his five step-brothers which broke out as a result of this proceeding. Leo was largely under the influence of his wife Irene (*q.v.*), and when he died in 780 he left her as the guardian of his successor, Constantine VI.

Leo V., surnamed The Armenian, emperor of the East, 813–820, was a distinguished general of Nicephorus I. and Michael I. After rendering good service on behalf of the latter in a war with the Arabs (812), he was summoned in 813 to co-operate in a campaign against the Bulgarians. Taking advantage of the disaffection prevalent among the troops, he left Michael in the lurch at the battle of Adrianople and subsequently led a successful revolution against him. Leo justified his usurpation by repeatedly defeating the Bulgarians who had been contemplating the siege of Constantinople (814–817). By his vigorous measures of repression against the Paulicians and image-worshippers he roused considerable opposition, and after a conspiracy under his friend Michael Psellus had been foiled by the imprisonment of its leader, he was assassinated in the palace chapel on Christmas Eve, 820.

See E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 193-195. (M. O. B. C.)

Leo VI., surnamed The Wise and The Philosopher, Byzantine emperor, 886–911. He was a weak-minded ruler, chiefly occupied with unimportant wars with barbarians and struggles with churchmen. The chief event of his reign was the capture of Thessalonica (904) by Mahommedan pirates (described in *The Capture of Thessalonica* by John Cameniata) under the renegade Leo of Tripolis. In Sicily and Lower Italy the imperial arms were unsuccessful, and the Bulgarian Symeon, who assumed the title of "Czar of the Bulgarians and autocrat of the Romaei" secured the independence of his church by the establishment of a patriarchate. Leo's somewhat absurd surname may be explained by the facts that he "was less ignorant than the greater part of his contemporaries in church and state, that his education had been directed by the learned Photius, and that several books of profane and ecclesiastical science were composed by the pen, or in the name, of the imperial philosopher" (Gibbon). His works include seventeen *Oracula*, in iambic verse, on the destinies of future emperors and patriarchs of Constantinople; thirty-three *Orations*, chiefly on theological subjects (such as church festivals); *Basilica*, the completion of the digest of the laws of Justinian, begun by Basil I., the father of Leo; some epigrams in the Greek *Anthology*; an iambic lament on the melancholy condition of the empire; and some palindromic verses, curiously called *καρκίνοι* (crabs). The treatise on military tactics, attributed to him, is probably by Leo III., the Isaurian.

Complete edition in Migne, *Patrologia Graeca*, cvii.; for the literature of individual works see C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897). (J. H. F.)

LEO, Brother (d. *c.* 1270), the favourite disciple, secretary and confessor of St Francis of Assisi. The dates of his birth and of his becoming a Franciscan are not known; but he was one of the small group of most trusted companions of the saint during his last years. After Francis's death Leo took a leading part in the opposition to Elias: he it was who broke in pieces the marble box which Elias had set up for offertories for the completion of the basilica at Assisi. For this Elias had him scourged, and this outrage on St Francis's dearest disciple consolidated the opposition to Elias and brought about his deposition. Leo was the leader in the early stages of the struggle in the order for the maintenance of St Francis's ideas on strict poverty, and the chief inspirer of the tradition of the Spirituals on St Francis's life and teaching. The claim that he wrote the so-called *Speculum perfectionis* cannot be allowed, but portions of it no doubt go back to him. A little volume of his writings has been published by Lemmeus (*Scripta Iratris Leonis*, 1901). Leo assisted at St Clara's deathbed, 1253; after suffering many persecutions from the dominant party in the order he died at the Portiuncula in extreme old age.

All that is known concerning him is collected by Paul Sabatier in the "Introduction" to the *Speculum perfectionis* (1898). See St Francis and Franciscans. (E. C. B.)

LEO, HEINRICH (1799–1878), German historian, was born at Rudolstadt on the 19th of March 1799, his father being chaplain to the garrison there. His family, not of Italian origin—as he himself was inclined to believe on the strength of family tradition—but established in Lower Saxony so early as the 16th century, was typical of the German upper middle classes, and this fact, together with the strongly religious atmosphere in which he was brought up and his early enthusiasm for nature, largely determined the bent of his mind. The taste for historical study was, moreover, early instilled into him by the eminent philologist Karl Wilhelm Göttling (1793–1869), who in 1816 became a master at the Rudolstadt gymnasium. From 1816 to 1819 Leo studied at the universities of Breslau, Jena and Göttingen, devoting himself more especially to history, philology and theology. At this time the universities were still agitated by the Liberal and patriotic aspirations aroused by the War of Liberation; at Breslau Leo fell under the influence of Jahn, and joined the political gymnastic association (*Turnverein*); at Jena he attached himself to the radical wing of the German *Burschenschaft*, the so-called "Black Band," under the leadership of Karl Follen. The murder of Kotzebue by Karl Sand, however, shocked him out of his extreme revolutionary views, and from this time he tended, under the influence of the writings of Hamann and Herder, more and more in the direction of conservatism and romanticism, until at last he ended, in a mood almost of pessimism, by attaching himself to the extreme right wing of the forces of reaction. So early as April 1819, at Göttingen, he had fallen under the influence of Karl Ludwig von Haller's *Handbuch der allgemeinen Staatenkunde* (1808), a text-book of the counter-Revolution. On the 11th of May 1820 he took his doctor's degree; in the same year he qualified as *Privatdozent* at the university of Erlangen. For this latter purpose he had chosen as his thesis the constitution of the free Lombard cities in the middle ages, the province in which he was destined to do most for the scientific study of history. His interest in it was greatly stimulated by a journey to Italy in 1823; in 1824 he returned to the subject, and, as the result, published in five volumes a history of the Italian states (1829–1832). Meanwhile he had been established (1822–1827) as *Dozent* at Berlin, where he came in contact with the leaders of German thought and was somewhat spoilt by the flattering attentions of the highest Prussian society. Here, too, it was that Hegel's philosophy of history made a deep impression upon him. It was at Halle, however, where he remained for forty years (1828–1868), that he acquired his fame as an academical teacher. His wonderful power of exposition, aided by a remarkable memory, is attested by the most various witnesses. In 1830 he became ordinary professor.

In addition to his lecturing, Leo found time for much literary and political work. He collaborated in the *Jahrbücher für Wissenschaftliche Kritik* from its foundation in 1827 until the publication was stopped in 1846. As a critic of independent views he won the approval of Goethe; on the other hand, he fell into violent controversy with Ranke about questions connected with Italian history. Up to the revolutionary year 1830 his religious views had remained strongly tinged with rationalism, Hegel remaining his guide in religion as in practical politics and the treatment of history. It was not till 1838 that Leo's polemical work *Die Hegelingen* proclaimed his breach with the radical developments of the philosopher's later disciples; a breach which developed into opposition to the philosopher himself. Under the impression of the July revolution in Paris and of the orthodox and pietistic influences at Halle, Leo's political convictions were henceforth dominated by reactionary principles. As a friend of the Prussian "Camarilla" and of King Frederick William IV. he collaborated especially in the high conservative *Politisches Wochenblatt*, which first appeared in 1831, as well as in the *Evangelische Kirchenzeitung*, the *Kreuzzeitung* and the *Volksblatt für Stadt und Land*. In all this his critics scented an inclination towards Catholicism; and Leo did actually glorify the counter-Reformation, *e.g.* in his *History of the Netherlands* (2 vols. 1832–1835). His other historical works also, notably his *Universalgeschichte* (6 vols., 1835–1844), display a very one-sided point of view. When, however, in connexion with the quarrel about the archbishopric of Cologne (1837), political Catholicism raised its head menacingly, Leo turned against it with extreme violence in his open letter (1838) to Goerres, its foremost champion. On the other hand, he took a lively part in the politico-religious controversies within the fold of Prussian Protestantism.

Leo was by nature highly excitable and almost insanely passionate, though at the same time strictly honourable, unselfish, and in private intercourse even gentle. During the last year of his life his mind suffered rapid decay, of which signs had been apparent so early as 1868. He died at Halle on the 24th of April 1878. In addition to the works already mentioned, he left behind an account of his early life (*Meine Jugendzeit*, Gotha, 1880) which is of interest.

See Lord Acton, *English Historical Review*, i. (1886); H. Haupt, *Karl Follen und die Giessener Schwarzen* (Giessen, 1907); W. Herbst, *Deutsch-Evangelische Blätter*, Bd. 3; P. Krägelin, *H. Leo*, vol. i. (1779–1844) (Leipzig, 1908); P. Kraus, *Allgemeine Konservative Monatsschrift*, Bd. 50 u. 51; R. M. Meyer, *Gestalten und Probleme* (1904); W. Schrader, *Geschichte der Friedrichs-Universität in Halle* (Berlin, 1894); C. Varrentrapp, *Historische Zeitschrift*, Bd. 92; F. X. Wegele, *Allgemeine Deutsche Biographie*, Bd. 18 (1883);

Geschichte der deutschen Historiographie (1885); G. Wolf, *Einführung in das Studium der neueren Geschichte* (1910). Leo's *Rectitudines singularum personarum nebst einer einleitenden Abhandlung über Landsiedelung, Landbau, gutsherrliche und bäuerliche Verhältnisse der Angelsachsen*, was translated into English by Lord Acton (1852). (J. Hn.)

LEO, JOHANNES (*c.* 1494–1552), in Italian Giovanni Leo or Leone, usually called Leo Africanus, sometimes Eliberitanus (*i.e.* of Granada), and properly known among the Moors as Al Hassan Ibn Mahommed Al Wezaz Al Fasi, was the author of a *Descrizione dell' Affrica*, or *Africae descriptio*, which long ranked as the best authority on Mahommedan Africa. Born probably at Granada of a noble Moorish stock (his father was a landowner; an uncle of his appears as an envoy from Fez to Timbuktu), he received a great part of his education at Fez, and while still very young began to travel widely in the Barbary States. In 1512 we trace him at Morocco, Tunis, Bugia and Constantine; in 1513 we find him returning from Tunis to Morocco; and before the close of the latter year he seems to have started on his famous Sudan and Sahara journeys (1513–1515) which brought him to Timbuktu, to many other regions of the Great Desert and the Niger basin (Guinea, Melli, Gago, Walata, Aghadez, Wangara, Katsena, &c.), and apparently to Bornu and Lake Chad. In 1516–1517 he travelled to Constantinople, probably visiting Egypt on the way; it is more uncertain when he visited the three Arabias (*Deserta*, *Felix* and *Petraea*), Armenia and "Tartary" (the last term is perhaps satisfied by his stay at Tabriz). His three Egyptian journeys, immediately after the Turkish conquest, all probably fell between 1517 and 1520; on one of these he ascended the Nile from Cairo to Assuan. As he was returning from Egypt about 1520 he was captured by pirates near the island of Gerba, and was ultimately presented as a slave to Leo X. The pope discovered his merit, assigned him a pension, and having persuaded him to profess the Christian faith, stood sponsor at his baptism, and bestowed on him (as Ramusio says) his own names, Johannes and Leo. The new convert, having made himself acquainted with Latin and Italian, taught Arabic (among his pupils was Cardinal Egidio Antonini, bishop of Viterbo); he also wrote books in both the Christian tongues he had acquired. His *Description of Africa* was first, apparently, written in Arabic, but the primary text now remaining is that of the Italian version, issued by the author at Rome, on the 10th of March 1526, three years after Pope Leo's death, though originally undertaken at the latter's suggestion. The Moor seems to have lived on Rome for some time longer, but he returned to Africa some time before his death at Tunis in 1552; according to some, he renounced his Christianity and returned to Islam; but the later part of his career is obscure.

The *Descrizione dell' Affrica* in its original Arabic MS. is said to have existed for some time in the library of Vincenzo Pinelli (1535–1601); the Italian text, though issued in 1526, was first printed by Giovanni Battista Ramusio in his *Navigationi et Viaggi* (vol. i.) of 1550. This was reprinted in 1554, 1563, 1588, &c. In 1556 Jean Temporal executed at Lyons an admirable French version from the Italian (*Historiale description de l'Afrique*); and in the same year appeared at Antwerp both Christopher Plantin's and Jean Bellere's pirated issues of Temporal's translation, and a new (very inaccurate) Latin version by Joannes Florianus, *Joannis Leonis Africani de totius Africae descriptione libri i.-ix.* The latter was reprinted in 1558, 1559 (Zürich), and 1632 (Leiden), and served as the basis of John Pory's Elizabethan English translation, made at the suggestion of Richard Hakluyt (*A Geographical Historie of Africa*, London, 1600). Pory's version was reissued, with notes, maps, &c., by Robert Brown, E. G. Ravenstein, &c. (3 vols., Hakluyt Society, London, 1896). An excellent German translation was made by Lorsbach, from the Italian, in 1805 (*Johann Leos des Afrikaners Beschreibung von Afrika*, Herborn). See also Francis Moore's *Travels into the inland parts of Africa* (1738), containing a translation of Leo's account of negro kingdoms. Heinrich Barth intended to have made a fresh version, with a commentary, but was prevented by death; as it is, his own great works on the Sudan are the best elucidation of the *Descrizione dell' Affrica*.

Leo also wrote lives of the Arab physicians and philosophers (*De viris quibusdam illustribus apud Arabes*; see J. A. Fabricius, *Bibliotheca Graeca*, Hamburg, 1726, xiii. 259-298); a Spanish-Arabic vocabulary, now lost, but noticed by Ramusio as having been consulted by the famous Hebrew physician, Jacob Mantino; a collection of Arabic epitaphs in and near Fez (the MS. of this Leo presented, it is said, to the brother of the king); and poems, also lost. It is stated, moreover, that Leo intended writing a history of the Mahommedan religion, an epitome of Mahommedan chronicles, and an account of his travels in Asia and Egypt. (C. R. B.)

LEO, LEONARDO (1694–1744), more correctly Lionardo Oronzo Salvatore de Leo, Italian musical composer, was born on the 5th of August 1694 at S. Vito dei Normanni, near Brindisi. He became a student at the Conservatorio della Piètà dei Turchini at Naples in 1703, and was a pupil first of Provenzale and later of Nicola Fago. It has been supposed that he was a pupil of Pitoni and Alessandro Scarlatti, but he could not possibly have studied with either of these composers, although he was undoubtedly influenced by their compositions. His earliest known work was a sacred drama, *L'Infedeltà abbattuta*, performed by his fellow-students in 1712. In 1714 he produced, at the court theatre, an opera, *Pisistrato*, which was much admired. He held various posts at the royal chapel, and continued to write for the stage, besides teaching at the conservatorio. After adding comic scenes to Gasparini's *Bajazette* in 1722 for performance at Naples, he composed a comic opera, *La Mpeca scoperta*, in Neapolitan dialect, in 1723. His most famous comic opera was *Amor vuol sofferenze* (1739), better known as *La Finta Frascatana*, highly praised by Des Brosses. He was equally distinguished as a composer of serious opera, *Demofoonte* (1735), *Farnace* (1737) and *L'Olimpiade* (1737) being his most famous works in this branch, and is still better known as a composer of sacred music. He died of apoplexy on the 31st of October 1744 while engaged in the composition of new airs for a revival of *La Finta Frascatana*.

Leo was the first of the Neapolitan school to obtain a complete mastery over modern harmonic counterpoint. His sacred music is masterly and dignified, logical rather than passionate, and free from the sentimentality which disfigures the work of F. Durante and G. B. Pergolesi. His serious operas suffer from a coldness and severity of style, but in his comic operas he shows a keen sense of humour. His *ensemble* movements are spirited, but never worked up to a strong climax.

A fine and characteristic example of his sacred music is the *Dixit Dominus* in C, edited by C. V. Stanford and published by Novello. A number of songs from operas are accessible in modern editions. (E. J. D.)

LEO (The Lion), in astronomy, the fifth sign of the zodiac (*q.v.*), denoted by the symbol Ω. It is also a constellation, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.). According to Greek mythology this constellation is the Nemean lion, which, after being killed by Hercules, was raised to the heavens by Jupiter in honour of Hercules. A part of Ptolemy's Leo is now known as Coma Berenices (*q.v.*). α Leonis, also known as Cor Leonis or the Lion's Heart, Regulus, Basilicus, &c., is a very bright star of magnitude 1·23, and parallax 0·02″, and proper motion 0·27″ per annum. γ Leonis is a very fine orange-yellow binary star, of magnitudes 2 and 4, and period 400 years. ι Leonis is a binary, composed of a 4th magnitude pale yellow star, and a 7th magnitude blue star. The Leonids are a meteoric swarm, appearing in November and radiating from this constellation (see Meteor).

LEOBEN, a town in Styria, Austria, 44 m. N.W. of Graz by rail. Pop. (1900) 10,204. It is situated on the Mur, and part of its old walls and towers still remain. It has a well-known academy of mining and a number of technical schools. Its extensive iron-works and trade in iron are a consequence of its position on the verge of the important lignite deposits of Upper Styria and in the neighbourhood of the iron mines and furnaces of Vordernberg and Eisenerz. On the 18th of April 1797 a preliminary peace was concluded here between Austria and France, which led to the treaty of Campo-Formio.

LEOBSCHÜTZ (Bohemian *Lubczyce*), a town of Germany, in the Prussian province of Silesia, on the Zinna, about 20 m. to the N.W. of Ratibor by rail. Pop. (1905) 12,700. It has a large trade in wool, flax and grain, its markets for these commodities being very numerously attended. The principal industries are malting, carriage-building, wool-spinning and glass-making. The town contains three Roman Catholic churches, a Protestant church, a synagogue, a new town-hall and a gymnasium. Leobschütz existed in the 10th century, and from 1524 to 1623 was the capital of the principality of Jägerndorf.

See F. Troska, *Geschichte der Stadt Leobschütz* (Leobschütz, 1892).

LEOCHARES, a Greek sculptor who worked with Scopas on the Mausoleum about 350 B.C. He executed statues of the family of Philip of Macedon, in gold and ivory, which were set up by that king in the Philippeum at Olympia. He also with Lysippus made a group in bronze at Delphi representing a lion-hunt of Alexander. Of this the base with an inscription was recently found. We hear of other statues by Leochares of Zeus, Apollo and Ares. The statuette in the Vatican, representing Ganymede being carried away by an eagle, though considerably restored and poor in execution, so closely corresponds with Pliny's description of a group by Leochares that we are justified in considering it a copy of that group, especially as the Vatican statue shows all the characteristics of Attic 4th-century art. Pliny (*N.H.* 34. 79) writes: "Leochares made a group of an eagle aware whom it is carrying off in Ganymede and to whom it is bearing him; holding the boy delicately in its claws, with his garment between." (For engraving see GREEK ART, Plate I. fig. 53.) The tree stem is skilfully used as a support; and the upward strain of the group is ably rendered. The close likeness both in head and pose between the Ganymede and the well-known Apollo Belvidere has caused some modern archaeologists to assign the latter also to Leochares. With somewhat more confidence we may regard the fine statue of Alexander the Great at Munich as a copy of his gold and ivory portrait at Olympia. (P. G.)

LEOFRIC (d. 1057), earl of Mercia, was a son of Leofwine, earl of Mercia, and became earl at some date previous to 1032. Henceforth, being one of the three great earls of the realm, he took a leading part in public affairs. On the death of King Canute in 1035 he supported the claim of his son Harold to the throne against that of Hardicanute; and during the quarrel between Edward the Confessor and Earl Godwine in 1051 he played the part of a mediator. Through his efforts civil war was averted, and in accordance with his advice the settlement of the dispute was referred to the Witan. When he became earl of Mercia his direct rule seems to have been confined to Cheshire, Staffordshire, Shropshire and the borders of north Wales, but afterwards he extended the area of his earldom. As Chester was his principal residence and the seat of his government, he is sometimes called earl of Chester. Leofric died at Bromley in Staffordshire on the 31st of August 1057. His wife was Godgifu, famous in legend as Lady Godiva. Both husband and wife were noted as liberal benefactors to the church, among their foundations being the famous Benedictine monastery at Coventry. Leofric's son, Ælfgar, succeeded him as earl of Mercia.

See E. A. Freeman, *The Norman Conquest*, vols. i. and ii. (1877).

LEOMINSTER, a market-town and municipal borough in the Leominster parliamentary division of Herefordshire, England, in a rich agricultural country on the Lugg, 157 m. W.N.W. of London and 12½ N. of Hereford on the Great Western and London & North-Western railways. Pop. (1901) 5826. Area, 8728 acres. Some fine old timber houses lend picturesqueness to the wide streets. The parish church, of mixed architecture, including the Norman nave of the old priory church, and containing some of the most beautiful examples of window tracery in England, was restored in 1866, and enlarged by the addition of a south nave in 1879. The Butter Cross, a beautiful example of timber work of the date 1633, was removed when the town-hall was building, and re-erected in the pleasure ground of the Grange. Trade is chiefly in agricultural produce, wool and cider, as the district is rich in orchards. Brewing (from the produce of local hop-gardens) and the manufacture of agricultural implements are also carried on. The town is under a mayor, four aldermen and twelve councillors.

Merewald, king of Mercia, is said to have founded a religious house in Leominster (Llanlieni, Leofminstre, Lempster) in 660, and a nunnery existed here until the Conquest, when the place became a royal demesne. It was granted by Henry I. to the monks of Reading, who built in it a cell of their abbey, and under whose protection the town grew up and was exempted from the sphere of the county and hundred courts. In 1539 it reverted to the crown; and in 1554 was incorporated, by a charter renewed in 1562, 1563, 1605, 1666, 1685 and 1786. The borough returned two members to the parliament of 1295 and to other parliaments, until by the Representation Act 1867 it lost one representative, and by the Redistribution of Seats Act 1885 separate representation. A fair was granted in the time of Henry II., and fairs in the seasons of Michaelmas and the feasts of St Philip and St James and of Edward the Confessor, in 1265, 1281 and 1290 respectively. Charters to the burghers authorized fairs on the days of St Peter and of St Simon and St Jude in 1554, on St Bartholomew's day in 1605, in Mid-lent week in 1665, and on the feast of the Purification and on the 2nd of May in 1685; these fairs have modern representatives. A market was held by the abbey by a grant of Henry I.; Friday is now market day. Leominster was famous for wool from the 13th to the 18th century. There were gilds of mercers, tailors, drapers, dyers and glovers in the 16th century. In 1835 the wool trade was said to be dead; and that of glove-making, which had been important, was diminishing. Hops and apples were grown in 1715.

See G. Townsend, *The Town and Borough of Leominster* (1863), and John Price, *An Historical and Topographical Account of Leominster and its Vicinity* (Ludlow, 1715).

LEOMINSTER, a township of Worcester county, Massachusetts, U.S.A., about 45 m. N.W. of Boston and about 20 m. N. by E. of Worcester. Pop. (1890) 7269; (1900) 12,392, of whom 2827 were foreign-born; (1910 census) 17,580. It is a broken, hilly district, 26·48 sq. m. in area, traversed by the Nashua river, crossed by the Northern Division of the New York, New Haven & Hartford railroad, and by the Fitchburg Division of the Boston & Maine, and connected with Boston, Worcester and other cities by interurban electric lines. Along the N.E. border and mostly in the township of Lunenburg are Whalom Lake and Whalom Park, popular pleasure resorts. The principal villages are Leominster, 5 m. S.E. of Fitchburg, and North Leominster; the two adjoin and are virtually one. According to the Special U.S. Census of Manufactures of 1905 the township had in that year a greater diversity of important manufacturing industries than any place of its size in the state, or, probably, in the United States; its 65 manufactories, with a capital of $4,572,726 and with a product for the year valued at $7,501,720 (39% more than in 1900), produced celluloid and horn work (the manufacture of which is a more important industry here than elsewhere in the United States), celluloid combs, furniture, paper, buttons, pianos and piano-cases, children's carriages and sleds, stationery, leatherboard, worsted, woollen and cotton goods, shirts, paper boxes, &c. Leominster owns and operates its water-works. The township was formed from a part of Lancaster township in 1740.

LEÓN, LUIS PONCE DE (1527–1591), Spanish poet and mystic, was born at Belmonte de Cuenca, entered the university of Salamanca at the age of fourteen, and in 1544 joined the Augustinian order. In 1561 he obtained a theological chair at Salamanca, to which in 1571 was added that of sacred literature. He was denounced to the Inquisition for translating the book of Canticles, and for criticizing the text of the Vulgate. He was consequently imprisoned at Valladolid from March 1572 till December 1576; the charges against him were then abandoned, and he was released with an admonition. He returned to Salamanca as professor of Biblical exegesis, and was again reported to the Inquisition in 1582, but without result. In 1583–1585 he published the three books of a celebrated mystic treatise, *Los Nombres de Cristo*, which he had written in prison. In 1583 also appeared the most popular of his prose works, a treatise entitled *La Perfecta Casada*, for the use of a lady newly married. Ten days before his death, which occurred at Madrigal on the 23rd of August 1591, he was elected vicar general of the Augustinian order. Luis de León is not only the greatest of Spanish mystics; he is among the greatest of Spanish lyrical poets. His translations of Euripides, Pindar, Virgil and Horace are singularly happy; his original pieces, whether devout like the ode *De la vida del cielo*, or secular like the ode *A Salinas*, are instinct with a serene sublimity unsurpassed in any literature, and their form is impeccable. Absorbed by less worldly interests, Fray Luis de León refrained from printing his poems, which were not issued till 1631, when Quevedo published them as a counterblast to *culteranismo*.

The best edition of Luis de León's works is that of Merino (6 vols., Madrid, 1816); the reprint (Madrid, 1885) by C. Muñoz Saenz is incorrect. The text of *La Perfecta Casada* has been well edited by Miss Elizabeth Wallace (Chicago, 1903). See *Coleccion de documentos inéditos para la historia de España*, vols. x.-xi.; F. H. Reusch, *Luis de León und die spanische Inquisition* (Bonn, 1873); M. Gutiérrez, *Fray Luis de León y la filosofía española* (Madrid, 1885); M. Menendez y Pelayo, *Estudios de crítica literaria* (Madrid, 1893), Primera série, pp. 1-72.

LEON, MOSES [BEN SHEM-ṬOB] **DE** (d. 1305), Jewish scholar, was born in Leon (Spain) in the middle of the 13th century and died at Arevalo. His fame is due to his authorship of the most influential Kabbalist work, the *Zohar* (see KABBALA), which was attributed to Simon b. Yoḥai, a Rabbi of the 2nd century. In modern times the discovery of the modernity of the *Zohar* has led to injustice to the author. Moses de Leon undoubtedly used old materials and out of them constructed a work of genius. The discredit into which he fell was due partly to the unedifying incidents of his personal career. He led a wandering life, and was more or less of an adventurer. But as to the greatness of his work, the profundity of his philosophy and the brilliance of his religious idealism, there can be no question.

See Graetz, *History of the Jews*, vol. iv. ch. i.; Geiger, *Leon de Modena*. (I. A.)

LEON OF MODENA (1571–1648), Jewish scholar, was born in Venice, of a notable French family which had migrated to Italy after the expulsion of the Jews from France. He was a precocious child, but, as Graetz points out, his lack of stable character prevented his gifts from maturing. "He pursued all sorts of occupations to support himself, viz. those of preacher, teacher of Jews and Christians, reader of prayers, interpreter, writer, proof-reader, bookseller, broker, merchant, rabbi, musician, matchmaker and manufacturer of amulets." Though he failed to rise to real distinction he earned a place by his criticism of the Talmud among those who prepared the way for the new learning in Judaism. One of Leon's most effective works was his attack on the Kabbala (*'Ari Nohem*, first published in 1840), for in it he demonstrated that the "Bible of the Kabbalists" (the *Zohar*) was a modern composition. He became best known, however, as the interpreter of Judaism to the Christian world. At the instance of an English nobleman he prepared an account of the religious customs of the Synagogue, *Riti Ebraici* (1637). This book was widely read by Christians; it was rendered into various languages, and in 1650 was translated into English by Edward Chilmead. At the time the Jewish question was coming to the fore in London, and Leon of Modena's book did much to stimulate popular interest. He died at Venice.

See Graetz, *History of the Jews* (Eng. trans.), vol. v. ch. iii.; *Jewish Encyclopedia*, viii. 6; Geiger, *Leon de Modena*. (I. A.)

LEÓN, or LEÓN DE LAS ALDAMAS, a city of the state of Guanajuato, Mexico, 209 m. N.W. of the federal capital and 30 m. W. by N. of the city of Guanajuato. Pop. (1895) 90,978; (1900) 62,623, León ranking fourth in the latter year among the cities of Mexico. The Mexican Central gives it railway connexion with the national capital and other prominent cities of the Republic. León stands in a fertile plain on the banks of the Turbio, a tributary of the Rio Grande de Lerma, at an elevation of 5862 ft. above sea-level and in the midst of very attractive surroundings. The country about León is considered to be one of the richest cereal-producing districts of Mexico. The city itself is subject to disastrous floods, sometimes leading to loss of life as well as damage to property, as in the great flood of 1889. León is essentially a manufacturing and commercial city; it has a cathedral and a theatre, the latter one of the largest and finest in the republic. The city is regularly built, with wide streets and numerous shady parks and gardens. It manufactures saddlery and other leather work, gold and silver embroideries, cotton and woollen goods, especially *rebozos* (long shawls), soap and cutlery. There are also tanneries and flour mills. The city has a considerable trade in wheat and flour. The first settlement of León occurred in 1552, but its formal foundation was in 1576, and it did not reach the dignity of a city until 1836.

LEON, the capital of the department of Leon, Nicaragua, an episcopal see, and the largest city in the republic, situated midway between Lake Managua and the Pacific Ocean, 50 m. N.W. of Managua, on the railway from that city to the Pacific port of Corinto. Pop. (1905) about 45,000, including the Indian town of Subtiaba. Leon covers a very wide area, owing to its gardens and plantations. Its houses are usually one-storeyed, built of adobe and roofed with red tiles; its public buildings are among the finest in Central America. The massive and elaborately ornamented cathedral was built in the Renaissance style between 1746 and 1774; a Dominican church in Subtiaba is little less striking. The old (1678) and new (1873) episcopal palaces, the hospital, the university and the barracks (formerly a Franciscan monastery) are noteworthy examples of Spanish colonial architecture. Leon has a large general trade, and manufactures cotton and woollen fabrics, ice, cigars, boots, shoes and saddlery; its tanneries supply large quantities of cheap leather for export. But its population (about 60,000 in 1850) tends to decrease.

At the time of the Spanish conquest Subtiaba was the residence of the great cacique of Nagrando, and contained an important Indian temple. The city of Leon, founded by Francisco Hernandez de Cordova in 1523, was originally situated at the head of the western bay of Lake Managua, and was not removed to its present position till 1610. Thomas Gage, who visited it in 1665, describes it as a splendid city; and in 1685 it yielded rich booty to William Dampier (*q.v.*). Until 1855 Leon was the capital of Nicaragua, although its great commercial rival Granada contested its claim to that position, and the jealousy between the two cities often resulted in bloodshed. Leon was identified with the interests of the democracy of Nicaragua, Granada with the clerical and aristocratic parties.

See NICARAGUA; E. G. Squier, *Central America*, vol. i. (1856); and T. Gage, *Through Mexico, &c.* (1665).

LEON, the name of a modern province and of an ancient kingdom, captaincy-general and province in north-western Spain. The modern province, founded in 1833, is bounded on the N. by Oviedo, N.E. by Santander, E. by Palencia, S. by Valladolid and Zamora and W. by Orense and Lugo. Pop. (1900) 386,083. Area, 5986 sq. m. The boundaries of the province on the north and west, formed respectively by the central ridge and southerly offshoots of the Cantabrian Mountains (*q.v.*), are strongly marked; towards the south-east the surface merges imperceptibly into the Castilian plateau, the line of demarcation being for the most part merely conventional. Leon belongs partly to the river system of the Miño (see SPAIN), partly to that of the Duero or Douro (*q.v.*), these being separated by the Montañas de Leon, which extend in a continuous wall (with passes at Manzanal and Poncebadon) from north to south-west. To the north-west of the Montañas de Leon is the richly wooded pastoral and highland district known as the Vierzo, which in its lower valleys produces grain, fruit, and wine in abundance. The Tierra del Campo in the west of the province is fairly productive, but in need of irrigation. The whole province is sparsely peopled. Apart from agriculture, stock-raising and mining, its commerce and industries are unimportant. Cattle, mules, butter, leather, coal and iron are exported. The hills of Leon were worked for gold in the time of the Romans; iron is still obtained, and coal-mining developed considerably towards the close of the 19th century. The only towns with more than 5000 inhabitants in 1900 were Leon (15,580) and Astorga (5573) (*q.v.*). The main railway from Madrid to Corunna passes through the province, and there are branches from the city of Leon to Vierzo, Oviedo, and the Biscayan port of Gijón.

At the time of the Roman conquest, the province was inhabited by the Vettones and Callaici; it afterwards formed part of Hispania Tarraconensis. Among the Christian kingdoms which arose in Spain as the Moorish invasion of the 8th century receded, Leon was one of the oldest. The title of king of Leon was first assumed by Ordoño in 913. Ferdinand I. (the Great) of Castile united the crowns of Castile and Leon in the 11th century; the two were again separated in the 12th, until a final union took place (1230) in the person of St Ferdinand. The limits of the kingdom varied with the vicissitudes of war, but roughly speaking it may be said to have embraced what are now the provinces of Leon, Palencia, Valladolid, Zamora and Salamanca. For a detailed account of this kingdom, see SPAIN: *History*. The captaincy-general of the province of Leon before 1833 included Leon, Zamora and Salamanca. The Leonese, or inhabitants of these three provinces, have less individuality, in character and physique, than the people of Galicia, Catalonia or Andalusia, who are quite distinct from what is usually regarded as the central or national Spanish type, *i.e.* the Castilian. The Leonese belong partly to the Castilian section of the Spaniards, partly to the north-western section which includes the Galicians and Asturians. They have comparatively few of the Moorish traits which are so marked in the south and east of Spain. Near Astorga there dwells a curious tribe, the Maragatos, sometimes considered to be a remnant of the original Celtiberian inhabitants. As a rule the Maragatos earn their living as muleteers or carriers; they wear a distinctive costume, mix as little as possible with their neighbours and do not marry outside their own tribe.

LEON, an episcopal see and the capital of the Spanish province of Leon, situated on a hill 2631 ft. above sea-level, in the angle made by the Torio and Bernesga, streams which unite on the south, and form the river Leon, a tributary of the Esla. Pop. (1900) 15,580. Leon is on the main railway from Madrid to Oviedo, and is connected with Astorga by a branch line. The older quarters of the city, which contain the cathedral and other medieval buildings, are surrounded by walls, and have lost little of their beauty and interest from the restoration carried out in the second half of the 19th century. During the same period new suburbs grew up outside the walls to house the industrial population which was attracted by the development of iron-founding and the manufacture of machinery, railway-plant, chemicals and leather. Leon thus comprises two towns—the old, which is mainly ecclesiastical in its character, and the new, which is industrial. The cathedral, founded in 1199 and only finished at the close of the 14th century, is built of a warm cream-coloured stone, and is remarkable for simplicity, lightness and strength. It is one of the finest examples of Spanish Gothic, smaller, indeed, than the cathedrals of Burgos and Toledo, but exquisite in design and workmanship. The chapter library contains some valuable manuscripts. The collegiate church of San Isidoro was founded by Ferdinand I. of Castile in 1063 and consecrated in 1149. Its architecture is Romanesque. The church contains some fine plate, including the silver reliquary in which the bones of St Isidore of Seville are preserved, and a silver processional cross dating from the 16th century, which is one of the most beautiful in the country. The convent and church of San Marcos, planned in 1514 by Ferdinand the Catholic, founded by Charles V. in 1537, and consecrated in 1541, are Renaissance in style. They are built on the site of a hostel used by pilgrims on their way to Santiago de Compostela. The provincial museum occupies the chapterhouse and contains some interesting Roman monuments. The lower part of the city walls consists of Roman masonry dating from the 3rd century. Other buildings are the high school, ecclesiastical seminaries, hospital, episcopal palace and municipal and provincial halls.

Leon (Arab. *Liyun*) owes its name to the Legio Septima Gemina of Galba, which, under the later emperors, had its headquarters here. About 540 Leon fell into the hands of the Gothic king Leovigild, and in 717 it capitulated to the Moors. Retaken about 742, it ultimately, in the beginning of the 10th century, became the capital of the kingdom of Leon (see SPAIN: *History*). About 996 it was taken by Almansur, but on his death soon afterwards it reverted to the Spaniards. It was the seat of several ecclesiastical councils, the first of which was held under Alphonso V. in 1012 and the last in 1288.

LEONARDO DA VINCI (1452–1519), the great Italian painter, sculptor, architect, musician, mechanician, engineer and natural philosopher, was the son of a Florentine lawyer, born out of wedlock by a mother in a humble station, variously described as a peasant and as of gentle birth. The place of his birth was Vinci, a *castello* or fortified hill village in the Florentine territory near Empoli, from which his father's family derived its name. The Christian name of the father was Piero (the son of Antonio the son of Piero the son of Guido, all of whom had been men of law like their descendant). Leonardo's mother was called Catarina. Her relations with Ser Piero da Vinci seem to have come to an end almost immediately upon the birth of their son. She was soon afterwards married to one Accattabriga di Piero del Vacca, of Vinci. Ser Piero on his part was four times married, and had by his last two wives nine sons and two daughters; but he had from the first acknowledged the boy Leonardo and brought him up in his own house, principally, no doubt, at Florence. In that city Ser Piero followed his profession with success, as notary to many of the chief families in the city, including the Medici, and afterwards to the signory or governing council of the state. The son born to him before marriage grew up into a youth of shining promise. To splendid beauty and activity of person he joined a winning charm of temper and manners, a tact for all societies, and an aptitude for all accomplishments. An inexhaustible intellectual energy and curiosity lay beneath this amiable surface. Among the multifarious pursuits to which the young Leonardo set his hand, the favourites at first were music, drawing and modelling. His father showed some of his drawings to an acquaintance, Andrea del Verrocchio, who at once recognized the boy's artistic vocation, and was selected by Ser Piero to be his master.

Verrocchio, although hardly one of the great creative or inventive forces in the art of his age at Florence, was a first-rate craftsman alike as goldsmith, sculptor and painter, and particularly distinguished as a teacher. In his studio Leonardo worked for several years (about 1470–1477) in the company of Lorenzo di Credi and other less celebrated pupils. Among his contemporaries he formed special ties of friendship with the painters Sandro Botticelli and Pietro Perugino. He had soon learnt all that Verrocchio had to teach—more than all, if we are to believe the oft-told tale of the figure, or figures, executed by the pupil in the picture of Christ's Baptism designed by the master for the monks of Vallombrosa. The work in question is now in the Academy at Florence. According to Vasari the angel kneeling on the left, with a drapery over the right arm, was put in by Leonardo, and when Verrocchio saw it his sense of its superiority to his own work caused him to forswear painting for ever after. The latter part of the story is certainly false. The picture, originally painted in tempera, has suffered much from later repaints in oil, rendering exact judgment difficult. The most competent opinion inclines to acknowledge the hand of Leonardo, not only in the face of the angel, but also in parts of the drapery and of the landscape background. The work was probably done in or about 1470, when Leonardo was eighteen years old. By 1472 we find him enrolled in the lists of the painters' gild at Florence. Here he continued to live and work for ten or eleven years longer. Up till 1477 he is still spoken of as a pupil or apprentice of Verrocchio; but in that year he seems to have been taken into special favour by Lorenzo the Magnificent, and to have worked as an independent artist under his patronage until 1482–1483. In 1478 we find him receiving an important commission from the signory, and in 1480 another from the monks of San Donato in Scopeto.

Leonardo was not one of those artists of the Renaissance who sought the means of reviving the ancient glories of art mainly in the imitation of ancient models. The antiques of the Medici gardens seem to have had little influence on him beyond that of generally stimulating his passion for perfection. By his own instincts he was an exclusive student of nature.

From his earliest days he had flung himself upon that study with an unprecedented ardour of delight and curiosity. In drawing from life he had early found the way to unite precision with freedom and fire—the subtlest accuracy of expressive definition with vital movement and rhythm of line—as no draughtsman had been able to unite them before. He was the first painter to recognize the play of light and shade as among the most significant and attractive of the world's appearances, the earlier schools having with one consent subordinated light and shade to colour and outline. Nor was he a student of the broad, usual, patent appearances only of the world; its fugitive, fantastic, unaccustomed appearances attracted him most of all. Strange shapes of hills and rocks, rare plants and animals, unusual faces and figures of men, questionable smiles and expressions, whether beautiful or grotesque, far-fetched objects and curiosities, were things he loved to pore upon and keep in memory. Neither did he stop at mere appearances of any kind, but, having stamped the image of things upon his brain, went on indefatigably to probe their hidden laws and causes. He soon satisfied himself that the artist who was content to reproduce the external aspects of things without searching into the hidden workings of nature behind them, was one but half equipped for his calling. Every fresh artistic problem immediately became for him a far-reaching scientific problem as well. The laws of light and shade, the laws of "perspective," including optics and the physiology of the eye, the laws of human and animal anatomy and muscular movement, those of the growth and structure of plants and of the powers and properties of water, all these and much more furnished food almost from the beginning to his insatiable spirit of inquiry.

The evidence of the young man's predilections and curiosities is contained in the legends which tell of lost works produced by him in youth. One of these was a cartoon or monochrome painting of Adam and Eve in tempera, and in this, besides the beauty of the figures, the infinite truth and elaboration of the foliage and animals in the background are celebrated in terms which bring to mind the treatment of the subject by Albrecht Dürer in his famous engraving done thirty years later. Again, a peasant of Vinci having in his simplicity asked Ser Piero to get a picture painted for him on a wooden shield, the father is said to have laughingly handed on the commission to his son, who thereupon shut himself up with all the noxious insects and grotesque reptiles he could find, observed and drew and dissected them assiduously, and produced at last a picture of a dragon compounded of their various shapes and aspects, which was so fierce and so life-like as to terrify all who saw it. With equal research and no less effect he painted on another occasion the head of a snaky-haired Medusa. (A picture of this subject which long did duty at the Uffizi for Leonardo's work is in all likelihood merely the production of some later artist to whom the descriptions of that work have given the cue.) Lastly, Leonardo is related to have begun work in sculpture about this time by modelling several heads of smiling women and children.

Of certified and accepted paintings produced by the young genius, whether during his apprentice or his independent years at Florence (about 1470–1482), very few are extant, and the two most important are incomplete. A small and charming strip of an oblong "Annunciation" at the Louvre is generally accepted as his work, done soon after 1470; a very highly wrought drawing at the Uffizi, corresponding on a larger scale to the head of the Virgin in the same picture, seems rather to be a copy by a later hand. This little Louvre "Annunciation" is not very compatible in style with another and larger, much-debated "Annunciation" at the Uffizi, which manifestly came from the workshop of Verrocchio about 1473–1474, and which many critics claim confidently for the young Leonardo. It may have been joint studio-work of Verrocchio and his pupils including Leonardo, who certainly was concerned in it, since a study for the sleeve of the angel, preserved at Christ Church, Oxford, is unquestionably by his hand. The landscape, with its mysterious spiry mountains and winding waters, is very Leonardesque both in this picture and in another contemporary product of the workshop, or as some think of Leonardo's hand, namely a very highly and coldly finished small "Madonna with a Pink" at Munich. The likeness he is recorded to have painted of Ginevra de' Benci used to be traditionally identified with the fine portrait of a matron at the Pitti absurdly known as *La Monaca*: more lately it has been recognized in a rather dull, expressionless Verrocchiesque portrait of a young woman with a fanciful background of pine-sprays in the Liechtenstein gallery at Vienna. Neither attribution can be counted convincing. Several works of sculpture, including a bas-relief at Pistoia and a small terra-cotta model of a St John at the Victoria and Albert Museum, have also been claimed, but without general consent, as the young master's handiwork. Of many brilliant early drawings by him, the first that can be dated is a study of landscape done in 1473. A magnificent silver-point head of a Roman warrior at the British Museum was clearly done, from or for a bas-relief, under the immediate influence of Verrocchio. A number of studies of heads in pen or silver point, with some sketches for Madonnas, including a charming series in the British Museum for a "Madonna with the Cat," may belong to the same years or the first years of his independence. A sheet with two studies of heads bears a MS. note of 1478, saying that in one of the last months of that year he began painting the "Two Maries." One of the two may have been a picture of the Virgin appearing to St Bernard, which we know he was commissioned to paint in that year for a chapel in the Palace of the Signory, but never finished: the commission was afterwards transferred to Filippino Lippi, whose performance is now in the Badia. One of the two heads on this dated sheet may probably have been a study for the same St Bernard; it was used afterwards by some follower for a St Leonard in a stiff and vapid "Ascension of Christ," wrongly attributed to the master himself in the Berlin Museum. A pen-drawing representing a ringleader of the Pazzi conspiracy, Bernardo Baroncelli, hung out of a window of the Bargello after his surrender by the sultan at Constantinople to the emissaries of Florence, can be dated from its subject as done in December 1479. A number of his best drawings of the next following years are preparatory pen-studies for an altarpiece of the "Adoration of the Magi," undertaken early in 1481 on the commission of the monks of S. Donato at Scopeto. The preparation in monochrome for this picture, a work of extraordinary power both of design and physiognomical expression, is preserved at the Uffizi, but the painting itself was never carried out, and after Leonardo's failure to fulfil his contract Filippino Lippi had once more to be employed in his place. Of equal or even more intense power, though of narrower scope, is an unfinished monochrome preparation for a St Jerome, found accidentally at Rome by Cardinal Fesch and now in the Vatican gallery; this also seems to belong to the first Florentine period, but is not mentioned in documents.

The tale of completed work for these twelve or fourteen years (1470–1483 or thereabouts) is thus very scanty. But it must be remembered that Leonardo was already full of projects in mechanics, hydraulics, architecture, and military and civil engineering, ardently feeling his way in the work of experimental study and observation in every branch of theoretical or applied science in which any beginning had been made in his age, as well as in some in which he was himself the first pioneer. He was full of new ideas concerning both the laws and the applications of mechanical forces. His architectural and engineering projects were of a daring which amazed even the fellow-citizens of Alberti and Brunelleschi. History presents few figures more attractive to the mind's eye than that of Leonardo during this period of his all-capable and dazzling youth. He did not indeed escape calumny, and was even denounced on a charge of immoral practices, but fully and honourably acquitted. There was nothing about him, as there was afterwards about Michelangelo, dark-tempered, secret or morose; he was open and genial with all men. He has indeed praised "the self-sufficing power of solitude" in almost the same phrase as Wordsworth, and from time to time would even in youth seclude himself for a season in complete intellectual absorption, as when he toiled among his bats and wasps and lizards, forgetful of rest and food, and insensible to the noisomeness of their corruption. But we have to picture him as anon coming out and gathering about him a tatterdemalion company, and jesting with them until they were in fits of laughter, for the sake of observing their burlesque physiognomies; anon as eagerly frequenting the society of men of science and learning of an older generation like the mathematician Benedetto Aritmetico, the physician, geographer and astronomer Paolo Toscanelli, the famous Greek Aristotelian Giovanni Argiropoulo; or as out-rivalling all the youth of the city now by charm of recitation, now by skill in music and now by feats of strength and horsemanship; or as stopping to buy caged birds in the market that he might set them free and watch them rejoicing in their flight; or again as standing radiant in his rose-coloured cloak and his rich gold hair among the throng of young and old on the piazza, and holding them spellbound while he expatiated on the great projects in art and mechanics that were teeming in his mind. Unluckily it is to written records and to imagination that we have to trust exclusively for our picture. No portrait of Leonardo as he appeared during this period of his life has come down to us.

But his far-reaching schemes and studies brought him no immediate gain, and diverted him from the tasks by which he should have supported himself. For all his shining power and promise he remained poor. Probably also his exclusive belief in experimental methods, and slight regard for mere authority whether in science or art made the intellectual atmosphere of the Medicean circle, with its passionate mixed cult of the classic past and of a Christianity mystically blended and reconciled with Platonism, uncongenial to him. At any rate he was ready to leave Florence when the chance was offered him of fixed service at the court of Ludovico Sforza (il Moro) at Milan. Soon after that prince had firmly established his power as nominal guardian and protector of his nephew Gian Galeazzo but really as usurping ruler of the state, he revived a project previously mooted for the erection of an equestrian monument in honour of the founder of his house's greatness, Francesco Sforza, and consulted Lorenzo dei Medici on the choice of an artist. Lorenzo recommended the young Leonardo, who went to Milan accordingly (at some uncertain date in or about 1483), taking as a gift from Lorenzo and a token of his own skill a silver lute of wondrous sweetness fashioned in the likeness of a horse's head. Hostilities were at the moment imminent between Milan and Venice; it was doubtless on that account that in the letter commending himself to the duke, and setting forth his own capacities, Leonardo rests his title to patronage chiefly on his attainments and inventions in military engineering. After asserting these in detail under nine different heads, he speaks under a tenth of his proficiency as a civil engineer and architect, and adds lastly a brief paragraph with reference to what he can do in painting and sculpture, undertaking in particular to carry out in a fitting manner the monument to Francesco Sforza.

The first definite documentary evidence of Leonardo's employments at Milan dates from 1487. Some biographers have supposed that the interval, or part of it, between 1483 and that date was occupied by travels in the East. The grounds of the supposition are some drafts occurring among his MSS. of a letter addressed to the *diodario* or *diwâdar* of Syria, lieutenant of the sultan of Babylon (Babylon meaning according to a usage of that time Cairo). In these drafts Leonardo describes in the first person, with sketches, a traveller's strange experiences in Egypt, Cyprus, Constantinople, the Cilician coasts about Mount Taurus and Armenia. He relates the rise and persecution of a prophet and preacher, the catastrophe of a falling mountain and submergence of a great city, followed by a general inundation, and the claim of the prophet to have foretold these disasters; adding physical descriptions of the Euphrates river and the marvellous effects of sunset light on the Taurus range. No contemporary gives the least hint of Leonardo's having travelled in the East; to the places he mentions he gives their classical and not their current Oriental names; the catastrophes he describes are unattested from any other source; he confuses the Taurus and the Caucasus; some of the phenomena he mentions are repeated from Aristotle and Ptolemy; and there seems little reason to doubt that these passages in his MSS. are merely his drafts of a projected geographical treatise or perhaps romance. He had a passion for geography and travellers' tales, for descriptions of natural wonders and ruined cities, and was himself a practised fictitious narrator and fabulist, as other passages in his MSS. prove. Neither is the gap in the account of his doings after he first went to the court of Milan really so complete as has been represented. Ludovico was vehemently denounced and attacked during the earlier years of his usurpation, especially by the partisans of his sister-in-law Bona of Savoy, the mother of the rightful duke, young Gian Galeazzo. To repel these attacks he employed the talents of a number of court poets and artists, who in public recitation and pageant, in emblematic picture and banner and device, proclaimed the wisdom and kindness of his guardianship and the wickedness of his assailants. That Leonardo was among the artists thus employed is proved both by notes and projects among his MSS. and by allegoric sketches still extant. Several such sketches are at Christ Church, Oxford: one shows a horned hag or she-fiend urging her hounds to an attack on the state of Milan, and baffled by the Prudence and Justice of Il Moro (all this made clear by easily recognizable emblems). The allusion must almost certainly be to the attempted assassination of Ludovico by agents of the duchess Bona in 1484. Again, it must have been the pestilence decimating Milan in 1484–1485 which gave occasion to the projects submitted by Leonardo to Ludovico for breaking up the city and reconstructing it on improved sanitary principles. To 1485–1486 also appears to belong the inception of his elaborate though unfulfilled architectural plans for beautifying and strengthening the *Castello*, the great stronghold of the ruling power in the state. Very soon afterwards he must have begun work upon his plans and models, undertaken during an acute phase of the competition which the task had called forth between German and Italian architects, for another momentous enterprise, the completion of Milan cathedral. Extant records of payments made to him in connexion with these architectural plans extend from August 1487 to May 1490: in the upshot none of them was carried out. From the beginning of his residence with Ludovico his combination of unprecedented mechanical ingenuity with apt allegoric invention and courtly charm and eloquence had made him the directing spirit in all court ceremonies and festivities. On the occasion of the marriage of the young duke Gian Galeazzo with Isabella of Aragon in 1487, we find Leonardo devising all the mechanical and spectacular part of a masque of Paradise; and presently afterwards designing a bathing pavilion of unheard-of beauty and ingenuity for the young duchess. Meanwhile he was filling his note-books as busily as ever with the results of his studies in statics and dynamics, in human anatomy, geometry and the phenomena of light and shade. It is probable that from the first he had not forgotten his great task of the Sforza monument, with its attendant researches in equine movement and anatomy, and in the science and art of bronze casting on a great scale. The many existing sketches for the work (of which the chief collection is at Windsor) cannot be distinctly dated. In 1490, the seventh year of his residence at Milan, after some expressions of impatience on the part of his patron, he had all but got his model ready for display on the occasion of the marriage of Ludovico with Beatrice d'Este, but at the last moment was dissatisfied with what he had done and determined to begin all over again.

In the same year, 1490, Leonardo enjoyed some months of uninterrupted mathematical and physical research in the libraries and among the learned men of Pavia, whither he had been called to advise on some architectural difficulties concerning the cathedral. Here also the study of an ancient equestrian monument (the so-called *Regisole*, destroyed in 1796) gave him fresh ideas for his Francesco Sforza. In January 1491 a double Sforza-Este marriage (Ludovico Sforza himself with Beatrice d'Este, Alfonso d'Este with Anna Sforza the sister of Gian

Galeazzo) again called forth his powers as a masque and pageant-master. For the next following years the ever-increasing gaiety and splendour of the Milanese court gave him continual employment in similar kinds, including the composition and recitation of jests, tales, fables and "prophecies" (*i.e.* moral and social satires and allegories cast in the future tense); among his MSS. occur the drafts of many such, some of them both profound and pungent. Meanwhile he was again at work upon the monument to Francesco Sforza, and this time to practical purpose. When ambassadors from Austria came to Milan towards the close of 1493 to escort the betrothed bride of their emperor Maximilian, Bianca Maria Sforza, away on her nuptial journey, the finished colossal model, 26 ft. high, was at last in its place for all to see in the courtyard of the Castello. Contemporary accounts attest the magnificence of the work and the enthusiasm it excited, but are not precise enough to enable us to judge to which of the two main groups of extant sketches its design corresponded. One of these groups shows the horse and rider in relatively tranquil march, in the manner of the Gattemalata monument put up fifty years before by Donatello at Padua and the Colleoni monument on which Verocchio was now engaged at Venice. Another group of sketches shows the horse galloping or rearing in violent action, in some instances in the act of trampling a fallen enemy. Neither is it possible to discriminate with certainty the sketches intended for the Sforza monument from others which Leonardo may have done in view of another and later commission for an equestrian statue, namely, that in honour of Ludovico's great enemy, Gian Giacomo Trivulzio.

The year 1494 is a momentous one in the history of Italian politics. In that year the long ousted and secluded prince, Gian Galeazzo, died under circumstances more than suspicious. In that year Ludovico, now duke of Milan in his own right, for the strengthening of his power against Naples, first entered into those intrigues with Charles VIII. of France which later brought upon Italy successive floods of invasion, revolution and calamity. The same year was one of special importance in the prodigiously versatile activities of Leonardo da Vinci. Documents show him, among other things, planning during an absence of several months from the city vast new engineering works for improving the irrigation and water-ways of the Lomellina and adjacent regions of the Lombard plain; ardently studying phenomena of storm and lightning, of river action and of mountain structure; co-operating with his friend, Donato Bramante, the great architect, in fresh designs for the improvement and embellishment of the Castello at Milan; and petitioning the duke to secure him proper payment for a Madonna lately executed with the help of his pupil, Ambrogio de Predis, for the brotherhood of the Conception of St Francis at Milan. (This is almost certainly the fine, slightly altered second version of the "Virgin of the Rocks," now in the National Gallery, London. The original and earlier version is one of the glories of the Louvre, and shows far more of a Florentine and less of a Milanese character than the London picture.) In the same year, 1494, or early in the next, Leonardo, if Vasari is to be trusted, paid a visit to Florence to take part in deliberations concerning the projected new council-hall to be constructed in the palace of the Signory. Lastly, recent research has proved that it was in 1494 that Leonardo got to work in earnest on what was to prove not only by far his greatest but by far his most expeditiously and steadily executed work in painting. This was the "Last Supper" undertaken for the refectory of the convent church of Sta Maria delle Grazie at Milan on the joint commission (as it would appear) of Ludovico and of the monks themselves.

This picture, the world-famous "Cenacolo" of Leonardo, has been the subject of much erroneous legend and much misdirected experiment. Having through centuries undergone cruel injury, from technical imperfections at the outset, from disastrous atmospheric conditions, from vandalism and neglect, and most of all from unskilled repair, its remains have at last (1904–1908) been treated with a mastery of scientific resource and a tenderness of conscientious skill that have revived for ourselves and for posterity a great part of its power. At the same time its true history has been investigated and re-established. The intensity of intellectual and manual application which Leonardo threw into the work is proved by the fact that he finished it within four years, in spite of all his other avocations and of those prolonged pauses of concentrated imaginative effort and intense self-critical brooding to which we have direct contemporary witness. He painted the picture on the wall in tempera, not, according to the legend which sprung up within twenty years of its completion, in oil. The tempera vehicle, perhaps including new experimental ingredients, did not long hold firmly to its plaster ground, nor that to the wall. Flaking and scaling set in; hard crusts of mildew formed, dissolved and re-formed with changes of weather over both the loosened parts and those that remained firm. Decade after decade these processes went on, a rain of minute scales and grains falling, according to one witness, continually from the surface, till the picture seemed to be perishing altogether. In the 18th century attempts were first made at restoration. They all proceeded on the false assumption, dating from the early years of the 16th century, that the work had been executed in oil. With oil it was accordingly at one time saturated in hopes of reviving the colours. Other experimenters tried various "secrets," which for the most part meant deleterious glues and varnishes. Fortunately not very much of actual repainting was accomplished except on some parts of the garments. The chief operations were carried on by Bellotti in 1726, by Mazza in 1770, and by Barezzi in 1819 and the following years. None of them arrested, some actually accelerated, the natural agencies of damp and disintegration, decay and mildew. Yet this mere ghost of a picture, this evocation, half vanished as it was, by a great world-genius of a mighty spiritual world-event, remained a thing indescribably impressive. The ghost has now been brought back to much of true life again by the skill of the most scrupulous of all restorers, Cavaliere Cavenaghi, who, acting under the authority of a competent commission, and after long and patient experiment, found it possible to secure to the wall the innumerable blistered, mildewed and half-detached flakes and scales of the original work that yet remained, to clear the surface thus obtained of much of the obliterating accretions due to decay and mishandling, and to bring the whole to unity by touching tenderly in with tempera the spots and spaces actually left bare. A further gain obtained through these operations has been the uncovering, immediately above the main subject, of a beautiful scheme of painted lunettes and vaultings, the lunettes filled by Leonardo's hand with inscribed scutcheons and interlaced plait or knot ornaments (*intrecciamenti*), the vaultings with stars on a blue ground. The total result, if adequate steps can be taken to counteract the effects of atmospheric change in future, will remain a splendid gain for posterity and a happy refutation of D'Annunzio's despairing poem, the *Death of a Masterpiece*.

Leonardo's "Last Supper," for all its injuries, became from the first, and has ever since remained, for all Christendom the typical representation of the scene. Goethe in his famous criticism has said all that needs to be said of it. The painter has departed from precedent in grouping the disciples, with their Master in the midst, along the far side and the two ends of a long, narrow table, and in leaving the near or service side of the table towards the spectator free. The chamber is seen in a perfectly symmetrical perspective, its rear wall pierced by three plain openings which admit the sense of quiet distance and mystery from the open landscape beyond; by the central of these openings, which is the widest of the three, the head and shoulders of the Saviour are framed in. On His right and left are ranged the disciples in equal numbers. The furniture and accessories of the chamber, very simply conceived, have been rendered with scrupulous exactness and distinctness; yet they leave to the human and dramatic elements the absolute mastery of the scene. The serenity of the holy company has within a moment been broken by the words of their Master, "One of you shall betray Me." In the agitation of their consciences and affections, the disciples have started into groups or clusters along the table, some standing, some still remaining seated. There are four of these groups, of three disciples each, and each group is harmoniously interlinked by some natural connecting action with the next. Leonardo, though no special student of the Greeks, has perfectly carried out the Greek principle of expressive variety in particulars subordinated to general symmetry. He has used all his acquired science of linear and aerial perspective to create an almost complete illusion to the eye, but an illusion that has in it nothing trivial, and in heightening our sense of the material reality of the scene only heightens its profound spiritual impressiveness and gravity. The results of his intensest meditations on the psychology and the human and divine significance of the event (on which he has left some pregnant hints in written words of his own) are perfectly fused with those of his subtlest technical calculations on the rhythmical balancing of groups and arrangement of figures in space.

Of authentic preparatory studies for this work there remain but few. There is a sheet at the Louvre of much earlier date than the first idea or commission for this particular picture, containing some nude sketches for the arrangement of the subject; another later and farther advanced, but still probably anterior to the practical commission, at Venice, and a MS. sheet of great interest at the Victoria and Albert Museum, on which the painter has noted in writing the dramatic motives appropriate to the several disciples. At Windsor and Milan are a few finished studies in red chalk for the heads. A highly-reputed series of life-sized chalk drawings of the same heads, of which the greater portion is at Weimar, consists of early copies, and is interesting though having no just claim to originality. Scarcely less doubtful is the celebrated unfinished and injured study of the head of Christ at the Brera, Milan.

Leonardo's triumph with his " Last Supper " encouraged him in the hope of proceeding now to the casting of the Sforza monument or " Great Horse," the model of which had stood for the last three years the admiration of all beholders, in the Corte Vecchio of the Castello. He had formed a new and close friendship with Luca Pacioli of Borgo San Sepolcro, the great mathematician, whose *Summa de aritmetica, geometrica*, &c., he had eagerly bought at Pavia on its first appearance, and who arrived at the Court of Milan about the moment of the completion of the " Cenacolo." Pacioli was equally amazed and delighted at Leonardo's two great achievements in sculpture and painting, and still more at the genius for mathematical, physical and anatomical research shown in the collections of MS. notes which the master laid before him. The two began working together on the materials for Pacioli's next book, *De divina proportione.* Leonardo obtained Pacioli's help in calculations and measurements for the great task of casting the bronze horse and man. But he was soon called away by Ludovico to a different undertaking, the completion of the interior decorations, already begun by another hand and interrupted, of certain chambers of the Castello called the *Saletta Negra* and the *Sala Grande dell' Asse*, or *Sala della Torre*. When, in the last decade of the 19th century, works of thorough architectural investigation and repair were undertaken in that building under the superintendence of Professor Luca Beltrami, a devoted foreign student, Dr Paul Müller-Walde, obtained leave to scrape for traces of Leonardo's handiwork beneath the replastered and whitewashed walls and ceilings of chambers that might be identified with these. In one small chamber there was cleared a frieze of cupids intermingled with foliage; but in this, after the first moments of illusion, it was only possible to acknowledge the hand of some unknown late and lax decorator of the school, influenced as much by Raphael as by Leonardo. In another room (*Sala del Tesoro*) was recovered a gigantic headless figure, in all probability of Mercury, also wrongly claimed at first for Leonardo, and afterwards, to all appearance rightly, for Bramante. But in the great *Sala dell' Asse* (or *della Torre*) abundant traces of Leonardo's own hand were found, in the shape of a decoration of intricate geometrical knot or plait work combined with natural leafage; the abstract puzzle-pattern, of a kind in which Leonardo took peculiar pleasure, intermingling in cunning play and contrast with a pattern of living boughs and leaves exquisitely drawn in free and vital growth. Sufficient portions of this design were found in good preservation to enable the whole to be accurately restored—a process as legitimate in such a case as censurable in the case of a figure-painting. For these and other artistic labours Leonardo was rewarded in 1498 (ready money being with difficulty forthcoming and his salary being long in arrears) by the gift of a suburban garden outside the Porta Vercelli.

But again he could not get leave to complete the task in hand. He was called away on duty as chief military engineer (*ingegnere camerale*) with the special charge of inspecting and maintaining all the canals and waterways of the duchy. Dangers were accumulating upon Ludovico and the state of Milan. France had become Ludovico's enemy; and Louis XII., the pope and Venice had formed a league to divide his principality among them. He counted on baffling them by forming a counter league of the principalities of northern Italy, and by raising the Turks against Venice, and the Germans and Swiss against France. Germans and Swiss, however, inopportunely fell to war against each other. Ludovico travelled to Innsbruck, the better to push his interests (September 1499). In his absence Louis XII. invaded the Milanese, and the officers left in charge of the city surrendered it without striking a blow. The invading sovereign, going to Sta Maria delle Grazie with his retinue to admire the renowned painting of the " Last Supper," asked if it could not be detached from the wall and transported to France. The French lieutenant in Milan, Gian Giacomo Trivulzio, the embittered enemy of Ludovico, began exercising a vindictive tyranny over the city which had so long accepted the sway of the usurper. Great artists were usually exempt from the consequences of political revolutions, and Trivulzio, now or later, commissioned Leonardo to design an equestrian monument to himself. Leonardo, having remained unmolested at Milan for two months under the new régime, but knowing that Ludovico was preparing a great stroke for the re-establishment of his power, and that fresh convulsions must ensue, thought it best to provide for his own security. In December he left Milan with his friend Luca Pacioli, having first sent some of his modest savings to Florence for investment. His intention was to watch events. They took a turn which made him a stranger to Milan for the next seven years. Ludovico, at the head of an army of Swiss mercenaries, returned victoriously in February 1500, and was welcomed by a population disgusted with the oppression of the invaders. But in April he was once more overthrown by the French in a battle fought at Novara, his Swiss clamouring at the last moment for their overdue pay, and treacherously refusing to fight against a force of their own countrymen led by La Trémouille. Ludovico was taken prisoner and carried to France; the city, which had been strictly spared on the first entry of Louis XII., was entered and sacked; and the model of Leonardo's great statue made a butt (as eye witnesses tell) for Gascon archers. Two years later we find the duke Ercole of Ferrara begging the French king's lieutenant in Milan to let him have the model, injured as it was, for the adornment of his own city; but nothing came of the petition, and within a short time it seems to have been totally broken up.

Thus, of Leonardo's sixteen years' work at Milan (1483–1499) the results actually remaining are as follows: The Louvre " Virgin of the Rocks " possibly, *i.e.* as to its execution; the conception and style are essentially Florentine, carried out by Leonardo to a point of intense and almost glittering finish, of quintessential, almost overstrained, refinement in design and expression, and invested with a new element of romance by the landscape in which the scene is set—a strange watered country of basaltic caves and arches, with the lights and shadows striking sharply and yet mysteriously among rocks, some upright, some jutting, some pendent, all tufted here and there with exquisite growths of shrub and flower. The National Gallery " Virgin of the Rocks " certainly, with help from Ambrogio de Predis; in this the Florentine character of the original is modified by an admixture of Milanese elements, the tendency to harshness and over-elaboration of detail softened, the strained action of the angel's pointing hand altogether dropped, while in many places pupils' work seems recognizable beside that of the master. The "Last Supper" of Sta Maria delle Grazie, his masterpiece; as to its history and present condition enough has been said. The decorations of the ceiling of the Sala della Torre in the Castello. Other paintings done by him at Milan are mentioned, and attempts have been made to identify them with works still existing. He is known to have painted portraits of two of the king's mistresses, Cecilia Gallerani and Lucrezia Crivelli. Cecilia Gallerani used to be identified as a lady with ringlets and a lute, depicted in a portrait at Milan, now rightly assigned to Bartolommeo Veneto. More lately she has by some been conjecturally recognized in a doubtful, though Leonardesque, portrait of a lady with a weasel in the Czartoryski collection at Prague. Lucrezia Crivelli has, with no better reason, been identified with the famous "Belle Ferronnière" (a mere misnomer, caught from the true name of another portrait which used to hang near it) at the Louvre; this last is either a genuine Milanese portrait by Leonardo himself or an extraordinarily fine work of his pupil Boltraffio. Strong claims have also been made on behalf of a fine profile portrait resembling Beatrice d'Este in the Ambrosiana; but this the best judges are agreed in regarding as a work, done in a lucky hour, of Ambrogio de Predis. A portrait of a musician in the same gallery is in like manner contested between the master and the pupil. Mention is made of a "Nativity" painted for and sent to the emperor Maximilian, and also apparently of some picture painted for Matthias Corvinus, king of Hungary; both are lost or at least unidentified. The painters especially recorded as Leonardo's immediate pupils during this part of his life at Milan are the two before mentioned, Giovanni Antonio Boltraffio and Ambrogio Preda or de Predis, with Marco d'Oggionno and Andrea Salai, the last apparently less a fully-trained painter than a studio assistant and personal attendant, devotedly attached and faithful in both capacities. Leonardo's own native Florentine manner had at first been not a little modified by that of the Milanese school as he found it represented in the works of such men as Bramantino, Borgognone and Zenale; but his genius had in its turn reacted far more strongly upon the younger members of the school, and exercised, now or later, a transforming and dominating influence not only upon his immediate pupils, but upon men like Luini, Giampetrino, Bazzi, Cesare da Sesto and indeed the whole Lombard school in the early 15th century. Of sculpture done by him during this period we have no remains, only the tragically tantalizing history of the Sforza monument. Of drawings there are very many, including few only for the "Last Supper," many for the Sforza monument, as well as the multitude of sketches, scientific and other, which we find intermingled among the vast body of his miscellaneous MSS., notes and records. In mechanical, scientific and theoretical studies of all kinds it was a period, as these MSS. attest, of extraordinary activity and self-development. At Pavia in 1494 we find him taking up literary and grammatical studies, both in Latin and the vernacular; the former, no doubt, in order the more easily to read those among the ancients who had laboured in the fields that were his own, as Euclid, Galen, Celsus, Ptolemy, Pliny, Vitruvius and, above all, Archimedes; the latter with a growing hope of some day getting into proper form and order the mass of materials he was daily accumulating for treatises on all his manifold subjects of enquiry. He had been much helped by his opportunities of intercourse with the great architects, engineers and mathematicians who frequented the court of Milan—Bramante, Alberghetti, Andrea di Ferrara, Pietro Monti, Fazio Cardano and, above all, Luca Pacioli. The knowledge of Leonardo's position among and familiarity with such men early helped to spread the idea that he had been at the head of a regularly constituted academy of arts and sciences at Milan. The occurrence of the words "Achademia Leonardi Vinci" on certain engravings, done after his drawings, of geometric "knots" or puzzle-patterns (things for which we have already learned his partiality), helped to give currency to this impression not only in Italy but in the North, where the same engravings were copied by Albrecht Dürer. The whole notion has been proved mistaken. There existed no such academy at Milan, with Leonardo as president. The academies of the day represented the prevailing intellectual tendency of Renaissance humanism, namely, an absorbing enthusiasm for classic letters and for the transcendental speculations of Platonic and neo-Platonic mysticism, not unmixed with the traditions and practice of medieval alchemy, astrology and necromantics. For these last pursuits Leonardo had nothing but contempt. His many-sided and far-reaching studies in experimental science were mainly his own, conceived and carried out long in advance of his time, and in communion with only such more or less isolated spirits as were advancing along one or another of the same paths of knowledge. He learnt indeed on these lines eagerly wherever he could, and in learning imparted knowledge to others. But he had no school in any proper sense except his studio, and his only scholars were those who painted there. Of these one or two, as we have evidence, tried their hands at engraving; among their engravings were these "knots," which, being things of use for decorative craftsmen to copy, were inscribed for identification, and perhaps for protection, as coming from the Achademia Leonardi Vinci; a trifling matter altogether, and quite unfit to sustain the elaborate structure of conjecture which has been built on it.

To return to the master: when he and Luca Pacioli left Milan in December 1499, their destination was Venice. They made a brief stay at Mantua, where Leonardo was graciously received by the duchess Isabella Gonzaga, the most cultured of the many cultured great ladies of her time, whose portrait he promised to paint on a future day; meantime he made the fine chalk drawing of her now at the Louvre. Arrived at Venice, he seems to have occupied himself chiefly with studies in mathematics and cosmography. In April the friends heard of the second and final overthrow of Ludovico il Moro, and at that news, giving up all idea of a return to Milan, moved on to Florence, which they found depressed both by internal troubles and by the protraction of the indecisive and inglorious war with Pisa. Here Leonardo undertook to paint an altar-piece for the Church of the Annunziata, Filippino Lippi, who had already received the commission, courteously retiring from it in his favour. A year passed by, and no progress had been made with the painting. Questions of physical geography and engineering engrossed him as much as ever. He writes to correspondents making enquiries about the tides in the Euxine and Caspian Seas. He reports for the information of the *Arte de' Mercanti* on the precautions to be taken against a threatening landslip on the hill of S. Salvatore dell' Osservanza. He submits drawings and models for the canalization and control of the waters of the Arno, and propounds, with compulsive eloquence and conviction, a scheme for transporting the Baptistery of St John, the "bel San Giovanni" of Dante, to another part of the city, and elevating it on a stately basement of marble. Meantime the Servite brothers of the Annunziata were growing impatient for the completion of their altar-piece. In April 1501 Leonardo had only finished the cartoon, and this all Florence flocked to see and admire. Isabella Gonzaga, who cherished the hope that he might be induced permanently to attach himself to the court of Mantua, wrote about this time to ask news of him, and to beg for a painting from him for her study, already adorned with masterpieces by the first hands of Italy, or at least for a "small Madonna, devout and sweet as is natural to him." In reply her correspondent says that the master is wholly taken up with geometry and very impatient of the brush, but at the same time tells her all about his just completed cartoon for the Annunziata. The subject was the Virgin seated in the lap of St Anne, bending forward to hold her child who had half escaped from her embrace to play with a lamb upon the ground. The description answers exactly to the composition of the celebrated picture of the Virgin and St Anne at the Louvre. A cartoon of this composition in the Esterhazy collection at Vienna is held to be only a copy, and the original cartoon must be regarded as lost. But another of kindred though not identical motive has come down to us and is preserved in the Diploma Gallery at the Royal Academy. In this incomparable work St Anne, pointing upward with her left hand, smiles with an intense look of wondering, questioning, inward sweetness into the face of the Virgin, who in her turn smiles down upon her child as He leans from her lap to give the blessing to the little St John standing beside her. Evidently two different though nearly related designs had been maturing in Leonardo's mind. A rough first sketch for the motive of the Academy cartoon is in the British Museum; one for the motive of the lost cartoon and of the Louvre picture is at Venice. No painting by Leonardo from the Academy cartoon exists, but in the Ambrosiana at Milan there is one by Luini, with the figure of St Joseph added. It remains a matter of debate whether the Academy cartoon or that shown by Leonardo at the Annunziata in 1501 was the earlier. The probabilities seem in favour of the Academy cartoon. This, whether done at Milan or at Florence, is in any case a typically perfect and harmonious example of the master's Milanese manner; while in the other composition with the lamb the action and attitude of the Virgin are somewhat strained, and the original relation between her head and her mother's, lovely both in design and expression, is lost.

In spite of the universal praise of his cartoon, Leonardo did not persevere with the picture, and the monks of the Annunziata had to give back the commission to Filippino Lippi, at whose death the task was completed by Perugino. It remains uncertain whether a small Madonna with distaff and spindle, which the correspondent of Isabella Gonzaga reports Leonardo as having begun for one Robertet, a favourite of the king of France, was ever finished. He painted one portrait, it is said, at this time, that of Ginevra Benci, a kinswoman, perhaps sister, of a youth Giovanni di Amerigo Benci, who shared his passion for cosmographical studies; and probably began another, the famous "La Gioconda," which was only finished four years afterwards. The gonfalionere Soderini offered him in vain, to do with it what he would, the huge half-spoiled block of marble out of which Michelangelo three years later wrought his "David." Isabella Gonzaga again begged, in an autograph letter, that she might have a painting by his hand, but her request was put off; he did her, however, one small service by examining and reporting on some jewelled vases, formerly the property of Lorenzo de' Medici, which had been offered her. The importunate expectations of a masterpiece or masterpieces in painting or sculpture, which beset him on all hands in Florence, inclined him to take service again with some princely patron, if possible of a genius commensurate with his own, who would give him scope to carry out engineering schemes on a vast scale. Accordingly he suddenly took service, in the spring of 1502, with Cesare Borgia, duke of Valentinois, then almost within sight of the realization of his huge ambitions, and meanwhile occupied in consolidating his recent conquests in the Romagna. Between May 1502 and March 1503 Leonardo travelled as chief engineer to Duke Caesar over a great part of central Italy. Starting with a visit to Piombino, on the coast opposite Elba, he went by way of Siena to Urbino, where he made drawings and began works; was thence hastily summoned by way of Pesaro and Rimini to Cesena; spent two months between there and Cesenatico, projecting and directing canal and harbour works, and planning the restoration of the palace of Frederic II.; thence hurriedly joined his master, momentarily besieged by enemies at Imola; followed him probably to Sinigaglia and Perugia, through the whirl of storms and surprises, vengeances and treasons, which marked his course that winter, and finally, by way of Chiusi and Acquapendente, as far as Orvieto and probably to Rome, where Caesar arrived on the 14th of February 1503. The pope's death and Caesar's own downfall were not destined to be long delayed. But Leonardo apparently had already had enough of that service, and was back at Florence in March. He has left dated notes and drawings made at most of the stations we have named, besides a set of six large-scale maps drawn minutely with his own hand, and including nearly the whole territory of the Maremma, Tuscany and Umbria between the Apennines and the Tyrrhene Sea.

At Florence he was at last persuaded, on the initiative of Piero Soderini, to undertake for his native city a work of painting as great as that with which he had adorned Milan. This was a battle-piece to decorate one of the walls of the new council-hall in the palace of the signory. He chose an episode in the victory won by the generals of the republic in 1440 over Niccolo Piccinino near a bridge at Anghiari, in the upper valley of the Tiber. To the young Michelangelo was presently entrusted a rival battle-piece to be painted on another wall of the same apartment; he chose, as is well known, a surprise of the Florentine forces in the act of bathing near Pisa. About the same time Leonardo took part in the debate on the proper site for Michelangelo's newly finished colossal "David," and voted in favour of the Loggia dei Lanzi, against a majority which included Michelangelo himself. Neither Leonardo's genius nor his noble manners could soften the rude and taunting temper of the younger man, whose style as an artist, nevertheless, in subjects both of tenderness and terror, underwent at this time a profound modification from Leonardo's example.

In one of the sections of his projected *Treatise on Painting*, Leonardo has detailed at length, and obviously from his own observation, the pictorial aspects of a battle. His choice of subject in this instance was certainly not made from any love of warfare or indifference to its horrors. In his MSS. there occur almost as many trenchant sayings on life and human affairs as on art and natural law; and of war he has disposed in two words as a "bestial frenzy" (*pazzia bestialissima*). In his design for the Hall of Council he set himself to depict this frenzy at its fiercest. He chose the moment of a terrific struggle for the colours between the opposing sides; hence the work became commonly known as the "Battle of the Standard." Judging by the accounts of those who saw it, and the fragmentary evidences which remain, the tumultuous medley of men and horses, and the expressions of martial fury and despair, must have been conceived and rendered with a mastery not less commanding than had been the looks and gestures of bodeful sorrow and soul's perplexity among the quiet company on the convent wall at Milan. The place assigned to Leonardo for the preparation of his cartoon was the Sala del Papa at Santa Maria Novella. He for once worked steadily and unremittingly at his task. His accounts with the signory enable us to follow its progress step by step. He had finished the cartoon in less than two years (1504–1505), and when it was exhibited along with that of Michelangelo, the two rival works seemed to all men a new revelation of the powers of art, and served as a model and example of the students of that generation, as the frescoes of Masaccio in the Carmine had served to those of two generations earlier. The young Raphael, whose incomparable instinct for rhythmical design had been trained hitherto on subjects of holy quietude and rapt contemplation according to the traditions of Umbrian art, learnt from Leonardo's example to apply the same instinct to themes of violent action and strife. From the same example Fra Bartolommeo and a crowd of other Florentine painters of the rising or risen generation took in like manner a new impulse. The master lost no time in proceeding to the execution of his design upon the mural surface; this time he had devised a technical method of which, after a preliminary trial in the Sala del Papa, he regarded the success as certain; the colours, whether tempera or other remains in doubt, were to be laid on a specially prepared ground, and then both colours and ground made secure upon the wall by the application of heat. When the central group was done the heat was applied, but it was found to take effect unequally; the colours in the upper part ran or scaled from the wall, and the result was a failure more or less complete. The unfinished and decayed painting remained for some fifty years on the wall, but after 1560 was covered over with new frescoes by Vasari. The cartoon did not last so long. After doing its work as the most inspiring of all examples for students it seems to have been cut up. When Leonardo left Italy for good in 1516 he is recorded to have left "the greater part of it" in deposit at the hospital of S. Maria Nuova, where he was accustomed also to deposit his moneys, and whence it seems before long to have disappeared. Our only existing memorials of the great work are a number of small pen-studies of fighting men and horses, three splendid studies in red chalk at Budapest for heads in the principal group, one head at Oxford copied by a contemporary of the size of the original cartoon (above life); a tiny sketch, also at Oxford, by Raphael after the principal group; an engraving done by Zacchia of Lucca in 1558 not after the original but after a copy; a 16th-century Flemish drawing of the principal group, and another, splendidly spirited, by Rubens, both copies of copies; with Edelinck's fine engraving after the Rubens drawing.

During these years, 1503–1506, Leonardo also resumed (if it is true that he had already begun it before his travels with Cesare Borgia) the portrait of Madonna Lisa, the Neapolitan wife of Zanobi del Giocondo, and finished it to the last pitch of his powers. In this lady he had found a sitter whose face and smile possessed in a singular degree the haunting, enigmatic charm in which he delighted. He worked, it is said, at her portrait during some portion of four successive years, causing music to be played during the sittings that the rapt expression might not fade from off her countenance. The picture was bought afterwards by Francis I. for four thousand gold florins, and is now one of the glories of the Louvre. The richness of colouring on which Vasari expatiates has indeed flown, partly from injury, partly because in striving for effects of light and shade the painter was accustomed to model his figures on a dark ground, and in this as in his other oil-pictures the ground has to a large extent come through. Nevertheless, in its dimmed and blackened state, the portrait casts an irresistible spell alike by subtlety of expression, by refinement and precision of drawing, and by the romantic invention of its background. It has been the theme of endless critical rhapsodies, among which that of Pater is perhaps the most imaginative as it is the best known.

In the spring of 1506 Leonardo, moved perhaps by chagrin at the failure of his work in the Hall of Council, accepted a pressing invitation to Milan, from Charles d'Amboise, Maréchal de Chaumont, the lieutenant of the French king in Lombardy. The leave of absence granted to him by the signory on the request of the French viceroy was for three months only. The period was several times extended, at first grudgingly, Soderini complaining that Leonardo had treated the republic ill in the matter of the battle picture; whereupon the painter honourably offered to refund the money paid, an offer which the signory as honourably refused. Louis XII. sent messages urgently desiring that Leonardo should await his own arrival in Milan, having seen a small Madonna by him in France (probably that painted for Robertet) and hoping to obtain from him works of the same class and perhaps a portrait. The king arrived in May 1507, and soon afterwards Leonardo's services were formally and amicably transferred from the signory of Florence to Louis, who gave him the title of painter and engineer in ordinary. In September of the same year troublesome private affairs called him to Florence. His father had died in 1504, apparently intestate. After his death Leonardo experienced unkindness from his seven half-brothers, Ser Piero's legitimate sons. They were all much younger than himself. One of them, who followed his father's profession, made himself the champion of the others in disputing Leonardo's claim to his share, first in the paternal inheritance, and then in that which had been left to be divided between the brothers and sisters by an uncle. The litigation that ensued dragged on for several years, and forced upon Leonardo frequent visits to Florence and interruptions of his work at Milan, in spite of pressing letters to the authorities of the republic from Charles d'Amboise, from the French king himself, and from others of his powerful friends and patrons, begging that the proceedings might be accelerated. There are traces of work done during these intervals of compulsory residence at Florence. A sheet of sketches drawn there in 1508 shows the beginning of a Madonna now lost except in the form of copies, one of which (known as the "Madonna Litta") is at St Petersburg, another in the Poldi-Pezzoli Museum at Milan. A letter from Leonardo to Charles d'Amboise in 1511, announcing the end of his law troubles, speaks of two Madonnas of different sizes that he means to bring with him to Milan. One was no doubt that just mentioned; can the other have been the Louvre "Virgin with St Anne and St John," now at last completed from the cartoon exhibited in 1501? Meantime the master's main home and business were at Milan. Few works of painting and none of sculpture (unless the unfulfilled commission for the Trivulzio monument belongs to this time) are recorded as occupying him during the seven years of his second residence in that city (1506–1513). He had attached to himself a new and devoted young friend and pupil of noble birth, Francesco Melzi. At the villa of the Melzi family at Vaprio, where Leonardo was a frequent visitor, a colossal Madonna on one of the walls is traditionally ascribed to him, but is rather the work of Sodoma or of Melzi himself working under the master's eye. Another painter in the service of the French king, Jehan Perréal or Jehan de Paris, visited Milan, and consultations on technical points were held between him and Leonardo. But Leonardo's chief practical employments were evidently on the continuation of his great hydraulic and irrigation works in Lombardy. His old trivial office of pageant-master and inventor of scientific toys was revived on the occasion of Louis XII.'s triumphal entry after the victory of Agnadello in 1509, and gave intense delight to the French retinue of the king. He was consulted on the construction of new choir-stalls for the cathedral. He laboured in the natural sciences as ardently as ever, especially at anatomy in company with the famous professor of Pavia, Marcantonio della Torre. To about this time, when he was approaching his sixtieth year, may belong the noble portrait-drawing of himself in red chalk at Turin. He looks too old for his years, but quite unbroken; the character of a veteran sage has fully imprinted itself on his countenance; the features are grand, clear and deeply lined, the mouth firmly set and almost stern, the eyes strong and intent beneath their bushy eyebrows, the hair flows untrimmed over his shoulders and commingles with a majestic beard.

Returning to Milan with his law-suits ended in 1511, Leonardo might have looked forward to an old age of contented labour, the chief task of which, had he had his will, would undoubtedly have been to put in order the vast mass of observations and speculations accumulated in his note-books, and to prepare some of them for publication. But as his star seemed rising that of his royal protector declined. The hold of the French on Lombardy was rudely shaken by hostile political powers, then confirmed again for a while by the victories of Gaston de Foix, and finally destroyed by the battle in which that hero fell under the walls of Ravenna. In June 1512 a coalition between Spain, Venice and the pope re-established the Sforza dynasty in power at Milan in the person of Ludovico's son Massimiliano. This prince must have been familiar with Leonardo as a child, but perhaps resented the ready transfer of his allegiance to the French, and at any rate gave him no employment. Within a few months the ageing master uprooted himself from Milan, and moved with his chattels and retinue of pupils to Rome, into the service of the house that first befriended him, the Medici. The vast enterprises of Pope Julius II. had already made Rome the chief seat and centre of Italian art. The accession of Giulio de' Medici in 1513 under the title of Leo X. raised on all hands hopes of still ampler and more sympathetic patronage. Leonardo's special friend at the papal court was the pope's youngest brother, Giuliano de' Medici, a youth who combined dissipated habits with thoughtful culture and a genuine interest in arts and sciences. By his influence Leonardo and his train were accommodated with apartments in the Belvedere of the Vatican. But the conditions of the time and place proved adverse. The young generation held the field. Michelangelo and Raphael, who had both, as we have seen, risen to greatness partly on Leonardo's shoulders, were fresh from the glory of their great achievements in the Sistine Chapel and the Stanze. Their rival factions hated each other, but both, especially the faction of Michelangelo, turned bitterly against the veteran newcomer. The pope, indeed, is said to have been delighted with Leonardo's minor experiments and ingenuities in science, and especially by a kind of zoological toys which he had invented by way of pastime, as well as mechanical tricks played upon living animals. But for the master's graver researches and projects he cared little, and was far more interested in the dreams of astrologers and alchemists. When Leonardo, having received a commission for a picture, was found distilling for himself a new medium of oils and herbs before he had begun the design, the pope was convinced, not quite unreasonably, that nothing serious would come of it. The only paintings positively recorded as done by him at Rome are two small panels for an official of the papal court, one of a child, the other of a Madonna, both now lost or unrecognized. To this time may also belong a lost Leda, standing upright with the god in swan's guise at her side and the four children near their feet. This picture was at Fontainebleau in the 16th century and is known from several copies, the finest of them at the Borghese gallery, as well as from one or two preliminary sketches by the master himself and a small sketch copy by Raphael. A portrait of a Florentine lady, said to have been painted for Giuliano de' Medici and seen afterwards in France, may also have been done at Rome; or may what we learn of this be only a confused account of the Monna Lisa? Tradition ascribes to Leonardo an attractive fresco of a Madonna with a donor in the convent of St Onofrio, but this seems to be clearly the work of Boltraffio. The only engineering works we hear of at this time are some on the harbour and defences of Cività Vecchia. On the whole the master in these Roman days found himself slighted for the first and only time in his life. He was, moreover, plagued by insubordination and malignity on the part of two German assistant craftsmen lodged in his apartments. Charges of impiety and body-snatching laid by these men in connexion with his anatomical studies caused the favour of the pope to be for a time withdrawn. After a stay of less than two years, Leonardo left Rome under the following circumstances. Louis XII. of France had died in the last days of 1514. His young and brilliant successor, Francis I., surprised Europe by making a sudden dash at the head of an army across the Alps to vindicate his rights in Italy. After much hesitation Leo X. in the summer of 1515 ordered Giuliano de' Medici, as gonfalonier of the Church, to lead a papal force into the Emilia and watch the movements of the invader. Leonardo accompanied his protector on the march, and remained with the headquarters of the papal army at Piacenza when Giuliano fell ill and retired to Florence. After the battle of Marignano it was arranged that Francis and the pope should meet in December at Bologna. The pope, travelling by way of Florence and discussing there the great new scheme of the Laurentian library, entertained the idea of giving the commission to Leonardo; but Michelangelo came in hot haste from Rome and succeeded in securing it for himself. As the time for the meeting of the potentates at Bologna drew near, Leonardo proceeded thither from Piacenza, and in due course was presented to the king. Between the brilliant young sovereign and the grand old sage an immediate and strong sympathy sprang up; Leonardo accompanied Francis on his homeward march as far as Milan, and there determined to accept the royal invitation to France, where a new home was offered him with every assurance of honour and regard.

The remaining two and a half years of Leonardo's life were spent at the Castle of Cloux near Amboise, which was assigned, with a handsome pension, to his use. The court came often to Amboise, and the king delighted in his company, declaring his knowledge both of the fine arts and of philosophy to be beyond those of all mortal men. In the spring of 1518 Leonardo had occasion to exercise his old talents as a festival-master when the dauphin was christened and a Medici-Bourbon marriage celebrated. He drew the designs for a new palace at Amboise, and was much engaged with the project of a great canal to connect the Loire and Saône. An ingenious attempt has been made to prove, in the absence of records, that the famous spiral staircase at Blois was also of his designing.

Among his visitors was a fellow-countryman, Cardinal Louis of Aragon, whose secretary has left an account of the day. Leonardo, it seems, was suffering from some form of slight paralysis which impaired his power of hand. But he showed the cardinal three pictures, the portrait of a Florentine lady done for Giuliano de' Medici (the Gioconda ?), the Virgin in the lap of St Anne (the Louvre picture; finished at Florence or Milan 1507–1513?), and a youthful John the Baptist. The last, which may have been done since he settled in France, is the darkened and partly repainted, but still powerful and haunting half-length figure in the Louvre, with the smile of inward ravishment and the prophetic finger beckoning skyward like that of St Anne in the Academy cartoon. Of the "Pomona" mentioned by Lomazzo as a work of the Amboise time his visitor says nothing, nor yet of the Louvre "Bacchus," which tradition ascribes to Leonardo but which is clearly pupil's work. Besides pictures, the master seems also to have shown and explained to his visitors some of his vast store of notes and observations on anatomy and physics. He kept hoping to get some order among his papers, the accumulation of more than forty years, and perhaps to give the world some portion of the studies they contained. But his strength was nearly exhausted. On Easter Eve 1519, feeling that the end was near, he made his will. It made provision, as became a great servant of the most Christian king, for masses to be said and candles to be offered in three different churches of Amboise, first among them that of St Florentin, where he desired to be buried, as well as for sixty poor men to serve as torch-bearers at his funeral. Vasari babbles of a death-bed conversion and repentance. But Leonardo had never been either a friend or an enemy of the Church. Sometimes, indeed, he denounces fiercely enough the arts and pretensions of priests; but no one has embodied with such profound spiritual insight some of the most vital moments of the Christian story. His insatiable researches into natural fact brought upon him among the vulgar some suspicion of practising those magic arts which of all things he scouted and despised. The bent of his mind was all towards the teachings of experience and against those of authority, and laws of nature certainly occupied far more of his thoughts than dogmas of religion; but when he mentions these it is with respect as throwing light on the truth of things from a side which was not his own. His conformity at the end had in it nothing contradictory of his past. He received the sacraments of the Church and died on the 2nd of May 1519. King Francis, then at his court of St Germain-en-Laye, is said to have wept for the loss of such a servant; that he was present beside the death-bed and held the dying painter in his arms is a familiar but an untrue tale. After a temporary sepulture elsewhere his remains were transported on the 12th of August to the cloister of St Florentin according to his wish. He left all his MSS. and apparently all the contents of his studio, with other gifts, to the devoted Melzi, whom he named executor; to Salai and to his servant Battista Villanis a half each of his vineyard outside Milan; gifts of money and clothes to his maid Maturina; one of money to the poor of the hospital in Amboise; and to his unbrotherly half-brothers a sum of four hundred ducats lying to his credit at Florence.

History tells of no man gifted in the same degree as Leonardo was at once for art and science. In art he was an inheritor and perfecter, born in a day of great and many-sided endeavours on which he put the crown, surpassing both predecessors and contemporaries. In science, on the other hand, he was a pioneer, working wholly for the future, and in great part alone. That the two stupendous gifts should in some degree neutralize each other was inevitable. No imaginable strength of any single man would have sufficed to carry out a hundredth part of what Leonardo essayed. The mere attempt to conquer the kingdom of light and shade for the art of painting was destined to tax the skill of generations, and is perhaps not wholly and finally accomplished yet. Leonardo sought to achieve that conquest and at the same time to carry the old Florentine excellences of linear drawing and psychological expression to a perfection of which other men had not dreamed. The result, though marvellous in quality, is in quantity lamentably meagre. Knowing and doing allured him equally, and in art, which consists in doing, his efforts were often paralysed by his strained desire to know. The thirst for knowledge had first been aroused in him by the desire of perfecting the images of beauty and power which it was his business to create.

Thence there grew upon him the passion of knowledge for its own sake. In the splendid balance of his nature the Virgilian longing, *rerum cognoscere causas*, could never indeed wholly silence the call to exercise his active powers. But the powers he cared most to exercise ceased by degree to be those of imaginative creation, and came to be those of turning to practical human use the mastery which his studies had taught him over the forces of nature. In science he was the first among modern men to set himself most of those problems which unnumbered searchers of later generations have laboured severally or in concert to solve. Florence had had other sons of comprehensive genius, artistic and mechanical, Leon Battista Alberti perhaps the chief. But the more the range and character of Leonardo's studies becomes ascertained the more his greatness dwarfs them all. A hundred years before Bacon, say those who can judge best, he showed a firmer grasp of the principles of experimental science than Bacon showed, fortified by a far wider range of actual experiment and observation. Not in his actual conclusions, though many of these point with surprising accuracy in the direction of truths established by later generations, but in the soundness, the wisdom, the tenacity of his methods lies his great title to glory. Had the Catholic reaction not fatally discouraged the pursuit of the natural sciences in Italy, had Leonardo even left behind him any one with zeal and knowledge enough to extract from the mass of his MSS. some portion of his labours in those sciences and give them to the world, an incalculable impulse would have been given to all those enquiries by which mankind has since been striving to understand the laws of its being and control the conditions of its environment,—to mathematics and astronomy, to mechanics, hydraulics, and physics generally, to geology, geography, and cosmology, to anatomy and the sciences of life. As it was, these studies of Leonardo—"studies intense of strong and stern delight"—seemed to his trivial followers and biographers merely his whims and fancies, *ghiribizzi*, things to be spoken of slightingly and with apology. The MSS., with the single exception of some of those relating to painting, lay unheeded and undivulged until the present generation; and it is only now that the true range of Leonardo's powers is beginning to be fully discerned.

So much for the intellectual side of Leonardo's character and career. As a moral being we are less able to discern what he was like. The man who carried in his brain so many images of subtle beauty, as well as so much of the hidden science of the future, must have lived spiritually, in the main, alone. Of things communicable he was at the same time, as we have said, communicative—a genial companion, a generous and loyal friend, ready and eloquent of discourse, impressing all with whom he was brought in contact by the power and the charm of genius, and inspiring fervent devotion and attachment in friends and pupils. We see him living on terms of constant affection with his father, and in disputes with his brothers not the aggressor but the sufferer from aggression. We see him full of tenderness to animals, a virtue not common in Italy in spite of the example of St Francis; open-handed in giving, not eager in getting—"poor," he says, "is the man of many wants"; not prone to resentment—"the best shield against injustice is to double the cloak of long-suffering"; zealous in labour above all men—"as a day well spent gives joyful sleep, so does a life well spent give joyful death." With these instincts and maxims, and with his strength, granting it almost more than human, spent ever tunnelling in abstruse mines of knowledge, his moral experience is not likely to have been deeply troubled. In religion, he regarded the faith of his age and country at least with imaginative sympathy and intellectual acquiescence, if no more. On the political storms which shook his country and drove him from one employment to another, he seems to have looked not with the passionate participation of a Dante or a Michelangelo but rather with the serene detachment of a Goethe. In matters of the heart, if any consoling or any disturbing passion played a great part in his life, we do not know it; we know only (apart from a few passing shadows cast by calumny and envy) of affectionate and dignified relations with friends, patrons and pupils, of public and private regard mixed in the days of his youth with dazzled admiration, and in those of his age with something of reverential awe.

The Drawings of Leonardo.—These are among the greatest treasures ever given to the world by the human spirit expressing itself in pen and pencil. Apart from the many hundreds of illustrative pen-sketches scattered through his autobiographic and scientific MSS., the principal collection is at Windsor Castle (partly derived from the Arundel collection); others of importance are in the British Museum; at Christ Church, Oxford; in the Louvre, at Chantilly, in the Uffizi, the Venice Academy, the Royal Library at Turin, the Museum of Budapest, and in the collections of M. Bonnat, Mrs Mond, and Captain Holford. Leonardo's chief implements were pen, silver-point, and red and black chalk (red chalk especially). In silver-point there are many beautiful drawings of his earlier time, and some of his later; but of the charming heads of women and young men in this material attributed to him in various collections, comparatively few are his own work, the majority being drawings in his spirit by his pupils Ambrogio Preda or Boltraffio. Leonardo appears to have been left-handed. There is some doubt on the point; but a contemporary and intimate friend, Luca Pacioli, speaks of his "ineffable left hand"; all the best of his drawings are shaded downward from left to right, which would be the readiest way for a left-handed man; and his habitual eccentric practice of writing from right to left is much more likely to have been due to natural left-handedness than to any desire of mystery or concealment. A full critical discussion and catalogue of the extant drawings of Leonardo are to be found in Berenson's *Drawings of the Florentine Painters*.

The Writings of Leonardo.—The only printed book bearing Leonardo's name until the recent issues of transcripts from his MSS. was the celebrated *Treatise on Painting* (*Trattato della pittura*, *Traité de la peinture*). This consists of brief didactic chapters, or more properly paragraphs, of practical direction or critical remark on all the branches and conditions of a painter's practice. The original MS. draft of Leonardo has been lost, though a great number of notes for it are scattered through the various extant volumes of his MSS. The work has been printed in two different forms; one of these is an abridged version consisting of 365 sections; the first edition of it was published in Paris in 1551, by Raphael Dufresne, from a MS. which he found in the Barberini library; the last, translated into English by J. F. Rigaud, in London, 1877. The other is a more extended version, in 912 sections, divided into eight books; this was printed in 1817 by Guglielmo Manzi at Rome, from two MSS. which he had discovered in the Vatican library; a German translation from the same MS. has been edited by G. H. Ludwig in Eitelberger's series of *Quellenschriften für Kunstgeschichte* (Vienna, 1882; Stuttgart, 1885). On the history of the book in general see Max Jordan, *Das Malerbuch des Leonardo da Vinci* (Leipzig, 1873). The unknown compilers of the Vatican MSS. must have had before them much more of Leonardo's original text than is now extant. Only about a quarter of the total number of paragraphs are identical with passages to be found in the master's existing autograph note-books. It is indeed doubtful whether Leonardo himself ever completed the MS. treatise (or treatises) on painting and kindred subjects mentioned by Fra Luca Pacioli and by Vasari, and probable that the form and order, and perhaps some of the substance, of the *Trattato* as we have it was due to compilers and not to the master himself.

In recent years a whole body of scholars and editors have been engaged in giving to the world the texts of Leonardo's existing MSS. The history of these is too complicated to be told here in any detail. Francesco Melzi (d. 1570) kept the greater part of his master's bequest together as a sacred trust as long as he lived, though even in his time some MSS. on the art of painting seem to have passed into other hands. But his descendants suffered the treasure to be recklessly dispersed. The chief agents in their dispersal were the Doctor Orazio Melzi who possessed them in the last quarter of the 16th century; the members of a Milanese family called Mazzenta, into whose hands they passed in Orazio Melzi's lifetime; and the sculptor Pompeo Leoni, who at one time entertained the design of procuring their presentation to Philip II. of Spain, and who cut up a number of the note-books to form the great miscellaneous single volume called the *Codice Atlantico*, now at Milan. This volume, with a large proportion of the total number of other Leonardo MSS. then existing, passed into the hands of a Count Arconati, who presented them to the Ambrosian library at Milan in 1636. In the meantime the earl of Arundel had made a vain attempt to purchase one of these volumes (the *Codice Atlantico*?) at a great price for the king of England. Some stray parts of the collection, including the MSS. now at Windsor, did evidently come into Lord Arundel's possession, and the history of some other parts can be followed; while much, it is evident, was lost for good. In 1796 Napoleon swept away to Paris, along with the other art treasures of Italy, the whole of the Leonardo MSS. at the Ambrosiana: only the *Codice Atlantico* was afterwards restored, the other volumes remaining the property of the Institut de France. These also have had their adventures, two of them having been stolen by Count Libri and passed temporarily into the collection of Lord Ashburnham, whence they were in recent years made over again to the Institute. The first important step towards a better knowledge of the MSS. was made by the beginning, in 1880, of the great series of publications from the MSS. of the Institut de France undertaken by C. Ravaisson-Mollien; the next by the publication in 1883 of Dr J. P. Richter's *Literary Works of Leonardo da Vinci* (see Bibliography): this work included, besides a history and analytical index of the MSS., facsimiles of a number of selected pages containing matter of autobiographical, artistic, or literary interest, with transcripts and translations of their MS. contexts. Since then much progress has been made in the publication of the complete MSS., scientific and other, whether with adequate critical apparatus or in the form of mere facsimile without transliteration or comment.

A brief statement follows of the present distribution of the several MSS. and of the form in which they are severally published:—

England.—*Windsor*: Nine MSS., chiefly on anatomy, published entire in simple facsimile by Rouveyre (Paris, 1901); partially, with transliterations and introduction by Piumati and Sabachnikoff (Paris, 1898, foll.); *British Museum*: one MS., miscellaneous, unpublished; *Victoria and Albert Museum*: ten note-books bound in 3 vols.; facsimile by Rouveyre, *Holkham* (collection of Lord Leicester), 1 vol., on hydraulics and the action of water; published in facsimile with transliteration and notes by Gerolamo Calvi. **France.**—*Institut de France*: seventeen MSS., all published with transliteration and notes by C. Ravaisson-Mollien (6 vols., Paris, 1880–1891). **Italy.**—*Milan, Ambrosiana*: the *Codice Atlantico*, the huge miscellany, of vital importance for the study of the master, put together by Pompeo Leoni; published in facsimile, with transliteration, by the Accademia dei Lincei (1894, foll.); *Milan*: collection of Count Trivulzio; 1 vol., miscellaneous; published and edited by L. Beltrami (1892); *Rome*: collection of Count Marszolini; *Treatise on the Flight of Birds*, published and edited by Piumati and Sabachnikoff (Paris, 1492).

Bibliography.—The principal authorities are:—"Il libro di Antonio Billi," edited from MS. by G. de Fabriazy in *Archivio Storico Ital.* ser. v. vol. 7; "Breve vita di Leonardo da Vinci, scritto da un adnonimo del 1500" (known as the Anonimo Gaddiano), printed by G. Milanesi in *Archivio Storico Ital.* t. xvi. (1872), translated with notes by H. P. Horne in series published by the Unicorn Library (1903); Paolo Giovio, "Leonardi Vincii vita," in his *Elogia*, printed in Tiraboschi, *Storia della Lett. Ital.* t. vii. pt. 4, and in *Classici Italiani*, vol. 314; Vasari, in his celebrated *Lives of the Painters* (1st ed., Florence, 1550; 2nd ed. *ibid.* 1568; ed. Milanesi, with notes and supplements, 1878–1885); Sabba da Castiglione, *Ricordi* (Venice, 1565); G. P. Lomazzo, *Trattato dell' arte della pittura*, &c. (Milan, 1584–1585); *Id.*, *Idea del tempio della pittura* (Milan, 1591); Le Père Dan, *Le Trésor . . . de Fontainebleau* (1642); J. B. Venturi, *Essai sur les ouvrages physico-mathématiques de L. da V.* (Paris, 1797); C. Amoretti, *Memorie storiche sulla vita, &c. di L. da V.* (Milan, 1804), a work which laid the foundation of all future researches; Giuseppe Bossi, *Del Cenacolo di L. da V.* (Milan, 1810); C. Fumagalli, *Scuola di Leonardo da Vinci* (1811); Gaye, *Carteggio d'artisti* (1839–1841); G. Uzielli, *Ricerche intorno a L. da V.*, series 1, 2 (Florence, 1872; Rome, 1884; series 1 revised, Turin, 1896), documentary researches of the first importance for the study; C. L. Calvi, *Notizie dei principali professori di belle arti* (Milan, 1869); Arsène Houssaye, *Histoire de L. de V.* (Paris, 1869 and 1876, an agreeable literary biography of the pre-critical kind); Mrs Heaton, *Life of L. da V.* (London, 1872), a work also made obsolete by recent research; Hermann Grothe, *L. da V. als Ingenieur und Philosoph* (Berlin, 1874); A. Marks, the *S. Anne of L. da V.* (London, 1882); J. P. Richter, *The Literary Works of L. da V.* (2 vols., London, 1883), this is the very important and valuable history of and selection from the texts mentioned above under MSS.; Ch. Ravaisson-Mollien, *Les Écrits de L. da V.* (Paris, 1881); Paul Müller Walde, *L. da V., Lebensskizze und Forschungen* (Munich, 1889–1890); *Id.*, "Beiträge zur Kenntniss des L. da V.," *in Jahrbuch der k. Preussischen Kunstsammlungen* (1897–1899), the first immature and incomplete, the second of high value: the whole life of this writer has been devoted to the study of L. da V., but it is uncertain whether the vast mass of material collected by him will ever take shape or see the light; G. Gronau, *L. da V.* (London, 1902); Bernhard Berenson, *The Drawings of the Florentine Painters* (London, 1903); Edmondo Solmi, *Studi sulla filosofia naturale di L. da V.* (Modena, 1898); *Id.*, *Leonardo* (Florence, 1st ed. 1900, 2nd ed. 1907; this last edition of Solmi's work is by far the most complete and satisfactory critical biography of the master which yet exists); A. Rosenberg, *L. da V.*, in Knackfuss's series of art biographies (Leipzig, 1898); Gabriel Séailles, *L. da V., l'artiste et le savant* (1st ed. 1892, 2nd ed. 1906), a lucid and careful general estimate of great value, especially in reference to Leonardo's relations to modern science; Edward McCurdy, *L. da V.*, in Bell's "Great Masters" series (1904 and 1907), a very sound and trustworthy summary of the master's career as an artist; *Id.*, *L. da V.'s Note-Books* (1908), a selection from the passages of chief general interest in the master's MSS., very well chosen, arranged, and translated, with a useful history of the MSS. prefixed, *Le Vicende del Cenacolo di L. da V. nel secolo XIX.* (Milan, 1906), an official account of the later history and vicissitudes of the "Last Supper" previous to its final repair; Luca Beltrami, *Il Castello di Milano* (1894); *Id.*, *L. da V. et la Sala dell' Asse* (1902); *Id.*, "Il Cenacolo di Leonardo," in *Raccolta Vinciana* (Milan, 1908), the official account of the successful work of repair carried out by Signor Cavenaghi in the preceding years; Woldemar von Seidlitz, *Leonardo da Vinci, der Wendepunkt der Renaissance* (2 vols., 1909), a comprehensive and careful work by an accomplished and veteran critic, inclined to give perhaps an excessive share in the reputed works of Leonardo to a single pupil, Ambrogio Preda. It seems needless to give references to the voluminous discussion in newspapers and periodicals concerning the authenticity of a wax bust of Flora acquired in 1909 for the Berlin Museum and unfortunately ascribed to Leonardo da Vinci, its real author having been proved by external and internal evidence to be the Englishman Richard Cockle Lucas, and its date 1846. (S. C.)

LEONARDO OF PISA (Leonardus Pisanus or Fibonacci), Italian mathematician of the 13th century. Of his personal history few particulars are known. His father was called Bonaccio, most probably a nickname with the ironical meaning of "a good, stupid fellow," while to Leonardo himself another nickname, Bigollone (dunce, blockhead), seems to have been given. The father was secretary in one of the numerous factories erected on the southern and eastern coasts of the Mediterranean by the warlike and enterprising merchants of Pisa. Leonardo was educated at Bugia, and afterwards toured the Mediterranean. In 1202 he was again in Italy and published his great work, *Liber abaci*, which probably procured him access to the learned and refined court of the emperor Frederick II. Leonardo certainly was in relation with some persons belonging to that circle when he published in 1220 another more extensive work, *De practica geometriae*, which he dedicated to the imperial astronomer Dominicus Hispanus. Some years afterwards (perhaps in 1228) Leonardo dedicated to the well-known astrologer Michael Scott the second edition of his *Liber abaci*, which was printed with Leonardo's other works by Prince Bald. Boncompagni (Rome, 1857–1862, 2 vols.). The other works consist of the *Practica geometriae* and some most striking papers of the greatest scientific importance, amongst which the *Liber quadratorum* may be specially signalized. It bears the notice that the author wrote it in 1225, and in the introduction Leonardo tells us the occasion of its being written. Dominicus had presented Leonardo to Frederick II. The presentation was accompanied by a kind of mathematical performance, in which Leonardo solved several hard problems proposed to him by John of Palermo, an imperial notary, whose name is met with in several documents dated between 1221 and 1240. The methods which Leonardo made use of in solving those problems fill the *Liber quadratorum*, the *Flos*, and a *Letter to Magister Theodore*. All these treatises seem to have been written nearly at the same period, and certainly before the publication of the second edition of the *Liber abaci*, in which the *Liber quadratorum* is expressly mentioned. We know nothing of Leonardo's fate after he issued that second edition.

Leonardo's works are mainly developments of the results obtained by his predecessors; the influences of Greek, Arabian, and Indian mathematicians may be clearly discerned in his methods. In his *Practica geometriae* plain traces of the use of the Roman *agrimensores* are met with; in his *Liber abaci* old Egyptian problems reveal their origin by the reappearance of the very numbers in which the problem is given, though one cannot guess through what channel they came to Leonardo's knowledge. Leonardo cannot be regarded as the inventor of that very great variety of truths for which he mentions no earlier source.

The *Liber abaci*, which fills 459 printed pages, contains the most perfect methods of calculating with whole numbers and with fractions, practice, extraction of the square and cube roots, proportion, chain rule, finding of proportional parts, averages, progressions, even compound interest, just as in the completest mercantile arithmetics of our days. They teach further the solution of problems leading to equations of the first and second degree, to determinate and indeterminate equations, not by single and double position only, but by real algebra, proved by means of geometric constructions, and including the use of letters as symbols for known numbers, the unknown quantity being called *res* and its square *census*.

The second work of Leonardo, his *Practica geometriae* (1220) requires readers already acquainted with Euclid's planimetry, who are able to follow rigorous demonstrations and feel the necessity for them. Among the contents of this book we simply mention a trigonometrical chapter, in which the words *sinus versus arcus* occur, the approximate extraction of cube roots shown more at large than in the *Liber abaci*, and a very curious problem, which nobody would search for in a geometrical work, viz.—To find a square number remaining so after the addition of 5. This problem evidently suggested the first question, viz.—To find a square number which remains a square after the addition and subtraction of 5, put to our mathematician in presence of the emperor by John of Palermo, who, perhaps, was quite enough Leonardo's friend to set him such problems only as he had himself asked for. Leonardo gave as solution the numbers $11\frac{97}{144}$, $16\frac{97}{144}$ and $6\frac{97}{144}$,—the squares of $3\frac{5}{12}$, $4\frac{1}{12}$ and $2\frac{7}{12}$; and the method of finding them is given in the *Liber quadratorum*. We observe, however, that this kind of problem was not new. Arabian authors already had found three square numbers of equal difference, but the difference itself had not been assigned in proposing the question. Leonardo's method, therefore, when the difference was a fixed condition of the problem, was necessarily very different from the Arabian, and, in all probability, was his own discovery. The *Flos* of Leonardo turns on the second question set by John of Palermo, which required the solution of the cubic equation $x^3+2x^2+10x=20$. Leonardo, making use of fractions of the sexagesimal scale, gives $x=1^0\ 22^i\ 7^{ii}\ 42^{iii}\ 33^{iv}\ 4^v\ 40^{vi}$, after having demonstrated, by a discussion founded on the 10th book of Euclid, that a solution by square roots is impossible. It is much to be deplored that Leonardo does not give the least intimation how he found his approximative value, outrunning by this result more than three centuries. Genocchi believes Leonardo to have been in possession of a certain method called *regula aurea* by H. Cardan in the 16th century, but this is a mere hypothesis without solid foundation. In the *Flos* equations with negative values of the unknown quantity are also to be met with, and Leonardo perfectly understands the meaning of these negative solutions. In the *Letter to Magister Theodore* indeterminate problems are chiefly worked, and Leonardo hints at his being able to solve by a general method any problem of this kind not exceeding the first degree.

As for the influence he exercised on posterity, it is enough to say that Luca Pacioli, about 1500, in his celebrated *Summa*, leans so exclusively to Leonardo's works (at that time known in manuscript only) that he frankly acknowledges his dependence on them, and states that wherever no other author is quoted all belongs to Leonardus Pisanus.

Fibonacci's series is a sequence of numbers such that any term is the sum of the two preceding terms; also known as *Lamé's series.* (M. Ca.)

LEONCAVALLO, RUGGIERO (1858-), Italian operatic composer, was born at Naples and educated for music at the conservatoire. After some years spent in teaching and in ineffectual attempts to obtain the production of more than one opera, his *Pagliacci* was performed at Milan in 1892 with immediate success; and next year his *Medici* was also produced there. But neither the latter nor *Chatterton* (1896)—both early works—obtained any favour; and it was not till *La Bohème* was performed in 1897 at Venice that his talent obtained public confirmation. Subsequent operas by Leoncavallo were *Zaza* (1900), and *Der Roland* (1904). In all these operas he was his own librettist.

LEONIDAS, king of Sparta, the seventeenth of the Agiad line. He succeeded, probably in 489 or 488 B.C., his half-brother Cleomenes, whose daughter Gorgo he married. In 480 he was sent with about 7000 men to hold the pass of Thermopylae against the army of Xerxes. The smallness of the force was, according to a current story, due to the fact that he was deliberately going to his doom, an oracle having foretold that Sparta could be saved only by the death of one of its kings: in reality it seems rather that the ephors supported the scheme half-heartedly, their policy being to concentrate the Greek forces at the Isthmus. Leonidas repulsed the frontal attacks of the Persians, but when the Malian Ephialtes led the Persian general Hydarnes by a mountain track to the rear of the Greeks he divided his army, himself remaining in the pass with 300 Spartiates, 700 Thespians and 400 Thebans. Perhaps he hoped to surround Hydarnes' force: if so, the movement failed, and the little Greek army, attacked from both sides, was cut down to a man save the Thebans, who are said to have surrendered. Leonidas fell in the thickest of the fight; his head was afterwards cut off by Xerxes' order and his body crucified. Our knowledge of the circumstances it too slight to enable us to judge of Leonidas's strategy, but his heroism and devotion secured him an almost unique place in the imagination not only of his own but also of succeeding times.

See Herodotus v. 39-41, vii. 202-225, 238, ix. 10; Diodorus xi. 4-11; Plutarch, *Apophthegm. Lacon.; de malignitate Herodoti*, 28-33; Pausanias i. 13, iii. 3, 4; Isocrates, *Paneg.* 92; Lycurgus, *c. Leocr.* 110, 111; Strabo i. 10, ix. 429; Aelian, *Var hist.* iii. 25; Cicero, *Tusc. disput* i. 42, 49; *de Finibus*, ii. 30; Cornelius Nepos, *Themistocles*, 3; Valerius Maximus iii. 2; Justin ii. 11. For modern criticism on the battle of Thermopylae see G. B. Grundy, *The Great Persian War* (1901); G. Grote, *History of Greece*, part ii., c. 40; E. Meyer, *Geschichte des Altertums*, iii., §§ 219, 220; G. Busolt, *Griechische Geschichte*, 2nd ed., ii. 666-688; J. B. Bury, "The Campaign of Artemisium and Thermopylae," in *British School Annual*, ii. 83 seq.; J. A. R. Munro, "Some Observations on the Persian Wars, II.," in *Journal of Hellenic Studies*, xxii. 294-332. (M. N. T.)

LEONTIASIS OSSEA, a rare disease characterized by an overgrowth of the facial and cranial bones. The common form is that in which one or other maxilla is affected, its size progressively increasing both regularly and irregularly, and thus encroaching on the cavities of the orbit, the mouth, the nose and its accessory sinuses. Exophthalmos gradually develops, going on later to a complete loss of sight due to compression of the optic nerve by the overgrowth of bone. There may also be interference with the nasal respiration and with the taking of food. In the somewhat less common form of this rare disease the overgrowth of bone affects all the cranial bones as well as those of the face, the senses being lost one by one and death finally resulting from cerebral pressure. There is no treatment other than exposing the overgrown bone, and chipping away pieces, or excising entirely where possible.

LEONTINI (mod. *Lentini*), an ancient town in the south-east of Sicily, 22 m. N.N.W. of Syracuse direct, founded by Chalcidians from Naxos in 729 B.C. It is almost the only Greek settlement not on the coast, from which it is 6 m. distant. The site, originally held by the Sicels, was seized by the Greeks owing to its command of the fertile plain on the north. It was reduced to subjection in 498 B.C. by Hippocrates of Gela, and in 476 Hieron of Syracuse established here the inhabitants of Catana and Naxos. Later on Leontini regained its independence, but in its efforts to retain it, the intervention of Athens was more than once invoked. It was mainly the eloquence of Gorgias (*q.v.*) of Leontini which led to the abortive Athenian expedition of 427. In 422 Syracuse supported the oligarchs against the people and received them as citizens, Leontini itself being forsaken. This led to renewed Athenian intervention, at first mainly diplomatic; but the exiles of Leontini joined the envoys of Segesta in persuading Athens to undertake the great expedition of 415. After its failure, Leontini became subject to Syracuse once more (see Strabo vi. 272). Its independence was guaranteed by the treaty of 405 between Dionysius and the Carthaginians, but it very soon lost it again. It was finally stormed by M. Claudius Marcellus in 214 B.C. In Roman times it seems to have been of small importance. It was destroyed by the Saracens A.D. 848, and almost totally ruined by the earthquake of 1698. The ancient city is described by Polybius (vii. 6) as lying in a bottom between two hills, and facing north. On the western side of this bottom rân a river with a row of houses on its western bank under the hill. At each end was a gate, the northern leading to the plain, the southern, at the upper end, to Syracuse. There was an acropolis on each side of the valley, which lies between precipitous hills with flat tops, over which buildings had extended. The eastern hill[1] still has considerable remains of a strongly fortified medieval castle, in which some writers are inclined (though wrongly) to recognize portions of Greek masonry. See G. M. Columba, in *Archeologia di Leontinoi* (Palermo, 1891), reprinted from *Archivio Storico Siciliano*, xi.; P. Orsi in *Römische Mitteilungen* (1900), 61 seq. Excavations were made in 1899 in one of the ravines in a Sicel necropolis of the third period; explorations in the various Greek cemeteries resulted in the discovery of some fine bronzes, notably a fine bronze *lebes*, now in the Berlin museum. (T. As.)

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[1] As a fact there are two flat valleys, up both of which the modern Lentini extends; and hence there is difficulty in fitting Polybius's account to the site.

LEONTIUS, theological writer, born at Byzantium, flourished during the 6th century. He is variously styled Byzantinus, Hierosolymitanus (as an inmate of the monastery of St Saba near Jerusalem and Scholasticus (the first "schoolman," as the introducer of the Aristotelian definitions into theology; according to others, he had been an advocate, a special meaning of the word *scholasticus*). He himself states that in his early years he belonged to a Nestorian community. Nothing else is known of his life; he is frequently confused with others of the same name, and it is uncertain which of the works bearing the name Leontius are really by him. Most scholars regard as genuine the polemical treatises *Contra Nestorianos et Eutychianos*, *Contra Nestorianos*, *Contra Monophysitas*, *Contra Severum* (patriarch of Antioch); and the Σχόλια, generally called *De Sectis*. An essay *Adversus fraudes Apollinaristarum* and two homilies are referred to other hands, the homilies to a Leontius, presbyter of Constantinople.

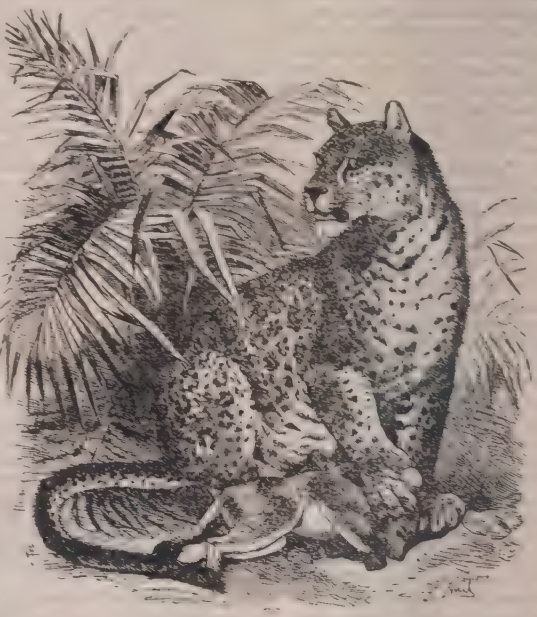
Collected works in J. P. Migne, *Patrologia Graeca*, lxxxvi.; for the various questions connected with Leontius see F. Loops, *Das Leben und die polemischen Werke des Leontios von Byzanz* (Leipzig, 1887); W. Rügamer, *Leontius von Byzanz* (1894); V. Ermoni, *De Leontio Byzantino* (Paris, 1895); C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897); J. P. Junglas, *Leontius von Byzanz* (1908). For other persons of the name see Fabricius, *Bibliotheca Graeca* (ed. Harles), viii. 323.

LEOPARD,[1] Pard or Panther (*Felis pardus*), the largest spotted true cat of the Old World, with the exception of the snow-leopard, which is, however, inferior in point of size to the largest leopard. (See Carnivora and Snow-Leopard.) Leopards, known in India as *cheeta* (*chita*), are characterized by the rosette-like form of the black spots on the greater part of the body, and the absence of a central spot from each rosette. Towards the head and on the limbs the spots tend to become solid, but there is great local variation in regard to their form and arrangement. In the Indian leopard, the true *Felis pardus*, the spots are large and rosette-like, and the same is the case with the long-haired Persian leopard (*F. pardus tulliana*). On the other hand the heavily built and thick-haired Manchurian *F. p. villosa* has more consolidated spots. African leopards, again, to one of which the name *F. p. leopardus* is applicable, show a decided tendency to a breaking-up of the spots; West African animals being much darker-coloured than those from the east side of the continent.

Both as regards structure and habits, the leopard may be reckoned as one of the more typical representatives of the genus *Felis*, belonging to that section in which the hyoid bone is loosely connected with the skull, owing to imperfect ossification of its anterior arch, and the pupil of the eye when contracted under the influence of light is circular, not linear as in the smaller cats.

The size of leopards varies greatly, the head and body usually measuring from $3\frac{1}{2}$ to $4\frac{1}{2}$ ft. in length, and the tail from $2\frac{1}{2}$ to 3 ft., but some specimens exceed these limits, while the Somali leopard (*F. p. nanopardus*) falls considerably short of them. The ground-colour of the fur varies from a pale fawn to a rufous buff, graduating in the Indian race into pure white on the under-parts and inside of the limbs. Generally speaking, the spots on the under parts and limbs are simple and blacker than those on the other parts of the body. The bases of the ears behind are black, the tips buff. The upper side of the tail is buff, spotted with broken rings like the back, its under surface white with simple spots. The hair of the cubs is longer than that of the adults, its ground-colour less bright, and its spots less distinct. Perfectly black leopards, which in certain lights show the characteristic markings on the fur, are not uncommon, and are examples of *melanism*, occurring as individual variations, sometimes in one cub out of a litter of which the rest are normally coloured, and therefore not indicating a distinct race, much less a species. These are met with chiefly in southern Asia; melanism among African leopards taking the form of an excessive breaking-up of the spots, which finally show a tendency to coalesce.

In habits the leopard resembles the other large cat-like animals, yielding to none in the ferocity of its disposition. It is exceedingly quick in its movements, but seizes its prey by waiting in ambush or stealthily approaching to within springing distance, when it suddenly rushes upon it and tears it to ground with its powerful claws and teeth. It preys upon almost any animal it can overcome, such as antelopes, deer, sheep, goats, monkeys, peafowl, and has a special liking for dogs. It not unfrequently attacks human beings in India, chiefly children and old women, but instances have been known of a leopard becoming a regular "man-eater." When favourable opportunities occur, it often kills many more victims than it can devour at once, either to gratify its propensity for killing or for the sake of their fresh blood. It generally inhabits woody districts, and can climb trees with facility when hunted, but usually lives on or near the ground, among rocks, bushes and roots and low branches of large trees.



The Leopard (*Felis pardus*).

The geographical range of the leopard embraces practically all Africa, and Asia from Palestine to China and Manchuria, inclusive of Ceylon and the great Malay Islands as far as Java. Fossil bones and teeth, indistinguishable from those of existing leopards, have been found in cave-deposits of Pleistocene age in Spain, France, Germany and England. (R. L.*; W. H. F.)

LEOPARDI, GIACOMO, Count (1798–1837), Italian poet, was born at Recanati in the March of Ancona, on the 29th of June 1798. All the circumstances of his parentage and education conspired to foster his precocious and sensitive genius at the expense of his physical and mental health. His family was ancient and patrician, but so deeply embarrassed as to be only rescued from ruin by the energy of his mother, who had taken the control of business matters entirely into her own hands, and whose engrossing devotion to her undertaking seems to have almost dried up the springs of maternal tenderness. Count Monaldo Leopardi, the father, a mere nullity in his own household, secluded himself in his extensive library, to which his nervous, sickly and deformed son had free access, and which absorbed him exclusively in the absence of any intelligent sympathy from his parents, any companionship except that of his brothers and sister, or any recreation in the dullest of Italian towns. The lad spent his days over grammars and dictionaries, learning Latin with little assistance, and Greek and the principal modern languages with none at all. Any ordinarily clever boy would have emerged from this discipline a mere pedant and bookworm. Leopardi came forth a Hellene, not merely a consummate Greek scholar, but penetrated with the classical conception of life, and a master of antique form and style. At sixteen he composed a Latin treatise on the Roman rhetoricians of the 2nd century, a commentary on Porphyry's life of Plotinus and a history of astronomy; at seventeen he wrote on the popular errors of the ancients, citing more than four hundred authors. A little later he imposed upon the first scholars of Italy by two odes in the manner of Anacreon. At eighteen he produced a poem of considerable length, the *Appressamento alla Morte*, which, after being lost for many years, was discovered and published by Zanino Volta. It is a vision of the omnipotence of death, modelled upon Petrarch, but more truly inspired by Dante, and in its conception, machinery and general tone offering a remarkable resemblance to Shelley's *Triumph of Life* (1822), of which Leopardi probably never heard. This juvenile work was succeeded (1819) by two lyrical compositions which at once placed the author upon the height which he maintained ever afterwards. The ode to Italy, and that on the monument to Dante erected at Florence, gave voice to the dismay and affliction with which Italy, aroused by the French Revolution from the torpor of the 17th and 18th centuries, contemplated her forlorn and degraded condition, her political impotence, her degeneracy in arts and arms and the frivolity or stagnation of her intellectual life. They were the outcry of a student who had found an ideal of national existence in his books, and to whose disappointment everything in his own circumstances lent additional poignancy. But there is nothing unmanly or morbid in the expression of these sentiments, and the odes are surprisingly exempt from the failings characteristic of young poets. They are remarkably chaste in diction, close and nervous in style, sparing in fancy and almost destitute of simile and metaphor, antique in spirit, yet pervaded by modern ideas, combining Landor's dignity with a considerable infusion of the passion of Byron. These qualities continued to characterize Leopardi's poetical writings throughout his life. A third ode, on Cardinal Mai's discoveries of ancient MSS., lamented in the same spirit of indignant sorrow the decadence of Italian literature. The publication of these pieces widened the breach between Leopardi and his father, a well-meaning but apparently dull and apathetic man, who had lived into the 19th century without imbibing any of its spirit, and who provoked his son's contempt by a superstition unpardonable in a scholar of real learning. Very probably from a mistaken idea of duty to his son, very probably, too, from his own entire dependence in pecuniary matters upon his wife, he for a long time obstinately refused Leopardi funds, recreation, change of scene, everything that could have contributed to combat the growing pessimism which eventually became nothing less than monomaniacal. The affection of his brothers and sister afforded him some consolation, and he found intellectual sympathy in the eminent scholar and patriot Pietro Giordani, with whom he assiduously corresponded at this period, partly on the ways and means of escaping from "this hermitage, or rather seraglio, where the delights of civil society and the advantages of solitary life are alike wanting." This forms the keynote of numerous letters of complaint and lamentation, as touching but as effeminate in their pathos as those of the banished Ovid. It must be remembered in fairness that the weakness of Leopardi's eyesight frequently deprived him for months together of the resource of study. At length (1822) his father allowed him to repair to Rome, where, though cheered by the encouragement of C. C. J. Bunsen and Niebuhr, he found little satisfaction in the trifling pedantry that passed for philology and archaeology, while his sceptical opinions prevented his taking orders, the indispensable condition of public employment in the Papal States. Dispirited and with exhausted means, he returned to Recanati, where he spent three miserable years, brightened only by the production of several lyrical masterpieces, which appeared in 1824. The most remarkable is perhaps the *Bruto Minore*, the condensation of his philosophy of despair. In 1825 he accepted an engagement to edit Cicero and Petrarch for the publisher Stella at Milan, and took up his residence at Bologna, where his life was for a time made almost cheerful by the friendship of the countess Malvezzi. In 1827 appeared the *Operette Morali*, consisting principally of dialogues and his imaginary biography of Filippo Ottonieri, which have given Leopardi a fame as a prose writer hardly inferior to his celebrity as a poet. Modern literature has few productions so eminently classical in form and spirit, so symmetrical in construction and faultless in style. Lucian is evidently the model; but the wit and irony which were playthings to Lucian are terribly earnest with Leopardi. Leopardi's invention is equal to Lucian's and his only drawback in comparison with his exemplar is that, while the latter's campaign against pretence and imposture commands hearty sympathy, Leopardi's philosophical creed is a repulsive hedonism in the disguise of austere stoicism. The chief interlocutors in his dialogues all profess the same unmitigated pessimism, claim emancipation from every illusion that renders life tolerable to the vulgar, and assert or imply a vast moral and intellectual superiority over unenlightened mankind. When, however, we come to inquire what renders them miserable, we find it is nothing but the privation of pleasurable sensation, fame, fortune or some other external thing which a lofty code of ethics would deny to be either indefeasibly due to man or essential to his felicity. A page of *Sartor Resartus* scatters Leopardi's sophistry to the winds, and leaves nothing of his dialogues but the consummate literary skill that would render the least fragment precious. As works of art they are a possession for ever, as contributions to moral philosophy they are worthless, and apart from their literary qualities can only escape condemnation if regarded as lyrical expressions of emotion, the wail extorted from a diseased mind by a diseased body. *Filippo Ottonieri* is a portrait of an imaginary philosopher, imitated from the biography of a real sage in Lucian's *Demonax*. Lucian has shown us the philosopher he wished to copy, Leopardi has truly depicted the philosopher he was. Nothing can be more striking or more tragical than the picture of the man superior to his fellows in every quality of head and heart, and yet condemned to sterility and impotence because he has, as he imagines, gone a step too far on the road to truth, and illusions exist for him no more. The little tract is full of remarks on life and character of surprising depth and justice, manifesting what powers of observation as well as reflection were possessed by the sickly youth who had seen so little of the world.

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[1] The name (Late Lat. *leopardus*, Late Gr. λεόπαρδος) was given by the ancients to an animal supposed to have been a cross between a lion (Lat. *leo*, Gr. λέων) and a pard (Gr. πάρδος, Pers. *pars*) or panther. Medieval heralds made no distinction in shape between a lion and a leopard, but marked the difference by drawing the leopard showing the full face (see Heraldry: § *Beasts and Birds*).

Want of means soon drove Leopardi back to Recanati, where, deaf, half-blind, sleepless, tortured by incessant pain, at war with himself and every one around him except his sister, he spent the two most unhappy years of his unhappy life. In May 1831 he escaped to Florence, where he formed the acquaintance of a young Swiss philologist, M. de Sinner. To him he confided his unpublished philological writings, with a view to their appearance in Germany. A selection appeared under the title *Excerpta ex schedis criticis J. Leopardi* (Bonn, 1834). The remaining MSS. were purchased after Sinner's death by the Italian government, and, together with Leopardi's correspondence with the Swiss philologist, were partially edited by Aulard. In 1831 appeared a new edition of Leopardi's poems, comprising several new pieces of the highest merit. These are in general less austerely classical than his earlier compositions, and evince a greater tendency to description, and a keener interest in the works and ways of ordinary mankind. *The Resurrection*, composed on occasion of his unexpected recovery, is a model of concentrated energy of diction, and *The Song of the Wandering Shepherd in Asia* is one of the highest flights of modern lyric poetry. The range of the author's ideas is still restricted, but his style and melody are unsurpassable. Shortly after the publication of these pieces (October 1831) Leopardi was driven from Florence to Rome by an unhappy attachment. His feelings are powerfully expressed in two poems, *To Himself* and *Aspasia*, which seem to breathe wounded pride at least as much as wounded love. In 1832 Leopardi returned to Florence, and there formed acquaintance with a young Neapolitan, Antonio Ranieri, himself an author of merit, and destined to enact towards him the part performed by Severn towards Keats, an enviable title to renown if Ranieri had not in his old age tarnished it by assuming the relation of Trelawny to the dead Byron. Leopardi accompanied Ranieri and his sister to Naples, and under their care enjoyed four years of comparative tranquillity. He made the acquaintance of the German poet Platen, his sole modern rival in the classical perfection of form, and composed *La Ginestra*, the most consummate of all his lyrical masterpieces, strongly resembling Shelley's *Mont Blanc*, but more perfect in expression. He also wrote at Naples *The Sequel to the Battle of the Frogs and Mice*, a satire in *ottava rima* on the abortive Neapolitan revolution of 1820, clever and humorous, but obscure from the local character of the allusions. The more painful details of his Neapolitan residence may be found by those who care to seek for them in the deplorable publication of Ranieri's peevish old age (*Sette anni di sodalizio*). The decay of Leopardi's constitution continued; he became dropsical; and a sudden crisis of his malady, unanticipated by himself alone, put an end to his life-long sufferings on the 15th of June 1837.

The poems which constitute Leopardi's principal title to immortality are only forty-one in number, and some of these are merely fragmentary. They may for the most part be described as odes, meditative soliloquies, or impassioned addresses, generally couched in a lyrical form, although a few are in magnificent blank verse. Some idea of the style and spirit of the former might be obtained by imagining the thoughts of the last book of Spenser's *Faerie Queene* in the metre of his *Epithalamium*. They were first edited complete by Ranieri at Florence in 1845, forming, along with the *Operette Morali*, the first volume of an edition of Leopardi's works, which does not, however, include *The Sequel to the Battle of the Frogs and Mice*, first printed at Paris in 1842, nor the afterwards discovered writings. Vols. ii.-iv. contain the philological essays and translations, with some letters, and vols. v. and vi. the remainder of the correspondence. Later editions are those of G. Chiarini and G. Mestica. The juvenile essays preserved in his father's library at Recanati were edited by Cugnoni (*Opere inedite*) in 1879, with the consent of the family. See Cappelleti, *Bibliografia Leopardiana* (Parma, 1882). Leopardi's biography is mainly in his letters (*Epistolario*, 1st ed., 1849, 5th ed., 1892), to which his later biographers (Brandes, Bouché-Leclercq, Rosa) have merely added criticisms, excellent in their way, more particularly Brandes's, but generally over-rating Leopardi's significance in the history of human thought. W. E. Gladstone's essay (*Quart. Rev.*, 1850), reprinted in vol. ii. of the author's *Gleanings*, is too much pervaded by the theological spirit, but is in the main a pattern of generous and discriminating eulogy. There are excellent German translations of the poems by Heyse and Brandes. An English translation of the essays and dialogues by C. Edwards appeared in 1882, and most of the dialogues were translated with extraordinary felicity by James Thomson, author of *The City of Dreadful Night*, and originally published in the *National Reformer*. (R. G.)

LEOPARDO, ALESSANDRO (d. *c.* 1512), Italian sculptor, was born and died at Venice. His first known work is the imposing mausoleum of the doge Andrea Vendramini, now in the church of San Giovanni e Paolo; in this he had the co-operation of Tullio Lombardo, but the finest parts are Leopardo's. Some of the figures have been taken away, and two in the Berlin museum are considered to be certainly his work. He was exiled on a charge of fraud in 1487, and recalled in 1490 by the senate to finish Verrocchio's colossal statue of Bartolommeo Colleoni. He worked between 1503 and 1505 on the tomb of Cardinal Zeno at St Mark's, which was finished in 1515 by Pietro Lombardo; and in 1505 he designed and cast the bronze sockets for the three flagstaffs in the square of St Mark's, the antique character of the decorations suggesting some Greek model. (See VENICE.)

LEOPOLD (M.H. Ger. *Liupolt*; O.H. Ger. *Liupald*, from *liut*, Mod. Ger. *Leute*, "people," and *pald*, "bold," *i.e.* "bold for the people"), the name which has been that of several European sovereigns.

LEOPOLD I. (1640–1705), Roman emperor, the second son of the emperor Ferdinand III. and his first wife Maria Anna, daughter of Philip III. of Spain, was born on the 9th of June 1640. Intended for the Church, he received a good education, but his prospects were changed by the death of his elder brother, the German king Ferdinand IV., in July 1654, when he became his father's heir. In 1655 he was chosen king of Hungary and in 1656 king of Bohemia, and in July 1658, more than a year after his father's death, he was elected emperor at Frankfort, in spite of the intrigues of Cardinal Mazarin, who wished to place on the imperial throne Ferdinand, elector of Bavaria, or some other prince whose elevation would break the Habsburg succession. Mazarin, however, obtained a promise from the new emperor that he would not send assistance to Spain, then at war with France, and, by joining a confederation of German princes, called the league of the Rhine, France secured a certain influence in the internal affairs of Germany. Leopold's long reign covers one of the most important periods of European history; for nearly the whole of its forty-seven years he was pitted against Louis XIV. of France, whose dominant personality completely overshadowed Leopold. The emperor was a man of peace and never led his troops in person; yet the greater part of his public life was spent in arranging and directing wars. The first was with Sweden, whose king Charles X. found a useful ally in the prince of Transylvania, George II. Rakocky, a rebellious vassal of the Hungarian crown. This war, a legacy of the last reign, was waged by Leopold as the ally of Poland until peace was made at Oliva in 1660. A more dangerous foe next entered the lists. The Turks interfered in the affairs of Transylvania, always an unruly district, and this interference brought on a war with the Empire, which after some desultory operations really began in 1663. By a personal appeal to the diet at Regensburg Leopold induced the princes to send assistance for the campaign; troops were also sent by France, and in August 1664 the great imperialist general, Montecucculi, gained a notable victory at St Gotthard. By the peace of Vasvar the emperor made a twenty years' truce with the sultan, granting more generous terms than his recent victory seemed to render necessary.

After a few years of peace began the first of three wars between France and the Empire. The aggressive policy pursued by Louis XIV. towards Holland had aroused the serious attention of Europe, and steps had been taken to check it. Although the French king had sought the alliance of several German princes and encouraged the Turks in their attacks on Austria the emperor at first took no part in this movement. He was on friendly terms with Louis, to whom he was closely related and with whom he had already discussed the partition of the lands of the Spanish monarchy; moreover, in 1671 he arranged with him a treaty of neutrality. In 1672, however, he was forced to take action. He entered into an alliance for the defence of Holland and war broke out; then, after this league had collapsed owing to the defection of the elector of Brandenburg, another and more durable alliance was formed for the same purpose, including, besides the emperor, the king of Spain and several German princes, and the war was renewed. At this time, twenty-five years after the peace of Westphalia, the Empire was virtually a confederation of independent princes, and it was very difficult for its head to conduct any war with vigour and success, some of its members being in alliance with the enemy and others being only lukewarm in their support of the imperial interests. Thus this struggle, which lasted until the end of 1678, was on the whole unfavourable to Germany, and the advantages of the treaty of Nijmwegen (February 1679) were with France.

Almost immediately after the conclusion of peace Louis renewed his aggressions on the German frontier. Engaged in a serious struggle with Turkey, the emperor was again slow to move, and although he joined a league against France in 1682 he was glad to make a truce at Regensburg two years later. In 1686 the league of Augsburg was formed by the emperor and the imperial princes, to preserve the terms of the treaties of Westphalia and of Nijmwegen. The whole European position was now bound up with events in England, and the tension lasted until 1688, when William of Orange won the English crown and Louis invaded Germany. In May 1689 the grand alliance was formed, including the emperor, the kings of England, Spain and Denmark, the elector of Brandenburg and others, and a fierce struggle against France was waged throughout almost the whole of western Europe. In general the several campaigns were favourable to the allies, and in September 1697 England and Holland made peace with Louis at Ryswick.

To this treaty Leopold refused to assent, as he considered that his allies had somewhat neglected his interests, but in the following month he came to terms and a number of places were transferred from France to Germany. The peace with France lasted for about four years and then Europe was involved in the War of the Spanish Succession. The king of Spain, Charles II., was a Habsburg by descent and was related by marriage to the Austrian branch, while a similar tie bound him to the royal house of France. He was feeble and childless, and attempts had been made by the European powers to arrange for a peaceable division of his extensive kingdom. Leopold refused to consent to any partition, and when in November 1700 Charles died, leaving his crown to Philip, duke of Anjou, a grandson of Louis XIV., all hopes of a peaceable settlement vanished. Under the guidance of William III. a powerful league, the grand alliance, was formed against France; of this the emperor was a prominent member, and in 1703 he transferred his claim on the Spanish monarchy to his second son, the archduke Charles. The early course of the war was not favourable to the imperialists, but the tide of defeat had been rolled back by the great victory of Blenheim before Leopold died on the 5th of May 1705.

In governing his own lands Leopold found his chief difficulties in Hungary, where unrest was caused partly by his desire to crush Protestantism. A rising was suppressed in 1671 and for some years Hungary was treated with great severity. In 1681, after another rising, some grievances were removed and a less repressive policy was adopted, but this did not deter the Hungarians from revolting again. Espousing the cause of the rebels the sultan sent an enormous army into Austria early in 1683; this advanced almost unchecked to Vienna, which was besieged from July to September, while Leopold took refuge at Passau. Realizing the gravity of the situation somewhat tardily, some of the German princes, among them the electors of Saxony and Bavaria, led their contingents to the imperial army which was commanded by the emperor's brother-in-law, Charles, duke of Lorraine, but the most redoubtable of Leopold's allies was the king of Poland, John Sobieski, who was already dreaded by the Turks. On the 12th of September 1683 the allied army fell upon the enemy, who was completely routed, and Vienna was saved. The imperialists, among whom Prince Eugene of Savoy was rapidly becoming prominent, followed up the victory with others, notably one near Mohacz in 1687 and another at Zenta in 1697, and in January 1699 the sultan signed the treaty of Karlowitz by which he admitted the sovereign rights of the house of Habsburg over nearly the whole of Hungary. Before the conclusion of the war, however, Leopold had taken measures to strengthen his hold upon this country. In 1687 at the diet of Pressburg the constitution was changed, the right of the Habsburgs to succeed to the throne without election was admitted and the emperor's elder son Joseph was crowned hereditary king of Hungary.

During this reign some important changes were made in the constitution of the Empire. In 1663 the imperial diet entered upon the last stage of its existence, and became a body permanently in session at Regensburg; in 1692 the duke of Hanover was raised to the rank of an elector, becoming the ninth member of the electoral college; and in 1700 Leopold, greatly in need of help for the impending war with France, granted the title of king of Prussia to the elector of Brandenburg. The net result of these and similar changes was to weaken the authority of the emperor over the members of the Empire, and to compel him to rely more and more upon his position as ruler of the Austrian archduchies and of Hungary and Bohemia, and Leopold was the first who really appears to have realized this altered state of affairs and to have acted in accordance therewith.

The emperor was married three times. His first wife was Margaret Theresa (d. 1673), daughter of Philip IV. of Spain; his second Claudia Felicitas (d. 1676), the heiress of Tirol; and his third Eleanora, a princess of the Palatinate. By his first two wives he had no sons, but his third wife bore him two, Joseph and Charles, both of whom became emperors. He had also four daughters.

Leopold was a man of industry and education, and during his later years he showed some political ability. Extremely tenacious of his rights, and regarding himself as an absolute sovereign, he was also very intolerant and was greatly influenced by the Jesuits. In person he was short, but strong and healthy. Although he had no inclination for a military life he loved exercises in the open air, such as hunting and riding; he had also a taste for music.

Leopold's letters to Marco d'Aviano from 1680 to 1699 were edited by O. Klopp and published at Graz in 1888. Other letters are found in the *Fontes rerum Austriacarum*, Bände 56 and 57 (Vienna, 1903–1904). See also F. Krones, *Handbuch der Geschichte Österreichs* (Berlin, 1876–1879); R. Baumstark, *Kaiser Leopold I.* (1873); and A. F. Pribram, *Zur Wahl Leopolds I.* (Vienna, 1888).

(A. W. H.*)

LEOPOLD II. (1747–1792), Roman emperor, and grand-duke of Tuscany, son of the empress Maria Theresa and her husband, Francis I., was born in Vienna on the 5th of May 1747. He was a third son, and was at first educated for the priesthood, but the theological studies to which he was forced to apply himself are believed to have influenced his mind in a way unfavourable to the Church. On the death of his elder brother Charles in 1761 it was decided that he should succeed to his father's grand duchy of Tuscany, which was erected into a "secundogeniture" or apanage for a second son. This settlement was the condition of his marriage on the 5th of August 1764 with Maria Louisa, daughter of Charles III. of Spain, and on the death of his father Francis I. (13th August 1765) he succeeded to the grand duchy. For five years he exercised little more than nominal authority under the supervision of counsellors appointed by his mother. In 1770 he made a journey to Vienna to secure the removal of this vexatious guardianship, and returned to Florence with a free hand. During the twenty years which elapsed between his return to Florence and the death of his eldest brother Joseph II. in 1790 he was employed in reforming the administration of his small state. The reformation was carried out by the removal of the ruinous restrictions on industry and personal freedom imposed by his predecessors of the house of Medici, and left untouched during his father's life; by the introduction of a rational system of taxation; and by the execution of profitable public works, such as the drainage of the Val di Chiana. As he had no army to maintain, and as he suppressed the small naval force kept up by the Medici, the whole of his revenue was left free for the improvement of his state. Leopold was never popular with his Italian subjects. His disposition was cold and retiring. His habits were simple to the verge of sordidness, though he could display splendour on occasion, and he could not help offending those of his subjects who had profited by the abuses of the Medicean régime. But his steady, consistent and intelligent administration, which advanced step by step, making the second only when the first had been justified by results, brought the grand duchy to a high level of material prosperity. His ecclesiastical policy, which disturbed the deeply rooted convictions of his people, and brought him into collision with the pope, was not successful. He was unable to secularize the property of the religious houses, or to put the clergy entirely under the control of the lay power.

During the last few years of his rule in Tuscany Leopold had begun to be frightened by the increasing disorders in the German and Hungarian dominions of his family, which were the direct result of his brother's headlong methods. He and Joseph II. were tenderly attached to one another, and met frequently both before and after the death of their mother, while the portrait by Pompeo Baltoni in which they appear together shows that they bore a strong personal resemblance to one another. But it may be said of Leopold, as of Fontenelle, that his heart was made of brains. He knew that he must succeed his childless eldest brother in Austria, and he was unwilling to inherit his unpopularity. When, therefore, in 1789 Joseph, who knew himself to be dying, asked him to come to Vienna, and become co-regent, Leopold coldly evaded the request. He was still in Florence when Joseph II. died at Vienna on the 20th of February 1790, and he did not leave his Italian capital till the

3rd of March. Leopold, during his government in Tuscany, had shown a speculative tendency to grant his subjects a constitution. When he succeeded to the Austrian lands he began by making large concessions to the interests offended by his brother's innovations. He recognized the Estates of his different dominions as "the pillars of the monarchy," pacified the Hungarians and divided the Belgian insurgents by concessions. When these failed to restore order, he marched troops into the country, and re-established at the same time his own authority, and the historic franchises of the Flemings. Yet he did not surrender any part that could be retained of what Maria Theresa and Joseph had done to strengthen the hands of the state. He continued, for instance, to insist that no papal bull could be published in his dominions without his consent (*placetum regium*).

If Leopold's reign as emperor, and king of Hungary and Bohemia, had been prolonged during years of peace, it is probable that he would have repeated his successes as a reforming ruler in Tuscany on a far larger scale. But he lived for barely two years, and during that period he was hard pressed by peril from west and east alike. The growing revolutionary disorders in France endangered the life of his sister Marie Antoinette, the queen of Louis XVI., and also threatened his own dominions with the spread of a subversive agitation. His sister sent him passionate appeals for help, and he was pestered by the royalist emigrants, who were intriguing both to bring about an armed intervention in France, and against Louis XVI. From the east he was threatened by the aggressive ambition of Catherine II. of Russia, and by the unscrupulous policy of Prussia. Catherine would have been delighted to see Austria and Prussia embark on a crusade in the cause of kings against the Revolution. While they were busy beyond the Rhine, she would have annexed what remained of Poland, and would have made conquests in Turkey. Leopold II. had no difficulty in seeing through the rather transparent cunning of the Russian empress, and he refused to be misled. To his sister he gave good advice and promises of help if she and her husband could escape from Paris. The emigrants who followed him pertinaciously were refused audience, or when they forced themselves on him were peremptorily denied all help. Leopold was too purely a politician not to be secretly pleased at the destruction of the power of France and of her influence in Europe by her internal disorders. Within six weeks of his accession he displayed his contempt for her weakness by practically tearing up the treaty of alliance made by Maria Theresa in 1756 and opening negotiations with England to impose a check on Russia and Prussia. He was able to put pressure on England by threatening to cede his part of the Low Countries to France, and then, when secure of English support, he was in a position to baffle the intrigues of Prussia. A personal appeal to Frederick William II. led to a conference between them at Reichenbach in July 1790, and to an arrangement which was in fact a defeat for Prussia. Leopold's coronation as king of Hungary on the 15th of November 1790, was preceded by a settlement with the diet in which he recognized the dominant position of the Magyars. He had already made an eight months' truce with the Turks in September, which prepared the way for the termination of the war begun by Joseph II. the peace of Sistova being signed in August 1791. The pacification of his eastern dominions left Leopold free to re-establish order in Belgium and to confirm friendly relations with England and Holland.

During 1791 the emperor continued to be increasingly preoccupied with the affairs of France. In January he had to dismiss the count of Artois, afterwards Charles X., king of France, in a very peremptory way. His good sense was revolted by the folly of the French emigrants, and he did his utmost to avoid being entangled in the affairs of that country. The insults inflicted on Louis XVI. and Marie Antoinette, however, at the time of their attempted flight to Varennes in June, stirred his indignation, and he made a general appeal to the sovereigns of Europe to take common measures in view of events which "immediately compromised the honour of all sovereigns, and the security of all governments." Yet he was most directly interested in the conference at Sistova, which in June led to a final peace with Turkey. On the 25th of August he met the king of Prussia at Pillnitz, near Dresden, and they drew up a declaration of their readiness to intervene in France if and when their assistance was called for by the other powers. The declaration was a mere formality, for, as Leopold knew, neither Russia nor England was prepared to act, and he endeavoured to guard against the use which he foresaw the emigrants would endeavour to make of it. In face of the agitation caused by the Pillnitz declaration in France, the intrigues of the emigrants, and the attacks made by the French revolutionists on the rights of the German princes in Alsace, Leopold continued to hope that intervention might not be required. When Louis XVI. swore to observe the constitution of September 1791, the emperor professed to think that a settlement had been reached in France. The attacks on the rights of the German princes on the left bank of the Rhine, and the increasing violence of the parties in Paris which were agitating to bring about war, soon showed, however, that this hope was vain. Leopold met the threatening language of the revolutionists with dignity and temper. His sudden death on the 1st of March 1792 was an irreparable loss to Austria.

Leopold had sixteen children, the eldest of his eight sons being his successor, the emperor Francis II. Some of his other sons were prominent personages in their day. Among them were: Ferdinand III., grand duke of Tuscany; the archduke Charles, a celebrated soldier; the archduke John, also a soldier; the archduke Joseph, palatine of Hungary; and the archduke Rainer, viceroy of Lombardy-Venetia.

Several volumes containing the emperor's correspondence have been published. Among these are: *Joseph II. und Leopold von Toskana. Ihr Briefwechsel 1781–1790* (Vienna, 1872), and *Marie Antoinette, Joseph II. und Leopold II. Ihr Briefwechsel* (Vienna, 1866), both edited by A. Ritter von Arneth; *Joseph II., Leopold II. und Kaunitz. Ihr Briefwechsel* (Vienna, 1873); and *Leopold II., Franz II. und Catharina. Ihre Correspondenz nebst einer Einleitung: Zur Geschichte der Politik Leopolds II.* (Leipzig, 1874), both edited by A. Beer; and *Leopold II. und Marie Christine. Ihr Briefwechsel 1781–1792*, edited by A. Wolf (Vienna, 1867). See also H. von Sybel, *Über die Regierung Kaiser Leopolds II.* (Munich, 1860); A. Schultze, *Kaiser Leopold II. und die französische Revolution* (Leipzig, 1899); and A. Wolf and H. von Zwiedeneck-Südenhorst, *Österreich unter Maria Theresa, Joseph II. und Leopold II.* (Berlin, 1882–1884).

LEOPOLD I. (1790–1865), king of the Belgians, fourth son of Francis, duke of Saxe-Coburg-Saalfeld, and uncle of Queen Victoria of England, was born at Coburg on the 18th of December 1790. At the age of eighteen he entered the military service of Russia, and accompanied the emperor Alexander to Erfurt as a member of his staff. He was required by Napoleon to quit the Russian army, and spent some years in travelling. In 1813 he accepted from the emperor Alexander the post of a cavalry general in the army of invasion, and he took part in the whole of the campaign of that and the following year, distinguishing himself in the battles of Leipzig, Lützen and Bautzen. He entered Paris with the allied sovereigns, and accompanied them to England. He married in May 1816 Charlotte, only child of George, prince regent, afterwards George IV., heiress-presumptive to the British throne, and was created duke of Kendal in the British peerage and given an annuity of £50,000. The death of the princess in the following year was a heavy blow to his hopes, but he continued to reside in England. In 1830 he declined the offer of the crown of Greece, owing to the refusal of the powers to grant conditions which he considered essential to the welfare of the new kingdom, but was in the following year elected king of the Belgians (4th June 1831). After some hesitation he accepted the crown, having previously ascertained that he would have the support of the great powers on entering upon his difficult task, and on the 12th of July he made his entry into Brussels and took the oath to observe the constitution. During the first eight years of his reign he was confronted with the resolute hostility of King William I. of Holland, and it was not until 1839 that the differences between the two states, which until 1830 had formed the kingdom of the Netherlands, were finally settled at the conference of London by the treaty of the 24 Articles (see Belgium). From this date until his death, King Leopold spent all his energies in the wise administration of the affairs of the newly formed kingdom, which may be said to owe in a large measure its first consolidation and constant prosperity to the care and skill of his discreet and fatherly government. In 1848 the throne of Belgium stood unshaken amidst the revolutions which marked that year in almost every European country. On the 8th of August 1832 Leopold married, as his second wife, Louise of Orleans, daughter of Louis Philippe, king of the French. Queen Louise endeared herself to the Belgian people, and her death in 1850 was felt as a national loss. This union produced two sons and one daughter—(1) Leopold, afterwards king of the Belgians; (2) Philip, count of Flanders; (3) Marie Charlotte, who married Maximilian of Austria, the unfortunate emperor of Mexico. Leopold I. died at Laeken on the 10th of December 1865. He was a most cultured man and a great reader, and did his utmost during his reign to encourage art, science and education. His judgment was universally respected by contemporary sovereigns and statesmen, and he was frequently spoken of as "the Nestor of Europe" (see also Victoria, Queen).

See Th. Juste, *Léopold I^{er}, roi des Belges d'après des doc. inéd. 1793–1865* (2 vols., Brussels, 1868), and *Les Fondateurs de la monarchie Belge* (22 vols., Brussels, 1878–1880); J. J. Thonissen, *La Belgique sous le règne de Léopold I^{er}* (Louvain, 1862).

LEOPOLD II. [Leopold Louis Philippe Marie Victor] (1835–1909), king of the Belgians, son of the preceding, was born at Brussels on the 9th of April 1835. In 1846 he was created duke of Brabant and appointed a sub-lieutenant in the army, in which he served until his accession, by which time he had reached the rank of lieutenant-general. On attaining his majority he was made a member of the senate, in whose proceedings he took a lively interest, especially in matters concerning the development of Belgium and its trade. On the 22nd of August 1853 Leopold married Marie Henriette (1836–1902), daughter of the archduke Joseph of Austria, palatine of Hungary, by his wife Marie Dorothea, duchess of Württemberg. This princess, who was a great-granddaughter of the empress Maria Theresa, and a great-niece of Marie Antoinette, endeared herself to the people by her elevated character and indefatigable benevolence, while her beauty gained for her the sobriquet of "The Rose of Brabant"; she was also an accomplished artist and musician, and a fine horsewoman. Between the years 1854 and 1865 Leopold travelled much abroad, visiting India and China as well as Egypt and the countries on the Mediterranean coast of Africa. On the 10th of December 1865 he succeeded his father. On the 28th of January 1869 he lost his only son, Leopold (b. 1859), duke of Hainaut. The king's brother Philip, count of Flanders (1837–1905), then became heir to the throne; and on his death his son Albert (b. 1875) became heir-presumptive. During the Franco-Prussian War (1870–1871) the king of the Belgians preserved neutrality in a period of unusual difficulty and danger. But the most notable event in Leopold's career was the foundation of the Congo Free State (*q.v.*). While still duke of Brabant he had been the first to call the attention of the Belgians to the need of enlarging their horizon beyond sea, and after his accession to the throne he gave the first impulse towards the development of this idea by founding in 1876 the *Association Internationale Africaine.* He enlisted the services of H. M. Stanley, who visited Brussels in 1878 after exploring the Congo river, and returned in 1879 to the Congo as agent of the *Comité d'Études du Haut Congo*, soon afterwards reorganized as the "International Association of the Congo." This association was, in 1884–1885, recognized by the powers as a sovereign state under the name of the *État Indépendant du Congo.* Leopold's exploitation of this vast territory, which he administered autocratically, and in which he associated himself personally with various financial schemes, was understood to bring him an enormous fortune; it was the subject of acutely hostile criticism, to a large extent substantiated by the report of a commission of inquiry instituted by the king himself in 1904, and followed in 1908 by the annexation of the state to Belgium (see Congo Free State: *History*). In 1880 Leopold sought an interview with General C. G. Gordon and obtained his promise, subject to the approval of the British government, to enter the Belgian service on the Congo. Three years later Leopold claimed fulfilment of the promise, and Gordon was about to proceed to the Congo when the British government required his services for the Sudan. On the 15th of November 1902 King Leopold's life was attempted in Brussels by an Italian anarchist named Rubino. Queen Marie Henriette died at Spa on the 19th of September of the same year. Besides the son already mentioned she had borne to Leopold three daughters—Louise Marie Amélie (b. 1858), who in 1875 married Philip of Saxe-Coburg and Gotha, and was divorced in 1906; Stéphanie (b. 1864), who married Rudolph, crown prince of Austria, in 1881, and after his death in 1889 married, against her father's wishes, Elemer, Count Lonyay, in 1900; and Clémentine (b. 1872). At the time of the queen's death an unseemly incident was occasioned by Leopold's refusal to see his daughter Stéphanie, who in consequence was not present at her mother's funeral. The disagreeable impression on the public mind thus created was deepened by an unfortunate litigation, lasting for two years (1904–1906), over the deceased queen's will, in which the creditors of the princess Louise, together with princess Stéphanie (Countess Lonyay), claimed that under the Belgian law the queen's estate was entitled to half of her husband's property. This claim was disallowed by the Belgian courts. The king died at Laeken, near Brussels, on the 17th of December 1909. On the 23rd of that month his nephew took the oath to observe the constitution, assuming the title of Albert I. King Leopold was personally a man of considerable attainments and much strength of character, but he was a notoriously dissolute monarch, who even to the last offended decent opinion by his indulgences at Paris and on the Riviera. The wealth he amassed from the Congo he spent, no doubt, royally not only in this way but also on public improvements in Belgium; but he had a hard heart towards the natives of his distant possession.

LEOPOLD II. (1797–1870), of Habsburg-Lorraine, grand-duke of Tuscany, was born on the 3rd of October 1797, the son of the grand-duke Ferdinand III., whom he succeeded in 1824. During the first twenty years of his reign he devoted himself to the internal development of the state. His was the mildest and least reactionary of all the Italian despotisms of the day, and although always subject to Austrian influence he refused to adopt the Austrian methods of government, allowed a fair measure of liberty to the press, and permitted many political exiles from other states to dwell in Tuscany undisturbed. But when in the early 'forties a feeling of unrest spread throughout Italy, even in Tuscany demands for a constitution and other political reforms were advanced; in 1845–1846 riots broke out in various parts of the country, and Leopold granted a number of administrative reforms. But Austrian influence prevented him from going further, even had he wished to do so. The election of Pope Pius IX. gave fresh impulse to the Liberal movement, and on the 4th of September 1847 Leopold instituted the National Guard—a first step towards the constitution; shortly after the marchese Cosimo Ridolfi was appointed prime minister. The granting of the Neapolitan and Piedmontese constitutions was followed (17th February 1848) by that of Tuscany, drawn up by Gino Capponi. The revolution in Milan and Vienna aroused a fever of patriotic enthusiasm in Tuscany, where war against Austria was demanded; Leopold, giving way to popular pressure, sent a force of regulars and volunteers to co-operate with Piedmont in the Lombard campaign. His speech on their departure was uncompromisingly Italian and Liberal. "Soldiers," he said, "the holy cause of Italian freedom is being decided to-day on the fields of Lombardy. Already the citizens of Milan have purchased their liberty with their blood and with a heroism of which history offers few examples. . . . Honour to the arms of Italy! Long live Italian independence!" The Tuscan contingent fought bravely, if unsuccessfully, at Curtatone and Montanara. On the 26th of June the first Tuscan parliament assembled, but the disturbances consequent on the failure of the campaign in Lombardy led to the resignation of the Ridolfi ministry, which was succeeded by that of Gino Capponi. The riots continued, especially at Leghorn, which was a prey to actual civil war, and the democratic party of which F. D. Guerrazzi and G. Montanelli were leading lights became every day more influential. Capponi resigned, and Leopold reluctantly agreed to a Montanelli-Guerrazzi ministry, which in its turn had to fight against the extreme republican party. New elections in the autumn of 1848 returned a constitutional majority, but it ended by voting in favour of a constituent assembly. There was talk of instituting a central Italian kingdom with Leopold as king, to form part of a larger Italian federation, but in the meanwhile the grand-duke, alarmed at the revolutionary and republican agitations in Tuscany and encouraged by the success of the Austrian arms, was, according to Montanelli, negotiating with Field-Marshal Radetzky and with Pius IX., who had now abandoned his Liberal tendencies, and fled to Gaeta. Leopold had left Florence for Siena, and eventually for Porto S. Stefano, leaving a letter to Guerrazzi in which, on account of a protest from the pope, he declared that he could not agree to the proposed constituent assembly. The utmost confusion prevailed in Florence and other parts of Tuscany. On the 9th of February 1849 the republic was proclaimed, largely as a result of Mazzini's exhortations, and on the 18th Leopold sailed for Gaeta. A third parliament was elected and Guerrazzi appointed dictator. But there was great discontent, and the defeat of Charles Albert at Novara caused consternation among the Liberals. The majority, while fearing an Austrian invasion, desired the return of the grand-duke who had never been unpopular, and in April 1849 the municipal council usurped the powers of the assembly and invited him to return, "to save us by means of the restoration of the constitutional monarchy surrounded by popular institutions, from the shame and ruin of a foreign invasion." Leopold accepted, although he said nothing about the foreign invasion, and on the 1st of May sent Count Luigi Serristori to Tuscany with full powers. But at the same time the Austrians occupied Lucca and Leghorn, and although Leopold simulated surprise at their action it has since been proved, as the Austrian general d'Aspre declared at the time, that Austrian intervention was due to the request of the grand-duke. On the 24th of May the latter appointed G. Baldasseroni prime minister, on the 25th the Austrians entered Florence and on the 28th of July Leopold himself returned. In April 1850 he concluded a treaty with Austria sanctioning the continuation for an indefinite period of the Austrian occupation with 10,000 men; in September he dismissed parliament, and the following year established a concordat with the Church of a very clerical character. He feebly asked Austria if he might maintain the constitution, and the Austrian premier, Prince Schwarzenberg, advised him to consult the pope, the king of Naples and the dukes of Parma and Modena. On their advice he formally revoked the constitution (1852). Political trials were held, Guerrazzi and many others being condemned to long terms of imprisonment, and although in 1855 the Austrian troops left Tuscany, Leopold's popularity was gone. A part of the Liberals, however, still believed in the possibility of a constitutional grand-duke who could be induced for a second time to join Piedmont in a war against Austria, whereas the popular party headed by F. Bartolommei and G. Dolfi realized that only by the expulsion of Leopold could the national aspirations be realized. When in 1859 France and Piedmont made war on Austria, Leopold's government failed to prevent numbers of young Tuscan volunteers from joining the Franco-Piedmontese forces. Finally an agreement was arrived at between the aristocratic constitutionalists and the popular party, as a result of which the grand-duke's participation in the war was formally demanded. Leopold at first gave way, and entrusted Don Neri Corsini with the formation of a ministry. The popular demands presented by Corsini were for the abdication of Leopold in favour of his son, an alliance with Piedmont and the reorganization of Tuscany in accordance with the eventual and definite reorganization of Italy. Leopold hesitated and finally rejected the proposals as derogatory to his dignity. On the 27th of April there was great excitement in Florence, Italian colours appeared everywhere, but order was maintained, and the grand-duke and his family departed for Bologna undisturbed. Thus the revolution was accomplished without a drop of blood being shed, and after a period of provisional government Tuscany was incorporated in the kingdom of Italy. On the 21st of July Leopold abdicated in favour of his son Ferdinand IV., who never reigned, but issued a protest from Dresden (26th March 1860). He spent his last years in Austria, and died in Rome on the 29th of January 1870.

Leopold of Tuscany was a well-meaning, not unkindly man, and fonder of his subjects than were the other Italian despots; but he was weak, and too closely bound by family ties and Habsburg traditions ever to become a real Liberal. Had he not joined the conclave of autocrats at Gaeta, and, above all, had he not summoned Austrian assistance while denying that he had done so, in 1849, he might yet have preserved his throne, and even changed the whole course of Italian history. At the same time his rule, if not harsh, was enervating and demoralizing.

See G. Baldasseroni, *Leopoldo II* (Florence, 1871), useful but reactionary in tendency, the author having been Leopold's minister, G. Montanelli, *Memorie sull' Italia* (Turin, 1853); F. D. Guerrazzi, *Memorie* (Leghorn, 1848); Zobi, *Storia civile della Toscana*, vols. iv.-v. (Florence, 1850–1852); A. von Reumont, *Geschichte Toscanas* (2 vols., Gotha, 1876–1877); M. Bartolommei-Gioli, *Il Rivolgimento Toscano e l'azione popolare* (Florence, 1905); C. Tivaroni, *L' Italia durante il dominio Austriaco*, vol. i. (Turin, 1892), and *L' Italia degli Italiani*, vol. i. (Turin, 1895). See also RICASOLI; BARTOLOMMEI; CAPPONI, GINO; &c. (L. V.*)

LEOPOLD II., a lake of Central Africa in the basin of the Kasai affluent of the Congo, cut by 2° S. and 18° 10′ E. It has a length N. to S. of about 75 m., is 30 m. across at its northern end, tapering towards its southern end. Numerous bays and gulfs render its outline highly irregular. Its shores are flat and marshy, the lake being (in all probability) simply the lowest part of a vast lake which existed here before the Kasai system breached the barrier—at Kwa mouth—separating it from the Congo. The lake is fed by the Lokoro (about 300 m. long) and smaller streams from the east. Its northern and western affluents are comparatively unimportant. It discharges its waters (at its southern end) into the Mfini, which is in reality the lower course of the Lukenye. The lake is gradually diminishing in area; in the rainy season it overflows its banks. The surrounding country is very flat and densely wooded.

See KASAI; and articles and maps in *Le Mouvement géog.*, specially vol. xiv., No. 29 (1897) and vol. xxiv., No. 38 (1907).

LEOTYCHIDES, Spartan king, of the Eurypontid family, was descended from Theopompus through his younger son Anaxandridas (Herod. viii. 131), and in 491 B.C. succeeded Demaratus (*q.v.*), whose title to the throne he had with Cleomenes' aid successfully challenged. He took part in Cleomenes' second expedition to Aegina, on which ten hostages were seized and handed over to the Athenians for safe custody: for this he narrowly escaped being surrendered to the Aeginetans after Cleomenes' death. In the spring of 479 we find him in command of the Greek fleet of 110 ships, first at Aegina and afterwards at Delos. In August he attacked the Persian position at Mycale on the coast of Asia Minor opposite Samos, inflicted a crushing defeat on the land-army, and annihilated the fleet which was drawn up on the shore. Soon afterwards he sailed home with the Peloponnesians, leaving the Athenians to prosecute the siege of Sestos. In 476 he led an army to Thessaly to punish the Aleuadae of Larisa for the aid they had rendered to the Persians and to strengthen Spartan influence in northern Greece. After a series of successful engagements he accepted a bribe from the enemy to withdraw. For this he was brought to trial at Sparta, and to save his life fled to the temple of Athena Alea at Tegea. Sentence of exile was passed, his house was razed and his grandson Archidamus II. ascended the throne (Herod. vi. 65-87, ix. 90-114; Thucydides i. 89; Pausanias iii. 4. 3. 7. 9-10; Plutarch, *De malignitate Herodoti*, 21, p. 859 D; Diodorus xi. 34-37).

According to Diodorus (xi. 48) Leotychides reigned twenty-two, his successor Archidamus forty-two years. The total duration of the two reigns, sixty-four years, we know to be correct, for Leotychides came to the throne in 491 and Archidamus (*q.v.*) died in 427. On this basis, then, Leotychides's exile would fall in 469 and the Thessalian expedition in that or the preceding year (so E. Meyer, *Geschichte des Altertums*, iii. § 287). But Diodorus is not consistent with himself; he attributes (xi. 48) Leotychides's death to the year 476–475 and he records (xii. 35) Archidamus's death in 434–433, though he introduces him in the following years at the head of the Peloponnesian army (xii. 42, 47, 52). Further, he says expressly that Leotychides ἐτελεύτησεν ἄρξας ἔτη εἴκοσι καὶ δύο, *i.e.* he lived twenty-two years after his accession. The twenty-two years, then, may include the time which elapsed between his exile and his death. In that case Leotychides died in 469, and 476–475 may be the year in which his reign, though not his life, ended. This date seems, from what we know of the political situation in general, to be more probable than the later one for the Thessalian campaign.

G. Busolt, *Griech. Geschichte*, iii. 83, note; J. B. Bury, *History of Greece*, p. 326; G. Grote, *History of Greece*, new edition 1888, iv. 349, note; also abridged edition 1907, p. 273, note 3. Beloch's view (*Griech. Geschichte*, i. 455, note 2) that the expedition took place in 476, the trial and flight in 469, is not generally accepted. (M. N. T.)

LEOVIGILD, or LÖWENHELD (d. 586), king of the Visigoths, became king in 568 after the short period of anarchy which followed the death of King Athanagild, whose widow, Goisvintha, he married. At first he ruled that part of the Visigothic kingdom which lay to the south of the Pyrenees, his brother Liuva or Leova governing the small part to the north of these mountains; but in 572 Liuva died and Leovigild became sole king. At this time the Visigoths who settled in Spain early in the 5th century were menaced by two powerful enemies, the Suevi who had a small kingdom in the north-west of the peninsula, and the Byzantines who had answered Athanagild's appeal for help by taking possession of a stretch of country in the south-east. Their kingdom, too, was divided and weakened by the fierce hostility between the orthodox Christians and those who professed Arianism. Internal and external dangers alike, however, failed to daunt Leovigild, who may fairly be called the restorer of the Visigothic kingdom. He turned first against the Byzantines, who were defeated several times; he took Cordova and chastised the Suevi; and then by stern measures he destroyed the power of those unruly and rebellious chieftains who had reduced former kings to the position of ciphers. The chronicler tells how, having given peace to his people, he, first of the Visigothic sovereigns, assumed the attire of a king and made Toledo his capital. He strengthened the position of his family and provided for the security of his kingdom by associating his two sons, Recared and Hermenegild, with himself in the kingly office and placing parts of the land under their rule. Leovigild himself was an Arian, being the last of the Visigothic kings to hold that creed; but he was not a bitter foe of the orthodox Christians, although he was obliged to punish them when they conspired against him with his external enemies. His son Hermenegild, however, was converted to the orthodox faith through the influence of his Frankish wife, Ingundis, daughter of King Sigebert I., and of Leander, metropolitan of Seville. Allying himself with the Byzantines and other enemies of the Visigoths, and supported by most of the orthodox Christians he headed a formidable insurrection. The struggle was fierce; but at length, employing persuasion as well as force, the old king triumphed. Hermenegild was captured; he refused to give up his faith and in March or April 585 he was executed. He was canonized at the request of Philip II., king of Spain, by Pope Sixtus V. About this time Leovigild put an end to the kingdom of the Suevi. During his last years he was engaged in a war with the Franks. He died at Toledo on the 21st of April 586 and was succeeded by his son Recared.

LEPANTO,[1] **BATTLE OF,** fought on the 7th of October 1571. The conquest of Cyprus by the Turks, and their aggressions on the Christian powers, frightened the states of the Mediterranean into forming a holy league for their common defence. The main promoter of the league was Pope Pius V., but the bulk of the forces was supplied by the republic of Venice and Philip II. of Spain, who was peculiarly interested in checking the Turks both because of the Moorish element in the population of Spain, and because he was also sovereign of Naples and Sicily. In compliment to King Philip, the general command of the league's fleet was given to his natural brother, Don John of Austria. It included, however, only twenty-four Spanish ships. The great majority of the two hundred galleys and eight galeasses, of which the fleet was composed, came from Venice, under the command of the proveditore Barbarigo; from Genoa, which was in close alliance with Spain, under Gianandrea Doria; and from the Pope whose squadron was commanded by Marc Antonio Colonna. The Sicilian and Neapolitan contingents were commanded by the marquess of Santa Cruz, and Cardona, Spanish officers. Eight thousand Spanish soldiers were embarked. The allied fleet was collected slowly at Messina, from whence it advanced by the passage between Ithaca and Cephalonia to Cape Marathia near Dragonera. The Turkish fleet which had come up from Cyprus and Crete anchored in the Gulf of Patras. It consisted in all of 273 galleys which were of lighter build than the Christians', and less well supplied with cannon or small arms. The Turks still relied mainly on the bow and arrow. Ali, the capitan pasha, was commander-in-chief, and he had with him Chulouk Bey of Alexandria, commonly called Scirocco, and Uluch Ali, dey of Algiers. On the 7th of October the Christian fleet advanced to the neighbourhood of Cape Scropha. It was formed in the traditional order of the galleys—a long line abreast, subdivided into the centre or "battle" commanded by Don John in person, the left wing under the proveditore Barbarigo, and the right under Gianandrea Doria. But a reserve squadron was placed behind the centre under the marquess of Santa Cruz, and the eight lumbering galeasses were stationed at intervals in front of the line to break the formation of the Turks. The capitan pasha left his anchorage in the Gulf of Patras with his fleet in a single line, without reserve or advance-guard. He was himself in the centre, with Scirocco on his right and Uluch Ali on his left. The two fleets met south of Cape Scropha, both drawn up from north to south, the land being close to the left flank of the Christians, and the right of the Turks. To the left of the Turks and the right of the Christians, there was open sea. Ali Pasha's greater numbers enabled him to outflank his enemy. The Turks charged through the intervals between the galeasses, which proved to be of no value. On their right Scirocco outflanked the Venetians of Barbarigo, but the better build of the galleys of Saint Mark and the admirable discipline of their crews gave them the victory. The Turks were almost all sunk or driven on shore. Scirocco and Barbarigo both lost their lives. On the centre Don John and the capitan pasha met prow to prow —the Christians reserving the fire of their bow guns (called *di cursia*) till the moment of impact, and then boarding. Ali Pasha was slain and his galley taken. Everywhere on the centre the Christians gained the upper hand, but their victory was almost turned into a defeat by the mistaken manœuvres of Doria. In fear lest he should be outflanked by Uluch Ali, he stood out to sea, leaving a gap between himself and the centre. The dey of Algiers, who saw the opening, reversed the order of his squadron, and fell on the right of the centre. The galleys of the Order of Malta, which were stationed at this point, suffered severely, and their flagship was taken with great slaughter. A disaster was averted by the marquess of Santa Cruz, who brought up the reserve. Uluch Ali then retreated with sail and oar, bringing most of his division off in good order.

The loss of life in the battle was enormous, being put at 20,000 for the Turks and 8000 for the Christians. The battle of Lepanto was of immense political importance. It gave the naval power of the Turks a blow from which it never recovered, and put a stop to their aggression in the Eastern Mediterranean. Historically the battle is interesting because it was the last example of an encounter on a great scale between fleets of galleys and also because it was the last crusade. The Christian powers of the Mediterranean did really combine to avert the ruin of Christendom. Hardly a noble house of Spain or Italy was not represented in the fleet, and the princes headed the boarders. Volunteers came from all parts of Europe, and it is said that among them was Sir Richard Grenville, afterwards famous for his fight in the "Revenge" off Flores in the Azores. Cervantes was undoubtedly present, and had his left hand shattered by a Turkish bullet.

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[1] For Lepanto see NAUPACTUS.

For full accounts of the battle, with copious references to authorities and to ancient controversies, mostly arising out of the conduct of Doria, see Sir W. Stirling Maxwell, *Don John of Austria* (1883); and Jurien de la Gravière, *La Guerre de Chypre et la bataille de Lepanto* (1888). (D. H.)

LE PAUTRE, JEAN (1618–1682), French designer and engraver. He was apprenticed to a carpenter and builder and in addition to learning mechanical and constructive work developed considerable facility with the pencil. His designs, which were innumerable in quantity and exuberant in fancy, consisted mainly of ceilings, friezes, chimney-pieces, doorways and mural decorations; he also devised fire-dogs, sideboards, cabinets, console tables, mirrors and other pieces of furniture; he was long employed at the Gobelins. His work is often excessively flamboyant and over-elaborate; he revelled in amorini and swags, arabesques and cartouches. His chimney-pieces, however, were frequently simple and elegant. His engraved plates, almost entirely original, are something like 1500 in number and include a portrait of himself. He became a member of the academy of Paris in 1677.

LEPCHA, the name of the aboriginal inhabitants of Sikkim (*q.v.*). A peace-loving people, the Lepchas have been repeatedly conquered by surrounding hill-tribes, and their ancient patriarchal customs are dying out. The total number of speakers of Lepcha, or Rong, in all India in 1901, was only 19,291. Their rich and beautiful language has been preserved from extinction by the efforts of General Mainwaring and others; but their literature was almost entirely destroyed by the Tibetans, and their traditions are being rapidly forgotten. Once free and independent, they are now the poorest people in Sikkim, and it is from them that the coolie class is drawn. They are above all things woodmen, knowing the ways of beasts and birds, and possessing an extensive zoological and botanical nomenclature of their own.

See Florence Donaldson, *Lepcha Land* (1900).

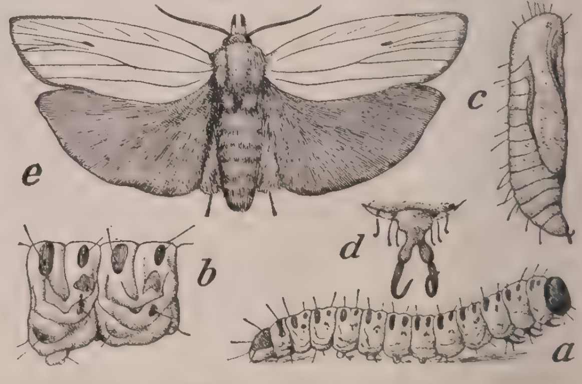
LE PELETIER (or LEPELLETIER), **DE SAINT-FARGEAU, LOUIS MICHEL** (1760–1793), French politician, was born on the 29th of May 1760 at Paris. He belonged to a well-known family, his great-grandfather, Michel Robert Le Peletier des Forts, count of Saint-Fargeau, having been controller-general of finance. He inherited a great fortune, and soon became president of the parlement of Paris and in 1789 he was a deputy of the *noblesse* to the States-General. At this time he shared the conservative views of the majority of his class; but by slow degrees his ideas changed and became very advanced. On the 13th of July 1789 he demanded the recall of Necker, whose dismissal by the king had aroused great excitement in Paris; and in the Constituent Assembly he had moved the abolition of the penalty of death, of the galleys and of branding, and the substitution of beheading for hanging. This attitude won him great popularity, and on the 21st of June 1790 he was made president of the Constituent Assembly. During the existence of the Legislative Assembly, he was president of the general council for the department of the Yonne, and was afterwards elected by this department as a deputy to the Convention. Here he was in favour of the trial of Louis XVI. by the assembly and voted for the death of the king. This vote, together with his ideas in general, won him the hatred of the royalists, and on the 20th of January 1793, the eve of the execution of the king, he was assassinated in the Palais Royal at Paris by a member of the king's body-guard. The Convention honoured Le Peletier by a magnificent funeral, and the painter J. L. David represented his death in a famous picture, which was later destroyed by his daughter. Towards the end of his life, Le Peletier had interested himself in the question of public education; he left fragments of a plan, the ideas contained in which were borrowed in later schemes. His assassin fled to Normandy, where, on the point of being discovered, he blew out his brains. Le Peletier had a brother, Félix (1769–1837), well known for his advanced ideas. His daughter, Suzanne Louise, was "adopted" by the French nation.

See *Œuvres de M. le Peletier de Saint-Fargeau* (Brussels, 1826) with a life by his brother Félix; E. Le Blant, "Le Peletier de St-Fargeau, et son meurtrier," in the *Correspondant* review (1874); F. Clerembray, *Épisodes de la Révolution* (Rouen, 1891); Brette, "La Réforme de la législation universelle, et le plan de Lepelletier Saint-Fargeau," in *La Révolution française*, xlii. (1902); and M. Tourneux, *Bibliog. de l'hist. de Paris* . . . (vol. i., 1890, Nos. 3896–3910, and vol. iv., 1906, *s.v.* Lepeletier).

LEPIDOLITE, or LITHIA-MICA, a mineral of the mica group (see MICA). It is a basic aluminium, potassium and lithium fluo-silicate, with the approximate formula $KLi\,[Al(OH,F)_2]\,Al(SiO_3)_3$. Lithia and fluorine are each present to the extent of about 5%; rubidium and caesium are sometimes present in small amounts. Distinctly developed monoclinic crystals or cleavage sheets of large size are of rare occurrence, the mineral being usually found as scaly aggregates, and on this account was named lepidolite (from Gr. λεπίς, scale) by M. H. Klaproth in 1792. It is usually of a lilac or peach-blossom colour, but is sometimes greyish-white, and has a pearly lustre on the cleavage surfaces. The hardness is $2\frac{1}{2}$–4 and the sp. gr. 2·8–2·9, the optic axial angle measures 50°–70°. It is found in pegmatite-veins, often in association with pink tourmaline (rubellite) and sometimes intergrown in parallel position with muscovite. Scaly masses of considerable extent are found at Rozena near Bystrzitz in Moravia and at Pala in San Diego county, California. The material from Rozena has been known since 1791, and has sometimes been cut and polished for ornamental purposes: it has a pretty colour and spangled appearance and takes a good polish, but is rather soft. At Pala it has been extensively mined for the preparation of lithium and rubidium salts. Other localities for the mineral are the island of Utö in Sweden, and Auburn and Paris in Maine, U.S.A.; at Alabashka near Mursinka in the Urals large isolated crystals have been found, and from Central Australia transparent cleavage sheets of a fine lilac colour are known.

The lithium-iron mica *zinnwaldite* or *lithionite* is closely allied to lepidolite, differing from it in containing some ferrous iron in addition to the constituents mentioned above. It occurs as greyish silvery scales with hexagonal outlines in the tin-bearing granites of Zinnwald in the Erzgebirge, Bohemia and of Cornwall. (L. J. S.)

LEPIDOPTERA (Gr. λεπίς, a scale or husk, and πτερόν, a wing), a term used in zoological classification for one of the largest and best-known orders of the class Hexapoda (*q.v.*), in order that comprises the insects popularly called butterflies and moths. The term was first used by Linnaeus (1735) in the sense still accepted by modern zoologists, and there are few groups of animals as to whose limits and distinguishing characters less controversy has arisen.



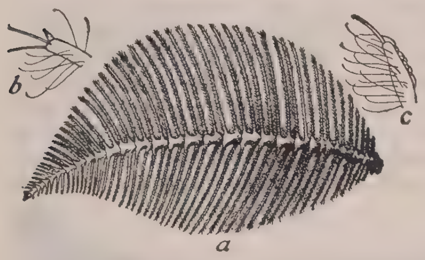
After Edwards, Riley and Howard's *Insect Life*, vol. 3 (U.S. Dept. Agr.).

FIG. 1.—*e*, *Crytophasa unipuctata*, Donov., Australia. *a*, Larva; *c*, pupa, natural size; *b*, 2nd and 3rd abdominal segments of larva; *d*, cremaster of pupa, magnified.

Characters.—The name of the order indicates the fact that the wings (and other parts of the body) are clothed with flattened cuticular structures—the scales (fig. 7)—that may be regarded as modified arthropodan "hairs." Such scales are not peculiar to the Lepidoptera—they are found also on many of the Aptera, on the Psocidae, a family of Corrodentia, on some Coleoptera (beetles) and on the gnats (Culicidae), a family of Diptera. The most distinctive structural features of the Lepidoptera are to be found in the jaws. The mandibles are mere vestiges or entirely absent; the second maxillae are usually reduced to a narrow transverse mentum which bears the scale-covered labial palps, between which project the elongate first maxillae, grooved on their inner faces, so as to form when apposed a tubular proboscis adapted for sucking liquid food.

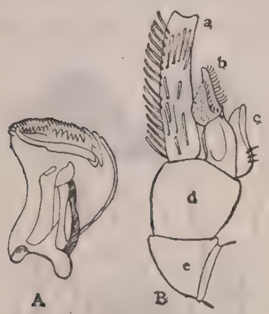
All Lepidoptera are hatched as the eruciform soft-bodied type of larva (fig. 1, *a*) known as the caterpillar, with biting mandibles, three pairs of thoracic legs and with a variable number (usually five pairs) of abdominal prolegs, which carry complete or incomplete circles of hooklets. The pupa in a single family only is free (*i.e.* with the appendages free from the body), and mandibulate. In the vast majority of the order it is more or less obtect (*i.e.* with the appendages fixed to the cuticle of the body) and without mandibles (fig. 1, *c*).

Structure.—The head in the Lepidoptera is sub-globular in shape with the compound eyes exceedingly well developed, and with a pair of ocelli or "simple eyes" often present on the vertex. It is connected to the thorax by a relatively broad and membranous "neck." The feelers are many-jointed, often they are complex, the segments bearing processes arranged in a comb-like manner and furnished with numerous sensory hairs (fig. 2). The complexity of the feelers is carried to its highest development in certain male moths that have a wonderful power of discovering their females by smell or some analogous sense. Often the feelers are excessively complex in male moths whose maxillae are so reduced that they take no food in the imaginal state. The nature of the jaws has already been briefly described. Functional mandibles of peculiar form (fig. 3, A) are present in the remarkable small moths of the genus *Micropteryx* (or *Eriocephala*), and there are vestiges of these jaws in other moths of low type, but the minute structures in the higher Lepidoptera that were formerly described as mandibles are now believed to belong to the labrum, the true mandibles being perhaps represented by rounded prominences, not articulated with the head-capsule. Throughout the order, as a whole, the jaws are adapted for sucking liquid food, and the suctorial proboscis (often erroneously called a "tongue") is formed as was shown by J. C. Savigny in 1816 by two elongated and flexible outgrowths of the first maxillae, usually regarded as representing the outer lobes or galeae (fig. 4, A, B, *g*). These structures are grooved along their inner faces and by means of a series of interlocking hair-like bristles can be joined together so as to form a tubular sucker (fig. 4, C). At their extremities they are beset with club-like sense-organs, whose apparent function is that of taste. The proboscis when in use is stretched out in front of the head and inserted into the corolla of a flower or elsewhere, for the absorption of liquid nourishment. When at rest, the proboscis is rolled up into a close spiral beneath the head and between the labial palps (fig. 4, A, *p*). Only in the genus *Micropteryx* mentioned above is the lacinia of the maxilla (as A. Walter has shown) developed (fig. 3, B, *c*). The maxillary palp is usually a mere vestige (fig. 4, B, *p*) though it is conspicuous in a few families of small moths. A considerable number of Lepidoptera take no food in the imaginal state; in these the maxillae are reduced or altogether atrophied. The second maxillae are intimately fused together to form the labium, which consists only of a reduced mentum, bearing sometimes vestigial lobes and always a pair of palps. These have two or three segments and are clothed with scales. The form and direction of the terminal segment of the labial palp afford valuable characters in classification.



From Riley and Howard, *Insect Life*, vol. 7 (U.S. Dept. Agr.).

FIG. 2.—*a*, Feeler of Saturniid Moth (*Telea polyphemus*). *b*, *c*, Tips of branches, highly magnified.



After A. Walter (*Jen. Zeits. f. Naturw.* vol. 18).

FIG. 3.—A, Mandible, and B, 1st maxilla of *Micropteryx* (*Eriocephala*). Magnified.

a, Palp.
b, Galea.
c, Lacinia.
d, Stipes.
e, Cardo of maxilla.

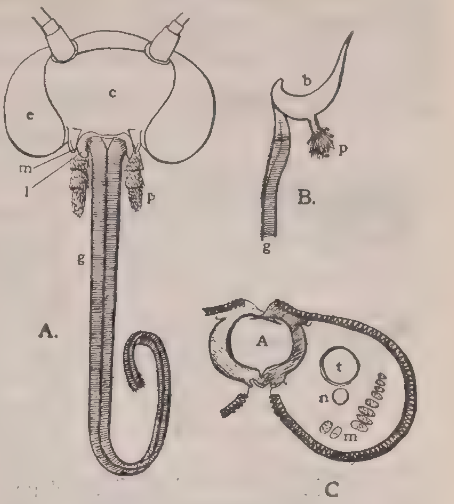
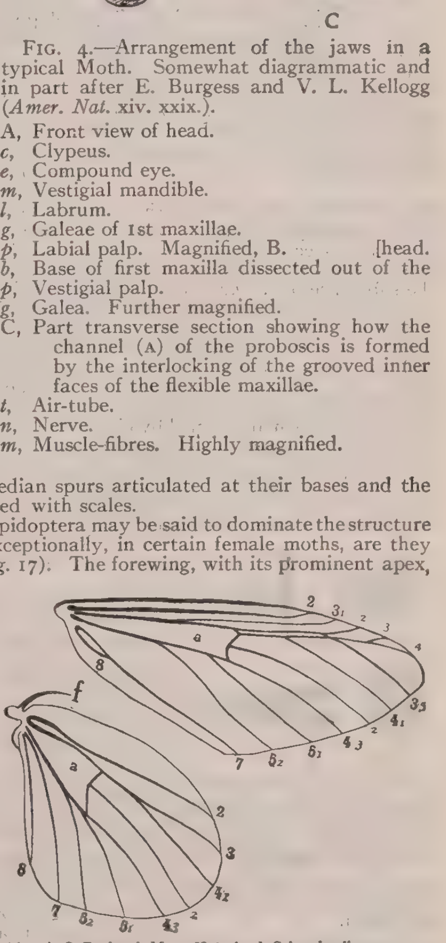


FIG. 4.—Arrangement of the jaws in a typical Moth. Somewhat diagrammatic and in part after E. Burgess and V. L. Kellogg (*Amer. Nat.* xiv. xxix.).

A, Front view of head.
c, Clypeus.
e, Compound eye.
m, Vestigial mandible.
l, Labrum.
g, Galeae of 1st maxillae.
p, Labial palp. Magnified.
B. *b*, Base of first maxilla dissected out of the head.
p, Vestigial palp.
g, Galea. Further magnified.
C, Part transverse section showing how the channel (A) of the proboscis is formed by the interlocking of the grooved inner faces of the flexible maxillae.
t, Air-tube.
n, Nerve.
m, Muscle-fibres. Highly magnified.

In the thorax of the Lepidoptera the foremost segment or prothorax is very small, and not movable on the mesothorax. In many families it carries a pair of small erectile plates—the patagia—which have been regarded as serially homologous with the wings. The mesothorax is extensive; its scutum forming most of the dorsal thoracic area and small plates—tegulae—are often present at the base of the forewings, as in Hymenoptera. The tegulae which are beset with long hair-like scales are often conspicuous. The metathorax is smaller than the mesothorax. The legs are of the typical hexapodan form with five-segmented feet; the shins often bear terminal and median spurs articulated at their bases and the entire limbs are clothed with scales.

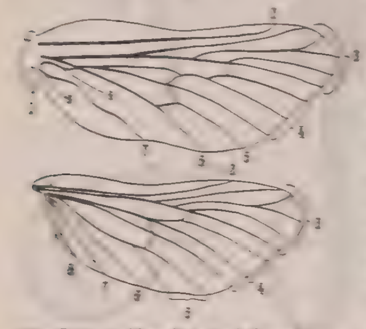
The wings of the Lepidoptera may be said to dominate the structure of the insect; only exceptionally, in certain female moths, are they vestigial or absent (fig. 17). The forewing, with its prominent apex, is longer than the hindwing, and the neuration in both (see figs. 5 and 6) is for the most part longitudinal, only a few transverse nervures, which are, in fact, branches of the median trunk, marking off a discoidal areolet or "cell" (fig. 5, *a*). The five branches of the radial nervure (figs. 5, 6, *3*) (see HEXAPODA) are usually present in the forewing, but the hindwing, in most families, has only a single radial nervure; its anal area is, however, often more strongly developed than that of the forewing. The two wings of a side are usually kept together during flight by a few stout bristles—the frenulum—(fig. 5, *f*) projecting from the base of the costa of the hindwing and fitting beneath a membranous fold or a few thickened scales—the retinaculum—on the under surface of the forewing. In butterflies there is no frenulum, but a costal outgrowth of the



After A. S. Packard, *Mem. Nat. Acad. Sci.* vol. vii.

FIG. 5.—Wing-neuration of a Notodont Moth. 2, Subcostal; 3, radial; 4, median; 5, cubital; 7, 8, anal nervures. *a*, Discoidal areolet or "cell"; *f*, frenulum. Note that the forewing has five branches (1—5) of the radial nervure, the hindwing one only. The first anal nervure (No. 6) is absent.

hindwing subserves the same function. In the most primitive moths a small lobate outgrowth—the jugum (fig. 6, *j.*)—from the dorsum of the forewing is present, but it can be of little service in keeping the two wings together. A jugum may be also present on the hindwing. The legs, which are generally used for clinging rather than for walking, have five-segmented feet and are covered with scales. In some families the front pair are reduced and without tarsal segments.



After Packard, *Mem. Nat. Acad. Sci.* vol. vii.

FIG. 6.—Wing-neuration of a Swift Moth (*Hepialus*). *j*, Jugum. Nervures numbered as in fig. 5. Note that there are five branches to the radial nervure (No. 3) in both fore- and hindwing, and that the median trunk nervure (No. 4) traverses the discoidal areolet.

Ten abdominal segments are recognizable in many Lepidoptera, but the terminal segments are reduced or modified to form external organs of reproduction. In the male, according to the interpretation of C. Peytoureau, the lateral plates belonging to the ninth segment form paired claspers (valves) with harpes or series of ridges or teeth, while the tergum of the tenth segment forms a dorsal hook—the uncus—and its sternum a ventral process or scaphium. In the female the terminal segments form, in some cases, a protrusible ovipositor, but the typical hexapodan ovipositor with its three pairs of processes is undeveloped in the Lepidoptera.

As already mentioned, the characteristic scales on the wings, legs and body of the Lepidoptera are cuticular structures. A complete series of transitional forms can be traced between the most elaborate flattened scales (fig. 7, B) with numerous longitudinal striae and a simple articulated "hair." Either a "hair" or a scale owes its origin to a special cell of the ectoderm (hypodermis), a process from which grows through the general cuticle and forms around itself the substance of the cuticular appendage. The scales on the wings are arranged in regular rows (fig. 7, A), and the general cuticle is drawn out into a narrow neck or collar around the base of each scale. The scales can be easily rubbed from the surface of the wing, and the series of collars in which the scales rest are then evident (fig. 7, A, *c*) on the wing-membrane. On the wings of many male butterflies there are specially modified scales—the androconia (fig. 7, C)—which are formed by glandular cells and diffuse a scented secretion. In some cases, the androconia are mixed among the ordinary scales; in others they are associated into conspicuous "brands" (see fig. 10). The admirable colours of the wings of the Lepidoptera are due partly to pigment in the scales—as in the case of yellows, browns, reds and blacks—partly to "interference" effects from the fine striae on the scales—as with the blues, purples and greens.

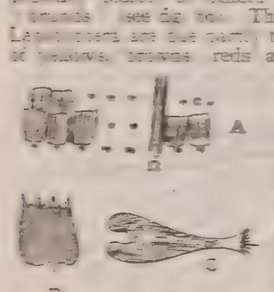


FIG. 7.—A, Arrangement of scales in rows on wing of Butterfly (*Vanessa*); *c*, collar-like outgrowths of scales. Magnified. B, simple scale, and C, an androconium, more highly magnified.

A few points of interest in the internal structure of the Lepidoptera deserve mention. The mouth opens into a sub-globular, muscular pharynx which is believed to suck the liquid food through the proboscis, and force it along the slender gullet into a crop-like enlargement or diverticulum of the fore-gut known as a "food-reservoir" or "sucking-stomach." The true stomach is tubular, and beyond it lies the intestine into which open the three pairs of excretory (Malpighian) tubes. The terminal part of the intestine is of wide diameter, and in some cases gives off a short caecum. The brain and the sub-oesophageal ganglia are closely approximated; there are two or three thoracic and four (rarely five) abdominal ganglia. In the female each ovary has four ovarian tubes, in which the large egg-cells are enclosed in follicles and associated with nutritive cells. There is a special bursa which in the Hepialidae opens with the vagina on the eighth abdominal sternum. In the Micropterygidae, Eriocraniidae and the lower Tineides, the duct of the bursa leads into the vagina, which still opens on the eighth sternum. But in most Lepidoptera, the bursa opens by a vestibule on the eighth sternum, distinct from the vagina, whose opening shifts back to the ninth, the duct of the bursa being connected with the vagina by a canal which opens opposite to the spermatheca. In the male, the two testes are usually fused into a single mass, and a pair of tubular accessory glands open into the vasa deferentia or into the ejaculatory duct. In a few families—the Hepialidae and Saturniidae for example—the testes retain the primitive paired arrangement. These details have been worked out by various students, among whom W. H. Jackson and W. Petersen deserve special mention. Summing up the developmental history of the genital ducts, Jackson remarks that there is "an Ephemeridal stage, which ends towards the close of larval life, an Orthopteran stage, indicated during the quiescent period preceding pupation, and a Lepidopteran stage which begins with the commencement of pupal life."

Development.—Many observations have been made on the embryology of the Lepidoptera; for some of the more important results of these see HEXAPODA. The post-embryonic development of Lepidoptera is more familiar, perhaps, than that of any other group of animals. The egg shows great variation in its outward form, the outer envelope or chorion being in some families globular, in others flattened, in others again erect and sub-conical or cylindrical; while its surface often exhibits a beautifully regular series of ribs and furrows. Throughout the order the larva is of the form known as the caterpillar (fig. 1, *a*, *b*, fig. 8 B) characterized by the presence of three pairs of jointed and clawed legs on the thorax and a variable number of pairs of abdominal "prolegs"—sub-cylindrical outgrowths of the abdominal segments, provided with a complete or incomplete circle of booklets at the extremity.

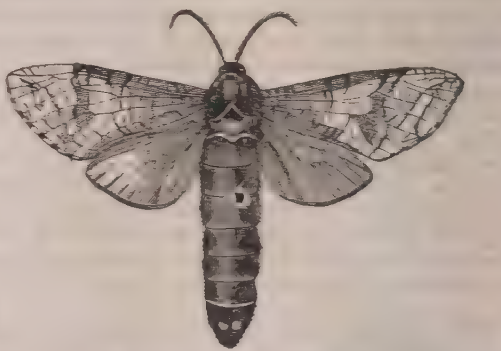


FIG. 8 A.—*Cossus macmurtrei.* (MacMurtrie's Goat Moth.) N. America.

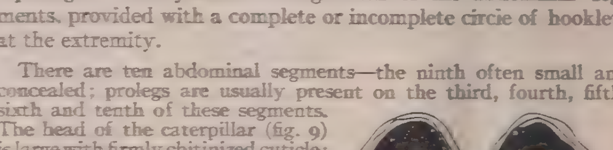


FIG. 8 B.—Larva of *Cossus cossus.* (Goat Moth.) Europe.

There are ten abdominal segments—the ninth often small and concealed; prolegs are usually present on the third, fourth, fifth, sixth and tenth of these segments. The head of the caterpillar (fig. 9) is large with firmly chitinized cuticle; it carries usually twelve simple eyes or ocelli, a pair of short feelers (fig. 9 *At*) and a pair of strong mandibles (fig. 9, *Mn*), for the caterpillar feeds by biting leaves or other plant-tissues. The first maxillae, so highly developed in the imago, are in the larva small and inconspicuous appendages, each bearing two short jointed processes,—the galea and the palp (fig. 9, *Mx*). The second maxillae form a plate-like labium on whose surface projects the spinneret which is usually regarded as a modified hypopharynx (fig. 9, *Lm*). The silk-glands whose ducts open on this spinneret are paired convoluted tubes lying alongside the elongate cylindrical stomach. In the common "silkworm" these glands are five times as long as the body of the caterpillar. They are regarded as modified salivary glands, though the correspondence has been doubted by some students. The body of the caterpillar is usually cylindrical and wormlike, with the

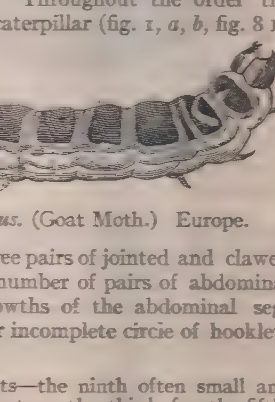
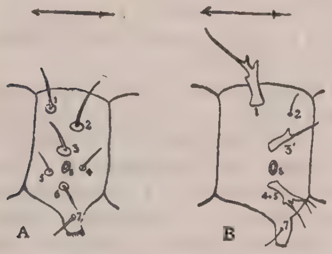


FIG. 9.—Head of Goat Moth Caterpillar (*Cossus*) from behind. Magnified. (From Miall and Denny after Lyonnet.)

At, Feeler.
Mn, Mandible.
Mx, First maxilla.
Lm, Second maxillae (Labium) with spinneret.

segmentation well marked and the cuticle feebly chitinized and flexible. Firm chitinous plates are, however, not seldom present on the prothorax and on the hindmost abdominal segment. The segments are mostly provided with bristle or spine-bearing tubercles, whose arrangement has lately been shown by H. G. Dyar to give partially trustworthy indications of relationship. On either side of the median line we find two dorsal or trapezoidal tubercles (Nos. 1 and 2), while around the spiracle are grouped (Nos. 3, 4 and 5) supra-, post-, and pre-spiracular tubercles; below are the subspiraculars, of which there may be two (Nos. 6, 7). The last-named is situated on the base of the abdominal proleg, and yet another tubercle (No. 8) may be present on the inner aspect of the proleg. The spiracles are very conspicuous on the body of a caterpillar, occurring on the prothorax and on the first eight abdominal segments. Various tubercles may become coalesced or aborted (fig. 10, B); often, in conjunction with the spines that they bear, the tubercles serve as a valuable protective armature for the caterpillar. Much discussion has taken place as to whether the abdominal prolegs are or are not developed directly from the embryonic abdominal appendages. In the more lowly families of Lepidoptera, these organs are provided at the extremity with a complete circle of hooklets, but in the more highly organized families, only the inner half of this circle is retained.

The typical Lepidopteran pupa, or "chrysalis," as shown in the higher families, is an obtect pupa (fig. 11) with no trace of mandibles, the appendages being glued to the body by an exudation, and motion being possible only at three of the abdominal intersegmental regions, the fifth and sixth abdominal segments at most being "free." A flattened or pointed process—the cremaster—often prominent at the tail-end, may carry one or several hooks (fig. 1, *d*) which serve to anchor the pupa to its cocoon or to suspend butterfly-pupae from their pad of silk (fig. 11). In the lower families the pupa (fig. 1, *c*) is only incompletely obtect, and a greater number of abdominal segments can move on one another. The seventh abdominal segment is, in all female lepidopterous pupae, fused with those behind it; in the male "incomplete" pupa this becomes "free" and so may the segments anterior to it, in both sexes, forward to and including the third. The presence of circles of spines on the abdominal segments enables the "incomplete" pupa as a whole to work its way partly out of the cocoon when the time for the emergence of the imago draws near. In the family of the Eriocraniidae (often called the Micropterygidae) the pupa resembles that of a caddis-fly (*Trichopteron*) being active before the emergence of the imago and provided with strong mandibles by means of which it bites its way out of the cocoon. The importance of the pupa in the phylogeny and classification of the Lepidoptera has lately been demonstrated by T. A. Chapman in a valuable series of papers. Sometimes organs are present in the pupa which are undeveloped in the imago, such as the maxillary palps of the Sesiidae (clearwing moths) and the pectination on the feelers of female Saturniids. E. B. Poulton has drawn attention to the ancestral value of such characters.



B, after Grote, *Mitt. aus dem Roemer Museum*, No. 6.

FIG. 10.—Abdominal segments of Caterpillars, to show arrangement of tubercles; the arrows point anteriorly. A, Generalized condition; B, specialized condition in the Saturniidae. *s*, Spiracle; the numbering of the tubercles is explained in the text. Note that in B No. 2 is much reduced and disappears after the first moult. 4 and 5 are coalesced, and 6 is absent.

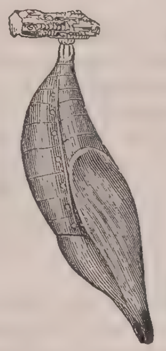


FIG. 11.—Pupa of a Butterfly (*Amathusia phidippus*).

Habits and Life-Relations.—The attractiveness of the Lepidoptera and the conspicuous appearance of many of them have led to numerous observations on their habits. The method of feeding of the imago by the suction of liquids has already been mentioned in connexion with the structure of the maxillae and the food-canal. Nectar from flowers is the usual food of moths and butterflies, most of which alight on a blossom before thrusting the proboscis into the corolla of the flower, while others—the hawk moths (Sphingidae) for example—remain poised in the air in front of the flower by means of excessively rapid vibration of the wings, and quickly unrolling the proboscis sip the nectar. Certain flowers with remarkably long tubular corollas seem to be specially adapted for the visits of hawk moths. Some Lepidoptera have other sources of food-supply. The juices of fruit are often sought for, and certain moths can pierce the envelope of a succulent fruit with the rough cuticular outgrowths at the tips of the maxillae, so as to reach the soft tissue within. Animal juices attract other Lepidoptera, which have been observed to suck blood from a wounded mammal; while putrid meat is a familiar "lure" for the gorgeous "purple emperor" butterfly (*Apatura iris*). The water of streams or the dew on leaves may be frequently sought by Lepidoptera desirous of quenching their thirst, possibly with fatal results, the insects being sometimes drowned in rivers in large numbers. Members of several families of the Lepidoptera—the Hepialidae, Lasiocampidae and Saturniidae, for example—have the maxillae vestigial or aborted, and take no food at all after attaining the winged condition. In such insects there is a complete "division of labour" between the larval and the imaginal instars, the former being entirely devoted to nutritive, the latter to reproductive functions.

Of much interest is the variety displayed among the Lepidoptera in the season and the duration of the various instars. The brightly coloured vanessid butterflies, for example, emerge from the pupa in the late summer and live through the winter in sheltered situations, reappearing to lay their eggs in the succeeding spring. Many species, such as the vapourer moths (*Orgyia*), lay eggs in the autumn, which remain unhatched through the winter. The eggs of the well-known magpie moths (*Abraxas*) hatch in autumn and the caterpillar hibernates while still quite small, awaiting for its growth the abundant food-supply to be afforded by the next year's foliage. The codlin moths (*Carpocapsa*) pass the winter as resting full-grown larvae, which seek shelter and spin cocoons in autumn, but do not pupate until the succeeding spring. Lastly, many of the Lepidoptera hibernate in the pupal stage; the death's head moth (*Acherontia*) and the cabbage-white butterflies (*Pieris*) are familiar examples of such. The last-named insects afford instances of the "double-brooded" condition, two complete life-cycles being passed through in the year. The flour moth (*Ephestia kühniella*) is said to have five successive generations in a twelvemonth. On the other hand, certain species whose larvae feed in wood or on roots take two or three years to reach the adult stage.

The rate of growth of the larva depends to a great extent on the nature of its food, and the feeding-habits of caterpillars afford much of interest and variety to the student. The contrast among the Lepidoptera between the suctorial mouth of the imago and the biting jaws of the caterpillar is very striking (cf. figs. 4 and 9), and the profound transformation in structure which takes place is necessarily accompanied by the change from solid to liquid food. The first meal of a young caterpillar is well known to be often its empty egg-shell; from this it turns to feed upon the leaves whereon its provident parent has laid her eggs. But in a few cases hatching takes place in winter or early spring, and the young larvae have then to find a temporary food until their own special plant is available. For example, the caterpillars of some species of *Xanthia* and other noctuid moths feed at first upon willow-catkins. On the other hand, the caterpillars of the pith moth (*Blastodacna*) hatched at midsummer, feed on leaves when young, and burrow into woody shoots in autumn. All who have tried to rear caterpillars know that, while those of some species will feed only on one particular species of plant, others will eat several species of the same genus or family, while others again are still less particular, some being able to feed on almost any green herb. It is curious to note how certain species change their food in different localities, a caterpillar confined to one plant in some localities being less particular elsewhere. Individual aberrations in food are of special interest in suggesting the starting-point for a change in the race. When we consider the vast numbers of the Lepidoptera and the structural modifications which they have undergone, their generally faithful adherence to a vegetable diet is remarkable. The vast majority of caterpillars eat leaves, usually devouring them openly, and, if of large size, quickly reducing the amount of foliage on the plant. But many small caterpillars keep, apparently for the sake of concealment, to the under surface of the leaf, while others burrow into the green tissue, forming a characteristic sinuous "mine" between the two leaf-skins. In several families we find the habit of burrowing in woody stems,—the "goat" (*Cossus*, fig. 8) and the clearwings (Sesiidae), for example, while others, like the larvae of the swift moths (Hepialidae) live underground devouring roots (fig 12). The richer nutrition in the green food is usually shown by the quicker growth of the numerous caterpillars that feed on it, as compared with the slower development of the wood and root-feeding species. Aquatic larvae are very rare among the Lepidoptera The caterpillars of the pyralid "china-mark" moths (*Hydrocampa*, fig. 13), however, live under water, feeding on duckweed (*Lemna*) and breathing atmospheric air, a film of which is enclosed in a spun-up shelter beneath the leaves, while the larvae of *Paraponyx*, which feed on *Stratiotes*, have closed spiracles and breathe dissolved air by means of branchial filaments along the sides of the body.

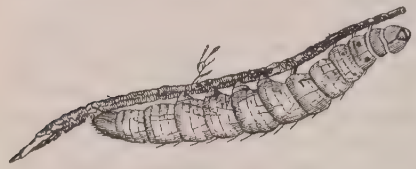


FIG. 12.—Larva of *Hepialus humuli* (ghost moth).

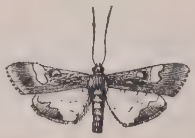
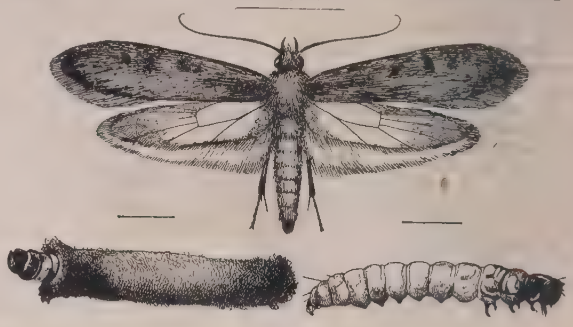


FIG. 13.—*Hydrocampa aquatilis* (water moth).

We may now turn to instances of more anomalous modes of feeding. The clothes moths (Tineids) have invaded our dwellings and found a congenial food-stuff for their larvae in our garments. A few small species of the same group are reared in meal and other human food-stores; so are the caterpillars of some pyralid moths (*Ephestia*), while others (*Asopia*, *Aglossa*) feed upon kitchen refuse. Two species of crambid moths (*Aphomia sociella* and *Galleria melonella*) find a home in bee-hives, where their caterpillars feed upon the wax, while the waxy secretion from the body of the great American lantern-fly (*Fulgora candelaria*) serves both as shelter and food for the caterpillar of the moth *Epipyrops anomala*. Very few caterpillars have developed a thoroughly carnivorous habit. That of *Cosmia trapezina* feeds on oak and other leaves, but devours smaller caterpillars which happen to get in its way, and if shaken from the tree, eats other larvae while climbing the trunk. *Xylina ornithopus* and a few other species are said to be always carnivorous when opportunity offers; the small looping caterpillar of a "pug" moth (*Eupithecia coronata*) has been observed to eat a larva three times as big as itself. The caterpillars of *Orthosia pistacina* live together in peace while their food is moist, but devour each other when it dries up; this is true cannibalism—a term which should not be applied to the habit of preying on another species. A few carnivorous caterpillars do not attack other caterpillars, but prey upon insects of another order; among these *Fenescia tarquinius*, which eats aphides, and *Erastria scitula*, which feeds upon scale insects, must be reckoned as benefactors to mankind. The life-history of the latter moth has been worked out by H. Rouzaud. It inhabits the shores of the Mediterranean, and its caterpillar devours the coccids upon various fruit-trees, especially the black-scale (*Lecanium oleae*) of the olive. The moth, which is a small noctuid, the white markings on whose wings give it the appearance of a bird-dropping when at rest in the daytime, appears in May, and lays her eggs, singly and far apart, upon the trees infested by the coccids. When hatched, the young caterpillar selects a large female coccid, eats its way through the scale, and devours the insect beneath; having done this it makes its way to a fresh victim. As it increases in size it forms a case for itself made of the scales of its victims, excrement, &c., bound together by silk which it spins, and, protected by this covering, which closely resembles the smut-covered bark of the tree, it roams about during its later stages, devouring several coccids every day. So nutritious is the food, that four or five successive broods follow each other through the summer.

The habit just mentioned of forming some kind of protective covering out of foreign substances spun together by silk is practised by caterpillars of different families. The clothes moth larvae (*Tinea*, fig. 14), for example, make a tubular dwelling out of the pellets of wool passed from their own intestines, while the allied Tortricid caterpillars roll up leaves and spin for themselves cylindrical shelters. The habit of spinning over the food plant a protective mass of web, whereon the caterpillars of a family can live together socially is not uncommon. In the case of the small ermine moths (*Hyponomeuta*) the caterpillars remain associated throughout their lives and pupate in cocoons on the mass of web produced by their common labour. But the larger, spiny caterpillars of the vanessid butterflies usually scatter away from the nest of their infancy when they have attained a certain size.



After Marlatt (after Riley), *Bull. 4, Div. Ent. U.S. Dept. Agr.*

FIG. 14.—Clothes Moth (*Tinea pellionella*), with larva in and out of its case. Magnified.

Spines and hairs seem to be often effective protections for caterpillars; the experiments of E. B. Poulton and others tend to show that hairy caterpillars (fig. 15) are distasteful to birds. Many caterpillars are protected by the harmony of their general green coloration with their surroundings. When the insect attains a large size—as in the case of the hawk moth (Sphingid) caterpillars—the extensive green surface becomes broken up by diagonal dark markings (fig. 46*b*), thus simulating the effect of light and shade among the foliage. A remarkable result of Poulton's experiments has been the establishment of a reflex effect through the skin on the colour of a caterpillar. Some species of "loopers" (Geometridae, fig. 43) for example, if placed when young among surroundings of a certain colour, become closely assimilated thereto—dark brown among dark twigs, green among green leaves. These colour-reflexes in conjunction with the elongate twig-like shape of the caterpillars and their habit of stretching themselves straight out from a branch, afford some of the best and most familiar examples of "protective resemblance." The "terrifying attitude" of caterpillars, and the supposed resemblance borne by some of them to serpents and other formidable vertebrates or arthropods, are discussed in the article MIMICRY.

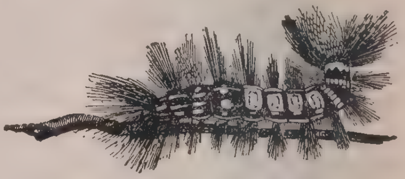
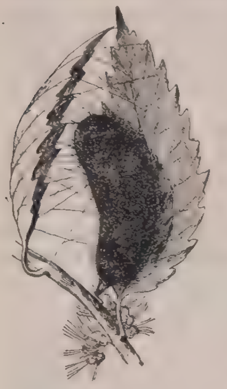


FIG. 15.—Larva of *Orgyia gonostigma*. Europe.

The silk produced by a caterpillar is, as we have seen, often advantageous in its own life-relations, but its great use is in connexion with the pupal stage. In the life-history of many Lepidoptera, the last act of the caterpillar is to spin a cocoon which may afford protection to the pupa. In some cases this is formed entirely of the silk produced by the spinning-glands, and may vary from the loose meshwork that clothes the pupa of the diamond-back moth (*Plutella cruciferarum*) to the densely woven cocoon of the silkworms (Bombycidae and Saturniidae) or the hard shell-like covering of the eggars (Lasiocampidae). Frequently foreign substances are worked up with the silk and serve to strengthen the cocoon, such as hairs from the body of the caterpillar itself, as among the "tigers" (Arctiidae) or chips of wood, as with the timber-burrowing larva of the "goat" (*Cossus*). In many families of Lepidoptera we can trace a degeneration of the cocoon. Thus, the pupae of most owl moths (Noctuidae) and hawk moths (Sphingidae) lie buried in an earthen cell. Among the butterflies we find that the cocoon is reduced to a pad of silk which gives attachment to the cremaster; in the Pieridae there is in addition a girdle of silk around the waist-region of the pupa, but the pupae of the Nymphalidae (figs. 11, 65) simply hang from the supporting pad by the tail-end. Poulton has shown that the colours of some exposed pupae vary with the nature of the surroundings of the larva during the final stage.



After Ratzeburg, *Insect Life*, vol. 2 (U.S. Dept. Agr.).

FIG. 16.—Pupa of Gypsy Moth (*Porthetria dispar*) sheltered in leaves joined by silken threads. Below is the cast larval cuticle.

When the pupal stage is complete the insect has to make its way out of the cocoon. In the lower families of moths it is the pupa which comes out at least partially, working itself onwards by the spines on its abdominal segments; the pupa of the primitive *Micropteryx* has functional mandibles with which it bites through the cocoon. In the higher Lepidoptera the pupa is immovable, and the imago, after the ecdysis of the pupal cuticle, must emerge. This emergence is in some cases facilitated by the secretion of an acid or alkaline solvent discharged from the mouth or from the hind-gut, which weakens the cocoon—so that the delicate moth can break through without injury.

As might be expected, the conditions to which larva and pupa are subjected have often a marked influence on the nature of the imago. An indifferent food-supply for the larva leads to a dwarfing of the moth or butterfly. Many converging lines of experiment and observation tend to show that cool conditions during the pupal stage frequently induce darkening of pigment in the imago, while a warm temperature brightens the colours of the perfect insect. For example, in many species of butterfly that are double-brooded, the spring brood emerging from the wintering pupae are more darkly coloured than the summer brood, but if the pupae producing the latter be subjected artificially to cold conditions, the winter form of imago results. It is usually impossible, however, to produce the summer form of the species from wintering pupae by artificial heat. From this A. Weismann argued that the more stable winter form must be regarded as representing the ancestral race of the species. Further examples of this "seasonal dimorphism" are afforded by many tropical butterflies which possess a darker "wet-season" and a brighter "dry-season" generation. So different in appearance are often these two seasonal forms that before their true relationship was worked out they had been naturally regarded as independent species. The darkening of wing-patterns in many species of Lepidoptera has been carefully studied in our own British fauna. Melanic or melanochroic varieties are specially characteristic of western and hilly regions, and some remarkable dark races (fig. 43) of certain geometrid moths have arisen and become perpetuated in the manufacturing districts of the north of England. The production of these melanic forms is explained by J. W. Tutt and others as largely due to the action of natural selection, the damp and sooty conditions of the districts where they occur rendering unusually dark the surfaces—such as rocks, tree-trunks and palings—on which moths habitually rest and so favouring the survival of dark, and the elimination of pale varieties, as the latter would be conspicuous to their enemies. Breeding experiments have shown that these melanic races are sometimes "dominant" to their parent-stock. An evidently adaptive connexion can be frequently traced between the resting situation and attitude of the insect and the colour and pattern of its wings. Moths that rest with the hindwings concealed beneath the forewings (fig. 34, *f*) often have the latter dull and mottled, while the former are sometimes highly coloured. Butterflies whose normal resting attitude is with the wings closed vertically over the back (fig. 63) so that the under surface is exposed to view, often have this under surface mottled and inconspicuous although the upper surface may be bright with flashing colours. Various degrees of such "protective resemblance" can be traced, culminating in the wonderful "imitation" of its surroundings shown by the tropical "leaf-butterflies" (*Kallima*), the under surfaces of whose wings, though varying greatly, yet form in every case a perfect representation of a leaf in some stage or other of decay, the butterfly at the same time disposing of the rest of its body so as to bear out the deception. How this is effected is best told by A. R. Wallace, who was the first to observe it, in his work *The Malay Archipelago*:—

> "The habit of the species is always to rest on a twig and among dead or dried leaves, and in this position, with the wings closely pressed together, their outline is exactly that of a moderately sized leaf slightly curved or shrivelled. The tail of the hindwings forms a perfect stalk and touches the stick, while the insect is supported by the middle pair of legs, which are not noticed among the twigs and fibres that surround it. The head and antennae are drawn back between the wings so as to be quite concealed, and there is a little notch hollowed out at the very base of the wings, which allows the head to be retracted sufficiently."

But the British Vanessids often rest on a bare patch of ground with the brightly coloured upper surface of their wings fully exposed to view, and even make themselves still more conspicuous by fanning their wings up and down. Some genera and families of Lepidoptera, believed to secrete noxious juices that render them distasteful, are adorned with the staring contrasts of colour usually regarded as "warning," while other genera, belonging to harmless families sought for as food by birds and lizards, are believed to obtain complete or partial immunity by their likeness to the conspicuous noxious groups. (See MIMICRY.)

Sexual dimorphism is frequent among the Lepidoptera. In many families this takes the form of more elaborate feelers in the male than in the female moth. Such complex feelers (fig. 2) bear numerous sensory (olfactory) nerve-endings and give to the males that possess them a wonderful power of discovering their mates. A single captive female of the Endromidae or Lasiocampidae often causes hundreds of males of her species to "assemble" around her prison, and this character is made use of by collectors who want to secure specimens. In many butterflies—notably the "blues" (Lycaenidae)—the male is brilliant while the female is dull, and in other groups (the Danainae for example) he is provided with scent-producing glands believed to be "alluring" in function. The apparent evidence given by the sexual differences among the Lepidoptera in favour of C. Darwin's theory of sexual selection finds no support from a study of their habits. The male indeed usually seeks the female, but she appears to exercise no choice in pairing. In some cases the female is attracted by the male, and here a modified form of sexual selection appears to be operative. The ghost swift moth (*Hepialus humuli*) affords a curious and interesting example of this condition, the female showing the usual brown and buff coloration of her genus, while the wings of the male are pure white, rendering him conspicuous in the dusky evening when pairing takes place. But in the northernmost

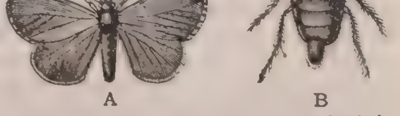


FIG. 17.—Vapourer Moth (*Ocneria detrita*). S. Europe. A, Male; B, Female.

haunts of the species, where there is no midsummer night, the male closely resembles the female in wing patterns, the development of the conspicuous white being needless. A very interesting sexual dimorphism is seen in the wingless condition of several female moths—the winter moths (*Hybernia* and *Cheimatobia*) among the Geometridae and the vapourers (*Orgyia* and *Ocneria*) among the Lymantriidae for example (fig. 17). It might be thought that the loss of power of flight by the female would seriously restrict the range of the species. In such insects, however, the caterpillars are often active and travel far.

Distribution and Migration.—The range of the Lepidoptera is practically world-wide; they are absent from the most remote and inhospitable of the arctic and antarctic lands, but even Kerguelen possesses a few small indigenous moths. Many of the large and dominant families have a range wide as that of the order, and certain species that have attached themselves to man—like the meal moths and the clothes moths—have become almost cosmopolitan. Interesting and suggestive restrictions of range can, however, be often traced. Although butterflies have been found in 82° N. latitude in Greenland, they are unknown in Iceland, and only a few species of the group reach New Zealand. Three large sections—the Ithomiinae, Heliconiinae and Brassolinae—of the great butterfly family Nymphalidae are peculiar to the Neotropical region, while the Morphinae, a characteristically South American group, have a few Oriental genera in India and Indo-Malaya. The Acraeinae, another section of the same family, have the vast majority of their species in Ethiopian Africa, but are represented eastwards in the Oriental and Australian regions and westwards in South America. A comparison of the lepidopterous faunas of Ireland, Great Britain and the European continent is very instructive, and suggests strongly that, despite their power of flight the Lepidoptera are mostly dependent on land-connexions for the extension of their range. For example, Ireland has only forty of the seventy species of British butterflies. The range of many Lepidoptera is of course determined by the distribution of the plants on which their larvae feed.

Nevertheless certain species of powerful flight, and some that might be thought feeble on the wing, often cross sea-channels and establish or reinforce distant colonies. Caterpillars of the great death's head moth (*Acherontia atropos*) are found every summer feeding in British and Irish potato fields, but it is doubtful if any of the pupae resulting from them survive the winter in our climate. It is believed by Tutt that the species is only maintained by a fresh immigration of moths from the South each summer. Hosts of white butterflies (*Pieris*) have been frequently observed crossing the English Channel from France to Kent. Migrating swarms of Lepidoptera have often been met by sailors in mid-ocean; thus, Tutt records the presence around a sailing ship in the Atlantic of such a swarm of the rather feeble moth *Deiopeia pulchella*, nearly 1000 m. from its nearest known habitat. This migratory instinct is connected with the gregarious habits of many Lepidoptera. For example, H. W. Bates states that at one place in South America he noticed eighty different species flying about in enormous numbers in the sunshine, and these, with few exceptions, were males, the females remaining within the forest shades. Darwin describes a "butterfly shower," which he observed 10 m. off the South American coast, extending as far as the eye could reach; "even by the aid of the telescope," he adds, "it was not possible to see a space free from butterflies." Sir J. Emerson Tennent, witnessed in Ceylon a mighty host of butterflies of white or pale yellow hue, "apparently miles in breadth and of such prodigious extension as to occupy hours and even days uninterruptedly in their passage." Observations at Heligoland by H. Gätke have shown that migrating moths "travel under the same conditions as migrating birds, and for the most part in their company, in an east to west direction; they fly in swarms, the numbers of which defy all attempts at computation and can only be expressed by millions." The painted lady butterfly (*Pyrameis cardui*) comes in repeated swarms from the Mediterranean region into northern and western Europe, while in North America companies of the monarch (*Anosia archippus*) invade Canada every summer from the United States, and are believed to return southwards in autumn. This latter species has, during the last half-century, extended its range south-westwards across the Pacific and reached the Austro-Malayan islands, while several specimens have occurred in southern and western England, though it has not established itself on this side of the Atlantic. It is noteworthy that the introduction of its food-plant —*Asclepias*—into the Sandwich Islands in 1850 apparently enabled it to spread across the Pacific.

Fossil History.—Our knowledge of the geological history of the Lepidoptera is but scanty. Certain Oolitic fossil insects from the lithographic stone of Solenhofen, Bavaria, have been described as moths, but it is only in Tertiary deposits that undoubted Lepidoptera occur, and these, all referable to existing families, are very scarce. Most of them come from the Oligocene beds of Florissant, Colorado, and have been described by S. H. Scudder. The paucity of Lepidoptera among the fossils is not surprising when we consider the delicacy of their structure, and though their past history cannot be traced back beyond early Cainozoic times, we can have little doubt from the geographical distribution of some of the families that the order originated with the other higher Endopterygota in the Mesozoic epoch.

Classification.—The order Lepidoptera contains more than fifty families, the discussion of whose mutual relationships has given rise to much difference of opinion. The generally received distinction is between butterflies or *Rhopalocera* (Lepidoptera with clubbed feelers, whose habit is to fly by day) and moths or *Heterocera* (Lepidoptera with variously shaped feelers, mostly crepuscular or nocturnal in habit). This distinction is quite untenable as a zoological conception, for the relationship of butterflies to some moths is closer than that of many families of Heterocera to each other. Still more objectionable is the division of the order into *Macrolepidoptera* (including the butterflies and large moths) and the *Microlepidoptera* (comprising the smaller moths). Most of the recent suggestions for the division of the Lepidoptera into sub-orders depend upon some single character. Thus J. H. Comstock has proposed to separate the three lowest families, which have—like caddis-flies (Trichoptera) —a jugum on each forewing, as a sub-order *Jugatae*, distinct from all the rest of the Lepidoptera—the *Frenatae*, mostly possessing a frenulum on the hindwing. A. S. Packard places one family (Micropterygidae) with functional mandibles and a lacinia in the first maxilla alone in a sub-order *Laciniata*, all the rest of the order forming the sub-order *Haustellata*. T. A. Chapman divides the families with free or incompletely obtect and mobile pupae (*Incompletae*) from those with obtect pupae which never leave the cocoon (*Obtectae*), and this is probably the most natural primary division of the Lepidoptera that has as yet been suggested. Dyar puts forward a classification founded entirely on the structure of the larva, while Tutt divides the Lepidoptera into three great stirps characterized by the shape of the chorion of the egg. The primitive form of the egg is oval, globular, or flattened with the micropyle at one end; from this has apparently been derived the upright form of egg with the micropyle on top which characterizes the butterflies and the higher moths. These schemes, though helpful in pointing out important differences, are unnatural in that they lay stress on single, often adaptive, characters to the exclusion of others equally important. Although it is perhaps best to establish no division among the Lepidoptera between the order and the family, an attempt has been made in the classification adopted in this article to group the families into tribes or super-families which may indicate their probable affinities. The systematic work of G. F. Hampson, A. R. Grote and E. Meyrick has done much to place the classification of the Lepidoptera on a sound basis, so far as the characters of the imago are concerned, but attention must also be paid to the preparatory stages if a truly natural system is to be reached.

Jugatae.

Three families are included in this group having in common certain primitive characters of the wings and neuration (see fig. 6), as well as of the larva and pupa. There is a membranous lobe or jugum near the base of the wing, and the neuration of the hindwing is closely like that of the forewing, the radial nervure being five-branched in both. The pupa has four or five movable segments, and the larval prolegs have complete circles of hooklets.

The three families of the Jugatae are not very closely related to each other. The *Micropterygidae* (often known as *Eriocephalidae*), comprising a few small moths with metallic wings, are the most primitive of all Lepidoptera. They are provided with functional mandibles, while the maxillae have distinct laciniae, well-developed palps and galeae not modified for suction (see fig. 3). The larva is remarkable on account of its long feelers, the presence of pairs of jointed prolegs on the first eight abdominal segments, an anal sucker beneath the last segment and bladder-like outgrowths on the cuticle. These curious larvae feed on wet moss. The family has only a few genera scattered widely over the earth's surface (Europe, America, Australia, New Zealand).

The *Eriocraniidae* resemble the Micropterygidae in appearance, but the imago has no mandibles, and the maxillae, though short and provided with conspicuous palps, have no laciniae and form a proboscis as in Lepidoptera generally. The abdomen of the female carries a serrate piercing process, and the eggs are laid in the leaves of deciduous trees, the white larvae, with aborted legs, mining in the leaf tissue. The fully-fed larva winters in an underground cocoon and then changes into the most remarkable of all known lepidopterous pupae, with relatively enormous toothed mandibles which bite a way out of the cocoon in preparation for the final change. These pupal mandibles of the Eriocraniidae, together with the nature of the imaginal maxillae in the Micropterygidae (Eriocephalidae) and the wing-neuration in both families, point strongly to a relationship between the Lepidoptera and the Trichoptera.

The *Hepialidae* or swift moths—the third family of the Jugatae—are in some respects specialized. The moths are of large or moderate size with the maxillae in a vestigial condition, no food being taken after the attainment of the perfect state. The larvae (fig. 12) feed either on roots or in the wood of trees and shrubs, not attaining their growth in less than a year and some large exotic species living for two or three. The family is world-wide in range, and Australia possesses some almost gigantic and strangely coloured genera.

Tineides.

A large assemblage of moths, mostly of small size, are included in this group. The wings have no jugum, but there is a frenulum on the hindwing, which has, as in all the groups above the Jugatae, only a single radial nervure. Three anal nervures are present in the hindwing in those families whose wings are well developed, but in several families of small moths the wings of both pairs are very narrow and pointed, and the neuration is consequently reduced. The sub-costal nervure of the hindwing is usually present and distinct from the radial nervure. The egg is flat except in the Cossidae and Castniidae in which it is upright. The larval prolegs, with few exceptions, have a complete circle of hooklets, and the larvae usually feed in some concealed situation. The pupa is incompletely obtect, with three (in some females only two) to five free abdominal segments, and emerges partly from the cocoon before the moth appears. The cremaster serves to anchor the pupa to its cocoon at the correct degree of emergence, and thus facilitates the eclosion of the imago.

The *Cossidae* are a small family of large moths (figs. 8, 18, 19) belonging to this section, characterized by their heads with erect rough scales or hairs, the pectinate feelers of the males, their reduced maxillae so that no food is taken in the perfect state, and their wings with the fifth radial nervure arising from the third, and the main median nervure forking in the discoidal areolet. The larvae feed in plant stems, often in the wood of trees, forming tunnels and galleries, and usually taking a year or more to reach maturity. The pupa which has three or four free segments in the male and four or five in the female, rests in a cocoon within the food plant, often strengthened by chips of wood, or in a subterranean cocoon. The family is fairly well represented in the tropics; the British fauna possesses only three species, of which the "goat" (*Cossus cossus*) and the "leopard" (*Zeuzera pyrina*) are well known, the caterpillars of both being often injurious to timber and fruit trees.

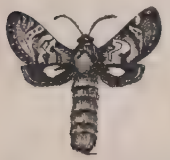


FIG. 18.—*Stygia australis.* S. Europe.

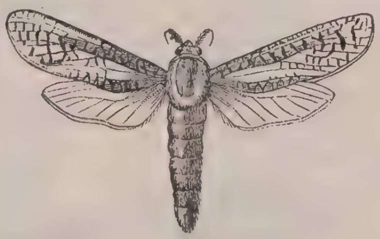


FIG. 19.—*Zeuzera scalaris.* India.

The *Tortricidae* are a large family of small moths (see fig. 1), nearly allied to the Cossidae. The fifth radial nervure does not arise from the third, the maxillae are well developed, but their palps are obsolete; the head is densely clothed with erect scales; the terminal segment of the labial palp is short and obtuse. The female pupa has three, the male four, free segments. All the larvae of these moths have some method of concealing themselves while feeding. A frequent plan is to roll up a leaf of the food-plant, fastening the twisted portion with silken threads so as to make a tubular retreat; this is the habit of the caterpillar of the green bell moth (*Tortrix viridana*) which often ravages the foliage of oak plantations. The larvae of the pine-shoot moths (*Retinia*) shelter in solidified resinous exudations from their coniferous food-plants, while the codlin-moth caterpillar (*Carpocapsa pomonella*) feeds in apples and pears, growing with the growth of the fruit which affords them both provender and home. The antics of "jumping-beans" are due to the movements of tortricid caterpillars within the substance of the seed.

The *Psychidae* are a small but widely-distributed family of moths whose males have the head, densely clothed with rough hairs, bearing complex, bipectinated feelers, but with the maxillae reduced and useless. The larvae live in portable cases made of grass, pieces of leaf or stick, with a silken lining, and these cases serve as cocoons for the pupae which agree in structure with those of the Tortricidae. But the most remarkable feature of the family is the extreme degradation of the female, which, wingless, legless and without jaws or feelers, never emerges from the cocoon.

The *Castniidae* are a small family of large, conspicuous, day-flying exotic moths (fig. 20) whose clubbed feelers and bright colours give them a resemblance to butterflies, although their wing-neuration is of the primitive tineoid type; the smooth larvae feed on the stems or roots of plants and the pupal structure agrees with that of the Tortricidae and Psychidae. The distribution of the family is confined to Tropical America and the Indo-Malayan and Australian regions.

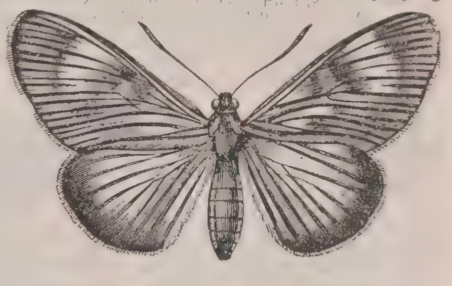


FIG. 20.—*Castnia acraeoides.* Brazil.

The *Zygaenidae* (burnet moths) are a large family of day-flying moths (fig. 21) adorned with brilliant metallic colours. The feelers are long, stout in the middle and tapering, bearing numerous long or short pectinations. The well-developed maxillae have vestigial palps. The larvae—often very conspicuously coloured—are remarkable among the Tineides in having incomplete circles of hooks on the prolegs, and they feed exposed on the leaves of various plants. The pupa, enclosed in a silken cocoon, has four or five free segments. The *Limacodidae* are a small family of brownish nocturnal moths, allied to the Zygaenidae and agreeing with them in the structure of the pupa. The larva in this family also is an exposed feeder, but it is remarkable in form, being flattened and slug-like, without prolegs and adorned with curious spinous processes.

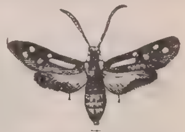


FIG. 21.—*Neurosymploca concinna.* S. Africa.

The *Sesiidae* are a large family of small, narrow-winged moths, the sub-costal nervure of the hindwing being absent and the wings being for the most part destitute of scales (fig. 22). The maxillae are developed but their palps are vestigial, while the terminal segment of the labial palp is short and pointed. Many of these insects have their bodies banded with black and yellow; this in conjunction with the transparent wings makes some of them like wasps or hornets in appearance. The larvae feed in the woody stems of various plants. The pupa, with three or four free abdominal segments, remains within its cocoon, formed with chips of wood, until the time for its final change draws near; then it works itself partly out of the tree by means of the spines on its abdominal segments.

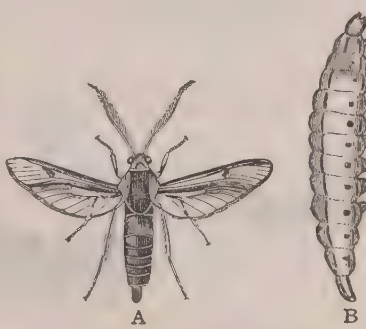


FIG. 22.—A, *Sesia asiliformis* (Gad-fly Hawk Moth). Europe. B, Larva.

The *Nepticulidae* are the smallest of all the Lepidoptera, measuring only 3–8 mm. across the outspread wings, which are all lanceolate and pointed at the tip. The sucking portions of the maxillae are vestigial, but the palps are long and jointed. The larvae, without thoracic limbs or prolegs, but sometimes with paired rudimentary processes on some of the segments, mine in the leaves of plants. The pupa, with four free abdominal segments in the female and five in the male, rests in a cocoon usually outside the mine.

The *Adelidae* are a family of delicate, but larger, moths with very long feelers (fig. 23) especially in the males. The larvae feed, when young, in flowers, later, protected by a flat case, they devour leaves, the pupa resembles that of the Nepticulidae in structure. The female has an ovipositor adapted for piercing plant tissues.

The *Tineidae* are a large and important family of small moths (figs. 14, 24, 25) with rough-haired heads, and with the maxillae and their palps usually well developed. Many of the genera have narrow pointed wings with degraded neuration. The larvae differ in their habits, some—*Gracilaria* for example—mine in leaves, while others, like the well-known caterpillars of the clothes moth (*Tinea*) surround themselves with portable cases (fig. 14) formed by spinning together their own excrement. The female pupa has three, the male four free abdominal segments.

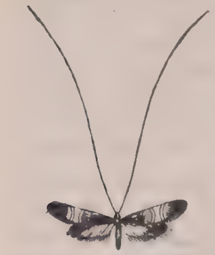


FIG. 23.—*Adela degeerella*. Europe.

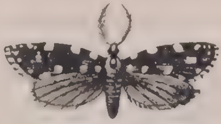


FIG. 24.—*Euplocampus anthracinus*. Europe.

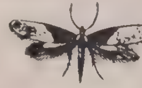


FIG. 25.—*Tinea tapetzella* (Clothes Moth). Europe.

Plutellides.

This group includes a few large families of small moths that are linked by their imaginal and larval structure to the Tineidae (in which they have often been included) and by their pupal structure to the higher groups that have yet to be considered. The moths have labial palps with slender pointed terminal segments, and narrow pointed wings, but the neuration (except in the Elachistidae) is less degenerate than in most Tineidae. The hairy covering of the head is smooth, and the maxillary palps are usually vestigial. The egg is flat, and the larval prolegs have complete circles of hooklets. The pupa is obtect with only two free abdominal segments (fifth and sixth) in both sexes and does not move out of the cocoon.

Four families are included in this group. The *Plutellidae* (fig. 26) have the maxillary palps developed, in some genera, as slender threadlike appendages directed straight forward. The larvae do not usually mine in leaves, but feed openly, keeping to the underside for protection (*Plutella*), or spinning by their united labour a mass of web over the food-plant (*Hyponomeuta*). In the other three families the maxillary palps are vestigial or obsolete. The *Elachistidae* have remarkably narrow, pointed wings and their larvae mine in leaves or form portable cases and feed among seeds. In the *Oecophoridae* (fig. 27) the sub-costal nervure of the hindwing is free and distinct throughout its length, and the larvae usually feed among spun leaves or seeds, or in decayed wood. The *Gelechiidae* are a large family with similar larval habits; the moths are distinguished by the sinuate termen of the hindwing and the connexion of its sub-costal nervure with the discoidal areolet.

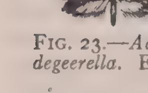


FIG. 26.—*Cerostoma asperella*. Europe.

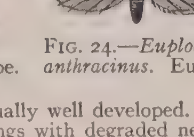


FIG. 27.—*Psecadia pusiella*.

Pyralides.

This group includes a number of moths of delicate build with elongate legs, the maxillae and their palps being usually well developed. The forewings have two anal nervures, the hindwings three (fig. 30, *h*, *i*); in the hindwing the subcostal nervure bends towards and often connects with the radial, and the frenulum is usually present. The egg is flat. The larva has complete circles of hooklets on its five pairs of prolegs, and the pupa (usually completely obtect) does not move at all from its cocoon. This group includes the only Lepidoptera that have aquatic larvae.

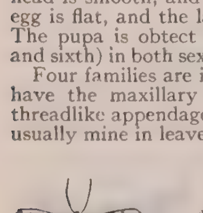


FIG. 28.—*Pterophorus spilodactylus*. Europe.

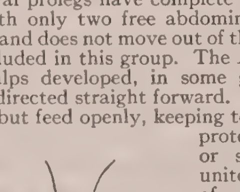
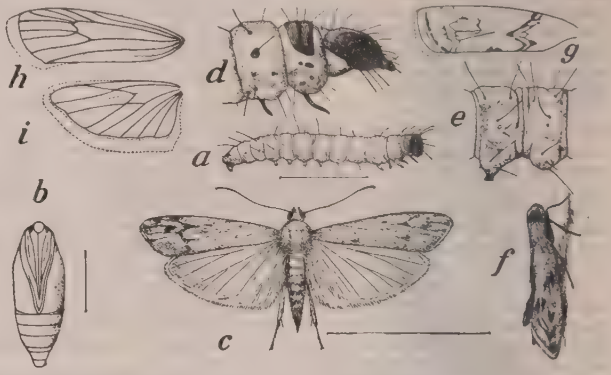


FIG. 29.—*Orneodes hexadactylus* (24-plumed Moth). Europe.

Of the families comprised in this division three deserve special mention. The *Pterophoridae* (plume moths, fig. 28) usually have the wings deeply cleft—a single cleft in the forewing and two in the hindwing. The hairy larvae feed openly on leaves, while the soft and hairy pupa remains attached to its cocoon by the cremaster, although it is incompletely obtect and has three or four free abdominal segments. The *Orneodidae* (multiplume moths) have all the wings six-cleft. Our British species, *Orneodes hexadactyla* (fig. 29), is an exquisite little insect, whose larva feeds on the blossoms of honeysuckle. The pupa is completely obtect, with only two free abdominal segments. The *Pyralidae* (figs. 13, 30), a large family with numerous divisions, have entire wings, and their pupae are obtect. The caterpillars feed in some kind of shelter, some spinning a loose case among the leaves of their food-plant, others burrowing into dry vegetable substances or eating the waxen cells of bees. Several species of this group, such as the Mediterranean flour moth, *Ephestia kühniella* (fig. 30), become serious pests in storehouses and granaries, their larvae devouring flour and similar food-stuffs.



After Riley and Howard, *Insect Life*, vol. 2 (U.S. Dept. Agr.).

FIG. 30.—Flour Moth (*Ephestia kühniella*).

c, With wings spread.
f, At rest.
g, *h*, *i*, Marking and neuration of wings.
a, Larva.
b, Pupa.
d, Head and front body-segments of larva.
e, 2nd and 3rd abdominal segments.

Noctuides.

In this group may be included a number of families of moths with the second median nervure of the forewing arising close to the third. This feature of neuration characterizes also the Jugatae (see fig. 6), Tineides, Plutellides and Pyralides. But the Noctuides differ from these groups in having only two anal nervures in the hindwing. The maxillary palps are absent or vestigial, and a frenulum is usually present on the hindwing. The larva has usually ten prolegs, whose hooklets are arranged only along the inner edge, while the immobile pupa is always obtect with only two free abdominal segments (the fifth and sixth). The Lasiocampidae and their allies have flat eggs, but in the Noctuidae, Arctiidae and their allies the egg is upright.

The *Lasiocampidae*, together with a few small families, differ from the majority of this group in wanting a frenulum. The maxillae of the Lasiocampidae are so reduced that no food is taken in the imaginal state, and in correlation with this condition the feelers of the male are strongly (those of the female more feebly) bipectinated. The moths are stout, hairy insects, usually brown or yellow in the pattern of their wings. The caterpillars are densely hairy and many species hibernate in the larval stage. The pupa is enclosed in a hard, dense cocoon, whence the name "eggars" is often applied to the family, which has a wide distribution, but is absent from New Zealand. The *Drepanulidae* are an allied family, in which the frenulum is usually present, while the hindmost pair of larval prolegs are absent, their segment being prolonged into a pointed process which is raised up when the caterpillar is at rest. The hook-tip moths represent this family in the British fauna.

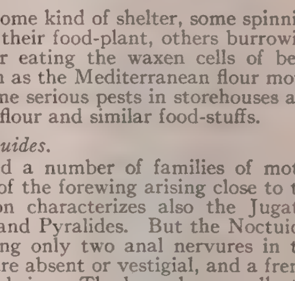


FIG. 31.—*Claterna cydonia*. India.

The *Lymantriidae* resemble the Lasiocampidae in their hairy bodies and vestigial maxillae, but the frenulum is usually present on the hindwing and the feelers are bipectinate only in the males. Some females of this family—the vapourer moths (*Orgyia* and allies, fig. 17), for example—are degenerate creatures with vestigial wings. The larvae (fig. 15) are very hairy, and often carry dense tufts on some of their segments; hence the name of "tussocks" frequently applied to them. The pupae are also often hairy (fig. 16)—an exceptional condition—and are protected by a cocoon of silk mixed with some of the larval hairs, while the female sheds some hairs from her own abdomen to cover the eggs. The family is widely distributed, its headquarters being the eastern tropics. To that part of the world is restricted the allied family of the *Hypsidae*, distinguished from the "tussocks" by the slender upturned terminal segment of the labial palps and by the development of the maxillae.

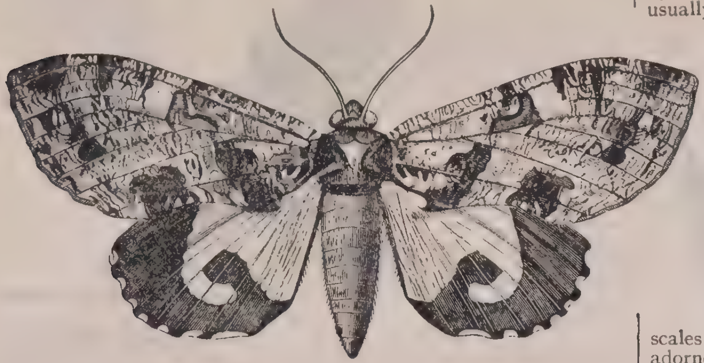


FIG. 32.—*Ophideres imperator*. Madagascar.

The *Noctuidae* are the largest and most dominant family of the Lepidoptera, comprising some 10,000 known species. They are mostly moths of dull coloration, flying at dusk or by night. The maxillae are well developed, the hindwing has a frenulum, and its sub-costal nervure touches the radial near the base. The larvae of the Noctuidae (fig. 34, *c*) are rarely hairy and the pupa (fig. 34, *d*) usually rests in an earthen cell, being often the wintering stage for the species; sometimes the pupa is enclosed in a loose cocoon of silk and leaves. In some Noctuidae (fig. 32) the hindwings are brightly coloured, but these are concealed beneath the dull, inconspicuous forewings when the insect rests (fig. 34, *f*). Nearly allied to the Noctuidae, but very different in appearance, are the gaily-coloured *Agaristidae*, a family of day-flying moths (figs. 35, 36), confined to the warmer regions of the globe and distinguished by their thickened feelers, those of the Noctuids being thread-like or slightly pectinate.

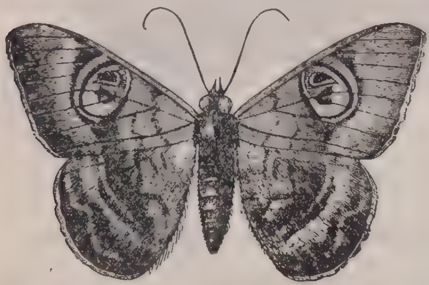
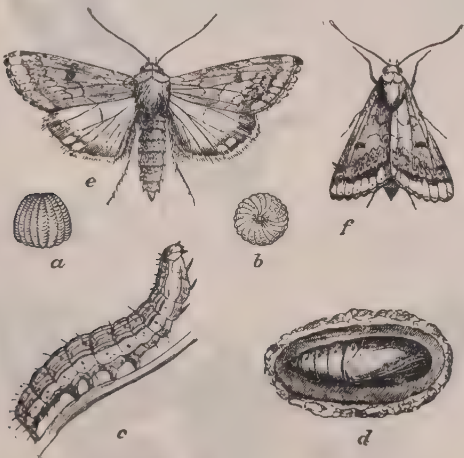


FIG. 33.—*Cyligramma fluctuosa*. W. Africa.



From Mally, *Bull. 24, Div. Ent. U.S. Dept. Agr.*

FIG. 34.—*e*, *f*, *Heliothis armigera*. Europe. *c*, Larva; *d*, pupa in cell. Natural size. *a*, *b*, Egg, highly magnified.

The *Arctiidae* (tiger moths, footmen, &c.) are allied to the Noctuidae, but their wing-neuration is more specialized, the sub-costal nervure of the hindwing being confluent with the radial for the basal part of its course. These moths (fig. 37) have gaily coloured wings, and the caterpillars are often densely covered with long smooth hairs. The pupae are enclosed in silken cocoons (fig. 38). The highest specialization of structure in this group of the Lepidoptera is reached by the *Syntomidae*, a family nearly allied to the Arctiidae, but with the sub-costal nervure in the hindwing absent. The Syntomidae have elongate narrow forewings and short hindwings, usually dark in colour with clear spots and dashes destitute of scales (fig. 40). The body, on the other hand, is often brilliantly adorned. The family, abundant in the tropics of the Old World, has only two European species.

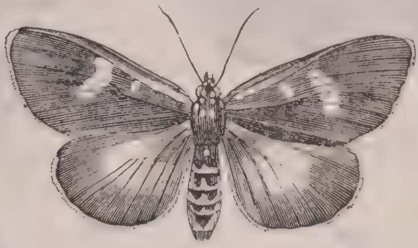


FIG. 35.—*Rothia pales*. Madagascar.

Sphingides.

This group includes a series of families which agree with the Noctuides in most points, but are distinguished by the origin of the second median nervure of the forewing close to the first, or from the discocellular nervure midway between the first and third medians (see fig. 5). These neurational characters may appear somewhat insignificant, but such slight though constant distinctions in structures of no adaptational value may be safely regarded as truly significant of relationship. Several of the families in this group have lost the frenulum. In larval and pupal characters the Sphingides generally resemble the Noctuides, but in some families there is a reduction in the number of the larval prolegs. The egg is spherical or flat, upright only in the Notodontidae.

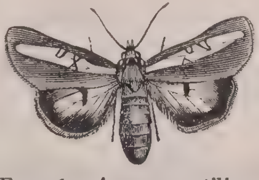


FIG. 36.—*Aegocera rectilinea.* Tropical Africa.

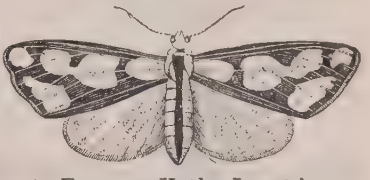
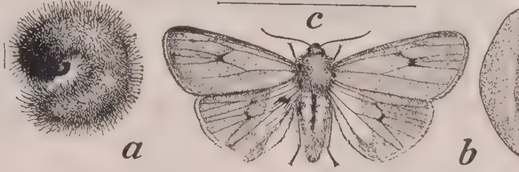


FIG. 37.—*Haploa Lecontei.* N. America.



After Lugger, Riley and Howard, *Insect Life*, vol. 2 (U.S. Dept. Agr.).

FIG. 38.—*c*, Tiger Moth (*Phragmatobia fuliginosa*, Linn.). Europe. *a*, Caterpillar; *b*, cocoon with pupa. Slightly enlarged.

The *Notodontidae* are stout, hairy moths (figs. 5, 41, 42 *a*) with maxillae and frenulum developed. In the larva the prolegs on the hindmost segment are sometimes modified into pointed outgrowths which are carried erect when the caterpillar moves about. From these structures whip-like, coloured processes are protruded by the caterpillar (fig. 42 *b*) of the puss moth (*Cerura*) when alarmed; these processes are believed to help in "terrifying" the caterpillar's enemies. Allied to the Notodontidae are the *Cymatophoridae*—a family of moths agreeing with the Noctuidae in appearance and habits—and the large and important family of the *Geometridae*.

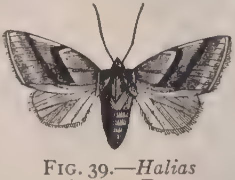


FIG. 39.—*Halias prasinana*. Europe.

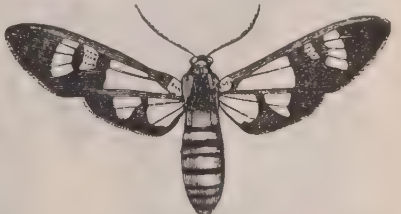


FIG. 40.—*Euchromia formosa*. S. Africa.

The moths (fig. 43) of this family are distinguished from the Notodontidae by their delicate build and elongate feet, the caterpillars (fig. 43, *c*) by the absence or vestigial condition of the three anterior pairs of prolegs. The two hinder pairs of prolegs are therefore alone functional and the larva progresses by "looping," *i.e.* bending the body so as to bring these prolegs close up to the thoracic legs, and then, taking a fresh grip on the twig whereon it walks, stretching the body straight out again. Many of these larvae have a striking resemblance both in form and colour to the twigs of their food-plant. In some of the species the female has the wings reduced to useless vestiges. The family is world-wide in its range. The tropical *Uraniidae* are large handsome moths (figs. 44, 45), often with exquisite wing-patterns, allied to the Geometridae, but distinguished by the absence of a frenulum in the moth and the presence of the normal ten prolegs in the larva.

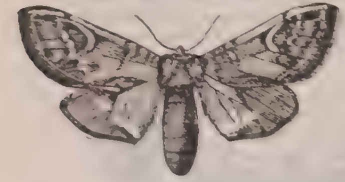


FIG. 41.—*Notodonta ziczac* (Pebble Prominent Moth). Europe.

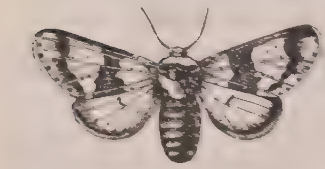


FIG. 42*a*.—*Cerura borealis*. N. America.

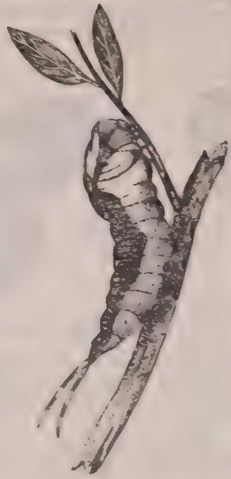
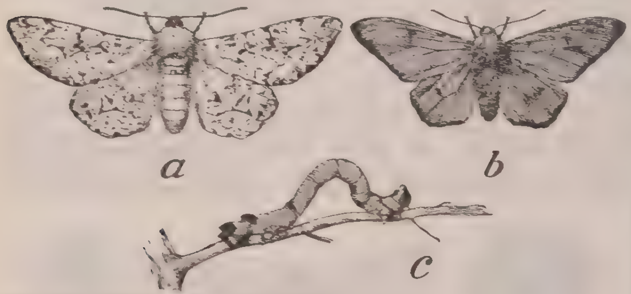


FIG. 42*b*.—Larva of *Cerura* (Puss Moth).



After Grote, *Natural Science* (J. M. Dent & Co.).

FIG. 43.—Geometrid Moth (*Amphidasys betularia*, Linn.). Europe. *a*, Large grey type; *b*, dark variety; *c*, caterpillar in looping attitude.

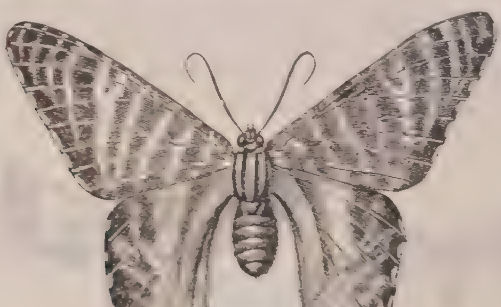


FIG. 44.—*Urania boisduvalii*. Cuba.

The *Sphingidae* (hawk moths) are insects often of large size (figs. 46*a*, 47), with spindle-shaped feelers, elongate and powerful fore-wings and the maxillae very well developed. The hindwing carries a frenulum and has its sub-costal nervure connected with the radial by a short bar. The caterpillars have the full number of prolegs, and, in many genera, carry a prominent dorsal horn on the eighth abdominal segment (fig. 46 *b*). The pupa lies in an earthen cell. On account of their powerful flight the moths of this family have a wide range; certain species—like *Acherontia atropos* and *Protoparce convolvuli*—migrate into the British Islands in numbers almost every summer.

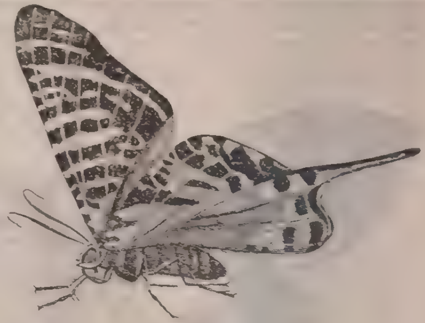


FIG. 45.—*Urania boisduvalii* at rest, showing under surface of wings.

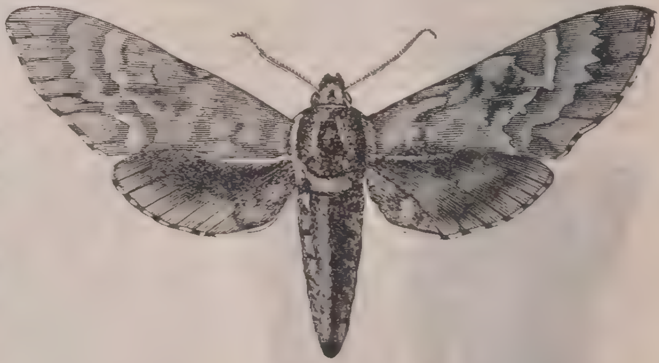


FIG. 46*a*.—*Chlaenogramma jasminearum* (Jessamine Sphinx). N. America.

A group of families in which the first maxillae are vestigial, the feelers bipectinate and the pupa enclosed in a dense silken cocoon, have been regarded as the most highly specialized of all the moths, though according to other views the whole series of the Lepidoptera culminates in the Syntomidae. Of these cocoon-spinning families may be specially mentioned the *Eupterotidae*, large brown or yellow moths inhabiting tropical Asia and Africa, and represented in Europe only by the "processionary moth" (*Cnethocampa processionea*). In this family the frenulum is present, and the larvae are protected with tufts of long hair. The *Bombycidae* have no frenulum, and the larvae are smooth, with some of the segments humped and the eighth abdominal often carrying a dorsal spine. The family

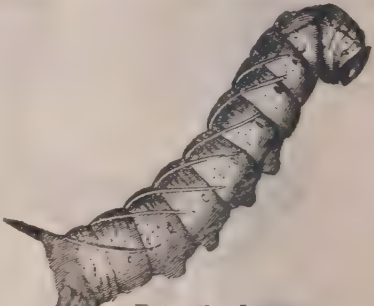


FIG. 46*b*.—Larva.

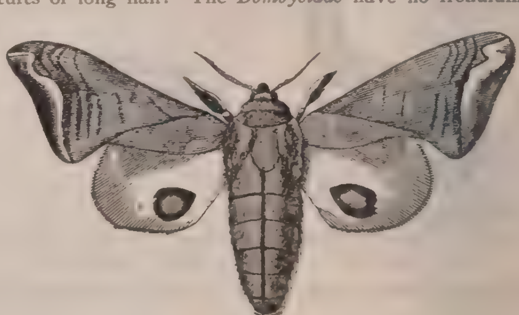
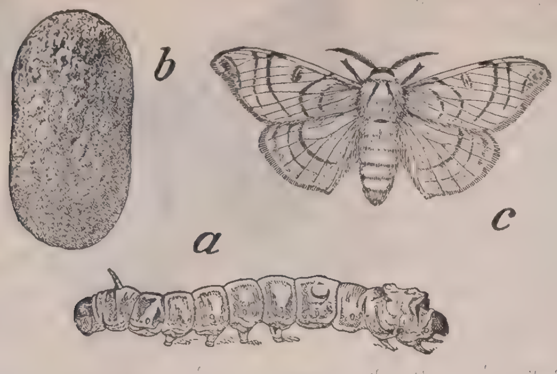


FIG. 47.—*Smerinthus ocellatus* (Eyed Hawk moth). Europe.

is tropical in its distribution, but the common silkworm (*Bombyx mori*, fig. 48) has become acclimatized in southern Europe and is the source of most of the silk used in manufacture and art. Of commercial value also is the silk spun by the great moths of the family *Saturniidae*, well represented in warm countries and contributing a single species (*Saturnia pavonia-minor*) to the British fauna. These moths (fig. 49) have but a single anal nervure in the hindwing and only three radial nervures in the forewing. The wing-patterns are handsome and striking; usually an unscaled "eyespot" is conspicuous at the end of each discoidal areolet. The caterpillars are protected by remarkable spine-bearing tubercles (fig. 10, B).



After C. V. Riley, *Bull. 14, Div. Ent. U.S. Dept. Agr.*

FIG. 48.—*Bombyx mori*. China. *a*, Caterpillar (the common silk-worm); *b*, cocoon; *c*, male moth.

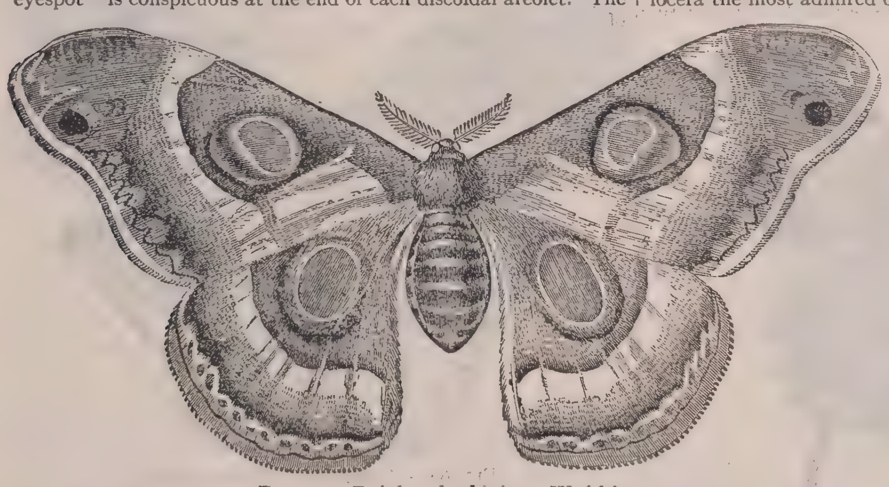


FIG. 49.—*Epiphora bouhiniae*. W. Africa.

Grypocera.

This group stands at the base of the series of families that are usually distinguished as "butterflies." The feelers are recurved at the tip, and thickened just before the extremity. The forewing has the full number of radial nervures, distinct and evenly spaced, and two anal nervures; the frenulum is usually absent. The larvae (fig. 51) have prolegs with complete circles of hooklets, and often feed in concealed situations, while the pupa is protected by a light cocoon. The affinities of this group are clearly not with the higher groups of moths just described, but with some of the lower families. According to Meyrick they are most closely related to the Pyralidae, but Hampson and most other students would derive them (through the Castniidae) from a primitive Tineoid stock allied to the Cossidae and Zygaenidae.

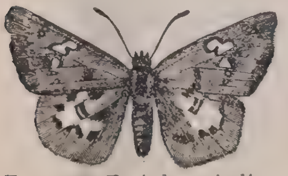


FIG. 50.—*Tagiades sabadius*. S. Africa.

Three families are included in the section. The North American *Megathymidae* and the Australian *Euschemonidae* have a frenulum and are usually reckoned among the "moths." The *Hesperiidae* in which the frenulum is wanting form the large family of the skipper butterflies, represented in our own fauna by several species. They are insects with broad head—the feelers being widely separated—usually brown or grey wings (fig. 50) and a peculiar jerky flight. The family has an extensive range but is unknown in Greenland, New Zealand, and in many oceanic islands.

Rhopalocera.

This group comprises the typical butterflies which are much more highly specialized than the Grypocera, and may be readily distinguished by the knobbed or clubbed feelers and by the absence of a frenulum. Two or more of the radial nervures in the forewing arise from a common stalk or are suppressed. The egg is "upright." The larvae have hooklets only on the inner edges of the prolegs. The pupa is very highly modified, only two free abdominal segments are ever recognizable, and in some genera even these have become consolidated. The cocoon is reduced to a pad of silk, to which the pupa is attached, suspended by the cremastral hooks; in some families there is also a silken girdle around the waist-region. In correlation with the exposed condition of the pupa, we find the presence of a specially developed "head-piece" or "nose-horn" to protect the head-region of the contained imago. Their bright colours and conspicuous flight in the sunshine has made the Rhopalocera the most admired of all insects by the casual observer.

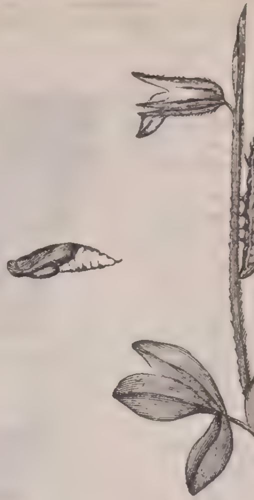


FIG. 51.—Chrysalis and Larva of *Nisoniades tages* (dingy skipper). Europe.

A modification that has taken place in several families of butterflies is the reduction of the first pair of legs. H. W. Bates arranged the families in a series depending on this character, but neurational and pupal features must be taken into account as well, and the sequence followed here is modified from that proposed by A. R. Grote and J. W. Tutt.

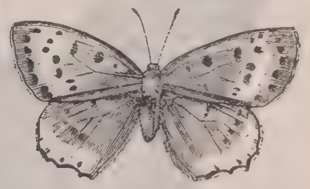


FIG. 52.—*Chrysophanus thoe.* N. America.

The *Lycaenidae* are a large family including the small butterflies (figs. 52, 53, 54) popularly known as blues, coppers and hairstreaks. The forelegs in the female are normal, but in the male the tarsal segments are shortened and the claws sometimes are absent. The forewing has only three or four radial nervures (fig. 55), the last two of which arise from a common stalk; the feelers are inserted close together on the head. The larva is short and hairy, somewhat like a woodlouse in shape, the broad sides concealing the legs and prolegs, while the pupa, which is also hairy or bristly, is attached by the cremaster to a silken pad and cinctured with a silken thread. The upper surfaces of the wings of these insects are usually of a bright metallic hue—blue or coppery—while beneath there are often numerous dark centred "eye-spots." The family is widely distributed. Nearly related are the *Lemoniidae*, a family abundantly represented in the Neotropical Region, but scarce in the Old World and having only a single European species (*Nemeobius lucinia*) which occurs also in England. In the Lemoniidae (figs. 56, 57) the forelegs of the male are reduced and useless for walking. The *Libytheidae* may be recognized by the elongate snout-like palps,

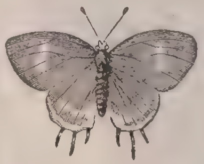


FIG. 53.—*Rathinda amor.* India.

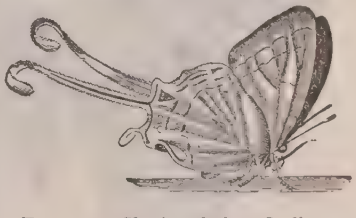
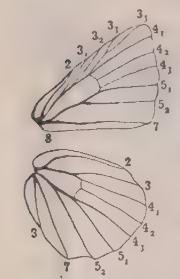


FIG. 54.—*Cheritra freja.* India.

the five-branched radial nervure of the forewing, the cylindrical hairy larva, and the pupa attached only by the cremaster.

The *Papilionidae* are large butterflies with ample wings, and all six legs fully developed in both sexes. The forewing has five radial and two anal nervures, the second of the latter being free from the first and running to the dorsum of the wing, while the hindwing has but a single anal, and is frequently prolonged into a "tail" at the third median nervure (fig. 58). The larva is cylindrical, never hairy but often tuberculate and provided with a dorsal retractile tentacle (osmaterium) on the prothorax. The pupa, which has a double "nose-horn," is attached by the cremaster and a waist-girdle to the food-plant in the Papilioninae (fig. 58), but lies in a web on the ground among the Parnasiinae (figs. 59, 60). The latter sub-family includes the well-known Apollo butterflies of the Alps. The former is represented in the British fauna by the East Anglian swallow-tail (*Papilio machaon*), and is very abundant in the warmer regions of the world, including some of the most magnificent and brilliant of insects.



After Grote, *Natural Science*, vol. 12 (J. M. Dent & Co.).

FIG. 55.—Neuration of Wings in *Lycaena*.
2, Sub-costal.
3, Radial.
4, Median.
5, Cubital.
7, 8, Anal nervures.

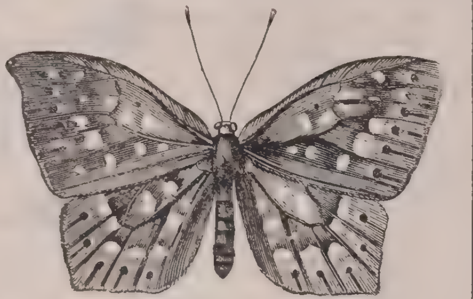


FIG. 56.—*Eurybia carolina*. Brazil

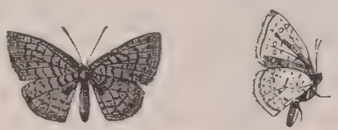


FIG. 57.—*Calephelis caenius*. N. America.

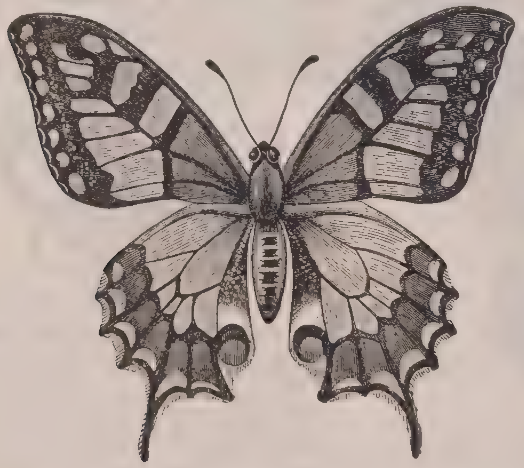


FIG. 58.—*Papilio machaon* (Swallow-tail). Europe.

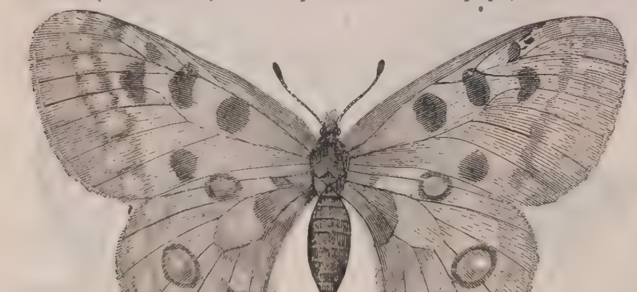


FIG. 59.—*Parnassius apollo* (Apollo). European Alps.

Agreeing with the Papilionidae in the six perfect legs of both sexes and the cincture-support of the pupa we find the *Pieridae*—the family of the white and yellow butterflies (figs. 61, 62)—represented by ten species in the British fauna and very widely spread over the earth's surface. In the *Pieridae* there are two anal nervures in the hindwing, while the second anal nervure in the forewing runs into the first; the larva is cylindrical and hairy without an osmaterium. The pupa has a single "nose-horn," and in the more highly organized genera there is no mobility whatever between its abdominal segments. The wintering pupae of the common cabbage butterflies (*Pieris brassicae* and *P. rapae*) are common objects attached to walls and fences and their colour harmonizes, to a great extent, with that of their surroundings.

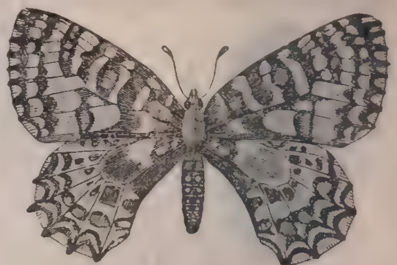


FIG. 60.—*Thais medesicaste*. S. France.

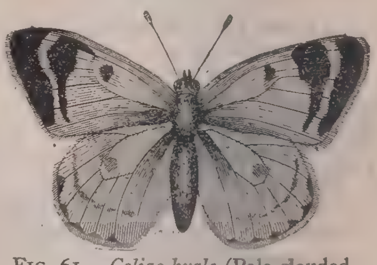


FIG. 61.—*Colias hyale* (Pale clouded Yellow Butterfly). Europe.

The *Nymphalidae* are by far the largest and most dominant family of butterflies. In both sexes the forelegs are useless for walking (fig. 63), the tarsal segments being absent and the short shins clothed with long hairs, whence the name of brush-footed butterflies is often applied to the family. The neuration of the wings resembles that found among the Pieridae, but in the Nymphalidae the pupa, which has a double nose-horn (fig. 65)—as in *Papilio*—is suspended from the cremaster only, no girdling thread being present, or it lies simply on the ground. The egg is elongate and sub-conical in form and ornamented with numerous ribs, while the larva is usually protected by numerous spines (fig. 64) arising from the segmental tubercles. To this family belong our common gaily-coloured butterflies—the tortoiseshells, peacock (fig. 65), admirals, fritillaries

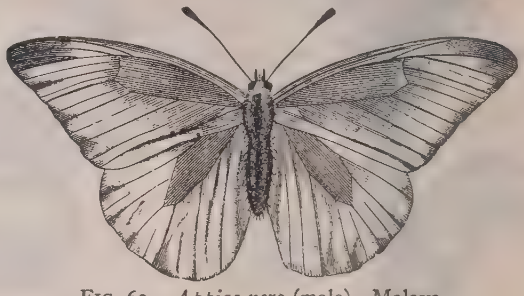


FIG. 62.—*Appias nero* (male). Malaya

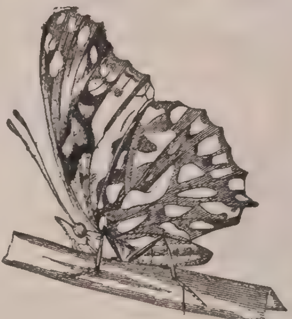


FIG. 63.—*Dione moneta*. Brazil.

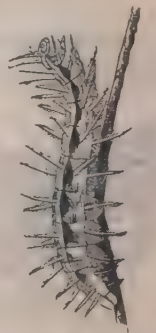


FIG. 64.—Larva of *Argynnis paphia* (Silver-washed Fritillary). Europe.

and emperors. In most cases the bright colouring is confined to the upper surface of the wings, the under-side being mottled and often inconspicuous. Most members of the group Vanessidi—the peacock and tortoiseshells (*Vanessa*) and the red admiral (*Pyrameis*) for example—hibernate in the imaginal state. This large family is divided into several sub-families whose characters may be briefly given, as they are considered to be distinct families by many entomologists. The *Danainae* (or *Euploeinae*, fig. 66) have the anal nervures of the forewing arising from a common stalk, the discoidal areolets in both wings closed, and the front feet of the female thickened; their larvae are smooth with fleshy processes. The danaine butterflies range over all the warmer parts of the world, becoming most numerous in the eastern tropics, where flourish the handsome purple *Euploeae* whose males often have "brands" on the wings; these insects are conspicuously marked and are believed to be distasteful to birds and lizards. So are the South American *Ithomiinae*, distinguished from the Danainae by the slender feet of the females; the narrow winged, tawny *Acraeinae*, with simple anal nervures, thick hairy palps and spiny larvae; and the *Heliconiinae* whose palps are compressed, scaly at the sides and hairy in front. This last named sub-family is confined to the Neotropical Region, while the Acraeinae are most numerous in the Ethiopian. The *Nymphalinae* include the British vanessids (fig. 65), and a vast assemblage of exotic genera (figs. 68, 70), characterized by the "open" discoidal areolets (fig. 67) owing to the absence of the transverse "disco-cellular" nervules. In the *Morphinae*—including some magnificent South American insects with deep or azure blue wings, and a few rather dull-coloured Oriental genera—the areolets are closed in the forewings and often in the hindwings. The larvae of the Morphinae (fig. 71) are smooth

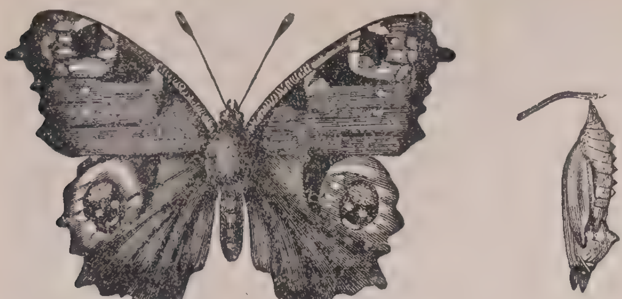


FIG. 65.—*Vanessa io* (Peacock) and its pupa.

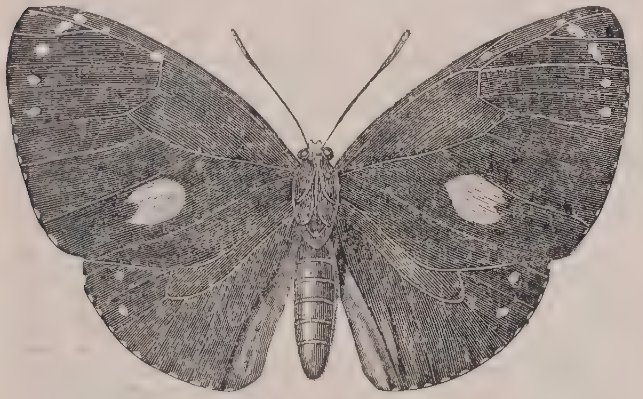
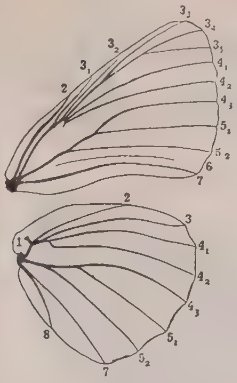


FIG. 66.—*Euploea leucostictos* (male). Malaya.



After A. R. Grote, *Natural Science*, vol. 12 (J. M. Dent & Co.).

FIG. 67.—Neuration of Wings in a Nymphaline Butterfly.

2, Sub-costal.
3, Radial.
4, Median.
5, Cubital.
6, 7, 8, Anal nervures.

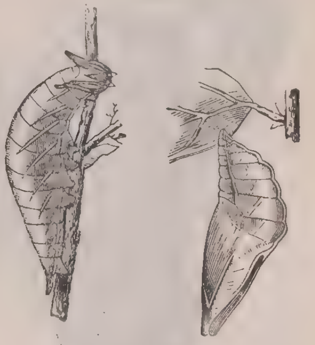


FIG. 69.—Larva and Pupa of *Apatura ilia*.

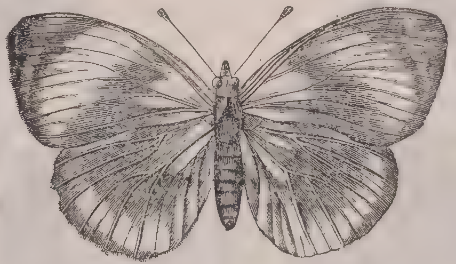


FIG. 70.—*Callithea sapphira.* Brazil.

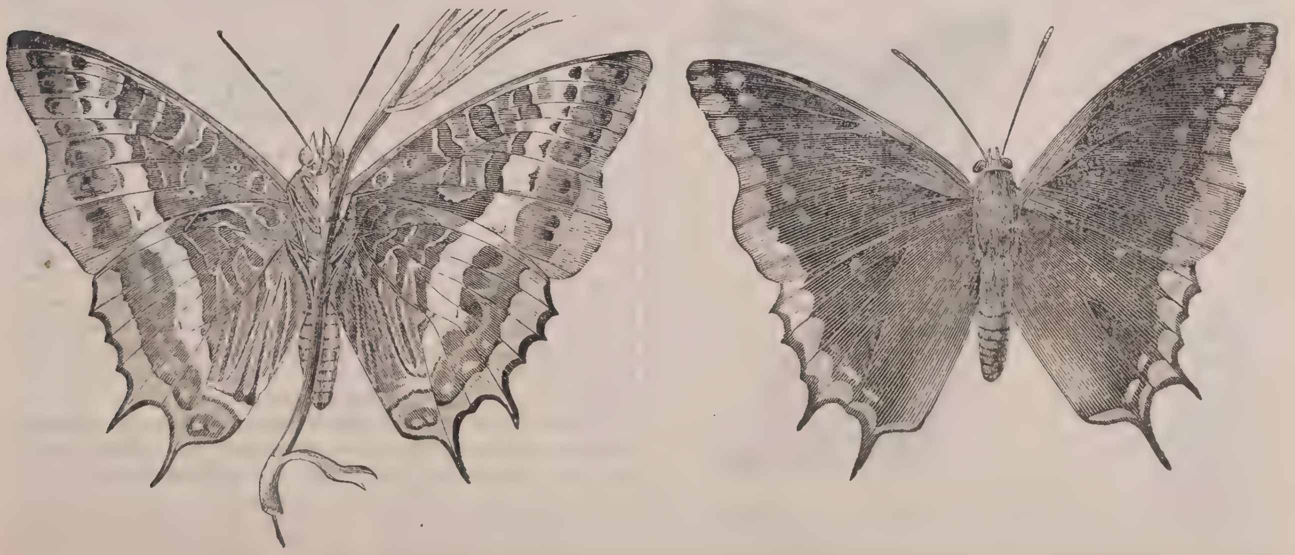


FIG. 68.—*Nymphalis jason.* W. Africa. Upper and under surface.

or horns with a forked tail-segment. A similar larva characterizes the South American *Brassolinae* or owl-butterflies—

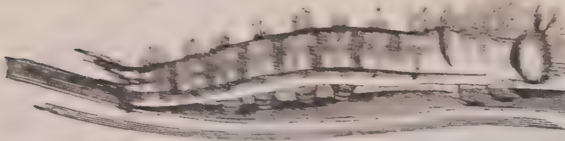


FIG. 71.—Larva of *Amathusia phidippus*.

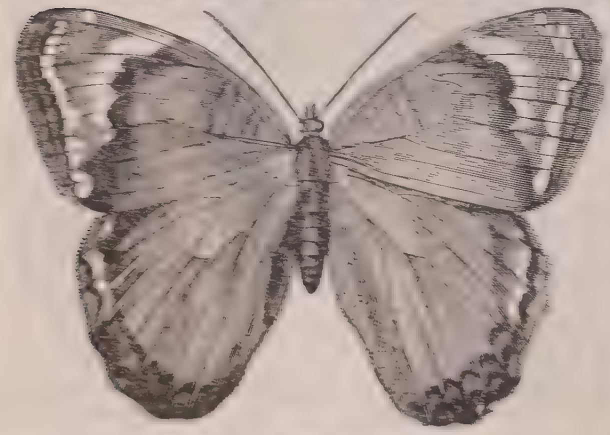


FIG. 72.—*Opsiphanes syme*. Brazil.

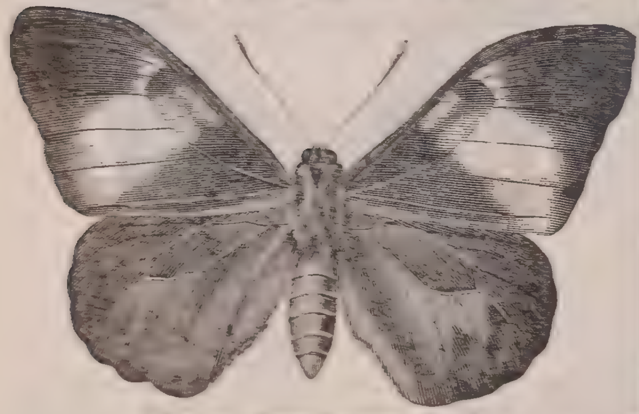
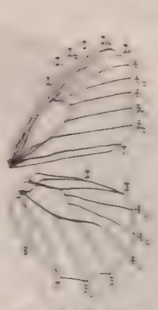


FIG. 73.—*Brassolis sophorae*. Brazil.



[illegible] A. R. Grote. [illegible]

FIG. 74.—Neuration of wings in *Pararge* (a satyrid butterfly).

2. Subcostal.
3. Radial.
4. Median.
5. Cubital.
7, 8 Anal nervures.

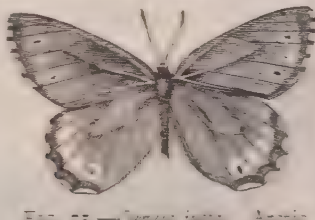


FIG. 75.—*Oeneis jutta*. Arctic Regions.

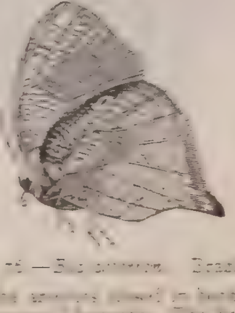


FIG. 76.—[illegible] Brazil.

[illegible] insects (fig. 76) with the [illegible] in both wings, which are ornamented with large "eye-spots" (ocelli). The *Satyrinae*, including our native browns and the Alpine *Erebiae*, resemble the foregoing group in many respects of structure, but the sub-costal nervure is greatly thickened at the base (fig. 74). This sub-family is world-wide in its distribution. One genus (*Oeneis*, fig. 75) is found in high northern latitudes, but reappears in South America. The dark spotted species of *Erebia* are familiar insects to travellers among the Alps; yet butterflies nearly related to these Alpine insects occur in Patagonia, in South Africa and in New Zealand. Such facts of distribution clearly show that though the Nymphalidae have attained a high degree of specialization among the Lepidoptera, some of their genera have a history which goes back to a time when the distribution of land and water on the earth's surface must have been very different from what it is to-day.

BIBLIOGRAPHY.—The handsome Lepidoptera, with their interesting and easily observed life-histories, have naturally attracted many students, and the literature of the order is enormous. M. Malpighi's treatise on the anatomy of the silkworm (*De Bombycibus*, London, 1669) and P. Lyonnet's memoir on the Goat-caterpillar, are among the earliest and most famous of entomological writings. W. F. Kirby's *Handbook to the Order Lepidoptera* (5 vols., London, 1894–1897) should be consulted for references to the older systematic writers such as Linnaeus, J. C. Fabricius, J. Hübner, P. Cramer, E. Doubleday and W. C. Hewitson. Kirby's *Catalogues* are also invaluable for the systematist. For the jaws of the Lepidoptera see F. Darwin, *Quart. Journ. Mic. Sci.* xv. (1875); E. Burgess, *Amer. Nat.* xiv. (1880); A. Walter, *Jen. Zeits. f. Naturw.* xviii. (1885); W. Breitenbach, *Ib.* xv. (1882); V. L. Kellogg, *Amer. Nat.* xxix. (1895). The last-named deals also with wing structure, which is further described by A. Spuler, *Zeits. wiss. Zool.* liii. (1892) and *Zool. Jahrb. Anat.* viii. (1895); A. R. Grote, *Mitt. aus dem Roemer-Museum* (Hildesheim, 1896–1897); G. Enderlein, *Zool. Jahrb. Anat.* xvi. (1903), and many others. For scales see A. G. Mayer, *Bull. Mus. Comp. Zool. Harvard*, xxix. (1896). For internal anatomy W. H. Jackson, *Trans. Linn. Soc. Zool.* (2) v. (1891), and W. Petersen, *Mém. Acad. Imp. Sci. St Pétersbourg* (8) ix. (1900). The early stages and transformations of Lepidoptera are described by J. Gonin, *Bull. Soc. Vaud. Sci. Nat.* xxx. (1894); E. B. Poulton, *Trans. Linn. Soc. Zool.* (2) v. (1891); H. G. Dyar, *Ann. New York Acad. Sci.* viii. (1894); T. A. Chapman, *Trans. Entom. Soc. Lond.* (1893), &c. For habits and life-relations see A. Seitz, *Zool. Jahrb. Syst.* v., vii. (1890, 1894); A. Weismann, *Studies in the Theory of Descent* (London, 1882) and *Entomologist*, xxix. (1896); F. Merrifield, *Trans. Entom. Soc. Lond.* (1890, 1893, 1905); M. Standfuss, *Handbuch der paläarktischen Gross-schmetterlinge* (Jena, 1896); R. Trimen, *Proc. Ent. Soc. Lond.* (1898); E. B. Poulton, *Colours of Animals* (London, 1890); *Trans. Entom. Soc.* (1892 and 1903), and *Journ. Linn. Soc. Zool.* xxvi. (1898); F. E. Beddard, *Animal Coloration* (London, 1892). For distribution see H. J. Elwes, *Proc. Entom. Soc. Lond.* (1894); J. W. Tutt, *Migration and Dispersal of Insects* (London, 1902); Fossil Lepidoptera, S. H. Scudder, *8th Rep. U.S. Geol. Survey* (1889). Among recent general works on the Lepidoptera, most of which contain numerous references to the older literature, may be mentioned A. S. Packard's unfinished work on the Bombycine Moths of N. America, *Mem. Nat. Acad. Sci. Philadelphia*, vii. (1895), and *Mem. Acad. Sci. Washington*, ix. (1905); D. Sharp's chapter in *Cambridge Nat. Hist.* vi. (London, 1898); G. F. Hampson, *Moths of India* (4 vols., London, 1892–1896), and *Catalogue of the Lepidoptera Phalaenae* (1895) and onwards; S. H. Scudder, *Butterflies of New England* (3 vols., Cambridge, Mass., 1888–1889); W. J. Holland, *Butterfly Book* (New York, 1899). Works on the British Lepidoptera are numerous, for example, those of H. T. Stainton (1851), C. G. Barrett (1893–1907), E. Meyrick (1895), and J. W. Tutt (1899 and onwards). For recent general systematic works, the student should consult the catalogues mentioned above and the *Zoological Record*. The writings of O. Staudinger, E. Schatz, C. Oberthür, K. Jordan, C. Aurivillius and P. Mabille may be specially mentioned.

(G. H. C.)

LEPIDUS, the name of a Roman patrician family in the Aemilian gens.

1. MARCUS AEMILIUS LEPIDUS, one of the three ambassadors sent to Egypt in 201 B.C. as guardians of the infant king Ptolemy V. He was consul in 187 and 175, censor 179, *pontifex maximus* from 180 onwards, and was six times chosen by the censors *princeps senatus*. He died in 152. He distinguished himself in the war with Antiochus III. of Syria, and against the Ligurians. He made the Via Aemilia from Ariminum to Placentia, and led colonies to Mutina and Parma.

Livy xl. 42-46, *epit.* 48; Polybius xvi. 34.

2. MARCUS AEMILIUS LEPIDUS, surnamed PORCINA (probably from his personal appearance), consul 137 B.C. Being sent to Spain to conduct the Numantine war, he began against the will of the senate to attack the Vaccaei. This enterprise was so unsuccessful that he was deprived of his command in 136 and condemned to pay a fine. He was among the greatest of the earlier Roman orators, and Cicero praises him for having

introduced the well-constructed sentence and even flow of language from Greek into Roman oratory.

Cicero, *Brutus*, 25, 27, 86, 97; Vell. Pat. ii. 10; Appian, *Hisp.* 80-83; Livy, *epit.* 56.

3. Marcus Aemilius Lepidus, father of the triumvir. In 81 B.C. he was praetor of Sicily, where he made himself detested by oppression and extortion. In the civil wars he sided with Sulla and bought much of the confiscated property of the Marian partisans. Afterwards he became leader of the popular party, and with the help of Pompey was elected consul for 78, in spite of the opposition of Sulla. When the dictator died, Lepidus tried in vain to prevent the burial of his body in the Campus Martius, and to alter the constitution established by him. His colleague Lutatius Catulus found a tribune to place his veto on Lepidus's proposals; and the quarrel between the two parties in the state became so acute that the senate made the consuls swear not to take up arms. Lepidus was then ordered by the senate to go to his province, Transalpine Gaul; but he stopped in Etruria on his way from the city and began to levy an army. He was declared a public enemy early in 77, and forthwith marched against Rome. A battle took place in the Campus Martius, Pompey and Catulus commanding the senatorial army, and Lepidus was defeated. He sailed to Sardinia, in order to put himself into connexion with Sertorius in Spain, but here also suffered a repulse, and died shortly afterwards.

Plutarch, *Sulla*, 34, 38, *Pompey*, 15; Appian, *B.C.* i. 105, 107; Livy, *epit.* 90; Florus iii. 23; Cicero, *Balbus*, 15.

4. Marcus Aemilius Lepidus, the triumvir. He joined the party of Julius Caesar in the civil wars, and was by the dictator thrice nominated *magister equitum* and raised to the consulship in 46 B.C. He was a man of great wealth and influence, and it was probably more on this ground than on account of his ability that Caesar raised him to such honours. In the beginning of 44 B.C he was sent to Gallia Narbonensis, but before he had left the city with his army Caesar was murdered. Lepidus, as commander of the only army near Rome, became a man of great importance in the troubles which followed. Taking part with Marcus Antonius (Mark Antony), he joined in the reconciliation which the latter effected with the senatorial party, and afterwards sided with him when open war broke out. Antony, after his defeat at Mutina, joined Lepidus in Gaul, and in August 43 Octavian (afterwards the emperor Augustus), who had forced the senate to make him consul, effected an arrangement with Antony and Lepidus, and their triumvirate was organized at Bononia. Antony and Octavian soon reduced Lepidus to an inferior position. His province of Gaul and Spain was taken from him; and, though he was included in the triumvirate when it was renewed in 37, his power was only nominal. He made an effort in the following year to regain some reality of power, conquered part of Sicily, and claimed the whole island as his province, but Octavian found means to sap the fidelity of his soldiers, and he was obliged to supplicate for his life. He was allowed to retain his fortune and the office of *pontifex maximus* to which he had been appointed in 44, but had to retire into private life. According to Suetonius (*Augustus*, 16) he died at Circeii in the year 13.

See Rome: *History* ii., "The Republic," Period C, *ad fin.*; Appian, *Bell. Civ.* ii.-v.; Dio Cassius xli.-xlix.; Vell. Pat. ii. 64, 80; Orelli's *Onomasticon* to Cicero.

LE PLAY, PIERRE GUILLAUME FRÉDÉRIC (1806–1882), French engineer and economist, was born at La Rivière-Saint-Sauveur (Calvados) on the 11th of April 1806, the son of a custom-house official. He was educated at the École Polytechnique, and from there passed into the State Department of Mines. In 1834 he was appointed head of the permanent committee of mining statistics, and in 1840 engineer-in-chief and professor of metallurgy at the school of mines, where he became inspector in 1848. For nearly a quarter of a century Le Play spent his vacations travelling in the various countries of Europe, and collected a vast quantity of material bearing upon the social condition of the working classes. In 1855 he published *Les Ouvriers européens*, which comprised a series of thirty-six monographs on the budgets of typical families selected from the most diverse industries. The Académie des Sciences conferred on him the Montyon prize. Napoleon III., who held him in high esteem, entrusted him with the organization of the Exhibition of 1855, and appointed him counsellor of state, commissioner general of the Exhibition of 1867, senator of the empire and grand officer of the Legion of Honour. He died in Paris on the 5th of April 1882.

In 1856 Le Play founded the *Société internationale des études pratiques d'Économie sociale*, which has devoted its energies principally to forwarding social studies on the lines laid down by its founder. The journal of the society, *La Réforme sociale*, founded in 1881, is published fortnightly. Other works of Le Play are *La Réforme sociale* (2 vols., 1864; 7th ed., 3 vols., 1887); *L'Organisation de la famille* (1871); *La Constitution de l'Angleterre* (in collaboration with M. Delaire, 1875). See article in *Harvard Quarterly Journal of Economics* (June 1890), by H. Higgs.

LEPROSY (*Lepra Arabum, Elephantiasis Graecorum, Aussatz, Spedalskhed*), the greatest disease of medieval Christendom, identified, on the one hand, with a disease endemic from the earliest historical times (1500 B.C.) in the delta and valley of the Nile, and, on the other hand, with a disease now common in Asia, Africa, South America, the West Indies, and certain isolated localities of Europe. An authentic representation of the leprosy of the middle ages exists in a picture at Munich by Holbein, painted at Augsburg in 1516; St Elizabeth gives bread and wine to a prostrate group of lepers, including a bearded man whose face is covered with large round reddish knobs, an old woman whose arm is covered with brown blotches, the leg swathed in bandages through which matter oozes, the bare knee also marked with discoloured spots, and on the head a white rag or plaster, and, thirdly, a young man whose neck and face (especially round the somewhat hairless eyebrows) are spotted with brown patches of various size. It is conjectured by Virchow that the painter had made studies of lepers from the leper-houses then existing at Augsburg. These external characters of medieval leprosy agree with the descriptions of it by the ancients, and with the pictures of modern leprosy given by Danielssen and Boeck for Norway, by various authors for sporadic European cases, by Anderson for Malacca, by Carter for India, by Wolff for Madeira and by Hillis for British Guiana. There has been some confusion in the technical naming of the disease; it is called *Elephantiasis* (*Leontiasis, Satyriasis*) by the Greek writers, and *Lepra* by the Arabians.

Leprosy is now included among the parasitic diseases (see Parasitic Diseases). The cause is believed to be infection by the bacillus leprae, a specific microbe discovered by Armauer Hansen in 1871. It is worthy of note that tuberculosis is very common among lepers, and especially attacks the serous membranes. The essential character of leprosy is a great multiplication of cells, resembling the "granulation cells" of lupus and syphilis, in the tissues affected, which become infiltrated and thickened, with degeneration and destruction of their normal elements. The new cells vary in size from ordinary leucocytes to giant cells three or four times larger. The bacilli are found in these cells, sometimes in small numbers, sometimes in masses. The structures most affected are the skin, nerves, mucous membranes and lymphatic glands.

The symptoms arise from the anatomical changes indicated, and they vary according to the parts attacked. Three types of disease are usually described—(1) nodular, (2) smooth or anaesthetic, (3) mixed. In the first the skin is chiefly affected, in the second the nerves; the third combines the features of both. It should be understood that this classification is purely a matter of convenience, and is based on the relative prominence of symptoms, which may be combined in all degrees. The incubation period of leprosy—assuming it to be due to infection—is unknown, but cases are on record which can only be explained on the hypothesis that it may be many years. The invasion is usually slow and intermittent. There are occasional feverish attacks, with the usual constitutional disturbance and other slight premonitory signs, such as changes in the colour of the skin and in its sensibility. Sometimes, but rarely, the onset is acute and the characteristic symptoms develop rapidly. These begin with an eruption which differs markedly according to the type of disease. In the nodular form dark red or coppery patches appear on the face, backs of the hands, and feet or on the body; they are generally symmetrical, and vary from the size of a shilling upwards. They come with one of the feverish attacks and fade away when it has gone, but only to return. After a time infiltration and thickening of the skin become noticeable, and the nodules appear. They are lumpy excrescences, at first pink but changing to brown. Thickening of the skin of the face produces a highly characteristic appearance, recalling the aspect of a lion. The tissues of the eye undergo degenerative changes; the mucous membrane of the nose and throat is thickened, impairing the breathing and the voice; the eyebrows fall off; the ears and nose become thickened and enlarged. As the disease progresses the nodules tend to break down and ulcerate, leaving open sores. The patient, whose condition is extremely wretched, gradually becomes weaker, and eventually succumbs to exhaustion or is carried off by some intercurrent disease, usually inflammation of the kidneys or tuberculosis. A severe case may end fatally in two years, but, as a rule, when patients are well cared for the illness lasts several years. There is often temporary improvement, but complete recovery from this form of leprosy rarely or never occurs. The smooth type is less severe and more chronic. The eruption consists of patches of dry, slightly discoloured skin, not elevated above the surface. These patches are the result of morbid changes affecting the cutaneous nerves, and are accompanied by diminished sensibility over the areas of skin affected. At the same time certain nerve trunks in the arm and leg, and particularly the ulnar nerve, are found to be thickened. In the further stages the symptoms are those of increasing degeneration of the nerves. Bullae form on the skin, and the discoloured patches become enlarged; sensation is lost, muscular power diminished, with wasting, contraction of tendons, and all the signs of impaired nutrition. The nails become hard and clawed; perforating ulcers of the feet are common; portions of the extremities, including whole fingers and toes, die and drop off. Later, paralysis becomes more marked, affecting the muscles of the face and limbs. The disease runs a very chronic course, and may last twenty or thirty years. Recovery occasionally occurs. In the mixed form, which is probably the most common, the symptoms described are combined in varying degrees. Leprosy may be mistaken for syphilis, tuberculosis, ainhum (an obscure disease affecting negroes, in which the little toe drops off), and several affections of the skin. Diagnosis is established by the presence of the bacillus leprae in the nodules or bullae, and by the signs of nerve degeneration exhibited in the anaesthetic patches of skin and the thickened nerve trunks.

In former times leprosy was often confounded with other skin diseases, especially psoriasis and leucoderma; the white leprosy of the Old Testament was probably a form of the latter. But there is no doubt that true leprosy has existed from time immemorial. Prescriptions for treating it have been found in Egypt, to which a date of about 4600 B.C. is assigned. The disease is described by Aristotle and by later Greek writers, but not by Hippocrates, though leprosy derives its name from his "lepra" or "scaly" disease, which was no doubt psoriasis. In ancient times it was widely prevalent throughout Asia as well as in Egypt, and among the Greeks and Romans. In the middle ages it became extensively diffused in Europe, and in some countries—France, England, Germany and Spain—every considerable town had its leper-house, in which the patients were segregated. The total number of such houses has been reckoned at 19,000. The earliest one in England was established at Canterbury in 1096, and the latest at Highgate in 1472. At one time there were at least 95 religious hospitals for lepers in Great Britain and 14 in Ireland (Sir James Simpson). During the 15th century the disease underwent a remarkable diminution. It practically disappeared in the civilized parts of Europe, and the leper-houses were given up. It is a singular fact that this diminution was coincident with the great extension of syphilis (see PROSTITUTION). The general disappearance of leprosy at this time is the more unintelligible because it did not take effect everywhere. In Scotland the disease lingered until the 19th century, and in some other parts it has never died out at all. At the present time it still exists in Norway, Iceland, along the shores of the Baltic, in South Russia, Greece, Turkey, several Mediterranean islands, the Riviera, Spain and Portugal. Isolated cases occasionally occur elsewhere, but they are usually imported. The Teutonic races seem to be especially free from the taint. Leper asylums are maintained in Norway and at two or three places in the Baltic, San Remo, Cyprus, Constantinople, Alicante and Lisbon. Except in Spain, where some increase has taken place, the disease is dying out. The number of lepers in Norway was 3000 in 1856, but has now dwindled to a few hundreds. They are no longer numerous in any part of Europe. On the other hand, leprosy prevails extensively throughout Asia, from the Mediterranean to Japan, and from Arabia to Siberia. It is also found in nearly all parts of Africa, particularly on the east and west coasts near the equator. In South Africa it has greatly increased, and attacks the Dutch as well as natives. Leper asylums have been established at Robben Island near Cape Town, and in Tembuland. In Australia, where it was introduced by Chinese, it has also spread to Europeans. In New Zealand the Maoris are affected; but the amount of leprosy is not large in either country. A much more remarkable case is that of the Hawaiian Islands, where the disease is believed to have been imported by Chinese. It was unknown before 1848, but in 1866 the number of lepers had risen to 230 and in 1882 to 4000 (Liveing). All attempts to stop it by segregating lepers in the settlement of Molokai appear to have been fruitless. In the West Indies and on the American continent, again, leprosy has a wide distribution. It is found in nearly all parts of South and Central America, and in certain parts of North America—namely, Louisiana, California (among Chinese), Minnesota, Wisconsin and North and South Dakota (Norwegians), New Brunswick (French Canadians).

It is difficult to find any explanation of the geographical distribution and behaviour of leprosy. It seems to affect islands and the sea-coast more than the interior, and to some extent this gives colour to the old belief that it is caused or fostered by a fish diet, which has been revived by Mr Jonathan Hutchinson, but is not generally accepted. Leprosy is found in interiors where fish is not an article of diet. Climate, again, has obviously little, if any, influence. The theory of heredity is equally at fault, whether it be applied to account for the spread of the disease by transmission or for its disappearance by the elimination of susceptible persons. The latter is the manner in which heredity might be expected to act, if at all, for lepers are remarkably sterile. But we see the disease persisting among the Eastern races, who have been continuously exposed to its selective influence from the earliest times, while it has disappeared among the Europeans, who were affected very much later. The opposite theory of hereditary transmission from parents to offspring is also at variance with many observed facts. Leprosy is very rarely congenital, and no cases have occurred among the descendants to the third generation of 160 Norwegian lepers settled in the United States. Again, if hereditary transmission were an effective influence, the disease could hardly have died down so rapidly as it did in Europe in the 15th century. Then we have the theory of contagion. There is no doubt that human beings are inoculable with leprosy, and that the disease may be communicated by close contact. Cases have been recorded which prove it conclusively; for instance, that of a man who had never been out of the British islands, but developed leprosy after sharing for a time the bed and clothes of his brother, who had contracted the disease in the West Indies. Some of the facts noted, such as the extensive dissemination of the disease in Europe during the middle ages, and its subsequent rapid decline, suggest the existence of some unknown epidemic factor. Poverty and insanitation are said to go with the prevalence of leprosy, but they go with every malady, and there is nothing to show that they have any special influence. Vaccination has been blamed for spreading it, and a few cases of communication by arm-to-arm inoculation are recorded. The influence of this factor, however, can only be trifling. Vaccination is a new thing, leprosy a very old one; where there is most vaccination there is no leprosy, and where there is most leprosy there is little or no vaccination. In India 78% of the lepers are unvaccinated, and in Canton since vaccination was introduced leprosy has declined (Cantlie). On the whole we must conclude that there is still much to be learnt about the conditions which govern the prevalence of leprosy.

With regard to prevention, the isolation of patients is obviously desirable, especially in the later stages, when open sores may disseminate the bacilli; but complete segregation, which has been urged, is regarded as impracticable by those who have had most experience in leprous districts. Scrupulous cleanliness should be exercised by persons attending on lepers or brought into close contact with them. In treatment the most essential thing is general care of the health, with good food and clothing. The tendency of modern therapeutics to attach increasing importance to nutrition in various morbid states, and notably in diseases of degeneration, such as tuberculosis and affections of the nervous system, is borne out by experience in leprosy, which has affinities to both; and this suggests the application to it of modern methods for improving local as well as general nutrition by physical means. A large number of internal remedies have been tried with varying results; those most recommended are chaulmoogra oil, arsenic, salicylate of soda, salol and chlorate of potash. Vergueira uses Collargol intravenously and subcutaneously, and states that in all the cases treated there was marked improvement, and hair that had been lost grew again. Calmette's Anterenene injected subcutaneously has been followed by good results. Deycke together with R. Bey isolated from a non-ulcerated leprous nodule a streptothrix which they call S. leproides. Its relation to the bacillus is uncertain. They found that injections of this organism had marked curative effects, due to a neutral fat which they named "Nastin." Injections of Nastin together with Benzoyl Chloride directly act on the lepra bacilli. Some cases were unaffected by this treatment, but with others the effect was marvellous. Dr W. A. Pusey of Chicago uses applications of carbon dioxide snow with good effect. In the later stages of the disease there is a wide field for surgery, which is able to give much relief to sufferers.

Literature.—For history and geographical distribution, see Hirsch, *Handbuch der historisch-geographischen Pathologie* (1st ed., Erlangen, 1860, with exhaustive literature). For pathology, Virchow, *Die krankhaften Geschwülste* (Berlin, 1863–1867), vol. ii. For clinical histories, R. Liveing, *Elephantiasis Graecorum or True Leprosy* (London, 1873), ch. iv. For medieval leprosy—in Germany, Virchow, in *Virchow's Archiv*, five articles, vols. xviii.-xx. (1860–1861); in the Netherlands, Israëls, in *Nederl. Tijdschr. voor Geneeskunde*, vol. i. (1857); in Britain, J. Y. Simpson, *Edin. Med. and Surg. Journ.*, three articles, vols. lxvi. and lxvii. (1846–1847). Treatises on modern leprosy in particular localities: Danielssen and Boeck (Norway), *Traité de la Spédalskhed*, with atlas of twenty-four coloured plates (Paris, 1848); A. F. Anderson, *Leprosy as met with in the Straits Settlements*, coloured photographs with explanatory notes (London, 1872); H. Vandyke Carter (Bombay), *On Leprosy and Elephantiasis*, with coloured plates (London, 1874); Hillis, *Leprosy in British Guiana*, an account of West Indian leprosy, with twenty-two coloured plates (London, 1882). See also the dermatological works of Hebra, Erasmus Wilson, Bazin and Jonathan Hutchinson (also the latter's letters to *The Times* of the 11th of April and the 25th of May 1903); *British Medical Journal* (April 1, 1908); *American Journal of Dermatology* (Dec. 1907); *The Practitioner* (February 1910). An important early work is that of P. G. Hensler, *Vom abendländischen Aussatze im Mittelalter* (Hamburg, 1790).

LEPSIUS, KARL RICHARD (1810–1884), German Egyptologist, was born at Naumburg-am-Saale on the 23rd of December 1810, and in 1823 was sent to the "Schulpforta" school near Naumburg, where he came under the influence of Professor Lange. In 1829 he entered the university of Leipzig, and one year later that of Göttingen, where, under the influence of Otfried Müller, he finally decided to devote himself to the archaeological side of philology. From Göttingen he proceeded to Berlin, where he graduated in 1833 as doctor with the thesis *De tabulis Eugubinis*. In the same year he proceeded to study in Paris, and was commissioned by the duc de Luynes to collect material from the Greek and Latin writers for his work on the weapons of the ancients. In 1834 he took the Volney prize with his *Paläographie als Mittel der Sprachforschung*. Befriended by Bunsen and Humboldt, Lepsius threw himself with great ardour into Egyptological studies, which, since the death of Champollion in 1832, had attracted no scholar of eminence and weight. Here Lepsius found an ample field for his powers. After four years spent in visiting the Egyptian collections of Italy, Holland and England, he returned to Germany, where Humboldt and Bunsen united their influence to make his projected visit to Egypt a scientific expedition with royal support. For three years Lepsius and his party explored the whole of the region in which monuments of ancient Egyptian and Ethiopian occupation are found, from the Sudan above Khartum to the Syrian coast. At the end of 1845 they returned home, and the results of the expedition, consisting of casts, drawings and squeezes of inscriptions and scenes, maps and plans collected with the utmost thoroughness, as well as antiquities and papyri, far surpassed expectations. In 1846 he married Elisabeth Klein, and his appointment to a professorship in Berlin University in the following August afforded him the leisure necessary for the completion of his work. In 1859 the twelve volumes of his vast *Denkmäler aus Ägypten und Äthiopien* were finished, supplemented later by a *text* prepared from the note-books of the expedition; they comprise its entire archaeological, palaeographical and historical results. In 1866 Lepsius again went to Egypt, and discovered the famous Decree of Tanis or Table of Canopus, an inscription of the same character as the Rosetta Stone, in hieroglyphic, demotic and Greek. In 1873 he was appointed keeper of the Royal Library, Berlin, which, like the Berlin Museum, owes much to his care. About ten years later he was appointed Geheimer Oberregierungsrath. He died at Berlin on the 10th of July 1884. Besides the colossal *Denkmäler* and other publications of texts such as the *Todtenbuch der Ägypter* (*Book of the Dead*, 1842) his other works, amongst which may be specially named his *Königsbuch der Ägypter* (1858) and *Chronologie der Ägypter* (1849), are characterized by a quality of permanence that is very remarkable in a subject of such rapid development as Egyptology. In spite of his scientific training in philology Lepsius left behind few translations of inscriptions or discussions of the meanings of words: by preference he attacked historical and archaeological problems connected with the ancient texts, the alphabet, the metrology, the names of metals and minerals, the chronology, the royal names. On the other hand one of his latest works, the *Nubische Grammatik* (1880), is an elaborate grammar of the then little-known Nubian language, preceded by a linguistic sketch of the African continent. Throughout his life he profited by the gift of attaching to himself the right men, whether as patrons or, like Weidenbach and Stern, as assistants. Lepsius was a fine specimen of the best type of German scholar.

See *Richard Lepsius*, by Georg Ebers (New York, 1887), and art. Egypt, section *Exploration and Research*.

LEPTINES, an Athenian orator, known as the proposer of a law that no Athenian, whether citizen or resident alien (with the sole exception of the descendants of Harmodius and Aristogeiton), should be exempt from the public charges (λειτουργίαι) for the state festivals. The object was to provide funds for the festivals and public spectacles at a time when both the treasury and the citizens generally were short of money. It was further asserted that many of the recipients of immunity were really unworthy of it. Against this law Demosthenes delivered (354 B.C.) his well-known speech *Against Leptines* in support of the proposal of Ctesippus that all the cases of immunity should be carefully investigated. Great stress is laid on the reputation for ingratitude and breach of faith which the abolition of immunities would bring upon the state. Besides, the law itself had been passed unconstitutionally, for an existing law confirmed these privileges, and by the constitution of Solon no law could be enacted until any existing law which it contravened had been repealed. The law was probably condemned. Nothing further is known of Leptines.

See the edition of the speech by J. E. Sandys (1890).

LEPTIS, the name of two towns in ancient Africa. The first, Leptis Magna (Λεπτίμαγνα), the modern Lebda, was in Tripolitana between Tripolis and Mesrata at the mouth of the Cinyps; the second, Leptis Parva (Λέπτις ἡ μικρά), known also as Leptiminus or Leptis minor, the modern Lamta, was a small harbour of Byzacena between Ruspina (Monastir) and Thapsus (Dimas).

1. Leptis Magna was one of the oldest and most flourishing of the Phoenician emporia established on the coasts of the greater Syrtis, the chief commercial entrepot for the interior of the African continent. It was founded by the Sidonians (Sallust, *Jug.* 78) who were joined later by people of Tyre (Pliny, *Hist. Nat.* v. 17). Herodotus enlarges on the fertility of its territory (iv. 175, v. 42). It was tributary to Carthage to which it paid a contribution of a talent a day (Livy xxxiv. 62). After the Second Punic War Massinissa made himself master of it (Sallust, *Jug.* 78; Livy xxxiv. 62; Appian viii. 106). During the Jugurthine War it appealed for protection to Rome (Sallust, *Jug.* 78). Though captured and plundered by Juba, it maintained its allegiance to Rome, supported the senatorial cause, received Cato the younger with the remains of the Pompeian forces after Pharsalus 48 B.C. After his victory Julius Caesar imposed upon it an annual contribution of 300,000 measures of oil. Nevertheless, it preserved its position as a free city governed by its own magistrates (*C.I.L.* viii. 7). It received the title of *municipium* (*C.I.L.* viii. 8), and was subsequently made a *colonia* by Trajan (*C.I.L.* viii. 10). Septimius Severus, who was born there, beautified the place and conferred upon it the *Ius Italicum*. Leptis Magna was the limit of the Roman state, the last station of the *limes Tripolitanus*; hence, especially during the last centuries of the Empire, it suffered much from the Nomads of the desert, the Garamantes, the Austuriani and the Levathae (Ammian. Marc. xxviii. 6; Procop. *De Aedif.* vi. 4). Its commerce declined and its harbour silted up. Justinian made a vain attempt to rebuild it (Procop. *ibid.*; Ch. Diehl, *L'Afrique byzantine*, p. 388). It was the seat of a bishopric, but no mention is made of its bishops after 462.

Leptis Magna had a citadel which protected the commercial city which was generally called Neapolis, the situation of which may be compared with that of Carthage at the foot of Byrsa. Its ruins are still imposing; remains of ramparts and docks, a theatre, a circus and various buildings of the Roman period still exist. Inscriptions show that the current pronunciation of the name was Lepcis, Lepcitana, instead of Leptis, Leptitana (Tissot, *Géogr. comp. de la prov. d'Afrique*, ii. 219; Clermont-Ganneau, *Recueil d'archéologie orientale*, vi. 41; *Comptes rendus de l'Acad. des Inscr. et B.-Lettres*, 1903, p. 333; Cagnat, *C.R. Acad.*, 1905, p. 531). The coins of Leptis Magna, like the majority of the emporia in the neighbourhood, present a series from the Punic period. They are of bronze with the legend לפקי (*Lepqi*). They have on one side the head of Bacchus, Hercules or Cybele, and on the other various emblems of these deities. From the Roman period we have also coins bearing the heads of Augustus, Livia and Tiberius, which still have the name of the town in Neo-Punic script (Lud. Müller, *Numism. de l'anc. Afrique*, ii. 3).

The ruins of Leptis Magna have been visited by numerous travellers since the time of Frederick William and Henry William Beechey (*Travels*, pp. 51 and 74) and Heinrich Barth (*Wanderungen*, pp. 306, 360); they are described by Ch. Tissot (*Géogr. comp.* ii. 219 et seq.); Cl. Perroud, *De Syrticis emporiis*, p. 33 (Paris, 1881, in 8°); see also a description in the New York journal, *The Nation* (1877), vol. xxvii. No. 683. M. Méhier de Mathuisieulx explored the site afresh in 1901; his account is inserted in the *Nouvelles Archives des missions*, x. 245-277; cf. vol. xii. See also J. Toutain, "Le Limes Tripolitanus en Tripolitaine," in the *Bulletin archéologique du comité des travaux historiques* (1905).

2. Leptis Parva (Lamta), 7½ m. from Monastir, which is often confused by modern writers with Leptis Magna in their interpretations of ancient texts (Tissot, *Géogr. comp.* ii. 169), was, according to the *Tabula Peutingeriana*, 18 m. south of Hadrumetum. Evidently Phoenician in origin like Leptis Magna, it was in the Punic period of comparatively slight importance. Nevertheless, it had fortifications, and the French engineer, A. Daux, has discovered a probable line of ramparts Like its neighbour Hadrumetum, Leptis Parva declared for Rome after the last Punic War. Also after the fall of Carthage in 146 it preserved its autonomy and was declared a *civitas libera et immunis* (Appian, *Punica*, 94; *C.I.L.* i. 200; *De bell. Afric.* c. xii.). Julius Caesar made it the base of his operations before the battle of Thapsus in 46 (Ch. Tissot, *Géogr. comp.* ii. 728). Under the Empire Leptis Parva became extremely prosperous; its bishops appeared in the African councils from 258 onwards. In Justinian's reorganization of Africa we find that Leptis Parva was with Capsa one of the two residences of the *Dux Byzacenae* (Tissot, *op. cit.* p. 171). The town had coins under Augustus and Tiberius. On the obverse is the imperial effigy with a Latin legend, and on the reverse the Greek legend ΛΕΠΤΙΣ with the bust of Mercury (Lud. Müller, *Numism. de l'anc. Afrique*, ii. 49). The ruins extend along the sea-coast to the north-west of Lemta; the remains of docks, the amphitheatre and the acropolis can be distinguished; a Christian cemetery has furnished tombs adorned with curious mosaics.

See *Comptes rendus de l'Acad. des Inscrip. et B.-Lettres* (1883), p. 189; Cagnat and Saladin, "Notes d'archéol. tunisiennes," in the *Bulletin monumental* of 1884; *Archives des missions*, xii. 111; Cagnat, *Explorations archéol. en Tunisie*, 3me fasc. pp. 9-16, and *Tour du monde* (1881), i. 292; Saladin, *Rapport sur une mission en Tunisie* (1886), pp. 9-20; *Bulletin archéol. du comité de travaux historiques* (1895), pp. 69-71 (inscriptions of Lamta); *Bulletin de la Soc. archéol. de Sousse* (1905; plan of the ruins of Lamta). (E. B.*)

LE PUY, or Le Puy en Velay, a town of south-eastern France, capital of the department of Haute-Loire, 90 m. S.W. of Lyons on the Paris-Lyon railway. Pop. (1906) town, 17,291; commune, 21,420. Le Puy rises in the form of an amphitheatre from a height of 2050 ft. above sea-level upon Mont Anis, a hill that divides the left bank of the Dolézon from the right bank of the Borne (a rapid stream joining the Loire 3 m. below). From the new town, which lies east and west in the valley of the Dolézon, the traveller ascends the old feudal and ecclesiastical town through narrow steep streets, paved with pebbles of lava, to the cathedral commanded by the fantastic pinnacle of Mont Corneille. Mont Corneille, which is 433 ft. above the Place de Breuil (in the lower town), is a steep rock of volcanic breccia, surmounted by an iron statue of the Virgin (53 ft. high) cast, after a model by Bonassieux, out of guns taken at Sebastopol. Another statue, that of Msgr de Morlhon, bishop of Le Puy, also sculptured by Bonassieux, faces that of the Virgin. From the platform of Mont Corneille a magnificent panoramic view is obtained of the town and of the volcanic mountains, which make this region one of the most interesting parts of France.

The Romanesque cathedral (Notre-Dame), dating chiefly from the first half of the 12th century, has a particoloured façade of white sandstone and black volcanic breccia, which is reached by a flight of sixty steps, and consists of three tiers, the lowest composed of three high arcades opening into the porch, which extends beneath the first bays of the nave; above are three windows lighting the nave; and these in turn are surmounted by three gables, two of which, those to the right and the left, are of open work. The staircase continues within the porch, where it divides, leading on the left to the cloister, on the right into the church. The doorway of the south transept is sheltered by a fine Romanesque porch. The isolated bell-tower (184 ft.), which rises behind the choir in seven storeys, is one of the most beautiful examples of the Romanesque transition period. The bays of the nave are covered in by octagonal cupolas, the central cupola forming a lantern. The choir and transepts are barrel-vaulted. Much veneration is paid to a small image of the Virgin on the high altar, a modern copy of the medieval image destroyed at the Revolution. The cloister, to the north of the choir, is striking, owing to its variously-coloured materials and elegant shafts. Viollet-le-Duc considered one of its galleries to belong to the oldest known type of cathedral cloister (8th or 9th century). Connected with the cloister are remains of fortifications of the 13th century, by which it was separated from the rest of the city. Near the cathedral the baptistery of St John (11th century), built on the foundations of a Roman building, is surrounded by walls and numerous remains of the period, partly uncovered by excavations. The church of St Lawrence (14th century) contains the tomb and statue of Bertrand du Guesclin, whose ashes were afterwards carried to St Denis.

Le Puy possesses fragmentary remains of its old line of fortifications, among them a machicolated tower, which has been restored, and a few curious old houses dating from the 12th to the 17th century. In front of the hospital there is a fine medieval porch under which a street passes. Of the modern monuments the statue of Marie Joseph Paul, marquis of La Fayette, and a fountain in the Place de Breuil, executed in marble, bronze and syenite, may be specially mentioned. The museum, named after Charles Crozatier, a native sculptor and metal-worker to whose munificence it principally owes its existence, contains antiquities, engravings a collection of lace, and ethnographical and natural history collections. Among the curiosities of Le Puy should be noted the church of St Michel d'Aiguilhe, beside the gate of the town, perched on an isolated rock like Mont Corneille, the top of which is reached by a staircase of 271 steps. The church dates from the end of the 10th century and its chancel is still older. The steeple is of the same type as that of the cathedral. Three miles from Le Puy are the ruins of the Château de Polignac, one of the most important feudal strongholds of France.

Le Puy is the seat of a bishopric, a prefect and a court of assizes, and has tribunals of first instance and of commerce, a board of trade arbitration, a chamber of commerce, and a branch of the Bank of France. Its educational institutions include ecclesiastical seminaries, lycées and training colleges for both sexes and municipal industrial schools of drawing, architecture and mathematics applied to arts and industries. The principal manufacture is that of lace and guipure (in woollen, linen, cotton, silk and gold and silver threads), and distilling, leather-dressing, malting and the manufacture of chocolate and cloth are carried on. Cattle, woollens, grain and vegetables are the chief articles of trade.

It is not known whether Le Puy existed previously to the Roman invasion. Towards the end of the 4th or beginning of the 5th century it became the capital of the country of the Vellavi, at which period the bishopric, originally at Revession, now St Paulien, was transferred hither. Gregory of Tours speaks of it by the name of Anicium, because a chapel "ad Deum" had been built on the mountain, whence the name of Mont Adidon or Anis, which it still retains. In the 10th century it was called Podium Sanctae Mariae, whence Le Puy. In the middle ages there was a double enclosure, one for the cloister, the other for the town. The sanctuary of Nôtre Dame was much frequented by pilgrims, and the city grew famous and populous. Rivalries between the bishops who held directly of the see of Rome and had the right of coining money, and the lords of Polignac, revolts of the town against the royal authority, and the encroachments of the feudal superiors on municipal prerogatives often disturbed the quiet of the town. The Saracens in the 8th century, the Routiers in the 12th, the English in the 14th, the Burgundians in the 15th, successively ravaged the neighbourhood. Le Puy sent the flower of its chivalry to the Crusades in 1096, and Raymond d'Aiguille, called d'Agiles, one of its sons, was their historian. Many councils and various assemblies of the states of Languedoc met within its walls; popes and sovereigns, among the latter Charlemagne and Francis I., visited its sanctuary. Pestilence and the religious wars put an end to its prosperity. Long occupied by the Leaguers, it did not submit to Henry IV. until many years after his accession.

LERDO DE TEJADA, SEBASTIAN (1825–1889), president of Mexico, was born at Jalapa on the 25th of April 1825. He was educated as a lawyer and became a member of the supreme court. He became known as a liberal leader and a supporter of President Juarez. He was minister of foreign affairs for three months in 1857, and became president of the Chamber of Deputies in 1861. During the French intervention and the reign of the emperor Maximilian he continued loyal to the patriotic party, and had an active share in conducting the national resistance. He was minister of foreign affairs to President Juarez, and he showed an implacable resolution in carrying out the execution of Maximilian at Querétaro. When Juarez died in 1872 Lerdo succeeded him in office in the midst of a confused civil war. He achieved some success in pacifying the country and began the construction of railways. He was re-elected on the 24th of July 1876, but was expelled in January of the following year by Porfirio Diaz. He had made himself unpopular by the means he took to secure his re-election and by his disposition to limit state rights in favour of a strongly centralized government. He fled to the United States and died in obscurity at New York in 1889.

See H. H. Bancroft, *Pacific States*, vol. 9 (San Francisco, 1882–1890).

LERICI, a village of Liguria, Italy, situated on the N.E. side of the Gulf of Spezia, about 12 m. E.S.E. of Spezia, and 4 m. W.S.W. of Sarzana by road, 17 ft. above sea-level. Pop. (1901) 9326. Its small harbour is guarded by an old castle, said to have been built by Tancred; in the middle ages it was the chief place on the gulf. S. Terenzo, a hamlet belonging to Lerici, was the residence of Shelley during his last days. Farther north-west is the Bay of Pertusola, with its large lead-smelting works.

LÉRIDA, a province of northern Spain, formed in 1833 of districts previously included in the ancient province of Catalonia, and bounded on the N. by France and Andorra, E. by Gerona and Barcelona, S. by Tarragona and W. by Saragossa and Huesca. Pop. (1900) 274,590; area 4690 sq. m. The northern half of Lérida belongs entirely to the Mediterranean or eastern section of the Pyrenees, and comprises some of the finest scenery in the whole chain, including the valleys of Aran and La Cerdaña, and large tracts of forest. It is watered by many rivers, the largest of which is the Segre, a left-hand tributary of the Ebro. South of the point at which the Segre is joined on the right by the Noguera Pallaresa, the character of the country completely alters. The Llaños de Urgel, which comprise the greater part of southern Lérida, are extensive plains forming part of the Ebro valley, but redeemed by an elaborate system of canals from the sterility which characterizes so much of that region in Aragon. Lérida is traversed by the main railway from Barcelona to Saragossa, and by a line from Tarragona to the city of Lérida. In 1904 the Spanish government agreed with France to carry another line to the mouth of an international tunnel through the Pyrenees. Industries are in a more backward condition than in any other province of Catalonia, despite the abundance of water-power. There are, however, many saw-mills, flour-mills, and distilleries of alcohol and liqueurs, besides a smaller number of cotton and linen factories, paper-mills, soap-works, and oil and leather factories. Zinc, lignite and common salt are mined, but the output is small and of slight value. There is a thriving trade in wine, oil, wool, timber, cattle, mules, horses and sheep, but agriculture is far less prosperous than in the maritime provinces of Catalonia. Lérida (*q.v.*) is the capital (pop. 21,432), and the only town with more than 5000 inhabitants. Séo de Urgel, near the headwaters of the Segre, is a fortified city which has been an episcopal see since 840, and has had a close historical connexion with Andorra (*q.v.*). Solsona, on a small tributary of the Cardoner, which flows through Barcelona to the Mediterranean, is the *Setelix* of the Romans, and contains in its parish church an image of the Virgin said to possess miraculous powers, and visited every year by many hundreds of pilgrims. Cervera, on a small river of the same name, contains the buildings of a university which Philip V. established here in 1717. This university had originally been founded at Barcelona in the 15th century, and was reopened there in 1842. In character, and especially in their industry, intelligence and keen local patriotism, the inhabitants of Lérida are typical Catalans. (See CATALONIA.)

LÉRIDA, the capital of the Spanish province of Lérida, on the river Segre and the Barcelona-Saragossa and Lérida-Tarragona railways. Pop. (1900) 21,432. The older parts of the city, on the right bank of the river, are a maze of narrow and crooked streets, surrounded by ruined walls and a moat, and commanded by the ancient citadel, which stands on a height overlooking the plains of Noguera on the north and of Urgel on the south. On the left bank, connected with the older quarters by a fine stone bridge and an iron railway bridge, are the suburbs, laid out after 1880 in broad and regular avenues of modern houses. The old cathedral, last used for public worship in 1707, is a very interesting late Romanesque building, with Gothic and Mauresque additions; but the interior was much defaced by its conversion into barracks after 1717. It was founded in 1203 by Pedro II. of Aragon, and consecrated in 1278. The fine octagonal belfry was built early in the 15th century. A second cathedral, with a Corinthian façade, was completed in 1781. The church of San Lorenzo (1270–1300) is noteworthy for the beautiful tracery of its Gothic windows; its nave is said to have been a Roman temple, converted by the Moors into a mosque and by Ramon Berenguer IV., last count of Barcelona, into a church. Other interesting buildings are the Romanesque town hall, founded in the 13th century but several times restored, the bishop's palace and the military hospital, formerly a convent. The museum contains a good collection of Roman and Romanesque antiquities; and there are a school for teachers, a theological seminary and academies of literature and science. Leather, paper, glass, silk, linen and cloth are manufactured in the city, which has also some trade in agricultural produce.

Lérida is the *Ilerda* of the Romans, and was the capital of the people whom they called *Ilerdenses* (Pliny) or *Ilergetes* (Ptolemy). By situation the key of Catalonia and Aragon, it was from a very early period an important military station. In the Punic Wars it sided with the Carthaginians and suffered much from the Roman arms. In its immediate neighbourhood Hanno was defeated by Scipio in 216 B.C., and it afterwards became famous as the scene of Caesar's arduous struggle with Pompey's generals Afranius and Petreius in the first year of the civil war (49 B.C.). It was already a *municipium* in the time of Augustus, and enjoyed great prosperity under later emperors. Under the Visigoths it became an episcopal see, and at least one ecclesiastical council is recorded to have met here (in 546). Under the Moors *Lareda* became one of the principal cities of the province of Saragossa; it became tributary to the Franks in 793, but was reconquered in 797. In 1149 it fell into the hands of Ramon Berenguer IV. In modern times it has come through numerous sieges, having been taken by the French in November 1707 during the War of Succession, and again in 1810. In 1300 James II. of Aragon founded a university at Lérida, which achieved some repute in its day, but was suppressed in 1717, when the university of Cervera was founded.

LERMA, FRANCISCO DE SANDOVAL Y ROJAS, DUKE OF (1552–1625), Spanish minister, was born in 1552. At the age of thirteen he entered the royal palace as a page. The family of Sandoval was ancient and powerful, but under Philip II. (1556–1598) the nobles, with the exception of a few who held viceroyalties or commanded armies abroad, had little share in the government. The future duke of Lerma, who was by descent marquis of Denia, passed his life as a courtier, and possessed no political power till the accession of Philip III. in 1598. He had already made himself a favourite with the prince, and was in fact one of the incapable men who, as the dying king Philip II. foresaw, were likely to mislead the new sovereign. The old king's fears were fully justified. No sooner was Philip III. king than he entrusted all authority to his favourite, whom he created duke of Lerma in 1599 and on whom he lavished an immense list of offices and grants. The favour of Lerma lasted for twenty years, till it was destroyed by a palace intrigue carried out by his own son. Philip III. not only entrusted the entire direction of his government to Lerma, but authorized him to affix the royal signature to documents, and to take whatever presents were made to him. No royal favourite was ever more amply trusted, or made a worse use of power. At a time when the state was practically bankrupt, he encouraged the king in extravagance, and accumulated for himself a fortune estimated by contemporaries at forty-four millions of ducats. Lerma was pious withal, spending largely on religious houses, and he carried out the ruinous measures for the expulsion of the Moriscoes in 1610—a policy which secured him the admiration of the clergy and was popular with the mass of the nation. He persisted in costly and useless hostilities with England till, in 1604, Spain was forced by exhaustion to make peace, and he used all his influence against a recognition of the independence of the Low Countries. The fleet was neglected, the army reduced to a remnant, and the finances ruined beyond recovery. His only resources as a finance minister were the debasing of the coinage, and foolish edicts against luxury and the making of silver plate. Yet it is probable that he would never have lost the confidence of Philip III., who divided his life between festivals and prayers, but for the domestic treachery of his son, the duke of Uceda, who combined with the king's confessor, Aliaga, whom Lerma had introduced to the place, to turn him out. After a long intrigue in which the king was all but entirely dumb and passive, Lerma was at last compelled to leave the court, on the 4th of October 1618. As a protection, and as a means of retaining some measure of power in case he fell from favour, he had persuaded Pope Paul V. to create him cardinal, in the year of his fall. He retired to the town of Lerma in Old Castile, where he had built himself a splendid palace, and then to Valladolid. Under the reign of Philip IV., which began in 1621 he was despoiled of part of his wealth, and he died in 1625.

The history of Lerma's tenure of office is in vol. xv. of the *Historia General de España* of Modesto Lafuente (Madrid, 1855)—with references to contemporary authorities.

LERMONTOV, MIKHAIL YUREVICH (1814–1841), Russian poet and novelist, often styled the poet of the Caucasus, was born in Moscow, of Scottish descent, but belonged to a respectable family of the Tula government, and was brought up in the village of Tarkhanui (in the Penzensk government), which now preserves his dust. By his grandmother—on whom the whole care of his childhood was devolved by his mother's early death and his father's military service—no cost nor pains was spared to give him the best education she could think of. The intellectual atmosphere which he breathed in his youth differed little from that in which Pushkin had grown up, though the domination of French had begun to give way before the fancy for English, and Lamartine shared his popularity with Byron. From the academic gymnasium in Moscow Lermontov passed in 1830 to the university, but there his career came to an untimely close through the part he took in some acts of insubordination to an obnoxious teacher. From 1830 to 1834 he attended the school of cadets at St Petersburg, and in due course he became an officer in the guards. To his own and the nation's anger at the loss of Pushkin (1837) the young soldier gave vent in a passionate poem addressed to the tsar, and the very voice which proclaimed that, if Russia took no vengeance on the assassin of her poet, no second poet would be given her, was itself an intimation that a poet had come already. The tsar, however, seems to have found more impertinence than inspiration in the address, for Lermontov was forthwith sent off to the Caucasus as an officer of dragoons. He had been in the Caucasus with his grandmother as a boy of ten, and he found himself at home by yet deeper sympathies than those of childish recollection. The stern and rocky virtues of the mountaineers against whom he had to fight, no less than the scenery of the rocks and mountains themselves, proved akin to his heart; the emperor had exiled him to his native land. He was in St Petersburg in 1838 and 1839, and in the latter year wrote the novel, *A Hero of Our Time*, which is said to have been the occasion of the duel in which he lost his life in July 1841. In this contest he had purposely selected the edge of a precipice, so that if either combatant was wounded so as to fall his fate should be sealed.

Lermontov published only one small collection of poems in 1840. Three volumes, much mutilated by the censorship, were issued in 1842 by Glazounov; and there have been full editions of his works in 1860 and 1863. To Bodenstedt's German translation of his poems (*Michail Lermontov's poetischer Nachlass*, Berlin, 1842, 2 vols.), which indeed was the first satisfactory collection, he is indebted for a wide reputation outside of Russia. His novel has found several translators (August Boltz, Berlin, 1852, &c.). Among his best-known pieces are "Ismail-Bey," "Hadji Abrek," "Walerik," "The Novice," and, remarkable as an imitation of the old Russian ballad, "The song of the tsar Ivan Vasilivitch, his young bodyguard, and the bold merchant Kalashnikov."

See Taillandier, "Le Poète du Caucase," in *Revue des deux mondes*

(February 1855), reprinted in *Allemagne et Russie* (Paris, 1856); Duduishkin's "Materials for the Biography of Lermontov," prefixed to the 1863 edition of his works. *The Demon*, translated by Sir Alexander Condie Stephen (1875), is an English version of one of his longer poems. (W. R. S.-R.)

LEROUX, PIERRE (1798–1871), French philosopher and economist, was born at Bercy near Paris on the 7th of April 1798, the son of an artisan. His education was interrupted by the death of his father, which compelled him to support his mother and family. Having worked first as a mason and then as a compositor, he joined P. Dubois in the foundation of *Le Globe* which became in 1831 the official organ of the Saint-Simonian community, of which he became a prominent member. In November of the same year, when Enfantin preached the enfranchisement of women and the functions of the *couple-prêtre*, Leroux separated himself from the sect. In 1838, with J. Regnaud, who had seceded with him, he founded the *Encyclopédie nouvelle* (eds. 1838–1841). Amongst the articles which he inserted in it were *De l'égalité* and *Réfutation de l'éclectisme*, which afterwards appeared as separate works. In 1840 he published his treatise *De l'humanité* (2nd ed. 1845), which contains the fullest exposition of his system, and was regarded as the philosophical manifesto of the Humanitarians. In 1841 he established the *Revue indépendante*, with the aid of George Sand, over whom he had great influence. Her *Spiridion*, which was dedicated to him, *Sept cordes de la lyre*, *Consuelo*, and *La Comtesse de Rudolstadt*, were written under the Humanitarian inspiration. In 1843 he established at Boussac (Creuse) a printing association organized according to his systematic ideas, and founded the *Revue sociale*. After the outbreak of the revolution of 1848 he was elected to the Constituent Assembly, and in 1849 to the Legislative Assembly, but his speeches on behalf of the extreme socialist wing were of so abstract and mystical a character that they had no effect. After the *coup d'état* of 1851 he settled with his family in Jersey, where he pursued agricultural experiments and wrote his socialist poem *La Grève de Samarez*. On the definitive amnesty of 1869 he returned to Paris, where he died in April 1871, during the Commune.

The writings of Leroux have no permanent significance in the history of thought. He was the propagandist of sentiments and aspirations rather than the expounder of a systematic theory. He has, indeed, a system, but it is a singular medley of doctrines borrowed, not only from Saint-Simonian, but from Pythagorean and Buddhistic sources. In philosophy his fundamental principle is that of what he calls the "triad"—a triplicity which he finds to pervade all things, which in God is "power, intelligence and love," in man "sensation, sentiment and knowledge." His religious doctrine is Pantheistic; and, rejecting the belief in a future life as commonly conceived, he substitutes for it a theory of metempsychosis. In social economy his views are very vague; he preserves the family, country and property, but finds in all three, as they now are, a despotism which must be eliminated. He imagines certain combinations by which this triple tyranny can be abolished, but his solution seems to require the creation of families without heads, countries without governments and property without rights of possession. In politics he advocates absolute equality—a democracy pushed to anarchy.

See Raillard, *Pierre Leroux et ses œuvres* (Paris, 1899); Thomas, *Pierre Leroux: sa vie, son œuvre, sa doctrine* (Paris, 1904); L. Reybaud, *Études sur les réformateurs et socialistes modernes*; article in R. H. Inglis Palgrave's *Dictionary of Pol. Econ.*

LEROY-BEAULIEU, HENRI JEAN BAPTISTE ANATOLE (1842–), French publicist, was born at Lisieux, on the 12th of February 1842. In 1866 he published *Une troupe de comédiens*, and afterwards *Essai sur la restauration de nos monuments historiques devant l'art et devant le budget*, which deals particularly with the restoration of the cathedral of Evreux. He visited Russia in order to collect documents on the political and economic organization of the Slav nations, and on his return published in the *Revue des deux mondes* (1882–1889) a series of articles, which appeared shortly afterwards in book form under the title *L'Empire des tsars et les Russes* (4th ed., revised in 3 vols., 1897–1898). The work entitled *Un empereur, un roi, un pape, une restauration*, published in 1879, was an analysis and criticism of the politics of the Second Empire. *Un homme d'état russe* (1884) gave the history of the emancipation of the serfs by Alexander II. Other works are *Les Catholiques libéraux, l'église et le libéralisme* (1890), *La Papauté, le socialisme et la démocracie* (1892), *Les Juifs et l'antisémitisme; Israël chez les nations* (1893), *Les Arméniens et la question arménienne* (1896), *L'Antisémitisme* (1897), *Études russes et européennes* (1897). These writings, mainly collections of articles and lectures intended for the general public, display enlightened views and wide information. In 1881 Leroy-Beaulieu was elected professor of contemporary history and eastern affairs at the École Libre des Sciences Politiques, becoming director of this institution on the death of Albert Sorel in 1906, and in 1887 he became a member of the Académie des Sciences Morales et Politiques.

Two of Leroy-Beaulieu's works have been translated into English: one as the *Empire of the Tsars and the Russians*, by Z. A. Regozin (New York, 1893–1896), and another as *Papacy, Socialism, Democracy*, by B. L. O'Donnell (1892). See W. E. H. Lecky, *Historical and Political Essays* (1908).

LEROY-BEAULIEU, PIERRE PAUL (1843–), French economist, brother of the preceding, was born at Saumur on the 9th of December 1843, and educated in Paris at the Lycée Bonaparte and the École de Droit. He afterwards studied at Bonn and Berlin, and on his return to Paris began to write for *Le Temps*, *Revue nationale* and *Revue contemporaine*. In 1867 he won a prize offered by the Academy of Moral Science with an essay entitled "L'Influence de l'état moral et intellectuel des populations ouvrières sur le taux des salaires." In 1870 he gained three prizes for essays on "La Colonization chez les peuples modernes," "L'Administration en France et en Angleterre," and "L'Impôt foncier et ses conséquences économiques." In 1872 Leroy-Beaulieu became professor of finance at the newly-founded École Libre des Sciences Politiques, and in 1880 he succeeded his father-in-law, Michel Chevalier, in the chair of political economy in the Collège de France. Several of his works have made their mark beyond the borders of his own country. Among these may be mentioned his *Recherches économiques, historiques et statistiques sur les guerres contemporaines*, a series of studies published between 1863 and 1869, in which he calculated the loss of men and capital caused by the great European conflicts. Other works by him are—*La Question monnaie au dix-neuvième siècle* (1861), *Le Travail des femmes au dix-neuvième siècle* (1873), *Traité de la science des finances* (1877), *Essai sur la repartition des richesses* (1882), *L'Algérie et la Tunisie* (1888), *Précis d'économie politique* (1888), and *L'État moderne et ses fonctions* (1889). He also founded in 1873 the *Économiste français*, on the model of the English *Economist*. Leroy-Beaulieu may be regarded as the leading representative in France of orthodox political economy, and the most pronounced opponent of protectionist and collectivist doctrines.

LERWICK, a municipal and police burgh of Shetland, Scotland, the most northerly town in the British Isles. Pop. (1901) 4281. It is situated on Brassay Sound, a fine natural harbour, on the east coast of the island called Mainland, 115 m. N.E. of Kirkwall, in Orkney, and 340 m. from Leith by steamer. The town dates from the beginning of the 17th century, and the older part consists of a flagged causeway called Commercial Street, running for 1 m. parallel with the sea (in which the gable ends of several of the quaint-looking houses stand), and so narrow in places as not to allow of two vehicles passing each other. At right angles to this street lanes ascend the hill-side to Hillhead, where the more modern structures and villas have been built. At the north end stands Fort Charlotte, erected by Cromwell, repaired in 1665 by Charles II. and altered in 1781 by George III., after whose queen it was named. It is now used as a depôt for the Naval Reserve, for whom a large drill hall was added. The Anderson Institute, at the south end, was constructed as a secondary school in 1862 by Arthur Anderson, a native, who also presented the Widows' Asylum in the same quarter, an institution intended by preference for widows of Shetland sailors. The town-hall, built in 1881, contains several stained-glass windows, two of which were the gift of citizens of Amsterdam and Hamburg, in gratitude for services rendered by the islanders to fishermen and seamen of those ports. Lerwick's main industries are connected with the fisheries, of which it is an important centre. Docks, wharves, piers, curing stations and warehouses have been provided or enlarged to cope with the growth of the trade, and an esplanade has been constructed along the front. The town is also the chief distributing agency for the islands, and carries on some business in knitted woollen goods. One mile west of Lerwick is Clickimin Loch, separated from the sea by a narrow strip of land. On an islet in the lake stands a ruined "broch" or round tower.

LE SAGE, ALAIN RENÉ (1668–1747), French novelist and dramatist, was born at Sarzeau in the peninsula of Rhuys, between the Morbihan and the sea, on the 13th of December 1668. Rhuys was a legal district, and Claude le Sage, the father of the novelist, held the united positions of advocate, notary and registrar of its royal court. His wife's name was Jeanne Brenugat. Both father and mother died when Le Sage was very young, and his property was wasted or embezzled by his guardians. Little is known of his youth except that he went to school with the Jesuits at Vannes until he was eighteen. Conjecture has it that he continued his studies at Paris, and it is certain that he was called to the bar at the capital in 1692. In August 1694 he married the daughter of a joiner, Marie Elizabeth Huyard. She was beautiful but had no fortune, and Le Sage had little practice. About this time he met his old schoolfellow, the dramatist Danchet, and is said to have been advised by him to betake himself to literature. He began modestly as a translator, and published in 1695 a French version of the *Epistles* of Aristaenetus, which was not successful. Shortly afterwards he found a valuable patron and adviser in the abbé de Lyonne, who bestowed on him an annuity of 600 livres, and recommended him to exchange the classics for Spanish literature, of which he was himself a student and collector.

Le Sage began by translating plays chiefly from Rojas and Lope de Vega. *Le Traitre puni* and *Le Point d'honneur* from the former, *Don Félix de Mendoce* from the latter, were acted or published in the first two or three years of the 18th century. In 1704 he translated the continuation of *Don Quixote* by Avellaneda, and soon afterwards adapted a play from Calderon, *Don César Ursin*, which had a divided fate, being successful at court and damned in the city. He was, however, nearly forty before he obtained anything like decided success. But in 1707 his admirable farce of *Crispin rival de son maître* was acted with great applause, and *Le Diable boiteux* was published. This latter went through several editions in the same year, and was frequently reprinted till 1725, when Le Sage altered and improved it considerably, giving it its present form. Notwithstanding the success of *Crispin*, the actors did not like Le Sage, and refused a small piece of his called *Les Étrennes* (1707). He thereupon altered it into *Turcaret*, his theatrical masterpiece, and one of the best comedies in French literature. This appeared in 1709. Some years passed before he again attempted romance writing, and then the first two parts of *Gil Blas de Santillane* appeared in 1715. Strange to say, it was not so popular as *Le Diable boiteux*. Le Sage worked at it for a long time, and did not bring out the third part till 1724, nor the fourth till 1735. For this last he had been part paid to the extent of a hundred pistoles some years before its appearance. During these twenty years he was, however, continually busy. Notwithstanding the great merit and success of *Turcaret* and *Crispin*, the Théâtre Français did not welcome him, and in the year of the publication of *Gil Blas* he began to write for the Théâtre de la Foire—the comic opera held in booths at festival time. This, though not a very dignified occupation, was followed by many writers of distinction at this date, and by none more assiduously than by Le Sage. According to one computation he produced, either alone or with others, about a hundred pieces, varying from strings of songs with no regular dialogues, to comediettas only distinguished from regular plays by the introduction of music. He was also industrious in prose fiction. Besides finishing *Gil Blas* he translated the *Orlando innamorato* (1721), rearranged *Guzman d'Alfarache* (1732), published two more or less original novels, *Le Bachelier de Salamanque* and *Estévanille Gonzales*, and in 1733 produced the *Vie et aventures de M. de Beauchesne*, which is curiously like certain works of Defoe. Besides all this, Le Sage was also the author of *La Valise trouvée*, a collection of imaginary letters, and of some minor pieces, of which *Une journée des parques* is the most remarkable. This laborious life he continued until 1740, when he was more than seventy years of age. His eldest son had become an actor, and Le Sage had disowned him, but the second was a canon at Boulogne in comfortable circumstances. In the year just mentioned his father and mother went to live with him. At Boulogne Le Sage spent the last seven years of his life, dying on the 17th of November 1747. His last work, *Mélange amusant de saillies d'esprit et de traits historiques les plus frappants*, had appeared in 1743.

Not much is known of Le Sage's life and personality, and the foregoing paragraph contains not only the most important but almost the only facts available for it. The few anecdotes which we have of him represent him as a man of very independent temper, declining to accept the condescending patronage which in the earlier part of the century was still the portion of men of letters. Thus it is said that, on being remonstrated with, as he thought impolitely, for an unavoidable delay in appearing at the duchess of Bouillon's house to read *Turcaret*, he at once put the play in his pocket and retired, refusing absolutely to return. It may, however, be said that as in time so in position he occupies a place apart from most of the great writers of the 17th and 18th centuries respectively. He was not the object of royal patronage like the first, nor the pet of *salons* and coteries like the second. Indeed, he seems all his life to have been purely domestic in his habits, and purely literary in his interests.

The importance of Le Sage in French and in European literature is not entirely the same, and he has the rare distinction of being more important in the latter than in the former. His literary work may be divided into three parts. The first contains his Théâtre de la Foire and his few miscellaneous writings, the second his two remarkable plays *Crispin* and *Turcaret*, the third his prose fictions. In the first two he swims within the general literary current in France; he can be and must be compared with others of his own nation. But in the third he emerges altogether from merely national comparison. It is not with Frenchmen that he is to be measured. He formed no school in France; he followed no French models. His work, admirable as it is from the mere point of view of style and form, is a parenthesis in the general development of the French novel. That product works its way from Madame de la Fayette through Marivaux and Prévost, not through Le Sage. His literary ancestors are Spaniards, his literary contemporaries and successors are Englishmen. The position is almost unique; it is certainly interesting and remarkable in the highest degree.

Of Le Sage's miscellaneous work, including his numerous farce-operettas, there is not much to be said except that they are the very best kind of literary hack-work. The pure and original style of the author, his abundant wit, his cool, humoristic attitude towards human life, which wanted only greater earnestness and a wider conception of that life to turn it into true humour, are discernible throughout. But this portion of his work is practically forgotten, and its examination is incumbent only on the critic. *Crispin* and *Turcaret* show a stronger and more deeply marked genius, which, but for the ill-will of the actors, might have gone far in this direction. But Le Sage's peculiar unwillingness to attempt anything absolutely new discovered itself here. Even when he had devoted himself to the Foire theatre, it seems that he was unwilling to attempt, when occasion called for it, the absolute innovation of a piece with only one actor, a crux which Alexis Piron, a lesser but a bolder genius, accepted and carried through. *Crispin* and *Turcaret* are unquestionably Molièresque, though they are perhaps more original in their following of Molière than any other plays that can be named. For this also was part of Le Sage's idiosyncrasy that, while he was apparently unable or unwilling to strike out an entirely novel line for himself, he had no sooner entered upon the beaten path than he left it to follow his own devices. *Crispin rival de son maître* is a farce in one act and many scenes, after the earlier manner of motion. Its plot is somewhat extravagant, inasmuch as it lies in the effort of a knavish valet, not as usual to further his master's interests, but to supplant that master in love and gain. But the charm of the piece consists first in the lively bustling action of the short scenes which take each other up so promptly and smartly that the spectator has not time to cavil at the improbability of the action, and secondly in the abundant wit of the dialogue. *Turcaret* is a far more important piece of work and ranks high among comedies dealing with the actual society of their time. The only thing which prevents it from holding the very highest place is a certain want of unity in the plot. This want, however, is compensated in *Turcaret* by the most masterly profusion of character-drawing in the separate parts. Turcaret, the ruthless, dishonest and dissolute financier, his vulgar wife as dissolute as himself, the harebrained marquis, the knavish chevalier, the baroness (a coquette with the finer edge taken off her fine-ladyhood, yet by no means unlovable), are each and all finished portraits of the best comic type, while almost as much may be said of the minor characters. The style and dialogue are also worthy of the highest praise; the wit never degenerates into mere "wit-combats."

It is, however, as a novelist that the world has agreed to remember Le Sage. A great deal of unnecessary labour has been spent on the discussion of his claims to originality. What has been already said will give a sufficient clue through this thorny ground. In mere form Le Sage is not original. He does little more than adopt that of the Spanish picaroon romance of the 16th and 17th century. Often, too, he prefers merely to rearrange and adapt existing work, and still oftener to give himself a kind of start by adopting the work of a preceding writer as a basis. But it may be laid down as a positive truth that he never, in any work that pretends to originality at all, is guilty of anything that can fairly be called plagiarism. Indeed we may go further, and say that he is very fond of asserting or suggesting his indebtedness when he is really dealing with his own funds. Thus the *Diable boiteux* borrows the title, and for a chapter or two the plan and almost the words, of the *Diablo Cojuelo* of Luis Velez de Guevara. But after a few pages Le Sage leaves his predecessor alone. Even the plan of the Spanish original is entirely discarded, and the incidents, the episodes, the style, are as independent as if such a book as the *Diablo Cojuelo* had never existed. The case of *Gil Blas* is still more remarkable. It was at first alleged that Le Sage had borrowed it from the *Marcos de Obregon* of Vincent Espinel, a curiously rash assertion, inasmuch as that work exists and is easily accessible, and as the slightest consultation of it proves that, though it furnished Le Sage with separate incidents and hints for more than one of his books, *Gil Blas* as a whole is not in the least indebted to it. Afterwards Father Isla asserted that *Gil Blas* was a mere translation from an actual Spanish book—an assertion at once incapable of proof and disproof, inasmuch as there is no trace whatever of any such book. A third hypothesis is that there was some manuscript original which Le Sage may have worked up in his usual way, in the same way, for instance, as he professes himself to have worked up the *Bachelor of Salamanca*. This also is in the nature of it incapable of refutation, though the argument from the *Bachelor* is strong against it, for there could be no reason why Le Sage should be more reticent of his obligations in the one case than in the other. Except, however, for historical reasons, the controversy is one which may be safely neglected, nor is there very much importance in the more impartial indication of sources—chiefly works on the history of Olivares—which has sometimes been attempted. That Le Sage knew Spanish literature well is of course obvious; but there is as little doubt (with the limitations already laid down) of his real originality as of that of any great writer in the world. *Gil Blas* then remains his property, and it is admittedly the capital example of its own style. For Le Sage has not only the characteristic, which Homer and Shakespeare have, of absolute truth to human nature as distinguished from truth to this or that national character, but he has what has been called the quality of detachment, which they also have. He never takes sides with his characters as Fielding (whose master, with Cervantes, he certainly was) sometimes does. Asmodeus and Don Cleofas, Gil Blas and the Archbishop and Doctor Sangrado, are produced by him with exactly the same impartiality of attitude. Except that he brought into novel writing this highest quality of artistic truth, it perhaps cannot be said that he did much to advance prose fiction in itself. He invented, as has been said, no new *genre*; he did not, as Marivaux and Prévost did, help on the novel as distinguished from the romance. In form his books are undistinguishable, not merely from the Spanish romances which are, as has been said, their direct originals, but from the medieval *romans d'aventures* and the Greek prose romances. But in individual excellence they have few rivals. Nor should it be forgotten, as it sometimes is, that Le Sage was a great master of French style, the greatest unquestionably between the classics of the 17th century and the classics of the 18th. He is perhaps the last great writer before the decadence (for since the time of Paul Louis Courier it has not been denied that the *philosophe* period is in point of style a period of decadence). His style is perfectly easy at the same time that it is often admirably epigrammatic. It has plenty of colour, plenty of flexibility, and may be said to be exceptionally well fitted for general literary work.

The dates of the original editions of Le Sage's most important works have already been given. He published during his life a collection of his regular dramatic works, and also one of his pieces for the Foire, but the latter is far from exhaustive; nor is there any edition which can be called so, though the *Œuvres choisies* of 1782 and 1818 are useful, and there are so-called *Œuvres complètes* of 1821 and 1840. Besides critical articles by the chief literary critics and historians, the work of Eugène Lintilhac, in the *Grands écrivains français* (1893), should be consulted. The *Diable boiteux* and *Gil Blas* have been reprinted and translated numberless times. Both will be found conveniently printed, together with *Estévanille Gonzales* and *Guzman d'Alfarache*, the best of the minor novels, in four volumes of Garnier's *Bibliothèque amusante* (Paris, 1865). *Turcaret* and *Crispin* are to be found in all collected editions of the French drama. There is a useful edition of them, with ample specimens of Le Sage's work for the Foire, in two volumes (Paris, 1821). (G. Sa.)

LES ANDELYS, a town of northern France, capital of an arrondissement in the department of Eure about 30 m. S.E. of Rouen by rail. Pop. (1906) 3955. Les Andelys is formed by the union of Le Grand Andely and Le Petit Andely, the latter situated on the right bank of the Seine, the former about half a mile from the river. Grand Andely, founded, according to tradition, in the 6th century, has a church (13th, 14th and 15th centuries) parts of which are of fine late Gothic and Renaissance architecture. The works of art in the interior include beautiful stained glass of the latter period. Other interesting buildings are the hôtel du Grand Cerf dating from the first half of the 16th century, and the chapel of Sainte-Clotilde, close by a spring which, owing to its supposed healing powers, is the object of a pilgrimage. Grand Andely has a statue of Nicolas Poussin a native of the place. Petit Andely sprang up at the foot of the eminence on which stands the château Gaillard, now in ruins, but formerly one of the strongest fortresses in France (see Fortification and Siegecraft and Castle). It was built by Richard Cœur de Lion at the end of the 12th century to protect the Norman frontier, was captured by the French in 1204 and passed finally into their possession in 1449. The church of St Sauveur at Petit Andely also dates from the end of the 12th century. Les Andelys is the seat of a sub-prefect and of a tribunal of first instance, has a preparatory infantry school; it carries on silk milling, and the manufacture of leather, organs and sugar. It has trade in cattle, grain, flour, &c.

LES BAUX, a village of south-eastern France, in the department of Bouches-du-Rhône, 11 m. N.E. of Arles by road. Pop. (1906) 111. Les Baux, which in the middle ages was a flourishing town, is now almost deserted. Apart from a few inhabited dwellings, it consists of an assemblage of ruined towers, fallen walls and other débris, which cover the slope of a hill crowned by the remains of a huge château, once the seat of a celebrated "court of love." The ramparts, a medieval church, the château, parts of which date to the 11th century, and many of the dwellings are, in great part, hollowed out of the white friable limestone on which they stand. Here and there may be found houses preserving carved façades of Renaissance workmanship. Les Baux has given its name to the reddish rock (bauxite) which is plentiful in the neighbourhood and from which aluminium is obtained. In the middle ages Les Baux was the seat of a powerful family which owned the Terre Baussenques, extensive domains in Provence and Dauphiné. The influence of the seigneurs de Baux in Provence declined before the power of the house of Anjou, to which they abandoned many of their possessions. In 1632 the château and the ramparts were dismantled.

LESBONAX, of Mytilene, Greek sophist and rhetorician, flourished in the time of Augustus. According to Photius (*cod.* 74) he was the author of sixteen political speeches, of which two are extant, a hortatory speech after the style of Thucydides, and a speech on the Corinthian War. In the first he exhorts the Athenians against the Spartans, in the second (the title of which is misleading) against the Thebans (edition by F. Kiehr, *Lesbonactis quae supersunt*, Leipzig, 1907). Some erotic letters are also attributed to him.

The Lesbonax described in Suidas as the author of a large number of philosophical works is probably of much earlier date; on the other hand, the author of a small treatise *Περὶ Σχημάτων* on grammatical figures (ed. Rudolf Müller, Leipzig, 1900), is probably later.

LESBOS (Mytilene, Turk. *Midullu*), an island in the Aegean sea, off the coast of Mysia, N. of the entrance of the Gulf of Smyrna, forming the main part of a sanjak in the archipelago vilayet of European Turkey. It is divided into three districts, Mytilene or Kastro in the E., Molyvo in the N., and Calloni in the W. Since the middle ages it has been known as Mytilene, from the name of its principal town. Strabo estimated the circumference of the island at 1100 stadia, or about 138 m., and Scylax reckoned it seventh in size of the islands of the Mediterranean. The width of the channel between it and the mainland varies from 7 to 10 m. The island is roughly triangular in shape; the three points are Argennum on the N.E., Sigrium (Sigri) on the W., and Malea (Maria) on the S.E. The Euripus Pyrrhaeus (Calloni) is a deep gulf on the west between Sigrium and Malea. The country though mountainous is very fertile, Lesbos being celebrated in ancient times for its wine, oil and grain. Homer refers to its wealth. Its chief produce now is olives, which also form its principal export. Soap, skins and valonea are also exported, and mules and cattle are extensively bred. The sardine fishery is an important trade, and antimony, marble and coal are found on the island. The surface is rugged and mountainous, the highest point, Mount Olympus (Hagios Elias) being 3080 ft. The island has suffered from periodical earthquakes. The roads were remade in 1889, and there is telegraphic communication on the island, and to the mainland by cable. The ports are Sigri and Mytilene. The Gulf of Calloni and Hiera or Olivieri can only be entered by vessels of small draught.

The chief town, called Mytilene, is built in amphitheatre shape round a small hill crowned by remains of an ancient fortress. There are now 14 mosques and 7 churches, including a cathedral. It was originally built on an island close to the eastern coast of Lesbos, and afterwards when the town became too large for the island, it was joined to Lesbos by a causeway, and the city spread along the coast. There was a harbour on each side of the small island. Maloeis, by some surmised to be the northern of these, was not far away. Besides the five cities which gave the island the name of Pentapolis (Mytilene, Methymna, Antissa, Eresus, Pyrrha), there was a town called Arisba, destroyed by an earthquake in the time of Herodotus. Professor Conze thinks that this is the site now called Palaikastro, N.E. of Calloni. Pyrrha lay S.E. of Calloni, and is now also called Palaikastro. Antissa was on the N. coast near Sigri. It was destroyed by the Romans in 168 B.C. Eresus was also near Sigri on the S. coast. Methymna was on the N. coast, on the site of Molyvo, still the second city of the island. The name Methymna is derived from the wine (Gr. *μέθυ*) for which it was famous. Considerable remains of town walls and other buildings are to be seen on all these sites. (E. GR.)

History.—Although the position of Lesbos near the old-established trade-route to the Hellespont marks it out as an important site even in pre-historic days, no evidence on the early condition of the island is as yet obtainable, beyond the Greek tradition which represented it at the time of the Trojan War as inhabited by an original stock of Pelasgi and an immigrant population of Ionians. In historic times it was peopled by an "Aeolian" race who reckoned Boeotia as their motherland and claimed to have migrated about 1050 B.C.; its principal nobles traced their pedigree to Orestes, son of Agamemnon. Lesbos was the most prominent of Aeolian settlements, and indeed played a large part in the early development of Greek life. Its commercial activity is attested by several colonies in Thrace and the Troad, and by the participation of its traders in the settlement of Naucratis in Egypt; hence also the town of Mytilene, by virtue of its good harbour, became the political capital of the island. The climax of its prosperity was reached about 600 B.C., when a citizen named Pittacus was appointed as *aesymnetes* (dictator) to adjust the balance between the governing nobility and the insurgent commons and by his wise administration and legislation won a place among the Seven Sages of Greece. These years also constitute the golden age of Lesbian culture. The lyric poetry of Greece, which owed much to two Lesbians of the 7th century, the musician Terpander and the dithyrambist Arion, attained the standard of classical excellence under Pittacus' contemporaries Alcaeus and Sappho. In the 6th century the importance of the island declined, partly through a protracted and unsuccessful struggle with Athens for the possession of Sigeum near the Hellespont, partly through a crushing naval defeat inflicted by Polycrates of Samos (about 550). The Lesbians readily submitted to Persia after the fall of Croesus of Lydia, and although hatred of their tyrant Coës, a Persian protégé, drove them to take part in the Ionic revolt (499–493), they made little use of their large navy and displayed poor spirit at the decisive battle of Lade. In the 5th century Lesbos for a long time remained a privileged member of the Delian League (*q.v.*), with full rights of self-administration, and under the sole obligation of assisting Athens with naval contingents. Nevertheless at the beginning of the Peloponnesian War the ruling oligarchy of Mytilene forced on a revolt, which was ended after a two years' siege of that town (429–427). The Athenians, who had intended to punish the rebels by a wholesale execution, contented themselves with killing the ringleaders, confiscating the land and establishing a garrison. In the later years of the war Lesbos was repeatedly attacked by the Peloponnesians, and in 405 the harbour of Mytilene was the scene of a battle between the admirals Callicratidas and Conon. In 389 most of the island was recovered for the Athenians by Thrasybulus; in 377 it joined the Second Delian League, and remained throughout a loyal member, although in the second half of the century the dominant democracy was for a while supplanted by a tyranny. In 334 Lesbos served as a base for the Persian admiral Memnon against Alexander the Great. During the Third Macedonian War the Lesbians sided with Perseus against Rome; similarly in 88 they became eager allies of Mithradates VI. of Pontus, and Mytilene stood a protracted siege on his behalf. This town, nevertheless, was raised by Pompey to the status of a free community, thanks no doubt to his confidant Theophanes, a native of Mytilene.

Of the other towns on the island, Antissa, Eresus and Pyrrha possess no separate history. Methymna in the 5th and 4th centuries sometimes figures as a rival of Mytilene, with an independent policy. Among the distinguished Lesbians, in addition to those cited, may be mentioned the cyclic poet Lesches, the historian Hellanicus and the philosophers Theophrastus and Cratippus.

During the Byzantine age the island, which now assumes the name of Mytilene, continued to flourish. In 1091 it fell for a while into the hands of the Seljuks, and in the following century was repeatedly occupied by the Venetians. In 1224 it was recovered by the Byzantine emperors, who in 1354 gave it as a dowry to the Genoese family Gattilusio. After prospering under their administration Mytilene passed in 1462 under Turkish control, and has since had an uneventful history. The present population is about 130,000 of whom 13,000 are Turks and Moslems and 117,000 Greeks.

See Strabo xiii. pp. 617-619; Herodotus ii. 178, iii. 39, vi. 8, 14; Thucydides iii. 2-50; Xenophon, *Hellenica*, i., ii.; S. Plehn, *Lesbiacorum Liber* (Berlin, 1828); C. T. Newton, *Travels and Discoveries in the Levant* (London, 1865); B. V. Head, *Historia Numorum* (Oxford, 1887), pp. 487-488; E. L. Hicks and G. F. Hill, *Greek Historical Inscriptions* (Oxford, 1901), Nos. 61, 94, 101, 139, 164; Conze, *Reise auf der Insel Lesbos* (1865); Koldewey, *Antike Baureste auf Lesbos* (Berlin, 1890). (M. O. B. C.)

LESCHES (Lescheos in Pausanias x. 25. 5), the reputed author of the *Little Iliad* ('Ιλιὰς μικρά), one of the "cyclic" poems. According to the usually accepted tradition, he was a native of Pyrrha in Lesbos, and flourished about 660 B.C. (others place him about 50 years earlier). The *Little Iliad* took up the story of the Homeric *Iliad*, and, beginning with the contest between Ajax and Odysseus for the arms of Achilles, carried it down to the fall of Troy (Aristotle, *Poetics*, 23). According to the epitome in the *Chrestomathy* of Proclus, it ended with the admission of the wooden horse within the walls of the city. Some ancient authorities ascribe the work to a Lacedaemonian named Cinaethon, and even to Homer.

See F. G. Welcker, *Der epische Cyclus* (1865–1882); Müller and Donaldson, *Hist. of Greek Literature*, i. ch. 6; G. H. Bode, *Geschichte der hellenischen Dichtkunst*, i.

LESCURE, LOUIS MARIE JOSEPH, MARQUIS DE (1766–1793), French soldier and anti-revolutionary, was born near Bressuire. He was educated at the École Militaire, which he left at the age of sixteen. He was in command of a company of cavalry in the Régiment de Royal-Piémont, but being opposed to the ideas of the Revolution he emigrated in 1791; he soon, however, returned to France, and on the 10th of August 1792 took part in the defence of the Tuileries against the mob of Paris. The day after, he was forced to leave Paris, and took refuge in the château of Clisson near Bressuire. On the outbreak of the revolt of Vendée against the Republic, he was arrested and imprisoned with all his family, as one of the promoters of the rising. He was set at liberty by the Royalists, and became one of their leaders, fighting at Thouars, taking Fontenay and Saumur (May–June 1793), and, after an unsuccessful attack on Nantes, joining H. du Verger de la Rochejaquelein, another famous Vendean leader. Their peasant troops, opposed to the republican general F. J. Westermann, sustained various defeats, but finally gained a victory between Tiffauges and Cholet on the 19th of September 1793. The struggle was then concentrated round Chatillon, which was time after time taken and lost by the Republicans. Lescure was killed on the 15th of October 1793 near the château of La Tremblaye between Einée and Fougères.

See Marquise de la Rochejaquelein (Lescure's widow, who afterwards married La Rochejaquelein), *Mémoires* (Paris, 1817); Jullien de Courcelles, *Dictionnaire des généraux français*, tome vii. (1823); T. Muret, *Histoire des guerres de l'ouest* (Paris, 1848); and J. A. M. Crétineau-Joly, *Guerres de Vendée* (1834).

LESDIGUIÈRES, FRANÇOIS DE BONNE, DUC DE (1543–1626), constable of France, was born at Saint-Bonnet de Champsaur on the 1st of April 1543, of a family of notaries with pretensions to nobility. He was educated at Avignon under a Protestant tutor, and had begun the study of law in Paris when he enlisted as an archer. He served under the lieutenant-general of his native province of Dauphiné, Bertrand de Simiane, baron de Gordes, but when the Huguenots raised troops in Dauphiné Lesdiguières threw in his lot with them, and under his kinsman Antoine Rambaud de Furmeyer, whom he succeeded in 1570, distinguished himself in the mountain warfare that followed by his bold yet prudent handling of troops. He fought at Jarnac and Moncontour, and was a guest at the wedding of Henry IV. of Navarre. Warned of the impending massacre he retired hastily to Dauphiné, where he secretly equipped and drilled a determined body of Huguenots, and in 1575, after the execution of Montbrun, became the acknowledged leader of the Huguenot resistance in the district with the title of commandant general, confirmed in 1577 by Marshal Damville, by Condé in 1580, and by Henry of Navarre in 1582. He seized Gap by a lucky night attack on the 3rd of January 1577, re-established the reformed religion there, and fortified the town. He refused to acquiesce in the treaty of Poitiers (1578) which involved the surrender of Gap, and after two years of fighting secured better terms for the province. Nevertheless in 1580 he was compelled to hand the place over to Mayenne and to see the fortifications dismantled. He took up arms for Henry IV. in 1585, capturing Chorges, Embrun, Châteauroux and other places, and after the truce of 1588–1589 secured the complete submission of Dauphiné. In 1590 he beat down the resistance of Grenoble, and was now able to threaten the leaguers and to support the governor of Provence against the raids of Charles Emmanuel I. of Savoy. He defeated the Savoyards at Esparron in April 1591, and in 1592 began the reconquest of the marquessate of Saluzzo which had been seized by Charles Emmanuel. After his defeat of the Spanish allies of Savoy at Salebertrano in June 1593 there was a truce, during which Lesdiguières was occupied in maintaining the royal authority against Éperon in Provence. The war with Savoy proceeded intermittently until 1601, when Henry IV. concluded peace, much to the dissatisfaction of Lesdiguières. The king regarded his lieutenant's domination in Dauphiné with some distrust, although he was counted among the best of his captains. Nevertheless he made him a marshal of France in 1609, and ensured the succession to the lieutenant-generalship of Dauphiné, vested in Lesdiguières since 1597, to his son-in-law Charles de Créquy. Sincerely devoted to the throne, Lesdiguières took no part in the intrigues which disturbed the minority of Louis XIII., and he moderated the political claims made by his co-religionists under the terms of the Edict of Nantes. After the death of his first wife, Claudine de Bérenger, he married the widow of Ennemond Matel, a Grenoble shopkeeper, who was murdered in 1617. Lesdiguières was then 73, and this lady, Marie Vignon, had long been his mistress. He had two daughters, one of whom, Françoise, married Charles de Créquy. In 1622 he formally abjured the Protestant faith, his conversion being partly due to the influence of Marie Vignon. He was already a duke and peer of France; he now became constable of France, and received the order of the Saint Esprit. He had long since lost the confidence of the Huguenots, but he nevertheless helped the Vaudois against the duke of Savoy. Lesdiguières had the qualities of a great general, but circumstances limited him to the mountain warfare of Dauphiné, Provence and Savoy. He had almost unvarying success through sixty years of fighting. His last campaign, fought in alliance with Savoy to drive the Spaniards from the Valtelline, was the least successful of his enterprises. He died of fever at Valence on the 21st of September 1626.

The life of the Huguenot captain has been written in detail by Ch. Dufuyard, *Le Connétable de Lesdiguières* (Paris, 1892). His first biographer was his secretary Louis Videl, *Histoire de la vie du connestable de Lesdiguières* (Paris, 1638). Much of his official correspondence, with an admirable sketch of his life, is contained in *Actes et correspondance du connétable de Lesdiguières*, edited by Comte Douglas and J. Roman in *Documents historiques inédits pour servir à l'histoire de Dauphiné* (Grenoble, 1878). Other letters are in the *Lettres et mémoires* (Paris, 1647) of Duplessis-Mornay.

LESGHIANS, or LESGHIS (from the Persian *Leksi*, called Leki by the Grusians or Georgians, Armenians and Ossetes), the collective name for a number of tribes of the eastern Caucasus, who, with their kinsfolk the Chechenzes, have inhabited Daghestan from time immemorial. They spread southward into the Transcaucasian circles Kuba, Shemakha, Nukha and Sakataly. They are mentioned as Λῆχαι by Strabo and Plutarch along with the Γῆλαι (perhaps the modern Galgai, a Chechenzian tribe), and their name occurs frequently in the chronicles of the Georgians, whose territory was exposed to their raids for centuries, until, on the surrender (1859) to Russia of the Chechenzian chieftain Shamyl, they became Russian subjects. Moses of Chorene mentions a battle in the reign of the Armenian king Baba (A.D. 370–377), in which Shagir, king of the Lekians, was slain. The most important of the Lesghian tribes are the Avars (*q.v.*), the Kasimukhians or Lakians, the Darghis and the

Kurins or Lesghians proper. Komarov[1] gives the total number of the tribes as twenty-seven, all speaking distinct dialects. Despite this, the Lesghian peoples, with the exception of the Udi and Kubatschi, are held to be ethnically identical. The Lesghians are not usually so good-looking as the Circassians or the Chechenzes. They are tall, powerfully built, and their hybrid descent is suggested by the range of colouring, some of the tribes exhibiting quite fair, others quite dark, individuals. Among some there is an obvious mongoloid strain. In disposition they are intelligent, bold and persistent, and capable of reckless bravery, as was proved in their struggle to maintain their independence. They are capable of enduring great physical fatigue. They live a semi-savage life on their mountain slopes, for the most part living by hunting and stock-breeding. Little agriculture is possible. Their industries are mainly restricted to smith-work and cutlery and the making of felt cloaks, and the women weave excellent shawls. They are for the most part fanatical Mahommedans.

See Moritz Wagner, *Schamyl* (Leipzig, 1854); von Seidlitz, "Ethnographie des Kaukasus," in *Petermann's Mitteilungen* (1880); Ernest Chantre, *Recherches anthropologiques dans le Caucase* (Lyon, 1885–1887); J. de Morgan, *Recherches sur les origines des peuples du Caucase* (Paris, 1889).

LESINA (Serbo-Croatian, *Hvar*), an island in the Adriatic Sea, forming part of Dalmatia, Austria. Lesina lies between the islands of Brazza on the north and Curzola on the south; and is divided from the peninsula of Sabbioncello by the Narenta channel. Its length is 41 m.; its greatest breadth less than 4 m. It has a steep rocky coast with a chain of thinly wooded limestone hills. The climate is mild, and not only the grape and olive, but dates, figs and the carob or locust-bean flourish. The cultivation of these fruits, boat-building, fishing and the preparation of rosemary essence and liqueurs are the principal resources of the islanders. Lesina (*Hvar*) and Cittavecchia (*Starigrad*) are the principal towns and seaports, having respectively 2138 and 3120 inhabitants. Lesina, the capital, contains an arsenal, an observatory and some interesting old buildings of the 16th century. It is a Roman Catholic bishopric, and the centre of an administrative district, which includes Cittavecchia, Lissa, and some small neighbouring islands. Pop. (1900) of island 18,091, of district 27,928.

To the primitive "Illyrian" race, whose stone cists and bronze implements have been disinterred from barrows near the capital, may perhaps be attributed the "Cyclopean" walls at Cittavecchia. About 385 B.C., a Greek colony from Paros built a city on the site of the present Lesina, naming it *Paros* or *Pharos*. The forms *Phara*, *Pharia* (common among Latin writers), and *Pityeia*, also occur. In 229 B.C. the island was betrayed to the Romans by Demetrius, lieutenant of the Illyrian queen Teuta; but in 219, as Demetrius proved false to Rome also, his capital was razed by Lucius Aemilius Paullus. *Neos Pharos*, now Cittavecchia, took its place, and flourished until the 6th century, when the island was laid waste by barbarian invaders. Constantine Porphyrogenitus mentions Lesina as a colony of pagan Slavs, in the 10th century. Throughout the middle ages it remained a purely Slavonic community; and its name, which appears in old documents as *Lisna*, *Lesna* or *Lyesena*, "wooded" is almost certainly derived from the Slavonic *lyĕs*, "forest," not from the Italian *lesina*, "an awl." But the old form Pharia persisted, as *Far* or *Hvar*, with the curious result that the modern Serbo-Croatian name is Greek, and the modern Italian name Slavonic in origin. Lesina became a bishopric in 1145, and received a charter from Venice in 1331. It was sacked by the enemies of Venice in 1354 and 1358; ceded to Hungary in the same year; held by Ragusa from 1413 to 1416; and incorporated in the Venetian dominions in 1420. During the 16th century Lesina city had a considerable maritime trade, and, though sacked and partly burned by the Turks in 1571, it remained the chief naval station of Venice, in these waters, until 1776, when it was superseded by Curzola. Passing to Austria in 1797, and to France in 1805, it withstood a Russian attack in 1807, but was surrendered by the French in 1813, and finally annexed to Austria in 1815.

LESION (through Fr. from Lat. *laesio*, injury, *laedere*, to hurt), an injury, hurt, damage. In Scots law the term is used of damage suffered by a party in a contract sufficient to enable him to bring an action for setting it aside. In pathology, the chief use, the word is applied to any morbid change in the structure of an organ, whether shown by visible changes or by disturbance of function.

LESKOVATS (LESKOVATZ or LESKOVAC), a town in Servia, between Nish and Vranya, on the railway line from Nish to Salonica. Pop. (1901) 13,707. It is the headquarters of the Servian hemp industry, the extensive plain in which the town lies growing the best flax and hemp in all the Balkan peninsula. The plain is not only the most fertile portion of Servia, but also the best cultivated. Besides flax and hemp, excellent tobacco is grown. Five valleys converge on the plain from different directions, and the inhabitants of the villages in these valleys are all occupied in growing flax and hemp, which they send to Leskovats to be stored or manufactured into ropes. After Belgrade and Nish, Leskovats is the most prosperous town in Servia.

LESLEY, JOHN (1527–1596), Scottish bishop and historian, was born in 1527. His father was Gavin Lesley, rector of Kingussie. He was educated at the university of Aberdeen, where he took the degree of M.A. In 1538 he obtained a dispensation permitting him to hold a benefice, notwithstanding his being a natural son, and in June 1546 he was made an acolyte in the cathedral church of Aberdeen, of which he was afterwards appointed a canon and prebendary. He also studied at Poitiers, at Toulouse and at Paris, where he was made doctor of laws in 1553. In 1558 he took orders and was appointed Official of Aberdeen, and inducted into the parsonage and prebend of Oyne. At the Reformation Lesley became a champion of Catholicism. He was present at the disputation held in Edinburgh in 1561, when Knox and Willox were his antagonists. He was one of the commissioners sent the same year to bring over the young Queen Mary to take the government of Scotland. He returned in her train, and was appointed a privy councillor and professor of canon law in King's College, Aberdeen, and in 1565 one of the senators of the college of justice. Shortly afterwards he was made abbot of Lindores, and in 1565 bishop of Ross, the election to the see being confirmed in the following year. He was one of the sixteen commissioners appointed to revise the laws of Scotland, and the volume of the *Actis and Constitutionis of the Realme of Scotland* known as the Black Acts was, chiefly owing to his care, printed in 1566.

The bishop was one of the most steadfast friends of Queen Mary. After the failure of the royal cause, and whilst Mary was a captive in England, Lesley (who had gone to her at Bolton) continued to exert himself on her behalf. He was one of the commissioners at the conference at York in 1568. He appeared as her ambassador at the court of Elizabeth to complain of the injustice done to her, and when he found he was not listened to he laid plans for her escape. He also projected a marriage for her with the duke of Norfolk, which ended in the execution of that nobleman. For this he was put under the charge of the bishop of London, and then of the bishop of Ely (in Holborn), and afterwards imprisoned in the Tower of London. During his confinement he collected materials for his history of Scotland, by which his name is now chiefly known. In 1571 he presented the latter portion of this work, written in Scots, to Queen Mary to amuse her in her captivity. He also wrote for her use his *Piae Consolationes*, and the queen devoted some of the hours of her captivity to translating a portion of it into French verse.

In 1573 he was liberated from prison, but was banished from England. For two years he attempted unsuccessfully to obtain the assistance of Continental princes in favour of Queen Mary. While at Rome in 1578 he published his Latin history *De Origine, Moribus, et Rebus Gestis Scotorum*. In 1579 he went to France, and was made suffragan and vicar-general of the archbishopric of Rouen. Whilst visiting his diocese, however, he was thrown into prison, and had to pay 3000 pistoles to prevent his being given up to Elizabeth. During the remainder of the reign of Henry III. he lived unmolested, but on the accession of the Protestant Henry IV. he again fell into trouble. In 1590 he was thrown into prison, and had to purchase his freedom at the same expense as before. In 1593 he was made bishop of Coutances in Normandy, and had licence to hold the bishopric of Ross till he should obtain peaceable possession of the former see. He retired to an Augustinian monastery near Brussels, where he died on the 31st of May 1596.

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[1] *Ethnological Map of Daghestan.*

The chief works of Lesley are as follows: *A Defence of the Honour of . . . Marie, Queene of Scotland, by Eusebius Dicaeophile* (London, 1569), reprinted, with alterations, at Liége in 1571, under the title, *A Treatise concerning the Defence of the Honour of Marie, Queene of Scotland, made by Morgan Philippes, Bachelar of Divinitie*, *Piae afflicti animi consolationes, ad Mariam Scot. Reg.* (Paris, 1574); *De origine, moribus et rebus gestis Scotorum libri decem* (Rome, 1578; re-issued 1675); *De illustrium feminarum in republica administranda authoritate libellus* (Reims, 1580; a Latin version of a tract on "The Lawfulness of the Regiment of Women": cf. Knox's pamphlet); *De titulo et jure Mariae Scot. Reg., quo regni Angliae successionem sibi juste vindicat* (Reims, 1580; translated in 1584). The history of Scotland from 1436 to 1561 owes much, in its earlier chapters, to the accounts of Hector Boece (*q.v.*) and John Major (*q.v.*), though no small portion of the topographical matter is first-hand. In the later sections he gives an independent account (from the Catholic point of view) which is a valuable supplement and a corrective in many details, to the works of Buchanan and Knox. A Scots version of the history was written in 1596 by James Dalrymple of the Scottish Cloister at Regensburg. It has been printed for the Scottish Text Society (2 vols., 1888–1895) under the editorship of the Rev. E. G. Cody, O.S.B. A slight sketch by Lesley of Scottish history from 1562 to 1571 has been translated by Forbes-Leith in his *Narrative of Scottish Catholics* (1885), from the original MS. now in the Vatican.

LESLEY, J. PETER (1819–1903), American geologist, was born in Philadelphia on the 17th of September 1819. It is recorded by Sir A. Geikie that "He was christened Peter after his father and grandfather, and at first wrote his name 'Peter Lesley, Jr.,' but disliking the Christian appellation that had been given to him, he eventually transformed his signature by putting the J. of 'Junior' at the beginning." He was educated for the ministry at the university of Pennsylvania, where he graduated in 1838; but the effects of close study having told upon his health, he served for a time as sub-assistant on the first geological survey of Pennsylvania under Professor H. D. Rogers, and was afterwards engaged in a special examination of the coal regions. On the termination of the survey in 1841 he entered Princeton seminary and renewed his theological studies, at the same time giving his leisure time to assist Professor Rogers in preparing the final report and map of Pennsylvania. He was licensed to preach in 1844; he then paid a visit to Europe and entered on a short course of study at the university of Halle. Returning to America he worked during two years for the American Tract Society, and at the close of 1847 he joined Professor Rogers again in preparing geological maps and sections at Boston. He then accepted the pastorate of the Congregational church at Milton, a suburb of Boston, where he remained until 1851, when, his views having become Unitarian, he abandoned the ministry and entered into practice as a consulting geologist. In the course of his work he made elaborate surveys of the Cape Breton coal-field, and of other coal and iron regions. From 1855 to 1859 he was secretary of the American Iron Association; for twenty-seven years (1858–1885) he was secretary and librarian of the American Philosophical Society; from 1872 to 1878 he was professor of geology and dean of the faculty of science in the university of Pennsylvania, and from 1874–1893 he was in charge of the second geological survey of the state. He then retired to Milton, Mass., where he died on the 1st of June 1903. He published *Manual of Coal and its Topography* (1856); *The Iron Manufacturer's Guide to the Furnaces, Forges and Rolling Mills of the United States* (1859).

See Memoir by Sir A. Geikie in *Quart. Journ. Geol. Soc.* (May 1904); and Memoir (with portrait) by B. S. Lyman, printed in advance with portrait, and afterwards in abstract only in *Trans. Amer. Inst. Mining Engineers*, xxxiv. (1904) p. 726.

LESLIE, CHARLES (1650–1722), Anglican nonjuring divine, son of John Leslie (1571–1671), bishop of Raphoe and afterwards of Clogher, was born in July 1650 in Dublin, and was educated at Enniskillen school and Trinity College, Dublin. Going to England he read law for a time, but soon turned his attention to theology, and took orders in 1680. In 1687 he became chancellor of the cathedral of Connor and a justice of the peace, and began a long career of public controversy by responding in public disputation at Monaghan to the challenge of the Roman Catholic bishop of Clogher. Although a vigorous opponent of Roman Catholicism, Leslie was a firm supporter of the Stuart dynasty, and, having declined at the Revolution to take the oath to William and Mary, he was on this account deprived of his benefice. In 1689 the growing troubles in Ireland induced him to withdraw to England, where he employed himself for the next twenty years in writing various controversial pamphlets in favour of the nonjuring cause, and in numerous polemics against the Quakers, Jews, Socinians and Roman Catholics, and especially in that against the Deists with which his name is now most commonly associated. He had the keenest scent for every form of heresy and was especially zealous in his defence of the sacraments. A warrant having been issued against him in 1710 for his pamphlet *The Good Old Cause, or Lying in Truth*, he resolved to quit England and to accept an offer made by the Pretender (with whom he had previously been in frequent correspondence) that he should reside with him at Bar-le-Duc. After the failure of the Stuart cause in 1715, Leslie accompanied his patron into Italy, where he remained until 1721, in which year, having found his sojourn amongst Roman Catholics extremely unpleasant, he sought and obtained permission to return to his native country. He died at Glaslough, Monaghan, on the 13th of April 1722.

The *Theological Works* of Leslie were collected and published by himself in 2 vols. folio in 1721; a later edition, slightly enlarged, appeared at Oxford in 1832 (7 vols. 8vo). Though marred by persistent arguing in a circle they are written in lively style and show considerable erudition. He had the somewhat rare distinction of making several converts by his reasonings, and Johnson declared that "Leslie was a reasoner, and a reasoner who was not to be reasoned against." An historical interest in all that now attaches to his subjects and his methods, as may be seen when the promise given in the title of his best-known work is contrasted with the actual performance. The book professes to be *A Short and Easy Method with the Deists, wherein the certainty of the Christian Religion is Demonstrated by Infallible Proof from Four Rules, which are incompatible to any imposture that ever yet has been, or that can possibly be* (1697). The four rules which, according to Leslie, have only to be rigorously applied in order to establish not the probability merely but the absolute certainty of the truth of Christianity are simply these: (1) that the matter of fact be such as that men's outward senses, their eyes and ears, may be judges of it; (2) that it be done publicly, in the face of the world; (3) that not only public monuments be kept up in memory of it, but some outward actions be performed; (4) that such monuments and such actions or observances be instituted and do commence from the time that the matter of fact was done. Other publications of Leslie are *The Snake in the Grass* (1696), against the Quakers; *A Short Method with the Jews* (1689); *Gallienus Redivivus* (an attack on William III., 1695); *The Socinian Controversy Discussed* (1697); *The True Notion of the Catholic Church* (1703); and *The Case Stated between the Church of Rome and the Church of England* (1713).

LESLIE, CHARLES ROBERT (1794–1859), English genre-painter, was born in London on the 19th of October 1794. His parents were American, and when he was five years of age he returned with them to their native country. They settled in Philadelphia, where their son was educated and afterwards apprenticed to a bookseller. He was, however, mainly interested in painting and the drama, and when George Frederick Cooke visited the city he executed a portrait of the actor, from recollection of him on the stage, which was considered a work of such promise that a fund was raised to enable the young artist to study in Europe. He left for London in 1811, bearing introductions which procured for him the friendship of West, Beechey, Allston, Coleridge and Washington Irving, and was admitted as a student of the Royal Academy, where he carried off two silver medals. At first, influenced by West and Fuseli, he essayed "high art," and his earliest important subject depicted Saul and the Witch of Endor; but he soon discovered his true aptitude and became a painter of cabinet-pictures, dealing, not like those of Wilkie, with the contemporary life that surrounded him, but with scenes from the great masters of fiction, from Shakespeare and Cervantes, Addison and Molière, Swift, Sterne, Fielding and Smollett. Of individual paintings we may specify "Sir Roger de Coverley going to Church" (1810); "May-day in the Time of Queen Elizabeth" (1821); "Sancho Panza and the Duchess" (1824); "Uncle Toby and the Widow Wadman" (1831); *La Malade Imaginaire*, act iii. sc. 6 (1843); and the "Duke's Chaplain Enraged leaving the Table," from *Don Quixote* (1849). Many of his more important subjects exist in varying replicas. He possessed a sympathetic imagination, which enabled him to enter freely into the spirit of the author whom he illustrated, a delicate perception for female beauty, an unfailing eye for character and its outward manifestation in face and figure, and a genial and sunny sense of humour, guided by an instinctive refinement which prevented it from overstepping the bounds of good taste. In 1821 Leslie was elected A.R.A., and five years later full academician. In 1833 he left for America to become teacher of drawing in the military academy at West Point, but the post proved an irksome one, and in some six months he returned to England. He died on the 5th of May 1859.

In addition to his skill as an artist, Leslie was a ready and pleasant writer. His *Life* of his friend Constable, the landscape painter, appeared in 1843, and his *Handbook for Young Painters*, a volume embodying the substance of his lectures as professor of painting to the Royal Academy, in 1855. In 1860 Tom Taylor edited his *Autobiographical Recollections and Letters*, which contain interesting reminiscences of his distinguished friends and contemporaries.

LESLIE, FRED [FREDERICK HOBSON] (1855–1892), English actor, was born at Woolwich on the 1st of April 1855. He made his first stage appearance in London as Colonel Hardy in *Paul Pry* in 1878. He had a good voice, and in 1882 made a great hit as Rip Van Winkle in Planquette's opera of that name at the Comedy. In 1885 he appeared at the Gaiety as Jonathan Wild in H. P. Stephens and W. Yardley's burlesque *Little Jack Sheppard*. His extraordinary success in this part determined his subsequent career, and for some years he and Nelly Farren, with whom he played in perfect association, were the pillars of Gaiety burlesque. Leslie's "Don Caesar de Bazan" in *Ruy Blas, or the Blasé Roué*, was perhaps the most popular of his later parts. In all of them it was his own versatility and entertaining personality which caused the attraction; whether he sang, danced, whistled or "gagged," his performance was an unending flow of high spirits and infectious charm. Under the pseudonym of "A. C. Torr" he was acknowledged on the programmes as part author of these burlesques, and while on occasion he acted in more serious comedy, for which he had undoubted capacity, his fame rests on his connexion with them. In 1881 and 1883 he played in America. He died on the 7th of December 1892.

See W. T. Vincent, *Recollections of Fred Leslie* (1894).

LESLIE, SIR JOHN (1766–1832), Scottish mathematician and physicist, was born of humble parentage at Largo, Fifeshire, on the 10th of April 1766, and received his early education there and at Leven. In his thirteenth year, encouraged by friends who had even then remarked his aptitude for mathematical and physical science, he entered the university of St Andrews. On the completion of his arts course, he nominally studied divinity at Edinburgh until 1787; in 1788–1789 he spent rather more than a year as private tutor in a Virginian family, and from 1790 till the close of 1792 he held a similar appointment at Etruria in Staffordshire, with the family of Josiah Wedgwood, employing his spare time in experimental research and in preparing a translation of Buffon's *Natural History of Birds*, which was published in nine 8vo vols. in 1793, and brought him some money. For the next twelve years (passed chiefly in London or at Largo, with an occasional visit to the continent of Europe) he continued his physical studies, which resulted in numerous papers contributed by him to Nicholson's *Philosophical Journal*, and in the publication (1804) of the *Experimental Inquiry into the Nature and Properties of Heat*, a work which gained him the Rumford Medal of the Royal Society of London. In 1805 he was elected to succeed John Playfair in the chair of mathematics at Edinburgh, not, however, without violent though unsuccessful opposition on the part of a narrow-minded clerical party who accused him of heresy in something he had said as to the "unsophisticated notions of mankind" about the relation of cause and effect. During his tenure of this chair he published two volumes of a *Course of Mathematics*—the first, entitled *Elements of Geometry, Geometrical Analysis and Plane Trigonometry*, in 1809, and the second, *Geometry of Curve Lines*, in 1813; the third volume, on *Descriptive Geometry and the Theory of Solids* was never completed. With reference to his invention (in 1810) of a process of artificial congelation, he published in 1813 *A Short Account of Experiments and Instruments depending on the relations of Air to Heat and Moisture*; and in 1818 a paper by him "On certain impressions of cold transmitted from the higher atmosphere, with an instrument (the aethrioscope) adapted to measure them," appeared in the *Transactions of the Royal Society of Edinburgh*. In 1819, on the death of Playfair, he was promoted to the more congenial chair of natural philosophy, which he continued to hold until his death, and in 1823 he published, chiefly for the use of his class, the first volume of his never-completed *Elements of Natural Philosophy*. Leslie's main contributions to physics were made by the help of the "differential thermometer," an instrument whose invention was contested with him by Count Rumford. By adapting to this instrument various ingenious devices he was enabled to employ it in a great variety of investigations, connected especially with photometry, hygroscopy and the temperature of space. In 1820 he was elected a corresponding member of the Institute of France, the only distinction of the kind which he valued, and early in 1832 he was created a knight. He died at Coates, a small property which he had acquired near Largo, on the 3rd of November 1832.

LESLIE, THOMAS EDWARD CLIFFE (1827–1882), English economist, was born in the county of Wexford in (as is believed) the year 1827. He was the second son of the Rev. Edward Leslie, prebendary of Dromore, and rector of Annahilt, in the county of Down. His family was of Scottish descent, but had been connected with Ireland since the reign of Charles I. Amongst his ancestors were that accomplished prelate, John Leslie (1571–1671), bishop first of Raphoe and afterwards of Clogher, who, when holding the former see, offered so stubborn a resistance to the Cromwellian forces, and the bishop's son Charles (see above), the nonjuror. Cliffe Leslie received his elementary education from his father, who resided in England, though holding church preferment as well as possessing some landed property in Ireland; by him he was taught Latin, Greek and Hebrew, at an unusually early age; he was afterwards for a short time under the care of a clergyman at Clapham, and was then sent to King William's College, in the Isle of Man, where he remained until, in 1842, being then only fifteen years of age, he entered Trinity College, Dublin. He was a distinguished student there, obtaining, besides other honours, a classical scholarship in 1845, and a senior moderatorship (gold medal) in mental and moral philosophy at his degree examination in 1846. He became a law student at Lincoln's Inn, was for two years a pupil in a conveyancer's chambers in London, and was called to the English bar. But his attention was soon turned from the pursuit of legal practice, for which he seems never to have had much inclination, by his appointment, in 1853, to the professorship of jurisprudence and political economy in Queen's College, Belfast. The duties of this chair requiring only short visits to Ireland in certain terms of each year, he continued to reside and prosecute his studies in London, and became a frequent writer on economic and social questions in the principal reviews and other periodicals. In 1870 he collected a number of his essays, adding several new ones, into a volume entitled *Land Systems and Industrial Economy of Ireland, England and Continental Countries*. J. S. Mill gave a full account of the contents of this work in a paper in the *Fortnightly Review*, in which he pronounced Leslie to be "one of the best living writers on applied political economy." Mill had sought his acquaintance on reading his first article in *Macmillan's Magazine*; he admired his talents and took pleasure in his society, and treated him with a respect and kindness which Leslie always gratefully acknowledged.

In the frequent visits which Leslie made to the continent, especially to Belgium and some of the less-known districts of France and Germany, he occupied himself much in economic and social observation, studying the effects of the institutions and system of life which prevailed in each region, on the material and moral condition of its inhabitants. In this way he gained an extensive and accurate acquaintance with continental rural economy, of which he made excellent use in studying parallel phenomena at home. The accounts he gave of the results of his observations were among his happiest efforts; "no one," said Mill, "was able to write narratives of foreign visits at once so instructive and so interesting." In these excursions he made the acquaintance of several distinguished persons, amongst others of M. Léonce de Lavergne and M. Émile de Laveleye. To the memory of the former of these he afterwards paid a graceful tribute in a biographical sketch (*Fortnightly Review*, February 1881); and to the close of his life there existed between him and M. de Laveleye relations of mutual esteem and cordial intimacy.

Two essays of Leslie's appeared in volumes published under the auspices of the Cobden Club, one on the "Land System of France" (2nd ed., 1870), containing an earnest defence of *la petite culture* and still more of *la petite propriété*; the other on "Financial Reform" (1871), in which he exhibited in detail the impediments to production and commerce arising from indirect taxation. Many other articles were contributed by him to reviews between 1875 and 1879, including several discussions of the history of prices and the movements of wages in Europe, and a sketch of life in Auvergne in his best manner; the most important of them, however, related to the philosophical method of political economy, notably a memorable one which appeared in the Dublin University periodical, *Hermathena*. In 1879 the provost and senior fellows of Trinity College published for him a volume in which a number of these articles were collected under the title of *Essays in Political and Moral Philosophy*. These and some later essays, together with the earlier volume on *Land Systems*, form the essential contribution of Leslie to economic literature. He had long contemplated, and had in part written, a work on English economic and legal history, which would have been his *magnum opus*—a more substantial fruit of his genius and his labours than anything he has left. But the MS. of this treatise, after much pains had already been spent on it, was unaccountably lost at Nancy in 1872; and, though he hoped to be able speedily to reproduce the missing portion and finish the work, no material was left in a state fit for publication. What the nature of it would have been may be gathered from an essay on the "History and Future of Profit" in the *Fortnightly Review* for November 1881, which is believed to have been in substance an extract from it.

That he was able to do so much may well be a subject of wonder when it is known that his labours had long been impeded by a painful and depressing malady, from which he suffered severely at intervals, whilst he never felt secure from its recurring attacks. To this disease he in the end succumbed at Belfast, on the 27th of January 1882.

Leslie's work may be distributed under two heads, that of applied political economy and that of discussion on the philosophical method of the science. The *Land Systems* belonged principally to the former division. The author perceived the great and growing importance for the social welfare of both Ireland and England of what is called "the land question," and treated it in this volume at once with breadth of view and with a rich variety of illustrative detail. His general purpose was to show that the territorial systems of both countries were so encumbered with elements of feudal origin as to be altogether unfitted to serve the purposes of a modern industrial society. The policy he recommended is summed up in the following list of requirements, "a simple jurisprudence relating to land, a law of equal intestate succession, a prohibition of entail, a legal security for tenants' improvements, an open registration of title and transfer and a considerable number of peasant properties." The volume is full of practical good sense, and exhibits a thorough knowledge of home and foreign agricultural economy; and in the handling of the subject is everywhere shown the special power which its author possessed of making what he wrote interesting as well as instructive. The way in which sagacious observation and shrewd comment are constantly intermingled in the discussion not seldom reminds us of Adam Smith, whose manner was more congenial to Leslie than the abstract and arid style of Ricardo.

But what, more than anything else, marks him as an original thinker and gives him a place apart among contemporary economists, is his exposition and defence of the historical method in political economy. Both at home and abroad there has for some time existed a profound and growing dissatisfaction with the method and many of the doctrines of the hitherto dominant school, which, it is alleged, under a "fictitious completeness, symmetry and exactness" disguises a real hollowness and discordance with fact. It is urged that the attempt to deduce the economic phenomena of a society from the so-called universal principle of "the desire of wealth" is illusory, and that they cannot be fruitfully studied apart from the general social conditions and historic development of which they are the outcome. Of this movement of thought Leslie was the principal representative, if not the originator, in England. There is no doubt, for he has himself placed it on record, that the first influence which impelled him in the direction of the historical method was that of Sir Henry Maine, by whose personal teaching of jurisprudence, as well as by the example of his writings, he was led "to look at the present economic structure and state of society as the result of a long evolution." The study of those German economists who represent similar tendencies doubtless confirmed him in the new line of thought on which he had entered, though he does not seem to have been further indebted to any of them except, perhaps, in some small degree to Roscher. And the writings of Comte, whose "prodigious genius," as exhibited in the *Philosophie Positive*, he admired and proclaimed, though he did not accept his system as a whole, must have powerfully co-operated to form in him the habit of regarding economic science as only a single branch of sociology, which should always be kept in close relation to the others. The earliest writing in which Leslie's revolt against the so-called "orthodox school" distinctly appears is his *Essay on Wages*, which was first published in 1868 and was reproduced as an appendix to the volume on *Land Tenures*. In this, after exposing the inanity of the theory of the wage-fund, and showing the utter want of agreement between its results and the observed phenomena, he concludes by declaring that "political economy must be content to take rank as an inductive, instead of a purely deductive science," and that, by this change of character, "it will gain in utility, interest and real truth far more than a full compensation for the forfeiture of a fictitious title to mathematical exactness and certainty." But it is in the essays collected in the volume of 1879 that his attitude in relation to the question of method is most decisively marked. In one of these, on "the political economy of Adam Smith," he exhibits in a very interesting way the co-existence in the *Wealth of Nations* of historical-inductive investigation in the manner of Montesquieu with a priori speculation founded on theologico-metaphysical bases, and points out the error of ignoring the former element, which is the really characteristic feature of Smith's social philosophy, and places him in strong contrast with his *soi-disant* followers of the school of Ricardo. The essay, however, which contains the most brilliant polemic against the "orthodox school," as well as the most luminous account and the most powerful vindication of the new direction, was that of which we have above spoken as having first appeared in *Hermathena*. It may be recommended as supplying the best extant presentation of one of the two contending views of economic method. On this essay mainly rests the claim of Leslie to be regarded as the founder and first head of the English historical school of political economy. Those who share his views on the philosophical constitution of the science regard the work he did, notwithstanding its unsystematic character, as in reality the most important done by any English economists in the latter half of the 19th century. But even the warmest partisans of the older school acknowledge that he did excellent service by insisting on a kind of inquiry, previously too much neglected, which was of the highest interest and value, in whatever relation it might be supposed to stand to the establishment of economic truth. The members of both groups alike recognized his great learning, his patient and conscientious habits of investigation and the large social spirit in which he treated the problems of his science. (J. K. I.)

LESLIE, a police burgh of Fifeshire, Scotland. Pop. (1901) 3587. It lies on the Leven, the vale of which is overlooked by the town, 4 m. W. of Markinch by the North British railway. The industries include paper-making, flax-spinning, bleaching and linen-weaving. The old church claims to be the "Christ's Kirk on the Green" of the ancient ballads of that name. A stone on the Green, called the Bull Stone, is said to have been used when bull-baiting was a popular pastime. Leslie House, the seat of the earl of Rothes, designed by Sir William Bruce, rivalled Holyrood in magnificence. It was noted for its tapestry and its gallery of family portraits and other pictures, including a portrait of Rembrandt by himself. Daniel Defoe considered its park the glory of the kingdom. The mansion sustained serious damage from fire in 1763. Norman Leslie, master of Rothes, was concerned in the killing of Cardinal Beaton (1546), and the dagger with which John Leslie, Norman's uncle, struck the fatal blow is preserved in Leslie House.

Markinch (pop. 1400), a police burgh situated between Conland Burn and the Leven, 7¼ m. N. by E. of Kirkcaldy by the North British railway, is a place of great antiquity. A cell of the Culdees was established here by one of the last of the Celtic bishops, the site of which may possibly be marked by the ancient cross of Balgonie. Markinch is also believed to have been a residence of the earlier kings, where prior to the 11th century they occasionally administered justice; and in the reign of William the Lion (d. 1214) the warrantors of goods alleged to have been stolen were required to appear here. Its industries comprise bleaching, flax-spinning, paper-making, distilling and coal-mining. Balgonie Castle, close by, the keep of which is 80 ft. high, was a residence of Alexander Leslie, the first earl of Leven, and at Balfour Castle were born Cardinal Beaton and his uncle and nephew the archbishops of Glasgow.

LESPINASSE, JEANNE JULIE ÉLÉONORE DE (1732–1776), French author, was born at Lyons on the 9th of November 1732. A natural child of the comtesse d'Albon, she was brought up as the daughter of Claude Lespinasse of Lyons. On leaving her convent school she became governess in the house of her mother's legitimate daughter, Mme de Vichy, who had married the brother of the marquise du Deffand. Here Mme du Deffand made her acquaintance, and, recognizing her extraordinary gifts, persuaded her to come to Paris as her companion. The alliance lasted ten years (1754–1764) until Mme du Deffand became jealous of the younger woman's increasing influence, when a violent quarrel ensued. Mlle de Lespinasse set up a salon of her own which was joined by many of the most brilliant members of Mme du Deffand's circle. D'Alembert was one of the most assiduous of her friends and eventually came to live under the same roof. There was no scandal attached to this arrangement, which ensured d'Alembert's comfort and lent influence to Mlle de Lespinasse's salon. Although she had neither beauty nor rank, her ability as a hostess made her reunions the most popular in Paris. She owes her distinction, however, not to her social success, but to circumstances which remained a secret during her lifetime from her closest friends. Two volumes of *Lettres* published in 1809 displayed her as the victim of a passion of a rare intensity. In virtue of this ardent, intense quality Sainte Beuve and other of her critics place her letters in the limited category to which belong the Latin letters of Héloïse and those of the Portuguese Nun. Her first passion, a reasonable and serious one, was for the marquis de Mora, son of the Spanish ambassador in Paris. De Mora had come to Paris in 1765, and with some intervals remained there until 1772 when he was ordered to Spain for his health. On the way to Paris in 1774 to fulfil promises exchanged with Mlle de Lespinasse, he died at Bordeaux. But her letters to the comte de Guibert, the worthless object of her fatal infatuation, begin from 1773. From the struggle between her affection for de Mora and her blind passion for her new lover they go on to describe her partial disenchantment on Guibert's marriage and her final despair. Mlle de Lespinasse died on the 23rd of May 1776, her death being apparently hastened by the agitation and misery to which she had been for the last three years of her life a prey. In addition to the *Lettres* she was the author of two chapters intended as a kind of sequel to Sterne's *Sentimental Journey*.

Her *Lettres* . . . were published by Mme de Guibert in 1809 and a spurious additional collection appeared in 1820. Among modern editions may be mentioned that of Eugène Asse (1876–1877). *Lettres inédites de Mademoiselle de Lespinasse à Condorcet, à D'Alembert, à Guibert, au comte de Crillon*, edited by M. Charles Henry (1887), contains copies of the documents available for her biography. Mrs Humphry Ward's novel, *Lady Rose's Daughter*, owes something to the character of Mlle de Lespinasse.

LES SABLES D'OLONNE, a seaport of western France, capital of an arrondissement of the department of Vendée, on an inlet of the Atlantic seaboard, 23 m. S.W. of La Roche-sur-Yon by rail. Pop. (1906) 11,847. The town stands between the sea on the south and the port on the north, while on the west it is separated by a channel from the suburb of La Chaume, built at the foot of a range of dunes 65 ft. high, which terminates southwards in the rocky peninsula of L'Aiguille. The beautiful smoothly sloping beach, 1 m. in length, is much frequented by bathers. To the north of Sables extend salt-marshes and oyster-parks, yielding 6,000,000 to 8,000,000 oysters per annum. Sables has a church built in the Late Gothic style towards the middle of the 17th century. The port, consisting of a tidal basin and a wet-dock, is accessible to vessels of 2000 tons, but is dangerous when the winds are from the south-west. The lighthouse of Barges, a mile out at sea to the west, is visible for 17 to 18 nautical miles. The inhabitants are employed largely in sardine and tunny fishing; there are imports of coal, wood, petroleum and phosphates. Boat-building and sardine-preserving are carried on. The town has a sub-prefecture and a tribunal of first instance.

Founded by Basque or Spanish sailors, Sables was the first place in Poitou invaded by the Normans in 817. Louis XI., who went there in 1472, granted the inhabitants various privileges, improved the harbour, and fortified the entrance. Captured and recaptured during the Wars of Religion, the town afterwards became a nursery of hardy sailors and privateers, who harassed the Spaniards and afterwards the English. In 1696 Sables was bombarded by the combined fleets of England and Holland. In the middle of the 18th century hurricanes caused grievous damage to town and harbour.

LES SAINTES-MARIES, a coast village of south-eastern France in the department of Bouches-du-Rhône, 24 m. S.S.W. of Arles by rail. Pop. (1906) 544. Saintes-Maries is situated in the plain of the Camargue, 1½ m. E. of the mouth of the Petit-Rhône. It is the object of an ancient and famous pilgrimage due to the tradition that Mary, sister of the Virgin, and Mary, mother of James and John, together with their black servant Sara, Lazarus, Martha, Mary Magdalen and St Maximin fled thither to escape persecution in Judaea. The relics of the two Maries, who are said to have been buried at Saintes-Maries, are bestowed in the upper storey of the apse of the fortress-church, a remarkable building of the 12th century with crenelated and machicolated walls. Two festivals are held in the town, a less important one in October, the other, on the 24th and 25th of May, unique for its gathering of gipsies who come in large numbers to do honour to the tomb of their patroness Sara, contained in the crypt below the apse.

LESSE, one of the most romantic of the smaller rivers of Belgium. It rises at Ochamps in the Ardennes, and flowing in a north-westerly course reaches the Meuse at Anseremme, a few miles above Dinant. The river is only 49 m. long, but its meandering course may be judged by the fact that it is no more than 29 m. from Ochamps to Anseremme in a straight line. There is a good deal of pretty scenery along this river, as, for instance, at Ciergnon, but the most striking part of the valley is contained in the last 12 m. from Houyet to Anseremme. In this section the river is confined between opposing walls of cliff ranging from 300 to 500 ft. above the river. Here were discovered in the caves near Walzin the bones of prehistoric men, and other evidence of the primitive occupants of this globe at a period practically beyond computation. Another curious natural feature of the Lesse is that on reaching the hill of Han it disappears underground, reappearing about 1 m. farther on at the village of that name. Here are the curious and interesting Han grottoes. The Lesse receives altogether in its short course the water of thirteen tributaries.

LESSEPS, FERDINAND DE (1805–1894). French diplomatist and maker of the Suez Canal, was born at Versailles on the 19th of November 1805. The origin of his family has been traced back as far as the end of the 14th century. His ancestors, it is believed, came from Scotland, and settled at Bayonne when that region was occupied by the English. One of his great-grandfathers was town clerk and at the same time secretary to Queen Anne of Neuberg, widow of Charles II. of Spain, exiled to Bayonne after the accession of Philip V. From the middle of the 18th century the ancestors of Ferdinand de Lesseps followed the diplomatic career, and he himself occupied with real distinction several posts in the same calling from 1825 to 1849. His uncle was ennobled by King Louis XVI., and his father was made a count by Napoleon I. His father, Mathieu de Lesseps (1774–1832), was in the consular service; his mother, Catherine de Grivégnée, was Spanish, and aunt of the countess of Montijo, mother of the empress Eugénie. His first years were spent in Italy, where his father was occupied with his consular duties. He was educated at the College of Henry IV. in Paris. From the age of 18 years to 20 he was employed in the commissary department of the army. From 1825 to 1827 he acted as assistant vice-consul at Lisbon, where his uncle, Barthélemy de Lesseps, was the French chargé d'affaires. This uncle was an old companion of La Pérouse and a survivor of the expedition in which that navigator perished. In 1828 Ferdinand was sent as an assistant vice-consul to Tunis, where his father was consul-general. He courageously aided the escape of Youssouff, pursued by the soldiers of the bey, of whom he was one of the officers, for violation of the seraglio law. Youssouff acknowledged this protection given by a Frenchman by distinguishing himself in the ranks of the French army at the time of the conquest of Algeria. Ferdinand de Lesseps was also entrusted by his father with missions to Marshal Count Clausel, general-in-chief of the army of occupation in Algeria. The marshal wrote to Mathieu de Lesseps on the 18th of December 1830: "I have had the pleasure of meeting your son, who gives promise of sustaining with great credit the name he bears." In 1832 Ferdinand de Lesseps was appointed vice-consul at Alexandria. To the placing in quarantine of the vessel which took him to Egypt is due the origin of his great conception of a canal across the isthmus of Suez. In order to help him to while away the time at the lazaretto, M. Mimaut, consul-general of France at Alexandria, sent him several books, among which was the memoir written upon the Suez Canal, according to Bonaparte's instructions, by the civil engineer Lapère, one of the scientific members of the French expedition. This work struck de Lesseps's imagination, and gave him the idea of piercing the African isthmus. This idea, moreover, was conceived in circumstances that were to prepare the way for its realization. Mehemet Ali, who was the viceroy of Egypt, owed his position, to a certain extent, to the recommendations made in his behalf to the French government by Mathieu de Lesseps, who was consul-general in Egypt when Mehemet Ali was a simple colonel. The viceroy therefore welcomed Ferdinand affectionately, while Said Pacha, Mehemet's son, began those friendly relations that he did not forget later, when he gave him the concession for making the Suez Canal. In 1833 Ferdinand de Lesseps was sent as consul to Cairo, and soon afterwards given the management of the consulate-general at Alexandria, a post that he held until 1837. While he was there a terrible epidemic of the plague broke out and lasted for two years, carrying off more than a third of the inhabitants of Cairo and Alexandria. During this time he went from one city to the other, according as the danger was more pressing, and constantly displayed an admirable zeal and an imperturbable energy. Towards the close of the year 1837 he returned to France, and on the 21st of December married Mlle Agathe Delamalle, daughter of the government prosecuting attorney at the court of Angers. By this marriage M. de Lesseps became the father of five sons. In 1839 he was appointed consul at Rotterdam, and in the following year transferred to Malaga, the place of origin of his mother's family. In 1842 he was sent to Barcelona, and soon afterwards promoted to the grade of consul-general. In the course of a bloody insurrection in Catalonia, which ended in the bombardment of Barcelona, Ferdinand de Lesseps showed the most persistent bravery, rescuing from death, without distinction, the men belonging to the rival factions, and protecting and sending away not only the Frenchmen who were in danger, but foreigners of all nationalities. From 1848 to 1849 he was minister of France at Madrid. In the latter year the government of the French Republic confided to him a mission to Rome at the moment when it was a question whether the expelled pope would return to the Vatican with or without bloodshed. Following his interpretation of the instructions he had received, de Lesseps began negotiations with the existing government at Rome, according to which Pius IX. should peacefully re-enter the Vatican and the independence of the Romans be assured at the same time. But while he was negotiating, the elections in France had caused a change in the foreign policy of the government. His course was disapproved; he was recalled and brought before the council of state, which blamed his conduct without giving him a chance to justify himself. Rome, attacked by the French army, was taken by assault after a month's sanguinary siege. M. de Lesseps then retired from the diplomatic service, and never afterwards occupied any public office. In 1853 he lost his wife and daughter at a few days' interval. Perhaps his energy would not have been sufficient to sustain him against these repeated blows of destiny if, in 1854, the accession to the viceroyalty of Egypt of his old friend, Said Pacha, had not given a new impulse to the ideas that had haunted him for the last twenty-two years concerning the Suez Canal. Said Pacha invited M. de Lesseps to pay him a visit, and on the 7th of November 1854 he landed at Alexandria; on the 30th of the same month Said Pacha signed the concession authorizing M. de Lesseps to pierce the isthmus of Suez.

A first scheme, indicated by him, was immediately drawn out by two French engineers who were in the Egyptian service, MM. Linant Bey and Mougel Bey. This project, differing from others that had been previously presented or that were in opposition to it, provided for a direct communication between the Mediterranean and the Red Sea. After being slightly modified, the plan was adopted in 1856 by an international commission of civil engineers to which it had been submitted. Encouraged by this approval, de Lesseps no longer allowed anything to stop him. He listened to no adverse criticism and receded before no obstacle. Neither the opposition of Lord Palmerston, who considered the projected disturbance as too radical not to endanger the commercial position of Great Britain, nor the opinions entertained, in France as well as in England, that the sea in front of Port Said was full of mud which would obstruct the entrance to the canal, that the sands from the desert would fill the trenches—no adverse argument, in a word, could dishearten Ferdinand de Lesseps. His faith made him believe that his adversaries were in the wrong; but how great must have been this faith, which permitted him to undertake the work at a time when mechanical appliances for the execution of such an undertaking did not exist, and when for the utilization of the proposed canal there was as yet no steam mercantile marine! Impelled by his convictions and talent, supported by the emperor Napoleon III. and the empress Eugénie, he succeeded in rousing the patriotism of the French and obtaining by their subscriptions more than half of the capital of two hundred millions of francs which he needed in order to form a company. The Egyptian government subscribed for eighty millions' worth of shares. The company was organized at the end of 1858. On the 25th of April 1859 the first blow of the pickaxe was given by Lesseps at Port Said, and on the 17th of November 1869 the canal was officially opened by the Khedive, Ismail Pacha (see SUEZ CANAL). While in the interests of his canal Lesseps had resisted the opposition of British diplomacy to an enterprise which threatened to give to France control of the shortest route to India, he acted loyally towards Great Britain after Lord Beaconsfield had acquired the Suez shares belonging to the Khedive, by frankly admitting to the board of directors of the company three representatives of the British government. The consolidation of interests which resulted, and which has been developed by the addition in 1884 of seven other British directors, chosen from among shipping merchants and business men, has augmented, for the benefit of all concerned, the commercial character of the enterprise.

Ferdinand de Lesseps steadily endeavoured to keep out of politics. If in 1869 he appeared to deviate from this principle by being a candidate at Marseilles for the Corps Législatif, it was because he yielded to the entreaties of the Imperial government in order to strengthen its goodwill for the Suez Canal. Once this goodwill had been shown, he bore no malice towards those who rendered him his liberty by preferring Gambetta. He afterwards declined the other candidatures that were offered him: for the Senate in 1876, and for the Chamber in 1877. In 1873 he became interested in a project for uniting Europe and Asia by a railway to Bombay, with a branch to Peking. He subsequently encouraged Major Roudaire, who wished to transform the Sahara desert into an inland sea. The king of the Belgians having formed an International African Society, de Lesseps accepted the presidency of the French committee, facilitated M. de Brazza's explorations, and acquired stations that he subsequently abandoned to the French government. These stations were the starting-point of French Congo. In 1879 a congress assembled in the rooms of the Geographical Society at Paris, under the presidency of Admiral de la Roncière le Noury, and voted in favour of the making of the Panama Canal. Public opinion, it may be declared, designated Ferdinand de Lesseps as the head of the enterprise. It was upon that occasion that Gambetta bestowed upon him the title of *Le Grand Français*. He was not a man to shirk responsibility, and notwithstanding that he had reached the age of 74, he undertook to carry out the Panama Canal project (see PANAMA CANAL and FRANCE: *History*). Politics, which de Lesseps had always avoided, was his greatest enemy in this matter. The winding-up of the Panama Company having been declared in the month of December 1888, the adversaries of the French Republic, seeking for a scandal that would imperil the government, hoped to bring about the prosecution of the directors of the Panama Company. Their attacks were so vigorously made that the government was obliged, in self-defence, to have judicial proceedings taken against Ferdinand de Lesseps, his son Charles (b. 1849) and his co-workers Fontane and Cottu. Charles de Lesseps, a victim offered to the fury of the politicians, tried to divert the storm upon his head and prevent it from reaching his father. He managed to draw down upon himself alone the burden of the condemnations pronounced. One of the consequences of the persecutions of which he was the object was to oblige him to spend three years, from 1896 to 1899, in England, where his participation in the management of the Suez Canal had won for him some strong friendships, and where he was able to see the great respect in which the memory and name of his father were held by Englishmen.

Ferdinand de Lesseps died at La Chenaie on the 7th of December 1894. He had contracted a second marriage in 1869 with Mlle Autard de Bragard, daughter of a former magistrate of Mauritius; and eleven out of twelve children of this marriage survived him. M. de Lesseps was a member of the French Academy, of the Academy of Sciences, of numerous scientific societies, Grand Cross of the Legion of Honour and of the Star of India, and had received the freedom of the City of London. According to some accounts he was unconscious of the disastrous events that took place during the closing months of his life. Others report that, feeling himself powerless to scatter the gathered clouds, and aware of his physical feebleness, he had had the moral courage to pass in the eyes of his family, which he did not wish to afflict, as the dupe of the efforts they employed to conceal the truth from him. This last version would not be surprising if we relied upon the following portrait, sketched by a person who knew him intimately:—"Simple in his tastes, never thinking of himself, constantly preoccupied about others, supremely kind, he did not and would not recognize such a thing as evil. Of a confiding nature, he was inclined to judge others by himself. This naturally affectionate abandonment that every one felt in him had procured him profound attachments and rare devotions. He showed, while making the Suez Canal, what a gift he possessed for levying the pacific armies he conducted. He set duty above everything, had in the highest degree a reverence for honour, and placed his indomitable courage at the service of everything that was beneficial with an abnegation that nothing could tire. His marvellous physical and moral equilibrium gave him an evenness of temper which always rendered his society charming. Whatever his cares, his work or his troubles, I have never noticed in him aught but generous impulses and a love of humanity carried even to those heroic imprudences of which they alone are capable who devote themselves to the amelioration of humanity." No doubt this eulogy requires some reservations. The striking and universal success which crowned his work on the Suez Canal gave him an absoluteness of thought which brooked no contradiction, a despotic temper before which every one must bow, and against which, when he had once taken a resolution, nothing could prevail, not even the most authoritative opposition or the most legitimate entreaties. He had resolved to construct the Panama Canal without locks, to make it an uninterrupted navigable way. All attempts to dissuade him from this resolution failed before his tenacious will. At his advanced age he went with his youngest child to Panama to see with his own eyes the field of his new enterprise. He there beheld the Culebra and the Chagres; he saw the mountain and the stream, those two greatest obstacles of nature that sought to bar his route. He paid no heed to them, but began the struggle against the Culebra and the Chagres. It was against them that was broken his invincible will, sweeping away in the defeat the work of Panama, his own fortune, his fame and almost an atom of his honour. But this atom, only grazed by calumny, has already been restored to him by posterity, for he died poor, having been the first to suffer by the disaster to his illusions. Political agitators, in order to sap the power of the Opportunist party, did not hesitate to drag in the mud one of the greatest citizens of France. But when the Panama "scandal" has been forgotten, for centuries to come the traveller in saluting the statue of Ferdinand de Lesseps at the entrance of the Suez Canal will pay homage to one of the most powerful embodiments of the creative genius of the 19th century.

See G. Barnett Smith, *The Life and Enterprises of Ferdinand de Lesseps* (London, 1893); and *Souvenirs de quarante ans*, by Ferdinand de Lesseps (trans. by C. B. Pitman). (DE B.)

LESSING, GOTTHOLD EPHRAIM (1729–1781), German critic and dramatist, was born at Kamenz in Upper Lusatia (Oberlausitz), Saxony, on the 22nd of January 1729. His father, Johann Gottfried Lessing, was a clergyman, and, a few years after his son's birth, became *pastor primarius* or chief pastor of Kamenz. After attending the Latin school of his native town, Gotthold was sent in 1741 to the famous school of St Afra at Meissen, where he made such rapid progress, especially in classics and mathematics, that, towards the end of his school career, he was described by the rector as "a steed that needed double fodder." In 1746 he entered the university of Leipzig as a theological student. The philological lectures of Johann Friedrich Christ (1700–1756) and Johann August Ernesti (1707–1781) proved, however, more attractive than those on theology, and he attended the philosophical disputations presided over by his friend A. G. Kästner, professor of mathematics and also an epigrammatist of repute. Among Lessing's chief friends in Leipzig were C. F. Weisse (1726–1804) the dramatist, and Christlob Mylius (1722–1754), who had made some name for himself as a journalist. He was particularly attracted by the theatre then directed by the talented actress Karoline Neuber (1697–1760), who had assisted Gottsched in his efforts to bring the German stage into touch with literature. Frau Neuber even accepted for performance Lessing's first comedy, *Der junge Gelehrte* (1748), which he had begun at school. His father naturally did not approve of these new interests and acquaintances, and summoned him home. He was only allowed to return to Leipzig on the condition that he would devote himself to the study of medicine. Some medical lectures he did attend, but as long as Frau Neuber's company kept together the theatre had an irresistible fascination for him.

In 1748, however, the company broke up, and Lessing, who had allowed himself to become surety for some of the actors' debts, was obliged to leave Leipzig too, in order to escape their creditors. He went to Wittenberg, and afterwards, towards the end of the year, to Berlin, where his friend Mylius had established himself as a journalist. In Berlin Lessing now spent three years, maintaining himself chiefly by literary work. He translated three volumes of Charles Rollin's *Histoire ancienne*, wrote several plays—*Der Misogyn, Der Freigeist, Die Juden*—and in association with Mylius, began the *Beiträge zur Historie und Aufnahme des Theaters* (1750), a periodical—which soon came to an end—for the discussion of matters connected with the drama. Early in 1751 he became literary critic to the *Vossische Zeitung*, and in this position laid the foundation for his reputation as a reviewer of learning, judgment and wit. At the end of 1751 he was in Wittenberg again, where he spent about a year engaged in unremitting study and research. He then returned to Berlin with a view to making literature his profession; and the next three years were among the busiest of his life. Besides translating for the booksellers, he issued several numbers of the *Theatralische Bibliothek*, a periodical similar to that which he had begun with Mylius; he also continued his work as critic to the *Vossische Zeitung*. In 1754 he gave a particularly brilliant proof of his critical powers in his *Vademecum für Herrn S. G. Lange*; as a retort to that writer's overbearing criticism, Lessing exposed with scathing satire Lange's errors in his popular translation of Horace.

By 1753 Lessing felt that his position was sufficiently assured to allow of him issuing an edition of his collected writings (*Schriften*, 6 vols., 1753–1755). They included his lyrics and epigrams, most of which had already appeared during his first residence in Berlin in a volume of *Kleinigkeiten*, published anonymously. Much more important were the papers entitled *Rettungen*, in which he undertook to vindicate the character of various writers—Horace and writers of the Reformation period, such as Cochlaeus and Cardanus—who had been misunderstood or falsely judged by preceding generations. The *Schriften* also contained Lessing's early plays, and one new one, *Miss Sara Sampson* (1755). Hitherto Lessing had, as a dramatist, followed the methods of contemporary French comedy as cultivated in Leipzig; *Miss Sara Sampson*, however, marks the beginning of a new period in the history of the German drama. This play, based more or less on Lillo's *Merchant of London*, and influenced in its character-drawing by the novels of Richardson, is the first *bürgerliches Trauerspiel*, or "tragedy of common life" in German. It was performed for the first time at Frankfort-on-Oder in the summer of 1755, and received with great favour. Among Lessing's chief friends during his second residence in Berlin were the philosopher Moses Mendelssohn (1729–1786), in association with whom he wrote in 1755 an admirable treatise, *Pope ein Metaphysiker!* tracing sharply the lines which separate the poet from the philosopher. He was also on intimate terms with C. F. Nicolai (1733–1811), a Berlin bookseller and rationalistic writer, and with the "German Horace" K. W. Ramler (1725–1798); he had also made the acquaintance of J. W. L. Gleim (1719–1803), the Halberstadt poet, and E. C. von Kleist (1715–1759), a Prussian officer, whose fine poem, *Der Frühling*, had won for him Lessing's warm esteem.

In October 1755 Lessing settled in Leipzig with a view to devoting himself more exclusively to the drama. In 1756 he accepted the invitation of Gottfried Winkler, a wealthy young merchant, to accompany him on a foreign tour for three years. They did not, however, get beyond Amsterdam, for the outbreak of the Seven Years' War made it necessary for Winkler to return home without loss of time. A disagreement with his patron shortly after resulted in Lessing's sudden dismissal; he demanded compensation and, although in the end the court decided in his favour, it was not until the case had dragged on for about six years. At this time Lessing began the study of medieval literature to which attention had been drawn by the Swiss critics, Bodmer and Breitinger, and wrote occasional criticisms for Nicolai's *Bibliothek der schönen Wissenschaften*. In Leipzig Lessing had also an opportunity of developing his friendship with Kleist who happened to be stationed there. The two men were mutually attracted, and a warm affection sprang up betweem them. In 1758 Kleist's regiment being ordered to new quarters, Lessing decided not to remain behind him and returned again to Berlin. Kleist was mortally wounded in the following year at the battle of Kunersdorf.

Lessing's third residence in Berlin was made memorable by the *Briefe, die neueste Literatur betreffend* (1759–1765), a series of critical essays—written in the form of letters to a wounded officer—on the principal books that had appeared since the beginning of the Seven Years' War. The scheme was suggested by Nicolai, by whom the *Letters* were published. In Lessing's share in this publication, his critical powers and methods are to be seen at their best. He insisted especially on the necessity of truth to nature in the imaginative presentation of the facts of life, and in one letter he boldly proclaimed the superiority of Shakespeare to Corneille, Racine and Voltaire. At the same time he marked the immutable conditions to which even genius must submit if it is to succeed in its appeal to our sympathies. While in Berlin at this time, he edited with Ramler a selection from the writings of F. von Logau, an epigrammatist of the 17th century, and introduced to the German public the *Lieder eines preussischen Grenadiers*, by J. W. L. Gleim. In 1759 he published *Philotas*, a prose tragedy in one act, and also a complete collection of his fables, preceded by an essay on the nature of the fable. The latter is one of his best essays on criticism, defining with perfect lucidity what is meant by "action" in works of the imagination, and distinguishing the action of the fable from that of the epic and the drama.

In 1760, feeling the need of some change of scene and work, Lessing went to Breslau, where he obtained the post of secretary to General Tauentzien, to whom Kleist had introduced him in Leipzig. Tauentzien was not only a general in the Prussian army, but governor of Breslau, and director of the mint. During the four years which Lessing spent in Breslau, he associated chiefly with Prussian officers, went much into society, and developed a dangerous fondness for the gaming table. He did not, however, lose sight of his true goal; he collected a large library, and, after the conclusion of the Seven Years' War, in 1763, he resumed more enthusiastically than ever the studies which had been partially interrupted. He investigated the early history of Christianity and penetrated more deeply than any contemporary thinker into the significance of Spinoza's philosophy. He also found time for the studies which were ultimately to appear in the volume entitled *Laokoon*, and in fresh spring mornings he sketched in a garden the plan of *Minna von Barnhelm*.

After resigning his Breslau appointment in 1765, he hoped for a time to obtain a congenial appointment in Dresden, but nothing came of this and he was again compelled, much against his will, to return to Berlin. His friends there exerted themselves to obtain for him the office of keeper of the royal library, but Frederick had not forgotten Lessing's quarrel with Voltaire, and declined to consider his claims. During the two years which Lessing now spent in the Prussian capital, he was restless and unhappy, yet it was during this period that he published two of his greatest works, *Laokoon, oder über die Grenzen der Malerei und Poesie* (1766) and *Minna von Barnhelm* (1767). The aim of *Laokoon*, which ranks as a classic, not only in German but in European literature, is to define by analysis the limitations of poetry and the plastic arts. Many of his conclusions have been corrected and extended by later criticism; but he indicated more decisively than any of his predecessors the fruitful principle that each art is subject to definite conditions, and that it can accomplish great results only by limiting itself to its special function. The most valuable parts of the work are those which relate to poetry, of which he had a much more intimate knowledge than of sculpture and painting. His exposition of the methods of Homer and Sophocles is especially suggestive, and he may be said to have marked an epoch in the appreciation of these writers, and of Greek literature generally. The power of *Minna von Barnhelm*, Lessing's greatest drama, was also immediately recognized. Tellheim, the hero of the comedy, is an admirable study of a manly and sensitive soldier, with somewhat exaggerated ideas of conventional honour; and Minna, the heroine, is one of the brightest and most attractive figures in German comedy. The subordinate characters are conceived with even more force and vividness; and the plot, which reflects precisely the struggles and aspirations of the period that immediately followed the Seven Years' War, is simply and naturally unfolded.

In 1767 Lessing settled in Hamburg, where he had been invited to take part in the establishment of a national theatre. The scheme promised well, and, as he associated himself with Johann Joachim Christoph Bode (1730–1793), a literary man whom he respected, in starting a printing establishment, he hoped that he might at last look forward to a peaceful and prosperous career. The theatre, however, was soon closed, and the printing establishment failed, leaving behind it a heavy burden of debt. In despair, Lessing determined towards the end of his residence in Hamburg to quit Germany, believing that in Italy he might find congenial labour that would suffice for his wants. The *Hamburgische Dramaturgie* (1767–1768), Lessing's commentary on the performances of the National Theatre, is the first modern handbook of the dramatist's art. By his original interpretation of Aristotle's theory of tragedy, he delivered German dramatists from the yoke of the classic tragedy of France, and directed them to the Greek dramatists and to Shakespeare. Another result of Lessing's labours in Hamburg was the *Antiquarische Briefe* (1768), a series of masterly letters in answer to Christian Adolf Klotz (1738–1771), a professor of the university of Halle, who, after flattering Lessing, had attacked him, and sought to establish a kind of intellectual despotism by means of critical journals which he directly or indirectly controlled. In connexion with this controversy Lessing wrote his brilliant little treatise, *Wie die Alten den Tod gebildet* (1769), contrasting the medieval representation of death as a skeleton with the Greek conception of death as the twin-brother of sleep.

Instead of settling in Italy, as he intended, Lessing accepted in 1770 the office of librarian at Wolfenbüttel, a post which was offered to him by the hereditary prince of Brunswick. In this position he passed his remaining years. For a time he was not unhappy, but the debts which he had contracted in Hamburg weighed heavily on him, and he missed the society of his friends; his health, too, which had hitherto been excellent, gradually gave way. In 1775 he travelled for nine months in Italy with Prince Leopold of Brunswick, and in the following year he married Eva König, the widow of a Hamburg merchant, with whom he had been on terms of intimate friendship. But their happiness lasted only for a brief period; in 1778 she died in childbed.

Soon after settling in Wolfenbüttel, Lessing found in the library the manuscript of a treatise by Berengarius of Tours on transubstantiation in reply to Lanfranc. This was the occasion of Lessing's powerful essay on Berengarius, in which he vindicated the latter's character as a serious and consistent thinker. In 1771 he published his *Zerstreute Anmerkungen über das Epigramm, und einige der vornehmsten Epigrammatisten*—a work which Herder described as "itself an epigram." Lessing's theory of the origin of the epigram is somewhat fanciful, but no other critic has offered so many pregnant hints as to the laws of epigrammatic verse, or defended with so much force and ingenuity the character of Martial. In 1772 he published *Emilia Galotti*, a tragedy which he had begun many years before in Leipzig. The subject was suggested by the Roman legend of Virginia, but the scene is laid in an Italian court, and the whole play is conceived in the spirit of the "tragedy of common life." Its defect is that its tragic conclusion does not seem absolutely inevitable, but the characters—especially those of the Gräfin Orsina and Marinelli, the prince of Guastalla's chamberlain who weaves the intrigue from which Emilia escapes by death, are powerfully drawn. Having completed *Emilia Galotti*, which the younger generation of playwrights at once accepted as a model, Lessing occupied himself for some years almost exclusively with the treasures of the Wolfenbüttel library. The results of these researches he embodied in a series of volumes, *Zur Geschichte und Literatur*, the first being issued in 1773, the last in the year of his death.

The last period of Lessing's life was devoted chiefly to theological controversy. H. S. Reimarus (1694–1768), professor of oriental languages in Hamburg, who commanded general respect as a scholar and thinker, wrote a book entitled *Apologie oder Schutzschrift für die vernünftigen Verehrer Gottes*. His standpoint was that of the English deists, and he investigated, without hesitation, the evidence for the miracles recorded in the Bible. The manuscript of this work was, after the author's death, entrusted by his daughter to Lessing, who published extracts from it in his *Zur Geschichte und Literatur* in 1774–1778. These extracts, the authorship of which was not publicly avowed, were known as the *Wolfenbütteler Fragmente*. They created profound excitement among orthodox theologians, and evoked many replies, in which Lessing was bitterly condemned for having published writings of so dangerous a tendency. His most formidable assailant was Johann Melchior Goeze (1717–1786), the chief pastor of Hamburg, a sincere and earnest theologian, but utterly unscrupulous in his choice of weapons against an opponent. To him, therefore, Lessing addressed in 1778 his most elaborate answers—*Eine Parabel*, *Axiomata*, eleven letters with the title *Anti-Goeze*, and two pamphlets in reply to an inquiry by Goeze as to what Lessing meant by Christianity. These papers are not only full of thought and learning; they are written with a grace, vivacity and energy that make them hardly less interesting to-day than they were to Lessing's contemporaries. He does not undertake to defend the conclusions of Reimarus; his immediate object is to claim the right of free criticism in regard even to the highest subjects of human thought. The argument on which he chiefly relies is that the Bible cannot be considered necessary to a belief in Christianity, since Christianity was a living and conquering power before the New Testament in its present form was recognized by the church. The true evidence for what is essential in Christianity, he contends, is its adaptation to the wants of human nature; hence the religious spirit is undisturbed by the speculations of the boldest thinkers. The effect of this controversy was to secure wider freedom for writers on theology, and to suggest new problems regarding the growth of Christianity, the formation of the canon and the essence of religion. The Brunswick government having, in deference to the consistory, confiscated the *Fragments* and ordered Lessing to discontinue the controversy, he resolved, as he wrote to Elise Reimarus, to try "whether they would let him preach undisturbed from his old pulpit, the stage." In *Nathan der Weise*, written in the winter of 1778–1779, he gave poetic form to the ideas which he had already developed in prose. Its governing conception is that noble character may be associated with the most diverse creeds, and that there can, therefore, be no good reason why the holders of one sect of religious principles should not tolerate those who maintain wholly different doctrines. The play, which is written in blank verse, is too obviously a continuation of Lessing's theological controversy to rank high as poetry, but the representatives of the three religions—the Mahommedan Saladin, the Jew Nathan and the Christian Knight Templar—are finely conceived, and show that Lessing's dramatic instinct had, in spite of other interests, not deserted him. In 1780 appeared *Die Erziehung des Menschengeschlechts*, the first half of which he had published in 1777 with one of the *Fragments*. This work, composed a hundred brief paragraphs, was the last, and is one of the most suggestive of Lessing's writings. The doctrine on which its argument is based is that no dogmatic creed can be regarded as final, but that every historical religion had its share in the development of the spiritual life of mankind. Lessing also maintains that history reveals a definite law of progress, and that occasional retrogression may be necessary for the advance of the world towards its ultimate goal. These ideas formed a striking contrast to the principles both of orthodox and of sceptical writers in Lessing's day, and gave a wholly new direction to religious philosophy. Another work of Lessing's last years, *Ernst und Falk* (a series of five dialogues, of which the first three were published in 1777, the last two in 1780), also set forth many new points of view. Its nominal subject is freemasonry, but its real aim is to plead for a humane and charitable spirit in opposition to a narrow patriotism, an extravagant respect for rank, and exclusive devotion to any particular church.

Lessing's theological opinions exposed him to much petty persecution, and he was in almost constant straits for money. Nothing, however, broke his manly and generous spirit. To the end he was always ready to help those who appealed to him for aid, and he devoted himself with growing ardour to the search for truth. He formed many new plans of work, but in the course of 1780 it became evident to his friends that he would not be able much longer to continue his labours. His health had been undermined by excessive work and anxiety, and after a short illness he died at Brunswick on the 15th of February 1781. "We lose much in him," wrote Goethe after Lessing's death, "more than we think." It may be questioned whether there is any other writer to whom the Germans owe a deeper debt of gratitude. He was succeeded by poets and philosophers who gave Germany for a time the first place in the intellectual life of the world, and it was Lessing, as they themselves acknowledged, who prepared the way for their achievements. Without attaching himself to any particular system of philosophical doctrine, he fought error incessantly, and in regard to art, poetry and the drama and religion, suggested ideas which kindled the enthusiasm of aspiring minds, and stimulated their highest energies.

BIBLIOGRAPHY.—The first edition of Lessing's collected works, edited by his brother Karl Gotthelf Lessing (1740–1812), J. J. Eschenburg and F. Nicolai, appeared in 26 vols. between 1791 and 1794, as a continuation of the *Vermischte Schriften*, edited by Lessing himself in 4 vols. (1771–1785); the *Sämtliche Schriften*, edited by Karl Lachmann, were published in 13 vols. (1825–1828), this edition being subsequently re-edited by W. von Maltzahn (1853–1857) and by F. Muncker (21 vols., 1886 ff.), the last mentioned being the standard edition of Lessing's works. Other editions are *Lessings Werke*, published by Hempel, under the editorship of various scholars (23 vols., 1868–1877); an illustrated edition published by Grote in 8 vols. (1875, new ed., 1882); *Lessings Werke*, edited by R. Boxberger and H. Blümner, in Kürschner's *Deutsche Nationalliteratur*, vols. 58–71 (1883–1890). There are also many popular editions. Lessing's correspondence is included in the Lachmann editions and in that of Hempel (edited by C. C. Redlich, 1879; *Nachträge und Berichtigungen*, 1886); his correspondence with his wife was published as early as 1789 (2 vols., new edition by A. Schöne, 1885). The chief biographies of Lessing are by K. G. Lessing (his brother), (1793–1795, a reprint in Reclam's *Universalbibliothek*); by J. F. Schink (1825); T. W. Danzel and G. E. Guhrauer (1850–1853, 2nd ed. by W. von Maltzahn and R. Boxberger, 2 vols., 1880–1881); A. Stahr (2 vols., 1859, 9th ed., 1887); J. Sime, *Lessing, his Life and Works* (2 vols., 1877); H. Zimmern, *Lessing's Life and Works* (1878); H. Düntzer, *Lessings Leben* (1882); E. Schmidt, *Lessing, Geschichte seines Lebens und seiner Schriften* (2 vols., 1884–1892, 3rd ed., 1910)—this is the most complete biography; T. W. Rolleston, *Lessing* (in "Great Writers," 1889); K. Borinski, *Lessing* (2 vols., 1900). Cf. also C. Hebler, *Lessing-Studien* (1862); A. Lehmann, *Forschungen über Lessings Sprache* (1875); W. Cosack, *Materialien zu Lessings Hamburgischer Dramaturgie* (1876, 2nd ed., 1891); H. Blümner, *Lessings Laokoon* (1876, 2nd ed., 1880); H. Blümner, *Laokoon-Studien* (2 vols., 1881–1882); K. Fischer, *Lessing als Reformator der deutschen Literatur dargestellt* (2 vols., 1881, 2nd ed., 1888); B. A. Wagner, *Lessing-Forschungen* (1881); J. W. Braun, *Lessing im Urteile seiner Zeitgenossen* (2 vols., 1884); P. Albrecht, *Lessings Plagiate* (6 vols., 1890 ff.); K. Werder, *Vorlesungen über Lessings Nathan* (1892); G. Kettner, *Lessings Dramen im Lichte ihrer und unsrer Zeit* (1904). Translations of Lessing's *Dramatic Works* (2 vols., 1878), edited by E. Bell, and of *Laokoon, Dramatic Notes and the Representation of Death by the Ancients*, by E. C. Beasley and H. Zimmern (1 vol., 1879), will be found in Bohn's "Standard Library."

(J. SI.; J. G. R.)

LESSON (through Fr. *leçon* from Lat. *lectio*, reading; *legere*, to read), properly a certain portion of a book appointed to be read aloud, or learnt for repetition, hence anything learnt or studied, a course of instruction or study. A specific meaning of the word is that of a portion of Scripture or other religious writings appointed to be read at divine service, in accordance with a table known as a "lectionary." In the Church of England the lectionary is so ordered that most of the Old Testament is read through during the year as the First Lesson at Morning and Evening Prayer, and as the Second Lesson the whole of the New Testament, except Revelation, of which only portions are read. (See LECTION and LECTIONARY.)

LESTE, a desert wind, similar to the Leveche (*q.v.*), observed in Madeira. It blows from an easterly direction in autumn, winter and spring, rarely in summer, and is of intense dryness, sometimes reducing the relative humidity at Funchal to below 20%. The Leste is commonly accompanied by clouds of fine red sand.

L'ESTRANGE, SIR ROGER (1616–1704), English pamphleteer on the royalist and court side during the Restoration epoch, but principally remarkable as the first English man of letters of any distinction who made journalism a profession, was born at Hunstanton in Norfolk on the 17th of December 1616. In 1644, during the civil war, he headed a conspiracy to seize the town of Lynn for the king, under circumstances which led to his being condemned to death as a spy. The sentence, however, was not executed, and after four years' imprisonment in Newgate he escaped to the Continent. He was excluded from the Act of Indemnity, but in 1653 was pardoned by Cromwell upon his personal solicitation, and lived quietly until the Restoration, when after some delay his services and sufferings were acknowledged by his appointment as licenser of the press. This office was administered by him in the spirit which might be expected from a zealous cavalier. He made himself notorious, not merely by the severity of his literary censorship, but by his vigilance in the suppression of clandestine printing. In 1663 (see NEWSPAPERS) he commenced the publication of the *Public Intelligencer* and the *News*, from which eventually developed the famous official paper the *London Gazette* in 1665. In 1679 he again became prominent with the *Observator*, a journal specially designed to vindicate the court from the charge of a secret inclination to popery. He discredited the Popish Plot, and the suspicion he thus incurred was increased by the conversion of his daughter to Roman Catholicism, but there seems no reason to question the sincerity of his own attachment to the Church of England. In 1687 he gave a further proof of independence by discontinuing the *Observator* from his unwillingness to advocate James II.'s Edict of Toleration, although he had previously gone all lengths in support of the measures of the court. The Revolution cost him his office as licenser, and the remainder of his life was spent in obscurity. He died in 1704. It is to L'Estrange's credit that among the agitations of a busy political life he should have found time for much purely literary work as a translator of Josephus, Cicero, Seneca, Quevedo and other standard authors.

LESUEUR, DANIEL, the pseudonym of JEANNE LAPANZE, *née* Loiseau (1860–), French poet and novelist, who was born in Paris in 1860. She published a volume of poems, *Fleurs d'avril* (1882), which was crowned by the Academy She also wrote some powerful novels dealing with contemporary life: *Le Mariage de Gabrielle* (1882); *Un Mystérieux Amour* (1892), with a series of philosophical sonnets; *L'Amant de Geneviève* (1883); *Marcelle* (1885); *Une Vie tragique* (1890); *Justice de femme* (1893); *Comédienne Haine d'amour* (1894) *Honneur d'une femme* (1901); *La Force du passé* (1905). Her poems were collected in 1895. She published in 1905 a book on the economic status of women, *L'Évolution féminine*; and in 1891–1893 a translation (2 vols.) of the works of Lord Byron, which was awarded a prize by the Academy. Her *Masque d'amour*, a five-act play based on her novel (1904) of the same name, was produced at the Théâtre Sarah Bernhardt in 1905. She received the ribbon of the Legion of Honour in 1900, and the prix Vitet from the French Academy in 1905. She married in 1904 Henry Lapanze (b. 1867), a well-known writer on art.

LE SUEUR, EUSTACHE (1617–1655), one of the founders of the French Academy of painting, was born on the 19th of November 1617 at Paris, where he passed his whole life, and where he died on the 30th of April 1655. His early death and retired habits have combined to give an air of romance to his simple history, which has been decorated with as many fables as that of Claude. We are told that, persecuted by Le Brun, who was jealous of his ability, he became the intimate friend and correspondent of Poussin, and it is added that, broken-hearted at the death of his wife, Le Sueur retired to the monastery of the Chartreux and died in the arms of the prior. All this, however, is pure fiction. The facts of Le Sueur's life are these. He was the son of Cathelin Le Sueur, a turner and sculptor in wood, who placed his son with Vouet, in whose studio he rapidly distinguished himself. Admitted at an early age into the guild of master-painters, he left them to take part in establishing the academy of painting and sculpture, and was one of the first twelve professors of that body. Some paintings, illustrative of the Hypnerotomachia Polyphili, which were reproduced in tapestry, brought him into notice, and his reputation was further enhanced by a series of decorations (Louvre) in the mansion of Lambert de Thorigny, which he left uncompleted, for their execution was frequently interrupted by other commissions. Amongst these were several pictures for the apartments of the king and queen in the Louvre, which are now missing, although they were entered in Bailly's inventory (1710); but several works produced for minor patrons have come down to us. In the gallery of the Louvre are the "Angel and Hagar," from the mansion of De Tonnay Charente; "Tobias and Tobit," from the Fieubet collection; several pictures executed for the church of Saint Gervais; the "Martyrdom of St Lawrence," from Saint Germain de l'Auxerrois; two very fine works from the destroyed abbey of Marmoutiers; "St Paul preaching at Ephesus," one of Le Sueur's most complete and thorough performances, painted for the goldsmith's corporation in 1649; and his famous series of the "Life of St Bruno," executed in the cloister of the Chartreux. These last have more personal character than anything else which Le Sueur produced, and much of their original beauty survives in spite of injuries and restorations and removal from the wall to canvas. The Louvre also possesses many fine drawings (reproduced by Braun), of which Le Sueur left an incredible quantity, chiefly executed in black and white chalk. His pupils, who aided him much in his work, were his wife's brother, Th. Goussé, and three brothers of his own, as well as Claude Lefebvre and Patel the landscape painter.

Most of his works have been engraved, chiefly by Picart, B. Audran, Seb. Leclerc, Drevet, Chauveau, Poilly and Desplaces. Le Sueur's work lent itself readily to the engraver's art, for he was a charming draughtsman; he had a truly delicate perception of varied shades of grave and elevated sentiment, and possessed the power to render them. His graceful facility in composition was always restrained by a very fine taste, but his works often fail to please completely, because, producing so much, he had too frequent recourse to conventional types, and partly because he rarely saw colour except with the cold and clayey quality proper to the school of Vouet; yet his "St Paul at Ephesus" and one or two other works show that he was not naturally deficient in this sense, and whenever we get direct reference to nature—as in the monks of the St Bruno series—we recognize his admirable power to read and render physiognomy of varied and serious type.

See Guillet de St Georges, *Mém. inéd.*; C. Blanc, *Histoire des peintres*; Vitet, *Catalogue des tableaux du Louvre*; d'Argenville, *Vies des peintres*.

LESUEUR, JEAN FRANÇOIS (1760 or 1763–1837), French musical composer, was born on the 15th of January 1760 (or 1763) at Drucat-Plessiel, near Abbeville. He was a choir boy in the cathedral of Amiens, and then became musical director at various churches. In 1786 he obtained by open competition the musical directorship of the cathedral of Notre-Dame in Paris, where he gave successful performances of sacred music with a full orchestra. This place he resigned in 1787; and, after a retirement of five years in a friend's country house, he produced *La Caverne* and two other operas at the Théâtre Feydeau in Paris. At the foundation of the Paris Conservatoire (1795) Lesueur was appointed one of its inspectors of studies, but was dismissed in 1802, owing to his disagreements with Méhul. Lesueur succeeded G. Paisiello as *Maestro di cappella* to Napoleon, and produced (1804) his *Ossian* at the Opéra. He also composed for the emperor's coronation a mass and a Te Deum. Louis XVIII., who had retained Lesueur in his court, appointed him (1818) professor of composition at the Conservatoire; and at this institution he had, among many other pupils, Hector Berlioz, Ambroise Thomas, Louis Désiré, Besozzi and Charles Gounod. He died on the 6th of October 1837. Lesueur composed eight operas and several masses, and other sacred music. All his works are written in a style of rigorous simplicity.

See Raoul Rochette, *Les Ouvrages de M. Lesueur* (Paris, 1839).

LE TELLIER, MICHEL (1603–1685), French statesman, was born in Paris on the 19th of April 1603. Having entered the public service he became maître des requêtes and in 1640 intendant of Piedmont; in 1643, owing to his friendship with Mazarin, he became secretary of state for military affairs, being an efficient administrator. In 1677 he was made chancellor of France and he was one of those who influenced Louis XIV. to revoke the Edict of Nantes. He died on the 30th of October 1685, a few days after the revocation had been signed. Le Tellier, who amassed great wealth, left two sons, one the famous statesman Louvois and another who became archbishop of Reims. His correspondence is in the Bibliothèque nationale in Paris.

See L. Caron, *Michel Le Tellier, intendant d'armée au Piémont* (Paris, 1881).

Another Michel le Tellier (1643–1719) was confessor of the French king Louis XIV. Born at Vire on the 16th of December 1643 he entered the Society of Jesus and later became prominent in consequence of his violent attacks on the Jansenists. He was appointed provincial of his order in France, but it was not until 1709 that he became the king's confessor. In this capacity all his influence was directed towards urging Louis to further persecutions of the Protestants. He was exiled by the regent Orleans, but he had returned to France when he died at La Flèche on the 2nd of September 1719.

LETHAL (Lat. *lethalis*, for *letalis*, deadly, from *letum*, death; the spelling is due to a confusion with Gr. λήθη, forgetfulness), an adjective meaning "deadly," "fatal," especially as applied to weapons, drugs, &c. A "lethal chamber" is a room or receptacle in which animals may be put to death painlessly, by the admission of poisonous gases.

LETHARGY (Gr. ληθαργία, from λήθη, forgetfulness), drowsiness, torpor. In pathology the term is used of a morbid condition of deep and lasting sleep from which the sufferer can be with difficulty and only temporarily aroused. The term Negro or African lethargy was formerly applied to the disease now generally known as "sleeping sickness" (*q.v.*).

LETHE ("Oblivion"), in Greek mythology, the daughter of Eris (Hesiod, *Theog.* 227) and the personification of forgetfulness. It is also the name of a river in the infernal regions. Those initiated in the mysteries were taught to distinguish two streams in the lower world, one of memory and one of oblivion. Directions for this purpose, written on a gold plate, have been found in a tomb at Petilia, and near Lebadeia, at the oracle of Trophonius, which was counted an entrance to the lower world, the two springs Mnemosyne and Lethe were shown (Pausanias ix. 39. 8). This thought begins to appear in literature in the end of the 5th century B.C., when Aristophanes (*Frogs*, 186) speaks of the plain of Lethe. Plato (*Rep.* x.) embodies the idea in one of his finest myths.

LE TRÉPORT, a maritime town of northern France in the department of Seine-Inférieure, on the English Channel, at the mouth of the Bresle, 114 m. N.N.W. of Paris on the Northern railway. Pop. (1906) 4619. Owing to its nearness to the capital, Le Tréport is a favourite watering-place of the Parisians. A good view is obtained from Mont Huon, which rises to the south-west of the town. The mouth of the Bresle forms a small port, comprising an outer tidal harbour and an inner dock accessible to vessels drawing from 13 to 16 ft. The fisheries and oyster parks with their dependent industries, shipbuilding and glass manufacture, furnish the chief occupations of the inhabitants. Coal, timber, ice and jute are imported; *articles de Paris*, sugar, &c., are exported. The chief buildings are the church of St Jacques (16th century), which has finely carved vaulting and good modern stained glass, and the casino erected 1896–1897. About 1 m. north-east of Le Tréport is the small bathing resort of Mers. The Eu-Tréport canal, uniting the two towns, has a length of about 3 m., and is navigable by vessels drawing 14 ft. Le Tréport (the ancient *Ulterior Portus*) was a port of some note in the middle ages and suffered from the English invasions. Louis Philippe twice received Queen Victoria here.

LETRONNE, JEAN ANTOINE (1787–1848), French archaeologist, was born at Paris on the 25th of January 1787. His father, a poor engraver, sent him to study art under the painter David, but his own tastes were literary, and he became a student in the Collège de France, where it is said he used to exercise his already strongly developed critical faculty by correcting for his own amusement old and bad texts of Greek authors, afterwards comparing the results with the latest and most approved editions. From 1810 to 1812 he travelled in France, Switzerland and Italy, and on his return to Paris published an *Essai critique sur la topographie de Syracuse* (1812), designed to elucidate Thucydides. Two years later appeared his *Recherches géographiques et critiques* on the *De Mensura Orbis Terrae* of Dicuil. In 1815 he was commissioned by government to complete the translation of Strabo which had been begun by Laporte-Dutheil, and in March 1816 he was one of those who were admitted to the Academy of Inscriptions by royal ordinance, having previously contributed a *Mémoire*, "On the Metrical System of the Egyptians," which had been crowned. Further promotion came rapidly; in 1817 he was appointed director of the École des Chartes, in 1819 inspector-general of the university, and in 1831 professor of history in the Collège de France. This chair he exchanged in 1838 for that of archaeology, and in 1840 he succeeded Pierre C. François Daunou (1761–1840) as keeper of the national archives. Meanwhile he had published, among other works, *Considérations générales sur l'évaluation des monnaies grecques et romaines et sur la valeur de l'or et de l'argent avant la découverte de l'Amérique* (1817), *Recherches pour servir à l'histoire d'Égypte pendant la domination des Grecs et des Romains* (1823), and *Sur l'origine grecque des zodiaques prétendus égyptiens* (1837). By the last-named he finally exploded a fallacy which had up to that time vitiated the chronology of contemporary Egyptologists. His *Diplômes et chartres de l'époque Mérovingienne sur papyrus et sur vélin* were published in 1844. The most important work of Letronne is the *Recueil des inscriptions grecques et latines de l'Égypte*, of which the first volume appeared in 1842, and the second in 1848. He died at Paris on the 14th of December 1848.

LETTER (through Fr. *lettre* from Lat. *littera* or *litera*, letter of the alphabet; the origin of the Latin word is obscure; it has probably no connexion with the root of *linere*, to smear, *i.e.* with wax, for an inscription with a stilus), a character or symbol expressing any one of the elementary sounds into which a spoken word may be analysed, one of the members of an alphabet. As applied to things written, the word follows mainly the meanings of the Latin plural *litterae*, the most common meaning attaching to the word being that of a written communication from one person to another, an epistle (*q.v.*). For the means adopted to secure the transmission of letters see POST AND POSTAL SERVICE. The word is also, particularly in the plural, applied to many legal and formal written documents, as in letters patent, letters rogatory and dismissory, &c. The Latin use of the plural is also followed in the employment of "letters" in the sense of literature (*q.v.*) or learning.

LETTERKENNY, a market town of Co. Donegal, Ireland, 23 m. W. by S. of Londonderry by the Londonderry and Lough Swilly and Letterkenny railway. Pop. (1901) 2370. It has a harbour at Port Ballyrane, 1 m. distant on Lough Swilly. In the market square a considerable trade in grain, flax and provisions is prosecuted. Rope-making and shirt-making are industries. The handsome Roman Catholic cathedral for the diocese of Raphoe occupies a commanding site, and cost a large sum, as it contains carving from Rome, glass from Munich and a pulpit of Irish and Carrara marble. It was consecrated in 1901. There is a Catholic college dedicated to St Ewnan. The town, which is governed by an urban district council, is a centre for visitors to the county. Its name signifies the "hill of the O'Cannanans," a family who lorded over Tyrconnell before the rise of the O'Donnells.

LETTER OF CREDIT, a letter, open or sealed, from a banker or merchant, containing a request to some other person or firm to advance the bearer of the letter, or some other person named therein, upon the credit of the writer a particular or an unlimited sum of money. A letter of credit is either general or special. It is general when addressed to merchants or other persons in general, requesting an advance to a third person, and special when addressed to a particular person by name requesting him to make such an advance. A letter of credit is not a negotiable instrument. When a letter of credit is given for the purchase of goods, the letter of credit usually states the particulars of the merchandise against which bills are to be drawn, and shipping documents (bills of lading, invoices, insurance policies) are usually attached to the draft for acceptance.

LETTERS PATENT. It is a rule alike of common law and sound policy that grants of freehold interests, franchises, liberties, &c., by the sovereign to a subject should be made only after due consideration, and in a form readily accessible to the public. These ends are attained in England through the agency of that piece of constitutional machinery known as "letters patent." It is here proposed to consider only the characteristics of letters patent generally. The law relating to letters patent for inventions is dealt with under the heading PATENTS.

Letters patent (*litterae patentes*) are letters addressed by the sovereign "to all to whom these presents shall come," reciting the grant of some dignity, office, monopoly, franchise or other privilege to the patentee. They are not sealed up, but are left open (hence the term "patent"), and are recorded in the Patent Rolls in the Record Office, or in the case of very recent grants, in the Chancery Enrolment Office, so that all subjects of the realm may read and be bound by their contents. In this respect they differ from certain other letters of the sovereign directed to particular persons and for particular purposes, which, not being proper for public inspection, are closed up and sealed on the outside, and are thereupon called *writs close* (*litterae clausae*) and are recorded in the Close Rolls. Letters patent are used to put into commission various powers inherent in the crown—legislative powers, as when the sovereign entrusts to others the duty of opening parliament or assenting to bills; judicial powers, *e.g.* of gaol delivery; executive powers, as when the duties of Treasurer and Lord High Admiral are assigned to commissioners of the Treasury and Admiralty (Anson, *Const.* ii. 47). Letters patent are also used to incorporate bodies by charter—in the British colonies, this mode of legislation is frequently applied to joint stock companies (cf. Rev. Stats. Ontario, c. 191, s. 9)—to grant a *congé d'élire* to a dean and chapter to elect a bishop, or licence to convocation to amend canons; to grant pardon, and to confer certain offices and dignities. Among grants of offices, &c., made by letters patent the following may be enumerated: offices in the Heralds' College; the dignities of a peer, baronet and knight bachelor; the appointments of lord-lieutenant, custos rotulorum of counties, judge of the High Court and Indian and Colonial judgeships, king's counsel, crown livings; the offices of attorney- and solicitor-general, commander-in-chief, master of the horse, keeper of the privy seal, postmaster-general, king's printer; grants of separate courts of quarter-sessions. The fees payable in respect of the grant of various forms of letters patent are fixed by orders of the lord chancellor, dated 20th of June 1871, 18th of July 1871 and 11th of Aug. 1881. (These orders are set out at length in the *Statutory Rules and Orders Revised* (ed. 1904), vol. ii. *tit.* "Clerk of the Crown in Chancery," pp. i. et seq.) Formerly each colonial governor was appointed and commissioned by letters patent under the great seal of the United Kingdom. But since 1875, the practice has been to create the office of governor in each colony by letters patent, and then to make each appointment to the office by commission under the Royal Sign Manual and to give to the governor so appointed instructions in a uniform shape under the Royal Sign Manual. The letters patent, commission and instructions, are commonly described as the Governor's Commission (see Jenkyns, *British Rule and Jurisdiction beyond the Seas*, p. 100; the forms now in use are printed in Appx. iv. Also the *Statutory Rules and Codes Revised*, ed. 1904, under the title of the colony to which they relate). The Colonial Letters Patent Act 1863 provides that letters patent shall not take effect in the colonies or possessions beyond the seas until their publication there by proclamation or otherwise (s. 2), and shall be void unless so published within nine months in the case of colonies east of Bengal or west of Cape Horn, and within six months in any other case. Colonial officers and judges holding offices by patent for life or for a term certain, are removable by a special procedure—"amotion"—by the Governor and Council, subject to a right of appeal to the king in Council (Leave of Absence Act, formerly cited as "Burke's Act" 1782; see *Montagu* v. *Governor of Van Diemen's Land*, 1849, 6 Moo. P.C. 491; *Willis* v. *Gipps*, 1846, 6 St. Trials [N.S., 311]). The law of conquered or ceded colonies may be altered by the crown by letters patent under the Great Seal as well as by Proclamation or Order in Council (*Jephson* v. *Riera*, 1835, 3 Knapp, 130; 3 St. Trials [N.S.] 591).

Procedure.—Formerly letters patent were always granted under the Great Seal. But now, under the Crown Office Act 1877, and the Orders in Council made under it, many letters patent are sealed with the wafer great seal. Letters patent for inventions are issued under the seal of the Patent Office. The procedure by which letters patent are obtained is as follows: A warrant for the issue of letters patent is drawn up, and is signed by the lord chancellor; this is submitted to the law officers of the crown, who countersign it; finally, the warrant thus signed and countersigned is submitted to His Majesty, who affixes his signature. The warrant is then sent to the Crown Office and is filed, after it has been acted upon by the issue of letters patent under the great or under the wafer seal as the case may be. The letters patent are then delivered into the custody of those in whose favour they are granted.

Construction.—The construction of letters patent differs from that of other grants in certain particulars: (i.) Letters patent, contrary to the ordinary rule, are construed in a sense favourable to the grantor (viz. the crown) rather than to the grantee; although this rule is said not to apply so strictly where the grant is made for consideration, or where it purports to be made *ex certâ scientiâ et mero motu*. (ii.) When it appears from the face of the grant that the sovereign has been mistaken or deceived, either in matter of fact or in matter of law, as, *e.g.* by false suggestion on the part of the patentee, or by misrecital of former grants, or if the grant is contrary to law or uncertain, the letters patent are absolutely void, and may still, it would seem, be cancelled (except as regards letters patent for inventions, which are revoked by a special procedure, regulated by § 26 of the Patents Act 1883), by the procedure known as *scire facias*, an action brought against the patentee in the name of the crown with the fiat of the attorney-general.

As to letters patent generally, see Bacon's *Abridgment* ("Prerogative," F.); Chitty's *Prerogative*; Hindmarsh on *Patents* (1846); Anson, *Law and Custom of the Const.* ii. (3rd ed., Oxford and London, 1907–1908). (A. W. R.)

LETTRES DE CACHET. Considered solely as French documents, *lettres de cachet* may be defined as letters signed by the king of France, countersigned by one of his ministers, and closed with the royal seal (*cachet*). They contained an order—in principle, any order whatsoever—emanating directly from the king, and executory by himself. In the case of organized bodies *lettres de cachet* were issued for the purpose of enjoining members to assemble or to accomplish some definite act; the provincial estates were convoked in this manner, and it was by a *lettre de cachet* (called *lettre de jussion*) that the king ordered a parlement to register a law in the teeth of its own remonstrances. The best-known *lettres de cachet*, however, were those which may be called penal, by which the king sentenced a subject without trial and without an opportunity of defence to imprisonment in a state prison or an ordinary gaol, confinement in a convent or a hospital, transportation to the colonies, or relegation to a given place within the realm.

The power which the king exercised on these various occasions was a royal privilege recognized by old French law, and can be traced to a maxim which furnished a text of the *Digest* of Justinian: "Rex solutus est a legibus." This signified particularly that when the king intervened directly in the administration proper, or in the administration of justice, by a special act of his will, he could decide without heeding the laws, and even in a sense contrary to the laws. This was an early conception, and in early times the order in question was simply verbal; thus some letters patent of Henry III. of France in 1576 (Isambert, *Anciennes lois françaises*, xiv. 278) state that François de Montmorency was "prisoner in our castle of the Bastille in Paris by verbal command" of the late king Charles IX. But in the 14th century the principle was introduced that the order should be written, and hence arose the *lettre de cachet*. The *lettre de cachet* belonged to the class of *lettres closes*, as opposed to *lettres patentes*, which contained the expression of the legal and permanent will of the king, and had to be furnished with the seal of state affixed by the chancellor. The *lettres de cachet*, on the contrary, were signed simply by a secretary of state (formerly known as *secrétaire des commandements*) for the king; they bore merely the imprint of the king's privy seal, from which circumstance they were often called, in the 14th and 15th centuries, *lettres de petit signet* or *lettres de petit cachet*, and were entirely exempt from the control of the chancellor.

While serving the government as a silent weapon against political adversaries or dangerous writers and as a means of punishing culprits of high birth without the scandal of a suit at law, the *lettres de cachet* had many other uses. They were employed by the police in dealing with prostitutes, and on their authority lunatics were shut up in hospitals and sometimes in prisons. They were also often used by heads of families as a means of correction, *e.g.* for protecting the family honour from the disorderly or criminal conduct of sons; wives, too, took advantage of them to curb the profligacy of husbands and vice versa. They were issued by the intermediary on the advice of the intendants in the provinces and of the lieutenant of police in Paris. In reality, the secretary of state issued them in a completely arbitrary fashion, and in most cases the king was unaware of their issue. In the 18th century it is certain that the letters were often issued blank, *i.e.* without containing the name of the person against whom they were directed; the recipient, or mandatary, filled in the name in order to make the letter effective.

Protests against the *lettres de cachet* were made continually by the parlement of Paris and by the provincial parlements, and often also by the States-General. In 1648 the sovereign courts of Paris procured their momentary suppression in a kind of charter of liberties which they imposed upon the crown, but which was ephemeral. It was not until the reign of Louis XVI. that a reaction against this abuse became clearly perceptible. At the beginning of that reign Malesherbes during his short ministry endeavoured to infuse some measure of justice into the system, and in March 1784 the baron de Breteuil, a minister of the king's household, addressed a circular to the intendants and the lieutenant of police with a view to preventing the crying abuses connected with the issue of *lettres de cachet*. In Paris, in 1779, the *Cour des Aides* demanded their suppression, and in March 1788 the parlement of Paris made some exceedingly energetic remonstrances, which are important for the light they throw upon old French public law. The crown, however, did not decide to lay aside this weapon, and in a declaration to the States-General in the royal session of the 23rd of June 1789 (art. 15) it did not renounce it absolutely. *Lettres de cachet* were abolished by the Constituent Assembly, but Napoleon re-established their equivalent by a political measure in the decree of the 9th of March 1801 on the state prisons. This was one of the acts brought up against him by the *sénatus-consulte* of the 3rd of April 1814, which pronounced his fall "considering that he has violated the constitutional laws by the decrees on the state prisons."

See Honoré Mirabeau, *Les Lettres de cachet et des prisons d'état* (Hamburg, 1782), written in the dungeon at Vincennes into which his father had thrown him by a *lettre de cachet*, one of the ablest and most eloquent of his works, which had an immense circulation and was translated into English with a dedication to the duke of Norfolk in 1788; Frantz Funck-Brentano, *Les Lettres de cachet à Paris* (Paris, 1904); and André Chassaigne, *Les Lettres de cachet sous l'ancien régime* (Paris, 1903). (J. P. E.)

LETTUCE, known botanically as *Lactuca sativa* (nat. ord. Compositae), a hardy annual, highly esteemed as a salad plant. The London market-gardeners make preparation for the first main crop of Cos lettuces in the open ground early in August, a frame being set on a shallow hotbed, and, the stimulus of heat not being required, this is allowed to subside till the first week in October, when the soil, consisting of leaf-mould mixed with a little sand, is put on 6 or 7 in. thick, so that the surface is within 4½ in. of the sashes. The best time for sowing is found to be about the 11th of October, one of the best varieties being Lobjoits Green Cos. When the seeds begin to germinate the sashes are drawn quite off in favourable weather during the day, and put on, but tilted, at night in wet weather. Very little watering is required, and the aim should be to keep the plants gently moving till the days begin to lengthen. In January a more active growth is encouraged, and in mild winters a considerable extent of the planting out is done, but in private gardens the preferable time would be February. The ground should be light and rich, and well manured below, and the plants put out at 1 ft. apart each way with the dibble. Frequent stirring of the ground with the hoe greatly encourages the growth of the plants. A second sowing should be made about the 5th of November, and a third in frames about the end of January or beginning of February. In March a sowing may be made in some warm situation out of doors; successional sowings may be made in the open border about every third or fourth week till August, about the middle of which month a crop of Brown Cos, Hardy Hammersmith or Hardy White Cos should be sown, the latter being the most reliable in a severe winter. These plants may be put out early in October on the sides of ridges facing the south or at the front of a south wall, beyond the reach of drops from the copings, being planted 6 or 8 in. apart. Young lettuce plants should be thinned out in the seed-beds before they crowd or draw each other, and transplanted as soon as possible after two or three leaves are formed. Some cultivators prefer that the summer crops should not be transplanted, but sown where they are to stand, the plants being merely thinned out; but transplanting checks the running to seed, and makes the most of the ground.

For a winter supply by gentle forcing, the Hardy Hammersmith and Brown Dutch Cabbage lettuces, and the Brown Cos and Green Paris Cos lettuces, should be sown about the middle of August and in the beginning of September, in rich light soil, the plants being pricked out 3 in. apart in a prepared bed, as soon as the first two leaves are fully formed. About the middle of October the plants should be taken up carefully with balls attached to the roots, and should be placed in a mild hotbed of well-prepared dung (about 55°) covered about 1 ft. deep with a compost of sandy peat, leaf-mould and a little well-decomposed manure. The Cos and Brown Dutch varieties should be planted about 9 in. apart. Give plenty of air when the weather permits, and protect from frost. For winter work Stanstead Park Cabbage Lettuce is greatly favoured now by London market-gardeners, as it stands the winter well. Lee's Immense is another good variety, while All the Year Round may be sown for almost any season, but is better perhaps for summer crops.

There are two races of the lettuce, the Cos lettuce, with erect oblong heads, and the Cabbage lettuce, with round or spreading heads,—the former generally crisp, the latter soft and flabby in texture. Some of the best lettuces for general purposes of the two classes are the following:—

Cos: White Paris Cos, best for summer; Green Paris Cos, hardier than the white; Brown Cos, Lobjoits Green Cos, one of the hardiest and best for winter; Hardy White Cos.

Cabbage: Hammersmith Hardy Green: Stanstead Park, very hardy, good for winter; Tom Thumb; Brown Dutch; Neapolitan, best for summer; All the Year Round; Golden Ball, good for forcing in private establishments.

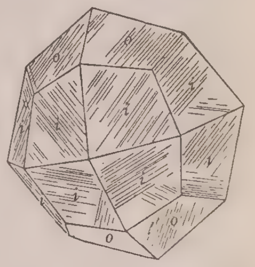
Lactuca virosa, the strong-scented lettuce, contains an alkaloid which has the power of dilating the pupil and may possibly be identical with hyoscyamine, though this point is as yet not determined. No variety of lettuce is now used for any medicinal purpose, though there is probably some slight foundation for the belief that the lettuce has faint narcotic properties.

LEUCADIA, the ancient name of one of the Ionian Islands, now Santa Maura (*q.v.*), and of its chief town (Hamaxichi).

LEUCIPPUS, Greek philosopher, born at Miletus (or Elea), founder of the Atomistic theory, contemporary of Zeno, Empedocles and Anaxagoras. His fame was so completely overshadowed by that of Democritus, who subsequently developed the theory into a system, that his very existence was denied by Epicurus (Diog. Laërt. x. 7), followed in modern times by E. Rohde. Epicurus, however, distinguishes Leucippus from Democritus, and Aristotle and Theophrastus expressly credit him with the invention of Atomism. There seems, therefore, no reason to doubt his existence, although nothing is known of his life, and even his birthplace is uncertain. Between Leucippus and Democritus there is an interval of at least forty years; accordingly, while the beginnings of Atomism are closely connected with the doctrines of the Eleatics, the system as developed by Democritus is conditioned by the sophistical views of his time, especially those of Protagoras. While Leucippus's notion of Being agreed generally with that of the Eleatics, he postulated its plurality (atoms) and motion, and the reality of not-Being (the void) in which his atoms moved.

See DEMOCRITUS. On the Rohde-Diels controversy as to the existence of Leucippus, see F. Lortzing in Bursian's *Jahresbericht*, vol. cxvi. (1904); also J. Burnet, *Early Greek Philosophy* (1892).

LEUCITE, a rock-forming mineral composed of potassium and aluminium metasilicate $KAl(SiO_3)_2$. Crystals have the form of cubic icositetrahedra {211}, but, as first observed by Sir David Brewster in 1821, they are not optically isotropic, and are therefore pseudo-cubic. Goniometric measurements made by G. vom Rath in 1873 led him to refer the crystals to the tetragonal system, the faces *o* being distinct from those lettered *i* in the adjoining figure. Optical investigations have since proved the crystals to be still more complex in character, and to consist of several orthorhombic or monoclinic individuals, which are optically biaxial and repeatedly twinned, giving rise to twin-lamellae and to striations on the faces. When the crystals are raised to a temperature of about 500° C. they become optically isotropic, the twin-lamellae and striations disappearing, reappearing, however, when the crystals are again cooled. This pseudo-cubic character of leucite is exactly the same as that of the mineral boracite (*q.v.*).



The crystals are white (hence the name suggested by A. G. Werner in 1791, from λευκός) or ash-grey in colour, and are usually dull and opaque, but sometimes transparent and glassy; they are brittle and break with a conchoidal fracture. The hardness is 5·5, and the specific gravity 2·5. Enclosures of other minerals, arranged in concentric zones, are frequently present in the crystals. On account of the colour and form of the crystals the mineral was early known as "white garnet." French authors employ R. J. Haüy's name "amphigène." (L. J. S.)

Leucite Rocks.—Although rocks containing leucite are numerically scarce, many countries such as England being entirely without them, yet they are of wide distribution, occurring in every quarter of the globe. Taken collectively, they exhibit a considerable variety of types and are of great interest petrographically. For the presence of this mineral it is necessary that the silica percentage of the rock should not be high, for leucite never occurs in presence of free quartz. It is most common in lavas of recent and Tertiary age, which have a fair amount of potash, or at any rate have potash equal to or greater than soda; if soda preponderates nepheline occurs rather than leucite. In pre-Tertiary rocks leucite is uncommon, since it readily decomposes and changes to zeolites, analcite and other secondary minerals. Leucite also is rare in plutonic rocks and dike rocks, but leucite-syenite and leucite-tinguaite bear witness to the possibility that it may occur in this manner. The rounded shape of its crystals, their white or grey colour, and rough cleavage, make the presence of leucite easily determinable in many of these rocks by simple inspection, especially when the crystals are large. "Pseudo-leucites" are rounded areas consisting of felspar, nepheline, analcite,

&c., which have the shape, composition and sometimes even the crystalline forms of leucite; they are probably pseudomorphs or paramorphs, which have developed from leucite because this mineral, in its isometric crystals, is not stable at ordinary temperatures and [illegible] Leucite is very often accompanied by nepheline, [illegible] which make their appearance with some frequency are melanite, garnet and melilite.

The plutonic leucite-bearing rocks are leucite-syenite and missourite. Of these the former consists of orthoclase, nepheline, sodalite, diopside and aegirine, biotite and sphene. Two occurrences are known, one in Arkansas, the other in Sutherlandshire, Scotland. The Scottish rock has been called borolanite. Both examples show large rounded spots in the hand specimens; they are pseudo-leucites and under the microscope prove to consist of orthoclase, nepheline, sodalite and decomposition products. These have a radiate arrangement externally, but are of irregular structure at their centres; it is interesting to note that in both rocks melanite is an important accessory. The missourites are more basic and consist of leucite, olivine, augite and biotite; the leucite is partly fresh, partly altered to analcite, and the rock has a spotted character recalling that of the leucite-syenites. It has been found only in the Highwood Mountains of Montana.

The leucite-bearing dike-rocks are members of the tinguaite and monchiquite groups. The leucite-tinguaites are usually pale grey or greenish in colour and consist principally of nepheline, alkali-felspar and aegirine. The latter forms bright green moss-like patches and growths of indefinite shape, or in other cases scattered acicular prisms, among the felspars and nephelines of the ground mass. Where leucite occurs, it is always eumorphic in small, rounded, many-sided crystals in the ground mass, or in larger masses which have the same characters as the pseudo-leucites. Biotite occurs in some of these rocks, and melanite also is present. Nepheline appears to decrease in amount as leucite increases. Rocks of this group are known from Rio de Janeiro, Arkansas, Kola (in Finland), Montana and a few other places. In Greenland there are leucite-tinguaites with much arfvedsonite (hornblende) and eudyalite. Wherever they occur they accompany leucite- and nepheline-syenites. Leucite-monchiquites are fine-grained dark rocks consisting of olivine, titaniferous augite and iron oxides, with a glassy ground mass in which small rounded crystals of leucite are scattered. They have been described from Bohemia.

By far the greater number of the rocks which contain leucite are lavas of Tertiary or recent geological age. They are never acid rocks which contain quartz, but felspar is usually present, though there are certain groups of leucite lavas which are non-felspathic. Many of them also contain nepheline, sodalite, hauyne and nosean; the much rarer mineral melilite appears also in some examples. The commonest ferromagnesian mineral is augite (sometimes rich in soda), with olivine in the more basic varieties. Hornblende and biotite occur also, but are less common. Melanite is found in some of the lavas, as in the leucite-syenites.

The rocks in which orthoclase (or sanidine) is present in considerable amount are leucite-trachytes, leucite-phonolites and leucitophyres. Of these groups the two former, which are not sharply distinguished from one another by most authors, are common in the neighbourhood of Rome (L. Bracciano, L. Bolsena). They are of trachytic appearance, containing phenocysts of sanidine, leucite, augite and biotite. Sodalite or hauyne may also be present, but nepheline is typically absent. Rocks of this class occur also in the tuffs of the Phlegraean Fields, near Naples. The leucitophyres are rare rocks which have been described from various parts of the volcanic district of the Rhine (Olbrück, Laacher See, &c.) and from Monte Vulture in Italy. They are rich in leucite, but contain also some sanidine and often much nepheline with hauyne or nosean. Their pyroxene is principally aegirine or aegirine augite; some of them are rich in melanite. Microscopic sections of some of these rocks are of great interest on account of their beauty and the variety of felspathoid minerals which they contain. In Brazil leucitophyres have been found which belong to the Carboniferous period.

Those leucite rocks which contain abundant essential plagioclase felspar are known as leucite-tephrites and leucite-basanites. The former consist mainly of plagioclase, leucite and augite, while the latter contain olivine in addition. The leucite is often present in two sets of crystals, both porphyritic and as an ingredient of the ground mass. It is always idiomorphic with rounded outlines. The felspar ranges from bytownite to oligoclase, being usually a variety of labradorite; orthoclase is scarce. The augite varies a good deal in character, being green, brown or violet, but aegirine (the dark green pleochroic soda-iron-augite) is seldom present. Among the accessory minerals biotite, brown hornblende, hauyne, iron oxides and apatite are the commonest; melanite and nepheline may also occur. The ground mass of these rocks is only occasionally rich in glass. The leucite-tephrites and leucite-basanites of Vesuvius and Somma are familiar examples of this class of rocks. They are black or ashy-grey in colour, often vesicular, and may contain many large grey phenocrysts of leucite. Their black augite and yellow green olivine are also easily detected in hand specimens. From Volcan-[illegible] and Roccamonfina similar rocks are obtained; they occur also in Bohemia, in Java, Celebes, Kilimanjaro (Africa) and near Trebizond in Asia Minor.

Leucite lavas from which felspar is absent are divided into the leucitites and leucite basalts. The latter contain olivine, the former do not. Pyroxene is the usual ferromagnesian mineral, and resembles that of the tephrites and basanites. Sanidine, melanite, hauyne and perofskite are frequent accessory minerals in these rocks, and many of them contain melilite in some quantity. The well-known leucitite of the Capo di Bove, near Rome, is rich in this mineral, which forms irregular plates, yellow in the hand specimen, enclosing many small rounded crystals of leucite. Bracciano and Roccamonfina are other Italian localities for leucitite, and in Java, Montana, Celebes and New South Wales similar rocks occur. The leucite-basalts belong to more basic types and are rich in olivine and augite. They occur in great numbers in the Rhenish volcanic district (Eifel, Laacher See) and in Bohemia, and accompany tephrites or leucitites in Java, Montana, Celebes and Sardinia. The "peperino" of the neighbourhood of Rome is a leucitite tuff. (J. S. F.)

LEUCTRA, a village of Boeotia in the territory of Thespiae, chiefly noticeable for the battle fought in its neighbourhood in 371 B.C. between the Thebans and the Spartans and their allies. A Peloponnesian army, about 10,000 strong, which had invaded Boeotia from Phocis, was here confronted by a Boeotian levy of perhaps 6000 soldiers under Epaminondas (*q.v.*). In spite of inferior numbers and the doubtful loyalty of his Boeotian allies, Epaminondas offered battle on the plain before the town. Massing his cavalry and the 50-deep column of Theban infantry on his left wing, he sent forward this body in advance of his centre and right wing. After a cavalry engagement in which the Thebans drove their enemies off the field, the decisive issue was fought out between the Theban and Spartan foot. The latter, though fighting well, could not sustain in their 12-deep formation the heavy impact of their opponents' column, and were hurled back with a loss of about 2000 men, of whom 700 were Spartan citizens, including the king Cleombrotus. Seeing their right wing beaten, the rest of the Peloponnesians retired and left the enemy in possession of the field. Owing to the arrival of a Thessalian army under Jason of Pherae, whose friendship they did not trust, the Thebans were unable to exploit their victory. But the battle is none the less of great significance in Greek history. It marks a revolution in military tactics, affording the first known instance of a deliberate concentration of attack upon the vital point of the enemy's line. Its political effects were equally far-reaching, for the loss in material strength and prestige which the Spartans here sustained deprived them for ever of their supremacy in Greece.

AUTHORITIES.—Xenophon, *Hellenica*, vi. 4. 3-15; Diodorus xi. 51-56; Plutarch, *Pelopidas*, chs. 20-23; Pausanias ix. 13. 2-10; G. B. Grundy, *The Topography of the Battle of Plataea* (London, 1894), pp. 73-76; H. Delbrück, *Geschichte der Kriegskunst* (Berlin, 1900), i. 130 ff. (M. O. B. C.)

LEUK (Fr. *Loèche Ville*), an ancient and very picturesque little town in the Swiss canton of the Valais. It is built above the right bank of the Rhone, and is about 1 m. from the Leuk-Susten station (15½ m. east of Sion and 17½ m. west of Brieg) on the Simplon railway. In 1900 it had 1592 inhabitants, all but wholly German-speaking and Romanists. About 10½ m. by a winding carriage road N. of Leuk, and near the head of the Dala valley, at a height of 4629 ft. above the sea-level, and overshadowed by the cliffs of the Gemmi Pass (7641 ft.; *q.v.*) leading over to the Bernese Oberland, are the Baths of Leuk (*Leukerbad*, or *Loèche les Bains*). They have only 613 permanent inhabitants, but are much frequented in summer by visitors (largely French and Swiss) attracted by the hot mineral springs. These are 22 in number, and are very abundant. The principal is that of St Laurence, the water of which has a temperature of 124° F. The season lasts from June to September. The village in winter is long deprived of sunshine, and is much exposed to avalanches, by which it was destroyed in 1518, 1719 and 1756, but it is now protected by a strong embankment from a similar catastrophe. (W. A. B. C.)

LEUTHEN, a village of Prussian Silesia, 10 m. W. of Breslau, memorable as the scene of Frederick the Great's victory over the Austrians on December 5, 1757. The high road from Breslau to [illegible] crosses the marshy Schweidnitz Water at Lissa and immediately enters the rolling country about Neumarkt

Leuthen itself stands some 4000 paces south of the road, and a similar distance south again lies Sagschütz, while Nypern, on the northern edge of the hill country, is 5000 paces from the road. On Frederick's approach the Austrians took up a line of battle resting on the two last-named villages. Their whole position was strongly garrisoned and protected by obstacles, and their artillery was numerous though of light calibre. A strong outpost of Saxon cavalry was in Borne to the westward. Frederick had the previous day surprised the Austrian bakeries at Neumarkt, and his Prussians, 33,000 to the enemy's 82,000, moved towards Borne and Leuthen early on the 5th. The Saxon outpost was rushed at in the morning mist, and, covered by their advanced guard on the heights beyond, the Prussians wheeled to their right. Prince Charles of Lorraine, the Austrian commander-in-chief, on Leuthen Church tower, could make nothing of Frederick's movements, and the commander of his right wing (Lucchesi) sent him message after message from Nypem and Gocklerwitz asking for help, which was eventually despatched. But the real blow was to fall on the left under Nadasdy. While the Austrian commander was thus wasting time, the Prussians were marching against Nadasdy in two columns, which preserved their distances with an exactitude which has excited the wonder of modern generations of soldiers; at the due place they wheeled into line of battle obliquely to the Austrian front, and in one great *échelon*,—the cavalry of the right wing foremost, and that of the left "refused,"—Frederick advanced on Sagschütz. Nadasdy, surprised, put a bold face on the matter and made a good defence, but he was speedily routed, and, as the Prussians advanced, battalion after battalion was rolled up towards Leuthen until the Austrians faced almost due south. The fighting in Leuthen itself was furious; the Austrians stood, in places, 100 deep, but the disciplined valour of the Prussians carried the village. For a moment the victory was endangered when Lucchesi came down upon the Prussian left wing from the north, but Driesen's cavalry, till then refused, charged him in flank and scattered his troopers in wild rout. This stroke ended the battle. The retreat on Breslau became a rout almost comparable to that of Waterloo, and Prince Charles rallied, in Bohemia, barely 37,000 out of his 82,000. Ten thousand Austrians were left on the field, 21,000 taken prisoners (besides 17,000 in Breslau a little later), with 51 colours and 116 cannon. The Prussian loss in all was under 5500. It was not until 1854 that a memorial of this astonishing victory was erected on the battlefield.

See Carlyle, *Frederick*, bk. xviii. cap. x.; V. Ollech, *Friedrich der Grosse von Kolin bis Leuthen* (Berlin, 1858); Kutzen, *Schlacht bei Leuthen* (Breslau, 1851); and bibliography under SEVEN YEARS' WAR.

LEUTZE, EMANUEL (1816–1868), American artist, was born at Gmünd, Württemberg, on the 24th of May 1816, and as a child was taken by his parents to Philadelphia, where he early displayed talent as an artist. At the age of twenty-five he had earned enough to take him to Düsseldorf for a course of art study at the royal academy. Almost immediately he began the painting of historical subjects, his first work, "Columbus before the Council of Salamanca," being purchased by the Düsseldorf Art Union. In 1860 he was commissioned by the United States Congress to decorate a stairway in the Capitol at Washington, for which he painted a large composition, "Westward the Star of Empire takes its Way." His best-known work, popular through engraving, is "Washington crossing the Delaware," a large canvas containing a score of life-sized figures; it is now owned by the Metropolitan Museum of Art, New York. He became a member of the National Academy of Design in 1860, and died at Washington, D.C., on the 18th of July 1868.

LEVALLOIS-PERRET, a north-western suburb of Paris, on the right bank of the Seine, 2½ m. from the centre of the city. Pop. (1906) 61,419. It carries on the manufacture of motor-cars and accessories, carriages, groceries, liqueurs, perfumery, soap, &c., and has a port on the Seine.

LEVANT (from the French use of the participle of *lever*, to rise, for the east, the orient), the name applied widely to the coastlands of the eastern Mediterranean Sea from Greece to Egypt, or, in a more restricted and commoner sense, to the Mediterranean coastlands of Asia Minor and Syria. In the 16th and 17th centuries the term "High Levant" was used of the Far East. The phrase "to levant," meaning to abscond, especially of one who runs away leaving debts unpaid, particularly of a betting man or gambler, is taken from the Span. *levantar*, to lift or break up, in such phrases as *levantar la casa*, to break up a household, or *el campo*, to break camp.

LEVASSEUR, PIERRE EMILE (1828–), French economist, was born in Paris on the 8th of December 1828. Educated in Paris, he began to teach in the lycée at Alençon in 1852, and in 1857 was chosen professor of rhetoric at Besançon. He returned to Paris to become professor at the lycée Saint Louis, and in 1868 he was chosen a member of the academy of moral and political sciences. In 1872 he was appointed professor of geography, history and statistics in the Collège de France, and subsequently became also professor at the Conservatoire des arts et métiers and at the École libre des sciences politiques. Levasseur was one of the founders of the study of commercial geography, and became a member of the Council of Public Instruction, president of the French society of political economy and honorary president of the French geographical society.

His numerous writings include: *Histoire des classes ouvrières en France depuis la conquête de Jules César jusqu'à la Révolution* (1859); *Histoire des classes ouvrières en France depuis la Révolution jusqu'à nos jours* (1867); *L'Étude et l'enseignement de la géographie* (1871); *La Population française* (1889–1892); *L'Agriculture aux États-Unis* (1894); *L'Enseignement primaire dans les pays civilisés* (1897); *L'Ouvrier américain* (1898); *Questions ouvrières et industrielles sous la troisième République* (1907); and *Histoire des classes ouvrières et de l'industrie en France de 1789 à 1870* (1903–1904). He also published a *Grand Atlas de géographie physique et politique* (1890–1892).

LEVECHE, the name given to the dry hot sirocco wind in Spain; often incorrectly called the "solano." The direction of the Leveche is mostly from S.E., S. or S.W., and it occurs along the coast from Cabo de Gata to Cabo de Nao, and even beyond Malaga for a distance of some 10 m. inland.

LEVÉE (from Fr. *lever*, to raise), an embankment which keeps a river in its channel. A river such as the Mississippi (*q.v.*), draining a large area, carries a great amount of sediment from its swifter head-streams to the lower ground. As soon as a stream's velocity is checked, it drops a portion of its load of sediment and spreads an alluvial fan in the lower part of its course. This deposition of material takes place particularly at the sides of the stream where the velocity is least, and the banks are in consequence raised above the main channel, so that the river becomes lifted bodily upwards in its bed, and flows above the level of the surrounding country. In flood-time the muddy water flows over the river's banks, where its velocity is at once checked as it flows gently down the outer side, causing more material to be deposited there, and a long alluvial ridge, called a natural levée, to be built up on either side of the stream. These ridges may be wide or narrow, but they slope from the stream's outer banks to the plain below, and in consequence require careful watching, for if the levée is broken by a "crevasse," the whole body of the river may pour through and flood the country below. In 1890 the Mississippi near New Orleans broke through the Nita crevasse and flowed eastward with a current of 15 m. an hour, spreading destruction in its path. The Hwang-ho river in China is peculiarly liable to these inundations. The word levée is also sometimes used to denote a riverside quay or landing-place.

LEVEE (from the French substantival use of *lever*, to rise; there is no French substantival use of *levée* in the English sense), a reception or assembly held by the British sovereign or his representative, in Ireland by the lord-lieutenant, in India by the viceroy, in the forenoon or early afternoon, at which men only are present in distinction from a "drawing-room," at which ladies also are presented or received. Under the *ancien règime* in France the *lever* of the king was regulated, especially under Louis XIV., by elaborate etiquette, and the various divisions of the ceremonial followed the stages of the king's rising from bed, from which it gained its name. The *petit lever* began when the king had washed and said his daily offices; to this were admitted the princes of the blood, certain high officers of the household and those to whom a special permit had been granted; then followed the *première entrée*, to which came the secretaries and other officials and those having the *entrée*; these were received by the king in his dressing-gown. Finally, at the *grand lever*, the remainder of the household, the nobles and gentlemen of the court were received; the king by that time was shaved, had changed his linen and was in his wig. In the United States the term "levee" was formerly used of the public receptions held by the president.

LEVELLERS, the name given to an important political party in England during the period of the Civil War and the Commonwealth. The germ of the Levelling movement must be sought for among the Agitators (*q.v.*), men of strong republican views, and the name Leveller first appears in a letter of the 1st of November 1647, although it was undoubtedly in existence as a nickname before this date (Gardiner, *Great Civil War*, iii. 380). This letter refers to these extremists thus: "They have given themselves a new name, viz. Levellers, for they intend to sett all things straight, and rayse a parity and community in the kingdom."

The Levellers first became prominent in 1647 during the protracted and unsatisfactory negotiations between the king and the parliament, and while the relations between the latter and the army were very strained. Like the Agitators they were mainly found among the soldiers; they were opposed to the existence of kingship, and they feared that Cromwell and the other parliamentary leaders were too complaisant in their dealings with Charles; in fact they doubted their sincerity in this matter. Led by John Lilburne (*q.v.*) they presented a manifesto, *The Case of the Army truly stated*, to the commander-in-chief, Lord Fairfax, in October 1647. In this they demanded a dissolution of parliament within a year and substantial changes in the constitution of future parliaments, which were to be regulated by an unalterable "law paramount." In a second document, *The Agreement of the People*, they expanded these ideas, which were discussed by Cromwell, Ireton and other officers on the one side, and by John Wildman, Thomas Rainsborough and Edward Sexby for the Levellers on the other. But no settlement was made; some of the Levellers clamoured for the king's death, and in November 1647, just after his flight from Hampton Court to Carisbrooke, they were responsible for a mutiny which broke out in two regiments at Corkbush Field, near Ware. This, however, was promptly suppressed by Cromwell. During the twelve months which immediately preceded the execution of the king the Levellers conducted a lively agitation in favour of the ideas expressed in the *Agreement of the people*, and in January 1648 Lilburne was arrested for using seditious language at a meeting in London. But no success attended these and similar efforts, and their only result was that the Levellers regarded Cromwell with still greater suspicion.

Early in 1649, just after the death of the king, the Levellers renewed their activity. They were both numerous and dangerous, and they stood up, says Gardiner, "for an exaggeration of the doctrine of parliamentary supremacy." In a pamphlet, *England's New Chains*, Lilburne asked for the dissolution of the council of state and for a new and reformed parliament. He followed this up with the *Second Part of England's New Chains*; his writings were declared treasonable by parliament, and in March 1649 he and three other leading Levellers, Richard Overton, William Walwyn and Prince were arrested. The discontent which was spreading in the army was fanned when certain regiments were ordered to proceed to Ireland, and in April 1649 there was a meeting in London; but this was quickly put down by Fairfax and Cromwell, and its leader, Robert Lockyer, was shot. Risings at Burford and at Banbury were also suppressed without any serious difficulty, and the trouble with the Levellers was practically over. Gradually they became less prominent, but under the Commonwealth they made frequent advances to the exiled king Charles II., and there was some danger from them early in 1655 when Wildman was arrested and Sexby escaped from England. The distinguishing mark of the Leveller was a sea-green ribbon.

Another but more harmless form of the same movement was the assembling of about fifty men on St George's Hill near Oatlands in Surrey. In April 1649 these "True Levellers" or "Diggers," as they were called, took possession of some unoccupied ground which they began to cultivate. They were, however, soon dispersed, and their leaders were arrested and brought before Fairfax, when they took the opportunity of denouncing landowners. It is interesting to note that Lilburne and his colleagues objected to being designated Levellers, as they had no desire to take away "the proper right and title that every man has to what is his own."

Cromwell attacked the Levellers in his speech to parliament in September 1654 (Carlyle, *Cromwell's Letters and Speeches*, Speech II.). He said: "A nobleman, a gentleman, a yeoman; the distinction of these; that is a good interest of the nation, and a great one. The 'natural' magistracy of the nation, was it not almost trampled under foot, under despite and contempt, by men of Levelling principles? I beseech you, for the orders of men and ranks of men, did not that Levelling principle tend to the reducing of all to an equality? Did it 'consciously' think to do so; or did it 'only unconsciously' practise towards that for property and interest? 'At all events,' what was the purport of it but to make the tenant as liberal a fortune as the landlord? Which, I think, if obtained, would not have lasted long."

In 1724 there was a rising against enclosures in Galloway, and a number of men who took part therein were called Levellers or Dykebreakers (A. Lang, *History of Scotland*, vol. iv.). The word was also used in Ireland during the 18th century to describe a secret revolutionary society similar to the Whiteboys. (A. W. H.*)

LEVEN, ALEXANDER LESLIE, 1st Earl of (*c.* 1580–1661), Scottish general, was the son of George Leslie, captain of Blair-in-Athol, and a member of the family of Leslie of Balquhain. After a scanty education he sought his fortune abroad, and became a soldier, first under Sir Horace Vere in the Low Countries, and afterwards (1605) under Charles IX. and Gustavus Adolphus of Sweden, in whose service he remained for many years and fought in many campaigns with honour. In 1626 Leslie had risen by merit to the rank of lieutenant-general, and had been knighted by Gustavus. In 1628 he distinguished himself by his constancy and energy in the defence of Stralsund against Wallenstein, and in 1630 seized the island of Rügen in the name of the king of Sweden. In the same year he returned to Scotland to assist in recruiting and organizing the corps of Scottish volunteers which James, 3rd marquis of Hamilton, brought over to Gustavus in 1631. Leslie received a severe wound in the following winter, but was able nevertheless to be present at Gustavus's last battle at Lützen. Like many others of the soldiers of fortune who served under Gustavus, Leslie cherished his old commander's memory to the day of his death, and he kept with particular care a jewel and miniature presented to him by the king. He continued as a general officer in the Swedish army for some years, was promoted in 1636 to the rank of field marshal, and continued in the field until 1638, when events recalled him to his own country. He had married long before this—in 1637 his eldest son was made a colonel in the Swedish army—and he had managed to keep in touch with Scottish affairs.

As the foremost Scottish soldier of his day he was naturally nominated to command the Scottish army in the impending war with England, a post which, resigning his Swedish command, he accepted with a glad heart, for he was an ardent Covenanter and had caused "a great number of our commanders in Germany subscryve our covenant" (Baillie's *Letters*). On leaving Sweden he brought back his arrears of pay in the form of cannon and muskets for his new army. For some months he busied himself with the organization and training of the new levies, and with inducing Scottish officers abroad to do their duty to their country by returning to lead them. Diminutive in size and somewhat deformed in person as he was, his reputation and his shrewdness and simple tact, combined with the respect for his office of lord general that he enforced on all ranks, brought even the unruly nobles to subordination. He had by now amassed a considerable fortune and was able to live in a manner befitting a commander-in-chief, even when in the field. One of his first exploits was to take the castle of Edinburgh by surprise, without the loss of a man. He commanded the Scottish army at Dunse Law in May of that year, and in 1640 he invaded England, and defeated the king's troops at Newburn on the Tyne, which gave him possession of Newcastle and of the open country as far as the Tees. At the treaty with the king at Ripon, Leslie was one of the commissioners of the Scottish parliament, and when Charles visited Edinburgh Leslie entertained him magnificently and accompanied him when he drove through the streets. His affirmations of loyalty to the crown, which later events caused to be remembered against him, were sincere enough, but the complicated politics of the time made it difficult for Leslie, the lord general of the Scottish army, to maintain a perfectly consistent attitude. However, his influence was exercised chiefly to put an end to, even to hush up, the troubles, and he is found, now giving a private warning to plotters against the king to enable them to escape, now guarding the Scottish parliament against a royalist *coup d'état*, and now securing for an old comrade of the German wars, Patrick Ruthven, Lord Ettrick, indemnity for having held Edinburgh Castle for the king against the parliament. Charles created him, by patent dated Holyrood, October 11, 1641, earl of Leven and Lord Balgonie, and made him captain of Edinburgh Castle and a privy councillor. The parliament recognized his services by a grant, and, on his resigning the lord generalship, appointed him commander of the permanent forces. A little later, Leven, who was a member of the committee of the estates which exercised executive powers during the recess of parliament, used his great influence in support of a proposal to raise a Scottish army to help the elector palatine in Germany, but the Ulster massacres gave this force, when raised, a fresh direction and Leven himself accompanied it to Ireland as lord general. He did not remain there long, for the Great Rebellion (*q.v.*) had begun in England, and negotiations were opened between the English and the Scottish parliaments for mutual armed assistance. Leven accepted the command of the new forces raised for the invasion of England, and was in consequence freely accused of having broken his personal oath to Charles, but he could hardly have acted otherwise than he did, and at that time, and so far as the Scots were concerned, to the end of the struggle, the parliaments were in arms, professedly and to some extent actually, to rescue his majesty from the influence of evil counsellors.

The military operations preceding Marston Moor are described under Great Rebellion, and the battle itself under its own heading. Leven's great reputation, wisdom and tact made him an ideal commander for the allied army formed by the junction of Leven's, Fairfax's and Manchester's in Yorkshire. After the battle the allied forces separated, Leven bringing the siege of Newcastle to an end by storming it. In 1645 the Scots were less successful, though their operations ranged from Westmorland to Hereford, and Leven himself had many administrative and political difficulties to contend with. These difficulties became more pronounced when in 1646 Charles took refuge with the Scottish army. The king remained with Leven until he was handed over to the English parliament in 1647, and Leven constantly urged him to take the covenant and to make peace. Presbyterians and Independents had now parted, and with no more concession than the guarantee of the covenant the Scottish and English Presbyterians were ready to lay down their arms, or to turn them against the "sectaries." Leven was now old and infirm, and though retained as nominal commander-in-chief saw no further active service. He acted with Argyll and the "godly" party in the discussions preceding the second invasion of England, and remained at his post as long as possible in the hope of preventing the Scots becoming merely a royalist instrument for the conquest of the English Independents. But he was induced in the end to resign, though he was appointed lord general of all new forces that might be raised for the defence of Scotland. The occasion soon came, for Cromwell annihilated the Scottish invaders at Preston and Uttoxeter, and thereupon Argyll assumed political and Leven military control at Edinburgh. But he was now over seventy years of age, and willingly resigned the effective command to his subordinate David Leslie (see Newark, Lord), in whom he had entire confidence. After the execution of Charles I. the war broke out afresh, and this time the "godly" party acted with the royalists. In the new war, and in the disastrous campaign of Dunbar, Leven took but a nominal part, though attempts were afterwards made to hold him responsible. But once more the parliament refused to accept his resignation. Leven at last fell into the hands of a party of English dragoons in August 1651, and with some others was sent to London. He remained incarcerated in the Tower for some time, till released on finding securities for £20,000, upon which he retired to his residence in Northumberland. While on a visit to London he was again arrested, for a technical breach of his engagement, but by the intercession of the queen of Sweden he obtained his liberty. He was freed from his engagements in 1654, and retired to his seat at Balgonie in Fifeshire, where he died at an advanced age in 1661. He acquired considerable landed property, particularly Inchmartin in the Carse of Gowrie, which he called Inchleslie.

See Leven and Melville, Earls of, below.

LEVEN, a police burgh of Fifeshire, Scotland. Pop. (1901) 5577. It is situated on the Firth of Forth, at the mouth of the Leven, 5¾m. E. by N. of Thornton Junction by the North British railway. The public buildings include the town hall, public hall and people's institute, in the grounds of which the old town cross has been erected. The industries are numerous, comprising flax-spinning, brewing, linen-weaving, paper-making, seed-crushing and rope-making, besides salt-works, a foundry, saw-mill and brick-works. The wet dock is not much used, owing to the constant accumulation of sand. The golf-links extending for 2 m. to Lundin are among the best in Scotland. Two miles N.E. is Lundin Mill and Drumochie, usually called Lundin (pop. 570), at the mouth of Kiel Burn, with a station on the Links. The three famous standing stones are supposed to be either of "Druidical" origin or to mark the site of a battle with the Danes. In the vicinity are the remains of an old house of the Lundins, dating from the reign of David II. To the N.W. of Leven lies the parish of Kennoway (pop. 870). In Captain Seton's house, which still stands in the village of Kennoway, Archbishop Sharp spent the night before his assassination (1679). One mile east of Lundin lies Largo (pop. of parish 2046), consisting of Upper Largo, or Kirkton of Largo, and Lower Largo. The public buildings include Simpson institute, with a public hall, library, reading-room, bowling-green and lawn-tennis court, and John Wood's hospital, founded in 1659 for poor persons bearing his name. A statue of Alexander Selkirk, or Selcraig (1676–1721), the prototype of "Robinson Crusoe," who was born here, was erected in 1886. Sir John Leslie (1766–1832), the natural philosopher, was also a native. Largo claims two famous sailors, Admiral Sir Philip Durham (1763–1845), commander-in-chief at Portsmouth from 1836 to 1839, and Sir Andrew Wood (d. 1515), the trusted servant of James III. and James IV., who sailed the "Great Michael," the largest ship of its time. When he was past active service he had a canal cut from his house to the parish church, to which he was rowed every Sunday in an eight-oared barge. Largo House was granted to him by James III., and the tower of the original structure still exists. About 1½ m. from the coast rises the height of Largo Law (948 ft.). Kellie Law lies some 5½ m. to the east.

LEVEN, LOCH, a lake of Kinross-shire, Scotland. It has an oval shape, the longer axis running from N.W. to S.E., has a length of 3⅔ m., and a breadth of 2⅔ m. and is situated near the south and east boundaries of the shire. It lies at a height of 350 ft. above the sea. The mean depth is less than 15 ft., with a maximum of 83 ft., the lake being thus one of the shallowest in Scotland. Reclamation works carried on from 1826 to 1836 reduced its area by one quarter, but it still possesses a surface area of 5½ sq. m. It drains the county and is itself drained by the Leven. It is famous for the Loch Leven trout (*Salmo levenensis*, considered by some a variety of *S. trutta*), which are remarkable for size and quality. The fishings are controlled by the Loch Leven Angling Association, which organizes competitions attracting anglers from far and near. The loch contains seven islands. Upon St Serf's, the largest, which commemorates the patron saint of Fifeshire, are the ruins of the Priory of Portmoak—so named from St Moak, the first abbot—the oldest Culdee establishment in Scotland. Some time before 961 it was made over to the bishop of St Andrews, and shortly after 1144 a body of canons regular was established on it in connexion with the priory of canons regular founded in that year at St Andrews. The second largest island, Castle Island, possesses remains of even greater interest. The first stronghold is supposed to have been erected by Congal, son of Dongart, king of the Picts. The present castle dates from the 13th century and was occasionally used as a royal residence. It is said to have been in the hands of the English for a time, from whom it was delivered by Wallace. It successfully withstood Edward Baliol's siege in 1335, and was granted by Robert II. to Sir William Douglas of Lugton. It became the prison at various periods of Robert II.; of Alexander Stuart, earl of Buchan, "the Wolf of Badenoch"; Archibald, earl of Douglas (1429); Patrick Graham, archbishop of St Andrews (who died, still in bondage, on St Serf's Island in 1478), and of Mary, queen of Scots. The queen had visited it more than once before her detention, and had had a presence chamber built in it. Conveyed hither in June 1567 after her surrender at Carberry, she signed her abdication within its walls on the 4th of July and effected her escape on the 2nd of May 1568. The keys of the castle, which were thrown into the loch during her flight, were found and are preserved at Dalmahoy in Midlothian. Support of Mary's cause had involved Thomas Percy, 7th earl of Northumberland (b. 1528). He too was lodged in the castle in 1569, and after three years' imprisonment was handed over to the English, by whom he was beheaded at York in 1572. The proverb that "Those never got luck who came to Loch Leven" sums up the history of the castle. The causeway connecting the isle with the mainland was long submerged too deeply for use, but the reclamation operations already referred to almost brought it into view again.

LEVEN AND MELVILLE, EARLS OF. The family of Melville which now holds these two earldoms is descended from Sir John Melville of Raith in Fifeshire. Sir John, who was a member of the reforming party in Scotland, was put to death for high treason on the 13th of December 1548; he left with other children a son Robert (1527–1621), who in 1616 was created a lord of parliament as Lord Melville of Monymaill. Before his elevation to the Scottish peerage Melville had been a stout partisan of Mary, queen of Scots, whom he represented at the English court, and he had filled several important offices in Scotland under her son James VI. The fourth holder of the lordship of Melville was George (*c.* 1634–1707), a son of John, the 3rd lord (d. 1643), and a descendant of Sir John Melville. Implicated in the Rye House plot against Charles II., George took refuge in the Netherlands in 1683, but he returned to England after the revolution of 1688 and was appointed secretary for Scotland by William III. in 1689, being created earl of Melville in the following year. He was made president of the Scottish privy council in 1696, but he was deprived of his office when Anne became queen in 1702, and he died on the 20th of May 1707. His son David, 2nd earl of Melville (1660–1728), fled to Holland with his father in 1683; after serving in the army of the elector of Brandenburg he accompanied William of Orange to England in 1688. At the head of a regiment raised by himself he fought for William at Killiecrankie and elsewhere, and as commander-in-chief of the troops in Scotland he dealt promptly and effectively with the attempted Jacobite rising of 1708. In 1712, however, his office was taken from him and he died on the 6th of June 1728.

Alexander Leslie, 1st earl of Leven (*q.v.*), was succeeded in his earldom by his grandson Alexander, who died without sons in July 1664. The younger Alexander's two daughters were then in turn countesses of Leven in their own right; and after the death of the second of these two ladies in 1676 a dispute arose over the succession to the earldom between John Leslie, earl (afterwards duke) of Rothes, and David Melville, 2nd earl of Melville, mentioned above. In 1681, however, Rothes died, and Melville, who was a great-grandson of the 1st earl of Leven, assumed the title, calling himself earl of Leven and Melville after he succeeded his father as earl of Melville in May 1707. Since 1805 the family has borne the name of Leslie-Melville. In 1906 John David Leslie-Melville (b. 1886) became 12th earl of Leven and 11th earl of Melville.

See Sir W. Fraser, *The Melvilles, Earls of Melville, and the Leslies, Earls of Leven* (1890); and the *Leven and Melville Papers*, edited by the Hon. W. H. Leslie-Melville for the Bannatyne Club (1843).

LEVER, CHARLES JAMES (1806–1872), Irish novelist, second son of James Lever, a Dublin architect and builder, was born in the Irish capital on the 31st of August 1806. His descent was purely English. He was educated in private schools, where he wore a ring, smoked, read novels, was a ringleader in every breach of discipline, and behaved generally like a boy destined for the navy in one of Captain Marryat's novels. His escapades at Trinity College, Dublin (1823–1828), whence he took the degree of M.B. in 1831, form the basis of that vast cellarage of anecdote from which all the best vintages in his novels are derived. The inimitable Frank Webber in *Charles O'Malley* (spiritual ancestor of Foker and Mr Bouncer) was a college friend, Robert Boyle, later on an Irish parson. Lever and Boyle sang ballads of their own composing in the streets of Dublin, after the manner of Fergusson or Goldsmith, filled their caps with coppers and played many other pranks embellished in the pages of *O'Malley*, *Con Cregan* and *Lord Kilgobbin*. Before seriously embarking upon the medical studies for which he was designed, Lever visited Canada as an unqualified surgeon on an emigrant ship, and has drawn upon some of his experiences in *Con Cregan*, *Arthur O'Leary* and *Roland Cashel*. Arrived in Canada he plunged into the backwoods, was affiliated to a tribe of Indians and had to escape at the risk of his life, like his own Bagenal Daly.

Back in Europe, he travelled in the guise of a student from Göttingen to Weimar (where he saw Goethe), thence to Vienna; he loved the German student life with its beer, its fighting and its fun, and several of his merry songs, such as "The Pope he loved a merry life" (greatly envied by Titmarsh), are on *Student-lied* models. His medical degree admitted him to an appointment from the Board of Health in Co. Clare and then as dispensary doctor at Port Stewart, but the liveliness of his diversions as a country doctor seems to have prejudiced the authorities against him. In 1833 he married his first love, Catherine Baker, and in February 1837, after varied experiences, he began running *The Confessions of Harry Lorrequer* through the pages of the recently established *Dublin University Magazine*. During the previous seven years the popular taste had declared strongly in favour of the service novel as exemplified by *Frank Mildmay*, *Tom Cringle*, *The Subaltern*, *Cyril Thornton*, *Stories of Waterloo*, *Ben Brace* and *The Bivouac*; and Lever himself had met William Hamilton Maxwell, the titular founder of the genre. Before *Harry Lorrequer* appeared in volume form (1839), Lever had settled on the strength of a slight diplomatic connexion as a fashionable physician in Brussels (16, Rue Ducale). *Lorrequer* was merely a string of Irish and other stories good, bad and indifferent, but mostly rollicking, and Lever, who strung together his anecdotes late at night after the serious business of the day was done, was astonished at its success. "If this sort of thing amuses them, I can go on for ever." Brussels was indeed a superb place for the observation of half-pay officers, such as Major Monsoon (Commissioner Meade), Captain Bubbleton and the like, who terrorized the *tavernes* of the place with their endless peninsular stories, and of English society a little damaged, which it became the specialty of Lever to depict. He sketched with a free hand, wrote, as he lived, from hand to mouth, and the chief difficulty he experienced was that of getting rid of his characters who "hung about him like those tiresome people who never can make up their minds to bid you good night." Lever had never taken part in a battle himself, but his next three books, *Charles O'Malley* (1841), *Jack Hinton* and *Tom Burke of Ours* (1843), written under the spur of the writer's chronic extravagance, contain some splendid military writing and some of the most animated battle-pieces on record. In pages of *O'Malley* and *Tom Burke* Lever anticipates not a few of the best effects of Marbot, Thiébaut, Lejeune, Griois, Seruzier, Burgoyne and the like. His account of the Douro need hardly fear comparison, it has been said, with Napier's. Condemned by the critics, Lever had completely won the general reader from the Iron Duke himself downwards.

In 1842 he returned to Dublin to edit the *Dublin University Magazine*, and gathered round him a typical coterie of Irish wits (including one or two hornets) such as the O'Sullivans, Archer Butler, W. Carleton, Sir William Wilde, Canon Hayman, D. F. McCarthy, McGlashan, Dr Kenealy and many others. In June 1842 he welcomed at Templeogue, 4 m. south-west of Dublin, the author of the *Snob Papers* on his Irish tour (the *Sketch Book* was, later, dedicated to Lever). Thackeray recognized the fund of Irish sadness beneath the surface merriment. "The author's character is not humour but sentiment. The spirits are mostly artificial, the *fond* is sadness, as appears to me to be that of most Irish writing and people." The Waterloo episode in *Vanity Fair* was in part an outcome of the talk between the two novelists. But the "Galway pace," the display he found it necessary to maintain at Templeogue, the stable full of horses, the cards, the friends to entertain, the quarrels to compose and the enormous rapidity with which he had to complete *Tom Burke*, *The O'Donoghue* and *Arthur O'Leary* (1845), made his native land an impossible place for Lever to continue in. Templeogue would soon have proved another Abbotsford. Thackeray suggested London. But Lever required a new field of literary observation and anecdote. His *sève originel* was exhausted and he decided to renew it on the continent. In 1845 he resigned his editorship and went back to Brussels, whence he started upon an unlimited tour of central Europe in a family coach. Now and again he halted for a few months, and entertained to the limit of his resources in some ducal castle or other which he hired for an off season. Thus at Riedenburg, near Bregenz, in August 1846, he entertained Charles Dickens and his wife and other well-known people. Like his own *Daltons* or *Dodd Family Abroad* he travelled continentally, from Carlsruhe to Como, from Como to Florence, from Florence to the Baths of Lucca and so on, and his letters home are the litany of the literary remittance man, his ambition now limited to driving a pair of novels abreast without a diminution of his standard price for serial work ("twenty pounds a sheet"). In the *Knight of Gwynne*, a story of the Union (1847), *Con Cregan* (1849), *Roland Cashel* (1850) and *Maurice Tiernay* (1852) we still have traces of his old manner; but he was beginning to lose his original joy in composition. His *fond* of sadness began to cloud the animal joyousness of his temperament. Formerly he had written for the happy world which is young and curly and merry; now he grew fat and bald and grave. "After 38 or so what has life to offer but one universal declension. Let the crew pump as hard as they like, the leak gains every hour." But, depressed in spirit as he was, his wit was unextinguished; he was still the delight of the *salons* with his stories, and in 1867, after a few years' experience of a similar kind at Spezia, he was cheered by a letter from Lord Derby offering him the more lucrative consulship of Trieste. "Here is six hundred a year for doing nothing, and you are just the man to do it." The six hundred could not atone to Lever for the lassitude of prolonged exile. Trieste, at first "all that I could desire," became with characteristic abruptness "detestable and damnable." "Nothing to eat, nothing to drink, no one to speak to." "Of all the dreary places it has been my lot to sojourn in this is the worst" (some references to Trieste will be found in *That Boy of Norcott's*, 1869). He could never be alone and was almost morbidly dependent upon literary encouragement. Fortunately, like Scott, he had unscrupulous friends who assured him that his last efforts were his best. They include *The Fortunes of Glencore* (1857), *Tony Butler* (1865), *Luttrell of Arran* (1865), *Sir Brooke Fosbrooke* (1866), *Lord Kilgobbin* (1872) and the table-talk of *Cornelius O'Dowd*, originally contributed to Blackwood. His depression, partly due to incipient heart disease, partly to the growing conviction that he was the victim of literary and critical conspiracy, was confirmed by the death of his wife (23rd April 1870), to whom he was tenderly attached. He visited Ireland in the following year and seemed alternately in very high and very low spirits. Death had already given him one or two runaway knocks, and, after his return to Trieste, he failed gradually, dying suddenly, however, and almost painlessly, from failure of the heart's action on the 1st of June 1872. His daughters, one of whom, Sydney, is believed to have been the real author of *The Rent in a Cloud* (1869), were well provided for.

Trollope praised Lever's novels highly when he said that they were just like his conversation. He was a born raconteur, and had in perfection that easy flow of light description which without tedium or hurry leads up to the point of the good stories of which in earlier days his supply seemed inexhaustible. With little respect for unity of action or conventional novel structure, his brightest books, such as *Lorrequer*, *O'Malley* and *Tom Burke*, are in fact little more than recitals of scenes in the life of a particular "hero," unconnected by any continuous intrigue. The type of character he depicted is for the most part elementary. His women are mostly rouées, romps or Xanthippes; his heroes have too much of the Pickle temper about them and fall an easy prey to the serious attacks of Poe or to the more playful gibes of Thackeray in *Phil Fogarty* or Bret Harte in *Terence Deuville*. This last is a perfect bit of burlesque. Terence exchanges nineteen shots with the Hon. Captain Henry Somerset in the glen. "At each fire I shot away a button from his uniform. As my last bullet shot off the last button from his sleeve, I remarked quietly, 'You seem now, my lord, to be almost as ragged as the gentry you sneered at,' and rode haughtily away." And yet these careless sketches contain such haunting creations as Frank Webber, Major Monsoon and Micky Free, "the Sam Weller of Ireland." Falstaff is alone in the literature of the world; but if ever there came a later Falstaff, Monsoon was the man. As for Baby Blake, is she not an Irish Di Vernon? The critics may praise Lever's thoughtful and careful later novels as they will, but *Charles O'Malley* will always be the pattern of a military romance.

Superior, it is sometimes claimed, in construction and style, the later books approximate it may be thought to the good *ordinary* novel of commerce, but they lack the *extraordinary* qualities, the incommunicable "go" of the early books—the élan of Lever's untamed youth. Artless and almost formless these productions may be, but they represent to us, as very few other books can, that pathetic ejaculation of Lever's own—"Give us back the wild freshness of the morning!" We know the novelist's teachers, Maxwell, Napier, the old-fashioned compilation known as *Victoires, conquêtes et désastres des Français* (1835), and the old buffers at Brussels who emptied the room by uttering the word "Badajos." But where else shall we find the equals of the military scenes in *O'Malley* and *Tom Burke*, or the military episodes in *Jack Hinton*, *Arthur O'Leary* (the story of Aubuisson) or *Maurice Tiernay* (nothing he ever did is finer than the chapter introducing "A remnant of Fontenoy")? It is here that his true genius lies, even more than in his talent for conviviality and fun, which makes an early copy of an early Lever (with Phiz's illustrations) seem literally to exhale an atmosphere of past and present entertainment. It is here that he is a true romancist, not for boys only, but also for men.

Lever's lack of artistry and of sympathy with the deeper traits of the Irish character have been stumbling-blocks to his reputation among the critics. Except to some extent in *The Martins of Cro'Martin* (1856) it may be admitted that his portraits of Irish are drawn too exclusively from the type depicted in Sir Jonah Barrington's *Memoirs* and already well known on the English stage. He certainly had no deliberate intention of "lowering the national character." Quite the reverse. Yet his posthumous reputation seems to have suffered in consequence, in spite of all his Gallic sympathies and not unsuccessful endeavours to apotheosize the "Irish Brigade."

The chief authorities are the *Life*, by W. J. Fitzpatrick (1879), and the *Letters*, ed. in 2 vols. by Edmund Downey (1906), neither of which, however, enables the reader to penetrate below the surface. See also Dr Garnett in *Dict. Nat. Biog.*; *Dublin Univ. Mag.* (1880), 465 and 570; Anthony Trollope's *Autobiography*; *Blackwood* (August 1862); *Fortnightly Review*, vol. xxxii.; Andrew Lang's *Essays in Little* (1892); Henley's *Views and Reviews*; Hugh Walker's *Literature of the Victorian Era* (1910); *The Bookman Hist. of English Literature* (1906), p. 467; *Bookman* (June 1906; portraits). A library edition of the novels in 37 vols. appeared 1897–1899 under the superintendence of Lever's daughter, Julie Kate Neville. (T. Se.)

LEVER (through O. Fr. *leveour*, *levere*, mod. *levier*, from Lat. *levare*, to lift, raise), a mechanical device for raising bodies; the "simple" lever consists of a rigid bar free to move about a fixed point, termed the *fulcrum*; one point of the rod is connected to the piece to be moved, and power is applied at another point (see MECHANICS).

LEVERRIER, URBAIN JEAN JOSEPH (1811–1877), French astronomer, was born at St Lô in Normandy on the 11th of March 1811. His father, who held a small post under government, made great efforts to send him to Paris, where a brilliant examination gained him, in 1831, admittance to the École Polytechnique. The distinction of his career there was rewarded with a free choice amongst the departments of the public service open to pupils of the school. He selected the administration of tobaccos, addressing himself especially to chemical researches under the guidance of Gay-Lussac, and gave striking proof of ability in two papers on the combinations of phosphorus with hydrogen and oxygen, published in *Annales de Chimie et de Physique* (1835 and 1837). His astronomical vocation, like that of Kepler, came from without. The place of teacher of that science at the École Polytechnique falling vacant in 1837, it was offered to and accepted by Leverrier, who, "docile to circumstance," instantly abandoned chemistry, and directed the whole of his powers to celestial mechanics. The first fruits of his labours were contained in two memoirs presented to the Academy, September 16 and October 14, 1839. Pursuing the investigations of Laplace, he demonstrated with greater rigour the stability of the solar system, and calculated the limits within which the eccentricities and inclinations of the planetary orbits vary. This remarkable début excited much attention, and, on the recommendation of François Arago, he took in hand the theory of Mercury, producing, in 1843, vastly improved tables of that planet. The perturbations of the comets discovered, the one by H. A. E. A. Faye in November 1843, the other by Francesco de Vico a year later, were minutely investigated by Leverrier, with the result of disproving the supposed identity of the first with Lexell's lost comet of 1770, and of the other with Tycho's of 1585. On the other hand, he made it appear all but certain that Vico's comet was the same with one seen by Philippe de Lahire in 1678. Recalled once more, by the summons of Arago, to planetary studies, he was this time invited to turn his attention to Uranus. Step by step, with sagacious and patient accuracy, he advanced to the great discovery which has immortalized his name. Carefully sifting all the known causes of disturbance, he showed that one previously unknown had to be reckoned with, and on the 23rd of September 1846 the planet Neptune was discerned by J. G. Galle (d. 1910) at Berlin, within one degree of the spot Leverrier had indicated (see NEPTUNE).

This memorable achievement was greeted with an outburst of public enthusiasm. Academies vied with each other in enrolling Leverrier among their members; the Royal Society awarded him the Copley medal; the king of Denmark sent him the order of the Dannebrog; he was named officer in the Legion of Honour, and preceptor to the comte de Paris; a chair of astronomy was created for his benefit at the Faculty of Sciences; he was appointed adjunct astronomer to the Bureau of Longitudes. Returned to the Legislative Assembly in 1849 by his native department of Manche, he voted with the anti-republican party, but devoted his principal attention to subjects connected with science and education. After the *coup d'état* of 1851 he became a senator and inspector-general of superior instruction, sat upon the commission for the reform of the École Polytechnique (1854), and, on the 30th of January 1854, succeeded Arago as director of the Paris observatory. His official work in the latter capacity would alone have strained the energies of an ordinary man. The institution had fallen into a state of lamentable inefficiency. Leverrier placed it on a totally new footing, freed it from the control of the Bureau of Longitudes, and raised it to its due rank among the observatories of Europe. He did not escape the common lot of reformers. His uncompromising measures and unconciliatory manner of enforcing them raised a storm only appeased by his removal on the 5th of February 1870. On the death of his successor Charles Eugène Delaunay (1816–1872), he was reinstated by Thiers, but with authority restricted by the supervision of a council. In the midst of these disquietudes, he executed a task of gigantic proportions. This was nothing less than the complete revision of the planetary theories, followed by a laborious comparison of results with the most authentic observations, and the construction of tables representing the movements thus corrected. It required all his indomitable perseverance to carry through a purpose which failing health continually menaced with frustration. He had, however, the happiness of living long enough to perfect his work. Three weeks after he had affixed his signature to the printed sheets of the theory of Neptune he died at Paris on the 23rd of September 1877. By his marriage with Mademoiselle Choquet, who survived him little more than a month, he left a son and daughter.

The discovery with which Leverrier's name is popularly identified was only an incident in his career. The elaboration of the scheme of the heavens traced out by P. S. Laplace in the *Mécanique céleste* was its larger aim, for the accomplishment of which forty years of unremitting industry barely sufficed. He nevertheless found time to organize the meteorological service in France and to promote the present system of international weather-warnings. He founded the Association Scientifique, and was active in introducing a practical scientific element into public education. His inference of the existence, between Mercury and the sun, of an appreciable quantity of circulating matter (*Comptes rendus*, 1859, ii. 379), has not yet been verified. He was twice, in 1868 and 1876, the recipient of the gold medal of the Royal Astronomical Society, London, and the university of Cambridge conferred upon him, in 1875, the honorary degree of LL.D. His planetary and solar tables were adopted by the *Nautical Almanac*, as well as by the *Connaissance des temps*.

The *Annales de l'Observatoire de Paris*, the publication of which was set on foot by Leverrier, contain, in vols. i.-vi. (*Mémoires*) (1855–1861) and x.-xiv. (1874–1877), his theories and tables of the several planets. In vol. i. will be found, besides his masterly report on the observatory, a general theory of secular inequalities, in which the development of the disturbing function was carried further than had previously been attempted.

The memoirs and papers communicated by him to the Academy were summarized in *Comptes rendus* (1839–1876), and the more important published in full either separately or in the *Conn. des temps* and the *Journal des mathématiques*. That entitled *Développemens sur différents points de la théorie des perturbations* (1841), was translated in part xviii. of Taylor's *Scientific Memoirs*. For his scientific work see Professor Adams's address, *Monthly Notices*, xxxvi. 232, and F. Tisserand's review in *Ann. de l'Obs.* tom. xv. (1880); for a notice of his life, J. Bertrand's "Éloge historique," *Mém. de l'Ac. des Sciences*, tom. xli., 2^{me} série (A. M. C.)

LEVERTIN, OSCAR IVAN (1862–1906), Swedish poet and man of letters, was born of Jewish parents at Norrköping on the 17th of July 1862. He received his doctorate in letters at Upsala in 1887, and was subsequently *docent* at Upsala, and later professor of literature at Stockholm. Enforced sojourns in southern Europe on account of health familiarized him with foreign languages. He began by being an extreme follower of the naturalist school, but on his return in 1890 from a two years' residence in Davos he wrote, in collaboration with the poet C. G. Verner von Heidenstam (b. 1859), a novel, *Pepitas bröllop* (1890), which was a direct attack on naturalism. His later volumes of short stories, *Rococonoveller* and *Sista noveller*, are fine examples of modern Swedish fiction. The lyrical beauty of his poems, *Legender och visor* (1891), placed him at the head of the romantic reaction in Sweden. In his poems entitled *Nya Dikter* (1894) he drew his material partly from medieval sources, and a third volume of poetry in 1902 sustained his reputation. His last poetical work (1905) was *Kung Salomo och Morolf*, poems founded on an eastern legend. As a critic he first attracted attention by his books on the Gustavian age of Swedish letters: *Teater och drama under Gustaf III.* (1889), &c. He was an active collaborator in the review *Ord och Bild.* He died in 1906, at a time when he was engaged on his *Linné*, posthumously published, a fragment of a great work on Linnaeus.

LEVI, HERMANN (1839–1900), German orchestral conductor, was born at Giessen on the 7th of November 1839, and was the son of a Jewish rabbi. He was educated at Giessen and Mannheim, and came under Vincenz Lachner's notice. From 1855 to 1858 Levi studied at the Leipzig conservatorium, and after a series of travels which took him to Paris, he obtained his first post as music director at Saarbrücken, which post he exchanged for that at Mannheim in 1861. From 1862 to 1864 he was chief conductor of the German opera in Rotterdam, then till 1872 at Carlsruhe, when he went to Munich, a post he held until 1896, when ill-health compelled him to resign. Levi's name is indissolubly connected with the increased public appreciation of Wagner's music. He conducted the first performance of *Parsifal* at Bayreuth in 1882, and was connected with the musical life of that place during the remainder of his career. He visited London in 1895.

LEVI, LEONE (1821–1888), English jurist and statistician, was born of Jewish parents on the 6th of June 1821, at Ancona, Italy. After receiving an early training in a business house in his native town, he went to Liverpool in 1844, became naturalized, and changing his faith, joined the Presbyterian church. Perceiving the necessity, in view of the unsystematic condition of the English law on the subject, for the establishment of chambers and tribunals of commerce in England, he warmly advocated their institution in numerous pamphlets; and as a result of his labours the Liverpool Chamber of Commerce, of which Levi was made secretary, was founded in 1849. In 1850 Levi published his *Commercial Law of the World*, being an exhaustive and comparative treatise upon the laws and codes of mercantile countries. Appointed in 1852 to the chair of commercial law in King's College, London, he proved himself a highly competent and popular instructor, and his evening classes were a most successful innovation. He was called to the bar at Lincoln's Inn in 1859, and received from the university of Tübingen the degree of doctor of political science. His chief work—*History of British Commerce and of the Economic Progress of the British Nation, 1763–1870*, is perhaps a rather too partisan account of British economic development, being a eulogy upon the blessings of Free Trade, but its value as a work of reference cannot be gainsaid. Among his other works are: *Work and Pay; Wages and Earnings of the Working Classes; International Law, with Materials for a Code.* He died on the 7th of May 1888.

LEVIATHAN, the Hebrew name (*livyāthān*), occurring in the poetical books of the Bible, of a gigantic animal, apparently the sea or water equivalent of behemoth (*q.v.*), the king of the animals of the dry land. In Job xli. 15 it would seem to represent the crocodile, in Isaiah xxvii. 1 it is a crooked and piercing serpent, the dragon of the sea; cf. Psalms civ. 26. The etymology of the word is uncertain, but it has been taken to be connected with a root meaning "to twist." Apart from its scriptural usage, the word is applied to any gigantic marine animal such as the whale, and hence, figuratively, of very large ships, and also of persons of outstanding strength, power, wealth or influence. Hobbes adopted the name as the title of his principal work, applying it to "the multitude so united in one person . . . called a commonwealth. . . . This is the generation of that Leviathan, or rather . . . of that mortal God, to which we owe under the immortal God, our peace and defence."

LEVIRATE (Lat. *levir*, a husband's brother), a custom, sometimes even a law, compelling a dead man's brother to marry his widow. It seems to have been widespread in primitive times, and is common to-day. Of the origin and primitive purpose of the levirate marriage various explanations have been put forward:—

1. It has been urged that the custom was primarily based on the law of inheritance; a wife, regarded as a chattel, being inherited like other possessions. The social advantage of providing one who should maintain the widow doubtless aided the spread of the custom. The abandonment of a woman and her children in the nomadic stage of civilization would be equivalent to death for them; hence with some peoples the levirate became a duty rather than a right. Among the Thlinkets, for example, when a man dies, his brother or his sister's son must marry the widow, a failure in this duty occasioning feuds. The obligation on a man to provide for his sister-in-law is analogous to other duties devolving on kinsfolk, such as the vendetta.

2. J. F. McLennan, however, would assume the levirate to be a relic of polyandry, and in his argument lays much stress on the fact that it is the dead man's *brother* who inherits the widow. But among many races who follow the custom, such as the Fijians, Samoans, Papuans of New Guinea, the Caroline Islanders, and some tribes in the interior of Western Equatorial Africa, the rule of inheritance is to the brother first. Thus among the Santals, "when the elder brother dies, the next younger inherits the widow, children and all the property." Further, there is no known race where it is permitted to a son to marry his own mother. Inheriting a woman in primitive societies would be always tantamount to marrying her, and, apart from any special laws of inheritance, it would be natural for the brother to take over the widow. In polygamous countries where a man leaves many widows the son would have a right of ownership over these, and could dispose of them or keep them as he pleased, his own mother alone excepted. Thus among the Bakalai, an African tribe, widows may marry the son of their dead husband, or in default of a son, can live with the brother. The Negroes of Benin and the Gabun and the Kaffirs of Natal have similar customs. In New Caledonia every man, married or single, must immediately marry his brother's widow. In Polynesia the levirate has the force of law, and it is common throughout America and Asia.

3. Another explanation of the custom has been sought in a semi-religious motive which has had extraordinary influence in countries where to die without issue is regarded as a terrible calamity. The fear of this catastrophe would readily arise among people who did not believe in personal immortality, and to whom the extinction of their line would be tantamount to annihilation. Or it is easily conceivable as a natural result of ancestor-worship, under which failure of offspring entailed deprivation of cherished rites and service.[1] Thus it is only when the dead man has no offspring that the Jewish, Hindu and Malagasy laws prescribe that the brother shall "raise up seed" to him. In this sense the levirate forms part of the Deuteronomic Code, under which, however, the obligation is restricted to the brother who "dwelleth together" (*i.e.* on the family estate) with the dead man, and the first child only of the levirate marriage is regarded as that of the dead man. That the custom was obsolescent seems proved by the enjoining of ceremony on any brother who wished to evade the duty, though he had to submit to an insult from his sister-in-law, who draws off his sandal and spits in his face. The biblical story of Ruth exemplifies the custom, though with further modifications (see RUTH, BOOK OF). Finally the custom is forbidden in Leviticus, though in New Testament times the levirate law was still observed by some Jews. The ceremony ordained by Deuteronomy is still observed among the orthodox. Among the Hindus the *levir* did not take his brother's widow as wife, but he had intercourse with her. This practice was called *niyoga*.

4. Yet another suggested origin of the levirate is agrarian, the motive being to keep together under the levirate husband the

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[1] An expression of this idea is quoted from the *Mahābhārata* (Muir's trans.), by Max Müller (Gifford Lectures), *Anthropological Religion*, p. 31—

> "That stage completed, seek a wife
> And gain the fruit of wedded life,
> A race of sons, by rites to seal,
> When thou art gone, thy spirit's weal."

property which would otherwise have been divided among all the brothers or next of kin.

See J. F. McLennan, *Studies in Ancient History* (London, 1886) and "The Levirate and Polyandry," in *The Fortnightly Review*, n.s. vol. xxi. (1877); C. N. Starcke, *The Primitive Family in its Origin and Development* (London, 1889); Edward Westermarck, *History of Human Marriage* (London, 1894), pp. 510-514, where are valuable notes containing references to numerous books of travel; H. Spencer, *Principles of Sociology*, ii. 649; A. H. Post, *Einleitung in das Stud. d. Ethnolog. Jurisprud.* (1886).

LÉVIS (formerly Pointe Levi), the chief town of Lévis county, Quebec, Canada, situated on the precipitous south bank of the St Lawrence, opposite Quebec city. Pop. (1901) 7783. It is on the Intercolonial railway, and is the eastern terminus of the Grand Trunk and Quebec Central railways. It contains the Lorne dock, a Dominion government graving dock, 445 ft. long, 100 ft. wide, with a depth on the sill of 26½ and 20½ ft. at high water, spring and neap tides respectively. It is an important centre of the river trade, and is connected by steam ferries with the city of Quebec. It is named after the maréchal duc de Lévis, the last commander of the French troops in Canada.

LEVITES, or sons of Levi (son of Jacob by Leah), a sacred caste in ancient Israel, the guardians of the temple service at Jerusalem.[1]

1. *Place in Ritual.*—In the developed hierarchical system the ministers of the sanctuary are divided into distinct grades. All are "Levites" by descent, and are thus correlated in the genealogical and other lists, but the true priesthood is confined to the sons of Aaron, while the mass of the Levites are subordinate servants who are not entitled to approach the altar or to perform any strictly priestly function. All access to the Deity is restricted to the one priesthood and to the one sanctuary at Jerusalem; the worshipping subject is the nation of Israel as a unity, and the function of worship is discharged on its behalf by divinely chosen priests. The ordinary individual may not intrude under penalty of death; only those of Levitical origin may perform service, and they are essentially the servants and hereditary serfs of the Aaronite priests (see Num. xviii.). But such a scheme finds no place in the monarchy; it presupposes a hierocracy under which the priesthood increased its rights by claiming the privileges which past kings had enjoyed; it is the outcome of a complicated development in Old Testament religion in the light of which it is to be followed (see HEBREW RELIGION).

First (*a*), in the earlier biblical writings which describe the state of affairs under the Hebrew monarchy there is not this fundamental distinction among the Levites, and, although a list of Aaronite high-priests is preserved in a late source, internal details and the evidence of the historical books render its value extremely doubtful (1 Chron. vi. 3-15, 49-53). In Jerusalem itself the subordinate officers of the temple were not members of a holy gild, but of the royal body-guard, or bond-slaves who had access to the sacred courts, and might even be uncircumcised foreigners (Josh. ix. 27; 1 Kings xiv. 28; 2 Kings xi.; cf. Zeph. i. 8 seq.; Zech. xiv. 21). Moreover, ordinary individuals might serve as priests (1 Sam. ii. 11, 18, vii. 1; see 2 Sam. viii. 18, deliberately altered in 1 Chron. xviii. 17); however, every Levite was a priest, or at least qualified to become one (Deut. x. 8, xviii. 7; Judges xvii. 5-13), and when the author of 1 Kings xii. 31, wishes to represent Jeroboam's priests as illegitimate, he does not say that they were not Aaronites, but that they were not of the sons of Levi.

The next stage (*b*) is connected with the suppression of the local high-places or minor shrines in favour of a central sanctuary. This involved the suppression of the Levitical priests in the country (cf. perhaps the allusion in Deut. xxi. 5); and the present book of Deuteronomy, in promulgating the reform, represents the Levites as poor scattered "sojourners" and recommends them to the charity of the people (Deut. xii. 12, 18 seq., xiv. 27, 29, xvi. 11, 14, xxvi. 11 sqq.). However, they are permitted to congregate at "the place which Yahweh shall choose," where they may perform the usual priestly duties together with their brethren who "stand there before Yahweh," and they are allowed their share of the offerings (Deut. xviii. 6-8).[2] The Deuteronomic history of the monarchy actually ascribes to the Judaean king Josiah (621 B.C.) the suppression of the high-places, and states that the local priests were brought to Jerusalem and received support, but did not minister at the altar (2 Kings xxiii. 9). Finally, a scheme of ritual for the second temple raises this exclusion to the rank of a principle. The Levites who had been idolatrous are punished by exclusion from the proper priestly work, and take the subordinate offices which the uncircumcised and polluted foreigners had formerly filled, while the sons of Zadok, who had remained faithful, are henceforth the legitimate priests, the only descendants of Levi who are allowed to minister unto Yahweh (Ezek. xliv. 6-15, cf. xl. 46, xliii. 19, xlviii. 11). "A threefold cord is not quickly broken," and these three independent witnesses agree in describing a significant innovation which ends with the supremacy of the Zadokites of Jerusalem over their brethren.

In the last stage (*c*) the exclusion of the ordinary Levites from all share in the priesthood of the sons of Aaron is looked upon as a matter of course, dating from the institution of priestly worship by Moses. The two classes are supposed to have been founded separately (Exod. xxviii., cf. xxix. 9; Num. iii. 6-10), and so far from any degradation being attached to the rank and file of the Levites, their position is naturally an honourable one compared with that of the mass of non-Levitical worshippers (see Num. i. 50-53), and they are taken by Yahweh as a surrogate for the male first-born of Israel (iii. 11-13). They are inferior only to the Aaronites to whom they are "joined" (xviii. 2, a play on the name Levi) as assistants. Various adjustments and modifications still continue, and a number of scattered details may indicate that internal rivalries made themselves felt. But the different steps can hardly be recovered clearly, although the fact that the priesthood was extended beyond the Zadokites to families of the dispossessed priests points to some compromise (1 Chron. xxiv.). Further, it is subsequently found that certain classes of temple servants, the singers and porters, who had once been outside the Levitical gilds, became absorbed as the term "Levite" was widened, and this change is formally expressed by the genealogies which ascribe to Levi, the common "ancestor" of them all, the singers and even certain families whose heathenish and foreign names show that they were once merely servants of the temple.[3]

2. *Significance of the Development.*—Although the legal basis for the final stage is found in the legislation of the time of Moses (latter part of the second millennium B.C.), it is in reality scarcely earlier than the 5th century B.C., and the Jewish theory finds analogies when developments of the Levitical service are referred to David (1 Chron. xv. seq., xxiii. sqq.), Hezekiah (2 Chron. xxix.) and Josiah (xxxv.)—contrast the history in the earlier books of Samuel and Kings—or when the still later book of Jubilees (xxxii.) places the rise of the Levitical priesthood in the patriarchal period. The traditional theory of the Mosaic origin of the elaborate Levitical legislation cannot be maintained save by the most arbitrary and inconsequential treatment of the evidence and by an entire indifference to the historical spirit; and, although numerous points of detail still remain very obscure, the three leading stages in the Levitical institutions are now recognized by nearly all independent scholars. These stages with a number of concomitant features confirm the literary hypothesis that biblical history is in the main due to two leading recensions, the Deuteronomic and the Priestly (cf. [*b*] and [*c*] above), which have incorporated older sources.[4] If the hierarchical system as

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[1] For the derivation of "Levi" see below § 4 end.

[2] The words "beside that which cometh of the sale of his patrimony" (lit. "his sellings according to the fathers") are obscure; they seem to imply some additional source of income which the Levite enjoys at the central sanctuary.

[3] For the *nĕthīnīm* ("given") and "children of the slaves of Solomon" (whose hereditary service would give them a pre-eminence over the temple slaves), see art. NETHINIM, and Benzinger, *Ency. Bib.* cols. 3397 sqq.

[4] In defence of the traditional view, see S. I. Curtiss, *The Levitical Priests* (1877), with which his later attitude should be contrasted see *Primitive Semitic Religion To-day*, pp. 14, 50, 133 seq., 171, 238 sqq., 241 sqq.); W. L. Baxter, *Sanctuary and Sacrifice* (1895).

it existed in the post-exilic age was really the work of Moses, it is inexplicable that all trace of it was so completely lost that the degradation of the non-Zadokites in Ezekiel was a new feature and a punishment, whereas in the Mosaic law the ordinary Levites, on the traditional view, was already forbidden priestly rights under penalty of death. There is in fact no clear evidence of the existence of a distinction between priests and Levites in any Hebrew writing demonstrably earlier than the Deuteronomic stage, although, even as the Pentateuch contains ordinances which have been carried back by means of a "legal convention" to the days of Moses, writers have occasionally altered earlier records of the history to agree with later standpoints.[1]

No argument in support of the traditional theory can be drawn from the account of Korah's revolt (Num. xvi. sqq., see § 3) or from the Levitical cities (Num. xxxv.; Josh. xxi.). Some of the latter were either not conquered by the Israelites until long after the invasion; or, if conquered, were not held by Levites; and names are wanting of places in which priests are actually known to have lived. Certainly the names are largely identical with ancient holy cities, which, however, are holy because they possessed noted shrines, not because the inhabitants were members of a holy tribe. Gezer and Taanach, for example, are said to have remained in the hands of Canaanites (Judges i. 27, 29; cf. 1 Kings ix. 16), and recent excavation has shown how far the cultus of these cities was removed from Mosaic religion and ritual and how long the grosser elements persisted.[2] On the other hand, the sanctuaries obviously had always their local ministers, all of whom in time could be called Levitical, and it is only in this sense, not in that of the late priestly legislation, that a place like Shechem could ever have been included. Further, instead of holding cities and pasture-grounds, the Levites are sometimes described as scattered and divided (Gen. xlix. 7; Deut. xviii. 6), and though they may naturally possess property as private individuals, they alone of all the tribes of Israel possess no tribal inheritance (Num. xviii. 23, xxvi. 62; Deut. x. 9; Josh. xiv. 3). This fluctuation finds a parallel in the age at which the Levites were to serve; for neither has any reasonable explanation been found on the traditional view. Num. iv. 3 fixes the age at thirty, although in i. 3 it has been reduced to twenty; but in 1 Chron. xxiii. 3, David is said to have numbered them from the higher limit, whereas in *vv.* 24, 27 the lower figure is given on the authority of "the last words (or acts) of David." In Num. viii. 23-26, the age is given as twenty-five, but twenty became usual and recurs in Ezra iii. 8 and 2 Chron. xxxi. 17. There are, however, independent grounds for believing that 1 Chron. xxiii. 24, 27, 2 Chron. xxxi. 17 belong to later insertions and that Ezr. iii. 8 is relatively late.

When, in accordance with the usual methods of Hebrew genealogical history, the Levites are defined as the descendants of Levi, the third son of Jacob by Leah (Gen. xxix. 34), a literal interpretation is unnecessary, and the only narrative wherein Levi appears as a person evidently delineates under the form of personification events in the history of the Levites (Gen. xxxiv.).[3] They take their place in Israel as the tribe set apart for sacred duties, and without entering into the large question how far the tribal schemes can be used for the earlier history of Israel, it may be observed that no adequate interpretation has yet been found of the ethnological traditions of Levi and other sons of Leah in their historical relation to one another or to the other tribes. However intelligible may be the notion of a tribe *reserved* for priestly service, the fact that it does not apply to early biblical history is apparent from the heterogeneous details of the Levitical divisions. The incorporation of singers and porters is indeed a late process, but it is typical of the tendency to co-ordinate all the religious classes (see GENEALOGY: *Biblical*). The genealogies in their complete form pay little heed to Moses, although Aaron and Moses could typify the priesthood and other Levites generally (1 Chron. xxiii. 14). Certain priesthoods in the first stage (§ 1 [*a*]) claimed descent from these prototypes, and it is interesting to observe (1) the growing importance of Aaron in the later sources of "the Exodus," and (2) the relation between Mosheh (Moses) and his two sons Gershom and Eliezer, on the one side, and the Levitical names Mushi (*i.e.* the Mosaite), Gershon and the Aaronite priest Eleazar, on the other. There are links, also, which unite Moses with Kenite, Rechabite, Calebite and Edomite families, and the Levitical names themselves are equally connected with the southern tribes of Judah and Simeon and with the Edomites.[4] It is to be inferred, therefore, that some relationship subsisted, or was thought to subsist, among (1) the Levites, (2) clans actually located in the south of Palestine, and (3) families whose names and traditions point to a southern origin. The exact meaning of these features is not clear, but if it be remembered (*a*) that the Levites of post-exilic literature represent only the result of a long and intricate development, (*b*) that the name "Levite," in the later stages at least, was extended to include all priestly servants, and (*c*) that the priesthoods, in tending to become hereditary, included priests who were Levites by adoption and not by descent, it will be recognized that the examination of the evidence for the earlier stages cannot confine itself to those narratives where the specific term alone occurs.

3. *The Traditions of the Levites.*—In the "Blessing of Moses" (Deut. xxxiii. 8-11), Levi is a collective name for the priesthood, probably that of (north) Israel. He is the guardian of the sacred oracles, knowing no kin, and enjoying his privileges for proofs of fidelity at Massah and Meribah. That these places (in the district of Kadesh) were traditionally associated with the origin of the Levites is suggested by various Levitical stories, although it is in a narrative now in a context pointing to Horeb or Sinai that the Levites are Israelites who for some cause (now lost) severed themselves from their people and took up a stand on behalf of Yahweh (Exod. xxxii.). Other evidence allows us to link together the Kenites, Calebites and Danites in a tradition of some movement into Palestine, evidently quite distinct from the great invasion of Israelite tribes which predominates in the existing records. The priesthood of Dan certainly traced its origin to Moses (Judges xvii. 9, xviii. 30); that of Shiloh claimed an equally high ancestry (1 Sam. ii. 27 seq.).[5] Some tradition of a widespread movement appears to be ascribed to the age of Jehu, whose accession, promoted by the prophet Elisha, marks the end of the conflict between Yahweh and Baal. To a Rechabite (the clan is allied to the Kenites) is definitely ascribed a hand in Jehu's sanguinary measures, and, though little is told of the obviously momentous events, one writer clearly alludes to a bloody period when reforms were to be effected by the sword (1 Kings xix. 17). Similarly the story of the original selection of the Levites in the wilderness mentions an uncompromising massacre of idolaters. Consequently, it is very noteworthy that popular tradition preserves the recollection of some attack by the "brothers" Levi and Simeon

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A. van Hoonacker, *Le Sacerdoce lévitique* (1899); and J. Orr, *Problem of the O.T.* (1905). These and other apologetic writings have so far failed to produce any adequate alternative hypothesis, and while they argue for the traditional theory, later revision not being excluded, the modern critical view accepts late dates for the literary sources in their present form, and explicitly recognizes the presence of much that is ancient. Note the curious old tradition that Ezra wrote out the law which had been burnt (2 Esdr. xiv. 21 sqq.).

[1] For example, in 1 Kings viii. 4, there are many indications that the context has undergone considerable editing at a fairly late date. The Septuagint translators did not read the clause which speaks of "priests *and* Levites," and 2 Chron. v. 5 reads "the Levite priests," the phrase characteristic of the Deuteronomic identification of priestly and Levitical ministry. 1 Sam. vi. 15, too, brings in the Levites, but the verse breaks the connexion between 14 and 16. For the present disorder in the text of 2 Sam. xv. 24, see the commentaries.

[2] See Father H. Vincent, O.P., *Canaan d'après l'exploration récente* (1907), pp. 151, 200 sqq., 463 sq.

[3] So Gen. xxxiv. 7, Hamor has wrought folly "in Israel" (cf. Judges xx. 6 and often), and in *v.* 30 "Jacob" is not a personal but a collective idea, for he says, "I am a few men," and the capture and destruction of a considerable city is in the nature of things the work of more than two individuals. In the allusion to Levi and Simeon in Gen. xlix. the two are spoken of as "brothers" with a communal assembly. See, for other examples of personification, GENEALOGY: *Biblical.*

[4] See E. Meyer, *Israeliten u. ihre Nachbarstämme*, pp. 299 sqq. (passim); S. A. Cook, *Ency. Bib.* col. 1665 seq.; *Crit. Notes on O T. History*, pp. 84 sqq., 122-125.

[5] The second element of the name Abiathar is connected with Jether or Jethro, the father-in-law of Moses, and even Ichabod (1 Sam. iv. 21) seems to be an intentional reshaping of Jochebed which is elsewhere the name of the mother of Moses. Phinehas, Eli's son, becomes in later writings the name of a prominent Aaronite priest in the days of the exodus from Egypt.

upon the famous holy city of Shechem to avenge their "sister" Dinah (Gen. xxxiv.), and that a detailed narrative tells of the bloodthirsty though pious Danites who sacked an Ephraimite shrine on their journey to a new home (Judges xvii. sq.).

The older records utilized by the Deuteronomic and later compilers indicate some common tradition which has found expression in these varying forms. Different religious standpoints are represented in the biblical writings, and it is now important to observe that the prophecies of Hosea unmistakably show another attitude to the Israelite priesthood. The condemnation of Jehu's bloodshed (Hos. i. 4) gives another view of events in which both Elijah and Elisha were concerned, and the change is more vividly realized when it is found that even to Moses and Aaron, the traditional founders of Israelite religion and ritual, is ascribed an offence whereby they incurred Yahweh's wrath (Num. xx. 12, 24, xxvii. 14; Deut. ix. 20, xxxii. 51). The sanctuaries of Shiloh and Dan lasted until the deportation of Israel (Judges xviii. 30 seq.), and some of their history is still preserved in the account of the late premonarchical age (12th–11th centuries B.C.). Shiloh's priestly gild is condemned for its iniquity (1 Sam. iii. 11-14), the sanctuary mysteriously disappears, and the priests are subsequently found at Nob outside Jerusalem (1 Sam. xxi. seq.). All idea of historical perspective has been lost, since the fall of Shiloh was apparently a recent event at the close of the 7th century (Jer. vii. 12-15, xxvi. 6-9). But the tendency to ascribe the disasters of northern Israel to the priesthood (see esp. Hosea) takes another form when an inserted prophecy revokes the privileges of the ancient and honourable family, foretells its overthrow, and announces the rise of a new faithful and everlasting priesthood, at whose hands the dispossessed survivors, reduced to poverty, would beg some priestly office to secure a livelihood (1 Sam. ii. 27-36). The sequel to this phase is placed in the reign of Solomon, when David's old priest Abiathar, sole survivor of the priests of Shiloh, is expelled to Anathoth (near Jerusalem), and Zadok becomes the first chief priest contemporary with the foundation of the *first* temple (1 Kings ii. 27, 35). These situations cannot be severed from what is known elsewhere of the Deuteronomic teaching, of the reform ascribed to Josiah, or of the principle inculcated by Ezekiel (see § 1 [*b*]). The late specific tendency in favour of Jerusalem agrees with the Deuteronomic editor of Kings who condemns the sanctuaries of Dan and Bethel for calf-worship (1 Kings xii. 28-31), and does not acknowledge the northern priesthood to be Levitical (1 Kings xii. 31, note the interpretation in 2 Chron. xi. 14, xiii. 9). It is from a similar standpoint that Aaron is condemned for the manufacture of the golden calf, and a compiler (not the original writer) finds its sequel in the election of the faithful Levites.[1]

In the third great stage there is another change in the tone. The present (priestly) recension of Gen. xxxiv. has practically justified Levi and Simeon from its standpoint of opposition to intermarriage, and in spite of Jacob's curse (Gen. xlix. 5-7) later traditions continue to extol the slaughter of the Shechemites as a pious duty. Post-exilic revision has also hopelessly obscured the offence of Moses and Aaron, although there was already a tendency to place the blame upon the people (Deut. i. 37, iii. 26, iv. 21). When two-thirds of the priestly families are said to be Zadokites and one-third are of the families of Abiathar, some reconciliation, some adjustment of rivalries, is to be recognized (1 Chron. xxiv.). Again, in the composite story of Korah's revolt, one version reflects a contest between Aaronites and the other Levites who claimed the priesthood (Num. xvi. 8-11, 36-40), while another shows the supremacy of the Levites as a caste either over the rest of the people (? cf. the prayer, Deut. xxxiii. 11), or, since the latter are under the leadership of Korah, later the eponym of a gild of singers, perhaps over the more subordinate ministers who once formed a separate class.[2] In the composite work Chronicles-Ezra-Nehemiah (dating after the post-exilic Levitical legislation) a peculiar interest is taken in the Levites, more particularly in the singers, and certain passages even reveal some animus against the Aaronites (2 Chron. xxix. 34, xxx. 3) A Levite probably had a hand in the work, and this, with the evidence for the Levitical Psalms (see Psalms), gives the caste an interesting place in the study of the transmission of the biblical records.[3] But the history of the Levites in the early post-exilic stage and onwards is a separate problem, and the work of criticism has not advanced sufficiently for a proper estimate of the various vicissitudes. However, the feeling which was aroused among the priests when some centuries later the singers obtained from Agrippa the privilege of wearing the priestly linen dress (Josephus, *Ant.* xx. 9. 6), at least enables one to appreciate more vividly the scantier hints of internal jealousies during the preceding years.[4]

4. *Summary.*—From the inevitable conclusion that there are three stages in the written sources for the Levitical institutions, the next step is the correlation of allied traditions on the basis of the genealogical evidence. But the problem of fitting these into the history of Israel still remains The assumption that the earlier sources for the pre-monarchical history, as incorporated by late compilers, are necessarily trustworthy confuses the inquiry (on Gen. xxxiv., see Simeon), and even the probability of a reforming spirit in Jehu's age depends upon the internal criticism of the related records (see Jews, §§ 11-14). The view that the Levites came from the south may be combined with the conviction that there Yahweh had his seat (cf. Deut. xxxiii. 2; Judges v. 4; Hab. iii. 3), but the latter is only one view, and the traditions of the patriarchs point to another belief (cf. also Gen. iv. 26). The two are reconciled when the God of the patriarchs reveals His name for the first time unto Moses (Exod. iii. 15, vi. 3). With these variations is involved the problem of the early history of the Israelites.[5] Moreover, the real Judaean tendency which associates the fall of Eli's priesthood at Shiloh with the rise of the Zadokites involves the literary problems of Deuteronomy, a composite work whose age is not certainly known, and of the twofold Deuteronomic redaction elsewhere, one phase of which is more distinctly Judaean and anti-Samaritan. There are vicissitudes and varying standpoints which point to a complicated literary history and require some historical background, and, apart from actual changes in the history of the Levites, some allowance must be made for the real character of the circles where the diverse records originated or through which they passed. The key must be sought in the exilic and post-exilic age where, unfortunately, direct and decisive evidence is lacking. It is clear that the Zadokite priests were rendered legitimate by finding a place for their ancestor in the Levitical genealogies—through Phinehas (cf. Num. xxv. 12 seq.), and Aaron—there was a feeling that a legitimate priest must be an Aaronite, but the historical reason for this is uncertain (see R. H. Kennett, *Journ. Theolog. Stud.*, 1905, pp. 161 sqq.). Hence, it is impossible at present to trace the earlier steps which led to the grand hierarchy of post-exilic Judaism. Even the name Levite itself is of uncertain origin. Though popularly connected with *lāvāh*, "be joined, attached," an ethnic from Leah has found some favour; the Assyrian *lī'u* "powerful, wise," has also been suggested. The term has been more plausibly identified with *l-v-'* (fem. *l-v-'-t*), the name given in old Arabian inscriptions (*e.g.* at al-'Olā, south-east of Elath) to the priests and priestesses of the Arabian god Vadd (so especially Hommel, *Anc. Heb. Trad.*, pp. 278 seq.). The date of the evidence, however, has not been fixed with unanimity, and this very

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[1] With this development in Israelite religion, observe that Judaean cult included the worship of a brazen serpent, the institution of which was ascribed to Moses, and that, according to the compiler of Kings, Hezekiah was the first to destroy it when he suppressed idolatrous worship in Judah (2 Kings xviii. 4). It may be added that the faithful Kenites (found in N. Palestine, Judges iv. 11) appear in another light when threatened with captivity by Asshur (Num. xxiv. 22; cf. fall of Dan and Shiloh), and if their eponym is Cain (*q.v.*), the story of Cain and Abel serves, amid a variety of purposes, to condemn the murder of the settled agriculturist by the nomad, but curiously allows that any retaliation upon Cain shall be avenged (see below, note 5).

[2] The name Korah itself is elsewhere Edomite (Gen. xxxvi. 5, 14, 18) and Calebite (1 Chron. ii. 43). See *Ency. Bib.*, *s.v.*

[3] The musical service of the temple has no place in the Pentateuch, but was considerably developed under the second temple and attracted the special attention of Greek observers (Theophrastus, *apud* Porphyry, *de Abstin.* ii. 26); see on this subject, R. Kittel's *Handkommentar* on Chronicles, pp. 90 sqq.

[4] Even the tithes enjoyed by the Levites (Num. xviii. 21 seq.) were finally transferred to the priests (so in the Talmud: see *Yebamoth*, fol. 86*a*, Carpzov, *App. ad Godw.* p. 624; Hottinger, *De Dec.* vi. 8, ix. 17).

[5] For some suggestive remarks on the relation between nomadism and the Levites, and their influence upon Israelite religion and literary tradition, see E. Meyer, *Die Israeliten u. ihre Nachbarstämme* (1906), pp. 82-89, 138; on the problems of early Israelite history, see Simeon (end), Jews, §§ 5, 8, and Palestine, *History*.

attractive and suggestive view requires confirmation and independent support.

Authorities.—For the argument in § 1, see Wellhausen, *Prolegomena*, pp. 121-151; W. R. Smith, *Old Test. in Jew. Church* (2nd ed., Index, *s.v.* "Levites"); A. Kuenen, *Hexateuch*, §§ 3 n. 16; 11, pp. 203 sqq.; 15 n. 15 (more technical); also the larger commentaries on Exodus-Joshua and the ordinary critical works on Old Testament literature. In § 1 and part of § 2 use has been freely made of W. R. Smith's article "Levites" in the 9th edition of the *Ency. Brit.* (see the revision by A. Bertholet, *Ency. Bib.* col. 2770 sqq.). For the history of the Levites in the post-exilic and later ages, see the commentaries on Numbers (by G. B. Gray) and Chronicles (E. L. Curtis), and especially H. Vogelstein, *Der Kampf zwischen Priestern u. Leviten seit den Tagen Ezechiels*, with Kuenen's review in his *Gesammelte Abhandlungen* (ed. K. Budde, 1894). See further Priest. (S. A. C.)

LEVITICUS, in the Bible, the third book of the Pentateuch. The name is derived from that of the Septuagint version (τὸ) λευ[ε]ιτικόν (sc. βιβλίον), though the English form is due to the Latin rendering, *Leviticus* (sc. *liber*). By the Jews the book is called *Wayyiḳrā* (וַיִּקְרָא) from the first word of the Hebrew text, but it is also referred to (in the Talmud and Massorah) as *Tōrath kōhănīm* (תּוֹרַת כֹּהֲנִים, law of the priests), *Sēpher kōhănīm* (סֵפֶר כ״, book of the priests), and *Sēpher ḳorbānīm* (סֵפֶר קָרְבָּנִים, book of offerings). As a descriptive title *Leviticus*, "the Levitical book," is not inappropriate to the contents of the book, which exhibits an elaborate system of sacrificial worship. In this connexion, however, the term "Levitical" is used in a perfectly general sense, since there is no reference in the book itself to the Levites themselves.

The book of Leviticus presents a marked contrast to the two preceding books of the Hexateuch in that it is derived from one document only, viz. the Priestly Code (P), and contains no trace of the other documents from which the Hexateuch has been compiled. Hence the dominant interest is a priestly one, while the contents are almost entirely legislative as opposed to historical. But though the book as a whole is assigned to a single document, its contents are by no means homogeneous: in fact the critical problem presented by the legislative portions of Leviticus, though more limited in scope, is very similar to that of the other books of the Hexateuch. Here, too, the occurrence of repetitions and divergencies, the variations of standpoint and practice, and, at times, the linguistic peculiarities point no less clearly to diversity of origin.

The historical narrative with which P connects his account of the sacred institutions of Israel is reduced in Leviticus to a minimum, and presents no special features. The consecration of Aaron and his sons (viii. ix.) resumes the narrative of Exod. xl., and this is followed by a brief notice of the death of Nadab and Abihu (x. 1-5), and later by an account of the death of the blasphemer (xxiv. 10 f.). Apart from these incidents, which, in accordance with the practice of P, are utilized for the purpose of introducing fresh legislation, the book consists of three main groups or collections of ritual laws: (1) chaps. i.–vii., laws of sacrifice; (2) chaps. xi.–xv., laws of purification, with an appendix (xvi.) on the Day of Atonement; (3) chaps. xvii.–xxvi., the Law of Holiness, with an appendix (xxvii.) on vows and tithes. In part these laws appear to be older than P, but when examined in detail the various collections show unmistakably that they have undergone more than one process of redaction before they assumed the form in which they are now presented. The scope of the present article does not permit of an elaborate analysis of the different sections, but the evidence adduced will, it is hoped, afford sufficient proof of the truth of this statement.

I. *The Laws of Sacrifice.*—Chaps. i.–vii. This group of laws clearly formed no part of the original narrative of P since it interrupts the connexion of chap. viii. with Exod. xl. For chap. viii. describes how Moses carried out the command of Exod. xl. 12-15 in accordance with the instructions given in Exod. xxix. 1-35, and bears the same relation to the latter passage that Exod. xxxv. ff. bears to Exod. xxv. ff. Hence we can only conclude that Lev. i.–vii. were added by a later editor. This conclusion does not necessarily involve a late date for the laws themselves, many of which have the appearance of great antiquity, though their original form has been considerably modified. But though these chapters form an independent collection of laws, and were incorporated as such in P, a critical analysis of their contents shows that they were not all derived from the same source.

The collection falls into two divisions, (*a*) i.–vi. 7 (Heb. v. 26), and (*b*) vi. 8 (Heb. vi. 1)–vii., the former being addressed to the people and the latter to the priests. The laws contained in (*a*) refer to (1) burnt-offerings, i.; (2) meal-offerings, ii.; (3) peace-offerings, iii.; (4) sin-offerings, iv. (on v. 1-13 see below); (5) trespass-offerings, v. 14–vi. 7 (Heb. v. 14-26). The laws in (*b*) cover practically the same ground—(1) burnt-offerings, vi. 8-13 (Heb. *vv.* 1-6); (2) meal-offerings, vi. 14-18 (Heb. *vv.* 7-11); (3) the meal-offering of the priest, vi. 19-23 (Heb. *vv.* 12-16); (4) sin-offerings, vi. 24-30 (Heb. *vv.* 17-23); (5) trespass-offerings, vii. 1-7, together with certain regulations for the priest's share of the burnt- and meal-offerings (*vv.* 8-10); (6) peace-offerings, vii. 11-21. Then follow the prohibition of eating the fat or blood (*vv.* 22-28), the priest's share of the peace-offerings (*vv.* 29-34), the priest's anointing-portion (*vv.* 35, 36), and the subscription (*vv.* 37, 38). The second group of laws is thus to a certain extent supplementary to the first, and was, doubtless, intended as such by the editor of chaps. i.–vii. Originally it can hardly have formed part of the same collection; for (*a*) the order is different, that of the second group being supported by its subscription, and (*b*) the laws in vi. 8–vii. are regularly introduced by the formula "This is the law (*tōrah*) of. . . ." Most probably the second group was excerpted by the editor of chaps. i.–vii. from another collection for the purpose of supplementing the laws of i.–v., more especially on points connected with the functions and dues of the officiating priests.

Closer investigation, however, shows that both groups of laws contain heterogeneous elements and that their present form is the result of a long process of development. Thus i. and iii. seem to contain genuinely old enactments, though i. 14-17 is probably a later addition, since there is no reference to birds in the general heading *v.* 2. Chap. ii. 1-3, on the other hand, though it corresponds in form to i. and iii., interrupts the close connexion between those chapters, and should in any case stand after iii.: the use of the second for the third person in the remaining verses points to a different source. As might be expected from the nature of the sacrifice with which it deals, iv. (sin-offerings) seems to belong to a relatively later period of the sacrificial system. Several features confirm this view: (1) the blood of the sin-offering of the "anointed priest" and of the whole congregation is brought within the veil and sprinkled on the altar of incense, (2) the sin-offering of the congregation is a bullock, and not, as elsewhere, a goat (ix. 15; Num. xv. 24), (3) the altar of incense is distinguished from the altar of burnt-offering (as opposed to Exod. xxix.; Lev. viii. ix.). Chap. v. 1-13 have usually been regarded as an appendix to iv., setting forth (*a*) a number of typical cases for which a sin-offering is required (*vv.* 1-6), and (*b*) certain concessions for those who could not afford the ordinary sin-offering (*vv.* 7-13). But *vv.* 1-6, which are not homogeneous (*vv.* 2 and 3 treating of another question and interrupting *vv.* 1, 4, 5 f.), cannot be ascribed to the same author as iv.: for (1) it presents a different theory of the sin-offering (contrast v. 1 f. with iv. 2), (2) it ignores the fourfold division of offerings corresponding to the rank of the offender, (3) it fails to observe the distinction between sin- and trespass-offering (in *vv.* 6, 7, "his guilt-offering" (אֲשָׁמוֹ) appears to have the sense of a "penalty" or "forfeit," unless with Baentsch we read קָרְבָּנוֹ "his oblation" in each case; cf. *v.* 11, iv. 23 ff. Verses 7-13, on the other hand, form a suitable continuation of iv., though probably they are secondary in character. Chap. v. 14 (Heb. v. 26)–vi. 7 contain regulations for the trespass-offering, in which the distinctive character of that offering is clearly brought out. The cases cited in vi. 1-7 (Heb. v. 20-26) are clearly analogous to those in v. 14-16, from which they are at present separated by *vv.* 17-19. These latter prescribe a trespass-offering for the same case for which in iv. 22 f. a sin-offering is required: it is noticeable also that no restitution, the characteristic feature of the *āshām*, is prescribed. It is hardly doubtful that the verses are derived from a different source to that of their immediate context, possibly the same as v. 1-6.

The subscription (vii. 37, 38) is our chief guide to determining the original extent of the second group of laws (vi. 8 [Heb. vi. 1]–vii. 36). From it we infer that originally the collection only dealt with the five chief sacrifices (vi. 8-13; 14-18; 24, 25, 27-30; vii. 1-6; 11-21) already discussed in i.–v., since only these are referred to in the colophon where they are given in the same order (the consecration-offering [*v.* 37] is probably due to the same redactor who introduced the gloss "in the day when he is anointed" in vi. 20). Of the remaining sections vi. 19-23 (Heb. 12-16), the daily meal-offering of the (high-) priest, betrays its secondary origin by its absence from the subscription, cf. also the different introduction. Chaps. vi. 26 (Heb. 19) and vii. 7 assign the offering to the officiating priest in contrast to vi. 18 (Heb. 11), 29 (Heb. 22), vii. 6 ("every male among the priests"), and possibly belong, together with vii. 8-10, to a separate collection which dealt especially with priestly dues. Chap. vii. 22-27, which prohibit the eating of fat and blood, are addressed to the community at large, and were, doubtless, inserted here in connexion with the sacrificial meal which formed the usual accompaniment of the peace-offering. Chap. vii. 28-34 are also addressed to the people, and cannot therefore have formed part of the original priestly manual; *v.* 33 betrays the same hand as vi. 26 (Heb. 19) and vii. 7, and with 35*a* may be assigned to the same collection as those verses; to the redactor must be assigned *vv.* 32 (a doublet of *v.* 33), 34, 35*b* and 36.

Chaps. viii.–x. As stated, these chapters form the original sequel to Exod. xl. They describe (*a*) the consecration of Aaron and his sons, a ceremony which lasted seven days (viii.), and (*b*) the public worship on the eighth day, at which Aaron and his sons officiated for the first time as priests (ix.); then follow (*c*) an account of the death of Nadab and Abihu for offering strange fire (x. 1-5); (*d*) various regulations affecting the priests (*vv.* 12-15), and (*e*) an explanation, in narrative form, of the departure in ix. 15 from the rules for the sin-offering given in vi. 30 (*vv.* 16-20).

According to Exod. xl. 1-15 Moses was commanded to set up the Tabernacle and to consecrate the priests, and the succeeding verses (16-38) describe how the former command was carried out. The execution of the second command, however, is first described in Lev. viii., and since the intervening chapters exhibit obvious traces of belonging to another source, we may conclude with some certainty that Lev. viii. formed the immediate continuation of Exod. xl. in the original narrative of P. But it has already been pointed out (see EXODUS) that Exod. xxxv.–xl. belong to a later stratum of P than Exod. xxv.–xxix., hence it is by no means improbable that Exod. xxxv.–xl. have superseded an earlier and shorter account of the fulfilment of the commands in Exod. xxv.–xxix. If this be the case, we should naturally expect to find that Lev. viii., which bears the same relation to Exod. xxix. 1-35 as Exod. xxxv. ff. to Exod. xxv. ff. also belonged to a later stratum. But Lev. viii., unlike Exod xxxv. ff., only mentions one altar, and though in its present form the chapter exhibits marks of later authorship, these marks form no part of the original account, but are clearly the work of a later editor. These additions, the secondary character of which is obvious both from the way in which they interrupt the context and also from their contents, are (1), *v.* 10, the anointing of the Tabernacle in accordance with Exod. xxx. 26 ff.: it is not enjoined in Exod. xxix.; (2) *v.* 11, the anointing of the altar and the laver (cf. Exod. xxx. 17 ff.) as in Exod. xxix. 36*b*, xxx. 26 ff.); (3) *v.* 30, the sprinkling of blood and oil on Aaron and his sons. Apart from these secondary elements, which readily admit of excision, the chapter is in complete accord with P as regards point of view and language, and is therefore to be assigned to that source.

The consecration of Aaron and his sons was, according to P, a necessary preliminary to the offering of sacrifice, and chap. ix. accordingly describes the first solemn act of worship. The ceremony consists of (*a*) the offerings for Aaron, and (*b*) those for the congregation; then follows the priestly blessing (*v.* 22), after which Moses and Aaron enter the sanctuary, and on reappearing once more bless the people. The ceremony terminates with the appearance of the glory of Yahweh, accompanied by a fire which consumes the sacrifices on the altar. Apart from a few redactional glosses the chapter as a whole belongs to P. The punishment of Nadab and Abihu by death for offering "strange fire" (x. 1-5) forms a natural sequel to chap. ix. To this incident a number of disconnected regulations affecting the priests have been attached, of which the first, viz. the prohibition of mourning to Aaron and his sons (*vv.* 6, 7), alone has any connexion with the immediate context; as it stands, the passage is late in form (cf. xxi. 10 ff.). The second passage, *vv.* 8, 9, which prohibits the use of wine and strong drink to the priest when on duty, is clearly a later addition. The connexion between these verses and the following is extremely harsh, and since *vv.* 10, 11 relate to an entirely different subject (cf. xi. 47), the latter verses must be regarded as a misplaced fragment. Verses 12-15 relate to the portions of the meal- and peace-offerings which fell to the lot of the priests, and connect, therefore, with chap. ix.; possibly they have been wrongly transferred from that chapter. In the remaining paragraph, x. 16-20, we have an interesting example of the latest type of additions to the Hexateuch. According to ix. 15 (cf. *v.* 11) the priests had burnt the flesh of the sin-offering which had been offered on behalf of the congregation, although its blood had not been taken into the inner sanctuary (cf. iv. 1-21, vi. 26). Such treatment, though perfectly legitimate according to the older legislation (Exod. xxix. 14; cf. Lev. viii. 17), was in direct contradiction to the ritual of vi. 24 ff., which prescribed that the flesh of ordinary sin-offerings should be eaten by the priests. Such a breach of ritual on the part of Aaron and his sons seemed to a later redactor to demand an explanation, and this is furnished in the present section.

II. *The Laws of Purification.*—Chaps. xi.–xv. This collection of laws comprises four main sections relating to (1) clean and unclean beasts (xi.), (2) childbirth (xii.), (3) leprosy (xiii. xiv.), and (4) certain natural secretions (xv.). These laws, or *tōrōth*, are so closely allied to each other by the nature of their contents and their literary form (cf. especially the recurring formula "This is the law of . . ." xi. 46, xii. 7, xiii. 59, xiv. 32, 54, 57, xv. 32) that they must originally have formed a single collection. The collection, however, has clearly undergone more than one redaction before reaching its final form. This is made evident not only by the present position of chap. xii. which in *v.* 2 presupposes chap. xv. (cf. xv. 19), and must originally have followed after that chapter, but also by the contents of the different sections, which exhibit clear traces of repeated revision. At the same time it seems, like chaps. i.–vii., xvii.–xxvi., to have been formed independently of P and to have been added to that document by a later editor; for in its present position it interrupts the main thread of P's narrative, chap. xvi. forming the natural continuation of chap. x.; and, further, the inclusion of Aaron as well as Moses in the formula of address (xi. 1, xiii. 1, xiv. 33, xv. 1) is contrary to the usage of P.

1. Chap. xi. consists of two main sections, of which the first (*vv.* 1-23, 41-47) contains directions as to the clean and unclean animals which may or may not be used for food, while the second (*vv.* 24-40) treats of the defilement caused by contact with the carcases of unclean animals (in. *v.* 39 f. contact with clean animals after death is also forbidden), and prescribes certain rites of purification. The main interest of the chapter, from the point of view of literary criticism, centres in the relation of the first section to the Law of Holiness (xvii.–xxvi.) and to the similar laws in Deut. xiv. 3-20. From xx. 25 it has been inferred with considerable probability that H, or the Law of Holiness, originally contained legislation of a similar character with reference to clean and unclean animals; and many scholars have held that the first section (*vv.* 1 [or 2]-23 and 41-47) really belongs to that code. But while *vv.* 43-45 may unhesitatingly be assigned to H, the remaining verses fail to exhibit any of the characteristic features of that code. We must assign them, therefore, to another source, though, in view of xx. 25 and xi. 43-45, it is highly probable that they have superseded similar legislation belonging to H.

The relation of Lev. xi. 2-23 to Deut. xiv. 4-20 is less easy to determine, since the phenomena presented by the two texts are somewhat inconsistent. The two passages are to a large extent verbally identical, but while Deut. xiv. 4*b*, 5 both defines and exemplifies the clean animals (as opposed to Lev. xi. 3; which only defines them), the rest of the Deuteronomic version is much shorter than that of Leviticus. Thus, except for *vv.* 4*b*, 5, the Deuteronomic version, which in its general style, and to a certain extent in its phraseology (cf. מִין *kind*, *vv.* 13, 15, 18, and שֶׁרֶץ *swarm*, *v.* 19), shows traces of a priestly origin, might be regarded as an abridgment of Lev. xi. But the Deuteronomic version uses טמא *unclean*, throughout (*vv.* 7, 10, 19), while Lev. xi. from *v.* 11 onwards employs the technical term שֶׁקֶץ *detestable thing*, and it is at least equally possible to treat the longer version of Leviticus as an expansion of Deut. xiv. 4-20. The fact that Deut. xiv. 21 permits the stranger (גֵּר) to eat the flesh of any animal that dies a natural death, while Lev. xvii. 25 places him on an equal footing with the Israelite, cannot be cited in favour of the priority of Deuteronomy since *v.* 21 is clearly supplementary; cf. also Lev. xi. 39. On the whole it seems best to accept the view that both passages are derived separately from an earlier source.

2. Chap. xii. prescribes regulations for the purification of a woman after the birth of (*a*) a male and (*b*) a female child. It has been already pointed out that this chapter would follow more suitably after chap. xv., with which it is closely allied in regard to subject-matter. The closing formula (*v.* 7) shows clearly that, as in the case of v. 7-13 (cf. i. 14-17), the concessions in favour of the poorer worshipper are a later addition.

3. Chaps. xiii., xiv. The regulations concerning leprosy fall readily into four main divisions: (*a*) xiii. 1-46*a*, an elaborate description of the symptoms common to the earlier stages of leprosy and other skin diseases to guide the priest in deciding as to the cleanness or uncleanness of the patient; (*b*) xiii. 47-59, a further description of different kinds of mould or fungus-growth affecting stuffs and leather; (*c*) xiv. 1-32, the rites of purification to be employed after the healing of leprosy; and (*d*) xiv. 33-53, regulations dealing with the appearance of patches of mould or mildew on the walls of a house. Like other collections the group of laws on leprosy easily betrays its composite character and exhibits unmistakable evidence of its gradual growth. There is, however, no reason to doubt that a large portion of the laws is genuinely old since the subject is one that would naturally call for early legislation; moreover, Deut. xxiv. 8 presupposes the existence of regulations concerning leprosy, presumably oral, which were in the possession of the priests. The earliest sections are admittedly xiii. 1-46*a* and xiv. 2-8*a*, the ritual of the latter being obviously of a very archaic type. The secondary character of xiii. 47-59 is evident: it interrupts the close connexion between xiii. 1-46*a* and xiv. 2-8*a*, and further it is provided with its own colophon in *v.* 59. A similar character must be assigned to the remaining verses of chap. xiv., with the exception of the colophon in *v.* 57*b*; the latter has been successively expanded in *vv.* 54-57*a* so as to include the later additions. Thus xiv. 9-20 prescribes a second and more elaborate ritual of purification after the healing of leprosy, though the leper, according to *v.* 8*a*, is already clean; its secondary character is further shown by the heightening of the ceremonial which seems to be modelled on that of the consecration of the priests

(viii. 23 ff.), the multiplication of sacrifices and the minute regulations with regard to the blood and oil. The succeeding section (*vv.* 21-32) enjoins special modifications for those who cannot afford the more costly offerings of *vv.* 9-20, and like v. 7-13, xii. 8 is clearly a later addition; cf. the separate colophon, *v.* 32. The closing section xiv. 33-53 is closely allied to xiii. 47-59, though probably later in date: probably the concluding verses (48-53), in which the same rites are prescribed for the purification of a house as are ordained for a person in *vv.* 3-8*a*, were added at a still later period.

4. Chap. xv. deals with the rites of purification rendered necessary by various natural secretions, and is therefore closely related to chap. xii. On the analogy of the other laws it is probable that the old *tōrāh*, which forms the basis of the chapter, has been subsequently expanded, but except in the colophon (*vv.* 32-34), which displays marks of later redaction, there is nothing to guide us in separating the additional matter.

Chap. xvi. It may be regarded as certain that this chapter consists of three main elements, only one of which was originally connected with the ceremonial of the Day of Atonement, and that it has passed through more than one stage of revision. Since the appearance of Benzinger's analysis *ZATW* (1889), critics in the main have accepted the division of the chapter into three independent sections: (1) *vv.* 1-4, 6, 12, 13, 34*b* (probably *vv.* 23, 24 also form part of this section), regulations to be observed by Aaron whenever he might enter "the holy place within the veil." These regulations are the natural outcome of the death of Nadab and Abihu (x. 1-5), and their object is to guard Aaron from a similar fate; the section thus forms the direct continuation of chap. x.; (2) *vv.* 29-34*a*, rules for the observance of a yearly fast day, having for their object the purification of the sanctuary and of the people; (3) *vv.* 5, 7-10, 14-22, 26-28, a later expansion of the blood-ritual to be performed by the high-priest when he enters the Holy of Holies, with which is combined the strange ceremony of the goat which is sent away into the wilderness to Azazel. The matter common to the first two sections, viz. the entrance of the high priest into the Holy of Holies, was doubtless the cause of their subsequent fusion; beyond this, however, the sections have no connexion with one another, and must originally have been quite independent. Doubtless, as Benzinger suggests, the rites to be performed by the officiating high priest on the annual Day of Atonement, which are not prescribed in *vv.* 29-34*a*, were identical with those laid down in chap. ix. That the third section belongs to a later stage of development and was added at a later date is shown by (*a*) the incongruity of *vv.* 14 ff. with *v.* 6—according to the latter the purification of Aaron is a preliminary condition of his entrance within the veil—and (*b*) the elaborate ceremonial in connexion with the sprinkling of the blood. The first section, doubtless, belongs to the main narrative of P; it connects directly with chap. x. and presupposes only one altar (cf. *v.* 12, Exod. xxviii. 35). The second and third sections, however, must be assigned to a later stratum of P, if only because they appear to have been unknown to Ezra (Neh. ix. 1); the fact that Ezra's fast day took place on the twenty-fourth day of the seventh month (as opposed to Lev. xvi. 29, xxiii. 26 f.) acquires an additional importance in view of the agreement between Neh. viii. 23 f. and Lev. xxiii. 33 f. as to the date of the Feast of Tabernacles. No mention is made of the Day of Atonement in the pre-exilic period, and it is a plausible conjecture that the present law arose from the desire to turn the spontaneous fasting of Neh. ix. 1 into an annual ceremony; in any case directions as to the annual performance of the rite must originally have preceded *vv.* 29 ff. Possibly the omission of this introduction is due to the redactor who combined (1) and (2) by transferring the regulations of (1) to the ritual of the annual Day of Atonement. At a later period the ritual was further developed by the inclusion of the additional ceremonial contained in (3).

III. *The Law of Holiness.*—Chaps. xvii.–xxvi. The group of laws contained in these chapters has long been recognized as standing apart from the rest of the legislation set forth in Leviticus. For, though they display undeniable affinity with P, they also exhibit certain features which closely distinguish them from that document. The most noticeable of these is the prominence assigned to certain leading ideas and motives, especially to that of *holiness*. The idea of holiness, indeed, is so characteristic of the entire group that the title "Law of Holiness," first given to it by Klostermann (1877), has been generally adopted. The term "holiness" in this connexion consists positively in the fulfilment of ceremonial obligations and negatively in abstaining from the defilement caused by heathen customs and superstitions, but it also includes obedience to the moral requirements of the religion of Yahweh.

On the literary side also the chapters are distinguished by the paraenetic setting in which the laws are embedded and by the use of a special terminology, many of the words and phrases occurring rarely, if ever, in P (for a list of characteristic phrases cf. Driver, *L.O.T.*^{6}, p.49). Further, the structure of these chapters, which closely resembles that of the other two Hexateuchal codes (Exod. xx. 22–xxiii. and Deut. xii.–xxviii.), may reasonably be adduced in support of their independent origin. All three codes contain a somewhat miscellaneous collection of laws; all alike commence with regulations as to the place of sacrifice and close with an exhortation. Lastly, some of the laws treat of subjects which have been already dealt with in P (cf. xvii. 10-14 and vii. 26 f., xix. 6-8 and vii. 15-18). It is hardly doubtful also that the group of laws, which form the basis of chaps. xvii.–xxvi., besides being independent of P, represent an older stage of legislation than that code. For the sacrificial system of H (=Law of Holiness) is less developed than that of P, and in particular shows no knowledge of the sin- and trespass-offerings; the high priest is only *primus inter pares* among his brethren, xxi. 10 (cf. Lev. x. 6, 7, where the same prohibition is extended to all the priests); the distinction between "holy" and "most holy" things (Num. xviii. 8) is unknown to Lev. xxii. (Lev. xxi. 22 is a later addition). It cannot be denied, however, that chaps. xvii.–xxvi. present many points of resemblance with P, both in language and subject-matter, but on closer examination these points of contact are seen to be easily separable from the main body of the legislation. It is highly probable, therefore, that these marks of P are to be assigned to the compiler who combined H with P. But though it may be regarded as certain that H existed as an independent code, it cannot be maintained that the laws which it contains are all of the same origin or belong to the same age. The evidence rather shows that they were first collected by an editor before they were incorporated in P. Thus there is a marked difference in style between the laws themselves and the paraenetic setting in which they are embedded; and it is not unnatural to conjecture that this setting is the work of the first editor.

Two other points in connexion with H are of considerable importance: (*a*) the possibility of other remains of H, and (*b*) its relation to Deuteronomy and Ezekiel.

(*a*) It is generally recognized that H, in its present form, is incomplete. The original code must, it is felt, have included many other subjects now passed over in silence. These, possibly, were omitted by the compiler of P, because they had already been dealt with elsewhere, or they may have been transferred to other connexions. This latter possibility is one that has appealed to many scholars, who have accordingly claimed many other passages of P as parts of H. We have already accepted xi. 43 ff. as an undoubted excerpt from H, but, with the exception of Num. xv. 37-41 (on fringes), the other passages of the Hexateuch which have been attributed to H do not furnish sufficient evidence to justify us in assigning them to that collection. Moore (*Ency. Bibl.* col. 2787) rightly points out that "resemblance in the subject or formulation of laws to *tōrōth* incorporated in H may point to a relation to the *sources* of H, but is not evidence that these laws were ever included in that collection."

(*b*) The exact relation of H to Deuteronomy and Ezekiel is hard to determine. That chaps. xvii.–xxvi. display a marked affinity to Deuteronomy cannot be denied. Like D, they lay great stress on the duties of humanity and charity both to the Israelite and to the stranger (Deut. xxiv.; Lev. xix.; compare also laws affecting the poor in Deut. xv.; Lev. xxv.), but in some respects the legislation of H appears to reflect a more advanced stage than that of D, *e.g.* the rules for the priesthood (chap. xxi.), the feasts (xxiii. 9-20, 39-43), the Sabbatical year (xxv. 1-7, 18-22), weights and measures (xix. 35 f.). It must be remembered, however, that these laws have passed through more than one stage of revision and that the original regulations have been much obscured by later glosses and additions; it is therefore somewhat hazardous to base any argument on their present form. "The mutual independence of the two (codes) is rather to be argued from the absence of laws identically formulated, the lack of agreement in order either in the whole or in smaller portions, and the fact that of the peculiar motives and phrases of R_D there is no trace in H (Lev. xxiii. 40 is almost solitary). It is an unwarranted assumption that all the fragments of Israelite legislation which have been preserved lie in one serial development" (Moore, *Ency. Bibl.* col. 2790).

The relation of H to Ezekiel is remarkably close, the resemblances between the two being so striking that many writers have regarded Ezekiel as the author of H. Such a theory, however, is excluded by the existence of even greater differences of style and matter, so that the main problem to be decided is whether Ezekiel is prior to H or vice versa. The main arguments brought forward by those who maintain the priority of Ezekiel are (1) the fact that H makes mention of a high priest, whereas Ezekiel betrays no knowledge of such an official, and (2) that the author of Lev. xxvi. presupposes a condition of exile and looks forward to a restoration from it. Too much weight, however, must not be attached to these points; for (1) the phrase used in Lev. xxi. 10 (*literally*, "he who is greater than his brethren") cannot be regarded as the equivalent of the definitive "chief priest" of P, and is rather comparable with the usage of 2 Kings xxii. 4 ff., xxv. 18 ("the chief priest"), cf. "the priest" in xi. 9 ff., xvi. 10 ff.; and (2) the passages in Lev. xxvi. (*vv.* 34 f., 39-45), which are especially cited in support of the exilic standpoint of the writer, are just those which, on other grounds, show signs of later interpolation. The following considerations undoubtedly suggest the priority of H: (1) there is no trace in H of the distinction between priests and Levites first introduced by Ezekiel; (2) Ezekiel xviii., xx., xxii., xxiii. appear to presuppose the laws of

Lev. xviii.–xx.; (3) the calendar of Lev. xxiii. represents an earlier stage of development than the fixed days and months of Ezek. xlv.; (4) the sin- and trespass-offerings are not mentioned in H (cf. Ezek. xl. 39, xlii. 13, xliv. 29, xlvi. 20); (5) the parallels to H, which are found especially in Ezek. xviii., xx., xxii. f., include both the paraenetic setting and the laws; and lastly, (6) a comparison of Lev. xxvi. with Ezekiel points to the greater originality of the former. Baentsch, however, who is followed by Bertholet, adopts the view that Lev. xxvi. is rather an independent hortatory discourse modelled on Ezekiel. The same writer further maintains that H consists of three separate elements, viz. chaps. xvii.; xviii.–xx., with various ordinances in chaps. xxiii.–xxv.; and xxii., xxiii., of which the last is certainly later than Ezekiel, while the second is in the main prior to that author. But the arguments which he adduces in favour of the threefold origin of H are not sufficient to outweigh the general impression of unity which the code presents.

Chap. xvii. comprises four main sections which are clearly marked off by similar introductory and closing formulae: (1) *vv.* 3-7, prohibition of the slaughter of domestic animals, unless they are presented to Yahweh; (2) *vv.* 8, 9, sacrifices to be offered to Yahweh alone; (3) *vv.* 10-12, prohibition of the eating of blood; (4) *vv.* 13, 14, the blood of animals not used in sacrifice to be poured on the ground. The chapter as a whole is to be assigned to H. At the same time it exhibits many marks of affinity with P, a phenomenon most easily explained by the supposition that older laws of H have been expanded and modified by later hands in the spirit of P. Clear instances of such revision may be seen in the references to "the door of the tent of meeting" (*vv.* 4, 5, 6, 9) and "the camp" (*v.* 3), as well as in *vv.* 6, 11, 12-14; *vv.* 15, 16 (prohibiting the eating of animals that die a natural death or are torn by beasts) differ formally from the preceding paragraphs, and are to be assigned to P. What remains after the excision of later additions, however, is not entirely uniform, and points to earlier editorial work on the part of the compiler of H. Thus *vv.* 3-7 reflect two points of view, *vv.* 3, 4 drawing a contrast between profane slaughter and sacrifice, while *vv.* 5-7 distinguish between sacrifices offered to Yahweh and those offered to demons.

Chap. xviii. contains laws on prohibited marriages (*vv.* 6-18) and various acts of unchastity (*vv.* 19-23) embedded in a paraenetic setting (*vv.* 1-5 and 24-30), the laws being given in the 2nd pers. sing., while the framework employs the 2nd pers. plural. With the exception of *v.* 21 (on Molech worship), which is here out of place, and has possibly been introduced from xx. 2-5, the chapter displays all the characteristics of H.

Chap. xix. is a collection of miscellaneous laws, partly moral, partly religious, of which the fundamental principle is stated in *v.* 2 ("Ye shall be holy"). The various laws are clearly defined by the formula "I am Yahweh," or "I am Yahweh your God," phrases which are especially characteristic of chaps. xviii.–xx. The first group of laws (*vv.* 3 f.) corresponds to the first table of the decalogue, while *vv.* 11-18 are analogous to the second table; *vv.* 5-8 (on peace-offerings) are obviously out of place here, and are possibly to be restored to the cognate passage xxii. 29 f., while the humanitarian provisions of *vv.* 9 and 10 (cf. xxiii. 22) have no connexion with the immediate context; similarly *v.* 20 (to which a later redactor has added *vv.* 21, 22, in accordance with vi. 6 f.) appears to be a fragment from a penal code; the passage resembles Exod. xxi. 7 ff., and the offence is clearly one against property, the omission of the punishment being possibly due to the redactor who added *vv.* 21, 22.

Chap. xx. Prohibitions against Molech worship, *vv.* 2-5, witchcraft, *vv.* 6 and 27, unlawful marriages and acts of unchastity, *vv.* 10-21. Like chap. xviii., the main body of laws is provided with a paraenetic setting, *vv.* 7, 8 and 22-24; it differs from that chapter, however, in prescribing the death penalty in each case for disobedience. Owing to the close resemblance between the two chapters, many critics have assumed that they are derived from the same source and that the latter chapter was added for the purpose of supplying the penalties. This view, however, is not borne out by a comparison of the two chapters, for four of the cases mentioned in chap. xviii. (*vv.* 7, 10, 17*b*, 18) are ignored in chap. xx., while the order and in part the terminology are also different; further, it is difficult on this view to explain why the two chapters are separated by chap. xix. A more probable explanation is that the compiler of H has drawn from two parallel, but independent, sources. Signs of revision are not lacking, especially in *vv.* 2-5, where *vv.* 4 f. are a later addition intended to reconcile the inconsistency of *v.* 2 with *v.* 3 (R_H); *v.* 6, which is closely connected with xix. 31, appears to be less original than *v.* 27, and may be ascribed to the same hand as *v.* 3; *v.* 9 can hardly be in its original context—it would be more suitable after xxiv. 15. The paraenetic setting (*vv.* 7, 8 and 22-24) is to be assigned to the compiler of H, who doubtless prefaced the parallel version with the additional laws of *vv.* 2-6. Verses 25, 26 apparently formed the conclusion of a law on clean and unclean animals similar to that of chap. xi., and very probably mark the place where H's regulations on that subject originally stood.

Chaps. xxi., xxii. A series of laws affecting the priests and offerings, viz. (1) regulations ensuring the holiness of (*a*) ordinary priests, xxi. 1-9, and (*b*) the chief priest, *vv.* 10-15; (2) a list of physical defects which exclude a priest from exercising his office, *vv.* 16-24; (3) the enjoyment of sacred offerings limited to (*a*) priests, if they are ceremonially clean, xxi. 1-9, and (*b*) members of a priestly family, *vv.* 10-16; (4) animals offered in sacrifice must be without blemish, *vv.* 17-25; (5) further regulations with regard to sacrifices, *vv.* 26-30, with a paraenetic conclusion, *vv.* 31-33.

These chapters present considerable difficulty to the literary critic; for while they clearly illustrate the application of the principle of "holiness," and in the main exhibit the characteristic phraseology of H, they also display many striking points of contact with P and the later strata of P, which have been closely interwoven into the original laws. These phenomena can be best explained by the supposition that we have here a body of old laws which have been subjected to more than one revision. The nature of the subjects with which they deal is one that naturally appealed to the priestly schools, and owing to this fact the laws were especially liable to modification and expansion at the hands of later legislators who wished to bring them into conformity with later usage. Signs of such revision may be traced back to the compiler of H, but the evidence shows that the process must have been continued down to the latest period of editorial activity in connexion with P. To redactors of the school of P belong such phrases as "the sons of Aaron" (xxi. 1, 24, xxii. 2, 18), "the seed of Aaron" (xxi. 21, xxii. 4 and "thy seed," *v.* 17; cf. xxii. 3), "the offerings of the Lord made by fire" (xxi. 6, 21, xxii. 22, 27), "the most holy things" (xxi. 22; cf. xxii. 3 ff. "holy things" only), "throughout their (or your) generations" (xxi. 7, xxii. 3), the references to the anointing of Aaron (xxi. 10, 12) and the Veil (xxi. 23), the introductory formulae (xxi. 1, 16 f., xxii. 1 f., 17 f., 26) and the subscription (xxi. 24). Apart from these redactional additions, chap. xxi. is to be ascribed to H, *vv.* 6 and 8 being possibly the work of R_H. Most critics detect a stronger influence of P in chap. xxii., more especially in *vv.* 3-7 and 17-25, 29, 30; most probably these verses have been largely recast and expanded by later editors, but it is noticeable that they contain no mention of either sin- or trespass-offerings.

Chap. xxiii. A calendar of sacred seasons. The chapter consists of two main elements which can easily be distinguished from one another, the one being derived from P and the other from H. To the former belongs the fuller and more elaborate description of *vv.* 4-8, 21, 23-38; to the latter, *vv.* 9-20, 22, 39-44. Characteristic of the priestly calendar are (1) the enumeration of "holy convocations," (2) the prohibition of all work, (3) the careful determination of the date by the day and month, (4) the mention of "the offerings made by fire to Yahweh," and (5) the stereotyped form of the regulations. The older calendar, on the other hand, knows nothing of "holy convocations," nor of abstinence from work; the time of the feasts, which are clearly connected with agriculture, is only roughly defined with reference to the harvest (cf. Exod. xxiii. 14 ff., xxxiv. 22; Deut. xvi. 9 ff.).

The calendar of P comprises (*a*) the Feast of Passover and the Unleavened Cakes, *vv.* 4-8; (*b*) a fragment of Pentecost, *v.* 21; (*c*) the Feast of Trumpets, *vv.* 23-25; (*d*) the Day of Atonement, *vv.* 26-32; and (*e*) the Feast of Tabernacles, *vv.* 33-36, with a subscription in *vv.* 37, 38. With these have been incorporated the older regulations of H on the Feast of Weeks, or Pentecost, *vv.* 9-20, which have been retained in place of P's account (cf. *v.* 21), and on the Feast of Tabernacles, *vv.* 39-44, the latter being clearly intended to supplement *vv.* 33-36. The hand of the redactor who combined the two elements may be seen partly in additions designed to accommodate the regulations of H to P (*e.g.* *v.* 39*a*, "on the fifteenth day of the seventh month," and 39*b*, "and on the eighth day shall be a solemn rest"), partly in the later expansions corresponding to later usage, *vv.* 12 f., 18, 19*a*, 21*b*, 41. Further, *vv.* 26-32 (on the Day of Atonement, cf. xvi.) are a later addition to the P sections.

Chap. xxiv. affords an interesting illustration of the manner in which the redactor of P has added later elements to the original code of H. For the first part of the chapter, with its regulations as to (*a*) the lamps in the Tabernacle, *vv.* 1-4, and (*b*) the Shewbread, *vv.* 5-9, is admittedly derived from P, *vv.* 1-4, forming a supplement to Exod. xxv. 31-40 (cf. xxvii. 20 f.) and Num. viii. 1-4, and *vv.* 5-9 to Exod. xxv. 30. The rest of the chapter contains old laws (*vv.* 15*b*-22) derived from H on blasphemy, manslaughter and injuries to the person, to which the redactor has added an historical setting (*vv.* 10-14, 23) as well as a few glosses.

Chap. xxv. lays down regulations for the observance of (*a*) the Sabbatical year, *vv.* 1-7, 19-22, and (*b*) the year of Jubilees, *vv.* 8-18, 23, and then applies the principle of redemption to (1) land and house property, *vv.* 24-34, and (2) persons, *vv.* 35-55. The rules for the Sabbatical year (*vv.* 1-7) are admittedly derived from H, and *vv.* 19-22 are also from the same source. Their present position after *vv.* 8-18 is due to the redactor who wished to apply the same rules to the year of Jubilee. But though the former of the two sections on the year of Jubilee (*vv.* 8-18, 23) exhibits undoubted signs of P, the traces of H are also sufficiently marked to warrant the conclusion that the latter code included laws relating to the year of Jubilee, and that these have been modified by R_P and then connected with the regulations for the Sabbatical year. Signs of the redactor's handiwork may be seen in *vv.* 9, 11-13 (the year of Jubilee treated as a fallow year) and 15, 16 (cf. the repetition of "ye shall not wrong one another," *vv.* 14 and 17). Both on historical and on critical grounds, however, it is improbable that the principle of restitution underlying the regulations for the year of Jubilee was originally extended to *persons* in the earlier code. For it is difficult to harmonize the laws as to the release of Hebrew slaves with the other legislation on the same subject (Exod. xxi. 2-6; Deut. xv.), while both the secondary position which they occupy in this chapter and their more elaborate and formal character point to a later origin for *vv.* 35-55. Hence these verses in the main must be assigned to R_P. In this connexion it is noticeable that *vv.* 35-38, 39-40*a*, 43, 47, 53, 55, which show the characteristic marks of H, bear no special relation to the year of Jubilee, but merely inculcate a more humane treatment of those Israelites who are compelled by circumstances to sell themselves either to their brethren or to strangers. It is probable, therefore, that they form no part of the original legislation of the year of Jubilee, but were incorporated at a later period. The present form of *vv.* 24-34 is largely due to R_P, who has certainly added *vv.* 32-34 (cities of the Levites) and probably *vv.* 29-31.

Chap. xxvi. The concluding exhortation. After reiterating commands to abstain from idolatry and to observe the Sabbath, *vv.* 1, 2, the chapter sets forth (*a*) the rewards of obedience, *vv.* 3-13, and (*b*) the penalties incurred by disobedience to the preceding laws, *vv.* 14-46. The discourse, which is spoken throughout in the name of Yahweh, is similar in character to Exod. xxiii. 20-33 and Deut. xxviii., more especially to the latter. That it forms an integral part of H is shown both by the recurrence of the same distinctive phraseology and by the emphasis laid on the same motives. At the same time it is hardly doubtful that the original discourse has been modified and expanded by later hands, especially in the concluding paragraphs. Thus *vv.* 34, 35, which refer back to xxv. 2 ff., interrupt the connexion and must be assigned to the priestly redactor, while *vv.* 40-45 display obvious signs of interpolation. With regard to the literary relation of this chapter with Ezekiel, it must be admitted that Ezekiel presents many striking parallels, and in particular makes use, in common with chap. xxvi., of several expressions which do not occur elsewhere in the Old Testament. But there are also points of difference both as regards phraseology and subject-matter, and in view of these latter it is impossible to hold that Ezekiel was either the author or compiler of this chapter.

Chap. xxvii. On the commutation of vows and tithes. The chapter as a whole must be assigned to a later stratum of P, for while *vv.* 2-25 (on vows) presuppose the year of Jubilee, the section on tithes, *vv.* 30-33, marks a later stage of development than Num. xviii. 21 ff. (P); *vv.* 26-29 (on firstlings and devoted things) are supplementary restrictions to *vv.* 2-25.

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LEVY, AMY (1861–1889), English poetess and novelist, second daughter of Lewis Levy, was born at Clapham on the 10th of November 1861, and was educated at Newnham College, Cambridge. She showed a precocious aptitude for writing verse of exceptional merit, and in 1884 she published a volume of poems, *A Minor Poet and Other Verse*, some of the pieces in which had already been printed at Cambridge with the title *Xantippe and Other Poems*. The high level of this first publication was maintained in *A London Plane Tree and Other Poems*, a collection of lyrics published in 1889, in which the prevailing pessimism of the writer's temperament was conspicuous. She had already in 1888 tried her hand at prose fiction in *The Romance of a Shop*, which was followed by *Reuben Sachs*, a powerful novel. She committed suicide on the 10th of September 1889.

LEVY, AUGUSTE MICHEL (1844–), French geologist, was born in Paris on the 7th of August 1844. He became inspector-general of mines, and director of the Geological Survey of France. He was distinguished for his researches on eruptive rocks, their microscopic structure and origin; and he early employed the polarizing microscope for the determination of minerals. In his many contributions to scientific journals he described the granulite group, and dealt with pegmatites, variolites, eurites, the ophites of the Pyrenees, the extinct volcanoes of Central France, gneisses, and the origin of crystalline schists. He wrote *Structures et classification des roches éruptives* (1889), but his more elaborate studies were carried on with F. Fouqué. Together they wrote on the artificial production of felspar, nepheline and other minerals, and also of meteorites, and produced *Minéralogie micrographique* (1879) and *Synthèse des minéraux et des roches* (1882). Levy also collaborated with A. Lacroix in *Les Minéraux des roches* (1888) and *Tableau des minéraux des roches* (1889).

LEVY (Fr. *levée*, from *lever*, Lat. *levare*, to lift, raise), the raising of money by the collection of an assessment, &c., a tax or compulsory contribution; also the collection of a body of men for military or other purposes. When all the able-bodied men of a nation are enrolled for service, the French term *levée en masse*, levy in mass, is frequently used.

LEWALD, FANNY (1811–1889), German author, was born at Königsberg in East Prussia on the 24th of March 1811, of Jewish parentage. When seventeen years of age she embraced Christianity, and after travelling in Germany, France and Italy, settled in 1845 at Berlin. Here, in 1854, she married the author, Adolf Wilhelm Theodor Stahr (1805–1876), and removed after his death in 1876 to Dresden, where she resided, engaged in literary work, until her death on the 5th of August 1889. Fanny Lewald is less remarkable for her writings, which are mostly sober, matter-of-fact works, though displaying considerable talent and culture, than for her championship of "women's rights," a question which she was practically the first German woman to take up, and for her scathing satire on the sentimentalism of the Gräfin Hahn Hahn. This authoress she ruthlessly attacked in the exquisite parody (*Diogena, Roman von Iduna Gräfin H . . . . H. . . .* (2nd ed., 1847). Among the best known of her novels are *Klementine* (1842); *Prinz Louis Ferdinand* (1849; 2nd ed., 1859); *Das Mädchen von Hela* (1860); *Von Geschlecht zu Geschlecht* (8 vols., 1863–1865); *Benvenuto* (1875), and *Stella* (1883; English by B. Marshall, 1884). Of her writings in defence of the emancipation of women *Osterbriefe für die Frauen* (1863) and *Für und wider die Frauen* (1870) are conspicuous. Her autobiography, *Meine Lebensgeschichte* (6 vols., 1861–1862), is brightly written and affords interesting glimpses of the literary life of her time.

A selection of her works was published under the title *Gesammelte Schriften* in 12 vols. (1870–1874). Cf. K. Frenzel, *Erinnerungen und Strömungen* (1890).

LEWANIKA (*c.* 1860–), paramount chief of the Barotse and subject tribes occupying the greater part of the upper Zambezi basin, was the twenty-second of a long line of rulers, whose founder invaded the Barotse valley about the beginning of the 17th century, and according to tradition was the son of a woman named Buya Mamboa by a god. The graves of successive ruling chiefs are to this day respected and objects of pilgrimage for purposes of ancestor worship. Lewanika was born on the upper Kabompo in troublous times, where his father—Letia, a son of a former ruler—lived in exile during the interregnum of a foreign dynasty (Makololo), which remained in possession from about 1830 to 1865, when the Makololo were practically exterminated in a night by a well-organized revolt. Once more masters of their own country, the Barotse invited Sepopa, an uncle of Lewanika, to rule over them. Eleven years of brutality and licence resulted in the tyrant's expulsion and subsequent assassination, his place being taken by Ngwana-Wina, a nephew. Within a year abuse of power brought about this chief's downfall (1877), and he was succeeded by Lobosi, who assumed the name of Lewanika in 1885. The early years of his reign were also stained by many acts of blood, until in 1884 the torture and murder of his own brother led to open rebellion, and it was only through extreme presence of mind that the chief escaped with his life into exile. His cousin, Akufuna or Tatela, was then proclaimed chief. It was during his brief reign that François Coillard, the eminent missionary, arrived at Lialui, the capital. The following year Lewanika, having collected his partisans, deposed the usurper and re-established his power. Ruthless revenge not unmixed with treachery characterized his return to power, but gradually the strong personality of the high-minded François Coillard so far influenced him for good that from about 1887 onward he ruled tolerantly and showed a consistent desire to better the condition of his people. In 1890 Lewanika, who two years previously had proposed to place himself under the protection of Great Britain, concluded a treaty with the British South Africa Company, acknowledging its supremacy and conceding to it certain mineral rights. In 1807 Mr R. T. Coryndon took up his position at Lialui as British agent, and the country to the east of 25° E. was thrown open to settlers, that to the west being reserved to the Barotse chief. In 1905 the king of Italy's award in the Barotse boundary dispute with Portugal deprived Lewanika of half of his dominions, much of which had been ruled by his ancestors for many generations. In 1902 Lewanika attended the coronation of Edward VII. as a guest of the nation. His recognized heir was his eldest son Letia.

See BAROTSE, and the works there cited, especially *On the Threshold of Central Africa* (London, 1897), by François Coillard.

(A. ST. H. G.)

LEWES, CHARLES LEE (1740–1803), English actor, was the son of a hosier in London. After attending a school at Ambleside he returned to London, where he found employment as a postman; but about 1760 he went on the stage in the provinces, and some three years later began to appear in minor parts at Covent Garden Theatre. His first rôle of importance was that of "Young Marlow" in *She Stoops to Conquer*, at its production of that comedy in 1773, when he delivered an epilogue specially written for him by Goldsmith. He remained a member of the Covent Garden company till 1783, appearing in many parts, among which were "Fag" in *The Rivals*, which he "created," and "Sir Anthony Absolute" in the same comedy. In 1783 he removed to Drury Lane, where he assumed the Shakespearian rôles of "Touchstone," "Lucio" and "Falstaff." In 1787 he left London for Edinburgh, where he gave recitations, including Cowper's "John Gilpin." For a short time in 1792 Lewes assisted Stephen Kemble in the management of the Dundee Theatre; in the following year he went to Dublin, but he was financially unsuccessful and suffered imprisonment for debt. He employed his time in compiling his *Memoirs*, a worthless production published after his death by his son. He was also the author of some poor dramatic sketches. Lewes died on the 23rd of July 1803. He was three times married; the philosopher, George Henry Lewes, was his grandson.

See John Genest, *Some Account of the English Stage* (Bath, 1832).

LEWES, GEORGE HENRY (1817–1878), British philosopher and literary critic, was born in London in 1817. He was a grandson of Charles Lee Lewes, the actor. He was educated in London, Jersey, Brittany, and finally at Dr Burney's school in Greenwich. Having abandoned successively a commercial and a medical career, he seriously thought of becoming an actor, and between 1841 and 1850 appeared several times on the stage. Finally he devoted himself to literature, science and philosophy. As early as 1836 he belonged to a club formed for the study of philosophy, and had sketched out a physiological treatment of the philosophy of the Scottish school. Two years later he went to Germany, probably with the intention of studying philosophy. In 1840 he married a daughter of Swynfen Stevens Jervis (1798–1867), and during the next ten years supported himself by contributing to the quarterly and other reviews. These articles discuss a wide variety of subject, and, though often characterized by hasty impulse and imperfect study, betray a singularly acute critical judgment, enlightened by philosophic study. The most valuable are those on the drama, afterwards republished under the title *Actors and Acting* (1875). With this may be taken the volume on *The Spanish Drama* (1846). The combination of wide scholarship, philosophic culture and practical acquaintance with the theatre gives these essays a high place among the best efforts in English dramatic criticism. In 1845–1846 he published *The Biographical History of Philosophy*, an attempt to depict the life of philosophers as an ever-renewed fruitless labour to attain the unattainable. In 1847–1848 he made two attempts in the field of fiction—*Ranthrope*, and *Rose, Blanche and Violet*—which, though displaying considerable skill both in plot construction and in characterization, have taken no permanent place in literature. The same is to be said of an ingenious attempt to rehabilitate Robespierre (1849). In 1850 he collaborated with Thornton Leigh Hunt in the foundation of the *Leader*, of which he was the literary editor. In 1853 he republished under the title of *Comte's Philosophy of the Sciences* a series of papers which had appeared in that journal. In 1851 he became acquainted with Miss Evans (George Eliot) and in 1854 left his wife. Subsequently he lived with Miss Evans as her husband (see ELIOT, GEORGE).

The culmination of Lewes's work in prose literature is the *Life of Goethe* (1855), probably the best known of his writings. Lewes's many-sidedness of mind, and his combination of scientific with literary tastes, eminently fitted him to appreciate the large nature and the wide-ranging activity of the German poet. The high position this work has taken in Germany itself, notwithstanding the boldness of its criticism and the unpopularity of some of its views (*e.g.* on the relation of the second to the first part of *Faust*), is a sufficient testimony to its general excellence. From about 1853 Lewes's writings show that he was occupying himself with scientific and more particularly biological work. He may be said to have always manifested a distinctly scientific bent in his writings, and his closer devotion to science was but the following out of early impulses. Considering that he had not had the usual course of technical training, these studies are a remarkable testimony to the penetration of his intellect. The most important of these essays are collected in the volumes *Seaside Studies* (1858), *Physiology of Common Life* (1859), *Studies in Animal Life* (1862), and *Aristotle, a Chapter from the History of Science* (1864). They are much more than popular expositions of accepted scientific truths. They contain able criticisms of authorized ideas, and embody the results of individual research and individual reflection. He made a number of impressive suggestions, some of which have since been accepted by physiologists. Of these the most valuable is that now known as the doctrine of the functional indifference of the nerves—that what are known as the specific energies of the optic, auditory and other nerves are simply differences in their mode of action due to the differences of the peripheral structures or sense-organs with which they are connected. This idea was subsequently arrived at independently by Wundt (*Physiologische Psychologie*, 2nd ed., p. 321). In 1865, on the starting of the *Fortnightly Review*, Lewes became its editor, but he retained the post for less than two years, when he was succeeded by John Morley. This date marks the transition from more strictly scientific to philosophic work. He had from early youth cherished a strong liking for philosophic studies; one of his earliest essays was an appreciative account of Hegel's *Aesthetics*. Coming under the influence of positivism as unfolded both in Comte's own works and in J. S. Mill's *System of Logic*, he abandoned all faith in the possibility of metaphysic, and recorded this abandonment in the above-mentioned *History of Philosophy*. Yet he did not at any time give an unqualified adhesion to Comte's teachings, and with wider reading and reflection his mind moved away further from the positivist standpoint. In the preface to the third edition of his *History of Philosophy* he avowed a change in this direction, and this movement is still more plainly discernible in subsequent editions of the work. The final outcome of this intellectual progress is given to us in *The Problems of Life and Mind*, which may be regarded as the crowning work of his life. His sudden death on the 28th of November 1878 cut short the work, yet it is complete enough to allow us to judge of the author's matured conceptions on biological, psychological and metaphysical problems. Of his three sons only one, Charles (1843–1801), survived him; in the first London County Council Election (1889) he was elected for St Pancras; he was also much interested in the Hampstead Heath extension.

Philosophy.—The first two volumes on *The Foundations of a Creed* lay down what Lewes regarded as the true principles of philosophizing. He here seeks to effect a *rapprochement* between metaphysics and science. He is still so far a positivist as to pronounce all inquiry into the ultimate nature of things fruitless. What matter, force, spirit are in themselves is a futile question that belongs to the sterile region of "metempirics." But philosophical questions may be so stated as to be susceptible of a precise solution by scientific method. Thus, since the relation of subject to object falls within our experience, it is a proper matter for philosophic investigation. It may be questioned whether Lewes is right in thus identifying the methods of science and philosophy. Philosophy is not a mere extension of scientific knowledge; it is an investigation of the nature and validity of the knowing process itself. In any case Lewes cannot be said to have done much to aid in the settlement of properly philosophical questions. His whole treatment of the question of the relation of subject to object is vitiated by a confusion between the scientific truth that mind and body coexist in the living organism and the philosophic truth that all knowledge of objects implies a knowing subject. In other words, to use Shadworth Hodgson's phrase, he mixes up the question of the *genesis* of mental forms with the question of their *nature* (see *Philosophy of Reflexion*, ii. 40–58). Thus he reaches the "monistic" doctrine that mind and matter are two aspects of the same existence by attending simply to the parallelism between psychical and physical processes given as a fact (or a probable fact) of our experience, and by leaving out of account their relation as subject and object in the cognitive act. His identification of the two as phases of one existence is open to criticism, not only from the point of view of philosophy, but from that of science. In his treatment of such ideas as "sensibility," "sentience" and the like, he does not always show whether he is speaking of physical or of psychical phenomena. Among the other properly philosophic questions discussed in these two volumes the nature of the casual relation is perhaps the one which is handled with most freshness and suggestiveness. The third volume, *The Physical Basis of Mind*, further develops the writer's views on organic activities as a whole. He insists strongly on the radical distinction between organic and inorganic processes, and on the impossibility of ever explaining the former by purely mechanical principles. With respect to the nervous system, he holds that all its parts have one and the same elementary property, namely, sensibility. Thus sensibility belongs as much to the lower centres of the spinal cord as to the brain, contributing in this more elementary form elements to the "subconscious" region of mental life. The higher functions of the nervous system, which make up our conscious mental life, are merely more complex modifications of this fundamental property of nerve substance. Closely related to this doctrine is the view that the nervous organism acts as a whole, that particular mental operations cannot be referred to definitely circumscribed regions of the brain, and that the hypothesis of nervous activity passing in the centre by an isolated pathway from one nerve-cell to another is altogether illusory. By insisting on the complete coincidence between the regions of nerve-action and sentience, and by holding that these are but different aspects of one thing, he is able to attack the doctrine of animal and human automatism, which affirms that feeling or consciousness is merely an incidental concomitant of nerve-action and in no way essential to the chain of physical events. Lewes's views in psychology, partly opened up in the earlier volumes of the *Problems*, are more fully worked out in the last two volumes (3rd series). He discusses the method of psychology with much insight. He claims against Comte and his followers a place for introspection in psychological research. In addition to this subjective method there must be an objective, which consists partly in a reference to nervous conditions and partly in the employment of sociological and historical data. Biological knowledge, or a consideration of the organic conditions, would only help us to explain mental *functions*, as feeling and thinking; it would not assist us to understand differences of mental *faculty* as manifested in different races and stages of human development. The organic conditions of these differences will probably for ever escape detection. Hence they can be explained only as the products of the social environment. This idea of dealing with mental phenomena in their relation to social and historical conditions is probably Lewes's most important contribution to psychology. Among other points which he emphasizes is the complexity of mental phenomena. Every mental state is regarded as compounded of three factors in different proportions—namely, a process of sensible affection, of logical grouping and of motor impulse. But Lewes's work in psychology consists less in any definite discoveries than in the inculcation of a sound and just method. His biological training prepared him to view mind as a complex unity, in which the various functions interact one on the other, and of which the highest processes are identical with and evolved out of the lower. Thus the operations of thought, "or the logic of signs," are merely a more complicated form of the elementary operations of sensation and instinct or "the logic of feeling." The whole of the last volume of the *Problems* may be said to be an illustration of this position. It is a valuable repository of psychological facts, many of them drawn from the more obscure regions of mental life and from abnormal experience, and is throughout suggestive and stimulating. To suggest and to stimulate the mind, rather than to supply it with any complete system of knowledge, may be said to be Lewes's service in philosophy. The exceptional rapidity and versatility of his intelligence seems to account at once for the freshness in his way of envisaging the subject-matter of philosophy and psychology, and for the want of satisfactory elaboration and of systematic co-ordination. (J. S.; X.)

LEWES, a market-town and municipal borough and the county town of Sussex, England, in the Lewes parliamentary division, 50 m. S. from London by the London, Brighton & South Coast railway. Pop. (1901) 11,249. It is picturesquely situated on the slope of a chalk down falling to the river Ouse. Ruins of the old castle, supposed to have been founded by King Alfred and rebuilt by William de Warenne shortly after the Conquest, rise from the height. There are two mounds which bore keeps, an uncommon feature. The castle guarded the pass through the downs formed by the valley of the Ouse. In one of the towers is the collection of the Sussex Archaeological Society. St Michael's church is without architectural merit, but contains old brasses and monuments; St Anne's church is a transitional Norman structure; St Thomas-at-Cliffe is Perpendicular; St John's, Southover, of mixed architecture, preserves some early Norman portions, and has some relics of the Warenne family. In the grounds of the Cluniac priory of St Pancras, founded in 1078, the leaden coffins of William de Warenne and Gundrada his wife were dug up during an excavation for the railway in 1845. There is a free grammar school dating from 1512, and among the other public buildings are the town hall and corn exchange, county hall, prison, and the Fitzroy memorial library. The industries include the manufacture of agricultural implements, brewing, tanning, and iron and brass founding. The municipal borough is under a mayor, 6 aldermen and 18 councillors. Area, 1042 acres.

The many neolithic and bronze implements that have been discovered, and the numerous tumuli and earthworks which surround Lewes, indicate its remote origin. The town Lewes (Loewas, Loewen, Leswa, Laquis, Latisaquensis) was in the royal demesne of the Saxon kings, from whom it received the privilege of a market. Æthelstan established two royal mints there, and by the reign of Edward the Confessor, and probably before, Lewes was certainly a borough. William I. granted the whole barony of Lewes, including the revenue arising from the town, to William de Warenne, who converted an already existing fortification into a place of residence. His descendants continued to hold the barony until the beginning of the 14th century. In default of male issue, it then passed to the earl of Arundel, with whose descendants it remained until 1439, when it was divided between the Norfolks, Dorsets and Abergavennys. By 1086 the borough had increased 30% in value since the beginning of the reign, and its importance as a port and market-town is evident from Domesday. A gild merchant seems to have existed at an early date. The first mention of it is in a charter of Reginald de Warenne, about 1148, by which he restored to the burgesses the privileges they had enjoyed in the time of his grandfather and father, but of which they had been deprived. In 1595 a "Fellowship" took the place of the old gild and in conjunction with two constables governed the town until the beginning of the 18th century. The borough seal probably dates from the 14th century. Lewes was incorporated by royal charter in 1881. The town returned two representatives to parliament from 1295 until deprived of one member in 1867. It was disfranchised in 1885. Earl Warenne and his descendants held the fairs and markets from 1066. In 1792 the fair-days were the 6th of May, Whit-Tuesday, the 26th of July (for wool), and the 2nd of October. The market-day was Saturday. Fairs are now held on the 6th of May for horses and cattle, the 20th of July for wool, and the 21st and 28th of September for Southdown sheep. A corn-market is held every Tuesday, and a stock-market every alternate Monday. The trade in wool has been important since the 14th century.

Lewes was the scene of the battle fought on the 14th of May 1264 between Henry III. and Simon de Montfort, earl of Leicester. Led by the king and by his son, the future king Edward I., the royalists left Oxford, took Northampton and drove Montfort from Rochester into London. Then, harassed on the route by their foes, they marched through Kent into Sussex and took up their quarters at Lewes, a stronghold of the royalist Earl Warenne. Meanwhile, reinforced by a number of Londoners, Earl Simon left London and reached Fletching, about 9 m. north of Lewes, on the 13th of May. Efforts at reconciliation having failed he led his army against the town, which he hoped to surprise, early on the following day. His plan was to direct his main attack against the priory of St Pancras, which sheltered the king and his brother Richard, earl of Cornwall, king of the Romans, while causing the enemy to believe that his principal objective was the castle, where Prince Edward was. But the surprise was not complete and the royalists rushed from the town to meet the enemy in the open field. Edward led his followers against the Londoners, who were gathered around the standard of Montfort, put them to flight, pursued them for several miles, and killed a great number of them. Montfort's ruse, however, had been successful. He was not with his standard as his foes thought, but with the pick of his men he attacked Henry's followers and took prisoner both the king and his brother. Before Edward returned from his chase the earl was in possession of the town. In its streets the prince strove to retrieve his fortunes, but in vain. Many of his men perished in the river, but others escaped, one band, consisting of Earl Warenne and others, taking refuge in Pevensey Castle. Edward himself took sanctuary and on the following day peace was made between the king and the earl.

LEWES, a town in Sussex county, Delaware, U.S.A., in the S.E. part of the state, on Delaware Bay. Pop. (1910), 2158. Lewes is served by the Philadelphia, Baltimore & Washington (Pennsylvania System), and the Maryland, Delaware & Virginia railways. Its harbour is formed by the Delaware Breakwater, built by the national government and completed in 1869, and 2¼ m. above it another breakwater was completed in December 1901 by the government. The cove between them forms a harbour of refuge of about 550 acres. At the mouth of Delaware Bay, about 2 m. below Lewes, is the Henlopen Light, one of the oldest lighthouses in America. The Delaware Bay pilots make their headquarters at Lewes. Lewes has a large trade with northern cities in fruits and vegetables, and is a subport of entry of the Wilmington Customs District. The first settlement on Delaware soil by Europeans was made near here in 1631 by Dutch colonists, sent by a company organized in Holland in the previous year by Samuel Blommaert, Killian van Rensselaer, David Pieterszen de Vries and others. The settlers called the place Zwaanendael, valley of swans. The settlement was soon entirely destroyed by the Indians, and a second body of settlers whom de Vries, who had been made director of the colony, brought in 1632 remained for only two years. The fact of the settlement is important; because of it the English did not unite the Delaware country with Maryland, for the Maryland Charter of 1632 restricted colonization to land within the prescribed boundaries, uncultivated and either uninhabited or inhabited only by Indians. In 1658 the Dutch established an Indian trading post, and in 1659 erected a fort at Zwaanendael. After the annexation of the Delaware counties to Pennsylvania in 1682, its name was changed to Lewes, after the town of that name in Sussex, England. It was pillaged by French pirates in 1698. One of the last naval battles of the War of Independence was fought in the bay near Lewes on the 8th of April 1782, when the American privateer "Hyder Ally" (16), commanded by Captain Joshua Barnes (1759–1818), defeated and captured the British sloop "General Monk" (20), which had been an American privateer, the "General Washington," had been captured by Admiral Arbuthnot's squadron in 1780, and was now purchased by the United States government and, as the "General Washington," was commanded by Captain Barnes in 1782–1784. In March 1813 the town was bombarded by a British frigate.

See the "History of Lewes" in the *Papers* of the Historical Society of Delaware, No. xxxviii. (Wilmington, 1903); and J. T. Scharf, *History of Delaware* (2 vols., Philadelphia, 1888).

LEWIS, SIR GEORGE CORNEWALL, Bart. (1806–1863), English statesman and man of letters, was born in London on the 21st of April 1806. His father, Thomas F. Lewis, of Harpton Court, Radnorshire, after holding subordinate office in various administrations, became a poor-law commissioner, and was made a baronet in 1846. Young Lewis was educated at Eton and at Christ Church, Oxford, where in 1828 he took a first-class in classics and a second-class in mathematics. He then entered the Middle Temple, and was called to the bar in 1831. In 1833 he undertook his first public work as one of the commissioners to inquire into the condition of the poor Irish residents in the United Kingdom.[1] In 1834 Lord Althorp included him in the commission to inquire into the state of church property and church affairs generally in Ireland. To this fact we owe his work on *Local Disturbances in Ireland, and the Irish Church Question* (London, 1836), in which he condemned the existing connexion between church and state, proposed a state provision for the Catholic clergy, and maintained the necessity of an efficient workhouse organization. During this period Lewis's mind was much occupied with the study of language. Before leaving college he had published some observations on Whately's doctrine of the predicables, and soon afterwards he assisted Thirlwall and Hare in starting the *Philological Museum*. Its successor, the *Classical Museum*, he also supported by occasional contributions. In 1835 he published an *Essay on the Origin and Formation of the Romance Languages* (re-edited in 1862), the first effective criticism in England of Raynouard's theory of a uniform romance tongue, represented by the poetry of the troubadours. He also compiled a glossary of provincial words used in Herefordshire and the adjoining counties. But the most important work of this earlier period was one to which his logical and philological tastes contributed. The *Remarks on the Use and Abuse of some Political Terms* (London, 1832) may have been suggested by Bentham's *Book of Parliamentary Fallacies*, but it shows all that power of clear sober original thinking which marks his larger and later political works. Moreover, he translated Boeckh's *Public Economy of Athens* and Müller's *History of Greek Literature*, and he assisted Tufnell in the translation of Müller's *Dorians*. Some time afterwards he edited a text of the *Fables* of Babrius. While his friend Hayward conducted the *Law Magazine*, he wrote in it frequently on such subjects as secondary punishments and the penitentiary system. In 1836, at the request of Lord Glenelg, he accompanied John Austin to Malta, where they spent nearly two years reporting on the condition of the island and framing a new code of laws. One leading object of both commissioners was to associate the Maltese in the responsible government of the island. On his return to England Lewis succeeded his father as one of the principal poor-law commissioners. In 1841 appeared the *Essay on the Government of Dependencies*, a systematic statement and discussion of the various relations in which colonies may stand towards the mother country. In 1844 Lewis married Lady Maria Theresa Lister, sister of Lord Clarendon, and a lady of literary tastes. Much of their married life was spent in Kent House, Knightsbridge. They had no children. In 1847 Lewis resigned his office. He was then returned for the county of Hereford, and Lord John Russell appointed him secretary to the Board of Control, but a few months afterwards he became under-secretary to the Home Office. In this capacity he introduced two important bills, one for the abolition of turnpike trusts and the management of highways by a mixed county board, the other for the purpose of defining and regulating the law of parochial assessment. In 1850 he succeeded Hayter as financial secretary to the treasury. About this time, also, appeared his *Essay on the Influence of Authority in Matters of Opinion*. On the dissolution of parliament which followed the resignation of Lord John Russell's ministry in 1852, Lewis was defeated for Herefordshire and then for Peterborough. Excluded from parliament he accepted the editorship of the *Edinburgh Review*, and remained editor until 1855. During this period he served on the Oxford commission, and on the commission to inquire into the government of London. But its chief fruits were the *Treatise on the Methods of Observation and Reasoning in Politics*, and the *Enquiry into the Credibility of the Early Roman History*,[2] in which he vigorously attacked the theory of epic lays and other theories on which Niebuhr's reconstruction of that history had proceeded. In 1855 Lewis succeeded his father in the baronetcy. He was at once elected member for the Radnor boroughs, and Lord Palmerston made him chancellor of the exchequer. He had a war loan to contract and heavy additional taxation to impose, but his industry, method and clear vision carried him safely through. After the change of ministry in 1859 Sir George became home secretary under Lord Palmerston, and in 1861, much against his wish, he succeeded Sidney Herbert (Lord Herbert of Lea) at the War Office. The closing years of his life were marked by increasing intellectual vigour. In 1859 he published an able *Essay on Foreign Jurisdiction and the Extradition of Criminals*, a subject to which the attempt on Napoleon's life, the discussions on the Conspiracy Bill, and the trial of Bernard, had drawn general attention. He advocated the extension of extradition treaties, and condemned the principal idea of *Weltrechtsordnung* which Mohl of Heidelberg had proposed. His two latest works were the *Survey of the Astronomy of the Ancients*, in which, without professing any knowledge of Oriental languages, he applied a sceptical analysis to the ambitious Egyptology of Bunsen; and the *Dialogue on the Best Form of Government*, in which, under the name of Crito, the author points out to the supporters of the various systems that there is no one abstract government which is the best possible for all times and places. An essay on the *Characteristics of Federal, National, Provincial and Municipal Government* does not seem to have been published. Sir George died in April 1863. A marble bust by Weekes stands in Westminster Abbey.

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[1] See the *Abstract of Final Report of Commissioners of Irish Poor Enquiry*, &c., by G. C. Lewis and N. Senior (1837).

[2] Translated into German by Liebrecht (Hanover, 1858).

Lewis was a man of mild and affectionate disposition, much beloved by a large circle of friends, among whom were Sir E. Head, the Grotes, the Austins, Lord Stanhope, J. S. Mill, Dean Milman, the Duff Gordons. In public life he was distinguished, as Lord Aberdeen said, "for candour, moderation, love of truth." He had a passion for the systematic acquirement of knowledge, and a keen and sound critical faculty. His name has gone down to history as that of a many-sided man, sound in judgment, unselfish in political life, and abounding in practical good sense.

A reprint from the *Edinburgh Review* of his long series of papers on the *Administration of Great Britain* appeared in 1864, and his *Letters to various Friends* (1870) were edited by his brother Gilbert, who succeeded him in the baronetcy.

LEWIS, HENRY CARVILL (1853–1888), American geologist, was born in Philadelphia on the 16th of November 1853. Educated in the university of Pennsylvania he took the degree of M.A. in 1876. He became attached to the Geological Survey of Pennsylvania in 1879, serving for three years as a volunteer member, and during this term he became greatly interested in the study of glacial phenomena. In 1880 he was chosen professor of mineralogy in the Philadelphia academy of natural sciences, and in 1883 he was appointed to the chair of geology in Haverford College, Pennsylvania. During the winters of 1885 to 1887 he studied petrology under H. F. Rosenbusch at Heidelberg, and during the summers he investigated the glacial geology of northern Europe and the British Islands. His observations in North America, where he had studied under Professor G. F. Wright, Professor T. C. Chamberlin and Warren Upham, had demonstrated the former extension of land-ice, and the existence of great terminal moraines. In 1884 his *Report on the Terminal Moraine in Pennsylvania and New York* was published: a work containing much information on the limits of the North American ice-sheet. In Britain he sought to trace in like manner the southern extent of the terminal moraines formed by British ice-sheets, but before his conclusions were matured he died at Manchester on the 21st of July 1888. The results of his observations were published in 1894 entitled *Papers and Notes on the Glacial Geology of Great Britain and Ireland*, edited by Dr H. W. Crosskey.

See "Prof. Henry Carvill Lewis and his Work in Glacial Geology," by Warren Upham, *Amer. Geol.* vol. ii. (Dec. 1888) p. 371, with portrait.

LEWIS, JOHN FREDERICK (1805–1876), British painter, son of F. C. Lewis, engraver, was born in London. He was elected in 1827 associate of the Society of Painters in Water Colours, of which he became full member in 1829 and president in 1855; he resigned in 1858, and was made associate of the Royal Academy in 1859 and academician in 1865. Much of his earlier life was spent in Spain, Italy and the East, but he returned to England in 1851 and for the remainder of his career devoted himself almost exclusively to Eastern subjects, which he treated with extraordinary care and minuteness of finish, and with much beauty of technical method. He is represented by a picture, "Edfou: Upper Egypt," in the National Gallery of British Art. He achieved equal eminence in both oil and water-colour painting.

LEWIS, MATTHEW GREGORY (1775–1818), English romance-writer and dramatist, often referred to as "Monk" Lewis, was born in London on the 9th of July 1775. He was educated for a diplomatic career at Westminster school and at Christ Church, Oxford, spending most of his vacations abroad in the study of modern languages; and in 1794 he proceeded to the Hague as attaché to the British embassy. His stay there lasted only a few months, but was marked by the composition, in ten weeks, of his romance *Ambrosio, or the Monk*, which was published in the summer of the following year. It immediately achieved celebrity; but some passages it contained were of such a nature that about a year after its appearance an injunction to restrain its sale was moved for and a rule *nisi* obtained. Lewis published a second edition from which he had expunged, as he thought, all the objectionable passages, but the work still remains of such a character as almost to justify the severe language in which Byron in *English Bards and Scotch Reviewers* addresses—

> "Wonder-working Lewis, Monk or Bard,
> Who fain would'st make Parnassus a churchyard;
> Even Satan's self with thee might dread to dwell,
> And in thy skull discern a deeper hell."

Whatever its demerits, ethical or aesthetic, may have been, *The Monk* did not interfere with the reception of Lewis into the best English society; he was favourably noticed at court, and almost as soon as he came of age he obtained a seat in the House of Commons as member for Hindon, Wilts. After some years, however, during which he never addressed the House, he finally withdrew from a parliamentary career. His tastes lay wholly in the direction of literature, and *The Castle Spectre* (1796, a musical drama of no great literary merit, but which enjoyed a long popularity on the stage), *The Minister* (a translation from Schiller's *Kabale u. Liebe*), *Rolla* (1797, a translation from Kotzebue), with numerous other operatic and tragic pieces, appeared in rapid succession. *The Bravo of Venice*, a romance translated from the German, was published in 1804; next to *The Monk* it is the best known work of Lewis. By the death of his father he succeeded to a large fortune, and in 1815 embarked for the West Indies to visit his estates; in the course of this tour, which lasted four months, the *Journal of a West Indian Proprietor*, published posthumously in 1833, was written. A second visit to Jamaica was undertaken in 1817, in order that he might become further acquainted with, and able to ameliorate, the condition of the slave population; the fatigues to which he exposed himself in the tropical climate brought on a fever which terminated fatally on the homeward voyage on the 14th of May 1818.

The Life and Correspondence of M. G. Lewis, in two volumes, was published in 1839.

LEWIS, MERIWETHER (1774–1809), American explorer, was born near Charlottesville, Virginia, on the 18th of August 1774. In 1794 he volunteered with the Virginia troops called out to suppress the "Whisky Insurrection," was commissioned as ensign in the regular United States army in 1795, served with distinction under General Anthony Wayne in the campaigns against the Indians, and attained the rank of captain in 1797. From 1801 to 1803 he was the private secretary of President Jefferson. On the 18th of January 1803 Jefferson sent a confidential message to Congress urging the development of trade with the Indians of the Missouri Valley and recommending that an exploring party be sent into this region, notwithstanding the fact that it was then held by Spain and owned by France. Congress appropriated funds for the expedition, and the president instructed Lewis to proceed to the head-waters of the Missouri river and thence across the mountains to the Pacific Ocean. With Jefferson's consent Lewis chose as a companion Lieut. William Clark, an old friend and army comrade. The preparations were made under the orders of the War Department, and, until the news arrived that France had sold Louisiana to the United States, they were conducted in secrecy. Lewis spent some time in Philadelphia, gaining additional knowledge of the natural sciences and learning the use of instruments for determining positions; and late in 1803 he and Clark, with twenty-nine men from the army, went into winter quarters near St Louis, where the men were subjected to rigid training. On the 14th of May 1804 the party, with sixteen additional members, who, however, were to go only a part of the way, started up the Missouri river in three boats, and by the 2nd of November had made the difficult ascent of the stream as far as 47° 21′ N. lat., near the site of the present Bismarck, North Dakota, where, among the Mandan Indians, they passed the second winter. Early in April 1805 the ascent of the Missouri was continued as far as the three forks of the river, which were named the Jefferson, the Gallatin and the Madison. The Jefferson was then followed to its source in the south-western part of what is now the state of Montana. Procuring a guide and horses from the Shoshone Indians, the party pushed westward through the Rocky Mountains in September, and on the 7th of October embarked in canoes on a tributary of the Columbia river, the mouth of which they reached on the 15th of November. They had travelled upwards of 4000 m. from their starting-point, had encountered various Indian tribes never before seen by whites, had made valuable scientific collections and observations, and were the first explorers to reach the Pacific by crossing the continent north of Mexico. After spending the winter on the Pacific coast they started on the 23rd of March 1806 on their return journey, and, after crossing the divide, Lewis with one party explored Maria's river, and Clark with another the Yellowstone. On the 12th of August the two explorers reunited near the junction of the Yellowstone and the Missouri, and on the 23rd of September reached St Louis. In spite of exposure, hardship and peril only one member of the party died, and only one deserted. No later feat of exploration, perhaps, in any quarter of the globe has exceeded this in romantic interest. The expedition was commemorated by the Lewis and Clark Centennial Exposition at Portland, Oregon, in 1905. The leaders and men of the exploring party were rewarded with liberal grants of land from the public domain, Lewis receiving 1500 acres; and in March 1807 Lewis was made governor of the northern part of the territory obtained from France in 1803, which had been organized as the Louisiana Territory. He performed the duties of this office with great efficiency, but it is said that in the unwonted quiet of his new duties, his mind, always subject to melancholy, became unbalanced, and that while on his way to Washington he committed suicide about 60 m. south-west of Nashville, Tennessee, on the 11th of October 1809. It is not definitely known, however, whether he actually committed suicide or was murdered.

Bibliography.—Jefferson's *Message from the President of the United States, Communicating Discoveries made in Exploring the Missouri, Red River and Washita by Captains Lewis and Clark, Dr Sibley and Mr Dunbar* (Washington, 1806, and subsequent editions) is the earliest account, containing the reports sent back by the explorers in the winter of 1804–1805. Patrick Gass's *Journal of the Voyages and Travels of a Corps of Discovery under the Command of Capt. Lewis and Capt. Clark* (Pittsburg, 1807) is the account of a sergeant in the party. Biddle and Allen's *History of the Expedition under the Command of Captains Lewis and Clark* (2 vols., Philadelphia, 1814) is a condensation of the original journals. There are numerous reprints of this work, the best being that of Elliott Coues (4 vols., New York, 1893), which contains additions from the original manuscripts and a new chapter, in the style of Biddle, inserted as though a part of the original text. As a final authority consult R. G. Thwaites (ed.), *The Original Journals of the Lewis and Clark Expedition* (8 vols., New York, 1904–1905), containing all the known literary records of the expedition. For popular accounts see W. R. Lighton, *Lewis and Clark* (Boston, 1901); O. D. Wheeler, *The Trail of Lewis and Clark* (2 vols., New York, 1904); and Noah Brooks (ed.), *First across the Continent: Expedition of Lewis and Clark* (New York, 1901).

LEWISBURG, a borough and the county-seat of Union county, Pennsylvania, U.S.A., on the W. bank of West Branch of the Susquehanna river, about 50 m. N. of Harrisburg. Pop. (1900) 3457 (60 foreign-born); (1910) 3081. It is served by the Pennsylvania and the Philadelphia & Reading railways. It is the seat of Bucknell University (coeducational), opened in 1846 as the university of Lewisburg and renamed in 1886 in honour of William Bucknell (1809–1890), a liberal benefactor. The university comprises a College of Liberal Arts, an Academy for Young Men, an Institute for Young Women, and a School of Music, and in 1908–1909 had 50 instructors and 775 students, of whom 547 were in the College of Liberal Arts. The city is situated in a farming region, and has various manufactures, including flour, lumber, furniture, woollens, nails, foundry products and carriages. Lewisburg (until about 1805 called Derrstown) was founded and laid out in 1785 by Ludwig Derr, a German, and was chartered as a borough in 1812.

LEWISHAM, a south-eastern metropolitan borough of London, England, bounded N.W. by Deptford, N.E. by Greenwich, E. by Woolwich, and W. by Camberwell, and extending S. to the boundary of the county of London. Pop. (1901) 127,495. Its area is for the most part occupied by villas. It includes the districts of Blackheath and Lee in the north, Hither Green, Catford and Brockley in the central parts, and Forest Hill and part of Sydenham in the south-west. In the districts last named well-wooded hills rise above 300 ft., and this is an especially favoured residential quarter, its popularity being formerly increased by the presence of medicinal springs, discovered in 1640, on Sydenham Common. Towards the south, in spite of the constant extension of building, there are considerable tracts of ground uncovered, apart from public grounds. In the north the borough includes the greater part of Blackheath (*q.v.*), an open common of considerable historical interest. The other principal pleasure grounds are Hilly Fields (46 acres) and Ladywell Recreation Grounds (46 acres) in the north-west part of the borough; and at Sydenham (but outside the boundary of the county of London) is the Crystal Palace. Among institutions are the Horniman Museum, Forest Hill (1901); Morden's College, on the south of Blackheath, founded at the close of the 17th century by Sir John Morden for Turkey merchants who were received as pensioners, and subsequently extended in scope; numerous schools in the same locality; and the Park Fever Hospital, Hither Green. The parliamentary borough of Lewisham returns one member. The borough council consists of a mayor, 7 aldermen and 42 councillors. Area, 7014·4 acres.

LEWISTON, a city of Androscoggin county, Maine, U.S.A., on the Androscoggin river, opposite Auburn, with which it is connected by four steel bridges, and about 36 m. N.E. of Portland. Pop. (1900) 23,761, of whom 9316 were foreign-born; (1910 census) 26,247. It is served by the Maine Central, the Grand Trunk, the Portland & Rumford Falls and the Lewiston, Augusta & Waterville (electric) railways. The surrounding country is hilly and the river is picturesque; in the vicinity there are many lakes and ponds abounding in salmon and trout. The Maine fish hatchery is on Lake Auburn, 3 m. above the city. Lewiston is the seat of Bates College, a non-sectarian institution, which grew out of the Maine State Seminary (chartered in 1855), and was chartered in 1864 under its present name, adopted in honour of Benjamin E. Bates (d. 1877), a liberal benefactor. In 1908–1909 the college had 25 instructors and 440 students, and its library contained 34,000 volumes. The campus of the college is about 1 m. from the business portion of Lewiston and covers 50 acres; among the college buildings are an auditorium (1909) given by W. Scott Libbey of Lewiston, and the Libbey Forum for the use of the three literary societies and the two Christian associations of the college. The literary societies give excellent training in forensics. The matriculation pledge requires from male students total abstinence from intoxicants as a condition of membership. There are no secret fraternities. From the beginning women have been admitted on the same terms as men. The Cobb Divinity School (Free Baptist), which was founded at Parsonfield, Maine, in 1840 as a department of Parsonfield Seminary, and was situated in 1842–1844 at Dracut, Massachusetts, in 1844–1854 at Whitestown, New York, and in 1854–1870 at New Hampton, New Hampshire, was removed to Lewiston in 1870 and became a department (known as Bates Theological Seminary until 1888) of Bates College, with which it was merged in 1908. Lewiston has a fine city hall, a Carnegie library and a public park of 10½ acres, with a bronze soldiers' monument by Franklin Simmons, who was born in 1839 at Webster near Lewiston, and is known for his statues of Roger Williams, William King, Francis H. Pierpont and U. S. Grant in the national Capitol, and for " Grief " and " History " on the Peace Monument at Washington. In Lewiston are the Central Maine General Hospital (1888), the Sisters' Hospital (1888), under the charge of the French Catholic Sisters of Charity, a home for aged women, a young women's home and the Hesley Asylum for boys. The Shrine Building (Kora Temple), dedicated in 1909, is the headquarters of the Shriners of the state. The river at Lewiston breaks over a ledge of mica-schist and gneiss, the natural fall of 40 ft. having been increased to more than 50 ft. by a strong granite dam; and 3 m. above the city at Deer Rips a cement dam furnishes 10,000 horse-power. The water-power thus obtained is distributed by canals from the nearer dam and transmitted by wire from the upper dam. The manufacture of cotton goods is the principal industry, and in 1905 the product of the city's cotton mills was valued at about one-third of that of the mills of the whole state. Among other industries are the manufacture of woollen goods, shirts, dry-plates, carriages, spools and bobbins, and boots and shoes, and the dyeing and finishing of textiles. The total factory product in 1905 was valued at $8,527,649. The municipality owns its water works and electric lighting plant. Lewiston was settled in 1770, incorporated as a township in 1795 and chartered as a city in 1861. It was the home of Nelson Dingley (1832–1899), who from 1856 until his death controlled the Lewiston *Journal*. He was governor of the state in 1874–1876, Republican representative in Congress in 1881–1899, and the drafter of the Dingley Tariff Bill (1897).

LEWIS-WITH-HARRIS, the most northerly island of the Outer Hebrides, Scotland. It is sometimes called the Long Island and is 24 m. from the nearest point of the mainland, from which it is separated by the strait called The Minch. It is 60 m. long and has an extreme breadth of 30 m., its average breadth being 15 m. It is divided into two portions by a line roughly drawn between Loch Resort on the west and Loch Seaforth on the east, of which the larger or more northerly portion, known as Lewis (pron. *Lews*), belongs to the county of Ross and Cromarty and the lesser, known as Harris, to Inverness-shire. The area of the whole island is 492,800 acres, or 770 sq. m., of which 368,000 acres belong to Lewis. In 1891 the population of Lewis was 27,045, of Harris 3681; in 1901 the population of Lewis was 28,357, of Harris 3803, or 32,160 for the island, of whom 17,175 were females, 11,209 spoke Gaelic only, and 17,685 both Gaelic and English. There is communication with certain ports of the Western Highlands by steamer via Stornoway every week—oftener during the tourist and special seasons—the steamers frequently calling at Loch Erisort, Loch Sealg, Ardvourlie, Tarbert, Ardvey, Rodel and The Obe. The coast is indented to a remarkable degree, the principal sea-lochs in Harris being East and West Loch Tarbert; and in Lewis, Loch Seaforth, Loch Erisort and Broad Bay (or Loch a Tuath) on the east coast and Loch Roag and Loch Resort on the west. The mainland is dotted with innumerable fresh-water lakes. The island is composed of gneiss rocks, excepting a patch of granite near Carloway, small bands of intrusive basalt at Gress and in Eye Peninsula and some Torridonian sandstone at Stornoway, Tong, Vatskir and Carloway. Most of Harris is mountainous, there being more than thirty peaks above 1000 ft. high. Lewis is comparatively flat, save in the south-east, where Ben More reaches 1874 ft., and in the south-west, where Mealasbhal (1885) is the highest point; but in this division there are only eleven peaks exceeding 1000 ft. in height. The rivers are small and unimportant. The principal capes are the Butt of Lewis, in the extreme north, where the cliffs are nearly 150 ft. high and crowned with a lighthouse, the light of which is visible for 19 m.; Tolsta Head, Tiumpan Head and Cabag Head, on the east; Renish Point, in the extreme south; and, on the west, Toe Head and Gallon Head. The following inhabited islands in the Inverness-shire division belong to the parish of Harris: off the S.W. coast, Bernera (pop. 524), Ensay, Killigray and Pabbay; off the W. coast, Scarp (160), Soay and Tarrensay (72); off the E. coast, Scalpa (587) and Scotasay. Belonging to the county of Ross and Cromarty are Great Bernera (580) to the W. of Lewis, in the parish of Uig, and the Shiant Isles, about 21 m. S. of Stornoway, in the parish of Lochs, so named from the number of its sea lochs and fresh-water lakes. The south-eastern base of Broad Bay is furnished by the peninsula of Eye, attached to the main mass by so slender a neck as seemingly to be on the point of becoming itself an island. Much of the surface of both Lewis and Harris is composed of peat and swamp; there are scanty fragments of an ancient forest. The rainfall for the year averages 41·7 in., autumn and winter being very wet. Owing to the influence of the Gulf Stream, however, the temperature is fairly high, averaging for the year 46·6° F., for January 39·5° F. and for August 56·5° F.

The economic conditions of the island correspond with its physical conditions. The amount of cultivable land is small and poor. Sir James Matheson (1796–1878), who purchased the island in 1844, is said to have spent nearly £350,000 in reclamation and improvements. Barley and potatoes are the chief crops. A large number of black cattle are reared and some sheep-farming is carried on in Harris. Kelp-making, once important, has been extinct for many years. Harris has obtained great reputation for tweeds. The cloth has an aroma of heather and peat, and is made in the dwellings of the cotters, who use dyes of long-established excellence. The fisheries are the principal mainstay of the people. In spite of the very considerable reductions in rent effected by the Crofters' Commission (appointed in 1886) and the sums expended by government, most of the crofters still live in poor huts amid dismal surroundings. The island affords good sporting facilities. Many of the streams abound with salmon and trout; otters and seals are plentiful, and deer and hares common; while bird life includes grouse, ptarmigan, woodcock, snipe, heron, widgeon, teal, eider duck, swan and varieties of geese and gulls. There are many antiquarian remains, including duns, megaliths, ruined towers and chapels and the like. At RODEL, in the extreme south of Harris, is a church, all that is left of an Augustinian monastery. The foundation is Norman and the superstructure Early English. On the towers are curious carved figures and in the interior several tombs of the Macleods, the most remarkable being that of Alastair (Alexander), son of William Macleod of Dunvegan, dated 1528. The monument, a full-length recumbent effigy of a knight in armour, lies at the base of a tablet in the shape of an arch divided into compartments, in which are carved in bas-relief, besides the armorial bearings of the deceased and a rendering of Dunvegan castle, several symbolical scenes, one of which exhibits Satan weighing in the balance the good and evil deeds of Alastair Macleod, the good obviously preponderating. Stornoway, the chief town (pop. 3852) is treated under a separate heading. At CALLERNISH, 13 m. due W. of Stornoway, are several stone circles, one of which is probably the most perfect example of so-called " Druidical " structures in the British Isles. In this specimen the stones are huge, moss-covered, undressed blocks of gneiss. Twelve of such monoliths constitute the circle, in the centre of which stands a pillar 17 ft. high. From the circle there runs northwards an avenue of stones, comprising on the right-hand side nine blocks and on the left-hand ten. There also branch off from the circle, on the east and west, a single line of four stones and, on the south, a single line of five stones. From the extreme point of the south file to the farther end of the avenue on the north is a distance of 127 yds. and the width from tip to tip of the east and west arms is 41 yds. Viewed from the north end of the avenue, the design is that of a cross. The most important fishery centre on the west coast is Carloway, where there is the best example of a broch, or fort, in the Hebrides. Rory, the blind harper who translated the Psalms into Gaelic, was born in the village. Tarbert, at the head of East Loch Tarbert, is a neat, clean village, in communication by mail-car with Stornoway. At Coll, a few miles N. by E. of Stornoway, is a mussel cave; and at Gress, 2 m. or so beyond in the same direction, there is a famous seals' cave, adorned with fine stalactites. Port of Ness, where there is a harbour, is the headquarters of the ling fishery. Loch Seaforth gave the title of earl to a branch of the Mackenzies, but in 1716 the 5th earl was attainted for Jacobitism and the title forfeited. In 1797 Francis Humberston Mackenzie (1754–1815), chief of the Clan Mackenzie, was created Lord Seaforth and Baron Mackenzie of Kintail, and made colonel of the 2nd battalion of the North British Militia, afterwards the 3rd battalion of the Seaforth Highlanders. The 2nd battalion of the Seaforth Highlanders was formerly the Ross-shire Buffs, which was raised in 1771.

LEXICON, a dictionary (*q.v.*). The word is the Latinized form of Gr. *λεξικόν*, sc. *βιβλίον*, a word-book (*λέξις*, word, *λέγειν*, to speak). Lexicon, rather than dictionary, is used of word-books of the Greek language, and sometimes of Arabic and Hebrew.

LEXINGTON, BARON, a title borne in the English family of Sutton from 1645 to 1723. Robert Sutton (1594–1668), son of Sir William Sutton of Averham, Nottinghamshire, was a member of parliament for his native county in 1625 and again in 1640. He served Charles I. during the Civil War, making great monetary sacrifices for the royal cause, and in 1645 the king created him Baron Lexington, this being a variant of the name of the Nottinghamshire village of Laxton. His estate suffered during the time of the Commonwealth, but some money was returned to him by Charles II. He died on the 13th of October 1668. His only son, Robert, the 2nd baron (1661–1723), supported in the House of Lords the elevation of William of Orange to the throne, and was employed by that king at court and on diplomatic business. He also served as a soldier, but he is chiefly known as the British envoy at Vienna during the conclusion of the treaty of Ryswick, and at Madrid during the negotiations which led to the treaty of Utrecht. He died on the 19th of September 1723. His letters from Vienna, selected and edited by the Hon. H. M. Sutton, were published as the *Lexington Papers* (1851). Lexington's barony became extinct on his death, but his estates descended to the younger sons of his daughter Bridget (d. 1734), the wife of John Manners, 3rd duke of Rutland. Lord George Manners, who inherited these estates in 1762, is the ancestor of the family of Manners-Sutton. An earlier member of this family is Oliver Sutton, bishop of Lincoln from 1280 to 1299.

LEXINGTON, a city and the county-seat of Fayette county, Kentucky, U.S.A., about 75 m. S. of Cincinnati. Pop. (1900) 26,369, of whom 10,130 were negroes and 924 were foreign-born; (1910 census), 35,099. It is served by the Louisville & Nashville, the Southern, the Chesapeake & Ohio, the Cincinnati, New Orleans & Texas Pacific, the Lexington & Eastern, and electric railways. The city, which lies at an altitude of about 950 ft., is situated near the centre of the celebrated "blue grass" region, into which extend a number of turnpike roads. Its public buildings include the court house and the Federal building, both built of Bowling Green oolitic limestone. Among the public institutions are two general hospitals—St Joseph's (Roman Catholic) and Good Samaritan (controlled by the Protestant churches of the city)—the Eastern Lunatic Asylum (1815, a state institution since 1824), with 250 acres of grounds; a state House of Reform for Girls and a state House of Reform for Boys (both at Greendale, a suburb); an orphan industrial school (for negroes); and two Widows' and Orphans' Homes, one established by the Odd Fellows of Kentucky and the other by the Knights of Pythias of the state. Lexington is the seat of Transylvania University (non-sectarian; coeducational), formerly Kentucky University (Disciples of Christ), which grew out of Bacon College (opened at Georgetown, Ky., in 1836), was chartered in 1858 as Kentucky University, and was opened at Harrodsburg, Ky., in 1859, whence after a fire in 1864 it removed to Lexington in 1865. At Lexington it was consolidated with the old Transylvania University, a well-known institution which had been chartered as Transylvania Seminary in 1783, was opened near Danville, Ky., in 1785, was removed to Lexington in 1789, was re-chartered as Transylvania University in 1798, and virtually ceased to exist in 1859.[1] In 1908 Kentucky University resumed the old name, Transylvania University. It has a college of Liberal Arts, a College of Law, a Preparatory School, a Junior College for Women, and Hamilton College for women (founded in 1869 as Hocker Female College), over which the university assumed control in 1903, and a College of the Bible, organized in 1865 as one of the colleges of the university, but now under independent control. In 1907–1908 Transylvania University, including the College of the Bible, had 1129 students. At Lexington are the State University, two colleges for girls—the Campbell-Hagerman College and Sayre College—and St Catherine's Academy (Roman Catholic). The city is the meeting-place of a Chatauqua Assembly, and has a public library. The State University was founded (under the Federal Land Grant Act of 1862) in 1865 as the State Agricultural and Mechanical College, was opened in 1866, and was a college of Kentucky University until 1878. In 1890 the college received a second Federal appropriation, and it received various grants from the state legislature, which in 1880 imposed a state tax of one-half of 1% for its support. In connexion with it an Agricultural Experiment Station was established in 1885. In 1908 its title became, by act of Legislature, the State University. The university has a College of Agriculture, a College of Arts and Science, a College of Law, a School of Civil Engineering, a School of Mechanical and Electrical Engineering, and a School of mining Engineering. The university campus is the former City Park, in the southern part of the city. In 1907–1908 the university had 1064 students. The city is the see of a Protestant Episcopal bishopric.

Lexington was the home of Henry Clay from 1797 until his death in 1852, and in his memory a monument has been erected, consisting of a magnesian-limestone column (about 120 ft.) in the Corinthian style and surmounted by a statue of Clay, the head of which was torn off in 1902 by a thunderbolt. Clay's estate, "Ashland," is now one of the best known of the stock-farms in the vicinity; the present house is a replica of Clay's home. The finest and most extensive of these stock-farms, and probably the finest in the world, is "Elmendorf," 6 m. from the city. On these farms many famous trotting and running horses have been raised. There are two race-tracks in Lexington, and annual running and trotting race meetings attract large crowds. The city's industries consist chiefly in a large trade in tobacco, hemp, grain and live stock—there are large semi-annual horse sales—and in the manufacture of "Bourbon" whisky, tobacco, flour, dressed flax and hemp, carriages, harness and saddles. The total value of the city's factory products in 1905 was $2,774,329 (46·9% more than in 1900).

Lexington was named from Lexington, Massachusetts, in 1775 by a party of hunters who were encamped here when they received the news of the battle of Lexington; the permanent settlement dates from 1779. It was laid out in 1781, incorporated as a town in 1782, and chartered as a city in 1832. The first newspaper published west of the Alleghany Mountains, the *Kentucky Gazette*, was established here in 1787, to promote the separation of Kentucky from Virginia. The first state legislature met here in 1792, but later in the same year Frankfort became the state capital. Until 1907, when the city was enlarged by annexation, its limits remained as they were first laid out, a circle with a radius of 1 m., the court house being its centre.

See G. W. Ranck, *History of Lexington, Kentucky* (Cincinnati, 1872).

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[1] See Robert Peter, *Transylvania University: Its Origin, Rise, Decline and Fall* (Louisville, 1896), and his *History of the Medical Department of Transylvania University* (Louisville, 1905).

LEXINGTON, a township of Middlesex county, Massachusetts, U.S.A., about 11 m. N.W of Boston. Pop. (1900) 3831, (1910 U.S. census) 4918. It is traversed by the Boston & Maine railroad and by the Lowell & Boston electric railway. Its area is about 17 sq. m., and it contains three villages—Lexington, East Lexington and North Lexington. Agriculture is virtually the only industry. Owing to its historic interest the village of Lexington is visited by thousands of persons annually, for it was on the green or common of this village that the first armed conflict of the American War of Independence occurred. On the green stand a monument erected by the state in 1799 to the memory of the minute-men who fell in that engagement, a drinking fountain surmounted by a bronze statue (1900, by Henry Hudson Kitson) of Captain John Parker, who was in command of the minute-men, and a large boulder, which marks the position of the minute-men when they were fired upon by the British. Near the green, in the old burying-ground, are the graves of Captain Parker and other American patriots—the oldest gravestone is dated 1690. The Hancock-Clarke House (built in part in 1698) is now owned by the Lexington Historical Society and contains a museum of revolutionary and other relics, which were formerly exhibited in the Town Hall. The Buckman Tavern (built about 1690), the rendezvous of the minute-men, and the Munroe Tavern (1695), the headquarters of the British, are still standing, and two other houses, on the common, antedate the War of Independence. The Cary Library in this village, with 25,000 volumes (1908), was founded in 1868, and was housed in the Town Hall from 1871 until 1906, when it was removed to the Cary Memorial Library building. In the library are portraits of Paul Revere, William Dawes and Lord Percy. The Town Hall (1871) contains statues of John Hancock (by Thomas R. Gould) and Samuel Adams (by Martin Millmore), of the "Minute-Man of 1775" and the "Soldier of 1861," and a painting by Henry Sandham, "The Battle of Lexington."

Lexington was settled as a part of Cambridge as early as 1642. It was organized as a parish in 1691 and was made a township (probably named in honour of Lord Lexington) in 1713. In the evening of the 18th of April 1775 a British force of about 800 men under Lieut.-Colonel Francis Smith and Major John Pitcairn was sent by General Thomas Gage from Boston to destroy military stores collected by the colonists at Concord, and to seize John Hancock and Samuel Adams, then at Parson Clarke's house (now known as the Hancock-Clarke House) in Lexington. Although the British had tried to keep this movement a secret, Dr Joseph Warren discovered their plans and sent out Paul Revere and William Dawes to give warning of their approach. The expedition had not proceeded far when Smith, discovering that the country was aroused, despatched an express to Boston for reinforcements and ordered Pitcairn to hasten forward with a detachment of light infantry. Early in the morning of the 19th Pitcairn arrived at the green in the village of Lexington, and there found between sixty and seventy minute-men under Captain John Parker drawn up in line of battle. Pitcairn ordered them to disperse, and on their refusal to do so his men fired a volley. Whether a stray shot preceded the first volley, and from which side it came, are questions which have never been determined. After a second volley from the British, Parker ordered his men to withdraw. The engagement lasted only a few minutes, but eight Americans were killed and nine were wounded; not more than two or three of the British were wounded. Hancock and Adams had escaped before the British troops reached Lexington. The British proceeded from Lexington to Concord (*q.v.*). On their return they were continually fired upon by Americans from behind trees, rocks, buildings and other defences, and were threatened with complete destruction until they were rescued at Lexington by a force of 1000 men under Lord Hugh Percy (later, 1786, duke of Northumberland). Percy received the fugitives within a hollow square, checked the onslaught for a time with two field-pieces, used the Munroe Tavern for a hospital, and later in the day carried his command with little further injury back to Boston. The British losses for the entire day were 73 killed, 174 wounded and 26 missing; the American losses were 49 killed, 39 wounded and 5 missing.

In 1839 a state normal school for women (the first in Massachusetts and the first public training school for teachers in the United States) was opened at Lexington; it was transferred to West Newton in 1844 and to Framingham in 1853.

See Charles Hudson, *History of the Town of Lexington* (Boston, 1868), and the publications of the Lexington Historical Society, (1890 seq.).

LEXINGTON, a city and the county-seat of Lafayette county, Missouri, U.S.A., situated on the S. bank of the Missouri river, about 40 m. E. of Kansas City. Pop. (1900) 4190, including 1170 negroes and 283 foreign-born; (1910) 5242. It is served by the Atchison, Topeka & Santa Fé, the Wabash (at Lexington Junction, 4 m. N.W.), and the Missouri Pacific railway systems. The city lies for the most part on high broken ground at the summit of the river bluffs, but in part upon their face. Lexington is the seat of the Lexington College for Young Women (Baptist, established 1855), the Central College for Women (Methodist Episcopal, South; opened 1869), and the Wentworth Military Academy (1880). There are steam flour mills, furniture factories and various other small manufactories; but the main economic interest of the city is in brickyards and coal-mines in its immediate vicinity. It is one of the principal coal centres of the state, Higginsville (pop. in 1910, 2628), about 12 m. S. E., in the same county, also being important. Lexington was founded in 1819, was laid out in 1832, and, with various additions, was chartered as a city in 1845. A new charter was received in 1870. Lexington succeeded Sibley as the eastern terminus of the Santa Fé trade, and was in turn displaced by Independence; it long owed its prosperity to the freighting trade up the Missouri, and at the opening of the Civil War it was the most important river town between St Louis and St Joseph and commanded the approach by water to Fort Leavenworth.

After the Confederate success at Wilson's Creek (Aug. 10, 1861), General Sterling Price advanced northward, and with about 15,000 men arrived in the vicinity of Lexington on the 12th of September. Here he found a Federal force of about 2800 men under Colonel James A. Mulligan (1830–1864) throwing up intrenchments on Masonic College Hill, an eminence adjoining Lexington on the N.E. An attack was made on the same day and the Federals were driven within their defences, but at night General Price withdrew to the Fair-grounds not far away and remained there five days waiting for his wagon train and for reinforcements. On the 18th the assault was renewed, and on the 20th the Confederates, advancing behind movable breastworks of water-soaked bales of hemp, forced the besieged, now long without water, to surrender. The losses were: Confederate, 25 killed and 75 wounded; Federal, 39 killed and 120 wounded. At the end of September General Price withdrew, leaving a guard of only a few hundred in the town, and on the 16th of the next month a party of 220 Federal scouts under Major Frank J. White (1842–1875) surprised this guard, released about 15 prisoners, and captured 60 or more Confederates. Another Federal raid on the town was made in December of the same year by General John Pope's cavalry. Again, during General Price's Missouri expedition in 1864, a Federal force entered Lexington on the 16th of October, and three days later there was some fighting about 4 m. S. of the town.

LEXINGTON, a town and the county-seat of Rockbridge county, Virginia, U.S.A., on the North river (a branch of the James), about 30 m. N.N.W. of Lynchburg. Pop. (1900) 3203 (1252 negroes); (1910) 2931. It is served by the Chesapeake & Ohio and the Baltimore & Ohio railways. The famous Natural Bridge is about 16 m. S.W., and there are mineral springs in the vicinity—at Rockbridge Baths, 10 m. N., at Wilson's Springs, 12 m. N., and at Rockbridge Alum Springs, 17 m. N.W. Lexington is best known as the seat of Washington and Lee University, and of the Virginia Military Institute. The former grew out of Augusta Academy, which was established in 1749 in Augusta county, about 15 m. S.W. of what is now the city of Staunton, was renamed Liberty Hall and was established near

Lexington in 1780, and was chartered as Liberty Hall Academy in 1782. In 1798 its name was changed to Washington Academy, in recognition of a gift from George Washington of some shares of canal stock, which he refused to receive from the Virginia legislature. In 1802 the Virginia branch of the Society of the Cincinnati disbanded and turned over to the academy its funds, about $25,000; in 1813 the academy took the name Washington College; and in 1871 its corporate name was changed to Washington and Lee University, the addition to the name being made in honour of General Robert E. Lee, who was the president of the college from August 1865 until his death in 1870. He was succeeded by his son, General George Washington Custis Lee (b. 1832), president from 1871 to 1897, and Dr William Lyne Wilson (1843–1900), the eminent political leader and educator, was president from 1897 to 1900. In 1908–1909 the university comprised a college, a school of commerce, a school of engineering and a school of law, and had a library of 47,000 volumes, 23 instructors and 565 students. In the Lee Memorial chapel, on the campus, General Robert E. Lee is buried, and over his grave is a notable recumbent statue of him by Edward Virginius Valentine (b. 1838). The Virginia Military Institute was established in March 1839, when its cadet corps supplanted the company of soldiers maintained by the state to garrison the Western Arsenal at Lexington. The first superintendent (1839–1890) was General Francis Henney Smith (1812–1890), a graduate (1833) of the United States Military Academy; and from 1851 until the outbreak of the Civil War "Stonewall" Jackson was a professor in the Institute—he is buried in the Lexington cemetery and his grave is marked by a monument. On the campus of the institute is a fine statue, "Virginia Mourning Her Dead," by Moses Ezekiel (b. 1844), which commemorates the gallantry of a battalion of 250 cadets from the institute, more than 50 of whom were killed or wounded during the engagement at New Market on the 15th of May 1864. In 1908–1909 the institute had 21 instructors and 330 cadets. Flour is manufactured in Lexington and lime in the vicinity. The town owns and operates its water-works. The first settlers of Rockbridge county established themselves in 1737 near the North river, a short distance below Lexington. The first permanent settlement on the present site was made about 1778. On the 11th of June 1864, during the occupation of the town by Federal troops under General David Hunter, most of the buildings in the town and those of the university were damaged and all those of the institute, except the superintendent's headquarters, were burned.

LEYDEN, JOHN (1775–1811), British orientalist and man of letters, was born on the 8th of September 1775 at Denholm on the Teviot, not far from Hawick. Leyden's father was a shepherd, but contrived to send his son to Edinburgh University to study for the ministry. Leyden was a diligent but somewhat miscellaneous student, reading everything apparently, except theology, for which he seems to have had no taste. Though he completed his divinity course, and in 1798 received licence to preach from the presbytery of St Andrews, it soon became clear that the pulpit was not his vocation. In 1794 Leyden had formed the acquaintance of Dr Robert Anderson, editor of *The British Poets*, and of *The Literary Magazine*. It was Anderson who introduced him to Dr Alexander Murray, and Murray, probably, who led him to the study of Eastern languages. They became warm friends and generous rivals, though Leyden excelled, perhaps, in the rapid acquisition of new tongues and acquaintance with their literature, while Murray was the more scientific philologist. Through Anderson also he came to know Richard Heber, by whom he was brought under the notice of Sir Walter Scott, who was then collecting materials for his *Minstrelsy of the Scottish Border*. Leyden was admirably fitted for helping in this kind of work, for he was a borderer himself, and an enthusiastic lover of old ballads and folk-lore. Scott tells how, on one occasion, Leyden walked 40 m. to get the last two verses of a ballad, and returned at midnight, singing it all the way with his loud, harsh voice, to the wonder and consternation of the poet and his household.

Leyden meanwhile compiled a work on the *Discoveries and Settlements of Europeans in Northern and Western Africa*, suggested by Mungo Park's travels, edited *The Complaint of Scotland*, printed a volume of Scottish descriptive poems, and nearly finished his *Scenes of Infancy*, a diffuse poem based on border scenes and traditions. He also made some translations from Eastern poetry, Persian and Arabic. At last his friends got him an appointment in India on the medical staff, for which he qualified by a year's hard work. In 1803 he sailed for Madras, and took his place in the general hospital there. He was promoted to be naturalist to the commissioners going to survey Mysore, and in 1807 his knowledge of the languages of India procured him an appointment as professor of Hindustani at Calcutta; this he soon after resigned for a judgeship, and that again to be a commissioner in the court of requests in 1809, a post which required a familiarity with several Eastern tongues. In 1811 he joined Lord Minto in the expedition to Java. Having entered a library which was said to contain many Eastern MSS., without having the place aired, he was seized with Batavian fever, and died, after three days' illness, on the 28th of August 1811.

LEYDEN JAR, or CONDENSER, an electrical appliance consisting in one form of a thin glass jar partly coated inside and outside with tin foil, or in another of a number of glass plates similarly coated. When the two metal surfaces are connected for a short time with the terminals of some source of electromotive force, such as an electric machine, an induction coil or a voltaic battery, electric energy is stored up in the condenser in the form of electric strain in the glass, and can be recovered again in the form of an electric discharge.

Early history.

The earliest form of Leyden jar consisted of a glass vial or thin Florence flask, partly full of water, having a metallic nail inserted through the cork which touched the water. The bottle was held in the hand, and the nail presented to the prime conductor of an electrical machine. If the person holding the bottle subsequently touched the nail, he experienced an electric shock. This experiment was first made by E. G. von Kleist of Kammin in Pomerania in 1745,[1] and it was repeated in another form in 1746 by Cunaeus and P. van Musschenbroek, of the university of Leyden (Leiden), whence the term Leyden jar.[2] J. H. Winkler discovered that an iron chain wound round the bottle could be substituted for the hand, and Sir William Watson in England shortly afterward showed that iron filings or mercury could replace the water within the jar. Dr John Bevis of London suggested, in 1746, the use of sheet lead coatings within and without the jar, and subsequently the use of tin foil or silver leaf made closely adherent to the glass. Benjamin Franklin and Bevis devised independently the form of condenser known as a Franklin or Leyden pane, which consists of a sheet of glass, partly coated on both sides with tin foil or silver leaf, a margin of glass all round being left to insulate the two tin foils from each other. Franklin in 1747 and 1748 made numerous investigations on the Leyden jar, and devised a method of charging jars in series as well as in parallel. In the former method, now commonly known as charging in *cascade*, the jars are insulated and the outside coating of one jar is connected to the inside coating of the next and so on for a whole series, the inside coating of the first jar and the outside coating of the last jar being the terminals of the condenser. For charging in parallel a number of jars are collected in a box, and all the outside coatings are connected together metallically and all the inside coatings brought to one common terminal. This arrangement is commonly called a battery of Leyden jars. To Franklin also we owe the important knowledge that the electric charge resides really in the glass and not in the metal coatings, and that when a condenser has been charged the metallic coatings can be exchanged for fresh ones and yet the electric charge of the condenser remains.

In its modern form the Leyden jar consists of a wide-mouthed bottle of thin English flint glass of uniform thickness,

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[1] Park Benjamin, *The Intellectual Rise in Electricity*, p. 512.

[2] *Ibid.* p. 519.

Modern construction.

free from flaws. About half the outside and half the inside surface is coated smoothly with tin foil, and the remainder of the glazed surface is painted with shellac varnish. A wooden stopper closes the mouth of the jar, and through it a brass rod passes which terminates in a chain, or better still, three elastic brass springs, which make good contact with the inner coating. The rod terminates externally in a knob or screw terminal. The jar has a certain capacity C which is best expressed in microfarads or electrostatic units (see Electrostatics), and is determined by the surface of the tin foil and thickness and quality of the glass. The jar can be charged so that a certain potential difference V, reckoned in volts, exists between the two coatings. If a certain critical potential is exceeded, the glass gives way under the electric strain and is pierced. The safe voltage for most glass jars is about 20,000 volts for glass $\frac{1}{10}$th in. in thickness; this corresponds with an electric spark of about 7 millimetres in length. When the jar is charged, it is usually discharged through a metallic arc called the discharging tongs, and this discharge is in the form of an oscillatory current (see Electrokinetics). The energy stored up in the jar in joules is expressed by the value of $\frac{1}{2}CV^2$, where C is the capacity measured in farads and V the potential difference of the coatings in volts. If the capacity C is reckoned in microfarads then the energy storage is equal to $CV^2/2\times10^6$ joules or $0\cdot737$ $CV^2/2\times10^6$ foot-pounds. The size of jar commonly known as a quart size may have a capacity from $\frac{1}{400}$th to $\frac{1}{800}$th of a microfarad, and if charged to 20,000 volts stores up energy from a quarter to half a joule or from $\frac{3}{16}$ths to $\frac{3}{8}$ths of a foot-pound.

High tension condensers.

Leyden jars are now much employed for the production of the high frequency electric currents used in wireless telegraphy (see Telegraphy, Wireless). For this purpose they are made by Moscicki in the form of glass tubes partly coated by silver chemically deposited on the glass on the inner and outer surfaces. The tubes have walls thicker at the ends than in the middle, as the tendency to puncture the glass is greatest at the edges of the coatings. In other cases, Leyden jars or condensers take the form of sheets of mica or micanite or ebonite partly coated with tin foil or silver leaf on both sides; or a pile of sheets of alternate tin foil and mica may be built up, the tin foil sheets having lugs projecting out first on one side and then on the other. All the lugs on one side are connected together, and so also are all the lugs on the other side, and the two sets of tin foils separated by sheets of mica constitute the two metallic surfaces of the Leyden jar condenser. For the purposes of wireless telegraphy, when large condensers are required, the ordinary Leyden jar occupies too much space in comparison with its electrical capacity, and hence the best form of condenser consists of a number of sheets of crown glass, each partly coated on both sides with tin foil. The tin foil sheets have lugs attached which project beyond the glass. The plates are placed in a vessel full of insulating oil which prevents the glow or brush discharge taking place over their edges. All the tin foils on one side of the glass plates are connected together and all the tin foils on the opposite sides, so as to construct a condenser of any required capacity. The box should be of glass or stoneware or other non-conducting material. When glass tubes are used it is better to employ tubes thicker at the ends than in the middle, as it has been found that when the safe voltage is exceeded and the glass gives way under electric strain, the piercing of the glass nearly always takes place at the edges of the tin foil.

Compressed air condensers.

Glass is still commonly used as a dielectric because of its cheapness, high dielectric strength or resistance to electric puncture, and its high dielectric constant (see Electrostatics). It has been found, however, that very efficient condensers can be made with compressed air as dielectric. If a number of metal plates separated by small distance pieces are enclosed in an iron box which is pumped full of air to a pressure, say, of 100 lb. to 1 sq. in., the dielectric strength of the air is greatly increased, and the plates may therefore be brought very near to one another without causing a spark to pass under such voltage as would cause discharge in air at normal pressure. Condensers of this kind have been employed by R. A. Fessenden in wireless telegraphy, and they form a very excellent arrangement for standard condensers with which to compare the capacity of other Leyden jars. Owing to the variation in the value of the dielectric constant of glass with the temperature and with the frequency of the applied electromotive force, and also owing to electric glow discharge from the edges of the tin foil coatings, the capacity of an ordinary Leyden jar is not an absolutely fixed quantity, but its numerical value varies somewhat with the method by which it is measured, and with the other circumstances above mentioned. For the purpose of a standard condenser a number of concentric metal tubes may be arranged on an insulating stand, alternate tubes being connected together. One coating of the condenser is formed by one set of tubes and the other by the other set, the air between being the dielectric. Paraffin oil or any liquid dielectric of constant inductivity may replace the air.

See J. A. Fleming, *Electric Wave Telegraphy* (London, 1906); R. A. Fessenden, "Compressed Air for Condensers," *Electrician*, 1905, 55, p. 795; Moscicki, "Construction of High Tension Condensers," *L'Éclairage électrique*, 1904, 41, p. 14, or *Engineering*, 1904, p. 865. (J. A. F.)

LEYS, HENDRIK, Baron (1815–1869), Belgian painter, was born at Antwerp on the 18th of February 1815. He studied under Wappers at the Antwerp Academy. In 1833 he painted "Combat d'un grenadier et d'un cosaque," and in the following year "Combat de Bourguignons et Flamands." In 1835 he went to Paris where he was influenced by the Romantic movement. Examples of this period of his painting are "Massacre des échevins de Louvain," "Mariage flamand," "Le Roi des arbalétriers" and other works. Leys was an imitative painter in whose works may rapidly be detected the schools which he had been studying before he painted them. Thus after his visit to Holland in 1839 he reproduced many of the characteristics of the Dutch genre painters in such works as "Franz Floris se rendant à une fête" (1845) and "Service divin en Hollande" (1850). So too the methods of Quentin Matsys impressed themselves upon him after he had travelled in Germany in 1852. In 1862 Leys was created a baron. At the time of his death, which occurred in August 1869, he was engaged in decorating with fresco the large hall of the Antwerp Hôtel de Ville.

LEYTON, an urban district forming one of the north-eastern suburbs of London, England, in the Walthamstow (S.W.) parliamentary division of Essex. Pop. (1891) 63,106; (1901) 98,912. It lies on the east (left) bank of the Lea, along the flat open valley of which runs the boundary between Essex and the county of London. The church of St Mary, mainly a brick reconstruction, contains several interesting memorials; including one to William Bowyer the printer (d. 1737), erected by his son and namesake, more famous in the same trade. Here is also buried John Strype the historian and biographer (d. 1737), who held the position of curate and lecturer at this church. Leyton is in the main a residential as distinct from a manufacturing locality. Its name is properly Low Leyton, and the parish includes the district of Leytonstone to the east. Roman remains have been discovered here, but no identification with a Roman station by name has been made with certainty. The ground of the Essex County Cricket Club is at Leyton.

LHASA (Lhassa, Lassa, "God's ground"), the capital of Tibet. It lies in 29° 39′ N., 91° 5′ E., 11,830 ft. above sea-level. Owing to the inaccessibility of Tibet and the political and religious exclusiveness of the lamas, Lhasa was long closed to European travellers, all of whom during the latter half of the 19th century were stopped in their attempts to reach it. It was popularly known as the "Forbidden City." But its chief features were known by the accounts of the earlier Romish missionaries who visited it and by the investigations, in modern times, of native Indian secret explorers, and others, and the British armed mission of 1904 (see Tibet).

Site and General Aspect.—The city stands in a tolerably level plain, which is surrounded on all sides by hills. Along its southern side, about ½ m. south of Lhasa, runs a considerable river called the Kyichu (Ki-chu) or Kyi, flowing here from E.N.E., and joining the great Tsangpo (or upper course of the Brahmaputra) some 38 m. to the south-west. The hills round the city are barren. The plain, however, is fertile, though in parts marshy. There are gardens scattered over it round the city, and these are planted with fine trees. The city is screened from view from the west by a rocky ridge, lofty and narrow, with summits at the north and south, the one flanked and crowned by the majestic buildings of Potala, the chief residence of the Dalai lama, the other by the temple of medicine. Groves, gardens and open ground intervene between this ridge and the city itself for a distance of about 1 m. A gate through the centre of the ridge gives access from the west; the road thence to the north part of the city throws off a branch to the Yutok sampa or turquoise-tiled covered bridge, one of the noted features of Lhasa, which crosses a former channel of the Kyi, and carries the road to the centre of the town.

The city is nearly circular in form, and less than 1 m. in diameter. It was walled in the latter part of the 17th century, but the walls were destroyed during the Chinese occupation in 1722. The chief streets are fairly straight, but generally of no great width. There is no paving or metal, nor any drainage system, so that the streets are dirty and in parts often flooded. The inferior quarters are unspeakably filthy, and are rife with evil smells and large mangy dogs and pigs. Many of the houses are of clay and sun-dried brick, but those of the richer people are of stone and brick. All are frequently white-washed, the doors and windows being framed in bands of red and yellow. In the suburbs there are houses entirely built of the horns of sheep and oxen set in clay mortar. This construction is in some cases very roughly carried out, but in others it is solid and highly picturesque. Some of the inferior huts of this type are inhabited by the Ragyaba or scavengers, whose chief occupation is that of disposing of corpses according to the practice of cutting and exposing them to the dogs and birds of prey. The houses generally are of two or three storeys. Externally the lower part generally presents dead walls (the ground floor being occupied by stables and similar apartments); above these rise tiers of large windows with or without projecting balconies, and over all flat broad-eaved roofs at varying levels. In the better houses there are often spacious and well-finished apartments, and the principal halls, the verandahs and terraces are often highly ornamented in brilliant colours. In every house there is a kind of chapel or shrine, carved and gilt, on which are set images and sacred books.

The Jokhang.

Temples and Monasteries.—In the centre of the city is an open square which forms the chief market-place. Here is the great temple of the "Jo" or Lord Buddha, called the Jokhang,[1] regarded as the centre of all Tibet, from which all the main roads are considered to radiate. This is the great metropolitan sanctuary and church-centre of Tibet, the St Peter's or Lateran of Lamaism. It is believed to have been founded by the Tibetan Constantine, Srong-tsan-gampo, in 652, as the shrine of one of those two very sacred Buddhist images which were associated with his conversion and with the foundation of the civilized monarchy in Tibet. The exterior of the building is not impressive; it rises little above the level of other buildings which closely surround it, and the effect of its characteristic gilt roof, though conspicuous and striking from afar, is lost close at hand.

The main building of the Jokhang is three storeys high. The entrance consists of a portico supported on timber columns, carved and gilt, while the walls are engraved with Chinese, Mongolian and Tibetan characters, and a great prayer-wheel stands on one side. Massive folding doors, ornamented with scrollwork in iron, lead to an antehall, and from this a second gate opens into a courtyard surrounded by a verandah with many pillars and chapels, and frescoes on its walls. On the left is the throne of the grand lama, laid with cushions, together with the seats of other ecclesiastical dignitaries, variously elevated according to the rank of their occupants. An inner door with enclosed vestibule gives access to the quadrangular choir or chancel, as it may be called, though its centre is open to the sky. On either side of it are three chapels, and at the extremity is the rectangular "holy of holies," flanked by two gilded images of the coming Buddha, and screened by lattice-work. In it is the shrine on which sits the great image of Ṣakya, set about with small figures, lamps and a variety of offerings, and richly jewelled, though the workmanship of the whole is crude. In the second and third storeys of the temple are shrines and representations of a number of gods and goddesses. The temple contains a vast accumulation of images, gold and silver vessels, lamps, reliquaries and precious bric-à-brac of every kind. The daily offices are attended by crowds of worshippers, and a sacred way which leads round the main building is constantly traversed by devotees who perform the circuit as a work of merit, always in a particular direction. The temple was found by the members of the British mission who visited it to be exceedingly dirty, and the atmosphere was foul with the fumes of butter-lamps.

Besides the convent-cells, halls of study and magazines of precious lumber, buildings grouped about the Jokhang are occupied by the civil administration, *e.g.* as treasuries, customs office, courts of justice, &c., and there are also private apartments for the grand lama and other high functionaries. No woman is permitted to pass the night within the precinct.

In front of the main entrance to the Jokhang, in the shadow of a sacred willow tree, stands a famous monument, the Doring monolith, which bears the inscribed record of a treaty of peace concluded in 822 (or, according to another view, in 783) between the king of Tibet and the emperor of China. Before this monument the apostate from Lamaism, Langdharma, brother and successor of the last-named king, is said to have been standing when a fanatic recluse, who had been stirred by a vision to avenge his persecuted faith, assassinated him.

Potala.

The famous Potala hill, covered by the palace of the Dalai lama, forms a majestic mountain of building; with its vast inward-sloping walls broken only in the upper parts by straight rows of many windows, and its flat roofs at various levels, it is not unlike a fortress in appearance. At the south base of the rock is a large space enclosed by walls and gates, with great porticoes on the inner side. This swarms with lamas and with beggars. A series of tolerably easy staircases, broken by intervals of gentle ascent, leads to the summit of the rock. The whole width of this is occupied by the palace. The central part of this group of buildings (for the component parts of Potala are of different dates) rises in a vast quadrângular mass above its satellites to a great height, terminating in gilt canopies similar to those on the Jokhang. Here on the lofty terrace is the grand lama's promenade, and from this great height he looks down upon the crowds of his votaries far below. This central member of Potala is called the red palace from its crimson colour, which distinguishes it from the rest. It contains the principal halls and chapels and shrines of past Dalai lamas. There is in these much rich decorative painting, with jewelled work, carving and other ornament, but the interior of Potala as a whole cannot compare in magnificence with the exterior. Among the numerous other buildings of note on or near Potala hill, one is distinguished by the Chinese as one of the principal beauties of Lhasa. This is a temple not far from the base of the hill, in the middle of a lake which is surrounded by trees and shrubberies. This temple, called Lu-kang, is circular in form, with a *loggia* or portico running all round and adorned with paintings. Its name, "the serpent house," comes from the tradition of a serpent or dragon, which dwelt here and must be propitiated lest it should cause the waters to rise and flood Lhasa.

Another great and famous temple is Ramo-ché, at the north side of the city. This is also regarded as a foundation of Srong-tsan-gampo, and is said to contain the body of his Chinese wife and the second of the primeval palladia, the image that she brought with her to the Snow-land; whence it is known as the "small Jokhang." This temple is noted for the practice of magical arts. Its buildings are in a neglected condition.

Another monastery within the city is that of Moru, also on the north side, remarkable for its external order and cleanliness. Though famous as a school of orthodox magic, it is noted also for the printing-house in the convent garden. This convent was the temporary residence of the regent during the visit of the British mission in 1904. Other monasteries in or near the city are the Tsamo Ling or Chomoling at the north-west corner; the Tangyä Ling or Tengyeling at the west of the city; the Kundä Ling or Kundeling about 1 m. west of the city, at the foot of a low isolated hill called Chapochi. Three miles south, beyond the river, is the Tsemchog Ling or Tsecholing. These four convents are known as "The Four Ling." From their inmates the Dalai lama's regent, during his minority, was formerly chosen. The temple of medicine, as already stated, crowns the summit (Chagpa) at the end of the ridge west of the city, opposite to that on which stands the Potala. It is natural that in a country possessing a religious system like that of Tibet the medical profession should form a branch of the priesthood. "The treatment of disease, though based in some measure upon a judicious use of the commoner simple drugs of the country, is, as was inevitable amongst so superstitious a people, saturated with absurdity" (Waddell, *Lhasa and its Mysteries*).

The three great monasteries in the vicinity of Lhasa, all claiming to be foundations of Tsongkhapa (1356–1418), the medieval reformer and organizer of the modern orthodox Lama Church, "the yellow caps," are the following:—

1. *Debung* (written *'Bras spungs*) is 6 m. west of Lhasa at the foot

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[1] The name given by Köppen (*Die lamaische Kirche*, Berlin, 1859, p. 74) is "La Brang," by which it is sometimes known.

of the hills which flank the plain on the north. It is one of the largest monasteries in the world, having some 8000 monks. In the middle of the convent buildings rises a kind of pavilion, brilliant with colour and gilding, which is occupied by the Dalai Lama when he visits Debung once a year and expounds to the inmates. The place is frequented by the Mongol students who come to Lhasa to graduate, and is known in the country as the Mongol convent; it has also been notorious as a centre of political intrigue. Near it is the seat of the chief magician of Tibet, the Nachung Chos-kyong, a building picturesque in itself and in situation.

2. *Sera* is 3 m. north of the city on the acclivity of the hills and close to the road by which pilgrims enter from Mongolia. From a distance the crowd of buildings and temples, rising in amphitheatre against a background of rocky mountains, forms a pleasing picture. In the recesses of the hill, high above the convent, are scattered cells of lamas adopting the solitary life. The chief temple of Sera, a highly ornate building, has a special reputation as the resting-place of a famous *Dorjē*, *i.e.* the *Vajra* or Thunderbolt of Jupiter, the symbol of the strong and indestructible, which the priest grasps and manipulates in various ways during prayer. The emblem is a bronze instrument, shaped much like a dumbbell with pointed ends, and it is carried solemnly in procession to the Jokhang during the New Year's festival.

The hill adjoining Sera is believed to be rich in silver ore, but it is not allowed to be worked. On the summit is a spring and a holy place of the Lhasa Mahommedans, who resort thither. Near the monastery there is said to be gold, which is worked by the monks. "Should they . . . discover a nugget of large size, it is immediately replaced in the earth, under the impression that the large nuggets . . . germinate in time, producing the small lumps which they are privileged to search for" (Nain Singh).

3. *Galdan.*—This great convent is some 25 m. east of Lhasa, on the other side of the Kyichu. It is the oldest monastery of the "Yellow" sect, having been founded by Tsongkhapa and having had him for its first superior. Here his body is said to be preserved with miraculous circumstances; here is his tomb, of marble and malachite, with a great shrine said to be of gold, and here are other relics of him, such as the impression of his hands and feet.

Samyé is another famous convent intimately connected with Lhasa, being said to be used as a treasury by the government, but it lies some 36 m. south-east on the left bank of the great Tsangpo. It was founded in 770, and is the oldest extant monastery in Tibet. It is surrounded by a very high circular stone wall, 1½ m. in circumference, with gates facing the four points of the compass. On this wall Nain Singh, who was here on his journey in 1874, counted 1030 votive piles of brick. One very large temple occupies the centre, and round it are four smaller but still large temples. Many of the idols are said to be of pure gold, and the wealth is very great. The interiors of the temples are covered with beautiful writing in enormous characters, which the vulgar believe to be the writing of Ṣakya himself.

Population and Trade.—The total population of Lhasa, including the lamas in the city and vicinity, is probably about 30,000; a census in 1854 made the figure 42,000, but it is known to have greatly decreased since. There are only some 1500 resident Tibetan laymen and about 5500 Tibetan women. The permanent population embraces, besides Tibetans, settled families of Chinese (about 2000 persons), as well as people from Nepal, from Ladak, and a few from Bhotan and Mongolia. The Ladakis and some of the other foreigners are Mahommedans, and much of the trade is in their hands. Desideri (1716) speaks also of Armenians and even "Muscovites." The Chinese have a crowded burial-ground at Lhasa, tended carefully after their manner. The Nepalese (about 800) supply the mechanics and metal-workers. There are among them excellent gold- and silversmiths; and they make the elaborate gilded canopies crowning the temples. The chief industries are the weaving of a great variety of stuffs from the fine Tibetan wool; the making of earthenware and of the wooden porringers (varying immensely in elaboration and price) of which every Tibetan carries one about with him; also the making of certain fragrant sticks of incense much valued in China and elsewhere.

As Lhasa is not only the nucleus of a cluster of vast monastic establishments, which attract students and aspirants to the religious life from all parts of Tibet and Mongolia, but is also a great place of pilgrimage, the streets and public places swarm with visitors from every part of the Himalayan plateau,[1] and from all the steppes of Asia between Manchuria and the Balkhash Lake. Naturally a great traffic arises quite apart from the pilgrimage. The city thus swarms with crowds attracted by devotion and the love of gain, and presents a great diversity of language, costume and physiognomy; though, in regard to the last point, varieties of the broad face and narrow eye greatly predominate. Much of the retail trade of the place is in the hands of the women. The curious practice of the women in plastering their faces with a dark-coloured pigment is less common in Lhasa than in the provinces.

During December especially traders arrive from western China by way of Tachienlu bringing every variety of silk-stuffs, carpets, china-ware and tea; from Siningfu come silk, gold lace, Russian goods, carpets of a superior kind, semi-precious stones, horse furniture, horses and a very large breed of fat-tailed sheep; from eastern Tibet, musk in large quantities, which eventually finds its way to Europe through Nepal; from Bhotan and Sikkim, rice; from Sikkim also tobacco; besides a variety of Indian and European goods from Nepal and Darjeeling, and *charas* (resinous exudation of hemp) and saffron from Ladakh and Kashmir. The merchants leave Lhasa in March, before the setting in of the rains renders the rivers impassable.

The tea importation from China is considerable, for tea is an absolute necessary to the Tibetan. The tea is of various qualities, from the coarsest, used only for "buttered" tea (a sort of broth), to the fine quality drunk by the wealthy. This is pressed into bricks or cakes weighing about 5½ ℔, and often passes as currency. The quantity that pays duty at Tachienlu is about 10,000,000 ℔, besides some amount smuggled. No doubt a large part of this comes to Lhasa.

Lhasa Festivities.—The greatest of these is at the new year. This lasts fifteen days, and is a kind of lamaic carnival, in which masks and mummings, wherein the Tibetans take especial delight, play a great part. The celebration commences at midnight, with shouts and clangour of bells, gongs, chank-shells, drums and all the noisy repertory of Tibetan music; whilst friends exchange early visits and administer coarse sweetmeats and buttered tea. On the second day the Dalai Lama gives a grand banquet, at which the Chinese and native authorities are present, whilst in the public spaces and in front of the great convents all sorts of shows and jugglers' performances go on. Next day a regular Tibetan exhibition takes place. A long cable, twisted of leather thongs, is stretched from a high point in the battlements of Potala slanting down to the plain, where it is strongly moored. Two men slide from top to bottom of this huge hypothenuse, sometimes lying on the chest (which is protected by a breast-plate of strong leather), spreading their arms as if to swim, and descending with the rapidity of an arrow-flight. Occasionally fatal accidents occur in this performance, which is called "the dance of the gods"; but the survivors are rewarded by the court, and the Grand Lama himself is always a witness of it. This practice occurs more or less over the Himalayan plateau, and is known in the neighbourhood of the Ganges as *Barat*. It is employed as a kind of expiatory rite in cases of pestilence and the like. Exactly the same performance is described as having been exhibited in St Paul's Churchyard before King Edward VI., and again before Philip of Spain, as well as, about 1750, at Hertford and other places in England (see Strutt's *Sports*, &c., 2nd ed., p. 198).

The most remarkable celebration of the new year's festivities is the great jubilee of the *Monlam* (*sMon-lam*, "prayer"), instituted by Tsongkhapa himself in 1408. Lamas from all parts of Tibet, but chiefly from the great convents in the neighbourhood, flock to Lhasa, and every road leading thither is thronged with troops of monks on foot or horseback, on yaks or donkeys, carrying with them their breviaries and their cooking-pots. Those who cannot find lodging bivouac in the streets and squares, or pitch their little black tents in the plain. The festival lasts six days, during which there reigns a kind of saturnalia. Unspeakable confusion and disorder reign, while gangs of lamas parade the streets, shouting, singing and coming to blows. The object of this gathering is, however, supposed to be devotional. Vast processions take place, with mystic offerings and lama-music, to the Jokhang and Moru convents; the Grand Lama himself assists at the festival, and from an elevated throne beside the Jokhang receives the offerings of the multitude and bestows his benediction.

On the 15th of the first month multitudes of torches are kept ablaze, which lighten up the city to a great distance, whilst the interior of the Jokhang is illuminated throughout the night by innumerable lanterns shedding light on coloured figures in bas-relief, framed in arabesques of animals, birds and flowers, and representing the history of Buddha and other subjects, all modelled in butter. The figures are executed on a large scale, and, as described by Huc, who witnessed the festival at Kunbum on the frontier of China, with extraordinary truth and skill. These singular works of art occupy some months in preparation, and on the morrow are thrown away. On other days horse-races take place from Sera to Potala, and foot-races from Potala to the city. On the 27th of the month the holy *Dorjē* is carried in solemn procession from Sera to the Jokhang, and to the presence of the lama at Potala.

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[1] Among articles sold in the Lhasa bazaars are fossil bones, called by the people "lightning bones," and believed to have healing virtues.

Of other great annual feasts, one, in the fourth month, is assigned to the conception of Sakya, but appears to connect itself with the old nature-feast of the entering of spring, and to be more or less identical with the *Hūlī* of India. A second, the consecration of the waters, in September–October, appears, on the confines of India, to be associated with the Dasehra.

On the 30th day of the second month there takes place a strange ceremony, akin to that of the scapegoat (which is not unknown in India). It is called the driving out of the demon. A man is hired to perform the part of demon (or victim rather), a part which sometimes ends fatally. He is fantastically dressed, his face mottled with white and black, and is then brought forth from the Jokhang to engage in quasi-theological controversy with one who represents the Grand Lama. This ends in their throwing dice against each other (as it were for the weal or woe of Lhasa). If the demon were to win the omen would be appalling; so this is effectually barred by false dice. The victim is then marched outside the city, followed by the troops and by the whole populace, hooting, shouting and firing volleys after him. Once he is driven off, the people return, and he is carried off to the Samyé convent. Should he die shortly after, this is auspicious; if not, he is kept in ward at Samyé for a twelvemonth.

Nain Singh, whose habitual accuracy is attested by many facts, mentions a strange practice of comparatively recent origin, according to which the civil power in the city is put up to auction for the first twenty-three days of the new year. The purchaser, who must be a member of the Debung monastery, and is termed the *Jalno*, is a kind of lord of misrule, who exercises arbitrary authority during that time for his own benefit, levying taxes and capricious fines upon the citizens.

History.—The seat of the princes whose family raised Tibet to a position among the powers of Asia was originally on the Yarlung river, in the extreme east of the region now occupied by Tibetan tribes. It was transplanted to Lhasa in the 7th century by the king Srong-tsan-gampo, conqueror, civilizer and proselytizer, the founder of Buddhism in Tibet, the introducer of the Indian alphabet. On the three-peaked crag now occupied by the palace-monastery of the Grand Lama this king is said to have established his fortress, while he founded in the plain below temples to receive the sacred images, brought respectively from Nepal and from China by the brides to whom his own conversion is attributed.

Tibet endured as a conquering power some two centuries, and the more famous among the descendants of the founder added to the city. This-rong-de-tsan (who reigned 740–786) is said to have erected a great temple-palace of which the basement followed the Tibetan style, the middle storey the Chinese, and the upper storey the Indian—a combination which would aptly symbolize the elements that have moulded the culture of Lhasa. His son, the last of the great orthodox kings, in the next century, is said to have summoned artists from Nepal and India, and among many splendid foundations to have erected a sanctuary (at Samyé) of vast height, which had nine storeys, the three lower of stone, the three middle of brick, the three uppermost of timber. With this king the glory of Tibet and of ancient Lhasa reached its zenith, and in 822, a monument recording his treaty on equal terms with the Great T'ang emperor of China was erected in the city. There followed dark days for Lhasa and the Buddhist church in the accession of this king's brother Lang-dharma, who has been called the Julian of the lamas. This king rejected the doctrine, persecuted and scattered its ministers, and threw down its temples, convents and images. It was more than a century before Buddhism recovered its hold and its convents were rehabilitated over Tibet. The country was then split into an infinity of petty states, many of them ruled from the convents by warlike ecclesiastics; but, though the old monarchy never recovered, Lhasa seems to have maintained some supremacy, and probably never lost its claim to be the chief city of that congeries of principalities, with a common faith and a common language, which was called Tibet.

The Arab geographers of the 10th century speak of Tibet, but without real knowledge, and none speaks of any city that we can identify with Lhasa. The first passage in any Western author in which such identification can be probably traced occurs in the narrative of Friar Odoric of Pordenone (*c.* 1330). This remarkable traveller's route from Europe to India, and thence by sea to China, can be traced satisfactorily, but of his journey homeward through Asia the indications are very fragmentary. He speaks, however, on this return journey of the realm of Tibet, which lay on the confines of India proper: "The folk of that country dwell in tents made of black felt. But the chief and royal city is all built with walls of black and white, and all its streets are very well paved. In this city no one shall dare to shed the blood of any, whether man or beast, for the reverence they bear a certain idol that is there worshipped. In that city dwelleth the *Abassi, i.e.* in their tongue the pope, who is the head of all the idolaters, and has the disposal of all their benefices such as they are after their manner."

We know that Kublai Khan had constituted a young prince of the Lama Church, Mati Dhwaja, as head of that body, and tributary ruler of Tibet, but besides this all is obscure for a century. This passage of Odoric shows that such authority continued under Kublai's descendants, and that some foreshadow of the position since occupied by the Dalai Lama already existed. But it was not till a century after Odoric that the strange heredity of the dynasty of the Dalai Lamas of Lhasa actually began. In the first two centuries of its existence the residence of these pontiffs was rather at Debung or Sera than at Lhasa itself, though the latter was the centre of devout resort. A great event for Lhasa was the conversion, or reconversion, of the Mongols to Lamaism (*c.* 1577), which made the city the focus of sanctity and pilgrimage to so vast a tract of Asia. It was in the middle of the 17th century that Lhasa became the residence of the Dalai Lama. A native prince, known as the Tsangpo, with his seat at Shigatse, had made himself master of southern Tibet, and threatened to absorb the whole. The fifth Dalai Lama, Nagwang Lobzang, called in the aid of a Kalmuck prince, Gushi Khan, from the neighbourhood of the Koko-nor, who defeated and slew the Tsangpo and made over full dominion in Tibet to the lama (1641). The latter now first established his court and built his palace on the rock-site of the fortress of the ancient monarchy, which apparently had fallen into ruin, and to this he gave the name of Potala.

The founder of Potala died in 1681. He had appointed as "regent" or civil administrator (*Deisri*, or *Deba*) one supposed to be his own natural son. This remarkable personage, Sangye Gyamtso, of great ambition and accomplishment, still renowned in Tibet as the author of some of the most valued works of the native literature, concealed the death of his master, asserting that the latter had retired, in mystic meditation or trance, to the upper chambers of the palace. The government continued to be carried on in the lama's name by the regent, who leagued with Galdan Khan of Dzungaria against the Chinese (Manchu) power. It was not till the great emperor Kang-hi was marching on Tibet that the death of the lama, sixteen years before, was admitted. A solemn funeral was then performed, at which 108,000 lamas assisted, and a new incarnation was set up in the person of a youth of fifteen, Tsangs-yang Gyamtso. This young man was the scandal of the Lamaist Church in every kind of evil living and debauchery, so that he was deposed and assassinated in 1701. But it was under him and the regent Sangye Gyamtso that the Potala palace attained its present scale of grandeur, and that most of the other great buildings of Lhasa were extended and embellished.

For further history and bibliography, see TIBET. Consult also LAMAISM. (H. Y.; L. A. W.)

L'HÔPITAL (or L'HOSPITAL), **MICHEL DE** (*c.* 1505–1573), French statesman, was born near Aigueperse in Auvergne (now Puy-de-Dôme). His father, who was physician to the constable Charles of Bourbon, sent him to study at Toulouse, whence at the age of eighteen he was driven, a consequence of the evil fortunes of the family patron, to Padua, where he studied law and letters for about six years. On the completion of his studies he joined his father at Bologna, and afterwards, the constable having died, went to Rome in the suite of Charles V. For some time he held a position in the papal court at Rome, but about 1534 he returned to France, and becoming an advocate, his marriage, in 1537, procured for him the post of counsellor to the parlement of Paris. This office he held until 1547, when he was sent by Henry II. on a mission to Bologna, where the council of Trent was at that time sitting; after sixteen months of wearisome inactivity there, he was by his own desire recalled at the close of 1548. L'Hôpital now for some time held the position of chancellor to the king's sister, Margaret, duchess of Berry. In 1553, on the recommendation of the Cardinal of Lorraine, he was named master of the requests, and afterwards president of the chambre des comptes. In 1559 he accompanied the princess Margaret, now duchess of Savoy, to Nice, where, in the following year, tidings reached him that he had been chosen to succeed François Olivier (1487–1560) in the chancellorship of France.

One of his first acts after entering on the duties of his office was to cause the parlement of Paris to register the edict of Romorantin, of which he is sometimes, but erroneously, said to have been the author. Designed to protect heretics from the secret and summary methods of the Inquisition, it certainly had his sympathy and approval. In accordance with the consistent policy of inclusion and toleration by which the whole of his official life was characterized, he induced the council to call the assembly of notables, which met at Fontainebleau in August 1560 and agreed that the States General should be summoned, all proceedings against heretics being meanwhile suppressed, pending the reformation of the church by a general or national council. The States General met in December; the edict of Orleans (January 1561) followed, and finally, after the colloquy of Poissy, the edict of January 1562, the most liberal, except that of Nantes, ever obtained by the Protestants of France. Its terms, however, were not carried out, and during the war which was the inevitable result of the massacre of Vassy in March, L'Hôpital, whose dismissal had been for some time urged by the papal legate Hippolytus of Este, found it necessary to retire to his estate at Vignay, near Étampes, whence he did not return until after the pacification of Amboise (March 19, 1563). It was by his advice that Charles IX. was declared of age at Rouen in August 1563, a measure which really increased the power of Catherine de' Medici; and it was under his influence also that the royal council in 1564 refused to authorize the publication of the acts of the council of Trent, on account of their inconsistency with the Gallican liberties. In 1564–1566 he accompanied the young king on an extended tour through France; and in 1566 he was instrumental in the promulgation of an important edict for the reform of abuses in the administration of justice. The renewal of the religious war in September 1567, however, was at once a symptom and a cause of diminished influence to L'Hôpital, and in February 1568 he obtained his letters of discharge, which were registered by the parlement on the 11th of May, his titles, honours and emoluments being reserved to him during the remainder of his life. Henceforward he lived a life of unbroken seclusion at Vignay, his only subsequent public appearance being by means of a *mémoire* which he addressed to the king in 1570 under the title *Le But de la guerre et de la paix, ou discours du chancelier l'Hospital pour exhorter Charles IX. à donner la paix à ses sujets*. Though not exempt from considerable danger, he passed in safety through the troubles of St Bartholomew's eve. His death took place either at Vignay or at Bellébat on the 13th of March 1573.

After his death Pibrac, assisted by De Thou and Scévole de Sainte-Marthe, collected a volume of the *Poëmata* of L'Hôpital, and in 1585 his grandson published *Epistolarum seu Sermonum libri sex*. The complete *Œuvres de l'Hôpital* were published for the first time by P. J. S. Dufey (5 vols., Paris, 1824–1825). They include his "Harangues" and "Remonstrances," the *Epistles*, the *Mémoire* to Charles IX., a *Traité de la réformation de la justice*, and his will. See also A. F. Villemain, *Vie du Chancelier de l'Hôpital* (Paris, 1874); R. G. E. T. St-René Taillandier, *Le Chancelier de l'Hospital* (Paris, 1861); Dupré-Lasalle, *Michel de l'Hospital avant son élévation au poste de chancelier de France* (Paris, 1875–1899); Amphoux, *Michel de l'Hospital et la liberté de conscience au XVI^e siècle* (Paris, 1900); C. T. Atkinson, *Michel de l'Hospital* (London, 1900), containing an appendix on bibliography and sources; A. E. Shaw, *Michel de l'Hospital and his Policy* (London, 1905); and Eugène and Émile Haag, *La France protestante* (2nd ed., 1877 seq.).

LIAO-YANG, a city of China, formerly the chief town of the province of Liao-tung or Shêng-king (southern Manchuria), 35 m. S. of Mukden. It is situated in a rich cotton district in the fertile valley of the Liao, on the road between Niuchwang and Mukden, and carries on a considerable trade. The walls include an area about 2½ m. long by 2 m. broad, and there are fairly extensive suburbs; but a good deal even of the enclosed area is under cultivation. The population is estimated at 100,000. Liao-yang was one of the first objectives of the Japanese during the Russo-Japanese War, and its capture by them resulted in some of the fiercest fighting during the campaign, from the 24th of August to the 4th of September 1904.

LIAS, in geology, the lowermost group of Jurassic strata. Originally the name seems to have been written "Lyas"; it is most probably a provincial form of "layers," strata, employed by quarrymen in the west of England; it has been suggested, however, that the Fr. *liais*, Breton *leach*=a stone, Gaelic *leac*=a flat stone, may have given rise to the English "Lias." Liassic strata occupy an important position in England, where they crop out at Lyme Regis on the Dorsetshire coast and extend thence by Bath, along the western flank of the Cotswold Hills, forming Edge Hill and appearing at Banbury, Rugby, Melton, Grantham, Lincoln, to Redcar on the coast of Yorkshire. They occur also in Glamorganshire, Shropshire, near Carlisle, in Skye, Raasay (Pabba, Scalpa and Broadfoot beds), and elsewhere in the north of Scotland, and in the north-east of Ireland. East of the belt of outcrop indicated, the Lias is known to occur beneath the younger rocks for some distance farther east, but it is absent from beneath London, Reading, Ware, Harwich, Dover, and in the southern portion of the area in which these towns lie; the Liassic rocks are probably thinned out against a concealed ridge of more ancient rocks. The table on following page will serve to illustrate the general characters of the English Lias and the subdivisions adopted by the Geological Survey. By the side are shown the principal zonal ammonites, and, for comparison, the subdivisions preferred by Messrs Tate and Blake and by A. de Lapparent.

The important fact is clearly demonstrated in the table, that where the Lias is seen in contact with the Trias below or the Inferior Oolite above, there is, as a rule, a gradual passage from the Liassic formation, both downwards and upwards; hence Professor de Lapparent includes in his *Liassique System* the zone of *Ammonites opalinus* at the top, and the Rhaetic beds at the bottom (see OOLITE; RHAETIC). Owing to the transgression of the Liassic sea the strata rest in places upon older Palaeozoic rocks. The thickness of the Lias varies considerably; in Dorsetshire it is 900 ft., near Bath it has thinned to 280 ft., and beneath Oxford it is further reduced. In north Gloucestershire it is 1360 ft., Northampton 760 ft., Rutland 800 ft., Lincolnshire 950 ft., and in Yorkshire about 500 ft.

The Lias of England was laid down in conditions very similar to those which obtained at the same time in north France and north Germany, that is to say, on the floor of a shallow sea; but in the Alpine region limestones are developed upon a much greater scale. Many of the limestones are red and crystalline marbles such as the "ammonitico-rosso-inferiore" of the Apennines; a grey, laminated limestone is known as the "Fleckenmergel." The whitish "Hierlatzkalke," the Adnet beds and the "Grestener beds" in the eastern Alps and Balkan Mountains are important phases of Alpine Lias. The Grestener beds contain a considerable amount of coal. The Lias of Spain and the Pyrenees contains much dolomitic limestone. This formation is widely spread in western Europe; besides the localities already cited it occurs in Swabia, the Rhenish provinces, Alsace-Lorraine, Luxemburg, Ardennes, Normandy, Austria-Hungary, the Balkan States, Greece and Scania. It has not been found north of Kharkov in Russia, but it is present in the south and in the Caucasus, in Anatolia, Persia and the Himalayas. It appears on the eastern side of Japan, in Borneo, Timor, New Caledonia and New Zealand (Bastion beds); in Algeria, Tunisia and elsewhere in North Africa, and on the west coast of Madagascar. In South America it is found in the Bolivian Andes, in Chile and Argentina; it appears also on the Pacific coast of North America.

The economic products of the Lias are of considerable importance. In the Lower Lias of Lincolnshire and the Middle Lias of Oxfordshire, Northamptonshire, Lincolnshire, Leicestershire and Yorkshire the beds of ironstone are of great value. Most of these ores are limestones that have been converted into iron carbonate with some admixture of silicates; they weather near the surface into hydrated peroxide.

	S.W. England and Midlands.	Yorkshire.	Ammonite Zones.[1]	Divisions according to A. de Lapparent.[2]
Upper Lias.	Midford Sands (passage beds) Clays with Cement-stones Limestones and Clays	Alum shale Jet Rock Grey Shale	*Am. jurensis* ,, *communis* ,, *serpentinus* } U. ,, *annulatus*	(Including the *opalinus* zone of the Inferior Oolite.) Toarcien.
Middle Lias.	Marlstone and Sands (Rock Bed and Ironstones) Micaceous Clays and Sands	Ironstone Series Sandy Series	*Am. spinatus* ,, *margaritatus*	Charmouthien.
Lower Lias.	Clays with occasional bands of Limestone	Upper Series with Ironstone nodules	*Am. capricornus* ,, *Jamesoni* and ,, *armatus* } M.	
	Limestones and Clays	Lower Series with Sandy and Marly Beds	,, *oxynotus* ,, *Bucklandi* ,, *angulatus* ,, *planorbis* } L.	Sinémourien. Hettangien including "White Lias."
				Rhétien.

[1] The brackets indicate the divisions made by R. Tate and J. F. Blake.

[2] *Traité de géologie* (5th ed., Paris, 1906).

At Frodingham in Lincolnshire the oolitic iron ore reaches 30 ft. in thickness, of which 12 ft. are workable. In Gloucestershire the top beds of the Lower Lias and lower beds of the Middle division are the most ferruginous; the best ores near Woodstock and Banbury and between Market Harborough and Leicester are at the summit of the Middle Lias in the Marlstone or Rock bed. The ironstone of Fawler is sometimes known as Blenheim ore. The ores of the Cleveland district in Yorkshire have a great reputation; the main seam is 11 ft. thick at Eston, where it rests directly upon the Pecten Seam, the two together aggregating 15 ft. 6 in. Similar iron ores of this age are worked at Meurthe-et-Moselle, Villerupt, Marbache, Longuy, Champagneulles, &c. Some of the Liassic limestones are used as building stones, the more important ones being the Lower Lias Sutton stone of Glamorganshire and Middle Lias Hornton stone, the best of the Lias building stones, from Edge Hill. The limestones are often used for paving. The limestones of the Lower Lias are much used for the production of hydraulic cement and "Blue Lias" lime at Rugby, Barrow-on-Soar, Barnstone, Lyme Regis, Abertham and many other places. Roman cement has been made from the nodules in the Upper Lias of Yorkshire; alum is obtained from the same horizon. A considerable trade was formerly done in jet, the best quality being obtained from the "Serpentinus" beds, but "bastard" or soft jet is found in many of the other strata in the Yorkshire Lias. Both Lower and Upper Lias clays have been used in making bricks and tiles.

Fossils are abundant in the Lias; Lyme Regis, Shepton Mallet, Rugby, Robin Hood's Bay, Ilminster, Whitby and Golden Cap near Charmouth are well-known localities. The saurian reptiles, *Ichthyosaurus* and *Plesiosaurus*, are found in excellent preservation along with the Pterodactyl. Among the fishes are *Hybodus*, *Dapedius*, *Pholidophorus*, *Acrodus*. The crinoids, *Pentacrinus* and *Extracrinus* are locally abundant. Insect remains are very abundant in certain beds. Many ammonites occur in this formation in addition to the forms used as zonal indexes mentioned in the table. *Lima gigantea*, *Posidonomya Bronni*, *Inoceramus dubius*, *Gryphaea cymbium* and *G. arcuata* are common pelecypods. *Amberleya capitanea*, *Pleurotomaria anglica* are Lias gasteropods. *Leptaena*, *Spiriferina*, *Terebratella* and *Rhynchonella tetrahedra* and *R. variabilis* are among the brachiopods.

Certain dark limestones with regular bedding which occur in the Carboniferous System are sometimes called "Black Lias" by quarrymen.

See "The Lias of England and Wales" (Yorkshire excepted), by H. B. Woodward, *Geol. Survey Memoir* (London, 1893); and, for Yorkshire, "The Jurassic Rocks of Britain," vol. i., "Yorkshire," by C. Fox-Strangways, *Geol. Survey Memoir*. See also JURASSIC. (J. A. H.)

LIBANIUS (A.D. 314–393), Greek sophist and rhetorician, was born at Antioch, the capital of Syria. He studied at Athens, and spent most of his earlier manhood in Constantinople and Nicomedia. His private classes at Constantinople were much more popular than those of the public professors, who had him expelled in 346 (or earlier) on the charge of studying magic. He removed his school to Nicomedia, where he remained five years. After another attempt to settle in Constantinople, he finally retired to Antioch (354). Though a pagan, he enjoyed the favour of the Christian emperors. When Julian, his special patron, restored paganism as the state religion, Libanius showed no intolerance. Among his pupils he numbered John Chrysostom, Basil (bishop of Caesarea) and Ammianus Marcellinus. His works, consisting chiefly of orations (including his autobiography), declamations on set topics, letters, life of Demosthenes, and arguments to all his orations are voluminous. He devoted much time to the classical Greek writers, and had a thorough contempt for Rome and all things Roman. His speeches and letters throw considerable light on the political and literary history of the age. The letters number 1607 in the Greek original; with these were formerly included some 400 in Latin, purporting to be a translation, but now proved to be a forgery by the Italian humanist F. Zambeccari (15th century).

Editions: Orations and declamations, J. J. Reiske (1791–1797); letters, J. C. Wolf (1738); two additional declamations, R. Förster (*Hermes*, ix. 22, xii. 217), who in 1903 began the publication of a complete edition; *Apologia Socratis*, Y. H. Rogge (1891). See also E. Monnier, *Histoire de Libanius* (1866); L. Petit, *Essai sur la vie et la correspondance du sophiste Libanius* (1866); G. R. Sievers, *Das Leben des Libanius* (1868); R. Förster, *F. Zambeccari und die Briefe des Libanius* (1878). Some letters from the emperor Julian to Libanius will be found in R. Hercher, *Epistolographi Graeci* (1873). Sixteen letters to Julian have been translated by J. Duncombe (*The Works of the Emperor Julian*, i. 303-332, 3rd ed., London, 1798). The oration on the emperor Julian is translated by C. W. King (in Bohn's "Classical Library," London, 1888), and that in Defence of the Temples of the Heathen by Dr Lardner (in a volume of translations by Thomas Taylor, from Celsus and others, 1830). See further J. E. Sandys, *Hist. of Classical Scholarship*, i. (1906), and A. Harrent, *Les Écoles d' Antioche* (1898).

LIBATION (Lat. *libatio*, from *libare*, to take a portion of something, to taste, hence to pour out as an offering to a deity, &c.; cf. Gr. λείβειν), a drink offering, the pouring out of a small quantity of wine, milk or other liquid as a ceremonial act. Such an act was performed in honour of the dead (Gr. χοαί, Lat. *profusiones*), in making of treaties (Gr. σπονδή, σπένδειν = *libare*, whence σπονδαί, treaty), and particularly in honour of the gods (Gr. λοιβή, Lat. *libatio*, *libamentum*, *libamen*). Such libations to the gods were made as part of the daily ritual of domestic worship, or at banquets or feasts to the Lares, or to special deities, as by the Greeks to Hermes, the god of sleep, when going to rest.

LIBAU (Lettish, *Leepaya*), a seaport of Russia, in the government of Courland, 145 m. by rail S.W. of Riga, at the northern extremity of a narrow sandy peninsula which separates Lake Libau (12 m. long and 2 m. wide) from the Baltic Sea. Its population has more than doubled since 1881 (30,000), being 64,505 in 1897. The town is well built of stone, with good gardens, and has a naval cathedral (1903). The harbour was

2 m. S. of the town until a canal was dug through the peninsula in 1697; it is now deepened to 23 ft., and is mostly free from ice throughout the year. Since being brought, in 1872, into railway connexion with Moscow, Orel and Kharkov, Libau has become an important port. New Libau possesses large factories for colours, explosives, machinery belts, sails and ropes, tobacco, furniture, matches, as well as iron works, agricultural machinery works, tin-plate works, soap works, saw-mills, breweries, oil-mills, cork and linoleum factories and flour-mills. The exports reach the annual value of £3,250,000 to £5,500,000, oats being the chief export, with flour, wheat, rye, butter, eggs, spirits, flax, linseed, oilcake, pork, timber, horses and petroleum. The imports average £1,500,000 to £2,000,000 annually. Shipbuilding, including steamers for open-sea navigation, is on the increase. North of the commercial harbour and enclosing it the Russian government made (1893–1906) a very extensive fortified naval port, protected by moles and breakwaters. Libau is visited for sea-bathing in summer.

The port of Libau, *Lyra portus*, is mentioned as early as 1263; it then belonged to the Livonian Order or Brothers of the Sword. In 1418 it was burnt by the Lithuanians, and in 1560 it was mortgaged by the grandmaster of the Teutonic Order, to which it had passed, to the Prussian duke Albert. In 1701 it was captured by Charles XII. of Sweden, and was annexed to Russia in 1795.

See Wegner, *Geschichte der Stadt Libau* (Libau, 1898).

LIBEL and **SLANDER**, the terms employed in English law to denote injurious attacks upon a man's reputation or character by words written or spoken, or by equivalent signs. In most early systems of law verbal injuries are treated as a criminal or quasi-criminal offence, the essence of the injury lying not in pecuniary loss, which may be compensated by damages, but in the personal insult which must be atoned for—a vindictive penalty coming in the place of personal revenge. By the law of the XII. Tables, the composition of scurrilous songs and gross noisy public affronts were punished by death. Minor offences of the same class seem to have found their place under the general conception of *injuria*, which included ultimately every form of direct personal aggression which involved contumely or insult. In the later Roman jurisprudence, which has, on this point, exercised considerable influence over modern systems of law, verbal injuries are dealt with in the edict under two heads. The first comprehended defamatory and injurious statements made in a public manner (*convicium contra bonos mores*). In this case the essence of the offence lay in the unwarrantable public proclamation. In such a case the truth of the statements was no justification for the unnecessarily public and insulting manner in which they had been made. The second head included defamatory statements made in private, and in this case the offence lay in the imputation itself, not in the manner of its publication. The truth was therefore a sufficient defence, for no man had a right to demand legal protection for a false reputation. Even belief in the truth was enough, because it took away the intention which was essential to the notion of *injuria*. The law thus aimed at giving sufficient scope for the discussion of a man's character, while it protected him from needless insult and pain. The remedy for verbal injuries was long confined to a civil action for a money penalty, which was estimated according to the gravity of the case, and which, although vindictive in its character, doubtless included practically the element of compensation. But a new remedy was introduced with the extension of the criminal law, under which many kinds of defamation were punished with great severity. At the same time increased importance attached to the publication of defamatory books and writings, the *libri* or *libelli famosi*, from which we derive our modern use of the word libel; and under the later emperors the latter term came to be specially applied to anonymous accusations or pasquils, the dissemination of which was regarded as peculiarly dangerous, and visited with very severe punishment, whether the matter contained in them were true or false.

The earlier history of the English law of defamation is somewhat obscure. Civil actions for damages seem to have been tolerably frequent so far back as the reign of Edward I. There was no distinction drawn between words written and spoken. When no pecuniary penalty was involved such cases fell within the old jurisdiction of the ecclesiastical courts, which was only finally abolished in the 19th century. It seems, to say the least, uncertain whether any generally applicable criminal process was in use. The crime of *scandalum magnatum*, spreading false reports about the magnates of the realm, was established by statutes, but the first fully reported case in which libel is affirmed generally to be punishable at common law is one tried in the star chamber in the reign of James I. In that case no English authorities are cited except a previous case of the same nature before the same tribunal; the law and terminology appear to be taken directly from Roman sources, with the insertion that libels tended to a breach of the peace; and it seems probable that that not very scrupulous tribunal had simply found it convenient to adopt the very stringent Roman provisions regarding the *libelli famosi* without paying any regard to the Roman limitations. From that time we find both the criminal and civil remedies in full operation, and the law with regard to each at the present time may now be considered.

Civil Law.—The first important distinction encountered is that between slander and libel, between the oral and written promulgation of defamatory statements. In the former case the remedy is limited. The law will not take notice of every kind of abusive or defamatory language. It must be shown either that the plaintiff has suffered actual damage as a direct consequence of the slander, or that the imputation is of such a nature that we are entitled to infer damage as a necessary consequence. The special damage on which an action is founded for slanderous words must be of the nature of pecuniary loss. Loss of reputation or of position in society, or even illness, however clearly it may be traced to the slander, is insufficient. When we cannot prove special damage, the action for slander is only allowed upon certain strictly defined grounds. These are the imputation of a crime or misdemeanour which is punishable corporeally, *e.g.* by imprisonment; the imputation of a contagious or infectious disease; statements which tend to the disherison of an apparent heir (other cases of slander of title when the party is in possession requiring the allegation of special damage); the accusing a woman of unchastity (Slander of Women Act 1891); and, lastly, slanders directed against a man's professional or business character, which tend directly to prejudice him in his trade, profession, or means of livelihood. In the latter case the words must either be directly aimed at a man in his business or official character, or they must be such as necessarily to imply unfitness for his particular office or occupation. Thus words which merely reflect generally upon the moral character of a tradesman or professional man are not actionable, but they are actionable if directed against his dealings in the course of his trade or profession. But, in the case of a merchant or trader, an allegation which affects his credit generally is enough, and it has been held that statements are actionable which affect the ability or moral characters of persons who hold offices, or exercise occupation which require a high degree of ability, or infer peculiar confidence. In every case the plaintiff must have been at the time of the slander in the actual exercise of the occupation or enjoyment of the office with reference to which the slander is supposed to have affected him.

The action for libel is not restricted in the same way as that for slander. Originally there appears to have been no essential distinction between them, but the establishment of libel as a criminal offence had probably considerable influence, and it soon became settled that written defamatory statements, or pictures and other signs which bore a defamatory meaning, implied greater malice and deliberation, and were generally fraught with greater injury than those made by word of mouth. The result has been that the action for libel is not limited to special grounds, or by the necessity of proving special damage. It may be founded on any statement which disparages a man's private or professional character, or which tends to hold him up to hatred, contempt or ridicule. In one of the leading cases, for example, the plaintiff obtained damages because it was said of him that he was a hypocrite, and had used the cloak of religion for unworthy purposes. In another case a charge of ingratitude was held sufficient. In civil cases the libel must be published by being brought by the defendant under the notice of a third party; it has been held that it is sufficient if this has been done by gross carelessness, without deliberate intention to publish. Every person is liable to an action who is concerned in the publication of a libel, whether he be the author, printer or publisher; and the extent and manner of the publication, although not affecting the ground of the action, is a material element in estimating the damages.

It is not necessary that the defamatory character of the words or writing complained of should be apparent on their face. They may be couched in the form of an insinuation, or may derive their sting from a reference to circumstances understood by the persons to whom they are addressed. In such a case the plaintiff must make the injurious sense clear by an averment called an innuendo, and it is for the jury to say whether the words bore the meaning thus ascribed to them.

In all civil actions for slander and libel the falsity of the injurious statements is an essential element, so that the defendant is always entitled to justify his statements by their truth; but when the statements are in themselves defamatory, their falsity is presumed, and the burden of proving their truth is laid upon the defendant. There are however a large class of false defamatory statements, commonly called privileged, which are not actionable on account of the particular circumstances in which they are made. The general theory of law with regard to these cases is this. It is assumed that in every case of defamation intention is a necessary element; but in the ordinary case, when a statement is false and defamatory, the law presumes that it has been made or published with an evil intent, and will not allow this presumption to be rebutted by evidence or submitted as matter of fact to a jury. But there are certain circumstances in which the natural presumption is quite the other way. There are certain natural and proper occasions on which statements may be made which are in themselves defamatory, and which may be false, but which naturally suggest that the statements may have been made from a perfectly proper motive and with entire belief in their truth. In the cases of this kind which are recognized by law, the presumption is reversed. It lies with the plaintiff to show that the defendant was actuated by what is called *express malice*, by an intention to do harm, and in this case the question is not one of legal inference for the court, but a matter of fact to be decided by the jury. Although, however, the theory of the law seems to rest entirely upon natural presumption of intention, it is pretty clear that in determining the limits of privilege the courts have been almost wholly guided by considerations of public or general expediency.

In some cases the privilege is absolute, so that we cannot have an action for defamation even although we prove express malice. Thus no action of this kind can be maintained for statements made in judicial proceedings if they are in any sense relevant to the matter in hand. In the same way no statements or publications are actionable which are made in the ordinary course of parliamentary proceedings. Papers published under the authority of parliament are protected by a special act, 3 & 4 Vict. c. 9, 1840, which was passed after a decree of the law courts adverse to the privilege claimed. The reports of judicial and parliamentary proceedings stand in a somewhat different position, which has only been attained after a long and interesting conflict. The general rule now is that all reports of parliamentary or judicial proceedings are privileged in so far as they are honest and impartial. Even *ex parte* proceedings, in so far as they take place in public, now fall within the same rule. But if the report is garbled, or if part of it only is published, the party who is injured in consequence is entitled to maintain an action, and to have the question of malice submitted to a jury.

Both absolute and qualified privilege are given to newspaper reports under certain conditions by the Law of Libel Amendment Act 1888. The reports must, however, be published in a newspaper as defined in the Newspaper Libel and Registration Act 1881. Under this act a newspaper must be published "at intervals not exceeding twenty-six days."

By s. 3 of the act of 1888 fair and accurate reports of judicial proceedings are absolutely privileged provided that the report is published contemporaneously with the proceedings and no blasphemous or indecent matter is contained therein. By s. 4 a limited privilege is given to fair and accurate reports (1) of the proceedings of a *bona fide* public meeting lawfully held for a lawful purpose and for the furtherance and discussion of any matter of public concern, even when the admission thereto is restricted; (2) of any meeting, open either to the public or to a reporter, of a vestry, town council, school board, board of guardians, board of local authority, formed or constituted under the provisions of any act of parliament, or of any committee appointed by any of these bodies; or of any meeting of any commissioners authorized to act by letters patent, act of parliament, warrant under royal sign manual, or other lawful warrant or authority, select committees of either House of parliament, justices of the peace in quarter sessions assembled for administrative or deliberative purposes; (3) of the publication of any notice or report issued for the information of the public by any government office or department, officer of state, commissioner of police or chief constable, and published at their request. But the privilege given in s. 4 does not authorize the publication of any blasphemous or indecent matter; nor is the protection available as a defence if it be proved that the reports or notices were published maliciously, in the legal sense of the word, or the defendant has been requested to insert in the newspaper in which the report was issued a reasonable letter or statement by way of contradiction or explanation, and has refused or neglected to do so. Moreover, nothing in s. 4 is to interfere with any privilege then existing, or to protect the publication of any matter not of public concern, or in cases where publication is not for the public benefit. Consequently no criminal prosecution should be commenced where the interests of the public are not affected. By the Law of Libel Amendment Act 1888, s. 8, no criminal prosecution for libel is to be commenced against any newspaper proprietor, publisher or editor unless the order of a judge at chambers has been first obtained. This protection does not cover the actual writer of the alleged libel.

In private life a large number of statements are privileged so long as they remain matters of strictly private communication. It is difficult to define the limits of private privilege without extensive reference to concrete cases; but generally it may be said that it includes all communications made in performance of a duty not merely legal but moral or social, answers to *bona fide* inquiries, communications made by persons in confidential relations regarding matters in which one or both are interested, and even statements made within proper limits by persons in the *bona fide* prosecution of their own interest. Common examples of this kind of privilege are to be found in answer to inquiries as to the character of servants or the solvency of a trader, warnings to a friend, communications between persons who are jointly interested in some matters of business. But in every case care must be taken not to exceed the limits of publication required by the occasion, or otherwise the privilege is lost. Thus defamatory statements may be privileged when made to a meeting of shareholders, but not when published to others who have no immediate concern in the business.

In a few instances in which an action cannot be maintained even by the averment of malice, the plaintiff may maintain an action by averring not only malice but also want of reasonable and probable cause. The most common instances of this kind are malicious charges made in the ordinary course of justice and malicious prosecutions. In such cases it would be contrary to public policy to punish or prevent every charge which was made from a purely malicious motive, but there is no reason for protecting accusations which are not only malicious, but destitute of all reasonable probability.

Criminal Law.—Publications which are blasphemous, immoral or seditious are frequently termed libels, and are punishable both at common law and by various statutes. The matter, however, which constitutes the offence in these publications lies beyond our present scope. Libels upon individuals may be prosecuted by criminal information or indictment, but there can be no criminal prosecution for slander. So far as concerns the definition of libel, and its limitation by the necessity of proving in certain cases express malice, there is no substantial difference between the rules which apply to criminal prosecutions and to civil actions, with the one important exception (now considerably modified) that the falsity of a libel is not in criminal law an essential element of the offence. If the matter alleged were in itself defamatory, the court would not permit inquiry into its truth. The sweeping application of this rule seems chiefly due to the indiscriminate use, in earlier cases, of a rule in Roman law which was only applicable to certain modes of publication, but has been supported by various reasons of general policy, and especially by the view that one main reason for punishing a libel was its tendency to provoke a breach of the peace.

An important dispute about the powers of the jury in cases of libel arose during the 19th century in connexion with some well-known trials for seditious libels. The point is familiar to readers of Macaulay in connexion with the trial of the seven bishops, but the cases in which it was brought most prominently forward, and which led to its final settlement, were those against Woodfall (the printer of *Junius*), Wilkes and others, and especially the case against Shipley, the dean of St Asaph (21 St. Tr. 925), in which the question was fought by Lord Erskine with extraordinary energy and ability. The controversy turned upon the question whether the jury were to be strictly confined to matters of fact which required to be proved by evidence, or whether in every case they were entitled to form their own opinion upon the libellous character of the publication and the intention of the author. The jury, if they pleased, had it in their power to return a general verdict of guilty or not guilty, but both in theory and practice they were subject in law to the directions of the court, and had to be informed by it as to what they were to take into consideration in determining upon their verdict. There is no difficulty about the general application of this principle in criminal trials. If the crime is one which is inferred by law from certain facts, the jury are only concerned with these facts, and must accept the construction put upon them by law. Applying these principles to the case of libel, juries were directed that it was for the court to determine whether the publication fell within the definition of libel, and whether the case was one in which malice was to be inferred by construction of law. If the case were one in which malice was inferred by law, the only facts left to the jury were the fact of publication and the meaning averred by innuendoes; they could not go into the question of intention, unless the case were one of privilege, in which express malice had to be proved. In general principle, therefore, the decisions of the court were in accordance with the ordinary principles of criminal law. But there were undoubtedly some peculiarities in the case of libel. The sense of words, the inferences to be drawn from them, and the effect which they produce are not so easily defined as gross matters of fact. They seem to belong to those cases in which the impression made upon a jury is more to be trusted than the decision of a judge. Further, owing to the mode of procedure, the defendant was often punished before the question of law was determined. But, nevertheless, the question would scarcely have been raised had the libels related merely to private matters. The real ground of dispute was the liberty to be accorded to political discussion. Had the judges taken as wide a view of privilege in discussing matters of public interest as they do now, the question could scarcely have arisen; for Erskine's whole contention really amounted to this, that the jury were entitled to take into consideration the good or bad intent of the authors, which is precisely the question which would now be put before them in any matter which concerned the public. But at that time the notion of a special privilege attaching to political discussion had scarcely arisen, or was confined within very narrow limits, and the cause of free political discussion seemed to be more safely entrusted to juries than to courts. The question was finally settled by the Libel Act 1792, by which the jury were entitled to give a general verdict on the whole matter put in issue.

Scots Law.—In Scots law there were originally three remedies for defamation. It might be prosecuted by or with the concurrence of the lord advocate before the court of justiciary; or, secondly, a criminal remedy might be obtained in the commissary (ecclesiastical) courts, which originally dealt with the defender by public retractation or penance, but subsequently made use of fines payable to their own procurator or to the party injured, these latter being regarded as solatium to his feelings; or, lastly, an action of damages was competent before the court of session, which was strictly civil in its character and aimed at the reparation of patrimonial loss. The first remedy has fallen into disuse; the second and third (the commissary courts being now abolished) are represented by the present action for damages or solatium. Originally the action before the court of session was strictly for damages—founded, not upon the *animus injuriandi*, but upon culpa, and could be defended by proving the truth of the statements. But in time the court of session began to assume the original jurisdiction of the commissary courts, and entertained actions for solatium in which the *animus injuriandi* was a necessary element, and to which, as in Roman law, the truth was not necessarily a defence. Ultimately the two actions got very much confused. We find continual disputes as to the necessity for the *animus injuriandi* and the applicability of the plea of *veritas convicii*, which arose from the fact that the courts were not always conscious that they were dealing with two actions, to one of which these notions were applicable, and to the other not. On the introduction of the jury court, presided over by an English lawyer, it was quite natural that he, finding no very clear distinction maintained between damage and solatium, applied the English plea of truth as a justification to every case, and retained the *animus injuriandi* both in ordinary cases and cases of privilege in the same shape as the English conception of malice. The leading and almost only differences between the English and Scots law now are that the latter makes no essential distinction between oral and written defamation, that it practically gives an action for every case of defamation, oral or written, upon which in England a civil action might be maintained for libel, and that it possesses no criminal remedy. In consequence of the latter defect and the indiscriminate application of the plea of veritas to every case both of damages and solatium, there appears to be no remedy in Scotland even for the widest and most needless publication of offensive statements if only they are true.

American Law.—American law scarcely if at all differs from that of England. In so far indeed as the common law is concerned, they may be said to be substantially identical. The principal statutes which have altered the English criminal law are represented by equivalent legislation in most American states.

See generally W. B. Odgers, *Libel and Slander*; Fraser, *Law of Libel and Slander*.

LIBELLATICI, the name given to a class of persons who, during the persecution of Decius, A.D. 250, evaded the consequences of their Christian belief by procuring documents (*libelli*) which certified that they had satisfied the authorities of their submission to the edict requiring them to offer incense or sacrifice to the imperial gods. As thirty-eight years had elapsed since the last period of persecution, the churches had become in many ways lax, and the number of those who failed to hold out under the persecution was very great. The procedure of the courts which had cognizance of the matter was, however, by no means strict, and the judges and subordinate officials were often not ill-disposed towards Christians, so that evasion was fairly easy. Many of those who could not hold out were able to secure certificates which gave them immunity from punishment without actually renouncing the faith, just as "parliamentary certificates" of conformity used to be given in England without any pretext of fact. It is to the persons who received such certificates that the name *libellatici* belonged (those who actually fulfilled the edict being called *thurificati* or *sacrificati*). To calculate their number would be impossible, but we know from the writings of Cyprian, Dionysius of Alexandria and other contemporaries, that they were a numerous class, and that they were to be found in Italy, in Egypt and in Africa, and among both clergy and laity. Archbishop Benson is probably right in thinking that "there was no systematic and regular procedure in the matter," and that the *libelli* may have been of very different kinds. They must, however, as a general rule, have consisted of a certificate *from the authorities* to the effect that the accused person had satisfied them. [The name *libellus* has also been applied to another kind of document —to the letters given by confessors, or by those who were about to suffer martyrdom, to persons who had fallen, to be used to secure forgiveness for them from the authorities of the Church. With such *libelli* we are not here concerned.] The subject has acquired a fresh interest from the fact that two of these actual *libelli* have been recovered, in 1893 and 1894 respectively, both from Egypt; one is now in the Brugsch Pasha collection in the Berlin Museum; the other is in the collection of papyri belonging to the Archduke Rainer. The former is on a papyrus leaf about

8 by 3 in., the latter on mere fragments of papyrus which have been pieced together. The former was first deciphered and described by Dr Fritz Krebs, the latter by Dr K. Wessely: both are given and commented upon by Dr Benson. There is a remarkable similarity between them: in each the form is that N. "was ever constant in sacrificing to the gods"; and that he now, in the presence of the commissioners of the sacrifices (*οἱ ἡρημένοι τῶν θυσῶν*), has both sacrificed and drunk [*or* has poured libations], and has tasted of the victims, in witness whereof he begs them to sign this certificate. Then follows the signature, with attestations. The former of the two is dated, and the date must fall in the year 250. It is impossible to prove that either of the documents actually refers to Christians: they may have been given to pagans who had been accused and had cleared themselves, or to former Christians who had apostatized. But no doubt *libelli* in this same form were delivered, in Egypt at least, to Christians who secured immunity without actual apostasy; and the form in Italy and Africa probably did not differ widely from this. The practice gave rise to complicated problems of ecclesiastical discipline, which are reflected in the correspondence of Cyprian and especially in the Novatian controversy.

See E. W. Benson, *Cyprian* (London, 1897); *Theol. Literaturzeitung*, 20th of January and 17th of March 1894. (W. E. Co.)

LIBER and **LIBERA,** in Roman mythology, deities, male and female, identified with the Greek Dionysus and Persephone. In honour of Liber (also called Liber Pater and Bacchus) two festivals were celebrated. In the country feast of the vintage, held at the time of the gathering of the grapes, and the city festival of March 17th called *Liberalia* (Ovid, *Fasti*, iii. 711) we find purely Italian ceremonial unaffected by Greek religion. The country festival was a great merry-making, where the first-fruits of the new must were offered to the gods. It was characterized by the grossest symbolism, in honour of the fertility of nature. In the city festival, growing civilization had impressed a new character on the primitive religion, and connected it with the framework of society. At this time the youths laid aside the boy's *toga praetexta* and assumed the man's *toga libera* or *virilis* (*Fasti*, iii. 771). Cakes of meal, honey and oil were offered to the two deities at this festival. Liber was originally an old Italian god of the productivity of nature, especially of the vine. His name indicated the free, unrestrained character of his worship. When, at an early period, the Hellenic religion of Demeter spread to Rome, Liber and Libera were identified with Dionysus and Persephone, and associated with another Italian goddess Ceres, who was identified with Demeter. By order of the Sibylline books, a temple was built to these three deities near the Circus Flaminius; the whole cultus was borrowed from the Greeks, down even to the terminology, and priestesses were brought from the Greek cities.

LIBERAL PARTY, in Great Britain, the name given to and accepted by the successors of the old Whig party (see WHIG AND TORY), representing the political party opposed to Toryism or Conservatism, and claiming to be the originators and champions of political reform and progressive legislation. The term came into general use definitely as the name of one of the two great parties in the state when Mr Gladstone became its leader, but before this it had already become current coin, as a political appellation, through a natural association with the use of such phrases as "liberal ideas," in the sense of "favourable to change," or "in support of political freedom and democracy." In this respect it was the outcome of the French Revolution, and in the early years of the 19th century the term was used in a French form; thus Southey in 1816 wrote about the "British *Liberales*." But the Reform Act and the work of Bentham and Mill resulted in the crystallization of the term. In Leigh Hunt's autobiography (1850) we read of "newer and more thorough-going Whigs . . . known by the name of Radicals . . . since called Liberals"; and J. S. Mill in 1865 wrote (from his own Liberal point of view), "A Liberal is he who looks forward for his principles of government; a Tory looks backward." The gradual adoption of the term for one of the great parties, superseding "Whig," was helped by the transition period of "Liberal Conservatism," describing the position of the later Peelites; and Mr Gladstone's own career is the best instance of its changing signification; moreover the adjective "liberal" came meanwhile into common use in other spheres than that of parliamentary politics, *e.g.* in religion, as meaning "intellectually advanced" and free from the trammels of tradition. Broadly speaking, the Liberal party stands for progressive legislation in accordance with freedom of social development and advanced ethical ideas. It claims to represent government by the people, by means of trust in the people, in a sense which denies genuine popular sympathy to its opponents. Being largely composed of dissenters, it has identified itself with opposition to the vested interests of the Church of England; and, being apt to be thwarted by the House of Lords, with attempts to override the veto of that house. Its old watchword, "Peace, retrenchment and reform," indicated its tendency to avoidance of a "spirited" foreign policy, and to parsimony in expenditure. But throughout its career the Liberal party has always been pushed forward by its extreme Radical wing, and economy in the spending of public money is no longer cherished by those who chiefly represent the non-taxpaying classes. The party organization lends itself to the influence of new forces. In 1861 a central organization was started in the "Liberal Registration Association," composed "of gentlemen of known Liberal opinions"; and a number of "Liberal Associations" soon rose throughout the country. Of these, that at Birmingham became, under Mr J. Chamberlain and his active supporter Mr Schnadhorst, particularly active in the 'seventies; and it was due to Mr Schnadhorst that in 1877 a conference was held at Birmingham which resulted in the formation of the "National Federation of Liberal Associations," or "National Liberal Federation," representing a system of organization which was dubbed by Lord Beaconsfield "the Caucus." The Birmingham Caucus and the Central Liberal Association thus coexisted, the first as an independent democratic institution, the second as the official body representing the whips of the party, the first more advanced and "Radical," the second inclined to Whiggishness. Friction naturally resulted, but the 1880 elections confirmed the success of the Caucus and consolidated its power. And in spite of the Home Rule crisis in 1886, resulting in the splitting off of the Liberal Unionists—"dissentient Liberals," as Mr Gladstone called them—from the Liberal party, the organization of the National Liberal Federation remained, in the dark days of the party, its main support. Its headquarters were, however, removed to London, and under Mr Schnadhorst it was practically amalgamated with the old Central Association.

It is impossible here to write in detail the later history of the Liberal party, but the salient facts will be found in such articles as those on Mr Gladstone, Mr J. Chamberlain, Lord Rosebery, Sir Henry Campbell-Bannerman, Mr H. H. Asquith and Mr David Lloyd George.

See, apart from general histories of the period, M. Ostrogorski's *Democracy and the Organization of Political Parties* (Eng. trans. 1902).

LIBER DIURNUS ROMANORUM PONTIFICUM, or "Journal of the Roman Pontiffs," the name given to a collection of formulae used in the papal chancellery in preparing official documents, such as the installation of a pope, the bestowal of the pallium and the grant of papal privileges. It was compiled between 685 and 751, and was constantly employed until the 11th century, when, owing to the changed circumstances of the Church, it fell into disuse, and was soon forgotten and lost. During the 17th century a manuscript of the *Liber* was discovered in Rome by the humanist, Lucas Holstenius, who prepared an edition for publication; for politic reasons, however, the papal authorities would not allow this to appear, as the book asserted the superiority of a general council over the pope. It was, however, published in France by the Jesuit, Jean Garnier, in 1680, and other editions quickly followed.

The best modern editions are one by Eugène de Rozière (Paris, 1869) and another by T. E. von Sichel (Vienna, 1889), both of which contain critical introductions. The two existing manuscripts of the *Liber* are in the Vatican library, Rome, and in the library of St Ambrose at Milan.

LIBERIA, a negro republic in West Africa, extending along the coast of northern Guinea about 300 m., between the British colony of Sierra Leone on the N.W. and the French colony of the Ivory Coast on the S.E. The westernmost point of Liberia (at the mouth of the river Mano) lies in about 6° 55′ N. and 11° 32′ W. The southernmost point of Liberia, and at the same time almost its most eastern extension, is at the mouth of the Cavalla, beyond Cape Palmas, only 4° 22′ N. of the equator, and in about 7° 33′ W. The width of Liberia inland varies very considerably; it is greatest, about 200 m., from N.E. to S.W. The Liberia-Sierra Leone boundary was determined by a frontier commission in 1903. Commencing at the mouth of the river Mano, it follows the Mano up stream till that river cuts 10° 40′ W. It then followed this line of longitude to its intersection with N. latitude 9° 6′, but by the Franco-Liberian understanding of 1907 the frontier on this side was withdrawn to 8° 25′ N., where the river Makona crosses 10° 40′ W. The Liberian frontier with the adjacent French possessions was defined by the Franco-Liberian treaty of 1892, but as the definition therein given was found to be very difficult of reconciliation with geographical features (for in 1892 the whole of the Liberian interior was unmapped) further negotiations were set on foot. In 1905 Liberia proposed to France that the boundary line should follow the river Moa from the British frontier of Sierra Leone up stream to near the source of the Moa (or Makona), and that from this point the boundary should run eastwards along the line of water-parting between the system of the Niger on the north and that of the coast rivers (Moa, Lofa, St Paul's) on the south, until the 8th degree of N. latitude was reached, thence following this 8th degree eastwards to where it cuts the head stream of the Cavalla river. From this point the boundary between France and Liberia would be the course of the Cavalla river from near its source to the sea. Within the limits above described Liberia would possess a total area of about 43,000 to 45,000 sq. m. But after deliberation and as the result of certain "frontier incidents" France modified her counter-proposals in 1907, and the actual definition of the northern and eastern frontiers of Liberia is as follows:—

> Starting from the point on the frontier of the British colony of Sierra Leone where the river Moa or Makona crosses that frontier, the Franco-Liberian frontier shall follow the left bank of the river Makona up stream to a point 5 kilometres to the south of the town of Bofosso. From this point the frontier shall leave the line of the Makona and be carried in a south-easterly direction to the source of the most north-westerly affluent of the Nuon river or Western Cavalla. This line shall be so drawn as to leave on the French side of the boundary the following towns: Kutumai, Kisi Kurumai, Sundibú, Zuapa, Nzibila, Koiama, Bangwedu and Lola. From the north-westernmost source of the Nuon the boundary shall follow the right bank of the said Nuon river down stream to its presumed confluence with the Cavalla, and thenceforward the right bank of the river Cavalla down to the sea. If the ultimate destination of the Nuon is not the Cavalla river, then the boundary shall follow the right bank of the Nuon down stream as far as the town of Tuleplan, A line shall then be drawn from the southern outskirts of the town of Tuleplan due E. to the Cavalla river, and thence shall follow the right bank of the Cavalla river to the sea.

(The delimitation commission proved that the Nuon does not flow into the Cavalla, but about 6° 30′ N. it flows very near the north-westernmost bend of that river. Tuleplan is in about lat. 6° 50′ N. The river Makona takes a much more northerly course than had been estimated. The river Nuon also is situated 20 or 30 m. farther to the east than had been supposed. Consequently the territory of Liberia as thus demarcated is rather larger than it would appear on the uncorrected English maps of 1907—about 41,000 sq. m.)

It is at the southern extremity of Liberia, Cape Palmas, that the West African coast from Morocco to the southernmost extremity of Guinea turns somewhat abruptly eastwards and northwards and faces the Gulf of Guinea. As the whole coastline of Liberia thus fronts the sea route from Europe to South Africa it is always likely to possess a certain degree of strategical importance. The coast, however, is unprovided with a single good harbour. The anchorage at Monrovia is safe, and with some expenditure of money a smooth harbour could be made in front of Grand Basa.

Coast Features.—The coast is a good deal indented, almost all the headlands projecting from north-east to south-west. A good deal of the seaboard is dangerous by reason of the sharp rocks which lie near the surface. As most of the rivers have rapids or falls actually at the sea coast or close to it, they are, with the exception of the Cavalla, useless for penetrating far inland, and the whole of this part of Africa from Cape Palmas north-west to the Senegal suggests a sunken land. In all probability the western projection of Africa was connected by a land bridge with the opposite land of Brazil as late as the Eocene period of the Tertiary epoch. The Liberian coast has few lagoons compared with the adjoining littoral of Sierra Leone or that of the Ivory Coast. The coast, in fact, rises in some places rather abruptly from the sea. Cape Mount (on the northern side of which is a large lagoon—Fisherman Lake) at its highest point is 1050 ft. above sea level. Cape Mesurado is about 350 ft., Cape Palmas about 200 ft. above the sea. There is a salt lake or lagoon between the Cape Palmas river and the vicinity of the Cavalla. Although very little of the coast belt is actually swampy, a kind of natural canalization connects many of the rivers at their mouths with each other, though some of these connecting creeks are as yet unmarked on maps.

Mountains.—Although there are patches of marsh—generally the swampy bottoms of valleys—the whole surface of Liberia inclines to be hilly or even mountainous at a short distance inland from the coast. In the north-east, French explorers have computed the altitudes of some mountains at figures which would make them the highest land surfaces of the western projection of Africa—from 6000 to 9000 ft. But these altitudes are largely matters of conjecture. The same mountains have been sighted by English explorers coming up from the south and are pronounced to be "very high." It is possible that they may reach to 6000 ft. in some places. Between the western bend of the Cavalla river and the coast there is a somewhat broken mountain range with altitudes of from 2000 to 5000 ft. (approximate). The Pō range to the west of the St Paul's river may reach in places to 3000 ft.

Rivers.—The work of the Franco-Liberian delimitation commission in 1908–1909 cleared up many points connected with the hydrography of the country. Notably it traced the upper Cavalla, proving that that river was not connected either with the Nuon on the west or the Ko or Zo on the east. The upper river and the left bank of the lower river of the Cavalla are in French territory. It rises in about 7° 50′ N., 8° 30′ W. in the Nimba mountains, where also rise the Nuon, St John's and Dukwia rivers. After flowing S.E. the Cavalla, between 7° and 6° N., under the name of Dugu, makes a very considerable elbow to the west, thereafter resuming its south-easterly course. It is navigable from the sea for some 80 m. from its mouth and after a long series of rapids is again navigable. Unfortunately the Cavalla does not afford a means of easy penetration into the rich hinterland of Liberia on account of the bad bar at its mouth. The Nuon (or Nipwe), which up to 1908 was described sometimes as the western Cavalla and sometimes as the upper course of the St John's river, has been shown to be the upper course of the Cestos. About 6° 30′ N. it approaches within 16 m. of the Cavalla. It rises in the Nimba mountains some 10 m. S. of the source of the Cavalla, and like all the Liberian rivers (except the Cavalla) it has a general S.W. flow. The St Paul, though inferior to the Cavalla in length, is a large river with a considerable volume of water. The main branch rises in the Beila country nearly as far north as 9° N. under the name of Diani. Between 8° and 7° N. it is joined by the Wé from the west and the Walé from the east. The important river Lofa flows nearly parallel with the St Paul's river and enters the sea about 40 m. to the west, under the name of Little Cape Mount river. The Mano or Bewa river rises in the dense Gora forest, but is of no great importance until it becomes the frontier between Liberia and Sierra Leone. The Dukwia and Farmington are tortuous rivers entering the sea under the name of the river Junk (Portuguese, *Junco*). The Farmington is a short stream, but the Dukwia is believed to be the lower course of the Mani, which rises as the Tigney (Tige), north of the source of the Cavalla, just south of 8° N. The St John's river of the Basa country appears to be of considerable importance and volume. The Sino river rises in the Niete mountains and brings down a great volume of water to the sea, though it is not a river of considerable length. The Duobe rises at the back of the Satro Mountains and flows nearly parallel with the Cavalla, which it joins. The Moa or Makona river is a fine stream of considerable volume, but its course is perpetually interrupted by rocks and rapids. Its lower course is through the territory of Sierra Leone, and it enters the sea as the Sulima.

Climate and Rainfall.—Liberia is almost everywhere well watered. The climate and rainfall over the whole of the coast region for about 120 m. inland are equatorial, the rainfall in the western half of the country being about 150 in. per annum and in the eastern half about 100 in. North of a distance of about 120 m. inland the climate is not quite so rainy, and the weather is much cooler during the dry season. This region beyond the hundred-miles coast belt is far more agreeable and healthy to Europeans.

Forests.—Outside a coast belt of about 20 m. and south of 8° N. the country is one vast forest, except where the natives have cleared the land for cultivation. In many districts the land has been cleared and cultivated and then abandoned, and has relapsed into scrub and jungle which is gradually returning to the condition of forest. The densest forest of all would seem to be that known as Gora, which is almost entirely uninhabited and occupies an area of about 6000 sq. m. between the Pō hills and the British frontier. There is another very dense forest stretching with little interruption from the eastern side of the St Paul's river nearly to the Cavalla. The Nidi forest is noteworthy for its magnificent growth of *Funtumia* rubber trees. It extends between the Duobe and the Cavalla rivers. The extreme north of Liberia is still for the most part a very well-watered country, covered with a rich vegetation, but there are said to be a few breaks that are rather stony and that have a very well-marked dry season in which the vegetation is a good deal burnt up. In the main Liberia is the forest country par excellence of West Africa, and although this region of dense forests overlaps the political frontiers of both Sierra Leone and the Ivory Coast, it is a feature of physical geography so nearly coincident with the actual frontiers of Liberia as to give this country special characteristics clearly marked in its existing fauna.

Fauna.—The fauna of Liberia is sufficiently peculiar, at any rate as regards vertebrates, to make it very nearly identical with a "district" or sub-province of the West African province, though in this case the Liberian "district" would not include the northernmost portions of the country and would overlap on the east and west into Sierra Leone and the French Ivory Coast. It is probable that the Liberian chimpanzee may offer one or more distinct varieties; there is an interesting local development of the Diana monkey, sometimes called the bay-thighed monkey (*Cercopithecus diana ignita*) on account of its brilliant orange-red thighs. One or more species of bats are peculiar to the country—*Vespertilio stampflii*, and perhaps *Roussettus büttikoferi*; two species of shrew (*Crocidura*), one dormouse (*Graphiurus nagtglasii*); the pygmy hippopotamus (*H. liberiensis*)—differing from the common hippopotamus by its much smaller size and by the reduction of the incisor teeth to a single pair in either jaw, or occasionally to the odd number of three; and two remarkable *Cephalophus* antelopes peculiar to this region so far as is known—these are the white-shouldered duiker, *Cephalophus jentinki*, and the zebra antelope, *C. doriae*, a creature the size of a small goat, of a bright bay brown, with broad black zebra-like stripes. Amongst other interesting mammals are four species of the long-haired *Colobus* monkeys (black, black and white, greenish-grey and reddish-brown); the Potto lemur, fruit bats of large size with monstrous heads (*Hypsignathus monstrosus*); the brush-tailed African porcupine; several very brightly coloured squirrels; the scaly-tailed flying *Anomalurus*; the common porcupine; the leopard, serval, golden cat (*Felis celidogaster*) in two varieties, the copper-coloured and the grey, possibly the same animal at different ages; the striped and spotted hyenas (beyond the forest region); two large otters; the tree hyrax, elephant and manati; the red bush pig (*Potamochoerus porcus*); the West African chevrotain (*Dorcatherium*); the Senegalese buffalo; Bongo antelope (*Boocercus*); large yellow-backed duiker (*Cephalophus sylvicultrix*), black duiker, West African hartebeest (beyond the forest), pygmy antelope (*Neotragus*); and three species of *Manis* or pangolin (*M. gigantea*, *M. longicaudata* and *M. tricuspis*).

The birds of Liberia are not quite so peculiar as the mammals. There is the interesting white-necked guineafowl, *Agelastes* (which is found on the Gold Coast and elsewhere west of the lower Niger); there is one peculiar species of eagle owl (*Bubo lettii*) and a very handsome sparrow-hawk (*Accipiter büttikoferi*); a few sun-birds, warblers and shrikes are peculiar to the region. The other birds are mainly those of Senegambia and of the West African forest region generally. A common and handsome bird is the blue plantain-eater (*Corythaeola*). The fishing vulture (*Gypohierax*) is found in all the coast districts, but true vultures are almost entirely absent except from the north, where the small brown *Percnopterus* makes its appearance. A flamingo (*Phoeniconaias*) visits Fisherman Lake, and there are a good many species of herons. Cuckoos are abundant, some of them of lovely plumage, also rollers, kingfishers and hornbills. The last family is well represented, especially by the three forest forms—the elate hornbill and black hornbill (*Ceratogymna*), and the long-tailed, white-crested hornbill (*Ortholophus leucolophus*). There is one trogon—green and crimson, a brightly coloured ground thrush (*Pitta*), numerous woodpeckers and barbets; glossy starlings, the black and white African crow and a great variety of brilliantly coloured weaver birds, waxbills, shrikes and sun-birds.

As regards reptiles, there are at least seven poisonous snakes—two cobras, two puff-adders and three vipers. The brilliantly coloured red and blue lizard (*Agama colonorum*) is found in the coast region of eastern Liberia. There are three species of crocodile, at least two chameleons (probably more when the forest is further explored), the large West African python (*P. sebae*) and a rare Boine snake (*Calabaria*). On the sea coast there is the leathery turtle (*Dermochelis*) and also the green turtle (*Chelone*). In the rivers and swamps there are soft-shelled turtle (*Trionyx* and *Sternothaerus*). The land tortoises chiefly belong to the genus *Cynyxis*. The fresh-water fish seem in their affinities to be nearly allied to those of the Niger and the Nile. There is a species of *Polypterus*, and it is probable that the *Protopterus* or lung fish is also found there, though its existence has not as yet been established by a specimen. As regards invertebrates, very few species or genera are peculiar to Liberia so far as is yet known, though there are probably one or two butterflies of local range. The gigantic scorpions (*Pandinus imperator*)—more than 6 in. long—are a common feature in the forest. One noteworthy feature in Liberia, however, is the relative absence of mosquitoes, and the white ants and some other insect pests are not so troublesome here as in other parts of West Africa. The absence or extreme paucity of mosquitoes no doubt accounts for the infrequency of malarial fever in the interior.

Flora.—Nowhere, perhaps, does the flora of West Africa attain a more wonderful development than in the republic of Liberia and in the adjoining regions of Sierra Leone and the Ivory Coast. This is partly due to the equatorial position and the heavy rainfall. The region of dense forest, however, does not cover the whole of Liberia; the Makona river and the northern tributaries of the Lofa and St Paul's flow through a mountainous country covered with grass and thinly scattered trees, while the ravines and watercourses are still richly forested. A good deal of this absence of forest is directly due to the action of man. Year by year the influence of the Mahommedan tribes on the north leads to the cutting down of the forest, the extension of both planting and pasture and the introduction of cattle and even horses. In the regions bordering the coast also a good deal of the forest has disappeared, its place being taken (where the land is not actually cultivated) by very dense scrub. The most striking trees in the forest region are, in the basin of the Cavalla, the giant *Funtumia elastica*, which grows to an altitude of 200 ft.; various kinds of *Parinarium*, *Oldfieldia* and *Khaya*; the bombax or cotton tree, giant dracaenas, many kinds of fig; *Borassus* palms, oil palms, the climbing *Calamus* palms, and on the coast the coconut. The most important palm of the country perhaps is the *Raphia vinifera*, which produces the piassava fibre of commerce. There are about twenty-two different trees, shrubs and vines producing rubber of more or less good quality. These belong chiefly to the Apocynaceous order. In this order is the genus *Strophanthus*, which is represented in Liberia by several species, amongst others *S. gratus*. This *Strophanthus* is not remarkable for its rubber—which is mere bird lime—but for the powerful poison of its seeds, often used for poisoning arrows, but of late much in use as a drug for treating diseases of the heart. Coffee of several species is indigenous and grows wild. The best known is the celebrated *Coffea liberica*. The kola tree is also indigenous. Large edible nuts are derived from *Coula edulis* of the order Olacineae. The country is exceedingly rich in Aroids, many of which are epiphytic, festooning the trunks of tall trees with a magnificent drapery of abundant foliage. A genus much represented is *Culcasia*, and swampy localities are thickly set with the giant *Cyrtosperma* arum, with flower spathes that are blotched with deep purple. Ground orchids and tree orchids are well represented; *Polystachya liberica*, an epiphytic orchid with sprays of exquisite small flowers of purple and gold, might well be introduced into horticulture for its beauty. The same might be said of the magnificent *Lissochilus roseus*, a terrestrial orchid, growing to 7 ft. in height, with rose-coloured flowers nearly 1 in. long; there are other orchids of fantastic design in their green and white flowers, some of which have spurs (nectaries) nearly 7 in. long.

Many trees offer magnificent displays of flowers at certain seasons of the year; perhaps the loveliest effect is derived from the bushes and trailing creepers of the *Combretum* genus, which, during the "winter" months from December to March, cover the scrub and the forest with mantles of rose colour. *Smaethmannia* trees are thickly set at this season with large blossoms of waxen white. Very beautiful also are the red velvet or white velvet sepals of the *Mussaenda* genus. Bamboos of the genus *Oxytenanthera* are indigenous. Tree ferns are found on the mountains above 4000 ft. The bracken grows in low sandy tracts near the coast. The country in general is a fern paradise, and the iridescent creeping *Selaginella* (akin to *Lycopodium*) festoons the undergrowth by the wayside. The cultivated trees and plants of importance are, besides rubber, the manioc or cassada, the orange tree, lime, cacao, coffee, pineapple (which now runs wild over the whole of Liberia), sour sop, ginger, papaw, alligator apple, avocado pear, okro, cotton (*Gossypium peruvianum*—the kidney cotton), indigo, sweet potato, capsicum (chillie), bread-fruit, arrowroot (*Maranta*), banana, yam, "coco"-yam (*Colocasia antiquorum*, var. *esculenta*), maize, sorghum, sugar cane, rice and eleusine (*Eleusine*), besides gourds, pumpkins, cabbages and onions.

Minerals.—The hinterland of Liberia has been but slightly explored for mineral wealth. In a general way it is supposed that the lands lying between the lower St Paul's river and the Sierra Leone frontier are not much mineralized, except that in the vicinity of river mouths there are indications of bitumen. The sand of nearly all the rivers contains a varying proportion of gold. Garnets and mica are everywhere found. There have been repeated stories of diamonds obtained from the Finley Mountains (which are volcanic) in the central province, but all specimens sent home, except one, have hitherto proved to be quartz crystals. There are indications of sapphires and other forms of corundum. Corundum indeed is abundantly met with in the eastern half of Liberia. The sand of the rivers contains monazite. Graphite has been discovered in the Pō Hills. Lead has been reported from the Nidi or Niete Mountains. Gold is present in some abundance in the river sand of central Liberia, and native reports speak of the far interior as being rich in gold. Iron—haematite—is present almost everywhere. There are other indications of bitumen, besides those mentioned, in the coast region of eastern Liberia.

History and Population.—Tradition asserts that the Liberian coast was first visited by Europeans when it was reached by the Dieppois merchant-adventurers in the 14th century. The French in the 17th century claimed that but for the loss of the archives of Dieppe they would be able to prove that vessels from this Norman port had established settlements at Grand Basa, Cape Mount, and other points on the coast of Liberia. No proof has yet been forthcoming, however, that the Portuguese were not the first white men to reach this coast. The first Portuguese pioneer was Pedro de Sintra, who discovered and noted in 1461 the remarkable promontory of Cape Mount, Cape Mesurado (where the capital, Monrovia, is now situated) and the mouth of the Junk river. In 1462 de Sintra returned with another Portuguese captain, Sueiro da Costa, and penetrated as far as Cape Palmas and the Cavalla river. Subsequently the Portuguese mapped the whole coast of Liberia, and nearly all the prominent features—capes, rivers, islets—off that coast still bear Portuguese names. From the 16th century onwards, English, Dutch, German, French and other European traders contested the commerce of this coast with the Portuguese, and finally drove them away. In the 18th century France once or twice thought of establishing colonies here. At the end of the 18th century, when the tide was rising in favour of the abolition of slavery and the repatriation of slaves, the Grain Coast [so called from the old trade in the "Grains of Paradise" or *Amomum* pepper] was suggested once or twice as a suitable home for repatriated negroes. Sierra Leone, however, was chosen first on account of its possessing an admirable harbour. But in 1821 Cape Mesurado was selected by the American Colonization Society as an appropriate site for the first detachment of American freed negroes, whom difficulties in regard to extending the suffrage in the United States were driving away from a still slave-holding America. From that date, 1821, onwards to the present day, negroes and mulattos—freed slaves or the descendants of such—have been crossing the Atlantic in small numbers to settle on the Liberian coast. The great migrations took place during the first half of the 19th century. Only two or three thousand American emigrants—at most—have come to Liberia since 1860.

The colony was really founded by Jehudi Ashmun, a white American, between 1822 and 1828. The name "Liberia" was invented by the Rev. R. R. Gurley in 1824. In 1847 the American colonists declared their country to be an independent republic, and its status in this capacity was recognized in 1848–1849 by most of the great powers with the exception of the United States. Until 1857 Liberia consisted of two republics—Liberia and Maryland. These American settlements were dotted at intervals along the coast from the mouth of the Sewa river on the west to the San Pedro river on the east (some 60 m. beyond Cape Palmas). Some tracts of territory, such as the greater part of the Kru coast, still, however, remain without foreign—American—settlers, and in a state of quasi-independence. The uncertainty of Liberian occupation led to frontier troubles with Great Britain and disputes with France. Finally, by the English and French treaties of 1885 and 1892 Liberian territory on the coast was made continuous, but was limited to the strip of about 300 m. between the Mano river on the west and the Cavalla river on the east. The Sierra Leone-Liberia frontier was demarcated in 1903; then followed the negotiations with France for the exact delimitation of the Ivory Coast-Liberia frontier, with the result that Liberia lost part of the hinterland she had claimed. Reports of territorial encroachments aroused much sympathy with Liberia in America and led in February 1909 to the appointment by President Roosevelt of a commission which visited Liberia in the summer of that year to investigate the condition of the country. As a result of the commissioners' report negotiations were set on foot for the adjustment of the Liberian debt and the placing of United States officials in charge of the Liberian customs. In July 1910 it was announced that the American government, acting in general agreement with Great Britain, France and Germany, would take charge of the finances, military organization, agriculture and boundary questions of the republic. A loan for £400,000 was also arranged. Meantime the attempts of the Liberian government to control the Kru coast led to various troubles, such as the fining or firing upon foreign steamships for alleged contraventions of regulations. During 1910 the natives in the Cape Palmas district were at open warfare with the Liberian authorities.

One of the most notable of the Liberian presidents was J. J. Roberts, who was nearly white, with only a small proportion of negro blood in his veins. But perhaps the ablest statesman that this American-Negro republic has as yet produced is a pure-blooded negro—President Arthur Barclay, a native of Barbados in the West Indies, who came to Liberia with his parents in the middle of the 19th century, and received all his education there. President Barclay was of unmixed negro descent, but came of a Dahomey stock of superior type.[1] Until the accession to power of President Barclay in 1904 (he was re-elected in 1907), the Americo-Liberian government on the coast had very uncertain relations with the indigenous population, which is well armed and tenacious of local independence. But of late Liberian influence has been extending, more especially in the counties of Maryland and Montserrado.

The president is now elected for a term of four years. There is a legislature of eight senators and thirteen representatives. The type of the constitution is very like that of the United States. Increasing attention is being given to education, to deal with which there are several colleges and a number of schools. The judicial functions are discharged by four grades of officials—the local magistrates, the courts of common pleas, the quarterly courts (five in number) and the supreme court.

The customs service includes British customs officers lent to the Liberian service. A gunboat for preventive service purchased from the British government and commanded by an Englishman, with native petty officers and crew, is employed by the Liberian government. The language of government and trade is English, which is understood far and wide throughout Liberia. As the origin of the Sierra Leonis and the Americo-Liberian settlers was very much the same, an increasing intimacy is growing up between the English-speaking populations of these adjoining countries. Order is maintained in Liberia to some extent by a militia.

The population of Americo-Liberian origin in the coast regions is estimated at from 12,000 to 15,000. To these must be added about 40,000 civilized and Christianized negroes who make common cause with the Liberians in most matters, and have gradually been filling the position of Liberian citizens.

For administrative purposes the country is divided into four counties, Montserrado, Basa, Sino and Maryland, but Cape Mount in the far west and the district round it has almost the status of a fifth county. The approximate revenue for 1906 was £65,000, and the expenditure about £60,000, but some of the revenue was still collected in paper of uncertain value. There are three custom-houses, or ports of entry on the Sierra Leone land frontier between the Moa river on the north and the Mano on the south, and nine ports of entry along the coast. At all of these Europeans are allowed to settle and trade, and with very slight restrictions they may now trade almost anywhere in Liberia. The rubber trade is controlled by the Liberian Rubber Corporation, which holds a special concession from the Liberian government for a number of years, and is charged with the preservation of the forests. Another English company has constructed motor roads in the Liberian hinterland to connect centres of trade with the St Paul's river. The trade is done almost entirely with Great Britain, Germany and Holland, but friendly relations are maintained with Spain, as the Spanish plantations in Fernando Pō are to a great extent worked by Liberian labour.

The indigenous population must be considered one of the assets of Liberia. The native population—apart from the American element—is estimated at as much as 2,000,000; for although large areas appear to be uninhabited forest, other parts are most densely populated, owing to the wonderful fertility of the soil. The native tribes belong more or less to the following divisions, commencing on the west, and proceeding eastwards: (1) Vai, Gbandi, Kpwesi, Mende, Buzi and Mandingo (the Vai, Mende and Mandingo are Mahommedans); all these tribes speak languages derived from a common stock. (2) In the densest forest region between the Mano and the St Paul's river is the powerful Gora tribe of unknown linguistic affinities. (3) In the coast region between the St Paul's river and the Cavalla (and beyond) are the different tribes of Kru stock and language family—Dē, Basā, Gibi, Kru, Grebo, Putu, Sikoñ, &c. &c. The actual Kru tribe inhabits the coast between the river Cestos on the west and Grand Sesters on the east. It is known all over the Atlantic coasts of Africa, as it furnishes such a large proportion of the seamen employed on men-of-war and merchant ships in these tropical waters. Many of the indigenous races of Liberia in the forest belt beyond 40 m. from the coast still practise cannibalism. In some of these forest tribes the women still go quite naked, but clothes of a Mahommedan type are fast spreading over the whole country. Some of the indigenous races are of very fine physique. In the Nidi country the women are generally taller than the men. No traces of a Pygmy race have as yet been discovered, nor any negroes of low physiognomy. Some of the Krumen are coarse and ugly, and this is the case with the Mende people; but as a rule the indigenes of Liberia are handsome, well-proportioned negroes, and some of the Mandingos have an almost European cast of feature.

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[1] Amongst other remarkable negroes that Liberian education produced was Dr E. W. Blyden (b. 1832), the author of many works dealing with negro questions.

AUTHORITIES.—Col. Wauwerman, *Liberia; Histoire de la fondation d'un état nègre* (Brussels, 1885); J. Büttikofer, *Reisebilder aus Liberia* (Leiden, 1890); Sir Harry Johnston, *Liberia* (2 vols., London, 1906), with full bibliography; Maurice Delafosse, *Vocabulaires comparatifs de plus de 60 langues et dialectes parlés à la Côte d'Ivoire et dans la région limitrophe* (1904), a work which, though it professes to deal mainly with philology, throws a wonderful light on the relationships and history of the native tribes of Liberia.

(H. H. J.)

LIBERIUS, pope from 352 to 366, the successor of Julius I., was consecrated according to the *Catalogus Liberianus* on the 22nd of May. His first recorded act was, after a synod had been held at Rome, to write to Constantius, then in quarters at Arles (353–354), asking that a council might be called at Aquileia with reference to the affairs of Athanasius; but his messenger Vincentius of Capua was compelled by the emperor at a conciliabulum held in Arles to subscribe against his will a condemnation of the orthodox patriarch of Alexandria. In 355 Liberius was one of the few who, along with Eusebius of Vercelli, Dionysius of Milan and Lucifer of Cagliari, refused to sign the condemnation of Athanasius, which had anew been imposed at Milan by imperial command upon all the Western bishops; the consequence was his relegation to Beroea in Thrace, Felix II. (antipope) being consecrated his successor by three "catascopi haud episcopi," as Athanasius called them. At the end of an exile of more than two years he yielded so far as to subscribe a formula giving up the "homoousios," to abandon Athanasius, and to accept the communion of his adversaries—a serious mistake, with which he has justly been reproached. This submission led the emperor to recall him from exile; but, as the Roman see was officially occupied by Felix, a year passed before Liberius was sent to Rome. It was the emperor's intention that Liberius should govern the Church jointly with Felix, but on the arrival of Liberius, Felix was expelled by the Roman people. Neither Liberius nor Felix took part in the council of Rimini (359). After the death of the emperor Constantius in 361, Liberius annulled the decrees of that assembly, but, with the concurrence of SS. Athanasius and Hilarius, retained the bishops who had signed and then withdrawn their adherence. In 366 Liberius gave a favourable reception to a deputation of the Eastern episcopate, and admitted into his communion the more moderate of the old Arian party. He died on the 24th of September 366.

His biographers used to be perplexed by a letter purporting to be from Liberius, in the works of Hilary, in which he seems to write, in 352, that he had excommunicated Athanasius at the instance of the Oriental bishops; but the document is now held to be spurious See Hefele, *Conciliengesch.* i. 648 seq. Three other letters, though contested by Hefele, seem to have been written by Liberius at the time of his submission to the emperor.

(L. D.*)

LIBER PONTIFICALIS, or GESTA PONTIFICUM ROMANORUM (*i.e.* book of the popes), consists of the lives of the bishops of Rome from the time of St Peter to the death of Nicholas I. in 867. A supplement continues the series of lives almost to the close of the 9th century, and several other continuations were written later. During the 16th century there was some discussion about the authorship of the *Liber*, and for some time it was thought to be the work of an Italian monk, Anastasius Bibliothecarius (d. 886). It is now, however, practically certain that it was of composite authorship and that the earlier part of it was compiled about 530, three centuries before the time of Anastasius. This is the view taken by Louis Duchesne and substantially by G. Waitz and T. Mommsen, although these scholars think that it was written about a century later. The *Liber* contains much information about papal affairs in general, and about endowments, martyrdoms and the like, but a considerable part of it is obviously legendary. It assumes that the bishops of Rome exercised authority over the Christian Church from its earliest days.

The Liber, which was used by Bede for his *Historia Ecclesiastica*, was first printed at Mainz in 1602. Among other editions is the one edited by T. Mommsen for the *Monumenta Germaniae historica. Gesta Romanorum pontificum*, Band i., but the best is the one by L. Duchesne, *Le Liber pontificalis: texte, introduction, commentaire* (Paris, 1884–1892). See also the same writer's *Étude sur le Liber pontificalis* (Paris, 1877); and the article by A. Brackmann in Herzog-Hauck's *Realencyklopädie*, Band xi. (Leipzig, 1902).

LIBERTAD, or LA LIBERTAD, a coast department of Peru, bounded N. by Lambayeque and Cajamarca, E. by San Martin, S. by Ancachs, S.W. and W. by the Pacific. Pop. (1906 estimate) 188,200; area 10,209 sq. m. Libertad formerly included the present department of Lambayeque. The Western Cordillera divides it into two nearly equal parts, the western consisting of a narrow, arid, sandy coast zone and the western slopes of the Cordillera broken into valleys by short mountain spurs, and the eastern a high inter-Andine valley lying between the Western and Central Cordilleras and traversed by the upper Marañon or Amazon, which at one point is less than 90 m. in a straight line from the Pacific coast. The coast region is traversed by several short streams, which are fed by the melting snows of the Cordillera and are extensively used for irrigation. These are (the names also applying to their valleys) the Jequetepeque or Pacasmayo, in whose valley rice is an important product, the Chicama, in whose valley the sugar plantations are among the largest and best in Peru, the Moche, Viru, Chao and Santa; the last, with its northern tributary, the Tablachaca, forming the southern boundary line of the department. The Santa Valley is also noted for its sugar plantations. Cotton is produced in several of these valleys, coffee in the Pacasmayo district, and coca on the mountain slopes about Huamachuco and Otuzco, at elevations of 3000 to 6000 ft. above sea-level. The upland regions, which have a moderate rainfall and a cool, healthy climate, are partly devoted to agriculture on a small scale (producing wheat, Indian corn, barley, potatoes, quinua, alfalfa, fruit and vegetables), partly to grazing and partly to mining. Cattle and sheep have been raised on the upland pastures of Libertad and Ancachs since early colonial times, and the llama and alpaca were reared throughout this "sierra" country long before the Spanish conquest. Gold and silver mines are worked in the districts of Huamachuco, Otuzco and Pataz, and coal has been found in the first two. The department had 169 m. of railway in 1906, viz.: from Pacasmayo to Yonán (in Cajamarca) with a branch to Guadalupe, 60 m.; from Salaverry to Trujillo with its extension to Ascope, 47 m.; from Trujillo to Laredo, Galindo and Menocucho, 18½ m.; from Huanchaco to Roma, 25 m.; and from Chicama to Pampas, 18½ m. The principal ports are Pacasmayo and Salaverry, which have long iron piers built by the national government; Malabrigo, Huanchuco, Guañape and Chao are open roadsteads. The capital of the department is Trujillo. The other principal towns are San

Pedro, Otuzco, Huamachuco, Santiago de Chuco and Tuyabamba—all provincial capitals and important only through their mining interests, except San Pedro, which stands in the fertile district of the Jequetepeque. The population of Otuzco (35 m. N.E. of Trujillo) was estimated to be about 4000 in 1896, that of Huamachuco (65 m. N.E. of Trujillo) being perhaps slightly less.

LIBERTARIANISM (from Lat. *libertas*, freedom), in ethics, the doctrine which maintains the freedom of the will, as opposed to necessitarianism or determinism. It has been held in various forms. In its extreme form it maintains that the individual is absolutely free to chose this or that action indifferently (the *liberum arbitrium indifferentiae*), but most libertarians admit that acquired tendencies, environment and the like, exercise control in a greater or less degree.

LIBERTINES, the nickname, rather than the name, given to various political and social parties. It is futile to deduce the name from the Libertines of Acts vi. 9; these were "sons of freedmen," for it is vain to make them citizens of an imaginary Libertum, or to substitute (with Beza) Libustines, in the sense of inhabitants of Libya. In a sense akin to the modern use of the term "libertine," *i.e* a person who sets the rules of morality, &c., at defiance, the word seems first to have been applied, as a stigma, to Anabaptists in the Low Countries (Mark Pattison, *Essays*, ii. 38). It has become especially attached to the liberal party in Geneva, opposed to Calvin and carrying on the tradition of the Liberators in that city; but the term was never applied to them till after Calvin's death (F. W. Kampschulte, *Johann Calvin*). Calvin, who wrote against the "Libertins qui se nomment Spirituelz" (1545), never confused them with his political antagonists in Geneva, called Perrinistes from their leader Amadeo Perrin. The objects of Calvin's polemic were the Anabaptists above mentioned, whose first obscure leader was Coppin of Lisle, followed by Quintin of Hennegau, by whom and his disciples, Bertram des Moulins and Claude Perseval, the principles of the sect were disseminated in France. Quintin was put to death as a heretic at Tournai in 1546. His most notable follower was Antoine Pocquet, a native of Enghien, Belgium, priest and almoner (1540–1549), afterwards pensioner of the queen of Navarre, who was a guest of Bucer at Strassburg (1543–1544) and died some time after 1560. Calvin (who had met Quintin in Paris) describes the doctrines he impugns as pantheistic and antinomian.

See Choisy in Herzog-Hauck's *Realencyklopädie* (1902).

(A. Go.*)

LIBERTINES, SYNAGOGUE OF THE, a section of the Hellenistic Jews who attacked Stephen (Acts vi. 9). The passage reads, *τίνες τῶν ἐκ τῆς συναγωγῆς τῆς λεγομένης Λιβερτίνων, καὶ Κυρηναίων καὶ 'Αλεξανδρέων, καὶ τῶν ἀπὸ Κιλικίας καὶ 'Ασίας*, and opinion is divided as to the number of synagogues here named. The probability is that there are three, corresponding to the geographical regions involved, (1) Rome and Italy, (2) N.E. Africa, (3) Asia Minor. In this case "the Synagogue of the Libertines" is the assembly of "the Freedmen" from Rome, descendants of the Jews enslaved by Pompey after his conquest of Judaea 63 B.C. If, however, we take *Λιβερτίνων καὶ Κυρηναίων καὶ 'Αλεξανδρέων* closely together, the first name must denote the people of some city or district. The obscure town Libertum (inferred from the title Episcopus Libertinensis in connexion with the synod of Carthage, A.D. 411) is less likely than the reading (*Λιβύων* or) *Λιβυστίνων* underlying certain Armenian versions and Syriac commentaries. The Greek towns lying west from Cyrene would naturally be called Libyan. In any case the interesting point is that these returned Jews, instead of being liberalized by their residence abroad, were more tenacious of Judaism and more bitter against Stephen than those who had never left Judaea.

LIBERTY (Lat. *libertas*, from *liber*, free), generally the state of freedom, especially opposed to subjection, imprisonment or slavery, or with such restricted or figurative meaning as the circumstances imply. The history of political liberty is in modern days identified practically with the progress of civilization. In a more particular sense, "a liberty" is the term for a franchise, a privilege or branch of the crown's prerogative granted to a subject, as, for example, that of executing legal process; hence the district over which the privilege extends. Such liberties are exempt from the jurisdiction of the sheriff and have separate commissions of the peace, but for purposes of local government form part of the county in which they are situated. The exemption from the jurisdiction of the sheriff was recognized in England by the Sheriffs Act 1887, which provides that the sheriff of a county shall appoint a deputy at the expense of the lord of the liberty, such deputy to reside in or near the liberty. The deputy receives and opens in the sheriff's name all writs, the return or execution of which belongs to the bailiff of the liberty, and issues to the bailiff the warrant required for the due execution of such writs. The bailiff then becomes liable for non-execution, mis-execution or insufficient return of any writs, and in the case of non-return of any writ, if the sheriff returns that he has delivered the writ to a bailiff of a liberty, the sheriff will be ordered to execute the writ notwithstanding the liberty, and must cause the bailiff to attend before the high court of justice and answer why he did not execute the writ.

In nautical phraseology various usages of the term are derived from its association with a sailor's leave on shore, *e.g.* liberty-man, liberty-day, liberty-ticket.

A History of Modern Liberty, in eight volumes, of which the third appeared in 1906, has been written by James Mackinnon; see also Lord Acton's lectures, and such works as J. S. Mill's *On Liberty* and Sir John Seeley's *Introduction to Political Science*.

LIBERTY PARTY, the first political party organized in the United States to oppose the spread and restrict the political power of slavery; and the lineal precursor of the Free Soil and Republican parties. It originated in the Old North-west. Its organization was preceded there by a long anti-slavery religious movement. James G. Birney (*q.v.*), to whom more than to any other man belongs the honour of founding and leading the party, began to define the political duties of so-called "abolitionists" about 1836; but for several years thereafter he, in common with other leaders, continued to disclaim all idea of forming a political party. In state and local campaigns, however, non-partisan political action was attempted through the questioning of Whig and Democratic candidates. The utter futility of seeking to obtain in this way any satisfactory concessions to anti-slavery sentiment was speedily and abundantly proved. There arose, consequently, a division in the American Anti-slavery Society between those who were led by W. L. Garrison (*q.v.*), and advocated political non-resistance—and, besides, had loaded down their anti-slavery views with a variety of religious and social vagaries, unpalatable to all but a small number—and those who were led by Birney, and advocated independent political action. The sentiment of the great majority of "abolitionists" was, by 1838, strongly for such action; and it was clearly sanctioned and implied in the constitution and declared principles of the Anti-slavery Society; but the capture of that organization by the Garrisonians, in a "packed" convention in 1830, made it unavailable as a party nucleus—even if it had not been already outgrown—and hastened a separate party organization. A convention of abolitionists at Warsaw, New York, in November 1839 had resolved that abolitionists were bound by every consideration of duty and expediency to organize an independent political party. Accordingly, the political abolitionists, in another convention at Albany, in April 1840, containing delegates from six states but not one from the North-west, launched the "Liberty Party," and nominated Birney for the presidency. In the November election he received 7069 votes.[1]

The political "abolitionists" were abolitionists only as they were restrictionists: they wished to use the federal government to exclude (or abolish) slavery from the federal Territories and the District of Columbia, but they saw no opportunity to attack slavery in the states—*i.e.* to attack the institution *per se*; also they declared there should be "absolute and unqualified division of the General Government from slavery"—which implied an amendment of the constitution. They proposed to use ordinary moral and political means to attain their ends—not, like the Garrisonians, to abstain from voting, or favour the dissolution of the Union.

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[1] Mr T. C. Smith estimates that probably not one in ten of even professed abolitionists supported Birney; only in Massachusetts did he receive as much as 1% of the total vote cast.

After 1840 the attempt began in earnest to organize the Liberty Party thoroughly, and unite all anti-slavery men. The North-west, where "there was, after 1840, very little known of Garrison and his methods" (T. C. Smith), was the most promising field, but though the contest of state and local campaigns gave morale to the party, it made scant political gains (in 1843 it cast hardly 10% of the total vote); it could not convince the people that slavery should be made the paramount question in politics. In 1844, however, the Texas question gave slavery precisely this pre-eminence in the presidential campaign. Until then, neither Whigs nor Democrats had regarded the Liberty Party seriously; now, however, each party charged that the Liberty movement was corruptly auxiliary to the other. As the campaign progressed, the Whigs alternately abused the Liberty men and made frantic appeals for their support. But the Liberty men were strongly opposed to Clay personally; and even if his equivocal campaign letters (see Clay, Henry) had not left exceedingly small ground for belief that he would resist the annexation of Texas, still the Liberty men were not such as to admit that an end justifies the means; therefore they again nominated Birney. He received 62,263 votes[1]—many more than enough in New York to have carried that state and the presidency for Clay, had they been thrown to his support. The Whigs, therefore, blamed the Liberty Party for Democratic success and the annexation of Texas; but—quite apart from the issue of political ethics—it is almost certain that though Clay's chances were injured by the Liberty ticket, they were injured much more outside the Liberty ranks, by his own quibbles.[2] After 1844 the Liberty Party made little progress. Its leaders were never very strong as politicians, and its ablest organizer, Birney, was about this time compelled by an accident to abandon public life. Moreover, the election of 1844 was in a way fatal to the party; for it seemed to prove that though "abolition" was not the party programme, still its antecedents and personnel were too radical to unite the North; and above all it could not, after 1844, draw the disaffected Whigs, for though their party was steadily moving toward anti-slavery their dislike of the Liberty Party effectually prevented union. Indeed, no party of one idea could hope to satisfy men who had been Whigs or Democrats. At the same time, anti-slavery Whigs and Democrats were segregating in state politics, and the issue of excluding slavery from the new territory acquired from Mexico afforded a golden opportunity to unite all anti-slavery men on the principle of the Wilmot Proviso (1846). The Liberty Party reached its greatest strength (casting 74,017 votes) in the state elections of 1846. Thereafter, though growing somewhat in New England, it rapidly became ineffective in the rest of the North. Many, including Birney, thought it should cease to be an isolated party of one idea—striving for mere balance of power between Whigs and Democrats, welcoming small concessions from them, almost dependent upon them. Some wished to revivify it by making it a party of general reform. One result was the secession and formation of the Liberty League, which in 1847 nominated Gerrit Smith for the presidency. No adequate effort was made to take advantage of the disintegration of other parties. In October 1847, at Buffalo, was held the third and last national convention. John P. Hale—whose election to the United States Senate had justified the first successful union of Liberty men with other anti-slavery men in state politics—was nominated for the presidency. But the nomination by the Democrats of Lewis Cass shattered the Democratic organization in New York and the North-west; and when the Whigs nominated General Taylor, adopted a non-committal platform, and showed hostility to the Wilmot Proviso, the way was cleared for a union of all anti-slavery men. The Liberty Party, abandoning therefore its independent nominations, joined in the first convention and nominations of the Free Soil Party (*q.v.*), thereby practically losing its identity, although it continued until after the organization of the Republican Party to maintain something of a semi-independent organization. The Liberty Party has the unique honour among third-parties in the United States of seeing its principles rapidly adopted and realized.

See T. C. Smith, *History of the Liberty and Free Soil Parties in the Northwest* (Harvard University Historical Studies, New York, 1897), and lives and writings of all the public men mentioned above; also of G. W. Julian, J. R. Giddings and S. P. Chase.

LIBITINA, an old Roman goddess of funerals. She had a sanctuary in a sacred grove (perhaps on the Esquiline), where, by an ordinance of Servius Tullius, a piece of money (*lucar Libitinae*) was deposited whenever a death took place. Here the undertakers (*libitinarii*), who carried out all funeral arrangements by contract, had their offices, and everything necessary was kept for sale or hire; here all deaths were registered for statistical purposes. The word *Libitina* then came to be used for the business of an undertaker, funeral requisites, and (in the poets) for death itself. By later antiquarians Libitina was sometimes identified with Persephone, but more commonly (partly or completely) with Venus Lubentia or Lubentina, an Italian goddess of gardens. The similarity of name and the fact that Venus Lubentia had a sanctuary in the grove of Libitina favoured this idea. Further, Plutarch (*Quaest. Rom.* 23) mentions a small statue at Delphi of Aphrodite Epitymbia (A. of tombs = Venus Libitina), to which the spirits of the dead were summoned. The inconsistency of selling funeral requisites in the temple of Libitina, seeing that she is identified with Venus, is explained by him as indicating that one and the same goddess presides over birth and death; or the association of such things with the goddess of love and pleasure is intended to show that death is not a calamity, but rather a consummation to be desired. Libitina may, however, have been originally an earth goddess, connected with luxuriant nature and the enjoyments of life (cf. *lub-et*, *lib-ido*); then, all such deities being connected with the underworld, she also became the goddess of death, and that side of her character predominated in the later conceptions.

See Plutarch, *Numa*, 12; Dion. Halic. iv. 15; Festus xvi., s.v. "Rustica Vinalia"; Juvenal xii. 121, with Mayor's note; G. Wissowa in Roscher's *Lexicon der Mythologie*, s.v.

LIBMANAN, a town of the province of Ambos Camarines, Luzon, Philippine Islands, on the Libmanan river, 11 m. N.W. of Nueva Cáceres, the capital. Pop. (1903) 17,416. It is about 4½ m. N.E. of the Bay of San Miguel. Rice, coco-nuts, hemp, Indian corn, sugarcane, bejuco, arica nuts and camotes, are grown in the vicinity, and the manufactures include hemp goods, alcohol (from coco-nut-palm sap), copra, and baskets, chairs, hammocks and hats of bejuco and bamboo. The Libmanan river, a tributary of the Bicol, into which it empties 2 m. below the town, is famous for its clear cold water and for its sulphur springs. The language is Bicol.

LIBO, in ancient Rome, the name of a family belonging to the Scribonian gens. It is chiefly interesting for its connexion with the Puteal Scribonianum or Puteal Libonis in the forum at Rome,[3] dedicated or restored by one of its members, perhaps the praetor of 204 B.C., or the tribune of the people in 149. In its vicinity the praetor's tribunal, removed from the comitium in the 2nd century B.C., held its sittings, which led to the place becoming the haunt of litigants, money-lenders and business people. According to ancient authorities, the Puteal Libonis was between the temples of Castor and Vesta, near the Porticus Julia and the Arcus Fabiorum, but no remains have been discovered. The idea that an irregular circle of travertine blocks, found near the temple of Castor, formed part of the puteal is now abandoned.

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[1] Birney's vote was reduced by a disgraceful election trick by the Whigs (the circulation of a forged letter on the eve of the election); a trick to which he had exposed himself by an ingenuously honest reception of Democratic advances in a matter of local good-government in Michigan.

[2] *E.g.* Horace Greeley made the Whig charge; but in later life he repeatedly attributed Clay's defeat simply to Clay's own letters; and for Millard Fillmore's important opinion see footnote to Know Nothing Party.

[3] *Puteal* was the name given to an erection (or enclosure) on a spot which had been struck by lightning; it was so called from its resemblance to the stone kerb or low enclosure round a well (*puteus*).

See Horace, *Sat.* ii. 6. 35, *Epp.* i. 19. 8; Cicero, *Pro Sestio*, 8; for the well-known coin of L. Scribonius Libo, representing the puteal of Libo, which rather resembles a *cippus* (sepulchral monument) or an altar, with laurel wreaths, two lyres and a pair of pincers or tongs below the wreaths (perhaps symbolical of Vulcanus as forger of lightning), see C. Hülsen, *The Roman Forum* (Eng. trans. by J. B. Carter, 1906), p. 150, where a marble imitation found at Veii is also given.

LIBON, a Greek architect, born at Elis, who was employed to build the great temple of Zeus at Olympia (*q.v.*) about 460 B.C. (Pausanias v. 10. 3).

LIBOURNE, a town of south-western France, capital of an arrondissement of the department of Gironde, situated at the confluence of the Isle with the Dordogne, 22 m. E.N.E. of Bordeaux on the railway to Angoulême. Pop. (1906) town, 15,280; commune, 19,323. The sea is 56 m. distant, but the tide affects the river so as to admit of vessels drawing 14 ft. reaching the town at the highest tides. The Dordogne is here crossed by a stone bridge 492 ft. long, and a suspension bridge across the Isle connects Libourne with Fronsac, built on a hill on which in feudal times stood a powerful fortress. Libourne is regularly built. The Gothic church, restored in the 19th century, has a stone spire 232 ft. high. On the quay there is a machicolated clock-tower which is a survival of the ramparts of the 14th century; and the town-house, containing a small museum and a library, is a quaint relic of the 16th century. There is a statue of the Duc Decazes, who was born in the neighbourhood. The sub-prefecture, tribunals of first instance and of commerce, and a communal college are among the public institutions. The principal articles of commerce are the wines and brandies of the district. Printing and cooperage are among the industries.

Like other sites at the confluence of important rivers, that of Libourne was appropriated at an early period. Under the Romans *Condate* stood rather more than a mile to the south of the present Libourne; it was destroyed during the troubles of the 5th century. Resuscitated by Charlemagne, it was rebuilt in 1269, under its present name and on the site and plan it still retains, by Roger de Leybourne (of Leybourne in Kent), seneschal of Guienne, acting under the authority of King Edward I. of England. It suffered considerably in the struggles of the French and English for the possession of Guienne in the 14th century.

See R. Guinodie, *Hist. de Libourne* (2nd ed., 2 vols., Libourne, 1876–1877).

LIBRA (" THE BALANCE "), in astronomy, the 7th sign of the zodiac (*q.v.*), denoted by the symbol ♎, resembling a pair of scales, probably in allusion to the fact that when the sun enters this part of the ecliptic, at the autumnal equinox, the days and nights are equal. It is also a constellation, not mentioned by Eudoxus or Aratus, but by Manetho (3rd century B.C.) and Geminus (1st century B.C.), and included by Ptolemy in his 48 asterisms; Ptolemy catalogued 17 stars, Tycho Brahe 10, and Hevelius 20. *δ Librae* is an Algol (*q.v.*) variable, the range of magnitude being 5·0 to 6·2, and the period 2 days 7 hrs. 51 min.; and the cluster *M. 5 Librae* is a faint globular cluster of which only about one star in eleven is variable.

LIBRARIES. A library (from Lat. *liber*, book), in the modern sense, is a collection of printed or written literature. As such, it implies an advanced and elaborate civilization. If the term be extended to any considerable collection of written documents, it must be nearly as old as civilization itself. The earliest use to which the invention of inscribed or written signs was put was probably to record important religious and political transactions. These records would naturally be preserved in sacred places, and accordingly the earliest libraries of the world were probably temples, and the earliest librarians priests. And indeed before the extension of the arts of writing and reading the priests were the only persons who could perform such work as, *e.g.* the compilation of the *Annales Maximi*, which was the duty of the pontifices in ancient Rome. The beginnings of literature proper in the shape of ballads and songs may have continued to be conveyed orally only from one generation to another, long after the record of important religious or civil events was regularly committed to writing. The earliest collections of which we know anything, therefore, were collections of archives. Of this character appear to have been such famous collections as that of the Medians at Ecbatana, the Persians at Susa or the hieroglyphic archives of Knossos discovered by A. J. Evans (*Scripta Minoa*, 1909) of a date synchronizing with the XIIth Egyptian dynasty. It is not until the development of arts and sciences, and the growth of a considerable written literature, and even of a distinct literary class, that we find collections of books which can be called libraries in our modern sense. It is of libraries in the modern sense, and not, except incidentally, of archives that we are to speak.

ANCIENT LIBRARIES

Assyria.

The researches which have followed the discoveries of P. E. Botta and Sir H. Layard have thrown unexpected light not only upon the history but upon the arts, the sciences and the literatures of the ancient civilizations of Babylonia and Assyria. In all these wondrous revelations no facts are more interesting than those which show the existence of extensive libraries so many ages ago, and none are more eloquent of the elaborateness of these forgotten civilizations. In the course of his excavations at Nineveh in 1850, Layard came upon some chambers in the south-west palace, the floor of which, as well as the adjoining rooms, was covered to the depth of a foot with tablets of clay, covered with cuneiform characters, in many cases so small as to require a magnifying glass. These varied in size from 1 to 12 in. square. A great number of them were broken, as Layard supposed by the falling in of the roof; but as George Smith thought by having fallen from the upper storey, upon which he believed the collection to have been placed. These tablets formed the library of the great monarch Assur-bani-pal—the Sardanapalus of the Greeks—the greatest patron of literature amongst the Assyrians. It is estimated that this library consisted of some ten thousand distinct works and documents, some of the works extending over several tablets. The tablets appear to have been methodically arranged and catalogued, and the library seems to have been thrown open for the general use of the king's subjects.[1] A great portion of this library has already been brought to England and deposited in the British museum, but it is calculated that there still remain some 20,000 fragments to be gathered up. For further details as to Assyrian libraries, and the still earlier Babylonian libraries at Tello, the ancient Lagash, and at Niffer, the ancient Nippur, from which the Assyrians drew their science and literature, see BABYLONIA and NIPPUR.

Ancient Egyptian Libraries.

Of the libraries of ancient Egypt our knowledge is scattered and imperfect, but at a time extending to more than 6000 years ago we find numerous scribes of many classes who recorded official events in the life of their royal masters or details of their domestic affairs and business transactions. Besides this official literature we possess examples of many commentaries on the sacerdotal books, as well as historical treatises, works on moral philosophy and proverbial wisdom, science, collections of medical receipts as well as a great variety of popular novels and humoristic pieces. At an early date Heliopolis was a literary centre of great importance with culture akin to the Babylonian. Attached to every temple were professional scribes whose function was partly religious and partly scientific. The sacred books of Thoth constituted as it were a complete encyclopaedia of religion and science, and on these books was gradually accumulated an immense mass of exposition and commentary. We possess a record relating to " the land of the collected works [library] of Khufu," a monarch of the IVth dynasty, and a similar inscription relating to the library of Khafra, the builder of the second pyramid. At Edfu the library was a small chamber in the temple, on the wall of which is a list of books, among them a manual of Egyptian geography (Brugsch, *History of Egypt*, 1881, i. 240). The exact position of Akhenaten's library (or archives) of clay tablets is known and the name of the room has been read on the books of which it has been built. A library of charred books has been found at Mendes (Egypt Expl. Fund, *Two Hieroglyphic Papyri*), and we have references to temple libraries in the Silsileh "Nile" stelae and perhaps in the great Harris papyri. The most famous of the Egyptian libraries is that of King Osymandyas, described by Diodorus Siculus, who relates that it bore an inscription which he renders by the Greek words ΨΥΧΗΣ ΙΑΤΡΕΙΟΝ "the Dispensary of the Soul." Osymandyas has been identified with the great king Rameses II. (1300–1236 B.C.) and the seat of the library is supposed to have been the Ramessaeum at Western Thebes. Amen-em-hant was the name of one of the directors of the Theban libraries. Papyri from the palace, of a later date, have been discovered by Professor W. F. Flinders Petrie. At Thebes the scribes of the "Foreign Office" are depicted at work in a room which was perhaps rather an office than a library. The famous Tel-el-Amarna tablets (1383–1365 B.C.) were stored in "the place of the records of the King." There were record offices attached to the granary and treasury departments and we know of a school or college for the reproduction of books, which were kept in boxes and in jars. According to Eustathius there was a great collection at Memphis. A heavy blow was dealt to the old Egyptian literature by the Persian invasion, and many books were carried away by the conquerors. The Egyptians were only delivered from the yoke of Persia to succumb to that of Greece and Rome and henceforward their civilization was dominated by foreign influences. Of the Greek libraries under the Ptolemies we shall speak a little further on.

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[1] See Menant, *Bibliothèque du palais de Ninive* (Paris, 1880).

Greece.

Of the libraries of ancient Greece we have very little knowledge, and such knowledge as we possess comes to us for the most part from late compilers. Amongst those who are known to have collected books are Pisistratus, Polycrates of Samos, Euclid the Athenian, Nicocrates of Cyprus, Euripides and Aristotle (Athenaeus i. 4). At Cnidus there is said to have been a special collection of works upon medicine. Pisistratus is reported to have been the first of the Greeks who collected books on a large scale. Aulus Gellius, indeed, tells us, in language perhaps "not well suited to the 6th century B.C.,"[1] that he was the first to establish a public library. The authority of Aulus Gellius is hardly sufficient to secure credit for the story that this library was carried away into Persia by Xerxes and subsequently restored to the Athenians by Seleucus Nicator. Plato is known to have been a collector; and Xenophon tells us of the library of Euthydemus. The library of Aristotle was bequeathed by him to his disciple Theophrastus, and by Theophrastus to Neleus, who carried it to Scepsis, where it is said to have been concealed underground to avoid the literary cupidity of the kings of Pergamum. Its subsequent fate has given rise to much controversy, but, according to Strabo (xiii. pp. 608, 609), it was sold to Apellicon of Teos, who carried it to Athens, where after Apellicon's death it fell a prey to the conqueror Sulla, and was transported by him to Rome. The story told by Athenaeus (i. 4) is that the library of Neleus was purchased by Ptolemy Philadelphus. The names of a few other libraries in Greece are barely known to us from inscriptions; of their character and contents we know nothing. If, indeed, we are to trust Strabo entirely, we must believe that Aristotle was the first person who collected a library, and that he communicated the taste for collecting to the sovereigns of Egypt. It is at all events certain that the libraries of Alexandria were the most important as they were the most celebrated of the ancient world. Under the enlightened rule of the Ptolemies a society of scholars and men of science was attracted to their capital. It seems pretty certain that Ptolemy Soter had already begun to collect books, but it was in the reign of Ptolemy Philadelphus that the libraries were properly organized and established in separate buildings. Ptolemy Philadelphus sent into every part of Greece and Asia to secure the most valuable works, and no exertions or expense were spared in enriching the collections. Ptolemy Euergetes, his successor, is said to have caused all books brought into Egypt by foreigners to be seized for the benefit of the library, while the owners had to be content with receiving copies of them in exchange. Nor did the Alexandrian scholars exhibit the usual Hellenic exclusiveness, and many of the treasures of Egyptian and even of Hebrew literature were by their means translated into Greek. There were two libraries at Alexandria; the larger, in the Brucheum quarter, was in connexion with the Museum, a sort of academy, while the smaller was placed in the Serapeum. The number of volumes in these libraries was very large, although it is difficult to attain any certainty as to the real numbers amongst the widely varying accounts. According to a scholium of Tzetzes, who appears to draw his information from the authority of Callimachus and Eratosthenes, who had been librarians at Alexandria, there were 42,800 vols. or rolls in the Serapeum and 490,000 in the Brucheum.[2] This enumeration seems to refer to the librarianship of Callimachus himself under Ptolemy Euergetes. In any case the figures agree tolerably well with those given by Aulus Gellius[3] (700,000) and Seneca[4] (400,000). It should be observed that, as the ancient roll or volume usually contained a much smaller quantity of matter than a modern book—so that, *e.g* the history of Herodotus might form nine "books" or volumes, and the *Iliad* of Homer twenty-four—these numbers must be discounted for the purposes of comparison with modern collections. The series of the first five librarians at Alexandria appears to be pretty well established as follows: Zenodotus, Callimachus, Eratosthenes, Apollonius and Aristophanes; and their activity covers a period of about a century. The first experiments in bibliography appear to have been made in producing catalogues of the Alexandrian libraries. Amongst other lists, two catalogues were prepared by order of Ptolemy Philadelphus, one of the tragedies, the other of the comedies contained in the collections. The Πίνακες of Callimachus formed a catalogue of all the principal books arranged in 120 classes. When Caesar set fire to the fleet in the harbour of Alexandria, the flames accidentally extended to the larger library of the Brucheum, and it was destroyed.[5] Antony endeavoured to repair the loss by presenting to Cleopatra the library from Pergamum. This was very probably placed in the Brucheum, as this continued to be the literary quarter of Alexandria until the time of Aurelian. Thenceforward the Serapeum became the principal library. The usual statement that from the date of the restoration of the Brucheum under Cleopatra the libraries continued in a flourishing condition until they were destroyed after the conquest of Alexandria by the Saracens in A.D. 640 can hardly be supported. It is very possible that one of the libraries perished when the Brucheum quarter was destroyed by Aurelian, A.D. 273. In 389 or 391 an edict of Theodosius ordered the destruction of the Serapeum, and its books were pillaged by the Christians. When we take into account the disordered condition of the times, and the neglect into which literature and science had fallen, there can be little difficulty in believing that there were but few books left to be destroyed by the soldiers of Amru. The familiar anecdote of the caliph's message to his general rests mainly upon the evidence of Abulfaraj, so that we may be tempted to agree with Gibbon that the report of a stranger who wrote at the end of six hundred years is overbalanced by the silence of earlier and native annalists. It is, however, so far from easy to settle the question that a cloud of names could easily be cited upon either side, while some of the most careful inquirers confess the difficulty of a decision[6] (see ALEXANDRIA, III.).

Alexandria.

The magnificence and renown of the libraries of the Ptolemies excited the rivalry of the kings of Pergamum, who vied with the Egyptian rulers in their encouragement of literature. The

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[1] Grote, *History of Greece*, iv. 37, following Becker.

[2] Ritschl, *Die alexandrinischen Bibliotheken*, p. 22; *Opusc. phil.* i. § 123.

[3] *N.A.* vi. 17.

[4] *De tranq. an.* 9.

[5] Parthey (*Alexandrinisches Museum*) assigns topographical reasons for doubting this story.

[6] Some of the authorities have been collected by Parthey, *op. cit.*

Pergamum.

German researches in the acropolis of Pergamum between 1878 and 1886 revealed four rooms which had originally been appropriated to the library (Alex. Conze, *Die pergamen. Bibliothek*, 1884). Despite the obstacles presented by the embargo placed by the Ptolemies upon the export of papyrus, the library of the Attali attained considerable importance, and, as we have seen, when it was transported to Egypt numbered 200,000 vols. We learn from a notice in Suidas that in 221 B.C. Antiochus the Great summoned the poet and grammarian Euphorion of Chalcis to be his librarian.

Rome.

The early Romans were far too warlike and practical a people to devote much attention to literature, and it is not until the last century of the republic that we hear of libraries in Rome. The collections of Carthage, which fell into their hands when Scipio sacked that city (146 B.C.), had no attractions for them; and with the exception of the writings of Mago upon agriculture, which the senate reserved for translation into Latin, they bestowed all the books upon the kinglets of Africa (Pliny, *H.N.* xviii. 5). It is in accordance with the military character of the Romans that the first considerable collections of which we hear in Rome were brought there as the spoils of war. The first of these was that brought by Aemilius Paulus from Macedonia after the conquest of Perseus (167 B.C.). The library of the conquered monarch was all that he reserved from the prizes of victory for himself and his sons, who were fond of letters. Next came the library of Apellicon the Teian, brought from Athens by Sulla (86 B.C.). This passed at his death into the hands of his son, but of its later history nothing is known. The rich stores of literature brought home by Lucullus from his eastern conquests (about 67 B.C.) were freely thrown open to his friends and to men of letters. Accordingly his library and the neighbouring walks were much resorted to, especially by Greeks. It was now becoming fashionable for rich men to furnish their libraries well, and the fashion prevailed until it became the subject of Seneca's scorn and Lucian's wit. The zeal of Cicero and Atticus in adding to their collections is well known to every reader of the classics. Tyrannion is said to have had 30,000 vols. of his own; and that M. Terentius Varro had large collections we may infer from Cicero's writing to him: "Si hortum in bibliotheca habes, nihil deerit." Not to prolong the list of private collectors, Serenus Sammonicus is said to have left to his pupil the young Gordian no less than 62,000 vols. Amongst the numerous projects entertained by Caesar was that of presenting Rome with public libraries, though it is doubtful whether any steps were actually taken towards its execution. The task of collecting and arranging the books was entrusted to Varro. This commission, as well as his own fondness for books, may have led Varro to write the book upon libraries of which a few words only have come down to us, preserved by a grammarian. The honour of being the first actually to dedicate a library to the public is said by Pliny and Ovid to have fallen to G. Asinius Pollio, who erected a library in the Atrium Libertatis on Mount Aventine, defraying the cost from the spoils of his Illyrian campaign. The library of Pollio was followed by the public libraries established by Augustus. That emperor, who did so much for the embellishment of the city, erected two libraries, the Octavian and the Palatine. The former was founded (33 B.C.) in honour of his sister, and was placed in the Porticus Octaviae, a magnificent structure, the lower part of which served as a promenade, while the upper part contained the library. The charge of the books was committed to C. Melissus. The other library formed by Augustus was attached to the temple of Apollo on the Palatine hill, and appears from inscriptions to have consisted of two departments, a Greek and a Latin one, which seem to have been separately administered. The charge of the Palatine collections was given to Pompeius Macer, who was succeeded by Julius Hyginus, the grammarian and friend of Ovid. The Octavian library perished in the fire which raged at Rome for three days in the reign of Titus. The Palatine was, at all events in great part, destroyed by fire in the reign of Commodus. The story that its collections were destroyed by order of Pope Gregory the Great in the 6th century is now generally rejected. The successors of Augustus, though they did not equal him in their patronage of learning, maintained the tradition of forming libraries. Tiberius, his immediate successor, established one in his splendid house on the Palatine, to which Gellius refers as the "Tiberian library," and Suetonius relates that he caused the writings and images of his favourite Greek poets to be placed in the public libraries. Vespasian established a library in the Temple of Peace erected after the burning of the city under Nero. Domitian restored the libraries which had been destroyed in the same conflagration, procuring books from every quarter, and even sending to Alexandria to have copies made. He is also said to have founded the Capitoline library, though others give the credit to Hadrian. The most famous and important of the imperial libraries, however, was that created by Ulpius Trajanus, known as the Ulpian library, which was first established in the Forum of Trajan, but was afterwards removed to the baths of Diocletian. In this library were deposited by Trajan the "libri lintei" and "libri elephantini," upon which the senatus consulta and other transactions relating to the emperors were written. The library of Domitian, which had been destroyed by fire in the reign of Commodus, was restored by Gordian, who added to it the books bequeathed to him by Serenus Sammonicus. Altogether in the 4th century there are said to have been twenty-eight public libraries in Rome.

Roman provincial libraries.

Nor were public libraries confined to Rome. We possess records of at least 24 places in Italy, the Grecian provinces, Asia Minor, Cyprus and Africa in which libraries had been established, most of them attached to temples, usually through the liberality of generous individuals. The library which the younger Pliny dedicated to his townsmen at Comum cost a million sesterces and he contributed a large sum to the support of a library at Milan. Hadrian established one at Athens, described by Pausanias, and recently identified with a building called the Stoa of Hadrian, which shows a striking similarity with the precinct of Athena at Pergamum. Strabo mentions a library at Smyrna; Aulus Gellius one at Patrae and another at Tibur from which books could be borrowed. Recent discoveries at Ephesus in Asia Minor and Timegad in Algeria have furnished precise information as to the structural plan of these buildings. The library at Ephesus was founded by T. Julius Aquila Polemaeanus in memory of his father, pro-consul of Asia in the time of Trajan, about A.D. 106–107. The library at Timegad was established at a cost of 400,000 sesterces by M. Julius Quintianus Flavius Rogatianus, who probably lived in the 3rd century (R. Cagnat, "Les Bibliothèques municipales dans l'Empire Romain," 1906, *Mém. de l'Acad. des Insc.*, tom. xxxviii. pt. 1). At Ephesus the light came through a circular opening in the roof; the library at Timegad greatly resembles that discovered at Pompeii and possesses a system of book stores. All these buildings followed the same general plan, consisting of a reading-room and more or less ample book stores; the former was either rectangular or semi-circular in shape and was approached under a stately portico and colonnade. In a niche facing the entrance a statue was always erected; that formerly at Pergamum—a figure of Minerva—is now preserved at Berlin. From a well-known line of Juvenal (*Sat.* iii. 219) we may assume that a statue of the goddess was usually placed in libraries. The reading-room was also ornamented with busts or life-sized images of celebrated writers. The portraits or authors were also painted on medallions on the presses (*armaria*) in which the books or rolls were preserved as in the library of Isidore of Seville; sometimes these medallions decorated the walls, as in a private library discovered by Lanciani in 1883 at Rome (*Ancient Rome*, 1888, p. 193). Movable seats, known to us by pictorial representations, were in use. The books were classified, and the presses (framed of precious woods and highly ornamented) were numbered to facilitate reference from the catalogues. A private library discovered at Herculaneum contained 1756 MSS. placed on shelves round the room to a height of about 6 ft. with a central press. In the public rooms some of the books were arranged in the reading-room and some in the adjacent book stores. The Christian libraries of later foundation closely followed the classical prototypes not only in their structure but also in smaller details. The general appearance of a Roman library is preserved in the library of the Vatican fitted up by Sextus V. in 1587 with painted presses, busts and antique vases.

As the number of libraries in Rome increased, the librarian, who was generally a slave or freedman, became a recognized public functionary. The names of several librarians are preserved to us in inscriptions, including that of C. Hymenaeus, who appears to have fulfilled the double function of physician and librarian to Augustus. The general superintendence of the public libraries was committed to a special official. Thus from Nero to Trajan, Dionysius, an Alexandrian rhetorician, discharged this function. Under Hadrian it was entrusted to his former tutor C. Julius Vestinus, who afterwards became administrator of the Museum at Alexandria.

Constantinople.

When the seat of empire was removed by Constantine to his new capital upon the Bosporus, the emperor established a collection there, in which Christian literature was probably admitted for the first time into an imperial library. Diligent search was made after the Christian books which had been doomed to destruction by Diocletian. Even at the death of Constantine, however, the number of books which had been brought together amounted only to 6900. The smallness of the number, it has been suggested, seems to show that Constantine's library was mainly intended as a repository of Christian literature. However this may be, the collection was greatly enlarged by some of Constantine's successors, especially by Julian and Theodosius, at whose death it is said to have increased to 100,000 vols. Julian, himself a close student and voluminous writer, though he did his best to discourage learning among the Christians, and to destroy their libraries, not only augmented the library at Constantinople, but founded others, including one at Nisibis, which was soon afterwards destroyed by fire. From the Theodosian code we learn that in the time of that emperor a staff of seven copyists was attached to the library at Constantinople under the direction of the librarian. The library was burnt under the emperor Zeno in 477, but was again restored.

Meanwhile, as Christianity made its way and a distinctively Christian literature grew up, the institution of libraries became part of the ecclesiastical organization. Bishop Alexander (d. A.D. 250) established a church library at Jerusalem, and it became the rule to attach to every church a collection necessary for the inculcation of Christian doctrine. There were libraries at Cirta, at Constantinople and at Rome. The basilica of St Lawrence at Rome contained a library or *archivum* founded by Pope Damasus at the end of the 4th century. Most of these collections were housed in the sacred edifices and consisted largely of copies of the Holy Scriptures, liturgical volumes and works of devotion. They also included the *Gesta Martyrum* and *Matriculae Pauperum* and official correspondence. Many of the basilicas had the apse subdivided into three smaller hemicycles, one of which contained the library (Lanciani, *op. cit.* p. 187). The largest of these libraries, that founded by Pamphilus (d. A.D. 309) at Caesarea, and said to have been increased by Eusebius, the historian of the church, to 30,000 vols., is frequently mentioned by St Jerome. St Augustine bequeathed his collection to the library of the church at Hippo, which was fortunate enough to escape destruction at the hands of the Vandals. The hermit communities of the Egyptian deserts formed organizations which developed into the later monastic orders of Western Europe and the accumulation of books for the brethren was one of their cares.

The removal of the capital to Byzantium was in its result a serious blow to literature. Henceforward the science and learning of the East and West were divorced. The libraries of Rome ceased to collect the writings of the Greeks, while the Greek libraries had never cared much to collect Latin literature. The influence of the church became increasingly hostile to the study of pagan letters. The repeated irruptions of the barbarians soon swept the old learning and libraries alike from the soil of Italy. With the close of the Western empire in 476 the ancient history of libraries may be said to cease.

MEDIEVAL PERIOD

Gaul.

During the first few centuries after the fall of the Western empire, literary activity at Constantinople had fallen to its lowest ebb. In the West, amidst the general neglect of learning and literature, the collecting of books, though not wholly forgotten, was cared for by few. Sidonius Apollinaris tells us of the libraries of several private collectors in Gaul. Publius Consentius possessed a library at his villa near Narbonne which was due to the labour of three generations. The most notable of these appears to have been the prefect Tonantius Ferreolus, who had formed in his villa of Prusiana, near Nîmes, a collection which his friend playfully compares to that of Alexandria. The Goths, who had been introduced to the Scriptures in their own language by Ulfilas in the 4th century, began to pay some attention to Latin literature. Cassiodorus, the favourite minister of Theodoric, was a collector as well as an author, and on giving up the cares of government retired to a monastery which he founded in Calabria, where he employed his monks in the transcription of books.

Henceforward the charge of books as well as of education fell more and more exclusively into the hands of the church. While the old schools of the rhetoricians died out new monasteries arose everywhere. Knowledge was no longer pursued for its own sake, but became subsidiary to religious and theological teaching. The proscription of the old classical literature, which is symbolized in the fable of the destruction of the Palatine library by Gregory the Great, was only too effectual. The Gregorian tradition of opposition to pagan learning long continued to dominate the literary pursuits of the monastic orders and the labours of the scriptorium.

Alcuin.

During the 6th and 7th centuries the learning which had been driven from the Continent took refuge in the British Islands, where it was removed from the political disturbances of the mainland. In the Irish monasteries during this period there appear to have been many books, and the Venerable Bede was superior to any scholar of his age. Theodore of Tarsus brought a considerable number of books to Canterbury from Rome in the 7th century, including several Greek authors. The library of York, which was founded by Archbishop Egbert, was almost more famous than that of Canterbury. The verses are well known in which Alcuin describes the extensive library under his charge, and the long list of authors whom he enumerates is superior to that of any other library possessed by either England or France in the 12th century, when it was unhappily burnt. The inroads of the Northmen in the 9th and 10th centuries had been fatal to the monastic libraries on both sides of the channel. It was from York that Alcuin came to Charlemagne to superintend the school attached to his palace; and it was doubtless inspired by Alcuin that Charles issued the memorable document which enjoined that in the bishoprics and monasteries within his realm care should be taken that there shall be not only a regular manner of life, but also the study of letters. When Alcuin finally retired from the court to the abbacy of Tours, there to carry out his own theory of monastic discipline and instruction, he wrote to Charles for leave to send to York for copies of the books of which they had so much need at Tours.

Charlemagne.

While Alcuin thus increased the library at Tours, Charlemagne enlarged that at Fulda, which had been founded in 774, and which all through the middle ages stood in great respect. Lupus Servatus, a pupil of Hrabanus Maurus at Fulda, and afterwards abbot of Ferrières, was a devoted student of the classics and a great collector of books. His correspondence illustrates the difficulties which then attended the study of literature through the paucity and dearness of books, the declining care for learning, and the increasing troubles of the time. Nor were private collections of books altogether wanting during the period in which Charlemagne and his successors laboured to restore the lost traditions of liberal education and literature. Pepin le Bref had indeed met with scanty response to the request for books which he addressed to the pontiff Paul I. Charlemagne, however, collected a considerable number of choice books for his private use in two places. Although these collections were dispersed at his death, his son Louis formed a library which continued to exist under Charles the Bald. About the same time Everard, count of Friuli, formed a considerable collection which he bequeathed to a monastery. But the greatest private collector of the middle ages was doubtless Gerbert, Pope Sylvester II., who showed the utmost zeal and spent large sums in collecting books, not only in Rome and Italy, but from Germany, Belgium and even from Spain.

St Benedict.

The hopes of a revival of secular literature fell with the decline of the schools established by Charles and his successors. The knowledge of letters remained the prerogative of the church, and for the next four or five centuries the collecting and multiplication of books were almost entirely confined to the monasteries. Several of the greater orders made these an express duty; this was especially the case with the Benedictines. It was the first care of St Benedict, we are told, that in each newly founded monastery there should be a library, "et velut curia quaedam illustrium auctorum." Monte Cassino became the starting-point of a long line of institutions which were destined to be the centres of religion and of literature. It must indeed be remembered that literature in the sense of St Benedict meant Biblical and theological works, the lives of the saints and martyrs, and the lives and writings of the fathers. Of the reformed Benedictine orders the Carthusians and the Cistercians were those most devoted to literary pursuits. The abbeys of Fleury, of Melk and of St Gall were remarkable for the splendour of their libraries. In a later age the labours of the congregation of St Maur form one of the most striking chapters in the history of learning. The Augustinians and the Dominicans rank next to the Benedictines in their care for literature. The libraries of St Geneviève and St Victor, belonging to the former, were amongst the largest of the monastic collections. Although their poverty might seem to put them at a disadvantage as collectors, the mendicant orders cultivated literature with much assiduity, and were closely connected with the intellectual movement to which the universities owed their rise. In England Richard of Bury praises them for their extraordinary diligence in collecting books. Sir Richard Whittington built a large library for the Grey Friars in London, and they possessed considerable libraries at Oxford.

It would be impossible to attempt here an account of all the libraries established by the monastic orders. We must be content to enumerate a few of the most eminent.

Monastic libraries.

In Italy Monte Cassino is a striking example of the dangers and vicissitudes to which monastic collections were exposed. Ruined by the Lombards in the 6th century, the monastery was rebuilt and a library established, to fall a prey to Saracens and to fire in the 9th. The collection then reformed survived many other chances and changes, and still exists. Boccaccio gives a melancholy description of its condition in his day. It affords a conspicuous example of monastic industry in the transcription not only of theological but also of classical works. The library of Bobbio, which owed its existence to Irish monks, was famous for its palimpsests. The collection, of which a catalogue of the 10th century is given by Muratori (*Antiq. Ital. Med. Aev.* iii. 817–824), was mainly transferred to the Ambrosian library at Milan. Of the library of Pomposia, near Ravenna, Montfaucon has printed a catalogue dating from the 11th century (*Diarium Italicum*, chap. xxii.).

Of the monastic libraries of France the principal were those of Fleury, of Cluny, of St Riquier and of Corbie. At Fleury Abbot Macharius in 1146 imposed a contribution for library purposes upon the officers of the community and its dependencies, an example which was followed elsewhere. After many vicissitudes, its MSS., numbering 238, were deposited in 1793 in the town library of Orleans. The library of St Riquier in the time of Louis the Pious contained 256 MSS., with over 500 works. Of the collection at Corbie in Picardy we have also catalogues dating from the 12th and from the 17th centuries. Corbie was famous for the industry of its transcribers, and appears to have stood in active literary intercourse with other monasteries. In 1638, 400 of its choicest manuscripts were removed to St Germain-des-Prés. The remainder were removed after 1794, partly to the national library at Paris, partly to the town library of Amiens.

The chief monastic libraries of Germany were at Fulda, Corvey, Reichenau and Sponheim. The library at Fulda owed much to Charlemagne and to its abbot Hrabanus Maurus. Under Abbot Sturmius four hundred monks were hired as copyists. In 1561 the collection numbered 774 volumes. The library of Corvey on the Weser, after being despoiled of some of its treasures in the Reformation age, was presented to the university of Marburg in 1811. It then contained 109 vols., with 400 or 500 titles. The library of Reichenau, of which several catalogues are extant, fell a prey to fire and neglect, and its ruin was consummated by the Thirty Years' War. The library of Sponheim owes its great renown to John Tritheim, who was abbot at the close of the 15th century. He found it reduced to 10 vols., and left it with upwards of 2000 at his retirement. The library at St Gall, formed as early as 816 by Gozbert, its second abbot, still exists.

England.

In England the principal collections were those of Canterbury, York, Wearmouth, Jarrow, Whitby, Glastonbury, Croyland, Peterborough and Durham. Of the library of the monastery of Christ Church, Canterbury, originally founded by Augustine and Theodore, and restored by Lanfranc and Anselm, a catalogue has been preserved dating from the 13th or 14th century, and containing 698 volumes, with about 3000 works. Bennet Biscop, the first abbot of Wearmouth, made five journeys to Rome, and on each occasion returned with a store of books for the library. It was destroyed by the Danes about 867. Of the library at Whitby there is a catalogue dating from the 12th century. The catalogue of Glastonbury has been printed by Hearne in his edition of John of Glastonbury. When the library of Croyland perished by fire in 1091 it contained about 700 vols. The library at Peterborough was also rich; from a catalogue of about the end of the 14th century it had 344 vols., with nearly 1700 titles. The catalogues of the library at the monastery of Durham have been printed by the Surtees Society, and form an interesting series. These catalogues with many others[1] afford abundant evidence of the limited character of the monkish collections, whether we look at the number of their volumes or at the nature of their contents. The scriptoria were manufactories of books and not centres of learning. That in spite of the labours of so many transcribers the costliness and scarcity of books remained so great may have been partly, but cannot have been wholly, due to the scarcity of writing materials. It may be suspected that indolence and carelessness were the rule in most monasteries, and that but few of the monks keenly realized the whole force of the sentiment expressed by one of their number in the 12th century—"Claustrum sine armario quasi castrum sine armamentario." Nevertheless it must be admitted that to the labours of the monastic transcribers we are indebted for the preservation of Latin literature.

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[1] The oldest catalogue of a western library is that of the monastery of Fontanelle in Normandy compiled in the 8th century. Many catalogues may be found in the collections of D'Achery, Martene and Durand, and Pez, in the bibliographical periodicals of Naumann and Petzholdt and the *Centralblatt f. Bibliothekswissenschaft*. The Rev. Joseph Hunter has collected some particulars as to the contents of the English monastic libraries, and Ed. Edwards has printed a list of the catalogues (*Libraries and Founders of Libraries*, 1865, pp. 448–454). See also G. Becker, *Catalogi Bibliothecarum Antiqui* (1885). There are said to be over six hundred such catalogues in the Royal Library at Munich. In the 14th century the Franciscans compiled a general catalogue of the MSS. in 160 English libraries and about the year 1400 John Boston, a Benedictine monk of Bury, travelled over England and a part of Scotland and examined the libraries of 195 religious houses (Tanner, *Bibliotheca Brit. Hibern.* 1748). Leland's list of the books he found during his visitation of the houses in 1539–1545 is printed in his *Collectanea* (ed. Hearne, 1715, 6 vols.). T. W. Williams has treated Gloucestershire and Bristol medieval libraries and their catalogues in a paper in the Bristol and Gloucestershire *Arch. Soc.* vol. xxxi.

The development of library arrangements.

The subject of the evolution of the arrangement of library rooms and fittings as gradually developed throughout medieval Europe should not be passed over.[1] The real origin of library organization in the Christian world, one may almost say the origin of modern library methods, began with the rule of St Benedict early in the 6th century. In the 48th chapter the monks were ordered to borrow a book apiece and to read it straight through. There was no special apartment for the books in the primitive Benedictine house. After the books became too numerous to be kept in the church they were preserved in *armaria*, or chests, in the cloister; hence the word *armarius*, the Benedictine librarian, who at first joined with it the office of precentor. The Benedictine regulations were developed in the stricter observances of the Cluniacs, which provided for a kind of annual report and stocktaking. The Carthusians were perhaps the first to lend books away from the convent; and the Cistercians to possess a separate library official as well as a room specially devoted to books. The observances of the Augustinians contained rules for the binding, repairing, cataloguing and arranging the books by the librarian, as well as a prescription of the exact kind of chest to be used. Among the Premonstratensians or Reformed Augustinians, it was one of the duties of the librarian to provide for the borrowing of books elsewhere for the use of the monks. The Mendicant Friars found books so necessary that at last Richard de Bury tells us with some exaggeration that their libraries exceeded all others. Many volumes still exist which belonged to the library at Assisi, the parent house of the Franciscans, of which a catalogue was drawn up in 1381. No authentic monastic bookcase can now be found; the doubtful example shown at Bayeux probably contained ecclesiastical utensils. At the Augustinian priory at Barnwell the presses were lined with wood to keep out the damp and were partitioned off both vertically and horizontally. Sometimes there were recesses in the walls of the cloisters fitted with shelves and closed with a door. These recesses developed into a small windowless room in the Cistercian houses. At Clairvaux, Kirkstall, Fountains, Tintern, Netley and elsewhere this small chamber was placed between the chapter-house and the transept of the church. At Meaux in Holderness the books were lodged on shelves against the walls and even over the door of such a chamber. In many houses the treasury or spendiment contained two classes of books—one for the monks generally, others more closely guarded. A press near the infirmary contained books used by the reader in the refectory. By the end of the 15th century the larger monasteries became possessed of many volumes and found themselves obliged to store the books, hitherto placed in various parts of the building, in a separate apartment. We now find libraries being specially built at Canterbury, Durham, Citeaux, Clairvaux and elsewhere, and with this specialization there grew up increased liberality in the use of books and learned strangers were admitted. Even at an early date students were permitted to borrow from the Benedictines at St Germain-des-Prés at Paris, of which a later foundation owned in 1513 a noble library erected over the south wall of the cloister, and enlarged and made very accessible to the outer world in the 17th and 18th centuries. The methods and fittings of college libraries of early foundation closely resembled those of the monastic libraries. There was in both the annual giving out and inspection of what we would now call the lending department for students; while the books, fastened by chains—a kind of reference department kept in the library chamber for the common use of the fellows—followed a similar system in monastic institutions. By the 15th century collegiate and monastic libraries were on the same plan, with the separate room containing books placed on their sides on desks or lecterns, to which they were attached by chains to a horizontal bar. As the books increased the accommodation was augmented by one or two shelves erected above the desks. The library at Cesena in North Italy may still be seen in its original condition. The Laurentian library at Florence was designed by Michelangelo on the monastic model. Another good example of the old form may be seen in the library of Merton College at Oxford, a long narrow room with bookcases standing between the windows at right angles to the walls. In the chaining system one end was attached to the wooden cover of the book while the other ran freely on a bar fixed by a method of double locks to the front of the shelf or desk on which the book rested. The fore edges of the volumes faced the reader. The seat and shelf were sometimes combined. Low cases were subsequently introduced between the higher cases, and the seat replaced by a step. Shelf lists were placed at the end of each case. There were no chains in the library of the Escorial, erected in 1584, which showed for the first time bookcases placed against the walls. Although chains were no longer part of the appliances in the newly erected libraries they continued to be used and were ordered in bequests in England down to the early part of the 18th century. Triple desks and revolving lecterns, raised by a wooden screw, formed part of the library furniture. The English cathedral libraries were fashioned after the same principle. The old methods were fully reproduced in the fittings at Westminster, erected at a late date. Here we may see books on shelves against the walls as well as in cases at right angles to the walls; the desk-like shelves for the chained volumes (no longer in existence) have a slot in which the chains could be suspended, and are hinged to allow access to shelves below. An ornamental wooden tablet at the end of each case is a survival of the old shelf list. By the end of the 17th century the type of the public library developed from collegiate and monastic prototypes, became fixed as it were throughout Europe (H. R. Tedder, "Evolution of the Public Library," in *Trans. of 2nd Int. Library Conference*, 1897, 1898).

Arabians.

The first conquests of the Arabians, as we have already seen, threatened hostility to literature. But, as soon as their conquests were secured, the caliphs became the patrons of learning and science. Greek manuscripts were eagerly sought for and translated into Arabic, and colleges and libraries everywhere arose. Baghdad in the east and Cordova in the west became the seats of a rich development of letters and science during the age when the civilization of Europe was most obscured. Cairo and Tripoli were also distinguished for their libraries. The royal library of the Fatimites in Africa is said to have numbered 100,000 manuscripts, while that collected by the Omayyads of Spain is reported to have contained six times as many. It is said that there were no less than seventy libraries opened in the cities of Andalusia. Whether these figures be exaggerated or not—and they are much below those given by some Arabian writers, which are undoubtedly so—it is certain that the libraries of the Arabians and the Moors of Spain offer a very remarkable contrast to those of the Christian nations during the same period.[2]

Renaissance.

The literary and scientific activity of the Arabians appears to have been the cause of a revival of letters amongst the Greeks of the Byzantine empire in the 9th century. Under Leo the Philosopher and Constantine Porphyrogenitus the libraries of Constantinople awoke into renewed life. The compilations of such writers as Stobaeus, Photius and Suidas, as well as the labours of innumerable critics and commentators, bear witness to the activity, if not to the lofty character of the pursuits, of the Byzantine scholars. The labours of transcription were industriously pursued in the libraries and in the monasteries of Mount Athos and the Aegean, and it was from these quarters that the restorers of learning brought into Italy so many Greek manuscripts. In this way many of the treasures of ancient literature had been already conveyed to the West before the fate which overtook the libraries of Constantinople on the fall of the city in 1453.

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[1] This subject has been specially treated by J. Willis Clark in several works, of which the chief is a masterly volume, *The Care of Books* (1901). See also Dom Gasquet, "On Medieval Monastic Libraries," in his *Old English Bible* (1897).

[2] Among the Arabs, however, as among the Christians, theological bigotry did not always approve of non-theological literature, and the great library of Cordova was sacrificed by Almanzor to his reputation for orthodoxy, 978 A.D.

Meanwhile in the West, with the reviving interest in literature which already marks the 14th century, we find arising outside the monasteries a taste for collecting books. St Louis of France and his successors had formed small collections, none of which survived its possessor. It was reserved for Charles V. to form a considerable library which he intended to be permanent. In 1373 he had amassed 910 volumes, and had a catalogue of them prepared, from which we see that it included a good deal of the new sort of literature. In England Guy, earl of Warwick, formed a curious collection of French romances, which he bequeathed to Bordesley Abbey on his death in 1315. Richard d'Aungervyle of Bury, the author of the *Philobiblon*, amassed a noble collection of books, and had special opportunities of doing so as Edward III.'s chancellor and ambassador. He founded Durham College at Oxford, and equipped it with a library a hundred years before Humphrey, duke of Gloucester, made his benefaction of books to the university. The taste for secular literature, and the enthusiasm for the ancient classics, gave a fresh direction to the researches of collectors. A disposition to encourage literature began to show itself amongst the great. This was most notable amongst the Italian princes. Cosimo de' Medici formed a library at Venice while living there in exile in 1433, and on his return to Florence laid the foundation of the great Medicean library. The honour of establishing the first modern public library in Italy had been already secured by Niccolo Niccoli, who left his library of over 800 volumes for the use of the public on his death in 1436. Frederick, duke of Urbino, collected all the writings in Greek and Latin which he could procure, and we have an interesting account of his collection written by his first librarian, Vespasiano. The ardour for classical studies led to those active researches for the Latin writers who were buried in the monastic libraries which are especially identified with the name of Poggio. For some time before the fall of Constantinople, the perilous state of the Eastern empire had driven many Greek scholars from that capital into western Europe, where they had directed the studies and formed the taste of the zealous students of the Greek language and literature. The enthusiasm of the Italian princes extended itself beyond the Alps. Matthias Corvinus, king of Hungary, amassed a collection of splendidly executed and magnificently bound manuscripts, which at his death are said to have reached the almost incredible number of 50,000 vols. The library was not destined long to survive its founder. There is reason to believe that it had been very seriously despoiled even before it perished at the hands of the Turks on the fall of Buda in 1527. A few of its treasures are still preserved in some of the libraries of Europe. While these munificent patrons of learning were thus taking pains to recover and multiply the treasures of ancient literature by the patient labour of transcribers and calligraphers, an art was being elaborated which was destined to revolutionize the whole condition of literature and libraries. With the invention of printing, so happily coinciding with the revival of true learning and sound science, the modern history of libraries may be said to begin.

MODERN LIBRARIES

In most of the European countries and in the United States libraries of all kinds have during the last twenty years been undergoing a process of development and improvement which has greatly altered their policy and methods. At one time libraries were regarded almost entirely as repositories for the storage of books to be used by the learned alone, but now they are coming to be regarded more and more as workshops or as places for intellectual recreation adapted for every department of life. This is particularly to be found as the ideal in the public libraries of the Anglo-Saxon races throughout the world.

The following details comprise the chief points in the history, equipment and methods of the various libraries and systems noticed.

The United Kingdom.

State Libraries.—The British Museum ranks in importance before all the great libraries of the world, and excels in the arrangement and accessibility of its contents. The library consists of over 2,000,000 printed volumes and 56,000 manuscripts, but this large total does not include pamphlets and other small publications which are usually counted in other libraries. Adding these together it is probable that over 5,000,000 items are comprised in the collections. This extraordinary opulence is principally due to the enlightened energy of Sir Anthony Panizzi (*q.v.*). The number of volumes in the printed book department, when he took the keepership in 1837, was only 240,000; and during the nineteen years he held that office about 400,000 were added, mostly by purchase, under his advice and direction. It was Panizzi likewise who first seriously set to work to see that the national library reaped all the benefits bestowed upon it by the Copyright Act.

British Museum.

The foundation of the British Museum dates from 1753, when effect was given to the bequest (in exchange for £20,000 to be paid to his executors) by Sir Hans Sloane, of his books, manuscripts, curiosities, &c., to be held by trustees for the use of the nation. A bill was passed through parliament for the purchase of the Sloane collections and of the Harleian MSS., costing £10,000. To these, with the Cottonian MSS., acquired by the country in 1700, was added by George II., in 1757, the royal library of the former kings of England, coupled with the privilege, which that library had for many years enjoyed, of obtaining a copy of every publication entered at Stationers' Hall. This addition was of the highest importance, as it enriched the museum with the old collections of Archbishop Cranmer, Henry prince of Wales, and other patrons of literature, while the transfer of the privilege with regard to the acquisition of new books, a right which has been maintained by successive Copyright Acts, secured a large and continuous augmentation. A lottery having been authorized to defray the expenses of purchases, as well as for providing suitable accommodation, the museum and library were established in Montague House, and opened to the public 15th January 1759. In 1763 George III. presented the well-known Thomason collection (in 2220 volumes) of books and pamphlets issued in England between 1640 and 1662, embracing all the controversial literature which appeared during that period. The Rev. C. M. Cracherode, one of the trustees, bequeathed his collection of choice books in 1799; and in 1820 Sir Joseph Banks left to the nation his important library of 16,000 vols. Many other libraries have since then been incorporated in the museum, the most valuable being George III.'s royal collection (15,000 vols. of tracts, and 65,259 vols. of printed books, including many of the utmost rarity, which had cost the king about £130,000), which was presented (for a pecuniary consideration, it has been said) by George IV. in 1823, and that of the Right Honourable Thomas Grenville (20,240 vols. of rare books, all in fine condition and binding), which was acquired under bequest in 1846. The Cracherode, Banksian, King's and Grenville libraries are still preserved as separate collections. Other libraries of minor note have also been absorbed in a similar way, while, at least since the time of Panizzi, no opportunity has been neglected of making useful purchases at all the British and Continental book auctions.

The collection of English books is far from approaching completeness, but, apart from the enormous number of volumes, the library contains an extraordinary quantity of rarities. Few libraries in the United States equal either in number or value the American books in the museum. The collection of Slavonic literature, due to the initiative of Thomas Watts, is also a remarkable feature. Indeed, in cosmopolitan interest the museum is without a rival in the world, possessing as it does the best library in any European language out of the territory in which the language is vernacular. The Hebrew, the Chinese, and printed books in other Oriental languages are important and represented in large numbers. Periodical literature has not been forgotten, and the series of newspapers is of great extent and interest. Great pains are taken by the authorities to obtain the copies of the newspapers published in the United Kingdom to which they are entitled by the provisions of the Copyright Act, and upwards of 3400 are annually collected, filed and bound.

The department of MSS. is almost equal in importance to that of the printed books. The collection of MSS. in European languages ranges from the 3rd century before Christ down to our own times, and includes the *Codex Alexandrinus* of the Bible. The old historical chronicles of England, the charters of the Anglo-Saxon kings, and the celebrated series of Arthurian romances are well represented; and care has been taken to acquire on every available opportunity the unprinted works of English writers. The famous collections of MSS. made by Sir Robert Cotton and Robert Harley, earl of Oxford, have already been mentioned, and from these and other sources the museum has become rich in early Anglo-Saxon and Latin codices, some of them being marvels of skill in calligraphy and ornamentation, such as the charters of King Edgar and Henry I. to Hyde Abbey, which are written in gold letters; or the Lindisfarne gospels (A.D. 700) containing the earliest extant Anglo-Saxon version of the Latin gospels. The Burney collection of classical MSS. furnished important additions, so that from this source and from the collection of Arundel MSS. (transferred from the Royal Society in 1831), the museum can boast of an early copy of the *Iliad*, and one of the earliest known codices of the *Odyssey*. Among the unrivalled collection of Greek papyri are the unique MSS. of several works of ancient literature. Irish, French and Italian MSS. are well represented. Special reference may be made to the celebrated Bedford Hours, illuminated for the duke of Bedford, regent of France, to the Sforza Book of Hours and to Queen Mary's Psalter. The Oriental collection is also extremely valuable, including the library formed by Mr Rich (consul at Baghdad in the early part of the 19th century), and a vast quantity of Arabic, Persian and Turkish MSS.; the Chambers collection of Sanskrit MSS.; several other collections of Indian MSS.; and a copious library of Hebrew MSS. (including that of the great scholar Michaelis, and codices of great age, recently brought from Yemen). The collection of Syriac MSS., embracing the relics of the famous library of the convent of St Mary Deipara in the Nitrian desert, formed by the abbot Moses of Nisibis, in the 10th century, is the most important in existence; of the large store of Abyssinian volumes many were amassed after the campaign against King Theodore. The number of genealogical rolls and documents relating to the local and family history of Great Britain is very large. Altogether there are now more than 56,000 MSS. (of which over 9000 are Oriental), besides more than 75,000 charters and rolls. There is a very large and valuable collection of printed and manuscript music of all kinds, and it is probable that of separate pieces there are nearly 200,000. The catalogue of music is partly in manuscript and partly printed, and a separate printed catalogue of the MS. music has been published. The number of maps is also very large, and a printed catalogue has been issued.

The general catalogue of the printed books was at one time kept in MS. in large volumes, but since 1880 the entries have gradually been superseded by the printed titles forming part of the large alphabetical catalogue which was completed in 1900. This important work is arranged in the order of authors' names, with occasional special entries at words like Bible, periodicals and biographical names. It is being constantly supplemented and forms an invaluable bibliographical work of reference.

The other printed catalogues of books commence with one published in 2 vols. folio (1787), followed by that of 1813–1819 in 7 vols. 8vo; the next is that of the library of George III. (1820–1829, 5 vols. folio, with 2 vols. 8vo, 1834), describing the geographical and topographical collections; and then the *Bibliotheca Grenvilliana* (1842–1872, 4 vols. 8vo). The first vol. (letter A) of a general catalogue appeared in 1841 in a folio volume which has never been added to. The octavo catalogue of the Hebrew books came out in 1867; that of the Sanskrit and Pali literature is in 4to (1876); and the Chinese catalogue is also in 4to (1877). There is a printed list of the books of reference (1910) in the reading-room.

The printed catalogues of the MSS. are—that of the old Royal Library (1734, 4to), which in 1910 was shortly to be superseded by a new one; the Sloane and others hitherto undescribed (1782, 2 vols. 4to); the Cottonian (1802, folio); the Harleian (1808, 4 vols. folio); the Hargrave (1818, 4to); the Lansdowne (1819, folio); the Arundel (1840, folio); the Burney (1840, folio); the Stowe (1895–1896, 4to); the Additional, in periodical volumes since 1836; the Greek Papyri (1893–1910); the Oriental (Arabic and Ethiopic), 5 pts., folio (1838–1871); the Syriac (1870–1873, 3 pts., 4to); the Ethiopic (1877, 4to); the Persian (1879–1896, 4 vols. 4to); and the Spanish (1875–1893, 4 vols. 8vo); Turkish (1888); Hebrew and Samaritan (1900–1909, 3 vols.); Sanskrit (1903); Hindi, &c. (1899); Sinhalese (1900). There are also catalogues of the Greek and Egyptian papyri (1839–1846, 5 pts., folio). Many other special catalogues have been issued, including one of the Thomason Collection of Civil War pamphlets, Incunabula (vol. i.), Romances (MSS.), Music, Seals and Arabic, Hebrew and other Oriental books, maps, prints and drawings. Perhaps the most useful catalogue of all is the *Subject-index to Modern Works* issued in 1881–1905 (4 vols.) and compiled by Mr G. K. Fortescue.

The *Rules for compiling catalogues in the department of printed books* were revised and published in 1906.

The building in which the library is housed forms part of the fine group situated in Great Russell Street in central London, and is distinguished by a stately circular reading-room designed by Sydney Smirke from suggestions and sketches supplied by Sir A. Panizzi. This was begun in 1855 and opened in 1857. The room is surrounded by book stores placed in galleries with iron floors, in which, owing to congestion of stock, various devices have been introduced, particularly a hanging and rolling form of auxiliary bookcase. The presses inside the reading-room, arranged in three tiers, contain upwards of 60,000 vols., those on the ground floor (20,000) being books of reference to which readers have unlimited access. The accommodation for readers is comfortable and roomy, each person having a portion of table fitted with various conveniences. Perhaps not the least convenient arrangement here is the presence of the staff in the centre of the room, at the service of readers who require aid.

In order to enjoy the privilege of reading at the British Museum, the applicant (who must be over twenty-one years of age) must obtain a renewable ticket of admission through a recommendation from a householder addressed to the principal librarian.

The pressure upon the space at the command of the library has been so great that additional land at the rear and sides of the existing buildings was purchased by the government for the further extension of the Museum. One very important wing facing Torrington Square was nearly completed in 1910. The Natural History Museum, South Kensington, a department of the British Museum under separate management, has a library of books on the natural sciences numbering nearly 100,000 vols.

Patent Office.

Next in importance to the British Museum, and superior to it in accessibility, is the Library of the Patent Office in Southampton Buildings, London. This is a department of the Board of Trade, and though primarily intended for office use and patentees, it is really a public library freely open to anyone. The only formality required from readers is a signature in a book kept in the entrance hall. After this readers have complete access to the shelves. The library contains considerably over 110,000 vols., and possesses complete sets of the patents specifications of all countries, and a remarkable collection of the technical and scientific periodicals of all countries. The library was first opened in 1855, in somewhat unsuitable premises, and in 1897 it was transferred to a handsome new building.

The reading-room is provided with two galleries and the majority of the books are open to public inspection without the need for application forms. A printed catalogue in author-alphabetical form has been published with supplement, and in addition, separate subject catalogues are issued. This is one of the most complete libraries of technology in existence, and its collection of scientific transactions and periodicals is celebrated.

Other state libraries.

Another excellent special library is the National Art Library, founded in 1841 and transferred to South Kensington in 1856. It contains about half a million books, prints, drawings and photographs, and is used mostly by the students attending the art schools, though the general public can obtain admission on payment of sixpence per week.

A somewhat similar library on the science side is the

Science Library of the Victoria and Albert Museum, South Kensington, which was founded in 1857. It is a general science collection and incorporates most of the books which at one time were in the Museum of Practical Geology.

The only other state library which is open to the public is that of the Board of Education in Whitehall, which was opened in a new building in 1908. It contains a large collection of works on educational subjects for which a special classification has been devised and printed.

The other state libraries in London may be briefly noted as follows: Admiralty (1700), 40,000 vols.; College of Arms, or Heralds College, 15,000 vols.; Colonial Office, *c.* 15,000 vols.; Foreign Office, *c.* 80,000 vols.; Home Office (1800) *c.* 10,000 vols.; House of Commons (1818), *c.* 50,000 vols.; House of Lords (1834), 50,000 vols.; India Office (1800), *c.* 86,000 vols.; Kew, Royal Botanic Gardens (1853), 22,000 vols.; and Royal Observatory (Greenwich), *c.* 20,000 vols.

Outside London the most important state library is the National Library of Ireland, Dublin, founded in 1877 and incorporating the library of the Royal Dublin Society. It is housed in a handsome building (1890) and contains about 200,000 vols., classified on the Decimal system, and catalogued in various forms. The library of the Museum of Science and Art at Edinburgh, containing over 20,000 vols., was opened to the public in 1890. Practically every department of the state has a reference library of some kind for the use of the staff, and provision is also made for lending libraries and reading-rooms in connexion with garrisons, naval depots and other services of the army and navy.

No professional qualifications are required for positions in British state libraries, most of the assistants being merely second-division clerks who have passed the Civil Service examinations. It would be an advantage from an administrative point of view if the professional certificates of the Library Association were adopted by the Civil Service Commissioners as compulsory requirements in addition to their own examination. The official recognition of a grade of properly trained librarians would tend to improve the methods and efficiency of the state libraries, which are generally behind the municipal libraries in organization and administration.

Oxford.

University and Collegiate Libraries.—The Bodleian Library, Oxford, though it had been preceded by various efforts towards a university library, owed its origin to Sir Thomas Bodley (*q.v.*). Contributing largely himself, and procuring contributions from others, he opened the library with upwards of 2000 vols. in 1602. In 1610 he obtained a grant from the Stationers' Company of a copy of every work printed in the country, a privilege still enjoyed under the provisions of the various copyright acts. The additions made to the library soon surpassed the capacity of the room, and the founder proceeded to enlarge it. By his will he left considerable property to the university for the maintenance and increase of the library. The example set by Bodley found many noble imitators. Amongst the chief benefactors have been Archbishop Laud, the executors of Sir Kenelm Digby, John Selden, Sir Thomas (Lord) Fairfax, Richard Gough, Francis Douce, Richard Rawlinson, and the Rev. Robert Mason. The library now contains almost 800,000 printed vols., and about 41,000 manuscripts. But the number of volumes, as bound up, conveys a very inadequate idea of the size or value of the collection. In the department of Oriental manuscripts it is perhaps superior to any other European library; and it is exceedingly rich in other manuscript treasures. It possesses a splendid series of Greek and Latin *editiones principes* and of the earliest productions of English presses. Its historical manuscripts contain most valuable materials for the general and literary history of the country.

The last general catalogue of the printed books was printed in 4 vols. folio (1843–1851). In 1859 it was decided to prepare a new manuscript catalogue on the plan of that then in use at the British Museum, and this has been completed in duplicate. In 1910 it was being amended with a view to printing. It is an alphabetical author-catalogue; and the Bodleian, like the British Museum, has no complete subject-index. A slip-catalogue on subjects was, however, in course of preparation in 1910, and there are classified hand-lists of accessions since 1883. There are also printed catalogues of the books belonging to several of the separate collections. The MSS. are in general catalogued according to the collections to which they belong, and they are all indexed. A number of the catalogues of manuscripts have been printed.

In 1860 the beautiful Oxford building known as the "Radcliffe Library," now called the "Radcliffe Camera," was offered to the curators of the Bodleian by the Radcliffe trustees. The Radcliffe Library was founded by the famous physician Dr John Radcliffe, who died in 1714, and bequeathed, besides a permanent endowment of £350 a year, the sum of £40,000 for a building. The library was opened in 1749. Many years ago the trustees resolved to confine their purchases of books to works on medicine and natural science. When the university museum and laboratories were built in 1860, the trustees allowed the books to be transferred to the museum. It is used as a storehouse for the more modern books, and it also serves as a reading-room. It is the only room open after the hour when the older building is closed owing to the rule as to the exclusion of artificial light. In 1889 the gallery of the Radcliffe Camera was opened as an addition to the reading-room.

A *Staff Kalendar* has been issued since 1902, which with a *Supplement* contains a complete list of cataloguing rules, routine work of the libraries and staff, and useful information of many kinds concerning the library methods.

The Bodleian Library is open by right to all graduate members of the university, and to others upon producing a satisfactory recommendation. No books are allowed to be sent out of the library except by special leave of the curators and convocation of the university. The administration and control of the library are committed to a librarian and board of thirteen curators. The permanent endowment is comparatively small; the ordinary expenditure, chiefly defrayed from the university chest, is about £10,000. Within recent years the use of wheeling metal bookcases has been greatly extended, and a large repository has been arranged for economical book storage underground.

The Taylor Institution is due to the benefaction of Sir Robert Taylor, an architect, who died in 1788, leaving his property to found an establishment for the teaching of modern languages. The library was established in 1848, and is devoted to the literature of the modern European languages. It contains a fair collection of works on European philology, with a special Dante collection, about 1000 Mazarinades and 400 Luther pamphlets. The Finch collection, left to the university in 1830, is also kept with the Taylor Library. Books are lent out to members of the university and to others on a proper introduction. The endowment affords an income of £800 to £1000 for library purposes.

The libraries of the several colleges vary considerably in extent and character, although, owing chiefly to limited funds, the changes and growth of all are insignificant. That of All Souls was established in 1443 by Archbishop Chichele, and enlarged in 1710 by the munificent bequest of Christopher Codrington. It devotes special attention to jurisprudence, of which it has a large collection. It possesses 40,000 printed volumes and 300 MSS., and fills a splendid hall 200 ft. long. The library of Brasenose College has a special endowment fund, so that it has, for a college library, the unusually large income of £200. The library of Christ Church is rich in divinity and topography. It embraces the valuable library bequeathed by Charles Boyle, 4th earl of Orrery, amounting to 10,000 volumes, the books and MSS. of Archbishop Wake, and the Morris collection of Oriental books. The building was finished in 1761, and closely resembles the basilica of Antoninus at Rome, now the Dogana. Corpus possesses a fine collection of Aldines, many of them presented by its founder, Bishop Fox, and a collection of 17th-century tracts catalogued by Mr Edwards, with about 400 MSS. Exeter College Library has 25,000 volumes, with special collections of classical dissertations and English theological and political tracts. The library of Jesus College has few books of later date than the early part of the last century. Many of them are from the bequest of Sir Leoline Jenkins, who built the existing library. There are also some valuable Welsh MSS. The library of Keble College consists largely of theology, including the MSS. of many of Keble's works. The library of Magdalen College has about 22,500 volumes (including many volumes of pamphlets) and 250 MSS. It has scientific and topographical collections. The library of Merton College has of late devoted itself to foreign modern history. New College Library has about 17,000 printed volumes and about 350 MSS., several of which were presented by its founder, William of Wykeham. Oriel College Library, besides its other possessions, has a special collection of books on comparative philology and mythology, with a printed catalogue. The fine library of Queen's College is strong in theology, in English and modern European history, and in English county histories. St John's College Library is largely composed of the literature of theology and jurisprudence before 1750, and possesses a collection of medical books of the 16th and 17th centuries. The newer half of the library building was erected by Inigo Jones at the expense of Laud, who also gave many printed and manuscript books. The room used as a library at Trinity College formed part of Durham College, the library of which was established by Richard of Bury. Wadham College Library includes a collection of botanical books bequeathed by Richard Warner in 1775 and a collection of books, relating chiefly to the Spanish Reformers, presented by the executors of Benjamin Wiffen. Worcester College Library has of late specially devoted itself to classical archaeology. It is also rich in old plays.

The college libraries as a rule have not been used to the extent they deserve, and a good deal must be done before they can be said to be as useful and efficient as they might be.

Cambridge.

The history of the University Library at Cambridge dates from the earlier part of the 15th century. Two early lists of its contents are preserved, the first embracing 52 vols. dating from about 1425, the second a shelf-list, apparently of 330 vols., drawn up by the outgoing proctors in 1473. Its first great benefactor was Thomas Scott of Rotherham, archbishop of York, who erected in 1475 the building in which the library continued until 1755. He also gave more than 200 books and manuscripts to the library, some of which still remain. The library received other benefactions, but nevertheless appeared "but mean" to John Evelyn when he visited Cambridge in 1654. In 1666 Tobias Rustat presented a sum of money to be invested to buy the choicest and most useful books. In 1715 George I. presented the library of Bishop Moore, which was very rich in early English printed books, forming over 30,000 vols. of printed books and manuscripts. The funds bequeathed by William Worts and John Manistre, together with that of Rustat, produce at present about £1500 a year. The share of university dues appropriated to library purposes amounts to £3000 a year. In addition the library is entitled to new books under the Copyright Acts. The number of printed volumes in the library cannot be exactly stated, as no recent calculation on the subject exists. It has been estimated at half a million. It includes a fine series of *editiones principes* of the classics and of the early productions of the English press. The MSS. number over 6000, in which are included a considerable number of adversaria or printed books with MS. notes, which form a leading feature in the collection. The most famous of the MSS. is the celebrated copy of the four gospels and the Acts of the Apostles, which is known as *Codex Bezae*, and which was presented to the university by that Reformer.

A catalogue of the MSS. has been published in 4 vols. (1856–1861), and this has been followed up by the publication of a number of separate catalogues of Persian, Syriac, Hebrew, Chinese, &c , MSS. There is no published catalogue of the books, although the catalogue is in print, the accessions being printed and cut up and arranged in volumes. A catalogue of English books before 1640 is in course of publication. The regulations of the library with regard to the lending of books are very liberal, as many as ten volumes being allowed out to one borrower at the same time. The annual income is about £7000.

There is a library attached to the Fitzwilliam Museum, bequeathed to the university in 1816. It consists of the entire library of Lord Fitzwilliam, with the addition of an archaeological library bought from the executors of Colonel Leake, and a small number of works, chiefly on the history of art, since added by purchase or bequest. It contains a collection of engravings of old masters, a collection of music, printed and MS., and a collection of illuminated MSS., chiefly French and Flemish, of the 14th to 16th centuries. The books are not allowed to be taken out. Catalogues and reprints of some of the music and other collections have been published.

The library of Trinity College, which is contained in a magnificent hall built by Sir Christopher Wren, has about 90,000 printed and 1918 MS. vols., and is especially strong in theology, classics and bibliography. It owes to numerous gifts and bequests the possession of a great number of rare books and manuscripts. Amongst these special collections are the Capell collection of early dramatic and especially Shakespearian literature, the collection of German theology and philosophy bequeathed by Archdeacon Hare, and the Grylls bequest in 1863 of 9600 vols., including many early printed books. There are printed catalogues of the Sanskrit and other Oriental MSS. by Dr Aufrecht and Professor Palmer, and of the incunabula by the late librarian, Mr Sinker. The library is open to all members of the college, and the privilege of using it is liberally extended to properly accredited students. One of the most interesting libraries is that of Trinity Hall, in which the original bookcases and benches are preserved, and many books are seen chained to the cases, as used formerly to be the practice.

None of the other college libraries rivals Trinity in the number of books. The library of Christ's College received its first books from the foundress. Clare College Library includes a number of Italian and Spanish plays of the end of the 16th century left by George Ruggle. The library of Corpus Christi College first became notable through the bequest of books and MSS. made by Archbishop Parker in 1575. The printed books are less than 5000 in number, and the additions now made are chiefly in such branches as throw light on the extremely valuable collection of ancient MSS., which attracts scholars from all parts of Europe. There is a printed catalogue of these MSS. Gonville and Caius College Library is of early foundation. A catalogue of the MSS. was printed in 1849, with pictorial illustrations, and a list of the incunabula in 1850. The printed books of King's College includes the fine collection bequeathed by Jacob Bryant in 1804. The MSS. are almost wholly Oriental, chiefly Persian and Arabic, and a catalogue of them has been printed. Magdalene College possesses the curious library formed by Pepys and bequeathed by him to the college, together with his collections of prints and drawings and of rare British portraits. It is remarkable for its treasures of popular literature and English ballads, as well as for the Scottish manuscript poetry collected by Sir Richard Maitland. The books are kept in Pepys's own cases, and remain just as he arranged them himself. The library of Peterhouse is the oldest library in Cambridge, and possesses a catalogue of some 600 or 700 books dating from 1418, in which year it was completed. It is chiefly theological, though it possesses a valuable collection of modern works on geology and natural science, and a unique collection of MS. music. Queen's College Library contains about 30,000 vols. mainly in theology, classics and Semitic literature, and has a printed class-catalogue. The library of St John's College is rich in early printed books, and possesses a large collection of English historical tracts. Of the MSS. and rare books there is a printed catalogue.

London.

The library of the university of London, founded in 1837, has over 60,000 vols. and includes the Goldsmith Library of economic literature, numbering 30,000 vols. Other collections are De Morgan's collection of mathematical books, Grote's classical library, &c. There is a printed catalogue of 1897, with supplements. Since its removal to South Kensington, this library has been greatly improved and extended. University College Library, Gower Street, established in 1829, has close upon 120,000 vols. made up chiefly of separate collections which have been acquired from time to time. Many of these collections overlap, and much duplicating results, leading to congestion. These collections include Jeremy Bentham's library, Morrison's Chinese library, Barlow's Dante library, collections of law, mathematical, Icelandic, theological, art, oriental and other books, some of them of great value.

King's College Library, founded in 1828, has over 30,000 vols. chiefly of a scientific character. In close association with the university of London is the London School of Economics and Political Science in Clare Market, in which is housed the British Library of Political Science with 50,000 vols. and a large number of official reports and pamphlets.

The collegiate library at Dulwich dates from 1619, and a list of its earliest accessions, in the handwriting of the founder, may still be seen. There are now about 17,000 vols. of miscellaneous works of the 17th and 18th centuries, with a few rare books. A catalogue of them was printed in 1880; and one describing the MSS. (567) and the muniments (606) was issued during the succeeding year. The last two classes are very important, and include the well-known "Alleyn Papers" and the theatrical diary of Philip Henslow. Sion College is a gild of the parochial clergy of the city and suburbs of London, and the library was founded in 1629 for their use; laymen may also read (but not borrow) the books when recommended by some beneficed metropolitan clergyman. The library is especially rich in liturgies, Port-Royal authors, pamphlets, &c., and contains about 100,000 vols. classified on a modification of the Decimal system. The copyright privilege was commuted in 1835 for an annual sum of £363, 15s. 2d. The present building was opened in 1886 and is one of the striking buildings of the Victoria Embankment.

Most of the London collegiate or teaching institutions have libraries attached to them, and it will only be necessary to mention a few of the more important to get an idea of their variety: Baptist College (1810), 13,000 vols.; Bedford College (for women), 17,000 vols.; Birkbeck College (1823), 12,000 vols.; Congregational Library (1832–1893), 14,000 vols.; the Royal College of Music, containing the library of the defunct Sacred Harmonic Society; Royal Naval College (Greenwich, 1873), 7000 vols.; St Bartholomew's Hospital (1422), 15,000 vols.; St Paul's School (1509), 10,000 vols.; the Working Men's College (1854), 5000 vols.; and all the Polytechnic schools in the Metropolitan area.

English provinces.

The university library of Durham (1832) contains about 35,000 vols., and all the modern English universities—Birmingham, Mason University College (1880), 27,000 vols.; Leeds, Liverpool (1882), 56,000 vols.; Manchester, Victoria University, which absorbed Owens College (1851), 115,000 vols.; Newcastle-upon-Tyne; Sheffield (1907), &c.—have collections of books. The libraries in connexion with theological colleges and public schools throughout England are often quite extensive, and reference may be made to Eton College (1441), 25,000 vols.; Haileybury (1862), 12,000 vols.; Harrow (Vaughan Library), 12,000 vols.; Mill Hill; Oscott College, Erdington (1838), 36,000 vols.; Rugby (1878), 8000 vols.; Stonyhurst College (1794), *c.* 40,000 vols., &c. The new building for the university of Wales at Bangor has ample accommodation for an adequate library, and the University College at Aberystwith is also equipped with a library.

Scotland.

The origin of the University Library of Edinburgh is to be found in a bequest of his books of theology and law made to the town in 1580 by Clement Little, advocate. This was two years before the foundation of the university, and in 1584 the town council caused the collection to be removed to the college, of which they were the patrons. As it was the only library in the town, it continued to grow and received many benefactions, so that in 1615 it became necessary to erect a library building. Stimulated perhaps by the example of Bodley at Oxford, Drummond of Hawthornden made a large donation of books, of which he printed a catalogue in 1627, and circulated an appeal for assistance from others. In 1678 the library received a bequest of 2000 vols. from the Rev. James Nairne. In 1709 the library became entitled to the copy privilege, which has since been commuted for a payment of £575 per annum. In 1831 the books were removed to the present library buildings, for which a parliamentary grant had been obtained. The main library hall (190 ft. in length) is one of the most splendid apartments in Scotland. One of the rooms is set apart as a memorial to General Reid, by whose benefaction the library has greatly benefited. Amongst the more recent accessions have been the Halliwell-Phillips Shakespeare collection, the Laing collection of Scottish MSS., the Baillie collection of Oriental MSS. (some of which are of great value), and the Hodgson collection of works on political economy. The library now consists of about 210,000 vols. of printed books with over 2000 MSS. Recently it has been found necessary to make considerable additions to the shelving. The library of the university of Glasgow dates from the 15th century, and numbers George Buchanan and many other distinguished men amongst its early benefactors. A classified subject-catalogue has been printed, and there is also a printed dictionary catalogue. The annual accessions are about 1500, and the commutation-grant £707. Connected with the university, which is trustee for the public, is the library of the Hunterian Museum, formed by the eminent anatomist Dr William Hunter. It is a collection of great bibliographical interest, as it is rich in MSS. and in fine specimens of early printing, especially in Greek and Latin classics. There are about 200,000 vols. in the library.

The first mention of a library at St Andrews is as early as 1456. The three colleges were provided with libraries of their own about the time of their foundation—St Salvator's 1455, St Leonard's 1512, St Mary's 1537. The University Library was established about 1610 by King James VI., and in the course of the 18th century the college libraries were merged in it. The copyright privilege was commuted in 1837. The collection numbers 120,000 vols. exclusive of pamphlets, with about 200 MSS., chiefly of local interest. A library is supposed to have existed at Aberdeen since the foundation of King's College by Bishop Elphinstone in 1494. The present collection combines the libraries of King's College and Marischal College, now incorporated in the university. The latter had its origin in a collection of books formed by the town authorities at the time of the Reformation, and for some time kept in one of the churches. The library has benefited by the Melvin bequest, chiefly of classical books, and those of Henderson and Wilson, and contains some very valuable books. The general library is located in Old Aberdeen in a room of imposing design, while the medical and law books are in the New Town in Marischal College. The library has a grant, in lieu of the copyright privilege, of £320. The annual income of the library is £2500, and it contains over 180,000 vols. The books are classified on a modification of the decimal system, and there are printed author and MS. subject-catalogues. By arrangement with the municipal library authority, books are lent to non-students. All the technical schools, public schools, and theological and other colleges in Scotland are well equipped with libraries as the following list will show:—Aberdeen: Free Church College, 17,000 vols. Edinburgh: Fettes College, *c.* 5000 vols.; Heriot's Hospital (1762), *c.* 5000 vols.; New College (1843), 50,000 vols. Glasgow: Anderson's College (containing the valuable Euing music library), 16,000 vols.; United Free Church Theological College, 33,000 vols. Trinity College, Glenalmond, 5000 vols.

Ireland.

The establishment of the library of Trinity College, Dublin, is contemporaneous with that of the Bodleian at Oxford, and it is an interesting circumstance that, when Challoner and Ussher (afterwards the archbishop) were in London purchasing books to form the library, they met Bodley there, and entered into friendly intercourse and co-operation with him to procure the choicest and best books. The commission was given to Ussher and Challoner as trustees of the singular donation which laid the foundation of the library. In the year 1601 the English army determined to commemorate their victory over the Spanish troops at Kinsale by some permanent monument. Accordingly they subscribed the sum of £1800 to establish a library in the university of Dublin. For Ussher's own collection, consisting of 10,000 vols. and many valuable MSS., the college was also indebted to military generosity. On his death in 1655 the officers and soldiers of the English army then in Ireland purchased the whole collection for £22,000 with the design of presenting it to the college. Cromwell, however, interfered, alleging that he proposed to found a new college, where the books might more conveniently be preserved. They were deposited therefore in Dublin Castle, and the college only obtained them after the Restoration. In 1674 Sir Jerome Alexander left his law books with some valuable MSS. to the college. In 1726 Dr Palliser, archbishop of Cashel, bequeathed over 4000 vols. to the library; and ten years later Dr Gilbert gave the library nearly 13,000 vols. which he had himself collected and arranged. In 1745 the library received a valuable collection of MSS. as a bequest from Dr Stearne. In 1802 the collection formed by the pensionary Fagel, which had been removed to England on the French invasion of Holland, was acquired for £10,000. It consisted of over 20,000 vols. In 1805 Mr Quin bequeathed a choice collection of classical and Italian books. There have been many other smaller donations, in addition to which the library is continually increased by the books received under the Copyright Act. The library now contains 300,000 vols. and over 2000 MSS. There is no permanent endowment, and purchases are made by grants from the board. The whole collections are contained in one building, erected in 1732, consisting of eight rooms. The great library hall is a magnificent apartment over 200 ft. long. A new reading-room was opened in 1848. A catalogue of the books acquired before 1872 has been printed (1887). There is a printed catalogue of the MSS. and Incunabula (1890). Graduates of Dublin, Oxford, and Cambridge are admitted to read permanently, and temporary admission is granted by the board to any fit person who makes application.

The library of Queen's College, Belfast (1849), contains about 60,000 vols., while Queen's College, Cork (1849), has over 32,000 vols. St Patrick's College, Maynooth (1795), has about 60,000, and other collegiate libraries are well supplied with books.

Cathedral and church libraries.

With one or two exceptions, libraries are attached to the cathedrals of England and Wales. Though they are of course intended for the use of the cathedral or diocesan clergy, they are in most cases open to any respectable person who may be properly introduced. They seldom contain very much modern literature, chiefly consisting of older theology, with more or less addition of classical and historical literature. They vary in extent from a few volumes, as at Llandaff or St David's, to 20,000 vols., as at

Durham. Together they possess nearly 150,000 printed and manuscript vols. As a rule, very little is spent upon them, and they are very little used. The chamber in the old cloisters, in which the library of the dean and chapter of Westminster is preserved, is well known from the charming description by Washington Irving in his *Sketch Book.* There are about 14,000 vols., mostly of old theology and history, including many rare Bibles and other valuable books. The library of the dean and chapter of St Paul's Cathedral was founded in very early times, and now numbers some 22,000 vols. and pamphlets, mainly theological, with a good collection of early Bibles and Testaments, Paul's Cross Sermons, and works connected with the cathedral.

Perhaps the best library of Catholic theology in London is that of the Oratory at South Kensington, established in 1849, and now containing nearly 35,000 vols. The Catholic Cathedral of Westminster, of recent foundation, contains about 22,000 vols. The archiepiscopal library at Lambeth was founded in 1610 by Archbishop Bancroft, and has been enriched by the gifts of Laud, Tenison, Manners Sutton, and others of his successors; it is now lodged in the noble hall built by Juxon. The treasures consist of the illuminated MSS., and a rich store of early printed books; of the latter two catalogues have been issued by Samuel Roffey Maitland (1792–1866). The MSS. are described in H. J. Todd's catalogue, 1812. The total number of printed books and manuscripts is nearly 45,000.

The library of Christ Church, Oxford, belongs alike to the college and the cathedral, but will be more properly described as a college library. The cathedral library of Durham dates from monastic times, and possesses many of the books which belonged to the monastery. These were added to by Dean Sudbury, the second founder of the library, and Bishop Cosin. The collection has been considerably increased in more modern times, and now contains 15,000 vols. It is especially rich in MSS., some of which are of great beauty and value; a catalogue of them was printed in 1825. The library has good topographical and entomological collections. The chapter spend £370 per annum in salaries and in books. The library at York numbers about 11,000 vols., and has been very liberally thrown open to the public. It is kept in the former chapel of the archbishop's palace, and has many valuable MSS. and early printed books. The foundation of the library at Canterbury dates probably from the Roman mission to England, A.D. 596, although the library does not retain any of the books then brought over, or even of the books said to have been sent by Pope Gregory to the first archbishop in 601. It is recorded that among Lanfranc's buildings was a new library, and Becket is said to have collected books abroad to present to the library. The collection now numbers about 9900 printed books, with about 110 MS. vols., and between 6000 and 7000 documents. A catalogue was printed in 1802. The present building was erected in 1867 on part of the site of the monastic dormitory. The library at Lincoln contains 7400 vols., of which a catalogue was printed in 1859. It possesses a fine collection of political tracts of the age of Elizabeth, James and Charles I. The present collection at Chichester dates from the Restoration only; that at Ely is rich in books and tracts relating to the non-jurors. The library at Exeter possesses many Saxon MSS. of extreme interest, one of them being the gift of Leofric, the first bishop. The treasures of Lichfield were destroyed by the Puritans during the civil war, and the existing library is of later formation. Frances, duchess of Somerset, bequeathed to it nearly 1000 vols., including the famous Evangeliary of St Chad. The collection at Norwich is chiefly modern, and was presented by Dr Sayers. The earlier library at Peterborough having almost wholly perished in the civil war, Bishop White Kennett became the virtual founder of the present collection. Salisbury is rich in incunabula, and a catalogue has recently been printed. Winchester Cathedral Library is mainly the bequest of Bishop Morley in the 17th century. The library at Bristol, then numbering 6000 or 7000 vols., was burnt and pillaged by the mob in the riots of 1831. Only about 1000 vols. were saved, many of which were recovered, but few additions have been made to them. At Chester in 1691 Dean Arderne bequeathed his books and part of his estate "as the beginning of a public library for the clergy and city." The library of Hereford is a good specimen of an old monastic library; the books are placed in the Lady Chapel, and about 230 choice MSS. are chained to oaken desks. The books are ranged with the edges outwards upon open shelves, to which they are attached by chains and bars. Another most interesting "chained" library is that at Wimborne Minster, Dorset, which contains about 280 books in their original condition. The four Welsh cathedrals were supplied with libraries by a deed of settlement in 1709. The largest of them, that of St Asaph, has about 1750 vols. The Bibliotheca Leightoniana, or Leightonian Library, founded by Archbishop Leighton in 1684 in Dunblane Cathedral, Scotland, contains about 2000 vols., and is the only cathedral library in Scotland of any historic interest. The library of St Benedict's Abbey, Fort Augustus (1878) with 20,000 vols. is an example of a recent foundation. The public library in St Patrick's Cathedral, Dublin, sometimes called Marsh's Library after its founder, was established about 1694 by Archbishop Marsh, was incorporated by act of parliament in 1707, and endowed by its founder at his death in 1713. The building was erected by the founder, and the original oak fittings still remain. There is no room for additions, and a large collection of modern books was refused a few years ago on that account. The endowment is too small to allow of purchases from the funds of the library, so that it still retains the character of a 17th-century library. The books are chiefly theological, and in the learned languages; they include the libraries of Bishop Stillingfleet and of Elias Bouhereau, a French refugee, who was the first librarian.

Endowed libraries.

Endowed libraries may be defined as those which have been directly established by the bequests of individuals or corporate bodies, excluding those which have been assisted by donors or are merely named after them. As compared with the United States, the endowed libraries of Britain are few in number, although several are of great importance. London possesses very few libraries which have been endowed by individual donors. The principal are the Bishopsgate Institute (1891), which was founded out of sundry City of London charities, and now contains about 44,000 vols., and is celebrated for a fine collection of local prints, drawings and maps. It is open free to persons in the east part of the City. The Cripplegate Institute (1896) in Golden Lane, also founded out of charity moneys, has three branches—St Bride's Foundation Institute (18,000 vols.), jointly; Queen Street, Cheapside, Branch (8000 vols.); and St Luke's Institute (5000 vols.)—and contains 28,000 vols. Lectures and other entertainments are features of both these libraries. Dr Williams' library was founded by the will of an eminent Presbyterian divine of that name; it was opened in 1729. The books (50,000) are housed in a new building in Gordon Square, completed in 1873. Theology of all schools of opinion is represented, and there are special collections of theosophical books and MSS., the works of Boehme, Law, and other mystical writers. The MSS. include the original minutes of the Westminster Assembly, letters and treatises of Richard Baxter, &c. The St Bride Foundation Technical Reference Library (1895) is a very complete collection of books and specimens of printing and the allied arts, including the libraries of William Blades and Talbot Baines Reed, and a number of more modern books presented by Mr Passmore Edwards. It contains about 18,000 vols., and is open to all persons interested in printing, lithography, &c., and also to the general public.

The most notable of the English provincial endowed libraries are those established in Manchester. The fine old library established by Humphrey Chetham in 1653 is still housed in the old collegiate buildings where Sir Walter Raleigh was once entertained by Dr Dee. The collection consists largely of older literature, and numbers about 60,000 volumes and MSS. It is freely open to the public, and may be said to have been the first free library in England. Catalogues in broad classified form were issued in 1791–1863, and there have been supplements since. A remarkable instance of a great library established by private munificence is that of the John Rylands Library at Manchester, which was founded, erected and endowed by Mrs E. A. Rylands in memory of her husband, and is contained in a magnificent building designed by Basil Champneys and opened in 1899. The collection was formed largely on the famous Althorp Library, made by Earl Spencer (40,000 vols.), one of the most remarkable collections of early printed books and rare Bibles ever brought together. The present number of volumes is about 115,000, of which over 2500 are incunabula. A short-title catalogue, 3 vols. 4to., and one of English books, have been published, and a manuscript dictionary catalogue has been provided. Several valuable special catalogues and descriptive lists have been issued, one of the latest being a special catalogue of the architectural works contained in all the Manchester libraries.

The William Salt Library, a special Staffordshire library with numerous MSS. and other collections, formed to bring together materials for a history of Staffordshire, was opened to the public in 1874 in the town of Stafford. It contains nearly 20,000 books, prints and other items.

Other endowed libraries in the English provinces which deserve mention are the Bingham Public Library (1905) at Cirencester; the Guille-Allès Library (1856), Guernsey; St Deiniol's Library (1894), Hawarden, founded by William Ewart Gladstone, the great statesman; and the Shakespeare Memorial Library and theatre (1879) at Stratford-upon-Avon.

The most important endowed library in Scotland is the Mitchell Library in Glasgow, founded by Stephen Mitchell, tobacco-manufacturer (1874), who left £70,000 for the purpose. It was opened in 1877 in temporary premises, and after various changes will soon be transferred to a very fine new building specially erected. It contains some very valuable special collections, among which may be mentioned Scottish poetry, Burns' works, Glasgow books and printing, and a choice collection of fine books on art and other subjects given by Robert Jeffrey. It contains nearly 200,000 vols. and is the reference library for the Glasgow public library system. Another older Glasgow public library, also founded by a tobacco merchant, is Stirling's and Glasgow Public Library (1791), which was endowed by Walter Stirling, and amalgamated with an existing subscription library. It contains 60,000 vols. and is free to reference readers, but a subscription is charged for borrowing privileges. Still another Glasgow institution is Baillie's Institution Free Reference Library, established under the bequest of George Baillie (1863), but not opened till 1887. It contains over 24,000 vols. Other Scottish endowed libraries are the Anderson Library, Woodside, Aberdeen (1883); the Taylor Free Library, Crieff (1890); the Elder Free Library, Govan (1900); and the Chambers Institution, Peebles (1859), founded by William Chambers, the well-known publisher. The public library of Armagh, Ireland, was founded by Lord Primate Robinson in 1770, who gave a considerable number of books and an endowment. The books are freely available, either on the spot, or by loan on deposit of double the value of the work applied for.

Libraries of societies and learned bodies.

There are many libraries belonging to societies devoted to the study of every kind of subject, and it is only necessary to mention a few of the principal. Full particulars of most of them will be found in Reginald A. Rye's *Libraries of London: a Guide for Students* (1910), a work of accuracy and value.

Of the law libraries, that at Lincoln's Inn, London, is the oldest and the largest. It dates from 1497, when John Nethersale, a member of the society, made a bequest of forty marks, part of which was to be devoted to the building of a library for the benefit of the students of the laws of England. A catalogue of the printed books was published in 1859 and since supplemented, and the MSS. were catalogued by the Rev. Joseph Hunter in 1837. There are about 72,000 vols. The library of the Inner Temple is known to have existed in 1540. In the middle of the 17th century it received a considerable benefaction from William Petyt, the well-known keeper of the Tower records. There are now about 60,000 vols., including the pamphlets collected by John Adolphus for his *History of England*, books on crime and prisons brought together by Mr Crawford, and a selection of works on jurisprudence made by John Austin. A library in connexion with the Middle Temple was in existence during the reign of Henry VIII., but the date usually assigned to its foundation is 1641, when Robert Ashley left his books to the inn of which he had been a member. There are now about 50,000 vols. Gray's Inn Library (21,000 vols.) was perhaps established before 1555. In 1669 was made the first catalogue of the books, and the next, still extant, in 1689. The Law Society (1828) has a good law and general library (50,000 vols.), including the best collection of private acts of parliament in England. The library of the Royal Society (1667), now housed in Burlington House, contains over 80,000 vols., of which many are the transactions and other publications of scientific bodies. The Royal Institution of Great Britain (1803) possesses a reference library of 60,000 vols. Some of its early catalogues were in classified form. The London Institution (1805), in the City, is a general library of reference and lending books open to members only. There are about 150,000 vols., and lectures are given in connexion with the institution. The Royal Society of Arts has a library numbering about 11,000 vols., chiefly the publications of other learned bodies.

The best library of archaeology and kindred subjects is that of the Society of Antiquaries, Burlington House, consisting of nearly 40,000 printed vols. and many MSS. It is rich in early printed books, topography, heraldry and numismatics, and includes a curious collection of books on pageants presented by Mr Fairholt, and the remarkable assemblage of lexicographical works formerly belonging to Albert Way.

Of libraries devoted to the natural sciences may be mentioned those of the Geological Society of London (1807), with over 30,000 vols. and maps; the Linnean Society (1788), 35,000 vols.; the Zoological Society (1829), about 31,000 vols. Of libraries associated with medicine there are those of the Royal Society of Medicine (1907), incorporating a number of medical societies, over 95,000 vols., about to be housed in a new building; the Royal College of Physicians (1525), 26,000 vols.; the British Medical Association, 20,000 vols.; the Royal College of Surgeons of England (1800), 60,000 vols., with a MS. catalogue on cards; the Chemical Society (1841), over 25,000 vols.; and the Pharmaceutical Society of Great Britain (1841), about 15,000 vols. Other important London society libraries are—the Royal Geographical Society (1830), 50,000 vols., and numerous maps in a special room, open to the public for reference; the Royal Colonial Institute (1868), 70,000 vols. of British colonial literature; the Royal United Service Institution, Whitehall (1831), has 32,000 works on military and naval subjects and a museum. Large and interesting collections of books are owned by the British and Foreign Bible Society, the Institution of Civil Engineers, the Institution of Electrical Engineers (containing the Ronalds Library), the Royal Academy, the Royal Institute of British Architects, and practically every other working society in London.

The English provincial libraries connected with societies or learned bodies are mostly attached to those concerned with law, medicine, and various antiquarian, literary and scientific subjects. The headquarters of most national societies being in London to some extent accounts for the comparatively small number of these special libraries in the provinces.

The most important libraries of this description outside London are situated in Scotland and Ireland, and one at least is practically a national collection.

The principal library in Scotland is that of the Faculty of Advocates at Edinburgh, who in 1680 appointed a committee of their number, which reported that "it was fitt that, seeing if the recusants could be made pay their entire money, there wold be betwixt three thousand and four thousand pounds in cash; that the same be imployed on the best and fynest lawers and other law bookes, conforme to a catalogue to be condescended upon by the Facultie, that the samen may be a fonde for ane Bibliothecque whereto many lawers and others may leave their books." In 1682 the active carrying out of the scheme was committed to the Dean of Faculty, Sir George Mackenzie of Rosehaugh, who may be regarded as the founder of the library. In 1684 the first librarian was appointed, and the library appears to have made rapid progress, since it appears from the treasurer's accounts that in 1686 the books and furniture were valued at upwards of £11,000 Scots, exclusive of donations. In the year 1700, the rooms in the Exchange Stairs, Parliament Close, in which the library was kept, being nearly destroyed by fire the collection was removed to the ground floor of the Parliament House, where it has ever since remained. The library retains the copyright privilege conferred upon it in 1709. Of the special collections the most important are the Astorga collection of old Spanish books, purchased by the faculty in 1824 for £4000; the Thorkelin collection, consisting of about 1200 vols., relating chiefly to the history and antiquities of the northern nations, and including some rare books on old Scottish poetry; the Dietrich collection of over 100,000 German pamphlets and dissertations, including many of the writings of Luther and Melanchthon, purchased for the small sum of £80; and the Combe collection.

The faculty appear early to have turned their attention to the collection of MSS., and this department of the library now numbers about 3000 vols. Many of them are of great interest and value, especially for the civil and ecclesiastical history of Scotland before and after the Reformation. There are thirteen monastic chartularies which escaped the destruction of the religious houses to which they belonged. The MSS. relating to Scottish church history include the collections of Spottiswoode, Wodrow and Calderwood. The Wodrow collection consists of 154 vols., and includes his correspondence, extending from 1694 to 1726. Sir James Balfour's collection and the Balcarres papers consist largely of original state papers, and include many interesting royal letters of the times of James V., Queen Mary and James VI. The Sibbald papers, numbering over 30 vols., are largely topographical. The Riddel notebooks, numbering 156 vols., contain collections to illustrate the genealogy of Scottish families. There are about one hundred volumes of Icelandic MSS., purchased in 1825 from Professor Finn Magnusson, and some Persian and Sanskrit, with a few classical, manuscripts. The department has some interesting treasures of old poetry, extending to 73 vols. The most important are the Bannatyne MS., in 2 vols. folio, written by George Bannatyne in 1568, and the Auchinleck MS., a collection of ancient English poetry, named after Alexander Boswell of Auchinleck, who presented it in 1774.

The first catalogue of the printed books was compiled in 1692, and contains a preface by Sir George Mackenzie. Another was prepared under the care of Ruddiman in 1742. In 1853 the late Mr Halkett commenced a catalogue, which has been printed in 6 vols. 4to, with a supplement, and includes all the printed books in the library at the end of 1871, containing about 260,000 entries. The library, managed by a keeper and staff, under a board of six curators, is easily accessible to all persons engaged in literary work, and now contains about 500,000 vols.

The library of the Writers to the Signet was established by the Society at Edinburgh in 1755. At first it consisted of law books exclusively, but in 1788 they began to collect the best editions of works in other departments of literature. During the librarianship of Macvey Napier (1805–1837) the number of volumes was more than sextupled, and in 1812 the library was removed to the new hall adjoining the Parliament House. In 1834 the upper hall was devoted to the collection. This is a magnificent apartment 142 ft. long, with a beautiful cupola painted by Stothard. The library now contains over 110,000 vols. and includes some fine specimens of early printing, as well as many other rare and costly works. It is especially rich in county histories and British topography and antiquities. A catalogue of the law books was printed in 1856. The late David Laing, who became librarian in 1837, published the first volume of a new catalogue in 1871, and in 1891 this was completed with a subject index. The books are lent out to the writers and even to strangers recommended by them.

The library of the Royal Irish Academy at Dublin was established on the formation of the Academy in 1785 for the purpose of promoting the study of science, literature and antiquities in Ireland. The library possesses about 80,000 printed vols. and MSS. There is a large collection of MSS. and books relating to the history, ancient language, and antiquities of Ireland. They include the Betham collection, acquired partly by public subscription in 1851. The library is partly supported by a government grant and is freely open on a proper introduction. The publication of Irish MSS. in the library was begun in 1870, and has since continued; the general catalogue is in manuscript form.

The library of King's Inns was founded, pursuant to a bequest of books and legal MSS. under the will of Mr Justice Robinson in 1787, to form the nucleus of a library for law students. It is partly supported from the funds of the benchers, but partly also by a treasury grant in lieu of the copyright privilege.

It is needless to describe the other society libraries, as most of them are described in annuals like the *Literary Year-book* and similar publications, with statistics of stock, issues, &c., brought up to date.

Proprietary and subscription libraries.

Proprietary and subscription libraries were at one time more common than now, as, owing to the steady advance of the municipal library, the minor subscription libraries have been gradually extinguished. A striking example of this is furnished by the mechanics' institutes which used to flourish all over the country. In most cases these have been handed over to the local authorities by the owners to form the nucleus of the public rate-supported library, and in this way the older libraries have been preserved and valuable aid has been given to the popular library movement. Somewhat akin to the mechanics' institutes are the libraries established in connexion with various co-operative societies in the north of England. Together with working men's club libraries, there must be nearly 100 libraries of the class just mentioned, ranging in size from a few hundred vols. to 30,000 or 40,000 vols. The affiliated clubs of the Working Men's Club and Institute Union possess among them over 100,000 vols.

Among subscription libraries, the London Library stands first in order of importance. It was founded in 1841 as a lending library for the use of scholars, and Dean Milman, Sir G. C. Lewis, W. E. Gladstone, Thomas Carlyle, Henry Hallam and other eminent men took part in its formation. By means of a moderate subscription, funds were raised for the purchase of books on general subjects, which now amount to about 250,000 vols. Of these elaborate and excellent author and subject catalogues have been printed. The last is valuable as a classified guide to the contents of the library.

Some mention should be made also of the more important subscription or proprietary libraries, which were formed for the most part in the latter half of the 18th century. The earliest circulating library in the metropolis was established about the middle of the 18th century. The first in Birmingham was opened by Hutton in 1757. The idea of a proprietary library appears to have been first carried out at Liverpool in 1758. The library then formed still flourishes at the Lyceum, and possesses a collection of 55,000 vols. and an income of £1000 a year. In 1760 a library was formed at Warrington which has been merged in the Warrington Museum. The Leeds library was established in 1768, and now has 64,000 vols. In 1772 the Bristol museum and library was formed, and numbered Coleridge, Southey and Landor among its earlier members. It has now been merged in the reference collection of the Bristol public libraries. The Birmingham (old) library was formed in 1779, and its rules were drawn up by Dr Priestley. The library has now about 80,000 vols.

Other English proprietary libraries have been established at Leicester, Liverpool (Athenaeum, 1798), Manchester, Nottingham and elsewhere. In Scotland the first subscription library was started by Allan Ramsay, the poet, at Edinburgh in 1725, and since that time commercial subscription libraries have increased greatly in number and size, Mudie's and *The Times* Book Club being typical modern examples.

Club libraries.

Many of the principal clubs possess libraries; that of the Athenaeum (London) is by far the most important. It now numbers about 75,000 vols. of books in all departments of literature, and is especially rich in well-bound and fine copies of works on the fine arts, archaeology, topography and history. The pamphlets, of which there is a complete printed catalogue, as well as of the books, form a remarkable series, including those collected by Gibbon and Mackintosh. Next comes the Reform Club, with about 60,000 vols., chiefly in belles-lettres, with a fair proportion of parliamentary and historical works. The National Liberal Club, containing the Gladstone Library, has about 45,000 vols., and may be used occasionally by non-members. The Oxford and Cambridge Club has 30,000 vols. in general and classical literature. At the Garrick there is a small dramatic collection; and the (Senior) United Service Club, besides a number of books on professional subjects, possesses the fine library which formerly belonged to Dugald Stewart.

Other London clubs which possess libraries are the Carlton with 25,000 vols.; the Constitutional with 12,000 vols.; Grand Lodge of Freemasons, 10,000 vols.; Alpine, 5000 vols.; Travellers, 8000 vols.; and Junior Carlton, 6000 vols. In the provinces and in Scotland and Ireland every club of a social character has a reading-room, and in most cases a library is attached.

Municipal libraries.

The first act of parliament authorizing the establishment of public libraries in England was obtained by William Ewart, M.P. for the Dumfries Burghs, in 1850. This arose out of the report of a special parliamentary committee appointed to enquire into the management of the British Museum in 1835, and a more general report on libraries in 1849, at which much evidence was submitted to prove the necessity for providing public libraries. Ewart obtained both committees and also, in 1845, procured an act for "encouraging the establishment of museums in large towns." Neither the 1845 nor 1850 acts proved effective, owing chiefly to the limitation of the library rate to ½d. in the £ of rental, which produced in most cases an insufficient revenue. In 1853 the Library Act of 1850 was extended to Ireland and Scotland, and in 1854 Scotland obtained an act increasing the rate limit from ½d. to 1d. in the £. In 1855 Ireland also obtained a penny rate, and later in the same year England obtained the same power by an act which remained the principal library act, with some intermediate amendments, till 1892, when a Public Library Consolidation Act was passed. In the following year, 1893, the power of adopting the acts, or putting them in operation, was transferred from the ratepayers to the local authority, save in the case of rural parishes and the metropolitan vestries. By the London Government Act of 1899, however, the metropolitan boroughs were given the power of adopting the acts of 1892–1893 without consulting the ratepayers, so that as the law at present stands, any urban district can put the public libraries acts in force without reference to the voters. Rural parishes are still required by the provisions of the Local Government Act 1894 to adopt the 1892 Libraries Act by means of a parish meeting, or if a poll is demanded, by means of a poll of the voters.

The main points in British library legislation are as follows:—

(*a*) The acts are permissive in character and not compulsory, and can only be put in force by a vote of a majority of members in an urban district or city, or of a majority of voters in rural districts.

(*b*) The amount of rate which can be collected is limited to one penny in the pound of the rateable value of the district, though in some towns power has been obtained by special legislation for local purposes to increase the amount to 2d. In a few cases, as at Birmingham, no limit is fixed. The incomes produced by the penny in the pound range from less than £10 in a rural district to over £25,000 in a large city.

(*c*) Municipal libraries are managed by committees appointed by the local authorities, who may, if so disposed, delegate to them all their powers and duties under section 15 of the act of 1892. The local authorities in England have also power to appoint persons on such committees who are not members of the council. By the Scottish principal act of 1887 committees are to consist of one-half councillors and one-half non-councillors, not to exceed a total of 20, and these committees become independent bodies not subject to the councils. Glasgow has contracted out of this arrangement by means of a special act. In Ireland, committees are appointed much on the same system as in England.

(*d*) Power is given to provide libraries, museums, schools for science, art galleries and schools for art. Needless to say it is impossible to carry on so many departments with the strictly limited means provided by the acts, although some towns have attempted to do so. The Museums and Gymnasiums Act of 1891 enables an additional rate of ½d. to be raised for either purpose, and many places which have established museums or art galleries under the provisions of the Libraries Acts have also adopted the Museums Act in order to increase their revenues.

(*e*) The regulation and management of public libraries are entrusted to the library authority, which may either be the local authority, or a committee with a full or partial delegation of powers. The library authority can buy books, periodicals, specimens of art and science, and make all necessary rules for the proper working of the libraries A staff can be appointed, and arrangements may be made with adjoining local authorities for the joint use of one or more libraries. Buildings may also be erected, and money borrowed for the purpose on the security of the local rates. These are the main provisions of the library legislation of the United Kingdom as at present existing. Revision and amendment are wanted as regards the abolition or raising of the rate limitation, and some clearer definitions as to powers which can be exercised, as, for example, the right to spend money on lectures. The rate limitation is the most serious obstacle to progress, and it affects the smaller towns to a much greater degree than large cities or areas.

Between 1850 and 1910 about 630 local government areas of all kinds adopted the Public Libraries Acts. Of these a considerable number had in 1910 not yet put the acts in operation, whilst the London Government Act 1899, by joining various previously independent vestries or boards, extinguished about 23 library areas. The Metropolitan County of London in 1910 comprised 25 library areas, or counting also the City, 26, and only Marylebone, Bethnal Green and parts of Finsbury and Paddington remained unprovided. Practically every large city or district council has adopted the Public Libraries Acts or obtained special legislation, and the only important places, in addition to Marylebone and Bethnal Green, unprovided in 1910 were Bacup, Crewe, Dover, Jarrow, Scarborough, Swindon, Weymouth, Llandudno, Govan, Leith, Pollokshaws and Wishaw. In all, 556 places had library systems in operation, and among them they possessed about 925 buildings.

The progress of the public library movement was very slow up to 1887, the year of Queen Victoria's jubilee. From 1887, however, when many districts established libraries as memorials to Queen Victoria, the progress has been much more rapid. An immense stimulus to the movement was given from about 1900, when Mr Andrew Carnegie (*q.v.*) began to present library buildings to towns in England as well as to Scotland and the United States. The result of this action was to increase the number of municipal libraries from 146 in 1886 to 556 in 1910; and in the 10 years up to 1910 during which Mr Carnegie's gifts had been offered, no fewer than 163 places had put the acts in operation, a yearly average of over 16 adoptions.

There is one municipal library whose importance demands special mention, although it is not rate-supported under the provisions of the Public Libraries Acts. This is the Guildhall library of the Corporation of the City of London, which is a free public reference library with a periodicals reading-room, and a lending department for officials and members of the corporation. A library was established for London by Sir Richard Whittington between 1421–1426, and several notices in the civic records show how well in those times the citizens cared for their books. But it did not remain without accident; in 1522 the Lord Protector Somerset carried off three cart-loads of books, and during the great fire of 1666 the remainder was destroyed together with the library buildings. Nothing was done to repair the loss until 1824, when a committee was appointed, and rooms set apart for library purposes. In 1840 a catalogue of 10,000 vols. was printed, and in 1859 a second was prepared of 40,000 vols. In consequence of the large and increasing number of the readers, the present fine building was commenced about ten years later, and, after having cost £90,000, was opened in 1873 as a free public library.

There are now upwards of 136,000 printed vols. and 5900 MSS. in the Guildhall library. The contents are of a general character, and include a special collection of books about London, the Solomons Hebrew and rabbinical library, and the libraries of the Clockmakers Company and the old Dutch church in Austin Friars. Recently the fine collection of books by and about Charles Dickens, called the National Dickens Library, was added, and other special libraries of a valuable nature, as well as an extensive and well-cared-for collection of London prints, and drawings.

British library administration. There is such a variety of library buildings in the United Kingdom that it is not possible to single out examples for special description, but a brief statement of their work and methods will help to give some idea of the extent of their activities.

The total number of borrowers enrolled in 1910 was[1] about 2,200,000, 59% males and 41% females, 48% under 20 years of age and 52% over 20. Industrial and commercial occupations were followed by 49% of the borrowers, the balance of 51% being domestic, professional, unstated, and including 20% of students and scholars. To these borrowers 60,000,000 vols. are circulated every year for home-reading, and of this large number 54% represented fiction, including juvenile literature. The Reference libraries issued over 11,000,000 vols., exclusive of books consulted at open shelves, and to the Reading-rooms, Magazines, Newspapers, Directories, Time-tables, &c., allowing only one consultation for each visit, 85,000,000 visits are made per annum. Allowing 5% for the reading of fiction in current magazines, it appears that the percentage of fiction read in British municipal libraries, taking into account the work of every issuing or consulting department, is only about 24%. This fact should be carefully recorded, as in the past municipal libraries have suffered in the esteem of all sections of the public, by being erroneously described as mere centres for the distribution of common novels. The quality of the fiction selected is the best obtainable, and, as shown above, it is not read to an unreasonable or unnecessary extent.

The changes in character, policy and methods which have marked library administration in the United Kingdom, have affected libraries of all kinds, but on the whole the municipal libraries have been most active in the promotion of improvements. It is evident, moreover, even to the most casual observer, that a complete revolution in library practice has been effected since 1882, not only in the details of administration, but in the initiation of ideas and experiments. One of the most notable changes has been the gradual disappearance of the unclassified library. Previous to 1882 very little had been accomplished in the way of scientific classification schemes equipped with suitable notations, although the Decimal method of Mr Melvil Dewey had been applied in the United States. After that date this system began to be adopted for reference departments in British municipal libraries, till in 1910 at least 120 places had been classified by means of the scheme. An English scheme, called the "Adjustable," with a notation, but not fully expanded, has been adopted in 53 places, and a very complete and minute scheme called the "Subject," also English, has been used in nearly 40 libraries, although it only dates from 1906. That much remains to be accomplished in this direction is indicated by the fact that over 340 municipal libraries were in 1910 not closely classified, but only arranged in broad numerical or alphabetical divisions. The adoption of exact schemes of classification for books in libraries may be said to double their utility almost mechanically, and in course of time an unclassified municipal library will be unknown. The other kinds of library—state, subscription, university, &c.—are very often not classified, but some use the Decimal system, while others, like the Patent Office, have systems peculiar to themselves.

The catalogue, as a means of making known the contents of books, has also undergone a succession of changes, both in policy and mechanical construction. At one period, before access to the shelves and other methods of making known the contents of libraries had become general, the printed catalogue was relied upon as practically the sole guide to the books. Many excellent examples of such catalogues exist, in author, subject and classified form, and some of them are admirable contributions to bibliography. Within recent years, however, doubts have arisen in many quarters, both in Europe and America, as to the wisdom of printing the catalogues of general popular libraries which possess comparatively few rare or extraordinary books. A complete catalogue of such a library is out of date the moment it is printed, and in many cases the cost is very great, while only a small number is sold. For these and other reasons, modern libraries have begun to compile complete catalogues only in MS. form, and to issue comparatively cheap class-lists at intervals, supplemented by monthly or quarterly bulletins or lists of recent accessions, which in combination will answer most of the questions likely to be put to a catalogue. Various improvements in the mechanical construction of manuscript catalogues have contributed to popularize them, and many libraries use the card, sheaf and other systems which allow constant and infinite intercalation coupled with economy and ease in making additions.

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[1] *Guide to Librarianship* by J. D. Brown (1909).

The idea of using separate slips or cards for cataloguing books, in order to obtain complete powers of arrangement and revision is not new, having been applied during the French revolutionary period to the cataloguing of libraries. More recently the system has been applied to various commercial purposes, such as book-keeping by what is known as the "loose-leaf ledger," and in this way greater public attention has been directed to the possibilities of adjustable methods both in libraries and for business. The card system is perhaps the most generally used at present, but many improvements in the adjustable binders, called by librarians the "sheaf system," will probably result in this latter form becoming a serious rival. The card method consists of a series of cards in alphabetical or other order kept on edge in trays or drawers, to which projecting guides are added in order to facilitate reference. Entries are usually made on one side of the card, and one card serves for a single entry. The sheaf method provides for slips of an uniform size being kept in book form in volumes capable of being opened by means of a screw or other fastening, for the purpose of adding or withdrawing slips. In addition to the advantage of being in book-form the sheaf system allows both sides of a slip to be used, while in many cases from two to twelve entries may be made on one slip. This is a great economy and leads to considerable saving of space. A great advantage resulting from the use of an adjustable manuscript catalogue, in whatever form adopted, is the simplicity with which it can be kept up-to-date. This is an advantage which in the view of many librarians outweighs the undoubted valuable qualities of comparative safety and multiplication of copies possessed by the printed form. There are many different forms of both card and sheaf systems, and practically every library now uses one or other of them for cataloguing or indexing purposes.

One other modification in connexion with the complete printed catalogue has been tried with success, and seems worthy of brief mention. After a complete manuscript catalogue has been provided in sheaf form, a select or eclectic catalogue is printed, comprising all the most important books in the library and those that represent special subjects. This, when supplemented by a printed list or bulletin of additions, seems to supply every need.

The most striking tendency of the modern library movement is the great increase in the freedom allowed to readers both in reference and lending departments. Although access to the shelves was quite a common feature in the older subscription libraries, and in state libraries like the British Museum and Patent Office, it is only within comparatively recent years that lending library borrowers were granted a similar privilege. Most municipal reference libraries grant access to a large or small collection of books, and at Cambridge, Birmingham and elsewhere in the United Kingdom, the practice is of long standing. So also in the United States, practically every library has its open shelf collection. On the continent of Europe, however, this method is not at all general, and books are guarded with a jealousy which in many cases must militate against their utility. The first "safe-guarded" open access municipal lending library was opened at Clerkenwell (now Finsbury), London, in 1893, and since then over one hundred cities and districts of all sizes in Britain have adopted the system. The British municipal libraries differ considerably from those of the United States in the safeguards against abuse which are employed, and the result is that their losses are insignificant, whilst in America they are sometimes enormous. Pawtucket and Cleveland in America were pioneers to some extent of the open shelf system for lending libraries, but the methods employed had little resemblance to the safe-guarded system of British libraries. The main features of the British plan are: exact classification; class, shelf and book guiding; the provision of automatic locking wickets to regulate the entrance and exit of borrowers, and the rule that borrowers must be registered before they can obtain admission. This last rule is not always current in America, and in consequence abuses are liable to take place. The great majority of British and American libraries, whether allowing open access or not, use cards for charging or registering books loaned to borrowers. In the United Kingdom a considerable number of places still use indicators for this purpose, although this mechanical method is gradually being restricted to fiction, save in very small places.

Other activities of modern libraries which are common to both Britain and America are courses of lectures, book exhibitions, work with children, provision of books for the blind and for foreign residents, travelling libraries and the education of library assistants. In many of the recent buildings, especially in those erected from the gifts of Mr Andrew Carnegie, special rooms for lectures and exhibitions and children are provided. Courses of lectures in connexion with the Liverpool and Manchester public libraries date from 1866, but during the years 1900–1910 there was a very great extension of this work. As a rule these courses are intended to direct attention to the literature of the subjects treated, as represented in the libraries, and in this way a certain amount of mutual advantage is secured. In some districts the libraries work in association with the education authorities, and thus it is rendered possible to keep schools supplied with books, over which the teachers are able to exercise supervision. This connexion between libraries and schools is much less common in the United Kingdom than in the British colonies and the United States, where the libraries are regarded as part of the national system of education. Excellent work has been accomplished within recent years by the Library Association in the training of librarians, and it is usual for about 300 candidates to come forward annually for examination in literary history, bibliography, classification, cataloguing, library history and library routine for which subjects certificates and diplomas are awarded. The profession of municipal librarian is not by any means remunerative as compared with employment in teaching or in the Civil Service, and until the library rate is increased there is little hope of improvement.

The usefulness of public libraries has been greatly increased by the work of the Library Association, founded in 1877, during the first International Library Conference held in London in October 1877. A charter of incorporation was granted to the association in 1898. It holds monthly and annual meetings, publishes a journal, conducts examinations, issues certificates, holds classes for instruction, and has greatly helped to improve the public library law. The Library Assistants Association (1895) publishes a journal. A second International Library Conference was held at London in 1897, and a third at Brussels in 1910. Library associations have been started in most of the countries of Europe, and the American Library Association, the largest and most important in existence, was established in 1876. These associations are giving substantial aid in the development and improvement of library methods and the status of librarians, and it is certain that their influence will in time produce a more scientific and valuable type of library than at present generally exists.

British Colonies and India.

The majority of the British Colonies and Dependencies have permissive library laws on lines very similar to those in force in the mother country. There are, however, several points of difference which are worth mention. The rate limit is not so strict in every case, and an effort is made to bring the libraries into closer relations with the educational machinery of each colony. There is, for example, no rate limit in Tasmania; and South Australia may raise a library rate equivalent to 3d. in the £, although, in both cases, owing to the absence of large towns, the legislation existing has not been adopted. In Africa, Australia and Canada the governments make grants to public libraries up to a certain amount, on condition that the reading-rooms are open to the public, and some of the legislatures are even in closer touch with the libraries. The Canadian and Australian libraries are administered more or less on American lines, whilst those of South Africa, India, &c., are managed on the plan followed in England.

Africa.

There are several important libraries in South Africa, and many small town libraries which used to receive a government grant equal to the subscriptions of the members, but in no case did such grants exceed £150 for any one library in one year. These grants fluctuate considerably owing to the changes and temper of successive governments, and since the last war they have been considerably reduced everywhere. One of the oldest libraries is the South African Public Library at Cape Town established in 1818, which enjoys the copyright-privilege of receiving a free copy of every publication issued in Cape Colony. This library contains the great collection of colonial books bequeathed by Sir George Grey. The libraries of the various legislatures are perhaps the best supported and most important, but mention should be made of the public libraries of Port Elizabeth, Cape Colony, which published an excellent catalogue, and the public libraries at Kimberley; Durban, Natal; Bloemfontein, Orange River Colony; Bulawayo, Rhodesia; Johannesburg, Transvaal; and the public and university libraries at Pretoria. None of the libraries of North Africa are specially notable, although there are considerable collections at Cairo and Algiers.

Australasia.

All the public libraries, mechanics' institutes, schools of arts and similar institutes receive aid from the government, either in the form of grants of money or boxes of books sent from some centre. The public library of New South Wales, Sydney (1869), which includes the Mitchell Library of over 50,000 vols., now possesses a total of nearly 250,000 vols., and circulates books to country libraries, lighthouses and teachers' associations to the number of about 20,000 vols. per annum. The public library of Victoria, Melbourne (1853), with about 220,000 vols., also sends books to 443 country libraries of various kinds, which among them possess 750,000 vols., and circulate annually considerably over 2½ million vols. The university library at Melbourne (1855) has over 20,000 vols., and the libraries connected with the parliament and various learned societies are important. The public library of South Australia, Adelaide, has about 75,000 vols., and is the centre for the distribution of books to the institutes throughout the colony. These institutes possess over 325,000 vols. There is a good public library at Brisbane, Queensland, and there are a number of state-aided schools of arts with libraries attached. The Library of Parliament in Brisbane possesses over 40,000, and the Rockhampton School of Arts has 10,000 vols. Western Australia has a public library at Perth, which was established in 1887, and the small town institutes are assisted as in the other colonies.

Tasmania has several good libraries in the larger towns, but none of them had in 1910 taken advantage of the act passed in 1867 which gives municipalities practically unlimited powers and means as far as the establishment and maintenance of public libraries are concerned. At Hobart the Tasmanian Public Library (1849) is one of the most important, with 25,000 vols.

New Zealand is well equipped with public libraries established under acts dating from 1869 to 1877, as well as subscription, college and government libraries. At Auckland the Free Public Library (1880) has 50,000 vols., including Sir George Grey's Australasian collection; the Canterbury Public Library, Christchurch (1874), has 40,000 vols.; the University of Otago Library, Dunedin (1872), 10,000 vols.; and the public library at Wellington (1893) contains 20,000 vols.

India and the East.

Apart from government and royal libraries, there are many college, society, subscription and others, both English and oriental. It is impossible to do more than name a few of the most notable. Lists of many of the libraries in private hands including descriptions of their MS. contents have been issued by the Indian government. At Calcutta the Sanskrit college has 1652 printed Sanskrit volumes and 2769 Sanskrit MSS., some as old as the 14th century; there is also a large collection of Jain MSS. The Arabic library attached to the Arabic department of the Madrasa was founded about 1781, and now includes 731 printed volumes, 143 original MSS. and 151 copies; the English library of the Anglo-Persian department dates from 1854, and extends to 3254 vols. The library of the Asiatic Society of Bengal was founded in 1784, and now contains 15,000 printed vols., chiefly on eastern and philological subjects, with a valuable collection of 9500 Arabic and Persian MSS.

At Bombay the library of the Bombay branch of the Royal Asiatic Society, established in 1804 as the Literary Society of Bengal, is now an excellent general and oriental collection of 75,000 printed vols. and MSS., described in printed catalogues. The Moolla Feroze Library was bequeathed for public use by Moolla Feroze, head priest of the Parsis of the Kudmi sect in 1831, and consisted chiefly of MSS., in Arabic and Persian on history, philosophy and astronomy; some additions of English and Gujarati works have been made, as well as of European books on Zoroastrianism. The Native General Library (1845) has 11,000 vols., and there are libraries attached to Elphinstone College and the university of Bombay.

The library of Tippoo Sahib, consisting of 2000 MSS., fell into the hands of the British, and a descriptive catalogue of them by Charles Stewart was published at Cambridge in 1809, 4to. A few were presented to public libraries in England, but the majority were placed in the college of Fort William, then recently established. The first volume, containing Persian and Hindustani poetry, of the *Catalogue of the Libraries of the King of Oudh*, by A. Sprenger, was published at Calcutta in 1854. The compiler shortly afterwards left the Indian service, and no measures were taken to complete the work. On the annexation of the kingdom in 1856 the ex-king is believed to have taken some of the most valuable MSS. to Calcutta, but the largest portion was left behind at Lucknow. During the siege the books were used to block up windows, &c., and those which were not destroyed were abandoned and plundered by the soldiers. Many were burnt for fuel; a few, however, were rescued and sold by auction, and of these some were purchased for the Asiatic Society of Bengal.

Perhaps the most remarkable library in India is that of the rājā of Tanjore, which dates from the end of the 16th or beginning of the 17th century, when Tanjore was under the rule of the Telugu Nāiks, who collected Sanskrit MSS. written in the Telugu character. In the 18th century the Mahrattas conquered the country, and since that date the library increased but slowly. By far the greater portion of the store was acquired by Sharabhojī Rājā during a visit to Benares in 1820–1830; his successor Sivajī added a few, but of inferior value. There are now about 18,000 MSS. written in Devanāgarī, Nandināgarī, Telugu, Kannada, Granthī, Malayālam, Bengalī, Panjābī or Kashmirī, and Uriya; 8000 are on palm leaves. Dr Burnell's printed catalogue describes 12,375 articles.

The Royal Asiatic Society has branches with libraries attached in many of the large cities of India, the Straits Settlements, Ceylon, China, Japan, &c. At Rangoon in Burma there are several good libraries. The Raffles Library at Singapore was established as a proprietary institution in 1844, taken over by the government in 1874, and given legal status by an ordinance passed in 1878. It now contains about 35,000 vols. in general literature, but books relating to the Malayan peninsula and archipelago have been made a special feature, and since the acquisition of the collection of J. R. Logan in 1879 the library has become remarkably rich in this department. In Ceylon there is the Museum Library at Colombo (1877), which is maintained by the government, and there are many subscription and a few oriental libraries.

Canada.

The public libraries of the various provinces of Canada have grown rapidly in importance and activity, and, assisted as they are by government and municipal grants, they promise to rival those of the United States in generous equipment. Most of the library work in Canada is on the same lines as that of the United States, and there are no special points of difference worth mention. The library laws of the Dominion are embodied in a series of acts dating from 1854, by which much the same powers are conferred on local authorities as by the legislation of Britain and the United States. An important feature of the Canadian library law is the close association maintained between schools and libraries, and in some provinces the school libraries are established by the school and not the library laws. There is also an important extension of libraries to the rural districts, so that in every direction full provision is being made for the after-school education and recreation of the people.

The province of Ontario has a very large and widespread library system of which full particulars are given in the annual reports of the minister of education. The library portion has been printed separately, and with its illustrations and special articles forms quite a handbook of Canadian library practice. There are now 413 public libraries described as free and not free, and of these 131 free and 234 not free reported in 1909. The free libraries possessed 775,976 vols. and issued 2,421,049 vols. The not free libraries, most of which receive legislative or municipal grants, possessed 502,879 vols. and issued 650,826 vols. This makes a grand total of 1,278,855 vols. in municipal and assisted subscription libraries without counting the university and other libraries in the province. The most important other libraries in Ontario are—Queen's University, Kingston (1841), 40,000 vols.; Library of Parliament, Ottawa, about 250,000 vols.; university of Ottawa, 35,000 vols.; Legislative Library of Ontario, Toronto, about 100,000 vols.; university of Toronto (1856), 50,000 vols. The Public (municipal) Library of Toronto has now over 152,000 vols.

In the province of Quebec, in addition to the state-aided libraries there are several large and important libraries, among which may be mentioned the Fraser Institute, Montreal, 40,000 vols.; McGill University, Montreal (1855), 125,000 vols., comprising many important collections; the Seminary of St Sulpice, Montreal, about 80,000 vols.; Laval University, Quebec, 125,000 vols.; and the library of the Legislature (1792), about 100,000 vols. In the western provinces several large public, government and college libraries have been formed, but none of them are as old and important as those in the eastern provinces.

In Nova Scotia there are now 279 cases of books circulating among the school libraries, containing about 40,000 vols., and in addition 2800 vols. were stocked for the use of rural school libraries. The rural school libraries of Nova Scotia are regulated by a special law, and a little handbook has been printed, somewhat similar to that published by the French educational authorities for the communale libraries. The Legislative Library at Halifax contains nearly 35,000 vols., and the Dalhousie University (1868), in the same town, contains about 20,000 vols. The Legislative Library of Prince Edward Island, Charlottetown, containing the Dodd Library, issues books for home use. The school law of New Brunswick provides for grants being made in aid of school libraries by the Board of Education equal to one half the amount raised by a district, and a series of rules has been published. The only other British libraries in America of much consequence are those in the West Indian Islands. The Institute of Jamaica, Kingston (1879) has about 15,000 vols.; the Trinidad Public Library (1841), recently revised and catalogued, 23,000 vols.; and there are a few small legislative and college libraries in addition.

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United States of America.

The libraries of the United States are remarkable for their number, size, variety, liberal endowment and good administration. The total number of libraries with over 1000 vols. was 5383 in 1900, including those attached to schools and institutions, and in 1910 there were probably at least 10,000 libraries having 1000 vols. and over. It is impossible to do more than glance at the principal libraries and activities, where the field is so immense, and a brief sketch of some of the chief federal, state, university, endowed and municipal libraries will therefore be presented.

Federal libraries.

The Library of Congress was first established in 1800 at Washington, and was burned together with the Capitol by the British army in 1814. President Jefferson's books were purchased to form the foundation of a new library, which continued to increase slowly until 1851, when all but 20,000 vols. were destroyed by fire. From this time the collection has grown rapidly, and now consists of about 1,800,000 vols. In 1866 the library of the Smithsonian Institution, consisting of 40,000 vols., chiefly in natural science, was transferred to the Library of Congress. The library is specially well provided in history, jurisprudence, the political sciences and Americana. Since 1832 the law collections have been constituted into a special department. This is the national library. In 1870 the registry of copyrights was transferred to it under the charge of the librarian of Congress, and two copies of every publication which claims copyright are required to be deposited. Cards for these are now printed and copies are sold to other libraries for an annual subscription fixed according to the number taken. The building in which the library is now housed was opened in 1897. It covers 3½ acres of ground, contains 10,000,000 cub. ft. of space, and has possible accommodation for over 4 million vols. Its cost was $6,500,000, or including the land, $7,000,000. It is the largest, most ornate and most costly building in the world yet erected for library purposes. Within recent years the appropriation has been largely increased, and the bibliographical department has been able to publish many valuable books on special subjects. The *A.L.A. Catalog* (1904) and *A.L.A. Portrait Index* (1906), may be mentioned as of especial value. The classification of the library is being gradually completed, and in every respect this is the most active government library in existence.

Other important federal libraries are those attached to the following departments at Washington: Bureau of Education (1868); Geological Survey (1882); House of Representatives; Patent Office (1836); Senate (1868); Surgeon General's Office (1870), with an elaborate analytical printed catalogue of world-wide fame.

State libraries.

Although the state libraries of Pennsylvania and New Hampshire are known to have been established as early as 1777, it was not until some time after the revolution that any general tendency was shown to form official libraries in connexion with the state system. It is especially within the last thirty years that the number of these libraries has so increased that now every state and territory possesses a collection of books and documents for official and public purposes. These collections depend for their increase upon annual appropriations by the several states, and upon a systematic exchange of the official publications of the general government and of the several states and territories. The largest is that of the state of New York at Albany, which contains nearly 500,000 vols., and is composed of a general and a law library. Printed and MS. card catalogues have been issued. The state libraries are libraries of reference, and only members of the official classes are allowed to borrow books, although any well-behaved person is admitted to read in the libraries.

University libraries.

The earliest libraries formed were in connexion with educational institutions, and the oldest is that of Harvard (1638). It was destroyed by fire in 1764, but active steps were at once taken for its restoration. From that time to the present, private donations have been the great resource of the library. In 1840 the collection was removed to Gore Hall, erected for the purpose with a noble bequest from Christopher Gore (1758–1829), formerly governor of Massachusetts. There are also ten special libraries connected with the different departments of the university. The total numbers of vols. in all these collections is over 800,000. There is a MS. card-catalogue in two parts, by authors and subjects, which is accessible to the readers. The only condition of admission to use the books in Gore Hall is respectability; but only members of the university and privileged persons may borrow books. The library of Yale College, New Haven, was founded in 1701, but grew so slowly that, even with the 1000 vols. received from Bishop Berkeley in 1733, it had only increased to 4000 vols. in 1766, and some of these were lost in the revolutionary war. During the 19th century the collection grew more speedily, and now the library numbers over 550,000 vols.

Other important university and college libraries are Amherst College, Mass. (1821), 93,000 vols.; Brown University, R.I. (1767), 156,000 vols.; Columbia University, N.Y. (1763), 430,000 vols.; Cornell University, N.Y. (1868), 355,000 vols.; Dartmouth College, N.H. (1769), 106,000 vols.; Johns Hopkins University, Baltimore (1876), 220,000 vols.; Lehigh University, Pa. (1877), 150,000 vols.; Leland Stanford University, Cal. (1891), 113,000 vols.; Princeton University, N.J. (1746), 260,000 vols.; University of California (1868), 240,000 vols.; University of Chicago, Ill. (1892), 480,000 vols.; University of Michigan (1837), 252,000 vols.; University of Pennsylvania (1749), 285,000 vols. There are numerous other college libraries, several of them even larger than some of those named above.

Subscription and Endowed Libraries.

The establishment of proprietary or subscription libraries runs back into the first half of the 18th century, and is connected with the name of Benjamin Franklin. It was at Philadelphia, in the year 1731, that he set on foot what he called "his first project of a public nature, that for a subscription library. . . . The institution soon manifested its ability, was imitated by other towns and in other provinces." The Library Company of Philadelphia was soon regularly incorporated, and gradually drew to itself other collections of books, including the Loganian Library, which was vested in the company by the state legislature in 1792 in trust for public use. Hence the collection combines the character of a public and of a proprietary library, being freely open for reference purposes, while the books circulate only among the subscribing members. It numbers at present 226,000 vols., of which 11,000 belong to the Loganian Library, and may be freely lent. In 1869 Dr James Rush left a bequest of over one million dollars for the purpose of erecting a building to be called the Ridgeway branch of the library. The building is very handsome, and has been very highly spoken of as a library structure. Philadelphia has another large proprietary library—that of the Mercantile Library Company, which was established in 1821. It possesses 200,000 vols., and its members have always enjoyed direct access to the shelves. The library of the Boston Athenaeum was established in 1807, and numbers 235,000 vols. It has published an admirable dictionary-catalogue. The collection is especially rich in art and in history, and possesses a part of the library of George Washington. The Mercantile Library Association of New York, which was founded in 1820, has over 240,000 vols. New York possesses two other large proprietary libraries, one of which claims to have been formed as early as 1700 as the "public" library of New York. It was organized as the New York Society Library in 1754, and has been especially the library of the old Knickerbocker families and their descendants, its contents bearing witness to its history. It contains about 100,000 vols. The Apprentices' Library (1820) has about 100,000 vols., and makes a special feature of works on trades and useful arts.

The Astor Library in New York was founded by a bequest of John Jacob Astor, whose example was followed successively by his son and grandson. The library was opened to the public in 1854, and consists of a careful selection of the most valuable books upon all subjects. It is a library of reference, for which purpose it is freely open, and books are not lent out. It is "a working library for studious persons." The Lenox Library was established by James Lenox in 1870, when a body of trustees was incorporated by an act of the legislature. In addition to the funds intended for the library building and endowment, amounting to $1,247,000, the private collection of books which Mr Lenox had long been accumulating is extremely valuable. Though it does not rank high in point of mere numbers, it is exceedingly rich in early books on America, in Bibles, in Shakesperiana and in Elizabethan poetry. Both those libraries are now merged in the New York Public Library. The Peabody Institute at Baltimore was established by George Peabody in 1857, and contains a reference library open to all comers. The institute has an endowment of $1,000,000, which, however, has to support, besides the library, a conservatoire of music, an art gallery, and courses of popular lectures. It has a very fine printed dictionary catalogue and now contains nearly 200,000 vols. In the same city is the Enoch Pratt Free Library (1882) with 257,000 vols. In the city of Chicago are two very important endowed libraries, the Newberry Library (1887) with over 200,000 vols., and the John Crerar Library (1894), with 235,000 vols. Both of these are reference libraries of great value, and the John Crerar Library specializes in science, for which purpose its founder left $3,000,000.

It will be sufficient to name a few of the other endowed libraries to give an idea of the large number of donors who have given money to libraries. Silas Bronson (Waterbury), Annie T. Howard (New Orleans), Joshua Bates (Boston), Charles E. Forbes (Northampton, Mass.), Mortimer F. Reynolds (Rochester, N.Y.), Leonard Case (Cleveland), I. Osterhout (Wilkes-Barré, Pa.), and above all Andrew Carnegie, whose library benefactions exceed $53,000,000.

It remains to mention another group of proprietary and society libraries.

Since the organization of the government in 1789, no less than one hundred and sixty historical societies have been formed in the United States, most of which still continue to exist. Many of them have formed considerable libraries, and possess extensive and valuable manuscript collections. The oldest of them is the Massachusetts Historical Society, which dates from 1791.

The earliest of the scientific societies, the American Philosophical Society (1743), has 73,000 vols. The most extensive collection is that of the Academy of Natural Sciences of Philadelphia, which consists of 80,000 vols. and pamphlets. For information as to the numerous professional libraries of the United States—theological, legal and medical—the reader may be referred to the authorities quoted below.

Municipal Libraries.

In no country has the movement for the development of municipal libraries made such progress as in the United States; these institutions called free or public as the case may be are distinguished for their work, enterprise and the liberality with which they are supported. They are established under laws passed by the different states, the first to pass such an enactment being Massachusetts, which in 1848 empowered the city of Boston to establish a free public library. This was subsequently extended to the whole state in 1851. Other states followed, all with more or less variation in the provisions, till practically every state in the Union now has a body of library laws. In general the American library law is much on the same lines as the English. In most states the acts are permissive. In New Hampshire aid is granted by the state to any library for which a township contracts to make a definite annual appropriation. A limit is imposed in most states on the library tax which may be levied, although there are some, like Massachusetts and New Hampshire, which fix no limit. In every American town the amount derived from the library tax usually exceeds by double or more the same rate raised in Britain in towns of similar size. For example, East Orange, N.J., with a population of 35,000, expends £2400, while Dumfries in Scotland, with 23,000 pop. expends £500. Cincinnati, 345,000 pop., expenditure £26,000; Islington (London), 350,000 pop., expenditure £8200, is another example. In the smaller towns the difference is not so marked, but generally the average American municipal library income is considerably in excess of the British one. Many American municipal libraries have also endowments which add to their incomes.

American Library Administration.

In one respect the American libraries differ from those of the United Kingdom. They are usually managed by a small committee or body of trustees, about five or more in number, who administer the library independent of the city council. This is akin to the practice in Scotland, although there, the committees are larger. In addition to the legislation authorizing town libraries to be established, thirty-two states have formed state library commissions. These are small bodies of three or five trained persons appointed by the different states which, acting on behalf of the state, encourage the formation of local libraries, particularly in towns and villages, and in many cases have authority to aid their establishment by the grant out of the state funds of a certain sum (usually $100) towards the purchase of books, upon the appropriation of a similar sum by the local authorities. These commissions are prepared to aid further with select lists of desirable books, and with suggestions or advice in the problems of construction and maintenance. Such commissions are in existence in Alabama, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Vermont, Washington and Wisconsin.

The reports and other documents issued by some of these commissioners are very interesting and valuable, especially as regards the light they throw on the working of the travelling libraries in country districts. These to some extent are a revival of the "itinerating" library idea of Samuel Brown of Haddington in Scotland, who from 1817 to 1836 carried on a system of travelling subscription libraries in that country. At the time of his death there were 3850 vols. in 47 libraries. The American travelling libraries, often under state supervision, are well organized and numerous, and the books are circulated free. New York was the pioneer in this movement which now extends to most of the states which have established library commissions. There are also town travelling libraries and deposit stations in addition to branches, so that every effort is made to bring people in outlying districts into touch with books.

The municipal libraries of the United States work in conjunction with the schools, and it is generally considered that they are part of the educational machinery of the country. In the case of New York the state libraries have been put under the control of the university of the state of New York, which also inaugurated the travelling libraries. Work with the schools and children generally is more cultivated in the libraries of the United States than elsewhere. In some cases the libraries send collections of books to the schools; in others provision is made for children's reading-rooms and lending departments at the library buildings. At Cleveland (Ohio), Pittsburg (Pa.), New York and many other places, elaborate arrangements are in force for the convenience and amusement of children. There is a special school, the Carnegie Library training school for children's librarians, at Pittsburg, and within recent years the instruction has included the art of telling stories to children at the libraries. This "story-hour" idea has been the cause of considerable discussion in the United States, librarians and teachers being divided in opinion as to the value of the service. The chief factors in children's work in American libraries, often overlooked by critics, are the number of non-English reading adults and the large number of children of foreign origin. The adults do not use the libraries to any large extent, but the children, who learn English at the schools, are brought into close touch with the juvenile departments of the libraries. In this way many libraries are obliged to undertake special work for children, and as a rule it is performed in a sane, practical and economical manner. The preponderance of women librarians and their natural sentimental regard for children has tended to make this work loom rather largely in some quarters, but with these exceptions the activity on behalf of children is justified on many grounds. But above all, it is manifest that a rapidly growing nation, finding homes for thousands of foreigners and their children annually, must use every means of rapidly educating their new citizens, and the public library is one of the most efficient and ready ways of accomplishing this great national object.

With regard to methods, the American libraries are working on much the same plan as those of the United Kingdom. They allow access to the shelves more universally, and there is much more standardization in classification and other internal matters. The provision of books is more profuse, although there is, on the whole, more reading done in the United Kingdom. The largest municipal library system in America, and also in the world, is that of New York City, which, after struggling with a series of Free Circulating Libraries, blossomed out in 1895 into the series of combinations which resulted in the present great establishment. In that year, the Astor and Lenox libraries (see above) were taken over by the city, and in addition, $2,000,000 was given by one of the heirs of Mr S. J. Tilden, who had bequeathed about $4,000,000 for library purposes in New York but whose will had been upset in the law courts. In 1901 Mr Andrew Carnegie gave about £1,500,000 for the purpose of providing 65 branches, and these are now nearly all erected. A very fine central library building has been erected, and when the organization is completed there will be no system of municipal libraries to equal that of New York. It possesses about 1,400,000 vols. in the consolidated libraries. Brooklyn, although forming part of Greater New York, has an independent library system, and possesses about 560,000 vols. distributed among 26 branches and including the old Brooklyn Library which has been absorbed in the municipal library system. At Boston (Mass.) is one of the most renowned public libraries in the United States, and also the oldest established by act of legislature. It was first opened to the public in 1854, and is now housed in a very magnificently decorated building which was completed in 1895. The central library contains many fine special collections, and there are 28 branch and numerous school libraries in connexion. It possesses about 1,000,000 vols. altogether, its annual circulation is about 1,500,000 vols., and its annual expenditure is nearly £70,000.

Other notable municipal libraries are those of Philadelphia (1891), Chicago (1872); Los Angeles (Cal.), 1872; Indianapolis (1868), Detroit (1865), Minneapolis (1885), St Louis (1865), Newark, N.J. (1889), Cincinnati (1856), Cleveland (1869), Allegheny (1890), Pittsburg (1895), Providence, R.I. (1878), Milwaukee (1875), Washington, D.C. (1898), Worcester, Mass. (1859), Buffalo (1837).

AUTHORITIES.—*The Annual Library Index* (New York, 1908)—contains a select list of libraries in the United States; Arthur E. Bostwick, *The American Public Library*, illust. (New York, 1910)—the most comprehensive general book; Bureau of Education, *Statistics of Public Libraries in the United States and Canada* (1893)—this has been succeeded by a list of "Public, Society and School Libraries," reprinted at irregular intervals from the Report of the Commissioner of Education and giving a list of libraries containing over 5000 vols. with various other particulars; Clegg, *International Directory of Booksellers* (1910) and earlier issues—contains a list of American libraries with brief particulars; John C. Dana, *A Library Primer* (Chicago, 1910)—the standard manual of American library practice; *Directory of Libraries in the United States and Canada* (6th ed., Minneapolis, 1908)—a brief list of 4500 libraries, with indication of the annual income of each; Wm. I. Fletcher, *Public Libraries in America* (2nd ed., Boston, 1899), illust.; T. W. Koch, *Portfolio of Carnegie Libraries* (1908); Cornelia Marvin, *Small Library Buildings* (Boston, 1908); A. R. Spofford, *A Book for all Readers. . . the Formation of Public and Private Libraries* (1905).

France.

French libraries (other than those in private hands) belong either to the state, to the departments, to the communes or to learned societies, educational establishments and other public institutions; the libraries of judicial or administrative bodies are not considered to be owned by them, but to be state property. Besides the unrivalled library accommodation of the capital, France possesses a remarkable assemblage of provincial libraries. The communal and school libraries also form striking features of the French free library system. Taking as a basis for comparison the *Tableau statistique des bibliothèques publiques* (1857), there were at that date 340 departmental libraries with a total of 3,734,260 vols., and 44,436 MSS. In 1908 the number of volumes in all the public libraries; communal, university, learned societies, educational and departmental, was more than 20,060,148 vols., 93,986 MSS. and 15,530 incunabula. Paris alone now possesses over 10,570,000 printed vols., 147,543 MSS., 5000 incunabula, 609,439 maps and plans, 2,000,000 prints (designs and reproductions).

Paris.

The Bibliothèque Nationale (one of the most extensive libraries in the world) has had an advantage over others in the length of time during which its contents have been accumulating, and in the great zeal shown for it by several kings and other eminent men. Enthusiastic writers find the original of this library in the MS. collections of Charlemagne and Charles the Bald, but these were dispersed in course of time, and the few precious relics of them which the national library now possesses have been acquired at a much later date. Of the library which St Louis formed in the 13th century (in imitation of what he had seen in the East) nothing has fallen into the possession of the Bibliothèque Nationale, but much has remained of the royal collections made by kings of the later dynasties. The real foundation of the institution (formerly known as the Bibliothèque du Roi) may be said to date from the reign of King John, the Black Prince's captive, who had a considerable taste for books, and bequeathed his "royal library" of MSS. to his successor Charles V. Charles V. organized his library in a very effective manner, removing it from the Palais de la Cité to the Louvre, where it was arranged on desks in a large hall of three storeys, and placed under the management of the first librarian and cataloguer, Claude Mallet, the king's valet-de-chambre. His catalogue was a mere shelf-list, entitled *Inventaire des Livres du Roy nostre Seigneur estans au chastel du Louvre*; it is still extant, as well as the further inventories made by Jean Blanchet in 1380, and by Jean le Bègue in 1411 and 1424. Charles V. was very liberal in his patronage of literature, and many of the early monuments of the French language are due to his having employed Nicholas Oresme, Raoul de Presle and other scholars to make translations from ancient texts. Charles VI. added some hundreds of MSS. to the royal library, which, however, was sold to the regent, duke of Bedford, after a valuation had been established by the inventory of 1424. The regent transferred it to England, and it was finally dispersed at his death in 1435. Charles VII. and Louis XI. did little to repair the loss of the precious Louvre library, but the news of the invention of printing served as a stimulus to the creation of another one, of which the first librarian was Laurent Paulmier. The famous miniaturist, Jean Foucquet of Tours, was named the king's *enlumineur*, and although Louis XI. neglected to avail himself of many precious opportunities that occurred in his reign, still the new library developed gradually with the help of confiscation. Charles VIII. enriched it with many fine MSS. executed by his order, and also with most of the books that had formed the library of the kings of Aragon, seized by him at Naples. Louis XII., on coming to the throne, incorporated the Bibliothèque du Roi with the fine Orleans library at Blois, which he had inherited. The Blois library, thus augmented, and further enriched by plunder from the palaces of Pavia, and by the purchase of the famous Gruthuyse collection, was described at the time as one of the four marvels of France. Francis I. removed it to Fontainebleau in 1534, enlarged by the addition of his private library. He was the first to set the fashion of fine artistic bindings, which was still more cultivated by Henry II., and which has never died out in France. During the librarianship of Amyot (the translator of Plutarch) the library was transferred from Fontainebleau to Paris, not without the loss of several books coveted by powerful thieves. Henry IV. removed it to the Collége de Clermont, but in 1604 another change was made, and in 1622 it was installed in the Rue de la Harpe. Under the librarianship of J. A. de Thou it acquired the library of Catherine de' Medici, and the glorious Bible of Charles the Bald. In 1617 a decree was passed that two copies of every new publication should be deposited in the library, but this was not rigidly enforced till Louis XIV.'s time. The first catalogue worthy of the name was finished in 1622, and contains a description of some 6000 vols., chiefly MSS. Many additions were made during Louis XIII.'s reign, notably that of the Dupuy collection, but a new era dawned for the Bibliothèque du Roi under the patronage of Louis XIV. The enlightened activity of Colbert, one of the greatest of collectors, so enriched the library that it became necessary for want of space to make another removal. It was therefore in 1666 installed in the Rue Vivien (now Vivienne) not far from its present habitat. The departments of engravings and medals were now created, and before long rose to nearly equal importance with that of books. Marolles's prints, Foucquet's books, and many from the Mazarin library were added to the collection, and, in short, the Bibliothèque du Roi had its future pre-eminence undoubtedly secured. Nic. Clément made a catalogue in 1684 according to an arrangement which has been followed ever since (that is, in twenty-three classes, each one designated by a letter of the alphabet), with an alphabetical index to it. After Colbert's death Louvois emulated his predecessor's labours, and employed Mabillon, Thevenot and others to procure fresh accessions from all parts of the world. A new catalogue was compiled in 1688 in 8 vols. by several distinguished scholars. The Abbé Louvois, the minister's son, became head of the library in 1691, and opened it to all students—a privilege which although soon withdrawn was afterwards restored. Towards the end of Louis XIV.'s reign it contained over 70,000 vols. Under the management of the Abbé Bignon numerous additions were made in all departments, and the library was removed to its present home in the Rue Richelieu. Among the more important acquisitions were 6000 MSS. from the private library of the Colbert family, Bishop Huet's forfeited collection, and a large number of Oriental books imported by missionaries from the farther East, and by special agents from the Levant. Between 1739 and 1753 a catalogue in 11 vols. was printed, which enabled the administration to discover and to sell its duplicates. In Louis XVI.'s reign the sale of the La Vallière library furnished a valuable increase both in MSS. and printed books. A few years before the Revolution broke out the latter department contained over 300,000 vols. and opuscules. The Revolution was serviceable to the library, now called the Bibliothèque Nationale, by increasing it with the forfeited collections of the *émigrés*, as well as of the suppressed religious communities. In the midst of the difficulties of placing and cataloguing these numerous acquisitions, the name of Van Praet appears as an administrator of the first order. Napoleon increased the amount of the government grant; and by the strict enforcement of the law concerning new publications, as well as by the acquisition of several special collections, the Bibliothèque made considerable progress during his reign towards realizing his idea that it should be universal in character. At the beginning of last century the recorded numbers were 250,000 printed vols., 83,000 MSS., and 1,500,000 engravings. After Napoleon's downfall the MSS. which he had transferred from Berlin, Hanover, Florence, Venice, Rome, the Hague and other places had to be returned to their proper owners. The MacCarthy sale in 1817 brought a rich store of MSS. and incunabula. From that time onwards to the present, under the enlightened administration of MM. Taschereau and Delisle and Marcel, the accessions have been very extensive.

According to the statistics for 1908 the riches of the Bibliothèque Nationale may be enumerated as follows: (1) Département des Imprimés: more than 3,000,000 vols.; Maps and plans, 500,000 in 28,000 vols. (2) Département des Manuscrits: 110,000 MSS. thus divided: Greek 4960, Latin 21,544, French 44,913, Oriental and miscellaneous 38,583. (3) Département des Estampes: 1,000,000 pieces. (4) Département des Medailles: 207,096 pieces.

Admittance to the "salle de travail" is obtained through a card procured from the secretarial office; the "salle publique" contains 344 places for readers, who are able to consult more than 50,000 vols. of books of reference. Great improvements have lately been introduced into the service. A "salle de lecture publique" is free to all readers and is much used. New buildings are in process of construction. The slip catalogue bound in volumes dates from 1882 and gives a list of all accessions since that date; it is divided into two parts, one for the names of authors and the other for subjects. There is not yet, as at the British Museum, an alphabetical catalogue of all the printed works and kept up by periodical supplements, but since 1897 a *Catalogue général des livres imprimés* has been begun. In 1909 the 38th vol. containing letters A to Delp had appeared. Some volumes are published each year, but the earlier volumes only contain a selection of the books; this inconvenience has now been remedied. Among the other catalogues published by the Printed Book Department, the following may be mentioned: *Répertoire alphabétique des livres mis à la disposition des lecteurs dans la salle de travail* (1896, 8vo), *Liste des périodiques français et étrangers mis à la disposition des lecteurs* (1907, 4to, autogr.), *Liste des périodiques étrangers* (new ed., 1896, 8vo) and *Supplément* (1902, 8vo), *Bulletin des récentes publications françaises* (from 1882, 8vo), *Catalogue des dissertations et écrits académiques provenant des échanges avec les universités étrangères* (from 1882, 8vo). The other extensive catalogues apart from those of the 18th century are: *Catalogue de l'histoire de France* (1885–1889, 4to, 11 vols.); *Table des auteurs,* par P. Marchal (1895, 4to), with the following autographed supplements: *Histoire locale* (1880); *Histoire généalogique et biographies* (1884); *Mœurs et coutumes, archéologie* (1885); *Histoire maritime et militaire* (1894); *Histoire constitutionnelle* (1895); *Sciences médicales* (1857–1889, 3 vols., 4to); *Histoire de la Grande-Bretagne* (1875–1878, autogr.); *Histoire de l'Espagne et du Portugal* (1883, autogr.); *Histoire de l'Asie* (1894); *Histoire de l'Afrique* (1895, autogr.); *Histoire de l'Amérique*, par G. Barringer (1903–1908, autogr.); *Factums et autres documents judiciaires antérieurs à 1790*, par Corda et A. Trudon des Ormes (1890–1907, 8 vols., 8vo); *Catalogue général des incunables des bibliothèques publiques de France*, par M. Pellechet et L. Polain, t. i.-iii. (1897–1909, 8vo); *Livres d'heures imprimés au XV^{e} siècle conservés dans les bibliothèques publiques de Paris*, par P. Lacombe (1907, 8vo), &c. In the Geographical section there is L. Vallée's *Catalogue des cartes et plans relatifs à Paris et aux environs de Paris* (1908, 8vo). The following should be mentioned: *Bibliographie générale des travaux historiques et archéologiques publiés par les sociétés savantes de la France*, par R. de Lasteyrie avec la collaboration d'E. Lefèvre-Pontalis, S. Bougenot, A. Vidier, t. i.-vi. (1885–1908, 4to). The scientific division of this work (in two parts) is by Deniker. The printed catalogues and the autographed and manuscript lists of the Département des Manuscrits are very numerous and greatly facilitate research. For the French there are: H. Omont, *Catalogue général des manuscrits français* (1895–1897, 9 vols. 8vo); H. Omont, *Nouvelles acquisitions* (continuation of the same catalogue, 1899–1900, 3 vols. 8vo); H. Omont, *Anciens Inventaires de la Bibliothèque Nationale* (1908–1909, 2 vols. 8vo); E. Coyecque, *Inventaire de la Collection Anisson sur l'histoire de l'imprimerie et de la librairie* (1900, 2 vols. 8vo). Without repeating the catalogues mentioned in the tenth edition of the *Encyclopaedia Britannica*, it is yet necessary to mention the following: *Catalogue de la collection Baluze*; *Inventaire des sceaux de la collection Clairambault*; *Catalogue de la collection des cinq-cents et des mélanges Colbert*; *Catalogue des collections Duchesne et de Bréquigny*; those of the Dupuy, Joly de Fleury, and Moreau collections, and that of provincial history, &c. For the Greek collection the most important catalogues have been made by H. Omont, the present Keeper of the Manuscripts, and these are: *Inventaire sommaire des MSS. grecs* (1886–1898, 4 vols. 8vo); *Catalogus codicum hagiographicorum graecorum* (1896, 8vo); *Facsimilés des plus anciens MSS. grecs en onciale et en minuscule du IX^{e} au XIV^{e} siècle* (1891, fol.); as well as *Description des peintures et autres ornements contenus dans les MSS. latins*, par H. Bordier (1883, 4to). The lists of the Latin MSS. are: *Inventaire des manuscrits latins et nouvelles acquisitions jusqu'en 1874* (1863–1874, 7 pts. 8vo) and *Manuscrits latins et français ajoutés aux fonds des nouvelles acquisitions 1875–1881* (1891, 2 vols. 8vo), by M. Delisle; M. Omont published *Nouvelles Acquisitions du département des manuscrits* (1892–1907, 8 pts. 8vo), and B. Haureau, *Notices et extraits de quelques manuscrits latins* (1890–1893, 6 vols. 8vo). The principal modern catalogues of the oriental collection are: B. de Slane, *Catalogue des MSS. arabes, avec supplément* (1883–1895, 4to); E. Blochet, *Catalogue des MSS. arabes, persans, et turcs de la collection Schefer* (1900); E. Blochet, *Inventaire des MSS. arabes de la collection Decourtemanche* (1906); F. Macler, *Catalogue des MSS. arméniens et géorgiens* (1908). For other oriental languages the following catalogues have been compiled: *MSS. birmans et cambodgiens* (1879); *MSS. chinois, coréens et japonais* (1900–1907); *MSS. coptes* (1906); *MSS. éthiopiens* (1859–1877); *MSS. hébreux et samaritains* (1867–1903); *MSS. indo-chinois* (in the press); *MSS. malayo-polynésiens* (in the press); *MSS. mazdéens* (1900); *MSS. mexicains* (1899); *MSS. persans*, t. i. (1905); *MSS. sanscrits et pâlis* (1899, 1907–1908); *MSS. siamois* (1887); *MSS. syriaques et sabéens* (1874–1896); *MSS. thibétains* (in the press), &c. The catalogues of manuscripts in modern languages are nearly all completed. The Départements des Médailles et des Estampes possess excellent catalogues, and the following should be mentioned: E. Babelon, *Catalogue des monnaies grecques* (1890–1893); E. Babelon, *Inventaire sommaire de la collection Waddington* (1898); *Médailles fausses recueillies*, par Hoffmann (1902); Muret et Chabouillet, *Catalogue des monnaies gauloises* (1889–1892); Prou, *Catalogue des monnaies françaises* (1892–1896); H. de la Tour, *Catalogue de la collection Rouyer*, 1re *partie* (1899); *Catalogues des monnaies et médailles d'Alsace* (1902); *Cat. des monnaies de l'Amérique du Nord* (1861); *Cat. des monnaies musulmanes* (1887–1891); *Cat. des plombs* (1900); *Cat. des bronzes antiques* (1889); *Cat. des camées antiques et modernes* (1897–1899); *Cat. des vases peints* (1902–1904, 2 vols.). In the Département des Estampes the following should be mentioned: F. Courboin, *Catalogue sommaire des gravures et lithographies de la Réserve* (1900–1901); Duplessis, *Cat. des portraits français et étrangers* (1896–1907, 6 vols.); H. Bouchot, *Les Portraits au crayon des XVI^{e} et XVII^{e} siècles* (1884); *Cat. des dessins relatifs à l'histoire du théâtre* (1896); F. Courboin, *Inventaire des dessins, photographies et gravures relatives à l'histoire générale de l'art* (1895, 2 vols.), &c.

The Bibliothèque de l'Arsenal was founded by the marquis de Paulmy (Antoine-René d'Argenson) in the 18th century; it received in 1786 80,000 vols. from the duc de La Vallière. Before its confiscation as national property it had belonged to the comte d'Artois, who had bought it from the marquis de Paulmy in his lifetime. It contains at the present time about 600,000 vols., 19,000 manuscripts, 120,000 prints and the Bastille collection (2500 portfolios) of which the inventory is complete; it is the richest library for the literary history of France and has more than 30,000 theatrical pieces.

L'Inventaire des manuscrits was made by H. Martin (1885–1899, t. i.-viii.); the other catalogues and lists are: *Extrait du catalogue des journaux conservés à la Bibliothèque de l'Arsenal* ("Bulletin des biblioth. et des archives" t. i.); *Archives de la Bastille*, par F. Funck-Brentano (1892–1894, 3 vols. 8vo); *Notice sur les dépôts littéraires* par J. B. Labiche, (1880, 8vo); *Catalogue des estampes, dessins et cartes composant le cabinet des estampes de la bibliothèque de l'Arsenal*, par G. Schefer (1894–1905, 8 pts. 8vo).

The Bibliothèque Mazarine owes its origin to the great cardinal, who confided the direction to Gabriel Naudé; it was open to the public in 1642, and was transferred to Rue de Richelieu in 1648. Dispersed during the Fronde in the lifetime of Mazarin, it was reconstituted after the death of the cardinal in 1661, when it contained 40,000 vols. which were left to the Collège des Quatre-Nations, which in 1691 made it again public. It now has 250,000 vols.; with excellent manuscript catalogues.

The catalogues of incunabula and manuscripts are printed: P. Marais et A. Dufresne de Saint-Léon, *Catalogue des incunables de la bibliothèque Mazarine* (1893, 8vo); *Supplément, additions et corrections* (1898, 4 vols. 8vo); *Catalogue des MSS.*, par A. Molinier (1885–1892, 4 vols. 8vo); *Inventaire sommaire des MSS. grecs*, par H. Omont.

The first library of the Genovéfains had nearly disappeared owing to bad administration when Cardinal François de la Rochefoucauld, who had charge of the reformation of that religious order, constituted in 1642 a new library with his own books. The Bibliothèque Ste-Geneviève in 1716 possessed 45,000 vols.; important gifts were made by Letellier in 1791, and the duc d'Orléans increased it still more. It became national property in 1791, and was called the Bibliothèque du Panthéon and added to the Lycée Henri IV. under the empire. In 1908 the library contained 350,000 printed vols., 1225 incunabula, 3510 manuscripts, 10,000 prints (including 7357 portraits and 3000 maps and plans).

The printed catalogues at present comprise: Poirée et Lamoureux, *Catalogue abrégé de la bibliothèque Ste-Geneviève* (1891, 8vo); 3 supplements (1890–1896, 1897–1899, 1900–1902); *Catalogue des incunables de la bibliothèque Ste-Geneviève, rédigé par Daunou*, publié par M. Pellechet (1892, 8vo); *Catalogue général des MSS.*, par Ch. Kohler (1894–1896, 2 vols. 8vo); *Inventaire sommaire des MSS. grecs*, par H. Omont; *Notices sur quelques MSS. normands*, par E. Deville (1904–1906, 10 pts. 8vo), &c.

The Bibliothèque des Archives nationales, founded in 1808 by Daunou, contains 30,000 vols. on sciences auxiliary to history. It is only accessible to the officials.

It would be impossible to describe all the official, municipal and academic libraries of Paris more or less open to the public, which are about 200 in number, and in the following survey we deal only with those having 10,000 vols. and over.

The Bibliothèque du Ministère des affaires étrangères was founded by the marquis de Torcy, minister for foreign affairs under Louis XIV.; it contains 80,000 vols. and is for official use only. The Bibliothèque du Ministère de l'Agriculture dates from 1882 and has only 4000 vols. At the Ministry for the Colonies the library (of 10,000 vols.) dates from 1897; the catalogue was published in 1905; the library of the Colonial office is attached to this ministry; suppressed in 1896, it was re-established in 1899, and now contains 6000 vols., 7400 periodicals and 5000 photographs; it is open to the public. There are 30,000 vols. in the Bibliothèque du Ministère du commerce et de l'industrie; the Bibliothèque du Ministère des finances was burnt at the Commune, but has been reconstituted and now contains 35,000 vols.; connected with it are the libraries of the following offices: Contributions directes, Contributions indirectes, Enregistrement et inspection des finances; the contents of these four libraries make a total of 13,500 vols. The Bibliothèque du Ministère de la Guerre was formed by Louvois and possesses 130,000 vols. and 800 MSS. and an income of 20,000 francs; the catalogues are *Bibliothèque du dépôt de la guerre: Catalogue* (1883–1890); *Suppléments* (1893–1896); *Catalogue des MSS.*, par J. Lemoine (1910). The following libraries are connected with this department: Comité de santé (10,000 vols.), École supérieure de guerre (70,000 vols.), Comité technique de l'artillerie (24,000 vols.). The Bibliothèque du Ministère de l'Intérieur was founded in 1793 and has 80,000 vols. The Bibliothèque du Ministère de la Justice possesses 10,000 vols., and L'Imprimerie Nationale which is connected with it has a further 19,000 vols. There are also the following law libraries:

Cour d'appel (12,000 vols.); Ordre des avocats, dating from 1871 (56,000 vols., with a catalogue printed in 1880–1882); the Bibliothèque des avocats de la cour de Cassation (20,000 vols.); that of the Cour de Cassation (40,000 vols.). The Bibliothèque du Ministère de la Marine is of old formation (catalogue 1838–1843); it contains 100,000 vols. and 356 MSS.; the catalogue of manuscripts was compiled in 1907. The Bibliothèque du service hydrographique de la Marine has 65,000 vols. and 250 MSS. The Ministère des Travaux publics possesses 12,000 vols., and the Sous-Secrétariat des postes et télégraphes a further 30,000 vols. The Bibliothèque de la Chambre des députés (1796) possesses 250,000 printed books and 1546 MSS. (*Catalogue des manuscrits*, by E. Coyecque et H. Debray, 1907; *Catalogue des livres de jurisprudence, d'économie politique, de finances, et d'administration*, 1883). The Bibliothèque du Sénat (1818) contains 150,000 vols. and 1343 MSS. The Bibliothèque du Conseil d'État has 30,000 vols. All these libraries are only accessible to officials except by special permission.

The Bibliothèque Historique de la ville de Paris was destroyed in 1871, but Jules Cousin reconstituted it in 1872; it possesses 400,000 vols., 3500 MSS. and 14,000 prints; the principal printed catalogues are *Catalogue des imprimés de la Réserve* by M. Poëte (1910), *Catalogue des manuscrits*, by F. Bournon (1893); a *Bulletin* has been issued periodically since 1906. The Bibliothèque administrative de la préfecture de la Seine is divided into two sections: French (40,000 vols.) and foreign (22,000 vols.); it is only accessible to officials and to persons having a card of introduction; the catalogues are printed.

The other libraries connected with the city of Paris are that of the Conseil municipal (20,000 vols.), the Bibliothèques Municipales Populaires, 82 in number with a total of 590,000 books; those of the 22 Hospitals (92,887 vols.), the Préfecture de police (10,000 vols.), the Bibliothèque Forney (10,000 vols. and 80,000 prints), the five Écoles municipales supérieures (19,700 vols.), the six professional schools (14,200 vols.).

The libraries of the university and the institutions dealing with higher education in Paris are well organized and their catalogues generally printed.

The Bibliothèque de l'Université, although at present grouped as a system in four sections in different places, historically considered is the library of the Sorbonne. This was founded in 1762 by Montempuis and only included the faculties of Arts and Theology. It changed its name several times; in 1800 it was the Bibliothèque du Prytanée, in 1808 Bibliothèque des Quatre Lycées and in 1812 Bibliothèque de l'Université de France. The sections into which the Bibliothèque de l'Université is now divided are: (1) Facultés de Sciences et des Lettres à la Sorbonne, (2) Faculté de Médecine, (3) Faculté de droit, (4) École supérieure de pharmacie. Before the separation of Church and State there was a fifth section, that of Protestant theology. After the Bibliothèque nationale it is the richest in special collections, and above all as regards classical philology, archaeology, French and foreign literature and literary criticism, just as the library of the Faculté des Sciences et des Lettres is notable for philosophy, mathematics and chemico-physical sciences. The great development which has taken place during the last thirty years, especially under the administration of M. J. de Chantepie du Dézert, its installation since 1897 in the buildings of the New Sorbonne, have made it a library of the very first rank. The reading-room only seats about 300 persons. The average attendance per day is 1200, the number of books consulted varies from 1500 to 3000 vols. a day, and the loans amount to 14,000 vols. per year. The store-rooms, although they contain more than 1200 mètres of shelves and comprise two buildings of five storeys each, are insufficient for the annual accessions, which reach nearly 10,000 vols. by purchase and presentation. Amongst the latter the most important are the bequests of Leclerc, Peccot, Lavisse, Derenbourg and Beljame; the last-named bequeathed more than 3000 vols., including an important Shakespearean library. The first section contains more than 550,000 vols., 2800 periodicals which include over 70,000 vols., 320 incunabula, 2106 MSS., more than 2000 maps and plans and some prints. The alphabetical catalogues are kept up day by day on slips. The classified catalogues were in 1910 almost ready for printing, and some had already been published: *Périodiques* (1905); *Cartulaires* (1907); *Mélanges jubilaires et publications commémoratives* (1908); *Inventaires des MSS.*, by E. Chatelain (1892); *Incunables*, by E. Chatelain (1902); and *Supplément, Réserve de la bibliothèque 1401–1540*, by Ch. Beaulieux (1909); *Nouvelles acquisitions* (1905–1908); *Catalogue des livres de G. Duplessis donnés à l'Université de Paris* (1907), *Catalogue collectif des bibliothèques universitaires* by Fécamp (1898–1901). For French thèses, of which the library possesses a rich collection, the catalogues are as follows: Mourier et Deltour, *Catalogue des thèses de lettres* (1809, &c.); A. Maire, *Répertoire des thèses de lettres* (1809–1900); A. Maire, *Catalogue des thèses de sciences* (1809–1890) with *Supplément* to 1900 by Estanave; *Catalogue des thèses publié par le Ministère de l'Instruction publique* (1882, &c.).

At the Sorbonne are also to be found the libraries of A. Dumont and V. Cousin (15,000 vols.), and those of the laboratories, of which the richest is the geological (30,000 specimens and books). The section relating to medicine, housed since 1891 in the new buildings of the Faculté de Médecine, includes 180,000 vols. and 88 MSS. (catalogue 1910). The Bibliothèque de la faculté de droit dates from 1772 and contains 80,000 vols., 239 MSS. The fourth section, l'École supérieure de pharmacie, greatly developed since 1882, now contains 50,000 vols.

The other libraries connected with higher education include that of the École des Beaux-Arts (40,000 vols., 100,000 reproductions, 14,000 drawings). The library of the École normale supérieure (1794), established in the Rue d'Ulm in 1846, has received legacies from Verdet (1867), Caboche (1887), Lerambert-Whitcomb (1890), and a portion of Cuvier's library; the system of classification in use is practically the same as that of the Sorbonne, being devised by Philippe Lebas (librarian of the Sorbonne) about 1845; there are 200,000 vols. The library of the Muséum d'histoire naturelle dates from the 18th century, and contains 220,000 vols., 2000 MSS., 8000 original drawings on vellum beginning in 1631. The Bibliothèque de l'Office et Musée de l'Instruction publique (formerly Musée pédagogique), founded only in 1880, has 75,000 vols. In 1760 was founded the Bibliothèque de l'Institut de France, which is very rich; its acquisitions come particularly from gifts and exchanges (400,000 vols., numerous and scarce; valuable MSS., especially modern ones).

The following may be briefly mentioned: Conservatoire national de musique (1775), which receives everything published in France relating to music (200,000 vols.); the Bibliothèque du théâtre de l'Opéra (25,000 vols., 5000 songs, 20,000 romances, and a dramatic library of 12,000 vols. and 20,000 prints); the Théâtre français (40,000 vols.); the Académie de médecine (15,000 vols., 10,000 vols. of periodicals, 5000 portraits), l'Observatoire (18,400 vols.); the Bureau des Longitudes (15,000 vols. and 850 MSS.). The scholastic libraries are: L'École centrale des arts et manufactures (16,000 vols.); l'École coloniale (11,000 vols.); l'École d'application du service de santé militaire (23,000 vols.); l'École d'application du génie maritime (14,000 vols.); l'École libre des sciences politiques (25,000 vols., 250 periodicals); l'École normale d'instituteurs de la Seine (10,000 vols.); l'École normale israélite (30,000 vols., 250 MSS.); l'École nationale des ponts-et-chaussées (9000 vols., 5000 MSS., 5000 photographs); Bibliothèque de l'Institut catholique (160,000 vols.); l'Institut national agronomique (25,000 vols.); Faculté libre de théologie protestante (36,000 vols.); Conservatoire des arts et métiers (46,000 vols., 2500 maps and plans); Bibliothèque polonaise, administered by the Académie des Sciences de Cracovie (80,000 vols., 30,000 prints); Séminaire des Missions étrangères (25,000 vols.); l'Association Valentin Haüy, established 1885 (2000 vols. printed in relief) which lends out 40,000 books per annum; l'Association générale des Étudiants (22,000 vols.), which lends and allows reference on the premises to books by students; Bibliothèque de la Chambre de Commerce (40,000 vols.), the catalogues of which were printed in 1879, 1889 and 1902; the Société nationale d'agriculture (20,000 vols.); the Société d'anthropologie (23,000 vols.); the Société asiatique (12,000 vols., 200 MSS.); the Société chimique de France (10,000 vols.), the catalogue of which was published in 1907; the Société de chirurgie, dating from 1843 (20,000 vols.); the Société entomologique (30,000 vols.); the Société de géographie founded 1821 (60,000 vols., 6000 maps, 22,000 photographs, 2200 portraits, 80 MSS. of which the catalogue was printed in 1901); the Société géologique de France (15,000 vols., 30,000 specimens, 800 periodicals); the Société de l'histoire du protestantisme français, founded in 1852 (50,000 vols., 1000 MSS.; income 25,000 frs.); the Société d'encouragement pour l'industrie nationale (50,000 vols., income 8000 frs.); the Société des Ingénieurs civils (47,000 vols.; catalogue made in 1894); the Société de legislation comparée (15,000 vols., 4500 pamphlets); and lastly the Bibliothèque de la Société de Statistique de Paris, founded in 1860 (60,000 vols., with a printed catalogue).

Before the Revolution there were in Paris alone 1100 libraries containing altogether 2,000,000 vols. After the suppression of the religious orders the libraries were confiscated, and in 1791 more than 800,000 vols. were seized in 162 religious houses and transferred to eight literary foundations in accordance with a decree of November 14, 1789. In the provinces 6,000,000 vols. were seized and transferred to local depositories. The organization of the central libraries under the decree of 3 Brumaire An IV. (October 25, 1795) came to nothing, but the consular edict of January 28, 1803 gave definitive organization to the books in the local depositories. From that time the library system was reconstituted, alike in Paris and the provinces. Unfortunately many precious books and MSS. were burnt, since by the decree of 4 Brumaire An II. (October 25, 1793) the Committee of Instruction ordered, on the proposition of its president the deputy Romme, the destruction or modification of books and objects of art, under the pretext that they recalled the outward signs of feudalism.

The books in the provincial libraries, not including those in private hands or belonging to societies, number over 9,200,000 vols., 15,540 incunabula and 93.986 MSS. The number in the colonies and protected states outside France is uncertain, but it extends to more than 200,000 vols.; to this number must be

Libraries of the Departments.

added the 2,428,954 vols. contained in the university libraries. There are over 300 departmental libraries, and as many belong to learned societies. The increase in the provincial libraries is slower than that of the Parisian collections. With the exception of 26 libraries connected specially with the state, the others are municipal and are administered under state control by municipal librarians. The original foundation of most of the libraries dates but a short time before the Revolution, but there are a few exceptions. Thus the Bibliothèque d'Angers owes its first collection to Alain de la Rue about 1376; it now contains 72,485 vols., 134 incunabula and 2039 MSS. That of Bourges dates from 1466 (36,856 vols., 325 incunabula, 741 MSS.). The library of Carpentras was established by Michel Anglici between 1452 and 1474 (50,000 vols., 2154 MSS.). Mathieu de la Porte is said to be the founder of the library at Clermont-Ferrand at the end of the 15th century; it contained rather more than 49,000 vols. at the time of its union with the Bibliothèque Universitaire.

Amongst the libraries which date from the 16th century must be mentioned that at Lyons founded by François I. in 1527; it possesses 113,168 vols., 870 incunabula and 5243 MSS. That of the Palais des Arts has 82,079 vols., 64 incunabula and 311 MSS.

In the 17th century were established the following libraries: Abbeville, by Charles Sanson in 1685 (46,929 vols., 42 incunabula, 342 MSS.); Besançon by Abbé Boisot in 1696 (93,580 vols., 1000 incunabula, 2247 MSS.). In 1604 the Consistoire réformé de la Rochelle established a library which possesses to-day 58,900 vols., 14 incunabula, 1715 MSS. St Étienne, founded by Cardinal de Villeroi, has 50,000 vols., 8 incunabula, 343 MSS.

The principal libraries founded during the 18th century are the following: Aix-en-Provence, established by Tournon and Méjane in 1705 (160,000 vols., 300 incunabula, 1351 MSS.); Bordeaux, 1738 (200,000 vols., 3491 MSS.); Chambéry, 1736 (64,200 vols., 47 incunabula, 155 MSS.); Dijon, 1701, founded by P. Fevret (125,000 vols., 211 incunabula, 1669 MSS.); Grenoble, 1772 (260,772 vols., 635 incunabula, 2485 MSS.); Marseilles, 1799 (111,672 vols., 143 incunabula, 1691 MSS.); Nancy, founded in 1750 by Stanislas (126,149 vols., 205 incunabula, 1695 MSS.); Nantes, 1753 (103,328 vols., 140 incunabula, 2750 MSS.); Nice, founded in 1786 by Abbé Massa (55,000 vols., 300 incunabula, 150 MSS.); Nîmes, founded by J. T. de Séguier in 1778 (80,000 vols., 61 incunabula, 675 MSS.); Niort, by Jean de Dieu and R. Bion in 1771 (49,413 vols., 67 incunabula, 189 MSS.); Perpignan, by Maréchal de Mailly in 1759 (27,200 vols., 80 incunabula, 127 MSS.); Rennes, 1733 (110,000 vols., 116 incunabula, 602 MSS., income 8950 frs.); Toulouse, by archbishop of Brienne in 1782 (213,000 vols., 859 incunabula, 1020 MSS.).

Nearly all the other municipal libraries date from the Revolution, or rather from the period of the redistribution of the books in 1803. The following municipal libraries possess more than 100,000 vols.: Avignon (135,000 vols., 698 incunabula, 4152 MSS.), of which the first collection was the legacy of Calvet in 1810; Caen (122,000 vols., 109 incunabula, 665 MSS.); Montpellier (130,300 vols., 40 incunabula, 251 MSS.); Rouen (140,000 vols., 400 incunabula, 4000 MSS.); Tours (123,000 vols., 451 incunabula, 1999 MSS.); Versailles (161,000 vols., 436 incunabula, 1213 MSS.).

The following towns have libraries with more than 50,000 volumes: Amiens, Auxerre, Beaune, Brest, Douai, le Hâvre, Lille, le Mans, Orléans, Pau, Poitiers, Toulon and Verdun.

The catalogues of the greater part of the municipal libraries are printed. Especially valuable is the *Catalogues des MSS. des bibliothèques de Paris et des Départements*, which began to appear in 1885; the MSS. of Paris fill 18 octavo volumes, and those of the provinces 50.

The libraries of the provincial universities, thanks to their reorganization in 1882 and to the care exhibited by the general inspectors, are greatly augmented. Aix has 74,658 vols.; Alger 160,489; Besançon 24,275; Bordeaux 216,278; Caen 127,542; Clermont 173,000; Dijon 117,524; Grenoble 127,400; Lille 215,427; Lyons 425,624; Marseilles 53,763; Montpellier 210,938; Nancy 139,036; Poitiers 180,000; Rennes 166,427; Toulouse 232,000.

Since 1882 the educational libraries have largely developed; in 1877 they were 17,764 in number; in 1907 they were 44,021, containing 7,757,917 vols. The purely scholastic libraries have decreased; in 1902 there were 2674 libraries with 1,034,132 vols., whilst after the reorganization (Circulaire of March 14, 1904) there were only 1131 with 573,279 vols. The Société Franklin pour la propagation des bibliothèques populaires et militaires distributed among the libraries which it controls 55,185 vols., between the years 1900 and 1909.

AUTHORITIES.—Information has been given for this account by M. Albert Maire, librarian at the Sorbonne. See also the following works:—*Bibliothèque Nationale:* I. *Bâtiments, collections, organisation, département des estampes, département des médailles et antiques*, par Henri Marcel, Henri Bouchot et Ernest Babelon. II. *Le Département des imprimés et la section de géographie. Le Département des manuscrits*, par Paul Marchal et Camille Couderc (Paris, 1907, 2 vols.); Félix Chambon, *Notes sur la bibliothèque de l'Université de Paris de 1763 à 1905* (Ganat, 1905); Fosseyeux, *La Bibliothèque des hôpitaux de Paris* (Revue des bibliothèques, t. 18, 1908); Alfred Franklin, *Guide des savants, des littérateurs et des artistes dans les bibliothèques de Paris* (Paris, 1908); *Instruction du 7 Mars 1899 sur l'organisation des bibliothèques militaires* (Paris, 1899); Henri Jadart, *Les Anciennes bibliothèques de Reims, leur sort en 1790–1791 et la formation de la bibliothèque publique* (Reims, 1891); Henry Marcel, *Rapport adressé au Ministre de l'Instruction Publique, sur l'ensemble des services de la bibliothèque nationale en 1905* (Journal Officiel, 1906); Henry Martin, *Histoire de la bibliothèque de l'Arsenal* (Paris, 1899); E. Morel, *Le Développement des bibliothèques publiques* (Paris, 1909); Théod. Mortreuil, *La Bibliothèque nationale, son origine et ses accroissements; notice historique* (Paris, 1878); Abbé L. V. Pécheur, *Histoire des bibliothèques publiques du département de l'Aisne existant à Soissons, Laon et Saint-Quentin* (Soissons, 1884); M. Poète, E. Beaurepaire and E. Clouzot, *Une visite à la bibliothèque de la ville de Paris* (Paris, 1907); E. de Saint-Albin, *Les Bibliothèques municipales de la ville de Paris* (Paris, 1896); B. Subercaze, *Les Bibliothèques populaires, scolaires et pédagogiques* (Paris, 1892).

Germany (with Austria-Hungary and Switzerland).

Germany.

Germany is emphatically the home of large libraries; her former want of political unity and consequent multiplicity of capitals have had the effect of giving her many large state libraries, and the number of her universities has tended to multiply considerable collections; 1617 libraries were registered by P. Schwenke in 1891. As to the conditions, hours of opening, &c., of 200 of the most important of them, there is a yearly statement in the *Jahrbuch der deutschen Bibliotheken*, published by the Verein deutscher Bibliothekare.

The public libraries of the German empire are of four distinct types: state libraries, university libraries, town libraries and popular libraries. The administration and financial affairs of the state and university libraries are under state control. The earlier distinction between these two classes has become less and less marked. Thus the university libraries are no longer restricted to professors and students, but they are widely used by scientific workers, and books are borrowed extensively, especially in Prussia. In Prussia, as a link between the state and the libraries, there has been since 1907 a special office which deals with library matters at the Ministry of Public Instruction. Generally the state does not concern itself with the town libraries and the popular libraries, but there is much in common between these two classes. Sometimes popular libraries are under the supervision of a scientifically administered town library as in Berlin, Dantzig, &c.; elsewhere, as at Magdeburg, we see an ancient foundation take up the obligations of a public library. Only in Prussia and Bavaria are regulations in force as to the professional education of librarians. Since 1904 the librarians of the Prussian state libraries have been obliged to complete their university courses and take up their doctorate, after which they have to work two years in a library as volunteers and then undergo a technical examination. The secretarial officials since 1909 have to reach a certain educational standard and must pass an examination. This regulation has been in force as regards librarians in Bavaria from 1905.

Berlin.

Berlin is well supplied with libraries, 268 being registered by P. Schwenke and A. Hortzschansky in 1906, with about 5,000,000 printed vols. The largest of them is the Royal Library, which was founded by the "Great Elector" Frederick William, and opened as a public library in a wing of the electoral palace in 1661. From 1699 the library became entitled to a copy of every book published within the royal territories, and it has received many valuable accessions by purchase and otherwise. It now includes 1,230,000 printed vols. and over 30,000 MSS. The amount yearly expended upon binding and the acquisition of books, &c., is £11,326. The catalogues are in manuscript, and include two general alphabetical catalogues, the one in volumes, the other on slips, as well as a systematic catalogue in volumes. The following annual printed catalogues are issued: *Verzeichnis der aus der neu erschienenen Literatur von der K. Bibliothek und den Preussischen Universitäts-Bibliotheken erworbenen Druckschriften* (since 1892); *Jahresverzeichnis der an den Deutschen Universitäten erschienenen Schriften* (since 1887); *Jahresverzeichnis der an den Deutschen Schulanstalten erschienenen Abhandlungen* (since 1889). There is besides a printed *Verzeichnis der im grossen Lesesaal aufgestellten Handbibliothek* (4th ed. 1909), the alphabetical *Verzeichnis der laufenden Zeitschriften* (last ed., 1908), and the classified *Verzeichnis der laufenden Zeitschriften*

(1908). The catalogue of MSS. are mostly in print, vols. 1–13, 16–23 (1853–1905). The library is specially rich in oriental MSS., chiefly due to purchases of private collections. The musical MSS. are very remarkable and form the richest collection in the world as regards autographs. The building, erected about 1780 by Frederick the Great, has long been too small, and a new one was completed in 1909. The building occupies the whole space between the four streets: Unter den Linden, Dorotheenstrasse, Universitätsstrasse and Charlottenstrasse, and besides the Royal Library, houses the University Library and the Academy of Sciences. The conditions as to the use of the collections are, as in most German libraries, very liberal. Any adult person is allowed to have books in the reading-room. Books are lent out to all higher officials, including those holding educational offices in the university, &c., and by guarantee to almost any one recommended by persons of standing; borrowing under pecuniary security is also permitted. By special leave of the librarian, books and MSS. may be sent to a scholar at a distance, or, if especially valuable, may be deposited in some public library where he can conveniently use them. In 1908–1909 264,000 vols. were used in the reading-rooms, 312,000 were lent inside Berlin, and 32,000 outside. There is a regular system of exchange between the Royal Library and a great number of Prussian libraries. It is the same in Bavaria, Württemberg and Baden; the oldest system is that between Darmstadt and Giessen (dating from 1837). There is either no charge for carriage to the borrower or the cost is very small. The reading-room and magazine hall are, with the exception of Sundays and holidays, open daily from 9 to 9, the borrowing counter from 9 to 6.

Associated with the Royal Library are the following undertakings: the *Gesamtkatalog der Preussischen wissenschaftlichen Bibliotheken* (describing the printed books in the Royal Library and the Prussian University Libraries in one general catalogue upon slips), the Auskunftsbureau der Deutschen Bibliotheken (bureau to give information where any particular book may be consulted), and the Kommission für den Gesamtkatalog der Wiegendrucke (to draw up a complete catalogue of books printed before 1500).

The University Library (1831) numbers 220,000 vols. together with 250,000 academical and school dissertations. The number of volumes lent out in 1908–1909 was 104,000. The library possesses the right to receive a copy of every work published in the province of Brandenburg.

Some of the governmental libraries are important, especially those of the Statistisches Landesamt (184,000 vols.); Reichstag (181,000 vols.); Patent-Amt (118,000 vols.); Haus der Abgeordneten (100,000 vols.); Auswärtiges-Amt (118,000 vols.).

The public library of Berlin contains 102,000 vols.; connected therewith 28 municipal Volksbibliotheken and 14 municipal reading-rooms. The 28 Volksbibliotheken contain (1908) 194,000 vols.

The Prussian university libraries outside Berlin include Bonn (332,000 printed vols., 1500 MSS.); Breslau (330,000 printed vols., 3700 MSS.); Göttingen, from its foundation in 1736/7 the best administered library of the 18th century (552,000 printed vols., 6800 MSS.); Greifswald (200,000 printed vols., 800 MSS.); Halle (261,000 printed vols., 2000 MSS.); Kiel (278,000 printed vols., 2400 MSS.); Königsberg (287,000 printed vols., 1500 MSS.); Marburg (231,000 printed vols. and about 800 MSS.); Münster (191,000 printed vols., 800 MSS.). Under provincial administration are the Königliche and Provinzialbibliothek at Hanover (203,000 printed vols., 4000 MSS.); the Landesbibliothek at Cassel (230,000 printed vols., 4400 MSS.); and the Kaiser-Wilhelm-Bibliothek at Posen (163,000 printed vols.). A number of the larger towns possess excellent municipal libraries; Aix-la-Chapelle (112,000 vols.); Breslau (164,000 vols., 4000 MSS.); Dantzig (145,600 vols., 2900 MSS.); Frankfort a/M (342,000 vols. besides MSS.); Cassel Murhardsche Bibliothek (141,000 vols., 6300 MSS.); Cologne (235,000 vols.); Treves (100,000 vols., 2260 MSS.); Wiesbaden (158,000 vols.).

Munich.

The libraries of Munich, though not so numerous as those of Berlin, include two of great importance. The Royal Library, for a long time the largest collection of books in Germany, was founded by Duke Albrecht V. of Bavaria (1550–1579), who made numerous purchases from Italy, and incorporated the libraries of the Nuremberg physician and historian Schedel, of Widmannstadt, and of J. J. Fugger. The number of printed vols. is estimated at about 1,100,000 and about 50,000 MSS. The library is especially rich in incunabula, many of them being derived from the libraries of over 150 monasteries closed in 1803. The oriental MSS. are numerous and valuable, and include the library of Martin Haug. The amount annually spent upon books and binding is £5000. The catalogues of the printed books are in manuscript, and include (1) a general alphabetical catalogue, (2) an alphabetical repertorium of each of the 195 subdivisions of the library, (3) biographical and other subject catalogues. A printed catalogue of MSS. in 8 vols. was in 1910 nearly complete; the first was published in 1858. The library is open on weekdays from 8 to 1 (November to March 8.30 to 1), and on Monday to Friday (except from August 1 to September 15) also from 3 to 8. The regulations for the use of the library are very similar to those of the Royal Library at Berlin. The building was erected for this collection under King Louis I. in 1832–1843. The archives are bestowed on the ground floor, and the two upper floors are devoted to the library, which occupies seventy-seven apartments. The University Library was originally founded at Ingolstadt in 1472, and removed with the university to Munich in 1826. At present the number of vols. amounts to 550,000; the MSS. number 2000. Forty-six Munich libraries are described in Schwenke's *Adressbuch*, 15 of which possessed in 1909 about 2,000,000 printed vols. and about 60,000 MSS. After the two mentioned above the most noteworthy is the Königlich Bayrische Armee-Bibliothek (100,000 printed vols., 1000 MSS.).

The chief Bavarian libraries outside Munich are the Royal Library at Bamberg (350,000 vols., 4300 MSS.) and the University Library at Würzburg (390,000 vols., 1500 MSS.); both include rich monastic libraries. The University Library at Erlangen has 237,000 vols. The Staats-Kreis and Stadtbibliothek at Augsburg owns 200,000 vols., and 2000 MSS.; Nuremberg has two great collections, the Bibliothek des Germanischen National-museums (250,000 vols., 3550 MSS.) and the Stadtbibliothek (104,000 vols., 2500 MSS.).

Dresden.

In 1906 there were in Dresden 78 public libraries with about 1,495,000 vols. The Royal Public Library in the Japanese Palace was founded in the 16th century. Among its numerous acquisitions have been the library of Count Bünau in 1764, and the MSS. of Ebert. Special attention is devoted to history and literature. The library possesses more than 520,000 vols. (1909); the MSS. number 6000. Admission to the reading-room is granted to any respectable adult on giving his name, and books are lent out to persons qualified by their position or by a suitable guarantee. Here, as at other large libraries in Germany, works of belles-lettres are only supplied for a literary purpose. The number of persons using the reading-room in a year is about 14,000, and about 23,000 vols. are lent. The second largest library in Dresden, the Bibliothek des Statistischen Landes-Amtes, has 120,000 vols.

Leipzig is well equipped with libraries; that of the University has 550,000 vols. and 6500 MSS. The Bibliothek des Reichsgerichts has 151,000 vols., the Pädagogische Central-Bibliothek der Comenius-Stiftung 150,000 vols., and the Stadtbibliothek 125,000 vols., with 1500 MSS.

Stuttgart.

The Royal Public Library of Stuttgart, although only established in 1765, has grown so rapidly that it now possesses about 374,000 vols. of printed works and 5300 MSS. There is a famous collection of Bibles, containing over 7200 vols. The annual expenditure devoted to books and binding is £2475. The library also enjoys the copy-privilege in Württemberg. The annual number of borrowers is over 2600, who use nearly 29,000 vols. The number issued in the reading-room is 41,000. The number of parcels despatched from Stuttgart is nearly 23,000. Admission is also gladly granted to the Royal Private Library, founded in 1810, which contains about 137,000 vols.

Of the other libraries of Württemberg the University Library of Tübingen (500,000 vols. and 4100 MSS.) need only be noted.

Darmstadt.

The Grand-ducal Library of Darmstadt was established by the grand-duke Louis I. in 1819, on the basis of the still older library formed in the 17th century, and includes 510,000 vols. and about 3600 MSS. (1909). The number of vols. used in the course of the year is about 90,000, of which 14,000 are lent out.

Among the other libraries of the Grand Duchy of Hesse the most remarkable are the University Library at Giessen (230,000 vols., 1500 MSS.), and the Stadtbibliothek at Mainz (220,000 vols., 1200 MSS.) to which is attached the Gutenberg Museum.

In the Grand Duchy of Baden are the Hof- und Landes-bibliothek at Carlsruhe (202,000 vols., 3800 MSS.), the University Library at Freiburg i/B (300,000 vols., 700 MSS.), and the University Library at Heidelberg. This, the oldest of the German University libraries, was founded in 1386. In 1623 the whole collection, described by Joseph Scaliger in 1608 as "locupletior et meliorum librorum quam Vaticana," was carried as a gift to the pope and only the German MSS. were afterwards returned. The library was re-established in 1703, and after 1800 enriched with monastic spoils; it now contains about 400,000 vols. and 3500 MSS. for the most part of great value.

Among the State or University libraries of other German states should be mentioned Detmold (110,000 vols.); Jena (264,000 vols.); Neustrelitz (130,000 vols.); Oldenburg (126,000 vols.); Rostock (275,000 vols.); Schwerin (225,000 vols.); and Weimar (270,000), all possessing rich collections of MSS.

Gotha.

The Ducal Library of Gotha was established by Duke Ernest the Pious in the 17th century, and contains many valuable books and MSS. from monastic collections. It numbers about 192,000 vols., with 7400 MSS. The catalogue of the oriental MSS., chiefly collected by Seetzen, and forming one-half of the collection, is one of the best in existence.

The Ducal Library at Wolfenbüttel, founded in the second half of the 16th century by Duke Julius, was made over to the university of Helmstedt in 1614, whence the most important treasures were returned to Wolfenbüttel in the 19th century; it now numbers 300,000 vols., 7400 MSS.

The chief libraries of the Hanse towns are: Bremen (Stadtbibliothek, 141,000 vols.), and Lübeck (Stadtbibliothek, 121,000 vols.); the most important being the Stadtbibliothek at Hamburg, made public since 1648 (383,000 vols., 7300 MSS., among them many Mexican). Hamburg has also in the Kommerzbibliothek (120,000 vols.) a valuable trade collection, and the largest Volksbibliothek (about 100,000 vols.) after that at Berlin. Alsace-Lorraine has the most recently formed of the great German collections—the Universitäts- und Landesbibliothek at Strassburg, which, though founded only in 1871 to replace that which had been destroyed in the siege, already ranks amongst the largest libraries of the empire. Its books amount to 922,000 vols., the number of MSS. is 5900.

Austria.

The *Adressbuch der Bibliotheken der Oesterreich-ungarischen Monarchie* by Bohatta and Holzmann (1900) describes 1014 libraries in Austria, 656 in Hungary, and 23 in Bosnia and Herzegovina. Included in this list, however, are private lending libraries.

The largest library in Austria, and one of the most important collections in Europe, is the Imperial Public Library at Vienna, apparently founded by the emperor Frederick III. in 1440, although its illustrious librarian Lambecius, in the well-known inscription over the entrance to the library which summarizes its history attributes this honour to Frederick's son Maximilian. However this may be, the munificence of succeeding emperors greatly added to the wealth of the collection, including a not inconsiderable portion of the dispersed library of Corvinus. Since 1808 the library has also been entitled to the copy-privilege in respect of all books published in the empire. The sum devoted to the purchase and binding of books is £6068 annually. The number of printed vols. is 1,000,000; 8000 incunabula. The MSS. amount to 27,000, with 100,000 papyri of the collection of Archduke Rainer. The main library apartment is one of the most splendid halls in Europe. Admission to the reading-room is free to everybody, and books are also lent out under stricter limitations. The University Library of Vienna was established by Maria Theresa. The reading-room is open to all comers, and the library is open from 1st Oct. to 30th June from 9 a.m. to 8 p.m.; in the other months for shorter hours. In 1909 447,391 vols. were used in the library, 45,000 vols. lent out in Vienna, and 6519 vols. sent carriage free to borrowers outside Vienna. The number of printed vols. is 757,000. For the purchase of books and binding the Vienna University Library has annually 60,000 crowns from the state as well as 44,000 crowns from matriculation fees and contributions from the students.

The total number of libraries in Vienna enumerated by Bohatta and Holzmann is 165, and many of them are of considerable extent. One of the oldest and most important libraries of the monarchy is the University Library at Cracow, with 380,000 vols. and 8169 MSS.

The number of monastic libraries in Austria is very considerable. They possess altogether more than 2,500,000 printed vols., 25,000 incunabula and 25,000 MSS. The oldest of them, and the oldest in Austria, is that of the monastery of St Peter at Salzburg, which was established by Archbishop Arno (785–821). It includes 70,000 vols., nearly 1500 incunabula. The three next in point of antiquity are Kremsmünster (100,000), Admont (86,000) and Melk (70,000), all of them dating from the 11th century. Many of the librarians of these monastic libraries are trained in the great Vienna libraries. There is no official training as in Prussia and Bavaria.

Hungary.

Information about income, administration, accessions, &c., of the chief libraries in the Hungarian kingdom, are given in the Hungarian *Statistical Year Book* annually. The largest library in Hungary is the Széchenyi-Nationalbibliothek at Budapest, founded in 1802 by the gift of the library of Count Franz Széchenyi. It contains 400,000 printed vols., 16,000 MSS., and has a remarkable collection of Hungarica. The University Library of Budapest includes 273,000 printed books and more than 2000 MSS. Since 1897 there has been in Hungary a Chief Inspector of Museums and Libraries whose duty is to watch all public museums and libraries which are administered by committees, municipalities, religious bodies and societies. He also has undertaken the task of organizing a general catalogue of all the MSS. and early printed books in Hungary.

The libraries of the monasteries and other institutions of the Catholic Church are many in number but not so numerous as in Austria. The chief among them, the library of the Benedictines at St Martinsberg, is the central library of the order in Hungary and contains nearly 170,000 vols. It was reconstituted in 1802 after the re-establishment of the order. The principal treasures of this abbey (11th century) were, on the secularization of the monasteries under Joseph II., distributed among the state libraries in Budapest.

Switzerland.

Among the Swiss libraries, which numbered 2096 in 1868, there is none of the first rank. Only three possess over 200,000 vols.—the University Library at Basle founded in 1460, the Cantonal Library at Lausanne, and the Stadtbibliothek at Berne, which since 1905 is united to the University Library of that city. One great advantage of the Swiss libraries is that they nearly all possess printed catalogues, which greatly further the plan of compiling a great general catalogue of all the libraries of the republic. A valuable co-operative work is their treatment of Helvetiana. All the literature since 1848 is collected by the Landes-Bibliothek at Berne, established in 1895 for this special object. The older literature is brought together in the Bürgerbibliothek at Lucerne, for which it has a government grant. The monastic libraries of St Gall and Einsiedeln date respectively from the years 830 and 946, and are of great historical and literary interest.

AUTHORITIES.—Information has been supplied for this account by Professor Dr A. Hortzschansky, librarian of the Royal Library, Berlin. See also *Adressbuch der deutschen Bibliotheken* by Paul Schwenke (Leipzig, 1893); *Jahrbuch der deutschen Bibliotheken* (Leipzig, 1902–1910); *Berliner Bibliothekenführer*, by P. Schwenke and A. Hortzschansky (Berlin, 1906); A. Hortzschansky, *Die K. Bibliothek zu Berlin* (Berlin, 1908); Ed. Zarncke, *Leipziger Bibliothekenführer* (Leipzig, 1909); J. Bohatta and M. Holzmann, *Adressbuch der Bibliotheken der österreich-ungarischen Monarchie* (Vienna, 1900); Ri. Kukula, *Die österreichischen Studienbibliotheken* (1905); A. Hübl, *Die österreichischen Klosterbibliotheken in den Jahren 1848–1908* (1908); P. Gulyas, *Das ungarische Oberinspektorat der Museen und Bibliotheken* (1909); *Die über 10,000 Bände zählenden öffentlichen-Bibliotheken Ungarns, im Jahre 1908* (Budapest, 1910); H. Escher, "Bibliothekswesen" in *Handbuch der Schweizer Volkswirtschaft*, vol. i. (1903).

Italy.

As the former centre of civilization, Italy is, of course, the country in which the oldest existing libraries must be looked for, and in which the rarest and most valuable MSS. are preserved. The Vatican at Rome and the Laurentian Library at Florence are sufficient in themselves to entitle Italy to rank before most other states in that respect, and the venerable relics at Vercelli, Monte Cassino and La Cava bear witness to the enlightenment of the peninsula while other nations were slowly taking their places in the circle of Christian polity. The local rights and interests which so long helped to impede the unification of Italy were useful in creating and preserving at numerous minor centres many libraries which otherwise would probably have been lost during the progress of absorption that results from such centralization as exists in England. In spite of long centuries of suffering and of the aggression of foreign swords and foreign gold, Italy is still rich in books and MSS. The latest official statistics (1896) give particulars of 1831 libraries, of which 419 are provincial and communal. In 1893 there were 542 libraries of a popular character and including circulating libraries.

Governmental libraries.

The governmental libraries (*biblioteche governative*) number 36 and are under the authority of the minister of public instruction. The *Regolamento* controlling them was issued in the *Bolletino Ufficiale*, 5 Dec. 1907. They consist of the national central libraries of Rome (Vittorio Emanuele) and Florence, of the national libraries of Milan (Braidense), Naples, Palermo, Turin and Venice (Marciana); the Biblioteca governativa at Cremona; the Marucelliana, the Mediceo-Laurenziana and the Riccardiana at Florence; the governativa at Lucca; the Estense at Modena; the Brancacciana and that of San Giacomo at Naples; the Palatina at Parma; the Angelica, the Casanatense, and the Lancisiana at Rome; the university libraries of Bologna, Cagliari, Catania, Genoa, Messina, Modena, Naples, Padua, Pavia, Pisa, Rome and Sassari; the Ventimiliana at Catania (joined to the university library for administrative purposes); the Vallicelliana and the musical library of the R. Accad. of St Cecilia at Rome; the musical section of the Palatine at Parma; and the Lucchesi-Palli (added to the national library at Naples). There are provisions whereby small collections can be united to larger libraries in the same place and where there are several government libraries in one city a kind of corporate administration can be arranged. The libraries belonging to bodies concerned with higher education, to the royal scientific and literary academies, fine art galleries, museums and scholastic institutions are ruled by special regulations. The minister of public instruction is assisted by a technical board.

The librarians and subordinates are divided into (1) librarians, or keepers of MSS.; (2) sub-librarians, or sub-keepers of MSS.; (3) attendants, or book distributors; (4) ushers, &c. Those of class 1 constitute the "board of direction," which is presided over by the librarian, and meets from time to time to consider important measures connected with the administration of the library. Each library is to possess, alike for books and MSS., a general inventory, an accessions register, an alphabetical author-catalogue and a subject-catalogue. When they are ready, catalogues of the special collections are to be compiled, and these the government intends to print. A general catalogue of the MSS. was in 1910 being issued together with catalogues of oriental codices and incunabula. Various other small registers are provided for. The sums granted by the state for library purposes must be applied to (1) salaries and the catalogues of the MSS.; (2) maintenance and other expenses; (3) purchase of books, binding and repairs, &c. Books are chosen by the librarians. In the university libraries part of the expenditure is decided by the librarians, and part by a council formed by the professors of the different faculties. The rules (*Boll. Ufficiale*, Sept. 17, 1908) for lending books and MSS. allow them to be sent to other countries under special circumstances.

The 36 *biblioteche governative* annually spend about 300,000 lire in books. From the three sources of gifts, copyright and purchases, their accessions in 1908 were 142,930, being 21,122 more than the previous year. The number of readers is increasing. In 1908 there were 1,176,934, who made use of 1,650,542 vols., showing an increase of 30,456 readers and 67,579 books as contrasted with the statistics of the previous year. Two monthly publications catalogue the accessions of these libraries, one dealing with copyright additions of Italian literature, the other with all foreign books.

The minister of public instruction has kept a watchful eye upon the literary treasures of the suppressed monastic bodies. In 1875 there were 1700 of these confiscated libraries, containing two millions and a half of volumes. About 650 of the collections were added to the contents of the public libraries already in existence; the remaining 1050 were handed over to the different local authorities, and served to form 371 new communal libraries, and in 1876 the number of new libraries so composed was 415.

Vatican.

The Biblioteca Vaticana stands in the very first rank among European libraries as regards antiquity and wealth of MSS. We can trace back the history of the Biblioteca Vaticana to the earliest records of the *Scrinium Sedis Apostolicae*, which was enshrined in safe custody at the Lateran, and later on partly in the Turris Chartularia; but of all the things that used to be stored there, the only survival, and that is a dubious example, is the celebrated Codex Amiatinus now in the Laurentian Library at Florence. Of the new period inaugurated by Innocent III. there but remains to us the inventory made under Boniface VIII. The library shared in the removal of the Papal court to Avignon, where the collection was renewed and increased, but the Pontifical Library at Avignon has only in part, and in later times, been taken into the Library of the Vatican. This latter is a new creation of the great humanist popes of the 15th century. Eugenius IV. planted the first seed, but Nicholas V. must be looked upon as the real founder of the library, to which Sixtus IV. consecrated a definite abode, ornate and splendid, in the Court of the Pappagallo. Sixtus V. erected the present magnificent building in 1588, and greatly augmented the collection. The library increased under various popes and librarians, among the most noteworthy of whom were Marcello Cervini, the first *Cardinale Bibliotecario*, later Pope Marcel II., Sirleto and A. Carafa. In 1600 it was further enriched by the acquisition of the valuable library of Fulvio Orsini, which contained the pick of the most precious libraries. Pope Paul V. (1605–1621) separated the library from the archives, fixed the progressive numeration of the Greek and Latin MSS., and added two great halls, called the Pauline, for the new codices. Under him and under Urban VIII. a number of MSS. were purchased from the Convento of Assisi, of the Minerva at Rome, of the Capranica College, &c. Especially noteworthy are the ancient and beautiful MSS. of the monastery of Bobbio, and those which were acquired in various ways from the monastery of Rossano. Gregory XV. (1622) received from Maximilian I., duke of Bavaria, by way of compensation for the money supplied by him for the war, the valuable library of the Elector Palatine, which was seized by Count Tilly at the capture of Heidelberg. Alexander VII. (1658), having purchased the large and beautiful collection formerly belonging to the dukes of Urbino, added the MSS. of it to the Vatican library. The *Libreria della Regina*, *i.e.* of Christina, queen of Sweden, composed of very precious manuscripts from ancient French monasteries, from St Gall in Switzerland, and others—also of the MSS. of Alexandre Petau, of great importance for their history and French literature, was purchased and in great part presented to the Vatican library by Pope Alexander VIII. (Ottoboni) in 1689, while other MSS. came in later with the Ottoboni library. Under Clement XI. there was the noteworthy purchase of the 54 Greek MSS. which had belonged to Pius II., and also the increase of the collection of Oriental MSS. Under Benedict XIV. there came into the Vatican library, as a legacy, the library of the Marchese Capponi, very rich in rare and valuable Italian editions, besides 285 MSS.; and by a purchase, the Biblioteca Ottoboniana, which, from its wealth in Greek, Latin, and even Hebrew MSS., was, after that of the Vatican, the richest in all Rome. Clement XIII. in 1758, Clement XIV. in 1769, and Pius VI. in 1775 were also benefactors. During three centuries the vast and monumental library grew with uninterrupted prosperity, but it was to undergo a severe blow at the end of the 18th century. In 1798, as a sequel to the Treaty of Tolentino, 500 MSS. picked from the most valuable of the different collections were sent to Paris by the victorious French to enrich the Bibliothèque Nationale and other libraries. These, however, were chiefly restored in 1815. Most of the Palatine MSS., which formed part of the plunder, found their way back to the university of Heidelberg. Pius VII. acquired for the Vatican the library of Cardinal Zelada in 1800, and among other purchases of the 19th century must be especially noted the splendid Cicognara collection of archaeology and art (1823); as well as the library in 40,000 vols. of Cardinal Angelo Mai (1856). Recent more important purchases, during the Pontificate of Leo XIII., have been the Borghese MSS., about 300 in number, representing part of the ancient library of the popes at Avignon; the entire precious library of the Barberini; the Borgia collection *De Propaganda Fide*, containing Latin and Oriental MSS., and 500 incunabula.

Few libraries are so magnificently housed as the Biblioteca Vaticana. The famous *Codici Vaticani* are placed in the *salone* or great double hall, which is decorated with frescoes depicting ancient libraries and councils of the church. At the end of the great hall an immense gallery, also richly decorated, and extending to 1200 ft., opens out from right to left. Here are preserved in different rooms the codici Palatini, Regin., Ottoboniani, Capponiani, &c. The printed books only are on open shelves, the MSS. being preserved in closed cases. The printed books that were at first stored in the Borgia Apartment, now with the library of Cardinal Mai, constitute in great part the *Nuova Sala di Consultazione*, which was opened to students under the Pontificate of Leo XIII. Other books, on the other hand, are still divided into 1^{a} and 2^{da} raccolta, according to the ancient denomination, and are stored in adjacent halls.

Well-reasoned calculations place the total number of printed books at 400,000 vols.; of incunabula about 4000, with many vellum copies; 500 Aldines and a great number of bibliographical rarities. The Latin manuscripts number 31,373; the Greek amount to 4148; the Oriental MSS., of which the computation is not complete, amount to about 4000. Among the Greek and Latin MSS. are some of the most valuable in the world, alike for antiquity and intrinsic importance. It is sufficient to mention the famous biblical *Codex Vaticanus* of the 4th century, the two Virgils of the 4th and 5th centuries, the Bembo Terence, the palimpsest *De Republica* of Cicero, conjectured to be of the 4th century, discovered by Cardinal Mai, and an extraordinary number of richly ornamented codices of great beauty and costliness. The archives are apart from the library, and are accessible in part to the public under conditions. Leo XIII. appointed a committee to consider what documents of general interest might expediently be published.

The Biblioteca Vaticana is now open from October 1st to Easter every morning between 9 and 1 o'clock, and from Easter to June 29 from 8 o'clock to 12, with the exception of Sundays, Thursdays and the principal feast days.

Catalogues of special classes of MSS. have been published. The Oriental MSS. have been described by J. S. Assemani, *Bibliotheca orientalis Clementino-Vaticana* (Rome, 1719–1728, 4 vols. folio), and *Bibl. Vat. codd. MSS. catalogus ab S. E. et J. S. Assemano redactus* (ib., 1756–1759, 3 vols. folio), and by Cardinal Mai in *Script. Vet. nova collectio*. The Coptic MSS. have been specially treated by G. Zoega (Rome, 1810, folio) and by F. G. Bonjour (Rome, 1699, 4to). There are printed catalogues of the Capponi (1747) and the Cicognara (1820) libraries. The following catalogues have lately been printed: E. Stevenson, *Codd. Palatini Graeci* (1885), *Codd. Gr. Reg. Sueciae et Pii II.* (1888); Feron-Battaglini, *Codd. Ottobon. Graeci* (1893); C. Stornaiolo, *Codd. Urbinates Gr.* (1895); E. Stevenson, *Codd. Palatini Lat.* tom. 1 (1886); G. Salvo-Cozzo, *Codici Capponiani* (1897); M. Vattasso and P. Franchi de' Cavalieri, *Codd. Lat. Vaticani*, tom. 1 (1902); C. Stornaiolo, *Codices Urbinates Latini*, tom. 1 (1902); E. Stevenson, *Inventario dei libri stampati Palatino-Vaticani* (1886–1891); and several volumes relating to Egyptian papyri by O. Marucchi. Some of the greatest treasures have been reproduced in facsimile.

Other Roman libraries.

The most important library in Italy for modern requirements is the Nazionale Centrale Vittorio Emanuele. From its foundation in 1875, incorporating the *biblioteca maior o secreta* of the Jesuits in the Collegio Romano, and all the cloister libraries of the Provincia Romana which had devolved to the state through the suppression of the Religious Orders, it has now, by purchases, by donations, through the operation of the law of the press increased to about 850,000 printed vols., and is continually being ameliorated. It possesses about 1600 incunabula and 6200 MSS. Noteworthy among these are the Farfensi and the Sessoriani MSS. of Santa Croce in Jerusalem, and some of these last of the 6th to the 8th centuries are real treasures. The library has been recently reorganized. It is rich in the history of the renaissance, Italian and foreign reviews, and Roman topography. A monthly *Bollettino* is issued of modern foreign literature received by the libraries of Italy.

The Biblioteca Casanatense, founded by Cardinal Casanate in 1698, contains about 200,000 printed vols., over 2000 incunabula, with many Roman and Venetian editions, and more than 5000 MSS., among which are examples of the 8th, 9th and 10th centuries. They are arranged in eleven large rooms, the large central hall being one of the finest in Rome. It is rich in theology, the history of the middle ages, jurisprudence and the economic, social and political sciences. An incomplete catalogue of the printed books by A. Audiffredi still remains a model of its kind (Roma, 1761–1788, 4 vols. folio, and part of vol. v.).

The Biblioteca Angelica was founded in 1605 by Monsignor Angelo Rocca, an Augustinian, and was the first library in Rome to throw open its doors to the public. It contains about 90,000 vols., of which about 1000 are incunabula; 2570 MSS., of which 120 are Greek, and 91 Oriental. It includes all the authentic acts of the Congregatio de Auxiliis and the collections of Cardinal Passionei and Lucas Holstenius.

The Biblioteca Universitaria Alessandrina was founded by Pope Alexander VII., with the greater part of the printed books belonging to the dukes of Urbino, and was opened in 1676. In 1815 Pius VII. granted to it the right to receive a copy of every printed book in the States of the Church, which grant at the present time, by virtue of the laws of Italy, is continued, but limited to the province of Rome. The library possesses 130,000 printed books, 600 incunabula, 376 MSS.

The library of the Senate was established at Turin in 1848. It contains nearly 87,000 vols. and is rich in municipal history and the statutes of Italian cities, the last collection extending to 2639 statutes or vols. for 679 municipalities. The library of the Chamber of Deputies contains 120,000 vols. and pamphlets. It is rich in modern works, and especially in jurisprudence, native and foreign history, economics and administration.

The Biblioteca Vallicelliana was founded by Achille Stazio (1581), and contains some valuable manuscripts, including a Latin Bible of the 8th century attributed to Alcuin, and some inedited writings of Baronius. It now contains 28,000 vols. and 2315 MSS. Since 1884 it has been in the custody of the R. Società Romana di Storia Patria. The Biblioteca Lancisiana, founded in 1711 by G. M. Lancisi, is valuable for its medical collections.

In 1877 Professor A. Sarti presented to the city of Rome his collection of fine-art books, 10,000 vols., which was placed in charge of the Accademia di San Luca, which already possessed a good artistic library. The Biblioteca Centrale Militare (1893) includes 66,000 printed vols. and 72,000 maps and plans relating to military affairs; and the Biblioteca della R. Accad. di S. Cecilia (1875), a valuable musical collection of 40,000 volumes and 2300 MSS.

Among the private libraries accessible by permission, the Chigiana (1660) contains 25,000 vols. and 2877 MSS. The Corsiniana, founded by Clement XII. (Lorenzo Corsini) is rich in incunabula, and includes one of the most remarkable collections of prints, the series of Marc-Antonios being especially complete. It was added to the Accademia dei Lincei in 1884 and now extends to 43,000 vols. The library of the Collegium de Propaganda Fide was established by Urban VIII. in 1626. It owes its present richness almost entirely to testamentary gifts, among which may be mentioned those of Cardinals Borgia, Caleppi and Di Pietro. It is a private collection for the use of the congregation and of those who belong to it, but permission may be obtained from the superiors. There are at least thirty libraries in Rome which are more or less accessible to the public.

Subiaco.

At Subiaco, about 40 m. from Rome, the library of the Benedictine monastery of Santa Scolastica is not a very large one, comprising only 6000 printed vols. and 400 MSS., but the place is remarkable as having been the first seat of typography in Italy. It was in this celebrated Protocoenobium that Schweynheim and Pannartz, fresh from the dispersion of Fust and Schoeffer's workmen in 1462, established their press and produced a series of very rare and important works which are highly prized throughout Europe. The Subiaco library, although open daily to readers, is only visited by students who are curious to behold the cradle of the press in Italy, and to inspect the series of original editions preserved in their first home.

Florence.

The Biblioteca Nazionale Centrale of Florence, formed from the union of Magliabechi's library with the Palatina, is the largest after the Vittorio Emanuele at Rome. The Magliabechi collection became public property in 1714, and with accessions from time to time, held an independent place until 1862, when the Palatina (formed by Ferdinand III., Grand Duke of Tuscany), was incorporated with it. An old statute by which a copy of every work printed in Tuscany was to be presented to the Magliabechi library was formerly much neglected, but has been maintained more rigorously in force since 1860. Since 1870 it receives by law a copy of every book published in the kingdom. A *Bollettino* is issued describing these accessions. There are many valuable autograph originals of famous works in this library, and the MSS. include the most important extant *codici* of Dante and later poets, as well as of the historians from Villani to Machiavelli and Guicciardini. Amongst the printed books is a very large assemblage of rare early impressions, a great number of the *Rappresentazioni* of the 16th century, at least 200 books printed on vellum, and a copious collection of municipal histories and statutes, of *testi di lingua* and of maps. The Galileo collection numbers 308 MSS. The MS. portolani, 25 in number, are for the most part of great importance; the oldest is dated 1417, and several seem to be the original charts executed for Sir Robert Dudley (duke of Northumberland) in the preparation of his *Arcano del Mare*. The library contains (1909) 571,698 printed vols., 20,222 MSS., 9037 engravings, 21,000 portraits, 3847 maps, and 3575 incunabula. In 1902 the Italian parliament voted the funds for a new building which is being erected on the Corso dei Tintori close to the Santa Croce Church.

Milan.

The Biblioteca Nazionale of Milan, better known as the Braidense, founded in 1770 by Maria Theresa, consists of 243,000 printed vols. 1787 MSS. and over 3000 autographs. It comprises nearly 2300 books printed in the 15th century (including the rare *Monte Santo di Dio* of Bettini, 1477), 913 Aldine impressions, and a xylographic *Biblia Pauperum*. Amongst the MSS. are an early Dante and autograph letters of Galileo, some poems in Tasso's autograph, and a fine series of illustrated service-books, with miniatures representing the advance of Italian art from the 12th to the 16th century. One room is devoted to the works of Manzoni.

Naples.

The Biblioteca Nazionale at Naples, though only opened to the public in 1804, is the largest library of that city. The nucleus from which it developed was the collection of Cardinal Seripando, which comprised many MSS. and printed books of great value. Acquisitions came in from other sources, especially when in the year 1848 many private and conventual libraries were thrown on the Neapolitan market, and still more so in 1860. The Biblical section is rich in rarities, commencing with the Mainz Bible of 1462, printed on vellum. Other special features are the collection of *testi di lingua*, that of books on volcanoes, the best collection in existence of the publications of Italian literary and scientific societies and a nearly complete set of the works issued by the Bodoni press. The MSS. include a palimpsest containing writings of the 3rd, 5th and 6th centuries under a grammatical treatise of the 8th, 2 Latin papyri of the 6th century, over 50 Latin Bibles, many illuminated books with miniatures, and the autographs of G. Leopardi. There are more than 40 books printed on vellum in the 15th and 16th centuries, including a fine first Homer; and several MS. maps and portolani, one dating from the end of the 14th century. The library contains about 389,100 printed vols., 7990 MSS. and 4217 incunabula.

Palermo. The Biblioteca Nazionale of Palermo, founded from the Collegio Massimo of the Jesuits, with additions from other libraries of that suppressed order, is rich in 15th-century books, which have been elaborately described in a catalogue printed in 1875, and in Aldines and bibliographical curiosities of the 16th and following centuries, and a very complete series of the Sicilian publications of the 16th century, many being unique. The library contains 167,898 printed vols., 2550 incunabula, 1537 MSS.

Turin. The Biblioteca Nazionale Universitatia of Turin took its origin in the donation of the private library of the House of Savoy, which in 1720 was made to the University by Vittorio Amedeo II. The disastrous fire of January 1904 destroyed about 24,000 out of the 300,000 vols. which the library possessed, and of the MSS., the number of which was 4138, there survive now but 1500 in a more or less deteriorated condition. Among those that perished were the palimpsests of Cicero, Cassidorus, the Codex Theodosianus and the famous *Livre d'Heures*. What escaped the fire entirely was the valuable collection of 1095 incunabula, the most ancient of which is the *Rationale Divinorum Officiorum* of 1459. Since the fire the library has been enriched by new gifts, the most conspicuous of which is the collection of 30,000 vols. presented by Baron Alberto Lumbroso, principally relating to the French Revolution and empire. The library was in 1910 about to be transferred to the premises of the Palazzo of the Debito Publico. **Venice.** The Biblioteca Marciana, or library of St Mark at Venice, was traditionally founded in 1362 by a donation of MSS. from the famous Petrarch (all of them now lost) and instituted as a library by Cardinal Bessarione in 1468. The printed vols. number 417,314. The precious contents include 12,106 MSS. of great value, of which more than 1000 Greek codices were given by Cardinal Bessarione, important MS. collections of works on Venetian history, music and theatre, rare incunabula, and a great number of volumes, unique or exceedingly rare, on the subject of early geographical research. Amongst the MSS. is a Latin Homer, an invaluable codex of the laws of the Lombards, and the autograph MS. of Sarpi's *History of the Council of Trent*. Since the fall of the republic and the suppression of the monasteries a great many private and conventual libraries have been incorporated with the Marciana, which had its first abode in the Libreria del Sansovino, from which in turn it was transferred in 1812 to the Palazzo Ducale, and from this again in 1904 to the Palazzo della Zecca (The Mint).

University libraries. Among the university libraries under government control some deserve special notice. First in historical importance comes the Biblioteca della Università at Bologna, founded by the naturalist U. Aldrovandi, who bequeathed by his will in 1605 to the senate of Bologna his collection of 3800 printed books and 360 MSS. Count Luigi F. Marsili increased the library by a splendid gift in 1712 and established an Istituto delle Scienze, reconstituted as a public library by Benedict XIV. in 1756. The printed books number 255,000 vols., and the MSS. 5000. The last comprise a rich Oriental collection of 547 MSS. in Arabic, 173 in Turkish, and several in Persian, Armenian and Hebrew. Amongst the Latin codices is a Lactantius of the 6th or 7th century. The other noteworthy articles include a copy of the Armenian gospels (12th century), the Avicenna, with miniatures dated 1194, described in Montfaucon's *Diarium Italicum*, and some unpublished Greek texts. Amongst the Italian MSS. is a rich assemblage of municipal histories. Mezzofanti was for a long time the custodian here, and his own collection of books has been incorporated in the library, which is remarkable likewise for the number of early editions and Aldines which it contains. A collection of drawings by Agostino Caracci is another special feature of worth. The grand hall with its fine furniture in walnut wood merits particular attention. The Biblioteca della Università at Naples was established by Joachim Murat in 1812 in the buildings of Monte Oliveto, and has thence been sometimes called the "Biblioteca Gioacchino." Later it was transferred to the Royal University of studies, and was opened to the public in 1827. It was increased by the libraries of several monastic bodies. The most copious collections relate to the study of medicine and natural science. It possesses about 300,000 printed books, 404 incunabula, 203 Aldines, and 196 Bodoni editions, but the more important incunabula and MSS. about the middle of the 19th century went to enrich the Biblioteca Nazionale. Other important university libraries are those of Catania (1755), 130,000 vols.; Genoa (1773), 132,000 vols., 1588 MSS.; Pavia (1763), 250,000 vols., 1100 MSS.; Padua (200,000 vols., 2356 MSS.), which in 1910 was housed in a new building; Cagliari (90,000 vols.); Sassari (74,000 vols.). Messina, destroyed in the earthquake of 1908, preserved, however, beneath its ruins the more important part of its furniture and fittings, and in 1910 was already restored to active work, as regards the portion serving for the reawakened Faculty of Law in the University.

Mediceo-Laurenziana. Chief among the remaining government libraries comes the world-famed Biblioteca Mediceo-Laurenziana at Florence, formed from the collections of Cosimo the Elder, Pietro de' Medici, and Lorenzo the Magnificent (which, however, passed away from the family after the expulsion of the Medici from Florence, and were repurchased in 1508 by Cardinal Giovanni, afterwards Leo X.). It was first constituted as a public library in Florence by Clement VII., who charged Michelangelo to construct a suitable edifice for its reception. It was opened to the public by Cosimo I. in 1571, and has ever since gone on increasing in value, the accessions in the 18th century alone being enough to double its former importance. The printed books it contains are probably no more than 11,000 in number, but are almost all of the highest rarity and interest, including 242 incunabula of which 151 *editiones principes*. It is, however, the precious collection of MSS., amounting to 9693 articles, which gives its chief importance to this library. They comprise more than 700 of dates earlier than the 11th century. Some of them are the most valuable codices in the world—the famous Virgil of the 4th or 5th century, Justinian's *Pandects* of the 6th, a Homer of the 10th, and several other very early Greek and Latin classical and Biblical texts, as well as copies in the handwriting of Petrarch, about 100 codices of Dante, a *Decameron* copied by a contemporary from Boccaccio's own MS., and Cellini's MS. of his autobiography. Bandini's catalogue of the MSS. occupies 13 vols. folio, printed in 1764–1778. Administratively united to the Laurentian is the Riccardiana rich in MSS. of Italian literature, especially the Florentine (33,000 vols., 3905 MSS.). At Florence the Biblioteca Marucelliana, founded in 1703, remarkable for its artistic wealth of early woodcuts and metal engravings, was opened to the public in 1753. The number of these and of original drawings by the old masters amounts to 80,000 pieces; the printed volumes number 200,000, the incunabula 620, and the MSS. 1500. **Modena.** At Modena is the famous Biblioteca Estense, so called from having been founded by the Este family at Ferrara in 1393; it was transferred to Modena by Cesare D'Este in 1598. Muratori, Zaccaria and Tiraboschi were librarians here, and made good use of the treasures of the library. It is particularly rich in early printed literature and valuable codices. Between 1859 and 1867 it was known as the Biblioteca Palatina. The printed vols. number 150,570, the incunabula 1600, the MSS. 3336, besides the 4958 MSS. and the 100,000 autographs of the Campori collection.

The oldest library at Naples is the Biblioteca Brancacciana, with many valuable MSS. relating to the history of Naples. Two planispheres by Coronelli are preserved here. It was founded in 1673 by Cardinal F. M. Brancaccio, and opened by his heirs in 1675; 150,000 vols. and 3000 MSS. **Parma.** The Regia Biblioteca di Parma, founded definitively in 1779, owes its origin to the grand-duke Philip, who employed the famous scholar Paciaudi to organize it. It is now a public library containing 308,770 vols. and 4890 MSS. Amongst its treasures is De Rossi's magnificent collection of Biblical and rabbinical MSS. Also worthy of note are the Bibl. Pubblica or governation of Lucca (1600) with 214,000 vols., 725 incunabula and 3091 MSS. and that of Cremona (1774), united to that of the Museo Civico.

Ambrosiana. Among the great libraries not under government control, the most important is the famous Biblioteca Ambrosiana at Milan, founded in 1609 by Cardinal Fed. Borromeo. It contains 230,000 printed vols. and 8400 MSS. Amongst the MSS. are a Greek Pentateuch of the 5th century, the famous Peshito and Syro-Hexaplar from the Nitrian convent of St Maria Deipara, a Josephus written on papyrus, supposed to be of the 5th century, several palimpsest texts, including an early Plautus, and St Jerome's commentary on the Psalms in a volume of 7th-century execution, full of contemporary glosses in Irish, Gothic fragments of Ulfilas, and a Virgil with notes in Petrarch's handwriting. Cardinal Mai was formerly custodian here. In 1879 Professor C. Mensinger presented his "Biblioteca Europea," consisting of 2500 vols., 300 maps and 5000 pieces, all relating to the literature and linguistics of European countries. The Melzi and Trivulzio libraries should not pass without mention here, although they are private and inaccessible without special permission. The former is remarkable for its collection of early editions with engravings, including the Dante of 1481, with twenty designs by Baccio Bandinelli. The latter is rich in MSS. with miniatures of the finest and rarest kind, and in printed books of which many are unique or nearly so. It consists of 70,000 printed vols. At Genoa the Biblioteca Franzoniana, founded about 1770 for the instruction of the poorer classes, is noteworthy as being the first European library lighted up at night for the use of readers.

Monte Cassino. The foundation of the monastery of Monte Cassino is due to St Benedict, who arrived there in the year 529, and established the prototype of all similar institutions in western Europe. The library of printed books now extends to about 20,000 vols., chiefly relating to the theological sciences, but including some rare editions. A collection of the books belonging to the monks contains about the same number of volumes. But the chief glory of Monte Cassino consists of the *archivio*, which is quite apart; and this includes more than 30,000 bulls, diplomas, charters and other documents, besides 1000 MSS. dating from the 6th century downwards. The latter comprehend some very early Bibles and important codices of patristic and other medieval writings. There are good written catalogues, and descriptions with extracts are published in the *Bibliotheca Casinensis*. The monastery was declared a national monument in 1866. At Ravenna the Biblioteca Classense

Vercelli.

has a 10th-century codex of Aristophanes and two 14th-century codices of Dante. At Vercelli the Biblioteca dell' Archivio Capitolare, the foundation of which can be assigned to no certain date, but must be referred to the early days when the barbarous conquerors of Italy had become christianized, comprises nothing but MSS., all of great antiquity and value. Amongst them is an Evangeliarium S. Eusebii in Latin, supposed to be of the 4th century; also the famous codex containing the Anglo-Saxon homilies which have been published by the Ælfric Society.

La Cava.

The Biblioteca del Monastero della S. Trinità, at La Cava dei Tirreni in the province of Salerno, is said to date from the foundation of the abbey itself (beginning of the 11th century). It contains only some 10,000 vols., but these include a number of MSS. of very great rarity and value, ranging from the 8th to the 14th century. Amongst these is the celebrated Codex Legum Longobardorum, dated 1004, besides a well-known geographical chart of the 12th century, over 100 Greek MSS., and about 1000 charters beginning with the year 840, more than 200 of which belong to the Lombard and Norman periods. The library is now national property, the abbot holding the office of Keeper of the Archives.

Not a few of the communal and municipal libraries are of great extent and interest: Bologna (1801), 191,000 vols., 5060 MSS.; Brescia, Civica Quiriniana, 125,000 vols., 1500 MSS.; Ferrara (1753), 91,000 vols., 1698 MSS., many Ferrarese rarities; Macerata, the Mozzi-Borgetti (1783–1835, united 1855), 50,000 vols.; Mantua, 70,000 vols., 1300 MSS.; Novara, Negroni e Civica (1847 and 1890), 75,000 vols.; Padua, 90,000 vols., 1600 MSS.; Palermo (1760), 216,000 vols., 3263 MSS., coins and Sicilian collection; Perugia (1852), founded by P. Podiani, 70,000 vols., 915 MSS.; Siena (1758), founded by S. Bandini, fine art collection, 83,250 vols., 5070 MSS.; Venice, Museo Civico Correr, 50,000 vols., 11,000 MSS.; Verona (1792, public since 1802), 180,000 vols., 2650 MSS.; Vicenza, Bertoliana (1708), local literature, archives of religious corporations, 175,000 vols., 6000 MSS.

Popular libraries have now been largely developed in Italy, chiefly through private or municipal enterprise; they enjoy a small state subvention of £1000. The government report for 1908 stated that 319 communes possessed *biblioteche popolari* numbering altogether 415. Of these, 313 were established by municipalities, 113 by individuals, 8 by business houses, 80 by working men's societies and 15 by ministers of religion; 225 are open to the public, 358 lend books, 221 gratuitously, and 127 on payment of a small fee. In order to establish these institutions throughout the kingdom, a *Bollettino* has been published at Milan since 1907, and a National Congress was held at Rome in December 1908.

Information has been given for this account by Dr G. Staderini of the Biblioteca Casanatense, Rome. See also F. Bluhme, *Iter Italicum* (Berlin, 1824–1836); *Notizie sulle biblioteche governative del regno d' Italia* (Roma, 1893); *Le biblioteche governative Italiane nel 1898* (Roma, 1900); *Statistica delle biblioteche* (Roma, 1893–1896, 2 pts.); *Le biblioteche popolari in Italia, relazione al Ministro della Pubb. Istruzione* (Roma, 1898); *Bollettino delle biblioteche popolari* (Milano, 1907, in progress); E. Fabietti, *Manuale per le biblioteche popolari* (2da ediz., Milano); *Le biblioteche pop. al 1° Congresso Naz. 1908* (Milano, 1910).

Latin America.

Much interest in libraries has not been shown in south, central and other parts of Latin America. Most of the libraries which exist are national or legislative libraries.

Cuba.

As the libraries of the republic of Cuba are more Spanish than American in character, it will be convenient to consider them here. The chief libraries are in Havana, and the best are the Biblioteca Publica and the University Library. The Biblioteca Publica has within recent years been completely overhauled, and is now one of the most actively-managed libraries in Latin America.

Mexico.

Out of the twenty-nine states and territories of the Mexican republic about half have public libraries, and only a small proportion of the contents consists of modern literature. Many possess rare and valuable books, of interest to the bibliographer and historian, which have come from the libraries of the suppressed religious bodies. There is a large number of scientific and literary associations in the republic, each possessing books. The Society of Geography and Statistics, founded in 1851 in Mexico City, is the most important of them, and owns a fine museum and excellent library. After the triumph of the Liberal party the cathedral, university and conventual libraries of the city of Mexico came into the possession of the government, and steps were taken to form them into one national collection. No definite system was organized, however, until 1867, when the church of San Augustin was taken and fitted up for the purpose. In 1884 it was opened as the Biblioteca Nacional, and now possesses over 200,000 vols. Two copies of every book printed in Mexico must be presented to this library. Most of the libraries of Mexico, city or provincial, are subscription, and belong to societies and schools of various kinds.

Argentina.

The importance of public libraries has been fully recognized in Argentina, and more than two hundred of them are in the country. They are due to benefactions, but the government in every case adds an equal sum to any endowment. A central commission exists for the purpose of facilitating the acquisition of books and to promote a uniform excellence of administration. The most considerable is the Biblioteca Nacional at Buenos Aires, which is passably rich in MSS., some of great interest, concerning the early history of the Spanish colonies. There is also the Biblioteca Municipal with about 25,000 vols. There are libraries attached to colleges, churches and clubs, and most of the larger towns possess public libraries.

Brazil.

The chief library in Brazil is the Bibliotheca Publica Nacional at Rio de Janeiro (1807) now comprising over 250,000 printed vols. with many MSS. National literature and works connected with South America are special features of this collection. A handsome new building has been erected which has been fitted up in the most modern manner. Among other libraries of the capital may be mentioned those of the Faculty of Medicine, Marine Library, National Museum, Portuguese Literary Club, Bibliotheca Fluminense, Benedictine Monastery, and the Bibliotheca Municipal. There are various provincial and public libraries throughout Brazil, doing good work, and a typical example is the public library of Maranhao.

Chile.

The Biblioteca Nacional at Santiago is the chief library in Chile. The catalogue is printed, and is kept up by annual supplements. It possesses about 100,000 vols. There is also a University Library at Santiago, and a fairly good Biblioteca Publica at Valparaiso.

Peru.

The Biblioteca Nacional at Lima was founded by a decree of the liberator San Martin on the 28th of August 1821, and placed in the house of the old convent of San Pedro. The nucleus of the library consisted of those of the university of San Marcos and of several monasteries, and a large present of books was also made by San Martin. The library is chiefly interesting from containing so many MSS. and rare books relating to the history of Peru in viceregal times.

Spain and Portugal.

Most of the royal, state and university libraries of Spain and Portugal have government control and support. In Portugal the work of the universities is to a certain extent connected up, and an official bulletin is published in which the laws and accessions of the libraries are contained.

The chief library in Spain is the Biblioteca Nacional (formerly the Biblioteca Real) at Madrid. The printed volumes number 600,000 with 200,000 pamphlets. Spanish literature is of course well represented, and, in consequence of the numerous accessions from the libraries of the suppressed convents, the classes of theology, canon law, history, &c., are particularly complete. There are 30,000 MSS., including some finely illuminated codices, historical documents, and many valuable autographs. The collection of prints extends to 120,000 pieces, and was principally formed from the important series bought from Don Valentin Carderera in 1865. The printed books have one catalogue arranged under authors' names, and one under titles; the departments of music, maps and charts, and prints have subject-catalogues as well. There is a general index of the MSS., with special catalogues of the Greek and Latin codices and genealogical documents. The cabinet of medals is most valuable and well arranged. Of the other Madrid libraries it is enough to mention the Biblioteca de la Real Academia de la Historia, 1758 (20,000 vols. and 1500 MSS.), which contains some printed and MS. Spanish books of great value, including the well-known Salazar collection. The history of the library of the Escorial (*q.v.*) has been given elsewhere. In 1808, before the invasion, the Escorial is estimated to have contained 30,000 printed vols. and 3400 MSS.; Joseph removed the collection to Madrid, but when it was returned by Ferdinand 10,000 vols. were missing. There are now about 40,000 printed vols. The Arabic MSS. have been described by M. Casiri, 1760–1770; and a catalogue of the Greek codices by Müller was issued at the expense of the French government in 1848. There is a MS. catalogue of the printed books. Permission to study at the Escorial, which is one of the royal private libraries, must be obtained by special application. The Biblioteca Provincial y Universitaria of Barcelona (1841) contains about 155,000 vols., and that of Seville (1767) has 82,000 vols. Other cities in Spain possess provincial or university libraries open to students under various restrictions, among them may be mentioned the Biblioteca Universitaria of Salamanca (1254) with over 80,000 vols.

Portugal.

Among the libraries of Portugal the Bibliotheca Nacional at Lisbon (1796) naturally takes the first place. In 1841 it was largely increased from the monastic collections, which, however, seem to have been little cared for according to a report prepared by the principal librarian three years later. There are now said to be 400,000 vols. of printed books, among which theology, canon law, history and Portuguese and Spanish literature largely predominate. The MSS. number 16,000 including many of great value. There is also a cabinet of 40,000 coins and medals. The Bibliotheca da Academia, founded in 1780, is preserved in the suppressed convent of the Ordem Terceira da Penitencia. In 1836 the Academy acquired the library of that convent, numbering 30,000 vols., which have since been kept apart. The Archivo Nacional, in the same building, contains the archives of the kingdom, brought here after the destruction of the Torre do Castello during the great earthquake.

The Biblioteca Publica Municipal at Oporto is the second largest in Portugal, although only dating from the 9th of July 1833, the anniversary of the debarcation of D. Pedro, and when the memorable siege was still in progress; from that date to 1874 it was styled the Real Biblioteca do Porto. The regent (ex-emperor of Brazil) gave to the town the libraries of the suppressed convents in the northern provinces, the municipality undertaking to defray the expense of keeping up the collection. Recent accessions consist mainly of Portuguese and French books. The important Camoens collection is described in a printed catalogue (Oporto, 1880). A notice of the MSS. may be found in *Catalogo dos MSS. da B. Publica Eborense*, by H. da Cunha Rivara (Lisbon, 1850–1870), 3 vols. folio, and the first part of an *Indice preparatorio do Catalogo dos Manuscriptos* was produced in 1880. The University Library of Coimbra (1591) contains about 100,000 vols., and other colleges possess libraries.

Netherlands.

Since 1900 there has been considerable progress made in both Belgium and Holland in the development of public libraries, and several towns in the latter country have established popular libraries after the fashion of the municipal libraries of the United Kingdom and America.

Belgium.

The national library of Belgium is the Bibliothèque Royale at Brussels, of which the basis may be said to consist of the famous Bibliothèque des ducs de Bourgogne, the library of the Austrian sovereigns of the Low Countries, which had gradually accumulated during three centuries. After suffering many losses from thieves and fire, in 1772 the Bibliothèque de Bourgogne received considerable augmentations from the libraries of the suppressed order of Jesuits, and was thrown open to the public. On the occupation of Brussels by the French in 1794 a number of books and MSS. were confiscated and transferred to Paris (whence the majority were returned in 1815); in 1795 the remainder were formed into a public library under the care of La Serna Santander, who was also town librarian, and who was followed by van Hulthem. At the end of the administration of van Hulthem a large part of the precious collections of the Bollandists was acquired. In 1830 the Bibliothèque de Bourgogne was added to the state archives, and the whole made available for students. Van Hulthem died in 1832, leaving one of the most important private libraries in Europe, described by Voisin in *Bibliotheca Hulthemiana* (Brussels, 1836), 5 vols., and extending to 60,000 printed vols. and 1016 MSS., mostly relating to Belgian history. The collection was purchased by the government in 1837; and, having been added to the Bibliothèque de Bourgogne (open since 1772) and the Bibliothèque de la Ville (open since 1794), formed what has since been known as the Bibliothèque Royale de Belgique. The printed volumes now number over 600,000 with 30,000 MSS., 105,000 prints and 80,000 coins and medals. The special collections, each with a printed catalogue, consist of the Fonds van Hulthem, for national history; the Fonds Fétis, for music; the Fonds Goethals, for genealogy; and the Fonds Müller, for physiology. The catalogue of the MSS. has been partly printed, and catalogues of accessions and other departments are also in course of publication. There are libraries attached to most of the departments of the government, the ministry of war having 120,000 vols. and the ministry of the interior, 15,000 vols. An interesting library is the Bibliothèque Collective des Sociétés Savantes founded in 1906 to assemble in one place the libraries of all the learned societies of Brussels. It contains about 40,000 vols. which have been catalogued on cards. The Bibliothèque du Conservatoire royal de Musique (1832) contains 12,000 vols. and 6000 dramatic works. The popular or communal libraries of Brussels contain about 30,000 vols. and those of the adjoining suburbs about 50,000 vols., most of which are distributed through the primary and secondary schools. At Antwerp the Stadt Bibliothek (1805) has now 70,000 vols., and is partly supported by subscriptions and endowments. The valuable collection of books in the Musée Plantin-Moretus (1640) should also be mentioned. It contains 11,000 MSS. and 15,000 printed books, comprising the works issued by the Plantin family and many 15th-century books.

The University Library of Ghent, known successively as the Bibliothèque de l'École Centrale and Bibliothèque Publique de la Ville, was founded upon the old libraries of the Conseil de Flandres, of the College des Échevins, and of many suppressed religious communities. It was declared public in 1797, and formally opened in 1798. On the foundation of the university in 1817 the town placed the collection at its disposal, and the library has since remained under state control. The printed volumes now amount to 353,000. There are important special collections on archaeology, Netherlands literature, national history, books printed in Flanders, and 23,000 historical pamphlets of the 16th and 17th centuries. The main catalogue is in MS. on cards. There are printed catalogues of the works on jurisprudence (1839), and of the MSS. (1852). The Bibliothèque de l'Université Catholique of Louvain is based upon the collection of Beyerlinck, who bequeathed it to his alma mater in 1627; this example was followed by Jacques Romain, professor of medicine, but the proper organization of the library began in 1636. There are now said to be 211,000 vols. The Bibliothèque de l'Université of Liége dates from 1817, when on the foundation of the university the old Bibliothèque de la Ville was added to it. There are now 350,000 printed vols., pamphlets, MSS., &c. The Liége collection (of which a printed catalogue appeared in 3 vols. 8vo., 1872), bequeathed by M. Ulysse Capitaine, extends to 12,061 vols. and pamphlets. There are various printed catalogues. The Bibliothèques Populaires of Liége established in 1862, now number five, and contain among them 50,000 vols. which are circulated to the extent of 130,000 per annum among the school children. The Bibliothèque publique of Bruges (1798) contains 145,600 printed books and MSS., housed in a very artistic building, once the Tonlieu or douane, 1477. There are communal libraries at Alost, Arlon (1842), Ath (1842), Courtrai, Malines (1864), Mons (1797), Namur (1800), Ostend (1861), Tournai (1794, housed in the Hôtel des Anciens Prêtres, 1755), Ypres (1839) and elsewhere, all conducted on the same system as the French communal libraries. Most of them range in size from 5000 to 40,000 vols. and they are open as a rule only part of the day. Every small town has a similar library, and a complete list of them, together with much other information, will be found in the *Annuaire de la Belgique, scientifique, artistique et littéraire* (Brussels 1908 and later issues).

Holland.

The national library of Holland is the Koninklijke Bibliotheek at Hague, which was established in 1798, when it was decided to join the library of the princes of Orange with those of the defunct government bodies in order to form a library for the States-General, to be called the National Bibliotheek. In 1805 the present name was adopted; and since 1815 it has become the national library. In 1848 the Baron W. Y. H. van Westreenen van Tiellandt bequeathed his valuable books, MSS., coins and antiquities to the country, and directed that they should be preserved in his former residence as a branch of the royal library. There are now upwards of 500,000 vols. of printed books, and the MSS. number 6000, chiefly historical, but including many fine books of hours with miniatures. Books are lent all over the country. The library boasts of the richest collection in the world of books on chess, Dutch incunabula, Elzevirs and Spinozana. There is one general written catalogue arranged in classes, with alphabetical indexes. In 1800 a printed catalogue was issued, with four supplements down to 1811; and since 1866 a yearly list of additions has been published. Special mention should be made of the excellent catalogue of the incunabula published in 1856.

The next library in numerical importance is the famous Bibliotheca Academiae Lugduno-Batavae, which dates from the foundation of the university of Leiden by William I., prince of Orange, on the 8th of February 1575. It has acquired many valuable additions from the books and MSS. of the distinguished scholars, Golius. Joseph Scaliger, Isaac Voss, Ruhnken and Hemsterhuis. The MSS. comprehend many of great intrinsic importance. The library of the Society of Netherland Literature has been placed here since 1877; this is rich in the national history and literature. The Arabic and Oriental MSS. known as the Legatum Warnerianum are of great value and interest; and the collection of maps bequeathed in 1870 by J. J. Bodel Nyenhuis is also noteworthy. The library is contained in a building which was formerly a church of the Béguines, adapted in 1860 somewhat after the style of the British Museum. The catalogues (one alphabetical and one classified) are on slips, the titles being printed. A catalogue of books and MSS. was printed in 1716, one of books added between 1814 and 1847 and a supplementary part of MSS. only in 1850. A catalogue of the Oriental MSS. was published in 6 vols. (1851–1877). The Bibliotheek der Rijks Universiteit (1575) at Leiden contains over 190,000 vols.

The University Library at Utrecht dates from 1582, when certain conventual collections were brought together in order to form a public library, which was shortly afterwards enriched by the books bequeathed by Hub. Buchelius and Ev. Pollio. Upon the foundation of the university in 1636, the town library passed into its charge. Among the MSS. are some interesting cloister MSS. and the famous "Utrecht Psalter," which contains the oldest text of the Athanasian creed. The last edition of the catalogue was in 2 vols. folio, 1834, with supplement in 1845, index from 1845–1855 in 8vo., and additions 1856–1870, 2 vols. 8vo. A catalogue of the MSS. was issued in 1887. The titles of accessions are now printed in sheets and pasted down for insertion. There are now about 250,000 vols. in the library.

The basis of the University Library at Amsterdam consists of a collection of books brought together in the 15th century and preserved in the Nieuwe Kerk. At the time of the Reformation in 1578 they became the property of the city, but remained in the Nieuwe Kerk for the use of the public till 1632, when they were transferred to the Athenaeum. Since 1877 the collection has been known as the University Library, and in 1881 it was removed to a building designed upon the plan of the new library and reading-room of the British Museum. The library includes the best collection of medical works in Holland, and the Bibliotheca Rosenthaliana of Hebrew and Talmudic literature is of great fame and value; a catalogue of the last was printed in 1875. The libraries of the Dutch Geographical and other societies are preserved here. A general printed catalogue was issued in 6 vols. 8vo., Amsterdam (1856–1877); one describing the bequests of J. de Bosch Kemper, E. J. Potgieter and F. W. Rive, in 3 vols., 8vo. (1878–1879); a catalogue of the MSS. of Professor Moll was published in 1880, and one of those of P. Camper in 1881. Other catalogues have been published up to 1902, including one of the MSS. The library contains about half a million volumes. There are popular subscription libraries with reading-rooms in all parts of Holland, and in Rotterdam there is a society for the encouragement of social culture which has a large library as part of its equipment. At Hague, Leiden, Haarlem, Dordrecht and other towns popular libraries have been established, and there is a movement of recent growth, in favour of training librarians on advanced English lines.

The library of the Genootschap van Kunsten en Wetenschappen at Batavia contains books printed in Netherlandish India, works relating to the Indian Archipelago and adjacent countries, and the history of the Dutch in the East. There are 20,000 printed vols. and 1630 MSS., of which 243 are Arabic, 445 Malay, 303 Javanese, 60 Batak and 517 on lontar leaves, in the ancient Kawi, Javanese and Bali languages, &c. Printed catalogues of the Arabic, Malay, Javanese and Kawi MSS. have been issued.

Scandinavia.

Owing largely to so many Scandinavian librarians having been trained and employed in American libraries, a greater approach has been made to Anglo-American library ideals in Norway, Sweden and Denmark than anywhere else on the continent of Europe.

Denmark. The beginning of the admirably managed national library of Denmark, the great Royal Library at Copenhagen (Det Store Kongelige Bibliothek) may be said to have taken place during the reign of Christian III. (1533–1559), who took pride in importing foreign books and choice MSS.; but the true founder was Frederick III. (1648–1670); to him is mainly due the famous collection of Icelandic literature and the acquisition of Tycho Brahe's MSS. The present building (in the Christiansborg castle) was begun in 1667. Among notable accessions may be mentioned the collections of C. Reitzer, the count of Danneskjöld (8000 vols. and 500 MSS.) and Count de Thott; the last bequeathed 6039 vols. printed before 1531, and the remainder of his books, over 100,000 vols., was eventually purchased. In 1793 the library was opened to the public, and it has since remained under state control. Two copies of every book published within the kingdom must be deposited here. The incunabula and block books form an important series. There is a general classified catalogue in writing for the use of readers; and an alphabetical one on slips arranged in boxes for the officials. A good catalogue of the de Thott collection was printed in 12 vols. 8vo. (1789–1795); a catalogue of the French MSS. appeared in 1844; of Oriental MSS., 1846; of the Danish collection, 1875, 8vo. Annual reports and accounts of notable MSS. have been published since 1864. The library now contains over 750,000 vols.

The University Library, founded in 1482, was destroyed by fire in 1728, and re-established shortly afterwards. A copy of every Danish publication must be deposited here. The MSS. include the famous Arne-Magnean collection. There are now about 400,000 vols. in this library. The Statsbiblioteket of Aarhus (1902) possesses about 200,000 vols. and the Landsbókasafn Islands (National Library) of Reykjavik, Iceland, has about 50,000 printed books and 5500 MSS. In Copenhagen there are 11 popular libraries supported in part by the city, and there are at least 50 towns in the provinces with public libraries and in some cases reading-rooms. An association for promoting public libraries was formed in 1905, and in 1909 the minister of public instruction appointed a special adviser in library matters. About 800 towns and villages are aided by the above named association, the state and local authorities, and it is estimated that they possess among them 500,000 vols., and circulate over 1,000,000 vols. annually.

Norway. The chief library in Norway is the University Library at Christiania, established at the same time as the university, September 2nd, 1811, by Frederick II., with a donation from the king of many thousands of duplicates from the Royal Library at Copenhagen, and since augmented by important bequests. Annual catalogues are issued and there are now over 420,000 vols. in the collection. The Deichmanske Bibliothek in Christiania was founded by Carl Deichmann in 1780 as a free library. In 1898 it was reorganized, and in 1903 the open shelf method was installed by Haakon Nyhuus, the librarian, who had been trained in the United States. The library is partly supported by endowment, partly by grants from the municipality. It now contains about 85,000 vols., and is a typical example of a progressive library. The Free Library at Bergen (1872) has about 90,000 vols. and has recently been re-housed in a new building. A free library, with open shelves, has also been opened at Trondhjem. The library connected with the Kongellige Videnskabers Selskab at Trondhjem now contains about 120,000 vols. Owing to the absence of small towns and villages in Norway, most of the library work is concentrated in the coast towns.

Sweden. The Royal Library at Stockholm was first established in 1585. The original collection was given to the university of Upsala by Gustavus II., that formed by Christina is at the Vatican, and the library brought together by Charles X. was destroyed by fire in 1697. The present library was organized shortly afterwards. The Benzelstjerna-Engeström Library (14,500 printed vols. and 1200 MSS.) rich in materials for Swedish history) is now annexed to it. Natural history, medicine and mathematics are left to other libraries. Among the MSS. the *Codex Aureus* of the 6th or 7th century, with its interesting Anglo-Saxon inscription, is particularly noteworthy. The catalogues are in writing, and are both alphabetical and classified; printed catalogues have been issued of portions of the MSS. The present building was opened in 1882. The library now contains about 320,000 printed books and over 11,000 MSS. The Karolinska Institutet in Stockholm, contains a library of medical books numbering over 40,000.

The University Library at Upsala was founded by Gustavus Adolphus in 1620, from the remains of several convent libraries; he also provided an endowment. The MSS. chiefly relate to the history of the country, but include the *Codex Argenteus*, containing the Gothic gospels of Ulfilas. The general catalogue is in writing. A catalogue was printed in 1814; special lists of the foreign accessions have been published each year from 1850; the Arabic, Persian and Turkish MSS. are described by C. J Tornberg, 1846. It now contains about 340,000 printed books and MSS. The library at Lund dates from the foundation of the university in 1668, and was based upon the old cathedral library. The MSS. include the de la Gardie archives, acquired in 1848. There are about 200,000 vols. in the library. The Stadsbibliotek of Gothenburg contains about 100,000 vols., and has a printed catalogue.

Russia.

The imperial Public Library at St Petersburg is one of the largest libraries in the world, and now possesses about 1,800,000 printed vols. and 34,000 MSS., as well as large collections of maps, autographs, photographs, &c. The beginning of this magnificent collection may be said to have been the books seized by the Czar Peter during his invasion of Courland in 1714; the library did not receive any notable augmentation, however, till the year 1795, when, by the acquisition of the famous Zaluski collection, the Imperial Library suddenly attained a place in the first rank among great European libraries. The Zaluski Library was formed by the Polish count Joseph Zaluski, who collected at his own expense during forty-three years no less than 200,000 vols., which were added to by his brother Andrew, bishop of Cracow, by whom in 1747 the library was thrown open to the public. At his death it was left under the control of the Jesuit College at Warsaw; on the suppression of the order it was taken care of by the Commission of Education; and finally in 1795 it was transferred by Suwaroff to St Petersburg as a trophy of war. It then extended to 260,000 printed vols. and 10,000 MSS., but in consequence of the withdrawal of many medical and illustrated works to enrich other institutions, hardly 238,000 vols. remained in 1810. Literature, history and theology formed the main features of the Zaluski Library; the last class alone amounted to one-fourth of the whole number. Since the beginning of the 19th century, through the liberality of the sovereigns, the gifts of individuals, careful purchases, and the application of the law of 1810, whereby two copies of every Russian publication must be deposited here, the Imperial Library has attained its present extensive dimensions. Nearly one hundred different collections, some of them very valuable and extensive, have been added from time to time. They include, for example, the Tolstoi Sclavonic collection (1830), Tischendorf's MSS. (1858), the Dolgorousky Oriental MSS. (1859), and the Firkowitsch Hebrew (Karaite) collection (1862–1863), the libraries of Adelung (1858) and Tobler (1877), that of the Slavonic scholar Jungmann (1856), and the national MSS. of Karamzin (1867). This system of acquiring books, while it has made some departments exceedingly rich, has left others comparatively meagre. The library was not regularly opened to the public until 1814; it is under the control of the minister of public instruction. There are fine collections of Aldines and Elzevirs, and the numerous incunabula are instructively arranged.

The manuscripts include 26,000 codices, 41,340 autographs, 4689 charters and 576 maps. The glory of this department is the celebrated *Codex Sinaiticus* of the Greek Bible, brought from the convent of St Catherine on Mount Sinai by Tischendorf in 1859. Other important Biblical and patristic codices are to be found among the Greek and Latin MSS.; the Hebrew MSS.

include some of the most ancient that exist, and the Samaritan collection is one of the largest in Europe; the Oriental MSS. comprehend many valuable texts, and among the French are some of great historical value. The general catalogues are in writing, but many special catalogues of the MSS. and printed books have been published.

The nucleus of the library at the Hermitage Palace was formed by the empress Catherine II., who purchased the books and MSS. of Voltaire and Diderot. In the year 1861 the collection amounted to 150,000 vols., of which nearly all not relating to the history of art were then transferred to the Imperial Library. There are many large and valuable libraries attached to the government departments in St Petersburg, and most of the academies and colleges and learned societies are provided with libraries.

The second largest library in Russia is contained in the Public Museum at Moscow. The class of history is particularly rich, and Russian early printed books are well represented. The MSS. number 5000, including many ancient Sclavonic codices and historical documents of value. One room is devoted to a collection of Masonic MSS., which comprehend the archives of the lodges in Russia between 1816 and 1821. There is a general alphabetical catalogue in writing; the catalogue of the MSS. has been printed, as well as those of some of the special collections. This large and valuable library now contains close upon 1,000,000 printed books and MSS. The Imperial University at Moscow (1755) has a library of over 310,000 vols., and the Duchovnaja Academy has 120,000 vols. The Imperial Russian Historical Museum (1875–1883) in Moscow contains nearly 200,000 vols. and most of the state institutions and schools are supplied with libraries. All the Russian universities have libraries, some of them being both large and valuable—Dorpat (1802) 400,000 vols.; Charkov (1804) 180,000 vols.; Helsingfors (1640–1827) 193,000 vols.; Kasan (1804) 242,000 vols.; Kiev (1832) 125,000 vols.; Odessa (1865) 250,000 vols.; and Warsaw (1817) 550,000 vols. There are also communal or public libraries at Charkov (1886) 110,000 vols.; Odessa (1830) 130,000 vols.; Reval (1825) 40,000 vols.; Riga, 90,000 vols.; Vilna (1856) 210,000 vols. and many other towns. A text-book on library economy, based on Graesel and Brown, was issued at St Petersburg in 1904.

Eastern Europe.

At Athens the National Library (1842) possesses about 260,000 vols., and there is also a considerable library at the university. The Public Library at Corfu has about 40,000 vols. Belgrade University Library has 60,000 vols. and the University Library of Sofia has 30,000 vols. Constantinople University in 1910 had a library in process of formation, and there are libraries at the Greek Literary Society (20,000 vols.) and Theological School (11,000 vols.).

China.

Chinese books were first written on thin slips of bamboo, which were replaced by silk or cloth scrolls in the 3rd century B.C., paper coming into use in the beginning of the 2nd century. These methods were customary down to the 10th or 11th century.. There were no public libraries in the western sense.

The practice of forming national collections of the native literature originated in the attempts to recover the works destroyed in the "burning of the books" by the "First Emperor" (220 B.C.). In 190 B.C. the law for the suppression of literary works was repealed, but towards the close of the 1st century B.C. many works were still missing. Hsiao Wu (139–86 B.C.) formed the plan of Repositories, in which books might be stored, with officers to transcribe them. Liu Hsiang (80–9 B.C.) was specially appointed to classify the literature and form a library. His task was completed by his son, and the *resumé* of their labours is a detailed catalogue with valuable notes describing 11,332 "sections" (volumes) by 625 authors. Similar national collections were formed by nearly every succeeding dynasty. The high estimation in which literature has always been held has led to the formation of very large imperial, official and private collections of books. Large numbers of works, chiefly relating to Buddhism and Taoism, are also stored in many of the temples. Chinese books are usually in several, and frequently in many volumes. The histories and encyclopaedias are mostly of vast dimensions. Collections of books are kept in wooden cupboards or on open shelves, placed on their sides, each set (*t'ao*) of volumes (*pên*) being protected and held together by two thin wooden or card boards, one forming the front cover (in a European book) and the other the back cover, joined by two cords or tapes running round the whole. By untying and tying these tapes the *t'ao* is opened and closed. The titles of the whole work and of each section are written on the edge (either the top or bottom in a European book) and so face outwards as it lies on the shelf. Catalogues are simple lists with comments on the books, not the systematic and scientific productions used in Western countries. There are circulating libraries in large numbers in Peking, Canton and other cities.

See E. T. C. Werner, "Chinese Civilisation" (in H. Spencer's *Descriptive Sociology*, pt. ix.).

Japan.

The ancient history of libraries in Japan is analogous to that of China, with whose civilization and literature it had close relations. Since about 1870, however, the great cities and institutions have established libraries on the European model.

Perhaps the most extensive library of the empire is that of the Imperial Cabinet (1885) at Tokio with over 500,000 vols., consisting of the collections of the various government departments, and is for official use alone. The University Library (1872) is the largest open to students and the public; it contains over 400,000 vols. of which 230,000 are Chinese and Japanese. The Public Library and reading-room (Tosho-Kwan) at Ueno Park (1872) was formed in 1872 and contains over 250,000 vols., of which about one-fifth are European books. At Tokio are also to be found the Ohashi Library (1902) with 60,000 vols. and the Hibaya Library (1908) with 130,000 vols. and the Nanki Library (1899) with 86,000 vols. The library of the Imperial University of Kyoto contains nearly 200,000 vols., of which over 90,000 are in European languages. To this is attached the library of the Fukuoka Medical College with 113,000 vols. The Municipal Library of Kyoto (1898) contains 46,000 vols. Other important municipal libraries in Japan are those at Akita in the province of Ugo (1899), 47,000 vols., at Mito, province of Hitachi (1908), 25,000 vols., Narita, province of Shimosa (1901), 36,000 vols., chiefly Buddhistic, Yamaguchi, province of Suó (1907), 23,000 vols. The libraries of the large temples often contain books of value to the philologist. Lending libraries of native and Chinese literature have existed in Japan from very early times.

LIBRARY ASSOCIATIONS AND TRAINING

The first and largest association established for the study of librarianship was the American Library Association (1876). The Library Association of the United Kingdom was formed in 1877 as an outcome of the first International Library Conference, held at London, and in 1898 it received a royal charter. It publishes a *Year Book*, the monthly *Library Association Record*, and a number of professional handbooks. It also holds examinations in Literary History, Bibliography and Library Economy, and issues certificates and diplomas. There are also English and Scottish district library associations. The Library Assistants Association was formed in 1895 and has branches in different parts of England, Wales and Ireland. It issues a monthly magazine entitled *The Library Assistant.* There is an important Library Association in Germany which issues a year-book giving information concerning the libraries of the country, and a similar organization in Austria-Hungary which issues a magazine at irregular intervals. An Association of Archivists and Librarians was formed at Brussels in 1907, and there are similar societies in France, Italy, Holland and elsewhere. In every country there is now some kind of association for the study of librarianship, archives or bibliography. International conferences have been held at London, 1877; London, 1897; Paris (at Exhibition), 1903; St Louis, 1904; Brussels (preliminary), 1908; and Brussels, 1910.

LIBRARY PERIODICALS.—The following is a list of the current periodicals which deal with library matters, with the dates of their establishment and place of publication: *The Library Journal* (New York, 1876); *The Library* (London, 1889); *Public Libraries* (Chicago, 1896); *The Library World* (London, 1898); *The Library Assistant* (1898); *The Library Association Record* (1899); *Library Work* (Minneapolis, U.S., 1906); *Bulletin of the American Library Association* (Boston, 1907); *Revue des bibliothèques* (Paris, 1891); *Bulletin des bibliothèques populaires* (Paris, 1906); *Courrier des Bibliothèques* (Paris); *Bulletin de l'institut international de bibliographie* (Brussels, 1895); *Revue des bibliothèques et archives de Belgique* (Brussels, 1903); *Tijdschrift voor boekund bibliothekwezen* (Hague, 1903); *De Boekzaal* (Hague, 1907); *Bogsamlingsbladet* (Copenhagen, 1906); *For Folke-og Barnboksamlinger* (Christiania, 1906); *Folkebibliotheksbladet* (Stockholm, 1903); *Zentralblatt für Bibliothekswesen* (Leipzig, 1884); *Blätter fur Volksbibliotheken und Lesehallen* (1899; occasional supplement to the above); *Bibliographie des Bibliotheks- und Buchwesens* (ed. by Adalbert Hortzschansky, 1904; issued in the *Zentralblatt*); *Jahrbuch der Deutschen Bibliotheken* (Leipzig, 1902); *Minerva. Jahrbuch der gelehrten Welt* (Strassburg, 1890); *Mitteilungen des österreichischen Vereins für Bibliothekswesen* (Vienna, 1896); *Ceská Osvéta* (Novy Bydzov, Bohemia, 1905); *Revista delle biblioteche e degli archivi* (Florence, 1890); *Bollettino delle biblioteche popolari* (Milan, 1907); *Revista de Archivos, Bibliotecas y Museos Madrid* (1907); *The Gakuto* (Tokio, Japan, 1897). (H. R. T.; J. D. BR.)

LIBRATION (Lat. *libra*, a balance), a slow oscillation, as of a balance; in astronomy especially the seeming oscillation of the moon around her axis, by which portions of her surface near the edge of the disk are alternately brought into sight and swung out of sight.

LIBYA, the Greek name for the northern part of Africa, with which alone Greek and Roman history are concerned. It is mentioned as a land of great fertility in Homer (*Odyssey*, iv. 85), but no indication of its extent is given. It did not originally include Egypt, which was considered part of Asia, and first assigned to Africa by Ptolemy, who made the isthmus of Suez and the Red Sea the boundary between the two continents. The name Africa came into general use through the Romans. In the early empire, North Africa (excluding Egypt) was divided into Mauretania, Numidia, Africa Propria and Cyrenaica. The old name was reintroduced by Diocletian, by whom Cyrenaica (detached from Crete) was divided into Marmarica (Libya inferior) in the east, and Cyrenaica (Libya superior) in the west. A further distinction into Libya interior and exterior is also known. The former (ἡ ἐντός) included the interior (known and unknown) of the continent, as contrasted with the N. and N.E. portion; the latter (ἡ ἔξω, called also simply Libya, or *Libyae nomos*), between Egypt and Marmarica, was so called as having once formed an Egyptian "nome." See AFRICA, ROMAN.

LICATA, a seaport of Sicily, in the province of Girgenti, 24 m. S.E. of Girgenti direct and 54 m. by rail. Pop. (1901) 22,931. It occupies the site of the town which Phintias of Acragas (Agrigentum) erected after the destruction of Gela, about 281 B.C., by the Mamertines, and named after himself. The river Salso, which flows into the sea on the east of the town, is the ancient *Himera Meridionalis*. The promontory at the foot of which the town is situated, the *Poggio di Sant' Angelo*, is the Ecnomus (*Eknomon*) of the Greeks, and upon its slopes are scanty traces of ancient structures and rock tombs. It was off this promontory that the Romans gained the famous naval victory over the Carthaginians in the spring of 256 B.C., while the plain to the north was the scene of the defeat of Agathocles by Hamilcar in 310 B.C. The modern town is mainly important as a shipping port for sulphur.

LICENCE (through the French from Lat. *licentia*, *licere*, to be lawful), permission, leave, liberty, hence an abuse of liberty, licentiousness; in particular, a formal authority to do some lawful act. Such authority may be either verbal or written; when written, the document containing the authority is called a "licence." Many acts, lawful in themselves, are regulated by statutory authority, and licences must be obtained. For the sale of alcoholic liquor see LIQUOR LAWS.

LICHEN (*lichen ruber*), in medical terminology, a papular disease of the skin, consisting of an eruption in small thickly set, slightly elevated red points, more or less widely distributed over the body, and accompanied by slight febrile symptoms.

LICHENS, in botany, compound or dual organisms each consisting of an association of a higher fungus, with a usually unicellular, sometimes filamentous, alga. The fungal part of the organism nearly always consists of a number of the *Discomycetes* or *Pyrenomycetes*, while the algal portion is a member of the Schizophyceae (Cyanophyceae or Blue-green Algae) or of the Green Algae; only in a very few cases is the fungus a member of the Basidiomycetes. The special fungi which take part in the association are, with rare exceptions, not found growing separately, while the algal forms are constantly found free. The reproductive organs of the lichen are of a typically fungal character, *i.e.* are apothecia or perithecia (see FUNGI) and spermogonia. The algal cells are never known to form spores while part of the lichen-thallus, but they may do so when separated from it and growing free. The fungus thus clearly takes the upper hand in the association.

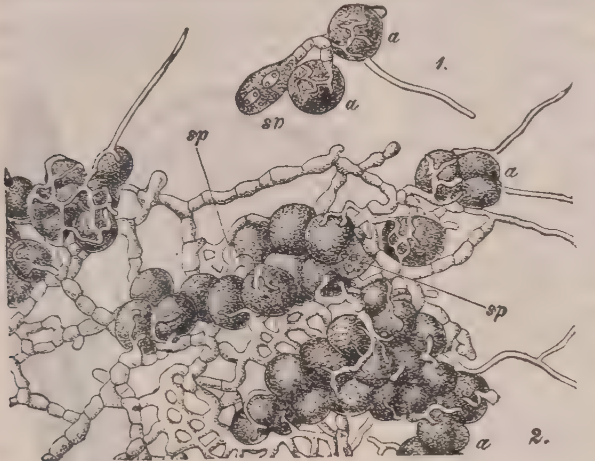
Owing to their peculiar dual nature, lichens are able to live in situations where neither the alga nor fungus could exist alone. The enclosed alga is protected by the threads (hyphae) of the fungus, and supplied with water and salts and, possibly, organic nitrogenous substances; in its turn the alga by means of its green or blue-green colouring matter and the sun's energy manufactures carbohydrates which are used in part by the fungus. An association of two organisms to their mutual advantage is known as *symbiosis*, and the lichen in botanical language is described as a symbiotic union of an alga and a fungus. This form of relationship is now known in other groups of plants (see BACTERIOLOGY and FUNGI), but it was first discovered in the lichens. The lichens are characterized by their excessively slow growth and their great length of life.

Until comparatively recent times the lichens were considered as a group of simple organisms on a level with algae and fungi. The green (or blue-green) cells were termed gonidia by Wallroth, who looked upon them as asexual reproductive cells, but when it was later realized that they were not reproductive elements they were considered as mere outgrowths of the hyphae of the thallus which had developed chlorophyll. In 1865 De Bary suggested the possibility that such lichens as *Collema*, *Ephebe*, &c., arose as a result of the attack of parasitic Ascomycetes upon the algae, Nostoc, Chroococcus, &c. In 1867 the observations of Famintzin and Baranetzky showed that the gonidia, in certain cases, were able to live outside the lichen-thallus, and in the case of Physcia, Evernia and Cladonia were able to form zoospores. Baranetzky therefore concluded that a certain number, if not all of the so-called algae were nothing more than free living lichen-gonidia. In 1869 Schwendener put forward the really illuminating view—exactly opposite to that of Baranetzky—that the gonidia in all cases were algae which had been attacked by parasitic fungi. Although Schwendener supported this view of the "dual" nature of lichens by very strong evidence and identified the more common lichen-gonidia with known free-living algae, yet the theory was received with a storm of opposition by nearly all lichenologists. These workers were unable to consider with equanimity the loss of the autonomy of their group and its reduction to the level of a special division of the fungi. The observations of Schwendener, however, received ample support from Bornet's (1873) examination of 60 genera. He investigated the exact relation of fungus and alga and showed that the same alga is able to combine with a number of different fungi to form lichens; thus *Chroolepus umbrinus* is found as the gonidia of 13 different lichen genera.

The view of the dual nature of lichens had hitherto been based on analysis; the final proof of this view was now supplied by the actual *synthesis* of a lichen from fungal and algal constituents. Rees in 1871 produced the sterile thallus of a *Collema* from its constituents; later Stahl did the same for three species. Later Bonnier (1886) succeeded in producing fertile thalli by sowing lichen spores and the appropriate algae upon sterile glass plates or portions of bark, and growing them in sterilized air (fig. 1). Möller also in 1887 succeeded in growing small lichen-thalli without their algal constituent (gonidia) on nutritive solutions; in the case of *Calicium* pycnidia were actually produced under these conditions.

The thallus or body of the lichen is of very different form in different genera. In the simplest filamentous lichens (*e.g.* *Ephebe pubescens*) the form of thallus is the form of the filamentous alga which is merely surrounded by the fungal hyphae (fig. 2). The next simplest forms are gelatinous lichens (*e.g.* *Collemaceae*); in these the algae are Chroococcaceae and Nostocaceae, and the fungus makes its way into the gelatinous membranes of the algal cells and ramifies there (fig. 3). We can distinguish this class of forms as lichens with a *homoiomerous* thallus, *i.e.* one in which the alga and fungus are equally distributed. The majority of the lichens, however, possess a stratified thallus in which the gonidia are found as a definite layer or layers embedded in a pseudo-parenchymatous mass of fungal hyphae, *i.e.* they are *heteromerous* (figs. 8 and 9). Obviously these two conditions may merge into one another, and the distinction is not of classificatory value.

In external form the heteromerous thallus presents the following modifications. (*a*) The *foliaceous* (leaf-like) thallus, which may be either peltate, *i.e.* rounded and entire, as in *Umbilicaria*, &c., or variously lobed and laciniated, as in *Sticta*, *Parmelia*, *Cetraria* (fig. 4), &c. This is the highest type of its development, and is sometimes very considerably expanded. (*b*) The *fruticose* thallus may be either erect, becoming pendulous, as in *Usnea* (fig. 5), *Ramalina*, &c., or prostrate, as in *Alectoria jubata*, var. *chalybeiformis*. It is usually divided into branches and branchlets, bearing some resemblance to a miniature shrub. An erect cylindrical thallus terminated by the fruit is termed a *podetium*, as in *Cladonia* (fig. 7). (*c*) The *crustaceous* thallus, which is the most common of all, forms a mere crust on the substratum, varying in thickness, and may be squamose (in *Squamaria*), radiate (in *Placodium*), areolate, granulose or pulverulent (in various *Lecanorae* and *Lecideae*). (*d*) The *hypophloeodal* thallus is often concealed beneath the bark of trees (as in some *Verrucariae* and *Arthoniae*), or enters into the fibres of wood (as in *Xylographa* and *Agyrium*), being indicated externally only by a very thin film (figs. 3, 4, 5, 6, 7 and 8). In colour also the thallus externally is very variable. In the dry and more typical state it is most frequently white or whitish, and almost as often greyish or greyish glaucous. Less commonly it is of different shades of brown, red, yellow and black. In the moist state of the thallus these colours are much less apparent, as the textures then become more or less translucent, and the thallus usually prevents the greenish colour of the gonidia (*e.g. Parmelia Borreri*, *Peltidea aphthosa*, *Umbilicaria pustulata* and pulverulent *Lecideae*).



After Bonnier, from v. Tavel. From Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 1.—*Xanthoria parietina*. By the fusion of the hyphae in the middle of the mycelium a pseudo-parenchymatous cortical layer has begun to form.

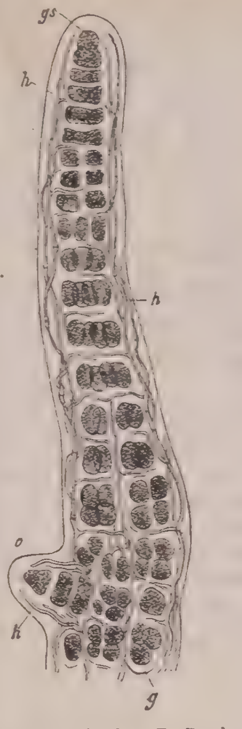
1, Germinating ascospore (*sp*) with branching germ-tube applied to the *Cystococcus* cells (*a*).
2, Thallus in process of formation.
sp, Two ascospores.
p, *Cystococcus* cells.

The thallus may be free upon the surface of the substratum (*e.g. Collema*) or may be fixed more or less closely to it by special hyphae or rhizoids. These may penetrate but slightly into the substratum, but the connexion established may be so close that it is impossible to remove the thallus from the substratum without injury (*e.g. Physcia, Placodium*). In some cases the rhizoids are united together into larger strands, the *rhizines*.

The typical heteromerous thallus shows on section a peripheral, thin and therefore transparent, layer, the *cortical layer*, and centrally a mass of denser tissue the so-called *medullary layer*, between these two layers is the algal zone or gonidial layer (figs. 8 and 9).

The term *epithallus* is sometimes applied to the superficial dense portion of the cortical layer and the term *hypothallus* to the layer, when specially modified, in immediate contact with the substratum; the hypothallus is usually dark or blackish. The cylindrical branches of the fruticose forms are usually radially symmetrical, but the flattened branches of these forms and also the thalli of the foliaceous form show a difference in the cortex of the upper and lower side. The cortical layer is usually more developed on the side towards the light, while in many lichens this is the only side provided with a cortical layer. The podetia of some species of Cladonia possess no cortical layer at all. The surface of the thallus often exhibits outgrowths in the form of warts, hairs, &c. The medullary layer, which usually forms the main part of the thallus, is distinguished from the cortical layer by its looser consistence and the presence in it of numerous, large, air-containing spaces.

Gonidia.—It has been made clear above that the gonidia are nothing more than algal cells, which have been ensnared by fungal hyphae and made to develop in captivity (fig. 1). Funfstuck gives ten free living algae which have been identified as the gonidia of lichens. *Pleurococcus* (*Cystococcus*) *humicola* in the majority of lichens, *e.g. Usnea*, *Cladonia*, *Physcia*, *Parmelia*, *Calicium*, many species of *Lecidea*, &c., *Trentepohlia* (*Chroolepus*) *umbrina* in many species of *Verrucaria*, *Graphidieae* and *Lecidea*; *Palmella botryoides* in *Epigloea*; *Pleurococcus vulgaris* in Acarospora, Dermatocarpon, Catillaria; *Dactylococcus infusionum* in *Solorina*, *Nephromia*; *Nostoc lichenoides* in most of the Collemaceae; *Rivularia rutida* in *Omphalaria*; *Lichina*, &c., *Polycoccus punctiformis* in *Peltigera*, *Pannaria* and *Stictina*; *Gloeocapsa polydermatica* in *Baeomyces* and *Omphalaria*; *Sirosiphon pulvinatus* in *Ephebe pubescens*. The majority of lichens are confined to one particular kind of gonidium (*i.e.* species of alga) but a few forms are known (*Lecanora granatina*, *Solorina crocea*) which make use of more than one kind in their development. In the case of *Solorina*, for example, the principal alga is a green alga, one of the Palmellaceae, but *Nostoc* (a blue-green alga) is also found playing a subsidiary part as



After Sachs, from De Bary's *Vergleichende Morphologie und Biologie der Pilze, Mycetozoen und Bacterien*, by permission of Wilhelm Engelmann.

FIG. 2.—*Ephebe pubescens*, Fr. A branched filiform thallus of *Stigonema* with the hyphae of the fungus growing through its gelatinous membranes. Extremity of a branch of the thallus with a young lateral branch *a*; *h*, hyphae; *g*, cells of the alga; *gs*, the apex of the thallus.

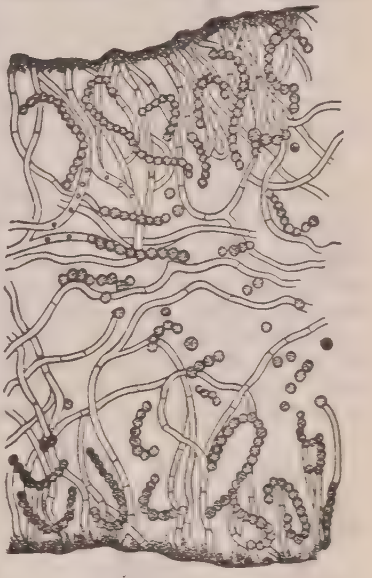


FIG. 3.—Section of Homoiomerous Thallus of *Collema conglomeratum*, with *Nostoc* threads scattered among the hyphae.

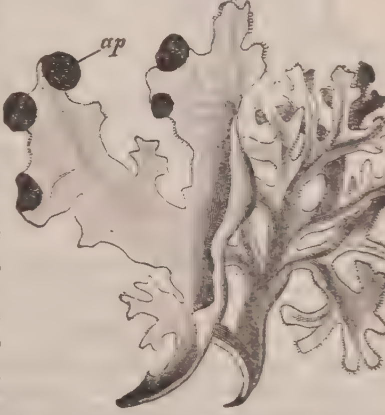


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FIG. 4.—*Cetraria islandica.* (Nat. size.) *ap*, Apothecium.

gonidia. In *L. granatina* the primary alga is *Pleurococcus*, the secondary, *Gleococapsa*.

Cephalodia.—In about 100 species of lichens peculiar growths are developed in the interior of the thallus which cause a slight projection of the upper or lower surface. These structures are known as *cephalodia* and they usually occupy a definite position in the thallus. They are distinguished by possessing as gonidia algae foreign to the ordinary part of the thallus. The foreign algae are always members of the Cyanophyceae and on the same individual and even in the same cephalodium more than one type of gonidium may be found. The function of these peculiar structures is unknown. Zukal has suggested that they may play the part of water-absorbing organs.

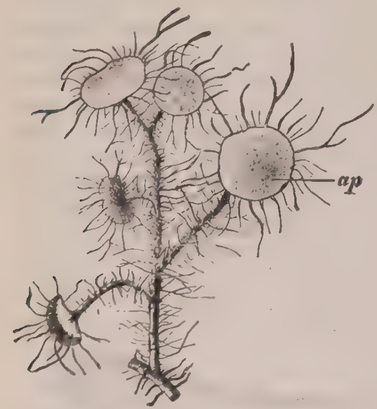

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FIG. 5.—*Usnea barbata*. (Nat. size.)
ap, Apothecium.

The exact relation of gonidia and hyphae has been investigated especially by Bornet and also by Hedlund, and very considerable differences have been shown to exist in different genera. In *Physma*, *Arnoldia*, *Phylliscum* and other genera the gonidia are killed sooner or later by special hyphal branches, *haustoria*, which pierce the membrane of the algal cell, penetrate the protoplasm and absorb the contents (fig. 11, C). In other cases, *e.g. Synalissa*, *Micarea*, the haustoria pierce the membrane, but do not penetrate the protoplasm (fig. 11, D). In many other cases, especially those algae possessing *Pleurococcus* as their gonidia, there are no penetrating hyphae, but merely special short hyphal branches which are in close contact with the membrane of the algal cell (fig. 3).

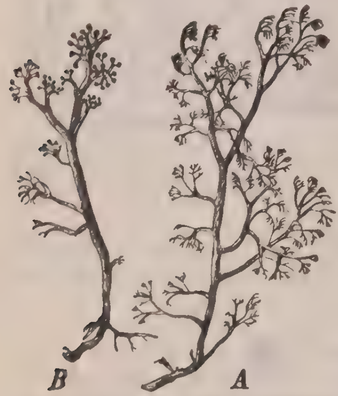

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FIG. 6.—*Cladonia rangiferina*. (Nat. size.)

A, Sterile.
B, With ascus-fruit at the ends of the branches.

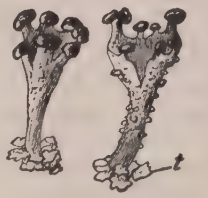

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FIG. 7. — *Cladonia coccifera*. Podetia bearing apothecia. (Nat. size.)

t, Scales of primary thallus.

Reproduction.

There are three methods of reproduction of the lichen: by fragmentation, by soredia, by the formation of fungal spores. In the first process, portions of thallus containing gonidia may be accidentally separated and so may start new plants. The second method is only a special process of fragmentation. The soredia are found in a large number of lichens, and consist of a single gonidium or groups of gonidia, surrounded by a sheath and hyphae. They arise usually in the gonidial layer of the thallus by division of the gonidia and the development around them of the hyphal investment; their increase in number leads to the rupture of the enclosing cortical layer and the soredia escape from the thallus as a powdery mass (fig. 12). Since they are provided with both fungal and algal elements, they are able to develop directly, under suitable conditions, into a new thallus. The soredia are the most successful method of reproduction in lichens, for not only are some forms nearly always without spore-formation and in others the spores laregly abortive, but in all cases the spore represents only the fungal component of the thallus, and its success in the development of a new lichen-thallus depends on the chance meeting, at the time of germination, with the appropriate algal component.

Conidia.—Contrary to the behaviour of the non-lichen forming Ascomycetes the lichen-fungi show very few cases of ordinary conidial formation. Bornet describes free conidia in *Arnoldia minitula*, and *Placodium decipiens* and *Conidia*-formation has been described by Neubner in the Caliciae.

Spermatia.—In the majority of genera of lichens small flask-shaped structures are found embedded in the thallus (fig. 13). These were investigated by Tulasne in 1853, who gave them the name *spermogonia* The lower, ventral portion of the spermogonium is lined by delicate hyphae, the *sterigmata*, which give origin to minute colourless cells, the *spermatia*. The sterigmata are either simple (fig. 13, C) or septate—the so-called arthrosterigmata (fig. 13, B). The spermogonia open by a small pore at the apex, towards which the sterigmata converge and through which the spermatia escape (fig. 13). There are two views as to the nature of the spermatia. In one view they are mere asexual conidia, and the term *pycnoconidia* is accordingly applied since they are borne in structures like the non-sexual *pycnidia* of other fungi. In the other view the spermatia are the male sexual cells and thus are rightly named; it should, however, be pointed out that this was not the view of Tulasne, though we owe to him the designation which carries with it the sexual significance. The question is one very difficult to settle owing to the fact that the majority of spermatia appear to be functionless. In favour of the conidial view is the fact that in the case of *Collema* and a few other forms the spermatia have been made to germinate in artificial cultures, and in the case of *Calicium parietinum* Möller succeeded in producing a spermogonia bearing thallus from a spermatium. For the germination of the spermatia in nature there is only the observation of Hedlund, that in *Catillaria denigrata* and *C. prasena* a thallus may be derived from the spermatia under natural conditions. In relation to the view that the spermatia are sexual cells, or at least were primitively so, it must be pointed out that although the actual fusion of the spermatial nucleus with a female nucleus has not been observed, yet in a few cases the spermatia have been seen to fuse with a projecting portion (trichogyne) of the ascogonium, as in *Collema* and *Physcia*, and there is very strong circumstantial evidence that fertilization takes place (see later in section on development of ascocarp). The resemblance of the spermatia and spermogonia to those of Uredineae should be pointed out, where also there is considerable evidence for their original sexual nature, though they appear in that group to be functionless in all cases. The observations of Möller, &c., on the germination cannot be assumed to negative the sexual hypothesis for the sexual cells of *Ulothrix* and *Ectocarpus*, for example

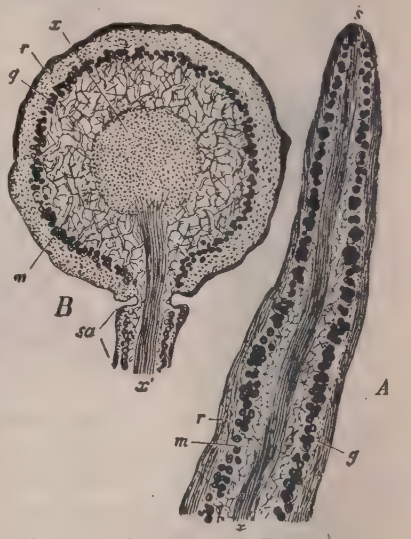

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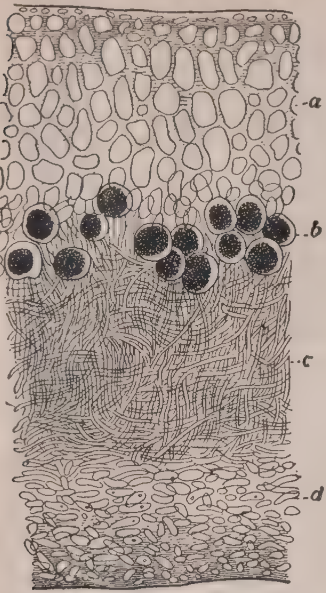
FIG. 8.—*Usnea barbata*. (Mag. nearly 100 times.)

A, Optical longitudinal section of the extremity of a thin branch of the thallus which has become transparent in solution of potash.
B, Transverse section through a stronger branch with the point of origin of an adventitious branch (*sa*).
r, Cortical layer.
m, Medullary layer.
x, Stout axile strand.
g, The algal zone (*Cystococcus*).
s, Apex of the branch.

are able to develop with or without fusion. The most satisfactory view in the present state of our knowledge seems to be that the spermatia are male cells which, while retaining their fertilizing action in a few cases are now mainly functionless. The female sexual organs, the ascogonia, would thus in the majority of cases develop by the aid of some reduced sexual process or the ascocarps be developed without relation to sexual organs. A further argument in support of this view is that it is in complete agreement with what we know of the sexuality of the ordinary, free-living ascomycetes, where we find both normal and reduced forms (see FUNGI).

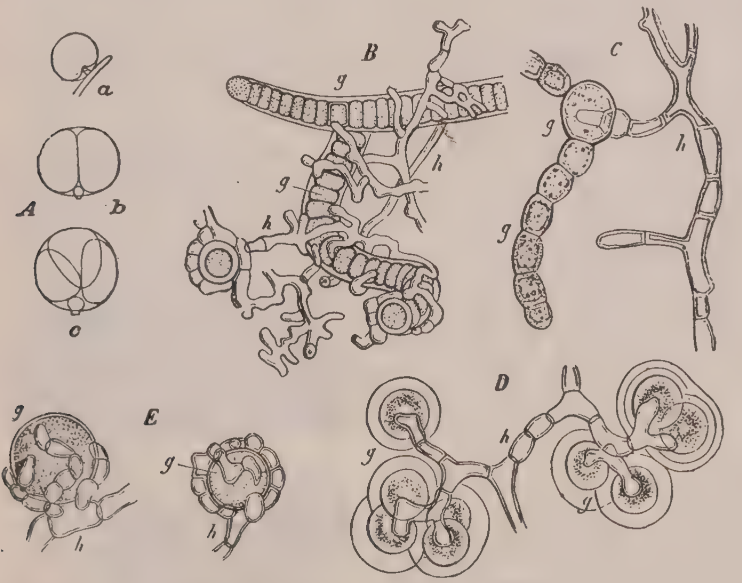


From *Beiträge zur Wissenschaftlichen Botanik.*

FIG. 9.—Section of Heteromerous Lichen Thallus.

a, Upper cortical layer.
d, Lower cortical layer.
c, Medullary layer.
b, Gonidial layer.

Fruit Bodies.—We find two chief types of fruit bodies in the lichens, the *perithecium* and *apothecium*; the first when the fungal element is a member of the Pyrenomycetes division of the Ascomycetes, the second when the fungus belongs to the Discomycetes division. In the two genera of lichens—the *Basidiolichens*—in which the fungus is a member of the Basidiomycetes, we have the fructification characteristic of that class of fungi: these are dealt with separately. The perithecium is very constant in form and since the gonidia take no part in the formation of this organ or that of the apothecium it has the general structure characteristic of that division of fungi. The apothecia, though of the normal fungal type and usually disk-shaped, are somewhat more variable, and since the variations are of value in classification some more details may be added.



After Bornet, from De Bary's *Vergleichende Morphologie und Biologie der Pilze, Mycetozoen und Bacterien*, by permission of Wilhelm Engelmann.

FIG. 11.—Lichen-forming Algae. (A, C, D, E mag. 950, B 650 times.) The **alga is** in all cases indicated by the letter *g*, the assailing hyphae by *h*.

A, *Pleurococcus*, Ag. (*Cystococcus*, Näg.) attacked by the germ-tube from a spore of *Physica parietina.*
B, *Scytonema* from the thallus of *Stereocaulon ramulosum.*
C, *Nostoc* from the thallus of *Physma chalazanum.*
D, *Gloeocapsa* from the thallus of *Synalissa Symphorea.*
E, *Pleurococcus* Sp. (*Cystococcus*) from the thallus of *Cladonia furcata.*

They present various shapes, of which the following are the principal: (*a*) *peltate*, which are large, rounded, without any distinct thalline margin[1] (*e.g. Usnea, Peltigera*); (*b*) *lecanorine*, or scutelliform, which are orbicular and surrounded by a distinct, more or less prominent thalline margin (*e.g. Parmelia, Lecanora*), having sometimes also in addition a proper one[1] (*e.g. Thelotrema, Urceolaria*); (*c*) *lecideine*, or patelliform, which are typically orbicular, with only a proper margin (*e.g. Lecidea*), sometimes obsolete, and which are occasionally irregular in shape, angular or flexuose (*e.g. Lecidea jurana, L. myrmecina*), or complicated and gyrose (*e.g. Gyrophora*), and even stipitate (*e.g. Baeomyces*); (*d*) *lirelliform*, which are of very irregular figure, elongated, branched or flexuose, with only a proper margin (*e.g. Xylographa, Graphis*, &c.) or none (*e.g.* some *Arthoniae*), and often very variable even in the same species. In colour the apothecia are extremely variable, and it is but rarely that they are the same colour as the thallus (*e.g. Usnea, Ramalina*). Usually they are of a different colour, and may be black, brown, yellowish, or also less frequently rose-coloured, rusty-red, orange-reddish, saffron, or of various intermediate shades. Occasionally in the same species their colour is very variable (*e.g. Lecanora metaboloides, Lecidea decolorans*), while sometimes they are white or glaucous, rarely greenish, pruinose. Lecideine apothecia, which are not black, but otherwise variously coloured, are termed *biatorine.*

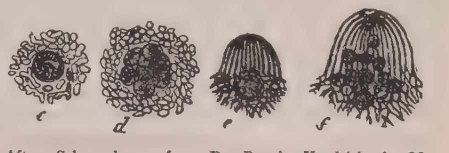


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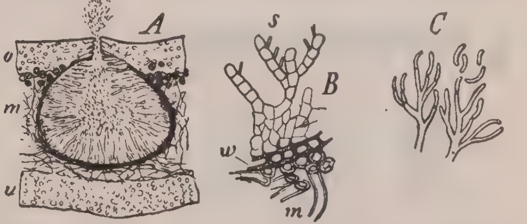
FIG. 12.—*Usnea barbata.* (Mag. more than 500 times.)

c, An isolated mature soredium, with an algal cell (*Pleurococcus*) in the envelope or hyphae.
d, Another with several algal cells **in** optical longitudinal section.
e, f, Two soredia in the act of germinating; the hyphal envelope has grown out below into rhizoid branches, and above shows already the structure of the apex of the **thallus** (see fig. 9).

The two principal parts of which an apothecium consists are the *hypothecium* and the hymenium, or thecium. The *hypothecium* is the basal part of the apothecium on which the *hymenium* is borne; the latter consists of asci (thecae) with ascospores, and paraphyses. The paraphyses (which may be absent entirely in the Pyrenolichens) are erect, colourless filaments which are usually dilated and coloured at the apex; the apices are usually cemented together into a definite layer, the *epithecium* (fig. 14). The spores themselves may be unicellular without a septum or multicellular with one or more septa. Sometimes the two cavities are restricted to the two ends of the spore, the *polaribilocular* type and the two loculi may be united



After Tulasne, from De Bary's *Vergleichende Morphologie und Biologie der Pilze, Mycetozoen und Bacterien*, by permission of Wilhelm Engelmann.

FIG. 13.—*A, B, Gyrophora cylindrica.* (A mag. 90, B 390 times, C highly magnified.)

A, A vertical median section through a spermogonium imbedded in the thallus.
o, Upper rind.
u, Under rind.
m, Medullary layer of the thallus.
B, Portion of a very thin section from the base of the spermogonium.
w, Its wall from which proceed sterigmata with rod-like spermatia (*s*).
m, Medullary hyphae of the thallus.
C, *Cladonia novae Angliae*, Delise; sterigmata with spermatia from the spermogonium.

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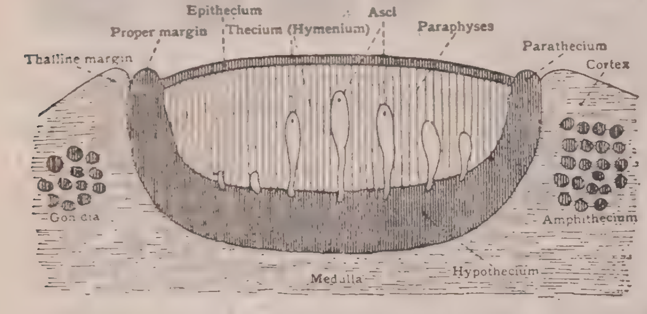
[1] The *thalline margin* (margo thallinus) is the projecting edge of a special layer of thallus, the amphithecium, round the actual apothecium; the *proper margin* (margo proprius) is the projecting edge of the apothecium itself.

by a narrow channel (fig. 15). At other times the spores are divided by both transverse and longitudinal septa producing the muriform (murali-divided) spore so called from the resemblance of the individual chambers to the stones in a wall. The very large single spores of *Pertusaria* have been shown to contain numerous nuclei and when they germinate develop a large number of germ tubes.

Development of the Ascocarps.—As the remarks on the nature of the spermatia show, the question of the sexuality of the lichens has been hotly disputed in common with that of the rest of the Ascomycetes. As indicated above, the weight of evidence seems to favour what has been put forward in the case of the non-lichen-forming fungi (see FUNGI), that in some cases the ascogonia develop as a result of a previous fertilization by spermatia, in other cases the ascogonia develop without such a union, while in still other cases the reduction goes still farther and the ascogenous hyphae instead of developing from the ascogonia are derived directly from the vegetative hyphae.



After Darbishire, from *Berichte der deutschen botanischen Gesellschaft*, by permission of Borntraeger & Co.

FIG. 14.—Diagram showing Apothecium in Section and surrounding Portion of Thallus, and special terms used to designate these parts.

The first exact knowledge as to the origin of the ascocarp was the work of Stahl on *Collema* in 1877. He showed that the archicarp consisted of two parts, a lower coiled portion, the ascogonium, and an upper portion, the trichogyne, which projected from the thallus. Only when a spermatium was found attached to the trichogyne did the further development of the ascogonium take place. From these observations he drew the natural conclusion that the spermatium was a male, sexual cell. This view was hotly contested by many workers and it was sought to explain the trichogyne—without much success—as a respiratory organ, or as a boring organ which made a way for the developing apothecium. It was not till 1898, however, that Stahl's work received confirmation and addition at the hands of Baur (fig. 16). The latter showed that in *Collema crispum* there are two kinds of thalli, one with numerous apothecia, the other quite sterile or bearing only a few. The sterile thalli possessed no spermogonia, but were found to show sometimes as many as 1000 archicarps with trichogynes; yet none or very few came to maturity. The fertile thalli were shown to bear either spermogonia or to be in immediate connexion with spermogonia-bearing thalli. Furthermore Baur showed that after the fusion of the spermatium with the trichogyne the transverse walls of that organ became perforated. There was thus very strong circumstantial evidence in favour of fertilization, although the male nucleus was not traced. The further work of Baur, and that of Darbishire, Funfstuck and Lindau, have shown that in a number of other cases trichogynes are present. Thus ascogonia with trichogynes have been observed in *Endocarpon*, *Collema*, *Pertusaria*, *Lecanora*, *Gyrophora*, *Parmelia*, *Ramalina*, *Physcia*, *Anaptychia* and *Cladonia*. In *Nephroma*, *Peltigera*, *Peltidea* and *Solorina* ascogonia without trichogynes have been observed. In *Collema* and a form like *Xanthoria parietina* it is probable that actual fertilization takes place, and possibly also in some of the other forms. It is probable, however, that in the majority of cases the ascogonia develop without normal fertilization, as is necessarily the case where the ascogonia have no trichogynes or the spermatia are absent. In these cases we should expect to find some reduced process of fertilization similar to that of *Humaria granulata* among the ordinary Ascomycetes, where in the absence of the antheridia the female nuclei fuse in pairs. In other lichens we should expect to find the ascogenous hyphae arising directly from the vegetative hyphae as in *Humaria rutilans* among the ordinary fungi, where the process is associated with the fusion of vegetative nuclei. It is possible that *Solorina saccata* belongs to this class. Cytological details of nuclear behaviour among the lichens are, however, difficult to obtain owing to the slow growth of these forms and the often refractory nature of the material in the matter of preparation for microscopical examination.

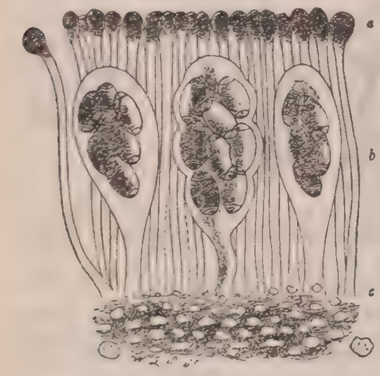
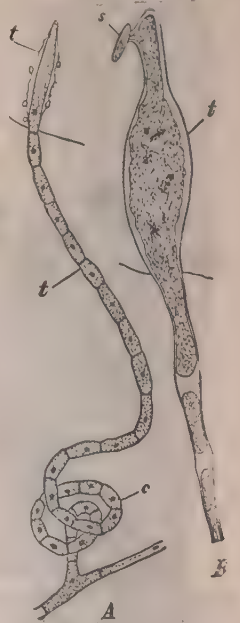


FIG. 15.—Vertical Section of Apothecium of *Xanthoria parietina*.
- *a*, Paraphyses.
- *b*, Asci (thecae) with bilocular spores.
- *c*, Hypothecium.



After E. Baur, from Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 16.—*Collema crispum*.
- A, Carpogonium, *c*, with its trichogyne *t*.
- B, Apex of the trichogyne with the spermatium, *s*, attached.

Ejection of Spores.—The spores are ejected from the apothecia and perithecia as in the fungi by forcible ejaculation from the asci. In the majority of forms it is clear that the soredia rather than the ascospore must play the more important part in lichen distribution as the development of the ordinary spores is dependent on their finding the proper alga on the substratum on which they happen to fall. In a number of forms (*Endocarpon pusillum*, *Stigmaatonima cataleptum*, various species of *Staurothele*), however, there is a special arrangement by which the spores are, on ejection, associated with gonidia. In these forms gonidia are found in connexion with the young fruit; such algal cells undergo numerous divisions becoming very small in size and penetrating into the hymenium among the asci and paraphyses. When the spores are thrown out some of these hymenial gonidia, as they are called, are carried with them. When the spores germinate the germ-tubes surround the algal cells, which now increase in size and become the normal gonidia of the thallus.

Basidiolichens.

As is clear from the above, nearly all the lichens are produced by the association of an ascomycetous fungus with algae. For some obscure reason the Basidiomycetes do not readily form lichens, so that only a few forms are known in which the fungal element is a member of this family. The two best-known genera are *Cora* and *Dictyonema*; *Corella*, whose hymenium is unknown, is also placed here by Wainio. The so-called Gasterolichens, *Trichocoma* and *Emericella*, have been shown to be merely ascomycetous fungi. *Clavaria mucida*, however, has apparently some claims to be considered as a Basidiolichen, since the base of the fruit body and the thallus from which it arises, according to Coker, always shows a mixture of hyphae and algae.

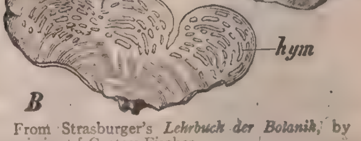


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FIG. 17.—*Cora pavonia*. A, Viewed from above; B, From below; *hym*, hymenium. (Nat. size.)

The best-known species is *Cora pavonia*, which is found in tropical regions growing on the bare earth and on trees; the gonidia belong to the genus *Chroococcus* while the fungus belongs, apparently, to the Thelephoreae (see FUNGI). This lichen seems unique in the fact that the fungal element is also found growing and fruiting entirely devoid of algae, while in the ascolichens the fungus portion seems to have become so specialized to its symbiotic mode of life that it is never found growing independently.

The genus *Dictyonema* has gonidia belonging to the blue-green alga, *Scytonema*. When the fungus predominates in the thallus it has a bracket-like mode of growth and is found projecting from the branches of trees with the hymenium on the under side. When the alga is predominant it forms felted patches on the bark of trees, the *Laudatea* form. It is said that the fungus of *Cora pavonia* and of *Dictyonema* is identical, the difference being in the nature of the alga.

Mode of Life.

Lichens are found growing in various situations such as bare earth, the bark of trees, dead wood, the surface of stones and rocks, where they have little competition to fear from ordinary plants. As is well known, the lichens are often found in the most exposed and arid situations; in the extreme polar regions these plants are practically the only vegetable forms of life. They owe their capacity to live under the most inhospitable conditions to the dual nature of the organism, and to their capacity to withstand extremes of heat, cold and drought without destruction. On a bare rocky surface a fungus would die from want of organic substance and an alga from drought and want of mineral substances. The lichen, however, is able to grow as the alga supplies organic food material and the fungus has developed a battery of acids (see below) which enable it actually to dissolve the most resistant rocks. It is owing to the power of disintegrating by both mechanical and chemical means the rocks on which they are growing that lichens play such an important part in soil-production. The resistance of lichens is extraordinary; they may be cooled to very low temperatures and heated to high temperatures without being killed. They may be dried so thoroughly that they can easily be reduced to powder yet their vitality is not destroyed but only suspended; on being supplied with water they absorb it rapidly by their general surface and renew their activity. The life of many lichens thus consists of alternating periods of activity when moisture is plentiful, and completely suspended animation under conditions of dryness. Though so little sensitive to drought and extremes of temperature lichens appear to be very easily affected by the presence in the air of noxious substances such as are found in large cities or manufacturing towns. In such districts lichen vegetation is entirely or almost entirely absent. The growth of lichens is extremely slow and many of them take years before they arrive at a spore-bearing stage. *Xanthoria parietina* has been known to grow for forty-five years before bearing apothecia. This slowness of growth is associated with great length of life and it is probable that individuals found growing on hard mountain rocks or on the trunks of aged trees are many hundreds of years old. It is possible that specimens of such long-lived species as *Lecidea geographica* actually outrival in longevity the oldest trees.

Relation of Fungus and Alga.

The relation of the two constituents of the lichen have been briefly stated in the beginning of this article. The relation of the fungus to the alga, though it may be described in general terms as one of symbiosis, partakes also somewhat of the nature of parasitism. The algal cells are usually controlled in their growth by the hyphae and are prevented from forming zoospores, and in some cases, as already described, the algal cells are killed sooner or later by the fungus. The fungus seems, on the other hand, to stimulate the algal cells to special development, for those in the lichen are larger than those in the free state, but this is not necessarily adverse to the idea of parasitism, for it is well known that an increase in the size of the cells of the host is often the result of the attacks of parasitic fungi. It must be borne in mind that the exact nutritive relations of the two constituents of the lichen have not been completely elucidated, and that it is very difficult to draw the line between symbiosis and parasitism. The lichen algae are not alone in their specialization to the symbiotic (or parasitic) mode of life, for, as stated earlier, the fungus appear in the majority of cases to have completely lost the power of independent development since with very rare exceptions they are not found alone. They also differ very markedly from free living fungi in their chemical reactions.

Chemistry of Lichens.

The chemistry of lichens is very complex, not yet fully investigated and can only be very briefly dealt with here. The wall of the hyphae of the fungus give in the young state the ordinary reactions of cellulose but older material shows somewhat different reactions, similar to those of the so-called fungus-cellulose. In many lichen-fungi the wall shows various chemical modifications. In numerous lichens, *e.g. Cetraria islandica*, the wall contains Lichenin ($C_6H_{10}O_5$), a gummy substance which swells in cold water and dissolves in hot. Besides this substance, a very similar one, Isolichenin, is also found which is distinguished from lichenin by the fact that it dissolves in cold water and turns blue under the reaction of Iodine. Calcium oxalate is a very common substance, especially in crustaceous lichens; fatty oil in the form of drops or as an infiltration in the membrane is also common; it sometimes occurs in special cells and in extreme cases may represent 90% of the dry substance as in *Verrucaria calciseda*, *Biatora immersa*.

Colouring Matters.—Many lichens, as is well known, exhibit a vivid colouring which is usually due to the incrustation of the hyphae with crystalline excretory products. These excretory products have usually an acid nature and hence are generally known as lichen-acids. A large number of these acids, which are mostly benzene derivatives, have been isolated and more or less closely investigated. They are characterized by their insolubility or very slight solubility in water; as examples may be mentioned erythrinic acid in *Roccella* and *Lecanora*; evernic acid in species of *Evernia*, *Ramalina* and *Cladonia*; lecanoric acid in *Lecanora*, *Gyrophora*. The so-called chrysophanic acid found in *Xanthoria* (Physcia) *parietina* is not an acid but a quinone and is better termed physcion.

Colour Reactions of Lichens.—The classification of lichens is unique in the fact that chemical colour reactions are used by many lichenologists in the discrimination of species, and these reactions are included in the specific diagnoses. The substances used as tests in these reactions are caustic potash and calcium hypochlorite; the former being the substance dissolved in an equal weight of water and the latter a saturated extract of bleaching powder in water. These substances are represented by lichenologists by the signs K and CaCl respectively, and the presence or absence of the colour reactions are represented thus, K+, CaCl+, or K−, CaCl−. If the cortical layer should exhibit positive reaction and the medulla of the same species a negative reaction with both reagents, the result is represented thus, K±CaCl±. If a reaction is only produced after the consecutive addition of the two reagents, this is symbolized by K(CaCl)+. A solution of iodine is also used as a test owing to the blue or wine-red colour which the thallus, hymenium or spores may give with this reagent. The objection to the case of these colour reactions is due to the indefinite nature of the reaction and the doubt as to the constant presence of a definite chemical compound in a given species. A yellow colour with caustic potash solution is produced not only by atranoric acid but also by evernic acid, thamnolic acid, &c. Again in the case of *Xanthoria parietina* vulpinic acid is only to be found in young thalli growing on sandstone; in older forms or in those growing on another substratum it is not to be detected. A similar relation between oil formation and the nature of the substratum has been observed in many lichens. Considerations such as these should make one very wary in placing reliance on these colour reactions for the purposes of classification.

Economic Uses of Lichens.

In the arts, as food and as medicine, many lichens have been highly esteemed, though others are not now employed for the same purposes as formerly.

1. *Lichens Used in the Arts.*—Of these the most important are such as yield, by maceration in ammonia, the dyes known in commerce as archil, cudbear and litmus. These, however, may with propriety be regarded as but different names for the same pigmentary substance, the variations in the character of which are attributable to the different modes in which the pigments are manufactured. Archil proper is derived from several species of *Roccella* (*e.g. R. Montaguei*, *R. tinctoria*), which yield a rich purple dye; it once fetched a high price in the market. Of considerable value is the "perelle" prepared from *Lecanora parella*, and used in the preparation of a red or crimson dye. Inferior to this is "cudbear," derived from *Lecanora tartarea*, which was formerly very extensively employed by the peasantry of north Europe for giving a scarlet or purple colour to woollen cloths. By adding certain alkalies to the other ingredients used

in the preparation of these pigments, the colour becomes indigo-blue, in which case it is the litmus of the Dutch manufacturers. Amongst other lichens affording red, purple or brown dyes may be mentioned *Ramalina scopulorum*, *Parmelia, saxatilis* and *P. omphalodes*, *Umbilicaria pustulata* and several species of *Gyrophora*, *Urceolaria scruposa*, all of which are more or less employed as domestic dyes. Yellow dyes, again, are derived from *Chlorea vulpina*, *Platysma juniperinum*, *Parmelia caperata* and *P. conspersa*, *Physcia flavicans*, *Ph. parietina* and *Ph. lychnea*, though like the preceding they do not form articles of commerce, being merely used locally by the natives of the regions in which they occur most plentifully. In addition to these, many exotic lichens, belonging especially to *Parmelia* and *Sticta* (*e.g. Parmelia tinctorum*, *Sticta argyracea*), are rich in colouring matter, and, if obtained in sufficient quantity, would yield a dye in every way equal to archil. These pigments primarily depend upon special acids contained in the thalli of lichens, and their presence may readily be detected by means of the reagents already noticed. In the process of manufacture, however, they undergo various changes, of which the chemistry is still but little understood. At one time also some species were used in the arts for supplying a gum as a substitute for gum-arabic. These were chiefly *Ramalina fraxinea*, *Evernia prunastri* and *Parmelia physodes*, all of which contain a considerable proportion of gummy matter (of a much inferior quality, however, to gum-arabic), and were employed in the process of calico-printing and in the making of parchment and cardboard. In the 17th century some filamentose and fruticulose lichens, viz. species of *Usnea* and *Ramalina*, also *Evernia furfuracea* and *Cladonia rangiferina*, were used in the art of perfumery. From their supposed aptitude to imbibe and retain odours, their powder was the basis of various perfumes, such as the celebrated "Poudre de Cypre" of the hairdressers, but their employment in this respect has long since been abandoned.

2. *Nutritive Lichens.*—Of still greater importance is the capacity of many species for supplying food for man and beast. This results from their containing starchy substances, and in some cases a small quantity of saccharine matter of the nature of mannite. One of the most useful nutritious species is *Cetraria islandica*, "Iceland moss," which, after being deprived of its bitterness by boiling in water, is reduced to a powder and made into cakes, or is boiled and eaten with milk by the poor Icelander, whose sole food it often constitutes. Similarly *Cladonia rangiferina* and *Cl. sylvatica*, the familiar "reindeer moss," are frequently eaten by man in times of scarcity, after being powdered and mixed with flour. Their chief importance, however, is that in Lapland and other northern countries they supply the winter food of the reindeer and other animals, who scrape away the snow and eagerly feed upon them. Another nutritious lichen is the "Tripe de Roche" of the arctic regions, consisting of several species of the *Gyrophorei*, which when boiled is often eaten by the Canadian hunters and Red Indians when pressed by hunger. But the most singular esculent lichen of all is the "manna lichen," which in times of drought and famine has served as food for large numbers of men and cattle in the arid steppes of various countries stretching from Algiers to Tartary. This is derived chiefly from *Lecanora esculenta*, which grows unattached on the ground in layers from 3 to 6 in. thick over large tracts of country in the form of small irregular lumps of a greyish or white colour. In connexion with their use as food we may observe that of recent years in Scandinavia and Russia an alcoholic spirit has been distilled from *Cladonia rangiferina* and extensively consumed, especially in seasons when potatoes were scarce and dear. Formerly also *Sticta pulmonaria* was much employed in brewing instead of hops, and it is said that a Siberian monastery was much celebrated for its beer which was flavoured with the bitter principle of this species.

3. *Medicinal Lichens.*—During the middle ages, and even in some quarters to a much later period, lichens were extensively used in medicine in various European countries. Many species had a great repute as demulcents, febrifuges, astringents, tonics, purgatives and anthelmintics. The chief of those employed for one or other, and in some cases for several, of these purposes were *Cladonia pyxidata*, *Usnea barbata*, *Ramalina farinacea*, *Evernia prunastri*, *Cetraria islandica*, *Sticta pulmonaria*, *Parmelia saxatilis*, *Xanthoria parietina* and *Pertusaria amara*. Others again were believed to be endowed with specific virtues, *e.g. Peltigera canina*, which formed the basis of the celebrated "pulvis antilyssus" of Dr Mead, long regarded as a sovereign cure for hydrophobia; *Platysma juniperinum*, lauded as a specific in jaundice, no doubt on the *similia similibus* principle from a resemblance between its yellow colour and that of the jaundiced skin; *Peltidea aphthosa*, which on the same principle was regarded by the Swedes, when boiled in milk, as an effectual remedy for the *aphthae* or rash on their children. Almost all of these virtues, general or specific, were imaginary; and at the present day, except perhaps in some remoter districts of northern Europe, only one of them is employed as a remedial agent. This is the "Iceland moss" of the druggists' shops, which is undoubtedly an excellent demulcent in various dyspeptic and chest complaints. No lichen is known to be possessed of any poisonous properties to man, although *Chlorea vulpina* is believed by the Swedes to be so. Zukal has considered that the lichen acids protect the lichen from the attacks of animals; the experiments of Zopf, however, have cast doubt on this; certainly lichens containing very bitter acids are eaten by mites though some of the acids appear to be poisonous to frogs.

Classification.

The dual nature of the lichen thallus introduces at the outset a classificatory difficulty. Theoretically the lichens may be classified on the basis of their algal constituent, on the basis of their fungal constituent, or they may be classified as if they were homogeneous organisms. The first of these systems is impracticable owing to the absence of algal reproductive organs and the similarity of the algal cells (gonidia) in a large number of different forms. The second system is the most obvious one, since the fungus is the dominant partner and produces reproductive organs. The third system was that of Nylander and his followers, who did not accept the Schwenderian doctrine of duality. In actual practice the difference between the second and third methods is not very great since the fungus is the producer of the reproductive organs and generally the main constituent. Most systems agree in deriving the major divisions from the characters of the reproductive organs (perithecia, apothecia, or basidiospore bearing fructification), while the characters of the algal cells and those of the thallus generally are used for the minor divisions. The difference between the various systems lies in the relative importance given to the reproductive characters on the one hand and the vegetative characters on the other. In the system (1854–1855) of Nylander the greater weight is given to the latter, while in more modern systems the former characters receive the more attention.

A brief outline of a system of classification, mainly that of Zahlbruckner as given in Engler and Prantl's *Pflanzenfamilien*, is outlined below.

There are two main divisions of lichens, *Ascolichenes* and *Basidiolichenes*, according to the nature of the fungal element, whether an ascomycete or basidiomycete. The Ascolichenes are again divided into *Pyrenocarpeae* or *Pyrenolichenes* and *Gymnocarpeae* or *Discolichenes*; the first having an ascocarp of the nature of a perithecium, the second bearing their ascospores in an open apothecium.

PYRENOLICHENES

Series I. Perithecium simple not divided.
- *a.* With *Pleurococcus* or *Palmella* gonidia.
  Moriolaceae, Verrucariaceae, Pyrenothamnaceae.
- *b.* With *Chroolepus* gonidia.
  Pyrenulaceae, Paratheliaceae.
- *c.* With *Phyllactidium* or *Cephaleurus* gonidia.
  Strigulaceae.
- *d.* With *Nostoc* or *Scytonema* gonidia.
  Pyrenidiaceae.

Series II. Perithecia divided or imperfectly divided by cross-walls.
Mycoporaceae with *Palmella* or *Chroolepus* gonidia.

DISCOLICHENES

Series I. Coniocarpineae. The paraphyses branch and form a network (capillitium) over the asci, the capillitium and ejected spores forming a long persistent powdery mass (mazaedium).
  Caliciaceae, Cypheliaceae, Sphaerophoraceae.

Series II. Graphidineae. Apothecia seldom round, usually elongated-ellipsoidal, no capillitium.
  Arthoniaceae, Graphidiaceae, Roccellaceae.

Series III. Cyclocarpineae, Apothecium usually circular, no capillitium.
  A. Spores usually two-celled, either with a strongly thickened cross-wall often perforated by a narrow canal or with cross-wall only slightly thickened. In the first case the spores are usually colourless, the second case always brown.
    Buelliaceae, Physciaceae.
  B. Spores unicellular, parallel-multicellular or muriform, usually colourless, cross-walls usually thin.
    α Thallus in moist state more or less gelatinous.
      Gonidia always belonging to the Cyanophyceae, Lichinaceae, Ephebaceae, Collemaceae, Pyrenopsidaceae.
    β Thallus not gelatinous.
      Coenogoniaceae, Lecideaceae, Cladoniaceae, Lecanoraceae, Pertusariaceae, Peltigeraceae, Stictaceae, Pannariaceae, Gyrophoraceae, Parmeliaceae, Cladoniaceae, Usneaceae.

BASIDIOLICHENES (Hymenolichenes)

Cora, *Dictyonema* (incl. Laudatea), *Corella* (doubtfully placed here as the hymenium is unknown).

Habitats and Distribution of Lichens.

1. *Habitats.*—These are extremely varied, and comprise a great number of very different substrata. Chiefly, however, they are the bark of trees, rocks, the ground, mosses and, rarely, perennial leaves. (*a*) With respect to *corticolous* lichens, some prefer the rugged bark of old trees (*e.g. Ramalina, Parmelia, Stictei*) and others the smooth bark of young trees and shrubs (*e.g. Graphidei* and some *Lecideae*). Many are found principally in large forests (*e.g. Usnea, Alectoria jubata*); while a few occur more especially on trees by roadsides (*e.g. Physcia parietina* and *Ph. pulverulenta*). In connexion with corticolous lichens may be mentioned those *lignicole* species which grow on decayed, or decaying wood of trees and on old pales (*e.g. Caliciei*, various *Lecideae, Xylographa*), (*b*) As to *saxicolous* lichens, which occur on rocks and stones, they may be divided into two sections, viz. *calcicolous* and *calcifugous.* To the former belong such as are found on calcareous and cretaceous rocks, and the mortar of walls (*e.g. Lecanora calcarea, Lecidea calcivora* and several *Verrucariae*), while all other saxicolous lichens may be regarded as belonging to the latter, whatever may be the mineralogical character of the substratum. It is here worthy of notice that the apothecia of several calcicolous lichens (*e.g. Lecanora Prevostii, Lecidea calcivora*) have the power of forming minute cavities in the rock, in which they are partially buried. (*c*) With respect to terrestrial species, some prefer peaty soil (*e.g. Cladonia, Lecidea decolorans*), others calcareous soil (*e.g. Lecanora crassa, Lecidea decipiens*), others sandy soil or hardened mud (*e.g. Collema limosum, Peltidea venosa*); while many may be found growing on all kinds of soil, from the sands of the sea-shore to the granitic detritus of lofty mountains, with the exception of course of cultivated ground, there being no agrarian lichens. (*d*) *Muscicolous* lichens again are such as are most frequently met with on decayed mosses and *Jungermannia*, whether on the ground, trees or rocks (*e.g. Leptogium muscicola, Gomphillus calicioides*). (*e*) The *epiphyllous* species are very peculiar as occurring upon perennial leaves of certain trees and shrubs, whose vitality is not at all affected by their presence as it is by that of fungi. In so far, however, as is known, they are very limited in number (*e.g. Lecidea, Bouteillei, Strigula*).

Sometimes various lichens occur abnormally in such unexpected habitats as dried dung of sheep, bleached bones of reindeer and whales, old leather, iron and glass, in districts where the species are abundant. It is apparent that in many cases lichens are quite indifferent to the substrata on which they occur, whence we infer that the preference of several for certain substrata depends upon the temperature of the locality or that of the special habitat. Thus in the case of saxicolous lichens the mineralogical character of the rock has of itself little or no influence upon lichen growth, which is influenced more especially and directly by their physical properties, such as their capacity for retaining heat and moisture. As a rule lichens grow commonly in open exposed habitats, though some are found only or chiefly in shady situations; while, as already observed, scarcely any occur where the atmosphere is impregnated with smoke. Many species also prefer growing in moist places by streams, lakes and the sea, though very few are normally and probably none entirely, *aquatic*, being always at certain seasons exposed for a longer or shorter period to the atmosphere (*e.g. Lichina, Leptogium rivulare, Endocarpon fluviatile, Verrucaria maura*). Some species are entirely parasitical on other lichens (*e.g.* various *Lecideae* and *Pyrenocarpei*), and may be peculiar to one (*e.g. Lecidea vitellinaria*) or common to several species (*e.g. Habrothallus parmeliarum*). A few, generally known as *erratic* species, have been met with growing unattached to any substratum (*e.g. Parmelia revoluta*, var. *concentrica, Lecanora esculenta*); but it can hardly be that these are really free *ab initio* (*vide* Crombie in *Journ. Bot.*, 1872, p. 306). It is to the different characters of the stations they occupy with respect to exposure, moisture, &c., that the variability observed in many types of lichens is to be attributed.

2. *Distribution.*—From what has now been said it will readily be inferred that the distribution of lichens over the surface of the globe is regulated, not only by the presence of suitable substrata, but more especially by climatic conditions. At the same time it may safely be affirmed that their geographical range is more extended than that of any other class of plants, occurring as they do in the coldest and warmest regions—on the dreary shores of arctic and antarctic seas and in the torrid valleys of tropical climes, as well as on the greatest mountain elevations yet attained by man, on projecting rocks even far above the snow-line (*e.g. Lecidea geographica*). In arctic regions lichens form by far the largest portion of the vegetation, occurring everywhere on the ground and on rocks, and fruiting freely; while terrestrial species of *Cladonia* and *Stereocaulon* are seen in the greatest luxuriance and abundance spreading over extensive tracts almost to the entire exclusion of other vegetation. The lichen flora of temperate regions again is essentially distinguished from the preceding by the frequency of corticolous species belonging to *Lecanora, Lecidea* and *Graphidei.* In intertropical regions lichens attain their maximum development (and beauty) in the foliaceous *Stictei* and *Parmeliei,* while they are especially characterized by epiphyllous species, as *Strigula*, and by many peculiar corticole *Thelotremei, Graphidei* and *Pyrenocarpei.* Some lichens, especially saxicolous ones, seem to be cosmopolitan (*e.g. Lecanora subfusca, Cladonia pyxidata*); and others, not strictly cosmopolitan, have been observed in regions widely apart. A considerable number of species, European and exotic, seem to be *endemic*, but further research will no doubt show that most of them occur in other climatic regions similar to those in which they have hitherto alone been detected. To give any detailed account, however, of the distribution of the different genera (not to speak of that of individual species) of lichens would necessarily far exceed available limits.

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Entwickelung einiger Flechtenapothecien "; (*Flora*, Bd. 88, 1901); "Untersuchungen über die Entwickelungsgeschichte der Flechtenapothecien," *Bot. Zeit.* (1904); O. V. Darbishire, "Über die Apothecium-entwickelung der Flechte, Physcia pulverulenta," *Nyl. Prings. Jahrb*, (Bd. 34, 1900). Chemistry.—W. Zopf, "Vergleichende Produkte," *Beitr. z. bot. Centralbl.* (Bd. 14, 1903); *Die Flechtenstoffe* (Jena, 1907). (J. M. C.; V. H. B.)

LICHFIELD, a city, county of a city, and municipal borough in the Lichfield parliamentary division of Staffordshire, England, 118 m. N.W. from London. Pop. (1901) 7902. The London and North-Western railway has stations at Trent Valley Junction on the main line, and in the city on a branch westward. The town lies in a pleasant country, on a small stream draining eastward to the Trent, with low hills to the E. and S. The cathedral is small (the full internal length is only 370 ft., and the breadth of the nave 68 ft.), but beautiful in both situation and style. It stands near a picturesque sheet of water named Minster Pool. The present building dates from various periods in the 13th and early 14th centuries, but the various portions cannot be allocated to fixed years, as the old archives were destroyed during the Civil Wars of the 17th century. The earlier records of the church are equally doubtful. A Saxon church founded by St Chad, who was subsequently enshrined here, occupied the site from the close of the 7th century; of its Norman successor portions of the foundations have been excavated, but no record exists either of its date or of its builders. The fine exterior of the cathedral exhibits the feature, unique in England, of a lofty central and two lesser western spires, of which the central, 252 ft. high, is a restoration attributed to Sir Christopher Wren after its destruction during the Civil Wars. The west front is composed of three stages of ornate arcading, with niches containing statues, of which most are modern. Within, the south transept shows simple Early English work, the north transept and chapter house more ornate work of a later period in that style, the nave, with its geometrical ornament, marks the transition to the Decorated style, while the Lady chapel is a beautiful specimen of fully developed Decorated work with an apsidal east end. The west front probably falls in date between the nave and the Lady chapel. Among numerous monuments are—memorials to Samuel Johnson, a native of Lichfield, and to David Garrick, who spent his early life and was educated here; a monument to Major Hodson, who fell in the Indian mutiny, and whose father was canon of Lichfield; the tomb of Bishop Hacket, who restored the cathedral after the Civil Wars; and a remarkable effigy of Perpendicular date displaying Sir John Stanley stripped to the waist and awaiting chastisement. Here is also the "Sleeping Children," a masterpiece by Chantrey (1817).

A picturesque bishop's palace (1687) and a theological college (1857) are adjacent to the cathedral. The diocese covers the greater part of Staffordshire and about half the parishes in Shropshire, with small portions of Cheshire and Derbyshire. The church of St Chad is ancient though extensively restored; on its site St Chad is said to have occupied a hermit's cell. The principal schools are those of King Edward and St Chad. There are many picturesque half-timbered and other old houses, among which is that in which Johnson was born, which stands in the market-place, and is the property of the corporation and opened to the public. There is also in the market place a statue to Johnson. A fair is held annually on Whit-Monday, accompanied by a pageant of ancient origin. Brewing is the principal industry, and in the neighbourhood are large market gardens. The city is governed by a mayor, 6 aldermen and 18 councillors. Area, 3475 acres.

There is a tradition that "Christianfield" near Lichfield was the site of the martyrdom of a thousand Christians during the persecutions of Maximian about 286, but there is no evidence in support of the tradition. At Wall, 3 m. from the present city, there was a Romano-British village called Letocetum ("grey wood"), from which the first half of the name Lichfield is derived. The first authentic notice of Lichfield (*Lyccidfelth*, *Lychfeld*, *Litchfield*) occurs in Bede's history where it is mentioned as the place where St Chad fixed the episcopal see of the Mercians. After the foundation of the see by St Chad in 669, it was raised in 786 by Pope Adrian through the influence of Offa, King of Mercia, to the dignity of an archbishopric, but in 803 the primacy was restored to Canterbury. In 1075 the see of Lichfield was removed to Chester, and thence a few years later to Coventry, but it was restored in 1148. At the time of the Domesday Survey Lichfield was held by the bishop of Chester: it is not called a borough, and it was a small village, whence, on account of its insignificance, the see had been moved. The lordship and manor of the town were held by the bishop until the reign of Edward VI., when they were leased to the corporation. There is evidence that a castle existed here in the time of Bishop Roger Clinton (*temp.* Henry I.), and a footpath near the grammar-school retains the name of Castle-ditch. Richard II. gave a charter (1387) for the foundation of the gild of St Mary and St John the Baptist; this gild obtained the whole local government, which it exercised until its dissolution by Edward VI., who incorporated the town (1548), vesting the government in two bailiffs and twenty-four burgesses; further charters were given by Mary, James I. and Charles II. (1664), the last, incorporating it under the title of the "bailiffs and citizens of the city of Lichfield," was the governing charter until 1835; under this charter the governing body consisted of two bailiffs and twenty-four brethren. Lichfield sent two members to the parliament of 1304 and to a few succeeding parliaments, but the representation did not become regular until 1552; in 1867 it lost one member, and in 1885 its representation was merged in that of the county. By the charter of James I. the market day was changed from Wednesday to Tuesday and Friday; the Tuesday market disappeared during the 19th century; the only existing fair is a small pleasure fair of ancient origin held on Ash-Wednesday; the annual fête on Whit-Monday claims to date from the time of Alfred. In the Civil Wars Lichfield was divided. The cathedral authorities with a certain following were for the king, but the townsfolk generally sided with the parliament, and this led to the fortification of the close in 1643. Lord Brooke, notorious for his hostility to the church, came against it, but was killed by a deflected bullet on St Chad's day, an accident welcomed as a miracle by the Royalists. The close yielded and was retaken by Prince Rupert in this year; but on the breakdown of the king's cause in 1646 it again surrendered. The cathedral suffered terrible damage in these years.

See Rev. T. Harwood, *Hist. and Antiquities of Church and City of Lichfield* (1806), *Victoria County History, Stafford.*

LICH-GATE, or LYCH-GATE (from O. Eng. *lic* "a body, a corpse"; cf. Ger. *Leiche*), the roofed-in gateway or porch-entrance to churchyards. Lich-gates existed in England certainly thirteen centuries ago, but comparatively few early ones survive, as they were almost always of wood. One at Bray, Berkshire, is dated 1448. Here the clergy meet the corpse and some portion of the service is read. The gateway was really part of the church; it also served to shelter the pall-bearers while the bier was brought from the church. In some lich-gates there stood large flat stones called lich-stones upon which the corpse, usually uncoffined, was laid. The most common form of lich-gate is a simple shed composed of a roof with two gabled ends, covered with tiles or thatch. At Berrynarbor, Devon, there is a lich-gate in the form of a cross, while at Troutbeck, Westmorland, there are three lich-gates to one churchyard. Some elaborate gates have chambers over them. The word *lich* entered into composition constantly in old English, thus, lich-bell, the hand-bell rung before a corpse; lich-way, the path along which a corpse was carried to burial (this in some districts was supposed to establish a right-of-way); lich-owl, the screech-owl, because its cry was a portent of death; and lyke-wake, a night watch over a corpse.

LICHTENBERG, GEORG CHRISTOPH (1742–1799), German physicist and satirical writer, was born at Oberramstadt, near Darmstadt, on the 1st of July 1742. In 1763 he entered Göttingen university, where in 1769 he became extraordinary professor of physics, and six years later ordinary professor. This post he held till his death on the 24th of February 1799. As a physicist he is best known for his investigations in electricity, more especially as to the so-called Lichtenberg figures, which are fully described in two memoirs *Super nova methodo motum ac naturam fluidi electrici investigandi* (Göttingen, 1777–1778). These figures, originally studied on account of the light they were supposed to throw on the nature of the electric fluid or fluids, have reference to the distribution of electricity over the surface of non-conductors. They are produced as follows: A sharp-pointed needle is placed perpendicular to a non-conducting plate, such as of resin, ebonite or glass, with its point very near to or in contact with the plate, and a Leyden jar is discharged into the needle. The electrification of the plate is now tested by sifting over it a mixture of flowers of sulphur and red lead. The negatively electrified sulphur is seen to attach itself to the positively electrified parts of the plate, and the positively electrified red lead to the negatively electrified parts. In addition to the distribution of colour thereby produced, there is a marked difference in the *form* of the figure, according to the nature of the electricity originally communicated to the plate. If it be positive, a widely extending patch is seen on the plate, consisting of a dense nucleus, from which branches radiate in all directions; if negative the patch is much smaller and has a sharp circular boundary entirely devoid of branches. If the plate receives a mixed charge, as, for example, from an induction coil, a "mixed" figure results, consisting of a large red central nucleus, corresponding to the negative charge, surrounded by yellow rays, corresponding to the positive charge. The difference between the positive and negative figures seems to depend on the presence of the air; for the difference tends to disappear when the experiment is conducted in vacuo. Riess explains it by the negative electrification of the plate caused by the friction of the water vapour, &c., driven along the surface by the explosion which accompanies the disruptive discharge at the point. This electrification would favour the spread of a positive, but hinder that of a negative discharge. There is, in all probability, a connexion between this phenomenon and the peculiarities of positive and negative brush and other discharge in air.

As a satirist and humorist Lichtenberg takes high rank among the German writers of the 18th century. His biting wit involved him in many controversies with well-known contemporaries, such as Lavater, whose science of physiognomy he ridiculed, and Voss, whose views on Greek pronunciation called forth a powerful satire, *Über die Pronunciation der Schöpse des alten Griechenlandes* (1782). In 1769 and again in 1774 he resided for some time in England and his *Briefe aus England* (1776–1778), with admirable descriptions of Garrick's acting, are the most attractive of his writings. He contributed to the *Göttinger Taschenkalender* from 1778 onwards, and to the *Göttingisches Magazin der Literatur und Wissenschaft*, which he edited for three years (1780–1782) with J. G. A. Forster. He also published in 1794–1799 an *Ausführliche Erklärung der Hogarthschen Kupferstiche.*

Lichtenberg's *Vermischte Schriften* were published by F. Kries in 9 vols. (1800–1805); new editions in 8 vols. (1844–1846 and 1867). Selections by E. Grisebach, *Lichtenbergs Gedanken und Maximen* (1871); by F. Robertag (in Kürschner's *Deutsche Nationalliteratur* (vol. 141, 1886); and by A. Wilbrandt (1893). Lichtenberg's *Briefe* have been published in 3 vols. by C. Schüddekopf and A. Leitzmann (1900–1902); his *Aphorismen* by A. Leitzmann (3 vols., 1902–1906). See also R. M. Meyer, *Swift und Lichtenberg* (1886); F. Lauchert, *Lichtenbergs schriftstellerische Tätigkeit* (1893); and A. Leitzmann, *Aus Lichtenbergs Nachlass* (1899).

LICHTENBERG, formerly a small German principality on the west bank of the Rhine, enclosed by the Nahe, the Blies and the Glan, now belonging to the government district of Trier, Prussian Rhine province. The principality was constructed of parts of the electorate of Trier, of Nassau-Saarbrücken and other districts, and lay between Rhenish Bavaria and the old Prussian province of the Rhine. Originally called the lordship of Baumholder, it owed the name of Lichtenberg and its elevation in 1819 to a principality to Ernest, duke of Saxe-Coburg, to whom it was ceded by Prussia, in 1816, in accordance with terms agreed upon at the congress of Vienna. The duke, however, restored it to Prussia in 1834, in return for an annual pension of £12,000 sterling. The area is about 210 sq. m.

LICINIANUS, GRANIUS, Roman annalist, probably lived in the age of the Antonines (2nd century A.D.). He was the author of a brief epitome of Roman history based upon Livy, which he utilized as a means of displaying his antiquarian lore. Accounts of omens, portents, prodigies and other remarkable things apparently took up a considerable portion of the work. Some fragments of the books relating to the years 163–178 B.C. are preserved in a British Museum MS.

EDITIONS.—C. A. Pertz (1857); seven Bonn students (1858); M. Flemisch (1904); see also J. N. Madvig, *Kleine philologische Schriften* (1875), and the list of articles in periodicals in Flemisch's edition (p. iv.).

LICINIUS [FLAVIUS GALERIUS VALERIUS LICINIANUS], Roman emperor, A.D. 307–324, of Illyrian peasant origin, was born probably about 250. After the death of Flavius Valerius Severus he was elevated to the rank of Augustus by Galerius, his former friend and companion in arms, on the 11th of November 307, receiving as his immediate command the provinces of Illyricum. On the death of Galerius, in May 311, he shared the entire empire with Maximinus, the Hellespont and the Thracian Bosporus being the dividing line. In March 313 he married Constantia, half-sister of Constantine, at Mediolanum (Milan), in the following month inflicted a decisive defeat on Maximinus at Heraclea Pontica, and established himself master of the East, while his brother-in-law, Constantine, was supreme in the West. In 314 his jealousy led him to encourage a treasonable enterprise on the part of Bassianus against Constantine. When his perfidy became known a civil war ensued, in which he was twice severely defeated—first near Cibalae in Pannonia (October 8th, 314), and next in the plain of Mardia in Thrace; the outward reconciliation, which was effected in the following December, left Licinius in possession of Thrace, Asia Minor, Syria and Egypt, but added numerous provinces to the Western empire. In 323 Constantine, tempted by the "advanced age and unpopular vices" of his colleague, again declared war against him, and, having defeated his army at Adrianople (3rd of July 323), succeeded in shutting him up within the walls of Byzantium. The defeat of the superior fleet of Licinius by Flavius Julius Crispus, Constantine's eldest son, compelled his withdrawal to Bithynia, where a last stand was made; the battle of Chrysopolis, near Chalcedon (18th of September), finally resulted in his submission. He was interned at Thessalonica and executed in the following year on a charge of treasonable correspondence with the barbarians.

See Zosimus ii. 7-28; Zonaras xiii. 1; Victor, *Caes.* 40, 41; Eutropius x. 3; Orosius vii. 28.

LICINIUS CALVUS STOLO, GAIUS, Roman statesman, the chief representative of the plebeian Licinian gens, was tribune in 377 B.C., consul in 361. His name is associated with the Licinian or Licinio-Sextian laws (proposed 377, passed 367), which practically ended the struggle between patricians and plebeians. He was himself fined for possessing a larger share of the public land than his own law allowed.

See ROME: *History*, II. "The Republic."

LICINIUS MACER CALVUS, GAIUS (82–47 B.C.), Roman poet and orator, was the son of the annalist Licinius Macer. As a poet he is associated with his friend Catullus, whom he followed in style and choice of subjects. As an orator he was the leader of the opponents of the florid Asiatic school, who took the simplest Attic orators as their model and attacked even Cicero as wordy and artificial. Calvus held a correspondence on questions connected with rhetoric, perhaps (if the reading be correct) the *commentarii* alluded to by Tacitus (*Dialogus*, 23; compare also Cicero, *Ad Fam.* xv. 21). Twenty-one speeches by him are mentioned, amongst which the most famous were those delivered against Publius Vatinius. Calvus was very short of stature, and is alluded to by Catullus (Ode 53) as *Salaputium disertum* (eloquent Lilliputian).

For Cicero's opinion see *Brutus*, 82; Quintilian x. 1. 115; Tacitus, *Dialogus*, 18. 21; the monograph by F. Plessis (Paris, 1896) contains a collection of the fragments (verse and prose).

LICODIA EUBEA, a town of Sicily in the province of Catania, 4 m. W. of Vizzini, which is 39 m. S.W. of Catania by rail. Pop. (1901) 7033. The name Eubea was given to the place in 1872 owing to a false identification with the Greek city of Euboea, a colony of Leontini, founded probably early in the 6th century B.C. and taken by Gelon. The town occupies the site of an unknown Sicel city, the cemeteries of which have been explored. A few vases of the first period were found, but practically all the tombs explored in 1898 belonged to the fourth period (700–500 B.C.) and show the gradual process of Hellenization among the Sicels.

See *Römische Mitteilungen*, 1898, 305 seq.; *Notizie degli scavi*, 1902, 219. (T. As.)

LICTORS (*lictores*), in Roman antiquities, a class of the attendants (*apparitores*) upon certain Roman and provincial magistrates.[1] As an institution (supposed by some to have been borrowed from Etruria) they went back to the regal period and continued to exist till imperial times. The majority of the city lictors were freedmen; they formed a corporation divided into decuries, from which the lictors of the magistrates in office were drawn; provincial officials had the nomination of their own. In Rome they wore the toga, perhaps girded up; on a campaign and at the celebration of a triumph, the red military cloak (*sagulum*); at funerals, black. As representatives of magistrates who possessed the *imperium*, they carried the fasces and axes in front of them (see FASCES). They were exempt from military service; received a fixed salary; theoretically they were nominated for a year, but really for life. They were the constant attendants, both in and out of the house, of the magistrate to whom they were attached. They walked before him in Indian file, cleared a passage for him (*summovere*) through the crowd, and saw that he was received with the marks of respect due to his rank. They stood by him when he took his seat on the tribunal; mounted guard before his house, against the wall of which they stood the fasces; summoned offenders before him, seized, bound and scourged them, and (in earlier times) carried out the death sentence. It should be noted that directly a magistrate entered an allied, independent state, he was obliged to dispense with his lictors. The king had twelve lictors; each of the consuls (immediately after their institution) twelve, subsequently limited to the monthly officiating consul, although Caesar appears to have restored the original arrangement; the dictator, as representing both consuls, twenty-four; the emperors twelve, until the time of Domitian, who had twenty-four. The Flamen Dialis, each of the Vestals, the *magister vicorum* (overseer of the sections into which the city was divided) were also accompanied by lictors. These lictors were probably supplied from the *lictores curiatii*, thirty in number, whose functions were specially religious, one of them being in attendance on the pontifex maximus. They originally summoned the comitia curiata, and when its meetings became merely a formality, acted as the representatives of that assembly. Lictors were also assigned to private individuals at the celebration of funeral games, and to the aediles at the games provided by them and the theatrical representations under their supervision.

For the fullest account of the lictors, see Mommsen, *Römisches Staatsrecht*, i. 355, 374 (3rd ed., 1887).

LIDDELL, HENRY GEORGE (1811–1898), English scholar and divine, eldest son of the Rev. Henry George Liddell, younger brother of the first Baron Ravensworth, was born at Binchester, near Bishop Auckland, on the 6th of February 1811. He was educated at Charterhouse and Christ Church, Oxford. Gaining a double first in 1833, Liddell became a college tutor, and was ordained in 1838. In the same year Dean Gaisford appointed him Greek reader in Christ Church, and in 1846 he was appointed to the headmastership of Westminster School. Meanwhile his life work, the great *Lexicon* (based on the German work of F. Passow), which he and Robert Scott began as early as 1834, had made good progress, and the first edition appeared in 1843. It immediately became the standard Greek-English dictionary and still maintains this rank, although, notwithstanding the great additions made of late to our Greek vocabulary from inscriptions, papyri and other sources, scarcely any enlargement has been made since about 1880. The 8th edition was published in 1897. As headmaster of Westminster Liddell enjoyed a period of great success, followed by trouble due to the outbreak of fever and cholera in the school. In 1855 he accepted the deanery of Christ Church, then vacant by the death of Gaisford. In the same year he brought out a *History of Ancient Rome* (much used in an abridged form as the *Student's History of Rome*) and took a very active part in the first Oxford University Commission. His tall figure, fine presence and aristocratic mien were for many years associated with all that was characteristic of Oxford life. Coming just at the transition period when the "old Christ Church," which Pusey strove so hard to preserve, was inevitably becoming broader and more liberal, it was chiefly due to Liddell that necessary changes were effected with the minimum of friction. In 1859 Liddell welcomed the then prince of Wales when he matriculated at Christ Church, being the first holder of that title who had matriculated since Henry V. In conjunction with Sir Henry Acland, Liddell did much to encourage the study of art at Oxford, and his taste and judgment gained him the admiration and friendship of Ruskin. In 1891, owing to advancing years, he resigned the deanery. The last years of his life were spent at Ascot, where he died on the 18th of January 1898. Dean Liddell married in July 1846 Miss Lorina Reeve (d. 1910), by whom he had a numerous family.

See memoir by H. L. Thompson, *Henry George Liddell* (1899).

LIDDESDALE, the valley of Liddel Water, Roxburghshire, Scotland, extending in a south-westerly direction from the vicinity of Peel Fell to the Esk, a distance of 21 m. The Waverley route of the North British railway runs down the dale, and the Catrail, or Picts' Dyke, crosses its head. At one period the points of vantage on the river and its affluents were occupied with freebooters' peel-towers, but many of them have disappeared and the remainder are in decay. Larriston Tower belonged to the Elliots, Mangerton to the Armstrongs and Park to "little Jock Elliot," the outlaw who nearly killed Bothwell in an encounter in 1566. The chief point of interest in the valley, however, is Hermitage Castle, a vast, massive H-shaped fortress of enormous strength, one of the oldest baronial buildings in Scotland. It stands on a hill overlooking Hermitage Water, a tributary of the Liddel. It was built in 1244 by Nicholas de Soulis and was captured by the English in David II.'s reign. It was retaken by Sir William Douglas, who received a grant of it from the king. In 1492 Archibald Douglas, 5th earl of Angus, exchanged it for Bothwell Castle on the Clyde with Patrick Hepburn, 1st earl of Bothwell. It finally passed to the duke of Buccleuch, under whose care further ruin has been arrested. It was here that Sir Alexander Ramsay of Dalhousie was starved to death by Sir William Douglas in 1342, and that James Hepburn, 4th earl of Bothwell, was visited by Mary, queen of Scots, after the assault referred to.

To the east of the castle is Ninestane Rig, a hill 943 ft. high, 4 m. long and 1 m. broad, where it is said that William de Soulis, hated for oppression and cruelty, was (in 1320) boiled by his own vassals in a copper cauldron, which was supported on two of the nine stones which composed the "Druidical" circle that gave the ridge its name. Only five of the stones remain. James Telfer (1802–1862), the writer of ballads, who was born in the parish of Southdean (pronounced Soudan), was for several years schoolmaster of Saughtree, near the head of the valley. The castle of the lairds of Liddesdale stood near the junction of Hermitage Water and the Liddel and around it grew up the village of Castleton.

LIDDON, HENRY PARRY (1829–1890), English divine, was the son of a naval captain and was born at North Stoneham, Hampshire, on the 20th of August 1829. He was educated at King's College School, London, and at Christ Church, Oxford, where he graduated, taking a second class, in 1850. As vice-principal of the theological college at Cuddesdon (1854–1859) he wielded considerable influence, and, on returning to Oxford as vice-principal of St Edmund's Hall, became a growing force among the undergraduates, exercising his influence in strong opposition to the liberal reaction against Tractarianism, which had set in after Newman's secession in 1845. In 1864 the bishop of Salisbury (W. K. Hamilton), whose examining chaplain he had been, appointed him prebendary of Salisbury cathedral. In 1866 he delivered his Bampton Lectures on the doctrine of the divinity of Christ. From that time his fame as a preacher, which had been steadily growing, may be considered established. In 1870 he was made canon of St Paul's Cathedral, London. He had before this published *Some Words for God*, in which, with great power and eloquence, he combated the scepticism of the day. His preaching at St Paul's soon attracted vast crowds. The afternoon sermon, which fell to the lot of the canon in residence, had usually been delivered in the choir, but soon after Liddon's appointment it became necessary to preach the sermon under the dome, where from 3000 to 4000 persons used to gather to hear the preacher. Few orators belonging to the Church of England have acquired so great a reputation as Liddon. Others may have surpassed him in originality, learning or reasoning power, but for grasp of his subject, clearness of language, lucidity of arrangement, felicity of illustration, vividness of imagination, elegance of diction, and above all, for sympathy with the intellectual position of those whom he addressed, he has hardly been rivalled. In the elaborate arrangement of his matter he is thought to have imitated the great French preachers of the age of Louis XIV. In 1870 he had also been made Ireland professor of exegesis at Oxford. The combination of the two appointments gave him extensive influence over the Church of England. With Dean Church he may be said to have restored the waning influence of the Tractarian school, and he succeeded in popularizing the opinions which, in the hands of Pusey and Keble, had appealed to thinkers and scholars. His forceful spirit was equally conspicuous in his opposition to the Church Discipline Act of 1874, and in his denunciation of the Bulgarian atrocities of 1876. In 1882 he resigned his professorship and utilized his thus increased leisure by travelling in Palestine and Egypt, and showed his interest in the Old Catholic movement by visiting Döllinger at Munich. In 1886 he became chancellor of St Paul's, and it is said that he declined more than one offer of a bishopric. He died on the 9th of September 1890, in the full vigour of his intellect and at the zenith of his reputation. He had undertaken and nearly completed an elaborate life of Dr Pusey, for whom his admiration was unbounded; and this work was completed after his death by Messrs Johnston and Wilson. Liddon's great influence during his life was due to his personal fascination and the beauty of his pulpit oratory rather than to any high qualities of intellect. As a theologian his outlook was that of the 16th rather than the 19th century; and, reading his Bampton Lectures now, it is difficult to realize how they can ever have been hailed as a great contribution to Christian apologetics. To the last he maintained the narrow standpoint of Pusey and Keble, in defiance of all the developments of modern thought and modern scholarship; and his latter years were embittered by the consciousness that the younger generation of the disciples of his school were beginning to make friends of the Mammon of scientific unrighteousness. The publication in 1889 of *Lux Mundi*, a series of essays attempting to harmonize Anglican Catholic doctrine with modern thought, was a severe blow to him, for it showed that even at the Pusey House, established as the citadel of Puseyism at Oxford, the principles of Pusey were being departed from. Liddon's importance is now mainly historical. He was the last of the classical pulpit orators of the English Church, the last great popular exponent of the traditional Anglican orthodoxy. Besides the works mentioned, Liddon published several volumes of *Sermons*, a volume of Lent lectures entitled *Some Elements of Religion* (1870), and a collection of *Essays and Addresses* on such themes as Buddhism, Dante, &c.

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[1] The Greek equivalents of *lictor* are ῥαβδοῦχος, ῥαβδοφόρος, ῥαβδονόμος (rod-bearer); the Latin word is variously derived from: (*a*) *ligare*, to bind or arrest a criminal; (*b*) *licere*, to summon, as convoking assemblies or haling offenders before the magistrate; (*c*) *licium*, the girdle with which (according to some) their toga was held up; (*d*) Plutarch (*Quaestiones Romanae*, 67), assuming an older form λιτωρ, suggests an identification with λειτουργός, one who performs a public office.

See *Life and Letters*, by J. O. Johnston (1904); G. W. E. Russell, *H. P. Liddon* (1903); A. B. Donaldson, *Five Great Oxford Leaders* (1900), from which the life of Liddon was reprinted separately in 1905.

LIE, JONAS LAURITZ EDEMIL (1833–1908), Norwegian novelist, was born on the 6th of November 1833 close to Hougsund (Eker), near Drammen. In 1838, his father being appointed sheriff of Tromsö, the family removed to that Arctic town. Here the future novelist enjoyed an untrammelled childhood among the shipping of the little Nordland capital, and gained acquaintance with the wild seafaring life which he was afterwards to describe. In 1846 he was sent to the naval school at Frederiksvaern, but his extreme near-sight unfitted him for the service, and he was transferred to the Latin school at Bergen. In 1851 he went to the university of Christiania, where Ibsen and Björnson were among his fellow-students. Jonas Lie, however, showed at this time no inclination to literature. He pursued his studies as a lawyer, took his degrees in law in 1858, and settled down to practice as a solicitor in the little town of Kongsvinger. In 1860 he married his cousin, Thomasine Lie, whose collaboration in his work he acknowledged in 1893 in a graceful article in the *Samtiden* entitled "Min hustru." In 1866 he published his first book, a volume of poems. He made unlucky speculations in wood, and the consequent financial embarrassment induced him to return to Christiania to try his luck as a man of letters. As a journalist he had no success, but in 1870 he published a melancholy little romance, *Den Fremsynte* (Eng. trans., *The Visionary*, 1894), which made him famous. Lie proceeded to Rome, and published *Tales* in 1871 and *Tremasteren "Fremtiden"* (Eng. trans., *The Barque "Future,"* Chicago, 1879), a novel, in 1872. His first great book, however, was *Lodsen og hans Hustru* (*The Pilot and his Wife*, 1874), which placed him at the head of Norwegian novelists; it was written in the little town of Rocca di Papa in the Albano mountains. From that time Lie enjoyed, with Björnson and Ibsen, a stipend as poet from the Norwegian government. Lie spent the next few years partly in Dresden, partly in Stuttgart, with frequent summer excursions to Berchtesgaden in the Bavarian highlands. During his exile he produced the drama in verse called *Faustina Strozzi* (1876). Returning to Norway, Lie began a series of romances of modern life in Christiania, of which *Thomas Ross* (1878) and *Adam Schrader* (1879) were the earliest. He returned to Germany, and settled first in Dresden again, then in Hamburg, until 1882, when he took up his abode in Paris, where he lived in close retirement in the society of Scandinavian friends. His summers were spent at Berchtesgaden in Tirol. The novels of his German period are *Rutland* (1881) and *Gaa paa* ("*Go Ahead!*" 1882), tales of life in the Norwegian merchant navy. His subsequent works, produced with great regularity, enjoyed an immense reputation in Norway. Among the best of them are: *Livsslaven* (1883, Eng. trans., "*One of Life's Slaves,*" 1895); *Familjen paa Gilje* ("*The Family of Gilje,*" 1883); *Malstroem* (1885), describing the gradual ruin of a Norwegian family; *Et Samliv* ("*Life in Common,*" 1887), describing a marriage of convenience. Two of the most successful of his novels were *The Commodore's Daughters* (1886) and *Niobe* (1894), both of which were presented to English readers in the International library, edited by Mr Gosse. In 1891–1892 he wrote, under the influence of the new romantic impulse, twenty-four folk-tales, printed in two volumes entitled *Trold*. Some of these were translated by R. N. Bain in *Weird Tales* (1893), illustrated by L. Housman. Among his later works were the romance *Naar Sol gaar ned* ("*When the Sun goes down,*" 1895), the powerful novel of *Dyre Rein* (1896), the fairy drama of *Lindelin* (1897), *Faste Forland* (1899), a romance which contains much which is autobiographical, *When the Iron Curtain falls* (1901), and *The Consul* (1904). His *Samlede Vaerker* were published at Copenhagen in 14 vols. (1902–1904). Jonas Lie left Paris in 1891, and, after spending a year in Rome, returned to Norway, establishing himself at Holskogen, near Christiansand. He died at Christiania on the 5th of July 1908. As a novelist he stands with those minute and unobtrusive painters of contemporary manners who defy arrangement in this or that school. He is with Mrs Gaskell or Ferdinand Fabre; he is not entirely without relation with that old-fashioned favourite of the public, Fredrika Bremer.

His son, Erik Lie (b. 1868), published a successful volume of stories, *Med Blyanten*, in 1890; and is also the author of various works on literary history. An elder son, Mons Lie (b. 1864), studied the violin in Paris, but turned to literature in 1894. Among his works are the plays *Tragedier om Kjaerlighed* (1897); *Lombardo and Agrippina* (1898); *Don Juan* (1900); and the novels, *Sjöfareren* (1901); *Adam Ravn* (1903) and *I. Kvindensnet* (1904). (E. G.)

LIE, MARIUS SOPHUS (1842–1899), Norwegian mathematician, was born at Nordfjordeif, near Bergen, on the 17th of December 1842, and was educated at the university of Christiania, where he took his doctor's degree in 1868 and became extraordinary professor of mathematics (a chair created specially for him) four years later. In 1886 he was chosen to succeed Felix Klein in the chair of geometry at Leipzig, but as his fame grew a special post was arranged for him in Christiania. But his health was broken down by too assiduous study, and he died at Christiania on the 18th of February 1899, six months after his return. Lie's work exercised a great influence on the progress of mathematical science during the later decades of the 19th century. His primary aim has been declared to be the advancement and elaboration of the theory of differential equations, and it was with this end in view that he developed his theory of transformation groups, set forth in his *Theorie der Transformationsgruppen* (3 vols., Leipzig, 1888–1893), a work of wide range and great originality, by which probably his name is best known. A special application of his theory of continuous groups was to the general problem of non-Euclidean geometry. The latter part of the book above mentioned was devoted to a study of the foundations of geometry, considered from the standpoint of B. Riemann and H. von Helmholtz; and he intended to publish a systematic exposition of his geometrical investigations, in conjunction with Dr G. Scheffers, but only one volume made its appearance (*Geometrie der Berührungstransformationen*, Leipzig, 1896). Lie was a foreign member of the Royal Society, as well as an honorary member of the Cambridge Philosophical Society and the London Mathematical Society, and his geometrical inquiries gained him the much-coveted honour of the Lobatchewsky prize.

An analysis of Lie's works is given in the *Bibliotheca Mathematica* (Leipzig, 1900).

LIEBER, FRANCIS (1800–1872), German-American publicist, was born at Berlin on the 18th of March 1800. He served with his two brothers under Blücher in the campaign of 1815, fighting at Ligny, Waterloo and Namur, where he was twice dangerously wounded. Shortly afterwards he was arrested for his political sentiments, the chief evidence against him being several songs of liberty which he had written. After several months he was discharged without a trial, but was forbidden to pursue his studies at the Prussian universities. He accordingly went to Jena, where he took his degrees in 1820, continuing his studies at Halle and Dresden. He subsequently took part in the Greek War of Independence, publishing his experiences in his *Journal in Greece* (Leipzig, 1823, and under the title *The German Anacharsis*, Amsterdam, 1823). For a year he was in Rome as tutor to the son of the historian Niebuhr, then Prussian ambassador. Returning to Berlin in 1823, he was imprisoned at Koepenik, but was released after some months through the influence of Niebuhr. In 1827 he went to the United States and as soon as possible was naturalized as a citizen. He settled at Boston, and for five years edited *The Encyclopaedia Americana* (13 vols.). From 1835 to 1856 he was professor of history and political economy in South Carolina College at Columbia, S.C., and during this period wrote his three chief works, *Manual of Political Ethics* (1838), *Legal and Political Hermeneutics* (1839), and *Civil Liberty and Self Government* (1853). In 1856 he resigned and next year was elected to a similar post in Columbia College, New York, and in 1865 became professor of constitutional history and public law in the same institution. During the Civil War Lieber rendered services of great value to the government. He was one of the first to point out the madness of secession, and was active in upholding the Union. He prepared, upon the requisition of the president, the important *Code of War for the Government of the Armies of the United States in the Field*, which was promulgated by the Government in General Orders No. 100 of the war department. This code suggested to Bluntschli his codification of the law of nations, as may be seen in the preface to his *Droit International Codifié*. During this period also Lieber wrote his *Guerilla Parties with Reference to the Laws and Usages of War*. At the time of his death he was the umpire of the commission for the adjudication of Mexican claims. He died on the 2nd of October 1872. His books were acquired by the University of California, and his papers were placed in the Johns Hopkins University.

His *Miscellaneous Writings* were published by D. C. Gilman (Philadelphia, 1881). See T. S. Perry, *Life and Letters* (1882), and biography by Harby (1899).

LIEBERMANN, MAX (1849–), German painter and etcher, was born in Berlin. After studying under Steffeck, he entered the school of art at Weimar in 1869. Though the straightforward simplicity of his first exhibited picture, "Women plucking Geese," in 1872, presented already a striking contrast to the conventional art then in vogue, it was heavy and bituminous in colour, like all the artist's paintings before his visit to Paris at the end of 1872. A summer spent at Barbizon in 1873, where he became personally acquainted with Millet and had occasion to study the works of Corot, Troyon, and Daubigny, resulted in the clearing and brightening of his palette, and taught him to forget the example of Munkacsy, under whose influence he had produced his first pictures in Paris. He subsequently went to Holland, where the example of Israels confirmed him in the method he had adopted at Barbizon; but on his return to Munich in 1878 he caused much unfavourable criticism by his realistic painting of "Christ in the Temple," which was condemned by the clergy as irreverent and remained his only attempt at a scriptural subject. Henceforth he devoted himself exclusively to the study of free-light and to the painting of the life of humble folk. He found his best subjects in the orphanages and asylums for the old in Amsterdam, among the peasants in the fields and village streets of Holland, and in the beer-gardens, factories, and workrooms of his own country. Germany was reluctant, however, in admitting the merit of an artist whose style and method were so markedly at variance with the time-honoured academic tradition. Only when his fame was echoed back from France, Belgium, and Holland did his compatriots realize the eminent position which is his due in the history of German art. It is hardly too much to say that Liebermann has done for his country what Millet did for France. His pictures hold the fragrance of the soil and the breezes of the heavens. His people move in their proper atmosphere, and their life is stated in all its monotonous simplicity, without artificial pathos or melodramatic exaggeration. His first success was a medal awarded him for "An Asylum for Old Men" at the 1881 Salon. In 1884 he settled again in Berlin, where he became professor of the Academy in 1898. He became a member of the Société nationale des Beaux Arts, of the Société royale belge des Aquarellistes, and of the Cercle des Aquarellistes at the Hague. Liebermann is represented in most of the German and other continental galleries. The Berlin National Gallery owns "The Flax-Spinners"; the Munich Pinakothek, "The Woman with Goats"; the Hamburg Gallery, "The Net-Menders"; the Hanover Gallery, the "Village Street in Holland." "The Seamstress" is at the Dresden Gallery; the "Man on the Dunes" at Leipzig; "Dutch Orphan Girls" at Strassburg; "Beer-cellar at Brandenburg" at the Luxembourg Museum in Paris, and the "Knöpflerinnen" in Venice. His etchings are to be found in the leading print cabinets of Europe.

LIEBIG, JUSTUS VON, Baron (1803–1873), German chemist, was born at Darmstadt, according to his baptismal certificate, on the 12th of May 1803 (4th of May, according to his mother). His father, a drysalter and dealer in colours, used sometimes to make experiments in the hope of finding improved processes for the production of his wares, and thus his son early acquired familiarity with practical chemistry. For the theoretical side he read all the text-books which he could find, somewhat to the detriment of his ordinary school studies. Having determined to make chemistry his profession, at the age of fifteen he entered the shop of an apothecary at Appenheim, near Darmstadt; but he soon found how great is the difference between practical pharmacy and scientific chemistry, and the explosions and other incidents that accompanied his private efforts to increase his chemical knowledge disposed his master to view without regret his departure at the end of ten months. He next entered the university of Bonn, but migrated to Erlangen when the professor of chemistry, K. W. G. Kastner (1783–1857), was appointed in 1821 to the chair of physics and chemistry at the latter university. He followed this professor to learn how to analyse certain minerals, but in the end he found that the teacher himself was ignorant of the process. Indeed, as he himself said afterwards, it was a wretched time for chemistry in Germany. No laboratories were accessible to ordinary students, who had to content themselves with what the universities could give in the lecture-room and the library, and though both at Bonn and Erlangen Liebig endeavoured to make up for the deficiencies of the official instruction by founding a students' physical and chemical society for the discussion of new discoveries and speculations, he felt that he could never become a chemist in his own country. Therefore, having graduated as Ph.D. in 1822, he left Erlangen—where he subsequently complained that the contagion of the "greatest philosopher and metaphysician of the century" (Schelling), in a period "rich in words and ideas, but poor in true knowledge and genuine studies," had cost him two precious years of his life—and by the liberality of Louis I., grand-duke of Hesse-Darmstadt, was enabled to go to Paris. By the help of L. J. Thénard he gained admission to the private laboratory of H. F. Gaultier de Claubry (1792–1873), professor of chemistry at the École de Pharmacie, and soon afterwards, by the influence of A. von Humboldt, to that of Gay-Lussac, where in 1824 he concluded his investigations on the composition of the fulminates. It was on Humboldt's advice that he determined to become a teacher of chemistry, but difficulties stood in his way. As a native of Hesse-Darmstadt he ought, according to the academical rules of the time, to have studied and graduated at the university of Giessen, and it was only through the influence of Humboldt that the authorities forgave him for straying to the foreign university of Erlangen. After examination his Erlangen degree was recognized, and in 1824 he was appointed extraordinary professor of chemistry at Giessen, becoming ordinary professor two years later. In this small town his most important work was accomplished. His first care was to persuade the Darmstadt government to provide a chemical laboratory in which the students might obtain a proper practical training. This laboratory, unique of its kind at the time, in conjunction with Liebig's unrivalled gifts as a teacher, soon rendered Giessen the most famous chemical school in the world; men flocked from every country to enjoy its advantages, and many of the most accomplished chemists of the 19th century had to thank it for their early training. Further, it gave a great impetus to the progress of chemical education throughout Germany, for the continued admonitions of Liebig combined with the influence of his pupils induced many other universities to build laboratories modelled on the same plan. He remained at Giessen for twenty-eight years, until in 1852 he accepted the invitation of the Bavarian government to the ordinary chair of chemistry at Munich university, and this office he held, although he was offered the chair at Berlin in 1865, until his death, which occurred at Munich on the 10th of April 1873.

Apart from Liebig's labours for the improvement of chemical teaching, the influence of his experimental researches and of his contributions to chemical thought was felt in every branch of the science. In regard to methods and apparatus, mention should be made of his improvements in the technique of organic analysis, his plan for determining the natural alkaloids and for ascertaining the molecular weights of organic bases by means of their chloroplatinates, his process for determining the quantity of urea in a solution—the first step towards the introduction of precise chemical methods into practical medicine—and his invention of the simple form of condenser known in every laboratory. His contributions to inorganic chemistry were numerous, including investigations on the compounds of antimony, aluminium, silicon, &c., on the separation of nickel and cobalt, and on the analysis of mineral waters, but they are outweighed in importance by his work on organic substances. In this domain his first research was on the fulminates of mercury and silver, and his study of these bodies led him to the discovery of the isomerism of cyanic and fulminic acids, for the composition of fulminic acid as found by him was the same as that of cyanic acid, as found by F. Wöhler, and it became necessary to admit them to be two bodies which differed in properties, though of the same percentage composition. Further work on cyanogen and connected substances yielded a great number of interesting derivatives, and he described an improved method for the manufacture of potassium cyanide, an agent which has since proved of enormous value in metallurgy and the arts. In 1832 he published, jointly with Wöhler, one of the most famous papers in the history of chemistry, that on the oil of bitter almonds (benzaldehyde), wherein it was shown that the radicle benzoyl might be regarded as forming an unchanging constituent of a long series of compounds obtained from oil of bitter almonds, throughout which it behaved like an element. Berzelius hailed this discovery as marking the dawn of a new era in organic chemistry, and proposed for benzoyl the names "Proïn" or "Orthrin" (from πρωΐ and ὄρθρυς). A continuation of their work on bitter almond oil by Liebig and Wöhler, who remained firm friends for the rest of their lives, resulted in the elucidation of the mode of formation of that substance and in the discovery of the ferment emulsin as well as the recognition of the first glucoside, amygdalin, while another and not less important and far-reaching inquiry in which they collaborated was that on uric acid, published in 1837. About 1832 he began his investigations into the constitution of ether and alcohol and their derivatives. These on the one hand resulted in the enunciation of his ethyl theory, by the light of which he looked upon those substances as compounds of the radicle ethyl (C_2H_5), in opposition to the view of J. B. A. Dumas, who regarded them as hydrates of olefiant gas (ethylene); on the other they yielded chloroform, chloral and aldehyde, as well as other compounds of less general interest, and also the method of forming mirrors by depositing silver from a slightly ammoniacal solution by acet aldehyde. In 1837 with Dumas he published a note on the constitution of organic acids, and in the following year an elaborate paper on the same subject appeared under his own name alone; by this work T. Graham's doctrine of polybasicity was extended to the organic acids. Liebig also did much to further the hydrogen theory of acids.

These and other studies in pure chemistry mainly occupied his attention until about 1838, but the last thirty-five years of his life were devoted more particularly to the chemistry of the processes of life, both animal and vegetable. In animal physiology he set himself to trace out the operation of determinate chemical and physical laws in the maintenance of life and health. To this end he examined such immediate vital products as blood, bile and urine; he analysed the juices of flesh, establishing the composition of creatin and investigating its decomposition products, creatinin and sarcosin; he classified the various articles of food in accordance with the special function performed by each in the animal economy, and expounded the philosophy of cooking; and in opposition to many of the medical opinions of his time taught that the heat of the body is the result of the processes of combustion and oxidation performed within the organism. A secondary result of this line of study was the preparation of his food for infants and of his extract of meat. Vegetable physiology he pursued with special reference to agriculture, which he held to be the foundation of all trade and industry, but which could not be rationally practised without the guidance of chemical principles. His first publication on this subject was *Die Chemie in ihrer Anwendung auf Agricultur und Physiologie* in 1840, which was at once translated into English by Lyon Playfair. Rejecting the old notion that plants derive their nourishment from humus, he taught that they get carbon and nitrogen from the carbon dioxide and ammonia present in the atmosphere, these compounds being returned by them to the atmosphere by the processes of putrefaction and fermentation—which latter he regarded as essentially chemical in nature—while their potash, soda, lime, sulphur, phosphorus, &c., come from the soil. Of the carbon dioxide and ammonia no exhaustion can take place, but of the mineral constitutents the supply is limited because the soil cannot afford an indefinite amount of them; hence the chief care of the farmer, and the function of manures, is to restore to the soil those minerals which each crop is found, by the analysis of its ashes, to take up in its growth. On this theory he prepared artificial manures containing the essential mineral substances together with a small quantity of ammoniacal salts, because he held that the air does not supply ammonia fast enough in certain cases, and carried out systematic experiments on ten acres of poor sandy land which he obtained from the town of Giessen in 1845. But in practice the results were not wholly satisfactory, and it was a long time before he recognized one important reason for the failure in the fact that to prevent the alkalis from being washed away by the rain he had taken pains to add them in an insoluble form, whereas, as was ultimately suggested to him by experiments performed by J. T. Way about 1850, this precaution was not only superfluous but harmful, because the soil possesses a power of absorbing the soluble saline matters required by plants and of retaining them, in spite of rain, for assimilation by the roots.

Liebig's literary activity was very great. The Royal Society's *Catalogue of Scientific Papers* enumerates 318 memoirs under his name, exclusive of many others published in collaboration with other investigators. A certain impetuousness of character which disposed him to rush into controversy whenever doubt was cast upon the views he supported accounted for a great deal of writing, and he also carried on an extensive correspondence with Wöhler and other scientific men. In 1832 he founded the *Annalen der Pharmazie*, which became the *Annalen der Chemie und Pharmazie* in 1840 when Wöhler became joint-editor with himself, and in 1837 with Wöhler and Poggendorff he established the *Handwörterbuch der reinen und angewandten Chemie*. After the death of Berzelius he continued the *Jahresbericht* with H. F. M. Kopp. The following are his most important separate publications, many of which were translated into English and French almost as soon as they appeared: *Anleitung zur Analyse der organischen Körper* (1837); *Die Chemie in ihrer Anwendung auf Agrikultur und Physiologie* (1840); *Die Thier-Chemie oder die organische Chemie in ihrer Anwendung auf Physiologie und Pathologie* (1842); *Handbuch der organischen Chemie mit Rücksicht auf Pharmazie* (1843); *Chemische Briefe* (1844); *Chemische Untersuchungen über das Fleisch und seine Zubereitung zum Nahrungsmittel* (1847); *Die Grundsätze der Agrikultur-Chemie* (1855); *Über Theorie und Praxis in der Landwirthschaft* (1856); *Naturwissenschaftliche Briefe über die moderne Landwirthschaft* (1859). A posthumous collection of his miscellaneous addresses and publications appeared in 1874 as *Reden und Abhandlungen*, edited by his son George (b. 1827). His criticism of Bacon, *Über Francis von Verulam*, was first published in 1863 in the *Augsburger allgemeine Zeitung*, where also most of his letters on chemistry made their first appearance.

See *The Life Work of Liebig* (London, 1876), by his pupil A. W. von Hofmann, which is the Faraday lecture delivered before the London Chemical Society in March 1875, and is reprinted in Hofmann's *Zur Erinnerung an vorangegangene Freunde*; also W. A. Shenstone, *Justus von Liebig, his Life and Work* (1895).

LIEBKNECHT, WILHELM (1826–1900), German socialist, was born at Giessen on the 29th of March 1826. Left an orphan at an early age, he was educated at the gymnasium in his native town, and attended the universities of Giessen, Bonn and Marburg. Before he left school he had become affected by the political discontent then general in Germany; he had already studied the writings of St Simon, from which he gained his first interest in communism, and had been converted to the extreme republican theories of which Giessen was a centre. He soon came into conflict with the authorities, and was expelled from Berlin apparently in consequence of the strong sympathy he displayed for some Poles, who were being tried for high treason. He proposed in 1846 to migrate to America, but went instead to Switzerland, where he earned his living as a teacher. As soon as the revolution of 1848 broke out he hastened to Paris, but the attempt to organize a republican corps for the invasion of Germany was prevented by the government. In September, however, in concert with Gustav von Struve, he crossed the Rhine from Switzerland at the head of a band of volunteers, and proclaimed a republic in Baden. The attempt collapsed; he was captured, and, after suffering eight months' imprisonment, was brought to trial. Fortunately for him, a new rising had just broken out; the mob burst into the court, and he was acquitted. During the short duration of the revolutionary government he was an active member of the most extreme party, but on the arrival of the Prussian troops he succeeded in escaping to France. Thence he went to Geneva, where he came into intercourse with Mazzini; but, unlike most of the German exiles, he was already an adherent of the socialist creed, which at that time was more strongly held in France. Expelled from Switzerland he went to London, where he lived for thirteen years in close association with Karl Marx. He endured great hardships, but secured a livelihood by teaching and writing; he was a correspondent of the *Augsburger Allgemeine Zeitung*. The amnesty of 1861 opened for him the way back to Germany, and in 1862 he accepted the post of editor of the *Norddeutsche Allgemeine Zeitung*, the founder of which was an old revolutionist. Only a few months elapsed before the paper passed under Bismarck's influence. There is no more curious episode in German history than the success with which Bismarck acquired the services of many of the men of 1848, but Liebknecht remained faithful to his principles and resigned his editorship. He became a member of the Arbeiterverein, and after the death of Ferdinand Lassalle he was the chief mouthpiece in Germany of Karl Marx, and was instrumental in spreading the influence of the newly-founded *International*. Expelled from Prussia in 1865, he settled at Leipzig, and it is primarily to his activity in Saxony among the newly-formed unions of workers that the modern social democrat party owes its origin. Here he conducted the *Demokratisches Wochenblatt*. In 1867 he was elected a member of the North German Reichstag, but in opposition to Lassalle's followers he refused all compromise with the "capitalists," and avowedly used his position merely for purposes of agitation whilst taking every opportunity for making the parliament ridiculous. He was strongly influenced by the "great German" traditions of the democrats of 1848, and, violently anti-Prussian, he distinguished himself by his attacks on the policy of 1866 and the "revolution from above," and by his opposition to every form of militarism. His adherence to the traditions of 1848 are also seen in his dread of Russia, which he maintained to his death. His opposition to the war of 1870 exposed him to insults and violence, and in 1872 he was condemned to two years' imprisonment in a fortress for treasonable intentions. The union of the German Socialists in 1874 at the congress of Gotha was really a triumph of his influence, and from that time he was regarded as founder and leader of the party. From 1874 till his death he was a member of the German Reichstag, and for many years also of the Saxon diet. He was one of the chief spokesmen of the party, and he took a very important part in directing its policy. In 1881 he was expelled from Leipzig, but took up his residence in a neighbouring village. After the lapse of the Socialist law (1890) he became chief editor of the *Vorwärts*, and settled in Berlin. If he did not always find it easy in his later years to follow the new developments, he preserved to his death the idealism of his youth, the hatred both of Liberalism and of State Socialism; and though he was to some extent overshadowed by Bebel's greater oratorical power, he was the chief support of the orthodox Marxian tradition. Liebknecht was the author of numerous pamphlets and books, of which the most important were: *Robert Blum und seine Zeit* (Nuremberg, 1892); *Geschichte der Französischen Revolution* (Dresden, 1890); *Die Emser Depesche* (Nuremberg, 1899) and *Robert Owen* (Nuremberg, 1892). He died at Charlottenburg on the 6th of August 1900.

See Kurt Eisner, *Wilhelm Liebknecht, sein Leben und Wirken* (Berlin, 1900).

LIECHTENSTEIN, the smallest independent state in Europe, save San Marino and Monaco. It lies some way S. of the Lake of Constance, and extends along the right bank of the Rhine, opposite Swiss territory, between Sargans and Sennwald, while on the E. it also comprises the upper portion of the Samina glen that joins the Ill valley at Frastanz, above Feldkirch. It is about 12 m. in length, and covers an area of 61·4 or 68·8 sq. m. (according to different estimates). Its loftiest point rises at the S.E. angle of the state, in the Rhätikon range, and is named to Naafkopf or the Rothe Wand (8445 ft.); on its summit the Swiss, Vorarlberg, and Liechtenstein frontiers join. In 1901 the population was 9477 (of whom 4890 were women and 4587 men). The capital is Vaduz (1523 ft.), with about 1100 inhabitants, and 2 m. S. of the Schaan railway station, which is 2 m. from Buchs (Switz.). Even in the 17th century the Romonsch language was not extinguished in the state, and many Romonsch place-names still linger, *e.g.* Vaduz, Samina, Gavadura, &c. Now the population is German-speaking and Romanist. The constitution of 1862 was amended in 1878, 1895 and 1901. All males of 24 years of age are primary electors, while the diet consists of 12 members, holding their seats for 4 years and elected indirectly, together with 3 members nominated by the prince. The prince has a lieutenant resident at Vaduz, whence there is an appeal to the prince's court at Vienna, with a final appeal (since 1884) to the supreme district court at Innsbruck. Compulsory military service was abolished in 1868, the army having till then been 91 strong. The principality forms ecclesiastically part of the diocese of Coire, while as regards customs duties it is joined with the Vorarlberg, and as regards postal and coinage arrangements with Austria, which (according to the agreement of 1852, renewed in 1876, by which the principality entered the Austrian customs union) must pay it at least 40,000 crowns annually. In 1904 the revenues of the principality amounted to 888,931 crowns, and its expenditure to 802,163 crowns. There is no public debt.

The county of Vaduz and the lordship of Schellenberg passed through many hands before they were bought in 1613 by the count of Hohenems (to the N. of Feldkirch). In consequence of financial embarrassments, that family had to sell both (the lordship in 1699, the county in 1713) to the Liechtenstein family, which had since the 12th century owned two castles of that name (both now ruined), one in Styria and the other a little S.W. of Vienna. In 1719 these new acquisitions were raised by the emperor into a principality under the name of Liechtenstein, which formed part successively of the Holy Roman Empire (till 1806) and of the German Confederation (1815–1866), having been sovereign 1806–1815 as well as since 1866.

See J. Falke's *Geschichte d. fürstlichen Hauses Liechtenstein* (3 vols., Vienna, 1868–1883); J. C. Heer, *Vorarlberg und Liechtenstein* (Feldkirch, 1906); P. Kaiser, *Geschichte d. Fürstenthums Liechtenstein* (Coire, 1847); F. Umlauft, *Das Fürstenthum Liechtenstein* (Vienna, 1891); E. Walder, *Aus den Bergen* (Zürich, 1896); A. Waltenberger, *Algäu, Vorarlberg, und Westtirol* (Rtes. 25 and 26) (10th ed., Innsbruck, 1906). (W. A. B. C.)

LIÉGE, one of the nine provinces of Belgium, touching on the east the Dutch province of Limburg and the German district of Rhenish Prussia. To a certain extent it may be assumed to represent the old prince-bishopric. Besides the city of Liége it contains the towns of Verviers, Dolhain, Seraing, Huy, &c. The Meuse flows through the centre of the province, and its valley from Huy down to Herstal is one of the most productive mineral districts in Belgium. Much has been done of late years to develop the agricultural resources of the Condroz district south of the Meuse. The area of the province is 723,470 acres, or 1130 sq. m. The population in 1904 was 863,254, showing an average of 763 per sq. m.

LIÉGE (Walloon, *Lige*, Flemish, *Luik*, Ger. *Lüttich*), the capital of the Belgian province that bears its name. It is finely situated on the Meuse, and was long the seat of a prince-bishopric. It is the centre of the Walloon country, and Scott commits a curious mistake in *Quentin Durward* in making its people talk Flemish. The Liége Walloon is the nearest existing approach to the old Romance language. The importance of the city to-day arises from its being the chief manufacturing centre in Belgium, and owing to its large output of arms it has been called the Birmingham of the Netherlands. The productive coal-mines of the Meuse valley, extending from its western suburb of Seraing to its northern faubourg of Herstal, constitute its chief wealth. At Seraing is established the famous manufacturing firm of Cockerill, whose offices are in the old summer palace of the prince-bishops.

The great cathedral of St Lambert was destroyed and sacked by the French in 1794, and in 1802 the church of St Paul, dating from the 10th century but rebuilt in the 13th, was declared the cathedral. The law courts are installed in the old palace of the prince-bishops, a building which was constructed by Bishop Eyerard de la Marck between 1508 and 1540. The new boulevards are well laid out, especially those flanking the river, and the views of the city and surrounding country are very fine. The university, which has separate schools for mines and arts and manufactures, is one of the largest in the country, and enjoys a high reputation for teaching in its special line.

Liége is a fortified position of far greater strength than is generally appreciated. In the wars of the 18th century Liége played but a small part. It was then defended only by the citadel and a detached fort on the right side of the Meuse, but at a short distance from the river, called the Chartreuse. Marlborough captured these forts in 1703 in preparation for his advance in the following year into Germany which resulted in the victory of Blenheim. The citadel and the Chartreuse were still the only defences of Liége in 1888 when, after long discussions, the Belgian authorities decided on adequately fortifying the two important passages of the Meuse at Liége and Namur. A similar plan was adopted at each place, viz. the construction of a number of detached forts along a perimeter drawn at a distance varying from 4 to 6 m. of the town, so as to shelter it so far as possible from bombardment. At Liége twelve forts were constructed, six on the right bank and six on the left. Those on the right bank beginning at the north and following an eastern curve are Barchon, Evegnée, Fléron, Chaudfontaine, Embourg and Boncelles. The average distance between each fort is 4 m., but Fléron and Chaudfontaine are separated by little over 1 m. in a direct line as they defend the main line of railway from Germany. The six forts on the left bank also commencing at the north, but following a western curve, are Pontisse, Liers, Lantin, Loncin, Hollogne and Flemalle. These forts were constructed under the personal direction of General Brialmont, and are on exactly the same principle as those he designed for the formidable defences of Bucarest. All the forts are constructed in concrete with casemates, and the heavy guns are raised and lowered automatically. Communication is maintained between the different forts by military roads in all cases, and by steam tramways in some. It is estimated that 25,000 troops would be required for the defence of the twelve forts, but the number is inadequate for the defence of so important and extensive a position. The population of Liége, which in 1875 was only 117,600, had risen by 1900 to 157,760, and in 1905 it was 168,532.

History.—Liége first appears in history about the year 558, at which date St Monulph, bishop of Tongres, built a chapel near the confluence of the Meuse and the Legia. A century later the town, which had grown up round this chapel, became the favourite abode of St Lambert, bishop of Tongres, and here he was assassinated. His successor St Hubert raised a splendid church over the tomb of the martyred bishop about 720 and made Liége his residence. It was not, however, until about 930 that the title bishop of Tongres was abandoned for that of bishop of Liége. The episcopate of Notger (972–1008) was marked by large territorial acquisitions, and the see obtained recognition as an independent principality of the Empire. The popular saying was "Liége owes Notger to God, and everything else to Notger." By the munificent encouragement of successive bishops Liége became famous during the 11th century as a centre of learning, but the history of the town for centuries records little else than the continuous struggles of the citizens to free themselves from the exactions of their episcopal sovereigns; the aid of the emperor and of the dukes of Brabant being frequently called in to repress the popular risings. In 1316 the citizens compelled Bishop Adolph de la Marck to sign a charter, which made large concessions to the popular demands. It was, however, a triumph of short duration, and the troubles continued, the insurgent subjects now and again obtaining a fleeting success, only to be crushed by the armies of the powerful relatives of the bishops, the houses of Brabant or of Burgundy. During the episcopate of Louis de Bourbon (1456–1484) the Liégeois, having expelled the bishop, had the temerity to declare war on Philip V., duke of Burgundy. Philip's son, Charles the Bold, utterly defeated them in 1467, and razed the walls of the town to the ground. In the following year the citizens again revolted, and Charles being once more successful delivered up the city to sack and pillage for three days, and deprived the remnant of the citizens of all their privileges. This incident is narrated in *Quentin Durward*. The long episcopate of Eberhard de la Marck (1505–1538) was a time of good administration and of quiet, during which the town regained something of its former prosperity. The outbreak of civil war between two factions, named the *Cluroux* and the *Grignoux*, marked the opening of the 17th century. Bishop Maximilian Henry of Bavaria (1650–1688) at last put an end to the internal strife and imposed a regulation (*règlement*) which abolished all the free institutions of the citizens and the power of the gilds. Between this date and the outbreak of the French Revolution the chief efforts of the prince-bishops were directed to maintaining neutrality in the various wars, and preserving their territory from being ravaged by invading armies. They were only in part successful. Liége was taken by Marlborough in 1702, and the fortress was garrisoned by the Dutch until 1718. The French revolutionary armies overran the principality in 1792, and from 1794 to the fall of Napoleon it was annexed to France, and was known as the department of the Ourthe. The Congress of Vienna in 1815 decreed that Liége with the other provinces of the southern Netherlands should form part of the new kingdom of the Netherlands under the rule of William I., of the house of Orange. The town of Liége took an active part in the Belgian revolt of 1830, and since that date the ancient principality has been incorporated in the kingdom of Belgium.

The see, which at first bore the name of the bishopric of Tongres, was under the metropolitan jurisdiction of the archbishops of Cologne. The principality comprised besides the town of Liége and its district, the counties of Looz and Hoorn, the marquessate of Franchimont, and the duchy of Bouillon.

AUTHORITIES.—Théodore Bouille, *Histoire de la ville et du pays de Liége* (3 vols., Liége, 1725–1732); A. Borgnet, *Histoire de la révolution liégeoise* (2 vols., Liége, 1865); Baron B. C. de Gerlache, *Histoire de Liége* (Brussels, 1843); J. Daris, *Histoire du diocèse et de la principauté de Liége* (10 vols., Liége, 1868–1885); Ferdinand Henaux, *Histoire du pays de Liége* (2 vols., Liége, 1857); L. Polain, *Histoire de l'ancien pays de Liége* (2 vols., Liége, 1844–1847). For full bibliography see Ulysse Chevalier, *Répertoire des sources historiques. Topo-bibliographie*, s.v. (Montbéliard, 1900).

LIEGE, an adjective implying the mutual relationship of a feudal superior and his vassal; the word is used as a substantive of the feudal superior, more usually in this sense, however, in the form "liege lord," and also of the vassals, his "lieges." Hence the word is often used of the loyal subjects of a sovereign, with no reference to feudal ties. It appears that *ligeitas* or *ligentia*, the medieval Latin term for this relationship, was restricted to a particular form of homage. According to N. Broussel (*Nouvel examen de l'usage général des fiefs en France*, 1727) the homage of a "liege" was a stronger form of the ordinary homage, the especial distinction being that while the ordinary vassal only undertook forty days' military service, the liege promised to serve as long as the war might last, in which his superior was engaged (cf. Ducange, *Glossarium*, s.v. "*Ligius*").

The etymology of the word has been much discussed. It comes into English through the O. Fr. *lige* or *liege*, Med. Lat. *ligius*. This was early connected with the Lat. *ligatus*, bound, *ligare*, to bind, from the sense of the obligation of the vassal to his lord, but this has been generally abandoned. Broussel takes the Med. Lat. *liga*, *i.e.*, *foedus*, *confederatio*, the English "league," as the origin. Ducange connects it with the word *lities*, which appears in a gloss of the Salic law, and is defined as a *scriptitius*, *servus glebae*. The more usually accepted derivation is now from the Old High Ger. *ledic*, or *ledig*, meaning "free" (Mod. Ger. *ledig* means unoccupied, *vacuus*). This is confirmed by the occurrence in a charter of Otto of Benthem, 1253, of a word "ledigh-man" (quoted in Ducange, *Glossarium*, s.v.), *Proinde affecti sumus ligius homo, quod Teutonice dictur Ledighman*. Skeat, in explaining the application of "free" to such a relationship as that subsisting between a feudal superior and his vassal, says "'a *liege* lord' seems to have been the lord of a free band; and his *lieges*, though serving under him, were privileged men, free from all other obligations; their name being due to their *freedom*, not to their service" (*Etym. Dict.*, ed. 1898). A. Luchaire (*Manuel des institutions françaises*, 1892, p. 189, n. 1) considers it difficult to call a man "free" who is under a strict obligation to another; further that the "liege" was not free from all obligation to a third party, for the charters prove without doubt that the "liege men" owed duty to more than one lord.

LIEGNITZ, a town in Germany, in the Prussian province of Silesia, picturesquely situated on the Katzbach, just above its junction with the Schwarzwasser, and 40 m. W.N.W. of Breslau, on the main line of railway to Berlin via Sommerfeld. Pop. (1885) 43,347, (1905) 59,710. It consists of an old town, surrounded by pleasant, shady promenades, and several well-built suburbs. The most prominent building is the palace, formerly the residence of the dukes of Liegnitz, rebuilt after a fire in 1835 and now used as the administrative offices of the district. The Ritter Akademie, founded by the emperor Joseph I. in 1708 for the education of the young Silesian nobles, was reconstructed as a gymnasium in 1810. The Roman Catholic church of St John, with two fine towers, contains the burial vault of the dukes. The principal Lutheran church, that of SS. Peter and Paul (restored in 1892–1894), dates from the 14th century. The manufactures are considerable, the chief articles made being cloth, wool, leather, tobacco, pianos and machinery. Its trade in grain and its cattle-markets are likewise important. The large market gardens in the suburbs grow vegetables of considerable annual value.

Liegnitz is first mentioned in an historical document in the year 1004. In 1163 it became the seat of the dukes of Liegnitz, who greatly improved and enlarged it. The dukes were members of the illustrious Piast family, which gave many kings to Poland. During the Thirty Years' War Liegnitz was taken by the Swedes, but was soon recaptured by the Imperialists. The Saxon army also defeated the imperial troops near Liegnitz in 1634. On the death of the last duke of Liegnitz in 1675, the duchy came into the possession of the Empire, which retained it until the Prussian conquest of Silesia in 1742. On the 15th of August 1760 Frederick the Great gained a decisive victory near Liegnitz over the Austrians, and in August 1813 Blücher defeated the French in the neighbourhood at the battle of the Katzbach. During the 19th century Liegnitz rapidly increased in population and prosperity. In 1906 the German autumn manœuvres were held over the terrain formerly the scene of the great battles already mentioned.

See Schuchard, *Die Stadt Liegnitz* (Berlin, 1868); Sammter and Kraffert, *Chronik von Liegnitz* (Liegnitz, 1861–1873); Jander, *Liegnitz in seinem Entwickelungsgange* (Liegnitz, 1905); and *Führer für Liegnitz und seine Umgebung* (Liegnitz, 1897); and the *Urkundenbuch der Stadt Liegnitz bis 1455*, edited by Schirrmacher (Liegnitz, 1866).

LIEN, in law. The word *lien* is literally the French for a band, cord or chain, and keeping in mind that meaning we see in what respect it differs from a pledge on the one hand and a mortgage on the other. It is the bond which attaches a creditor's right to a debtor's property, but which gives no right *ad rem*, *i.e.* to property in the thing; if the property is in the possession of the creditor he may retain it, but in the absence of statute he cannot sell to recover what is due to him without the ordinary legal process against the debtor; and if it is not in possession, the law would indeed assist him to seize the property, and will hold it for him, and enable him to sell it in due course and pay himself out of the proceeds, but does not give him the property itself. It is difficult to say at what period the term lien made its appearance in English law; it probably came from more than one source. In fact, it was used as a convenient phrase for any right against the owner of property in regard to the property not specially defined by other better recognized species of title.

The possessory lien of a tradesman for work done on the thing, of a carrier for his hire, and of an innkeeper for his bill, would seem to be an inherent right which must have been in existence from the dawn, or before the dawn, of civilization. Probably the man who made or repaired weapons in the Stone Age was careful not to deliver them until he received what was stipulated for, but it is also probable that the term itself resulted from the infusion of the civil law of Rome into the common law of England which the Norman Conquest brought about, and that it represents the "tacit pledge" of the civil law. As might be expected, so far as the possessory lien is concerned the common law and civil law, and probably the laws of all countries, whether civilized or not, coincide; but there are many differences with respect to other species of lien. For instance, by the common law—in this respect a legacy of the feudal system—a landlord has a lien over his tenant's furniture and effects for rent due, which can be enforced without the assistance of the law simply by the landlord taking possession, personally or by his agent, and selling enough to satisfy his claim; whereas the maritime lien is more distinctly the product of the civil law, and is only found and used in admiralty proceedings, the high court of admiralty having been founded upon the civil law, and still (except so far as restrained by the common-law courts prior to the amalgamation and co-ordination of the various courts by the Judicature Acts, and as affected by statute law) acting upon it. The peculiar effects of this maritime lien are discussed below. There is also a class of liens, usually called equitable liens (*e.g.* that of an unpaid vendor of real property over the property sold), which are akin to the nature of the civil law rather than of the common law. The word lien does not frequently occur in statute law, but it is found in the extension of the common-law "carriers' or shipowners' lien" in the Merchant Shipping Act 1894; in the definition, extension and limitation of the vendor's lien; in the Factors Act 1877, and the Sale of Goods Act 1893; in granting a maritime lien to a shipmaster for his wages and disbursements, and in regulating that of the seamen in the Merchant Shipping Act 1894; and in the equity jurisdiction of the county courts 1888.

Common-Law Liens.—These may be either particular, *i.e.* a right over one or more specified articles for a particular debt, or general, *i.e.* for all debts owing to the creditor by the debtor.

The requisites for a particular lien are, firstly, that the creditor should be in possession of the article; secondly, that the debt should be incurred with reference to the article; and thirdly, that the amount of the debt should be certain. It may be created by express contract, by implied contract (such as the usage of a particular trade or business), or as a consequence of the legal relation existing between the parties. As an example of the first, a shipowner at common law has a lien on the cargo for the freight; but though the shipper agrees to pay dead freight in addition, *i.e.* to pay freight on any space in the ship which he fails to occupy with his cargo, the shipowner has no lien on the cargo for such dead freight except by express agreement. The most usual form of the second is that which is termed a possessory lien—the right a ship-repairer has to retain a ship in his yard till he is paid for the repairs executed upon her,[1] and the right a cobbler has to retain a pair of shoes till he is paid for the repairs done to them. But this lien is only in respect of the work done on, and consequent benefit received by, the subject of the lien. Hence an agistor of cattle has no lien at common law upon them for the value of the pasturage consumed, though he may have one by agreement; nor a conveyancer upon deeds which he has not drawn, but which are in his possession for reference. The most common example of the third is that of a carrier, who is bound by law to carry for all persons, and has, therefore, a lien for the price of the carriage on the goods carried. It has been held that even if the goods are stolen, and entrusted to the carrier by the thief, the carrier can hold them for the price of the carriage against the rightful owner. Of the same nature is the common-law lien of an innkeeper on the baggage of his customer for the amount of his account, he being under a legal obligation to entertain travellers generally. Another instance of the same class is where a person has obtained possession of certain things over which he claims to hold a lien in the exercise of a legal right. For example, when a lord of a manor has seized cattle as estrays, he has a lien upon them for the expense of their keep as against the real owner; but the holder's claim must be specific, otherwise a general tender of compensation releases the lien.

A general lien is a right of a creditor to retain property, not merely for charges relating to it specifically, but for debts due on a general account. This not being a common-law right, is viewed by the English courts with the greatest jealousy, and to be enforced must be strictly proved. This can be done by proof either of an express or implied contract or of a general usage of trade. The first of these is established by the ordinary methods or by previous dealings between the parties on such terms; the second is recognized in certain businesses; it would probably be exceedingly difficult, if not impossible, to extend it at the present time to any other trades. When, however, a lien by general usage has once been judicially established, it becomes part of the Law Merchant, and the courts are bound to recognize and enforce it. The best known and most important instance is the right of a solicitor to retain papers in his hands belonging to his client until his account is settled. The solicitor's lien, though probably more commonly enforced than any other, is of no great antiquity in English law, the earliest reported case of it being in the reign of James II.; but it is now of a twofold nature. In the first place there is the retaining lien. This is similar in kind to other possessory liens, but of a general nature attaching to all papers of the client, and even to his money, up to the amount of the solicitor's bill, in the hands of the solicitor in the ordinary course of business. There are certain exceptions which seem to have crept in for the same reason as the solicitor's lien itself, *i.e.* general convenience of litigation; such exceptions are the will of the client after his decease, and proceedings in bankruptcy. In this latter case the actual possessory lien is given up, the solicitor's interests and priorities being protected by the courts, and it may be said that the giving up the papers is really only a means of enforcing the lien they give in the bankruptcy proceedings. In the second place there is what is called a charging lien—more correctly classed under the head of equitable lien, since it does not require possession, but is a lien the solicitor holds over property recovered or preserved for his client. He had the lien on an order by the court upon a fund in court by the common law, but as to property generally it was only given by 23 & 24 Vict. c. 127, § 28; and it has been held to attach to property recovered in a probate action (*ex parte Tweed*, C.A. 1899, 2 Q.B. 167). A banker's lien is the right of a banker to retain securities belonging to his customer for money due on a general balance. Other general liens, judicially established, are those of wharfingers, brokers and factors (which are in their nature akin to those of solicitors and bankers), and of calico printers, packers of goods, fullers (at all events at Exeter), dyers and millers; but in all these special trades it is probable that the true reason is that the account due was for one continuous transaction. The calico would come to be printed, the goods to be packed, the cloth to be bleached, the silk to be dyed, and the corn to be ground, in separate parcels, and at different times, but all as one undertaking; and they are therefore, though spoken of as instances of general lien, only adaptations by the courts of the doctrine of particular lien to special peculiarities of business. In none of these cases would the lien exist, in the absence of special agreement, for other matters of account, such as money lent or goods sold.

Equitable Liens.—"Where equity has jurisdiction to enforce rights and obligations growing out of an executory contract," *e.g.* in a suit for specific performance, "this equitable theory of remedies cannot be carried out unless the notion is admitted that the contract creates some right or interest in or over specific property, which the decree of the court can lay hold of, and by means of which the equitable relief can be made efficient. The doctrine of equitable liens supplies this necessary element; and it was introduced for the sole purpose of furnishing a ground for these specific remedies which equity confers, operating upon particular identified property instead of the general pecuniary recoveries granted by courts of common law. It follows, therefore, that in a large class of executory contracts express and implied, which the common law regards as creating no property, right nor interest analogous to property, but only a mere personal right to obligation, equity recognizes in addition to the personal obligation a particular right over the thing with which the contract deals, which it calls a *lien*, and which though not property is analogous to property, and by means of which the plaintiff is enabled to follow the identical thing and to enforce the defendant's obligation by a remedy which operates directly on the thing.

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[1] This right, however, is not absolute, but depends on the custom of the port (*Raitt* v. *Mitchell*, 1815, 4 Camp. 146).

The theory of equitable liens has its ultimate foundation, therefore, in contracts express or implied which either deal or in some manner relate to specific property, such as a tract of land, particular chattels or securities, a certain fund and the like. It is necessary to divest oneself of the purely legal notion concerning the effects of such contracts, and to recognize the fact that equity regards them as creating a charge upon, or hypothecation of, the specific thing, by means of which the personal obligation arising from the agreement may be more effectively enforced than by a mere pecuniary recovery at law" (Pomeroy, 2 Eq. Jur. 232).

This description from an American text-book seems to give at once the fullest and most concise definition and description of an equitable lien. It differs essentially from a common-law lien, inasmuch as in the latter possession or occupation is as a rule necessary, whereas in the equitable lien the person claiming the lien is seldom in possession or occupation of the property, its object being to obtain the possession wholly or partially. A special instance of such a lien is that claimed by a publisher over the copyright of a book which he has agreed to publish on terms which are not complied with—for example, the author attempting to get the book published elsewhere. It cannot perhaps be said that this has been absolutely decided to exist, but a strong opinion of the English court of exchequer towards the close of the 18th century was expressed in its favour (*Brook* v. *Wentworth*, 3 Anstruther 881). Other instances are the charging lien of a solicitor, and the lien of a person on improvements effected by him on the property of another who "lies by" and allows the work to be done before claiming the property. So also of a trustee for expenses lawfully incurred about the trust property. The power of a limited liability company to create a lien upon its own shares was in 1901 established (*Allen* v. *Gold Reefs, &c.*, C.A. 1900, 1 Ch. 656).

Maritime Liens.—Maritime lien differs from all the others yet considered, in its more elastic nature. Where a maritime lien has once attached to property—and it may and generally does attach without possession—it will continue to attach, unless lost by laches, so long as the thing to which it attaches exists, notwithstanding changes in the possession of and property in the thing, and notwithstanding that the new possessor or owner may be entirely ignorant of its existence; and even if enforced it leaves the owner's personal liability for any balance unrealized intact (the "*Gemma*," 1899, P. 285). So far as England is concerned, it must be borne in mind that the courts of admiralty were conducted in accordance with the principles of civil law, and in that law both the pledge with possession and the hypothecation without possession were well recognized. The extreme convenience of such a right as the latter with regard to such essentially movable chattels as ships is apparent. Strictly speaking, a maritime lien is confined to cases arising in those matters over which the courts of admiralty had original jurisdiction, viz. collisions at sea, seamen's wages, salvage and bottomry, in all of which cases the appropriate remedy is a proceeding *in rem* in the admiralty court. In the first of these—collisions at sea—if there were no maritime lien there would frequently be no remedy at all. When two ships have collided at sea it may well be that the innocent ship knows neither the name nor the nationality of the wrongdoer, and the vessel may escape with slight damage and not have to make a port of refuge in the neighbourhood. Months afterwards it is ascertained that she was a foreign ship, and in the interval she has changed owners. Then, were it not a fact that a maritime lien invisible to the wrongdoer nevertheless attaches itself to his ship at the moment of collision, and continues to attach, the unfortunate owner of the innocent ship would have no remedy, except the doubtful one of pursuing the former owner of the wrong-doing vessel in his own country in a personal action where such proceedings are allowed—which is by no means the case in all foreign countries. The same reasons apply, though not possibly with quite the same force, to the other classes of cases mentioned.

Between 1840 and 1873 the jurisdiction of the admiralty court was largely extended. At the latter date it was merged in the probate, divorce and admiralty division of the High Court of Justice. Since the merger questions have arisen as to how far the enlargement of jurisdiction has extended the principle of maritime lien. An interesting article on this subject by J. Mansfield, barrister-at-law, will be found in the *Law Quarterly Review*, vol. iv., October 1888. It must be sufficient to state here that where legislation has extended the already existing jurisdiction to which a maritime lien pertained, the maritime lien is extended to the subject matter, but that where a new jurisdiction is given, or where a jurisdiction formerly existing without a maritime lien is extended, no maritime lien is given, though even then the extended jurisdiction can be enforced by proceedings *in rem*. Of the first class of extended jurisdictions are collisions, salvage and seamen's wages. Prior to 1840 the court of admiralty only had jurisdiction over these when occurring or earned on the high seas. The jurisdiction, and with it the maritime lien, is extended to places within the body of a county in collision or salvage; and as to seamen's wages, whereas they were dependent on the earning of freight, they are now free from any such limitation; and also, whereas the remedy *in rem* was limited to seamen's wages not earned under a special contract, it is now extended to all seamen's wages, and also to a master's wages and disbursements, and the maritime lien covers all these. The new jurisdiction given over claims for damage to cargo carried into any port in England or Wales, and on appeal from the county courts over all claims for damage to cargo under £300, though it may be prosecuted by proceedings *in rem*, *i.e.* by arrest of the ship, yet confers no maritime lien; and so also in the case of claims by material men (builders and fitters-out of ships) and for necessaries. Even though in the latter case the admiralty court had jurisdiction previously to 1840 where the necessaries were supplied on the high seas, yet as it could not be shown that such jurisdiction had ever been held to confer a maritime lien, no such lien is given. Even now there is much doubt as to whether towage confers a maritime lien or not, the services rendered being pursuant to contract, and frequently to a contract made verbally or in writing on the high seas, and being rendered also to a great extent on the high seas. In these cases and to that extent the high court of admiralty would have had original jurisdiction. But prior to 1840 towage, as now rendered by steam tugs expressly employed for the service, was practically unknown, and therefore there was no established catena of precedent to show the exercise of a maritime lien. It may be argued on the one hand that towage is only a modified form of salvage, and therefore entitled to a maritime lien, and on the other that it is only a form of necessary power supplied like a new sail or mast to a ship to enable her to complete her voyage expeditiously, and therefore of the nature of necessaries, and as such not entitled to a maritime lien. The matter is not of academical interest only, for though in the case of an inward-bound ship the tug owner can make use of his statutory right of proceeding *in rem*, and so obtain much of the benefit of a maritime lien, yet in the case of an outward-bound ship, if she once gets away without payment, and the agent or other authorized person refuses or is unable to pay, the tug owner's claim may, on the return of the ship to a British port, be met by an allegation of a change of ownership, which defeats his right of proceeding at all if he has no maritime lien; whereas if he has a maritime lien he can still proceed against the ship and recover his claim, if he has not been guilty of laches.

A convenient division of the special liens other than possessory on ships may be made by classifying them as maritime, statutory-maritime or quasi-maritime, and statutory. The first attach only in the case of damage done by collision between ships on the high seas, salvage on the high seas, bottomry and seamen's wages so far as freight has been earned; the second attach in cases of damage by collision within the body of a county, salvage within the body of a county, life salvage everywhere, seamen's wages even if no freight has been earned, master's wages and disbursements. These two classes continue to attach notwithstanding a change of ownership without notice of the lien, if there have been no laches in enforcing it (the "*Bold Buccleuch*," 1852, 7 Moo. P.C. 267; the "*Kong Magnus*," 1891, P. 223). The third class, which only give a right to proceed *in rem, i.e.* against the ship itself, attach, so long as there is no *bona fide* change of ownership, without citing the owners, in all cases of claims for damage to ship and of claims for damage to cargo where no owner is domiciled in England or Wales. Irrespective of this limitation, they attach in all cases not only of damage to cargo, but also of breaches of contract to carry where the damage does not exceed £300, when the suit must be commenced in a county court having admiralty jurisdiction; and in cases of claims for necessaries supplied elsewhere than in the ship's home port, for wages earned even under a special contract by masters and mariners, and of claims for towage. In all three classes the lien also exists over cargo where the suit from its nature extends to it, as in salvage and in some cases of bottomry or respondentia, and in cases where proceedings are taken against cargo by the shipowner for a breach of contract (cargo *ex* "*Argos*" and the "*Hewsons*," 1873, L.R. 5 P.C. 134; the "*Alina*," 1880, 5 Ex. D. 227).

Elsewhere than in England, and those countries such as the United States which have adopted her jurisprudence in maritime matters generally, the doctrine of maritime lien, or that which is substituted for it, is very differently treated. Speaking generally, those states which have adopted the Napoleonic codes or modifications of them—France, Italy, Spain, Holland, Portugal, Belgium, Greece, Turkey, and to some extent Russia—have instead of a maritime lien the civil-law principle of privileged debts. Amongst these in all cases are found claims for salvage, wages, bottomry under certain restrictions, and necessaries. Each of these has a privileged claim against the ship, and in some cases against freight and cargo as well, but it is a matter of very great importance that, except in Belgium, a claim for collision damage (which as we have seen confers a maritime lien, and one of a very high order, in Great Britain) confers no privilege against the wrong-doing ship, whilst in all these countries an owner can get rid of his personal liability by abandoning the ship and freight to his creditor, and so, if the ship is sunk, escape all liability whilst retaining any insurance there may be. This, indeed, was at one time the law of Great Britain; the measure of damage was limited by the value of the *res*; and in the United States at the present time a shipowner can get rid of his liability for damage by abandoning the ship and freight. A different rule prevails in Germany and the Scandinavian states. There claims relating to the ship, unless the owner has specially rendered himself liable, confer no personal claim at all against him. The claim is limited *ab initio* to ship and freight, except in the case of seamen's wages, which do confer a personal claim so far as they have been earned on a voyage or passage completed prior to the loss of the ship. In all maritime states, however, except Spain, a provisional arrest of the ship is allowed, and thus between the privilege accorded to the debt and the power to arrest till bail is given or the ship abandoned to creditors, a condition of things analogous to the maritime lien is established; especially as these claims when the proper legal steps have been taken to render them valid—usually by endorsement on the ship's papers on board, or by registration at her port of registry—attach to the ship and follow her into the hands of a purchaser. They are in fact notice to him of the incumbrance.

Duration of Lien.—So long as the party claiming the lien at common law retains the property, the lien continues, notwithstanding the debt in respect of which it is claimed becoming barred by the Statute of Limitations (*Higgins* v. *Scott*, 1831, 2 B. & Ald. 413). But if he takes proceedings at law to recover the debt, and on a sale of the goods to satisfy the judgment purchases them himself, he so alters the nature of the possession that he loses his lien (*Jacobs* v. *Latour*, 5 Bing. 130). An equitable lien probably in all cases continues, provided the purchaser of the subject matter has notice of the lien at the time of his purchase. A maritime lien is in no respect subject to the Statute of Limitations, and continues in force notwithstanding a change in the ownership of the property without notice, and is only terminated when it has once attached, by laches on the part of the person claiming it (the "*Kong Magnus*," 1891, P. 223). There is an exception in the case of seamen's wages, where by 4 Anne c. 16 (*Stat. Rev.* 4 & 5 Anne c. 3) all suits for seamen's wages in the Admiralty must be brought within six years.

Ranking of Maritime Liens.—There may be several claimants holding maritime and other liens on the same vessel. For example, a foreign vessel comes into collision by her own fault and is damaged and her cargo also; she is assisted into port by salvors and ultimately under a towage agreement, and put into the hands of a shipwright who does necessary repairs. The innocent party to the collision has a maritime lien for his damage, and the seamen for their wages; the cargo owner has a suit *in rem* or a statutory lien for damage, and the shipwright a possessory lien for the value of his repairs, while the tugs certainly have a right *in rem* and possibly a maritime lien also in the nature of salvage. The value of the property may be insufficient to pay all claims, and it becomes a matter of great consequence to settle whether any, and if so which, have priority over the others, or whether all rank alike and have to divide the proceeds of the property *pro ratâ* amongst them. The following general rules apply: liens for benefits conferred rank against the fund in the inverse, and those for the reparation of damage sustained in the direct order of their attaching to the *res*; as between the two classes those last mentioned rank before those first mentioned of earlier date; as between liens of the same class and the same date, the first claimant has priority over others who have not taken action. The courts of admiralty, however, allow equitable considerations, and enter into the question of marshalling assets. For example, if one claimant has a lien on two funds, or an effective right of action in addition to his lien, and another claimant has only a lien upon one fund, the first claimant will be obliged to exhaust his second remedy before coming into competition with the second. As regards possessory liens, the shipwright takes the ship as she stands, *i.e.* with her incumbrances, and it appears that the lien for seaman's wages takes precedence of a solicitor's lien for costs, under a charging order made in pursuance of the Solicitors Act 1860, § 28.

Subject to equitable considerations, the true principle appears to be that services rendered under an actual or implied contract, which confer a maritime lien, make the holder of the lien in some sort a proprietor of the vessel, and therefore liable for damage done by her—hence the priority of the damage lien—but, directly it has attached, benefits conferred on the property by enabling it to reach port in safety benefit the holder of the damage lien in common with all other prior holders of maritime liens. It is less easy to see why of two damage liens the earlier should take precedence of the later, except on the principle that the *res* which came into collision the second time is depreciated in value by the amount of the existing lien upon her for the first collision, and where there was more than one damage lien, and also liens for benefits conferred prior to the first collision between the two collisions and subsequent to the second, the court would have to make a special order to meet the peculiar circumstances. The claim of a mortgagee naturally is deferred to all maritime liens, whether they are for benefits conferred on the property in which he is interested or for damage done by it, and also for the same reason to the possessory lien of the shipwright, but both the possessory lien of the shipwright and the claim of the mortgagee take precedence over a claim for necessaries, which only confers a statutory lien or a right to proceed *in rem* in certain cases. In other maritime states possessing codes of commercial law, the privileged debts are all set out in order of priority in these codes, though, as has been already pointed out, the lien for damage by collision—the most important in English law—has no counterpart in most of the foreign codes.

Stoppage in Transitu.—This is a lien held by an unpaid vendor in certain cases over goods sold after they have passed out of his actual possession. It has been much discussed whether it is an equitable or common-law right or lien. The fact appears to be that it has always been a part of the Law Merchant, which, properly speaking, is itself a part of the common law of England unless inconsistent with it. This particular right was, in the first instance, held by a court of equity to be equitable and not contrary to English law, and by that decision this particular part of the Law Merchant was approved and became part of the common law of England (see per Lord Abinger in *Gibson* v. *Carruthers*, 8 M. & W., p. 336 et seq.). It may be described as a lien by the Law Merchant, decided by equity to be part of the common law, but in its nature partaking rather of the character of an equitable lien than one at common law. "It is a right which arises solely upon the insolvency of the buyer, and is based on the plain reason of justice and equity that one man's goods shall not be applied to the payment of another man's debts. If, therefore, after the vendor has delivered the goods out of his own possession and put them in the hands of a carrier for delivery to the buyer, he discovers that the buyer is insolvent, he may re-take the goods if he can before they reach the buyer's possession, and thus avoid having his property applied to paying debts due by the buyer to other people" (*Benjamin on Sales*, 2nd ed., 289). This right, though only recognized by English law in 1690, is highly favoured by the courts on account of its intrinsic justice, and extends to quasi-vendors, or persons in the same position, such as consignors who have bought on behalf of a principal and forwarded the goods. It is, however, defeated by a lawful transfer of the document of title to the goods by the vendor to a third person, who takes it *bonâ fide* and for valuable consideration (Factors Act 1889; Sale of Goods Act 1893).

Assignment or Transfer of Lien.—A lien being a personal right acquired in respect of personal services, it cannot, as a rule, be assigned or transferred; but here again there are exceptions. The personal representative of the holder of a possessory lien on his decease would probably in all cases be held entitled to it; and it has been held that the lien over a client's papers remains with the firm of solicitors notwithstanding changes in the constitution of the firm (*Gregory* v. *Cresswell*, 14 L.J. Ch. 300). So also where a solicitor, having a lien on documents for his costs, assigned the debt to his bankers with the benefit of the lien, it was held that the bankers might enforce such lien in equity. But though a tradesman has a lien on the property of his customer for his charges for work done upon it, where the property is delivered to him by a servant acting within the scope of his employment, such lien cannot be transferred to the servant, even if he has paid the money himself; and the lien does not exist at all if the servant was acting without authority in delivering the goods, except where (as in the case of a common carrier) he is bound to receive the goods, in which case he retains his lien for the carriage against the rightful owner. Where, however, there is a lien on property of any sort not in possession, a person acquiring the property with knowledge of the lien takes it subject to such lien. This applies to equitable liens, and cannot apply to those common-law liens in which possession is necessary. It is, however, true that by statute certain common-law liens can be transferred, *e.g.* under the Merchant Shipping Act a master of a ship having a lien upon cargo for his freight can transfer the possession of the cargo to a wharfinger, and with it the lien (Merchant Shipping Act 1894, § 494). In this case, however, though the matter is simplified by the statute, if the wharfinger was constituted the agent or servant of the shipmaster, his possession would be the possession of the shipmaster, and there would be no real transfer of the lien; therefore the common-law doctrine is not altered, only greater facilities for the furtherance of trade are given by the statute, enabling the wharfinger to act in his own name without reference to his principal, who may be at the other side of the world. So also a lien may be retained, notwithstanding that the property passes out of possession, where it has to be deposited in some special place (such as the Custom-House) to comply with the law. Seamen cannot sell or assign or in any way part with their maritime lien for wages (Merchant Shipping Act 1894, § 156), but, nevertheless, with the sanction of the court, a person who pays seamen their wages is entitled to stand in their place and exercise their rights (the *Cornelia Henrietta*, 1866, L.R. 1 Ad. & Ec. 51).

Waiver.—Any parting with the possession of goods is in general a waiver of the lien upon them; for example, when a factor having a lien on the goods of his principal gives them to a carrier to be carried at the expense of his principal, even if undisclosed, he waives his lien, and has no right to stop the goods *in transitu* to recover it; so also where a coach-builder who has a lien on a carriage for repairs allows the owner from time to time to take it out for use without expressly reserving his lien, he has waived it, nor has he a lien for the standage of the carriage except by express agreement, as mere standage does not give a possessory lien. It has even been held that where a portion of goods sold as a whole for a lump sum has been taken away and paid for proportionately, the conversion has taken place and the lien for the residue of the unpaid purchase-money has gone (*Gurr* v. *Cuthbert*, 1843, 12 L.J. Ex. 309). Again, an acceptance of security for a debt is inconsistent with the existence of a lien, as it substitutes the credit of the owner for the material guarantee of the thing itself, and so acts as a waiver of the lien. For the same reason even an agreement to take security is a waiver of the lien, though the security is not, in fact, given (*Alliance Bank* v. *Broon*, 11 L.T. 332).

Sale of Goods under Lien.—At common law the lien only gives a right to retain the goods, and ultimately to sell by legal process, against the owner; but in certain cases a right has been given by statute to sell without the intervention of legal process, such as the right of an innkeeper to sell the goods of his customer for his unpaid account (Innkeepers Act 1878, § 1), the right of a wharfinger to sell goods entrusted to him by a shipowner with a lien upon them for freight, and also for their own charges (Merchant Shipping Act 1894, §§ 497, 498), and of a railway company to sell goods for their charges (Railway Clauses Act 1845, § 97). Property affected by an equitable lien or a maritime lien cannot be sold by the holder of the lien without the interposition of the court to enforce an order, or judgment of the court. In Admiralty cases, where a sale is necessary, no bail having been given and the property being under arrest, the sale is usually made by the marshal in London, but may be elsewhere on the parties concerned showing that a better price is likely to be obtained.

American Law.—In the United States, speaking very generally, the law relating to liens is that of England, but there are some considerable differences occasioned by three principal causes. (1) Some of the Southern States, notably Louisiana, have never adopted the common law of England. When that state became one of the United States of North America it had (and still preserves) its own system of law. In this respect the law is practically identical with the Code Napoleon, which, again speaking generally, substitutes privileges for liens, *i.e.* gives certain claims a prior right to others against particular property. These privileges being *strictissimae interpretationis*, cannot be extended by any principle analogous to the English doctrine of equitable liens. (2) Probably in consequence of the United States and the several states composing it having had a more democratic government than Great Britain, in their earlier years at all events, certain liens have been created by statute in several states in the interest of the working classes which have no parallel in Great Britain, *e.g.* in some states workmen employed in building a house or a ship have a lien upon the building or structure itself for their unpaid wages. This statutory lien partakes rather of the nature of an equitable than of a common-law lien, as the property is not in the possession of the workman, and it may be doubted whether the right thus conferred is more beneficial to the workman than the priority his wages have in bankruptcy proceedings in England. Some of the states have also practically extended the maritime lien to matters over which it was never contended for in England. (3) By the constitution of the United States the admiralty and inter-state jurisdiction is vested in the federal as distinguished from the state courts, and these federal courts have not been liable to have their jurisdiction curtailed by prohibition from courts of common law, as the court of admiralty had in England up to the time of the Judicature Acts; consequently the maritime lien in the United States extends further than it does in England, even after recent enlargements; it covers claims for necessaries and by material men (see *Maritime Lien*), as well as collision, salvage, wages, bottomry and damage to cargo.

Difficulties connected with lien occasionally arise in the federal courts in admiralty cases, from a conflict on the subject between the municipal law of the state where the court happens to sit and the admiralty law; but as there is no power to prohibit the federal court, its view of the admiralty law based on the civil law prevails. More serious difficulties arise where a federal court has to try inter-state questions, where the two states have different laws on the subject of lien; one for example, like Louisiana, following the civil law, and the other the common law and equitable practice of Great Britain. The question as to which law is to govern in such a case can hardly be said to be decided. "The question whether equitable liens can exist to be enforced in Louisiana by the federal courts, notwithstanding its restrictive law of privileges, is still an open one" (Derris, *Contracts of Pledge*, 517; and see *Burdon Sugar Refining Co.* v. *Payne*, 167 U.S. 127).

British Colonies.—In those colonies which before the Canadian federation were known as Upper Canada and the Maritime Provinces of British North America, and in the several Australasian states where the English common law is enforced except as modified by colonial statute, the principles of lien, whether by common law or equitable or maritime, discussed above with reference to England, will prevail; but questions not dissimilar to those treated of in reference to the United States may arise where colonies have come to the crown of Great Britain by cession, and where different systems of municipal law are enforced. For example, in Lower Canada the law of France prior to the Revolution occupies the place of the common law in England, but is generally regulated by a code very similar to the Code Napoleon; in Mauritius and its dependencies the Code Napoleon itself is in force except so far as modified by subsequent ordinances. In South Africa, and to some extent in Ceylon and Guiana, Roman-Dutch law is in force; in the island of Trinidad old Spanish law, prior to the introduction of the present civil code of Spain, is the basis of jurisprudence. Each several system of law requires to be studied on the point; but, speaking generally, apart from the possessory lien of workmen and the maritime lien of the vice-admiralty courts, it may be assumed that the rules of the civil law, giving a privilege or priority in certain specified cases rather than a lien as understood in English law, prevail in those colonies where the English law is not in force. (F. W. Ra.)

LIERRE (Flemish, *Lier*), a town in the province of Antwerp, Belgium; 9 m. S.E. of Antwerp. Pop. (1904) 24,229. It carries on a brisk industry in silk fabrics. Its church of St Gommaire was finished in 1557 and contains three fine glass windows, the gift of the archduke Maximilian, to celebrate his wedding with Mary of Burgundy.

LIESTAL, the capital (since 1833) of the half canton of Basel-Stadt in Switzerland. It is a well-built but uninteresting industrial town, situated on the left bank of the Ergolz stream, and is the most populous town in the entire canton of Basel, after Basel itself. By rail it is 9¼ m. S.E. of Basel, and 15¾ m. N.W. of Olten. In the 15th-century town hall (*Rathaus*) is preserved the golden drinking cup of Charles the Bold, duke of Burgundy, which was taken at the battle of Nancy in 1477. In 1900 the population was 5403, all German-speaking and mainly Protestants. The town was sold in 1302 by its lord to the bishop of Basel who, in 1400, sold it to the city of Basel, at whose hands it suffered much in the Peasants' War of 1653, and so consented gladly to the separation of 1833.

LIEUTENANT, one who takes the place, office and duty of and acts on behalf of a superior or other person. The word in English preserves the form of the French original (from *lieu*, place, *tenant*, holding), which is the equivalent of the Lat. *locum tenens*, one holding the place of another. The usual English pronunciation appears early, the word being frequently spelled *lieftenant*, *lyeftenant* or *luftenant* in the 14th and 15th centuries. The modern American pronunciation is *lewtenant*, while the German is represented by the present form of the word *Leutnant*. In French history, *lieutenant du roi* (*locum tenens regis*) was a title borne by the officer sent with military powers to represent the king in certain provinces. With wider powers and functions, both civil as well as military, and holding authority throughout an entire province, such a representative of the king was called *lieutenant général du roi*. The first appointment of these officials dates from the reign of Philip IV. the Fair (see Constable). In the 16th century the administration of the provinces was in the hands of *gouverneurs*, to whom the *lieutenants du roi* became subordinates. The titles *lieutenant civil* or *criminel* and *lieutenant général de police* have been borne by certain judicial officers in France (see Châtelet and Bailiff: *Bailli*). As the title of the representative of the sovereign, "lieutenant" in English usage appears in the title of the lord lieutenant of Ireland, and of the lords lieutenant of the counties of the United Kingdom (see below).

The most general use of the word is as the name of a grade of naval and military officer. It is common in this application to nearly every navy and army of the present day. In Italy and Spain the first part of the word is omitted, and an Italian and Spanish officer bearing this rank are called *tenente* or *teniente* respectively. In the British and most other navies the lieutenants are the commissioned officers next in rank to commanders, or second class of captains. Originally the lieutenant was a soldier who aided, and in case of need replaced, the captain, who, until the latter half of the 17th century, was not necessarily a seaman in any navy. At first one lieutenant was carried, and only in the largest ships. The number was gradually increased, and the lieutenants formed a numerous corps. At the close of the Napoleonic War in 1815 there were 3211 lieutenants in the British navy. Lieutenants now often qualify for special duties such as navigation, or gunnery, or the management of torpedoes. In the British army a lieutenant is a subaltern officer ranking next below a captain and above a second lieutenant. In the United States of America subalterns are classified as first lieutenants and second lieutenants. In France the two grades are *lieutenant* and *sous-lieutenant*, while in Germany the *Leutnant* is the lower of the two ranks, the higher being *Ober-leutnant* (formerly *Premier-leutnant*). A "captain lieutenant" in the British army was formerly the senior subaltern who virtually commanded the colonel's company or troop, and ranked as junior captain, or "puny captain," as he was called by Cromwell's soldiers.

The lord lieutenant of a county, in England and Wales and in Ireland, is the principal officer of a county. His creation dates from the reign of Henry VIII. (or, according to some, Edward VI.), when the military functions of the sheriff were handed over to him. He was responsible for the efficiency of the militia of the county, and afterwards of the yeomanry and volunteers. He was commander of these forces, whose officers he appointed. By the Regulation of the Forces Act 1871, the jurisdiction, duties and command exercised by the lord lieutenant were revested in the crown, but the power of recommending for first appointments was reserved to the lord lieutenant. By the Territorial and Reserve Forces Act 1907, the lord lieutenant of a county was constituted president of the county association. The office of lord lieutenant is honorary, and is held during the royal pleasure, but virtually for life. Appointment to the office is by letters patent under the great seal. Usually, though not necessarily, the person appointed lord lieutenant is also appointed custos rotulorum (*q.v.*). Appointments to the county bench of magistrates are usually made on the recommendation of the lord lieutenant (see Justice of the Peace).

A deputy lieutenant (denoted frequently by the addition of the letters D.L. after a person's name) is a deputy of a lord lieutenant of a county. His appointment and qualifications previous to 1908 were regulated by the Militia Act 1882. By s. 30 of that act the lieutenant of each county was required from time to time to appoint such properly qualified persons as he thought fit, living within the county, to be deputy lieutenants. At least twenty had to be appointed for each county, if there were so many qualified; if less than that number were qualified, then all the duly qualified persons in the county were to be appointed. The appointments were subject to the sovereign's approval, and a return of all appointments to, and removals from, the office had to be laid before parliament annually. To qualify for the appointment of deputy lieutenant a person had to be (*a*) a peer of the realm, or the heir-apparent of such a peer, having a place of residence within the county; or (*b*) have in possession an estate in land in the United Kingdom of the yearly value of not less than £200; or (*c*) be the heir-apparent of such a person; or (*d*) have a clear yearly income from personalty within the United Kingdom of not less than £200 (s. 33). If the lieutenant were absent from the United Kingdom, or through illness or other cause were unable to act, the sovereign might authorize any three deputy lieutenants to act as lieutenant (s. 31), or might appoint a deputy lieutenant to act as vice-lieutenant. Otherwise, the duties of the office were practically nominal, except that a deputy lieutenant might attest militia recruits and administer the oath of allegiance to them. The reorganization in 1907 of the forces of the British crown, and the formation of county associations to administer the territorial army, placed increased duties on deputy lieutenants, and it was publicly announced that the king's approval of appointments to that position would only be given in the case of gentlemen who had served for ten years in some force of the crown, or had rendered eminent service in connexion with a county association.

The lord lieutenant of Ireland is the head of the executive in that country. He represents his sovereign and maintains the formalities of government, the business of government being entrusted to the department of his chief secretary, who represents the Irish government in the House of Commons, and may have a seat in the cabinet. The chief secretary occupies an important position, and in every cabinet either the lord lieutenant or he has a seat.

Lieutenant-governor is the title of the governor of an Indian province, in direct subordination to the governor-general in council. The lieutenant-governor comes midway in dignity between the governors of Madras and Bombay, who are appointed from England, and the chief commissioners of smaller provinces. In the Dominion of Canada the governors of provinces also have the title of lieutenant-governor. The representatives of the sovereign in the Isle of Man and the Channel Islands are likewise styled lieutenant-governors.

LIFE, the popular name for the activity peculiar to protoplasm (*q.v.*). This conception has been extended by analogy to phenomena different in kind, such as the activities of masses of water or of air, or of machinery, or by another analogy, to the duration of a composite structure, and by imagination to real or supposed phenomena such as the manifestations of incorporeal entities. From the point of view of exact science life is associated with matter, is displayed only by living bodies, by all living bodies, and is what distinguishes living bodies from bodies that are not alive. Herbert Spencer's formula that life is "the continuous adjustment of internal relations to external relations" was the result of a profound and subtle analysis, but omits the fundamental consideration that we know life only as a quality of and in association with living matter.

In developing our conception we must discard from consideration the complexities that arise from the organization of the higher living bodies, the differences between one living animal and another, or between plant and animal. Such differentiations and integrations of living bodies are the subject-matter of discussions on evolution; some will see in the play of circumambient media, natural or supernatural, on the simplest forms of living matter, sufficient explanation of the development of such matter into the highest forms of living organisms; others will regard the potency of such living matter so to develop as a mysterious and peculiar quality that must be added to the conception of life. Choice amongst these alternatives need not complicate investigation of the nature of life. The explanation that serves for the evolution of living matter, the vehicle of life, will serve for the evolution of life. What we have to deal with here is life in its simplest form.

The definition of life must really be a description of the essential characters of life, and we must set out with an investigation of the characters of living substance with the special object of detecting the differences between organisms and unorganized matter, and the differences between dead and living organized matter.

Living substance (see PROTOPLASM), as it now exists in all animals and plants, is particulate, consisting of elementary organisms living independently, or grouped in communities, the communities forming the bodies of the higher animals and plants. These small particles or larger communities are subject to accidents, internal or external, which destroy them, immediately or slowly, and thus life ceases; or they may wear out, or become clogged by the products of their own activity. There is no reason to regard the mortality of protoplasm and the consequent limited duration of life as more than the necessary consequence of particulate character of living matter (see LONGEVITY).

Protoplasm, the living material, contains only a few elements, all of which are extremely common and none of which is peculiar to it. These elements, however, form compounds characteristic of living substance and for the most part peculiar to it. Proteid, which consists of carbon, hydrogen, nitrogen, oxygen and sulphur, is present in all protoplasm, is the most complex of all organic bodies, and, so far, is known only from organic bodies. A multitude of minor and simpler organic compounds, of which carbohydrates and fats are the best known, occur in different protoplasm in varying forms and proportions, and are much less isolated from the inorganic world. They may be stages in the elaboration or disintegration of protoplasm, and although they were at one time believed to occur only as products of living matter, are gradually being conquered by the synthetic chemist. Finally, protoplasm contains various inorganic substances, such as salts and water, the latter giving it its varying degrees of liquid consistency.

We attain, therefore, our first generalized description of life as the property or peculiar quality of a substance composed of none but the more common elements, but of these elements grouped in various ways to form compounds ranging from proteid, the most complex of known substances to the simplest salts. The living substance, moreover, has its mixture of elaborate and simple compounds associated in a fashion that is peculiar. The older writers have spoken of protoplasm or the cell as being in a sense "manufactured articles"; in the more modern view such a conception is replaced by the statement that protoplasm and the cell have behind them a long historical architecture. Both ideas, or both modes of expressing what is fundamentally the same idea, have this in common, that life is not a sum of the qualities of the chemical elements contained in protoplasm, but a function first of the peculiar architecture of the mixture, and then of the high complexity of the compounds contained in the mixture. The qualities of water are no sum of the qualities of oxygen and hydrogen, and still less can we expect to explain the qualities of life without regard to the immense complexity of the living substance.

We must now examine in more detail the differences which exist or have been alleged to exist between living organisms and inorganic bodies. There is no essential difference in structure. Confusion has arisen in regard to this point from attempts to compare organized bodies with crystals, the comparison having been suggested by the view that as crystals present the highest type of inorganic structure, it was reasonable to compare them with organic matter. Differences between crystals and organized bodies have no bearing on the problem of life, for organic substance must be compared with a liquid rather than with a crystal, and differs in structure no more from inorganic liquids than these do amongst themselves, and less than they differ from crystals. Living matter is a mixture of substances chiefly dissolved in water; the comparison with the crystals has led to a supposed distinction in the mode of growth, crystals growing by the superficial apposition of new particles and living substance by intussusception. But inorganic liquids also grow in the latter mode, as when a soluble substance is added to them.

The phenomena of movement do not supply any absolute distinction. Although these are the most obvious characters of life, they cannot be detected in quiescent seeds, which we know to be alive, and they are displayed in a fashion very like life by inorganic foams brought in contact with liquids of different composition. Irritability, again, although a notable quality of living substance, is not peculiar to it, for many inorganic substances respond to external stimulation by definite changes. Instability, again, which lies at the root of Spencer's definition "continuous adjustment of internal relations to external relations" is displayed by living matter in very varying degrees from the apparent absolute quiescence of frozen seeds to the activity of the central nervous system, whilst there is a similar range amongst inorganic substances.

The phenomena of reproduction present no fundamental distinction. Most living bodies, it is true, are capable of reproduction, but there are many without this capacity, whilst, on the other hand, it would be difficult to draw an effective distinction between that reproduction of simple organisms which consists of a sub-division of their substance with consequent resumption of symmetry by the separate pieces, and the breaking up of a drop of mercury into a number of droplets.

Consideration of the mode of origin reveals a more real if not an absolute distinction. All living substance so far as is known at present (see BIOGENESIS) arises only from already existing living substance. It is to be noticed, however, that green plants have the power of building up living substance from inorganic material, and there is a certain analogy between the building up of new living material only in association with pre-existing living material, and the greater readiness with which certain inorganic reactions take place if there already be present some trace of the result of the reaction.

The real distinction between living matter and inorganic matter is chemical. Living substance always contains proteid, and although we know that proteid contains only common inorganic elements, we know neither how these are combined to form proteid, nor any way in which proteid can be brought into existence except in the presence of previously existing proteid. The central position of the problem of life lies in the chemistry of proteid, and until that has been fully explored, we are unable to say that there is any problem of life behind the problem of proteid.

Comparison of living and lifeless organic matter presents the initial difficulty that we cannot draw an exact line between a living and a dead organism. The higher "warm-blooded" creatures appear to present the simplest case and in their life-history there seems to be a point at which we can say "that which was alive is now dead." We judge from some major arrest of activity, as when the heart ceases to beat. Long after this, however, various tissues remain alive and active, and the event to which we give the name of death is no more than a superficially visible stage in a series of changes. In less highly integrated organisms, such as "cold-blooded" vertebrates, the point of death is less conspicuous, and when we carry our observations further down the scale of animal life, there ceases to be any salient phase in the slow transition from life to death.

The distinction between life and death is made more difficult by a consideration of cases of so-called "arrested vitality." If credit can be given to the stories of Indian fakirs, it appears that human beings can pass voluntarily into a state of suspended animation that may last for weeks. The state of involuntary trance, sometimes mistaken for death, is a similar occurrence. A. Leeuwenhoek, in 1719, made the remarkable discovery, since abundantly confirmed, that many animalculae, notably tardigrades and rotifers, may be completely desiccated and remain in that condition for long periods without losing the power of awaking to active life when moistened with water. W. Preyer has more recently investigated the matter and has given it the name "anabiosis." Later observers have found similar occurrences in the cases of small nematodes, rotifers and bacteria. The capacity of plant seeds to remain dry and inactive for very long periods is still better known. It has been supposed that in the case of the plant seeds and still more in that of the animals, the condition of anabiosis was merely one in which the metabolism was too faint to be perceptible by ordinary methods of observation, but the elaborate experiments of W. Kochs would seem to show that a complete arrest of vital activity is compatible with viability. The categories, "alive" and "dead," are not sufficiently distinct for us to add to our conception of life by comparing them. A living organism usually displays active metabolism of proteid, but the metabolism may slow down, actually cease and yet reawaken; a dead organism is one in which the metabolism has ceased and does not reawaken.

Origin of Life.—It is plain that we cannot discuss adequately the origin of life or the possibility of the artificial construction of living matter (see Abiogenesis and Biogenesis) until the chemistry of protoplasm and specially of proteid is more advanced. The investigations of O. Bütschli have shown how a model of protoplasm can be manufactured. Very finely triturated soluble particles are rubbed into a smooth paste with an oil of the requisite consistency. A fragment of such a paste brought into a liquid in which the solid particles are soluble, slowly expands into a honeycomb like foam, the walls of the minute vesicles being films of oil, and the contents being the soluble particles dissolved in droplets of the circumambient liquid. Such a model, properly constructed, that is to say, with the vesicles of the foam microscopic in size, is a marvellous imitation of the appearance of protoplasm, being distinguishable from it only by a greater symmetry. The nicely balanced conditions of solution produce a state of unstable equilibrium, with the result that internal streaming movements and changes of shape and changes of position in the model simulate closely the corresponding manifestations in real protoplasm. The model has no power of recuperation; in a comparatively short time equilibrium is restored and the resemblance with protoplasm disappears. But it suggests a method by which, when the chemistry of protoplasm and proteid is better known, the proper substances which compose protoplasm may be brought together to form a simple kind of protoplasm.

It has been suggested from time to time that conditions very unlike those now existing were necessary for the first appearance of life, and must be repeated if living matter is to be constructed artificially. No support for such a view can be derived from observations of the existing conditions of life. The chemical elements involved are abundant; the physical conditions of temperature pressure and so forth at which living matter is most active, and within the limits of which it is confined, are familiar and almost constant in the world around us. On the other hand, it may be that the initial conditions for the synthesis of proteid are different from those under which proteid and living matter display their activities. E. Pflüger has argued that the analogies between living proteid and the compounds of cyanogen are so numerous that they suggest cyanogen as the starting-point of protoplasm. Cyanogen and its compounds, so far as we know, arise only in a state of incandescent heat. Pflüger suggests that such compounds arose when the surface of the earth was incandescent, and that in the long process of cooling, compounds of cyanogen and hydrocarbons passed into living protoplasm by such processes of transformation and polymerization as are familiar in the chemical groups in question, and by the acquisition of water and oxygen. His theory is in consonance with the interpretation of the structure of protoplasm as having behind it a long historical architecture and leads to the obvious conclusion that if protoplasm be constructed artificially it will be by a series of stages and that the product will be simpler than any of the existing animals or plants.

Until greater knowledge of protoplasm and particularly of proteid has been acquired, there is no scientific room for the suggestion that there is a mysterious factor differentiating living matter from other matter and life from other activities. We have to scale the walls, open the windows, and explore the castle before crying out that it is so marvellous that it must contain ghosts.

As may be supposed, theories of the origin of life apart from doctrines of special creation or of a primitive and slow spontaneous generation are mere fantastic speculations. The most striking of these suggests an extra-terrestrial origin. H. E. Richter appears to have been the first to propound the idea that life came to this planet as cosmic dust or in meteorites thrown off from stars and planets. Towards the end of the 19th century Lord Kelvin (then Sir W. Thomson) and H. von Helmholtz independently raised and discussed the possibility of such an origin of terrestrial life, laying stress on the presence of hydrocarbons in meteoric stones and on the indications of their presence revealed by the spectra of the tails of comets. W. Preyer has criticized such views, grouping them under the phrase "theory of cosmozoa," and has suggested that living matter preceded inorganic matter. Preyer's view, however, enlarges the conception of life until it can be applied to the phenomena of incandescent gases and has no relation to ideas of life derived from observation of the living matter we know.

References.—O. Bütschli, *Investigations on Microscopic Foams and Protoplasm* (Eng. trans. by E. A. Minchin, 1894), with a useful list of references; H. von Helmholtz, *Vorträge und Reden*, ii. (1884); W. Kochs, *Allgemeine Naturkunde*, x. 673 (1890); A. Leeuwenhoek, *Epistolae ad Societatem regiam Anglicam* (1719); E. Pflüger, "Über einige Gesetze des Eiweissstoffwechsels," in *Archiv. Ges. Physiol.* liv. 333 (1893); W. Preyer, *Die Hypothesen über den Ursprung des Lebens* (1880); H. E. Richter, *Zur Darwinischen Lehre* (1865); Herbert Spencer, *Principles of Biology*; Max Verworm, *General Physiology* (English trans. by F. S. Lee, 1899), with a very full literature. (P. C. M.)

LIFE-BOAT, and LIFE-SAVING SERVICE. The article on Drowning and Life-Saving (*q.v.*) deals generally with the means of saving life at sea, but under this heading it is convenient to include the appliances connected specially with the life-boat service. The ordinary open boat is unsuited for life-saving in a stormy sea, and numerous contrivances, in regard to which the lead came from England, have been made for securing the best type of life-boat.

The first life-boat was conceived and designed by Lionel Lukin, a London coachbuilder, in 1785. Encouraged by the prince of Wales (George IV.), Lukin fitted up a Norway yawl as a life-boat, took out a patent for it, and wrote a pamphlet descriptive of his "Insubmergible Boat." Buoyancy he obtained by means of a projecting gunwale of cork and air-chambers inside—one of these being at the bow, another at the stern. Stability he secured by a false iron keel. The self-righting and self-emptying principles he seems not to have thought of; at all events he did not compass them. Despite the patronage of the prince, Lukin went to his grave a neglected and disappointed man. But he was not altogether unsuccessful, for, at the request of the Rev Dr Shairp, Lukin fitted up a coble as an "unimmergible" life-boat, which was launched at Bamborough, saved several lives the first year and afterwards saved many lives and much property.

Public apathy in regard to shipwreck was temporally swept away by the wreck of the "Adventure" of Newcastle in 1789. This vessel was stranded only 300 yds. from the shore, and her crew dropped, one by one, into the raging breakers in presence of thousands of spectators, none of whom dared to put off in an ordinary boat to the rescue. An excited meeting among the people of South Shields followed; a committee was formed, and premiums were offered for the best models of a life-boat. This called forth many plans, of which those of William Wouldhave, a painter, and Henry Greathead, a boatbuilder, of South Shields, were selected. The committee awarded the prize to the latter, and, adopting the good points of both models, gave the order for the construction of their boat to Greathead. This boat was rendered buoyant by nearly 7 cwts. of cork, and had very raking stem and stern-posts, with great curvature of keel. It did good service, and Greathead was well rewarded; nevertheless no other life-boat was launched till 1798, when the duke of Northumberland ordered Greathead to build him a life-boat which he endowed. This boat also did good service, and its owner ordered another in 1800 for Oporto. In the same year Mr Cathcart Dempster ordered one for St Andrews, where, two years later, it saved twelve lives. Thus the value of life-boats began to be recognized, and before the end of 1803 Greathead had built thirty-one boats—eighteen for England, five for Scotland and eight for foreign lands. Nevertheless, public interest in life-boats was not thoroughly aroused till 1823.

In that year Sir William Hillary, Bart., stood forth to champion the life-boat cause. Sir William dwelt in the Isle of Man, and had assisted with his own hand in the saving of three hundred and five lives. In conjunction with two members of parliament—Mr Thomas Wilson and Mr George Hibbert—Hillary founded the "Royal National Institution for the Preservation of Life from Shipwreck." This, perhaps the grandest of England's charitable societies, and now named the "Royal National Life-boat Institution," was founded on the 4th of March 1824. The king patronized it; the archbishop of Canterbury presided at its birth; the most eloquent men in the land—among them Wilberforce—pleaded the cause; nevertheless, the institution began its career with a sum of only £9826. In the first year twelve new life-boats were built and placed at different stations, besides which thirty-nine life-boats had been stationed on the British shores by benevolent individuals and by independent associations over which the institution exercised no control though it often assisted them. In its early years the institution placed the mortar apparatus of Captain Manby at many stations, and provided for the wants of sailors and others saved from shipwreck,—a duty subsequently discharged by the "Shipwrecked Fishermen and Mariners' Royal Benevolent Society." At the date of the institution's second report it had contributed to the saving of three hundred and forty-two lives, either by its own life-saving apparatus or by other means for which it had granted rewards. With fluctuating success, both as regards means and results, the institution continued its good work—saving many lives, and occasionally losing a few brave men in its tremendous battles with the sea. Since the adoption of the self-righting boats, loss of life in the service has been comparatively small and infrequent.

Towards the middle of the 19th century the life-boat cause appeared to lose interest with the British public, though the life-saving work was prosecuted with unremitting zeal, but the increasing loss of life by shipwreck, and a few unusually severe disasters to life-boats, brought about the reorganization of the society in 1850. The Prince Consort became vice-patron of the institution in conjunction with the king of the Belgians, and Queen Victoria, who had been its patron since her accession, became an annual contributor to its funds. In 1851 the duke of Northumberland became president, and from that time forward a tide of prosperity set in, unprecedented in the history of benevolent institutions, both in regard to the great work accomplished and the pecuniary aid received. In 1850 its committee undertook the immediate superintendence of all the life-boat work on the coasts, with the aid of local committees. Periodical inspections, quarterly exercise of crews, fixed rates of payments to coxswains and men, and quarterly reports were instituted, at the time when the self-righting self-emptying boat came into being. This boat was the result of a hundred-guinea prize, offered by the president, for the best model of a life-boat, with another hundred to defray the cost of a boat built on the model chosen. In reply to the offer no fewer than two hundred and eighty models were sent in, not only from all parts of the United Kingdom, but from France, Germany, Holland and the United States of America. The prize was gained by Mr James Beeching of Great Yarmouth, whose model, slightly modified by Mr James Peake, one of the committee of inspection, was still further improved as time and experience suggested (see below).

The necessity of maintaining a thoroughly efficient life-boat service is now generally recognized by the people not only of Great Britain, but also of those other countries on the European Continent and America which have a sea-board, and of the British colonies, and numerous life-boat services have been founded more or less on the lines of the Royal National Life-boat Institution. The British Institution was again reorganized in 1883; it has since greatly developed both in its life-saving efficiency and financially, and has been spoken of in the highest terms as regards its management by successive governments—a Select Committee of the House of Commons in 1897 reporting to the House that the thanks of the whole community were due to the Institution for its energy and good management. On the death of Queen Victoria in January 1901 she was succeeded as patron of the Institution by Edward VII., who as prince of Wales had been its president for several years. At the close of 1908 the Institution's fleet consisted of 280 life-boats, and the total number of lives for the saving of which the committee of management had granted rewards since the establishment of the Institution in 1824 was 47,983. At this time there were only seventeen life-boats on the coast of the United Kingdom which did not belong to the Institution. In 1882 the total amount of money received by the Institution from all sources was £57,797, whereas in 1901 the total amount received had increased to £107,293. In 1908 the receipts were £115,303, the expenditure £90,335.

In 1882 the Institution undertook, with the view of diminishing the loss of life among the coast fishermen, to provide the masters and owners of fishing-vessels with trustworthy aneroid barometers, at about a third of the retail price, and in 1883 the privilege was extended to the masters and owners of coasters under 100 tons burden. At the end of 1901 as many as 4417 of these valuable instruments had been supplied. In 1889 the committee of management secured the passing of the Removal of Wrecks Act 1877 Amendment Act, which provides for the removal of wrecks in non-navigable waters which might prove dangerous to life-boat crews and others. Under its provisions numerous highly dangerous wrecks have been removed.

In 1893 the chairman of the Institution moved a resolution in the House of Commons that, in order to decrease the serious loss of life from shipwreck on the coast, the British Government should provide either telephonic or telegraphic communication between all the coast-guard stations and signal stations on the coast of the United Kingdom; and that where there are no coast-guard stations the post offices nearest to the life-boat stations should be electrically connected, the object being to give the earliest possible information to the life-boat authorities at all times, by day and night, when the life-boats are required for service; and further, that a Royal Commission should be appointed to consider the desirability of electrically connecting the rock lighthouses, light-ships, &c., with the shore. The resolution was agreed to without a division, and its intention has been practically carried out, the results obtained having proved most valuable in the saving of life.

On the 1st of January 1898 a pension and gratuity scheme was introduced by the committee of management, under which life-boat coxswains, bowmen and signalmen of long and meritorious service, retiring on account of old age, accident, ill-health or abolition of office, receive special allowances as a reward for their good services. While these payments act as an incentive to the men to discharge their duties satisfactorily, they at the same time assist the committee of management in their effort to obtain the best men for the work. For many years the Institution has given compensation to any who may have received injury while employed in the service, besides granting liberal help to the widows and dependent relatives of any in the service who lose their own lives when endeavouring to rescue others.

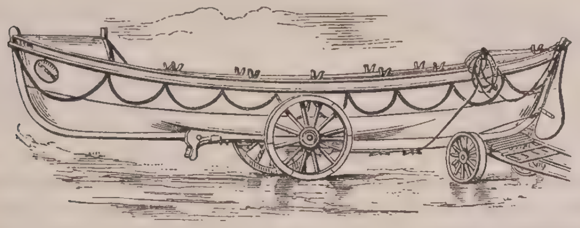

Fig. 1.—The 33-ft., Double-banked, Ten-oared, Self-righting and Self-emptying Life-boat (1881) of the Institution on its Transporting Carriage, ready for launching.

A very marked advance in improvement in design and suitability for service has been made in the life-boat since the reorganization of the Institution in 1883, but principally since 1887, when, as the result of an accident in December 1886 to two self-righting life-boats in Lancashire, twenty-seven out of twenty-nine of the men who manned them were drowned. At this time a permanent technical sub-committee was appointed by the Institution, whose object was, with the assistance of an eminent consulting naval architect—a new post created—and the Institution's official experts, to give its careful attention to the designing of improvements in the life-boat and its equipment, and to the scientific consideration of any inventions or proposals submitted by the public, with a view to adopting them if of practical utility. Whereas in 1881 the self-righting life-boat of that time was looked upon as the Institution's special life-boat, and there were very few life-boats in the Institution's fleet not of that type, at the close of 1901 the life-boats of the Institution included 60 non-self-righting boats of various types, known by the following designations: Steam life-boats 4, Cromer 3, Lamb and White 1, Liverpool 14, Norfolk and Suffolk 19, tubular 1, Watson 18. In 1901 a steam-tug was placed at Padstow for use solely in conjunction with the life-boats on the north coast of Cornwall. The self-righting life-boat of 1901 was a very different boat from that of 1881. The Institution's present policy is to allow the men who man the life-boats, after having seen and tried by deputation the various types, to select that in which they have the most confidence.

The present life-boat of the self-righting type (fig. 2) differs materially from its predecessor, the stability being increased and the righting power greatly improved. The test of efficiency in this last quality was formerly considered sufficient if the boat would quickly right herself in smooth water without her crew and gear, but every self-righting life-boat now built by the Institution will right with her full crew and gear on board, with her sails set and the anchor down. Most of the larger self-righting boats are furnished with "centre-boards" or "drop-keels" of varying size and weight, which can be used at pleasure, and materially add to their weather qualities. The drop-keel was for the first time placed in a life-boat in 1885.

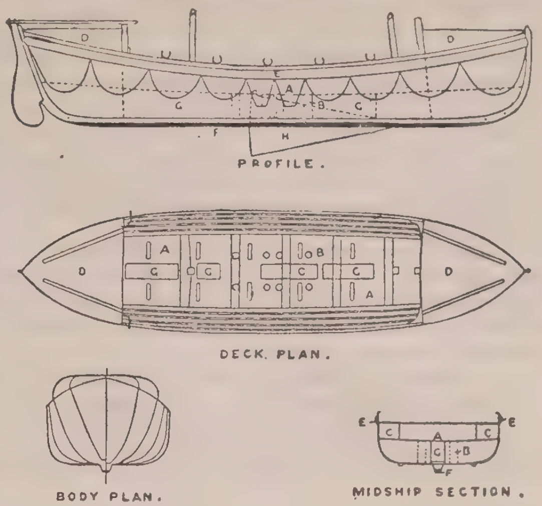

Fig. 2.—Plans, Profile and Section of Modern English Self-righting Life-boat.

A, Deck.
B, Relieving valves for automatic discharge of water off deck.
C, Side air-cases above deck.
D, End air compartments, usually called "end-boxes," an important factor in self-righting.
E, Wale, or fender.
F, Iron keel ballast, important in general stability and self-righting.
G, Water-ballast tanks.
H, Drop-keel.

Steam was first introduced into a life-boat in 1890, when the Institution, after very full inquiry and consideration, stationed on the coast a steel life-boat, 50 ft. long and 12 ft. beam, and a depth of 3 ft. 6 in., propelled by a turbine wheel driven by engines developing 170 horse-power. It had been

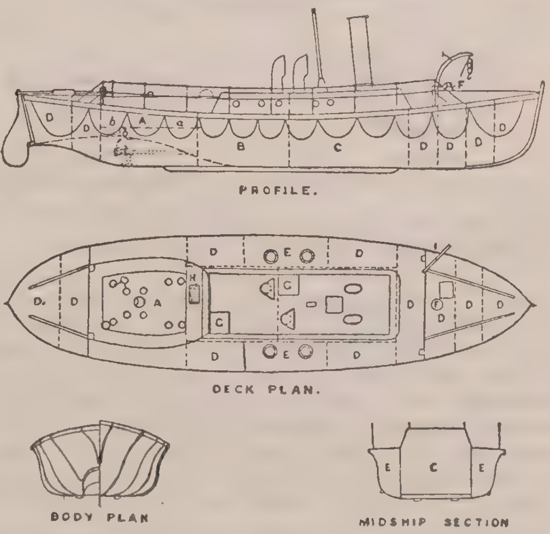

Fig. 3.—Plans, Profile and Section of English Steam Life-boat.

A, Cockpit.
a, Deck.
b, Propeller hatch.
c, Relief valves.
B, Engine-room.
C, Boiler-room.
D, Water-tight compartments.
E, Coal-bunkers.
F, Capstan.
G, Hatches to engine-and boiler-rooms.
H, Cable reel.
I, Anchor davit.

previously held by all competent judges that a mechanically-propelled life-boat, suitable for service in heavy weather, was a problem surrounded by so many and great difficulties that even the most sanguine experts dared not hope for an early solution of it. This type of boat (fig. 3) has proved very useful. It is, however, fully recognized that boats of this description can necessarily be used at only a very limited number of stations, and where there is a harbour which never dries out. The highest speed attained by the first hydraulic steam life-boat was rather more than 9 knots, and that secured in the latest $9\frac{1}{2}$ knots. In 1909 the fleet of the Institution included 4 steam life-boats and 8 motor life-boats. The experiments with motor life-boats in previous years had proved successful.

The other types of pulling and sailing life-boats are all non-self-righting, and are specially suitable for the requirements of the different parts of the coast on which they are placed. Their various qualities will be understood by a glance at the illustrations (figs. 4, 5, 6, 7 and 8).

The Institution continues to build life-boats of different sizes according to the requirements of the various points of the coast at which they are placed, but of late years the tendency has been generally to increase the dimensions of the boats. This change of policy is mainly due to the fact that the small coasters and fishing-boats have in great measure disappeared, their places being taken by steamers and steam trawlers. The cost of the building and equipping of pulling and sailing life-boats has materially increased, more especially since 1898, the increase being mainly due to improvements and the seriously augmented charges for materials and labour. In 1881 the average cost of a fully-equipped life-boat and carriage was £650, whereas at the end of 1901 it amounted to £1000, the average annual cost of maintaining a station having risen to about £125.

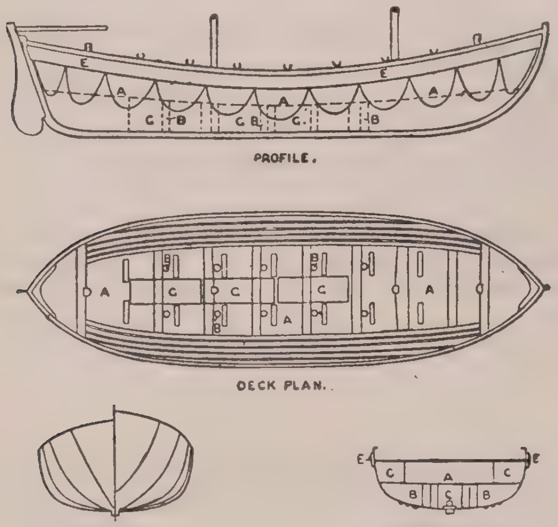

FIG. 4.—Plans, Profile and Section of Cromer Type of Life-boat.

A, Deck.
B, Relieving valves for automatic discharge of water off deck.
C, Side air-cases above deck.
E, Wale, or fender.
G, Water-ballast tanks.

The *transporting-carriage* continues to be a most important part of the equipment of life-boats, generally of the self-righting type, and is indispensable where it is necessary to launch the boats at any point not in the immediate vicinity of the boat-house. It is not, however, usual to supply carriages to boats of larger dimensions than 37 ft. in length by 9 ft. beam, those in excess as regards length and beam being either launched by means of special slipways or kept afloat. The transporting-carriage of to-day has been rendered particularly useful at places where the beach is soft, sandy or shingly, by the introduction in 1888 of Tipping's sand-plates. They are composed of an endless plateway or jointed wheel tyre fitted to the main wheels of the carriage, thereby enabling the boat to be transferred with rapidity and with greatly decreased labour over beach and soft sand. Further efficiency in launching has also been attained at many stations by the introduction in 1890 of pushing-poles, attached to the transporting-carriages, and of horse launching-poles, first used in 1892. Fig. 9 gives a view of the modern transporting-carriage fitted with Tipping's sand- or wheel-plates.

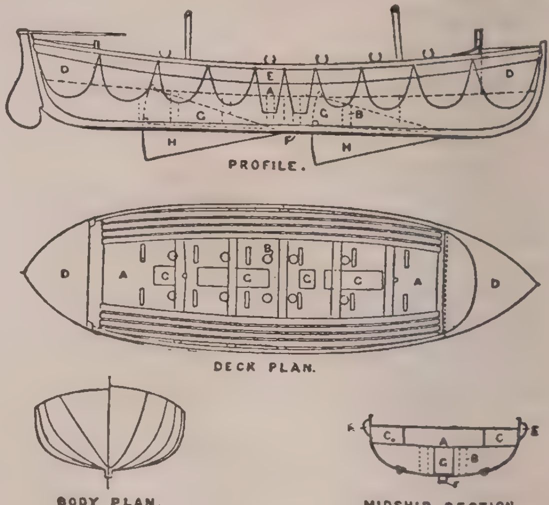

FIG. 5.—Plans, Profile and Section of Liverpool Type of Life-boat. A, B, C, E, G, as in fig. 3; D, end air-compartments; F, iron keel; H, drop-keels.

The *life-belt* has since 1898 been considerably improved, being now less cumbersome than formerly, and more comfortable. The feature of the principal improvement is the reduction in length of the corks under the arms of the wearer and the rounding-off of the upper portions, the result being that considerably more freedom is provided for the arms. The maximum extra buoyancy has thereby been reduced from 25 ℔ to 22 ℔, which is more than sufficient to support a man heavily clothed with his head and shoulders above the water, or to enable him to support another person besides himself. Numerous life-belts of very varied descriptions, and made of all sorts of materials, have been patented, but it is generally agreed that for life-boat work the cork life-belt of the Institution has not yet been equalled.

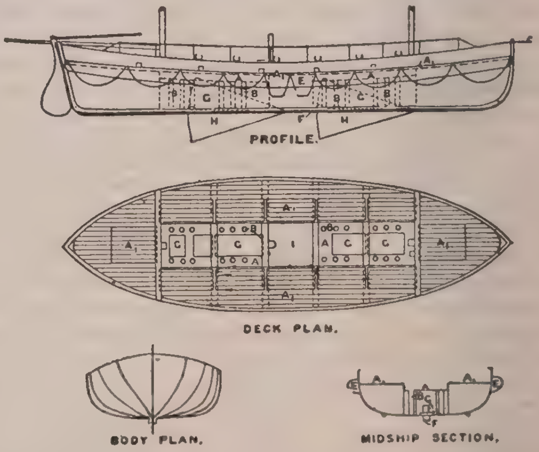

FIG. 6.—Plans, Profile and Section of Norfolk and Suffolk Type of Life-boat. A, B, E, F, G, H, as in fig. 4; A, side deck; I, cable-well.

Life-saving rafts, seats for ships' decks, dresses, buoys, belts, &c.,

have been produced in all shapes and sizes, but apparently nothing indispensable has as yet been brought out. Those interested in life-saving appliances were hopeful that the Paris Exhibition of 1900 would have produced some life-saving invention which might prove a benefit to the civilized world, but so lacking in real merit were the life-saving exhibits that the jury of experts were unable to award to any of the 435 competitors the Andrew Pollok prize of £4000 for the best method or device for saving life from shipwreck.

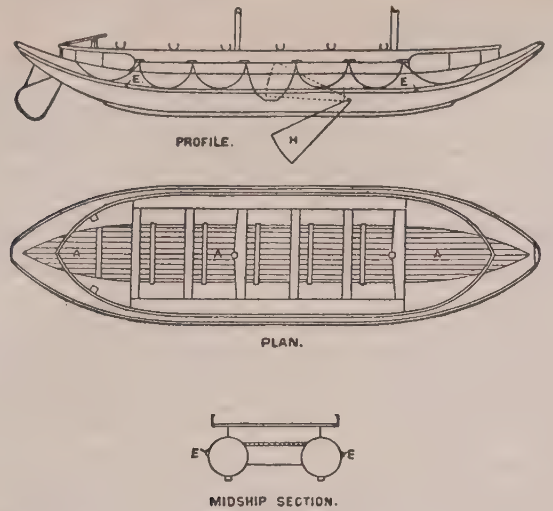

Fig. 7.—Plan, Profile and Section of Tubular Type of Life-boat. A, deck; E, wale, or fender; H, drop-keel.

The *rocket apparatus*, which in the United Kingdom is under the management of the coast-guard, renders excellent service in life-saving. This, next to the life-boat, is the most important and successful means by which shipwrecked persons are rescued on the British shores. Many vessels are cast every year on the rocky parts of the coasts, under cliffs, where no life-boat could be of service. In such places the rocket alone is available.

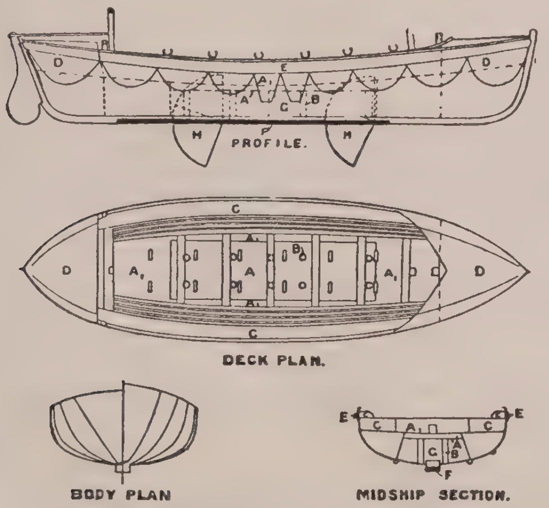

Fig. 8.—Plans, Profile and Section of Watson Type of Life-boat. Lettering as in fig. 5, but C, side air-cases above deck and thwarts.

The rocket apparatus consists of five principal parts, viz. the rocket, the rocket-line, the whip, the hawser and the sling life-buoy. The mode of working it is as follows. A rocket, having a light line attached to it, is fired over the wreck. By means of this line the wrecked crew haul out the whip, which is a double or endless line, rove through a block with a tail attached to it. The tail-block, having been detached from the rocket-line, is fastened to a mast, or other portion of the wreck, high above the water. By means of the whip the rescuers haul off the hawser, to which is hung the travelling or sling life-buoy. When one end of the hawser has been made fast to the mast, about 18 in. *above* the whip, and its other end to tackle fixed to an anchor on shore, the life-buoy is run out by the rescuers, and the shipwrecked persons, getting into it one at a time, are hauled ashore. Sometimes, in cases of urgency, the life-buoy is worked by means of the whip alone, without the hawser. Captain G. W. Manby, F.R.S., in 1807 invented, or at least introduced, the mortar apparatus, on which the system of the rocket apparatus, which superseded it in England, is founded. Previously, however, in 1791, the idea of throwing a rope from a wreck to the shore by means of a shell from a mortar had occurred to Serjeant Bell of the Royal Artillery, and about the same time, to a Frenchman named La Fère, both of whom made successful experiments with their apparatus. In the same year (1807) a rocket was proposed by Mr Trengrouse of Helston in Cornwall, also a hand and lead line as means of communicating with vessels in distress. The *heaving-cane* was a fruit of the latter suggestion. In 1814 forty-five mortar stations were established, and Manby received £2000, in addition to previous grants, in acknowledgment of the good service rendered by his invention. Mr John Dennett of Newport, Isle of Wight, introduced the rocket, which was afterwards extensively used. In 1826 four places in the Isle of Wight were supplied with Dennett's rockets, but it was not till after government had taken the apparatus under its own control, in 1855, that the rocket invented by Colonel Boxer was adopted. Its peculiar characteristic lies in the combination of two rockets in one case, one being a continuation of the other, so that, after the first compartment has carried the machine to its full elevation, the second gives it an additional impetus whereby a great increase of range is obtained. (R. M. B.; C. Di.)

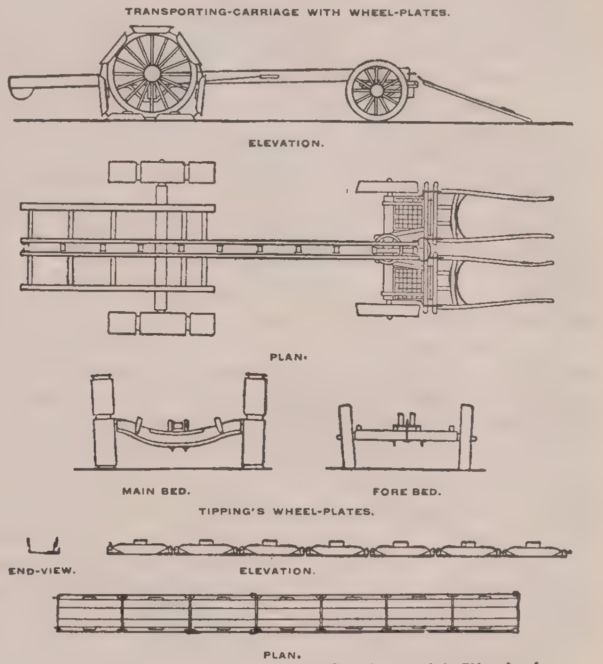

Fig. 9.—Life-boat Transporting-Carriage with Tipping's Wheel-Plates.

United States.—In the extent of coast line covered, magnitude of operations and the extraordinary success which has crowned its efforts, the life-saving service of the United States is not surpassed by any other institution of its kind in the world. Notwithstanding the exposed and dangerous nature of the coasts flanking and stretching between the approaches to the principal seaports, and the immense amount of shipping concentrating upon them, the loss of life among a total of 121,459 persons imperilled by marine casualty within the scope of the operations of the service from its organization in 1871 to the 30th of June 1907, was less than 1%, and even this small proportion is made up largely of persons washed overboard immediately upon the striking of vessels and before any assistance could reach them, or lost in attempts to land in their own boats, and people thrown into the sea by the capsizing of small craft. In the scheme of the service, next in importance to the saving of life is the saving of property from marine disaster, for which no salvage or reward is allowed. During the period named vessels and cargoes to the value of nearly two hundred million dollars were saved, while only about a quarter as much was lost.

The first government life-saving stations were plain boat-houses erected on the coast of New Jersey in 1848, each equipped with a fisherman's surf-boat and a mortar and life-car with accessories. Prior to this time, as early as 1789, a benevolent organization known as the Massachusetts Humane Society had erected rude huts along the coast of that state, followed by a station at Cohasset in 1807 equipped with a boat for use by volunteer crews. Others were subsequently added. Between 1849 and 1870 this society secured appropriations from Congress aggregating $40,000. It still maintains sixty-nine stations on the Massachusetts coast. The government service was extended in 1849 to the coast of Long Island, and in 1850 one station was placed on the Rhode Island coast. In 1854 the appointment of keepers for the New Jersey and Long Island stations, and a superintendent for each of these coasts, was authorized by law. Volunteer crews were depended upon until 1870, when Congress authorized crews at each alternate station for the three winter months.

The present system was inaugurated in 1871 by Sumner I. Kimball, who in that year was appointed chief of the Revenue Cutter Service, which had charge of the few existing stations. He recommended an appropriation of $200,000 and authority for the employment of crews for all stations for such periods as were deemed necessary, which were granted. The existing stations were thoroughly overhauled and put in condition for the housing of crews; necessary boats and equipment were furnished; incapable keepers, who had been appointed largely for political reasons, were supplanted by experienced men; additional stations were established; all were manned by capable surfmen; the merit system for appointments and promotions was inaugurated; a beach patrol system was introduced, together with a system of signals; and regulations for the government of the service were promulgated. The result of the transformation was immediate and striking. At the end of the year it was found that not a life had been lost within the domain of the service; and at the end of the second year the record was almost identical, but one life having been lost, although the service had been extended to embrace the dangerous coast of Cape Cod. Legislation was subsequently secured, totally eliminating politics in the choice of officers and men, and making other provisions necessary for the completion of the system. The service continued to grow in extent and importance until, in 1878, it was separated from the Revenue Cutter Service and organized into a separate bureau of the Treasury, its administration being placed in the hands of a general superintendent appointed by the president and confirmed by the senate, his term of office being limited only by the will of the president. Mr Kimball was appointed to the position, which he still held in 1909.

The service embraces thirteen districts, with 280 stations located at selected points upon the sea and lake coasts. Nine districts on the Atlantic and Gulf coasts contain 201 stations, including nine houses of refuge on the Florida coast, each in charge of a keeper only, without crews; three districts on the Great Lakes contain 61 stations, including one at the falls of the Ohio river, Louisville, Kentucky; and one district on the Pacific coast contains 18 stations, including one at Nome, Alaska.

The general administration of the service is conducted by a general superintendent; an inspector of life-saving stations and two superintendents of construction of life-saving stations detailed from the Revenue Cutter Service; a district superintendent for each district; and assistant inspectors of stations, also detailed from the Revenue Cutter Service "to perform such duties in connexion with the conduct of the service as the general superintendent may require." There is also an advisory board on life-saving appliances consisting of experts, to consider devices and inventions submitted by the general superintendent.

Station crews are composed of a keeper and from six to eight surfmen, with an additional man during the winter months at most of the stations on the Atlantic coast. The surfmen are re-enlisted from year to year during good behaviour, subject to a thorough physical examination. The keepers are also subject to annual physical examinations after attaining the age of fifty-five. Stations on the Atlantic and Gulf coasts are manned from August 1st to May 31st. On the lakes the active season covers the period of navigation, from about April 1st to early in December. The falls station at Louisville, and all stations on the Pacific coast, are in commission continuously. One station, located in Dorchester Bay, an expanse of water within Boston harbour, where numerous yachts rendezvous and many accidents occur, which, with the one at Louisville are believed to be the only floating life-saving stations in the world, is manned from May 1st to November 15th. Its equipment includes a steam tug and two gasoline launches, the latter being harboured in a slip cut into the after-part of the station and extending from the stern to nearly amidships. The Louisville stations guard the falls of the Ohio river, where life is much endangered from accidents to vessels passing over the falls and small craft which are liable to be drawn into the chutes while attempting to cross the river. Its equipment includes two river skiffs which can be instantly launched directly from the ways at one end of the station. These skiffs are small boats modelled much like surf-boats, designed to be rowed by one or two men. Other equipments are provided for the salvage of property. The stations, located as near as practicable to a launching place, contain as a rule convenient quarters for the residence of the keeper and crew and a boat and apparatus room. In some instances the dwelling- and boat-house are built separately. Each station has a look-out tower for the day watch.

The principal apparatus consists of surf- and life-boats, Lyle gun and breeches-buoy apparatus and life-car. The Hunt gun and Cunningham line-carrying rocket are available at selected stations on account of their greater range, but their use is rarely necessary. The crews are drilled daily in some portion of rescue work, as practice in manœuvring, upsetting and righting boats, with the breeches-buoy, in the resuscitation of the apparently drowned and in signalling. The district officers upon their quarterly visits examine the crews orally and by drill, recording the proficiency of each member, including the keeper, which record accompanies their report to the general superintendent. For watch and patrol the day of twenty-four hours is divided into periods of four or five hours each. Day watches are stood by one man in the look-out tower or at some other point of vantage, while two men are assigned to each night watch between sunset and sunrise. One of the men remains on watch at the station, dividing his time between the beach look-out and visits to the telephone at specified intervals to receive messages, the service telephone system being extended from station to station nearly throughout the service, with watch telephones at half-way points. The other man patrols the beach to the end of his beat and returns, when he takes the look-out and his watchmate patrols in the opposite direction. A like patrol and watch is maintained in thick or stormy weather in the daytime. Between adjacent stations a record of the patrol is made by the exchange of brass checks; elsewhere the patrolman carries a watchman's clock, on the dial of which he records the time of his arrival at the keypost which marks the end of his beat. On discovering a vessel standing into danger the patrolman burns a Coston signal, which emits a brilliant red flare, to warn the vessel of her danger. The number of vessels thus warned averages about two hundred in each year, whereby great losses are averted, the extent of which can never be known. When a stranded vessel is discovered, the patrolman's Coston signal apprises the crew that they are seen and assistance is at hand. He then notifies his station, by telephone if possible. When such notice is received at the station, the keeper determines the means with which to attempt a rescue, whether by boat or beach-apparatus. If the beach-apparatus is chosen, the apparatus cart is hauled to a point directly opposite the wreck by horses, kept at most of the stations during the inclement months, or by the members of the crew. The gear is unloaded, and while being set up—the members of the crew performing their several allotted parts simultaneously—the keeper fires a line over the wreck with the Lyle gun, a small bronze cannon weighing, with its 18 ℔ elongated iron projectile to which the line is attached, slightly more than 200 ℔, and having an extreme range of about 700 yds., though seldom available at wrecks for more than 400 yds. This gun was the invention of Lieutenant (afterwards Colonel) David A. Lyle, U.S. Army. Shotlines are of three sizes, $\frac{4}{32}$, $\frac{7}{32}$ and $\frac{9}{32}$ of an inch diameter, designated respectively Nos. 4, 7 and 9. The two larger are ordinarily used, the No. 4 for extreme range. A line having been fired within reach of the persons on the wreck, an endless rope rove through a tail-block is sent out by it with instructions, printed in English and French on a tally-board, to make the tail fast to a mast or other elevated portion of the wreck. This done, a 3-in. hawser is bent on to the whip and hauled off to the wreck, to be made fast a little above the tail-block, after which the shore end is hauled taut over a crotch by means of tackle attached to a sand anchor. From this hawser the breeches-buoy or life-car is suspended and drawn between the ship and shore of the endless whip-line. The life-car can also be drawn like a boat between ship and shore without the use of a hawser. The breeches-buoy is a cork life-buoy to which is attached a pair of short canvas breeches, the whole suspended from a traveller block by suitable lanyards. It usually carries one person at a time, although two have frequently been brought ashore together. The life-car, first introduced in 1848, is a boat of corrugated iron with a convex iron cover, having a hatch in the top for the admission of passengers, which can be fastened either from within or without, and a few perforations to admit air, with raised edges to exclude water. At wreck operations during the night the shore is illuminated by powerful acetylene (calcium carbide) lights. If any of the rescued persons are frozen, as often happens, or are injured or sick, first aid and simple remedies are furnished them. Dry clothing, supplied by the Women's National Relief Association, is also furnished to survivors, which the destitute are allowed to keep.

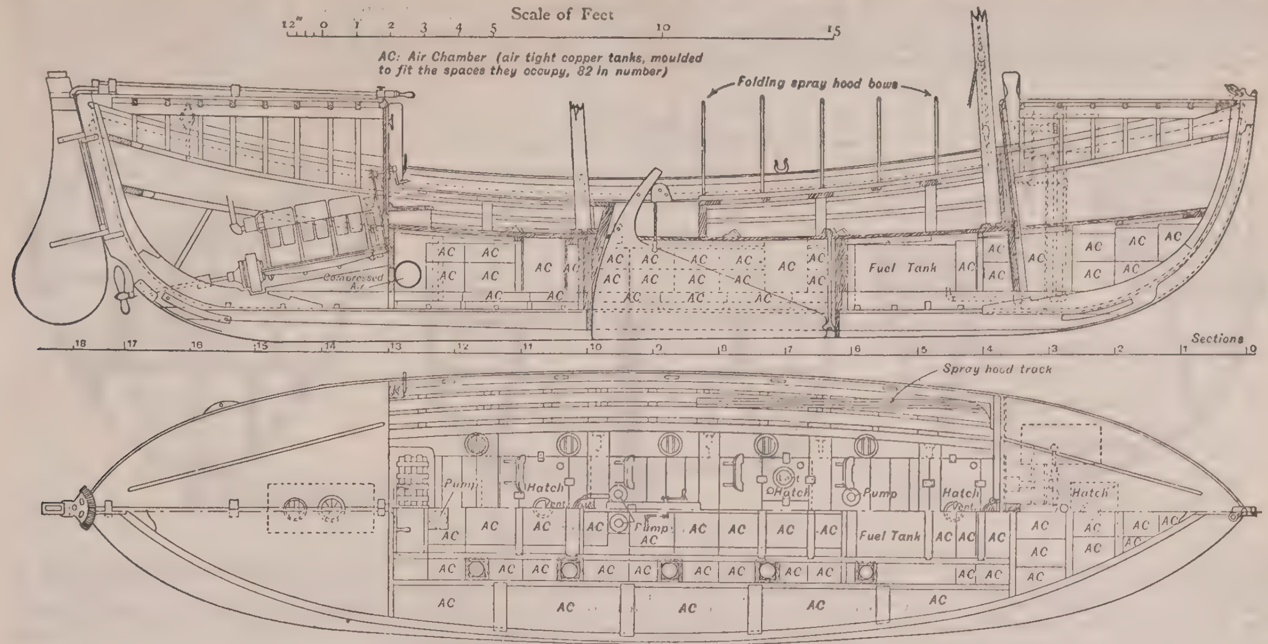
Scale of Feet
12" 0 1 2 3 4 5 10 15
AC: Air Chamber (air tight copper tanks, moulded to fit the spaces they occupy, 82 in number)
Folding spray hood bows
Compressed Air
AC
Fuel Tank
Sections
18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Spray hood track
Pump
Hatch
Vent
Fuel Tank

FIG. 10.—American Power Life-boat.

Several types of light open surf-boats are used, adapted to the special requirements of the different localities and occasions. They are built of cedar, from 23 to 27 ft. long, and are provided with end air chambers and longitudinal air cases on each side under the thwarts.

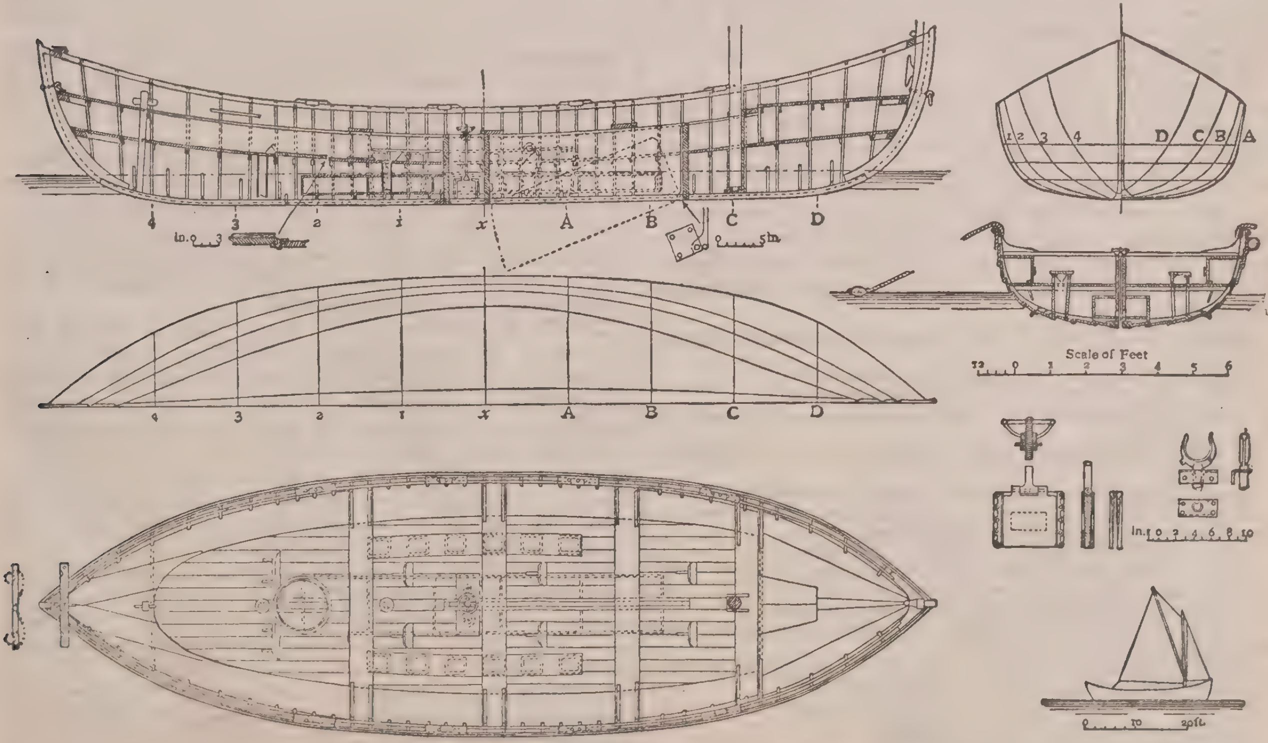
4 3 2 1 x A B C D
in. 0 3
5 in.
1 2 3 4 D C B A
Scale of Feet
12 0 1 2 3 4 5 6
In. 0 2 4 6 8 10
0 10 20 ft.

FIG. 11.—Beebe-McLellan Self-bailing Boat.

Self-righting and self-bailing life-boats, patterned after those used in England and other countries, have heretofore been used at most of the Lake stations and at points on the ocean coast where they can be readily launched from ways. Most of these boats, however, have now been transformed into power boats without the sacrifice of any of their essential qualities. The installation of power is effected by introducing a 25 H.P. four-cycle gasoline motor, weighing with its fittings, tanks, &c., about 800 lb. The engine is installed in the after air chamber, with the starting crank, reversing clutches, &c., recessed into the bulkhead to protect them from accidents. These boats attain a speed of from 7 to 9 m. an hour, and have proved extremely efficient. A new power life-boat (fig. 10) on somewhat improved lines, 36 ft. in length, and equipped with a 35-40 H.P. gasoline engine, promises to prove still more efficient. A number of surf-boats have also been equipped with gasoline engines of from 5 to 7 H.P., for light and quick work, with very satisfactory results.

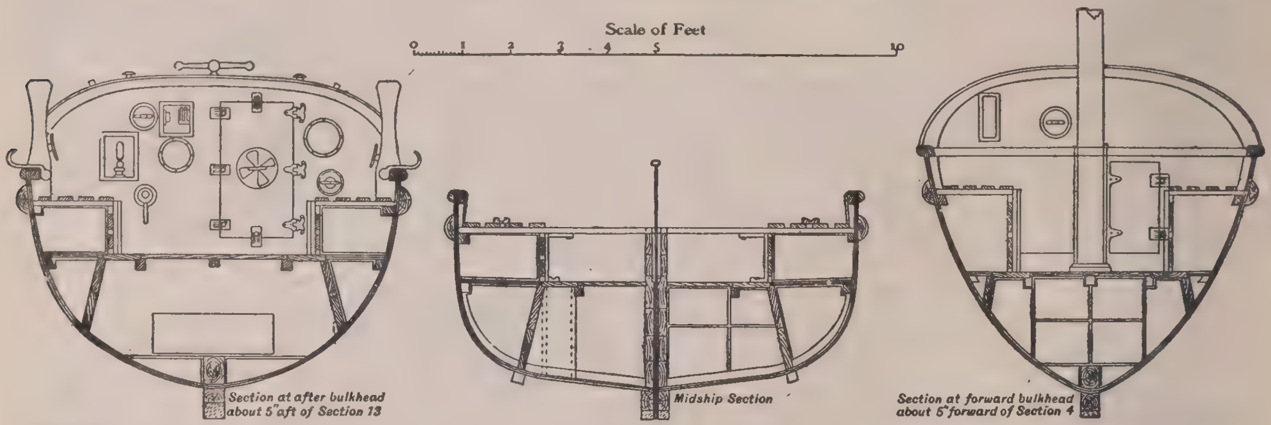
Scale of Feet
0
1
2
3
4
5
10
Section at after bulkhead about 5" aft of Section 13
Midship Section
Section at forward bulkhead about 5" forward of Section 4

FIG. 12.—Details of boat shown in Fig. 10.

A distinctively American life-boat extensively used is the Beebe-McLellan self-bailing boat (fig. 11), which for all round life-saving work is held in the highest esteem. It possesses all the qualities of the self-righting and self-bailing life-boats in use in all life-saving institutions, except that of self-righting; and the sacrifice of this quality is largely counteracted by the ease with which it can be righted by its crew when capsized. For accomplishing this the crews are thoroughly drilled. In drill a trained crew can upset and right the boat and resume their places at the oars in twenty seconds. The boat is built of cedar, weighs about 1200 ℔, and can be used at all stations and launched by the crew directly off the beach from the boat-wagon especially made for it. The self-bailing quality is secured by a water-tight deck at a level a little above the load water line with relieving tubes fitted with valves through which any water shipped runs back into the sea by gravity. Air cases along the sides under the thwarts, inclining towards the middle of the boat, minimize the quantity of water taken in, and the water-ballast tank in the bottom increases the stability by the weight of the water which can be admitted by opening the valve. When transported along the land it is empty. The Beebe-McLellan boat is 25 ft. long, 7 ft. beam, and will carry 12 to 15 persons in addition to its crew. Some of these boats, intended for use in localities where the temperature of the water will not permit of frequent upsetting and righting drills, are built with end air cases which render them self-righting.

In addition to the principal appliances described, a number of minor importance are included in the equipment of every life-saving station, such as launching carriages for life-boats, roller boat-skids, heaving sticks and all necessary tools. Members of all life-saving crews are required on all occasions of boat practice or duty at wrecks to wear life-belts of the prescribed pattern. (A. T. T.)

Life-boat Service in other Countries.—Good work is done by the life-boat service in other countries, most of these institutions having been formed on the lines of the Royal National Life-boat Institution of Great Britain. The services are operating in the following countries:—

Belgium.—Established in 1838. Supported entirely by government.

Denmark.—Established in 1848. Government service.

Sweden.—Established in 1856. Government service.

France.—Established in 1865. Voluntary association, but assisted by the government.

Germany.—Established in 1885. Supported entirely by voluntary contributions.

Turkey (Black Sea).—Established in 1868. Supported by dues.

Russia.—Established in 1872. Voluntary association, but receiving an annual grant from the government.

Italy.—Established in 1879. Voluntary association.

Spain.—Established in 1880. Voluntary association, but receiving annually a grant of £1440 from government.

Canada.—Established in 1880. Government service.

Holland.—Established in 1884. Voluntary association, but assisted by a government subsidy.

Norway.—Established in 1891. Voluntary association, but receiving a small annual grant from government.

Portugal.—Established in 1898. Voluntary society.

India (*East Coast*).—Voluntary association.

Australia (*South*).—Voluntary association.

New Zealand.—Voluntary association.

Japan.—The National Life-boat Institution of Japan was founded in 1889. It is a voluntary society, assisted by government. Its affairs are managed by a president and a vice-president, supported by a very influential council. The head office is at Tôkyô; there are numerous branches with local committees. The Imperial government contributes an annual subsidy of 20,000 *yen* (£2000). The members of the Institution consist of three classes—honorary, ordinary and sub-ordinary, the amount contributed by the member determining the class in which he is placed. The chairman and council are not, as in Great Britain, appointed by the subscribers, but by the president, who must always be a member of the imperial family. The Institution bestows three medals: (*a*) the medal of merit, to be awarded to persons rendering distinguished service to the Institution; (*b*) the medal of membership, to be held by honorary and ordinary members or subscribers; and (*c*) the medal of praise, which is bestowed on those distinguishing themselves by special service in the work of rescue.

LIFFORD, the county town of Co. Donegal, Ireland, on the left bank of the Foyle. Pop. (1901) 446. The county gaol, court house and infirmary are here, but the town is practically a suburb of Strabane, across the river, in Co. Londonderry. Lifford, formerly called Ballyduff, was a chief stronghold of the O'Donnells of Tyrconnell. It was incorporated as a borough (under the name of Liffer) in the reign of James I. It returned two members to the Irish parliament until the union in 1800.

LIGAMENT (Lat. *ligamentum*, from *ligare*, to bind), anything which binds or connects two or more parts; in anatomy a piece of tissue connecting different parts of an organism (see CONNECTIVE TISSUES and JOINTS).

LIGAO, a town near the centre of the province of Albay, Luzon, Philippine Islands, close to the left bank of a tributary of the Bicol river, and on the main road through the valley. Pop. (1903) 17,687. East of the town rises Mayón, an active volcano, and the rich volcanic soil in this region produces hemp, rice and coco-nuts. Agriculture is the sole occupation of the inhabitants. Their language is Bicol.

LIGHT. *Introduction.*—§ 1. "Light" may be defined subjectively as the sense-impression formed by the eye. This is the most familiar connotation of the term, and suffices for the discussion of optical subjects which do not require an objective definition, and, in particular, for the treatment of physiological optics and vision. The objective definition, or the "nature of light," is the *ultima Thule* of optical research. "Emission theories," based on the supposition that light was a stream of corpuscles, were at first accepted. These gave place during the opening decades of the 19th century to the "undulatory or wave theory," which may be regarded as culminating in the "elastic solid theory"—so named from the lines along which the mathematical investigation proceeded—and according to which light is a transverse vibratory motion propagated longitudinally though the aether. The mathematical researches of James Clerk Maxwell have led to the rejection of this theory, and it is now held that light is identical with electromagnetic disturbances, such as are generated by oscillating electric currents or moving magnets. Beyond this point we cannot go at present. To quote Arthur Schuster (*Theory of Optics*, 1904), "So long as the character of the displacements which constitute the waves remains undefined we cannot pretend to have established a theory of light." It will thus be seen that optical and electrical phenomena are co-ordinated as a phase of the physics of the "aether," and that the investigation of these sciences culminates in the derivation of the properties of this conceptual medium, the existence of which was called into being as an instrument of research.[1] The methods of the elastic-solid theory can still be used with advantage in treating many optical phenomena, more especially so long as we remain ignorant of fundamental matters concerning the origin of electric and magnetic strains and stresses; in addition, the treatment is more intelligible, the researches on the electromagnetic theory leading in many cases to the derivation of differential equations which express quantitative relations between diverse phenomena, although no precise meaning can be attached to the symbols employed. The school following Clerk Maxwell and Heinrich Hertz has certainly laid the foundations of a complete theory of light and electricity, but the methods must be adopted with caution, lest one be constrained to say with Ludwig Boltzmann as in the introduction to his *Vorlesungen über Maxwell's Theorie der Elektricität und des Lichtes*:—

> "So soll ich denn mit saurem Schweiss
> Euch lehren, was ich selbst nicht weiss."
> GOETHE, *Faust.*

The essential distinctions between optical and electromagnetic phenomena may be traced to differences in the lengths of light-waves and of electromagnetic waves. The aether can probably transmit waves of any wave-length, the velocity of longitudinal propagation being about $3\cdot10^{10}$ cms. per second. The shortest waves, discovered by Schumann and accurately measured by Lyman, have a wave-length of 0·0001 mm.; the ultra-violet, recognized by their action on the photographic plate or by their promoting fluorescence, have a wave-length of 0·0002 mm.; the eye recognizes vibrations of a wave-length ranging from about 0·0004 mm. (violet) to about 0·0007 (red); the infra-red rays, recognized by their heating power or by their action on phosphorescent bodies, have a wave-length of 0·001 mm.; and the longest waves present in the radiations of a luminous source are the residual rays ("*Rest-strahlen*") obtained by repeated reflections from quartz (·0085 mm.), from fluorite (0·056 mm.), and from sylvite (0·06 mm.). The research-field of optics includes the investigation of the rays which we have just enumerated. A delimitation may then be made, inasmuch as luminous sources yield no other radiations, and also since the next series of waves, the electromagnetic waves, have a minimum wave-length of 6 mm.

§ 2. The commonest subjective phenomena of light are colour and visibility, *i.e.* why are some bodies visible and others not, or, in other words, what is the physical significance of the words "transparency," "colour" and "visibility." What is ordinarily understood by a *transparent* substance is one which transmits all the rays of white light without appreciable absorption—that some absorption does occur is perceived when the substance is viewed through a sufficient thickness. *Colour* is due to the absorption of certain rays of the spectrum, the unabsorbed rays being transmitted to the eye, where they occasion the sensation of colour (see COLOUR; ABSORPTION OF LIGHT). Transparent bodies are seen partly by reflected and partly by transmitted light, and opaque bodies by absorption. Refraction also influences visibility. Objects immersed in a liquid of the same refractive index and dispersion would be invisible; for example, a glass rod can hardly be seen when immersed in Canada balsam; other instances occur in the petrological examination of rock-sections under the microscope. In a complex rock-section the boldness with which the constituents stand out are measures of the difference between their refractive indices and the refractive index of the mounting medium, and the more nearly the indices coincide the less defined become the boundaries, while the interior of the mineral may be most advantageously explored. Lord Rayleigh has shown that transparent objects can only be seen when non-uniformly illuminated, the differences in the refractive indices of the substance and the surrounding medium becoming inoperative when the illumination is uniform on all sides. R. W. Wood has performed experiments which confirm this view.

The analysis of white light into the spectrum colours, and the re-formation of the original light by transmitting the spectrum through a reversed prism, proved, to the satisfaction of Newton and subsequent physicists until late in the 19th century, that the various coloured rays were present in white light, and that the action of the prism was merely to sort out the rays. This view, which suffices for the explanation of most phenomena, has now been given up, and the modern view is that the prism or grating really does *manufacture* the colours, as was held previously to Newton. It appears that white light is a sequence of irregular wave trains which are analysed into series of more regular trains by the prism or grating in a manner comparable with the analytical resolution presented by Fourier's theorem. The modern view points to the *mathematical* existence of waves of all wave-lengths in white light, the Newtonian view to the *physical* existence. Strictly, the term "monochromatic" light is only applicable to light of a single wave-length (which can have no actual existence), but it is commonly used to denote light which cannot be analysed by the instruments at our disposal; for example, with low-power instruments the light emitted by sodium vapour would be regarded as homogeneous or monochromatic, but higher power instruments resolve this light into two components of different wave-lengths, each of which is of a higher degree of homogeneity, and it is not impossible that these rays may be capable of further analysis.

§ 3. *Divisions of the Subject.*—In the early history of the science of light or optics a twofold division was adopted: *Catoptrics* (from Gr. *κάτοπτρον*, a mirror), embracing the phenomena of reflection, *i.e.* the formation of images by mirrors; and *Dioptrics* (Gr. *διά*, through), embracing the phenomena of refraction, *i.e.* the bending of a ray of light when passing obliquely through the surface dividing two media.[2] A third element, *Chromatics* (Gr. *χρῶμα*, colour), was subsequently introduced to include phenomena involving colour transformations, such as the iridescence of mother-of-pearl, feathers, soap-bubbles, oil floating on water, &c. This classification has been discarded (although the terms, particularly "dioptric" and "chromatic," have survived as adjectives) in favour of a twofold division: geometrical optics and physical optics. *Geometrical optics* is a mathematical development (mainly effected by geometrical methods) of three laws assumed to be rigorously true: (1) the law of rectilinear propagation, viz. that light travels in straight lines or *rays* in any homogeneous medium; (2) the law of reflection, viz. that the incident and reflected rays at any point of a surface are equally inclined to, and coplanar with, the normal to the surface at the point of incidence; and (3) the law of refraction, viz. that the incident and refracted rays at a surface dividing two media make angles with the normal to the surface at the point of incidence whose sines are in a ratio (termed the "refractive index") which is constant for every particular pair of media, and that the incident and refracted rays are coplanar with the normal. *Physical optics*, on the other hand, has for its ultimate object the elucidation of the question: what is light? It investigates the nature of the rays themselves, and, in addition to determining the validity of the axioms of geometrical optics, embraces phenomena for the explanation of which an expansion of these assumptions is necessary.

Of the subordinate phases of the science, "physiological optics" is concerned with the phenomena of vision, with the eye as an optical instrument, with colour-perception, and with such allied subjects as the appearance of the eyes of a cat and the luminosity of the glow-worm and firefly; "meteorological optics" includes phenomena occasioned by the atmosphere, such as the rainbow, halo, corona, mirage, twinkling of stars and colour of the sky, and also the effects of atmospheric dust in promoting such brilliant sunsets as were seen after the eruption of Krakatoa; "magneto-optics" investigates the effects of electricity and magnetism on optical properties; "photo-chemistry," with its more practical development photography, is concerned with the influence of light in effecting chemical action; and the term "applied optics" may be used to denote, on the one hand, the experimental investigation of material for forming optical systems, *e.g.* the study of glasses with a view to the formation of a glass of specified optical properties (with which may be included such matters as the transparency of rock-salt for the infra-red and of quartz for the ultra-violet rays), and, on the other hand, the application of geometrical and physical investigations to the construction of optical instruments.

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[1] The invention of "aethers" is to be carried back, at least, to the Greek philosophers, and with the growth of knowledge they were empirically postulated to explain many diverse phenomena. Only one "aether" has survived in modern science—that associated with light and electricity, and of which Lord Salisbury, in his presidential address to the British Association in 1894, said, "For more than two generations the main, if not the only, function of the word 'aether' has been to furnish a nominative case to the verb 'to undulate.'" (See AETHER.)

[2] With the Greeks the word "Optics" or Ὀπτικά (from ὄπτομαι, the obsolete present of ὁρῶ, I see) was restricted to questions concerning vision, &c., and the nature of light.

§ 4. *Arrangement of the Subject.*—The following three divisions of this article deal with: (I.) the history of the science of light; (II.) the nature of light; (III.) the velocity of light; but a summary (which does not aim at scientific precision) may here be given to indicate to the reader the inter-relation of the various optical phenomena, those phenomena which are treated in separate articles being shown in larger type.

The simplest subjective phenomena of light are Colour and intensity, the measurement of the latter being named Photometry. When light falls on a medium, it may be returned by Reflection or it may suffer Absorption; or it may be transmitted and undergo Refraction, and, if the light be composite, Dispersion; or, as in the case of oil films on water, brilliant colours are seen, an effect which is due to Interference. Again, if the rays be transmitted in two directions, as with certain crystals, "double refraction" (see Refraction, Double) takes place, and the emergent rays have undergone Polarization. A Shadow is cast by light falling on an opaque object, the complete theory of which involves the phenomenon of Diffraction. Some substances have the property of transforming luminous radiations, presenting the phenomena of Calorescence, Fluorescence and Phosphorescence. An optical system is composed of any number of Mirrors or Lenses, or of both. If light falling on a system be not brought to a focus, *i.e.* if all the emergent rays be not concurrent, we are presented with a Caustic and an Aberration. An optical instrument is simply the setting up of an optical system, the Telescope, Microscope, Objective, optical Lantern, Camera lucida, Camera obscura and the Kaleidoscope are examples; instruments serviceable for simultaneous vision with both eyes are termed Binocular instruments; the Stereoscope may be placed in this category; the optical action of the Zoëtrope, with its modern development the Cinematograph, depends upon the physiological persistence of Vision. Meteorological optical phenomena comprise the Corona, Halo, Mirage, Rainbow, colour of Sky and Twilight, and also astronomical refraction (see Refraction, Astronomical); the complete theory of the corona involves Diffraction, and atmospheric Dust also plays a part in this group of phenomena.

I. History

§ 1. There is reason to believe that the ancients were more familiar with optics than with any other branch of physics; and this may be due to the fact that for a knowledge of external things man is indebted to the sense of vision in a far greater degree than to other senses. That light travels in straight lines—or, in other words, that an object is seen in the direction in which it really lies—must have been realized in very remote times. The antiquity of mirrors points to some acquaintance with the phenomena of reflection, and Layard's discovery of a convex lens of rock-crystal among the ruins of the palace of Nimrud implies a knowledge of the burning and magnifying powers of this instrument. The Greeks were acquainted with the fundamental law of reflection, viz. the equality of the angles of incidence and reflection; and it was Hero of Alexandria who proved that the path of the ray is the least possible. The lens, as an instrument for magnifying objects or for concentrating rays to effect combustion, was also known. Aristophanes, in the *Clouds* (*c.* 424 B.C.), mentions the use of the burning-glass to destroy the writing on a waxed tablet; much later, Pliny describes such glasses as solid balls of rock-crystal or glass, or hollow glass balls filled with water, and Seneca mentions their use by engravers. A treatise on optics (Κατοπτρικά), assigned to Euclid by Proclus and Marinus, shows that the Greeks were acquainted with the production of images by plane, cylindrical and concave and convex spherical mirrors, but it is doubtful whether Euclid was the author, since neither this work nor the Ὀπτικά, a work treating of vision and also assigned to him by Proclus and Marinus, is mentioned by Pappus, and more particularly since the demonstrations do not exhibit the precision of his other writings.

Reflection, or catoptrics, was the key-note of their explanations of optical phenomena; it is to the reflection of solar rays by the air that Aristotle ascribed twilight, and from his observation of the colours formed by light falling on spray, he attributes the rainbow to reflection from drops of rain. Although certain elementary phenomena of refraction had also been noted—such as the apparent bending of an oar at the point where it met the water, and the apparent elevation of a coin in a basin by filling the basin with water—the quantitative law of refraction was unknown; in fact, it was not formulated until the beginning of the 17th century. The analysis of white light into the continuous spectrum of rainbow colours by transmission through a prism was observed by Seneca, who regarded the colours as fictitious, placing them in the same category as the iridescent appearance of the feathers on a pigeon's neck.

§ 2. The aversion of the Greek thinkers to detailed experimental inquiry stultified the progress of the science; instead of acquiring facts necessary for formulating scientific laws and correcting hypotheses, the Greeks devoted their intellectual energies to philosophizing on the nature of light itself. In their search for a theory the Greeks were mainly concerned with vision—in other words, they sought to determine how an object was seen, and to what its colour was due. Emission theories, involving the conception that light was a stream of concrete particles, were formulated. The Pythagoreans assumed that vision and colour were caused by the bombardment of the eye by minute particles projected from the surface of the object seen. The Platonists subsequently introduced three elements—a stream of particles emitted by the eye (their "divine fire"), which united with the solar rays, and, after the combination had met a stream from the object, returned to the eye and excited vision.

In some form or other the emission theory—that light was a longitudinal propulsion of material particles—dominated optical thought until the beginning of the 19th century. The authority of the Platonists was strong enough to overcome Aristotle's theory that light was an activity (ἐνέργεια) of a medium which he termed the *pellucid* (διαφανές); about two thousand years later Newton's exposition of his corpuscular theory overcame the undulatory hypotheses of Descartes and Huygens; and it was only after the acquisition of new experimental facts that the labours of Thomas Young and Augustin Fresnel indubitably established the wave-theory.

§ 3. The experimental study of refraction, which had been almost entirely neglected by the early Greeks, received more attention during the opening centuries of the Christian era. Cleomedes, in his *Cyclical Theory of Meteors*, *c.* A.D. 50, alludes to the apparent bending of a stick partially immersed in water, and to the rendering visible of coins in basins by filling up with water; and also remarks that the air may refract the sun's rays so as to render that luminary visible, although actually it may be below the horizon. The most celebrated of the early writers on optics is the Alexandrian Ptolemy (2nd century). His writings on light are believed to be preserved in two imperfect Latin manuscripts, themselves translations from the Arabic. The subjects discussed include the nature of light and colour; the formation of images by various types of mirrors, refractions at the surface of glass and of water, with tables of the angle of refraction corresponding to given angles of incidence for rays passing from air to glass and from air to water; and also astronomical refractions, *i.e.* the apparent displacement of a heavenly body due to the refraction of light in its passage through the atmosphere. The authenticity of these manuscripts has been contested: the *Almagest* contains no mention of the *Optics*, nor is the subject of astronomical refractions noticed, but the strongest objection, according to A. de Morgan, is the fact that their author was a poor geometer.

§ 4. One of the results of the decadence of the Roman empire was the suppression of the academies, and few additions were made to scientific knowledge on European soil until the 13th century. Extinguished in the West, the spirit of research was kindled in the East. The accession of the Arabs to power and territory in the 7th century was followed by the acquisition of the literary stores of Greece, and during the following five centuries the Arabs, both by their preservation of existing works and by their original discoveries (which, however, were but few), took a permanent place in the history of science. Pre-eminent among Arabian scientists is Alhazen, who flourished in the 11th century. Primarily a mathematician and astronomer, he also investigated a wide range of optical phenomena. He examined the anatomy of the eye, and the functions of its several parts in promoting vision; and explained how it is that we see one object with two eyes, and then not by a single ray or beam as had been previously held, but by two cones of rays proceeding from the object, one to each eye. He attributed vision to emanations from the body seen; and on his authority the Platonic theory fell into disrepute. He also discussed the magnifying powers of lenses; and it may be that his writings on this subject inspired the subsequent invention of spectacles. Astronomical observations led to the investigation of refraction by the atmosphere, in particular, astronomical refraction; he explained the phenomenon of twilight, and showed a connexion between its duration and the height of the atmosphere. He also treated *optical deceptions*, both in direct vision and in vision by reflected and refracted light, including the phenomenon known as the *horizontal moon*, *i.e.* the apparent increase in the diameter of the sun or moon when near the horizon. This appearance had been explained by Ptolemy on the supposition that the diameter was actually increased by refraction, and his commentator Theon endeavoured to explain why an object appears larger when viewed under water. But actual experiment showed that the diameter did not increase. Alhazen gave the correct explanation, which, however, Friar Bacon attributes to Ptolemy. We judge of distance by comparing the angle under which an object is seen with its supposed distance, so that if two objects be seen under nearly equal angles and one be supposed to be more distant than the other, then the former will be supposed to be the larger. When near the horizon the sun or moon, conceived as very distant, are intuitively compared with terrestrial objects, and therefore they appear larger than when viewed at elevations.

§ 5. While the Arabs were acting as the custodians of scientific knowledge, the institutions and civilizations of Europe were gradually crystallizing. Attacked by the Mongols and by the Crusaders, the Bagdad caliphate disappeared in the 13th century. At that period the Arabic commentaries, which had already been brought to Europe, were beginning to exert great influence on scientific thought; and it is probable that their rarity and the increasing demand for the originals and translations led to those forgeries which are of frequent occurrence in the literature of the middle ages. The first treatise on optics written in Europe was admitted by its author Vitello or Vitellio, a native of Poland, to be based on the works of Ptolemy and Alhazen. It was written in about 1270, and first published in 1572, with a Latin translation of Alhazen's treatise, by F. Risner, under the title *Thesaurus opticae*. Its tables of refraction are more accurate than Ptolemy's; the author follows Alhazen in his investigation of lenses, but his determinations of the foci and magnifying powers of spheres are inaccurate. He attributed the twinkling of stars to refraction by moving air, and observed that the scintillation was increased by viewing through water in gentle motion; he also recognized that both reflection and refraction were instrumental in producing the rainbow, but he gave no explanation of the colours.

The *Perspectiva Communis* of John Peckham, archbishop of Canterbury, being no more than a collection of elementary propositions containing nothing new, we have next to consider the voluminous works of Vitellio's illustrious contemporary, Roger Bacon. His writings on light, *Perspectiva* and *Specula mathematica*, are included in his *Opus majus*. It is conceivable that he was acquainted with the nature of the images formed by light traversing a small orifice—a phenomenon noticed by Aristotle, and applied at a later date to the construction of the camera obscura. The invention of the magic lantern has been ascribed to Bacon, and his statements concerning spectacles, the telescope, and the microscope, if not based on an experimental realization of these instruments, must be regarded as masterly conceptions of the applications of lenses. As to the nature of light, Bacon adhered to the theory that objects are rendered visible by emanations from the eye.

The history of science, and more particularly the history of inventions, constantly confronts us with the problem presented by such writings as Friar Bacon's. Rarely has it been given to one man to promote an entirely new theory or to devise an original instrument; it is more generally the case that, in the evolution of a single idea, there comes some stage which arrests our attention, and to which we assign the dignity of an "invention." Furthermore, the obscurity that surrounds the early history of spectacles, the magic lantern, the telescope and the microscope, may find a partial solution in the spirit of the middle ages. The natural philosopher who was bold enough to present to a prince a pair of spectacles or a telescope would be in imminent danger of being regarded in the eyes of the church as a powerful and dangerous magician; and it is conceivable that the maker of such an instrument would jealously guard the secret of its actual construction, however much he might advertise its potentialities.[1]

§ 6. The awakening of Europe, which first manifested itself in Italy, England and France, was followed in the 16th century by a period of increasing intellectual activity. The need for experimental inquiry was realized, and a tendency to dispute the dogmatism of the church and to question the theories of the established schools of philosophy became apparent. In the science of optics, Italy led the van, the foremost pioneers being Franciscus Maurolycus (1494–1575) of Messina, and Giambattista della Porta (1538–1615) of Naples. A treatise by Maurolycus entitled *Photismi de Lumine et Umbra prospectivum radiorum incidentium facientes* (1575), contains a discussion of the measurement of the intensity of light—an early essay in photometry; the formation of circular patches of light by small holes of any shape, with a correct explanation of the phenomenon; and the optical relations of the parts of the eye, maintaining that the crystalline humour acts as a lens which focuses images on the retina, explaining short- and long-sight (myopia and hypermetropia), with the suggestion that the former may be corrected by concave, and the latter by convex, lenses. He observed the spherical aberration due to elements beyond the axis of a lens, and also the caustics of refraction (diacaustics) by a sphere (seen as the bright boundaries of the luminous patches formed by receiving the transmitted light on a screen), which he correctly regarded as determined by the intersections of the refracted rays. His researches on refraction were less fruitful; he assumed the angles of incidence and refraction to be in the constant ratio of 8 to 5, and the rainbow, in which he recognized four colours, orange, green, blue and purple, to be formed by rays reflected in the drops along the sides of an octagon. Porta's fame rests chiefly on his *Magia naturalis sive de miraculis rerum naturalium*, of which four books were published in 1558, the complete work of twenty books appearing in 1589. It attained great popularity, perhaps by reason of its astonishing medley of subjects—pyrotechnics and perfumery, animal reproduction and hunting, alchemy and optics,—and it was several times reprinted, and translated into English (with the title *Natural Magick*, 1658), German, French, Spanish, Hebrew and Arabic. The work contains an account of the camera obscura, with the invention of which the author has sometimes been credited; but, whoever the inventor, Porta was undoubtedly responsible for improving and popularizing that instrument, and also the magic lantern. In the same work practical applications of lenses are suggested, combinations comparable with telescopes are vaguely treated and spectacles are discussed. His *De Refractione, optices parte* (1593) contains an account of binocular vision, in which are found indications of the principle of the stereoscope.

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[1] It seems probable that spectacles were in use towards the end of the 13th century. The Italian dictionary of the *Accademici della Crusca* (1612) mentions a sermon of Jordan de Rivalto, published in 1305, which refers to the invention as "not twenty years since"; and Muschenbroek states that the tomb of Salvinus Armatus, a Florentine nobleman who died in 1317, bears an inscription assigning the invention to him. (See the articles TELESCOPE and CAMERA OBSCURA for the history of these instruments.)

§ 7. The empirical study of lenses led, in the opening decade of the 17th century, to the emergence of the telescope from its former obscurity. The first form, known as the Dutch or Galileo telescope, consisted of a convex and a concave lens, a combination which gave erect images; the later form, now known as the "Keplerian" or "astronomical" telescope (in contrast with the earlier or "terrestrial" telescope) consisted of two convex lenses, which gave inverted images. With the microscope, too, advances were made, and it seems probable that the compound type came into common use about this time. These single instruments were followed by the invention of binoculars, *i.e.* instruments which permitted simultaneous vision with both eyes. There is little doubt that the experimental realization of the telescope, opening up as it did such immense fields for astronomical research, stimulated the study of lenses and optical systems. The investigations of Maurolycus were insufficient to explain the theory of the telescope, and it was Kepler who first determined the principle of the Galilean telescope in his *Dioptrice* (1611), which also contains the first description of the astronomical or Keplerian telescope, and the demonstration that rays parallel to the axis of a plano-convex lens come to a focus at a point on the axis distant twice the radius of the curved surface of the lens, and, in the case of an equally convex lens, at an axial point distant only once the radius. He failed, however, to determine accurately the case for unequally convex lenses, a problem which was solved by Bonaventura Cavalieri, a pupil of Galileo.

Early in the 17th century great efforts were made to determine the law of refraction. Kepler, in his *Prolegomena ad Vitellionem* (1604), assiduously, but unsuccessfully, searched for the law, and can only be credited with twenty-seven empirical rules, really of the nature of approximations, which he employed in his theory of lenses. The true law—that the ratio of the sines of the angles of incidence and refraction is constant—was discovered in 1621 by Willebrord Snell (1591–1626); but was published for the first time after his death, and with no mention of his name, by Descartes. Whereas in Snell's manuscript the law was stated in the form of the ratio of certain lines, trigonometrically interpretable as a ratio of cosecants, Descartes expressed the law in its modern trigonometrical form, viz. as the ratio of the sines. It may be observed that the modern form was independently obtained by James Gregory and published in his *Optica promota* (1663). Armed with the law of refraction, Descartes determined the geometrical theory of the primary and secondary rainbows, but did not mention how far he was indebted to the explanation of the primary bow by Antonio de Dominis in 1611; and, similarly, in his additions to the knowledge of the telescope the influence of Galileo is not recorded.

§ 8. In his metaphysical speculations on the system of nature, Descartes formulated a theory of light at variance with the generally accepted emission theory and showing some resemblance to the earlier views of Aristotle, and, in a smaller measure, to the modern undulatory theory. He imagined light to be a pressure transmitted by an infinitely elastic medium which pervades space, and colour to be due to rotatory motions of the particles of this medium. He attempted a mechanical explanation of the law of refraction, and came to the conclusion that light passed more readily through a more highly refractive medium. This view was combated by Pierre de Fermat (1601–1665), who, from the principle known as the "law of least time," deduced the converse to be the case, *i.e.* that the velocity varied inversely with the refractive index. In brief, Fermat's argument was as follows: Since nature performs her operations by the most direct routes or shortest paths, then the path of a ray of light between any two points must be such that the time occupied in the passage is a minimum. The rectilinear propagation and the law of reflection obviously agree with this principle, and it remained to be proved whether the law of refraction tallied.

Although Fermat's premiss is useless, his inference is invaluable, and the most notable application of it was made in about 1824 by Sir William Rowan Hamilton, who merged it into his conception of the "characteristic function," by the help of which all optical problems, whether on the corpuscular or on the undulator theory, are solved by one common process. Hamilton was in possession of the germs of this grand theory some years before 1824, but it was first communicated to the Royal Irish Academy in that year, and published in imperfect instalments some years later. The following is his own description of it. It is of interest as exhibiting the origin of Fermat's deduction, its relation to contemporary and subsequent knowledge, and its connexion with other analytical principles. Moreover, it is important as showing Hamilton's views on a very singular part of the more modern history of the science to which he contributed so much.

> "Those who have meditated on the beauty and utility, in theoretical mechanics, of the general method of Lagrange, who have felt the power and dignity of that central dynamical theorem which he deduced, in the *Mécanique analytique* . . ., must feel that mathematical optics can only *then* attain a coordinate rank with mathematical mechanics . . ., when it shall possess an appropriate method, and become the unfolding of a central idea. . . . It appears that if a general method in deductive optics can be attained at all, it must flow from some law or principle, itself of the highest generality, and among the highest results of induction. . . . [This] must be the principle, or law, called usually the Law of Least Action; suggested by questionable views, but established on the widest induction, and embracing every known combination of media, and every straight, or bent, or curved line, ordinary or extraordinary, along which light (whatever light may be) extends its influence successively in space and time: namely, that this linear path of light, from one point to another, is always found to be such that, if it be compared with the other infinitely various lines by which in thought and in geometry the same two points might be connected, a certain integral or sum, called often *Action*, and depending by fixed rules on the length, and shape, and position of the path, and on the media which are traversed by it, is less than all the similar integrals for the other neighbouring lines, or, at least, possesses, with respect to them, a certain *stationary* property. From this Law, then, which may, perhaps, be named the LAW OF STATIONARY ACTION, it seems that we may most fitly and with best hope set out, in the synthetic or deductive process and in the search of a mathematical method.
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> "Accordingly, from this known law of least or stationary action I deduced (long since) another connected and coextensive principle, which may be called by analogy the LAW OF VARYING ACTION, and which seems to offer naturally a method such as we are seeking; the one law being as it were the last step in the ascending scale of induction, respecting linear paths of light, while the other law may usefully be made the first in the descending and deductive way.
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> "The former of these two laws was discovered in the following manner. The elementary principle of straight rays showed that light, under the most simple and usual circumstances, employs the direct, and therefore the shortest, course to pass from one point to another. Again, it was a very early discovery (attributed by Laplace to Ptolemy), that, in the case of a plane mirror, the bent line formed by the incident and reflected rays is shorter than any other bent line having the same extremities, and having its point of bending on the mirror. These facts were thought by some to be instances and results of the simplicity and economy of nature; and Fermat, whose researches on maxima and minima are claimed by the Continental mathematicians as the germ of the differential calculus, sought anxiously to trace some similar economy in the

more complex case of refraction. He believed that by a metaphysical or cosmological necessity, arising from the simplicity of the universe, light always takes the course which it can traverse in the shortest time. To reconcile this metaphysical opinion with the law of refraction, discovered experimentally by Snellius, Fermat was led to suppose that the two lengths, or *indices*, which Snellius had measured on the incident ray prolonged and on the refracted ray, and had observed to have one common projection on a refracting plane, are inversely proportional to the two successive velocities of the light before and after refraction, and therefore that the velocity of light is diminished on entering those denser media in which it is observed to approach the perpendicular; for Fermat believed that the time of propagation of light along a line bent by refraction was represented by the sum of the two products, of the incident portion multiplied by the index of the first medium and of the refracted portion multiplied by the index of the second medium; because he found, by his mathematical method, that this sum was less, in the case of a plane refractor, than if light went by any other than its actual path from one given point to another, and because he perceived that the supposition of a velocity inversely as the index reconciled his mathematical discovery of the minimum of the foregoing sum with his cosmological principle of least time. Descartes attacked Fermat's opinions respecting light, but Leibnitz zealously defended them; and Huygens was led, by reasonings of a very different kind, to adopt Fermat's conclusions of a velocity inversely as the index, and of a *minimum time* of propagation of light, in passing from one given point to another through an ordinary refracting plane. Newton, however, by his theory of emission and attraction, was led to conclude that the velocity of light was *directly*, not *inversely*, as the index, and that it was *increased* instead of being *diminished* on entering a denser medium; a result incompatible with the theorem of the shortest time in refraction. This theorem of shortest time was accordingly abandoned by many, and among the rest by Maupertuis, who, however, proposed in its stead, as a new cosmological principle, that *celebrated law of least action* which has since acquired so high a rank in mathematical physics, by the improvements of Euler and Lagrange."

§ 9. The second half of the 17th century witnessed developments in the practice and theory of optics which equal in importance the mathematical, chemical and astronomical acquisitions of the period. Original observations were made which led to the discovery, in an embryonic form, of new properties of light, and the development of mathematical analysis facilitated the quantitative and theoretical investigation of these properties. Indeed, mathematical and physical optics may justly be dated from this time. The phenomenon of *diffraction*, so named by Grimaldi, and by Newton *inflection*, which may be described briefly as the spreading out, or deviation, from the strictly rectilinear path of light passing through a small aperture or beyond the edge of an opaque object, was discovered by the Italian Jesuit, Francis Maria Grimaldi (1619–1663), and published in his *Physico-Mathesis de Lumine* (1665); at about the same time Newton made his classical investigation of the spectrum or the band of colours formed when light is transmitted through a prism,[1] and studied *interference* phenomena in the form of the colours of thin and thick plates, and in the form now termed *Newton's rings*; *double refraction*, in the form of the dual images of a single object formed by a rhomb of Iceland spar, was discovered by Bartholinus in 1670; Huygens's examination of the transmitted beams led to the discovery of an absence of symmetry now called *polarization*; and the finite velocity of light was deduced in 1676 by Ole Roemer from the comparison of the observed and computed times of the eclipses of the moons of Jupiter.

These discoveries had a far-reaching influence upon the theoretical views which had been previously held: for instance, Newton's recombination of the spectrum by means of a second (inverted) prism caused the rejection of the earlier view that the prism actually manufactured the colours, and led to the acceptance of the theory that the colours were physically present in the white light, the function of the prism being merely to separate the physical mixture; and Roemer's discovery of the finite velocity of light introduced the necessity of considering the momentum of the particles which, on the accepted emission theory, composed the light. Of greater moment was the controversy concerning the emission or corpuscular theory championed by Newton and the undulatory theory presented by Huygens (see section II. of this article). In order to explain the colours of thin plates Newton was forced to abandon some of the original simplicity of his theory; and we may observe that by postulating certain motions for the Newtonian corpuscles all the phenomena of light can be explained, these motions aggregating to a transverse displacement translated longitudinally, and the corpuscles, at the same time, becoming otiose and being replaced by a medium in which the vibration is transmitted. In this way the Newtonian theory may be merged into the undulatory theory. Newton's results are collected in his *Opticks*, the first edition of which appeared in 1704. Huygens published his theory in his *Traité de lumière* (1690), where he explained reflection, refraction and double refraction, but did not elucidate the formation of shadows (which was readily explicable on the Newtonian hypothesis) or polarization; and it was this inability to explain polarization which led to Newton's rejection of the wave theory. The authority of Newton and his masterly exposition of the corpuscular theory sustained that theory until the beginning of the 19th century, when it succumbed to the assiduous skill of Young and Fresnel.

§ 10. Simultaneously with this remarkable development of theoretical and experimental optics, notable progress was made in the construction of optical instruments. The increased demand for telescopes, occasioned by the interest in observational astronomy, led to improvements in the grinding of lenses (the primary aim being to obtain forms in which spherical aberration was a minimum), and also to the study of achromatism, the principles of which followed from Newton's analysis and snythesis of white light. Kepler's supposition that lenses having the form of surfaces of revolution of the conic sections would bring rays to a focus without spherical aberration was investigated by Descartes, and the success of the latter's demonstration led to the grinding of ellipsoidal and hyperboloidal lenses, but with disappointing results.[2] The grinding of spherical lenses was greatly improved by Huygens, who also attempted to reduce chromatic aberration in the refracting telescope by introducing a stop (*i.e.* by restricting the aperture of the rays); to the same experimenter are due compound eye-pieces, the invention of which had been previously suggested by Eustachio Divini. The so-called Huygenian eye-piece is composed of two plano-convex lenses with their plane faces towards the eye; the field-glass has a focal length three times that of the eye-glass, and the distance between them is twice the focal length of the eye-glass. Huygens observed that spherical aberration was diminished by making the deviations of the rays at the two lenses equal, and Ruggiero Giuseppe Boscovich subsequently pointed out that the combination was achromatic. The true development, however, of the achromatic refracting telescope, which followed from the introduction of compound object-glasses giving no dispersion, dates from about the middle of the 18th century.

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[1] Newton's observation that a second refraction did not change the colours had been anticipated in 1648 by Marci de Kronland (1595–1667), professor of medicine at the university of Prague, in his *Thaumantias*, who studied the spectrum under the name of *Iris trigonia*. There is no evidence that Newton knew of this, although he mentions de Dominic's experiment with the glass globe containing water.

[2] The geometrical determination of the form of the surface which will reflect, or of the surface dividing two media which will refract, rays from one point to another, is very easily effected by using the "characteristic function" of Hamilton, which for the problems under consideration may be stated in the form that "the optical paths of all rays must be the same." In the case of reflection, if A and B be the diverging and converging points, and P a point on the reflecting surface, then the locus of P is such that $AP+PB$ is constant. Therefore the surface is an ellipsoid of revolution having A and B as foci. If the rays be parallel, *i.e.* if A be at infinity, the surface is a paraboloid of revolution having B as focus and the axis parallel to the direction of the rays. In refraction if A be in the medium of index μ, and B in the medium of index μ', the characteristic function shows that $\mu AP+\mu' PB$, where P is a point on the surface, must be constant. Plane sections through A and B of such surfaces were originally investigated by Descartes, and are named Cartesian ovals. If the rays be parallel, *i.e.* A be at infinity, the surface becomes an ellipsoid of revolution having B for one focus, μ'/μ for eccentricity, and the axis parallel to the direction of the rays.

The difficulty of obtaining lens systems in which aberrations were minimized, and the theory of Newton that colour production invariably attended refraction, led to the manufacture of improved specula which permitted the introduction of reflecting telescopes. The idea of this type of instrument had apparently occurred to Marin Mersenne in about 1640, but the first reflector of note was described in 1663 by James Gregory in his *Optica promota;* a second type was invented by Newton, and a third in 1672 by Cassegrain. Slight improvements were made in the microscope, although the achromatic type did not appear until about 1820, some sixty years after John Dollond had determined the principle of the achromatic telescope (see ABERRATION, TELESCOPE, MICROSCOPE, BINOCULAR INSTRUMENT).

§ 11. Passing over the discovery by Ehrenfried Walther Tschirnhausen (1651–1708) of the caustics produced by reflection ("catacaustics") and his experiments with large reflectors and refractors (for the manufacture of which he established glass-works in Italy); James Bradley's discovery in 1728 of the "aberration of light," with the subsequent derivation of the velocity of light, the value agreeing fairly well with Roemer's estimate; the foundation of scientific photometry by Pierre Bouguer in an essay published in 1729 and expanded in 1760 into his *Traité d'optique sur la graduation de la lumière*; the publication of John Henry Lambert's treatise on the same subject, entitled *Photometria, sive de Mensura et Gradibus Luminis, Colorum et Umbrae* (1760); and the development of the telescope and other optical instruments, we arrive at the closing decades of the 18th century. During the forty years 1780 to 1820 the history of optics is especially marked by the names of Thomas Young and Augustin Fresnel, and in a lesser degree by Arago, Malus, Sir William Herschel, Fraunhofer, Wollaston, Biot and Brewster.

Although the corpuscular theory had been disputed by Benjamin Franklin, Leonhard Euler and others, the authority of Newton retained for it an almost general acceptance until the beginning of the 19th century, when Young and Fresnel instituted their destructive criticism. Basing his views on the earlier undulatory theories and diffraction phenomena of Grimaldi and Hooke, Young accepted the Huygenian theory, assuming, from a false analogy with sound waves, that the wave-disturbance was longitudinal, and ignoring the suggestion made by Hooke in 1672 that the direction of the vibration might be transverse, *i.e.* at right angles to the direction of the rays. As with Huygens, Young was unable to explain diffraction correctly, or polarization. But the assumption enabled him to establish the principle of interference,[1] one of the most fertile in the science of physical optics. The undulatory theory was also accepted by Fresnel who, perceiving the inadequacy of the researches of Huygens and Young, showed in 1818 by an analysis which, however, is not quite free from objection, that, by assuming that every element of a wave-surface could act as a source of secondary waves or wavelets, the diffraction bands were due to the interference of the secondary waves formed by each element of a primary wave falling upon the edge of an obstacle or aperture. One consequence of Fresnel's theory was that the bands were independent of the nature of the diffracting edge—a fact confirmed by experiment and therefore invalidating Young's theory that the bands were produced by the interference between the primary wave and the wave reflected from the edge of the obstacle. Another consequence, which was first mathematically deduced by Poisson and subsequently confirmed by experiment, is the paradoxical phenomenon that a small circular disk illuminated by a point source casts a shadow having a bright centre.

§ 12. The undulatory theory reached its zenith when Fresnel explained the complex phenomena of polarization, by adopting the conception of Hooke that the vibrations were transverse, and not longitudinal.[2] Polarization by double refraction had been investigated by Huygens, and the researches of Wollaston and, more especially, of Young, gave such an impetus to the study that the Institute of France made double refraction the subject of a prize essay in 1812. E. L. Malus (1775–1812) discovered the phenomenon of polarization by reflection about 1808 and investigated metallic reflection; Arago discovered circular polarization in quartz in 1811, and, with Fresnel, made many experimental investigations, which aided the establishment of the Fresnel-Arago laws of the interference of polarized beams; Biot introduced a reflecting polariscope, investigated the colours of crystalline plates and made many careful researches on the rotation of the plane of polarization; Sir David Brewster made investigations over a wide range, and formulated the law connecting the angle of polarization with the refractive index of the reflecting medium. Fresnel's theory was developed in a strikingly original manner by Sir William Rowan Hamilton, who interpreted from Fresnel's analytical determination of the geometrical form of the wave-surface in biaxal crystals the existence of two hitherto unrecorded phenomena. At Hamilton's instigation Humphrey Lloyd undertook the experimental search, and brought to light the phenomena of external and internal conical refraction.

The undulatory vibration postulated by Fresnel having been generally accepted as explaining most optical phenomena, it became necessary to determine the mechanical properties of the aether which transmits this motion. Fresnel, Neumann, Cauchy, MacCullagh, and, especially, Green and Stokes, developed the "elastic-solid theory." By applying the theory of elasticity they endeavoured to determine the constants of a medium which could transmit waves of the nature of light. Many different allocations were suggested (of which one of the most recent is Lord Kelvin's "contractile aether," which, however, was afterwards discarded by its author), and the theory as left by Green and Stokes has merits other than purely historical. At a later date theories involving an action between the aether and material atoms were proposed, the first of any moment being J. Boussinesq's (1867). C. Christiansen's investigation of anomalous dispersion in 1870, and the failure of Cauchy's formula (founded on the elastic-solid theory) to explain this phenomenon, led to the theories of W. Sellmeier (1872), H. von Helmholtz (1875), E. Ketteler (1878), E. Lommel (1878) and W. Voigt (1883). A third class of theory, to which the present-day theory belongs, followed from Clerk Maxwell's analytical investigations in electromagnetics. Of the greatest exponents of this theory we may mention H. A. Lorentz, P. Drude and J. Larmor, while Lord Rayleigh has, with conspicuous brilliancy, explained several phenomena (*e.g.* the colour of the sky) on this hypothesis.

For a critical examination of these theories see section II. of this article; reference may also be made to the *British Association Reports*: "On Physical Optics," by Humphrey Lloyd (1834), p. 35; "On Double Refraction," by Sir G. G. Stokes (1862), p. 253; "On Optical Theories," by R. T. Glazebrook (1885), p. 157.

§ 13. *Recent Developments.*—The determination of the velocity of light (see section III. of this article) may be regarded as definitely settled, a result contributed to by A. H. L. Fizeau (1849), J. B. L. Foucault (1850, 1862), A. Cornu (1874), A. A. Michelson (1880), James Young and George Forbes (1882), Simon Newcomb (1880–1882) and Cornu (1900). The velocity in moving media was investigated theoretically by Fresnel; and Fizeau (1859), and Michelson and Morley (1886) showed experimentally that the velocity was increased in running water by an amount agreeing with Fresnel's formula, which was based on the hypothesis of a stationary aether. The optics of moving media have also been investigated by Lord Rayleigh, and more especially by H. A. Lorentz, who also assumed a stationary aether. The relative motion of the earth and the aether has an important connexion with the phenomenon of the aberration of light, and has been treated with masterly skill by Joseph Larmor and others (see AETHER). The relation of the earth's motion to the intensities of terrestrial sources of light was investigated theoretically by Fizeau, but no experimental inquiry was made until 1903, when Nordmeyer obtained negative results, which were confirmed by the theoretical investigations of A. A. Bucherer and H. A. Lorentz.

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[1] Young's views of the nature of light, which he formulated as *Propositions* and *Hypotheses*, are given *in extenso* in the article INTERFERENCE. See also his article "Chromatics" in the supplementary volumes to the 3rd edition of the *Encyclopaedia Britannica.*

[2] A crucial test of the emission and undulatory theories, which was realized by Descartes, Newton, Fermat and others, consisted in determining the velocity of light in two differently refracting media. This experiment was conducted in 1850 by Foucault, who showed that the velocity was less in water than in air, thereby confirming the undulatory and invalidating the emission theory.

Experimental photometry has been greatly developed since the pioneer work of Bouguer and Lambert and the subsequent introduction of the photometers of Ritchie, Rumford, Bunsen and Wheatstone, followed by Swan's in 1859, and O. R. Lummer and E. Brodhun's instrument (essentially the same as Swan's) in 1889. This expansion may largely be attributed to the increase in the number of artificial illuminants—especially the many types of filament- and arc-electric lights, and the incandescent gas light. Colour photometry has also been notably developed, especially since the enunciation of the "Purkinje phenomenon" in 1825. Sir William Abney has contributed much to this subject, and A. M. Meyer has designed a photometer in which advantage is taken of the phenomenon of contrast colours. "Flicker photometry" may be dated from O. N. Rood's investigations in 1893, and the same principle has been applied by Haycraft and Whitman. These questions—colour and flicker photometry—have important affinities to colour perception and the persistence of vision (see VISION). The spectrophotometer, devised by De Witt Bristol Brace in 1899, which permits the comparison of similarly coloured portions of the spectra from two different sources, has done much valuable work in the determination of absorptive powers and extinction coefficients. Much attention has also been given to the preparation of a standard of intensity, and many different sources have been introduced (see PHOTOMETRY). Stellar photometry, which was first investigated instrumentally with success by Sir John Herschel, was greatly improved by the introduction of Zöllner's photometer, E. C. Pickering's meridian photometer and C. Pritchard's wedge photometer. Other methods of research in this field are by photography—photographic photometry—and radiometric method (see PHOTOMETRY, CELESTIAL).

The earlier methods for the experimental determination of refractive indices by measuring the deviation through a solid prism of the substance in question or, in the case of liquids, through a hollow prism containing the liquid, have been replaced in most accurate work by other methods. The method of total reflection, due originally to Wollaston, has been put into a very convenient form, applicable to both solids and liquids, in the Pulfrich refractometer (see REFRACTION). Still more accurate methods, based on interference phenomena, have been devised. Jamin's interference refractometer is one of the earlier forms of such apparatus; and Michelson's interferometer is one of the best of later types (see INTERFERENCE). The variation of refractive index with density has been the subject of much experimental and theoretical inquiry. The empirical rule of Gladstone and Dale was often at variance with experiment, and the mathematical investigations of H. A. Lorentz of Leiden and L. Lorenz of Copenhagen on the electromagnetic theory led to a more consistent formula. The experimental work has been chiefly associated with the names of H. H. Landolt and J. W. Brühl, whose results, in addition to verifying the Lorenz-Lorentz formula, have established that this function of the refractive index and density is a colligative property of the molecule, *i.e.* it is calculable additively from the values of this function for the component atoms, allowance being made for the mode in which they are mutually combined (see CHEMISTRY, PHYSICAL). The preparation of lenses, in which the refractive index decreases with the distance from the axis, by K. F. J. Exner, H. F. L. Matthiessen and Schott, and the curious results of refraction by non-homogeneous media, as realized by R. Wood may be mentioned (see MIRAGE).

The spectrum of white light produced by prismatic refraction has engaged many investigators. The infra-red or heat waves were discovered by Sir William Herschel, and experiments on the actinic effects of the different parts of the spectrum on silver salts by Scheele, Senebier, Ritter, Seebeck and others, proved the increased activity as one passed from the red to the violet and the ultra-violet. Wollaston also made many investigations in this field, noticing the dark lines—the "Fraunhofer lines"—which cross the solar spectrum, which were further discussed by Brewster and Fraunhofer, who thereby laid the foundations of modern spectroscopy. Mention may also be made of the investigations of Lord Rayleigh and Arthur Schuster on the resolving power of prisms (see DIFFRACTION), and also of the modern view of the function of the prism in analysing white light. The infra-red and ultra-violet rays are of especial interest since, although not affecting vision after the manner of ordinary light, they possess very remarkable properties. Theoretical investigation on the undulatory theory of the law of reflection shows that a surface, too rough to give any trace of regular reflection with ordinary light, may regularly reflect the long waves, a phenomenon experimentally realized by Lord Rayleigh. Long waves—the so-called "residual rays" or "*Rest-strahlen*"—have also been isolated by repeated reflections from quartz surfaces of the light from zirconia raised to incandescence by the oxyhydrogen flame (E. F. Nichols and H. Rubens); far longer waves were isolated by similar reflections from fluorite ($56\ \mu$) and sylvite ($61\ \mu$) surfaces in 1899 by Rubens and E. Aschkinass. The short waves—ultra-violet rays—have also been studied, the researches of E. F. Nichols on the transparency of quartz to these rays, which are especially present in the radiations of the mercury arc, having led to the introduction of lamps made of fused quartz, thus permitting the convenient study of these rays, which, it is to be noted, are absorbed by ordinary clear glass. Recent researches at the works of Schott and Genossen, Jena, however, have resulted in the production of a glass transparent to the ultra-violet.

Dispersion, *i.e.* that property of a substance which consists in having a different refractive index for rays of different wavelengths, was first studied in the form known as "ordinary dispersion" in which the refrangibility of the ray increased with the wave-length. Cases had been observed by Fox Talbot, Le Roux, and especially by Christiansen (1870) and A. Kundt (1871–1872) where this normal rule did not hold; to such phenomena the name "anomalous dispersion" was given, but really there is nothing anomalous about it at all, ordinary dispersion being merely a particular case of the general phenomenon. The Cauchy formula, which was founded on the elastic-solid theory, did not agree with the experimental facts, and the germs of the modern theory, as was pointed out by Lord Rayleigh in 1900, were embodied in a question proposed by Clerk Maxwell for the Mathematical Tripos examination for 1869. The principle, which occurred simultaneously to W. Sellmeier (who is regarded as the founder of the modern theory) and had been employed about 1850 by Sir G. G. Stokes to explain absorption lines, involves an action between the aether and the molecules of the dispersing substance. The mathematical investigation is associated with the names of Sellmeier, Hermann Helmholtz, Eduard Ketteler, P. Drude, H. A. Lorentz and Lord Rayleigh, and the experimental side with many observers—F. Paschen, Rubens and others; absorbing media have been investigated by A. W. Pflüger, a great many aniline dyes by K. Stöckl, and sodium vapour by R. W. Wood. Mention may also be made of the beautiful experiments of Christiansen (1884) and Lord Rayleigh on the colours transmitted by white powders suspended in liquids of the same refractive index. If, for instance, benzol be gradually added to finely powdered quartz, a succession of beautiful colours—red, yellow, green and finally blue—is transmitted, or, under certain conditions, the colours may appear at once, causing the mixture to flash like a fiery opal. Absorption, too, has received much attention; the theory has been especially elaborated by M. Planck, and the experimental investigation has been prosecuted from the purely physical standpoint, and also from the standpoint of the physical chemist, with a view to correlating absorption with constitution.

Interference phenomena have been assiduously studied. The experiments of Young, Fresnel, Lloyd, Fizeau and Foucault, of Fresnel and Arago on the measurement of refractive indices by the shift of the interference bands, of H. F. Talbot on the "Talbot bands" (which he insufficiently explained on the principle of interference, it being shown by Sir G. B. Airy that diffraction phenomena supervene), of Baden-Powell on the "Powell bands," of David Brewster on "Brewster's bands," have been developed, together with many other phenomena—Newton's rings, the colours of thin, thick and mixed plates, &c.—in a striking manner, one of the most important results being the construction of interferometers applicable to the determination of refractive indices and wave-lengths, with which the names of Jamin, Michelson, Fabry and Perot, and of Lummer and E. Gehrcke are chiefly associated. The mathematical investigations of Fresnel may be regarded as being completed by the analysis chiefly due to Airy, Stokes and Lord Rayleigh. Mention may be made of Sir G. G. Stokes' attribution of the colours of iridescent crystals to periodic twinning; this view has been confirmed by Lord Rayleigh (*Phil. Mag.*, 1888) who, from the purity of the reflected light, concluded that the laminae were equidistant by the order of a wave-length. Prior to 1891 only interference between waves proceeding in the same direction had been studied. In that year Otto H. Wiener obtained, on a film $\frac{1}{20}$th of a wave-length in thickness, photographic impressions of the stationary waves formed by the interference of waves proceeding in opposite directions, and in 1892 Drude and Nernst employed a fluorescent film to record the same phenomenon. This principle is applied in the Lippmann colour photography, which was suggested by W. Zenker, realized by Gabriel Lippmann, and further investigated by R. G. Neuhauss, O. H. Wiener, H. Lehmann and others.

Great progress has been made in the study of diffraction, and "this department of optics is precisely the one in which the wave theory has secured its greatest triumphs" (Lord Rayleigh). The mathematical investigations of Fresnel and Poisson were placed on a dynamical basis by Sir G. G. Stokes; and the results gained more ready interpretation by the introduction of "Babinet's principle" in 1837, and Cornu's graphic methods in 1874. The theory also gained by the researches of Fraunhofer, Airy, Schwerd, E. Lommel and others. The theory of the concave grating, which resulted from H. A. Rowland's classical methods of ruling lines of the necessary nature and number on curved surfaces, was worked out by Rowland, E. Mascart, C. Runge and others. The resolving power and the intensity of the spectra have been treated by Lord Rayleigh and Arthur Schuster, and more recently (1905), the distribution of light has been treated by A. B. Porter. The theory of diffraction is of great importance in designing optical instruments, the theory of which has been more especially treated by Ernst Abbe (whose theory of microscopic vision dates from about 1870) by the scientific staff at the Zeiss works, Jena, by Rayleigh and others. The theory of coronae (as diffraction phenomena) was originally due to Young, who, from the principle involved, devised the *eriometer* for measuring the diameters of very small objects; and Sir G. G. Stokes subsequently explained the appearances presented by minute opaque particles borne on a transparent plate. The polarization of the light diffracted at a slit was noted in 1861 by Fizeau, whose researches were extended in 1892 by H. Du Bois, and, for the case of gratings, by Du Bois and Rubens in 1904. The diffraction of light by small particles was studied in the form of very fine chemical precipitates by John Tyndall, who noticed the polarization of the beautiful cerulean blue which was transmitted. This subject—one form of which is presented in the blue colour of the sky—has been most auspiciously treated by Lord Rayleigh on both the elastic-solid and electromagnetic theories. Mention may be made of R. W. Wood's experiments on thin metal films which, under certain conditions, originate colour phenomena inexplicable by interference and diffraction. These colours have been assigned to the principle of optical resonance, and have been treated by Kossonogov (*Phys. Zeit.*, 1903). J. C. Maxwell Garnett (*Phil. Trans.* vol. 203) has shown that the colours of coloured glasses are due to ultra-microscopic particles, which have been directly studied by H. Siedentopf and R. Zsigmondy under limiting oblique illumination.

Polarization phenomena may, with great justification, be regarded as the most engrossing subject of optical research during the 19th century; the assiduity with which it was cultivated in the opening decades of that century received a great stimulus when James Nicol devised in 1828 the famous "Nicol prism," which greatly facilitated the determination of the plane of vibration of polarized light, and the facts that light is polarized by reflection, repeated refractions, double refraction and by diffraction also contributed to the interest which the subject excited. The rotation of the plane of polarization by quartz was discovered in 1811 by Arago; if white light be used the colours change as the Nicol rotates—a phenomenon termed by Biot "rotatory dispersion." Fresnel regarded rotatory polarization as compounded from right- and left-handed (dextro- and laevo-) circular polarizations; and Fresnel, Cornu, Dove and Cotton effected their experimental separation. Legrand des Cloizeaux discovered the enormously enhanced rotatory polarization of cinnabar, a property also possessed—but in a lesser degree—by the sulphates of strychnine and ethylene diamine. The rotatory power of certain liquids was discovered by Biot in 1815; and at a later date it was found that many solutions behaved similarly. A. Schuster distinguishes substances with regard to their action on polarized light as follows: substances which act in the isotropic state are termed *photogyric*; if the rotation be associated with crystal structure, *crystallogyric*; if the rotation be due to a magnetic field, *magnetogyric*; for cases not hitherto included the term *allogyric* is employed, while optically inactive substances are called *isogyric*. The theory of photogyric and crystallogyric rotation has been worked out on the elastic-solid (MacCullagh and others) and on the electromagnetic hypotheses (P. Drude, Cotton, &c.). Allogyrism is due to a symmetry of the molecule, and is a subject of the greatest importance in modern (and, more especially, organic) chemistry (see STEREOISOMERISM).

The optical properties of metals have been the subject of much experimental and theoretical inquiry. The explanations of MacCullagh and Cauchy were followed by those of Beer, Eisenlohr, Lundquist, Ketteler and others; the refractive indices were determined both directly (by Kundt) and indirectly by means of Brewster's law; and the reflecting powers from $\lambda=251\,\mu\mu$ to $\lambda=1500\,\mu\mu$ were determined in 1900–1902 by Rubens and Hagen. The correlation of the optical and electrical constants of many metals has been especially studied by P. Drude (1900) and by Rubens and Hagen (1903).

The transformations of luminous radiations have also been studied. John Tyndall discovered calorescence. Fluorescence was treated by John Herschel in 1845, and by David Brewster in 1846, the theory being due to Sir G. G. Stokes (1852). More recent studies have been made by Lommel, E. L. Nichols and Merritt (*Phys. Rev.*, 1904), and by Millikan who discovered polarized fluorescence in 1895. Our knowledge of phosphorescence was greatly improved by Becquerel, and Sir James Dewar obtained interesting results in the course of his low temperature researches (see LIQUID GASES). In the theoretical and experimental study of radiation enormous progress has been recorded. The pressure of radiation, the necessity of which was demonstrated by Clerk Maxwell on the electromagnetic theory, and, in a simpler manner, by Joseph Larmor in his article RADIATION in these volumes, has been experimentally determined by E. F. Nichols and Hull, and the tangential component by J. H. Poynting. With the theoretical and practical investigation the names of Balfour Stewart, Kirchhoff, Stefan, Bartoli, Boltzmann, W. Wien and Larmor are chiefly associated. Magneto-optics, too, has been greatly developed since Faraday's discovery of the rotation of the plane of polarization by the magnetic field. The rotation for many substances was measured by Sir William H. Perkin, who attempted a correlation between rotation and composition. Brace effected the analysis of the beam into its two circularly polarized components, and in 1904 Mills measured their velocities. The Kerr effect, discovered in 1877, and the Zeeman effect (1896) widened the field of research, which, from its intimate connexion with the nature of light and electromagnetics, has resulted in discoveries of the greatest importance.

§ 14. *Optical Instruments.*—Important developments have been made in the construction and applications of optical instruments. To these three factors have contributed. The mathematician has quantitatively analysed the phenomena observed by the physicist, and has inductively shown what results are to be expected from certain optical systems. A consequence of this was the detailed study, and also the preparation, of glasses of diverse properties; to this the chemist largely contributed, and the manufacture of the so-called *optical glass* (see GLASS) is possibly the most scientific department of glass manufacture. The mathematical investigations of lenses owe much to Gauss, Helmholtz and others, but far more to Abbe, who introduced the method of studying the aberrations separately, and applied his results with conspicuous skill to the construction of optical systems. The development of Abbe's methods constitutes the main subject of research of the present-day optician, and has brought about the production of telescopes, microscopes, photographic lenses and other optical apparatus to an unprecedented pitch of excellence. Great improvements have been effected in the stereoscope. Binocular instruments with enhanced stereoscopic vision, an effect achieved by increasing the distance between the object glasses, have been introduced. In the study of diffraction phenomena, which led to the technical preparation of gratings, the early attempts of Fraunhofer, Nobert and Lewis Morris Rutherfurd, were followed by H. A. Rowland's ruling of plane and concave gratings which revolutionized spectroscopic research, and, in 1898, by Michelson's invention of the echelon grating. Of great importance are interferometers, which permit extremely accurate determinations of refractive indices and wave-lengths, and Michelson, from his classical evaluation of the standard metre in terms of the wave-lengths of certain of the cadmium rays, has suggested the adoption of the wave-length of one such ray as a standard with which national standards of length should be compared. Polarization phenomena, and particularly the rotation of the plane of polarization by such substances as sugar solutions, have led to the invention and improvements of polarimeters. The polarized light employed in such instruments is invariably obtained by transmission through a fixed Nicol prism—the polarizer—and the deviation is measured by the rotation of a second Nicol—the analyser. The early forms, which were termed "light and shade" polarimeters, have been generally replaced by "half-shade" instruments. Mention may also be made of the microscopic examination of objects in polarized light, the importance of which as a method of crystallographic and petrological research was suggested by Nicol, developed by Sorby and greatly expanded by Zirkel, Rosenbusch and others.

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Contemporary progress is reported in current scientific journals, *e.g.* the *Transactions* and *Proceedings* of the Royal Society, and of the Physical Society (London), the *Philosophical Magazine* (London), the *Physical Review* (New York, 1893 seq.) and in the *British Association Reports*; in the *Annales de chimie et de physique* and *Journal de physique* (Paris); and in the *Physikalische Zeitschrift* (Leipzig) and the *Annalen der Physik und Chemie* (since 1900: *Annalen der Physik*) (Leipzig). (C. E.*)

II. Nature of Light

1. *Newton's Corpuscular Theory.*—Until the beginning of the 19th century physicists were divided between two different views concerning the nature of optical phenomena. According to the one, luminous bodies emit extremely small corpuscles which can freely pass through transparent substances and produce the sensation of light by their impact against the retina. This *emission* or *corpuscular theory* of light was supported by the authority of Isaac Newton,[1] and, though it has been entirely superseded by its rival, the *wave-theory*, it remains of considerable historical interest.

2. *Explanation of Reflection and Refraction.*—Newton supposed the light-corpuscles to be subjected to attractive and repulsive forces exerted at very small distances by the particles of matter. In the interior of a homogeneous body a corpuscle moves in a straight line as it is equally acted on from all sides, but it changes its course at the boundary of two bodies, because, in a thin layer near the surface there is a resultant force in the direction of the normal. In modern language we may say that a corpuscle has at every point a definite potential energy, the value of which is constant throughout the interior of a homogeneous body, and is even equal in all bodies of the same kind, but changes from one substance to another. If, originally, while moving in air, the corpuscles had a definite velocity v_0, their velocity v in the interior of any other substance is quite determinate. It is given by the equation $\frac{1}{2}mv^2-\frac{1}{2}mv_0{}^2=A$, in which m denotes the mass of a corpuscle, and A the excess of its potential energy in air over that in the substance considered.

A ray of light falling on the surface of separation of two bodies is reflected according to the well-known simple law, if the corpuscles are acted on by a sufficiently large force directed towards the first medium. On the contrary, whenever the field of force near the surface is such that the corpuscles can penetrate into the interior of the second body, the ray is refracted. In this case the law of Snellius can be deduced from the consideration that the projection w of the velocity on the surface of separation is not altered, either in direction or in magnitude. This obviously requires that the plane passing through the incident and the refracted rays be normal to the surface, and that, if α_1 and α_2 are the angles of incidence and of refraction, v_1 and v_2 the velocities of light in the two media,

$$\sin \alpha_1/\sin \alpha_2 = w/v_1 : w/v_2 = v_2/v_1. \qquad (1)$$

The ratio is constant, because, as has already been observed, v_1 and v_2 have definite values.

As to the unequal refrangibility of differently coloured light, Newton accounted for it by imagining different kinds of corpuscles. He further carefully examined the phenomenon of total reflection, and described an interesting experiment connected with it. If one of the faces of a glass prism receives on the inside a beam of light of such obliquity that it is totally reflected under ordinary circumstances, a marked change is observed when a second piece of glass is made to approach the reflecting face, so as to be separated from it only by a very thin layer of air. The reflection is then found no longer to be total, part of the light finding its way into the second piece of glass. Newton concluded from this that the corpuscles are attracted by the glass even at a certain small measurable distance.

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[1] Newton, *Opticks* (London, 1704).

3. *New Hypotheses in the Corpuscular Theory.*—The preceding explanation of reflection and refraction is open to a very serious objection. If the particles in a beam of light all moved with the same velocity and were acted on by the same forces, they all ought to follow exactly the same path. In order to understand that part of the incident light is reflected and part of it transmitted, Newton imagined that each corpuscle undergoes certain alternating changes; he assumed that in some of its different "phases" it is more apt to be reflected, and in others more apt to be transmitted. The same idea was applied by him to the phenomena presented by very thin layers. He had observed that a gradual increase of the thickness of a layer produces periodic changes in the intensity of the reflected light, and he very ingeniously explained these by his theory. It is clear that the intensity of the transmitted light will be a minimum if the corpuscles that have traversed the front surface of the layer, having reached that surface while in their phase of easy transmission, have passed to the opposite phase the moment they arrive at the back surface. As to the nature of the alternating phases, Newton (*Opticks*, 3rd ed., 1721, p. 347) expresses himself as follows:—"Nothing more is requisite for putting the Rays of Light into Fits of easy Reflexion and easy Transmission than that they be small Bodies which by their attractive Powers, or some other Force, stir up Vibrations in what they act upon, which Vibrations being swifter than the Rays, overtake them successively, and agitate them so as by turns to increase and decrease their Velocities, and thereby put them into those Fits."

4. *The Corpuscular Theory and the Wave-Theory compared.*—Though Newton introduced the notion of periodic changes, which was to play so prominent a part in the later development of the wave-theory, he rejected this theory in the form in which it had been set forth shortly before by Christiaan Huygens in his *Traité de la lumière* (1690), his chief objections being: (1) that the rectilinear propagation had not been satisfactorily accounted for; (2) that the motions of heavenly bodies show no sign of a resistance due to a medium filling all space; and (3) that Huygens had not sufficiently explained the peculiar properties of the rays produced by the double refraction in Iceland spar. In Newton's days these objections were of much weight.

Yet his own theory had many weaknesses. It explained the propagation in straight lines, but it could assign no cause for the equality of the speed of propagation of all rays. It adapted itself to a large variety of phenomena, even to that of double refraction (Newton says [*ibid.*]:—". . . the unusual Refraction of Iceland Crystal looks very much as if it were perform'd by some kind of attractive virtue lodged in certain Sides both of the Rays, and of the Particles of the Crystal."), but it could do so only at the price of losing much of its original simplicity.

In the earlier part of the 19th century, the corpuscular theory broke down under the weight of experimental evidence, and it received the final blow when J. B. L. Foucault proved by direct experiment that the velocity of light in water is not greater than that in air, as it should be according to the formula (1), but less than it, as is required by the wave-theory.

5. *General Theorems on Rays of Light.*—With the aid of suitable assumptions the Newtonian theory can accurately trace the course of a ray of light in any system of isotropic bodies, whether homogeneous or otherwise; the problem being equivalent to that of determining the motion of a material point in a space in which its potential energy is given as a function of the coordinates. The application of the dynamical principles of "least and of varying action" to this latter problem leads to the following important theorems which William Rowan Hamilton made the basis of his exhaustive treatment of systems of rays.[1] The total energy of a corpuscle is supposed to have a given value, so that, since the potential energy is considered as known at every point, the velocity v is so likewise.

(*a*) The path along which light travels from a point A to a point B is determined by the condition that for this line the integral $\int v ds$, in which ds is an element of the line, be a minimum (provided A and B be not too near each other). Therefore, since $v=\mu v_0$, if v_0 is the velocity of light *in vacuo* and μ the index of refraction, we have for every variation of the path the points A and B remaining fixed,

$$\delta\int\mu ds=0. \tag{2}$$

(*b*) Let the point A be kept fixed, but let B undergo an infinitely small displacement BB′ ($=q$) in a direction making an angle θ with the last element of the ray AB. Then, comparing the new ray AB′ with the original one, it follows that

$$\delta\int\mu ds=\mu_B q\cos\theta, \tag{3}$$

where μ_B is the value of μ at the point B.

6. *General Considerations on the Propagation of Waves.*—"Waves," *i.e.* local disturbances of equilibrium travelling onward with a certain speed, can exist in a large variety of systems. In a theory of these phenomena, the state of things at a definite point may in general be defined by a certain directed or vector quantity $\mathbf{P}$,[2] which is zero in the state of equilibrium, and may be called the disturbance (for example, the velocity of the air in the case of sound vibrations, or the displacement of the particles of an elastic body from their positions of equilibrium). The components $\mathbf{P}_x$, $\mathbf{P}_y$, $\mathbf{P}_z$ of the disturbance in the directions of the axes of coordinates are to be considered as functions of the coordinates x, y, z and the time t, determined by a set of partial differential equations, whose form depends on the nature of the problem considered. If the equations are homogeneous and linear, as they always are for sufficiently small disturbances, the following theorems hold.

(*a*) Values of $\mathbf{P}_x$, $\mathbf{P}_y$, $\mathbf{P}_z$ (expressed in terms of x, y, z, t) which satisfy the equations will do so still after multiplication by a common arbitrary constant.

(*b*) Two or more solutions of the equations may be combined into a new solution by addition of the values of $\mathbf{P}_x$, those of $\mathbf{P}_y$, &c., *i.e.* by compounding the vectors $\mathbf{P}$, such as they are in each of the particular solutions.

In the application to light, the first proposition means that the phenomena of propagation, reflection, refraction, &c., can be produced in the same way with strong as with weak light. The second proposition contains the principle of the "superposition" of different states, on which the explanation of all phenomena of interference is made to depend.

In the simplest cases (monochromatic or homogeneous light) the disturbance is a simple harmonic function of the time ("simple harmonic vibrations"), so that its components can be represented by

$$\mathbf{P}_x=a_1\cos(nt+f_1),\ \mathbf{P}_y=a_2\cos(nt+f_2),\ \mathbf{P}_z=a_3\cos(nt+f_3).$$

The "phases" of these vibrations are determined by the angles $nt+f_1$, &c., or by the times $t+f_1/n$, &c. The "frequency" n is constant throughout the system, while the quantities f_1, f_2, f_3, and perhaps the "amplitudes" a_1, a_2, a_3 change from point to point. It may be shown that the end of a straight line representing the vector $\mathbf{P}$, and drawn from the point considered, in general describes a certain ellipse, which becomes a straight line, if $f_1=f_2=f_3$. In this latter case, to which the larger part of this article will be confined, we can write in vector notation

$$\mathbf{P}=\mathbf{A}\cos(nt+f), \tag{4}$$

where $\mathbf{A}$ itself is to be regarded as a vector.

We have next to consider the way in which the disturbance changes from point to point. The most important case is that of plane waves with constant amplitude $\mathbf{A}$. Here f is the same at all points of a plane ("wave-front") of a definite direction, but changes as a linear function as we pass from one such wave-front to the next. The axis of x being drawn at right angles to the wave-fronts, we may write $f=f_0-kx$, where f_0 and k are constants, so that (4) becomes

$$\mathbf{P}=\mathbf{A}\cos(nt-kx+f_0). \tag{5}$$

This expression has the period $2\pi/n$ with respect to the time and the perion $2\pi/k$ with respect to x, so that the "time of vibration" and the "wave-length" are given by $T=2\pi/n$, $\lambda=2\pi/k$. Further, it is easily seen that the phase belonging to certain values of x and t is equal to that which corresponds to $x+\Delta x$ and $t+\Delta t$ provided $\Delta x=(n/k)\Delta t$. Therefore the phase, or the disturbance itself, may be said to be propagated in the direction normal to the wave-fronts with a velocity (velocity of the waves) $v=n/k$, which is connected with the time of vibration and the wave-length by the relation

$$\lambda=vT. \tag{6}$$

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[1] *Trans. Irish Acad.* 15, p. 69 (1824); 16, part i. "Science," p. 4 (1830), part ii., *ibid.* p. 93 (1830); 17, part i., p. 1 (1832).

[2] This kind of type will always be used in this article to denote vectors.

In isotropic bodies the propagation can go on in all directions with the same velocity. In anisotropic bodies (crystals), with which the theory of light is largely concerned, the problem is more complicated. As a general rule we can say that, for a given direction of the wave-fronts, the vibrations must have a determinate direction, if the propagation is to take place according to the simple formula given above. It is to be understood that for a given direction of the waves there may be two or even more directions of vibration of the kind, and that in such a case there are as many different velocities, each belonging to one particular direction of vibration.

7. *Wave-surface.*—After having found the values of v for a particular frequency and different directions of the wave-normal, a very instructive graphical representation can be employed.

Let ON be a line in any direction, drawn from a fixed point O, OA a length along this line equal to the velocity v of waves having ON for their normal, or, more generally, OA, OA′, &c., lengths equal to the velocities v, v', &c., which such waves have according to their direction of vibration, Q, Q′, &c., planes perpendicular to ON through A, A^1, &c. Let this construction be repeated for all directions of ON, and let W be the surface that is touched by all the planes Q, Q′, &c. It is clear that if this surface, which is called the "wave-surface," is known, the velocity of propagation of plane waves of any chosen direction is given by the length of the perpendicular from the centre O on a tangent plane in the given direction. It must be kept in mind that, in general, each tangent plane corresponds to one definite direction of vibration. If this direction is assigned in each point of the wave-surface, the diagram contains all the information which we can desire concerning the propagation of plane waves of the frequency that has been chosen.

The plane Q employed in the above construction is the position after unit of time of a wave-front perpendicular to ON and originally passing through the point O. The surface W itself is often considered as the locus of all points that are reached in unit of time by a disturbance starting from O and spreading towards all sides. Admitting the validity of this view, we can determine in a similar way the locus of the points reached in some infinitely short time dt, the wave-surface, as we may say, or the "elementary wave," corresponding to this time. It is similar to W, all dimensions of the latter surface being multiplied by dt. It may be noticed that in a heterogeneous medium a wave of this kind has the same form as if the properties of matter existing at its centre extended over a finite space.

8. *Theory of Huygens.*—Huygens was the first to show that the explanation of optical phenomena may be made to depend on the wave-surface, not only in isotropic bodies, in which it has a spherical form, but also in crystals, for one of which (Iceland spar) he deduced the form of the surface from the observed double refraction. In his argument Huygens availed himself of the following principle that is justly named after him: Any point that is reached by a wave of light becomes a new centre of radiation from which the disturbance is propagated towards all sides. On this basis he determined the progress of light-waves by a construction which, under a restriction to be mentioned in §13, applied to waves of any form and to all kinds of transparent media. Let σ be the surface (wave-front) to which a definite phase of vibration has advanced at a certain time t, dt an infinitely small increment of time, and let an elementary wave corresponding to this interval be described around each point P of σ. Then the envelope σ' of all these elementary waves is the surface reached by the phase in question at the time $t+dt$, and by repeating the construction all successive positions of the wave-front can be found.

Huygens also considered the propagation of waves that are laterally limited, by having passed, for example, through an opening in an opaque screen. If, in the first wave-front σ, the disturbance exists only in a certain part bounded by the contour s, we can confine ourselves to the elementary waves around the points of that part, and to a portion of the new wave-front σ' whose boundary passes through the points where σ' touches the elementary waves having their centres on s. Taking for granted Huygens's assumption that a sensible disturbance is only found in those places where the elementary waves are touched by the new wave-front, it may be inferred that the lateral limits of the beam of light are determined by lines, each element of which joins the centre P of an elementary wave with its point of contact P′ with the next wave-front. To lines of this kind, whose course can be made visible by using narrow pencils of light, the name of "rays" is to be given in the wave-theory. The disturbance may be conceived to travel along them with a velocity $u=\text{PP}'/dt$, which is therefore called the "ray-velocity."

The construction shows that, corresponding to each direction of the wave-front (with a determinate direction of vibration), there is a definite direction and a definite velocity of the ray. Both are given by a line drawn from the centre of the wave-surface to its point of contact with a tangent plane of the given direction. It will be convenient to say that this line and the plane are conjugate with each other. The rays of light, curved in non-homogeneous bodies, are always straight lines in homogeneous substances. In an isotropic medium, whether homogeneous or otherwise, they are normal to the wave-fronts, and their velocity is equal to that of the waves.

By applying his construction to the reflection and refraction of light, Huygens accounted for these phenomena in isotropic bodies as well as in Iceland spar. It was afterwards shown by Augustin Fresnel that the double refraction in biaxal crystals can be explained in the same way, provided the proper form be assigned to the wave-surface.

In any point of a bounding surface the normals to the reflected and refracted waves, whatever be their number, always lie in the plane passing through the normal to the incident waves and that to the surface itself. Moreover, if α_1 is the angle between these two latter normals, and α_2 the angle between the normal to the boundary and that to any one of the reflected and refracted waves, and v_1, v_2 the corresponding wave-velocities, the relation

$$\sin\alpha_1/\sin\alpha_2=v_1/v_2 \qquad (7)$$

is found to hold in all cases. These important theorems may be proved independently of Huygens's construction by simply observing that, at each point of the surface of separation, there must be a certain connexion between the disturbances existing in the incident, the reflected, and the refracted waves, and that, therefore, the lines of intersection of the surface with the positions of an incident wave-front, succeeding each other at equal intervals of time dt, must coincide with the lines in which the surface is intersected by a similar series of reflected or refracted wave-fronts.

In the case of isotropic media, the ratio (7) is constant, so that we are led to the law of Snellius, the index of refraction being given by

$$\mu=v_1/v_2 \qquad (8)$$

(cf. equation 1).

9. *General Theorems on Rays, deduced from Huygens's Construction.*—(*a*) Let A and B be two points arbitrarily chosen in a system of transparent bodies, ds an element of a line drawn from A to B, u the velocity of a ray of light coinciding with ds. Then the integral $\int u^{-1}ds$, which represents the time required for a motion along the line with the velocity u, is a minimum for the course actually taken by a ray of light (unless A and B be too far apart). This is the "principle of least time" first formulated by Pierre de Fermat for the case of two isotropic substances. It shows that the course of a ray of light can always be inverted.

(*b*) Rays of light starting in all directions from a point A and travelling onward for a definite length of time, reach a surface σ, whose tangent plane at a point B is conjugate, in the medium surrounding B, with the last element of the ray AB.

(*c*) If all rays issuing from A are concentrated at a point B, the integral $\int u^{-1}ds$ has the same value for each of them.

(*d*) In case (*b*) the variation of the integral caused by an infinitely small displacement q of B, the point A remaining fixed, is given by $\delta\int u^{-1}ds=q\cos\theta/v_{\text{B}}$. Here θ is the angle between the displacement q and the normal to the surface σ, in the direction of propagation, v_{B} the velocity of a plane wave tangent to this surface.

In the case of isotropic bodies, for which the relation (8) holds, we recover the theorems concerning the integral $\int\mu ds$ which we have deduced from the emission theory (§ 5).

10. *Further General Theorems.*—(*a*) Let V$_1$ and V$_2$ be two planes in a system of isotropic bodies, let rectangular axes of coordinates be chosen in each of these planes, and let x_1, y_1 be the coordinates of a point A in V$_1$, and x_2, y_2 those of a point B in V$_2$. The integral $\int\mu ds$, taken for the ray between A and B, is a function of x_1, y_1, x_2, y_2 and, if ξ_1 denotes either x_1 or y_1, and ξ_2 either x_2 or y_2, we shall have

$$\frac{\partial^2}{\partial\xi_1\,\partial\xi_2}\int\mu ds=\frac{\partial^2}{\partial\xi_2\,\partial\xi_1}\int\mu ds.$$

On both sides of this equation the first differentiation may be performed by means of the formula (3). The second differentiation admits of a geometrical interpretation, and the formula may finally be employed for proving the following theorem:

Let ω_1 be the solid angle of an infinitely thin pencil of rays issuing from A and intersecting the plane V$_2$ in an element σ_2 at the point B. Similarly, let ω_2 be the solid angle of a pencil starting from B and falling on the element σ_1 of the plane V$_1$ at the point A. Then, denoting by μ_1 and μ_2 the indices of refraction of the matter at the points A and B, by θ_1 and θ_2 the sharp angles which the ray AB at its extremities makes with the normals to V$_1$ and V$_2$, we have

$$\mu_1^2\,\sigma_1\,\omega_1\cos\theta_1=\mu_2^2\,\sigma_2\,\omega_2\cos\theta_2.$$

(*b*) There is a second theorem that is expressed by exactly the same formula, if we understand by σ_1 and σ_2 elements of surface that are related to each other as an object and its optical image—by ω_1, ω_2 the infinitely small openings, at the beginning and the end of its course, of a pencil of rays issuing from a point A of σ_1 and coming together at the corresponding point B of σ_2, and by θ_1, θ_2 the sharp angles which one of the rays makes with the normals to σ_1 and σ_2. The proof may be based upon the first theorem. It suffices to consider the section σ of the pencil by some intermediate plane, and a bundle of rays starting from the points of σ_1 and reaching those of σ_2 after having all passed through a point of that section σ.

(*c*) If in the last theorem the system of bodies is symmetrical around the straight line AB, we can take for σ_1 and σ_2 circular planes having AB as axis. Let h_1 and h_2 be the radii of these circles, *i.e.* the linear dimensions of an object and its image, ϵ_1 and ϵ_2 the infinitely small angles which a ray R going from A to B makes with the axis at these points. Then the above formula gives $\mu_1 h_1 \epsilon_1 = \mu_2 h_2 \epsilon_2$, a relation that was proved, for the particular case $\mu_1 = \mu_2$ by Huygens and Lagrange. It is still more valuable if one distinguishes by the algebraic sign of h_2 whether the image is direct or inverted, and by that of ϵ_2 whether the ray R on leaving A and on reaching B lies on opposite sides of the axis or on the same side.

The above theorems are of much service in the theory of optical instruments and in the general theory of radiation.

11. *Phenomena of Interference and Diffraction.*—The impulses or motions which a luminous body sends forth through the universal medium or aether, were considered by Huygens as being without any regular succession; he neither speaks of vibrations, nor of the physical cause of the colours. The idea that monochromatic light consists of a succession of simple harmonic vibrations like those represented by the equation (5), and that the sensation of colour depends on the frequency, is due to Thomas Young[1] and Fresnel,[2] who explained the phenomena of interference on this assumption combined with the principle of super-position. In doing so they were also enabled to determine the wave-length, ranging from 0·000076 cm. at the red end of the spectrum to 0·000039 cm. for the extreme violet and, by means of the formula (6), the number of vibrations per second. Later investigations have shown that the infra-red rays as well as the ultra-violet ones are of the same physical nature as the luminous rays, differing from these only by the greater or smaller length of their waves. The wave-length amounts to 0·006 cm. for the least refrangible infra-red, and is as small as 0·00001 cm. for the extreme ultra-violet.

Another important part of Fresnel's work is his treatment of diffraction on the basis of Huygens's principle. If, for example, light falls on a screen with a narrow slit, each point of the slit is regarded as a new centre of vibration, and the intensity at any point behind the screen is found by compounding with each other the disturbances coming from all these points, due account being taken of the phases with which they come together (see DIFFRACTION; INTERFERENCE).

12. *Results of Later Mathematical Theory.*—Though the theory of diffraction developed by Fresnel, and by other physicists who worked on the same lines, shows a most beautiful agreement with observed facts, yet its foundation, Huygens's principle, cannot, in its original elementary form, be deemed quite satisfactory. The general validity of the results has, however, been confirmed by the researches of those mathematicians (Siméon Denis Poisson, Augustin Louis Cauchy, Sir G. G. Stokes, Gustav Robert Kirchhoff) who investigated the propagation of vibrations in a more rigorous manner. Kirchhoff[3] showed that the disturbance at any point of the aether inside a closed surface which contains no ponderable matter can be represented as made up of a large number of parts, each of which depends upon the state of things at one point of the surface. This result, the modern form of Huygens's principle, can be extended to a system of bodies of any kind, the only restriction being that the source of light be not surrounded by the surface. Certain causes capable of producing vibrations can be imagined to be distributed all over this latter, in such a way that the disturbances to which they give rise in the enclosed space are exactly those which are brought about by the real source of light.[4] Another interesting result that has been verified by experiment is that, whenever rays of light pass through a focus, the phase undergoes a change of half a period. It must be added that the results alluded to in the above, though generally presented in the terms of some particular form of the wave theory, often apply to other forms as well.

13. *Rays of Light.*—In working out the theory of diffraction it is possible to state exactly in what sense light may be said to travel in straight lines. Behind an opening *whose width is very large in comparison with the wave-length* the limits between the illuminated and the dark parts of space are approximately determined by rays passing along the borders.

This conclusion can also be arrived at by a mode of reasoning that is independent of the theory of diffraction.[5] If linear differential equations admit a solution of the form (5) with **A** constant, they can also be satisfied by making **A** a function of the coordinates, such that, in a wave-front, it changes very little over a distance equal to the wave-length λ, and that it is constant along each line conjugate with the wave-fronts. In cases of this kind the disturbance may truly be said to travel along lines of the said direction, and an observer who is unable to discern lengths of the order of λ, and who uses an opening of much larger dimensions, may very well have the impression of a cylindrical beam with a sharp boundary.

A similar result is found for curved waves. If the additional restriction is made that their radii of curvature be very much larger than the wave-length, Huygens's construction may confidently be employed. The amplitudes all along a ray are determined by, and proportional to, the amplitude at one of its points.

14. *Polarized Light.*—As the theorems used in the explanation of interference and diffraction are true for all kinds of vibratory motions, these phenomena can give us no clue to the special kind of vibrations in light-waves. Further information, however, may be drawn from experiments on plane polarized light. The properties of a beam of this kind are completely known when the position of a certain plane passing through the direction of the rays, and *in* which the beam is said to be polarized, is given. "This plane of polarization," as it is called, coincides with the plane of incidence in those cases where the light has been polarized by reflection on a glass surface under an angle of incidence whose tangent is equal to the index of refraction (Brewster's law).

The researches of Fresnel and Arago left no doubt as to the direction of the vibrations in polarized light with respect to that of the rays themselves. In isotropic bodies at least, the vibrations are exactly transverse, *i.e.* perpendicular to the rays, either in the plane of polarization or at right angles to it. The first part of this statement also applies to unpolarized light, as this can always be dissolved into polarized components.

Much experimental work has been done on the production of polarized rays by double refraction and on the reflection of polarized light, either by isotropic or by anisotropic transparent bodies, the object of inquiry being in the latter case to determine the position of the plane of polarization of the reflected rays and their intensity.

In this way a large amount of evidence has been gathered by which it has been possible to test different theories concerning the nature of light and that of the medium through which it is propagated. A common feature of nearly all these theories is that the aether is supposed to exist not only in spaces void of matter, but also in the interior of ponderable bodies.

15. *Fresnel's Theory.*—Fresnel and his immediate successors assimilated the aether to an elastic solid, so that the velocity of propagation of transverse vibrations could be determined by the formula $v = \sqrt{(K/\rho)}$, where K denotes the modulus of rigidity and ρ the density. According to this equation the different properties of various isotropic transparent bodies may arise from different values of K, of ρ, or of both. It has, however, been found that if both K and ρ are supposed to change from one substance to another, it is impossible to obtain the right reflection formulae. Assuming the constancy of K Fresnel was led to equations which agreed with the observed properties of the reflected light, if he made the further assumption (to be mentioned in what follows as "Fresnel's assumption") that the vibrations of plane polarized light are perpendicular to the plane of polarization.

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[1] *Phil. Trans.* (1802), part i. p. 12.

[2] *Œuvres complètes de Fresnel* (Paris, 1866). (The researches were published between 1815 and 1827.)

[3] *Ann. Phys. Chem.* (1883), 18, p. 663.

[4] H. A. Lorentz, *Zittingsversl. Akad. v. Wet. Amsterdam*, 4 (1896), p. 176.

[5] H. A. Lorentz, *Abhandlungen über theoretische Physik*, 1 (1907), p. 415.

Let the indices p and n relate to the two principal cases in which the incident (and, consequently, the reflected) light is polarized in the plane of incidence, or normally to it, and let positive directions h and h' be chosen for the disturbance (at the surface itself) in the incident and for that in the reflected beam, in such a manner that, by a common rotation, h and the incident ray prolonged may be made to coincide with h' and the reflected ray. Then, if a_1 and a_2 are the angles of incidence and refraction, Fresnel shows that, in order to get the reflected disturbance, the incident one must be multiplied by

$$a_p = -\sin(a_1 - a_2)/\sin(a_1 + a_2) \qquad (9)$$

in the first, and by

$$a_n = \tan(a_1 - a_2)/\tan(a_1 + a_2) \qquad (10)$$

in the second principal case.

As to double refraction, Fresnel made it depend on the unequal elasticity of the aether in different directions. He came to the conclusion that, for a given direction of the waves, there are two possible directions of vibration (§ 6), lying in the wave-front, at right angles to each other, and he determined the form of the wave-surface, both in uniaxal and in biaxal crystals.

Though objections may be urged against the dynamic part of Fresnel's theory, he admirably succeeded in adapting it to the facts.

16. *Electromagnetic Theory.*—We here leave the historical order and pass on to Maxwell's theory of light.

James Clerk Maxwell, who had set himself the task of mathematically working out Michael Faraday's views, and who, both by doing so and by introducing many new ideas of his own, became the founder of the modern science of electricity,[1] recognized that, at every point of an electromagnetic field, the state of things can be defined by two vector quantities, the "electric force" **E** and the "magnetic force" **H**, the former of which is the force acting on unit of electricity and the latter that which acts on a magnetic pole of unit strength. In a non-conductor (dielectric) the force **E** produces a state that may be described as a displacement of electricity from its position of equilibrium. This state is represented by a vector **D** ("dielectric displacement") whose magnitude is measured by the quantity of electricity reckoned per unit area which has traversed an element of surface perpendicular to **D** itself. Similarly, there is a vector quantity **B** (the "magnetic induction") intimately connected with the magnetic force **H**. Changes of the dielectric displacement constitute an electric current measured by the rate of change of **D**, and represented in vector notation by

$$\mathbf{C} = \dot{\mathbf{D}} \qquad (11)$$

Periodic changes of **D** and **B** may be called "electric" and "magnetic vibrations." Properly choosing the units, the axes of coordinates (in the first proposition also the positive direction of s and n), and denoting components of vectors by suitable indices, we can express in the following way the fundamental propositions of the theory.

(*a*) Let s be a closed line, σ a surface bounded by it, n the normal to σ. Then, for all bodies,

$$\int \mathbf{H}_s ds = \frac{1}{c}\int \mathbf{C}_n d\sigma, \qquad \int \mathbf{E}_s ds = -\frac{1}{c}\frac{d}{dt}\int \mathbf{B}_n d\sigma,$$

where the constant c means the ratio between the electro-magnet and the electrostatic unit of electricity.

From these equations we can deduce:

(*α*) For the interior of a body, the equations

$$\frac{\partial \mathbf{H}_z}{\partial y} - \frac{\partial \mathbf{H}_y}{\partial z} = \frac{1}{c}\mathbf{C}_x, \quad \frac{\partial \mathbf{H}_x}{\partial z} - \frac{\partial \mathbf{H}_z}{\partial x} = \frac{1}{c}\mathbf{C}_y, \quad \frac{\partial \mathbf{H}_y}{\partial x} - \frac{\partial \mathbf{H}_x}{\partial y} = \frac{1}{c}\mathbf{C}_z \qquad (12)$$

$$\frac{\partial \mathbf{E}_z}{\partial y} - \frac{\partial \mathbf{E}_y}{\partial z} = -\frac{1}{c}\frac{\partial \mathbf{B}_x}{\partial t}, \quad \frac{\partial \mathbf{E}_x}{\partial z} - \frac{\partial \mathbf{E}_z}{\partial x} = -\frac{1}{c}\frac{\partial \mathbf{B}_y}{\partial t}, \quad \frac{\partial \mathbf{E}_y}{\partial x} - \frac{\partial \mathbf{E}_x}{\partial y} = -\frac{1}{c}\frac{\partial \mathbf{B}_z}{\partial t}; \qquad (13)$$

(*β*) For a surface of separation, the continuity of the tangential components of **E** and **H**;

(*γ*) The solenoidal distribution of **C** and **B**, and in a dielectric that of **D**. A solenoidal distribution of a vector is one corresponding to that of the velocity in an incompressible fluid. It involves the continuity, at a surface, of the normal component of the vector.

(*b*) The relation between the electric force and the dielectric displacement is expressed by

$$\mathbf{D}_x = \epsilon_1 \mathbf{E}_x, \quad \mathbf{D}_y = \epsilon_2 \mathbf{E}_y, \quad \mathbf{D}_z = \epsilon_3 \mathbf{E}_z, \qquad (14)$$

the constants ϵ_1, ϵ_2, ϵ_3 (dielectric constants) depending on the properties of the body considered. In an isotropic medium they have a common value ϵ, which is equal to unity for the free aether, so that for this medium $\mathbf{D} = \mathbf{E}$.

(*c*) There is a relation similar to (14) between the magnetic force and the magnetic induction. For the aether, however, and for all ponderable bodies with which this article is concerned, we may write $\mathbf{B} = \mathbf{H}$.

It follows from these principles that, in an isotropic dialectric, transverse electric vibrations can be propagated with a velocity

$$v = c/\sqrt{\epsilon}. \qquad (15)$$

Indeed, all conditions are satisfied if we put

$$\left.\begin{array}{l} \mathbf{D}_x = 0,\ \mathbf{D}_y = a \cos n(t - xv^{-1} + l),\ \mathbf{D}_z = 0, \\ \mathbf{H}_x = 0,\ \mathbf{H}_y = 0 \qquad\qquad\qquad\quad,\ \mathbf{H}_z = avc^{-1} \cos n(t - xv^{-1} + l) \end{array}\right\} (16)$$

For the free aether the velocity has the value c. Now it had been found that the ratio c between the two units of electricity agrees within the limits of experimental errors with the numerical value of the velocity of light in aether. (The mean result of the most exact determinations[2] of c is $3{,}001 \cdot 10^{10}$cm./sec., the largest deviations being about $0{,}008 \cdot 10^{10}$; and Cornu[3] gives $3{,}001 \cdot 10^{10} \pm 0{,}003 \cdot 10^{10}$ as the most probable value of the velocity of light.) By this Maxwell was led to suppose that light consists of transverse electromagnetic disturbances. On this assumption, the equations (16) represent a beam of plane polarized light. They show that, in such a beam, there are at the same time electric and magnetic vibrations, both transverse, and at right angles to each other.

It must be added that the electromagnetic field is the seat of two kinds of energy distinguished by the names of electric and magnetic energy, and that, according to a beautiful theorem due to J. H. Poynting,[4] the energy may be conceived to flow in a direction perpendicular both to the electric and to the magnetic force. The amounts per unit of volume of the electric and the magnetic energy are given by the expressions

$$\tfrac{1}{2}(\mathbf{E}_x\mathbf{D}_x + \mathbf{E}_y\mathbf{D}_y + \mathbf{E}_z\mathbf{D}_z), \qquad (17)$$

and

$$\tfrac{1}{2}(\mathbf{H}_x\mathbf{B}_x + \mathbf{H}_y\mathbf{B}_y + \mathbf{H}_z\mathbf{B}_z) = \tfrac{1}{2}\mathbf{H}^2, \qquad (18)$$

whose mean values for a full period are equal in every beam of light.

The formula (15) shows that the index of refraction of a body is given by $\sqrt{\epsilon}$, a result that has been verified by Ludwig Boltzmann's measurements[5] of the dielectric constants of gases. Thus Maxwell's theory can assign the true cause of the different optical properties of various transparent bodies. It also leads to the reflection formulae (9) and (10), provided the electric vibrations of polarized light be supposed to be perpendicular to the plane of polarization, which implies that the magnetic vibrations are parallel to that plane.

Following the same assumption Maxwell deduced the laws of double refraction, which he ascribes to the unequality of ϵ_1, ϵ_2, ϵ_3. His results agree with those of Fresnel and the theory has been confirmed by Boltzmann,[6] who measured the three coefficients in the case of crystallized sulphur, and compared them with the principal indices of refraction. Subsequently the problem of crystalline reflection has been completely solved and it has been shown that, in a crystal, Poynting's flow of energy has the direction of the rays as determined by Huygens's construction.

Two further verifications must here be mentioned. In the first place, though we shall speak almost exclusively of the propagation of light in transparent dielectrics, a few words may be said about the optical properties of conductors. The simplest assumption concerning the electric current **C** in a metallic body is expressed by the equation $\mathbf{C} = \sigma\mathbf{E}$, where σ is the coefficient of conductivity. Combining this with his other formulae (we may say with (12) and (13)), Maxwell found that there must be an absorption of light, a result that can be readily understood since the motion of electricity in a conductor gives rise to a development of heat. But, though Maxwell accounted in this way for the fundamental fact that metals are opaque bodies, there remained a wide divergence between the values of the coefficient of absorption as directly measured and as calculated from the electrical conductivity; but in 1903 it was shown by E. Hagen and H. Rubens[7] that the agreement is very satisfactory in the case of the extreme infra-red rays.

In the second place, the electromagnetic theory requires that a surface struck by a beam of light shall experience a certain pressure. If the beam falls normally on a plane disk, the pressure is normal too; its total amount is given by $c^{-1}(i_1 + i_2 - i_3)$, if i_1, i_2 and i_3 are the quantities of energy that are carried forward per unit of time by the incident, the reflected, and the transmitted light. This result has been quantitatively verified by E. F. Nicholls and G. F. Hull.[8]

Maxwell's predictions have been splendidly confirmed by the experiments of Heinrich Hertz[9] and others on electromagnetic waves; by diminishing the length of these to the utmost, some physicists have been able to reproduce with them all phenomena of reflection, refraction (single and double), interference, and polarization.[10] A table of the wave-lengths observed in the aether now has to contain, besides the numbers given in § 11, the lengths of the waves produced by electromagnetic apparatus and extending from the long waves used in wireless telegraphy down to about 0·6 cm.

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[1] Clerk Maxwell, *A Treatise on Electricity and Magnetism* (Oxford, 1st ed., 1873).

[2] H. Abraham, *Rapports présentés au congrès de physique de 1900* (Paris), 2, p. 247.

[3] *Ibid.*, p. 225.

[4] *Phil. Trans.*, 175 (1884), p. 343.

[5] *Ann. d. Phys. u. Chem.* 155 (1875), p. 403.

[6] *Ibid.* 153 (1874), p. 525.

[7] *Ann. d. Phys.* 11 (1903), p. 873.

[8] *Phys. Review*, 13 (1901), p. 293.

[9] Hertz, *Untersuchungen über die Ausbreitung der elektrischen Kraft* (Leipzig, 1892).

[10] A. Righi, *L'Ottica delle oscillazioni elettriche* (Bologna, 1897); P. Lebedew, *Ann. d. Phys. u. Chem.*, 56 (1895), p. 1.

17. *Mechanical Models of the Electromagnetic Medium.*—From the results already enumerated, a clear idea can be formed of the difficulties which were encountered in the older form of the wave-theory. Whereas, in Maxwell's theory, longitudinal vibrations are excluded *ab initio* by the solenoidal distribution of the electric current, the elastic-solid theory had to take them into account, unless, as was often done, one made them disappear by supposing them to have a very great velocity of propagation, so that the aether was considered to be practically incompressible. Even on this assumption, however, much in Fresnel's theory remained questionable. Thus George Green,[1] who was the first to apply the theory of elasticity in an unobjectionable manner, arrived on Fresnel's assumption at a formula for the reflection coefficient A_n sensibly differing from (10).

In the theory of double refraction the difficulties are no less serious. As a general rule there are in an anisotropic elastic solid three possible directions of vibration (§ 6), at right angles to each other, for a given direction of the waves, but none of these lies in the wave-front. In order to make two of them do so and to find Fresnel's form for the wave-surface, new hypotheses are required. On Fresnel's assumption it is even necessary, as was observed by Green, to suppose that in the absence of all vibrations there is already a certain state of pressure in the medium.

If we adhere to Fresnel's assumption, it is indeed scarcely possible to construct an elastic model of the electromagnetic medium. It may be done, however, if the velocities of the particles in the model are taken to represent the magnetic force **H**, which, of course, implies that the vibrations of the particles are parallel to the plane of polarization, and that the magnetic energy is represented by the kinetic energy in the model. Considering further that, in the case of two bodies connected with each other, there is continuity of **H** in the electromagnetic system, and continuity of the velocity of the particles in the model, it becomes clear that the representation of **H** by that velocity must be on the same scale in all substances, so that, if ξ, η, ζ are the displacements of a particle and g a universal constant, we may write

$$\mathbf{H}_x = g\frac{\partial\xi}{\partial t}, \quad \mathbf{H}_y = g\frac{\partial\eta}{\partial t}, \quad \mathbf{H}_z = g\frac{\partial\zeta}{\partial t}. \qquad (19)$$

By this the magnetic energy per unit of volume becomes

$$\tfrac{1}{2}g^2\left\{\left(\frac{\partial\xi}{\partial t}\right)^2+\left(\frac{\partial\eta}{\partial t}\right)^2+\left(\frac{\partial\zeta}{\partial t}\right)^2\right\},$$

and since this must be the kinetic energy of the elastic medium, the density of the latter must be taken equal to g^2, so that it must be the same in all substances.

It may further be asked what value we have to assign to the potential energy in the model, which must correspond to the electric energy in the electromagnetic field. Now, on account of (11) and (19), we can satisfy the equations (12) by putting $\mathbf{D}_x = gc\left(\frac{\partial\zeta}{\partial y}-\frac{\partial\eta}{\partial z}\right)$, &c., so that the electric energy (17) per unit of volume becomes

$$\tfrac{1}{2}g^2c^2\left\{\frac{1}{\epsilon_1}\left(\frac{\partial\zeta}{\partial y}-\frac{\partial\eta}{\partial z}\right)^2+\frac{1}{\epsilon_2}\left(\frac{\partial\xi}{\partial z}-\frac{\partial\zeta}{\partial x}\right)^2+\frac{1}{\epsilon_3}\left(\frac{\partial\eta}{\partial x}-\frac{\partial\xi}{\partial y}\right)^2\right\}.$$

This, therefore, must be the potential energy in the model.

It may be shown, indeed, that, if the aether has a uniform constant density, and is so constituted that in any system, whether homogeneous or not, its potential energy per unit of volume can be represented by an expression of the form

$$\tfrac{1}{2}\left\{\mathrm{L}\left(\frac{\partial\zeta}{\partial y}-\frac{\partial\eta}{\partial z}\right)^2+\mathrm{M}\left(\frac{\partial\xi}{\partial z}-\frac{\partial\zeta}{\partial x}\right)^2+\mathrm{N}\left(\frac{\partial\eta}{\partial x}-\frac{\partial\xi}{\partial y}\right)^2\right\}, \qquad (20)$$

where L, M, N are coefficients depending on the physical properties of the substance considered, the equations of motion will exactly correspond to the equations of the electromagnetic field.

18. *Theories of Neumann, Green, and MacCullagh.*—A theory of light in which the elastic aether has a uniform density, and in which the vibrations are supposed to be parallel to the plane of polarization, was developed by Franz Ernst Neumann,[2] who gave the first deduction of the formulas for crystalline reflection. Like Fresnel, he was, however, obliged to introduce some illegitimate assumptions and simplifications. Here again Green indicated a more rigorous treatment.

By specializing the formula for the potential energy of an anisotropic body he arrives at an expression which, if some of his coefficients are made to vanish and if the medium is supposed to be incompressible, differs from (20) only by the additional terms

$$2\left\{\mathrm{L}\left(\frac{\partial\zeta}{\partial y}\frac{\partial\eta}{\partial z}-\frac{\partial\eta}{\partial y}\frac{\partial\zeta}{\partial z}\right)+\mathrm{M}\left(\frac{\partial\xi}{\partial z}\frac{\partial\zeta}{\partial x}-\frac{\partial\zeta}{\partial z}\frac{\partial\xi}{\partial x}\right)+\mathrm{N}\left(\frac{\partial\eta}{\partial x}\frac{\partial\xi}{\partial y}-\frac{\partial\xi}{\partial x}\frac{\partial\eta}{\partial y}\right)\right\}. \qquad (21)$$

If ξ, η, ζ vanish at infinite distance the integral of this expression over all space is zero, when L, M, N are constants, and the same will be true when these coefficients change from point to point, provided we add to (21) certain terms containing the differential coefficients of L, M, N, the physical meaning of these terms being that, besides the ordinary elastic forces, there is some extraneous force (called into play by the displacement) acting on all those elements of volume where L, M, N are not constant. We may conclude from this that all phenomena can be explained if we admit the existence of this latter force, which, in the case of two contingent bodies, reduces to a surface-action on their common boundary.

James MacCullagh[3] avoided this complication by simply assuming an expression of the form (20) for the potential energy. He thus established a theory that is perfectly consistent in itself, and may be said to have foreshadowed the electromagnetic theory as regards the form of the equations for transparent bodies. Lord Kelvin afterwards interpreted MacCullagh's assumption by supposing the only action which is called forth by a displacement to consist in certain couples acting on the elements of volume and proportional to the components $\tfrac{1}{2}\{(\partial\zeta/\partial y)-(\partial\eta/\partial z)\}$, &c., of their rotation from the natural position. He also showed[4] that this "rotational elasticity" can be produced by certain hidden rotations going on in the medium.

We cannot dwell here upon other models that have been proposed, and most of which are of rather limited applicability. A mechanism of a more general kind ought, of course, to be adapted to what is known of the molecular constitution of bodies, and to the highly probable assumption of the perfect permeability for the aether of all ponderable matter, an assumption by which it has been possible to escape from one of the objections raised by Newton (§ 4) (see AETHER).

The possibility of a truly satisfactory model certainly cannot be denied. But it would, in all probability, be extremely complicated. For this reason many physicists rest content, as regards the free aether, with some such general form of the electromagnetic theory as has been sketched in § 16.

19. *Optical Properties of Ponderable Bodies. Theory of Electrons.*—If we want to form an adequate representation of optical phenomena in ponderable bodies, the conceptions of the molecular and atomistic theories naturally suggest themselves. Already, in the elastic theory, it had been imagined that certain material particles are set vibrating by incident waves of light. These particles had been supposed to be acted on by an elastic force by which they are drawn back towards their positions of equilibrium, so that they can perform free vibrations of their own, and by a resistance that can be represented by terms proportional to the velocity in the equations of motion, and may be physically understood if the vibrations are supposed to be converted in one way or another into a disorderly heat-motion. In this way it had been found possible to explain the phenomena of dispersion and (selective) absorption, and the connexion between them (anomalous dispersion).[5] These ideas have been also embodied into the electromagnetic theory. In its more recent development the extremely small, electrically charged particles, to which the name of "electrons" has been given, and which are supposed to exist in the interior of all bodies, are considered as forming the connecting links between aether and matter, and as determining by their arrangement and their motion all optical phenomena that are not confined to the free aether.[6]

It has thus become clear why the relations that had been established between optical and electrical properties have been found to hold only in some simple cases (§16). In fact it cannot be doubted that, for rapidly alternating electric fields, the formulae expressing the connexion between the motion of electricity and the electric force take a form that is less simple than the one previously admitted, and is to be determined in each case by elaborate investigation. However, the general boundary conditions given in § 16 seem to require no alteration. For this reason it has been possible, for example, to establish a satisfactory theory of metallic reflection, though the propagation of light in the interior of a metal is only imperfectly understood.

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[1] "Reflection and Refraction," *Trans. Cambr. Phil. Soc.* 7, p. 1 (1837); "Double Refraction," *ibid.* p. 121 (1839).

[2] "Double Refraction," *Ann. d. Phys. u. Chem.* 25 (1832), p. 418; "Crystalline Reflection," *Abhandl. Akad. Berlin* (1835), p. 1.

[3] *Trans. Irish Acad.* 21, "Science," p. 17 (1839).

[4] *Math. and Phys. Papers* (London, 1890), 3, p. 466.

[5] Helmholtz, *Ann. d. Phys. u. Chem.*, 154 (1875), p. 582.

[6] H. A. Lorentz, *Versuch einer Theorie der elektrischen u. optischen Erscheinungen in bewegten Körpern* (1895) (Leipzig, 1906); J. Larmor, *Aether and Matter* (Cambridge, 1900).

One of the fundamental propositions of the theory of electrons is that an electron becomes a centre of radiation whenever its velocity changes either in direction or in magnitude. Thus the production of Röntgen rays, regarded as consisting of very short and irregular electromagnetic impulses, is traced to the impacts of the electrons of the cathode-rays against the anticathode, and the lines of an emission spectrum indicate the existence in the radiating body of as many kinds of regular vibrations, the knowledge of which is the ultimate object of our investigations about the structure of the spectra. The shifting of the lines caused, according to Doppler's law, by a motion of the source of light, may easily be accounted for, as only general principles are involved in the explanation. To a certain extent we can also elucidate the changes in the emission that are observed when the radiating source is exposed to external magnetic forces ("Zeeman-effect"; see MAGNETO-OPTICS).

20. *Various Kinds of Light-motion.*—(*a*) If the disturbance is represented by

$$\mathbf{P}_x=0, \mathbf{P}_y=a\cos(nt-kx+f),\ \mathbf{P}_z=a'\cos(nt-kx+f'),$$

so that the end of the vector **P** describes an ellipse in a plane perpendicular to the direction of propagation, the light is said to be elliptically, or in special cases circularly, polarized. Light of this kind can be dissolved in many different ways into plane polarized components.

There are cases in which plane waves must be elliptically or circularly polarized in order to show the simple propagation of phase that is expressed by formulae like (5). Instances of this kind occur in bodies having the property of rotating the plane of polarization, either on account of their constitution, or under the influence of a magnetic field. For a given direction of the wave-front there are in general two kinds of elliptic vibrations, each having a definite form, orientation, and direction of motion, and a determinate velocity of propagation. All that has been said about Huygens's construction applies to these cases.

(*b*) In a perfect spectroscope a sharp line would only be observed if an endless regular succession of simple harmonic vibrations were admitted into the instrument. In any other case the light will occupy a certain extent in the spectrum, and in order to determine its distribution we have to decompose into simple harmonic functions of the time the components of the disturbance, at a point of the slit for instance. This may be done by means of Fourier's theorem.

An extreme case is that of the unpolarized light emitted by incandescent solid bodies, consisting of disturbances whose variations are highly irregular, and giving a continuous spectrum. But even with what is commonly called homogeneous light, no perfectly sharp line will be seen. There is no source of light in which the vibrations of the particles remain for ever undisturbed, and a particle will never emit an endless succession of uninterrupted vibrations, but at best a series of vibrations whose form, phase and intensity are changed at irregular intervals. The result must be a broadening of the spectral line.

In cases of this kind one must distinguish between the velocity of propagation of the phase of regular vibrations and the velocity with which the said changes travel onward (see below, iii. *Velocity of Light*).

(*c*) In a train of plane waves of definite frequency the disturbance is represented by means of goniometric functions of the time and the coordinates. Since the fundamental equations are linear, there are also solutions in which one or more of the coordinates occur in an exponential function. These solutions are of interest because the motions corresponding to them are widely different from those of which we have thus far spoken. If, for example, the formulae contain the factor

$$e^{-rx}\cos(nt-sy+l)$$

with the positive constant r, the disturbance is no longer periodic with respect to x, but steadily diminishes as x increases. A state of things of this kind, in which the vibrations rapidly die away as we leave the surface, exists in the air adjacent to the face of a glass prism by which a beam of light is totally reflected. It furnishes us an explanation of Newton's experiment mentioned in § 2.

(H. A. L.)

III. VELOCITY OF LIGHT

The fact that light is propagated with a definite speed was first brought out by Ole Roemer at Paris, in 1676, through observations of the eclipses of Jupiter's satellites, made in different relative positions of the Earth and Jupiter in their respective orbits. It is possible in this way to determine the time required for light to pass across the orbit of the earth. The dimensions of this orbit, or the distance of the sun, being taken as known, the actual speed of light could be computed. Since this computation requires a knowledge of the sun's distance, which has not yet been acquired with certainty, the actual speed is now determined by experiments made on the earth's surface. Were it possible by any system of signals to compare with absolute precision the times at two different stations, the speed could be determined by finding how long was required for light to pass from one station to another at the greatest visible distance. But this is impracticable, because no natural agent is under our control by which a signal could be communicated with a greater velocity than that of light. It is therefore necessary to reflect a ray back to the point of observation and to determine the time which the light requires to go and come. Two systems have been devised for this purpose. One is that of Fizeau, in which the vital appliance is a rapidly revolving toothed wheel; the other is that of Foucault, in which the corresponding appliance is a mirror revolving on an axis in, or parallel to, its own plane.

Fizeau.

The principle underlying Fizeau's method is shown in the accompanying figs. 1 and 2. Fig. 1 shows the course of a ray of light which, emanating from a luminous point L, strikes the plane surface of a plate of glass M at an angle of about 45°. A fraction of the light is reflected from the two surfaces of the glass to a distant reflector R, the plane of which is at right angles to the course of the ray. The latter is thus reflected back on its own course and, passing through the glass M on its return, reaches a point E behind the glass. An observer with his eye at E looking through the glass sees the return ray as a distant luminous point in the reflector R, after the light has passed over the course in both directions.

In actual practice it is necessary to interpose the object glass of a telescope at a point O, at a distance from M nearly equal to its focal length. The function of this appliance is to render the diverging rays, shown by the dotted lines, nearly parallel, in order that more light may reach R and be thrown back again. But the principle may be conceived without respect to the telescope, all the rays being ignored except the central one, which passes over the course we have described.

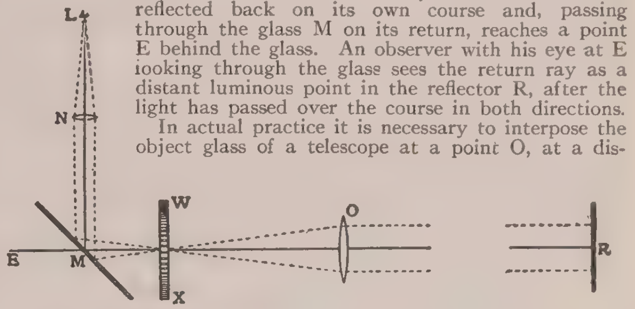

FIG. 1.

Conceiving the apparatus arranged in such a way that the observer sees the light reflected from the distant mirror R, a fine toothed wheel WX is placed immediately in front of the glass M, with its plane perpendicular to the course of the ray, in such a way that the ray goes out and returns through an opening between two adjacent teeth. This wheel is represented in section by WX in fig. 1, and a part of its circumference, with the teeth as viewed by the observer, is shown in fig. 2. We conceive that the latter sees the luminous point between two of the teeth at K. Now, conceive that the wheel is set in revolution. The ray is then interrupted as every tooth passes, so that what is sent out is a succession of flashes. Conceive that the speed of the mirror is such that while the flash is going to the distant mirror and returning again, each tooth of the wheel takes the place of an opening between the teeth. Then each flash sent out will, on its return, be intercepted by the adjacent tooth, and will therefore become invisible. If the speed be now doubled, so that the teeth pass at intervals equal to the time required for the light to go and come, each flash sent through an opening will return through the adjacent opening, and will therefore be seen with full brightness. If the speed be continuously increased the result will be successive disappearances and reappearances of the light, according as a tooth is or is not interposed when the ray reaches the apparatus on its return. The computation of the time of passage and return is then very simple. The speed of the wheel being known, the number of teeth passing in one second can be computed. The order of the disappearance, or the number of teeth which have passed while the light is going and coming, being also determined in each case, the interval of time is computed by a simple formula.

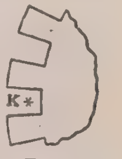

FIG. 2.

Cornu.

The most elaborate determination yet made by Fizeau's method was that of Cornu. The station of observation was at the Paris Observatory. The distant reflector, a telescope with a reflector at its focus, was at Montlhéry, distant 22,910 metres from the toothed wheel. Of the wheels most used one had 150 teeth, and was 35 millimetres in diameter; the other had 200 teeth, with a diameter of 45 mm. The highest speed attained was about 900 revolutions per second. At this speed, 135,000 (or 180,000) teeth would pass per second, and about 20 (or 28) would pass while the light was going and coming. But the actual speed attained was generally less than this. The definitive result derived by Cornu from the entire series of experiments was 300,400 kilometres per second. Further details of this work need not be set forth because the method is in several ways deficient in precision. The eclipses and subsequent reappearances of the light taking place gradually, it is impossible to fix with entire precision upon the moment of complete eclipse. The speed of the wheel is continually varying, and it is impossible to determine with precision what it was at the instant of an eclipse.

The defect would be lessened were the speed of the toothed wheel placed under control of the observer who, by action in one direction or the other, could continually check or accelerate it, so as to keep the return point of light at the required phase of brightness. If the phase of complete extinction is chosen for this purpose a definite result cannot be reached; but by choosing the moment when the light is of a certain definite brightness, before or after an eclipse, the observer will know at each instant whether the speed should be accelerated or retarded, and can act accordingly. The nearly constant speed through as long a period as is deemed necessary would then be found by dividing the entire number of revolutions of the wheel by the time through which the light was kept constant. But even with these improvements, which were not actually tried by Cornu, the estimate of the brightness on which the whole result depends would necessarily be uncertain. The outcome is that, although Cornu's discussion of his experiments is a model in the care taken to determine so far as practicable every source of error, his definitive result is shown by other determinations to have been too great by about $\frac{1}{1000}$ part of its whole amount.

Young and Forbes.

An important improvement on the Fizeau method was made in 1880 by James Young and George Forbes at Glasgow. This consisted in using two distant reflectors which were placed nearly in the same straight line, and at unequal distances. The ratio of the distances was nearly 12 : 13. The phase observed was not that of complete extinction of either light, but that when the two lights appeared equal in intensity. But it does not appear that the very necessary device of placing the speed of the toothed wheel under control of the observer was adopted. The accordance between the different measures was far from satisfactory, and it will suffice to mention the result which was

Velocity in vacuo = 301,382 km. per second.

These experimenters also found a difference of 2% between the speed of red and blue light, a result which can only be attributed to some unexplained source of error.

The Foucault system is much more precise, because it rests upon the measurement of an angle, which can be made with great precision.

Foucault.

The vital appliance is a rapidly revolving mirror. Let AB (fig. 3) be a section of this mirror, which we shall first suppose at rest. A ray of light LM emanating from a source at L, is reflected in the direction MQR to a distant mirror R, from which it is perpendicularly reflected back upon its original course. This mirror R should be slightly concave, with the centre of curvature near M, so that the ray shall always be reflected back to M on whatever point of R it may fall. Conceiving the revolving mirror M as at rest, the return ray will after three reflections, at M, R and M again, be returned along its original course to the point L from which it emanated. An important point is that the return ray will always follow the fixed line ML no matter what the position of the movable mirror M, provided there is a distant reflector to send the ray back. Now, suppose that, while the ray is going and coming, the mirror M, being set in revolution, has turned from the position in which the ray was reflected to that shown by the dotted line. If α be the angle through which the surface has turned, the course of the return ray, after reflection, will then deviate from ML by the angle 2α, and so be thrown to a point E, such that the angle $LME = 2\alpha$. If the mirror is in rapid rotation the ray reflected from it will strike the distant mirror as a series of flashes, each formed by the light reflected when the mirror was in the position AB. If the speed of rotation is uniform, the reflected rays from the successive flashes while the mirror is in the dotted position will thus all follow the same direction ME after their second reflection from the mirror. If the motion is sufficiently rapid an eye observing the reflected ray will see the flashes as an invariable point of light so long as the speed of revolution remains constant. The time required for the light to go and come is then equal to that required by the mirror to turn through half the angle LME, which is therefore to be measured. In practice it is necessary on this system, as well as on that of Fizeau, to condense the light by means of a lens, Q, so placed that L and R shall be at conjugate foci. The position of the lens may be either between the luminous point L and the mirror M, or between M and R, the latter being the only one shown in the figure. This position has the advantage that more light can be concentrated, but it has the disadvantage that, with a given magnifying power, the effect of atmospheric undulation, when the concave reflector is situated at a great distance, is increased in the ratio of the focal length of the lens to the distance LM from the light to the mirror. To state the fact in another form, the amplitude of the disturbances produced by the air in linear measure are proportional to the focal distance of the lens, while the magnification required increases in the inverse ratio of the distance LM. Another difficulty associated with the Foucault system in the form in which its originator used it is that if the axis of the mirror is at right angles to the course of the ray, the light from the source L will be flashed directly into the eye of the observer, on every passage of the revolving mirror through the position in which its normal bisects the two courses of the ray. This may be avoided by inclining the axis of the mirror.

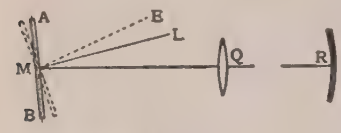

FIG. 3.

In Foucault's determination the measures were not made upon a luminous point, but upon a reticule, the image of which could not be seen unless the reflector was quite near the revolving mirror. Indeed the whole apparatus was contained in his laboratory. The effective distance was increased by using several reflectors; but the entire course of the ray measured only 20 metres. The result reached by Foucault for the velocity of light was 298,000 kilometres per second.

Michelson.

The first marked advance on Foucault's determination was made by Albert A. Michelson, then a young officer on duty at the U.S. Naval Academy, Annapolis. The improvement consisted in using the image of a slit through which the rays of the sun passed after reflection from a heliostat. In this way it was found possible to see the image of the slit reflected from the distant mirror when the latter was nearly 600 metres from the station of observation. The essentials of the arrangement are those we have used in fig. 3, L being the slit. It will be seen that the revolving mirror is here interposed between the lens and its focus. It was driven by an air turbine, the blast of which was under the control of the observer, so that it could be kept at any required speed. The speed was determined by the vibrations of two tuning forks. One of these was an electric fork, making about 120 vibrations per second, with which the mirror was kept in unison by a system of rays reflected from it and the fork. The speed of this fork was determined by comparison with a freely vibrating fork from time to time. The speed of the revolving mirror was generally about 275 turns per second, and the deflection of the image of the slit about 112·5 mm. The mean result of nearly 100 fairly accordant determinations was:—

Velocity of light in air . . .	299,828 km. per sec.
Reduction to a vacuum . .	+82
Velocity of light in a vacuum .	299,910 ± 50

Newcomb.

While this work was in progress Simon Newcomb obtained the official support necessary to make a determination on a yet larger scale. The most important modifications made in the Foucault-Michelson system were the following:—

1. Placing the reflector at the much greater distance of several kilometres.

2. In order that the disturbances of the return image due to the passage of the ray through more than 7 km. of air might be reduced to a minimum, an ordinary telescope of the "broken back" form was used to send the ray to the revolving mirror.

3. The speed of the mirror was, as in Michelson's experiments, completely under control of the observer, so that by drawing one or the other of two cords held in the hand the return image could be kept in any required position. In making each measure the receiving telescope hereafter described was placed in a fixed position and during the "run" the image was kept as nearly as practicable upon a vertical thread passing through its focus. A "run" generally lasted about two minutes, during which time the mirror commonly made between 25,000 and 30,000 revolutions. The speed per second was found by dividing the entire number of revolutions by the number of seconds in the "run." The extreme deviations between the times of transmission of the light, as derived from any two runs, never approached to the thousandth part of its entire amount. The average deviation from the mean was indeed less than $\frac{1}{5000}$ part of the whole.

To avoid the injurious effect of the directly reflected flash, as well as to render unnecessary a comparison between the directions of the outgoing and the return ray, a second telescope, turning horizontally on an axis coincident with that of the revolving mirror, was used to receive the return ray after reflection. This required the use of an elongated mirror of which the upper half of the surface reflected the outgoing ray, and the lower other half received and reflected the ray on its return. On this system it was not necessary to incline the mirror in order to avoid the direct reflection of the return ray. The greatest advantage of this system was that the revolving mirror could be turned in either direction without break of continuity, so that the angular measures were made between the directions of the return ray after reflection when the mirror moved in opposite directions. In this way the speed of the mirror was as good as doubled, and the possible constant errors inherent in the reference to a fixed direction for the sending telescope were eliminated. The essentials of the apparatus are shown in fig. 4. The revolving mirror was a rectangular prism M of steel, 3 in. high and 1½ in. on a side in cross section, which was driven by a blast of air acting on two fan-wheels, not shown in the fig., one at the top, the other at the bottom of the mirror. NPO is the object-end of the fixed sending telescope the rays passing through it being reflected to the mirror by a prism P. The receiving telescope ABO is straight, and has its objective under O. It was attached to a frame which could turn around the same axis as the mirror. The angle through which it moved was measured by a divided arc immediately below its eye-piece, which is not shown in the figure. The position AB is that for receiving the ray during a rotation of the mirror in the anti-clockwise direction; the position A′B′ that for a clockwise rotation.

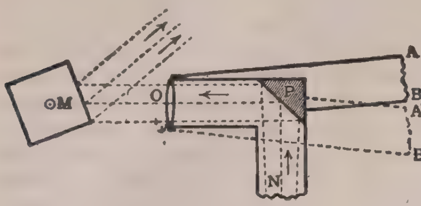

FIG. 4.

In these measures the observing station was at Fort Myer, on a hill above the west bank of the Potomac river. The distant reflector was first placed in the grounds of the Naval Observatory, at a distance of 2551 metres. But the definitive measures were made with the reflector at the base of the Washington monument, 3721 metres distant. The revolving mirror was of nickel-plated steel, polished on all four vertical sides. Thus four reflections of the ray were received during each turn of the mirror, which would be coincident were the form of the mirror invariable. During the preliminary series of measures it was found that two images of the return ray were sometimes formed, which would result in two different conclusions as to the velocity of light, according as one or the other was observed. The only explanation of this defect which presented itself was a tortional vibration of the revolving mirror, coinciding in period with that of revolution, but it was first thought that the effect was only occasional.

In the summer of 1881 the distant reflector was removed from the Observatory to the Monument station. Six measures made in August and September showed a systematic deviation of +67 km. per second from the result of the Observatory series. This difference led to measures for eliminating the defect from which it was supposed to arise. The pivots of the mirror were reground, and a change made in the arrangement, which would permit of the effect of the vibration being determined and eliminated. This consisted in making the relative position of the sending and receiving telescopes interchangeable. In this way, if the measured deflection was too great in one position of the telescopes, it would be too small by an equal amount in the reverse position. As a matter of fact, when the definitive measures were made, it was found that with the improved pivots the mean result was the same in the two positions. But the new result differed systematically from both the former ones. Thirteen measures were made from the Monument in the summer of 1882, the results of which will first be stated in the form of the time required by the ray to go and come. Expressed in millionths of a second this was:—

Least result of the 13 measures	24·819
Greatest result	24·831
Double distance between mirrors	7·44242 km.

Applying a correction of +12 km. for a slight convexity in the face of the revolving mirror, this gives as the mean result for the speed of light in air, 299,778 km. per second. The mean results for the three series were:—

Observatory, 1880–1881	V in air = 299,627
Monument, 1881	V „ = 299,694
Monument, 1882	V „ = 299,778

The last result being the only one from which the effect of distortion was completely eliminated, has been adopted as definitive. For reduction to a vacuum it requires a correction of +82 km. Thus the final result was concluded to be

Velocity of light in vacuo = 299,860 km. per second.

This result being less by 50 km. than that of Michelson, the latter made another determination with improved apparatus and arrangements at the Case School of Applied Science in Cleveland. The result was

Velocity in vacuo = 299,853 km. per second.

So far as could be determined from the discordance of the separate measures, the mean error of Newcomb's result would be less than ±10 km. But making allowance for the various sources of systematic error the actual probable error was estimated at ±30 km.

It seems remarkable that since these determinations were made, a period during which great improvements have become possible in every part of the apparatus, no complete redetermination of this fundamental physical constant has been carried out.

The experimental measures thus far cited have been primarily those of the velocity of light in air, the reduction to a vacuum being derived from theory alone. The fundamental constant at the basis of the whole theory is the speed of light in a vacuum, such as the celestial spaces. The question of the relation between the velocity in vacuo, and in a transparent medium of any sort, belongs to the domain of physical optics. Referring to the preceding section for the principles at play we shall in the present part of the article confine ourselves to the experimental results. With the theory of the effect of a transparent medium is associated that of the possible differences in the speed of light of different colours.

Velocity and wave-length.

The question whether the speed of light in vacuo varies with its wave-length seems to be settled with entire certainty by observations of variable stars. These are situated at different distances, some being so far that light must be several centuries in reaching us from them. Were there any difference in the speed of light of various colours it would be shown by a change in the colour of the star as its light waxed and waned. The light of greatest speed preceding that of lesser speed would, when emanated during the rising phase, impress its own colour on that which it overtook. The slower light would predominate during the falling phase. If there were a difference of 10 minutes in the time at which light from the two ends of the visible spectrum arrived, it would be shown by this test. As not the slightest effect of the kind has ever been seen, it seems certain that the difference, if any, cannot approximate to $\frac{1}{1{\cdot}000{\cdot}000}$ part of the entire speed. The case is different when light passes through a refracting medium. It is a theoretical result of the undulatory theory of light that its velocity in such a medium is inversely proportional to the refractive index of the medium. This being different for different colours, we must expect a corresponding difference in the velocity.

Foucault and Michelson have tested these results of the undulatory theory by comparing the time required for a ray of light to pass through a tube filled with a refracting medium, and through air. Foucault thus found, in a general way, that there actually was a retardation; but his observations took account only of the mean retardation of light of all the wave-lengths, which he found to correspond with the undulatory theory. Michelson went further by determining the retardation of light of various wave-lengths in carbon bisulphide. He made two series of experiments, one with light near the brightest part of the spectrum; the other with red and blue light. Putting V for the speed in a vacuum and V_1 for that in the medium, his result was

Yellow light	$V : V_1 = 1{\cdot}758$
Refractive index for yellow	1·64
Difference from theory	+0·12

The estimated uncertainty was only 0·02, or ⅙ of the difference between observation and theory.

The comparison of red and blue light was made differentially. The colours selected were of wave-length about 0·62 for red and 0·49 for blue. Putting V_r and V_b for the speeds of red and blue light respectively in bisulphide of carbon, the mean result compares with theory as follows:—

Observed value of the ratio V_r, V_b	1·0245
Theoretical value (Verdet)	1·025

This agreement may be regarded as perfect. It shows that the divergence of the speed of yellow light in the medium from theory, as found above, holds through the entire spectrum.

The excess of the retardation above that resulting from theory is probably due to a difference between "wave-speed" and "group-speed" pointed out by Rayleigh. Let fig. 5 represent a short series of progressive undulations of constant period and wave-length. The wave-speed is that required to carry a wave crest A to the position of the crest B in the wave time.

But when a flash of light like that measured passes through a refracting medium, the front waves of the flash are continually dying away, as shown at the end of the figure, and the place of each is taken by the wave following. A familiar case of this sort is seen when a stone is thrown into a pond. The front waves die out one at a time, to be followed by others, each of which goes further than its predecessor, while new waves are formed in the rear. Hence the group, as represented in the figure by the larger waves in the middle, moves as a whole more slowly than do the individual waves. When the speed of light is measured the result is not the wave-speed as above defined, but something less, because the result depends on the time of the group passing through the medium. This lower speed is called the group-velocity of light. In a vacuum there is no dying out of the waves, so that the group-speed and the wave-speed are identical. From Michelson's experiments it would follow that the retardation was about 1/14 of the whole speed. This would indicate that in carbon bisulphide each individual light wave forming the front of a moving ray dies out in a space of about 15 wave-lengths.

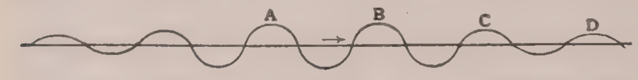

FIG. 5.

AUTHORITIES.—For Foucault's descriptions of his experiments see *Comptes Rendus* (September 22 and November 24, 1862), and *Recueil de Travaux Scientifiques de Léon Foucault* (2 vols., 4to, Paris, 1878). Cornu's determination is found in *Annales de l'Observatoire de Paris, Mémoires*, vol. xiii. The works of Michelson and Newcomb are published *in extenso* in the *Astronomical Papers of the American Ephemeris*, vols. i. and ii. (S. N.)

LIGHTFOOT, JOHN (1602–1675), English divine and rabbinical scholar, was the son of Thomas Lightfoot, vicar of Uttoxeter, Staffordshire, and was born at Stoke-upon-Trent on the 29th of March 1602. His education was received at Morton Green near Congleton, Cheshire, and at Christ's College, Cambridge, where he was reckoned the best orator among the undergraduates. After taking his degree he became assistant master at Repton in Derbyshire; after taking orders he was appointed curate of Norton-under-Hales in Shropshire. There he attracted the notice of Sir Rowland Cotton, an amateur Hebraist of some distinction, who made him his domestic chaplain at Bellaport. Shortly after the removal of Sir Rowland to London, Lightfoot, abandoning an intention to go abroad, accepted a charge at Stone in Staffordshire, where he continued for about two years. From Stone he removed to Hornsey, near London, for the sake of reading in the library of Sion College. His first published work, entitled *Erubhin, or Miscellanies, Christian and Judaical, penned for recreation at vacant hours*, and dedicated to Sir R. Cotton, appeared at London in 1629. In September 1630 he was presented by Sir R. Cotton to the rectory of Ashley in Staffordshire, where he remained until June, 1642, when he went to London, probably to superintend the publication of his next work, *A Few and New Observations upon the Book of Genesis: the most of them certain; the rest, probable; all, harmless, strange and rarely heard of before*, which appeared at London in that year. Soon after his arrival in London he became minister of St Bartholomew's church, near the Exchange; and in 1643 he was appointed to preach the sermon before the House of Commons on occasion of the public fast of the 29th of March. It was published under the title of *Elias Redivivus*, the text being Luke i. 17; in it a parallel is drawn between the Baptist's ministry and the work of reformation which in the preacher's judgment was incumbent on the parliament of his own day.

Lightfoot was also one of the original members of the Westminster Assembly; his "Journal of the Proceedings of the Assembly of Divines from January 1, 1643 to December 31, 1644," now printed in the thirteenth volume of the 8vo edition of his *Works*, is a valuable historical source for the brief period to which it relates. He was assiduous in his attendance, and, though frequently standing almost or quite alone, especially in the Erastian controversy, he exercised a material influence on the result of the discussions of the Assembly. In 1643 Lightfoot published *A Handful of Gleanings out of the Book of Exodus*, and in the same year he was made master of Catharine Hall by the parliamentary visitors of Cambridge, and also, on the recommendation of the Assembly, was promoted to the rectory of Much Munden in Hertfordshire; both appointments he retained until his death. In 1644 was published in London the first instalment of the laborious but never completed work of which the full title runs *The Harmony of the Four Evangelists among themselves, and with the Old Testament, with an explanation of the chiefest difficulties both in Language and Sense: Part I. From the beginning of the Gospels to the Baptism of our Saviour.* The second part *From the Baptism of our Saviour to the first Passover after* followed in 1647, and the third *From the first Passover after our Saviour's Baptism to the second* in 1650. On the 26th of August 1645 he again preached before the House of Commons on the day of their monthly fast. His text was Rev. xx. 1, 2. After controverting the doctrine of the Millenaries, he urged various practical suggestions for the repression with a strong hand of current blasphemies, for a thorough revision of the authorized version of the Scriptures, for the encouragement of a learned ministry, and for a speedy settlement of the church. In the same year appeared *A Commentary upon the Acts of the Apostles, chronical and critical; the Difficulties of the text explained, and the times of the Story cast into annals. From the beginning of the Book to the end of the Twelfth Chapter. With a brief survey of the contemporary Story of the Jews and Romans* (down to the third year of Claudius). In 1647 he published *The Harmony, Chronicle, and Order of the Old Testament*, which was followed in 1655 by *The Harmony, Chronicle, and Order of the New Testament*, inscribed to Cromwell. In 1654 Lightfoot had been chosen vice-chancellor of the university of Cambridge, but continued to reside by preference at Munden, in the rectory of which, as well as in the mastership of Catharine Hall, he was confirmed at the Restoration. The remainder of his life was devoted to helping Brian Walton with the Polyglot Bible (1657) and to his own best-known work, the *Horae Hebraicae et Talmudicae*, in which the volume relating to Matthew appeared in 1658, that relating to Mark in 1663, and those relating to 1 Corinthians, John and Luke, in 1664, 1671 and 1674 respectively. While travelling from Cambridge to Ely where he had been collated in 1668 by Sir Orlando Bridgman to a prebendal stall), he caught a severe cold, and died at Ely on the 6th of December 1675. The *Horae Hebraicae et Talmudicae impensae in Acta Apostolorum et in Ep. S. Pauli ad Romanos* were published posthumously.

The *Works* of Lightfoot were first edited, in 2 vols. fol., by G. Bright and Strype in 1684; the *Opera Omnia, cura Joh. Texelii*, appeared at Rotterdam in 1686 (2 vols. fol.), and again, edited by J. Leusden, at Franeker in 1699 (3 vols. fol.). A volume of *Remains* was published at London in 1700. The *Hor. Hebr. et Talm.* were also edited in Latin by Carpzov (Leipzig, 1675–1679), and again, in English, by Gandell (Oxford, 1859). The most complete edition is that of the *Whole Works*, in 13 vols. 8vo, edited, with a life, by R. Pitman (London, 1822–1825). It includes, besides the works already noticed, numerous sermons, letters and miscellaneous writings; and also *The Temple, especially as it stood in the Days of our Saviour* (London, 1650).

See D. M. Welton, *John Lightfoot, the Hebraist* (Leipzig, 1878).

LIGHTFOOT, JOSEPH BARBER (1828–1889), English theologian and bishop of Durham, was born at Liverpool on the 13th of April 1828. His father was a Liverpool accountant. He was educated at King Edward's school, Birmingham, under James Prince Lee, afterwards bishop of Manchester, and had as contemporaries B. F. Westcott and E. W. Benson. In 1847 Lightfoot went up to Trinity College, Cambridge, and there read for his degree with Westcott. He graduated senior classic and 30th wrangler, and was elected a fellow of his college. From 1854 to 1859 he edited the *Journal of Classical and Sacred Philology*. In 1857 he became tutor and his fame as a scholar grew rapidly. He was made Hulsean professor in 1861, and shortly afterwards chaplain to the Prince Consort and honorary chaplain in ordinary to the queen. In 1866 he was Whitehall preacher, and in 1871 he became canon of St Paul's. His sermons were not remarkable for eloquence, but a certain solidity and balance of judgment, an absence of partisanship, a sobriety of expression combined with clearness and force of diction, attracted hearers and inspired them with confidence. As was written of him in *The Times* after his death, " his personal character carried immense weight, but his great position depended still more on the universally recognized fact that his belief in Christian truth and his defence of it were supported by learning as solid and comprehensive as could be found anywhere in Europe, and by a temper not only of the utmost candour but of the highest scientific capacity. The days in which his university influence was asserted were a time of much shaking of old beliefs. The disintegrating speculations of an influential school of criticism in Germany were making their way among English men of culture just about the time, as is usually the case, when the tide was turning against them in their own country. The peculiar service which was rendered at this juncture by the 'Cambridge School' was that, instead of opposing a mere dogmatic opposition to the Tübingen critics, they met them frankly on their own ground; and instead of arguing that their conclusions ought not to be and could not be true, they simply proved that their facts and their premisses were wrong. It was a characteristic of equal importance that Dr Lightfoot, like Dr Westcott, never discussed these subjects in the mere spirit of controversy. It was always patent that what he was chiefly concerned with was the substance and the life of Christian truth, and that his whole energies were employed in this inquiry because his whole heart was engaged in the truths and facts which were at stake. He was not diverted by controversy to side-issues; and his labour was devoted to the positive elucidation of the sacred documents in which the Christian truth is enshrined."

In 1872 the anonymous publication of *Supernatural Religion* created considerable sensation. In a series of masterly papers in the *Contemporary Review*, between December 1874 and May 1877, Lightfoot successfully undertook the defence of the New Testament canon. The articles were published in collected form in 1889. About the same time he was engaged in contributions to W. Smith's *Dictionary of Christian Biography* and *Dictionary of the Bible*, and he also joined the committee for revising the translation of the New Testament. In 1875 he became Lady Margaret professor of divinity in succession to William Selwyn. He had previously written his commentaries on the epistles to the Galatians (1865), Philippians (1868) and Colossians (1875), the notes to which were distinguished by sound judgment and enriched from his large store of patristic and classical learning. These commentaries may be described as to a certain extent a new departure in New Testament exegesis. Before Lightfoot's time commentaries, especially on the epistles, had not infrequently consisted either of short homilies on particular portions of the text, or of endeavours to enforce foregone conclusions, or of attempts to decide with infinite industry and ingenuity between the interpretations of former commentators. Lightfoot, on the contrary, endeavoured to make his author interpret himself, and by considering the general drift of his argument to discover his meaning where it appeared doubtful. Thus he was able often to recover the meaning of a passage which had long been buried under a heap of contradictory glosses, and he founded a school in which sobriety and common sense were added to the industry and ingenuity of former commentators. In 1879 Lightfoot was consecrated bishop of Durham in succession to C. Baring. His moderation, good sense, wisdom, temper, firmness and erudition made him as successful in this position as he had been when professor of theology, and he speedily surrounded himself with a band of scholarly young men. He endeavoured to combine his habits of theological study with the practical work of administration. He exercised a large liberality and did much to further the work of temperance and purity organizations. He continued to work at his editions of the *Apostolic Fathers*, and in 1885 published an edition of the Epistles of Ignatius and Polycarp, collecting also a large store of valuable materials for a second edition of Clement of Rome, which was published after his death (1st ed., 1869). His defence of the authenticity of the Epistles of Ignatius is one of the most important contributions to that very difficult controversy. His unremitting labours impaired his health and shortened his splendid career at Durham. He was never married. He died at Bournemouth on the 21st of December 1889, and was succeeded in the episcopate by Westcott, his schoolfellow and lifelong friend.

Four volumes of his *Sermons* were published in 1890.

LIGHTHOUSE, a form of building erected to carry a light for the purpose of warning or guidance, especially at sea.

1. EARLY HISTORY.—The earliest lighthouses, of which records exist, were the towers built by the Libyans and Cushites in Lower Egypt, beacon fires being maintained in some of them by the priests. Lesches, a Greek poet (*c.*660 B.C.) mentions a lighthouse at Sigeum (now Cape Incihisari) in the Troad. This appears to have been the first light regularly maintained for the guidance of mariners. The famous Pharos[1] of Alexandria, built by Sostratus of Cnidus in the reign of Ptolemy II. (283–247 B.C.) was regarded as one of the wonders of the world. The tower, which took its name from that of the small island on which it was built, is said to have been 600 ft. in height, but the evidence in support of this statement is doubtful. It was destroyed by an earthquake in the 13th century, but remains are said to have been visible as late as 1350. The name Pharos became the general term for all lighthouses, and the term " pharology " has been used for the science of lighthouse construction.

The tower at Ostia was built by the emperor Claudius (A.D. 50). Other famous Roman lighthouses were those at Ravenna, Pozzuoli and Messina. The ancient Pharos at Dover and that at Boulogne, later known as *la Tour d'Ordre*, were built by the Romans and were probably the earliest lighthouses erected in western Europe. Both are now demolished.

The light of Cordouan, on a rock in the sea at the mouth of the Gironde, is the earliest example now existing of a wave-swept tower. Earlier towers on the same rock are attributed the first to Louis le Debonnaire (*c.* A.D. 805) and the second to Edward the Black Prince. The existing structure was begun in 1584 during the reign of Henri II. of France and completed in 1611. The upper part of the beautiful Renaissance building was removed towards the end of the 18th century and replaced by a loftier cylindrical structure rising to a height of 207 ft. above the rock and with the focal plane of the light 196 ft. above high water (fig. 1). Until the 18th century the light exhibited from the tower was from an oak log fire, and subsequently a coal fire was in use for many years. The ancient tower at Corunna, known as the Pillar of Hercules, is supposed to have been a Roman Pharos. The Torre del Capo at Genoa originally stood on the promontory of San Berrique. It was built in 1139 and first used as a lighthouse in 1326. It was rebuilt on its present site in 1643. This beautiful tower rises 236 ft. above the cliff, the light being elevated 384 ft. above sea-level. A lens light was first installed in 1841. The Pharos of Meloria was constructed by the Pisans in 1154 and was several times rebuilt until finally destroyed in 1290. On the abandonment of Meloria by the Pisans, they erected the still existing tower at Leghorn in 1304.

In the 17th and 18th centuries numerous towers, on which were erected braziers or grates containing wood or coal fires, were established in various positions on the coasts of Europe. Among such stations in the United Kingdom were Tynemouth (*c.* 1608), the Isle of May (1636), St Agnes (1680), St Bees (1718) and the Lizard (1751). The oldest lighthouse in the United States is believed to be the Boston light situated on Little Brewster Island on the south side of the main entrance to Boston Harbour, Mass. It was established in 1716, the present structure dating from 1859. During the American War of Independence the lighthouse suffered many vicissitudes and was successively destroyed and rebuilt three times by the American or British forces. At the third rebuilding in 1783 a stone tower 68 ft. in height was erected, the illuminant consisting of four oil lamps. Other early lighthouse structures on the New England coast were those at Beaver Tail, near the entrance to Newport Harbour (1740), and the Brant at the entrance to Nantucket Harbour (1754). A watch-house and beacon appear to have been erected on Beacon or Lighthouse Island as well as on Point Allerton Hill near Boston, prior to 1673, but these structures would seem to have been in the nature of look-out stations in time of war rather than lighthouses for the guidance of mariners.

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[1] A full account is given in Hermann Thiersch, *Pharos Antike, Islam und Occident* (1909). See also MINARET.

2. Lighthouse Structures.—The structures of lighthouses may be divided into two classes, (*a*) those on rocks, shoals or in other situations exposed to the force of the sea, and (*b*) the more numerous class of land structures.

Wave-swept Towers.—In determining the design of a lighthouse tower to be erected in a wave-swept position consideration must be given to the physical features of the site and its surroundings. Towers of this description are classified as follows: (1) Masonry and concrete structures; (2) Openwork steel and iron-framed erections on pile or other foundations; (3) Cast iron plated towers; (4) Structures erected on cylinder foundations.

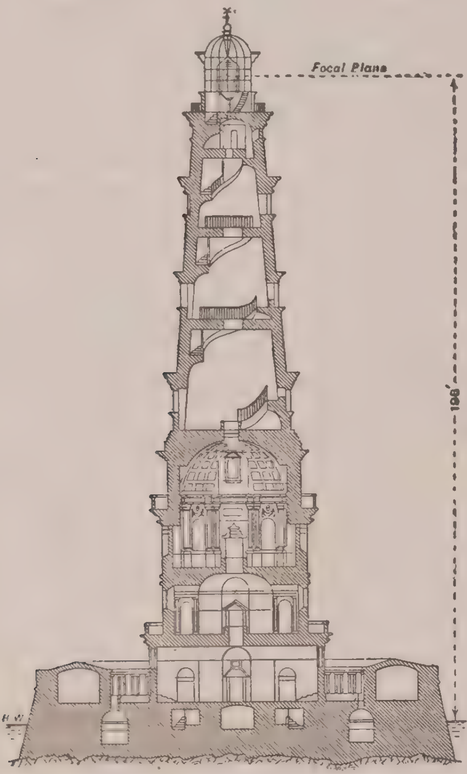


Fig. 1.—Cordouan Lighthouse.

(1) *Masonry Towers.*—Masonry or concrete towers are generally preferred for erection on wave-swept rocks affording good foundation, and have also been constructed in other situations where adequate foundations have been made by sinking caissons into a soft sea bed. Smeaton's tower on the Eddystone Rock is the model upon which most later designs of masonry towers have been based, although many improvements in detail have since been made. In situations of great exposure the following requirements in design should be observed: (*a*) The centre of gravity of the tower structure should be as low as possible. (*b*) The mass of the structure superimposed at any horizontal section must be sufficient to prevent its displacement by the combined forces of wind and waves without dependence on the adhesion at horizontal joint faces or on the dovetailing of stones introduced as an additional safeguard. (*c*) The structure should be circular in plan throughout, this form affording the least resistance to wave stroke and wind pressure in any direction. (*d*) The lower portion of the tower exposed to the direct horizontal stroke of the waves should, for preference, be constructed with vertical face. The upper portion to be either straight with uniform batter or continuously curved in the vertical plane. External projections from the face of the tower, except in the case of a gallery under the lantern, should be avoided, the surface throughout being smooth. (*e*) The height from sea-level to the top of the tower should be sufficient to avoid the obscuration of the light by broken water or dense spray driving over the lantern. (*f*) The foundation of the tower should be carried well into the solid rock. (*g*) The materials of which the tower is built should be of high density and of resistant nature. (*h*) The stones used in the construction of the tower, at any rate those on the outer face, should be dovetailed or joggled one to the other in order to prevent their being dislodged by the sea during the process of construction and as an additional safeguard of stability. Of late years, cement concrete has been used to a considerable extent for maritime structures, including lighthouses, either alone or faced with masonry.

(2) *Openwork Structures.*—Many examples of openwork steel and iron lighthouses exist. Some typical examples are described hereafter. This form of design is suitable for situations where the tower has to be carried on a foundation of iron or steel piles driven or screwed into an insecure or sandy bottom, such as on shoals, coral reefs and sand banks or in places where other materials of construction are exceptionally costly and where facility of erection is a desideratum.

(3) *Cast iron Towers.*—Cast iron plated towers have been erected in many situations where the cost of stone or scarcity of labour would have made the erection of a masonry tower excessively expensive.

(4) *Caisson Foundations.*—Cylinder or caisson foundations have been used for lighthouse towers in numerous cases where such structures have been erected on sand banks or shoals. A remarkable instance is the Rothersand Tower. Two attempts have been made to sink a caisson in the outer Diamond Shoal off Cape Hatteras on the Atlantic coast of the United States, but these have proved futile.

The following are brief descriptions of the more important wave-swept towers in various parts of the world.

Eddystone (*Winstanley's Tower*).—The Eddystone rocks, which lie about 14 m. off Plymouth, are fully exposed to south-west seas. The reef is submerged at high water of spring tides. Four towers have been constructed on the reef. The first lighthouse (fig. 2 was polygonal in plan and highly ornamented with galleries and projections which offered considerable resistance to the sea stroke. The work was begun by Henry Winstanley, a gentleman of Essex, in 1695. In 1698 it was finished to a height of 80 ft. to the wind vane and the light exhibited, but in the following year, in consequence of damage by storms, the tower was increased in diameter from 16 ft. to 24 ft. by the addition of an outer ring of masonry and made solid to a height of 20 ft. above the rock, the tower being raised to nearly 120 ft. The work was completed in the year 1700. The lower part of the structure appears to have been of stone, the upper part and lantern of timber. During the great storm of the 20th of November 1703 the tower was swept away, those in it at the time, including the builder, being drowned.

Eddystone (*Rudyerd's Tower*, fig. 3).—This structure was begun in 1706 and completed in 1709. It was a frustum of a cone 22 ft. 8 in. in diameter at the base and 14 ft. 3 in. at the top. The tower was 92 ft. in height to the top of the lantern. The work consisted principally of oak timbers securely bolted and cramped together, the lower part being filled in solid with stone to add weight to the structure. The simplicity of the design and the absence of projections from the outer face rendered the tower very suitable to withstand the onslaught of the waves. The lighthouse was destroyed by fire in 1755.

Eddystone (*Smeaton's Tower*, fig. 4).—This famous work, which consisted entirely of stone, was begun in 1756, the light being first exhibited in 1759. John Smeaton was the first engineer to use dovetailed joints for the stones in a lighthouse structure. The stones, which averaged 1 ton in weight, were fastened to each other by means of dovetailed vertical joint faces, oak key wedges, and by oak tree-nails wedged top and bottom, extending vertically from every course into the stones beneath it. During the 19th century the tower was strengthened on two occasions by the addition of heavy wrought iron ties, and the overhanging cornice was reduced in diameter to prevent the waves from lifting the stones from their beds. In 1877, owing partly to the undermining of the rock on which the tower was built and the insufficient height of the structure, the Corporation of Trinity House determined on the erection of a new lighthouse in place of Smeaton's tower.

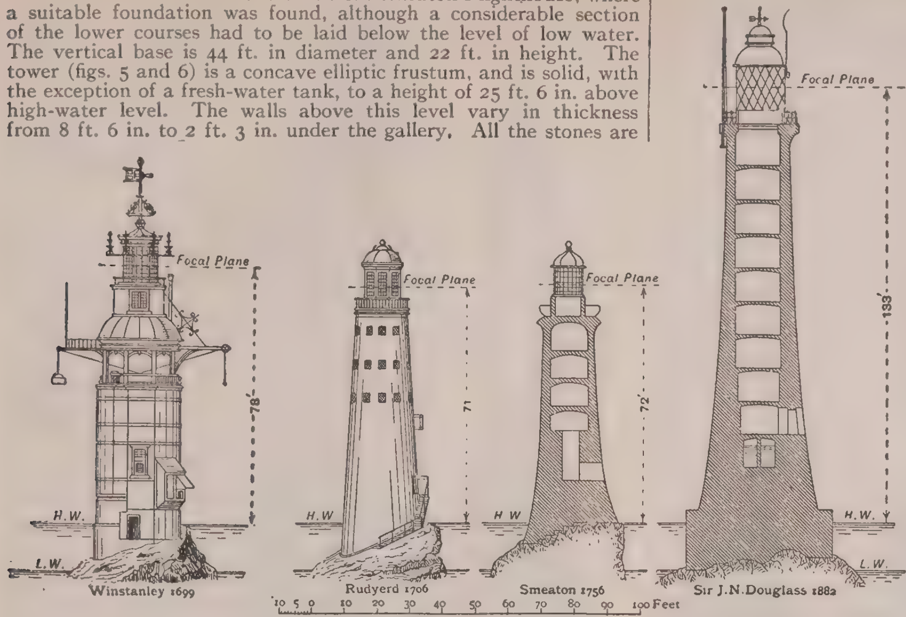


FIG. 2. FIG. 3. FIG. 4. FIG. 5.

Lighthouses on the Eddystone.

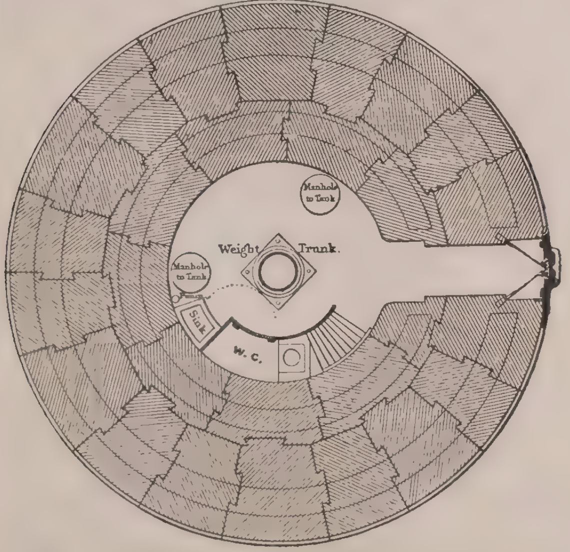


FIG. 6.—Plan of Entrance Floor, Eddystone Lighthouse.

Eddystone, New Lighthouse (*J. N. Douglass*).—The site selected for the new tower is 120 ft. S.S.E. from Smeaton's lighthouse, where a suitable foundation was found, although a considerable section of the lower courses had to be laid below the level of low water. The vertical base is 44 ft. in diameter and 22 ft. in height. The tower (figs. 5 and 6) is a concave elliptic frustum, and is solid, with the exception of a fresh-water tank, to a height of 25 ft. 6 in. above high-water level. The walls above this level vary in thickness from 8 ft. 6 in. to 2 ft. 3 in. under the gallery. All the stones are dovetailed, both horizontally and vertically, on all joint faces, the stones of the foundation course being secured to the rock by Muntz metal bolts. The tower contains 62,133 cub. ft. of granite, weighing 4668 tons. The height of the structure from low water ordinary spring tides to the mean focal plane is 149 ft. and it stands 133 ft. above high water. The lantern is a cylindrical helically framed structure with domed roof. The astragals are of gunmetal and the pedestal of cast iron. The optical apparatus consists of two superposed tiers of refracting lens panels, 12 in each tier of 920 mm. focal distance. The lenses subtend an angle of 92° vertically. The 12 lens panels are arranged in groups of two, thus producing a group flashing light showing 2 flashes of 1½ seconds' duration every half minute, the apparatus revolving once in 3 minutes. The burners originally fitted in the apparatus were of 6-wick pattern, but these were replaced in 1904 by incandescent oil vapour burners. The intensity of the combined beam of light from the two apparatus is 292,000 candles. At the time of the completion of the lighthouse two bells, weighing 2 tons each and struck by mechanical power, were installed for fog-signalling purposes. Since that date an explosive gun-cotton fog signal has been erected, the bells being removed. At a lower level in the tower are installed 2 21-in. parabolic silvered reflectors with 2-wick burners, throwing a fixed light of 8000 candle-power over a danger known as the Hand Deeps. The work of preparing the foundation was begun on the 17th of July 1878, the foundation stone being laid by the late duke of Edinburgh on the 19th of August 1879. The last stone was laid on the 1st of June 1881, and the light was exhibited for the first time on the 18th of May 1882. The upper portion of Smeaton's tower, which was removed on completion of the new lighthouse, was re-erected on Plymouth Hoe, where it replaced the old Trinity House sea mark. One of the principal features in the design of the new Eddystone lighthouse tower is the solid vertical base. This construction was much criticized at the time, but experience has proved that heavy seas striking the massive cylindrical structure are immediately broken up and rush round to the opposite side, spray alone ascending to the height of the lantern gallery. On the other hand, the waves striking the old tower at its foundation ran up the surface, which presented a curved face to the waves, and, unimpeded by any projection until arriving at the lantern gallery, were partially broken up by the cornice and then spent themselves in heavy spray over the lantern. The shock to which the cornice of the gallery was exposed was so great that stones were sometimes lifted from their beds. The new Eddystone tower presents another point of dissimilarity from Smeaton's structure, in that the stones forming the floors consist of single corbels built into the wall and constituting solid portions thereof. In Smeaton's tower the floors consisted of stone arches, the thrust being taken by the walls of the tower itself, which were strengthened for the purpose by building in chains in the form of hoops (fig. 7). The system of constructing corbelled stone floors was first adopted by R. Stevenson in the Bell Rock lighthouse (fig. 8).

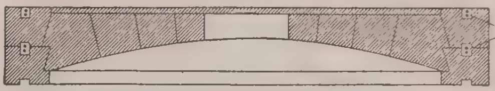


FIG. 7.—Floor, Smeaton's Eddystone Lighthouse.

Bell Rock Lighthouse (fig. 9).—The Bell Rock, which lies 12 m. off the coast of Forfarshire, is exposed to a considerable extent at low water. The tower is submerged to a depth of about 16 ft. at high water of spring tides. The rock is of hard sandstone. The lighthouse was constructed by Robert Stevenson and is 100 ft. in height, the solid portion being carried to a height of 21 ft. above high water. The work of construction was begun in 1807, and finished in 1810, the light being first exhibited in 1811. The total weight of the tower is 2076 tons. A new lantern and dioptric apparatus were erected on the tower in 1902. The focal plane of the light is elevated 93 ft. above high water.

Skerryvore Lighthouse (fig. 10).—The Skerryvore Rocks, 12 m. off the island of Tyree in Argyllshire, are wholly open to the Atlantic. The work, designed by Alan Stevenson, was begun in 1838 and finished in 1844. The tower, the profile of which is a hyperbolic curve, is 138 ft. high to the lantern base, 42 ft. diameter at the base, and 16 ft. at the top. Its weight is 4308 tons. The structure contains 9 rooms in addition to the lantern chamber. It is solid to a height of 26 ft. above the base.

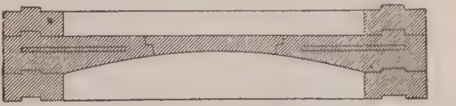


FIG. 8.—Floor, Stevenson's Bell Rock Lighthouse.

Heaux de Brehat Lighthouse.—The reef on which this tower is constructed lies off the coast of Brittany, and is submerged at high tide. The work was carried out in 1836–1839. The tower is circular in plan with a gallery at a height of about 70 ft. above the base. The tower is 156 ft. in height from base to lantern floor.

Haut Banc du Nord Lighthouse.—This tower is placed on a reef at the north-west extremity of the Île de Ré, and was constructed in 1849–1853. It is 86 ft. in height to the lantern floor.

Bishop Rock Lighthouse.—The lighthouse on the Bishop Rock, which is the westernmost landfall rock of the Scilly Islands, occupies perhaps a more exposed situation than any other in the world

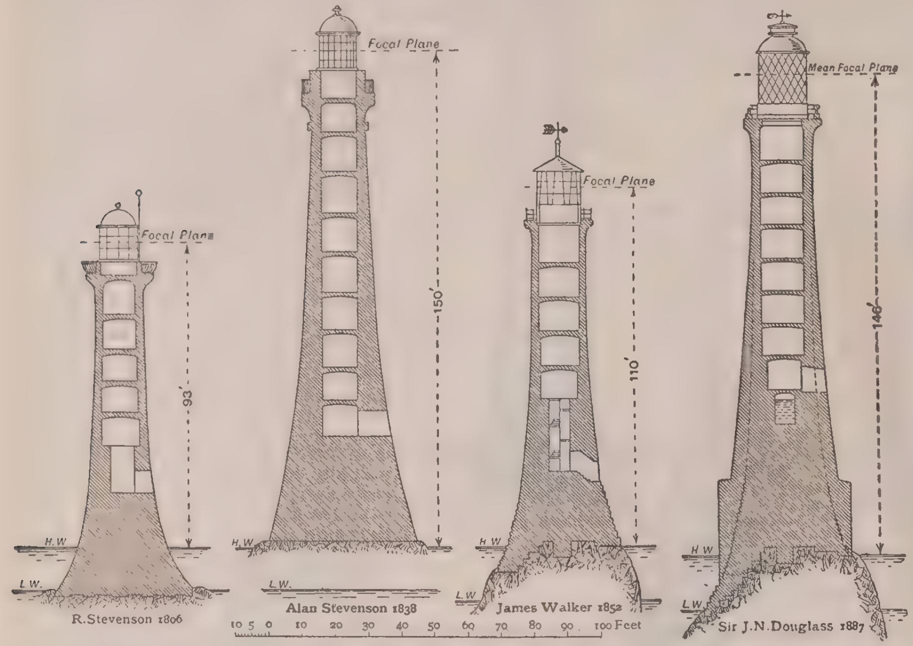


Fig. 9.—Bell Rock. Fig. 10.—Skerryvore. Fig. 11.—Bishop Rock. Fig. 12.—Bishop Rock.

The first lighthouse erected there was begun in 1847 under the direction of N. Douglass. The tower consisted of a cast and wrought iron openwork structure having the columns deeply sunk into the rock. On the 5th of February 1850, when the tower was ready for the erection of the lantern and illuminating apparatus, a heavy storm swept away the whole of the structure. This tower was designed for an elevation of 94 ft. to the focal plane. In 1851 the erection of a granite tower, from the designs of James Walker, was begun; the light was first exhibited in 1858. The tower (fig. 11) had an elevation to the focal plane of 110 ft., the lower 14 courses being arranged in steps, or offsets, to break up the force of the waves. This structure also proved insufficient to withstand the very heavy seas to which it was exposed. Soon after its completion the 5-cwt. fog bell, fixed to the lantern gallery 100 ft. above high-water mark, was washed away, together with the flagstaff and ladder. The tower vibrated considerably during storms, and it was found that some of the external blocks of granite had been split by the excessive stress to which they had been exposed. In 1874 the tower was strengthened by bolting continuous iron ties to the internal surfaces of the walls. In 1881, when further signs of damage appeared, it was determined to remove the upper storey or service room of the lighthouse, and to case the structure from its base upwards with granite blocks securely dovetailed to each other and to the existing work. At the same time it was considered advisable to increase the elevation of the light, and place the mean focal plane of the new apparatus at an elevation of 146 ft. above high-water mark. The work was begun in 1883, and the new apparatus was first illuminated on the 25th of October 1887. During the operation of heightening the tower it was necessary to install a temporary light, consisting of a cylindrical lightship lantern with catoptric apparatus; this was raised from time to time in advance of the structure as the work proceeded. The additional masonry built into the tower amounts approximately to 3220 tons. Profiting by the experience gained after the construction of the new Eddystone tower, Sir J. N. Douglass decided to build the lower portion of the improved Bishop Rock tower in the form of a cylinder, but with considerably increased elevation (figs. 12 and 13). The cylindrical base is 40 ft. in diameter, and rises to 25 ft. above high-water mark. The lantern is cylindrical and helically framed, 14 ft. in diameter, the glazing being 15 ft. in height. The optical apparatus consists of two superposed tiers of lenses of 1330 mm. focal distance, the lenses subtending a horizontal angle of 36° and a vertical angle of 80°. The apparatus consists of 5 groups of lenses each group producing a double flashing light of one minute period, the whole apparatus revolving once in five minutes. The maximum aggregate candle-power of the flash is 622,000 candles. A gun-cotton explosive fog signal is attached to the lantern. The cost of the various lighthouses on the Bishop Rock has been as follows:

1. Cast iron lighthouse	£12,500	0	0
2. Granite lighthouse	34,559	18	9
3. Improved granite lighthouse	64,889	0	0

The Smalls Lighthouse.—A lighthouse has existed on the Smalls rock, 18½ m. off Milford Haven, since 1776, when an oak pile structure was erected by Henry Whiteside. The existing structure, after the model of the second lighthouse on the Bishop Rock, was erected in 1856–1861 by the Trinity House and is 114 ft. in height from the foundation to the lantern floor. A new optical apparatus was installed in 1907.

Minot's Ledge Lighthouse.—The tower, which is 89 ft. in height, is built of granite upon a reef off Boston Harbor, Mass., and occupied five years in construction, being completed in 1860 at a cost of £62,500. The rock just bares at low water. The stones are dovetailed vertically but not on their horizontal beds in the case of the lower 40 ft. or solid portion of the tower, bonding bolts being substituted for the horizontal dovetailed joints used in the case of the Wolf and other English towers. The shape of the tower is a conical frustum.

Wolf Rock Lighthouse.—This much exposed rock lies midway between the Scilly Isles and the Lizard Point, and is submerged to the depth of about 6 ft. at high water. The tower was erected in 1862–1869 (fig. 14). It is 116 ft. 6 in. high, 41 ft. 8 in. diameter at the base, decreasing to 17 ft. at the top. The walls are 7 ft. 9½ in. thick, decreasing to 2 ft. 3 in. The shaft is a concave elliptic frustum, and contains 3296 tons. The lower part of the tower has projecting scarcements in order to break up the sea.

Dhu Heartach Rock Lighthouse.—The Dhu Heartach Rock, 35 ft. above high water, is 14 m. from the island of Mull, which is the nearest shore. The maximum diameter of the tower (fig. 15), which is of parabolic outline, is 36 ft., decreasing to 16 ft.; the shaft is solid for 32 ft. above the rock; the masonry weighs 3115 tons, of which 1810 are contained in the solid part. This tower occupied six years in erection, and was completed in 1872.

Great Basses Lighthouse, Ceylon.—The Great Basses lighthouse lies 6 m. from the nearest land. The cylindrical base is 32 ft. in diameter, above which is a tower 67 ft. 5 in. high and 23 ft. in diameter. The walls vary in thickness from 5 ft. to 2 ft. The tower, including the base, contains about 2768 tons. The work was finished in three years, 1870–1873.

Spectacle Reef Lighthouse, Lake Huron.—This is a structure similar to that on Minot's ledge, standing on a limestone reef at the northern end of the lake. The tower (fig. 16) was constructed with a view to withstanding the effects of ice massing in solid fields thousands of acres in extent and travelling at considerable velocity. The tower is in shape the frustum of a cone, 32 ft. in diameter at the base and 93 ft. in height to the coping of the gallery. The focal plane is at a level of 97 ft. above the base. The lower 34 ft. of the tower is solid. The work was completed in 1874, having occupied four years. The cost amounted to approximately £78,000.

Chicken Rock Lighthouse.—The Chicken Rock lies 1 m. off the Calf of Man. The curve of the tower, which is 123 ft. 4 in. high, is hyperbolic, the diameter varying from 42 ft. to 16 ft. The tower is submerged 5 ft. at high-water springs. The solid part is 32 ft. 6 in. in height, weighing 2050 tons, the whole weight of the tower being 3557 tons. The walls decrease from 9 ft. 3 in. to 2 ft. 3 in. in thickness. The work was begun in 1869 and completed in 1874.

Ar'men Lighthouse.—The masonry tower, erected by the French Lighthouse Service, on the Ar'men Rock off the western extremity of the Île de Sein, Finistère, occupied fifteen years in construction (1867–1881). The rock is of small area, barely uncovered at low water, and it was therefore found impossible to construct a tower having a base diameter greater than 24 ft. The focal plane of the light is 94 ft. above high water (fig. 17).

St George's Reef Lighthouse, California.—This structure consists of a square pyramidal stone tower rising from the easterly end of an oval masonry pier, built on a rock to a height of 60 ft. above the water. The focal plane is at an elevation of 146 ft. above high water. The site is an exceedingly dangerous one, and the work, which was completed in 1891, cost approximately £144,000.

Rattray Head Lighthouse.—This lighthouse was constructed between the years 1892 and 1895 by the Northern Lighthouse Commissioners upon the Ron Rock, lying about one-fifth of a mile off Rattray Head, Aberdeenshire. The focal plane is 91 ft. above high water, the building being approximately 113 ft. in height. In the tower there is a fog-horn worked by compressed air.

Fastnet Lighthouse.—In the year 1895 it was reported to the Irish Lights Commissioners that the then existing lighthouse on the Fastnet Rock off the south-west coast of Ireland, which was completed in 1854 and consisted of a circular cast iron tower 86 ft. in height on the summit of the rock, was considerably undermined. It was subsequently determined to proceed with the erection of a granite structure of increased height and founded upon a sound ledge of rock on one side of the higher, but now considerably undermined,

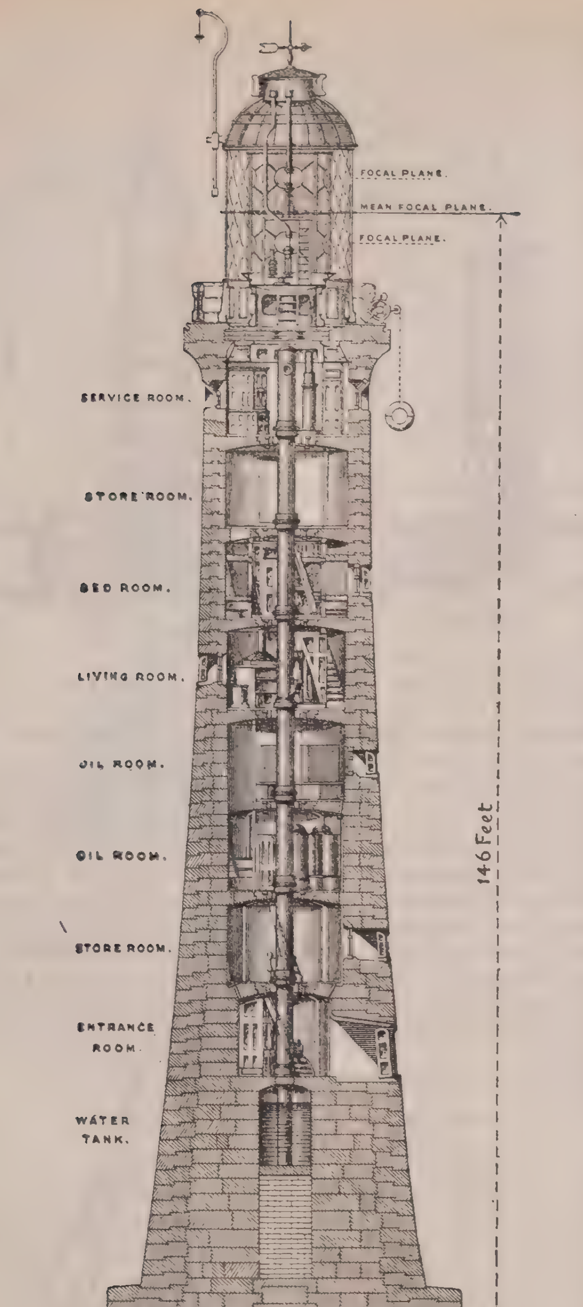


FIG. 13.—Bishop Rock Lighthouse.

portion of the reef. This lighthouse tower has its foundation laid near high-water level. The focal plane is at a level of 158 ft. above high-water mark. The cost of the structure, which was commenced in 1899 and completed in 1904, was £79,000.

Beachy Head Lighthouse.—A lighthouse has been erected upon the foreshore at the foot of Beachy Head, near Eastbourne, to replace the old structure on the cliff having an elevation of 284 ft. above high-water mark. Experience proved that the light of the latter was frequently obscured by banks of mist or fog, while at the lower level the transparency of the atmosphere was considerably less impaired. The Trinity House therefore decided in the year 1899 to proceed with the construction of a granite tower upon the foreshore at a distance of some 570 ft. from the base of the cliff (fig. 18). The foreshore at this point consists of chalk, and the selected site just bares at low water ordinary spring tides. The foundation course was laid at a depth of 10 ft. below the surface, the area being excavated within a coffer-dam. The tower, which is 47 ft. in diameter at the base, has an elevation to the focal plane above high water of 103 ft., or a total height from foundation course to gallery coping of 123 ft. 6 in. The lower or solid portion of the tower has its face stones constructed in vertical offsets or steps in a similar manner to that adopted at the Wolf Rock and elsewhere. The tower is constructed with a facing of granite, all the stones being dovetailed in the usual manner. The hearting of the base is largely composed of concrete. The work was completed in 1902 and cost £56,000.

Maplin Lighthouse.—The screw pile lighthouse erected on the Maplin Sand in the estuary of the river Thames in 1838 is the earliest of its kind and served as a model for numerous similar structures in various parts of the world. The piles are nine in number, 5 in. diameter of solid wrought iron with screws 4 ft. diameter (fig. 19).

Fowey Rocks Lighthouse, Florida.—This iron structure, which was begun in 1875 and completed in 1878, stands on the extreme northern point of the Florida reefs. The height of the tower, which is founded on wrought iron piles driven 10 ft. into the coral rock, is 110 ft. from high water to focal plane. The iron openwork pyramidal structure encloses a plated iron dwelling for the accommodation of the keepers. The cost of construction amounted to £32,600

Alligator Reef Lighthouse, Florida.—This tower is one of the finest iron sea-swept lighthouse structures in the world. It consists of a pyramidal iron framework 135 ft. 6 in. in height, standing on the Florida Reef in 5 ft. of water. The cost of the structure, which is similar to the Fowey Rocks tower, was £37,000.

American Shoal Lighthouse, Florida.—This tower (fig. 20) is typical of the openwork pile structures on the Florida reefs, and was completed in 1880. The focal plane of the light is at an elevation of 109 ft. above high water.

Wolf Trap Lighthouse.—This building was erected during the years 1893 and 1894 on Wolf Trap Spit in Chesapeake Bay, near the site of the old openwork structure which was swept away by ice early in 1893. The new tower is formed upon a cast iron caisson 30 ft. in diameter sunk 18 ft. into the sandy bottom. The depth of water on the shoal is 16 ft. at low water. The caisson was filled with concrete, and is surmounted by a brick superstructure 52 ft. in height from low water to the focal plane of the light. A somewhat similar structure was erected in 1885–1887 on the Fourteen Foot Bank in Delaware Bay, at a cost of £24,700. The foundation in this case was, however, shifting sand, and the caisson was carried to a greater depth.

Rothersand Lighthouse.—This lighthouse, off the entrance to the river Weser (Germany), is a structure of great interest on account of the difficulties met with in its construction. The tower had to be founded on a bottom of shifting sand 20 ft. below low water and in a very exposed situation. Work was begun in May 1881, when attempts were made to sink an iron caisson under pneumatic pressure. Owing to the enormous scour removing the sand from one side of the caisson it tilted to an alarming angle, but eventually it was sunk to a level of 70 ft. below low-water mark. In October of the same year the whole structure collapsed. Another attempt, made in May 1883, to sink a caisson of bi-convex shape in plan 47 ft. long, 37 ft. wide and 62 ft. in height, met with success, and after many difficulties the structure was sunk to a depth of 73 ft. below low water, the sides being raised by the addition of iron plating as the caisson sank. The sand was removed from the interior by suction. Around the caisson foundation were placed 74,000 cub. yds. of mattress work and stones, the interior being filled with concrete. Towards the end of 1885 the lighthouse was completed, at a total cost, including the first attempt, of over £65,000. The tower is an iron structure in the shape of a concave elliptic frustum, its base being founded upon the caisson foundation at about half-tide level (fig. 21). The light is electric, the current being supplied by cable from the shore. The focal plane is 78 ft. above high water or 109 ft. from the sand level. The total height from the foundation of the caisson to the top of the vane is 185 ft.

Other famous wave-swept towers are those at Haulbowline Rock (Carlingford Lough, Ireland, 1823); Horsburgh (Singapore, 1851); Bayes d'Olonne (Bay of Biscay, 1861); Hanois (Alderney, 1862); Daedalus Reef, iron tower (Red Sea, 1863); Alguada Reef (Bay of Bengal, 1865); Longships (Land's End, 1872); the Prongs (Bombay, 1874); Little Basses (Ceylon, 1878); the Graves (Boston, U.S.A.,

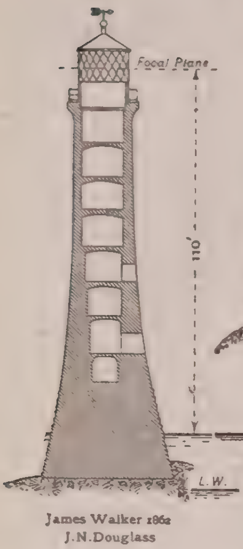


FIG. 14.—Wolf Rock.

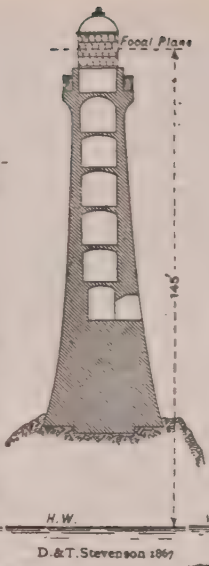


FIG. 15.—Dhu Heartach.

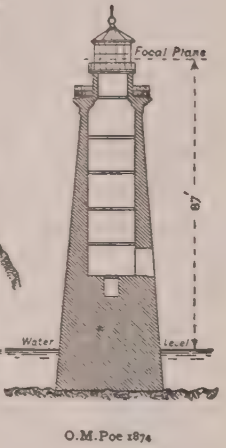


FIG. 16.—Spectacle Reef.

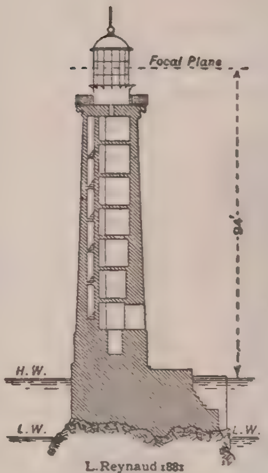


FIG. 17.—Ar'men.

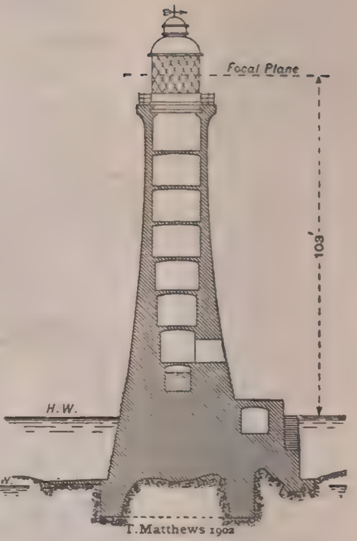


FIG. 18.—Beachy Head.

1905); Jument d'Ouessant (France, 1907); and Roche Bonne (France, building 1910).

Jointing of Stones in Rock Towers.—Various methods of jointing the stones in rock towers are shown in figs. 6 and 22. The great distinction between the towers built by successive engineers to the Trinity House and other rock lighthouses is that, in the former the stones of each course are dovetailed together both laterally and vertically and are not connected by metal or wooden pins and wedges and dowled as in most other cases. This dovetail method was first adopted at the Hanois Rock at the suggestion of Nicholas Douglass. On the upper face, one side and at one end of each block is a dovetailed projection. On the under face and the other side and end, corresponding dovetailed recesses are formed with just sufficient clearance for the raised bands to enter in setting (fig. 23). The cement mortar in the joint formed between the faces so locks the dovetails that the stones cannot be separated without breaking (fig. 24).

TABLE I.—*Comparative Cost of Exposed Rock Towers.*

Name of Structure.	Total Cost.	Cub. ft.	Cost per cub. ft. of Masonry.
Eddystone, Smeaton (1759)	£40,000 0 0	13,343	£2 19 11½
Bell Rock, Firth of Forth (1811)	55,619 12 1	28,530	1 19 0
Skerryvore, west coast of Scotland (1844)	72,200 11 6	58,580	1 4 7¾
Bishop Rock, first granite tower (1858)	34,559 18 9	35,209	0 19 7½
Smalls, Bristol Channel (1861)	50,124 11 8	46,386	1 1 7¼
Hanois, Alderney (1862)	25,296 0 0	24,542	1 0 7¼
Wolf Rock, Land's End (1869)	62,726 0 0	59,070	1 1 3
Dhu Heartach, west coast of Scotland (1872)	72,584 9 7	42,050	1 14 6
Longships, Land's End (1872)	43,869 8 11	47,610	0 18 5
Eddystone, Douglass (1882)	59,255 0 0	65,198	0 18 2
Bishop Rock, strengthening and part reconstruction (1887)	64,889 0 0	45,080	1 8 9
Great Basses, Ceylon (1873)	63,560 0 0	47,819	1 6 7
Minot's Ledge, Boston, Mass. (1860)	62,500 0 0	36,322	1 17 2
Spectacle Reef, Lake Huron (1874)	78,125 0 0	42,742	1 16 2
Ar'men, France (1881)	37,692 0 0	32,400	1 3 3
Fastnet, Ireland (1904)	79,000 0 0	62,600	1 5 5½

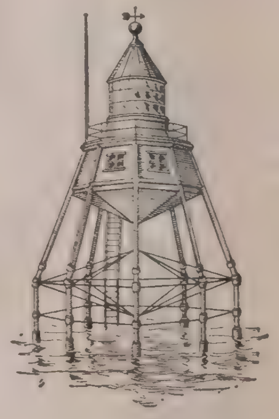


FIG. 19.—Maplin Pile Lighthouse.

Effect of Waves.—The wave stroke to which rock lighthouse towers are exposed is often considerable. At the Dhu Heartach, during the erection of the tower, 14 joggled stones, each of 2 tons weight, were washed away after having been set in cement at a height of 37 ft. above high water, and similar damage was done during the construction of the Bell Rock tower. The effect of waves on the Bishop Rock and Eddystone towers has been noted above.

Land Structures for Lighthouses.—The erection of lighthouse towers and other buildings on land presents no difficulties of construction, and such buildings are of ordinary architectural character. It will therefore be unnecessary to refer to them in detail. Attention is directed to the Phare d'Eckmuhl at Penmarc'h (Finistère), completed in 1897. The cost of this magnificent structure, 207 ft. in height from the ground, was largely defrayed by a bequest of £12,000 left by the marquis de Blocqueville. It is constructed entirely of granite, and is octagonal in plan. The total cost of the tower and other lighthouse buildings amounted to £16,000.

The tower at Île Vierge (Finistère), completed in 1902, has an elevation of 247 ft. from the ground level to the focal plane, and is probably the highest structure of its kind in the world.

The brick tower, constructed at Spurn Point, at the entrance to the Humber and completed in 1895, replaced an earlier structure erected by Smeaton at the end of the 18th century. The existing tower is constructed on a foundation consisting of concrete cylinders sunk in the shingle beach. The focal plane of the light is elevated 120 ft. above high water.

Besides being built of stone or brick, land towers are frequently constructed of cast iron plates or open steel-work with a view to economy. Fine examples of the former are to be found in many British colonies and elsewhere, that on Dassen Island (Cape of Good Hope), 105 ft. in height to the focal plane, being typical (fig. 25). Many openwork structures up to 200 ft. in height have been built. Recent examples are the towers erected at Cape San Thomé (Brazil) in 1882, 148 ft. in height (fig. 26), Mocha (Red Sea) in 1903, 180 ft. and Sanganeb Reef (Red Sea) 1906, 165 ft. in height to the focal plane.

3. Optical Apparatus.—Optical apparatus in lighthouses is required for one or other of three distinct purposes: (1) the concentration of the rays derived from the light source into a belt of light distributed evenly around the horizon, condensation in the vertical plane only being employed; (2) the concentration of the rays both vertically and horizontally into a pencil or cone of small angle directed towards the horizon and caused to revolve about the light source as a centre, thus producing a flashing light; and (3) the condensation of the light in the vertical plane and also in the horizontal plane in such a manner as to concentrate the rays over a limited azimuth only.

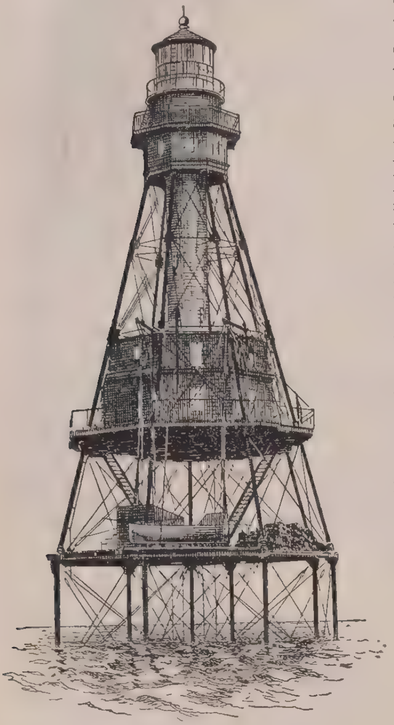


Fig. 20.—American Shoal Lighthouse, Florida.

Apparatus falling under the first category produce a fixed light, and further distinction can be provided in this class by mechanical means of occultation, resulting in the production of an occulting or intermittent light. Apparatus included in the second class are usually employed to produce flashing lights, but sometimes the dual condensation is taken advantage of to produce a fixed pencil of rays thrown towards the horizon for the purpose of marking an isolated danger or the limits of a narrow channel. Such lights are best described by the French term *feux de direction*. Catoptric apparatus, by which dual condensation is produced, are moreover sometimes used for fixed lights, the light pencils overlapping each other in azimuth. Apparatus of the third class are employed for sector lights or those throwing a beam of light over a wider azimuth than can be conveniently covered by an apparatus of the second class, and for reinforcing the beam of light emergent from a fixed apparatus in any required direction.

The above classification of apparatus depends on the resultant effect of the optical elements. Another classification divides the instruments themselves into three classes: (*a*) catoptric, (*b*) dioptric and (*c*) catadioptric.

Catoptric apparatus are those by which the light rays are reflected only from the faces of incidence, such as silvered mirrors of plane, spherical, parabolic or other profile. *Dioptric* elements are those in which the light rays pass through the optical glass, suffering refraction at the incident and emergent faces (fig. 27). *Catadioptric* elements are combined of the two foregoing and consist of optical prisms in which the light rays suffer refraction at the incident face, total internal reflexion at a second face and again refraction on emergence at the third face (fig. 28).

The object of these several forms of optical apparatus is not only to produce characteristics or distinctions in lights to enable them to be readily recognized by mariners, but to utilize the light rays in directions above and below the horizontal plane, and also, in the case of revolving or flashing lights, in azimuths not requiring to be illuminated for strengthening the beam in the direction of the mariner. It will be seen that the effective condensation in flashing lights is very much greater than in fixed belts, thus enabling higher intensities to be obtained by the use of flashing lights than with fixed apparatus.

Catoptric System.—Parabolic reflectors, consisting of small facets of silvered glass set in plaster of Paris, were first used about the year 1763 in some of the Mersey lights by Mr Hutchinson, then dock master at Liverpool (fig. 29). Spherical metallic reflectors were introduced in France in 1781, followed by parabolic reflectors on silvered copper in 1790 in England and France, and in Scotland in 1803. The earlier lights were of fixed type, a number of reflectors being arranged on a frame or stand in such a manner that the pencils of emergent rays overlapped and thus illuminated the whole horizon continuously. In 1783 the first revolving light was erected at Marstrand in Sweden. Similar apparatus were installed at Cordouan (1790), Flamborough Head (1806) and at the Bell Rock (1811). To produce a revolving or flashing light the reflectors were fixed on a revolving carriage having several faces. Three or more reflectors in a face were set with their axes parallel.

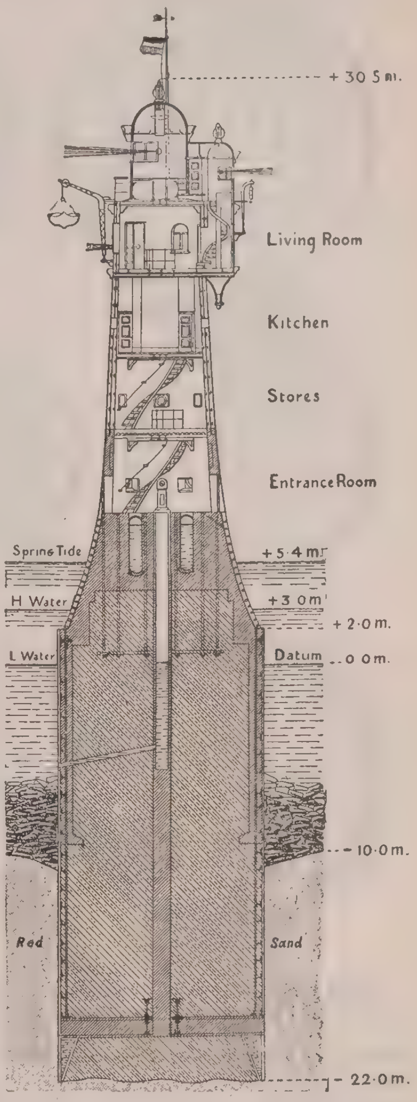


Fig. 21.—Rothersand Lighthouse.

A type of parabolic reflector now in use is shown in fig. 30. The sizes in general use vary from 21 in. to 24 in. diameter. These instruments are still largely used for light-vessel illumination, and a few important land lights are at the present time of catoptric type, including those at St Agnes (Scilly Islands), Cromer and St Anthony (Falmouth).

Dioptric System.—The first adaptation of dioptric lenses to lighthouses is probably due to T. Rogers, who used lenses at one of the Portland lighthouses between 1786 and 1790. Subsequently lenses by the same maker were used at Howth, Waterford and the North Foreland. Count Buffon had in 1748 proposed to grind out of a solid piece of glass a lens in steps or concentric zones in order to reduce the thickness to a minimum (fig. 31). Condorcet in 1773 and Sir D. Brewster in 1811 designed built-up lenses consisting of stepped annular rings. Neither of these proposals, however, was intended to apply to lighthouse purposes. In 1822 Augustin Fresnel constructed a built-up annular lens in which the centres of curvature of the different rings receded from the axis according to their distances from the centre, so as practically to eliminate spherical aberration; the only spherical surface being the small central part or "bull's eye" (fig. 32). These lenses were intended for revolving lights only. Fresnel next produced his cylindric refractor or lens belt, consisting of a zone of glass generated by the revolution round a vertical axis of a medial section of the annular lens (fig. 33). The lens belt condensed and parallelized the light rays in the vertical plane only, while the annular lens does so in every plane. The first revolving light constructed from Fresnel's designs was erected at the Cordouan lighthouse in 1823. It consisted of 8 panels of annular lenses placed round the lamp at a focal distance of 920 mm. To utilize the light, which would otherwise escape above the lenses, Fresnel introduced a series of 8 plain silvered mirrors, on which the light was thrown by a system of lenses. At a subsequent period mirrors were also placed in the lower part of the optic. The apparatus was revolved by clockwork. This optic embodied the first combination of dioptric and catoptric elements in one design (fig. 34). In the following year Fresnel designed a dioptric lens with catoptric mirrors for fixed light, which was the first of its kind installed in a lighthouse. It was erected at the Chassiron lighthouse in 1827 (fig. 35). This combination is geometrically perfect, but not so practically on account of the great loss of light entailed by metallic reflection which is at least 25% greater than the system described under. Before his death in 1827 Fresnel devised his totally reflecting or catadioptric prisms to take the place of the silvered reflectors previously used above and below the lens elements (fig. 28). The ray F*i* falling on the prismoidal ring ABC is refracted in the direction *i r* and meeting the face AB at an angle of incidence greater than the critical, is totally reflected in the direction *r e*, emerging after second refraction in a horizontal direction. Fresnel devised these prisms for use in fixed light apparatus, but the principle was, at a later date, also applied to flashing lights, in the first instance by T. Stevenson. Both the dioptric lens and catadioptric prism invented by Fresnel are still in general use, the mathematical calculations of the great French designer still forming the basis upon which lighthouse opticians work.

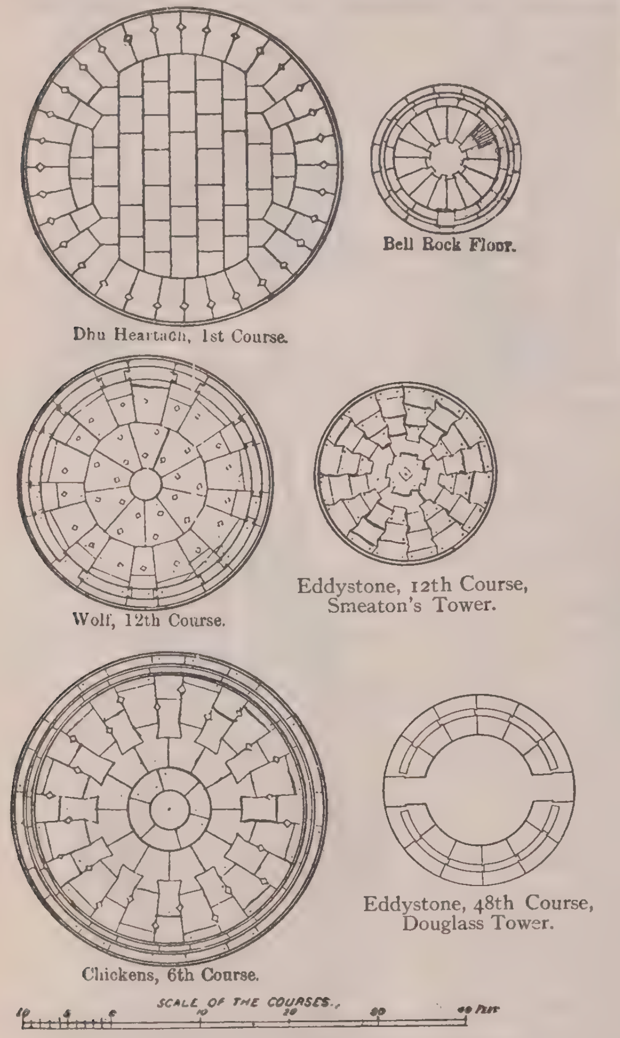

Dhu Heartach, 1st Course.
Bell Rock Floor.
Wolf, 12th Course.
Eddystone, 12th Course, Smeaton's Tower.
Chickens, 6th Course.
Eddystone, 48th Course, Douglass Tower.

FIG. 22.—Courses of various Lighthouse Towers.

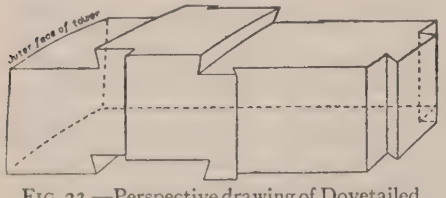


FIG. 23.—Perspective drawing of Dovetailed Stone (Wolf Rock).

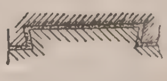


FIG. 24.—Section of Dovetail.

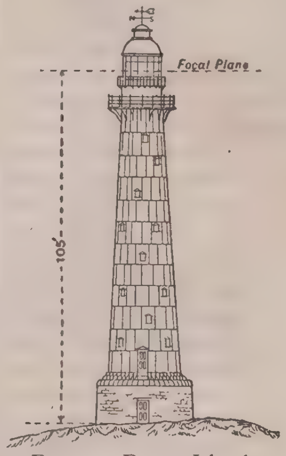


FIG. 25.—Dassen Island Lighthouse (cast iron).

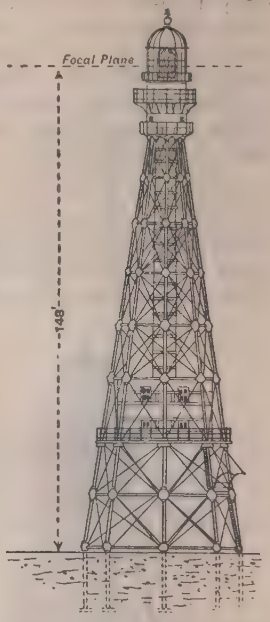


FIG. 26.—Cape San Thomé Lighthouse.

Fresnel also designed a form of fixed and flashing light in which the distinction of a fixed light, varied by flashes, was produced by placing panels of straight refracting prisms in a vertical position on a revolving carriage outside the fixed light apparatus. The revolution of the upright prisms periodically increased the power of the beam, by condensation of the rays emergent from the fixed apparatus, in the horizontal plane.

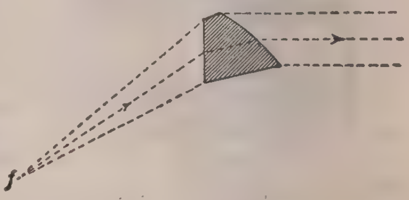


FIG. 27.—Dioptric Prism.

The lens segments in Fresnel's early apparatus were of polygonal form instead of cylindrical, but subsequently manufacturers succeeded in grinding glass in cylindrical rings of the form now used. The first apparatus of this description was made by Messrs Cookson of Newcastle in 1836 at the suggestion of Alan Stevenson and erected at Inchkeith.

In 1825 the French Commission des Phares decided upon the exclusive use of lenticular apparatus in its service. The Scottish Lighthouse Board followed with the Inchkeith revolving apparatus in 1835 and the Isle of May fixed optic in 1836. In the latter instrument Alan Stevenson introduced helical frames for holding the glass prisms in place, thus avoiding complete obstruction of the light rays in any azimuth. The first dioptric light erected by the Trinity House was that formerly at Start Point in Devonshire, constructed in 1836. Catadioptric or reflecting prisms for revolving lights were not used until 1850, when Alan Stevenson designed them for the North Ronaldshay lighthouse.

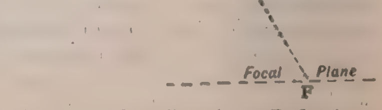


FIG. 28.—Catadioptric or Reflecting Prism.

Dioptric Mirror.—The next important improvement in lighthouse optical work was the invention of the dioptric spherical mirror by Mr (afterwards Sir) J. T. Chance in 1862. The zones or prisms are generated round a vertical axis and divided into segments. This form of mirror is still in general use (figs. 36 and 37).

Azimuthal Condensing Prisms.—Previous to 1850 all apparatus were designed to emit light of equal power in every azimuth either constantly or periodically. The only exception was where a light was situated on a stretch of coast where a mirror could be placed behind the flame to utilize the rays, which would otherwise pass landward, and reflect them back, passing through the flame and lens in a seaward direction. In order to increase the intensity of lights in certain azimuths T. Stevenson devised his azimuthal condensing prisms which, in various forms and methods of application, have been largely used for the purpose of strengthening the light rays in required directions as, for instance, where coloured sectors are provided. Applications of this system will be referred to subsequently.

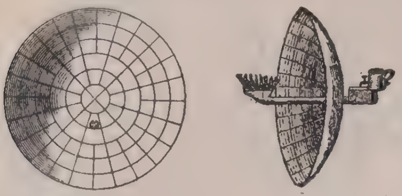


FIG. 29.—Early Reflector and Lamp (1763).

Optical Glass for Lighthouses.—In the early days of lens lights the only glass used for the prisms was made in France at the St Gobain and Premontré works, which have long been celebrated for the high quality of optical glass produced. The early dioptric lights erected in the United Kingdom, some 13 in all, were made by Messrs Cookson of South Shields, who were instructed by Léonor Fresnel, the brother of Augustin. At first they tried to mould the lens and then to grind it out of one thick sheet of glass. The successors of the Cookson firm abandoned the manufacture of lenses in 1845, and the firm of Letourneau & Lepaute of Paris again became the monopolists. In 1850 Messrs Chance Bros. & Co. of Birmingham began the manufacture of optical glass, assisted by M. Tabouret, a French expert who had been a colleague of Augustin Fresnel himself. The first light made by the firm was shown at the Great Exhibition of 1851, since when numerous dioptric apparatus have been constructed by Messrs Chance, who are, at this time, the only manufacturers of lighthouse glass in the United Kingdom. Most of the glass used for apparatus constructed in France is manufactured at St Gobain. Some of the glass used by German constructors is made at Rathenow in Prussia and Goslar in the Harz.

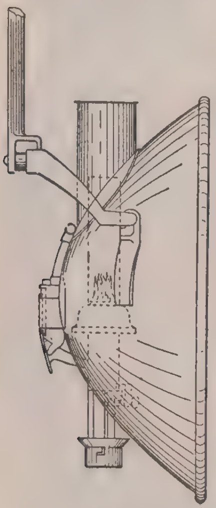


FIG. 30.—Modern Parabolic Reflector.

The glass generally employed for lighthouse optics has for its refractive index a mean value of $\mu = 1{\cdot}51$, the corresponding critical angle being 41° 30′. Messrs Chance have used dense flint glass for the upper and lower refracting rings of high angle lenses and for dioptric mirrors in certain cases. This glass has a value of $\mu = 1{\cdot}62$ with critical angle 38° 5′.

Occulting Lights.—During the last 25 years of the 19th century the disadvantages of fixed lights became more and more apparent. At the present day the practice of installing such, except occasionally in the case of the smaller and less important of harbour or river lights, has practically ceased. The necessity for providing a distinctive characteristic for every light when possible has led to the conversion of many of the fixed-light apparatus of earlier years into occulting lights, and often to their supersession by more modern and powerful flashing apparatus. An occulting apparatus in general use consists of a cylindrical screen, fitting over the burner, rapidly lowered and raised by means of a cam-wheel at stated intervals. The cam-wheel is actuated by means of a weight or spring clock. Varying characteristics may be procured by means of such a contrivance—single, double, triple or other systems of occultation. The eclipses or periods of darkness bear much the same relation to the times of illumination as do the flashes to the eclipses in a revolving or flashing light. In the case of a first-order fixed light the cost of conversion to an occulting characteristic does not exceed £250 to £300. With apparatus illuminated by gas the occultations may be produced by successively raising and lowering the gas at stated intervals. Another form of occulting mechanism employed consists of a series of vertical screens mounted on a carriage and revolving round the burner. The carriage is rotated on rollers or ball bearings or carried upon a small mercury float. The usual driving mechanism employed is a spring clock. "Otter" screens are used in cases when it is desired to produce different periods of occultations in two or more positions in azimuth in order to differentiate sectors marking shoals, &c. The screens are of sheet metal blacked and arranged vertically, some what in the manner of the laths of a venetian blind, and operated by mechanical means.

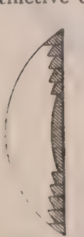


FIG. 31.
Buffon's Lens.

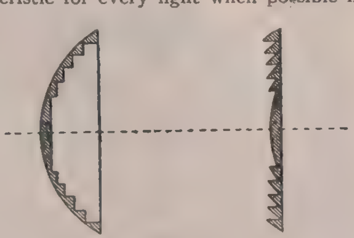


FIG. 32.
Fresnel's Annular Lens.

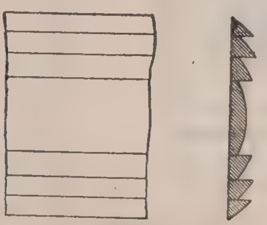
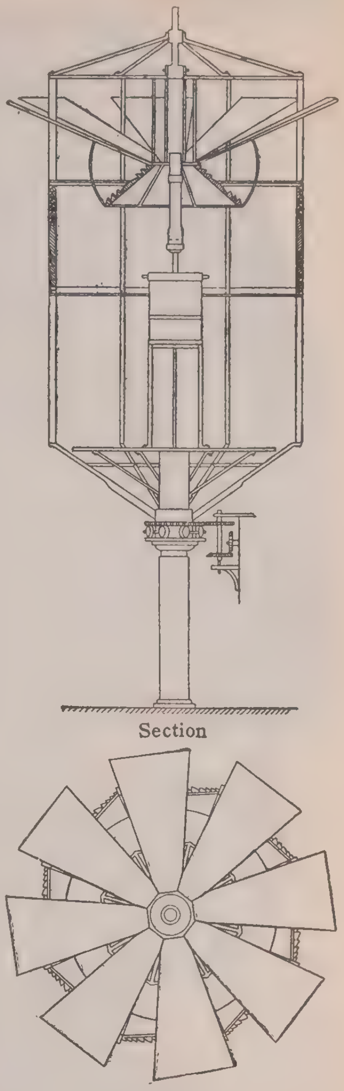


FIG. 33.
Fresnel's Lens Belt.



Section

Plan

FIG. 34.—Fresnel's Revolving Apparatus at Cordouan Lighthouse.

Leading Lights.—In the case of lights designed to act as a lead through a narrow channel or as direction lights, it is undesirable to employ a flashing apparatus. Fixed-light optics are employed to meet such cases, and are generally fitted with occulting mechanism A typical apparatus of this description is that at Gage Roads, Fremantle, West Australia (fig. 38). The occulting bright light covers the fairway, and is flanked by sectors of occulting red and green light marking dangers and intensified by vertical condensing prisms. A good example of a holophotal direction light was exhibited at the 1900 Paris Exhibition, and afterwards erected at Suzac lighthouse (France). The light consists of an annular lens 500 mm. focal distance, of 180° horizontal angle and 157° vertical, with a mirror of 180° at the back. The lens throws a red beam of about $4\frac{1}{2}^\circ$ amplitude in azimuth, and 50,000 candle-power over a narrow channel. The illuminant is an incandescent petroleum vapour burner. Holophotal direction lenses of this type can only be applied where the sector to be marked is of comparatively small angle. Silvered metallic mirrors of parabolic form are also used for the purpose. The use of single direction lights frequently renders the construction of separate towers for leading lights unnecessary.

If two distinct lights are employed to indicate the line of navigation through a channel or between dangers they must be sufficiently far apart to afford a good lead, the front or seaward light being situated at a lower elevation than the rear or landward one.

Coloured Lights.—Colour is used as seldom as possible as a distinction, entailing as it does a considerable reduction in the power of the light. It is necessary in some instances for differentiating sectors over dangers and for harbour lighting purposes. The use of coloured lights as alternating flashes for lighthouse lights is not to be commended, on account of the unequal absorption of the coloured and bright rays by the atmosphere. When such distinction has been employed, as in the Wolf Rock apparatus, the red and white beams can be approximately equalized in initial intensity by constructing the lens and prism panels for the red light of larger angle than those for the white beams. Owing to the absorption by the red colouring, the power of a red beam is only 40% of the intensity of the corresponding white light. The corresponding intensity of green light is 25%. When red or green sectors are employed they should invariably be reinforced by mirrors, azimuthal condensing prisms, or other means to raise the coloured beam to approximately the same intensity as the white light. With the introduction of group-flashing characteristics the necessity for using colour as a means of distinction disappeared.

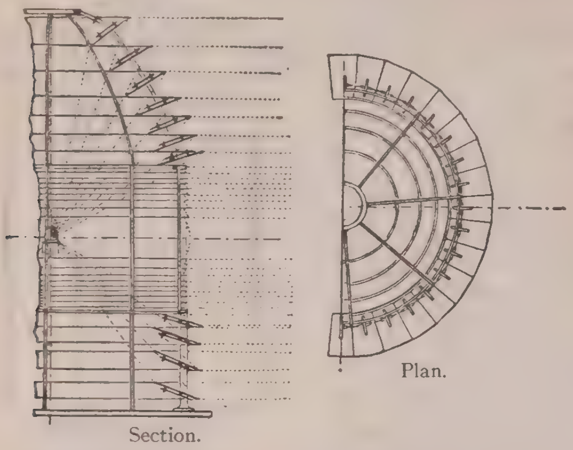


Fig. 35.—Fixed Apparatus at Chassiron Lighthouse (1827).

High-Angle Vertical Lenses.—Messrs Chance of Birmingham have manufactured lenses having 97° of vertical amplitude, but this result was only attained by using dense flint glass of high refractive index for the upper and lower elements. It is doubtful, however, whether the use of refracting elements for a greater angle than 80° vertically is attended by any material corresponding advantage.

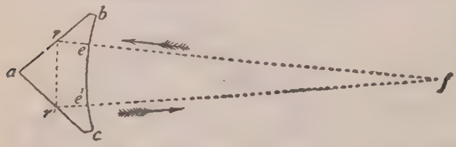


Fig. 36.—Vertical Section. Prism of Dioptric Spherical Mirror.

Group Flashing Lights.—One of the most useful distinctions consists in the grouping of two or more flashes separated by short intervals of darkness, the group being succeeded by a longer eclipse. Thus two, three or more flashes of, say, half second duration or less follow each other at intervals of about 2 seconds and are succeeded by an eclipse of, say, 10 seconds, the sequence being completed in a period of, say, 15 seconds. In 1874 Dr John Hopkinson introduced the very valuable improvement of dividing the lenses of a dioptric revolving light with the panels of reflecting prisms above and below them, setting them at an angle to produce the group-flashing characteristic. The first apparatus of this type constructed were those now in use at Tampico, Mexico and the Little Basses lighthouse, Ceylon (double flashing). The Casquets apparatus (triple flashing) was installed in 1877. A group-flashing catoptric light had, however, been exhibited from the "Royal Sovereign" light-vessel in 1875. A sectional plan of the quadruple-flashing first order apparatus at Pendeen in Cornwall is shown in fig. 39; and fig. 55 (Plate I.) illustrates a double flashing first order light at Pachena Point in British Columbia. Hopkinson's system has been very extensively used, most of the group-flashing lights shown in the accompanying tables, being designed upon the general lines he introduced. A modification of the system consists in grouping two or more lenses together separated by equal angles, and filling the remaining angle in azimuth by a reinforcing mirror or screen. A group-flashing distinction was proposed for gas lights by J. R. Wigham of Dublin, who obtained it in the case of a revolving apparatus by alternately raising and lowering the flame. The first apparatus in which this method was employed was erected at Galley Head, Co. Cork (1878). At this lighthouse 4 of Wigham's large gas burners with four tiers of first-order revolving lenses, eight in each tier, were adopted. By successive lowering and raising of the gas flame at the focus of each tier of lenses he produced the group-flashing distinction. The light showed, instead of one prolonged flash at intervals of one minute, as would be produced by the apparatus in the absence of a gas occulter, a group of short flashes varying in number between six and seven. The uncertainty, however, in the number of flashes contained in each group is found to be an objection to the arrangement. This device was adopted at other gas-illuminated stations in Ireland at subsequent dates. The quadriform apparatus and gas installation at Galley Head were superseded in 1907 by a first order biform apparatus with incandescent oil vapour burner showing five flashes every 20 seconds.

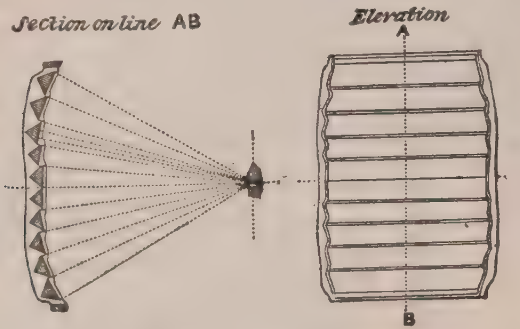


Fig. 37.—Chance's Dioptric Spherical Mirror.

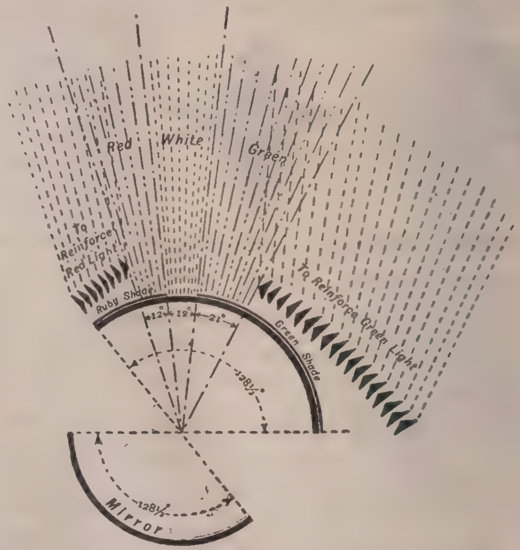


Fig. 38.—Gage Roads Direction Light.

Flashing Lights indicating Numbers.—Captain F. A. Mahan, late engineer secretary to the United States Lighthouse Board, devised for that service a system of flashing lights to indicate certain numbers. The apparatus installed at Minot's Ledge lighthouse near Boston Harbour, Massachusetts, has a flash indicating the number 143, thus: - ---- ---, the dashes indicating short flashes. Each group is separated by a longer period of darkness than that between successive members of a group. The flashes in a group indicating a figure are about 1½ seconds apart, the groups being 3 seconds apart, an interval of 16 seconds' darkness occurring between each repetition. Thus the number is repeated every half minute. Two examples of this system were exhibited by the United States Lighthouse Board at the Chicago Exhibition in 1893, viz. the second-order apparatus just mentioned and a similar light of the first order for Cape Charles on the Virginian coast. The lenses are arranged in a somewhat

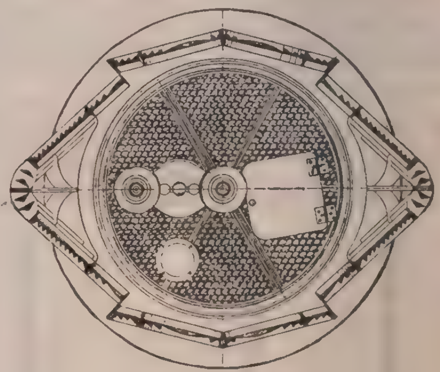


Fig. 39.—Pendeen Apparatus. Plan at Focal Plane.

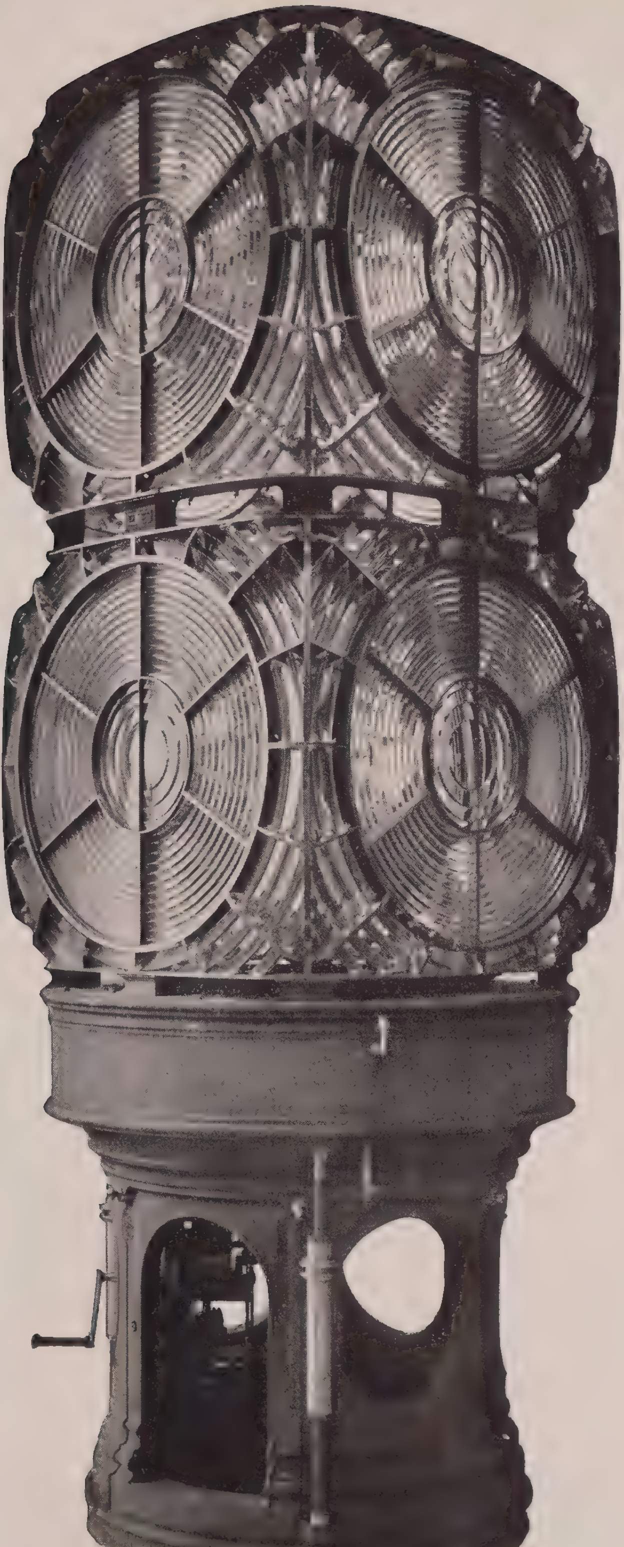


FIG. 54.—FASTNET LIGHTHOUSE—FIRST ORDER SINGLE-FLASHING BIFORM APPARATUS.

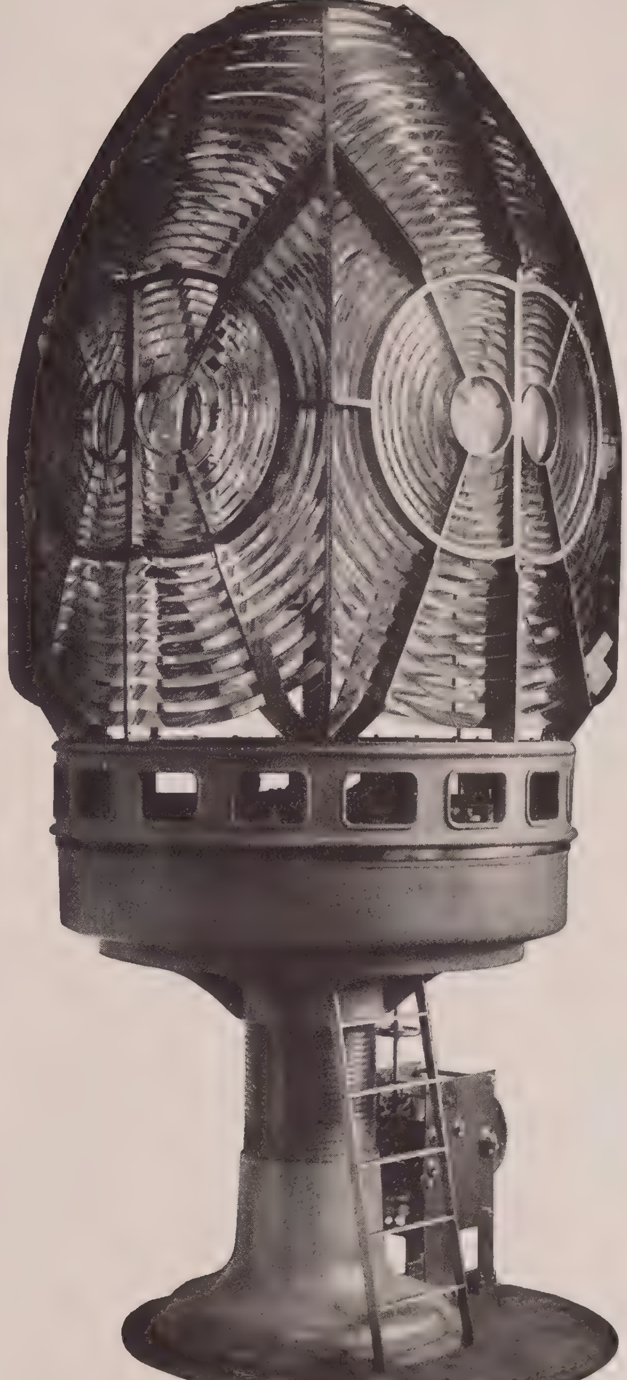


FIG. 55.—PACHENA POINT LIGHTHOUSE, B.C.—FIRST ORDER DOUBLE-FLASHING APPARATUS.

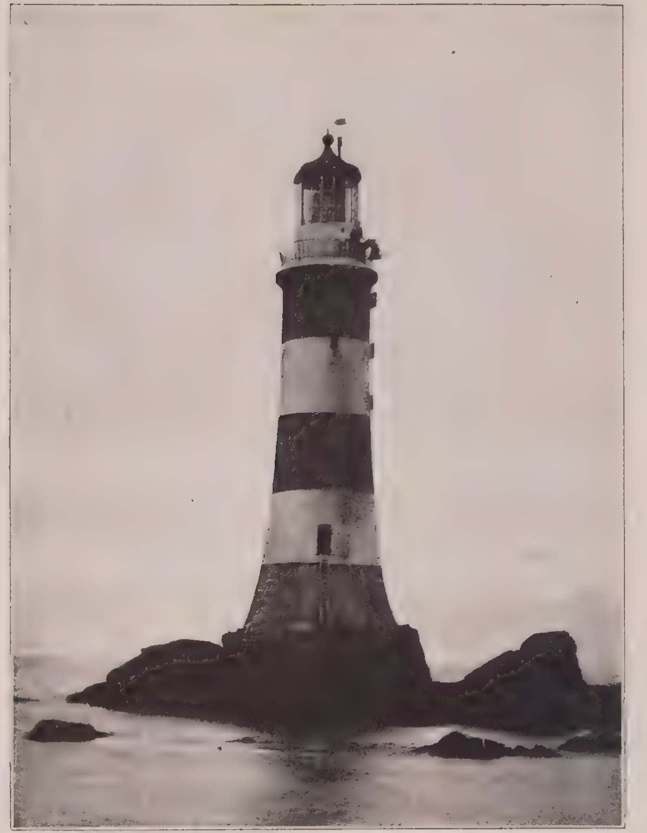


FIG. 56.—OLD EDDYSTONE LIGHTHOUSE.

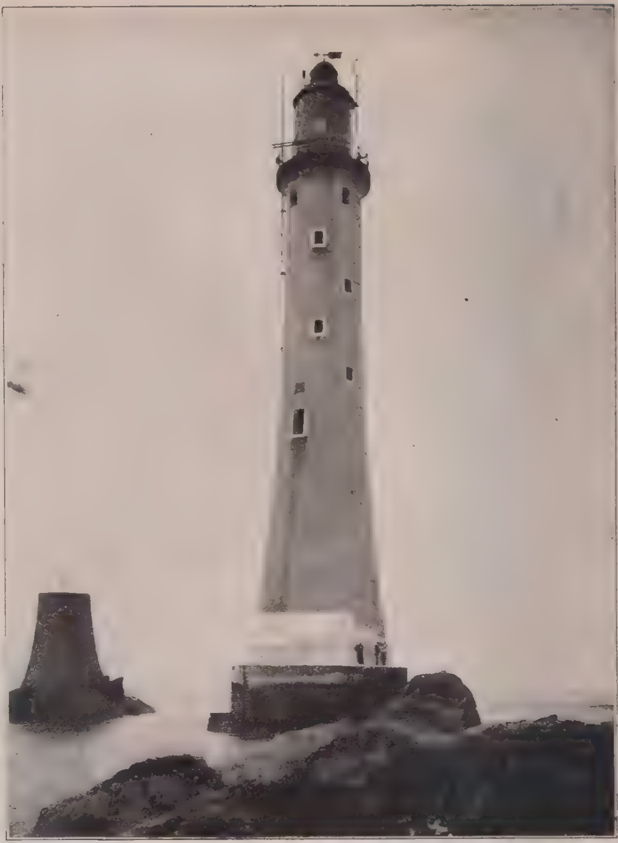


FIG. 57.—EDDYSTONE LIGHTHOUSE.

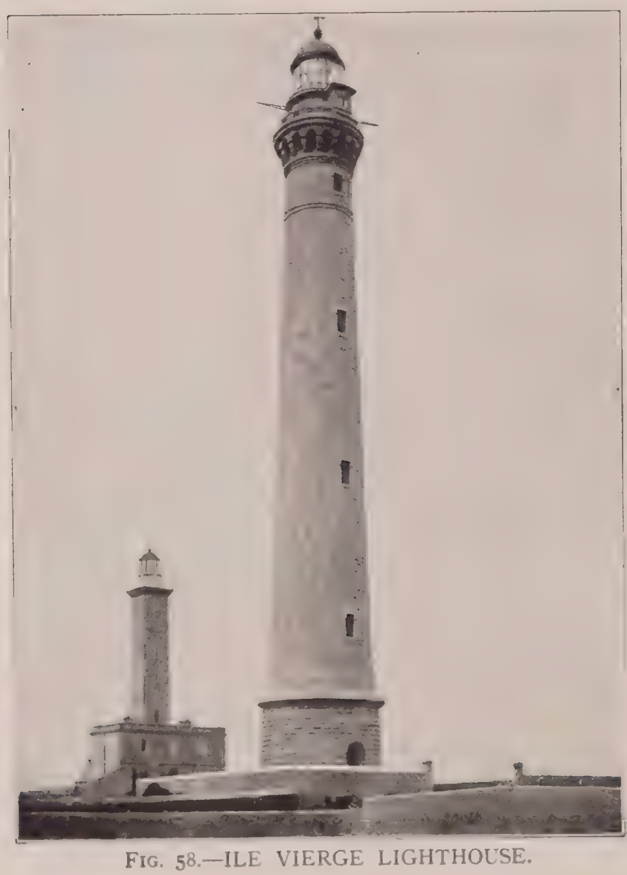


FIG. 58.—ILE VIERGE LIGHTHOUSE.

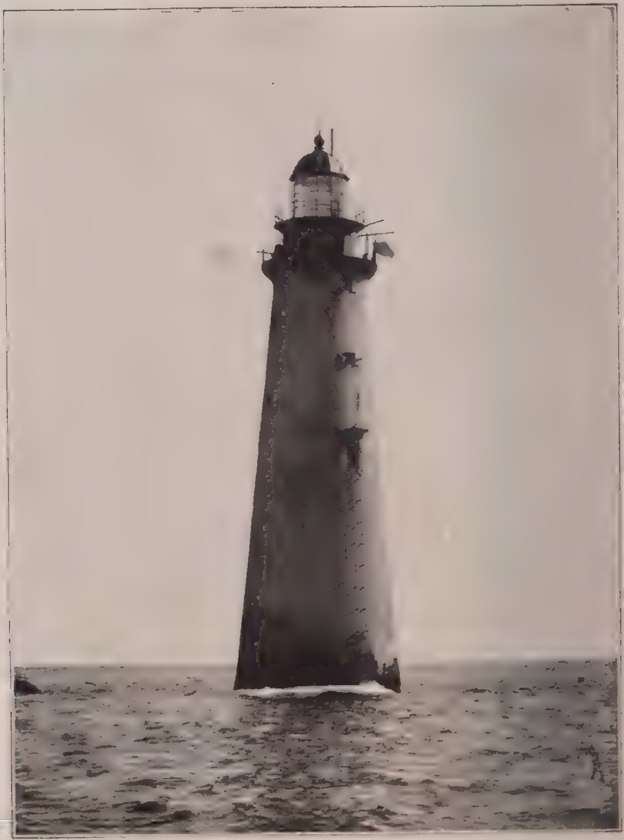


FIG. 59.—MINOT'S LEDGE LIGHTHOUSE.

similar manner to an ordinary group-flashing light, the groups of lenses being placed on one side of the optic, while the other is provided with a catadioptric mirror. This system of numerical flashing for lighthouses has been frequently proposed in various forms, notably by Lord Kelvin. The installation of the lights described is, however, the first practical application of the system to large and important coast lights. The great cost involved in the alteration of the lights of any country to comply with the requirements of a numerical system is one of the objections to its general adoption.

Hyper-radial Apparatus.—In 1885 Messrs Barbier of Paris constructed the first hyper-radial apparatus (1330 mm. focal distance) to the design of Messrs D. and C. Stevenson. This had a height of 1812 mm. It was tested during the South Foreland experiments in comparison with other lenses, and found to give excellent results with burners of large focal diameter. Apparatus of similar focal distance (1330 mm.) were subsequently established at Round Island, Bishop Rock, and Spurn Point in England, Fair Isle and Sule Skerry (fig. 40) in Scotland, Bull Rock and Tory Island in Ireland, Cape d'Antifer in France, Pei Yu-shan in China and a lighthouse in Brazil.

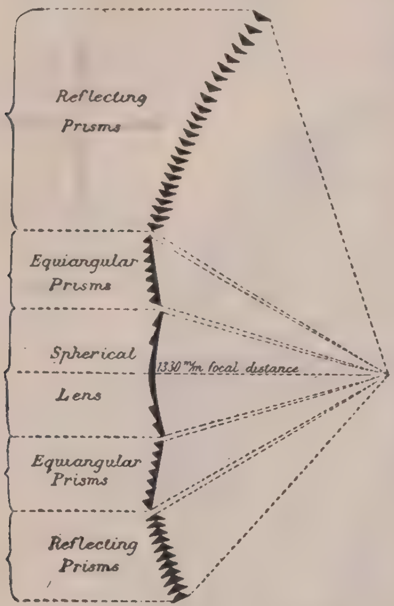


FIG. 40.—Sule Skerry Apparatus.

The light erected in 1907 at Cape Race, Newfoundland, is a fine example of a four-sided hyper-radial apparatus mounted on a mercury float. The total weight of the revolving part of the light amounts to 7 tons, while the motive clock weight required to rotate this large mass at a speed of two complete revolutions a minute is only 8 cwt. and the weight of mercury required for flotation 950 lb. A similar apparatus was placed at Manora Point, Karachi, India, in 1908 (fig. 41).

The introduction of incandescent and other burners of focal compactness and high intensity has rendered the use of optics of such large dimensions as the above, intended for burners of great focal diameter, unnecessary. It is now possible to obtain with a second-order optic (or one of 700 mm. focal distance), having a powerful incandescent petroleum burner in focus, a beam of equal intensity to that which would be obtained from the apparatus having a 10-wick oil burner or 108-jet gas burner at its focus.

Stephenson's Spherical Lenses and Equiangular Prisms.—Mr C. A. Stephenson in 1888 designed a form of lens spherical in the horizontal and vertical sections. This admitted of the construction of lenses of long focal distance without the otherwise corresponding necessity of increased diameter of lantern. A lens of this type and of 1330 mm. focal distance was constructed in 1890 for Fair Isle lighthouse. The spherical form loses in efficiency if carried beyond an angle subtending 20° at the focus, and to obviate this loss Mr Stephenson designed his equiangular prisms, which have an inclination outwards. It is claimed by the designer that the use of equiangular prisms results in less loss of light and less divergence than is the case when either the spherical or Fresnel form is adopted. An example of this design is seen (fig. 40) in the Sule Skerry apparatus (1895).

Fixed and Flashing Lights.—The use of these lights, which show a fixed beam varied at intervals by more powerful flashes, is not to be recommended, though a large number were constructed in the earlier years of dioptric illumination and many are still in existence The distinction can be produced in one or other of three ways: (*a*) by the revolution of detached panels of straight condensing lens prisms placed vertically around a fixed light optic, (*b*) by utilizing revolving lens panels in the middle portion of the optic to produce the flashing light, the upper and lower sections of the apparatus being fixed zones of catadioptric or reflecting elements emitting a fixed belt of light, and (*c*) by interposing panels of fixed light section between the flashing light panels of a revolving apparatus. In certain conditions of the atmosphere it is possible for the fixed light of low power to be entirely obscured while the flashes are visible, thus vitiating the true characteristic of the light. Cases have frequently occurred of such lights being mistaken for, and even described in lists of light as, revolving or flashing lights.

"*Cute*" *and Screens.*—Screens of coloured glass, intended to distinguish the light in particular azimuths, and of sheet iron, when it is desired to "cut off" the light sharply on any angle, should be fixed as far from the centre of the light as possible in order to reduce the escape of light rays due to divergence. These screens are usually attached to the lantern framing.

Divergence.—A dioptric apparatus designed to bend all incident rays of light from the light source in a horizontal direction would, if the flame could be a point, have the effect of projecting a horizontal band or zone of light, in the case of a fixed apparatus, and a cylinder of light rays, in the case of a flashing light, towards the horizon. Thus the mariner in the near distance would receive no light, the rays, visible only at or near the horizon, passing above the level of his eye. In practice this does not occur, sufficient natural divergence being produced ordinarily owing to the magnitude of the flame. Where the electric arc is employed it is often necessary to design the prisms so as to produce artificial divergence. The measure of the natural divergence for any point of the lens is the angle whose sine is the ratio of the diameter of the flame to the distance of the point from centre of flame.

In the case of vertical divergence the mean height of the flame must be substituted for the diameter. The angle thus obtained is the total divergence, that is, the sum of the angles above and below the horizontal plane or to right and left of the medial section. In fixed dioptric lights there is, of course, no divergence in the horizontal plane. In flashing lights the horizontal divergence is a matter of considerable importance, determining as it does the duration or length of time the flash is visible to the mariner.

Feux-Éclairs or Quick Flashing Lights.—One of the most important developments in the character of lighthouse illuminating apparatus that has occurred in recent years has been in the direction of reducing the length of flash. The initiative in this matter was taken by the French lighthouse authorities, and in France alone forty lights of this type were established between 1892 and 1901. The use of short flash lights rapidly spread to other parts of the world. In England the lighthouse at Pendeen (1900) exhibits a quadruple flash every 15 seconds, the flashes being about $\frac{1}{4}$ second duration (fig. 39), while the bivalve apparatus erected on Lundy Island (1897) shows 2 flashes of $\frac{1}{3}$ second duration in quick succession every 20 seconds. Since 1900 many quick flashing lights have been erected on the coasts of the United Kingdom and in other countries. The early *feux-éclairs*, designed by the French engineers and others, had usually a flash of $\frac{1}{10}$th to $\frac{1}{3}$rd of a second duration. As a result of experiments carried out in France in 1903–1904, $\frac{3}{10}$ second has been adopted by the French authorities as the minimum duration for white flashing lights. If shorter flashes are used it is found that the reduction in duration is attended by a corresponding, but not proportionate, diminution in effective intensity. In the case of many electric flashing lights the duration is of necessity reduced, but the greater initial intensity of the flash permits this loss without serious detriment to efficiency. Red or green requires a considerably greater duration than do white flashes. The intervals between the flashes in lights of this character are also small, $2\frac{1}{2}$ seconds to 7 seconds. In group-flashing lights the intervals between the flashes are about 2 seconds or even less, with periods of 7 to 10 or 15 seconds between the groups. The flashes are arranged in single, double, triple or even quadruple groups, as in the older forms of apparatus. The *feu-éclair* type of apparatus enables a far higher intensity of flash to be obtained than was previously possible without any corresponding increase in the luminous power of the burner or other source of light. This result depends entirely upon the greater ratio of condensation of light employed, panels of greater angular breadth than was customary in the older forms of apparatus being used with a higher rotatory velocity. It has been urged that short flashes are insufficient for taking bearings, but the utility of a light in this respect does not seem to depend so much upon the actual length of the flash as upon its frequent recurrence at short intervals. At the Paris Exhibition of 1900 was exhibited a fifth-order flashing light giving short flashes at 1 second intervals; this represents the extreme to which the movement towards the reduction of the period of flashing lights has yet been carried.

Mercury Floats.—It has naturally been found impracticable to revolve the optical apparatus of a light with its mountings, sometimes weighing over 7 tons, at the high rate of speed required for *feux-éclairs* by means of the old system of roller carriages, though for some small quick-revolving lights ball bearings have been successfully adopted. It has therefore become almost the universal practice to carry the rotating portions of the apparatus upon a mercury float. This beautiful application of mercury rotation was the invention of Bourdelles, and is now utilized not only for the high-speed apparatus, but also generally for the few examples of the older type still being constructed. The arrangement consists of an annular cast iron bath or trough of such dimensions that a similar but slightly smaller annular float immersed in the bath and surrounded by mercury displaces a volume of the liquid metal whose weight is equal to that of the apparatus supported. Thus a comparatively insignificant quantity of mercury, say 2 cwt., serves to ensure the flotation of a mass of over 3 tons. Certain differences exist between the type of float usually constructed in France and those generally designed by English engineers. In all cases provision is made for lowering the mercury bath or raising the float and apparatus for examination. Examples of mercury floats are shown in figs. 41, 42, 43 and Plate I., figs. 54 an 55.

Multiform Apparatus.—In order to double the power to be obtained from a single apparatus at stations where lights of exceptionally high intensity are desired, the expedient of placing one complete lens apparatus above another has sometimes been adopted, as at the Bishop Rock (fig. 13), and at the Fastnet lighthouse in Ireland (Plate I., fig. 54). Triform and quadriform apparatus have also been erected in Ireland; particulars of the Tory Island triform apparatus will be found in table VII. The adoption of the multiform system involves the use of lanterns of increased height.

Twin Apparatus.—Another method of doubling the power of a light is by mounting two complete and distinct optics side by side on the same revolving table, as shown in fig. 43 of the Île Vierge apparatus. Several such lights have been installed by the French Lighthouse Service.

Port Lights.—Small self-contained lanterns and lights are in common use for marking the entrances to harbours and in other similar positions where neither high power nor long range is requisite. Many such lights are unattended in the sense that they do not require the attention of a keeper for days and even weeks together. These are described in more detail in section 6 of this article. A typical port light consists of a copper or brass lantern containing a lens of the fourth order (250 mm. focal distance) or smaller, and a single wick or 2-wick Argand capillary burner. Duplex burners are also used. The apparatus may exhibit a fixed light or, more usually, an occulting characteristic is produced by the revolution of screens actuated by spring clockwork around the burner. The lantern may be placed at the top of a column, or suspended from the head of a mast. Coal gas and electricity are also used as illuminants for port lights when local supplies are available. The optical apparatus used in connexion with electric light is described below.

"Orders" of Apparatus.—Augustin Fresnel divided the dioptric lenses, designed by him, into "orders" or sizes depending on their focal distance. This division is still used, although two additional "orders," known as "small third order" and "hyper-radial" respectively are in ordinary use. The following

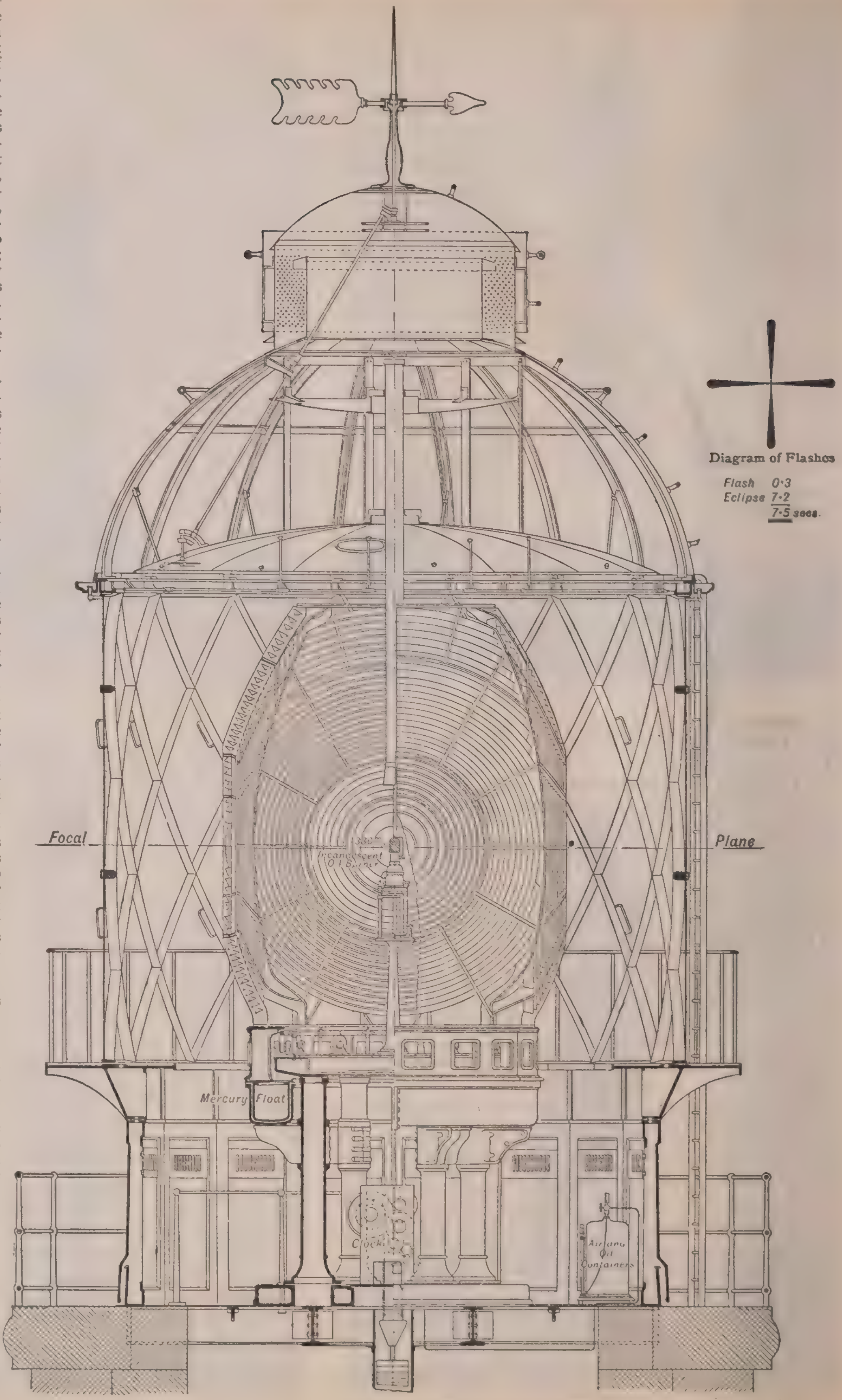


Fig. 41.—Manora Point Apparatus and Lantern.

table gives the principal dimensions of the several sizes in use:—

TABLE II.

Order.	Focal Distance, mm.	Vertical Angles of Optics. (Ordinary Dimensions.)			
		Dioptric Belt only.	Holophotal Optics.		
			Lower Prisms.	Lens.	Upper Prisms.
Hyper-Radial	1330	80°	21°	57°	48°
1st order . .	920	92°,80°,58°	21°	57°	48°
2nd ,, . .	700	80°	21°	57°	48°
3rd ,, . .	500	80°	21°	57°	48°
Small 3rd order . .	375	80°	21°	57°	48°
4th order . .	250	80°	21°	57°	48°
5th ,, . .	187·5	80°	21°	57°	48°
6th ,, . .	150	80°	21°	57°	48°

Lenses of small focal distance are also made for buoy and beacon lights.

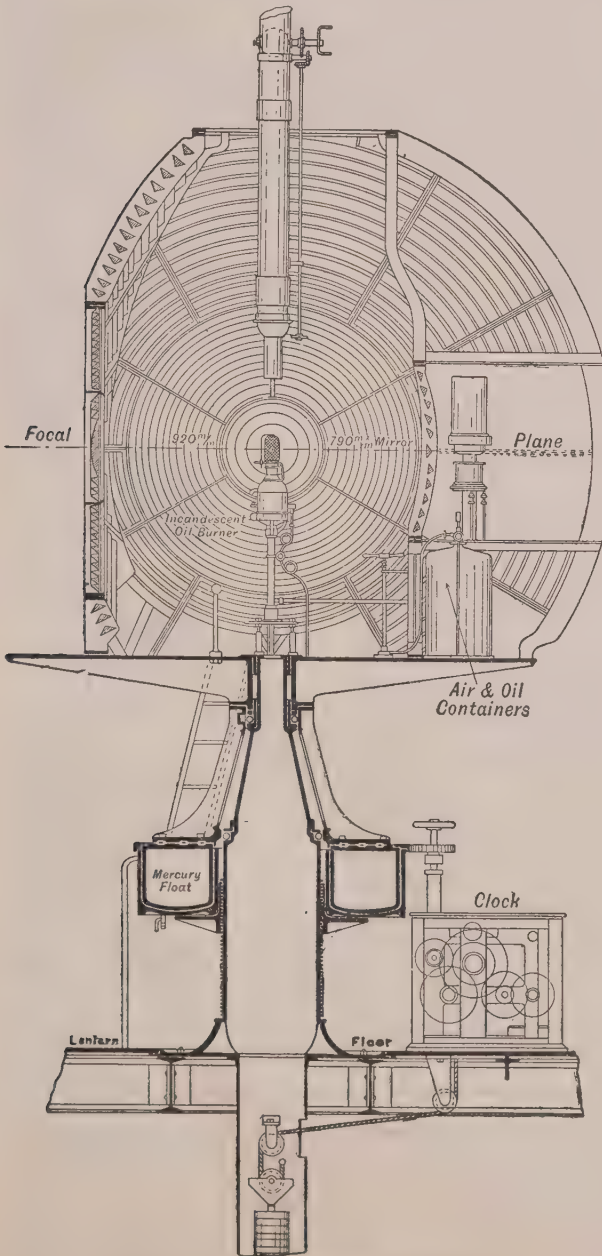


FIG. 42.—Cape Naturaliste Apparatus.

Light Intensities.—The powers of lighthouse lights in the British Empire are expressed in terms of standard candles or in "lighthouse units" (one lighthouse unit = 1000 standard candles). In France the unit is the "Carcel" = ·952 standard candle. The powers of burners and optical apparatus, then in use in the United Kingdom, were carefully determined by actual photometric measurement in 1892 by a committee consisting of the engineers of the three general lighthouse boards, and the values so obtained are used as the basis for calculating the intensities of all British lights. It was found that the intensities determined by photometric measurement were considerably less than the values given by the theoretical calculations formerly employed. A deduction of 20% was made from the mean experimental results obtained to compensate for loss by absorption in the lantern glass, variations in effects obtained by different men in working the burners and in the illuminating quality of oils, &c. The resulting reduced values are termed "service" intensities.

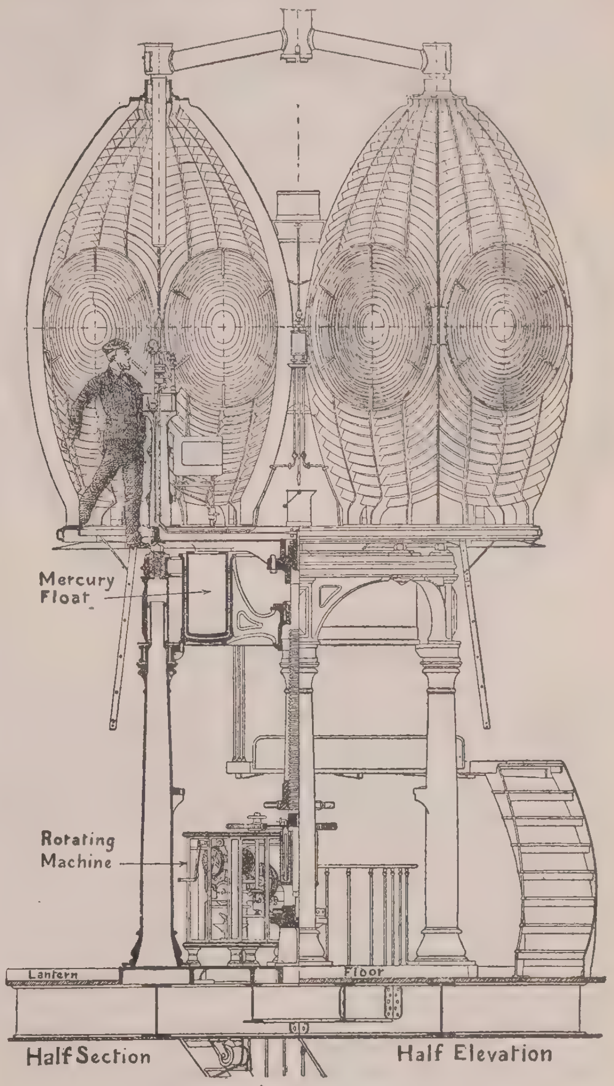


FIG. 43.—Île Vierge Apparatus.

As has been explained above, the effect of a dioptric apparatus is to condense the light rays, and the measure of this condensation is the ratio between the vertical divergence and the vertical angle of the optic in the case of fixed lights. In flashing lights the ratio of vertical condensation must be multiplied by the ratio between the horizontal divergence and the horizontal angle of the panel. The loss of light by absorption in passing through the glass and by refraction varies from 10% to 15%. For apparatus containing catadioptric elements a larger deduction must be made.

The intensity of the flash emitted from a dioptric apparatus, showing a white light, may be found approximately by the empirical formula $I = PCVH/vh$, where I = intensity of resultant beam, P = service intensity of flame, V = vertical angle of optic, v = angle of mean vertical divergence, H = horizontal angle of panel, h = angle of mean horizontal divergence, and C = constant varying between ·9 and ·75 according to the description of apparatus. The factor H/*h* must be eliminated in the case of fixed lights. Deduction must also be made in the case of coloured lights. It should, however, be pointed out that photometric measurements alone can be relied upon to give accurate values for lighthouse intensities. The values obtained by the use of Allard's formulae, which were largely used before the necessity for actual photometric measurements came to be appreciated, are considerably in excess of the true intensities.

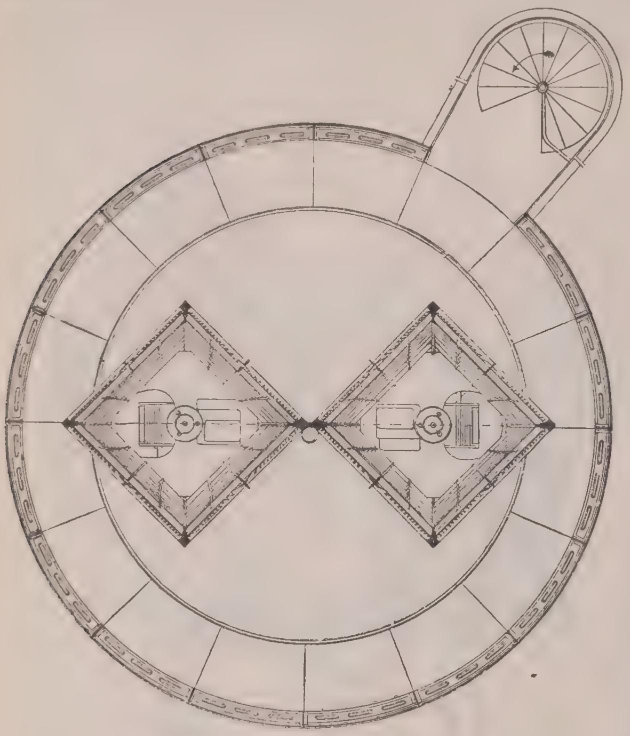


FIG. 43A.—Île Vierge Apparatus and Lantern. Plan at focal plane.

Optical Calculations.—The mathematical theory of optical apparatus for lighthouses and formulae for the calculations of profiles will be found in the works of the Stevensons, Chance, Allard, Reynaud, Ribière and others. Particulars of typical lighthouse apparatus will be found in tables VI. and VII.

4. ILLUMINANTS.—The earliest form of illuminant used for lighthouses was a fire of coal or wood set in a brazier or grate erected on top of the lighthouse tower. Until the end of the 18th and even into the 19th century this primitive illuminant continued to be almost the only one in use. The coal fire at the Isle of May light continued until 1810 and that at St Bees lighthouse in Cumberland till 1823. Fires are stated to have been used on the two towers of Nidingen, in the Kattegat, until 1846. Smeaton was the first to use any form of illuminant other than coal fires; he placed within the lantern of his Eddystone lighthouse a chandelier holding 24 tallow candles each of which weighed ⅝ of a ℔ and emitted a light of 2·8 candle power. The aggregate illuminating power was 67·2 candles and the consumption at the rate of 3·4 ℔ per hour.

Oil.—Oil lamps with flat wicks were used in the Liverpool lighthouses as early as 1763. Argand, between 1780 and 1783, perfected his cylindrical wick lamp which provides a central current of air through the burner, thus allowing the more perfect combustion of the gas issuing from the wick. The contraction in the diameter of the glass chimney used with wick lamps is due to Lange, and the principle of the multiple wick burner was devised by Count Rumford. Fresnel produced burners having two, three and four concentric wicks. Sperm oil, costing 5s. to 8s. per gallon, was used in English lighthouses until 1846, but about that year colza oil was employed generally at a cost of 2s. 9d. per gallon. Olive oil, lard oil and coconut oil have also been used for lighthouse purposes in various parts of the world.

Mineral Oil Burners.—The introduction of mineral oil, costing a mere fraction of the expensive animal and vegetable oils, revolutionized the illumination of lighthouses. It was not until 1868 that a burner was devised which successfully consumed hydro-carbon oils. This was a multiple wick burner invented by Captain Doty. The invention was quickly taken advantage of by lighthouse authorities, and the "Doty" burner, and other patterns involving the same principle, remained practically the only oil burners in lighthouse use until the last few years of the 19th century.

The lamps used for supplying oil to the burner are of two general types, viz. those in which the oil is maintained under pressure by mechanical action and constant level lamps. In the case of single wick, and some 2-wick burners, oil is supplied to the burner by the capillary action of the wick alone.

The mineral oils ordinarily in use are petroleum, which for lighthouse purposes should have a specific gravity of from ·820 to ·830 at 60° F. and flashing point of not less than 230° F. (Abel close test), and Scottish shale oil or paraffin with a specific gravity of about ·810 at 60° F. and flash point of 140° to 165° F. Both these varieties may be obtained in England at a cost of about 6½d. per gallon in bulk.

Coal Gas had been introduced in 1837 at the inner pier light of Troon (Ayrshire) and in 1847 it was in use at the Heugh lighthouse (West Hartlepool). In 1878 cannel coal gas was adopted for the Galley Head lighthouse, with 108-jet Wigham burners. Sir James Douglass introduced gas burners consisting of concentric rings, two to ten in number, perforated on the upper edges. These give excellent results and high intensity, 2600 candles in the case of the 10-ring burner with a flame diameter at the focal plane of 5⅝ in. They are still in use at certain stations. The use of multiple ring and jet gas burners is not being further extended. Gas for lighthouse purposes generally requires to be specially made; the erection of gas works at the station is thus necessitated and a considerable outlay entailed which is avoided by the use of oil as an illuminant.

Incandescent Coal Gas Burners.—The invention of the Welsbach mantle placed at the disposal of the lighthouse authorities the means of producing a light of high intensity combined with great focal compactness. For lighthouse purposes other gaseous illuminants than coal gas are as a rule more convenient and economical, and give better results with incandescent mantles. Mantles have, however, been used with ordinary coal gas in many instances where a local supply is available.

Incandescent Mineral Oil Burners.—Incandescent lighting with high-flash mineral oil was first introduced by the French Lighthouse Service in 1898 at L'Île Penfret lighthouse. The burners employed are all made on the same principle, but differ slightly in details according to the type of lighting apparatus for which they are intended. The principle consists in injecting the liquid petroleum in the form of spray mixed with air into a vaporizer heated by the mantle flame or by a subsidiary heating burner. A small reservoir of compressed air is used—charged by means of a hand pump—for providing the necessary pressure for injection. On first ignition the vaporizer is heated by a spirit flame to the required temperature. A reservoir air pressure of 125 ℔ per sq. in. is employed, a reducing valve supplying air to the oil at from 60 to 65 ℔ per sq. in. Small reservoirs containing liquefied carbon dioxide have also been employed for supplying the requisite pressure to the oil vessel.

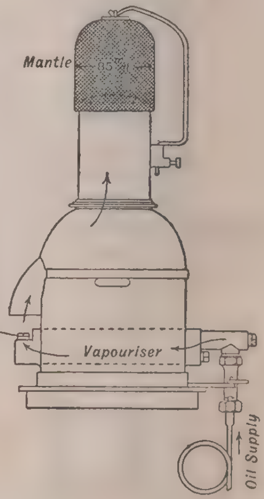


FIG. 44.—"Chance" Incandescent Oil Burner, with 85 mm. diameter mantle.

The candle-power of apparatus in which ordinary multiple wick burners were formerly employed is increased by over 300% by the substitution of suitable incandescent oil burners. In 1902 incandescent oil burners were adopted by the general lighthouse authorities in the United Kingdom. The burners used in the Trinity House Service and some of those made in France have the vaporizers placed over the flame. In other forms, of which the "Chance" burner (fig. 44) is a type, the vaporization is effected by means of a subsidiary burner placed under the main flame.

Particulars of the sizes of burner in ordinary use are given in the following table.

Diameter of Mantle.	Service Intensity.	Consumption of oil. Pints per hour.
35 mm.	600 candles.	·50
55 mm.	1200 ,,	1·00
85 mm.	2150 ,,	2·25
Triple mantle 50 mm.	3300 ,,	3·00

The intrinsic brightness of incandescent burners generally may be taken as being equivalent to from 30 candles to 40 candles per sq. cm. of the vertical section of the incandescent mantle.

In the case of wick burners, the intrinsic brightness varies, according to the number of wicks and the type of burner from about 3·5 candles to about 12 candles per sq. cm., the value being at its maximum with the larger type of burner. The luminous intensity of a beam from a dioptric apparatus is, *ceteris paribus*, proportional to the intrinsic brightness of the luminous source of flame, and not of the total luminous intensity. The intrinsic brightness of the flame of oil burners increases only slightly with their focal diameter, consequently while the consumption of oil increases the efficiency of the burner for a given apparatus decreases. The illuminating power of the condensed beam can only be improved to a slight extent, and, in fact, is occasionally decreased, by increasing the number of wicks in the burner. The same argument applies to the case of multiple ring and multiple jet gas burners which, notwithstanding their large total intensity, have comparatively small intrinsic brightness. The economy of the new system is instanced by the case of the Eddystone bi-form apparatus, which with the concentric 6-wick burner consuming 2500 gals. of oil per annum, gave a total intensity of 79,250 candles. Under the new régime the intensity is 292,000 candles, the oil consumption being practically halved.

Incandescent Oil Gas Burners.—It has been mentioned that incandescence with low-pressure coal gas produces flames of comparatively small intrinsic brightness. Coal gas cannot be compressed beyond a small extent without considerable injurious condensation and other accompanying evils. Recourse has therefore been had to compressed oil gas, which is capable of undergoing compression to 10 or 12 atmospheres with little detriment, and can conveniently be stored in portable reservoirs. The burner employed resembles the ordinary Bunsen burner with incandescent mantle, and the rate of consumption of gas is 27·5 cub. in. per hour per candle. A reducing valve is used for supplying the gas to the burner at constant pressure. The burners can be left unattended for considerable periods. The system was first adopted in France, where it is installed at eight lighthouses, among others the Ar'men Rock light, and has been extended to other parts of the world including several stations in Scotland and England. The mantles used in France are of 35 mm. diameter. The 35 mm. mantle gives a candle-power of 400, with an intrinsic brightness of 20 candles per sq. cm.

The use of oil gas necessitates the erection of gas works at the lighthouse or its periodical supply in portable reservoirs from a neighbouring station. A complete gas works plant costs about £800. The annual expenditure for gas lighting in France does not exceed £72 per light where works are installed, or £32 where gas is supplied from elsewhere. In the case of petroleum vapour lighting the annual cost of oil amounts to about £26 per station.

Acetylene.—The high illuminating power and intrinsic brightness of the flame of acetylene makes it a very suitable illuminant for lighthouses and beacons, providing certain difficulties attending its use can be overcome. At Grangemouth an unattended 21-day beacon has been illuminated by an acetylene flame for some years with considerable success, and a beacon light designed to run unattended for six months was established on Bedout Island in Western Australia in 1910. Acetylene has also been used in the United States, Germany, the Argentine, China, Canada, &c., for lighthouse and beacon illumination. Many buoys and beacons on the German and Dutch coasts have been supplied with oil gas mixed with 20% of acetylene, thereby obtaining an increase of over 100% in illuminating intensity. In France an incandescent burner consuming acetylene gas mixed with air has been installed at the Chassiron lighthouse (1902). The French Lighthouse Service has perfected an incandescent acetylene burner with a 55 mm. mantle having an intensity of over 2000 candle-power, with intrinsic brightness of 60 candles per sq. cm.

Electricity.—The first installation of electric light for lighthouse purposes in England took place in 1858 at the South Foreland, where the Trinity House established a temporary plant for experimental purposes. This installation was followed in 1862 by the adoption of the illuminant at the Dungeness lighthouse, where it remained in service until the year 1874 when oil was substituted for electricity. The earliest of the permanent installations now existing in England is that at Souter Point which was illuminated in 1871. There are in England four important coast lights illuminated by electricity, and one, viz. Isle of May, in Scotland. Of the former St Catherine's, in the Isle of Wight, and the Lizard are the most powerful. Elctricity was substituted as an illuminant for the then existing oil light at St Catherine's in 1888. The optical apparatus consisted of a second-order 16-sided revolving lens, which was transferred to the South Foreland station in 1904, and a new second order (700 mm.) four-sided optic with a vertical angle of 139°, exhibiting a flash of ·21 second duration every 5 seconds substituted for it. A fixed holophote is placed inside the optic in the dark or landward arc, and at the focal plane of the lamp. This holophote condenses the rays from the arc falling upon it into a pencil of small angle, which is directed horizontally upon a series of reflecting prisms which again bend the light and throw it downwards through an aperture in the lantern floor on to another series of prisms, which latter direct the rays seaward in the form of a sector of fixed red light at a lower level in the tower. A somewhat similar arrangement exists at Souter Point lighthouse.

The apparatus installed at the Lizard in 1903 is similar to that at St Catherine's, but has no arrangement for producing a subsidiary sector light. The flash is of ·13 seconds duration every 3 seconds. The apparatus replaced the two fixed electric lights erected in 1878.

The Isle of May lighthouse, at the mouth of the Firth of Forth, was first illuminated by electricity in 1886. The optical apparatus consists of a second-order fixed-light lens with reflecting prisms, and is surrounded by a revolving system of vertical condensing prisms which split up the vertically condensed beam of light into 8 separate beams of 3° in azimuth. The prisms are so arranged that the apparatus, making one complete revolution in the minute, produces a group characteristic of 4 flashes in quick succession every 30 seconds (fig. 45). The fixed light is not of the ordinary Fresnel section, the refracting portion being confined to an angle of 10°, and the remainder of the vertical section consisting of reflecting prisms.

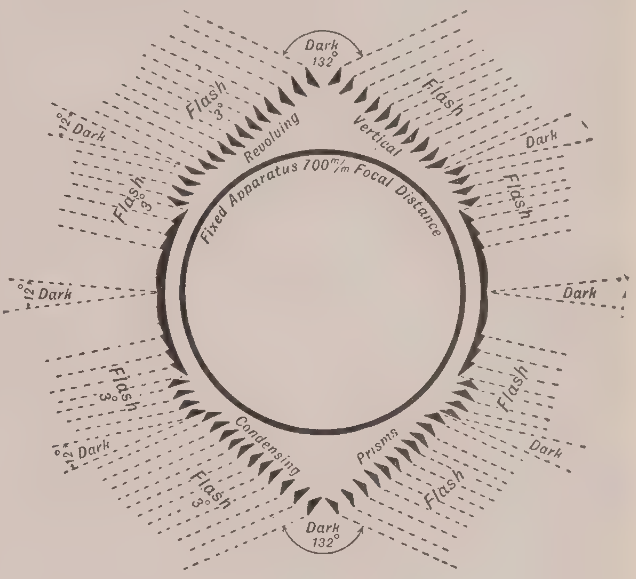


FIG. 45.—Isle of May Apparatus.

In France the old south lighthouse at La Hève was lit by electricity in 1863. This installation was followed in 1865 by a similar one at the north lighthouse. In 1910 there were thirteen important coast lights in France illuminated by electricity. In other parts of the world, Macquarie lighthouse, Sydney, was lit by electricity in 1883; Tino, in the gulf of Spezia, in 1885; and Navesink lighthouse, near the entrance to New York Bay, in 1898. Electric apparatus were also installed at the lighthouse at Port Said in 1869, on the opening of the canal; Odessa in 1871; and at the Rothersand, North Sea, in 1885. There are several other lights in various parts of the world illuminated by this agency.

Incandescent electric lighting has been adopted for the illumination of certain light-vessels in the United States, and a few small harbour and port lights, beacons and buoys.

Table VI. gives particulars of some of the more important electric lighthouses of the world.

Electric Lighthouse Installations in France.—A list of the thirteen lighthouses on the French coast equipped with electric light installations will be found in table VI. It has been already mentioned that the two lighthouses at La Hève were lit by electric light in 1863 and 1865. These installations were followed within a few years by the establishment of electricity as illuminant at Gris-Nez. In 1882 M. Allard, the then director-general of the French Lighthouse Service, prepared a scheme for the electric lighting of the French littoral by means of 46 lights distributed more or less uniformly along the coast-line. All the apparatus were to be of the same general type, the optics consisting of a fixed belt of 300 mm. focal distance, around the outside of which revolved a system of 24 faces of vertical lenses. These vertical panels condensed the belt of fixed light into beams of 3° amplitude in azimuth, producing flashes of about ¾ sec. duration. To illuminate the near sea the vertical divergence of the lower prisms of the fixed belt was artificially increased. These optics are very similar to that in use at the Souter Point lighthouse, Sunderland. The intensities obtained were 120,000 candles in the case of fixed lights and 900,000 candles with flashing lights. As a result of a nautical inquiry held in 1886, at which date the lights of Dunkerque, Calais, Gris-Nez, La Canche, Baleines and

Planier had been lighted, in addition to the old apparatus at La Hève, it was decided to limit the installation of electrical apparatus to important landfall lights—a decision which the Trinity House had already arrived at in the case of the English coast—and to establish new apparatus at six stations only. These were Créac'h d'Ouessant (Ushant), Belle-Île, La Coubre at the mouth of the river Gironde, Barfleur, Île d'Yeu and Penmarc'h. At the same time it was determined to increase the powers of the existing electric lights. The scheme as amended in 1886 was completed in 1902.[1]

All the electrically lit apparatus, in common with other optics established in France since 1893, have been provided with mercury rotation. The most recent electric lights have been constructed in the form of twin apparatus, two complete and distinct optics being mounted side by side upon the same revolving table and with corresponding faces parallel. It is found that a far larger aggregate candle-power is obtained from two lamps with 16 mm. to 23 mm. diameter carbons and currents of 60 to 120 amperes than with carbons and currents of larger dimensions in conjunction with single optics of greater focal distance. A somewhat similar circumstance led to the choice of the twin form for the two very powerful non-electric apparatus at Île Vierge (figs. 43 and 43A) and Ailly, particulars of which will be seen in table VII.

Several of the de Meritens magneto-electric machines of 5·5 K.W., laid down many years ago at French electric lighthouse stations, are still in use. All these machines have five induction coils, which, upon the installation of the twin optics, were separated into two distinct circuits, each consisting of 2½ coils. This modification has enabled the old plants to be used with success under the altered conditions of lighting entailed by the use of two lamps. The generators adopted in the French service for use at the later stations differ materially from the old type of de Meritens machine. The Phare d'Eckmühl (Penmarc'h) installation serves as a type of the more modern machinery. The dynamos are alternating current two-phase machines, and are installed in duplicate. The two lamps are supplied with current from the same machine, the second dynamo being held in reserve. The speed is 810 to 820 revolutions per minute.

The lamp generally adopted is a combination of the Serrin and Berjot principles, with certain modifications. Clockwork mechanism with a regulating electro-magnet moves the rods simultaneously and controls the movements of the carbons so that they are displaced at the same rate as they are consumed. It is usual to employ currents of varying power with carbons of corresponding dimensions according to the atmospheric conditions. In the French service two variations are used in the case of twin apparatus produced by currents of 60 and 120 amperes at 45 volts with carbons 14 mm. and 18 mm. diameter, while in single optic apparatus currents of 25, 50 and 100 amperes are utilized with carbon of 11 mm., 16 mm. and 23 mm. diameter. In England fluted carbons of larger diameter are employed with correspondingly increased current. Alternating currents have given the most successful results in all respects. Attempts to utilize continuous current for lighthouse arc lights have, up to the present, met with little success.

The cost of a first-class electric lighthouse installation of the most recent type in France, including optical apparatus, lantern, dynamos, engines, air compressor, siren, &c., but not buildings, amounts approximately to £5900.

Efficiency of the Electric Light.—In 1883 the lighthouse authorities of Great Britain determined that an exhaustive series of experiments should be carried out at the South Foreland with a view to ascertaining the relative suitability of electricity, gas and oil as lighthouse illuminants. The experiments extended over a period of more than twelve months, and were attended by representatives of the chief lighthouse authorities of the world. The results of the trials tended to show that the rays of oil and gas lights suffered to about equal extent by atmospheric absorption, but that oil had the advantage over gas by reason of its greater economy in cost of maintenance and in initial outlay on installation. The electric light was found to suffer to a much larger extent than either oil or gas light per unit of power by atmospheric absorption, but the infinitely greater total intensity of the beam obtainable by its use, both by reason of the high luminous intensity of the electric arc and its focal compactness, more than outweighed the higher percentage of loss in fog. The final conclusion of the committee on the relative merits of electricity, gas or oil as lighthouse illuminants is given in the following words: "That for ordinary necessities of lighthouse illumination, mineral oil is the most suitable and economical illuminant, and that for salient headlands, important landfalls, and places where a very powerful light is required electricity offers the greater advantages."

5. MISCELLANEOUS LIGHTHOUSE EQUIPMENT. *Lanterns.*—Modern lighthouse lanterns usually consist of a cast iron or steel pedestal, cylindrical in plan, on which is erected the lantern glazing, surmounted by a domed roof and ventilator (fig. 41). Adequate ventilation is of great importance, and is provided by means of ventilators in the pedestal and a large ventilating dome or cowl in the roof. The astragals carrying the glazing are of wrought steel or gun-metal. The astragals are frequently arranged helically or diagonally, thus causing a minimum of obstruction to the light rays in any vertical section and affording greater rigidity to the structure. The glazing is usually ¼-in. thick plate-glass curved to the radius of the lantern. In situations of great exposure the thickness is increased. Lantern roofs are of sheet steel or copper secured to steel or cast-iron rafter frames. In certain instances it is found necessary to erect a grille or network outside the lantern to prevent the numerous sea birds, attracted by the light, from breaking the glazing by impact. Lanterns vary in diameter from 5 ft. to 16 ft. or more, according to the size of the optical apparatus. For first order apparatus a diameter of 12 ft. or 14 ft. is usual.

Lightning Conductors.—The lantern and principal metallic structures in a lighthouse are usually connected to a lightning conductor carried either to a point below low water or terminating in an earth plate embedded in wet ground. Conductors may be of copper tape or copper-wire rope.

Rotating Machinery.—Flashing-light apparatus are rotated by clockwork mechanism actuated by weights. The clocks are fitted with speed governors and electric warning apparatus to indicate variation in speed and when rewinding is required. For occulting apparatus either weight clocks or spring clocks are employed.

Accommodation for Keepers, &c.—At rock and other isolated stations, accommodation for the keepers is usually provided in the towers. In the case of land lighthouses, dwellings are provided in close proximity to the tower. The service or watch room should be situated immediately under the lantern floor. Oil is usually stored in galvanized steel tanks. A force pump is sometimes used for pumping oil from the storage tanks to a service tank in the watch-room or lantern.

6. UNATTENDED LIGHTS AND BEACONS.—Until recent years no unattended lights were in existence. The introduction of Pintsch's gas system in the early 'seventies provided a means of illumination for beacons and buoys of which large use has been made. Other illuminants are also in use to a considerable extent.

Unattended Electric Lights.—In 1884 an iron beacon lighted by an incandescent lamp supplied with current from a secondary battery was erected on a tidal rock near Cadiz. A 28-day clock was arranged for eclipsing the light between sunrise and sunset and automatically cutting off the current at intervals to produce an occulting characteristic. Several small dioptric apparatus illuminated with incandescent electric lamps have been made by the firm of Barbier Bénard et Turenne of Paris, and supplied with current from batteries of Daniell cells, with electric clockwork mechanism for occulting the light. These apparatus have been fitted to beacons and buoys, and are generally arranged to automatically switch off the current during the day-time. They run unattended for periods up to two months. Two separate lenses and lamps are usually provided, with lamp changer, only one lamp being in circuit at a time. In the event of failure in the upper lamp of the two the current automatically passes to the lower lamp.

Oil-gas Beacons.—In 1881 a beacon automatically lighted by Pintsch's compressed oil gas was erected on the river Clyde, and large numbers of these structures have since been installed in all parts of the world. The gas is contained in an iron or steel reservoir placed within the beacon structure, refilled by means of a flexible hose on the occasions of the periodical visits of the tender. The beacons, which remain illuminated for periods up to three months are charged to 7 atmospheres. Many lights are provided with occulting apparatus actuated by the gas passing from the reservoir to the burner automatically cutting off and turning on the supply. The Garvel beacon (1899) on the Clyde is shown in fig. 46. The burner has 7 jets, and the light is occulting. Since 1907 incandescent mantle burners for oil gas have been largely used for beacon illumination, both for fixed and occulting lights.

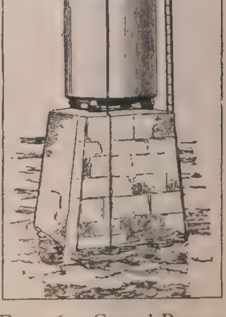


FIG. 46.—Garvel Beacon.

Acetylene has also been used for the illumination of beacons and other unattended lights.

Lindberg Lights.—In 1881–1882 several beacons lighted automatically by volatile petroleum spirit on the Lindberg-Lyth and Lindberg-Trotter systems were established in Sweden. Many lights of this type have subsequently been placed in different parts of the world. The volatile spirit lamp burns day and night. Occultations are produced by a screen or series of screens rotated round the light by the ascending current of heated air and gases from the lamp acting upon a horizontal fan. The speed of rotation of the fan cannot be accurately adjusted, and the times of occultation therefore are liable to slight variation. The lights run unattended for periods up to twenty-one days.

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[1] In 1901 one of the lights decided upon in 1886 and installed in 1888—Créac'h d'Ouessant—was replaced by a still more powerful twin apparatus exhibited at the 1900 Paris Exhibition. Subsequently similar apparatus to that at Créac'h were installed at Gris-Nez, La Canche, Planier, Barfleur, Belle-Île and La Coubre, and the old Dunkerque optic has been replaced by that removed from Belle-Île.

Benson-Lee Lamps.—An improvement upon the foregoing is the Benson-Lee lamp, in which a similar occulting arrangement is often used, but the illuminant is paraffin consumed in a special burner having carbon-tipped wicks which require no trimming. The flame intensity of the light is greater than that of the burner consuming light spirit. The introduction of paraffin also avoids the danger attending the use of the more volatile spirit. Many of these lights are in use on the Scottish coast. They are also used in other parts of the United Kingdom, and in the United States, Canada and other countries.

Permanent Wick Lights.—About 1891 the French Lighthouse Service introduced petroleum lamps consuming ordinary high-flash lighthouse oil, and burning without attention for periods of several months. The burners are of special construction, provided with a very thick wick which is in the first instance treated in such a manner as to cause the formation of a deposit of carbonized tar on its exposed upper surface. This crust prevents further charring of the wick after ignition, the oil becoming vaporized from the under side of the crust. Many fixed, occulting and flashing lights fitted with these burners are established in France and other countries. In the case of the occulting types a revolving screen is placed around the burner and carried upon a miniature mercury float. The rotation is effected by means of a small Gramme motor on a vertical axis, fitted with a speed governor, and supplied with current from a battery of primary cells. The oil reservoir is placed in the upper part of the lantern and connected with the burner by a tube, to which is fitted a constant level regulator for maintaining the burning level of the oil at a fixed height. In the flashing or revolving light types the arrangement is generally similar, the lenses being revolved upon a mercury float which is rotated by the electric motor. The flashing apparatus established at St Marcouf in 1901 has a beam intensity of 1000 candle-power, and is capable of running unattended for three months. The electric current employed for rotating the apparatus is supplied by four Lalande and Chaperon primary cells, coupled in series, each giving about 0·15 ampere at a voltage of 0·65. The power required to work the apparatus is at the maximum about 0·165 ampere at 0·75 volt, the large surplus of power which is provided for the sake of safety being absorbed by a brake or governor connected with the motor.

Wigham Beacon Lights.—Wigham introduced an oil lamp for beacon and buoy purposes consisting of a vertical container filled with ordinary mineral oil or paraffin, and carrying a roller immediately under the burner case over which a long flat wick passes. One end of the wick is attached to a float which falls in the container as the oil is consumed, automatically drawing a fresh portion of the wick over the roller. The other end of the wick is attached to a free counterweight which serves to keep it stretched. The oil burns from the convex surface of the wick as it passes over the roller, a fresh portion being constantly passed under the action of the flame. The light is capable of burning without attention for thirty days. These lights are also fitted with occulting screens on the Lindberg system. The candle-power of the flame is small.

7. LIGHT-VESSELS.—The earliest light-vessel placed in English waters was that at the Nore in 1732. The early light-ships were of small size and carried lanterns of primitive construction and small size suspended from the yard-arms. Modern light-vessels are of steel, wood or composite construction. Steel is now generally employed in new ships. The wood and composite ships are sheathed with Muntz metal. The dimensions of English light-vessels vary. The following may be taken as the usual limits:

Length	80 ft. to 114 ft.
Beam	20 ft. to 24 ft.
Depth moulded . .	13 ft. to 15 ft. 6 in.
Tonnage	155 to 280.

The larger vessels are employed at outside and exposed stations, the smaller ships being stationed in sheltered positions and in estuaries. The moorings usually consist of 3-ton mushroom anchors and 1⅝ open link cables. The lanterns in common use are 8 ft. in diameter, circular in form, with glazing 4 ft. in height. They are annular in plan, surrounding the mast of the vessel upon which they are hoisted for illumination, and are lowered to the deck level during the day. Fixed lanterns mounted on hollow steel masts are now being used in many services, and are gradually displacing the older type. The first English light-vessel so equipped was constructed in 1904. Of the 87 light-vessels in British waters, including unattended light-vessels, eleven are in Ireland and six in Scotland. At the present time there are over 750 light-vessels in service throughout the world.

Until about 1895 the illuminating apparatus used in light-vessels was exclusively of catoptric form, usually consisting of 21 in. or 24 in. silvered parabolic reflectors, having 1, 2 or 3-wick mineral oil burners in focus. The reflectors and lamps are hung in gimbals to preserve the horizontal direction of the beams.

The following table gives the intensity of beam obtained by means of a type of reflector in general use:

21-in. Trinity House Parabolic Reflector.

	Service Intensity of Beam.
Burners 1 wick "Douglass"	2715 candles
,, 2 ,, (Catoptric) .	4004 ,,
,, 2 ,, (Dioptric) .	6722 ,,
,, 3 ,, ...	7528 ,,

In revolving flashing lights two or more reflectors are arranged in parallel in each face. Three, four or more faces or groups of reflectors are arranged around the lantern in which they revolve, and are carried upon a turn-table rotated by clockwork. The intensity of the flashing beam is therefore equivalent to the combined intensities of the beams emitted by the several reflectors in each face. The first light-vessel with revolving light was placed at the Swin Middle at the entrance to the Thames in 1837. Group-flashing characteristics can be produced by special arrangements of the reflectors. Dioptric apparatus is now being introduced in many new vessels, the first to be so fitted in England being that stationed at the Swin Middle in 1905, the apparatus of which is gas illuminated and gives a flash of 25,000 candle-power.

Fog signals, when provided on board light-vessels are generally in the form of reed-horns or sirens, worked by compressed air. The compressors are driven from steam or oil engines. The cost of a modern type of English light-vessel, with power-driven compressed air siren, is approximately £16,000.

In the United States service, the more recently constructed vessels have a displacement of 600 tons, each costing £18,000. They are provided with self-propelling power and steam whistle fog signals. The illuminating apparatus is usually in the form of small dioptric lens lanterns suspended at the mast-head—3 or more to each mast, but a few of the ships, built since 1907, are provided with fourth-order revolving dioptric lights in fixed lanterns. There are 53 light-vessels in service on the coasts of the United States with 13 reserve ships.

Electrical Illumination.—An experimental installation of the electric light placed on board a Mersey light-vessel in 1886 by the Mersey Docks and Harbour Board proved unsuccessful. The United States Lighthouse Board in 1892 constructed a light-vessel provided with a powerful electric light, and moored her on the Cornfield Point station in Long Island Sound. This vessel was subsequently placed off Sandy Hook (1894) and transferred to the Ambrose Channel Station in 1907. Five other light-vessels in the United States have since been provided with incandescent electric lights—either with fixed or occulting characteristics—including Nantucket Shoals (1896), Fire Island (1897), Diamond Shoals (1898), Overfalls Shoal (1901) and San Francisco (1902).

Gas Illumination.—In 1896 the French Lighthouse Service completed the construction of a steel light-vessel (Talais), which was ultimately placed at the mouth of the Gironde. The construction of this vessel was the outcome of experiments carried out with a view to produce an efficient light-vessel at moderate cost, lit by a dioptric flashing light with incandescent oil-gas burner. The construction of the Talais was followed by that of a second and larger vessel, the Snouw, on similar lines, having a length of 65 ft. 6 in., beam 20 ft. and a draught of 12 ft., with a displacement of 130 tons. The cost of this vessel complete with optical apparatus and gas-holders, with accommodation for three men, was approximately £5000. The vessel was built in 1898–1899.[1] A third vessel was constructed in 1901–1902 for the Sandettié Bank on the general lines adopted for the preceding examples of her class, but of the following increased dimensions: length 115 ft.; width at water-line 20 ft. 6 in.; and draught 15 ft., with a displacement of 342 tons (fig. 47). Accommodation is provided for a crew of eight men. The optical apparatus (fig. 48) is dioptric, consisting of 4 panels of 250 mm. focal distance, carried upon a "Cardan" joint below the lens table, and counter-balanced by a heavy pendulum weight. The apparatus is revolved by clockwork and illuminated by compressed oil gas with incandescent mantle. The candle-power of the beam is 35,000. The gas is contained in three reservoirs placed in the hold. The apparatus is contained in a 6-ft. lantern constructed at the head of a tubular mast 2 ft. 6 in. diameter. A powerful siren is provided with steam engine and boiler for working the air compressors. The total cost of the vessel, including fog signal and optical apparatus, was £13,600. A vessel of similar construction to the Talais was placed by the Trinity House in 1905 on the Swin Middle station. The illuminant is oil gas. Gas illuminated light-vessels have also been constructed for the German and Chinese Lighthouse Service.

Unattended Light-vessels.—In 1881 an unattended light-vessel, illuminated with Pintsch's oil gas, was constructed for the Clyde, and is still in use at the Garvel Point. The light is occulting, and is shown from a dioptric lens fitted at the head of a braced iron lattice tower 30 ft. above water-level. The vessel is of iron, 40 ft. long, 12 ft. beam and 8 ft. deep, and has a storeholder on board containing oil gas under a pressure of six atmospheres capable of maintaining a light for three months. A similar vessel is placed off Calshot Spit in Southampton Water, and several have been constructed for the

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[1] Both the Talais and Snouw light-vessels have since been converted into unattended light-vessels.

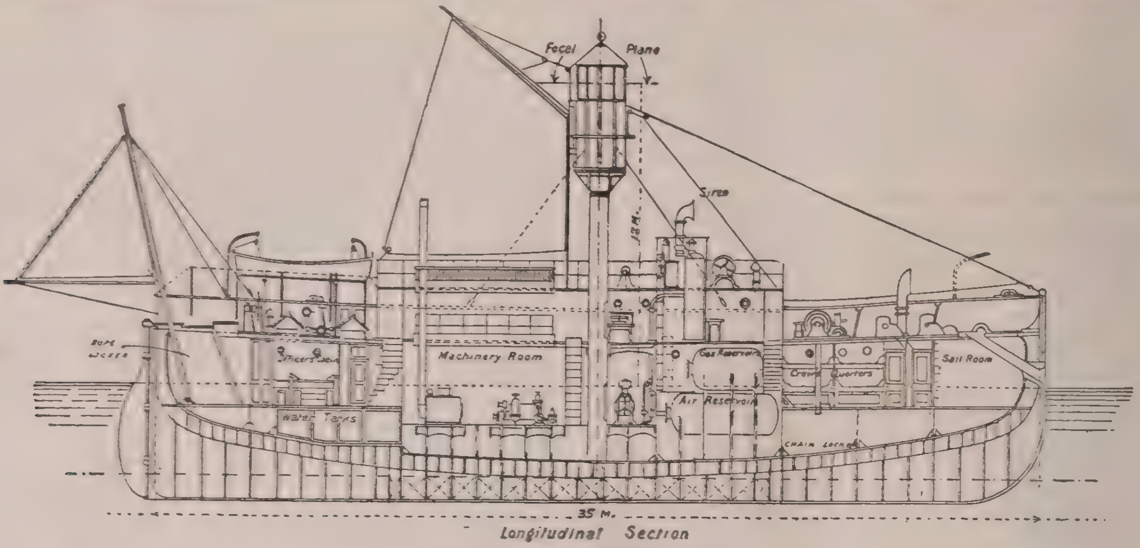

FIG. 47.—Sandettié Lightship.

French and other Lighthouse Services. The French boats are provided with deep main and bilge keels similar to those adopted in the larger gas illuminated vessels. In 1901 a light-vessel 60 ft. in length was placed off the Otter Rock on the west coast of Scotland; it is constructed of steel, 24 ft. beam, 12 ft. deep and draws 9 ft. of water (fig. 49). The focal plane is elevated 25 ft. above the waterline, and the lantern is 6 ft. in diameter. The optical apparatus is of 500 mm. focal distance and hung in gimbals with a pendulum balance and "Cardan" joint as in the Sandettié light-vessel. The illuminant is oil gas, with an occulting characteristic. The storeholder contains 10,500 cub. ft. of gas at eight atmospheres, sufficient to supply the light for ninety days and nights. A bell is provided, struck by clappers moved by the roll of the vessel. The cost of the vessel complete was £2979. The Northern Lighthouse Commissioners have four similar vessels in service, and others have been stationed in the Hugli estuary, at Bombay, off the Chinese coasts and elsewhere. In 1909 an unattended gas illuminated light-vessel provided with a dioptric flashing apparatus was placed at the Lune Deep in Morecambe Bay. It is also fitted with a fog bell struck automatically by a gas operated mechanism.

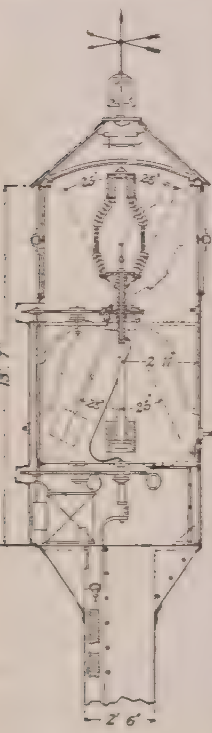

FIG. 48.—Lantern of Sandettié Lightship.

Electrical Communication of Light-vessels with the Shore.—Experiments were instituted in 1886 at the Sunk light-vessel off the Essex coast with the view to maintaining telephonic communication with the shore by means of a submarine cable 9 m. in length. Great difficulties were experienced in maintaining communication during stormy weather, breakages in the cable being frequent. These difficulties were subsequently partially overcome by the employment of larger vessels and special moorings. Wireless telegraphic installations have now (1910) superseded the cable communications with light-vessels in English waters except in four cases. Seven light-vessels, including the four off the Goodwin Sands, are now fitted for wireless electrical communication with the shore.

In addition many pile lighthouses and isolated rock and island stations have been placed in electrical communication with the shore by means of cables or wireless telegraphy. The Fastnet lighthouse was, in 1894, electrically connected with the shore by means of a non-continuous cable, it being found impossible to maintain a continuous cable in shallow water near the rock owing to the heavy wash of the sea. A copper conductor, carried down from the tower to below low-water mark, was separated from the cable proper, laid on the bed of the sea in a depth of 13 fathoms, by a distance of about 100 ft. The lighthouse was similarly connected to earth on the opposite side of the rock. The conductor terminated in a large copper plate, and to the cable end was attached a copper mushroom. Weak currents were induced in the lighthouse conductor by the main current in the cable, and messages received in the tower by the help of electrical relays. On the completion of the new tower on the Fastnet Rock in 1906 this installation was superseded by a wireless telegraphic installation.

8. DISTRIBUTION AND DISTINCTION OF LIGHTS, &c.—*Methods of Distinction.*—The following are the various light characteristics which may be exhibited to the mariner:—

Fixed.—Showing a continuous or steady light. Seldom used in modern lighthouses and generally restricted to small port or harbour lights. A fixed light is liable to be confused with lights of shipping or other shore lights.

Flashing.[1]—Showing a single flash, the duration of darkness always being greater than that of light. This characteristic or that immediately following is generally adopted for important lights. The French authorities have given the name *Feux-Eclair* to flashing lights of short duration.

Group-Flashing.—Showing groups of two or more flashes in quick succession (not necessarily of the same colour) separated by eclipses with a larger interval of darkness between the groups.

Fixed and Flashing.—Fixed light varied by a single white or coloured flash, which may be preceded and followed by a short eclipse. This type of light, in consequence of the unequal intensities of the beams, is unreliable, and examples are now seldom installed although many are still in service.

Fixed and Group-Flashing.—Similar to the preceding and open to the same objections.

Revolving.—This term is still retained in the "Lists of Lights" issued by the Admiralty and some other authorities to denote a light gradually increasing to full effect, then decreasing to eclipse. At short distances and in clear weather a faint continuous light may be observed. There is no essential difference between revolving and flashing lights, the distinction being merely due to the speed of rotation, and the term might well be abandoned as in the United States lighthouse list.

Occulting.—A continuous light with, at regular intervals, one sudden and total eclipse, the duration of light always being equal to or greater than that of darkness. This characteristic is usually exhibited by fixed dioptric apparatus fitted with some form of occulting mechanism. Many lights formerly of fixed characteristic have been converted to occulting.

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[1] For the purposes of the mariner a light is classed as flashing or occulting solely according to the duration of light and darkness and without any reference to the apparatus employed. Thus, an occulting apparatus, in which the period of darkness is greater than that of light, is classed in the Admiralty "List of Lights" as a "flashing" light.

Group Occulting.—A continuous light with, at regular intervals, groups of two or more sudden and total eclipses.

Alternating.—Lights of different colours (generally red and white) alternately without any intervening eclipse. This characteristic is not to be recommended for reasons which have already been referred to. Many of the permanent and unwatched lights on the coasts of Norway and Sweden are of this description.

Colour.—The colours usually adopted for lights are white, red and green. White is to be preferred whenever possible, owing to the great absorption of light by the use of red or green glass screens.

Sectors.—Coloured lights are often requisite to distinguish cuts or sectors, and should be shown from fixed or occulting light apparatus and not from flashing apparatus. In marking the passage through a channel, or between sandbanks or other dangers, coloured light sectors are arranged to cover the dangers, white light being shown over the fairway with sufficient margin of safety between the edges of the coloured sectors next the fairway and the dangers.

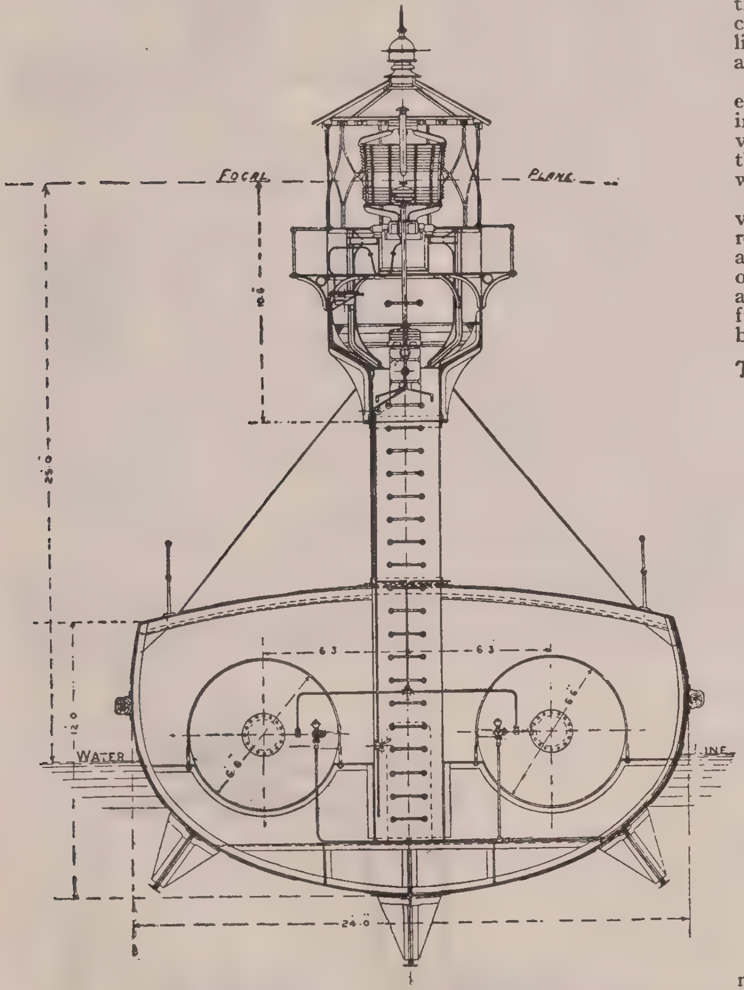


FIG. 49.—Otter Rock Light-vessel.

Choice of Characteristic and Description of Apparatus.—In determining the choice of characteristic for a light due regard must be paid to existing lights in the vicinity. No light should be placed on a coast line having a characteristic the same as, or similar to, another in its neighbourhood unless one or more lights of dissimilar characteristic, and at least as high power and range, intervene. In the case of "landfall lights" the characteristic should differ from any other within a range of 100 m. In narrow seas the distance between lights of similar characteristic may be less. Landfall lights are, in a sense, the most important of all and the most powerful apparatus available should be installed at such stations. The distinctive characteristic of a light should be such that it may be readily determined by a mariner without the necessity of accurately timing the period or duration of flashes. For landfall and other important coast stations flashing dioptric apparatus of the first order (920 mm. focal distance) with powerful burners are required. In countries where the atmosphere is generally clear and fogs are less prevalent than on the coasts of the United Kingdom, second or third order lights suffice for landfalls having regard to the high intensities available by the use of improved illuminants. Secondary coast lights may be of second, third or fourth order of flashing character, and important harbour lights of third or fourth order. Less important harbours and places where considerable range is not required, as in estuaries and narrow seas, may be lighted by flashing lights of fourth order or smaller size. Where sectors are requisite, occulting apparatus should be adopted for the main light: or subsidiary lights, fixed or occulting, may be exhibited from the same tower as the main light but at a lower level. In such cases the vertical distance between the high and the low light must be sufficient to avoid commingling of the two beams at any range at which both lights are visible. Such commingling or blending is due to atmospheric aberration.

Range of Lights.—The range of a light depends first on its elevation above sea-level and secondly on its intensity. Most important lights are of sufficient power to render them visible at the full geographical range in clear weather. On the other hand there are many harbour and other lights which do not meet this condition.

The distances given in lists of lights from which lights are visible—except in the cases of lights of low power for the reason given above—are usually calculated in nautical miles as seen from a height of 15 ft. above sea-level, the elevation of the lights being taken as above high water. Under certain atmospheric conditions, and especially with the more powerful lights, the *glare* of the light may be visible considerably beyond the calculated range.

TABLE III.—*Distances at which Objects can be seen at Sea, according to their Respective Elevations and the Elevation of the Eye of the Observer.* (A. Stevenson.)

Heights in Feet.	Distances in Geographical or Nautical Miles.	Heights in Feet.	Distances in Geographical or Nautical Miles.
5	2·565	110	12·03
10	3·628	120	12·56
15	4·443	130	13·08
20	5·130	140	13·57
25	5·736	150	14·02
30	6·283	200	16·22
35	6·787	250	18·14
40	7·255	300	19·87
45	7·696	350	21·46
50	8·112	400	22·94
55	8·509	450	24·33
60	8·886	500	25·65
65	9·249	550	26·90
70	9·598	600	28·10
75	9·935	650	29·25
80	10·26	700	30·28
85	10·57	800	32·45
90	10·88	900	34·54
95	11·18	1000	36·28
100	11·47		

EXAMPLE: A tower 200 ft. high will be visible 20·66 nautical miles to an observer, whose eye is elevated 15 ft. above the water; thus, from the table:

15 ft. elevation,	distance visible		4·44	nautical miles
200	"	"	16·22	"
			20·66	"

Elevation of Lights.—The elevation of the light above sea-level need not, in the case of landfall lights, exceed 200 ft., which is sufficient to give a range of over 20 nautical miles. One hundred and fifty feet is usually sufficient for coast lights. Lights placed on high headlands are liable to be enveloped in banks of fog at times when at a lower level the atmosphere is comparatively clear (*e.g.* Beachy Head). No definite rule can, however, be laid down, and local circumstances, such as configuration of the coast line, must be taken into consideration in every case.

Choice of Site.—"Landfall" stations should receive first consideration and the choice of location for such a light ought never to be made subservient to the lighting of the approaches to a port. Subsidiary lights are available for the latter purpose. Lights installed to guard shoals, reefs or other dangers should, when practicable, be placed seaward of the danger itself, as it is desirable that seamen should be able to "make" the light with confidence. Sectors marking dangers seaward of the light should not be employed except when the danger is in the near vicinity of the light. Outlying dangers required marking by a light placed on the danger or by a floating light in its vicinity.

9. Illuminated Buoys.—*Gas Buoys.* Pintsch's oil gas has been in use for the illumination of buoys since 1878. In 1883 an automatic occulter was perfected, worked by the gas passing from the reservoir to the burner. The lights placed on these buoys burn continuously for three or more months. The buoys and lanterns are made in various forms and sizes. The spar buoy (fig. 50) may be adopted for situations where strong tides or currents prevail. Oil gas lights are frequently fitted to Courtenay whistling (fig. 51) and bell buoys.

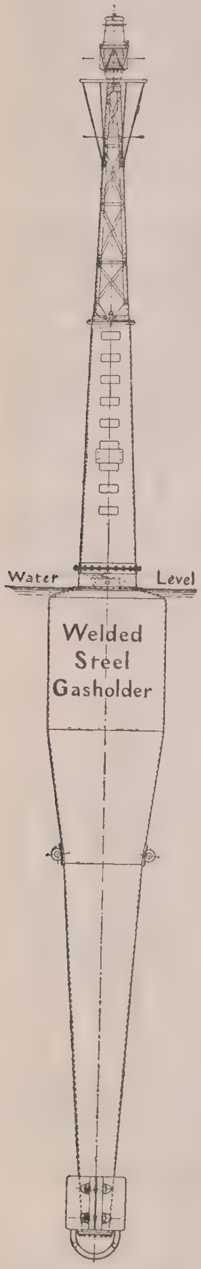


Fig. 50.—Spar Gas Buoy.

In the ordinary type of gas buoy lantern the burner employed is of the multiple-jet, Argand ring, or incandescent type. Incandescent mantles have been applied to buoy lights in France with successful results. Since 1906, and more recently the same system of illumination has been adopted in England and other countries. The lenses employed are of cylindrical dioptric fixed-light form, usually 100 mm. to 300 mm. diameter. Some of the largest types of gas-buoy in use on the French coast have an elevation from water level to the focal plane of over 26 ft. with a beam intensity of more than 1000 candles. A large gas-buoy with an elevation of 34 ft. to the focal plane was placed at the entrance to the Gironde in 1907. It has an incandescent burner and exhibits a light of over 1500 candles. Oil gas forms the most trustworthy and efficient illuminant for buoy purposes yet introduced, and the system has been largely adopted by lighthouse and harbour authorities.

There are now over 2000 buoys fitted with oil gas apparatus, in addition to 600 beacons, light-vessels and boats.

Electric Lit Buoys.—Buoys have been fitted with electric light, both fixed and occulting. Six electrically lit spar-buoys were laid down in the Gedney channel, New York lower bay, in 1888. These were illuminated by 100 candle-power Swan lamps with continuous current supplied by cable from a power station on shore. The wear and tear of the cables caused considerable trouble and expense. In 1895 alternating current was introduced. The installation was superseded by gas lit buoys in 1904.

Acetylene and Oil Lighted Buoys.—Acetylene has been extensively employed for the lighting of buoys in Canada and in the United States; to a less extent it has also been adopted in other countries. Both the low pressure system, by which the acetylene gas is produced by an automatic generator, and the so-called high pressure system in which purified acetylene is held in solution in a high pressure gasholder filled with asbestos composition saturated with acetone, have been employed for illuminating buoys and beacons. Wigham oil lamps are also used to a limited extent for buoy lighting.

Bell Buoys.—One form of clapper actuated by the roll of the buoy (shown in fig. 52) consists of a hardened steel ball placed in a horizontal phosphor-bronze cylinder provided with rubber buffers. Three of these cylinders are arranged around the mouth of the fixed bell, which is struck by the balls rolling backwards and forwards as the buoy moves. Another form of bell mechanism consists of a fixed bell with three or more suspended clappers placed externally which strike the bell when the buoy rolls.

10. Fog Signals.—The introduction of coast fog signals is of comparatively recent date. They were, until the middle of the 19th century, practically unknown except so far as a few isolated bells and guns were concerned. The increasing demands of navigation, and the application of steam power to the propulsion of ships resulting in an increase of their speed, drew attention to the necessity of providing suitable signals as aids to navigation during fog and mist. In times of fog the mariner can expect no certain assistance from even the most efficient system of coast lighting, since the beams of light from the most powerful electric lighthouse are frequently entirely dispersed and absorbed by the particles of moisture, forming a sea fog of even moderate density, at a distance of less than a ¼ m. from the shore. The careful experiments and scientific research which have been devoted to the subject of coast fog-signalling have produced much that is useful and valuable to the mariner, but unfortunately the practical results so far have not been so satisfactory as might be desired, owing to (1) the very short range of the most powerful signals yet produced under certain unfavourable acoustic conditions of the atmosphere, (2) the difficulty experienced by the mariner in judging at any time how far the atmospheric conditions are against him in listening for the expected signal, and (3) the difficulty in locating the position of a sound signal by phonic observations.

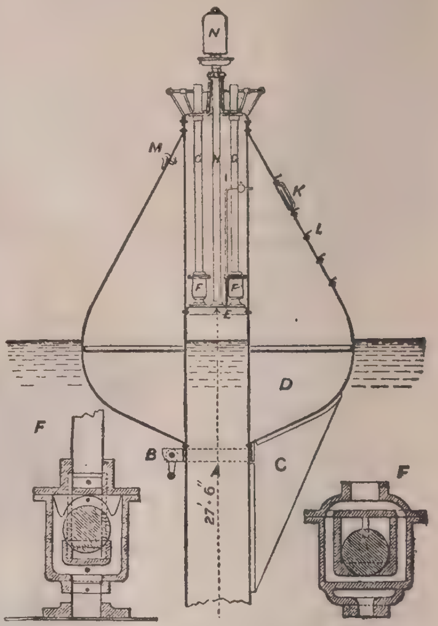


Fig. 51.—Courtenay's Automatic Whistling Buoy.

A, Cylinder, 27 ft. 6 in. long.
B, Mooring shackle.
C, Rudder.
D, Buoy.
E, Diaphragm.
F, Ball valves.
G, Air inlet tubes.
H, Air (compressed outlet tube to whistle.
I, Compressed air inlet to buoy.
K, Manhole.
L, Steps.
N, Whistle.

Bells and Gongs are the oldest and, generally speaking, the least efficient forms of fog signals. Under very favourable acoustic conditions the sounds are audible at considerable ranges. On the other hand, 2-ton bells have been inaudible at distances of a few hundred yards. The 1893 United States trials showed that a bell weighing 4000 ℔ struck by a 450 ℔ hammer was heard at a distance of 14 m. across a gentle breeze and at over 9 m. against a 10-knot breeze. Bells are frequently used for beacon and buoy signals, and in some cases at isolated rock and other stations where there is insufficient accommodation for sirens and horns, but their use is being gradually discontinued in this country for situations where a

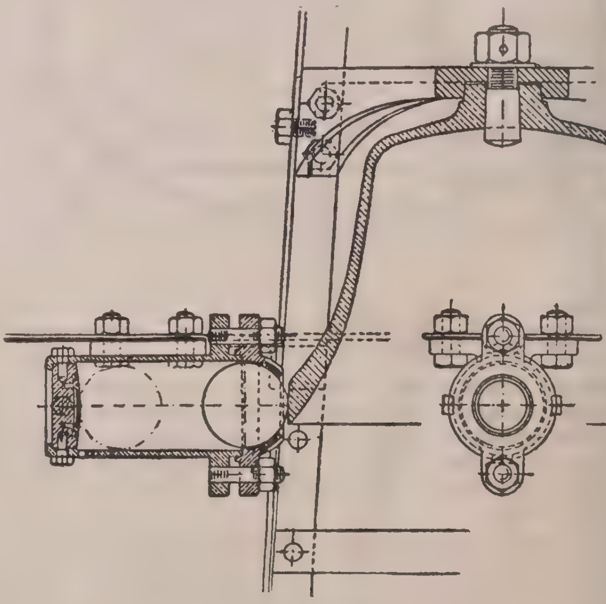


Fig. 52.—Buoy Bell.

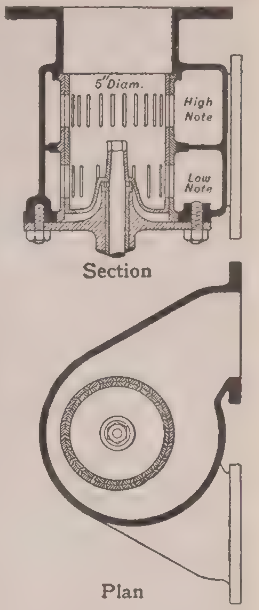
powerful signal is required. Gongs, usually of Chinese manufacture, were formerly in use on board English lightships and are still used to some extent abroad. These are being superseded by more powerful sound instruments.

Explosive Signals.—Guns were long used at many lighthouse and light-vessel stations in England, and are still in use in Ireland and at some foreign stations. These are being gradually displaced by other explosive or compressed air signals. No explosive signals are in use on the coasts of the United States. In 1878 sound rockets charged with gun-cotton were first used at Flamborough Head and were afterwards supplied to many other stations.[1] The nitrated gun-cotton or tonite signals now in general use are made up in 4 oz. charges. These are hung at the end of an iron jib or pole attached to the lighthouse lantern or other structure, and fired by means of a detonator and electric battery. The discharge may take place within 12 ft. of a structure without danger. The cartridges are stored for a considerable period without deterioration and with safety. This form of signal is now very generally adopted for rock and other stations in Great Britain, Canada, Newfoundland, northern Europe and other parts of the world. An example will be noticed in the illustration of the Bishop Rock lighthouse, attached to the lantern (fig. 13). Automatic hoisting and firing appliances are also in use.

Whistles.—Whistles, whether sounded by air or steam, are not used in Great Britain, except in two instances of harbour signals under local control. It has been objected that their sound has too great a resemblance to steamers' whistles, and they are wasteful of power. In the United States and Canada they are largely used. The whistle usually employed consists of a metallic dome or bell against which the high-pressure steam impinges. Rapid vibrations are set up both in the metal of the bell and in the internal air, producing a shrill note. The Courtenay buoy whistle, already referred to, is an American invention and finds favour in the United States, France, Germany and elsewhere.

Reed-Horns.—These instruments in their original form were the invention of C. L. Daboll, an experimental horn of his manufacture being tried in 1851 by the United States Lighthouse Board. In 1862 the Trinity House adopted the instrument for seven land and light-vessel stations. For compressing air for the reed-horns as well as sirens, caloric, steam, gas and oil engines have been variously used, according to local circumstances. The reed-horn was improved by Professor Holmes, and many examples from his designs are now in use in England and America. At the Trinity House experiments with fog signals at St Catherine's (1901) several types of reed-horn were experimented with. The Trinity House service horn uses air at 15 ℔ pressure with a consumption of ·67 cub. ft. per second and 397 vibrations. A small manual horn of the Trinity House type consumes ·67 cub. ft. of air at 5 ℔ pressure. The trumpets of the latter are of brass.

Sirens.—The most powerful and efficient of all compressed air fog signals is the siren. The principle of this instrument may be briefly explained as follows:—It is well known that if the tympanic membrane is struck periodically and with sufficient rapidity by air impulses or waves a musical sound is produced. Robinson was the first to construct an instrument by which successive puffs of air under pressure were ejected from the mouth of a pipe. He obtained this effect by using a stop-cock revolving at high speed in such a manner that 720 pulsations per second were produced by the intermittent escape of air through the valves or ports, a smooth musical note being given. Cagniard de la Tour first gave such an instrument the name of siren, and constructed it in the form of an air chamber with perforated lid or cover, the perforations being successively closed and opened by means of a similarly perforated disk fitted to the cover and revolving at high speed. The perforations being cut at an angle, the disk was self-rotated by the oblique pressure of the air in escaping through the slots. H. W. Dove and Helmholtz introduced many improvements, and Brown of New York patented, about 1870, a steam siren with two disks having radial perforations or slots. The cylindrical form of the siren now generally adopted is due to Slight, who used two concentric cylinders, one revolving within the other, the sides being perforated with vertical slots. To him is also due the centrifugal governor largely used to regulate the speed of rotation of the siren. Over the siren mouth is placed a conical trumpet to collect and direct the sound in the desired direction. In the English service these trumpets are generally of considerable length and placed vertically, with bent top and bell mouth. Those at St Catherine's are of cast-iron with copper bell mouth, and have a total axial length of 22 ft. They are 5 in. in diameter at the siren mouth, the bell mouth being 6 ft. in diameter. At St Catherine's the sirens are two in number, 5 in. in diameter, being sounded simultaneously and in unison (fig. 53). Each siren is provided with ports for producing a high note as well as a low note, the two notes being sounded in quick succession once every minute. The trumpet mouths are separated by an angle of 120° between their axes. This double form has been adopted in certain instances where the angle desired to be covered by the sound is comparatively wide. In Scotland the cylindrical form is used generally, either automatically or motor driven. By the latter means the admission of air to the siren can be delayed until the cylinder is rotating at full speed, and a much sharper sound is produced than in the case of the automatic type. The Scottish trumpets are frequently constructed so that the greater portion of the length is horizontal. The Girdleness trumpet has an axial length of 16 ft., 11 ft. 6 in. being horizontal. The trumpet is capable of being rotated through an angle as well as dipped below the horizon. It is of cast-iron, no bell mouth is used, and the conical mouth is 4 ft. in diameter. In France the sirens are cylindrical and very similar to the English self-driven type. The trumpets have a short axial length, 4 ft. 6 in., and are of brass, with bent bell mouth. The Trinity House has in recent years reintroduced the use of disk sirens, with which experiments are still being carried out both in the United Kingdom and abroad. For light-vessels and rock stations where it is desired to distribute the sound equally in all directions the mushroom-head trumpet is occasionally used. The Casquets trumpet of this type is 22 ft. in length, of cast-iron, with a mushroom top 6 ft. in diameter. In cases where neither the mushroom trumpet nor the twin siren is used the single bent trumpet is arranged to rotate through a considerable angle. Table IV. gives particulars of a few typical sirens of the most recent form.



Section

Plan

FIG. 53.—St Catherine's Double-noted Siren.

TABLE IV.

Station.	Description.	Vibrations per sec.		Sounding Pressure in ℔ per sq. in.	Cub. ft. of air used per sec. of blast reduced to atmospheric pressure.		Remarks.
		High.	Low.		High.	Low.	
St Catherine's (Trinity House)	Two 5-in. cylindrical, automatically driven sirens	295	182	25	32	16	The air consumption is for 2 sirens.
Girdleness (N.L.C.)	7-in. cylindrical siren, motor driven	234	100	30	130	26	
Casquets (Trinity House)	7-in. disk siren, motor driven	. .	98	25	. .	36	
French pattern siren	6-in. cylindrical siren, automatically driven	326	. .	28	14	. .	A uniform note of 326 vibrations per sec. has now been adopted generally in France.

Since the first trial of the siren at the South Foreland in 1873 a very large number of these instruments have been established both at lighthouse stations and on board light-vessels. In all cases in Great Britain and France they are now supplied with air compressed by steam or other mechanical power. In the United States and some other countries steam, as well as compressed air, sirens are in use.

Diaphones.—The diaphone is a modification of the siren, which has been largely used in Canada since 1903 in place of the siren. It is claimed that the instrument emits a note of more constant pitch than does the siren. The distinction between the two instruments is that in the siren a revolving drum or disk alternately opens and closes elongated air apertures, while in the diaphone a piston pulsating at high velocity serves to alternately cover and uncover air slots in a cylinder.

The St Catherine's Experiments.—Extensive trials were carried out during 1901 by the Trinity House at St Catherine's lighthouse, Isle of Wight, with several types of sirens and reed-horns. Experiments were also made with different pattern of trumpets, including forms having elliptical sections, the long axis being placed vertically. The conclusions of the committee may be briefly summarized as follows: (1) When a large arc requires to be guarded two fixed trumpets suitably placed are more effective than one large trumpet capable of being rotated. (2) When the arc to be guarded is larger than that effectively covered by two trumpets, the mushroom-head trumpet is a satisfactory instrument for the purpose. (3) A siren rotated by a separate motor yields better results than when self-driven. (4) No advantage commensurate with the additional power required is obtained by the use of air at a higher pressure than 25 lb per sq. in. (5) The number of vibrations per second produced by the siren or reed should be in unison with the proper note of the associated trumpet. (6) When two notes of different pitch are employed the difference between these should, if possible, be an octave. (7) For calm weather a low note is more suitable than a high note, but when sounding against the wind and with a rough and noisy sea a high note has the greater range. (8) From causes which cannot be determined at the time or predicted beforehand, areas sometimes exist in which the sounds of fog signals may be greatly enfeebled or even lost altogether. This effect was more frequently observed during comparatively calm weather and at no great distance from the signal station. (It has often been observed that the sound of a signal may be entirely lost within a short distance of the source, while heard distinctly at a greater distance and at the same time.) (9) The siren was the most effective signal experimented with; the reed-horn, although inferior in power, is suitable for situations of secondary importance. (No explosive signals were under trial during the experiments.) (10) A fog signal, owing to the uncertainty attending its audibility, must be regarded only as an auxiliary aid to navigation which cannot at all times be relied upon.

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[1] The Flamborough Head rocket was superseded by a siren fog signal in 1908.

Submarine Bell Signals.—As early as 1841 J. D. Colladon conducted experiments on the lake of Geneva to test the suitability of water as a medium for transmission of sound signals and was able to convey distinctly audible sounds through water for a distance of over 21 m., but it was not until 1904 that any successful practical application of this means of signalling was made in connexion with light-vessels. There are at present (1910) over 120 submarine bells in service, principally in connexion with light-vessels, off the coasts of the United Kingdom, United States, Canada, Germany, France and other countries. These bells are struck by clappers actuated by pneumatic or electrical mechanism. Other submerged bells have been fitted to buoys and beacon structures, or placed on the sea bed; in the former case the bell is actuated by the motion of the buoy and in others by electric current, transmitted by cable from the shore. In some cases, when submarine bells are associated with gas buoys or beacons, the compressed gas is employed to actuate the bell striking mechanism. To take full advantage of the signals thus provided it is necessary for ships approaching them to be fitted with special receiving mechanism of telephonic character installed below the water line and in contact with the hull plating. The signals are audible by the aid of ear pieces similar to ordinary telephone receivers. Not only can the bell signals be heard at considerable distances—frequently over 10 m.—and in all conditions of weather, but the direction of the bell in reference to the moving ship can be determined within narrow limits. The system is likely to be widely extended and many merchant vessels and war ships have been fitted with signal receiving mechanism.

The following table (V.) gives the total numbers of fog signals of each class in use on the 1st of January 1910 in certain countries.

TABLE V.

	Sirens.	Diaphone.	Horns, Trumpets, &c.		Whistles.	Explosive Signals (tonite, &c).	Guns.	Bells.	Gongs.	Submarine Bells.	Totals.
			Power.	Manual.							
England and Channel Islands	44	..	27	31	2	15	..	48	10	16	193
Scotland and Isle of Man	35	..	6	2	..	5	..	16	3	..	67
Ireland	12	..	2	6	..	11	3	11	..	3	48
France	12	..	7	1	..	1	..	25	..	2	48
United States (excluding inland lakes and rivers)	43	..	35	15	59	..	..	218	1	36	407
British North America (excluding inland lakes and rivers)	6	66	5	79	16	8	..	24	..	11	215

When two kinds of signal are employed at any one station, one being subsidiary, the latter is omitted from the enumeration. Buoy and unattended beacon bells and whistles are also omitted, but local port and harbour signals not under the immediate jurisdiction of the various lighthouse boards are included, more especially in Great Britain.

11. LIGHTHOUSE ADMINISTRATION. The principal countries of the world possess organized and central authorities responsible for the installation and maintenance of coast lights and fog signals, buoys and beacons.

United Kingdom.—In England the corporation of Trinity House, or according to its original charter, "The Master Wardens, and Assistants of the Guild Fraternity or Brotherhood of the most glorious and undivided Trinity and of St Clement, in the Parish of Deptford Strond, in the county of Kent," existed in the reign of Henry VII. as a religious house with certain duties connected with pilotage, and was incorporated during the reign of Henry VIII. In 1565 it was given certain rights to maintain beacons, &c., but not until 1680 did it own any lighthouses. Since that date it has gradually purchased most of the ancient privately owned lighthouses and has erected many new ones. The act of 1836 gave the corporation control of English coast lights with certain supervisory powers over the numerous local lighting authorities, including the Irish and Scottish Boards. The corporation now consists of a Master, Deputy-master, and 22 Elder Brethren (10 of whom are honorary), together with an unlimited number of Younger Brethren, who, however, perform no executive duties. In Scotland and the Isle of Man the lights are under the control of the Commissioners of Northern Lighthouses constituted in 1786 and incorporated in 1798. The lighting of the Irish coast is in the hands of the Commissioners of Irish Lights formed in 1867 in succession to the old Dublin Ballast Board. The principal local light boards in the United Kingdom are the Mersey Docks and Harbour Board, and the Clyde Lighthouse Trustees. The three general lighthouse boards of the United Kingdom, by the provision of the Mercantile Marine Act of 1854, are subordinate to the Board of Trade, which controls all finances.

On the 1st of January 1910 the lights, fog signals and submarine bells in service under the control of the several authorities in the United Kingdom were as follows:

	Light-houses.	Light-vessels.	Fog Signals.	Sub-marine Bells.
Trinity House	116	51	97	12
Northern Lighthouse Commissioners	138	5	44	..
Irish Lights Commissioners	93	11	35	3
Mersey Docks and Harbour Board	16	6	13	2
Admiralty	31	2	6	..
Clyde Lighthouse Trustees	14	1	5	..
Other local lighting authorities	809	11	89	2
Totals	1217	87	289	19

Some small harbour and river lights of subsidiary character are not included in the above total.

United States.—The United States Lighthouse Board was constituted by act of Congress in 1852. The Secretary of Commerce and Labor is the ex-officio president. The board consists of two officers of the navy, two engineer officers of the army, and two civilian scientific members, with two secretaries, one a naval officer, the other an officer of engineers in the army. The members are appointed by the president of the United States. The coast-line of the states, with the lakes and rivers and Porto Rico, is divided into 16 executive districts for purposes of administration.

The following table shows the distribution of lighthouses, light-vessels, &c., maintained by the lighthouse board in the United States in June 1909. In addition there are a few small lights and buoys privately maintained.

Lighthouses and beacon lights	1333
Light-vessels in position	53
Light-vessels for relief	13
Gas lighted buoys in position	94
Fog signals operated by steam or oil engines	228
Fog signals operated by clockwork, &c.	205
Submarine signals	43
Post lights	2333
Day or unlighted beacons	1157
Bell buoys in position	169
Whistling buoys in position	94
Other buoys	5760
Steam tenders	51
Constructional Staff	318
Light keepers; and light attendants	3137
Officers and crews of light-vessels and tenders	1693

France.—The lighthouse board of France is known as the Commission des Phares, dating from 1792 and remodelled in 1811, and is under the direction of the minister of public works. It consists of four engineers, two naval officers and one member of the Institute, one inspector-general of marine engineers, and one hydrographic engineer. The chief executive officers are an Inspecteur Général des Ponts et Chaussées, who is director of the board, and another engineer of the same corps, who is engineer-in-chief and secretary. The board has control of about 750 lights, including those of

TABLE VI.—*Electric Lighthouse Apparatus.*

Name.	Characteristic.	Period.	Duration of Flash.	Candle-power (Service Intensity).	Focal Distance of Lens.	Ratio of Angular Breadth of Panel to Whole Circle.	Current.	Voltage.	Carbons.	Electric Generators.	Lamps.	Engines.	Elevation above High Water.	Year Established.	Remarks.
UNITED KINGDOM—		Secs.	Secs.	Standard Candles.	mm.		Amps.		mm.				Feet.		
Souter Point (Durham)	Single flash	30	5		500	1 : 8	. .	40	17	Holmes machines, alternating (400 revs.)	Serrin	Steam	150	1871	Fixed light apparatus, with revolving vertical condensing lenses in eight panels.
South Foreland (Kent)	Single flash	2.5	.35	Candle-power not officially determined.	700	1 : 16	. .	40	26	do.	Serrin	Steam	374	1904	Lens elements only; 97° vertical angle. (This apparatus was in use at St Catherine's, 1888 to 1904, and replaced the two fixed electric lights established in 1872.)
Lizard (Cornwall)	Single flash	3	.13		700	1 : 4	145 for 50 mm. carbons	40	50 and 60 fluted	De Meritens alternators (600 revs.)	Modified Berjot-Serrin	Oil engines	230	1903	Mercury rotation; vertical angle, 139°. Replaced the two fixed electric lights erected in 1878.
St Catherine's (Isle of Wight)	Single flash	5	.21		700	1 : 4	145 for 50 mm. carbons	40	50 and 60 fluted	do.	do.	2 Steam, each 50 h.p.	136	1904	Mercury rotation; vertical angle, 139°.
Isle of May (Firth of Forth)	4 flash	30	.4		700 (Fixed apparatus)	1 : 8	220	40	40	do.	Berjot-Serrin	Steam	240	1886	Fixed light apparatus, with revolving vertical condensing lenses.
FRANCE— Dunkerque (Strait of Dover)	2 flash	10	.2 to .4	3,500,000 to 6,500,000	300	1 : 12	30 and 60	45	14 and 18	2 De Meritens alternators, each of 5.5 k.w. (550 revs.)	Improved Serrin	2 Semi-portable steam, each 30 i.h.p.	193	1902	Twelve panels in groups of two. (This apparatus was in use at Barfleur, 1893 to 1902.)
Calais (Strait of Dover) [Les Baleines (1882) similar]	4 flash	15	.75	900,000	300	1 : 24	60	45	18	do.	French Service pattern (1902)	do.	190	1883	Fixed light apparatus, with revolving vertical condensing prisms.
Cap Gris-nez (Strait of Dover)	Single flash	5	.10 to .14	15,000,000 to 30,000,000	300	1 : 4	60 to 120	45	18 and 28	do.	do.	Steam	233	1899	Twin optic, mercury rotation. (This light superseded a triple-flashing electric light, with intermediate red flash, of the Calais type, established in 1885. The first installation of the electric light at this station was in 1869.)
La Canche (Strait of Dover)	2 flash	10	.10 to .14	15,000,000 to 30,000,000	300	1 : 4	30 to 60	45	14 and 18	do.	do.	do.	174	1900	Twin optic, mercury rotation. (This light superseded a fixed electric light established in 1884.)
Cap de la Hève (Havre, English Channel) [Île d'Yeu in the Bay of Biscay (1895) similar]	Single flash	5	.10 to .14	10,000,000 to 20,000,000	300	1 : 4	60 to 120	45	18 and 28	De Meritens alternators (550 revs.)	Improved Serrin	do.	397	1893	Mercury rotation. (The first installation of electric light at this lighthouse was in 1863.)
Créac'h d'Ouessant (Ushant) [Barfleur (English Channel) 1903, La Coubre (Bay of Biscay) 1905, and Belle Île (Bay of Biscay) 1903, similar]	2 flash	10	.10 to .14	15,000,000 to 30,000,000	300	1 : 4	60 to 120	45	18 and 28	2 De Meritens alternators, each of 5.5 k.w. (550 revs.)	French Service pattern (1902)	do.	225	1901	Twin optic, mercury rotation. (This light superseded a double-flashing electric light, similar to that now at Dunkerque, established in 1888.)
Penmarc'h (Phare d'Eckmühl) (Finistère)	Single flash	5	.10 to .14	15,000,000 to 30,000,000	300	1 : 4	30 and 60	45	14 and 18	Two-phase Labour alternators (810 to 820 revs.)	do.	do.	197	1897	Twin optic, mercury rotation.
Planier (near Marseilles)	Single flash	5	.10 to .14	15,000,000 to 30,000,000	300	1 : 4	30 to 60	45	14 to 18	De Meritens alternators (550 revs.)	do.	do.	207	1902	Twin optic, mercury rotation. (This light superseded an electric light established in 1881, showing a group of three white flashes separated by one red flash of the Calais type.)
ITALY— Tino (Gulf of Spezia)	3 flash	30	1.25	Undetermined.	700	1 : 24	50 110 200	50	15 25 35	do. (830 revs.)	Berjot-Serrin	do.	384	1885	Eight panels of three lenses each, no mirror.
AMERICA— Navesink (Entrance to New York Bay)	Single flash	5	.08	About 60,000,000	700	Nearly 1 : 2	Max. 100	50	23	Alternating dynamos (800 revs.)	Modified Serrin (Ciolina)	Oil, each 25 h.p.	246	1898	Mercury rotation. Bivalve of 165°.
AUSTRALIA— Macquarie (Sydney, N.S.W.)	Single flash	60	8	5,000,000	920	1 : 16	55 110	50	15 25	De Meritens alternators (600 revs.)	Serrin	Gas	345	1883	16-panel revolving apparatus, with 180° fixed mirror.

TABLE VII.—*Typical Non-Electric Lighthouse Apparatus.*

Name.	Locality.	Characteristic.	Period	Duration of Flashes.	Candle-Power in Standard Candles (Service Intensity).	Focal Distance of Lens.	Ratio of Angular Breadth of Panel to Whole Circle.	Illuminant.	Burner.	Service Candle-power of Burner.	Height above High Water.	Year Established.[1]	Remarks.
			Secs.	Secs.		mm.					Feet.		
Casquets	Channel Islands	3 flash	30	1.5	185,000	920	1 : 9	Incandescent petroleum vapour	"Matthews" 3-50 mm. dia. mantles	3300	120	1877	Dioptric holophote, 126½° vertical angle; 3 sides of 3 panels in each.
Eddystone	South Devon	2 flash	30	1.5	292,000	920	1 : 12	do.	do.	3300	133	1882	Biform apparatus, lens elements only, 92° vertical angle; 6 sides of 2 panels each.
Bishop Rock	Scilly Isles	2 flash	60	4.0	622,000	1330	1 : 10	do.	do.	3500	134	1886	Biform apparatus, lens elements only, 80° vertical angle; 5 sides of 2 panels each.
Spurn Point	Yorkshire	Single flash	20	1.5	510,000	1330	1 : 6	do.	do.	3300	120	1895	Lens elements only, 80° vertical angle.
Lundy Island	Bristol Channel	2 flash	20	.33	374,000	920	Nearly 1 : 4	do.	do.	3300	165	1897	Mercury rotation, 4 panel bivalve. [St. Mary's Isle, Northumberland (1898), is similar.]
Pendeen	Cornwall	4 flash	15	.25	190,000	920	1 : 8	do.	do.	3300	195	1900	80° vertical angle lens, 2 sides of 4 panels each, mercury rotation.
Roker Pier	Sunderland	Single flash	5	.10	175,000	500	Nearly 1 : 2	do.	"Chance" 55 mm. dia. mantle	1200	83	1903	Mercury rotation; univalve 164° in azimuth, with 164° dioptric mirror in rear.
Bell Rock	Near Firth of Tay	Red and white flashes alternately every 30 secs.	60	.50	392,000	920 and 1330	White about 1 : 9 red about 1 : 2.2	do.	"Chance" 55 mm. dia. mantle	1200	93	1902	Combined hyper-radial and first-order light with back prisms in white and mirrors in red. Revolves in 60 secs. [Holy Island, 1905 (Lamlash), similar, flash every 15 secs.]
Kinnaird's Head	Aberdeenshire	Single flash	15	.50	881,000	920 and 1330	1 : 2.2	do.	do.	2150	120	1903	Composite apparatus; panels of 1330 mm. and 920 mm. focal distance; 2 faces.
Tarbet Ness	Dornoch Firth	6 flash	30	.50	89,000	700	1 : 12	do.	"Chance" 55 mm. dia. mantle	1200	175	1892	6 panels (lens) of 30° with 180° mirror. [Douglas Head (Isle of Man) similar.]
Sule Skerry	West of Orkneys	3 flash	30	1.0	378,000	1330	1 : 9	do.	"Chance" 85 mm. dia. mantle	2150	113	1895	Equiangular lenses.
Pladda	South end of Arran Island	3 flash	30	.50	597,000	1330	1 : 6	do.	do.	2150	130	1901	3 equiangular lens panels with mirror in rear; side panels eccentric. [Hyskin Rocks (1904) similar.]
Tory Island	Co. Donegal	3 flash	60	3.0	17,000 to 320,000	1330	1 : 6	Coal Gas	Wigham, 108 jets (maximum)	2300 (max.)	130	1887	Triform apparatus, vertical angle of lenses 65°; 6 sides, one revolution in 6 minutes. The single flash from lens is divided by eclipsing burner into 3 flashes.
Fastnet	Co. Cork	Single flash	5	.17	750,000	920	1 : 4	Incandescent petroleum vapour	Irish pattern 50 mm. mantle	1200	160	1904	Biform apparatus; 4 panels of 90° vertical angle and 90° in azimuth; mercury rotation.
Kinsale	do.	2 flash	10	.25	460,000	920	1 : 6	do.	do.	1200	236	1907	Biform apparatus, 3 sides each of 2 panels; vertical angle 96°; mercury rotation. [St. John's Point, Co. Down (1908) similar, period 7.5 secs.]
Howth Bailey	Dublin Bay	Single flash	30	1.0	950,000	920	13 : 32	do.	Irish pattern 3-50 mm. dia. mantles	3300	134	1902	Bivalve apparatus; panels of 147° in azimuth and 122° vertical angle; mercury rotation.
Chassiron	Bay of Biscay	Single flash	10	1.0	70,000	920	1 : 8	Oil	6 wick	480	164	1891	The old first-order apparatus has been utilized in all cases.
				.50	180,000	920	1 : 8	Incandescent oil gas	30 mm. dia. mantle	400	164	1895	
				.70	360,000	920	1 : 8	Incandescent acetylene	55 mm. dia. mantle	1300	164	1902	
Cap d'Antifer	English Channel	Single flash	20	1.0	400,000	1330	1 : 6	Incandescent petroleum vapour	French pattern 85 mm. mantle	2150	394	1894	Mercury rotation; hyper-radial apparatus with reflecting prisms. This is the only apparatus of this focal distance on the French coast.
Ile de Batz	Finistère	4 flash	25	.37	200,000	920	1 : 8	do.	do.	2150	223	1900	Group-flashing apparatus; 4 panels of 45°, with 180° mirror in rear; mercury rotation.
Ar'men	do.	3 flash	20	.38	200,000	700	1 : [illegible]	do.	do.	2150	94	1897	Mercury rotation; 3 panels, mirror in rear.
Villefranche	Mediterranean	Single flash	5	.38	250,000	700	1 : [illegible]	do.	do.	2150	229	1902	Mercury rotation.
Ile Vierge	Finistère	Single flash	5	.38	500,000	700	1 : [illegible]	do.	do.	2150	252	1902	Twin optic; mercury rotation.
Kennery Island	Bombay	2 flash	10	.25	250,000	920	Nearly 1 : 4	do.	70 mm. dia. mantle	1400	153	1902	Mercury rotation; bivalve apparatus; 2 double-flashing 170° panels.
Cape Race	Newfoundland	Single flash	7.5	.30	1,100,000	1330	1 : 4	do.	"Chance" 85 mm. dia. mantle	2150	165	1907	4 panels, vertical angle 121½°; mercury rotation. [Manora Point, Karachi, 1909, similar.]
Pachena Point	British Columbia	2 flash	7.5	.44	220,000	920	1 : 8	do.	do.	2150	..	1908	Mercury rotation. 4 sides of 2 panels each.
Cape Hermes	Cape Colony	Single flash	3	.31	30,000	250	1 : 3	do.	"Chance" 55 mm. dia. mantle	1200	175	1904	3 panels, vertical angle 150°; mercury rotation.
Hood Point	do.	4 flash	40	.58	200,000	920	1 : 8	do.	"Chance" 85 mm. dia. mantle	2150	180	1895	Mercury rotation; 4 panels of 45° in azimuth and 80° vertical angle, with catadioptric mirror in rear.
Cape Naturaliste	West Australia	2 flash	10	.15	450,000	920	About 1 : 3	do.	do.	2150	404	1904	Mercury rotation; 2 lenses of 126½° in azimuth, with mirror of 107°.
Point Cloates	do.	Single flash	5	.30	300,000	700	1 : 3	do.	do.	2150	190	1909	Mercury rotation; 3 panels, each 120° in azimuth and 133½° vertical angle.
Pecks Ledge	Connecticut, U.S.A.	2 flash	30	.50	10,000	250	1 : 4	do.	34 mm. dia. mantle	300	54	1906	Rotated on ball bearings. 2 lenses of 90° each and mirror.
Fire Island	New York, U.S.A.	Single flash	60	4.0	250,000	920	1 : 8	do.	55 mm. dia. mantle	1000	167	1858	Rotated on roller bearings.
Gray's Harbor	Washington, Pacific Coast, U.S.A.	Alternating red and white flashes	5	.20	White 10,000 red 8,000	500	..	Oil	3 wick	160	122	1898	Mercury rotation; one (red) lens of 170° in azimuth, reinforced by two 60° mirrors; one (white) lens of 60° in azimuth.

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[1] The dates given are of the establishment of the optical apparatus. In many cases incandescent burners have been installed at later dates.

Corsica, Algeria, &c. A similar system has been established in Spain.

English Colonies.—In Canada the coast lighting is in the hands of the minister of marine, and in most other colonies the public works departments have control of lighthouse matters.

Other Countries.—In Denmark, Austria, Holland, Russia, Sweden, Norway and many other countries the minister of marine has charge of the lighting and buoying of coasts; in Belgium the public works department controls the service.

In the Trinity House Service at shore lighthouse stations there are usually two keepers, at rock stations three or four, one being ashore on leave. When there is a fog signal at a station there is usually an additional keeper, and at electric light stations a mechanical engineer is also employed as principal keeper. The crews of light-vessels as a rule consist of 11 men, three of them and the master or mate going on shore in rotation.

The average annual cost of maintenance of an English shore lighthouse, with two keepers, is £275. For shore lighthouses with three keepers and a siren fog signal the average cost is £444. The maintenance of a rock lighthouse with four keepers and an explosive fog signal is about £760, and an electric light station costs about £1100 annually to maintain.

A light-vessel of the ordinary type in use in the United Kingdom entails an annual expenditure on maintenance of approximately £1320, excluding the cost of periodical overhaul.

Authorities.—Smeaton, *Eddystone Lighthouse* (London, 1793); A. Fresnel, *Mémoire sur un nouveau system d'éclairage des phares* (Paris, 1822); R. Stevenson, *Bell Rock Lighthouse* (Edinburgh, 1824); Alan Stevenson, *Skerryvore Lighthouse* (1847); Renaud, *Mémoire sur l'éclairage et le balisage des côtes de France* (Paris, 1864); Allard, *Mémoire sur l'intensité et la portée des phares* (Paris, 1876); T. Stevenson, *Lighthouse Construction and Illumination* (London, 1881); Allard, *Mémoire sur les phares électriques* (Paris, 1881); Renaud, *Les Phares* (Paris, 1881); Edwards, *Our Sea Marks* (London, 1884); D. P. Heap, *Ancient and Modern Lighthouses* (Boston, 1889); Allard, *Les Phares* (Paris, 1889); Rey, *Les Progrès d'éclairage des côtes* (Paris, 1898); Williams, *Life of Sir J. N. Douglass* (London, 1900); J. F. Chance, *The Lighthouse Work of Sir Jas. Chance* (London, 1902); de Rochemont and Deprez, *Cours des travaux maritimes*, vol. ii. (Paris, 1902); Ribière, *Phares et Signaux maritimes* (Paris, 1908); Stevenson, "Isle of May Lighthouse," *Proc. Inst. Mech. Engineers* (1887); J. N. Douglass, "Beacon Lights and Fog Signals," *Proc. Roy. Inst.* (1889); Ribière, "Propriétés optiques des appareils des phares," *Annales des ponts et chaussées* (1894); Preller, "Coast Lighthouse Illumination in France," *Engineering* (1896); "Lighthouse Engineering at the Paris Exhibition," *Engineer* (1901–1902); N. G. Gedye, "Coast Fog Signals," *Engineer* (1902); *Trans. Int. Nav. Congress* (Paris, 1900, Milan, 1905); *Proc. Int. Eng. Congress* (Glasgow, 1901, St Louis, 1904); *Proc. Int. Maritime Congress* (London, 1893); J. T. Chance, "On Optical Apparatus used in Lighthouses," *Proc. Inst. C.E.* vol. xxvi.; J. N. Douglass, "The Wolf Rock Lighthouse," *ibid.* vol. xxx.; W. Douglass, "Great Basses Lighthouse," *ibid.* vol. xxxviii.; J. T. Chance, "Dioptric Apparatus in Lighthouses," *ibid.* vol. lii.; J. N. Douglass, "Electric Light applied to Lighthouse Illumination," *ibid.* vol. lvii.; W. T. Douglass, "The New Eddystone Lighthouse," *ibid.* vol. lxxv.; Hopkinson, "Electric Lighthouses at Macquarie and Tino," *ibid.* vol. lxxxvii.; Stevenson, "Ailsa Craig Lighthouse and Fog Signals," *ibid.* vol. lxxxix.; W. T. Douglass, "The Bishop Rock Lighthouses," *ibid.* vol. cviii.; Brebner, "Lighthouse Lenses," *ibid.* vol. cxi.; Stevenson, "Lighthouse Refractors," *ibid.* vol. cxvii.; Case, "Beachy Head Lighthouse," *ibid.* vol. clix.; *Notice sur les appareils d'éclairage* (French Lighthouse Service exhibits at Chicago and Paris) (Paris, 1893 and 1900); *Report on U.S. Lighthouse Board Exhibit at Chicago* (Washington, 1894); *Reports of the Lighthouse Board of the United States* (Washington, 1852, et seq.); British parliamentary reports, *Lighthouse Illuminants* (1883, et seq.), *Light Dues* (1896), *Trinity House Fog Signal Committee* (1901), *Royal Commission on Lighthouse Administration* (1908); *Mémoires de la Société des Ingénieurs Civils de France, Annales des ponts et chaussées* (Paris); *Proc. Inst.C.E.*; *The Engineer*; *Engineering* (*passim*). (W. T. D.; N. G. G.)

LIGHTING. Artificial light is generally produced by raising some body to a high temperature. If the temperature of a solid body be greater than that of surrounding bodies it parts with some of its energy in the form of radiation. Whilst the temperature is low these radiations are not of a kind to which the eye is sensitive; they are exclusively radiations less refrangible and of greater wave-length than red light, and may be called infra-red. As the temperature is increased the infra-red radiations increase, but presently there are added radiations which the eye perceives as red light. As the temperature is further increased, the red light increases, and yellow, green and blue rays are successively thrown off. On raising the temperature to a still higher point, radiations of a wave-length shorter even than violet light are produced, to which the eye is insensitive, but which act strongly on certain chemical substances; these may be called ultra-violet rays. Thus a very hot body in general throws out rays of various wave-length; the hotter the body the more of every kind of radiation will it throw out, but the proportion of short waves to long waves becomes vastly greater as the temperature is increased. Our eyes are only sensitive to certain of these waves, viz. those not very long and not very short. The problem of the artificial production of light with economy of energy is the same as that of raising some body to such a temperature that it shall give as large a proportion as possible of those rays which the eye is capable of feeling. For practical purposes this temperature is the highest temperature we can produce. As an illustration of the luminous effect of the high temperature produced by converting other forms of energy into heat within a small space, consider the following statements. If burned in ordinary gas burners, 120 cub. ft. of 15 candle gas will give a light of 360 standard candles for one hour. The heat produced by the combustion is equivalent to about 60 million foot-pounds. If this gas be burned in a modern gas-engine, about 8 million foot-pounds of useful work will be done outside the engine, or about 4 horse-power for one hour. If this be used to drive a dynamo for one hour, even if the machine has an efficiency of only 80%, the energy of the current will be about 6,400,000 foot-pounds per hour, about half of which, or only 3,200,000 foot-pounds, is converted into radiant energy in the electric arc. But this electric arc will radiate a light of 2000 candles when viewed horizontally, and two or three times as much when viewed from below. Hence 3 million foot-pounds changed to heat in the electric arc may be said roughly to affect our eyes six times as much as 60 million foot-pounds changed to heat in an ordinary gas burner.

Owing to the high temperature at which it remains solid, and to its great emissive power, the radiant body used for artificial illumination is usually some form of carbon. In an oil or ordinary coal-gas flame this carbon is present in minute particles derived from the organic substances with which the flame is supplied and heated to incandescence by the heat liberated in their decomposition, while in the electric light the incandescence is the effect of the heat developed by the electric current passed through a resisting rod or filament of carbon. In some cases, however, other substances replace carbon as the radiating body; in the incandescent gas light certain earthy oxides are utilized, and in metallic filament electric lamps such metals as tungsten or tantalum.

1. Oil Lighting

Vegetable and animal oils.

From the earliest times the burning of oil has been a source of light, but until the middle of the 19th century only oils of vegetable and animal origin were employed in indoor lamps for this purpose. Although many kinds were used locally, only colza and sperm oils had any very extended use, and they have been practically supplanted by mineral oil, which was introduced as an illuminant in 1853. Up to the latter half of the 18th century the lamps were shallow vessels into which a short length of wick dipped; the flame was smoky and discharged acrid vapours, giving the minimum of light with the maximum of smell. The first notable improvement was made by Ami Argand in 1784. His burner consisted of two concentric tubes between which the tubular wick was placed; the open inner tube led a current of air to play upon the inner surface of the circular flame, whilst the combustion was materially improved by placing around the flame a chimney which rested on a perforated gallery a short distance below the burner. Argand's original burner is the parent form of innumerable modifications, all more or less complex, such as the Carcel and the moderator.

A typical example of the Argand burner and chimney is represented in fig. 1, in which the burner is composed of three tubes, *d*, *f*, *g*. The tube *g* is soldered to the bottom of the tube *d*, just above *o*, and the interval between the outer surface of the tube *g* and the inner surface of the tube *d* is an annular cylindrical cavity closed at the bottom, containing the cylindrical cotton wick immersed in oil. The wick is fixed to the wick tube *ki*, which is capable of being moved spirally; within the annular cavity is also the tube *f*, which can be moved round, and serves to elevate and depress the wick. P is a cup that screws on the bottom of the tube *d*, and receives the superfluous oil that drops down from the wick along the inner surface of the tube *g*. The air enters through the holes *o*, *o*, and passes up through the tube *g* to maintain the combustion in the interior of the circular flame. The air which maintains the combustion on the exterior part of the wick enters through the holes *m*, with which *rn* is perforated. When the air in the chimney is rarefied by the heat of the flame, the surrounding heavier air, entering the lower part of the chimney, passes upward with a rapid current, to restore the equilibrium. RG is the cylindrical glass chimney with a shoulder or constriction at R, G. The oil flows from a side reservoir, and occupies the cavity between the tubes *g* and *d*. The part *ki* is a short tube, which receives the circular wick, and slides spirally on the tube *g*, by means of a pin working in the hollow spiral groove on the exterior surface of *g*. The wick-tube has also a catch, which works in a perpendicular slit in the tube *f*; and, by turning the tube *f*, the wick-tube will be raised or lowered, for which purpose a ring, or gallery, *rn*, fits on the tube *d*, and receives the glass chimney RG; a wire S is attached to the tube *f*, and, bending over, descends along the outside of *d*. The part *rn*, that supports the glass chimney, is connected by four other wires with the ring *q*, which surrounds the tube *d*, and can be moved round. When *rn* is turned round, it carries with it the ring *q*, the wire S, and the tube *f*, thus raising or depressing the wick.

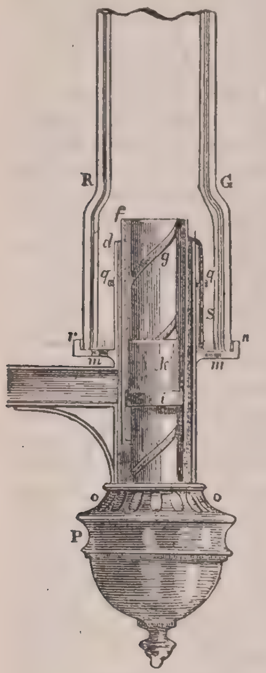


FIG. 1.

A device in the form of a small metallic disk or button, known as the Liverpool button from having been first adopted in the so-called Liverpool lamp, effects for the current of air passing up the interior of the Argand burner the same object as the constriction of the chimney RG secures in the case of the external tube. The button fixed on the end of a wire is placed right above the burner tube *g*, and throws out equally all round against the flame the current of air which passes up through *g*. The result of these expedients, when properly applied, is the production of an exceedingly solid brilliant white light, absolutely smokeless, this showing that the combustion of the oil is perfectly accomplished.

The means by which a uniformly regulated supply of oil is brought to the burner varies with the position of the oil reservoir. In some lamps, not now in use, by ring-formed reservoirs and other expedients, the whole of the oil was kept as nearly as possible at the level of the burner. In what are termed fountain reading, or study lamps, the principal reservoir is above the burner level, and various means are adopted for maintaining a supply from them at the level of the burner. But the most convenient position for the oil reservoir in lamps for general use is directly under the burner, and in this case the stand of the lamp itself is utilized as the oil vessel. In the case of fixed oils, as the oils of animal and vegetable origin used to be called, it is necessary with such lamps to introduce some appliance for forcing a supply of oil to the burner, and many methods of effecting this were devised, most of which were ultimately superseded by the moderator lamp. The Carcel or pump lamp, invented by B. G. Carcel in 1800, is still to some extent used in France. It consists of a double piston or pump, forcing the oil through a tube to the burner, worked by clockwork.

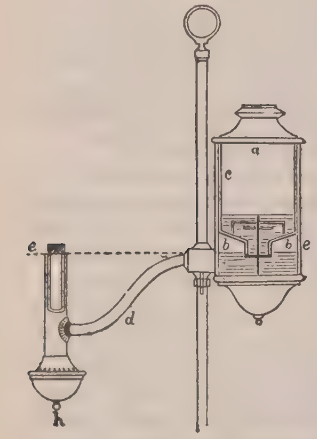


FIG. 2.—Section of Reading Lamp.

A form of reading lamp still in use is seen in section in fig. 2. The lamp is mounted on a standard on which it can be raised or lowered at will, and fixed by a thumb screw. The oil reservoir is in two parts, the upper *ac* being an inverted flask which fits into *bb*, from which the burner is directly fed through the tube *d*; *h* is an overflow cup for any oil that escapes at the burner, and it is pierced with air-holes for admitting the current of air to the centre tube of the Argand burner. The lamp is filled with oil by withdrawing the flask *ac*, filling it, and inverting it into its place. The under reservoir *bb* fills from it to the burner level *ee*, on a line with the mouth of *ac*. So soon as that level falls below the mouth of *ac*, a bubble of air gets access to the upper reservoir, and oil again fills up *bb* to the level *ee*.

The moderator lamp (fig. 3), invented by Franchot about 1836, from the simplicity and efficiency of its arrangements rapidly superseded almost all other forms of mechanical lamp for use with animal and vegetable oils. The two essential features of the moderator lamp are (1) the strong spiral spring which, acting on a piston within the cylindrical reservoir of the lamp, serves to propel the oil to the burner, and (2) the ascending tube C through which the oil passes upwards to the burner. The latter consist of two sections, the lower fixed to and passing through the piston A into the oil reservoir, and the upper attached to the burner. The lower or piston section moves within the upper, which forms a sheath enclosing nearly its whole length when the spring is fully wound up. Down the centre of the upper tube passes a wire, "the moderator," G, and it is by this wire that the supply of oil to the burner is regulated. The spring exerts its greatest force on the oil in the reservoir when it is fully wound up, and in proportion as it expands and descends its power decreases. But when the apparatus is wound up the wire passing down the upper tube extends throughout the whole length of the lower and narrower piston tube, obstructing to a certain extent the free flow of the oil. In proportion as the spring uncoils, the length of the wire within the lower tube is decreased; the upward flow of oil is facilitated in the same ratio as the force urging it upwards is weakened. In all mechanical lamps the flow is in excess of the consuming capacity of the burner, and in the moderator the surplus oil, flowing over the wick, falls back into the reservoir above the piston, whence along with new supply oil it descends into the lower side by means of leather valves *a*, *a*. B represents the rack which, with the pinion D, winds up the spiral spring hard against E when the lamp is prepared for use. The moderator wire is seen separately in GG; and FGC illustrates the arrangement of the sheathing tubes, in the upper section of which the moderator is fixed.

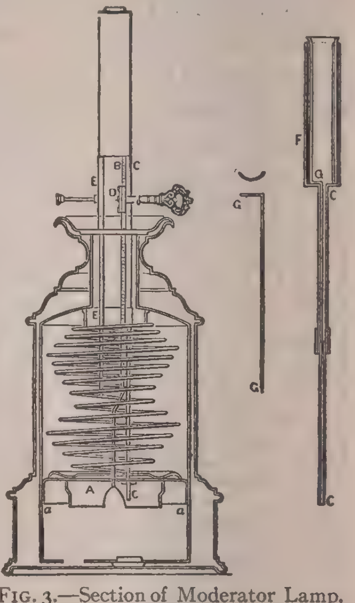


FIG. 3.—Section of Moderator Lamp.

Mineral oils.

As early as 1781 the idea was mooted of burning naphtha, obtained by the distillation of coal at low temperatures, for illuminating purposes, and in 1820, when coal gas was struggling into prominence, light oils obtained by the distillation of coal tar were employed in the Holliday lamp, which is still the chief factor in illuminating the street barrow of the costermonger. In this lamp the coal naphtha is in a conical reservoir, from the apex of which it flows slowly down through a long metal capillary to a rose burner, which, heated up by the flame, vaporizes the naphtha, and thus feeds the ring of small jets of flame escaping from its circumference.

It was in 1847 that James Young had his attention drawn to an exudation of petroleum in the Riddings Colliery at Alfreton, in Derbyshire, and found that he could by distillation obtain from it a lubricant of considerable value. The commercial success of this material was accompanied by a failure of the supply, and, rightly imagining that as the oil had apparently come from the Coal Measures, it might be obtained by distillation from material of the same character, Young began investigations in this direction, and in 1850 started distilling oils from a shale known as the "Bathgate mineral," in this way founding the Scotch oil industry. At first little attention was paid to the fitness of the oil for burning purposes, although in the early days at Alfreton Young attempted to burn some of the lighter distillates in an Argand lamp, and later in a lamp made many years before for the consumption of turpentine. About 1853, however, it was noticed that the lighter distillates were being shipped to Germany, where lamps fitted for the consumption of the grades of oil now known as lamp oil were being made by Stohwasser of Berlin; some of these lamps were imported, and similar lamps were afterwards manufactured by Laidlaw in Edinburgh.

In Pennsylvania in 1859 Colonel E. L. Drake's successful boring for petroleum resulted in the flooding of the market with oil at prices never before deemed possible, and led to the introduction of lamps from Germany for its consumption. Although the first American patent for a petroleum lamp is dated 1859, that year saw forty other applications, and for the next twenty years they averaged about eighty a year.

English lamp-makers were not behind in their attempts to improve on the methods in use for producing the highest results from the various grades of oil, and in 1865 Hinks introduced the duplex burner, while later improvements made in various directions, by Hinks, Silber, and Defries led to the high degree of perfection to be found in the lamps of to-day. Mineral oil for lamps as used in England at the present time may be defined as consisting of those portions of the distillate from shale oil or crude petroleum which have their flash-point above 73° F., and which are mobile enough to be fed by capillarity in sufficient quantity to the flame. The oil placed in the lamp reservoir is drawn up by the capillarity of the wick to the flame, and being there volatilized, is converted by the heat of the burning flame into a gaseous mixture of hydrogen and hydrocarbons, which is ultimately consumed by the oxygen of the air and converted into carbon dioxide and water vapour, the products of complete combustion.

To secure high illuminating power, together with a smokeless flame and only products of complete combustion, strict attention must be paid to several important factors. In the first place, the *wick* must be so arranged as to supply the right quantity of oil for gasification at the burner-head—the flame must be neither starved nor overfed: if the former is the case great loss of light is occasioned, while an excess of oil, by providing more hydrocarbons than the air-supply to the flame can completely burn, gives rise to smoke and products of incomplete combustion. The action of the wick depending on the capillary action of the microscopic tubes forming the cotton fibre, nothing but long-staple cotton of good quality should be employed; this should be spun into a coarse loose thread with as little twist in it as possible, and from this the wick is built up. Having obtained a wick of soft texture and loose plait, it should be well dried before the fire, and when put in position in the lamp must fill the wick-holder without being compressed. It should be of sufficient length to reach to the bottom of the oil reservoir and leave an inch or two on the bottom. Such a wick will suck up the oil in a regular and uniform way, provided that the level of the oil is not allowed to fall too low in the lamp, but it must be remembered that the wick acts as a filter for the oil, and that if any sediment be present it will be retained by and choke the capillaries upon which the action of the wick depends, so that a wick should not be used for too long a time. A good rule is that the wick should, when new, trail for 2 in. on the bottom of the oil vessel, and should be discarded when these 2 in. have been burnt off.

When the lamp is lighted the oil burns with a heavy, smoky flame, because it is not able to obtain sufficient oxygen to complete the combustion, and not only are soot flakes produced, but products of incomplete combustion, such as carbon monoxide and even petroleum vapour, escape—the first named highly injurious to health, and the second of an offensive odour. To supply the *necessary amount of air* to the flame, an artificial draught has to be created which shall impinge upon the bottom of the flame and sweep upwards over its surface, giving it rigidity, and by completing the combustion in a shorter period of time than could be done otherwise, increasing the calorific intensity and thus raising the carbon particles in the flame to a far higher incandescence so as to secure a greater illuminating power. This in practice has been done in two ways, first by drawing in the air by the up-suck of the heated and expanded products of combustion in a chimney fitted over the flame, and secondly by creating a draught from a small clockwork fan in the base of the lamp. It is necessary to break the initial rush of the draught: this is mostly effected by disks of perforated metal in the base of the burner, called *diffusers*, while the metal dome which surrounds and rises slightly above the wick-holder serves to deflect the air on to the flame, as in the Wanzer lamp. These arrangements also act to a certain extent as regenerators, the air passing over the heated metal surfaces being warmed before reaching the flame, whilst disks, cones, buttons, perforated tubes, inner air-tubes, &c., have been introduced to increase the illuminating power and complete the combustion.

According to Sir Boverton Redwood, duplex burners which give a flame of 28 candle-power have an average oil consumption of 50 grains per candle per hour, while Argand flames of 38 candle-power consume about 45 grains of oil per candle per hour. These figures were obtained from lamps of the best types, and to obtain information as to the efficiency of the lamps used in daily practice, a number of the most popular types were examined, using both American and Russian oil. The results obtained are embodied in Table I. The first noteworthy point in this table is the apparent superiority of the American over Russian oil in the majority of the lamps employed, and there is no doubt that the bulk of the lamps on the market are constructed to burn American or shale oil. A second interesting point is that with the flat-flame lamps the Russian oil is as good as the American. We have Redwood's authority, moreover, for the fact that after prolonged burning the Russian oil, even in lamps least suited to it, gives highly improved results. Although the average consumption with these lamps is close upon 60 grains per candle with American oil, yet some of the burners are so manifestly wasteful that 50 grains per candle-power per hour is the fairest basis to take for any calculation as to cost.

TABLE I.

Type.	Name.	Grains of Oil per candle-power per hour.		Total Candle-power.	
		American.	Russian.	American.	Russian.
Circular wick	Veritas, 60-line	64·5	112·5	122·5	78
	„ 30 „	42·5	50·	60	60
	„ 20 „	43·75	58·5	40	35
	Ariel, 12-line centre draught	52·8	70·9	18	18
	Reading, 14-line	97·9	85·4	12	12
	Kosmos, 10-line	63·9	97·2	9	9
	Wizard, 15-line	56·9	51·3	18	19
Flat wick, single	Wanzer, no glass	42·6	48·3	17	17
	Solid slip, gauze and cone	84·4	84·4	8	8
	Old slip, fixed gauze	60·9	89·3	7	7
„ duplex	Feeder wick	56·2	55·7	20	22
	Ordinary	51·2	46·6	20	22

American oil—Sp. gr. 0·7904; flash-point, 110° F. Russian oil—Sp. gr. 0·823; flash-point, 83° F.

The dangers of the mineral oil lamp, which were a grave drawback in the past, have been very much reduced by improvements in construction and quality, and if it were possible to abolish the cheap and dangerous rubbish sold in poor neighbourhoods, and to prevent the use of side-fillers and glass reservoirs in lamps of better quality, a still larger reduction in the number of accidents would take place. In the use of the lamp for domestic purposes only soft well-fitting wicks should be employed, and the lamp should be filled with oil each day so as never to allow it to burn too low and so leave a large space above the surface of the oil in the reservoir. The lamp should never be moved whilst alight, and it should only be put out by means of a proper extinguisher or by blowing across the top instead of down the chimney. By these means the risk of accident would be so reduced as to compare favourably with other illuminants.

Candles, oil and coal gas all emit the same products of complete combustion, viz. carbon dioxide and water vapour. The quantities of these compounds emitted from different illuminants for every candle of light per hour will be seen from the following table:

Illuminant.	Cubic Feet per Candle. Carbon Dioxide.	Cubic Feet per Candle. Water Vapour.
Sperm candle	0·41	0·41
Oil lamp	0·24	0·18
Gas—Flat flame	0·26	0·67
Argand	0·17	0·45
Regenerative	0·07	0·19
Incandescent	0·03	0·08

From these data it appears that if the sanitary condition of the air of a dwelling-room be measured by the amount of carbon dioxide present, as is usually done, candles are the most prejudicial to health and comfort, oil lamps less so, and gas least, an assumption which practical experience does not bear out. The explanation of this is to be found in these facts: First, where we illuminate a room with candles or oil we are contented with a less intense and more local light than when we are using gas, and in a room of ordinary size would be more likely to use a lamp or two candles than the far higher illumination we should demand if gas were employed. Secondly, the amount of water vapour given off during the combustion of gas is greater than in the case of the other illuminants, and water vapour absorbing radiant heat from the burning gas becomes heated, and, diffusing itself about the room, causes great oppression. Also the air, being highly charged with moisture, is unable to take up so rapidly the water vapour which is always evaporating from the surface of our skin, and in this way the functions of the body receive a slight check, resulting in a feeling of depression.

Oil-spray lamps.

A very successful type of oil lamp for use in engineering is represented by the Lucigen, Doty, and Wells lights, in which the oil is forced from a reservoir by air-pressure through a spiral heated by the flame of the lamp, and the heated oil, being then ejected partly as vapour and partly as spray, burns with a large and highly luminous flame. The great drawback to these devices is that a certain proportion of the oil spray escapes combustion and is deposited in the vicinity of the light. This form of lamp is often used for heating as well as lighting; the rivets needed for the Forth Bridge were heated in trays by lamps of this type at the spot where they were required. The great advantage of these lamps was that oils of little value could be employed, and the light obtained approximated to 750 candles per gallon of oil consumed. They may to a certain extent be looked upon as the forerunners of perhaps the most successful form of incandescent oil-burner.

Oil applied to incandescent lighting.

As early as 1885 Arthur Kitson attempted to make a burner for heating purposes on the foregoing principle, *i.e.* by injecting oil under pressure from a fine tube into a chamber where it would be heated by the waste heat escaping from the flame below, the vapour so produced being made to issue from a small jet under the pressure caused by the initial air-pressure and the expansion in the gasifying tube. This jet of gas was then led into what was practically an atmospheric burner, and drew in with it sufficient air to cause its combustion with a non-luminous blue flame of great heating power. At the time when this was first done the Welsbach mantle had not yet reached the period of commercial utility, and attempts were made to use this flame for the generation of light by consuming it in a mantle of fine platinum gauze, which, although giving a very fine illuminating effect during the first few hours, very soon shared the fate of all platinum mantles—that is, carbonization of the platinum surface took place, and destroyed its power of light emissivity. It was not until 1893 that the perfecting of the Welsbach mantle enabled this method of consuming the oil to be employed. The Kitson lamp, and also the Empire lamp on a similar principle, have given results which ought to ensure their future success, the only drawback being that they need a certain amount of intelligent care to keep them in good working order.

Incandescent table-lamps.

Oil gas and oil vapours differ from coal gas merely in the larger proportion and greater complexity of the hydrocarbon molecules present, and to render the oil flame available for incandescent lighting it is only necessary to cause the oil gas or vapour to become mixed with a sufficient proportion of air before it arrives at the point of combustion. But with gases so rich in hydrocarbons as those developed from oil it is excessively difficult to get the necessary air intimately and evenly mixed with the gas in sufficient proportion to bring about the desired result. If even coal gas be taken and mixed with 2·27 volumes of air, its luminosity is destroyed, but such a flame would be useless with the incandescent mantle, as if the non-luminous flame be superheated a certain proportion of its luminosity will reappear. When such a flame is used with a mantle the superheating effect of the mantle itself very quickly leads to the decomposition of the hydrocarbons and blackening of the mantle, which not only robs it of its light-giving powers, but also rapidly ends its life. If, however, the proportion of air be increased, the appearance of the flame becomes considerably altered, and the hydrocarbon molecules being burnt up before impact with the heated surface of the mantle, all chance of blackening is avoided.

On the first attempts to construct a satisfactory oil lamp which could be used with the incandescent mantle, this trouble showed itself to be a most serious one, as although it was comparatively easy so to regulate a circular-wicked flame fed by an excess of air as to make it non-luminous, the moment the mantle was put upon this, blackening quickly appeared, while when methods for obtaining a further air supply were devised, the difficulty of producing a flame which would burn for a considerable time without constant necessity for regulation proved a serious drawback. This trouble has militated against most of the incandescent oil lamps placed upon the market.

It soon became evident that if a wick were employed the difficulty of getting it perfectly symmetrical was a serious matter, and that it could only be utilized in drawing the oil up to a heating chamber where it could be volatilized to produce the oil gas, which on then being mixed with air would give the non-luminous flame. In the earlier forms of incandescent oil lamps the general idea was to suck the oil up by the capillarity of a circular wick to a point a short distance below the opening of the burner at which the flame was formed, and here the oil was vaporized or gasified by the heat of the head of the burner. An air supply was then drawn up through a tube passing through the centre of the wick-tube, while a second air current was so arranged as to discharge itself almost horizontally upon the burning gas below the cap, in this way giving a non-luminous and very hot flame, which if kept very carefully adjusted afforded excellent results with an incandescent mantle. It was an arrangement somewhat of this character that was introduced by the Welsbach Company. The lamps, however, required such careful attention, and were moreover so irregular in their performance, that they never proved very successful. Many other forms have reached a certain degree of perfection, but have not so far attained sufficient regularity of action to make them commercial successes. One of the most successful was devised by F. Altmann, in which an ingenious arrangement caused the vaporization of oil and water by the heat of a little oil lamp in a lower and separate chamber, and the mixture of oil gas and steam was then burnt in a burner-head with a special arrangement of air supply, heating a mantle suspended above the burner-head.

The perfect petroleum incandescent lamp has not yet been made, but the results thus obtained show that when the right system has been found a very great increase in the amount of light developed from the petroleum may be expected. In one lamp experimented with for some time it was easy to obtain 3500 candle hours per gallon of oil, or three times the amount of light obtainable from the oil when burnt under ordinary conditions.

Air-gas.

Before the manufacture of coal-gas had become so universal as it is at present, a favourite illuminant for country mansions and even villages where no coal-gas was available was a mixture of air with the vapour of very volatile hydrocarbons, which is generally known as "air-gas." This was produced by passing a current of dry air through or over petroleum spirit or the light hydrocarbons distilled from tar, when sufficient of the hydrocarbon was taken up to give a luminous flame in flat flame and Argand burners in the same way as coal-gas, the trouble being that it was difficult to regulate the amount of hydrocarbon held in suspension by the air, as this varied very widely with the temperature. As coal-gas spread to the smaller villages and electric lighting became utilized in large houses, the use of air-gas died out, but with the general introduction of the incandescent mantle it again came to the front. In the earlier days of this revival, air-gas rich in hydrocarbon vapour was made and was further aerated to give a non-luminous flame by burning it in an atmospheric burner.

One of the best illustrations of this system was the Aerogene gas introduced by A. I. van Vriesland, which was utilized for lighting a number of villages and railway stations on the continent of Europe. In this arrangement a revolving coil of pipes continually dips into petroleum spirit contained in a cylinder, and the air passed into the cylinder through the coil of pipes becomes highly carburetted by the time it reaches the outlet at the far end of the cylinder. The resulting gas when burnt in an ordinary burner gives a luminous flame; it can be used in atmospheric burners differing little from those of the ordinary type. With an ordinary Welsbach "C" burner it gives a duty of about 30 candles per foot of gas consumed, the high illuminating power being due to the fact that the gas is under a pressure of from 6 to 8 in. With such a gas, containing a considerable percentage of hydrocarbon vapour, any leakage into the air of a room would give rise to an explosive mixture, in the same way that coal-gas would do, but inasmuch as mixtures of the vapour of petroleum spirit and air are only explosive for a very short range, that is, from 1·25 to 5·3%, some systems have been introduced in which by keeping the amount of petroleum vapour at 2% and burning the gas under pressure in a specially constructed non-aerating mantle burner, not only has it been found possible to produce a very large volume of gas per gallon of spirit employed, but the gas is itself non-explosive, increase in the amount of air taking it farther away from the explosive limit. The Hooker, De Laitte and several other systems have been based upon this principle.

2. GAS LIGHTING

In all measurements of illuminating value the standard of comparison used in England is the light yielded by a sperm candle of the size known as "sixes," *i.e.* six to the pound, consuming 120 grains of sperm per hour, and although in photometric work slight inequalities in burning have led to the candle being discarded in practice, the standard lamps burning pentane vapour which have replaced them are arranged to yield a light of ten candles, and the photometric results are expressed as before in terms of candles.

When William Murdoch first used coal-gas at his Redruth home in 1779, he burnt the gas as it escaped from the open end of a small iron tube, but soon realizing that this plan entailed very large consumption of gas and gave a very small amount of light, he welded up the end of his tube and bored three small holes in it, so arranged that they formed three divergent jets of flame. From the shape of the flame so produced this burner received the name of the "cockspur" burner, and it was the one used by Murdoch when in 1807 he fitted up an installation of gas lighting at Phillips & Lee's works in Manchester. This—the earliest form of gas burner—gave an illuminating value of a little under one candle per cubic foot of gas consumed, and this duty was slightly increased when the burner was improved by flattening up the welded end of the tube and making a series of small holes in line and close together, the jets of flame from which gave the burner the name of the "cockscomb." It did not need much inventive faculty to replace the line of holes by a saw-cut, the gas issuing from which burnt in a sheet, the shape of which led to the burner being called the "batswing." This was followed in 1820 by the discovery of J. B. Neilson, of Glasgow, whose name is remembered in connexion with the use of the hot-air blast in iron-smelting, that, by allowing two flames to impinge upon one another so as to form a flat flame, a slight increase in luminosity was obtained, and after several preliminary stages the union jet or "fishtail" burner was produced. In this form of burner two holes, bored at the necessary angle in the same nipple, caused two streams of gas to impinge upon each other so that they flattened themselves out into a sheet of flame. The flames given by the batswing and fishtail burners differed in shape, the former being wide and of but little height, whilst the latter was much higher and more narrow. This factor ensured for the fishtail a greater amount of popularity than the batswing burner had obtained, as the flame was less affected by draughts and could be used with a globe, although the illuminating efficiency of the two burners differed little.

Regenerative burner.

In a lecture at the Royal Institution on the 20th of May 1853, Sir Edward Frankland showed a burner he had devised for utilizing the heat of the flame to raise the temperature of the air supply necessary for the combustion of the gas. The burner was an Argand of the type then in use, consisting of a metal ring pierced with holes so as to give a circle of small jets, the ring of flame being surrounded by a chimney. But in addition to this chimney, Frankland added a second external one, extending some distance below the first and closed at the bottom by a glass plate fitted air-tight to the pillar carrying the burner. In this way the air needed for the combustion of the gas had to pass down the space between the two chimneys, and in so doing became highly heated, partly by contact with the hot glass, and partly by radiation. Sir Edward Frankland estimated that the temperature of the air reaching the flame was about 500° F. In 1854 a very similar arrangement was brought forward by the Rev. W. R. Bowditch, and, as a large amount of publicity was given to it, the inception of the regenerative burner was generally ascribed to Bowditch, although undoubtedly due to Frankland.

The principle of regeneration was adopted in a number of lamps, the best of which was brought out by Friedrich Siemens in 1879. Although originally made for heating purposes, the light given by the burner was so effective and superior to anything obtained up to that time that it was with some slight alterations adapted for illuminating purposes.

Improvements followed in the construction and design of the regenerative lamp, and when used as an overhead burner it was found that not only was an excellent duty obtained per cubic foot of gas consumed, but that the lamp could be made a most efficient engine of ventilation, as an enormous amount of vitiated air could be withdrawn from the upper part of a room through a flue in the ceiling space. So marked was the increase in light due to the regeneration that a considerable number of burners working on this principle were introduced, some of them like the Wenham and Cromartie coming into extensive use. They were, however, costly to instal, so that the flat flame burner retained its popularity in spite of the fact that its duty was comparatively low, owing to the flame being drawn out into a thin sheet and so exposed to the cooling influence of the atmosphere. Almost at the same time that Murdoch was introducing the cockscomb and cockspur burners, he also made rough forms of Argand burner, consisting of two concentric pipes between which the gas was led and burnt with a circular flame. This form was soon improved by filling in the space between the tubes with a ring of metal, bored with fine holes so close together that the jets coalesced in burning and gave a more satisfactory flame, the air necessary to keep the flame steady and ensure complete combustion being obtained by the draught created by a chimney placed around it. When it began to be recognized that the temperature of the flame had a great effect upon the amount of light emitted, the iron tips, which had been universally employed, both in flat flame and Argand burners, were replaced by steatite or other non-conducting material of similar character, to prevent as far as possible heat from being withdrawn from the flame by conduction.

In 1880 the burners in use for coal-gas therefore consisted of flat flame, Argand, and regenerative burners, and the duty given by them with a 16-candle gas was as follows:—

Burner.	Candle units per cub. ft. of gas.
Union jet flat flame, No. 0	0·59
,, ,, 1	0·85
,, ,, 2	1·22
,, ,, 3	1·63
,, ,, 4	1·74
,, ,, 5	1·87
,, ,, 6	2·15
,, ,, 7	2·44
Ordinary Argand	2·90
Standard Argand	3·20
Regenerative	7 to 10

The luminosity of a coal-gas flame depends upon the number of carbon particles liberated within it, and the temperature to which they can be heated. Hence the light given by a flame of coal-gas can be augmented by (1) increasing the number of the carbon particles, and (2) raising the temperature to which they are exposed. The first process is carried out by enrichment (see GAS: *Manufacture*), the second is best obtained by regeneration, the action of which is limited by the power possessed by the material of which burners are composed to withstand the superheating. Although with a perfectly made regenerative burner it might be possible for a short time to get a duty as high as 16 candles per cubic foot from ordinary coal-gas, such a burner constructed of the ordinary materials would last only a few hours, so that for practical use and a reasonable life for the burner 10 candles per cubic foot was about the highest commercial duty that could be reckoned on. This limitation naturally caused inventors to search for methods by which the emission of light could be obtained from coal-gas otherwise than by the incandescence of the carbon particles contained within the flame itself. A coal-gas flame consumed in an atmospheric burner under the conditions necessary to develop its maximum heating power could be utilized to raise to incandescence particles having a higher emissivity for light than carbon. This led to the gradual evolution of incandescent gas lighting.

Incandescent gas light.

Long before the birth of the Welsbach mantle it had been known that when certain unburnable refractory substances were heated to a high temperature they emitted light, and Goldsworthy Gurney in 1826 showed that a cylinder of lime could be brought to a state of dazzling brilliancy by the flame of the oxy-hydrogen blowpipe, a fact which was utilized by Thomas Drummond shortly afterwards in connexion with the Ordnance Survey of Ireland. The mass of a lime cylinder is, however, relatively very considerable, and consequently an excessive amount of heat has to be brought to bear upon it, owing to radiation and conduction tending to dissipate the heat. This is seen by holding in the flame of an atmospheric burner a coil of thick platinum wire, the result being that the wire is heated to a dull red only. With wire of medium thickness a bright red heat is soon attained, and a thin wire glows with a vivid incandescence, and will even melt in certain parts of the flame. Attempts were accordingly made to reduce the mass of the material heated, and this form of lighting was tried in the streets of Paris, buttons of zirconia and magnesia being heated by an oxy-coal-gas flame, but the attempt was soon abandoned owing to the high cost and constant renewals needed. In 1835 W. H. Fox Talbot discovered that even the feeble flame of a spirit lamp is sufficient to heat lime to incandescence, provided the lime be in a sufficiently fine state of division. This condition he fulfilled by soaking blotting-paper in a solution of a calcium salt and then incinerating it. Up to 1848, when J. P. Gillard introduced the intermittent process of making water-gas, the spirit flame and oxy-hydrogen flame were alone free from carbon particles. Desiring to use the water-gas for lighting as well as heating purposes Gillard made a mantle of fine platinum gauze to fit over the flame, and for a time obtained excellent results, but after a few days the lighting value of the mantle fell away gradually until it became useless, owing to the wire becoming eroded on the surface by the flame gases. This idea has been revived at intervals, but the trouble of erosion has always led to failure.

The next important stage in the history of gas lighting was the discovery by R. W. von Bunsen about 1855 of the atmospheric burner, in which a non-luminous coal-gas flame is obtained by causing the coal-gas before its combustion to mix with a certain amount of air. This simple appliance has opened up for coal-gas a sphere of usefulness for heating purposes as important as its use for lighting. After the introduction of the atmospheric burner the idea of the incandescent mantle was revived early in the eighties by the Clamond basket and a resuscitation of the platinum mantle. The Clamond basket or mantle, as shown at the Crystal Palace exhibition of 1882–1883, consisted of a cone of threads of calcined magnesia. A mixture of magnesium hydrate and acetate, converted into a paste or cream by means of water, was pressed through holes in a plate so as to form threads, and these, after being moulded to the required shape, were ignited. The heat decomposed the acetate to form a luting material which glued the particles of magnesium oxide produced into a solid mass, whilst the hydrate gave off water and became oxide. The basket was supported with its apex downwards in a little platinum wire cage, and a mixture of coal-gas and air was driven into it under pressure from an inverted blowpipe burner above it.

The Welsbach mantle was suggested by the fact that Auer von Welsbach had been carrying out researches on the rare earths, with constant use of the spectroscope. Desiring to obtain a better effect than that produced by heating his material on a platinum wire, he immersed cotton in a solution of the metallic salt, and after burning off the organic matter found that a replica of the original thread, composed of the oxide of the metal, was left, and that it glowed brightly in the flame. From this he evolved the idea of utilizing a fabric of cotton soaked in a solution of a metallic salt for lighting purposes, and in 1885 he patented his first commercial mantle. The oxides used in these mantles were zirconia, lanthania, and yttria, but these were so fragile as to be practically useless, whilst the light they emitted was very poor. Later he found that the oxide of thorium—thoria—in conjunction with other rare earth oxides, not only increased the light-giving powers of the mantle, but added considerably to its strength, and the use of this oxide was protected by his 1886 patent. Even these mantles were very unsatisfactory until it was found that the purity of the oxides had a wonderful effect upon the amount of light, and finally came the great discovery that it was a trace of ceria in admixture with the thoria that gave the mantle the marvellous power of emitting light.

Certain factors limit the number of oxides that can be used in the manufacture of an incandescent mantle. Atmospheric influences must not have any action upon them, and they must be sufficiently refractory not to melt or even soften to any extent at the temperature of the flame; they must also be non-volatile, whilst the shrinkage during the process of "burning off" must not be excessive. The following table gives the light-emissivity from pure and commercial samples of the oxides which most nearly conform to the above requirements; the effect of impurity upon the lighting power will be seen to be most marked.

	Pure.	Commercial.
Metals—		
Zirconia	1·5	3·1
Thoria	0·5	6·0
Earth metals—		
Cerite earths—Ceria	0·4	0·9
Lanthania		6·0
Yttrite earths—Yttria		3·2
Erbia	0·6	1·7
Common earths—Chromium oxide	0·4	0·4
Alumina	0·6	0·6
Alkaline earth metals—		
Baryta	3·3	3·3
Strontia	5·2	5·5
Magnesia	5·0	5·0

Of these oxides thoria, when tested for shrinkage, duration and strength, stands pre-eminent. It is also possible to employ zirconia and alumina. Zirconia has the drawback that in the hottest part of the flame it is liable not only to shrinkage and semi-fusion, but also to slow volatilization, and the same objections hold good with respect to alumina. With thoria the shrinkage is smaller than with any other known substance, and it possesses very high refractory powers.

The factor which gives thoria its pre-eminence as the basis of the mantle is that in the conversion of thorium nitrate into thorium oxide by heat, an enormous expansion takes place, the oxide occupying more than ten times the volume of the nitrate. This means that the mass is highly spongy, and contains an enormous number of little air-cells which must render it an excellent non-conductor. A mantle made with thoria alone gives practically no light. But the power of light-emissivity is awakened by the addition of a small trace of ceria; and careful experiment shows that as ceria is added to it little by little, the light which the mantle emits grows greater and greater, until the ratio of 99 % of thoria and 1 % of ceria is reached, when the maximum illuminating effect is obtained. The further addition of ceria causes gradual diminution of light, until, when with some 10 % of ceria has been added, the light given by the mantle is again almost inappreciable. When cerium nitrate is converted by heat into cerium oxide, the expansion which takes place is practically nil, the ceria obtained from a gramme of the nitrate occupying about the same space as the original nitrate. Thus, although by weight the ratio of ceria to thoria is as 1 : 99, by volume it is only as 1 : 999.

Manufacture of mantles.

The most successful form of mantle is made by taking a cylinder of cotton net about 8 in. long, and soaking it in a solution of nitrates of the requisite metals until the microscopic fibres of the cotton are entirely filled with liquid. A longer soaking is not advantageous, as the acid nature of the liquid employed tends to weaken the fabric and render it more delicate to handle. The cotton is then wrung out to free it from the excess of liquid, and one end is sewn together with an asbestos thread, a loop of the same material or of thin platinum wire being fixed across the constricted portion to provide a support by which the mantle may be held by the carrying rod, which is either external to the mantle, or (as is most often the case) fixed centrally in the burner head. It is then ready for "burning off," a process in which the organic matter is removed and the nitrates are converted into oxides. The flame of an atmospheric burner is first applied to the constricted portion at the top of the mantle, whereupon the cotton gradually burns downwards, the shape of the mantle to a great extent depending on the regularity with which the combustion takes place. A certain amount of carbon is left behind after the flame has died out, and this is burnt off by the judicious application of a flame from an atmospheric blast burner to the interior. The action which takes place during the burning off is as follows: The cellulose tubes of the fibre are filled with the crystallized nitrates of the metals used, and as the cellulose burns the nitrates decompose, giving up oxygen and forming fusible nitrites, which in their semi-liquid condition are rendered coherent by the rapid expansion as the oxide forms. As the action continues the nitrites become oxides, losing their fusibility, so that by the time the organic matter has disappeared a coherent thread of oxide is left in place of the nitrate-laden thread of cotton. In the early days of incandescent lighting the mantles had to be sent out unburnt, as no process was known by which the burnt mantle could be rendered sufficiently strong to bear carriage. As the success of a mantle depends upon its fitting the flame, and as the burning off requires considerable skill, this was a great difficulty. Moreover the acid nature of the nitrates in the fibres rapidly rotted them, unless they had been subjected to the action of ammonia gas, which neutralized any excess of acid. It was discovered, however, that the burnt-off mantle could be temporarily strengthened by dipping it in collodion, a solution of soluble guncotton in ether and alcohol together with a little castor-oil or similar material to prevent excessive shrinkage when drying. When the mantle was removed from the solution a thin film of solid collodion was left on it, and this could be burned away when required.

After the Welsbach mantle had proved itself a commercial success many attempts were made to evade the monopoly created under the patents, and, although it was found impossible to get the same illuminating power with anything but the mixture of 99% thoria and 1% ceria, many ingenious processes were devised which resulted in at least one improvement in mantle manufacture. One of the earliest attempts in this direction was the "Sunlight" mantle, in which cotton was saturated with the oxides of aluminium, chromium and zirconium, the composition of the burnt-off mantle being:—

Alumina	86·88
Chromium oxide	8·68
Zirconia	4·44
	100·00

The light given by these mantles was entirely dependent upon the proportion of chromium oxides present, the alumina playing the part of base in the same way that the thoria does in the Welsbach mantle, the zirconia being added merely to strengthen the structure. These mantles enjoyed considerable popularity owing to the yellowish pink light they emitted, but, although they could give an initial illumination of 12 to 15 candles per foot of gas consumed, they rapidly lost their light-giving power owing to the slow volatilization of the oxides of chromium and aluminium.

Another method of making the mantle was first to produce a basis of thoria, and, having got the fabric in thorium oxide, to coat it with a mixture of 99% thoria and 1% ceria. This modification seems to give an improvement in the initial amount of light given by the mantle. In the Voelker mantle a basis of thoria was produced, and was then coated by dipping in a substance termed by the patentee "Voelkerite," a body made by fusing together a number of oxides in the electric furnace. The fused mass was then dissolved in the strongest nitric acid, and diluted with absolute alcohol to the necessary degree. A very good mantle having great lasting power was thus produced. It was claimed that the process of fusing the materials together in the electric furnace altered the composition in some unexplained way, but the true explanation is probably that all water of hydration was eliminated.

The "Daylight" mantle consisted of a basis of thoria or thoria mixed with zirconia, dipped in collodion containing a salt of cerium in solution; on burning off the collodion the ceria was left in a finely divided condition on the surface of the thoria. In this way a very high initial illuminating power was obtained, which, however, rapidly fell as the ceria slowly volatilized.

Perhaps the most interesting development of the Welsbach process was dependent upon the manufacture of filaments of soluble guncotton or collodion as in the production of artificial silk. In general the process consisted in forcing a thick solution of the nitrated cellulose through capillary glass tubes, the bore of which was less than the one-hundredth of a millimetre. Ten or twelve of the expressed fibres were then twisted together and wound on a bobbin, the air of the room being kept sufficiently heated to cause the drying of the filaments a few inches from the orifice of the tube. The compound thread was next denitrated to remove its extreme inflammability, and for this purpose the skeins were dipped in a solution of (for instance) ammonium sulphide, which converted them into ordinary cellulose. After washing and drying the skeins were ready for the weaving machines. In 1894 F. de Mare utilized collodion for the manufacture of a mantle, adding the necessary salts to the collodion before squeezing it into threads. O. Knöfler in 1895, and later on A. Plaissetty, took out patents for the manufacture of mantles by a similar process to De Mare's, the difference between the two being that Knöfler used ammonium sulphide for the denitration of his fabric, whilst Plaissetty employed calcium sulphide, the objection to which is the trace of lime left in the material. Another method for making artificial silk which has a considerable reputation is that known as the Lehner process, which in its broad outlines somewhat resembles the Chardonnet, but differs from it in that the excessively high pressures used in the earlier method are done away with by using a solution of a more liquid character, the thread being hardened by passing through certain organic solutions. This form of silk lends itself perhaps better to the carrying of the salts forming the incandescent oxides than the previous solutions, and mantles made by this process, known as Lehner mantles, showed promise of being a most important development of De Mare's original idea. Mantles made by these processes show that it is possible to obtain a very considerable increase in life and light-emissivity, but mantles made on this principle could not now be sold at a price which would enable them to compete with mantles of the Welsbach type.

The cause of the superiority of these mantles having been realized, developments in the required direction were made. The structure of the cotton mantle differed widely from that obtained by the various collodion processes, and this alteration in structure was mainly responsible for the increase in life. Whereas the average of a large number of Welsbach mantles tested only showed a useful life of 700 to 1000 hours, the collodion type would average about 1500 hours, some mantles being burnt for an even longer period and still giving an effective illumination. This being so, it was clear that one line of advance would be found in obtaining some material which, whilst giving a structure more nearly approaching that of the collodion mantle, would be sufficiently cheap to compete with the Welsbach mantle, and this was successfully done.

By the aid of the microscope the structure of the mantle can be clearly defined, and in examining the Welsbach mantle before and after burning, it will be noticed that the cotton thread is a closely twisted and plaited rope of myriads of minute fibres, whilst the collodion mantle is a bundle of separate filaments without plait or heavy twisting, the number of such filaments varying with the process by which it was made. This latter factor experiment showed to have a certain influence on the useful light-giving life of the mantle, as whereas the Knöfler and Plaissetty mantles had an average life of about 1500 hours, the Lehner fabric, which contained a larger number of finer threads, could often be burnt continuously for over 3000 hours, and at the end of that period gave a better light than most of the Welsbach after as many hundred.

It is well known that plaiting gave the cotton candle-wick that power of bending over, when freed from the binding effect of the candle material and influenced by heat, which brought the tip out from the side of the flame. This, by enabling the air to get at it and burn it away, removed the nuisance of having to snuff the candle, which for many centuries has rendered it a tiresome method of lighting. In the cotton mantle, the tight twisting of the fibre brings this torsion into play. When the cotton fibres saturated with the nitrates of the rare metals are burnt off, and the conversion into oxides takes place, as the cotton begins to burn, not only does the shrinkage of the mass throw a strain on the oxide skeleton, but the last struggle of torsion in the burning of the fibre tends towards disintegration of the fragile mass, and this all plays a part in making the cotton mantle inferior to the collodion type.

If ramie fibre be prepared in such a way as to remove from it all traces of the glutinous coating, a silk-like fabric can be obtained from it, and if still further prepared so as to improve its absorbent powers, it can be formed into mantles having a life considerably greater than is possessed by those of the cotton fabric. Ramie thus seemed likely to yield a cheap competitor in length of endurance to the collodion mantle, and results have justified this expectation. By treating the fibre so as to remove the objections against its use for mantle-making, and then making it into threads with the least possible amount of twist, a mantle fabric can be made in every way superior to that given by cotton.

The Plaissetty mantles, which as now manufactured also show a considerable advance in life and light over the original Welsbach mantles, are made by impregnating stockings of either cotton or ramie with the nitrates of thorium and cerium in the usual way, and, before burning off, mercerizing the mantle by steeping in ammonia solution, which converts the nitrates into hydrates, and gives greater density and strength to the finished mantle. The manufacturers of the Plaissetty mantle have also made a modification in the process by which the saturated fabric can be so prepared as to be easily burnt off by the consumer on the burner on which it is to be used, in this way doing away with the initial cost of burning off, shaping, hardening and collodionizing.

Intensifying systems.

Since 1897 inventions have been patented for methods of intensifying the light produced by burning gas under a mantle and increasing the light generated per unit volume of gas. The systems have either been self-intensifying or have depended on supplying the gas (or gas and air) under an increased pressure. Of the self-intensifying systems those of Lucas and Scott-Snell have been the most successful. A careful study has been made by the inventor of the Lucas light of the influence of various sizes and shapes of chimneys in the production of draught. The specially formed chimney used exerts a suction on the gas flame and air, and the burner and mantle are so constructed as to take full advantage of the increased air supply, with the result that the candle power given by the mantle is considerably augmented. With the Scott-Snell system the results obtained are about the same as those given by the Lucas light, but in this case the waste heat from the burner is caused to operate a plunger working in the crown of the lamp which sucks and delivers gas to the burner. Both these systems are widely used for public lighting in many large towns of the United Kingdom and the continent of Europe.

The other method of obtaining high light-power from incandescent gas burners necessitates the use of some form of motive power in order to place the gas, or both gas and air, under an increased pressure. The gas compressor is worked by a water motor, hot air or gas engine; a low pressure water motor may be efficiently driven by water from the main, but with large installations it is more economical to drive the compressor by a gas engine. To overcome the intermittent flow of gas caused by the stroke of the engine, a regulator on the floating bell principle is placed after the compressor; the pressure of gas in the apparatus governs automatically the flow of gas to the engine. With the Sugg apparatus for high power lighting the gas is brought from the district pressure, which is equal to about $2\frac{1}{2}$ in. of water, to an average of 12 in. water pressure. The light obtained by this system when the gas pressure is $9\frac{1}{2}$ in. is 300 candle power with an hourly consumption of 10 cub. ft. of gas, equivalent to 30 candles per cubic foot, and with a gas pressure equal to 14 in. of water 400 candles are obtained with an hourly consumption of $12\frac{1}{2}$ cub. ft., which represents a duty of 32 candles per cubic foot of gas consumed. High pressure incandescent lighting makes it possible to burn a far larger volume of gas in a given time under a mantle than is the case with low pressure lighting, so as to create centres of high total illuminating value to compete with arc lighting in the illumination of large spaces, and the Lucas, Keith, Scott-Snell, Millennium, Selas, and many other pressure systems answer most admirably for this purpose.

Inverted burners.

The light given by the ordinary incandescent mantle burning in an upright position tends rather to the upward direction, because owing to the slightly conical shape of the mantle the maximum light is emitted at an angle a little above the horizontal. Inasmuch as for working purposes the surface that a mantle illuminates is at angles below 45° from the horizontal, it is evident that a considerable loss of efficient lighting is brought about, whilst directly under the light the burner and fittings throw a strong shadow. To avoid this trouble attempts have from time to time been made to produce inverted burners which should heat a mantle suspended below the mouth of the burner. As early as 1882 Clamond made what was practically an inverted gas and air blowpipe to use with his incandescent basket, but it was not until 1900–1901 that the inverted mantle became a possibility. Although there was a strong prejudice against it at first, as soon as a really satisfactory burner was introduced, its success was quickly placed beyond doubt. The inverted mantle has now proved itself one of the chief factors in the enormous success achieved by incandescent mantle lighting, as the illumination given by it is far more efficient than with the upright mantle, and it also lends itself well to ornamental treatment.

Burners.

When the incandescent mantle was first introduced in 1886 an ordinary laboratory Bunsen burner was experimentally employed, but unless a very narrow mantle just fitting the top of the tube was used the flame could not be got to fit the mantle, and it was only the extreme outer edge of the flame which endowed the mantle fabric with the high incandescent. A wide burner top was then placed on the Bunsen tube so as to spread the flame, and a larger mantle became possible, but it was then found that the slowing down of the rate of flow at the mouth of the burner owing to its enlargement caused flashing or firing back, and to prevent this a wire gauze covering was fitted to the burner head; and in this way the 1886–1887 commercial Welsbach burner was produced. The length of the Bunsen tube, however, made an unsightly fitting, so it was shortened, and the burner head made to slip over it, whilst an external lighting back plate was added. The form of the "C" burner thus arrived at has undergone no important further change. When later on it was desired to make incandescent mantle burners that should not need the aid of a chimney to increase the air supply, the long Bunsen tube was reverted to, and the Kern, Bandsept, and other burners of this class all have a greater total length than the ordinary burners. To secure proper mixing of the air and gas, and to prevent flashing back, they all have heads fitted with baffles, perforations, gauze, and other devices which oppose considerable resistance to the flow of the stream of air and gas.

In 1900, therefore, two classes of burner were in commercial existence for incandescent lighting—(1) the short burner with chimney, and (2) the long burner without chimney. Both classes had the burner mouth closed with gauze or similar device, and both needed as an essential that the mantle should fit closely to the burner head.

Prior to 1900 attempts had been made to construct a burner in which an incandescent mantle should be suspended head downwards. Inventors all turned to the overhead regenerative gas lamps of the Wenham type, or the inverted blowpipe used by Clamond, and in attempting to make an inverted Bunsen employed either artificial pressure to the gas or the air, or to both, or else enclosed the burner and mantle in a globe, and by means of a long chimney created a strong draught. These burners also were all regenerative and aimed at heating the air or gas or mixture of the two, and they had the further drawback of being complicated and costly. Regeneration is a valuable adjunct in ordinary gas lighting as it increases the actions that liberate the carbon particles upon which the luminosity of a flame is dependent, and also increases the temperature; but with the mixture of air and gas in a Bunsen regeneration is not a great gain when low and is a drawback when intense, because incipient combination is induced between the oxygen of the air and the coal-gas before the burner head is reached, the proportions of air and gas are disturbed, and the flame instead of being non-luminous shows slight luminosity and tends to blacken the mantle. The only early attempt to burn a mantle in an inverted position without regeneration or artificial pressure or draught was made by H. A. Kent in 1897, and he used, not an inverted Bunsen, but one with the top elongated and turned over to form a siphon, so that the point of admixture of air and gas was below the level of the burner head, and was therefore kept cool and away from the products of combustion.

In 1900 J. Bernt and E. Cérvenka set themselves to solve the problem of making a Bunsen burner which should consume gas under ordinary gas pressure in an inverted mantle. They took the short Bunsen burner, as found in the most commonly used upright incandescent burners, and fitted to it a long tube, preferably of non-conducting material, which they called an isolator, and which is designed to keep the flame at a distance from the Bunsen. They found that it burnt fairly well, and that the tendency of the flame to burn or lap back was lessened, but that the hot up-current of heated air and products of combustion streamed up to the air holes of the Bunsen, and by contaminating the air supply caused the flame to pulsate. They then fixed an inverted cone on the isolator to throw the products of combustion outwards and away from the air holes, and found that the addition of this "deflecting cone" steadied the flame. Having obtained a satisfactory flame, they attacked the problem of the burner head. Experiments showed that the burner head must be not only open but also of the same size or smaller than the burner tube, and that by projecting it downwards into the mantle and leaving a space between the mantle and the burner head the maximum mantle surface heated to incandescence was obtained. It was also found that the distance which the burner head projects into the mantle is equivalent to the same amount of extra water pressure on the gas, and with a long mantle it was found useful under certain conditions to add a cylinder or sleeve with perforated sides to carry the gas still lower into the mantle. The principles thus set forth by Kent, Bernt and Cérvenka form the basis of construction of all the types of inverted mantle burners which so greatly increased the popularity of incandescent gas lighting at the beginning of the 20th century, whilst improvements in the shape of the mantle for inverted lighting and the methods of attachment to the burner have added to the success achieved.

The wonderful increase in the amount of light that can be obtained from gas by the aid of the incandescent gas mantle is realized when one compares the 1 to 3·2 candles per cubic foot given by the burners used in the middle of the 19th century with the duty of incandescent burners, as shown in the following table:—

Light yielded per cubic foot of Gas.

Burner.	Candle power.
Low pressure upright incandescent burners	15 to 20 candles
Inverted burners	14 to 21 ,,
Kern burners	20 to 24 ,,
High pressure burners	22 to 36 ,,

(V. B. L.)

3. ELECTRIC LIGHTING.

Electric lamps are of two varieties: (1) *Arc Lamps* and (2) *Incandescent* or *Glow Lamps.* Under these headings we may briefly consider the history, physical principles, and present practice of the art of electric lighting.

1. *Arc Lamps.*—If a voltaic battery of a large number of cells has its terminal wires provided with rods of electrically-conducting carbon, and these are brought in contact and then slightly separated, a form of electric discharge takes place between them called the *electric arc.* It is not quite certain who first observed this effect of the electric current. The statement that Sir Humphry Davy, in 1801, first produced and studied the phenomenon is probably correct. In 1808 Davy had provided for him at the Royal Institution a battery of 2000 cells, with which he exhibited the electric arc on a large scale.

The electric arc may be produced between any conducting materials maintained at different potentials, provided that the source of electric supply is able to furnish a sufficiently large current; but for illuminating purposes pieces of hard graphitic carbon are most convenient. If some source of continuous electric current is connected to rods of such carbon, first brought into contact and then slightly separated, the following facts may be noticed: With a low electromotive force of about 50 or 60 volts no discharge takes place until the carbons are in actual contact, unless the insulation of the air is broken down by the passage of a small electric spark. When this occurs, the space between the carbons is filled at once with a flame or luminous vapour, and the carbons themselves become highly incandescent at their extremities. If they are horizontal the flame takes the form of an arch springing between their tips; hence the name *arc.* This varies somewhat in appearance according to the nature of the current, whether continuous or alternating, and according as it is formed in the open air or in an enclosed space to which free access of oxygen is prevented. Electric arcs between metal surfaces differ greatly in colour according to the nature of the metal. When formed by an alternating current of high electromotive force they resemble a lambent flame, flickering and producing a somewhat shrill humming sound.

Electric arcs may be classified into continuous or alternating current arcs, and open or enclosed arcs, carbon arcs with pure or chemically impregnated carbons, or so-called flame arcs, and arcs formed with metallic or oxide electrodes, such as magnetite. A continuous current arc is formed with an electric current flowing always in the same direction; an alternating current arc is formed with a periodically reversed current. An open arc is one in which the carbons or other material forming the arc are freely exposed to the air; an enclosed arc is one in which they are included in a glass vessel. If carbons impregnated with various salts are used to colour or increase the light, the arc is called a chemical or flame arc. The carbons or electrodes may be arranged in line one above the other, or they may be inclined so as to project the light downwards or more in one direction. In a carbon arc if the current is continuous the positive carbon becomes much hotter at the end than the negative, and in the open air it is worn away, partly by combustion, becoming hollowed out at the extremity into a *crater.* At the same time the negative carbon gradually becomes pointed, and also wears away, though much less quickly than the positive. In the continuous-current open arc the greater part of the light proceeds from the highly incandescent positive crater. When the arc is examined through dark glasses, or by the optical projection of its image upon a screen, a violet band or stream of vapour is seen to extend between the two carbons, surrounded by a nebulous golden flame or aureole. If the carbons are maintained at the right distance apart the arc remains steady and silent, but if the carbons are impure, or the distance between them too great, the true electric arc rapidly changes its place, flickering about and frequently becoming extinguished; when this happens it can only be restored by bringing the carbons once more into contact. If the current is alternating, then the arc is symmetrical, and both carbons possess nearly the same appearance. If it is enclosed in a vessel nearly air-tight, the rate at which the carbons are burnt away is greatly reduced, and if the current is continuous the positive carbon is no longer cratered out and the negative no longer so much pointed as in the case of the open arc.

Carbons.

Davy used for his first experiments rods of wood charcoal which had been heated and plunged into mercury to make them better conductors. Not until 1843 was it proposed by J. B. L. Foucault to employ pencils cut from the hard graphitic carbon deposited in the interior of gas retorts. In 1846 W. Greener and W. E. Staite patented a process for manufacturing carbons for this purpose, but only after the invention of the Gramme dynamo in 1870 any great demand arose for them. F. P. É. Carré in France in 1876 began to manufacture arc lamp carbons of high quality from coke, lampblack and syrup. Now they are made by taking some specially refined form of finely divided carbon, such as the soot or lampblack formed by cooling the smoke of burning paraffin or tar, or by the carbonization of organic matter, and making it into a paste with gum or syrup. This carbon paste is forced through dies by means of a hydraulic press, the rods thus formed being subsequently baked with such precautions as to preserve them perfectly straight. In some cases they are *cored*, that is to say, have a longitudinal hole down them, filled in with a softer carbon. Sometimes they are covered with a thin layer of copper by electro-deposition. They are supplied for the market in sizes varying from 4 or 5 to 30 or 40 millimetres in diameter, and from 8 to 16 in. in length. The value of carbons for arc lighting greatly depends on their purity and freedom from ash in burning, and on perfect uniformity of structure. For ordinary purposes they are generally round in section, but for certain special uses, such as lighthouse work, they are made fluted or with a star-shaped section. The positive carbon is usually of larger section than the negative. For continuous-current arcs a cored carbon is generally used as a positive, and a smaller solid carbon as a negative. For flame arc lamps the carbons are specially prepared by impregnating them with salts of calcium, magnesium and sodium. The calcium gives the best results. The rod is usually of a composite type. The outer zone is pure carbon to give strength, the next zone contains carbon mixed with the metallic salts, and the inner core is the same but less compressed. In addition to the metallic salts a flux has to be introduced to prevent the formation of a non-conducting ash, and this renders it desirable to place the carbons in a downward pointing direction to get rid of the slag so formed. Bremer first suggested in 1898 for this purpose the fluorides of calcium, strontium or barium. When such carbons are used to form an electric arc the metallic salts deflagrate and produce a flame round the arc which is strongly coloured, the object being to produce a warm yellow glow, instead of the somewhat violet and cold light of the pure carbon arc, as well as a greater emission of light. As noxious vapours are however given off, flame arcs can only be used out of doors. Countless researches have been made on the subject of carbon manufacture, and the art has been brought to great perfection.

Special manuals must be consulted for further information (see especially a treatise on *Carbon making for all electrical purposes*, by F. Jehl, London, 1906).

Physical phenomena.

The physical phenomena of the electric arc are best examined by forming a carbon arc between two carbon rods of the above description, held in line in a special apparatus, and arranged so as to be capable of being moved to or from each other with a slow and easily regulated motion. An arrangement of this kind is called *a hand-regulated arc lamp* (fig. 4). If such an arc lamp is connected to a source of electric supply having an electromotive force preferably of 100 volts, and if some resistance is included in the circuit, say about 5 ohms, a steady and continuous arc is formed when the carbons are brought together and then slightly separated. Its appearance may be most conveniently examined by projecting its image upon a screen of white paper by means of an achromatic lens. A very little examination of the distribution of light from the arc shows that the illuminating or candle-power is not the same in different directions. If the carbons are vertical and the positive carbon is the upper of the two, the illuminating power is greatest in a direction at an angle inclined about 40 or 50 degrees below the horizon, and at other directions has different values, which may be represented by the lengths of radial lines drawn from a centre, the extremities of which define a curve called the *illuminating curve* of the arc lamp (fig. 5). Considerable differences exist between the forms of the illuminating-power curves of the continuous and alternating current and the open or enclosed arcs. The chief portion of the emitted light proceeds from the incandescent crater; hence the form of the illuminating-power curve, as shown by A. P. Trotter in 1892, is due to the apparent area of the crater surface which is visible to an eye regarding the arc in that direction. The form of the illuminating-power curve varies with the length of the arc and relative size of the carbons. Leaving out of account for the moment the properties of the arc as an illuminating agent, the variable factors with which we are concerned are (i.) the current through the arc; (ii.) the potential difference of the carbons; (iii.) the length of the arc; and (iv.) the size of the carbons. Taking in the first place the typical direct-current arc between solid carbons, and forming arcs of different lengths and with carbons of different sizes, it will be found that, beginning at the lowest current capable of forming a true arc, the potential difference of the carbons (the arc P.D.) decreases as the current increases. Up to a certain current strength the arc is silent, but at a particular critical value P.D. suddenly drops about 10 volts, the current at the same time rising 2 or 3 amperes. At that moment the arc begins to *hiss*, and in this hissing condition, if the current is still further increased, P.D. remains constant over wide limits. This drop in voltage on hissing was first noticed by A. Niaudet (*La Lumière électrique*, 1881, 3, p. 287). It has been shown by Mrs Ayrton (*Journ. Inst. Elec. Eng.* 28, 1899, p. 400) that the hissing is mainly due to the oxygen which gains access from the air to the crater, when the latter becomes so large by reason of the increase of the current as to overspread the end of the positive carbon. According to A. E. Blondel and Hans Luggin, hissing takes place whenever the current density becomes greater than about 0·3 or 0·5 ampere per square millimetre of crater area.

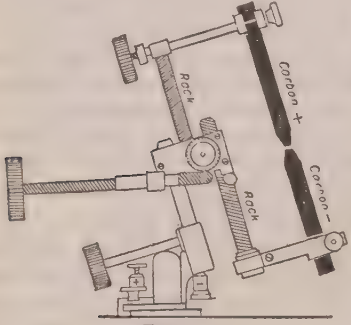


FIG. 4.

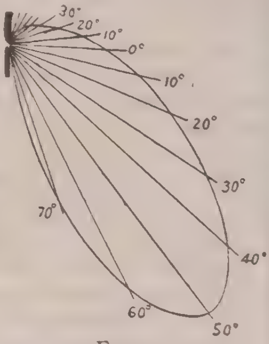


FIG. 5.

The relation between the current, the carbon P.D., and the length of arc in the case of the direct-current arc has been investigated by many observers with the object of giving it mathematical expression.

Let V stand for the potential difference of the carbons in volts, A for the current through the arc in amperes, L for the length of the arc in millimetres, R for the resistance of the arc; and let *a*, *b*, *c*, *d*, &c., be constants. Erik Edlund in 1867, and other workers after him, considered that their experiments showed that the relation between V and L could be expressed by a simple linear equation,

$$V=a+bL.$$

Later researches by Mrs Ayrton (*Electrician*, 1898, 41, p. 720), however, showed that for a direct-current arc of given size with solid carbons, the observed values of V can be better represented as a function both of A and of L of the form

$$V=a+bL+\frac{c+dL}{A}.$$

In the case of direct-current arcs formed with solid carbons, Edlund and other observers agree that the arc resistance R may be expressed by a simple straight line law, $R=e+fL$. If the arc is formed with cored carbons, Mrs Ayrton demonstrated that the lines expressing resistance as a function of arc length are no longer straight, but that there is a rather sudden dip down when the length of the arc is less than 3 mm.

The constants in the above equation for the potential difference of the carbons were determined by Mrs Ayrton in the case of solid carbons to be—

$$V=38{\cdot}9+2{\cdot}07L+\frac{11{\cdot}7+10{\cdot}5L}{A}.$$

There has been much debate as to the meaning to be given to the constant *a* in the above equation, which has a value apparently not far from forty volts for a direct-current arc with solid carbons. The suggestion made in 1867 by Edlund (*Phil. Mag.*, 1868, 36, p. 358), that it implied the existence of a counter-electromotive force in the arc, was opposed by Luggin in 1889 (*Wien. Ber.* 98, p. 1198), Ernst Lecher in 1888 (*Wied. Ann.*, 1888, 33, p. 609), and by Franz Stenger in 1892 (*Id.* 45, p. 33); whereas Victor von Lang and L. M. Arons in 1896 (*Id.* 30, p. 95), concluded that experiment indicated the presence of a counter-electromotive force of 20 volts. A. E. Blondel concludes, from experiments made by him in 1897 (*The Electrician*, 1897, 39, p. 615), that there is no counter-electromotive force in the arc greater than a fraction of a volt. Subsequently W. Duddell (*Proc. Roy. Soc.*, 1901, 68, p. 512) described experiments tending to prove the real existence of a counter-electromotive force in the arc, probably having a thermo-electric origin, residing near the positive electrode, and of an associated lesser adjuvant *e.m.f.* near the negative carbon.

This fall in voltage between the carbons and the arc is not uniformly distributed. In 1898 Mrs Ayrton described the results of experiments showing that if V_1 is the potential difference between the positive carbon and the arc, then

$$V_1=31{\cdot}28+\frac{9+3{\cdot}1L}{A};$$

and if V_2 is the potential difference between the arc and the negative carbon, then

$$V_2=7{\cdot}6+\frac{13{\cdot}6}{A}\cdot$$

where A is the current through the arc in amperes and L is the length of the arc in millimetres.

The total potential difference between the carbons, minus the fall in potential down the arc, is therefore equal to the sum of $V_1+V_2=V_3$.

$$\text{Hence } V_3=38{\cdot}88+\frac{22{\cdot}6+3{\cdot}1L}{A}.$$

The difference between this value and the value of V, the total potential difference between the carbons, gives the loss in potential due to the true arc. These laws are simple consequences of straight-line laws connecting the work spent in the arc at the two electrodes with the other quantities. If W be the work spent in the arc on either carbon, measured by the product of the current and the potential drop in passing from the carbon to the arc, or vice versa, then for the positive carbon $W=a+bA$, if the length of arc is constant, $W=c+dL$, if the current through the arc is constant, and for the negative carbon $W=e+fA$.

In the above experiments the potential difference between the carbons and the arc was measured by using a third exploring carbon as an electrode immersed in the arc. This method, adopted by Lecher, F. Uppenborn, S. P. Thompson, and J. A. Fleming, is open to the objection that the introduction of the third carbon may to a considerable extent disturb the distribution of potential.

The total work spent in the continuous-current arc with solid carbons may, according to Mrs Ayrton, be expressed by the equation

$$W=11\cdot7+10\cdot5L+(38\cdot9+2\cdot07L)A.$$

It will thus be seen that the arc, considered as a conductor, has the property that if the current through it is increased, the difference of potential between the carbons is decreased, and in one sense, therefore, the arc may be said to act as if it were a *negative resistance.* Frith and Rodgers (*Electrician*, 1896, 38, p. 75) have suggested that the resistance of the arc should be measured by the ratio between a small increment of carbon potential difference and the resulting small increment of current; in other words, by the equation dV/dA, and not by the ratio simply of $V:A$. Considerable discussion has taken place whether an electrical resistance can have a negative value, belonging as it does to the class of scalar mathematical quantities. Simply considered as an electrical conductor, the arc resembles an intensely heated rod of magnesia or other refractory oxide, the true resistance of which is decreased by rise of temperature. Hence an increase of current through such a rod of refractory oxide is accompanied by a decrease in the potential difference of the ends. This, however, does not imply a negative resistance, but merely the presence of a resistance with a negative temperature coefficient. If we plot a curve such that the ordinates are the difference of potential of the carbons and the abscissae the current through the arc for constant length of arc, this curve is now called a *characteristic curve* of the arc and its slope at any point the instantaneous resistance of the arc.

Other physical investigations have been concerned with the intrinsic brightness of the crater. It has been asserted by many observers, such as Blondel, Sir W. de W. Abney, S. P. Thompson, Trotter, L. J. G. Violle and others, that this is practically independent of the current passing, but great differences of opinion exist as to its value. Abney's values lie between 39 and 116, Trotter's between 80 and 170 candles per square millimetre. Blondel in 1893 made careful determinations of the brightness of the arc crater, and came to the conclusion that it was 160 candles per square millimetre. Subsequently J. E. Petavel found a value of 147 candles per square millimetre for current densities varying from ·06 to ·26 amperes per square millimetre (*Proc. Roy. Soc.*, 1899, 65, p. 469). Violle also, in 1893, supported the opinion that the brightness of the crater per square millimetre was independent of the current density, and from certain experiments and assumptions as to the specific heat of carbon, he asserted the temperature of the crater was about 3500° C. It has been concluded that this constancy of temperature, and therefore of brightness, is due to the fact that the crater is at the temperature of the boiling-point of carbon, and in that case its temperature should be raised by increasing the pressure under which the arc works. W. E. Wilson in 1895 attempted to measure the brightness of the crater under various pressures, and found that under five atmospheres the resistance of the arc appeared to increase and the temperature of the crater to fall, until at a pressure of 20 atmospheres the brightness of the crater had fallen to a dull red. In a later paper Wilson and G. F. Fitzgerald stated that these preliminary experiments were not confirmed, and their later researches throw considerable doubt on the suggestion that it is the boiling-point of carbon which determines the temperature of the crater. (See *Electrician*, 1895, 35, p. 260, and 1897, 38, p. 343.)

Alternating current arc.

The study of the alternating-current arc has suggested a number of new experimental problems for investigators. In this case all the factors, namely, current, carbon P.D., resistance, and illuminating power, are periodically varying; and as the electromotive force reverses itself periodically, at certain instants the current through the arc is zero. As the current can be interrupted for a moment without extinguishing the arc, it is possible to work the electric arc from an alternating current generator without apparent intermission in the light, provided that the frequency is not much below 50. During the moment that the current is zero the carbon continues to glow. Each carbon in turn becomes, so to speak, the crater carbon, and the illuminating power is therefore symmetrically distributed. The curve of illumination is as shown in fig. 3. The nature of the variation of the current and arc P.D. can be examined by one of two methods, or their modifications, originally due to Jules Joubert and A. E. Blondel. Joubert's method, which has been perfected by many observers, consists in attaching to the shaft of the alternator a contact which closes a circuit at an assigned instant during the phase. This contact is made to complete connexion either with a voltmeter or with a galvanometer placed as a shunt across the carbons or in series with the arc. By this arrangement these instruments do not read, as usual, the root-mean-square value of the arc P.D. or current, but give a constant indication determined by, and indicating, the instantaneous values of these quantities at some assigned instant. By progressive variation of the phase-instant at which the contact is made, the successive instantaneous values of the electric quantities can be measured and plotted out in the form of curves. This method has been much employed by Blondel, Fleming, C. P. Steinmetz, Tobey and Walbridge, Frith, H. Görges and many others. The second method, due to Blondel, depends on the use of the *Oscillograph*, which is a galvanometer having a needle or coil of very small periodic time of vibration, say $\frac{1}{2000}$th part of a second or less, so that its deflections can follow the variations of current passing through the galvanometer. An improved form of oscillograph, devised by Duddell, consists of two fine wires, which are strained transversely to the lines of flux of a strong magnetic field (see OSCILLOGRAPH). The current to be examined is made to pass up one wire and down the other, and these wires are then slightly displaced in opposite directions. A small mirror attached to the wires is thus deflected rapidly to and fro in synchronism with the variations of the current. From the mirror a ray of light is reflected which falls upon a photographic plate made to move across the field with a uniform motion. In this manner a photographic trace can be obtained of the wave form. By this method the variations of electric quantities in an alternating-current arc can be watched. The variation of illuminating power can be followed by examining and measuring the light of the arc through slits in a revolving stroboscopic disk, which is driven by a motor synchronously with the variation of current through the arc.

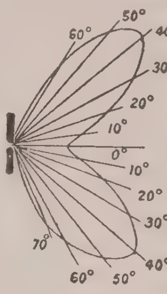


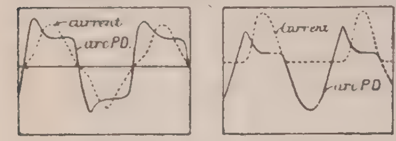
FIG. 6.

The general phenomena of the alternating-current arc are as follow:—

If the arc is supplied by an alternator of low inductance, and soft or cored carbons are employed to produce a steady and silent arc, the potential difference of the carbons periodically varies in a manner not very different from that of the alternator on open circuit. If, however, hard carbons are used, the alternating-current arc deforms the shape of the alternator electromotive force curve; the carbon P.D. curve may then have a very different form, and becomes, in general, more rectangular in shape, usually having a high peak at the front. The arc also impresses the deformation on the current curve. Blondel in 1893 (*Electrician*, 32, p. 161) gave a number of potential and current curves for alternating-current arcs, obtained by the Joubert contact method, using two movable coil galvanometers of high resistance to measure respectively potential difference and current. Blondel's deductions were that the shape of the current and volt curves is greatly affected by the nature of the carbons, and also by the amount of inductance and resistance in the circuit of the alternator. Blondel, W. E. Ayrton, W. E. Sumpner and Steinmetz have all observed that the alternating-current arc, when hissing or when formed with uncored carbons, acts like an inductive resistance, and that there is a lag between the current curves and the potential difference curves. Hence the *power-factor*, or ratio between the true power and the product of the root-mean-square values of arc current and carbon potential difference, in this case is less than unity. For silent arcs Blondel found power-factors lying between 0·88 and 0·95, and for hissing ones, values such as 0·70. Ayrton and Sumpner stated that the power-factor may be as low as 0·5. Joubert, as far back as 1881, noticed the deformation which the alternating-current arc impresses upon the electromotive force curve of an alternator, giving an open circuit a simple harmonic variation of electromotive force. Tobey and Walbridge in 1890 gave the results of a number of observations taken with commercial forms of alternating-current arc lamps, in which the same deformation was apparent. Blondel in 1896 came to the conclusion that with the same alternator we can produce carbon P.D. curves of very varied character, according to the material of the core, the length of the arc, and the inductance of the circuit. Hard carbons gave a P.D. curve with a flat top even when worked on a low inductance alternator.

The periodic variation of light in the alternating-current arc has also been the subject of inquiry. H. Görges in 1895 at Berlin applied a stroboscopic method to steady the variations of illuminating power. Fleming and Petavel employed a similar arrangement, driving the stroboscopic disk by a synchronous motor (*Phil. Mag.*, 1896, 41). The light passing through slits of the disk was selected in one particular period of the phase, and by means of a lens could be taken from any desired portion of the arc or the incandescent carbons. The light so selected was measured relatively to the mean value of the horizontal light emitted by the arc, and accidental variations were thus eliminated. They found that the light from any part is periodic, but owing to the slow cooling of the carbons never quite zero, the minimum value happening a little later than the zero value of the current. The light emitted by a particular carbon when it is the negative, does not reach such a large maximum value as when it is the positive. The same observers made experiments which seemed to show that for a given expenditure of power in the arc the alternating current arc in general gives less mean spherical candle-power than the continuous current one.

The effect of the wave form on the efficiency of the alternating-current arc has engaged the attention of many workers. Rössler and Wedding in 1894 gave an account of experiments with alternating-current arcs produced by alternators having electromotive force curves of very different wave forms, and they stated that the efficiency or mean spherical candle-power per watt expended in the arc was greatest for the flattest of the three wave forms by nearly 50%. Burnie in 1897 gave the results of experiments of the same kind. His conclusion was, that since the light of the arc is a function of the temperature, that wave form of current is most efficient which maintains the temperature most uniformly throughout the half period. Hence, generally, if the current rises to a high value soon after its commencement, and is preserved at that value, or nearly at that value, during the phase, the efficiency of the arc will be greater when the current curve is more pointed or peaked. An important contribution to our knowledge concerning alternating-current arc phenomena was made in 1899 by W. Duddell and E. W. Marchant, in a paper containing valuable results obtained with their improved oscillograph.[1] They studied the behaviour of the alternating-current arc when formed both with solid carbons, with cored carbons, and with carbon and metal rods. They found that with solid carbons the arc P.D. curve is always square-shouldered and begins with a peak, as shown in fig. 7 (*a*), but with cored carbons it is more sinusoidal. Its shape depends on the total resistance in the circuit, but is almost independent of the type of alternator, whereas the current wave form is largely dependent on the machine used, and on the nature and amount of the impedance in the circuit; hence the importance of selecting a suitable alternator for operating alternating-current arcs. The same observers drew attention to the remarkable fact that if the arc is formed between a carbon and metal rod, say a zinc rod, there is a complete interruption of the current over half a period corresponding to that time during which the carbon is positive; this suggests that the rapid cooling of the metal facilitates the flow of the current from it, and resists the flow of current to it. The dotted curve in fig. 7 (*b*) shows the current curve form in the case of a copper rod. By the use of the oscillograph Duddell and Marchant showed that the hissing continuous-current arc is intermittent, and that the current is oscillatory and may have a frequency of 1000 per second. They also showed that enclosing the arc increases the arc reaction, the front peak of the potential curve becoming more marked and the power-factor of the arc reduced.



(*a*) (*b*)

FIG. 7.

Enclosed arc lamps.

If a continuous-current electric arc is formed in the open air with a positive carbon having a diameter of about 15 millimetres, and a negative carbon having a diameter of about 9 millimetres, and if a current of 10 amperes is employed, the potential difference between the carbons is generally from 40 to 50 volts. Such a lamp is therefore called a 500-watt arc. Under these conditions the carbons each burn away at the rate of about 1 in. per hour, actual combustion taking place in the air which gains access to the highly-heated crater and negative tip; hence the most obvious means of preventing this disappearance is to enclose the arc in an air-tight glass vessel. Such a device was tried very early in the history of arc lighting. The result of using a completely air-tight globe, however, is that the contained oxygen is removed by combustion with the carbon, and carbon vapour or hydrocarbon compounds diffuse through the enclosed space and deposit themselves on the cool sides of the glass, which is thereby obscured. It was, however, shown by L. B. Marks (*Electrician* 31, p. 502, and 38, p. 646) in 1893, that if the arc is an arc formed with a small current and relatively high voltage, namely, 80 to 85 volts, it is possible to admit air in such small amount that though the rate of combustion of the carbons is reduced, yet the air destroys by oxidation the carbon vapour escaping from the arc. An arc lamp operated in this way is called an enclosed arc lamp (fig. 8). The top of the enclosing bulb is closed by a gas check plug which admits through a small hole a limited supply of air. The peculiarity of an enclosed arc lamp operated with a continuous current is that the carbons do not burn to a crater on the positive, and a sharp tip or mushroom on the negative, but preserve nearly flat surfaces. This feature affects the distribution of the light. The illuminating curve of the enclosed arc, therefore, has not such a strongly marked maximum value as that of the open arc, but on the other hand the true arc or column of incandescent carbon vapour is less steady in position, wandering round from place to place on the surface of the carbons. As a compensation for this defect, the combustion of the carbons per hour in commercial forms of enclosed arc lamps is about one-twentieth part of that of an open arc lamp taking the same current.

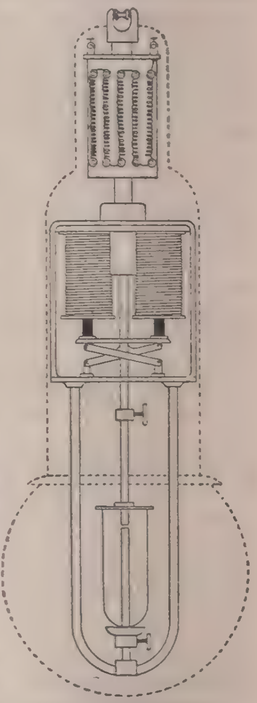


FIG. 8.—Enclosed Arc Lamp.

It was shown by Fleming in 1890 that the column of incandescent carbon vapour constituting the true arc possesses a unilateral conductivity (*Proc. Roy. Inst.* 13, p. 47). If a third carbon is dipped into the arc so as to constitute a third pole, and if a small voltaic battery of a few cells, with a galvanometer in circuit, is connected in between the middle pole and the negative carbon, it is found that when the negative pole of the battery is in connexion with the negative carbon the galvanometer indicates a current, but does not when the positive pole of the battery is in connexion with the negative carbon of the arc.

The arc as an illuminant.

Turning next to the consideration of the electric arc as a source of light, we have already noticed that the illuminating power in different directions is not the same. If we imagine an electric arc, formed between a pair of vertical carbons, to be placed in the centre of a hollow sphere painted white on the interior, then it would be found that the various zones of this sphere are unequally illuminated. If the points in which the carbons when prolonged would intercept the sphere are called the poles, and the line where the horizontal plane through the arc would intercept the sphere is called the equator, we might consider the sphere divided up by lines of latitude into zones, each of which would be differently illuminated. The total quantity of light or the total illumination of each zone is the product of the area of the zone and the intensity of the light falling on the zone measured in candle-power. We might regard the sphere as uniformly illuminated with an intensity of light such that the product of this intensity and the total surface of the sphere was numerically equal to the surface integral obtained by summing up the products of the areas of all the elementary zones and the intensity of the light falling on each. This mean intensity is called the *mean spherical candle-power* of the arc. If the distribution of the illuminating power is known and given by an illumination curve, the mean spherical candle-power can be at once deduced (*La Lumière électrique*, 1890, 37, p. 415).

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[1] *Journ. Inst. Elec. Eng.* 28, p. 1. The authors of this paper give numerous instructive curves taken with the oscillograph, showing the form of the arc P.D. and current curves for a great variety of alternating-current arcs.

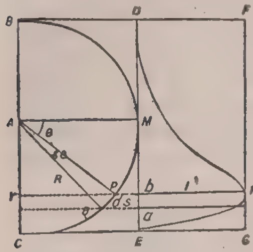

FIG. 9

Let BMC (fig. 9) be a semicircle which by revolution round the diameter BC sweeps out a sphere. Let an arc be situated at A, and let the element of the circumference PQ $= ds$ sweep out a zone of the sphere. Let the intensity of light falling on this zone be I. Then if $\theta =$ the angle MAP and $d\theta$ the incremental angle PAQ, and if R is the radius of the sphere, we have

$$ds = \mathrm{R}\,d\theta;$$

also, if we project the element PQ on the line DE we have

$$ab = ds \cos\theta,$$
$$\therefore ab = \mathrm{R} \cos\theta d\theta$$

and
$$\mathrm{I}ab = \mathrm{IR} \cos\theta d\theta.$$

Let r denote the radius PT of the zone of the sphere, then

$$r = \mathrm{R}\cos\theta.$$

Hence the area of the zone swept out by PQ is equal to

$$2\pi\mathrm{R}\cos\theta\, ds = 2\pi\mathrm{R}^2 \cos\theta d\theta$$

in the limit, and the total quantity of light falling on the zone is equal to the product of the mean intensity or candle-power I in the direction AP and the area of the zone, and therefore to

$$2\pi\mathrm{IR}^2 \cos\theta d\theta.$$

Let I_0 stand for the mean spherical candle-power, that is, let I_0 be defined by the equation

$$4\pi\mathrm{R}^2\mathrm{I}_0 = 2\pi\mathrm{R}\Sigma(\mathrm{I}ab)$$

where Σ (Iab) is the sum of all the light actually falling on the sphere surface, then

$$\mathrm{I}_0 = \frac{1}{2\mathrm{R}}\Sigma(\mathrm{I}ab)$$
$$= \frac{\Sigma(\mathrm{I}ab)}{2\mathrm{RI}_{max}}\mathrm{I}_{max}$$

where I_{max} stands for the maximum candle-power of the arc. If, then, we set off at b a line bH perpendicular to DE and in length proportional to the candle-power of the arc in the direction AP, and carry out the same construction for a number of different observed candle-power readings at known angles above and below the horizon, the summits of all ordinates such as bH will define a curve DHE. The mean spherical candle-power of the arc is equal to the product of the maximum candle-power (I_{max}), and a fraction equal to the ratio of the area included by the curve DHE to its circumscribing rectangle DFGE. The area of the curve DHE multiplied by $2\pi/\mathrm{R}$ gives us the *total flux of light* from the arc.

Owing to the inequality in the distribution of light from an electric arc, it is impossible to define the illuminating power by a single number in any other way than by stating the mean spherical candle-power. All such commonly used expressions as "an arc lamp of 2000 candle-power" are, therefore, perfectly meaningless.

Photometry of arc.

The photometry of arc lamps presents particular difficulties, owing to the great difference in quality between the light radiated by the arc and that given by any of the ordinarily used light standards. (For standards of light and photometers, see PHOTOMETER.) All photometry depends on the principle that if we illuminate two white surfaces respectively and exclusively by two separate sources of light, we can by moving the lights bring the two surfaces into such a condition that their *illumination* or *brightness* is the same without regard to any small colour difference. The quantitative measurement depends on the fact that the illumination produced upon a surface by a source of light is inversely as the square of the distance of the source. The trained eye is capable of making a comparison between two surfaces illuminated by different sources of light, and pronouncing upon their equality or otherwise in respect of brightness, apart from a certain colour difference; but for this to be done with accuracy the two illuminated surfaces, the brightness of which is to be compared, must be absolutely contiguous and not separated by any harsh line. The process of comparing the light from the arc directly with that of a candle or other similar flame standard is exceedingly difficult, owing to the much greater proportion and intensity of the violet rays in the arc. The most convenient practical working standard is an incandescent lamp run at a high temperature, that is, at an efficiency of about $2\frac{1}{2}$ watts per candle. If it has a sufficiently large bulb, and has been *aged* by being worked for some time previously, it will at a constant voltage preserve a constancy in illuminating power sufficiently long to make the necessary photometric comparisons, and it can itself be compared at intervals with another standard incandescent lamp, or with a flame standard such as a Harcourt pentane lamp.

In measuring the candle-power of arc lamps it is necessary to have some arrangement by which the brightness of the rays proceeding from the arc in different directions can be measured. For this purpose the lamp may be suspended from a support, and a radial arm arranged to carry three mirrors, so that in whatever position the arm may be placed, it gathers light proceeding at one particular angle above or below the horizon from the arc, and this light is reflected out finally in a constant horizontal direction. An easily-arranged experiment enables us to determine the constant loss of light by reflection at all the mirrors, since that reflection always takes place at 45°. The ray thrown out horizontally can then be compared with that from any standard source of light by means of a fixed photometer, and by sweeping round the radial arm the photometric or illuminating curve of the arc lamp can be obtained.

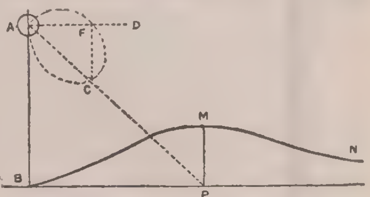

FIG. 10.

From this we can at once determine the nature of the illumination which would be produced on a horizontal surface if the arc lamp were suspended at a given distance above it. Let A (fig. 10) be an arc lamp placed at a height h(=AB) above a horizontal plane. Let ACD be the illuminating power curve of the arc, and hence AC the candle-power in a direction AP. The illumination (I) or brightness on the horizontal plane at P is equal to

$$\mathrm{AC}\cos\mathrm{APM}/(\mathrm{AP})^2 = \mathrm{FC}/(h^2+x^2),\ \text{where } x = \mathrm{BP}.$$

Hence if the candle-power curve of the arc and its height above the surface are known, we can describe a curve BMN, whose ordinate PM will denote the brightness on the horizontal surface at any point P. It is easily seen that this ordinate must have a maximum value at some point. This brightness is best expressed in *candle-feet*, taking the unit of illumination to be that given by a standard candle on a white surface at a distance of 1 ft. If any number of arc lamps are placed above a horizontal plane, the brightness at any point can be calculated by adding together the illuminations due to each respectively.

The process of delineating the photometric or polar curve of intensity for an arc lamp is somewhat tedious, but the curve has the advantage of showing exactly the distribution of light in different directions. When only the mean spherical or mean hemispherical candle-power is required the process can be shortened by employing an integrating photometer such as that of C. P. Matthews (*Trans. Amer. Inst. Elec. Eng.*, 1903, 19, p. 1465), or the lumen-meter of A. E. Blondel which enables us to determine at one observation the total flux of light from the arc and therefore the mean spherical candle-power per watt.

Street arc lighting.

In the use of arc lamps for street and public lighting, the question of the distribution of light on the horizontal surface is all-important. In order that street surfaces may be well lighted, the minimum illumination should not fall below 0·1 candle-foot, and in general, in well-lighted streets, the maximum illumination will be 1 candle-foot and upwards. By means of an illumination photometer, such as that of W. H. Preece and A. P. Trotter, it is easy to measure the illumination in candle-feet at any point in a street surface, and to plot out a number of contour lines of equal illumination. Experience has shown that to obtain satisfactory results the lamps must be placed on a high mast 20 or 25 ft. above the roadway surface. These posts are now generally made of cast iron in various ornamental forms (fig. 11), the necessary conductors for conveying the current up to the lamp being taken

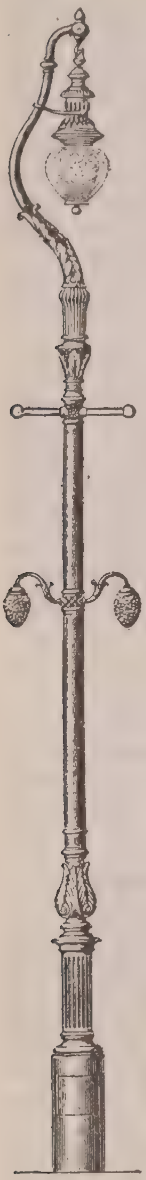

FIG. 11.

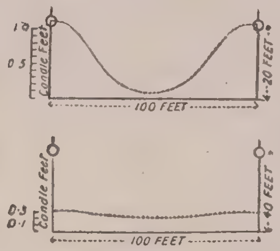

FIG. 12.

inside the iron mast. (The pair of incandescent lamps half-way down the standard are for use in the middle of the night, when the arc lamp would give more light than is required; they are lighted by an automatic switch whenever the arc is extinguished.) The lamp itself is generally enclosed in an opalescent spherical globe, which is woven over with wire-netting so that in case of fracture the pieces may not cause damage. The necessary trimming, that is, the replacement of carbons, is effected either by lowering the lamp or, preferably, by carrying round a portable ladder enabling the trimmer to reach it. For the purpose of public illumination it is very usual to employ a lamp taking 10 amperes, and therefore absorbing about 500 watts. Such a lamp is called a 500-watt arc lamp, and it is found that a satisfactory illumination is given for most street purposes by placing 500-watt arc lamps at distances varying from 40 to 100 yds., and at a height of 20 to 25 ft. above the roadway. The maximum candle-power of a 500-watt arc enclosed in a roughened or ground-glass globe will not exceed 1500 candles, and that of a 6·8-ampere arc (continuous) about 900 candles. If, however, the arc is an enclosed arc with double globes, the absorption of light would reduce the effective maximum to about 200 c.p. and 120 c.p. respectively. When arc lamps are placed in public thoroughfares not less than 40 yds. apart, the illumination anywhere on the street surface is practically determined by the two nearest ones. Hence the total illumination at any point may be obtained by adding together the illuminations due to each arc separately. Given the photometric polar curves or illuminating-power curves of each arc taken outside the shade or globe, we can therefore draw a curve representing the resultant illumination on the horizontal surface. It is obvious that the higher the lamps are placed, the more uniform is the street surface illumination, but the less its average value; thus two 10-ampere arcs placed on masts 20 ft. above the road surface and 100 ft. apart will give a maximum illumination of about 1·1 and a minimum of about 0·15 candle-feet in the interspace (fig 12). If the lamps are raised on 40-ft. posts the maximum illumination will fall to 0·3, and the minimum will rise to 0·2. For this reason masts have been employed as high as 90 ft. In docks and railway yards high masts (50 ft.) are an advantage, because the strong contrasts due to shadows of trucks, carts, &c., then become less marked, but for street illumination they should not exceed 30 to 35 ft. in height. Taking the case of 10-ampere and 6·8-ampere arc lamps in ordinary opal shades, the following figures have been given by Trotter as indicating the nature of the resultant horizontal illumination:—

Arc Current in Amperes.	Height above Road in Feet.	Distance apart in Feet.	Horizontal Illumination in Candle-Feet.	
			Maximum.	Minimum.
10	20	120	1·85	0·12
10	25	120	1·17	0·15
10	40	120	0·5	0·28
6·8	20	90	1·1	0·21
6·8	40	120	0·3	0·17

As regards distance apart, a very usual practice is to place the lamps at spaces equal to six to ten times their height above the road surface. Blondel (*Electrician*, 35, p. 846) gives the following rule for the height (h) of the arc to afford the maximum illumination at a distance (d) from the foot of the lamp-post, the continuous current arc being employed:—

For naked arc . . . . . $h=0{\cdot}95\,d$.
,, arc in rough glass globe . . $h=0{\cdot}85\,d$.
,, ,, opaline globe . . . $h=$,,
,, ,, opal globe . . . . $h=0{\cdot}5\,d$.
,, ,, holophane globe . . $h=0{\cdot}5\,d$.

These figures show that the distribution of light on the horizontal surface is greatly affected by the nature of the enclosing globe. For street illumination naked arcs, although sometimes employed in works and factory yards, are entirely unsuitable, since the result produced on the eye by the bright point of light is to paralyse a part of the retina and contract the pupil, hence rendering the eye less sensitive when directed on feebly illuminated surfaces. Accordingly, diffusing globes have to be employed. It is usual to place the arc in the interior of a globe of from 12 to 18 in. in diameter. This may be made of ground glass, opal glass, or be a dioptric globe such as the holophane. The former two are strongly absorptive, as may be seen from the results of experiments by Guthrie and Redhead. The following table shows the astonishing loss of light due to the use of opal globes:—

	Naked Arc.	Arc in Clear Globe.	Arc in Rough Glass Globe.	Arc in Opal Globe.
Mean spherical c.p. . . .	319	235	160	144
Mean hemispherical c.p. .	450	326	215	138
Percentage value of transmitted light	100	53	23	19
Percentage absorption .	0	47	77	81

By using Trotter's, Fredureau's or the holophane globe, the light may be so diffused that the whole globe appears uniformly luminous, and yet not more than 20% of the light is absorbed. Taking the absorption of an ordinary opal globe into account, a 500-watt arc does not usually give more than 500 c.p. as a maximum candle-power. Even with a naked 500-watt arc the mean spherical candle-power is not generally more than 500 c.p., or at the rate of 1 c.p. per watt. The maximum candle-power for a given electrical power is, however, greatly dependent on the current density in the carbon, and to obtain the highest current density the carbons must be as thin as possible. (See T. Hesketh, "Notes on the Electric Arc," *Electrician*, 39, p. 707.)

For the efficiency of arcs of various kinds, expressed by the mean hemispherical candle power per ampere and per watt expended in the arc, the following figures were given by L. Andrews ("Long-flame Arc Lamps," *Journal Inst. Elec. Eng.*, 1906, 37, p. 4).

	Candle-power per ampere.	Candle-power per watt.
Ordinary open carbon arc. . .	82	1·54
Enclosed carbon arc	55	0·77
Chemical carbon or flame arc . .	259	5·80
High voltage inclined carbon arc .	200	2·24

It will be seen that the flame arc lamp has an enormous advantage over other types in the light yielded for a given electric power consumption.

Arc lamp mechanism.

The practical employment of the electric arc as a means of illumination is dependent upon mechanism for automatically keeping two suitable carbon rods in the proper position, and moving them so as to enable a steady arc to be maintained. Means must be provided for holding the carbons in line, and when the lamp is not in operation they must fall together, or come together when the current is switched on, so as to start the arc. As soon as the current passes, they must be moved slightly apart, and gripped in position immediately the current reaches its right value, being moved farther apart if the current increases in strength, and brought together if it decreases. Moreover, it must be possible for a considerable length of carbon to be fed through the lamp as required.

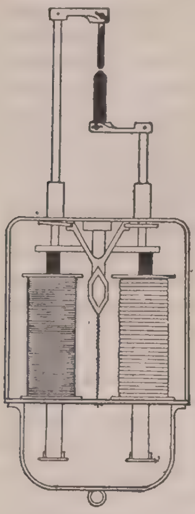

FIG. 13.

One early devised form of arc-lamp mechanism was a system of clock-work driven by a spring or weight, which was started and stopped by the action of an electromagnet; in modern lighthouse lamps a similar mechanism is still employed. W. E. Staite (1847), J. B. L. Foucault (1849), V. L. M. Serrin (1857), J. Duboscq (1858), and a host of later inventors, devised numerous forms of mechanical and clock-work lamps. The modern self-regulating type may be said to have been initiated in 1878 by the differential lamp of F. von Hefner-Alteneck, and the clutch lamp of C. F. Brush. The general principle of the former may be explained as follows: There are two solenoids, placed one above the other. The lower one, of thick wire, is in series with the two carbon rods forming the arc, and is hence called the *series coil.* Above this there is placed another solenoid of fine wire, which is called the *shunt coil.* Suppose an iron rod to be placed so as to be partly in one coil and partly in another; then when the coils are traversed by currents, the iron core will be acted upon by forces tending to pull it into these solenoids. If the iron core be attached to one end of a lever, the other end of which carries the upper carbon, it will be seen that if the carbons are in contact and the current is switched on, the series coil alone will be traversed by the current, and its magnetic action will draw down the iron core, and therefore pull the carbons apart and strike the arc. The moment the carbons separate, there will be a difference of potential between them, and the shunt coil will then come into action, and will act on the core so as to draw the carbons together. Hence the two solenoids act in opposition to each other, one increasing and the other diminishing the length of the arc, and maintaining the carbons in the proper position. In the lamp of this type the upper carbon is in reality attached to a rod having a side-rack gearing, with a train of wheels governed by a pendulum. The action of the series coil on the mechanism is to first lock or stop the train, and then lift it as a whole slightly. This strikes the arc. When the arc is too long, the series coil lowers the gear and finally releases the upper carbon, so that it can run down by its own weight. The principle of a shunt and series coil operating on an iron core in opposition is the basis of the mechanism of a number of arc lamps. Thus the lamp invented by F. Krizik and L. Piette, called from its place of origin the Pilsen lamp, comprises an iron core made in the shape of a double cone or spindle (fig. 13), which is so arranged in a brass tube that it can move into or out of a shunt and series coil, wound the one with fine and the other with thick insulated wire, and hence regulate the position of the carbon attached to it. The movement of this core is made to feed the carbons directly without the intervention of any clock-work, as in the case of the Hefner-Alteneck lamp. In the clutch-lamp mechanism the lower carbon is fixed, and the upper carbon rests upon it by its own weight and that of its holder. The latter consists of a long rod passing through guides, and is embraced somewhere by a ring capable of being tilted or lifted by a finger attached to the armature of an electromagnet the coils of which are in series with the arc. When the current passes through the magnet it attracts the armature, and by tilting the ring lifts the upper carbon-holder and hence strikes the arc. If the current diminishes in value, the upper carbon drops a little by its own weight, and the feed of the lamp is thus effected by a series of small lifts and drops of the upper carbon (fig. 14). Another element sometimes employed in arc-lamp mechanism is the brake-wheel regulator. This is a feature of one form of the Brockie and of the Crompton-Pochin lamps. In these the movement of the carbons is effected by a cord or chain which passes over a wheel, or by a rack geared with the brake wheel. When no current is passing through the lamp, the wheel is free to move, and the carbons fall together; but when the current is switched on, the chain or cord passing over the brake wheel, or the brake wheel itself is gripped in some way, and at the same time the brake wheel is lifted so that the arc is struck.

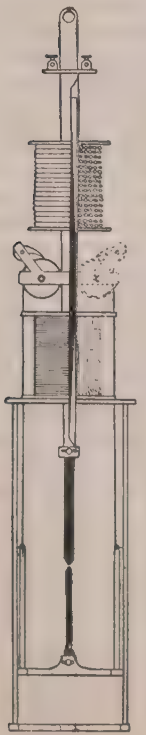

FIG. 14.

Although countless forms of self-regulating device have been invented for arc lamps, nothing has survived the test of time so well as the typical mechanisms which work with carbon rods in one line, one or both rods being moved by a controlling apparatus as required. The early forms of semi-incandescent arc lamp, such as those of R. Werdermann and others, have dropped out of existence. These were not really true arc lamps, the light being produced by the incandescence of the extremity of a thin carbon rod pressed against a larger rod or block. The once famous Jablochkoff candle, invented in 1876, consisted of two carbon rods about 4 mm. in diameter, placed parallel to each other and separated by a partition of kaolin, steatite or other refractory non-conductor. Alternating currents were employed, and the candle was set in operation by a match or starter of high-resistance carbon paste which connected the tips of the rods. When this burned off, a true arc was formed between the parallel carbons, the separator volatilizing as the carbons burned away. Although much ingenuity was expended on this system of lighting between 1877 and 1881, it no longer exists. One cause of its disappearance was its relative inefficiency in light-giving power compared with other forms of carbon arc taking the same amount of power, and a second equally important reason was the waste in carbons. If the arc of the electric candle was accidentally blown out, no means of relighting existed; hence the great waste in half-burnt candles. H. Wilde, J. C. Jamin, J. Rapieff and others endeavoured to provide a remedy, but without success.

It is impossible to give here detailed descriptions of a fraction of the arc-lamp mechanisms devised, and it must suffice to indicate the broad distinctions between various types. (1) Arc lamps may be either *continuous-current* or *alternating-current* lamps. For outdoor public illumination the former are greatly preferable, as owing to the form of the illuminating power-curve they send the light down on the road surface, provided the upper carbon is the positive one. For indoor, public room or factory lighting, *inverted arc* lamps are sometimes employed. In this case the positive carbon is the lower one, and the lamp is carried in an inverted metallic reflector shield, so that the light is chiefly thrown up on the ceiling, whence it is diffused all round. The alternating-current arc is not only less efficient in mean spherical candle-power per watt of electric power absorbed, but its distribution of light is disadvantageous for street purposes. Hence when arc lamps have to be worked off an alternating-current circuit for public lighting it is now usual to make use of a *rectifier*, which rectifies the alternating current into a unidirectional though pulsating current. (2.) Arc lamps may be also classified, as above described, into *open* or *enclosed arcs.* The enclosed arc can be made to burn for 200 hours with one pair of carbons, whereas open-arc lamps are usually only able to work, 8, 16 or 32 hours without recarboning, even when fitted with double carbons. (3) Arc lamps are further divided into *focussing* and *non-focussing* lamps. In the former the lower carbon is made to move up as the upper carbon moves down, and the arc is therefore maintained at the same level. This is advisable for arcs included in a globe, and absolutely necessary in the case of lighthouse lamps and lamps for optical purposes. (4) Another subdivision is into *hand-regulated* and *self-regulating* lamps. In the hand-regulated arcs the carbons are moved by a screw attachment as required, as in some forms of search-light lamp and lamps for optical lanterns. The carbons in large search-light lamps are usually placed horizontally. The self-regulating lamps may be classified into groups depending upon the nature of the regulating appliances. In some cases the regulation is controlled only by a *series coil*, and in others only by a *shunt coil.* Examples of the former are the original Gülcher and Brush clutch lamp, and some modern enclosed arc lamps; and of the latter, the Siemens "band" lamp, and the Jackson-Mensing lamp. In series coil lamps the variation of the current in the coil throws into or out of action the carbon-moving mechanism; in shunt coil lamps the variation in voltage between the carbons is caused to effect the same changes. Other types of lamp involve the use both of shunt and series coils acting against each other. A further classification of the self-regulating lamps may be found in the nature of the carbon-moving mechanism. This may be some modification of the Brush ring clutch, hence called *clutch* lamps; or some variety of *brake wheel*, as employed in Brockie and Crompton lamps; or else some form of *electric motor* is thrown into or out of action and effects the necessary changes. In many cases the arc-lamp mechanism is provided with a *dash-pot*, or contrivance in which a piston moving nearly air-tight in a cylinder prevents sudden jerks in the motion of the mechanism, and thus does away with the "hunting" or rapid up-and-down movements to which some varieties of clutch mechanism are liable. One very efficient form is illustrated in the Thomson lamp and Brush-Vienna lamp. In this mechanism a shunt and series coil are placed side by side, and have iron cores suspended to the ends of a rocking arm held partly within them. Hence, according as the magnetic action of the shunt or series coil prevails, the rocking arm is tilted backwards or forwards. When the series coil is not in action the *motion* is free, and the upper carbon-holder slides down, or the lower one slides up, and starts the arc. The series coil comes into action to withdraw the carbons, and at the same time locks the mechanism. The shunt coil then operates against the series coil, and between them the carbon is fed forwards as required. The control to be obtained is such that the arc shall never become so long as to flicker and become extinguished, when the carbons would come together again with a rush, but the feed should be smooth and steady, the position of the carbons responding quickly to each change in the current.

The introduction of enclosed arc lamps was a great improvement, in consequence of the economy effected in the consumption of carbon and in the cost of labour for trimming. A well-known and widely used form of enclosed arc lamp is the Jandus lamp, which in large current form can be made to burn for two hundred hours without re-carboning, and in small or midget form to burn for forty hours, taking a current of two amperes at 100 volts. Such lamps in many cases conveniently replace large sizes of incandescent lamps, especially for shop lighting, as they give a whiter light. Great improvements have also been made in inclined carbon arc lamps. One reason for the relatively low efficiency of the usual vertical rod arrangement is that the crater can only radiate laterally, since owing to the position of the negative carbon no crater light is thrown directly downwards. If, however, the carbons are placed in a downwards slanting position at a small angle like the letter V and the arc formed at the bottom tips, then the crater can emit downwards all the light it produces. It is found, however, that the arc is unsteady unless a suitable magnetic field is employed to keep the arc in position at the carbon tips. This method has been adopted in the Carbone arc, which, by the employment of inclined carbons, and a suitable electromagnet to keep the true arc steady at the ends of the carbons, has achieved considerable success. One feature of the Carbone arc is the use of a relatively high voltage between the carbons, their potential difference being as much as 85 volts.

Arrangement.

Arc lamps may be arranged either (i.) in series, (ii.) in parallel or (iii.) in series parallel. In the first case a number, say 20, may be traversed by the same current, in that case supplied at a pressure of 1000 volts. Each must have a magnetic cut-out, so that if the carbons stick together or remain apart the current to the other lamps is not interrupted, the function of such a cut-out being to close the main circuit immediately any one lamp ceases to pass current. Arc lamps worked in series are generally supplied with a current from a constant current dynamo, which maintains an invariable current of, say 10 amperes, independently of the number of lamps on the external circuit. If the lamps, however, are worked in series off a constant potential circuit, such as one supplying at the same time incandescent lamps, provision must be made by which a resistance coil can be substituted for any one lamp removed or short-circuited. When lamps are worked in parallel, each lamp is independent, but it is then necessary to add a resistance in series with the lamp. By special devices three lamps can be worked in series of 100 volt circuits. Alternating-current arc lamps can be worked off a high-tension circuit in parallel by providing each lamp with a small transformer. In some cases the alternating high-tension current is *rectified* and supplied as a unidirectional current to lamps in series. If single alternating-current lamps have to be worked off a 100 volt alternating-circuit, each lamp must have in series with it a choking coil or economy coil, to reduce the circuit pressure to that required for one lamp. Alternating-current lamps take a larger *effective* current, and work with a less effective or virtual carbon P.D., than continuous current arcs of the same wattage.

Cost.

The cost of working public arc lamps is made up of several items. There is first the cost of supplying the necessary electric energy, then the cost of carbons and the labour of recarboning, and, lastly, an item due to depreciation and repairs of the lamps. An ordinary type of open 10 ampere arc lamp, burning carbons 15 and 9 mm. in diameter for the positive and negative, and working every night of the year from dusk to dawn, uses about 600 ft. of carbons per annum. If the positive carbon is 18 mm. and the negative 12 mm., the consumption of each size of carbon is about 70 ft. per 1000 hours of burning. It may be roughly stated that at the present prices of plain open arc-lamp carbons the cost is about 15s. per 1000 hours of burning; hence if such a lamp is burnt every night from dusk to midnight the annual cost in that respect is about £1, 10s. The annual cost of labour per lamp for trimming is in Great Britain from £2 to £3; hence, approximately speaking, the cost per annum of maintenance of a public arc lamp burning every night from dusk to midnight is about £4 to £5, or perhaps £6, per annum, depreciation and repairs included. Since such a 10 ampere lamp uses half a Board of Trade unit of electric energy every hour, it will take 1000 Board of Trade units per annum, burning every night from dusk to midnight; and if this energy is supplied, say at 1½d. per unit, the annual cost of energy will be about £6, and the upkeep of the lamp, including carbons, labour for trimming and repairs, will be about £10 to £11 per annum. The cost for labour and carbons is considerably reduced by the employment of the enclosed arc lamp, but owing to the absorption of light produced by the inner enclosing globe, and the necessity for generally employing a second outer globe, there is a lower resultant candle-power per watt expended in the arc. Enclosed arc lamps are made to burn without attention for 200 hours, singly on 100 volt circuits, or two in series on 200 volt circuits, and in addition to the cost of carbons per hour being only about one-twentieth of that of the open arc, they have another advantage in the fact that there is a more uniform distribution of light on the road surface, because a greater proportion of light is thrown out horizontally.

It has been found by experience that the ordinary type of open arc lamp with vertical carbons included in an opalescent globe cannot compete in point of cost with modern improvements in gas lighting as a means of street illumination. The violet colour of the light and the sharp shadows, and particularly the non-illuminated area just beneath the lamp, are grave disadvantages. The high-pressure flame arc lamp with inclined chemically treated carbons has, however, put a different complexion on matters. Although the treated carbons cost more than the plain carbons, yet there is a great increase of emitted light, and a 9-ampere flame arc lamp supplied with electric energy at 1½d. per unit can be used for 1000 hours at an inclusive cost of about £5 to £6, the mean emitted illumination being at the rate of 4 c.p. per watt absorbed. In the Carbone arc lamp, the carbons are worked at an angle of 15° or 20° to each other and the arc is formed at the lower ends. If the potential difference of the carbons is low, say only 50-60 volts, the crater forms between the tips of the carbons and is therefore more or less hidden. If, however, the voltage is increased to 90-100 then the true flame of the arc is longer and is curved, and the crater forms at the exteme tip of the carbons and throws all its light downwards. Hence results a far greater mean hemispherical candle power (M.H.S.C.P.), so that whereas a 10-ampere 60 volt open arc gives at most 1200 M.H.S.C.P., a Carbone 10-ampere 85 volt arc will give 2700 M.H.S.C.P. Better results still can be obtained with impregnated carbons. But the flame arcs with impregnated carbons cannot be enclosed, so the consumption of carbon is greater, and the carbons themselves are more costly, and leave a greater ash on burning; hence more trimming is required. They give a more pleasing effect for street lighting, and their golden yellow globe of light is more useful than an equally costly plain arc of the open type. This improvement in efficiency is, however, accompanied by some disadvantages. The flame arc is very sensitive to currents of air and therefore has to be shielded from draughts by putting it under an "economizer" or chamber of highly refractory material which surrounds the upper carbon, or both carbon tips, if the arc is formed with inclined carbons. (For additional information on flame arc lamps see a paper by L. B. Marks and H. E. Clifford, *Electrician*, 1906, 57, p. 975.)

2. *Incandescent Lamps.*—Incandescent electric lighting, although not the first, is yet in one sense the most obvious method of utilizing electric energy for illumination. It was evolved from the early observed fact that a conductor is heated

when traversed by an electric current, and that if it has a high resistance and a high melting-point it may be rendered incandescent, and therefore become a source of light. Naturally every inventor turned his attention to the employment of wires of refractory metals, such as platinum or alloys of platinum-iridium, &c., for the purpose of making an incandescent lamp. F. de Moleyns experimented in 1841, E. A. King and J. W. Starr in 1845, J. J. W. Watson in 1853, and W. E. Staite in 1848, but these inventors achieved no satisfactory result. Part of their want of success is attributable to the fact that the problem of the economical production of electric current by the dynamo machine had not then been solved. In 1878 T. A. Edison devised lamps in which a platinum wire was employed as the light-giving agent, carbon being made to adhere round it by pressure. Abandoning this, he next directed his attention to the construction of an "electric candle," consisting of a thin cylinder or rod formed of finely-divided metals, platinum, iridium, &c., mixed with refractory oxides, such as magnesia, or zirconia, lime, &c. This refractory body was placed in a closed vessel and heated by being traversed by an electric current. In a further improvement he proposed to use a block of refractory oxide, round which a bobbin of fine platinum or platinum-iridium wire was coiled. Every other inventor who worked at the problem of incandescent lighting seems to have followed nearly the same path of invention. Long before this date, however, the notion of employing carbon as a substance to be heated by the current had entered the minds of inventors; even in 1845 King had employed a small rod of plumbago as the substance to be heated. It was obvious, however, that carbon could only be so heated when in a space destitute of oxygen, and accordingly King placed his plumbago rod in a barometric vacuum. S. W. Konn in 1872, and S. A. Kosloff in 1875, followed in the same direction.

Carbon filament lamp.

No real success attended the efforts of inventors until it was finally recognized, as the outcome of the work by J. W. Swan, T. A. Edison, and, in a lesser degree, St. G. Lane Fox and W. E. Sawyer and A. Man, that the conditions of success were as follow: First, the substance to be heated must be carbon in the form of a thin wire rod or thread, technically termed a *filament*; second, this must be supported and enclosed in a vessel formed entirely of glass; third, the vessel must be exhausted as perfectly as possible; and fourth, the current must be conveyed into and out of the carbon filament by means of platinum wires hermetically sealed through the glass.

One great difficulty was the production of the carbon filament. King, Sawyer, Man and others had attempted to cut out a suitably shaped piece of carbon from a solid block; but Edison and Swan were the first to show that the proper solution of the difficulty was to carbonize an organic substance to which the necessary form had been previously given. For this purpose cardboard, paper and ordinary thread were originally employed, and even, according to Edison, a mixture of lampblack and tar rolled out into a fine wire and bent into a spiral. At one time Edison employed a filament of bamboo, carbonized after being bent into a horse-shoe shape. Swan used a material formed by treating ordinary crochet cotton-thread with dilute sulphuric acid, the "parchmentized thread" thus produced being afterwards carbonized. In the modern incandescent lamp the filament is generally constructed by preparing first of all a form of soluble cellulose. Carefully purified cotton-wool is dissolved in some solvent, such as a solution of zinc chloride, and the viscous material so formed is forced by hydraulic pressure through a die. The long thread thus obtained, when hardened, is a semi-transparent substance resembling cat-gut, and when carefully carbonized at a high temperature gives a very dense and elastic form of carbon filament. It is cut into appropriate lengths, which after being bent into horse-shoes, double-loops, or any other shape desired, are tied or folded round carbon formers and immersed in plumbago crucibles, packed in with finely divided plumbago. The crucibles are then heated to a high temperature in an ordinary combustion or electric furnace, whereby the organic matter is destroyed, and a skeleton of carbon remains. The higher the temperature at which this carbonization is conducted, the denser is the resulting product. The filaments so prepared are sorted and measured, and short leading-in wires of platinum are attached to their ends by a carbon cement or by a carbon depositing process, carried out by heating electrically the junction of the carbon and platinum under the surface of a hydrocarbon liquid. They are then mounted in bulbs of lead glass having the same coefficient of expansion as platinum, through the walls of which, therefore, the platinum wires can be hermetically sealed. The bulbs pass into the exhausting-room, where they are exhausted by some form of mechanical or mercury pump. During this process an electric current is sent through the filament to heat it, in order to disengage the gases occluded in the carbon, and exhaustion must be so perfect that no luminous glow appears within the bulb when held in the hand and touched against one terminal of an induction coil in operation.

In the course of manufacture a process is generally applied to the carbon which is technically termed "treating." The carbon filament is placed in a vessel surrounded by an atmosphere of hydrocarbon, such as coal gas or vapour of benzol. If current is then passed through the filament the hydrocarbon vapour is decomposed, and carbon is thrown down upon the filament in the form of a lustrous and dense deposit having an appearance like steel when seen under the miscroscope. This deposited carbon is not only much more dense than ordinary carbonized organic material, but it has a much lower specific electric resistance. An untreated carbon filament is generally termed the primary carbon, and a deposited carbon the secondary carbon. In the process of treating, the greatest amount of deposit is at any places of high resistance in the primary carbon, and hence it tends to cover up or remedy the defects which may exist. The bright steely surface of a well-treated filament is a worse radiator than the rougher black surface of an untreated one; hence it does not require the expenditure of so much electric power to bring it to the same temperature, and probably on account of its greater density it ages much less rapidly.

Finally, the lamp is provided with a collar having two sole plates on it, to which the terminal wires are attached, or else the terminal wires are simply bent into two loops; in a third form, the Edison screw terminal, it is provided with a central metal plate, to which one end of the filament is connected, the other end being joined to a screw collar. The collars and screws are formed of thin brass embedded in plaster of Paris, or in some material like vitrite or black glass (fig. 15). To put the lamp into connexion with the circuit supplying the current, it has to be fitted into a socket or holder. Three of the principal types of holder in use are the bottom contact (B.C.) or Dornfeld socket, the Edison screw-collar socket and the Swan or loop socket. In the socket of C. Dornfeld (fig. 16, *a* and *a′*) two spring pistons, in contact with the two sides of the circuit, are fitted into the bottom of a short metallic tube having bayonet joint slots cut in the top. The brass collar on the lamp has two pins, by means of which a bayonet connexion is made between it and the socket; and when this is done, the spring pins are pressed against the sole plates on the lamp. In the Edison socket (fig. 16, *b*) a short metal tube with an insulating lining has on its interior a screw sleeve, which is in connexion with one wire of the circuit; at the bottom of the tube, and insulated from the screw sleeve, is a central metal button, which is in connexion with the other side of the circuit. On screwing the lamp into the socket, the screw collar of the lamp and the boss or plate at the base of the lamp make contact with the corresponding parts of the socket, and complete the connexion. In some cases a form of switch is included in the socket, which is then termed the key-holder. For loop lamps the socket consists of an insulated block, having on it two little hooks, which engage with the eyes of the lamp. This insulating block also carries some form of spiral spring or pair of spring loops, by means of which the lamp is pressed away from the socket, and the eyes kept tight by the hooks. This spring or Swan socket (fig. 16, *c*) is found useful in places where the lamps are subject to vibration, for in such cases the Edison screw collar cannot well be used, because the vibration loosens the contact of the lamp in the socket. The sockets may be fitted with appliances for holding ornamental shades or conical reflectors.

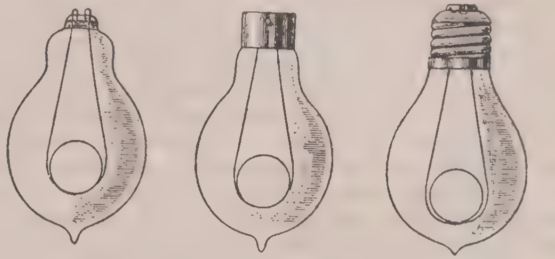

Fig. 15.

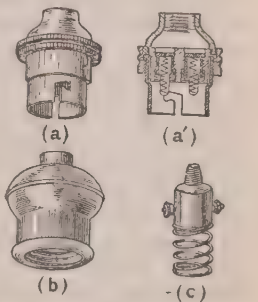

Fig. 16.—Incandescent Lamp Sockets.

The incandescent filament being a very brilliant line of light, various devices are adopted for moderating its brilliancy and distributing the light. A simple method is to sand-blast the exterior of the bulb, whereby it acquires an appearance similar to that of ground glass, or the bare lamp may be enclosed in a suitable glass shade. Such shades, however, if made of opalescent or semi-opaque glass, absorb 40 to 60% of the light; hence various forms of dioptric shade have been invented, consisting of clear glass ruled with prismatic grooves in such a manner as to diffuse the light without any very great absorption. Invention has been fertile in devising etched, coloured, opalescent, frosted and ornamental shades for decorative purposes, and in constructing special forms for use in situations, such as mines and factories for explosives, where the globe containing the lamp must be air-tight. High candle-power lamps, 500, 1000 and upwards, are made by placing in one large glass bulb a number of carbon filaments arranged in parallel between two rings, which are connected with the main leading-in wires. When incandescent lamps are used for optical purposes it is necessary to compress the filament into a small space, so as to bring it into the focus of a lens or mirror. The filament is then coiled or crumpled up into a spiral or zigzag form. Such lamps are called *focus lamps*.

Classification of lamps.

Incandescent lamps are technically divided into high and low voltage lamps, high and low efficiency lamps, standard and fancy lamps. The difference between high and low efficiency lamps is based upon the relation of the power absorbed by the lamp to the candle-power emitted. Every lamp when manufactured is marked with a certain figure, called the *marked volts*. This is understood to be the electromotive force in volts which must be applied to the lamp terminals to produce through the filament a current of such magnitude that the lamp will have a practically satisfactory life, and give in a horizontal direction a certain candle-power, which is also marked upon the glass. The numerical product of the current in amperes passing through the lamp, and the difference in potential of the terminals measured in volts, gives the total power taken up by the lamp in watts; and this number divided by the candle-power of the lamp (taking generally a horizontal direction) gives the *watts per candle-power*. This is an important figure, because it is determined by the temperature; it therefore determines the quality of the light emitted by the lamp, and also fixes the average duration of the filament when rendered incandescent by a current. Even in a good vacuum the filament is not permanent. Apart altogether from accidental defects, the carbon is slowly volatilized, and carbon molecules are also projected in straight lines from different portions of the filament. This process not only causes a change in the nature of the surface of the filament, but also a deposit of carbon on the interior of the bulb, whereby the glass is blackened and the candle-power of the lamp reduced. The volatilization increases very rapidly as the temperature rises. Hence at points of high resistance in the filament, more heat being generated, a higher temperature is attained, and the scattering of the carbon becomes very rapid; in such cases the filament is sooner or later cut through at the point of high resistance. In order that incandescent lighting may be practically possible, it is essential that the lamps shall have a certain *average life*, that is, duration; and this useful duration is fixed not merely by the possibility of passing a current through the lamp at all, but by the rate at which the candle-power diminishes. The decay of candle-power is called the *ageing* of the lamp, and the useful life of the lamp may be said to be that period of its existence before it has deteriorated to a point when it gives only 75% of its original candle-power. It is found that in practice carbon filament lamps, as at present made, if worked at a higher efficiency than 2½ watts per candle-power, exhibit a rapid deterioration in candle-power and an abbreviated life. Hence lamp manufacturers classify lamps into various classes, marked for use say at 2½, 3, 3½ and 4 watts per candle. A 2½ watt per candle lamp would be called a *high-efficiency lamp*, and a 4 watt per candle lamp would be called a *low-efficiency* lamp. In ordinary circumstances the low-efficiency lamp would probably have a longer life, but its light would be less suitable for many purposes of illumination in which colour discrimination is required.

The possibility of employing high-efficiency lamps depends greatly on the uniformity of the electric pressure of the supply. If the voltage is exceedingly uniform, then high-efficiency lamps can be satisfactorily employed; but they are not adapted for standing the variations in pressure which are liable to occur with public supply-stations, since, other things being equal, their filaments are less substantial. The classification into high and low voltage lamps is based upon the watts per candle-power corresponding to the marked volts. When incandescent lamps were first introduced, the ordinary working voltage was 50 or 100, but now a large number of public supply-stations furnish current to consumers at a pressure of 200 or 250 volts. This increase was necessitated by the enlarging area of supply in towns, and therefore the necessity for conveying through the same subterranean copper cables a large supply of electric energy without increasing the maximum current value and the size of the cables. This can only be done by employing a higher working electromotive force; hence arose a demand for incandescent lamps having marked volts of 200 and upwards, technically termed high-voltage lamps. The employment of higher pressures in public supply-stations has necessitated greater care in the selection of the lamp fittings, and in the manner of carrying out the wiring work. The advantages, however, of higher supply pressures, from the point of view of supply-stations, are undoubted. At the same time the consumer desired a lamp of a higher efficiency than the ordinary carbon filament lamp. The demand for this stimulated efforts to produce improved carbon lamps, and it was found that if the filament were exposed to a very high temperature, 3000° C. in an electric furnace, it became more refractory and was capable of burning in a lamp at an efficiency of 2½ watts per c.p. Inventors also turned their attention to substances other than carbon which can be rendered incandescent by the electric current.

Oxide filaments.

The luminous efficiency of any source of light, that is to say, the percentage of rays emitted which affect the eye as light compared with the total radiation, is dependent upon its temperature. In an ordinary oil lamp the luminous rays do not form much more than 3% of the total radiation. In the carbon-filament incandescent lamp, when worked at about 3 watts per candle, the luminous efficiency is about 5%; and in the arc lamp the radiation from the crater contains about 10 to 15% of eye-affecting radiation. The temperature of a carbon filament working at about 3 watts per candle is not far from the melting-point of platinum, that is to say, is nearly 1775° C. If it is worked at a higher efficiency, say 2·5 watts per candle-power, the temperature rises rapidly, and at the same time the volatilization and molecular scattering of the carbon is rapidly increased, so that the average duration of the lamp is very much shortened. An improvement, therefore, in the efficiency of the incandescent lamp can only be obtained by finding some substance which will endure heating to a higher temperature than the carbon filament. Inventors turned their attention many years ago, with this aim, to the refractory oxides and similar substances. Paul Jablochkoff in 1877 described and made a lamp consisting of a piece of kaolin, which was brought to a state of incandescence first by passing over it an electric spark, and afterwards maintained in a state of incandescence by a current of lower electromotive force. Lane Fox and Edison, in 1878, proposed to employ platinum wires covered with films of lime, magnesia, steatite, or with the rarer oxides, zirconia, thoria, &c.; and Lane Fox, in 1879, suggested as an incandescent substance a mixture of particles of carbon with the earthy oxides. These earthy oxides—magnesia, lime and the oxides of the rare earths, such as thoria, zirconia, erbia, yttria, &c.—possess the peculiarity that at ordinary temperatures they are practically non-conductors, but at very high temperatures their resistance at a certain point rapidly falls, and they become fairly good conductors. Hence if they can once be brought into a state of incandescence a current can pass through them and maintain them in that state. But at this temperature they give up oxygen to carbon; hence no mixtures of earthy oxides with carbon are permanent when heated, and failure has attended all attempts to use a carbon filament covered with such substances as thoria, zirconia or other of the rare oxides.

Nernst lamp. H. W. Nernst in 1897, however, patented an incandescent lamp in which the incandescent body consists entirely of a slender rod or filament of magnesia. If such a rod is heated by the oxyhydrogen blowpipe to a high temperature it becomes conductive, and can then be maintained in an intensely luminous condition by passing a current through it after the flame is withdrawn. Nernst found that by mixing together, in suitable proportions, oxides of the rare earths, he was able to prepare a material which can be formed into slender rods and threads, and which is rendered sufficiently conductive to pass a current with an electromotive force as low as 100 volts, merely by being heated for a few moments with a spirit lamp, or even by the radiation from a neighbouring platinum spiral brought to a state of incandescence.

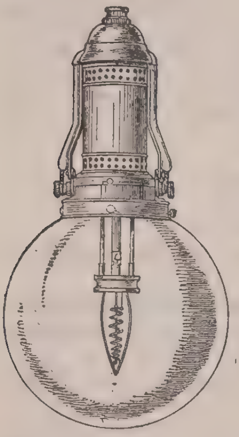

FIG. 17.—Nernst Lamp A Type.

The Nernst lamp, therefore (fig. 17), consists of a slender rod of the mixed oxides attached to platinum wires by an oxide paste. Oxide filaments of this description are not enclosed in an exhausted glass vessel, and they can be brought, without risk of destruction, to a temperature considerably higher than a carbon filament; hence the lamp has a higher luminous efficiency. The material now used for the oxide rod or "glower" of Nernst lamps is a mixture of zirconia and yttria, made into a paste and squirted or pressed into slender rods. This material is non-conductive when cold, but when slightly heated it becomes conductive and then falls considerably in resistance. The glower, which is straight in some types of the lamp but curved in others, is generally about 3 or 4 cm. long and 1 or 2 mm. in diameter. It is held in suitable terminals, and close to it, or round it, but not touching it, is a loose coil of platinum wire, also covered with oxide and called the "heater" (fig. 18). In series with it is a spiral of iron wire, enclosed in a bulb full of hydrogen, which is called the "ballast resistance." The socket also contains a switch controlled by an electromagnet. When the current is first switched on it passes through the heater coil which, becoming incandescent, by radiation heats the glower until it becomes conductive. The glower then takes current, becoming itself brilliantly incandescent, and the electromagnet becoming energized switches the heater coil out of circuit. The iron ballast wire increases in resistance with increase of current, and so operates to keep the total current through the glower constant in spite of small variations of circuit voltage. The disadvantages of the lamp are (1) that it does not light immediately after the current is switched on and is therefore not convenient for domestic use; (2) that it cannot be made in small light units such as 5 c.p.; (3) that the socket and fixture are large and more complicated than for the carbon filament lamp. But owing to the higher temperature, the light is whiter than that of the carbon glow lamp, and the efficiency or candle power per watt is greater. Since, however, the lamp must be included in an opal globe, some considerable part of this last advantage is lost. On the whole the lamp has found its field of operation rather in external than in domestic lighting.

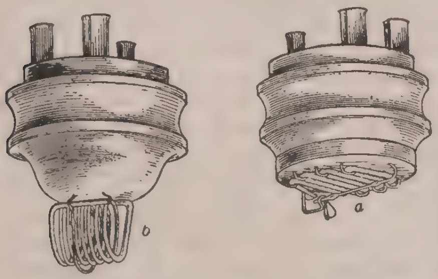

FIG. 18.—Nernst Lamp, Burners for B Type. *a*, low voltage; *b*, high voltage.

Metallic filament lamps. Great efforts were made in the latter part of the 19th century and the first decade of the 20th to find a material for the filament of an incandescent lamp which could replace carbon and yet not require a preliminary heating like the oxide glowers. This resulted in the production of refractory metallic filament lamps made of osmium, tantalum, tungsten and other rare metals. Auer von Welsbach suggested the use of osmium. This metal cannot be drawn into wire on account of its brittleness, but it can be made into a filament by mixing the finely divided metal with an organic binding material which is carbonized in the usual way at a high temperature, the osmium particles then cohering. The difficulty has hitherto been to construct in this way metallic filament lamps of low candle power (16 c.p.) for 220 volt circuits, but this is being overcome. When used on modern supply circuits of 220 volts a number of lamps may be run in series, or a step-down transformer employed.

The next great improvement came when W. von Bolton produced the tantalum lamp in 1904. There are certain metals known to have a melting point about 2000° C. or upwards, and of these tantalum is one. It can be produced from the potassium tantalo-fluoride in a pulverulent form. By carefully melting it *in vacuo* it can then be converted into the reguline form and drawn into wire. In this condition it has a density of 16·6 (water=1), is harder than platinum and has greater tensile strength than steel, viz. 95 kilograms per sq. mm., the value for good steel being 70 to 80 kilograms per sq. mm. The electrical resistance at 15° C. is 0·146 ohms per metre with section of 1 sq. mm. after annealing at 1900° C. *in vacuo* and therefore about 6 times that of mercury; the temperature coefficient is 0·3 per degree C. At the temperature assumed in an incandescent lamp when working at 1·5 watts per c.p. the resistance is 0·830 ohms per metre with a section of 1 sq. mm. The specific heat is 0·0365. Bolton invented methods of producing tantalum in the form of a long fine wire 0·05 mm. in diameter. To make a 25 c.p. lamp 650 mm., or about 2 ft., of this wire are wound backwards and forwards zigzag on metallic supports carried on a glass frame, which is sealed into an exhausted glass bulb. The tantalum lamp so made (fig. 19), working on a 110 volt circuit takes 0·36 amperes or 39 watts, and hence has an efficiency of about 1·6 watts per c.p. The useful life, that is the time in which it loses 20% of its initial candle power, is about 400-500 hours, but in general a life of 800-1000 hours can be obtained. The bulb blackens little in use, but the life is said to be shorter with alternating than with direct current. When worked on alternating current circuits the filament after a time breaks up into sections which become curiously sheared with respect to each other but still maintain electrical contact. The resistance of tantalum increases with the temperature; hence the temperature coefficient is positive, and sudden rises in working voltage do not cause such variations in candle-power as in the case of the carbon lamp.

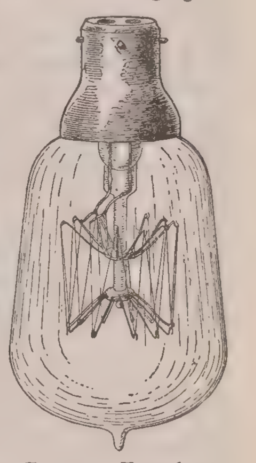

FIG. 19.—Tantalum Lamp.

Patents have also been taken out for lamps made with filaments of such infusible metals as tungsten and molybdenum, and Siemens and Halske, Sanders and others, have protected methods for employing zirconium and other rare metals. According to the patents of Sanders (German patents Nos. 133701, 137568, 137569) zirconium filaments are manufactured from the hydrogen or nitrogen compounds of the rare earths by the aid of some organic binding material. H. Kuzel of Vienna (British Patent No. 28154 of 1904) described methods of making metallic filaments from any metal. He employs the metals in a colloidal condition, either as hydrosol, organosol, gel, or colloidal suspension. The metals are thus obtained in a gelatinous form, and can be squirted into filaments which are dried and reduced to the metallic form by passing an electric current through them (*Electrician*, 57, 894). This process has a wide field of application, and enables the most refractory and infusible metals to be obtained in a metallic wire form. The zirconium and tungsten wire lamps are equal to or surpass the tantalum lamp in efficiency and are capable of giving light, with a useful commercial life, at an efficiency of about one watt per candle. Lamps called osram lamps, with filaments composed of an alloy of osmium and tungsten (wolfram), can be used with a life of 1000 hours when run at an efficiency of about 1·5 watts per candle.

Tungsten lamps are made by the processes of Just and Hanaman (German patent No. 154262 of 1903) and of Kuzel, and at a useful life of 1000 hours, with a falling off in light-giving power of only 10-15%, they have been found to work at an efficiency of one to 1·25 watts per c.p. Further collected information on modern metallic wire lamps and the patent literature thereof will be found in an article in the *Engineer* for December 7, 1906.

Mention should also be made of the Helion filament glow lamp in which the glower is composed largely of silicon, a carbon filament being used as a base. This filament is said to have a number of interesting qualities and an efficiency of about 1 watt per candle (see the *Electrician*, 1907, 58, p. 567).

Mercury vapour lamps.

The mercury vapour lamps of P. Cooper-Hewitt, C. O. Bastian and others have a certain field of usefulness. If a glass tube, highly exhausted, contains mercury vapour and a mercury cathode and iron anode, a current can be passed through it under high electromotive force and will then be maintained when the voltage is reduced. The mercury vapour is rendered incandescent and glows with a brilliant greenish light which is highly actinic, but practically monochromatic, and is therefore not suitable for general illumination because it does not reveal objects in their daylight colours. It is, however, an exceedingly economical source of light. A 3-ampere Cooper-Hewitt mercury lamp has an efficiency of 0·15 to 0·33 watts per candle, or practically the same as an arc lamp, and will burn for several thousand hours. A similar lamp with mercury vapour included in a tube of *uviol* glass specially transparent to ultra-violet light (prepared by Schott & Co. of Jena) seems likely to replace the Finsen arc lamp in the treatment of lupus. Many attempts have been made to render the mercury vapour lamp polychromatic by the use of amalgams of zinc, sodium and bismuth in place of pure mercury for the negative electrode.

Photometry of glow lamps.

An important matter in connexion with glow lamps is their photometry. The arrangement most suitable for the photometry and testing of incandescent lamps is a gallery or room large enough to be occupied by several workers, the walls being painted dead black. The photometer, preferably one of the Lummer-Brodhun form, is set up on a gallery or bench. On one side of it must be fixed a working standard, which as first suggested by Fleming is preferably a large bulb incandescent lamp with a specially "aged" filament. Its candle-power can be compared, at regular intervals and known voltages, with that of some accepted flame standard, such as the 10 candle pentane lamp of Vernon Harcourt. In a lamp factory or electrical laboratory it is convenient to have a number of such large bulb standard lamps. This working standard should be maintained at a fixed distance on one side of the photometer, such that when worked at a standard voltage it creates an illumination of one candle-foot on one side of the photometer disk. The incandescent lamp to be examined is then placed on the other side of the photometer disk on a travelling carriage, so that it can be moved to and fro. Arrangements must be made to measure the current and the voltage of this lamp under test, and this is most accurately accomplished by employing a potentiometer (*q.v.*). The holder which carries the lamp should allow the lamp to be held with its axis in any required position; in making normal measurements the lamp should have its axis vertical, the filament being so situated that none of the turns or loops overlies another as seen from the photometer disk. Observations can then be made of the candle-power corresponding to different currents and voltages.

The candle-power of the lamp varies with the other variables in accordance with exponential laws of the following kind:—

If A is the current in amperes through the lamp, V the voltage or terminal potential difference, W the power absorbed in watts, *c.p.* the maximum candle-power, and *a*, *b*, *c*, &c., constants, it has been found that A and *c.p.* are connected by an exponential law such that

$$c.p. = aA^x$$

For carbon filament lamps x is a number lying between 5 and 6, generally equal to 5·5 or 5·6. Also it has been found that $c.p. = bW^3$ very nearly, and that

$$c.p. = cV^y \text{ nearly}$$

where c is some other constant, and for carbon filaments y is a number nearly equal to 6. It is obvious that if the candle-power of the lamp varies very nearly as the 6th power of the current and of the voltage, the candle-power must vary as the cube of the wattage.

Sir W. de W. Abney and E. R. Festing have also given a formula connecting candle-power and watts equivalent to $c.p. = (W-d)^2$ where d is a constant.

In the case of the tantalum lamp the exponent x has a value near to 6, but the exponent y is a number near to 4, and the same for the osmium filament. Hence for these metallic glowers a certain percentage variation of voltage does not create so great a variation in candle-power as in the case of the carbon lamp.

Curves delineating the relation of these variables for any incandescent lamp are called its *characteristic-curves*. The life or average duration is a function of W/*c.p.*, or of the *watts per candle-power*, and therefore of the voltage at which the lamp is worked. It follows from the above relation that the watts per candle-power vary inversely as the fourth power of the voltage.

From limited observations it seems that the average life of a carbon-filament lamp varies as the fifth or sixth power of the watts per candle-power. If V is the voltage at which the lamp is worked and L is its average life, then L varies roughly as the twenty-fifth power of the reciprocal of the voltage, or

$$L = aV^{-25}.$$

A closer approximation to experience is given by the formula

$$\log_{10}L = 13{\cdot}5 - \frac{V}{10} - \frac{V^2}{20{,}000}.$$

(See J. A. Fleming, "Characteristic Curves of Incandescent Lamps," *Phil. Mag.* May 1885).

Ageing of lamps.

All forms of incandescent or glow lamps are found to deteriorate in light-giving power with use. In the case of carbon filaments this is due to two causes. As already explained, carbon is scattered from the filament and deposited upon the glass, and changes also take place in the filament which cause it to become reduced in temperature, even when subjected to the same terminal voltage. In many lamps it is found that the first effect of running the lamp is slightly to increase its candle-power, even although the voltage be kept constant; this is the result of a small decrease in the resistance of the filament. The heating to which it is subjected slightly increases the density of the carbon at the outset; this has the effect of making the filament lower in resistance, and therefore it takes more current at a constant voltage. The greater part, however, of the subsequent decay in candle-power is due to the deposit of carbon upon the bulb, as shown by the fact that if the filament is taken out of the bulb and put into a new clean bulb the candle-power in the majority of cases returns to its original value. For every lamp there is a certain point in its career which may be called the "smashing-point," when the candle-power falls below a certain percentage of the original value, and when it is advantageous to replace it by a new one. Variations of pressure in the electric supply exercise a prejudicial effect upon the light-giving qualities of incandescent lamps. If glow lamps, nominally of 100 volts, are supplied from a public lighting-station, in the mains of which the pressure varies between 90 and 110 volts, their life will be greatly abbreviated, and they will become blackened much sooner than would be the case if the pressure were perfectly constant. Since the candle-power of the lamp varies very nearly as the fifth or sixth power of the voltage, it follows that a variation of 10% in the electromotive force creates a variation of nearly 50% in the candle-power. Thus a 16 candle-power glow lamp, marked for use at 100 volts, was found on test to give the following candle-powers at voltages varying between 90 and 105: At 105 volts it gave 22·8 c.p.; at 100 volts, 16·7 c.p.; at 95 volts, 12·2 c.p.; and at 90 volts, 8·7 c.p. Thus a variation of 25% in the candle-power was caused by a variation in voltage of only 5%. The same kind of variation in working voltage exercises also a marked effect upon the average duration of the lamp. The following figures show the results of some tests on typical 3·1 watt lamps run at voltages above the normal, taking the average life when worked at the marked volts (namely, 100) as 1000 hours:

At 101 volts the life was	818 hours.
,, 102 ,, ,,	681 ,,
,, 103 ,, ,,	662 ,,
,, 104 ,, ,,	452 ,,
,, 105 ,, ,,	374 ,,
,, 106 ,, ,,	310 ,,

Voltage regulators.

Self-acting regulators have been devised by which the voltage at the points of consumption is kept constant, even although it varies at the point of generation. If, however, such a device is to be effective, it must operate very quickly, as even the momentary effect of increased pressure is felt by the lamp. It is only therefore where the working pressure can be kept exceedingly constant that high-efficiency lamps can be advantageously employed, otherwise the cost of lamp renewals more than counterbalances the economy in the cost of power. The slow changes that occur in the resistance of the filament make themselves evident by an increase in the watts per candle-power. The following table shows some typical figures indicating the results of ageing in a 16 candle-power carbon-filament glow lamp:—

Hours run.	Candle-Power.	Watts per Candle-Power.
0	16·0	3·16
100	15·8	3·26
200	15·86	3·13
300	15·68	3·37
400	15·41	3·53
500	15·17	3·51
600	14·96	3·54
700	14·74	3·74

The gradual increase in watts per candle-power shown by this table does not imply necessarily an increase in the total power taken by the lamp, but is the consequence of the decay in candle-power produced by the blackening of the lamp. Therefore, to estimate the value of an incandescent lamp the user must take into account not merely the price of the lamp and the initial watts per candle-power, but the rate of decay of the lamp.

Edison effect.

The scattering of carbon from the filament to the glass bulb produces interesting physical effects, which have been studied by T. A. Edison, W. H. Preece and J. A. Fleming. If into an ordinary carbon-filament glow lamp a platinum plate is sealed, not connected to the filament but attached to a third terminal, then it is found that when the lamp is worked with continuous current a galvanometer connected in between the middle plate and the positive terminal of the lamp indicates a current, but not when connected in between the negative terminal of the lamp and the middle plate. If the middle plate is placed between the legs of a horse-shoe-shaped filament, it becomes blackened most quickly on the side facing the negative leg. This effect, commonly called the *Edison effect*, is connected with an electric discharge and convection of carbon which takes place between the two extreme ends of the filament, and, as experiment seems to show, consists in the conveyance of an electric charge, either by carbon molecules or by bodies smaller than molecules. There is, however, an electric discharge between the ends of the filament, which rapidly increases with the temperature of the filament and the terminal voltage; hence one of the difficulties of manufacturing high-voltage glow lamps, that is to say, glow lamps for use on circuits having an electromotive force of 200 volts and upwards, is the discharge from one leg of the filament to the other.

Domestic use.

A brief allusion may be made to the mode of use of incandescent lamps for interior and private lighting. At the present time hardly any other method of distribution is adopted than that of an arrangement *in parallel*; that is to say, each lamp on the circuit has one terminal connected to a wire which finally terminates at one pole of the generator, and its other terminal connected to a wire leading to the other pole. The lamp filaments are thus arranged between the conductors like the rungs of a ladder. In series with each lamp is placed a switch and a fuse or cut-out. The lamps themselves are attached to some variety of ornamental fitting, or in many cases suspended by a simple pendant, consisting of an insulated double flexible wire attached at its upper end to a ceiling rose, and carrying at the lower end a shade and socket in which the lamp is placed. Lamps thus hung head downwards are disadvantageously used because their *end-on candle-power* is not generally more than 60% of their maximum candle-power. In interior lighting one of the great objects to be attained is uniformity of illumination with avoidance of harsh shadows. This can only be achieved by a proper distribution of the lamps. It is impossible to give any hard and fast rules as to what number must be employed in the illumination of any room, as a great deal depends upon the nature of the reflecting surfaces, such as the walls, ceilings, &c. As a rough guide, it may be stated that for every 100 sq. ft. of floor surface one 16 candle-power lamp placed about 8 ft. above the floor will give a dull illumination, two will give a good illumination and four will give a brilliant illumination. We generally judge of the nature of the illumination in a room by our ability to read comfortably in any position. That this may be done, the horizontal illumination on the book should not be less than one candle-foot. The following table shows approximately the illuminations in candle-feet, in various situations, derived from actual experiments:—

In a well-lighted room on the floor or tables	1·0 to 3·0 c.f.
On a theatre stage	3·0 to 4·0 c.f.
On a railway platform	·05 to ·5 c.f.
In a picture gallery	·65 to 3·5 c.f.
The mean daylight in May in the interior of a room	30·0 to 40·0 c.f.
In full sunlight	7000 to 10,000 c.f.
In full moonlight	1/60th to 1/100th c.f.

From an artistic point of view, one of the worst methods of lighting a room is by pendant lamps, collected in single centres in large numbers. The lights ought to be distributed in different portions of the room, and so shaded that the light is received only by reflection from surrounding objects. Ornamental effects are frequently produced by means of candle lamps in which a small incandescent lamp, imitating the flame of a candle, is placed upon a white porcelain tube as a holder, and these small units are distributed and arranged in electroliers and brackets. For details as to the various modes of placing conducting wires in houses, and the various precautions for safe usage, the reader is referred to the article ELECTRICITY SUPPLY. In the case of low voltage metallic filament lamps when the supply is by alternating current there is no difficulty in reducing the service voltage to any lower value by means of a transformer. In the case of direct current the only method available for working such low voltage lamps off higher supply voltages is to arrange the lamps in series.

Additional information on the subjects treated above may be found in the following books and original papers:—

Mrs Ayrton, *The Electric Arc* (London, 1900); Houston and Kennelly, *Electric Arc Lighting and Electric Incandescent Lighting*; S. P. Thompson, *The Arc Light*, Cantor Lectures, Society of Arts (1895); H. Nakano, "The Efficiency of the Arc Lamp," *Proc. American Inst. Elec. Eng.* (1889); A. Blondel, "Public and Street Lighting by Arc Lamps," *Electrician*, vols. xxxv. and xxxvi. (1895); T. Heskett, "Notes on the Electric Arc," *Electrician*, vol. xxxix. (1897); G. S. Ram, *The Incandescent Lamp and its Manufacture* (London, 1895); J. A. Fleming, *Electric Lamps and Electric Lighting* (London, 1899); J. A. Fleming, "The Photometry of Electric Lamps," *Jour. Inst. Elec. Eng.* (1903), 32, p. 1 (in this paper a copious bibliography of the subject of photometry is given); J. Dredge, *Electric Illumination* (2 vols., London, 1882, 1885); A. P. Trotter, "The Distribution and Measurement of Illumination," *Proc. Inst. C.E.* vol. cx. (1892); E. L. Nichols, "The Efficiency of Methods of Artificial Illumination," *Trans. American Inst. Elec. Eng.* vol. vi. (1889); Sir W. de W. Abney, *Photometry*, Cantor Lectures, Society of Arts (1894); A. Blondel, "Photometric Magnitudes and Units," *Electrician* (1894); J. E. Petavel, "An Experimental Research on some Standards of Light," *Proc. Roy. Soc.* lxv. 469 (1899); F. Jehl, *Carbon-Making for all Electrical Purposes* (London, 1906); G. B. Dyke, "On the Practical Determination of the Mean Spherical

Candle Power of Incandescent and Arc Lamps," *Phil. Mag.* (1905); the *Preliminary Report of the Sub-Committee of the American Institute of Electrical Engineers* on "Standards of Light"; Clifford C. Paterson, "Investigations on Light Standards and the Present Condition of the High Voltage Glow Lamp," *Jour. Inst. Elec. Eng.* (January 24, 1907); J. Swinburne, "New Incandescent Lamps," *Jour. Inst. Elec. Eng.* (1907); L. Andrews, "Long Flame Arc Lamps," *Jour. Inst. Elec. Eng.* (1906); W. von Bolton and O. Feuerlein, "The Tantalum Lamp," *The Electrician* (Jan. 27, 1905). Also the current issues of *The Illuminating Engineer*. (J. A. F.)

Methods of charging.

Commercial Aspects.—The cost of supplying electricity depends more upon the rate of supply than upon the quantity supplied; or, as John Hopkinson put it, "the cost of supplying electricity for 1000 lamps for ten hours is very much less than ten times the cost of supplying the same number of lamps for one hour." Efforts have therefore been made to devise a system of charge which shall in each case bear some relation to the cost of the service. Consumers vary largely both in respect to the quantity and to the period of their demands, but the cost of supplying any one of them with a given amount of electricity is chiefly governed by the amount of his maximum demand at any one time. The reason for this is that it is not generally found expedient to store electricity in large quantities. Electricity supply works generate the electricity for the most part at the moment it is used by the consumer. Electric lamps are normally in use on an average for only about four hours per day, and therefore the plant and organization, if employed for a lighting load only, are idle and unremunerative for about 20 hours out of the 24. It is necessary to have in readiness machinery capable of supplying the maximum possible requirements of all the consumers at any hour, and this accounts for a very large proportion of the total cost. The cost of raw material, viz. coal, water and stores consumed in the generation of electricity sold, forms relatively only a small part of the total cost, the major part of which is made up of the fixed charges attributable to the time during which the works are unproductive. This makes it very desirable to secure demands possessing high "load" and "diversity" factors. The correct way to charge for electricity is to give liberal rebates to those consumers who make prolonged and regular use of the plant, that is to say, the lower the "peak" demand and the more continuous the consumption, the better should be the discount. The consumer must be discouraged from making sudden large demands on the plant, and must be encouraged, while not reducing his total consumption, to spread his use of the plant over a large number of hours during the year. Mr Arthur Wright has devised a tariff which gives effect to this principle. The system necessitates the use of a special indicator—not to measure the quantity of electricity consumed, which is done by the ordinary meter—but to show the maximum amount of current taken by the consumer at any one time during the period for which he is to be charged. In effect it shows the proportion of plant which has had to be kept on hand for his use. If the indicator shows that say twenty lamps is the greatest number which the consumer has turned on simultaneously, then he gets a large discount on all the current which his ordinary meter shows that he has taken beyond the equivalent of one hour's daily use of those twenty lamps. Generally the rate charged under this system is 7d. per unit for the equivalent of one hour's daily use of the maximum demand and 1d. per unit for all surplus. It is on this principle that it pays to supply current for tramway and other purposes at a price which primâ facie is below the cost of production; it is only apparently so in comparison with the cost of producing electricity for lighting purposes. In the case of tramways the electricity is required for 15 or 16 hours per day. Electricity for a single lamp would cost on the basis of this "maximum-demand-indicator" system for 15 hours per day only 1·86d. per unit. In some cases a system of further discounts to very large consumers is combined with the Wright system. Some undertakers have abandoned the Wright system in favour of average flat rates, but this does not imply any failure of the Wright system; on the contrary, the system, having served to establish the most economical consumption of electricity, has demonstrated the average rate at which the undertakers are able to give the supply at a fair profit, and the proportion of possible new customers being small the undertakers find it a simplification to dispense with the maximum demand indicator. But in some cases a mistake has been made by offering the unprofitable early-closing consumers the option of obtaining electricity at a flat rate much lower than their load-factor would warrant and below cost price. The effect of this is to nullify the Wright system of charging, for a consumer will not elect to pay for his electricity on the Wright system if he can obtain a lower rate by means of a flat rate system. Thus the long-hour profitable consumer is made to pay a much higher price than he need be charged, in order that the unprofitable short-hour consumer may be retained and be made actually still more unprofitable. It is not improbable that ultimately the supply will be charged for on the basis of a rate determined by the size and character of the consumer's premises, or the number and dimensions of the electrical points, much in the same way as water is charged for by a water rate determined by the rent of the consumer's house and the number of water taps.

Wiring of houses.

Most new houses within an electricity supply area are wired for electricity during construction, but in several towns means have to be taken to encourage small shopkeepers and tenants of small houses to use electricity by removing the obstacle of the first outlay on wiring. The cost of wiring may be taken at 15s. to £2 per lamp installed including all necessary wire, switches, fuses, lamps, holders, casing, but not electroliers or shades. Many undertakers carry out wiring on the easy payment or hire-purchase system. Parliament has sanctioned the adoption of these systems by some local authorities and even authorized them to do the work by direct employment of labour. The usual arrangement is to make an additional charge of ½d. per unit on all current used, with a minimum payment of 1s. per 8 c.p. lamp, consumers having the option of purchasing the installation at any time on specified conditions. The consumer has to enter into an agreement, and if he is only a tenant the landlord has to sign a memorandum to the effect that the wiring and fittings belong to the supply undertakers. Several undertakers have adopted a system of maintenance and renewal of lamps, and at least one local authority undertakes to supply consumers with lamps free of charge.

Consumption.

There is still considerable scope for increasing the business of electricity supply by judicious advertising and other methods. Comparisons of the kilowatt hour consumption per capita in various towns show that where an energetic policy has been pursued the profits have improved by reason of additional output combined with increased load factor. The average number of equivalent 8 c.p. lamps connected per capita in the average of English towns is about 1·2. The average number of units consumed per capita per annum is about 23, and the average income per capita per annum is about 5s. In a number of American cities 20s. per capita per annum is obtained. In the United States a co-operative electrical development association canvasses both the general public and the electricity supply undertakers. Funds are provided by the manufacturing companies acting in concert with the supply authorities and contractors, and the spirit underlying the work is to advertise the merits of electricity—not any particular company or interest. Their efforts are directed to securing new consumers and stimulating the increased and more varied use of electricity among actual consumers.

All supply undertakers are anxious to develop the consumption of electricity for power purposes even more than for lighting, but the first cost of installing electric motors is a deterrent to the adoption of electricity in small factories and shops, and most undertakers are therefore prepared to let out motors, &c., on hire or purchase on varying terms according to circumstances.

A board of trade unit will supply one 8 c.p. carbon lamp of 30 hours or 30 such lamps for one hour. In average use an incandescent lamp will last about 800 hours, which is equal to about 12 months normal use; a good lamp will frequently last more than double this time before it breaks down.

A large number of towns have adopted electricity for street lighting. Frank Bailey has furnished particulars of photometric tests which he has made on new and old street lamps in the city of London. From these tests the following comparative figures are deduced:—

	Average total Cost per c.p. per annum.
Gas—	
Double burner ordinary low pressure incandescent (mean of six tests)	11·1d.
Single burner high-pressure gas	9·0
Double burner high-pressure gas	11·7
Arc lamp—	
Old type of lantern	8
Flame arc	5

From these tests of candle-power the illumination at a distance of 100 ft. from the source is estimated as follows:—

	Candle Ft.		Ratio.
Double ordinary incandescent gas lamp illumination	0·013	=	1·0
Single high pressure ordinary incandescent gas lamp illumination	0·016	=	1·24
Double high pressure ordinary incandescent gas lamp illumination	0·027	=	2·10
Ordinary arc lamp	0·060	=	4·50
Flame arc lamp	0·120	=	9·00

The cost of electricity, light for light, is very much less than that of gas. The following comparative figures relating to street lighting at Croydon have been issued by the lighting committee of that corporation:—

Type of Lamp.	Number of Lamps.	Distance apart (yds.)	Total Cost.	Average c.p. per Mile.	Cost per c.p. per annum.
Incandescent gas	2,137	80	£7,062	839	15·86d.
Incandescent electric	90	66	288	1,373	13·71
Electric arcs	428	65	7,212	10,537	11·32

Apart from cheaper methods of generation there are two main sources of economy in electric lighting. One is the improved arrangement and use of electrical installations, and the other is the employment of lamps of higher efficiency. As regards the first, increased attention has been given to the position, candle-power and shading of electric lamps so as to give the most effective illumination in varying circumstances and to avoid excess of light. The ease with which electric lamps may be switched on and off from a distance has lent itself to arrangements whereby current may be saved by switching off lights not in use and by controlling the number of lamps required to be alight at one time on an electrolier. Appreciable economies are brought about by the scientific disposition of lights and the avoidance of waste in use. As regards the other source of economy, the Nernst, the tantalum, the osram, and the metallized carbon filament lamp, although costing more in the first instance than carbon lamps, have become popular owing to their economy in current consumption. Where adopted largely they have had a distinct effect in reducing the rate of increase of output from supply undertakings, but their use has been generally encouraged as tending towards the greater popularity of electric light and an ultimately wider demand. Mercury vapour lamps for indoor and outdoor lighting have also proved their high efficiency, and the use of flame arc lamps has greatly increased the cheapness of outdoor electric lighting.

The existence of a "daylight load" tends to reduce the all-round cost of generating and distributing electricity. This daylight load is partly supplied by power for industrial purposes and partly by the demand for electricity in many domestic operations. The use of electric heating and cooking apparatus (including radiators, ovens, grills, chafing dishes, hot plates, kettles, flat-irons, curling irons, &c.) has greatly developed, and provides a load which extends intermittently throughout the greater part of the twenty-four hours. Electric fans for home ventilation are also used, and in the domestic operations where a small amount of power is required (as in driving sewing machines, boot cleaners, washing machines, mangles, knife cleaners, "vacuum" cleaners, &c.) the electric motor is being largely adopted. The trend of affairs points to a time when the total demand from such domestic sources will greatly exceed the demand for lighting only. The usual charges for current to be used in domestic heating or power operations vary from 1d. to 2d. per unit. As the demand increases the charges will undergo reduction, and there will also be a reflex action in bringing down the cost of electricity for lighting owing to the improved load factor resulting from an increase in the day demand. In the cooking and heating and motor departments also there has been improvement in the efficiency of the apparatus, and its economy is enhanced by the fact that current may be switched on and off as required.

Testing meters.

The Board of Trade are now prepared to receive electric measuring instruments for examination or testing at their electrical standardizing laboratory, where they have a battery power admitting of a maximum current of 7000 amperes to be dealt with. The London county council and some other corporations are prepared upon requisition to appoint inspectors to test meters on consumers' premises.

Wiring rules.

All supply undertakers now issue rules and regulations for the efficient wiring of electric installations. The rules and regulations issued by the institution of electrical engineers have been accepted by many local authorities and companies, and also by many of the fire insurance companies. The Phoenix fire office rules were the first to be drawn up, and are adopted by many of the fire offices, but some other leading insurance offices have their own rules under which risks are accepted without extra premium. In the opinion of the insurance companies "the electric light is the safest of all illuminants and is preferable to any others when the installation has been thoroughly well put up." Regulations have also been issued by the London county council in regard to theatres, &c., by the national board of fire underwriters of America (known as the "National Electrical Code"), by the fire underwriters association of Victoria (Commonwealth of Australia), by the Calcutta fire insurance agents association and under the Canadian Electric Light Inspection Act. In Germany rules have been issued by the Verband Deutscher Elektrotechniker and by the union of private fire insurance companies of Germany, in Switzerland by the Association Suisse des électriciens, in Austria by the Elektrotechnischer Verein of Vienna, in France by ministerial decree and by the syndicat professionel des industries électriques. (For reprints of these regulations see *Electrical Trades Directory*.) (E. Ga.)

LIGHTNING, the visible flash that accompanies an electric discharge in the sky. In certain electrical conditions of the atmosphere a cloud becomes highly charged by the coalescence of drops of vapour. A large drop formed by the fusion of many smaller ones contains the same amount of electricity upon a smaller superficial area, and the electric potential of each drop, and of the whole cloud, rises. When the cloud passes near another cloud stratum or near a hilltop, tower or tree, a discharge takes place from the cloud in the form of lightning. The discharge sometimes takes place from the earth to the cloud, or from a lower to a higher stratum, and sometimes from conductors silently. Rain discharges the electricity quietly to earth, and lightning frequently ceases with rain (see ATMOSPHERIC ELECTRICITY).

LIGHTNING CONDUCTOR, or LIGHTNING ROD (Franklin), the name usually given to apparatus designed to protect buildings or ships from the destructive effects of lightning (Fr. *paratonnerre*, Ger. *Blitzableiter*). The upper regions of the atmosphere being at a different electrical potential from the earth, the thick dense clouds which are the usual prelude to a thunder storm serve to conduct the electricity of the upper air down towards the earth, and an electrical discharge takes place across the air space when the pressure is sufficient. Lightning discharges were distinguished by Sir Oliver Lodge into two distinct types—the *A* and the *B* flashes. The *A* flash is of the simple type which arises when an electrically charged cloud approaches the earth without an intermediate cloud intervening. In the second type *B*, where another cloud intervenes between the cloud carrying the primary charge and the earth, the two clouds practically form a condenser; and when a discharge from the first takes place into the second the free charge on the earth side of the lower cloud is suddenly relieved, and the disruptive discharge from the latter to earth takes such an erratic course that according to the Lightning Research Committee "no series of lightning conductors of the hitherto recognized type suffice to protect the building." In Germany two kinds of lightning stroke have been recognized, one as "zündenden" (causing fire), analogous to the *B* flash, the other as "kalten" (not causing fire), the ordinary *A* discharge. The destructive effect of the former was noticed in 1884 by A. Parnell, who quoted instances of damage due to mechanical force, which he stated in many cases took place in a more or less upward direction.

The object of erecting a number of pointed rods to form a lightning conductor is to produce a glow or brush discharge and thus neutralize or relieve the tension of the thunder-cloud. This, if the latter is of the *A* type, can be successfully accomplished, but sometimes the lightning flash takes place so suddenly that it cannot be prevented, however great the number of points provided, there being such a store of energy in the descending cloud that they are unable to ward off the shock. A *B* flash may ignore the points and strike some metal work in the vicinity; to avoid damage to the structure this must also be connected to the conductors. A single air terminal is of no more use than an inscribed sign-board; besides multiplying the number of points, numerous paths, as well as interconnexions between the conductors, must be arranged to lead the discharge to the earth. The system of pipes and gutters on a roof must be imitated; although a single rain-water pipe would be sufficient to deal with a summer shower, in practice pipes are used in sufficient number to carry off the greatest storm.

Protected Area.—According to Lodge "there is no space near a rod which can be definitely styled an area of protection, for it is possible to receive violent sparks and shocks from the conductor itself, not to speak of the innumerable secondary discharges that are liable to occur in the wake of the main flash." The report of the Lightning Research Committee contains many examples of buildings struck in the so-called "protected area."

Material for Conductors.—Franklin's original rods (1752) were made of iron, and this metal is still employed throughout the continent of Europe and in the United States. British architects, who objected to the unsightliness of the rods, eventually specified copper tape, which is generally run round the sharp angles of a building in such a manner as to increase the chances of the lightning being diverted from the conductor. The popular idea is that to secure the greatest protection a rod of the largest area should be erected, whereas a single large conductor is far inferior to a number of smaller ones and copper as a material is not so suitable for the purpose as iron. A copper rod allows the discharge to pass too quickly and produces a violent shock, whereas iron offers more impedance and allows the flash to leak away by damping down the oscillations. Thus there is less chance of a side flash from an iron than from a copper conductor.

Causes of Failure.—A number of failures of conductors were noticed in the 1905 report of the Lightning Research Committee. One cause was the insufficient number of conductors and earth connexions; another was the absence of any system for connecting the metallic portion of the buildings to the conductors. In some cases the main stroke was received, but damage occurred by side-flash to isolated parts of the roof. There were several examples of large metallic surfaces being charged with electricity, the greater part of which was safely discharged, but enough followed unauthorized paths, such as a speaking-tube or electric bell wires, to cause damage. In one instance a flash struck the building at two points simultaneously; one portion followed the conductor, but the other went to earth jumping from a small finial to a greenhouse 30 ft. below.

Construction of Conductors.—The general conclusions of the Lightning Research Committee agree with the independent reports of similar investigators in Germany, Hungary and Holland. The following is a summary of the suggestions made:—The conductors may be of copper, or of soft iron protected by galvanizing or coated with lead. A number of paths to earth must be provided; well-jointed rain-water pipes may be utilized.

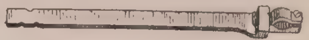

Fig. 1.—Holdfast.

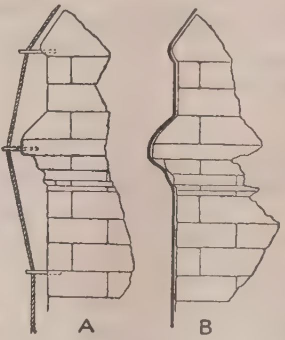

Fig. 2.

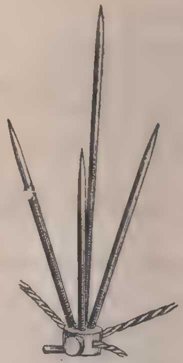

Fig. 3.—Aigrette.

Every chimney stack or other prominence should have an air terminal. Conductors should run in the most direct manner from air to earth, and be kept away from the walls by holdfasts (fig. 1), in the manner shown by A (fig. 2); the usual method is seen in B (fig. 2), where the tape follows the contour of the building and causes side flash. A building with a long roof should also be fitted with a horizontal conductor along the ridge, and to this aigrettes (fig. 3) should be attached; a simpler method is to support the cable by holdfasts armed with a spike (fig. 4). Joints must be held together mechanically as well as electrically, and should be protected from the action of the air. At Westminster Abbey the cables are spliced and inserted in a box which is filled with lead run in when molten.

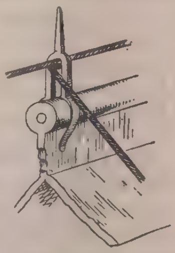

Fig. 4.—Holdfast on Roof.

Earth Connexion.—A copper plate not less than 3 sq. ft. in area may be used as an earth connexion if buried in permanently damp ground. Instead of a plate there are advantages in using the tubular earth shown in fig. 5. The cable packed in carbon descends to the bottom of the perforated tube which is driven into the ground, a connexion being made to the nearest rain-water pipe to secure the necessary moisture. No further attention is required. Plate earths should be tested every year. The number of earths depends on the area of the building, but at least two should be provided. Insulators on the conductor are of no advantage, and it is useless to gild or otherwise protect the points of the air-terminals. As heated air offers a good path for lightning (which is the reason why the kitchen-chimney is often selected by the discharge), a number of points should be fixed to high chimneys and there should be at least two conductors to earth. All roof metals, such as finials, flashings, rain-water gutters, ventilating pipes, cowls and stove pipes, should be connected to the system of conductors. The efficiency of the installation depends on the interconnexion of all metallic parts, also on the quality of the earth connexions. In the case of magazines used for explosives, it is questionable whether the usual plan of erecting rods at the sides of the buildings is efficient. The only way to ensure safety is to enclose the magazine in iron; the

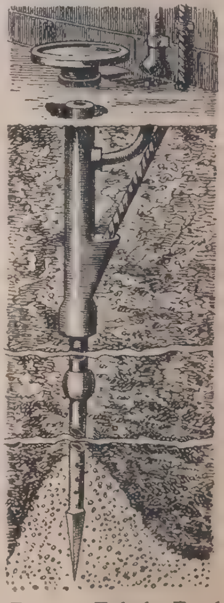

Fig. 5.—Tubular Earth.

next best is to arrange the conductors so that they surround it like a bird cage.

Bibliography.—The literature, although extensive, contains so many descriptions of ludicrous devices, that the student, after reading Benjamin Franklin's *Experiments and Observations on Electricity made at Philadelphia* (1769), may turn to the *Report* of the Lightning Rod Conference of December 1881. In the latter work there are abstracts of many valuable papers, especially the reports made to the French Academy, among others by Coulomb, Laplace, Gay-Lussac, Fresnel, Regnault, &c. In 1876 J. Clerk Maxwell read a paper before the British Association in which he brought forward the idea (based on Faraday's experiments) of protecting a building from the effects of lightning by surrounding it with a sort of cage of rods or stout wire. It was not, however, until the Bath meeting of the British Association in 1888 that the subject was fully discussed by the physical and engineering sections. Sir Oliver Lodge showed the futility of single conductors, and advised the interconnexion of all the metal work on a building to a number of conductors buried in the earth. The action of lightning flashes was also demonstrated by him in lectures delivered before the Society of Arts (1888). The Clerk Maxwell system was adopted to a large extent in Germany, and in July 1901 a sub-committee of the Berlin Electrotechnical Association was formed, which published rules. In 1900 a paper entitled "The Protection of Public Buildings from Lightning," by Killingworth Hedges, led to the formation, by the Royal Institute of British Architects and the Surveyors' Institution, of the Lightning Research Committee, on which the Royal Society and the Meteorological Society were represented. The *Report*, edited by Sir Oliver Lodge, Sir John Gavey and Killingworth Hedges (Hon. Sec.), was published in April 1905. An illustrated supplement, compiled by K. Hedges and entitled *Modern Lightning Conductors* (1905), contains particulars of the independent reports of the German committee, the Dutch Academy of Science, and the Royal Joseph university, Budapest. A description is also given of the author's modified Clerk Maxwell system, in which the metal work of the roofs of a building form the upper part, the rain-water pipes taking the place of the usual lightning-rods. See also Sir Oliver Lodge, *Lightning Conductors* (London, 1902). (K. H.)

Non-Christian religions.

LIGHTS, CEREMONIAL USE OF. The ceremonial use of lights in the Christian Church, with which this article is mainly concerned, probably has a double origin: in a very natural symbolism, and in the adaptation of certain pagan and Jewish rites and customs of which the symbolic meaning was Christianized. Light is everywhere the symbol of joy and of life-giving power, as darkness is of death and destruction. Fire, the most mysterious and impressive of the elements, the giver of light and of all the good things of life, is a thing sacred and adorable in primitive religions, and fire-worship still has its place in two at least of the great religions of the world. The Parsis adore fire as the visible expression of Ahura-Mazda, the eternal principle of light and righteousness; the Brahmans worship it as divine and omniscient.[1] The Hindu festival of Dewālī (Diyawālī, from *diya*, light), when temples and houses are illuminated with countless lamps, is held every November to celebrate Lakhshmi, the goddess of prosperity. In the ritual of the Jewish temple fire and light played a conspicuous part. In the Holy of Holies was a "cloud of light" (*shekinah*), symbolical of the presence of Yahweh, and before it stood the candlestick with six branches, on each of which and on the central stem was a lamp eternally burning; while in the forecourt was an altar on which the sacred fire was never allowed to go out. Similarly the Jewish synagogues have each their eternal lamp; while in the religion of Islam lighted lamps mark things and places specially holy; thus the Kaʽba at Mecca is illuminated by thousands of lamps hanging from the gold and silver rods that connect the columns of the surrounding colonnade.

Greece and Rome.

The Greeks and Romans, too, had their sacred fire and their ceremonial lights. In Greece the *Lampadedromia* or *Lampadephoria* (torch-race) had its origin in ceremonies connected with the relighting of the sacred fire. Pausanias (i. 26, § 6) mentions the golden lamp made by Callimachus which burned night and day in the sanctuary of Athena Polias on the Acropolis, and (vii. 22, §§ 2 and 3) tells of a statue of Hermes Agoraios, in the market-place of Pharae in Achaea, before which lamps were lighted. Among the Romans lighted candles and lamps formed part of the cult of the domestic tutelary deities; on all festivals doors were garlanded and lamps lighted (Juvenal, *Sat.* xii. 92; Tertullian, *Apol.* xxxv.). In the cult of Isis lamps were lighted by day. In the ordinary temples were candelabra, *e.g.* that in the temple of Apollo Palatinus at Rome, originally taken by Alexander from Thebes, which was in the form of a tree from the branches of which lights hung like fruit. In comparing pagan with Christian usage it is important to remember that the lamps in the pagan temples were not symbolical, but votive offerings to the gods. Torches and lamps were also carried in religious processions.

Funeral lamps.

The pagan custom of burying lamps with the dead conveyed no such symbolical meaning as was implied in the late Christian custom of placing lights on and about the tombs of martyrs and saints. Its object was to provide the dead with the means of obtaining light in the next world, a wholly material conception; and the lamps were for the most part unlighted. It was of Asiatic origin, traces of it having been observed in Phoenicia and in the Punic colonies, but not in Egypt or Greece. In Europe it was confined to the countries under the domination of Rome.[2]

Christian symbolism of light.

In Christianity, from the very first, fire and light are conceived as symbols, if not as visible manifestations, of the divine nature and the divine presence. Christ is "the true Light" (John i. 9), and at his transfiguration "the fashion of his countenance was altered, and his raiment was white and glistering" (Luke ix. 29); when the Holy Ghost descended upon the apostles, "there appeared unto them cloven tongues of fire, and it sat upon each of them" (Acts ii. 3); at the conversion of St Paul "there shined round him a great light from heaven" (Acts ix. 3); while the glorified Christ is represented as standing "in the midst of seven candlesticks . . . his head and hairs white like wool, as white as snow; and his eyes as a flame of fire" (Rev. i. 14, 15). Christians are "children of Light" at perpetual war with "the powers of darkness."

The early Church.

All this might very early, without the incentive of Jewish and pagan example, have affected the symbolic ritual of the primitive Church. There is, however, no evidence of any ceremonial use of lights in Christian worship during the first two centuries. It is recorded, indeed (Acts xx. 7, 8), that on the occasion of St Paul's preaching at Alexandria in Troas "there were many lights in the upper chamber"; but this was at night, and the most that can be hazarded is that a specially large number were lighted as a festive illumination, as in modern Church festivals (Martigny, *Dict. des antiqu. Chrét.*). As to a purely ceremonial use, such early evidence as exists is all the other way.

Tertullian and Lactantius.

A single sentence of Tertullian (*Apol.* xxxv.) sufficiently illuminates Christian practice during the 2nd century. "On days of rejoicing," he says, "we do not shade our door-posts with laurels nor encroach upon the day-light with lamps" (*die laeto non laureis postes obumbramus nec lucernis diem infringimus*). Lactantius, writing early in the 4th century, is even more sarcastic in his references to the heathen practice. "They kindle lights," he says, "as though to one who is in darkness. Can he be thought sane who offers the light of lamps and candles to the Author and Giver of all light?" (*Div. Inst.* vi. *de vero cultu*, cap. 2, in Migne, *Patr. lat.* vi. 637).[3] This is primarily an attack on votive lights, and does not necessarily exclude their ceremonial use in other ways. There is, indeed, evidence that they were so used before Lactantius wrote. The 34th canon of the synod of Elvira (305), which was contemporary with him, forbade candles to be lighted in cemeteries during the daytime, which points to an established custom as well as to an objection to it; and in the Roman catacombs lamps have been found of the 2nd and 3rd centuries which seem to have

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[1] "O Fire, thou knowest all things!" See A. Bourquin, "Brahmakarma, ou rites sacrés des Brahmans," in the *Annales du Musée Guimet* (Paris, 1884, t. vii.).

[2] J. Toutain, in Daremberg and Saglio, *Dictionnaire*, *s.v.* "Lucerna."

[3] This is quoted with approval by Bishop Jewel in the homily *Against Peril of Idolatry* (see below).

2nd and 3rd centuries.

been ceremonial or symbolical.[1] Again, according to the *Acta* of St Cyprian (d. 258), his body was borne to the grave *praelucentibus cereis*, and Prudentius, in his hymn on the martyrdom of St Lawrence (*Peristeph.* ii. 71, in Migne, *Patr. lat.* lx. 300), says that in the time of St Laurentius, *i.e.* the middle of the 3rd century, candles stood in the churches of Rome on golden candelabra. The gift, mentioned by Anastasius (*in Sylv.*), made by Constantine to the Vatican basilica, of a *pharum* of gold, garnished with 500 dolphins each holding a lamp, to burn before St Peter's tomb, points also to a custom well established before Christianity became the state religion.

Jerome and Vigilantius.

Whatever previous custom may have been—and for the earliest ages it is difficult to determine absolutely owing to the fact that the Christians held their services at night—by the close of the 4th century the ceremonial use of lights had become firmly and universally established in the Church. This is clear, to pass by much other evidence, from the controversy of St Jerome with Vigilantius.

Vigilantius, a presbyter of Barcelona, still occupied the position of Tertullian and Lactantius in this matter. "We see," he wrote, "a rite peculiar to the pagans introduced into the churches on pretext of religion, and, while the sun is still shining, a mass of wax tapers lighted. . . . A great honour to the blessed martyrs, whom they think to illustrate with contemptible little candles (*de vilissimis cereolis*)!" Jerome, the most influential theologian of the day, took up the cudgels against Vigilantius (he "ought to be called Dormitantius"), who, in spite of his fatherly admonition, had dared again "to open his foul mouth and send forth a filthy stink against the relics of the holy martyrs" (*Hier. Ep.* cix. al. 53—*ad Ripuarium Presbyt.*, in Migne, *Patr. lat.* p. 906). If candles are lit before their tombs, are these the ensigns of idolatry? In his treatise *contra Vigilantium* (*Patr. lat.* t. xxiii.) he answers the question with much common sense. There can be no harm if ignorant and simple people, or religious women, light candles in honour of the martyrs. "We are not born, but reborn, Christians," and that which when done for idols was detestable is acceptable when done for the martyrs. As in the case of the woman with the precious box of ointment, it is not the gift that merits reward, but the faith that inspires it. As for lights in the churches, he adds that "in all the churches of the East, whenever the gospel is to be read, lights are lit, though the sun be rising (*jam sole rutilante*), not in order to disperse the darkness, but as a visible sign of gladness (*ad signum laetitiae demonstrandum*)." Taken in connexion with a statement which almost immediately precedes this—"Cereos autem non clara luce accendimus, sicut frustra calumniaris: sed ut noctis tenebras hoc solatio temperemus" (§ 7)—this seems to point to the fact that the ritual use of lights in the church services, so far as already established, arose from the same conservative habit as determined the development of liturgical vestments, *i.e.* the lights which had been necessary at the nocturnal meetings were retained, after the hours of service had been altered, and invested with a symbolical meaning.

Practice in the 4th century.

Already they were used at most of the conspicuous functions of the Church. Paulinus, bishop of Nola (d. 431), describes the altar at the eucharist as "crowned with crowded lights,"[2] and even mentions the "eternal lamp."[3] For their use at baptisms we have, among much other evidence, that of Zeno of Verona for the West,[4] and that of Gregory of Nazianzus for the East.[5] Their use at funerals is illustrated by Eusebius's description of the burial of Constantine,[6] and Jerome's account of that of St Paula.[7] At ordinations they were used, as is shown by the 6th canon of the council of Carthage (398), which decrees that the acolyte is to hand to the newly ordained deacon *ceroferarium cum cereo*. As to the blessing of candles, according to the *Liber pontificalis* Pope Zosimus in 417 ordered these to be blessed,[8] and the Gallican and Mozarabic rituals also provided for this ceremony.[9] The Feast of the Purification of the Virgin, known as Candlemas (*q.v.*), because on this day the candles for the whole year are blessed, was established—according to some authorities—by Pope Gelasius I. about 492. As to the question of "altar lights," however, it must be borne in mind that these were not placed upon the altar, or on a retable behind it, until the 12th century. These were originally the candles carried by the deacons, according to the *Ordo Romanus* (i. 8; ii. 5; iii. 7) seven in number, which were set down either on the steps of the altar, or, later, behind it. In the Eastern Church, to this day, there are no lights on the high altar; the lighted candles stand on a small altar beside it, and at various parts of the service are carried by the lectors or acolytes before the officiating priest or deacon. The "crowd of lights" described by Paulinus as crowning the altar were either grouped round it or suspended in front of it; they are represented by the sanctuary lamps of the Latin Church and by the crown of lights suspended in front of the altar in the Greek.

Eastern Church.

Development of the use.

To trace the gradual elaboration of the symbolism and use of ceremonial lights in the Church, until its full development and systematization in the middle ages, would be impossible here. It must suffice to note a few stages in the process. The burning of lights before the tombs of martyrs led naturally to their being burned also before relics and lastly before images and pictures. This latter practice, hotly denounced as idolatry during the iconoclastic controversy (see Iconoclasm), was finally established as orthodox by the second general council of Nicaea (787), which restored the worship of images. A later development, however, by which certain lights themselves came to be regarded as objects of worship and to have other lights burned before *them*, was condemned as idolatrous by the synod of Noyon in 1344.[10] The passion for symbolism extracted ever new meanings out of the candles and their use. Early in the 6th century Ennodius, bishop of Pavia, pointed out the three-fold elements of a wax-candle (*Opusc.* ix. and x.), each of which would make it an offering acceptable to God; the rush-wick is the product of pure water, the wax is the offspring of virgin bees,[11] the flame is sent from heaven.[12] Clearly, wax was a symbol of the Blessed Virgin and the holy humanity of Christ. The later middle ages developed the idea. Durandus, in his *Rationale*, interprets the wax as the body of Christ, the wick as his soul, the flame as his divine nature; and the consuming candle as symbolizing his passion and death.

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[1] This symbolism—whatever it was—was not pagan, *i.e.* the lamps were not placed in the graves as part of the furniture of the dead—in the Catacombs they are found only in the niches of the galleries and the arcosolia—nor can they have been votive in the sense popularized later.

[2] "Clara coronantur densis altaria lychnis" (*Poem. De S. Felice natalitium*, xiv. 99, in Migne, *Patr. lat.* lxi. 467).

[3] "Continuum scyphus est argenteus aptus ad usum."

[4] "Sal, ignis et oleum" (Lib. i. Tract. xiv. 4, in Migne, xi. 358).

[5] *In sanct. Pasch.* c. 2; Migne, *Patr. graeca*, xxxvi. 624).

[6] *φῶτα τ' ἐφάψαντες κύκλῳ ἐπὶ σκευῶν χρυσῶν, θαυμαστὸν θέαμα τοῖς ὁρῶσι παρεῖχον* (*Vita Constantini*, iv. 66).

[7] "Cum alii Pontifices lampadas cereosque proferrent, alii choras psallentium ducerent" (Ep. cviii. *ad Eustochium virginem*, in Migne).

[8] This may be the paschal candle only. In some codices the text runs: "Per parochias concessit licentiam benedicendi Cereum Paschalem" (Du Cange, *Glossarium*, *s.v.* "Cereum Paschale"). In the three variants of the notice of Zosimus given in Duchesne's edition of the *Lib. pontif.* (1886–1892) the word *cera* is, however, alone used. Nor does the text imply that he gave to the suburbican churches a privilege hitherto exercised by the metropolitan church. The passage runs: "Hic constituit ut diaconi leva tecta haberent de palleis linostimis per parrochias et ut cera benedicatur," &c. *Per parrochias* here obviously refers to the head-gear of the deacons, not to the candles.

[9] See also the *Peregrinatio Sylviae* (386), 86, &c., for the use of lights at Jerusalem, and Isidore of Seville (*Etym.* vii. 12; xx. 10) for the usage in the West. That even in the 7th century the blessing of candles was by no means universal is proved by the 9th canon of the council of Toledo (671), "De benedicendo cereo et lucerna in privilegiis Paschae." This canon states that candles and lamps are not blessed in some churches, and that inquiries have been made why *we* do it. In reply, the council decides that it should be done to celebrate the mystery of Christ's resurrection. See Isidore of Seville, *Conc.*, in Migne, *Pat. lat.* lxxxiv. 369.

[10] Du Cange, *Glossarium*, *s.v.* "Candela."

[11] Bees were believed, like fish, to be sexless.

[12] "Venerandis compactam elementis facem tibi, Domine, mancipamus: in qua trium copula munerum primum de impari numero complacebit: quae quod gratis Deo veniat auctoribus, non habetur incertum: unum quod de fetibus fluminum accedunt nutrimenta flammarum: aliud quod apum tribuit intemerata fecunditas, in quarum partibus nulla partitur damna virginitas: ignis etiam coelo infusus adhibetur" (*Opusc.* x. in Migne, *Patr. lat.* t. lxiii.).

with the "Gentiles Idolators." This pronouncement, indeed, though it certainly condemns the use of ceremonial lights in most of its later developments, and especially the conception of them as votive offerings whether to God or to the saints, does not necessarily exclude, though it undoubtedly discourages, their purely symbolical use.[1] In this connexion it is worth pointing out that the homily against idolatry was reprinted, without alteration and by the king's authority, long after altar lights had been restored under the influence of the high church party supreme at court. Illegal under the Act of Uniformity they seem never to have been. The use of "wax lights and tapers" formed one of the indictments brought by P. Smart, a Puritan prebendary of Durham, against Dr Burgoyne, Cosin and others for setting up "superstitious ceremonies" in the cathedral "contrary to the Act of Uniformity." The indictments were dismissed in 1628 by Sir James Whitelocke, chief justice of Chester and a judge of the King's Bench, and in 1629 by Sir Henry Yelverton, a judge of Common Pleas and himself a strong Puritan (see *Hierurgia Anglicana*, ii pp. 230 seq.). The use of ceremonial lights was among the indictments in the impeachment of Laud and other bishops by the House of Commons, but these were not based on the Act of Uniformity. From the Restoration onwards the use of ceremonial lights, though far from universal, was not unusual in cathedrals and collegiate churches.[2] It was not, however, till the ritual revival of the 19th century that their use was at all widely extended in parish churches. The growing custom met with fierce opposition; the law was appealed to, and in 1872 the Privy Council declared altar lights to be illegal (*Martin* v. *Mackonochie*). This judgment, founded as was afterwards admitted on insufficient knowledge, produced no effect; and, in the absence of any authoritative pronouncement, advantage was taken of the ambiguous language of the Ornaments Rubric to introduce into many churches practically the whole ceremonial use of lights as practised in the pre-Reformation Church. The matter was again raised in the case of *Read and others* v. *the Bishop of Lincoln* (see LINCOLN JUDGMENT), one of the counts of the indictment being that the bishop had, during the celebration of Holy Communion, allowed two candles to be alight on a shelf or retable behind the communion table when they were not necessary for giving light. The archbishop of Canterbury, in whose court the case was heard (1889), decided that the mere presence of two candles on the table, burning during the service but lit before it began, was lawful under the first Prayer-Book of Edward VI. and had never been made unlawful. On the case being appealed to the Privy Council, this particular indictment was dismissed on the ground that the vicar, not the bishop, was responsible for the presence of the lights, the general question of the legality of altar lights being discreetly left open.

The "Lincoln Judgment."

The custom of placing lighted candles round the bodies of the dead, especially when "lying in state," has never wholly died out in Protestant countries, though their significance has long been lost sight of.[3] In the 18th century, moreover, it was still customary in England to accompany a funeral with lighted tapers. Picart (*op. cit.* 1737) gives a plate representing a funeral cortège preceded and accompanied by boys, each carrying four lighted candles in a branched candlestick. There seems to be no record of candles having been carried in other processions in England since the Reformation. The usage in this respect in some "ritualistic" churches is a revival of pre-Reformation ceremonial.

See the article "Lucerna," by J. Toutain in Daremberg and Saglio's *Dict. des antiquités grecques et romaines* (Paris, 1904); J. Marquardt, "Römische Privatalterthümer" (vol. v. of Becker's *Röm. Alterthümer*), ii. 238-301; article "Cièrges et lampes," in the Abbé J. A. Martigny's *Dict. des Antiquités Chrétiennes* (Paris, 1865); the articles "Lichter" and "Koimetarien" (pp. 834 seq) in Herzog-Hauck's *Realencyklopädie* (3rd ed., Leipzig. 1901); the article "Licht" in Wetzer and Welte's *Kirchenlexikon* (Freiburg-i.-B., 1882–1901), an excellent exposition of the symbolism from the Catholic point of view, also "Kerze" and "Lichter"; W. Smith and S. Cheetham, *Dict. of Chr. Antiquities* (London, 1875–1880), i. 939 seq.; in all these numerous further references will be found. See also Mühlbauer, *Gesch. u. Bedeutung der Wachslichter bei den kirchlichen Funktionen* (Augsburg, 1874); V. Thalhofer, *Handbuch der Katholischen Liturgik* (Freiburg-i.-B., 1887), i. 666 seq.; and, for the post-Reformation use in the Church of England, *Hierurgia Anglicana*, new ed. by Vernon Staley (London, 1903). (W. A. P.)

LIGNE, CHARLES JOSEPH, PRINCE DE (1735–1814), soldier and writer, came of a princely family of Hainaut, and was born at Brussels in 1735. As an Austrian subject he entered the imperial army at an early age. He distinguished himself by his valour in the Seven Years' War, notably at Breslau, Leuthen, Hochkirch and Maxen, and after the war rose rapidly to the rank of lieutenant field marshal. He became the intimate friend and counsellor of the emperor Joseph II., and, inheriting his father's vast estates, lived in the greatest splendour and luxury till the War of the Bavarian Succession brought him again into active service. This war was short and uneventful, and the prince then travelled in England, Germany, Italy, Switzerland and France, devoting himself impartially to the courts, the camps, the salons and the learned assemblies of philosophers and scientists in each country. In 1784 he was again employed in military work, and was promoted to Feldzeugmeister. In 1787 he was with Catherine II. in Russia, accompanied her in her journey to the Crimea, and was made a Russian field marshal by the empress. In 1788 he was present at the siege of Belgrade. Shortly after this he was invited to place himself at the head of the Belgian revolutionary movement, in which one of his sons and many of his relatives were prominent, but declined with great courtesy, saying that "he never revolted in the winter." Though suspected by Joseph of collusion with the rebels, the two friends were not long estranged, and after the death of the emperor the prince remained in Vienna. His Brabant estates were overrun by the French in 1792–1793, and his eldest son killed in action at La Croix-du-Bois in the Argonne (September 14, 1792). He was given the rank of field marshal (1809) and an honorary command at court, living in spite of the loss of his estates in comparative luxury and devoting himself to literary work. He lived long enough to characterize the proceedings of the congress of Vienna with the famous *mot*: "Le Congrès danse mais ne marche pas." He died at Vienna on the 13th of December 1814. His grandson, Eugene Lamoral de Ligne (1804–1880), was a distinguished Belgian statesman.

His collected works appeared in thirty-four volumes at Vienna during the last years of his life (*Mélanges militaires, littéraires, sentimentaires*), and he bequeathed his manuscripts to the emperor's Trabant Guard, of which he was captain (*Œuvres posthumes*, Dresden and Vienna, 1817). Selections were published in French and German (*Œuvres choisies de M. le prince de Ligne* (Paris, 1809); *Lettres et pensées du Maréchal Prince de Ligne*, ed. by Madame de Staël (1809); *Œuvres historiques, littéraires . . . correspondance et poésies diverses* (Brussels, 1859); *Des Prinzen Karl von Ligne militärische Werke*, ed. Count Pappenheim (Sulzbach, 1814). The most important of his numerous works on all military subjects is the *Fantaisies et préjugés militaires*, which originally appeared in 1780. A modern edition is that published by J. Dumaine (Paris, 1879). A German version (*Militärische Vorurtheile und Phantasien*, &c.) appeared as early as 1783. This work, though it deals lightly and cavalierly with the most important subjects (the prince even proposes to found an international academy of the art of war, wherein the reputation of generals could be impartially weighed), is a military classic, and indispensable to the students of the post-Frederician period. On the whole, it may be said that the prince adhered to the school of Guibert (*q.v.*), and a full discussion will be found in Max Jähns' *Gesch. d. Kriegswissenschaften*, iii. 2091 et seq. Another very celebrated work by the prince is the mock autobiography of Prince Eugene (1809).

See *Revue de Bruxelles* (October 1839); Reiffenberg, "Le Feld-maréchal Prince Charles Joseph de Ligne," *Mémoires de l'académie de Bruxelles*, vol. xix.; Peetermans, *Le Prince de Ligne, ou un écrivain grand seigneur* (Liége, 1857), *Études et notices historiques concernant l'histoire des Pays Bas*, vol. iii. (Brussels, 1890); *Mémoires*

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[1] This homily, written by Bishop Jewel, is largely founded on Bullinger's *De origine erroris in Divinorum et sacrorum cultu* (1528, 1539).

[2] A copper-plate in Bernard Picart's *Ceremonies and Religious Customs of the Various Nations* (Eng. trans., London, 1737), vi. pt. 1, p. 78, illustrating an Anglican Communion service at St Paul's, shows two lighted candles on the holy table.

[3] In some parts of Scotland it is still customary to place two lighted candles on a table beside a corpse on the day of burial.

et publications de la Société des Sciences, &c., du Hainault, vol. iii., 5th series; Dublet *Le Prince de Ligne et ses contemporains* (Paris, 1889), Wurzbach, *Biogr. Lexikon d. Kaiserth. Österr* (Vienna, 1858); Hirtenfeld, *Der Militär-Maria-Theresien-Orden*, vol. i. (Vienna, 1857), Ritter von Rettersberg, *Biogr. d ausgezeichnetsten Feldherren* (Prague, 1829); Schweigerd, *Österr. Helden*, vol. iii. (Vienna, 1854); Thürheim, *F. M. Karl Joseph Fürst de Ligne* (Vienna, 1877).

LIGNITE (Lat. *lignum*, wood), an imperfectly formed coal, usually brownish in colour, and always showing the structure of the wood from which it was derived (see Coal).

LIGONIER, JOHN (Jean Louis) **LIGONIER**, Earl (1680–1770), British Field Marshal, came of a Huguenot family of Castres in the south of France, members of which emigrated to England at the close of the 17th century. He entered the army as a volunteer under Marlborough. From 1702 to 1710 he was engaged, with distinction, in nearly every important battle and siege of the war. He was one of the first to mount the breach at the siege of Liége, commanded a company at the Schellenberg and at Blenheim, and was present at Menin (where he led the storming of the covered way), Ramillies, Oudenarde and Malplaquet (where he received twenty-three bullets through his clothing and remained unhurt). In 1712 he became governor of Fort St Philip, Minorca, and in 1718 was adjutant-general of the troops employed in the Vigo expedition, where he led the stormers of Fort Marin. Two years later he became colonel of the "Black Horse" (now 7th Dragoon Guards), a command which he retained for 29 years. His regiment soon attained an extraordinary degree of efficiency. He was made brigadier-general in 1735, major-general in 1739, and accompanied Lord Stair in the Rhine Campaign of 1742–1743. George II. made him a Knight of the Bath on the field of Dettingen. At Fontenoy Ligonier commanded the British foot, and acted throughout the battle as adviser to the duke of Cumberland. During the "Forty-Five" he was called home to command the British army in the Midlands, but in January 1746 was placed at the head of the British and British-paid contingents of the Allied army in the Low Countries. He was present at Roucoux (11th Oct. 1746), and, as general of horse, at Val (1st July 1747), where he led the last charge of the British cavalry. In this encounter his horse was killed, and he was taken prisoner, but was exchanged in a few days. With the close of the campaign ended Ligonier's active career, but (with a brief interval in 1756–1757) he occupied various high civil and military posts to the close of his life. In 1757 he was made, in rapid succession, commander-in-chief, colonel of the 1st Foot Guards (now Grenadier Guards), and a peer of Ireland under the title of Viscount Ligonier of Enniskillen, a title changed in 1762 for that of Clonmell. From 1759 to 1762 he was master-general of the Ordnance, and in 1763 he became Baron, and in 1766 Earl, in the English peerage. In the latter year he became field marshal. He died in 1770. His younger brother, Francis, was also a distinguished soldier; and his son succeeded to the Irish peerage of Lord Ligonier.

See Combes, *J. L. Ligonier, une étude* (Castres, 1866), and the histories of the 7th Dragoon Guards and Grenadier Guards.

LIGUORI, ALFONSO MARIA DEI (1696–1787), saint and doctor of the Church of Rome, was born at Marianella, near Naples, on the 27th of September 1696, being the son of Giuseppe dei Liguori, a Neapolitan noble. He began life at the bar, where he obtained considerable practice; but the loss of an important suit, in which he was counsel for a Neapolitan noble against the grand duke of Tuscany, and in which he had entirely mistaken the force of a leading document, so mortified him that he withdrew from the legal world. In 1726 he entered the Congregation of Missions as a novice, and became a priest in 1726. In 1732 he founded the "Congregation of the Most Holy Redeemer" at Scala, near Salerno; the headquarters of the Order were afterwards transferred to Nocera dei Pagani. Its members, popularly called Liguorians or Redemptorists, devote themselves to the religious instruction of the poor, more especially in country districts; Liguori specially forbade them to undertake secular educational work. In 1750 appeared his celebrated devotional book on the *Glories of Mary*; three years later came his still more celebrated treatise on moral theology. In 1755 this was much enlarged and translated into Latin under the title of *Homo Apostolicus*. In 1762, at the express desire of the pope, he accepted the bishopric of Sant' Agata dei Goti, a small town in the province of Benevent; though he had previously refused the archbishopric of Palermo. Here he worked diligently at practical reforms, being specially anxious to raise the standard of clerical life and work. In 1775 he resigned his bishopric on the plea of enfeebled health; he retired to his Redemptorists at Nocera, and died there in 1787. In 1796 Pius VI. declared him "venerable"; he was beatified by Pius VII. in 1816, canonized by Gregory XVI. in 1839, and finally declared one of the nineteen "Doctors of the Church" by Pius IX. in 1871.

Liguori is the chief representative of a school of casuistry and devotional theology still abundantly represented within the Roman Church. Not that he was in any sense its founder. He was simply a fair representative of the Italian piety of his day—amiable, ascetic in his personal habits, indefatigable in many forms of activity, and of more than respectable abilities; though the emotional side of his character had the predominance over his intellect. He was learned, as learning was understood among the Italian clergy of the 18th century; but he was destitute of critical faculty, and the inaccuracy of his quotations is proverbial. In his casuistical works he was a diligent compiler, whose avowed design was to take a middle course between the two current extremes of severity and laxity. In practice, he leant constantly towards laxity. Eighteenth-century Italy looked on religion with apathetic indifference, and Liguori convinced himself that only the gentlest and most lenient treatment could win back the alienated laity; hence he was always willing to excuse errors on the side of laxity as due to an excess of zeal in winning over penitents. Severity, on the other hand, seemed to him not only inexpedient, but positively wrong. By making religion hard it made it odious, and thus prepared the way for unbelief. Like all casuists, he took for granted that morality was a recondite science, beyond the reach of all but the learned. When a layman found himself in doubt, his duty was not to consult his conscience, but to take the advice of his confessor; while the confessor himself was bound to follow the rules laid down by the casuistical experts, who delivered themselves of a kind of "counsel's opinion" on all knotty points of practical morality. But experts proverbially differ: what was to be done when they disagreed? Suppose, for instance, that some casuists held it wrong to dance on Sunday, while others held it perfectly lawful. In Liguori's time there were four ways of answering the question. Strict moralists—called rigorists, or "tutiorists"—maintained that the austerer opinion ought always to be followed; dancing on Sundays was certainly wrong, if any good authorities had declared it to be so. Probabiliorists maintained that the more general opinion ought to prevail, irrespectively of whether it was the stricter or the laxer; dancing on Sunday was perfectly lawful, if the majority of casuists approved it. Probabilists argued that any opinion might be followed, if it could show good authority on its side, even if there was still better authority against it; dancing on Sunday must be innocent, if it could show a fair sprinkling of eminent names in its favour. The fourth and last school—the "laxists"—carried this principle a step farther, and held that a practice must be unobjectionable, if it could prove that any one "grave Doctor" had defended it; even if dancing on Sunday had hitherto lain under the ban of the church, a single casuist could legitimate it by one stroke of his pen. Liguori's great achievement lay in steering a middle course between these various extremes. The gist of his system, which is known as "equiprobabilism," is that the more indulgent opinion may always be followed, whenever the authorities in its favour are as good, or nearly as good, as those on the other side. In this way he claimed that he had secured liberty in its rights without allowing it to degenerate into licence. However much they might personally disapprove, zealous priests could not forbid their parishioners to dance on Sunday, if the practice had won widespread toleration; on the other hand, they could not relax the usual discipline of the church on the strength of a few unguarded opinions of too indulgent casuists. Thus the Liguorian system surpassed all its predecessors in securing uniformity in the confessional on a basis of established usage, two advantages amply sufficient to ensure its speedy general adoption within the Church of Rome.

Lives by A. M. Tannoja, a pupil of Liguori's (3 vols., Naples, 1798–1802); new ed., Turin, 1857; French trans., Paris, 1842); P. v. A. Giattini (Rome, 1815: Ger trans., Vienna, 1835); F. W. Faber (4 vols., London, 1848–1849); M. A. Hugues (Münster, 1857); O. Gisler (Einsiedeln, 1887); K. Dilgskron (2 vols., Regensburg, 1887), perhaps the best; A. Capecelatro (2 vols., Rome, 1893); A. des Retours (Paris, 1903); A. C. Berthe (St Louis, 1906).

Works (*a*) Collected editions. Italian: (Monza, 1819, 1828; Venice, 1830; Naples, 1840 ff.; Turin, 1887, ff.). French: (Tournai, 1855 ff., new ed., 1895 ff.) German: (Regensburg, 1842–1847). English: (22 vols., New York, 1887–1895). Editions of the *Theologia Moralis* and other separate works are very numerous. (*b*) *Letters*: (2 vols., Monza, 1831; 3 vols., Rome, 1887 ff.). See also Meyrick, *Moral and Devotional Theology of the Church of Rome, according to the Teaching of S. Alfonso de Liguori* (London, 1857), and art. Casuistry. (St. C.)

LIGURES BAEBIANI, in ancient geography, a settlement of Ligurians in Samnium, Italy. The towns of Taurasia and Cisauna in Samnium had been captured in 298 B.C. by the consul L. Cornelius Scipio Barbatus, and the territory of the former remained Roman state domain. In 180 B.C. 47,000 Ligurians from the neighbourhood of Luna (Ligures Apuani), with women and children, were transferred to this district, and two settlements were formed taking their names from the consuls of 181 B.C., the Ligures Baebiani and the Ligures Corneliani. The site of the former town lies 15 m. N. of Beneventum, on the road to Saepinum and Aesernia. In its ruins several inscriptions have been found, notably a large bronze tablet discovered in a public building in the Forum bearing the date A.D. 101, and relating to the alimentary institution founded by Trajan here (see Veleia). A sum of money was lent to landed proprietors of the district (whose names and estates are specified in the inscription), and the interest which it produced formed the income of the institution, which, on the model of that of Veleia, would have served to support a little over one hundred children. The capital was 401,800 sesterces, and the annual interest probably at 5%, *i.e.* 20,090 sesterces (£4018 and £201 respectively). The site of the other settlement—that of the Ligures Corneliani—is unknown.

See T. Mommsen in *Corp. Inscr. Lat.* ix. (Berlin, 1883), 125 sqq. (T. As.)

LIGURIA, a modern territorial division of Italy, lying between the Ligurian Alps and the Apennines on the N., and the Mediterranean on the S. and extending from the frontier of France on the W. to the Gulf of Spezia on the E. Its northern limits touch Piedmont and Lombardy, while Emilia and Tuscany fringe its eastern borders, the dividing line following as a rule the summits of the mountains. Its area is 2037 sq. m. The railway from Pisa skirts the entire coast of the territory, throwing off lines to Parma from Sarzana and Spezia, to Milan and Turin from Genoa, and to Turin from Savona, and there is a line from Ventimiglia to Cuneo and Turin by the Col di Tenda. Liguria embraces the two provinces of Genoa and Porto Maurizio (Imperia), which once formed the republic of Genoa. Its sparsely-peopled mountains slope gently northward towards the Po, descending, however, abruptly into the sea at several points; the narrow coast district, famous under the name of the Riviera (*q.v.*), is divided at Genoa into the Riviera di Ponente towards France, and the Riviera di Levante towards the east. Its principal products are wheat, maize, wine, oranges, lemons, fruits, olives and potatoes, though the olive groves are being rapidly supplanted by flower-gardens, which grow flowers for export. Copper and iron pyrites are mined. The principal industries are iron-works, foundries, iron shipbuilding, engineering, and boiler works (Genoa, Spezia, Sampierdarena, Sestri Ponente, &c.), the production of cocoons, and the manufacture of cottons and woollens. Owing to the sheltered situation and the mildness of their climate, many of the coast towns are chosen by thousands of foreigners for winter residence, while the Italians frequent them in summer for sea-bathing. The inhabitants have always been adventurous seamen—Columbus and Amerigo Vespucci were Genoese,—and the coast has several good harbours, Genoa, Spezia and Savona being the best. In educational and general development, Liguria stands high among the regions of Italy. The populations of the respective provinces and their chief towns are, according to the census of 1901 (*popolazione residente* or *legale*)—province of Genoa, pop. 931,156; number of communes 197; chief towns—Genoa (219,507), Spezia (66,263), Savona (38,648), Sampierdarena (34,084), Sestri Ponente (17,225). Province of Porto Maurizio, pop. 144,604, number of communes 106; chief towns—Porto Maurizio (7207), S. Remo (20,027), Ventimiglia (11,468), Oneglia (8252). Total for Liguria, 1,075,760.

The Ligurian coast became gradually subject to the Romans, and the road along it must have been correspondingly prolonged: up to the end of the Hannibalic war the regular starting-point for Spain by sea was Pisae, in 195 B.C. it was the harbour of Luna (Gulf of Spezia),[1] though Genua must have become Roman a little before this time, while, in 137 B.C., C. Hostilius Mancinus marched as far as Portus Herculis (Villafranca), and in 121 B.C. the province of Gallia Narbonensis was formed and the coast-road prolonged to the Pyrenees. In 14 B.C. Augustus restored the whole road from Placentia to Dertona (Via Postumia), and thence to Vada Sabatia (Via Aemilia [2]) and the River Varus (Var), so that it thenceforth took the name of Via Julia Augusta (see Aemilia, Via [2]). The other chief roads of Liguria were the portion of the Via Postumia from Dertona to Genua, a road from above Vada through Augusta Bagiennorum and Pollentia to Augusta Taurinorum, and another from Augusta Taurinorum to Hasta and Valentia. The names of the villages—Quarto, Quinto, &c.—on the south-east side and Pontedecimo on the north of Genoa allude to their distance along the Roman roads. The Roman Liguria, forming the ninth region of Augustus, was thus far more extensive than the modern, including the country on the north slopes of the Apennines and Maritime Alps between the Trebia and the Po, and extending a little beyond Albintimilium. On the west Augustus formed the provinces of the Alpes Maritimae and the Alpes Cottiae. Towns of importance were few, owing to the nature of the country. Dertona was the only colony, and Alba Pompeia, Augusta Bagiennorum, Pollentia, Hasta, Aquae Statiellae, and Genua may also be mentioned; but the Ligurians dwelt entirely in villages, and were organized as tribes. The mountainous character of Liguria made the spread of culture difficult; it remained a forest district, producing timber, cattle, ponies, mules, sheep, &c. Oil and wine had to be imported, and when the cultivation of the olive began is not known.

The arrangement made by Augustus lasted until the time of Diocletian, when the two Alpine provinces were abolished, and the watershed became the boundary between Italy and Gaul. At this time we find the name Liguria extended as far as Milan, while in the 6th century the old Liguria was separated from it, and under the Lombards formed the fifth Italian province under the name of Alpes Cottiae. In the middle ages the ancient Liguria north of the Apennines fell to Piedmont and Lombardy, while that to the south, with the coast strip, belonged to the republic of Genoa. (T. As.)

Archaeology and Philology.—It is clear that in earlier times the Ligurians occupied a much more extensive area than the Augustan region; for instance Strabo (i. 2, 92; iv. 1, 7) gives earlier authorities for their possession of the land on which the Greek colony of Massalia (Marseilles) was founded; and Thucydides (vi. 2) speaks of a settlement of Ligurians in Spain who expelled the Sicani thence. Southward their domain extended as far as Pisa on the coast of Etruria and Arretium inland in the time of Polybius (ii. 6), and a somewhat vague reference in Lycophron (line 1351) to the Ligurians as enemies of the founders of Agylla (*i.e.* Caere) suggests that they once occupied even a larger tract to the south. Seneca (*Cons ad Helv.* vii. 9), states that the population of Corsica was partly Ligurian. By combining traditions recorded by Dionysius (i. 22; xiv. 37) and others (*e.g.* Serv. *ad. Aen.* xi. 317) as having been held by Cato the Censor and by Philistus of Syracuse (385 B.C.) respectively, Professor Ridgeway (*Who were the Romans?* London, 1908, p. 3) decides in favour of identifying the Ligurians with a tribe called the Aborigines who occupy a large place in the early traditions of Italy (see Dionysius i. cc. 10 ff.); and who may at all events be regarded with reasonable certainty as constituting an early pre-Roman and pre-Tuscan stratum in the population of Central Italy (see Latium). For a discussion of this question see Volsci. Ridgeway holds that the language of the Ligurians, as well as their antiquities, was identical with that of the early Latins, and with that of the Plebeians of Rome (as contrasted with that of the Patrician or Sabine element), see Rome: *History* (*ad. init.*). The archaeological side of this important question is difficult. Although great progress has been made with the study of the different strata of remains in prehistoric Italy and of those of Liguria itself (see for instance the excellent *Introduction à l'histoire romaine* by Basile Modestov (Paris, 1907, p. 122 ff.) and W. Ridgeway's *Early Age of Greece*, p. 240 ff.) no general agreement has been reached among archaeologists as to the particular races who are to be identified as the authors of the early strata, earlier, that is, than that stratum which represents the Etruscans.

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[1] The dividing line between Liguria and Etruria was the lower course of the river Macra (Magra), so that, while the harbour of Luna was in the former, Luna itself was in the latter.

On the linguistic side some fairly certain conclusions have been reached. D'Arbois de Jubainville (*Les Premiers habitants de l'Europe*, ed. 2, Paris, 1889–1894) pointed out the great frequency of the suffix *-asco-* (and *-usco-*) both in ancient and in modern Ligurian districts, and as far north as *Caranusca* near Metz, and also in the eastern Alps and in Spain. He pointed out also, what can scarcely be doubted, that the great mass of the Ligurian proper names (*e.g.* the streams *Vinelasca*, *Porcobera*, *Comberanea*; *mons Tuledo*; *Venascum*), have a definite Indo-European character. Farther Karl Müllenhof in vol. iii. of his *Deutsche Alterthumskunde* (Berlin, 1898) made a careful collection of the proper names reserved in Latin inscriptions of the Ligurian districts, such as the *Tabula Genuatium* (*C.I.L.* i. 99) of 117 B.C. A complete collection of all Ligurian place and personal names known has been made by S. Elizabeth Jackson, B.A., and the collection is to be combined with the inscriptional remains of the district in *The Pre-Italic Dialects*, edited by R. S. Conway (see *The Proceedings of the British Academy*). Following Kretschmer *Kuhn's Zeitschrift* (xxxviii. 97), who discussed several inscriptions found near Ornavasso (Lago Maggiore) and concluded that they showed an Indo-European language, Conway, though holding that the inscriptions are more Celtic than Ligurian, pointed out strong evidence in the ancient place names of Liguria that the language spoken there in the period which preceded the Roman conquest was Indo-European, and belonged to a definite group, namely, languages which preserved the original *q* as Latin did, and did not convert it into *p* as did the Umbro-Safine tribes. The same is probably true of Venetia (see Veneti), and of an Indo-European language preserved on inscriptions found at Coligny and commonly referred to the Sequani (see *Comptes Rendus de l'Ac. d'Insc.*, Paris, 1897, 703; E. B. Nicholson, *Sequanian*, London, 1898; Thurneysen, *Zeitschr. f. Kelt. Phil.*, 1899, 523). Typically Ligurian names are *Quiamelius*, which contains the characteristic Ligurian word *melo-* "stone" as in *mons Blustiemelus* (*C.I.L.* v. 7749), *Intimelium* and the modern *Vintimiglia*. The tribal names *Soliceli*, *Stoniceli*, clearly contain the same element as Lat. *aequi-coli* (dwellers on the plain), *sati-cola*, &c., namely *quel-*, cf. Lat. *in-quil-inus*, *colo*, Gr. πολεῖν, τέλλεσθαι. And it should be added that the Ligurian ethnica show the prevailing use of the two suffixes -*co*- and -*ati*-, which there is reason to refer to the pre-Roman stratum of population in Italy (see Volsci).

Besides the authorities already cited the student may be referred to C. Pauli, *Altitalische Studien*, vol. i., especially for the alphabet of the insc.; W. Ridgeway, *Who were the Romans?* (followed by the abstract of a paper by the present writer) in *The Proceedings of the British Academy*, vol. iii. p. 42; and to W. H. Hall's, *The Romans on the Riviera and the Rhone* (London, 1898); Issel's *La Liguria geologica e preistorica* (Genoa, 1892). A further batch of Celto-Ligurian inscriptions from Giubiasco near Bellinzona (Canton Ticino) is published by G. Herbig, in the *Anzeiger f. Schweizer. Altertumskunde*, vii. (1905–1906), p. 187; and one of the same class by Elia Lattes, *Di un' Iscriz. ante-Romana trovata a Carcegna sul Lago d' Orta* (*Atti d. r. Accad. d. Scienze di Torino*, xxxix., Feb. 1904). (R. S. C.)

LI HUNG CHANG (1823–1901), Chinese statesman, was born on the 16th of February 1823 at Hofei, in Ngan-hui. From his earliest youth he showed marked ability, and when quite young he took his bachelor degree. In 1847 he became a Tsin-shi, or graduate of the highest order, and two years later was admitted into the imperial Hanlin college. Shortly after this the central provinces of the empire were invaded by the Taiping rebels, and in defence of his native district he raised a regiment of militia, with which he did such good service to the imperial cause that he attracted the attention of Tsêng Kuo-fan, the generalissimo in command. In 1859 he was transferred to the province of Fu-kien, where he was given the rank of taotai, or intendant of circuit. But Tsêng had not forgotten him, and at his request Li was recalled to take part against the rebels. He found his cause supported by the "Ever Victorious Army," which, after having been raised by an American named Ward, was finally placed under the command of Charles George Gordon. With this support Li gained numerous victories leading to the surrender of Suchow and the capture of Nanking. For these exploits he was made governor of Kiangsu, was decorated with a yellow jacket, and was created an earl. An incident connected with the surrender of Suchow, however, left a lasting stain upon his character. By an arrangement with Gordon the rebel wangs, or princes, yielded Nanking on condition that their lives should be spared. In spite of the assurance given them by Gordon, Li ordered their instant execution. This breach of faith so aroused Gordon's indignation that he seized a rifle, intending to shoot the falsifier of his word, and would have done so had not Li saved himself by flight. On the suppression of the rebellion (1864) Li took up his duties as governor, but was not long allowed to remain in civil life. On the outbreak of the rebellion of the Nienfei, a remnant of the Taipings, in Ho-nan and Shan-tung (1866) he was ordered again to take the field, and after some misadventures he succeeded in suppressing the movement. A year later he was appointed viceroy of Hukwang, where he remained until 1870, when the Tientsin massacre necessitated his transfer to the scene of the outrage. He was, as a natural consequence, appointed to the viceroyalty of the metropolitan province of Chihli, and justified his appointment by the energy with which he suppressed all attempts to keep alive the anti-foreign sentiment among the people. For his services he was made imperial tutor and member of the grand council of the empire, and was decorated with many-eyed peacocks' feathers.

To his duties as viceroy were added those of the superintendent of trade, and from that time until his death, with a few intervals of retirement, he practically conducted the foreign policy of China. He concluded the Chifu convention with Sir Thomas Wade (1876), and thus ended the difficulty caused by the murder of Mr Margary in Yunnan; he arranged treaties with Peru and Japan, and he actively directed the Chinese policy in Korea. On the death of the emperor T'ungchi in 1875 he, by suddenly introducing a large armed force into the capital, effected a *coup d'état* by which the emperor Kwang Sü was put on the throne under the tutelage of the two dowager empresses; and in 1886, on the conclusion of the Franco-Chinese war, he arranged a treaty with France. Li was always strongly impressed with the necessity of strengthening the empire, and when viceroy of Chihli he raised a large well-drilled and well-armed force, and spent vast sums both in fortifying Port Arthur and the Takú forts and in increasing the navy. For years he had watched the successful reforms effected in Japan and had a well-founded dread of coming into conflict with that empire. But in 1894 events forced his hand, and in consequence of a dispute as to the relative influence of China and Japan in Korea, war broke out. The result proved the wisdom of Li's fears. Both on land and at sea the Chinese forces were ignominiously routed, and in 1895, on the fall of Wei-hai-wei, the emperor sued for peace. With characteristic subterfuge his advisers suggested as peace envoys persons whom the mikado very properly and promptly refused to accept, and finally Li was sent to represent his imperial master at the council assembled at Shimonoseki. With great diplomatic skill Li pleaded the cause of his country, but finally had to agree to the cession of Formosa, the Pescadores, and the Liaotung peninsula to the conquerors, and to the payment of an indemnity of 200,000,000 taels. By a subsequent arrangement the Liaotung peninsula was restored to China, in exchange for an increased indemnity. During the peace discussions at Shimonoseki, as Li was being borne through the narrow streets of the town, a would-be assassin fired a pistol point-blank in his face. The wound inflicted was not serious, and after a few days' rest Li was able to take up again the suspended negotiations. In 1896 he represented the emperor at the coronation of the tsar, and visited Germany, Belgium, France, England, and the United States of America. For some time after his return to China his services were demanded at Peking, where he was virtually constituted minister for foreign affairs; but in 1900 he was transferred to Canton as viceroy of the two Kwangs. The Boxer movement, however, induced the emperor to recall him to the capital, and it was mainly owing to his exertions that, at the conclusion of the outbreak, a protocol of peace was signed in September 1901. For many months his health had been failing, and he died on the 7th of November 1901. He left three sons and one daughter. (R. K. D.)

LILAC,[1] or Pipe Tree (*Syringa vulgaris*), a tree of the olive family, Oleaceae. The genus contains about ten species of ornamental hardy deciduous shrubs native in eastern Europe and temperate Asia. They have opposite, generally entire leaves and large panicles of small regular flowers, with a bell-shaped calyx and a 4-lobed cylindrical corolla, with the two stamens characteristic of the order attached at the mouth of the tube. The common lilac is said to have come from Persia in the 16th century, but is doubtfully indigenous in Hungary, the borders of Moldavia, &c. Two kinds of *Syringa*, viz. *alba* and *caerulea*, are figured and described by Gerard (*Herball*, 1597), which he calls the white and the blue pipe privets. The former is the common privet, *Ligustrum vulgare*, which, and the ash tree, *Fraxinus excelsior*, are the only members of the family native in Great Britain. The latter is the lilac, as both figure and description agree accurately with it. It was carried by the European colonists to north-east America, and is still grown in gardens of the northern and middle states.

There are many fine varieties of lilac, both with single and double flowers; they are among the commonest and most beautiful of spring-flowering shrubs. The so-called Persian lilac of gardens (*S. dubia*, *S. chinensis* var. *Rothomagensis*), also known as the Chinese or Rouen lilac, a small shrub 4 to 6 ft. high with intense violet flowers appearing in May and June, is considered to be a hybrid between *S. vulgaris* and *S. persica*—the true Persian lilac, a native of Persia and Afghanistan, a shrub 4 to 7 ft. high with bluish-purple or white flowers. Of other species, *S. Josikaea*, from Transylvania, has scentless bluish-purple flowers; *S. Emodi*, a native of the Himalayas, is a handsome shrub with large ovate leaves and dense panicles of purple or white strongly scented flowers. Lilacs grow freely and flower profusely in almost any soil and situation, but when neglected are apt to become choked with suckers which shoot up in great numbers from the base. They are readily propagated by means of these suckers.

Syringa is also a common name for the mock-orange *Philadelphus coronarius* (nat. ord. Saxifragaceae), a handsome shrub 2 to 10 ft. high, with smooth ovate leaves and clusters of white flowers which have a strong orange-like scent. It is a native of western Asia, and perhaps some parts of southern Europe.

LILBURNE, JOHN (*c.* 1614–1657), English political agitator, was the younger son of a gentleman of good family in the county of Durham. At the age of twelve he was apprenticed to a clothier in London, but he appears to have early addicted himself to the "contention, novelties, opposition of government, and violent and bitter expressions" for which he afterwards became so conspicuous as to provoke the saying of Harry Marten (the regicide) that, "if the world was emptied of all but John Lilburn, Lilburn would quarrel with John, and John with Lilburn." He appears at one time to have been law-clerk to William Prynne. In February 1638, for the part he had taken in importing and circulating *The Litany* and other publications of John Bastwick and Prynne, offensive to the bishops, he was sentenced by the Star Chamber to be publicly whipped from the Fleet prison to Palace Yard, Westminster, there to stand for two hours in the pillory, and afterwards to be kept in gaol until a fine of £500 had been paid. He devoted his enforced leisure to his favourite form of literary activity, and did not regain his liberty until November 1640, one of the earliest recorded speeches of Oliver Cromwell being made in support of his petition to the House of Commons (Nov. 9, 1640). In 1641 he received an indemnity of £3000. He now entered the army, and in 1642 was taken prisoner at Brentford and tried for his life; sentence would no doubt have been executed had not the parliament by threatening reprisals forced his exchange. He soon rose to the rank of lieutenant-colonel, but in April 1645, having become dissatisfied with the predominance of Presbyterianism, and refusing to take the covenant, he resigned his commission, presenting at the same time to the Commons a petition for considerable arrears of pay. His violent language in Westminster Hall about the speaker and other public men led in the following July to his arrest and committal to Newgate, whence he was discharged, however, without trial, by order of the House, in October. In January 1647 he was committed to the Tower for accusations against Cromwell, but was again set at liberty in time to become a disappointed spectator of the failure of the "Levellers" or ultrademocratic party in the army at the Ware rendezvous in the following November. The scene produced a deep impression on his mind, and in February 1649 he along with other petitioners presented to the House of Commons a paper entitled *The Serious Apprehensions of a part of the People on behalf of the Commonwealth*, which he followed up with a pamphlet, *England's New Chains Discovered*, criticizing Ireton, and another exposing the conduct of Cromwell, Ireton and other leaders of the army since June 1647 (*The Hunting of the Foxes from Newmarket and Triploe Heath to Whitehall by Five Small Beagles*, the "beagles" being Lilburne, Richard Overton, William Walwyn, Prince and another). Finally, the *Second Part of England's New Chains Discovered*, a violent outburst against "the dominion of a council of state, and a constitution of a new and unexperienced nature," became the subject of discussion in the House, and led anew to the imprisonment of its author in the Tower on the 11th of April. His trial in the following October, on a charge of seditious and scandalous practices against the state, resulted in his unanimous acquittal, followed by his release in November. In 1650 he was advocating the release of trade from the restrictions of chartered companies and monopolists.

In January 1652, for printing and publishing a petition against Sir Arthur Hesilrige and the Haberdashers' Hall for what he conceived to have been an injury done to his uncle George Lilburne in 1649, he was sentenced to pay fines amounting to £7000, and to be banished the Commonwealth, with prohibition of return under the pain of death. In June 1653 he nevertheless came back from the Low Countries, where he had busied himself in pamphleteering and such other agitation as was possible, and was immediately arrested; the trial, which was protracted from the 13th of July to the 20th of August, issued in his acquittal, to the great joy of London, but it was nevertheless thought proper to keep him in captivity for "the peace of the nation." He was detained successively in the Tower, in Jersey, in Guernsey and in Dover Castle. At Dover he came under Quaker influence, and signified his readiness at last to be done with "carnal sword fightings and fleshly bustlings and contests"; and in 1655, on giving security for his good behaviour, he was set free. He now settled at Eltham in Kent, frequently preaching at Quaker meetings in the neighbourhood during the brief remainder of his troubled life. He died on the 29th of August 1657.

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[1] The Span. *lilac*, Fr. *lilac*, mod. *lilas*, are adapted from Arab. *lilak*, Pers. *līlak*, variant of *nilak*, of a blue colour, *nil*, blue, the indigo-plant.

His brother, Colonel Robert Lilburne, was among those who signed the death-warrant of Charles I. In 1656 he was M.P. for the East Riding of Yorkshire, and at the restoration was sentenced to lifelong imprisonment.

See D. Masson, *Life of Milton* (iv. 120); Clement Walker (*History of Independency*, ii. 247); W. Godwin (*Commonwealth*, iii. 163-177), and Robert Bisset (*Omitted Chapters of the History of England*, 191-251).

LILIACEAE, in botany, a natural order of Monocotyledons belonging to the series Liliiflorae, and generally regarded as representing the typical order of Monocotyledons. The plants are generally perennial herbs growing from a bulb or rhizome, sometimes shrubby as in butcher's broom (*Ruscus*) or tree-like as in species of *Dracaena*, *Yucca* or *Aloe*. The flowers are with few exceptions hermaphrodite, and regular with parts in threes (fig. 5), the perianth which is generally petaloid occupying the two outer whorls, followed by two whorls of stamens, with a superior ovary of three carpels in the centre of the flower; the ovary is generally three-chambered and contains an indefinite number of anatropous ovules on axile placentas (see fig. 2). The fruit is a capsule splitting along the septa (septicidal) (fig. 1), or between them (loculicidal), or a berry (fig. 6, *3*); the seeds contain a small embryo in a copious fleshy or cartilaginous endosperm. Liliaceae is one of the larger orders of flowering plants containing about 2500 species in 200 genera; it is of world-wide distribution. The plants show great diversity in vegetative structure, which together with the character and mode of dehiscence of the fruit afford a basis for the subdivision of the order into tribes, eleven of which are recognized. The following are the most important tribes.

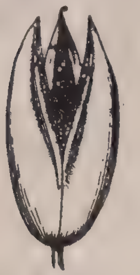


FIG. 1.—Fruit or Capsule of Meadow Saffron (*Colchicum autumnale*) dehiscing along the septa.

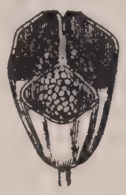


FIG. 2.—Same cut across showing the three chambers with the seeds attached along the middle line—axile placentation.

Melanthoideae.—The plants have a rhizome or corm, and the fruit is a capsule. It contains 36 genera, many of which are north temperate and three are represented in Britain, viz. *Tofieldia*, an arctic and alpine genus of small herbs with a slender scape springing from a tuft of narrow ensiform leaves and bearing a raceme of small green flowers; *Narthecium* (bog-asphodel), herbs with a habit similar to *Tofieldia*, but with larger golden-yellow flowers; and *Colchicum*, a genus with about 30 species including the meadow saffron or autumn crocus (*C. autumnale*). *Colchicum* illustrates the corm-development which is rare in Liliaceae though common in the allied order Iridaceae; a corm is formed by swelling at the base of the axis (figs. 3, 4) and persists after the flowers and leaves, bearing next season's plant as a lateral shoot in the axil of a scale-leaf at its base. *Gloriosa*, well known in cultivation, climbs by means of its tendril-like leaf-tips; it has handsome flowers with decurved orange-red or yellow petals; it is a native of tropical Asia and Africa. *Veratrum* is an alpine genus of the north temperate zone.

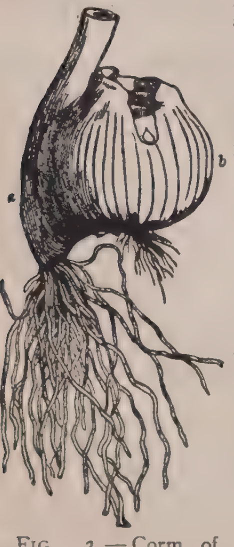


FIG. 3.—Corm of Meadow Saffron (*Colchicum autumnale*). *a*, Old corm shrivelling; *b*, young corm produced laterally from the old one.

Asphodeloideae.—The plants generally have a rhizome bearing radical leaves, as in asphodel, rarely a stem with a tuft of leaves as in *Aloe*, very rarely a tuber (*Eriospermum*) or bulb (*Bowiea*). The flowers are borne in a terminal raceme, the anthers open introrsely and the fruit is a capsule, very rarely, as in *Dianella*, a berry. It contains 64 genera. *Asphodelus* (asphodel) is a Mediterranean genus; *Simethis*, a slender herb with grassy radical leaves, is a native of west and southern Europe extending into south Ireland. *Anthericum* and *Chlorophytum*, herbs with radical often grass-like leaves and scapes bearing a more or less branched inflorescence of small generally white flowers, are widely spread in the tropics. Other genera are *Funkia*, native of China and Japan, cultivated in the open air in Britain; *Hemerocallis*, a small genus of central Europe and temperate Asia—*H. flava* is known in gardens as the day lily; *Phormium*, a New Zealand genus to which belongs New Zealand flax, *P. tenax*, a useful fibre-plant; *Kniphofia*, South and East Africa, several species of which are cultivated; and *Aloe*. A small group of Australian genera closely approach the order Juncaceae in having small crowded flowers with a scarious or membranous perianth; they include *Xanthorrhoea* (grass-tree or black-boy) and *Kingia*, arborescent plants with an erect woody stem crowned with a tuft of long stiff narrow leaves, from the centre of which rises a tall dense flower-spike or a number of stalked flower-heads; this group has been included in Juncaceae, from which it is doubtfully distinguished only by the absence of the long twisted stigmas which characterize the true rushes.

Allioideae.—The plants grow from a bulb or short rhizome; the inflorescence is an apparent umbel formed of several shortened monochasial cymes and subtended by a pair of large bracts. It contains 22 genera, the largest of which *Allium* has about 250 species—7 are British; *Agapanthus* or African lily is a well-known garden plant; in *Gagea*, a genus of small bulbous herbs found in most parts of Europe, the inflorescence is reduced to a few flowers or a single flower; *G. lutea* is a local and rare British plant.

Lilioideae.—Bulbous plants with a terminal racemose inflorescence; the anthers open introrsely and the capsule is loculicidal. It contains 28 genera, several being represented in Britain. The typical genus *Lilium* and *Fritillaria* are widely distributed in the temperate regions of the northern hemisphere; *F. meleagris*, snake's head, is found in moist meadows in some of the southern and central English counties; *Tulipa* contains more than 50 species in Europe and temperate Asia, and is specially abundant in the dry districts of central Asia; *Lloydia*, a small slender alpine plant, widely distributed in the northern hemisphere, occurs on Snowdon in Wales; *Scilla* (squill) is a large genus, chiefly in Europe and Asia—*S. nutans* is the bluebell or wild hyacinth; *Ornithogalum* (Europe, Africa and west Asia) is closely allied to *Scilla*—*O. umbellatum*, star of Bethlehem, is naturalized in Britain; *Hyacinthus* and *Muscari* are chiefly Mediterranean; *M. racemosum*, grape hyacinth, occurs in sandy pastures in the eastern counties of England. To this group belong a number of tropical and especially South African genera such as *Albuca*, *Urginea*, *Drimia*, *Lachenalia* and others.

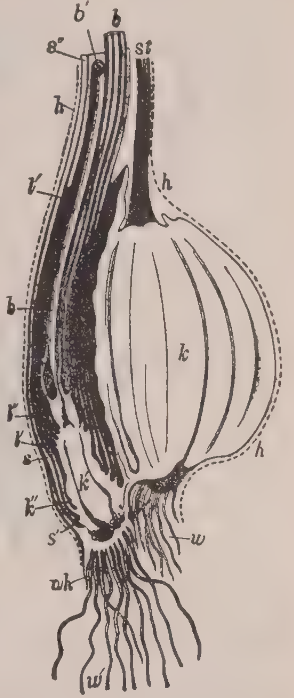


FIG. 4.—Corm of *Colchicum autumnale* in autumn when the plant is in flower.

k,	Present corm.
h, *h*,	Brown scales covering it.
w,	Its roots.
st,	Its withered flowering stem.
k′,	Younger corm produced from *k*.
wh,	Roots from *k′*, which grows at expense of *k*.
s, *s′*, *s″*,	Sheathing leaves.
l′, *l″*,	Foliage leaves.
b, *b′*,	Flowers.
k″,	Young corm produced from *k′*, in autumn, which in succeeding autumn will produce flowers.

Dracaenoideae.—The plants generally have an erect stem with a crown of leaves which are often leathery; the anthers open introrsely and the fruit is a berry or capsule. It contains 9 genera, several of which, such as *Yucca* (fig. 5), *Dracaena* and *Cordyline* include arborescent species in which the stem increases in thickness continually by a centrifugal formation of new tissue; an extreme case is afforded by *Dracaena Draco*, the dragon-tree of Teneriffe. *Yucca* and several allied genera are natives of the dry country of the southern and western United States and of Central America. *Dracaena* and the allied genus *Cordyline* occur in the warmer regions of the Old World. There is a close relation between the pollination of many yuccas and the life of a moth (*Pronuba yuccasella*); the flowers are open and scented at night when the female moth becomes active, first collecting a load of pollen and then depositing her eggs, generally in a different flower from that which has supplied the pollen. The eggs are deposited in the ovary-wall, usually just below an ovule; after each deposition the moth runs to the top of the pistil and thrusts some pollen into the opening of the stigma.

Development of larva and seed go on together, a few of the seeds serving as food for the insect, which when mature eats through the pericarp and drops to the ground, remaining dormant in its cocoon until the next season of flowering when it emerges as a moth.

Asparagoideae.—Plants growing from a rhizome; fruit a berry. *Asparagus* contains about 100 species in the dryer warmer parts of the Old World; it has a short creeping rhizome, from which springs a slender, herbaceous or woody, often very much branched, erect or climbing stem, the ultimate branches of which are flattened or needle-like leaf-like structures (*cladodes*), the true leaves being reduced to scales or, in the climbers, forming short, hard more or less recurved spines. *Ruscus aculeatus* (fig. 6) is butcher's broom, an evergreen shrub with flattened leaf-like cladodes, native in the southerly portion of England and Wales; the small flowers are unisexual and borne on the face of the cladode; the male contains three stamens, the filaments of which are united to form a short stout column on which are seated the diverging cells of the anthers; in the female the ovary is enveloped by a fleshy staminal tube on which are borne three barren anthers. *Polygonatum* and *Maianthemum* are allied genera with a herbaceous leafy stem and, in the former axillary flowers, in the latter flowers in a terminal raceme; both occur rarely in woods in Britain; *P. multiflorum* is the well-known Solomon's seal of gardens (fig. 7), so called from the seal-like scars on the rhizome of stems of previous seasons, the hanging flowers of which contain no honey, but are visited by bees for the pollen. *Convallaria* is lily of the valley; *Aspidistra*, native of the Himalayas, China and Japan, is a well-known pot plant; its flowers depart from the normal arrangement of the order in having the parts in fours (tetramerous). *Paris*, including the British Herb Paris (*P. quadrifolia*), has solitary tetra- to polymerous flowers terminating the short annual shoot which bears a whorl of four or more leaves below the flower; in this and in some species of the nearly allied genus *Trillium* (chiefly temperate North America) the flowers have a fetid smell, which together with the dark purple of the ovary and stigmas and frequently also of the stamens and petals, attracts carrion-loving flies, which alight on the stigma and then climb the anthers and become dusted with pollen; the pollen is then carried to the stigmas of another flower.

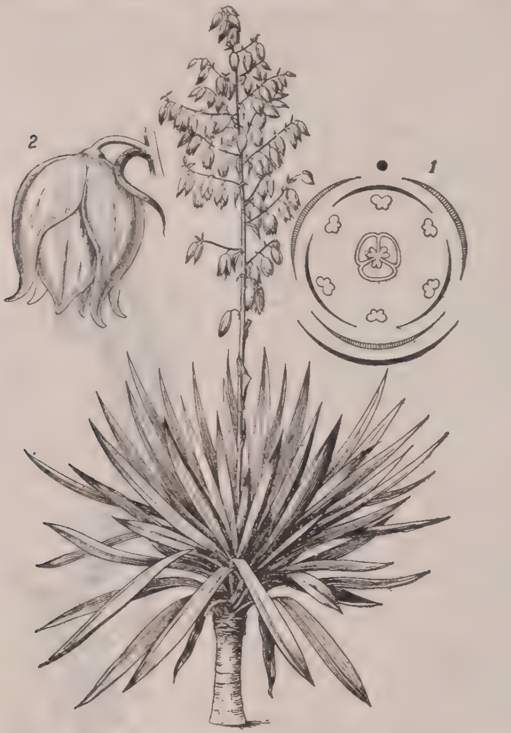


FIG. 5.—*Yucca gloriosa.* Plant much reduced. 1, Floral diagram. 2, Flower.

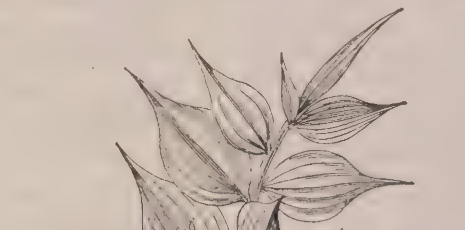
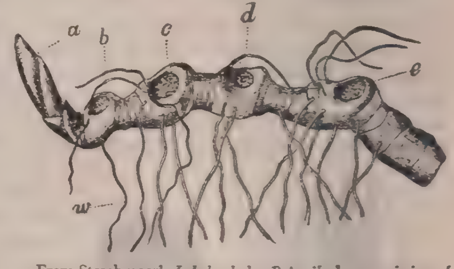


FIG. 6.—Twig of Butcher's Broom, *Ruscus aculeatus*, slightly enlarged. 1, Male flower, 2, female flower, both enlarged; 3, berry, slightly reduced.



From Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 7.—Rhizome of *Polygonatum multiflorum*.

a, Bud of next year's aerial shoot.
b, Scar of this year's, and *c*, *d*, *e*, scars of three preceding years' aerial shoots.
w, Roots.

Luzuriagoideae are shrubs or undershrubs with erect or climbing branches and fruit a berry. *Lapageria*, a native of Chile, is a favourite greenhouse climber with fine bell-shaped flowers.

Smilacoideae are climbing shrubs with broad net-veined leaves and small dioecious flowers in umbels springing from the leaf-axils; the fruit is a berry. They climb by means of tendrils, which are stipular structures arising from the leaf-sheath. *Smilax* is a characteristic tropical genus containing about 200 species; the dried roots of some species are the drug sarsaparilla.

The two tribes *Ophiopogonoideae* and *Aletroideae* are often included in a distinct order, Haemodoraceae. The plants have a short rhizome and narrow or lanceolate basal leaves; and they are characterized by the ovary being often half-inferior. They contain a few genera chiefly old world tropical and subtropical. The leaves of species of *Sansevieria* yield a valuable fibre.

Liliaceae may be regarded as the typical order of the series Liliiflorae. It resembles Juncaceae in the general plan of the flower, which, however, has become much more elaborate and varied in the form and colour of its perianth in association with transmission of pollen by insect agency; a link between the two orders is found in the group of Australian genera referred to above under Asphodeloideae. The tribe Ophiopogonoideae, with its tendency to an inferior ovary, suggests an affinity with the Amaryllidaceae which resemble Liliaceae in habit and in the horizontal plan of the flower, but have an inferior ovary. The tribe Smilacoideae, shrubby climbers with net-veined leaves and small unisexual flowers, bears much the same relationship to the order as a whole as does the order Dioscoreaceae, which have a similar habit, but flowers with an inferior ovary, to the Amaryllidaceae.

LILIENCRON, DETLEV VON (1844–1909), German poet and novelist, was born at Kiel on the 3rd of June 1844. He entered the army and took part in the campaigns of 1866 and 1870–71, in both of which he was wounded. He retired with the rank of captain and spent some time in America, afterwards settling at Kellinghusen in Holstein, where he remained till 1887. After some time at Munich, he settled in Altona and then at Altrahlstedt, near Hamburg. He died in July 1909. He first attracted attention by the volume of poems, *Adjutantenritte und andere Gedichte* (1883), which was followed by several unsuccessful dramas, a volume of short stories, *Eine Sommerschlacht* (1886), and a novel *Breide Hummelsbüttel* (1887). Other collections of short stories appeared under the titles *Unter flatternden Fahnen* (1888), *Der Mäcen* (1889), *Krieg und Frieden* (1891); of lyric poetry in 1889, 1890 (*Der Heidegänger und andere Gedichte*), 1893, and 1903 (*Bunte Beute*). Interesting, too, is the humorous epic *Poggfred* (1896; 2nd ed. 1904). Liliencron is one of the most eminent of recent German lyric poets; his *Adjutantenritte*, with its fresh original note, broke with the well-worn literary conventions which had been handed down from the middle of the century. Liliencron's work is, however, somewhat unequal, and he lacks the sustained power which makes the successful prose writer.

Liliencron's *Sämtliche Werke* have been published in 14 vols. (1904–1905); his *Gedichte* having been previously collected in four volumes under the titles *Kampf und Spiele*, *Kämpfe und Ziele*, *Nebel und Sonne* and *Bunte Beute* (1897–1903). See O. J. Bierbaum, *D. von Liliencron* (1892); H. Greinz, *Liliencron, eine literarhistorische Würdigung* (1896); F. Oppenheimer, *D. von Liliencron* (1898).

LILITH (Heb. *lilâtu*, "night"; hence "night-monster"), a female demon of Jewish folk-lore, equivalent to the English vampire. The personality and name are derived from a Babylonian-Assyrian demon Lilit or Lilu. Lilith was believed to have a special power for evil over children. The superstition was extended to a cult surviving among some Jews even as late as the 7th century A.D. In the Rabbinical literature Lilith becomes the first wife of Adam, but flies away from him and becomes a demon.

LILLE, a city of northern France, capital of the department of Nord, 154 m. N. by E. of Paris on the Northern railway. Pop. (1906) 196,624. Lille is situated in a low fertile plain on the right bank of the Deûle in a rich agricultural and industrial region of which it is the centre. It is a first-class fortress and headquarters of the I. army corps, and has an enceinte and a pentagonal citadel, one of Vauban's finest works, situated to the west of the town, from which it is divided by the Deûle. The modern fortifications comprise over twenty detached forts and batteries, the perimeter of the defences being about 20 m. Before 1858 the town, fortified by Vauban about 1668, occupied an elliptical area of about 2500 yds. by 1300, with the church of Notre-Dame de la Treille in the centre, but the ramparts on the south side have been demolished and the ditches filled up, their place being now occupied by the great Boulevard de la Liberté, which extends in a straight line from the goods station of the railway to the citadel. At the S.E. end of this boulevard are grouped the majority of the numerous educational establishments of the city. The new enceinte encloses the old communes of Esquermes, Wazemmes and Moulins-Lille, the area of the town being thus more than doubled. In the new quarters fine boulevards and handsome squares, such as the Place de la République, have been laid out in pleasant contrast with the sombre aspect of the old town. The district of St André to the north, the only elegant part of the old town, is the residence of the aristocracy. Outside the enceinte populous suburbs surround the city on every side. The demolition of the fortifications on the north and east of the city, which is continued in those directions by the great suburbs of La Madeleine, St Maurice and Fives, must accelerate its expansion towards Roubaix and Tourcoing. At the demolition of the southern fortifications, the Paris gate, a triumphal arch erected in 1682 in honour of Louis XIV., after the conquest of Flanders, was preserved. On the east the Ghent and Roubaix gates, built in the Renaissance style, with bricks of different colours, date from 1617 and 1622, the time of the Spanish domination. On the same side the Noble-Tour is a relic of the medieval ramparts. The present enceinte is pierced by numerous gates, including water gates for the canal of the Deûle and for the Arbonnoise, which extends into a marsh in the south-west corner of the town. The citadel, which contains the barracks and arsenal, is surrounded by public gardens. The more interesting buildings are in the old town, where, in the Grande Place and Rue Faidherbe, its animation is concentrated. St Maurice, a church in the late Gothic style, dates in its oldest portions from the 15th century, and was restored in 1872; Ste Cathérine belongs to the 15th, 16th and 18th centuries, St André to the first years of the 18th century, and Ste Madeleine to the last half of the 17th century; all possess valuable pictures, but St Maurice alone, with nave and double aisles, and elegant modern spire, is architecturally notable. Notre-Dame de la Treille, begun in 1855, in the style of the 15th century, possesses an ancient statue of the Virgin which is the object of a well-known pilgrimage. Of the civil buildings the Bourse (17th century) built round a courtyard in which stands a bronze statue of Napoleon I., the Hôtel d'Aigremont, the Hôtel Gentil and other houses are in the Flemish style; the Hôtel de Ville, dating in the main from the middle of the 19th century, preserves a portion of a palace built by Philip the Good, duke of Burgundy, in the 15th century. The prefecture, the Palais des Beaux-Arts, the law-courts, the school of arts and crafts, and the Lycée Faidherbe are imposing modern buildings. In the middle of the Grande Place stands a column, erected in 1848, commemorating the defence of the town in 1792 (see below), and there are also statues to Generals L. L. C. Faidherbe and F. O. de Négrier, and busts of Louis Pasteur and the popular poet and singer A. Desrousseaux. The Palais des Beaux-Arts contains a museum and picture galleries, among the richest in France, as well as a unique collection of original designs of the great masters bequeathed to Lille by J. B. Wicar, and including a celebrated wax model of a girl's head usually attributed to some Italian artist of the 16th century. The city also possesses a commercial and colonial museum, an industrial museum, a fine collection of departmental and municipal archives, the museum of the Institute of Natural Sciences and a library containing many valuable manuscripts, housed at the Hôtel de Ville. The large military hospital, once a Jesuit college, is one of several similar institutions.

Lille is the seat of a prefect and has tribunals of first instance and of commerce, a board of trade arbitrators, a chamber of commerce and a branch of the Bank of France. It is the centre of an académie (educational division) and has a university with faculties of laws, letters, science and medicine and pharmacy, together with a Catholic institute comprising faculties of theology, law, medicine and pharmacy, letters, science, a technical school, and a department of social and political science. Secondary education is given at the Lycée Faidherbe, and the Lycée Fénelon (for girls), a higher school of commerce, a national technical school and other establishments; to these must be added schools of music and fine arts, and the Industrial and Pasteur Institutes.

The industries, which are carried on in the new quarters of the town and in the suburbs, are of great variety and importance. In the first rank comes the spinning of flax and the weaving of cloth, table-linen, damask, ticking and flax velvet. The spinning of flax thread for sewing and lace-making is specially connected with Lille. The manufacture of woollen fabrics and cotton-spinning and the making of cotton-twist of fine quality are also carried on. There are important printing establishments, state factories for the manufacture of tobacco and the refining of saltpetre and very numerous breweries, while chemical, oil, white lead and sugar-works, distilleries, bleaching-grounds, dye-works, machinery and boiler works and cabinet-making occupy many thousands of workmen. Plant for sugar-works and distilleries, military stores, steam-engines, locomotives, and bridges of all kinds are produced by the company of Fives-Lille. Lille is one of the most important junctions of the Northern railway, and the Deûle canal affords communication with neighbouring ports and with Belgium. Trade is chiefly in the raw material and machinery for its industries, in the products thereof, and in the wheat and other agricultural products of the surrounding district.

Lille (l'Île) is said to date its origin from the time of Count Baldwin IV. of Flanders, who in 1030 surrounded with walls a little town which had arisen around the castle of Buc. In the first half of the 13th century, the town, which had developed rapidly, obtained communal privileges. Destroyed by Philip Augustus in 1213, it was rebuilt by Joanna of Constantinople, countess of Flanders, but besieged and retaken by Philip the Fair in 1297. After having taken part with the Flemings against the king of France, it was ceded to the latter in 1312. In 1369 Charles V., king of France, gave it to Louis de Male, who transmitted his rights to his daughter Margaret, wife of Philip the Bold, duke of Burgundy. Under the Burgundian rule Lille enjoyed great prosperity; its merchants were at the head of the London Hansa. Philip the Good made it his residence, and within its walls held the first chapters of the order of the Golden Fleece. With the rest of Flanders it passed from the dukes of Burgundy to Austria and then to Spain. After the death of Philip IV. of Spain, Louis XIV. reclaimed the territory and besieged Lille in 1667. He forced it to capitulate, but preserved all its laws, customs, privileges and liberties. In 1708, after an heroic resistance, it surrendered to Prince Eugène and the duke of Marlborough. The treaty of Utrecht restored it to France. In 1792 the Austrians bombarded it for nine days and nights without intermission, but had ultimately to raise the siege.

See É. Vanhende, *Lille et ses institutions communales de 620 à 1804* (Lille, 1888).

LILLEBONNE, a town of France in the department of Seine-Inférieure, 3½ m. N. of the Seine and 24 m. E. of Havre by the Western railway. Pop. (1906) 5370. It lies in the valley of the Bolbec at the foot of wooded hills. The church of Notre-Dame, partly modern, preserves a Gothic portal of the 16th century and a graceful tower of the same period. The park contains a fine cylindrical donjon and other remains of a castle founded by William the Conqueror and rebuilt in the 13th century. The principal industries are cotton-spinning and the manufacture of calico and candles.

Lillebonne under the Romans, *Juliobona*, was the capital of the Caletes, or inhabitants of the Pays de Caux, in the time of Caesar, by whom it was destroyed. It was afterwards rebuilt by Augustus, and before it was again ruined by the barbarian invasions it had become an important centre whence Roman roads branched out in all directions. The remains of ancient baths and of a theatre capable of holding 3000 persons have been brought to light. Many Roman and Gallic relics, notably a bronze statue of a woman and two fine mosaics, have been found and transported to the museum at Rouen. In the middle ages the fortifications of the town were constructed out of materials supplied by the theatre. The town recovered some of its old importance under William the Conqueror.

LILLIBULLERO, or LILLIBURLERO, the name of a song popular at the end of the 17th century, especially among the army and supporters of William III. in the war in Ireland during the revolution of 1688. The tune appears to have been much older, and was sung to an Irish nursery song at the beginning of the 17th century, and the attribution of Henry Purcell is based on the very slight ground that it was published in *Music's Handmaid*, 1689, as "A new Irish Tune" by Henry Purcell. It was also a marching tune familiar to soldiers. The doggerel verses have generally been assigned to Thomas Wharton, and deal with the administration of Talbot, earl of Tyrconnel, appointed by James as his lieutenant in Ireland in 1687. The refrain of the song *Lilliburlero bullen a la* gave the title of the song. Macaulay says of the song "The verses and the tune caught the fancy of the nation. From one end of England to the other all classes were singing this idle rhyme." Though Wharton claimed he had "sung a king out of three kingdoms" and Burnet says "perhaps never had so slight a thing so great an effect" the success of the song was "the effect, and not the cause of that excited state of public feeling which produced the revolution" (Macaulay, *Hist. of Eng.* chap. ix.).

LILLO, GEORGE (1693–1739), English dramatist, son of a Dutch jeweller, was born in London on the 4th of February 1693. He was brought up to his father's trade and was for many years a partner in the business. His first piece, *Silvia, or the Country Burial*, was a ballad opera produced at Lincoln's Inn Fields in November 1730. On the 22nd of June 1731 his domestic tragedy, *The Merchant*, renamed later *The London Merchant, or the History of George Barnwell*, was produced by Theophilus Cibber and his company at Drury Lane. The piece is written in prose, which is not free from passages which are really blank verse, and is founded on "An excellent ballad of George Barnwell, an apprentice of London who . . . thrice robbed his master, and murdered his uncle in Ludlow." In breaking through the tradition that the characters of every tragedy must necessarily be drawn from people of high rank and fortune he went back to the Elizabethan domestic drama of passion of which the *Yorkshire Tragedy* is a type. The obtrusively moral purpose of this play places it in the same literary category as the novels of Richardson. Scoffing critics called it, with reason, a "Newgate tragedy," but it proved extremely popular on the stage. It was regularly acted for many years at holiday seasons for the moral benefit of the apprentices. The last act contained a scene, generally omitted on the London stage, in which the gallows actually figured. In 1734 Lillo celebrated the marriage of the Princess Anne with William IV. of Orange in *Britannia and Batavia*, a masque. A second tragedy, *The Christian Hero*, was produced at Drury Lane on the 13th of January 1735. It is based on the story of Scanderbeg, the Albanian chieftain, a life of whom is printed with the play. Thomas Whincop (d. 1730) wrote a piece on the same subject, printed posthumously in 1747. Both Lillo and William Havard, who also wrote a dramatic version of the story, were accused of plagiarizing Whincop's *Scanderbeg*. Another murder-drama, *Fatal Curiosity*, in which an old couple murder an unknown guest, who proves to be their own son, was based on a tragedy at Bohelland Farm near Penryn in 1618. It was produced by Henry Fielding at the Little Theatre in the Haymarket in 1736, but with small success. In the next year Fielding tacked it on to his own *Historical Register for 1736*, and it was received more kindly. It was revised by George Colman the elder in 1782, by Henry Mackenzie in 1784, &c. Lillo also wrote an adaptation of the Shakespearean play of *Pericles, Prince of Tyre*, with the title *Marina* (Covent Garden, August 1st, 1738); and a tragedy, *Elmerick, or Justice Triumphant* (produced posthumously, Drury Lane, February 23rd, 1740). The statement made in the prologue to this play that Lillo died in poverty seems unfounded. His death took place on the 3rd of September 1739. He left an unfinished version of *Arden of Feversham*, which was completed by Dr John Hoadly and produced in 1759. Lillo's reputation proved short-lived. He has nevertheless a certain cosmopolitan importance, for the influence of *George Barnwell* can be traced in the sentimental drama of both France and Germany.

See *Lillo's Dramatic Works with Memoirs of the Author by Thomas Davies* (reprint by Lowndes, 1810); Cibber's *Lives of the Poets*, v.; Genest, *Some Account of the English Stage*; Alois Brandl, "Zu Lillo's Kaufmann in London," in *Vierteljahrschrift für Literaturgeschichte* (Weimar, 1890, vol. iii.); Leopold Hoffmann, *George Lillo* (Marburg, 1888); Paul von Hofmann-Wellenhof, *Shakspere's Pericles und George Lillo's Marina* (Vienna, 1885). There is a novel founded on Lillo's play, *Barnwell* (1807), by T. S. Surr, and in "George de Barnwell" (*Novels by Eminent Hands*) Thackeray parodies Bulwer-Lytton's *Eugene Aram*.

LILLY, WILLIAM (1602–1681), English astrologer, was born in 1602 at Diseworth in Leicestershire, his family having been settled as yeomen in the place for "many ages." He received a tolerably good classical education at the school of Ashby-de-la-Zouche, but he naïvely tells us what may perhaps have some significance in reference to his after career, that his master "never taught logic." In his eighteenth year, his father having fallen into great poverty, he went to London and was employed in attendance on an old citizen and his wife. His master, at his death in 1627, left him an annuity of £20; and, Lilly having soon afterwards married the widow, she, dying in 1633, left him property to the value of about £1000. He now began to dabble in astrology, reading all the books on the subject he could fall in with, and occasionally trying his hand at unravelling mysteries by means of his art. The years 1642 and 1643 were devoted to a careful revision of all his previous reading, and in particular having lighted on Valentine Naibod's *Commentary on Alchabitius*, he "seriously studied him and found him to be the profoundest author he ever met with." About the same time he tells us that he "did carefully take notice of every grand action betwixt king and parliament, and did first then incline to believe that as all sublunary affairs depend on superior causes, so there was a possibility of discovering them by the configurations of the superior bodies." And, having thereupon "made some essays," he "found encouragement to proceed further, and ultimately framed to himself that method which he ever afterwards followed." He then began to issue his prophetical almanacs and other works, which met with serious attention from some of the most prominent members of the Long Parliament. If we may believe himself, Lilly lived on friendly and almost intimate terms with Bulstrode Whitlock, Lenthall the speaker, Sir Philip Stapleton, Elias Ashmole and others. Even Selden seems to have given him some countenance, and probably the chief difference between him and the mass of the community at the time was that, while others believed in the general truth of astrology, he ventured to specify the future events to which its calculations pointed. Even from his own account of himself, however, it is evident that he did not trust implicitly to the indications given by the aspects of the heavens, but like more vulgar fortune-tellers kept his eyes and ears open for any information which might make his predictions safe. It appears that he had correspondents both at home and in foreign parts to keep him conversant with the probable current of affairs. Not a few of his exploits indicate rather the quality of a clever police detective than of a profound astrologer. After the Restoration he very quickly fell into disrepute. His sympathy with the parliament, which his predictions had generally shown, was not calculated to bring him into royal favour. He came under the lash of Butler, who, making allowance for some satiric exaggeration, has given in the character of Sidrophel a probably not very incorrect picture of the man; and, having by this time amassed a tolerable fortune, he bought a small estate at Hersham in Surrey, to which he retired, and where he diverted the exercise of his peculiar talents to the practice of medicine. He died in 1681.

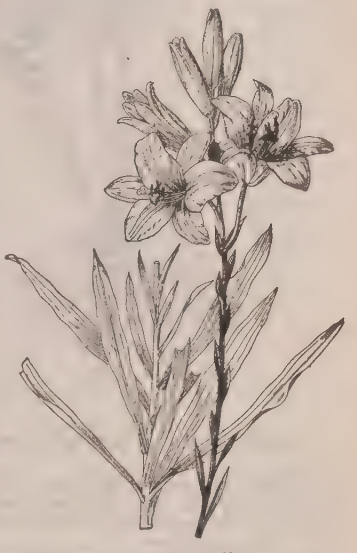
Lilly's life of himself, published after his death, is still worth looking into as a remarkable record of credulity. So lately as 1852 a prominent London publisher put forth a new edition of Lilly's *Introduction to Astrology*, "with numerous emendations adapted to the improved state of the science."

LILOAN, a town of the province of Cebú, Philippine Islands, on the E. coast, 10 m. N.E. of Cebú, the capital of the province. Pop. (1903), after the annexation of Compostela, 15,626. There are seventeen villages or *barrios* in the town, and eight of them had in 1903 a population exceeding 1000. The language is Visayan. Fishing is the principal industry. Liloan has one of the principal coal beds on the island; and rice, Indian corn, sugar-cane and coffee are cultivated. Coconuts and other tropical fruits are important products.

LILY, *Lilium*, the typical genus of the botanical order Liliaceae, embracing nearly eighty species, all confined to the northern hemisphere, and widely distributed throughout the north temperate zone. The earliest in cultivation were described in 1597 by Gerard (*Herball*, p. 146), who figures eight kinds of true lilies, which include *L. album* (*L. candidum*) and a variety, *bizantinum*, two umbellate forms of the type *L. bulbiferum*, named *L. aureum* and *L. cruentum latifolium*, and three with pendulous flowers, apparently forms of the martagon lily. Parkinson, in his *Paradisus* (1629), described five varieties of martagon, six of umbellate kinds—two white ones, and *L. pomponium*, *L. chalcedonicum*, *L. carniolicum* and *L. pyrenaicum*—together with one American, *L. canadense*, which had been introduced in 1629. For the ancient and medieval history of the lily, see M. de Cannart d'Hamale's *Monographie historique et littéraire des lis* (Malines, 1870). Since that period many new species have been added. The latest authorities for description and classification of the genus are J. G. Baker ("Revision of the Genera and Species of Tulipeae," *Journ. of Linn. Soc.* xiv. p. 211, 1874), and J. H. Elwes (*Monograph of the Genus* Lilium, 1880), who first tested all the species under cultivation, and has published every one beautifully figured by W. H. Fitch, and some hybrids. With respect to the production of hybrids, the genus is remarkable for its power of resisting the influence of foreign pollen, for the seedlings of any species, when crossed, generally resemble that which bears them. A good account of the new species and principal varieties discovered since 1880, with much information on the cultivation of lilies and the diseases to which they are subject, will be found in the report of the Conference on Lilies, in the *Journal of the Royal Horticultural Society*, 1901. The new species include a number discovered in central and western China by Dr Augustine Henry and other collectors; also several from Japan and California.

The structure of the flower represents the simple type of monocotyledons, consisting of two whorls of petals, of three free parts each, six free stamens, and a consolidated pistil of three carpels, ripening into a three-valved capsule containing many winged seeds. In form, the flower assumes three types: trumpet-shaped, with a more or less elongated tube, *e.g. L. longiflorum* and *L. candidum*; an open form with spreading perianth leaves, *e.g. L. auratum*; or assuming a pendulous habit, with the tips strongly reflexed, *e.g.* the martagon type. All have scaly bulbs, which in three west American species, as *L. Humboldti*, are remarkable for being somewhat intermediate between a bulb and a creeping rhizome. *L. bulbiferum* and its allies produce aerial reproductive bulbils in the axils of the leaves. The bulbs of several species are eaten, such as of *L. avenaceum* in Kamchatka, of *L. Martagon* by the Cossacks, and of *L. tigrinum*, the "tiger lily," in China and Japan. Medicinal uses were ascribed to the species, but none appear to have any marked properties in this respect.

The white lily, *L. candidum*, the λείριον of the Greeks, was one of the commonest garden flowers of antiquity, appearing in the poets from Homer downwards side by side with the rose and the violet. According to Hehn, roses and lilies entered Greece from the east by way of Phrygia, Thrace and Macedonia (*Kulturpflanzen und Hausthiere*, 3rd ed., p. 217). The word λείριον itself, from which *lilium* is derived by assimilation of consonants, appears to be Eranian (*Ibid.* p. 527), and according to ancient etymologists (Lagarde, *Ges. Abh.* p. 227) the town of Susa was connected with the Persian name of the lily *sûsan* (Gr. σοῦσον, Heb. *shôshan*). Mythologically the white lily, *Rosa Junonis*, was fabled to have sprung from the milk of Hera. As the plant of purity it was contrasted with the rose of Aphrodite. The word κρίνον, on the other hand, included red and purple lilies, Plin. *H.N.* xxi. 5 (11, 12), the red lily being best known in Syria and Judaea (Phaselis). This perhaps is the "red lily of Constantinople" of Gerard, *L. chalcedonicum*. The lily of the Old Testament (shôshan) may be conjectured to be a red lily from the simile in Cant. v. 13, unless the allusion is to the fragrance rather than the colour of the lips, in which case the white lily must be thought of. The "lilies of the field," Matt. vi. 28, are κρίνα, and the comparison of their beauty with royal robes suggests their identification with the red Syrian lily of Pliny. Lilies, however, are not a conspicuous feature in the flora of Palestine, and the red anemone (*Anemone coronaria*), with which all the hill-sides of Galilee are dotted in the spring, is perhaps more likely to have suggested the figure. For the lily in the pharmacopoeia of the ancients see Adams's *Paul. Aegineta*, iii. 196. It was used in unguents and against the bites of snakes, &c. In the middle ages the flower continued to be common and was taken as the symbol of heavenly purity. The three golden lilies of France are said to have been originally three lance-heads.

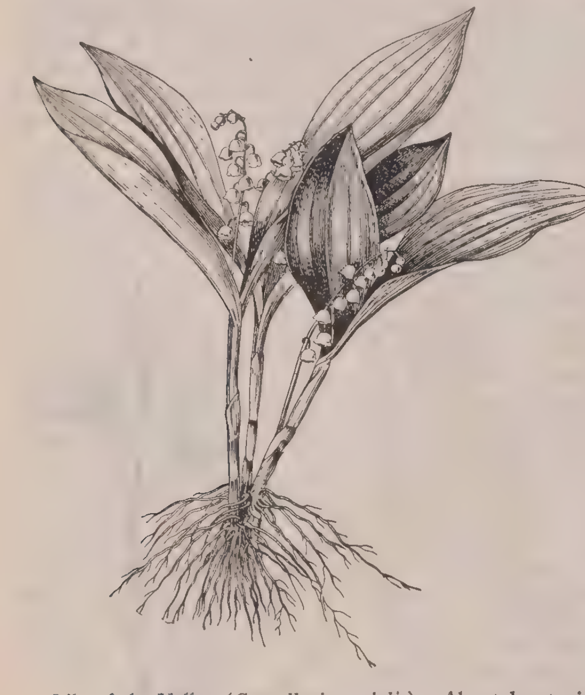


Madonna or White Lily (*Lilium candidum*). About ¼ nat. size.

Lily of the valley, *Convallaria majalis*, belongs to a different tribe (*Asparagoideae*) of the same order. It grows wild in woods in some parts of England, and in Europe, northern Asia and the Alleghany Mountains of North America. The leaves and flower-scapes spring from an underground creeping stem. The small pendulous bell-shaped flowers contain no honey but are visited by bees for the pollen.

The word "lily" is loosely used in connexion with many plants which are not really liliums at all, but belong to genera which are quite distinct botanically. Thus, the Lent lily is *Narcissus Pseudonarcissus*; the African lily is *Agapanthus umbellatus*; the Belladonna lily is *Amaryllis Belladonna* (*q.v.*); the Jacobaea lily is *Sprekelia formosissima*; the Mariposa lily is *Calochortus*; the lily of the Incas is *Alstroemeria pelegrina*; St Bernard's lily is *Anthericum Liliago*; St Bruno's lily is *Anthericum* (or *Paradisia*) *Liliastrum*; the water lily is *Nymphaea alba*; the Arum lily is *Richardia africana*; and there are many others.

The true lilies are so numerous and varied that no general cultural instructions will be alike suitable to all. Some species, as *L. Martagon, candidum, chalcedonicum, Szovitzianum* (or *colchicum*), *bulbiferum, croceum, Henryi, pomponium*—the "Turk's cap lily," and others, will grow in almost any good garden soil, and succeed admirably in loam of a rather heavy character, and dislike too much peat. But a compost of peat, loam and leaf-soil suits *L. auratum, Brownii, concolor, elegans, giganteum, japonicum, longiflorum, monadelphum, pardalinum, speciosum*, and the tiger lily (*L. tigrinum*) well, and a larger proportion of peat is indispensable for the beautiful American *L. superbum* and *canadense*. The margin of rhododendron beds, where there are sheltered recesses amongst the plants, suits many of the more delicate species well, partial shade and shelter of some kind being essential. The bulbs should be planted from 6 to 10 in. (according to size) below the surface, which should at once be mulched over with half-decayed leaves or coconut fibre to keep out frost.



Lily of the Valley (*Convallaria majalis*). About ¼ nat. size.

The noble *L. auratum*, with its large white flowers, having a yellow band and numerous red or purple spots, is a magnificent plant when grown to perfection; and so are the varieties called *rubro-vittatum* and *cruentum*, which have the central band crimson instead of yellow; and the broad-petalled *platyphyllum*, and its almost pure white sub-variety called *virginale*. Of *L. speciosum* (well known to most gardeners as *lancifolium*), the true typical form and the red-spotted and white varieties are grand plants for late summer blooming in the conservatory. The tiger lily, *L. tigrinum*, and its varieties *Fortunei, splendidum* and *flore-pleno*, are amongst the best species for the flower garden; *L. Thunbergianum* and its many varieties being also good border flowers. The pretty *L. Leichtlinii* and *L. colchicum* (or *Szovitzianum*) with drooping yellow flowers and the scarlet drooping-flowered *L. tenuifolium* make up, with those already mentioned, a series of the finest hardy flowers of the summer garden. The Indian *L. giganteum* is perfectly distinct in character, having broad heart-shaped leaves, and a noble stem 10 to 14 ft. high, bearing a dozen or more large deflexed, funnel-shaped, white, purple-stained flowers; *L. cordifolium* (China and Japan) is similar in character, but dwarfer in habit.

For pot culture, the soil should consist of three parts turfy loam to one of leaf-mould and thoroughly rotted manure, adding enough pure grit to keep the compost porous. If leaf-mould is not at hand, turfy peat may be substituted for it. The plants should be potted in October. The pots should be plunged in a cold frame and protected from frost, and about May may be removed to a sheltered and moderately shady place out-doors to remain till they flower, when they may be removed to the greenhouse. This treatment suits the gorgeous *L. auratum*, the splendid varieties of *L. speciosum* (*lancifolium*) and also the chaste-flowering trumpet-tubed *L. longiflorum* and its varieties. Thousands of bulbs of such lilies as *longiflorum* and *speciosum* are now retarded in refrigerators and taken out in batches for greenhouse work as required.

Diseases.—Lilies are, under certain conditions favourable to the development of the disease, liable to the attacks of three parasitic fungi. The most destructive is *Botrytis cinerea* which forms orange-brown or buff specks on the stems, pedicels, leaves and flower-buds, which increase in size and become covered with a delicate grey mould, completely destroying or disfiguring the parts attacked. The spores formed on the delicate grey mould are carried during the summer from one plant to another, thus spreading the disease, and also germinate in the soil where the fungus may remain passive during the winter producing a new crop of spores next spring, or sometimes attacking the scales of the bulbs forming small black hard bodies embedded in the flesh. For prevention, the surface soil covering bulbs should be removed every autumn and replaced by soil mixed with kainit; manure for mulching should also be mixed with kainit, which acts as a steriliser. If the fungus appears on the foliage spray with potassium sulphide solution (2 oz. in 3 gallons of water). *Uromyces Erythronii*, a rust, sometimes causes considerable injury to the foliage of species of *Lilium* and other bulbous plants, forming large discoloured blotches on the leaves. The diseased stems should be removed and burned before the leaves fall; as the bulb is not attacked the plant will start growth next season free from disease. *Rhizopus necans* is sometimes the cause of extensive destruction of bulbs. The fungus attacks injured roots and afterwards passes into the bulb which becomes brown and finally rots. The fungus hibernates in the soil and enters through broken or injured roots, hence care should be taken when removing the bulbs that the roots are injured as little as possible. An excellent packing material for dormant buds is coarsely crushed wood-charcoal to which has been added a sprinkling of flowers of sulphur. This prevents infection from outside and also destroys any spores or fungus mycelium that may have been packed away along with the bulbs.

When cultivated in greenhouses liliums are subject to attack from aphides (green fly) in the early stages of growth. These pests can be kept in check by syringing with nicotine, soft-soap and quassia solutions, or by "vaporising" two or three evenings in succession, afterwards syringing the plants with clear tepid water.

LILYE, or LILY, **WILLIAM** (*c.* 1468–1522), English scholar, was born at Odiham in Hampshire. He entered the university of Oxford in 1486, and after graduating in arts went on a pilgrimage to Jerusalem. On his return he put in at Rhodes, which was still occupied by the knights of St John, under whose protection many Greeks had taken refuge after the capture of Constantinople by the Turks. He then went on to Italy, where he attended the lectures of Sulpitius Verulanus and Pomponius Laetus at Rome, and of Egnatius at Venice. After his return he settled in London (where he became intimate with Thomas More) as a private teacher of grammar, and is believed to have been the first who taught Greek in that city. In 1510 Colet, dean of St Paul's, who was then founding the school which afterwards became famous, appointed Lilye the first high master. He died of the plague on the 25th of February 1522.

Lilye is famous not only as one of the pioneers of Greek learning, but as one of the joint-authors of a book, familiar to many generations of students during the 19th century, the old Eton Latin grammar. The *Brevissima Institutio*, a sketch by Colet, corrected by Erasmus and worked upon by Lilye, contains two portions, the author of which is indisputably Lilye. These are the lines on the genders of nouns, beginning *Propria quae maribus*, and those on the conjugation of verbs beginning *As in praesenti*. The *Carmen de Moribus* bears Lilye's name in the early editions; but Hearne asserts that it was written by Leland, who was one of his scholars, and that Lilye only adapted it. Besides the *Brevissima Institutio*, Lilye wrote a variety of Latin pieces both in prose and verse. Some of the latter are printed along with the Latin verses of Sir Thomas More in *Progymnasmata Thomae Mori et Gulielmi Lylii Sodalium* (1518). Another volume of Latin verse (*Antibossicon ad Gulielmum Hormannum*, 1521) is directed against a rival schoolmaster and grammarian, Robert Whittington, who had "under the feigned name of Bossus, much provoked Lilye with scoffs and biting verses."

See the sketch of Lilye's life by his son George, canon of St Paul's, written for Paulus Jovius, who was collecting for his history the lives of the learned men of Great Britain; and the article by J. H. Lupton, formerly sur-master of St Paul's School, in the *Dictionary of National Biography*.

LIMA, a city and the county-seat of Allen county, Ohio, U.S.A., on the Ottawa river, about 70 m. S.S.W. of Toledo, Pop. (1890) 15,981; (1900) 21,723, of whom 1457 were foreign-born and 731 were negroes; (1910 census) 30,508. It is served by the Pennsylvania (Pittsburgh, Ft. Wayne & Chicago division), the Erie, the Cincinnati, Hamilton & Dayton, the Lake Erie & Western, the Detroit, Toledo & Ironton railways, and by six interurban electric lines. Immediately N. of the city is a state asylum for the insane. Lima has a Carnegie library, a city hospital and a public park of 100 acres. Among the principal buildings are the county court house, a masonic temple, an Elks' home and a soldiers' and sailors' memorial building. Lima College was conducted here from 1893 to 1908. Lima is situated in the centre of the great north-western oil-field (Trenton limestone of the Ordovician system) of Ohio, which was first developed in 1885; the product of the Lima district was 20,575,138 barrels in 1896, 15,877,730 barrels in 1902 and 6,748,676 barrels in 1908. The city is a headquarters of the Standard Oil Company, and the refining of petroleum is one of the principal industries. The total value of the factory product in 1905 was $8,155,586, an increase of 31·1% over that in 1900. Lima contains railway shops of the Cincinnati, Hamilton & Dayton and the Lake Erie & Western railways. The city has a large wholesale and jobbing trade. The municipality owns and operates the water-works. Lima was laid out in 1831, and was first organized as a city under a general state law in 1842.

LIMA, a coast department of central Peru, bounded N. by Ancachs, E. by Junin and Huancavelica, S. by Ica and W. by the Pacific Ocean. Pop. (1906 estimate) 250,000; area 13,314 sq. m. The eastern boundary follows the crests of the Western Cordillera, which gives to the department the western slopes of this chain with the drainage basins of the rivers Huaura, Chancay, Chillon, Rimac, Lurin, Mala and Cañete. Although the department forms part of the rainless region, these rivers, fed from the snows of the high Andes, provide water for the irrigation of large areas devoted to the raising of cotton, sugar, sorghum, Indian corn, alfalfa, potatoes, grapes and olives. The sugar estates of the Cañete are among the best in Peru and are served by a narrow gauge railway terminating at the small port of Cerro Azul. Indian corn is grown in Chancay and other northern valleys, and is chiefly used, together with alfalfa and barley, in fattening swine for lard. The mineral resources are not important, though gold washings in the Cañete valley have been worked since early colonial times. One of the most important industrial establishments in the republic is the smelting works at Casapalca, on the Oroya railway, in the Rimac valley, which receives ores from neighbouring mines of the district of Huarochiri. The department is crossed from S.W. to N.E. by the Oroya railway, and several short lines run from the city of Lima to neighbouring towns. Besides Lima (*q.v.*) the principal towns are Huacho, Cañete (port), Canta, Yauyos, Chorrillos, Miraflores and Barranco—the last three being summer resorts for the people of the capital, with variable populations of 15,000, 6000 and 5000 respectively. About 15 m. S. of Lima, near the mouth of the Lurin, are the celebrated ruins of Pachacamac, which are believed to antedate the occupation of this region by the Incas.

LIMA, the principal city and the capital of Peru and of the department and province of Lima, on the left bank of the river Rimac, 7½ m. above its mouth and the same distance E. by N. of its seaport Callao, in 12° 2′ 34″ S., 77° 7′ 36″ W. Pop. (1906 estimate) 140,000, of whom a large proportion is of negro descent, and a considerable number of foreign birth. The city is about 480 ft. above sea-level, and stands on an arid plain, which rises gently toward the S., and occupies an angle between the Cerros de San Jeronimo (2493 ft.) and San Cristobal (1411 ft.) on the N. and a short range of low hills, called the Cerros de San Bartolomé, on the E. The surrounding region is arid, like all this part of the Pacific coast, but through irrigation large areas have been brought under cultivation, especially along the water-courses. The Rimac has its source about 105 m. N.E. of Lima and is fed by the melting snows of the higher Andes. It is an insignificant stream in winter and a raging torrent in summer. Its tributaries are all of the same character, except the Rio Surco, which rises near Chorrillos and flowing northward joins the Rimac a few miles above the city. These, with the Rio Lurin, which enters the Pacific a short distance S. of Chorrillos, provide water for irrigating the districts near Lima. The climate varies somewhat from that of the arid coast in general, in having a winter of four months characterized by cloudy skies, dense fogs and sometimes a drizzling rain. The air in this season is raw and chilly. For the rest of the year the sky is clear and the air dry. The mean temperature for the year is 66° F., the winter minimum being 59° and the summer maximum 78°.

The older part of Lima was laid out and built with mathematical regularity, the streets crossing each other at right angles and enclosing square areas, called *manzanas*, of nearly uniform size. Later extensions, however, did not follow this plan strictly, and there is some variation from the straight line in the streets and also in the size and shape of the manzanas. The streets are roughly paved with cobble stones and lighted with gas or electricity. A broad boulevard of modern construction partly encircles the city, occupying the site of the old brick walls (18 to 20 ft. high, 10 to 12 ft. thick at the base and 9 ft. at the top) which were constructed in 1585 by a Fleming named Pedro Ramon, and were razed by Henry Meiggs during the administration of President Balta. The water-supply is derived from the Rimac and filtered, and the drainage, once carried on the surface, now passes into a system of subterranean sewers. The streets and suburbs of Lima are served by tramways, mostly worked by electric traction. The suburban lines include two to Callao, one to Magdalena, and one to Miraflores and Chorrillos. On the north side of the river is the suburb or district of San Lazaro, shut in by the encircling hills and occupied in great part by the poorer classes. The principal squares are the Plaza Mayor, Plaza Bolívar (formerly P. de la Inquisicion and P. de la Independencia), Plaza de la Exposicion, and Plaza del Acho, on the north side of the river, the site of the bull-ring. The public gardens, connected with the Exposition palace on the S. side of the city, and the Paseo Colon are popular among the Limeños as pleasure resorts. The long Paseo Colon, with its parallel drives and paths, is ornamented with trees, shrubbery and statues, notably the Columbus statue, a group in marble designed by the sculptor Salvatore Revelli. It is the favourite fashionable resort. A part of the old wagon road from Lima to Callao, which was paved and improved with walks and trees by viceroy O'Higgins, is also much frequented. The avenue (3 m. long) leading from the city to Magdalena was beautified by the planting of four rows of palms during the Pierola administration. Among other public resorts are the Botanical garden, the Grau and Bolognesi avenues (parts of the Boulevard), the Acho avenue on the right bank of the Rimac, and the celebrated avenue of the Descalzos, on the N. side of the river, bordered with statuary. The noteworthy monuments of the city are the bronze equestrian statue of Bolívar in the plaza of that name, the Columbus statue already mentioned, the Bolognesi statue in the small square of that name, and the San Martin statue in the Plaza de la Exposicion. The 22nd of May monument, a marble shaft crowned by a golden bronze figure of Victory, stands where the Callao road crosses the Boulevard. Most conspicuous among the public buildings of Lima is the cathedral, whose twin towers and broad façade look down upon the Plaza Mayor. Its foundation stone was laid in 1535 but the cathedral was not consecrated until 1625. The great earthquake of 1746 reduced it to a mass of ruins, but it was reconstructed by 1758, practically, as it now stands. It has double aisles and ten richly-decorated chapels, in one of which rest the remains of Francisco Pizarro, the conqueror of Peru. Also facing the same square are the archiepiscopal and government palaces; the latter formerly the palace of the viceroys. The interesting *casa* of the Inquisition, whose tribunals rivalled those of Madrid in cruelty, faces upon Plaza Bolívar, as also the old University of San Marcos, which dates from 1551 and has faculties of theology, law, medicine, philosophy and literature, mathematics, and administrative and political economy. The churches and convents of Lima are richly endowed as a rule, and some of the churches represent a very large expenditure of money. The convent of San Francisco, near the Plaza Mayor, is the largest monastic establishment in Lima and contains some very fine carvings. Its church is the finest in the city after the cathedral. Other noteworthy churches are those of the convents of Santo Domingo, La Merced and San Augustine. There are a number of conventual establishments (for both sexes), which, with their chapels, and with the smaller churches, retreats, sanctuaries, &c., make up a total of 66 institutions devoted to religious observances. An attractive, and perhaps the most popular public building in Lima is the Exposition palace on the plaza and in the public gardens of the same name, on the south side of the city. It dates from 1872; its halls are used for important public assemblies, and its upper floor is occupied by the National Historical Institute, its museum and the gallery of historical paintings. Other noteworthy edifices and institutions are the National Library, the Lima Geographical Society, founded in 1888; the Mint, which dates from 1565 and is considered to be one of the best in South America; the great bull-ring of the Plaza del Acho, which dates from 1768 and can seat 8000 spectators; the Concepcion market; a modern penitentiary; and various charitable institutions. In addition to the old university on the Plaza Bolívar, which has been modernized and greatly improved, Lima has a school of engineers and mines (founded 1876), the old college of San Carlos, a normal school (founded 1905), a school of agriculture (situated outside the city limits and founded in 1902), two schools for girls under the direction of religious sisters, an episcopal seminary called the Seminario Conciliar de Santo Toribio, and a school of arts and trades in which elementary technical instruction is given. Under the old régime, primary instruction was almost wholly neglected, but the 20th century brought about important changes in this respect. In addition to the primary schools, the government maintains free night schools for workmen.

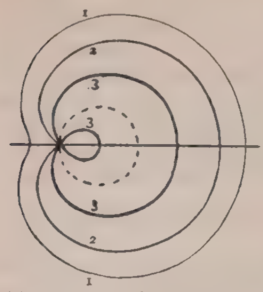
The residences of the city are for the most part of one storey and have mud walls supported by a wooden framework which enclose open spaces, called *patios*, around which the living rooms are ranged. The better class of dwellings have two floors and are sometimes built of brick. A projecting, lattice-enclosed window for the use of women is a prominent feature of the larger houses and gives a picturesque effect to the streets.

Manufacturing has had some considerable development since the closing years of the 19th century; the most important manufactories are established outside the city limits; they produce cotton and woollen textiles, the products of the sugar estates, chocolate, cocaine, cigars and cigarettes, beer, artificial liquors, cotton-seed oil, hats, macaroni, matches, paper, soap and candles. The commercial interests of the city are important, a large part of the interior being supplied from this point. With its port Callao the city is connected by two steam railways, one of which was built as early as 1848; one railway runs northward to Ancon, and another, the famous Oroya line, runs inland 130 m., crossing the Western Cordillera at an elevation of 15,645 ft. above sea-level, with branches to Cerro de Pasco and Huari. The export trade properly belongs to Callao, though often credited to Lima. The Limeños are an intelligent, hospitable, pleasure-loving people, and the many attractive features of their city make it a favourite place of residence for foreigners.

Lima was founded on the 18th of January 1535 by Francisco Pizarro, who named it Ciudad de los Reyes (City of the Kings) in honour of the emperor Charles V. and Doña Juana his mother, or, according to some authorities, in commemoration of the Feast of the Epiphany (6th January) when its site is said to have been selected. The name soon after gave place to that of Lima, a Spanish corruption of the Quichua word Rimac. In 1541 Lima was made an episcopal see, which in 1545 was raised to a metropolitan see. Under Spanish rule, Lima was the principal city of South America, and for a time was the entrepôt for all the Pacific coast colonies south of Panama. It became very prosperous during this period, though often visited by destructive earthquakes, the most disastrous of which was that of the 28th of October 1746, when the cathedral and the greater part of the city were reduced to ruins, many lives were lost, and the port of Callao was destroyed. Lima was not materially affected by the military operations of the war of independence until 1821, when a small army of Argentines and Chileans under General San Martin invested the city, and took possession of it on the 12th of July upon the withdrawal of the Spanish forces. San Martin was proclaimed the protector of Peru as a free state on the 28th of July, but resigned that office on the 20th of September 1822 to avoid a fratricidal struggle with Bolívar. In March 1828 Lima was again visited by a destructive earthquake, and in 1854–1855 an epidemic of yellow fever carried off a great number of its inhabitants. In November 1864, when a hostile Spanish fleet was on the coast, a congress of South American plenipotentiaries was held here to concert measures of mutual defence. Lima has been the principal sufferer in the many revolutions and disorders which have convulsed Peru under the republic, and many of them originated in the city itself. During the earlier part of this period the capital twice fell into the hands of foreigners, once in 1836 when the Bolivian general Santa Cruz made himself the chief of a Bolivian-Peruvian confederation, and again in 1837 when an invading force of Chileans and Peruvian refugees landed at Ancon and defeated the Peruvian forces under President Orbegoso. The city prospered greatly under the two administrations of President Ramon Castilla, who gave Peru its first taste of peace and good government, and under those of Presidents Balta and Pardo, during which many important public improvements were made. The greatest calamity in the history of Lima was its occupation by a Chilean army under the command of General Baquedano after the bloody defeat of the Peruvians at Miraflores on the 15th of January 1881. Chorrillos and Miraflores with their handsome country residences had already been sacked and burned and their helpless residents murdered. Lima escaped this fate, thanks to the intervention of foreign powers, but during the two years and nine months of this occupation the Chileans systematically pillaged the public edifices, turned the old university of San Marcos into barracks, destroyed the public library, and carried away the valuable contents of the Exposition palace, the models and apparatus of the medical school and other educational institutions, and many of the monuments and art treasures with which the city had been enriched. A forced contribution of $1,000,000 a month was imposed upon the population in addition to the revenues of the custom house. When the Chilean garrison under Captain Lynch was withdrawn on the 22nd of October 1883, it took 3000 wagons to carry away the plunder which had not already been shipped. Of the government palace and other public buildings nothing remained but the bare walls. The buoyant character of the people, and the sympathy and assistance generously offered by many civilized nations, contributed to a remarkably speedy recovery from so great a misfortune. Under the direction of its keeper, Don Ricardo Palma, 8315 volumes of the public library were recovered, to which were added valuable contributions from other countries. The portraits of the Spanish viceroys were also recovered, except five, and are now in the portrait gallery of the Exposition palace. The poverty of the country after the war made recovery difficult, but years of peace have assisted it.

See Mariano F. Paz Soldan, *Diccionario geográfico-estadistico del Perú* (Lima, 1877); Mateo Paz Soldan and M. F. Paz Soldan, *Geografia del Perú* (Paris, 1862); Manuel A. Fuentes, *Lima, or Sketches of the Capital of Peru* (London, 1866); C. R. Markham, *Cuzo and Lima* (London, 1856), and *History of Peru* (Chicago, 1892); Alexandre Garland, *Peru in 1906* (Lima, 1907); and C. R. Enock, *Peru* (London, 1908). For earlier descriptions see works referred to under PERU. (A. J. L.)

LIMAÇON (from the Lat. *limax*, a slug), a curve invented by Blaise Pascal and further investigated and named by Gilles Personne de Roberval. It is generated by the extremities of a rod which is constrained to move so that its middle point traces out a circle, the rod always passing through a fixed point on the circumference. The polar equation is $r=a+b\cos\theta$, where $2a$=length of the rod, and b=diameter of the circle. The curve may be regarded as an epitrochoid (see EPICYCLOID) in which the rolling and fixed circles have equal radii. It is the inverse of a central conic for the focus, and the first positive pedal of a circle for any point. The form of the limaçon depends on the ratio of the two constants; if a be greater than b, the curve lies entirely outside the circle; if a equals b, it is known as a cardioid (*q.v.*); if a is less than b, the curve has a node within the circle; the particular case when $b=2a$ is known as the trisectrix (*q.v.*). In the figure (1) is a limaçon, (2) the cardioid, (3) the trisectrix.



Properties of the limaçon may be deduced from its mechanical construction; thus the length of a focal chord is constant and the normals at the extremities of a focal chord intersect on a fixed circle. The area is $(b^2+a^2/2)\pi$, and the length is expressible as an elliptic integral.

LIMASOL, a seaport of Cyprus, on Akrotiri Bay of the south coast. Pop. (1901) 8298. Excepting a fort attributed to the close of the 12th century the town is without antiquities of interest, but in the neighbourhood are the ancient sites of Amathus and Curium. Limasol has a considerable trade in wine and carobs. The town was the scene of the marriage of Richard I., king of England, with Berengaria, in 1191.

LIMB. (1) (In O. Eng. *lim*, cognate with the O. Nor. and Icel. *limr*, Swed. and Dan. *lem*; probably the word is to be referred to a root *li-* seen in an obsolete English word "lith," a limb, and in the Ger. *Glied*), originally any portion or member of the body, but now restricted in meaning to the external members of the body of an animal apart from the head and trunk, the legs and arms, or, in a bird, the wings. It is sometimes used of the lower limbs only, and is synonymous with "leg." The word is also used of the main branches of a tree, of the projecting spurs of a range of mountains, of the arms of a cross, &c. As a translation of the Lat. *membrum*, and with special reference to the church as the "body of Christ," "limb" was frequently used by ecclesiastical writers of the 16th and 17th centuries of a person as being a component part of the church; cf. such expressions as "limb of Satan," "limb of the law," &c. From the use of *membrum* in medieval Latin for an estate dependent on another, the name "limb" is given to an outlying portion of another, or to the surbordinate members of the Cinque Ports, attached to one of the principal towns; Pevensey was thus a "limb" of Hastings. (2) An edge or border, frequently used in scientific language for the boundary of a surface. It is thus used of the edge of the disk of the sun or moon, of the expanded part of a petal or sepal in botany, &c. This word is a shortened form of "limbo" or "limbus," Lat. for an edge, for the theological use of which see LIMBUS.

LIMBACH, a town in the kingdom of Saxony, in the manufacturing district of Chemnitz, 6 m. N.W. of that city. Pop. (1905) 13,723. It has a public park and a monument to the composer Pache. Its industries include the making of worsteds, cloth, silk and sewing-machines, and dyeing and bleaching.

LIMBER, an homonymous word, having three meanings. (1) A two-wheeled carriage forming a detachable part of the equipment of all guns on travelling carriages and having on it a framework to contain ammunition boxes, and, in most cases, seats for two or three gunners. The French equivalent is *avant-train*, the Ger. *Protz* (see ARTILLERY and ORDNANCE). (2) An adjective meaning pliant or flexible and so used with reference to a person's mental or bodily qualities, quick, nimble, adroit. (3) A nautical term for the holes cut in the flooring in a ship above the keelson, to allow water to drain to the pumps.

The etymology of these words is obscure. According to the *New English Dictionary* the origin of (1) is to be found in the Fr. *limonière*, a derivative of *limon*, the shaft of a vehicle, a meaning which appears in English from the 15th century but is now obsolete, except apparently among the miners of the north of England. The earlier English forms of the word are *lymor* or *limmer*. Skeat suggests that (2) is connected with "limp," which he refers to a Teutonic base *lap-*, meaning to hang down. The *New English Dictionary* points out that while "limp" does not occur till the beginning of the 18th century, "limber" in this sense is found as early as the 16th. In Thomas Cooper's (1517 ?–1594) *Thesaurus Linguae Romanae et Britannicae* (1565), it appears as the English equivalent of the Latin *lentus*. A possible derivation connects it with "limb."

LIMBORCH, PHILIPP VAN (1633–1712), Dutch Remonstrant theologian, was born on the 19th of June 1633, at Amsterdam, where his father was a lawyer. He received his education at Utrecht, at Leiden, in his native city, and finally at Utrecht University, which he entered in 1652. In 1657 he became a Remonstrant pastor at Gouda, and in 1667 he was transferred to Amsterdam, where, in the following year, the office of professor of theology in the Remonstrant seminary was added to his pastoral charge. He was a friend of John Locke. He died at Amsterdam on the 30th of April 1712.

His most important work, *Institutiones theologiae christianae, ad praxin pietatis et promotionem pacis christianae unice directae* (Amsterdam, 1686, 5th ed., 1735), is a full and clear exposition of the system of Simon Episcopius and Stephan Curcellaeus. The fourth edition (1715) included a posthumous "Relatio historica de origine et progressu controversiarum in foederato Belgio de praedestinatione." Limborch also wrote *De veritate religionis Christianae amica collatio cum erudito Judaeo* (Gouda, 1687); *Historia Inquisitionis* (1692), in four books prefixed to the "Liber Sententiarum Inquisitionis Tolosanae" (1307–1323); and *Commentarius in Acta Apostolorum et in Epistolas ad Romanos et ad Hebraeos* (Rotterdam, 1711). His editorial labours included the publication of various works of his predecessors, and of *Epistolae ecclesiasticae praestantium ac eruditorum virorum* (Amsterdam, 1684), chiefly by Jakobus Arminius, Joannes Uytenbogardus, Konrad Vorstius (1569–1622), Gerhard Vossius (1577–1649), Hugo Grotius, Simon Episcopius (his grand-uncle) and Gaspar Barlaeus; they are of great value for the history of Arminianism. An English translation of the *Theologia* was published in 1702 by William Jones (*A Complete System or Body of Divinity, both Speculative and Practical, founded on Scripture and Reason*, London, 1702); and a translation of the *Historia Inquisitionis*, by Samuel Chandler, with "a large introduction concerning the rise and progress of persecution and the real and pretended causes of it" prefixed, appeared in 1731. See Herzog-Hauck, *Realencyklopädie*.

LIMBURG, one of the many small feudal states into which the duchy of Lower Lorraine was split up in the second half of the 11th century. The first count, Walram of Arlon, married Judith the daughter of Frederick of Luxemburg, duke of Lower Lorraine (d. 1065), who bestowed upon him a portion of his possessions lying upon both sides of the river Meuse. It received its name from the strong castle built by Count Walram on the river Vesdre, where the town of Limburg now stands. Henry, Walram's son (d. 1119), was turbulent and ambitious. On the death of Godfrey of Bouillon (1089) he forced the emperor Henry IV. to recognize him as duke of Lower Lorraine. He was afterwards deposed and imprisoned by Count Godfrey of Louvain on whom the ducal title had been bestowed by the emperor Henry V. (1106). For three generations the possession of the ducal title was disputed between the rival houses of Limburg and Louvain. At length a reconciliation took place (1155); the name of duke of Lower Lorraine henceforth disappears, the rulers of the territory on the Meuse become dukes of Limburg, those of the larger territory to the west dukes of Brabant. With the death of Duke Walram IV. (1280) the succession passed to his daughter, Irmingardis, who was married to Reinald I., count of Guelders. Irmingardis died without issue (1282), and her cousin, Count Adolph of Berg, laid claim to the duchy. His rights were disputed by Reinald, who was in possession and was recognized by the emperor. Too weak to assert his claim by force of arms Adolph sold his rights (1283) to John, duke of Brabant (*q.v.*). This led to a long and desolating war for five years, at the end of which (1288), finding the power of Brabant superior to his own Reinald in his turn sold his rights to count Henry III. of Luxemburg. Henry and Reinald, supported by the archbishop of Cologne and other allies, now raised a great army. The rival forces met at Woeringen (5th of June 1288) and John of Brabant (*q.v.*) gained a complete victory. It proved decisive, the duchies of Limburg and Brabant passing under the rule of a common sovereign. The duchy comprised during this period the bailiwicks of Hervé, Montzen, Baelen, Sprimont and Wallhorn, and the counties of Rolduc, Daelhem and Falkenberg, to which was added in 1530 the town of

Maastricht. The provisions and privileges of the famous Charter of Brabant, the *Joyeuse Entrée* (*q.v.*), were from the 15th century extended to Limburg and remained in force until the French Revolution. By the treaty of Westphalia (1648) the duchy was divided into two portions, the counties of Daelhem and Falkenberg with the town of Maastricht being ceded by Spain to the United Provinces, where they formed what was known as a "Generality-Land." At the peace of Rastatt (1714) the southern portion passed under the dominion of the Austrian Habsburgs and formed part of the Austrian Netherlands until the French conquest in 1794. During the period of French rule (1794–1814) Limburg was included in the two French departments of Ourthe and Meuse Inférieure. In 1814 the old name of Limburg was restored to one of the provinces of the newly created kingdom of the Netherlands, but the new Limburg comprised besides the ancient duchy, a piece of Gelderland and the county of Looz. At the revolution of 1830 Limburg, with the exception of Maastricht, threw in its lot with the Belgians, and during the nine years that King William refused to recognize the existence of the kingdom of Belgium the Limburgers sent representatives to the legislature at Brussels and were treated as Belgians. When in 1839 the Dutch king suddenly announced his intention of accepting the terms of the settlement proposed by the treaty of London, as drawn up by representatives of the great powers in 1831, Belgium found herself compelled to relinquish portions of Limburg and Luxemburg. The part of Limburg that lay on the right bank of the Meuse, together with the town of Maastricht and a number of communes—Weert, Haelen, Kepel, Horst, &c.—on the left bank of the river, became a sovereign duchy under the rule of the king of Holland. In exchange for the cession of the rights of the Germanic confederation over the portion of Luxemburg, which was annexed by the treaty to Belgium, the duchy of Limburg (excepting the communes of Maastricht and Venloo) was declared to belong to the Germanic confederation. This somewhat unsatisfactory condition of affairs continued until 1866, when at a conference of the great powers, held in London to consider the Luxemburg question (see Luxemburg), it was agreed that Limburg should be freed from every political tie with Germany. Limburg became henceforth an integral part of Dutch territory.

See P. S. Ernst, *Histoire du Limbourg* (7 vols., Liége, 1837–1852); C. J. Luzac, *De Landen van Overmuze in Zonderheid 1662* (Leiden, 1888); M. J. de Poully, *Histoire de Maastricht et de ses environs* (1850); *Diplomaticke bescheiden betreffends de Limburg-Luxemburgsche aangelegenheden 1866–1867* (The Hague, 1868); and R. Fruin, *Geschied. der Staats-Instellingen in Nederland* (The Hague, 1901). (G. E.)

LIMBURG, or Limbourg, the smallest of the nine provinces of Belgium, occupying the north-east corner of the kingdom. It represents only a portion of the ancient duchy of Limburg (see above). The part east of the Meuse was transferred to Holland by the London conference, and a further portion was attached to the province of Liége including the old capital now called Dolhain. Much of the province is represented by the wild heath district called the Campine, recently discovered to form an extensive coal-field. The operations for working it were only begun in 1906. North-west of Hasselt is Beverloo, where all the Belgian troops go through a course of instruction annually. Among the towns are Hasselt, the capital, St Trond and Looz. From the last named is derived the title of the family known as the dukes of Looz, whose antiquity equals that of the extinct reigning family of Limburg itself. The title of duc de Looz is one of the four existing ducal titles in the Netherlands, the other three being d'Arenberg, Croy and d'Ursel. Limburg contains 603,085 acres or 942 sq. m. In 1904 the population was 255,359, giving an average of 271 per sq. m.

LIMBURG, a town of Germany, in the Prussian province of Hesse-Nassau, on the Lahn, here crossed by a bridge dating from 1315, and on the main line of railway from Coblenz to Lollar and Cassel, with a branch to Frankfort-on-Main. Pop. (1905) 9917. It is the seat of a Roman Catholic bishop. The small seven-towered cathedral, dedicated to St George the martyr, is picturesquely situated on a rocky site overhanging the river. This was founded by Conrad Kurzbold, count of Niederlahngau, early in the 10th century, and was consecrated in 1235. It was restored in 1872–1878. Limburg has a castle, a new town hall and a seminary for the education of priests; its industries include the manufacture of cloth, tobacco, soap, machinery, pottery and leather. Limburg, which was a flourishing place during the middle ages, had its own line of counts until 1414, when it was purchased by the elector of Trier. It passed to Nassau in 1803. In September 1796 it was the scene of a victory gained by the Austrians under the archduke Charles over the French.

See Hillebrand, *Limburg an der Lahn unter Pfandherrschaft 1344–1624* (Wiesbaden, 1899).

LIMBURG, the south-easternmost and smallest province of Holland, bounded N. by Gelderland, N.W. by North Brabant, S.W. by the Belgian province of Limburg, and S. by that of Liége, and E. by Germany. Its area is 850 sq. m., and its population in 1900 was 281,934. It is watered by the Meuse (Maas) which forms part of its south-western boundary (with Belgium) and then flows through its northern portion, and by such tributaries as the Geul and Roer (Ruhr). Its capital is Maastricht, which gives name to one of the two administrative districts into which it is divided, the other being Roermond.

LIMBURG CHRONICLE, or Festi Limpurgenses, the name of a German chronicle written most probably by Tileman Elhen von Wolfhagen after 1402. It is a source for the history of the Rhineland between 1336 and 1398, but is perhaps more valuable for the information about German manners and customs, and the old German folk-songs and stories which it contains. It has also a certain philological interest.

The chronicle was first published by J. F. Faust in 1617, and has been edited by A. Wyss for the *Monumenta Germaniae historica. Deutsche Chroniken*, Band iv. (Hanover, 1883). See A. Wyss, *Die Limburger Chronik untersucht* (Marburg, 1875).

LIMBURGITE, in petrology, a dark-coloured volcanic rock resembling basalt in appearance, but containing normally no felspar. The name is taken from Limburg (Germany), where they occur in the well-known rock of the Kaiserstuhl. They consist essentially of olivine and augite with a brownish glassy ground mass. The augite may be green, but more commonly is brown or violet; the olivine is usually pale green or colourless, but is sometimes yellow (hyalosiderite). In the ground mass a second generation of small eumorphic augites frequently occurs; more rarely olivine is present also as an ingredient of the matrix. The principal accessory minerals are titaniferous iron oxides and apatite. Felspar though sometimes present is never abundant, and nepheline also is unusual. In some limburgites large phenocysts of dark brown hornblende and biotite are found, mostly with irregular borders blackened by resorption; in others there are large crystals of soda orthoclase or anorthoclase. Hauyne is an ingredient of some of the limburgites of the Cape Verde Islands. Rocks of this group occur in considerable numbers in Germany (Rhine district) and in Bohemia, also in Scotland, Auvergne, Spain, Africa (Kilimanjaro), Brazil, &c. They are associated principally with basalts, nepheline and leucite basalts and monchiquites. From the last-named rocks the limburgites are not easily separated as the two classes bear a very close resemblance in structure and in mineral composition, though many authorities believe that the ground mass of the monchiquites is not a glass but crystalline analcite. Limburgites may occur as flows, as sills or dykes, and are sometimes highly vesicular. Closely allied to them are the *augitites*, which are distinguished only by the absence of olivine; examples are known from Bohemia, Auvergne, the Canary Islands, Ireland, &c.

LIMBUS (Lat. for "edge," "fringe," *e.g.* of a garment), a theological term denoting the border of hell, where dwell those who, while not condemned to torture, yet are deprived of the joy of heaven. The more common form in English is "limbo," which is used both in the technical theological sense and derivatively in the sense of "prison," or for the condition of being lost, deserted, obsolete. In theology there are (1) the *Limbus Infantum*, and (2) the *Limbus Patrum*.

1. The *Limbus Infantum* or *Puerorum* is the abode to which

human beings dying without actual sin, but with their original sin unwashed away by baptism, were held to be consigned; the category included, not unbaptized infants merely, but also idiots, cretins and the like. The word "limbus," in the theological application, occurs first in the *Summa* of Thomas Aquinas; for its extensive currency it is perhaps most indebted to the *Commedia* of Dante (*Inf.* c. 4). The question as to the destiny of infants dying unbaptized presented itself to theologians at a comparatively early period. Generally speaking it may be said that the Greek fathers inclined to a cheerful and the Latin fathers to a gloomy view. Thus Gregory of Nazianzus (*Orat.* 40) says "that such children as die unbaptized without their own fault shall neither be glorified nor punished by the righteous Judge, as having done no wickedness, though they die unbaptized, and as rather suffering loss than being the authors of it." Similar opinions were expressed by Gregory of Nyssa, Severus of Antioch and others—opinions which it is almost impossible to distinguish from the Pelagian view that children dying unbaptized might be admitted to eternal life, though not to the kingdom of God. In his recoil from Pelagian heresy, Augustine was compelled to sharpen the antithesis between the state of the saved and that of the lost, and taught that there are only two alternatives—to be with Christ or with the devil, to be with Him or against Him. Following up, as he thought, his master's teaching, Fulgentius declared that it is to be believed as an indubitable truth that, "not only men who have come to the use of reason, but infants dying, whether in their mother's womb or after birth, without baptism in the name of the Father, Son and Holy Ghost, are punished with everlasting punishment in eternal fire." Later theologians and schoolmen followed Augustine in rejecting the notion of any final position intermediate between heaven and hell, but otherwise inclined to take the mildest possible view of the destiny of the irresponsible and unbaptized. Thus the proposition of Innocent III. that "the punishment of original sin is deprivation of the vision of God" is practically repeated by Aquinas, Scotus, and all the other great theologians of the scholastic period, the only outstanding exception being that of Gregory of Rimini, who on this account was afterwards called "tortor infantum." The first authoritative declaration of the Latin Church upon this subject was that made by the second council of Lyons (1274), and confirmed by the council of Florence (1439), with the concurrence of the representatives of the Greek Church, to the effect that "the souls of those who die in mortal sin or in original sin only forthwith descend into hell, but to be punished with unequal punishments." Perrone remarks (*Prael. Theol.* pt. iii. chap. 6, art. 4) that the damnation of infants and also the comparative lightness of the punishment involved in this are thus *de fide*; but nothing is determined as to the place which they occupy in hell, as to what constitutes the disparity of their punishment, or as to their condition after the day of judgment. In the council of Trent there was considerable difference of opinion as to what was implied in deprivation of the vision of God, and no definition was attempted, the Dominicans maintaining the severer view that the "limbus infantum" was a dark subterranean fireless chamber, while the Franciscans placed it in a region of light above the earth. Some theologians continue to maintain with Bellarmine that the infants "in limbo" are affected with some degree of sadness on account of a felt privation; others, following the *Nodus praedestinationis* of Celestine Sfrondati (1649–1696), hold that they enjoy every kind of natural felicity, as regards their souls now, and as regards their bodies after the resurrection, just as if Adam had not sinned. In the condemnation (1794) of the synod of Pistoia (1786), the twenty-sixth article declares it to be false, rash and injurious to treat as Pelagian the doctrine that those dying in original sin are not punished with fire, as if that meant that there is an intermediate place, free from fault and punishment, between the kingdom of God and everlasting damnation.

2. The *Limbus Patrum*, *Limbus Inferni* or *Sinus Abrahae* ("Abraham's Bosom"), is defined in Roman Catholic theology as the place in the underworld where the saints of the Old Testament were confined until liberated by Christ on his "descent into hell." Regarding the locality and its pleasantness or painfulness nothing has been taught as *de fide*. It is sometimes regarded as having been closed and empty since Christ's descent, but other authors do not think of it as separate in place from the *limbus infantum*. The whole idea, in the Latin Church, has been justly described as the mere *caput mortuum* of the old catholic doctrine of Hades, which was gradually superseded in the West by that of purgatory.

LIME (O. Eng. *lim*, Lat. *limus*, mud, from *linere*, to smear), the name given to a viscous exudation of the holly-tree, used for snaring birds and known as "bird-lime." In chemistry, it is the popular name of calcium oxide, CaO, a substance employed in very early times as a component of mortars and cementing materials. It is prepared by the burning of limestone (a process described by Dioscorides and Pliny) in kilns similar to those described under Cement. The value and subsequent treatment of the product depend on the purity of the limestone; a pure stone yields a "fat" lime which readily slakes; an impure stone, especially if magnesia be present, yields an almost unslakable "poor" lime. See Cement, Concrete and Mortar, for details.

Pure calcium oxide "quick-lime," obtained by heating the pure carbonate, is a white amorphous substance, which can be readily melted and boiled in the electric furnace, cubic and acicular crystals being deposited on cooling the vapour. It combines with water, evolving much heat and crumbling to pieces; this operation is termed "slaking" and the resulting product "slaked lime"; it is chemically equivalent to the conversion of the oxide into hydrate. A solution of the hydrate in water, known as lime-water, has a weakly alkaline reaction; it is employed in the detection of carbonic acid. "Milk of lime" consists of a cream of the hydrate and water. Dry lime has no action upon chlorine, carbon dioxide and sulphur dioxide, although in the presence of water combination ensues.

In medicine lime-water, applied externally, is an astringent and desiccative, and it enters into the preparation of linamentum calcis and carron oil which are employed to heal burns, eczema, &c. Applied internally, lime-water is an antacid; it prevents the curdling of milk in large lumps (hence its prescription for infants); it also acts as a gastric sedative. Calcium phosphate is much employed in treating rickets, and calcium chloride in haemoptysis and haemophylia. It is an antidote for mineral and oxalic acid poisoning.

LIME,[1] or Linden. The lime trees, species of *Tilia*, are familiar timber trees with sweet-scented, honeyed flowers, which are borne on a common peduncle proceeding from the middle of a long bract. The genus, which gives the name to the natural order Tiliaceae, contains about ten species of trees, natives of the north temperate zone. The general name *Tilia europaea*, the name given by Linnaeus to the European lime, includes several well-marked sub-species, often regarded as distinct species. These are: (1) the small-leaved lime, *T. parvifolia* (or *T. cordata*), probably wild in woods in England and also wild throughout Europe, except in the extreme south-east, and Russian Asia. (2) *T. intermedia*, the common lime, which is widely planted in Britain but not wild there, has a less northerly distribution than *T. cordata*, from which it differs in its somewhat larger leaves and downy fruit. (3) The large-leaved lime, *T. platyphyllos* (or *T. grandifolia*), occurs only as an introduction in Britain, and is wild in Europe south of Denmark. It differs from the other two limes in its larger leaves, often 4 in. across, which are downy beneath, its downy twigs and its prominently ribbed fruit. The lime sometimes acquires a great size; one is recorded in Norfolk as being 16 yds. in circumference, and Ray mentions one of the same girth. The famous linden tree which gave the town of Neuenstadt in Württemberg the name of "*Neuenstadt an der grossen Linden*" was 9 ft. in diameter.

The lime is a very favourite tree. It is an object of beauty in the spring when the delicately transparent green leaves are bursting from the protection of the pink and white stipules, which have formed the bud-scales, and retains its fresh green during early summer. Later, the fragrance of its flowers, rich in honey, attracts innumerable bees; in the autumn the foliage becomes a clear yellow but soon falls. Among the many famous avenues of limes may be mentioned that which gave the name to one of the best-known ways in Berlin, "Unter den Linden," and the avenue at Trinity College, Cambridge.

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[1] This is an altered form of O. Eng. and M. Eng. *lind*; cf. Ger. *Linde*, cognate with Gr. ἐλάτη, the silver fir. "Linden" in English means properly "made of lime—or lind—wood," and the transference to the tree is due to the Ger. *Lindenbaum*.

The economic value of the tree chiefly lies in the inner bark or liber (Lat. for bark), called bast, and the wood. The former was used for paper and mats and for tying garlands by the ancients (*Od*. i. 38; Pliny xvi. 14. 25, xxiv. 8. 33). Bast mats are now made chiefly in Russia, the bark being cut in long strips, when the liber is easily separable from the corky superficial layer. It is then plaited into mats about 2 yds. square; 14,000,000 come to Britain annually, chiefly from Archangel. The wood is used by carvers, being soft and light, and by architects in framing the models of buildings. Turners use it for light bowls, &c. *T. americana* (bass-wood) is one of the most common trees in the forests of Canada and extends into the eastern and southern United States. It is sawn into lumber and under the name of white-wood used in the manufacture of wooden ware, cheap furniture, &c., and also for paper pulp (C. S. Sargent, *Silva of North America*). It was cultivated by Philip Miller at Chelsea in 1752.

The common lime was well known to the ancients. Theophrastus says the leaves are sweet and used for fodder for most kinds of cattle. Pliny alludes to the use of the liber and wood, and describes the tree as growing in the mountain-valleys of Italy (xvi. 30). See also Virg. *Geo*. i. 173, &c.; Ov. *Met*. viii. 621, x. 92. Allusion to the lightness of the wood is made in Aristoph. *Birds*, 1378.

For the sweet lime (*Citrus Limetta* or *Citrus acida*) and lime-juice, see Lemon.

LIMERICK, a western county of Ireland, in the province of Munster, bounded N. by the estuary of the Shannon and the counties of Clare and Tipperary, E. by Tipperary, S. by Cork and W. by Kerry. The area is 680,842 acres, or about 1064 sq. m. The greater part of the county is comparatively level, but in the south-east the picturesque Galtees, which extend into Tipperary, attain in Galtymore a height of 3015 ft., and on the west, stretching into Kerry, there is a circular amphitheatre of less elevated mountains. The Shannon is navigable for large vessels to Limerick, above which are the rapids of Doonas and Castleroy, and a canal. The Shannon is widely famous as a sporting river, and Castleconnell is a well-known centre. The Maigne, which rises in the Galtees and flows into the Shannon, is navigable as far as the town of Adare.

This is mainly a Carboniferous Limestone county, with fairly level land, broken by ridges of Old Red Sandstone. On the north-east, the latter rock rises on Slievefelim, round a Silurian core, to 1523 ft. In the south, Old Red Sandstone rises above an enclosed area of Silurian shales at Ballylanders, the opposite scarp of Old Red Sandstone forming the Ballyhoura Hills on the Cork border. Volcanic ashes, andesites, basalts and intrusive sheets of basic rock, mark an eruptive episode in the Carboniferous Limestone. These are well seen under Carrigogunnell Castle, and in a ring of hills round Ballybrood. At Ballybrood, Upper Carboniferous beds occur, as an outlier of a large area that links the west of the county with the north of Kerry. The coals in the west are not of commercial value. Lead-ore has been worked in places in the limestone.

Limerick includes the greater part of the Golden Vale, the most fertile district of Ireland, which stretches from Cashel in Tipperary nearly to the town of Limerick. Along the banks of the Shannon there are large tracts of flat meadow land formed of deposits of calcareous and peaty matter, exceedingly fertile. The soil in the mountainous districts is for the most part thin and poor, and incapable of improvement. The large farms occupy the low grounds, and are almost wholly devoted to grazing. The acreage under tillage decreases, the proportion to pasturage being as one to nearly three. All the crops (of which oats and potatoes are the principal) show a decrease, but there is a growing acreage of meadow land. The numbers of live stock, on the other hand, are on the whole well maintained, and cattle, sheep, pigs, goats and poultry are all extensively reared. The inhabitants are employed chiefly in agriculture, but coarse woollens are manufactured, and also paper, and there are many meal and flour mills. Formerly there were flax-spinning and weaving mills, but the industry is now practically extinct. Limerick is the headquarters of an important salmon-fishery on the Shannon. The railway communications are entirely included in the Great Southern and Western system, whose main line crosses the south-eastern corner of the county, with two branches to the city of Limerick from Limerick Junction and from Charleville, and lines from Limerick south-westward to Tralee in county Kerry, and to Foynes on the Shannon estuary. Limerick is also served by a line from the north through county Tipperary. The port of Limerick, at the head of the estuary, is the most important on the west coast.

The county includes 14 baronies. The number of members returned to the Irish parliament was eight, two being returned for each of the boroughs of Askeaton and Kilmallock, in addition to two returned for the county, and two for the county of the city of Limerick. The present county parliamentary divisions are the east and west, each returning one member. The population (158,912 in 1891, 146,098 in 1901) shows a decrease somewhat under the average of the Irish counties generally, emigration being, however, extensive; of the total about 94% are Roman Catholics, and about 73% are rural. The chief towns are Limerick (pop. 38,151), Rathkeale (1749) and Newcastle or Newcastle West (2599). The city of Limerick constitutes a county in itself. Assizes are held at Limerick, and quarter-sessions at Bruff, Limerick, Newcastle and Rathkeale. The county is divided between the Protestant dioceses of Cashel, Killaloe and Limerick; and between the Roman Catholic dioceses of the same names.

Limerick was included in the kingdom of Thomond. Afterwards it had a separate existence under the name of Aine-Cliach. From the 8th to the 11th century it was partly occupied by the Danes (see Limerick, City). As a county, Limerick is one of the twelve generally considered to owe their formation to King John. By Henry II. it was granted to Henry Fitzherbert, but his claim was afterwards resigned, and subsequently various Anglo-Norman settlements were made. About 100,000 acres of the estates of the earl of Desmond, which were forfeited in 1586, were situated in the county, and other extensive confiscations took place after the Cromwellian wars. In 1709 a German colony from the Palatinate was settled by Lord Southwell near Bruff, Rathkeale and Adare.

There are only slight remains of the round tower at Ardpatrick, but that at Dysert is much better preserved; another at Kilmallock is in great part a reconstruction. There are important remains of stone-circles, pillar stones and altars at Loch Gur. In several places there are remains of old moats and tumuli. Besides the monasteries in the city of Limerick, the most important monastic ruins are those of Adare abbey, Askeaton abbey, Galbally friary, Kilflin monastery, Kilmallock and Monaster-Nenagh abbey.

LIMERICK, a city, county of a city, parliamentary borough, port and the chief town of Co. Limerick, Ireland, occupying both banks and an island (King's Island) of the river Shannon, at the head of its estuary, 129 m. W.S.W. of Dublin by the Great Southern and Western railway. Pop. (1901) 38,151. The situation is striking, for the Shannon is here a broad and noble stream, and the immediately surrounding country consists of the rich lowlands of its valley, while beyond rise the hills of the counties Clare and Tipperary. The city is divided into English Town (on King's Island), Irish Town and Newtown Pery, the first including the ancient nucleus of the city, and the last the principal modern streets. The main stream of the Shannon is crossed by Thomond Bridge and Sarsfield or Wellesley Bridge. The first is commanded by King John's Castle, on King's Island, a fine Norman fortress fronting the river, and used as barracks. At the west end of the bridge is preserved the Treaty Stone, on which the Treaty of Limerick was signed in 1691. The cathedral of St Mary, also on King's Island, was originally built in 1142–1180, and exhibits some Early English work, though largely altered at dates subsequent to that period. The Roman Catholic cathedral of St John is a modern building (1860) in early pointed style. The churches of St Munchin (to whom is attributed the foundation of the see in the 6th century) and St John, Whitamore's Castle and a Dominican priory, are other remains of antiquarian interest; while the principal city and county buildings are a chamber of commerce, a custom house commanding the river, and court house, town hall and barracks. A picturesque public park adjoins the railway station in Newtown Pery.

The port is the most important on the west coast, and accommodates vessels of 3000 tons in a floating dock; there is also a graving dock. Communication with the Atlantic is open and secure, while a vast network of inland navigation is opened up by a canal avoiding the rapids above the city. Quays extend for about 1600 yds. on each side of the river, and vessels of 600 tons can moor alongside at spring tides. The principal imports are grain, sugar, timber and coal. The exports consist mainly of agricultural produce. The principal industrial establishments include flour-mills (Limerick supplying most of the west of Ireland with flour), factories for bacon-curing and for condensed milk and creameries. Some brewing, distilling and tanning are carried on, and the manufacture of very beautiful lace is maintained at the Convent of the Good Shepherd; but a formerly important textile industry has lapsed. The salmon fisheries of the Shannon, for which Limerick is the headquarters of a district, are the most valuable in Ireland. The city is governed by a corporation, and the parliamentary borough returns one member.

Limerick is said to have been the *Regia* of Ptolemy and the *Rosse-de-Nailleagh* of the Annals of Multifernan. There is a tradition that it was visited by St Patrick in the 5th century, but it is first authentically known as a settlement of the Danes, who sacked it in 812 and afterwards made it the principal town of their kingdom of Limerick, but were expelled from it towards the close of the 10th century by Brian Boroimhe. From 1106 till its conquest by the English in 1174 it was the seat of the kings of Thomond or North Munster, and, although in 1179 the kingdom of Limerick was given by Henry II. to Herbert Fitzherbert, the city was frequently in the possession of the Irish chieftains till 1195. Richard I. granted it a charter in 1197. By King John it was committed to the care of William de Burgo, who founded English Town, and for its defence erected a strong castle. The city was frequently besieged in the 13th and 14th centuries. In the 15th century its fortifications were extended to include Irish Town, and until their demolition in 1760 it was one of the strongest fortresses of the kingdom. In 1651 it was taken by General Ireton, and after an unsuccessful siege by William III. in 1690 its resistance was terminated on the 3rd of October of the following year by the treaty of Limerick. The dismantling of its fortifications began in 1760, but fragments of the old walls remain. The original municipal rights of the city had been confirmed and extended by a succession of sovereigns, and in 1609 it received a charter constituting it a county of a city, and also incorporating a society of merchants of the staple, with the same privileges as the merchants of the staple of Dublin and Waterford. The powers of the corporation were remodelled by the Limerick Regulation Act of 1823. The prosperity of the city dates chiefly from the foundation of Newtown Pery in 1769 by Edmund Sexton Pery (d. 1806), speaker of the Irish House of Commons, whose family subsequently received the title of the earldom of Limerick. Under the Local Government Act of 1898 Limerick became one of the six county boroughs having a separate county council.

LIMERICK, a name which has been adopted to distinguish a certain form of verse which began to be cultivated in the middle of the 19th century. A limerick is a kind of burlesque epigram, written in five lines. In its earlier form it had two rhymes, the word which closed the first or second line being usually employed at the end of the fifth, but in later varieties different rhyming words are employed. There is much uncertainty as to the meaning of the name, and as to the time when it became attached to a particular species of nonsense verses. According to the *New Eng. Dict.* "a song has existed in Ireland for a very considerable time, the construction of the verse of which is identical with that of Lear's" (see below), and in which the invitation is repeated, "Will you come up to Limerick?" Unfortunately, the specimen quoted in the *New Eng. Dict.* is not only not identical with, but does not resemble Lear's. Whatever be the derivation of the name, however, it is now universally used to describe a set of verses formed on this model, with the variations in rhyme noted above:—

"There was an old man who said 'Hush!
I perceive a young bird in that bush!'
When they said, 'Is it small?'
He replied, 'Not at all!
It is five times the size of the bush.'"

The invention, or at least the earliest general use of this form, is attributed to Edward Lear, who, when a tutor in the family of the earl of Derby at Knowsley, composed, about 1834, a large number of nonsense-limericks to amuse the little grandchildren of the house. Many of these he published, with illustrations, in 1846, and they enjoyed and still enjoy an extreme popularity. Lear preferred to give a geographical colour to his absurdities, as in:—

"There was an old person of Tartary
Who cut through his jugular artery,
When up came his wife,
And exclaimed, 'O my Life,
How your loss will be felt through all Tartary!'"

but this is by no means essential. The neatness of the form has led to a very extensive use of the limerick for all sorts of mock-serious purposes, political, social and sarcastic, and a good many specimens have achieved a popularity which has been all the wider because they have, perforce, been confined to verbal transmission. In recent years competitions of the "missing word" type have had considerable vogue, the competitor, for instance, having to supply the last line of the limerick.

LIMES GERMANICUS. The Latin noun *limes* denoted generally a path, sometimes a boundary path (possibly its original sense) or boundary, and hence it was utilized by Latin writers occasionally to denote frontiers definitely delimited and marked in some distinct fashion. This latter sense has been adapted and extended by modern historians concerned with the frontiers of the Roman Empire. Thus the Wall of Hadrian in north England (see BRITAIN: *Roman*) is now sometimes styled the *Limes Britannicus*, the frontier of the Roman province of Arabia facing the desert the *Limes Arabicus* and so forth. In particular the remarkable frontier lines which bounded the Roman provinces of Upper (southern) Germany and Raetia, and which at their greatest development stretched from near Bonn on the Rhine to near Regensburg on the Danube, are often called the *Limes Germanicus*. The history of these lines is the subject of the following paragraphs. They have in the last fifteen years become much better known through systematic excavations financed by the German empire and through other researches connected therewith, and though many important details are still doubtful, their general development can be traced.

From the death of Augustus (A.D. 14) till after A.D. 70 Rome accepted as her German frontier the water-boundary of the Rhine and upper Danube. Beyond these rivers she held only the fertile plain of Frankfort, opposite the Roman border fortress of Moguntiacum (Mainz), the southernmost slopes of the Black Forest and a few scattered têtes-du-pont. The northern section of this frontier, where the Rhine is deep and broad, remained the Roman boundary till the empire fell. The southern part was different. The upper Rhine and upper Danube are easily crossed. The frontier which they form is inconveniently long, enclosing an acute-angled wedge of foreign territory—the modern Baden and Württemberg. The German populations of these lands seem in Roman times to have been scanty, and Roman subjects from the modern Alsace and Lorraine had drifted across the river eastwards. The motives alike of geographical convenience and of the advantages to be gained by recognizing these movements of Roman subjects combined to urge a forward policy at Rome, and when the vigorous Vespasian had succeeded the fool-criminal Nero, a series of advances began which gradually closed up the acute angle, or at least rendered it obtuse.

The first advance came about 74, when what is now Baden was invaded and in part annexed and a road carried from the Roman base on the upper Rhine, Strassburg, to the Danube just above Ulm. The point of the angle was broken off. The second advance was made by Domitian about A.D. 83. He pushed out from Moguntiacum, extended the Roman territory east of it and enclosed the whole within a systematically delimited and defended frontier with numerous blockhouses along it and larger forts in the rear. Among the blockhouses was one which by various enlargements and refoundations grew into the well-known Saalburg fort on the Taunus near Homburg. This advance necessitated a third movement, the construction of a frontier connecting the annexations of A.D. 74 and 83. We know the line of this frontier which ran from the Main across the upland Odenwald to the upper waters of the Neckar and was defended by a chain of forts. We do not, however, know its date, save that, if not Domitian's work, it was carried out soon after his death, and the whole frontier thus constituted was reorganized, probably by Hadrian, with a continuous wooden palisade reaching from Rhine to Danube. The angle between the rivers was now almost full. But there remained further advance and further fortification. Either Hadrian or, more probably, his successor Pius pushed out from the Odenwald and the Danube, and marked out a new frontier roughly parallel to but in advance of these two lines, though sometimes, as on the Taunus, coinciding with the older line. This is the frontier which is now visible and visited by the curious. It consists, as we see it to-day, of two distinct frontier works, one, known as the Pfahlgraben, is an earthen mound and ditch, best seen in the neighbourhood of the Saalburg but once extending from the Rhine southwards into southern Germany. The other, which begins where the earthwork stops, is a wall, though not a very formidable wall, of stone, the Teufelsmauer; it runs roughly east and west parallel to the Danube, which it finally joins at Heinheim near Regensburg. The Pfahlgraben is remarkable for the extraordinary directness of its southern part, which for over 50 m. runs mathematically straight and points almost absolutely true for the Polar star. It is a clear case of an ancient frontier laid out in American fashion. This frontier remained for about 100 years, and no doubt in that long period much was done to it to which we cannot affix precise dates. We cannot even be absolutely certain when the frontier laid out by Pius was equipped with the Pfahlgraben and Teufelsmauer. But we know that the pressure of the barbarians began to be felt seriously in the later part of the 2nd century, and after long struggles the whole or almost the whole district east of Rhine and north of Danube was lost—seemingly all within one short period—about A.D. 250.

The best English account will be found in H. F. Pelham's essay in *Trans. of the Royal Hist. Soc.* vol. 20, reprinted in his *Collected Papers*, pp. 178-211 (Oxford, 1910), where the German authorities are fully cited. (F. J. H.)

LIMESTONE, in petrography, a rock consisting essentially of carbonate of lime. The group includes many varieties, some of which are very distinct; but the whole group has certain properties in common, arising from the chemical composition and mineral character of its members. All limestones dissolve readily in cold dilute acids, giving off bubbles of carbonic acid. Citric or acetic acid will effect this change, though the mineral acids are more commonly employed. Limestones, when pure, are soft rocks readily scratched with a knife-blade or the edge of a coin, their hardness being 3; but unless they are earthy or incoherent, like chalk or sinter, they do not disintegrate by pressure with the fingers and cannot be scratched with the finger nail. When free from impurities limestones are white, but they generally contain small quantities of other minerals than calcite which affect their colour. Many limestones are yellowish or creamy, especially those which contain a little iron oxide, iron carbonate or clay. Others are bluish from the presence of iron sulphide, or pyrites or marcasite; or grey and black from admixture with carbonaceous or bituminous substances. Red limestones usually contain haematite; in green limestones there may be glauconite or chlorite. In crystalline limestones or marbles many silicates may occur producing varied colours, *e.g.* epidote, chlorite, augite (green); vesuvianite and garnet (brown and red); graphite, spinels (black and grey); epidote, chondrodite (yellow). The specific gravity of limestones ranges from 2·6 to 2·8 in typical examples.

When seen in the field, limestones are often recognizable by their method of weathering. If very pure, they may have smooth rounded surfaces, or may be covered with narrow runnels cut out by the rain. In such cases there is very little soil, and plants are found growing only in fissures or crevices where the insoluble impurities of the limestone have been deposited by the rain. The less pure rocks have often eroded or pitted surfaces, showing bands or patches rendered more resistant to the action of the weather by the presence of insoluble materials such as sand, clay or chert. These surfaces are often known from the crust of hydrous oxides of iron produced by the action of the atmosphere on any ferriferous ingredients of the rock; they are sometimes black when the limestone is carbonaceous; a thin layer of gritty sand grains may be left on the surface of limestones which are slightly arenaceous. Most limestones which contain fossils show these most clearly on weathered surfaces, and the appearance of fragments of corals, crinoids and shells on the exposed parts of a rock indicate a strong probability that that rock is a limestone. The interior usually shows the organic structures very imperfectly or not at all.

Another characteristic of pure limestones, where they occur in large masses occupying considerable areas, is the frequency with which they produce bare rocky ground, especially at high elevations, or yield only a thin scanty soil covered with short grass. In mountainous districts limestones are often recognizable by these peculiarities. The chalk downs are celebrated for the close green sward which they furnish. More impure limestones, like those of the Lias and Oolites, contain enough insoluble mineral matter to yield soils of great thickness and value, *e.g.* the Cornbrash. In limestone regions all waters tend to be hard, on account of the abundant carbonate of lime dissolved by percolating waters, and caves, swallow holes, sinks, pot-holes and underground rivers may occur in abundance. Some elevated tracts of limestone are very barren (*e.g.* the Causses), because the rain which falls in them sinks at once into the earth and passes underground. To a large extent this is true of the chalk downs, where surface waters are notably scarce, though at considerable depths the rocks hold large supplies of water.

The great majority of limestones are of organic formation, consisting of the debris of the skeletons of animals. Some are foraminiferal, others are crinoidal, shelly or coral limestones according to the nature of the creatures whose remains they contain. Of foraminiferal limestones chalk is probably the best known; it is fine, white and rather soft, and is very largely made up of the shells of globigerina and other foraminifera (see CHALK). Almost equally important are the nummulitic limestones so well developed in Mediterranean countries (Spain, France, the Alps, Greece, Algeria, Egypt, Asia Minor, &c.). The pyramids of Egypt are built mainly of nummulitic limestone. Nummulites are large cone-shaped foraminifera with many chambers arranged in spiral order. In Britain the small globular shells of *Saccamina* are important constituents of some Carboniferous limestones; but the upper portion of that formation in Russia, eastern Asia and North America is characterized by the occurrence of limestones filled with the spindle-shaped shells of *Fusulina*, a genus of foraminifera now extinct.

Coral limestones are being formed at the present day over a large extent of the tropical seas; many existing coral reefs must be of great thickness. The same process has been going on actively since a very early period of the earth's history, for similar rocks are found in great abundance in many geological formations. Some Silurian limestones are rich in corals; in the Devonian there are deposits which have been described as coral reefs (Devonshire, Germany). The Carboniferous limestone, or mountain limestones of England and North America, is sometimes nearly entirely coralline, and the great dolomite masses of the Trias in the eastern Alps are believed by many to be merely altered coral reefs. A special feature of coral limestones is that, although they may be to a considerable extent dolomitized, they are generally very free from silt and mechanical impurities.

Crinoidal limestones, though abundant among the older rocks, are not in course of formation on any great scale at the present time, as crinoids, formerly abundant, are now rare. Many Carboniferous and Silurian limestones consist mainly of the little cylindrical joints of these animals. They are easily recognized by their shape, and by the fact that many of them show a tube along their axes, which is often filled up by carbonate of lime; under the microscope they have a punctate or fenestrate structure and each joint behaves as a simple crystalline plate with uniform optical properties in polarized light. Remains of other echinoderms (starfishes and sea urchins) are often found in plenty in Secondary and Tertiary limestones, but very seldom make up the greater part of the rock. Shelly limestones may consist of mollusca or of brachiopoda, the former being common in limestones of all ages while the latter attained their principal development in the Palaeozoic epoch. The shells are often broken and may have been reduced to shell sand before the rock consolidated. Many rocks of this class are impure and pass into marls and shelly sandstones which were deposited in shallow waters, where land-derived sediment mingled with remains of the creatures which inhabited the water. Fresh-water limestones are mostly of this class and contain shells of those varieties of mollusca which inhabit lakes. Brackish water limestones also are usually shelly. Corallines (bryozoa, polyzoa, &c.), cephalopods (*e.g.* ammonites, belemnites), crustaceans and sponges occur frequently in limestones. It should be understood that it is not usual for a rock to be built up entirely of one kind of organism though it is classified according to its most abundant or most conspicuous ingredients.

In the organic limestones there usually occurs much finely granular calcareous matter which has been described as limestone mud or limestone paste. It is the finely ground substance which results from the breaking down of shells, &c., by the waves and currents, and by the decay which takes place in the sea bottom before the fragments are compacted into hard rock. The skeletal parts of marine animals are not always converted into limestone in the place where they were formed. In shallow waters, such as are the favourite haunts of mollusca, corals, &c., the tides and storms are frequently sufficiently powerful to shift the loose material on the sea bottom. A large part of a coral reef consists of broken coral rock dislodged from the growing mass and carried upwards to the beach or into the lagoon. Large fragments also fall over the steep outward slopes of the reef and build up a talus at their base. Coral muds and coral sands produced by the waves acting in these detached blocks, are believed to cover two and a half millions of square miles of the ocean floor. Owing to the fragile nature of the shells of foraminifera they readily become disintegrated, especially at considerable depths, largely by the solvent action of carbonic acid in sea water as they sink to the bottom. The chalk in very great part consists not of entire shells but of debris of foraminifera, and mollusca (such as *Inoceramus*, &c.). The Globigerina ooze is the most widespread of modern calcareous formations. It occupies nearly fifty millions of square miles of the sea bottom, at an average depth of two thousand fathoms. Pteropod ooze, consisting mainly of the shells of pteropods (mollusca) also has a wide distribution, especially in northern latitudes.

Consolidation may to a considerable extent be produced by pressure, but more commonly cementation and crystallization play a large part in the process. Recent shell sands on beaches and in dunes are not unfrequently converted into a soft, semi-coherent rock by rain water filtering downwards, dissolving and redepositing carbonate of lime between the sand grains. In coral reefs also the mass soon has its cavities more or less obliterated by a deposit of calcite from solution. The fine interstitial mud or paste presents a large surface to the solvents, and is more readily attacked than the larger and more compact shell fragments. In fresh-water marls considerable masses of crystalline calcite may be produced in this way, enclosing well-preserved molluscan shells. Many calcareous fragments consist of aragonite, wholly or principally, and this mineral tends to be replaced by calcite. The aragonite, as seen in sections under the microscope, is usually fibrous or prismatic, the calcite is more commonly granular with a well-marked network of rhombohedral cleavage cracks. The replacement of aragonite by calcite goes on even in shells lying on modern sea shores, and is often very complete in rocks belonging to the older geological periods. By the recrystallization of the finer paste and the introduction of calcite in solution the interior of shells, corals, foraminifera, &c., becomes occupied by crystalline calcite, sometimes in comparatively large grains, while the original organic structures may be very well preserved.

Some limestones are exceedingly pure, *e.g.* the chalk and some varieties of mountain limestone, and these are especially suited for making lime. The majority, however, contain admixture of other substances, of which the commonest are clay and sand. Clayey or argillaceous limestones frequently occur in thin or thick beds alternating with shales, as in the Lias of England (the marlstone series). Friable argillaceous fresh-water limestones are called "marls," and are used in many districts for top dressing soils, but the name "marl" is loosely applied and is often given to beds which are not of this nature (*e.g.* the red marls of the Trias). The "cement stones" of the Lothians in Scotland are argillaceous limestones of Lower Carboniferous age, which when burnt yield cement. The gault (Upper Cretaceous) is a calcareous clay, often containing well-preserved fossils, which lies below the chalk and attains considerable importance in the south-east of England. Arenaceous limestones pass by gradual transitions into shelly sandstones; in the latter the shells are often dissolved leaving cavities, which may be occupied by casts. Some of the Old Red Sandstone is calcareous. In other cases the calcareous matter has recrystallized in large plates which have shining cleavage surfaces dotted over with grains of sand (Lincolnshire limestone). The Fontainebleau sandstone has large calcite rhombohedra filled with sand grains. Limestones sometimes contain much plant matter which has been converted into a dark coaly substance, in which the original woody structures may be preserved or may not. The calcareous petrified plants of Fifeshire occur in such a limestone, and much has been learned from a microscopic study of them regarding the anatomy of the plants of the Carboniferous period. Volcanic ashes occur in some limestones, a good example being the calcareous schalsteins or tuffs of Devonshire, which are usually much crushed by earth movements. In the Globigerina ooze of the present day there is always a slight admixture of volcanic materials derived either from wind-blown dust, from submarine eruptions or from floating pieces of pumice. Other limestones contain organic matter in the shape of asphalt, bitumen or petroleum, presumably derived from plant remains. The well-known *Val de Travers* is a bituminous limestone of lower Neocomian age found in the valley of that name near Neuchâtel. Some of the oil beds of North America are porous limestones, in the cavities of which the oil is stored up. Siliceous limestones, where their silica is original and of organic origin, have contained skeletons of sponges or radiolaria. In the chalk the silica has usually been dissolved and redeposited as flint nodules, and in the Carboniferous limestone as chert bands. It may also be deposited in the corals and other organic remains, silicifying them, with preservation of the original structures (*e.g.* some Jurassic and Carboniferous limestones).

The oolitic limestones form a special group distinguished by their consisting of small rounded or elliptical grains resembling fish roe; when coarse they are called pisolites. Many of them are very pure and highly fossiliferous. The oolitic grains in section may have a nucleus, *e.g.* a fragment of a shell, quartz grain, &c., around which concentric layers have been deposited. In many cases there is also a radiating structure. They consist of calcite or aragonite, and between the grains there is usually a cementing material of limestone mud or granular calcite crystals. Deposits of silica, carbonate of iron or small rhombohedra of dolomite are often found in the interior of the spheroids, and oolites may be entirely silicified (Pennsylvania, Cambrian rocks of Scotland). Oolitic ironstones are very abundant in the Cleveland district of Yorkshire and form an important iron ore. They are often impure, and their iron may be present as haematite or as chalybite. Oolitic limestones are known from many geological formations, *e.g.* the Cambrian and Silurian of Scotland and Wales, Carboniferous limestone (Bristol), Jurassic, Tertiary and Recent limestones. They are forming at the present day in some coral reefs and in certain petrifying springs like those of Carlsbad. Their chief development in England is in the Jurassic rocks where they occur in large masses excellently adapted for building purposes, and yield the well-known freestones of Portland and Bath. Some hold that they are chemical precipitates and that the concentric oolitic structure is produced by successive layers of calcareous deposit laid down on fragments of shells, &c., in highly calcareous waters. An alternative hypothesis is that minute cellular plants (*Girvanella*, &c.), have extracted the carbonate of lime from the water, and have been the principal agents in producing the successive calcareous crusts. Such plants can live even in hot waters, and there seems much reason for regarding them as of importance in this connexion.

Another group of limestones is of inorganic or chemical origin, having been deposited from solution in water without the intervention of living organisms. A good example of these is the "stalactite" which forms pendent masses on the roofs of caves in limestone districts, the calcareous waters exposed to evaporation in the air of the cave laying down successive layers of stalactite in the places from which they drip. At the same time and in the same way "stalagmite" gathers on the floor below, and often accumulates in thick masses which contain bones of animals and the weapons of primitive cave-dwelling man. Calc sinters are porous limestones deposited by the evaporation of calcareous springs; travertine is a well-known Italian rock of this kind. At Carlsbad oolitic limestones are forming, but it seems probable that minute algae assist in this process. Chemical deposits of carbonate of lime may be produced by the evaporation of sea water in some upraised coral lagoons and similar situations, but it is unlikely that this takes place to any extent in the open sea, as sea water contains very little carbonate of lime, apparently because marine organisms so readily abstract it; still some writers believe that a considerable part of the chalk is really a chemical precipitate. Onyx marbles are banded limestones of chemical origin with variegated colours such as white, yellow, green and red. They are used for ornamental work and are obtained in Persia, France, the United States, Mexico, &c.

Limestones are exceedingly susceptible to chemical changes of a metasomatic kind. They are readily dissolved by carbonated waters and acid solutions, and their place may then be occupied by deposits of a different kind. The silification of oolites and coral rocks and their replacement by iron ores above mentioned are examples of this process. Many extensive hematite deposits are in this way formed in limestone districts. Phosphatization sometimes takes place, amorphous phosphate of lime being substituted for carbonate of lime, and these replacement products often have great value as sources of natural fertilizers. On ocean rocks in dry climates the droppings of birds (guano) which contain much phosphate, percolating into the underlying limestones change them into a hard white or yellow phosphate rock (*e.g.* Sombrero, Christmas Island, &c.), sometimes known as rock-guano or mineral guano. In the north of France beds of phosphate are found in the chalk; they occur also in England on a smaller scale. All limestones, especially those laid down in deep waters contain some lime phosphate, derived from shells of certain brachiopods, fish bones, teeth, whale bones, &c.

and this may pass into solution and be redeposited in certain horizons, a process resembling the formation of flints. On the sea bottom at the present day phosphatic nodules are found which have gathered round the dead bodies of fishes and other animals. As in flint the organic structures of the original limestone may be well preserved though the whole mass is phosphatized.

Where uprising heated waters carrying mineral solutions are proceeding from deep seated masses of igneous rocks they often deposit a portion of their contents in limestone beds. At Leadville, in Colorado, for example, great quantities of rich silver lead ore, which have yielded not a little gold, have been obtained from the limestones, while other rocks, though apparently equally favourably situated, are barren. The lead and fluorspar deposits of the north of England (Alston Moor, Derbyshire) occur in limestone. In the Malay States the limestones have been impregnated with tin oxide. Zinc ores are very frequently associated with beds of limestone, as at Vieille Montagne in Belgium, and copper ores are found in great quantity in Arizona in rocks of this kind. Apart from ore deposits of economic value a great number of different minerals, often well crystallized, have been observed in limestones.

When limestones occur among metamorphic schists or in the vicinity of intrusive plutonic masses (such as granite), they are usually recrystallized and have lost their organic structures. They are then known as crystalline limestones or marbles (*q.v.*). (J. S. F.)

LIMINA APOSTOLORUM, an ecclesiastical term used to denote Rome, and especially the church of St Peter and St Paul. A *Visitatio Liminum* might be undertaken *ex voto* or *ex lege*. The former, visits paid in accordance with a vow, were very frequent in the middle ages, and were under the special protection of the pope, who put the ban upon any who should molest pilgrims "who go to Rome for God's sake." The question of granting dispensations from such a vow gave rise to much canonical legislation, in which the papacy had finally to give in to the bishops. The visits demanded by law were of more importance. In 743 a Roman synod decreed that all bishops subject to the metropolitan see of Rome should meet personally every year in that city to give an account of the state of their dioceses. Gregory VII. included in the order all metropolitans of the Western Church, and Sixtus V. (by the bull *Romanus Pontifex*, Dec. 20, 1584) ordered the bishops of Italy, Dalmatia and Greece to visit Rome every three years; those of France, Germany, Spain and Portugal, Belgium, Hungary, Bohemia and the British Isles every four years; those from the rest of Europe every five years; and bishops from other continents every ten years. Benedict XIV. in 1740 extended the summons to all abbots, provosts and others who held territorial jurisdiction.

LIMITATION, STATUTES OF, the name given to acts of parliament by which rights of action are limited in the United Kingdom to a fixed period after the occurrence of the events giving rise to the cause of action. This is one of the devices by which lapse of time is employed to settle disputed claims. There are mainly two modes by which this may be effected. We may say that the active enjoyment of a right—or possession—for a determined period shall be a good title against all the world. That is the method known generally as PRESCRIPTION (*q.v.*). It looks to the length of time during which the defendant in a disputed claim has been in possession or enjoyment of the matter in dispute. But the principle of the statutes of limitation is to look to the length of time during which the plaintiff has been out of possession. The point of time at which he might first have brought his action having been ascertained, the lapse of the limited period after that time bars him for ever from bringing his action. In both cases the policy of the law is expressed by the maxim *Interest reipublicae ut sit finis litium*.

The principle of limitation was first adopted in English law in connexion with real actions, *i.e.* actions for the recovery of real property. At first a fixed date was taken, and no action could be brought of which the cause had arisen before that date. By the Statute of Westminster the First (3 Edward I. c. 39), the beginning of the reign of Richard I. was fixed as the date of limitation for such actions. This is the well-known "period of legal memory" recognized by the judges in a different class of cases to which a rule of prescription was applied. Possession of rights in *alieno solo* from time immemorial was held to be an indefeasible title, and the courts held time immemorial to begin with the first year of Richard I.

A period absolutely fixed became in time useless for the purposes of limitation, and the method of counting back a certain number of years from the date of the writs was adopted in the Statute 32 Henry VIII. c. 2, which fixed periods of thirty, fifty and sixty years for various classes of actions named therein. A large number of statutes since that time have established periods of limitation for different kinds of actions. Of those now in force the most important are the Limitation Act 1623 for personal actions in general, and the Real Property Limitation Act 1833 relating to actions for the recovery of land. The latter statute has been repealed and virtually re-enacted by the Real Property Limitation Act 1874, which reduced the period of limitation from twenty years to twelve, for all actions brought after the 1st January 1879. The principal section of the act of 1833 will show the *modus operandi*: "After the 31st December 1833, no person shall make an entry or distress, or bring an action to recover any land or rent *but within twenty years next after the time* at which the right to make such entry or distress or to bring such action shall have first accrued to some person through whom he claims, or shall have first accrued to the person making or bringing the same." Another section defines the times at which the right of action or entry shall be deemed to have accrued in particular cases; *e.g.* when the estate claimed shall have been an estate or interest in reversion, such right shall be deemed to have first accrued at the time at which such estate or interest became an estate or interest in possession. Thus suppose lands to be let by A to B from 1830 for a period of fifty years, and that a portion of such lands is occupied by C from 1831 without any colour of title from B or A—C's long possession would be of no avail against an action brought by A for the recovery of the land after the determination of B's lease. A would have twelve years after the determination of the lease within which to bring his action, and might thus, by an action brought in 1891, disestablish a person who had been in quiet possession since 1831. What the law looks to is not the length of time during which C has enjoyed the property, but the length of time which A has suffered to elapse since he might first have brought his action. It is to be observed, however, that the Real Property Limitation Act does more than bar the remedy. It extinguishes the right, differing in this respect from the other Limitation Acts, which, while barring the remedy, preserve the right, so that it may possibly become available in some other way than by action.

By section 14 of the act of 1833, when any acknowledgment of the title of the person entitled shall have been given to him or his agent in writing signed by the person in possession, or in receipt of the profits or rent, then the right of the person (to whom such acknowledgment shall have been given) to make an entry or distress or bring an action shall be deemed to have first accrued at the time at which such acknowledgment, or the last of such acknowledgments, was given. By section 15, persons under the disability of infancy, lunacy or coverture, or beyond seas, and their representatives, are to be allowed ten years from the termination of this disability, or death (which shall have first happened), notwithstanding that the ordinary period of limitation shall have expired.

By the act of 1623 actions of trespass, detinue, trover, replevin or account, actions on the case (except for slander), actions of debt arising out of a simple contract and actions for arrears of rent not due upon specialty shall be limited to six years from the date of the cause of action. Actions for assault, menace, battery, wounds and imprisonment are limited to four years, and actions for slander to two years. Persons labouring under the disabilities of infancy, lunacy or unsoundness of mind are allowed the same time after the removal of the disability. When the defendant was "beyond seas" (*i.e.* outside the United Kingdom and the adjacent islands) an extension of time was allowed, but by the Real Property Limitation Act of 1874 such an allowance is excluded as to real property, and as to other matters by the Mercantile Law Amendment Act 1856.

An acknowledgment, whether by payment on account or by mere spoken words, was formerly sufficient to take the case out of the statute. The Act 9 Geo. IV. c. 14 (Lord Tenterden's act) requires any promise or admission of liability to be in writing and signed by the party to be charged, otherwise it will not bar the statute.

Contracts under seal are governed as to limitation by the act of 1883, which provides that actions for rent upon any indenture of demise, or of covenant, or debt or any bond or other specialty, and on recognizances, must be brought within twenty years after cause of action. Actions of debt on an award (the submission being not under seal), or for a copyhold fine, or for money levied on a writ of *fieri facias*, must be brought within six years. With regard to the rights of the crown, the principle obtains that *nullum tempus occurrit regi*, so that no statute of limitation affects the crown without express mention. But by the Crown Suits Act 1769, as amended by the Crown Suits Act 1861, in suits relating to land, the claims of the crown to recover are barred after the lapse of sixty years. For the prosecution of criminal offences generally there is no period of limitation, except where they are punishable on summary conviction. In such case the period is six months by the Summary Jurisdiction Act 1848. But there are various miscellaneous limitations fixed by various acts, of which the following may be noticed. Suits and indictments under penal statutes are limited to two years if the forfeiture is to the crown, to one year if the forfeiture is to the common informer. Penal actions by persons aggrieved are limited to two years by the act of 1833. Prosecutions under the Riot Act can only be sued upon within twelve months after the offence has been committed, and offences against the Customs Acts within three years. By the Public Authorities Protection Act 1893, a prosecution against any person acting in execution of statutory or other public duty must be commenced within six months. Prosecutions under the Criminal Law Amendment Act, as amended by the Prevention of Cruelty to Children Act 1904, must be commenced within six months after the commission of the offence.

Trustees are expressly empowered to plead statutes of limitation by the Trustees Act 1888; indeed, a defence under the statutes of limitations must in general be specially pleaded. Limitation is regarded strictly as a law of procedure. The English courts will therefore apply their own rules to all actions, although the cause of action may have arisen in a country in which different rules of limitation exist. This is also a recognized principle of private international law (see J. A. Foote, *Private International Law*, 3rd ed., 1904, p. 516 seq.).

United States.—The principle of the statute of limitations has passed with some modification into the statute-books of every state in the Union except Louisiana, whose laws of limitation are essentially the prescriptions of the civil law drawn from the *Partidas*, or "Spanish Code." As to personal actions, it is generally provided that they shall be brought within a certain specified time—usually six years or less—from the time when the cause of action accrues, and not after, while for land the "general if not universal limitation of the right to bring action or to make entry is to twenty years after the right to enter or to bring the action accrues" (Bouvier's *Law Dictionary*, art. "Limitations"). The constitutional provision prohibiting states from passing laws impairing the obligation of contracts is not infringed by a law of limitations, unless it bars a right of action already accrued without giving a reasonable term within which to bring the action.

See Darby and Bosanquet, *Statutes of Limitations* (1899); Hewitt, *Statutes of Limitations* (1893).

LIMOGES, a town of west-central France, capital of the department of Haute-Vienne, formerly capital of the old province of Limousin, 176 m. S. by W. of Orleans on the railway to Toulouse. Pop. (1906) town, 75,906; commune, 88,597. The station is a junction for Poitiers, Angoulême, Périgueux and Clermont-Ferrand. The town occupies a hill on the right bank of the Vienne, and comprises two parts originally distinct, the *Cité* with narrow streets and old houses occupying the lower slope, and the town proper the summit. In the latter a street known as the Rue de la Boucherie is occupied by a powerful and ancient corporation of butchers. The site of the fortifications which formerly surrounded both quarters is occupied by boulevards, outside which are suburbs with wide streets and spacious squares. The cathedral, the most remarkable building in the Limousin, was begun in 1273. In 1327 the choir was completed, and before the middle of the 16th century the transept, with its fine north portal and the first two bays of the nave; from 1875 to 1890 the construction of the nave was continued, and it was united with the west tower (203 ft. high), the base of which belongs to a previous Romanesque church. In the interior there are a magnificent rood loft of the Renaissance, and the tombs of Jean de Langeac (d. 1541) and other bishops. Of the other churches of Limoges, St Michel des Lions (14th and 15th centuries) and St Pierre du Queyroix (12th and 13th centuries) both contain interesting stained glass. The principal modern buildings are the town hall and the law-courts. The Vienne is crossed by a railway viaduct and four bridges, two of which, the Pont St Étienne and the Pont St Martial, date from the 13th century. Among the chief squares are the Place d'Orsay on the site of a Roman amphitheatre, the Place Jourdan with the statue of Marshal J. B. Jourdan, born at Limoges, and the Place d'Aine with the statue of J. L. Gay-Lussac. President Carnot and Denis Dussoubs, both of whom have statues, were also natives of the town. The museum has a rich ceramic collection and art, numismatic and natural history collections.

Limoges is the headquarters of the XII. army corps and the seat of a bishop, a prefect, a court of appeal and a court of assizes, and has tribunals of first instance and of commerce, a board of trade arbitration, a chamber of commerce and a branch of the Bank of France. The educational institutions include a *lycée* for boys, a preparatory school of medicine and pharmacy, a higher theological seminary, a training college, a national school of decorative art and a commercial and industrial school. The manufacture and decoration of porcelain give employment to about 13,000 persons in the town and its vicinity. Shoemaking and the manufacture of clogs occupy over 2000. Other industries are liqueur-distilling, the spinning of wool and cloth-weaving, printing and the manufacture of paper from straw. Enamelling, which flourished at Limoges in the middle ages and during the Renaissance (see Enamel), but subsequently died out, was revived at the end of the 19th century. There is an extensive trade in wine and spirits, cattle, cereals and wood. The Vienne is navigable for rafts above Limoges, and the logs brought down by the current are stopped at the entrance of the town by the inhabitants of the Naveix quarter, who form a special gild for this purpose.

Limoges was a place of importance at the time of the Roman conquest, and sent a large force to the defence of Alesia. In 11 B.C. it took the name of Augustus (*Augustoritum*); but in the 4th century it was anew called by the name of the *Lemovices*, whose capital it was. It then contained palaces and baths, had its own senate and the right of coinage. Christianity was introduced by St Martial. In the 5th century Limoges was devastated by the Vandals and the Visigoths, and afterwards suffered in the wars between the Franks and Aquitanians and in the invasions of the Normans. Under the Merovingian kings Limoges was celebrated for its mints and its goldsmiths' work. In the middle ages the town was divided into two distinct parts, each surrounded by walls, forming separate fiefs with a separate system of administration, an arrangement which survived till 1792. Of these the more important, known as the *Château*, which grew up round the tomb of St Martial in the 9th century, and was surrounded with walls in the 10th and again in the 12th, was under the jurisdiction of the viscounts of Limoges, and contained their castle and the monastery of St Martial; the other, the *Cité*, which was under the jurisdiction of the bishop, had but a sparse population, the habitable ground being practically covered by the cathedral, the episcopal palace and other churches and religious buildings. In the Hundred Years' War the bishops sided with the French, while the viscounts were unwilling vassals of the English. In 1370 the *Cité*, which had opened its gates to the French, was taken by the Black Prince and given over to fire and sword.

The religious wars, pestilence and famine desolated Limoges in turn, and the plague of 1630–1631 carried off more than 20,000 persons. The wise administrations of Henri d'Aguesseau, father of the chancellor, and of Turgot enabled Limoges to recover its former prosperity. There have been several great fires, destroying whole quarters of the city, built, as it then was, of wood. That of 1790 lasted for two months, and destroyed 192 houses; and that of 1864 laid under ashes a large area. Limoges celebrates every seven years a curious religious festival (Fête d'Ostension), during which the relics of St Martial are exposed for seven weeks, attracting large numbers of visitors. It dates from the 10th century, and commemorates a pestilence (mal des ardents) which, after destroying 40,000 persons, is believed to have been stayed by the intercession of the saint.

Limoges was the scene of two ecclesiastical councils, in 1029 and 1031. The first proclaimed the title of St Martial as "apostle of Aquitaine"; the second insisted on the observance of the "truce of God." In 1005 Pope Urban II. held a synod of bishops here in connexion with his efforts to organize a crusade, and on this occasion consecrated the basilica of St Martial (pulled down after 1794).

See Célestin Poré, *Limoges*, in Joanne's guides, *De Paris à Ager* (1867); Ducourtieux, *Limoges d'après ses anciens plans* (1884) and *Limoges et ses environs* (3rd ed., 1894). A very full list of works on Limoges, the town, viscounty, bishopric, &c., is given by U. Chevalier in *Répertoire des sources hist. du moyen âge. Topo-bibliogr.* (Mont Céliard, 1903), t. ii. *s.v.*

LIMON, or PORT LIMON, the chief Atlantic port of Costa Rica, Central America, and the capital of a district also named Limon, on a bay of the Caribbean Sea, 103 m. E. by N. of San José. Pop. (1904) 3171. Limon was founded in 1871, and is the terminus of the transcontinental railway to Puntarenas which was begun in the same year. The swamps behind the town, and the shallow coral lagoon in front of it, have been filled in. The harbour is protected by a sea-wall built along the low-water line, and an iron pier affords accommodation for large vessels. A breakwater from the harbour to the island of Uvita, about 1200 yds. E. would render Limon a first-class port. There is an excellent water-supply from the hills above the harbour. Almost the entire coffee and banana crops of Costa Rica are sent by rail for shipment at Limon to Europe and the United States. The district (*comarca*) of Limon comprises the whole Atlantic littoral, thus including the Talamanca country inhabited by uncivilized Indians; the richest banana-growing territories in the country; and the valuable forests of the San Juan valley. It is annually visited by Indians from the Mosquito coast of Nicaragua, who come in canoes to fish for turtle. Its chief towns, after Limon, are Reventazon and Matina, both with fever than 3000 inhabitants.

LIMONITE, or BROWN IRON ORE, a natural ferric hydrate named from the Gr. λειμών (meadow), in allusion to its occurrence as "bog-ore" in meadows and marshes. It is never crystallized, but may have a fibrous or microcrystalline structure, and commonly occurs in concretionary forms or in compact and earthy masses; sometimes mammillated, botryoidal, reniform or stalactitic. The colour presents various shades of brown and yellow, and the streak is always brownish, a character which distinguishes it from haematite with a red, or from magnetite with a black streak. It is sometimes called brown haematite.

Limonite is a ferric hydrate, conforming typically with the formula $Fe_4O_3(OH)_6$, or $2Fe_2O_3 \cdot 3H_2O$. Its hardness is rather above 5, and its specific gravity varies from 3·5 to 4. In many cases it has been formed from other iron oxides, like haematite and magnetite, or by the alteration of pyrites or chalybite.

By the operation of meteoric agencies, iron pyrites readily pass into limonite often with retention of external form; and the masses of "gozzan" or "gossan" on the outcrop of certain mineral-veins consist of rusty iron ore formed in this way, and associated with cellular quartz. Many deposits of limonite have been found, on being worked, to pass downwards into ferrous carbonate; and crystals of chalybite converted superficially into limonite are well known. Minerals, like glauconite, which contain ferrous silicate, may in like manner yield limonite, on weathering. The ferric hydrate is also readily deposited from ferruginous waters, often by means of organic agencies. Deposits of brown iron ore of great economic value. occur in many sedimentary rocks, such as the Lias, Oolites and Lower Greensand of various parts of England. They appear in some cases to be altered limestones and in others altered glauconitic sandstones. An oolitic structure is sometimes present, and the ores are generally phosphatic, and may contain perhaps 30% of iron. The oolitic brown ores of Lorraine and Luxemburg are known as "minette," a diminutive of the French *mine* (ore), in allusion to their low content of metal. Granular and concretionary limonite accumulates by organic action on the floor of certain lakes in Sweden, forming the curious "lake ore." Larger concretions formed under other conditions are known as "bean ore." Limonite often forms a cementing medium in ferruginous sands and gravels, forming "pan"; and in like manner it is the agglutinating agent in many conglomerates, like the South African "banket," where it is auriferous. In iron-shot sands the limonite may form hollow concretions, known in some cases as "boxes." The "eagle stones" of older writers were generally concretions of this kind, containing some substance, like sand, which rattled when the hollow nodule was shaken. Bog iron ore is an impure limonite, usually formed by the influence of micro-organisms, and containing silica, phosphoric acid and organic matter, sometimes with manganese. The various kinds of brown and yellow ochre are mixtures of limonite with clay and other impurities; whilst in umber much manganese oxide is present. Argillaceous brown iron ore is often known in Germany as *Thoneisenstein*; but the corresponding term in English (clay iron stone) is applied to nodular forms of impure chalybite. J. C. Ullmann's name of stilpnosiderite, from the Greek στιλπνός (shining) is sometimes applied to such kinds of limonite as have a pitchy lustre. Deposits of limonite in cavities may have a rounded surface or even a stalactitic form, and may present a brilliant lustre, of blackish colour, forming what is called in Germany *Glaskopf* (glass head). It often happens that analyses of brown iron ores reveal a larger proportion of water than required by the typical formula of limonite, and hence new species have been recognized. Thus the yellowish brown ore called by E. Schmidt xanthosiderite, from ζανθός (yellow) and σίδηρος (iron), contains $Fe_2O(OH)_4$, or $Fe_2O_3 \cdot 2H_2O$; whilst the bog ore known as limnite, from λίμνη (marsh) has the formula $Fe(OH)_3$, or $Fe_2O_3 \cdot 3H_2O$. On the other hand there are certain forms of ferric hydrate containing less water than limonite and approaching to haematite in their red colour and streak: such is the mineral which was called hydrohaematite by A. Breithaupt, and is now generally known under R. Hermann's name of turgite, from the mines of Turginsk, near Bogoslovsk in the Ural Mountains. This has the formula $Fe_4O_5(OH)_2$, or $2Fe_2O_3 \cdot H_2O$. It probably represents the partial dehydration of limonite, and by further loss of water may pass into haematite or red iron ore. When limonite is dehydrated and deoxidized in the presence of carbonic acid, it may give rise to chalybite.

LIMOUSIN (or LIMOSIN), **LÉONARD** (*c.* 1505–*c.* 1577), French painter, the most famous of a family of seven Limoges enamel painters, was the son of a Limoges innkeeper. He is supposed to have studied under Nardon Pénicaud. He was certainly at the beginning of his career influenced by the German school—indeed, his earliest authenticated work, signed L. L. and dated 1532, is a series of eighteen plaques of the "Passion of the Lord," after Albrecht Dürer, but this influence was counterbalanced by that of the Italian masters of the school of Fontainebleau, Primaticcio, Rosso, Giulio Romano and Solario, from whom he acquired his taste for arabesque ornament and for mythological subjects. Nevertheless the French tradition was sufficiently ingrained in him to save him from becoming an imitator and from losing his personal style. In 1530 he entered the service of Francis I. as painter and *varlet de chambre*, a position which he retained under Henry II. For both these monarchs he executed many portraits in enamel—among them quite a number of plaques depicting Diane de Poitiers in various characters,—plates, vases, ewers, and cups, besides decorative works for the royal palaces, for, though he is best known as an enameller distinguished for rich colour, and for graceful designs in grisaille on black or bright blue backgrounds, he also enjoyed a great reputation as an oil-painter. His last signed works bear the date 1574, but the date of his death is uncertain, though it could not have been later than the beginning of 1577. It is on record that he executed close upon two thousand enamels. He is best represented at the Louvre, which owns his two famous votive tablets for the Sainte Chapelle, each consisting of twenty-three plaques, signed L. L. and dated 1553; "La Chasse," depicting Henry II. on a white horse, Diane de Poitiers behind him on horseback; and many portraits, including the kings by whom he was employed, Marguerite de Valois, the duc de Guise, and the cardinal de Lorraine. Other representative examples are at the Cluny and Limoges museums. In England some magnificent examples of his work are to be found at the Victoria and Albert Museum, the British Museum, and the Wallace Collection. In the collection of Signor Rocchi, in Rome, is an exceptionally interesting plaque representing Frances I. consulting a fortune-teller.

See *Léonard Limousin: peintre de portraits* (*L'Œuvre des peintres émailleurs*), by L. Boudery and E. Lachenaud (Paris, 1897)—a careful study, with an elaborate catalogue of the known existing examples of the artist's work. The book deals almost exclusively with the portraits illustrated. See also Alleaume and Duplessis, *Les Douze Apôtres—émaux de Léonard Limousin*, &c. (Paris, 1865); L. Boudery, *Exposition retrospective de Limoges en 1886* (Limoges, 1886); L. Boudery, *Léonard Limousin et son œuvre* (Limoges, 1895); *Limoges et le Limousin* (Limoges, 1865); A. Meyer, *L'Art de l'émail de Limoges, ancien et moderne* (Paris, 1896); Émile Molinier, *L'Émaillerie* (Paris, 1891).

LIMOUSIN (Lat. *Pagus Lemovicinus, ager Lemovicensis, regio Lemovicum, Lemozinum, Limosinium*, &c.), a former province of France. In the time of Julius Caesar the *pagus Lemovicinus* covered the county now comprised in the departments of Haute-Vienne, Corrèze and Creuse, with the *arrondissements* of Confolens in Charente and Nontron in Dordogne. These limits it retained until the 10th century, and they survived in those of the diocese of Limoges (except a small part cut off in 1317 to form that of Tulle) until 1790. The break-up into great fiefs in the 10th century, however, tended rapidly to disintegrate the province, until at the close of the 12th century Limousin embraced only the viscounties of Limoges, Turenne and Comborn, with a few ecclesiastical lordships, corresponding roughly to the present *arrondissements* of Limoges and Saint Yrien in Haute-Vienne and part of the *arrondissements* of Brive, Tulle and Ussel in Corrèze. In the 17th century Limousin, thus constituted, had become no more than a small *gouvernement*.

Limousin takes its name from the *Lemovices*, a Gallic tribe whose county was included by Augustus in the province of *Aquitanic Magna*. Politically its history has little of separate interest; it shared in general the vicissitudes of Aquitaine, whose dukes from 918 onwards were its over-lords at least till 1264, after which it was sometimes under them, sometimes under the counts of Poitiers, until the French kings succeeded in asserting their direct over-lordship. It was, however, until the 14th century, the centre of a civilization of which the enamelling industry (see Enamel) was only one expression. The Limousin dialect, now a mere *patois*, was regarded by the troubadours as the purest form of Provençal.

See A. Lerœux, *Géographie et histoire du Limousin* (Limoges, 1892). Detailed bibliography in Chevalier, *Répertoire des sources. Topo-bibliogr.* (Montbéliard, 1902), t. ii. *s.v.*

LIMPOPO, or Crocodile, a river of S.E. Africa over 1000 m. in length, next to the Zambezi the largest river of Africa entering the Indian Ocean. Its head streams rise on the northern slopes of the Witwatersrand less than 300 m. due W. of the sea, but the river makes a great semicircular sweep across the high plateau first N.W., then N.E. and finally S.E. It is joined early in its course by the Marico and Notwani, streams which rise along the westward continuation of the Witwatersrand, the ridge forming the water-parting between the Vaal and the Limpopo basins. For a great part of its course the Limpopo forms the north-west and north frontiers of the Transvaal. Its banks are well wooded and present many picturesque views. In descending the escarpment of the plateau the river passes through rocky ravines, piercing the Zoutpansberg near the north-east corner of the Transvaal at the Toli Azimé Falls. In the low country it receives its chief affluent, the Olifants river (450 m. long), which, rising in the high veld of the Transvaal east of the sources of the Limpopo, takes a more direct N.E. course than the main stream. The Limpopo enters the ocean in 25° 15′ S. The mouth, about 1000 ft. wide, is obstructed by sand-banks. In the rainy season the Limpopo loses a good deal of its water in the swampy region along its lower course. High-water level is 24 ft. above low-water level, when the depth in the shallowest part does not exceed 3 ft. The river is navigable all the year round by shallow-draught vessels from its mouth for about 100 m., to a spot known as Gungunyana's Ford. In flood time there is water communication south with the river Komati (*q.v.*). At this season stretches of the Limpopo above Gungunyana's Ford are navigable. The river valley is generally unhealthy.

The basin of the Limpopo includes the northern part of the Transvaal, the eastern portion of Bechuanaland, southern Matabeleland and a large area of Portuguese territory north of Delagoa Bay. Its chief tributary, the Olifants, has been mentioned. Of its many other affluents, the Macloutsie, the Shashi and the Tuli are the most distant north-west feeders. In this direction the Matoppos and other hills of Matabeleland separate the Limpopo basin from the valley of the Zambezi. A little above the Tuli confluence is Rhodes's Drift, the usual crossing-place from the northern Transvaal into Matabeleland. Among the streams which, flowing north through the Transvaal, join the Limpopo is the Nylstroom, so named by Boers trekking from the south in the belief that they had reached the river Nile. In the coast region the river has one considerable affluent from the north, the Chengane, which is navigable for some distance.

The Limpopo is a river of many names. In its upper course called the Crocodile that name is also applied to the whole river, which figures on old Portuguese maps as the Oori (or Oira) and Bembe. Though claiming the territory through which it ran the Portuguese made no attempt to trace the river. This was first done by Captain J. F. Elton, who in 1870 travelling from the Tati goldfields sought to open a road to the sea via the Limpopo. He voyaged down the river from the Shashi confluence to the Toli Azimé Falls, which he discovered, following the stream thence on foot to the low country. The lower course of the river had been explored 1868–1869 by another British traveller—St Vincent Whitshed Erskine. It was first navigated by a sea-going craft in 1884, when G. A. Chaddock of the British mercantile service succeeded in crossing the bar, while its lower course was accurately surveyed by Portuguese officers in 1895–1896. At the junction of the Lotsani, one of the Bechuanaland affluents, with the Limpopo, are ruins of the period of the Zimbabwes.

LINACRE (or Lynaker), **THOMAS** (*c.* 1460–1524), English humanist and physician, was probably born at Canterbury. Of his parentage or descent nothing certain is known. He received his early education at the cathedral school of Canterbury, then under the direction of William Celling (William Tilly of Selling), who became prior of Canterbury in 1472. Celling was an ardent scholar, and one of the earliest in England who cultivated Greek learning. From him Linacre must have received his first incentive to this study. Linacre entered Oxford about the year 1480, and in 1484 was elected a fellow of All Souls' College. Shortly afterwards he visited Italy in the train of Celling, who was sent by Henry VIII. as an envoy to the papal court, and he accompanied his patron as far as Bologna. There he became the pupil of Angelo Poliziano, and afterwards shared the instruction which that great scholar imparted at Florence to the sons of Lorenzo de' Medici. The younger of these princes became Pope Leo X., and was in after years mindful of his old companionship with Linacre. Among his other teachers and friends in Italy were Demetrius Chalcondylas, Hermolaus Barbarus, Aldus Romanus the printer of Venice, and Nicolaus Leonicenus of Vicenza. Linacre took the degree of doctor of medicine with great distinction at Padua. On his return to Oxford, full of the learning and imbued with the spirit of the Italian Renaissance, he formed one of the brilliant circle of Oxford scholars, including John Colet, William Grocyn and William Latimer, who are mentioned with so much warm eulogy in the letters of Erasmus.

Linacre does not appear to have practised or taught medicine in Oxford. About the year 1501 he was called to court as tutor of the young prince Arthur. On the accession of Henry VIII. he was appointed the king's physician, an office at that time of considerable influence and importance, and practised medicine in London, having among his patients most of the great statesmen and prelates of the time, as Cardinal Wolsey, Archbishop Warham and Bishop Fox.

After some years of professional activity, and when in advanced life, Linacre received priest's orders in 1520, though he had for some years previously held several clerical benefices. There is no doubt that his ordination was connected with his retirement from active life. Literary labours, and the cares of the foundation which owed its existence chiefly to him, the Royal College of Physicians, occupied Linacre's remaining years till his death on the 20th of October 1524.

Linacre was more of a scholar than a man of letters, and rather a man of learning than a scientific investigator. It is difficult now to judge of his practical skill in his profession, but it was evidently highly esteemed in his own day. He took no part in political or theological questions, and died too soon to have to declare himself on either side in the formidable controversies which were even in his lifetime beginning to arise. But his career as a scholar was one eminently characteristic of the critical period in the history of learning through which he lived. He was one of the first Englishmen who studied Greek in Italy, whence he brought back to his native country and his own university the lessons of the "New Learning." His teachers were some of the greatest scholars of the day. Among his pupils was one—Erasmus—whose name alone would suffice to preserve the memory of his instructor in Greek, and others of note in letters and politics, such as Sir Thomas More, Prince Arthur and Queen Mary. Colet, Grocyn, William Lilye and other eminent scholars were his intimate friends, and he was esteemed by a still wider circle of literary correspondents in all parts of Europe.

Linacre's literary activity was displayed in two directions, in pure scholarship and in translation from the Greek. In the domain of scholarship he was known by the rudiments of (Latin) grammar (*Progymnasmata Grammatices vulgaria*), composed in English, a revised version of which was made for the use of the Princess Mary, and afterwards translated into Latin by Robert Buchanan. He also wrote a work on Latin composition, *De emendata structura Latini sermonis*, which was published in London in 1524 and many times reprinted on the continent of Europe.

Linacre's only medical works were his translations. He desired to make the works of Galen (and indeed those of Aristotle also) accessible to all readers of Latin. What he effected in the case of the first, though not trifling in itself, is inconsiderable as compared with the whole mass of Galen's writings; and of his translations from Aristotle, some of which are known to have been completed, nothing has survived. The following are the works of Galen translated by Linacre: (1) *De sanitate tuenda*, printed at Paris in 1517; (2) *Methodus medendi* (Paris, 1519); (3) *De temperamentis et de Inaequali Intemperie* (Cambridge, 1521); (4) *De naturalibus facultatibus* (London, 1523); (5) *De symptomatum differentiis et causis* (London, 1524); (6) *De pulsuum Usu* (London, without date). He also translated for the use of Prince Arthur an astronomical treatise of Proclus, *De sphaera*, which was printed at Venice by Aldus in 1499. The accuracy of these translations and their elegance of style were universally admitted. They have been generally accepted as the standard versions of those parts of Galen's writings, and frequently reprinted, either as a part of the collected works or separately.

But the most important service which Linacre conferred upon his own profession and science was not by his writings. To him was chiefly owing the foundation by royal charter of the College of Physicians in London, and he was the first president of the new college, which he further aided by conveying to it his own house, and by the gift of his library. Shortly before his death Linacre obtained from the king letters patent for the establishment of readerships in medicine at Oxford and Cambridge, and placed valuable estates in the hands of trustees for their endowment. Two readerships were founded in Merton College, Oxford, and one in St John's College, Cambridge, but owing to neglect and bad management of the funds, they fell into uselessness and obscurity. The Oxford foundation was revived by the university commissioners in 1856 in the form of the Linacre professorship of anatomy. Posterity has done justice to the generosity and public spirit which prompted these foundations; and it is impossible not to recognize a strong constructive genius in the scheme of the College of Physicians, by which Linacre not only first organized the medical profession in England, but impressed upon it for some centuries the stamp of his own individuality.

The intellectual fastidiousness of Linacre, and his habits of minute accuracy were, as Erasmus suggests, the chief cause why he left no more permanent literary memorials. It will be found, perhaps, difficult to justify by any extant work the extremely high reputation which he enjoyed among the scholars of his time. His Latin style was so much admired that, according to the flattering eulogium of Erasmus, Galen spoke better Latin in the version of Linacre than he had before spoken Greek; and even Aristotle displayed a grace which he hardly attained to in his native tongue. Erasmus praises also Linacre's critical judgment ("vir non exacti tantum sed severi judicii"). According to others it was hard to say whether he were more distinguished as a grammarian or a rhetorician. Of Greek he was regarded as a consummate master; and he was equally eminent as a "philosopher," that is, as learned in the works of the ancient philosophers and naturalists. In this there may have been some exaggeration; but all have acknowledged the elevation of Linacre's character, and the fine moral qualities summed up in the epitaph written by John Caius: "Fraudes dolosque mire perosus; fidus amicis; omnibus ordinibus juxta carus."

The materials for Linacre's biography are to a large extent contained in the older biographical collections of George Lilly (in Paulus Jovius, *Descriptio Britanniae*), Bale, Leland and Pits, in Wood's *Athenae Oxonienses* and in the *Biographia Britannica*; but all are completely collected in the *Life of Thomas Linacre*, by Dr Noble Johnson (London, 1835). Reference may also be made to Dr Munk's *Roll of the Royal College of Physicians* (2nd ed., London, 1878); and the Introduction, by Dr J. F. Payne, to a facsimile reproduction of Linacre's version of *Galen de temperamentis* (Cambridge, 1881). With the exception of this treatise, none of Linacre's works or translations has been reprinted in modern times.

LINARES, an inland province of central Chile, between Talca on the N. and Ñuble on the S., bounded E. by Argentina and W. by the province of Maule. Pop. (1895) 101,858; area, 3942 sq. m. The river Maule forms its northern boundary and drains its northern and north-eastern regions. The province belongs partly to the great central valley of Chile and partly to the western slopes of the Andes, the S. Pedro volcano rising to a height of 11,800 ft. not far from the sources of the Maule. The northern part is fertile, as are the valleys of the Andean foothills, but arid conditions prevail throughout the central districts, and irrigation is necessary for the production of crops. The vine is cultivated to some extent, and good pasturage is found on the Andean slopes. The province is traversed from N. to S. by the Chilean Central railway, and the river Maule gives access to the small port of Constitucion, at its mouth. From Parral, near the southern boundary, a branch railway extends westward to Cauquenes, the capital of Maule. The capital, Linares, is centrally situated, on an open plain, about 20 m. S. of the river Maule. It had a population of 7331 in 1895 (which an official estimate of 1902 reduced to 7256). Parral (pop. 8586 in 1895; est. 10,219 in 1902) is a railway junction and manufacturing town.

LINARES, a town of southern Spain, in the province of Jaen, among the southern foothills of the Sierra Morena, 1375 ft. above sea-level and 3 m. N.W. of the river Guadalimar. Pop. (1900) 38,245. It is connected by four branch railways with the important argentiferous lead mines on the north-west, and with the main railways from Madrid to Seville, Granada and the principal ports on the south coast. The town was greatly improved in the second half of the 19th century, when the town hall, bull-ring, theatre and many other handsome buildings were erected; it contains little of antiquarian interest save a fine fountain of Roman origin. Its population is chiefly engaged in the lead-mines, and in such allied industries as the manufacture of gunpowder, dynamite, match for blasting purposes, rope and the like. The mining plant is entirely imported, principally from England; and smelting, desilverizing and the manufacture of lead sheets, pipes, &c., are carried on by British firms, which also purchase most of the ore raised. Linares lead is unsurpassed in quality, but the output tends to decrease. There is a thriving local trade in grain, wine and oil. About 2 m. S. is the village of Cazlona, which shows some remains of the ancient *Castulo*. The ancient mines some 5 m. N., which are now known as Los Pozos de Anibal, may possibly date from the 3rd century B.C., when this part of Spain was ruled by the Carthaginians.

LINCOLN, EARLS OF. The first earl of Lincoln was probably William de Roumare (*c.* 1095–*c.* 1155), who was created earl about 1140, although it is possible that William de Albini, earl of Arundel, had previously held the earldom. Roumare's grandson, another William de Roumare (*c.* 1150–*c.* 1198), is sometimes called earl of Lincoln, but he was never recognized as such, and about 1148 King Stephen granted the earldom to one of his supporters, Gilbert de Gand (d. 1156), who was related to the former earl. After Gilbert's death the earldom was dormant for about sixty years; then in 1216 it was given to another Gilbert de Gand, and later it was claimed by the great earl of Chester, Ranulf, or Randulph, de Blundevill (d. 1232). From Ranulf the title to the earldom passed through his sister Hawise to the family of Lacy, John de Lacy (d. 1240) being made earl of Lincoln in 1232. He was son of Roger de Lacy (d. 1212), justiciar of England and constable of Chester. It was held by the Lacys until the death of Henry, the 3rd earl. Henry served Edward I. in Wales, France and Scotland, both as a soldier and a diplomatist. He went to France with Edmund, earl of Lancaster, in 1296, and when Edmund died in June of this year, succeeded him as commander of the English forces in Gascony; but he did not experience any great success in this capacity and returned to England early in 1298. The earl fought at the battle of Falkirk in July 1298, and took some part in the subsequent conquest of Scotland. He was then employed by Edward to negotiate successively with popes Boniface VIII. and Clement V., and also with Philip IV. of France; and was present at the death of the English king in July 1307. For a short time Lincoln was friendly with the new king, Edward II., and his favourite, Piers Gaveston; but quickly changing his attitude, he joined earl Thomas of Lancaster and the baronial party, was one of the "ordainers" appointed in 1310 and was regent of the kingdom during the king's absence in Scotland in the same year. He died in London on the 5th of February 1311, and was buried in St Paul's Cathedral. He married Margaret (d. 1309), granddaughter and heiress of William Longsword, 2nd earl of Salisbury, and his only surviving child, Alice (1283–1348), became the wife of Thomas, earl of Lancaster, who thus inherited his father-in-law's earldoms of Lincoln and Salisbury. Lincoln's Inn in London gets its name from the earl, whose London residence occupied this site. He founded Whalley Abbey in Lancashire, and built Denbigh Castle.

In 1349 Henry Plantagenet, earl (afterwards duke) of Lancaster, a nephew of Earl Thomas, was created earl of Lincoln; and when his grandson Henry became king of England as Henry IV. in 1399 the title merged in the crown. In 1467 John de la Pole (*c.* 1464–1487), a nephew of Edward IV., was made earl of Lincoln, and the same dignity was conferred in 1525 upon Henry Brandon (1516–1545), son of Charles Brandon, duke of Suffolk. Both died without sons, and the next family to hold the earldom was that of Clinton.

Edward Fiennes Clinton, 9th Lord Clinton (1512–1585), lord high admiral and the husband of Henry VIII.'s mistress, Elizabeth Blount, was created earl of Lincoln in 1572. Before his elevation he had rendered very valuable services both on sea and land to Edward VI., to Mary and to Elizabeth, and he was in the confidence of the leading men of these reigns, including William Cecil, Lord Burghley. From 1572 until the present day the title has been held by Clinton's descendants. In 1768 Henry Clinton, the 9th earl (1720–1794), succeeded his uncle Thomas Pelham as 2nd duke of Newcastle-under-Lyne, and since this date the title of earl of Lincoln has been the courtesy title of the eldest son of the duke of Newcastle.

See G. E. C.(okayne), *Complete Peerage*, vol. v. (1893).

LINCOLN, ABRAHAM (1809–1865), sixteenth president of the United States of America, was born on "Rock Spring" farm, 3 m. from Hodgenville, in Hardin (now Larue) county, Kentucky, on the 12th of February 1809.[1] His grandfather,[2] Abraham Lincoln, settled in Kentucky about 1780 and was killed by Indians in 1784. His father, Thomas (1778–1851), was born in Rockingham (then Augusta) county, Virginia; he was hospitable, shiftless, restless and unsuccessful, working now as a carpenter and now as a farmer, and could not read or write before his marriage, in Washington county, Kentucky, on the 12th of June 1806, to Nancy Hanks (1783-1818), who was, like him, a native of Virginia, but had much more strength of character and native ability, and seemed to have been, in intellect and character, distinctly above the social class in which she was born. The Lincolns had removed from Elizabethtown, Hardin county, their first home, to the Rock Spring farm, only a short time before Abraham's birth; about 1813 they removed to a farm of 238 acres on Knob Creek, about 6 m. from Hodgenville; and in 1816 they crossed the Ohio river and settled on a quarter-section, $1\frac{1}{2}$ m. E. of the present village of Gentryville, in Spencer county, Indiana. There Abraham's mother died on the 5th of October 1818. In December 1819 his father married, at his old home, Elizabethtown, Mrs Sarah (Bush) Johnston (d. 1869), whom he had courted years before, whose thrift greatly improved conditions in the home, and who exerted a great influence over her stepson. Spencer county was still a wilderness, and the boy grew up in pioneer surroundings, living in a rude log-cabin, enduring many hardships and knowing only the primitive manners, conversation and ambitions of sparsely settled backwoods communities. Schools were rare, and teachers qualified only to impart the merest rudiments. "Of course when I came of age I did not know much," wrote he years afterward, "still somehow I could read, write and cipher to the rule of three, but that was all. I have not been to school since. The little advance I now have upon this store of education I have picked up from time to time under the pressure of necessity."[1] His entire schooling, in five different schools, amounted to less than a twelvemonth; but he became a good speller and an excellent penman. His own mother taught him to read, and his stepmother urged him to study. He read and re-read in early boyhood the Bible, Aesop, *Robinson Crusoe*, *Pilgrim's Progress*, Weems's *Life of Washington* and a history of the United States; and later read every book he could borrow from the neighbours, Burns and Shakespeare becoming favourites. He wrote rude, coarse satires, crude verse, and compositions on the American government, temperance, &c. At the age of seventeen he had attained his full height, and began to be known as a wrestler, runner and lifter of great weights. When nineteen he made a journey as a hired hand on a flatboat to New Orleans.

In March 1830 his father emigrated to Macon county, Illinois (near the present Decatur), and soon afterward removed to Coles county. Being now twenty-one years of age, Abraham hired himself to Denton Offutt, a migratory trader and storekeeper then of Sangamon county, and he helped Offutt to build a flatboat and float it down the Sangamon, Illinois and Mississippi rivers to New Orleans. In 1831 Offutt made him clerk of his country store at New Salem, a small and unsuccessful settlement in Menard county; this gave him moments of leisure to devote to self-education. He borrowed a grammar and other books, sought explanations from the village schoolmaster and began to read law. In this frontier community law and politics claimed a large proportion of the stronger and the more ambitious men; the law early appealed to Lincoln and his general popularity encouraged him as early as 1832 to enter politics. In this year Offutt failed and Lincoln was thus left without employment. He became a candidate for the Illinois House of Representatives; and on the 9th of March 1832 issued an address "To the people of Sangamon county" which betokens talent and education far beyond mere ability to "read, write and cipher," though in its preparation he seems to have had the help of a friend. Before the election the Black Hawk Indian War broke out; Lincoln volunteered in one of the Sangamon county companies on the 21st of April and was elected captain by the members of the company. It is said that the oath of allegiance was administered to Lincoln at this time by Lieut. Jefferson Davis. The company, a part of the 4th Illinois, was mustered out after the five weeks' service for which it volunteered, and Lincoln re-enlisted as a private on the 29th of May, and was finally mustered out on the 16th of June by Lieut. Robert Anderson, who in 1861 commanded the Union troops at Fort Sumter. As captain Lincoln was twice in disgrace, once for firing a pistol near camp and again because nearly his entire company was intoxicated. He was in no battle, and always spoke lightly of his military record. He was defeated in his campaign for the legislature in

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[1] Lincoln's birthday is a legal holiday in California, Colorado, Connecticut, Delaware, Florida, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Montana, Nevada, New Jersey, New York, North Dakota, Pennsylvania, South Dakota, Utah, Washington, West Virginia and Wyoming.

[2] Samuel Lincoln (*c.* 1619–1690), the president's first American ancestor, son of Edward Lincoln, gent., of Hingham, Norfolk, emigrated to Massachusetts in 1637 as apprentice to a weaver and settled with two older brothers in Hingham, Mass. His son and grandson were iron founders; the grandson Mordecai (1686–1736) moved to Chester county, Pennsylvania. Mordecai's son John (1711–*c.* 1773), a weaver, settled in what is now Rockingham county, Va., and was the president's great-grandfather.

1832, partly because of his unpopular adherence to Clay and the American system, but in his own election precinct, he received nearly all the votes cast. With a friend, William Berry, he then bought a small country store, which soon failed chiefly because of the drunken habits of Berry and because Lincoln preferred to read and to tell stories—he early gained local celebrity as a story-teller—rather than sell; about this time he got hold of a set of Blackstone. In the spring of 1833 the store's stock was sold to satisfy its creditors, and Lincoln assumed the firm's debts, which he did not fully pay off for fifteen years. In May 1833, local friendship, disregarding politics, procured his appointment as postmaster of New Salem, but this paid him very little, and in the same year the county surveyor of Sangamon county opportunely offered to make him one of his deputies. He hastily qualified himself by study, and entered upon the practical duties of surveying farm lines, roads and town sites. " This," to use his own words, " procured bread, and kept body and soul together."

In 1834 Lincoln was elected (second of four successful candidates, with only 14 fewer votes than the first) a member of the Illinois House of Representatives, to which he was re-elected in 1836, 1838 and 1840, serving until 1842. In his announcement of his candidacy in 1836 he promised to vote for Hugh L. White of Tennessee (a vigorous opponent of Andrew Jackson in Tennessee politics) for president, and said: " I go for all sharing the privileges of the government who assist in bearing its burdens. Consequently, I go for admitting all whites to the right of suffrage, who pay taxes or bear arms (by no means excluding females)"—a sentiment frequently quoted to prove Lincoln a believer in woman's suffrage. In this election he led the poll in Sangamon county. In the legislature, like the other representatives of that county, who were called the " Long Nine," because of their stature, he worked for internal improvements, for which lavish appropriations were made, and for the division of Sangamon county and the choice of Springfield as the state capital, instead of Vandalia. He and his party colleagues followed Stephen A. Douglas in adopting the convention system, to which Lincoln had been strongly opposed. In 1837 with one other representative from Sangamon county, named Dan Stone, he protested against a series of resolutions, adopted by the Illinois General Assembly, expressing disapproval of the formation of abolition societies and asserting, among other things, that " the right of property in slaves is sacred to the slave holding states under the Federal Constitution "; and Lincoln and Stone put out a paper in which they expressed their belief " that the institution of slavery is founded on both injustice and bad policy, but that the promulgation of abolition doctrines tends rather to increase than abate its evils," " that the Congress of the United States has no power under the Constitution to interfere with the institution of slavery in the different states," " that the Congress of the United States has the power, under the Constitution, to abolish slavery in the District of Columbia, but that the power ought not to be exercised unless at the request of the people of the District." Lincoln was very popular among his fellow legislators, and in 1838 and in 1840 he received the complimentary vote of his minority colleagues for the speakership of the state House of Representatives. In 1842 he declined a renomination to the state legislature and attempted unsuccessfully to secure a nomination to Congress. In the same year he became interested in the Washingtonian temperance movement.

In 1846 he was elected a member of the National House of Representatives by a majority of 1511 over his Democratic opponent, Peter Cartwright, the Methodist preacher. Lincoln was the only Whig member of Congress elected in Illinois in 1846. In the House of Representatives on the 22nd of December 1847 he introduced the " Spot Resolutions," which quoted statements in the president's messages of the 11th of May 1846 and the 7th and 8th of December that Mexican troops had invaded the territory of the United States, and asked the president to tell the precise " spot " of invasion; he made a speech on these resolutions in the House on the 12th of January 1848. His attitude toward the war and especially his vote for George Ashmun's amendment to the supply bill at this session, declaring that the Mexican War was " unnecessarily and unconstitutionally commenced by the President," greatly displeased his constituents. He later introduced a bill regarding slavery in the District of Columbia, which (in accordance with his statement of 1837) was to be submitted to the vote of the District for approval, and which provided for compensated emancipation, forbade the bringing of slaves into the District of Columbia, except by government officials from slave states, and the selling of slaves away from the District, and arranged for the emancipation after a period of apprenticeship of all slave children born after the 1st of January 1850. While he was in Congress he voted repeatedly for the principle of the Wilmot Proviso. At the close of his term in 1848 he declined an appointment as governor of the newly organized Territory of Oregon and for a time worked, without success, for an appointment as Commissioner of the General Land Office. During the presidential campaign he made speeches in Illinois, and in Massachusetts he spoke before the Whig State Convention at Worcester on the 12th of September, and in the next ten days at Lowell, Dedham, Roxbury, Chelsea, Cambridge and Boston. He had become an eloquent and influential public speaker, and in 1840 and 1844 was a candidate on the Whig ticket for presidential elector.

In 1834 his political friend and colleague John Todd Stuart (1807–1885), a lawyer in full practice, had urged him to fit himself for the bar, and had lent him text-books; and Lincoln, working diligently, was admitted to the bar in September 1836. In April 1837 he quitted New Salem, and removed to Springfield, which was the county-seat and was soon to become the capital of the state, to begin practice in a partnership with Stuart, which was terminated in April 1841; from that time until September 1843 he was junior partner to Stephen Trigg Logan (1800–1880), and from 1843 until his death he was senior partner of William Henry Herndon (1818–1891). Between 1849 and 1854 he took little part in politics, devoted himself to the law and became one of the leaders of the Illinois bar. His small fees—he once charged $3·50 for collecting an account of nearly $600·00—his frequent refusals to take cases which he did not think right and his attempts to prevent unnecessary litigation have become proverbial. Judge David Davis, who knew Lincoln on the Illinois circuit and whom Lincoln made in October 1862 an associate justice of the Supreme Court of the United States, said that he was " great both at *nisi prius* and before an appellate tribunal." He was an excellent cross-examiner, whose candid friendliness of manner often succeeded in eliciting important testimony from unwilling witnesses. Among Lincoln's most famous cases were: one (*Bailey* v. *Cromwell*, 4 Ill. 71; frequently cited) before the Illinois Supreme Court in July 1841 in which he argued against the validity of a note in payment for a negro girl, adducing the Ordinance of 1787 and other authorities; a case (tried in Chicago in September 1857) for the Rock Island railway, sued for damages by the owners of a steamboat sunk after collision with a railway bridge, a trial in which Lincoln brought to the service of his client a surveyor's knowledge of mathematics and a riverman's acquaintance with currents and channels, and argued that crossing a stream by bridge was as truly a common right as navigating it by boat, thus contributing to the success of Chicago and railway commerce in the contest against St Louis and river transportation; the defence (at Beardstown in May 1858) on the charge of murder of William (" Duff ") Armstrong, son of one of Lincoln's New Salem friends, whom Lincoln freed by controverting with the help of an almanac the testimony of a crucial witness that between 10 and 11 o'clock at night he had seen by moonlight the defendant strike the murderous blow—this dramatic incident is described in Edward Eggleston's novel, *The Graysons*; and the defence on the charge of murder (committed in August 1859) of " Peachy " Harrison, a grandson of Peter Cartwright, whose testimony was used with great effect.

From law, however, Lincoln was soon drawn irresistibly back into politics. The slavery question, in one form or another, had become the great overshadowing issue in national, and even in state politics; the abolition movement, begun in earnest by W. L. Garrison in 1831, had stirred the conscience of the North, and had had its influence even upon many who strongly deprecated its extreme radicalism; the Compromise of 1850 had failed to silence sectional controversy, and the Fugitive Slave Law, which was one of the compromise measures, had throughout the North been bitterly assailed and to a considerable extent had been nullified by state legislation; and finally in 1854 the slavery agitation was fomented by the passage of the Kansas-Nebraska Act, which repealed the Missouri Compromise and gave legislative sanction to the principle of "popular sovereignty"—the principle that the inhabitants of each Territory as well as of each state were to be left free to decide for themselves whether or not slavery was to be permitted therein. In enacting this measure Congress had been dominated largely by one man—Stephen A. Douglas of Illinois—then probably the most powerful figure in national politics. Lincoln had early put himself on record as opposed to slavery, but he was never technically an abolitionist; he allied himself rather with those who believed that slavery should be fought within the Constitution, that, though it could not be constitutionally interfered with in individual states, it should be excluded from territory over which the national government had jurisdiction. In this, as in other things, he was eminently clear-sighted and practical. Already he had shown his capacity as a forcible and able debater; aroused to new activity upon the passage of the Kansas-Nebraska Bill, which he regarded as a gross breach of political faith, he now entered upon public discussion with an earnestness and force that by common consent gave him leadership in Illinois of the opposition, which in 1854 elected a majority of the legislature; and it gradually became clear that he was the only man who could be opposed in debate to the powerful and adroit Douglas. He was elected to the state House of Representatives, from which he immediately resigned to become a candidate for United States senator from Illinois, to succeed James Shields, a Democrat; but five opposition members, of Democratic antecedents, refused to vote for Lincoln (on the second ballot he received 47 votes—50 being necessary to elect) and he turned the votes which he controlled over to Lyman Trumbull, who was opposed to the Kansas-Nebraska Act, and thus secured the defeat of Joel Aldrich Matteson (1808–1883), who favoured this act and who on the eighth ballot had received 47 votes to 35 for Trumbull and 15 for Lincoln. The various anti-Nebraska elements came together, in Illinois as elsewhere, to form a new party at a time when the old parties were disintegrating; and in 1856 the Republican party was formally organized in the state. Lincoln before the state convention at Bloomington of "all opponents of anti-Nebraska legislation" (the first Republican state convention in Illinois) made on the 29th of May a notable address known as the "Lost Speech." The National Convention of the Republican Party in 1856 cast 110 votes for Lincoln as its vice-presidential candidate on the ticket with Fremont, and he was on the Republican electoral ticket of this year, and made effective campaign speeches in the interest of the new party. The campaign in the state resulted substantially in a drawn battle, the Democrats gaining a majority in the state for president, while the Republicans elected the governor and state officers. In 1858 the term of Douglas in the United States Senate was expiring, and he sought re-election. On the 16th of June 1858 by unanimous resolution of the Republican state convention Lincoln was declared "the first and only choice of the Republicans of Illinois for the United States Senate as the successor of Stephen A. Douglas," who was the choice of his own party to succeed himself. Lincoln, addressing the convention which nominated him, gave expression to the following bold prophecy:—

> "A house divided against itself cannot stand. I believe this Government cannot endure permanently half slave and half free. I do not expect the Union to be dissolved—I do not expect the house to fall—but I do expect it will cease to be divided. It will become all one thing or all the other. Either the opponents of slavery will arrest the further spread of it, and place it where the public mind shall rest in the belief that it is in course of ultimate extinction; or its advocates will push it forward, till it shall become alike lawful in all the states, old as well as new—North as well as South."

In this speech, delivered in the state House of Representatives, Lincoln charged Pierce, Buchanan, Taney and Douglas with conspiracy to secure the Dred Scott decision. Yielding to the wish of his party friends, on the 24th of July, Lincoln challenged Douglas to a joint public discussion.[1] The antagonists met in debate at seven designated places in the state. The first meeting was at Ottawa, La Salle County, about 90 m. south-west of Chicago, on the 21st of August. At Freeport, on the Wisconsin boundary, on the 27th of August, Lincoln answered questions put to him by Douglas, and by his questions forced Douglas to "betray the South" by his enunciation of the "Freeport heresy," that, no matter what the character of Congressional legislation or the Supreme Court's decision "slavery cannot exist a day or an hour anywhere unless it is supported by local police regulations." This adroit attempt to reconcile the principle of popular sovereignty with the Dred Scott decision, though it undoubtedly helped Douglas in the immediate fight for the senatorship, necessarily alienated his Southern supporters and assured his defeat, as Lincoln foresaw it must, in the presidential campaign of 1860. The other debates were: at Jonesboro, in the southern part of the state, on the 15th of September; at Charleston, 150 m. N.E. of Jonesboro, on the 18th of September; and, in the western part of the state, at Galesburg (Oct. 7), Quincy (Oct. 13) and Alton (Oct. 15). In these debates Douglas, the champion of his party, was over-matched in clearness and force of reasoning, and lacked the great moral earnestness of his opponent; but he dexterously extricated himself time and again from difficult argumentative positions, and retained sufficient support to win the immediate prize. At the November election the Republican vote was 126,084, the Douglas Democratic vote was 121,940 and the Lecompton (or Buchanan) Democratic vote was 5091; but the Democrats, through a favourable apportionment of representative districts, secured a majority of the legislature (Senate: 14 Democrats, 11 Republicans; House: 40 Democrats, 35 Republicans), which re-elected Douglas. Lincoln's speeches in this campaign won him a national fame. In 1859 he made two speeches in Ohio—one at Columbus on the 16th of September criticising Douglas's paper in the September *Harper's Magazine*, and one at Cincinnati on the 17th of September, which was addressed to Kentuckians,—and he spent a few days in Kansas, speaking in Elwood, Troy, Doniphan, Atchison and Leavenworth, in the first week of December. On the 27th of February 1860 in Cooper Union, New York City, he made a speech (much the same as that delivered in Elwood, Kansas, on the 1st of December) which made him known favourably to the leaders of the Republican party in the East and which was a careful historical study criticising the statement of Douglas in one of his speeches in Ohio that "our fathers when they framed the government under which we live understood this question [slavery] just as well and even better than we do now," and Douglas's contention that "the fathers" made the country (and intended that it should remain) part slave. Lincoln pointed out that the majority of the members of the Constitutional Convention of 1787 opposed slavery and that they did not think that Congress had no power to control slavery in the Territories. He spoke at Concord,

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[1] Douglas and Lincoln first met in public debate (four on a side) in Springfield in December 1839. They met repeatedly in the campaign of 1840. In 1852 Lincoln attempted with little success to reply to a speech made by Douglas in Richmond. On the 4th of October 1854 in Springfield, in reply to a speech on the Nebraska question by Douglas delivered the day before, Lincoln made a remarkable speech four hours long, to which Douglas replied on the next day; and in the fortnight immediately following Lincoln attacked Douglas's record again at Bloomington and at Peoria. On the 26th of June 1857 Lincoln in a speech at Springfield answered Douglas's speech of the 12th in which he made over his doctrine of popular sovereignty to suit the Dred Scott decision. Before the actual debate in 1858 Douglas made a speech in Chicago on the 9th of July, to which Lincoln replied the next day; Douglas spoke at Bloomington on the 16th of July and Lincoln answered him in Springfield on the 17th.

Manchester, Exeter and Dover in New Hampshire, at Hartford (5th March), New Haven (6th March), Woonsocket (8th March) and Norwich (9th March). The Illinois State Convention of the Republican party, held at Decatur on the 9th and 10th of May 1860, amid great enthusiasm declared Abraham Lincoln its first choice for the presidential nomination, and instructed the delegation to the National Convention to cast the vote of the state as a unit for him.

The Republican national convention, which made "No Extension of Slavery" the essential part of the party platform, met at Chicago on the 16th of May 1860. At this time William H. Seward was the most conspicuous Republican in national politics, and Salmon P. Chase had long been in the fore-front of the political contest against slavery. Both had won greater national fame than had Lincoln, and, before the convention met, each hoped to be nominated for president. Chase, however, had little chance, and the contest was virtually between Seward and Lincoln, who by many was considered more "available," because it was thought that he could (and Seward could not) secure the vote of certain doubtful states. Lincoln's name was presented by Illinois and seconded by Indiana. At first Seward had the strongest support. On the first ballot Lincoln received only 102 votes to 173½ for Seward. On the second ballot Lincoln received 181 votes to Seward's 184½. On the third ballot the 50½ votes formerly given to Simon Cameron[1] were given to Lincoln, who received 231½ votes to 180 for Seward, and without taking another ballot enough votes were changed to make Lincoln's total 354 (233 being necessary for a choice) and the nomination was then made unanimous. Hannibal Hamlin, of Maine, was nominated for the vice-presidency. The convention was singularly tumultuous and noisy; large claques were hired by both Lincoln's and Seward's managers. During the campaign Lincoln remained in Springfield, making few speeches and writing practically no letters for publication. The campaign was unusually animated—only the Whig campaign for William Henry Harrison in 1840 is comparable to it: there were great torchlight processions of "wide-awake" clubs, which did "rail-fence," or zigzag, marches, and carried rails in honour of their candidate, the "rail-splitter." Lincoln was elected by a popular vote of 1,866,452 to 1,375,157 for Douglas, 847,953 for Breckinridge and 590,631 for Bell—as the combined vote of his opponents was so much greater than his own he was often called "the minority president"; the electoral vote was: Lincoln, 180; John C. Breckinridge, 72; John Bell, 39; Stephen A. Douglas, 12. On the 4th of March 1861 Lincoln was inaugurated as president. (For an account of his administration see UNITED STATES: *History*.)

During the campaign radical leaders in the South frequently asserted that the success of the Republicans at the polls would mean that the rights of the slave-holding states under the Federal constitution, as interpreted by them, would no longer be respected by the North, and that, if Lincoln were elected, it would be the duty of these slave-holding states to secede from the Union. There was much opposition in these states to such a course, but the secessionists triumphed, and by the time President Lincoln was inaugurated, South Carolina, Georgia, Alabama, Florida, Mississippi, Louisiana and Texas had formally withdrawn from the Union. A provisional government under the designation "The Confederate States of America," with Jefferson Davis as president, was organized by the seceding states, which seized by force nearly all the forts, arsenals and public buildings within their limits. Great division of sentiment existed in the North, whether in this emergency acquiescence or coercion was the preferable policy. Lincoln's inaugural address declared the Union perpetual and acts of secession void, and announced the determination of the government to defend its authority, and to hold forts and places yet in its possession. He disclaimed any intention to invade, subjugate or oppress the seceding states. "You can have no conflict," he said, "without being yourselves the aggressors." Fort Sumter, in Charleston harbour, had been besieged by the secessionists since January; and, it being now on the point of surrender through starvation, Lincoln sent the besiegers official notice on the 8th of April that a fleet was on its way to carry provisions to the fort, but that he would not attempt to reinforce it unless this effort were resisted. The Confederates, however, immediately ordered its reduction, and after a thirty-four hours' bombardment the garrison capitulated on the 13th of April 1861. (For the military history of the war, see AMERICAN CIVIL WAR.)

With civil war thus provoked, Lincoln, on the 15th of April, by proclamation called 75,000 three months' militia under arms, and on the 4th of May ordered the further enlistment of 64,748 soldiers and 18,000 seamen for three years' service. He instituted by proclamation of the 19th of April a blockade of the Southern ports, took effective steps to extemporize a navy, convened Congress in special session (on the 4th of July), and asked for legislation and authority to make the war "short, sharp and decisive." The country responded with enthusiasm to his summons and suggestions; and the South on its side was not less active.

The slavery question presented vexatious difficulties in conducting the war. Congress in August 1861 passed an act (approved August 6th) confiscating rights of slave-owners to slaves employed in hostile service against the Union. On the 30th of August General Fremont by military order declared martial law and confiscation against active enemies, with freedom to their slaves, in the State of Missouri. Believing that under existing conditions such a step was both detrimental in present policy and unauthorized in law, President Lincoln directed him (2nd September) to modify the order to make it conform to the Confiscation Act of Congress, and on the 11th of September annulled the parts of the order which conflicted with this act. Strong political factions were instantly formed for and against military emancipation, and the government was hotly beset by antagonistic counsel. The Unionists of the border slave states were greatly alarmed, but Lincoln by his moderate conservatism held them to the military support of the government.[2] Meanwhile he sagaciously prepared the way for the supreme act of statesmanship which the gathering national crisis already dimly foreshadowed. On the 6th of March 1862, he sent a special message to Congress recommending the passage of a resolution offering pecuniary aid from the general government to induce states to adopt gradual abolishment of slavery. Promptly passed by Congress, the resolution produced no immediate result except in its influence on public opinion. A practical step, however, soon followed. In April Congress passed and the president approved (6th April) an act emancipating the slaves in the District of Columbia, with compensation to owners—a measure which Lincoln had proposed when in Congress. Meanwhile slaves of loyal masters were constantly escaping to military camps. Some commanders excluded them altogether; others surrendered them on demand; while still others sheltered and protected them against their owners. Lincoln tolerated this latitude as falling properly within the military discretion pertaining to local army operations. A new case, however, soon demanded his official interference. On the 9th of May 1862 General David Hunter, commanding in the limited areas gained along the southern coast, issued a short order declaring his department under martial law, and adding—"Slavery and martial law in a free country are altogether incompatible. The persons in these three States—Georgia, Florida and South Carolina—heretofore held as slaves are, therefore, declared for ever free." As soon as this order, by the slow method of communication by sea, reached the newspapers, Lincoln (May 19) published a proclamation declaring it void; adding further, "Whether it be competent for me as commander-in-chief of the army and navy to declare the slaves of any state or states free, and whether at any time or in any case it shall have become a necessity indispensable to the maintenance of the government to exercise such supposed power, are questions which under my responsibility I reserve to myself, and which I cannot feel justified in leaving to the decision of commanders in the field. These are totally different questions from those of police regulations in armies or camps." But in the same proclamation Lincoln recalled to the public his own proposal and the assent of Congress to compensate states which would adopt voluntary and gradual abolishment. "To the people of these states now," he added, "I must earnestly appeal. I do not argue. I beseech you to make the argument for yourselves. You cannot, if you would, be blind to the signs of the times." Meanwhile the anti-slavery sentiment of the North constantly increased. Congress by express act (approved on the 19th of June) prohibited the existence of slavery in all territories outside of states. On July the 12th the president called the representatives of the border slave states to the executive mansion, and once more urged upon them his proposal of compensated emancipation. "If the war continues long," he said, "as it must if the object be not sooner attained, the institution in your states will be extinguished by mere friction and abrasion—by the mere incidents of the war. It will be gone, and you will have nothing valuable in lieu of it." Although Lincoln's appeal brought the border states to no practical decision—the representatives of these states almost without exception opposed the plan—it served to prepare public opinion for his final act. During the month of July his own mind reached the virtual determination to give slavery its *coup de grâce*; on the 17th he approved a new Confiscation Act, much broader than that of the 6th of August 1861 (which freed only those slaves in military service against the Union) and giving to the president power to employ persons of African descent for the suppression of the rebellion; and on the 22nd he submitted to his cabinet the draft of an emancipation proclamation substantially as afterward issued. Serious military reverses constrained him for the present to withhold it, while on the other hand they served to increase the pressure upon him from anti-slavery men. Horace Greeley having addressed a public letter to him complaining of "the policy you seem to be pursuing with regard to the slaves of the rebels," the president replied on the 22nd of August, saying, "My paramount object is to save the Union, and not either to save or destroy slavery. If I could save the Union without freeing any slave, I would do it; if I could save it by freeing all the slaves, I would do it; and, if I could do it by freeing some and leaving others alone, I would also do that." Thus still holding back violent reformers with one hand, and leading up halting conservatives with the other, he on the 13th of September replied among other things to an address from a delegation: "I do not want to issue a document that the whole world will see must necessarily be inoperative like the pope's bull against the comet. . . . I view this matter as a practical war measure, to be decided on according to the advantages or disadvantages it may offer to the suppression of the rebellion. . . . I have not decided against a proclamation of liberty to the slaves, but hold the matter under advisement."

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[1] Without Lincoln's knowledge or consent, the managers of his candidacy before the convention bargained for Cameron's votes by promising to Cameron a place in Lincoln's cabinet, should Lincoln be elected. Cameron became Lincoln's first secretary of war.

[2] In November 1861 the president drafted a bill providing (1) that all slaves more than thirty-five years old in the state of Delaware should immediately become free; (2) that all children of slave parentage born after the passage of the act should be free; (3) that all others should be free on attaining the age of thirty-five or after the 1st of January 1893, except for terms of apprenticeship; and (4) that the national government should pay to the state of Delaware $23,200 a year for twenty-one years. But this bill, which Lincoln had hoped would introduce a system of "compensated emancipation," was not approved by the legislature of Delaware, which considered it in February 1862.

The year 1862 had opened with important Union victories. Admiral A.H. Foote captured Fort Henry on the 6th of February, and Gen. U. S. Grant captured Fort Donelson on the 16th of February, and won the battle of Shiloh on the 6th and 7th of April. Gen. A. E. Burnside took possession of Roanoke island on the North Carolina coast (7th February). The famous contest between the new ironclads "Monitor" and "Merrimac" (9th April), though indecisive, effectually stopped the career of the Confederate vessel, which was later destroyed by the Confederates themselves. (See HAMPTON ROADS.) Farragut, with a wooden fleet, ran past the twin forts St Philip and Jackson, compelled the surrender of New Orleans (26th April), and gained control of the lower Mississippi. The succeeding three months brought disaster and discouragement to the Union army. M'Clellan's campaign against Richmond was made abortive by his timorous generalship, and compelled the withdrawal of his army. Pope's army, advancing against the same city by another line, was beaten back upon Washington in defeat. The tide of war, however, once more turned in the defeat of Lee's invading army at South Mountain and Antietam in Maryland on the 14th and on the 16th and 17th of September, compelling him to retreat.

With public opinion thus ripened by alternate defeat and victory, President Lincoln, on the 22nd of September 1862, issued his preliminary proclamation of emancipation, giving notice that on the 1st of January 1863, "all persons held as slaves within any state or designated part of a state the people whereof shall then be in rebellion against the United States shall be then, thenceforward and for ever free." In his message to Congress on the 1st of December following, he again urged his plan of gradual, compensated emancipation (to be completed on the 1st of December 1900) "as a means, not in exclusion of, but additional to, all others for restoring and preserving the national authority throughout the Union." On the 1st day of January 1863 the final proclamation of emancipation was duly issued, designating the States of Arkansas, Texas, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, and certain portions of Louisiana and Virginia, as "this day in rebellion against the United States," and proclaiming that, in virtue of his authority as commander-in-chief, and as a necessary war measure for suppressing rebellion, "I do order and declare that all persons held as slaves within said designated states and parts of states are and henceforward shall be free," and pledging the executive and military power of the government to maintain such freedom. The legal validity of these proclamations was never pronounced upon by the national courts; but their decrees gradually enforced by the march of armies were soon recognized by public opinion to be practically irreversible.[1] Such dissatisfaction as they caused in the border slave states died out in the stress of war. The systematic enlistment of negroes and their incorporation into the army by regiments, hitherto only tried as exceptional experiments, were now pushed with vigour, and, being followed by several conspicuous instances of their gallantry on the battlefield, added another strong impulse to the sweeping change of popular sentiment. To put the finality of emancipation beyond all question, Lincoln in the winter session of 1863–1864 strongly supported a movement in Congress to abolish slavery by constitutional amendment, but the necessary two-thirds vote of the House of Representatives could not then be obtained. In his annual message of the 6th of December 1864, he urged the immediate passage of the measure. Congress now acted promptly: on the 31st of January 1865, that body by joint resolution proposed to the states the 13th amendment of the Federal Constitution, providing that "neither slavery nor involuntary servitude, except as a punishment for crime, whereof the party shall have been duly convicted, shall exist within the United States or any place subject to their jurisdiction." Before the end of that year twenty-seven out of the thirty-six states of the Union (being the required three-fourths) had ratified the amendment, and official proclamation made by President Johnson on the 18th of December 1865, declared it duly adopted.

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[1] It is to be noted that slavery in the border slave states was not affected by the proclamation. The parts of Virginia and Louisiana not affected were those then considered to be under Federal jurisdiction; in Virginia 55 counties were excepted (including the 48 which became the separate state of West Virginia), and in Louisiana 13 parishes (including the parish of Orleans). As the Federal Government did not, at the time, actually have jurisdiction over the rest of the territory of the Confederate States, that really affected, some writers have questioned whether the proclamation really emancipated any slaves when it was issued. The proclamation had the most important political effect in the North of rallying more than ever to the support of the administration the large anti-slavery element. The adoption of the 13th amendment to the Federal Constitution in 1865 rendered unnecessary any decision of the U.S. Supreme Court upon the validity of the proclamation.

The foreign policy of President Lincoln, while subordinate in importance to the great questions of the Civil War, nevertheless presented several difficult and critical problems for his decision. The arrest (8th of November 1861) by Captain Charles Wilkes of two Confederate envoys proceeding to Europe in the British steamer "Trent" seriously threatened peace with England. Public opinion in America almost unanimously sustained the act; but Lincoln, convinced that the rights of Great Britain as a neutral had been violated, promptly, upon the demand of England, ordered the liberation of the prisoners (26th of December). Later friendly relations between the United States and Great Britain, where, among the upper classes, there was a strong sentiment in favour of the Confederacy, were seriously threatened by the fitting out of Confederate privateers in British ports, and the Administration owed much to the skilful diplomacy of the American minister in London, Charles Francis Adams. A still broader foreign question grew out of Mexican affairs, when events culminating in the setting up of Maximilian of Austria as emperor under protection of French troops demanded the constant watchfulness of the United States. Lincoln's course was one of prudent moderation. France voluntarily declared that she sought in Mexico only to satisfy injuries done her and not to overthrow or establish local government or to appropriate territory. The United States Government replied that, relying on these assurances, it would maintain strict non-intervention, at the same time openly avowing the general sympathy of its people with a Mexican republic, and that "their own safety and the cheerful destiny to which they aspire are intimately dependent on the continuance of free republican institutions throughout America." In the early part of 1863 the French Government proposed a mediation between the North and the South. This offer President Lincoln (on the 6th of February) declined to consider, Seward replying for him that it would only be entering into diplomatic discussion with the rebels whether the authority of the government should be renounced, and the country delivered over to disunion and anarchy.

The Civil War gradually grew to dimensions beyond all expectation. By January 1863 the Union armies numbered near a million men, and were kept up to this strength till the end of the struggle. The Federal war debt eventually reached the sum of $2,700,000,000. The fortunes of battle were somewhat fluctuating during the first half of 1863, but the beginning of July brought the Union forces decisive victories. The reduction of Vicksburg (4th of July) and Port Hudson (9th of July), with other operations, restored complete control of the Mississippi, severing the Southern Confederacy. In the east Lee had the second time marched his army into Pennsylvania to suffer a disastrous defeat at Gettysburg, on the 1st, 2nd and 3rd of July, though he was able to withdraw his shattered forces south of the Potomac. At the dedication of this battlefield as a soldiers' cemetery in November, President Lincoln made the following oration, which has taken permanent place as a classic in American literature:—

> "Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting-place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this. But, in a larger sense, we cannot dedicate, we cannot consecrate, we cannot hallow this ground. The brave men, living and dead, who struggled here have consecrated it far above our poor power to add or detract. The world will little note nor long remember what we say here, but it can never forget what they did here. It is for us the living rather to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honoured dead we take increased devotion to that cause for which they gave the last full measure of devotion—that we here highly resolve that these dead shall not have died in vain, that this nation under God shall have a new birth of freedom, and that government of the people, by the people, for the people, shall not perish from the earth."

In the unexpected prolongation of the war, volunteer enlistments became too slow to replenish the waste of armies, and in 1863 the government was forced to resort to a draft. The enforcement of the conscription created much opposition in various parts of the country, and led to a serious riot in the city of New York on the 13th–16th of July. President Lincoln executed the draft with all possible justice and forbearance, but refused every importunity to postpone it. It was made a special subject of criticism by the Democratic party of the North, which was now organizing itself on the basis of a discontinuance of the war, to endeavour to win the presidential election of the following year. Clement L. Vallandigham of Ohio, having made a violent public speech at Mt. Vernon, Ohio, on the 1st of May against the war and military proceedings, was arrested on the 5th of May by General Burnside, tried by military commission, and sentenced on the 16th to imprisonment; a writ of *habeas corpus* had been refused, and the sentence was changed by the president to transportation beyond the military lines. By way of political defiance the Democrats of Ohio nominated Vallandigham for governor on the 11th of June. Prominent Democrats and a committee of the Convention having appealed for his release, Lincoln wrote two long letters in reply discussing the constitutional question, and declaring that in his judgment the president as commander-in-chief in time of rebellion or invasion holds the power and responsibility of suspending the privilege of the writ of *habeas corpus*, but offering to release Vallandigham if the committee would sign a declaration that rebellion exists, that an army and navy are constitutional means to suppress it, and that each of them would use his personal power and influence to prosecute the war. This liberal offer and their refusal to accept it counteracted all the political capital they hoped to make out of the case; and public opinion was still more powerfully influenced in behalf of the president's action, by the pathos of the query which he propounded in one of his letters: "Must I shoot the simple-minded soldier boy who deserts, while I must not touch a hair of a wily agitator who induces him to desert?" When the election took place in Ohio, Vallandigham was defeated by a majority of more than a hundred thousand.

Many unfounded rumours of a willingness on the part of the Confederate States to make peace were circulated to weaken the Union war spirit. To all such suggestions, up to the time of issuing his emancipation proclamation, Lincoln announced his readiness to stop fighting and grant amnesty, whenever they would submit to and maintain the national authority under the Constitution of the United States. Certain agents in Canada having in 1864 intimated that they were empowered to treat for peace, Lincoln, through Greeley, tendered them safe conduct to Washington. They were by this forced to confess that they possessed no authority to negotiate. The president thereupon sent them, and made public, the following standing offer:—

> "To whom it may concern:
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> "Any proposition which embraces the restoration of peace, the integrity of the whole Union, and the abandonment of slavery, and which comes by and with an authority that can control the armies now at war against the United States, will be received and considered by the Executive Government of the United States, and will be met by liberal terms on substantial and collateral points, and the bearer or bearers thereof shall have safe conduct both ways.
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> "July 18, 1864." "Abraham Lincoln."

A noteworthy conference on this question took place near the close of the Civil War, when the strength of the Confederacy was almost exhausted. F. P. Blair, senior, a personal friend of Jefferson Davis, acting solely on his own responsibility, was permitted to go from Washington to Richmond, where, on the 12th of January 1865, after a private and unofficial interview, Davis in writing declared his willingness to enter a conference "to secure peace to the two countries." Report being duly made to President Lincoln, he wrote a note (dated 18th January) consenting to receive any agent sent informally "with the view of securing peace to the people of our common country." Upon the basis of this latter proposition three Confederate commissioners (A. H. Stevens, J. A. C. Campbell and R. M. T. Hunter) finally came to Hampton Roads, where President Lincoln and Secretary Seward met them on the U.S. steam transport "River Queen," and on the 3rd of February 1865 an informal conference of four hours' duration was held. Private reports of the interview agree substantially in the statement that the Confederates proposed a cessation of the Civil War, and postponement of its issues for future adjustment, while for the present the belligerents should unite in a campaign to expel the French from Mexico, and to enforce the Monroe doctrine. President Lincoln, however, although he offered to use his influence to secure compensation by the Federal government to slave-owners for their slaves, if there should be "voluntary abolition of slavery by the states," a liberal and generous administration of the Confiscation Act, and the immediate representation of the southern states in Congress, refused to consider any alliance against the French in Mexico, and adhered to the instructions he had given Seward before deciding to personally accompany him. These formulated three indispensable conditions to adjustment: first, the restoration of the national authority throughout all the states; second, no receding by the executive of the United States on the slavery question; third, no cessation of hostilities short of an end of the war, and the disbanding of all forces hostile to the government. These terms the commissioners were not authorized to accept, and the interview ended without result.

As Lincoln's first presidential term of four years neared its end, the Democratic party gathered itself for a supreme effort to regain the ascendancy lost in 1860. The slow progress of the war, the severe sacrifice of life in campaign and battle, the enormous accumulation of public debt, arbitrary arrests and suspension of *habeas corpus*, the rigour of the draft, and the proclamation of military emancipation furnished ample subjects of bitter and vindictive campaign oratory. A partisan coterie which surrounded M'Clellan loudly charged the failure of his Richmond campaign to official interference in his plans. Vallandigham had returned to his home in defiance of his banishment beyond military lines, and was leniently suffered to remain. The aggressive spirit of the party, however, pushed it to a fatal extreme. The Democratic National Convention adopted (August 29, 1864) a resolution (drafted by Vallandigham) declaring the war a failure, and demanding a cessation of hostilities; it nominated M'Clellan for president, and instead of adjourning *sine die* as usual, remained organized, and subject to be convened at any time and place by the executive national committee. This threatening attitude, in conjunction with alarming indications of a conspiracy to resist the draft, had the effect to thoroughly consolidate the war party, which had on the 8th of June unanimously renominated Lincoln, and had nominated Andrew Johnson of Tennessee for the vice-presidency. At the election held on the 8th of November 1864, Lincoln received 2,216,076 of the popular votes, and M'Clellan (who had openly disapproved of the resolution declaring the war a failure) but 1,808,725; while of the presidential electors 212 voted for Lincoln and 21 for M'Clellan. Lincoln's second term of office began on the 4th of March 1865.

While this political contest was going on the Civil War was being brought to a decisive close. Grant, at the head of the Army of the Potomac, followed Lee to Richmond and Petersburg, and held him in siege to within a few days of final surrender. General W. T. Sherman, commanding the bulk of the Union forces in the Mississippi Valley, swept in a victorious march through the heart of the Confederacy to Savannah on the coast, and thence northward to North Carolina. Lee evacuated Richmond on the 2nd of April, and was overtaken by Grant and compelled to surrender his entire army on the 9th of April 1865. Sherman pushed Johnston to a surrender on the 26th of April. This ended the war.

Lincoln being at the time on a visit to the army, entered Richmond the day after its surrender. Returning to Washington, he made his last public address on the evening of the 11th of April, devoted mainly to the question of reconstructing loyal governments in the conquered states. On the evening of the 14th of April he attended Ford's theatre in Washington. While seated with his family and friends absorbed in the play, John Wilkes Booth, an actor, who with others had prepared a plot to assassinate the several heads of government, went into the little corridor leading to the upper stage-box, and secured it against ingress by a wooden bar. Then stealthily entering the box, he discharged a pistol at the head of the president from behind, the ball penetrating the brain. Brandishing a huge knife, with which he wounded Colonel Rathbone who attempted to hold him, the assassin rushed through the stage-box to the front and leaped down upon the stage, escaping behind the scenes and from the rear of the building, but was pursued, and twelve days afterwards shot in a barn where he had concealed himself. The wounded president was borne to a house across the street, where he breathed his last at 7 A.M. on the 15th of April 1865.

President Lincoln was of unusual stature, 6 ft. 4 in., and of spare but muscular build; he had been in youth remarkably strong and skilful in the athletic games of the frontier, where, however, his popularity and recognized impartiality oftener made him an umpire than a champion. He had regular and prepossessing features, dark complexion, broad high forehead, prominent cheek bones, grey deep-set eyes, and bushy black hair, turning to grey at the time of his death. Abstemious in his habits, he possessed great physical endurance. He was almost as tender-hearted as a woman. "I have not willingly planted a thorn in any man's bosom," he was able to say. His patience was inexhaustible. He had naturally a most cheerful and sunny temper, was highly social and sympathetic, loved pleasant conversation, wit, anecdote and laughter. Beneath this, however, ran an undercurrent of sadness; he was occasionally subject to hours of deep silence and introspection that approached a condition of trance. In manner he was simple, direct, void of the least affectation, and entirely free from awkwardness, oddity or eccentricity. His mental qualities were—a quick analytic perception, strong logical powers, a tenacious memory, a liberal estimate and tolerance of the opinions of others, ready intuition of human nature; and perhaps his most valuable faculty was rare ability to divest himself of all feeling or passion in weighing motives of persons or problems of state. His speech and diction were plain, terse, forcible. Relating anecdotes with appreciative humour and fascinating dramatic skill, he used them freely and effectively in conversation and argument. He loved manliness, truth and justice. He despised all trickery and selfish greed. In arguments at the bar he was so fair to his opponent that he frequently appeared to concede away his client's case. He was ever ready to take blame on himself and bestow praise on others. "I claim not to have controlled events," he said, "but confess plainly that events have controlled me." The Declaration of Independence was his political chart and inspiration. He acknowledged a universal equality of human rights. "Certainly the negro is not our equal in colour," he said, "perhaps not in many other respects; still, in the right to put into his mouth the bread that his own hands have earned, he is the equal of every other man white or black." He had unchanging faith in self-government. "The people," he said, "are the rightful masters of both congresses and courts, not to overthrow the constitution, but to overthrow the men who pervert the constitution." Yielding and accommodating in non-essentials, he was inflexibly firm in a principle or position deliberately taken. "Let us have faith that right makes might," he said, "and in that faith let us to the end dare to do our duty as we understand it." The emancipation proclamation once issued, he reiterated his purpose never to retract or modify it. "There have been men base enough," he said, "to propose to me to return to slavery our black warriors of Port Hudson and Olustee, and thus win the respect of the masters they fought. Should I do so I should deserve to be damned in time and eternity. Come what will, I will keep my faith with friend and foe." Benevolence and forgiveness were the very basis of his character; his world-wide humanity is aptly embodied in a phrase of his second inaugural: "With malice toward none, with charity for all." His nature was deeply religious, but he belonged to no denomination.

Lincoln married in Springfield on the 4th of November 1842, Mary Todd (1818–1882), also a native of Kentucky, who bore him four sons, of whom the only one to grow up was the eldest, Robert Todd Lincoln (b. 1843), who graduated at Harvard in 1864, served as a captain on the staff of General Grant in 1865, was admitted to the Illinois bar in 1867, was secretary of war in the cabinets of Presidents Garfield and Arthur in 1881–1885, and United States Minister to Great Britain in 1889–1893, and was prominently connected with many large corporations, becoming in 1897 president of the Pullman Co.

Of the many statues of President Lincoln in American cities, the best known is that, in Chicago, by St Gaudens. Among the others are two by Thomas Ball, one in statuary hall in the Capitol at Washington, and one in Boston; two—one in Rochester, N.Y., and one in Springfield, Ill.—by Leonard W. Volk, who made a life-mask and a bust of Lincoln in 1860; and one by J. Q. A. Ward, in Lincoln Park, Washington. Francis B. Carpenter painted in 1864 "Lincoln signing the Emancipation Proclamation," now in the Capitol at Washington.

See *The Complete Works of Abraham Lincoln* (12 vols., New York, 1906–1907; enlarged from the 2-volume edition of 1894 by John G. Nicolay and John Hay). There are various editions of the Lincoln-Douglas debates of 1858; perhaps the best is that edited by E. E. Sparks (1908). There are numerous biographies, and biographical studies, including: John G. Nicolay and John Hay, *Abraham Lincoln: A History* (10 vols., New York, 1890), a monumental work by his private secretaries who treat primarily his official life; John G. Nicolay, *A Short Life of Abraham Lincoln* (New York, 1904), condensed from the preceding; John T. Morse, Jr., *Abraham Lincoln* (2 vols., Boston, 1896), in the "American Statesmen" series, an excellent brief biography, dealing chiefly with Lincoln's political career; Ida M. Tarbell, *The Early Life of Lincoln* (New York, 1896) and *Life of Abraham Lincoln* (2 vols., New York, 1900), containing new material to which too great prominence and credence is sometimes given; Carl Schurz, *Abraham Lincoln: An Essay* (Boston, 1891), a remarkably able estimate; Ward H. Lamon, *The Life of Abraham Lincoln from his Birth to his Inauguration as President* (Boston, 1872), supplemented by *Recollections of Abraham Lincoln 1847–1865* (Chicago, 1895), compiled by Dorothy Lamon, valuable for some personal recollections, but tactless, uncritical, and marred by the effort of the writer, who as marshal of the District of Columbia, knew Lincoln intimately, to prove that Lincoln's melancholy was due to his lack of religious belief of the orthodox sort; William H. Herndon and Jesse W. Weik, *Abraham Lincoln, the True Story of a Great Life* (3 vols., Chicago, 1889; revised, 2 vols., New York, 1892), an intimate and ill-proportioned biography by Lincoln's law partner who exaggerates the importance of the petty incidents of his youth and young manhood; Isaac N. Arnold, *History of Abraham Lincoln and the Overthrow of Slavery* (Chicago, 1867), revised and enlarged as *Life of Abraham Lincoln* (Chicago, 1885), valuable for personal reminiscences; Gideon Welles, *Lincoln and Seward* (New York, 1874), the reply of Lincoln's secretary of the navy to Charles Francis Adams's eulogy (delivered in Albany in April 1873) on Lincoln's secretary of state, W. H. Seward, in which Adams claimed that Seward was the premier of Lincoln's administration; F. B. Carpenter, *Six Months in the White House* (New York, 1866), an excellent account of Lincoln's daily life while president; Robert T. Hill, *Lincoln the Lawyer* (New York, 1906); A. Rothschild, *Lincoln, the Master of Men* (Boston, 1906); J. Eaton and E. O. Mason, *Grant, Lincoln, and the Freedmen* (New York, 1907); R. W. Gilder, *Lincoln, the Leader, and Lincoln's Genius for Expression* (New York, 1909); M. L. Learned, *Abraham Lincoln: An American Migration* (Philadelphia, 1909), a careful study of the Lincoln family in America; W. P. Pickett, *The Negro Problem: Abraham Lincoln's Solution* (New York, 1909); James H. Lea and J. R. Hutchinson, *The Ancestry of Abraham Lincoln* (Boston, 1909), a careful genealogical monograph; and C. H. McCarthy, *Lincoln's Plan of Reconstruction* (New York, 1901). For an excellent account of Lincoln as president see J. F. Rhodes, *History of the United States from the Compromise of 1850* (7 vols., 1893–1906). (J. G. N.; C. C. W.)

LINCOLN, a city and county of a city, municipal, county and parliamentary borough, and the county town of Lincolnshire, England. Pop. (1901) 48,784. It is picturesquely situated on the summit and south slope of the limestone ridge of the Cliff range of hills, which rises from the north bank of the river Witham, at its confluence with the Foss Dyke, to an altitude of 200 ft. above the river. The cathedral rises majestically from the crown of the hill, and is a landmark for many miles. Lincoln is 130 m. N. by W. from London by the Great Northern railway; it is also served by branches of the Great Eastern, Great Central and Midland railways.

Lincoln is one of the most interesting cities in England. The ancient British town occupied the crown of the hill beyond the Newport or North Gate. The Roman town consisted of two parallelograms of unequal length, the first extending west from the Newport gate to a point a little west of the castle keep. The second parallelogram, added as the town increased in size and importance, extended due south from this point down the hill towards the Witham as far as Newland, and thence in a direction due east as far as Broad Street. Returning thence due north, it joined the south-east corner of the first and oldest parallelogram in what was afterwards known as the Minster yard, and terminated its east side upon its junction with the north wall in a line with the Newport gate. This is the oldest part of the town, and is named "above hill." After the departure of the Romans, the city walls were extended still farther in a south direction across the Witham as far as the great bar gate, the south entrance to the High Street of the city; the junction of these walls with the later Roman one was effected immediately behind Broad Street. The "above hill" portion of the city consists of narrow irregular streets, some of which are too steep to admit of being ascended by carriages. The south portion, which is named "below hill," is much more commodious, and contains the principal business premises. Here also are the railway stations.

The glory of Lincoln is the noble cathedral of the Blessed Virgin Mary, commonly known as the Minster. As a study to the architect and antiquary this stands unrivalled, not only as embodying the earliest purely Gothic work extant, but as containing within its compass every variety of style from the simple massive Norman of the central west front, and the later and more ornate examples of that style in the west doorways and towers; onward through all the Gothic styles, of each of which both early and late examples appear. The building material is the oolite and calcareous stone of Lincoln Heath and Haydor, which has the peculiarity of becoming hardened on the surface when tooled. Formerly the cathedral had three spires, all of wood or leaded timber. The spire on the central tower, which would appear to have been the highest in the world, was blown down in 1547. Those on the two western towers were removed in 1808.

The ground plan of the first church, adopted from that of Rouen, was laid by Bishop Remigius in 1086, and the church was consecrated three days after his death, on the 6th of May 1092. The west front consists of an Early English screen (*c.* 1225) thrown over the Norman front, the west towers rising behind it. The earliest Norman work is part of that of Remigius; the great portals and the west towers up to the third storey are Norman *c.* 1148. The upper parts of them date from 1365. Perpendicular windows (*c.* 1450) are inserted. The nave and aisles were completed *c.* 1220. The transepts mainly built between 1186 and 1235 have two fine rose windows, that in the N. is Early English, and that in the S. Decorated. The first has beautiful contemporary stained glass. These are called respectively the Dean's Eye and Bishop's Eye. A Galilee of rich Early English work forms the entrance of the S. transept. Of the choir the western portion known as St Hugh's (1186–1204) is the famous first example of pointed work; the eastern, called the Angel Choir, is a magnificently ornate work completed in 1280. Fine Perpendicular canopied stalls fill the western part. The great east window, 57 ft. in height, is an example of transition from Early English to Decorated *c.* 1288. Other noteworthy features of the interior are the Easter sepulchre (*c.* 1300), the foliage ornamentation of which is beautifully natural; and the organ screen of a somewhat earlier date. The great central tower is Early English as far as the first storey, the continuation dates from 1307. The total height is 271 ft.; and the tower contains the bell, Great Tom of Lincoln, weighing over 5 tons. The dimensions of the cathedral internally are—nave, 252×79·6×80 ft.; choir, 158×82×72 ft.; angel choir, which includes presbytery and lady chapel, 166×44×72 ft.; main transept, 220×63×74 ft.; choir transept, 166×44×72 ft. The west towers are 206 ft. high.

The buildings of the close that call for notice are the chapter-house of ten sides, 60 ft. diameter, 42 ft. high, with a fine vestibule of the same height, built *c.* 1225, and therefore the earliest of English polygonal chapter-houses, and the library, a building of 1675, which contains a small museum. The picturesque episcopal palace contains work of the date of St Hugh, and the great hall is mainly Early English. There is some Decorated work, and much Perpendicular, including the gateway. It fell into disuse after the Reformation, but by extensive restoration was brought back to its proper use at the end of the 19th century. Among the most famous bishops were St Hugh of Avalon (1186–1200); Robert Grosseteste (1235–1253); Richard Flemming (1420–1431), founder of Lincoln College, Oxford; William Smith (1495–1514), founder of Brasenose College, Oxford; William Wake (1705–1716); and Edmund Gibson (1716–1723). Every stall has produced a prelate or cardinal. The see covers almost the whole of the county, with very small portions of Norfolk and Yorkshire, and it included Nottinghamshire until the formation of the bishopric of Southwell in 1884. At its earliest formation, when Remigius, almoner of the abbey of Fécamp, removed the seat of the bishopric here from Dorchester in Oxfordshire shortly after the Conquest, it extended from the Humber to the Thames, eastward beyond Cambridge, and westward beyond Leicester. It was reduced, however, by the formation of the sees of Ely, Peterborough and Oxford, and by the rearrangement of diocesan boundaries in 1837.

The remains of Roman Lincoln are of the highest interest. The Newport Arch or northern gate of *Lindum* is one of the most perfect specimens of Roman architecture in England. It consists of a great arch flanked by two smaller arches, of which one remains. The Roman Ermine Street runs through it, leading northward almost in a straight line to the Humber. Fragments of the town wall remain at various points; a large quantity of coins and other relics have been discovered; and remains of a burial-place and buildings unearthed. Of these last the most important is the series of column-bases, probably belonging to a Basilica, beneath a house in the street called Bail Gate, adjacent to the Newport Arch. A villa in Greetwell; a tesselated pavement, a milestone and other relics in the cloister; an altar unearthed at the church of St Swithin, are among many other discoveries. Among churches, apart from the minster, two of outstanding interest are those of St Mary-le-Wigford and St Peter-at-Gowts (*i.e.* sluice-gates), both in the lower part of High Street. Their towers, closely similar, are fine examples of perhaps very early Norman work, though they actually possess the characteristics of pre-Conquest workmanship. Bracebridge church shows similar early work; but as a whole the churches of Lincoln show plainly the results of the siege of 1644, and such buildings as St Botolph's, St Peter's-at-Arches and St Martin's are of the period 1720–1740. Several churches are modern buildings on ancient sites. There were formerly three small priories, five friaries and four hospitals in or near Lincoln. The preponderance of friaries over priories of monks is explained by the fact that the cathedral was served by secular canons. Bishop Grosseteste was the devoted patron of the friars, particularly the Franciscans, who were always in their day the town missionaries. The Greyfriars, near St Swithin's church, is a picturesque two-storied building of the 13th century. Lincoln is rich in early domestic architecture. The building known as John of Gaunt's stables, actually St Mary's Guild Hall, is of tw storeys, with rich Norman doorway and moulding. The Jews' House is another fine example of 12th-century building; and Norman remains appear in several other houses, such as Deloraine Court and the House of Aaron the Jew. Lincoln Castle, lying W. of the cathedral, was newly founded by William the Conqueror when Remigius decided to found his minster under its protection. The site, with its artificial mounds, is of much earlier, probably British, date. There are Norman remains in the Gateway Tower; parts of the walls are of this period, and the keep dates from the middle of the 12th century. Among medieval gateways, the Exchequer Gate, serving as the finance-office of the chapter, is a fine specimen of 13th-century work. Pottergate is of the 14th century, and Stonebow in High Street of the 15th, with the Guildhall above it. St Dunstan's Lock is the name, corrupted from Dunestall, now applied to the entrance to the street where a Jewish quarter was situated; here lived the Christian boy afterwards known as "little St Hugh," who was asserted to have been crucified by the Jews in 1255. His shrine remains in the S. choir aisle of the minster. Other antiquities are the Perpendicular conduit of St Mary in High Street and the High Bridge, carrying High Street over the Witham, which is almost unique in England as retaining some of the old houses upon it.

Among modern public buildings are the county hall, old and new corn exchanges and public library. Educational establishments include a grammar school, a girls' high school, a science and art school and a theological college. The arboretum in Monks Road is the principal pleasure-ground; and there is a race-course. The principal industry is the manufacture of agricultural machinery and implements; there are also iron foundries and maltings, and a large trade in corn and agricultural produce. The parliamentary borough, returning one member, falls between the Gainsborough division of the county on the N., and that of Sleaford on the S. Area, 3755 acres.

History.—The British Lindun, which, according to the geography of Claudius Ptolemaeus, was the chief town of the Coritani, was probably the nucleus of the Roman town of Lindum. This was at first a Roman legionary fortress, and on the removal of the troops northward was converted into a municipality with the title of *colonia.* Such important structural remains as have been described attest the rank and importance of the place, which, however, did not attain a very great size. Its bishop attended the council of Arles in 314, and Lincoln (*Lindocolina, Lincolle, Nicole*) is mentioned in the Itinerary of Antoninus written about 320. Although said to have been captured by Hengest in 475 and recovered by Ambrosius in the following year, the next authentic mention of the city is Bede's record that Paulinus preached in Lindsey in 628 and built a stone church at Lincoln in which he consecrated Honorius archbishop of Canterbury. During their inroads into Mercia, the Danes in 877 established themselves at Lincoln, which was one of the five boroughs recovered by King Edmund in 941. A mint established here in the reign of Alfred was maintained until the reign of Edward I. (Mint Street turning from High Street near the Stonebow recalls its existence.) At the time of the Domesday Survey Lincoln was governed by twelve Lawmen, relics of Danish rule, each with hereditable franchises of sac and soc. Whereas it had rendered £20 annually to King Edward, and £10 to the earl, it then rendered £100. There had been 1150 houses, but 240 had been destroyed since the time of King Edward. Of these 166 had suffered by the raising of the castle by William I. in 1068 partly on the site of the Roman camp. The strength of the position of the castle brought much fighting on Lincoln. In 1141 King Stephen regained both castle and city from the empress Maud, but was attacked and captured in the same year at the "Joust of Lincoln." In 1144 he besieged the castle, held by the earl of Chester, and recovered it as a pledge in 1146. In 1191 it was held by Gerard de Camville for Prince John and was besieged by William Longchamp, Richard's chancellor, in vain; in 1216 it stood a siege by the partisans of the French prince Louis, who were defeated at the battle called Lincoln Fair on the 19th of May 1217. Granted by Henry III. to William Longepée, earl of Salisbury, in 1224, the castle descended by the marriage of his descendant Alice to Thomas Plantagenet, and became part of the duchy of Lancaster.

In 1157 Henry II. gave the citizens their first charter, granting them the city at a fee-farm rent and all the liberties which they had had under William II., with their gild merchant for themselves and the men of the county as they had then. In 1200 the citizens obtained release from all but pleas of the Crown without the walls, and pleas of external tenure, and were given the pleas of the Crown within the city according to the customs of the city of London, on which those of Lincoln were modelled. The charter also gave them quittance of toll and lastage throughout the kingdom, and of certain other dues. In 1210 the citizens owed the exchequer £100 for the privilege of having a mayor, but the office was abolished by Henry III. and by Edward I. in 1290, though restored by the charter of 1300. In 1275 the citizens claimed the return of writs, assize of bread and ale and other royal rights, and in 1301 Edward I., when confirming the previous charters, gave them quittance of murage, pannage, pontage and other dues. The mayor and citizens were given criminal jurisdiction in 1327, when the burghmanmot held weekly in the gildhall since 1272 by the mayor and bailiffs was ordered to hear all local pleas which led to friction with the judges of assize. The city became a separate county by charter of 1409, when it was decreed that the bailiffs should henceforth be sheriffs and the mayor the king's escheator, and the mayor and sheriffs with four others justices of the peace with defined jurisdiction. As the result of numerous complaints of inability to pay the fee-farm rent of £180 Edward IV. enlarged the bounds of the city in 1466, while Henry VIII. in 1546 gave the citizens four advowsons, and possibly also in consequence of declining trade the city markets were made free of tolls in 1554. Incorporated by Charles I. in 1628 under a common council with 13 aldermen, 4 coroners and other officers, Lincoln surrendered its charters in 1684, but the first charter was restored after the Revolution, and was in force till 1834.

Parliaments were held at Lincoln in 1301, 1316 and 1327, and the city returned two burgesses from 1295 to 1885, when it lost one member. After the 13th century the chief interests of Lincoln were ecclesiastical and commercial. As early as 1103 Odericus declared that a rich citizen of Lincoln kept the treasure of King Magnus of Norway, supplying him with all he required, and there is other evidence of intercourse with Scandinavia. There was an important Jewish colony, Aaron of Lincoln being one of the most influential financiers in the kingdom between 1166 and 1186. It was probably jealousy of their wealth that brought the charge of the crucifixion of "little St Hugh" in 1255 upon the Jewish community. Made a staple of wool, leather and skins in 1291, famous for its scarlet cloth in the 13th century, Lincoln had a few years of great prosperity, but with the transference of the staple to Boston early in the reign of Edward III., its trade began to decrease. The craft gilds remained important until after the Reformation, a pageant still being held in 1566. The fair now held during the last whole week of April would seem to be identical with that granted by Charles II. in 1684. Edward III. authorized a fair from St Botolph's day to the feast of SS Peter and Paul in 1327, and William III. gave one for the first Wednesday in September in 1696, while the present November fair is, perhaps, a survival of that granted by Henry IV. in 1409 for fifteen days before the feast of the Deposition of St Hugh.

See *Historical Manuscripts Commission*, *Report*, xiv., appendix pt. 8; John Ross, *Civitas Lincolina, from its municipal and other Records* (London, 1870); J. G. Williams, "Lincoln Civic Insignia," *Lincolnshire Notes and Queries*, vols. vi.-viii. (Horncastle, 1901–1905); *Victoria County History*, *Lincolnshire*.

LINCOLN, a city and the county-seat of Logan county, Illinois, U.S.A., in the N. central part of the state, 156 m. S.W. of Chicago, and about 28 m. N.E. of Springfield. Pop. (1900) 8962, of whom 940 were foreign-born; (1910 census) 10,892. It is served by the Illinois Central and the Chicago & Alton railways and by the Illinois Traction Interurban Electric line. The city is the seat of the state asylum for feeble-minded children (established at Jacksonville in 1865 and removed to Lincoln in 1878), and of Lincoln College (Presbyterian) founded in 1865. There are also an orphans' home, supported by the Independent Order of Odd Fellows, and a Carnegie library. The old court-house in which Abraham Lincoln often practised is still standing. Lincoln is situated in a productive grain region, and has valuable coal mines. The value of the factory products increased from $375,167 in 1900 to $784,248 in 1905, or 109%. The first settlement on the site of Lincoln was made in 1835, and the city was first chartered in 1857.

LINCOLN, a city of S.E. Nebraska, U.S.A., county-seat of Lancaster county and capital of the state. Pop. (1900) 40,169 (5297 being foreign-born); (1910 census) 43,973. It is served by the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Union Pacific, the Missouri Pacific and the Chicago & North-Western railways. Lincoln is one of the most attractive residential cities of the Middle West. Salt Creek, an affluent of the Platte river, skirts the city. On this side the city has repeatedly suffered from floods. The principal buildings include a state capitol (built 1883–1889); a city-hall, formerly the U.S. government building (1874–1879); a county court-house; a federal building (1904–1906); a Carnegie library (1902); a hospital for crippled children (1905) and a home for the friendless, both supported by the state; a state penitentiary and asylum for the insane, both in the suburbs; and the university of Nebraska. In the suburbs there are three denominational schools, the Nebraska Wesleyan University (Methodist Episcopal, 1888) at University Place; Union College (Seventh Day Adventists, 1891) at College View; and Cotner University (Disciples of Christ, 1889, incorporated as the Nebraska Christian University) at Bethany. Just outside the city limits are the state fair grounds, where a state fair is held annually. Lincoln is the see of a Roman Catholic bishopric. The surrounding country is a beautiful farming region, but its immediate W. environs are predominantly bare and desolate salt-basins. Lincoln's "factory" product increased from $2,763,484 in 1900 to $5,222,620 in 1905, or 89%, the product for 1905 being 3·4% of the total for the state. The municipality owns and operates its electric-lighting plant and water-works.

The salt-springs attracted the first permanent settlers to the site of Lincoln in 1856, and settlers and freighters came long distances to reduce the brine or to scrape up the dry-weather surface deposits. In 1886–1887 the state sank a test-well 2463 ft. deep, which discredited any hope of a great underground flow or deposit. Scarcely any use is made of the salt waters locally. Lancaster county was organized extra-legally in 1859, and under legislative act in 1864; Lancaster village was platted and became the county-seat in 1864 (never being incorporated); and in 1867, when it contained five or six houses, its site was selected for the state capital after a hard-fought struggle between different sections of the state (see NEBRASKA).[1] The new city was incorporated as Lincoln (and formally declared the county-seat by the legislature) in 1869, and was chartered for the first time as a city of the second class in 1871; since then its charter has been repeatedly altered. After 1887 it was a city of the first class, and after 1889 the only member of the highest subdivision in that class. After a "reform" political campaign, the ousting in 1887 of a corrupt police judge by the mayor and city council, in defiance of an injunction of a federal court, led to a decision of the U.S. Supreme Court, favourable to the city authorities and important in questions of American municipal government.

LINCOLN JUDGMENT, THE. In this celebrated English ecclesiastical suit, the bishop of Lincoln (Edward King, *q.v.*) was cited before his metropolitan, the archbishop of Canterbury (Dr Benson), to answer charges of various ritual offences committed at the administration of Holy Communion in the church of St Peter at Gowts, in the diocese of Lincoln, on the 4th of December 1887, and in Lincoln cathedral on the 10th of December 1887. The promoters were Ernest de Lacy Read, William Brown, Felix Thomas Wilson and John Marshall, all inhabitants of the diocese of Lincoln, and the last two parishioners of St Peter at Gowts. The case has a permanent importance in two respects. First, certain disputed questions of ritual were legally decided. Secondly, the jurisdiction of the archbishop of Canterbury alone to try one of his suffragan bishops for alleged ecclesiastical offences was considered and judicially declared to be well founded both by the judicial committee of privy council and by the archbishop of Canterbury with the concurrence of his assessors. The proceedings were begun on the 2nd of June 1888 by a petition presented by the promoters to the archbishop, praying that a citation to the bishop of Lincoln might issue calling on him to answer certain ritual charges. On the 26th of June 1888 the archbishop, by letter, declined to issue citation, on the ground that until instructed by a competent court as to his jurisdiction, he was not clear that he had it. The promoters appealed to the judicial committee of the privy council, to which an appeal lies under 25 Henry VIII. c. 19 for "lack of justice" in the archbishop's court. The matter was heard on the 20th of July 1888, and on the 8th of August 1888 the committee decided (i.) that an appeal lay from the refusal of the archbishop to the judicial committee, and (ii.) that the archbishop had jurisdiction to issue a citation to the bishop of Lincoln and to hear the promoters' complaint, but they abstained from expressing an opinion as to whether the archbishop had a discretion to refuse citation—whether, in fact, he had any power of "veto" over the prosecution. The case being thus remitted to the archbishop, he decided to entertain it, and on the 4th of January 1889 issued a citation to the bishop of Lincoln.

On the 12th of February 1889 the archbishop of Canterbury sat in Lambeth Palace Library, accompanied by the bishops of London (Dr Temple), Winchester (Dr Harold Browne), Oxford (Dr Stubbs) and Salisbury (Dr Wordsworth), and the vicar-general (Sir J. Parker Deane) as assessors. The bishop of Lincoln appeared in person and read a "Protest" to the archbishop's jurisdiction to try him except in a court composed of the archbishop and all the bishops of the province as judges. The court adjourned in order that the question of jurisdiction might be argued. On the 11th of May the archbishop gave judgment to the effect that whether sitting alone or with assessors he had jurisdiction to entertain the charge. On the 23rd and 24th of July 1889 a further preliminary objection raised by the bishop of Lincoln's counsel was argued. The offences alleged against the bishop of Lincoln were largely breaches of various rubrics in the communion service of the Prayer Book which give directions to the "minister." These rubrics are by the Acts of Uniformity (1 Elizabeth c. 2, and 13 & 14 Car. II. c. 4) made legally binding. But it was argued that a bishop is not a "minister" so as to be bound by the rubrics. The archbishop, however, held otherwise, and the assessors (except the bishop of Salisbury, who dissented) concurred in this decision. At this and subsequent hearings the bishop of Hereford (Dr Atlay) took the place of the bishop of Winchester as an assessor, and the bishop of Rochester (Dr Thorold), originally appointed an assessor, but absent from England at the outset, was present.

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[1] Lincoln was about equally distant from Pawnee City and the Kansas border, the leading Missouri river towns, and the important towns of Fremont and Columbus on the N. side of the Platte.

Charges and decisions.

The case was heard on its merits in February 1890, before the archbishop and all the assessors, and the archbishop delivered his judgment on the 21st of November 1890. The alleged offences were eight in number. No facts were in dispute, but only the legality of the various matters complained of. I. The bishop was charged with having mixed water with wine in the chalice during the communion service, and II. with having administered the chalice so mixed to the communicants. It was decided that the mixing of the water with the wine during service was illegal, because an additional ceremony not enjoined in the Prayer Book, but that the administration of the mixed chalice, the mixing having been effected before service, was in accordance with primitive practice and not forbidden in the Church of England. III. The bishop was charged with the ceremonial washing of the vessels used for the holy communion, and with drinking the water used for these ablutions. It was decided that the bishop had committed no offence, and that what he had done was a reasonable compliance with the requirement of the rubric that any of the consecrated elements left over at the end of the celebration should be then and there consumed. IV. The bishop was charged with taking the eastward position (*i.e.* standing at the west side of the holy table with his face to the east and his back to the congregation) during the ante-communion service (*i.e.* the part of the communion service prior to the consecration prayer). The rubric requires the celebrant to stand at the north side of the table. A vast amount of research convinced the archbishop that this is an intentionally ambiguous phrase which may with equal accuracy be applied to the north end of the table as now arranged in churches, and to the long side of the table, which, in Edward VI.'s reign, was often placed lengthwise down the church, so that the long sides would face north and south. It was therefore decided (one of the assessors dissenting) that both positions are legal, and that the bishop had not offended in adopting the eastward position. V. The bishop was charged with so standing during the consecration prayer that the "Manual Acts" of consecration were invisible to the people gathered round. It should be stated that the courts (see *Ridsdale* v. *Clifton*, L.R. 1 P.D. 316; 2 P.D. 276) had already decided that the eastward position during the consecration prayer was legal, but that it must not be so used by the celebrant as to conceal the "Manual Acts." The archbishop held that the bishop of Lincoln had transgressed the law in this particular. VI. The bishop was charged with having, during the celebration of holy communion, allowed two candles to be alight on a shelf or retable behind the altar when they were not necessary for giving light. The archbishop decided that the mere presence of two altar candles burning during the service, but lit before it began, was lawful under the First Prayer Book of Edward VI., and has never been made unlawful, and, therefore, that the bishop was justified in what he had done. VII. The bishop was charged with having permitted the hymn known as *Agnus Dei* to be sung immediately after the consecration of the elements at a celebration of the holy communion. The archbishop decided that the use of hymns in divine service was too firmly established to be legally questioned, and that there was nothing to differentiate the use of this particular hymn at this point of the service from the use of other hymns on other occasions in public worship. VIII. The bishop was charged with making the sign of the Cross in the air with his hand in the benediction and at other times during divine service. The archbishop held that these crossings were ceremonies not enjoined and, therefore, illegal. The judgment confined itself to the legal declarations here summarized, and pronounced no monition or other sentence on the bishop of Lincoln in respect of the matters in which he appeared to have committed breaches of the ecclesiastical law.

The promoters appealed to the judicial committee. The bishop did not appear on the appeal, which was therefore argued on the side of the promoters only. The appeal was heard in June and July 1891, before Lords Halsbury, Hobhouse, Esher, Herschell, Hannen and Shand and Sir Richard Couch, with the bishop of Chichester (Dr Durnford), the bishop of St Davids (Dr Basil Jones) and the bishop of Lichfield (Dr Maclagan) as episcopal assessors. The points appealed were those above numbered II., III., IV., VI., VII. Judgment was given on the 2nd of August 1892, and the appeal failed on all points. As to II., III., IV., and VII. the Committee agreed with the archbishop. As to VI. (altar lights) they held that, as it was not shown that the bishop was responsible for the presence of lighted candles, the charge could not be sustained against him, and so dismissed it without considering the general question of the lawfulness of altar lights. They also held that the archbishop was within his right in pronouncing no sentence against the bishop, who, it should be added, conformed his practice to the judgment from the date of its delivery. (L. T. D.)

LINCOLNSHIRE, an eastern county of England, bounded N. by the Humber, E. by the German Ocean and the Wash, S.E. for 3 m. by Norfolk, S. by Cambridgeshire and Northamptonshire, S.W. by Rutland, W. by Leicestershire and Nottinghamshire and N.W. by Yorkshire. The area is 2646 sq. m., the county being second to Yorkshire of the English counties in size.

The coast-line, about 110 m. in length, including the Humber shore, is generally low and marshy, and artificial banks for guarding against the inroads of the sea are to be found, in places, all along the coast. From Grimsby to Skegness traces of a submarine forest are visible; but while the sea is encroaching upon some parts of the coast it is receding from others, as shown by Holbeach, which is now 6 m. from the sea. Several thousand acres have been reclaimed from this part of the Wash, and round the mouth of the Nene on the south-east. The deep bay between the coasts of Lincolnshire and Norfolk, called the Wash, is full of dangerous sandbanks and silt; the navigable portion off the Lincolnshire coast is known as the Boston Deeps. The rapidity of the tides in this inlet, and the lowness of its shores, which are generally indistinct on account of mist from a moderate offing, render this the most difficult portion of the navigation of the east coast of England. On some parts of the coast there are fine stretches of sand, and Cleethorpes, Skegness, Mablethorpe and Sutton-on-Sea are favourite resorts for visitors.

The surface of Lincolnshire is generally a large plain, small portions of which are slightly below the level of the sea. The south-east parts are perfectly flat; and about one-third of the county consists of fens and marshes, intersected in all directions by artificial drains, called locally dykes, delphs, drains, becks, leams and eaux. This flat surface is broken by two ranges of calcareous hills running north and south through the county, and known as the Lincoln Edge or Heights, or the Cliff, and the Wolds. The former range, on the west, runs nearly due north from Grantham to Lincoln, and thence to the Humber, traversing the Heaths of Lincolnshire, which were formerly open moors, rabbit warrens and sheep walks, but are now enclosed and brought into high cultivation. The Wolds form a ridge of bold hills extending from Spilsby to Barton-on-Humber for about 40 m., with an average breadth of about 8 m. The Humber separates Lincolnshire from Yorkshire. Its ports on the Lincolnshire side are the small ferry-ports of Barton and New Holland, and the important harbour of Grimsby. The Trent forms part of the boundary with Nottinghamshire, divides the Isle of Axholme (*q.v.*) from the district of Lindsey, and falls into the Humber about 30 m. below Gainsborough. The Witham rises on the S.W. border of the county, flows north past Grantham to Lincoln, and thence E. and S.E. to Boston, after a course of about 80 m. The Welland rises in north-west Northamptonshire, enters the county at Stamford, and, after receiving the Glen, flows through an artificial channel into the Fosdyke Wash. The Nene on the south-east has but a small portion of its course in Lincolnshire; it flows due north through an artificial outfall, called the Wisbech Cut. Between the Wolds and the sea lie the Marshes, a level tract of rich alluvial soil extending from Barton-on-Humber to Wainfleet, varying in breadth from 5 to 10 m. Between the Welland and the Nene in the south-east of the county are Gedney Marsh, Holbeach Marsh, Moulton Marsh and Sutton Marsh.

The Fens (*q.v.*), the soil of which has been formed partly by tidal action and partly by the decay of forests, occupy the Isle of Axholme on the north-west, the vale of Ancholme on the north, and most of the country south-east of Lincoln. The chief of these are the Holland, Wildmore, West and East Fens draining into the Witham; and the Deeping, Bourn, Great Porsand, and Whaplode Fens draining into the Welland.

The low lands adjoining the tidal reaches of the Trent and Humber, and part of those around the Wash have been raised above the natural level and enriched by the process of warping, which consists in letting the tide run over the land, and retaining it there a sufficient time to permit the deposit of the sand and mud held in solution by the waters.

Geology.—The geological formations for the most part extend in parallel belts, nearly in the line of the length of the county, from north to south, and succeed one another in ascending order from west to east. The lowest is the Triassic Keuper found in the Isle of Axholme and the valley of the Trent in the form of marls, sandstone and gypsum. Fish scales and teeth, with bones and footprints of the *Labyrinthodon*, are met with in the sandstone. The red clay is frequently dug for brick-making. The beds dip gently towards the east. At the junction between the Trias and Lias are series of beds termed Rhaetics, which seem to mark a transition from one to the other. These belts are in part exposed in pits near Newark, and extend north by Gainsborough to where the Trent flows into the Humber, passing thence into Yorkshire. The characteristic shells are found at Lea, 2 m. south of Gainsborough, with a thin bone-bed full of fish teeth and scales. The Lower Lias comes next in order, with a valuable bed of ironstone now largely worked. This bed is about 27 ft. in thickness, and crops out at Scunthorpe and Frodingham, where the workings are open and shallow. The Middle Lias, which enters the county near Woolsthorpe, is about 20 or 30 ft. thick, and is very variable both in thickness and mineralogical character; the iron ores of Denton and Caythorpe belong to this horizon. The Upper Lias enters the county at Stainby, passing by Grantham and Lincoln where it is worked for bricks. The Lias thus occupies a vale about 8 or 10 m. in width in the south, narrowing until on the Humber it is about a mile in width. To this succeed the Oolite formations. The Inferior Oolite, somewhat narrower than the Lias, extends from the boundary with Rutland due north past Lincoln to the vicinity of the Humber; it forms the Cliff of Lincolnshire with a strong escarpment facing westward. At Lincoln the ridge is notched by the river Witham. The principal member of the Inferior Oolite is the Lincolnshire limestone, which is an important water-bearing bed and is quarried at Lincoln, Ponton, Ancaster, and Kirton Lindsey for building stone. Eastward of the Inferior Oolite lie the narrow outcrops of the Great Oolite and Cornbrash. The Middle Oolite, Oxford clay and Corallian is very narrow in the south near Wilsthorpe, widening gradually about Sleaford. It then proceeds north from Lincoln with decreasing width to the vicinity of the Humber. The Upper Oolite, Kimeridge clay, starts from the vicinity of Stamford, and after attaining its greatest width near Horncastle, runs north-north-west to the Humber. The Kimeridge clay is succeeded by the Spilsby sandstone, Tealby limestone, Claxby ironstone, and carstone which represent the highest Jurassic and lowest Cretaceous rocks. In the Cretaceous system of the Wolds, the Lower Greensand runs nearly parallel with the Upper Oolite past South Willingham to the Humber. The Upper Greensand and Gault, represented in Lincolnshire by the Red Chalk, run north-west from Irby, widening out as far as Kelstern on the east, and cross the Humber. The Chalk formation, about equal in breadth to the three preceding, extends from Burgh across the Humber. The rest of the county, comprising all its south-east portions between the Middle Oolite belt and the sea, all its north-east portions between the chalk belt and the sea, and a narrow tract up the course of the Ancholme river, consists of alluvial deposits or of reclaimed marsh. In the northern part boulder clay and glacial sands cover considerable tracts of the older rocks. Bunter, Permian, and Coal Measure strata have been revealed by boring to underlie the Keuper near Haxey.

Gypsum is dug in the Isle of Axholme, whiting is made from the chalk near the shores of the Humber, and lime is made on the Wolds. Freestone is quarried around Ancaster, and good oolite building stone is quarried near Lincoln and other places. Ironstone is worked at several places and there are some blast furnaces.

At Woodhall Spa on the Horncastle branch railway there is a much-frequented bromine and iodine spring.

Climate, Soil and Agriculture.—The climate of the higher grounds is healthy, and meteorological observation does not justify the reputation for cold and damp often given to the county as a whole. The soils vary considerably, according to the geological formations; ten or twelve different kinds may be found in going across the country from east to west. A good sandy loam is common in the Heath division; a sandy loam with chalk, or a flinty loam on chalk marl, abounds on portions of the Wolds; an argillaceous sand, merging into rich loam, lies on other portions of the Wolds; a black loam and a rich vegetable mould cover most of the Isle of Axholme on the north-west; a well-reclaimed marine marsh, a rich brown loam, and a stiff cold clay variously occupy the low tracts along the Humber, and between the north Wolds and the sea; a peat earth, a deep sandy loam, and a rich soapy blue clay occupy most of the east and south Fens; and an artificial soil, obtained by "warping," occupies considerable low strips of land along the tidal reaches of the rivers.

Lincolnshire is one of the principal agricultural, especially grain-producing, counties in England. Nearly nine-tenths of the total area is under cultivation. The wide grazing lands have long been famous, and the arable lands are specially adapted for the growth of wheat and beans. The largest individual grain-crop, however, is barley. Both cattle and sheep are bred in great numbers. The cattle raised are the Shorthorns and improved Lincolnshire breeds. The dairy, except in the vicinity of large towns, receives little attention. The sheep are chiefly of the Lincolnshire and large Leicestershire breeds, and go to the markets of Yorkshire and London. Lincolnshire has long been famous for a fine breed of horses both for the saddle and draught. Horse fairs are held every year at Horncastle and Lincoln. Large flocks of geese were formerly kept in the Fens, but their number has been diminished since the drainage of these parts. Where a large number of them were bred, nests were constructed for them one above another; they were daily taken down by the gooseherd, driven to the water, and then reinstated in their nests, without a single bird being misplaced. Decoys were once numerous in the undrained state of the Fens.

Industries and Communications.—Manufactures are few and, relatively to the agricultural industry, small. The mineral industries, however, are of value, and there are considerable agricultural machine and implement factories at Lincoln, Boston, Gainsborough, Grantham and Louth. At Little Bytham a very hard brick, called adamantine clinker, is made of the siliceous clay that the Romans used for similar works. Bone-crushing, tanning, the manufacture of oil-cake for cattle, and rope-making are carried on in various places. Grimsby is an important port both for continental traffic and especially for fisheries; Boston is second to it in the county; and Gainsborough has a considerable traffic on the Trent. Sutton Bridge is a lesser port on the Wash.

The principal railway is the Great Northern, its main line touching the county in the S.W. and serving Grantham. Its principal branches are from Peterborough to Spalding, Boston, Louth and Grimsby; and from Grantham to Sleaford and Boston, and to Lincoln, and Boston to Lincoln. This company works jointly with the Great Eastern the line from March to Spalding, Lincoln, Gainsborough and Doncaster, and with the Midland that from Saxby to Bourn, Spalding, Holbeach, Sutton Bridge and King's Lynn. The Midland company has a branch from Newark to Lincoln, and the Lancashire, Derbyshire, and East Coast line terminates at Lincoln. The Great Central railway connects the west, Sheffield and Doncaster with Grimsby, and with Hull by ferry from New Holland. Canals connect Louth with the Humber, Sleaford with the Witham, and Grantham with the Trent near Nottingham; but the greater rivers and many of the drainage cuts are navigable, being artificially deepened and embanked.

Population and Administration.—The area of the ancient county is 1,693,550 acres, with a population in 1891 of 472,878 and in 1901 of 498,847. The primary divisions are three trithings or Ridings (*q.v.*). The north division is called the Parts of Lindsey, the south-west the Parts of Kesteven, and the south-east the Parts of Holland. Each of these divisions had in early times its own reeve or gerefa. Each constitutes an administrative county, the Parts of Lindsey having an area of 967,689 acres; Kesteven, 465,877 acres; and Holland, 262,766 acres. The Parts of Lindsey contain 17 wapentakes; Kesteven, exclusive of the soke and borough of Grantham and the borough of Stamford, 9 wapentakes; and Holland, 3 wapentakes. The municipal boroughs and urban districts are as follows:—

1. PARTS OF LINDSEY.—Municipal boroughs—Grimsby, a county borough (pop. 63,138), Lincoln, a city and county borough and the county town (48,784), Louth (9518). Urban districts—Alford

(2478), Barton-upon-Humber (5671), Brigg (3137), Broughton (1300), Brumby and Frodingham (2273), Cleethorpes with Thrunscoe (12,578), Crowle (2769), Gainsborough (17,660), Horncastle (4038), Mablethorpe (934), Market Rasen (2188), Roxby-cum-Risby (389), Scunthorpe (6750), Skegness (2140), Winterton (1361), Woodhall Spa (988).

2. Parts of Kesteven.—Municipal boroughs—Grantham (17,593), Stamford (8229). Urban districts—Bourne (4361), Bracebridge (1752), Ruskington (1196), Sleaford (5468).

3. Parts of Holland.—Municipal borough—Boston (15,667). Urban districts—Holbeach (4755), Long Sutton (2524), Spalding (9385), Sutton Bridge (2105). In the Parts of Holland the borough of Boston has a separate commission of the peace and there are two petty sessional divisions. Lincolnshire is in the Midland circuit. In the Parts of Kesteven the boroughs of Grantham and Stamford have each a separate commission of the peace and separate courts of quarter sessions, and there are 4 petty sessional divisions. In the Parts of Lindsey the county boroughs of Grimsby and Lincoln have each a separate commission of the peace and a separate court of quarter sessions, while the municipal borough of Louth has a separate commission of the peace, and there are 14 petty sessional divisions. The three administrative counties and the county boroughs contain together 761 civil parishes. The ancient county contains 580 ecclesiastical parishes and districts, wholly or in part. It is mostly in the diocese of Lincoln, but in part also in the dioceses of Southwell and York. For parliamentary purposes the county is divided into seven divisions, namely, West Lindsey or Gainsborough, North Lindsey or Brigg, East Lindsey or Louth, South Lindsey or Horncastle, North Kesteven or Sleaford, South Kesteven or Stamford, and Holland or Spalding, and the parliamentary boroughs of Boston, Grantham, Grimsby and Lincoln, each returning one member.

History.—Of the details of the English conquest of the district which is now Lincolnshire little is known, but at some time in the 6th century Engle and Frisian invaders appear to have settled in the country north of the Witham, where they became known as the Lindiswaras, the southern districts from Boston to the Trent basin being at this time dense woodland. In the 7th century the supremacy over Lindsey alternated between Mercia and Northumbria, but few historical references to the district are extant until the time of Alfred, whose marriage with Ealswitha was celebrated at Gainsborough three years before his accession. At this period the Danish inroads upon the coast of Lindsey had already begun, and in 873 Healfdene wintered at Torksey, while in 878 Lincoln and Stamford were included among the five Danish boroughs, and the organization of the districts dependent upon them probably resulted about this time in the grouping of Lindsey, Kesteven and Holland to form the shire of Lincoln. The extent and permanence of the Danish influence in Lincolnshire is still observable in the names of its towns and villages and in the local dialect, and, though about 918 the confederate boroughs were recaptured by Edward the Elder, in 993 a Viking fleet again entered the Humber and ravaged Lindsey, and in 1013 the district of the five boroughs acknowledged the supremacy of Sweyn. The county offered no active resistance to the Conqueror, and though Hereward appears in the Domesday Survey as a dispossessed under-tenant of the abbot of Peterborough at Witham-on-the-Hill, the legends surrounding his name do not belong to this county. In his northward march in 1068 the Conqueror built a castle at Lincoln, and portioned out the principal estates among his Norman followers, but the Domesday Survey shows that the county on the whole was leniently treated, and a considerable number of Englishmen retained their lands as subtenants.

The origin of the three main divisions of Lincolnshire is anterior to that of the county itself, and the outcome of purely natural conditions, Lindsey being in Roman times practically an island bounded by the swamps of the Trent and the Witham on the west and south and on the east by the North Sea, while Kesteven and Holland were respectively the regions of forest and of fen. Lindsey in Norman times was divided into three ridings—North, West and South—comprising respectively five, five and seven wapentakes; while, apart from their division into wapentakes, the Domesday Survey exhibits a unique planning out of the ridings into approximately equal numbers of 12-carucate hundreds, the term hundred possessing here no administrative or local significance, but serving merely as a unit of area for purposes of assessment. The Norman division of Holland into the three wapentakes of Elloe, Kirton and Skirbeck has remained unchanged to the present day. In Kesteven the wapentakes of Aswardhurn, Aveland, Beltisloe, Haxwell, Langoe, Loveden, Ness, Winnibriggs, and Grantham Soke have been practically unchanged, but the Domesday wapentakes of Boothby and Graffo now form the wapentake of Boothby Graffo. In Northriding Bradley and Haverstoe have been combined to form Bradley Haverstoe wapentake, and the Domesday wapentake of Epworth in Westriding has been absorbed in that of Manley. Wall wapentake in Westriding was a liberty of the bishop of Lincoln, and as late as 1515 the dean and chapter of Lincoln claimed delivery and return of writs in the manor and hundred of Navenby. In the 13th century Baldwin Wake claimed return of writs and a market in Aveland. William de Vesci claimed liberties and exemptions in Caythorpe, of which he was summoned to render account at the sheriff's tourn at Halton. The abbot of Peterborough, the abbot of Tupholme, the abbot of Bardney, the prior of Catleigh, the prior of Sixhills, the abbot of St Mary's, York, the prioress of Stixwould and several lay owners claimed liberties and jurisdiction in their Lincolnshire estates in the 13th century.

The shire court for Lincolnshire was held at Lincoln every forty days, the lords of the manor attending with their stewards, or in their absence the reeve and four men of the vill. The ridings were each presided over by a riding-reeve, and wapentake courts were held in the reign of Henry I. twelve times a year, and in the reign of Henry III. every three weeks, while twice a year all the freemen of the wapentake were summoned to the view of frankpledge or tourn held by the sheriff. The boundaries between Kesteven and Holland were a matter of dispute as early as 1389 and were not finally settled until 1816.

Lincolnshire was originally included in the Mercian diocese of Lichfield, but, on the subdivision of the latter by Theodore in 680, the fen-district was included in the diocese of Lichfield, while the see for the northern parts of the county was placed at "Sidnacester," generally identified with Stow. Subsequently both dioceses were merged in the vast West-Saxon bishopric of Dorchester, the see of which was afterwards transferred to Winchester, and by Bishop Remigius in 1072 to Lincoln. The archdeaconry of Lincoln was among those instituted by Remigius, and the division into rural deaneries also dates from this period. Stow archdeaconry is first mentioned in 1138, and in 1291 included four deaneries, while the archdeaconry of Lincoln included twenty-three. In 1536 the additional deaneries of Hill, Holland, Loveden and Graffoe had been formed within the archdeaconry of Lincoln, and the only deaneries created since that date are East and West Elloe and North and South Grantham in Lincoln archdeaconry. The deaneries of Gartree, Grimsby, Hill, Horncastle, Louthesk, Ludborough, Walshcroft, Wraggoe and Yarborough have been transferred from the archdeaconry of Lincoln to that of Stow. Benedictine foundations existed at Ikanho, Barrow, Bardney, Partney and Crowland as early as the 7th century, but all were destroyed in the Danish wars, and only Bardney and Crowland were ever rebuilt. The revival of monasticism after the Conquest resulted in the erection of ten Benedictine monasteries, and a Benedictine nunnery at Stainfield. The Cistercian abbeys at Kirkstead, Louth Park, Revesby, Vaudey and Swineshead, and the Cistercian nunnery at Stixwould were founded in the reign of Stephen, and at the time of the Dissolution there were upwards of a hundred religious houses in the county.

In the struggles of the reign of Stephen, castles at Newark and Sleaford were raised by Alexander, bishop of Lincoln, against the king, while Ranulf "Gernons," earl of Chester, in 1140 garrisoned Lincoln for the empress. The seizure of Lincoln by Stephen in 1141 was accompanied with fearful butchery and devastation, and by an accord at Stamford William of Roumare received Kirton in Lindsey, and his tenure of Gainsborough Castle was confirmed. In the baronial outbreak of 1173 Roger Mowbray, who had inherited the Isle of Axholme from Nigel d'Albini, garrisoned Ferry East, or Kinnard's Ferry, and Axholme against the king, and, after the destruction of their more northern fortresses in this campaign, Epworth in Axholme became the principal seat of the Mowbrays. In the struggles between John and his barons Lincoln in 1216 made peace with the king by surrendering hostages for the payment of a fine of 1000 marks, but after the landing of Louis the city was captured by Gilbert de Gant, then earl of Lincoln. After his disastrous march to Swineshead Abbey, John journeyed through Sleaford to Newark, where he died, and in the battle of Lincoln in 1217 Gilbert de Gant was captured and the city sacked. At the time of the Wars of the Roses the county, owing to territorial influence, was mainly Lancastrian, and in 1461 the Yorkist strongholds of Grantham and Stamford were sacked to such effect that the latter never recovered. The Lincolnshire rising of 1470 was crushed by the defeat of the rebels in the skirmish known as "Losecoat Field" near Stamford. In the Civil War of the 17th century, Lindsey for the most part declared for the king, and the Royalist cause was warmly supported by the earl of Lindsey, Viscount Newark, Sir Peregrine Bertie and the families of Dymoke, Heneage and Thorold. Lord Willoughby of Parham was a prominent Parliamentary leader, and the Isle of Axholme and the Puritan yeomanry of Holland declared for the parliament. In 1643 Cromwell won a small victory near Grantham, and the Royalist garrisons at Lynn and Lincoln surrendered to Manchester. In 1644, however, Newark, Gainsborough, Lincoln, Sleaford and Crowland were all in Royalist hands, and Newark only surrendered in 1646. Among other historic families connected with Lincolnshire were the Wakes of Bourne and the d'Eyncourts, who flourished at Blankney from the Conquest to the reign of Henry VI.; Belvoir Castle was founded by the Toenis, from whom it passed by the Daubeneys, then to the Barons Ros and later to the Manners, earls of Rutland. In the Lindsey Survey of 1115–1118 the name of Roger Marmion, ancestor of the Marmion family, who had inherited the fief of Robert Despenser, appears for the first time.

At the time of the Domesday Survey there were between 400 and 500 mills in Lincolnshire; 2111 fisheries producing large quantities of eels; 361 salt-works; and iron forges at Stow, St Mary and at Bytham. Lincoln and Stamford were flourishing centres of industry, and markets existed at Kirton-in-Lindsey, Louth, Old Bolingbroke, Spalding, Barton and Partney. The early manufactures of the county are all connected with the woollen trade, Lincoln being noted for its scarlet cloth in the 13th century, while an important export trade in the raw material sprang up at Boston. The disafforesting of Kesteven in 1230 brought large areas under cultivation, and the same period is marked by the growth of the maritime and fishing towns, especially Boston (which had a famous fish-market), Grimsby, Barton, Saltfleet, Wainfleet and Wrangle. The Lincolnshire towns suffered from the general decay of trade in the eastern counties which marked the 15th century, but agriculture was steadily improving, and with the gradual drainage of the fen-districts culminating in the vast operations of the 17th century, over 330,000 acres in the county were brought under cultivation, including more than two-thirds of Holland. The fen-drainage resulted in the extinction of many local industries, such as the trade in goose-feathers and the export of wild fowl to the London markets, a 17th-century writer terming this county "the aviary of England, 3000 mallards with other birds having been caught sometimes in August at one draught." Other historic industries of Lincolnshire are the breeding of horses and dogs and rabbit-snaring; the Witham was noted for its pike; and ironstone was worked in the south, now chiefly in the north and west.

As early as 1295 two knights were returned to parliament for the shire of Lincoln, and two burgesses each for Lincoln, Grimsby and Stamford. In the 14th century Lincoln and Stamford were several times the meeting-places of parliament or important councils, the most notable being the Lincoln Parliament of 1301, while at Stamford in 1309 a truce was concluded between the barons, Piers Gaveston and the king. Stamford discontinued representation for some 150 years after the reign of Edward II.; Grantham was enfranchised in 1463 and Boston in 1552. Under the act of 1832 the county was divided into a northern and southern division, returning each two members, and Great Grimsby lost one member. Under the act of 1868 the county returned six members in three divisions and Stamford lost one member. Under the act of 1885 the county returned seven members in seven divisions; Lincoln, Boston and Grantham lost one member each and Stamford was disfranchised.

Antiquities.—At the time of the suppression of the monasteries in the reign of Henry VIII. there were upwards of one hundred religious houses; and among the Fens rose some of the finest abbeys held by the Benedictines. The Gilbertines were a purely English order which took its rise in Lincolnshire, the canons following the Austin rule, the nuns and lay brothers that of the Cistercians. They generally lived in separate houses, but formed a community having a common church in which the sexes were divided by a longitudinal wall. These houses were at Alvingham, Catley, Holland Brigg, Lincoln, before the gate of which the first Eleanor Cross was erected by Edward I. to his wife, Newstead in Lindsey, Sempringham, the chief house of the order, founded by St Gilbert of Gaunt in 1139, of which the Norman nave of the church is in use, Stamford (a college for students) and Wellow. There were nunneries of the order at Haverholme, Nun Ormsby and Tunstal.

The following are a few of the most famous abbeys. Barlings (Premonstratensian), N.E. of Lincoln, was founded 1154, for fourteen canons. The tower, Decorated, with arcading pierced with windows, and the east wall of the south wing remain. The Benedictine Mitred Abbey of Crowland (*q.v.*) was founded 716, and refounded in 948. Part of the church is still in use. Thornton Abbey (Black Canons) in the north near the Humber was founded in 1139. There remain a fragment of the south wing of the transept, two sides of the decagonal chapter-house (1282) and the beautiful west gate-house, Early Perpendicular (1332–1388), with an oriel window on the east. Kirkstead Abbey (Cistercian) was founded in 1139. Little remains beyond an Early English chapel of singular beauty.

In the Parts of Lindsey several churches present curious early features, particularly the well-known towers of St Peter, Barton-on-Humber, St Mary-le-Wigford and St Peter at Gowts, Lincoln, which exhibit work of a pre-Conquest type. Stow church for Norman of various dates, Bottesford and St James, Grimsby, for Early English, Tattershall and Theddlethorpe for Perpendicular are fine examples of various styles.

In the Parts of Kesteven the churches are built of excellent stone which abounds at Ancaster and near Sleaford. The church of St Andrew, Heckington, is the best example of Decorated architecture in the county; it is famed for its Easter sepulchre and fine sedilia. The noble church of St Wulfram, Grantham, with one of the finest spires in England, is also principally Decorated; this style in fact is particularly well displayed in Kesteven, as in the churches of Caythorpe, Claypole, Navenby and Ewerby. At Stamford (*q.v.*) there are five churches of various styles.

It is principally in the Parts of Holland that the finest churches in the county are found; they are not surpassed by those of any other district in the kingdom, which is the more remarkable as the district is composed wholly of marsh land and is without stone of any kind. It is highly probable that the churches of the south part of this district owe their origin to the munificence of the abbeys of Crowland and Spalding. The church of Long Sutton, besides its fine Norman nave, possesses an Early English tower and spire which is comparable with the very early specimen at Oxford cathedral. Whaplode church is another noteworthy example of Norman work; for Early English work the churches of Kirton-in-Holland, Pinchbeck and Weston may be noticed; for Decorated those at Donington and Spalding; and for Perpendicular, Gedney, together with parts of Kirton church. Of the two later styles, however, by far the most splendid example is the famous church of St Botolph, Boston (*q.v.*), with its magnificent lantern-crowned tower or "stump."

There are few remains of medieval castles, although the sites of a considerable number are traceable. Those of Lincoln and Tattershall (a fine Perpendicular building in brick) are the most noteworthy, and there are also fragments at Boston and Sleaford. Country seats worthy of note (chiefly modern) are Aswarby Hall, Belton House, Brocklesby, Casewick, Denton Manor, Easton Hall, Grimsthorpe (of the 16th and 18th centuries, with earlier remains), Haverholm Priory, Nocton Hall, Panton Hall, Riby Grove, Somerby Hall, Syston Park and Uffington. The city of Lincoln is remarkably rich in remains of domestic architecture from the Norman period onward, and there are similar examples at Stamford and elsewhere. In this connexion the remarkable triangular bridge at Crowland of the 14th century (see BRIDGES) should be mentioned.

See *Victoria County History, Lincolnshire*; Thomas Allen, *The History of the County of Lincoln* (2 vols., London, 1834); C. G. Smith, *A Translation of that portion of the Domesday Book which relates to Lincolnshire and Rutlandshire* (London, 1870); G. S. Streatfield, *Lincolnshire and the Danes* (London, 1884); *Chronicle of the Rebellion in Lincolnshire, 1470*, ed. J. E. Nicholls, Camden Society, *Camden Miscellany*, vol. i. (London, 1847); *The Lincolnshire Survey, temp. Henry I.*, ed. James Greenstreet (London, 1884); *Lincolnshire Notes and Queries* (Horncastle, 1888); *Lincolnshire Record Society* (Horncastle, 1891).

LIND, JENNY (1820–1887), the famous Swedish singer, was born at Stockholm on the 6th of October 1820, the daughter of a lace manufacturer. Mlle Lundberg, an opera-dancer, first discovered her musical gift, and induced the child's mother to have her educated for the stage; during the six or seven years in which she was what was called an "actress pupil," she occasionally appeared on the stage, but in plays, not operas, until 1836, when she made a first attempt in an opera by A. F. Lindblad. She was regularly engaged at the opera-house in 1837. Her first great success was as Agathe, in Weber's *Der Freischütz*, in 1838, and by 1841, when she started for Paris, she had already become identified with nearly all the parts in which she afterwards became famous. But her celebrity in Sweden was due in great part to her histrionic ability, and there is comparatively little said about her wonderful vocal art, which was only attained after a year's hard study under Manuel Garcia, who had to remedy many faults that had caused exhaustion in the vocal organs. On the completion of her studies she sang before G. Meyerbeer, in private, in the Paris Opera-house, and two years afterwards was engaged by him for Berlin, to sing in his *Feldlager in Schlesien* (afterwards remodelled as *L'Étoile du nord*); but the part intended for her was taken by another singer, and her first appearance took place in *Norma* on the 15th of December 1844. She appeared also in Weber's *Euryanthe* and Bellini's *La Sonnambula*, and while she was at Berlin the English manager, Alfred Bunn, induced her to sign a contract (which she broke) to appear in London in the following season. In December 1845 she appeared at a Gewandhaus concert at Leipzig, and made the acquaintance of Mendelssohn, as well as of Joachim and many other distinguished German musicians. In her second Berlin season she added the parts of Donna Anna (Mozart's *Don Giovanni*), Julia (Spontini's *Vestalin*) and Valentine (Meyerbeer's *Les Huguenots*) to her repertory. She sang in operas or concerts at Aix-la-Chapelle, Hanover, Hamburg, Vienna, Darmstadt and Munich during the next year, and took up two Donizetti rôles, those of Lucia and "la Figlia del Reggimento," in which she was afterwards famous. At last Lumley, the manager of Her Majesty's Theatre, succeeded in inducing Mlle Lind to visit England, in spite of her dread of the penalties threatened by Bunn on her breach of the contract with him, and she appeared on the 4th of May 1847 as Alice in Meyerbeer's *Robert le Diable*. Her début had been so much discussed that the *furore* she created was a foregone conclusion. Nevertheless it exceeded everything of the kind that had taken place in London or anywhere else; the sufferings and struggles of her well-dressed admirers, who had to stand for hours to get into the pit, have become historic. She sang in several of her favourite characters, and in that of Susanna in Mozart's *Figaro*, besides creating the part of Amalia in Verdi's *I Masnadieri*, written for England and performed on the 22nd of July. In the autumn she appeared in operas in Manchester and Liverpool, and in concerts at Brighton, Birmingham, Hull, Edinburgh, Glasgow, Perth, Norwich, Bristol, Bath and Exeter. At Norwich began her acquaintance with the bishop, Edward Stanley (1779–1849), which was said to have led to her final determination to give up the stage as a career. After four more appearances in Berlin, and a short visit to Stockholm, she appeared in London in the season of 1848, when she sang in Donizetti's *L'Elisire d'amore* and Bellini's *I Puritani*, in addition to her older parts. In the same year she organized a memorable performance of *Elijah*, with the receipts of which the Mendelssohn scholarship was founded, and sang at a great number of charity and benefit concerts. At the beginning of the season of 1849 she intended to give up operatic singing, but a compromise was effected by which she was to sing the music of six operas, performed without action, at Her Majesty's Theatre; but the first, a concert performance of Mozart's *Il Flauto magico*, was so coldly received that she felt bound, for the sake of the manager and the public, to give five more regular representations, and her last performance on the stage was on the 10th of May 1849, in *Robert le Diable*. Her decision was not even revoked when the king of Sweden urged her to reappear in opera at her old home. She paid visits to Germany and Sweden again before her departure for America in 1850. Just before sailing she appeared at Liverpool, for the first time in England, in an oratorio of Handel, singing the soprano music in *The Messiah* with superb art. She remained in America for nearly two years, being for a great part of the time engaged by P. T. Barnum. In Boston, on the 5th of February 1852, she married Otto Goldschmidt (1829–1907), whom she had met at Lübeck in 1850. For some years after her return to England, her home for the rest of her life, she appeared in oratorios and concerts, and her dramatic instincts were as strongly and perhaps as advantageously displayed in these surroundings as they had been on the stage, for the grandeur of her conceptions in such passages as the "Sanctus" of *Elijah*, the intensity of conviction which she threw into the scene of the widow in the same work, or the religious fervour of "I know that my Redeemer liveth," could not have found a place in opera. In her later years she took an active interest in the Bach Choir, conducted by her husband, and not only sang herself in the chorus, but gave the benefit of her training to the ladies of the society. For some years she was professor of singing at the Royal College of Music. Her last public appearance was at Düsseldorf on the 20th of January 1870 when she sang in *Ruth*, an oratorio composed by her husband. She died at Malvern on the 2nd of November 1887. The supreme position she held so long in the operatic world was due not only to the glory of her voice, and the complete musicianship which distinguished her above all her contemporaries, but also to the naïve simplicity of her acting in her favourite parts, such as Amina, Alice or Agathe. In these and others she had the precious quality of conviction, and identified herself with the characters she represented with a thoroughness rare in her day. Unharmed by the perils of a stage career, she was a model of rectitude, generosity and straightforwardness, carrying the last quality into a certain blunt directness of manner that was sometimes rather startling. (J. A. F. M.)

LINDAU, PAUL (1839–), German dramatist and novelist, the son of a Protestant pastor, was born at Magdeburg on the 3rd of June 1839. He was educated at the gymnasium in Halle and subsequently in Leipzig and Berlin. He spent five years in Paris to further his studies, acting meanwhile as foreign correspondent to German papers. After his return to Germany in 1863 he was engaged in journalism in Düsseldorf and Elberfeld. In 1870 he founded *Das neue Blatt* at Leipzig; from 1872 to 1881 he edited the Berlin weekly, *Die Gegenwart*; and in 1878 he founded the well-known monthly, *Nord und Süd*, which he continued to edit until 1904. Two books of travel, *Aus Venetien* (Düsseldorf, 1864) and *Aus Paris* (Stuttgart, 1865), were followed by some volumes of critical studies, written in a light, satirical vein, which at once made him famous. These were *Harmlose Briefe eines deutschen Kleinstädters* (Leipzig, 2 vols., 1870), *Moderne Märchen für grosse Kinder* (Leipzig, 1870) and *Literarische Rücksichtslosigkeiten* (Leipzig, 1871). He was appointed intendant of the court theatre at Meiningen in 1895, but removed to Berlin in 1899, where he became manager of the Berliner Theater, and subsequently, until 1905, of the Deutsches Theater. He had begun his dramatic career in 1868 with *Marion*, the first of a long series of plays in which he displayed a remarkable talent for stage effect and a command of witty and lively dialogue. Among the more famous were *Maria und Magdalena* (1872), *Tante Therese* (1876), *Gräfin Lea* (1879), *Die Erste* (1895), *Der Abend* (1896), *Der Herr im Hause* (1899), *So ich dir* (1903), and he adapted many plays by Dumas, Augier and Sardou for the German stage. Five volumes of his plays have been published (Berlin, 1873–1888). Some of his volumes of short stories acquired great popularity, notably *Herr und Frau Bewer* (Breslau, 1882) and *Toggenburg und andere Geschichten* (Breslau, 1883). A novel-sequence entitled *Berlin* included *Der Zug nach dem Westen* (Stuttgart, 1886, 10th ed. 1903), *Arme Mädchen* (1887, 9th ed. 1905) and *Spitzen* (1888, 8th ed. 1904). Later novels were *Die Gehilfin* (Breslau, 1894), *Die Brüder* (Dresden, 1895), *Der König von Sidon* (Breslau, 1898). His earlier books on *Molière* (Leipzig, 1871) and *Alfred de Musset* (Berlin, 1877) were followed by some volumes of dramatic and literary criticism, *Gesammelte Aufsätze* (Berlin, 1875), *Dramaturgische Blätter* (Stuttgart, 2 vols., 1875; new series, Breslau, 1878, 2 vols.), *Vorspiele auf dem Theater* (Breslau, 1895).

His brother, RUDOLF LINDAU (b. 1829), was a well-known diplomatist and author. His novels and tales were collected in 1893 (Berlin, 6 vols.). The most attractive, such as *Reisegefährten* and *Der lange Holländer*, deal with the life of European residents in the Far East.

See Hadlich, *Paul Lindau als dramatischer Dichter* (2nd ed., Berlin, 1876).

LINDAU, a town and pleasure resort in the kingdom of Bavaria, and the central point of the transit trade between that country and Switzerland, situated on two islands off the north-eastern shore of Lake Constance. Pop. (1905) 6531. The town is a terminus of the Vorarlberg railway, and of the Munich-Lindau line of the Bavarian state railways, and is connected with the mainland both by a wooden bridge and by a railway enbankment erected in 1853. There are a royal palace and an old and a new town-hall (the older one having been built in 1422 and restored in 1886–1888), a museum and a municipal library with interesting manuscripts and a collection of Bibles, also classical, commercial and industrial schools. The harbour is much frequented by steamers from Constance and other places on the lake. There are also some Roman remains, the Heidenmauer, and a fine modern fountain, the Reichsbrunnen. Opposite the custom-house is a bronze statue of the Bavarian king Maximilian II., erected in 1856.

On the site now occupied by the town there was a Roman camp, the *castrum Tiberii*, and the authentic records of Lindau date back to the end of the 9th century, when it was known as Lintowa. In 1274, or earlier, it became a free imperial town; in 1331 it joined the Swabian league, and in 1531 became a member of the league of Schmalkalden, having just previously accepted the reformed doctrines. In 1647 it was ineffectually besieged by the Swedes. In 1804 it lost its imperial privileges and passed to Austria, being transferred to Bavaria in 1805.

See Boulan, *Lindau, vor altem und jetzt* (Lindau, 1872); and Stettners, *Führer durch Lindau und Umgebungen* (Lindau, 1900).

LINDEN, a town in the Prussian province of Hanover, 3 m. S.W. by rail from the city of that name, of which it practically forms a suburb, and from which it is separated by the Ihme. Pop. (1905) 57,941. It has a fine modern town-hall, and a classical and other schools. Chief among its industries are machine building, weaving, iron and steel works and the manufacture of chemicals, india-rubber goods and carpets.

LINDESAY, ROBERT, of Pitscottie (*c.* 1530–*c.* 1590), Scottish historian, of the family of the Lindesays of the Byres, was born at Pitscottie, in the parish of Ceres, Fifeshire, which he held in lease at a later period. His *Historie and Cronicles of Scotland*, the only work by which he is remembered, is described as a continuation of that of Hector Boece, translated by John Bellenden. It covers the period from 1437 to 1565, and, though it sometimes degenerates into a mere chronicle of short entries, is not without passages of great picturesqueness. Sir Walter Scott made use of it in *Marmion*; and, in spite of its inaccuracy in details, it is useful for the social history of the period. Lindesay's share in the *Cronicles* was generally supposed to end with 1565; but Dr Aeneas Mackay considers that the frank account of the events connected with Mary Stuart between 1565 and 1575 contained in one of the MSS. is by his hand and was only suppressed because it was too faithful in its record of contemporary affairs.

The *Historie and Cronicles* was first published in 1728. A complete edition of the text (2 vols.), based on the Laing MS. No. 218 in the university of Edinburgh, was published by the Scottish Text Society in 1899 under the editorship of Aeneas J. G. Mackay. The MS., formerly in the possession of John Scott of Halkshill, is fuller, and, though in a later hand, is, on the whole, a better representative of Lindesay's text.

LINDET, JEAN BAPTISTE ROBERT (1749–1825), French revolutionist, was born at Bernay (Eure). Before the Revolution he was an *avocat* at Bernay. He acted as *procureur-syndic* of the district of Bernay during the session of the Constituent Assembly. Appointed deputy to the Legislative Assembly and subsequently to the Convention, he attained considerable prominence. He was very hostile to the king, furnished a *Rapport sur les crimes imputés à Louis Capet* (10th of December 1792), and voted for the death of Louis without appeal or respite. He was instrumental in the establishment of the Revolutionary Tribunal and contributed to the downfall of the Girondists. As member of the Committee of Public Safety, he devoted himself particularly to the question of food-supplies, and it was only by dint of dogged perseverance and great administrative talent that he was successful in coping with this difficult problem. He had meanwhile been sent to suppress revolts in the districts of Rhône, Eure, Calvados and Finistère, where he had been able to pursue a conciliatory policy. Without being formally opposed to Robespierre, he did not support him, and he was the only member of the Committee of Public Safety who did not sign the order for the execution of Danton and his party. In a like spirit of moderation he opposed the Thermidorian reaction, and defended Barère, Billaud-Varenne the Collot d'Herbois from the accusations launched against them on the 22nd of March 1795. Himself denounced on the 20th of May 1795, he was defended by his brother Thomas, but only escaped condemnation by the vote of amnesty of the 4th of Brumaire, year IV. (26th of October 1795). He was minister of finance from the 18th of June to the 9th of November 1799, but refused office under the Consulate and the Empire. In 1816 he was proscribed by the Restoration government as a regicide, and did not return to France until just before his death on the 17th of February 1825. His brother Thomas made some mark as a Constitutional bishop and member of the Convention.

See Amand Montier, *Robert Lindet* (Paris, 1899); H. Turpin, *Thomas Lindet* (Bernay, 1886); A. Montier, *Correspondance de Thomas Lindet* (Paris, 1899).

LINDLEY, JOHN (1799–1865), English botanist, was born on the 5th of February 1799 at Catton, near Norwich, where his father, George Lindley, author of *A Guide to the Orchard and Kitchen Garden*, owned a nursery garden. He was educated at Norwich grammar school. His first publication, in 1819, a translation of the *Analyse du fruit* of L. C. M. Richard, was followed in 1820 by an original *Monographia Rosarum*, with descriptions of new species, and drawings executed by himself, and in 1821 by *Monographia Digitalium*, and by "Observations on Pomaceae," contributed to the Linnean Society. Shortly afterwards he went to London, where he was engaged by J. C. Loudon to write the descriptive portion of the *Encyclopaedia of Plants*. In his labours on this undertaking, which was completed in 1829, he became convinced of the superiority of the "natural" system of A. L. de Jussieu, as distinguished from the "artificial" system of Linnaeus followed in the *Encyclopaedia*; the conviction found expression in *A Synopsis of British Flora, arranged according to the Natural Order* (1829) and in *An Introduction to the Natural System of Botany* (1830). In 1829 Lindley, who since 1822 had been assistant secretary to the Horticultural Society, was appointed to the chair of botany in University College, London, which he retained till 1860; he lectured also on botany from 1831 at the Royal Institution, and from 1836 at the Botanic Gardens, Chelsea. During his professoriate he wrote many scientific and popular works, besides contributing largely to the *Botanical Register*, of which he was editor for many years, and to the *Gardener's Chronicle*, in which he had charge of the horticultural department from 1841. He was a fellow of the Royal, Linnean and Geological Societies. He died at Turnham Green on the 1st of November 1865.

Besides those already mentioned, his works include *An Outline of the First Principles of Horticulture* (1832), *An Outline of the Structure and Physiology of Plants* (1832), *A Natural System of Botany* (1836), *The Fossil Flora of Great Britain* (with William Hutton, 1831–1837), *Flora Medica* (1838), *Theory of Horticulture* (1840), *The Vegetable Kingdom* (1846), *Folia Orchidacea* (1852), *Descriptive Botany* (1858).

LINDLEY, NATHANIEL LINDLEY, Baron (1828–), English judge, son of John Lindley (*q.v.*), was born at Acton Green, Middlesex, on the 29th of November 1828. He was educated at University College School, and studied for a time at University College, London. He was called to the bar at the Middle Temple in 1850, and began practice in the Court of Chancery. In 1855 he published *An Introduction to the Study of Jurisprudence*, consisting of a translation of the general part of Thibaut's *System des Pandekten Rechts*, with copious notes. In 1860 he published in two volumes his *Treatise on the Law of Partnership, including its Application to Joint Stock and other Companies*, and in 1862 a supplement including the Companies Act of 1862. This work has since been developed into two text-books well known to lawyers as *Lindley on Companies* and *Lindley on Partnership*. He became a Q.C. in January 1872. In 1874 he was elected a bencher of the Middle Temple, of which he was treasurer in 1894. In 1875 he was appointed a justice of common pleas, the appointment of a chancery barrister to a common-law court being justified by the fusion of law and equity then shortly to be brought about, in theory at all events, by the Judicature Acts. In pursuance of the changes now made be became a justice of the common pleas division of the High Court of Justice, and in 1880 of the queen's bench division. In 1881 he was raised to the Court of Appeal and made a privy councillor. In 1897, Lord Justice Lindley succeeded Lord Esher as master of the rolls, and in 1900 he was made a lord of appeal in ordinary with a life peerage and the title of Baron Lindley. He resigned the judicial post in 1905. Lord Lindley was the last serjeant-at-law appointed, and the last judge to wear the serjeant's coif, or rather the black patch representing it, on the judicial wig. He married in 1858 Sarah Katherine, daughter of Edward John Teale of Leeds.

LINDLEY, WILLIAM (1808–1900), English engineer, was born in London on the 7th of September 1808, and became a pupil under Francis Giles, whom he assisted in designing the Newcastle and Carlisle and the London and Southampton railways. Leaving England about 1837, he was engaged for a time in railway work in various parts of Europe, and then returned, as engineer-in-chief to the Hamburg-Bergedorf railway, to Hamburg, near which city he had received his early education, and to which he was destined to stand in much the same relation as Baron Haussmann to Paris. His first achievement was to drain the Hammerbrook marshes, and so add some 1400 acres to the available area of the city. His real opportunity, however, came with the great fire which broke out on the 5th of May 1842 and burned for three days. He was entrusted with the direction of the operations to check its spread, and the strong measures he adopted, including the blowing-up of the town hall, brought his life into danger with the mob, who professed to see in him an English agent charged with the destruction of the port of Hamburg. After the extinction of the fire he was appointed consulting engineer to the senate and town council, to the Water Board and to the Board of Works. He began with the construction of a complete sewerage system on principles which did not escape criticism, but which experience showed to be good. Between 1844 and 1848 water-works were established from his designs, the intake from the Elbe being at Rothenburgsort. Subsidence tanks were used for clarification, but in 1853, when he designed large extensions, he urged the substitution of sand-filtration, which, however, was not adopted until the cholera epidemic of 1892–1893 had shown the folly of the opposition directed against it. In 1846 he erected the Hamburg gas-works; public baths and wash-houses were built, and large extensions to the port executed according to his plans in 1854; and he supervised the construction of the Altona gas and water works in 1855. Among other services he rendered to the city may be mentioned the trigonometrical survey executed between 1848 and 1860, and the conduct of the negotiations which in 1852 resulted in the sale of the "Steelyard" on the banks of the Thames belonging to it jointly with the two other Hanseatic towns, Bremen and Lübeck. In 1860 he left Hamburg, and during the remaining nineteen years of his professional practice he was responsible for many engineering works in various European cities, among them being Frankfort-on-the-Main, Warsaw, Pesth, Düsseldorf, Galatz and Basel. In Frankfort he constructed sewerage works on the same principles as those he followed in Hamburg, and the system was widely imitated not only in Europe, but also in America. He was also consulted in regard to water-works at Berlin, Kiel, Stralsund, Stettin and Leipzig; he advised the New River Company of London on the adoption of the constant supply system in 1851; and he was commissioned by the British Government to carry out various works in Heligoland, including the big retaining wall "Am Falm." He died at Blackheath, London, on the 22nd of May 1900.

LINDO, MARK PRAGER (1819–1879), Dutch prose writer, of English-Jewish descent, was born in London on the 18th of September 1819. He went to Holland when nineteen years of age, and once established there as a private teacher of the English language, he soon made up his mind to remain. In 1842 he passed his examination at Arnhem, qualifying him as a professor of English in Holland, subsequently becoming a teacher of the English language and literature at the gymnasium in that town. In 1853 he was appointed in a similar capacity at the Royal Military Academy in Breda. Meanwhile Lindo had obtained a thorough grasp of the Dutch language, partly during his student years at Utrecht University, where in 1854 he gained the degree of doctor of literature. His proficiency in the two languages led him to translate into Dutch several of the works of Dickens, Thackeray and others, and afterwards also of Fielding, Sterne and Walter Scott. Some of Lindo's translations bore the imprint of hasty and careless work, and all were very unequal in quality. His name is much more likely to endure as the writer of humorous original sketches and novelettes in Dutch, which he published under the pseudonym of De Oude Herr Smits ("Old Mr Smits"). Among the most popular are: *Brieven en Ontboezemingen* ("Letters and Confessions," 1853, with three "Continuations"); *Familie van Ons* ("Family of Ours," 1855); *Bekentenissen eener Jonge Dame* ("Confessions of a Young Lady," 1858); *Uittreksels uit het Dagboek van Wijlen den Heer Janus Snor* ("Extracts from the Diary of the late Mr Janus Snor," 1865); *Typen* ("Types," 1871); and, particularly, *Afdrukken van Indrukken* ("Impressions from Impressions," 1854, reprinted many times). The last-named was written in collaboration with Lodewyk Mulder, who contributed some of its drollest whimsicalities of Dutch life and character, which, for that reason, are almost untranslatable. Lodewyk Mulder and Lindo also founded together, and carried on, for a considerable time alone, the *Nederlandsche Spectator* ("The Dutch Spectator"), a literary weekly, still published at The Hague, which bears little resemblance to its English prototype, and which perhaps reached its greatest popularity and influence when Vosmaer contributed to it a brilliant weekly letter under the fanciful title of Vlugmaren ("Swifts"). Lindo's serious original Dutch writings he published under his own name, the principal one being *De Opkomst en Ontwikkeling van het Engelsche Volk* ("The Rise and Development of the British People," 2 vols. 1868–1874)—a valuable history. Lodewyk Mulder published in 1877–1879 a collected edition of Lindo's writings in five volumes, and there has since been a popular reissue. Lindo was appointed an inspector of primary schools in the province of South Holland in 1865, a post he held until his death at The Hague on the 9th of March 1879.

LINDSAY, the family name of the earls of Crawford. The family is one of great antiquity in Scotland, the earliest to settle in that country being Sir Walter de Lindesia, who attended David, earl of Huntingdon, afterwards King David I., in his colonization of the Lowlands early in the 12th century. The descendants of Sir Walter divided into three branches, one of which held the baronies of Lamberton in Scotland, and Kendal and Molesworth in England; another held Luffness and Crawford in Scotland and half Limesi in England; and a third held Breneville and Byres in Scotland and certain lands, not by baronial tenure, in England. The heads of all these branches sat as barons in the Scottish parliament for more than two hundred years before the elevation of the chief of the house to an earldom in 1398. The

Lindsays held the great mountain district of Crawford in Clydesdale, from which the title of the earldom is derived, from the 12th century till the close of the 15th, when it passed to the Douglas earls of Angus. See CRAWFORD, EARLS OF.

See A. W. C. Lindsay, afterwards earl of Crawford, *Lives of the Lindsays, or a Memoir of the Houses of Crawford and Belcarres* (3 vols., 1843 and 1858).

LINDSAY, a town and port of entry of Ontario, Canada, and capital of Victoria county, on the Scugog river, 57 m. N.E. of Toronto by rail, on the Canadian Pacific railway, and at the junction of the Port Hope and Haliburton branches and the Midland division of the Grand Trunk railway. Pop. (1901) 7003. It has steamboat communication, by way of the Trent canal, with Lake Scugog and the ports on the Trent system. It contains saw and grist mills, agricultural implement and other factories.

LINDSEY, THEOPHILUS (1723–1808), English theologian, was born in Middlewich, Cheshire, on the 20th of June 1723, and was educated at the Leeds Free School and at St John's College, Cambridge, where in 1747 he became a fellow. For some time he held a curacy in Spitalfields, London, and from 1754 to 1756 he travelled on the continent of Europe as tutor to the young duke of Northumberland. He was then presented to the living of Kirkby-Wiske in Yorkshire, and after exchanging it for that of Piddletown in Dorsetshire, he removed in 1763 to Catterick in Yorkshire. Here about 1764 he founded one of the first Sunday schools in England. Meanwhile he had begun to entertain anti-Trinitarian views, and to be troubled in conscience about their inconsistency with the Anglican belief; since 1769 the intimate friendship of Joseph Priestley had served to foster his scruples, and in 1771 he united with Francis Blackburne, archdeacon of Cleveland (his father-in-law), John Jebb (1736–1786), Christopher Wyvill (1740–1822) and Edmund Law 1703–1787), bishop of Carlisle, in preparing a petition to parliament with the prayer that clergymen of the church and graduates of the universities might be relieved from the burden of subscribing to the thirty-nine articles, and "restored to their undoubted rights as Protestants of interpreting Scripture for themselves." Two hundred and fifty signatures were obtained, but in February 1772 the House of Commons declined even to receive the petition by a majority of 217 to 71; the adverse vote was repeated in the following year, and in the end of 1773, seeing no prospect of obtaining within the church the relief which his conscience demanded, Lindsey resigned his vicarage. In April 1774 he began to conduct Unitarian services in a room in Essex Street, Strand, London, where first a church, and afterwards the Unitarian offices, were established. Here he remained till 1793, when he resigned his charge in favour of John Disney (1746–1816), who like himself had left the established church and had become his colleague. He died on the 3rd of November 1808.

Lindsey's chief work is *An Historical View of the State of the Unitarian Doctrine and Worship from the Reformation to our own Times* (1783); in it he claims, amongst others, Burnet, Tillotson, S. Clarke, Hoadly and Sir I. Newton for the Unitarian view. His other publications include *Apology on Resigning the Vicarage of Catterick* (1774), and *Sequel to the Apology* (1776); *The Book of Common Prayer reformed according to the plan of the late Dr Samuel Clarke* (1774); *Dissertations on the Preface to St John's Gospel and on praying to Jesus Christ* (1779); *Vindiciae Priestleianae* (1788); *Conversations upon Christian Idolatry* (1792); and *Conversations on the Divine Government, showing that everything is from God, and for good to all* (1802). Two volumes of *Sermons, with appropriate prayers annexed*, were published posthumously in 1810; and a volume of *Memoirs*, by Thomas Belsham, appeared in 1812.

LINDSTRÖM, GUSTAF (1829–1901), Swedish palaeontologist, was born at Wisby in Gotland on the 27th of August 1829. In 1848 he entered the university at Upsala, and in 1854 he took his doctor's degree. Having attended a course of lectures in Stockholm by S. L. Lovén, he became interested in the zoology of the Baltic, and published several papers on the invertebrate fauna, and subsequently on the fishes. In 1856 he became a school teacher, and in 1858 a master in the grammar school at Wisby. His leisure was devoted to researches on the fossils of the Silurian rocks of Gotland, including the corals, brachiopods, gasteropods, pteropods, cephalopods and crustacea. He described also remains of the fish *Cyathaspis* from Wenlock Beds, and (with T. Thorell) a scorpion *Palaeophonus* from Ludlow Beds at Wisby. He determined the true nature of the operculated coral *Calceola*; and while he described organic remains from other parts of northern Europe, he worked especially at the Palaeozoic fossils of Sweden. He was awarded the Murchison medal by the Geological Society of London in 1895. In 1876 he was appointed keeper of the fossil Invertebrata in the State Museum at Stockholm, where he died on the 16th of May 1901.

See obituary (with portrait), by F. A. Bather, in *Geol. Mag.* (July 1901), p. 333.

LINDUS, one of the three chief cities of the island of Rhodes, before their synoecism in the city of Rhodes. It is situated on the E. side of the island, and has a finely placed acropolis on a precipitous hill, and a good natural harbour just N. of it. Recent excavations have discovered the early temple of Athena Lindia on the Acropolis, and splendid Propylaea and a staircase, resembling those at Athens. The sculptors of the Laocoon are among the priests of Athena Lindia, whose names are recorded by inscriptions. Some early temples have also been found, and inscriptions cut on the rock recording the sacrifices known as *Βουκάτια*. There are also traces of a theatre and rock-cut tombs. On the Acropolis is a castle, built by the knights in the 14th century, and many houses in the town show work of the same date.

See RHODES; also Chr. Blinkenberg and K. F. Kinch, *Exploration arch. de Rhodes* (Copenhagen, 1904–1907).

LINE, a word of which the numerous meanings may be deduced from the primary ones of thread or cord, a succession of objects in a row, a mark or stroke, a course or route in any particular direction. The word is derived from the Lat. *linea*, where all these meanings may be found, but some applications are due more directly to the Fr. *ligne*. *Linea*, in Latin, meant originally "something made of hemp or flax," hence a cord or thread, from *linum*, flax. "Line" in English was formerly used in the sense of flax, but the use now only survives in the technical name for the fibres of flax when separated by heckling from the tow (see LINEN). The ultimate origin is also seen in the verb "to line," to cover something on the inside, originally used of the "lining" of a garment with linen.

In mathematics several definitions of the line may be framed according to the aspect from which it is viewed. The synthetical genesis of a line from the notion of a point is the basis of Euclid's definition, *γραμμὴ, δὲ μῆκος ἀπλατές* ("a line is widthless length"), and in a subsequent definition he affirms that the boundaries of a line are points, *γραμμῆς δὲ πέρατα σημεῖα.* The line appears in definition 6 as the boundary of a surface: *ἐπιφανείας δὲ πέρατα γραμμαί* ("the boundaries of a surface are lines"), Another synthetical definition, also treated by the ancient Greeks, but not by Euclid, regards the line as generated by the motion of a point (*ῥύσις σημείου*), and, in a similar manner, the "surface" was regarded as the flux of a line, and a "solid" as the flux of a surface. Proclus adopts this view, styling the line *ἀρχή* in respect of this capacity. Analytical definitions, although not finding a place in the Euclidean treatment, have advantages over the synthetical derivation. Thus the boundaries of a solid may define a plane, the edges a line, and the corners a point; or a section of a solid may define the surface, a section of a surface the line, and the section of a line the "point." The notion of dimensions follows readily from either system of definitions. The solid extends three ways, *i.e.* it has length, breadth and thickness, and is therefore three-dimensional; the surface has breadth and length and is therefore two-dimensional; the line has only extension and is unidimensional; and the point, having neither length, breadth nor thickness but only position, has no dimensions.

The definition of a "straight" line is a matter of much complexity. Euclid defines it as the line which lies evenly with respect to the points on itself—*εὐθεῖα γραμμή ἐστιν ἥτις ἐξ ἴσου τοῖς ἐφ' ἑαυτῆς σημείοις κεῖται*: Plato defined it as the line having its middle point hidden by the ends, a definition of no purpose since it only defines the line by the path of a ray of light. Archimedes defines a straight line as the shortest distance between two points.

A better criterion of rectilinearity is that of Simplicius, an Arabian commentator of the 5th century: *Linea recta est quaecumque super duas ipsius extremitates rotata non movetur de loco suo ad alium locum* ("a straight line is one which when rotated about its two extremities does not change its position"). This idea was employed by Leibnitz, and most auspiciously by Gierolamo Saccheri in 1733.

The drawing of a straight line between any two given points forms the subject of Euclid's first postulate—*ἠιτήσθω ἀπὸ παντὸς σημείου ἐπὶ πᾶν σημεῖον εὐθεῖαν γραμμὴν ἀγάγειν*, and the producing of a straight line continuously in a straight line is treated in the second postulate—*καὶ πεπερασμένην εὐθεῖαν κατὰ τὸ συνεχὲς ἐπ' εὐθείας ἐκβαλεῖν*.

For a detailed analysis of the geometrical notion of the line and rectilinearity, see W. B. Frankland, *Euclid's Elements* (1905). In analytical geometry the right line is always representable by an equation or equations of the first degree; thus in Cartesian coordinates of two dimensions the equation is of the form $Ax+By+C=0$, in triangular coordinates $Ax+By+Cz=0$. In three-dimensional coordinates, the line is represented by two linear equations. (See GEOMETRY, ANALYTICAL.) *Line geometry* is a branch of analytical geometry in which the line is the element, and not the point as with ordinary analytical geometry (see GEOMETRY, LINE).

LINE ENGRAVING, on plates of copper or steel, the method of engraving (*q.v.*), in which the line itself is hollowed, whereas in the woodcut when the line is to print black it is left in relief, and only white spaces and white lines are hollowed.

The art of line engraving has been practised from the earliest ages. The prehistoric Aztec hatchet given to Humboldt in Mexico was just as truly *engraved* as a modern copper-plate which may convey a design by Flaxman; the Aztec engraving is ruder than the European, but it is the same art. The important discovery which made line engraving one of the multiplying arts was the discovery how to print an incised line, which was hit upon at last by accident, and known for some time before its real utility was suspected. Line engraving in Europe does not owe its origin to the woodcut, but to the chasing on goldsmiths' work. The goldsmiths of Florence in the middle of the 15th century were in the habit of ornamenting their works by means of engraving, after which they filled up the hollows produced by the burin with a black enamel made of silver, lead and sulphur, the result being that the design was rendered much more visible by the opposition of the enamel and the metal. An engraved design filled up in this manner was called a *niello*. Whilst a niello was in progress the artist could not see it so well as if the enamel were already in the lines, yet he did not like to put in the hard enamel prematurely, as when once it was set it could not easily be got out again. He therefore took a sulphur cast of his niello in progress, on a matrix of fine clay, and filled up the lines in the sulphur with lampblack, thus enabling himself to judge of the state of his engraving. At a later period it was discovered that a proof could be taken on damped paper by filling the engraved lines with a certain ink and wiping it off the surface of the plate, sufficient pressure being applied to make the paper go into the hollowed lines and fetch the ink out of them. This was the beginning of plate printing. The niello engravers thought it a convenient way of proving their work—the metal itself—as it saved the trouble of the sulphur cast, but they saw no further into the future. They went on engraving nielli just the same to ornament plate and furniture; nor was it until the 16th century that the new method of printing was carried out to its great and wonderful results. There are, however, certain differences between plate-printing and block-printing which affect the essentials of art. When paper is driven *into* a line so as to fetch the ink out of it, the line may be of unimaginable fineness, it will print all the same; but when the paper is only pressed *upon* a raised line, the line must have some appreciable thickness; the wood engraving, therefore, can never—except in a *tour de force*—be so delicate as plate engraving. Again, not only does plate-printing excel block-printing in delicacy; it excels it also in force and depth. There never was, and there will never be, a woodcut line having the power of a deep line in a plate, for in block-printing the line is only a blackened surface of paper slightly impressed, whereas in plate-printing it is a *cast* with an additional thickness of printing ink.

The most important of the tools used in line-engraving is the burin, which is a bar of steel with one end fixed in a handle rather like a mushroom with one side cut away, the burin itself being shaped so that the cutting end when sharpened takes the form of a lozenge, point downwards. The burin acts exactly like a plough; it makes a furrow and turns out a shaving of metal as the plough turns the soil of a field. The burin, however, is pushed while the plough is pulled, and this peculiar character of the burin, or graver, as a pushed instrument at once establishes a wide separation between it and all the other instruments employed in the arts of design, such as pencils, brushes, pens and etching needles.

The elements of engraving with the burin upon metal will be best understood by an example of a very simple kind, as in the engraving of letters. The capital letter B contains in itself the rudiments of an engraver's education. As at first drawn, before the blacks are inserted, this letter consists of two perpendicular straight lines and four curves, all the curves differing from each other. Suppose, then, that the engraver has to make a B, he will scratch these lines, reversed, very lightly with a sharp point or style. The next thing is to cut out the blacks (not the whites, as in wood engraving), and this would be done with two different burins. The engraver would get his vertical black line by a powerful ploughing with the burin between his two preparatory first lines, and then take out some copper in the thickest parts of the two curves. This done, he would then take a finer burin and work out the gradation from the thick line in the midst of the curve to the thin extremities which touch the perpendicular. When there is much gradation in a line the darker parts of it are often gradually ploughed out by returning to it over and over again. The hollows so produced are afterwards filled with printing ink, just as the hollows in a niello were filled with black enamel; the surplus printing ink is wiped from the smooth surface of the copper, damped paper is laid upon it, and driven into the hollowed letter by the pressure of a revolving cylinder; it fetches the ink out, and you have your letter B in intense black upon a white ground.

When the surface of a metal plate is sufficiently polished to be used for engraving, the slightest scratch upon it will print as a black line, the degree of blackness being proportioned to the depth of the scratch. An engraved plate from which visiting cards are printed is a good example of some elementary principles of engraving. It contains thin lines and thick ones, and a considerable variety of curves. An elaborate line engraving, if it is a pure line engraving and nothing else, will contain only these simple elements in different combinations. The real line engraver is always engraving a line more or less broad and deep in one direction or another; he has no other business than this.

In the early Italian and early German prints, the line is used with such perfect simplicity of purpose that the methods of the artists are as obvious as if we saw them actually at work.

The student may soon understand the spirit and technical quality of the earliest Italian engraving by giving his attention to a few of the series which used erroneously to be called the "Playing Cards of Mantegna," but which have been shown by Mr Sidney Colvin to represent "a kind of encyclopaedia of knowledge."

The history of these engravings is obscure. They are supposed to be Florentine; they are certainly Italian; and their technical manner is called that of Baccio Baldini. But their style is as clear as a style can be, as clear as the artist's conception of his art. In all these figures the outline is the main thing, and next to that the lines which mark the leading folds of the drapery, lines quite classical in purity of form and severity of selection, and especially characteristic in this, that they are always really engraver's lines, such as may naturally be done with the burin, and they never imitate the freer line of the pencil or etching needle. Shading is used in the greatest moderation with thin straight strokes of the burin, that never overpower the stronger organic lines of the design. Of chiaroscuro, in any complete sense, there is none. The sky behind the figures is represented by white paper, and the foreground is sometimes occupied by flat decorative engraving, much nearer in feeling to calligraphy than to modern painting. Sometimes there is a cast shadow, but it is not studied, and is only used to give relief. In this early metal engraving the lines are often crossed in the shading, whereas in the earliest woodcuts they are not; the reason being that when lines are incised they can as easily be crossed as not, whereas, when they are reserved, the crossing involves much labour of a non-artistic kind. Here, then, we have pure line-engraving with the burin, that is, the engraving of the pure line patiently studied for its own beauty, and exhibited in an abstract manner, with care for natural form combined with inattention to the effects of nature. Even the forms are idealized, especially in the cast of draperies, for the express purpose of exhibiting the line to better advantage. Such are the characteristics of those very early Italian engravings which were attributed erroneously to Mantegna. When we come to Mantegna himself we find a style equally decided. Drawing and shading were for him two entirely distinct things. He did not draw and shade at the same time, as a modern chiaroscurist would, but he first got his outlines and the patterns on his dresses all very accurate, and then threw over them a veil of shading, a very peculiar kind of shading, all the lines being straight and all the shading diagonal. This is the primitive method, its peculiarities being due, not to a learned self-restraint, but to a combination of natural genius with technical inexperience, which made the early Italians at once desire and discover the simplest and easiest methods. Whilst the Italians were shading with straight lines the Germans had begun to use curves, and as soon as the Italians saw good German work they tried to give to their burins something of the German suppleness.

The characteristics of early metal engraving in Germany are seen to perfection in Martin Schongauer and Albert Dürer, who, though with striking differences, had many points in common. Schongauer died in 1488; whilst the date of Dürer's death is 1528. Schongauer was therefore a whole generation before Dürer, yet not greatly inferior to him in the use of the burin, though Dürer has a much greater reputation, due in great measure to his singular imaginative powers. Schongauer is the first great German engraver known by name, but he was preceded by an unknown German master, called "the Master of 1466," who had Gothic notions of art (in strong contrast to the classicism of Baccio Baldini), but used the burin skilfully, conceiving of line and shade as separate elements, yet shading with an evident desire to follow the form of the thing shaded, and with lines in various directions. Schongauer's art is a great stride in advance, and we find in him an evident pleasure in the bold use of the burin. Outline and shade, in Schongauer, are not nearly so much separated as in Baccio Baldini, and the shading, generally in curved lines, is far more masterly than the straight shading of Mantegna. Dürer continued Schongauer's curved shading, with increasing manual delicacy and skill; and as he found himself able to perform feats with the burin which amused both himself and his buyers, he over-loaded his plates with quantities of living and inanimate objects, each of which he finished with as much care as if it were the most important thing in the composition. The engravers of those days had no conception of any necessity for subordinating one part of their work to another; they drew, like children, first one object and then another object, and so on until the plate was furnished from top to bottom and from the left side to the right. Here, of course, is an element of facility in primitive art which is denied to the modern artist. In Dürer all objects are on the same plane. In his "St Hubert" (otherwise known as "St Eustace") of *c.* 1505, the stag is quietly standing on the horse's back, with one hoof on the saddle, and the kneeling knight looks as if he were tapping the horse on the nose. Dürer seems to have perceived the mistake about the stag, for he put a tree between us and the animal to correct it, but the stag is on the horse's back nevertheless. This ignorance of the laws of effect is least visible and obtrusive in plates which have no landscape distances, such as "The Coat of Arms with the Death's Head" (1503) and "The Coat of Arms with the Cock" (*c.* 1512).

Dürer's great manual skill and close observation made him a wonderful engraver of objects taken separately. He saw and rendered all objects; nothing escaped him; he applied the same intensity of study to everything. Though a thorough student of the nude—witness his Adam and Eve (1504) and other plates—he would pay just as much attention to the creases of a gaiter as to the development of a muscle; and though man was his main subject, he would study dogs with equal care (see the five dogs in the "St Hubert"), as well as pigs (see the "Prodigal Son," *c.* 1495); and at a time when landscape painting was unknown he studied every clump of trees, every visible trunk and branch, nay, every foreground plant, and each leaf of it separately. In his buildings he saw every brick like a bricklayer, and every joint in the woodwork like a carpenter. The immense variety of the objects which he engraved was a training in suppleness of hand. His lines go in every direction, and are made to render both the undulations of surfaces (see the plane in the Melencolia, 1514) and their texture (see the granular texture of the stones in the same print).

From Dürer we come to Italy again, through Marcantonio, who copied Dürer, translating more than sixty of his woodcuts upon metal. It is one of the most remarkable things in the history of art, that a man who had trained himself by copying northern work, little removed from pure Gothicism, should have become soon afterwards the great engraver of Raphael, who was much pleased with his work and aided him by personal advice. Yet, although Raphael was a painter, and Marcantonio his interpreter, the reader is not to infer that engraving had as yet subordinated itself to painting. Raphael himself evidently considered engraving a distinct art, for he never once set Marcantonio to work from a picture, but always (much more judiciously) gave him drawings, which the engraver might interpret without going outside his own art; consequently Marcantonio's works are always genuine engravings, and are never pictorial. Marcantonio was an engraver of remarkable power. In him the real pure art of line-engraving reached its maturity. He retained much of the early Italian manner in his backgrounds, where its simplicity gives a desirable sobriety; but his figures are boldly modelled in curved lines, crossing each other in the darker shades, but left single in the passages from dark to light, and breaking away in fine dots as they approach the light itself, which is of pure white paper. A school of engraving was thus founded by Raphael, through Marcantonio, which cast aside the minute details of the early schools for a broad, harmonious treatment.

The group known as the engravers of Rubens marked a new development. Rubens understood the importance of engraving as a means of increasing his fame and wealth, and directed Vorsterman and others. The theory of engraving at that time was that it ought not to render accurately the local colour of painting, which would appear wanting in harmony when dissociated from the hues of the picture; and it was one of the anxieties of Rubens so to direct his engravers that the result might be a fine plate independently of what he had painted. To this end he helped his engravers by drawings, in which he sometimes indicated what he thought the best direction for the lines. Rubens liked Vorsterman's work, and scarcely corrected it, a plate he especially approved being "Susannah and the Elders," which is a learned piece of work well modelled, and shaded everywhere on the figures and costumes with fine curved lines, the straight line being reserved for the masonry. Vorsterman quitted Rubens after executing fourteen important plates, and was succeeded by Paul Pontius, then a youth of twenty, who went on engraving from Rubens with increasing skill until the painter's death. Boetius a Bolswert engraved from Rubens towards the close of his life, and his brother Schelte a Bolswert engraved more than sixty compositions of Rubens, of the most varied character, including hunting scenes and landscapes. This brings us to the engraving of landscape as a separate study. Rubens treated landscape in a broad comprehensive manner, and Schelte's way of engraving it was also broad and comprehensive. The lines are long and often undulating, the cross-hatchings bold and rather obtrusive, for they often substitute unpleasant reticulations for the refinement and mystery of nature, but it was a beginning, and a vigorous beginning. The technical developments of engraving under the influence of

Rubens may be summed up briefly as follows: (1) The Italian outline had been discarded as the chief subject of attention, and modelling had been substituted for it; (2) broad masses had been substituted for the minutely finished detail of the northern schools; (3) a system of light and dark had been adopted which was not pictorial, but belonged especially to engraving, which it rendered (in the opinion of Rubens) more harmonious.

The history of line-engraving, from the time of Rubens to the beginning of the 19th century, is rather that of the vigorous and energetic application of principles already accepted than any new development. From the two sources already indicated, the school of Raphael and the school of Rubens, a double tradition flowed to England and France, where it mingled and directed English and French practice. The first influence on English line-engraving was Flemish, and came from Rubens through Vandyck, Vorsterman, and others; but the English engravers soon underwent French and Italian influences, for although Payne learned from a Fleming, Faithorne studied in France under Philippe de Champagne the painter and Robert Nanteuil the engraver. Sir Robert Strange studied in France under Philippe Lebas, and then five years in Italy, where he saturated his mind with Italian art. French engravers came to England as they went to Italy, so that the art of engraving became in the 18th century cosmopolitan. In figure-engraving the outline was less and less insisted upon. Strange made it his study to soften and lose the outline. Meanwhile, the great classical Renaissance school, with Gérard Audran at its head, had carried forward the art of modelling with the burin, and had arrived at great perfection of a sober and dignified kind. Audran was very productive in the latter half of the 17th century, and died in 1703, after a life of severe self-direction in labour, the best external influence he underwent being that of the painter Nicolas Poussin. He made his work more rapid by the use of etching, but kept it entirely subordinate to the work of the burin. One of the finest of his large plates is "St John Baptizing," from Poussin, with groups of dignified figures in the foreground and a background of grand classical landscape, all executed with the most thorough knowledge according to the ideas of that time. The influence of Claude Lorrain on the engraving of landscape was exercised less through his etchings than his pictures, which compelled the engravers to study delicate distinctions in the values of light and dark. Through Woollett and Vivarès, Claude exercised an influence on landscape engraving almost equal to that of Raphael and Rubens on the engraving of the figure, though he did not direct his engravers personally.

In the 19th century line-engraving received first an impulse and finally a check. The impulse came from the growth of public wealth, the increasing interest in art and the increase in the commerce of art, which, by means of engraving, fostered in England mainly by John Boydell, penetrated into the homes of the middle classes, as well as from the growing demand for illustrated books, which gave employment to engravers of first-rate ability. The check to line-engraving came from the desire for cheaper and more rapid methods, a desire satisfied in various ways, but especially by etching and by the various kinds of photography. Nevertheless, the 19th century produced most highly accomplished work in line-engraving, both in the figure and in landscape. Its characteristics, in comparison with the work of other centuries, were chiefly a more thorough and delicate rendering of local colour, light and shade, and texture. The elder engravers could draw as correctly as the moderns, but they either neglected these elements or admitted them sparingly, as opposed to the spirit of their art. In a modern engraving from Landseer may be seen the blackness of a man's boots (local colour), the soft roughness of his coat (texture), and the exact value in light and dark of his face and costume against the cloudy sky. Nay more, there is to be found every sparkle on bit, boot and stirrup. Modern painting pays more attention to texture and chiaroscuro than classical painting did, and engraving necessarily followed in the same directions. But there is a certain sameness in pure line-engraving more favourable to some forms and textures than to others. This sameness of line-engraving, and its costliness, led to the adoption of mixed methods, extremely prevalent in commercial prints from popular artists. In the well-known prints from Rosa Bonheur, for example, by T. Landseer, H. T. Ryall, and C. G. Lewis, the tone of the skies is got by machine-ruling, and so is much undertone in the landscape; the fur of the animals is all etched, and so are the foreground plants, the real burin work being used sparingly where most favourable to texture. Even in the exquisite engravings after Turner, by Cooke, Goodall, Wallis, Miller, Willmore, and others, who reached a degree of delicacy in light and shade far surpassing the work of the old masters, the engravers had recourse to etching, finishing with the burin and dry point. Turner's name may be added to those of Raphael, Rubens and Claude in the list of painters who have had a special influence upon engraving. The speciality of Turner's influence was in the direction of delicacy of tone. In this respect the Turner vignettes to Roger's poems were a high-water mark of human attainment, not likely ever to be surpassed.

The record of the art of line-engraving during the last quarter of the 19th century is one of continued decay. Technical improvements, it was hoped, might save the art; it was thought by some that the slight revival resultant on the turning back of the burin's cutting-point—whereby the operator pulled the tool towards him instead of pushing it from him—might effect much, in virtue of the time and labour saved by the device. But by the beginning of the 20th century pictorial line-engraving in England was practically non-existent, and, with the passing of Jeens and Stacpoole, the spasmodic demand by publishers for engravers to engrave new plates remained unanswered. Mr C. W. Sherborn, the exquisite and facile designer and engraver of book-plates, has scarcely been surpassed in his own line, but his art is mainly heraldic. There are now no men capable of such work as that with which Doo, J. H. Robinson, and their fellows maintained the credit of the English School. Line-engraving has been killed by etching, mezzotint and the "mixed method." The disappearance of the art is due not so much to the artistic objection that the personality of the line-engraver stands obtrusively between the painter and the public; it is rather that the public refuse to wait for several years for the proofs for which they have subscribed, when by another method they can obtain their plates more quickly. An important line plate may occupy a prodigious time in the engraving; J. H. Robinson's "Napoleon and the Pope" took about twelve years. The invention of steel-facing a copper plate would now enable the engraver to proceed more expeditiously; but even in this case he can no more compete with the etcher than the mezzotint-engraver can keep pace with the photogravure manufacturer.

The Art Union of London in the past gave what encouragement it could; but with the death of J. Stephenson (1886) and F. Bacon (1887) it was evident that all hope was gone. John Saddler at the end was driven, in spite of his capacity to do original work, to spend most of his time in assisting Thomas Landseer to rule the skies on his plates, simply because there was not enough line-engraving to do. Since then there was some promise of a revival, and Mr Bourne engraved a few of the pictures by Gustave Doré. But little followed. The last of the line-engravers of Turner's pictures died in the person of Sir Daniel Wilson (d. 1892), who, recognizing the hopelessness of his early profession, laid his graver aside, and left Europe for Canada and eventually became president of the university of Toronto.

If line-engraving still flourishes in France, it is due not a little to official encouragement and to intelligent fostering by collectors and connoisseurs. The prizes offered by the École des Beaux Arts would probably not suffice to give vitality to the art but for the employment afforded to the finished artist by the "Chalcographie du Musée du Louvre," in the name of which commissions are judiciously distributed. At the same time, it must be recognized that not only are French engravers less busy than they were in days when line-engraving was the only "important" method of picture-translation, but they work for the most part for much smaller rewards. Moreover, the class of the work has entirely changed, partly through the reduction of prices paid for it, partly through the change of taste and fashion, and partly, again, through the necessities of the situation. That is to say, that public impatience is but a partial factor in the abandonment of the fine broad sweeping trough cut deep into the copper which was characteristic of the earlier engraving, either simply cut or crossed diagonally so as to form the series of "lozenges" typical of engraving at its finest and grandest period. That method was slow; but scarcely less slow was the shallower work rendered possible by the steel plate by reason of the much greater degree of elaboration of which such plates were capable, and which the public was taught—mainly by Finden—to expect. The French engravers were therefore driven at last to simplify their work if they were to satisfy the public and live by the burin. To compensate for loss of colour, the art developed in the direction of elegance and refinement. Gaillard (d. 1887), Blanchard, and Alphonse François (d. 1888) were perhaps the earliest chiefs of the new school, the characteristics of which are the substitution of exquisite greys for the rich blacks of old, simplicity of method being often allied to extremely high elaboration. Yet the aim of the modern engraver has always been, while pushing the capability of his own art to the farthermost limit, to retain throughout the individual and personal qualities of the master whose work is translated on the plate. The height of perfection to which the art is reached is seen in the triptych of Mantegna by Achille Jacquet (d. 1909), to whom may perhaps be accorded the first place among several engravers of the front rank. This "Passion" (from the three pictures in the Louvre and at Tours, forming the predella of the San Zeno altarpiece in Verona) not only conveys the forms, sentiment, and colour of the master, but succeeds also in rendering the peculiar luminosity of the originals. Jacquet, who gained the *Prix de Rome* in 1870, also translated pictures of Sir Joshua Reynolds, and engraved fine plates after Paul Dubois, Cabanel, Bouguereau, Meissonier and Detaille. The freedom of much of his work suggests an affinity with etching and dry-point; indeed, it appears that he uses the etching-needle and acid to lay in some of his groundwork and outlines. Léopold Flameng's engraving after Jan van Eyck's "Virgin with the Donor," in the Louvre, is one of the most admirable works of its kind, retaining the quality and sentiment of the master, extreme minuteness and elaboration notwithstanding. Jules Jacquet is known for his work after Meissonier (especially the "Friedland") and after Bonnat; Adrien Didier for his plates after Holbein ("Anne of Cleves"), Raphael, and Paul Veronese, among the Old Masters, and Bonnat, Bouguereau, and Roybet among the new. Jazinski (Botticelli's "Primavera"), Sulpis (Mantegna and Gustave Moreau), Patricot (Gustave Moreau), Burney, and Champollion (d. 1901), have been among the leaders of the modern school. Their object is to secure the faithful transcript of the painter they reproduce, while readily sacrificing the power of the old method, which, whatever its force and its beauty, was easily acquired by mediocre artists of technical ability who were nevertheless unable to appreciate or reproduce anything beyond mechanical excellence.

The Belgian School of engraving is not without vitality. Gustave Biot was equally skilful in portraiture and subject (engraving after Gallait, Cabanel, Gustave Doré, among his best work); A. M. Danse executed plates after leading painters, and elaborated an effective "mixed method" of graver-work and dry-point; and de Meerman has engraved a number of good plates; but private patronage is hardly sufficient in Belgium to maintain the school in a state of prosperous efficiency.

In Germany, as might be expected, line-engraving retains not a little of its popularity in its more orthodox form. The novel Stauffer-Bern method, in which freedom and lightness are obtained with such delicacy that the fine lines, employed in great numbers, run into tone, and yield a supposed advantage in modelling, has not been without appreciation. But the more usual virtue of the graver has been best supported, and many have worked in the old-fashioned manner. Friedrich Zimmermann (d. 1887) began his career by engraving such prints as Guido Reni's "Ecce Homo" in Dresden, and then devoted himself to the translation of modern German painters. Rudolph Pfnor was an ornamentist representative of his class; and Joseph Kohlschein, of Düsseldorf, a typical exponent of the intelligent conservative manner. His "Marriage at Cana" after Paul Veronese, "The Sistine Madonna" after Raphael, and "St Cecilia" after the same master, are all plates of a high order.

In Italy the art is well-nigh as moribund as in England. When Vittorio Pica (of Naples) and Conconi (of Milan) have been named, it is difficult to mention other successors to the fine school of the 19th century which followed Piranesi and Volpato. A few of the pupils of Rosaspina and Paolo Toschi lived into the last quarter of the century, but to the present generation Asiolo, Jesi, C. Raimondi, L. Bigola, and Antonio Isac are remembered rather for their efforts than for their success in supporting their art against the combined opposition of etching, "process" and public indifference.

Outside Europe line-engraving can no longer be said to exist. Here and there a spasmodic attempt may be made to appeal to the artistic appreciation of a limited public; but no general attention is paid to such efforts, nor, it may be added, are these inherently worthy of much notice. There are still a few who can engrave a head from a photograph or drawing, or a small engraving for book-illustration or for book-plates; there are more who are highly proficient in mechanical engraving for decorative purposes; but the engraving-machine is fast superseding this class. In short, the art of worthily translating a fine painting beyond the borders of France, Belgium, Germany and perhaps Italy can scarcely be said to survive, and even in those countries it appears to exist on sufferance and by hot-house encouragement.

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LINEN and LINEN MANUFACTURES. Under the name of linen are comprehended all yarns spun and fabrics woven from flax fibre (see FLAX).

From the earliest periods of human history till almost the close of the 18th century the linen manufacture was one of the most extensive and widely disseminated of the domestic industries of European countries. The industry was most largely developed in Russia, Austria, Germany, Holland, Belgium, the northern provinces of France, and certain parts of England, in the north of Ireland, and throughout Scotland; and in these countries its importance was generally recognized by the enactment of special laws, having for their object the protection and extension of the trade. The inventions of Arkwright, Hargreaves and Crompton in the later part of the 18th century, benefiting almost exclusively the art of cotton-spinning, and the unparalleled development of that branch of textile manufactures, largely due to the ingenuity of these inventors, gave the linen trade as it then existed a fatal blow. Domestic spinning, and with it hand-loom weaving, immediately began to shrink; the trade which had supported whole villages and provinces entirely disappeared, and the linen manufacture, in attenuated dimensions and changed conditions, took refuge in special localities, where it resisted, not unsuccessfully, the further assaults of cotton, and, with varying fortunes, rearranged its relations in the community of textile industries. The linen industries of the United Kingdom were the first to suffer from the aggression of cotton; more slowly the influence of the rival textile reached other countries.

In 1810 Napoleon I. offered a reward of one million francs to any inventor who should devise the best machinery for the spinning of flax yarn. Within a few weeks thereafter Philippe de Girard patented in France important inventions for flax spinning by both dry and wet methods. His inventions, however, did not receive the promised reward and were neglected in his native country. In 1815 he was invited by the Austrian government to establish a spinning mill at Hirtenberg near Vienna, which was run with his machinery for a number of years, but it failed to prove a commercial success. In the meantime English inventors had applied themselves to the task of adapting machines to the preparation and spinning of flax. The foundation of machine spinning of flax was laid by John Kendrew and Thomas Porthouse of Darlington, who, in 1787, secured a patent for "a mill or machine upon new principles for spinning yarn from hemp, tow, flax or wool." By innumerable successive improvements and modifications, the invention of Kendrew and Porthouse developed into the perfect system of machinery with which, at the present day, spinning-mills are furnished; but progress in adapting flax fibres for mechanical spinning, and linen yarn for weaving cloth by power-loom was much slower than in the corresponding case of cotton.

Till comparatively recent times, the sole spinning implements were the spindle and distaff. The spindle, which is the fundamental apparatus in all spinning machinery, was a round stick or rod of wood about 12 in. in length, tapering towards each extremity, and having at its upper end a notch or slit into which the yarn might be caught or fixed. In general, a ring or "whorl" of stone or clay was passed round the upper part of the spindle to give it momentum and steadiness when in rotation, while in some few cases an ordinary potato served the purpose of a whorl. The distaff, or rock, was a rather longer and stronger bar or stick, around one end of which, in a loose coil or ball, the fibrous material to be spun was wound. The other extremity of the distaff was carried under the left arm, or fixed in the girdle at the left side, so as to have the coil of flax in a convenient position for drawing out to form the yarn. A prepared end of yarn being fixed into the notch, the spinster, by a smart rolling motion of the spindle with the right hand against the right leg, threw it out from her, spinning in the air, while, with the left hand, she drew from the rock an additional supply of fibre which was formed into a uniform and equal strand with the right. The yarn being sufficiently twisted was released from the notch, wound around the lower part of the spindle, and again fixed in the notch at the point insufficiently twisted; and so the rotating, twisting and drawing out operations went on till the spindle was full. So persistent is an ancient and primitive art of this description that in remote districts of Scotland—a country where machine spinning has attained a high standard—spinning with rock and spindle is still practised;[1] and yarn of extraordinary delicacy, beauty and tenacity has been spun by their agency. The first improvement on the primitive spindle was found in the construction of the hand-wheel, in which the spindle, mounted in a frame, was fixed horizontally, and rotated by a band passing round it and a large wheel, set in the same framework. Such a wheel became known in Europe about the middle of the 16th century, but it appears to have been in use for cotton spinning in the East from time immemorial. At a later date, which cannot be fixed, the treadle motion was attached to the spinning wheel, enabling the spinster to sit at work with both hands free; and the introduction of the two-handed or double-spindle wheel, with flyers or twisting arms on the spindles, completed the series of mechanical improvements effected on flax spinning till the end of the 18th century. The common use of the two-handed wheel throughout the rural districts of Ireland and Scotland is a matter still within the recollection of some people; but spinning wheels are now seldom seen.

The modern manufacture of linen divides itself into two branches, spinning and weaving, to which may be added the bleaching and various finishing processes, which, in the case of many linen textures, are laborious undertakings and important branches of industry. The flax fibre is received in bundles from the scutch mill, and after having been classed into various grades, according to the quality of the material, it is labelled and placed in the store ready for the flax mill. The whole operations in yarn manufacture comprise (1) hackling, (2) preparing and (3) spinning.

Hackling.—This first preparatory process consists not only in combing out, disentangling and laying smooth and parallel the separate fibres, but also serves to split up and separate into their ultimate filaments the strands of fibre which, up to this point, have been agglutinated together. The hackling process was originally performed by hand, and it was one of fundamental importance, requiring the exercise of much dexterity and judgment. The broken, ravelled and short fibres, which separate out in the hackling process, form tow, an article of much inferior value to the spinner. A good deal of hand-hackling is still practised, especially in Irish and continental mills; and it has not been found practicable, in any case, to dispense entirely with a rough preparation of the fibre by hand labour. In hackling by hand, the hackler takes a handful or "strick" of rough flax, winds the top end around his hands, and then, spreading out the root end as broad and flat as possible, by a swinging motion dashes the fibre into the hackle teeth or needles of the rougher or "ruffer." The rougher is a board plated with tin, and studded with spikes or teeth of steel about 7 in. in length, which taper to a fine sharp point. The hackler draws his strick several times through this tool, working gradually up from the roots to near his hand, till in his judgment the fibres at the root end are sufficiently combed out and smoothed. He then seizes the root end and similarly treats the top end of the strick. The same process is again repeated on a similar tool, the teeth of which are 5 in. long, and much more closely studded together; and for the finer counts of yarn a third and a fourth hackle may be used, of still increasing fineness and closeness of teeth. In dealing with certain varieties of the fibre, for fine spinning especially, the flax is, after roughing, broken or cut into three lengths—the top, middle and root ends. Of these the middle cut is most valuable, being uniform in length, strength and quality. The root end is more woody and harsh, while the top, though fine in quality, is uneven and variable in strength. From some flax of extra length it is possible to take two short middle cuts; and, again, the fibre is occasionally only broken into two cuts. Flax so prepared is known as "cut line" in contradistinction to "long line" flax, which is the fibre unbroken. The subsequent treatment of line, whether long or cut, does not present sufficient variation to require further reference to these distinctions.

In the case of hackling by machinery, the flax is first roughed and arranged in stricks, as above described under hand hackling. In the construction of hackling machines, the general principles of those now most commonly adopted are identical. The machines are known as vertical sheet hackling machines, their essential features being a set of endless leather bands or sheets revolving over a pair of rollers in a vertical direction. These sheets are crossed by iron bars, to which hackle stocks, furnished with teeth, are screwed. The hackle stocks on each separate sheet are of one size and gauge, but each successive sheet in the length of the machine is furnished with stocks of increasing fineness, so that the hackling tool at the end where the flax is entered is the coarsest, say about four pins per inch, while that to which the fibre is last submitted has the smallest and most closely set teeth. The finest tools may contain from 45 to 60 pins per inch. Thus the whole of the endless vertical revolving sheet presents a continuous series of hackle teeth, and the machines are furnished with a double set of such sheets revolving face to face, so close together that the pins of one set of sheets intersect those on the opposite stocks. Overhead, and exactly centred between these revolving sheets, is the head or holder channel, from which the flax hangs down while it is undergoing the hackling process on both sides. The flax is fastened in a holder consisting of two heavy flat plates of iron, between which it is spread and tightly screwed up. The holder is 11 in. in length, and the holder channel is fitted to contain a line of six, eight or twelve such holders, according to the number of separate bands of hackling stocks in the machine. The head or holder channel has a falling and rising motion, by which it first presents the ends and gradually more and more of the length of the fibre to the hackle teeth, and, after dipping down the full length of the fibre exposed, it slowly rises and lifts the flax clear of the hackle stocks. By a reciprocal motion all the holders are then moved forward one length; that at the last and finest set of stocks is thrown out, and place is made for filling in an additional holder at the beginning of the series. Thus with a six-tool hackle, or set of stocks, each holder full of flax from beginning to end descends into and rises from the hackle teeth six times in travelling from end to end of the machine. The root ends being thus first hackled, the holders are shot back along an inclined plane, the iron plates unclamped, the flax reversed, and the top ends are then submitted to the same hackling operation. The tow made during the hackling process is carried down by the pins of the sheet, and is stripped from them by means of a circular brush placed immediately under the bottom roller. The brush revolves in the same direction as, but quicker than the sheet, consequently the tow is withdrawn from the pins. The tow is then removed from the brush by a doffer roller, from which it is finally removed by a doffing knife. This material is then carded by a machine similar to, but finer than, the one described under JUTE (*q.v.*). The hackled flax, however, is taken direct to the preparing department.

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[1] See Sir Arthur Mitchell's *The Past in the Present* (Edinburgh, 1880).

Preparing.—The various operations in this stage have for their object the proper assortment of dressed line into qualities fit for spinning, and the drawing out of the fibres to a perfectly level and uniform continuous ribbon or sliver, containing throughout an equal quantity of fibre in any given length. From the hackling the now smooth, glossy and clean stricks are taken to the sorting room, where they are assorted into different qualities by the "line sorter," who judges by both eye and touch the quality and capabilities of the fibre. So sorted, the material is passed to the spreading and drawing frames, a series or system of machines all similar in construction and effect. The essential features of the spreading frame are: (1) the feeding cloth or creeping sheet, which delivers the flax to (2) a pair of "feed and jockey" rollers, which pass it on (3) to the gill frame or fallers. The gill frame consists of a series of narrow hackle bars, with short closely studded teeth, which travel between the feed rollers and the drawing or "boss and pressing" rollers to be immediately attended to. They are, by an endless screw arrangement, carried forward at approximately the same rate at which the flax is delivered to them, and when they reach the end of their course they fall under, and by a similar screw arrangement are brought back to the starting-point; and thus they form an endless moving level toothed platform for carrying away the flax from the feed rollers. This is the machine in which the fibres are, for the first time, formed into a continuous length termed a sliver. In order to form this continuous sliver it is necessary that the short lengths of flax should overlap each other on the spread sheet or creeping sheet. This sheet contains four or six divisions, so that four or six lots of overlapped flax are moving at the same time towards the first pair of rollers—the boss rollers or retaining rollers. The fibre passes between these rollers and is immediately caught by the rising gills which carry the fibre towards the drawing rollers. The pins of the gills should pass through the fibre so that they may have complete control over it, while their speed should be a little greater than the surface speed of the retaining rollers. The fibre is thus carried forward to the drawing rollers, which have a surface speed of from 10 to 30 times that of the retaining rollers. The great difference between the speeds of the retaining and drawing rollers results in each sliver being drawn out to a corresponding degree. Finally all the slivers are run into one and in this state are passed between the delivery rollers into the sliver cans. Each can should contain the same length of sliver, a common length being 1000 yds. A bell is automatically rung by the machine to warn the attendant that the desired length has been deposited into the can. From the spreading frame the cans of sliver pass to the drawing frames, where from four to twelve slivers combined are passed through feed rollers over gills, and drawn out by drawing rollers to the thickness of one. A third and fourth similar doubling and drawing may be embraced in a preparing system, so that the number of doublings the flax undergoes, before it arrives at the roving frame, may amount to from one thousand to one hundred thousand, according to the quality of yarn in progress. Thus, for example, the doublings on one preparing system may be $6 \times 12 \times 12 \times 12 \times 8 = 82,944$. The slivers delivered by the last drawing frame are taken to the roving frame, where they are singly passed through feed rollers and over gills, and, after drafting to sufficient tenuity, they are slightly twisted by flyers and wound on bobbins, in which condition the material—termed "rove" or "rovings"—is ready for the spinning frame.[1]

Spinning.—The spinning operation, which follows the roving, is done in two principal ways, called respectively dry spinning and wet spinning, the first being used for the lower counts or heavier yarns, while the second is exclusively adopted in the preparation of fine yarns. The spinning frame does not differ in principle from the throstle spinning machine used in cotton manufacture. The bobbins of flax rove are arranged in rows on each side of the frame (the spinning frames being all double) on pins in an inclined plane. The rove passes downwards through an eyelet or guide to a pair of nipping rollers between which and the final drawing rollers, placed in the case of dry spinning from 18 to 22 in. lower down, the fibre receives its final draft while passing over and under cylinders and guide-plate, and attains that degree of tenuity which the finished yarn must possess. From the last rollers the now attenuated material, in passing to the flyers receives the degree of twist which compacts the fibres into the round hard cord which constitutes spun yarn; and from the flyers it is wound on the more slowly rotating spool within the flyer arms, centred on the top of the spindle. The amount of twist given to the thread at the spinning frame varies from 1·5 to 2 times the square root of the count. In wet spinning the general sequence of operations is the same, but the rove, as unwound from its bobbin, first passes through a trough of water heated to about 120° Fahr.; and the interval between the two pairs of rollers in which the drawing out of the rove is accomplished is very much shorter. The influence of the hot water on the flax fibre appears to be that it softens the gummy substance which binds the separate cells together, and thereby allows the elementary cells to a certain extent to be drawn out without breaking the continuity of the fibre; and further it makes a finer, smoother and more uniform strand than can be obtained by dry spinning. The extent to which the original strick of flax as laid on the feeding roller for (say) the production of a 50 lea yarn is, by doublings and drawings, extended, when it reaches the spinning spindle, may be stated thus: 35 times on spreading frame, 15 times on first drawing frame, 15 times on second drawing frame, 14 times on third drawing frame, 15 times on roving frame and 10 times on spinning frame, in all 16,537,500 times its original length, with $8 \times 12 \times 16 = 1536$ doublings on the three drawing frames. That is to say, 1 yd. of hackled line fed into the spreading frame is spread out, mixed with other fibres, to a length of about 9400 m. of yarn, when the above drafts obtain. The drafts are much shorter for the majority of yarns.

The next operation is reeling from the bobbins into hanks. By act of parliament, throughout the United Kingdom the standard measure of flax yard is the "lea," called also in Scotland the "cut" of 300 yds. The flax is wound or reeled on a reel having a circumference of 90 in. (2½ yds.) making "a thread," and one hundred and twenty such threads form a lea. The grist or count of all fine yarns is estimated by the number of leas in 1 ℔; thus "50 lea" indicates that there are 50 leas or cuts of 300 yds. each in 1 ℔ of the yard so denominated. With the heavier yarns in Scotland the quality is indicated by their weight per "spyndle" of 48 cuts or leas; thus "3 ℔ tow yarn" is such as weighs 3 ℔ per spyndle, equivalent to "16 lea."

The hanks of yarn from wet spinning are either dried in a loft with artificial heat or exposed over ropes in the open air. When dry they are twisted back and forward to take the wiry feeling out of the yarn, and made up in bundles for the market as "grey yarn." English spinners make up their yarns into "bundles" of 20 hanks, each hank containing 10 leas; Irish spinners make hanks of 12 leas, 16⅔ of which form a bundle; Scottish manufacturers adhere to the spyndle containing 4 hanks of 12 cuts or leas.

Commercial qualities of yarn range from about 8 ℔ tow yarns (6 lea) up to 160 lea line yarn. Very much finer yarn up even to 400 lea may be spun from the system of machines found in many mills; but these higher counts are only used for fine thread for sewing and for the making of lace. The highest counts of cut line flax are spun in Irish mills for the manufacture of fine cambrics and lawns which are characteristic features of the Ulster trade. Exceedingly high counts have sometimes been spun by hand, and for the preparation of the finest lace threads it is said the Belgian hand spinners must work in damp cellars, where the spinner is guided by the sense of touch alone, the filament being too fine to be seen by the eye. Such lace yarn is said to have been sold for as much as £240 per ℔. In the Great Exhibition of 1851, yarn of 760 lea, equal to about 130 m. per ℔, was shown which had been spun by an Irish woman eighty-four years of age. In the same exhibition there was shown by a Cambray manufacturing firm hand-spun yarn equal to 1200 warp and 1600 weft or to more than 204 and 272 m. per ℔ respectively.

Bleaching.—A large proportion of the linen yarn of commerce undergoes a more or less thorough bleaching before it is handed over to the weaver. Linen yarns in the green condition contain such a large proportion of gummy and resinous matter, removable by bleaching, that cloths which might present a firm close texture in their natural unbleached state would become thin and impoverished in a perfectly bleached condition. Nevertheless, in many cases it is much more satisfactory to weave the yarns in the green or natural colour, and to perform all bleaching operations in the piece. Manufacturers allow about 20 to 25% of loss in weight of yarn in bleaching from the green to the fully bleached stage; and the intermediate stages of boiled, improved, duck, cream, half bleach and three-quarters bleach, all indicating a certain degree of bleaching, have corresponding degrees of loss in weight. The differences in colour resulting from different degrees of bleaching are taken advantage of for producing patterns in certain classes of linen fabrics.

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[1] The preparation of tow for spinning differs in essential features from the processes above described. Tow from different sources, such as scutching tow, hackle tow, &c. differs considerably in quality and value, some being very impure, filled with woody shives, &c. while other kinds are comparatively open and clean. A preliminary opening and cleaning is necessary for the dirty much-matted tows, and in general thereafter they are passed through two carding engines called respectively the breaker and the finisher cards till the slivers from their processes are ready for the drawing and roving frames. In the case of fine clean tows, on the other hand, passing through a single carding engine may be sufficient. The processes which follow the carding do not differ materially from those followed in the preparation of rove from line flax.

Linen thread is prepared from the various counts of fine bleached line yarn by winding the hanks on large spools, and twisting the various strands, two, three, four or six cord as the case may be, on a doubling spindle similar in principle to the yarn spinning frame, excepting, of course, the drawing rollers. A large trade in linen thread has been created by its use in the machine manufacture of boots and shoes, saddlery and other leather goods, and in heavy sewing-machine work generally. The thread industry is largely developed at Lisburn near Belfast, at Johnstone near Glasgow, Bridport, Dorsetshire, and at Paterson, New Jersey, United States. Fine cords, net twine and ropes are also twisted from flax.

Weaving.—The difficulties in the way of power-loom linen weaving, combined with the obstinate competition of hand-loom weavers, delayed the introduction of factory weaving of linen fabrics for many years after the system was fully applied to other textiles. The principal difficulty arose through the hardness and inelasticity of the linen yarns, owing to which the yarn frequently broke under the tension to which it was subjected. Competition with the hand-loom against the power-loom in certain classes of work is conceivable, although it is absolutely impossible for the work of the spinning wheel to stand against the rivalry of drawing, roving and spinning frames. To the present day, in Ireland especially, a great deal of fine weaving is done by hand-loom. Warden states that power was applied on a small scale to the weaving of canvas in London about 1812; that in 1821 power-looms were started for weaving linen at Kirkcaldy, Scotland; and that in 1824 Maberly & Co. of Aberdeen had two hundred power-looms erected for linen manufacture. The power-loom has been in uninterrupted use in the Broadford factory, Aberdeen, which then belonged to Maberly & Co., down to the present day, and that firm may be credited with being the effective introducers of power-loom weaving in the linen trade.

The various operations connected with linen weaving, such as winding, warping, dressing, beaming and drawing-in, do not differ in essential features from the like processes in the case of cotton weaving, &c., neither is there any significant modification in the looms employed (see WEAVING). Dressing is a matter of importance in the preparation of linen warps for beaming. It consists in treating the spread yarn with flour or farina paste, applied to it by flannel-covered rollers, the lowermost of which revolves in a trough of paste. The paste is equalized on the yarn by brushes, and dried by passing the web over steam-heated cylinders before it is finally wound on the beam for weaving.

Fabrics.

Linen fabrics are numerous in variety and widely different in their qualities, appearance and applications, ranging from heavy sail-cloth and rough sacking to the most delicate cambrics, lawns and scrims. The heavier manufactures include as a principal item sail-cloth, with canvas, tarpaulin, sacking and carpeting. The principal seats of the manufacture of these linens are Dundee, Arbroath, Forfar, Kirkcaldy, Aberdeen and Barnsley. The medium weight linens, which are used for a great variety of purposes, such as tent-making, towelling, covers, outer garments for men, linings, upholstery work, &c., include duck, huckaback, crash, tick, dowlas, osnaburg, low sheetings and low brown linens. Plain bleached linens form a class by themselves, and include principally the materials for shirts and collars and for bed sheets. Under the head of twilled linens are included drills, diapers and dimity for household use; and damasks for table linen, of which two kinds are distinguished—single or five-leaf damask, and double or eight-leaf damask, the pattern being formed by the intersection of warp and weft yarns at intervals of five and eight threads of yarn respectively. The fine linens are cambrics, lawns and handkerchiefs; and lastly, printed and dyed linen fabrics may be assigned to a special though not important class. In a general way it may be said regarding the British industry that the heavy linen trade centres in Dundee; medium goods are made in most linen manufacturing districts; damasks are chiefly produced in Belfast, Dunfermline and Perth; and the fine linen manufactures have their seat in Belfast and the north of Ireland. Leeds and Barnsley are the centres of the linen trade in England.

Linen fabrics have several advantages over cotton, resulting principally from the microscopic structure and length of the flax fibre. The cloth is much smoother and more lustrous than cotton cloth; and, presenting a less "woolly" surface, it does not soil so readily, nor absorb and retain moisture so freely, as the more spongy cotton; and it is at once a cool, clean and healthful material for bed-sheeting and clothing. Bleached linen, starched and dressed, possesses that unequalled purity, gloss and smoothness which make it alone the material suitable for shirt-fronts, collars and wristbands; and the gossamer delicacy, yet strength, of the thread it may be spun into fits it for the fine lace-making to which it is devoted. Flax is a slightly heavier material than cotton, while its strength is about double.

As regards the actual number of spindles and power-looms engaged in linen manufacture, the following particulars are taken from the report of the Flax Supply Association for 1905:—

Country.	Year.	Number of Spindles for Flax Spinning.	Year.	Number of Power-looms for Linen Weaving.
Austria-Hungary	1903	280,414	1895	3357
Belgium	1902	280,000	1900	3400
England and Wales	1905	49,941	1905	4424
France	1902	455,838	1891	18,083
Germany	1902	295,796	1895	7557
Holland	1896	8000	1891	1200
Ireland	1905	851,388	1905	34,498
Italy	1902	77,000	1902	3500
Norway	..	..	1880	120
Russia	1902	300,000	1889	7312
Scotland	1905	160,085	1905	17,185
Spain	..	..	1876	1000
Sweden	..	..	1884	286

British Exports of Linen Yarn and Cloth.

	1891.	1896.	1901.	1906.
Weight of linen yarn in pounds	14,859,900	18,462,300	12,971,100	14,978,200
Length in yards of linen piece goods, plain, bleached or unbleached	144,416,700	150,849,300	137,521,000	173,334,200
Length in yards of linen piece goods, checked, dyed or printed, also damask and diaper	11,807,600	17,986,100	8,007,600	13,372,100
Length in yards of sailcloth	3,233,400	5,372,600	4,686,700	4,251,400
Total length in yards of all kinds of linen cloth	159,457,700	174,208,000	150,215,300	190,957,700
Weight in pounds of linen thread for sewing	2,474,100	2,240,300	1,721,000	2,181,100

AUTHORITIES.—History of the trade, &c.: Warden's *Linen Trade, Ancient and Modern.* Spinning: Peter Sharp, *Flax, Tow and Jute Spinning* (Dundee); H. R. Carter, *Spinning and Twisting of Long Vegetable Fibres* (London). Weaving: Woodhouse and Milne, *Jute and Linen Weaving*, part i., Mechanism, part ii., Calculations and Cloth Structure (Manchester); and Woodhouse and Milne, *Textile Design: Pure and Applied* (London). (T. Wo.)

LINEN-PRESS, a contrivance, usually of oak, for pressing sheets, table-napkins and other linen articles, resembling a modern office copying-press. Linen presses were made chiefly in the 17th and 18th centuries, and are now chiefly interesting as curiosities of antique furniture. Usually quite plain, they were occasionally carved with characteristic Jacobean designs.

LINER, or LINE OF BATTLE SHIP, the name formerly given to a vessel considered large enough to take part in a naval battle. The practice of distinguishing between vessels fit, and those not fit, to "lie in a line of battle," arose towards the end of the 17th century. In the early 18th century all vessels of 50 guns and upwards were considered fit to lie in a line. After the Seven Years' War (1756–63) the 50-gun ships were rejected as too small. When the great revolutionary wars broke out the smallest line of battle ship was of 64 guns. These also came to be considered as too small, and later the line of battle-ships began with those of 74 guns. The term is now replaced by "battleship"; "liner" being the colloquial name given to the great passenger ships used on the main line of sea transport.

LING, PER HENRIK (1776–1839), Swedish medical-gymnastic practitioner, son of a minister, was born at Ljunga in the south of Sweden in 1776. He studied divinity, and took his degree in 1797, but then went abroad for some years, first to Copenhagen, where he taught modern languages, and then to Germany, France and England. Pecuniary straits injured his health, and he suffered much from rheumatism, but he had acquired meanwhile considerable proficiency in gymnastics and fencing. In 1804 he returned to Sweden, and established himself as a teacher in these arts at Lund, being appointed in 1805 fencing-master to the university. He found that his daily exercises had completely restored his bodily health, and his thoughts now turned towards applying this experience for the benefit of others. He attended the classes on anatomy and physiology, and went through the entire curriculum for the training of a doctor; he then elaborated a system of gymnastics, divided into four branches, (1) pedagogical, (2) medical, (3) military, (4) aesthetic, which carried out his theories. After several attempts to interest the Swedish government, Ling at last in 1813 obtained their co-operation, and the Royal Gymnastic Central Institute, for the training of gymnastic instructors, was opened in Stockholm, with himself as principal. The orthodox medical practitioners were naturally opposed to the larger claims made by Ling and his pupils respecting the cure of diseases—so far at least as anything more than the occasional benefit of some form of skilfully applied "massage" was concerned; but the fact that in 1831 Ling was elected a member of the Swedish General Medical Association shows that in his own country at all events his methods were regarded as consistent with professional recognition. Ling died in 1839, having previously named as the repositories of his teaching his pupils Lars Gabriel Branting (1799–1881), who succeeded him as principal of the Institute, and Karl Augustus Georgii, who became sub-director; his son, Hjalmar Ling (1820–1886), being for many years associated with them. All these, together with Major Thure Brandt, who from about 1861 specialized in the treatment of women (gynecological gymnastics), are regarded as the pioneers of Swedish medical gymnastics.

It may be convenient to summarize here the later history of Ling's system of medical gymnastics. A *Gymnastic Orthopaedic Institute* at Stockholm was founded in 1822 by Dr Nils Åkerman, and after 1827 received a government grant; and Dr Gustaf Zander elaborated a medico-mechanical system of gymnastics, known by his name, about 1857, and started his Zander Institute at Stockholm in 1865. At the Stockholm Gymnastic Central Institute qualified medical men have supervised the medical department since 1864; the course is three years (one year for qualified doctors). Broadly speaking, there have been two streams of development in the Swedish gymnastics founded on Ling's beginnings—either in a conservative direction, making certain forms of gymnastic exercises subsidiary to the prescriptions of orthodox medical science, or else in an extremely progressive direction, making these exercises a substitute for any other treatment, and claiming them as a cure for disease by themselves. Modern medical science recognizes fully the importance of properly selected exercises in preserving the body from many ailments; but the more extreme claim, which rules out the use of drugs in disease altogether, has naturally not been admitted. Modern professed disciples of Ling are divided, the representative of the more extreme section being Henrik Kellgren (b. 1837), who has a special school and following.

Ling and his earlier assistants left no proper written account of their treatment, and most of the literature on the subject is repudiated by one set or other of the gymnastic practitioners. Dr Anders Wide, M.D., of Stockholm, has published a *Handbook of Medical Gymnastics* (English edition, 1899), representing the more conservative practice. Henrik Kellgren's system, which, though based on Ling's, admittedly goes beyond it, is described in *The Elements of Kellgren's Manual Treatment* (1903), by Edgar F. Cyriax, who before taking the M.D. degree at Edinburgh had passed out of the Stockholm Institute as a "gymnastic director." See also the encyclopaedic work on *Sweden: its People and Industry* (1904), p. 348, edited by G. Sundbärg for the Swedish government.

LING[1] (*Molva vulgaris*), a fish of the family Gadidae, which is readily recognized by its long body, two dorsal fins (of which the anterior is much shorter than the posterior), single long anal fin, separate caudal fin, a barbel on the chin and large teeth in the lower jaw and on the palate. Its usual length is from 3 to 4 ft., but individuals of 5 or 6 ft. in length, and some 70 ℔ in weight, have been taken. The ling is found in the North Atlantic, from Spitzbergen and Iceland southwards to the coast of Portugal. Its proper home is the North Sea, especially on the coasts of Norway, Denmark, Great Britain and Ireland, it occurs in great abundance, generally at some distance from the land, in depths varying between 50 and 100 fathoms. During the winter months it approaches the shores, when great numbers are caught by means of long lines. On the American side of the Atlantic it is less common, although generally distributed along the south coast of Greenland and on the banks of Newfoundland. Ling is one of the most valuable species of the cod-fish family; a certain number are consumed fresh, but by far the greater portion are prepared for exportation to various countries (Germany, Spain, Italy). They are either salted and sold as "salt-fish," or split from head to tail and dried, forming, with similarly prepared cod and coal-fish, the article of which during Lent immense quantities are consumed in Germany and elsewhere under the name of "stock-fish." The oil is frequently extracted from the liver and used by the poorer classes of the coast population for the lamp or as medicine.

LINGARD, JOHN (1771–1851), English historian, was born on the 5th of February 1771 at Winchester, where his father, of an ancient Lincolnshire peasant stock, had established himself as a carpenter. The boy's talents attracted attention, and in 1782 he was sent to the English college at Douai, where he continued until shortly after the declaration of war by England (1793). He then lived as tutor in the family of Lord Stourton, but in October 1794 he settled along with seven other former members of the old Douai college at Crook Hall near Durham, where on the completion of his theological course he became vice-president of the reorganized seminary. In 1795 he was ordained priest, and soon afterwards undertook the charge of the chairs of natural and moral philosophy. In 1808 he accompanied the community of Crook Hall to the new college at Ushaw, Durham, but in 1811, after declining the presidency of the college at Maynooth, he withdrew to the secluded mission at Hornby in Lancashire, where for the rest of his life he devoted himself to literary pursuits. In 1817 he visited Rome, where he made researches in the Vatican Library. In 1821 Pope Pius VII. created him doctor of divinity and of canon and civil law; and in 1825 Leo XII. is said to have made him cardinal *in petto.* He died at Hornby on the 17th of July 1851.

Lingard wrote *The Antiquities of the Anglo-Saxon Church* (1806), of which a third and greatly enlarged addition appeared in 1845 under the title *The History and Antiquities of the Anglo-Saxon Church; containing an account of its origin, government, doctrines, worship, revenues, and clerical and monastic institutions*; but the work with which his name is chiefly associated is *A History of England, from the first invasion by the Romans to the commencement of the reign of William III.*, which appeared originally in 8 vols. at intervals between 1819 and 1830. Three successive subsequent editions had the benefit of extensive revision by the author; a fifth edition in 10 vols. 8vo appeared in 1849, and a sixth, with life of the author by Tierney prefixed to vol. x., in 1854–1855. Soon after its appearance it was translated into French, German and Italian. It is a work of ability and research; and, though Cardinal Wiseman's claim for its author that he was "the only impartial historian of our country" may be disregarded, the book remains interesting as representing the view taken of certain events in English history by a devout, but able and learned, Roman Catholic in the earlier part of the 19th century.

LINGAYAT (from *linga*, the emblem of Siva), the name of a peculiar sect of Siva worshippers in southern India, who call themselves *Vira-Saivas* (see HINDUISM). They carry on the person a stone *linga* (phallus) in a silver casket. The founder of the sect is said to have been Basava, a Brahman prime minister of a Jain king in the 12th century. The Lingayats are specially numerous in the Kanarese country, and to them the Kanarese language owes its cultivation as literature. Their priests are called Jangamas. In 1901 the total number of Lingayats in all India was returned as more than 2½ millions, mostly in Mysore and the adjoining districts of Bombay, Madras and Hyderabad.

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[1] As the name of the fish, "ling" is found in other Teut. languages; cf. Dutch and Ger. *Leng*, Norw. *langa*, &c. It is generally connected in origin with "long," from the length of its body. As the name of the common heather, *Calluna vulgaris* (see HEATH) the word is Scandinavian; cf. Dutch and Dan. *lyng*, Swed. *ljung*.

LINGAYEN, a town and the capital of the province of Pangasinán, Luzon, Philippine Islands, about 110 m. N. by W. of Manila, on the S. shore of the Gulf of Lingayen, and on a low and fertile island in the delta of the Agno river. Pop. (1903) 21,529. It has good government buildings, a fine church and plaza, the provincial high school and a girls' school conducted by Spanish Dominican friars. The climate is cool and healthy. The chief industries are the cultivation of rice (the most important crop of the surrounding country), fishing and the making of nipa-wine from the juice of the nipa palm, which grows abundantly in the neighbouring swamps. The principal language is Pangasinán; Ilocano is also spoken.

LINGEN, RALPH ROBERT WHEELER LINGEN, Baron (1819–1905), English civil servant, was born in February 1819 at Birmingham, where his father, who came of an old Hertfordshire family, with Royalist traditions, was in business. He became a scholar of Trinity College, Oxford, in 1837; won the Ireland (1838) and Hertford (1839) scholarships; and after taking a first-class in *Literae Humaniores* (1840), was elected a fellow of Balliol (1841). He subsequently won the Chancellor's Latin Essay (1843) and the Eldon Law scholarship (1846). After taking his degree in 1840, he became a student of Lincoln's Inn, and was called to the bar in 1847; but instead of practising as a barrister, he accepted an appointment in the Education Office, and after a short period was chosen in 1849 to succeed Sir J. Kay Shuttleworth as its secretary or chief permanent official. He retained this position till 1869. The Education Office of that day had to administer a somewhat chaotic system of government grants to local schools, and Lingen was conspicuous for his fearless discrimination and rigid economy, qualities which characterized his whole career. When Robert Lowe (Lord Sherbrooke) became, as vice-president of the council, his parliamentary chief, Lingen worked congenially with him in producing the Revised Code of 1862 which incorporated "payment by results"; but the education department encountered adverse criticism, and in 1864 the vote of censure in parliament which caused Lowe's resignation, founded (but erroneously) on an alleged "editing" of the school inspectors' reports, was inspired by a certain antagonism to Lingen's as well as to Lowe's methods. Shortly before the introduction of Forster's Education Act of 1870, he was transferred to the post of permanent secretary of the treasury. In this office, which he held till 1885, he proved a most efficient guardian of the public purse, and he was a tower of strength to successive chancellors of the exchequer. It used to be said that the best recommendation for a secretary of the treasury was to be able to say "No" so disagreeably that nobody would court a repetition. Lingen was at all events a most successful resister of importunate claims, and his undoubted talents as a financier were most prominently displayed in the direction of parsimony. In 1885 he retired. He had been made a C.B. in 1869 and a K.C.B. in 1878, and on his retirement he was created Baron Lingen. In 1889 he was made one of the first aldermen of the new London County Council, but he resigned in 1892. He died on the 22nd of July 1905. He had married in 1852, but left no issue.

LINGEN, a town in the Prussian province of Hanover, on the Ems canal, 43 m. N.N.W. of Münster by rail. Pop. 7500. It has iron foundries, machinery factories, railway workshops and a considerable trade in cattle, and among its other industries are weaving and malting and the manufacture of cloth. Lingen was the seat of a university from 1685 to 1819.

The county of Lingen, of which this town was the capital, was united in the middle ages with the county of Treklenburg. In 1508, however, it was separated from this and was divided into an upper and a lower county, but the two were united in 1541. A little later Lingen was sold to the emperor Charles V., from whom it passed to his son, Philip II. of Spain, who ceded it in 1597 to Maurice, prince of Orange. After the death of the English king, William III., in 1702, it passed to Frederick I., king of Prussia, and in 1815 the lower county was transferred to Hanover, only to be united again with Prussia in 1866.

See Möller, *Geschichte der vormaligen Grafschaft Lingen* (Lingen, 1874); Herrmann, *Die Erwerbung der Stadt und Grafschaft Lingen durch die Krone Preussen* (Lingen, 1902); and Schriever, *Geschichte des Kreiges Lingen* (Lingen, 1905).

LINGUET, SIMON NICHOLAS HENRI (1736–1794), French journalist and advocate, was born on the 14th of July 1736, at Reims, whither his father, the assistant principal in the Collège de Beauvais of Paris, had recently been exiled by *lettre de cachet* for engaging in the Jansenist controversy. He attended the Collège de Beauvais and won the three highest prizes there in 1751. He accompanied the count palatine of Zweibrücken to Poland, and on his return to Paris he devoted himself to writing. He published partial French translations of Calderon and Lope de Vega, and wrote parodies for the *Opéra Comique* and pamphlets in favour of the Jesuits. Received at first in the ranks of the *philosophes*, he soon went over to their opponents, possibly more from contempt than from conviction, the immediate occasion for his change being a quarrel with d'Alembert in 1762. Thenceforth he violently attacked whatever was considered modern and enlightened, and while he delighted society with his numerous sensational pamphlets, he aroused the fear and hatred of his opponents by his stinging wit. He was admitted to the bar in 1764, and soon became one of the most famous pleaders of his century. But in spite of his brilliant ability and his record of having lost but two cases, the bitter attacks which he directed against his fellow advocates, especially against Gerbier (1725–1788), caused his dismissal from the bar in 1775. He then turned to journalism and began the *Journal de politique et de littérature*, which he employed for two years in literary, philosophical and legal criticisms. But a sarcastic article on the French Academy compelled him to turn over the *Journal* to La Harpe and seek refuge abroad. Linguet, however, continued his career of free lance, now attacking and now supporting the government, in the *Annales politiques, civiles et littéraires*, published from 1777 to 1792, first at London, then at Brussels and finally at Paris. Attempting to return to France in 1780 he was arrested for a caustic attack on the duc de Duras (1715–1789), an academician and marshal of France, and imprisoned nearly two years in the Bastille. He then went to London, and thence to Brussels, where, for his support of the reforms of Joseph II., he was ennobled and granted an honorarium of one thousand ducats. In 1786 he was permitted by Vergennes to return to France as an Austrian counsellor of state, and to sue the duc d'Aiguillon (1730–1798), the former minister of Louis XV., for fees due him for legal services rendered some fifteen years earlier. He obtained judgment to the amount of 24,000 livres. Linguet received the support of Marie Antoinette; his fame at the time surpassed that of his rival Beaumarchais, and almost excelled that of Voltaire. Shortly afterwards he visited the emperor at Vienna to plead the case of Van der Noot and the rebels of Brabant. During the early years of the Revolution he issued several pamphlets against Mirabeau, who returned his ill-will with interest, calling him "the ignorant and bombastic M. Linguet, advocate of Neros, sultans and viziers." On his return to Paris in 1791 he defended the rights of San Domingo before the National Assembly. His last work was a defence of Louis XVI. He retired to Marnes near Ville d'Avray to escape the Terror, but was sought out and summarily condemned to death "for having flattered the despots of Vienna and London." He was guillotined at Paris on the 27th of June 1794.

Linguet was a prolific writer in many fields. Examples of his attempted historical writing are *Histoire du siècle d'Alexandre le Grand* (Amsterdam, 1762), and *Histoire impartiale des Jésuites* (Madrid, 1768), the latter condemned to be burned. His opposition to the *philosophes* had its strongest expressions in *Fanatisme des philosophes* (Geneva and Paris, 1764) and *Histoire des révolutions de* *l'empire romain* (Paris, 1766–1768). His *Théorie des lois civiles* (London, 1767) is a vigorous defence of absolutism and attack on the politics of Montesquieu. His best legal treatise is *Mémoire pour le comte de Morangies* (Paris, 1772); Linguet's imprisonment in the Bastille afforded him the opportunity of writing his *Mémoires sur la Bastille*, first published in London in 1789; it has been translated into English (Dublin, 1783, and Edinburgh, 1884–1887), and is the best of his works though untrustworthy.

See A. Devérité, *Notice pour servir à l'histoire de la vie et des écrits de S. N. H. Linguet* (Liége, 1782); Gardoz, *Essai historique sur la vie et les ouvrages de Linguet* (Lyon, 1808): J. F. Barrière, *Mémoire de Linguet et de Latude* (Paris, 1884); Ch. Monselet, *Les Oubliés et les dédaignés* (Paris, 1885), pp. 1-41; H. Monin, "Notice sur Linguet," in the 1889 edition of *Mémoires sur la Bastille*; J. Cruppi, *Un avocat journaliste au 18^e siècle, Linguet* (Paris, 1895); A. Philipp, *Linguet, ein Nationalökonom des XVIII Jahrhunderts in seinen rechtlichen, socialen und volkswirtschaftlichen Anschauungen* (Zürich, 1896); A. Lichtenberger, *Le Socialisme utopique* (1898), pp. 77-131.

LINK. (1) (Of Scandinavian origin; cf. Swed. *länk*, Dan. *laenke*; cognate with "flank," and Ger. *Gelenk*, joint), one of the loops of which a chain is composed; used as a measure of length in surveying, being $\frac{1}{100}$th part of a "chain." In Gunter's chain, a "link" = 7·92 in.; the chain used by American engineers consists of 100 links of a foot each in length (for "link work" and "link motions" see Mechanics: § *Applied*, and Steam Engine). The term is also applied to anything used for connecting or binding together, metaphorically or absolutely. (2) (O. Eng. *hlinc*, possibly from the root which appears in "to lean"), a bank or ridge of rising ground; in Scots dialect, in the plural, applied to the ground bordering on the sea-shore, characterized by sand and coarse grass; hence a course for playing golf. (3) A torch made of pitch or tow formerly carried in the streets to light passengers, by men or boys called "link-boys" who plied for hire with them. Iron link-stands supporting a ring in which the link might be placed may still be seen at the doorways of old London houses. The word is of doubtful origin. It has been referred to a Med. Lat. *lichinus*, which occurs in the form *linchinus* (see Du Cange, *Glossarium*); this, according to a 15th-century glossary, meant a wick or match. It is an adaptation of Gr. λύχνος, lamp. Another suggestion connects it with a supposed derivation of "linstock," from "lint." *The New English Dictionary* thinks the likeliest suggestion is to identify the word with the "link" of a chain. The tow and pitch may have been manufactured in lengths, and then cut into sections or "links."

LINKÖPING, a city of Sweden, the seat of a bishop, and chief town of the district (*län*) of Östergötland. Pop. (1900) 14,552. It is situated in a fertile plain 142 m. by rail S.W. of Stockholm, and communicates with Lake Roxen (½ m. to the north) and the Göta and Kinda canals by means of the navigable Stångå. The cathedral (1150–1499), a Romanesque building with a beautiful south portal and a Gothic choir, is, next to the cathedral of Upsala, the largest church in Sweden. It contains an altar-piece by Martin Heemskerck (d. 1574), which is said to have been bought by John II. for twelve hundred measures of wheat. In the church of St Lars are some paintings by Per Horberg (1746–1816), the Swedish peasant artist. Other buildings of note are the massive episcopal palace (1470–1500), afterwards a royal palace, and the old gymnasium founded by Gustavus Adolphus in 1627, which contains the valuable library of old books and manuscripts belonging to the diocese and state college, and collection of coins and antiquities. There is also the Östergötland Museum, with an art collection. The town has manufactures of tobacco, cloth and hosiery. It is the head-quarters of the second army division.

Linköping early became a place of mark, and was already a bishop's see in 1082. It was at a council held in the town in 1153 that the payment of Peter's pence was agreed to at the instigation of Nicholas Breakspeare, afterwards Adrian IV. The coronation of Birger Jarlsson Valdemar took place in the cathedral in 1251; and in the reign of Gustavus Vasa several important diets were held in the town. At Stångåbro (Stångå Bridge), close by, an obelisk (1898) commemorates the battle of Stångåbro (1598), when Duke Charles (Protestant) defeated the Roman Catholic Sigismund. A circle of stones in the Iron Market of Linköping marks the spot where Sigismund's adherents were beheaded in 1600.

LINLEY, THOMAS (1732–1795), English musician, was born at Wells, Somerset, and studied music at Bath, where he settled as a singing-master and conductor of the concerts. From 1774 he was engaged in the management at Drury Lane theatre, London, composing or compiling the music of many of the pieces produced there, besides songs and madrigals, which rank high among English compositions. He died in London on the 19th of November 1795. His eldest son Thomas (1756–1778) was a remarkable violinist, and also a composer, who assisted his father; and he became a warm friend of Mozart. His works, with some of his father's, were published in two volumes, and these contain some lovely madrigals and songs. Another son, William (1771–1835), who held a writership at Madras, was devoted to literature and music and composed glees and songs. Three daughters were similarly gifted, and were remarkable both for singing and beauty; the eldest of them Elizabeth Ann (1754–1792), married Richard Brinsley Sheridan in 1773, and thus linked the fortunes of her family with his career.

LINLITHGOW, JOHN ADRIAN LOUIS HOPE, 1st Marquess of (1860–1908), British administrator, was the son of the 6th earl of Hopetoun. The Hope family traced their descent to John de Hope, who accompanied James V.'s queen Madeleine of Valois from France to Scotland in 1537, and of whose great-grand-children Sir Thomas Hope (d. 1646), lord advocate of Scotland, was ancestor of the earls of Hopetoun, while Henry Hope settled in Amsterdam, and was the ancestor of the famous Dutch bankers of that name, and of the later Hopes of Bedgebury, Kent. Sir Thomas's son, Sir James Hope of Hopetoun (1614–1661), Scottish lord of session, was grandfather of Charles, 1st earl of Hopetoun in the Scots peerage (1681–1742), who was created earl in 1703; and his grandson, the 3rd earl, was in 1809 made a baron of the United Kingdom. John, the 4th earl (1765–1823), brother of the 3rd earl, was a distinguished soldier, who for his services in the Peninsular War was created Baron Niddry in 1814 before succeeding to the earldom. The marquessate of Linlithgow was bestowed on the 7th earl of Hopetoun in 1902, in recognition of his success as first governor (1900–1902) of the commonwealth of Australia; he died on the 1st of March 1908, being succeeded as 2nd marquess by his eldest son (b. 1887).

An earldom of Linlithgow was in existence from 1600 to 1716, this being held by the Livingstones, a Scottish family descended from Sir William Livingstone. Sir William obtained the barony of Callendar in 1346, and his descendant, Sir Alexander Livingstone (d. *c.* 1450), and other members of this family were specially prominent during the minority of King James II. Alexander Livingstone, 7th Lord Livingstone (d. 1623), the eldest son of William, the 6th lord (d. *c.* 1580), a supporter of Mary, queen of Scots, was a leading Scottish noble during the reign of James VI. and was created earl of Linlithgow in 1600. Alexander's grandson, George, 3rd earl of Linlithgow (1616–1690), and the latter's son, George, the 4th earl (*c.* 1652–1695), were both engaged against the Covenanters during the reign of Charles II. When the 4th earl died without sons in August 1695 the earldom passed to his nephew, James Livingstone, 4th earl of Callendar. James, who then became the 5th earl of Linlithgow, joined the Stuart rising in 1715; in 1716 he was attainted, being thus deprived of all his honours, and he died without sons in Rome in April 1723.

The earldom of Callendar, which was thus united with that of Linlithgow, was bestowed in 1641 upon James Livingstone, the third son of the 1st earl of Linlithgow. Having seen military service in Germany and the Netherlands, James was created Lord Livingstone of Almond in 1633 by Charles I., and eight years later the king wished to make him lord high treasurer of Scotland. Before this, however, Almond had acted with the Covenanters, and during the short war between England and Scotland in 1640 he served under General Alexander Leslie, afterwards earl of Leven. But the trust reposed in him by the Covenanters did not prevent him in 1640 from signing the "band of Cumbernauld," an association for defence against Argyll, or from being in some way mixed up with the "Incident," a plot for the seizure of the Covenanting leaders, Hamilton and Argyll. In 1641 Almond became an earl, and, having declined the offer of a high position in the army raised by Charles I., he led a division of the Scottish forces into England in 1644 and helped Leven to capture Newcastle. In 1645 Callendar, who often imagined himself slighted, left the army, and in 1647 he was one of the promoters of the "engagement" for the release of the king. In 1648, when the Scots marched into England, he served as lieutenant-general under the duke of Hamilton, but the duke found him as difficult to work with as Leven had done previously, and his advice was mainly responsible for the defeat at Preston. After this battle he escaped to Holland. In 1650 he was allowed to return to Scotland, but in 1654 his estates were seized and he was imprisoned; he came into prominence once more at the Restoration. Callendar died on March 1674, leaving no children, and, according to a special remainder, he was succeeded in the earldom by his nephew Alexander (d. 1685), the second son of the 2nd earl of Linlithgow; and he again was succeeded by his nephew Alexander (d. 1692), the second son of the 3rd earl of Linlithgow. The 3rd earl's son, James, the 4th earl, then became 5th earl of Linlithgow (see *supra*).

LINLITHGOW, a royal, municipal and police burgh and county town of Linlithgowshire, Scotland. Pop. (1901) 4279. It lies in a valley on the south side of a loch, 17½ m. W. of Edinburgh by the North British railway. It long preserved an antique and picturesque appearance, with gardens running down to the lake, or climbing the lower slopes of the rising ground, but in the 19th century much of it was rebuilt. About 4 m. S. by W. lies the old village of Torphichen (pop. 540), where the Knights of St John of Jerusalem had their chief Scottish preceptory. The parish kirk is built on the site of the nave of the church of the establishment, but the ruins of the transept and of part of the choir still exist. Linlithgow belongs to the Falkirk district group of parliamentary burghs with Falkirk, Airdrie, Hamilton and Lanark. The industries include shoe-making, tanning and currying, manufactures of paper, glue and soap, and distilling. An old tower-like structure near the railway station is traditionally regarded as a mansion of the Knights Templar. Other public buildings are the first town house (erected in 1668 and restored in 1848 after a fire); the town hall, built in 1888; the county buildings and the burgh school, dating from the pre-Reformation period. There are some fine fountains. The Cross Well in front of the town house, a striking piece of grotesque work carved in stone, originally built in the reign of James V., was rebuilt in 1807. Another fountain is surmounted by the figure of St Michael, the patron-saint of the burgh. Linlithgow Palace is perhaps the finest ruin of its kind in Scotland. Heavy but effective, the sombre walls rise above the green knolls of the promontory which divides the lake into two nearly equal portions. In plan it is almost square (168 ft. by 174 ft.), enclosing a court (91 ft. by 88 ft.), in the centre of which stands the ruined fountain of which an exquisite copy was erected in front of Holyrood Palace by the Prince Consort. At each corner there is a tower with an internal spiral staircase, that of the north-west angle being crowned by a little octagonal turret known as "Queen Margaret's Bower," from the tradition that it was there that the consort of James IV. watched and waited for his return from Flodden. The west side, whose massive masonry, hardly broken by a single window, is supposed to date in part from the time of James III., who later took refuge in one of its vaults from his disloyal nobles; but the larger part of the south and east side belongs to the period of James V., about 1535; and the north side was rebuilt in 1619–1620 by James VI. Of James V.'s portion, architecturally the richest, the main apartments are the Lyon chamber or parliament hall and the chapel royal. The grand entrance, approached by a drawbridge, was on the east side; above the gateway are still some weather-worn remains of rich allegorical designs. The palace was reduced to ruins by General Hawley's dragoons, who set fire to it in 1746. Government grants have stayed further dilapidation. A few yards to the south of the palace is the church of St Michael, a Gothic (Scottish Decorated) building (180 ft. long internally excluding the apse, by 62 ft. in breadth excluding the transepts), probably founded by David I. in 1242, but mainly built by George Crichton, bishop of Dunkeld (1528–1536). The central west front steeple was till 1821 topped by a crown like that of St Giles', Edinburgh. The chief features of the church are the embattled and pinnacled tower, with the fine doorway below, the nave, the north porch and the flamboyant window in the south transept. The church contains some fine stained glass, including a window to the memory of Sir Charles Wyville Thomson (1830–1882), the naturalist, who was born in the parish.

Linlithgow (wrongly identified with the Roman *Lindum*) was made a royal burgh by David I. Edward I. encamped here the night before the battle of Falkirk (1298), wintered here in 1301, and next year built "a pele [castle] mekill and strong," which in 1313 was captured by the Scots through the assistance of William Bunnock, or Binning, and his hay-cart. In 1369 the customs of Linlithgow yielded more than those of any other town in Scotland, except Edinburgh; and the burgh was taken with Lanark to supply the place of Berwick and Roxburgh in the court of the Four Burghs (1368). Robert II. granted it a charter of immunities in 1384. The palace became a favourite residence of the kings of Scotland, and often formed part of the marriage settlement of their consorts (Mary of Guelders, 1449; Margaret of Denmark, 1468; Margaret of England, 1503). James V. was born within its walls in 1512, and his daughter Mary on the 7th of December 1542. In 1570 the Regent Moray was assassinated in the High Street by James Hamilton of Bothwellhaugh. The university of Edinburgh took refuge at Linlithgow from the plague in 1645–1646; in the same year the national parliament, which had often sat in the palace, was held there for the last time. In 1661 the Covenant was publicly burned here, and in 1745 Prince Charles Edward passed through the town. In 1859 the burgh was deprived by the House of Lords of its claim to levy bridge toll and custom from the railway company.

LINLITHGOWSHIRE, or West Lothian, a south-eastern county of Scotland, bounded N. by the Firth of Forth, E. and S.E. by Edinburghshire, S.W. by Lanarkshire and N.W. by Stirlingshire. It has an area of 76,861 acres, or 120 sq. m., and a coast line of 17 m. The surface rises very gradually from the Firth to the hilly district in the south. A few miles from the Forth a valley stretches from east to west. Between the county town and Bathgate are several hills, the chief being Knock (1017 ft.), Cairnpapple, or Cairnnaple (1000), Cocklerue (said to be a corruption of Cuckold-le-Roi, 912), Riccarton Hills (832) terminating eastwards in Binny Craig, a striking eminence similar to those of Stirling and Edinburgh, Torphichen Hills (777) and Bowden (749). In the coast district a few bold rocks are found, such as Dalmeny, Dundas (well wooded and with a precipitous front), the Binns and a rounded eminence of 559 ft. named Glower-o'er-'em or Bonnytoun, bearing on its summit a monument to General Adrian Hope, who fell in the Indian Mutiny. The river Almond, rising in Lanarkshire and pursuing a north-easterly direction, enters the Firth at Cramond after a course of 24 m., during a great part of which it forms the boundary between West and Mid Lothian. Its right-hand tributary, Breich Water, constitutes another portion of the line dividing the same counties. The Avon, rising in the detached portion of Dumbartonshire, flows eastwards across south Stirlingshire and then, following in the main a northerly direction, passes the county town on the west and reaches the Firth about midway between Grangemouth and Bo'ness, having served as the boundary of Stirlingshire, during rather more than the latter half of its course. The only loch is Linlithgow Lake (102 acres), immediately adjoining the county town on the north, a favourite resort of curlers and skaters. It is 10 ft. deep at the east end and 48 ft. at the west. Eels, perch and braise (a species of roach) are abundant.

Geology.—The rocks of Linlithgowshire belong almost without exception to the Carboniferous system. At the base is the Calciferous Sandstone series, most of which lies between the Bathgate Hills and the eastern boundary of the county. In this series are the Queensferry limestone, the equivalent of the Burdiehouse limestone of Edinburgh, and the Binny sandstone group with shales and clays and the Houston coal bed. At more than one horizon in this series oil shales are found. The Bathgate Hills are formed of basaltic lavas and tuffs—an interbedded volcanic group possibly 2000 ft. thick in the Calciferous Sandstone and Carboniferous Limestone series. A peculiar serpentinous variety of the prevailing rock is quarried at Blackburn for oven floors; it is known as "lakestone." Binns Hill is the site of one of the volcanic cones of the period. The Carboniferous Limestone series consists of an upper and lower limestone group—including the Petershill, Index, Dykeneuk and Craigenbuck limestones—and a middle group of shales, ironstones and coals; the Smithy, Easter Main, Foul, Red and Splint coals belong to this horizon. Above the Carboniferous Limestone the

Millstone grit series crops in a belt which may be traced from the mouth of the Avon southwards to Whitburn. This is followed by the true coal-measures with the Boghead or Torbanehill coal, the Colinburn, Main, Ball, Mill and Upper Cannel or Shotts gas coals of Armadale, Torbanehill and Fauldhouse.

Climate and Agriculture.—The average rainfall for the year is 29·9 in., and the average temperature 47·5° F. (January 38° F.; July 59·5° F.). More than three-fourths of the county, the agriculture of which is highly developed, is under cultivation. The best land is found along the coast, as at Carriden and Dalmeny. The farming is mostly arable, permanent pasture being practically stationary (at about 22,000 acres). Oats is the principal grain crop, but barley and wheat are also cultivated. Farms between 100 and 300 acres are the most common. Turnips and potatoes are the leading green crops. Much land has been reclaimed; the parish of Livingston, for example, which in the beginning of the 18th century was covered with heath and juniper, is now under rotation. In Torphichen and Bathgate, however, patches of peat moss and swamp occur, and in the south there are extensive moors at Fauldhouse and Polkemmet. Live stock does not count for so much in West Lothian as in other Scottish counties, though a considerable number of cattle are fattened and dairy farming is followed successfully; the fresh butter and milk finding a market in Edinburgh. There is some sheep-farming, and horses and pigs are reared. The wooded land occurs principally in the parks and "policies" surrounding the many noblemen's mansions and private estates.

Other Industries.—The shale-oil trade flourishes at Bathgate, Broxburn, Armadale, Uphall, Winchburgh, Philpstoun and Dalmeny. There are important iron-works with blast furnaces at Bo'ness, Kinneil, Whitburn and Bathgate, and coal is also largely mined at these places. Coal-mining is supposed to have been followed since Roman times, and the earliest document extant regarding coalpits in Scotland is a charter granted about the end of the 12th century to William Oldbridge of Carriden. Fire-clay is extensively worked in connexion with the coal, and ironstone employs many hands. Limestone, freestone and whinstone are all quarried. Binny freestone was used for the Royal Institution and the National Gallery in Edinburgh, and many important buildings in Glasgow. Some fishing is carried on from Queensferry, and Bo'ness is the principal port.

Communications.—The North British Railway Company's line from Edinburgh to Glasgow runs across the north of the county, it controls the approaches to the Forth Bridge, and serves the rich mineral district around Airdrie and Coatbridge in Lanarkshire via Bathgate. The Caledonian Railway Company's line from Glasgow to Edinburgh touches the extreme south of the shire. The Union Canal, constructed in 1818–1822 to connect Edinburgh with the Forth and Clyde Canal near Camelon in Stirlingshire, crosses the county, roughly following the N.B.R. line to Falkirk. The Union Canal, which is 31 m. long and belongs to the North British railway, is carried across the Almond and Avon on aqueducts designed by Thomas Telford, and near Falkirk is conveyed through a tunnel 2100 ft. long.

Population and Administration.—In 1891 the population amounted to 52,808, and in 1901 to 65,708, showing an increase of 24·43% in the decennial period, the highest of any Scottish county for that decade, and a density of 547 persons to the sq. m. In 1901 five persons spoke Gaelic only, and 575 Gaelic and English. The chief towns, with populations in 1901, are Bathgate (7549), Borrowstounness (9306), Broxburn (7099) and Linlithgow (4279). The shire returns one member to parliament. Linlithgowshire is part of the sheriffdom of the Lothians and Peebles, and a resident sheriff-substitute sits at Linlithgow and Bathgate. The county is under school-board jurisdiction, and there are academies at Linlithgow, Bathgate and Bo'ness. The local authorities entrust the bulk of the "residue" grant to the County Secondary Education Committee, which subsidizes elementary technical classes (cookery, laundry and dairy) and science and art and technological classes, including their equipment.

History.—Traces of the Pictish inhabitants still exist. Near Inveravon is an accumulation of shells—mostly oysters, which have long ceased to be found so far up the Forth—considered by geologists to be a natural bed, but pronounced by antiquaries to be a kitchen midden. Stone cists have been discovered at Carlowrie, Dalmeny, Newliston and elsewhere; on Cairnnaple is a circular structure of remote but unknown date; and at Kipps is a cromlech that was once surrounded by stones. The wall of Antoninus lies for several miles in the shire. The discovery of a fine legionary tablet at Bridgeness in 1868 is held by some to be conclusive evidence that the great rampart terminated at that point and not at Carriden. Roman camps can be distinguished at several spots. On the hill of Bowden is an earthwork, which J. Stuart Glennie and others connect with the struggle of the ancient Britons against the Saxons of Northumbria. The historical associations of the county mainly cluster round the town of Linlithgow (*q.v.*). Kingscavil (pop. 629) disputes with Stonehouse in Lanarkshire the honour of being the birthplace of Patrick Hamilton, the martyr (1504–1528).

See Sir R. Sibbald, *History of the Sheriffdoms of Linlithgow and Stirlingshire* (Edinburgh, 1710); G. Waldie, *Walks along the Northern Roman Wall* (Linlithgow, 1883); R. J. H. Cunningham, *Geology of the Lothians* (Edinburgh, 1838).

LINNAEUS, the name usually given to CARL VON LINNÉ (1707–1778), Swedish botanist, who was born on the 13th of May, O.S. (May 23, N.S.) 1707 at Råshult, in the province of Småland, Sweden, and was the eldest child of Nils Linnaeus the comminister, afterwards pastor, of the parish, and Christina Brodersonia, the daughter of the previous incumbent. In 1717 he was sent to the primary school at Wexiö, and in 1724 he passed to the gymnasium. His interests were centred on botany, and his progress in the studies considered necessary for admission to holy orders, for which he was intended, was so slight that in 1726 his father was recommended to apprentice him to a tailor or shoemaker. He was saved from this fate through Dr Rothman, a physician in the town, who expressed the belief that he would yet distinguish himself in medicine and natural history, and who further instructed him in physiology. In 1727 he entered the university of Lund, but removed in the following year to that of Upsala. There, through lack of means, he had a hard struggle until, in 1729, he made the acquaintance of Dr Olaf Celsius (1670–1756), professor of theology, at that time working at his *Hierobotanicon*, which saw the light nearly twenty years later. Celsius, impressed with Linnaeus's knowledge and botanical collections, and finding him necessitous, offered him board and lodging.

During this period, he came upon a critique which ultimately led to the establishment of his artificial system of plant classification. This was a review of Sébastien Vaillant's *Sermo de Structura Florum* (Leiden, 1718), a thin quarto in French and Latin; it set him upon examining the stamens and pistils of flowers, and, becoming convinced of the paramount importance of these organs, he formed the idea of basing a system of arrangement upon them. Another work by Wallin, *Γάμος φύτων, sive Nuptiae Arborum Dissertatio* (Upsala, 1729), having fallen into his hands, he drew up a short treatise on the sexes of plants, which was placed in the hands of the younger Olaf Rudbeck (1660–1740), the professor of botany in the university. In the following year Rudbeck, whose advanced age compelled him to lecture by deputy, appointed Linnaeus his adjunctus; in the spring of 1730, therefore, the latter began his lectures. The academic garden was entirely remodelled under his auspices, and furnished with many rare species. In the preceding year he had solicited appointment to the vacant post of gardener, which was refused him on the ground of his capacity for better things.

In 1732 he undertook to explore Lapland, at the cost of the Academy of Sciences of Upsala; he traversed upwards of 4600 m., and the cost of the journey is given at 530 copper dollars, or about £25 sterling. His own account was published in English by Sir J. E. Smith, under the title *Lachesis Lapponica*, in 1811; the scientific results were published in his *Flora Lapponica* (Amsterdam, 1737). In 1733 Linnaeus was engaged at Upsala in teaching the methods of assaying ores, but was prevented from delivering lectures on botany for academic reasons. At this juncture the governor of Dalecarlia invited him to travel through his province, as he had done through Lapland. Whilst on this journey, he lectured at Fahlun to large audiences; and J. Browallius (1707–1755), the chaplain there, afterwards bishop of Åbo, strongly urged him to go abroad and take his degree of M.D. at a foreign university, by which means he could afterwards settle where he pleased. Accordingly he left Sweden in 1735. Travelling by Lübeck and Hamburg, he proceeded to Harderwijk, where he went through the requisite examinations, and defended his thesis on the cause of intermittent fever. His scanty funds were now nearly spent, but he passed on through Haarlem to Leiden; there he called on Jan Fredrik Gronovius (1690–1762), who, returning the visit, was shown the *Systema naturae* in MS., and was so greatly astonished at it that he sent it to press at his own expense. This famous system, which, artificial as it was, substituted order for confusion, largely made its way on account of the lucid and admirable laws, and comments on them, which were issued almost at the same time (see BOTANY). H. Boerhaave, whom Linnaeus saw after waiting eight days for admission, recommended him to J. Burman (1707–1780), the professor of botany at Amsterdam, with whom he stayed a twelvemonth. While there he issued his *Fundamenta Botanica*, an unassuming small octavo, which exercised immense influence. For some time also he lived with the wealthy banker, G. Clifford (1685–1750), who had a magnificent garden at Hartecamp, near Haarlem.

In 1736 Linnaeus visited England. He was warmly recommended by Boerhaave to Sir Hans Sloane, who seems to have received him coldly. At Oxford Dr Thomas Shaw welcomed him cordially; J. J. Dillenius, the professor of botany, was cold at first, but afterwards changed completely, kept him a month, and even offered to share the emoluments of the chair with him. He saw Philip Miller (1691–1771), the *Hortulanorum Princeps*, at Chelsea Physic Garden, and took some plants thence to Clifford; but certain other stories which are current about his visit to England are of very doubtful authenticity.

On his return to the Netherlands he completed the printing of his *Genera Plantarum*, a volume which must be considered the starting-point of modern systematic botany. During the same year, 1737, he finished arranging Clifford's collection of plants, living and dried, described in the *Hortus Cliffortianus*. During the compilation he used to "amuse" himself with drawing up the *Critica Botanica*, also printed in the Netherlands. But this strenuous and unremitting labour told upon him; the atmosphere of the Low Countries seemed to oppress him beyond endurance; and, resisting all Clifford's entreaties to remain with him, he started homewards, yet on the way he remained a year at Leiden, and published his *Classes Plantarum* (1738). He then visited Paris, where he saw Antoine and Bernard de Jussieu, and finally sailed for Sweden from Rouen. In September 1738 he established himself as a physician in Stockholm, but, being unknown as a medical man, no one at first cared to consult him; by degrees, however, he found patients, was appointed naval physician at Stockholm, with minor appointments, and in June 1739 married Sara Moræa. In 1741 he was appointed to the chair of medicine at Upsala, but soon exchanged it for that of botany. In the same year, previous to this exchange, he travelled through Öland and Gothland, by command of the state, publishing his results in *Öländska och Gothländska Resa* (1745). The index to this volume shows the first employment of specific names in nomenclature.

Henceforward his time was taken up by teaching and the preparation of other works. In 1745 he issued his *Flora Suecica* and *Fauna Suecica*, the latter having occupied his attention during fifteen years; afterwards, two volumes of observations made during journeys in Sweden, *Wästgöta Resa* (Stockholm, 1747), and *Skånska Resa* (Stockholm, 1751). In 1748 he brought out his *Hortus Upsaliensis*, showing that he had added eleven hundred species to those formerly in cultivation in that garden. In 1750 his *Philosophia Botanica* was given to the world; it consists of a commentary on the various axioms he had published in 1735 in his *Fundamenta Botanica*, and was dictated to his pupil P. Löfling (1729–1756), while the professor was confined to his bed by an attack of gout. But the most important work of this period was his *Species Plantarum* (Stockholm, 1753), in which the specific names are fully set forth. In the same year he was created knight of the Polar Star, the first time a scientific man had been raised to that honour in Sweden. In 1755 he was invited by the king of Spain to settle in that country, with a liberal salary, and full liberty of conscience, but he declined on the ground that whatever merits he possessed should be devoted to his country's service, and Löfling was sent instead. He was enabled now to purchase the estates of Säfja and Hammarby; at the latter he built his museum of stone, to guard against loss by fire. His lectures at the university drew men from all parts of the world; the normal number of students at Upsala was five hundred, but while he occupied the chair of botany there it rose to fifteen hundred. In 1761 he was granted a patent of nobility, antedated to 1757, from which time he was styled Carl von Linné. To his great delight the tea-plant was introduced alive into Europe in 1763; in the same year his surviving son Carl (1741–1783) was allowed to assist his father in his professorial duties, and to be trained as his successor. At the age of sixty his memory began to fail; an apoplectic attack in 1774 greatly weakened him; two years after he lost the use of his right side; and he died on the 10th of January 1778 at Upsala, in the cathedral of which he was buried.

With Linnaeus arrangement seems to have been a passion; he delighted in devising classifications, and not only did he systematize the three kingdoms of nature, but even drew up a treatise on the *Genera Morborum*. When he appeared upon the scene, new plants and animals were in course of daily discovery in increasing numbers, due to the increase of trading facilities; he devised schemes of arrangement by which these acquisitions might be sorted provisionally, until their natural affinities should have become clearer. He made many mistakes; but the honour due to him for having first enunciated the principles for defining genera and species, and his uniform use of specific names, is enduring. His style is terse and laconic; he methodically treated of each organ in its proper turn, and had a special term for each, the meaning of which did not vary. The reader cannot doubt the author's intention; his sentences are business-like and to the point. The omission of the verb in his descriptions was an innovation, and gave an abruptness to his language which was foreign to the writing of his time; but it probably by its succinctness added to the popularity of his works.

No modern naturalist has impressed his own character with greater force upon his pupils than did Linnaeus. He imbued them with his own intense acquisitiveness, reared them in an atmosphere of enthusiasm, trained them to close and accurate observation, and then despatched them to various parts of the globe.

His published works amount to more than one hundred and eighty, including the *Amoenitates Academicae*, for which he provided the material, revising them also for press; corrections in his handwriting may be seen in the Banksian and Linnean Society's libraries. Many of his works were not published during his lifetime; those which were are enumerated by Dr Richard Pulteney in his *General View of the Writings of Linnaeus* (1781). His widow sold his collections and books to Sir J. E. Smith, the first president of the Linnean Society of London. When Smith died in 1828, a subscription was raised to purchase the herbarium and library for the Society, whose property they became. The manuscripts of many of Linnaeus's publications, and the letters he received from his contemporaries, also came into the possession of the Society. (B. D. J.)

LINNELL, JOHN (1792–1882), English painter, was born in London on the 16th of June 1792. His father being a carver and gilder, Linnell was early brought into contact with artists, and when he was ten years old he was drawing and selling his portraits in chalk and pencil. His first artistic instruction was received from Benjamin West, and he spent a year in the house of John Varley the water-colour painter, where he had William Hunt and Mulready as fellow-pupils, and made the acquaintance of Shelley, Godwin and other men of mark. In 1805 he was admitted a student of the Royal Academy, where he obtained medals for drawing, modelling and sculpture. He was also trained as an engraver, and executed a transcript of Varley's "Burial of Saul." In after life he frequently occupied himself with the burin, publishing, in 1834, a series of outlines from Michelangelo's frescoes in the Sistine chapel, and, in 1840, superintending the issue of a selection of plates from the pictures in Buckingham Palace, one of them, a Titian landscape, being mezzotinted by himself. At first he supported himself mainly by miniature painting, and by the execution of larger portraits, such as the likenesses of Mulready, Whately, Peel and Carlyle. Several of his portraits he engraved with his own hand in line and mezzotint. He also painted many subjects like the "St John Preaching," the "Covenant of Abraham," and the "Journey to Emmaus," in which, while the landscape is usually prominent the figures are yet of sufficient importance to supply the title of the work. But it is mainly in connexion with his paintings of pure landscape that his name is known. His works commonly deal with some scene of typical uneventful English landscape, which is made impressive by a gorgeous effect of sunrise or sunset. They are full of true poetic feeling, and are rich and glowing in colour. Linnell was able to command very large prices for his pictures, and about 1850 he purchased a property at Redhill, Surrey, where he resided till his death on the 20th of January 1882, painting with unabated power till within the last few years of his life. His leisure was greatly occupied with a study of the Scriptures in the original, and he published several pamphlets and larger treatises of Biblical criticism. Linnell was one of the best friends and kindest patrons of William Blake. He gave him the two largest commissions he ever received for single series of designs—£150 for drawings and engravings of *The Inventions to the Book of Job*, and a like sum for those illustrative of Dante.

LINNET, O. Eng. *Linete* and *Linet-wige*, whence seems to have been corrupted the old Scottish "Lintquhit," and the modern northern English "Lintwhite"—originally a somewhat generalized bird's name, but latterly specialized for the *Fringilla cannabina* of Linnaeus, the *Linota cannabina* of recent ornithologists. This is a common song-bird, frequenting almost the whole of Europe south of lat. 64°, and in Asia extending to Turkestan. It is known as a winter visitant to Egypt and Abyssinia, and is abundant at all seasons in Barbary, as well as in the Canaries and Madeira. Though the fondness of this species for the seeds of flax (*Linum*) and hemp (*Cannabis*) has given it its common name in so many European languages,[1] it feeds largely, if not chiefly in Britain on the seeds of plants of the order *Compositae*, especially those growing on heaths and commons. As these waste places have been gradually brought under the plough, in England and Scotland particularly, the haunts and means of subsistence of the linnet have been curtailed, and hence its numbers have undergone a very visible diminution throughout Great Britain. According to its sex, or the season of the year, it is known as the red, grey or brown linnet, and by the earlier English writers on birds, as well as in many localities at the present time, these names have been held to distinguish at least two species; but there is now no question among ornithologists on this point, though the conditions under which the bright crimson-red colouring of the breast and crown of the cock's spring and summer plumage is donned and doffed may still be open to discussion. Its intensity seems due, however, in some degree at least, to the weathering of the brown fringes of the feathers which hide the more brilliant hue, and in the Atlantic islands examples are said to retain their gay tints all the year round, while throughout Europe there is scarcely a trace of them visible in autumn and winter; but, beginning to appear in spring, they reach their greatest brilliancy towards midsummer; they are never assumed by examples in confinement. The linnet begins to breed in April, the nest being generally placed in a bush at no great distance from the ground. It is nearly always a neat structure composed of fine twigs, roots or bents, and lined with wool or hair. The eggs, often six in number, are of a very pale blue marked with reddish or purplish brown. Two broods seem to be common in the course of the season, and towards the end of summer the birds—the young greatly preponderating in number—collect in large flocks and move to the sea-coast, whence a large proportion depart for more southern latitudes. Of these emigrants some return the following spring, and are recognizable by the more advanced state of their plumage, the effect presumably of having wintered in countries enjoying a brighter and hotter sun.

Nearly allied to the foregoing species is the twite, so named from its ordinary call-note, or mountain-linnet, the *Linota flavirostris*, or *L. montium* of ornithologists, which can be distinguished by its yellow bill, longer tail and reddish-tawny throat. This bird never assumes any crimson on the crown or breast, but the male has the rump at all times tinged more or less with that colour. In Great Britain in the breeding-season it seems to affect exclusively hilly and moorland districts from Herefordshire northward, in which it partly or wholly replaces the common linnet, but is very much more local in its distribution, and, except in the British Islands and some parts of Scandinavia, it only appears as an irregular visitant in winter. At that season it may, however, be found in large flocks in the low-lying countries, and as regards England even on the seashore. In Asia it seems to be represented by a kindred form *L. brevirostris*.

The redpolls form a little group placed by many authorities in the genus *Linota*, to which they are unquestionably closely allied, and, as stated elsewhere (see FINCH), the linnets seem to be related to the birds of the genus *Leucosticte*, the species of which inhabit the northern parts of North-West America and of Asia. *L. tephrocotis* is generally of a chocolate colour, tinged on some parts with pale crimson or pink, and has the crown of the head silvery-grey. Another species, *L. arctoa*, was formerly said to have occurred in North America, but its proper home is in the Kurile Islands or Kamchatka. This has no red in its plumage. The birds of the genus *Leucosticte* seem to be more terrestrial in their habit than those of *Linota*, perhaps from their having been chiefly observed where trees are scarce; but it is possible that the mutual relationship of the two groups is more apparent than real. Allied to *Leucosticte* is *Montifringilla*, to which belongs the snow-finch of the Alps, *M. nivalis*, often mistaken by travellers for the snow-bunting, *Plectrophanes nivalis*. (A. N.)

LINSANG, the native name of one of the members of the viverrine genus *Linsanga*. There are four species of the genus, from the Indo-Malay countries. Linsangs are civet-like creatures, with the body and tail greatly elongated; and the ground colour fulvous marked with bold black patches, which in one species (*L. pardicolor*) are oblong. In West Africa the group is represented by the smaller and spotted *Poiana richardsoni* which has a genet-like hind-foot. (See CARNIVORA.)

LINSEED, the seed of the common flax (*q.v.*) or lint, *Linum usitatissimum*. These seeds, the linseed of commerce, are of a lustrous brown colour externally, and a compressed and elongated oval form, with a slight beak or projection at one extremity. The brown testa contains, in the outer of the four coats into which it is microscopically distinguishable, an abundant secretion of mucilaginous matter; and it has within it a thin layer of albumen, enclosing a pair of large oily cotyledons. The seeds when placed in water for some time become coated with glutinous matter from the exudation of the mucilage in the external layer of the epidermis; and by boiling in sixteen parts of water they exude sufficient mucilage to form with the water a thick pasty decoction. The cotyledons contain the valuable linseed oil referred to below. Linseed grown in tropical countries is much larger and more plump than that obtained in temperate climes, but the seed from the colder countries yields a finer quality of oil.

Linseed formed an article of food among the Greeks and Romans, and it is said that the Abyssinians at the present day eat it roasted. The oil is to some extent used as food in Russia and in parts of Poland and Hungary. The still prevalent use of linseed in poultices for open wounds is entirely to be reprobated. It has now been abandoned by practitioners. The principal objections to this use of linseed is that it specially favours the growth of micro-organisms. There are numerous clean and efficient substitutes which have all its supposed advantages and none of its disadvantages. There are now no medicinal uses of this substance. Linseed cake, the marc left after the expression of the oil, is a most valuable feeding substance for cattle.

Linseed is subject to extensive and detrimental adulterations, resulting not only from careless harvesting and cleaning, whereby seeds of the flax dodder, and other weeds and grasses are mixed with it, but also from the direct admixture of cheaper and inferior oil-seeds, such as wild rape, mustard, sesame, poppy, &c., the latter adulterations being known in trade under the generic name of "buffum." In 1864, owing to the serious aspect of the prevalent adulteration, a union of traders was formed under the name of the "Linseed Association." This body samples all linseed oil arriving in England and reports on its value.

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[1] *E.g.* Fr. *Linotte*, Ger. *Hänfling*, Swed. *Hämpling*.

Linseed oil, the most valuable drying oil, is obtained by expression from the seeds, with or without the aid of heat. Preliminary to the operation of pressing, the seeds are crushed and ground to a fine meal. Cold pressing of the seeds yields a golden-yellow oil, which is often used as an edible oil. Larger quantities are obtained by heating the crushed seeds to 160° F. (71° C.), and then expressing the oil. So obtained, it is somewhat turbid and yellowish-brown in colour. On storing, moisture and mucilaginous matter gradually settle out. After storing several years it is known commercially as "tanked oil," and has a high value in varnish-making. The delay attendant on this method of purification is avoided by treating the crude oil with 1 to 2% of a somewhat strong sulphuric acid, which chars and carries down the bulk of the impurities. For the preparation of "artist's oil," the finest form of linseed oil, the refined oil is placed in shallow trays covered with glass, and exposed to the action of the sun's rays. Numerous other methods of purification, some based on the oxidizing action of ozone, have been suggested. The yield of oil from different classes of seed varies, but from 23 to 28% of the weight of the seed operated on should be obtained. A good average quality of seed weighing about 392 ℔ per quarter has been found in practice to give out 109 ℔ of oil.

Commercial linseed oil has a peculiar, rather disagreeable sharp taste and smell; its specific gravity is given as varying from 0·928 to 0·953, and it solidifies at about −27°. By saponification it yields a number of fatty acids—palmitic, myristic, oleic, linolic, linolenic and isolinolenic. Exposed to the air in thin films, linseed oil absorbs oxygen and forms "linoxyn," a resinous semi-elastic, caoutchouc-like mass, of uncertain composition. The oil, when boiled with small proportions of litharge and minium, undergoes the process of resinification in the air with greatly increased rapidity.

Its most important use is in the preparation of oil paints and varnishes. By painters both raw and boiled oil are used, the latter forming the principal medium in oil painting, and also serving separately as the basis of all oil varnishes. Boiled oil is prepared in a variety of ways—that most common being by heating the raw oil in an iron or copper boiler, which, to allow for frothing, must only be about three-fourths filled. The boiler is heated by a furnace, and the oil is brought gradually to the point of ebullition, at which it is maintained for two hours, during which time moisture is driven off, and the scum and froth which accumulate on the surface are ladled out. Then by slow degrees a proportion of "dryers" is added—usually equal weights of litharge and minium being used to the extent of 3% of the charge of oil; and with these a small proportion of umber is generally thrown in. After the addition of the dryers the boiling is continued two or three hours; the fire is then suddenly withdrawn, and the oil is left covered up in the boiler for ten hours or more. Before sending out, it is usually stored in settling tanks for a few weeks, during which time the uncombined dryers settle at the bottom as "foots." Besides the dryers already mentioned, lead acetate, manganese borate, manganese dioxide, zinc sulphate and other bodies are used.

Linseed oil is also the principal ingredient in printing and lithographic inks. The oil for ink-making is prepared by heating it in an iron pot up to the point where it either takes fire spontaneously or can be ignited with any flaming substance. After the oil has been allowed to burn for some time according to the consistence of the varnish desired, the pot is covered over, and the product when cooled forms a viscid tenacious substance which in its most concentrated form may be drawn into threads. By boiling this varnish with dilute nitric acid vapours of acrolein are given off, and the substance gradually becomes a solid non-adhesive mass the same as the ultimate oxidation product of both raw and boiled oil.

Linseed oil is subject to various falsifications, chiefly through the addition of cotton-seed, niger-seed and hemp-seed oils; and rosin oil and mineral oils also are not infrequently added. Except by smell, by change of specific gravity, and by deterioration of drying properties, these adulterations are difficult to detect.

LINSTOCK (adapted from the Dutch *lontstok*, *i.e.* "match-stick," from *lont*, a match, *stok*, a stick; the word is sometimes erroneously spelled "lintstock" from a supposed derivation from "lint" in the sense of tinder), a kind of torch made of a stout stick a yard in length, with a fork at one end to hold a lighted match, and a point at the other to stick in the ground. "Linstocks" were used for discharging cannon in the early days of artillery.

LINT (in M. Eng. *linnet*, probably through Fr. *linette*, from *lin*, the flax-plant; cf. "line"), properly the flax-plant, now only in Scots dialect; hence the application of such expressions as "lint-haired," "lint white locks" to flaxen hair. It is also the term applied to the flax when prepared for spinning, and to the waste material left over which was used for tinder. "Lint" is still the name given to a specially prepared material for dressing wounds, made soft and fluffy by scraping or ravelling linen cloth.

LINTEL (O. Fr. *lintel*, mod. *linteau*, from Late Lat. *limitellum*, *limes*, boundary, confused in sense with *limen*, threshold; the Latin name is *supercilium*, Ital. *soprasogli*, and Ger. *Sturz*), in architecture, a horizontal piece of stone or timber over a doorway or opening, provided to carry the superstructure. In order to relieve the lintel from too great a pressure a "discharging arch" is generally built over it.

LINTH, or LIMMAT, a river of Switzerland, one of the tributaries of the Aar. It rises in the glaciers of the Tödi range, and has cut out a deep bed which forms the Grossthal that comprises the greater portion of the canton of Glarus. A little below the town of Glarus the river, keeping its northerly direction, runs through the alluvial plain which it has formed, towards the Walensee and the Lake of Zürich. But between the Lake of Zürich and the Walensee the huge desolate alluvial plain grew ever in size, while great damage was done by the river, which overflowed its bed and the dykes built to protect the region near it. The Swiss diet decided in 1804 to undertake the "correction" of this turbulent stream. The necessary works were begun in 1807 under the supervision of Hans Conrad Escher of Zürich (1767–1823). The first portion of the undertaking was completed in 1811, and received the name of the "Escher canal," the river being thus diverted into the Walensee. The second portion, known as the "Linth canal," regulated the course of the river between the Walensee and the Lake of Zürich and was completed in 1816. Many improvements and extra protective works were carried out after 1816, and it was estimated that the total cost of this great engineering undertaking from 1807 to 1902 amounted to about £200,000, the date for the completion of the work being 1911. To commemorate the efforts of Escher, the Swiss diet in 1823 (after his death) decided that his male descendants should bear the name of "Escher von der Linth." On issuing from the Lake of Zürich the Linth alters its name to that of "Limmat," it does not appear wherefore, and, keeping the north-westerly direction it had taken from the Walensee, joins the Aar a little way below Brugg, and just below the junction of the Reuss with the Aar. (W. A. B. C.)

LINTON, ELIZA LYNN (1822–1898), English novelist, daughter of the Rev. J. Lynn, vicar of Crosthwaite, in Cumberland, was born at Keswick on the 10th of February 1822. She early manifested great independence of character, and in great measure educated herself from the stores of her father's library. Coming to London about 1845 with a large stock of miscellaneous erudition, she turned this to account in her first novels, *Azeth the Egyptian* (1846) and *Amymone* (1848), a romance of the days of Pericles. Her next story, *Realities*, a tale of modern life (1851), was not successful, and for several years she seemed to have abandoned fiction. When, in 1865, she reappeared with *Grasp your Nettle*, it was as an expert in a new style of novel-writing—stirring, fluent, ably-constructed stories, retaining the attention throughout, but affording little to reflect upon or to remember. Measured by their immediate success, they gave her an honourable position among the writers of her day, and secure of an audience, she continued to write with vigour nearly until her death. *Lizzie Lorton of Greyrigg* (1866), *Patricia Kemball* (1874), *The Atonement of Leam Dundas* (1877) are among the best examples of this more mechanical side of her talent, to which there were notable exceptions in *Joshua Davidson* (1872), a bold but not irreverent adaptation of the story of the Carpenter of Nazareth to that of the French Commune; and *Christopher Kirkland*, a veiled autobiography (1885). Mrs Linton was a practised and constant writer in the journals of the day; her articles on the "Girl of the Period" in the *Saturday Review* produced a great sensation, and she was a constant contributor to the *St James's Gazette*, the *Daily News* and other leading newspapers. Many of her detached essays have been collected. In 1858 she married W. J. Linton, the engraver, but the union was soon terminated by mutual consent; she nevertheless brought up one of Mr Linton's daughters by a former marriage. A few years before her death she retired to Malvern. She died in London on the 14th of July 1898.

Her reminiscences appeared after her death under the title of *My Literary Life* (1899) and her life has been written by G. S. Layard (1901).

LINTON, WILLIAM JAMES (1812–1897), English wood-engraver, republican and author, was born in London. He was educated at Stratford, and in his sixteenth year was apprenticed to the wood-engraver G. W. Bonner. His earliest known work is to be found in Martin and Westall's *Pictorial Illustrations of the Bible* (1833). He rapidly rose to a place amongst the foremost wood-engravers of the time. After working as a journeyman engraver with two or three firms, losing his money over a cheap political library called the "National," and writing a life of Thomas Paine, he went into partnership (1842) with John Orrin Smith. The firm was immediately employed on the *Illustrated London News*, just then projected. The following year Orrin Smith died, and Linton, who had married a sister of Thomas Wade, editor of *Bell's Weekly Messenger*, found himself in sole charge of a business upon which two families were dependent. For years he had concerned himself with the social and European political problems of the time, and was now actively engaged in the republican propaganda. In 1844 he took a prominent part in exposing the violation by the English post-office of Mazzini's correspondence. This led to a friendship with the Italian revolutionist, and Linton threw himself with ardour into European politics. He carried the first congratulatory address of English workmen to the French Provisional Government in 1848. He edited a twopenny weekly paper, *The Cause of the People*, published in the Isle of Man, and he wrote political verses for the Dublin *Nation*, signed "Spartacus." He helped to found the "International League" of patriots, and, in 1850, with G. H. Lewes and Thornton Hunt, started *The Leader*, an organ which, however, did not satisfy his advanced republicanism, and from which he soon withdrew. The same year he wrote a series of articles propounding the views of Mazzini in *The Red Republican*. In 1852 he took up his residence at Brantwood, which he afterwards sold to John Ruskin, and from there issued *The English Republic*, first in the form of weekly tracts and afterwards as a monthly magazine—"a useful exponent of republican principles, a faithful record of republican progress throughout the world; an organ of propagandism and a medium of communication for the active republicans in England." Most of the paper, which never paid its way and was abandoned in 1855, was written by himself. In 1852 he also printed for private circulation an anonymous volume of poems entitled *The Plaint of Freedom*. After the failure of his paper he returned to his proper work of wood-engraving. In 1857 his wife died, and in the following year he married Eliza Lynn (afterwards known as Mrs Lynn Linton) and returned to London. In 1864 he retired to Brantwood, his wife remaining in London. In 1867, pressed by financial difficulties, he determined to try his fortune in America, and finally separated from his wife, with whom, however, he always corresponded affectionately. With his children he settled at Appledore, New Haven, Connecticut, where he set up a printing-press. Here he wrote *Practical Hints on Wood-Engraving* (1879), *James Watson, a Memoir of Chartist Times* (1879), *A History of Wood-Engraving in America* (1882), *Wood-Engraving, a Manual of Instruction* (1884), *The Masters of Wood-Engraving*, for which he made two journeys to England (1890), *The Life of Whittier* (1893), and *Memories*, an autobiography (1895). He died at New Haven on the 29th of December 1897. Linton was a singularly gifted man, who, in the words of his wife, if he had not bitten the Dead Sea apple of impracticable politics, would have risen higher in the world of both art and letters. As an engraver on wood he reached the highest point of execution in his own line. He carried on the tradition of Bewick, fought for intelligent as against merely manipulative excellence in the use of the graver, and championed the use of the "white line" as well as of the black, believing with Ruskin that the former was the truer and more telling basis of aesthetic expression in the wood-block printed upon paper.

See W. J. Linton, *Memories*; F. G. Kitton, article on "Linton" in *English Illustrated Magazine* (April 1891); G. S. Layard, *Life of Mrs Lynn Linton* (1901). (G. S. L.)

LINTOT, BARNABY BERNARD (1675–1736), English publisher, was born at Southwater, Sussex, on the 1st of December 1675, and started business as a publisher in London about 1698. He published for many of the leading writers of the day, notably Vanbrugh, Steele, Gay and Pope. The latter's *Rape of the Lock* in its original form was first published in *Lintot's Miscellany*, and Lintot subsequently issued Pope's translation of the *Iliad* and the joint translation of the *Odyssey* by Pope, Fenton and Broome. Pope quarrelled with Lintot with regard to the supply of free copies of the latter translation to the author's subscribers, and in 1728 satirized the publisher in the *Dunciad*, and in 1735 in the *Prologue to the Satires*, though he does not appear to have had any serious grievance. Lintot died on the 3rd of February 1736.

LINUS, one of the saints of the Gregorian canon, whose festival is celebrated on the 23rd of September. All that can be said with certainty about him is that his name appears at the head of all the lists of the bishops of Rome. Irenaeus (*Adv. Haer.* iii. 3. 3) identifies him with the Linus mentioned by St Paul in 2 Tim. iv. 21. According to the *Liber Pontificalis*, Linus suffered martyrdom, and was buried in the Vatican. In the 17th century an inscription was found near the confession of St Peter, which was believed to contain the name Linus; but it is not certain that this epitaph has been read correctly or completely. The apocryphal Latin account of the death of the apostles Peter and Paul is falsely attributed to Linus.

See *Acta Sanctorum*, Septembris, vi. 539-545; C. de Smedt, *Dissertationes selectae in primam aetatem hist. eccl.* pp. 300-312 (Ghent, 1876); L. Duchesne's edition of the *Liber Pontificalis*, i. 121 (Paris, 1886); R. A. Lipsius, *Die apokryphen Apostelgeschichten*, ii. 85-96 (Brunswick, 1883–1890); J. B. de Rossi, *Bullettino di archeologia cristiana*, p. 50 (1864). (H. De.)

LINUS, one of a numerous class of heroic figures in Greek legend, of which other examples are found in Hyacinthus and Adonis. The connected legend is always of the same character: a beautiful youth, fond of hunting and rural life, the favourite of some god or goddess, suddenly perishes by a terrible death. In many cases the religious background of the legend is preserved by the annual ceremonial that commemorated it. At Argos this religious character of the Linus myth was best preserved: the secret child of Psamathe by the god Apollo, Linus is exposed, nursed by sheep and torn in pieces by sheep-dogs. Every year at the festival Arnis or Cynophontis, the women of Argos mourned for Linus and propitiated Apollo, who in revenge for his child's death had sent a female monster (Poinē), which tore the children from their mothers' arms. Lambs were sacrificed, all dogs found running loose were killed, and women and children raised a lament for Linus and Psamathe (Pausanias i. 43. 7; Conon, *Narrat.* 19). In the Theban version, Linus, the son of Amphimarus and the muse Urania, was a famous musician, inventor of the Linus song, who was said to have been slain by Apollo, because he had challenged him to a contest (Pausanias ix. 29. 6). A later story makes him the teacher of Heracles, by whom he was killed because he had rebuked his pupil for stupidity (Apollodorus ii. 4. 9). On Mount Helicon there was a grotto containing his statue, to which sacrifice was offered every year before the sacrifices to the Muses. From being the inventor of musical methods, he was finally transformed by later writers into a composer of prophecies and legends. He was also said to have adapted the Phoenician letters introduced by Cadmus to the Greek language. It is generally agreed that Linus and Ailinus are of Semitic origin, derived from the words *ai lanu* (woe to us), which formed the burden of the Adonis and similar songs popular in the East. The Linus song is mentioned in Homer; the tragedians often use the word αἴλινος as the refrain in mournful songs, and Euripides calls the custom a Phrygian one. Linus, originally the personification of the song of lamentation, becomes, like Adonis, Maneros, Narcissus, the representative of the tender life of nature and of the vegetation destroyed by the fiery heat of the dog-star.

The chief work on the subject is H. Brugsch, *Die Adonisklage und das Linoslied* (1852); see also article in Roscher's *Lexikon der Mythologie*; J. G. Frazer, *Golden Bough* (ii. 224, 253), where, the identity of Linus with Adonis (possibly a corn-spirit) being assumed, the lament is explained as the lamentation of the reapers over the dead corn-spirit; W. Mannhardt, *Wald- und Feldculte*, ii. 281.

LINZ, capital of the Austrian duchy and crownland of Upper Austria, and see of a bishop, 117 m. W. of Vienna by rail. Pop. (1900) 58,778. It lies on the right bank of the Danube and is connected by an iron bridge, 308 yds. long, with the market-town of Urfahr (pop. 12,827) on the opposite bank. Linz possesses two cathedrals, one built in 1669–1682 in rococo style, and another in early Gothic style, begun in 1862. In the Capuchin church is the tomb of Count Raimondo Montecucculi, who died at Linz in 1680. The museum Francisco-Carolinum, founded in 1833 and reconstructed in 1895, contains several important collections relating to the history of Upper Austria. In the Franz Josef-Platz stands a marble monument, known as Trinity Column, erected by the emperor Charles VI. in 1723, commemorating the triple deliverance of Linz from war, fire, and pestilence. The principal manufactories are of tobacco, boat-building, agricultural implements, foundries and cloth factories. Being an important railway junction and a port of the Danube, Linz has a very active transit trade.

Linz is believed to stand on the site of the Roman station *Lentia*. The name of Linz appears in documents for the first time in 799 and it received municipal rights in 1324. In 1490 it became the capital of the province above the Enns. It successfully resisted the attacks of the insurgent peasants under Stephen Fadinger on the 21st and 22nd of July 1626, but its suburbs were laid in ashes. During the siege of Vienna in 1683, the castle of Linz was the residence of Leopold I. In 1741, during the War of the Austrian Succession, Linz was taken by the Bavarians, but was recovered by the Austrians in the following year. The bishopric was established in 1784.

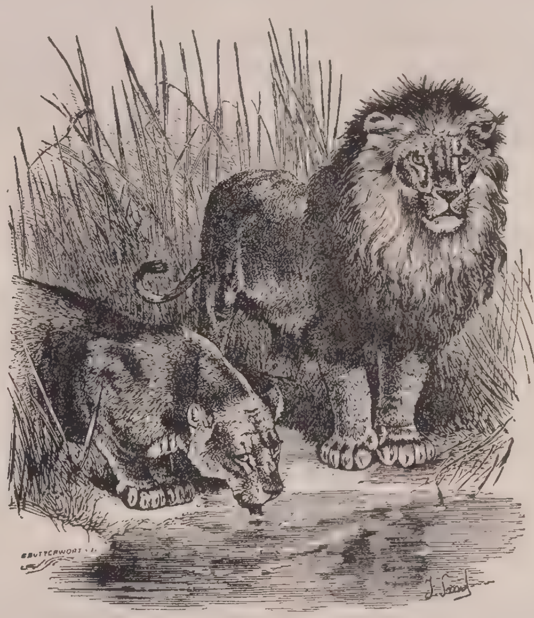
See F. Krackowitzer, *Die Donaustadt Linz* (Linz, 1901).

LION (Lat. *leo, leonis*; Gr. λέων). From the earliest historic times few animals have been better known to man than the lion. Its habitat made it familiar to all the races among whom human civilization took its origin. The literature of the ancient Hebrews abounds in allusions to the lion; and the almost incredible numbers stated to have been provided for exhibition and destruction in the Roman amphitheatres (as many as six hundred on a single occasion by Pompey, for example) show how abundant these animals must have been within accessible distance of Rome.

Even within the historic period the geographical range of the lion covered the whole of Africa, the south of Asia, including Syria, Arabia, Asia Minor, Persia and the greater part of northern and central India. Professor A. B. Meyer, director of the zoological museum at Dresden, has published an article on the alleged existence of the lion in historical times in Greece, a translation of which appears in the *Report* of the Smithsonian Institution for 1905. Meyer is of opinion that the writer of the *Iliad* was probably acquainted with the lion, but this does not prove its former existence in Greece. The accounts given by Herodotus and Aristotle merely go to show that about 500 B.C. lions existed in some part of eastern Europe. The Greek name for the lion is very ancient, and this suggests, although by no means demonstrates, that it refers to an animal indigenous to the country. Although the evidence is not decisive, it seems probable that lions did exist in Greece at the time of Herodotus; and it is quite possible that the representation of a lion-chase incised on a Mycenean dagger may have been taken from life. In prehistoric times the lion was spread over the greater part of Europe; and if, as is very probable, the so-called *Felis atrox* be inseparable, its range also included the greater part of North America.

At the present day the lion is found throughout Africa (save in places where it has been exterminated by man) and in Mesopotamia, Persia, and some parts of north-west India. According to Dr W. T. Blanford, lions are still numerous in the reedy swamps, bordering the Tigris and Euphrates, and also occur on the west flanks of the Zagros mountains and the oak-clad ranges near Shiraz, to which they are attracted by the herds of swine which feed on the acorns. The lion nowhere exists in the table-land of Persia, nor is it found in Balūchistān. In India it is confined to the province of Kathiawar in Gujerat, though within the 19th century it extended through the north-west parts of Hindustan, from Bahāwalpur and Sind to at least the Jumna (about Delhi) southward as far as Khāndesh, and in central India through the Sagur and Narbuda territories, Bundelkund, and as far east as Palamau. It was extirpated in Hariāna about 1824. One was killed at Rhyli, in the Dumaoh district, Sagur and Narbuda territories, so late as in the cold season of 1847–1848; and about the same time a few still remained in the valley of the Sind river in Kotah, central India.

The variations in external characters which lions present, especially in the colour and the amount of mane, as well as in the general colour of the fur, indicate local races, to which special names have been given; the Indian lion being *F. leo gujratensis*. It is noteworthy, however, that, according to Mr F. C. Selous, in South Africa the black-maned lion and others with yellow scanty manes are found, not only in the same locality, but even among individuals of the same parentage.



After a Drawing by Woll in Elliot's Monograph of the *Felidae*.

FIG. 1.—Lion and Lioness (*Felis leo*).

The lion belongs to the genus *Felis* of Linnaeus (for the characters and position of which see CARNIVORA), and differs from the tiger and leopard in its uniform colouring, and from all the other *Felidae* in the hair of the top of the head, chin and neck, as far back as the shoulder, being not only much longer, but also differently disposed from the hair elsewhere, being erect or directed forwards, and so constituting the characteristic ornament called the mane. There is also a tuft of elongated hairs at the end of the tail, one upon each elbow, and in most lions a copious fringe along the middle line of the under surface of the body, wanting, however, in some examples. These characters are, however, peculiar to the adults of the male sex; and even as regards coloration young lions show indications of the darker stripes and mottlings so characteristic of the greater number of the members of the genus. The usual colour of the adult is yellowish-brown, but it may vary from a deep red or chestnut brown to an almost silvery grey. The mane, as well as the long hair of the other parts of the body, sometimes scarcely differs from the general colour, but is usually darker and not unfrequently nearly black. The mane begins to grow when the animal is about three years old, and is fully developed at five or six.

In size the lion is only equalled or exceeded by the tiger among existing *Felidae*; and though both species present great variations, the largest specimens of the latter appear to surpass the largest lions. A full-sized South African lion, according to Selous, measures slightly less than 10 ft. from nose to tip of tail, following the curves of the body. Sir Cornwallis Harris gives 10 ft. 6 in., of which the tail occupies 3 ft. The lioness is about a foot less.

The internal structure of the lion, except in slight details, resembles that of other *Felidae*, the whole organization being that of an animal adapted for an active, predaceous existence. The teeth especially exemplify the carnivorous type in its highest condition of development. The most important function they have to perform, that of seizing and holding firmly animals of considerable size and strength, violently struggling for life, is provided for by the great, sharp-pointed and sharp-edged canines, placed wide apart at the angles of the mouth, the incisors between them being greatly reduced in size and kept back nearly to the same level, so as not to interfere with their action. The jaws are short and strong, and the width of the zygomatic arches, and great development of the bony ridges on the skull, give ample space for the attachment of the powerful muscles by which they are closed. In the cheek-teeth the sectorial or scissor-like cutting function is developed at the expense of the tubercular or grinding, there being only one rudimentary tooth of the latter form in the upper jaw, and none in the lower. They are, however, sufficiently strong to break bones of large size. The tongue is long and flat, and remarkable for the development of the papillae of the anterior part of the dorsal surface, which (except near the edge) are modified so as to resemble long, compressed, recurved, horny spines or claws, which, near the middle line, attain the length of one-fifth of an inch. They give the part of the tongue on which they occur the appearance and feel of a coarse rasp. The feet are furnished with round soft pads or cushions covered with thick, naked skin, one on the under surface of each of the principal toes, and one larger one of trilobed form, behind these, under the lower ends of the metacarpal and metatarsal bones, which are placed nearly vertically in ordinary progression. The claws are large, strongly compressed, sharp, and exhibit the retractile condition in the highest degree, being drawn backwards and upwards into a sheath by the action of an elastic ligament so long as the foot is in a state of repose, but exerted by muscular action when the animal strikes its prey.

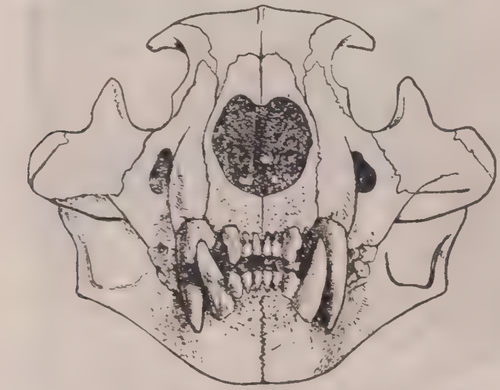


FIG. 2.—Front View of Skull of Lion.

The lion lives chiefly in sandy plains and rocky places interspersed with dense thorn-thickets, or frequents the low bushes and tall rank grass and reeds that grow along the sides of streams and near the springs where it lies in wait for the larger herbivorous animals on which it feeds. Although occasionally seen abroad during the day, especially in wild and desolate regions, where it is subject to little molestation, the night is, as in the case of so many other predaceous animals, the period of its greatest activity. It is then that its characteristic roar is chiefly heard, as thus graphically described by Gordon-Cumming:—

> "One of the most striking things connected with the lion is his voice, which is extremely grand and peculiarly striking. It consists at times of a low deep moaning, repeated five or six times, ending in faintly audible sighs; at other times he startles the forest with loud, deep-toned, solemn roars, repeated in quick succession, each increasing in loudness to the third or fourth, when his voice dies away in five or six low muffled sounds very much resembling distant thunder. At times, and not unfrequently, a troop may be heard, roaring in concert, one assuming the lead, and two, three or four more regularly taking up their parts, like persons singing a catch. Like our Scottish stags at the rutting season, they roar loudest in cold frosty nights; but on no occasions are their voices to be heard in such perfection, or so intensely powerful, as when two or three troops of strange lions approach a fountain to drink at the same time. When this occurs, every member of each troop sounds a bold roar of defiance at the opposite parties; and when one roars, all roar together, and each seems to vie with his comrades in the intensity and power of his voice. The power and grandeur of these nocturnal concerts is inconceivably striking and pleasing to the hunter's ear."

"The usual pace of a lion," C. J. Andersson says, "is a walk, and, though apparently rather slow, yet, from the great length of his body, he is able to get over a good deal of ground in a short time. Occasionally he trots, when his speed is not inconsiderable. His gallop—or rather succession of bounds—is, for a short distance, very fast—nearly or quite equal to that of a horse."

"The lion, as with other members of the feline family," the same writer says, "seldom attacks his prey openly, unless compelled by extreme hunger. For the most part he steals upon it in the manner of a cat, or ambushes himself near to the water or a pathway frequented by game. At such times he lies crouched upon his belly in a thicket until the animal approaches sufficiently near, when, with one prodigious bound, he pounces upon it. In most cases he is successful, but should his intended victim escape, as at times happens, from his having miscalculated the distance, he may make a second or even a third bound, which, however, usually prove fruitless, or he returns disconcerted to his hiding-place, there to wait for another opportunity." His food consists of all the larger herbivorous animals of the country in which he resides—buffaloes, antelopes, zebras, giraffes or even young elephants or rhinoceroses. In cultivated districts cattle, sheep, and even human inhabitants are never safe from his nocturnal ravages. He appears, however, as a general rule, only to kill when hungry or attacked, and not for the mere pleasure of killing, as with some other carnivorous animals. He, moreover, by no means limits himself to animals of his own killing, but, according to Selous, often prefers eating game that has been killed by man, even when not very fresh, to taking the trouble to catch an animal himself.

The lion appears to be monogamous, a single male and female continuing attached to each other irrespectively of the pairing season. At all events the lion remains with the lioness while the cubs are young and helpless, and assists in providing her and them with food, and in educating them in the art of providing for themselves. The number of cubs at a birth is from two to four, usually three. They are said to remain with their parents till they are about three years old.

Though not strictly gregarious, lions appear to be sociable towards their own species, and often are found in small troops sometimes consisting of a pair of old ones with their nearly full-grown cubs, but occasionally of adults of the same sex; and there seems to be evidence that several lions will associate for the purpose of hunting upon a preconcerted plan. Their natural ferocity and powerful armature are sometimes turned upon one another; combats, often mortal, occur among male lions under the influence of jealousy; and Andersson relates an instance of a quarrel between a hungry lion and lioness over the carcase of an antelope which they had just killed, and which did not seem sufficient for the appetite of both, ending in the lion not only killing, but devouring his mate. Old lions, whose teeth have become injured with constant wear, become "man-eaters," finding their easiest means of obtaining a subsistence in lurking in the neighbourhood of villages, and dashing into the tents at night and carrying off one of the sleeping inmates. Lions never climb.

With regard to the character of the lion, those who have had opportunities of observing it in its native haunts differ greatly. The accounts of early writers as to its courage, nobility and magnanimity have led to a reaction, causing some modern authors to accuse it of cowardice and meanness. Livingstone goes so far as to say, "nothing that I ever learned of the lion could lead me to attribute to it either the ferocious or noble character ascribed to it elsewhere," and he adds that its roar is not distinguishable from that of the ostrich. These different estimates depend to a great extent upon the particular standard of the writer, and also upon the circumstance that lions, like other animals, show considerable individual differences in character, and behave differently under varying circumstances.

(W. H. F.; R. L.*)

LIONNE, HUGUES DE (1611–1671), French statesman, was born at Grenoble on the 11th of October 1611, of an old family of Dauphiné. Early trained for diplomacy, his remarkable abilities attracted the notice of Cardinal Mazarin, who sent him as secretary of the French embassy to the congress of Münster, and, in 1642, on a mission to the pope. In 1646 he became secretary to the queen regent; in 1653 obtained high office in the king's household; and in 1654 was ambassador extraordinary at the election of Pope Alexander VII. He was instrumental in forming the league of the Rhine, by which Austria was cut off from the Spanish Netherlands, and, as minister of state, was associated with Mazarin in the Peace of the Pyrenees (1659), which secured the marriage of Louis XIV. to the infanta Maria Theresa. At the cardinal's dying request he was appointed his successor in foreign affairs, and, for the next ten years, continued to direct French foreign policy. Among his most important diplomatic successes were the treaty of Breda (1667), the treaty of Aix-la-Chapelle (1668) and the sale of Dunkirk. He died in Paris on the 1st of September 1671, leaving memoirs. He was a man of pleasure, but his natural indolence gave place to an unflagging energy when the occasion demanded it; and, in an age of great ministers, his consummate statesmanship placed him in the front rank.

See Ulysse Chevalier, *Lettres inédites de Hugues de Lionne . . . précédées d'une notice historique sur la famille de Lionne* (Valence, 1879); J. Valfrey, *La diplomatie française au XVIII^e siècle: Hugues de Lionne, ses ambassadeurs* (2 vols., Paris, 1877–1881). For further works see Rochas, *Biogr. du Dauphiné* (Paris, 1860), tome ii. p. 87.

LIOTARD, JEAN ETIENNE (1702–1789), French painter, was born at Geneva. He began his studies under Professor Gardelle and Petitot, whose enamels and miniatures he copied with considerable skill. He went to Paris in 1725, studying under J. B. Massé and F. le Moyne, on whose recommendation he was taken to Naples by the Marquis Puysieux. In 1735 he was in Rome, painting the portraits of Pope Clement XII. and several cardinals. Three years later he accompanied Lord Duncannon to Constantinople, whence he went to Vienna in 1742 to paint the portraits of the imperial family. His eccentric adoption of oriental costume secured him the nickname of "the Turkish painter." Still under distinguished patronage he returned to Paris in 1744, visited England, where he painted the princess of Wales in 1753, and went to Holland in 1756, where, in the following year, he married Marie Fargues. Another visit to England followed in 1772, and in the next two years his name figures among the Royal Academy exhibitors. He returned to his native town in 1776 and died at Geneva in 1789.

Liotard was an artist of great versatility, and though his fame depends largely on his graceful and delicate pastel drawings, of which "La Liseuse," the "Chocolate Girl," and "La Belle Lyonnaise" at the Dresden Gallery are delightful examples, he achieved distinction by his enamels, copperplate engravings and glass painting. He also wrote a *Treatise on the Art of Painting*, and was an expert collector of paintings by the old masters. Many of the masterpieces he had acquired were sold by him at high prices on his second visit to England. The museums of Amsterdam, Berne, and Geneva are particularly rich in examples of his paintings and pastel drawings. A picture of a Turk seated is at the Victoria and Albert Museum, while the British Museum owns two of his drawings. The Louvre has, besides twenty-two drawings, a portrait of General Hérault and a portrait of the artist is to be found at the Sala dei pittori, in the Uffizi Gallery, Florence.

See *La Vie et les œuvres de Jean Etienne Liotard (1702–1789), étude biographique et iconographique*, by E. Humbert, A. Revilliod, and J. W. R. Tilanus (Amsterdam, 1897).

LIP (a word common in various forms to Teutonic languages, cf Ger. *Lippe*, Dan. *laebe*; Lat. *labium* is cognate), one of the two fleshy protuberant edges of the mouth in man and other animals, hence transferred to such objects as resemble a lip, the edge of a circular or other opening, as of a shell, or of a wound, or of any fissure in anatomy and zoology; in this last usage the Latin *labium* is more usually employed. It is also used of any projecting edge, as in coal-mining, &c. Many figurative uses are derived from the connexion with the mouth as the organ of speech. In architecture "lip moulding" is a term given to a moulding employed in the Perpendicular period, from its resemblance to an overhanging lip. It is often found in base mouldings, and is not confined to England, there being similar examples in France and Italy.

LIPA, a town of the province of Batangas, Luzon, Philippine Islands, about 90 m. S. by E. of Manila. Pop. (1903) 37,934. Lipa is on high ground at the intersection of old military roads, is noted for its cool and healthy climate, and is one of the largest and wealthiest inland towns of the archipelago. Many of its houses have two storeys above the ground-floor, and its church and convent together form a very large building. The surrounding country is very fertile, producing sugar-cane, Indian corn, cacao, tobacco and indigo. The cultivation of coffee was begun here on a large scale about the middle of the 19th century and was increased gradually until 1889–1890 when an insect pest destroyed the trees. The language of Lipa is Tagalog.

LIPAN, a tribe of North American Indians of Athabascan stock. Their former range was central Texas. Later they were driven into Mexico. They were pure nomads, lived entirely by hunting, and were perhaps the most daring of the Texas Indians. A few survivors were brought back from Mexico in 1905 and placed on a reservation in New Mexico.

LIPARI ISLANDS (anc. Αἰόλου νῆσοι, or *Aeoliae Insulae*), a group of volcanic islands N. of the eastern portion of Sicily. They are seven in number—Lipari (*Lipara*, pop. in 1901, 15,290), Stromboli (*Strongyle*), Salina (*Didyme*, pop. in 1901, 4934), Filicuri (*Phoenicusa*), Alicuri (*Ericusa*), Vulcano (*Hiera, Therasia* or *Thermissa*), the mythical abode of Hephaestus, and Panaria (*Euonymus*). The island of Aiolie, the home of Aiolos, lord of the winds, which Ulysses twice visited in his wanderings, has generally been identified with one of this group. A colony of Cnidians and Rhodians was established on Lipara in 580–577 B.C.[1] The inhabitants were allied with the Syracusans, and were attacked by the Athenian fleet in 427 B.C., and by the Carthaginians in 397 B.C., while Agathocles plundered a temple on Lipara in 301 B.C. During the Punic wars the islands were a Carthaginian naval station of some importance until the Romans took possession of them in 252 B.C. Sextus Pompeius also used them as a naval base. Under the Empire the islands served as a place of banishment for political prisoners. In the middle ages they frequently changed hands. The island of Lipari contains the chief town (population in 1901, 5855), which bears the same name and had municipal rights in Roman times. It is the seat of a bishop. It is fertile and contains sulphur springs and vapour baths, which were known and used in ancient times. Pumicestone is exported.

Stromboli, 22 m. N.E. of Lipari, is a constantly active volcano, ejecting gas and lava at brief intervals, and always visible at night. Salina, 3 m. N.W. of Lipari, consisting of the cones of two extinct volcanoes, that on the S.E., Monte Salvatore (3155 ft.), being the highest point in the islands, is the most fertile of the whole group and produces good Malmsey wine: it takes its name from the salt-works on the south coast. Vulcano, ½ m.

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[1] Greek coins of the Lipari Islands are preserved in the museum at Cefalù.

S. of Lipari, contains a still smoking crater. Sulphur works were started in 1874, but have since been abandoned.

See Archduke Ludwig Salvator of Austria, *Die Liparischen Inseln*, 8 vols. (for private circulation) (Prague, 1893 seqq.).

LIPETSK, a town of Russia, in the government of Tambov, 108 m. by rail W. of the city of Tambov, on the right bank of the river Voronezh. Pop. (1897) 16,353. The town is built of wood and the streets are unpaved. There are sugar, tallow, and leather works, and distilleries, and an active trade in horses, cattle, tallow, skins, honey and timber. The Lipetsk mineral springs (chalybeate) came into repute in the time of Peter the Great and attract a good many visitors.

LIPPE, a river of Germany, a right-bank tributary of the Rhine. It rises near Lippspringe under the western declivity of the Teutoburger Wald, and, after being joined by the Alme, the Pader and the Ahse on the left, and by the Stever on the right, flows into the Rhine near Wesel, after a course of 154 m. It is navigable downwards from Lippstadt, for boats and barges, by the aid of twelve locks, drawing less than 4 ft. of water. The river is important for the transport facilities it affords to the rich agricultural districts of Westphalia.

LIPPE, a principality of Germany and constituent state of the German empire, bounded N.W., W. and S. by the Prussian province of Westphalia and N.E. and E. by the Prussian provinces of Hanover and Hesse-Nassau and the principality of Waldeck-Pyrmont. It also possesses three small enclaves—Kappel and Lipperode in Westphalia and Grevenhagen near Höxter. The area is 469 sq. m., and the population (1905) 145,610, showing a density of 125 to the sq. m. The greater part of the surface is hilly, and in the S. and W., where the Teutoburger Wald practically forms its physical boundary, mountainous. The chief rivers are the Weser, which crosses the north extremity of the principality, and its affluents, the Werre, Exter, Kalle and Emmer. The Lippe, which gives its name to the country, is a purely Westphalian river and does not touch the principality at any point. The forests of Lippe, among the finest in Germany, produce abundance of excellent timber. They occupy 28% of the whole area, and consist mostly of deciduous trees, beech preponderating. The valleys contain a considerable amount of good arable land, the tillage of which employs the greater part of the inhabitants. Small farms, the larger proportion of which are under 2½ acres, are numerous, and their yield shows a high degree of prosperity among the peasant farmers. The principal crops are potatoes, beetroot (for sugar), hay, rye, oats, wheat and barley. Cattle, sheep and swine are also reared, and the "Senner" breed of horses, in the stud farm at Lopshorn, is celebrated. The industries are small and consist mainly in the manufacture of starch, paper, sugar, tobacco, and in weaving and brewing. Lemgo is famous for its meerschaum pipes and Salzuflen for its brine-springs, producing annually about 1500 tons of salt, which is mostly exported. Each year, in spring, about 15,000 brickmakers leave the principality and journey to other countries, Hungary, Sweden and Russia, to return home in the late autumn.

The roads are well laid and kept in good repair. A railway intersects the country from Herford (on the Cologne-Hanover main line) to Altenbeken; and another from Bielefeld to Hameln traverses it from W. to E. More than 95% of the population in 1905 were Protestants. Education is provided for by two gymnasia and numerous other efficient schools. The principality contains seven small towns, the chief of which are Detmold, the seat of government, Lemgo, Horn and Blomberg. The present constitution was granted in 1836, but it was altered in 1867 and again in 1876. It provides for a representative chamber of twenty-one members, whose functions are mainly consultative. For electoral purposes the population is divided into three classes, rated according to taxation, each of which returns seven members. The courts of law are centred at Detmold, whence an appeal lies to the court of appeal at Celle in the Prussian province of Hanover. The estimated revenue in 1909 was £113,000 and the expenditure £116,000. The public debt in 1908 was £64,000. Lippe has one vote in the German Reichstag, and also one vote in the Bundesrat, or federal council. Its military forces form a battalion of the 6th Westphalian infantry.

History.—The present principality of Lippe was inhabited in early times by the Cherusii, whose leader Arminius (Hermann) annihilated in A.D. 9 the legions of Varus in the Teutoburger Wald. It was afterwards occupied by the Saxons and was subdued by Charlemagne. The founder of the present reigning family, one of the most ancient in Germany, was Bernard I. (1113–1144), who received a grant of the territory from the emperor Lothair, and assumed the title of lord of Lippe (*edler Herr von Lippe*). He was descended from a certain Hoold who flourished about 950. Bernard's successors inherited or obtained several counties, and one of them, Simon III. (d. 1410), introduced the principles of primogeniture. Under Simon V. (d. 1536), who was the first to style himself count, the Reformation was introduced into the country. His grandson, Simon VI. (1555–1613), is the ancestor of both lines of the princes of Lippe. In 1613 the country, as it then existed, was divided among his three sons, the lines founded by two of whom still exist, while the third (Brake) became extinct in 1709. Lippe proper was the patrimony of the eldest son, Simon VII. (1587–1627), upon whose descendant Frederick William Leopold (d. 1802) the title of prince of the empire was bestowed in 1789, a dignity already conferred, though not confirmed, in 1720. Philip, the youngest son of Simon VI., received but a scanty part of his father's possessions, but in 1640 he inherited a large part of the countship of Schaumburg, including Bückeburg, and adopted the title of count of Schaumburg-Lippe. The ruler of this territory became a sovereign prince in 1807. Simon VII. had a younger son, Jobst Hermann (d. 1678), who founded the line of counts of Lippe-Biesterfeld, and a cadet branch of this family were the counts of Lippe-Weissenfeld. In 1762 these two counties—Biesterfeld and Weissenfeld—passed by arrangement into the possession of the senior and ruling branch of the family. Under the prudent government of the princess Pauline (from 1802 to 1820), widow of Frederick William Leopold, the little state enjoyed great prosperity. In 1807 it joined the Confederation of the Rhine and in 1813 the German Confederation. Pauline's son, Paul Alexander Leopold, who reigned from 1820 to 1851, also ruled in a wise and liberal spirit, and in 1836 granted the charter of rights upon which the constitution is based. In 1842 Lippe entered the German Customs Union (*Zollverein*), and in 1866 threw in its lot with Prussia and joined the North German Confederation.

The Lippe succession dispute.

The line of rulers in Lippe dates back, as already mentioned, to Simon VI. But besides this, the senior line, the two collateral lines of counts, Lippe-Biesterfeld and Lippe-Weissenfeld and the princely line of Schaumburg-Lippe, also trace their descent to the same ancestor, and these three lines stand in the above order as regards their rights to the Lippe succession, the counts being descended from Simon's eldest son and the princes from his youngest son. These facts were not in dispute when in March 1895 the death of Prince Woldemar, who had reigned since 1875, raised a dispute as to the succession. Woldemar's brother Alexander, the last of the senior line, was hopelessly insane and had been declared incapable of ruling. On the death of Woldemar, Prince Adolph of Schaumburg-Lippe, fourth son of Prince Adolph George of that country and brother-in-law of the German emperor, took over the regency by virtue of a decree issued by Prince Woldemar, but which had until the latter's death been kept secret. The Lippe house of representatives consequently passed a special law confirming the regency in the person of Prince Adolph, but with the proviso that the regency should be at an end as soon as the disputes touching the succession were adjusted; and with a further proviso that, should this dispute not have been settled before the death of Prince Alexander, then, if a competent court of law had been secured before that event happened, the regency of Prince Adolph should continue until such court had given its decision. The dispute in question had arisen because the heads of the two collateral countly lines had entered a *caveat*. In order to adjust matters the Lippe government moved the *Bundesrat*, on the 5th of July 1895, to pass an imperial law declaring the *Reichsgericht* (the supreme tribunal of the empire) a competent court to adjudicate upon the claims of the rival lines to the succession. In consequence the Bundesrat passed a resolution on the 1st of February 1896, requesting the chancellor of the empire to bring about a compromise for the appointment of a court of arbitration between the parties. Owing to the mediation of the chancellor a compact was on the 3rd of July 1896 concluded between the heads of the three collateral lines of the whole house of Lippe, binding "both on themselves and on the lines of which they were the heads." By clause 2 of this compact, a court of arbitration was to be appointed, consisting of the king of Saxony and six members selected by him from among the members of the supreme court of law of the empire. This court was duly constituted, and on the 22nd of June 1897 delivered judgment to the effect that Count Ernest of Lippe-Biesterfeld, head of the line of Lippe-Biesterfeld, was entitled to succeed to the throne of Lippe on the death of Prince Alexander. In consequence of this judgment Prince Adolph resigned the regency and Count Ernest became regent in his stead. On the 26th of September 1904 Count Ernest died and his eldest son, Count Leopold, succeeded to the regency; but the question of the succession was again raised by the prince of Schaumburg-Lippe, who urged that the marriage of Count William Ernest, father of Count Ernest, with Modeste von Unruh, and that of the count regent Ernest himself with Countess Carline von Wartensleben were not *ebenbürtig* (equal birth), and that the issue of these marriages were therefore excluded from the succession. Prince George of Schaumburg-Lippe and the count regent, Leopold, thereupon entered into a compact, again referring the matter to the Bundesrat, which requested the chancellor of the empire to agree to the appointment of a court of arbitration consisting of two civil senates of the supreme court, sitting at Leipzig, to decide finally the matter in dispute. It was further provided in the compact that Leopold should remain as regent, even after the death of Alexander, until the decision of the court had been given. Prince Alexander died on the 13th of January 1905; Count Leopold remained as regent, and on the 25th of October the court of arbitration issued its award, declaring the marriages in question (which were, as proved by document, contracted with the consent of the head of the house in each case) *ebenbürtig*, and that in pursuance of the award of the king of Saxony the family of Lippe-Biesterfeld, together with the collateral lines sprung from Count William Ernest (father of the regent, Count Ernest) were in the order of nearest agnates called to the succession. Leopold (b. 1871) thus became prince of Lippe.

See A. Falkmann, *Beiträge zur Geschichte des Fürstenthums Lippe* (Detmold, 1857–1892; 6 vols.); Schwanold, *Das Fürstentum Lippe, das Land und seine Bewohner* (Detmold, 1899); Piderit, *Die lippischen Edelherrn im Mittelalter* (Detmold, 1876); A. Falkmann and O. Preuss, *Lippische Regenten* (Detmold, 1860–1868); H. Triepel, *Der Streit um die Thronfolge im Fürstentum Lippe* (Leipzig, 1903); and P. Laband, *Die Thronfolge im Fürstentum Lippe* (Freiburg, 1891); and *Schiedsspruch in dem Rechtstreit über die Thronfolge im Fürstentum Lippe vom 25 Okt. 1905* (Leipzig, 1906).

LIPPI, the name of three celebrated Italian painters.

I. Fra Filippo Lippi (1406–1469), commonly called Lippo Lippi, one of the most renowned painters of the Italian quattrocento, was born in Florence—his father, Tommaso, being a butcher. His mother died in his childhood, and his father survived his wife only two years. His aunt, a poor woman named Monna Lapaccia, then took charge of the boy; and in 1420, when fourteen years of age, he was registered in the community of the Carmelite friars of the Carmine in Florence. Here he remained till 1432, and his early faculty for fine arts was probably developed by studying the works of Masaccio in the neighbouring chapel of the Brancacci. Between 1430 and 1432 he executed some works in the monastery, which were destroyed by a fire in 1771; they are specified by Vasari, and one of them was particularly marked by its resemblance to Masaccio's style. Eventually Fra Filippo quitted his convent, but it appears that he was not relieved from some sort of religious vow; in a letter dated in 1439 he speaks of himself as the poorest friar of Florence, and says he is charged with the maintenance of six marriageable nieces. In 1452 he was appointed chaplain to the convent of S. Giovannino in Florence, and in 1457 rector (*Rettore Commendatario*) of S. Quirico at Legania, and his gains were considerable and uncommonly large from time to time; but his poverty seems to have been chronic, the money being spent, according to one account, in frequently recurring amours.

Vasari relates some curious and romantic adventures of Fra Filippo, which modern biographers are not inclined to believe. Except through Vasari, nothing is known of his visits to Ancona and Naples, and his intermediate capture by Barbary pirates and enslavement in Barbary, whence his skill in portrait-sketching availed to release him. This relates to a period, 1431–1437, when his career is not otherwise clearly accounted for. The doubts thrown upon his semi-marital relations with a Florentine lady appear, however, to be somewhat arbitrary; Vasari's account is circumstantial, and in itself not greatly improbable. Towards June 1456 Fra Filippo was settled in Prato (near Florence) for the purpose of fulfilling a commission to paint frescoes in the choir of the cathedral. Before actually undertaking this work he set about painting, in 1458, a picture for the convent chapel of S. Margherita of Prato, and there saw Lucrezia Buti, the beautiful daughter of a Florentine, Francesco Buti; she was either a novice or a young lady placed under the nuns' guardianship. Lippi asked that she might be permitted to sit to him for the figure of the Madonna (or it might rather appear of S. Margherita); he made passionate love to her, abducted her to his own house, and kept her there spite of the utmost efforts the nuns could make to reclaim her The fruit of their loves was a boy, who became the painter, not less celebrated than his father, Filippino Lippi (noticed below). Such is substantially Vasari's narrative, published less than a century after the alleged events; it is not refuted by saying, more than three centuries later, that perhaps Lippo had nothing to do with any such Lucrezia, and perhaps Lippino was his adopted son, or only an ordinary relative and scholar. The argument that two reputed portraits of Lucrezia in paintings by Lippo are not alike, one as a Madonna in a very fine picture in the Pitti gallery, and the other in the same character in a Nativity in the Louvre, comes to very little; and it is reduced to nothing when the disputant adds that the Louvre painting is probably not done by Lippi at all. Besides, it appears more likely that not the Madonna in the Louvre but a S. Margaret in a picture now in the Gallery of Prato is the original portrait (according to the tradition) of Lucrezia Buti.

The frescoes in the choir of Prato cathedral, being the stories of the Baptist and of St Stephen, represented on the two opposite wall spaces, are the most important and monumental works which Fra Filippo has left, more especially the figure of Salome dancing, and the last of the series, showing the ceremonial mourning over Stephen's corpse. This contains a portrait of the painter, but which is the proper figure is a question that has raised some diversity of opinion. At the end wall of the choir are S. Giovanni Gualberto and S. Alberto, and on the ceiling the four evangelists.

The close of Lippi's life was spent at Spoleto, where he had been commissioned to paint, for the apse of the cathedral, some scenes from the life of the Virgin. In the semidome of the apse is Christ crowning the Madonna, with angels, sibyls and prophets. This series, which is not wholly equal to the one at Prato, was completed by Fra Diamante after Lippi's death. That Lippi died in Spoleto, on or about the 8th of October 1469, is an undoubted fact; the mode of his death is again a matter of dispute. It has been said that the pope granted Lippi a dispensation for marrying Lucrezia, but that, before the permission arrived, he had been poisoned by the indignant relatives either of Lucrezia herself, or of some lady who had replaced her in the inconstant painter's affections. This is now generally regarded as a fable; and indeed a vendetta upon a man aged sixty-three for a seduction committed at the already mature age of fifty-two seems hardly plausible. Fra Filippo lies buried in Spoleto, with a monument erected to him by Lorenzo the Magnificent; he had always been zealously patronized by the Medici family, beginning with Cosimo, Pater Patriae. Francesco di Pesello (called Pesellino) and Sandro Botticelli were among his most distinguished pupils.

In 1441 Lippi painted an altarpiece for the nuns of S. Ambrogio which is now a prominent attraction in the Academy of Florence, and has been celebrated in Browning's well-known poem. It represents the coronation of the Virgin among angels and saints, of whom many are Bernardine monks. One of these, placed to the right, is a half-length portrait of Lippo, pointed out by an inscription upon an angel's scroll "Is perfecit opus." The price paid for this work in 1447 was 1200 Florentine lire, which seems surprisingly large. For Germiniano Inghirami of Prato he painted the "Death of St Bernard," a fine specimen still extant. His principal altarpiece in this city is a Nativity in the refectory of S. Domenico—the Infant on the ground adored by the Virgin and Joseph, between Sts George and Dominic, in a rocky landscape, with the shepherds playing and six angels in the sky. In the Uffizi is a fine Virgin adoring the infant Christ, who is held by two angels; in the National Gallery, London, a "Vision of St Bernard." The picture of the "Virgin and Infant with an Angel," in this same gallery, also ascribed to Lippi, is disputable.

Few pictures are so thoroughly enjoyable as those of Lippo Lippi; they show the naïveté of a strong, rich nature, redundant in lively and somewhat whimsical observation. He approaches religious art from its human side, and is not pietistic though true to a phase of Catholic devotion. He was perhaps the greatest colourist and technical adept of his time, with good draughtsmanship—a naturalist, with less vulgar realism than some of his contemporaries, and with much genuine episodical animation, including semi-humorous incidents and low characters. He made little effort after perspective and none for foreshortenings, was fond of ornamenting pilasters and other architectural features. Vasari says that Lippi was wont to hide the extremities in drapery to evade difficulties. His career was one of continual development, without fundamental variation in style or in colouring. In his great works the proportions are larger than life.

Along with Vasari's interesting and amusing, and possibly not very unauthentic, account of Lippo Lippi, the work of Crowe and Cavalcaselle should be consulted. Also: E. C. Strutt, *Fra Lippo Lippi* (1901); C. M. Phillimore, *Early Florentine Painters* (1881); B. Supino, *Fra Filippo Lippi* (illustrated) (1902). It should be observed that Crowe and Cavalcaselle give 1412 as the date of the painter's birth, and this would make a considerable difference in estimating details of his after career. We have preferred to follow the more usual account. The self-portrait dated 1441 looks like a man much older than twenty-nine.

II. Filippino, or Lippino Lippi (1460–1505), was the natural son of Fra Lippo Lippi and Lucrezia Buti, born in Florence and educated at Prato. Losing his father before he had completed his tenth year, the boy took up his avocation as a painter, studying under Sandro Botticelli and probably under Fra Diamante. The style which he formed was to a great extent original, but it bears clear traces of the manner both of Lippo and of Botticelli—more ornamental than the first, more realistic and less poetical than the second. His powers developed early; for we find him an accomplished artist by 1480, when he painted an altarpiece, the "Vision of St Bernard," now in the Badia of Florence; it is in tempera, with almost the same force as oil painting. Soon afterwards, probably from 1482 to 1490, he began to work upon the frescoes which completed the decoration of the Brancacci chapel in the Carmine, commenced by Masolino and Masaccio many years before. He finished Masaccio's "Resurrection of the King's Son," and was the sole author of "Paul's Interview with Peter in Prison," the "Liberation of Peter," the "Two Saints before the Proconsul" and the "Crucifixion of Peter." These works are sufficient to prove that Lippino stood in the front rank of the artists of his time. The dignified and expressive figure of St Paul in the second-named subject has always been particularly admired, and appears to have furnished a suggestion to Raphael for his "Paul at Athens." Portraits of Luigi Pulci, Antonio Pollajuolo, Lippino himself and various others are in this series. In 1485 he executed the great altarpiece of the "Virgin and Saints," with several other figures, now in the Uffizi Gallery. Another of his leading works is the altarpiece for the Nerli chapel in S. Spirito—the "Virgin Enthroned," with splendidly living portraits of Nerli and his wife, and a thronged distance. In 1489 Lippino was in Rome, painting in the church of the Minerva, having first passed through Spoleto to design the monument for his father in the cathedral of that city. Some of his principal frescoes in the Minerva are still extant, the subjects being in celebration of St Thomas Aquinas. In one picture the saint is miraculously commended by a crucifix; in another, triumphing over heretics. In 1496 Lippino painted the "Adoration of the Magi" now in the Uffizi, a very striking picture, with numerous figures. This was succeeded by his last important undertaking, the frescoes in the Strozzi chapel, in the church of S. Maria Novella in Florence—"Drusiana Restored to Life by St John, the Evangelist," "St John in the Cauldron of Boiling Oil" and two subjects from the legend of St Philip. These are conspicuous and attractive works, yet somewhat grotesque and exaggerated—full of ornate architecture, showy colour and the distinctive peculiarities of the master. Filippino, who had married in 1497, died in 1505. The best reputed of his scholars was Raffaellino del Garbo.

Like his father, Filippino had a most marked original genius for painting, and he was hardly less a chief among the artists of his time than Fra Filippo had been in his: it may be said that in all the annals of the art a rival instance is not to be found of a father and son each of whom had such pre-eminent natural gifts and leadership. The father displayed more of sentiment and candid sweetness of motive; the son more of richness, variety and lively pictorial combination. He was admirable in all matters of decorative adjunct and presentment, such as draperies, landscape backgrounds and accessories; and he was the first Florentine to introduce a taste for antique details of costume, &c. He formed a large collection of objects of this kind, and left his designs of them to his son. In his later works there is a tendency to a mannered development of the extremities, and generally to facile overdoing. The National Gallery, London, possesses a good and characteristic though not exactly a first-rate specimen of Lippino, the "Virgin and Child between Sts Jerome and Dominic"; also an "Adoration of the Magi," of which recent criticism contests the authenticity. Crowe and Cavalcaselle, supplemented by the writings of Berenson, should be consulted as to this painter. An album of his works is in Newnes' Art-library.

III. Lorenzo Lippi (1606–1664), painter and poet, was born in Florence. He studied painting under Matteo Rosselli, the influence of whose style, and more especially of that of Santi di Tito, is to be traced in Lippi's works, which are marked by taste, delicacy and a strong turn for portrait-like naturalism. His maxim was "to poetize as he spoke, and to paint as he saw." After exercising his art for some time in Florence, and having married at the age of forty the daughter of a rich sculptor named Susini, Lippi went as court painter to Innsbruck, where he has left many excellent portraits. There he wrote his humorous poem named *Malmantile Racquistato*, which was published under the anagrammatic pseudonym of "Perlone Zipoli." Lippi was somewhat self-sufficient, and, when visiting Parma, would not look at the famous Correggios there, saying that they could teach him nothing. He died of pleurisy in 1664, in Florence.

The most esteemed works of Lippi as a painter are a "Crucifixion" in the Uffizi gallery at Florence, and a "Triumph of David" which he executed for the salone of Angiolo Galli, introducing into it portraits of the seventeen children of the owner. The *Malmantile Racquistato* is a burlesque romance, mostly compounded out of a variety of popular tales; its principal subject-matter is an expedition for the recovery of a fortress and territory whose queen had been expelled by a female usurper. It is full of graceful or racy Florentine idioms, and is counted by Italians as a "testo di lingua." Lippi is more generally or more advantageously remembered by this poem than by anything which he has left in the art of painting. It was not published until 1688, several years after his death. Lanzi as to Lorenzo Lippi's pictorial work, and Tiraboschi and other literary historians as to his writings, are among the best authorities.

W. M. R.

LIPPSPRINGE, a town and watering-place in the Prussian province of Westphalia, lying under the western slope of the Teutoburger Wald, 5 m. N. of Paderborn. Pop. (1905) 3100. The springs, the Arminius Quelle and the Liborius Quelle, for which it is famous, are saline waters of a temperature of 70° F., and are utilized both for bathing and drinking in cases of pulmonary consumption and chronic diseases of the respiratory organs. The annual number of visitors amounts to about 6000. Lippspringe is mentioned in chronicles as early as the 9th century, and here in the 13th century the order of the Templars established a stronghold. It received civic rights about 1400.

See Dammann, *Der Kurort Lippspringe* (Paderborn, 1900); Königer, *Lippspringe* (Berlin, 1893); and Frey, *Lippspringe, Kurort für Lungenkranke* (Paderborn, 1899).

LIPPSTADT, a town in the Prussian province of Westphalia, on the river Lippe, 20 m. by rail W. by S. of Paderborn, on the main line to Düsseldorf. Pop. (1905) 15,436. The Marien Kirche is a large edifice in the Transitional style, dating from the 13th century. It has several schools, among them being one which was originally founded as a nunnery in 1185. The manufactures include cigar-making, distilling, carriage-building and metal-working.

Lippstadt was founded in 1168 by the lords of Lippe, the rights over one half of the town passing subsequently by purchase to the counts of the Mark, which in 1614 was incorporated with Brandenburg. In 1850 the prince of Lippe-Detmold sold his share to Prussia when this joint lordship ceased. In 1620 Lippstadt was occupied by the Spaniards and in 1757 by the French.

See Chalybäus, *Lippstadt, ein Beitrag zur deutschen Städtegeschichte* (Lippstadt, 1876).

LIPSIUS, JUSTUS (1547–1606), the Latinized name of Joest (Juste or Josse) Lips, Belgian scholar, born on the 18th of October (15th of November, according to Amiel) 1547 at Overyssche, a small village in Brabant, near Brussels. Sent early to the Jesuit college in Cologne, he was removed at the age of sixteen to the university of Louvain by his parents, who feared that he might be induced to become a member of the Society of Jesus. The publication of his *Variarum Lectionum Libri Tres* (1567), dedicated to Cardinal Granvella, procured him an appointment as Latin secretary and a visit to Rome in the retinue of the cardinal. Here Lipsius remained two years, devoting his spare time to the study of the Latin classics, collecting inscriptions and examining MSS. in the Vatican. A second volume of miscellaneous criticism (*Antiquarum Lectionum Libri Quinque*, 1575), published after his return from Rome, compared with the *Variae Lectiones* of eight years earlier, shows that he had advanced from the notion of purely conjectural emendation to that of emending by collation. In 1570 he wandered over Burgundy, Germany, Austria, Bohemia, and was engaged for more than a year as teacher in the university of Jena, a position which implied an outward conformity to the Lutheran Church. On his way back to Louvain, he stopped some time at Cologne, where he must have comported himself as a Catholic. He then returned to Louvian, but was soon driven by the Civil War to take refuge in Antwerp, where he received, in 1579, a call to the newly founded university of Leiden, as professor of history. At Leiden, where he must have passed as a Calvinist, Lipsius remained eleven years, the period of his greatest productivity. It was now that he prepared his *Seneca*, perfected, in successive editions, his *Tacitus* and brought out a series of works, some of pure scholarship, others collections from classical authors, others again of general interest. Of this latter class was a treatise on politics (*Politicorum Libri Sex*, 1589), in which he showed that, though a public teacher in a country which professed toleration, he had not departed from the state maxims of Alva and Philip II. He lays it down that a government should recognize only one religion, and that dissent should be extirpated by fire and sword. From the attacks to which this avowal exposed him, he was saved by the prudence of the authorities of Leiden, who prevailed upon him to publish a declaration that his expression, *Ure, seca*, was a metaphor for a vigorous treatment. In the spring of 1590, leaving Leiden under pretext of taking the waters at Spa, he went to Mainz, where he was reconciled to the Roman Catholic Church. The event deeply interested the Catholic world, and invitations poured in on Lipsius from the courts and universities of Italy, Austria and Spain. But he preferred to remain in his own country, and finally settled at Louvain, as professor of Latin in the Collegium Buslidianum. He was not expected to teach, and his trifling stipend was eked out by the appointments of privy councillor and historiographer to the king of Spain. He continued to publish dissertations as before, the chief being his *De militia romana* (Antwerp, 1595) and *Lovanium* (Antwerp, 1605; 4th ed., Wesel, 1671), intended as an introduction to a general history of Brabant. He died at Louvian on the 23rd of March (some give 24th of April) 1606.

Lipsius's knowledge of classical antiquity was extremely limited. He had but slight acquaintance with Greek, and in Latin literature the poets and Cicero lay outside his range. His greatest work was his edition of Tacitus. This author he had so completely made his own that he could repeat the whole, and offered to be tested in any part of the text, with a poniard held to his breast, to be used against him if he should fail. His *Tacitus* first appeared in 1575, and was five times revised and corrected—the last time in 1606, shortly before his death. His *Opera Omnia* appeared in 8 vols. at Antwerp (1585, 2nd ed., 1637).

A full list of his publications will be found in van der Aa, *Biographisch Woordenboek der Nederlanden* (1865), and in *Bibliographie Lipsienne* (Ghent, 1886–1888). In addition to the biography by A. le Mire (Aubertus Miraeus) (1609), the only original account of his life, see M. E. C. Nisard, *Le Triumvirat littéraire au XVIe siècle* (1852); A. Räss, *Die Convertiten seit der Reformation* (1867); P. Bergman's *Autobiographie de J. Lipse* (1889); L. Galesloot, *Particularités sur la vie de J. Lipse* (1877); E. Amiel, *Un Publiciste du XVIe siècle. Juste Lipse* (1884); and L. Müller, *Geschichte der klassischen Philologie in den Niederlanden.* The articles by J. J. Thonissen of Louvain in the *Nouvelle Biographie générale*, and L. Roersch in *Biographie nationale de Belgique*, may also be consulted.

LIPSIUS, RICHARD ADELBERT (1830–1892), German Protestant theologian, son of K. H. A. Lipsius (d. 1861), who was rector of the school of St Thomas at Leipzig, was born at Gera on the 14th of February 1830. He studied at Leipzig, and eventually (1871) settled at Jena as professor ordinarius. He helped to found the "Evangelical Protestant Missionary Union" and the "Evangelical Alliance," and from 1874 took an active part in their management. He died at Jena on the 19th of August 1892. Lipsius wrote principally on dogmatics and the history of early Christianity from a liberal and critical standpoint. A Neo-Kantian, he was to some extent an opponent of Albrecht Ritschl, demanding "a connected and consistent theory of the universe, which shall comprehend the entire realm of our experience as a whole. He rejects the doctrine of dualism in a truth, one division of which would be confined to 'judgments of value,' and be unconnected with our theoretical knowledge of the external world. The possibility of combining the results of our scientific knowledge with the declarations of our ethico-religious experience, so as to form a consistent philosophy, is based, according to Lipsius, upon the unity of the personal ego, which on the one hand knows the world scientifically, and on the other regards it as the means of realizing the ethico-religious object of its life" (Otto Pfleiderer). This, in part, is his attitude in *Philosophie und Religion* (1885). In his *Lehrbuch der evang.-prot. Dogmatik* (1876; 3rd ed., 1893) he deals in detail with the doctrines of "God," "Christ," "Justification" and the "Church." From 1875 he assisted K. Hase, O. Pfleiderer and E. Schrader in editing the *Jahrbücher für prot. Theologie*, and from 1885 till 1891 he edited the *Theol. Jahresbericht.*

His other works include *Die Pilatusakten* (1871, new ed., 1886), *Dogmatische Beiträge* (1878), *Die Quellen der ältesten Ketzergeschichte* (1875), *Die apokryphen Apostelgeschichten* (1883–1890), *Hauptpunkte der christl. Glaubenslehre im Umriss dargestellt* (1889), and commentaries on the Epistles to the Galatians, Romans and Philippians in H. J. Holtzmann's *Handkommentar zum Neuen Testament* (1891–1892).

LIPTON, SIR THOMAS JOHNSTONE, Bart. (1850–), British merchant, was born at Glasgow in 1850, of Irish parents. At a very early age he was employed as errand boy to a Glasgow stationer; at fifteen he emigrated to America, where at first he worked in a grocery store, and afterwards as a tram-car driver in New Orleans, as a traveller for a portrait firm, and on a plantation in South Carolina. Eventually, having saved some money, he returned to Glasgow and opened a small provision shop. Business gradually increased, and by degrees Lipton had provision shops first all over Scotland and then all over the United Kingdom. To supply his retail shops on the most favourable terms, he purchased extensive tea, coffee and cocoa plantations in Ceylon, and provided his own packing-house for hogs in Chicago, and fruit farms, jam factories, bakeries and bacon-curing establishments in England. In 1898 his business was converted into a limited liability company. At Queen Victoria's diamond jubilee in 1897 he gave £20,000 for providing dinners for a large number of the London poor. In 1898 he was knighted, and in 1902 was made a baronet. In the world of yacht-racing he became well known from his repeated attempts to win the America Cup.

LIQUEURS, the general term applied to perfumed or flavoured potable spirits, sweetened by the addition of sugar. The term "liqueur" is also used for certain wines and unsweetened spirits of very superior quality, or remarkable for their bouquet, such as tokay or fine old brandy or whisky. The basis of all the "liqueurs" proper consists of (*a*) relatively strong alcohol or spirit, which must be as pure and neutral as possible; (*b*) sugar or syrup; and (*c*) flavouring matters. There are three distinct main methods of manufacturing liqueurs. The first, by which liqueurs of the highest class are prepared, is the "distillation" or "alcoholate" process. This consists in macerating various aromatic substances such as seeds, leaves, roots and barks of plants, &c., with strong spirit and subsequently distilling the infusion so obtained generally in the presence of a whole or a part of the solid matter. The mixture of spirit, water and flavouring matters which distils over is termed the "alcoholate." To this is added a solution of sugar or syrup, and frequently colouring matter in the shape of harmless vegetable extracts or burnt sugar, and a further quantity of flavouring matter in the shape of essential oils or clear spirituous vegetable extracts. The second method of making liqueurs is that known as the "essence" process. It is employed, as a rule, for cheap and inferior articles; the process resolving itself into the addition of various essential oils, either natural or artificially prepared, and of spirituous extracts to strong spirit, filtering and adding the saccharine matter to the clear filtrate. The third method of manufacturing liqueurs is the "infusion" process, in which alcohol and sugar are added to various fresh fruit juices. Liqueurs prepared by this method are frequently called "cordials." It has been suggested that "cordials" are articles of home manufacture, and that liqueurs are necessarily of foreign origin, but it is at least doubtful whether this is entirely correct. The French, who excel in the preparation of liqueurs, grade their products, according to their sweetness and alcoholic strength, into *crêmes*, *huiles* or *baumes*, which have a thick, oily consistency; and *eaux*, *extraits* or *élixirs*, which, being less sweetened, are relatively limpid. Liqueurs are also classed, according to their commercial quality and composition, as *ordinaires*, *demi-fines*, *fines* and *sur-fines*. Certain liqueurs, containing only a single flavouring ingredient, or having a prevailing flavour of a particular substance, are named after that body, for instance, *crême de vanille*, *anisette*, *kümmel*, *crême de menthe*, &c. On the other hand, many well-known liqueurs are compounded of very numerous aromatic principles. The nature and quantities of the flavouring agents employed in the preparation of liqueurs of this kind are kept strictly secret, but numerous "recipes" are given in works dealing with this subject. Among the substances frequently used as flavouring agents are aniseed, coriander, fennel, wormwood, gentian, sassafras, amber, hyssop, mint, thyme, angelica, citron, lemon and orange peel, peppermint, cinnamon, cloves, iris, caraway, tea, coffee and so on. The alcoholic strength of liqueurs ranges from close on 80% of alcohol by volume in some kinds of absinthe, to 27% in anisette. The liqueur industry is a very considerable one, there being in France some 25,000 factories. Most of these are small, but some 600,000 gallons are annually exported from France alone. For absinthe, benedictine, chartreuse, curaçoa, kirsch and vermouth see under separate headings. Among other well-known trade liqueurs may be mentioned maraschino, which takes its name from a variety of cherry—the marasca—grown in Dalmatia, the centre of the trade being at Zara; kümmel, the flavour of which is largely due to caraway seeds; allasch, which is a rich variety of kümmel; and cherry and other "fruit" brandies and whiskies, the latter being perhaps more properly termed cordials.

See Duplais, *La Fabrication des liqueurs*; and Rocques, *Les Eaux-de-vie et liqueurs*.

LIQUIDAMBAR, Liquid Amber or Sweet Gum, a product of *Liquidambar styraciflua* (order Hamamelideae), a deciduous tree of from 80 to 140 ft. high, with a straight trunk 4 or 5 ft. in diameter, a native of the United States, Mexico and Central America. It bears palmately-lobed leaves, somewhat resembling those of the maple, but larger. The male and female inflorescences are on different branches of the same tree, the globular heads of fruit resembling those of the plane. This species is nearly allied to *L. orientalis*, a native of a very restricted portion of the south-west coast of Asia Minor, where it forms forests. The earliest record of the tree appears to be in a Spanish work by F. Hernandez, published in 1651, in which he describes it as a large tree producing a fragrant gum resembling liquid amber, whence the name (*Nov. Plant.*, &c., p. 56). In Ray's *Historia Plantarum* (1686) it is called *Styrax liquida*. It was introduced into Europe in 1681 by John Banister, the missionary collector sent out by Bishop Compton, who planted it in the palace gardens at Fulham. The wood is very compact and fine-grained—the heart-wood being reddish, and, when cut into planks, marked transversely with blackish belts. It is employed for veneering in America. Being readily dyed black, it is sometimes used instead of ebony for picture frames, balusters, &c.; but it is too liable to decay for out-door work.

The gum resin yielded by this tree has no special medicinal virtues, being inferior in therapeutic properties to many others of its class. Mixed with tobacco, the gum was used for smoking at the court of the Mexican emperors (Humboldt iv. 10). It has long been used in France as a perfume for gloves, &c. It is mainly produced in Mexico, little being obtained from trees growing in higher latitudes of North America, or in England.

LIQUIDATION (*i.e.* making "liquid" or clear), in law, the clearing off or settling of a debt. The word was more especially used in bankruptcy law to define the method by which, under the Bankruptcy Act 1869, the affairs of an insolvent debtor were arranged and a composition accepted by his creditors without actual bankruptcy. It was abolished by the Bankruptcy Act 1883 (see Bankruptcy). In a general sense, liquidation is used for the act of adjusting debts, as the Egyptian Law of Liquidation, July 1880, for a general settlement of the liabilities of Egypt. In company law, liquidation is the winding up and dissolving a company. The winding up may be either voluntary or compulsory, and an officer, termed a liquidator, is appointed, who takes into his custody all the property of the company and performs such duties as are necessary on its behalf (see Company).

LIQUID GASES.[1] Though Lavoisier remarked that if the earth were removed to very cold regions of space, such as those of Jupiter or Saturn, its atmosphere, or at least a portion of its aeriform constituents, would return to the state of liquid (*Œuvres*, ii. 805), the history of the liquefaction of gases may be said to begin with the observation made by John Dalton in his essay "On the Force of Steam or Vapour from Water and various other Liquids" (1801): "There can scarcely be a doubt entertained respecting the reducibility of all elastic fluids of whatever kind into liquids; and we ought not to despair of effecting it in low temperatures and by strong pressures exerted on the unmixed gases." It was not, however, till 1823 that the question was investigated by systematic experiment. In that year Faraday, at the suggestion of Sir Humphry Davy, exposed hydrate of chlorine to heat under pressure in the laboratories of the Royal Institution. He placed the substance at the end of one arm of a bent glass tube, which was then hermetically sealed, and decomposing it by heating to 100° F., he saw a yellow liquid distil to the end of the other arm. This liquid he surmised to be chlorine separated from the water by the heat and "condensed into a dry fluid by the mere pressure of its own abundant vapour," and he verified his surmise by compressing chlorine gas, freed from water by exposure to sulphuric acid, to a pressure of about four atmospheres, when the same yellow fluid was produced (*Phil. Trans.*, 1823, 113, pp. 160-165). He proceeded to experiment with a number of other gases subjected in sealed tubes to the pressure caused by their own continuous production by chemical action, and in the course of a few weeks liquefied sulphurous acid, sulphuretted hydrogen, carbonic acid, euchlorine, nitrous acid, cyanogen, ammonia and muriatic acid, the last of which, however, had previously been obtained by Davy. But he failed with hydrogen, oxygen, fluoboric, fluosilicic and phosphuretted hydrogen gases (*Phil. Trans.*, *ib.* pp. 189-198). Early in the following year he published an "Historical statement respecting the liquefaction of gases" (*Quart. Journ. Sci.*, 1824, 16, pp. 229-240), in which he detailed several recorded cases in which previous experimenters had reduced certain gases to their liquid state.

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[1] Figs. 1, 5, 6, 7, 10 11, 12, 13 in this article are from *Proc. Roy. Inst.*, by permission

In 1835 Thilorier, by acting on bicarbonate of soda with sulphuric acid in a closed vessel and evacuating the gas thus obtained under pressure into a second vessel, was able to accumulate large quantities of liquid carbonic acid, and found that when the liquid was suddenly ejected into the air a portion of it was solidified into a snow-like substance (*Ann. chim. phys.*, 1835, 60, pp. 427-432). Four years later J. K. Mitchell in America, by mixing this snow with ether and exhausting it under an air pump, attained a minimum temperature of 146° below zero F., by the aid of which he froze sulphurous acid gas to a solid.

Stimulated by Thilorier's results and by considerations arising out of the work of J. C. Cagniard de la Tour (*Ann. chim. phys.*, 1822, 21, pp. 127 and 178, and 1823, 22, p. 410), which appeared to him to indicate that gases would pass by some simple law into the liquid state, Faraday returned to the subject about 1844, in the "hope of seeing nitrogen, oxygen and hydrogen either as liquid or solid bodies, and the latter probably as a metal" (*Phil. Trans.*, 1845, 135, pp. 155-157). On the basis of Cagniard de la Tour's observation that at a certain temperature a liquid under sufficient pressure becomes a vapour or gas having the same bulk as the liquid, he inferred that "at this temperature or one a little higher, it is not likely that any increase of pressure, except perhaps one exceedingly great, would convert the gas into a liquid." He further surmised that the Cagniard de la Tour condition might have its point of temperature for oxygen, nitrogen, hydrogen, &c., below that belonging to the bath of solid carbonic acid and ether, and he realized that in that case no pressure which any apparatus would be able to bear would be able to bring those gases into the liquid or solid state, which would require a still greater degree of cold. To fulfil this condition he immersed the tubes containing his gases in a bath of solid carbonic acid and ether, the temperature of which was reduced by exhaustion under the air pump to -166° F., or a little lower, and at the same time he subjected the gases to pressures up to 50 atmospheres by the use of two pumps working in series. In this way he added six substances, usually gaseous, to the list of those that could be obtained in the liquid state, and reduced seven, including ammonia, nitrous oxide and sulphuretted hydrogen, into the solid form, at the same time effecting a number of valuable determinations of vapour tensions. But he failed to condense oxygen, nitrogen and hydrogen, the original objects of his pursuit, though he found reason to think that "further diminution of temperature and improved apparatus for pressure may very well be expected to give us these bodies in the liquid or solid state." His surmise that increased pressure alone would not suffice to bring about change of state in these gases was confirmed by subsequent investigators, such as M. P. E. Berthelot, who in 1850 compressed oxygen to 780 atmospheres (*Ann. chim. phys.*, 1850, 30, p. 237), and Natterer, who a few years later subjected the permanent gases to a pressure of 2790 atmospheres, without result; and in 1869 Thomas Andrews (*Phil. Trans.*, 11) by his researches on carbonic acid finally established the conception of the "critical temperature" as that temperature, differing for different bodies, above which no gas can be made to assume the liquid state, no matter what pressure it be subjected to (see CONDENSATION OF GASES).

About 1877 the problem of liquefying the permanent gases was taken up by L. P. Cailletet and R. P. Pictet, working almost simultaneously though independently. The former relied on the cold produced by the sudden expansion of the gases at high compression. By means of a specially designed pump he compressed about 100 cc. of oxygen in a narrow glass tube to about 200 atmospheres, at the same time cooling it to about -29° C., and on suddenly releasing the pressure he saw momentarily in the interior of the tube a mist (*brouillard*), from which he inferred the presence of a vapour very near its point of liquefaction. A few days later he repeated the experiment with hydrogen, using a pressure of nearly 300 atmospheres, and observed in his tube an exceedingly fine and subtle fog which vanished almost instantaneously. At the time when these experiments were carried out it was generally accepted that the mist or fog consisted of minute drops of the liquefied gases. Even had this been the case, the problem would not have been completely solved, for Cailletet was unable to collect the drops in the form of a true stable liquid, and at the best obtained a "dynamic" not a "static" liquid, the gas being reduced to a form that bears the same relation to a true liquid that the partially condensed steam issuing from the funnel of a locomotive bears to water standing in a tumbler. But subsequent knowledge showed that even this proximate liquefaction could not have taken place, and that the fog could not have consisted of drops of liquid hydrogen, because the cooling produced by the adiabatic expansion would give a temperature of only 44° abs., which is certainly above the critical temperature of hydrogen. Pictet again announced that on opening the tap of a vessel containing hydrogen at a pressure of 650 atmospheres and cooled by the cascade method (see CONDENSATION OF GASES) to -140° C., he saw issuing from the orifice an opaque jet which he assumed to consist of hydrogen in the liquid form or in the liquid and solid forms mixed. But he was no more successful than Cailletet in collecting any of the liquid, which—whatever else it may have been, whether ordinary air or impurities associated with the hydrogen—cannot have been hydrogen because the means he employed were insufficient to reduce the gas to what has subsequently been ascertained to be its critical point, below which of course liquefaction is impossible. It need scarcely be added that if the liquefaction of hydrogen be rejected a fortiori Pictet's claim to have effected its solidification falls to the ground.

After Cailletet and Pictet, the next important names in the history of the liquefaction of gases are those of Z. F. Wroblewski and K. S. Olszewski, who for some years worked together at Cracow. In April 1883 the former announced to the French Academy that he had obtained oxygen in a completely liquid state and (a few days later) that nitrogen at a temperature of -136° C., reduced suddenly from a pressure of 150 atmospheres to one of 50, had been seen as a liquid which showed a true meniscus, but disappeared in a few seconds. But with hydrogen treated in the same way he failed to obtain even the mist reported by Cailletet. At the beginning of 1884 he performed a more satisfactory experiment. Cooling hydrogen in a capillary glass tube to the temperature of liquid oxygen, he expanded it quickly from 100 atmospheres to one, and obtained the appearance of an instantaneous ebullition. Olszewski confirmed this result by expanding from a pressure of 190 atmospheres the gas cooled by liquid oxygen and nitrogen boiling under reduced pressure, and even announced that he saw it running down the walls of the tube as a colourless liquid.

Wroblewski, however, was unable to observe this phenomenon, and Olszewski himself, when seven years later he repeated the experiment in the more favourable conditions afforded by a larger apparatus, was unable to produce again the colourless drops he had previously reported: the phenomenon of the appearance of sudden ebullition indeed lasted longer, but he failed to perceive any meniscus such as would have been a certain indication of the presence of a true liquid. Still, though neither of these investigators succeeded in reaching the goal at which they aimed, their work was of great value in elucidating the conditions of the problem and in perfecting the details of the apparatus employed. Wroblewski in particular devoted the closing years of his life to a most valuable investigation of the isothermals of hydrogen at low temperatures. From the data thus obtained he constructed a van der Waals equation which enabled him to calculate the critical temperature, pressure and density of hydrogen with very much greater certainty than had previously been possible. Liquid oxygen, liquid nitrogen and liquid air—the last was first made by Wroblewski in 1885—became something more than mere curiosities of the laboratory, and by the year 1891 were produced in such quantities as to be available for the purposes of scientific research. Still, nothing was added to the general principles upon which the work of Cailletet and Pictet was based, and the "cascade" method, together with adiabatic expansion from high compression (see CONDENSATION OF GASES), remained the only means of procedure at the disposal of experimenters in this branch of physics.

In some quarters a certain amount of doubt appears to have arisen as to the sufficiency of these methods for the liquefaction of hydrogen. Olszewski, for example, in 1895 pointed out that the succession of less and less condensible gases necessary for the cascade method breaks down between nitrogen and hydrogen, and he gave as a reason for hydrogen not having been reduced to the condition of a static liquid the non-existence of a gas intermediate in volatility between those two. By 1894 attempts had been made in the Royal Institution laboratories to manufacture an artificial gas of this nature by adding a small proportion of air to the hydrogen, so as to get a mixture with a critical point of about −200° C. When such a mixture was cooled to that temperature and expanded from a high degree of compression into a vacuum vessel, the result was a white mass of solid air together with a clear liquid of very low density. This was in all probability hydrogen in the true liquid state, but it was not found possible to collect it owing to its extreme volatility. Whether this artificial gas might ultimately have enabled liquid hydrogen to be collected in open vessels we cannot say, for experiments with it were abandoned in favour of other measures, which led finally to a more assured success.

Vacuum Vessels.—The problem involved in the liquefaction of hydrogen was in reality a double one. In the first place, the gas had to be cooled to such a temperature that the change to the liquid state was rendered possible. In the second, means had to be discovered for protecting it, when so cooled, from the influx of external heat, and since the rate at which heat is transferred from one body to another increases very rapidly with the difference between their temperatures, the question of efficient heat insulation became at once more difficult and more urgent in proportion to the degree of cold attained. The second part of the problem was in fact solved first. Of course packing with non-conducting materials was an obvious expedient when it was not necessary that the contents of the apparatus should be visible to the eye, but in the numerous instances when this was not the case such measures were out of the question. Attempts were made to secure the desired end by surrounding the vessel that contained the cooled or liquid gas with a succession of other vessels, through which was conducted the vapour given off from the interior one. Such devices involved awkward complications in the arrangement of the apparatus, and besides were not as a rule very efficient, although some workers, *e.g.* Dr Kamerlingh Onnes, of Leiden, reported some success with their use. In 1892 it occurred to Dewar that the principle of an arrangement he had used nearly twenty years before for some calorimetric experiments on the physical constants of hydrogenium, which was a natural deduction from the work of Dulong and Petit on radiation, might be employed with advantage as well to protect cold substances from heat as hot ones from cold. He therefore tried the effect of surrounding his liquefied gas with a highly exhausted space. The result was entirely successful. Experiment showed that liquid air contained in a glass vessel with two walls, the space between which was a high vacuum, evaporated at only one fifth the rate it did when in an ordinary vessel surrounded with air at atmospheric pressure, the convective transference of heat by means of the gas particles being enormously reduced owing to the vacuum. But in addition these vessels lent themselves to an arrangement by which radiant heat could still further be cut off, since it was found that when the inner wall was coated with a bright deposit of silver, the influx of heat was diminished to one-sixth of the amount existing without the metallic coating. The total effect, therefore, of the high vacuum and silvering is to reduce the in-going heat to one-thirtieth part. In making such vessels a mercurial vacuum has been found very satisfactory. The vessel in which the vacuum is to be produced is provided with a small subsidiary vessel joined by a narrow tube with the main vessel, and connected with a powerful air-pump. A quantity of mercury having been placed in it, it is heated in an oil- or air-bath to about 200° C., so as to volatilize the mercury, the vapour of which is removed by the pump. After the process has gone on for some time, the pipe leading to the pump is sealed off, the vessel immediately removed from the bath, and the small subsidiary part immersed in some cooling agent such as solid carbonic acid or liquid air, whereby the mercury vapour is condensed in the small vessel and a vacuum of enormous tenuity left in the large one. The final step is to seal off the tube connecting the two. In this way a vacuum may be produced having a vapour pressure of about the hundred-millionth of an atmosphere at 0° C. If, however, some liquid mercury be left in the space in which the vacuum is produced, and the containing part of the vessel be filled with liquid air, the bright mirror of mercury which is deposited on the inside wall of the bulb is still more effective than silver in protecting the chamber from the influx of heat, owing to the high refractive index, which involves great reflecting power, and the bad heat-conducting powers of mercury.

With the discovery of the remarkable power of gas absorption possessed by charcoal cooled to a low temperature (see below), it became possible to make these vessels of metal. Previously this could not be done with success, because gas occluded in the metal gradually escaped and vitiated the vacuum; but now any stray gas may be absorbed by means of charcoal so placed in a pocket within the vacuous space that it is cooled by the liquid in the interior of the vessel. Metal vacuum vessels (fig. 1), of a capacity of from 2 to 20 litres, may be formed of brass, copper, nickel or tinned iron, with necks of some alloy that is a bad conductor of heat, silvered glass vacuum cylinders being fitted as stoppers. Such flasks, when properly constructed, have an efficiency equal to that of the chemically-silvered glass vacuum vessels now commonly used in low temperature investigations, and they are obviously better adapted for transport. The principle of the Dewar vessel is utilized in the Thermos flasks which are now extensively manufactured and employed for keeping liquids warm in hospitals, &c.

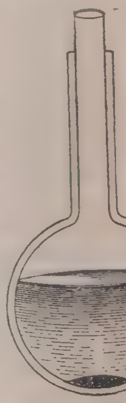

FIG. 1.—Metallic Vacuum Vessel.

Thermal Transparency at Low Temperatures.—The proposition, once enunciated by Pictet, that at low temperatures all substances have practically the same thermal transparency, and are equally ineffective as non-conductors of heat, is based on erroneous observations. It is true that if the space between the two walls of a double-walled vessel is packed with substances like carbon, magnesia, or silica, liquid air placed in the interior will boil off even more quickly than it will when the space merely contains air at atmospheric pressure; but in such cases it is not so much the carbon, &c., that bring about the transference of heat, as the air contained in their interstices. If this air be pumped out such substances are seen to exert a very considerable influence in stopping the influx of heat, and a vacuum vessel which has the space between its two walls filled with a non-conducting material of this kind preserves a liquid gas even better than one in which that space is simply exhausted of air. In experiments on this point double-walled glass tubes, as nearly identical in shape and size as possible, were mounted in sets of three on a common stem which communicated with an air-pump, so that the degree of exhaustion in each was equal. In two of each three the space between the double walls was filled with the powdered material it was desired to test, the third being left empty and used as the standard. The time required for a certain quantity of liquid air to evaporate from the interior of this empty bulb being called 1, in each of the eight sets of triple tubes, the times required for the same quantity to boil off from the other pairs of tubes were as follows:—

Charcoal	5	Lampblack	5
Magnesia	2	Silica	4
Graphite	1·3	Lampblack	4
Alumina	3·3	Lycopodium	2·5
Calcium carbonate	2·5	Barium carbonate	1·3
Calcium fluoride	1·25	Calcium phosphate	2·7
Phosphorus (amorphous)	1	Lead oxide	2
Mercuric iodide	1·5	Bismuth oxide	6

Other experiments of the same kind made—(*a*) with similar vacuum vessels, but with the powders replaced by metallic and other septa; and (*b*) with vacuum vessels having their walls silvered, yielded the following results:—

(*a*) Vacuum space empty	1	Vacuum space empty	1
Three turns silver paper, bright surface inside	4	Three turns black paper, black outside	3
Three turns silver paper, bright surface outside	4	Three turns black paper, black inside	3
Vacuum space empty	1	Vacuum space empty	1
Three turns gold paper, gold outside	4	Three turns, not touching, of sheet lead	4
Some pieces of gold-leaf put in so as to make contact between walls of vacuum-tube	0·3	Three turns, not touching, of sheet aluminium	4
(*b*) Vacuum space empty, silvered on inside surfaces	1	Empty silvered vacuum	1
Silica in silvered vacuum space	1·1	Charcoal in silvered vacuum	1·25

It appears from these experiments that silica, charcoal, lampblack, and oxide of bismuth all increase the heat insulations to four, five and six times that of the empty vacuum space. As the chief communication of heat through an exhausted space is by molecular bombardment, the fine powders must shorten the free path of the gaseous molecules, and the slow conduction of heat through the porous mass must make the conveyance of heat-energy more difficult than when the gas molecules can impinge upon the relatively hot outer glass surface, and then directly on the cold one without interruption. (See *Proc. Roy. Inst.* xv. 821-826.)

Density of Solids and Coefficients of Expansion at Low Temperatures.—The facility with which liquid gases, like oxygen or nitrogen, can be guarded from evaporation by the proper use of vacuum vessels (now called Dewar vessels), naturally suggests that the specific gravities of solid bodies can be got by direct weighing when immersed in such fluids. If the density of the liquid gas is accurately known, then the loss of weight by fluid displacement gives the specific gravity compared to water. The metals and alloys, or substances that can be got in large crystals, are the easiest to manipulate. If the body is only to be had in small crystals, then it must be compressed under strong hydraulic pressure into coherent blocks weighing about 40 to 50 grammes. Such an amount of material gives a very accurate density of the body about the boiling point of air, and a similar density taken in a suitable liquid at the ordinary temperature enables the mean coefficient of expansion between +15° C. and −185° C. to be determined. One of the most interesting results is that the density of ice at the boiling point of air is not more than 0·93, the mean coefficient of expansion being therefore 0·000081. As the value of the same coefficient between 0° C. and −27° C. is 0·000155, it is clear the rate of contraction is diminished to about one-half of what it was above the melting point of the ice. This suggests that by no possible cooling at our command is it likely we could ever make ice as dense as water at 0°C., far less 4° C. In other words, the volume of ice at the zero of temperature would not be the minimum volume of the water molecule, though we have every reason to believe it would be so in the case of the majority of known substances. Another substance of special interest is solid carbonic acid. This body has a density of 1·53 at −78° C. and 1·633 at −185° C., thus giving a mean coefficient of expansion between these temperatures of 0·00057. This value is only about $\frac{1}{3}$ of the coefficient of expansion of the liquid carbonic acid gas just above its melting point, but it is still much greater at the low temperature than that of highly expansive solids like sulphur, which at 40° C. has a value of 0·00019. The following table gives the densities at the temperature of boiling liquid air (−185°C.) and at ordinary temperatures (17° C.), together with the mean coefficient of expansion between those temperatures, in the case of a number of hydrated salts and other substances:

TABLE I.

	Density at −185° C.	Density at +17° C.	Mean coefficient of expansion between −185° C. and +17° C.
Aluminium sulphate (18)[1]	1·7194	1·6913	0·0000811
Sodium biborate (10)	1·7284	1·6937	0·0001000
Calcium chloride (6)	1·7187	1·6775	0·0001191
Magnesium chloride (6)	1·6039	1·5693	0·0001072
Potash alum (24)	1·6414	1·6144	0·0000813
Chrome alum (24)	1·7842	1·7669	0·0000478
Sodium carbonate (10)	1·4926	1·4460	0·0001563
Sodium phosphate (12)	1·5446	1·5200	0·0000787
Sodium thiosulphate (5)	1·7635	1·7290	0·0000969
Potassium ferrocyanide (3)	1·8988	1·8533	0·0001195
Potassium ferricyanide	1·8944	1·8109	0·0002244
Sodium nitro-prusside (4)	1·7196	1·6803	0·0001138
Ammonium chloride	1·5757	1·5188	0·0001820
Oxalic acid (2)	1·7024	1·6145	0·0002643
Methyl oxalate	1·5278	1·4260	0·0003482
Paraffin	0·9770	0·9103	0·0003567
Naphthalene	1·2355	1·1589	0·0003200
Chloral hydrate	1·9744	1·9151	0·0001482
Urea	1·3617	1·3190	0·0001579
Iodoform	4·4459	4·1955	0·0002930
Iodine	4·8943	4·6631	0·0002510
Sulphur	2·0989	2·0522	0·0001152
Mercury	14·382	..	0·0000881 [2]
Sodium	1·0056	0·972	0·0001810
Graphite (Cumberland)	2·1302	2·0990	0·0000733

[1] The figures within parentheses refer to the number of molecules of water of crystallization.

[2] −189° to −38·85° C.

It will be seen from this table that, with the exception of carbonate of soda and chrome alum, the hydrated salts have a coefficient of expansion that does not differ greatly from that of ice at low temperatures. Iodoform is a highly expansive body like iodine, and oxalate of methyl has nearly as great a coefficient as paraffin, which is a very expansive solid, as are naphthalene and oxalic acid. The coefficient of solid mercury is about half that of the liquid metal, while that of sodium is about the value of mercury at ordinary temperatures. Further details on the subject can be found in the *Proc. Roy. Inst.* (1895), and *Proc. Roy. Soc.* (1902).

Density of Gases at Low Temperatures.—The ordinary mode of determining the density of gases may be followed, provided that the glass flask, with its carefully ground stop-cock sealed on, can stand an internal pressure of about five atmospheres, and that all the necessary corrections for change of volume are made. All that is necessary is to immerse the exhausted flask in boiling oxygen, and then to allow the second gas to enter from a gasometer by opening the stop-cock until the pressure is equalized. The stop-cock being closed, the flask is now taken out of the liquid oxygen and left in the balance-room until its temperature is equalized. It is then weighed against a similar flask used as a counterpoise. Following such a method, it has been found that the weight of 1 litre of oxygen vapour at its boiling point of 90·5° absolute is 4·420 grammes, and therefore the specific volume is 226·25 cc. According to the ordinary gaseous laws, the litre ought to weigh 4·313 grammes, and the specific volume should be 231·82 cc. In other words, the product of pressure and volume at the boiling point is diminished by 2·46 %. In a similar way the weight of a litre of nitrogen vapour at the boiling point of oxygen was found to be 3·90, and the inferred value for 78° absolute, or its own boiling point, would be 4·51, giving a specific volume of 221·3.

Regenerative Cooling.—One part of the problem being thus solved and a satisfactory device discovered for warding off heat in such vacuum vessels, it remained to arrange some practically efficient method for reducing hydrogen to a temperature sufficiently low for liquefaction. To gain that end, the idea naturally occurred of using adiabatic expansion, not intermittently, as when gas is allowed to expand suddenly from a high compression, but in a continuous process, and an obvious way of attempting to carry out this condition was to enclose the orifice at which expansion takes place in a tube, so as to obtain a constant stream of cooled gas passing over it. But further consideration of this plan showed that although the gas jet would be cooled near the point of expansion owing to the conversion of a portion of its sensible heat into dynamical energy of the moving gas, yet the heat it thus lost would be restored to it almost immediately by the destruction of this mechanical energy through friction and its consequent reconversion into heat. Thus the net result would be *nil* so far as change of temperature through the performance of external work was concerned. But the conditions in such an arrangement resemble that in the experiments of Thomson and Joule on the thermal changes which occur in a gas when it is forced under pressure through a porous plug or narrow orifice, and those experimenters found, as the former of them had predicted, that a change of temperature does take place, owing to internal work being done by the attraction of the gas molecules. Hence the effective result obtainable in practice by such an attempt at continuous adiabatic expansion as that suggested above is to be measured by the amount of the "Thomson-Joule effect," which depends entirely on the internal, not the external, work done by the gas. To Linde belongs the credit of having first seen the essential importance of this effect in connexion with the liquefaction of gases by adiabatic expansion, and he was, further, the first to construct an industrial plant for the production of liquid air based on the application of this principle.

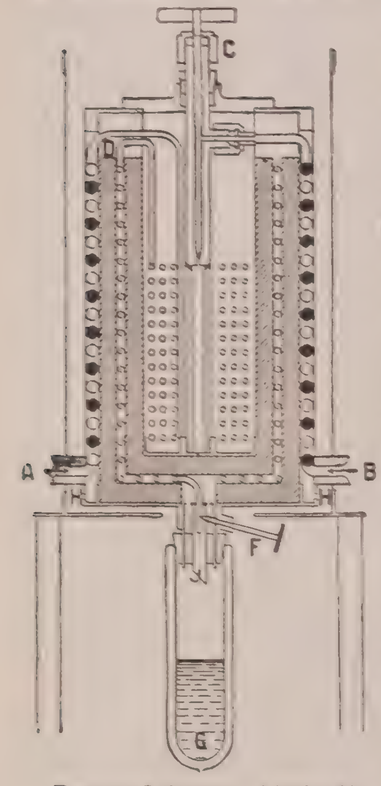

Fig. 2.—Laboratory Liquid Air Machine.

A, Air or oxygen inlet.
B, Carbon dioxide inlet.
C, Carbon dioxide valve.
D, Regenerator coils.
F, Air or oxygen expansion valve.
G, Vacuum vessel with liquid air or oxygen.
H, Carbon dioxide and air outlet.
○, Air coil.
●, Carbon dioxide coil.

The change of temperature due to the Thomson-Joule effect varies in amount with different gases, or rather with the temperature at which the operation is conducted. At ordinary temperatures oxygen and carbonic acid are cooled, while hydrogen is slightly heated. But hydrogen also is cooled if before being passed through the nozzle or plug it is brought into a thermal condition comparable to that of other gases at ordinary temperatures—that is to say, when it is initially cooled to a temperature having the same ratio to its critical point as their temperatures have to their critical points—and similarly the more condensible gases would be heated, and not cooled, by passing through a nozzle or plug if they were employed at a temperature sufficiently above their critical points. Each gas has therefore a point of inversion of the Thomson-Joule effect, and this temperature is, according to the theory of van der Waals, about 6·75 times the critical temperature of the body. Olszewski has determined the inversion-point in the case of hydrogen, and finds it to be 192·5° absolute, the theoretical critical point being thus about 28·5°, absolute. The cooling effect obtained is small, being for air about ¼° C. per atmosphere difference of pressure at ordinary temperatures. But the decrement of temperature is proportional to the difference of pressure and inversely as the absolute temperature, so that the Thomson-Joule effect increases rapidly by the combined use of a lower temperature and greater difference of gas pressure. By means of the "regenerative" method of working, which was described by C.W. Siemens in 1857, developed and extended by Ernest Solvay in 1885, and subsequently utilized by numerous experimenters in the construction of low temperature apparatus, a practicable liquid air plant was constructed by Linde. The gas which has passed the orifice and is therefore cooled is made to flow backwards round the tube that leads to the nozzle; hence that portion of the gas that is just about to pass through the nozzle has some of its heat abstracted, and in consequence on expansion is cooled to a lower temperature than the first portion. In its turn it cools a third portion in the same way, and so the reduction of temperature goes on progressively until ultimately a portion of the gas is liquefied. Apparatus based on this principle has been employed not only by Linde in Germany, but also by Tripler in America and by Hampson and Dewar in England. The last-named experimenter exhibited in December 1895 a laboratory machine of this kind (fig. 2), which when supplied with oxygen initially cooled to −79° C., and at a pressure of 100-150 atmospheres, began to yield liquid in about a quarter of an hour after starting. The initial cooling is not necessary, but it has the advantage of reducing the time required for the operation. The efficiency of the Linde process is small, but it is easily conducted and only requires plenty of cheap power. When we can work turbines or other engines at low temperatures, so as to effect cooling through the performance of external work, then the economy in the production of liquid air and hydrogen will be greatly increased.

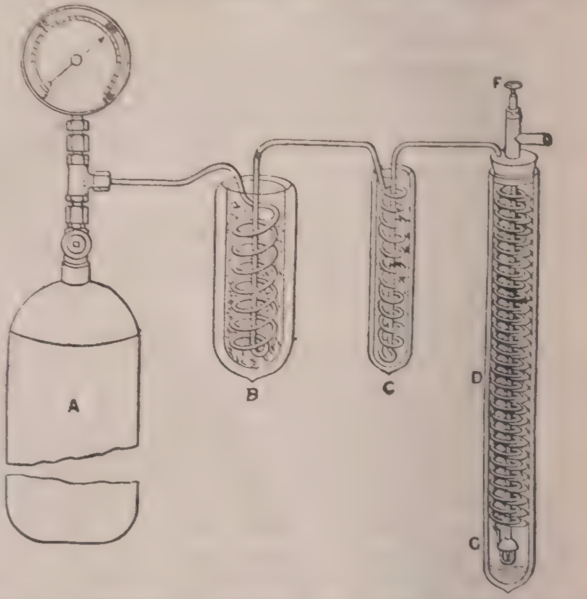

Fig. 3.—Hydrogen Jet Apparatus. A, Cylinder containing compressed hydrogen. B and C, Vacuum vessels containing carbonic acid under exhaustion and liquid air respectively. D, Regenerating coil in vacuum vessel. F, Valve. G, Pin-hole nozzle.

This treatment was next extended to hydrogen. For the reason already explained, it would have been futile to experiment with this substance at ordinary temperatures, and therefore as a preliminary it was cooled to the temperature of boiling liquid air, about −190° C. At this temperature it is still 2½ times above its critical temperature, and therefore its liquefaction in these circumstances would be comparable to that of air, taken at + 60° C., in an apparatus like that just described. Dewar showed in 1896 that hydrogen cooled in this way and expanded in a regenerative coil from a pressure of 200 atmospheres was rapidly reduced in temperature to such an extent that after the apparatus had been working a few minutes the issuing jet was seen to contain liquid, which was sufficiently proved to be liquid hydrogen by the fact that it was so cold as to freeze liquid air and oxygen into hard white solids. Though with this apparatus, a diagrammatic representation of which is shown in fig. 3, it was now found possible at the time to collect the liquid in an open vessel, owing to its low specific gravity and the rapidity of the gas-current, still the general type of the arrangement seemed so promising that in the next two years there was laid down in the laboratories of the Royal Institution a large plant—it weighs 2 tons and contains 3000 ft. of pipe—which is designed on precisely the same principles, although its construction is far more elaborate. The one important novelty, without which it is practically impossible to succeed, is the provision of a device to surmount the difficulty of withdrawing the liquefied hydrogen after it has been made. The desideratum is really a means of forming an aperture in the bottom of a vacuum vessel by which the contained liquid may be run out. For this purpose the lower part of the vacuum vessel (D in fig. 3) containing the jet is modified as shown in fig. 4; the inner vessel is prolonged in a fine tube, coiled spirally, which passes through the outer wall of the vacuum vessel, and thus sufficient elasticity is obtained to enable the tube to withstand without fracture the great contraction consequent on the extreme cold to which it is subjected. Such peculiarly shaped vacuum vessels were made by Dewar's directions in Germany, and have subsequently been supplied to and employed by other experimenters.

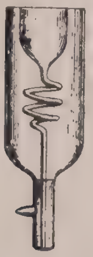

Fig. 4.—Bottom of Vacuum Vessel.

With the liquefying plant above referred to liquid hydrogen was for the first time collected in an open vessel on the 10th of May 1898. The gas at a pressure of 180 atmospheres was cooled to −205° C. by means of liquid air boiling *in vacuo*, and was then passed through the nozzle of the regenerative coil, which was enclosed in vacuum vessels in such a way as to exclude external heat as perfectly as possible. In this way some 20 cc. of the liquid had been collected when the experiment came to a premature end, owing to the nozzle of the apparatus becoming blocked by a dense solid—air-ice resulting from the congelation of the air which was present to a minute extent as an impurity in the hydrogen. This accident exemplifies what is a serious trouble encountered in the production of liquid hydrogen, the extreme difficulty of obtaining the gas in a state of sufficient purity, for the presence of 1% of foreign matters, such as air or oxygen, which are more condensible than hydrogen, is sufficient to cause complete stoppage, unless the nozzle valve and jet arrangement is of special construction. In subsequent experiments the liquid was obtained in larger quantities—on the 13th of June 1901 five litres of it were successfully conveyed through the streets of London from the laboratory of the Royal Institution to the rooms of the Royal Society—and it may be said that it is now possible to produce it in any desired amount, subject only to the limitations entailed by expense. Finally, the reduction of hydrogen to a solid state was successfully undertaken in 1899. A portion of the liquid carefully isolated in vacuum-jacketed vessels was suddenly transformed into a white mass resembling frozen foam, when evaporated under an air-pump at a pressure of 30 or 40 mm., and subsequently hydrogen was obtained as a clear transparent ice by immersing a tube containing the liquid in this solid foam.

Liquefaction of Helium.—The subjection of hydrogen completed the experimental proof that all gases can be reduced to the liquid and solid states by the aid of pressure and low temperature, at least so far as regards those in the hands of the chemist at the beginning of the last decade of the 19th century. But a year or so before hydrogen was obtained in the liquid form, a substance known to exist in the sun from spectroscopic researches carried out by Sir Edward Frankland and Sir J. Norman Lockyer was shown by Sir William Ramsay to exist on the earth in small quantities. Helium (*q.v.*), as this substance was named, was found by experiment to be a gas much less condensable than hydrogen. Dewar in 1901 expanded it from a pressure of 80-100 atmospheres at the temperature of solid hydrogen without perceiving the least indication of liquefaction. Olszewski repeated the experiment in 1905, using the still higher initial compression of 180 atmospheres, but he equally failed to find any evidence of liquefaction, and in consequence was inclined to doubt whether the gas was liquefiable at all, whether in fact it was not a truly "permanent" gas. Other investigators, however, took a different and more hopeful view of the matter. Dewar, for instance (*Pres. Address Brit. Assoc.*, 1902), basing his deductions on the laws established by van der Waals and others from the study of phenomena at much higher temperatures, anticipated that the boiling-point of the substance would be about 5° absolute, so that the liquid would be about four times more volatile than liquid hydrogen, just as liquid hydrogen is four times more volatile than liquid air; and he expressed the opinion that the gas would succumb on being subjected to the process that had succeeded with hydrogen, except that liquid hydrogen, instead of liquid air, evaporating under exhaustion must be employed as the primary cooling agent, and must also be used to surround the vacuum vessel in which the liquid was collected.

Various circumstances combined to prevent Dewar from actually carrying out the operation thus foreshadowed, but his anticipations were justified and the sufficiency of the method he indicated practically proved by Dr H. Kamerlingh Onnes, who, working with the splendid resources of the Leiden cryogenic laboratory, succeeded in obtaining helium in the liquid state on the 10th of July 1908. Having prepared 200 litres of the gas (160 litres in reserve) from monazite sand,[1] he cooled it with exhausted liquid hydrogen to a temperature of 15 or 16° abs., and expanded it through a regenerative coil under a pressure of 50 to 100 atmospheres, making use of the most elaborate precautions to prevent influx of heat and securing the absence of less volatile gases that might freeze and block the tubes of the apparatus by including in the helium circuit charcoal cooled to the temperature of liquid air. Operations began at 5·45 in the morning with the preparation of the necessary liquid hydrogen, of which 20 litres were ready by 1·30. The circulation of the helium was started at 4·30 in the afternoon and was continued until the gas had been pumped round the circuit twenty times; but it was not till 7·30, when the last bottle of liquid hydrogen had been brought into requisition, that the surface of the liquid was seen, by reflection of light from below, standing out sharply like the edge of a knife against the glass wall of the vacuum vessel. Its boiling-point has been determined as being 4° abs., its critical temperature 5°, and its critical pressure not more than three atmospheres. The density of the liquid is found to be 0·015 or about twice that of liquid hydrogen. It could not be solidified even when exhausted under a pressure of 2 mm., which in all probability corresponds to a temperature of 2° abs. (see *Communications from the physical laboratory at the University of Leiden*, 1908–1909).

The following are brief details respecting some of the more important liquid gases that have become available for study within recent years. (For argon, neon, krypton, &c., see Argon.)

Oxygen.—Liquid oxygen is a mobile transparent-liquid, possessing a faint blue colour. At atmospheric pressure it boils at −181·5° C.; under a reduced pressure of 1 cm. of mercury its temperature falls to −210° C. At the boiling point it has a density of 1·124 according to Olszewski, or of 1·168 according to Wroblewski; Dewar obtained the value 1·1375 as the mean of twenty observations by weighing a number of solid substances in liquid oxygen, noting the apparent relative density of the liquid, and thence calculating its real density, Fizeau's values for the coefficients of expansion of the solids being employed. The capillarity of liquid oxygen is about one-sixth that of water; it is a non-conductor of electricity, and is strongly magnetic. By its own evaporation it cannot be reduced to the solid state, but exposed to the temperature of liquid hydrogen it is frozen into a solid mass, having a pale bluish tint, showing by reflection all the absorption bands of the liquid. It is remarkable that the same absorption bands occur in the compressed gas. Dewar gives the melting-point as 38° absolute, and the density at the boiling-point of hydrogen as 1·4526. The refractive index of the liquid for the D sodium ray is 1·2236.

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[1] It may be noted that now that the commercial production of oxygen is effected by the liquefaction of air, with separation of its constituents in what is essentially a Coffey still, the chemist has at his command large quantities not only of the less volatile constituents, krypton and xenon, but also of the more volatile ones, neon and helium. Roughly a million volumes of air contain 20 volumes of neon and helium, about 15 of the former to 5 of the latter, approximately 1 volume of hydrogen being associated with them, so that in view of the enormous amounts of oxygen that are produced, helium can be obtained in practically any quantity directly from the atmosphere.

Ozone.—This gas is easily liquefied by the use of liquid air. The liquid obtained is intensely blue, and on allowing the temperature to rise, boils and explodes about −120° C. About this temperature it may be dissolved in bisulphide of carbon to a faint blue solution. The liquid ozone seems to be more magnetic than liquid oxygen.

Nitrogen forms a transparent colourless liquid, having a density of 0·8042 at its boiling-point, which is −195·5° C. The refractive index for the D line is 1·2053. Evaporated under diminished pressure the liquid becomes solid at a temperature of −215° C., melting under a pressure of 90 mm. The density of the solid at the boiling-point of hydrogen is 1·0265.

Air.—Seeing that the boiling-points of nitrogen and oxygen are different, it might be expected that on the liquefaction of atmospheric air the two elements would appear as two separate liquids. Such, however, is not the case; they come down simultaneously as one homogeneous liquid. Prepared on a large scale, liquid air may contain as much as 50% of oxygen when collected in open vacuum-vessels, but since nitrogen is the more volatile it boils off first, and as the liquid gradually becomes richer in oxygen the temperature at which it boils rises from about −192° C. to about −182° C. At the former temperature it has a density of about 0·910. It is a non-conductor of electricity. Properly protected from external heat, and subjected to high exhaustion, liquid air becomes a stiff transparent jelly-like mass, a magma of solid nitrogen containing liquid oxygen, which may indeed be extracted from it by means of a magnet, or by rapid rotation of the vacuum vessel in imitation of a centrifugal machine. The temperature of this solid under a vacuum of about 14 mm. is −216°. At the still lower temperatures attainable by the aid of liquid hydrogen it becomes a white solid, having, like solid oxygen, a faint blue tint. The refractive index of liquid air is 1·2068.

Fluorine, prepared in the free state by Moissan's method of electrolysing a solution of potassium fluoride in anhydrous hydrofluoric acid, was liquefied in the laboratories of the Royal Institution, London, in 1897. Exposed to the temperature of quietly-boiling liquid oxygen, the gas did not change its state, though it lost much of its chemical activity, and ceased to attack glass. But a very small vacuum formed over the oxygen was sufficient to determine liquefaction, a result which was also obtained by cooling the gas to the temperature of freshly-made liquid air boiling at atmospheric pressure. Hence the boiling-point is fixed at about −187° C. The liquid is of a clear yellow colour, possessing great mobility. Its density is 1·14, and its capillarity rather less than that of liquid oxygen. The liquid, when examined in a thickness of 1 cm., does not show any absorption bands, and it is not attracted by a magnet. Cooled in liquid hydrogen it is frozen to a white solid, melting at about 40° abs.

Hydrogen.—Liquid hydrogen is the lightest liquid known to the chemist, having a density slightly less than 0·07 as compared with water, and being six times lighter than liquid marsh-gas, which is next in order of lightness. One litre weighs only 70 grammes, and 1 gramme occupies a volume of 14-15 cc. In spite of its extreme lightness, however, it is easily seen, has a well-defined meniscus and drops well. At its boiling-point the liquid is only 55 times denser than the vapour it is giving off, whereas liquid oxygen in similar condition is 258 times denser than its vapour, and nitrogen 177 times. Its atomic volume is about 14·3, that of liquid oxygen being 13·7, and that of liquid nitrogen 16·6, at their respective boiling-points. Its latent heat of vaporization about the boiling-point is about 121 gramme-calories, and the latent heat of fluidity cannot exceed 16 units, but may be less. Hydrogen appears to have the same specific heat in the liquid as in the gaseous state, about 3·4. Its surface tension is exceedingly low, about one-fifth that of liquid air at its boiling-point, or one-thirty-fifth that of water at ordinary temperatures, and this is the reason that bubbles formed in the liquid are so small as to give it an opalescent appearance during ebullition. The liquid is without colour, and gives no absorption spectrum. Electric sparks taken in the liquid between platinum poles give a spectrum showing the hydrogen lines C and F bright on a background of continuous spectrum. Its refractive index at the boiling-point has theoretically the value 1·11. It was measured by determining the relative difference of focus for a parallel beam of light sent through a spherical vacuum vessel filled successively with water, liquid oxygen and liquid hydrogen; the result obtained was 1·12. Liquid hydrogen is a non-conductor of electricity. The precise determination of its boiling-point is a matter of some difficulty. The first results obtained from the use of a platinum resistance thermometer gave −238° C., while a similar thermometer made with an alloy of rhodium-platinum indicated a value 8 degrees lower. Later, a gold thermometer indicated about −249° C., while with an iron one the result was only −210° C. It was thus evident that electrical resistance thermometers are not to be trusted at these low temperatures, since the laws correlating resistance and temperature are not known for temperatures at and below the boiling-point of hydrogen, though they are certainly not the same as those which hold good higher up the thermometric scale. The same remarks apply to the use of thermo-electric junctions at such exceptional temperatures. Recourse was therefore had to a constant-volume hydrogen thermometer, working under reduced pressure, experiments having shown that such a thermometer, filled with either a simple or a compound gas (*e.g.* oxygen or carbonic acid) at an initial pressure somewhat less than one atmosphere, may be relied upon to determine temperatures down to the respective boiling-points of the gases with which they are filled. The result obtained was −252° C. Subsequently various other determinations were carried out in thermometers filled with hydrogen derived from different sources, and also with helium, the average value given by the experiments being −252·5° C. (See "The Boiling Point of Liquid Hydrogen determined by Hydrogen and Helium Gas Thermometers," *Proc. Roy. Soc.*, 7th February 1901.) The critical temperature is about 30° absolute (−243° C.), and the critical pressure about 15 atmospheres. Hydrogen has not only the lowest critical temperature of all the old permanent gases, but it has the lowest critical pressure. Given a sufficiently low temperature, therefore, it is the easiest gas to liquefy so far as pressure is concerned. Solid hydrogen has a temperature about 4° less. By exhaustion under reduced pressure a still lower depth of cold may be attained, and a steady temperature reached less than 16° above the zero of absolute temperature. By the use of high exhaustion, and the most stringent precautions to prevent the influx of heat, a temperature of 13° absolute (−260° C.) may be reached. This is the lowest steady temperature which can be maintained by the evaporation of solid hydrogen. At this temperature the solid has a density of about 0·077. Solid hydrogen presents no metallic characteristics, such as were predicted for it by Faraday, Dumas, Graham and other chemists and neither it nor the liquid is magnetic.

The Approach to the Absolute Zero.—The achievement of Kamerlingh Onnes has brought about the realization of a temperature removed only 3° from the absolute zero, and the question naturally suggests itself whether there is any probability of a still closer approach to that point. The answer is that if, as is not impossible, there exists a gas, as yet unisolated, which has an atomic weight one-half that of helium, that gas, liquefied in turn by the aid of liquid helium, would render that approach possible, though the experimental difficulties of the operation would be enormous and perhaps prohibitive. The results of experiments bearing on this question and of theory based on them are shown in table II. The third column shows the critical temperature of the gas which can be liquefied by continuous expansion through a regenerative cooling apparatus, the operation being started from the initial temperature shown in the second column, while the fourth column gives the temperature of the resulting liquid. It will be seen that by the use of liquid or solid hydrogen as a cooling agent, it should be possible to liquefy a body having a critical temperature of about 6° to 8° on the absolute scale, and a boiling point of about 4° or 5°, while with the aid of liquid helium at an initial temperature of 5° we could liquefy a body having a critical temperature of 2° and a boiling point of 1°.

TABLE II.

Substance.	Initial Temperature. Abs. Degrees.	Critical Temperature. Abs. Degrees.	Boiling Points. Abs. Degrees.
(Low red heat) .	760	304	195 (CO_2)
(52° C.) . . .	325	130	86 (Air)
Liquid air under exhaustion .	75	30	20 (H)
Liquid hydrogen	20	8	5 (He)
Solid hydrogen .	15	6	4
Liquid helium .	5	2	1

It is to be remarked, however, that even so the physicist would not have attained the absolute zero, and he can scarcely hope ever to do so. It is true he would only be a very short distance from it, but it must be remembered that in a thermodynamic sense one degree low down the scale, say at 10° absolute, is equivalent to 30° at the ordinary temperature, and as the experimenter gets to lower and lower temperatures, the difficulties of further advance increase, not in arithmetical but in geometrical progression. Thus the step between the liquefaction of air and that of hydrogen is, thermodynamically and practically, greater than that between the liquefaction of chlorine and that of air, but the number of degrees of temperature that separates the boiling-points of the first pair of substances is less than half what it is in the case of the second pair. But the ratio of the absolute boiling-points in the first pair of substances is as 1 to 4, whereas in the second pair it is only 1 to 3, and it is this value that expresses the difficulty of the transition.

But though Ultima Thule may continue to mock the physicist's efforts, he will long find ample scope for his energies in the investigation of the properties of matter at the temperatures placed at his command by liquid air and liquid and solid hydrogen. Indeed, great as is the sentimental interest attached to the liquefaction of these refractory gases, the importance of the achievement lies rather in the fact that it opens out new fields of research and enormously widens the horizon of physical science, enabling the natural philosopher to study the properties and behaviour of matter under entirely novel conditions. We propose to indicate briefly the general directions in which such inquiries have so far been carried on, but before doing so will call attention to the power of absorbing gases possessed by cooled charcoal, which has on that account proved itself a most valuable agent in low temperature research.

Gas Absorption by Charcoal.—Felix Fontana was apparently the first to discover that hot charcoal has the power of absorbing gases, and his observations were confirmed about 1770 by Joseph Priestley, to whom he had communicated them. A generation later Theodore de Saussure made a number of experiments on the subject, and noted that at ordinary temperatures the absorption is accompanied with considerable evolution of heat. Among subsequent investigators were Thomas Graham and Stenhouse, Faure and Silberman, and Hunter, the last-named showing that charcoal made from coco-nut exhibits greater absorptive powers than other varieties. In 1874 Tait and Dewar for the first time employed charcoal for the production of high vacua, by using it, heated to a red heat, to absorb the mercury vapour in a tube exhausted by a mercury pump; and thirty years afterwards it occurred to the latter investigator to try how its absorbing powers are affected by cooling it, with the result that he found them to be greatly enhanced. Some of his earlier observations are given in table III., but it must be pointed out that much larger absorptions were obtained subsequently when it was found that the quality of the charcoal was greatly influenced by the mode in which it was prepared, the absorptive power being increased by carbonizing the coco-nut shell slowly at a gradually increasing temperature. The results in the table were all obtained with the same specimen of charcoal, and the volumes of the gases absorbed, both at ordinary and at low temperatures, were measured under standard conditions—at 0° C., and 760 mm. pressure. It appears that at the lower temperature there is a remarkable increase of absorption for every gas, but that the increase is in general smaller as the boiling-points of the various gases are lower. Helium is conspicuous for the fact that it is absorbed to a comparatively slight extent at both the higher and the lower temperature, but in this connexion it must be remembered that, being the most volatile gas known, it is being treated at a temperature which is relatively much higher than the other gases. At −185° (=88° abs.), while hydrogen is at about 4½ times its boiling-point (20° abs.), helium is at about 20 times its boiling-point (4·5° abs.), and it might, therefore, be expected that if it were taken at a temperature corresponding to that of the hydrogen, *i.e.* at 4 or 5 times its boiling-point, or say 20° abs., it would undergo much greater absorption. This expectation is borne out by the results shown in table IV., and it may be inferred that charcoal cooled in liquid helium would absorb helium as freely as charcoal cooled in liquid hydrogen absorbs hydrogen. It is found that a given specimen of charcoal cooled in liquid oxygen, nitrogen and hydrogen absorbs about equal volumes of those three gases (about 260 cc. per gramme; and, as the relation between volume and temperature is nearly lineal at the lowest portions of either the hydrogen or the helium absorption, it is a legitimate inference that at a temperature of 5° to 6° abs. helium would be as freely absorbed by charcoal as hydrogen is at its boiling-point and that the boiling-point of helium lies at about 5° abs.

TABLE III.—*Gas Absorption by Charcoal.*

	Volume absorbed at 0° Cent.	Volume absorbed at −185° Cent.
Helium	2 cc.	15 cc.
Hydrogen	4	135
Electrolytic gas	12	150
Argon	12	175
Nitrogen	15	155
Oxygen	18	230
Carbonic oxide	21	190
Carbonic oxide and oxygen	30	195

TABLE IV.—*Gas Absorption by Charcoal at Low Temperatures.*

Temperature.	Helium. Vols. of Carbon.	Hydrogen. Vols. of Carbon.
−185° C. (boiling-point of liquid air)	2½	137
−210° C. (liquid air under exhaustion)	5	180
−252° C. (boiling-point of liquid hydrogen)	160	258
−258° C. (solid hydrogen)	195	..

The rapidity with which air is absorbed by charcoal at −185° C. and under small pressures is illustrated by table V., which shows the reductions of pressure effected in a tube of 2000 cc. capacity by means of 20 grammes of charcoal cooled in liquid air.

TABLE V.—*Velocity of Absorption.*

Time of Exhaustion.	Pressure in mm.	Time of Exhaustion.	Pressure in mm.
0 sec.	2·190	60 sec.	0·347
10 ,,	1·271	2 min.	0·153
20 ,,	0·869	5 ,,	0·0274
30 ,,	0·632	10 ,,	0·00205
40 ,,	0·543	19 ,,	0·00025
50 ,,	0·435	..	..

Charcoal Occlusion Pressures.—For measuring the gas concentration, pressure and temperature, use may be made of an apparatus of the type shown in fig. 5. A mass of charcoal, E, immersed in liquid air, is employed for the preliminary exhaustion of the McLeod gauge G and of the charcoal C, which is to be used in the actual experiments, and is then sealed off at S. The bulb C is then placed in a large spherical vacuum vessel containing liquid oxygen which can be made to boil at any definite temperature under diminished pressure which is measured by the manometer R. The volume of gas admitted into the charcoal is determined by the burette D and the pipette P, and the corresponding occlusion pressure at any concentration and any temperature below 90° abs. by the gauge G. In presence of charcoal, and for small concentrations, great variations are shown in the relation between the pressure and the concentration of different gases, all at the same temperature. Table VI. gives the comparison between hydrogen and nitrogen at the temperature of liquid air, 25 grammes of charcoal being employed. It is seen that 15 cc. of hydrogen produce nearly the same pressure (0·0645 mm.) as 2500 cc. of nitrogen (0·06172 mm.). This result shows how

TABLE VI.

Volume of Gas absorbed.	Occlusion Hydrogen Pressure.	Occlusion Nitrogen Pressure.
cc.	mm.	mm.
0	0·00003	0·00005
5	0·0228	..
10	0·0455	..
15	0·0645	..
20	0·0861	..
25	0·1105	..
30	0·1339	0·00031
35	0·1623	..
40	0·1870	..
130	..	0·00110
500	..	0·00314
1000	..	0·01756
1500	..	0·02920
2500	..	0·06172

enormously greater, at the temperature of liquid air, is the volatility of hydrogen as compared with that of nitrogen. In the same way the concentrations, for the same pressure, vary greatly with temperature, as is exemplified by table VII., even though the pressures are not quite constant. The temperatures employed were the boiling-points of hydrogen, oxygen and carbon dioxide.

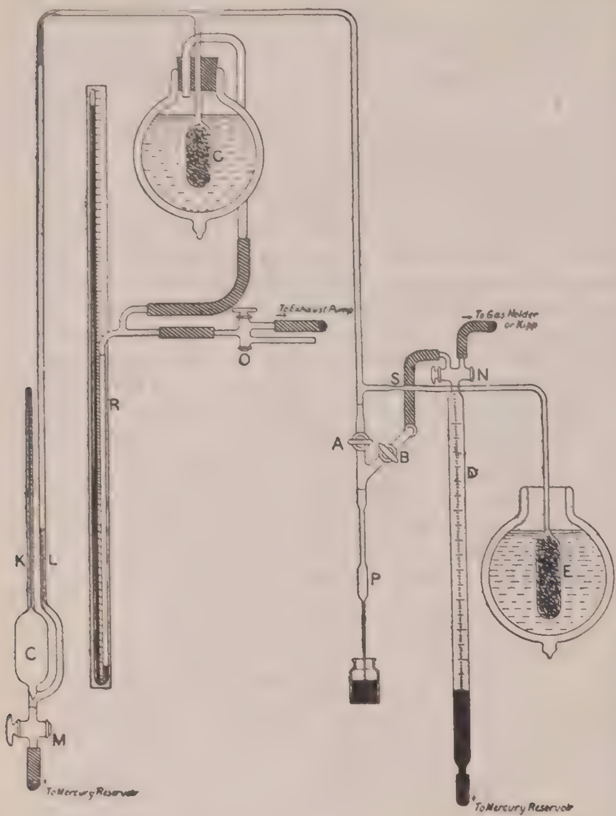

Fig. 5.

Table VII.

Gas.	Concentration in cc. per grm. of Charcoal.	Pressure in mm.	Temperature Absolute.
Helium . . .	97	2·2	20°
Hydrogen . .	397	2·2	20°
Hydrogen . .	15	2·1	90°
Nitrogen . . .	250	1·6	90°
Oxygen . . .	300	1·0	90°
Carbon dioxide .	90	3·6	195°

Heat of Occlusion.—In every case when gases are condensed to the liquid state there is evolution of heat, and during the absorption of a gas in charcoal or any other occluding body, as hydrogen in palladium, the amount of heat evolved exceeds that of direct liquefaction. From the relation between occlusion-pressure and temperature at the same concentration, the reaction being reversible, it is possible to calculate this heat evolution. Table VIII. gives the mean molecular latent heats of occlusion resulting from Dewar's experiments for a number of gases, having concentrations in the charcoal as shown. The concentrations were so regulated as to start with an initial pressure not exceeding 3 mm. at the respective boiling-points of hydrogen, nitrogen, oxygen and carbon dioxide.

Table VIII.

Gas.	Concentration cc. per grm.	Molecular Latent Heat.	Mean Temperature Absolute.
Helium . . .	97	483·0	18°
Hydrogen . . .	390	524·4	18°
Hydrogen . . .	20	2005·6	78°
Nitrogen . . .	250	3059·0	82°
Oxygen . . .	300	3146·4	82°
Carbon dioxide .	90	6099·6	180°

Production of High Vacua.—Exceedingly high vacua can be obtained by the aid of liquid gases, with or without charcoal. If a vessel containing liquid hydrogen be freely exposed to the atmosphere, a rain of snow (solid air) at once begins to fall upon the surface of the liquid; similarly, if one end of a sealed tube containing ordinary air be immersed in the liquid, the same thing happens, but since there is now no new supply to take the place of the air that has been solidified and has accumulated in the cooled portion of the tube, the pressure is quickly reduced to something like one-millionth of an atmosphere, and a vacuum is formed of such tenuity that the electric discharge can be made to pass only with difficulty. Liquid air can be employed in the same manner if the tube, before sealing, is filled with some less volatile gas or vapour, such as sulphurous acid, benzol or water vapour. But if a charcoal condenser be used in conjunction with the liquid air it becomes possible to obtain a high vacuum when the tube contains air initially. For instance, in one experiment, with a bulb having a capacity of 300 cc. and filled with air at a pressure of about 1·7 mm. and at a temperature of 15° C., when an attached condenser with 5 grammes of charcoal was cooled in liquid air, the pressure was reduced to 0·0545 mm. of mercury in five minutes, to 0·01032 mm. in ten minutes, to 0·000139 mm. in thirty minutes, and to 0·000047 mm. in sixty minutes. The condenser then being cooled in liquid hydrogen the pressure fell to 0·0000154 mm. in ten minutes, and to 0·0000058 mm. in a further ten minutes when solid hydrogen was employed as the cooling agent, and no doubt, had it not been for the presence of hydrogen and helium in the air, an even greater reduction could have been effected. Another illustration of the power of cooled charcoal to produce high vacua is afforded by a Crookes radiometer. If the instrument be filled with helium at atmospheric pressure and a charcoal bulb attached to it be cooled in liquid air, the vanes remain motionless even when exposed to the concentrated beam of an electric arc lamp; but if liquid hydrogen be substituted for the liquid air rapid rotation at once sets in. When a similar radiometer was filled with hydrogen and the attached charcoal bulb was cooled in liquid air rotation took place, because sufficient of the gas was absorbed to permit motion. But when the charcoal was cooled in liquid hydrogen instead of in liquid air, the absorption increased and consequently the rarefaction became so high that there was no motion when the light from the arc was directed on the vanes. These experiments again permit of an inference as to the boiling-point of helium. A fall of 75% in the temperature of the charcoal bulb, from the boiling-point of air to the boiling-point of hydrogen, reduced the vanes to rest in the case of the radiometer filled with hydrogen; hence it might be inferred that a fall of like amount from the boiling-point of hydrogen would reduce the vanes of the helium radiometer to rest, and consequently that the boiling-point of helium would be about 5° abs.

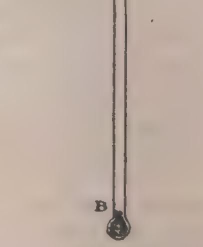

Fig. 6.

The vacua obtainable by means of cooled charcoal are so high that it is difficult to determine the pressures by the McLeod gauge, and the radiometer experiments referred to above suggested the possibility of another means of ascertaining such pressures, by determining the pressures below which the radiometer would not spin. The following experiment shows how the limit of pressure can be ascertained by reference to the pressures of mercury vapour which have been very accurately determined through a wide range of temperature. To a radiometer (fig. 6) with attached charcoal bulb B was sealed a tube ending in a small bulb A containing a globule of mercury. The radiometer and bulb B were heated, exhausted and repeatedly washed out with pure oxygen gas, and then the mercury was allowed to distil for some time into the charcoal cooled in liquid air. On exposure to the electric beam the vanes began to spin, but soon ceased when the bulb A was cooled in liquid air. When, however, the mercury was warmed by placing the bulb in liquid water, the vanes began to move again, and in the particular radiometer used this was found to happen when the temperature of the mercury had risen to −23° C. corresponding to a pressure of about one fifty-millionth of an atmosphere.

For washing out the radiometer with oxygen the arrangement shown in fig. 7 is convenient. Here A is a bulb containing perchlorate of potash, which when heated gives off pure oxygen; C is again the radiometer and B the charcoal bulb. The side tube E is for the purpose of examining the gas given off by minerals like thorianite or the gaseous products of the transformation of radioactive bodies.

Analytic Uses.—Another important use of liquid gases is an analytic agents, and for this purpose liquid air is becoming an almost essential laboratory reagent. It is one of the most convenient agents for drying gases and for their purification. If a mixture of gases be subjected to the temperature of liquid air, it is obvious that all the constituents that are more condensable than air will be reduced to liquid, while those that are less condensable will either remain as a gaseous residue or be dissolved in the liquid obtained. The bodies present in the latter may be separated by fractional distillation, while the contents of the gaseous residue may be further differentiated by the air of still lower temperatures, such as are obtainable by liquid hydrogen. An apparatus such as the following can be used to separate both the less and the more volatile gases of the atmosphere, the former being obtained from their solution in liquid air by fractional distillation at low pressure and separation of the condensable part of the distillate by cooling in liquid hydrogen, while the latter are extracted from the residue of liquid air, after the distillation of the first fraction, by allowing it to evaporate gradually at a temperature rising only very slowly.

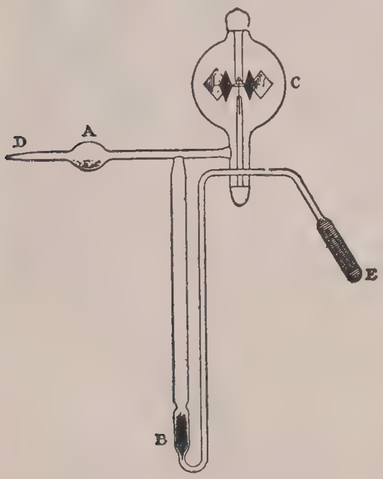

Fig. 7.

In fig. 8, A represents a vacuum-jacketed vessel, containing liquid air; this can be made to boil at reduced pressure and therefore be lowered in temperature by means of an air-pump, which is in communication with the vessel through the pipe *s*. The liquid boiled away is replenished when necessary from the reservoir C, *p* being a valve, worked by handle *q*, by which the flow along *r* is regulated. The vessel B, immersed in the liquid air of A, communicates with the atmosphere by *a*; hence when the temperature of A falls under exhaustion below that of liquid air, the contents of B condense, and if the stop-cock *m* is kept open, and *n* shut, air from the outside is continuously sucked in until B is full of liquid, which contains in solution the whole of the most volatile gases of the atmosphere which have passed in through *a*. At this stage of the operation *m* is closed and *n* opened, a passage thus being opened along *b* from A to the remainder of the apparatus seen on the left side of the figure. Here E is a vacuum vessel containing liquid hydrogen, and *d* a three-way cock by which communication can be established either btween *b* and D, between *b* and *e*, the tube leading to the sparking-tube *g*, or between D and *e*. If now *d* is arranged so that there is a free passage from *b* to D, and the stop-cock *n* also opened, the gas dissolved in the liquid in B, together with some of the most volatile part of that liquid, quickly distils over into D, which is at a much lower temperature than B, and some of it condenses there in the solid state. When a small fraction of the contents of B has thus distilled over, *d* is turned so as to close the passage between D and *b* and open that between D and *e*, with the result that the gas in D is pumped out by the mercury-pump, shown diagrammatically at *F*, along the tube *e* (which is immersed in the liquid hydrogen in order that any more condensable gas carried along by the current may be frozen out) to the sparking-tube or tubes *g*, where it can be examined spectroscopically. When the apparatus is used to separate the least volatile part of the gases in the atmosphere, the vessel E and its contents are omitted, and the tube *b* made to communicate with the pump through a number of sparking-tubes which can be sealed off successively. The nitrogen and oxygen which make up the bulk of the liquid in B are allowed to evaporate gradually, the temperature being kept low so as to check the evaporation of gases less volatile than oxygen. When most of the oxygen and nitrogen have thus been removed, the stop-cock *n* is closed, and the tubes partially exhausted by the pump; spectroscopic examination is made of the gases they contain, and repeated from time to time as more gas is allowed to evaporate from B. The general sequence of spectra, apart from those of nitrogen, oxygen and carbon compounds, which are never eliminated by the process of distillation alone, is as follows: The spectrum of argon first appears, followed by the brightest (green and yellow) rays of krypton. Then the intensity of the argon spectrum wanes and it gives way to that of krypton, until, as Runge observed, when a Leyden jar is in the circuit, the capillary part of the sparking-tube has a magnificent blue colour, while the wide ends are bright pale yellow. Without a jar the tube is nearly white in the middle and yellow about the poles. As distillation proceeds, the temperature of the vessel containing the residue of liquid air being allowed to rise slowly, the brightest (green) rays of xenon begin to appear, and the krypton rays soon die out, being superseded by those of xenon. At this stage the capillary part of the sparking-tube is, with a jar in circuit, a brilliant green, and it remains green, though less brilliant, if the jar is removed.

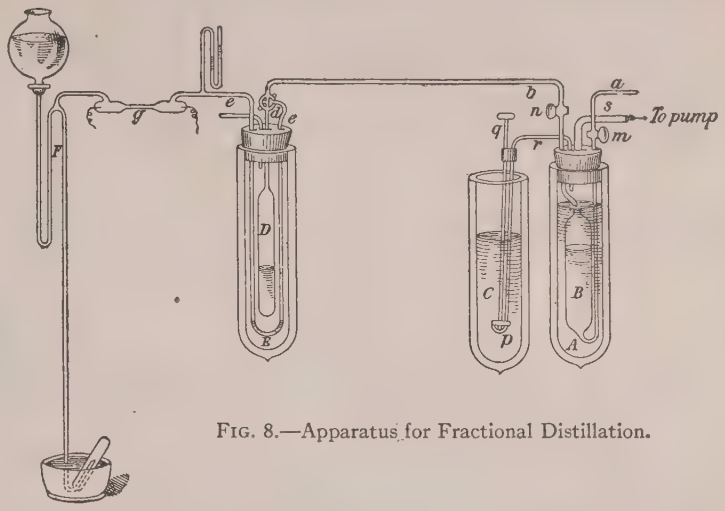

Fig. 8.—Apparatus for Fractional Distillation.

An improved form of apparatus for the fractionation is represented in fig. 9. The gases to be separated, that is, the least volatile part of atmospheric air, enter the bulb B from a gasholder by the tube *a* with stop-cock *c*. B, which is maintained at a low temperature by being immersed in liquid hydrogen, A, boiling under reduced pressure, in turn communicates through the tube *b* and stop-cock *d* with a sparking-tube or tubes *f*, and so on through *e* with a mercurial pump. To

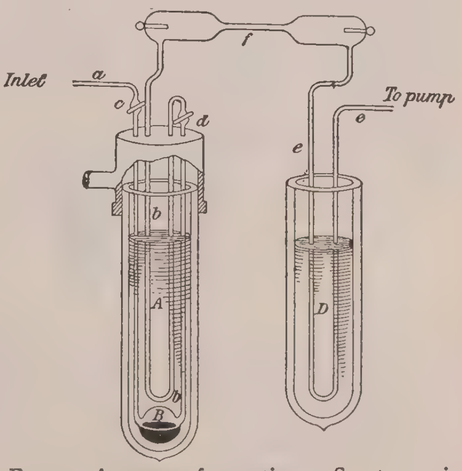

Fig. 9.—Apparatus for continuous Spectroscopic Examination.

use the apparatus, stop-cock *d* is closed and *c* opened, and gas allowed to pass from the gasholder into B, where it is condensed in the solid form. Stop-cock *c* then being closed and *d* opened, gas passes into the exhausted tube *f*, where it is examined with the spectroscope. The vessel D contains liquid air, in which the tube *e* is immersed in order to condense vapour of mercury which would otherwise pass from the pump into the sparking-tube. The success of the operation of separating all the gases which occur in air and which boil at different temperatures, depends on keeping the temperature of B as low as possible, as will be understood from the following consideration:—

The pressure p, of a gas G, above the same material in the liquid state, at temperature T, is given approximately by the formula

$$\log p = A - \frac{B}{T},$$

where A and B are constants for the same material. For some other gas G′ the formula will be

$$\log p_1 = A_1 - \frac{B_1}{T},$$

and

$$\log \frac{p}{p_1} = A - A_1 + \frac{B_1 - B}{T},$$

Now for argon, krypton and xenon respectively the values of A are 6·782, 6·972 and 6·963, and those of B are 339, 496·3 and 669·2; so that for these substances and many others $A - A_1$ is always a small quantity, while $\frac{B_1 - B}{T}$ is considerable and increases as T diminishes. Hence the ratio of p to p_1 increases rapidly as T diminishes, and by evaporating all the gases from the solid state, and keeping the solid at as low a temperature as possible, the gas that is taken off by the mercurial pump first consists mainly of the substance which has the lowest boiling point, in this case nitrogen, and is succeeded with comparative abruptness by the gas which has the next higher boiling point. Examination of the spectrum in the sparking-tube easily reveals the change from one gas to another, and when that is observed the reservoirs into which the gases are pumped can be changed and the fractions stored separately. Or several sparking-tubes may be arranged so as to form parallel communications between *b* and *e*, and can be successively sealed off at the desired stages of fractionation.

Analytical operations can often be performed still more conveniently with the help of charcoal, taking advantage of the selective character of its absorption, the general law of which is that the more volatile the gas the less is it absorbed at a given temperature. The following are some examples of its employment for this purpose. If it be required to separate the helium which is often found in the gases given off by a thermal spring, they are subjected to the action of charcoal cooled with liquid air. The result is the absorption of the less volatile constituents, *i.e.* all except hydrogen and helium. The gaseous residue, with the addition of oxygen, is then sparked, and the water thus formed is removed together with the excess of oxygen, when helium alone remains. Or the separation may be effected by a method of fractionation as described above. To separate the most volatile constituents of the atmosphere an apparatus such as that shown in fig. 10 may be employed. In one experiment with this, when 200 c.c. was supplied from the graduated gas-holder F to the vessel D, containing 15 grammes of charcoal cooled in liquid air, the residue which passed on unabsorbed to the sparking-tube AB, which had a small charcoal bulb C attached, showed the C and F lines of hydrogen, the yellow and some of the orange lines of neon and the yellow and green of helium. By using a second charcoal vessel E, with stop-cocks at H, I, J, K and L to facilitate manipulation, considerable quantities of the most volatile gases can be collected. After the charcoal in E has been saturated, the stop-cock K is closed and I and J are opened for a short time, to allow the less condensable gas in E to be sucked into the second condenser D along with some portion of air. The condenser E is then taken out of the liquid air, heated quickly to 15° C. to expel the occluded air and replaced. More air is then passed in, and by repeating the operation several times 50 litres of air can be treated in a short time, supplying sparking-tubes which will show the complete spectra of the volatile constituents of the air.

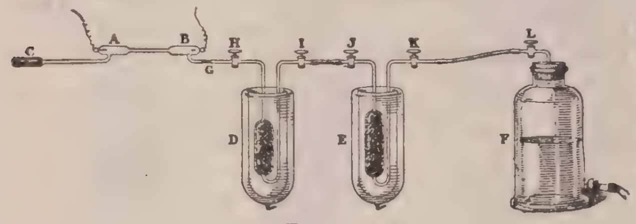

FIG. 10.

The less volatile constituents of the atmosphere, krypton and xenon, may be obtained by leading a current of air, purified by passage through a series of tubes cooled in liquid air, through a charcoal condenser also cooled in liquid air. The condenser is then removed and placed in solid carbon dioxide at −78° C. The gas that comes off is allowed to escape, but what remains in the charcoal is got out by heating and exhaustion, the carbon compounds and oxygen are removed and the residue, consisting of nitrogen with krypton and xenon, is separated into its constituents by condensation and fractionation. Another method is to cover a few hundred grammes of charcoal with old liquid air, which is allowed to evaporate slowly in a silvered vacuum vessel; the gases remaining in the charcoal are then treated in the manner described above.

Charcoal enables a mixture containing a high percentage of oxygen to be extracted from the atmosphere. In one experiment 50 grammes of it, after being heated and exhausted were allowed to absorb air at −185° C.; some 5 or 6 litres were taken up in ten minutes, and it then presumably contained air of the composition of the atmosphere, *i.e.* 20% oxygen and 80% nitrogen, as shown in fig. 11. But when more air was passed over it, the portion that was not absorbed was found to consist of about 98% nitrogen, showing that excess of oxygen was being absorbed, and in the course of a few hours the occluded gas attained a new and apparently definite composition exhibited in fig. 12. When the charcoal containing this mixture was transferred to a vacuum vessel and allowed to warm up slowly, the successive litres of gas when collected and analyzed separately showed the following composition:—

1st litre	18·5% oxygen
2nd litre	20·6% „
3rd litre	53·0% „
4th litre	72·0% „
5th litre	79·0% „
6th litre	84·0% „

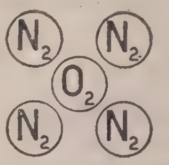

FIG. 11.

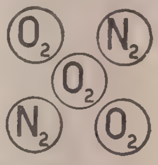

FIG. 12.

Calorimetry.—Certain liquid gases lend themselves conveniently to the construction of a calorimeter, in which the heat in weighed quantities of any substance with which it is desired to experiment may be measured by the quantity of liquid gas they are able to evaporate. One advantage of this method is that a great range of temperature is available when liquid air, oxygen, nitrogen or hydrogen is employed as the calorimetric substance. Another is the relatively large quantity of gas yielded by the evaporation, as may be seen from table IX.,

TABLE IX.

Liquid Gases.	Boiling Point.	Liquid Volume of 1 gram at Boiling Point in c.c.	Latent Heat in gram Calories.	Volume of Gas at 0° C. and 760 mm per gram Calorie in c.c.
Sulphurous acid	+ 10°C.	0·7	97·0	3·6
Carbonic acid .	− 78·0	0·65 (solid)	142·4	3·6
Ethylene . .	−103·0	1·7	119·0	7·0
Oxygen . .	−182·5	0·9	53·0	13·2
Nitrogen . .	−195·6	1·3	50·0	15·9
Hydrogen . .	−252·5	14·3	125·0	88·9
Helium . .	−269·0	7·0	13·0	450·0

which shows the special physical constants of the various gases that are of importance in calorimetry. In consequence it is easy to detect $\frac{1}{50}$ gram calorie with liquid air and so little as $\frac{1}{800}$ gram calorie with liquid hydrogen.

The apparatus (fig. 13) consists of a large vacuum vessel A, of 2 or 3 litres' capacity, containing liquid air, in which is inserted a smaller vacuum vessel B, of 25-30 c.c. capacity, having sealed to it a long narrow tube G that projects above the mouth of A and is held in place by some loosely packed cotton wool. To the top of this tube the test tube C, containing the material under investigation, is connected by a piece of flexible rubber tubing D; this enables C to be tilted so as to throw a piece or pieces of the contained material into the calorimeter. An improved form of this receptacle, attached to B by a flexible tube at D′, is shown at C′. In this P is a wire movable through a cork Q and having at its end a hook by which a piece of the substance under examination can be pulled up and dropped into B. In the absence of other arrangements the substance is at the temperature of the room, but when lower initial temperatures are desired a vacuum vessel H containing solid carbonic acid, liquid ethylene, air or other gas, can be placed to envelop C or C′, or higher temperatures may be obtained by filling the surrounding vessel with vapour of water or other liquids. The gas volatilized in B is conveyed by a side tube E to be collected in a graduated receiver F over water, oil or other liquid. If liquid hydrogen is to be used as the calorimetric substance the instrument must be so modified as to prevent the ordinary atmosphere from entering G, and to that end a current of hydrogen supplied from a Kipp apparatus is arranged to flow continuously through D and E until the moment of making the experiment, when it is cut off by a suitable stop-cock. In this case the outer vessel must contain liquid hydrogen instead of liquid air.

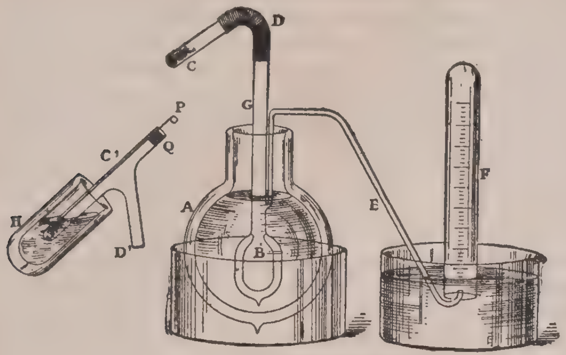

FIG. 13.—Calorimetric Apparatus.

Dewar used pure metallic lead for the purpose of conveying definite amounts of heat to liquid gas calorimeters of this kind, that metal being selected on the ground of the small variation in its specific heat at low temperatures. He was thus able to determine the latent heats of evaporation of liquid oxygen, nitrogen and hydrogen directly at their boiling points, and he also ascertained the specific heats of a large number of inorganic and organic bodies, and of some gases in the solid state, such as carbon dioxide, sulphurous acid and ammonia. Perhaps his most interesting results were those which showed the variation in the specific heats of diamond, graphite and ice as typical bodies (table X.). With Professor Curie he used both the liquid oxygen and the liquid hydrogen calorimeter for preliminary measurements of the rate at which radium bromide gives out energy at low temperatures. The quantity of the salt available was 0·42 gram, and the thermal evolutions were as follows:—

TABLE X.

Substance.	18° to −78° C., or, at −30° C.	−78° to −188° C., or, at −133° C.	−188° to −252° C., or, at −220° C.
Diamond	0·0794	0·0190	0·0043
Graphite	0·1341	0·0599	0·0133
Ice	0·463*	0·285	0·146

*This is from −18° to −78° in the ice experiment.

	Gas evolved per minute.	Calories per hour.	
Liquid oxygen	5·5 c.c.	22·8	Crystals.
Liquid hydrogen	51·0 ,,	31·6	
Melting ice	..	24·1	
Liquid oxygen	2·0 ,,	8·3	After fusion.
Liquid oxygen	2·5 ,,	10·3	Emanation condensed.

The apparent increase of heat evolution at the temperature of liquid hydrogen was probably due to the calorimeter being too small; hydrogen spray was thus carried away with the gas, making the volume of gas too great and inferentially also the heat evolved.

Liquid air and liquid hydrogen calorimeters open up an almost unlimited field of research in the determination of specific heats and other thermal constants, and are certain to become common laboratory instruments for such purposes.

Chemical Action.—By extreme cold chemical action is enormously reduced, though it may not in all cases be entirely abolished even at the lowest temperatures yet attained; one reason for this diminution of activity may doubtless be sought in the fact that in such conditions most substances are solid, that is, in the state least favourable to chemical combination. Thus an electric pile of sodium and carbon ceases to yield a current when immersed in liquid oxygen. Sulphur, iron and other substances can be made to burn under the surface of liquid oxygen if the combustion is properly established before the sample is immersed, and the same is true of a fragment of diamond. Nitric oxide in the gaseous condition combines instantly with free oxygen, producing the highly-coloured gas, nitric peroxide, but in the solid condition it may be placed in contact with liquid oxygen without showing any signs of chemical action. If the combination of a portion of the mixture is started by elevation of temperature, then detonation may take place throughout the cooled mass. The stability of endothermic bodies like nitric oxide and ozone at low temperatures requires further investigation. The behaviour of fluorine, which may be regarded as the most active of the elements, is instructive in this respect. As a gas, cooled to −180° C. it loses the power of attacking glass; similarly silicon, borax, carbon, sulphur and phosphorus at the same temperature do not become incandescent in an atmosphere of the gas. Passed into liquid oxygen, the gas dissolves and imparts a yellowish tint to the liquid; if the oxygen has been exposed to the air for some hours, the fluorine produces a white flocculent precipitate, which if separated by filtering deflagrates with violence as the temperature rises. It appears to be a hydrate of fluorine. As a liquid at −210° fluorine attacks turpentine also cooled to that temperature with explosive force and the evolution of light, while the direction of a jet of hydrogen upon its surface is immediately followed by combination and a flash of flame. Even when the point of a tube containing solid fluorine is broken off under liquid hydrogen, a violent explosion ensues.

Photographic Action.—The action of light on photographic plates, though greatly diminished at −180°, is far from being in abeyance; an Eastman film, for instance, remains fairly sensitive at −210°. At the still lower temperature of liquid hydrogen the photographic activity is reduced to about half what it is at that of liquid air; in other words, about 10% of the original sensitivity remains. Experiments carried out with an incandescent lamp, a Röntgen bulb and the ultra-violet spark from magnesium and cadmium, to discover at what distances from the source of light the plates must be placed in order to receive an equal photographic impression, yielded the results shown in table XI.

TABLE XI.

Source of Light.	Cooled Plate.	Uncooled Plate.	Ratio of Intensities at Balance.
16 C.P. lamp	20 in.	50 in.	1 to 6
Röntgen bulb	10 in.	$24\frac{3}{4}$ in.	1 to 6
Ultra-violet spark	$22\frac{1}{2}$ in.	90 in.	1 to 16

It appears that the photographic action of both the incandescent lamp and the Röntgen rays is reduced by the temperature of liquid air to 17% of that exerted at ordinary temperatures, while ultra-violet radiation retains only 6%. It is possible that the greater dissipation of the latter by the photographic film at low temperatures than at ordinary ones is due to its absorption and subsequent emission as a phosphorescent glow, and that if the plate could be developed at a low temperature it would show no effect, the photographic action taking place subsequently through an internal phosphorescence in the film during the time it is heating up. With regard to the transparency of bodies to the Röntgen radiation at low temperatures, small tubes of the same bore, filled with liquid argon and chlorine, potassium, phosphorus, aluminium, silicon and sulphur, were exposed at the temperature of liquid air (in order to keep the argon and chlorine solid), in front of a photographic plate shielded with a sheet of aluminium, to an X-ray bulb. The sequence of the elements as mentioned represents the order of increasing opacity observed in the shadows. Sodium and liquid oxygen and air, nitrous and nitric oxides, proved much more transparent than chlorine. Tubes of potassium, argon and liquid chlorine showed no very marked difference of density on the photographic plates. It appears that argon is relatively more opaque to the Röntgen radiation than either oxygen, nitrogen or sodium, and is on a level with potassium, chlorine, phosphorus, aluminium and sulphur. This fact may be regarded as supporting the view that the atomic weight of argon is twice its density relative to hydrogen, since in general the opacity of elements in the solid state increases with the atomic weight.

Phosphorescence.—Phosphorescing sulphides of calcium, which are luminous at ordinary temperatures, and whose emission of light is increased by heating, cease to be luminous if cooled to −80° C. But their light energy is merely rendered latent, not destroyed, by such cold, and they still retain the capacity of taking in light energy at the low temperature, to be evolved again when they are warmed. At the temperature of liquid air many bodies become phosphorescent which do not exhibit the phenomenon at all, or only to a very slight extent, at ordinary temperatures, *e.g.* ivory, indiarubber, egg-shells, feathers, cotton-wool, paper, milk, gelatine, white of egg, &c. Of definite chemical compounds, the platinocyanides among the inorganic bodies seem to yield the most brilliant effects. Crystals of ammonium platinocyanide, if stimulated by exposure to the ultra-violet radiation of the electric arc—or better still of a mercury vapour lamp in quartz—while kept moistened with liquid air, may be seen in the dark to glow faintly so long as they are kept cold, but become exceedingly brilliant when the liquid air evaporates and the temperature rises. Among organic bodies the phenomenon is particularly well marked with the ketonic compounds and others of the same type. The chloro-, bromo-, iodo-, sulpho- and nitro-compounds show very little effect as a rule. The activity of the alcohols, which is usually considerable, is destroyed by the addition of a little iodine. Coloured salts, &c., are mostly inferior in activity to white ones. When the lower temperature of liquid hydrogen is employed there is a great increase in phosphorescence under light stimulation as compared with that observed with liquid air. The radio-active bodies, like radium, which exhibit self-luminosity in the dark, maintain that luminosity unimpaired when cooled in liquid hydrogen.

Some crystals become for a time self-luminous when placed in liquid hydrogen, because the high electric stimulation due to the cooling causes actual electric discharges between the crystal molecules. This phenomenon is very pronounced with nitrate of uranium and some platinocyanides, and cooling such crystals even to the temperature of liquid air is sufficient to develop marked electrical and luminous effects, which are again observed, when the crystal is taken out of the liquid, during its return to normal temperature. Since both liquid hydrogen and liquid air are good electrical insulators, the fact that electric discharges take place in them proves that the electric potential generated by the cooling must be very high. A crystal of nitrate of uranium indeed gets so highly charged electrically that it refuses to sink in liquid air, although its density is 2·8 times greater, but sticks to the side of the vacuum vessel, and requires for its displacement a distinct pull on the silk thread to which it is attached. Such a crystal quickly removes cloudiness from liquid air by attracting all the suspended particles to its surface, just as a fog is cleared out of air by electrification. It is interesting to observe that neither fused nitrate of uranium nor its solution in absolute alcohol shows any of the remarkable effects of the crystalline state on cooling.

Cohesion.—The physical force known as cohesion is greatly increased by low temperatures. This fact is of much interest in connexion with two conflicting theories of matter. Lord Kelvin's view was that the forces that hold together the ultimate particles of bodies may be accounted for without assuming any other forces than that of gravitation, or any other law than the Newtonian. An opposite view is that the phenomena of cohesion, chemical union, &c., or the general phenomena of the aggregation of molecules, depend on the molecular vibrations as a physical cause (Tolver Preston, *Physics of the Ether*, p. 64). Hence at the zero of absolute temperature, this vibrating energy being in complete abeyance, the phenomena of cohesion should cease to exist and matter generally be reduced to an incoherent heap of "cosmic dust." This second view receives no support from experiment. Atmospheric air, for instance, frozen at the temperature of liquid hydrogen, is a hard solid, the strength of which gives no hint that with a further cooling of some 20 degrees it would crumble into powder. On the contrary, the lower the scale of temperature is descended, the more powerful become the forces which hold together the particles of matter. A spiral of fusible metal, which at ordinary temperatures cannot support the weight of an ounce without being straightened out, will, when cooled to the temperature of liquid oxygen, and so long as it remains in that cooled condition, support several pounds and vibrate like a steel spring. Similarly a bell of fusible metal at −182° C. gives a distinct metallic ring when struck. Balls of iron, lead, tin, ivory, &c., thus cooled, exhibit an increased rebound when dropped from a height; an indiarubber ball, on the other hand, becomes brittle, and is smashed to atoms by a very moderate fall. Tables XII. and XIII., which give the mean results of a large number of experiments, show the increased breaking stress gained by metals while they are cooled to the temperature of liquid oxygen.

TABLE XII.—*Breaking Stress in Pounds of Metallic Wires 0·098 inch in diameter.*

	+15° C.	−182° C.
Steel (soft)	420	700
Iron	320	670
Copper	200	300
Brass	310	440
German silver	470	600
Gold	255	340
Silver	330	420

TABLE XIII.—*Breaking Stress in Pounds of Cast Metallic Test-pieces; diameter of rod—0·2 inch.*

	+15° C.	−182° C.
Tin	200	390
Lead	77	170
Zinc	35	26
Mercury	0	31
Bismuth	60	30
Antimony	61	30
Solder	300	645
Fusible metal (Wood)	140	450

In the second series of experiments the test-pieces were 2 in. long and were all cast in the same mould. It will be noticed that in the cases of zinc, bismuth and antimony the results appear to be abnormal, but it may be pointed out that it is difficult to get uniform castings of crystalline bodies, and it is probable that by cooling such stresses are set up in some set of cleavage planes as to render rupture comparatively easy. In the case of strong steel springs the rigidity modulus does not appear to be greatly affected by cold, for although a number were examined, no measurable differences could be detected in their elongation under repeated additions of the same load. No quantitative experiments have been made on the cohesive properties of the metals at the temperature of boiling hydrogen (−252°), owing to the serious cost that would be involved. A lead wire cooled in liquid hydrogen did not become brittle, as it could be bent backwards and forwards in the liquid.

Electrical Resistivity.—The first experiments on the conductivity of metals at low temperatures appear to have been made by Wroblewski (*Comptes rendus*, ci. 160), and by Cailletet and Bouty (*Journ. de phys.* 1885, p. 297). The former's experiments were undertaken to test the suggestion made by Clausius that the resistivity of pure metals is sensibly proportional to the absolute temperature; he worked with copper having a conductibility of 98%, and carried out measurements at various temperatures, the lowest of which was that given by liquid nitrogen boiling under reduced pressure. His general conclusion was that the resistivity decreases much more quickly than the absolute temperature, so as to approach zero at a point not far below the temperature of nitrogen evaporating *in vacuo*. Cailletet and Bouty, using ethylene as the refrigerant, and experimenting at temperatures ranging from 0° C. to −100° C. and −123° C., constructed formulae intended to give the coefficients of variation in electrical resistance for mercury, tin, silver, magnesium, aluminium, copper, iron and platinum. Between 1892 and 1896 Dewar and Fleming carried out a large number of experiments to ascertain the changes of conductivity that occur in metals and alloys cooled in liquid air or oxygen to −200° C. The method employed was to obtain the material under investigation in the form of a fine regular wire and to wind it in a small coil; this was then plunged in the liquid and its resistance determined. The accompanying chart (fig. 14) gives the results in a compendious form, the temperatures being expressed not in degrees of the ordinary air-thermometer scale, but in platinum degrees as given by one particular platinum resistance thermometer which was used throughout the investigation. A table showing the value of these degrees in degrees centigrade according to Dickson will be found in the *Phil. Mag.* for June 1898, p. 527; to give some idea of the relationship, it may be stated here that −100° of the platinum thermometer = −94°·2 C., −150° plat. = − 140°·78 C., and −200° plat. = − 185° 53 C. In general, the resistance of perfectly pure metals was greatly decreased by cold—so much so that, to judge by the course of the curves on the chart, it appeared probable that at the zero of absolute temperature resistance would vanish altogether and all pure metals become perfect conductors of electricity. This conclusion, however, has been rendered very doubtful by subsequent observations by Dewar, who found that with the still lower temperatures attainable with liquid hydrogen the increases of conductivity became less for each decrease of temperature, until a point was reached where the curves bent sharply round and any further diminution of resistance became very small; that is, the conductivity remained finite. The reduction in resistance of some of the metals at the boiling point of hydrogen is very remarkable. Thus copper has only $\frac{1}{105}$th, gold $\frac{1}{30}$th, platinum $\frac{1}{35}$th to $\frac{1}{17}$th, silver $\frac{1}{24}$th the resistance at melting ice, but iron is only reduced to $\frac{1}{8}$th part of the same initial resistance. Table XIV. shows the progressive decrease of resistance for certain metals and one alloy as the temperature is lowered from that of boiling water down to that of liquid hydrogen boiling under reduced pressure; it also gives the "vanishing temperature," at which the conductivity would become perfect if the resistance continued to decrease in the same ratio with still lower temperatures, the values being derived from the extrapolation curves of the relation between resistance and temperature, according to Callendar and Dickson. It will be seen that many of the substances have actually been cooled to a lower temperature than that at which their resistance ought to vanish.

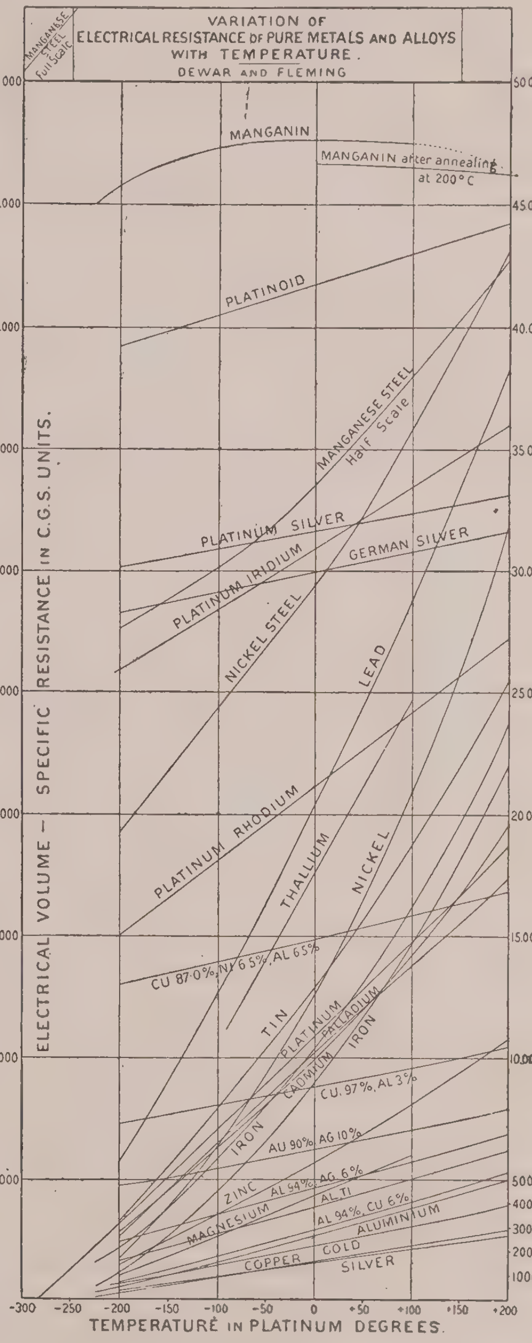

Fig. 14.—Chart of the Variation of Electrical Resistance of Pure Metals and Alloys with Temperature. (Dewar and Fleming.)

In the case of alloys and impure metals, cold brings about a much smaller decrease in resistivity, and the continuations of the curves at no time show any sign of passing through the zero point. The influence of the presence of impurities in minute quantities is strikingly shown in the case of bismuth. Various specimens of the metal, prepared with great care by purely chemical methods, gave in the hands of Dewar and Fleming some very anomalous results, appearing to reach at −80° C. a maximum of conductivity, and thereafter to increase in resistivity with decrease of temperature. But when the determinations were carried out on a sample of really pure bismuth prepared electrolytically, a normal curve was obtained corresponding to that given by other pure metals. As to alloys, there is usually some definite mixture of two pure metals which has a maximum resistivity, often greater than that of either of the constituents. It appears too that high, if not the highest, resistivity corresponds to possible chemical compounds of the two metals employed, *e.g.* platinum 33 parts with silver 66 parts = $PtAg_4$; iron 80 with nickel 20 = Fe_4Ni; platinum 80 with iridium 20 = $IrPt_4$; and copper 70 with manganese 30 = Cu_2Mn. The product obtained by adding a small quantity of one metal to another has a higher specific resistance than the predominant constituent, but the curve is parallel to, and therefore the same in shape as, that of the latter (cf. the curves for various mixtures of Al and Cu on the chart). The behaviour of carbon and of insulators like gutta-percha, glass, ebonite, &c., is in complete contrast to the metals,

TABLE XIV.

Metals.	Platinum.	Platinum-rhodium Alloy.	Gold.	Silver.	Copper.	Iron.
Resistance at 100° C.	39·655	36·87	16·10	8·336	11·572	4·290
,, 0° C.	28·851	31·93	11·58	5·990	8·117	2·765
,, carbonic acid	19·620	. .	. .	. .	. .	. .
,, liquid oxygen	7·662	22·17	3·380	1·669	1·589	0·633
,, ,, nitrogen	. .	. .	. .	. .	1·149	. .
,, ,, oxygen under exhaustion	4·634	20·73	. .	. .	. .	. .
,, ,, hydrogen	0·826	18·96	0·381	0·244	0·077	0·356
,, ,, hydrogen under exhaustion	0·705	18·90	0·298	0·226	0·071	. .
Resistance coefficients	0·003745	0·003607	0·003903	0·003917	0·004257	0·005515
Vanishing temperatures (Centigrade)	−244·50° −244·15°	−543·39° −530·32°	−257·90° −257·8°	−252·26° −252·25°	−225·62° −226·04°	−258·40° C. −246·80° D.

for their resistivity steadily increases with cold. The thermoelectric properties of metals at low temperatures are discussed in the article THERMOELECTRICITY.

Magnetic Phenomena.—Low temperatures have very marked effects upon the magnetic properties of various substances. Oxygen, long known to be slightly magnetic in the gaseous state, is powerfully attracted in the liquid condition by a magnet, and the same is true, though to a less extent, of liquid air, owing to the proportion of liquid oxygen it contains. A magnet of ordinary carbon steel has its magnetic moment temporarily increased by cooling, that is, after it has been brought to a permanent magnetic condition ("aged"). The effect of the first immersion of such a magnet in liquid air is a large diminution in its magnetic moment, which decreases still further when it is allowed to warm up to ordinary temperatures. A second cooling, however, increases the magnetic moment, which is again decreased by warming, and after a few repetitions of this cycle of cooling and heating the steel is brought into a condition such that its magnetic moment at the temperature of liquid air is greater by a constant percentage than it is at the ordinary temperature of the air. The increase of magnetic moment seems then to have reached a limit, because on further cooling to the temperature of liquid hydrogen hardly any further increase is observed. The percentage differs with the composition of the steel and with its physical condition. It is greater, for example, with a specimen tempered very soft than it is with another specimen of the same steel tempered glass hard. Aluminium steels show the same kind of phenomena as carbon ones, and the same may be said of chrome steels in the permanent condition, though the effect of the first cooling with them is a slight increase of magnetic moment. Nickel steels present some curious phenomena. When containing small percentages of nickel (*e.g.* 0·84 or 3·82), they behave under changes of temperature much like carbon steel. With a sample containing 7·65%, the phenomena after the permanent state had been reached were similar, but the first cooling produced a slight increase in magnetic moment. But steels containing 18·64 and 29% of nickel behaved very differently. The result of the first cooling was a reduction of the magnetic moment, to the extent of nearly 50% in the case of the former. Warming again brought about an increase, and the final condition was that at the temperature of liquid air the magnetic moment was always less than at ordinary temperatures. This anomaly is all the more remarkable in that the behaviour of pure nickel is normal, as also appears to be generally the case with soft and hard iron. Silicon, tungsten and manganese steels are also substantially normal in their behaviour, although there are considerable differences in the magnitudes of the variations they display (*Proc. Roy. Soc.* lx. 57 et seq.; also "The Effect of Liquid Air Temperatures on the Mechanical and other Properties of Iron and its Alloys," by Sir James Dewar and Sir Robert Hadfield, *Id.* lxxiv. 326-336).

Low temperatures also affect the permeability of iron, *i.e.* the degree of magnetization it is capable of acquiring under the influence of a certain magnetic force. With fine Swedish iron, carefully annealed, the permeability is slightly reduced by cooling to −185° C. Hard iron, however, in the same circumstances suffers a large increase of permeability. Unhardened steel pianoforte wire, again, behaves like soft annealed iron. As to hysteresis, low temperatures appear to produce no appreciable effect in soft iron; for hard iron the observations are undecisive.

Biological Research.—The effect of cold upon the life of living organisms is a matter of great intrinsic interest as well as of wide theoretical importance. Experiment indicates that moderately high temperatures are much more fatal, at least to the lower forms of life, than are exceedingly low ones. Professor M'Kendrick froze for an hour at a temperature of −182° C. samples of meat, milk, &c., in sealed tubes; when these were opened, after being kept at blood-heat for a few days, their contents were found to be quite putrid. More recently some more elaborate tests were carried out at the Jenner (now Lister) Institute of Preventive Medicine on a series of typical bacteria. These were exposed to the temperature of liquid air for twenty hours, but their vitality was not affected, their functional activities remained unimpaired and the cultures which they yielded were normal in every respect. The same result was obtained when liquid hydrogen was substituted for air. A similar persistence of life has been demonstrated in seeds, even at the lowest temperatures; they were frozen for over 100 hours in liquid air at the instance of Messrs Brown and Escombe, with no other effect than to afflict their protoplasm with a certain inertness, from which it recovered with warmth. Subsequently commercial samples of barley, peas and vegetable-marrow and mustard seeds were literally steeped for six hours in liquid hydrogen at the Royal Institution, yet when they were sown by Sir W. T. Thiselton Dyer at Kew in the ordinary way, the proportion in which germination occurred was no smaller than with other batches of the same seeds which had suffered no abnormal treatment. Mr Harold Swithinbank has found that exposure to liquid air has little or no effect on the vitality of the tubercle bacillus, although by very prolonged exposures its virulence is modified to some extent; but alternate exposures to normal and very cold temperatures do have a decided effect both upon its vitality and its virulence. The suggestion once put forward by Lord Kelvin, that life may in the first instance have been conveyed to this planet on a meteorite, has been objected to on the ground that any living organism would have been killed before reaching the earth by its passage through the intense cold of interstellar space; the above experiments on the resistance to cold offered by seeds and bacteria show that this objection at least is not fatal to Lord Kelvin's idea.

At the Lister Institute of Preventive Medicine liquid air has been brought into use as an agent in biological research. An inquiry into the intracellular constituents of the typhoid bacillus, initiated under the direction of Dr Allan Macfadyen, necessitated the separation of the cell-plasma of the organism. The method at first adopted for the disintegration of the bacteria was to mix them with silver-sand and churn the whole up in a closed vessel in which a series of horizontal vanes revolved at a high speed. But certain disadvantages attached to this procedure, and accordingly some means was sought to do away with the sand and triturate the bacilli *per se.* This was found in liquid air, which, as had long before been shown at the Royal Institution, has the power of reducing materials like grass or the leaves of plants to such a state of brittleness that they can easily be powdered in a mortar. By its aid a complete trituration of the typhoid bacilli has been accomplished at the Jenner Institute, and the same process, already applied with success also to yeast cells and animal cells, is being extended in other directions.

Industrial Applications.—While liquid air and liquid hydrogen are being used in scientific research to an extent which increases every day, their applications to industrial purposes are not so numerous. The temperatures they give used as simple refrigerants are much lower than are generally required industrially, and such cooling as is needed can be obtained quite satisfactorily, and far more cheaply, by refrigerating machinery employing more easily condensable gases. Their use as a source of motive power, again, is impracticable for any ordinary purposes, on the score of inconvenience and expense. Cases may be conceived of in which for special reasons it might prove advantageous to use liquid air, vaporized by heat derived from the surrounding atmosphere, to drive compressed-air engines, but any advantage so gained would certainly not be one of cheapness. No doubt the power of a waterfall running to waste might be temporarily conserved in the shape of liquid air, and thereby turned to useful effect. But the reduction of air to the liquid state is a process which involves the expenditure of a very large amount of energy, and it is not possible even to recover all that expended energy during the transition of the material back to the gaseous state. Hence to suggest that by using liquid air in a motor more power can be developed than was expended in producing the liquid air by which the motor is worked, is to propound a fallacy worse than perpetual motion, since such a process would have an efficiency of more than 100%. Still, in conditions where economy is of no account, liquid air might perhaps, with effectively isolated storage, be utilized as a motive power, *e.g.* to drive the engines of submarine boats and at the same time provide a supply of oxygen for the crew; even without being used in the engines, liquid air or oxygen might be found a convenient form in which to store the air necessary for respiration in such vessels. But a use to which liquid air machines have already been put to a large extent is for obtaining oxygen from the atmosphere. Although when air is liquefied the oxygen and nitrogen are condensed simultaneously, yet owing to its greater volatility the latter boils off the more quickly of the two, so that the remaining liquid becomes gradually richer and richer in oxygen. The fractional distillation of liquid air is the method now universally adopted for the preparation of oxygen on a commercial scale, while the nitrogen simultaneously obtained is used for the production of cyanamide, by its action on carbide of calcium. An interesting though minor application of liquid oxygen, or liquid air from which most of the nitrogen has evaporated, depends on the fact that if it be mixed with powdered charcoal, or finely divided organic bodies, it can be made by the aid of a detonator to explode with a violence comparable to that of dynamite. This explosive, which might properly be called an emergency one, has the disadvantage that it must be prepared on the spot where it is to be used and must be fired without delay, since the liquid evaporates in a short time and the explosive power is lost; but, on the other hand, if a charge fails to go off it has only to be left a few minutes, when it can be withdrawn without any danger of accidental explosion.

For further information the reader may consult W. L. Hardin, *Rise and Development of the Liquefaction of Gases* (New York, 1899), and Lefèvre, *La Liquéfaction des gaz et ses applications*; also the article CONDENSATION OF GASES. But the literature of liquid gases is mostly contained in scientific periodicals and the proceedings of learned societies. Papers by Wroblewski and Olszewski on the liquefaction of oxygen and nitrogen may be found in the *Comptes rendus*, vols. xcvi.-cii., and there are important memoirs by the former on the relations between the gaseous and liquid states and on the compressibility of hydrogen in *Wien. Akad. Sitzber.* vols. xciv. and xcvii.; his pamphlet *Comme l'air a été liquéfié* (Paris, 1885) should also be referred to. For Dewar's work, see *Proc. Roy. Inst.* from 1878 onwards, including "Solid Hydrogen" (1900); "Liquid Hydrogen Calorimetry" (1904); "New Low Temperature Phenomena" (1905); "Liquid Air and Charcoal at Low Temperatures" (1906); "Studies in High Vacua and Helium at Low Temperatures" (1907); also "The Nadir of Temperature and Allied Problems" (Bakerian Lecture), *Proc. Roy. Soc.* (1901), and the Presidential Address to the British Association (1902). The researches of Fleming and Dewar on the electrical and magnetic properties of substances at low temperatures are described in *Proc. Roy. Soc.* vol. lx., and *Proc. Roy. Inst.* (1896); see also "Electrical Resistance of Pure Metals, Alloys and Non-Metals at the Boiling-point of Oxygen," *Phil. Mag.* vol. xxxiv. (1892); "Electrical Resistance of Metals and Alloys at Temperatures approaching the Absolute Zero," *ibid.* vol. xxxvi. (1893); "Thermoelectric Powers of Metals and Alloys between the Temperatures of the Boiling-point of Water and the Boiling-point of Liquid Air," *ibid.* vol. xl. (1895); and papers on the dielectric constants of various substances at low temperatures in *Proc. Roy. Soc.* vols. lxi. and lxii. Optical and spectroscopic work by Liveing and Dewar on liquid gases is described in *Phil. Mag.* vols. xxxiv. (1892), xxxvi. (1893), xxxviii. (1894) and xl. (1895); for papers by the same authors on the separation and spectroscopic examination of the most volatile and least volatile constituents of atmospheric air, see *Proc. Roy. Soc.* vols. lxiv., lxvii. and lxviii. An account of the influence of very low temperatures on the germinative power of seeds is given by H. T. Brown and F. Escombe in *Proc. Roy. Soc.* vol. lxii., and by Sir W. Thiselton Dyer, *ibid.* vol. lxv., and their effect on bacteria is discussed by A. Macfadyen, *ibid.* vols. lxvi. and lxxi. (J. DR.)

LIQUORICE. The hard and semi-vitreous sticks of paste, black in colour and possessed of a sweet somewhat astringent taste, known as liquorice paste or black sugar, are the inspissated juice of the roots of a leguminous plant, *Glycyrrhiza glabra*, the *radix glycyrrhizae* of the pharmacopoeia. The plant is cultivated throughout the warmer parts of Europe, especially on the Mediterranean shores, and to some extent in Louisiana and California. The roots for use are obtained in lengths of 3 or 4 ft., varying in diameter from $\frac{1}{4}$ to 1 in.; they are soft, flexible and fibrous, and internally of a bright yellow colour, with a characteristic, sweet pleasant taste. To this sweet taste of its root the plant owes its generic name *Glycyrrhiza* (γλυκύῤῥιζα, the sweet-root), of which the word liquorice is a corruption. The roots contain grape-sugar, starch, resin, asparagine, malic acid and the glucoside glycyrrhizin, $C_{24}H_{36}O_9$, a yellow amorphous powder with an acid reaction and a distinctive bitter-sweet taste. On hydrolysis, glycyrrhizin yields glucose and glycyrrhetin.

Stick liquorice is made by crushing and grinding the roots to a pulp, which is boiled in water over an open fire, and the decoction separated from the solid residue of the root is evaporated till a sufficient degree of concentration is attained, after which, on cooling, it is rolled into the form of sticks or other shapes for the market. The preparation of the juice is a widely extended industry along the Mediterranean coasts; but the quality best appreciated in the United Kingdom is made in Calabria, and sold under the names of Solazzi and Corigliano juice. Liquorice enters into the composition of many cough lozenges and other demulcent preparations; and in the form of aromatic syrups and elixirs it has a remarkable effect in masking the taste of nauseous medicines.

LIQUOR LAWS. In most Western countries the sale of alcoholic liquor is regulated by law. The original and principal object is to check the evils arising from the immoderate use of such liquor, in the interest of public order, morality and health; a secondary object is to raise revenue from the traffic. The form and the stringency of the laws passed for these purposes vary very widely in different countries according to the habits of the people and the state of public opinion. The evils which it is desired to check are much greater in some countries than in others. Generally speaking they are greater in northern countries and cold and damp climates than in southern and more sunny ones. Climate has a marked influence on diet for physiological reasons over which we have no control. The fact is attested by universal experience and is perfectly natural and inevitable, though usually ignored in those international comparisons of economic conditions and popular customs which have become so common. It holds good both of food and drink. The inhabitants of south Europe are much less given to alcoholic excess than those of central Europe, who again are more temperate than those of the north. There is even a difference between localities so near together as the east and west of Scotland. The chairman of the Prison Commissioners pointed out before a British royal commission in the year 1897 the greater prevalence of drunkenness in the western half, and attributed it in part to the dampness of the climate on the western coast. But race also has an influence. The British carry the habit of drinking wherever they go, and their colonial descendants retain it even in hot and dry climates. The Slav peoples and the Magyars in central Europe are much more intemperate than the Teutonic and Latin peoples living under similar climatic conditions. These natural differences lead, in accordance with the principle discerned and enunciated by Montesquieu, to the adoption of different laws, which vary with the local conditions. But social laws of this character also vary with the state of public opinion, not only in different countries but in the same country at different times. The result is that the subject is in a state of incessant flux. There are not only many varieties of liquor laws, but also frequent changes in them, and new experiments are constantly being tried. The general tendency is towards increased stringency, not so much because the evils increase, though that happens in particular places at particular times, as because public opinion moves broadly towards increasing condemnation of excess and increasing reliance on legislative interference. The first is due partly to a general process of refining manners, partly to medical influence and the growing attention paid to health; the second to a universal tendency which seems inherent in democracy.

Liquor laws may be classified in several ways, but the most useful way for the present purpose will be to take the principal methods of conducting the traffic as they exist, under four main headings, and after a brief explanation give some account of the laws in the principal countries which have adopted them. The four methods are: (1) licensing or commercial sale for private profit under a legal permit; (2) sale by authorized bodies not for private profit, commonly known as the Scandinavian or company system; (3) state monopoly; (4) prohibition. It is not a scientific classification, because the company system is a form of licensing and prohibition is no sale at all; but it follows the lines of popular discussion and is more intelligible than one of a more technical character would be. All forms of liquor legislation deal mainly with retail sale, and particularly with the sale for immediate consumption on the spot.

1. *Licensing.*—This is by far the oldest and the most widely adopted method; it is the one which first suggests itself in the natural course of things. Men begin by making and selling a thing without let or hindrance to please themselves. Then objections are raised, and when they are strong or general enough the law interferes in the public interest, at first mildly; it says in effect—This must not go on in this way or to this extent; there must be some control, and permission will only be given to duly authorized persons. Such persons are licensed or permitted to carry on the traffic under conditions, and there is obviously room for infinite gradations of strictness in granting permission and infinite variety in the conditions imposed. The procedure may vary from mere notification of the intention to open an establishment up to a rigid and minutely detailed system of annual licensing laid down by the law. But in all cases, even when mere notification is required, the governing authority has the right to refuse permission or to withdraw it for reasons given, and so it retains the power of control. At the same time holders of the permission may be compelled to pay for the privilege and so contribute to the public revenue. The great merit of the licensing system is its perfect elasticity, which permits adjustment to all sorts of conditions and to the varying demands of public opinion. It is in force in the United Kingdom, which first adopted it, in most European countries, in the greater part of North America, including both the United States and Canada, in the other British dominions and elsewhere.

2. *The Scandinavian or Company System.*—The principle of this method is the elimination of private profit on the ground that it removes an incentive to the encouragement of excessive drinking. A monopoly of the sale of liquor is entrusted to a body of citizens who have, or are supposed to have, no personal interest in it, and the profits are applied to public purposes. The system, which is also called "disinterested management," is adopted in Sweden and Norway; and the principle has been applied in a modified form in England and Finland by the operation of philanthropic societies which, however, have no monopoly but are on the same legal footing as ordinary traders.

3. *State Monopoly.*—As the name implies, this system consists in retaining the liquor trade in the hands of the state, which thus secures all the profit and is at the same time able to exercise complete control. It is adopted in Russia, in certain parts of the United States and, in regard to the wholesale trade, in Switzerland.

4. *Prohibition.*—This may be general or local; in the latter case it is called "local option" or "local veto." The sale of liquor is made illegal in the hope of preventing drinking altogether or of diminishing it by making it more difficult. General prohibition has been tried in some American states, and is still in force in a few; it is also applied to native races, under civilized rule, both in Africa and North America. Local prohibition is widely in force in the United States, Canada and Australasia, Sweden and Norway. In certain areas in other countries, including the United Kingdom, the sale of liquor is in a sense prohibited, not by the law, but by the owners of the property who refuse to allow any public-houses. Such cases have nothing to do with the law, but they are mentioned here because reference is often made to them by advocates of legal prohibition.

THE UNITED KINGDOM

England has had a very much longer experience of liquor legislation than any other country, and the story forms an introduction necessary to the intelligent comprehension of liquor legislation in general. England adopted a licensing system in 1551, and has retained it, with innumerable modifications, ever since. The English were notorious for hard drinking for centuries before licensing was adopted, and from time to time sundry efforts had been made to check it, but what eventually compelled the interference of the law was the growth of crime and disorder associated with the public-houses towards the end of the 15th century. Numbers of men who had previously been engaged in the civil wars or on the establishment of feudal houses were thrown on the world and betook themselves to the towns, particularly London, where they frequented the ale-houses, "dicing and drinking," and lived largely on violence and crime. An act was passed in 1495 against vagabonds and unlawful games, whereby justices of the peace were empowered to "put away common ale-selling in towns and places where they should think convenient and to take sureties of keepers of ale-houses in their good behaviour." That was the beginning of statutory control of the trade. The act clearly recognized a connexion between public disorder and public-houses. The latter were ale-houses, for at that time ale was the drink of the people; spirits had not yet come into common use, and wine, the consumption of which on the premises was prohibited in 1552, was only drunk by the wealthier classes.

Early History of Licensing.—The act of 1551–1552, which introduced licensing, was on the same lines but went further. It confirmed the power of suppressing common ale-selling, and enacted that no one should be allowed to keep a common ale-house or "tippling" house without obtaining the permission of the justices in open session or of two of their number. It further "directed that the justices should take from the persons whom they licensed such bond and surety by recognisance as they should think convenient, and empowered them in quarter session to inquire into and try breaches by licensed persons of the conditions of their recognisances and cases of persons keeping ale-houses without licences and to punish the offenders" (Bonham Carter, Royal Commission on Liquor Licensing Laws, vol. iii.). This act embodied the whole principle of licensing, and the object was clearly stated in the preamble: "For as much as intolerable hurts and troubles to the commonwealth of this realm doth daily grow and increase through such abuses and disorders as are had and used in common ale-houses and other places called tippling houses." The evil was not due merely to the use of alcoholic liquor but to the fact that these houses, being public-houses, were the resort of idle and disorderly characters. The distinction should be borne in mind.

The act seems to have been of some effect, for no further legislation was attempted for half a century, though there is abundant evidence of the intemperate habits of all classes. Mr Bonham Carter (*loc. cit.*) observes:—

> "The recognisances referred to in the act were valuable instruments for controlling the conduct of ale-house keepers. The justices, in exercise of their discretion, required the recognisances to contain such conditions for the management and good order of the business as they thought suitable. In this way a set of regulations came into existence, many of which were subsequently embodied in acts of Parliament. In some counties general rules were drawn up, which every ale-house keeper was bound to observe."

It is interesting to note that among the conditions laid down about this time were the following: Closing at 9 P.M. and during divine service on Sunday; in some cases complete closing on Sunday except to travellers; the licence-holder to notify to the constable all strangers staying for more than a night and not to permit persons to continue drinking or tippling; prohibition of unlawful games, receiving stolen goods and harbouring bad characters; the use of standard measures and prices fixed by law. There was, however, no uniformity of practice in these respects until the 17th century, when an attempt was made to establish stricter and more uniform control by a whole series of acts passed between 1603 and 1627. The evils which it was sought to remedy by these measures were the existence of unlicensed houses, the use of ale-houses for mere drinking and the prevalence of disorder. It was declared that the ancient and proper use of inns and ale-houses was the refreshment and lodging of travellers, and that they were not meant for "entertainment and harbouring of lewd and idle people to spend and consume their money and their time in lewd and drunken manner." Regulations were strengthened for the suppression of unlicensed houses, licences were made annual, and the justices were directed to hold a special licensing meeting once a year (1618). Penalties were imposed on innkeepers for permitting tippling, and also on tipplers and drunkards (1625). In 1634 licensing was first applied to Ireland. Later in the century heavy penalties were imposed for adulteration.

The next chapter in the history of licensing has to do with spirits, and is very instructive. Spirits were not a native product like beer; brandy was introduced from France, gin from the Netherlands and whisky from Ireland; but down to the year 1690 the consumption was small. The home manufacture was strictly limited, and high duties on imported spirits rendered them too dear for the general public unless smuggled. Consequently the people had not acquired the taste for them. But in 1690 distilling was thrown open to any one on the payment of very trifling duties, spirits became extremely cheap and the consumption increased with great rapidity. Regulation of the retail traffic was soon found to be necessary, and by an act passed in 1700–1701, the licensing requirements already existing for ale-house keepers were extended to persons selling distilled liquors for consumption on the premises. A new class of public-houses in the shape of spirit bars grew up. In the year 1732 a complete and detailed survey of all the streets and houses in London was carried out by William Maitland, F.R.S. Out of a total of 95,968 houses he found the following: brew-houses 171, inns 207, taverns 447, ale-houses 5975, brandy-shops 8659; total number of licensed houses for the retail sale of liquor 15,288, of which considerably more than one-half were spirit bars. The population was about three-quarters of a million. About one house in every six was licensed at this time, and that in spite of attempts made to check the traffic by restrictive acts passed in 1728–1729. The physical and moral evils caused by the excessive consumption of spirits were fully recognized; an additional duty of 5s. a gallon was placed on the distiller, and retailers were compelled to take out an excise licence of £20 per annum. The object was to make spirits dearer and therefore less accessible. At the same time, with a view to lessening the number of houses, the licensing procedure of the justices was amended by the provision that licences should only be granted at a general meeting of the justices acting in the division where the applicant resided, thus abolishing the power conferred by the original licensing act, of any two justices to grant a licence. This change, effected in 1729, was a permanent improvement, though it did not prevent the existence of the prodigious numbers of houses recorded by Maitland in 1732. The attempt to make spirits dearer by high excise duties, on the other hand, was adjudged a failure because it led to illicit trade, and the act of 1728 was repealed in 1732. But the evil was so glaring that another and more drastic attempt in the same direction was made in 1736, when the famous Gin Act was passed in response to a petition presented to parliament by the Middlesex magistrates, declaring "that the drinking of geneva and other distilled waters had for some years past greatly increased; that the constant and excessive use thereof had destroyed thousands of His Majesty's subjects; that great numbers of others were by its use rendered unfit for useful labour, debauched in morals and drawn into all manner of vice and wickedness. . . ." The retailing of spirits in quantities of less than 2 gallons was made subject to a licence costing £50 and the retailer had also to pay a duty of 20s. on every gallon sold. This experiment in "high licensing" was a disastrous failure, though energetic attempts were made to enforce it by wholesale prosecutions and by strengthening the regulations against evasion. Public opinion was inflamed against it, and the only results were corruptions of the executive and an enormous increase of consumption through illicit channels. The consumption of spirits in England and Wales nearly doubled between 1733 and 1742, and the state of things was so intolerable that after much controversy the high duties were repealed in 1742 with the object of bringing the trade back into authorized channels; the cost of a licence was reduced from £50 to £1 and the retail duty from 20s. to 1d. a gallon.

This period witnessed the high-water mark of intemperance in England. From various contemporary descriptions it is abundantly clear that the state of things was incomparably worse than anything in modern times, and that women, whose participation in the practice of drinking and frequenting public-houses is recorded by writers in the previous century, were affected as well as men. The experience is particularly instructive because it includes examples of excess and deficiency of opportunities and the ill effects of both on a people naturally inclined to indulgence in drink. It was followed by more judicious action, which showed the adaptability of the licensing system and the advantages of a mean between laxity and severity. Between 1743 and 1753 acts were passed which increased control in a moderate way and proved much more successful than the previous measures. The retail licence duty was moderately raised and the regulations were amended and made stricter. The class of houses eligible for licensing was for the first time taken into account, and the retailing of spirits was only permitted on premises assessed for rates and, in London, of the annual value of £10; justices having an interest in the trade were excluded from licensing functions. Another measure which had an excellent effect made "tippling" debts—that is, small public-houses debts incurred for spirits—irrecoverable at law. The result of these measures was that consumption diminished and the class of houses improved. At the same time (1753) the general licensing provisions were strengthened and extended. The distinction between new licences and the renewal of old ones was for the first time recognized; applicants for new licences in country districts were required to produce a certificate of character from the clergy, overseers and church-wardens or from three or four householders. The annual licensing sessions were made statutory, and the consent of a justice was required for the transfer of a licence from one person to another during the term for which it was granted. Penalties for infringing the law were increased, and the licensing system was extended to Scotland (1755–1756). With regard to wine, it has already been stated that consumption on the premises was forbidden in 1552, and at the same time the retail sale was restricted to towns of some importance and the number of retailers, who had to obtain an appointment from the corporation or the justices, was strictly limited. In 1660 consumption on the premises was permitted under a Crown (excise) licence, good for a variable term of years; in 1756 this was changed to an annual excise licence of fixed amount, and in 1792 wine was brought under the same jurisdiction of the justices as other liquors.

It is clear from the foregoing that a great deal of legislation occurred during the 18th century, and that by successive enactments, particularly about the middle of the century, the licensing system gradually became adjusted to the requirements of the time and took a settled shape. The acts then passed still form the basis of the law. In the early part of the 19th century another period of legislative activity set in. A parliamentary inquiry into illicit trade in spirits took place in 1821, and in 1828 important acts were passed amending and consolidating the laws for England and for Scotland; in 1833 a general Licensing Act was passed for Ireland. These are still the principal acts, though they have undergone innumerable amendments and additions. The English act of 1828 introduced certain important changes. A licence from the justices was no longer required for the sale of liquor for consumption off the premises, and the power of the justices to suppress public-houses at their discretion (apart from the annual licensing), which they had possessed since 1495, was taken away. The removal of this power, which had long been obsolete, was the natural corollary of the development of the licensing system, its greater stringency and efficiency and the increase of duties imposed on the trade. Men on whom these obligations were laid, and who were freshly authorized to carry on the business every year, could not remain liable to summary deprivation of the privileges thus granted and paid for. The justices had absolute discretion to withhold licences from an applicant whether new or old; but an appeal was allowed to quarter sessions against refusal and also against conviction for offences under the act. The main points in the law at this time were the following. The sale of alcoholic liquors for consumption on the premises was forbidden under penalties except to persons authorized according to law by the justices. Licences were granted for one year and had to be renewed annually. The justices held a general meeting each year at a specified time for the purpose of granting licences; those peculiarly interested in the liquor trade were disqualified. The licence contained various provisions for regulating the conduct of the house and maintaining order, but closing was only required during the hours of divine service on Sunday. Applicants for new licences and for the transfer of old ones (granted at a special sessions of the justices) were required to give notice to the local authorities and to post up notices at the parish church and on the house concerned.

Excise Licences.—It will be convenient at this point to explain the relation between that part of the licensing system which is concerned with the conduct of the traffic and lies in the jurisdiction of the justices and that part which has to do with taxation or revenue. The former is the earlier and more important branch of legislative interference; we have traced its history from 1495 down to 1828. Its object from the beginning was the maintenance of public order and good conduct, which were impaired by the misuse of public-houses; and all the successive enactments were directed to that end. They were attempts to suppress or moderate the evils arising from the traffic by regulating it. The excise licensing system has nothing to do with public order or the conduct of the traffic; its object is simply to obtain revenue, and for a long time the two systems were quite independent. But time and change gradually brought them into contact and eventually they came to form two aspects of one unified system. Licensing for revenue was first introduced in 1660 at the same time as duties on the manufacture of beer and spirits; but it was of an irregular character and was only applied to wine, which was not then under the jurisdiction of the justices at all (see above). In 1710 a small annual tax was imposed on the retailers of beer and ale and collected by means of a stamp on the justices' licence. In 1728 an annual excise licence of £20 was imposed on retailers of spirits, and in 1736 this was raised to £50 (see above). The object of these particular imposts, however, was rather to check the sale, as previously explained, than to secure revenue. In 1756 the previous tax on the retail sale of wine for consumption on the premises was changed to an annual excise licence, which was in the next year extended to "made wines" and "sweets" (British wines). Similar licences, in place of the previous stamps, were temporarily required for beer and ale between 1725 and 1742 and permanently imposed in 1808. Thus the system of annual excise licences became gradually applied to all kinds of liquor. In 1825 the laws relating to them were consolidated and brought into direct relation with the other licensing laws. It was enacted that excise licences for the retail of liquor should only be granted to persons holding a justices' licence or—to use the more correct term—certificate. The actual permission to sell was obtained on payment of the proper dues from the excise authorities, but they had no power to withhold it from persons authorized by the justices. And that was still the system in 1910.

Licensing since 1828.—There was no change in the form of the British licensing system between the consolidation of the law in 1825–1828 and the time (1910) at which we write; but there were a great many changes in administrative detail and some changes in principle. Only the most important can be mentioned. In 1830 a bold experiment was tried in exempting the sale of beer from the requirement of a justice's licence. Any householder rated to the parish was entitled, under a bond with sureties, to take out an excise licence for the sale of beer for consumption on or off the premises. This measure, which applied to England and was commonly known as the Duke of Wellington's Act, had two objects; one was to encourage the consumption of beer in the hope of weaning the people from spirits; the other was to counteract the practice of "tieing" public-houses to breweries by creating free ones. With regard to the first, it was believed that spirit-drinking was increasing again at the time and was doing a great deal of harm. The reason appears to have been a great rise in the returns of consumption, which followed a lowering of the duty on spirits from 11s. 8¼d. to 7s. a gallon in 1825. The latter step was taken because of the prevalence of illicit distillation. In 1823 the duty had been lowered for the same reason in Scotland from 6s. 2d. and in Ireland from 5s. 7d. to a uniform rate of 2s. 4¾d. a gallon, with so much success in turning the trade from illegal to legal channels that a similar change was thought advisable in England, as stated. The legal or apparent consumption rose at once from 7 to nearly 13 million gallons; but it is doubtful if there was much or any real increase. According to an official statement, more than half the spirits consumed in 1820 were illicit. The facts are of much interest in showing what had already been shown in the 18th century, that the liquor trade will not bear unlimited taxation; the traffic is driven underground. It is highly probable that this accounts for part of the great fall in consumption which followed the raising of the spirit duty from 11s. to 14s. 9d. under Mr Lloyd George's Budget in 1909. With regard to "tied" houses, this is the original form of public-house. When beer was first brewed for sale a "tap" for retail purposes was attached to the brewery, and public-houses may still be found bearing the name "The Brewery Tap." At the beginning of the 19th century complaints were made of the increasing number of houses owned or controlled by breweries and of the dependence of the licence-holders, and in 1817 a Select Committee inquired into the subject. The Beerhouse Act does not appear to have checked the practice or to have diminished the consumption of spirits; but it led to a great increase in the number of beer-houses. It was modified in 1834 and 1840, but not repealed until 1869, when beer-houses were again brought under the justices.

Most of the other very numerous changes in the law were concerned with conditions imposed on licence-holders. The hours of closing are the most important of these. Apart from the ancient regulations of closing during divine service on Sunday, there were no restrictions in 1828; but after that at least a dozen successive acts dealt with the point. The first important measure was applied in London under a Police Act in 1839; it ordered licensed houses to be closed from midnight on Saturday to mid-day on Sunday, and produced a wonderful effect on public order. In 1853 a very important act (Forbes Mackenzie) was passed for Scotland, by which sale on Sunday was wholly forbidden, except to travellers and lodgers, and was restricted on week days to the hours between 8 A.M. and 11 P.M. This act also introduced a distinction between hotels, public-houses and grocers licensed to sell liquor, and forbade the sale to children under 14 years, except as messengers, and to intoxicated persons. In England, after a series of enactments in the direction of progressive restriction, uniform regulations as to the hours of opening and closing for licensed premises were applied in 1874, and are still in force (see below). In 1878 complete Sunday closing, as in Scotland, was applied in Ireland, with the exemption of the five largest towns, Dublin, Belfast, Cork, Limerick and Waterford; and in 1881 the same provision was extended to Wales.

Other changes worthy of note are the following. In 1860 the free sale of wine for consumption off the premises was introduced by the Wine and Refreshment Houses Act, which authorized any shopkeeper to take out an excise licence for this purpose; the licences so created were subsequently known as grocers' licences. By the same act refreshment houses were placed under certain restrictions, but were permitted to sell wine for consumption on the premises under an excise licence. In 1861 spirit dealers were similarly authorized to sell spirits by the bottle. The effect of these measures was to exempt a good deal of the wine and spirit trade from the control of the justices, and the idea was to wean people from public-house drinking by encouraging them to take what they wanted at home and in eating-houses.

In 1869 this policy of directing the habits of the people into channels thought to be preferable, which had been inaugurated in 1830, was abandoned for one of greater stringency all round, which has since been maintained. All the beer and wine retail licences were brought under the discretion of the justices, but they might only refuse "off" licences and the renewal of previously existing beer-house "on" licences upon specified grounds, namely (1) unsatisfactory character, (2) disorder, (3) previous misconduct, (4) insufficient qualification of applicant or premises. In 1872 an important act further extended the policy of restriction; new licences had to be confirmed, and the right of appeal in case of refusal was taken away; penalties for offences were increased and extended, particularly for public drunkenness, and for permitting drunkenness; the sale of spirits to persons under 16 was prohibited. In 1876 many of these provisions were extended to Scotland. In 1886 the sale of liquor for consumption on the premises was forbidden to persons under 13 years. In 1901 the sale for "off" consumption was prohibited to persons under 14, except in sealed vessels; this is known as the Child Messenger Act. These measures for the protection of children were extended in 1908 by an act which came into operation in April 1909, excluding children under 14 from the public-house bars altogether. The progressive protection of children by the law well illustrates the influence of changing public opinion. The successive measures enumerated were not due to increasing contamination of children caused by their frequenting the public-house, but to recognition of the harm they sustain thereby. The practice of taking and sending children to the public-house, and of serving them with drink, is an old one in England. A great deal of evidence on the subject was given before a Select Committee of the House of Commons in 1834; but it is only in recent years, when the general concern for children has undergone a remarkable development in all directions, that attempts have been made to stop it. In 1902 clubs, which had been increasing, and habitual drunkards, were brought under the law.

In 1904 a new principle was introduced into the licensing system in England, and this, too, was due to change in public opinion. Between 1830 and 1869, under the influence of the legislation described above, a continuous increase in the number of public-houses took place in England; but after 1869 they began to diminish through stricter control, and this process has gone on continuously ever since. Reduction of numbers became a prime object with many licensing benches; they were reluctant to grant new licences, and made a point of extinguishing old ones year by year. At first this was easily effected under the new and stringent provisions of the legislation of 1869–1872, but it gradually became more difficult as the worst houses disappeared and the remaining ones were better conducted, and gave less and less excuse for interference. But the desire for reduction still gained ground, and a new principle was adopted. Houses against which no ill-conduct was alleged were said to be "superfluous," and on that ground licences were taken away. But this, again, offended the general sense of justice; it was felt that to take away a man's living or a valuable property for no fault of his own was to inflict a great hardship. To meet the difficulty the principle of compensation was introduced by the act of 1904. It provides that compensation shall be paid to a licence-holder (also to the owner of the premises) whose licence is withdrawn on grounds other than misconduct of the house or unsuitability of premises or of character. The compensation is paid out of a fund raised by an annual charge on the remaining licensed houses. This act has been followed by a large reduction of licences.

State of the Law in 1910.—In consequence of the long history and evolution of legislation in the United Kingdom and of the innumerable minor changes introduced, only a few of which have been mentioned above, the law has become excessively complicated. The differences between the English, Scottish and Irish codes, the distinction between the several kinds of liquor, between consumption on and off the premises, between new licences and the renewal of old ones, between premises licensed before 1869 and those licensed since, between excise and justices' licences—all these and many other points make the subject exceedingly intricate; and it is further complicated by the uncertainty of the courts and a vast body of case-made law. Only a summary of the chief provisions can be given here.

1. The open sale of intoxicating liquor (spirits, wine, sweets, beer, cider) by retail is confined to persons holding an excise licence, with a few unimportant exceptions, including medicine.

2. A condition precedent to obtaining such a licence is permission granted by the justices who are the licensing authority and called a justices' licence or certificate. Theatres, passenger boats and canteens are exempted from this condition; also certain dealers in spirits and wine.

3. Justices' licences are granted at special annual meetings of the local justices, called Brewster Sessions. Justices having a pecuniary interest in the liquor trade of the district, except as railway shareholders, are disqualified from acting; "bias" due to other interests may also be a disqualification.

4. Justices' licences are only granted for one year and must be renewed annually, with the exception of a particular class, created by the act of 1904 and valid for a term of years. Distinctions are made between granting a new licence and renewing an old one. The proceedings are stricter and more summary in the case of a new licence; notice of application must be given to the local authorites; the premises must be of a certain annual value; a plan of the premises must be deposited beforehand in the case of an "on" licence; the justices may impose conditions and have full discretion to refuse without any right of appeal; the licence, if granted, must be confirmed by a higher authority. In the case of old licences on the other hand, no notice is required; they are renewed to the former holders on application, as a matter of right; unless there is opposition or objection, which may come from the police or from outside parties or from the justices themselves. If there is objection the renewal may be refused, but only on specified grounds—namely misconduct, unfitness of premises or character, disqualification; otherwise compensation is payable on the plan explained above. There is a right of appeal to a higher court against refusal. In all cases, whether the justices have full discretion or not, they must exercise their discretion in a judicial manner and not arbitrarily.

5. Licences may be transferred from one person to another in case of death, sickness, bankruptcy, change of tenancy, wilful omission to apply for renewal, forfeiture or disqualification. Licences may also be transferred from one house to another in certain circumstances.

6. A licence may be forfeited through the conviction of the holder of certain specified serious offences.

7. Persons may similarly be disqualified from holding a licence.

8. Liquor may only be sold on the premises specified in the licence and during the following hours:—week-days; London, 5 A.M. to 12.30 P.M. (Saturday, midnight); large towns 6 A.M. to 11 P.M.; other places 6 A.M. to 10 P.M.—Sundays; London, 1 P.M. to 3 P.M., 6 P.M. to 11 P.M.; other places 12.30 P.M. (or 1 P.M.) to 2.30 P.M. (or 3 P.M.), 6 P.M. to 10 P.M.; Christmas Day and Good Friday are counted as Sunday. In Scotland, Wales and Ireland (except the five chief towns) no sale is permitted on Sunday. Licence holders may sell during prohibited hours to lodgers staying in the house and to *bona-fide* travellers, who must be not less than 3 m. from the place they slept in on the previous night. Extension of hours of sale may be granted for special occasions and for special localities (*e.g.* early markets).

9. The following proceedings are prohibited in licensed premises: permitting children under 14 to be in a bar, selling any liquor to children under 14 for consumption on the premises, selling liquor to children under 14 as messengers except in corked and sealed vessels, selling spirits for consumption on the premises to persons under 16; selling to drunken persons and to habitual drunkards; permitting drunkenness, permitting disorder, harbouring prostitutes, harbouring constables, supplying liquor to constables on duty, bribing constables, permitting betting (persistent) or gaming, permitting premises to be used as a brothel, harbouring thieves, permitting seditious meetings; permitting the payment of wagers on premises; permitting premises to be used for election committee rooms. In and within 20 m. of London music and dancing are prohibited on licensed premises except under special licences.

10. The police have the right of entry to licensed premises at any time for the purpose of preventing or detecting offences.

11. The injurious adulteration of any liquor is prohibited; also the dilution of beer; but dilution of spirits is not unlawful if the customer's attention is drawn to the fact.

12. All clubs in which intoxicating liquor is sold must be registered. If the liquor is the collective property of the members no licence is required for retail sale, but no liquor can be sold for consumption off the premises. Clubs run for profit, known as proprietory clubs, are on the same legal footing as public-houses.

13. Penalties incurred by licence-holders for offences under the foregoing provisions. For selling any other kind of liquor than that authorized—first offence, fine not exceeding £50 or one month's imprisonment; second offence, fine not exceeding £100 or 3 months' imprisonment with forfeiture of licence and, if ordered, confiscation of liquor and disqualification for five years; third offence, fine not exceeding £100 or six months' imprisonment with forfeiture of licence and, if ordered, confiscation of liquor and unlimited disqualification. Under the Excise Acts the penalty for selling without a licence is—for spirits, a fine of £100, confiscation of liquor, forfeiture of licence and perpetual disqualification; for wine, a fine of £20; for beer or cider "on" consumption £20, "off" consumption £10. For sale to children; first offence, fine up to £2, second offence, fine up to £5. Permitting premises to be used as a brothel, fine of £20, forfeiture of licence and perpetual disqualification. Other offences, fine up to £10 for first conviction, up to £20 for second.

14. The following are offences on the part of the public. Being found drunk on any highway or other public place or on licensed premises; penalty, fine up to 10s. for first conviction, up to 20s. for second, and up to 40s. for third. Riotous or disorderly conduct while drunk; fine up to 40s. Falsely pretending to be a traveller or lodger; fine up to £5. Causing children to be in a bar or sending them for liquor contrary to the law; fine up to £2 for first and up to £5 for second offence. Attempt to obtain liquor by a person notified to the police as an habitual drunkard; fine up to 20s. for first offence, up to 40s. for subsequent ones. Giving drunken persons liquor or helping them to get it on licensed premises; fine up to 40s. or imprisonment for a month. Causing children under 11 to sing or otherwise perform on licensed premises, and causing boys under 14 or girls under 16 to do so between 9 P.M. and 6 A.M.; fine up to £25 or three months' imprisonment.

The foregoing statement of the law does not in all respects apply to Scotland and Ireland, where the administration differs somewhat from that of England. In Scotland the provost and bailies are the licensing authority in royal and parliamentary burghs, and elsewhere the justices. They hold two sessions annually for granting licences and have considerably more power in some respects than in England. The hours of opening are from 8 A.M. to 11 P.M. (week days only), but there is a discretionary power to close at 10 P.M. In Ireland the licensing authority is divided between quarter sessions and petty sessions. Public-house licences are granted and transferred at quarter sessions; renewals and other licences are dealt with at petty sessions. In Dublin, Belfast, Cork, Londonderry and Galway the licensing jurisdiction of quarter sessions is exercised by the recorder, elsewhere by the justices assembled and presided over by the county court judge. The licensing jurisdiction of petty sessions is exercised by two or more justices, but in Dublin by one divisional justice.

Excise Licences and Taxation.—The excise licences may be divided into four classes, (1) manufacturers', (2) wholesale dealers', (3) retail dealers' for "on" consumption, (4) retail dealers' for "off" consumption. Only the two last classes come under the jurisdiction of the justices, as explained above. The total number of different excise licences is between 30 and 40, but

Licence.	Old Duty.	New Duty 1909–1910.
Manufacturers' Licences—		
Distiller (spirits)	£10, 10s.	£10 for first 50,000 gallons, £10 for every additional 25,000 gallons.
Rectifier (spirits)	£10, 10s.	£15, 15s.
Brewer	£1	£1 for first 100 barrels, 12s. for every additional 50 barrels.
Sweets (British wines)	£1	£5, 5s.
Wholesale Dealers' Licences—		
Spirits	£10, 10s.	£15, 15s.
Beer	£3, 6s. 1d.	£10, 10s.
Wine	£10, 10s.	No change.
Sweets	£5, 5s.	No change.
Retail Licences On—		
Full or Publican's (spirits, beer, wine and cider)	£4, 10s. to £60 according to annual value of premises.	Half the annual value of premises, with a fixed minimum ranging from £5 in places with less than 2000 inhabitants to £35 in towns having over 100,000 inhabitants.
Beer-house	£3, 10s.	One-third of annual value of premises, with a minimum as above ranging from £3, 10s. to £23, 10s.
Wine (confectioners')	£3, 10s.	From £4, 10s. to £12 according to annual value.
Cider	£1, 5s.	From £2, 5s. to £6.
Sweets	£1, 5s.	From £2, 5s. to £6.
Retail Licences Off—		
Spirits	£3, 3s.	From £10 to £50 according to annual value.
Spirits (grocers', Scotland)	£4, 4s. to £13, 13s. 6d.	
Spirits (grocers', Ireland)	£9, 18s. 5d. to £14, 6s. 7d.	
Beer (England)	£1, 5s.	£1, 10s. to £10.
Beer (grocers', Scotland)	£2, 10s. and £4, 4s.	£1, 10s. to £10.
Wine (grocers').	£2, 10s. 0d.	£2, 10s. to £10.

several of them are subvarieties and unimportant or are peculiar to Scotland or Ireland. The duties charged on them were greatly changed and increased by the Finance Act of 1909–1910, and it seems desirable to state the changes thus introduced. The table on the previous page gives the principal kinds of licence with the old and the new duties.

There are in addition "occasional" licences valid for one or more days, which come under the jurisdiction of the justices; the duty is 2s. 6d. a day for the full licence (raised to 10s.) and 1s. for beer or wine only (raised to 5s.).

The total amount raised by the excise licences in the United Kingdom for the financial year ending 31st March 1909 was £2,209,928. Of this amount £1,712,160, or nearly four-fifths, was derived from the full or publicans' licence, £126,053 from the wholesale spirit licence and £88,167 from the beer-house licence; the rest are comparatively unimportant. But the licences only represent a small part of the revenue derived from liquor. The great bulk of it is collected by means of duties on manufacture and importation. The total amount for the year ending March 1909 was £37,428,189, or nearly 30% of the total taxation revenue of the country. The excise duties on the manufacture of spirits yielded £17,456,366 and those on beer £12,691,332; customs duties on importation yielded £5,046,949. The excise duty on spirits was at the rate of 11s. a gallon, raised at the end of April 1909 to 14s. 9d.; the corresponding duty on beer is 7s. 9d. a barrel (36 gallons). The relative taxation of the liquor trade in the United States, which has become important as a political argument, is discussed below.

Effects of Legislation.—The only effects which can be stated with precision and ascribed with certainty to legislation are the increase or diminution of the number of licences or licensed premises; secondary effects, such as increase or diminution of consumption and of drunkenness, are affected by so many causes that only by a very careful, well-informed and dispassionate examination of the facts can positive conclusions be drawn with regard to the influence of legislation (see TEMPERANCE). There is no more prolific ground for fallacious statements and arguments, whether unconscious or deliberate. The course of legislation traced above, however, does permit the broad conclusion that great laxity and the multiplication of facilities tend to increase drinking and disorder in a country like the United Kingdom, and that extreme severity produces the same or worse effects by driving the trade into illicit channels, which escape control, and thus really increasing facilities while apparently diminishing them. The most successful course has always been a mean between these extremes in the form of restraint judiciously applied and adjusted to circumstances. The most salient feature of the situation as influenced by the law in recent years is the progressive reduction in the number of licensed houses since 1869. Previously they had been increasing in England.

The number of public-houses, including beer-houses for "on" consumption, in 1831 was 82,466; in 1869 it had risen to 118,602; in 1909 it had fallen again to 94,794. But if the proportion of public-houses to population be taken there has been a continuous fall since 1831, as the following table shows:—

England and Wales.

Year.	No. of "on" Licences.	Proportion per 10,000 of Population.
1831	82,466	59
1871	112,886	49
1901	101,940	31
1909	94,794	26

The change may be put in another way. In 1831 there was one public-house to 168 persons; in 1909 the proportion was 1 to 375. The proportional reduction goes back to the 18th century. In 1732 there was in London one public-house to every 50 persons (see above).

In Scotland the number of public-houses has been diminishing since 1829, when there were 17,713; in 1909 there were only 7065, while the population had more than doubled. The number in proportion to population has therefore fallen far more rapidly than in England, thus—1831, 1 to 134 persons; 1909, 1 to 690 persons. In Ireland the story is different. There has been a fall in the number of public-houses since 1829, when there were 20,548; but it has not been large or continuous and the population has been steadily diminishing during the time, so that the proportion to population has actually increased, thus—1831, 1 to 395 persons; 1909, 1 to 249 persons. As a whole, however, the United Kingdom shows a large and progressive diminution of public-houses to population; nor is this counterbalanced by an increase of "off" licences. If we take the whole number of licences we get the following movement in recent years:—

No. of Retail Licences ("on" and "off") per 10,000 of Population.

	1893.	1903.	1909.
England and Wales	46	42	37
Scotland	37	33	30
Ireland	41	46	45
United Kingdom	45	42	37

The diminution in the number of public-houses in England was markedly accelerated by the act of 1904, which introduced the principle of compensation. The average annual rate of reduction in the ten years 1894–1904 before the act was 359; in the four years 1905–1908; after the act it rose to 1388. The average annual number of licences suppressed with compensation was 1137, and the average annual amount of compensation paid was £1,096,946, contributed by the trade as explained above.

The reduction of public-houses has been accompanied in recent years by a constant increase in the number of clubs. By the act of 1902, which imposed registration, they were brought under some control and the number of legal clubs was accurately ascertained. Previously the number was only estimated from certain *data* with approximate accuracy. The following table gives the official figures:—

Clubs: England and Wales.

	1887.	1896.	1904.	1905.	1906.	1907.	1908.	1909.
Number	1982	3655	6371	6589	6721	6907	7133	7353
Proportion per 10,000	0·7	1·1	1·89	1·93	1·95	1·98	2·02	2·08

Clubs represent alternative channels to the licensed trade and they are under much less stringent control; they have no prohibited hours and the police have not the same right of entry. In so far, therefore, as clubs replace public-houses the reduction of the latter does not mean diminished facilities for drinking, but the contrary. In the years 1903–1908 the average number of clubs proceeded against for offences was 74 and the average number struck off the register was 52. The increase of clubs and the large proportion struck off the register suggest the need of caution in dealing with the licensed trade; over-stringent measures defeat their own end.

Persistent attempts have for many years been made to effect radical changes in the British system of licensing by the introduction of some of the methods adopted in other countries, and particularly those in the United States. But it is difficult to engraft new and alien methods, involving violent change, upon an ancient system consolidated by successive statutory enactments and confirmed by time and usage. The course of the law and administration since 1869 has made it particularly difficult. The stringent conditions imposed on licence-holders have given those who fulfil them a claim to consideration, and the reduction of licences, by limiting the market, has enhanced their value. An expectation of renewal, in the absence of misconduct, has grown up by usage and been confirmed by the law, which recognizes the distinction between granting a new licence and renewing an old one, by the treasury which levies death duties on the assumption that a licence is an enduring property, by local authorities which assess upon the same assumption, and by the High Courts of Justice, whose decisions have repeatedly turned on this point. The consequence of all this is that very large sums have been invested in licensed property, which has become part of the settled order of society; and to destroy it by some sudden innovation would cause a great shock. The position is entirely different in other countries where no such control has ever been exercised. It is possible to impose a new system where previously there was none, but not to replace suddenly an old and settled one for something entirely different. Only the most convincing proof of the need and the advantages of the change would justify it; and such proof has not been forthcoming. The British system has the great merit of combining adaptability to different circumstances and to changing customs with continuity and steadiness of administration. The advantages of abandoning it for some other are more than doubtful, the difficulties are real and serious. Over a very long period it has been repeatedly readjusted in conformity with the movement of public opinion and of national habits; while under it the executive have gradually got the traffic well in hand, and a great and progressive improvement in order and conduct has taken place. The process is gradual but sure, and the record will compare favourably with that of any other comparable country. Further readjustment will follow and is desirable. The great defect of the law is its extreme complexity; it needs recasting and simplification. There are too many kinds of licence, and the classification does not correspond with the actual conditions of the traffic. Some licences are obsolete and superfluous; others make no distinction between branches of the trade which fulfil entirely different functions and require different treatment. The full or publican's licence, which is incomparably the most important, places on the same legal footing hotels, restaurants, village inns and mere drinking bars, and the lack of distinction is a great stumbling-block. In the attempt made in 1908 to introduce new legislation it was found necessary to incorporate distinctions between different classes of establishment, although that was not contemplated in the original bill. It will always be found necessary whenever the subject is seriously approached, because the law has to deal with things as they actually are. It does not fall within the scope of this article to discuss the numerous controversial questions which arise in connexion with various legislative proposals for dealing with the liquor traffic; but an account of the methods which it has been proposed to adopt from other countries will be found below.

The United States

The liquor legislation of the United States presents a great contrast to that of the United Kingdom, but it is not less interesting in an entirely different way. In place of a single homogeneous system gradually evolved in the course of centuries it embraces a whole series of different ones based on the most diverse principles and subject to sudden changes and frequent experiments. It is not sufficiently understood in Europe that the legislatures of the several states are sovereign in regard to internal affairs and make what laws they please subject to the proviso that they cannot over-ride the Federal law. There is therefore no uniformity in regard to such matters as liquor legislation, and it is a mistake to speak of any particular system as representing the whole country. The United States government only interferes with the traffic to tax it for revenue, and to regulate the sale of liquor to Indians, to soldiers, etc. The liquor traffic is subject—whether in the form of manufacture, wholesale or retail trade—to a uniform tax of 25 dollars (£5) per annum imposed on every one engaged in it. Congress, under the constitution, controls interstate commerce, and the Supreme Court has decided that without its consent no state can prevent a railway or other carrying agency from bringing liquor to any point within its borders from outside. Thus no state can keep out liquor or prevent its consumption, but any state legislature may make what internal regulations it pleases and may prohibit the manufacture and sale altogether within its own borders. It may go further. In 1887 a judgment was delivered by the Supreme Court of the United States that it is within the discretionary power of a state to protect public health, safety and morals even by the destruction of property without compensation, and that the constitution of the United States is not thereby violated. Use has been made of this power in Kansas, and it appears therefore that persons who engage in the liquor trade do so at their own risk. There is in fact no stability at all except in a few states which have incorporated some principle in their constitutions, and even that does not ensure continuity of practice, as means are easily found for evading the law or substituting some other system which amounts to the same thing. As a whole the control of the liquor traffic oscillates violently between attempted suppression and great freedom combined with heavy taxation of licensed houses.

In the great majority of the states some form of licensing exists; it is the prevailing system and was adopted, no doubt from England, at an early period. It is exercised in various ways. The licensing authority may be the municipality or a specially constituted body or the police or a judicial body. The last, which is the method in Pennsylvania, seems to be exceptional. According to Mr Fanshawe there is a general tendency, due to the prevailing corruption, to withdraw from municipal authorities power over the licensing, and to place this function in the hands of commissioners, who may be elected or nominated. In New York state the licensing commissioners used to be nominated in cities by the mayors and elected elsewhere; but by the Raines law of 1896 the whole administration was placed under a state commissioner appointed by the governor with the consent of the Senate. A similar plan is in force in some important cities in other states. In Boston the licensing is in the hands of a police board appointed by the governor; in Baltimore and St Louis the authority is vested in commissioners similarly appointed; and in Washington the licensing commissioners are appointed by the president. In Pennsylvania, where the court of quarter sessions is the authority, the vesting of licensing in a judicial body dates back to 1676 and bears the stamp of English influence. It is noteworthy that in Philadelphia and Pittsburg (Allegheny county) the judicial court was for a time given up in favour of commissioners, but the change was a great failure and abandoned in 1888. The powers of the licensing authority vary widely; in some cases the only grounds of refusal are conduct and character, and licences are virtually granted to every applicant; in others the discretion to refuse is absolute. In Massachusetts the number of licences allowed bears a fixed ratio to the population, namely 1 to 1000, except in Boston, where it is 1 to 500, but as a rule where licences are given they are given freely. They are valid for a year and granted on conditions. The first and most general condition is the payment of a fee or tax, which varies in amount in different states. Under the "high licence" system (see below) it generally varies according to the size of the locality and the class of licence where different classes are recognized. In Massachusetts there are six licences; three for consumption on the premises—namely (1) full licence for all liquors, (2) beer, cider, and light wine, (3) beer and cider; two for consumption off the premises—namely (1) spirits, (2) other liquors; the sixth is for druggists. In New York state also there are six classes of licence, though they are not quite the same; but in many states there appears to be only one licence, and no distinction between on and off sale, wholesale or retail. Another condition generally imposed in addition to the tax is a heavy bond with sureties; it varies in amount but is usually not less than 2000 dollars (£400) and may be as high as 6000 dollars (£1200). A condition precedent to the granting of a licence imposed in some states is the deposit of a petition or application some time beforehand, which may have to be backed by a certain number of local residents or tax-payers. In Pennsylvania the required number is 12, and this is the common practice elsewhere; in Missouri a majority of tax-payers is required, and the licence may even then be refused, but if the petition is signed by two-thirds of the tax-payers the licensing authority is bound to grant it. This seems to be a sort of genuine local option. Provision is also generally made for hearing objectors. Another condition sometimes required (Massachusetts and Iowa) is the consent of owners of adjoining property. In some states no licences are permitted within a stated distance of certain institutions; *e.g.* public parks (Missouri) and schools (Massachusetts). Regulations imposed on the licensed trade nearly always include prohibition of sale to minors under 18 and to drunkards, on Sundays, public holidays and election days, and prohibition of the employment of barmaids. Sunday closing, which is universal, dates at least from 1816 (Indiana) and is probably much older. The hours of closing on week days vary considerably but are usually 10 P.M. or 11 P.M. Other things are often prohibited including indecent pictures, games and music.

State Prohibition.—In a few states no licences are allowed. State prohibition was first introduced in 1846 under the influence of a strong agitation in Maine, and within a few years the example was followed by the other New England states; by Vermont in 1852, Connecticut in 1854, New Hampshire in 1855 and later by Massachusetts and Rhode Island. They have all now after a more or less prolonged trial given it up except Maine. Other states which have tried and abandoned it are Illinois (1851–1853), Indiana (1855–1858), Michigan, Iowa, Nebraska, South Dakota. The great Middle states have either never tried it, as in the case of New York (where it was enacted in 1855 but declared unconstitutional), Pennsylvania and New Jersey, or only gave it a nominal trial, as with Illinois and Indiana. A curious position came about in Ohio,[1] one of the great industrial states. It did not adopt prohibition, which forbids the manufacture and sale of liquor; but in 1851 it abandoned licensing, which had been in force since 1792, and incorporated a provision in the constitution declaring that no licence should thereafter be granted in the state. The position then was that retail sale without a licence was illegal and that no licence could be granted. This singular state of things was changed in 1886 by the "Dow law," which authorized a tax on the trade and rendered it legal without expressly sanctioning or licensing it. There were therefore no licences and no licensing machinery, but the traffic was taxed and conditions imposed. In effect the Dow law amounted to repeal of prohibition and its replacement by the freest possible form of licensing. In Iowa, which early adopted a prohibitory law, still nominally in force, a law, known as the "mulct law," was passed in 1894 for taxing the trade and practically legalizing it under conditions. The story of the forty years' struggle in this state between the prohibition agitation and the natural appetites of mankind is exceedingly instructive; it is an extraordinary revelation of political intrigue and tortuous proceedings, and an impressive warning against the folly of trying to coerce the personal habits of a large section of the population against their will. It ended in a sort of compromise, in which the coercive principle is preserved in one law and personal liberty vindicated by another contradictory one. The result may be satisfactory, but it might be attained in a less expensive manner. What suffers is the principle of law itself, which is brought into disrepute.

State prohibition, abandoned by the populous New England and central states, has in recent years found a home in more remote regions. In 1907 it was in force in five states—Maine, Kansas, North Dakota, Georgia and Oklahoma; in January, 1909, it came into operation in Alabama, Mississippi, and North Carolina; and in July 1909 in Tennessee.

Local Prohibition.—The limited form of prohibition known as local veto is much more extensively applied. It is an older plan than state prohibition, having been adopted by the legislature of Indiana in 1832. Georgia followed in the next year, and then other states took it up for several years until the rise of state prohibition in the middle of the century caused it to fall into neglect for a time. But the states which adopted and then abandoned general prohibition fell back on the local form, and a great many others have also adopted it. In 1907 it was in force in over 30 states, including all the most populous and important, with one or two exceptions. But the extent to which it is applied varies very widely and is constantly changing, as different places take it up and drop it again. Some alternate in an almost regular manner every two or three years, or even every year; and periodical oscillations of a general character occur in favour of the plan or against it as the result of organized agitation followed by reaction. The wide discrepancies between the practice of different states are shown by some statistics collected in 1907, when the movement was running favourably to the adoption of no licence. In Tennessee the whole state was under prohibition with the exception of 5 municipalities; Arkansas, 56 out of 75 counties; Florida, 35 out of 46 counties; Mississippi, 56 out of 77 counties; North Carolina, 70 out of 97 counties; Vermont, 3 out of 6 cities and 208 out of 241 towns. These appear to be the most prohibitive states, and they are all of a rural character. At the other end of the scale were Pennsylvania with 1 county and a few towns ("town" in America is generally equivalent to "village" in England); Michigan, 1 county and a few towns; California, parts of 8 or 10 counties. New York had 308 out of 933 towns, Ohio, 480 out of 768 towns, Massachusetts, 19 out of 33 cities and 249 out of 321 towns. At the end of 1909 a strong reaction against the prohibition policy set in, notably in Massachusetts.

There is no more uniformity in the mode of procedure than in the extent of application. At least five methods are distinguished. In the most complete and regular form a vote is taken every year in all localities whether there shall be licences or not in the ensuing year and is decided by a bare majority. A second method of applying the general vote is to take it at any time, but not oftener than once in four years, on the demand of one-tenth of the electorate. A third plan is to apply this principle locally and put the question to the vote, when demanded, in any locality. A fourth and entirely different system is to invest the local authority with powers to decide whether there shall be licences or not; and a fifth is to give residents power to prevent licences by means of protest or petition. The first two methods are those most widely in force; but the third plan of taking a local vote by itself is adopted in some important states, including New York, Ohio and Illinois. Opinions differ widely with regard to the success of local veto, but all independent observers agree that it is more successful than state prohibition, and the preference accorded to it by so many states after prolonged experience proves that public opinion broadly endorses that view. Its advantage lies in its adaptability to local circumstances and local opinion. It prevails mainly in rural districts and small towns; in the larger towns it is best tolerated where they are in close proximity to "safety valves" or licensed areas in which liquor can be obtained; the large cities do not adopt it. On the other hand, it has some serious disadvantages. The perpetually renewed struggle between the advocates and opponents of prohibition is a constant cause of social and political strife; and the alternate shutting up and opening of public houses in many places makes continuity of administration impossible, prevents the executive from getting the traffic properly in hand, upsets the habits of the people, demoralizes the trade and stands in the way of steady improvement.

Public Dispensaries.—This entirely different system of controlling the traffic has been in general operation in one state only, South Carolina; but it was also applied to certain areas in the neighbouring states of North Carolina, Georgia and Alabama. The coloured element is very strong in these states, especially in South Carolina, where the coloured far exceeds the white population. The dispensary system was inaugurated there in 1893. It had been preceded by a licensing system with local veto (adopted in 1882), but a strong agitation for state prohibition brought matters to a crisis in 1891. The usual violent political struggle, which is the only constant feature of liquor legislation in the United States, took place, partly on temperance and partly on economic grounds; and a way out was found by adopting an idea from the town of Athens in Georgia, where the liquor trade was run by the municipality through a public dispensary. A law was passed in 1892 embodying this principle but applying it to the whole state. The measure was fiercely contested in the courts and the legislature for years and it underwent numerous amendments, but it survived. Under it the state became the sole purveyor of liquor, buying wholesale from the manufacturers and selling retail through dispensaries under public management and only for consumption off the premises. Many changes were introduced from time to time without abandoning the principle, but in 1907 the system of state control was replaced by one of county administration. Local veto is also in force, and thus the localities have the choice of a dispensary or no sale at all. The regulations are very strict. The dispensaries are few and only open on week-days and during the day-time; they close at sunset. Liquor is only sold in bottles and in not less quantities than half a pint of spirits and a pint of beer, and it must be taken away; bars are abolished. There is a general consensus of testimony to the effect of the system in improving public order especially among the coloured population, who are very susceptible to drink. The law seems to be well carried out in general, but Charleston and Columbia, the only two considerable towns, are honeycombed with illicit drink-shops, as the writer has proved by personal experience. Columbia is the capital and the seat of cotton manufactures, as are all the larger towns, with the exception of Charleston, which is the port and business centre. The population of the state is predominantly rural, and local prohibition obtains in 18 out of 41 counties.

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[1] In 1908 local option was adopted in Ohio.

The following statistical comparison, extracted from the United States Census of 1900 and the Inland Revenue Returns by Mr W. O. Tatum (*New Encyclopedia of Social Reform*) and here presented in tabular form, is highly instructive. It shows the population and number of liquor dealers paying the United States tax in two prohibition states, one state under what is considered the best licensing system, and South Carolina.

State.	Population.	Wholesale Liquor Dealers.	Retail Liquor Dealers.
Maine (Prohibition) . .	694,466	51	1366
Kansas (Prohibition) . .	1,470,495	129	3125
Massachusetts (Licence) .	2,805,346	617	5092
S. Carolina (Dispensary) .	1,340,316	13	534

This table may be said to epitomize the results of the United States restrictive liquor laws. It presents examples of three different systems; the proportion of retail liquor sellers to population is—under complete prohibition, 1 to 508 and 1 to 475; under licence and local prohibition, 1 to 530; under dispensary and local prohibition, 1 to 2509. But the remarkable thing is the enormous amount of illicit traffic existing under all three systems. It is incomparably greatest under complete prohibition because the whole of the traffic in these states is illicit. In South Carolina one of the wholesale dealers and 388 of the 534 retailers were illicit. In Massachusetts the number cannot be stated, but it is very large. If the whole state were under licence the total legal number of licences, which is limited in proportion to population (see above), would be 3400; and in that case there would be some 1700 illicit retailers. But a large part of the state, probably more than half, is under local prohibition, so that the majority of the 5000 retail dealers must be illicit. These facts, which are typical and not exceptional, reveal the failure of the laws to control the traffic; only partial or spasmodic attempts are made to enforce them and to a great extent they are ignored by common consent. The illegal trade is carried on so openly that the United States revenue officers have no difficulty in collecting the federal tax. It is not a satisfactory state of things, or one which countries where law is respected would care to imitate. The example is a good lesson in what to avoid.

Taxation.—Mention has been made above of the federal and state taxation imposed on the liquor trade. The former is uniform; the latter varies greatly, even in those states which have adopted the "high licence." This system is intended to fulfil two purposes; to act as an automatic check on the number of licences and to produce revenue. It was introduced in Nebraska in 1881, when a tax of 1000 dollars (£200) was placed on saloons (public houses) in large towns, and half that amount in smaller ones. The practice gradually spread and has now been adopted by a large number of states, noticeably the populous and industrial north-eastern and central states. In Massachusetts, where the high licence was adopted in 1874 when the state returned to licensing after a trial of prohibition, the fees are exceptionally high, the minimum for a fully licensed on and off house being 1300 dollars (£260); in Boston the average tax is £310. In New York state it ranges from 150 dollars (£30) in sparsely populated districts to 1200 dollars (£240), and in Pennsylvania it is much the same. In New Jersey, on the other hand, it ranges from £20 to £60; in Connecticut from £50 to £90; in Rhode Island from £40 to £80. In Missouri, which has a special system of its own and a sort of sliding scale, great variations occur and in some cases the tax exceeds £500. In Michigan it is uniform at £100. The mean for the large cities is £133. The revenue derived from this source is distributed in many ways, but is generally divided in varying proportions between the state, the county and the municipality; sometimes a proportion goes to the relief of the poor, to road-making or some other public purpose. The amount levied in the great cities is very large. It will be seen from the foregoing that the taxation of licences is much heavier in the United States than in the United Kingdom. The total yield was ascertained by a special inquiry in 1896 and found to be rather less than 12 millions sterling; in the same year the yield from the same source in the United Kingdom was just under 2 millions. Allowing for difference of population the American rate of taxation was 3¼ times as great as the British. It has been inferred that the liquor trade is much more highly taxed in the United States and that it would bear largely increased taxation in the United Kingdom; that argument was brought forward in support of Mr Lloyd George's budget of 1909. But it only takes account of the tax on licences and leaves out of account the tax on liquor which is the great source of revenue in the United Kingdom, as has been shown above. The scales are much lower in the United States, especially on spirits, which are only taxed at the average rate of 5s. 8d. a gallon against 11s. (raised to 14s. 9d. in 1909) in the United Kingdom. Mr Frederic Thompson has calculated out the effect of the two sets of rates and shown that if British rates were applied to the United States the average yield in the three years ending 1908 would be raised from 44 millions to 76 millions; and conversely if American rates were applied to the United Kingdom the average yield would be lowered from 36 millions to 23 millions. Taking licences and liquor taxation together he finds that the application of the British standards for both would still raise the total yield in the United States by 39%; and that even the exceptionally high rates prevailing in Massachusetts would, if applied to the United Kingdom, produce some 4 millions less revenue than the existing taxation. Other calculations based on the consumption and taxation per head lead to the same conclusion that the trade is actually taxed at a considerably higher rate in the United Kingdom. In the three years ending 1908 the average amount paid per head in taxation was 13s. 8¾d. in the United States and 17s. 6¾d. in the United Kingdom. It may be added that the method of taxing licences heavily has certain disadvantages; it stimulates that illicit trade which is the most outstanding feature of the traffic in the United States, and combined with the extreme insecurity of tenure involved in local option it gives licence-holders additional inducements to make as much money as possible by any means available, while they have the opportunity, for no compensation is ever paid for sudden dispossession. The notion that the trade will stand an indefinite amount of taxation is a dangerous and oft-proved fallacy.

European Countries.

With the exception of Sweden, Norway and Russia, which have special systems of their own, the continental countries of Europe have as yet paid comparatively little legislative attention to the subject of the liquor traffic, which is recognized by the law but for the most part freely permitted with a minimum of interference. Differences exist, but, generally speaking, establishments may be opened under a very simple procedure, which amounts to an elementary form of licensing, and the permission is only withdrawn for some definite and serious offence. Regulations and conditions are for the most part left to the discretion of the local authority and the police and are not burdensome. The reason for such freedom as compared with the elaborate and stringent codes of the United Kingdom and the United States is not less concern for public welfare but the simple fact that the traffic gives less trouble and causes less harm through the abuse of drink; the habits of the people are different in regard to the character of the drinks consumed, the mode of consumption and the type of establishment. Cafés, restaurants and beer-gardens are much more common, and mere pot-houses less so than in the English-speaking countries. Where trouble arises and engages the attention of the authorities and the legislature, it is almost invariably found to be associated with the consumption of spirits. In several of the wine-producing countries, which are generally marked by the temperate habits of the people, the widespread havoc among the vines caused some years ago by the phylloxera led to an increased consumption of spirits which had a bad effect and aroused considerable anxiety. This was notably the case in France, where an anti-alcohol congress, held in 1903, marked the rise of public and scientific opinion on the subject. Temperance societies have become active, and in some countries there is a movement towards stricter regulations or at least a demand for it; but in others the present law is a relaxation of earlier ones.

France.—The present law governing the licensing of establishments where liquor is sold for consumption on the premises was passed in 1880; it abrogated the previous decree of 1851, by which full discretion was vested in the local authorities, and freed the traffic from arbitrary restrictions. It provides that any person desiring to open a café, cabaret or other place for retailing liquor must give notice to the authorities, with details concerning himself, the establishment and the proprietor, at least 15 days beforehand; the authority in Paris is the préfecture of police and elsewhere the mairie. Transfers of proprietorship or management must be notified within 15 days, and intended transference of location 8 days beforehand. The penalty for infraction is a fine of 16 francs to 100 francs. Legal minors and persons convicted of certain crimes and offences—theft, receiving stolen goods, various forms of swindling, offences against morality, the sale of adulterated articles—are prohibited; in the case of crimes, for ever; in the case of offences, for five years. Otherwise permission cannot be refused, subject to conditions which the local authority has power to lay down regulating the distance of such establishments from churches, cemeteries, hospitals, schools and colleges. But persons engaged in the trade, who are convicted of the offences mentioned above and of infraction of the law for the suppression of public drunkenness, are disabled, as above. The law practically amounts to free trade and the number of houses has increased under it; in 1900 there was one to every 81 persons. This proportion is only exceeded by Belgium. Under the Local Government Act of 1884 municipal authorities are empowered, for the maintenance of public order, to fix hours of closing, regulate dancing, forbid the employment of girls and the harbouring of prostitutes and make other regulations. The hours of closing differ considerably but usually they are 11 P.M., midnight or 1 A.M. The trade is lightly taxed; retailers pay from 15 to 50 francs a year; wholesale dealers, 125 francs; breweries the same in most departments, distilleries 25 francs. The excise revenue from liquor amounted to £20,000,000 in 1900.

Germany.—The German law and practice are broadly similar to the French, but the several states vary somewhat in detail. Under the imperial law of 1879 inns or hotels and retail trade in spirits for on or off consumption may not be carried on without a permit or licence from the local authority which, however, can only be refused on the ground of character or of unsuitability of premises. This is the general law of the empire; but the state governments are empowered to make the granting of a licence for retailing spirits dependent on proof that it is locally required, and also to impose the same condition on inn-keeping and the retailing of other drinks in places with less than 15,000 inhabitants and in larger ones which obtain a local statute to that effect. Before a licence is granted the opinion of the police and other executive officers is to be taken. The licensing authority is the mayor in towns and the chairman of the district council in rural areas. The provisions with regard to the dependence of a licence on local requirements have been adopted by Prussia and other states, but apparently little or no use is made of them. Permits are very freely granted, and the number of licensed houses, though not so great as in France, is very high in proportion to population. Three classes of establishment are recognized—(1) *Gast-wirthschaft*, (2) *Schank-wirthschaft*, (3) *Klein-handel*. *Gast-wirthschaft* is inn-keeping, or the lodging of strangers in an open house for profit, and includes "pensions" of a public character; the imperial law provides that a licence may be limited to this function and need not include the retailing of liquor. *Schank-wirthschaft* is the retailing for profit of all sorts of drinks, including coffee and mineral waters; it corresponds to café in France and refreshment house in England; but the mere serving of food does not come under the law with which we are here concerned. *Klein-handel* is retail sale either for on or off consumption, and the liquor for which a licence is required in this connexion is described as *branntwein* or *spiritus*, and is defined as distilled alcoholic liquor, whether by itself or in combination. A licence for *Schank-wirthschaft* includes *Klein-handel*, but not vice-versa; none is required for the retail sale of wine which is the seller's own produce. Licences may be withdrawn for offences against the law. Licensed houses are under the supervision of the police, who fix the hours of closing; it is usually 10 P.M., but is commonly extended to 11 P.M. or midnight in the larger towns and still later in the case of particular establishments. Some cafés in Berlin do not close till 3 A.M. and some never close at all. Persons remaining on the premises in forbidden hours after being ordered to leave by the landlord are liable to punishment. Serving drunkards and persons of school age is forbidden. Drunkards, in addition to fines or imprisonment for disorderly conduct, are liable to be deprived of control of their affairs and placed under guardianship. For music and dancing special permits are required. With regard to taxation, in Prussia all business establishments beyond a certain value pay an annual tax and licensed houses are on the same footing as the rest. Businesses producing less than £75 a year or of less than £150 capital value are free; the rest are arranged in four classes on a rising scale. In the three lower classes the tax ranges from a minimum of 4s. to a maximum of £24; in the highest class, which represents businesses producing £2500 and upwards (or a capital value of £50,000 and upwards) the tax is 1% of the profits. There is also a stamp duty on the licence ranging from 1s. 6d. to £5. The latter goes to the local revenue, the business tax to the government. Beer and spirits are also subject to an excise tax, from which the imperial revenue derived £7,700,000 in 1901; but the total taxation of the liquor trade could only be calculated from the returns of all the federated states.

The laws of France and Germany are fairly representative of the European states, with some minor variations. In *Holland* the number of licensed spirit retailers is limited in proportion to population (1 to 500), and the taxation, which is both national and local, ranges from 10 to 25% of the annual value.

In *Austria-Hungary* and *Rumania* the licence duty is graduated according to the population of the place, as used to be the case in Prussia. In 1877 a severe police law was applied to Galicia in order to check the excesses of spirit-drinking. The Poles, it may be observed, are spirit-drinkers, and the exceptional treatment of this part of the Austrian empire is one more illustration of the trouble arising from that habit, which forces special attempts to restrain it. The law, just mentioned, in Holland is another instance; and the particular cases of Russia and Scandinavia, described below, enforce the same lesson. Where the drink of the people is confined to wine and beer there is comparatively little trouble. In *Switzerland* the manufacture and wholesale sale of spirits has been a federal monopoly since 1887, but the retailing is a licensed trade, as elsewhere, and is less restricted than formerly. Before federation in 1874 the cantons used to direct local authorities to restrict the number of licences in proportion to population; but under the new constitution the general principle of free trade was laid down, and the Federal Council intimated to the cantonal authorities that it was no longer lawful to refuse a licence on the ground that it was not needed.

Russia.—In 1895 Russia entered upon an experiment in regard to the spirit traffic and began to convert the previously existing licence system into a state monopoly. The experiment was held to be successful and was gradually extended to the whole country. Under this system, which to some extent resembles that of South Carolina but is much less rigid, the distilleries remain in private hands but their output is under government control. The retail sale is confined to government shops, which sell only in sealed bottles for consumption off the premises, and to commercial establishments which sell on commission for the government. Spirit bars are abolished and only in a few high class restaurants are spirits sold by the glass; in ordinary eating-houses and at railway refreshment rooms they are sold in sealed government bottles but may be consumed on the premises. The primary object was to check the excesses of spirit-drinking which were very great in Russia among the mass of the people. The effect has been a very large reduction in the number of liquor shops, which has extended also to the licensed beer-houses though they are not directly affected as such. Presumably when they could no longer sell spirits it did not pay them to take out a licence for beer.

Sweden and Norway.—In these countries the celebrated "Gothenburg" or company system is in force together with licensing and local veto. Like the Russian state monopoly the company system applies only to spirits, and for the same reason; spirits are or were the common drink of the people and excessive facilities in the early part of the 19th century produced the usual result. The story is very similar to that of England in the 18th century, given above. From 1774 to 1788 distilling in Sweden was a crown monopoly, but popular opposition and illicit trade compelled the abandonment of this plan in favour of general permission granted to farmers, innkeepers and landowners. At the beginning of the 19th century the right to distil belonged to every owner and cultivator of land on payment of a trifling licence duty, and it was further extended to occupiers. In 1829 the number of stills paying licence duty was 173,124 or 1 to every 16 persons; the practice was in fact universal and the whole population was debauched with spirits. The physical and moral results were the same as those recorded in England a hundred years before. The supply was somewhat restricted by royal ordinance in 1835, but the traffic was not effectively dealt with until 1855 when a law was passed which practically abolished domestic distilling by fixing a minimum daily output of 200 gallons, with a tax of about 10d. a gallon. This turned the business into a manufacture and speedily reduced the number of stills. At the same time the retail sale was subjected to drastic regulations. A licensing system was introduced which gave the local authority power to fix the number of licences and put them up to auction or to hand over the retail traffic altogether to a company formed for the purpose of carrying it on. The latter idea, which is the Gothenburg system, was taken from the example of Falun and Jönköping which had a few years ago voluntarily adopted the plan. The law of 1855 further gave rural districts the power of local veto. Four-fifths of the population live in rural districts, and the great majority of them immediately took advantage of the provision. The company system, on the other hand, was not applied by the towns until 1865, when Gothenburg adopted it.

In Norway the course of events was very similar. There, too, distilling and spirit-drinking were practically universal in the early part of the century under the laws of 1816, but were checked by legislation a few years sooner than in Sweden. In 1845 a special licensing system was introduced, giving the local authority power to fix the number of licences, and in 1848 the small and domestic stills were stopped. The Gothenburg system was not adopted in Norway until 1871 and then with some modification. The essence of this method of conducting the retail traffic is that the element of private gain is eliminated. A monopoly is granted to a company consisting of a number of disinterested citizens of standing with a capital, and they manage the sale both for "on" and "off" consumption in the public interest. The profits, after payment of 5% on the capital, originally went in Sweden mainly to the municipality in relief of rates, in Norway to objects of public utility. The latter was considered preferable because it offers less temptation to make the profits as high as possible. Fault has, however, been found with both methods, and payment of profits to the state is now preferred. In 1894 a law was passed in Norway providing for the following distribution; 65% to the state, 20% to the company, and 15% to the municipality. In 1907 Sweden adopted a law in the same direction. The intention is to eliminate more completely the motive of gain from the traffic. In 1898 the net profits of the companies exceeded half a million sterling in Sweden and reached £117,500 in Norway.

The company system had in 1910 had more than half a century's trial; it had gone through some vicissitudes and been subjected to much criticism, which was balanced by at least as much eulogy. It had held its own in Sweden, where 101 towns had adopted it in 1906. In Norway at the same date it was in force in 32 towns while 29 had adopted local veto, which was extended from the country districts, where it had previously been optional, to the towns by the law of 1894.

As we have already said, it only applies to spirits. In both countries the sale of beer and wine for "on" consumption is carried on in the ordinary way under a licensing system; the sale of beer in bottles for consumption off the premises is practically free. The beer traffic is regarded by some as a "safety valve" and by others as a defect in the system. The consumption has greatly increased in Sweden; in Norway it increased up to 1900 and has since declined. But other more deleterious substitutes for spirits have come into use in the shape of concocted "wines" and methylated spirits. The company management has had the following effects: it has greatly reduced the number of spirit bars, improved their character and conduct, added eating-rooms, where good and cheap meals are served, stopped drinking on credit and by persons under 18 years of age, shortened the hours of sale, raised the price and lowered the strength of spirits. But the restrictions placed on the sale for consumption on the premises has stimulated the retail bottle trade and home drinking.

British Dominions.

Canada.—Liquor legislation in Canada has been much influenced by the proximity and example of the United States. Licensing, modified by local veto, prevails throughout the Dominion except in the Indian settlements; but the several provinces have their own laws, which vary in stringency. As a whole the licensing system rather resembles the American than the British type. The licensing authority is either a board of commissioners or the municipality, and there has been the same tendency as in the United States to substitute the former for the latter. In British Columbia no new hotel licence is granted in cities except on the request of two-thirds of the owners and occupiers of the adjoining property, but their consent is not necessary for renewal. In other provinces the municipal authority has power to limit as well as regulate the licensed trade. Sunday closing is the rule; on week-days the usual closing hour in the large towns is 11 P.M. The power of locally prohibiting licensed houses by vote was introduced by the Canada Temperance Act, a federal law passed in 1875 and commonly known as the Scott Act. Extensive use has been made of it, especially in the maritime provinces, where the temperance sentiment is very strong, but in recent years it has rather lost ground. In 1908 it was in force in 22 counties or cities, of which ten were in Nova Scotia, ten in New Brunswick and two in Manitoba; it was nowhere in force in the remaining provinces. Three elections were held under the act in 1907–1908, two in Nova Scotia and one in New Brunswick, and in the first two prohibition was defeated. In 1910 Nova Scotia, apparently dissatisfied with the progress of local prohibition under the Scott Act, passed a prohibitory law for the whole province, exempting Halifax, the capital and only considerable town, but making provision for its subsequent inclusion by a referendum to the ratepayers. There is in Canada the same oscillation of public opinion as in the United States, and the same toleration of evasion of the law. The writer has stayed in hotels in several prohibition towns, where there was not only a regular bar but a printed wine list from which anything could be ordered at meals without any concealment at all. The chief difference between the conduct of hotels under prohibition and under licensing is that under licensing the bar is closed at the legal hour, which is usually 11 o'clock, and under prohibition it remains open as long as there are any customers to serve. The law is nominally respected by imposing a periodical fine. In small towns and rural districts local prohibition is much more effective. In short the experience of Canada confirms that of the United States. In addition to the federal law, the local authorities have power, in Quebec, to prohibit as well as to regulate the trade. The high licence system has not been adopted in Canada. The total revenue derived by the Dominion government in 1908 from taxation of the liquor trade, including duties and licence fees, was £1,800,000.

Australia.—The licensing laws of Australia are less repressive and the practice more resembles the British model. Queensland has adopted local prohibition, but it is not applied. New South Wales has a limited form of veto applying only to new licences; South Australia has the same together with a provision for the optional reduction of licences; Victoria, on the other hand, allows an option both ways, for reducing or increasing the licences; West Australia and Tasmania merely give the local ratepayers the right of protest; in West Australia it holds good against new licences only and if a majority object the licence is refused; in Tasmania protest may be made against renewals and transfers also, but the decision lies with the licensing authority. There is practically no prohibition in the Commonwealth.

New Zealand.—This state has a licensing system with local option provisions of its own. The licensing authority is a local committee, and there are seven kinds of licence, of which two are for consumption on the premises. The fees range from £1 for a wine licence to £40 for a full publican's licence in towns, or £45 for one permitting an additional hour's sale at night; the fees go to the revenue of the local authority. In 1907 the total number of licences granted was 2179 and the fees paid amounted to £45,865. Of the whole number, 1367, or 1 to every 666 persons, were houses licensed for on consumption. The closing hour is 10 P.M. except for houses specially licensed to be open till 11 P.M. In 1893 local option was introduced by the Alcoholic Liquors Sale Control Act, which provided for the taking of a poll on the question of licences. The electoral districts for the purpose are the same as for the House of Representatives, except that the cities of Auckland, Wellington, Christchurch and Dunedin each form a single district for the licensing poll. It is taken at the same time as the election of members of the House of Representatives, and three questions are propounded—(1) continuance of existing licences, (2) reduction, (3) no licences. A voter may vote for two proposals but not more. An absolute majority of all the votes recorded carries (1); an absolute majority of all the votes recorded carries (2), whereupon the licensing committee reduces the licences by any number from 5 to 25% of the total. But if three-fifths of all the votes cast are in favour of no licence then that supersedes (1) and (2). The poll taken in December 1905 gave the following results: of the 68 districts 40 carried no proposal (which is equivalent to continuance of existing licences), 18 carried continuance, 4 reduction, 6 no licence, including 3 which had previously adopted no licence. Women, it must be remembered, vote as well as men. The aggregate vote in favour of no licence shows a large proportional increase since the first poll in the present system in 1896.

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LIRA, the Italian name (Lat. *libra*, pound) for a silver coin, the Italian unit of value in the Latin Monetary Union, corresponding to the French, Swiss and Belgian franc (*q.v.*), and the drachma of Greece, &c. The name is sometimes used of the Turkish pound, *medjidie*.

LIRI, or GARIGLIANO (anc. *Liris*), a river of central Italy, which rises at Cappadocia, 7 m. W. of Avezzano, and traverses a beautiful valley between lofty mountains, running S.S.E. as far as Arce. This valley is followed by the railway from Avezzano to Roccasecca. At Isola del Liri are two fine waterfalls. Below Ceprano, the ancient Fregellae, after it has issued from the mountains, the Liri is joined by the Sacco (anc. *Trerus*) formed by the union of several torrents between Palestrina and Segni, and the Melfa from the mountains N.E. of Atina, and runs E. through a broader valley. It then turns S. again through the mountains S.W. of the Via Latina (the line of which is followed by the modern railway to Naples), keeping W. of Rocca Monfina, and falls into the sea just below Minturnae, after a course of 104 m. It is not navigable at any point.

LIROCONITE, a rare mineral consisting of hydrous basic copper and aluminium arsenate, with the probable formula

$Cu_9Al_4(OH)_{15}(AsO_4)_5.20H_2O$. It crystallizes in the monoclinic system, forming flattened octahedra almost lenticular in shape (hence the German name *Linsenkupfer*). Characteristic is the bright sky-blue colour, though sometimes, possibly owing to differences in chemical composition, it is verdigris-green. The colour of the streak or powder is rather paler; hence the name liroconite, from the Gr. λειρός, pale, and κονία, powder. The hardness is 2½, and the specific gravity 2·95. The mineral was found at the beginning of the 19th century in the copper mines near Gwennap in Cornwall, where it was associated with other copper arsenates in the upper, oxidized portions of the lodes. (L. J. S.)

LISBON (*Lisboa*), the capital of the kingdom of Portugal and of the department of Lisbon; on the right bank of the river Tagus, near its entrance into the Atlantic Ocean, in 38° 42′ 24″ N. and 9° 11′ 10″ W. Pop. (1900) 356,009. Lisbon, the westernmost of European capitals, is built in a succession of terraces up the sides of a range of low hills, backed by the granite mountains of Cintra. It fronts the Tagus, and the view from the river of its white houses, and its numerous parks and gardens, is comparable in beauty with the approach to Naples or Constantinople by sea. The lower reaches of the estuary form a channel (Entrada do Tejo) about 2 m. wide and 8 m. long, which is partially closed at its mouth by a bar of silt. Owing to the reclamation of the foreshore on the right, and the consequent narrowing of the waterway, the current flows very swiftly down this channel, which is the sole outlet for the immense volume of water accumulated in the Rada de Lisboa—a tidal lake formed by the broadening of the estuary in its upper part to fill a basin 11 m. long with an average breadth of nearly 7 m. The southern or left shore of the channel rises sharply from the water's edge in a line of almost unbroken though not lofty cliffs; the margin of the lake is flat, marshy and irregular. Lisbon extends for more than 5 m. along the shores of both channel and lake, and for more than 3 m. inland. Its suburbs, which generally terminate in a belt of vineyards, parks or gardens, interspersed with villas and farms, stretch in some cases beyond the Estrada Militar, or Estrada da Nova Circumvallação, an inner line of defence 25 m. long, supplementary to the forts and other military works at the mouth of the Tagus, on the heights of Cintra and Alverca, and at Caxias, Sacavem, Monsanto and Ameixoeira. The climate of Lisbon is mild and equable, though somewhat oppressive in summer. Extreme cold is so rare that in the twenty years 1856–1876 snow fell only thrice; and in the 18th and early 19th centuries Lisbon was justly esteemed as a winter health-resort. The mean annual temperature is 60·1° F., the mean for winter 50·9°, the average rainfall 29·45 in. As in 1906, when no rain fell between April and September, long periods of drought are not uncommon, although the proximity of the Atlantic and the frequency of sea-fogs keep the atmosphere humid; the mean atmospheric moisture is nearly 71 (100=saturation). There is a good water supply, conveyed to the city by two vast aqueducts. The older of these is the Aqueducto das Aguas Livres, which was built in the first half of the 18th century and starts from a point near Bellas, 15 m. W.N.W. Its conduits, which are partly underground, are conveyed across the Alcantara valley through a magnificent viaduct of thirty-five arches, exceeding 200 ft. in height. At the Lisbon end of the aqueduct is the Mae d'Agua (*i.e.* "Mother of Water"), containing a huge stone hall in the midst of which is the reservoir. The Alviella aqueduct, opened in 1880, brings water from Alviella near Pernes, 70 m. N.N.E. Numerous fountains are among the means of distribution. Sewage is discharged into the Tagus, and the sanitation of the city is good, except in the older quarters.

Divisions of the City.—The four municipal districts (*bairros*) into which Lisbon is divided are the *Alfama*, or old town, in the east; the *Cidade Baixa*, or lower town, which extends inland from the naval arsenal and custom house; the *Bairro Alto*, comprising all the high ground west of the Cidade Baixa; and the *Alcantara*, or westernmost district, named after the small river Alcantara, which flows down into the Tagus. Other names commonly used, though unofficial, are "Lisboa Oriental" as an alternative for Alfama; "Lisboa Occidental" for the slopes which lead from the Cidade Baixa to the Bairro Alto; "Buenos Ayres" (originally so named from the number of its South American residents) for the Bairro Alto S.W. of the Estrella Gardens and E. of the Necessidades Park; "Campo de Ourique" and "Rato" for the suburbs respectively N.W. and N.E. of Buenos Ayres.

The Alfama.—The Alfama, which represents Roman and Moorish Lisbon, is less rich in archaeological interest than its great antiquity might suggest, although parts of a Roman temple, baths, &c., have been disinterred. But as the earthquake of 1755 did comparatively little damage to this quarter, many of its narrow, steep and winding alleys retain the medieval aspect which all other parts of the city have lost; and almost rival the slums of Oporto in picturesque squalor. The most conspicuous feature of the Alfama is the rocky hill surmounted by the Castello de São Jorge, a Moorish citadel which has been converted into a fort and barracks. The Sé Patriarchal, a cathedral founded in 1150 by Alphonso I., is said by tradition to have been a Moorish mosque. It was wrecked by an earthquake in 1344 and rebuilt in 1380, but the earthquake of 1755 shattered the dome, the roof and belfry were subsequently burned, and after the work of restoration was completed the choir and façade were the only parts of the 14th-century Gothic church unspoiled. In one of the side chapels is the tomb of St Vincent (d. 304), patron saint of Lisbon; a pair of ravens kept within the cathedral precincts are popularly believed to be the same birds which, according to the legend, miraculously guided the saint's vessel to the city. The armorial bearings of Lisbon, representing a ship and two ravens, commemorate the legend. Other noteworthy buildings in the Alfama are the 12th-century church of São Vicente de Fóra, originally, as its name implies, "outside" the city; the 13th-century chapel of Nossa Senhora do Monte; the 16th-century church of Nossa Senhora da Graça, which contains a reputed wonder-working statue of Christ and the tomb of Alphonso d'Albuquerque (1453–1515); and a secularized Augustinian monastery, used as the archbishop's palace.

Modern Lisbon.—West of the Alfama the city dates chiefly from the period after the great earthquake. Its lofty houses, arranged in long straight streets, its gardens and open spaces, a few of its public buildings, and almost all its numerous statues and fountains, will bear comparison with those of any European capital. The centre of social and commercial activity is the district which comprises the Praça do Commercio, Rua Augusta, Rocío, and Avenida da Liberdade, streets and squares occupying the valley of a vanished tributary of the Tagus. The Praça do Commercio is a spacious square, one side of which faces the river, while the other three sides are occupied by the arcaded buildings of the custom house, post office and other government property. In the midst is a bronze equestrian statue of Joseph I., by J. M. de Castro, which was erected in 1775 and gives point to the name of "Black Horse Square" commonly applied to the Praça by the British. A triumphal arch on the north side leads to Rua Augusta, originally intended to be the cloth-merchants' street; for the plan upon which Lisbon was rebuilt after 1755 involved the restriction of each industry to a specified area. This plan succeeded in the neighbouring Rua Aurea and Rua da Prata, still, as their names indicate, famous for goldsmiths' and silversmiths' shops. Rua Augusta terminates on the north in the Rocío or Praça de Dom Pedro Quarto, a square paved with mosaic of a curious undulatory pattern and containing two bronze fountains, a lofty pillar surmounted by a statue of Pedro IV., and the royal national theatre (Theatro de Dona Maria Segunda), erected on the site which the Inquisition buildings occupied from 1520 to 1836. The narrow Rua do Principe, leading past the central railway station, a handsome Mauresque building, connects the Rocío with the Avenida da Liberdade, one of the finest avenues in Europe. The central part of the Avenida, a favourite open-air resort of Lisbon society, is used for riding and driving; on each side of it are paved double avenues of trees, with flower-beds, statues, ponds, fountains, &c., and between these and the broad pavements are two roadways for trams and heavy traffic. Thus the Avenida has the appearance of three parallel streets, separated by avenues of trees instead of houses. Its width exceeds 300 ft. It owes its name to an obelisk 98 ft. high, erected in 1882 at its southern end, to commemorate the liberation of Portugal from Spanish rule (December, 1640). North and north-east of the Avenida are the Avenida Park, the Edward VII. Park (so named in memory of a visit paid to Lisbon by the king of England in 1903), Campo Grande, with its finely wooded walks, and Campo Pequeno, with the bull-ring. Other noteworthy public gardens are the Passeio da Estrella, commanding magnificent views of the city and river, the Largo do Principe Real, planted with bananas and other tropical trees, the Tapada das Necessidades, originally the park of one of the royal residences, and the Botanical Gardens of the polytechnic school, with a fine avenue of palms and collections of tropical and subtropical flora hardly surpassed in Europe. There are large Portuguese cemeteries east and west of Lisbon, a German cemetery, and an English cemetery, known also as *Os Cyprestes* from the number of its cypresses. This was laid out in 1717 at the cost of the British and Dutch residents and contains the graves of Henry Fielding (1707–1754), the novelist, and Dr Philip Doddridge (1702–1751), the Nonconformist divine.

Lisbon is the seat of an archbishop who since 1716 has borne *ex officio* the honorary title of patriarch; he presides over the House of Peers and is usually appointed a cardinal. The churches of modern Lisbon are generally built in the Italian style of the 18th century; the interiors are overlaid with heavy ornament. Perhaps the finest is the Estrella church, with its white marble dome and twin towers visible for many miles above the city. The late Renaissance church of São Roque contains two beautiful chapels dating from the 18th century, one of which is inlaid with painted tiles, while the other was constructed in Rome of coloured marbles, and consecrated by the pope before being shipped to Lisbon. Its mosaics and lapis lazuli pillars are exceptionally fine. The 14th-century Gothic Igreja do Carmo was shattered by the great earthquake. Only the apse, pillared aisles and outer walls remain standing, and the interior has been converted into an archaeological museum. The church of Nossa Senhora da Conceição has a magnificent Manoeline façade.

The Palacio das Cortes, in which both Houses of Parliament sit, is a 16th-century Benedictine convent, used for its present purpose since 1834. It contains the national archives, better known as the Torre do Tombo collection, because in 1375 the archives were first stored in a tower of that name. The royal palace, or Paço das Necessidades, west of Buenos Ayres, is a vast 18th-century mansion occupying the site of a chapel dedicated to Nossa Senhora das Necessidades (*i.e.* "Our Lady who helps at need").

The Suburbs of Ajuda and Belem.—In the extreme west of Lisbon, beyond the Alcantara valley, are Belem (*i.e.* "Bethlehem"), beside the Tagus, and Ajuda, on the heights above. The Paço de Belem, built in 1700 for the counts of Aveiro, became the chief royal palace under John V. (1706–1750). The Torre de Belem, on the foreshore, is a small tower of beautiful design, built in 1520 for the protection of shipping. The finest ecclesiastical building in Portugal except the monasteries of Alcobaça and Batalha also fronts the river. It is the Convento dos Jeronymos, a Hieronymite convent and church, founded in 1499 to commemorate the discovery of the sea-route to India by Vasco da Gama. It was built of white limestone by João de Castilho (d. 1581), perhaps the greatest of Manoeline architects. Its cloisters form a square with blunted corners, surrounded by a two-storeyed arcade, every available portion of which is covered with exquisite sculptures. Parts of the building have been restored, but the cloisters and the beautiful central gateway remain unspoiled. The interior contains many royal tombs, including that of Catherine of Braganza (d. 1705), the wife of Charles II. of England. The supposed remains of Camoens and Vasco da Gama were interred here in 1880. In 1834, when the convent was secularized, its buildings were assigned to the Casa Pia, an orphanage founded by Maria I. Since 1903 they have contained the archaeological collections of the Portuguese Ethnological Museum. The royal Ajuda palace, begun (1816–1826) by John VI. but left unfinished, derives its name from the chapel of N. S. de Ajuda ("Our Lady of Aid"). It contains some fine pictures and historical trophies. In the coach-house there is an unsurpassed collection of state coaches, the cars upon which figures of saints are borne in procession, sedan chairs, old cabriolets and other curious vehicles.

The Environs of Lisbon.—The administrative district of Lisbon has an area of 3065 sq. m., with a population of 709,509 in 1900. It comprises the lower parts of the Tagus and Sado; the sea-coast from 5 m. S. of Cape Carvoeiro to within 3 m. of the bluff called the Escarpa do Rojo; and a strip of territory extending inland for a mean distance of 30 m. This region corresponds with the southern part of Estremadura (*q.v.*). Its more important towns, Setubal, Cintra, Torres Vedras and Mafra, are described in separate articles. Sines, a small seaport on Cape Sines, was the birthplace of Vasco da Gama. On the left bank of the Tagus, opposite Lisbon, are the small towns of Almada, Barreiro, Aldeia Gallega and Seixal, and the hamlet of Trafaria, inhabited by fishermen. The beautiful strip of coast west of Oeiras and south of Cape Roca is often called the "Portuguese Riviera." Its fine climate, mineral springs and sea-bathing attract visitors at all seasons to the picturesque fortified bay of Cascaes, or to Estoril, Mont' Estoril and São João do Estoril, modern towns consisting chiefly of villas, hotels and gardens. The Boca do Inferno ("Mouth of Hell") is a cavity in the rocks at Cascaes resembling the Bufador at Peñiscola (*q.v.*). The villages of Carcavellos, Bucellas, Lumiar and Collares produce excellent wines; at Carcavellos is the receiving station for cables, with a large British staff, and a club and grounds where social and athletic meetings are held by the British colony. Alhandra, on the right bank of the Tagus, above Lisbon, was the birthplace of Albuquerque; fighting bulls for the Lisbon arena are bred in the adjacent pastures.

Railways, Shipping and Commerce.—Lisbon has five railway stations—the central (Lisboa-Rocío), for the lines to Cintra, northern and central Portugal, and Madrid via Valencia de Alcántara; the Santa Apolonia or Caes dos Soldados, at the eastern extremity of the quays, for the same lines (excluding Cintra) and for southern Portugal and Andalusia; the Caes do Sodré and Santos, farther west along the quays, for Cascaes; and the Barreiro, on the left bank of the Tagus, for southern Portugal. In 1902 the railways north and south of the Tagus were connected near Lisbon by a bridge. In the previous year an extensive system of electric tramways replaced the old-fashioned cable cars and mule trams. Electric and hydraulic lifts are used where the streets are too steep for trams. Lisbon is lighted by both electricity and gas; it has an admirable telephone service, and is connected by the Carcavellos cable-station with Cornwall (England), Vigo in Galicia, Gibraltar, the Azores and Madeira.

Ships of the largest size can enter the Tagus, and the Barreiro inlet is navigable at low water by vessels drawing 16 ft. There are extensive quays along the right bank, with hydraulic cranes, two graving docks, a slipway, warehouses and lines of railway. The government and private docks are on the left bank. Loading and discharging are principally effected by means of lighters. The exports are wines, oil, fruit, tinned fish, salt, colonial produce, cork, pitwood, leather and wool. The imports include cotton and woollen goods, linen, ale and porter, butter, tea, hardware, tin plates, coal, iron, machinery, chemical manure, &c., from Great Britain; grain and petroleum from the United States; dried codfish from Norway and Newfoundland; silks, perfumery and fancy goods from France; hemp, flax, grain, petroleum and cloth from Russia; linen, machinery, hardware, sugar, &c., from Germany and Holland; iron, steel, timber, pitch and salt fish from the Baltic; cocoa, coffee, wax and rubber from the Portuguese colonies. Towards the close of the 19th century the tourist traffic from Great Britain and Germany attained considerable importance, and Lisbon has long been one of the principal ports of debarcation for passengers from Brazil and of embarcation for emigrants to South America. Shipbuilding, including the construction of vessels for the national navy, is a growing industry. The fisheries have always been important, and in no European fishmarket is the produce more varied. Sardines and tunny are cured and tinned for export. In addition to a fleet of about 600 sailing boats, the Tagus is the headquarters of a small fleet of steam trawlers. The industries of Lisbon include dyeing, distillation of spirits and manufactures of woollen, cotton, silk and linen fabrics, of pottery, soap, paper, chemicals, cement, corks, tobacco, preserved foods and biscuits.

Education and Charity.—Although the seat of the only university in Portugal was fixed at Coimbra in 1527, Lisbon is the educational centre of the Portuguese world, including Brazil.

Its chief learned societies are the Society of Medical Sciences, the Geographical Society, the Royal Academy of Sciences, the Academy of Fine Arts, the Royal Conservatory of Music and the Propaganda de Portugal. The museum of the Academy of Fine Arts contains the largest collection of pictures and statues by native and foreign artists in Portugal. The Geographical Society has gained an international reputation; it possesses a valuable library and museum. The National Library, founded in 1796, contains over 400,000 printed books, and upwards of 9000 MSS. There are also colonial, naval, artillery, natural history and commercial museums, meteorological and astronomical observatories, zoological gardens and an aquarium. Purely educational institutions include the medical, polytechnic, military and naval schools, commercial, agricultural and industrial institutes, a school of art, a central lyceum, a school for teachers, &c. The English college for British Roman Catholics dates from 1628. The Irish Dominicans have a seminary, and Portuguese ecclesiastical schools are numerous. There are hospitals for women, and for contagious diseases, almshouses, orphanages, a foundling hospital and a very large quarantine station on the south bank of the Tagus, founded in 1857 after an outbreak of yellow fever had devastated the city. Foremost among the theatres, circuses and other places of amusement is the royal opera-house of São Carlos, built in 1792–1793 on the model of the Scala at Milan.

Population.—The population of Lisbon, 187,404[1] in 1878, rose to 301,206 in 1890 and 356,009 in 1900. It includes a large foreign colony, composed chiefly of Spaniards, British, Germans, French, Brazilians and immigrants from the Portuguese colonies, among whom are many half-castes. The majority of the Spaniards are domestic servants and labourers from Galicia, whose industry and easily gained knowledge of the kindred Portuguese language enables them to earn a better livelihood here than in their own homes. The British, German and French communities control a large share of the foreign trade. The Brazilians and colonial immigrants are often merchants and landowners who come to the mother-country to spend their fortunes in a congenial social environment.

The street life of the city is full of interest. The bare-footed, ungainly fishwives, dressed in black and bearing flat trays of fish on their heads; the Galician water-carriers, with their casks; the bakers, bending beneath a hundredweight of bread slung in a huge basket from their shoulders; the countrymen, with their sombreros, sashes and hardwood quarter-staves, give colour and animation to their surroundings; while the bag-pipes played by peasants from the north, the whistles of the knife-grinders, and the distinctive calls of the vendors of fruit, lottery tickets, or oil and vinegar, contribute a babel of sound. For church festivals and holidays the country-folk come to town, the women riding on pillions behind the men, adorned in shawls, aprons and handkerchiefs of scarlet or other vivid hues, and wearing the strings of coins and ornaments of exquisite gold and silver filigree which represent their savings or dowries. The costumes and manners of all classes may be seen at their best in the great bull-ring of Campo Pequeno, a Mauresque building which holds many thousands of spectators. A Lisbon bull-fight is a really brilliant exhibition of athletic skill and horsemanship, in which amateurs often take part, and neither horses nor bulls are killed. There is a Tauromachic Club solely for amateurs.

History.—The name Lisbon is a modification of the ancient name *Olisipo*, also written *Ulyssippo* under the influence of a mythical story of a city founded by Odysseus (Ulysses) in Iberia, which, however, according to Strabo, was placed by ancient tradition rather in the mountains of Turdetania (the extreme south of Spain). Under the Romans Olisipo became a *municipium* with the epithet of *Felicitas Julia*, but was inferior in importance to the less ancient *Emerita Augusta* (Mérida). From 407 to 585 it was occupied by Alaric, and thenceforward by the Visigoths until 711, when it was taken by the Moors. Under the Moors the town bore in Arabic the name of *Al Oshbūna* or *Lashbūna*. It was the first point of Moslem Spain attacked by the Normans in 844. When Alphonso I. of Portugal took advantage of the decline and fall of the Almoravid dynasty to incorporate the provinces of Estremadura and Alemtejo in his new kingdom, Lisbon was the last city of Portugal to fall into his hands, and yielded only after a siege of several months (21st October 1147), in which he was aided by English and Flemish crusaders on their way to Syria. In 1184 the city was again attacked by the Moslems under the powerful caliph Abu Yakub, but the enterprise failed. In the reign of Ferdinand I., the greater part of the town was burned by the Castilian army under Henry II. (1373), and in 1384 the Castilians again besieged Lisbon, but without success. Lisbon became the seat of an archbishop in 1390, the seat of government in 1422. During the 16th century it gained much in wealth and splendour from the establishment of a Portuguese empire in India and Africa. From 1580 to 1640 Lisbon was a provincial town under Spanish rule, and it was from this port that the Spanish Armada sailed in 1588. In 1640 the town was captured by the duke of Braganza, and the independence of the kingdom restored.

For many centuries the city had suffered from earthquakes, and on the 1st of November 1755 the greater part of it was reduced almost in an instant to a heap of ruins. A tidal wave at the same time broke over the quays and wrecked the shipping in the Tagus; fire broke out to complete the work of destruction; between 30,000 and 40,000 persons lost their lives; and the value of the property destroyed was about £20,000,000. The shock was felt from Scotland to Asia Minor. Careful investigation by Daniel Sharpe, an English geologist, has delimited the area in and near Lisbon to which its full force was confined. Lisbon is built in a geological basin of Tertiary formation, the upper portion of which is loose sand and gravel destitute of organic remains, while below these are the so-called Almada beds of yellow sand, calcareous sandstone and blue clay rich in organic remains. The Tertiary deposits, which altogether cover an area of more than 2000 sq. m., are separated near Lisbon from rocks of the Secondary epoch by a great sheet of basalt. The uppermost of these Secondary rocks is the hippurite limestone. It was found that no building on the blue clay escaped destruction, none on any of the Tertiary deposits escaped serious injury, and all on the hippurite limestone and basalt were undamaged. The line at which the earthquake ceased to be destructive thus corresponded exactly with the boundary of the Tertiary deposits.

At the beginning of the 19th century the French invasion, followed by the removal of the court to Rio de Janeiro, the Peninsular War, the loss of Brazil and a period of revolution and dynastic trouble, resulted in the utter decadence of Lisbon, from which the city only recovered after 1850 (see PORTUGAL: *History*).

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LISBURN, a market town, and cathedral city of Co. Antrim, Ireland, situated in a beautiful and fertile district on the Lagan, and on the Great Northern railway, 8 m. S.S.W. of Belfast. Pop. (1901) 11,461. Christ Church (1622) which possesses a fine octagonal spire, is the cathedral church of the united Protestant dioceses of Down, Connor and Dromore, and contains a monument to Jeremy Taylor, who was bishop of the see. The public park was presented to the town by Sir Richard Wallace (d. 1890), and after his death the castle gardens were also given to the town. The staple manufacture is linen, especially damasks and muslins, originally introduced by Huguenots. There are also bleaching and dyeing works, and a considerable agricultural trade. The town is governed by an urban district council. The ruins of Castle Robin, 2 m. N. of the town, stand on a summit of the White Mountains, and the building dates from the time of Queen Elizabeth. At Drumbo, 3½ m. E. of Lisburn, is one of the finest examples of early fortification in Ireland, known as the Giant's Ring, with a cromlech in the centre. Here are also a round tower and the remains of a church ascribed to St Patrick.

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[1] This figure represents the population of a smaller area than that of modern Lisbon, for the civic boundaries were extended by a decree dated the 23rd of December 1886.

In the reign of James I., Lisburn, which was then known as Lisnegarvy (Gambler's Fort), was an inconsiderable village, but in 1627 it was granted by Charles I. to Viscount Conway, who erected the castle for his residence, and laid the foundation of the prosperity of the town by the introduction of English and Welsh settlers. In November 1641 the town was taken by the insurgents, who on the approach of superior numbers set fire to it. The troops of Cromwell gained a victory near the town in 1648, and the castle surrendered to them in 1650. The church was constituted a cathedral in 1662 by Charles II., from whom the town received the privilege of returning two members to parliament, but after the Union it returned only one and in 1885 ceased to be a parliamentary borough. Lisburn gives the titles of earl and viscount to the family of Vaughan.

LISIEUX, a town of north-western France, capital of an arrondissement in the department of Calvados, 30 m. E. of Caen by rail. Pop. (1906) 15,194. Lisieux is prettily situated in the valley of the Touques at its confluence with the Orbiquet. Towers of the 16th century, relics of the old fortifications, remain, and some of the streets, bordered throughout by houses of the 14th, 15th and 16th centuries, retain their medieval aspect. The church of St Peter, formerly a cathedral, is reputed to be the first Gothic church built in Normandy. Begun in the latter half of the 12th century it was completed in the 13th and 16th centuries. There is a lantern-tower over the crossing and two towers surmount the west façade, one only of which has a spire, added towards the end of the 16th century. In the interior there is a Lady-Chapel, restored in the 15th century by Bishop Pierre Cauchon, one of the judges of Joan of Arc. The church of St Jacques (late 15th century) contains beautiful glass of the Renaissance, some remarkable stalls and old frescoes, and a curious picture on wood, restored in 1681. The church of St Désir (18th century) once belonged to a Benedictine abbey. The old episcopal palace near the cathedral is now used as a court-house, museum, library and prison, and contains a beautiful hall called the salle dorée. Lisieux is the seat of a sub-prefect, and has tribunals of first instance and of commerce, a chamber of arts and manufactures, a board of trade arbitrators and a communal college. Its manufactures of woollens are important, and bleaching, wool and flax-spinning, tanning, brewing, timber-sawing, metal-founding, and the manufacture of machinery, hosiery and boots and shoes are carried on; there is trade in grain, cattle and cheese.

In the time of Caesar, Lisieux, under the name of *Noviomagus*, was the capital of the Lexovii. Though destroyed by the barbarians, by the 6th century it had become one of the most important towns of Neustria. Its bishopric, suppressed in 1802, dates from that period. In 877 it was pillaged by the Normans; and in 911 was included in the duchy of Normandy by the treaty of St Clair-sur-Epte. Civil authority was exercised by the bishop as count of the town. In 1136 Geoffrey Plantagenet laid siege to Lisieux, which had taken the side of Stephen of Blois. The town was not reduced till 1141, by which time both it and the neighbourhood had been brought to the direst extremities of famine. In 1152 the marriage of Henry II. of England to Eleanor of Guienne, which added so largely to his dominions, was celebrated in the cathedral. Thomas à Becket took refuge here, and some vestments used by him are shown in the hospital chapel. Taken by Philip Augustus and reunited to France in 1203, the town was a frequent subject of dispute between the contending parties during the Hundred Years' War, the religious wars, and those of the League.

LISKEARD, a market town and municipal borough in the Bodmin parliamentary division of Cornwall, England, 15 m. W.N.W. of Plymouth, on the Great Western and the Liskeard and Looe railways. Pop. (1901) 4010. It lies high, above two small valleys opening to that of the Looe river, in a hilly, picturesque district. The Perpendicular church of St Martin, with a tower of earlier date, having a Norman arch, is one of the largest ecclesiastical buildings in the county. The site of a castle built by Richard, brother of Henry III. and earl of Cornwall, is occupied by public gardens. At the grammar school, which formerly occupied a building in those gardens, Dr John Wolcot, otherwise known as Peter Pindar, was educated. Liskeard was formerly an important mining centre. Its manufactures include leather and woollen goods, and there are iron foundries. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 2704 acres.

Liskeard (Liscarret) was at the time of the Domesday Survey an important manor with a mill rendering 12d. yearly and a market rendering 4s. By the Conqueror it had been given to the count of Mortain by whom it was held in demesne. Ever since that time it has passed with the earldom or duchy of Cornwall. The fertility of its soil and the river Looe probably led to early settlement at Liskeard. Richard, king of the Romans, recognized its natural advantages and built the manor house or castle and resided there occasionally. In 1240 he constituted Liskeard a free borough and its burgesses freemen with all the liberties enjoyed by the burgesses of Launceston and Helston. In 1266 he granted fairs at the Feasts of the Assumption and St Matthew. His son Edmund earl of Cornwall in 1275 granted to the burgesses for a yearly rent of £18 (sold by William III. to Lord Somers) the borough in fee farm with its mills, tolls, fines and pleas, pleas of the crown excepted. Liskeard was made a coinage town for tin in 1304. Edward the Black Prince secured to the burgesses in 1355 immunity from pleas outside their franchise for trespass done within the borough. Queen Elizabeth granted a charter of incorporation in 1580 under which there were to be a mayor, recorder and eight councillors. This charter was surrendered to Charles II. in 1680 and a new one granted by his brother under which the corporation became a self-elected body. From 1295 to 1832 Liskeard sent two members to the House of Commons. The parliamentary franchise, at first exercised by the burgesses, was vested by James' charter in the corporation and freemen. By determining to admit no new freemen the voters became reduced to between 30 and 60. Sir Edward Coke was returned for this borough in 1620, and Edward Gibbon the historian in 1774. In 1832 Liskeard was deprived of one of its members and in 1885 it became merged in the county.

Besides the fairs already mentioned a third was added by Elizabeth's charter to be held on Ascension Day. These are still among the most considerable cattle fairs in the county. The same charter ratified a market on Mondays and provided for another on Saturdays. The latter is now held weekly, the former twice a month. The flour mill at Lamellion mentioned in the charter of 1275, and probably identical with the mill of the Domesday Survey, is still driven by water.

LISLE, ALICE (*c.* 1614–1685), commonly known as Lady Alice Lisle, was born about 1614. Her father, Sir White Beckenshaw, was descended from an old Hampshire family; her husband, John Lisle (d. 1664), had been one of the judges at the trial of Charles I., and was subsequently a member of Cromwell's House of Lords—hence his wife's courtesy title. Lady Lisle seems to have leaned to Royalism, but with this attitude she combined a decided sympathy with religious dissent. On the 20th of July 1685, a fortnight after the battle of Sedgemoor, the old lady consented to shelter John Hickes, a well-known Nonconformist minister, at her residence, Moyles Court, near Ringwood. Hickes, who was a fugitive from Monmouth's army, brought with him Richard Nelthorpe, also a partizan of Monmouth, and under sentence of outlawry. The two men passed the night at Moyles Court, and on the following morning were arrested, and their hostess, who had denied their presence in the house, was charged with harbouring traitors. Her case was tried by Judge Jeffreys at the opening of the "Bloody Assizes" at Winchester. She pleaded that she had no knowledge that Hickes's offence was anything more serious than illegal preaching, that she had known nothing previously of Nelthorpe (whose name was not included in the indictment, but was, nevertheless, mentioned to strengthen the case for the Crown), and that she had no sympathy with the rebellion. The jury reluctantly found her guilty, and, the law recognizing no distinction between principals and accessories in treason, she was sentenced to be burned. Jeffreys ordered that the sentence should be carried out that same afternoon, but a few days' respite was subsequently granted, and James II. allowed beheading to be substituted for burning. Lady Lisle was executed in Winchester market-place on the 2nd of September 1685. By many writers her death has been termed a judicial murder, and one of the first acts of parliament of William and Mary reversed the attainder on the ground that the prosecution was irregular and the verdict injuriously extorted by "the menaces and violences and other illegal practices" of Jeffreys. It is, however, extremely doubtful whether Jeffreys, for all his gross brutality, exceeded the strict letter of the existing law.

See Howell, *State Trials*; H. B. Irving, *Life of Judge Jeffreys*; Stephen, *History of the Criminal Law of England.*

LISMORE, an island in the entrance to Loch Linnhe, Argyllshire, Scotland, 5 m. N.W. of Oban. Pop. (1901) 500. It lies S.W. and N.E., is 9½ m. long and 1¾ m. broad, and has an area of 9600 acres. It divides the lower end of the loch into two channels, the Lynn of Morvern on the W. and the Lynn of Lorne on the E. The name is derived from the Gaelic *lios mòr*, "great garden." Several ruined castles stand on the coast, and the highest point of the island is 500 ft. above the sea. The inhabitants raise potatoes, oats, cattle and horses, and these, with dairy produce, form the bulk of the trade. Steamers call at Auchnacrosan. A Columban monastery was founded in Lismore by St Moluag about 592. About 1200 the see of Argyll was separated from Dunkeld by Bishop John, "the Englishman," and Lismore soon afterwards became the seat of the bishop of Argyll, sometimes called "Episcopus Lismoriensis," quite distinct from the bishop of the Isles (Sudreys and Isle of Man), called "Episcopus Sodoriensis" or "Insularum," whose see was divided in the 14th century into the English bishopric of Sodor and Man and the Scottish bishopric of the Isles. The Rev. John Macaulay (d. 1789), grandfather of Lord Macaulay, the historian, and the Rev. Donald M'Nicol (1735–1802), who took up the defence of the Highlands against Dr Johnson, were ministers of Lismore.

For the *Book of the Dean of Lismore* see CELT: *Scottish Gaelic Literature.*

LISMORE, a town of Rous county, New South Wales, Australia, 320 m. direct N. by E. of Sydney. Pop. (1901) 4378. It is the principal town of the north coast district, and the seat of a Roman Catholic bishop. The surrounding country is partly pastoral, and partly agricultural, the soil being very fertile. The town has a cathedral, school of art, and other public buildings, while its industrial establishments include saw-mills, sugar-mills, butter factories and an iron foundry. Standing at the head of navigation of the Richmond river, Lismore has a large export trade in dairy produce, poultry, pigs, and pine and cedar timber.

LISMORE, a market town and seat of a diocese in Co. Waterford, Ireland, 43 m. W.S.W. of Waterford by the Waterford and Mallow branch of the Great Southern & Western Railway. Pop. (1901) 1583. It is beautifully situated on a steep eminence rising abruptly from the Blackwater. At the verge of the rock on the western side is the old baronial castle, erected by King John in 1185, which was the residence of the bishops till the 14th century. It was besieged in 1641 and 1643, and in 1645 it was partly destroyed by fire. The present fabric is largely modern; while the portico was designed by Inigo Jones. To the east, on the summit of the height, is the cathedral of St Carthagh, of various dates. There are portions probably of the 12th and 13th centuries, but the bulk of the building is of the 17th century, and considerable additions, including the tower and spire, were made in the 19th. There are a grammar school, a free school and a number of charities. Some trade is carried on by means of the river, and the town is the centre of a salmon fishery district.

The original name of Lismore was Maghsciath. A monastery founded here by St Carthagh in 633 became so celebrated as a seat of learning that it is said no fewer than twenty churches were erected in its vicinity. The bishopric, which is said to have originated with this foundation, was united to that of Waterford in 1363. In the 9th and beginning of the 10th centuries the town was repeatedly plundered by the Danes, and in 978 the town and abbey were burned by the men of Ossory. Henry II., after landing at Waterford, received in Lismore castle the allegiance of the archbishops and bishops of Ireland. In 1518 the manor was granted to Sir Walter Raleigh, from whom it passed to Sir Richard Boyle, afterwards earl of Cork. From the earls of Cork it descended by marriage to the dukes of Devonshire. It was incorporated as a municipal borough in the time of Charles I., when it also received the privilege of returning members to parliament, but at the Union in 1800 it was disfranchised and also ceased to exercise its municipal functions.

LISSA (Serbo-Croation *Vis*; Lat. *Issa*), an island in the Adriatic sea, forming part of Dalmatia, Austria. Lissa lies 31 m. S. by W. of Spalato, and is the outermost island of the Dalmatian Archipelago. Its greatest length is 10½ m.; its greatest breadth 4½ m. In shape it is a long, roughly drawn parallelogram, surrounded by a wall of rock, which incloses the fertile central plain, and is broken, on the north, west and east by natural harbours. Its culminating point is Mount Hum (1942 ft.), on the south-west. The island, which belongs to the administrative district of Lesina, is divided between two communes, named after the chief towns, Lissa (*Vis*), on the north, and Comisa (*Komiža*), on the west. Lissa, the capital, has a strongly fortified harbour. It contains the palace of the old Venetian counts Gariboldi, the former residence of the English governor, the monastery of the Minorites and at a little distance to the west the ruins of the ancient city of Issa. The islanders gain their livelihood by viticulture, for which Issa was once famous, by sardine fishing and by the distillation of rosemary oil. Pop. (1900) 9918, of whom 5261 belonged to the town and commune of Lissa, and 4657 to Comisa.

Issa is said to have been settled by people from Lesbos, the Issa of the Aegean. The Parians, assisted by Dionysius the Elder of Syracuse, introduced a colony in the 4th century B.C. During the First Punic War (265–241 B.C.) the Issaeans with their beaked ships helped the Roman Duilius; and the great republic, having defended their island against the attacks of Agron of Illyria and his queen Teuta, again found them serviceable allies in the war with Philip of Macedon (*c.* 215–211). As early as 996 the Venetians ruled the island, and, though they retired for a time before the Ragusans, their power was effectually established in 1278. Velo Selo, then the chief settlement, was destroyed by Ferdinand of Naples in 1483 and by the Turks in 1571. The present city arose shortly afterwards. During the Napoleonic wars, the French held Lissa until 1811, and during this period the island prospered greatly, its population increasing from 4000 to 12,000 between 1808 and 1811. In the latter year the French squadron was defeated by the British (see below); though in the same year a French fleet, flying British colours, entered Lissa, and only retired after burning 64 merchantmen. Thenceforward the island gained a valuable trade in British goods, which, being excluded from every port under French control, were smuggled into Dalmatia. In 1812 the British established an administrative system, under native officials, in Lissa and the adjoining islands of Curzola and Lagosta. All three were ceded to Austria in 1815.

Battles of Lissa.—Two naval actions have been fought in modern times near this island. The first took place on the 13th of March 1811, and was fought between a Franco-Venetian squadron, under the command of an officer named Dubourdieu (of whom little or nothing else is known), and Captain (afterwards Sir) William Hoste with a small British force. The Franco-Venetian squadron (Venice was then part of the dominions of the emperor Napoleon) consisted of six frigates, of which four were of forty guns, and of five corvettes or small craft. The British squadron was composed of three frigates, the "Amphion," 32 (Captain William Hoste), the "Cerberus" (Captain Henry Whitby) and the "Active," 38 (Captain James A. Gordon). With them was the "Volage," 22 (Captain Phipps Hornby). The action has a peculiar interest because the French captain imitated the method of attack employed by Nelson at Trafalgar. He came down from windward in two lines parallel to one another, and at an angle to the British squadron. Captain Hoste was not compelled to lie still as the allies did at Trafalgar. He stood on, and as the two French lines had to overtake him as he slipped away at an angle to their course, one of them got in the way of the other. Captain Hoste materially forwarded the success of his manœuvre by leading the foremost French ship, the "Favorite," 40, on to a reef, which was known to himself, but not to the enemy. Both squadrons then turned, and the Franco-Venetians falling into great confusion were defeated in spite of the gallant fighting of the individual ships. Two prizes were taken and Dubourdieu was killed.

The second naval battle of Lissa was fought between the Austrian and Italian navies on the 20th of July 1866. The island, then in possession of the Austrians, was attacked by an Italian squadron from Ancona of 12 ironclads and 22 wooden vessels. One of the ironclads was damaged in a bombardment of the forts, and two were detached on other service, when an Austrian squadron of 7 ironclads, one unarmoured warship the "Kaiser" and a number of small craft which had left Fasano under the command of Admiral Tegethoff came to interrupt their operations. The Italian admiral Persano arranged his ships in a single long line ahead, which allowing for the necessary space between them meant that the Italian formation stretched for more than 2 m. Just before the action began Admiral Persano shifted his flag from the "Ré d'Italia," the fourth ship in order from the van, to the ram "Affondatore," the fifth. This made it necessary for the "Affondatore" and the ships astern to shorten speed, and, as the leading vessels stood on, a gap was created in the Italian line. Admiral Tegethoff, who was on the port bow of the Italians, attacked with his squadron in three divisions formed in obtuse angles. The Italians opened a very rapid and ill-directed fire at a distance of 1000 yds. The Austrians did not reply till they were at a distance of 300 yds. Under Tegethoff's vigorous leadership, and aided by the disorder in the Italian line, the Austrians brought on a brief, but to the Italians destructive, mêlée. They broke through an interval between the third and fourth Italian ships. The unarmed Austrian ships headed to attack the unarmed Italians in the rear. At this point an incident occurred to which an exaggerated importance was given. The Italian ironclad "Ré di Portogallo" of 5600 tons, in the rear of the line, stood out to cover the unarmoured squadron by ramming the Austrians. She was herself rammed by the wooden "Kaiser" (5000 tons), but received little injury, while the Austrian was much injured. The "Kaiser" and the wooden vessels then made for the protection of fort San Giorgio on Lissa unpursued. In the centre, where the action was hottest, the Austrian flagship "Ferdinand Max" of 5200 tons rammed and sank the "Ré d'Italia." The Italian "Palestro" of 2000 tons was fired by a shell and blew up. By midday the Italians were in retreat, and Tegethoff anchored at San Giorgio. His squadron had suffered very little from the wild fire of the Italians. The battle of the 20th July was the first fought at sea by modern ironclad steam fleets, and therefore attracted a great deal of attention. The sinking of the "Ré d'Italia" and the ramming of the "Portogallo" by the "Kaiser" gave an immense impulse to the then popular theory that the ram would be a leading, if not the principal, weapon in modern sea warfare. This calculation has not been borne out by more recent experience, and indeed was not justified by the battle itself, in which the attempts to ram were many and the successes very few. The "Ré d'Italia" was struck only because she was suddenly and most injudiciously backed, so that she had no way on when charged by the "Ferdinand Max."

For the first battle of Lissa see James's *Naval History*, vol. v. (1837). A clear account of the second battle will be found in Sir S. Eardley-Wilmot's *Development of Navies* (London, 1892); see also H. W. Wilson's *Ironclads in Action* (London, 1896). (D. H.)

LISSA (Polish *Lézno*), a town in the Prussian province of Posen, 25 m. N.E. from Glogau by rail and at the junction of lines to Breslau, Posen and Landsberg. Pop. (1905) 16,021. The chief buildings are the handsome palace, the medieval town-hall, the four churches and the synagogue. Its manufactures consist chiefly of shoes, machinery, liqueurs and tobacco; it also possesses a large steam flour-mill, and carries on a brisk trade in grain and cattle.

Lissa owes its rise to a number of Moravian Brothers who were banished from Bohemia by the emperor Ferdinand I. in the 16th century and found a refuge in a village on the estate of the Polish family of Leszczynski. Their settlement received municipal rights in 1561. During the Thirty Years' War the population was reinforced by other refugees, and Lissa became an important commercial town and the chief seat of the Moravian Brothers in Poland. Johann Amos Comenius was long rector of the celebrated Moravian school here. In 1656 and 1707 Lissa was burned down.

See Voigt, *Aus Lissas erster Blütezeit* (Lissa, 1905), and Sanden, *Geschichte der Lissaer Schule* (Lissa, 1905).

LIST, FRIEDRICH (1789–1846), German economist, was born at Reutlingen, Württemberg, on the 6th of August 1789. Unwilling to follow the occupation of his father, who was a prosperous tanner, he became a clerk in the public service, and by 1816 had risen to the post of ministerial under-secretary. In 1817 he was appointed professor of administration and politics at the university of Tübingen, but the fall of the ministry in 1819 compelled him to resign. As a deputy to the Württemberg chamber, he was active in advocating administrative reforms. He was eventually expelled from the chamber and in April 1822 sentenced to ten months' imprisonment with hard labour in the fortress of Asperg. He escaped to Alsace, and after visiting France and England returned in 1824 to finish his sentence, and was released on undertaking to emigrate to America. There he resided from 1825 to 1832, first engaging in farming and afterwards in journalism. It was in America that he gathered from a study of Alexander Hamilton's work the inspiration which made him an economist of his pronounced "National" views. The discovery of coal on some land which he had acquired made him financially independent, and he became United States consul at Leipzig in 1832. He strongly advocated the extension of the railway system in Germany, and the establishment of the *Zollverein* was due largely to his enthusiasm and ardour. His latter days were darkened by many misfortunes; he lost much of his American property in a financial crisis, ill-health also overtook him, and he brought his life to an end by his own hand on the 30th of November 1846.

List holds historically one of the highest places in economic thought as applied to practical objects. His principal work is entitled *Das Nationale System der Politischen Ökonomie* (1841). Though his practical conclusions were different from those of Adam Müller (1779–1829), he was largely influenced not only by Hamilton but also by the general mode of thinking of that writer, and by his strictures on the doctrine of Adam Smith. It was particularly against the cosmopolitan principle in the modern economical system that he protested, and against the absolute doctrine of free trade, which was in harmony with that principle. He gave prominence to the national idea, and insisted on the special requirements of each nation according to its circumstances and especially to the degree of its development.

He refused to Smith's system the title of the industrial, which he thought more appropriate to the mercantile system, and designated the former as "the exchange-value system." He denied the parallelism asserted by Smith between the economic conduct proper to an individual and to a nation, and held that the immediate private interest of the separate members of the community would not lead to the highest good of the whole. That the nation was an existence, standing between the individual and humanity, and formed into a unity by its language, manners, historical development, culture and constitution. That this unity must be the first condition of the security, wellbeing, progress and civilization of the individual; and private economic interests, like all others, must be subordinated to the maintenance, completion and strengthening of the nationality. The nation having a continuous life, its true wealth must consist—and this is List's fundamental doctrine—not in the quantity of exchange-values which it possesses, but in the full and many-sided development of its productive powers. Its economic education should be more important than the immediate production of values, and it might be right that one generation should sacrifice its gain and enjoyment to secure the strength and skill of the future. In the sound and normal condition of a nation which has attained economic maturity, the three productive powers of agriculture, manufactures and commerce should be alike developed. But the two latter factors are superior in importance, as exercising a more effective and fruitful influence on the whole culture of the nation, as well as on its independence. Navigation, railways, all higher technical arts, connect themselves specially with these factors; whilst in a purely agricultural state there is a tendency to stagnation. But for the growth of the higher forms of industry all countries are not adapted—only those of the temperate zones, whilst the torrid regions have a natural monopoly in the production of certain raw materials; and thus between these two groups of countries a division of labour and confederation of powers spontaneously takes place.

List then goes on to explain his theory of the stages of economic development through which the nations of the temperate zone, which are furnished with all the necessary conditions, naturally pass, in advancing to their normal economic state. These are (1) pastoral life, (2) agriculture, (3) agriculture united with manufactures; whilst in the final stage agriculture, manufactures and commerce are combined. The economic task of the state is to bring into existence through legislative and administrative action the conditions required for the progress of the nation through these stages. Out of this view arises List's scheme of industrial politics. Every nation, according to him, should begin with free trade, stimulating and improving its agriculture by intercourse with richer and more cultivated nations, importing foreign manufactures and exporting raw products. When it is economically so far advanced that it can manufacture for itself, then a system of protection should be employed to allow the home industries to develop themselves fully, and save them from being overpowered in their earlier efforts by the competition of more matured foreign industries in the home market. When the national industries have grown strong enough no longer to dread this competition, then the highest stage of progress has been reached; free trade should again become the rule, and the nation be thus thoroughly incorporated with the universal industrial union. What a nation loses for a time in exchange values during the protective period she much more than gains in the long run in productive power—the temporary expenditure being strictly analogous, when we place ourselves at the point of view of the life of the nation, to the cost of the industrial education of the individual. The practical conclusion which List drew for Germany was that she needed for her economic progress an extended and conveniently bounded territory reaching to the sea-coast both on north and south, and a vigorous expansion of manufactures and commerce, and that the way to the latter lay through judicious protective legislation with a customs union comprising all German lands, and a German marine with a Navigation Act. The national German spirit, striving after independence and power through union, and the national industry, awaking from its lethargy and eager to recover lost ground, were favourable to the success of List's book, and it produced a great sensation. He ably represented the tendencies and demands of his time in his own country; his work had the effect of fixing the attention, not merely of the speculative and official classes, but of practical men generally, on questions of political economy; and his ideas were undoubtedly the economic foundation of modern Germany, as applied by the practical genius of Bismarck.

See biographies of List by Goldschmidt (Berlin, 1878) and Jentsch (Berlin, 1901), also *Fr. List, ein Vorläufer und ein Opfer für das Vaterland* (Anon., 2 vols., Stuttgart, 1877); M. E. Hirst's *Life of Friedrich List* (London, 1909) contains a bibliography and a reprint of List's *Outlines of American Political Economy* (1827).

LIST (O.E. *liste*, a Teutonic word, cf. Dut. *lijst*, Ger. *Leiste*, adapted in Ital. *lista* and Fr. *liste*), properly a border or edging. The word was thus formerly used of a geographical boundary or frontier and of the lobe of the ear. In current usage "list" is the term applied to the "selvage" of a piece of cloth, the edging, *i.e.* of a web left in an unfinished state or of different material from the rest of the fabric, to be torn or cut off when it is made up, or used for forming a seam. A similar edging prevents unravelling. The material, cut off and collected, is known as "list," and is used as a soft cheap material for making slippers, padding cushions, &c. Until the employment of rubber, list was used to stuff the cushions of billiard tables. The same word probably appears, in a plural form "lists," applied to the barriers or palisades enclosing a space of ground set apart for tilting (see TOURNAMENT). It is thus used of any place of contest, and the phrase "to enter the lists" is frequently used in the sense of "to challenge." The word in this application was taken directly from the O. Fr. *lisse*, modern *lice*, in Med. Lat. *liciae*. This word is usually taken to be a Romanic adaptation of the Teutonic word. In medieval fortifications the *lices* were the palisades forming an outwork in front of the main walls of a castle or other fortified place, and the word was also used of the space enclosed between the palisades and the enceinte; this was used for exercising troops, &c. From a transference of "list," meaning edge or border, to a "strip" of paper, parchment, &c., containing a "list" of names, numbers, &c., comes the use of the word for an enumeration of a series of names of persons or things arranged in order for some specific purpose. It is the most general word for such an enumeration, other words, such as "register," "schedule," "inventory," "catalogue," having usually some particular connotation. The chief early use of list in this meaning was of the roll containing the names of soldiers; hence to "list a soldier" meant to enter a recruit's name for service, in modern usage "to enlist" him. There are numerous particular applications of "list," as in "civil list" (*q.v.*), "active or retired list" in the navy or army. The term "free list" is used of an enumeration of such commodities as may at a particular time be exempt from the revenue laws imposing an import duty.

The verb "to list," most commonly found in the imperative, meaning "hark!" is another form of "listen," and is to be referred, as to its ultimate origin, to an Indo-European root *klu-*, seen in Gr. κλύειν, to hear, κλέος, glory, renown, and in the English "loud." The same root is seen in Welsh *clûst* and Irish *clûas*, ear. Another word "list," meaning pleasure, delight, or, as a verb, meaning "to please, choose," is chiefly found in such phrases as "the wind bloweth where it listeth." This is from the O.E. *lystan*, cf. Dut. *lusten*, *Ger. lüsten*, to take pleasure in, and is also found in the English doublet "lust," now always used in the sense of an evil or more particularly sexual desire. It is probably an application of this word, in the sense of "inclination," that has given rise to the nautical term "list," for the turning over of a ship on to its side.

LISTA Y ARAGON, ALBERTO (1775–1848), Spanish poet and educationalist, was born at Seville on the 15th of October 1775. He began teaching at the age of fifteen, and when little over twenty was made professor of elocution and poetry at Seville university. In 1813 he was exiled, on political grounds, but pardoned in 1817. He then returned to Spain and, after teaching for three years at Bilbao, started a critical review at Madrid. Shortly afterwards he founded the celebrated college of San Mateo in that city. The liberal character of the San Mateo educational system was not favoured by the government, and in 1823 the college was closed. Lista after some time spent in Bayonne, Paris and London was recalled to Spain in 1833 to edit the official *Madrid Gazette*. He was one of the founders of the Ateneo, the free university of Madrid, and up till 1840 was director of a college at Cadiz. All the leading spirits of the young generation of Spaniards, statesmen, writers, soldiers and diplomatists came under his influence. He died at Seville on the 5th of October 1848.

LISTER, JOSEPH LISTER, 1st BARON (1827–), English surgeon, was born at Upton, in Essex, on the 5th of April 1827. His father, Joseph Jackson Lister, F.R.S., was eminent in science, especially in optical science, his chief claim to remembrance being that by certain improvements in lenses he raised the compound microscope from the position of a scientific toy, "distorting as much as it magnified," to its present place as a powerful engine of research. Other members of Lord Lister's family were eminent in natural science. In his boyhood Joseph Lister was educated at Quaker schools; first at Hitchin in Hertfordshire, and afterwards at Tottenham, near London. In 1844 he entered University College, London, as a student in arts, and took his B.A. degree at the University of London in 1847. He continued at University College as a medical student, and became M.B. and F.R.C.S. in 1852. The keen young student was not long in bringing his faculties to bear upon pathology and the practice of medicine. While house-surgeon at University College Hospital, he had charge of certain cases during an outbreak of hospital gangrene, and carefully observed the phenomena of the disease and the effects of treatment upon it. He was thus early led to suspect the parasitic nature of the disorder, and searched with the microscope the material of the spreading sore, in the hope of discovering in it some invading fungus; he soon convinced himself of the cardinal truth that its causes were purely local. He also minutely investigated cases of pyaemia, another terrible scourge of hospitals at that time, and made *camera lucida* sketches of the appearances revealed by the microscope.

To realize Lister's work it is necessary to remember the condition of surgical practice at that date. About the middle of the 19th century the introduction of anaesthetics had relieved the patient of much of the horror of the knife, and the surgeon of the duty of speed in his work. The agony of the sufferer had naturally and rightly compelled the public to demand rapid if not slap-dash surgery, and the surgeon to pride himself on it. Within decent limits of precision, the quickest craftsman was the best. With anaesthetics this state of things at any rate was changed. The pain of the operation itself no longer counted, and the surgeon was enabled not only to be as cautious and sedulous as dexterous, but also to venture upon long, profound and intricate operations which before had been out of the question. Yet unhappily this new enfranchisement seemed to be but an ironical liberty of Nature, who with the other hand took away what she had given. Direct healing of surgical wounds (" by first intention "), far from being the rule, was a piece of luck too rare to enter into the calculations of the operator; while of the graver surgical undertakings, however successful mechanically, the mortality by sepsis was ghastly. Suppuration, phagedaena and septic poisonings of the system carried away even the most promising patients and followed even trifling operations. Often, too, these diseases rose to the height of epidemic pestilences, so that patients, however extreme their need, dreaded the very name of hospital, and the most skilful surgeons distrusted their own craft. New hospitals or new wards were built, yet after a very short time the new became as pestiferous as the old; and even scrupulous care in ventilation and housemaids' cleanliness failed to prevent the devastation. Surgery had enlarged its freedom, but only to find the weight of its new responsibilities more than it could bear.

When Lister was appointed to the chair of surgery in Glasgow the infirmary of that city was a hotbed of septic disease; so much so that his hospital visits evidently distressed him greatly. Windows were widely opened, piles of clean towels were supplied, but still the pestilence stalked through the wards. The building stands to-day as it stood then, with no substantial alteration; but by the genius of Lister its surgical wards are now as free from septic accidents as the most modern hospital in the land. James Simpson, early in the 'sixties, pathetically denounced the awful mortality of operations in hospitals, and indeed uttered desperate protests against the hospital system itself; yet, not long afterwards, Lister came to prove that it was not in the hospital that the causes of that mortality lay hidden, but in the operator himself, his tools and his assistants. Happily this beneficent discovery was made in time to preserve the inestimable boon of the hospital system from the counsels of despair. When Lister took up the task speculation was on the wrong tack; the oxygen of the air was then supposed to be the chief cause of the dissolution of the tissues, and to prevent access of air was impossible. For instance, a simple fracture, as of a bone of the leg, would do perfectly well, while in the very next bed a compound fracture—one, that is, where the skin is lacerated, and access to the seat of injury opened out—would go disastrously wrong. If the limb were amputated, a large proportion of such cases of amputation succumbed to septic poisoning.

On graduation as bachelor of medicine, Lister went to Edinburgh, where he soon afterwards became house-surgeon to Mr Syme; and he was much impressed by the skill and judgment of this great surgeon, and also by the superiority of his method of dressing recent wounds with dry lint, as compared with the " water dressing " in use at University College. Yet under these more favourable conditions the amelioration was only one of degree; in most wounds indeed " union by first intention " was rendered impossible by the presence of the silk ligatures employed for arresting bleeding, for these could come away only by a process of suppuration. On the expiry of his house-surgeoncy in Edinburgh, Lister started in that city an extra-academical course of lectures on surgery; and in preparation for these he entered on a series of investigations into inflammation and allied subjects. These researches, which were detailed fully in three papers in *Phil. Trans.* (1859), and in his Croonian lecture to the Royal Society in 1863, testified to an earnestness of purpose, a persevering accuracy of observation and experiment and an insight of scientific conception which show that if Lister had never developed the aseptic method of surgery, he would have taken a very high place in pathology. In his speech in Paris at the Thirteenth International Congress of Medicine in 1900, Lord Lister said that he had done no more than seize upon Pasteur's discoveries and apply them to surgery. But though Lister saw the vast importance of the discoveries of Pasteur, he saw it because he was watching on the heights; and he was watching there alone. From Pasteur Lister derived no doubt two fruitful ideas: first, that decomposition in organic substances is due to living " germs "; and, secondly, that these lowly and minute forms of vegetable life spring always, like higher organisms, from parents like themselves, and cannot arise *de novo* in the animal body. After his appointment to the Glasgow chair in 1860, Lister had continued his researches on inflammation; and he had long been led to suspect that decomposition of the blood in the wound was the main cause of suppuration. The two great theories established by Pasteur seemed to Lister to open out the possibility of what had before appeared hopeless—namely, the prevention of putrefaction in the wound, and consequently the forestalling of suppuration. To exclude the oxygen of the air from wounds was impossible, but it might be practicable to protect them from microbes.

The first attempt to realize this idea was made upon compound fractures; and the means first employed was carbolic acid, the remarkable efficacy of which in deodorizing sewage made Lister regard it as a very powerful germicide. It was applied to the wound undiluted, so as to form with the blood a dense crust, the surface of which was painted daily with the acid till all danger had passed. The results, after a first failure, were in the highest degree satisfactory, so that, as Lister said in his presidential address to the British Association in Liverpool, he " had the joy of seeing these formidable injuries follow the same safe and tranquil course as simple fractures." The caustic property of undiluted carbolic acid, though insignificant in comparison with the far greater evils to be avoided in compound fracture, made it unsuited for general surgery. To make it applicable to the treatment of abscesses and incised wounds, it was necessary to mitigate its action by blending it with some inert body; and the endeavour to find the best medium for this purpose, such as to combine perfect antiseptic efficiency with the least possible irritation of the tissues, formed the subject of experiments continued for many years in the laboratory and in the ward. At one stage in these inquiries an attempt was made to provide an atmosphere free from living organisms by means of a fine spray of a watery solution of carbolic acid; for it was then supposed by Lister to be necessary not only to purify the surgeon's hands and instruments and the skin of the patient about the seat of operation, but also to wage war with the microbes which, as Pasteur had shown, people every cubic inch of the air of an inhabited room. Under the use of the spray better results were obtained than ever before, and this success encouraged its use. But researches carried on for several years into the relations of the blood to micro-organisms led Lister to doubt the harmfulness of the atmospheric dust. At the London Congress in 1881 he narrated experiments which proved that the serum of the blood is a very unfavourable soil for the development of the bacteria diffused through the air, and others which showed that the cells of an organizing blood-clot have a very remarkable power of disposing of microbes and of limiting their advance. Hence he considered it probable that in surgical operations the atmosphere might be disregarded altogether.[1] As long, however, as this was only a matter of probability, he did not dare to discard the spray. But at length, at the Berlin Congress in 1890, he was able to announce that the certainty he had so long desired had been arrived at. A careful consideration of the physical constitution of the spray had shown him that the microbes of the dust involved in its vortex could not possibly have their vitality destroyed or even impaired by it. Such being the case, the uniform success obtained when he had trusted the spray implicitly as an aseptic atmosphere, abandoning completely certain other precautions which he had before deemed essential, proved conclusively to his mind that the air might safely be left entirely out of consideration in operating.[1] Thus he learnt that not the spray only, but all antiseptic irrigations or washings of the wound also, with their attendant irritation of the cut surfaces, might be dispensed with—a great simplification, indirectly due to experiments with the spray. The spray had also served a very useful purpose by maintaining a pure condition of the *entourage* of the operation; not indeed in the way for which it was devised, but as a very mild form of irrigation. And Lister took care to emphasize the necessity for redoubled vigilance on the part of the surgeon and his assistants when this "unconscious caretaker," as he called it, had been discarded.

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[1] See *Trans. of the International Medical Congress* (1881), vol. ii. p. 373.

The announcement that he had given up the spray was absurdly interpreted in some quarters to mean that he had virtually abandoned his theory and his antiseptic methods. The truth is that the spray was only one of many devices tried for a while in the course of the long-continued endeavour to apply the antiseptic principle to the best advantage, and abandoned in favour of something better. Two main objects were always kept steadily in view by him—during the operation to guard the wound against septic microbes by such means as existing knowledge indicated, and afterwards to protect it against their introduction, avoiding at the same time all needless irritation of the tissues by the antiseptic. Upon the technical methods of attaining these ends this is not the place to enlarge; suffice it to say that the endowments and the industry of the discoverer, as seen in the rapidity and flexibility of mind with which he seized upon and selected the best means, were little less remarkable than the activity of the same faculties in his original ideas.

To illustrate this opinion, his work on the ligature may be taken. It had long been the universal practice of surgeons to employ threads of silk or flax for tying arteries, long ends being left to provide escape of the pus (invariably formed during the tedious process of the separation of the ligature) together with the portion of the arterial coats included in the knot. Lister hoped that if, by antiseptic means, the thread were deprived of living microbes, it would no longer cause suppuration, but might be left with short cut ends to become embedded permanently among the tissues of the wound, which thus would be allowed to heal by primary union throughout. A trial of this method upon the carotid artery of a horse having proved perfectly successful, he applied it in a case of aneurysm in the human subject; and here again the immediate results were all that could be desired. But a year later, the patient having died from other causes, the necropsy showed remnants of the silk thread incompletely absorbed, with appearances around them which seemed to indicate that they had been acting as causes of disturbance. Thus was suggested to him the idea of employing for the ligature some material susceptible of more speedy absorption; and the antiseptic treatment of contused wounds having shown that dead tissue, if protected from putrefaction, is removed by the surrounding structures without the intervention of suppuration, he resolved to try a thread of some such nature. Catgut, which is prepared from one of the constituents of the small intestine of the sheep, after steeping in a solution of carbolic acid, was used in a preliminary trial upon the carotid artery of a calf. The animal was killed a month later, when, on dissection, a very beautiful result was disclosed. The catgut, though removed, had not been simply absorbed; pari passu with its gradual removal, fibrous tissue of new formation had been laid down, so that in place of the dead catgut was seen a living ligature embracing the artery and incorporated with it. The wound meanwhile had healed without a trace of suppuration. This success appeared to justify the use of the catgut ligature in the human subject, and for a while the results were entirely satisfactory. But though this was the case with the old samples of catgut first employed, which, as Lister was afterwards led to believe, had been "seasoned" by long keeping, it was found that when catgut was used fresh as it comes from the makers, it was unsuited in various ways for surgical purposes. The attempt by special preparation to obtain an article in all respects trustworthy engaged his attention from time to time for years afterwards. To quote the words of Sir Hector Cameron, who was for several years assistant to Lord Lister, it required "labour and toilsome investigation and experiment of which few can have any adequate idea."

In 1869 Lister succeeded his father-in-law, Syme, in the chair of clinical surgery of Edinburgh. In 1877 he accepted an invitation to the chair of surgery at King's College, London, in the anticipation that here he would be more centrally placed for communication with the surgical world at home and abroad, and might thus exercise his beneficent mission to more immediate advantage. In 1896 Lister retired from practice, but not from scientific study. From 1895 to 1900 he was President of the Royal Society. In 1883 he was created a baronet, and in 1897 he was raised to the peerage as Baron Lister of Lyme Regis. Among the Coronation honours in 1902, he was nominated an original member of the new Order of Merit.

In England Lister's teaching was slow in making its way. The leading surgeons of Germany were among the first to seize upon the new idea with avidity and practical success; so early as 1875, in the course of a tour he made on the Continent, great festivals were held in his honour in Munich and Leipzig. The countrymen of Pasteur did not lag far behind; and it is no exaggeration to speak of Lister's appearances in foreign countries at this time as triumphal.

The relation of Semmelweiss to Lister is of historical importance. Lister's work on the antiseptic system began in 1864; his first publication on the subject was in March 1867. At this date, and for long afterwards, Semmelweiss was unknown, or ignored, not only by French and Germans, but also by his own Hungarian people; and this neglect broke his heart. The French Academy pronounced against his opinions, and so did the highest pathological authority in Germany. In England, till long after his death, probably his name was not so much as mentioned. In the early 'seventies Lister's method was in full operation in Hungary as elsewhere, yet none of the surgeons of Budapest ever mentioned Semmelweiss; not even when, in 1883, they gave a great banquet to Lister. It was after this occasion that Dr Duka, a Hungarian physician practising in London, wrote a biography of Semmelweiss, which he sent to Lister, and thus brought Semmelweiss before him for the first time. Thenceforth Lister generously regarded Semmelweiss as in some measure his forerunner; though Semmelweiss was not aware of the microbic origin of septic poisons, nor were his methods, magnificent as was their success in lying-in hospitals, suitable for surgical work.

In public Lord Lister's speeches were simple, clear and graceful, avoiding rhetorical display, earnest for the truth, jealous for his science and art, forgetful of himself. His writings, in like manner plain, lucid and forcible, scarcely betray the labour and thought of their production. With the courtesy and serenity of his carriage he combined a passionate humanity, so often characteristic of those who come of the Society of Friends, and a simple love of truth which showed itself in his generous encouragement of younger workers. (T. C. A.)

LISTER, MARTIN (*c.* 1638–1712), English naturalist and physician, was born at Radclive, near Buckingham. He was nephew of Sir Matthew Lister, physician to Anne, queen of James I., and to Charles I. He was educated at St John's College, Cambridge, 1655, graduated in 1658/9, and was elected a fellow in 1660. He became F.R.S. in 1671. He practised medicine at York until 1683, when he removed to London. In 1684 he received the degree of M.D. at Oxford, and in 1687 became F.R.C.P. He contributed numerous articles on natural history, medicine and antiquities to the *Philosophical*

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[1] See *Verhandlungen des X internationalen Congresses*, Bd. i. p. 33.

Transactions. His principal works were *Historiae animalium Angliae tres tractatus* (1678); *Historiae Conchyliorum* (1685–1692), and *Conchyliorum Bivalvium* (1696). As a conchologist he was held in high esteem, but while he recognized the similarity of fossil mollusca to living forms, he regarded them as inorganic imitations produced in the rocks. In 1683 he communicated to the Royal Society (*Phil. Trans.*, 1684), *An ingenious proposal for a new sort of maps of countries; together with tables of sands and clays, such as are chiefly found in the north parts of England.* In this essay he suggested the preparation of a soil or mineral map of the country, and thereby is justly credited with being the first to realize the importance of a geological survey. He died at Epsom on the 2nd of February 1712.

LISTON, JOHN (*c.* 1776–1846), English comedian, was born in London. He made his public *début* on the stage at Weymouth as Lord Duberley in *The Heir-at-law.* After several dismal failures in tragic parts, some of them in support of Mrs Siddons, he discovered accidentally that his *forte* was comedy, especially in the personation of old men and country boys, in which he displayed a fund of drollery and broad humour. An introduction to Charles Kemble led to his appearance at the Haymarket on the 10th of June 1805 as Sheepface in the *Village Lawyer*, and his association with this theatre continued with few interruptions until 1830. *Paul Pry*, the most famous of all his impersonations, was first presented on the 13th of September 1825, and soon became, thanks to his creative genius, a real personage. Liston remained on the stage till 1837; during his last years his mind failed, and he died on the 22nd of March 1846. He had married in 1807 Miss Tyrer (d. 1854), a singer and actress.

Several pictures of Liston in character are in the Garrick Club, London, and one as Paul Pry in the South Kensington Museum.

LISTON, ROBERT (1794–1847), Scottish surgeon, was born on the 28th of October 1794 at Ecclesmachan, Linlithgow, where his father was parish minister. He began the study of anatomy under Dr John Barclay (1758–1826) at Edinburgh in 1810, and soon became a skilful anatomist. After eight years' study, he became a lecturer on anatomy and surgery in the Edinburgh School of Medicine; and in 1827 he was elected one of the surgeons to the Royal Infirmary. In 1835 he was chosen professor of clinical surgery in University College, London, and this appointment he held until his death, which occurred in London on the 7th of December 1847. Liston was a teacher more by what he did than by what he said. He taught simplicity in all operative procedures; fertile in expedients, of great nerve and of powerful frame, he is remembered as an extraordinarily bold, skilful and rapid operator. He was the author of *The Elements of Surgery* (1831–1832) and *Practical Surgery* (1837), and made several improvements in methods of amputation, and in the dressing of wounds.

LISZT, FRANZ (1811–1886), Hungarian pianist and composer, was born on the 22nd of October 1811, at Raiding, in Hungary. His appeal to musicians was made in a threefold capacity, and we have, therefore, to deal with Liszt the unrivalled pianoforte virtuoso (1830–1848); Liszt the conductor of the "music of the future" at Weimar, the teacher of Tausig, Bülow and a host of lesser pianists, the eloquent writer on music and musicians, the champion of Berlioz and Wagner (1848–1861); and Liszt the prolific composer, who for some five-and-thirty years continued to put forth pianoforte pieces, songs, symphonic orchestral pieces, cantatas, masses, psalms and oratorios (1847–1882). As virtuoso he held his own for the entire period during which he chose to appear in public; but the militant conductor and prophet of Wagner had a hard time of it, and the composer's place is still in dispute. Liszt's father, a clerk to the agent of the Esterhazy estates and an amateur musician of some attainment, was Hungarian by birth and ancestry, his mother an Austrian-German. The boy's gifts attracted the attention of certain Hungarian magnates, who furnished 600 gulden annually for some years to enable him to study music at Vienna and Paris. At Vienna he had lessons in pianoforte playing from Carl Czerny of "Velocity" fame, and from Salieri in harmony and analysis of scores. In his eleventh year he began to play in public there, and Beethoven came to his second concert in April 1823. During the three years following he played in Paris, the French provinces and Switzerland, and paid three visits to England. In Paris he had composition lessons from Paër, and a six months' course of lessons in counterpoint from Reicha. In the autumn of 1825 the handsome and fascinating *enfant gâté* of the salons and ateliers —"La Neuvième Merveille du monde"—had the luck to get an operetta (*Don Sancho*) performed three times at the Académie Royale. The score was accidentally destroyed by fire, but a set of studies *à la* Czerny and Cramer, belonging to 1826 and published at Marseilles as 12 Études, op. i., is extant, and shows remarkable precocity. After the death of his father in 1828 young Liszt led the life of a teacher of the pianoforte in Paris, got through a good deal of miscellaneous reading, and felt the influence of the religious, literary and political aspirations of the time. He attended the meetings of the Saint-Simonists, lent an ear to the romantic mysticism of Père Enfantin and later to the teaching of Abbé Lamennais. He also played Beethoven and Weber in public—a very courageous thing in those days. The appearance of the violinist Paganini in Paris, 1831, marks the starting-point of the supreme eminence Liszt ultimately attained as a virtuoso. Paganini's marvellous technique inspired him to practise as no pianist had ever practised before. He tried to find equivalents for Paganini's effects, transcribed his violin caprices for the piano, and perfected his own technique to an extraordinary degree. After Paganini he received a fresh impulse from the playing and the compositions of Chopin, who arrived in 1831, and yet another impulse of equal force from a performance of Berlioz's "Symphonie Fantastique, épisode de la vie d'un artiste," in 1832. Liszt transcribed this work, and its influence ultimately led him to the composition of his "Poèmes symphoniques" and other examples of orchestral programme-music.

From 1833 to 1848—when he gave up playing in public—he was greeted with frantic applause as the prince of pianists. Five years (1835–1840) were spent in Switzerland and Italy, in semi-retirement in the company of Madame la comtesse d'Agoult (George Sand's friend and would-be rival, known in literary circles as "Daniel Stern," by whom Liszt had three children, one of them afterwards Frau Cosima Wagner): these years were devoted to further study in playing and composition, and were interrupted only by occasional appearances at Geneva, Milan, Florence and Rome, and by annual visits to Paris, when a famous contest with Thalberg took place in 1837. The enthusiasm aroused by Liszt's playing and his personality—the two are inseparable—reached a climax at Vienna and Budapest in 1839–1840, when he received a patent of nobility from the emperor of Austria, and a sword of honour from the magnates of Hungary in the name of the nation. During the eight years following he was heard at all the principal centres—including London, Leipzig, Berlin, Copenhagen, St Petersburg, Moscow, Warsaw, Constantinople, Lisbon and Madrid. He gained much money, and gave large sums in charity. His munificence with regard to the Beethoven statue at Bonn made a great stir. The subscriptions having come in but sparsely, Liszt took the matter in hand, and the monument was completed at his expense, and unveiled at a musical festival conducted by Spohr and himself in 1845. In 1848 he settled at Weimar with Princess Sayn-Wittgenstein (d. 1887), and remained there till 1861. During this period he acted as conductor at court concerts and on special occasions at the theatre, gave lessons to a number of pianists, wrote articles of permanent value on certain works of Berlioz and the early operas of Wagner, and produced those orchestral and choral pieces upon which his reputation as a composer mainly depends. His ambition to found a school of composers as well as a school of pianists met with complete success on the one hand and partial failure on the other. His efforts on behalf of Wagner, who was then an exile in Switzerland, culminated in the first performance of *Lohengrin* on the 28th of August 1850, before a special audience assembled from far and near. Among the works produced for the first time or rehearsed with a view to the furtherance of musical art were

Wagner's *Tannhäuser*, *Der fliegende Holländer*, *Das Liebesmahl der Apostel*, and *Eine Faust Overtüre*, Berlioz's *Benvenuto Cellini*, the *Symphonie Fantastique*, *Harold en Italie*, *Roméo et Juliette*, *La Damnation de Faust*, and *L'Enfance du Christ*—the last two conducted by the composer—Schumann's *Genoveva*, *Paradise and the Peri*, the music to *Manfred* and to *Faust*, Weber's *Euryanthe*, Schubert's *Alfonso und Estrella*, Raff's *König Alfred*, Cornelius's *Der Barbier von Baghdad* and many more. It was Liszt's habit to recommend novelties to the public by explanatory articles or essays, which were written in French (some for the *Journal des débats* and the *Gazette musicale* of Paris) and translated for the journals of Weimar and Leipzig—thus his two masterpieces of sympathetic criticism, the essays *Lohengrin et Tannhäuser à Weimar* and *Harold en Italie*, found many readers and proved very effective. They are now included, together with articles on Schumann and Schubert, and the elaborate and rather high-flown essays on Chopin and *Des Bohémiens et de leur musique en Hongrie* (the latter certainly, and the former probably, written in collaboration with Madame de Wittgenstein), in his *Gesammelte Schriften* (6 vols., Leipzig). The compositions belonging to the period of his residence at Weimar comprise two pianoforte concertos, in E flat and in A, the "Todtentanz," the "Concerto pathétique" for two pianos, the solo sonata "An Robert Schumann," sundry "Études," fifteen "Rhapsodies Hongroises," twelve orchestral "Poèmes symphoniques," "Eine Faust Symphonie," and "Eine Symphonie zu Dante's 'Divina Commedia,'" the "13th Psalm" for tenor solo, chorus and orchestra, the choruses to Herder's dramatic scenes "Prometheus," and the "Missa solennis" known as the "Graner Fest Messe." Liszt retired to Rome in 1861, and joined the Franciscan order in 1865.[1] From 1869 onwards Abbé Liszt divided his time between Rome and Weimar, where during the summer months he received pupils—gratis as formerly—and, from 1876 up to his death at Bayreuth on the 31st of July 1886, he also taught for several months every year at the Hungarian Conservatoire of Budapest.

About Liszt's pianoforte technique in general it may be said that it derives its efficiency from the teaching of Czerny, who brought up his pupil on Mozart, a little Bach and Beethoven, a good deal of Clementi and Hummel, and a good deal of his (Czerny's) own work. Classicism in the shape of solid, respectable Hummel on the one hand, and Carl Czerny, a trifle flippant, perhaps, and inclined to appeal to the gallery, on the other, these gave the musical parentage of young Liszt. Then appears the Parisian Incroyable and grand seigneur—"Monsieur Lits," as the Parisians called him. Later, we find him imitating Paganini and Chopin, and at the same time making a really passionate and deep study of Beethoven, Weber, Schubert, Berlioz. Thus gradually was formed the master of style—whose command of the instrument was supreme, and who played like an inspired poet. Liszt's strange musical nature was long in maturing its fruits. At the pianoforte his achievements culminate in the two books of studies, twice rewritten, and finally published in 1852 as *Études d'exécution transcendante*, the *Études de concert* and the *Paganini Studies*; the two concertos and the *Todtentanz*, the *Sonata in B minor*, the *Hungarian Rhapsodies* and the fine transcriptions of Beethoven's symphonies (the 9th for two pianofortes as well as solo), and of Berlioz's *Symphonie fantastique*, and the symphony, *Harold en Italie*. In his orchestral pieces of Liszt appears—next to Berlioz—as the most conspicuous and most thorough-going representative of programme music, *i.e.* instrumental music expressly contrived to illustrate in detail some poem or some succession of ideas or pictures. It was Liszt's aim to bring about a direct alliance or amalgamation of instrumental music with poetry. To effect this he made use of the means of musical expression for purposes of illustration, and relied on points of support outside the pale of music proper. There is always danger of failure when an attempt is thus made to connect instrumental music with conceptions not in themselves musical, for the order of the ideas that serve as a programme is apt to interfere with the order which the musical exposition naturally assumes—and the result in most cases is but an amalgam of irreconcilable materials. In pieces such as Liszt's "Poèmes symphoniques," *Ce qu'on entend sur la montagne* (1848–1856), after a poem by Victor Hugo, and *Die Ideale* (1853–1857), after a poem by Schiller, the hearer is bewildered by a series of startling orchestral effects which succeed one another apparently without rhyme or reason. The music does not conform to any sufficiently definite musical plan—it is hardly intelligible as music without reference to the programme. Liszt's masterpiece in orchestral music is the *Dante Symphony* (1847–1855), the subject of which was particularly well suited to his temperament, and offered good chances for the display of his peculiar powers as a master of instrumental effect. By the side of it ranks the *Faust Symphony* (1854–1857), in which the moods of Goethe's characters—Faust, Gretchen and Mephistopheles—are depicted in three instrumental movements, with a chorus of male voices, supplying a kind of comment, by way of close. The method of presentation in both symphonies is by means of representative themes (*Leitmotif*), and their combination and interaction. Incidents of the poem or the play are illustrated or alluded to as may be convenient, and the exigencies of musical form are not unfrequently disregarded for the sake of special effects. Of the twelve Poèmes symphoniques, *Orphée* is the most consistent from a musical point of view, and is exquisitely scored. Melodious, effective, readily intelligible, with a dash of the commonplace, *Les Préludes*, *Tasso*, *Mazeppa* and *Fest-Klänge* bid for popularity. In these pieces, as in almost every production of his, in lieu of melody Liszt offers fragments of melody—touching and beautiful, it may be, or passionate, or tinged with triviality; in lieu of a rational distribution of centres of harmony in accordance with some definite plan, he presents clever combinations of chords and ingenious modulations from point to point; in lieu of musical logic and consistency of design, he is content with rhapsodical improvisation. The power of persistence seems wanting. The musical growth is spoilt, the development of the themes is stopped, or prevented, by some reference to extraneous ideas. Everywhere the programme stands in the way. In much of Liszt's vocal music, particularly in the songs and choral pieces written to German words, an annoying discrepancy is felt to exist between the true sound of the words and the musical accents. The music is generally emotional, the expression direct and passionate; there is no lack of melodic charm and originality, yet the total effect is frequently disappointing. In the choral numbers of the five masses, and in the oratorios *Die Heilige Elisabeth* and *Christus*, the rarity of fugal polyphony acts as a drawback. Its almost complete absence in some of these works makes for monotony and produces a sense of dullness, which may not be inherent in all the details of the music, but is none the less distinctly present.

Omitting trifles and all publications that have been cancelled, the following list of compositions may be taken as fairly comprehensive:—

Pianoforte Pieces.—Études d'exécution transcendante; Études de concert; Zwei Etuden, Waldesrauschen, Gnomentanz; Ab Irato; Paganini Studies; Années de Pélerinage, 3 sets; Harmonies poétiques et religieuses, 1-10; Consolations, 1-6; Ave Maria in E; Sonata in B minor; Konzert-Solo in E minor; Scherzo und Marsch; Ballades, I. II.; Polonaises, I. II.; Apparitions, 1-3; Berceuse; Valse impromptu; Mazurka brillant; 3 Caprices Valses; Galop chromatique; Mephisto-Walzer, I.,II.,III. and Polka; Zwei Legenden, "Die Vogelpredigt," "Der heilige Franciscus auf den Wogen schreitend"; "Der Weihnachtsbaum," 1-12; Sarabande und Chaconne ("Almira"); Elegies, I., II. and III.; La lugubre Gondola; Dem Andenken Petöfi's; Mosonyi's Grabgeleit; Romance oubliée; Valses oubliées, 1-3; Liebesträume, 1-3 (originally songs); Hexameron; Rhapsodies Hongroises, 1-18.

Pieces for Two Pianos.—Concerto pathétique (identical with the Konzert-Solo in E minor); Dante symphony; Faust symphony; Poèmes symphoniques, 1-12; Beethoven's 9th symphony.

Pianoforte with Orchestra.—Concertos I. in E flat, II. in A; Todtentanz; Fantasie ueber Motif aus Beethoven's "Ruinen von Athen"; Fantasie ueber Ungarische National Melodien; Schubert's Fantasia in C; Weber's Polacca in E.

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[1] It is understood that, in point of fact, the Princess Wittgenstein was determined to marry Liszt; and as neither he nor her family wished their connexion to take this form, Cardinal Hohenlohe quietly had him ordained.—[Ed. *E.B.*].

Fantaisies de Concert for Piano Solo.—Don Juan; Norma; Sonnambula; I Puritani; Lucia, I., II.; Lucrezia, I., II.; La Juive; Robert le Diable; Les Huguenots; Le Prophète, 1-4. *Paraphrases*, Auber, Tarantella di bravura (Masaniello); Verdi, Rigoletto, Ernani, Il Trovatore; Mendelssohn, " Hochzeitsmarsch und Elfenreigen "; Gounod, Valse de Faust, Les Adieux de Roméo et Juliette; Tschaikowsky, Polonaise; Dargomiyski, Tarantelle; Cui, Tarantella; Saint-Saëns, Danse macabre; Schubert, Soirées de Vienne, Valses caprices, 1-9.

Transcriptions.—Beethoven's Nine Symphonies; Berlioz's " Symphonie fantastique," " Harold en Italie "; Bénédiction et Serment (Benvenuto Cellini); Danse des Sylphes (Damnation de Faust); Weber's overtures, Der Freischütz, Euryanthe, Oberon, Jubilee; Beethoven's and Hummel's Septets; Schubert's Divertissement à la Hongroise; Beethoven's Concertos in C minor, G and E flat (orchestra for a second piano); Wagner's Tannhäuser overture, march, romance, chorus of pilgrims; Lohengrin, Festzug und Brautlied, Elsa's Brautgang, Elsa's Traum, Lohengrin's Verweiss an Elsa; Fliegender Holländer, Spinnlied; Rienzi, Gebet; Rheingold, Walhall; Meistersinger, " Am stillen Herd "; Tristan, Isolde's Liebestod; Chopin's six Chants Polonais; Meyerbeer's Schillermarsch; Bach's six organ Preludes and Fugues; Prelude and Fugue in G minor; Beethoven, Adelaide; 6 miscellaneous and 6 Geistliche Lieder; Liederkreis; Rossini's Les Soirées musicales; Schubert, 59 songs; Schumann, 13 songs; Mendelssohn, 8 songs; Robert Franz, 13 songs.

Organ Pieces.—Missa pro organo; Fantasia and Fugue, " Ad nos, ad salutarem undam "; B-A-C-H Fugue; Variations on Bach's Basso continuo, " Weinen, Klagen "; Bach's Introduction and Fugue, " Ich hatte viel Bekümmerniss "; Bach's Choral Fugue, " Lob und Ehre "; Nicolai's Kirchliche Festouvertüre, " Ein feste Burg "; Allegri's Miserere; Mozart's Ave Verum; Arcadelt's Ave Maria; Lasso's Regina Coeli.

Orchestral Pieces.—Eine Symphonie zu Dante's " Divina Commedia "; Eine Faust Symphonie; Poèmes symphoniques: 1. " Ce qu'on entend sur la montagne "; 2. Tasso; 3. Les Préludes; 4. Orphée; 5. Prométhée; 6. Mazeppa; 7. Fest-Klänge; 8. Héroïde funèbre; 9. Hungaria; 10. Hamlet; 11. Hunnenschlacht; 12. Die Ideale; Zwei Episoden aus Lenau's Faust: I. Der nächtliche Zug, II. Der Tanz in der Dorfschenke; Marches, Rakoczy, Goethe, Huldigung, " Vom Fels zum Meer " (for a military band); Ungarischer, Heroischer and Sturmmarsch; Le Triomphe funèbre du Tasse; " Von der Wiege bis zum Grab "; six Hungarian rhapsodies; four marches; four songs, and Die Allmacht, by Schubert.

Vocal Music.—Oratorios: " Die Legende von der Heiligen Elisabeth," " Christus," " Stanislaus " (unfinished). Masses: Missa solennis for the inauguration of the cathedral at Gran; Ungarische Krönungs-messe; Missa choralis (with organ); Missa and Requiem for male voices (with organ); Psalms, 13, 137, 23 and 18; 12 Kirchen-Chor-Gesänge (with organ). Cantatas: Prometheus-chöre; " Beethoven Cantata "; " An die Künstler "; Die Glocken des Strassburger Münsters; 12 Chöre für Männergesang; Songs, 8 books; Scena, Jeanne d'Arc au bûcher.

Melodramatic Pieces for Declamation, with Pianoforte Accompaniment.—Leonore (Bürger); Der traurige Mönch (Lenau); Des todten Dichter's Liebe (Jokai); Der blinde Sänger (Tolstoy).

Editions, Text and Variants.—Beethoven's Sonatas; Weber's Concertstück and Sonatas; Schubert Fantasia, 4 Sonatas, Impromptus, Valses and Moments musicaux.

See also L. Ramaun, *Fr. Liszt als Künstler und Mensch* (1880–1894); E. Dannreuther, *Oxford Hist. of Music*, vol. vi. (1905).

(E. Da.)

LITANY. This word (λιτανεία), like λιτή (both from λίτομαι), is used by Eusebius and Chrysostom, commonly in the plural, in a general sense, to denote a prayer or prayers of any sort, whether public or private; it is similarly employed in the law of Arcadius (*Cod. Theod.* xvi. tit. 5, leg. 30), which forbids heretics to hold assemblies in the city " ad litaniam faciendam." But some trace of a more technical meaning is found in the epistle (*Ep.* 63) of Basil to the church of Neocaesarea, in which he argues, against those who were objecting to certain innovations, that neither were " litanies " used in the time of Gregory Thaumaturgus. The nature of the recently introduced litanies, which must be assumed to have been practised at Neocaesarea in Basil's day, can only be conjectured; probably they had many points in common with the " rogationes," which, according to Sidonius Apollinaris, had been coming into occasional use in France about the beginning of the 5th century, especially when rain or fine weather was desired, and, so far as the three fast days before Ascension were concerned, were first fixed, for one particular district at least, by Mamertus or Mamercus of Vienne (A.D. *c.* 450). We gather that they were penitential and intercessory prayers offered by the community while going about in procession, fasting and clothed in sackcloth. In the following century the manner of making litanies was to some extent regulated for the entire Eastern empire by one of the *Novels* of Justinian, which forbade their celebration without the presence of the bishops and clergy, and ordered that the crosses which were carried in procession should not be deposited elsewhere than in churches, nor be carried by any but duly appointed persons. The first synod of Orleans (A.D. 511) enjoins for all Gaul that the " litanies " before Ascension be celebrated for three days; on these days all menials are to be exempt from work, so that every one may be free to attend divine service. The diet is to be the same as in Quadragesima; clerks not observing these rogations are to be punished by the bishop. In A.D. 517 the synod of Gerunda provided for two sets of " litanies "; the first were to be observed for three days (from Thursday to Saturday) in the week after Pentecost with fasting, the second for three days from November 1. The second council of Vaison (529), consisting of twelve bishops, ordered the *Kyrie eleison*—now first introduced from the Eastern Church—to be sung at matins, mass and vespers.

A synod of Paris (573) ordered litanies to be held for three days at the beginning of Lent, and the fifth synod of Toledo (636) appointed litanies to be observed throughout the kingdom for three days from December 14. The first mention of the word litany in connexion with the Roman Church goes back to the pontificate of Pelagius I. (555), but implies that the thing was at that time already old. In 590 Gregory I., moved by the pestilence which had followed an inundation, ordered a " litania septiformis," sometimes called *litania major*, that is to say, a sevenfold procession of clergy, laity, monks, virgins, matrons, widows, poor and children. It must not be confused with the *litania septena* used in church on Easter Even. He is said also to have appointed the processions or litanies of April 25 (St Mark's day), which seem to have come in the place of the ceremonies of the old Robigalia. In 747 the synod of Cloveshoe ordered the litanies or rogations to be gone about on April 25 " after the manner of the Roman Church," and on the three days before Ascension " after the manner of our ancestors." The latter are still known in the English Church as Rogation Days. Games, horse racing, junkettings were forbidden; and in the litanies the name of Augustine was to be inserted after that of Gregory. The reforming synod of Mainz in 813 ordered the major litany to be observed by all for three days in sackcloth and ashes, and barefoot. The sick only were exempted.

As regards the form of words prescribed for use in these " litanies " or " supplications," documentary evidence is defective. Sometimes it would appear that the " procession " or " litany " did nothing else but chant *Kyrie eleison* without variation. There is no reason to doubt that from an early period the special written litanies of the various churches all showed the common features which are now regarded as essential to a litany, in as far as they consisted of (1) invocations, (2) deprecations, (3) intercessions, (4) supplications. But in details they must have varied immensely. The offices of the Roman Catholic Church at present recognize two litanies, the " Litaniae majores " and the " Litaniae breves," which differ from one another chiefly in respect of the fulness with which details are entered upon under the heads mentioned above. It is said that in the time of Charlemagne the angels Orihel, Raguhel, Tobihel were invoked, but the names were removed by Pope Zacharias as really belonging to demons. In some medieval litanies there were special invocations of S. Fides, S. Spes, S. Charitas. The litanies, as given in the Breviary, are at present appointed to be recited on bended knee, along with the penitential psalms, in all the six week-days of Lent when ordinary service is held. Without the psalms they are said on the feast of Saint Mark and on the three rogation days. A litany is chanted in procession before mass on Holy Saturday. The " litany " or " general supplication " of the Church of England, which is appointed " to be sung or said after morning prayer upon Sundays, Wednesdays and Fridays, and at other times when it shall be commanded by the ordinary," closely follows the " Litaniae majores " of the Breviary, the invocations of saints being of course omitted. A similar German litany will be found in the works of Luther.

In the Roman Church there are a number of special litanies peculiar to particular localities or orders, such as the "Litanies of Mary" or the "Litanies of the Sacred Name of Jesus."

There was originally a close connexion between the litany and the liturgy (*q.v.*). The ninefold *Kyrie eleison* at the beginning of the Roman Mass is a relic of a longer litany of which a specimen may still be seen in the Stowe missal. In the Ambrosian liturgy, the threefold *Kyrie eleison* or Lesser Litany occurs thrice, after the *Gloria in excelsis*, after the gospel and at the end of Mass; and on the first five Sundays in Lent a missal litany is placed before the *Oratio super populum*, and on the same five Sundays in the Mozarabic rite before the epistle. In Eastern liturgies litanies are a prominent feature, as in the case of the deacon's litany at the beginning of the *Missa fidelium* in the Clementine liturgy, immediately before the *Anaphora* in the Greek liturgy of St James, &c. (F. E. W.)

LITCHFIELD, a township and the county-seat of Litchfield county, Connecticut, U.S.A., about 28 m. W. of Hartford, and including the borough of the same name. Pop. of the township (1890) 3304; (1900) 3214; (1910) 3005; of the borough (1890) 1058; (1900) 1120; (1910) 903. Area of the township, 48·6 sq. m. The borough is served by the New York, New Haven & Hartford railroad. It is situated on elevated land, and is one of the most attractive of southern New England summer resorts. The principal elevation in the township is Mt. Prospect, at the base of which there is a vein of pyrrhotite, with small quantities of nickel and copper. On the southern border of the borough is Lake Bantam (about 900 acres, the largest lake in the state) whose falls, at its outlet, provide water power for factories of carriages and electrical appliances. Dairying is the most important industry, and in 1899 the county ranked first among the counties of the state in the value of its dairy products—$1,373,957, from 3465 farms, the value of the product for the entire state being $7,090,188.

The lands included in the township of Litchfield (originally called Bantam) were bought from the Indians in 1715–1716 for £15, the Indians reserving a certain part for hunting. The township was incorporated in 1719, was named Litchfield, after Lichfield in England, and was settled by immigrants from Hartford, Windsor, Wethersfield, Farmington and Lebanon (all within the state) in 1720–1721. In 1751 it became the county-seat of Litchfield county, and at the same time the borough of Litchfield (incorporated in 1879) was laid out. From 1776 to 1780 two depôts for military stores and a workshop for the Continental army were maintained, and the leaden statue of George III., erected in Bowling Green, New York City, in 1770, and torn down by citizens on the 9th of July 1776, was cut up and taken to Litchfield, where, in the house (still standing) of Oliver Wolcott it was melted into bullets for the American army by Wolcott's daughter and sister. Aaron Burr, whose only sister married Tapping Reeve (1744–1823), lived in Litchfield with Reeve in 1774–1775. In 1784 Reeve established here the Litchfield Law School, the first institution of its kind in America. In 1798 he associated with himself James Gould (1770–1838), who, after Reeve's retirement in 1820, continued the work, with the assistance of Jabez W. Huntington (1788–1847), until 1833. The school was never incorporated, it had no buildings, and the lectures were delivered in the law offices of its instructors, but among its 1000 or more students were many who afterwards became famous, including John C. Calhoun; Levi Woodbury (1789–1851), United States senator from New Hampshire in 1825–1831 and in 1841–1845, secretary of the navy in 1831–1834 and of the treasury in 1834–1841, and a justice of the United States Supreme Court from 1845; John Y. Mason; John M. Clayton; and Henry Baldwin (1780–1844), a justice of the United States Supreme Court from 1830. In 1792 Mrs Sarah Pierce made one of the first efforts toward the higher education of women in the United States by opening in Litchfield her Female Seminary, which had an influential career of about forty years, and numbered among its alumnae Harriet Beecher Stowe, Mrs Marshall O. Roberts, Mrs Cyrus W. Field and Mrs Hugh McCulloch. Litchfield was the birthplace of Ethan Allen; of Henry Ward Beecher; of Harriet Beecher Stowe, whose novel, *Poganuc People*, presents a picture of social conditions in Litchfield during her girlhood; of Oliver Wolcott, Jr. (1760–1833); of John Pierpont (1785–1866), the poet, preacher and lecturer; and of Charles Loring Brace, the philanthropist. It was also the home, during his last years, of Oliver Wolcott (1726–1797); of Colonel Benjamin Tallmadge (1774–1835), an officer on the American side in the War of Independence and later (from 1801 to 1817) a Federalist member of Congress; and of Lyman Beecher, who was pastor of the First Congregational church of Litchfield from 1810 to 1826.

See Payne K. Kilbourne, *Sketches and Chronicles of the Town of Litchfield, Connecticut* (Hartford, Conn., 1859); George C. Boswell, *The Litchfield Book of Days* (Litchfield, 1900); and for an account of the Litchfield Female Seminary, Emily N. Vanderpoel, *Chronicles of a Pioneer School* (Cambridge, Mass., 1903).

LITCHFIELD, a city of Montgomery county, Illinois, U. S. A., about 50 m. N.E. of St Louis, Missouri. Pop. (1900) 5918; (1910) 5971. Its principal importance is as a railway and manufacturing centre; it is served by the Chicago, Burlington & Quincy, the Chicago & Alton, the Cleveland, Cincinnati, Chicago & St Louis, the Illinois Central, the Wabash, and the Litchfield & Madison railways, and by electric lines connecting with St Louis and the neighbouring towns. In the vicinity are deposits of bituminous coal, fire-clay and moulding sand. There are various manufactures in the city. Litchfield was incorporated as a town in 1856, and was first chartered as a city in 1859.

LITCHI, or LEE-CHEE, the fruit of *Nephelium Litchi*, a small tree, native of southern China and one of the most important indigenous fruits. It is also cultivated in India. The tree bears large compound leaves with two to four pairs of leathery lanceolate pointed leaflets about 3 in. long, and panicles of small flowers without petals. The fruits are commonly roundish, about 1½ in. in diameter, with a thin, brittle, red shell which bears rough protuberances. In the fresh state they are filled with a sweet white pulp which envelops a large brown seed, but in the dried condition the pulp forms a blackish fleshy substance. The pulp is of the nature of an aril, that is, an additional seed-coat.

Nephelium Longana, the longan tree, also a native of southern China, is cultivated in that country, in the Malay Peninsula, India and Ceylon for its fruit, which is smaller than that of the litchi, being half an inch to an inch in diameter with a nearly smooth yellowish-brown brittle skin, and containing a pulpy aril resembling that of the litchi in flavour. Another species, *N. lappaceum*, a tall tree native of the Malay Peninsula, where it is known under the names Rambutan or Rambosteen, is also cultivated for its pleasantly acid pulpy aril. The fruit is oval, bright red in colour, about 2 in. long and covered with long fleshy hairs.

Nephelium belongs to the natural order Sapindaceae, and contains about twenty-two species.

LITERATURE, a general term which, in default of precise definition, may stand for the best expression of the best thought reduced to writing. Its various forms are the result of race peculiarities, or of diverse individual temperaments, or of political circumstances securing the predominance of one social class which is thus enabled to propagate its ideas and sentiments. In early stages of society, the classes which first attain a distinct literary utterance are priests who compile the chronicles of tribal religious development, or rhapsodes who celebrate the prowess of tribal chiefs. As man feels before he reasons, so poetry generally precedes prose. It embodies more poignantly the sentiment of unsophisticated man. Hence sacred books and war-songs are everywhere the earliest literary monuments, and both are essentially poetic compositions which have received a religious or quasi-religious sanction. The recitation of the Homeric poems at the Panathenaea corresponds to the recitation elsewhere of the sacred texts in the temple; the statement of Phemios (*Odyssey*, xxii. 347) that a god inspired his soul with all the varied ways of song expresses the ordinary belief of early historical times. Versicles of the sacred chronicles, or fragments of epic poems, were learned by heart and supplied a standard of popular literary taste. The public declamation of long chosen passages by priests, and still more by contending rhapsodes, served to evoke the latent sense of literary criticism; and, at a later stage, the critical spirit was still further stimulated by the performance of dramatic pieces written by competing poets. The epical record of the past was supplemented by the lyrical record of contemporary events, and as the Homeric poets had immortalized the siege of Troy, so Pindar commemorated Salamis. Prose of any permanent value would first show itself in the form of oratory, and the insertion of speeches by early historians indicates a connexion with rhetoric. The development of abstract reasoning would tend to deprive prose of its superfluous ornament and to provide a simpler and more accurate instrument.

No new *genre* has been invented since the days of Plato. The evolution of literature is completed in Greece, and there its subdivisions may best be studied. Epic poetry is represented by the Homeric cycle, lyrical poetry by Tyrtaeus, dramatic poetry by Aeschylus, history by Herodotus, oratory by Pericles, philosophy by Plato, and criticism by Zoilus, the earliest of slashing reviewers; and in each department there is a long succession of illustrious names. Roughly speaking, all subsequent literature is imitative. Ennius transplanted Greek methods to Rome; his contemporary L. Fabius Pictor, the earliest Roman historian, wrote in Greek; and the later Roman poets from Lucretius to Horace abound in imitations of Greek originals. The official adoption of Christianity as the state religion changed the spirit of literature, which became more and more provincial after the downfall of the empire. Literature did not perish during the "dark ages" which extend from the sixth century to the beginning of the 11th, but it was subordinate to scholarship. The dissolution of Latin was not complete till about the middle of the 9th century, and the new varieties of Romance did not become ripe for literary purposes till a hundred years later. Meanwhile, not a single literary masterpiece was produced in western Europe for five centuries; by comparison only do Boëthius and Venantius Fortunatus seem to be luminous points in the prolonged night; the promise of a literary renaissance at the court of Charlemagne was unfulfilled, and the task of creating a new literature devolved upon the descendants of the barbarians who had destroyed the old. The Celtic and Teutonic races elaborated literary methods of their own; but the fact that the most popular form of Irish verse is adopted from Latin prosody is conclusive evidence that the influence of Roman—and therefore of Greek—models persisted in the literature of the outlying provinces which had attained political independence. The real service rendered to literature by the provincials lay in the introduction and diffusion of legends freighted with a burden of mystery which had disappeared with Pan, and these new valuable materials went to form the substance of the new poetry.

The home of modern European literature must be sought in France, which assimilated the best elements in Celtic and Teutonic literature. From the 11th to the 14th century, France was the centre of intellectual life in Europe, as Greece and Rome had been before, and as Italy was to be afterwards. The *chansons de geste*, inspired by the sense of patriotism and the yearning for religious unity, inculcate feudal and Catholic doctrine, and as society in the western world was universally committed to feudalism and Catholicism, these literary expressions of both theories were widely accepted and copied. The Germanic origin of the French epic is lost sight of, and imitators are attracted by the French execution, and by the creative power of the *chansons de geste*. Again, France takes the stories of the Arthurian court from Welsh texts or from the lips of Welsh settlers, rehandles the romantic element, and, through Marie de France and Chrétien de Troyes, imparts to the whole a touch of personal artistry which is absent from the *chansons de geste*. The *matière de Bretagne* goes forth to Italy, Germany and England—later to Portugal and Spain—bearing the imprint of the French genius. Thus France internationalizes local subjects, and first assumes a literary function which, with few interruptions, she has since discharged. She further gives to Europe models of allegory in the *Roman de la rose*, founds the school of modern history through Villehardouin, inaugurates the religious drama and the secular theatre. She never again dominated the literatures of Europe so absolutely.

The literary sceptre passed from France to Italy during the 14th century. Brunetto Latini, who wrote in French as well as in Italian, is the connecting link between the literatures of the two countries; but Italy owes its eminence not so much to a general diffusion of literary accomplishment as to the emergence of three great personalities. Dante, Boccacio and Petrarch created a new art of poetry and of prose. England yielded to the fascination in the person of Chaucer, Spain in the person of her chancellor López de Ayala, and France in the person of Charles d'Orléans, the son of an Italian mother. Petrarch, once ambassador in France, alleged that there were no poets out of Italy, and indeed there were no living poets to compare with him elsewhere. But in all countries he raised up rivals—Chaucer, Marot, Garcilaso de la Vega—as Sannazaro did a century and a half later. Sannazaro's *Arcadia* captured the Portuguese Montemôr, whose pastoral novel the *Diana*, written in Spanish, inspired d'Urfé no less than Sidney, and, as d'Urfé's *Astrée* is considered the starting-point of the modern French novel, the historical importance of the Italian original cannot be exaggerated. Spain never obtained any intellectual predominance corresponding to that exercised by France and Italy, or to her political authority during the 16th and 17th centuries. This may be attributed partly to her geographical position which lies off the main roads of Europe, and partly to the fact that her literature is essentially local. Cervantes, indeed, may be said to have influenced all subsequent writers of fiction, and the influence of Spanish literature is visible in the body of European picaresque tales; but, apart from Corneille and a few other dramatists who preceded Molière in France, and apart from the Restoration drama in England, the influence of the Spanish drama was relatively small. In some respects it was too original to be imitated with success. Much the same may be said of England as of Spain. Like Spain, she lies outside the sphere of continental influence; like Spain, she has innumerable great names in every province of literature, and, in both cases, to Europe at large these long remained names and nothing more; like Spain, she is prone to reproduce borrowed materials in shapes so transformed and rigid as to be unrecognizable and unadaptable. Moreover, the Reformation isolated England from literary commerce with the Latin races, and till the 18th century Germany was little more than a geographical expression. Even when Germany recovered her literary independence, Lessing first heard of Shakespeare through Voltaire. Neither Shakespeare nor Milton was read in France before the 18th century—the first translated by Ducis, the second by Dupré de Saint-Maur—and they were read with curiosity rather than with rapture. On the other hand, Boileau, Rapin and Le Bossu were regarded as oracles in England, and through them French literature produced the "correctness" of Queen Anne's reign. Horace Walpole is half a Frenchman, Hume imitates Montesquieu's cold lucidity, Gibbon adapts Bossuet's majestic periods to other purposes. On the other hand Voltaire takes ideas from Locke, but his form is always intensely personal and inimitably French. After the 16th century English literature, as a whole, is refractory to external influence. Waves of enthusiasm pass over England—for Rousseau, for Goethe—but leave no abiding trace on English literature. During the latter half of the 18th century France resumed something of her old literary supremacy; the literatures of Italy and Spain at this period are purely derivative, and French influence was extended still further on the continent as the result of the Romantic movement. Since that impulse was exhausted, literature everywhere has been in a state of flux: it is less national, and yet fails to be cosmopolitan. All writers of importance, and many of no importance, are translated into other European languages; the quick succession of diverse and violent impressions has confused the scheme of literature. Literature suffers likewise from the competition of the newspaper press, and as the press has multiplied it has grown less literary. The diversities of modern interests, the want of leisure for concentrated thought, suggest that literature may become once more the pleasure of a small caste. But the desire for the one just form which always inspires the literary artist visits most men sometimes, and it cannot be doubted that literature will continue to accommodate itself to new conditions. (J. F.-K.)

LITERNUM, an ancient town of Campania, Italy, on the low sandy coast between Cumae and the mouth of the Volturnus. It was probably once dependent on Cumae. In 194 B.C. it became a Roman colony. It is mainly famous as the residence of the elder Scipio, who withdrew from Rome and died here. His tomb and villa are described by Seneca. Augustus is said to have conducted here a colony of veterans,[1] but the place never had any great importance, and the lagoons behind it made it unhealthy, though the construction of the Via Domitiana through it must have made it a posting station. It ceased to exist in the 8th century. No remains are visible.

See J. Beloch, *Campanien*, ed. ii. (Breslau, 1890), 377.

LITHGOW, WILLIAM (1582–? 1650), Scottish traveller and writer, was born and educated in Lanark. He was caught in a love-adventure, mutilated of his ears by the brothers of the lady (hence the sobriquet "Cut-lugged Willie"), and forced to leave Scotland. For nineteen years he travelled, mostly on foot, through Europe, the Levant, Egypt and northern Africa, covering, according to his estimate, over 36,000 m. The story of his adventures may be drawn from *The Totall Discourse of the Rare Adventures and painfull Peregrinations of long nineteene Yeares* (London, 1614; fuller edition, 1632, &c.); *A True and Experimentall Discourse upon the last siege of Breda* (London, 1637); and a similar book giving an account of the siege of Newcastle and the battle of Marston Moor (Edinburgh, 1645). He is the author of a *Present Surveigh of London* (London, 1643). He left six poems, written between 1618 and 1640 (reprinted by Maidment, Edinburgh, 1863). Of these "Scotland's Welcome to King Charles, 1633" has considerable antiquarian interest. His writing has no literary merit; but its excessively aureate style deserves notice.

The best account of Lithgow and his works is by F. Hindes Groome in the *Dict. Nat. Biog.* The piece entitled *Scotland's Paraenesis to King Charles II.* (1660), ascribed to him in the catalogue of the Advocates' Library, Edinburgh, cannot, from internal evidence, be his.

LITHGOW, a town of Cook county, New South Wales, Australia, 96 m. W.N.W. of Sydney by rail. Pop. (1901) 5268. The town is situated at an altitude of 3000 ft., in a valley of the Blue Mountains. It has pottery and terra-cotta works, breweries, a tweed factory, iron-works, saw-mills, soap-works and brickfields. Coal, kerosene shale, iron ore and building stone are found in the district.

LITHIUM [symbol Li, atomic weight 7·00 (O=16)], an alkali metal, discovered in 1817 by J. A. Arfvedson (*Ann. chim. phys.* 10, p. 82). It is only found in combination, and is a constituent of the minerals petalite, triphyline, spodumene and lepidolite or lithia mica. It occurs in small quantities in sea, river and spring water, and is also widely but very sparingly distributed throughout the vegetable kingdom. It may be obtained (in the form of its chloride) by fusing lepidolite with a mixture of barium carbonate and sulphate, and potassium sulphate (L. Troost, *Comptes rendus*, 1856, 43, p. 921). The fused mass separates into two layers, the upper of which contains a mixture of potassium and lithium sulphates; this is lixiviated with water and converted into the mixed chlorides by adding barium chloride, the solution evaporated and the lithium chloride extracted by a mixture of dry alcohol and ether. The metal may be obtained by heating dry lithium hydroxide with magnesium (H. N. Warren, *Chem. News*, 1896, 74, p. 6). L. Kahlenberg (*Jour. phys. Chem.*, 3, p. 601) obtained it by electrolysing the chloride in pyridine solution, a carbon anode and an iron or platinum cathode being used. O. Ruff and O. Johannsen (*Zeit. elektrochem.*, 1906, 55, p. 537) electrolyse a mixture of bromide and chloride which melts at 520°. It is a soft, silvery-white metal, which readily tarnishes on exposure. Its specific gravity is 0·59, and it melts at 180° C. It burns on ignition in air, and when strongly heated in an atmosphere of nitrogen it forms lithium nitride, Li_3N. It decomposes water at ordinary temperature, liberating hydrogen and forming lithium hydroxide.

Lithium hydride, LiH, obtained by heating the metal in a current of hydrogen at a red heat, or by heating the metal with ethylene to 700° C. (M. Guntz, *Comptes rendus*, 1896, 122, p. 244; 123, p. 1273). is a white solid which inflames when heated in chlorine. With alcohol it forms lithium ethylate, $LiOC_2H_5$, with liberation of hydrogen. *Lithium oxide*, Li_2O, is obtained by burning the metal in oxygen, or by ignition of the nitrate. It is a white powder which readily dissolves in water to form the *hydroxide*, LiOH, which is also obtained by boiling the carbonate with milk of lime. It forms a white caustic mass, resembling sodium hydroxide in appearance. It absorbs carbon dioxide, but is not deliquescent. *Lithium chloride* LiCl, prepared by heating the metal in chlorine, or by dissolving the oxide or carbonate in hydrochloric acid, is exceedingly deliquescent, melts below a red heat, and is very soluble in alcohol. *Lithium carbonate*, Li_2CO_3, obtained as a white amorphous precipitate by adding sodium carbonate to a solution of lithium chloride, is sparingly soluble in water. *Lithium phosphate*, Li_3PO_4, obtained by the addition of sodium phosphate to a soluble lithium salt in the presence of sodium hydroxide, is almost insoluble in water. *Lithium ammonium*, $LiNH_3$, is obtained by passing ammonia gas over lithium, the product being heated to 70° C. in order to expel any excess of ammonia. It turns brown-red on exposure to air, and is inflammable. It is decomposed by water evolving hydrogen, and when heated *in vacuo* at 50°-60° C. it gives lithium and ammonia. With ammonia solution it gives hydrogen and *lithiamide*, $LiNH_2$ (H. Moissan, *ibid.*, 1898, 127, p. 685). *Lithium carbide*, Li_2C_2, obtained by heating lithium carbonate and carbon in the electric furnace, forms a transparent crystalline mass of specific gravity 1·65, and is readily decomposed by cold water giving acetylene (H. Moissan, *ibid.*, 1896, 122, p. 362).

Lithium is detected by the faint yellow line of wave-length 6104, and the bright red line of wave-length 6708, shown in its flame spectrum. It may be distinguished from sodium and potassium by the sparing solubility of its carbonate and phosphate. The atomic weight of lithium was determined by J. S. Stas from the analysis of the chloride, and also by conversion of the chloride into the nitrate, the value obtained being 7·03 (O=16).

The preparations of lithium used in medicine are: *Lithii Carbonis*, dose 2 to 5 grs.; *Lithii Citras*, dose 5 to 10 grs.; and *Lithii Citras effervescens*, a mixture of citric acid, lithium citrate, tartaric acid and sodium bicarbonate, dose 60 to 120 grs. Lithium salts render the urine alkaline and are in virtue of their action diuretic. They are much prescribed for acute or chronic gout, and as a solvent to uric acid calculi or gravel, but their action as a solvent of uric acid has been certainly overrated, as it has been shown that the addition of medicinal doses of lithium to the blood serum does not increase the solubility of uric acid in it. In concentrated or large doses lithium salts cause vomiting and diarrhoea, due to a gastro-enteritis set up by their action. In medicinal use they should therefore be always freely diluted.

LITHOGRAPHY (Gr. *λίθος*, a stone, and *γράφειν*, to write), the process of drawing or laying down a design or transfer, on a specially prepared stone or other suitable surface, in such a way that impressions may be taken therefrom. The principle on which lithography is based is the antagonism of grease and water. A chemically pure surface having been secured on some substance that has an equal affinity for both grease and water, in a method hereafter to be described, the parts intended to print are covered with an unctuous composition and the rest of the surface is moistened, so that when a greasy roller is applied, the portion that is wet resists the grease and that in which an affinity for grease has been set up readily accepts it; and from the surface thus treated it will be seen that it is an easy thing to secure an impression on paper or other material by applying suitable pressure.

The inventor of lithography was Alois Senefelder (1771–1834); and it is remarkable what a grip he at once seemed to get of his invention, for whereas the invention of printing seems almost a matter of evolution, lithography seems to come upon the scene fully equipped for the battle of life, so that it would be a bold craftsman at the present day who would affirm that he knew more of the principles underlying his trade than Senefelder (*q.v.*) did within thirty years of its invention. Of course practice has led to dexterity, and the great volume of trade has induced many mechanical improvements and facilities, but the principles have not been taken any further, while some valuable methods have been allowed to fall into desuetude and would well repay some experimentally disposed person to revive.

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[1] Mommsen in *C.I.L.* x. 343 does not accept this statement, but an inscription found in 1885 confirms it.

Lithography may be divided into two main branches—that which is drawn with a greasy crayon (rather illogically called "chalk") on a grained stone, and that which is drawn in "ink" on a polished stone. Whatever may be thought in regard to the original work of the artists of various countries who have used lithography as a means of expression, there can be little doubt that in the former method the English professed lithographer has always held the pre-eminence, while French, German and American artists have surpassed them in the latter.

Chalk lithography subdivides itself into work in which the black predominates, although it may be supported by 5 or 6 shades of modified colour—this branch is known as "black and tint" work—and that in which the black is only used locally like any other colour. Frequently this latter class of work will require a dozen or more colours, while some of the finest examples have had some twenty to thirty stones employed in them. Work of this description is known as chromo-lithography. Each colour requires a separate stone, and work of the highest quality may want two or three blues with yellows, reds, greys and browns in proportion, if it is desired to secure a result that is an approximate rendering of the original painting or drawing. The question may perhaps be asked: "If the well-known three-colour process" (see PROCESS) "can give the full result of the artist's palette, why should it take so many more colours in lithography to secure the same result?" The answer is that the stone practically gives but three gradations—the solid, the half tint and the quarter tint, so that the combination of three very carefully prepared stones will give a very limited number of combinations, while a moderate estimate of the shades on a toned block would be six; so that a very simple mathematical problem will show the far greater number of combinations that the three blocks will give. Beyond this, the chromo-lithographer has to exercise very great powers of colour analysis; but the human mind is quite unable to settle offhand the exact proportion of red, blue and yellow necessary to produce some particular class say of grey, and this the camera with the aid of colour filters does with almost perfect precision.

Notwithstanding these disadvantages, lithography has these strong points: (1) its utility for small editions on account of its, at present, smaller prime cost; (2) its suitability for subjects of large size; (3) its superiority for subjects with outlines, for in such cases the outline can be done in one colour, whereas to secure this effect by the admixture of the three colours requires marvellously good registration, the absence of which would produce a very large proportion of "waste" or faulty copies; (4) capacity for printing on almost any paper, whereas, at the time of writing, the tri-colour process is almost entirely limited to printing on coated papers that are very heavy and not very enduring.

With regard to the two branches of chalk lithography, the firms that maintained the English supremacy for black and tint work in the early days were Hulemandel, Day and Haghe and Maclure, while the best chromo-lithographic work in the same period was done by Vincent Brooks, the brothers Hanhart, Thomas Kell and F. Kell. In reference to the personal work of professed lithographers during the same period, the names of Louis Haghe, J. D. Harding, J. Needham, C. Baugniet, L. Ghemar, William Simpson, R. J. Lane, J. H. Lynch, A. Maclure and Rimanozcy stand for black and tint work; while in chromo-lithography J. M. Carrick, C. Risdon, William Bunney, W. Long, Samuel Hodson, Edwin Buckman and J. Lewis have been conspicuous among those who have maintained the standard of their craft. In the foregoing list will be recognized the names of several who have had admirable works on the walls of the Royal Academy and other exhibitions; Mr Lane, who exhibited lithographs from 1824 to 1872, was for many years the doyen of lithographers, and the only one of their number to attain academic rank, but Lynch and John Cardwell Bacon were his pupils, and Bacon's son, the painter John H. F. Bacon, was elected to the Royal Academy in 1903. In the first decade of the 20th century the number of firms doing high-class work, and the artists who aided them in doing it, were more numerous than ever, and scarcely less able, but it would be outside the present purpose to differentiate between them.

The *raison d'être* of "stipple" work is its capacity for retransferring without serious loss of quality, for it can scarcely be contended that it is as artistic as the methods just described. Retransferring is the process of pulling impressions from the original stones with a view to making up a large sheet of one or more small subjects, or where it is desired to print a very large number without deterioration of the original or matrix stone. The higher class work in this direction has been done in France, Germany and the United States, where for many years superiority has been shown in regard to the excellence and rapidity of retransferring. To this cause may be attributed the fact that the box tops and Christmas cards on the English market were so largely done abroad until quite recent times. The work of producing even a small face in the finest hand stipple is a lengthy and tedious affair, and the English craftsman has seldom shown the patience necessary for this work; but since the American invention known as Ben Day's shading medium was introduced into England the trade has largely taken it up, and thereby much of the tedium has been avoided, so that it has been found possible by its means to introduce a freedom into stipple work that had not before been found possible, and a very much better class of work has since been produced in this department.

About the year 1868 grained paper was invented by Maclure, Macdonald & Co. This method consists in impressing on ordinary Scotch transfer or other suitable paper a grain closely allied to that of the lithographic stone. It appears to have been rather an improvement than a new invention, for drawing paper and even canvas had been coated previously with a material that adhered to a stone and left on the stone the greasy drawing that had been placed thereon; but still from this to the beautifully prepared paper that was placed on the market by the firm of which the late Andrew Maclure was the head was a great advance, and although the first use was by the ordinary craftsman it was not long before artists of eminence saw that a new and convenient mode of expression was opened up to them.

On the first introduction of lithography the artists of every nation hastened to avail themselves of it, but soon the cumbrous character of the stone, and the fact that their subjects had to be drawn backwards in order that they might appear correctly on the paper, wore down their newly-born zeal, and it was only when the grained paper system was perfected, by which they could make their drawings in the comfort of their studios without reversing, that any serious revival took place. Although excellent work on grained paper had been done by Andrew Maclure, Rimanozcy, John Cardwell Bacon, Rudofsky and other craftsmen, the credit for its furtherance among artists must be given to Thomas Way and his son T. R. Way, who did much valuable pioneer work in this direction. The adhesion of such artists of eminence as Whistler, Legros, Frank Short, Charles Shannon, Fantin Latour, William Strang, Will Rothenstein, Herbert Railton and Joseph Pennell, did not a little to aid lithography in resisting the encroachments of other methods into what may still be considered its sphere. As a means of reproducing effects which an artist would otherwise get by pencil or crayon, it remains entirely unequalled, and it is of obvious advantage to art that twenty-five or fifty copies of an original work should exist, which, without the aid of lithography, might have only been represented by a single sketch, perhaps stowed away among the possessions of one private collector.

In regard to grained paper work, undue stress has often been placed upon the rapid deterioration of the stone, some contending that only a few dozen first-class proofs can be taken; this has led to the feeling that it is unsuited to book illustration, and damage has been done to the trade of lithography thereby. It may be mentioned that quite recently about 100 auto-lithographs in black and three colours, the combined work of Mr and

Mrs Herbert Railton, have been treated by the Eberle system of etching described below, and although an infinitesimal loss of quality may have arisen, such as occurs when a copper etching is steel faced, some 2000 to 3000 copies were printed without further deterioration, and an edition of vignetted sketches was secured, far in advance of anything that could have been attained from the usual screen or half-toned blocks.

Grained paper is much used in the ordinary lithographic studio for work such as the hill shading of maps that can be done without much working up, but the velvety effects that in the hands of Louis Haghe and his contemporaries were so conspicuous, cannot be secured by this method. The effects referred to were obtained by much patient work of a "tinter," who practically laid a ground on which the more experienced and artistic craftsman did his work either by scraping or accentuation. Where fine rich blacks are needed, artists will do well to read the notes on the "aquatint" and "wash" methods described by Senefelder in his well-known treatise, and afterwards practised with great skill by Hulemandel.

Lithography is of great service in educational matters, as its use for diagrams, wall pictures and maps is very general; nor does the influence end with schooldays, for in the form of pictures at a moderate price it brings art into homes and lives that need brightening, and even in the form of posters on the much-abused hoardings does something for those who have to spend much of their time in the streets of great cities.

According to the census of 1901, 14,686 people in the United Kingdom found their occupation within the trade, while according to a Home Office return (1906), 20,367 persons other than lithographic printers were employed by the firms carrying on the business. As it may be assumed that an equal number are employed in France, Germany, the United States of America and the world at large, it is clear that a vast industrial army is employed in a trade that, like letterpress printing, has a very beneficial influence upon those engaged in it.

Technical Details.—The following description of the various methods of lithography is such as may be considered of interest to the general reader, but the serious student who will require formulas and more precise directions will do well to consult one of the numerous text-books on the subject.

Stone and Stone Substitutes.—The quality of stone first used by Alois Senefelder, and discovered by him at the village of Solenhofen in Bavaria, still remains unsurpassed. This deposit, which covers a very large area and underlies the villages of Solenhofen, Moernsheim and Langenaltheim, has often been described, sometimes for interested motives, as nearly exhausted; but a visit in 1906 revealed that the output—considerable as it had been during a period little short of a century—was very unimportant when compared to the great mass of carbonaceous limestone existing in the neighbourhood. The strong point in favour of this source of supply, in addition to its unrivalled quality, is the evenness of its stratification, and the fact that after the removal of the surface deposits, which are very thin, the stones come out of large size, in thickness of 3 to 5 in., and thus just suited for lithographic purposes and needing only to be wrought in the vertical direction. Other deposits of suitable stone have been found in France, Spain, Italy and Greece, but transit and the absence of suitable stratification have restricted them to little more than local use. Beyond this, few of the deposits other than in the neighbourhood of Solenhofen have been of the exact degree of density necessary, and the heavier varieties do not receive the grease with sufficient readiness. The desire to find other sources of supply has been stimulated by the social conditions existing in southern Bavaria, for the quarries are largely owned by peasant proprietors, who have very well-defined business habits of their own which make transactions difficult. Among other things, they will seldom supply the highest grades and the largest sizes to those who will not take their proportion of lower quality and smaller sizes; and this, in view of the very expensive transit down the Rhine to Rotterdam, with a railway journey at one end and a sea journey at the other, is a source of difficulty to the importer in other countries.

The earliest substitute for lithographic stone was zinc, which has been used from early days and is now more in demand than ever; it requires very careful printing as the grease only penetrates the material to a very slight extent, and the same must be said in regard to the water. From this cause, when not in experienced hands, trouble is likely to arise; and when this has occurred, remedial methods are much more difficult than with stones. When put away for storage, a dry place is very essential, as corrosion is easily set up. At first the plates were quite thick, and almost invariably grained by a zinc "muller" and acid; now a bath of acid is more generally used, and the operation is known as "passing," while the plates are quite thin, which renders them suitable for bending round the cylinders of rotary machines.

So far we have been dealing with plain zinc, but variations are caused, either by the oxidization of the surface or by coating the plate with a composition closely allied to lithographic stone and applied in a form of semi-solution. This class of plate was first invented by Messrs C. & E. Layton, and a modification was invented by Messrs Wezel and Naumann of Leipzig, who brought its use to a high pitch of perfection for transferred work such as Christmas cards. A treatment of iron plates by exposing them to a high temperature has recently been patented, and has had some measure of success, while the Parker printing plate, which is practically a sheet of zinc so treated as to secure greater porosity and freedom from oxidization, is rapidly securing a good position as a stone substitute.

Preparation of the Stones.—In this department the cleanliness so necessary right through the lithographic process must be carefully observed, and a leading point is to secure a level surface and to ensure that the front and back of the stone are strictly parallel, *i.e.* that the stones stand the test of both the straight edge and the callipers. A good plan to ensure evenness on the surface is to mark the front with two diagonal lines of some non-greasy substance till the top stone (which should not be too small, and should be constantly revolved on the larger one) has entirely removed them. The application of the straight edge from time to time will end in securing the desired flatness, on which so much of the future printing quality depends. The usual method is to rub out with sand, and then rub with pumice and polish with water of Ayr or snake stone. For chalk work, the further work of graining has to be done by revolving a small stone muller on the surface with exceedingly fine sand or powdered glass. Many appliances (some very expensive) have been devised for doing the principal part of this work by machine—none more effective than those methods by which a disk of about 12 in. is kept revolving on a rod attached to the ceiling, guided by hand over all parts of the stone; but for large surfaces the ceiling needs to be rather high so as to allow of a long expanding rod reaching the surface at a moderate angle. When this machine is fitted with friction disk driving, very wide variations of speed are possible, and the machine can be driven so slowly and evenly as to secure a very fair (but not first class) grain, in addition to speedy rubbing out, which is the chief aim of the apparatus.

Preparing a Subject in Chalk or Chalk and Tints.—This branch of work is much less in demand than formerly. A grey stone having been selected and finely grained with sand or powdered glass passed through a sieve of 80 to 120 meshes to the lineal inch, and the artist having made his tracing, this tracing is reversed upon the stone with the interposition of a piece of paper coated with red chalk, and the chalk side towards the surface; the lines on the tracing are then gone over with a tracing point, so that a reproduction in red chalk is left upon the stone. It will then be desirable to secure a stock of pointed Lemercier chalks of at least two grades, hard and soft: the pointing is a matter that requires experience, and is done by the worker drawing a sharp pen-knife towards him in a slicing manner as though trying to put a point upon a piece of cheese. Care should be taken that the falling pieces are gathered into a box, or they may do irreparable mischief to the work. The work of outlining is done with No. 1 or hard chalk, and until experience is gained it will be well to depend chiefly on this grade, securing rich dark effects by tinting or going over the stone in various directions and then finishing with lithographic ink where absolute blacks are required. This ink (Vanhymbeck's or Lemercier's are two good makes) needs careful preparation, the method being to warm a saucer and rub the ink dry upon it, then add a little distilled water and incorporate with the finger. It is of great importance not to use any ink left over for the next day, but always to have a fresh daily supply.

When the drawing is thus completed, it will require what is termed etching, by which the parts intended to receive the printing ink, and already protected by an acid-resisting grease, will be left above the unprotected surface. The acid and gum mixture varies in accordance with the quality of the work and the character of the stone. A patiently executed specimen will, for instance, stand more etching than a hastily drawn one; while a grey stone will require more of the nitric acid than a yellow one. This is one of the most important tasks that a lithographer has to perform. A proportion of 1·5 parts of acid to 100 parts of a strong solution of gum arabic will be found to be approximately what is required, but the exact proportion must be settled by experience, a safe course being to watch the action that occurs when a small quantity is placed on the unused margin of the stone. Many put the etching mixture on with a flat camel-hair brush, which should be of good width to avoid streaks. The present writer's own preference is to pour the mixture on to the stone when it is in a slanting position; or it is perhaps better to have an etching trough, a strong box lined with pitch, with bearers at the bottom to prevent the stone coming in contact with it, and a hole through which the diluted acid may pass away for subsequent use. The etching is then done with acid and water poured over the stone while in a sloping position, and the subsequent pouring of a solution of gum arabic completes the preparation. The late Mr William Simpson, whose Crimean lithographs are well known, once stated at the Society of Arts that in his opinion Mr Louis Haghe's reproduction of David Robert's great picture of "The Taking of Jerusalem" was the most important piece of chalk lithography ever executed, and that he well remembered that it took two years to execute it, and that all the combined talent of Messrs Day & Haghe's establishment was utilized in its etching. He stated that, notwithstanding every precaution, it was under-etched, and that after half a dozen impressions the great beauty and brilliancy of the work had departed. This incident indicates sufficiently the serious nature of this part of the lithographer's work.

If the chalk drawing has to have tints, it will be necessary to make as many dusted offsetts as there are colours to be used; in this class of work there are generally only two,—one warm or sandy shade and the other a quiet blue.—and these, with the black and the neutral colour secured by the superposition of the two shades, give an excellent result, of which Haghe's sketches in Belgium may be taken as a leading example.

In making such subjects suitable for present-day printing in the machine, the paper will require to be of a good "rag" quality, free from size and damped before printing. To secure accuracy of register the paper must be kept in a damp cloth to prevent the edges drying, and other machines should be kept available for each of the tints so that all work printed in black in the morning may be completed the same night. In this way large editions might be printed of either original or retransferred work at prices rendering the prints suitable for high-class magazines.

Preparing a Chromo Lithograph.—For this purpose the proceedings will be much the same as those suggested for the black and tint work, but the preliminary tracing will be done in lithographic ink on tracing transfer paper or scratched on gelatine, the lines being subsequently filled in with transfer ink, and will be used as a "key," a guide stone that will not be printed; and the number of stones necessary will probably be much more numerous. The initial point will be to consider if the work is to have the edition printed from it, or whether it has to be transferred after proving and before printing; generally speaking, large subjects such as diagrams or posters will be worked direct, while Christmas cards, postcards, handbills or labels, will be repeated many times on larger stones. For the former class a much wider range of methods is possible, but many of these are difficult to transfer, and the deterioration that arises makes it desirable to limit their use when transferring is contemplated. Therefore, chalk-rubbed tints, varnish tints, stumping, wash, air brush, are the methods for original work, while work that has to be transferred is limited to ink work in line or stipple on a polished stone with the aid of "mediums" as before described, and ink "spluttered" on to the stone from a tooth brush. It should be mentioned that work done on grained paper is more suitable for retransfer than ordinary chalk work, and so is often very useful when a chalk effect is desired from a polished stone. In proving, opaque colours will be got on first, and it will often be found a good plan to put the black on early, for it gives a good idea of how the work is proceeding, and the strength of the touches (for the black should generally be used sparingly) is often pleasantly softened by the semi-opaque colours which should come on next. It is desirable to pull impressions of each colour on thoroughly white paper, and beyond this in important work there should be a progressive colour pattern that will show how the work looked when two, three or more colours were on, for this may at the finish be invaluable to show where error has crept in, and is in any event an immense aid to the machine minder.

In regard to paper, a description made of rag or rag and esparto is most desirable for all work on grained stones, but for work in ink and consequently from polished stone a good coated paper with sufficient "size" in it is frequently desirable; this paper is generally called "chromo" paper.

There is at the present time very little encouragement for the high class of chromo-lithography that was so much in evidence from 1855 to 1875, but there is little doubt that the work could be done equally well by the present-day craftsmen if the demand revived. Belonging to the period mentioned, distinguished examples of chromo-lithography are "Blue Lights," after Turner, by Carrick; "Spanish Peasants" and the Lumley portrait of Shakespeare, by Risdon; "Queen Victoria receiving the Guards," by W. Bunney, after John Gilbert; and the series of chromos after John Leech, produced under the general direction of Vincent Brooks. A small proportion only of the Arundel Society's prints were executed in England, but many reproductions of water-colours after Birket Foster, Richardson, Wainwright and others were executed by Samuel Hodson, James Lewis and others. Perhaps the most consistently good work of modern times has been the reproduction of Pellegrini's and Leslie Ward's drawings for *Vanity Fair*, which from 1870 to 1906 were with very few exceptions executed by the firm of Vincent Brooks, Day & Son.

Transfers.—A very large proportion of work is got on to the stone by transfer, and there is no more important part of the business perhaps at the present time. When there is so much original lithography done on grained paper by artists of eminence, the transferring of grained paper drawings is the most important. The stone most desirable for this purpose will be neither a grey nor a light yellow, but one that stands mid-way between the two; it should be very carefully polished so as to be quite free from scratches, and brought to blood-heat by being gradually heated in an iron cupboard prepared with the necessary apparatus. The methods that sometimes prevail of pouring boiling water over the stone, heating with the flame of an ordinary plumber's lamp, or even heating the surface in front of a fire, are ineffective substitutes, for the surface may thus become unduly hot and spread the work, and there is no increased tendency for the chalk to enter into the stone and thus give the work a long life. If there are no colours or registration troubles to be considered, it is well to place the transfer in a damping book till the composition adheres firmly to the finger, before placing it on the stone; it should then be pulled through twice, after which it should be damped on the back and pulled through several times; after this has again been well damped the paper will be found to peel easily off the stone, leaving the work and nearly all the composition attached; the latter should then be very gently washed away.

In cases where the work for some reason must not stretch, such as the hills on a map, it will be necessary to keep the transfer dry and put it on a wet stone, but a piece of the margin of the paper should be tested to see that it is of a class that will adhere to the stone the first time it is pulled through. Unless the adhesion is very complete it may not be safe to pull it through more than once. For a small number of copies a very moderate "etch" is desirable, but for a long run, where the object is to secure a good edition rather than a few good proofs, the Eberle system may be adopted. This method consists in protecting the work with finely powdered resin and then applying the flame of an ordinary plumber's lamp; this will melt the protecting medium round the base of each grain of work and allow of a very vigorous "etch" being applied. As before stated it is not unusual to secure 2000 to 3000 good copies in the machine after this treatment; but the rollers, the ink and the superintendence must be of the best.

When the artist who is not a professed lithographer desires to make tints to his work, a reversed offset on grained paper should be made for each colour; this is done by pulling an impression in the usual way on a hard piece of paper, and while it is yet wet this should be faced with a piece of grained paper and pulled through again, when the grained paper will be found to have received the greater portion of the ink; this should be immediately dusted with offset powder of a red shade to prevent the grease passing into the paper, and the drawing of the tints should then be proceeded with in the usual way. Another method of transfer work is to pull impressions from copper or steel plates in transfer ink; it is in such way that simple etchings like those of Cruikshank, Phiz and others are produced, and nearly all commercial work such as maps, bill heads, &c., are prepared in the same manner.

Beyond this, much work is done in lithographic ink on what is called writing transfer paper, such as circulars, law writing for abstracts, specifications and plans.

Machinery.—The chief items are the hand presses and the machines, whether flat bed or rotary, the principal places of manufacture being Leeds, Otley and Edinburgh. Stimulated by American competition, the standard of excellence in the United Kingdom has been very considerably raised of late years. The rotary machines have only been possible since the more frequent use of aluminium and zinc, but these materials are more suitable to receive transfer than for the general use of an office, the chief reason being that corrections on stone are more easily accomplished and more lasting when done. Preliminary work is therefore frequently done on the stone and transferred to plates for the machine.

The question is very frequently asked as to how the necessary registration of the colours is secured; it may be stated for the benefit of the amateur that in hand printing this is generally done by pricking with a pair of needles through printed marks present on each stone; but in the machine this has been done in different ways, although in quite early days "pointing" or "needling" was done even on the machine. On modern machines this registration depends on the accurate cutting of the edge of the paper, of which at least one corner must be an absolute right angle. The paper is then laid on a sloping board in such a way that the longest of the two true edges gravitates into the gripper of the machine, the stops of which move slightly forward as the gripper closes; simultaneously what is called the "side lay" moves forward automatically to a given extent, and in this way at the critical moment the sheet is always in the same position in regard to the stone, which has already been firmly secured in the bed of the machine.

Quite recently a new method has come into use that is probably destined to be a great aid to the craft in its competition with other methods. This is known as offset printing; it is more a matter of evolution than invention, and proceeds from the method adopted in tin-plate decoration so much used for box-making and lasting forms of advertisement. It consists in bringing a sheet of rubber into contact with the charged stone and then setting-off the impression so obtained upon card, paper, pegamoid, cloth or other material, the elasticity of the rubber making it possible to print upon rough surfaces that have been previously unsuited to lithographic printing. Both flat bed and rotary machines are available for this system, the latter being restricted to zinc or aluminium plates, but giving a high speed, while the former can use both stones and metal plates and may be more effective for the highest grade of colour work; by both classes of machines the finest engraved note headings can be printed on rough paper, and colour work that has for so long been confined to coated or burnished papers will be available on surfaces such as the artists themselves use.

The following treatises may be referred to with advantage by those in search of more detailed information: *A Complete Course of Lithography*, by Alois Senefelder (R. Ackermann, London, 1819); *The Grammar of Lithography*, by W. D. Richmond (13th edition, E. Menken, London); *Handbook of Lithography*, by David Cumming (London, A. & C. Black). The first of these will only be found in libraries of importance; the others are present-day text-books.

(F. V. B.)

LITHOSPHERE (Gr. λίθος, a stone, and σφαῖρα, a sphere), the crust of the earth surrounding the earth's nucleus. The superficial soil, a layer of loose earthy material from a few feet to a few hundreds of feet in thickness, lies upon a zone of hard rock many thousands of feet in thickness but varying in character, and composed mainly of sandstones, shales, clays, limestones and metamorphic rocks. These two layers form the lithosphere. All the tectonic movements of the solid nucleus produce changes in the mobile lithosphere. Volcanic and seismic activity is manifested, mountains are folded, levels change, fresh surfaces are exposed to denudation, erosion and deposition. The crust is thus subject to constant change while retaining its more or less permanent character.

LITHUANIANS and **LETTS,** two kindred peoples of Indo-European origin, which inhabit several western provinces of Russia and the north-eastern parts of Poland and Prussia, on the shores of the Baltic Sea, and in the basins of the Niemen and of the Duna. Large colonies of Lithuanian and Lettic emigrants have been established in the United States. The two races number about 3,500,000, of whom 1,300,000 are Letts. Little is known about their origin, and nothing about the time of their appearance in the country they now inhabit. Ptolemy mentions (iii. 5) two clans, the Galindae and Sudeni, who probably belonged to the western subdivision of this racial group, the Borussians. In the 10th century the Lithuanians were already known under the name of Litva, and, together with two other branches of the same stem—the Borussians and the Letts—they occupied the south-eastern coast of the Baltic Sea from the Vistula to the Duna, extending north-east towards the Lakes Vierzi-järvi and Peipus, south-east to the watershed between the affluents of the Baltic and those of the Black Sea, and south to the middle course of the Vistula (Brest Litovsk)—a tract bounded by Finnish tribes in the north, and by Slavs elsewhere.

Inhabiting a forested, marshy country the Lithuanians have been able to maintain their national character, notwithstanding the vicissitudes of their history. Their chief priest, *Krive-Kriveyto* (the judge of the judges), under whom were seventeen classes of priests and elders, worshipped in the forests; the Waidelots brought their offerings to the divinities at the foot of oaks; even now, the veneration of great oaks is a widely spread custom in the villages of the Lithuanians, and even of the Letts.

Even in the 10th century the Lithuanian stem was divided into three main branches:—the *Borussians* or *Prussians*; the *Letts* (who call themselves *Latvis*, whilst the name under which they are known in Russian chronicles, *Letygola*, is an abbreviation of *Latvin-galas*, "the confines of Lithuania"); and the *Lithuanians*, or rather *Lituanians*, *Litva* or *Letuvininkaĭ*,—these last being subdivided into Lithuanians proper, and *Zhmud'* (*Zmudz*, *Samogitians* or *Zemailey*), the "Lowlanders." To these main branches must be added the *Yatvyags*, or *Yadzvings*, a warlike, black-haired people who inhabited the forests at the upper tributaries of the Niemen and Bug, and the survivors of whom are easily distinguishable as a mixture with White-Russians and Mazurs in some parts of Grodno, Plotsk, Lomza and Warsaw. Nestor's chronicle distinguishes also the *Zhemgala*, who later became known under the name of *Semigallia*, and in the 10th century inhabited the left bank of the Duna. Several authors consider also as Lithuanians the *Kors* of Russian chronicles, or *Courons* of Western authors, who inhabited the peninsula of Courland, and the *Golad*, a clan settled on the banks of the Porotva, tributary of the Moskva river, which seems to have been thrown far from the main stem during its migration to the north. The *Krivichi*, who inhabited what is now the government of Smolensk, seem to belong to the same stem. Their name recalls the Krive-Kriveyto, and their ethnological features recall the Lithuanians; but they are now as much Slavonic as Lithuanian.

All these peoples are only ethnographical subdivisions, and each of them was subdivided into numerous independent clans and villages, separated from one another by forests and marshes; they had no towns or fortified places. The Lithuanian territory thus lay open to foreign invasions, and the Russians as well as the German crusaders availed themselves of the opportunity. The Borussians soon fell under the dominion of Germans, and ceased to constitute a separate nationality, leaving only their name to the state which later became Prussia. The Letts were driven farther to the north, mixing there with Livs and Ehsts, and fell under the dominion of the Livonian order. Only the Lithuanians proper, together with Samogitians, succeeded in forming an independent state. The early history of this state is imperfectly known. During the continuous petty war carried on against Slavonic invasions, the military chief of one of the clans, Ryngold, acquired, in the first half of the 13th century, a certain preponderance over other clans of Lithuania and Black Russia (Yatvyags), as well as over the republics of Red Russia. At this time, the invasions of the Livonian order becoming more frequent, and always extending southward, there was a general feeling of the necessity of some organization to resist them, and Ryngold's son, Mendowg, availed himself of this opportunity to pursue the policy of his father. He made different concessions to the order, ceded to it several parts of Lithuania, and even agreed to be baptized, in 1250, at Novograd Litovsk, receiving in exchange a crown from Innocent IV., with which he was crowned king of Lithuanians. He also ceded the whole of Lithuania to the order in case he should die without leaving offspring. But he had accepted Christianity only to increase his influence among other clans; and, as soon as he had consolidated a union between Lithuanians, Samogitians and Cours, he relapsed, proclaiming, in 1260, a general uprising of the Lithuanian people against the Livonian order. The yoke was shaken off, but internal wars followed, and three years later Mendowg was killed. About the end of the 13th century a new dynasty of rulers of Lithuania was founded by Lutuwer, whose second son, Gedymin (1316–1341), with the aid of fresh forces he organized through his relations with Red Russia, established something like regular government; he at the same time extended his dominions over Russian countries—over Black Russia (Novogrodok, Zditov, Grodno, Slonim and Volkovysk) and the principalities of Polotsk, Tourovsk, Pinsk, Vitebsk and Volhynia. He named himself *Rex Lethowinorum et multorum Ruthenorum.* In 1325 he concluded a treaty with Poland against the Livonian order, which treaty was the first step towards the union of both countries realized two centuries later. The seven sons of Gedymin considered themselves as quite independent; but two of them, Olgierd and Keistut, soon became the more powerful. They represented two different tendencies which existed at that time in Lithuania. Olgierd, whose family relations attracted him towards the south, was the advocate of union with Russia; rather politician than warrior, he increased his influence by diplomacy and by organization. His wife and sons being Christians, he also soon agreed to be baptized in the Greek Church. Keistut represented the revival of the Lithuanian nationality. Continually engaged in wars with Livonia, and remaining true to the national religion, he became the national legendary hero. In 1345 both brothers agreed to re-establish the great principality of Lithuania, and, after having taken Vilna, the old sanctuary of the country, all the brothers recognized the supremacy of Olgierd. His son, Jagiello, who married the queen of Poland, Yadviga, after having been baptized in the Latin Church, was crowned, on the 14th of February 1386, king of Poland. At the beginning of the 15th century Lithuania extended her dominions as far east as Vyazma on the banks of the Moskva river, the present government of Kaluga, and Poutivl, and south-east as far as Poltava, the shores of the Sea of Azov, and Haji-bey (Odessa), thus including Kiev and Lutsk. The union with

Poland remained, however, but nominal until 1569, when Sigismund Augustus was king of Poland. In the 16th century Lithuania did not extend its power so far east and south-east as two centuries before, but it constituted a compact state, including Polotsk, Moghilev, Minsk, Grodno, Kovno, Vilna, Brest, and reaching as far south-east as Chernigov. From the union with Poland, the history of Lithuania becomes a part of Poland's history, Lithuanians and White-Russians partaking of the fate of the Polish kingdom (see POLAND: *History*). After its three partitions, they fell under the dominion of the Russian empire. In 1792 Russia took the provinces of Moghilev and Polotsk, and in 1793 those of Vilna, Troki, Novgorod-Syeversk, Brest and Vitebsk. In 1797 all these provinces were united together, constituting the "Lithuanian government" (Litovskaya Gubernia). But the name of Lithuanian provinces was usually given only to the governments of Vilna and Kovno, and, though Nicholas I. prohibited the use of this name, it is still used, even in official documents. In Russia, all the White-Russian population of the former Polish Lithuania are usually considered as Lithuanians, the name of Zhmud being restricted to Lithuanians proper.

The ethnographical limits of the Lithuanians are undefined, and their number is variously estimated. The Letts occupy a part of the Courland peninsula of Livonia and of Vitebsk, a few other settlements being spread also in the governments of Kovno, St Petersburg and Moghilev. The Lithuanians proper inhabit the governments of Kovno, Vilna, Suvalki and Grodno; while the Samogitians or Zhmud inhabit the governments of Kovno and Suvalki. To these must be added about 200,000 Borussians, the whole number of Lithuanians and Letts in Russia being, according to the census of 1897, 3,094,469. They are slowly extending towards the south, especially the Letts; numerous emigrants have penetrated into Slavonic lands as far as the government of Voronezh.

The Lithuanians are well built; the face is mostly elongated, the features fine; the very fair hair, blue eyes and delicate skin distinguish them from Poles and Russians. Their dress is usually plain in comparison with that of Poles, and the predominance in it of greyish colours has been frequently noticed. Their chief occupation is agriculture. The trades in towns are generally carried on by men of other races—mostly by Germans, Jews or Poles. The only exception is afforded to some extent by the Letts. The Samogitians are good hunters, and all Lithuanians are given to apiculture and cattle breeding. But the Lithuanians, as well in the Baltic provinces as in the central ones, were not until the most recent time proprietors of the soil they tilled. They have given a few families to the Russian nobility, but the great mass of the people became serfs of foreign landowners, German and Polish, who reduced them to the greatest misery. Since the Polish insurrection of 1863, the Russian government has given to the Lithuanians the land of the Polish proprietors on much easier terms than in central Russia; but the allotments of soil and the redemption taxes are very unequally distributed; and a not insignificant number of peasants (the *chinsheviki*) were even deprived of the land they had for centuries considered their own. The Letts remain in the same state as before, and are restrained from emigrating *en masse* only by coercive measures.

The Letts of Courland, with the exception of about 50,000 who belong to the Greek Church, are Lutherans. Nearly all can read. Those of the government of Vitebsk, who were under Polish dominion, are Roman Catholics, as well as the Lithuanians proper, a part of whom, however, have returned to the Greek Church, in which they were before the union with Poland. The Samogitians are Roman Catholics; they more than other Lithuanians have conserved their national features. But all Lithuanians have maintained much of their heathen practices and creed; the names of pagan divinities, very numerous in the former mythology, are continually mentioned in songs, and also in common speech.

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Language and Literature.—The Lithuanian, Lettic or Lettish and Borussian or Old Prussian languages together constitute a distinct linguistic subdivision, commonly called the Baltic subdivision, within the Indo-European family. They have many affinities to the Slavonic languages, and are sometimes included with them in a single linguistic group, the Balto-Slavic. In their phonology, however, though not in their structure the Baltic languages appear to be more primitive than the Slavonic. Lithuanian, for example, retains the archaic diphthongs which disappear in Slavonic—Lith. *véidas*, "face," Gr. *εἶδος*, O.S. *vidŭ*. Among other noteworthy phonological characteristics of Lithuanian are the conversion of *k* into a sibilant, the loss of *h* and change of all aspirates into tenues and the retention of primitive consonantal noun-terminations, *e.g.* the final *s* in Sans. *Vṛkás*, Lith. *vı̃lkas*, O.S. *vŭlkŭ*. Lettic is phonologically less archaic than Lithuanian, although in a few cases it has preserved Indo-European forms which have been changed in Lithuanian, *e.g.* the *s* and *z* which have become Lith. *sz* (*sh*) and *ž* (*zh*). The accent in Lithuanian is free; in Lettic, and apparently in Old Prussian, it ultimately became fixed on the first syllable.

In its morphology Lettic represents a later stage of development than Lithuanian, their mutual relationship being analogous to that between Old High German and Gothic. Both languages have preserved seven out of the eight Indo-European cases; Lithuanian has three numbers, but Lettic has lost the dual (except in *diwi*, "two" and *abbi*, "both"); the neuter gender, which still appears in Lithuanian pronouns, has also been entirely lost in Lettic; in Lithuanian there are four simple tenses (present, future, imperfect, preterite), but in Lettic the imperfect is wanting. In both languages the number of periphrastic verb-forms and of diminutives is large; in both there are traces of a suffix article; and both have enriched their vocabularies with many words of foreign, especially German, Russian and Polish origin. The numerous Lithuanian dialects are commonly divided into High or Southern, which changes *ty* and *dy* into *cz*, *dz*, and Low or Northern, which retains *ty*, *dy*. Lettic is divided into High (the eastern dialects), Low (spoken in N.W. Courland) and Middle (the literary language). Old Prussian ceased to be a spoken language in the 17th century; its literary remains, consisting chiefly of three catechisms and two brief vocabularies, date almost entirely from the period 1517–1561 and are insufficient to permit of any thorough reconstruction of the grammar.

The literary history of the Lithuanians and Letts dates from the Reformation and comprises three clearly defined periods. (1) Up to 1700 the chief printed books were of a liturgical character. (2) During the 18th century a vigorous educational movement began; dictionaries, grammars and other instructive works were compiled, and written poems began to take the place of songs preserved by oral tradition. (3) The revival of national sentiment at the beginning of the 19th century resulted in the establishment of newspapers and the collection and publication of the national folk-poetry. In both literatures, works of a religious character predominate, and both are rich in popular ballads, folk-tales and fables.

The first book printed in Lithuanian was a translation of Luther's shorter Catechism (Königsberg, 1547); other translations of devotional or liturgical works followed, and by 1701 59 Lithuanian books had appeared, the most noteworthy being those of the preacher J. Bretkun (1535–1602). The spread of Calvinism led to the publication, in 1701, of a Lithuanian New Testament. The first dictionary was printed in 1749. But perhaps the most remarkable work of the second period was *The Four Seasons*, a pastoral poem in hexameters by Christian Donalitius (1714–1780), which was edited by Nesselmann (Königsberg, 1869) with a German translation and notes. In the 19th century various collections of fables and folk-tales were published, and an epic, the *Onikshta Grove*, was written by Bishop Baranoski. But it was in journalism that the chief original work of the third period was done. F. Kelch (1801–1877) founded the first Lithuanian newspaper, and between 1834 and 1895 no fewer than 34 Lithuanian periodicals were published in the United States alone.

Luther's Catechism (Königsberg, 1586) was the first book printed in Lettic, as in the sister speech. In the 17th century various translations of psalms, hymns and other religious works were published, the majority being Calvinistic in tone. The educational movement of the 18th century was inaugurated by G. F. Stender (1714–1796), author of a Lettic dictionary and grammar, of poems, tales and of a *Book of Wisdom* which treats of elementary science and history. Much educational work was subsequently done by the Lettic Literary Society, which publishes a magazine (*Magazin*, Mitau, from 1827), and by the "Young Letts," who published various periodicals and translations of foreign classics, and endeavoured to free their language and thought from German influences. Somewhat similar tasks were undertaken by the "Young Lithuanians," whose first magazine the *Auszra* ("Dawn") was founded in 1883. From 1890 to 1910 the literature of both peoples was marked by an ever-increasing nationalism; among the names most prominent during this period may be mentioned those of the dramatist Steperman and the poet Martin Lap, both of whom wrote in Lettic.

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LITMUS (apparently a corruption of *lacmus*, Dutch *lacmoes*, *lac*, lac, and *moes*, pulp, due to association with "lit," an obsolete word for dye, colour; the Ger. equivalent is *Lackmus*, Fr *tournesol*), a colouring matter which occurs in commerce in the form of small blue tablets, which, however, consist mostly, not of the pigment proper, but of calcium carbonate and sulphate and other matter devoid of tinctorial value. Litmus is extensively employed by chemists as an indicator for the detection of free acids and free alkalis. An aqueous infusion of litmus, when exactly neutralized by an acid, exhibits a violet colour, which by the least trace of free acid is changed to red, while free alkali turns it to blue. The reagent is generally used in the form of test paper—bibulous paper dyed red, purple or blue by the respective kind of infusion. Litmus is manufactured in Holland from the same kinds of lichens (species of *Roccella* and *Lecanora*) as are used for the preparation of archil (*q.v.*).

LITOPTERNA, a suborder of South American Tertiary ungulate mammals typified by *Macrauchenia*, and taking their name ("smooth-heel") from the presence of a flat facet on the heel-bone, or calcaneum for the articulation of the fibula. The more typical members of the group were digitigrade animals, recalling in general build the llamas and horses; they have small brains, and a facet on the calcaneum for the fibula. The cheek-dentition approximates more or less to the perissodactyle type. Both the terminal faces of the cervical vertebrae are flat, the femur carries a third trochanter, the bones of both the carpus and tarsus are arranged in linear series, and the number of toes, although commonly three, varies between one and five, the third or middle digit being invariably the largest.

Of the two families, the first is the *Proterotheriidae*, which exhibits, in respect of the reduction of the digits, a curious parallelism to the equine line among the Perissodactyla; in this feature, as well as in the reduction of the teeth, it is more specialized than the second family.

The molar teeth approximate to the *Palaeotherium* type, but have a more or less strongly developed median longitudinal cleft. The three-toed type is represented by *Diadiaphorus*, in which the dental formula is $i.\frac{1}{2}, c.\frac{0}{1}, p\,\frac{4}{4}, m.\frac{3}{3}$, and the feet are very like those of *Hipparion*. The cervical vertebrae are of normal form, the orbit (as in the second family) is encircled by bone, the last molar has a third lobe, the single pair of upper incisors are somewhat elongated, and have a gap between and behind them, while the outer lower incisors are larger than the inner pair, the canines being small. The skull has a short muzzle, with elongated nasals. Remains of this and the other representatives of the group are found in the Patagonian Miocene. In *Proterotherium*, which includes smaller forms having the same, or nearly the same, dental formula, the molar teeth differ from those of *Diadiaphorus* by the deeper median longitudinal cleft, which completely divides the crown into an inner and an outer moiety, the two cones of the inner half being united. According to the description given by Argentine palaeontologists, this genus is also three-toed, the single-toed representative of the family being *Thoatherium*, in which the lateral metapodials, or splint-bones, are even more reduced than in the *Equidae*.

In the second family—*Macraucheniidae*—the dentition is complete (forty-four) and without a gap, the crowns of nearly all the teeth being of nearly uniform height, while the upper molars are distinguished from those of the *Proterotheriidae* by a peculiar arrangement of their two inner cones, and the elevation of the antero-posterior portion of the cingulum so as to form an extra pit on the crown. To describe this arrangement in detail is impossible here, but it may be stated that the two inner cones are closely approximated, and separated by a narrow V-shaped notch on the inner side of the crown. The elongated cervical vertebrae are peculiar in that the arch is perforated by the artery in the same manner as in the llamas.

In the Santa Cruz beds of Patagonia the family is represented by the generalized genus *Oxyodontotherium* (in which *Theosodon* may apparently be included). It comprises animals ranging up to the size of a tapir, in which the nostrils were more or less in the normal anterior position, and the cheek-teeth short-crowned, with the inner cones of the upper molars well developed and separated by a notch, and the pits of moderate depth. The last upper premolar is simpler than the molars, and the canine, which may be double-rooted, is like the earlier premolars. The radius and ulna, like the tibia and fibula, are distinct, and the metapodials rudimentary. On the other hand, in *Macrauchenia*, which was a much larger llama-like animal, the skull is elongated and narrow, with rudimentary nasals, and the aperture of the nose placed nearly on the line of the eyes and directed upwards, the muzzle not improbably terminating in a short trunk. Deep pits on the forehead probably served for the attachment of special muscles connected with the latter. Very curious is the structure of the cheek-teeth, which are high-crowned, with the two inner cones reduced to mere points, and the pits on the crown-surface large and funnel-shaped. In fact, the perissodactyle type is almost lost. The cervical vertebrae and limb-bones are very long, the radius and ulna being completely, and the tibia and fibula partially, united. The typical *M. patagonica* is a Pleistocene form as large as a camel, ranging from Patagonia to Brazil, but remains of smaller species have been found in the Pliocene (?) of Bolivia and Argentina.

The imperfectly known *Scalabrinia* of the Argentine Pliocene appears to occupy a position intermediate between *Oxyodontotherium* and *Macrauchenia*, having the nasal aperture situated in the middle of the length of the skull, and the crowns of the cheek-teeth nearly as tall as in the latter, but the lower molars furnished with a projecting process in the hinder valley, similar to one occurring in those of the former.

In this place may be mentioned another strange ungulate from the Santa Cruz beds of Patagonia, namely, *Astrapotherium*, sometimes regarded as typifying a suborder by itself. This huge ungulate had cheek-teeth singularly like those of a rhinoceros, and an enormous pair of tusk-like upper incisors, recalling the upper canines of *Machaerodus* on an enlarged scale. In the lower jaw are two large tusk-like canines between which are three pairs of curiously-formed spatulate incisors, and in both jaws there is a long diastema. The dental formula appears to be $i.\frac{1}{3}, c.\frac{0}{1}, p.\frac{2}{1}, m.\frac{3}{3}$.

Next *Astrapotherium* may be provisionally placed the genus *Homalodontotherium*, of which the teeth have much lower crowns, and are of a less decidedly rhinocerotic type than in *Astrapotherium*, and the whole dentition forms an even and unbroken series. The bodies of the cervical vertebrae are short, with flattened articular surfaces, the humerus has an enormous deltoid crest, suggestive of fossorial powers, and the femur is flattened, with a third trochanter. According to the Argentine palaeontologists, the carpus is of the alternating type, and the terminal phalanges of the pentedactyle feet are bifid, and very like those of Edentata. Indeed, this type of foot shows many edentate resemblances. The astragalus is square and flattened, articulating directly with the navicular, although not with the cuboid, and having a slightly convex facet for the tibia. From the structure of the above-mentioned type of foot, which is stated to have been found in association with the skull, it has been suggested that *Homalodontotherium* should be placed in the *Ancylopoda* (*q.v.*), but, to say nothing of the different form of the cheek-teeth, all the other South American Santa Cruz ungulates are so distinct from those of other countries that this seems unlikely. It may be suggested that we have rather to deal with an instance of parallelism—a view supported by the parallelism to the *Equidae* presented by certain members of the *Proterotheriidae*. (R. L.*)

LITOTES (Gr. λιτότης, plainness, λιτός, plain, simple, smooth), a rhetorical figure in which emphasis is secured for a statement by turning it into a denial of the contrary, *e.g.* "a citizen of no mean city," *i.e.* a citizen of a famous city, "A. is not a man to be neglected." Litotes is sometimes used for what should be more strictly called "meiosis" (Gr. μείωσις, lessening, diminution, μείων, lesser), where the expressions used apparently are weak or understated, but the effect is to intensify.

LITTER (through O. Fr. *litere* or *litiere*, mod. *litière* from Med. Lat. *lectaria*, classical *lectica*, *lectus*, bed, couch), a word used of a portable couch, shut in by curtains and borne on poles by bearers, and of a bed of straw or other suitable substance for animals; hence applied to the number of young produced by an animal at one birth, and also to any disordered heap of waste material, rubbish, &c. In ancient Greece, prior to the influence of Asiatic luxury after the Macedonian conquest, the litter (φορεῖον) was only used by invalids or by women. The Romans, when the *lectica* was introduced, probably about the latter half of the 2nd century B.C. (Gellius x. 3), used it only for travelling purposes. Like the Greek or Asiatic litter, it had a roof of skin (*pellis*) and side curtains (*vela*, *plagae*). Juvenal (iv. 20) speaks of transparent sides (*latis specularibus*). The slaves who bore the litter on their shoulders (*succollare*) were termed *lecticarii*, and it was a sign of luxury and wealth to employ six or even eight bearers. Under the Empire the litter began to be used in the streets of Rome, and its use was restricted and granted as a privilege (Suet. *Claudius*). The travelling *lectica* must be distinguished from the much earlier *lectica funebris* or *feretrum*, the funeral bier on which the dead were carried to their burial-place.

LITTLE FALLS, a city and the county-seat of Morrison county, Minnesota, U.S.A., on both banks of the Mississippi river, about 88 m. N.W. of Minneapolis. Pop. (1890) 2354; (1900) 5774, of whom 1559 were foreign-born, chiefly Germans and Swedes; (1905) 5856; (1910) 6078. It is served by the Northern Pacific railway. The city is situated in a prosperous farming region, and has excellent water-power and various manufactures. Little Falls was settled about 1850, was chartered as a city in 1889 and adopted a new charter in 1902. Here was buried the Chippewa chief, Hole-in-the-Day (*c.* 1827–1868), or Bagwunagijik, who succeeded his father, also named Hole-in-the-Day, as head chief of the Chippewas in 1846. Like his father, the younger Hole-in-the-Day led his tribe against the Sioux, and he is said to have prevented the Chippewas from joining the Sioux rising in 1862. His body was subsequently removed by his relatives.

LITTLE FALLS, a city of Herkimer county, New York, U.S.A., on the Mohawk river, 21 m. E.S.E. of Utica. Pop. (1890) 8783; (1900) 10,381, of whom 1915 were foreign-born; (1910 census) 12,273. It is served by the New York Central & Hudson River, the West Shore, the Utica & Mohawk Valley (electric), and the Little Falls & Dolgeville railways (the last named being 13 m. long and running only to Salisbury Center and by the Erie canal. The Mohawk river falls here by a series of rapids 45 ft. in less than a mile, furnishing water power. Among the manufactures are cotton yarn, hosiery and knit goods, leather, &c. In 1905 the city's factory products were valued at $4,471,080. The city has one of the largest cheese-markets in the United States. The manufacture of flour and grist-mill products was formerly an important industry; a mill burned in 1782 by Tories and Indians had supplied almost the entire Mohawk Valley, and particularly Forts Herkimer and Dayton. Near the city is the grave of General Nicholas Herkimer, to whom a monument was erected in 1896. Little Falls was settled by Germans in 1782, and was almost immediately destroyed by Indians and Tories. It was resettled in 1790, and was incorporated as a village in 1811 and as a city in 1895.

See George A. Hardin, *History of Herkimer County* (Syracuse, 1893).

LITTLEHAMPTON, a seaport and watering-place in the Chichester parliamentary division of Sussex, England, at the mouth of the Arun, 62 m. S. by W. from London by the London, Brighton & South Coast railway. Pop. of urban district (1901) 7363. There is a beach of firm sand. The harbour is easily accessible in all weathers, and has a small general trade.

LITTLE ROCK, the capital of Arkansas, U.S.A., and the county-seat of Pulaski county, situated near the centre of the state and on the S. bank of the Arkansas river, at the E. edge of the Ozark foothills. Pop. (1890) 25,874; (1900) 38,307, of whom 14,694 were of negro blood, and 2099 were foreign-born; (1910 census) 45,941. Little Rock is served by the Chicago, Rock Island & Pacific, the St Louis South Western, and the St Louis, Iron Mountain & Southern railways and by river boats. It occupies a comparatively level site of 11 sq. m. at an altitude of 250 to 400 ft. above sea-level and 50 ft. or more above the river, which is crossed here by three railway bridges and by a county bridge. The city derived its name (originally "le Petit Roche" and "The Little Rock") from a rocky peninsula in the Arkansas, distinguished from the "Big Rock" (the site of the army post, Fort Logan H. Roots), 1 m. W. of the city, across the river. The Big Rock is said to have been first discovered and named "Le Rocher Français" in 1722 by Sieur Bernard de la Harpe, who was in search of an emerald mountain; the Little Rock is now used as an abutment for a railway bridge. The state capitol, the state insane asylum, the state deaf mute institute, the state school for the blind, a state reform school, the penitentiary, the state library and the medical and law departments of the state university are at Little Rock; and the city is also the seat of the United States court for the eastern district of Arkansas, of a United States land office, of Little Rock College, of the St Mary's Academy, of a Roman Catholic orphanage and a Roman Catholic convent, and of two schools for negroes—the Philander Smith College (Methodist Episcopal, 1877), co-educational, and the Arkansas Baptist College. The city is the seat of Protestant Episcopal and Roman Catholic bishops. Little Rock has a Carnegie library (1908), an old ladies' home, a Florence Crittenton rescue home, a children's home, St Vincent's infirmary, a city hospital, a Catholic hospital, a physicians' and surgeons' hospital and the Arkansas hospital for nervous diseases. A municipal park system includes City, Forest, Wonderland and West End parks. Immigration from the northern states has been encouraged, and northern men control much of the business of the city. In 1905 the value of factory products was $4,689,787, being 38·8% greater than the value in 1900. Cotton and lumber industries are the leading interests; the value of cotton-seed oil and cake manufactured in 1905 was $967,043, of planing mill products $835,049, and of lumber and timber products $342,134. Printing and publishing and the manufacture of foundry and machine shop products and of furniture are other important industries. Valuable deposits of bauxite are found in Pulaski county, and the mines are the most important in the United States.

Originally the site of the city was occupied by the Quapaw Indians. The earliest permanent settlement by the whites was about 1813–1814; the county was organized in 1818 while still a part of Missouri Territory; Little Rock was surveyed in 1821, was incorporated as a town and became the capital of Arkansas in 1821, and was chartered as a city in 1836. In 1850 its population was only 2167, and in 1860 3727; but in 1870 it was 12,380. Little Rock was enthusiastically anti-Union at the outbreak of the Civil War. In February 1861, the United States Arsenal was seized by the state authorities. In September 1863 the Federal generals William Steele (1819–1885) and John W. Davidson (1824–1881), operating against General Sterling Price, captured the city, and it remained throughout the rest of the war under Federal control. Constitutional conventions met at Little Rock in 1836, 1864, 1868 and 1874, and also the Secession Convention of 1861. The *Arkansas Gazette*, established at Arkansas Post in 1819 and soon afterwards removed to the new capital, was the first newspaper published in Arkansas and one of the first published west of the Mississippi.

LITTLETON (or Lyttelton), **EDWARD,** Baron (1589–1645), son of Sir Edward Littleton (d. 1621) chief-justice of North Wales, was born at Munslow in Shropshire; he was educated at Oxford and became a lawyer, succeeding his father as chief-justice of North Wales. In 1625 he became a member of parliament and acted in 1628 as chairman of the committee of grievances upon whose report the Petition of Right was based. As a member of the party opposed to the arbitrary measures of Charles I. Littleton had shown more moderation than some of his colleagues, and in 1634, three years after he had been chosen recorder of London, the king attached him to his own side by appointing him solicitor-general. In the famous case about ship-money Sir Edward argued against Hampden. In 1640 he was made chief-justice of the common pleas and in 1641 lord keeper of the great seal, being created a peer as Baron Lyttelton. About this time, the lord keeper began to display a certain amount of indifference to the royal cause. In January 1642 he refused to put the great seal to the proclamation for the arrest of the five members and he also incurred the displeasure of Charles by voting for the militia ordinance. However, he assured his friend Edward Hyde, afterwards earl of Clarendon, that he had only taken this step to allay the suspicions of the parliamentary party who contemplated depriving him of the seal, and he undertook to send this to the king. He fulfilled his promise, and in May 1642 he himself joined Charles at York, but it was some time before he regained the favour of the king and the custody of the seal. Littleton died at Oxford on the 27th of August 1645; he left no sons and his barony became extinct. His only daughter, Anne, married her cousin Sir Thomas Littleton, Bart. (d. 1681), and their son Sir Thomas Littleton (*c.* 1647–1710), was speaker of the House of Commons from 1698 to 1700, and treasurer of the navy from 1700 to 1710. Macaulay thus sums up the character of Speaker Littleton and his relations to the Whigs: "He was one of their ablest, most zealous and most steadfast friends; and had been, both in the House of Commons and at the board of treasury, an invaluable second to Montague" (the earl of Halifax).

LITTLETON, SIR THOMAS DE (*c.* 1407–1481), English judge and legal author, was born, it is supposed, at Frankley Manor House, Worcestershire, about 1407. Littleton's surname was that of his mother, who was the sole daughter and heiress of Thomas de Littleton, lord of Frankley. She married one Thomas Westcote. Thomas was the eldest of four sons of the marriage, and took the name of Littleton, or, as it seems to have been more commonly spelt, Luttelton. The date of his birth is uncertain; a MS. pedigree gives 1422, but it was probably earlier than this. If, as is generally accepted, he was born at Frankley Manor, it could not have been before 1407, in which year Littleton's grandfather recovered the manor from a distant branch of the family. He is said by Sir E. Coke to have "attended one of the universities," but there is no corroboration of this statement. He was probably a member of the Inner Temple, and lectured there on the statute of Westminster II., *De Donis Conditionalibus*. His name occurs in the Paston Letters (ed. J. Gairdner, i. 60) about 1445 as that of a well-known counsel and in 1481/2 he received a grant of the manor of Sheriff Hales, Shropshire, from a Sir William Trussel as a reward for his services as counsel. He appears to have been recorder of Coventry in 1450; he was made escheator of Worcestershire, and in 1447/8 was under-sheriff of the same county; he became serjeant-at-law in 1453 and was afterwards a justice of assize on the northern circuit. In 1466 he was made a judge of the common pleas, and in 1475 a knight of the Bath. He died, according to the inscription on his tomb in Worcester cathedral, on the 23rd of August 1481. He married, about 1444, Joan, widow of Sir Philip Chetwind of Ingestrie in Staffordshire, and by her had three sons, through whom he became ancestor of the families holding the peerages of Cobham (formerly Lyttelton, *q.v.*) and Hatherton.

His *Treatise on Tenures* was probably written after he had been appointed to the bench. It is addressed to his second son Richard, who went to the bar, and whose name occurs in the year books of the reign of Henry VII. The book, both historically and from its intrinsic merit, may be characterized as the first text-book upon the English law of property. The law of property in Littleton's time was mainly concerned with rights over land, and it was the law relating to this class of rights which Littleton set himself to digest and classify. The time was ripe for the task. Ever since the Conquest regular courts of justice had been at work administering a law which had grown out of an admixture of Teutonic custom and of Norman feudalism. Under Henry II. the courts had been organized, and the practice of keeping regular records of the proceedings had been carefully observed. The centralizing influence of the royal courts and of the justices of assize, working steadily through three centuries, had made the rules governing the law of property uniform throughout the land; local customs were confined within certain prescribed limits, and were only recognized as giving rise to certain well-defined classes of rights, such, for instance, as the security of tenure acquired by villeins by virtue of the custom of the manor, and the rights of freeholders, in some towns, to dispose of their land by will. Thus, by the time of Littleton (Henry VI. and Edward IV.), an immense mass of material had been acquired and preserved in the rolls of the various courts. Reports of important cases were published in the "year books." A glance at Statham's *Abridgment*, the earliest digest of decided cases, published nearly at the same time as Littleton's *Tenures*, is sufficient to show the enormous bulk which reported cases had already attained as materials for the knowledge of English law.

Littleton's treatise was written in that peculiar dialect compounded of Norman-French and English phrases called law French. Although it had been provided by a statute of 36 Edward III. that *viva voce* proceedings in court should no longer be conducted in the French tongue, "which was much unknown in the realm," the practice of reporting proceedings in that language, and of using it in legal treatises, lingered till a much later period, and was at length prohibited by a statute passed in the time of the Commonwealth in 1650. Unlike the preceding writers on English law, Glanville, Bracton and the authors of the treatises known by the names of Britton and Fleta, Littleton borrows nothing from the sources of Roman law or the commentators. He deals exclusively with English law.

The book is written on a definite system, and is the first attempt at a scientific classification of rights over land. Littleton's method is to begin with a definition, usually clearly and briefly expressed, of the class of rights with which he is dealing. He then proceeds to illustrate the various characteristics and incidents of the class by stating particular instances, some of which refer to decisions which had actually occurred, but more commonly they are hypothetical cases put by way of illustration of his principles. He occasionally refers to reported cases. His book is thus much more than a mere digest of judicial decisions; to some extent he pursues the method which gave to Roman law its breadth and consistency of principle. In Roman law this result was attained through the practice of putting to jurisconsults hypothetical cases to be solved by them. Littleton, in like manner, is constantly stating and solving by reference to principles of law cases which may or may not have occurred in actual practice.

In dealing with freehold estates Littleton adopts a classification which has been followed by all writers who have attempted to systematize the English law of land, especially Sir M. Hale and Sir William Blackstone. It is indeed the only possible approach to a scientific arrangement of the intricate "estates in land" known to English law. He classifies estates in land by reference to their duration, or in other words by reference to the differences between the persons who are entitled to succeed upon the death of the person in possession or "tenant." First of all, he describes the characteristics of tenancy in fee simple. This is still as it was in Littleton's time the largest interest in land known to the law. Next in order comes tenancy in fee tail, the various classes of which are sketched by Littleton with brevity and accuracy, but he is silent as to the important practice, which first received judicial recognition shortly before his death, of "suffering a recovery," whereby through a series of judicial fictions a tenant in tail was enabled to convert his estate tail into a fee simple, thus acquiring full power of alienation. After discussing in their logical order other freehold interests in land, he passes to interests in land called by later writers interests less than freehold, namely, tenancies for terms of years and tenancies at will. With the exception of tenancy from year to year, now so familiar to us, but which was a judicial creation of a date later than the time of Littleton, the first book is a complete statement of the principles of the common law, as they for the most part still exist, governing and regulating interests in lands. The first book concludes with a very interesting chapter on copyhold tenures, which marks the exact point at which the tenant by copy of court roll, the successor of the villein, who in his turn represented the freeman reduced to villenage by the growth of the manorial system, acquired security of tenure.

The second book relates to the reciprocal rights and duties of lord and tenant, and is mainly of historical interest to the modern lawyer. It contains a complete statement of the law as it stood in Littleton's time relating to homage, fealty and escuage, the money compensation to be paid to the lord in lieu of military service to be rendered to the king, a peculiar characteristic of English as distinguished from Continental feudalism.

Littleton then proceeds to notice the important features of tenure by knight's service with its distinguishing incidents of the right of wardship of the lands and person of the infant heir or heiress, and the right of disposing of the ward in marriage. The non-military freehold tenures are next dealt with; we have an account of "socage tenure," into which all military tenures were subsequently commuted by a now unrecognized act of the Long Parliament in 1650, afterwards re-enacted by the well-known statute of Charles II. (1660), and of "frankalmoign," or the spiritual tenure by which churchmen held. In the description of burgage tenure and tenure in villenage, the life of which consists in the validity of ancient customs recognized by law, we recognize survivals of a time before the iron rule of feudalism had moulded the law of land in the interests of the king and the great lords. Finally he deals with the law of rents, discussing the various kinds of rents which may be reserved to the grantor upon a grant of lands and the remedies for recovery of rent, especially the remedy by distress.[1]

The third and concluding book of Littleton's treatise deals mainly with the various ways in which rights over land can be acquired and terminated in the case of a single possessor or several possessors. This leads him to discuss the various modes in which several persons may simultaneously have rights over the same land, as parceners:—daughters who are co-heiresses, or sons in gavelkind; joint tenants and tenants in common. Next follows an elaborate discussion upon what are called estates upon condition—a class of interests which occupied a large space in the early common law, giving rise on one side to estates tail, on another to mortgages. In Littleton's time a mortgage, which he carefully describes, was merely a conveyance of land by the tenant to the mortgagee, with a condition that, if the tenant paid to the mortgagee a certain sum on a certain day, he might re-enter and have the land again. If the condition was not fulfilled, the interest of the mortgagee became absolute, and Littleton gives no indication of any modification of this strict rule, such as was introduced by courts of equity, permitting the debtor to redeem his land by payment of all that was due to the mortgagee although the day of payment had passed, and his interest had become at law indefeasible. The remainder of the work is occupied with an exposition of a miscellaneous class of modes of acquiring rights of property, the analysis of which would occupy too large a space.

The work is thus a complete summary of the common law as it stood at the time. It is nearly silent as to the remarkable class of rights which had already assumed vast practical importance—equitable interests in lands. These are only noticed incidentally in the chapter on "Releases." But it was already clear in Littleton's time that this class of rights would become the most important of all. Littleton's own will, which has been preserved, may be adduced in proof of this assertion. Although nothing was more opposed to the spirit of Norman feudalism than that a tenant of lands should dispose of them by will, we find Littleton directing by his will the feoffees of certain manors to make estates to the persons named in his will. In other words, in order to acquire over lands powers unknown to the common law, the lands had been conveyed to "feoffees" who had full right over them according to the common law, but who were under a conscientious obligation to exercise those rights at the direction and for the exclusive benefit of the person to whose "use" the lands were held. This conscientious obligation was recognized and enforced by the chancellor, and thus arose the class of equitable interests in lands. Littleton is the first writer on English law after these rights had risen into a prominent position, and it is curious to find to what extent they are ignored by him.

Bibliography.—The work of Littleton occupies a place in the history of typography as well as of law. The earliest printed edition seems to be that by John Lettou and William de Machlinia, two printers who probably came from the Continent, and carried on their business in partnership, as their note to the edition of Littleton states, "in civitate Londoniarum, juxta ecclesiam omnium sanctorum." The date of this edition is uncertain, but the most probable conjecture, based on typographical grounds, places it about the latter part of 1481. The next edition is one by Machlinia alone, probably about two or three years later than the former. Machlinia was then in business alone "juxta pontem quae vulgo dicitur Fleta brigge." Next came the Rohan or Rouen edition, erroneously stated by Sir E. Coke to be the earliest, and to have been printed about 1533. It was, however, of a much earlier date. Tomlins, the latest editor of Littleton, gives reasons for thinking that it cannot have been later than 1490. It is stated in a note to have been printed at Rouen by William le Tailleur "ad instantiam Richardi Pynson." Copies of all these editions are in the British Museum. In all these editions the work is styled *Tenores Novelli*, probably to distinguish it from the "Old Tenures."

There are three early MSS. of Littleton in the University Library at Cambridge. One of these formerly contained a note on its first page to the effect that it was bought in St Paul's Churchyard on July 20, 1480. It was therefore in circulation in Littleton's lifetime. The other two MSS. are of a somewhat later date; but one of them contains what seems to be the earliest English translation of the *Tenures*, and is probably not later than 1500.

In the 16th century editions of Littleton followed in rapid succession from the presses of Pynson, Redmayne, Berthelet, Tottyl and others. The practice of annotating the text caused several additions to be introduced, which, however, are easily detected by comparison of the earlier copies. In 1581 West divided the text into 746 sections, which have ever since been preserved. Many of these editions were printed with large margins for purposes of annotation, specimens of which may be seen in Lincoln's Inn Library.

The practice of annotating Littleton was very general, and was adopted by many eminent lawyers besides Sir E. Coke, amongst others by Sir M. Hale. One commentary of this kind, by an unknown hand of earlier date than Sir E. Coke's, was edited by Cary in 1829. Following the general practice of dealing with Littleton as the great authority on the law of England, "the most perfect and absolute work that ever was written in any human science," Sir E. Coke made it in 1628 the text of that portion of his work which he calls the first part of the institutes of the law of England, in other words, the law of property.

The first printed English translation of Littleton was by Rastell, who seems to have combined the professions of author, printer and serjeant-at-law, between 1514 and 1533. Many English editions by various editors followed, the best of which is Tottyl's in 1556. Sir E. Coke adopted some translation earlier than this, which has since gone by the name of Sir E. Coke's translation. He, however, throughout comments not on the translation but on the French text; and the reputation of the commentary has to some extent obscured the intrinsic merit of the original.

See E. Wambaugh, *Littleton's Tenures in English* (Washington, D.C., 1903).

LITTRÉ, MAXIMILIEN PAUL ÉMILE (1801–1881), French lexicographer and philosopher, was born in Paris on the 1st of February 1801. His father had been a gunner, and afterwards sergeant-major of marine artillery, in the French navy, and was deeply imbued with the revolutionary ideas of the day. Settling down as a collector of taxes, he married Sophie Johannot, a free-thinker like himself, and devoted himself to the education of his son Émile. The boy was sent to the Lycée Louis-le-Grand, where he had for friends Hachette and Eugène Burnouf. After he had completed his course at school, he hesitated for a time as to what profession he should adopt, and meanwhile made himself master, not only of the English and German languages, but of the classical and Sanskrit literature and philology. At last he determined to study medicine, and in 1822 entered his name as a student of medicine. He passed all his examinations in due course, and had only his thesis to prepare in order to obtain his degree as doctor when in 1827 his father died, leaving his mother absolutely without resources. He at once renounced his degree, and, while attending the lectures of P. F. O. Rayer and taking a keen interest in medicine, began teaching Latin and Greek for a livelihood. He carried a musket on the popular side in the revolution of February 1830, and was one of the national guards who followed Charles X. to Rambouillet. In 1831 he obtained an introduction to Armand Carrel, the editor of the *National*, who gave him the task of reading the English and German papers for excerpts. Carrel by chance, in 1835, discovered the ability of his reader, who from that time became a constant contributor, and eventually director of the paper. In 1836 Littré began to contribute articles on all sorts of subjects to the *Revue des deux mondes*; in 1837 he married; and in 1839 appeared the first volume of his edition of the works of Hippocrates. The value of this work was recognized by his election the same year into the Académie des Inscriptions et Belles-Lettres. At this epoch he came across the works of Auguste Comte, the reading of which formed, as he himself said, "the cardinal point of his life," and from this time onward appears the influence of positivism on his own life, and, what is of more importance, his influence on positivism, for he gave as much to positivism as he received from it. He soon became a friend of Comte, and popularized his ideas in numerous works on the positivist philosophy. At the same time he continued his edition of Hippocrates, which was not completed till 1862, published a similar edition of Pliny's *Natural History*, and after 1844 took Fauriel's place on the committee engaged on the *Histoire littéraire de la France*, where his knowledge of the early French language and literature was invaluable.

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[1] These two books are stated, in a note to the table at the conclusion of the work, to have been made for the better understanding of certain chapters of the *Antient Book of Tenures*. This refers to a tract called *The Old Tenures*, said to have been written in the reign of Edward III. By way of distinguishing it from this work, Littleton's book is called in all the early editions "Tenores Novelli."

It was about 1844 that he started working on his great *Dictionnaire de la langue française*, which was, however, not to be completed till thirty years after. In the revolution of July 1848 he took part in the repression of the extreme republican party in June 1849. His essays, contributed during this period to the *National*, were collected together and published under the title of *Conservation, révolution et positivisme* in 1852, and show a thorough acceptance of all the doctrines propounded by Comte. However, during the later years of his master's life, he began to perceive that he could not wholly accept all the dogmas or the more mystic ideas of his friend and master, but he concealed his differences of opinion, and Comte failed to perceive that his pupil had outgrown him, as he himself had outgrown his master Saint-Simon. Comte's death in 1858 freed Littré from any fear of embittering his master's later years, and he published his own ideas in his *Paroles de la philosophie positive* in 1859, and at still greater length in his work in *Auguste Comte et la philosophie positive* in 1863. In this book he traces the origin of Comte's ideas through Turgot, Kant and Saint-Simon, then eulogizes Comte's own life, his method of philosophy, his great services to the cause and the effect of his works, and finally proceeds to show where he himself differs from him. He approved wholly of Comte's philosophy, his great laws of society and his philosophical method, which indeed he defended warmly against J. S. Mill, but declared that, while he believed in a positivist philosophy, he did not believe in a religion of humanity. About 1863, after completing his Hippocrates and his Pliny, he set to work in earnest on his French dictionary. In the same year he was proposed for the Académie Française, but rejected, owing to the opposition of Mgr. Dupanloup, bishop of Orleans, who denounced him in his *Avertissement aux pères de famille* as the chief of the French materialists. He also at this time started with G. Wyrouboff the *Philosophie Positive*, a review which was to embody the views of modern positivists. His life was thus absorbed in literary work till the overthrow of the empire called on him to take a part in politics. He felt himself too old to undergo the privations of the siege of Paris, and retired with his family to Britanny, whence he was summoned by M. Gambetta to Bordeaux, to lecture on history, and thence to Versailles to take his seat in the senate to which he had been chosen by the department of the Seine. In December 1871 he was elected a member of the Académie Française in spite of the renewed opposition of Mgr. Dupanloup, who resigned his seat rather than receive him. Littré's *Dictionary* was completed in 1873. An authoritative interpretation is given of the use of each word, based on the various meanings it had held in the past. In 1875 Littré was elected a life senator. The most notable of his productions in these years were his political papers attacking and unveiling the confederacy of the Orleanists and legitimists, and in favour of the republic, his republication of many of his old articles and books, among others the *Conservation, révolution et positivisme* of 1852 (which he reprinted word for word, appending a formal, categorical renunciation of many of the Comtist doctrines therein contained), and a little tract *Pour la dernière fois*, in which he maintained his unalterable belief in materialism. When it became obvious that the old man could not live much longer, his wife and daughter, who had always been fervent Catholics, strove to convert him to their religion. He had long interviews with Père Milleriot, a celebrated controversialist, and was much grieved at his death; but it is hardly probable he would have ever been really converted. Nevertheless, when on the point of death, his wife had him baptized, and his funeral was conducted with the rites of the Catholic Church. He died on the 2nd of June 1881.

The following are his most important works: his editions of Hippocrates (1839–1861), and of Pliny's *Natural History* (1848–1850); his translation of Strauss's *Vie de Jésus* (1839–1840), and Müller's *Manuel de physiologie* (1851); his edition of the works of Armand Carrel, with notes (1854–1858); the *Histoire de la langue française*, a collection of magazine articles (1862); and his *Dictionnaire de la langue française* (1863–1872). In the domain of science must be noted his edition, with Charles Robin, of Nysten's *Dictionnaire de médicine, de chirurgie*, &c. (1855); in that of philosophy, his *Analyse raisonnée du cours de philosophie positive de M. A. Comte* (1845); *Application de la philosophie positive au gouvernement* (1849); *Conservation, révolution et positivisme* (1852, 2nd ed., with supplement, 1879); *Paroles de la philosophie positive* (1859); *Auguste Comte et la philosophie positive* (1863); *La Science au point de vue philosophique* (1873); *Fragments de philosophie et de sociologie contemporaine* (1876); and his most interesting miscellaneous works, his *Études et glanures* (1880); *La Verité sur la mort d'Alexandre le grand* (1865); *Études sur les barbares et le moyen âge* (1867); *Médecine et médecins* (1871); *Littérature et histoire* (1875); and *Discours de réception à l'Académie française* (1873).

For his life consult C. A. Sainte-Beuve, *Notice sur M. Littré, sa vie et ses travaux* (1863); and *Nouveaux Lundis*, vol. v.; also the notice by M. Durand-Gréville in the *Nouvelle Revue* of August 1881; E. Caro, *Littré et le positivisme* (1883); Pasteur, *Discours de réception* at the Academy, where he succeeded Littré, and a reply by E. Renan. (H. M. S.)

LITURGY (Low Lat. *liturgia*; Gr. λεῖτος, public, and ἔργον, work; λειτουργός, a public servant), in the technical language of the Christian Church, the order for the celebration and administration of the Eucharist. In Eastern Christendom the Greek word λειτουργία is used in this sense exclusively. But in English-speaking countries the word "liturgy" has come to be used in a more popular sense to denote any or all of the various services of the Church, whether contained in separate volumes or bound up together in the form of a Book of Common Prayer. In this article the liturgy is treated in the former and stricter sense. (For the ancient Athenian λειτουργίαι, as forms of taxation, see FINANCE.)

In order to understand terms and references it will be convenient to give the tabular form the chief component parts of a liturgy, selecting the Liturgy of Rome as characteristic of Western, and that of Constantinople as characteristic of Eastern, Christendom; at the same time appending an explanation of some of the technical words which must be employed in enumerating those parts.

Order of the Roman Liturgy

Ordinary of the Mass.

1. Introit, or as it is always called in the Sarum rite, "Office," a Psalm or part of a Psalm sung at the entry of the priest, or clergy and choir.
2. Kyrie eleison, ninefold, and sometimes lengthily farsed representing an older, now obsolete, litany.
3. Collect, *i.e.* the collect for the day.
4. Prophetic lection, now obsolete, except on the Wednesday and Saturday Ember Days, Good Friday and Easter Even, and Wednesday after fourth and sixth Sundays in Lent.
5. Epistle.

6. Gradual. A few verses from the Psalms, the shrunken remainder of a whole Psalm.
7. Sequence A hymn now obsolete except on Feast of the Seven Dolours, Easter, Pentecost, Corpus Christi and at Masses for the dead.
8. Gospel.
9. Creed.
10. Collect, now obsolete, though the unanswered invitation, "Let us pray," still survives.
11. Offertory. A verse or verses from the Psalms sung at the offering of the elements.
12. Secret. A prayer or prayers said at the conclusion of the Offertory.
13. Sursum Corda. "Lift up your hearts." with following versicles.
14. Preface. There are now ten proper or special prefaces and one common preface. In older missals they were extremely numerous, almost every Sunday and Holy-day having one assigned to it. Many of them were very beautiful. In older missals, Nos. 13, 14 and 15 were sometimes arranged not as the concluding part of the Ordinary, but as the opening part of the Canon of the mass.
15. Sanctus, or Tersanctus, or Triumphal Hymn, "Holy, Holy, Holy," &c., ending with the Benedictus, "Blessed is he that cometh," &c.

Canon of the Mass.

1. Introductory prayer for acceptance. Te igitur, &c.
2. Intercession for the living. Memento, Domine famulorum, &c.
3. Commemoration of apostles and martyrs. Communicantes et memoriam, &c.
4. Prayer for acceptance and consecration of offering. Hanc igitur oblationem, &c.
5. Recital of words of institution. Qui pridie quam pateretur, &c.
6. Oblation. Unde et memores, &c.
7. Invocation. A passage difficult of interpretation, but apparently meant to be equivalent to the Eastern Epiklesis or invocation of the Holy Ghost. Supplices te rogamus, &c.
8. Intercession for the dead. Memento etiam, Domine, famulorum, &c.
9. Lord's Prayer, with a short introduction and the expansion of the last petition into a prayer known as the "Embolismus."
10. Fraction, *i.e.* breaking of the host into three parts, to symbolize the death and passion of Christ.
11. Commixture, *i.e.* placing a small portion of the consecrated bread into the chalice symbolizing the reunion of Christ's body and soul at the resurrection.
12. Agnus Dei, *i.e.* a three-fold petition to the Lamb of God.
13. Pax, *i.e.* the kiss of peace. The ancient ritual of the Pax has become almost obsolete.
14. Three prayers, accompanying the Pax and preliminary to communion.
15. Communion of priest and people (if any), a short anthem called "Communio" being sung meanwhile.
16. Ablution of paten and chalice.
17. Post-communion, *i.e.* a concluding prayer.
18. Dismissal.

The Canon of the Mass strictly ends with No. 9; Nos. 10-18 being an appendix to it.

LITURGY OF CONSTANTINOPLE

Mass of the Catechumens. After preparation and vesting.

1. The Deacon's Litany.
2. Three Anthems with accompanying prayers.
3. Little Entrance, *i.e.* ceremonial bringing in of the Book of the Gospels.
4. The Trisagion, *i.e.* an anthem with an accompanying prayer different from the Latin Sanctus or Tersanctus
5. Epistle.
6. Gospel with a prayer preceding it.
7. Bidding prayer.
8. Prayer for catechumens.
9. Dismissal of catechumens.
10. Spreading of the corporal.

Mass of the Faithful.

11. Prayers of the faithful.
12. Cherubic Hymn, "Let us who mystically represent the Cherubim, &c." not represented in the Latin liturgy.
13. Great Entrance, *i.e.* of the unconsecrated elements with incense and singing and intercessions.
14. Kiss of peace.
15. Creed.
16. The Benediction, *i.e.* 2 Cor. xiii. 14.
17. Sursum corda.
18. Preface.
19. Sanctus, or Tersanctus, or "Triumphal Hymn."
20. Recital of Words of Institution, prefaced by recital of the Redemption.
21. The oblation.
22. The invocation or Epiklesis.
23. Intercession for the dead.
24. Intercession for the living.
25. The Lord's Prayer.
26. Prayer of humble access (*a*) for people (*b*) for priest.
27. Elevation with the invitation "Holy things to holy people."
28. Fraction.
29. Commixture.
30. Thanksgiving.
31. Benediction.

In both these lists many interesting features of ceremonial, the use of incense, the infusion of warm water (Byzantine only), &c., have not been referred to. The lists must be regarded as skeletons only.

There are six main families or groups of liturgies, four of them being of Eastern and two of them of Western origin and use. They are known either by the names of the apostles with whom they are traditionally connected, or by the names of the countries or cities in which they have been or are still in use.

Group I. *The Syrian Rite* (St James).—The principal liturgies to be enumerated under this group are the Clementine liturgy, so called from being found in the eighth book of the Apostolic Constitutions, which claim in their title, though erroneously, to have been compiled by St Clement, the 1st-century bishop of Rome; the Greek liturgy of St James; the Syriac liturgy of St James. Sixty-four more liturgies of this group have existed, the majority being still in existence. Their titles are given in F. E. Brightman's *Liturgies, Eastern and Western* (1896), pp. lviii.-lxi.

Group II. *The Egyptian Rite* (St Mark).—This group includes the Greek liturgies of St Mark, St Basil and St Gregory, and the Coptic liturgies of St Basil, St Gregory, St Cyril or St Mark; together with certain less known liturgies the titles of which are enumerated by Brightman (*op. cit.* pp. lxxiii. lxxiv.). The liturgy of the Ethiopian church ordinances and the liturgy of the Abyssinian Jacobites, known as that of the Apostles, fall under this group.

Group III. *The Persian Rite* (SS. Adaeus and Maris).—This Nestorian rite is represented by the liturgy which bears the names of SS. Adaeus and Maris together with two others named after Theodore of Mopsuestia and Nestorius. This group has sometimes been called "East-Syrian." The titles of three more of its now lost liturgies have been preserved, namely those of Narses, Barsumas and Diodorus of Tarsus. The liturgy of the Christians of St Thomas, on the Malabar coast of India, formerly belonged to this group, but it was almost completely assimilated to the Roman liturgy by Portuguese Jesuits at the synod of Diamper in 1599.

Group IV. *The Byzantine Rite.*—The Greek liturgies of St Chrysostom, St Basil and St Gregory Dialogus, or The Presanctified, also extant in other languages, are the living representatives of this rite. The Greek liturgy of St Peter is classified under this group, but it is merely the Roman canon of the Mass &c., inserted in a Byzantine framework, and seems to have been used at one time by some Greek communities in Italy. To this group also belongs the Armenian liturgy, of which ten different forms have existed in addition to the liturgy now in general use named after St Athanasius.

We now come to the two western groups of liturgies, which more nearly concern the Latin-speaking nations of Europe, and which, therefore, must be treated of more fully.

Group V. *The Hispano-Gallican Rite* (St John).—This group of Latin liturgies, which once prevailed very widely in Western Europe, has been almost universally superseded by the liturgy of the Church of Rome. Where it survives, it has been more or less assimilated to the Roman pattern. It prevailed once throughout Spain, France, northern Italy, Great Britain and Ireland. The term "Ephesine" has been applied to this group or family of liturgies, chiefly by English liturgiologists, and the names of St John and of Ephesus, his place of residence, have been pressed into service in support of a theory of Ephesine origin, which, however, lacks proof and may now be regarded as a discarded hypothesis. Other theories represent the Gallican to be a survival of the original Roman liturgy, or as an importation into Western Europe from the east through a Milanese channel. The latter is Duchesne's theory (*Christian Worship*, London, 1904, 2nd ed., p. 94).

We must be content with mentioning these theories without attempting to discuss them.

The chief traces of oriental influence and affinity lie in the following points:—(1) various proclamations made by the deacon, including that of "Silentium facite" before the epistle (Migne, *Pat. Lat.* tom. lxxxv. col. 534); (2) the presence of a third lesson preceding the epistle, taken from the Old Testament; (3) the occasional presence of "preces" a series of short intercessions resembling the Greek "Ektené" or deacon's litany; (4) the position of the kiss of peace at an early point in the service, before the canon, instead of the Roman position after consecration; (5) the exclamation "Sancta sanctis" occurring in the Mozarabic rite, being the counterpart of the Eastern "Τὰ ἅγια τοῖς ἁγίοις," that is "holy things to holy people"; (6) traces of the presence of the "Epiklesis," that is to say, the invocation of the Holy Spirit, in its Eastern position after the words of institution, as in the prayer styled the Post-pridie in the Mozarabic service for the second Sunday after the octave of the Epiphany: "We beseech thee that thou wouldest sanctify this oblation with the permixture of thy Spirit, and conform it with full transformation into the body and blood of our Lord Jesus Christ" (Migne, *Pat. Lat.* tom. lxxxv. col. 250). On the other hand the great variableness of its parts, and the immense number of its proper prefaces, ally it to the Western family of liturgies.

We proceed now to give a more detailed account of the chief liturgies of this group.

1. *The Mozarabic Liturgy.*—This was the national liturgy of the Spanish church till the close of the 11th century, when the Roman liturgy was forced upon it. Its use, however, lingered on, till in the 16th century Cardinal Jimenes, anxious to prevent its becoming quite obsolete, had its books restored and printed, and founded a college of priests at Toledo to perpetuate its use. It survives now only in several churches in Toledo and in a chapel at Salamanca, and even there not without certain Roman modifications of its original text and ritual.

Its date and origin, like the date and origin of all existing liturgies, are uncertain, and enveloped in the mists of antiquity. It is not derived from the present Roman liturgy. Its whole structure, as well as separate details disprove such a parentage, and therefore it is strange to find St Isidore of Seville (*Lib. de Eccles. Offic.* i. 15) attributing it to St Peter. No proof is adduced, and the only value which can be placed upon such an unsupported assertion is that it shows that a very high and even apostolic antiquity was claimed for it. A theory, originating with Pinius, that it may have been brought by the Goths from Constantinople when they invaded Spain, is as improbable as it is unproven. It may have been derived from Gaul. The Gallican sister stood to it in the relation of twin-sister, if it could not claim that of mother. The resemblance was so great that when Charles the Bald (843–877) wished to get some idea of the character of the already obsolete Gallican rite, he sent to Toledo for some Spanish priests to perform Mass according to the Mozarabic rite in his presence. But there is no record of the conversion of Spain by Gallican missionaries. Christianity existed in Spain from the earliest times. Probably St Paul travelled there (Rom. xv. 24). It may be at least conjectured that its liturgy was Pauline rather than Petrine or Johannine.

2. *Gallican Liturgy.*—This was the ancient and national liturgy of the church in France till the commencement of the 9th century, when it was suppressed by order of Charlemagne, who directed the Roman missal to be everywhere substituted in its place. All traces of it seemed for some time to have been lost until three Gallican sacramentaries were discovered and published by Thomasius in 1680 under the titles of *Missale Gothicum*, *Missale Gallicum* and *Missale Francorum*, and a fourth was discovered and published by Mabillon in 1687 under the title of *Missale Gallicanum.* Fragmentary discoveries have been made since. Mone discovered fragments of eleven Gallican masses and published them at Carlsruhe in 1850. Other fragments from the library at St Gall have been published by Bunsen (*Analecta Ante-Nicaena*, iii. 263–266), and from the Ambrosian library at Milan by Cardinal Mai (*Scriptt. Vet. Vat. Coll.* iii. 2. 247). A single page was discovered in Gonville and Caius College, Cambridge, published in *Zeitschrift für Kath. Theologie*, vi. 370.

These documents, illustrated by early Gallican canons, and by allusions in the writings of Sulpicius Severus, Caesarius of Arles, Gregory of Tours, Germanus of Paris and other authors, enable us to reconstruct the greater part of this liturgy. The previously enumerated signs of Eastern origin and influence are found here as well as in the Mozarabic liturgy, together with certain other more or less minute peculiarities, which would be of interest to professed liturgiologists, but which we must not pause to specify here. They are the origin of the Ephesine theory that the Gallican liturgy was introduced into use by Irenaeus, bishop of Lyons (*c.* 130-200) who had learned it in the East from St Polycarp, the disciple of the apostle St John.

3. *Ambrosian Liturgy.*—Considerable variety of opinion has existed among liturgical writers as to the proper classification of the "Ambrosian" or "Milanese" liturgy. If we are to accept it in its present form and to make the present position of the great intercession for quick and dead the test of its *genus*, then we must classify it as "Petrine" and consider it as a branch of the Roman family. If, on the other hand, we consider the important variations from the Roman liturgy which yet exist, and the traces of still more marked variation which confront us in the older printed and MS. copies of the Ambrosian rite, we shall detect in it an original member of the Hispano-Gallican group of liturgies, which for centuries underwent a gradual but ever-increasing assimilation to Rome. We know this as a matter of history, as well as a matter of inference from changes in the text itself. Charlemagne adopted the same policy towards the Milanese as towards the Gallican church. He carried off all the Ambrosian church books which he could obtain, with the view of substituting Roman books in their place, but the completion of his intentions failed, partly through the attachment of the Lombards to their own rites, partly through the intercession of a Gallican bishop named Eugenius (Mabillon, *Mus. Ital.* tom. i. Pars. ii. p. 106). It has been asserted by Joseph Vicecomes that this is an originally independent liturgy drawn up by St Barnabas, who first preached the Gospel at Milan (*De Missae* Rit. 1 capp. xi. xii.), and this tradition is preserved in the title and proper preface for St Barnabas Day in the Ambrosian missal (Pamelius, *Liturgicon*, i. 385, 386), but it has never been proved.

We can trace the following points in which the Ambrosian differs from the Roman liturgy, many of them exhibiting traces of Eastern influence. Some of them are no longer found in recent Ambrosian missals and only survive in earlier MSS. such as those published by Pamelius (*Liturgicon*, tom. i. p. 293), Muratori (*Lit. Rom. Vet.* i. 132) and Ceriani (in his edition, 1881, of an ancient MS. at Milan). (*a*) The prayer entitled "oratio super sindonem" corresponding to the prayer after the spreading of the corporal; (*b*) the proclamation of silence by the deacon before the epistle; (*c*) the litanies said after the Ingressa (Introit) on Sundays in Lent, closely resembling the Greek Ekténé; (*d*) varying forms of introduction to the Lord's Prayer, in Coena Domini (Ceriani p. 116) in Pascha (*Ib.* p. 129); (*e*) the presence of passages in the prayer of consecration which are not part of the Roman canon and one of which at least corresponds in import and position though not in words to the Greek Invocation: *Tuum vero, est, omnipotens Pater, mittere*, &c. (*Ib.* p. 116); (*f*) the survival of a distinctly Gallican formula of consecration in the Post-sanctus "in Sabbato Sancto." *Vere sanctus, vere benedictus Dominus noster*, &c. (*Ib.* p. 125); (*g*) the varying nomenclature of the Sundays after Pentecost; (*h*) the position of the fraction or ritual breaking of bread before the Lord's Prayer; (*i*) the omission of the second oblation after the words of institution (Muratori, *Lit. Rom. Vet.* i. 133); (*k*) a third lection or *Prophetia* from the Old Testament preceding the epistle and gospel; (*l*) the lay offering of the oblations and the formulae accompanying their reception (Pamelius, *Liturgicon*, i. 297); (*m*) the position of the ablution of the hands in the middle of the canon just before the words of institution; (*n*) the position of the "oratio super populum," which corresponds in matter but not in name to the collect for the day, before the Gloria in Excelsis.

4. *Celtic Liturgy.*—We postpone the consideration of this liturgy till after we have treated of the next main group.

VI. *The Roman Rite* (St Peter).—There is only one liturgy to be enumerated under this group, viz. the present liturgy of the Church of Rome, which, though originally local in character and circumscribed in use, has come to be nearly co-extensive with the Roman Catholic Church, sometimes superseding earlier national liturgies, as in Gaul and Spain, sometimes incorporating more or less of the ancient ritual of a country into itself and producing from such incorporation a sub-class of distinct Uses, as in England, France and elsewhere. Even these subordinate Uses have for the most part become, or are rapidly becoming, obsolete.

The date, origin and early history of the Roman liturgy are obscure. The first Christians at Rome were a Greek-speaking community, and their liturgy must have been Greek, and is possibly represented in the so-called Clementine liturgy. But the date when such a state of things ceased, when and by whom the present Latin liturgy was composed, whether it is an original composition, or, as its structure seems to imply, a survival of some intermediate form of liturgy—all these are questions which are waiting for solution.

One MS. exists which has been claimed to represent the Roman liturgy as it existed in the time of Leo I., 440-461. It was discovered at Verona by Bianchini in 1735 and assigned by him to the 8th century and published under the title of *Sacramentarium Leonianum*; but this title was from the first conjectural, and is in the teeth of the internal evidence which the MS. itself affords. The question is discussed at some length by Muratori (*Lit. Rom. Vet.* tom. i. cap. i. col. 16). Assemani published it under the title of *Sacramentarium Veronense* in tom. vi. of his *Codex Liturg. Eccles. Univ.*

A MS. of the 7th or 8th century was found at Rome by Thomasius and published by him in 1680 under the title of *Sacramentarium Gelasianum*. But it was written in France and is certainly not a pure Gelasian codex; and although there is historical evidence of Pope Gelasius I. (492-496) having made some changes in the Roman liturgy, and although MSS. have been published by Gerbertus and others, claiming the title of Gelasian, we neither have nor are likely to have genuine and contemporary MS. evidence of the real state of the liturgy in that pope's time. The most modern and the best edition of the Gelasian Sacramentary is that by H. A. Wilson (Oxford, 1894).

The larger number of MSS. of this group are copies of the Gregorian Sacramentary, that is to say, MSS. representing or purporting to represent, the state of Roman liturgy in the days of Pope Gregory the Great. But they cannot be accepted as certain evidence for the following reasons: not one of them was written earlier than the 9th century, not one of them was written in Italy, but every one north of the Alps; every one contains internal evidence of a post-Gregorian date in the shape of masses for the repose or for the intercession of St Gregory and in various other ways.

The Roman liturgy seems to have been introduced into England in the 7th, into France in the 9th and into Spain in the 11th century, though no doubt it was known in both France and Spain to some extent before these dates. In France certain features of the service and certain points in the ritual of the ancient national liturgy became interwoven with its text and formed those many varying medieval Gallican Uses which are associated with the names of different French sees.

The chief distinguishing characteristics of the Roman rite are these: (*a*) the position of the great intercession for quick and dead within the canon, the commemoration of the living being placed just before and the commemoration of the departed just after the words of institution; (*b*) the absence of an "Epiklesis" or invocation of the Holy Ghost upon the elements; (*c*) the position of the "Pax" or "Kiss of Peace after the consecration" and before the communion, whereas in other liturgies it occurs at a much earlier point in the service.

Liturgies of the British Islands.

Period I. *The Celtic Church.*—Until recently almost nothing was known of the character of the liturgical service of the Celtic church which existed in these islands before the Anglo-Saxon Conquest, and continued to exist in Ireland, Scotland, Wales and Cornwall for considerable though varying periods of time after that event. But in recent times a good deal of light has been thrown on the subject, partly by the publication or republication of the few genuine works of Patrick, Columba, Columbanus, Adamnan and other Celtic saints; partly by the discovery of liturgical remains in the Scottish *Book of Deer* and in the Irish *Books of Dimma and Mulling* and the *Stowe Missal*, &c.; partly by the publication of medieval Irish compilations, such as the *Lebar Brecc*, *Liber Hymnorum*, *Martyrology of Oengus*, &c., which contain ecclesiastical kalendars, legends, treatises, &c., of considerable but very varying antiquity. The evidence collected from these sources is sufficient to prove that the liturgy of the Celtic church was of the Gallican type. In central England the churches, with everything belonging to them, were destroyed by the heathen invaders at the close of the 5th century; but the Celtic church in the remoter parts of England, as well as in the neighbouring kingdoms of Scotland and Ireland, retained its independence for centuries afterwards.

An examination of its few extant service-books and fragments of service-books yields the following evidence of the Gallican origin and character of the Celtic liturgy: (*a*) the presence of collects and anthems which occur in the Gallican or Mozarabic but not in the Roman liturgy; (*b*) various formulae of thanksgiving after communion; (*c*) frequent biddings or addresses to the people in the form of Gallican *Praefationes*; (*d*) the Gallican form of consecration, being a prayer called "Post-Sanctus" leading up to the words of institution; (*e*) the complicated rite of "fraction" or "the breaking of bread," as described in the Irish treatise at the end of the *Stowe Missel*, finds its only counterpart in the elaborate ceremonial of the Mozarabic church; (*f*) the presence of the Gallican ceremonial of *Pedilavium* or "Washing of feet" in the earliest Irish baptismal office.

For a further description of these and other features which are characteristic of or peculiar to the Celtic liturgy the reader is referred to F. E. Warren's *Liturgy and Ritual of the Celtic Church* (Oxford, 1881).

Period II. *The Anglo-Saxon Church.*—We find ourselves here on firmer ground, and can speak with certainty as to the nature of the liturgy of the English church after the beginning of the 7th century. Information is drawn from liturgical allusions in the extant canons of numerous councils, from the voluminous writings of Bede, Alcuin and many other ecclesiastical authors of the Anglo-Saxon period, and above all from a considerable number of service-books written in England before the Norman Conquest. Three of these books are missals of more or less completeness: (1) the *Leofric Missal*, a composite 10th- to 11th-century MS. presented to the cathedral of Exeter by Leofric, the first bishop of that see (1046–1072), now in the Bodleian library at Oxford; edited by F. E. Warren (Oxford, 1883); (2) the missal of Robert of Jumièges, archbishop of Canterbury (1051–1052), written probably at Winchester and presented by Archbishop Robert to his old monastery of Jumièges in the neighbourhood of Rouen, in the public library of which it now lies; edited by H. A. Wilson (London, 1896); (3) the *Red Book of Derby*, a MS. missal of the second half of the 11th century, now in the library of Corpus Christi College, Cambridge.

A perusal of these volumes proves what we should have expected a priori, that the Roman liturgy was in use in the Anglo-Saxon church. This was the case from the very first. That church owed its foundation to a Roman pontiff, and to Roman missionaries, who brought, as we are told by Bede, their native liturgical codices with them (*Hist. Eccles.* lib. ii. cap. 28). Accordingly, when we speak of an Anglo-Saxon missal, we mean a Roman missal only exhibiting one or more of the following features, which would differentiate it from an Italian missal of the same century. (*a*) Rubrics and other entries of a miscellaneous character written in the vernacular language of the country. (*b*) The commemoration of national or local saints in the kalendar, in the canon of the mass and in the litanies which occur for use on Easter Even and in the baptismal offices. (*c*) The presence of a few special masses in honour of those local saints, together with a certain number of collects of a necessarily local character, for the rulers of the country, for its natural produce, &c. (*d*) The addition of certain peculiarities of liturgical structure and arrangement interpolated into the otherwise purely Roman service from an extraneous source. There are two noteworthy examples of this in Anglo-Saxon service-books. Every Sunday and festival and almost every votive mass has its proper preface, although the number of such prefaces in the Gregorian sacramentary of the same period had been reduced to eight. There was a large but not quite equal number of triple episcopal benedictions to be pronounced by the bishop after the Lord's Prayer and before the communion. This custom must either have been perpetuated from the old Celtic liturgy or directly derived from a Gallican source.

Period III. *Anglo-Norman Church.*—The influx of numerous foreigners, especially from Normandy and Lorraine, which preceded, accompanied and followed the Conquest, and the occupation by them of the highest posts in church as well as state had a distinct effect on the liturgy of the English church. These foreign ecclesiastics brought over with them a preference for and a habit of using certain features of the Gallican liturgy and ritual, which they succeeded in incorporating into the service-books of the church of England. One of the Norman prelates, Osmund, count of Séez, earl of Dorset, chancellor of England, and bishop of Salisbury (1078–1099), is credited with having undertaken the revision of the English service-books; and the missal which we know as the *Sarum Missal*, or the *Missal according to the Use of Sarum*, practically became the liturgy of the English church. It was not only received into use in the province of Canterbury, but was largely adopted beyond those limits—in Ireland in the 12th and in various Scottish dioceses in the 12th and 13th centuries.

It would be beyond our scope here to give a complete list of the numerous and frequently minute differences between a medieval Sarum and the earlier Anglo-Saxon or contemporaneous Roman liturgy. They lie mainly in differences of collects and lections, variations of ritual on Candlemass, Ash Wednesday and throughout Holy Week; the introduction into the canon of the mass of certain clauses and usages of Gallican character or origin; the wording of rubrics in the subjunctive or imperative tense; the peculiar "Preces in prostratione"; the procession of Corpus Christi on Palm Sunday; the forms of ejection and reconciliation of penitents, &c. The varying episcopal benedictions as used in the Anglo-Saxon church were retained, but the numerous proper prefaces were discarded, the number being reduced to ten.

Besides the famous and far-spreading Use of Sarum, other Uses, more local and less known, grew up in various English dioceses. In virtue of a recognized diocesan independence, bishops were able to regulate or alter their ritual, and to add special masses or commemorations for use within the limits of their jurisdiction. The better known and the more distinctive of these Uses were those of York and Hereford, but we also find traces of or allusions to the Uses of Bangor, Lichfield, Lincoln, Ripon, St Asaph, St Paul's, Wells and Winchester.

Service-books.—The Eucharistic service was contained in the volume called the Missal (*q.v.*), as the ordinary choir offices were contained in the volume known as the Breviary (*q.v.*). But besides these two volumes there were a large number of other service-books. Mr W. Maskell has enumerated and described ninety-one such volumes employed by the Western Church only. It must be understood, however, that many of these ninety-one names are synonyms (*Mon. Rit. Eccles. Anglic.*, 1882, vol. i. p. ccxxx.). The list might be increased, but it will be possible here only to name and briefly describe a few of the more important of them. (1) The *Agenda* is the same as the Manual, for which see below. (2) The *Antiphonary* contained the antiphons or anthems, sung at the canonical hours, and certain other minor parts of the service. (3) The *Benedictional* contained those triple episcopal benedictions previously described as used on Sundays and on the chief festivals throughout the year. (4) The *Collectarium* contained the collects for the season, together with a few other parts of the day offices. It was an inchoate breviary. (5) The *Epistolarium* contained the epistles, and the *Evangelistarium* the gospels for the year. (7) The *Gradual* contained the introit, gradual, sequences, and the other portions of the communion service which were sung by the choir at high mass. (8) *The Legenda* contained the lections which were read at matins and at other times, and may be taken as a generic term to include the *Homiliarium*, *Passional* and other volumes. (9) The *Manual* was the name usually employed in England to denote the *Ritual*, which contained the baptismal, matrimonial and other offices which might be performed by the parish priest. (10) The *Pontifical* contained the orders of consecration, ordination, and such other rites as could, ordinarily, only be performed by a bishop. To these we must add a book which was not strictly a church office book, but a handy book for the use of the laity, and which was in very popular use and often very highly embellished from the 14th to the 16th century, the *Book of Hours*, or *Horae Beatae Mariae Virginis*, also known as the *Prymer* or *Primer*. It contained portions of the canonical hours, litanies, the penitential Psalms, and other devotions of a miscellaneous and private character. Detailed information about all these and other books is to be found in C. Wordsworth and H. Littlehales', *The Old Service Books of the English Church.*

The Eastern Church too possessed and still possesses numerous and voluminous service-books, of which the chief are the following: (1) The *Euchologian*, containing the liturgy itself with the remaining sacramental offices bound up in the same volume. (2) The *Horologion*, containing the unvarying portion of the Breviary. (3) The *Menaea*, being equivalent to a complete Breviary. (4) The *Menologion* or Martyrology. (5) The *Octoechus* and (6) The *Paracletice*, containing Troparia and answering to the Western antiphonary. (7) The *Pentecostarion*, containing the services from Easter Day to All Saints' Sunday. (8) The *Triodion*, containing those from Septuagesima Sunday to Easter Even. (9) The *Typicum* is a general book of rubrics corresponding to the Ordinale or the Pie of Western Christendom.

Period IV. *The Reformed Church.*—The Anglican liturgy of Reformation and post-Reformation times is described under the heading of PRAYER, BOOK OF COMMON, but a brief description may be added here of the liturgies of other reformed churches.

The Liturgy of the Scottish Episcopal Church.—This liturgy in nearly its present form was compiled by Scottish bishops in 1636 and imposed—or, to speak more accurately, attempted to be imposed—upon the Scottish people by the royal authority of Charles I. in 1637. The prelates chiefly concerned in it were Spottiswood, bishop of Glasgow; Maxwell, bishop of Ross; Wedderburn, bishop of Dunblane; and Forbes, bishop of Edinburgh. Their work was approved and revised by certain members of the English episcopate, especially Laud, archbishop of Canterbury; Juxon, bishop of London; and Wren, bishop of Ely. This liturgy has met with varied fortune and has passed through several editions. The present Scottish office dates from 1764. It is now used as an alternative form with the English communion office in the Scottish Episcopal Church.

The general arrangements of its parts approximates more closely to that of the first book of Edward VI. than to the present Anglican Book of Common Prayer. Among its noteworthy features are (*a*) the retention in its integrity and in its primitive position after the words of institution of the invocation of the Holy Spirit. That invocation runs thus: "And we most humbly beseech thee, O merciful Father, to hear us and of thy almighty goodness vouchsafe to bless and sanctify with thy word and Holy Spirit these thy gifts and creatures of bread and wine that they may become the body and blood of thy most dearly beloved Son" (edit. 1764). This kind of petition thus placed is found in the Eastern but not in the Roman or Anglican liturgies. (*b*) The reservation of the sacrament is permitted, by traditional usage, for the purpose of communicating the absent or the sick. (*c*) The minimum number of communicants is fixed at one or two instead of three or four.

For fuller information see Bishop J. Dowden, *The Annotated Scottish Communion Service* (Edinburgh, 1884).

American Liturgy.—The Prayer Book of "the Protestant Episcopal Church" in America was adopted by the general convention of the American church in 1789. It is substantially the same as the English Book of Common Prayer, but among important variations we may name the following: (*a*) The arrangement and wording of the order for Holy Communion rather resembles that of the Scottish than that of the English liturgy, especially in the position of the oblation and invocation immediately after the words of institution. (*b*) The Magnificat, Nunc dimittis and greater part of Benedictus were disused; but these were reinstated among the changes made in the Prayer Book in 1892. (*c*) Ten selections of Psalms are appointed for use as alternatives for the Psalms of the day. (*d*) *Gloria in excelsis* is allowed as a substitute for *Gloria Patri* at the end of the Psalms at morning and evening prayer. In addition to these there are many more both important and unimportant variations from the English Book of Common Prayer.

The Irish Prayer Book.—The Prayer Book in use in the Irish portion of the United Church of England and Ireland was the Anglican Book of Common Prayer, but after the disestablishment of the Irish church several changes were introduced into it by a synod held at Dublin in 1870. These changes included such important points as: (*a*) the excision of all lessons from the Apocrypha, (*b*) of the rubric ordering the recitation of the Athanasian Creed, (*c*) of the rubric ordering the vestments of the second year of Edward VI., (*d*) of the form of absolution in the office for the visitation of the sick, (*e*) the addition to the

Catechism of a question and answer bringing out more clearly the spiritual character of the real presence.

The Presbyterian Church.—The Presbyterian churches of Scotland at present possess no liturgy properly so called. Certain general rules for the conduct of divine service are contained in the "Directory for the Public Worship of God" agreed upon by the assembly of divines at Westminster, with the assistance of commissioners from the Church of Scotland, approved and established by an act of the general assembly, and by an act of parliament, both in 1645. In 1554 John Knox had drawn up an order of liturgy closely modelled on the Genevan pattern for the use of the English congregation to which he was then ministering at Frankfort. On his return to Scotland this form of liturgy was adopted by an act of the general assembly in 1560 and became the established form of worship in the Presbyterian church until the year 1645, when the Directory of Public Worship took its place. Herein regulations are laid down for the conduct of public worship, for the reading of Scripture and for extempore prayer before and after the sermon, and in the administration of the sacrament of baptism and the Lord's Supper, for the solemnization of marriage, visitation of the sick and burial of the dead, for the observance of days of public fasting and public thanksgiving, together with a form of ordination and a directory for family worship. In all these cases, though the general terms of the prayer are frequently indicated, the wording of it is left to the discretion of the minister, with these exceptions: At the act of baptism this formula must be used—"I baptize thee in the name of the Father, and of the Son, and of the Holy Ghost"; and for the Lord's Supper these forms are suggested, but with liberty to the minister to use "other the like, used by Christ or his apostles upon this occasion"—"According to the holy institution, command, and example of our blessed Saviour, Jesus Christ, I take this bread, and having given thanks, break it, and give it unto you. Take ye, eat ye; this is the body of Christ which is broken for you; do this in remembrance of him." And again "According to the institution, command and example of our Lord Jesus Christ, I take this cup and give it unto you; this cup is the New Testament in the blood of Christ, which is shed for the remission of the sins of many; drink ye all of it."

There is also an unvarying form of words directed to be used before the minister by the man to the woman, and by the woman to the man in the case of the solemnization of matrimony. The form of words on all other occasions, including ordination, is left to the discretion of the officiating minister or of the presbytery.

European Protestant Churches. The Calvinistic Churches.—Rather more of the liturgical element in the shape of a set form of words enters into the service of the French and German Calvinistic Protestants. The Sunday morning service as drawn up by Calvin was to open with a portion of Holy Scripture and the recitation of the ten commandments. Afterwards the minister, inviting the people to accompany him, proceeded to a confession of sins and supplication for grace. Then one of the Psalms of David was sung. Then came the sermon, prefaced by an extempore prayer and concluding with the Lord's Prayer, creed and benediction. The communion service began with an exhortation leading up to the apostles' creed; then followed a long exhortation, after which the bread and wine were distributed to the people, who advanced in reverence and order, while a Psalm was being sung, or a suitable passage of Scripture was being read. After all had communicated a set form of thanksgiving was said by the minister. Then the Song of Simeon was sung by the congregation, who were then dismissed with the blessing. This form of service has been modified in various ways from time to time, but it remains substantially the type of service in use among the reformed Calvinistic churches of Germany, Switzerland and France.

The Lutheran Church.—Luther was far more conservative than the rest of the Protestant reformers and his conservatism appeared nowhere more than in the service-books which he drew up for the use of the church which bears his name. In 1523 he published a treatise *Of the Order of the Service in the Congregation* and in 1526 he published the *German Mass*. Except that the vernacular was substituted for the Latin language, the old framework and order of the Roman missal were closely followed, beginning with the Confiteor, Introit, Kyrie eleison, still always sung in Greek, Gloria in excelsis, &c. The text of this and other Lutheran services is given in *Agende für christliche Gemeinden des Lutherischen Bekenntnisses* (Nördlingen, 1853). At the same time Luther was tolerant and expressed a hope that different portions of the Lutheran church would from time to time make such changes or adaptations in the order of service as might be found convenient. The Lutheran churches of northern Europe have not been slow to avail themselves of this advice and permission. Most of them have drawn up liturgies for themselves, sometimes following very closely, sometimes differing considerably from the original service composed by Luther himself. In 1822, on the union of the Lutheran and Reformed (Calvinistic) churches of Prussia, a new liturgy was published at Berlin. It is used in its entirety in the chapel royal, but great liberty as to its use was allowed to the parochical clergy, and considerable variations of text appear in the more recent editions of this service-book.

The Church of the New Jerusalem (Swedenborgians) and the Catholic Apostolic Church (Irvingites) and other Protestant bodies have drawn up liturgies for themselves, but they are hardly of sufficient historical importance to be described at length here.

The Old Catholics, lastly, published a *Rituale* in 1875 containing the occasional offices for baptism, matrimony, burial, &c., and a form for reception of Holy Communion, in the German language. This latter is for use in the otherwise unaltered service of the mass, corresponding in purpose to the order of Communion in English published the 8th of March 1548 and in use till Whitsunday 1549.

(F. E. W.)

LITUUS, the cavalry trumpet of the Romans, said by Macrobius (*Saturn.* lib. vi.) to have resembled the crooked staff borne by the Augurs. The lituus consisted of a cylindrical tube 4 or 5 ft. long, having a narrow bore, and terminating in a conical bell joint turned up in such a manner as to give the instrument the outline of the letter "J." Unlike the buccina, cornu and tuba, the other military service instruments of the Romans, the lituus has not been traced during the middle ages, the medieval instrument most nearly resembling it being the cromorne or tournebout, which, however, had lateral holes and was played by means of a reed mouthpiece. A lituus found in a Roman warrior's tomb at Cervetri (Etruria) in 1827 is preserved in the Vatican. Victor Mahillon gives its length as 1 m. 60, and its scale as in unison with that of the trumpet in G (*Catalogue descriptif*, 1896, pp. 29-30). (K. S.)

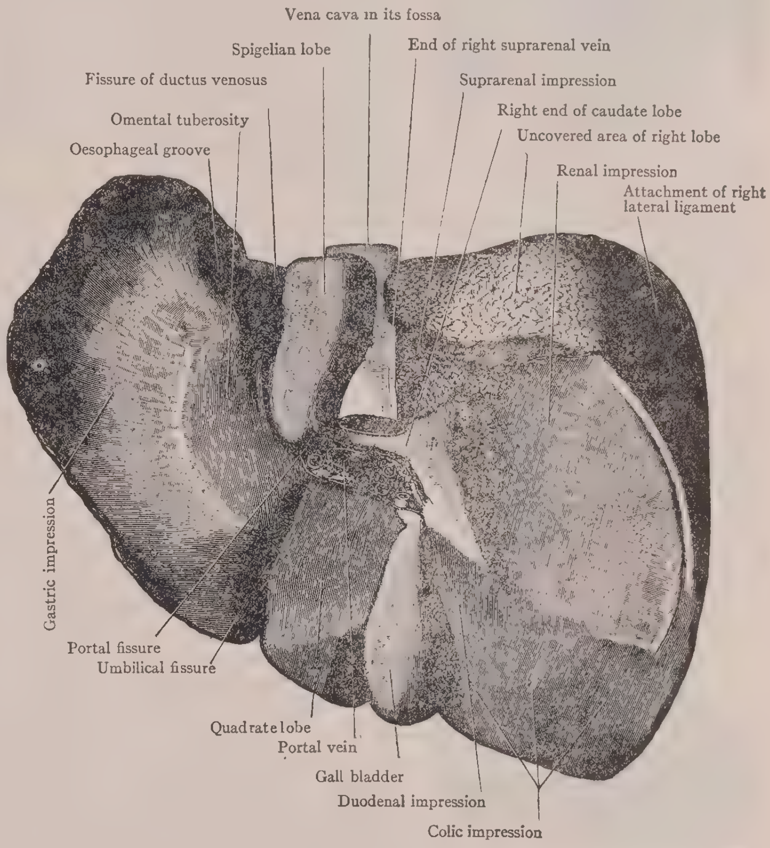
LIUDPRAND (LIUTPRAND, LUITPRAND) (*c.* 922–972), Italian historian and author, bishop of Cremona, was born towards the beginning of the 10th century, of a good Lombard family. In 931 he entered the service of King Hugo of Italy as page; he afterwards rose to a high position at the court of Hugo's successor Berengar, having become chancellor, and having been sent (949) on an embassy to the Byzantine court. Falling into disgrace with Berengar on his return, he attached himself to the emperor Otto I., whom in 961 he accompanied into Italy, and by whom in 962 he was made bishop of Cremona. He was frequently employed in missions to the pope, and in 968 to Constantinople to demand for the younger Otto (afterwards Otto II.) the hand of Theophano, daughter of the emperor Nicephorus Phocas. His account of this embassy in the *Relatio de Legatione Constantinopolitana* is perhaps the most graphic and lively piece of writing which has come down to us from the 10th century. The detailed description of Constantinople and the Byzantine court is a document of rare value—though highly coloured by his ill reception and offended dignity. Whether he returned in 971 with the embassy to bring Theophano or not is uncertain. Liudprand died in 972.

He wrote (1) *Antapodoseos, seu rerum per Europam gestarum, Libri VI*, an historical narrative, relating to the events from 887 to 949, compiled with the object of avenging himself upon Berengar and Willa his queen; (2) *Historia Ottonis*, a work of greater impartiality and merit, unfortunately covering only the years from 960 to 964; and (3) the *Relatio de Legatione Constantinopolitana* (968–969). All are to be found in the *Monum. Germ. Hist.* of Pertz, and in the *Rer. Ital. Script.* of Muratori; there is an edition by E. Dümmler (1877), and a partial translation into German, with an introduction by W. Wattenbach, is given in the second volume of the *Geschichtsschreiber der deutschen Vorzeit* (1853). Compare Wattenbach, *Deutschlands Geschichtsquellen im Mittelalter*. Three other works, entitled *Adversaria*, *Chronicon, 606-960*, and *Opusculum de vitis Romanorum pontificum*, are usually, but wrongly, assigned to Liudprand. An English translation of the embassy to Constantinople is in Ernest Henderson's *Select Documents of the Middle Ages* (Bohn series, 1896). A complete bibliography is in A. Potthast's *Bibl. Hist. Medii Aevi* (Berlin, 1896).

LIVE OAK, a city and the county-seat of Suwannee county, Florida, U.S.A., 81 m. by rail W. of Jacksonville. Pop. (1890) 687; (1900) 1659; (1905) 7200; (1910) **3450**. Live Oak is served by the Atlantic Coast Line, the Seaboard Air Line, the Live Oak, Perry & Gulf and the Florida railways. There are extensive areas of pine lands in the vicinity, and large quantities of sea-island cotton are produced in the county. Lumber and naval stores are also important products. The first settlement on the site of the city was made in 1865 by John Parshley, of Massachusetts, who erected a large saw-mill here. Live Oak was first incorporated as a town in 1874, and in 1903 was chartered as a city.

LIVER (O. Eng. *lifer*; cf. cognate forms, Dutch *lever*, Ger. *Leber*, Swed. *lefver*, &c.; the O. H. Ger. forms are *libara*, *lipora*, &c.; the Teut. word has been connected with Gr. ἧπαρ and Lat. *jecur*), in anatomy, a large reddish-brown digestive gland situated in the upper and right part of the abdominal cavity. When hardened *in situ* its shape is that of a right-angled, triangular prism showing five surfaces—superior, anterior, inferior, posterior and right lateral which represents the base of the prism. It weighs about three pounds or one-fortieth of the body weight.

Although the liver is a fairly solid organ, it is plastic, and moulds itself to even hollow neighbouring viscera rather than they to it. The superior surface is in contact with the diaphragm, but has peritoneum between (see Coelom and Serous Membranes). At its posterior margin the peritoneum of the great sac is reflected on to the diaphragm to form the anterior layer of the *coronary ligament*. Near the mid line of the body, and at right angles to the last, another reflection, the *falciform ligament*, runs forward, and the line of attachment of this indicates the junction of the *right* and *left lobes* of the liver. The anterior surface is in contact with the diaphragm and the anterior abdominal wall. The attachment of the falciform ligament is continued down it. The posterior surface is more complicated (see fig. 1); starting from the right and working toward the left, a large triangular area, uncovered by peritoneum and in direct contact with the diaphragm, is seen. This is bounded on the left by the inferior vena cava, which is sunk into a deep groove in the liver, and into the upper part of this the *hepatic veins* open. Just to the right of this and at the lower part of the bare area is a triangular depression for the right suprarenal body. To the left of the vena cava is the *Spigelian lobe*, which lies in front of the bodies of the tenth and eleventh thoracic vertebrae, the lesser sac of peritoneum, diaphragm and thoracic aorta intervening. To the left of this is the fissure for the *ductus venosus*, and to the left of this again, the left lobe, in which a broad shallow groove for the oesophagus may usually be seen. Sometimes the left lobe stretches as far as the left abdominal wall, but more often it ends below the apex of the heart, which is 3½ in. to the left of the mid line of the body. The relations of the lower surface can only be understood if it is realized that it looks backward and to the left as well as downward (see fig. 1). Again starting from the right side, two impressions are seen; the anterior one is for the hepatic flexure of the colon, and the posterior for the upper part of the right kidney. To the left of the colic impression is a smaller one for the second part of the duodenum. Next comes the *gall bladder*, a pear-shaped bag, the fundus of which is in front and below, the neck behind and above. From the neck passes the *cystic duct*, which is often twisted into the form of an S. To the left of the gall bladder is the *quadrate lobe*, which is in contact with the pylorus of the stomach. To the left of this is the *left lobe* of the liver, separated from the quadrate lobe by the umbilical fissure in which lies the *round ligament* of the liver, the remains of the umbilical vein of the foetus. Sometimes this fissure is partly turned into a tunnel by a bridge of liver substance known as the *pons hepatis*. The under surface of the left lobe is concave for the interior surface of the stomach (see Alimentary Canal: *Stomach Chamber*), while a convexity, known as the *tuber omentale*, fits into the lesser curvature of that organ. The posterior boundary of the quadrate lobe is the *transverse fissure*, which is little more than an inch long and more than half an inch wide. This fissure represents the hilum of the liver, and contains the right and left hepatic ducts and the right and left branches of the hepatic artery and portal vein, together with nerves and lymphatics, the whole being enclosed in some condensed subperitoneal tissue known as *Glisson's capsule*. Behind the transverse fissure the lower end of the Spigelian lobe is seen as a knob called the *tuber papillare*, and from the right of this a narrow bridge runs forward and to the right to join the Spigelian lobe to the right lobe and to shut off the transverse fissure from that for the vena cava. This is the *caudate lobe*. The right surface of the liver is covered with peritoneum and is in contact with the diaphragm, outside which are the pleura and lower ribs. From its lower margin the *right lateral ligament* is reflected on to the diaphragm. A similar fold passes from the tip of the left lobe as the *left lateral ligament*, and both these are the lateral margins of the coronary ligament. Sometimes, especially in women, a tongue-shaped projection downward of the right lobe is found, known as *Riedel's lobe*; it is of clinical interest as it may be mistaken for a tumour or floating kidney (see C. H. Leaf, *Proc. Anat. Soc.*, February 1899; *Journ. Anat. and Phys.* vol. 33, p. ix.). The right and left *hepatic ducts*, while still in the transverse fissure, unite into a single duct which joins the cystic duct from the gall bladder at an acute angle. When these have united the



From A. Birmingham Cunningham's *Text-book of Anatomy.*

Fig. 1.—The Liver from below and behind, showing the whole of the visceral surface and the posterior area of the parietal surface. The portal fissure has been slightly opened up to show the vessels passing through it; the other fissures are represented in their natural condition—closed. In this liver, which was hardened *in situ*, the impressions of the sacculations of the colon are distinctly visible at the colic impression. The round ligament and the remains of the ductus venosus are hidden in the depths of their fissures.

duct is known as the *common bile duct*, and runs down to the second part of the duodenum (see ALIMENTARY CANAL).

Minute Structure of the Liver.—The liver is made up of an enormous number of *lobules* of a conical form (see fig. 3). If the portal vein is followed from the transverse fissure, it will be seen to branch and rebranch until minute twigs called *interlobular veins* (fig. 2, *i*) ramify around the lobules. From these *intralobular capillaries* run toward the centre of the lobule, forming a network among the polygonal hepatic cells. On reaching the core of the conical lobule they are collected into a central or *intralobular vein* (fig. 2, *c*) which unites with other similar ones to form a *sublobular vein* (fig. 3, *s*). These eventually reach the hepatic radicles, and so the blood is conducted into the vena cava. In man the lobules are not distinctly separated one from the other, but in some animals, *e.g.* the pig, each one has a fibrous sheath derived from Glisson's capsule (fig. 3, *ct.*).

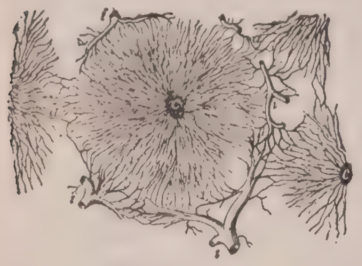


FIG. 2.—Transverse section through the hepatic lobules.

i, i, i, Interlobular veins ending in the intralobular capillaries.

c, c, Central veins joined by the intralobular capillaries. At *a, a* the capillaries of one lobule communicate with those adjacent to it.

Embryology.—The liver first appears as an entodermal hollow longitudinal outgrowth from the duodenum into the ventral mesentery. The upper part of this forms the future liver, and grows up into the *septum transversum* from which the central part of the diaphragm is formed (see DIAPHRAGM). From the cephalic part of this primary diverticulum solid rods of cells called the *hepatic cylinders* grow out, and these branch again and again until a cellular network is formed surrounding and breaking up the umbilical and vitelline veins. The liver cells, therefore, are entodermal, but the supporting connective tissue mesodermal from the septum transversum. The lower (caudal) part of the furrow-like outgrowth remains hollow and forms the gall bladder. At first the liver is embedded in the septum transversum, but later the diaphragm and it are constricted off one from the other, and soon the liver becomes very large and fills the greater part of the abdomen. At birth it is proportionately much larger than in the adult, and forms one-eighteenth instead of one-fortieth of the body weight, the right and left lobes being nearly equal in size.

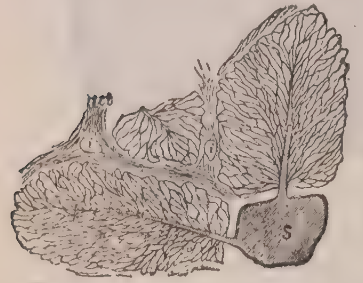


FIG. 3.—Vertical section through two hepatic lobules of a pig.

c, c, Central veins receiving the intralobular capillaries.

s, Sublobular vein.

ct, Interlobular connective tissue forming the capsules of the lobules.

i, i, Interlobular veins.

Comparative Anatomy.—In the Acrania (Amphioxus) the liver is probably represented by a single ventral diverticulum from the anterior end of the intestine, which has a hepatic portal circulation and secretes digestive fluid. In all the Craniata a solid liver is developed. In the adult lamprey among the Cyclostomata the liver undergoes retrogression, and the bile ducts and gall bladder disappear, though they are present in the larval form (Ammocoetes). In fishes and amphibians the organ consists of right and left lobes, and a gall-bladder is present. The same description applies to the reptiles, but a curious network of cystic ducts is found in snakes and to a less extent in crocodiles. In the Varanidae (Monitors) the hepatic duct is also retiform (see F. E. Beddard, *Proc. Zool. Soc.*, 1888, p. 105). In birds two lobes are also present, but in some of them, *e.g.* the pigeon, there is no gall-bladder.

In mammals Sir William Flower pointed out that a generalized type of liver exists, from which that of any mammal may be derived by suppression or fusion of lobes. The accompanying diagram of Flower (fig. 4) represents an ideal mammalian liver. It will be seen that the umbilical fissure (*u*) divides the organ into right and left halves, as in the lower vertebrates, but that the ventral part of each half is divided into a central and lateral lobe. Passing from right to left there are therefore: right lateral (*rl*), right central (*rc*), left central (*lc*), and left lateral (*ll*) lobes. The gall-bladder (*g*), when it is present, is always situated on the caudal surface or in the substance of the right central lobe. The Spigelian (*s*) and caudate lobes (*c*) belong to the right half of the liver, the latter being usually a leaf-shaped lobe attached by its stalk to the Spigelian, and having its blade flattened between the right lateral lobe and the right kidney. The vena cava (*vc*) is always found to the right of the Spigelian lobe and dorsal to the stalk of the caudate. In tracing the lobulation of man's liver back to this generalized type, it is evident at once that his quadrate lobe does not correspond to any one generalized lobe, but is merely that part of the right central which lies between the gall bladder and the umbilical fissure. From a careful study of human variations (see A. Thomson, *Journ. Anat. and Phys.* vol. 33, p. 546) compared with an Anthropoid liver, such as that of the gorilla, depicted by W. H. L. Duckworth (*Morphology and Anthropology*, Cambridge, 1904, p. 98), it is fairly clear that the human liver is formed, not by a suppression of any of the lobes of the generalized type, but by a fusion of those lobes and obliteration of certain fissures. This fusion is, probably correctly, attributed by Keith to the effect of pressure following the assumption of the erect position (Keith, *Proc. Anat. Soc. of Gt. Britain, Journ. Anat. and Phys.* vol. 33, p. xii.). The accompanying diagram (fig. 5) shows an abnormal human liver in the Anatomical Department of St Thomas's Hospital which reproduces the generalized type. In its lobulation it is singularly like, in many details, that of the baboon (*Papio maimon*) figured by G. Ruge (*Morph. Jahrb.*, Bd. 35, p. 197); see F. G. Parsons, *Proc. Anat. Soc.*, Feb. 1904, *Journ. Anat. and Phys.* vol. 33, p. xxiii. Georg Ruge "Die äusseren Formverhältnisse der Leber bei den Primaten," (*Morph. Jahrb.*, Bd. 29 and 35) gives a critical study of the primate liver, and among other things suggests the recognition of the Spigelian and caudate lobes as parts of a single lobe, for which he proposes the name of lobus venae cavae. This doubtless would be an advantage morphologically, though for human descriptive anatomy the present nomenclature is not likely to be altered.

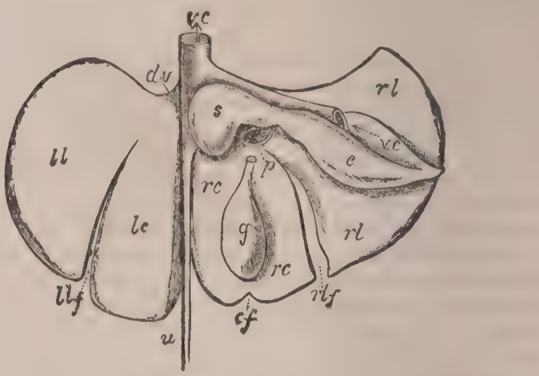


FIG. 4.—Diagrammatic Plan of the Inferior Surface of a Multilobed Liver of a Mammal. The posterior or attached border is uppermost.

u, Umbilical vein of the foetus, represented by the round ligament in the adult, lying in the umbilical fissure.
dv, The ductus venosus.
vc, The inferior vena cava.
p, The vena portae entering the transverse fissure.
llf, The left lateral fissure.
rlf, The right lateral fissure.
cf, The cystic fissure.
ll, The left lateral lobe.
lc, The left central lobe.
rc, The right central lobe.
rl, The right lateral lobe.
s, The Spigelian lobe.
c, The caudate lobe.
g, The gall bladder.

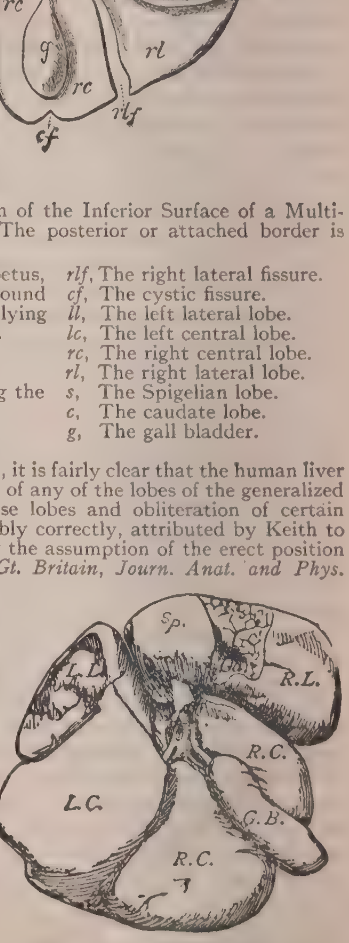


FIG. 5.—Human Liver showing a reversion to the generalized mammalian type.

The gall-bladder is usually present in mammals, but is wanting in the odd-toed ungulates (Perissodactyla) and Procavia (Hyrax). In the giraffe it may be absent or present. The cetacea and a few rodents are also without it. In the otter the same curious network of bile ducts already recorded in the reptiles is seen (see P. H. Burne, *Proc. Anat. Soc., Journ. Anat. and Phys.* vol. 33, p. xi.). (F. G. P.)

SURGERY OF LIVER AND GALL-BLADDER.—Exposed as it is in the upper part of the abdomen, and being somewhat friable, the human liver is often torn or ruptured by blows or kicks, and, the large blood-vessels being thus laid open, fatal haemorrhage into the belly-cavity may take place. The individual becomes faint, and the faintness keeps on increasing; and there are pain and tenderness in the liver-region. The right thing to do is to open the belly in the middle line, search for a wound in the liver and treat it by deep sutures, or by plugging it with gauze.

Cirrhosis of the Liver.—As the result of chronic irritation of the liver increased supplies of blood pass to it, and if the irritation is unduly prolonged inflammation is the result. The commonest causes of this chronic hepatitis are alcoholism and syphilis. The new fibrous tissue which is developed throughout the liver, as the result of the chronic inflammation, causes general enlargement of the liver with, perhaps, nausea, vomiting and jaundice. Later the new fibrous tissue undergoes contraction and the liver becomes smaller than natural. Blood then finds difficulty in passing through it, and, as a result, dropsy occurs in the belly (ascites). This may be relieved by tapping the cavity with a small hollow needle (Southey's trocar), or by passing into it a large sharp-pointed tube. This relieves the dropsy, but it does not cure the condition on which the dropsy depends. A surgical operation is sometimes undertaken with success for enabling the engorged veins to empty themselves into the blood-stream in a manner so as to avoid the liver-route.

Inflammation of the Liver (hepatitis) may also be caused by an attack of micro-organisms which have reached it through the veins coming from the large intestine, or through the main arteries. There are, of course, as the result, pain and tenderness, and there is often jaundice. The case should be treated by rest in bed, fomentations, calomel and saline aperients. But when the hepatitis is of septic origin, suppuration is likely to occur, the result being an hepatic abscess.

Hepatic Abscess is especially common in persons from the East who have recently undergone an attack of dysentery. In addition to the local pain and tenderness, there is a high temperature accompanied with shiverings or occasional rigors, the patient becoming daily more thin and miserable. Sometimes the abscess declares itself by a bulging at the surface, but if not an incision should be made through the belly-wall over the most tender spot, and a direct examination of the surface of the liver made. A bulging having been found, that part of the liver which apparently overlies the abscess should be stitched up to the sides of the opening made in belly-wall, and should then be explored by a hollow needle. Pus being found, the abscess should be freely opened and drained. It is inadvisable to explore for a suspected abscess with a hollow needle without first opening the abdomen, as septic fluid might thus be enabled to leak out, and infect the general peritoneal cavity. If an hepatic abscess is injudiciously left to itself it may eventually discharge into the chest, lungs or belly, or it may establish a communication with a piece of intestine. The only safe way for an abscess to evacuate itself is on to the surface of the body.

Hydatic Cysts are often met with in the liver. They are due to a peculiar development of the eggs of the tape-worm of the dog, which have been received into the alimentary canal with infected water or uncooked vegetables, such as watercress. The embryo of the taenia echinococcus finds its way from the stomach or intestine into a vein passing to the liver, and, settling itself in the liver, causes so much disturbance there that a capsule of inflammatory material forms around it. Inside this wall is the special covering of the embryo which shortly becomes distended with clear hydatid fluid. The cyst should be treated like a liver-abscess, by incision through the abdominal or thoracic wall, by circumferential suturing and by exploration and drainage.

Tumours of the Liver may be innocent or malignant. The most important of the former is the *gumma* of tertiary syphilis; this may steadily and completely disappear under the influence of iodide of potassium. The commonest form of malignant tumour is the result of the growth of cancerous elements which have been brought to the liver by the veins coming up from a primary focus of the large intestine. Active surgical treatment of such a tumour is out of the question. Fortunately it is, as a rule, painless.

The Gall-bladder may be ruptured by external violence, and if bile escapes from the rent in considerable quantities peritonitis will be set up, whether the bile contains septic germs or not. If, on opening the abdomen to find out what serious effects some severe injury has caused, the gall-bladder be found torn, the rent may be sewn up, or, if thought better, the gall-bladder may be removed. The peritoneal surfaces in the region of the liver should then be wiped clean, and the abdominal wound closed, except for the passage through it of a gauze drain.

Biliary concretions, known as *gall stones*, are apt to form in the gall-bladder. They are composed of crystals of bile-fat, cholesterine. Sometimes in the course of a *post-mortem* examination a gall-bladder is found packed full of gall-stones which during life had caused no inconvenience and had given rise to no suspicion of their presence. In other cases gall-stones set up irritation in the gall-bladder which runs on to inflammation, and the gall-bladder being infected by septic germs from the intestine (*bacilli coli*) an abscess forms.

Abscess of the Gall-bladder gives rise to a painful, tender swelling near the cartilage of the ninth rib of the right side. If the abscess is allowed to take its course, adhesions may form around it and it may burst into the intestine or on to the surface of the abdomen, a *biliary fistula* remaining. Abscess in the gall-bladder being suspected, an incision should be made down to it, and, its covering having been stitched to the abdominal wall, the gall-bladder should be opened and drained. The presence of concretions in the gall-bladder may not only lead to the formation of abscess but also to invasion of the gall-bladder by cancer.

Stones in the gall-bladder should be removed by operation, as, if left, there is a great risk of their trying to escape with the bile into the intestine and thus causing a blockage of the common bile-duct, and perhaps a fatal leakage of bile into the peritoneum through a perforating ulcer of the duct. If before opening the gall-bladder the surface is stitched to the deepest part of the abdominal wound, the biliary fistula left as the result of the opening of the abscess will close in due course.

"Biliary colic" is the name given to the distressing symptoms associated with the passage of a stone through the narrow bile-duct. The individual is doubled up with acute pains which, starting from the hepatic region, spread through the abdomen and radiate to the right shoulder blade. Inasmuch as the stone is blocking the duct, the bile is unable to flow into the intestine; so, being absorbed by the blood-vessels, it gives rise to jaundice. The distress is due to spasmodic muscular contraction, and it comes on at intervals, each attack increasing the patient's misery. He breaks out into profuse sweats and may vomit. If the stone happily finds its way into the intestine the distress suddenly ceases. In the meanwhile relief may be afforded by fomentations, and by morphia or chloroform, but if no prospect of the stone escaping into the intestine appears likely, the surgeon will be called upon to remove it by an incision through the gall-bladder, or the bile-duct, or through the intestine at the spot where it is trying to make its escape. Sometimes a gall-stone which has found its way into the intestine is large enough to block the bowel and give rise to intestinal obstruction which demands abdominal section.

A person who is of what used to be called a "biliary nature" should live sparingly and take plenty of exercise. He should avoid fat and rich food, butter, pastry and sauces, and should drink no beer or wine—unless it be some very light French wine or Moselle. He should keep his bowels regular, or even loose, taking every morning a dose of sulphate of soda in a glass of hot water. A course at Carlsbad, Vichy or Contrexéville, may be helpful. It is doubtful if drugs have any direct influence upon gall-stones, such as sulphate of soda, olive oil or oleate of soda. No reliance can be placed upon massage in producing the onward passage of a gall-stone from the gall-bladder towards the intestine. Indeed this treatment might be not only distressing but harmful. (E. O.*)

LIVERMORE, MARY ASHTON [RICE] (1821–1905), American reformer, was born in Boston, Massachusetts, on the 19th of December 1821. She studied at the female seminary at Charlestown, Mass.; taught French and Latin there, taught in a plantation school in southern Virginia; and for three years conducted a school of her own in Duxbury, Mass. Upon returning from Virginia she had joined the abolitionists, and she took an active part in the Washingtonian temperance movement.[1] In 1845 she married Daniel Parker Livermore (1819–1899), a Universalist clergyman. In 1857 they removed to Chicago, Illinois, where she assisted her husband in editing the religious weekly, *The New Covenant* (1857–1869). During the Civil War, as an associate member of the United States Sanitary Commission, and as an agent of its North-western branch, she organized many aid societies, contributed to the success of the North-western Sanitary Fair in Chicago in 1863, and visited army posts and hospitals. After the war she devoted herself to the promotion of woman's suffrage and to temperance reform, founding in Chicago in 1869 *The Agitator*, which in 1870 was merged into the *Woman's Journal* (Boston), of which she was an associate editor until 1872. She died in Melrose, Mass. on the 23rd of May 1905. She had been president of the Illinois, the Massachusetts and the American woman's suffrage associations, the Massachusetts Woman's Christian Temperance Union and the Woman's Congress, and a member of many other societies. She lectured in the United States, England and Scotland, contributed to magazines and wrote: *The Children's Army* (1844), temperance stories; *Thirty Years Too Late* (1848), a temperance story; *A Mental Transformation* (1848); *Pen Pictures* (1863), short stories; *What Shall We Do With Our Daughters? and Other Lectures* (1883); *My Story of the War* (1888); and *The Story of My Life* (1897). With Frances E. Willard, she edited *A Woman of the Century: Biographical Sketches of Leading American Women* (1893).

LIVERPOOL, EARLS OF. Charles Jenkinson, 1st earl of Liverpool (1729–1808), English statesman, eldest son of Colonel Charles Jenkinson (d. 1750) and grandson of Sir Robert Jenkinson, Bart., of Walcot, Oxfordshire, was born at Winchester on the 16th of May 1729. The family was descended from Anthony Jenkinson (d. 1611), sea-captain, merchant and traveller, the first Englishman to penetrate into Central Asia. Charles was educated at Charterhouse school and University College, Oxford, where he graduated M.A. in 1752. In 1761 he entered parliament as member for Cockermouth and was made under-secretary of state by Lord Bute; he won the favour of George III., and when Bute retired Jenkinson became the leader of the "king's friends" in the House of Commons. In 1763 George Grenville appointed him joint secretary to the treasury; in 1766, after a short retirement, he became a lord of the admiralty and then a lord of the treasury in the Grafton administration; and from 1778 until the close of Lord North's ministry in 1782 he was secretary-at-war. From 1786 to 1801 he was president of the board of trade and chancellor of the duchy of Lancaster, and he was popularly regarded as enjoying the confidence of the king to a special degree. In 1772 Jenkinson became a privy councillor and vice-treasurer of Ireland, and in 1775 he purchased the lucrative sinecure of clerk of the pells in Ireland and became master of the mint. In 1786 he was created Baron Hawkesbury, and ten years later earl of Liverpool. He died in London on the 17th of December 1808. Liverpool was twice married: firstly to Amelia (d. 1770), daughter of William Watts, governor of Fort William, Bengal, and secondly to Catherine, daughter of Sir Cecil Bisshoff, Bart., and widow of Sir Charles Cope, Bart.; he had a son by each marriage. He wrote several political works, but except his *Treatise on the Coins of the Realm* (1805) these are without striking merits. They are, *Dissertation on the establishment of a national and constitutional force in England independent of a standing army* (1756); *Discourse on the conduct of the government of Great Britain respecting neutral nations* (1758, new ed., 1837); and *Collection of Treaties between Great Britain and other Powers 1648–1783* (1785). His *Coins of the Realm* was reprinted by the Bank of England in 1880.

His son, Robert Banks Jenkinson, 2nd earl (1770–1828), was educated at Charterhouse and at Christ Church, Oxford, where he had George Canning, afterwards his close political associate, for a contemporary. In 1790 he entered parliament as member for Appleby; he became master of the mint in 1799 and foreign secretary in Addington's administration in 1801, when he conducted the negotiations for the abortive treaty of Amiens. On the accession of Pitt to power in 1804, he obtained the home office, having in the previous year been elevated as Baron Hawkesbury to the House of Lords, where he acted as leader of the government. He declined the premiership on the death of Pitt in 1806, and remained out of office until Portland became prime minister in 1807, when he again became secretary of state for home affairs. In 1808 he succeeded his father as earl of Liverpool. In the ministry of Spencer Perceval (1809–1812) he was secretary for war and the colonies. After the assassination of Perceval in May 1812 he became prime minister, and retained office till compelled in February 1827 to resign by the illness (paralysis) which terminated his life on the 4th of December 1828.

The political career of the 2nd Lord Liverpool was of a negative character so far as legislation was concerned; but he held office in years of great danger and depression, during which he "kept order among his colleagues, composed their quarrels, and oiled the wheels to make it possible for the machinery of government to work" (Spencer Walpole). The energy of Castlereagh and Canning secured the success of the foreign policy of his cabinet, but in his home policy he was always retrograde. The introduction of the bill of pains and penalties against Queen Caroline greatly increased his unpopularity, originated by the severe measures of repression employed to quell the general distress, which had been created by the excessive taxation which followed the Napoleonic wars. Lord Liverpool was destitute of wide sympathies and of true political insight, and his resignation of office was followed almost immediately by the complete and permanent reversal of his domestic policy. He was twice married but had no children, and he was succeeded by his half-brother Charles Cecil Cope Jenkinson, 3rd earl (1784–1851), who left three daughters. The baronetcy then passed to a cousin, and the peerage became extinct. But in 1905 the earldom was revived in the person of the 3rd earl's grandson, Cecil George Savile Foljambe (1846–1907), who had been a Liberal member of parliament from 1880 to 1892, and in 1893 was created Baron Hawkesbury. He was succeeded in 1907 by his son, Arthur (b. 1870).

For the life of the 2nd earl see the anonymous *Memoirs of the Public Life and Administration of Liverpool* (1827); C. D. Yonge, *Life and Administration of the 2nd Earl of Liverpool* (1868); T. E. Kebbel, *History of Toryism* (1886); and Sir S. Walpole, *History of England*, vol. ii. (1890).

LIVERPOOL, a city, municipal, county and parliamentary borough, and seaport of Lancashire, England, 201 m. N.W. of London by rail, situated on the right bank of the estuary of the Mersey, the centre of the city being about 3 m. from the open sea. The form of the city is that of an irregular semicircle, having the base line formed by the docks and quays extending about 9 m. along the east bank of the estuary, which here runs nearly north and south, and varies in breadth from 1 to 2 m. On the north the city is partly bounded by the borough of Bootle, along the shore of which the line of docks is continued. The area of the city is 16,619 acres exclusive of water area. The population at the census of 1901 was 684,958; the estimated population in 1908 was 753,203; the birth-rate for 1907 was 31·7 and the death-rate 18·3; in 1908 the rateable value was £4,679,520.

The city lies on a continuous slope varying in gradient, but in some districts very steep. Exposed to the western sea breezes, with a dry subsoil and excellent natural drainage, the site is naturally healthy. The old borough, lying between the pool, now completely obliterated, and the river, was a conglomeration of narrow alleys without any regard to sanitary provisions; and during the 16th and 17th centuries it was several times visited by plague. When the town expanded beyond its original limits, and spread up the slopes beyond the pool, a better state of things began to exist. The older parts of the town have at successive periods been entirely taken down and renovated. The commercial part of the city is remarkable for the number of palatial piles of offices, built chiefly of stone, among which the banks and insurance offices stand pre-eminent. The demand for cottages about the beginning of the 19th century led to the construction of what are called "courts," being narrow *culs de sac*, close packed, with no through ventilation. This resulted in a high rate of mortality, to contend with which enormous sums have been expended in sanitary reforms of various kinds. The more modern cottages and blocks of artisan dwellings have tended to reduce the rate of mortality.

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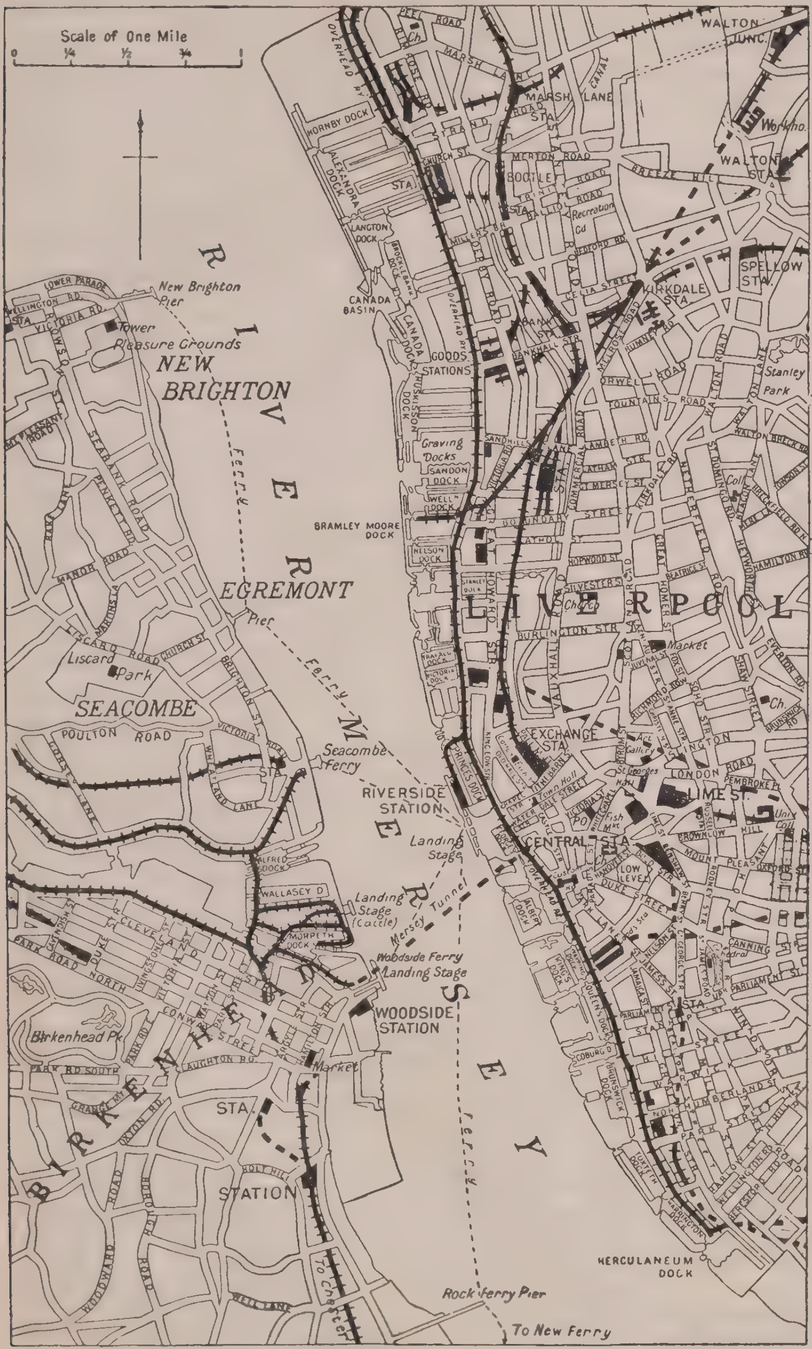
[1] This movement was started in 1840 by habitués of a Baltimore (Md.) tavern, who then founded the Washington Temperance Society (named in honour of George Washington). The movement spread rapidly in 1841–1843, but by the close of 1843 it had nearly spent its force. The members of the Society made a pledge not to drink spirituous or malt liquors, wine or cider. Women organized Martha Washington Societies as auxiliary organizations.


Scale of One Mile
0
¼
½
¾
1
RIVER MERSEY
LIVERPOOL
NEW BRIGHTON
New Brighton Pier
Tower
Pleasure Grounds
EGREMONT
Pier
SEACOMBE
Liscard Park
Seacombe Ferry
Ferry
BIRKENHEAD
Birkenhead Pk
WOODSIDE STATION
Woodside Ferry Landing Stage
Landing Stage (Cattle)
Mersey Tunnel
RIVERSIDE STATION
Landing Stage
PRINCES DOCK
EXCHANGE STA
CENTRAL STA
LIME ST.
BRAMLEY MOORE DOCK
CANADA BASIN
HORNBY DOCK
ALEXANDRA DOCK
LANGTON DOCK
Graving Docks
GOODS STATIONS
BOOTLE
WALTON
WALTON JUNC.
KIRKDALE STA
SPELLOW STA
Stanley Park
Recreation Gd
Workho.
Market
Coll
Univ Coll
HERCULANEUM DOCK
Rock Ferry Pier
To New Ferry
To Chester
STATION
STA
Market

Parks.—The earliest public park, the Prince's Park, was laid out in 1843 by private enterprise, and is owned by trustees, but the reversion has been acquired by the corporation. Sefton Park, the most extensive, containing 269 acres, was opened in 1872. A large portion of the land round the margin has been leased for the erection of villas. Wavertree, Newsham, Sheil and Stanley Parks have also been constructed at the public expense. Connected with Wavertree Park are the botanic gardens. A palm house in Sefton Park was opened in 1896 and a conservatory in Stanley Park in 1900. Since 1882 several of the city churchyards and burial grounds and many open spaces have been laid out as gardens and recreation grounds. A playground containing 108 acres in Wavertree was presented to the city in 1895 by an anonymous donor, and in 1902 the grounds of a private residence outside the city boundaries containing 94 acres were acquired and are now known as Calderstones Park. In 1906 about 100 acres of land in Roby, also outside the boundaries, was presented to the city. The total area of the parks and gardens of the city, not including the two last named, is 881½ acres. A boulevard about 1 m. in length, planted with trees in the centre, leads to the entrance of Prince's Park.

Public Buildings.—Scarcely any of the public buildings date from an earlier period than the 19th century. One of the earliest, and in many respects the most interesting, is the town-hall in Castle Street. This was erected from the designs of John Wood of Bath, and was opened in 1754. The building has since undergone considerable alterations and extensions, but the main features remain. It is a rectangular stone building in the Corinthian style, with an advanced portico added to the original building in 1811, and crowned with a lofty dome surmounted by a seated statue of Britannia, added in 1802. The interior was destroyed by fire in 1795, and was entirely remodelled in the restoration. In 1900 considerable alterations in the internal structure were made, and the council chamber extended so as to afford accommodation for the enlarged council. It contains a splendid suite of apartments, including a ball-room approached by a noble staircase. The building is occupied by the mayor as the municipal mansion house. A range of municipal offices was erected in Dale Street in 1860. The building is in the Palladian style, with a dominating tower and square pyramidal spire.

The crowning architectural feature of Liverpool is St George's Hall, completed in 1854. The original intention was to erect a hall suited for the triennial music festivals which had been held in the town. About the same time the corporation proposed to erect law-courts for the assizes, which had been transferred to Liverpool and Manchester. In the competitive designs, the first prize was gained in both cases by Harvey Lonsdale Elmes. He was employed to combine the two objects in a new design, of which the present building is the outcome. It is fortunate in its situation, occupying the most central position in the town, and surrounded by an area sufficiently extensive to exhibit its proportions, an advantage which was accentuated in 1898 by the removal of St John's church, which previously prevented an uninterrupted view of the west side. The plan is simple. The centre is occupied by the great hall, 169 ft. in length, and, with the galleries, 87 ft. wide and 74 ft. high, covered with a solid vault in masonry. Attached to each end, and opening therefrom, are the law-courts. A corridor runs round the hall and the courts, communicating with the various accessory rooms. Externally the east front is faced with a fine portico of sixteen Corinthian columns about 60 ft. in height. An advanced portico of similar columns fronts the south end crowned with a pediment filled with sculpture. The style is Roman, but the refinement of the details is suggestive of the best period of Grecian art. The great hall is finished with polished granite columns, marble balustrades and pavements, polished brass doors with foliated tracery. The fine organ was built by Messrs Willis of London, from the specification of Dr Samuel Wesley. Elmes having died in 1847 during the progress of the work, the building was completed by C. R. Cockerell, R.A.

Next to the public buildings belonging to the city, the most important is the exchange, forming three sides of a quadrangle on the north side of the town-hall. The town-hall was originally built to combine a mercantile exchange with municipal offices, but the merchants preferred to meet in the open street adjoining. This, with other circumstances, led to the erection of a new exchange, a building of considerable merit, which was begun in 1803 and opened in 1808. It had scarcely been in use for more than fifty years when it was found that the wants of commerce had outstripped the accommodation, and the structure was taken down to make room for the present building.

The revenue buildings, begun in 1828 on the site of the original Liverpool dock, formerly combined the customs, inland revenue, post-office and dock board departments but are now only used by the two first named. It is a heavy structure, with three advanced porticoes in the Ilyssus Ionic style. Near by stands the sailors' home, a large building in the Elizabethan style. The Philharmonic Hall in Hope Street, with not much pretension externally, is one of the finest music rooms in the kingdom; it accommodates an audience of about 2500.

The group of buildings forming the county sessions house, the free public library, museum, central technical school and gallery of art are finely situated on the slope to the north of St George's Hall. The library and gallery of art are separate buildings, connected by the circular reading-room in the middle. The latter possesses some features in construction worthy of note, having a circular floor 100 ft. in diameter without columns or any intermediate support, and a lecture-room underneath, amphitheatrical in form, with grades or benches hewn out of the solid rock. In 1884 the county sessions house just mentioned, adjoining the art gallery was opened for public business. In 1899 new post-office buildings in Victoria Street were completed. In 1907 two important additions were made to the buildings of Liverpool, the new offices of the dock board, built on the site of a portion of the Old George's dock, and the new cotton exchange in Oldhall street. The fine mass of buildings which constitute the university and the Royal Infirmary, lying between Brownlow Hill and Pembroke Place, both groups designed by Alfred Waterhouse, was begun in 1885.

Liverpool cathedral, intended when completed to be the largest in the country, from designs by G. F. Bodley and G. Gilbert Scott, was begun in 1904, when the foundation stone was laid by King Edward VII. The foundations were completed in 1906 and the superstructure begun. The foundation of the chapter-house was laid in that year by the duke of Connaught, and work was then begun on the Lady chapel, the vestries and the choir.

Railways.—There are three terminal passenger stations in Liverpool, the London & North Western at Lime Street, the Lancashire & Yorkshire at Exchange and the combined station of the Midland, Great Northern & Great Central at Central. By the Mersey tunnel (opened in 1886) connexion is made with the Wirral railway, the Great Central, the Great Western and the London & North Western, on the Cheshire side of the river. The Liverpool electric overhead railway running along the line of docks from Seaforth to Dingle was opened in 1893, and in 1905 a junction was made with the Lancashire and Yorkshire railway by which through passenger traffic between Southport and the Dingle has been established. In 1895 the Riverside station at the Prince's dock was completed, giving direct access from the landing stage to the London and North Western system.

Water Supply.—The original supply of water was from wells in the sandstone rock, but in 1847 an act was passed, under which extensive works were constructed at Rivington, about 25 m. distant, and a much larger supply was obtained. The vast increase of population led to further requirements, and in 1880 another act gave power to impound the waters of the Vyrnwy, one of the affluents of the Severn. These works were completed in 1892, a temporary supply having been obtained a year earlier. The corporation had also, however, obtained power to impound the waters of the Conwy and Marchnant rivers, and to bring them into Lake Vyrnwy, the main reservoir, by means of tunnels. This work was completed and opened by the prince of Wales (George V.) in March 1910.

Tramways.—The corporation in 1896 purchased the property, rights, powers and privileges of the Liverpool Electric Supply Company, and in the following year the undertaking of the Liverpool Tramway Company, which they formally took over in the autumn of the same year. Since that date a large and extended system of electric tramways has been laid down, which has led to a very remarkable increase in the receipts and the number of passengers carried.

Administration of Justice.—The city has quarter-sessions for criminal cases, presided over by the recorder, and held eight times in the year. At least two police courts sit daily, and more if required. One is presided over by the stipendiary magistrate and the others by the lay magistrates and the coroner. The court of passage is a very ancient institution, possibly dating from the foundation of the borough by King John, and intended for cases arising out of the imports and exports passing through the town. Its jurisdiction has been confirmed and settled by parliament and it is competent to try civil cases arising within the city to any amount. The mayor is *ex-officio* the judge, but the presiding judge is an assessor appointed by the crown and paid by the corporation. The court sits about five times a year. There is a Liverpool district registry of the chancery of the County Palatine of Lancaster which has concurrent jurisdiction with the high court (chancery division) within the hundred of West Derby. The vice-chancellor holds sittings in Liverpool. There is a Liverpool district registry of the high court of justice with common law, chancery, probate and admiralty jurisdiction, under two district registrars. The Liverpool county court has the usual limited jurisdiction over a wide local area, together with bankruptcy jurisdiction over the county court districts of St Helens, Widnes, Ormskirk and Southport, and admiralty jurisdiction over the same districts with the addition of Birkenhead, Chester, Runcorn and Warrington. There are two judges attached to the court.

Ecclesiastical.—The see of Liverpool was created in 1880 under the act of 1879, by the authority of the ecclesiastical commissioners, an endowment fund of about £100,000 having been subscribed for the purpose. The parish, which was separated from Walton-on-the-Hill in 1699, contained two churches, St Nicholas, the ancient chapel, and St Peter's, then built. There were two rectors, the living being held in medieties. Of recent years changes have been sanctioned by parliament. The living is now held by a single incumbent, and a large number of the churches which have since been built have been formed into parishes by the ecclesiastical commissioners. St Peter's has been constituted the pro-cathedral, pending the erection of the cathedral. Besides the two original parish churches, there are 103 others belonging to the establishment. The Roman Catholics form a very numerous and powerful body in the city, and it is estimated that from a third to a fourth of the entire population are Roman Catholics. A large part of these are Irish settlers or their descendants, but this district of Lancashire has always been a stronghold of Roman Catholicism, many of the landed gentry belonging to old Roman Catholic families.

Charities.—The earliest charitable foundation is the Blue Coat hospital, established in 1708, for orphans and fatherless children born within the borough. The original building, opened in 1718, is a quaint and characteristic specimen of the architecture of the period. It now maintains two hundred and fifty boys and one hundred girls. In 1906 the school was removed to new buildings at Wavertree. There is an orphan asylum, established in 1840, for boys, girls and infants, and a seamen's orphan asylum, begun in 1869, for boys and girls. The Roman Catholics have similar establishments. The Liverpool dispensaries founded in 1778 were among the pioneers of medical charity. The Royal Infirmary (opened in 1749) had a school of medicine attached, which has been very successful, and is now merged in the university. The sailors' home, opened in 1852, designed to provide board, lodging and medical attendance at a moderate charge for the seamen frequenting the port, is one of Liverpool's best-known charities. The David Lewis Workmen's Hostel is an effort to solve the difficulty of providing accommodation for unmarried men of the artizan class.

Literature, Art and Science.—The free library, museum and gallery of arts, established and managed by the city council, was originated in 1850. The first library building was erected by Sir William Brown. The Derby museum, containing the collections of Edward, the 13th earl, was presented by his son. The Mayer museum of historical antiquities and art was contributed by Mr Joseph Mayer, F.S.A. Sir Andrew Walker (d. 1893) erected in 1877 the art gallery which bears his name. Large additions were made in 1884, the cost being again defrayed by Sir Andrew Walker. An annual exhibition of painting is held in the autumn and a permanent collection has been formed, which was augmented in 1894 when the examples of early

Italian art numbering altogether about 180 pictures, collected at the beginning of the 19th century by William Roscoe, were deposited in the gallery. The Picton circular reading-room, and the rotunda lecture-room were built by the corporation and opened in 1879. Alterations in the museum were completed in 1902 by which its size was practically doubled. The literary and philosophical society was established in 1812. The Royal Institution, established mainly through the efforts of Roscoe in 1817, possessed a fine gallery of early art in the Walker Art Gallery, and is the centre of the literary institutions of the town.

Education.—Sunday schools were founded for poor children in 1784, as the result of a town's meeting. These were soon followed by day-schools supplied by the various denominations. The first were the Old Church schools in Moorfields (1789), the Unitarian schools in Mount Pleasant (1790) and Manesty Lane (1792) and the Wesleyan Brunswick school (1790). In 1826 the corporation founded two elementary schools, one of which, the North Corporation school, was erected in part substitution for the grammar school founded by John Crosse, rector of St Nicholas Fleshshambles, London, a native of Liverpool, in 1515, and carried on by the Corporation until 1815. From this date onward the number rapidly increased until the beginning of the School Board in 1870, and afterwards. Mention should be made of the training ship "Indefatigable" moored in the Mersey for the sons and orphans of sailors, and the reformatory institution at Heswall, Co. Chester, which has recently replaced the training ship "Akbar" formerly moored in the Mersey. Semi-private schools were founded by public subscription—the Royal Institution school (1819), the Liverpool Institute (1825) and the Liverpool College (1840). The first has ceased to exist. The Institute was a development of the Mechanics' Institute and was managed by a council of subscribers. It was divided into a high school and a commercial school. Under a scheme of the Board of Education under the Charitable Trusts Act this school, together with the Blackburne House high school for girls, became a public secondary school and was handed over to the corporation in 1905. Liverpool College was formerly divided into three schools, upper, middle and lower, for different classes of the community. The middle and lower schools passed into the control of the corporation in 1907. The Sefton Park elementary school and the Pupil Teachers' College in Clarence Street were transformed into municipal secondary schools for boys and girls in 1907 ;the corporation has also a secondary school for girls at Aigburth. There are several schools maintained by the Roman Catholics, two schools of the Girls' Public Day School Company and a large number of private schools. A cadet ship, the "Conway," for the training of boys intending to become officers in the mercantile marine, is moored in the Mersey. There are two training colleges for women, one undenominational, and the other conducted by the sisters of Notre Dame for Roman Catholic women. The central municipal technical school is in the Museum Buildings, and there are three branch technical schools. There are also a nautical college, a school of cookery and a school of art controlled by the Education Committee.

Liverpool University, as University College, received its charter of incorporation in 1881, and in 1884 was admitted as a college of the Victoria University. In the same year the medical school of the Royal Infirmary became part of the University College. In 1900 a supplemental charter extended the powers of self-government and brought the college into closer relations with the authorities of the city and with local institutions by providing for their fuller representation on the court of governors. In 1903 the charter of incorporation of the university of Liverpool was received, thus constituting it an independent university. The university is governed by the king as visitor, by a chancellor, two pro-chancellors, a vice-chancellor and a treasurer, by a court of over 300 members representing donors and public bodies, a council, senate, faculties and convocation. The fine group of buildings is situated on Brownlow Hill.

Trade and Commerce.—In 1800 the tonnage of ships entering the port was 450,060; in 1908 it reached 17,111,814 tons. In 1800 4746 vessels entered, averaging 94 tons; in 1908 there were 25,739, averaging 665 tons. The commerce of Liverpool extends to every part of the world, but probably the intercourse with North America stands pre-eminent, there being lines of steamers to New York, Philadelphia, Boston, Baltimore, Galveston, New Orleans and the Canadian ports. Cotton is the great staple import. Grain comes next, American (North and South) and Australian wheat and oats occupying a large proportion of the market. An enormous trade in American provisions, including live cattle, is carried on. Tobacco has always been a leading article of import into Liverpool, along with the sugar and rum from the West Indies. Timber forms an important part of the imports, the stacking yards extending for miles along the northern docks. In regard to exports, Liverpool possesses decided advantages; lying so near the great manufacturing districts of Lancashire and the West Riding of Yorkshire, this port is the natural channel of transmission for their goods, although the Manchester ship canal diverts a certain proportion of the traffic, while coal and salt are also largely exported.

Manufactures.—The manufactures of Liverpool are not extensive. Attempts have been repeatedly made to establish cotton mills in and near the city, but have resulted in failure. Engineering works, especially connected with marine navigation, have grown up on a large scale. Shipbuilding, in the early part of the 19th century, was active and prosperous, but has practically ceased. During the latter half of the 18th century and the beginning of the 19th, pottery and china manufacture flourished in Liverpool. John Sadler, a Liverpool manufacturer, was the inventor of printing on pottery, and during the early period of Josiah Wedgwood's career all his goods which required printing had to be sent to Liverpool. A large establishment, called the Herculaneum Pottery, was founded in a suburb on the bank of the Mersey, but the trade has long disappeared. Litherland, the inventor of the lever watch, was a Liverpool manufacturer, and Liverpool-made watches have always been held in high estimation. There are several extensive sugar refineries and corn mills. The confectionery trade has developed during recent years, several large works having been built, induced by the prospect of obtaining cheap sugar directly from the Liverpool quays. The cutting, blending and preparing of crude tobacco have led to the erection of factories employing some thousands of hands. There are also large mills for oil-pressing and making cattle-cake.

Docks.—The docks of the port of Liverpool on both sides of the Mersey are owned and managed by the same public trust, the Mersey Docks and Harbour Board. On the Liverpool side they extend along the margin of the estuary 6½ m., of which 1¼ m. is in the borough of Bootle. The Birkenhead docks have not such a frontage, but they extend a long way backward. The water area of the Liverpool docks and basins is 418 acres, with a lineal quayage of 27 m. The Birkenhead docks, including the great float of 120 acres, contain a water area of 165 acres, with a lineal quayage of 9½ m. The system of enclosed docks was begun by the corporation in 1709. They constituted from the first a public trust, the corporation never having derived any direct revenue from them, though the common council of the borough were the trustees, and in the first instance formed the committee of management. Gradually the payers of dock rates on ships and goods acquired influence, and were introduced into the governing body, and ultimately, by an act of 1857, the corporation was superseded. The management is vested in the Mersey Docks and Harbour Board, consisting of twenty-eight members, four of whom are nominated by the Mersey Conservancy commissioners, who consist of the first lord of the Admiralty, the chancellor of the duchy of Lancaster and the president of the Board of Trade, and the rest elected by the payers of rates on ships and goods, of whom a register is kept and annually revised. The revenue is derived from tonnage rates on ships, dock rates on goods, town dues on goods, with various minor sources of income.

Down to 1843 the docks were confined to the Liverpool side of the Mersey. Several attempts made to establish docks in Cheshire had been frustrated by the Liverpool corporation, who bought up the land and kept it in their own hands. In 1843, however, a scheme for docks in Birkenhead was carried through which ultimately proved unsuccessful, and the enterprise was acquired in 1855 by Liverpool. The Birkenhead docks were for many years only partially used, but are now an important centre for corn-milling, the importation of foreign cattle and export trade to the East. In addition to the wet docks, there are in Liverpool fourteen graving docks and three in Birkenhead, besides a gridiron on the Liverpool side.

The first portion of the great landing stage, known as the Georges' stage, was constructed in 1847, from the plans of Mr (afterwards Sir) William Cubitt, F.R.S. This was 500 ft. long. In 1857 the Prince's stage, 1000 ft. long, was built to the north of the Georges' stage and distant from it 500 ft. In 1874 the intervening space was filled up and the Georges' stage reconstructed. The fabric had just been completed, and was waiting to be inaugurated, when on the 28th of July 1874 it was destroyed by fire. It was again constructed with improvements. In 1896 it was farther extended to the north, and its length is now 2478 ft. and its breadth 80 ft. It is supported on floating pontoons about 200 in number, connected with the river wall by eight bridges, besides a floating bridge for heavy traffic 550 ft. in length and 35 ft. in width. The southern half is devoted to the traffic of the Mersey ferries, of which there are seven—New Brighton, Egremont, Seacombe, Birkenhead, Rock Ferry, New Ferry and Eastham. The northern half is used by ocean-going steamers and their tenders. The warehouses for storing produce form a prominent feature in the commercial part of the city. Down to 1841 these were entirely in private hands, distributed as chance might direct, but in that year a determined effort was made to construct docks with warehouses on the margin of the quays. This met with considerable opposition from those interested, and led to a municipal revolution, but the project was ultimately carried out in the construction of the Albert dock and warehouses, which were opened by Prince Albert in 1845. For general produce these warehouses are falling somewhat into disuse, but grain warehouses have been constructed by the dock board at Liverpool and Birkenhead, with machinery for discharging, elevating, distributing, drying and delivering. Warehouses for the storage of tobacco and wool have also been built by the board. The Stanley tobacco warehouse is the largest of its kind in the world, the area of its fourteen floors being some 36 acres.

Dredging operations at the bar of the Queen's channel, in the channel itself and at the landing stage enables the largest ocean liners to enter the river and approach the stage at practically all states of the tide. The dredging at the bar was begun as an experiment in September 1890 by two of the board's ordinary hopper barges of 500 tons capacity each fitted with centrifugal pumps. The result was favourable, and larger vessels have been introduced. Before dredging was begun the depth of water at dead low water of spring tides on the bar was only 11 ft.; now there is about 28 ft. under the same conditions. The space over which dredging has been carried on at the bar measures about 7000 ft. by 1250 ft., the latter being the average width of the buoyed cut or channel through the bar. Dredging has also taken place on shoals and projections of sand-banks in the main sea channels.

Municipality.—Under the Municipal Reform Act of 1835, the boundaries of the original borough were extended by the annexation of portions of the surrounding district, while further additions were made in 1895, 1902 and 1905. The city is divided into thirty-five wards with 103 councillors and 34 aldermen. In 1893 the title of mayor was raised to that of lord mayor. In 1885 the number of members of parliament was increased to nine by the creation of six new wards. The corporation of Liverpool has possessed from a very early period considerable landed property, the first grant having been made by Thomas, earl of Lancaster, in 1309. This land was originally of value only as a source of supply of turf for firing, but in modern times its capacity as building land has been a fruitful source of profit to the town. A large proportion of the southern district is held in freehold by the corporation and leased to tenants for terms of seventy-five years, renewable from time to time on a fixed scale of fines. There was formerly another source of income now cut off. The fee farm rents and town dues originally belonging to the crown were purchased from the Molyneux family in 1672 on a long lease, and subsequently in 1777 converted into a perpetuity. With the growth of the commerce of the port these dues enormously increased, and became a cause of great complaint by the shipping interest. In 1856 a bill was introduced into parliament, and passed, by which the town dues were transferred to the Mersey Docks and Harbour Board on payment of £1,500,000, which was applied in part to the liquidation of the bonded debt of the corporation, amounting to £1,150,000.

History.—During the Norse irruption of the 8th century colonies of Norsemen settled on both sides of the Mersey, as is indicated by some of the place-names. After the Conquest, the site of Liverpool formed part of the fief (inter Ripam et Mersham) granted by the Conqueror to Roger de Poictou, one of the great family of Montgomery. Although Liverpool is not named in Domesday it is believed to have been one of the six berewicks dependent on the manor of West Derby therein mentioned. After various forfeitures and regrants from the crown, it was handed over by Henry II. to his falconer Warine. In a deed executed by King John, then earl of Mortain, about 1191, confirming the grant of this with other manors to Henry Fitzwarine, son of the former grantee, the name of Liverpool first occurs. Probably its most plausible derivation is from the Norse *Hlithar-pollr*, "the pool of the slopes," the pool or inlet at the mouth of which the village grew up being surrounded by gently rising slopes. Another possible derivation is from the Prov. E. *lever*, the yellow flag or rush, A.S. *laefer*.

After the partial conquest of Ireland by Strongbow, earl of Pembroke, under Henry II., the principal ports of communication were Bristol for the south and Chester for the north. The gradual silting up of the river Dee soon so obstructed the navigation as to render Chester unsuitable. A quay was then constructed at Shotwick, about 8 m. below Chester, with a castle to protect it from the incursions of the neighbouring Welsh; but a better site was sought and soon found. Into the tidal waters of the Mersey a small stream, fed by a peat moss on the elevated land to the eastward, ran from north-east to south-west, forming at its mouth an open pool or sea lake, of which many existed on both sides of the river. The triangular piece of land thus separated formed a promontory of red sandstone rock, rising in the centre about 50 ft. above the sea-level, sloping on three sides to the water. The pool was admirably adapted as a harbour for the vessels of that period, being well protected, and the tide rising from 15 to 21 ft. King John repurchased the manor from Henry Fitzwarine, giving him other lands in exchange. Here he founded a borough, and by letters patent dated at Winchester, 28th of August 1207, invited his subjects to take up burgages.

From the patent rolls and the sheriff's accounts it appears that considerable use was made of Liverpool in the 13th century for shipping stores and reinforcements to Ireland and Wales.

In 1229 a charter was granted by Henry III., authorizing the formation of a merchants' gild, with hanse and other liberties and free customs, with freedom from toll throughout the kingdom. Charters were subsequently granted by successive monarchs down to the reign of William and Mary, which last was the governing charter to the date of the Municipal Reform Act (1835). In 1880 when the diocese of Liverpool was created, the borough was transformed into a city by royal charter.

The crown revenues from the burgage rents and the royal customs were leased in fee-farm from time to time, sometimes to the corporation, at other times to private persons. The first lease was from Henry III., in 1229, at £10 per annum. In the same year the borough, with all its appurtenances, was bestowed with other lands on Ranulf, earl of Chester, from whom it passed to his brother-in-law William de Ferrers, earl of Derby, who seems to have built Liverpool castle between 1232 and 1237. His grandson, Robert de Ferrers, was implicated in the rising of Simon de Montfort and his lands were confiscated in 1266 when Liverpool passed into the hands of Edmund, earl of Lancaster. Ultimately Liverpool again became the property of the crown, when Henry IV. inherited it from his father John of Gaunt, duke of Lancaster. In 1628 Charles I., in great straits for means which were refused by parliament, offered for sale about a thousand manors, among which Liverpool was included. The portion containing Liverpool was purchased by certain merchants of London, who, in 1635, reconveyed the crown rights, including the fee-farm rent of £14, 6s. 8d., to Sir Richard Molyneux, then recently created Viscount Molyneux of Maryborough, for the sum of £450. In 1672 all these rights and interests were acquired by the corporation.

Apart from the national objects for which Liverpool was founded, its trade developed slowly. From £10 per annum, in the beginning of the 13th century, the crown revenues had increased towards the end of the 14th century, to £38; but then they underwent a decline. The black death passed over Liverpool about 1360, and carried off a large part of the population. The Wars of the Roses in the 15th century unsettled the north-western districts and retarded progress for at least a century. The crown revenues diminished from £38 to less than half that sum, and were finally leased at £14, 6s. 8d., at which they continued until the sale by Charles I. It is, however, not safe to conclude that the reduced fee-farm rent represents an equivalent decline in prosperity; the privileges conferred by the various leases differed widely and may account for much of the apparent discrepancy.

Liverpool sent no representatives to Simon de Montfort's parliament in 1264, but to the first royal parliament, summoned in 1295, the borough sent two members, and again in 1307.

The writs of summons were then suspended for two centuries and a half. In 1547 Liverpool resumed the privilege of returning members. In 1588 the borough was represented by Francis Bacon, the philosopher and statesman. During the Civil War the town was fortified and garrisoned by the parliament. It sustained three sieges, and in 1644 was escaladed and taken by Prince Rupert with considerable slaughter.

The true rise of the commerce of Liverpool dates from the Restoration. Down to that period its population had been either stationary or retrogressive, probably never exceeding about 1000. Its trade was chiefly with Ireland, France and Spain, exporting fish and wool to the continent, and importing wines, iron and other commodities. The rise of the manufacturing industry of south Lancashire, and the opening of the American and West Indian trade, gave the first impulse to the progress which has since continued. By the end of the century the population had increased to 5000. In 1699 the borough was constituted a parish distinct from Walton, to which it had previously appertained. In 1709, the small existing harbour being found insufficient to accommodate the shipping, several schemes were propounded for its enlargement, which resulted in the construction of a wet dock closed with flood-gates impounding the water, so as to keep the vessels floating during the recess of the tide. This dock was the first of its kind. The name of the engineer was Thomas Steers.

About this date the merchants of Liverpool entered upon the slave trade, into which they were led by their connexion with the West Indies. In 1709 a single vessel of 30 tons burden made a venture from Liverpool and carried fifteen slaves across the Atlantic. In 1730, encouraged by parliament, Liverpool went heartily into the new trade. In 1751, fifty-three ships sailed from Liverpool for Africa, of 5334 tons in the aggregate. The ships sailed first to the west coast of Africa, where they shipped the slaves, and thence to the West India Islands, where the slaves were sold and the proceeds brought home in cargoes of sugar and rum. In 1765 the number of Liverpool slavers had increased to eighty-six, carrying 24,200 slaves. By the end of the century five-sixths of the African trade centred in Liverpool. Just before its abolition in 1807 the number of Liverpool ships engaged in the traffic was 185, carrying 49,213 slaves in the year.

Another branch of maritime enterprise which attracted the attention of the merchants of Liverpool was privateering, which, during the latter half of the 18th century, was a favourite investment. After the outbreak of the Seven Years' War with France and Spain, in 1756, the commerce of Liverpool suffered severely, the French having overrun the narrow seas with privateers, and the premiums for insurance against sea risks rose to an amount almost prohibitive. The Liverpool merchants took a lesson from the enemy, and armed and sent out their ships as privateers. Some of the early expeditions proving very successful, almost the whole community rushed into privateering, with results of a very chequered character. When the War of Independence broke out in 1775 American privateers swarmed about the West India Islands, and crossing the Atlantic intercepted British commerce in the narrow seas. The Liverpool merchants again turned their attention to retaliation. Between August 1778 and April 1779, 120 privateers were fitted out in Liverpool, carrying 1986 guns and 8745 men.

See W. Enfield, *Hist. of Leverpool* (1773); J. Aikin, *Forty Miles round Manchester* (1795); T. Troughton, *Hist. of Liverpool* (1810); M. Gregson, *Portfolio of Fragments relating to Hist. of Lancashire* (1817); H. Smithers, *Liverpool, its Commerce, &c.* (1825); R. Syers, *Hist. of Everton* (1830); E. Baines, *Hist. of County Palatine of Lancaster*, vol. iv. (1836); T. Baines, *Hist. of Commerce and Town of Liverpool* (1852); R. Brooke, *Liverpool during the last quarter of 18th Century* (1853); J. A. Picton, *Memorials of Liverpool* (2 vols., 1873); Ramsay Muir and Edith M. Platt, *A History of Municipal Government in Liverpool* (1906); Ramsay Muir, *A History of Liverpool* (1907). (W. F. I.)

LIVERSEDGE, an urban district in the Spen Valley parliamentary division of the West Riding of Yorkshire, England, 7 m. S.S.E. of Bradford, on the Lancashire & Yorkshire, Great Nothern, and London & North Western railways. Pop. (1901) 13,980. The industries are chiefly the manufacture of woollen goods, the making of machinery, chemical manufactures and coal mining.

LIVERY, originally the provision of food, clothing, &c., to household servants. The word is an adaptation of the Anglo-French *livrée*, from *livrer*, to deliver (Late Lat. *liberare*, to set free, to serve, to give freely), in the special sense of distributing. In the sense of a fixed allowance of provender for horses, it survives now only in "livery-stable," *i.e.* an establishment where horses and carriages are kept or let out for hire. From the meaning of provision of food and clothing the word is applied to a uniform worn by the retainers and servants of a household. In the 15th century in England a badge, collar or other insignia, the "livery," was worn by all those who pledged themselves to support one of the great barons in return for his promise of "maintenance," *i.e.* of protection against enemies; thus arose the custom of "livery and maintenance," suppressed by Henry VII. The members of the London city companies wore a distinctive costume or "livery," whence the term "livery companies." In law, the term "livery" means "delivery," the legal handing of property into the possession of another; for "livery of seisin" see FEOFFMENT.

LIVERY COMPANIES, the name given to particular companies or societies in the city of London. They belong to a class of institutions which at one time were universal in Europe. In most other countries they have disappeared; in England, while their functions have wholly changed, the organization remains. The origin of the city companies is to be found in the craftgilds of the middle ages. The absence of a strong central authority accounts for the tendency of confederation in the beginning of modern societies. Artificial groups, formed in imitation of the family, discharged the duties which the family was no longer able, and the state was not yet able, to undertake. The inhabitants of towns were forced into the societies known as gild-merchants, which in course of time monopolized the municipal government, became exclusive, and so caused the growth of similar societies among excluded citizens. The craftgilds were such societies, composed of handicraftsmen, which entered upon a struggle with the earlier gilds and finally defeated them. The circumstances and results of the struggle were of much the same character in England and on the continent. In London the victory of the crafts is decisively marked by the ordinance of the time of Edward II., which required every citizen to be a member of some trade or mystery, and by another ordinance in 1375 which transferred the right of election of corporate officers (including members of parliament) from the ward-representatives to the trading companies. Henceforward, and for many years, the companies engrossed political and municipal power in the city of London.

The trading fraternities assumed generally the character of corporations in the reign of Edward III. Many of them had been chartered before, but their privileges, hitherto exercised only on sufferance and by payment of their terms, were now confirmed by letters patent. Edward III. himself became a member of the fraternity of Linen Armourers, or Merchant Taylors, and other distinguished persons followed his example. From this time they are called livery companies, "from now generally assuming a distinctive dress or livery." The origin of the Grocers' Company is thus described: "Twenty-two persons, carrying on the business of pepperers in Soper's Lane, Cheapside, agree to meet together, to a dinner, at the Abbot of Bury's, St Mary Axe, and commit the particulars of their formation into a trading society to writing. They elect after dinner two persons of the company so assembled—Roger Osekyn and Lawrence de Haliwell—as their first governors or wardens, appointing, at the same time, in conformity with the pious custom of the age, a priest or chaplain to celebrate divine offices for their souls" (Heath's "Account of the Grocers' Company," quoted in Herbert's *Twelve Great Livery Companies*, 1836, i. 43). The religious observances and the common feasts were characteristic features of those institutions. They were therefore not merely trade unions in the current meaning of that phrase, but may rather be described as forms of industrial self-government, the basis of union being the membership of a common trade, and the authority of the society extending to the general welfare, spiritual and temporal, of its members. It must be remembered that they flourished at a time when the separate interests of master and servant had not yet been created; and, indeed, when that fundamental division of interests arose, the companies gradually lost their functions in the regulation of industry. The fact that the craftsmen were a homogeneous order will account for the wide authority claimed by their societies, and the important public powers which were conceded to them. In the regulation of trade they possessed extensive powers. They required every one carrying on the trade to join the company. In 1363, in answer to a remonstrance against the mischief caused by "the merchants called grocers who engrossed all manner of merchandize vendable, and who suddenly raised the prices of such merchandize within the realm," it was enacted "that all artificers and people of mysteries shall each choose his own mystery[1] before next Candlemas, and that, having so chosen it, he shall henceforth use no other." L. Brentano (*On Gilds*) holds that it is wrong to represent such regulations as monopolistic, inasmuch as there was no question whatever of a monopoly in that time nor until the degeneration of the craftgilds into limited corporations of capitalists. In the regulation of trade the right of search was an important instrument. The wardens of the grocers are to "assayen weights, powders, confeccions, platers, oyntments and all other things belonging to the same crafte." The goldsmiths had the assay of metals, the fishmongers the oversight of fish, the vintners of the tasting of wine, &c. The companies enforced their regulations on their members by force. Many of their ordinances looked to the domestic affairs and private conduct of the members. The grocers ordain "that no man of the fraternite take his neyghbor's house y^t is of the same fraternite, or enhaunce the rent against the will of the foresaid neyghbor." Perjury is to be punished by the wardens and society with such correction as that other men of the fellowship may be warned thereby. Members reduced to poverty by adventures on the sea, increased price of goods, borrowing and pledging, or any other misfortune, are to be assisted "out of the common money, according to his situation, if he could not do without."

Following what appears to be the natural law of their being, the companies gradually lost their industrial character. The course of decay would seem to have been the following. The capitalists gradually assumed the lead in the various societies, the richer members engrossed the power and the companies tended to become hereditary and exclusive. Persons might be members who had nothing to do with the craft, and the rise of great capitalists and the development of competition in trade made the regulation of industry by means of companies no longer possible. For an account of the "degeneration of craftgilds" a general reference may be made to Brentano, *On Gilds* (1870), and C. Gross, *The Gild Merchant* (2 vols., 1890). The usurpation of power on the part of the richer members was not always effected without opposition. Brentano refers to a pamphlet on the Clothworkers' Company, published in 1649, which asserts that "the commonalty" in the old charters meant, not the whole gild, but only the masters, wardens and assistants. Herbert records a dispute in the Goldsmiths' Company in 1529. The mode of electing officers, and the system of management generally, was challenged by three members who called themselves "artificers, poor men of the craft of goldsmiths." The company, or rather, the wardens, the assistants and livery presented a petition to the lord mayor, which was answered by the discontented craftsmen. The dispute was carried into the court of chancery and the star chamber. The artificers accused the company of subverting their grants, misappropriating the funds and changing the constitution of the society, and they complain of this being done by the usurpation of persons who "were but merchant goldsmiths, and had but little knowledge in the science." In 1531 the three complainants were expelled from the company, and then the dispute seems to have ended. In the last stage of the companies the members have ceased to have any connexion with the trades, and in most cases their regulative functions have disappeared. The one characteristic which has clung to them throughout is that of owners of property and managers of charitable trusts. The connexion between the companies and the municipality is shortly as follows. The ordinance of Edward II. required freemen of the city to be members of one or other of the companies. By the ordinance of 49 Edw. III. (1375), the trading companies were to nominate the members of common council, and the persons so nominated alone were to attend both at common councils and at elections. An ordinance in 7 Richard II. (1383) restored the elections of common councilmen to the wards, but corporate officers and representatives in parliament were elected by a convention summoned by the lord mayor from the nominees of the companies. An act of common council in 7 Edw. IV. (1467) appointed the election of mayor, sheriffs, &c., to be in the common council, together with the masters and wardens of the companies. By 15 Edw. IV. masters and wardens were ordered to associate with themselves the honest men of their mysteries, and come in their best liveries to the elections; that is to say, the franchise was restricted to the "liverymen" of the companies. At this time the corporation exercised supreme control over the companies, and the companies were still genuine associations of the traders and householders of the city. The delegation of the franchise to the liverymen was thus, in point of fact, the selection of a superior class of householders to represent the rest. When the corporation lost its control over the companies, and the members of the companies ceased to be traders and householders, the liverymen were no longer a representative class, and some change in the system became necessary. The Reform Acts of 1832 and 1867 reformed the representation in several particulars. The liverymen of the companies, being freemen of the city, have still, however, the exclusive power of electing the lord mayor, sheriffs, chamberlain and other corporate officers.

The contributions made by the companies to the public purposes of the state and the city are interesting points in their early history. Their wealth and their representative character made them a most appropriate instrument for the enforcement of irregular taxation. The loan of £21,263, 6s. 8d. to Henry VIII. for his wars in Scotland, in 1544, is believed by Herbert to be the first instance of a pecuniary grant to the crown, but the practice rapidly gained ground. The confiscation of ecclesiastical property at the time of the Reformation affected many of the trusts of the companies; and they were compelled to make returns of their property devoted to religious uses, and to pay over the rents to the crown. In course of time the taxation of the companies became "a regular source of supply to government." The historians of the city have for the most part described these as unjust and tyrannical exactions, but, looking at the representative and municipal character of the companies, and the purposes to which their contributions were applied, we may regard them as a rough but not unfair mode of taxation. The government, when money was wanted for public works, informed the lord mayor, who apportioned the sums required among the various societies, and issued precepts for its payment. Contributions towards setting the poor to work, erecting the Royal Exchange, cleansing the city ditch, discovering new countries, furnishing military and naval armaments, for men, arms and ammunition for the defence of the city, are among what Herbert calls the sponging expedients of the government. The crown occasionally interfered in a more unjustifiable manner with the companies in the exercise of their patronage. The Stuarts made strenuous efforts to get the control of the companies. Terrified by the proceedings in the *quo warranto* case, most of the companies surrendered their charters to the crown, but such surrenders were annulled by the act of 2 William and Mary

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[1] Properly the word should be spelled, as it was originally, "mistery;" it comes through the O. Fr. *mestier*, modern *métier*, from Lat. *ministerium*, service, employment, and meant a trade or craft, and hence the plays acted by craftsmen and members of gilds were called "mystery plays" (see DRAMA). For the word meaning a hidden or secret rite, with which this has so often been confused, see MYSTERY.

(1690) reserving the judgment in *quo warranto* against the city. The livery companies now in existence are the following:

Apothecaries.
Armourers and Brasiers.
Bakers.
Barbers.
Basket Makers.
Blacksmiths.
Bowyers.
Brewers.
Broderers.
Butchers.
Carmen.
Carpenters.
Clockmakers.
Clothworkers.
Coach and Coach-harness Makers.
Cooks.
Coopers.
Cordwainers.
Curriers.
Cutlers.
Distillers.
Drapers.
Dyers.
Fanmakers.
Farriers.
Fellowship Porters.
Feltmakers.
Fishmongers.
Fletchers.
Founders.
Framework Knitters.
Fruiterers.
Girdlers.
Glass Sellers.
Glaziers.
Glovers.
Gold and Silver Wyre-drawers.
Goldsmiths.
Grocers.
Gunmakers.
Haberdashers.
Horners.
Innholders.
Ironmongers.
Joiners.
Leathersellers.
Loriners.
Masons.
Mercers.
Merchant Taylors.
Musicians.
Needlemakers.
Painters.
Pattern Makers.
Pewterers.
Plaisterers.
Playing Card Makers.
Plumbers.
Poulters.
Saddlers.
Salters.
Scriveners.
Shipwrights.
Silkthrowsters.
Skinners.
Spectacle makers.
Stationers.
Tallow Chandlers.
Tin Plate Workers.
Turners.
Tylers and Bricklayers.
Upholders.
Wax chandlers.
Weavers.
Wheelwrights.
Woolmen.

The following are the twelve great companies in order of civic precedence: Mercers, Grocers, Drapers, Fishmongers, Goldsmiths, Skinners, Merchant Taylors, Haberdashers, Salters, Ironmongers, Vintners, Cloth-workers. The "Irish Society" was incorporated in the 11 James I. as "the governor and assistants of the new plantation in Ulster, within the realm of Ireland." The twelve companies contributed in equal portions the sum of £60,000 for the new scheme, by which it was intended to settle a Protestant colony in the lands forfeited by the Irish rebels. The companies divided the settlement into twelve nearly equal parts, assigning one to each, but the separate estates are still held to be under the paramount jurisdiction of the Irish Society. The charter of the society was revoked by the court of star chamber in the reign of Charles I., but a new one was granted by Charles II., under which the society still acts.

Most of the companies administer charities of large value. Many of them are governors of important schools, *e.g.* the Skinners have the Tonbridge Grammar School; the Mercers, St Paul's School; the Merchant Taylors, the school bearing their name, &c. The constitution of the livery companies usually embraces (*a*) the court, which includes the master and wardens, and is the executive and administrative body; (2) the livery or middle class, being the body from which the court is recruited; and (3) the general body of freemen, from which the livery is recruited. Some companies admit women as freemen. The freedom is obtained either by patrimony (by any person over twenty-one years of age born in lawful wedlock after the admission of his father to the freedom), by servitude (by being bound as an apprentice to a freeman of the company) or by redemption. Admission to many of the companies is subject to the payment of considerable fees. For example, in the Merchant Taylors the fees are—upon taking up the freedom, by patrimony or servitude, £1, 3s. 4d.; by redemption, £84; on admission to the livery, £80, 8s.; on election to the court of assistants, £115, 10s. At one time the position of the livery companies was a subject of much political discussion. Two parties threatened to attack them—on one side those who were anxious for extensive reforms in the municipal organization of London; on the other, those who wished to carry forward the process of inspection and revision of endowments, which had already overtaken the universities, schools and other charities. A Royal Commission was appointed in 1880 to inquire into all the livery companies, into the circumstances and dates of their foundation, the objects for which they were founded, and how far those objects were being carried into effect. A very valuable *Report and Appendix* (4 vols., 1884) was published, containing, *inter alia*, information on the constitution and powers of the governing bodies, the mode of admission of members of the companies, the mode of appointment, duties and salaries and other emoluments of the servants of the companies, the property of, or held in trust for, the companies, its value, situation and description. The companies very freely made returns to the commission, the only ones not doing so being the Broderers, Bowyers, Distillers, Glovers, Tin-Plate Workers and Weavers. The Commission estimated the annual income of the companies to be from £750,000 to £800,000, about £200,000 of that amount being trust income, the balance corporate income.

AUTHORITIES.—In addition to the *Report* referred to above the following works may be consulted: H. T. Riley, *Memorials of London and London Life* (1868); *Chronicle of London from 1089 to 1483* (ed. by Sir N. H. Nicolas and E. Tyrrel, 1827); *Munimenta Gildhallae Londiniensis*, in Rolls Series, ed. by H. T. Riley (4 vols., 1859–1862); J. Toulmin Smith, *English Gilds* (published by Early English Text Society), with essay by L. Brentano (1870); W. Herbert, *History of the Twelve Great Livery Companies* (1837); C. Gross, *The Gild Merchant* (2 vols., 1890); W. C. Hazlitt, *The Livery Companies of the City of London* (1892), contains a précis of the Royal Commission; P. H. Ditchfield, *The City Companies of London* (1904); G. Unwin, *The Gilds and Companies of London* (1908). (T. A. I.)

LIVIA DRUSILLA (*c.* 55 B.C.–A.D. 29), Roman empress, was originally the wife of Tiberius Claudius Nero, by whom she had two sons, Drusus and Tiberius (afterwards emperor). But she attracted the attention of the future emperor Augustus, who in 38 compelled her husband to divorce her and married her himself, having first got rid of his own wife Scribonia. Her two sons, at their dying father's request, were entrusted to the guardianship of Augustus, to whom she bore no children. Livia was suspected of committing various crimes to secure the throne for Tiberius, whereas Augustus naturally favoured the claims of his blood-relatives. The premature deaths of his nephew Marcellus (whom he had at first fixed upon as his successor) and of his grandsons Gaius and Lucius Caesar, the banishment of his grandson Agrippa Postumus, and even his own death, were attributed to her. But in any case Augustus's affection for his wife appears to have suffered no diminution up to the last; by his will he declared her and Tiberius (whom he had adopted in A.D. 4) his heirs; Livia inherited a third of his property; she was adopted into the Julian gens, and henceforth assumed the name of Julia Augusta. The senate also elected her chief priestess of the college founded in honour of the deified Augustus. She had now reached the summit of her ambition, and at first acted as joint-ruler with Tiberius. Tiberius, however, soon became tired of the maternal yoke; his retirement to Capreae is said to have been caused by his desire to escape from her. Livia continued to live quietly at Rome, in the full enjoyment of authority, until her death at an advanced age. Tiberius appears to have received the news with indifference, if not with satisfaction; he absented himself from the funeral, and refused to allow her apotheosis; her will was suppressed for a long time and only carried out, and the legacies paid, by Caligula.

See Tacitus, *Annals*, i. v.; Dio Cassius liii. 33, lv. 14-22, lviii. 2, lix. 2; Suetonius, *Tiberius*, 50, 51; J. Aschbach, *Livia, Gemahlin des Kaisers Augustus* (1864); V. Gardthausen, *Augustus und seine Zeit*, i. 1018 foll., ii. 631 foll.

LIVINGSTON, EDWARD (1764–1836), American jurist and statesman, was born in Clermont, Columbia county, New York, on the 26th of May 1764. He was a great-grandson of Robert Livingston, the first of the family to settle in America (see LIVINGSTON, WILLIAM, below). He graduated at Princeton in 1781, was admitted to the bar in 1785, and began to practise law in New York City, rapidly rising to distinction. In 1795–1801 he was a Republican representative in Congress, where he was one of the leaders of the opposition to Jay's treaty, introduced the resolution calling upon President Washington for all papers relating to the treaty, and at the close of Washington's administration voted with Andrew Jackson and other radicals against the address to the president. He opposed the Alien and Sedition Laws, introduced legislation on behalf of American seamen, and in 1800 attacked the president for permitting the extradition by the British government of Jonathan Robbins, who had committed murder on an English frigate, and had then escaped to South Carolina and falsely claimed to be an American citizen. In the debate on this question Livingston was opposed by John Marshall. In 1801 Livingston was appointed U.S. district-attorney for the state of New York, and while retaining that position was in the same year appointed mayor of New York City. When, in the summer of 1803, the city was visited with yellow fever, Livingston displayed courage and energy in his endeavours to prevent the spread of the disease and relieve distress. He suffered a violent attack of the fever, during which the people gave many proofs of their attachment to him. On his recovery he found his private affairs in some confusion, and he was at the same time deeply indebted to the government for public funds which had been lost through the mismanagement or dishonesty of a confidential clerk, and for which he was responsible as district-attorney. He at once surrendered all his property, resigned his two offices in 1803, and removed early in 1804 to Louisiana. He soon acquired a large law practice in New Orleans, and in 1826 repaid the government in full, including the interest, which at that time amounted to more than the original principal.

Almost immediately upon his arrival in Louisiana, where the legal system had previously been based on Roman, French and Spanish law, and where trial by jury and other peculiarities of English common law were now first introduced, he was appointed by the legislature to prepare a provisional code of judicial procedure, which (in the form of an act passed in April 1805) was continued in force from 1805 to 1825. In 1807, after conducting a successful suit on behalf of a client's title to a part of the batture or alluvial land near New Orleans, Livingston attempted to improve part of this land (which he had received as his fee) in the Batture, Ste Marie. Great popular excitement was aroused against him; his workmen were mobbed; and Governor Claiborne, when appealed to for protection, referred the question to the Federal government. Livingston's case was damaged by President Jefferson, who believed that Livingston had favoured Burr in the presidential election of 1800, and that he had afterwards been a party to Burr's schemes. Jefferson made it impossible for Livingston to secure his title, and in 1812 published a pamphlet "for the use of counsel" in the case against Livingston, to which Livingston published a crushing reply. Livingston's final victory in the courts brought him little financial profit because of the heavy expenses of the litigation. During the war with England from 1812 to 1815 Livingston was active in rousing the mixed population of New Orleans to resistance. He used his influence to secure amnesty for Lafitte and his followers upon their offer to fight for the city, and in 1814–1815 acted as adviser and volunteer aide-de-camp to General Jackson, who was his personal friend. In 1821, by appointment of the legislature, of which he had become a member in the preceding year, Livingston began the preparation of a new code of criminal law and procedure, afterwards known in Europe and America as the "Livingston Code." It was prepared in both French and English, as was required by the necessities of practice in Louisiana, and actually consisted of four codes—crimes and punishments, procedure, evidence in criminal cases, reform and prison discipline. Though substantially completed in 1824, when it was accidentally burned, and again in 1826, it was not printed entire until 1833. It was never adopted by the state. It was at once reprinted in England, France and Germany, attracting wide praise by its remarkable simplicity and vigour, and especially by reason of its philanthropic provisions in the code of reform and prison discipline, which noticeably influenced the penal legislation of various countries. In referring to this code, Sir Henry Maine spoke of Livingston as "the first legal genius of modern times" (*Cambridge Essays*, 1856, p. 17). The spirit of Livingston's code was remedial rather than vindictive; it provided for the abolition of capital punishment and the making of penitentiary labour not a punishment forced on the prisoner, but a matter of his choice and a reward for good behaviour, bringing with it better accommodations. His Code of Reform and Prison Discipline was adopted by Guatemala. Livingston was the leading member of a commission appointed to prepare a new civil code,[1] which for the most part the legislature adopted in 1825, and the most important chapters of which, including all those on contract, were prepared by Livingston alone.

Livingston was again a representative in Congress during 1823–1829, a senator in 1829–1831, and for two years (1831–1833) secretary of state under President Jackson. In this last position he was one of the most trusted advisers of the president, for whom he prepared a number of state papers, the most important being the famous anti-nullification proclamation of the 10th of December 1832. From 1833 to 1835 Livingston was minister plenipotentiary to France, charged with procuring the fulfilment by the French government of the treaty negotiated by W. C. Rives in 1831, by which France had bound herself to pay an indemnity of twenty-five millions of francs for French spoliations of American shipping chiefly under the Berlin and Milan decrees, and the United States in turn agreed to pay to France 1,500,000 francs in satisfaction of French claims. Livingston's negotiations were conducted with excellent judgment, but the French Chamber of Deputies refused to make an appropriation to pay the first instalment due under the treaty in 1833, relations between the two governments became strained, and Livingston was finally instructed to close the legation and return to America. He died on the 23rd of May 1836 at Montgomery Place, Dutchess county, New York, an estate left him by his sister, to which he had removed in 1831. Livingston was twice married. His first wife, Mary McEvers, whom he married on the 10th of April 1788, died on the 13th of March 1801. In June 1805 he married Madame Louise Moreau de Lassy (d. 1860), a widow nineteen years of age, whose maiden name was Davezac de Castera, and who was a refugee in New Orleans from the revolution in Santo Domingo. She was a woman of extraordinary beauty and intellect, and is said to have greatly influenced her husband's public career.

See C. H. Hunt, *Life of Edward Livingston* (New York, 1864); Livingston's *Works* (2 vols., New York, 1873); and Louise Livingston Hunt, *Memoir of Mrs Edward Livingston* (New York, 1886).

LIVINGSTON, ROBERT R. (1746–1813), American statesman, son of Robert R. Livingston (1718–1775; a justice of the New York supreme court after 1763) and brother of Edward Livingston (see above), was born in New York City, on the 27th of November 1746. He graduated at King's College, New York (now Columbia University), in 1765, was admitted to the bar in 1773, and for a short time was a law partner of John Jay. In 1773 he became recorder of New York City, but soon identified himself with the Whig or Patriot element there, and was forced to give up this position in 1775. He was a member of the second, third and fourth Provincial Congresses of New York (1775–1777), was a delegate from New York to the Continental Congress in 1775–1777 and again in 1779–1780, and was a member of the committee which drafted the Declaration of Independence. He was prevented from signing that document by his absence at the time to attend a meeting of the fourth New York Provincial Congress, which on the 10th of July became the Convention of the Representatives of the state of New York, and by which at Kingston in 1777 the first state constitution was adopted, Livingston having been a member of the committee that drafted this instrument. He was the first chancellor of the state, from 1777 to February 1801, and is best known as "Chancellor" Livingston. In this capacity he administered the oath of office to Washington at his first inauguration to the presidency, in New York, on the 30th of April 1789. Previously, from October 1781 to June 1783, he had been the first secretary of foreign affairs under the Confederation, and his European correspondence, especially with Franklin, was of the utmost value in accomplishing peace with Great Britain. In 1788 he had been a member of the New York Convention, which ratified for that state the Federal Constitution. He became an anti-Federalist and in 1798 unsuccessfully opposed John Jay in the New York gubernatorial campaign. In 1801, having refused an appointment as secretary of the navy, he became minister to France on President Jefferson's appointment. He had refused this post when Washington offered it to him in 1794. He arrived in France in November 1801, and in 1803, in association with James Monroe, effected on behalf of his government the purchase from France of what was then known as "Louisiana," the credit for this purchase being largely his (see LOUISIANA PURCHASE). In 1804 Livingston withdrew from public life, and after a year of travel in Europe returned to New York, where he promoted various improvements in agriculture. He did much to introduce the use of gypsum as a fertilizer, and published an *Essay on Sheep* (1809). He was long interested in the problem of steam navigation; before he went to France he received from the state of New York a monopoly of steam navigation on the waters of the state and assisted in the experiments of his brother-in-law, John Stevens; in Paris he met Robert Fulton, and with him in 1802 made successful trials on the Seine of a paddle wheel steamboat; in 1803 Livingston (jointly with Robert Fulton) received a renewal of his monopoly in New York, and the first successful steam-vessel, which operated on the Hudson in 1807, was named after Livingston's home, Clermont (N.Y.). He died at Clermont on the 26th of February 1813.

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[1] Preliminary work in the preparation of a new civil code had been done by James Brown and Moreau Lislet, who in 1808 reported a "Digest of the Civil Laws now in force in the Territory of Orleans with Alterations and Amendments adapted to the present Form of Government."

Livingston and George Clinton were chosen to represent New York state in Statuary Hall, in the Capitol, at Washington, D.C.; the statue of Livingston is by E. D. Palmer.

See Frederick de Peyster, *Biographical Sketch of Robert R. Livingston* (New York, 1876); Robert K. Morton, "Robert R. Livingston: Beginnings of American Diplomacy," in *The John P. Branch Historical Papers of Randolph-Macon College*, i. 299-324, and ii. 34-46; and J. B. Moore, "Robert R. Livingston and the Louisiana Purchase," in *Columbia University Quarterly*, v. 6 (1904), pp. 221-229.

LIVINGSTON, WILLIAM (1723–1790), American political leader, was born at Albany, New York, probably on the 30th of November 1723. He was the son of Philip Livingston (1686–1749), and grandson of Robert Livingston (1654–1725), who was born at Ancrum, Scotland, emigrated to America about 1673, and received grants (beginning in 1686) to "Livingston Manor" (a tract of land on the Hudson, comprising the greater part of what are now Dutchess and Columbia counties). This Robert Livingston, founder of the American family, became in 1675 secretary of the important Board of Indian Commissioners; he was a member of the New York Assembly in 1711–1715 and 1716–1727 and its speaker in 1718–1725, and in 1701 made the proposal that all the English colonies in America should be grouped for administrative purposes "into three distinct governments."

William Livingston graduated at Yale College in 1741, studied law in the city of New York, and was admitted to the bar in 1748. He served in the New York legislature (1759–1760), but his political influence was long exerted chiefly through pamphlets and newspaper articles. The Livingston family then led the Dissenters, who later became Whigs, and the De Lancey family represented the Anglican Tory interests. Through the columns of the *Independent Reflector*, which he established in 1752, Livingston fought the attempt of the Anglican party to bring the projected King's College (now Columbia University) under the control of the Church of England. After the suspension of the *Reflector* in 1753, he edited in the *New York Mercury* the "Watch Tower" section (1754–1755), which became the recognized organ of the Presbyterian faction. In opposition to the efforts of the Anglicans to procure the establishment of an American episcopate, he wrote an open *Letter to the Right Reverend Father in God, John Lord, Bishop of Llandaff* (1768), and edited and in large measure wrote the "American Whig" columns in the *New York Gazette* (1768–1769). In 1772 he removed to Elizabeth, New Jersey, where after 1773 he lived on his estate known as "Liberty Hall." He represented New Jersey in the first and second Continental Congresses (1774, 1775–1776), but left Philadelphia in June 1776, probably to avoid voting on the question of adopting the Declaration of Independence, which he regarded as inexpedient. He was chosen first governor of the state of New Jersey in 1776, and was regularly re-elected until his death in 1790. Loyal to American interests and devoted to General Washington, he was one of the most useful of the state executives during the War of Independence. While governor he was a frequent contributor to the *New Jersey Gazette*, and in this way he greatly aided the American cause during the war by his denunciation of the enemy and appeals to the patriotism of his countrymen. He was a delegate to the Federal Constitutional Convention of 1787, and supported the New Jersey small-state plan. In 1754 he joined with his brother, Philip Livingston, his brother-in-law, William Alexander ("Lord Stirling") and others in founding what is now known as the Society Library of New York. With the help of William Smith (1728–1793), the New York historian, William Livingston prepared a digest of the laws of New York for the period 1691–1756, which was published in two volumes (1752 and 1762). He died at Elizabeth, New Jersey, on the 25th of July 1790.

See Theodore Sedgwick, Jr., *Life of William Livingston* (New York, 1833); and E. B. Livingston, *The Livingstons of Livingston Manor* (1910).

His brother, PETER VAN BRUGH LIVINGSTON (1710–1792), was a prominent merchant and a Whig political leader in New York. He was one of the founders of the College of New Jersey (now Princeton University), was a member of the New York Council for some years before the War of Independence, a member and president of the First Provincial Congress of New York (1775), and a member of the Second Provincial Congress (1775–1776).

Another brother, PHILIP LIVINGSTON (1716–1778), was also prominent as a leader of the New York Whigs or Patriots. He was a member of the New York Assembly in 1759–1769, a delegate to the Stamp Act Congress of 1765, a member of the Continental Congress from 1774 until his death and as such a signer of the Declaration of Independence, and in 1777–1778 was a member of the first state senate.

William's son, (HENRY) BROCKHOLST LIVINGSTON (1757–1823), was an officer in the American War of Independence, and was an able lawyer and judge. From 1807 until his death he was an associate justice of the United States Supreme Court, and he wrote political pamphlets under the pen-name "Decius."

LIVINGSTONE, DAVID (1813–1873), Scottish missionary and explorer in Africa, was born on the 19th of March 1813, at the village of Blantyre Works, in Lanarkshire, Scotland. David was the second child of his parents, Neil Livingston (for so he spelled his name, as did his son for many years) and Agnes Hunter. His parents were typical examples of all that is best among the humbler families of Scotland. At the age of ten years David left the village school for the neighbouring cotton-mill, and by strenuous efforts qualified himself at the age of twenty-three to undertake a college curriculum. He attended for two sessions the medical and the Greek classes in Anderson's College, Glasgow, and also a theological class. In September 1838 he went up to London, and was accepted by the London Missionary Society as a candidate. He took his medical degree in the Faculty of Physicians and Surgeons in Glasgow in November 1840. Livingstone had set his heart on China, and it was a great disappointment to him that the society finally decided to send him to Africa. To an exterior in these early years somewhat heavy and uncouth, he united a manner which, by universal testimony, was irresistibly winning, with a fund of genuine but simple humour and fun that would break out on the most unlikely occasions, and in after years enabled him to overcome difficulties and mellow refractory chiefs when all other methods failed.

Livingstone sailed from England on the 8th of December 1840. From Algoa Bay he made direct for Kuruman, Bechuanaland, the mission station, 700 m. north, established by Robert Moffat twenty years before, and there he arrived on the 31st of July 1841. The next two years Livingstone spent in travelling about the country to the northwards, in search of a suitable outpost for settlement. During these two years he became convinced that the success of the white missionary in a field like Africa was not to be reckoned by the tale of doubtful conversions he could send home each year—that the proper work for such men was that of pioneering, opening up and starting new ground, leaving native agents to work it out in detail. The whole of his subsequent career was a development of this idea. He selected the valley of Mabotsa, on one of the sources of the Limpopo river, 200 m. north-east of Kuruman, as his first station. Shortly after his settlement here he was attacked by a lion which crushed his left arm. The arm was imperfectly set, and it was a source of trouble to him at times throughout his life, and was the means of identifying his body after his death. To a house, mainly built by himself at Mabotsa, Livingstone in 1844 brought home his wife, Mary Moffat, the daughter of Moffat of Kuruman. Here he laboured till 1846, when he removed to Chonuane, 40 m. farther north, the chief place of the Bakwain or Bakwena tribe under Sechele. In 1847 he again removed to Kolobeng, about 40 m. westwards, the whole tribe following their missionary. With the aid and in the company of two English sportsmen, William C. Oswell and Mungo Murray, he was able to undertake a journey to Lake Ngami, which had never yet been seen by a white man. Crossing the Kalahari Desert, of which Livingstone gave the first detailed account, they reached the lake on the 1st of August 1849. In April next year he made an attempt to reach Sebituane, who lived 200 m. beyond the lake, this time in company with his wife and children, but again got no farther than the lake, as the children were seized with fever. A year later, April 1851, Livingstone, again accompanied by his family and Oswell, set out, this time with the intention of settling among the Makololo for a period. At last he succeeded, and reached the Chobe (Kwando), a southern tributary of the Zambezi, and in the end of June reached the Zambezi itself at the town of Sesheke. Leaving the Chobe on the 13th of August the party reached Cape Town in April 1852. Livingstone may now be said to have completed the first period of his career in Africa, the period in which the work of the missionary had the greatest prominence. Henceforth he appears more in the character of an explorer, but it must be remembered that he regarded himself to the last as a pioneer missionary, whose work was to open up the country to others.

Having seen his family off to England, Livingstone left Cape Town on the 8th of June 1852, and turning north again reached Linyante, the capital of the Makololo, on the Chobe, on the 23rd of May 1853, being cordially received by Sekeletu and his people. His first object was to seek for some healthy high land in which to plant a station. Ascending the Zambezi, he, however, found no place free from the tsetse fly, and therefore resolved to discover a route to the interior from either the west or east coast. To accompany Livingstone twenty-seven men were selected from the various tribes under Sekeletu, partly with a view to open up a trade route between their own country and the coast. The start was made from Linyante on the 11th of November 1853, and, by ascending the Liba, Lake Dilolo was reached on the 20th of February 1854. On the 4th of April the Kwango was crossed, and on the 31st of May the town of Loanda was entered, Livingstone, however, being all but dead from fever, semi-starvation and dysentery. From Loanda Livingstone sent his astronomical observations to Sir Thomas Maclear at the Cape, and an account of his journey to the Royal Geographical Society, which in May 1855 awarded him its patron's medal. Loanda was left on the 20th of September 1854, but Livingstone lingered long about the Portuguese settlements. Making a slight détour to the north to Kabango, the party reached Lake Dilolo on the 13th of June 1855. Here Livingstone made a careful study of the hydrography of the country. He "now for the first time apprehended the true form of the river systems and the continent," and the conclusions he came to have been essentially confirmed by subsequent observations. The return journey from Lake Dilolo was by the same route as that by which the party came, Linyante being reached in the beginning of September.

For Livingstone's purposes the route to the west was unavailable, and he decided to follow the Zambezi to its mouth. With a numerous following, he left Linyante on the 8th of November 1855. A fortnight afterwards he discovered the famous "Victoria" falls of the Zambezi. He had already formed a true idea of the configuration of the continent as a great hollow or basin-shaped plateau, surrounded by a ring of mountains. Livingstone reached the Portuguese settlement of Tete on the 2nd of March 1856, in a very emaciated condition. Here he left his men and proceeded to Quilimane, where he arrived on the 20th of May, thus having completed in two years and six months one of the most remarkable and fruitful journeys on record. The results in geography and in natural science in all its departments were abundant and accurate; his observations necessitated a reconstruction of the map of Central Africa. When Livingstone began his work in Africa the map was virtually a blank from Kuruman to Timbuktu, and nothing but envy or ignorance can throw any doubt on the originality of his discoveries.

On the 12th of December he arrived in England, after an absence of sixteen years, and met everywhere the welcome of a hero. He told his story in his *Missionary Travels and Researches in South Africa* (1857) with straightforward simplicity, and with no effort after literary style, and no apparent consciousness that he had done anything extraordinary. Its publication brought what he would have considered a competency had he felt himself at liberty to settle down for life. In 1857 he severed his connexion with the London Missionary Society, with whom, however, he always remained on the best of terms, and in February 1858 he accepted the appointment of "Her Majesty's consul at Quilimane for the eastern coast and the independent districts in the interior, and commander of an expedition for exploring eastern and central Africa." The Zambezi expedition, of which Livingstone thus became commander, sailed from Liverpool in H.M.S. "Pearl" on the 10th of March 1858, and reached the mouth of the Zambezi on the 14th of May. The party, which included Dr (afterwards Sir) John Kirk and Livingstone's brother Charles, ascended the river from the Kongone mouth in a steam launch, the "Ma-Robert"; reaching Tete on the 8th of September. The remainder of the year was devoted to an examination of the river above Tete, and especially the Kebrabasa rapids. Most of the year 1859 was spent in the exploration of the river Shiré and Lake Nyasa, which was discovered in September; and during a great part of the year 1860 Livingstone was engaged in fulfilling his promise to take such of the Makololo home as cared to go. In January of next year arrived Bishop C. F. Mackenzie and a party of missionaries sent out by the Universities Mission to establish a station on the upper Shiré.

After exploring the river Rovuma for 30 m. in his new vessel the "Pioneer," Livingstone and the missionaries proceeded up the Shiré to Chibisa's; there they found the slave trade rampant. On the 15th of July Livingstone, accompanied by several native carriers, started to show the bishop the country. Several bands of slaves whom they met were liberated, and after seeing the missionary party settled in the highlands to the south of Lake Chilwa (Shirwa) Livingstone spent from August to November in exploring Lake Nyasa. While the boat sailed up the west side of the lake to near the north end, the explorer marched along the shore. He returned more resolved than ever to do his utmost to rouse the civilized world to put down the desolating slave-trade. On the 30th of January 1862, at the Zambezi mouth, Livingstone welcomed his wife and the ladies of the mission, with whom were the sections of the "Lady Nyassa," a river steamer which Livingstone had had built at his own expense. When the mission ladies reached the mouth of the Ruo tributary of the Shiré, they were stunned to hear of the death of the bishop and one of his companions. This was a sad blow to Livingstone, seeming to have rendered all his efforts to establish a mission futile. A still greater loss to him was that of his wife at Shupanga, on the 27th of April 1862.

The "Lady Nyassa" was taken to the Rovuma. Up this river Livingstone managed to steam 156 m., but farther progress was arrested by rocks. Returning to the Zambezi in the beginning of 1863, he found that the desolation caused by the slave trade was more horrible and widespread than ever. It was clear that the Portuguese officials were themselves at the bottom of the traffic. Kirk and Charles Livingstone being compelled to return to England on account of their health, the doctor resolved once more to visit the lake, and proceeded some distance up the west side and then north-west as far as the watershed that separates the Loangwa from the rivers that run into the lake.

Meanwhile a letter was received from Earl Russell recalling the expedition by the end of the year. In the end of April 1864 Livingstone reached Zanzibar in the "Lady Nyassa," and on the 23rd of July Livingstone arrived in England. He was naturally disappointed with the comparative failure of this expedition. Still the geographical results, though not in extent to be compared to those of his first and his final expeditions, were of high importance, as were those in various departments of science, and he had unknowingly laid the foundations of the British protectorate of Nyasaland. Details will be found in his *Narrative of an Expedition to the Zambesi and its Tributaries*, published in 1865.

By Sir Roderick Murchison and his other staunch friends Livingstone was as warmly welcomed as ever. When Murchison proposed to him that he should go out again, although he seems to have had a desire to spend the remainder of his days at home, the prospect was too tempting to be rejected. He was appointed British consul to Central Africa without a salary, and government contributed only £500 to the expedition. The chief help came from private friends. During the latter part of the expedition government granted him £1000, but that, when he learned of it, was devoted to his great undertaking. The Geographical Society contributed £500. The two main objects of the expedition were the suppression of slavery by means of civilizing influences, and the ascertainment of the watershed in the region between Nyasa and Tanganyika. At first Livingstone thought the Nile problem had been all but solved by Speke, Baker and Burton, but the idea grew upon him that the Nile sources must be sought farther south, and his last journey became in the end a forlorn hope in search of the "fountains" of Herodotus. Leaving England in the middle of August 1865, via Bombay, Livingstone arrived at Zanzibar on the 28th of January 1866. He was landed at the mouth of the Rovuma on the 22nd of March, and started for the interior on the 4th of April. His company consisted of thirteen sepoys, ten Johanna men, nine African boys from Nasik school, Bombay, and four boys from the Shiré region, besides camels, buffaloes, mules and donkeys. This imposing outfit soon melted away to four or five boys. Rounding the south end of Lake Nyasa, Livingstone struck in a north-north-west direction for the south end of Lake Tanganyika, over country much of which had not previously been explored. The Loangwa was crossed on the 15th of December 1866. On Christmas day Livingstone lost his four goats, a loss which he felt very keenly, and the medicine chest was stolen in January 1867. Fever came upon him, and for a time was his almost constant companion; this, with other serious ailments which subsequently attacked him, and which he had no medicine to counteract, told on even his iron frame. The Chambezi was crossed on the 28th of January, and the south end of Tanganyika reached on the 31st of March. Here, much to his vexation, he got into the company of Arab slave dealers (among them being Tippoo-Tib) by whom his movements were hampered; but he succeeded in reaching Lake Mweru (Nov. 1867). After visiting Lake Mofwa and the Lualaba, which he believed was the upper part of the Nile, he, on the 18th of July 1868, discovered Lake Bangweulu. Proceeding up the west coast of Tanganyika, he reached Ujiji on the 14th of March 1869, "a ruckle of bones." Livingstone recrossed Tanganyika in July, and passed through the country of the Manyema, but baffled partly by the natives, partly by the slave hunters, and partly by his long illnesses it was not till the 29th of March 1871 that he succeeded in reaching the Lualaba, at the town of Nyangwe, where he stayed four months, vainly trying to get a canoe to take him across. It was here that a party of Arab slavers, without warning or provocation, assembled one day when the market was busiest and commenced shooting the women, hundreds being killed or drowned in trying to escape. Livingstone had "the impression that he was in hell," but was helpless, though his "first impulse was to pistol the murderers." The account of this scene which he sent home roused indignation in England to such a degree as to lead to determined and to a considerable extent successful efforts to get the sultan of Zanzibar to suppress the trade. In sickened disgust the weary traveller made his way back to Ujiji, which he reached on the 13th of October. Five days after his arrival in Ujiji he was inspired with new life by the timely arrival of H. M. Stanley, the richly laden almoner of Mr Gordon Bennett, of the *New York Herald*. With Stanley Livingstone explored the north end of Tanganyika, and proved conclusively that the Rusizi runs into and not out of it. In the end of the year the two started eastward for Unyamwezi, where Stanley provided Livingstone with an ample supply of goods, and bade him farewell. Stanley left on the 15th of March 1872, and after Livingstone had waited wearily in Unyamwezi for five months, a troop of fifty-seven men and boys arrived, good and faithful fellows on the whole, selected by Stanley himself. Thus attended, he started on the 15th of August for Lake Bangweulu, proceeding along the east side of Tanganyika. His old enemy dysentery soon found him out. In January 1873 the party got among the endless spongy jungle on the east of Lake Bangweulu, Livingstone's object being to go round by the south and away west to find the "fountains." The doctor got worse and worse, and in the middle of April he had unwillingly to submit to be carried in a rude litter. On the 29th of April Chitambo's village on the Lulimala, in Ilala, on the south shore of the lake, was reached. The last entry in the journal is on the 27th of April: "Knocked up quite, and remain—recover—sent to buy milch goats. We are on the banks of the Molilamo." On the 30th of April he with difficulty wound up his watch, and early on the morning of the 1st of May the boys found "the great master," as they called him, kneeling by the side of his bed, dead. His faithful men preserved the body in the sun as well as they could, and, wrapping it carefully up, carried it and all his papers, instruments and other things across Africa to Zanzibar. It was borne to England with all honour, and on the 18th of April 1874, was deposited in Westminster Abbey. His faithfully kept journals during these seven years' wanderings were published under the title of the *Last Journals of David Livingstone in Central Africa*, in 1874, edited by his old friend the Rev. Horace Waller. In Old Chitambo's the time and place of his death are commemorated by a permanent monument, which replaced in 1902 the tree on which his native followers had recorded the event.

In spite of his sufferings and the many compulsory delays, Livingstone's discoveries during these last years were both extensive and of prime importance as leading to a solution of African hydrography. No single African explorer has ever done so much for African geography as Livingstone during his thirty years' work. His travels covered one-third of the continent, extending from the Cape to near the equator, and from the Atlantic to the Indian Ocean. Livingstone was no hurried traveller; he did his journeying leisurely, carefully observing and recording all that was worthy of note, with rare geographical instinct and the eye of a trained scientific observer, studying the ways of the people, eating their food, living in their huts, and sympathizing with their joys and sorrows. In all the countries through which he travelled his memory is cherished by the native tribes who, almost without exception, treated Livingstone as a superior being; his treatment of them was always tender, gentle and gentlemanly. By the Arab slavers whom he opposed he was also greatly admired, and was by them styled "the very great doctor." "In the annals of exploration of the Dark Continent," wrote Stanley many years after the death of the missionary explorer, "we look in vain among other nationalities for a name such as Livingstone's. He stands preeminent above all; he unites in himself all the best qualities of other explorers. . . . Britain . . . excelled herself even when she produced the strong and perseverant Scotchman, Livingstone." But the direct gains to geography and science are perhaps not the greatest results of Livingstone's journeys. His example and his death acted like an inspiration, filling Africa with an army of explorers and missionaries, and raising in Europe so powerful a feeling against the slave trade that through him it may be considered as having received its deathblow. Personally Livingstone was a pure and tender-hearted man, full of humanity and sympathy, simple-minded as a child.

The motto of his life was the advice he gave to some school children in Scotland—"Fear God, and work hard."

See, besides his own narratives and W. G. Blaikie's *Life* (1880), the publications of the London Missionary Society from 1840, the *Journal and Proceedings of the Royal Geographical Society*, the despatches to the Foreign Office sent home by Livingstone during his last two expeditions, and Stanley's *Autobiography* (1909) and *How I Found Livingstone* (1872). (J. S. K.)

LIVINGSTONE MOUNTAINS, a band of highlands in German East Africa, forming the eastern border of the rift-valley of Lake Nyasa, at the northern end of the lake. In parts these highlands, known also under their native name of Kinga, present rather the character of a plateau than of a true mountain range, but the latter name may be justified by the fact that they form a comparatively narrow belt of country, which falls considerably to the east as well as to the west. The northern end is well marked in 8° 50′ S. by an escarpment falling to the Ruaha valley, which is regarded as a north-eastern branch of the main rift-valley. Southwards the Livingstone range terminates in the deep valley of the Ruhuhu in 10° 30′ S., the first decided break in the highlands that is reached from the north, on the east coast of Nyasa. Geologically the range is formed on the side of the lake by a zone of gneiss running in a series of ridges and valleys generally parallel to its axis. The ridge nearest the lake (which in Mount Jamimbi or Chamembe, 9° 41′ S., rises to an absolute height of 7870 ft., or 6200 ft. above Nyasa) falls almost sheer to the water, the same steep slope being continued beneath the surface. Towards the south the range appears to have a width of some 20 m. only, but northwards it widens out to about 40 m., though broken here by the depression, drained towards the Ruaha, of Buanyi, on the south side of which is the highest known summit of the range (9600 ft.). North and east of Buanyi, as in the eastern half of the range generally, table-topped mountains occur, composed above of horizontally bedded quartzites, sandstones and conglomerates. The uplands are generally clothed in rich grass, forest occurring principally in the hollows, while the slopes towards the lake are covered with poor scrub. Native settlements are scattered over the whole range, and German mission stations have been established at Bulongwa and Mtandala, a little north of the north end of Nyasa. The climate is here healthy, and night frosts occur in the cold season. European crops are raised with success. At the foot of the mountains on Lake Nyasa are the ports of Wiedhafen, at the mouth of the Ruhuhu, and Old Langenburg, at the north-east corner of the lake. (E. He.)

LIVIUS ANDRONICUS (*c.* 284–204 B.C.), the founder of Roman epic poetry and drama. His name, in which the Greek 'Ανδρόνικος is combined with the gentile name of one of the great Roman houses, while indicative of his own position as a manumitted slave, is also significant of the influences by which Roman literature was fostered, viz. the culture of men who were either Greeks or "semi-Graeci" by birth and education, and the protection and favour bestowed upon them by the more enlightened members of the Roman aristocracy. He is supposed to have been a native of Tarentum, and to have been brought, while still a boy, after the capture of that town in 272, as a slave to Rome. He lived in the household of a member of the gens Livia, probably M. Livius Salinator. He determined the course which Roman literature followed for more than a century after his time. The imitation of Greek comedy, tragedy and epic poetry, which produced great results in the hands of Naevius, Plautus, Ennius and their successors, received its first impulse from him. To judge, however, from the insignificant remains of his writings, and from the opinions of Cicero and Horace, he can have had no pretension either to original genius or to artistic accomplishment. His real claim to distinction was that he was the first great schoolmaster of the Roman people. We learn from Suetonius that, like Ennius after him, he obtained his living by teaching Greek and Latin; and it was probably as a school-book, rather than as a work of literary pretension, that his translation of the *Odyssey* into Latin Saturnian verse was executed. This work was still used in schools in the time of Horace (*Epp.* ii. 1., 69), and, although faultily executed, satisfied a real want by introducing the Romans to a knowledge of Greek. Such knowledge became essential to men in a high position as a means of intercourse with Greeks, while Greek literature stimulated the minds of leading Romans. Moreover, southern Italy and Sicily afforded many opportunities for witnessing representations of Greek comedies and tragedies. The Romans and Italians had an indigenous drama of their own, known by the name of *Satura*, which prepared them for the reception of the more regular Greek drama. The distinction between this *Satura* and the plays of Euripides or Menander was that it had no regular plot. This the Latin drama first received from Livius Andronicus; but it did so at the cost of its originality. In 240, the year after the end of the first Punic War, he produced at the ludi Romani a translation of a Greek play (it is uncertain whether a comedy or tragedy or both), and this representation marks the beginning of Roman literature (Livy vii. 2). Livius himself took part in his plays, and in order to spare his voice he introduced the custom of having the solos (*cantica*) sung by a boy, while he himself represented the action of the song by dumb show. In his translation he discarded the native Saturnian metre, and adopted the iambic, trochaic and cretic metres, to which Latin more easily adapted itself than either to the hexameter or to the lyrical measures of a later time. He continued to produce plays for more than thirty years after this time. The titles of his tragedies—*Achilles*, *Aegisthus*, *Equus Trojanus*, *Hermione*, *Tereus*—are all suggestive of subjects which were treated by the later tragic poets of Rome. In the year 207, when he must have been of a great age, he was appointed to compose a hymn of thanksgiving, sung by maidens, for the victory of the Metaurus and an intercessory hymn to the Aventine Juno. As a further tribute of national recognition the "college" or "gild" of poets and actors was granted a place of meeting in the temple of Minerva on the Aventine.

See fragments in L. Müller, *Livi Andronici et Cn. Naevi Fabularum Reliquiae* (1885); also J. Wordsworth, *Fragments and Specimens of Early Latin* (1874); Mommsen, *Hist. of Rome*, bk. iii. ch. 14.

LIVNO, a town of Bosnia, situated on the eastern side of the fertile plain of Livno, at the foot of Mount Krug (6581 ft.). Pop. about 5000. The Dalmatian border is 7 m. W. Livno had a trade in grain, live-stock and silver filigree-work up to 1904, when a fire swept away more than 500 of the old Turkish houses, together with the Roman citadel. Remains prove that Livno occupies the site of a Roman settlement, the name of which is uncertain. The Roman Catholic convent of Gurici is 6 m. S.

LIVONIA, or LIVLAND (Russian, *Liflandia*), one of the three Baltic provinces of Russia, bounded W. by the Gulf of Riga, N. by Esthonia, E. by the governments of St Petersburg, Pskov and Vitebsk, and S. by Courland. A group of islands (1110 sq. m.) at the entrance of the Gulf of Riga, of which Oesel, Mohn, Runo and Paternoster are the largest, belong to this government. It covers an area of 18,160 sq. m., but of this the part of Lake Peipus which belongs to it occupies 1090. Its surface is diversified by several plateaus, those of Haanhof and of the Livonian Aa having an average elevation of 400 to 700 ft., while several summits reach 800 to 1000 ft. or more. The edges of the plateaus are gapped by deep valleys; the hilly tract between the Dvina and its tributary the Livonian Aa has received, from its picturesque narrow valleys, thick forests and numerous lakes, the name of "Livonian Switzerland." The plateau of Odenpäh, drained by tributaries of the Embach river, which flows for 93 m. from Lake Virz-yärvi into Lake Peipus, occupies an area of 2830 sq. m., and has an average elevation of 500 ft. More than a thousand lakes are scattered over Livonia, of which that of Virz-yärvi, having a surface of 106 sq. m. (115 ft. above sea-level), is the largest. Marshes and peat-bogs occupy one-tenth of the province. Of the numerous rivers, the Dvina, which flows for 90 m. along its frontier, the Pernau, Salis, Livonian Aa and Embach are navigable.

The Silurian formation which covers Esthonia, appears in the northern part of Livonia, the remainder of the province consisting of Devonian strata. The whole is overlaid with glacial deposits, sometimes 400 ft. thick. The typical bottom moraine, with erratics from Finland, extends all over the country. Glacial furrows, striae and elongated troughs are met with everywhere, running mostly from north-west to south-east, as well as *åsar* or *eskers*, which have the same direction. Sand-dunes cover large tracts on the shores of the Baltic. No traces of marine deposits are found higher than 100 or 150 ft. above the present sea-level. The soil is not very fertile. Forests cover about two-fifths of the surface. The climate is rather severe. The mean temperatures are 43° F. at Riga (winter 23°, summer 63°) and 40° at Yuriev. The winds are very variable; the average number of rainy and snowy days is 146 at Riga (rainfall 24·1 in.). Fogs are not uncommon.

The population of Livonia, which was 621,600 in 1816, reached 1,000,876 in 1870, and 1,295,231 in 1897, of whom 43·4% were Letts, 39·9% Ehsts, 7·6% Germans, 5·4% Russians, 2% Jews and 1·2% Poles. The estimated pop. in 1906 was 1,411,000. The Livs, who formerly extended east into the government of Vitebsk, have nearly all passed away. Their native language, of Finnish origin, is rapidly disappearing, their present language being a Lettish patois. In 1846 a grammar and dictionary of it were made with difficulty from the mouths of old people. The Ehsts, who resemble the Finns of Tavastland, have maintained their ethnic features, their customs, national traditions, songs and poetry, and their harmonious language. There is a marked revival of national feeling, favoured by "Young Esthonia." The prevailing religion is the Lutheran (79·8%); 14·3% belong to the Orthodox Greek Church; of the Russians, however, a considerable proportion are Raskolniks (Nonconformists); the Roman Catholics amount to 2·3%, and the Jews to 2%. The Russian civil code was introduced in the Baltic provinces in 1835, and the use of Russian, instead of German, in official correspondence and in law courts was ordered in 1867, but not generally brought into practice.

Nearly all the soil belongs to the nobility, the extent of the peasants' estates being only 15% of the entire area of the government. Serfdom was abolished in 1819, but the peasants remained under the jurisdiction of their landlords. The class of peasant proprietors being restricted to a small number of wealthy peasants, the bulk have remained tenants at will; they are very miserable, and about one-fourth of them are continually wandering in search of work. From time to time the emigration takes the shape of a mass movement, which the government stops by forcible measures. The average size of the landed estates is 9500 to 11,000 acres, far above the general average for Russia. Agriculture has reached a high degree of perfection on the estates of the landlords. The principal crops are rye, oats, barley, flax and potatoes, with some wheat, hemp and buckwheat. Dairy-farming and gardening are on the increase. Fishing in Lake Peipus gives occupation to nearly 100,000 persons, and is also carried on in the Gulf of Riga and in the rivers. Woollen, cloth, cotton and flax mills, steam flour and saw mills, distilleries and breweries, machinery works, paper mills, furniture, tobacco, soap, candle and hardware works are among the chief industrial establishments. Livonia carries on a large export trade, especially through Riga and Pernau, in petroleum, wool, oilcake, flax, linseed, hemp, grain, timber and wooden wares; the Dvina is the chief channel for this trade.

Education stands on a much higher level than elsewhere in Russia, no less than 87% of the children receiving regular instruction. The higher educational institutions include Yuriev (Dorpat) University, Riga polytechnic and a high school for the clergy.

The government is divided into nine districts, the chief towns of which, with their populations in 1897, are: Riga, capital of the government (282,943); Arensburg, in the island of Oesel (4621); Yuriev or Dorpat (42,421); Fellin (7659); Pernau (12,856); Walk (10,139); Wenden (6327); Werro (4154); and Wolmar (5124). The capital of the government is Riga.

Coins of the time of Alexander the Great, found on the island of Oesel, show that the coasts of the Baltic were at an early period in commercial relation with the civilized world. The chronicle of Nestor mentions as inhabitants of the Baltic coast the Chudes, the Livs, the Narova, Letgola, Semigallians and Korś. It was probably about the 9th century that the Chudes became tributary to the Varangian-Russian states. As they reacquired their independence, Yaroslav I. undertook in 1030 a campaign against them, and founded Yuriev (Dorpat). The Germans first penetrated into Livonia in the 11th century, and in 1158 several Lübeck and Visby merchants landed at the mouth of the Dvina. In 1186 the emissaries of the archbishop of Bremen began to preach Christianity among the Ehsts and Letts, and in 1201 the bishop of Livonia established his residence at Riga. In 1202 or 1204 Innocent III. recognized the order of Brothers of the Sword, the residence of its grand master being at Wenden; and the order, spreading the Christian religion by the sword among the natives, carried on from that time a series of uninterrupted wars against the Russian republics and Lithuania, as well as a struggle against the archbishop of Riga, Riga having become a centre for trade, intermediate between the Hanseatic towns and those of Novgorod, Pskov and Polotsk. The first active interference of Lithuania in the affairs of Livonia took place immediately after the great outbreak of the peasants on Oesel; Olgierd then devastated all southern Livonia. The order, having purchased the Danish part of Esthonia, in 1347, began a war against the bishop of Riga, as well as against Lithuania, Poland and Russia. The wars against those powers were terminated respectively in 1435, 1466 and 1483. About the end of the 15th century the master of the order, Plettenberg, acquired a position of great importance, and in 1527 he was recognized as a prince of the empire by Charles V. On the other hand, the authority of the bishops of Riga was soon completely destroyed (1566). The war of the order with Ivan IV. of Russia in 1558 led to a division of Livonia, its northern part, Dorpat included, being taken by Russia, and the southern part falling under the dominion of Poland. From that time (1561) Livonia formed a subject of dispute between Poland and Russia, the latter only formally abdicating its rights to the country in 1582. In 1621 it was the theatre of a war between Poland and Sweden, and was conquered by the latter power, enjoying thus for twenty-five years a milder rule. In 1654, and again at the beginning of the 18th century, it became the theatre of war between Poland, Russia and Sweden, and was finally conquered by Russia. The official concession was confirmed by the treaty of Nystad in 1721.

See E. Seraphim, *Geschichte Liv-, Esth-, und Kurlands* (2nd ed., Revel, 1897–1904) and *Geschichte von Livland* (Gotha, 1905, &c.).

(P. A. K.; J. T. Be.)

LIVY [Titus Livius] (59 B.C.–A.D. 17), Roman historian, was born at Patavium (Padua). The ancient connexion between his native city and Rome helped to turn his attention to the study which became the work of his life. For Padua claimed, like Rome, a Trojan origin, and Livy is careful to place its founder Antenor side by side with Aeneas. A more real bond of union was found in the dangers to which both had been exposed from the assaults of the Celts (Livy x. 2), and Padua must have been drawn to Rome as the conqueror of her hereditary foes. Moreover, at the time of Livy's birth, Padua had long been in possession of the full Roman franchise, and the historian's family name may have been taken by one of his ancestors out of compliment to the great Livian gens at Rome, whose connexion with Cisalpine Gaul is well-established (Suet. *Tib.* 3), and by one of whom his family may have been enfranchized.

Livy's easy independent life at Rome, and his aristocratic leanings in politics seem to show that he was the son of well-born and opulent parents; he was certainly well educated, being widely read in Greek literature, and a student both of rhetoric and philosophy. We have also evidence in his writings that he had prepared himself for his great work by researches into the history of his native town. His youth and early manhood, spent perhaps chiefly at Padua, were cast in stormy times, and the impression which they left upon his mind was ineffaceable. In the Civil War his personal sympathies were with Pompey and the republican party (Tac. *Ann.* iv. 34); but far more lasting in its effects was his experience of the licence, anarchy and confusion of these dark days. The rule of Augustus he seems to have accepted as a necessity, but he could not, like Horace and Virgil, welcome it as inaugurating a new and glorious era. He writes of it with despondency as a degenerate and declining age; and, instead of triumphant prophecies of world-wide rule, such as we find in Horace, Livy contents himself with pointing out the dangers which already threatened Rome, and exhorting his contemporaries to learn, in good time, the lessons which the past history of the state had to teach.

It was probably about the time of the battle of Actium that Livy established himself in Rome, and there he seems chiefly to have resided until his retirement to Padua shortly before his death. We have no evidence that he travelled much, though he must have paid at least one visit to Campania (xxxviii. 56), and he never, so far as we know, took any part in political life. Nor, though he enjoyed the personal friendship and patronage of Augustus (Tac. *Ann.* iv. 34) and stimulated the historical zeal of the future emperor Claudius (Suet. *Claud.* xli.), can we detect in him anything of the courtier. There is not in his history a trace of that rather gross adulation in which even Virgil does not disdain to indulge. His republican sympathies were freely expressed, and as freely pardoned by Augustus. We must imagine him devoted to the great task which he had set himself to perform, with a mind free from all disturbing cares, and in the enjoyment of all the facilities for study afforded by the Rome of Augustus, with its liberal encouragement of letters, its newly-founded libraries and its brilliant literary circles. As his work went on, the fame which he had never coveted came to him in ample measure. He is said to have declared in one volume of his history that he had already won glory enough, and the younger Pliny (*Epist.* ii. 3) relates that a Spaniard came all the way from Gades merely to see him, and, this accomplished, at once returned home satisfied. The accession of Tiberius (A.D. 14) materially altered for the worse the prospects of literature in Rome, and Livy retired to Padua, where he died. He had at least one son (Quintil. x. 1. 39), who also was possibly an author (Pliny, *Nat. Hist.* i. 5. 6), and a daughter married to a certain L. Magius, a rhetorician of no great merit (Seneca, *Controv.* x. 29. 2). Nothing further is known of his personal history.

Analysis of the History.—For us the interest of Livy's life centres in the work to which the greater part of it was devoted, the history of Rome from its foundation down to the death of Drusus (9 B.C.). Its proper title was *Ab urbe condita libri* (also called *historiae* and *annales*). Various indications point to the period from 27 to 20 B.C., as that during which the first decade was written. In the first book (19. 3) the emperor is called Augustus, a title which he assumed early in 27 B.C., and in ix. 18 the omission of all reference to the restoration, in 20 B.C., of the standards taken at Carrhae seems to justify the inference that the passage was written before that date. In the epitome of book lix. there is a reference to a law of Augustus which was passed in 18 B.C. The books dealing with the civil wars must have been written during Augustus's lifetime, as they were read by him (Tac. *Ann.* iv. 34), while there is some evidence that the last part, from book cxxi. onwards, was published after his death A.D. 14.

The work begins with the landing of Aeneas in Italy, and closes with the death of Drusus, 9 B.C., though it is possible that the author intended to continue it as far as the death of Augustus. The division into decades is certainly not due to the author himself, and is first heard of at the end of the 5th century; on the other hand, the division into *libri* or *volumina* seems to be original. That the books were grouped and possibly published in sets is rendered probable both by the prefaces which introduce new divisions of the work (vi. 1, xxi. 1, xxxi. 1) and by the description in one MS. of books cix.-cxvi. as "bellorum civilium libri octo." Such arrangement and publication in parts were, moreover, common with ancient authors, and in the case of a lengthy work almost a necessity.

Of the 142 *libri* composing the history, the first 15 carry us down to the eve of the great struggle with Carthage, a period, as Livy reckons it, of 488 years (xxxi. 1); 15 more (xvi–xxx.) cover the 63 years of the two great Punic wars. With the close of book xlv. we reach the conquest of Macedonia in 167 B.C. Book lviii. described the tribunate of Tiberius Gracchus, 133 B.C. In book lxxxix. we have the dictatorship of Sulla (81 B.C.), in ciii. Caesar's first consulship (59 B.C.), in cix.-cxvi. the civil wars to the death of Caesar (44 B.C.), in cxxiv. the defeat of Brutus and Cassius at Philippi, in cxxxiii. and cxxxiv. the battle of Actium and the accession of Augustus. The remaining eight books give the history of the first twenty years of Augustus's reign.

Of this vast work only a small portion has come down to modern times; only thirty-five books are now extant (i.-x., xxi.-xlv.), and of these xli. and xliii. are incomplete. The lost books seem to have disappeared between the 7th century and the revival of letters in the 15th—a fact sufficiently accounted for by the difficulty of transmitting so voluminous a work in times when printing was unknown, for the story that Pope Gregory I. burnt all the copies of Livy he could lay his hands on rests on no good evidence. Only one important fragment has since been recovered—the portion of book xci. discovered in the Vatican in 1772, and edited by Niebuhr in 1820. Very much no doubt of the substance of the lost books has been preserved both by such writers as Plutarch and Dio Cassius, and by epitomizers like Florus and Eutropius. But our knowledge of their contents is chiefly derived from the so-called *periochae* or epitomes, of which we have fortunately a nearly complete series, the epitomes of books cxxxvi. and cxxxvii. being the only ones missing.[1] These epitomes have been ascribed without sufficient reason to Florus (2nd century); but, though they are probably of even later date, and are disappointingly meagre, they may be taken as giving, so far as they go, a fairly authentic description of the original. They have been expanded with great ingenuity and learning by Freinsheim in Drakenborch's edition of Livy.[2] The *Prodigia* of Julius Obsequens and the list of consuls in the *Chronica* of Cassiodorus are taken directly from Livy, and to that extent reproduce the contents of the lost books. It is probable that Obsequens, Cassiodorus and the compiler of the epitomes did not use the original work but an abridgment.

Historical Standpoint.—If we are to form a correct judgment on the merits of Livy's history, we must, above all things, bear in mind what his aim was in writing it, and this he has told us himself in the celebrated preface. He set himself the task of recording the history of the Roman people, "the first in the world," from the beginning. The task was a great one, and the fame to be won by it uncertain, yet it would be something to have made the attempt, and the labour itself would bring a welcome relief from the contemplation of present evils; for his readers, too, this record will, he says, be full of instruction; they are invited to note especially the moral lessons taught by the story of Rome, to observe how Rome rose to greatness by the simple virtues and unselfish devotion of her citizens, and how on the decay of these qualities followed degeneracy and decline.

He does not, therefore, write, as Polybius wrote, for students of history. With Polybius the greatness of Rome is a phenomenon to be critically studied and scientifically explained; the rise of Rome forms an important chapter in universal history, and must be dealt with, not as an isolated fact, but in connexion with the general march of events in the civilized world. Still less has Livy anything in common with the naïve anxiety of Dionysius of Halicarnassus to make it clear to his fellow Greeks that the irresistible people who had mastered them was in origin, in race and in language Hellenic like themselves.

Livy writes as a Roman, to raise a monument worthy of the greatness of Rome, and to keep alive, for the guidance and the warning of Romans, the recollection alike of the virtues which had made Rome great and of the vices which had threatened her with destruction. In so writing he was in close agreement with the traditions of Roman literature, as well as with the conception of the nature and objects of history current in his time. To a large extent Roman literature grew out of pride in Rome, for, though her earliest authors took the form and often the language of their writings from Greece, it was the greatness of Rome that inspired the best of them, and it was from the annals of Rome that their themes were taken. And this is naturally true in an especial sense of the Roman historians; the long list of annalists begins at the moment when the great struggle with Carthage had for the first time brought Rome into direct connexion with the historic peoples of the ancient world, and when Romans themselves awoke to the importance of the part reserved for Rome to play in universal history. To write the annals of Rome became at once a task worthy of the best of her citizens. Though other forms of literature might be thought unbecoming to the dignity of a free-born citizen, this was never so with history. On the contrary, men of high rank and tried statesmanship were on that very account thought all the fitter to write the chronicles of the state they had served. And history in Rome never lost either its social prestige or its intimate and exclusive connexion with the fortunes of the Roman people. It was well enough for Greeks to busy themselves with the manners, institutions and deeds of the "peoples outside." The Roman historians, from Fabius Pictor to Tacitus, cared for none of these things. This exclusive interest in Rome was doubtless encouraged by the peculiar characteristics of the history of the state. The Roman annalist had not, like the Greek, to deal with the varying fortunes and separate doings of a number of petty communities, but with the continuous life of a single city. Nor was his attention drawn from the main lines of political history by the claims of art, literature and philosophy, for just as the tie which bound Romans together was that of citizenship, not of race or culture, so the history of Rome is that of the state, of its political constitution, its wars and conquests, its military and administrative system.

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[1] For the fragments of an epitome discovered at Oxyrhynchus see J. S. Reid in *Classical Review* (July, 1904); E. Kornemann, *Die neue Livius-Epitome aus Oxyrhynchus*, with text and commentary (Leipzig, 1904); C. H. Moore, "The Oxyrhynchus Epitome of Livy in relation to Obsequens and Cassiodorus," in *American Journal of Philology* (1904), 241.

[2] The various rumours once current of complete copies of Livy in Constantinople, Chios and elsewhere, are noticed by B. G. Niebuhr, *Lectures on the History of Rome from the first Punic War* (ed. L. Schmitz, 1844), i. 65.

Livy's own circumstances were all such as to render these views natural to him. He began to write at a time when, after a century of disturbance, the mass of men had been contented to purchase peace at the price of liberty. The present was at least inglorious, the future doubtful, and many turned gladly to the past for consolation. This retrospective tendency was favourably regarded by the government. It was the policy of Augustus to obliterate all traces of recent revolution, and to connect the new imperial régime as closely as possible with the ancient traditions and institutions of Rome and Italy. The *Aeneid* of Virgil, the *Fasti* of Ovid, suited well with his own restoration of the ancient temples, his revival of such ancient ceremonies as the Ludi Saeculares, his efforts to check the un-Roman luxury of the day, and his jealous regard for the purity of the Roman stock. And, though we are nowhere told that Livy undertook his history at the emperor's suggestion, it is certain that Augustus read parts of it with pleasure, and even honoured the writer with his assistance and friendship.

Livy was deeply penetrated with a sense of the greatness of Rome. From first to last its majesty and high destiny are present to his mind. Aeneas is led to Italy by the Fates that he may be the founder of Rome. Romulus after his ascension declares it to be the will of heaven that Rome should be mistress of the world; and Hannibal marches into Italy, that he may "set free the world" from Roman rule. But, if this ever-present consciousness often gives dignity and elevation to his narrative, it is also responsible for some of its defects. It leads him occasionally into exaggerated language (*e.g.* xxii. 33, "nullius usquam terrarum rei cura Romanos effugiebat"), or into such misstatements as his explanation of the course taken by the Romans in renewing war with Carthage, that "it seemed more suitable to the dignity of the Roman people." Often his jealousy for the honour of Rome makes him unfair and one-sided. In all her wars not only success but justice is with Rome. To the same general attitude is also due the omission by Livy of all that has no direct bearing on the fortunes of the Roman people. "I have resolved," he says (xxxix. 48), "only to touch on foreign affairs so far as they are bound up with those of Rome." As the result, we get from Livy very defective accounts even of the Italic peoples most closely connected with Rome. Of the past history and the internal condition of the more distant nations she encountered he tells us little or nothing, even when he found such details carefully given by Polybius.

Scarcely less strong than his interest in Rome is his interest in the moral lessons which her history seemed to him so well qualified to teach. This didactic view of history was a prevalent one in antiquity, and it was confirmed no doubt by those rhetorical studies which in Rome as in Greece formed the chief part of education, and which taught men to look on history as little more than a storehouse of illustrations and themes for declamation. But it suited also the practical bent of the Roman mind, with its comparative indifference to abstract speculation or purely scientific research. It is in the highest degree natural that Livy should have sought for the secret of the rise of Rome, not in any large historical causes, but in the moral qualities of the people themselves, and that he should have looked upon the contemplation of these as the best remedy for the vices of his own degenerate days. He dwells with delight on the unselfish patriotism of the old heroes of the republic. In those times children obeyed their parents, the gods were still sincerely worshipped, poverty was no disgrace, sceptical philosophies and foreign fashions in religion and in daily life were unknown. But this ethical interest is closely bound up with his Roman sympathies. His moral ideal is no abstract one, and the virtues he praises are those which in his view made up the truly Roman type of character. The prominence thus given to the moral aspects of the history tends to obscure in some degree the true relations and real importance of the events narrated, but it does so in Livy to a far less extent than in some other writers. He is much too skilful an artist either to resolve his history into a mere bundle of examples, or to overload it, as Tacitus is sometimes inclined to do, with reflections and axioms. The moral he wishes to enforce is usually either conveyed by the story itself, with the aid perhaps of a single sentence of comment, or put as a speech into the mouth of one of his characters (*e.g.* xxiii. 49; the devotion of Decius, viii. 10, cf. vii. 40; and the speech of Camillus, v. 54); and what little his narrative thus loses in accuracy it gains in dignity and warmth of feeling. In his portraits of the typical Romans of the old style, such as Q. Fabius Maximus, in his descriptions of the unshaken firmness and calm courage shown by the fathers of the state in the hour of trial, Livy is at his best; and he is so largely in virtue of his genuine appreciation of character as a powerful force in the affairs of men.

This enthusiasm for Rome and for Roman virtues is, moreover, saved from degenerating into gross partiality by the genuine candour of Livy's mind and by his wide sympathies with every thing great and good. Seneca (*Suasoriae* vi. 22) and Quintilian (x. 1. 101) bear witness to his impartiality. Thus, Hasdrubal's devotion and valour at the battle on the Metaurus are described in terms of eloquent praise; and even in Hannibal, the lifelong enemy of Rome, he frankly recognizes the great qualities that balanced his faults. Nor, though his sympathies are unmistakably with the aristocratic party, does he scruple to censure the pride, cruelty and selfishness which too often marked their conduct (ii. 54; the speech of Canuleius, iv. 3; of Sextius and Licinius, vi. 36); and, though he feels acutely that the times are out of joint, and has apparently little hope of the future, he still believes in justice and goodness. He is often righteously indignant, but never satirical, and such a pessimism as that of Tacitus and Juvenal is wholly foreign to his nature.

Though he studied and even wrote on philosophy (Seneca, *Ep.* 100. 9), Livy is by no means a philosophic historian. We learn indeed from incidental notices that he inclined to Stoicism and disliked the Epicurean system. With the scepticism that despised the gods (x. 40) and denied that they meddled with the affairs of men (xliii. 13) he has no sympathy. The immortal gods are everywhere the same; they govern the world (xxxvii. 45) and reveal the future to men by signs and wonders (xliii. 13), but only a debased superstition will look for their hand in every petty incident, or abandon itself to an indiscriminate belief in the portents and miracles in which popular credulity delights. The ancient state religion of Rome, with its temples, priests and auguries, he not only reverences as an integral part of the Roman constitution, with a sympathy which grows as he studies it, but, like Varro, and in true Stoic fashion, he regards it as a valuable instrument of government (i. 19. 21), indispensable in a well-ordered community. As distinctly Stoical is the doctrine of a fate to which even the gods must yield (ix. 4), which disposes the plans of men (i. 42) and blinds their minds (v. 37), yet leaves their wills free (xxxvii. 45).

But we find no trace in Livy of any systematic application of philosophy to the facts of history. He is as innocent of the leading ideas which shaped the work of Polybius as he is of the cheap theorizing which wearies us in the pages of Dionysius. The events are graphically, if not always accurately, described; but of the larger causes at work in producing them, of their subtle action and reaction upon each other, and of the general conditions amid which the history worked itself out, he takes no thought at all. Nor has Livy much acquaintance with either the theory or the practice of politics. He exhibits, it is true, political sympathies and antipathies. He is on the whole for the nobles and against the commons; and, though the unfavourable colours in which he paints the leaders of the latter are possibly reflected from the authorities he followed, it is evident that he despised and disliked the multitude. Of monarchy he speaks with a genuine Roman hatred, and we know that in the last days of the republic his sympathies were wholly with those who strove in vain to save it. He betrays, too, an insight into the evils which were destined finally to undermine the imposing fabric of Roman empire. The decline of the free population, the spread of slavery (vi. 12, vii. 25), the universal craving for wealth (iii. 26), the employment of foreign mercenaries (xxv. 33), the corruption of Roman race and Roman manners by mixture with aliens (xxxix. 3), are all noticed in tones of solemn warning. But his retired life had given him no wide experience of men and things. It is not surprising, therefore, to find that he fails altogether to present a clear and coherent picture of the history and working of the Roman constitution, or that his handling of intricate questions of policy is weak and inadequate.

Sources.—If from the general aim and spirit of Livy's history we pass to consider his method of workmanship, we are struck at once by the very different measure of success attained by him in the two great departments of an historian's labour. He is a consummate artist, but an unskilled and often careless investigator and critic. The materials which lay ready to his hand may be roughly classed under two heads: (1) the original evidence of monuments, inscriptions, &c., (2) the written tradition as found in the works of previous authors. It is on the second of these two kinds of evidence that Livy almost exclusively relies. Yet that even for the very early times a certain amount of original evidence still existed is proved by the use which was made of it by Dionysius, who mentions at least three important inscriptions, two dating from the regal period and one from the first years of the republic (iv. 26, iv. 58, x. 32). We know from Livy himself (iv. 20) that the breastplate dedicated by Aulus Cornelius Cossus (428 B.C.) was to be seen in his own day in the temple of Jupiter Feretrius, nor is there any reason to suppose that the *libri lintei*, quoted by Licinius Macer, were not extant when Livy wrote. For more recent times the materials were plentiful, and a rich field of research lay open to the student in the long series of laws, decrees of the senate, and official registers, reaching back, as it probably did, at least to the beginning of the 3rd century B.C. Nevertheless it seems certain that Livy never realized the duty of consulting these relics of the past, even in order to verify the statements of his authorities. Many of them he never mentions; the others (*e.g.* the *libri lintei*) he evidently describes at second hand. Antiquarian studies were popular in his day, but the instances are very few in which he has turned their results to account. There is no sign that he had ever read Varro; and he never alludes to Verrius Flaccus. The haziness and inaccuracy of his topography make it clear that he did not attempt to familiarize himself with the actual scenes of events even that took place in Italy. Not only does he confuse Thermon, the capital of Aetolia, with Thermopylae (xxxiii. 35), but his accounts of the Roman campaigns against Volsci, Aequi and Samnites swarm with confusions and difficulties; nor are even his descriptions of Hannibal's movements free from an occasional vagueness which betrays the absence of an exact knowledge of localities.

The consequence of this indifference to original research and patient verification might have been less serious had the written tradition on which Livy preferred to rely been more trustworthy. But neither the materials out of which it was composed, nor the manner in which it had been put together, were such as to make it a safe guide. It was indeed represented by a long line of respectable names. The majority of the Roman annalists were men of high birth and education, with a long experience of affairs, and their defects did not arise from seclusion of life or ignorance of letters. It is rather in the conditions under which they wrote and in the rules and traditions of their craft that the causes of their shortcomings must be sought.

The Annalists.

It was not until the 6th century from the foundation of the city that historical writing began in Rome. The father of Roman history, Q. Fabius Pictor, a patrician and a senator, can scarcely have published his annals before the close of the Second Punic War, but these annals covered the whole period from the arrival of Evander in Italy down at least to the battle by Lake Trasimene (217 B.C.). Out of what materials, then, did he put together his account of the earlier history? Recent criticism has succeeded in answering this question with some degree of certainty. A careful examination of the fragments of Fabius (see H. Peter, *Historicorum Romanorum Reliquiae*, Leipzig, 1870; and C. W. Nitzsch, *Röm. Annalistik*, Berlin, 1873) reveals in the first place a marked difference between the kingly period and that which followed the establishment of the republic. The history of the former stretches back into the regions of pure mythology. It is little more than a collection of fables told with scarcely any attempt at criticism, and with no more regard to chronological sequence than was necessary to make the tale run smoothly or to fill up such gaps as that between the flight of Aeneas from Troy and the supposed year of the foundation of Rome. But from its very commencement the history of the republic wears a different aspect. The mass of floating tradition, which had come down from early days, with its tales of border raids and forays, of valiant chiefs and deeds of patriotism, is now rudely fitted into a framework of a wholly different kind. This framework consists of short notices of important events, wars, prodigies, consecration of temples, &c., all recorded with extreme brevity, precisely dated, and couched in a somewhat archaic style. They were taken probably from one or more of the state registers, such as the annals of the pontiffs, or those kept by the aediles in the temple of Ceres. This bare official outline of the past history of his city was by Fabius filled in from the rich store of tradition that lay ready to his hand. The manner and spirit in which he effected this combination were no doubt wholly uncritical. Usually he seems to have transferred both annalistic notices and popular traditions to his pages much in the shape in which he found them. But he unquestionably gave undue prominence to the tales of the prowess and glory of the Fabii, and probably also allowed his own strong aristocratic sympathies to colour his version of the early political controversies. This fault of partiality was, according to Polybius, a conspicuous blot in Fabius's account of his own times, which was, we are told, full and in the main accurate, and, like the earlier portions, consisted of official annalistic notices, supplemented, however, not from tradition, but from his own experience and from contemporary sources. But even here Polybius charges him with favouring Rome at the expense of Carthage, and with the undue exaltation of the great head of his house, Q. Fabius Cunctator.

Nevertheless the comparative fidelity with which Fabius seems to have reproduced his materials might have made his annals the starting point of a critical history. But unfortunately intelligent criticism was exactly what they never received. It is true that in some respects a decided advance upon Fabius was made by subsequent annalists. M. Porcius Cato (234–149 B.C.) widened the scope of Roman history so as to include that of the chief Italian cities, and made the first serious attempt to settle the chronology. In his history of the Punic wars Caelius Antipater (c. 130 B.C.) added fresh material, drawn probably from the works of the Sicilian Greek Silenus, while Licinius Macer (70 B.C.) distinguished himself by the use he made of the ancient "linen books." No doubt, too, the later annalists, at any rate from Caelius Antipater onwards, improved upon Fabius in treatment and style. But in more essential points we can discern no progress. One annalist after another quietly adopted the established tradition, as it had been left by his predecessors, without any serious alterations of its main outlines. Of independent research and critical analysis we find no trace, and the general agreement upon main facts is to be attributed simply to the regularity with which each writer copied the one before him. But, had the later annalists contented themselves with simply reproducing the earlier ones, we should at least have had the old tradition before us in a simple and tolerably genuine form. As it was, while they slavishly clung to its substance, they succeeded, as a rule, in destroying all traces of its original form and colouring. L. Calpurnius Piso, tribune in 149 B.C. and consul in 133 B.C., prided himself on reducing the old legends to the level of common sense, and importing into them valuable moral lessons for his own generation. By Caelius Antipater the methods of rhetoric were first applied to history, a disastrous precedent enough. He inserted speeches, enlivened his pages with chance tales, and aimed, as Cicero tells us, at not merely narrating facts but also at beautifying them. His successors carried still farther the practice of dressing up the rather bald chronicles of earlier writers with all the ornaments of rhetoric. The old traditions were altered, almost beyond the possibility of recognition, by exaggerations, interpolations and additions. Fresh incidents were inserted, new motives suggested and speeches composed in order to infuse the required life and freshness into these dry bones of history. At the same time the political bias of the writers, and the political ideas of their day were allowed, in some cases perhaps half unconsciously, to affect their representations of past events. Annalists of the Gracchan age imported into the early struggles of patricians and plebeians the economic controversies of their own day, and painted the first tribunes in the colours of the two Gracchi or of Saturninus. In the next generation they dexterously forced the venerable records of the early republic to pronounce in favour of the ascendancy of the senate, as established by Sulla. To political bias was added family pride, for the gratification of which the archives of the great houses, the funeral panegyrics, or the imagination of the writer himself supplied an ample store of doubtful material. Pedigrees were invented, imaginary consulships and fictitious triumphs inserted, and family traditions and family honours were formally incorporated with the history of the state.

Things were not much better even where the annalists were dealing with recent or contemporary events. Here, indeed, their materials were naturally fuller and more trustworthy, and less room was left for fanciful decoration and capricious alteration of the facts. But their methods are in the main unchanged. What they found written they copied; the gaps they supplied, where personal experience failed, by imagination. No better proof of this can be given than a comparison of the annalist's version of history with that of Polybius. In the fourth and fifth decades of Livy the two appear side by side, and the contrast between them is striking. Polybius, for instance, gives the number of the slain at Cynoscephalae as 8000; the annalists raise it as high as 40,000 (Livy xxxiii. 10). In another case (xxxii. 6) Valerius Antias, the chief of sinners in this respect, inserts a decisive Roman victory over the Macedonians, in which 12,000 of the latter were slain and 2200 taken prisoner, an achievement recorded by no other authority.

Such was the written tradition on which Livy mainly relied. We have next to examine the manner in which he used it, and here we are met at the outset by the difficulty of determining with exactness what authorities he is following at any one time; for of the importance of full and accurate references he has no idea, and often for chapters together he gives us no clue at all. More often still he contents himself with such vague phrases as "they say," "the story goes," "some think," or speaks in general terms of "ancient writers" or "my authorities." Even where he mentions a writer by name, it is frequently clear that the writer named is not the one whose lead he is following at the moment, but that he is noticed incidentally as differing from Livy's guide for the time being on some point of detail (compare the references to Piso in the first decade, i. 55, ii. 32, &c.). It is very rarely that Livy explicitly tells us whom he has selected as his chief source (*e.g.* Fabius xxii. 7; Polybius xxxiii. 10). By a careful analysis, however, of those portions of his work which admit of a comparison with the text of his acknowledged authorities (*e.g.* fourth and fifth decades, see H. Nissen, *Untersuchungen*, Berlin, 1863), and elsewhere by comparing his version with the known fragments of the various annalists, and with what we are told of their style and method of treatment, we are able to form a general idea of his plan of procedure. As to the first decade, it is generally agreed that in the first and second books, at any rate, he follows such older and simpler writers as Fabius Pictor and Calpurnius Piso (the only ones whom he there refers to by name), to whom, so far as the first book is concerned, Niebuhr (*Lectures*, p. 33) would add the poet Ennius. With the close of the second book or the opening of the third we come upon the first traces of the use of later authors. Valerius Antias[1] is first quoted in iii. 5, and signs of his handiwork are visible here and there throughout the rest of the decade (vii. 36, ix. 27, x. 3-5). In the fourth book the principal authority is apparently Licinius Macer, and for the period following the sack of Rome by the Gauls Q. Claudius Quadrigarius, whose annals began at this point in the history. We have besides a single reference (vii. 3) to the antiquarian Cincius, and two (iv. 23, x. 9) to Q. Aelius Tubero, one of the last in the list of annalists. Passing to the third decade, we find ourselves at once confronted by a question which has been long and fully discussed—the relation between Livy and Polybius. Did Livy use Polybius at all, and, if so, to what extent?

It is conceded on all hands that Livy in this decade makes considerable use of other authorities than Polybius (*e.g.* Fabius xxii. 7; Caelius Antipater xxi. 38, 46, 47, xxii. 31, &c.), that he only once mentions Polybius (xxx. 45), and that, if he used him, he did so to a much less extent than in the fourth and fifth decades, and in a very different manner. It is also agreed that we can detect in Livy's account of the Hannibalic war two distinct elements, derived originally, the one from a Roman, the other from a non-Roman source. But from these generally accepted premises two opposite conclusions have been drawn. On the one hand, it is maintained (*e.g.* by Lachmann, C. Peter, H. Peter, *Hist. Rom. Relliq.*) that those parts of Livy's narrative which point to a non-Roman authority (*e.g.* Hannibal's movements prior to his invasion of Italy) are taken by Livy directly from Polybius, with occasional reference of course to other writers, and with the omission (as in the later decades) of all matters uninteresting to Livy or his Roman readers, and the addition of rhetorical touches and occasional comments. It is urged that Livy, who in the fourth and fifth decades shows himself so sensible of the great merits of Polybius, is not likely to have ignored him in the third, and that his more limited use of him in the latter case is fully accounted for by the closer connexion of the history with Rome and Roman affairs, and the comparative excellence of the available Roman authorities, and, lastly, that the points of agreement with Polybius, not only in matter but in expression, can only be explained on the theory that Livy is directly following the great Greek historian. On the other hand, it is maintained (especially by Schwegler, Nitzsch, and K. Böttcher) that the extent and nature of Livy's agreement with Polybius in this part of his work point rather to the use by both of a common original authority. It is argued that Livy's mode of using his authorities is tolerably uniform, and that his mode of using Polybius in particular is known with certainty from the later decades. Consequently the theory that he used Polybius in the third decade requires us to assume that in this one instance he departed widely, and without sufficient reason, from his usual course of procedure. Moreover, even in the passages where the agreement with Polybius is most apparent, there are so many discrepancies and divergencies in detail, and so many unaccountable omissions and additions, as to render it inconceivable that he had the text of Polybius before him. But all these are made intelligible if we suppose Livy to have been here following directly or indirectly the same original sources that were used by Polybius. The earliest of these original sources was probably Silenus, with whom may possibly be placed, for books xxi. xxii., Fabius Pictor. The latter Livy certainly used directly for some parts of the decade. The former he almost as certainly knew only at second hand, the intermediate authority being probably Caelius Antipater. This writer, who confined himself to a history of the Second Punic War, in seven books, is expressly referred to by Livy eleven times in the third decade; and in other passages where his name is not mentioned Livy can be shown to have followed him (*e.g.* xxii. 5, 49, 50, 51, xxiv. 9). In the latter books of the decade his chief authority is possibly Valerius Antias.

Polybius.

In the fourth and fifth decades the question of Livy's authorities presents no great difficulties, and the conclusions arrived at by Nissen in his masterly *Untersuchungen* have met with general acceptance. These may be shortly stated as follows. In the portions of the history which deal with Greece and the East, Livy follows Polybius, and these portions are easily distinguishable from the rest by their superior clearness, accuracy and fulness. On the other hand, for the history of Italy and western Europe he falls back on Roman annalists, especially, it seems, on Claudius Quadrigarius and Valerius Antias—a most unfortunate choice—and from them too he takes the annalistic mould into which his matter is cast.

Critical method.

Livy's general method of using these authorities was certainly not such as would be deemed satisfactory in a modern historian. He is indeed free from the grosser faults of deliberate injustice and falsification, and he resists that temptation to invent, to which "the minds of authors are only too much inclined" (xxii. 7). Nor is he unconscious of the necessity for some kind of criticism. He distinguishes between rumour and the precise statements of recognized authorities (cf. xxi. 46, v. 21, vii. 6). The latter he reproduced in the main faithfully, but with a certain exercise of discretion. Where they disagreed, he calls attention to the fact, occasionally pronouncing in favour of one version rather than another (ii. 41, xxi. 46) though often on no adequate grounds, or attempting to reconcile and explain discrepancies (vi. 12, 38). Where he detects or suspects the insertion of fabulous matter he has no scruple in saying so. Gross exaggerations, such as those in which Valerius Antias indulged, he roundly denounces, and with equal plainness of speech he condemns the family vanity which had so constantly corrupted and distorted the truth. "I suppose," he says (viii. 40), "that the record and memorial of these matters hath been depraved and corrupted by these funeral orations of praises, . . while every house and family draweth to it the honour and renown of noble exploits, martial feats and dignities by any untruth and lie, so it be colourable." The legendary character of the earliest traditions he frankly admits. "Such things as are reported either before or at the foundation of the city, more beautiful and set out with poets' fables than grounded upon pure and faithful records, I mean neither to aver nor disprove" (*Praef.*); and of the whole history previous to the sack of Rome by the Gauls (390 B.C.) he writes that it was obscure "both in regard of exceeding antiquity, and also for that in those days there were very few writings and monuments, the only faithful safeguard and true remembrancers of deeds past; and, besides, whatsoever was registered in the commentaries of the priests and in other public or private records, the same for the most part, when the city was burned, perished withal." Further than this, however, Livy's criticism does not go. Where his written authorities are not palpably inconsistent with each other or with probability he accepts and transcribes their record without any further inquiry, nor does he ever attempt to get behind this record in order to discover the original evidence on which it rested. His acceptance in any particular case of the version given by an annalist by no means implies that he has by careful inquiry satisfied himself of its truth. At the most it only presupposes a comparison with other versions, equally second-hand, but either less generally accepted or less in harmony with his own views of the situation; and in many cases the reasons he gives for his preference of one account over another are eminently unscientific. Livy's history, then, rests on no foundation of original research or even of careful verification. It is a compilation, and even as such it leaves much to be desired. For we cannot credit Livy with having made such a preliminary survey of his authorities as would enable him to determine their relations to each other, and fuse their various narratives into a consistent whole. It is clear, on the contrary, that his circle of authorities for any one decade was a comparatively small one, that of these he selected one, and transcribed him with the necessary embellishments and other slight modifications until impelled by various reasons to drop him. He then, without warning, takes up another, whom he follows in the same way. The result is a curious mosaic, in which pieces of all colours and dates are found side by side, and in which even the great artistic skill displayed throughout fails to conceal the lack of internal unity. Thus many of Livy's inconsistencies are due to his having pieced together two versions, each of which gave a differently coloured account of the same event. Mommsen (*Rom. Forschungen*, ii.) has clearly shown that this is what has happened in his relation of the legal proceedings against the elder Africanus in book xxxviii.; and in the story of the first secession, as he tells it, the older version which represented it as due to political and the later which explained it by economical grievances are found side by side. Similarly a change from one authority to another leads him not unfrequently to copy from the latter statements inconsistent with those he took from the former, to forget what he has previously said, or to treat as known a fact which has not been mentioned before (cf. ii. 1, xxxiv. 6, and Weissenborn's *Introduction*, p. 37). In other cases where the same event has been placed by different annalists in different years, or where their versions of it varied, it reappears in Livy as two events. Thus the four campaigns against the Volsci (ii. 17 seq.) are, as Schwegler (*R.G.* i. 13) rightly says, simply variations of one single expedition. Other instances of such "doublettes" are the two single combats described in xxiii. 46 and xxv. 18, and the two battles at Baecula in Spain (xxvii. 18 and xxviii. 13). Without doubt, too, much of the chronological confusion observable throughout Livy is due to the fact that he follows now one now another authority, heedless of their differences on this head. Thus he vacillates between the Catonian and Varronian reckoning of the years of the city, and between the chronologies of Polybius and the Roman annalists.

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[1] For Livy's debt to Valerius Antias, see A. A. Howard in *Harvard Studies in Classical Philology*, xvii. (1906), pp. 161 sqq.

To these defects in his method must be added the fact that he does not always succeed even in accurately reproducing the authority he is for the time following. In the case of Polybius, for instance, he allows himself great freedom in omitting what strikes him as irrelevant, or tedious, or uninteresting to his Roman readers, a process in which much valuable matter disappears. In other cases his desire to give a vividness and point to what he doubtless considered the rather bald and dry style of Polybius leads him into absurdities and inaccuracies. Thus by the treaty with Antiochus (188 B.C.) it was provided that the Greek communities of Asia Minor "shall settle their mutual differences by arbitration," and so far Livy correctly transcribes Polybius, but he adds with a rhetorical flourish, "or, if both parties prefer it, by war" (xxxviii. 38). Elsewhere his blunders are apparently due to haste, or ignorance or sheer carelessness; thus, for instance, when Polybius speaks of the Aetolians assembling at their capital Thermon, Livy (xxxiii. 35) not only substitutes Thermopylae but gratuitously informs his readers that here the Pylaean assemblies were held. Thanks partly to carelessness, partly to mistranslation, he makes sad havoc (xxxv. 5 seq.) of Polybius's account of the battle of Cynoscephalae. Finally, Livy cannot be altogether acquitted on the charge of having here and there modified Polybius in the interests of Rome.

Style.—Serious as these defects in Livy's method appear if viewed in the light of modern criticism, it is probable that they were easily pardoned, if indeed they were ever discovered, by his contemporaries. For it was on the artistic rather than on the critical side of history that stress was almost universally laid in antiquity, and the thing that above all others was expected from the historian was not so much a scientific investigation and accurate exposition of the truth as its skilful presentation in such a form as would charm and interest the reader. Tried by this standard, Livy deservedly won and held a place in the very first rank. Asinius Pollio sneered at his Patavinity, and the emperor Caligula denounced him as verbose, but with these exceptions the opinion of antiquity was unanimous in pronouncing him a consummate literary workman. The classical purity of his style, the eloquence of his speeches, the skill with which he depicted the play of emotion, and his masterly portraiture of great men, are all in turn warmly commended, and in our own day we question if any ancient historian is either more readable or more widely read. It is true that for us his artistic treatment of history is not without its drawbacks. The more trained historical sense of modern times is continually shocked by the obvious untruth of his colouring, especially in the earlier parts of his history, by the palpable unreality of many of the speeches, and by the naïveté with which he omits everything, however important, which he thinks will weary his readers. But in spite of all this we are forced to acknowledge that, as a master of what we may perhaps call "narrative history," he has no superior in antiquity; for, inferior as he is to Thucydides, to Polybius, and even to Tacitus in philosophic power and breadth of view, he is at least their equal in the skill with which he tells his story. He is indeed the prince of chroniclers, and in this respect not unworthy to be classed even with Herodotus (Quintilian, x. i. 101). Nor is anything more remarkable than the way in which Livy's fine taste and sense of proportion, his true poetic feeling and genuine enthusiasm, saved him from the besetting faults of the mode of treatment which he adopted. The most superficial comparison of his account of the earliest days of Rome with that given by Dionysius shows from what depths of tediousness he was preserved by these qualities. Instead of the wearisome prolixity and the misplaced pedantry which make the latter almost unreadable, we find the old tales briefly and simply told. Their primitive beauty is not marred by any attempt to force them into an historical mould, or disguised beneath an accumulation of the insipid inventions of later times. At the same time they are not treated as mere tales for children, for Livy never forgets the dignity that belongs to them as the prelude to the great epic of Rome, and as consecrated by the faith of generations. Perhaps an even stronger proof of the skill which enabled Livy to avoid dangers which were fatal to weaker men is to be found in his speeches. We cannot indeed regard them, with the ancients, as the best part of his history, for the majority of them are obviously unhistorical, and nearly all savour somewhat too much of the rhetorical schools to be perfectly agreeable to modern taste. To appreciate them we must take them for what they are, pieces of declamation, intended either to enliven the course of the narrative, to place vividly before the reader the feelings and aims of the chief actors, or more frequently still to enforce some lesson which the author himself has at heart. The substance, no doubt, of many of them Livy took from his authorities, but their form is his own, and, in throwing into them all his own eloquence and enthusiasm, he not only acted in conformity with the established traditions of his art, but found a welcome outlet for feelings and ideas which the fall of the republic had deprived of all other means of expression. To us, therefore, they are valuable not only for their eloquence, but still more as giving us our clearest insight into Livy's own sentiments, his lofty sense of the greatness of Rome, his appreciation of Roman courage and firmness, and his reverence for the simple virtues of older times. But, freely as Livy uses this privilege of speechmaking, his correct taste keeps his rhetoric within reasonable limits. With a very few exceptions the speeches are dignified in tone, full of life and have at least a dramatic propriety, while of such incongruous and laboured absurdities as the speech which Dionysius puts into the mouth of Romulus, after the rape of the Sabine women, there are no instances in Livy.

Speeches.

But, if our estimate of the merits of his speeches is moderated by doubts as to his right to introduce them at all, no such scruples interfere with our admiration for the skill with which he has drawn the portraits of the great men who figure in his pages. We may indeed doubt whether in all cases they are drawn with perfect accuracy and impartiality, but of their life-like vigour and clearness there can be no question. With Livy this portrait-painting was a labour of love. "To all great men," says Seneca, "he gave their due ungrudgingly," but he is at his best in dealing with those who, like Q. Fabius Maximus, "the Delayer," were in his eyes the most perfect types of the true Roman.

The general effect of Livy's narrative is no doubt a little spoilt by the awkward arrangement, adopted from his authorities, which obliges him to group the events by years, and thus to disturb their natural relations and continuity. As the result his history has the appearance of being rather a series of brilliant pictures loosely strung together than a coherent narrative. But it is impossible not to admire the copious variety of thought and language, and the evenly flowing style which carried him safely through the dreariest periods of his history; and still more remarkable is the dramatic power he displays when some great crisis or thrilling episode stirs his blood, such as the sack of Rome by the Gauls, the battle by the Metaurus and the death of Hasdrubal.

In style and language Livy represents the best period of Latin prose writing. He has passed far beyond the bald and meagre diction of the early chroniclers. In his hands Latin acquired a flexibility and a richness of vocabulary unknown to it before. If he writes with less finish and a less perfect rhythm than his favourite model Cicero, he excels him in the varied structure of his periods, and their adaptation to the subject-matter. It is true that here and there the "creamy richness" of his style becomes verbosity, and that he occasionally draws too freely on his inexhaustible store of epithets, metaphors and turns of speech; but these faults, which did not escape the censure even of friendly critics like Quintilian, are comparatively rare in the extant parts of his work. From the tendency to use a poetic diction in prose, which was so conspicuous a fault in the writers of the silver age, Livy is not wholly free. In his earlier books especially there are numerous phrases and sentences which have an unmistakably poetic ring, recalling sometimes Ennius and more often his contemporary Virgil. But in Livy this poetic element is kept within bounds, and serves only to give warmth and vividness to the narrative. Similarly, though the influence of rhetoric upon his language, as well as upon his general treatment, is clearly perceptible, he has not the perverted love of antithesis, paradox and laboured word-painting which offends us in Tacitus; and, in spite of the Venetian richness of his colouring, and the copious flow of his words, he is on the whole wonderfully natural and simple.

These merits, not less than the high tone and easy grace of his narrative and the eloquence of his speeches, gave Livy a hold on Roman readers such as only Cicero and Virgil besides him ever obtained. His history formed the groundwork of nearly all that was afterwards written on the subject. Plutarch, writers on rhetoric like the elder Seneca, moralists like Valerius Maximus, went to Livy for their stock examples. Florus and Eutropius abridged him; Orosius extracted from him his proofs of the sinful blindness of the pagan world; and in every school Livy was firmly established as a text-book for the Roman youth.

Text.—The received text of the extant thirty-five books of Livy is taken from different sources, and no one of our MSS. contains them all. The MSS. of the first decade, some thirty in number, are with one exception derived, more or less directly, from a single archetype, viz., the recension made in the 4th century by the two Nicomachi, Flavianus and Dexter, and by Victorianus. This is proved in the case of the older MSS. by written subscriptions to that effect, and in the case of the rest by internal evidence. Of all these descendants of the Nicomachean recension, the oldest is the Codex Parisinus of the 10th century, and the best the Codex Mediceus or Florentinus of the 11th. An independent value attaches to the ancient palimpsest of Verona, of which the first complete account was given by Mommsen in *Abhandl. der preussischen Akad. der Wissenschaften* (1868). It contains the third, fourth, fifth and fragments of the sixth book, and, according to Mommsen, whose conclusions are accepted by Madvig (*Emend. Livianae*, 2nd ed., 1877, p. 37), it is derived, not from the Nicomachean recension, but from an older archetype common to both.

For the third decade our chief authority is the Codex Puteanus, an uncial MS. of the 5th century, now at Paris. For the fourth we have two leading MSS.—Codex Bambergensis, 11th century, and the slightly older Codex Moguntinus, now lost and only known through the Mainz edition of 1518–1519. What remains of the fifth decade depends on the 5th century Laurishamensis or Vindobonensis from the monastery of Lorsch, edited at Basel in 1531.

A bibliography of the various editions of Livy, or of all that has been written upon him, cannot be attempted here. The following may be consulted for purposes of reference; W. Engelmann, *Scriptores Latini* (8th ed., by E. Preuss, 1882); J. E. B. Mayor, *Bibliographical Clue to Latin Literature* (1875); Teuffel-Schwabe, *History of Roman Literature* (Eng. trans.), 256, 257; M. Schanz, *Geschichte der römischen Litteratur*, ii. 1 (2nd ed., 1899). The best editions of the complete text are those of W. Weissenborn (1858–1862, containing an introductory essay on Livy's life and writings; new edition by M. Müller, 1902), and J. N. Madvig and J. L. Ussing (1863–1873). The only English translation of any merit is by Philemon Holland (1600). (H. F. P.; X.)

LIZARD (Lat. *lacerta*[1]), a name originally referred only to the small European species of four-legged reptiles, but now applied to a whole order (*Lacertilia*) which is represented by numerous species in all temperate and tropical regions. Lizards are reptiles which have a transverse external anal opening (instead of a longitudinal slit as in Crocodilians and tortoises) and which have the right and left halves of the mandibles connected by a sutural symphysis. The majority are distinguished from snakes by the possession of two pairs of limbs, of external ear-openings and movable eyelids, but since in not a few of the burrowing, snake-shaped lizards these characters give way entirely, it is well-nigh impossible to find a diagnosis which should be absolutely sufficient for the distinction between lizards and snakes. In such doubtful cases a number of characters have to be resorted to, and, while each of these may fail when taken singly, their combination decides the question. It is certain that the snakes have been evolved as a specialized branch from some Lacertilian stock, and that both "orders" are intimately related, but it is significant that it is only through the degraded members of the lizards that recent representatives of the two great groups seem to run into each other. Such critical characters are:—

	Lizards.	Snakes.
Limbs	2 pairs, 1 or 0.	0 or vestigial hind-limbs.
Ear-opening	Usually present.	Always absent.
Eyelids	Mostly movable.	No movable lids.
Tongue	Often not retractile.	Always bifid and retractile into itself.
Teeth	Pleuro- or acrodont, not anchylosed.	Acrodont, anchylosed.
Mandibles	Mostly firmly united suturally.	Never with suture, mostly ligamentous.
Columella cranii	Mostly present.	Absent.
	Mostly with bony arches across the temporal region.	No bony arches.
	Osteoderms common.	No osteoderms.

The lizards and snakes are the two dominant reptilian orders which are still on the increase in species, though certainly not in size. As a moderate estimate, the number of recent species of lizards is about 1700. As a group they are cosmopolitan, their northern limit approaching that of the permanently frozen subsoil, while in the southern hemisphere the southern point of Patagonia forms the farthest limit. As we approach the tropics, the variety of forms and the number of individuals increase, the most specialized and developed forms, and also the most degraded, being found in the tropics. In the temperate regions they hibernate. The majority live on broken ground, with or without much vegetation; many are arboreal and many are true desert animals, while a few are more or less aquatic; one, the leguan of the Galapagos, *Amblyrhynchus*, even enters the sea. Some, like the majority of the geckos, are nocturnal. In adaptation to these varied surroundings they exhibit great variety in shape, size and structure. Most of these modifications are restricted to the skin, limbs, tail or tongue. Most lizards live on animal food, varying from tiny insects and worms to lizards, snakes, birds and mammals, while others prefer a mixed or an entirely vegetable diet. Accordingly, the teeth and the whole digestive tract are modified. But swiftness, the apparatus necessary for climbing, running and digging, the mechanism of the tongue, the muscles of the jaws (hence modifications of the cranial arches) stand also in correlation with the kind of food and with the way in which it has to be procured. Generally the teeth are conical or pointed, more rarely blunt, grooved or serrated. They are inserted either on the inner side of the margin of the jaws (*pleurodonta*) or on the edge of the bones (*acrodonta*). The tongue is generally beset with more or less scaly or velvety papillae and has always a well-marked posterior margin, while the anterior portion may or may not be more or less retractile into the posterior part.

In many lizards the muscles of the segments of the tail are so loosely connected and the vertebrae are so weak that the tail easily breaks off. The severed part retains its muscular irritability for a short time, wriggling as if it were a living creature. A lizard thus mutilated does not seem to be much affected, and the lost part is slowly reproduced. This faculty is of advantage to those lizards which lack other means of escape when pursued by some other animal, which is satisfied with capturing the detached member.

The motions of most lizards are executed with great but not enduring rapidity. With the exception of the chameleon, all drag their body over the ground, the limbs being wide apart, turned outwards and relatively to the bulk of the body generally weak. But the limbs show with regard to development great variation, and an uninterrupted transition from the most perfect condition of two pairs with five separate clawed toes to their total disappearance; yet even limbless lizards retain bony vestiges beneath the skin. The motions of these limbless lizards are similar to those of snakes, which they resemble in their elongate body.

The eggs are elliptical in shape, both poles being equal, and are covered with a shell which may be thin and leathery or hard and calcareous. The number of eggs laid is small in comparison with other reptiles, rarely exceeding a score, and some like the anolis and the geckos deposit only one or two. The parents leave the eggs to hatch where they are deposited, in sand or in mould. Many lizards however, retain the eggs in the oviducts until the embryo is fully developed; these species then bring forth living young and are called ovo-viviparous by purists. Some lizards possess a considerable amount of intelligence; they play with each other, become very tame, and act deliberately according to circumstances. As a rule the Iguanids and Varans are as bright as the Agamas are dull. Many have the power of changing colour, a faculty which they share only with various frogs, toads and fishes. Lizards are not poisonous, with the single exception of *Heloderma*.

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[1] For the etymology of this word, see CROCODILE.

The Lacertilia, or lizards in the wider sense, fall easily into three natural groups: geckos (*q.v.*), chameleons (*q.v.*) and lizards.

I. Suborder, GECKONES. Pleurodont lizards with well-developed limbs; without temporal bony arches; postthoracic ribs united across the abdomen. Tongue, thick and broad, slightly nicked anteriorly. With few exceptions they have amphicoelous vertebrae, the parietal bones remain separate and they have no eyelids, with very few exceptions.

1. Family, *Geckonidae*.—Amphicoelous; parietals separate; clavicles dilated and with a perforation near the ventral end. Cosmopolitan, although mainly tropical, with about 270 species (see GECKO).

Nearly all geckos are nocturnal and the pupil contracts into a vertical slit, except in a few diurnal kinds, *e.g. Phelsuma* of islands in the Indian Ocean, and *Lygodactylus* of Africa. *Aelurosaurus* of Borneo and Australia, and *Ptenopus* of South Africa, have upper and lower movable eyelids. Whilst the skin is mostly soft on the back, with little granular tubercles, scales (except on the belly) are absent, but they are present in *Homopholis*, in *Geckolepis* of Madagascar, and most fully developed in *Teratoscincus scincus*. This peculiar little inhabitant of the steppes and desert regions of Turkestan and Persia, by rubbing the imbricating scales upon each other, produces a shrill cricket-like noise, whilst sitting at night in front of its hole in the ground. Furthermore it is so thoroughly adapted to running upon the desert sand that its digits are devoid of adhesive lamellae. The same beautiful adaptation to the surroundings exists also in *Ptenopus* (with fringed toes) and *Stenodactylus*, which are likewise deserticolous. *Aeluronyx* of Madagascar and Seychelles has cat-like retractile claws. *Naultinus elegans* of New Zealand is said to be viviparous; the others lay but one rather large egg at a time. Many species have a feeble voice which resembles a repeated click of the tongue, and their name "gecko" is supposed to be an Indian imitation of the sound.

2. Family, *Uroplatidae*.—Amphicoelous; parietals separate; but the nasal bones are fused together, and the clavicles are not dilated. Genus *Uroplates*, with a few species, *e.g. U. fimbriatus* in Madagascar.

3. Family, *Eublepharidae*.—Procoelous; parietals united; eyelids functional; clavicles expanded as in the true geckos which they resemble in other respects. The few genera and species are undoubtedly a heterogeneous assembly, as indicated by their very scattered distribution, but they all agree in their decidedly handsome colour pattern, bands of dark brown to maroon upon a light ground. *Eublepharis*, with one species each in Panama, Mexico, Texas and California; two in India. *Coleonyx elegans* in forests of Central America and Mexico. *Psilodactylus* in West Africa.

II. Suborder, CHAMAELEONTES. Acrodont, Old World lizards, with laterally compressed body, prehensile tail and well developed limbs with the digits arranged in opposing, grasping bundles of two and three respectively. The chameleons (*q.v.*) have many structural peculiarities.

III. Suborder, LACERTAE. Procoelous vertebrae; ventral portions of the clavicles not dilated; parietal bones fused into one.

The general appearance is too misleading for the classification of the Lacertae. E. D. Cope (*Proc. Ac. Philad.*, 1864, pp. 224 et seq. and *Proc. Amer. Ass.* xix., 1871, p. 236, &c.) therefore relied upon more fundamental characters, notably the presence or absence of osteoderms, the formation of the skull, the teeth and the tongue. G. A. Boulenger (*Ann. Nat. Hist.* 5, xiv., 1884, p. 117, &c.) has further improved upon the then prevailing arrangements, and has elaborated a classification which, used by himself in the three volumes of the catalogue of lizards in the British Museum, is followed in the present article with slight alterations in the order of treatment of the families. In the following diagnoses of the families preference is given to such characters as are most easily ascertained.

The 17 "families" fall into 4 or 5 main groups. Presumably the presence of osteoderms and of complete cranial arches are more archaic than their absence, just as we conclude that limbless forms have been evolved from various groups possessed of fully developed limbs. *Zonuridae* and *Anguidae* assume a central position, with *Agamidae* and *Iguanidae* as two parallel families (not very different from each other) of highest development, one in the Old World, the other in America. *Xenosaurus* seems to be an offshoot intermediate between the *Iguanidae* and the *Anguidae*; a degraded form of latter is perhaps *Aniella* of California, whilst *Heloderma* and *Lanthanotus* are also specialized and isolated offshoots. A second group is formed by the few American *Xantusiidae*, the numerous American *Teiidae*, and the burrowing, degraded American and African *Amphisbaenidae*. A third group comprises the cosmopolitan *Scincidae*, the African and Malagasy *Gerrhosauridae* which in various features remind us of the *Anguidae*, and the African and Eurasian *Lacertidae* which are the highest members of this group. *Anelytropidae* and perhaps also *Dibamidae* may be degraded Scincoids. The *Varanidae* stand quite alone, in many respects the highest of all lizards, with some, quite superficial, Crocodilian resemblances. Lastly there are the few *Pygopodidae* of the Australian region, with still quite obscure relationship.

Family 1. *Agamidae*.—Acrodont; tongue broad and thick, not protractile; no osteoderms. Old World.

The agamas have always two pairs of well-developed limbs. The teeth are usually differentiated into incisors, canines and molars. The skin is devoid of ossifications, but large and numerous cutaneous spines are often present, especially on the head and on the tail. The family, comprising some 200 species, with about 30 genera, shows great diversity of form: the terrestrial members are mostly flat-bodied, the arboreal more laterally compressed and often with a very long tail. Most of them are insectivorous, but a few are almost entirely vegetable feeders. They are an exclusively Old World family; they are most numerous in Australia (except New Zealand) and the Indian and Malay countries; comparatively few live in Africa (none in Madagascar) and in the countries from Asia Minor to India.

The majority of the ground-agamas, and the most common species of the plains, deserts or rocky districts of Africa and Asia, belong to the genera *Stellio* and *Agama*. Their scales are mixed with larger prominent spines, which in some species are particularly developed on the tail, and disposed in whorls. Nearly all travellers in the north of Africa mention the *Hardhón* of the Arabs (*Agama stellio*), which is extremely common, and has drawn upon itself the hatred of the Mahommedans by its habit of nodding its head, which they interpret as a mockery of their own movements whilst engaged in prayer. In some of the Grecian islands they are still called *korkordilos*, just as they were in the time of Herodotus. *Uromastix* is one of the largest of ground-agamas, and likewise found in Africa and Asia. The body is uniformly covered with granular scales, whilst the short, strong tail is armed with powerful spines disposed in whorls. The Indian species (*U. hardwicki*) is mainly herbivorous; the African *U. acanthinurus* and *U. spinipes*, the *Dab* of the Arabs, take mixed food. *Phrynocephalus* is typical of the steppes and deserts of Asia. *Ceratophora* and *Lyriocephalus scutatus*, the latter remarkable for its chameleon-like appearance, are Ceylonese. *Calotes*, peculiar to Indian countries, comprises many species, *e.g. C. ophiomachus*, generally known as the "bloodsucker" on account of the red colour on the head and neck displayed during excitement. *Draco* (see DRAGON) is Indo-Malayan. *Physignathus* is known from Australia to Cochin China.

Of the Australian agamas no other genus is so numerously represented and widely distributed as *Grammatophora*, the species of which grow to a length of from 8 to 18 in. Their scales are generally rough and spinous; but otherwise they possess no strikingly distinguishing peculiarity, unless the loose skin of their throat, which is transversely folded and capable of inflation, be regarded as such. On the other hand, two other Australian agamoids have attained some celebrity by their grotesque appearance, due to the extraordinary development of their integuments. One (fig. 1) is the frilled lizard (*Chlamydosaurus kingi*), which is restricted to Queensland and the north coast, and grows to a length of 3 ft., including the long tapering tail. It is provided with a frill-like fold of the skin round the neck, which, when erected, resembles a broad collar. This lizard when startled rises with the fore-legs off the ground and squats and runs on its hind-legs. The other lizard is one which most appropriately has been called *Moloch horridus*. It is covered with large and small spine-bearing tubercules; the head is small and the tail short. It is sluggish in its movements, and so harmless that its armature and (to a casual observer) repulsive appearance are its sole means of defence. It grows only to a length of 10 in., and is not uncommon in the flats of South and West Australia.

Family 2. *Iguanidae*.—Pleurodont; tongue broad and thick, not protractile; no osteoderms. America, Madagascar and Fiji Islands.

According to the very varied habits, their external appearance varies within wide limits, there being amongst the 300 species, with 50 genera, arboreal, terrestrial, burrowing and semi-aquatic forms and even one semi-marine kind. All have well-developed limbs. In their general structure the *Iguanidae* closely resemble the *Agamidae*, from which they differ mainly by the pleurodont dentition. Most of them are insectivorous. Some, especially *Anolis* and *Polychrus*, can change colour to a remarkable extent. The family ranges all through the neotropical region, inclusive of the Galapagos and the Antilles, into the southern and western states of North America. Remarkable cases of discontinuous distribution are *Chalarodon* and *Hoplurus* in Madagascar, and *Brachylophus fasciatus* in the Fiji Islands. *Conolophus subcristatus* and *Amblyrhynchus cristatus* inhabit the Galapagos; the former feeds upon cactus and leaves, the latter is semi-marine, diving for the algae which grow below tide-marks. For *Basiliscus* see BASILISK; IGUANA is dealt with under its own heading; allied is *Metopoceros cornutus* of Hayti. *Polychrus*, the "chameleon," and *Liolaemus* are South American; *Ctenosaura* of Central America and Mexico resembles the agamoid *Uromastix*. *Corythophanes* and *Laemanctus*, with only a few species, are rare inhabitants of the tropical forests of Central America and Mexico. *Sauromalus*, *Crotaphytus*, *Callisaurus*, *Holbrookia*, *Uma*, *Uta* are typical Sonoran genera, some ranging from Oregon through Mexico. Allied is *Sceloporus*, with about 34 species, the most characteristic genus of Mexican lizards; only 4 species live in the United States, and only 3 or 4 are found south of the Isthmus of Tehuantepec and are restricted to Central America. The majority are humivagous, while others are truly arboreal, *e.g. S. microlepidotus*, a species which, moreover, has the greatest possible altitudinal range, from the hot country of southern Oaxaca to the upper tree-line of Citlaltepetl, about 13,500 ft. elevation; many species are viviparous. *Phrynosoma*, with about a dozen species, the "horned toads" of California to Texas, and through Mexico. Some of these comical-looking little creatures are viviparous, others deposit their eggs in the ground. They are well concealed by the colour of their upper parts, which in most cases agrees with the prevailing tone of their surroundings, mostly arid, stony or sandy localities; the large spikes on the head protect them from being swallowed by snakes. The enlarged spiny scales scattered over the back look as if it were sprinkled with the dried husks of seeds. They are entirely insectivorous, bask on the broiling hot sand and then can run fast enough; otherwise they are sluggish, dig themselves into the sand by a peculiar shuffling motion of the fringed edges of their flattened bodies, and when surprised they feign death. The statement, persistently repeated (O. P. Hay, *Proc. U.S. Nat. Mus.* xv., 1892, pp. 375-378), that some, *e.g. P. blainvillei* of California, have the power of squirting a blood-red fluid from the corner of the eye, still requires renewed investigation.

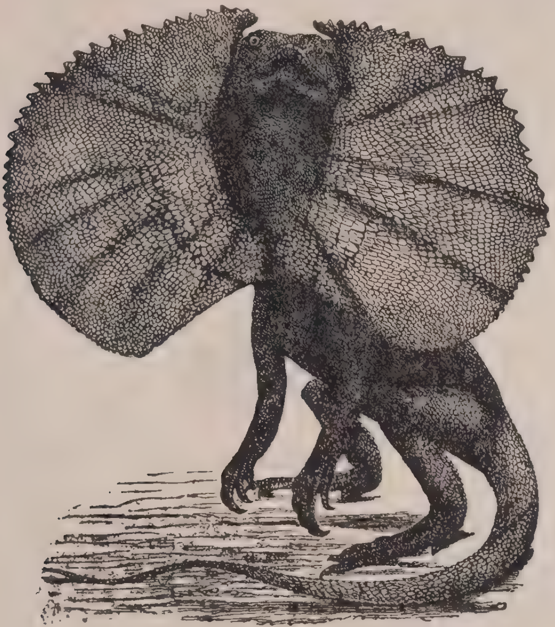

FIG. 1.—Frilled Lizard (*Chlamydosaurus kingi*).

The smallest lizards of this family belong to the genus *Anolis*, extremely numerous as regards species (more than 100) and individuals on bushes and trees of tropical America, and especially of the West Indies. They offer many points of analogy to the humming birds in their distribution, colours and even disposition. Hundreds may be seen on a bright day, disporting themselves on trees and fences, and entering houses. Like the iguanas, they (at least the males) are provided with a large, expansible dewlap at the throat, which is brilliantly coloured, and which they display on the slightest provocation. This appendage is merely a fold of the skin, ornamental and sexual; it has no cavity in its interior, and has no communication with the mouth or with the respiratory organs; it is supported by the posterior horns of the hyoid bone, and can be erected and spread at the will of the animal. The presence of such dewlaps in lizards is always a sign of an excitable temper. Many, *e.g. A. carolinensis*, the "chameleon," can change colour to an extraordinary degree. They are much fed upon by birds and snakes, and have a fragile tail, easily reproduced. They bring forth only one large egg at a time, but probably breed several times during the season.

Family 3. *Xenosauridae.*—Pleurodont; solid teeth; anterior part of tongue slightly emarginate and retractile, and covered with flat papillae; no osteoderms. Mexico.

The only representative of this family is *Xenosaurus grandis*, recorded from the mountains of Orizaba, Cordoba and Oaxaca. The four-footed creature is less than 1 ft. in length; the body is depressed, covered above with minute granules and tubercles; a distinct fold of skin extends from the axilla to the groin, reminding of the similar fold of some *Anguidae*, to which this singular genus seems to be allied.

Family 4. *Anguidae.*—Pleurodont; teeth solid, sometimes (*Ophiosaurus*) grooved; anterior part of tongue emarginate and retractile into the posterior portion; osteoderms on the body, and especially on the head where they are roofing over the temporal fossa; entirely zoophagous and ovo-viviparous. America, Europe and India.

Gerrhonotus, 8 species, in mountainous countries, from British Columbia to Costa Rica; like *Diploglossus s. Celestus* of Mexico, the Antilles and Central America, with well-developed limbs, but with a lateral fold. *Anguis fragilis* and two species of *Ophiosaurus* are the only members of this family which are not American, and even the third species of *Ophiosaurus*, *O. ventralis*, lives in the United States. *Ophiosaurus s. Pseudopus*, the glass-snake, from Morocco and the Balkan peninsula to Burma and Fokien; also in the U.S.A., with the limbs reduced to a pair of tiny spikes near the vent, and a lateral fold along the snake-like body. *Anguis*, with its sole species *fragilis*, the slow-worm or blind-worm, is devoid of a lateral fold, and the limbs are entirely absent. Europe, Algeria and western Asia.

Family 5. *Helodermatidae*, with *Heloderma* of Arizona and Mexico, and *Lanthanotus* of Borneo.—The teeth of *Heloderma* are recurved, with slightly swollen bases, loosely attached to the inner edge of the jaws; each tooth is grooved, and those of the lower jaw are in close vicinity of the series of labial glands which secrete a poison; the only instance among lizards.[1] Limbs well developed. Tongue resembling that of the *Anguidae*. The skin of the upper surface is granular, with many irregular bony tubercles which give it an ugly warty look. *H. horridum* in Mexico, and *H. suspectum*, the gila monster, in the hot and sandy lowlands of the Gila basin. The animal, which reaches a length of more than 2 ft., is blackish-brown and yellow or orange, and on the thick tail these "warning colours" are arranged in alternate rings. Small animals are probably paralyzed or killed by the bite, the poison being effective enough to produce severe symptoms even in man. The Zapotecs, who call the creature Talachini, and other tribes of Mexico have endowed it with fabulous properties and fear it more than the most poisonous snakes. *Lanthanotus corneensis*, of which only a few specimens are known, is apparently closely allied to *Heloderma*, although the teeth are not grooved, osteoderms are absent and probably also the poison glands.

Family 6. *Aniellidae.*—One genus, *Aniella*, with a few worm- or snake-shaped species in California, which seem to be degraded forms of *Anguidae*. The eyes and ears are concealed, the limbs are entirely absent, body and tail covered with soft, imbricating scales. The tongue is villose, smooth, bifid anteriorly. The few teeth are recurved, with swollen bases. The skull is much reduced. Total length of *A. pulchra* up to 8 in.

Family 7. *Zonuridae.*—Pleurodont; tongue short, villose, scarcely protractile, feebly nicked at the tip. With osteoderms at least upon the skull, where they roof in the temporal region. Africa and Madagascar.

Only 4 genera, with about 15 species. *Zonurus* of South Africa and Madagascar has the whole head, neck, back and tail covered with strong bony scales, the horny covering of which forms sharp spikes, especially on the tail. They defend themselves by jerking head and tail sidewards. *Z. giganteus* reaches 15 in. in length, and is, like the other members of the family, zoophagous. The other genera live in southern and in tropical Africa: *Pseudocordylus*, *Platysaurus* and *Chamaesaura*; the latter closely approaches the *Anguidae* by its snake-shaped body, very long tail and much reduced limbs, which in *C. macrolepis* are altogether absent.

Family 8. *Xantusiidae.*—Pleurodont; tongue very short and scaly; no osteoderms; supratemporal fossa roofed over by the cranial bones; eyes devoid of movable lids; tympanum exposed; femoral pores present; limbs and tail well developed. American.

Xantusia (so named after Xantus, a Hungarian collector), *e.g. X. vigilis* and a few other species from the desert tracts of Nevada and California to Lower California. *Lepidophyma flavomaculatum*, Central America; and *Cricosaura typica* in Cuba.

Family 9. *Tejidae.*—Teeth solid, almost acrodont; tongue long and narrow, deeply bifid, beset with papillae; no osteoderms; scales of the back very small or quite granular; limbs sometimes reduced. America.

This large, typically American family comprises more than 100 species which have been arranged in many genera. Some are entirely arboreal, dwellers in forests, while others, like *Cnemidophorus* and *Ameiva*, are strictly terrestrial, with great running powers; a few dwell below the surface and are transformed into almost limbless worm-shaped creatures. The family is essentially neotropical. Of its several dozen genera only two extend through and beyond Central America: *Ameiva* into the eastern and western Hot-lands of Mexico, *Cnemidophorus* (monographed by H. Gadow, *Proc. Zool. Soc.*, 1906, pp. 277-375) through Mexico into the United States, where *C. sexlineatus*, the "swift," has spread over most of the Union. *Tupinambis teguixin*, the "teju" of South America and the West Indies, is the largest member of the family; it reaches a length of a yard, most of which, however, belongs to the strong, whip-like tail. *Teguixin* is taken from the Aztec *teco-ixin*, *i.e.* rock-lizard, the vernacular name of *Sceloporus torquatus* which is one of the *Iguanidae* misspelt and misapplied. The tejus frequent forests and plantations and are carnivorous, eating anything they can overpower. They in turn are much hunted for the sake of their delicate flesh. They defend themselves not only with their powerful jaws and sharp claws, but also with lashing strokes of the long tail. They also use this whip for killing snakes which they are said to eat. Their long-oval, hard-shelled eggs are deposited in the ground. They retire into self-dug burrows. *Cophias* and *Scolecosaurus* have very much reduced limbs. In the genus *Tejus* the teeth of the adult become molar-like; and in *Dracaena* they are transformed into large, oval crushers, indicating strictly herbivorous habits, while most members of the family live upon animal food.

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[1] For anatomical detail and experiments, see R. W. Shufeldt, *P.Z.S.* (1890), p. 178; G. A. Boulenger, *ibid.* (1891), p. 109, and C. Stewart, *ibid.* (1891), p. 119.

Family 10. *Amphisbaenidae.*—The body is covered with soft skin, forming numerous rings with mere vestiges of scales. Worm-shaped, without limbs, except *Chirotes* which has short, clawed fore-limbs. Eyes and ears concealed. Tongue slightly elongated, covered with scale-like papillae and bifurcating. Tail extremely short. Acrodont or pleurodont. America, Mediterranean countries, and Africa with the exception of Madagascar.

Chirotes canaliculatus, and two other species; Pacific side of Mexico and Lower California. With five, four or three claws on the stout little digging fore-limbs. These pink, worm-like creatures live in sandy, moist localities, burrowing little tunnels and never appearing on the surface. *Amphisbaena* (*q.v.*). *Rhineura* of Florida, and also known from the Oligocene of South Dakota; *Lepidosternum* of South America; and *Anops* in America and Africa; *Blanus cinereus*, Mediterranean countries. *Trogonophis*, *Pachycalamus* and *Agamodon* of Africa are all acrodont; the other genera are pleurodont. In all about a dozen genera, with some 60, mostly tropical species.

Family 11. *Scincidae.*—Pleurodont Tongue scaly, feebly nicked in front. Osteoderms on the head and body. Limbs often reduced. Cosmopolitan. The temporal region is covered over, as in the *Lacertidae* and *Anguidae*, with strongly developed dermal ossifications. Similar osteoderms underlie the scales of the body and tail. Femoral pores are absent.

All the skinks seem to be viviparous, and they prefer dry, sandy ground, in which they burrow and move quickly about in search of their animal food. This partly subterranean life is correlated with the frequent reduction of the limbs which, in closely allied forms, show every stage from fully developed, five-clawed limbs to complete absence. Some have functional fore-limbs but mere vestiges of hind-limbs; in others this condition is reversed. In some deserticolous kinds e.g. *Ablepharus*, the lower eyelid is transformed into a transparent cover which is fused with the rim of the reduced upper lid. The same applies to the limbless little *Ophiopsiseps nasutus* of Australia. This large family contains about 400 species, with numerous genera; the greatest diversity in numbers and forms occurs in the tropical parts of the Old World, especially in the Australian region, inclusive of many of the Pacific islands. New Zealand has at least 6 species of *Lygosoma*. America, notably South America, has comparatively very few skinks.

The skink, which has given the name to the whole family, is a small lizard (*Scincus officinalis*) of 6 or 8 in. in length, common in arid districts of North Africa and Syria. A peculiarly wedge-shaped snout, and toes provided with strong fringes, enable this animal to burrow rapidly in and under the sand of the desert. In former times large quantities of it were imported in a dry state into Europe for officinal purposes, the drug having the reputation of being efficacious in diseases of the skin and lungs; and even now it may be found in apothecaries' shops in the south of Europe, country people regarding it as a powerful aphrodisiac for cattle.

Mabouia, with many species, in the whole of Africa, southern Asia and in tropical America. *M.* (*Euprepes*) *vittata*, the "poisson de sable" of Algeria, is semi-aquatic. *Chalcides s. Seps*, of the Mediterranean countries and south-western Asia, has a transparent disk on the lower eyelid which is movable; limbs very short or reduced to mere vestiges. *Lygosoma* circumtropical; *Eumeces*, also with many small species, in America, Africa and Asia. *Cyclodus s. Tiliqua* of Australia, Tasmania and Malay Islands, has stout lateral teeth with rounded-off crowns; *C. gigas* of the Moluccas and of New Guinea is the largest member of the family, reaching a length of nearly 2 ft.; the limbs are well developed, as in *Trachysaurus rugosus* of Australia, which is easily recognized by the large and rough scales and the short, broad, stump-like tail.

Family 12. *Anelytropidae.*—An artificial assembly of a few degraded Scincoids. The worm-shaped body is devoid of osteoderms. The tongue is short, covered with imbricating papillae and slightly nicked anteriorly. Teeth pleurodont. *Anelytropsis papillosus*, of which only three specimens are known, from the humus of forests in the state of Vera Cruz. Eyes concealed. *Typhlosaurus* and *Feylinia* in tropical Africa and Madagascar.

Family 13. *Dibamidae.*—*Dibamus novae-Guineae* of New Guinea, the Moluccas, Celebes and the Nicobar Islands. Tongue arrow-shaped, covered with curved papillae. The vermiform body is covered with cycloid imbricating scales, devoid of osteoderms. Limbs and even their arches are absent, excepting a pair of flaps which represent the hind-limbs in the males.

Family 14. *Gerrhosauridae.*—Pleurodont. Tongue long, with papillae, like that of the *Lacertidae* but only feebly nicked anteriorly. Osteoderms on the head and body, roofing over the temporal region. Femoral pores present, also mostly a lateral fold. Limbs sometimes reduced to small stumps. Tail long and brittle. The few genera and species of this family are restricted to Africa, south of the Sahara and Madagascar.

Gerrhosaurus, with lateral fold and complete limbs; *Tetradactylus* also with a fold, but with very variable limbs; *Condylosaurus*; all in Africa. *Zonosaurus* and *Tracheloptychus* in Madagascar.

Family 15. *Lacertidae.*—Pleurodont. Tongue long and bifid, with papillae or folds, with osteoderms on the head but not on the body. Limbs always well developed. Palaearctic and palaeotropical with the exception of Madagascar; not in the Australian region.

The *Lacertidae* or true lizards comprise about 20 genera, with some 100 species, most abundant in Africa; their northern limit coincides fairly with that of the permanently frozen subsoil. They all are terrestrial and zoophagous. The long, pointed tail is brittle.

Most of the European lizards with four well developed limbs belong to the genus *Lacerta*. Only three species occur in Great Britain (see fig. 2). The common lizard (*Lacerta vivipara*) frequents heaths and banks in England and Scotland, and is locally met with also in Ireland; it is viviparous. Much scarcer is the second species, the sand-lizard (*Lacerta agilis*), which is confined to some localities in the south of England, the New Forest and its vicinity; it does not appear to attain on English soil the same size as on the continent of Europe where it abounds, growing sometimes to a length of 9 in. Singularly, a snake (*Coronella laevis*), also common on the continent, and feeding principally on this lizard, has followed it across the British Channel, apparently existing in those localities only in which the sand-lizard has settled. This lizard is oviparous. The males differ by their brighter green ground colour from the females, which are brown, spotted with black. The third British species, the green lizard (*Lacerta viridis*), does not occur in England proper; it has found a congenial home in the island of Guernsey, but is there much less developed as regards size and beauty than on the continent. This species is larger than the two preceding; it is green, with minute blackish spots. In Germany and France one other species only (*Lacerta muralis*) appears; but in the south of Europe the species of *Lacerta* are much more numerous, the largest and finest, being *L. ocellata*, which grows to a length of 18 or 20 in., and is brilliantly green, ornamented with blue eye-like spots on the sides. Even the small island-rocks of the Mediterranean, sometimes only a few hundred yards in diameter, are occupied by peculiar races of lizards, which have attracted much attention from the fact that they have assumed under such isolated conditions a more or less dark, almost black, coloration. *L. muralis*, with its numerous varieties, has been monographed by G. A. Boulenger, *Trans. Zool. Soc.* xvii. (1905), pp. 351-422, pl. 22-29.

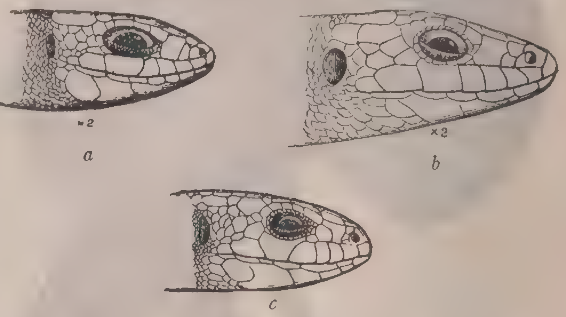


Fig. 2.—Heads of British Lizards. *a*, *Lacerta vivipara*; *b*, *L. agilis*; *c*, *L. viridis*.

Other genera are *Psammodromus* and *Acanthodactylus* in south-western Europe and northern Africa. *Cabrita* in India, with transparent lower eyelids. *Ophiops*, likewise with transparent but united lids, from North Africa to India.

Family 16. *Varanidae.*—Pleurodont. Tongue very long, smooth and bifid. Osteoderms absent. Limbs always well developed. Old World.

This family contains only one genus, *Varanus*, with nearly 30 species, in Africa, Arabia and southern Asia, and Australia, but not in Madagascar. The generic term is derived from the Arabic *Ouaran*, which means lizard. Owing to a ridiculous muddle, this Arabic word has been taken to mean "warning" lizard, hence the Latin *Monitor*, one of the many synonyms of this genus, now often used as the vernacular. Many of the "monitors" are semi-aquatic; *e.g. V. niloticus*, and these have a laterally compressed tail; others inhabit dry sandy districts, *e.g. V. scincus*, the *ouaran el ard* of North Africa; others prefer wooded localities. *V. salvator* is the largest species, reaching a length of 7 ft.; it ranges from Nepal and southern China to Cape York; a smaller species, common in New Guinea and Australia, is *V. gouldi*. They all are predaceous, powerful creatures, with a partiality for eggs. Their own eggs are laid in hollow trees, or buried in the sand. The young are prettily spotted with white and black ocelli, but the coloration of the adult is mostly very plain.

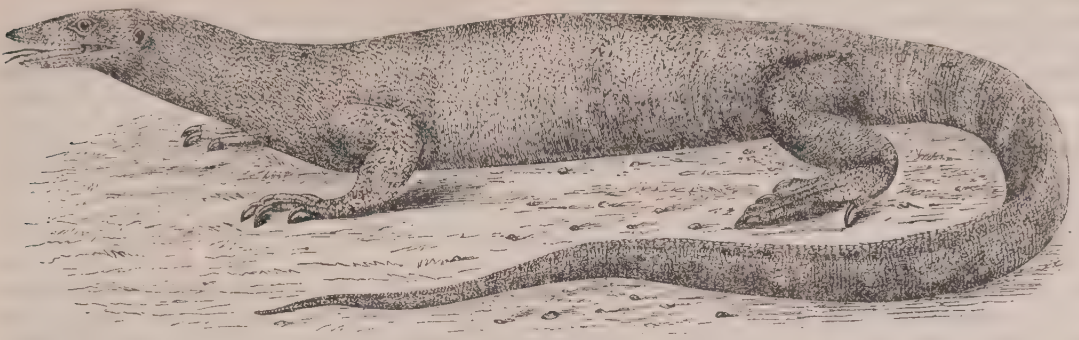


FIG. 3.—Monitor of the Nile (*Varanus niloticus*).

The following families are much degraded in conformity with their, in most cases, subterranean life. They are of doubtful relationships and contain each but a few species.

Family 17. *Pygopodidae.*—Pleurodont, snake-shaped, covered with roundish, imbricating scales. Tail long and brittle. Fore-limbs absent; hind-limbs transformed into a pair of scale-covered flaps. Tongue slightly forked. Eyes functional but devoid of movable lids. Australia, Tasmania and New Guinea.

Pygopus, e.g. P. lepidopus, about 2 ft. long, two-thirds belonging to the tail, distributed over the whole of Australia.

Lialis burtoni, of similar size and distribution, has the hind-limbs reduced to very small, narrow appendages. The members of this family seem to lead a snake-like life, not subterranean, and some are said to eat other lizards. *L. jicari*, from the Fly river, has a very snake-like appearance, with a long, pointed snout like certain tree-snakes, but with an easily visible ear-opening; their eyelids are reduced to a ring which is composed of two or three rows of small scales. (H. F. G.)

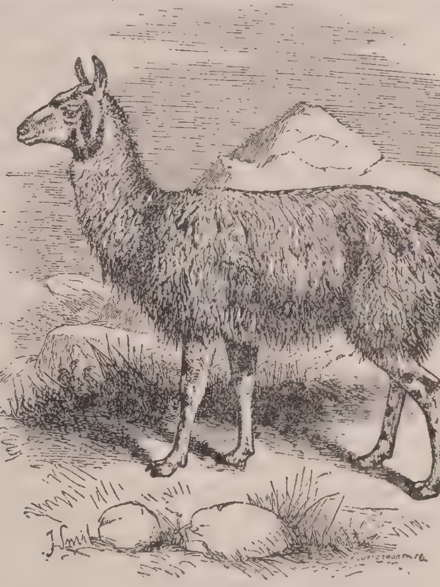
LIZARD POINT, or THE LIZARD, the southernmost point of Great Britain, in Cornwall, England, in 49° 57′ 30″ N., 5° 12′ W. It is generally the first British land sighted by ships bound up the English Channel, and there are two lighthouses on it. The cliff scenery is magnificent, and attracts many visitors. The coast is fretted into several small bays, such as Housel and, most famous of all, Kynance Cove; caves pierce the cliffs at many points, and bold isolated rocks fringe the shore. The coloured veining of the serpentine rock is a remarkable feature. The Lion's Den is a chasm formed by the falling in of a sea-cave in 1847; the Stags is a dangerous reef stretching southward from the point, and at Asparagus Island, Kynance Cove, is a natural funnel in which the air is compressed by the waves and causes a violent ejection of foam. The principal village is Lizard Town, 10½ m. from Helston, the nearest railway station.

LJUNGGREN, GUSTAF HÅKAN JORDAN (1823–1905), Swedish man of letters, was born at Lund on the 6th of March 1823. He was educated at Lund university, where he was professor of German (1850–1859), of aesthetics (1859–1889) and rector (1875–1885). He had been a member of the Swedish Academy for twenty years at the time of his death in September 1905. His most important work, *Svenska vitterhetens häfder efter Gustav III.'s död* (5 vols., Lund., 1873–1895), is a comprehensive study of Swedish literature in the 19th century. His other works include: *Framställning af de förnämste estetiska systemerna* (an exposition of the principal system of aesthetics; 2 vols., 1856–1860); *Svenska dramat intill slutet af 17 århundradet* (a history of the Swedish drama down to the end of the 17th century, Lund, 1864); an edition (1864) of the *Epistlar* of Bellman and Fredman, and a history of the Swedish Academy in the year of its centenary (1886).

His scattered writings were collected as *Smärre Skrifter* (3 vols., 1872–1881).

LLAMA, the Spanish modification of the Peruvian name of the larger of the two domesticated members of the camel-tribe indigenous to South America. The llama (*Lama huanacus glama*) is a domesticated derivative of the wild guanaco, which has been bred as a beast of burden. Chiefly found in southern Peru, it generally attains a larger size than the guanaco, and is usually white or spotted with brown or black, and sometimes altogether black. The following account by Augustin de Zarate was given in 1544:

"In places where there is no snow, the natives want water, and to supply this they fill the skins of sheep with water and make other living sheep carry them, for, it must be remarked, these sheep of Peru are large enough to serve as beasts of burden. They can carry about one hundred pounds or more, and the Spaniards used to ride them, and they would go four or five leagues a day. When they are weary they lie down upon the ground, and as there are no means of making them get up, either by beating or assisting them, the load must of necessity be taken off. When there is a man on one of them, if the beast is tired and urged to go on, he turns his head round, and discharges his saliva, which has an unpleasant odour, into the rider's face. These animals are of great use and profit to their masters, for their wool is very good and fine, particularly that of the species called pacas, which have very long fleeces; and the expense of their food is trifling, as a handful of maize suffices them, and they can go four or five days without water. Their flesh is as good as that of the fat sheep of Castile. There are now public shambles for the sale of their flesh in all parts of Peru, which was not the case when the Spaniards came first; for when one Indian had killed a sheep his neighbours came and took what they wanted, and then another Indian killed a sheep in his turn."



Llama.

The disagreeable habit of spitting is common to all the group.

In a wide sense the term "llama" is used to designate all the South American *Camelidae*. (See TYLOPODA.)

LLANBERIS, a town of Carnarvonshire, N. Wales, 8½ m. E. by S. of Carnarvon, by a branch of the London & North-Western railway. Pop. (1901) 3015. It is finely situated in a valley near the foot of Snowdon. The valley has two lakes, Llyn Peris and Llyn Padarn, of over 1 m. and 2 m. long respectively, about ¼ m. apart. From Padarn rises the Seint, called Rothell in its upper part. Dolbadarn Castle is a circular tower near the foot of Peris lake. Dolbadarn means the "Padarn meadow." Several Welsh churches are dedicated to Padarn. In the castle Owen Goch (Owen the Red) was imprisoned from 1254 to 1277, by the last Llewelyn, whose brother Dafydd held it for some time against Edward I. During the time of Owen Glendower (*temp.* Henry IV. and Henry V.), the castle often changed hands. Near is Ceunantmawr waterfall. The Vaenol slate quarries are here, and hence is the easiest ascent of Snowdon, with a railway to the summit. From the road over the fine Llanberis pass towards Capel Curig, a turn to the right leads to Beddgelert, through Nant Gwynnant ("white" or "happy valley," or "stream"), where Pembroke and Ieuan ap Robert (for the Lancastrians) had many skirmishes in the time of Edward IV. Gwynnant Lake is about 1 m. long by ¼ m. broad, and below it is the smaller Llyn Dinas.

LLANDAFF, a city of Glamorganshire, Wales, on the Taff Vale railway, 149 m. from London. Pop. (1901) 5777. It is almost entirely within the parliamentary borough of Cardiff. It is nobly situated on the heights which slope towards the southern bank of the Taff. Formerly the see of Llandaff was looked upon as the oldest in the kingdom; but its origin is obscure, although the first two bishops, St Dubricius and St Teilo, certainly flourished during the latter half of the 6th century. By the 12th century, when Urban was bishop, the see had acquired great wealth (as may be seen from the *Book of Llandaff*, a collection of its records and land-grants compiled probably by Geoffrey of Monmouth), but after the reign of Henry VIII. Llandaff, largely through the alienations of its bishops and the depredations of the canons, became impoverished, and its cathedral was left for more than a century to decay. In the 18th century a new church, in debased Italian style, was planted amid the ruins. This was demolished and replaced (1844–1869) by the present restored cathedral, due chiefly to the energy of Dean Williams. The oldest remaining portion is the chancel arch, belonging to the Norman cathedral built by Bishop Urban and opened in 1120. Jasper Tudor, uncle of Henry VII., was the architect of the north-west tower, portions of which remain. The cathedral is also the parish church. The palace or castle built by Urban was destroyed, according to tradition, by Owen Glendower in 1404, and only a gateway with flanking towers and some fragments of wall remain. After this, Mathern near Chepstow became the episcopal residence until about 1690, when it fell into decay, leaving the diocese without a residence until Llandaff Court was acquired during Bishop Ollivant's tenure of the see 1849–1882). For over 120 years the bishops had been non-resident. The ancient stone cross on the green (restored in 1897) is said to mark the spot on which Archbishop Baldwin, and his chaplain Giraldus Cambrensis, preached the Crusade in 1187. Money bequeathed by Thomas Howell, a merchant, who died in Spain in 1540, maintains an intermediate school for girls, managed by the Drapers' Company, Howell's trustees. There is an Anglican theological college, removed to Llandaff from Aberdare in 1907. The city is almost joined to Cardiff, owing to the expansion of that town.

Llandaff Court, already mentioned, was the ancient mansion of the Mathew family, from which Henry Matthews, 1st Viscount Llandaff (b. 1826), was descended. Another branch of this family formerly held the earldom of Llandaff in the Irish peerage. Henry Matthews, a barrister and Conservative M.P., whose father was a judge in Ceylon, was home secretary 1886–1892, and was created viscount in 1895.

LLANDEILO GROUP, in geology, the middle subdivision of the British Ordovician rocks. It was first described and named by Sir R. I. Murchison from the neighbourhood of Llandeilo in Carmarthenshire. In the type area it consists of a series of slaty rocks, shales, calcareous flagstones and sandstones; the calcareous middle portion is sometimes termed the "Llandeilo limestone"; and in the upper portion volcanic rocks are intercalated. A remarkable feature in the history of the Llandeilo rocks in Britain, more especially in North Wales and Cumberland, was the outbreak of volcanic action; vast piles of Llandeilo lava and ashes form such hills as Cader Idris, and the Arenigs in Wales, and Helvellyn and Scafell in Westmorland and Cumberland. The series is also found at Builth and in Pembrokeshire. The average thickness in Wales is about 2000 ft. The group is usually divided in this area into three sub-divisions. In the Corndon district of Shropshire the *Middleton Series* represents the Llandeilo group; it includes, in descending order, the Rorrington black shales, the *Meadowtown limestones* and flags, and the western grits and shales. In the Lake District the great *volcanic series of Borrowdale*, green slates and porphyries, 8000 to 9000 ft. in thickness, lies on this horizon; and in the Cross Fell area the *Milburn beds* of the Skiddaw slates (see ARENIG) appear to be of the same age. In Scotland the Llandeilo group is represented by the *Glenkiln shales*, black shales and yellowish mudstones with radiolarian cherts and volcanic tuffs; by the *Barr Series*, including the Benan conglomerates, Stinchar limestone and Kirkland sandstones; and by the Glenapp conglomerates and Tappins mudstones and grits south of Stinchar. Graptolitic shales, similar to those of southern Scotland, are traceable into the north-east of Ireland.

The fossils of the Llandeilo group include numerous graptolites, *Coenograptus gracilis* being taken as the zonal fossil of the upper portion, *Didymograptus Murchisoni* of the lower. Other forms are *Climacograptus Scharenbergi* and *Diplograptus foliaceus*. Many trilobites are found in these rocks, *e.g. Ogygia Buchi*, *Asaphus tyrannus*, *Calymene cambrensis*, *Cheirurus Sedgwickii*. Among the brachiopods are *Crania*, *Leptaena*, *Lingula*, *Strophomena*; *Cardiola* and *Modiolopsis* occur among the Pelecypods; *Euomphalus*, *Bellerophon*, *Murchisonia* among the Gasteropods; *Conularia* and *Hyolithes* among the Pteropods; the Cephalopods are represented by *Orthoceras* and *Cyrtoceras*. The green roofing slates and plumbago (graphite) of the Lake District are obtained from this group of rocks. (see ORDOVICIAN).

LLANDILO, or LLANDEILO FAWR, a market town and urban district of Carmarthenshire, Wales, picturesquely situated above the right bank of the river Towy. Pop. (1901) 1721. Llandilo is a station on the Mid-Wales section of the London & North-Western railway, and a terminus of the Llandilo-Llanelly branch line of the Great Western. The large parish church of St Teilo has a low embattled Perpendicular tower. Adjoining the town is the beautiful park of Lord Dynevor, which contains the ruined keep of Dinefawr Castle and the residence of the Rices (Lords Dynevor), erected early in the 17th century but modernized in 1858. Some of the loveliest scenery of South Wales lies within reach of Llandilo, which stands nearly in the centre of the Vale of Towy.

The name of Llandilo implies the town's early foundation by St Teilo, the great Celtic missionary of the 6th century, the friend of St David and reputed founder of the see of Llandaff. The historical interest of the place centres in its proximity to the castle of Dinefawr, now commonly called Dynevor, which was originally erected by Rhodri Mawr or his son Cadell about the year 876 on the steep wooded slopes overhanging the Towy. From Prince Cadell's days to the death of the Lord Rhys, last reigning prince of South Wales, in 1196, Dinefawr continued to be the recognized abode of South Welsh royalty. The castle ruins remain in the possession of the Rices, Lords Dynevor, heirs and descendants of Prince Cadell. At one period residence and park became known as New-town, a name now obsolete. Some personal relics of the celebrated Sir Rhys ap Thomas, K.G. (1451–1527), are preserved in the modern house. Dinefawr Castle and its estates were granted away by Henry VIII. on the execution for high treason of Sir Rhys's grandson, Rhys ap Griffith, but were restored to the family under Queen Mary.

LLANDOVERY (*Llan-ym-ddyffri*), a market town and ancient municipal borough of Carmarthenshire, Wales, situated amid hills near the left bank of the Towy. Pop. (1901) 1809. Llandovery is a station on the Mid-Wales section of the London & North Western railway. The old-fashioned town lies in the parish of Llandingat, and contains the two churches of Llandingat and Llanfair-ar-y-bryn. The slight remains of the castle stand on a hillock above the river Brân. The public school was founded here by Sir Thomas Phillips in 1847.

The place probably owes its Celtic name of Llan-ym-ddyffri (the church amid the waters) to the proximity of Llandingat church to the streams of the Towy, Brân and Gwydderig. On account of its commanding position at the head of the fertile vale of Towy, Llandovery was a strategic site of some importance in the middle ages. The castle erected here by the Normans early in the 12th century frequently changed owners during the course of the Anglo-Welsh wars before 1282. In 1485 the borough of Llandovery, or Llanymtheverye, was incorporated by a charter from Richard III., and this king's privileges were subsequently confirmed by Henry VIII. in 1521, and by Elizabeth in 1590, the Tudor queen's original charter being still extant and in the possession of the corporation, which is officially styled "the bailiff and burgesses of the borough of Llanymtheverye, otherwise Llandovery." The bailiff likewise holds the office of recorder, but has neither duties nor emoluments. In the 17th century the vicarage of Llandingat was held by the celebrated Welsh poet and preacher, Rhys Prichard, commonly called "the vicar of Llandovery" (d. 1644). In the middle of the 19th century William Rees of Tonn published at Llandovery many important works dealing with early Welsh history and archaeology.

LLANDOVERY GROUP, in geology, the lowest division of the Silurian (Upper Silurian)in Britain. C. Lapworth in 1879 proposed the name *Valentian* (from the ancient north British province of Valentia) for this group. It includes in the type area the Tarannon Shales 1000-1500 ft., Upper Llandovery and May Hill Sandstone 800 ft., Lower Llandovery, 600-1500 ft.

The *Lower Llandovery* rocks consist of conglomerates, sandstones and slaty beds. At Llandovery they rest unconformably upon Ordovician rocks (Bala), but in many other places no unconformity is traceable. These rocks occur with a narrow crop in Pembrokeshire, which curves round through Llandovery, and in the Rhyader district they attain a considerable thickness. Northwards they thin out towards Bala Lake. They occur also in Cardiganshire and Carmarthenshire in many places where they have not been clearly separated from the associated Ordovician rocks.

There is a change in the fauna on leaving the Ordovician and entering the Llandovery. Among the graptolites the Diplograptidae begin to be replaced by the Monograptidae. Characteristic graptolite zones, in descending order, are:—*Monograptus gregarius, Diplograptusvesiculosus, D. acuminatus.* Common trilobites are:—*Acidaspis, Encrinurus, Phacops, Proëtus*; among the brachiopods are *Orthis elegantula, O. testudinaria, Meristella crassa* and *Pentamerus* (*Stricklandinia*) *lens* (*Pentamerus* is so characteristic that the Llandovery rocks are frequently described as the "Pentamerus beds").

The *Upper Llandovery*, including the May Hill Sandstone of May Hill, Gloucestershire, is an arenaceous series generally conglomeratic at the base, with local lenticular developments of shelly limestone (Norbury, Hollies and Pentamerus limestones). It occurs with a narrow outcrop in Carmarthenshire at the base of the Silurian, disappearing beneath the Old Red Sandstone westward to reappear in Pembrokeshire; north-eastward the outcrop extends to the Longmynd, which the conglomerate wraps round. As it is followed along the crop it is found to rest unconformably upon the Lower Llandovery, Caradoc, Llandeilo, Cambrian and pre-Cambrian rocks. The fossils include the trilobites *Phacops caudata, Encrinurus punctatus, Calymene Blumenbachii*; the brachiopods *Pentamerus oblongus, Orthis calligramma, Atrypa reticularis*; the corals *Favosites, Lindostroemia*, &c.; and the zonal graptolites *Rastrites maximus* and *Monograptus spinigerus* and others (*Monograptus Sedgwicki, M. Clingani, M. proteus, Diplograptus Hughesii*).

The *Tarannon shales*, grey and blue slates, designated by A. Sedgwick the "paste rock," is traceable from Conway into Carmarthenshire; in Cardiganshire, besides the slaty facies, gritty beds make their appearance; and in the neighbourhood of Builth soft dark shales. The group is poor in fossils with the exception of graptolites; of these *Cyrtograptus grayae* and *Monograptus exiguus* are zonal forms. The Tarannon group is represented by the Rhyader Pale Shales in Radnorshire; by the Browgill beds, with *Monograptus crispus* and *M. turriculatus*, in the Lake district; in the Moffat Silurian belt in south Scotland by a thick development, including the Hawick rocks and Ardwell beds, and the Queensberry group or Gala (Grieston shales, Buckholm grits and Abbotsford flags); in the Girvan area, by the Drumyork flags, Bargany group and Penkill group; and in Ireland by the Treveshilly shales of Strangford Lough, and the shales of Salterstown, Co. Louth.

The Upper and Lower Llandovery rocks are represented in descending order by the Pale shales, Graptolite shales, Grey slates and Corwen grit of Merionethshire and Denbighshire. In the Rhyader district the Caban group (Gafalt beds, shales and grits and Caban conglomerate), and the Gwastaden group (Gigrin mudstones, Ddol shales, Dyffryn flags, Cerig Gwynion grits) lie on this horizon; at Builth also there is a series of grits and shales. In the Lake district the lower part of the Stockdale shales (Skelgill beds) is of Llandovery age. In south Scotland in the central and southern belt of Silurian rocks, which extends across the country from Luce Bay to St Abb's Head, the Birkhill shales, a highly crumpled series of graptolitic beds, represent the Llandovery horizon. In the Girvan area to the north their place is taken by the Camregan, Shaugh Hill and Mullock Hill groups. In Ireland the Llandovery rocks are represented by the Anascaul slates of the Dingle promontory, by the Owenduff and Gowlaun grits, Co. Galway, by the Upper Pomeroy beds, by the Uggool and Ballaghaderin beds, Co. Mayo, and by rocks of this age in Coalpit Bay and Slieve Felim Mountains.

Economic deposits in Llandovery rocks include slate pencils (Teesdale), building stone, flag-stone, road metal and lime. Lead ore occurs in Wales. (See Silurian.) (J. A. H.)

LLANDRINDOD, or Llandrindod Wells, a market town, urban district and health-resort of Radnorshire, Wales, situated in a lofty and exposed district near the river Ithon, a tributary of the Wye. Pop. (1901) 1827. Llandrindod is a station on the Mid-Wales section of the London & North-Western railway. The town annually receives thousands of visitors, and lies within easy reach of the beautiful Wye Valley and the wild district of Radnor Forest. The saline, sulphur and chalybeate springs of Llandrindod have long been famous. According to a treatise published by a German physician, Dr Wessel Linden, in 1754, the saline springs at Ffynon-llwyn-y-gog ("the well in the cuckoos' grove") in the present parish of Llandrindod had acquired more than a local reputation as early as the year 1696. In the 18th century both saline and sulphur springs were largely patronized by numbers of visitors, and about 1749 a Mr Grosvenor built a hydropathic establishment near the old church, on a site now covered by a farm-house known as Llandrindod Hall.

LLANDUDNO, a seaside resort in the Arfon parliamentary division of Carnarvonshire, North Wales, in a detached portion of the county east of the Conwy, on a strip of sandy soil terminating in the massive limestone of Great Orme's Head. Pop. of urban district (1901) 9279. The town is reached by the London & North-Western railway, and lies 227 m. N.W. of London. A village in 1850, Llandudno is to-day one of the most flourishing watering-places in North Wales. Sheltered by the Great Orme on the N.W. and by the Little Orme on the E., it faces a wide bay of the Irish Sea, and is backed by low sandhills. A Marine Drive encircles the Great Orme. The Little Orme has caverns and abounds in sea birds and rare plants. Close to the town are the Gloddaeth woods, open to visitors. On the Great Orme are old circular buildings, an ancient fortress, a "rocking-stone" (*crŷd Tudno*) and the 7th-century church of St Tudno, restored in 1885. Druidical and other British antiquities are numerous in the district. At Deganwy, or Diganwy, 2 m. from Llandudno, is a castle, Dinas Gonwy (Conwy fort), known to English historians as Gannoc, dating from the 11th or (according to the Welsh) earlier than the 9th century.

LLANELLY, a market town, urban district, and seaport of Carmarthenshire, Wales, situated on the north shore of the broad estuary of the river Loughor (Llwchwr), known as Burry river, which forms an inlet of Carmarthen Bay. Pop. (1901) 25,617. Llanelly is a station on the South Wales section of the Great Western railway. The town is wholly of modern appearance. The mother-church of St Elliw, or Elli (whence the town derives its name) has been practically rebuilt (1906), but it retains its 13th-century tower and other ancient features of the original fabric. Its situation on a broad estuary and its central position with regard to a neighbourhood rich in coal, iron and limestone, have combined to make Llanelly one of the many important industrial towns of South Wales. Anthracite and steam-coal from the collieries of the coast and along the Loughor Valley are exported from the extensive docks; and there are also large works for the smelting of copper and the manufacture of tin plates.

Llanelly, though an ancient parish and a borough by prescription under a portreeve and burgesses in the old lordship of Kidwelly, remained insignificant until the industrial development in South Wales during the 19th century. In 1810 the combined population of Llanelly, with its four subsidiary hamlets of Berwick, Glyn, Hencoed and Westowe, only amounted to 2972; in 1840 the inhabitants of the borough hamlet alone had risen to 4173. Llanelly is now the most populous town in Wales outside the confines of Glamorganshire. In 1832 Llanelly was added as a contributory borough to the Carmarthen parliamentary district.

LLANES, a seaport of northern Spain, in the province of Oviedo, on the river Carrocedo and the Bay of Biscay. Pop. (1900) 18,684. The streets are mostly narrow and irregular, and contain some curious old houses. The principal buildings are a fine Gothic church and an old Augustinian monastery, which has been converted into a school and meteorological station. In summer the fine climate, scenery and sea-bathing attract many visitors. Llanes is a second-class port for light-draught vessels; but the entrance is narrow, and rather difficult in rough weather. The trade is chiefly in agricultural produce, timber, butter and fish.

LLANGOLLEN, a picturesque market-town and summer resort of Denbighshire, N. Wales, in the Dee (*Dyfrdwy*) valley, on a branch of the Great Western Railway, 9 m. S.W. of Wrexham, 202½ m. from London by rail. Pop. of urban district (1901) 3303. The Dee is here crossed by a 14th-century bridge of four arches, "one of the seven wonders of Wales," built by John Trevor, afterwards bishop of St Asaph (*Llanelwy*). The Anglican church of St Collen, Norman and Early English, has a monument in the churchyard to the "Ladies of Llangollen," Lady Eleanor Butler and Hon. Sarah Ponsonby, of Plas Newydd, (1778 to 1829 and 1831 respectively). The house is now a museum. Castell Dinas Brân (the castle of the town of Brân; the mountain stream below is also called Brân), the ruins of a fortress on a high conical hill about 1 m. from the town, is supposedly British, of unknown date. "An old ruynous thinge," as the Elizabethan poet Churchyard calls it even in the 16th century, it was inhabited, apparently, about 1390, by Myfanwy Fechan of the Tudor Trevor family and beloved by the bard Howel ab Einion Llygliw, whose ode to her is still extant. Valle Crucis Abbey (*Llan Egwest*) is a Cistercian ruin at the foot of Bronfawr hill, some 2 m. N.W. of Llangollen, founded about 1200 by Madoc ab Gruffydd Maelor, lord of Dinas Brân and grandson of Owen Gwynedd, prince of Wales. Llan Egwest, dissolved in 1535, was given by James I. to Lord Edward Wootton. In the meadow adjoining, still called Llwyn y Groes ("grove of the cross"), is "Eliseg's Pillar." Eliseg was father of Brochmael, prince of Powys, and his grandson, Concen or Congen, appears to have erected the pillar, which is now broken, with an illegible inscription; the modern inscription dates only from 1779. At Llangollen are linen and woollen manufactures, and near are collieries, lime and iron works. Brewing, malting and slate-quarrying are also carried on. Within the parish, an aqueduct carries the Ellesmere canal across the Dee.

LLANQUIHUE (pron. *lan-kè-wa*), a province of southern Chile bordering on the northern shores of the Gulf and Straits of Chacao, and extending from the Pacific to the Argentine frontier. The province of Valdivia lies N. and is separated from it in part by the Bueno river. Pop. (1895) 78,315. Area 45,515 sq. m. It is a region of forests, rivers and lakes, and the greater part is mountainous. The rainfall is excessive, the average at Puerto Montt being 104 in. a year, and the temperature is singularly uniform, the average for the summer being 58½°, of the winter 47½°, and of the year 53° F. There are several large lakes in the eastern part of the province—Puyehue, on the northern frontier, Rupanco, Llanquihue and Todos los Santos. Lake Llanquihue is the largest body of fresh water in Chile, having an extreme length from N. to S., or from Octai to Varas, of about 33 m., and extreme breadth of nearly the same. There is a regular steamship service on the lake between Octai and Varas, and its western shores are well settled. The volcanoes of Calbuco and Osorno rise from near its eastern shores, the latter to a height of 7382 ft. The outlet of the lake is through Maullin river, the lower course of which is navigable. The other large rivers of the province are the Bueno, which receives the waters of Lakes Puyehue and Rupanco, and the Puelo, which has its rise in a lake of the same name in the Argentine territory of Chubut. A short tortuous river of this vicinity, called the Petrohue, affords an outlet for the picturesque lake of Todos los Santos, and enters the Reloncavi Inlet near the Puelo. The southern coast of the province is indented by a number of inlets and bays affording good fishing, but the mouths of the rivers flowing into the Pacific are more or less obstructed by sand-bars. Apart from the lumber industry, which is the most important, the productions of Llanquihue include wheat, barley, potatoes and cattle. The white population is composed in great part of Germans, who have turned large areas of forest lands in the northern districts into productive wheat fields. The capital is Puerto Montt, on a nearly land-locked bay called the Reloncavi, designed to be the southern terminus of the longitudinal railway from Tacna, a distance of 2152 m. An important town in the northern part of the province is Osorno, on the Rahue river, which is chiefly inhabited by Germans. It exports wheat and other farm produce, leather, lumber and beer.

LLANTRISANT, a small town and a contributory parliamentary borough of Glamorganshire, Wales, picturesquely situated with a southern aspect, commanding a fine view of the vale of Glamorgan, in a pass on the mountain range which separates that vale from the valley of the Taff. The population of the parish in 1901 was 10,091 and of the contributory borough 2057. A branch of the Taff Vale railway running from Pontypridd to Cowbridge and Aberthaw has a station, Cross Inn, ½ m. below the town, while nearly 2 m. farther south it passes (near the village of Pontyclun) through Llantrisant station on the Great Western railway main line, which is 156¼ m. by rail from London and 11 m. N.W. from Cardiff. The castle, which according to G. T. Clark was "second only to Cardiff in military importance," dates from the reign of Henry III. or Edward I. Of the original building nothing remains, and of a later building only a tall and slender fragment. It was the head of the lordship of Miskin, a great part of which was in the hands of native owners, until the last of them, Howel ap Meredith, was expelled by Richard de Clare (1229–1262). Since then it has always been in the hands of the lord of Glamorgan. It was in the near neighbourhood of the town that Edward II. was captured in 1327. In 1426 the then lord of Glamorgan, Richard, 5th earl of Warwick, granted to the residents a charter confirming grants made by his predecessors in 1346, 1397 and 1424. The corporation was abolished in 1883, and its property (including 284 acres of common land) is administered by a town trust under a scheme of the charity commissioners. The "freemen" of the borough, however, still hold a court leet in the town-hall. The market formerly held here has been discontinued, but there are four annual fairs. The church was dedicated to three saints (Illtyd, Gwyno and Tyfodwg), whence the name Llantrisant. Originally a Norman building, most of the present fabric belongs to the 15th century. There are numerous chapels. Welsh is still the predominant language. Oliver Cromwell's forbears were natives of this parish, as also was Sir Leoline Jenkins, secretary of state under Charles II. There are tinplate works at Pontyclun and numerous collieries in the district.

LLANTWIT MAJOR (Welsh *Llan-Illtyd-Fawr*), a small market town in the southern parliamentary division of Glamorganshire, South Wales, about 1 m. from the Bristol Channel, with a station on the Barry railway, 5 m. S. of Cowbridge. Pop. (1901) 1113. About 1 m. N.N.W. of the town there were discovered in 1888 the remains of a large Roman villa within a square enclosure of about 8 acres, which has been identified as part of the site of a Roman settlement mentioned in Welsh writings as Caer Wrgan. The building seemed to have been the scene of a massacre, possibly the work of Irish pirates in the 5th century, as some forty-three human skeletons and the remains of three horses were found within its enclosure. Etymological reasoning have led some to suggest that the Roman station of Bovium was at Boverton, 1 m. E. of the town, but it is more likely to have been at Ewenny (2 m. S.E. of Bridgend) or perhaps at Cowbridge. On the sea coast are two camps, one known as Castle Ditches, commanding the entrance to the creek of Colhugh, once the port of Llantwit. In the time of Henry I. a small colony of Flemings settled in the district. The town and church derive their name from St Illtyd or Iltutus, styled the "knight," a native of Brittany and a great-nephew of Germanus of Auxerre. Having come under the influence of St Cadoc, abbot of Llancarvan, 6 m. E.N.E. of Llantwit, Illtyd established at the latter place, about A.D. 520, a monastic college which became famous as a seat of learning. He attracted a number of scholars to him, especially from Brittany, including Samson, archbishop of Dol, Maglorius (Samson's successor) and Paul de Leon, while his Welsh students included David, the patron saint of Wales, Gildas the historian, Paulinus and Teilo. The college continued to flourish for several centuries, sending forth a large number of missionaries until, early in the 12th century, its revenues were appropriated to the abbey of Tewkesbury by Fitzhamon, the first Norman lord of Glamorgan. A school seems, however, to have lingered on in the place until it lost all its emoluments in the reign of Henry VIII. The present church of St Illtyd is the result of a sequence of churches which have sprung from a pre-Norman edifice, almost entirely rebuilt and greatly extended in the 13th century and again partially rebuilt late in the 14th century. It consists of an "eastern" church which (according to Professor Freeman) belonged probably to the monks, and is the only part now used for worship, a western one used as a parochial church before the dissolution, but now disused, and still farther west of this a chantry with sacristan's house, now in ruins. The western church consists of the nave of a once cruciform building, while in continuation of it was built the eastern church, consisting of chancel, nave (of great height and width but very short), aisles and an embattled western tower built over the junction of the two naves. A partial restoration was made in 1888, and a careful and more complete one in 1900–1905. In the church and churchyard are preserved some early monumental remains of the British church, dating from the 9th century, and some possibly from an earlier date. They include two cross-shafts and one cross with inscriptions in debased Latin (one being to the memory of St Illtyd) and two cylindrical pillars, most of them being decorated with interlaced work. There are some good specimens of domestic architecture of the 17th century. The town is situated in a fertile district and the inhabitants depend almost entirely on agriculture. Its weekly market is mainly resorted to for its stock sales. St Donats castle, 2 m. to the west, was for nearly seven centuries the home of the Stradling family.

As to the Roman remains, see the *Athenaeum* for October 20 (1888), and the *Antiquary* for August (1892). As to the church, see the *Archaeologia Cambrensis*, 3rd ser. iv. 31 (an article by Professor Freeman), 5th ser., v. 409 and xvii. 129, and 6th ser., iii. 56; A. C. Fryer, *Llantwit-Major: a Fifth Century University* (1893).

(D. Ll. T.)

LLANWRTYD WELLS, an urban district of Breconshire, south Wales, with a station on the central Wales section of the London & North Western railway, 231 m. from London. It is situated in the midst of wild mountain scenery on the river Irfon, a right-bank tributary of the Wye. The place is chiefly noted for its sulphur and chalybeate springs, the former being the strongest of the kind in Wales. The medicinal properties of the sulphur water were discovered, or perhaps rediscovered, in 1732 by a famous Welsh writer, the Rev. Theophilus Evans, then vicar of Llangammarch (to which living Llanwrtyd was a chapelry till 1871). Saline water is obtained daily in the season from Builth Wells. The Irfon is celebrated as a trout-stream. Out of the civil parish, which has an area of 10,785 acres and had in 1001 a population of 854, there was formed in 1907 the urban district, comprising 1611 acres, and with an estimated population at the date of formation of 812. Welsh is the predominant language of the district.

Four miles lower down the Irfon valley, at the junction of the Cammarch and Irfon, and with a station on the London & North Western railway, is the village of Llangammarch, noted for its barium springs. The ancient parish of Llangammarch consists of the townships of Penbuallt and Treflis, the wells being in the former, which comprises 11,152 acres and had in 1901 a population of only 433. John Penry, the Puritan martyr, was born at Cefn-brith in this parish. Charles Wesley's wife, Sarah Gwynne, was of Garth, an old residence just outside the parish.

LLEWELYN, the name of two Welsh princes.

Llewelyn I., Ab Iorwerth (d. 1240), prince of North Wales, was born after the expulsion of his father, Iorwerth, from the principality. In 1194, while still a youth, Llewelyn recovered the paternal inheritance. In 1201 he was the greatest prince in Wales. At first he was a friend of King John, whose illegitimate daughter, Joanna, he took to wife (1201); but the alliance soon fell through, and in 1211 John reduced Llewelyn to submission. In the next year Llewelyn recovered all his losses in North Wales. In 1215 he took Shrewsbury. His rising had been encouraged by the pope, by France, and by the English barons. His rights were secured by special clauses in Magna Carta. But he never desisted from his wars with the Marchers of South Wales, and in the early years of Henry III. he was several times attacked by English armies. In 1239 he was struck with paralysis and retired from the active work of government in favour of his son David. He retired into a Cistercian monastery.

See the lists of English chronicles for the reigns of John and Henry III.; also the Welsh chronicle *Brut y Tywysogion* (ed. Rolls Series); O. M. Edwards, *History of Wales* (1901); T. F. Tout in the *Political History of England*, iii. (1905).

Llewelyn II., Ab Gruffydd (d. 1282), prince of North Wales, succeeded his uncle David in 1246, but was compelled by Henry III. to confine himself to Snowdon and Anglesey. In 1254 Henry granted Prince Edward the royal lands in Wales. The steady encroachment of royal officers on Llewelyn's land began immediately, and in 1256 Llewelyn declared war. The Barons' War engaged all the forces of England, and he was able to make himself lord of south and north Wales. Llewelyn also assisted the barons. By the treaty of Shrewsbury (1265) he was recognized as overlord of Wales; and in return Simon de Montfort was supplied with Welsh troops for his last campaign. Llewelyn refused to do homage to Edward I., who therefore attacked him in 1276. He was besieged in the Snowdon mountains till hunger made him surrender, and conclude the humiliating treaty of Conway (1277). He was released, but in 1282 he revolted again, and was killed in a skirmish with the Mortimers, near Builth in central Wales.

See C. Bémont, *Simon de Montfort* (Paris, 1884); T. F. Tout in the *Political History of England*, iii. (1905); J. E. Morris in *The Welsh Wars of Edward I.* (1901).

LLORENTE, JUAN ANTONIO (1756–1823), Spanish historian, was born on the 30th of March 1756 at Rincon de Soto in Aragon. He studied at the university of Saragossa, and, having been ordained priest, became vicar-general to the bishop of Calahorra in 1782. In 1785 he became commissary of the Holy Office at Logroño, and in 1789 its general secretary at Madrid. In the crisis of 1808 Llorente identified himself with the Bonapartists, and was engaged for a few years in superintending the execution of the decree for the suppression of the monastic orders, and in examining the archives of the Inquisition. On the return of King Ferdinand VII. to Spain in 1814 he withdrew to France, where he published his great work, *Historia critica de la inquisicion de España* (Paris, 1815–1817). Translated into English, French, German, Dutch and Italian, it attracted much attention in Europe, and involved its author in considerable persecution, which, on the publication of his *Portraits politiques des papes* in 1822, culminated in a peremptory order to quit France. He died at Madrid on the 5th of February 1823. Both the personal character and the literary accuracy of Llorente have been assailed, but although he was not an exact historian there is no doubt that he made an honest use of documents relating to the Inquisition which are no longer extant.

The English translation of the *Historia* (London, 1826) is abridged. Llorente also wrote *Memorias para la historia de la revolucion española* (Paris, 1814–1816), translated into French (Paris, 1815–1819); *Noticias historicas sobre las tres provincias vascongadas* (Madrid, 1806–1808); an autobiography, *Noticia biografica* (Paris, 1818), and other works.

LLOYD, EDWARD (1845–), English tenor vocalist, was born in London on the 7th of March 1845, his father, Richard Lloyd, being vicar choralist at Westminster Abbey. From 1852 to 1860 he sang in the abbey choir, and was thoroughly trained in music, eventually becoming solo tenor at the Chapel Royal. He began singing at concerts in 1867, and in 1871 appeared at the Gloucester Musical Festival. His fine evenly-produced voice and pure style at once brought him into notice, and he gradually took the place of Sims Reeves as the leading English tenor of the day, his singing of classical music, and especially of Handel, being particularly admired. At the Handel Festivals after 1888 he was the principal tenor, and even in the vast auditorium at the Crystal Palace he triumphed over acoustic difficulties. In 1888, 1890 and 1892 he paid successful visits to the United States; but by degrees he appeared less frequently in public, and in 1900 he formally retired from the platform.

LLOYD, WILLIAM (1627–1717), English divine, successively bishop of St Asaph, of Lichfield and Coventry, and of Worcester, was born at Tilehurst, Berkshire, in 1627, and was educated at Oriel and Jesus Colleges, Oxford. He graduated M.A. in 1646. In 1663 he was prebendary of Ripon, in 1667 prebendary of Salisbury, in 1668 archdeacon of Merioneth, in 1672 dean of Bangor and prebendary of St Paul's, London, in 1680 bishop of St Asaph, in 1689 lord-almoner, in 1692 bishop of Lichfield and Coventry, and in 1699 bishop of Worcester. Lloyd was an indefatigable opponent of the Roman Catholic tendencies of James II., and was one of the seven bishops who for refusing to have the Declaration of Indulgence read in his diocese was charged with publishing a seditious libel against the king and acquitted (1688). He engaged Gilbert Burnet to write *The History of the Reformation of the Church of England* and provided him with much material. He was a good scholar and a keen student of biblical apocalyptic literature and himself "prophesied" to Queen Anne, Robert Harley, earl of Oxford, William Whiston, and John Evelyn the diarist. Lloyd was a stanch supporter of the revolution. His chief publication was *An Historical Account of Church Government as it was in Great Britain and Ireland when they first received the Christian Religion* (London, 1684, reprinted Oxford, 1842). He died at Hartlebury castle on the 30th of August 1717.

LLOYD, WILLIAM WATKISS (1813–1893), English man of letters, was born at Homerton, Middlesex, on the 11th of March 1813. He received his early education at Newcastle-under-Lyme grammar school, and at the age of fifteen entered a family business in London, with which he was connected for thirty-five years. He devoted his leisure to the study of art, architecture, archaeology, Shakespeare, classical and modern languages and literature. He died in London on the 22nd of December 1893. The work by which he is best known is *The Age of Pericles* (1875), characterized by soundness of scholarship, great learning, and a thorough appreciation of the period with which it deals, but rendered unattractive by a difficult and at times obscure style. He wrote also: *Xanthian Marbles* (1845); *Critical Essays upon Shakespeare's Plays* (1875); *Christianity in the Cartoons* [of Raphael] (1865), which excited considerable attention from the manner in which theological questions were discussed; *The History of Sicily to the Athenian War* (1872); *Panics and their Panaceas* (1869); an edition of *Much Ado about Nothing*, "now first published in fully recovered metrical form" (1884; the author held that all the plays were originally written in blank verse). A number of manuscripts still remain unpublished, the most important of which have been bequeathed to the British Museum, amongst them being: *A Further History of Greece*; *The Century of Michael Angelo*; *The Neo-Platonists*.

See Memoir by Sophia Beale prefixed to Lloyd's (posthumously published) *Elijah Fenton: his Poetry and Friends* (1894), containing a list of published and unpublished works.

LLOYD GEORGE, DAVID (1863–), British statesman, was born at Manchester on the 17th of January 1863. His father, William George, a Welshman of yeoman stock, had left Pembrokeshire for London at an early age and became a school teacher there, and afterwards in Liverpool and Haverfordwest, and then headmaster of an elementary school at Pwllheli, Carnarvonshire, where he married the daughter of David Lloyd, a neighbouring Baptist minister. Soon afterwards William George became headmaster of an elementary school in Manchester, but after the birth of his eldest son David his health failed, and he gave up his post and took a small farm near Haverfordwest. Two years later he died, leaving his widow in poor circumstances; a second child, another son, was posthumously born. Mrs George's brother, Richard Lloyd, a shoemaker at Llanystumdwy, and pastor of the Campbellite Baptists there, now became her chief support; it was from him that young David obtained his earliest views of practical and political life, and also the means of starting, at the age of fourteen, on the career of a solicitor.

Having passed his law preliminary, he was articled to a firm in Portmadoc, and in 1884 obtained his final qualifications. In 1888 he married Margaret, daughter of Richard Owen of Criccieth. From the first he managed to combine his solicitor's work with politics, becoming secretary of the South Carnarvonshire Anti-tithe League; and his local reputation was made by a successful fight, carried to the High Court, in defence of the right of Nonconformists to burial in the parish churchyard. In the first county council elections for Carnarvonshire he played a strenuous part on the Radical side, and was chosen an alderman; and in 1890, at a by-election for Carnarvon Boroughs, he was returned to parliament by a majority of 18 over a strong Conservative opponent. He held his seat successfully at the contests in 1892, 1895 and 1900, his reputation as a champion of Welsh nationalism, Welsh nonconformity and extreme Radicalism becoming thoroughly established both in parliament and in the country. In the House of Commons he was one of the most prominent guerrilla fighters, conspicuous for his audacity and pungency of utterance, and his capacity for obstruction while the Conservatives were in office. During the South African crisis of 1899–1902 he was specially vehement in opposition to Mr Chamberlain, and took the "pro-Boer" side so bitterly that he was mobbed in Birmingham during the 1900 election when he attempted to address a meeting at the Town Hall. But he was again returned for Carnarvon Boroughs; and in the ensuing parliament he came still more to the front by his resistance to the Education Act of 1902.

As the leader of the Welsh party, and one of the most dashing parliamentarians on the Radical side, his appointment to office when Sir H. Campbell-Bannerman became premier at the end of 1905 was generally expected; but his elevation direct to the cabinet as president of the Board of Trade was somewhat of a surprise. The responsibilities of administration have, however, often converted a political free-lance into a steady-going official, and the Unionist press did its best to encourage such a tendency by continual praise of the departmental action of the new minister. His settlement of the railway dispute in 1906 was universally applauded; and the bills he introduced and passed for reorganizing the port of London, dealing with Merchant Shipping, and enforcing the working in England of patents granted there, and so increasing the employment of British labour, were greeted with satisfaction by the tariff-reformers, who congratulated themselves that a Radical free-trader should thus throw over the policy of *laisser faire*. The president of the Board of Trade was the chief success of the ministry, and when Mr Asquith became premier in 1908 and promoted Mr Lloyd George to the chancellorship of the exchequer, the appointment was well received even in the City of London. For that year the budget was already settled, and it was introduced by Mr Asquith himself, the ex-chancellor; but Mr Lloyd George earned golden opinions, both at the Treasury and in parliament, by his industry and his handling of the Finance Bill, especially important for its inclusion of Old Age Pensions, in the later stages.

It was not till the time came nearer for the introduction of the budget for 1909–1910 that opinion in financial circles showed the change which was afterwards to become so marked. A considerable deficit, of about £16,000,000, was in prospect, and the chancellor of the exchequer aroused misgivings by alluding in a speech to the difficulty he had in deciding what "hen roost" to "rob." The government had been losing ground in the country, and Mr Lloyd George and Mr Winston Churchill were conspicuously in alliance in advocating the use of the budget for introducing drastic reforms in regard to licensing and land, which the resistance of the House of Lords prevented the Radical party from effecting by ordinary legislation. The well-established doctrine that the House of Lords could not amend, though it might reject, a money-bill, coupled with the fact that it never had gone so far as to reject a budget, was relied on by the extremists as dictating the obvious party tactics; and before the year 1909 opened, the possibility of the Lords being driven to compel a dissolution by standing on their extreme rights as regards the financial provision for the year was already canvassed in political circles, though it was hardly credited that the government would precipitate a constitutional crisis of such magnitude. When Mr Lloyd George, on the 29th of April, introduced his budget, its revolutionary character, however, created widespread dismay in the City and among the propertied classes. In a very lengthy speech, which had to be interrupted for half an hour while he recovered his voice, he ended by describing it as a "war budget" against poverty, which he hoped, in the result, would become "as remote to the people of this country as the wolves which once infested its forests." Some of the original proposals, which were much criticized, were subsequently dropped, including the permanent diversion of the Old Sinking Fund to a National Development Fund (created by a separate bill), and a tax on "ungotten minerals," for which was substituted a tax on mineral rights. But the main features of the budget were adhered to, and eventually passed the House of Commons on the 4th of November, in spite of the persistent opposition of the scanty Unionist minority. Apart from certain non-contentious provisions, such as a tax on motor-cars, the main features of the measure were large increases in the spirit and tobacco duties, license duties, estate, legacy and succession duties, and income tax, and an elaborate and novel system of duties on land-values ("increment duty," "reversion duty," "undeveloped land duty"), depending on the setting up of arrangements for valuation of a highly complicated kind. The discussions on the budget entirely monopolized public attention for the year, and while the measure was defended by Mr Lloyd George in parliament with much suavity, and by Mr Asquith, Sir Edward Grey and Mr Haldane outside the House of Commons with tact and moderation, the feelings of its opponents were exasperated by a series of inflammatory public speeches at Limehouse and elsewhere from the chancellor of the exchequer, who took these opportunities to rouse the passions of the working-classes against the landed classes and the peers. When the Finance Bill went up to the House of Lords, Lord Lansdowne gave notice that on the second reading he would move "that this House is not justified in giving its consent to this bill until it has been submitted to the judgment of the country," and on the last day of November this motion was carried by an overwhelming majority of peers. The government passed a solemn resolution of protest in the House of Commons and appealed to the country; and the general election of January 1910 took place amid unexampled excitement. The Unionists gained a hundred seats over their previous numbers, but the constitutional issue undoubtedly helped the government to win a victory, depending indeed solely on the votes of the Labour members and Irish Nationalists, which a year before had seemed improbable.

Events had now made Mr Lloyd George and his financial policy the centre of the Liberal party programme; but party tactics for the moment prevented the ministry, who remained in office, from simply sending the budget up again to the Lords and allowing them to pass it. There was no majority in the Commons for the budget as such, since the Irish Nationalists only supported it as an engine for destroying the veto of the Lords and thus preparing the way for Irish Home Rule. Instead, therefore, of proceeding with the budget, the government allowed the financial year to end without one, and brought forward resolutions for curtailing the powers of the Lords, on which, if rejected by them, another appeal could be made to the people (see PARLIAMENT). Hardly, however, had the battle been arrayed when the King's death in May upset all calculations. An immediate continuance of hostilities between the two Houses was impossible. A truce was called, and a conference arranged between four leaders from each side—Mr Lloyd George being one—to consider whether compromise on the constitutional question was not feasible. The budget for 1909–10 went quietly through, and before the August adjournment the chancellor introduced his budget for 1910–11, discussion being postponed till the autumn. It imposed no new taxation, and left matters precisely as they were. (H. CH.)

LLOYD'S, an association of merchants, shipowners, underwriters, and ship and insurance brokers, having its headquarters in a suite of rooms in the north-east corner of the Royal Exchange, London. Originally a mere gathering of merchants for business or gossip in a coffee-house kept by one Edward Lloyd in Tower Street, London, the earliest notice of which occurs in the *London Gazette* of the 18th of February 1688, this institution has gradually become one of the greatest organizations in the world in connexion with commerce. The establishment existed in Tower Street up to 1692, in which year it was removed by the proprietor to Lombard Street, in the centre of that portion of the city most frequented by merchants of the highest class. Shortly after this event Mr Lloyd established a weekly newspaper furnishing commercial and shipping news, in those days an undertaking of no small difficulty. This paper took the name of *Lloyd's News*, and, though its life was not long, it was the precursor of the now ubiquitous *Lloyd's List*, the oldest existing paper, the *London Gazette* excepted. In Lombard Street the business transacted at Lloyd's coffee-house steadily grew, but it does not appear that throughout the greater part of the 18th century the merchants and underwriters frequenting the rooms were bound together by any rules, or acted under any organization. By and by, however, the increase of marine insurance business made a change of system and improved accommodation necessary, and after finding a temporary resting-place in Pope's Head Alley, the underwriters and brokers settled in the Royal Exchange in March 1774. One of the first improvements in the mode of effecting marine insurance was the introduction of a printed form of policy. Hitherto various forms had been in use; and, to avoid numerous disputes the committee of Lloyd's proposed a general form, which was adopted by the members on the 12th of January 1779, and remains in use, with a few slight alterations, to this day. The two most important events in the history of Lloyd's during the 19th century were the reorganization of the association in 1811, and the passing of an act in 1871 granting to Lloyd's all the rights and privileges of a corporation sanctioned by parliament. According to this act of incorporation, the three main objects for which the society exists are—first, the carrying out of the business of marine insurance; secondly, the protection of the interests of the members of the association; and thirdly, the collection, publication and diffusion of intelligence and information with respect to shipping. In the promotion of the last-named object an intelligence department has been developed which for wideness of range and efficient working has no parallel among private enterprises. By Lloyd's Signal Station Act 1888, powers were conferred on Lloyd's to establish signal stations with telegraphic communications, and by the Derelict Vessels (Report) Act 1896, masters of British ships are required to give notice to Lloyd's agents of derelict vessels, which information is published by Lloyd's.

The rooms at Lloyd's are available only to subscribers and members. The former pay an annual subscription of five guineas without entrance fee, but have no voice in the management of the institution. The latter consist of non-underwriting members, who pay an entrance fee of twelve guineas, and of underwriting members who pay a fee of £100. Underwriting members are also required to deposit securities to the value of £5000 to £10,000, according to circumstances, as a guarantee for their engagements. The management of the establishment is delegated by the members to certain of their number selected as a "committee for managing the affairs of Lloyd's." With this body lies the appointment of all the officials and agents of the institution, the daily routine of duty being entrusted to a secretary and a large staff of clerks and other assistants. The mode employed in effecting an insurance at Lloyd's is simple. The business is done entirely by brokers, who write upon a slip of paper the name of the ship and shipmaster, the nature of the voyage, the subject to be insured, and the amount at which it is valued. If the risk is accepted, each underwriter subscribes his name and the amount he agrees to take or underwrite, the insurance being effected as soon as the total value is made up.

See F. Martin, *History of Lloyd's and of Marine Insurance in Great Britain* (1876).

LLWYD, EDWARD (1660–1709), British naturalist and antiquary, was born in Cardiganshire in 1660. He was educated at Jesus College, Oxford, but did not graduate; he received the degree of M.A. however in 1701. In 1690, after serving for six years as assistant, he succeeded R. Plot as keeper of the Ashmolean museum, a position which he retained until 1709. In 1699 he published *Lithophylacii Britannici Ichnographia*, in which he described and figured various fossils, personally collected or received from his friends, and these were arranged in cabinets in the museum. They were obtained from many parts of England, but mostly from the neighbourhood of Oxford. A second edition was prepared by Llwyd, but not published until 1760. He issued in 1707 the first volume of *Archaeologia Britannica* (afterwards discontinued). He was elected F.R.S. in 1708. He died at Oxford on the 30th of June 1709.

LOACH. The fish known as loaches (*Cobitinae*) form a very distinct subfamily of the *Cyprinidae*, and are even regarded by some authors as constituting a family. Characters: Barbels, three to six pairs; pharyngeal teeth in one row, in moderate number; anterior part of the air-bladder divided into a right and left chamber, separated by a constriction, and enclosed in a bony capsule, the posterior part free or absent. They are more or less elongate in form, often eel-shaped, and naked or covered with minute scales. Most of the species are small, the largest known measuring 12 (the European *Misgurnus fossilis*), 13 (the Chinese *Botia variegata*), or 14 in. (the Central Asian *Nemachilus siluroides*). They mostly live in small streams and ponds, and many are mountain forms. They are almost entirely confined to Europe and Asia, but one species (*Nemachilus abyssinicus*) has recently been discovered in Abyssinia. About 120 species are known, mostly from Central and South-Eastern Asia. Only two species occur in Great Britain: the common *Nemachilus barbatulus* and the rarer and more local *Cobitis taenia*. The latter extends across Europe and Asia to Japan. Many of these fishes delight in the mud at the bottom of ponds, in which they move like eels. In some cases the branchial respiration appears to be insufficient, and the intestinal tract acts as an accessory breathing organ. The air-bladder may be so reduced as to lose its hydrostatic function and become subservient to a sensory organ, its outer exposed surface being connected with the skin by a meatus between the bands of muscle, and conveying the thermo-barometrical impressions to the auditory nerves. Loaches are known in some parts of Germany as "Wetterfisch."

LOAD; LODE. The O.E. *lād*, from which both these words are derived, meant "way," "journey," "conveyance," and is cognate with Ger. *Leite*. The Teutonic root is also seen in the O. Teut. *laidjan*, Ger. *leiten*, from which comes "to lead." The meanings of the word have been influenced by a supposed connexion with "lade," O.E. *hladan*, a word common to many old branches of Teutonic languages in the sense of "to place," but used in English principally of the placing of cargo in a ship, hence "bill of lading," and of emptying liquor or fluid out of one vessel into another; it is from the word in this sense that is derived "ladle," a large spoon or cup-like pan with a long handle. The two words, though etymologically one, have been differentiated in meaning, the influence of the connexion with "lade" being more marked in "load" than in "lode," a vein of metal ore, in which the original meaning of "way" is clearly marked. A "load" was originally a "carriage," and its Latin equivalent in the *Promptorium Parvulorum* is *vectura*. From that it passed to that which is laid on an animal or vehicle, and so, as an amount usually carried, the word was used of a specific quantity of anything, a unit of weight, varying with the locality and the commodity. A "load" of wheat = 40 bushels, of hay = 36 trusses. Other meanings of "load" are: in electricity, the power which an engine or dynamo has to furnish; and in engineering, the weight to be supported by a structure, the "permanent load" being the weight of the structure itself, the "external load" that of anything which may be placed upon it.

LOAF, properly the mass of bread made at one baking, hence the smaller portions into which the bread is divided for retailing. These are of uniform size (see BAKING) and are named according to shape ("tin loaf," "cottage loaf," &c.), weight ("quartern loaf," &c.), or quality of flour ("brown loaf," &c.). "Loaf," O.E. *hlāf*, is a word common to Teutonic languages; cf. Ger. *Laib*, or *Leib*, Dan. *lev*, Goth. *hlaifs*; similar words with the same meaning are found in Russian, Finnish and Lettish, but these may have been adapted from Teutonic. The ultimate origin is unknown, and it is uncertain whether "bread" (*q.v.*) or "loaf" is the earlier in usage. The O.E. *hlāf* is seen in "Lammas" and in "lord," *i.e. hlaford* for *hlafweard*, the loaf-keeper, or "bread-warder"; cf. the O.E. word for a household servant *hlāf-ǣta*, loaf-eater. The Late Lat. *companio*, one who shares, *panis*, bread, Eng. "companion," was probably an adaptation of the Goth. *gahlaiba*, O.H. Ger. *gileipo*, messmate, comrade. The word "loaf" is also used in sugar manufacture, and is applied to sugar shaped in a mass like a cone, a "sugar-loaf," and to the small knobs into which refined sugar is cut, or "loaf-sugar."

The etymology of the verb "to loaf," *i.e.* to idle, lounge about, and the substantive "loafer," an idler, a lazy vagabond, has been much discussed. R. H. Dana (*Two Years before the Mast*, 1840) called the word "a newly invented Yankee word." J. R. Lowell (*Biglow Papers*, 2nd series, Introd.) explains it as German in origin, and connects it with *laufen*, to run, and states that the dialectical form *lofen* is used in the sense of "saunter up and down." This explanation has been generally accepted. The *New English Dictionary* rejects it, however, and states that *laufen* is not used in this sense, but points out that the German *Landläufer*, the English obsolete word "landlouper," or "landloper," one who wanders about the country, a vagrant or vagabond, has a resemblance in meaning. J. S. Farmer and W. E. Henley's *Dictionary of Slang and its Analogues* gives as French synonyms of "loafer," *chevalier de la loupe* and *loupeur*.

LOAM (O.E. *lām*; the word appears in Dut. *leem* and Ger. *Lehm*; the ultimate origin is the root *lai-*, meaning "to be sticky," which is seen in the cognate "lime," Lat. *limus*, mud, clay), a fertile soil composed of a mixture of sand, clay, and decomposed vegetable matter, the quantity of sand being sufficient to prevent the clay massing together. The word is also used of a mixture of sand, clay and straw, used for making casting-moulds and bricks, and for plastering walls, &c. (see SOIL).

LOAN (adapted from the Scandinavian form of a word common to Teutonic languages, cf. Swed. *lån*, Icel. *lān*, Dut. *leen*; the O.E. *lǣn* appears in "lend," the ultimate source is seen in the root of Gr. λείπειν and Lat. *linquere*, to leave), that which is lent; a sum of money or something of value lent for a specific or indefinite period when it or its equivalent is to be repaid or returned, usually at a specified rate of interest (see USURY and MONEY-LENDING). For public loans see FINANCE, NATIONAL DEBT, and the various sections on finance under the names of the various countries.

LOANDA (*São Paulo de Loanda*), a seaport of West Africa, capital of the Portuguese province of Angola, situated in 8° 48′ S., 13° 7′ E., on a bay between the rivers Bango and Kwanza. The bay, protected from the surf by a long narrow island of sand, is backed by a low sandy cliff which at its southern end sweeps out with a sharp curve and terminates in a bold point crowned by Fort San Miguel. The depth of water at the entrance to the bay is 20 fathoms or more. The bay has silted up considerably, but there is a good anchorage about 1⅓ m. from the shore in 7 to 14 fathoms, besides cranage accommodation and a floating dock. Vessels discharge into lighters, and are rarely delayed on account of the weather. A part of the town lies on the foreshore, but the more important buildings—the government offices, the governor's residence, the palace of the bishop of Angola, and the hospital—are situated on higher ground. Most of the European houses are large stone buildings of one storey with red tile roofs. Loanda possesses a meteorological observatory, public garden, tramways, gas-works, statues to Salvador Correia de Sá, who wrested Angola from the Dutch, and to Pedro Alexandrino, a former governor, and is the starting-point of the railway to Ambaca and Malanje.

Loanda was founded in 1576, and except between 1640 and 1648, when it was occupied by the Dutch, has always been in Portuguese possession. It was for over two centuries the chief centre of the slave trade between Portuguese West Africa and Brazil. During that time the traffic of the port was of no small account, and after a period of great depression consequent on the suppression of that trade, more legitimate commerce was developed. There is a regular service of steamers between the port and Lisbon, Liverpool and Hamburg. The town has some 15,000 inhabitants, including a larger European population than any other place on the west coast of Africa. It is connected by submarine cables with Europe and South Africa. Fully half the imports and export trade of Angola (*q.v.*) passes through Loanda.

LOANGO, a region on the west coast of Africa, extending from the mouth of the Congo river in 6° S. northwards through about two degrees. At one time included in the "kingdom of Congo" (see Angola, *History*), Loango became independent about the close of the 16th century, and was still of considerable importance in the middle of the 18th century. Buali, the capital, was situated on the banks of a small river not far from the port of Loango, where were several European "factories." The country afterwards became divided into a large number of petty states, while Portugal and France exercised an intermittent sovereignty over the coast. Here the slave trade was longer maintained than anywhere else on the West African seaboard; since its extirpation, palm oil and india-rubber have been the main objects of commerce. The Loango coast is now divided between French Congo and the Portuguese district of Kabinda (see those articles). The natives, mainly members of the Ba-Kongo group of Bantu negroes, and often called Ba-Fiot, are in general well-built, strongly dolichocephalous and very thick of skull, the skin of various shades of warm brown with the faintest suggestion of purple. Baldness is unknown, and many of the men wear beards. Physical deformity is extremely rare. In religious beliefs and in the use of fetishes they resemble the negroes of Upper Guinea.

LOBACHEVSKIY, NICOLAS IVANOVICH (1793–1856), Russian mathematician, was born at Makariev, Nizhniy-Novgorod, on the 2nd of November (N.S.) 1793. His father died about 1800, and his mother, who was left in poor circumstances, removed to Kazan with her three sons. In 1807 Nicolas, the second boy, entered as a student in the University of Kazan, then recently established. Five years later, having completed the curriculum, he began to take part in the teaching, becoming assistant professor in 1814 and extraordinary professor two years afterwards. In 1823 he succeeded to the ordinary professorship of mathematics, and retained the chair until about 1846, when he seems to have fallen into official disfavour. At that time his connexion with the university to which he had devoted his life practically came to an end, except that in 1855, at the celebration of his jubilee, he brought it as a last tribute his *Pangéométrie*, in which he summarized the results of his geometrical studies. This work was translated into German by H. Liebmann in 1902. He died at Kazan on the 24th of February (N.S.) 1856. Lobachevskiy was one of the first thinkers to apply a critical treatment to the fundamental axioms of geometry, and he thus became a pioneer of the modern geometries which deal with space other than as treated by Euclid. His first contribution to non-Euclidian geometry is believed to have been given in a lecture at Kazan in 1826, but the subject is treated in many of his subsequent memoirs, among which may be mentioned the *Geometrische Untersuchungen zur Theorie der Parallellinien* (Berlin, 1840, and a new edition in 1887), and the *Pangéométrie* already referred to, which in the subtitle is described as a précis of geometry founded on a general and rigorous theory of parallels. (See Geometry, § *Non-Euclidean*, and Geometry, § *Axioms of.*) In addition to his geometrical studies, he made various contributions to other branches of mathematical science, among them being an elaborate treatise on algebra (Kazan, 1834). Besides being a geometer of power and originality, Lobachevskiy was an excellent man of business. Under his administration the University of Kazan prospered as it had never done before; and he not only organized the teaching staff to a high degree of efficiency, but arranged and enriched its library, furnished instruments for its observatory, collected specimens for its museums and provided it with proper buildings. In order to be able to supervise the erection of the last, he studied architecture, with such effect, it is said, that he was able to carry out the plans at a cost considerably below the original estimates.

See F. Engel, *N. I. Lobatchewsky* (Leipzig, 1899).

LOBANOV-ROSTOVSKI, ALEXIS BORISOVICH, Prince (1824–1896), Russian statesman, was born on the 30th of December 1824, and educated, like Prince Gorchakov and so many other eminent Russians, at the lyceum of Tsarskoe Selo. At the age of twenty he entered the diplomatic service, and became minister at Constantinople in 1859. In 1863 a regrettable incident in his private life made him retire temporarily from the public service, but four years later he re-entered it and served for ten years as *adlatus* to the minister of the interior. At the close of the Russo-Turkish war in 1878 he was selected by the emperor to fill the post of ambassador at Constantinople, and for more than a year he carried out with great ability the policy of his government, which aimed at re-establishing tranquillity in the Eastern Question, after the disturbances produced by the reckless action of his predecessor, Count Ignatiev. In 1879 he was transferred to London, and in 1882 to Vienna; and in March 1895 he was appointed minister of foreign affairs in succession to M. de Giers. In this position he displayed much of the caution of his predecessor, but adopted a more energetic policy in European affairs generally and especially in the Balkan Peninsula. At the time of his appointment the attitude of the Russian government towards the Slav nationalities had been for several years one of extreme reserve, and he had seemed as ambassador to sympathize with this attitude. But as soon as he became minister of foreign affairs, Russian influence in the Balkan Peninsula suddenly revived. Servia received financial assistance; a large consignment of arms was sent openly from St Petersburg to the prince of Montenegro; Prince Ferdinand of Bulgaria became ostensibly reconciled with the Russian emperor, and his son Boris was received into the Eastern Orthodox Church; the Russian embassy at Constantinople tried to bring about a reconciliation between the Bulgarian exarch and the oecumenical patriarch; Bulgarians and Servians professed, at the bidding of Russia, to lay aside their mutual hostility. All this seemed to foreshadow the creation of a Balkan confederation hostile to Turkey, and the sultan had reason to feel alarmed. In reality Prince Lobanov was merely trying to establish a strong Russian hegemony among these nationalities, and he had not the slightest intention of provoking a new crisis in the Eastern Question so long as the general European situation did not afford Russia a convenient opportunity for solving it in her own interest without serious intervention from other powers. Meanwhile he considered that the integrity and independence of the Ottoman empire must be maintained so far as these other powers were concerned. Accordingly, when Lord Salisbury proposed energetic action to protect the Armenians, the cabinet of St Petersburg suddenly assumed the rôle of protector of the sultan and vetoed the proposal. At the same time efforts were made to weaken the Triple Alliance, the principal instrument employed being the *entente* with France, which Prince Lobanov helped to convert into a formal alliance between the two powers. In the Far East he was not less active, and became the protector of China in the same sense as he had shown himself the protector of Turkey. Japan was compelled to give up her conquests on the Chinese mainland, so as not to interfere with the future action of Russia in Manchuria, and the financial and other schemes for increasing Russian influence in that part of the world were vigorously supported. All this activity, though combined with a haughty tone towards foreign governments and diplomatists, did not produce much general apprehension, probably because there was a widespread conviction that he desired to maintain peace, and that his great ability and strength of character would enable him to control the dangerous forces which he boldly set in motion. However this may be, before he had time to mature his schemes, and when he had been the director of Russian policy for only eighteen months, he died suddenly of heart disease when travelling with the emperor on the 30th of August 1896. Personally Prince Lobanov was a *grand seigneur* of the Russian type, proud of being descended from the independent princes of Rostov, and at the same time an amiable man of wide culture, deeply versed in Russian history and genealogy, and perhaps the first authority of his time in all that related to the reign of the emperor Paul. (D. M. W.)

LÖBAU, a town of Germany, in the kingdom of Saxony, on the Löbau water, 12 m. S.E. of the town of Bautzen, on the Dresden-Görlitz railway. Pop. (1905) 10,683. There is a spa, König Albert-Bad, largely frequented during the summer season. The town has agricultural implement, pianoforte, sugar, machine-building and button works, and trade in grain, yarn, linen and stockings. Other industries are spinning, weaving, dyeing, bleaching and brewing.

Löbau is first mentioned as a town in 1221; it received civic rights early in the 14th century and, in 1346, became one of the six allied towns of Lusatia. It suffered severely during the Hussite war and was deprived of its rights in 1547.

See Bergmann, *Geschichte der Oberlausitzer Sechsstadt Löbau* (Bischofswerda, 1896); and Kretschmer, *Die Stadt Löbau* (Chemnitz, 1904).

LOBBY, a corridor or passage, also any apartment serving as an ante-room, waiting room or entrance hall in a building. The Med. Lat. *lobia, laubia* or *lobium*, from which the word was directly adapted, was used in the sense of a cloister, gallery or covered place for walking attached to a house, as defined by Du Cange (*Gloss. Med. et Inf. Lat.*, s.v. *Lobia*), *porticus operta ad spatiandum idonea, aedibus adjuncta.* The French form of *lobia* was *loge*, cf. Ital. *loggia*, and this gave the Eng. "lodge," which is thus a doublet of "lobby." The ultimate derivation is given under LODGE. Other familiar uses of the term "lobby" are its application (1) to the entrance hall of a parliament house, and (2) to the two corridors known as "division-lobbies," into which the members of the House of Commons and other legislative bodies pass on a division, their votes being recorded according to which "lobby," "aye" or "no," they enter. The entrance lobby to a legislative building is open to the public, and thus is a convenient place for interviews between members and their constituents or with representatives of public bodies, associations and interests, and the press. The influence and pressure thus brought to bear upon members of legislative bodies has given rise to the use of "to lobby," "lobbying," "lobbyist," &c., with this special significance. The practice, though not unknown in the British parliament, is most prevalent in the United States of America, where the use of the term first arose (see below).

LOBBYING, in America, a general term used to designate the efforts of persons who are not members of a legislative body to influence the course of legislation. In addition to the large number of American private bills which are constantly being introduced in Congress and the various state legislatures, there are many general measures, such as proposed changes in the tariff or in the railway or banking laws, which seriously affect special interests. The people who are most intimately concerned naturally have a right to appear before the legislature or its representative, the committee in charge of the bill, and present their side of the case. Lobbying in this sense is legitimate, and may almost be regarded as a necessity. Unfortunately, however, all lobbying is not of this innocent character. The great industrial corporations, insurance companies, and railway and traction monopolies which have developed in comparatively recent years are constantly in need of legislative favours; they are also compelled to protect themselves against legislation which is unreasonably severe, and against what are known in the slang of politics as *strikes* or *hold-ups*.[1] In order that these objects may be accomplished there are kept at Washington and at the various state capitals paid agents whose influence is so well recognized that they are popularly called "the third house." Methods of the most reprehensible kind have often been employed by them.

Attempts have been made to remedy the evil by constitutional prohibition, by statute law and by the action of the governor of the state supported by public opinion. Improper lobbying has been declared a felony in California, Georgia, Utah, Tennessee, Oregon, Montana and Arizona, and the constitutions of practically all of the states impose restrictions upon the enactment of special and private legislation. The Massachusetts anti-lobbying act of 1890, which has served as a model for the legislation of Maryland (1900), Wisconsin (1905) and a few of the other states, is based upon the publicity principle. Counsel and other legislative agents must register with the sergeant-at-arms giving the names and addresses of their employers and the date, term and character of their employment. In 1907 alone laws regulating lobbying were passed in nine states—Alabama, Connecticut, Florida, Idaho, Missouri, Nebraska, North Dakota, South Dakota and Texas.

See James Bryce, *American Commonwealth* (New York, ed. 1889), i. 673-678; Paul S. Reinsch, *American Legislatures and Legislative Methods* (New York, 1907), chaps. viii., ix.; Margaret A. Schaffner, "Lobbying," in *Wisconsin Comparative Legislation Bulletins*, No. 2; and G. M. Gregory, *The Corrupt Use of Money in Politics and Laws for its Prevention* (Madison, Wis., 1893).

LOBE, any round projecting part, specifically the lower part of the external ear, one of the parts into which the liver is divided, also one of several parts of the brain, divided by marked fissures (see LIVER and BRAIN). The Greek λοβός, from which "lobe" is derived, was applied to the lobe of the ear and of the liver, and to the pod of a leguminous plant.

LOBECK, CHRISTIAN AUGUST (1781–1860), German classical scholar, was born at Naumburg on the 5th of June 1781. After having studied at Jena and Leipzig, he settled at Wittenberg in 1802 as privat-docent, and in 1810 was appointed to a professorship in the university. Four years later, he accepted the chair of rhetoric and ancient literature at Königsberg, which he occupied till within two years of his death (25th of August 1860). His literary activities were devoted to the history of Greek religion and to the Greek language and literature. His greatest work, *Aglaophamus* (1829), is still valuable to students. In this he maintains, against the views put forward by G. F. Creuzer in his *Symbolik* (1810–1823), that the religion of the Greek mysteries (especially those of Eleusis) did not essentially differ from the national religion; that it was not esoteric; that the priests as such neither taught nor possessed any higher knowledge of God; that the Oriental elements were a later importation. His edition of the *Ajax* of Sophocles (1809) had gained him the reputation of a sound scholar and critic; his *Phrynichus* (1820) and *Paralipomena grammaticae graecae* (1837) exhibit the widest acquaintance with Greek literature. He had little sympathy with comparative philology, holding that it needed a lifetime to acquire a thorough knowledge of a single language.

See the article by L. Friedländer in *Allgemeine deutsche Biographie*; C. Bursian's *Geschichte der klassischen Philologie in Deutschland* (1883); Lehrs, *Populäre Aufsätze aus dem Altertum* (2nd ed., Leipzig, 1875); Ludwich, *Ausgewählte Briefe von und an Chr. Aug. Lobeck und K. Lehrs* (1894); also J. E. Sandys, *History of Classical Scholarship*, i. (1908), 103.

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[1] Bills introduced for purposes of blackmail.

LOBEIRA, JOÃO (*c.* 1233–1285), a Portuguese troubadour of the time of King Alphonso III., who is supposed to have been the first to reduce into prose the story of *Amadis de Gaula* (*q.v.*). D. Carolina Michaelis de Vasconcellos, in her masterly edition of the *Cancioneiro de Ajuda* (Halle, 1904, vol. i. pp. 523-524), gives some biographical notes on João Lobeira, who is represented in the Colocci Brancuti *Canzoniere* (Halle, 1880) by five poems (Nos. 230-235). In number 230, João Lobeira uses the same *ritournelle* that Oriana sings in *Amadis de Gaula*, and this has led to his being generally considered by modern supporters of the Portuguese case to have been the author of the romance, in preference to Vasco de Lobeira, to whom the prose original was formerly ascribed. The folklorist A. Thomas Pires (in his *Vasco de Lobeira*, Elvas, 1905), following the old tradition, would identify the novelist with a man of that name who flourished in Elvas at the close of the 14th and beginning of the 15th century, but the documents he publishes contain no reference to this Lobeira being a man of letters.

LOBELIA, the typical genus of the tribe *Lobelieae*, of the order Campanulaceae, named after Matthias de Lobel, a native of Lille, botanist and physician to James I. It numbers about two hundred species, natives of nearly all the temperate and warmer regions of the world, excepting central and eastern Europe as well as western Asia. They are annual or perennial herbs or under-shrubs, rarely shrubby; remarkable arborescent forms are the tree-lobelias found at high elevations on the mountains of tropical Africa. Two species are British, *L. Dortmanna* (named by Linnaeus after Dortmann, a Dutch druggist), which occurs in gravelly mountain lakes; and *L. urens*, which is only found on heaths, &c., in Dorset and Cornwall. The genus is distinguished from *Campanula* by the irregular corona and completely united anthers, and by the excessive acridity of the milky juice. The species earliest described and figured appears to be *L. cardinalis*, under the name *Trachelium americanum sive cardinalis planta*, "the rich crimson cardinal's flower"; Parkinson (*Paradisus*, 1629, p. 357) says, "it groweth neere the riuer of Canada, where the French plantation in America is seated." It is a native of the eastern United States. This and several other species are in cultivation as ornamental garden plants, *e.g.* the dwarf blue *L. Erinus*, from the Cape, which, with its numerous varieties, forms a familiar bedding plant. *L. splendens* and *L. fulgens*, growing from 1 to 2 ft. high, from Mexico, have scarlet flowers; *L. Tupa*, a Chilean perennial 6 to 8 ft. high, has reddish or scarlet flowers; *L. tenuior* with blue flowers is a recent acquisition to the greenhouse section, while *L. amaena*, from North America, as well as *L. syphilitica* and its hybrids, from Virginia, have also blue flowers. The last-named was introduced in 1665. The hybrids raised by crossing *cardinalis*, *fulgens*, *splendens* and *syphilitica*, constitute a fine group of fairly hardy and showy garden plants. Queen Victoria is a well-known variety, but there are now many others.

The *Lobelia* is familiar in gardens under two very different forms, that of the dwarf-tufted plants used for summer bedding, and that of the tall showy perennials. Of the former the best type is *L. Erinus*, growing from 4 to 6 in. high, with many slender stems, bearing through a long period a profusion of small but bright blue two-lipped flowers. The variety *speciosa* offers the best strain of the dwarf lobelias; but the varieties are being constantly superseded by new sorts. A good variety will reproduce itself sufficiently true from seed for ordinary flower borders, but to secure exact uniformity it is necessary to propagate from cuttings.

The herbaceous lobelias, of which *L. fulgens* may be taken as the type, may be called hardy except in so far as they suffer from damp in winter; they throw up a series of short rosette-like suckers round the base of the old flowering stem, and these sometimes, despite all the care taken of them, rot off during winter. The roots should either be taken up in autumn, and planted closely side by side in boxes of dry earth or ashes, these being set for the time they are dormant either in a cold frame or in any airy place in the greenhouse; or they may be left in the ground, in which case a brick or two should be put beside the plants, some coal ashes being first placed round them, and slates to protect the plants being laid over the bricks, one end resting on the earth beyond. About February they should be placed in a warm pit, and after a few days shaken out and the suckers parted, and potted singly into small pots of light rich earth. After being kept in the forcing pit until well established, they should be moved to a more airy greenhouse pit, and eventually to a cold frame preparatory to planting out. In the more favoured parts of the United Kingdom it is unnecessary to go to this trouble, as the plants are perfectly hardy; even in the suburbs of London they live for several years without protection except in very severe winters. They should have a loamy soil, well enriched with manure; and require copious waterings when they start into free growth. They may be raised from seeds, which, being very fine, require to be sown carefully; but they do not flower usually till the second year unless they are sown very early in heat.

The species *Lobelia inflata*, the "Indian tobacco" of North America, is used in medicine, the entire herb, dried and in flower, being employed. The species derives its specific name from its characteristic inflated capsules. It is somewhat irritant to the nostrils, and is possessed of a burning, acrid taste. The chief constituent is a volatile liquid alkaloid (cf. nicotine) named lobeline, which occurs to the extent of about 30%. This is a very pungent body, with a tobacco-like odour. It occurs in combination with lobelic acid and forms solid crystalline salts. The single preparation of this plant in the British Pharmacopeia is the *Tinctura Lobeliae Ethereae*, composed of five parts of spirits of ether to one of lobelia. The dose is 5 to 15 minims. The ether is employed in order to add to the efficacy of the drug in asthma, but a simple alcoholic tincture would be really preferable.

Lobelia has certain pharmacological resemblances to tobacco. It has no action upon the unbroken skin, but may be absorbed by it under suitable conditions. Taken internally in small doses, *e.g.* 5 minims of the tincture, it stimulates the peristaltic movements of the coecum and colon. In large doses it is a powerful gastro-intestinal irritant, closely resembling tobacco, and causing giddiness, headache, nausea, vomiting, purging and extreme prostration, with clammy sweats and faltering rapid pulse. Its action on the circulation is very decided. The cardiac terminals of the vagus nerves are paralysed, the pulse being thus accelerated by loss of the normal inhibitory influence, and the blood-vessels being relaxed owing to paresis of the vasomotor centre. The blood-pressure thus falls very markedly. The respiratory centre is similarly depressed, death ensuing from this action. Lobelia is thus a typical respiratory poison. In less than toxic doses the motor terminals of the vagi in the bronchi and bronchioles are paralysed, thus causing relaxation of the bronchial muscles. It is doubtful whether lobelia affects the cerebrum directly. It is excreted by the kidneys and the skin, both of which it stimulates in its passage. In general terms the drug may be said to stimulate non-striped muscular fibres in small, and paralyse them in toxic doses.

Five minims of the tincture may be usefully prescribed to be taken night and morning in chronic constipation due to inertia of the lower part of the alimentary canal. In spasmodic (neurotic) asthma, and also in bronchitis accompanied by asthmatic spasm of the bronchioles, the tincture may be given in comparatively large doses (*e.g.* one drachm) every fifteen minutes until nausea is produced. Thereafter, whether successful or not in relieving the spasm, the administration of the drug must be stopped.

LOBENSTEIN, a town of Germany, in the principality of Reuss, on the Lemnitz, situated in a pleasant and fertile country, 25 m. N.W. from Hof by railway. Pop. (1905) 2990. The town, grouped round a rock, upon which stand the ruins of the old castle, is exceedingly picturesque. It contains a spacious parish church, a palace, until 1824 the residence of the princes of Reuss-Lobenstein-Elersdorf, and a hydropathic establishment. The manufactures include dyeing, brewing and cigar-making.

See Zedler and Schott, *Führer durch Lobenstein und Umgebung* (2nd ed., Lobenstein, 1903).

LOBO, FRANCISCO RODRIGUES (?1575–?1627), Portuguese bucolic writer, a lineal descendant in the family of letters of Bernardim Ribeiro and Christovam Falcão. All we know of his life is that he was born of rich and noble parents at Leiria, and lived at ease in its picturesque neighbourhood, reading philosophy and poetry and writing of shepherds and shepherdesses by the rivers Liz and Lena. He studied at the university of Coimbra and took the degree of licentiate about 1600. He visited Lisbon from time to time, and tradition has it that he died by drowning on his way thither as he was descending the Tagus from Santarem. Though his first book, a little volume of verses (Romances) published in 1596, and his last, a rhymed welcome to King Philip III., published in 1623, are written in Spanish, he composed his eclogues and prose pastorals entirely in Portuguese, and thereby did a rare service to his country at a time when, owing to the Spanish domination, Castilian was the language preferred by polite society and by men of letters. His *Primavera*, a book that may be compared to the *Diana* of Jorge de Montemôr (Montemayor), appeared in 1601, its second part, the *Pastor Peregrino*, in 1608, and its third, the *Desenganado*, in 1614. The dullness of these lengthy collections of episodes without plan, thread or ideas, is relieved by charming and ingenious pastoral songs named *serranilhas*. His eclogues in endecasyllables are an echo of those of Camoens, but like his other verses they are inferior to his *redondilhas*, which show the traditional fount of his inspiration. In his *Corte na Aldeia* (1619), a man of letters, a young nobleman, a student and an old man of easy means, beguile the winter evenings at Cintra by a series of philosophic and literary discussions in dialogue which may still be read with pleasure. Lobo is also the author of an insipid epic in twenty cantos in *ottava rima* on the Constable D. Nuno Alvares Pereira, the hero of the war of independence against Spain at the end of the 14th century. The characteristics of his prose style are harmony, purity and elegance, and he ranks as one of Portugal's leading writers. A disciple of the Italian school, his verses are yet free from imitations of classical models, his descriptions of natural scenery are unsurpassed in the Portuguese language, and generally his writings strike a true note and show a sincerity that was rare at the time. Their popularity may be seen by the fact that the *Primavera* went through seven editions in the 17th century and nine in all, a large number for so limited a market as that of Portugal, while six editions exist of the *Pastor Peregrino* and four of the epic poem. An edition of his collected works was published in one volume in Lisbon in 1723, and another in four volumes, but less complete, appeared there in 1774.

See Costa e Silva, *Ensaio biographico critico*, v. 5-112, for a critical examination of Lobo's writings; also Bouterwek's *History of Portuguese Literature*. (E. Pr.)

LOBO, JERONIMO (1593–1678), Jesuit missionary, was born in Lisbon, and entered the Order of Jesus at the age of sixteen. In 1621 he was ordered as a missionary to India, and in 1622 he arrived at Goa. With the intention of proceeding to Abyssinia, whose Negus (emperor) Segued had been converted to Roman Catholicism by Pedro Paez, he left India in 1624. He disembarked on the coast of Mombasa, and attempted to reach his destination through the Galla country, but was forced to return. In 1625 he set out again, accompanied by Mendez, the patriarch of Ethiopia, and eight missionaries. The party landed on the coast of the Red Sea, and Lobo settled in Abyssinia as superintendent of the missions in Tigré. He remained there until death deprived the Catholics of their protector, the emperor Segued. Forced by persecution to leave the kingdom, in 1634 Lobo and his companions fell into the hands of the Turks at Massawa, who sent him to India to procure a ransom for his imprisoned fellow-missionaries. In this he was successful, but could not induce the Portuguese viceroy to send an armament against Abyssinia. Intent upon accomplishing this cherished project, he embarked for Portugal, and after he had been shipwrecked on the coast of Natal, and captured by pirates, arrived at Lisbon. Neither at this city, however, nor at Madrid and Rome, was any countenance given to Lobo's plan. He accordingly returned to India in 1640, and was elected rector, and afterwards provincial, of the Jesuits at Goa. After some years he returned to his native city, and died there on the 29th of January 1678.

Lobo wrote an account of his travels in Portuguese, which appears never to have been printed, but is deposited in the monastery of St Roque, Lisbon. Balthazar Telles made large use of the information therein in his *Historia geral da Ethiopia a Alta* (Coimbra, 1660), often erroneously attributed to Lobo (see Machado's *Bibliotheca Lusitana*). Lobo's own narrative was translated from a MS. copy into French in 1728 by the Abbé Joachim le Grand, under the title of *Voyage historique d'Abissinie*. In 1669 a translation by Sir Peter Wyche of several passages from a MS. account of Lobo's travels was published by the Royal Society (translated in M. Thévenot's *Relation des voyages* in 1673). An English abridgment of Le Grand's edition by Dr Johnson was published in 1735 (reprinted 1789). In a *Mémoire justificatif en réhabilitation des pères Pierre Paez et Jérôme Lobo*, Dr C. T. Beke maintains against Bruce the accuracy of Lobo's statements as to the source of the Abai branch of the Nile. See A. de Backer, *Bibliothèque de la Compagnie de Jésus* (ed. C. Sommervogel, iv., 1893).

LOBSTER (O.E. *lopustre, lopystre*, a corruption of Lat. *locusta*, lobster or other marine shell-fish; also a locust), an edible crustacean found on the coasts of the North Atlantic and Mediterranean. The name is sometimes loosely applied to any of the larger Crustacea of the order Macrura, especially to such as are used for food.

The true lobsters, forming the family *Homaridae*, are distinguished from the other Macrura by having the first three pairs of legs terminating in chelae or pincers. The first pair are large and massive and are composed of six segments, while the remaining legs are each composed of seven segments. The sternum of the last thoracic somite is immovably united with the preceding. This last character, together with some peculiarities of the branchial system, distinguish the lobsters from the freshwater crayfishes. The common lobster (*Homarus gammarus* or *vulgaris*) is found on the European coasts from Norway to the Mediterranean. The American lobster (*Homarus americanus*), which should perhaps be ranked as a variety rather than as a distinct species, is found on the Atlantic coast of North America from Labrador to Cape Hatteras. A third species, found at the Cape of Good Hope, is of small size and of no economic importance.

Both in Europe and in America the lobster is the object of an important fishery. It lives in shallow water, in rocky places, and is usually captured in traps known as lobster-pots, or creels, made of wickerwork or of hoops covered with netting, and having funnel-shaped openings permitting entrance but preventing escape. These traps are baited with pieces of fish, preferably stale, and are sunk on ground frequented by lobsters, the place of each being marked by a buoy. In Europe the lobsters are generally sent to market in the fresh state, but in America, especially in the northern New England states and in the maritime provinces of Canada, the canning of lobsters is an important industry. The European lobster rarely reaches 10 pounds in weight, though individuals of 14 pounds have been found, and in America there are authentic records of lobsters weighing 20 to 23 pounds.

The effects of over-fishing have become apparent, especially in America, rather in the reduced average size of the lobsters caught than in any diminution of the total yield. The imposition of a close time to protect the spawning lobsters has been often tried, but as the female carries the spawn attached to her body for nearly twelve months after spawning it is impossible to give any effective protection by this means. The prohibition of the capture of females carrying spawn, or, as it is termed, "in berry," is difficult to enforce. A minimum size, below which it is illegal to sell lobsters, is fixed by law in most lobster-fishing districts, but the value of the protection so given has also been questioned.

The Norway lobster (*Nephrops norvegicus*) is found, like the common lobster, from Norway to the Mediterranean. It is a smaller species, with long and slender claws and is of an orange colour, often beautifully marked with red and blue. It is found in deeper water and is generally captured by trawling. It is a curious and unexplained fact that nearly all the individuals so captured are males. It is less esteemed for food than the common species. In London it is sold under the name of "Dublin prawn."

The rock lobster, spiny lobster, or sea-crawfish (*Palinurus vulgaris*) belongs to the family *Palinuridae*, distinguished from the *Homaridae* by the fact that the first legs are not provided with chelae or pincers, and that all the legs possess only six segments. The antennae are very long and thick. It is found on the southern and western coasts of the British Islands and extends to the Mediterranean. It is highly esteemed for the table, especially in France, where it goes by the name of *Langouste*. Other species of the same family are used for food in various parts of the world, especially on the Pacific coast of North America and in Australia and New Zealand.

In Melbourne and Sydney the name of "Murray lobster" is given to a large species of crayfish (*Astacopsis spinifer*, formerly known as *Astacus*, or *Potamobius serratus*) which is much used for food. (W. T. Ca.)

LOCAL GOVERNMENT, a phrase specially adopted in English usage for the decentralized or deconcentrated administration, within a state or national and central government, of local affairs by local authorities. It is restricted not only in respect of area but also in respect of the character and extent of the duties assigned to them. It is not to be confused with local self-government in the wider sense in which the words are sometimes employed, *e.g.* for the granting by the crown of self-government to a colony; the expression, in a general way, may mean this, but "local government" as technically used in England refers more narrowly to the system of county or municipal administration, and English usage transfers it to denote the similar institutions in other countries. The growth and persistence of this kind of subordinate government is due practically to the need of relieving the central authority in the state, and to experience of the failure of a completely centralized bureaucracy. The degree to which local government is adopted varies considerably in different countries, and those which are the best examples of it in modern times—the United Kingdom, the United States, France and Germany—differ very much in their local institutions, partly through historical, partly through temperamental, causes. A certain shifting of ideas from time to time, as to what is local and what is central, is inevitable, and the same view is not possible in countries of different configuration, history or political system. The history and present state of the local government in the various countries are dealt with in the separate articles on them (ENGLAND, GERMANY, &c.), in the sections dealing with government and administration, or political institutions.

The best recent comparative study of local government is Percy Ashley's *Local and Central Government* (Murray, 1906), an admirable account of the evolution and working of the systems in England, France, Prussia and United States. Other important works, in addition to general works on constitutional law, are J. A. Fairlie's *Municipal Administration*, Shaw's *Municipal Government in Continental Europe*, Redlich and Hirst's *Local Government in England*, Mr and Mrs Sidney Webb's elaborate historical inquiry into English local government (1906), and for Germany, Bornhak's *Geschichte des preussischen Verwaltungsrechts.*

LOCAL GOVERNMENT BOARD, a department of the administration of the United Kingdom, constituted in 1871. It is the successor of the General Board of Health, established in 1848 pursuant to the Public Health Act of that year. The General Board of Health continued in existence until 1854, when it was reconstituted. Its existence under its new constitution was originally limited to one year, but was extended from year to year until 1858, when it was allowed to expire, its powers under the various acts for the prevention of diseases being transferred to the privy council, while those which related to the control of local authorities passed to the secretary of state for the home department, to whose department the staff of officers and clerks belonging to the board was transferred. This state of affairs continued until 1871, when the Local Government Board was created by the Local Government Board Act 1871. It consists of the lord president of the council, the five principal secretaries of state, the lord privy seal, the chancellor of the exchequer and a president appointed by the sovereign. The board itself seldom meets, and the duties of the department are discharged by the president assisted by a parliamentary and a permanent secretary and a permanent staff. The president and one of the secretaries usually have seats in parliament, and the president is generally a member of the cabinet. The salary of the president, formerly £2000, was raised in 1910 to £5000 a year. The board has all the powers of the secretary of state under the Public Health Act 1848, and the numerous subsequent acts relating to sanitary matters and the government of sanitary districts; together with all the powers and duties of the privy council under the acts relating to the prevention of epidemic disease and to vaccination. The powers and duties of the board have been largely added to by legislation since its creation; it may be said that the board exercises a general supervision over the numerous authorities to whom local government has been entrusted (see ENGLAND: *Local Government*). A committee presided over by Lord Jersey in 1904 inquired into the constitution and duties of the board, but made no recommendation as to any change therein. It recommended, however, an increase in the salaries of the president and of the parliamentary and permanent secretaries.

LOCARNO (Ger. *Luggarus*), a small town of Italian appearance in the Swiss canton of Tessin or Ticino, of which till 1881 it was one of the three capitals (the others being Bellinzona, *q.v.*, and Lugano, *q.v.*). It is built at the north or Swiss end of the Lago Maggiore, not far from the point at which the Maggia enters that lake, and is by rail 14 m. S.W. of Bellinzona. Its height above the sea-level is only 682 ft., so that it is said to be the lowest spot in Switzerland. In 1900 its population was 3603, mainly Italian-speaking and Romanists. It was taken from the Milanese in 1512 by the Swiss who ruled it till 1798, when it became part of the canton of Lugano in the Helvetic Republic, and in 1803 part of that of Tessin or Ticino, then first erected. In 1555 a number of Protestant inhabitants were expelled for religious reasons, and going to Zürich founded the silk industry there. Above Locarno is the romantically situated sanctuary of the Madonna del Sasso (now rendered easily accessible by a funicular railway) that commands a glorious view over the lake and the surrounding country. (W. A. B. C.)

LOCH, HENRY BROUGHAM LOCH, 1ST BARON (1827–1900), British colonial administrator, son of James Loch, M.P., of Drylaw, Midlothian, was born on the 23rd of May 1827. He entered the navy, but at the end of two years quitted it for the East India Company's military service, and in 1842 obtained a commission in the Bengal Light Cavalry. In the Sikh war in 1845 he was given an appointment on the staff of Sir Hugh Gough, and served throughout the Sutlej campaign. In 1852 he became second in command of Skinner's Horse. At the outbreak of the Crimean war in 1854, Loch severed his connexion with India, and obtained leave to raise a body of irregular Bulgarian cavalry, which he commanded throughout the war. In 1857 he was appointed attaché to Lord Elgin's mission to the East, was present at the taking of Canton, and in 1858 brought home the treaty of Yedo. In April 1860 he again accompanied Lord Elgin to China, as secretary of the new embassy sent to secure the execution by China of her treaty engagements. The embassy was backed up by an allied Anglo-French force. With Harry S. Parkes he negotiated the surrender of the Taku forts. During the advance on Peking Loch was chosen with Parkes to complete the preliminary negotiations for peace at Tungchow. They were accompanied by a small party of officers and Sikhs. It having been discovered that the Chinese were planning a treacherous attack on the British force, Loch rode back and warned the outposts. He then returned to Parkes and his party under a flag of truce hoping to secure their safety. They were all, however, made prisoners and taken to Peking, where the majority died from torture or disease. Parkes and Loch, after enduring irons and all the horrors of a Chinese prison, were afterwards more leniently treated. After three weeks' time the negotiations for their release were successful, but they had only been liberated ten minutes when orders were received from the Chinese emperor, then a fugitive in Mongolia, for their immediate execution. Loch never entirely recovered his health after this experience in a Chinese dungeon. Returning home he was made C.B., and for a while was private secretary to Sir George Grey, then at the Home Office. In 1863 he was appointed lieutenant-governor of the Isle of Man. During his governorship the House of Keys was transformed into an elective assembly, the first line of railway was opened, and the influx of tourists began to bring fresh prosperity to the island. In 1882 Loch, who had become K.C.B. in 1880, accepted a commissionership of woods and forests, and two years later was made governor of Victoria, where he won the esteem of all classes. In June 1889 he succeeded Sir Hercules Robinson as governor of Cape Colony and high commissioner of South Africa.

As high commissioner his duties called for the exercise of great judgment and firmness. The Boers were at the same time striving to frustrate Cecil Rhodes's schemes of northern expansion and planning to occupy Mashonaland, to secure control of Swaziland and Zululand and to acquire the adjacent lands up to the ocean. Loch firmly supported Rhodes, and, by informing President Kruger that troops would be sent to prevent any invasion of territory under British protection, he effectually crushed the "Banyailand trek" across the Limpopo (1890–91). Loch, however, with the approval of the imperial government, concluded in July–August 1890 a convention with President Kruger respecting Swaziland, by which, while the Boers withdrew all claims to territory north of the Transvaal, they were granted an outlet to the sea at Kosi Bay on condition that the republic entered the South African Customs Union. This convention was concluded after negotiations conducted with President Kruger by J. H. Hofmeyr on behalf of the high commissioner, and was made at a time when the British and Bond parties in Cape Colony were working in harmony. The Transvaal did not, however, fulfil the necessary condition, and in view of the increasingly hostile attitude of the Pretoria administration to Great Britain Loch became a strong advocate of the annexation by Britain of the territory east of Swaziland, through which the Boer railway to the sea would have passed. He at length induced the British government to adopt his view and on the 15th of March 1895 it was announced that these territories (Amatongaland, &c.), would be annexed by Britain, an announcement received by Mr Kruger "with the greatest astonishment and regret." Meantime Loch had been forced to intervene in another matter. When the commandeering difficulty of 1894 had roused the Uitlanders in the Transvaal to a dangerous pitch of excitement, he travelled to Pretoria to use his personal influence with President Kruger, and obtained the withdrawal of the obnoxious commandeering regulations. In the following year he entered a strong protest against the new Transvaal franchise law. Meanwhile, however, the general situation in South Africa was assuming year by year a more threatening aspect. Cecil Rhodes, then prime minister of Cape Colony, was strongly in favour of a more energetic policy than was supported by the Imperial government, and at the end of March 1895 the high commissioner, finding himself, it is believed, out of touch with his ministers, returned home a few months before the expiry of his term of office. In the same year he was raised to the peerage. When the Anglo-Boer war broke out in 1899 Loch took a leading part in raising and equipping a body of mounted men, named after him "Loch's Horse." He died in London on the 20th of June 1900, and was succeeded as 2nd baron by his son Edward (b. 1873).

LOCHABER, a district of southern Inverness-shire, Scotland, bounded W. by Loch Linnhe, the river and loch Lochy, N. by the Corryarrick range and adjoining hills, N.E. and E. by the district of Badenoch, S.E. by the district of Rannoch and S. by the river and loch Leven. It measures 32 m. from N.E. to S.W. and 25 m. from E. to W., and is remarkable for wild and romantic scenery, Ben Nevis being the chief mountain. The district has given its name to a celebrated type of axe, consisting of a long shaft with a blade like a scythe and a large hook behind it, which, according to Sir Walter Scott, was introduced into the Highlands and Ireland from Scandinavia. It was the weapon of the old City Guard of Edinburgh. The pathetic song of "Lochaber no more" was written by Allan Ramsay.

LOCHES, a town in France, capital of an arrondissement in the department of Indre-et-Loire, 29 m. S.E. of Tours by rail, on the left bank of the Indre. Pop. (1906) 3751. The town, one of the most picturesque in central France, lies at the foot of the rocky eminence on which stands the castle of the Anjou family, surrounded by an outer wall 1¼ m. in circumference, and consisting of the old collegiate church of St Ours, the royal lodge and the donjon. The church of St Ours dates from the 10th to the 12th centuries; among its distinguishing features are the huge stone pyramids surmounting the nave and the beautiful carving of the west door. The royal lodge, built by Charles VII. and used as the subprefecture, contains the tomb of Agnes Sorel and the oratory of Anne of Brittany. The donjon includes, besides the ruined keep (12th century), the Martelet, celebrated as the prison of Lodovico Sforza, duke of Milan, who died there in 1508, and the Tour Ronde, built by Louis XI. and containing the famous iron cages in which state prisoners, including—according to a story now discredited—their inventor Cardinal Balue, were confined. Loches has an hôtel-de-ville and several houses of the Renaissance period. It has a tribunal of first instance, a communal college and a training college. Liqueur-distilling and tanning are carried on together with trade in farm-produce, wine, wood and live-stock.

On the right bank of the Loire, opposite the town and practically its suburb, is the village of Beaulieu-lès-Loches, once the seat of a barony. Besides the parish church of St Laurent, a beautiful specimen of 12th-century architecture, it contains the remains of the great abbey church of the Holy Sepulchre founded in the 11th century by Fulk Nerra, count of Anjou, who is buried in the chancel. This chancel, which with one of the older transepts now constitutes the church, dates from the 15th century. The Romanesque nave is in ruins, but of the two towers one survives intact; it is square, crowned with an octagonal steeple of stone, and is one of the finest extant monuments of Romanesque architecture.

Loches (the Roman *Leucae*) grew up round a monastery founded about 500 by St Ours and belonged to the counts of Anjou from 886 till 1205. In the latter year it was seized from King John of England by Philip Augustus, and from the middle of the 13th century till after the time of Charles IX. the castle was a residence of the kings of France.

LOCHGELLY, a police burgh of Fifeshire, Scotland, 7½ m. N.E. of Dunfermline by the North British railway. Pop. (1901) 5472. The town is modern and owes its prosperity to the ironworks and collieries in its immediate vicinity. Loch Gelly, from which the town takes its name, situated ½ m. S. E., measures ½ m. in length by ¾ m. in breadth, contains some trout and pike, and has on its west banks Lochgelly House, a seat of the earl of Minto. The Romans are said to have had a station at Loch Ore in the parish of Ballingry, 2¼ m. N. by W., which was drained about the end of the 18th century and then cultivated. To the N.E. rises the hill of Benarty (1131 ft.). Hallyards, about 2 m. S.E. of Lochgelly, is a ruined house that once belonged to Sir William Kirkaldy of Grange, who held Edinburgh Castle for Queen Mary. Here James V. was received after his defeat at Solway Moss in 1542, and here a few Jacobites used to meet in 1715.

LOCHGILPHEAD, a municipal and police burgh of Argyllshire, Scotland, at the head of Loch Gilp, a small arm on the western side of Loch Fyne. Pop. (1901) 1313. The herring-fishery is the chief industry, but there is some weaving of woollens and, in summer, a considerable influx of visitors. ARDRISHAIG (pop. 1285), a seaport on the west of the mouth of Loch Gilp, is the east terminus of the Crinan Canal. It is the place of transhipment from the large Glasgow passenger steamers to the small craft built for the navigation of the canal. It is an important harbour in connexion with the Loch Fyne herring-fishery, and there is also a distillery. During the summer there is a coach service to Ford at the lower end of Loch Awe.

LOCHMABEN, a royal and police burgh of Dumfriesshire, Scotland, 8 m. N.E. of Dumfries, with a station on the Caledonian railway company's branch from Dumfries to Locherbie. Pop. (1901) 1328. It is delightfully situated, there being eight lakes in the immediate neighbourhood, while the river Annan, and the Waters of Ae, Kinnel and Dryfe are in the vicinity. The town hall is a handsome edifice with clock tower. At the south end of Castle Loch, the chief lake, stand the ruins, a mere shell, of Lochmaben Castle, dating from the 13th century, where local tradition declares that Robert Bruce was born—an honour which is also claimed, however, for Turnberry Castle on the coast of Ayrshire. In the parish church is a bell said to have been presented to King Robert by the pope after reconciliation with him. A statue of the king stands in front of the town hall. Whether it were his birthplace or not, the associations of Bruce with Lochmaben were intimate. He exempted his followers in the district from feudal service and their descendants—the "kindly tenants of Lochmaben"—were confirmed in their tenure by the court of session in 1824. The Castle Loch is the only fresh water in Scotland, and possibly in the British Isles, where the vendace (*coregonus vandesius*) occurs. This fish, which is believed to be growing scarcer, is alleged on doubtful authority to have been introduced by Queen Mary. It is captured by the sweep-net in August, and is esteemed as a delicacy. The lakes adjoining the town afford the inhabitants exceptional advantages for the game of curling. There was once a team of Lochmaben Curlers entirely composed of shoemakers (souters) who held their own against all comers, and their prowess added the phrase "to souter" to the vocabulary of the sport, the word indicating a match in which the winners scored "game" to their opponents' "love." Lochmaben unites with Annan, Dumfries, Kirkcudbright and Sanquhar (the Dumfries burghs) in returning one member to parliament.

LOCK, MATTHIAS, English 18th-century furniture designer and cabinet-maker. The dates of his birth and death are unknown; but he was a disciple of Chippendale, and subsequently of the Adams, and was possibly in partnership with Henry Copeland (*q.v.*). During the greater part of his life he belonged to that flamboyant school which derived its inspiration from Louis XV. models; but when he fell under the influence of Robert Adam he absorbed his manner so completely that it is often difficult to distinguish between them, just as it is sometimes easy to confound Lock's work with the weaker efforts of Chippendale. Thus from being extravagantly rococo he progressed to a simple ordered classicism. His published designs are not equal to his original drawings, many of which are preserved in the Victoria and Albert Museum, South Kensington, while the pieces themselves are often bolder and more solid than is suggested by the author's representations of them. He was a clever craftsman and holds a distinct place among the minor furniture designers of the second half of the 18th century.

Among his works, some of which were issued in conjunction with Copeland, are: *A New Drawing Book of Ornaments* (n. d.); *A New Book of Ornaments* (1768); *A New Book of Pier Frames, Ovals, Girandoles, Tables, &c.* (1769); and *A New Book of Foliage* (1769).

LOCK (from the O. Eng. *loc.*; the word appears, in different forms, in many Teutonic languages, but with such various meanings as "hole," Ger. *Loch*, "lid," Swed. *lock*, &c.; probably the original was a root meaning "to enclose"), a fastening, particularly one which consists of a bolt held in a certain position by one or more movable parts which require to be placed in definite positions by the aid of a key or of a secret arrangement of letters, figures or signs, before the bolt can be moved. It is with such fastenings that the present article chiefly deals.

The word is also used, in the original sense of an enclosure or barrier, for a length of water in a river or canal, or at the entrance of a dock, enclosed at both ends by gates, the "lock-gates," and fitted with sluices, to enable vessels to be raised from a lower to a higher level or vice versa (see CANAL and DOCK). In guns and rifles the lock is the mechanism which effects the firing of the charge; it thus appears in the names of old types of weapons, such as wheel-lock, match-lock, flint-lock (see ARMS AND ARMOUR, § *Firearms*; also GUN and RIFLE). Lock (Ger. *Locke*) in the sense of a curl or tuft of hair, the separate groups in which the hair naturally grows, may be, in ultimate origin, connected with the root of the main word. Lock-jaw is the popular name of the disease known as tetanus (*q.v.*). The name "Lock Hospital" is frequently used in English for a hospital for patients suffering from venereal diseases. According to the *New English Dictionary* there was in Southwark as early as 1453 a leper-hospital, known as the Lock Lazar House, which later was used for the treatment of venereal diseases. The name appears to have become used in the present sense as early as the end of the 17th century. Lock hospitals were established in London in 1745–1747 and in Dublin in 1754–1755.

The forms in which locks are manufactured, such as padlock, rim-lock, mortise-lock, one-sided or two-sided, &c., are necessarily extremely numerous; and the variations in the details of construction of any one of these forms are still more numerous, so that it is impossible to do more here than describe the main types which have been or are in common use. Probably the earliest locks were of Chinese origin. Specimens of these still extant are quite as secure as any locks manufactured in Europe up to the 18th century, but it is impossible to ascertain the date of their manufacture. With the exception, in all probability, of these Chinese examples, the earliest lock of which the construction is known is the Egyptian, which was used four thousand years ago. In fig. 1, *aa* is the body of the lock, *bb* the bolt and *cc* the key. The three pins *p*, *p*, *p* drop into three holes in the bolt when it is pushed in, and so hold it fast; and they are raised again by putting in the key through the large hole in the bolt and raising it a little, so that the pins in the key push the locking pins up out of the way of the bolt. It was evidently to locks and keys of this nature that the prophet alluded: "And the key of the house of David will I lay upon his shoulder" (Isaiah xxii. 22), the word *muftah* used in this passage being the common word for key to this day.

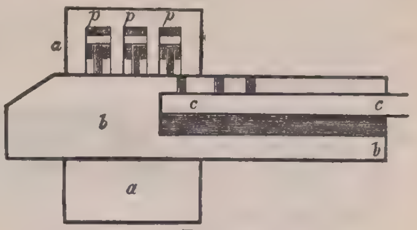

FIG. 1.

In the 18th century the European lock was nothing better than a mere bolt, held in its place, either shut or open, by a spring *b* (fig. 2), which pressed it down, and so held it at either one end or the other of the convex notch *aa*; and the only impediment to opening it was the wards which the key had to pass before it could turn in the keyhole. But it was always possible to find the shape of the wards by merely putting in a blank key covered with wax, and pressing it against them; and when this had been done it was unnecessary to cut out the key into the complicated form of the wards (such as fig. 3), because no part of that key does any work except the edge *bc* farthest from the pipe *a*; and so a key of the form fig. 4 would do just as well. Thus a small collection of skeleton keys, as they are called, of a few different patterns, was all the stock in trade that a lock-picker required.

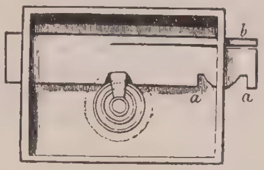

FIG. 2.

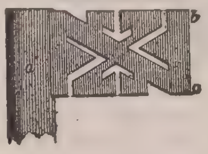

FIG. 3.

The common single-tumbler lock (fig. 5) requires two operations instead of one to open it. The tumbler *at* turns on a pivot at *t*, and has a square pin at *a*, which drops into a notch in the bolt *bb*, when it is either quite open or quite shut, and the tumbler must be lifted by the key before the bolt can be moved again. The tumbler offered little resistance to picking, as the height to which it might be lifted was not limited and the bolt would operate provided only that this height was sufficient; the improvement which formed the foundation of the modern key lock was the substitution of what is known as the "lever" for the tumbler, the difference being that the lever must be lifted to *exactly* the right height to allow the bolt to pass. This improvement, together with the obvious one of using more than one lever, was introduced in 1778 by Robert Barron, and is illustrated in figs. 6 and 7. Unless the square pin *a* (fig. 6) is lifted by the key to the proper height and no higher, the bolt cannot move. Fig. 8 illustrates the key of such a lock with four levers, the different distances between the centre of the key barrel and the edge of the bit being adapted to lift the levers to the respective heights required. This lock differs from the

Lever locks

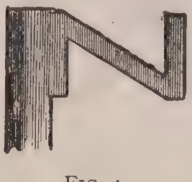

FIG. 4.

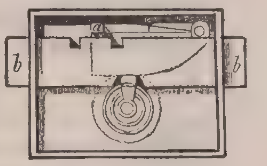

FIG. 5

modern lever lock only in the fact that Barron made his gating in the bolt and carried stumps on his levers, instead of having the main stump riveted into the bolt and the gatings in the levers as is the modern practice.

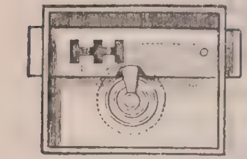

Fig. 6.

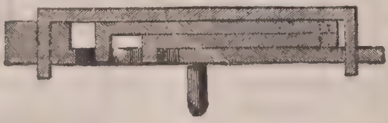

Fig. 7.

A lock operating on exactly the same principle but entirely different in construction (fig. 9) was invented by Joseph Bramah in 1784. It consists of an outer barrel *aaaa*, within which is a revolving barrel, *cccc*, held in place by a steel disk, *dd*, and provided with a pin *b* fixed eccentrically for operating the bolt; the barrel is prevented from turning by sheet metal sliders *ss*, which slide axially in radial grooves in the barrel and project into slots cut into the steel disk which is fastened to the case of the lock. Each slider has a gating cut in its outer edge sufficiently deep to allow it to embrace the inwardly projecting steel plate and turn on it with the barrel. The key is of tubular form having slots cut in its end, each of a depth corresponding to the position of the gating in one of the sliders; so that, on inserting the key, each slider is pushed in—against a spring—exactly far enough to bring its slot opposite the steel disk; in this position the barrel carrying the sliders is turned by the key and actuates the bolt.

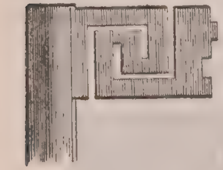

Fig. 8.

Up to 1851 it was generally believed that well-made lever locks of all types were practically unpickable, but at this time Alfred Charles Hobbs—an American—demonstrated, by picking the locks of Barron, Chubb, Bramah and others, that this belief was a fallacy. The method of Hobbs became widely known as the "tickling" or "tentative" method. In the modern lever lock the bolt carries a projecting piece—the "main stump"—which, when the levers are all raised to the proper height, enters the slots—"gatings"—in their faces. If, when the levers are not in this position, pressure is applied to the bolt, the main stump will press against the face of the levers; but owing to inaccuracies of workmanship and other causes the pressure will not be equal on all the levers. If now, the pressure on the bolt being maintained, each lever in turn is carefully raised a little, one will be found on which the pressure of the stump is greatest; this one is lifted till it becomes easy and then carefully lowered till it is sustained by the pressure of the stump in a new position. Another lever now bears the greatest pressure, and this in its turn is similarly treated. By this gradual or "tentative" process the levers will in time all be raised to the correct height and the bolt will slip back without, if sufficient care has been exercised, any of the levers having been raised above its correct position. Although this method of picking only became generally known in 1851, it is evident that it was not novel, since in 1817 one of Bramah's workmen, named Russell, invented the use of false notches or gatings, which were slots similar to the true gating but of small depth cut in the face of the levers. Similar false gatings were used in Anthony Radford Strutt's lock in 1819. The only possible object of these gatings—two of which are shown in each of the sliders of Bramah's lock—was to prevent the tentative method of picking. They are, however, not efficient for their purpose although they render the operation more difficult and tedious.

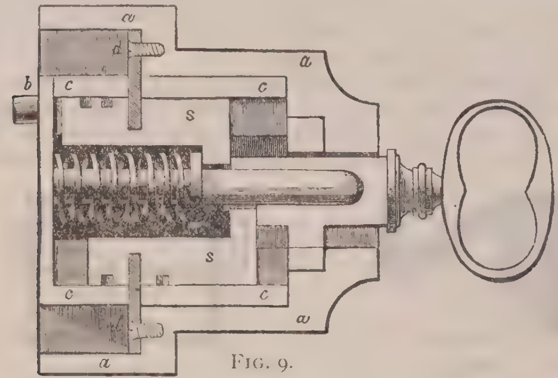

Fig. 9.

The best-known locks up to 1851 were those of Jeremiah Chubb, their popularity being due to their superior workmanship and probably still more to their title "detector." His lock, patented in 1818, contained a device intended to frustrate attempts at picking, and further to detect if such an attempt had been made. This device, at any rate as far as detecting was concerned, had been anticipated by the patent of Thomas Ruxton in 1816. Since the device only comes into operation when any lever is raised too high, it is not effective against a skilful application of the tentative method. The original form of this lock is shown in fig. 10, when the lever DT, which turns on a pin in the middle, is acted upon at its end T by a spring S, which will evidently allow some play to the lever on either side of the corner X; but the moment it is pushed past that point the spring will carry it farther in the same direction, like what is called in clock-work a jumper. In its proper position that end always remains above the turning-point; but, if any one of the tumblers is raised too high, the other end D of the detector, which reaches over all the levers, is lifted so far that the end T is sent down below the corner, and the tooth T then falls into a notch in the bolt, and so prevents it from being drawn back, even though all the levers are raised properly by the right key. It thus at once becomes obvious that somebody has been trying to pick the lock. The way to open it, then, is to turn the key the other way, as if to overlock the bolt; a short piece of gating near the end of the levers allows the bolt to advance just far enough to push the tooth of the detector up again by means of its inclination there, and then the lock can be opened as usual. To render the mechanism of locks more inaccessible for picking purposes, two devices, the "curtain" and the "barrel," were in use; these devices were simply the one a disk and the other a cylinder carrying a keyhole which revolved with the key and so closed the fixed keyhole in the case.

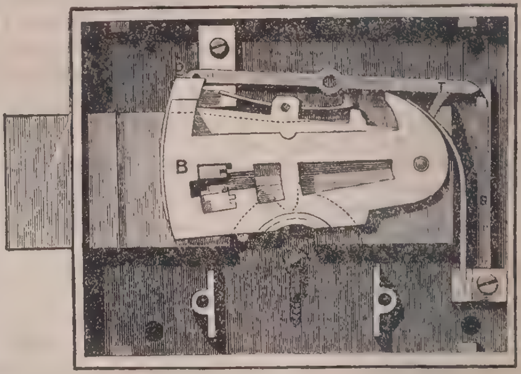

Fig. 10.

It is to Hobbs himself that we are indebted for the invention of the movable stump, since called the safety lever, the only device introduced rendering the tentative method of picking inoperative. This invention was incorporated in the "protector" locks of Hobbs, Hart & Co.; it consists in the employment of a movable main stump which is not riveted into the bolt as usual, but is set on the end *b* of a bent lever *abc* (fig. 11) which lies in a hollow of the bolt A behind it, turning on a pivot in the bolt itself, and kept steady by a small friction-spring *e*. The stump comes through a hole in the bolt large enough to let it have a little play; and the long end *a* of the lever stands just above the edge of a square pin *d*, which is fixed in the back plate of the lock. When the lock is locked, if the bolt be pushed back, no sensible pressure on the levers is produced, but only just enough to turn this protector lever, as Hobbs called it, on its pivot *c*, and so bring down its end *a* in front of the square pin, and then the bolt can no more be pushed back than when held by Chubb's detector. The protector is set free again by merely pushing the bolt forward with the key, without reference to the levers. However, the protector could be prevented from acting by a method used by the inventor himself for another purpose, viz., by pushing a piece of watch-spring through the keyhole, and up behind the bolt, so as to reach the protector at *a*, and keep it up while the bolt was pushed back, or, again, by pushing up the watch-spring between any two of the levers, and holding the end *b* of the protector with it, so as to press the stump against the levers. Both these devices, however, are prevented now by letting in a feather FF in a groove between the bolt and the back of the lock, which no watch-spring can pass, and also bringing a piece of the feather forward through the front gating of the levers just under the stump. In this form the lock is safe against any mode of picking known. A lock possessing valuable features was invented in 1852 by Sir Edmund Beckett—afterwards Lord Grimthorpe—but did not come into general use for commercial reasons.

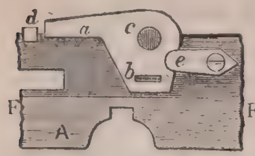

FIG. 11.

All the locks containing many levers so far described have a common defect in that the levers are moved in one direction by the key and in the other by springs. But it not infrequently happens that dirt or grease gets between the levers and causes two or more to stick together, in which case one of them is lifted too high and the bolt is prevented from operating. To overcome this difficulty locks, especially those intended for safes, have been made so that alternate levers move in opposite directions, the key having two bits on opposite sides. This construction entails that the key enter the body of the levers instead of passing below them, an arrangement that had previously been in use to reduce the space into which gunpowder could be packed through the keyhole.

Key locks.

The key locks chiefly used in English safes have been the ordinary lever lock with 6-8 or 10 levers, Chubb's "detector," Hobbs's "protector" or variants of these. In the Yale lock, which reverts in some degree to the idea of the ancient Egyptian lock, America has produced one key lock which has come into almost universal use in that country and is certainly worthy of note. The key of this lock, shown full size at *ka* in fig. 12, is remarkably small, being stamped from a piece of flat steel and weighing only a small fraction of an ounce. The barrel *abc* has to turn, as in the Bramah lock, in order to move the bolt, which is not shown in the figure. That may be done either as in Bramah locks or by a tongue or bit attached to the end *ab* of the barrel as in several other locks. The barrel is prevented from being turned, except by the proper key, thus. The (apparently) five plugs with spiral springs over them in fig. 12 are really all divided at the cross line *bc*, being all now lifted to the proper height by the key. Consequently the barrel *abc* can turn round, as there is no plug either projecting from it or projecting into it. But when the key is out, all the plugs are pushed down by the springs, and so the upper ones descend into the barrel and hold it fast. And again, if any of the steps of a false key are too high, some of the lower plugs will be pushed up beyond the barrel into the holes above them, and so the barrel cannot turn. The bevelled end of the key near *a* enables it to be pushed in under the plugs, though with some friction and resistance.

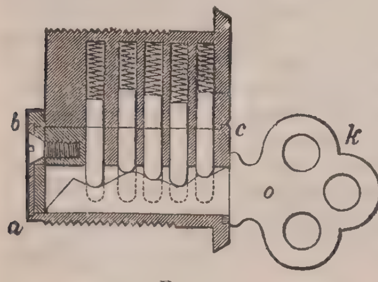

FIG. 12.

It is frequently convenient to have a number of different locks so arranged that, whilst each has its own individual key, yet one special or "master" key will operate any of the series. In warded locks this is done by "differing" the wards of the individual locks so that each key will only pass its own lock, and then filing away the bit of an extra key so that it will pass all the wards; the objection to this method is that any of the individual keys can easily be filed away and so form a master key. A better method, which meets this objection, consists in making all the levers except one—or if need be two—of each lock alike and cutting another gating or widening the gating in the differing levers, so as to pass the master key which has one—or two—special steps.

The growth of safe deposits has called for special locks so that when a box changes tenants the outgoing tenant's key shall be useless. In some cases the lock has been taken off and another substituted, but this is a clumsy makeshift now rarely employed, and has been superseded by the use of changeable key locks.

The first of these, invented by Robert Newell in 1841, was introduced into Great Britain from America by Hobbs in 1851. A simpler form, the construction of which is clearly shown by fig. 13, was brought out by Hobbs, Hart & Co. The bolt of this lock, instead of the ordinary main stump, carries a set of sliders, PPS, one corresponding to each lever and each carrying a projection S corresponding to a portion of the main stump. It will be seen that if any key having steps of certain lengths is inserted when the lock is unlocked and the bolt B thrown thereby, each slider will be raised to a height corresponding to that to which its lever is raised by the key, and the two fixed teeth CC will engage two of the teeth in the front of each slider, so that they will be held in place ready to enter the lever gatings when the same key is inserted.

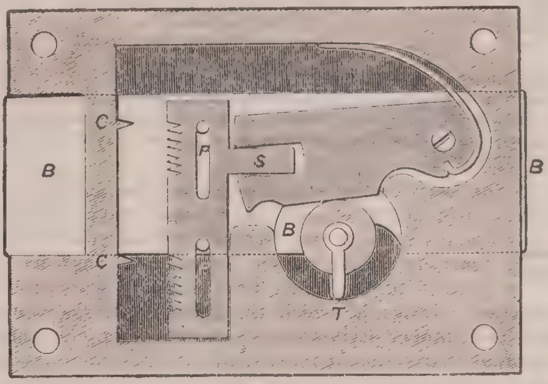

FIG. 13.

A changeable key lock introduced by the Chatwood Safe Co. has no gatings in the levers, whose fronts are cut with teeth gearing into similar teeth cut in a set of disks carrying the gatings. The disks are mounted on a stud which can be moved by a key from the back of the lock in such a way that while the main stump is in the gatings—keeping the disks in position—the disks are carried forward out of gear with the levers; the key can then be removed and another having steps of suitable length inserted and turned so as to raise the levers, the disks being then brought back into gear.

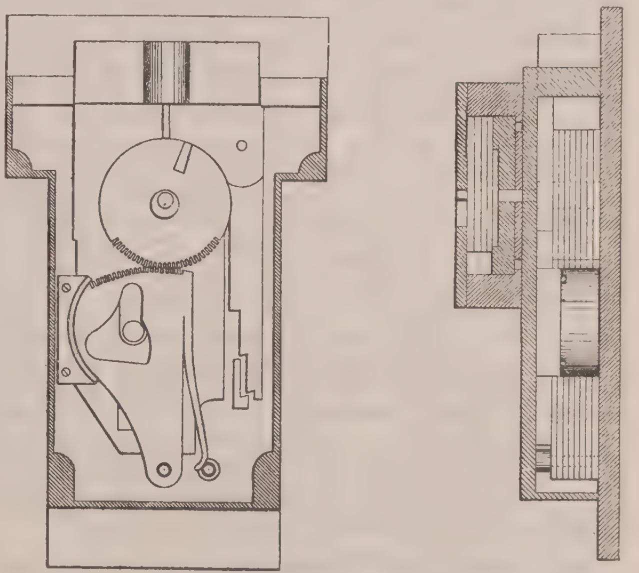

FIG. 14.

Both the above locks require that the key steps should have certain definite lengths corresponding to the teeth, but a later lock resembling to some extent that brought out by Hobbs, Hart & Co. has been introduced by the Chatwood Co., in which it is sufficient after unlocking the lock to file any of the key steps and so alter the pattern of the key in any way. In this lock, which is illustrated in fig. 14, unlike all those that have been described, the levers are not pivoted but slide upon guide stumps; the main stump is divided as in Hobbs Hart's lock, the various pieces being clamped together by a screw to form a solid stump. The sliders composing the main stump are not provided with teeth, the changing being effected as follows: when the bolt is partly shot by the correct key, the screw which binds the sliders together as it comes opposite an opening in the back of the case is loosened, the key is removed and altered—or a fresh key substituted—and is inserted so as to lift the levers to their correct height and expose the clamping screw at the back, which is then tightened. This lock is now commonly used for safe deposits, combined with a small lever lock of which the custodian carries the key, and which either blocks the bolt of the main lock or covers the keyhole.

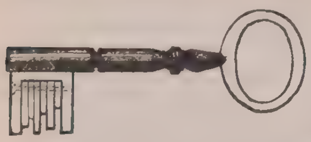
FIG. 15.

In connexion with changeable key locks requiring key steps of definite lengths, much ingenuity has been displayed in designing keys with movable bits or steps, as fig. 15, which are useful chiefly as duplicates, being built up to match the key from time to time in use, and then deposited in some bank or other secure place to be used in case of emergency.

Combination locks.

From the very earliest times secret devices, either to hide keyholes or to take the place of locks proper, have been in use; these are to-day only seriously represented by "combination" locks which, whilst following the same general principles as key locks, differ entirely in construction. Locks in which the arranging of the internal parts in their proper positions was secured by the manipulation of external parts marked with letters or numbers were common in China in very early times, but their history is unfortunately lost. This form of lock has been developed to a very high degree of perfection and is, for safes, in almost universal use to-day in America.

The American lock consists of a series of disks mounted upon one spindle, only one, however—the bolt disk—being fixed thereto, and provided each with a gating into which a stump connected with the bolt can drop when all the gatings lie upon a given line parallel to the axis of the spindle. Each disk is provided with a driving pin so arranged that it can impinge on and drive a similar pin in its next neighbour; the gating in the bolt disk and the portion of the stump which enters it are so formed that the disk can draw the bolt back. The spindle is provided on the outside with a knob and graduated disk—usually with 100 divisions—surrounded by an annulus on which a fixed position is denoted. Each disk, including the bolt disk, is provided with a pin projecting from its surface in such a way that the pin of one disk comes into contact with that of the next disk and drives it round. If, then, the bolt disk being at the back, there are three letter disks and the spindle is rotated to the left, the bolt disk will in the course of one revolution pick up letter disk No. 1—counting from the bolt disk—in the second revolution it will pick up No. 2, and in the third No. 3, the revolution being continued for part of a turn till the number corresponding to the correct position of No. 3 is reached. The revolution of the spindle is now reversed. The bolt disk leaves No. 1 in the first revolution and picks it up again, and the second revolution picks up No. 2. The motion is continued for part of a revolution till No. 2 is brought to the correct position (No. 3 obviously not being disturbed) and is then reversed. No. 1 is again left behind and picked up in the first revolution to the left, the motion being continued till the correct position of No. 1 is reached, when, on reversal, the gating in the bolt disk comes into the correct position, the stump falls and a continuance of the motion to the right draws back the bolt. A lock constructed in this way would be of little utility, as the combination would have to be determined once for all by the maker. The difficulty is got over by making the letter disks in two parts, the inner part carrying the driving pin and the outer the gating; these two parts are locked together by small cams or other devices which come into such a position that they can be released with the help of a square key when the lock is unlocked. The combination is set by altering the position of the inner disks with the driving pins in relation to the outer part carrying the gatings which are meanwhile held steady by the square key.

Time locks.

One advantage of the combination lock is that there is no key to be lost or stolen, but the means adopted by burglars, especially in America, are such that even this is not a perfect protection, cases having occurred in which a person has been compelled to disclose the combination. With key locks the keyhole through the safe door forms a distinct point of danger, and with combination locks the spindle passing through the door may be attacked by explosives. To obviate these two risks time locks were introduced in America and have been used in Europe. Essentially the time lock consists of a high-class chronometer or watch movement, little liable to get out of order, driving a disk provided with a gating such that the bolt can only enter the gating during certain hours; as a rule two, three or four chronometers are used, any one of which can release the lock.

The Yale time lock contains two chronometer movements which revolve two dial plates studded with twenty-four pins to represent the twenty-four hours of the day. These pins, when pushed in, form a track on which run rollers supporting the lever which secures the bolt or locking agency, but when they are drawn out the track is broken, the rollers fall down and the bolt is released. By pulling out the day pins, say from 9 till 4, the door is automatically prepared for opening between these hours, and at 4 it again of itself locks up. For keeping the repository closed over Sundays and holidays, a subsidiary segment or track is brought into play by which a period of twenty-four hours is added to the locked interval. Careful provision is made against the eventuality of running down or accidental stoppage of the clock motion, by which the rightful owner might be as seriously incommoded as the burglar. In the Yale lock, just before the chronometers run out, a trigger is released which depresses the lever by which the bolt is held in position. (A. B. CH.)

LOCKE, JOHN (1632–1704), English philosopher, was born at Wrington, 10 m. W. of Belluton, in Somersetshire, on the 29th of August 1632, six years after the death of Bacon, and three months before the birth of Spinoza. His father was a small landowner and attorney at Pensford, near the northern boundary of the county, to which neighbourhood the family had migrated from Dorsetshire early in that century. The elder Locke, a strict but genial Puritan, by whom the son was carefully educated at home, was engaged in the military service of the parliamentary party. "From the time that I knew anything," Locke wrote in 1660, "I found myself in a storm, which has continued to this time." For fourteen years his education, more or less interrupted, went on in the rural home at Belluton, on his father's little estate, half a mile from Pensford, and 6 m. from Bristol. In 1646 he entered Westminster School and remained there for six years. Westminster was uncongenial to him. Its memories perhaps encouraged the bias against public schools which afterwards disturbed his philosophic calm in his *Thoughts on Education.* In 1652 he entered Christ Church, Oxford, then under John Owen, the Puritan dean and vice-chancellor of the university. Christ Church was Locke's occasional home for thirty years. For some years after he entered, Oxford was ruled by the Independents, who, largely through Owen, unlike the Presbyterians, were among the first in England to advocate genuine religious toleration. But Locke's hereditary sympathy with the Puritans was gradually lessened by the intolerance of the Presbyterians and the fanaticism of the Independents. He had found in his youth, he says, that "what was called general freedom was general bondage, and that the popular assertors of liberty were the greatest engrossers of it too, and not unfitly called its *keepers.*" And the influence of the liberal divines of the Church of England afterwards showed itself in his spiritual development.

Under Owen scholastic studies were maintained with a formality and dogmatism unsuited to Locke's free inquisitive temper. The aversion to them which he expressed showed thus early an innate disposition to rebel against empty verbal reasoning. He was not, according to his own account of himself to Lady Masham, a hard student at first. He sought the company of pleasant and witty men, and thus gained knowledge of life. He took the ordinary bachelor's degree in 1656, and the master's in 1658. In December 1660 he was serving as tutor of Christ Church, lecturing in Greek, rhetoric and philosophy.

At Oxford Locke was nevertheless within reach of liberal intellectual influence tending to promote self-education and strong individuality. The metaphysical works of Descartes had appeared a few years before he went to Oxford, and the *Human Nature* and *Leviathan* of Hobbes during his undergraduate years. It does not seem that Locke read extensively, but he was attracted by Descartes. The first books, he told Lady Masham, which gave him a relish for philosophy, were those of this philosopher, although he very often differed from him. At the Restoration potent influences were drawing Oxford and England into experimental inquiries. Experiment in physics became the fashion. The Royal Society was then founded, and we find Locke experimenting in chemistry in 1663, also in meteorology, in which he was particularly interested all his life.

The restraints of a professional career were not suited to Locke. There is a surmise that early in his Oxford career he contemplated taking orders in the Church of England. His religious disposition attracted him to theology. Revulsion from the dogmatic temper of the Presbyterians, and the unreasoning enthusiasm of the Independents favoured sympathy afterwards with Cambridge Platonists and other liberal Anglican churchmen. Whichcote was his favourite preacher, and close intimacy with the Cudworth family cheered his later years. But, though he has a place among lay theologians, dread of ecclesiastical impediment to free inquiry, added to strong inclination for scientific investigation, made him look to medicine as his profession, and before 1666 we find him practising as a physician in Oxford. Nevertheless, although known among his friends as "Doctor Locke," he never graduated in medicine. His health was uncertain, for he suffered through life from chronic consumption and asthma. A fortunate event soon withdrew him from the medical profession.

Locke early showed an inclination to politics, as well as to theology and medicine. As early as 1665 he diverged for a short time from medical pursuits at Oxford, and was engaged as secretary to Sir Walter Vane on his mission to the Elector of Brandenburg. Soon after his return in 1666 the incident occurred which determined his career. Lord Ashley, afterwards first earl of Shaftesbury, had come to Oxford for his health. Locke was introduced to him by his physician, Dr Thomas. This was the beginning of a lasting friendship, sustained by common sympathy with liberty—civil, religious and philosophical. In 1667 Locke moved from Christ Church to Exeter House, Lord Ashley's London residence, to become his confidential secretary. Although he retained his studentship at Christ Church, and occasionally visited Oxford, as well as his patrimony at Belluton, he found a home and shared fortune with Shaftesbury for fifteen years.

Locke's commonplace books throw welcome light on the history of his mind in early life. A paper on the "Roman Commonwealth" which belongs to this period, expresses convictions about religious liberty and the relations of religion to the state that were modified and deepened afterwards; objections to the sacerdotal conception of Christianity appear in another article; short work is made of ecclesiastical claims to infallibility in the interpretation of Scripture in a third; a scheme of utilitarian ethics, wider than that of Hobbes, is suggested in a fourth. The most significant of those early revelations is the *Essay concerning Toleration* (1666), which anticipates conclusions more fully argued nearly thirty years later.

The Shaftesbury connexion must have helped to save Locke from those idols of the "Den" to which professional life and narrow experience is exposed. It brought him into contact with public men, the springs of political action and the duties of high office. The place he held as Shaftesbury's adviser is indeed the outstanding circumstance in his middle life. Exeter House afforded every opportunity for society. He became intimate among others with the illustrious Sydenham; he joined the Royal Society and served on its council. The foundation of the monumental work of his life was laid when he was at Exeter House. He was led to it in this way. It was his habit to encourage informal reunions of his intimates, to discuss debatable questions in science and theology. One of these, in the winter of 1670, is historically memorable. "Five or six friends," he says, met in his rooms and were discussing "principles of morality and religion. They found themselves quickly at a stand by the difficulties that arose on every side." Locke proposed some criticism of the necessary "limits of human understanding" as likely to open a way out of their difficulties. He undertook to attempt this, and fancied that what he had to say might find sufficient space on "one sheet of paper." What was thus "begun by chance, was continued by entreaty, written by incoherent parcels, and after long intervals of neglect resumed again as humour and occasions permitted." At the end of nearly twenty years the issue was given to the world as Locke's now famous *Essay Concerning Human Understanding*.

The fall of Shaftesbury in 1675 enabled Locke to escape from English politics. He found a retreat in France, where he could unite calm reflection upon the legitimate operations of "human understanding" with attention to his health. He spent three years partly at Montpellier and partly in Paris. His journals and commonplace books in these years show the *Essay* in preparation. At Paris he met men of science and letters—Peter Guenellon, the well-known Amsterdam physician; Ole Römer, the Danish astronomer; Thoynard, the critic; Melchisédech Thévenot, the traveller; Henri Justel, the jurist; and François Bernier, the expositor of Gassendi. But there is no mention of Malebranche, whose *Recherche de la vérité* had appeared three years before, nor of Arnauld, the illustrious rival of Malebranche.

Locke returned to London in 1679. Reaction against the court party had restored Shaftesbury to power. Locke resumed his old confidential relations, now at Thanet House in Aldersgate. A period of often interrupted leisure for study followed. It was a time of plots and counterplots, when England seemed on the brink of another civil war. In the end Shaftesbury was committed to the Tower, tried and acquitted. More insurrectionary plots followed in the summer of 1682, after which, suspected at home, the versatile statesman escaped to Holland, and died at Amsterdam in January 1683. In these two years Locke was much at Oxford and in Somerset, for the later movements of Shaftesbury did not commend themselves to him. Yet the government had their eyes upon him. "John Locke lives a very cunning unintelligible life here," Prideaux reported from Oxford in 1682. "I may confidently affirm," wrote John Fell, the dean of Christ Church, to Lord Sunderland, "there is not any one in the college who has heard him speak a word against, or so much as censuring, the government; and, although very frequently, both in public and private, discourses have been purposely introduced to the disparagement of his master, the earl of Shaftesbury, he could never be provoked to take any notice, or discover in word or look the least concern; so that I believe there is not in the world such a master of taciturnity and passion." Unpublished correspondence with his Somerset friend, Edward Clarke of Chipley, describes Locke's life in those troubled years. It also reveals the opening of his intimate intercourse with the Cudworth family, who were friends of the Clarkes, and connected by birth with Somerset. The letters allude to toleration in the state and comprehension in the church, while they show an indifference to theological dogma hardly consistent with an exclusive connexion with any sect.

In his fifty-second year, in the gloomy autumn of 1683, Locke retired to Holland, then the asylum of eminent persons who were elsewhere denied liberty of thought. Descartes and Spinoza had speculated there; it had been the home of Erasmus and Grotius; it was now the refuge of Bayle. Locke spent more than five years there; but his (unpublished) letters show that exile sat heavily upon him. Amsterdam was his first Dutch home, where he lived in the house of Dr Keen, under the assumed name of Dr Van der Linden. For a time he was in danger of arrest at the instance of the English government. After months of concealment he escaped; but he was deprived of his studentship at Christ Church by order of the king, and Oxford was thus closed against him. Holland introduced him to new friends. The chief of these was Limborch, the successor of Episcopius as Remonstrant professor of theology, lucid, learned and tolerant, the friend of Cudworth, Whichcote and More. By Limborch he was introduced to Le Clerc, the youthful representative of letters and philosophy in Limborch's college, who had escaped from Geneva and Calvinism to the milder atmosphere of Holland and the Remonstrants. The *Bibliothèque universelle* of Le Clerc was then the chief organ in Europe of men of letters. Locke contributed several articles. It was his first appearance as an author, although he was now fifty-four years of age. This tardiness in authorship is a significant fact in his life, in harmony with his tempered wisdom.

In the next fourteen years the world received through his books the thoughts which had been gradually forming, and were taking final shape while he was in Holland. The *Essay* was finished there, and a French epitome appeared in 1688 in Le

Clerc's journal, the forecast of the larger work. Locke was then at Rotterdam, where he lived for a year in the house of a Quaker friend, Benjamin Furley, or Furly, a wealthy merchant and lover of books. At Rotterdam he was a confidant of political exiles, including Burnet and the famous earl of Peterborough, and he became known to William, prince of Orange. William landed in England in November 1688; Locke followed in February 1689, in the ship which carried the princess Mary.

After his return to England in 1689 Locke emerged through authorship into European fame. Within a month after he reached London he had declined an offer of the embassy to Brandenburg, and accepted the modest office of commissioner of appeals. The two following years, during which he lived at Dorset Court in London, were memorable for the publication of his two chief works on social polity, and of the epoch-making book on modern philosophy which reveals the main principles of his life. The earliest of these to appear was his defence of religious liberty, in the *Epistola de Tolerantia*, addressed to Limborch, published at Gouda in the spring of 1689, and translated into English in autumn by William Popple, a Unitarian merchant in London. *Two Treatises on Government*, in defence of the right of ultimate sovereignty in the people, followed a few months later. The famous *Essay concerning Human Understanding* saw the light in the spring of 1690. He received £30 for the copyright, nearly the same as Kant got in 1781 for his *Kritik der reinen Vernunft*. In the *Essay* Locke was the critic of the empirical data of human experience: Kant, as the critic of the intellectual and moral presuppositions of experience, supplied the complement to the incomplete and ambiguous answer to its own leading question that was given in Locke's *Essay*. The *Essay* was the first book in which its author's name appeared, for the *Epistola de Tolerantia* and the *Treatises on Government* were anonymous.

Locke's asthma was aggravated by the air of London; and the course of public affairs disappointed him, for the settlement at the Revolution fell short of his ideal. In spring, 1691, he took up his residence in the manor house of Otes in Essex, the country seat of Sir Francis Masham, between Ongar and Harlow. Lady Masham was the accomplished daughter of Ralph Cudworth, and was his friend before he went to Holland. She told Le Clerc that after Locke's return from exile, " by some considerably long visits, he had made trial of the air of Otes, which is some 20 m. from London, and he thought that none would be so suitable for him. His company," she adds, " could not but be very desirable for us, and he had all the assurances we could give him of being always welcome; but, to make him easy in living with us, it was necessary he should do so on his own terms, which Sir Francis at last assenting to, he then believed himself at home with us, and resolved, if it pleased God, here to end his days as he did." At Otes he enjoyed for fourteen years as much domestic peace and literary leisure as was consistent with broken health, and sometimes anxious visits to London on public affairs, in which he was still an active adviser. Otes was in every way his home. In his letters and otherwise we have pleasant pictures of its inmates and domestic life and the occasional visits of his friends, among others Lord Peterborough, Lord Shaftesbury of the *Characteristics*, Sir Isaac Newton, William Molyneux and Anthony Collins.

At Otes he was busy with his pen. The *Letter on Toleration* involved him in controversy. An *Answer* by Jonas Proast of Queen's College, Oxford, had drawn forth in 1690 a *Second Letter*. A rejoinder in 1691 was followed by Locke's elaborate *Third Letter on Toleration* in the summer of the following year. In 1691 currency and finance were much in his thoughts, and in the following year he addressed an important letter to Sir John Somers on the *Consequences of the Lowering of Interest and Raising the Value of Money*. When he was in Holland he had written letters to his friend Clarke of Chipley about the education of his children. These letters formed the substance of the little volume entitled *Thoughts on Education* (1693), which still holds its place among classics in that department. Nor were the " principles of revealed religion " forgotten. The subtle theological controversies of the 17th century made him anxious to show how simple after all fundamental Christianity is. In the *Reasonableness of Christianity as delivered in the Scriptures* (anonymous, 1695), Locke sought to separate the divine essence of Christ's religion from later accretions of dogma, and from reasonings due to oversight of the necessary limits of human thought. This intended Eirenicon involved him in controversies that lasted for years. Angry polemics assailed the book. A certain John Edwards was conspicuous. Locke's *Vindication*, followed by a *Second Vindication* in 1697, added fuel to this fire. Above all, the great *Essay* was assailed and often misinterpreted by philosophers and divines. Notes of opposition had been heard almost as soon as it appeared. John Norris, the metaphysical rector of Bemerton and English disciple of Malebranche, criticized it in 1690. Locke took no notice at the time, but his second winter at Otes was partly employed in *An Examination of Malebranche's Opinion of Seeing all Things in God*, and in *Remarks upon some of Mr Norris's Books*, tracts which throw light upon his own ambiguous theory of perception through the senses. These were published after his death. A second edition of the *Essay*, with a chapter added on " Personal Identity," and numerous alterations in the chapter on " Power," appeared in 1694. The third, which was only a reprint, was published in 1695. Wynne's well-known abridgment helped to make the book known in Oxford, and his friend William Molyneux introduced it in Dublin. In 1695 a revival of controversy about the currency diverted Locke's attention. Events in that year occasioned his *Observations on Silver Money* and *Further Considerations on Raising the Value of Money*.

In 1696 Locke was induced to accept a commissionership on the Board of Trade. This required frequent visits to London. Meantime the *Essay on Human Understanding* and the *Reasonableness of Christianity* were becoming more involved in a wordy warfare between dogmatists and latitudinarians, trinitarians and unitarians. The controversy with Edwards was followed by a more memorable one with Stillingfleet, bishop of Worcester. John Toland, in his *Christianity not Mysterious*, had exaggerated doctrines in the *Essay*, and then adopted them as his own. In the autumn of 1696, Stillingfleet, an argumentative ecclesiastic more than a religious philosopher, in his *Vindication of the Doctrine of the Trinity*, charged Locke with disallowing mystery in human knowledge, especially in his account of the metaphysical idea of " substance. " Locke replied in January 1697. Stillingfleet's rejoinder appeared in May, followed by a *Second Letter* from Locke in August, to which the bishop replied in the following year. Locke's *Third Letter*, in which the ramifications of this controversy are pursued with a copious expenditure of acute reasoning and polished irony, was delayed till 1699, in which year Stillingfleet died. Other critics of the *Essay* entered the lists. One of the ablest was John Sergeant, a priest of the Roman Church, in *Solid Philosophy Asserted Against the Fancies of the Ideists* (1697). He was followed by Thomas Burnet and Dean Sherlock. Henry Lee, rector of Tichmarch, criticized the *Essay*, chapter by chapter in a folio volume entitled *Anti-Scepticism* (1702); John Broughton dealt another blow in his *Psychologia* (1703); and John Norris returned to the attack, in his *Theory of the Ideal or Intelligible World* (1701–1704). On the other hand Locke was defended with vigour by Samuel Bolde, a Dorsetshire clergyman. The *Essay* itself was meanwhile spreading over Europe, impelled by the name of its author as the chief philosophical defender of civil and religious liberty. The fourth edition (the last while Locke was alive) appeared in 1700, with important additional chapters on " Association of Ideas " and " Enthusiasm." What was originally meant to form another chapter was withheld. It appeared among Locke's posthumous writings as *The Conduct of the Understanding*, one of the most characteristic of his works. The French translation of the *Essay* by Pierre Coste, Locke's amanuensis at Otes, was issued almost simultaneously with the fourth edition. The Latin version by Richard Burridge of Dublin followed a year after, reprinted in due time at Amsterdam and at Leipzig.

In 1700 Locke resigned his commission at the Board of Trade, and devoted himself to Biblical studies and religious meditation. The Gospels had been carefully studied when he was preparing his *Reasonableness of Christianity*. He now turned to the Epistles of St Paul, and applied the spirit of the *Essay* and the ordinary rules of critical interpretation to a literature which he venerated as infallible, like the pious Puritans who surrounded his youth. The work was ready when he died, and was published two years after. A tract on *Miracles*, written in 1702, also appeared posthumously. Fresh adverse criticism of the *Essay* was reported to him in his last year, and the book was formally condemned by the authorities at Oxford. "I take what has been done rather as a recommendation of the book," he wrote to his young friend Anthony Collins, "and when you and I next meet we shall be merry on the subject." One attack only moved him. In 1704 his adversary, Jonas Proast, revived their old controversy. Locke in consequence began a *Fourth Letter on Toleration*. A few pages, ending in an unfinished paragraph, exhausted his remaining strength; but the theme which had employed him at Oxford more than forty years before, and had been a ruling idea throughout the long interval, was still dominant in the last days of his life.

All the summer of 1704 he continued to decline, tenderly nursed by Lady Masham and her step-daughter Esther. On the 28th of October he died, according to his last recorded words, "in perfect charity with all men, and in sincere communion with the whole church of Christ, by whatever names Christ's followers call themselves." His grave is on the south side of the parish church of High Laver, in which he often worshipped, near the tombs of the Mashams, and of Damaris, the widow of Cudworth. At the distance of 1 m. are the garden and park where the manor house of Otes once stood.

Locke's writings have made his intellectual and moral features familiar. The reasonableness of taking probability as our guide in life was in the essence of his philosophy. The desire to see for himself what is true in the light of reasonable evidence, and that others should do the same, was his ruling passion, if the term can be applied to one so calm and judicial. "I can no more know anything by another man's understanding," he would say, "than I can see by another man's eyes." This repugnance to believe blindly what rested on arbitrary authority, as distinguished from what was seen to be sustained by self-evident reason, or by demonstration, or by good probable evidence, runs through his life. He is typically English in his reverence for facts, whether facts of sense or of living consciousness, in his aversion from abstract speculation and verbal reasoning, in his suspicion of mysticism, in his calm reasonableness, and in his ready submission to truth, even when truth was incapable of being fully reduced to system by man. The delight he took in exercising reason in regard to everything he did was what his friend Pierre Coste remarked in Locke's daily life at Otes. "He went about the most trifling things always with some good reason. Above all things he loved order; and he had got the way of observing it in everything with wonderful exactness. As he always kept the useful in his eye in all his disquisitions, he esteemed the employments of men only in proportion to the good they were capable of producing; for which cause he had no great value for the critics who waste their lives in composing words and phrases in coming to the choice of a various reading, in a passage that has after all nothing important in it. He cared yet less for those professed disputants, who, being taken up with the desire of coming off with victory, justify themselves behind the ambiguity of a word, to give their adversaries the more trouble. And whenever he had to deal with this sort of folks, if he did not beforehand take a strong resolution of keeping his temper, he quickly fell into a passion; for he was naturally choleric, but his anger never lasted long. If he retained any resentment it was against himself, for having given way to so ridiculous a passion; which, as he used to say, "may do a great deal of harm, but never yet did anyone the least good." Large, "round-about" common sense, intellectual strength directed by a virtuous purpose, not subtle or daring speculation sustained by an idealizing faculty, in which he was deficient, is what we find in Locke. Defect in speculative imagination appears when he encounters the vast and complex final problem of the universe in its organic unity.

Locke is apt to be forgotten now, because in his own generation he so well discharged the intellectual mission of initiating criticism of human knowledge, and of diffusing the spirit of free inquiry and universal toleration which has since profoundly affected the civilized world. He has not bequeathed an imposing system, hardly even a striking discovery in metaphysics, but he is a signal example in the Anglo-Saxon world of the love of attainable truth for the sake of truth and goodness. "If Locke made few discoveries, Socrates made none." But both are memorable in the record of human progress.

In the inscription on his tomb, prepared by himself, Locke refers to his books as a true representation of what he was. They are concerned with *Social Economy*, *Christianity*, *Education* and *Philosophy*, besides *Miscellaneous* writings.

I. SOCIAL ECONOMY.—(1) *Epistola de Tolerantia* (1689, translated into English in the same year). (2) *Two Treatises on Government* (1690) (the *Patriarcha* of Filmer, to which the *First Treatise* was a reply, appeared in 1680). (3) *A Second Letter concerning Toleration* (1690). (4) *Some Considerations on the Consequence of Lowering the Rate of Interest and Raising the Value of Money* (1691). (5) *A Third Letter for Toleration* (1692). (6) *Short Observations on a printed paper entitled, "For encouraging the Coining of Silver Money in England, and after for Keeping it here"* (1695). (7) *Further Considerations concerning Raising the Value of Money* (1695) (occasioned by a *Report* containing an "Essay for the Amendment of Silver Coins," published that year by William Lowndes, secretary for the Treasury). (8) *A Fourth Letter for Toleration* (1706, posthumous).

II. CHRISTIANITY.—(1) *The Reasonableness of Christianity as delivered in the Scriptures* (1695). (2) *A Vindication of the Reasonableness of Christianity from Mr Edwards's Reflections* (1695). (3) *A Second Vindication of the Reasonableness of Christianity* (1697). (4) *A Paraphrase and Notes on the Epistles of St Paul to the Galatians, First and Second Corinthians, Romans and Ephesians. To which is prefixed an Essay for the understanding of St Paul's Epistles by consulting St Paul himself* (1705–1707, posthumous). (5) *A Discourse of Miracles* (1716, posthumous).

III. EDUCATION.—(1) *Some Thoughts concerning Education* (1693). (2) *The Conduct of the Understanding* (1706, posthumous). (3) *Some Thoughts concerning Reading and Study for a Gentleman* (1706, posthumous). (4) *Instructions for the Conduct of a Young Gentleman* (1706, posthumous). (5) *Of Study* (written in France in Locke's journal, and published in L. King's *Life of Locke* in 1830).

IV. PHILOSOPHY.—(1) *An Essay concerning Human Understanding*, in four books (1690). (2) *A Letter to the Bishop of Worcester concerning some passages relating to Mr Locke's Essay of Human Understanding in a late Discourse of his Lordship's in Vindication of the Trinity* (1697). (3) *Mr Locke's Reply to the Bishop of Worcester's Answer to his Letter* (1697). (4) *Mr Locke's Reply to the Bishop of Worcester's Answer to his Second Letter* (1699). (5) *An Examination of Father Malebranche's Opinion of Seeing all Things in God* (1706, posthumous). (6) *Remarks upon Some of Mr Norris's Books, wherein he asserts Father Malebranche's Opinion of Seeing all Things in God* (1720, posthumous).

MISCELLANEOUS.—(1) *A New Method of a Common Place Book* (1686). This was Locke's first article in the *Bibliothèque* of Le Clerc; his other contributions to it are uncertain, except the *Epitome of the Essay*, in 1688). (2) *The Fundamental Constitutions of Carolina* (prepared in 1673 when Locke was Lord Shaftesbury's secretary at Exeter House, remarkable for recognition of the principle of toleration, published in 1706, in the posthumous collection). (3) *Memoirs relating to the Life of Anthony, First Earl of Shaftesbury* (1706). (4) *Elements of Natural Philosophy* (1706). (5) *Observations upon the Growth and Culture of Vines and Olives* (1706). (6) *Rules of a Society which met once a Week, for their improvement in Useful Knowledge, and for the Promotion of Truth and Christian Charity* (1706). (7) *A Letter from a Person of Quality to his Friend in the Country*, published in 1875 (included by Des Maizeaux in his *Collection of Several Pieces of Mr John Locke's*, 1720), and soon afterwards burned by the common hangman by orders from the House of Lords, was disavowed by Locke himself. It may have been dictated by Shaftesbury. There are also miscellaneous writings of Locke first published in the biographies of Lord King (1830) and of Mr Fox Bourne (1876).

Letters from Locke to Thoynard, Limborch, Le Clerc, Guenellon, Molyneux, Collins, Sir Isaac Newton, the first and the third Lord Shaftesbury, Lords Peterborough and Pembroke, Clarke of Chipley and others are preserved, many of them unpublished, most of them in the keeping of Lord Lovelace at Horseley Towers, and of Mr Sanford at Nynehead in Somerset, or in the British Museum. They express the gracious courtesy and playful humour which were natural to him, and his varied interests in human life.

I. *Social Economy.*—It has been truly said that all Locke's writings, even the *Essay on Human Understanding* itself, were occasional, and "intended directly to counteract the enemies of reason and freedom in his own age." This appears in his works on social polity, written at a time when the principles of democracy and toleration were struggling with divine right of kings, and when "the popular assertors of public liberty were the greatest engrossers of it too." "The state" with Locke was the deliberate outcome of free contract rather than a natural growth or organism. That the people, in the exercise of their sovereignty, have the right to govern themselves in the way they judge to be for the common good; and that civil government, whatever form it assumes, has no right to interfere with religious beliefs that are not inconsistent with civil society, is at the foundation of his political philosophy. He rested this sovereignty on virtual mutual contract on the part of the people themselves to be so governed. But the terms of the contract might be modified by the sovereign people themselves, from time to time, in accommodation to changing circumstances. He saw that things in this world were in a constant flux, so that no society could remain long in the same state, and that "the grossest absurdities" must be the issue of "following custom when reason has left the custom." He was always disposed to liberal ecclesiastical concessions for the sake of peace, and he recommended harmonious co-operation with the civil magistrate in all matters of worship and government that were not expressly determined by Scripture.

The social contract.

The attack on Sir Robert Filmer in Locke's *First Treatise on Government* was an anachronism. The democratic principle argued for in the *Second Treatise*, while in advance of the practice of his age, was in parts anticipated by Aquinas and Bodin, as well as by Grotius and Hooker. Its guiding principle is, that civil rulers hold their power not absolutely but conditionally, government being essentially a moral trust, forfeited if the conditions are not fulfilled by the trustees. This presupposes an original and necessary law of nature or reason, as insisted on by Hooker. But it points to the constitution of civil society in the abstract rather than to the actual origin of government as a matter of fact and past history. There is no historical proof that power was formally entrusted to rulers by the conscious and deliberate action of the ruled. Indeed Locke seems to allow that the consent was at first tacit, and by anterior law of nature conditional on the beneficial purpose of the trust being realized. His *Treatises on Government* were meant to vindicate the Convention parliament and the English revolution, as well as to refute the ideas of absolute monarchy held by Hobbes and Filmer. They are classics in the library of English constitutional law and polity.

Religious Toleration.

Locke's philosophical defence of religious liberty in the four *Letters of Toleration* is the most far-reaching of his contributions to social polity. He had a more modest estimate of human resources for forming true judgments in religion, and a less pronounced opinion of the immorality of religious error, than either the Catholic or the Puritan. The toleration which he spent his life in arguing for involved a change from the authoritative and absolute to the relative point of view, as regards man's means of knowledge and belief. It was a protest against those who in theology "peremptorily require demonstration and demand certainty where probability only is to be had." The practice of universal toleration amidst increasing religious differences was an application of the conception of human understanding which governs his *Essay*. Once a paradox it is now commonplace, and the superabundant argument in the *Letters on Toleration* fatigues the modern reader. The change is due more to Locke himself than to anyone else. Free thought and liberty of conscience had indeed been pleaded for, on various grounds, in the century in which he lived. Chillingworth, Jeremy Taylor, Glanvill and other philosophical thinkers in the Church of England urged toleration in the state, in conjunction with wide comprehension in the church, on the ground of our necessary intellectual limitation and inability to reach demonstration in theological debates. Puritans like Owen and Goodwin, whose idea of ecclesiastical comprehension was dogmatic and narrow, were ready to accept sectarian variety, because it was their duty to allow many religions in the nation, but only one form of theology within their own sect. The existence of separate nationalities, on the other hand, was the justification of national churches according to the latitudinarian churchmen with whom Locke associated: a national church comprehensive in creed, and thus co-extensive with the nation was their ideal. Locke went far to unite in a higher principle elements in the broad Anglican and the Puritan theories, while he recognized the individual liberty of thought which distinguishes the national church of England. A constant sense of the limits of human understanding was at the bottom of his arguments for tolerance. He had no objection to a national establishment of religion, provided that it was comprehensive enough, and was really the nation organized to promote goodness; not to protect the metaphysical subtleties of sectarian theologians. The recall of the national religion to the simplicity of the gospels would, he hoped, make toleration of nonconformists unnecessary, as few would then remain. To the atheist alone Locke refuses full toleration, on the ground that social obligation can have no hold over him, for "the taking away of God dissolves all." He argued, too, against full toleration of the Church of Rome in England, on the ground of its unnational allegiance to a foreign sovereign. The unfitness of persecution as a means of propagating truth is copiously insisted on by Locke. Persecution can only transform a man into a hypocrite; belief is legitimately formed only by discernment of sufficient evidence; apart from evidence, a man has no right to control the understanding; he cannot determine arbitrarily what his neighbours must believe. Thus Locke's pleas for religious toleration resolve at last into his philosophical view of the foundation and limits of human knowledge.

II. *The Reasonableness of Christianity.*—The principles that governed Locke's social polity largely determined his attitude to Christianity. His "latitudinarianism" was the result of extraordinary reverence for truth, and a perception that knowledge may be sufficient for the purposes of human life while it falls infinitely short of speculative completeness. He never loses sight of essential reasonableness as the only ground on which Christian faith can ultimately rest. But Locke accepted Holy Scripture as infallible with the reverence of a Puritan. "It has God for its author, salvation for its end, and truth without any mixture of error for its matter." Yet he did not, like many Puritans, mean Scripture as interpreted by himself or by his sect. And faith in its infallibility was combined in Locke with deep distrust in "enthusiasm." This predisposed him to regard physical miracles as the solid criterion for distinguishing reasonable religious conviction from "inclinations, fancies and strong assurances." Assent in religion as in everything else he could justify only on the ground of its harmony with reason; professed "illumination without search, and certainty without proof" was to him a sign of absence of the divine spirit in the professor. Confidence that we are right, he would say, is in itself no proof that we are right: when God asks assent to the truth of a proposition in religion, he either shows us its intrinsic rationality by ordinary means, or he offers miraculous proof of the reality of which we need reasonable evidence. But we must know what we mean by miracle. Reasonableness, in short, must always at last be our guide. His own faith in Christianity rested on its moral excellence when it is received in its primitive simplicity, combined with the miracles which accompanied its original promulgation. But "even for those books which have the attestation of miracles to confirm their being from God, the miracles," he says, "are to be judged by the doctrine, and not the doctrine by the miracles." Miracles alone cannot vindicate the divinity of immoral doctrine. Locke's *Reasonableness of Christianity* was an attempt to recall religion from the crude speculations of theological sects, destructive of peace among Christians, to its original simplicity; but this is apt to conceal its transcendent mystery. Those who practically acknowledge the supremacy of Jesus as Messiah accept all that is essential to the Christianity of Locke. His own Christian belief, sincere and earnest, was more the outcome of the common sense which, largely through him, moulded the prudential theology of England in the 18th century, than of the nobler elements present in More, Cudworth and other religious thinkers of the preceding age, or afterwards in Law and Berkeley, Coleridge and Schleiermacher.

III. *Education.*—Locke has his place among classic writers on the theory and art of Education. His contribution may be taken as either an introduction to or an application of the *Essay on Human Understanding*. In the *Thoughts on Education* imaginative sentiment is never allowed to weigh against utility; information is subordinate to the formation of useful character; the part which habit plays in individuals is always kept in view; the dependence of intelligence and character, which it is the purpose of education to improve, upon health of body is steadily inculcated; to make children happy in undergoing education is a favourite precept; accumulating facts without exercising thought, and without accustoming the youthful mind to look for evidence, is always referred to as a cardinal vice. Wisdom more than much learning is what he requires in the teacher. In instruction he gives the first place to "that which may direct us to heaven," and the second to "the study of prudence, or discreet conduct, and management of ourselves in the several occurrences of our lives, which most assists our quiet prosperous passage through this present life." The infinity of real existence, in contrast with the necessary finitude of human understanding and experience, is always in his thoughts. This "disproportionateness" between the human mind and the universe of reality imposes deliberation in the selection of studies, and disregard for those which lie out of the way of a wise man. Knowledge of what other men have thought is perhaps of too little account with Locke. "It is an idle and useless thing to make it one's business to study what have been other men's sentiments in matters where only reason is to be judge." In his *Conduct of the Understanding* the pupil is invited to occupy the point at which "a full view of all that relates to a question" is to be had, and at which alone a rational discernment of truth is possible. The uneducated mass of mankind, he complains, either "seldom reason at all," or "put passion in the place of reason," or "for want of large, sound, round-about sense" they direct their minds only to one part of the evidence, "converse with one sort of men, read but one sort of books, and will not come in the hearing of but one sort of notions, and so carve out to themselves a little Goshen in the intellectual world, where light shines, and, as they conclude, day blesses them; but the rest of the vast expansion they give up to night and darkness, and avoid coming near it." Hasty judgment, bias, absence of an a priori "indifference" to what the evidence may in the end require us to conclude, undue regard for authority, excessive love for custom and antiquity, indolence and sceptical despair are among the states of mind marked by him as most apt to interfere with the formation of beliefs in harmony with the Universal Reason that is active in the universe.

IV. *Philosophy.*—The *Essay Concerning Human Understanding* embodies Locke's philosophy. It was the first attempt on a great scale, and in the Baconian spirit, to estimate critically the certainty and the adequacy of human knowledge, when confronted with God and the universe.

The "Introduction" to the *Essay* is the keynote to the whole. The ill-fortune of men in their past endeavours to comprehend themselves and their environment is attributed in a great measure to their disposition to extend their inquiries into matters beyond the reach of human understanding. To inquire with critical care into "the original, certainty and extent of human knowledge, together with the grounds and degrees of belief, opinion and assent," is accordingly Locke's design in this *Essay*. Excluding from his enquiry "the physical consideration of the mind," he sought to make a faithful report, based on an introspective study of consciousness, as to how far a human understanding of the universe can reach. Although his report might show that our knowledge at its highest must be far short of a "universal or perfect comprehension of whatsoever is," it might still be "sufficient" for us, because "suited to our individual state." The "light of reason," the "candle of the Lord," that is set up in us may be found to shine bright enough for all *our* purposes. If human understanding cannot fully solve the infinite problem of the universe, man may at least see that at no stage of his finite experience is he necessarily the sport of chance, and that he can practically secure his own wellbeing.

The last book of the *Essay*, which treats of Knowledge and Probability, is concerned more directly than the three preceding ones with Locke's professed design. It has been suggested that Locke may have begun with this book. It contains few references to the foregoing parts of the *Essay*, and it might have appeared separately without being much less intelligible than it is. The other books, concerned chiefly with ideas and words, are more abstract, and may have opened gradually on his mind as he studied more closely the subject treated in the fourth book. For Locke saw that the ultimate questions about our knowledge and its extent *presuppose* questions about ideas. Without ideas knowledge is impossible. "Idea" is thus a leading term in the *Essay*. It is used in a way peculiar to himself—"the term which, I think, stands best for whatsoever is the object of the understanding when a man thinks" or "whatever it is which the mind can be employed about." But ideas themselves are, he reminds us, "neither true nor false, being nothing but bare appearances," phenomena as we might call them. Truth and falsehood belong only to assertions or denials concerning ideas, that is, to our interpretations of our ideas according to their mutual relations.

Innate ideas.

That none of our ideas are "innate" is the argument contained in the first book. This means that the human mind, before any ideas are present to it, is a *tabula rasa*: it needs the quickening of ideas to become intellectually alive. The inward purpose of this famous argument is apt to be overlooked. It has been criticized as if it was a speculative controversy between empiricism and intellectualism. For this Locke himself is partly to blame. It is not easy to determine the antagonist he had in view. Lord Herbert is referred to as a defender of innateness. Locke was perhaps too little read in the literature of philosophy to do full justice to those more subtle thinkers who, from Plato downwards, have recognized the need for categories of the understanding and presuppositions of reason in the constitution of knowledge. "Innate," Lord Shaftesbury says, "is a word Mr Locke poorly plays on." For the real question is not about the *time* when ideas entered the mind, but "whether the constitution of man be such that, being adult and grown up, the ideas of order and administration of a God will not infallibly and necessarily spring up in him." This Locke himself sometimes seems to allow. "That there are certain propositions," we find him saying, "which, though the soul from the beginning, or when a man is born, does not know, yet, by assistance from the outward senses, and the help of some previous cultivation, it may afterwards come certainly to know the truth of, is no more than what I have affirmed in my first book" ("Epistle to Reader," in second edition). And much of our knowledge, as he shows in the fourth book, is rational insight, immediate or else demonstrable, and thus intellectually necessary in its constitution.

What Locke really objects to is, that any of our supposed knowledge should claim immunity from free criticism. He argues in the first book against the innateness of our knowledge of God and of morality; yet in the fourth book he finds that the existence of God is demonstrable, being supported by causal necessity, without which there can be no knowledge; and he also maintains that morality is as demonstrable as pure mathematics. The positions are not inconsistent. The demonstrable rational necessity, instead of being innate, or conscious from our birth, may lie latent or subconscious in the individual mind; but for all that, when we gradually become more awake intellectually, such truths are seen to "carry their own evidence along with them." Even in the first book he appeals to the common reason, which he calls "common sense." "He would be thought void of common sense who asked, on the one side, or, on the other, went to give a reason, *why* 'it is impossible for the same thing to be and not to be.' It carries its own light and evidence with it, and needs no other proof: he that understands the terms assents to it for its own sake, or else nothing else will ever be able to prevail with him to do it" (bk. i. chap. 3, § 4).

The truth is that neither Locke, on the one hand, nor the intellectualists of the 17th century, on the other, expressed their meaning with enough of precision; if they had, Locke's argument would probably have taken a form less open to the charge of mere empiricism. Locke believed that in attacking "innate principles" he was pleading for universal reasonableness instead of blind reliance on authority, and was thus, as he says, not "pulling up the foundations of knowledge," but "laying those foundations surer." When men heard that there were propositions that could not be doubted, it was a short and easy way to assume that what are only arbitrary prejudices are "innate" certainties, and therefore must be accepted unconditionally. This "eased the lazy from the pains of search, stopped the inquiry of the doubtful, concerning all that was once styled innate. It was no small advantage to those who affected to be masters and teachers to make this the principle of principles—that principles must not be questioned." The assumption that they were "innate" was enough "to take men off the use of their own reason and judgment, and to put them upon believing and taking upon trust without further examination. . . . Nor is it a small power it gives one man over another to have the authority to make a man swallow that for an innate principle which may serve his purpose who teacheth them" (bk. i. chap. 4, § 24).

Genesis of ideas.

The second book proposes a hypothesis regarding the genesis of our ideas and closes after an elaborate endeavour to verify it. The hypothesis is, that all human ideas, even the most complex and abstract and sublime, ultimately depend upon "experience." Otherwise, what we take to be ideas are only empty words. Here the important point is what human "experience" involves. Locke says that our "ideas" all come, either from the five senses or from reflective consciousness; and he proposes to show that even those concerned with the Infinite depend at last on one or other of these two sources: our "complex ideas" are all made up of "simple ideas," either from without or from within. The "verification" of this hypothesis, offered in the thirteenth and following chapters of the second book, goes to show in detail that even those ideas which are "most abstruse," how remote soever they may seem from original data of outward sense, or of inner consciousness, "are only such as the understanding frames to itself by repeating and joining together simple ideas that it had at first, either from perceiving objects of sense, or from reflection upon its own operations."

To prove this, our thoughts of space, time, infinity, power, substance, personal identity, causality, and others which "seem most remote from the supposed original" are examined in a "plain historical method," and shown to depend either on (*a*) perception of things external, through the five senses, or on (*b*) reflection upon operations of the mind within. Reflection, "though it be not sense, as having nothing to do with external objects," is yet, he says, "very like it, and might properly enough be called internal sense." But the suggestion that "sense" might designate *both* the springs of experience is misleading, when we find in the sequel how much Locke tacitly credits "reflection" with. The ambiguity of his language makes opposite interpretations of this cardinal part of the *Essay* possible; the best we can do is to compare one part with another, and in doubtful cases to give him the benefit of the doubt.

Although the second book is a sort of inventory of our ideas, as distinguished from the certainty and boundaries of our knowledge, Locke even here makes the assumption that the "simple ideas" of the five senses are practically qualities of things which exist without us, and that the mental "operations" discovered by "reflection" are those of a person continuously existing. He thus relieves himself of the difficulty of having at the outset to explain *how* the immediate data of outward sense and reflection are accepted as "qualities" of things and persons. He takes this as a fact.

Such, according to Locke, are the only simple ideas which can appear even in the sublimest human speculations. But the mind, in becoming gradually stored with its "simple ideas" is able to elaborate them in numberless modes and relations; although it is not in the power of the most exalted wit or enlarged understanding to invent or frame any new simple idea, not taken in in one or the other of these two ways. All that man can imagine about the universe or about God is necessarily confined to them. For proof of this Locke would have any one try to fancy a taste which had never affected his palate, or to frame the idea of a scent he had never felt, or an operation of mind, divine or human, foreign to all human consciousness.

Qualities of matter.

The contrast and correlation of these two data of experience is suggested in the chapter on the "qualities of matter" in which we are introduced to a noteworthy vein of speculation (bk. ii. chap. 8). This chapter, on "things and their qualities," looks like an interpolation in an analysis of mere "ideas." Locke here treats simple ideas of the five senses as qualities of outward things. And the sense data are, he finds, partly (*a*) revelations of external things themselves in their mathematical relations, and partly (*b*) sensations, boundless in variety, which are somehow awakened in us through contact and collision with things relatively to their mathematical relations. Locke calls the former sort "primary, original or essential qualities of matter," and the others "secondary or derived qualities." The primary, which are quantities rather than qualities, are inseparable from matter, and virtually identical with the ideas we have of them. On the other hand, there is nothing perceived in the mathematical relations of bodies which in the least resembles their secondary qualities. If there were no sentient beings in existence, the secondary qualities would cease to exist, "except perhaps as unknown modes of the primary, or, if not, as something still more obscure." On the other hand, "solidity, extension, figure and motion would," he assumes, "be really in the world as they are, whether there were any sensible being to perceive them or not."

Matter.

Thus far the outcome of what Locke teaches about matter is, that it is Something capable of being expressed in terms of mathematical quantity, and also in terms of our own sensations. A further step was to suggest the ultimate dependence of the secondary qualities of bodies upon "the bulk, figures, number, situation and motions of the solid parts of which the bodies consist," these mathematical or primary qualities "existing as we think of them whether or not they are perceived." This Locke proposes in a hesitating way. For we, "not knowing what particular size, figure and texture of parts they are on which depend, and from which result, those qualities which make our complex idea, for example, of gold, it is impossible we should know what other qualities result from, or are incompatible with, the same constitution of the insensible parts of gold; and so consequently must always coexist with that complex idea we have of it, or else are inconsistent with it."

Some of the most remarkable chapters in the second book concern what may be called "crucial instances" in verification of its fundamental hypothesis of the dependence of human knowledge upon the simple ideas presented in our dual experience (bk. ii. ch. 13-28). They carry us towards the ultimate mysteries which attract meditative minds. The hypothesis, that even our most profound and sublime speculations are all limited to data of the senses and of reflection, is crucially tested by the "modes" and "substances" and "relations" under which, in various degrees of complexity, we somehow find ourselves obliged to conceive those simple phenomena. Such are modes of quantity in space, and time and number, under which Locke reports that we find ourselves mentally impelled towards immensity, eternity and the innumerable—in a word, towards Infinity which seems to transcend quantity; then there is the complex thought of Substance, to which we find ourselves mysteriously impelled, when the simple phenomena of the senses come to be regarded as qualities of "something"; again there is the obscure idea of the identity of persons, notwithstanding their constant changes of state; and there is, above all, the inevitable tendency we somehow have to refund a change into what we call its "Cause," with the associated idea of active power. Locke begins with our complex ideas of Space, Succession or Time, and Number.

Immensity and endlessness and infinity.

Space, he says, appears when we use our senses of sight and touch; succession he finds "suggested" by all the changing phenomena of sense, and by "what passes in our minds"; number is "suggested by every object of our senses, and every thought of our minds, by everything that either doth exist or can be imagined." The modifications of which these are susceptible he reports to be "inexhaustible and truly infinite, extension alone affording a boundless field to the mathematicians." But the mystery latent in our ideas of space and time is, that "something in the mind" irresistibly hinders us from allowing the possibility of any limit to either. We find ourselves, when we try, compelled to lose our positive ideas of finite spaces in the negative idea of Immensity or Boundlessness, and our positive ideas of finite times in the negative thought of Endlessness. We have never seen, and we cannot imagine, an object whose extent is boundless. Yet we find when we reflect that something forces us to think that space and time must be unlimited. Thus Locke seems by implication to acknowledge something added by the mind to the original "simple ideas" of extension and succession; though he finds that what is added is not positively conceivable. When we reflect on immensity and eternity, we find them negations of all that is imaginable; and that whether we try infinite addition or infinite subdivision. He accepts this fact; he does not inquire why mind finds itself obliged to add without limit and to divide without limit. He simply reports that immensity and eternity are inevitable negative ideas, and also that every endeavour to realize them in positive images must be an attempt to represent as quantity what is beyond quantity. After all our additions we are as far from the infinite idea as we were at the beginning.

Substance and personality.

Locke is too faithful to facts to overlook the ultimate mysteries in human experience. This is further illustrated in his acknowledgment of the inconceivable that is at the root of our idea of Substance. He tries to phenomenalize it, and thus resolve it into simple ideas; but he finds that it cannot be phenomenalized, and yet that we cannot dispense with it. An unsubstantiated succession of phenomena, without a centre of unity to which they are referable as qualities, is unintelligible: we cannot have a language of adjectives without nouns. Locke had some apprehension of this transcendent intellectual obligation. According to his report, "the mind" always obliges us to suppose Something beyond positive phenomena to which the phenomena must be attributed; but he was perplexed by this "confused negative" idea. So for him the word substance means "only an uncertain supposition of we know not what." If one were to ask him what the substance is in which this colour and that taste or smell inhere, "he would find himself in a difficulty like that of the Indian, who, after saying that the world rested on an elephant, and the elephant on a broad-backed tortoise, could only suppose the tortoise to rest on 'Something, I know not what.'" The attempt to conceive it is like the attempt positively to conceive immensity or eternity: we are involved in an endless, ultimately incomprehensible, regress. We fail when we try either positively to phenomenalize substance or to dispense with the superphenomenal abstraction. Our only positive idea is of an aggregate of phenomena. And it is only thus, he says, that we can approach a positive conception of God, namely by "enlarging indefinitely some of the simple ideas we received from reflection." Why man must remain in this mental predicament, Locke did not inquire. He only reported the fact. He likewise struggled bravely to be faithful to fact in his report of the state in which we find ourselves when we try to conceive continued personal identity. The paradoxes in which he here gets involved illustrate this (bk. ii. ch. 27).

Causality.

Locke's thoughts about Causality and Active Power are especially noteworthy, for he rests our knowledge of God and of the external universe on those ultimate ideas. The intellectual demand for "the cause" of an event is what we find we cannot help having; yet it is a demand for what in the end the mind cannot fully grasp. Locke is content to trace the idea of "cause and effect," as far as mere natural science goes, to our "constant observation" that "qualities and finite substances begin to exist, and receive their existence from other beings which produce them." We find that this connexion is what gives intelligibility to ceaseless and what seemed chaotic changes, converting them into the divinely concatenated system which we call the universe." Locke seems hardly to realize all that is implied in scientific prevision or expectation of change. Anything, as far as "constant observation" tells us, might a priori have been the natural cause of anything; and no finite number of "observed" sequences, *per se*, can guarantee universality and necessity. The idea of power, or *active* causation, on the other hand, "is got," he acknowledges, not through the senses, but "through our consciousness of our own voluntary agency, and therefore through reflection" (bk. ii. ch. 21). In bodies we observe no active agency, only a sustained natural order in the succession of passive sensuous phenomena. The true source of change in the material world must be analogous to what we are conscious of when we exert volition. Locke here unconsciously approaches the spiritual view of active power in the physical universe afterwards taken by Berkeley, forming the constructive principle of his philosophy.

Ideas and words.

Locke's book about Ideas leads naturally to his Third Book which is concerned with Words, or the sensible signs of ideas. Here he analyses "abstract ideas," and instructively illustrates the confusion apt to be produced in them by the inevitable imperfection of words. He unfolds the relations between verbal signs and the several sorts of ideas; words being the means for enabling us to treat ideas as typical, abstract and general. "Some parts of this third book," concerning Words, Locke tells his friend Molyneux, "though the thoughts were easy and clear enough, yet cost me more pains to express than all the rest of my *Essay*. And therefore I should not much wonder, if there be in some places of it obscurity and doubtfulness."

Theory of knowledge.

The Fourth Book, about Knowledge proper and Probability, closes the *Essay*. Knowledge, he says, is perception of relations among ideas; it is expressed in our affirmations and negations; and real knowledge is discernment of the relations of ideas to what is real. In the foregoing part of the *Essay* he had dealt with "ideas" and "simple apprehension," here he is concerned with intuitive "judgment" and demonstrative "reasoning," also with judgments and reasonings about matters of fact. At the end of this patient search among our ideas, he supposes the reader apt to complain that he has been "all this while only building a castle in the air," and to ask what the purpose of all this stir is, if we are not thereby carried beyond mere ideas. "If it be true that knowledge lies only in the agreement or disagreement of ideas, the visions of an enthusiast and the reasonings of a sober man will be equally certain. It is no matter how things themselves are" (bk. iv. 4). This gives the keynote to the fourth book. It does not, however, carry him into a critical analysis of the rational constitution of knowledge, like Kant. Hume had not yet shown the sceptical objections against conclusions which Locke accepted without criticism. The subtle agnostic, who doubted reason because reason could not be supported in the end by empirical evidence, was less in his view than persons blindly resting on authority or prejudice. Total scepticism he would probably have regarded as unworthy of the serious attention of a wise man. "Where we perceive the agreement or disagreement of any of our ideas there is certain knowledge; and wherever we are sure these ideas agree with the reality of things, there is certain *real* knowledge" (bk. iv. ch. 4).

Locke's report about human knowledge and its narrow extent forms the first thirteen chapters of the fourth book. The remainder of the book is concerned for the most part with the probabilities on which human life practically turns, as he and Butler are fond of

Four sorts of knowable relations.

reminding us. As regards kinds of knowledge, he finds that "all knowledge we are capable of" must be assertion or denial of some one of three sorts of relation among our ideas themselves, or else of relations between our ideas and reality that exists independently of us and our ideas. Accordingly, knowledge is concerned either with (*a*) relations of identity and difference among ideas, as when we say that "blue is not yellow"; or (*b*) with mathematical relations, as that "two triangles upon equal bases between two parallels must be equal"; or (*c*) in assertions that one quality does or does not coexist with another in the same substance, as that "iron is susceptible of magnetical impressions, or that ice is not hot"; or (*d*) with ontological reality, independent of our perceptions, as that "God exists" or "I exist" or "the universe exists." The first sort is analytical; mathematical and ethical knowledge represents the second; physical science forms the third; real knowledge of self, God and the world constitutes the fourth.

Intuition and demonstration.

Locke found important differences in the way in which knowledge of any sort is reached. In some instances the known relation is self-evident, as when we judge intuitively that a circle cannot be a triangle, or that three must be more than two. In other cases the known relation is perceived to be intellectually necessary through the medium of premisses, as in a mathematical demonstration. All that is strictly knowledge is reached in these two ways. But there is a third sort, namely sense-perception, which hardly deserves the name. For "our perceptions of the particular existence of finite beings without us" go beyond mere probability, yet they are not purely rational. There is nothing self-contradictory in the supposition that our perceptions of things external are illusions, although we are somehow unable to doubt them. We find ourselves inevitably "conscious of a different sort of perception," when we actually see the sun by day and when we only imagine the sun at night.

Locke next inquired to what extent knowledge—in the way either of intuitive certainty, demonstrative certainty, or sense perception—is possible, in regard to each of the four (already mentioned) sorts of knowable relation. There is only one of the four in which our knowledge is coextensive with our ideas. It is that of "identity and diversity": we cannot be conscious at all without distinguishing, and every affirmation necessarily implies negation. The second sort of knowable relation is sometimes intuitively and sometimes demonstrably discernible. Morality, Locke thinks, as well as mathematical quantity, is capable of being demonstrated. "Where there is no property there is no injustice," is an example of a proposition "as certain as any demonstration in Euclid." Only we are more apt to be biassed, and thus to leave reason in abeyance, in dealing with questions of morality than in dealing with problems in mathematics.

Turning from abstract mathematical and moral relations to concrete relations of coexistence and succession among phenomena—the third sort of knowable relation—Locke finds the light of pure reason disappear; although these relations form "the greatest and most important part of what we desire to know." Of these, including as they do all inductive science, he reports that demonstrable knowledge "is very short, if indeed we have any at all"; and are not thrown wholly on presumptions of probability, or else left in ignorance. Man cannot attain perfect and infallible science of bodies. For natural science depends, he thinks, on knowledge of the relations between their secondary qualities on the one hand, and the mathematical qualities of their atoms on the other, or else "on something yet more remote from our comprehension." Now, as perception of these atoms and their relations is beyond us, we must be satisfied with inductive presumptions, for which "experimental verification" affords, after all, only conclusions that wider experience may prove to be inadequate. But this moral venture Locke accepts as "sufficient for our purposes."

Real existence.

Our knowledge under Locke's fourth category of relations—real existence—includes (*a*) intuitive perceptions of our own existence; (*b*) demonstrable certainty of the existence of God; and (*c*) actual perception of the existence of surrounding things, as long as, but only as long as the things are present to sense. "If I doubt all other things, that very doubt makes me perceive my own existence, and will not suffer me to doubt of that" (iv. 9. 3). Faith in the existence of God is virtually with Locke an expression of faith in the principle of active causality in its ultimate universality. Each person knows that he now exists, and is convinced that he had a beginning; with not less intuitive certainty he knows that "*nothing* can no more produce any real being than it can be equal to two right angles." His final conclusion is that there must be eternally "a most powerful and most knowing Being, in which, as the origin of all, must be contained all the perfections that can ever after exist," and out of which can come only what it has already in itself; so that as the cause of my mind, it must be Mind. There is thus causal necessity for Eternal Mind, or what we call "God." This is cautiously qualified thus in a letter to Anthony Collins, written by Locke a few months before he died: "Though I call the thinking faculty in me 'mind,' yet I cannot, because of that name, equal it in anything to that infinite and incomprehensible Being, which, for want of right and distinct conceptions, is called 'Mind' also." But the immanence of God in the things and persons that compose the universal order, with what this implies, is a conception foreign to Locke, whose habitual conception was of an extra-mundane deity, the dominant conception in the 18th century.

Knowledge of the external world.

Turning from our knowledge of Spirit to our knowledge of Matter, nearly all that one can affirm or deny about "things external is," according to Locke, not knowledge but venture or presumptive trust. We have, strictly speaking, no "knowledge" of real beings beyond our own self-conscious existence, the existence of God, and the existence of objects of sense as long as they are actually present to sense. "When I see an external object at a distance, a man for instance, I cannot but be satisfied of his existence while I am looking at him. (Locke might have added that when one only 'sees a man' it is merely his *visible* qualities that are perceived; his other qualities are as little 'actual present sensations' as if he were out of the range of sense.) But when the man leaves me alone, I cannot be certain that he still exists." "There is no necessary connexion between his existence a minute since (when he was present to any sense of sight) and his existence now (when he is absent from all my senses); by a thousand ways he may have ceased to be. I have not that certainty of his continued existence which we call knowledge; though the great likelihood of it puts it past doubt. But this is but probability and not knowledge" (chap. 11, § 9). Accordingly, purely rational science of external Nature is, according to Locke, impossible. All our "interpretations of nature" are inadequate; only reasonable probabilities, not final rational certainties. This boundless region affords at the best probabilities, ultimately grounded on moral faith, all beyond lies within the veil. Such is Locke's "plain, matter-of-fact" account of the knowledge of the Real that is open to man.

The rationale of probability.

We learn little from Locke as to the rationale of the probabilities on which man thus depends when he deals with the past, the distant or the future. The concluding chapters of the fourth book contain wise advice to those whose lives are passed in an ever-changing environment, for avoiding the frequent risk of error in their conclusions, with or without the help of syllogism, the office of which, as a means of discovery, is here critically considered.

Locke and Hume.

Investigation of the foundation of inductive inference was resumed by Hume where Locke left it. With a still humbler view of human reason than Locke's, Hume proposed as "a subject worthy of curiosity," to inquire into "the nature of that evidence which assures us of any real existence and matter of fact, *beyond* the present testimony of our senses and the records of our memory; a part of philosophy that has been little cultivated either by the ancients or the moderns." Hume argues that custom is a sufficient practical explanation of this gradual enlargement of our objective experience, and that no deeper explanation is open to man. All beyond each present transitory "impression" and the stores of memory is therefore reached blindly, through custom or habitual association. Associative tendency, individual or inherited, has since been the favourite constructive factor of human experience in Empirical Philosophy. This factor is not prominent in Locke's *Essay*. A short chapter on "association of ideas" was added to the second book in the fourth edition. And the tendency to associate is there presented, not as the fundamental factor of human knowledge, but as a chief cause of human error.

Locke and Kant.

Kant's critical analysis of pure reason is more foreign to Locke than the attempts of 18th- and 19th-century associationists and evolutionists to explain experience and science. Kant's aim was to show the necessary rational constitution of experience. Locke's design was less profound. It was his distinction to present to the modern world, in his own "historical plain method," perhaps the largest assortment ever made by any individual of facts characteristic of human understanding. Criticism of the presuppositions implied in those facts—by Kant and his successors, and in Britain more unpretentiously by Reid, all under the stimulus of Hume's sceptical criticism—has employed philosophers since the author of the *Essay on Human Understanding* collected materials that raised deeper philosophical problems than he tried to solve. Locke's mission was to initiate modern criticism of the foundation and limits of our knowledge. Hume negatively, and the German and Scottish schools constructively, continued what it was Locke's glory to have begun.

BIBLIOGRAPHY.—The *Essay concerning Human Understanding* has passed through more editions than any classic in modern philosophical literature. Before the middle of the 18th century it had reached thirteen, and it has now passed through some forty editions, besides being translated into Latin, French, Dutch, German and modern Greek. There are also several abridgments. In addition to those criticisms which appeared when Locke was alive, among the most important are Leibnitz's *Nouveaux Essais sur l'entendement humain*—written about 1700 and published in 1765, in which each chapter of the *Essay* of Locke is examined in a corresponding chapter by Leibnitz; Cousin's "École sensualiste: système de Locke," in his *Histoire de la philosophie au* $XVIII^e$ *siècle* (1829); and the criticisms in T. H. Green's Introduction to the *Philosophical Works of Hume* (1874). The *Essay, with Prolegomena, biographical, critical and historical*, edited by Professor Campbell Fraser and published by the Oxford Clarendon Press in 1894, is the only annotated edition, unless the *Nouveaux Essais* of Leibnitz may be reduced to this category.

The *Letters on Toleration*, *Thoughts on Education* and *The*

Reasonableness of Christianity have also gone through many editions, and been translated into different languages.

The first collected edition of Locke's *Works* was in 1714, in three folio volumes. The best is that by Bishop Law, in four quartos (1777). The one most commonly known is in ten volumes (1812).

The *Éloge* of Jean le Clerc (*Bibliothèque choisie*, 1705) has been the basis of the memoirs of Locke prefixed to the successive editions of his *Works*, or contained in biographical dictionaries. In 1829 a *Life of Locke* (2nd ed. in two volumes, with considerable additions, 1830), was produced by Peter, 7th Baron King, a descendant of Locke's cousin, Anne Locke. This adds a good deal to what was previously known, as Lord King was able to draw from the mass of correspondence, journals and commonplace books of Locke in his possession. In the same year Dr Thomas Foster published some interesting letters from Locke to Benjamin Furly. The most copious account of the life is contained in the two volumes by H. R. Fox-Bourne (1876), the results of laborious research among the Shaftesbury Papers, Locke MSS. in the British Museum, the Public Record Office, the Lambeth, Christ Church and Bodleian libraries, and in the Remonstrants' library at Amsterdam. Monographs on Locke by T. H. Fowler in 1880, in "English Men of Letters," and by Fraser, in 1890, in Blackwood's "Philosophical Classics" may be mentioned; also addresses by Sir F. Pollock and Fraser at the bicentenary commemoration by the British Academy of Locke's death, published in the *Proceedings* of the Academy (1904). See also C. Bastide, *John Locke; ses théories politiques et leur influence en Angleterre* (Paris, 1907); H. Ollion, *La Philosophie générale de J. L.* (1909). (A. C. F.)

LOCKE, MATTHEW (*c.* 1630–1677), English musician, perhaps the earliest English writer for the stage, was born at Exeter, where he became a chorister in the cathedral. His music, written with Christopher Gibbons (son of Orlando Gibbons), for Shirley's masque *Cupid and Death*, was performed in London in 1653. He wrote some music for Davenant's *Siege of Rhodes* in 1656; and in 1661 was appointed composer in ordinary to Charles II. During the following years he wrote a number of anthems for the Chapel Royal, and excited some criticism on the score of novelty, to which he replied with considerable heat (*Modern Church Music; pre-accused, censured and obstructed in its Performance before His Majesty, April 1st, 1666, &c.*; copies in the Fitzwilliam Museum, Cambridge, and the Royal College of Music). A good deal of music for the theatre followed, the most important being for Davenant's productions of *The Tempest* (1667) and of *Macbeth* (1672), but some doubt as to this latter has arisen, Purcell, Eccles or Leveridge, being also credited with it. He also composed various songs and instrumental pieces, and published some curious works on musical theory. He died in August 1677, an elegy being written by Purcell.

LOCKERBIE, a municipal and police burgh of Dumfriesshire, Scotland, in the district of Annandale, 14½ m. E.N.E. of Dumfries by the Caledonian railway. Pop. (1901) 2358. It has long been famous for its cattle and sheep sales, but more particularly for the great August lamb fair, the largest in Scotland, at which as many as 126,000 lambs have been sold. The town hall and Easton institute are in the Scottish Baronial style. The police station is partly accommodated in an ancient square tower, once the stronghold of the Johnstones, for a long period the ruling family under whose protection the town gradually grew up. At Dryfe Sands, about 2 m. to the W., a bloody encounter took place in 1593 between the Johnstones and Maxwells. The Maxwells were pursued into Lockerbie and almost exterminated; hence "Lockerbie Lick" became a proverbial expression, signifying an overwhelming defeat.

LOCKER-LAMPSON, FREDERICK (1821–1895), English man of letters, was born, on the 29th of May 1821, at Greenwich Hospital. His father, who was Civil Commissioner of the Hospital, was Edward Hawke Locker, youngest son of that Captain William Locker who gave Nelson the memorable advice "to lay a Frenchman close, and beat him." His mother, Eleanor Mary Elizabeth Boucher, was a daughter of the Rev. Jonathan Boucher, vicar of Epsom and friend of George Washington. After a desultory education, Frederick Locker began life in a colonial broker's office. Soon deserting this uncongenial calling, he obtained a clerkship in Somerset House, whence he was transferred to Lord Haddington's private office at the Admiralty. Here he became deputy-reader and *précis* writer. In 1850 he married Lady Charlotte Bruce, daughter of the Lord Elgin who brought the famous marbles to England, and sister of Lady Augusta Stanley. After his marriage he left the Civil Service, in consequence of ill-health. In 1857 he published *London Lyrics*, a slender volume of 90 pages, which, with subsequent extensions, constitutes his poetical legacy. *Lyra Elegantiarum* (1867), an anthology of light and familiar verse, and *Patchwork* (1879), a book of extracts, were his only other publications. In 1872 Lady Charlotte Locker died. Two years later Locker married Miss Hannah Jane Lampson, the only daughter of Sir Curtis Miranda Lampson, Bart., of Rowfant, Sussex, and in 1885 took his wife's surname. At Rowfant he died on the 30th of May 1895. Chronic ill-health debarred Locker from any active part in life, but it did not prevent his delighting a wide circle of friends by his gifts as a host and *raconteur*, and from accumulating many treasures as a connoisseur. His books are catalogued in the volume called the *Rowfant Library* (1886), to which an appendix (1900) was added, after his death, under the superintendence of his eldest son. As a poet, Locker belongs to the choir who deal with the gay rather than the grave in verse—with the polished and witty rather than the lofty or emotional. His good taste kept him as far from the broadly comic on the one side as his kind heart saved him from the purely cynical on the other. To something of Prior, of Praed and of Hood he added qualities of his own which lent his work distinction—a distinction in no wise diminished by his unwearied endeavour after directness and simplicity.

A posthumous volume of Memoirs, entitled *My Confidences* (1896), and edited by his son-in-law, Mr Augustine Birrell, gives an interesting idea of his personality and a too modest estimate of his gifts as a poet. (A. D.)

LOCKHART, GEORGE (1673–1731), of Carnwath, Scottish writer and politician, was a member of a Lanarkshire family tracing descent from Sir Simon Locard (the name being originally territorial, de Loch Ard), who is said to have accompanied Sir James Douglas on his expedition to the East with the heart of Bruce, which relic, according to Froissart, Locard brought home from Spain when Douglas fell in battle against the Moors, and buried in Melrose Abbey; this incident was the origin of the "man's heart within a fetterlock" borne on the Lockhart shield, which in turn perhaps led to the altered spelling of the surname. George Lockhart's grandfather was Sir James Lockhart of Lee (d. 1674), a lord of the court of session with the title of Lord Lee, who commanded a regiment at the battle of Preston. Lord Lee's eldest son, Sir William Lockhart of Lee (1621–1675), after fighting on the king's side in the Civil War, attached himself to Oliver Cromwell, whose niece he married, and by whom he was appointed commissioner for the administration of justice in Scotland in 1652, and English ambassador at the French court in 1656, where he greatly distinguished himself by his successful diplomacy. Lord Lee's second son, Sir George Lockhart (*c.* 1630–1689), was lord-advocate in Cromwell's time, and was celebrated for his persuasive eloquence; in 1674, when he was disbarred for alleged disrespect to the court of session in advising an appeal to parliament, fifty barristers showed their sympathy for him by withdrawing from practice. Lockhart was readmitted in 1676, and became the leading advocate in political trials, in which he usually appeared for the defence. He was appointed lord-president of the court of session in 1685; and was shot in the streets of Edinburgh on the 31st of March 1689 by John Chiesley, against whom the lord-president had adjudicated a cause. Sir George Lockhart purchased the extensive estates of the earls of Carnwath in Lanarkshire, which were inherited by his eldest son, George, whose mother was Philadelphia, daughter of Lord Wharton.

George Lockhart, who was member for the city of Edinburgh in the Scottish parliament, was appointed a commissioner for arranging the union with England in 1705. After the union he continued to represent Edinburgh, and later the Wigton burghs. His sympathies were with the Jacobites, whom he kept informed of all the negotiations for the union; in 1713 he took part in an abortive movement aiming at the repeal of the union. He was deeply implicated in the rising of 1715, the preparations for which he assisted at Carnwath and at Dryden, his Edinburgh residence. He was imprisoned in Edinburgh castle, but probably, through the favour of the duke of Argyll, he was released without being brought to trial; but his brother Philip was taken prisoner at the battle of Preston and condemned to be shot, the sentence being executed on the 2nd of December 1715. After his liberation Lockhart became a secret agent of the Pretender; but his correspondence with the prince fell into the hands of the government in 1727, compelling him to go into concealment at Durham until he was able to escape abroad. Argyll's influence was again exerted in Lockhart's behalf, and in 1728 he was permitted to return to Scotland, where he lived in retirement till his death in a duel on the 17th of December 1731. Lockhart was the author of *Memoirs of the Affairs of Scotland*, dealing with the reign of Queen Anne till the union with England, first published in 1714. These *Memoirs*, together with Lockhart's correspondence with the Pretender, and one or two papers of minor importance, were published in two volumes in 1817, forming the well-known "Lockhart Papers," which are a valuable authority for the history of the Jacobites.

Lockhart married Eupheme Montgomerie, daughter of Alexander, 9th earl of Eglinton, by whom he had a large family. His grandson James, who assumed his mother's name of Wishart in addition to that of Lockhart, was in the Austrian service during the Seven Years' War, and was created a baron and count of the Holy Roman Empire. He succeeded to the estates of Lee as well as of Carnwath, both of which properties passed, on the death of his son Charles without issue in 1802, to his nephew Alexander, who was created a baronet in 1806.

See *The Lockhart Papers* (2 vols., London, 1817); Andrew Lang, *History of Scotland* (4 vols., London, 1900). For the story of Sir Simon Lockhart's adventures with the heart of the Bruce, see Sir Walter Scott's *The Talisman*. (R. J. M.)

LOCKHART, JOHN GIBSON (1794–1854), Scottish writer and editor, was born on the 14th of July 1794 in the manse of Cambusnethan in Lanarkshire, where his father, Dr John Lockhart, transferred in 1796 to Glasgow, was minister. His mother, who was the daughter of the Rev. John Gibson, of Edinburgh, was a woman of considerable intellectual gifts. He was sent to the Glasgow high school, where he showed himself clever rather than industrious. He fell into ill-health, and had to be removed from school before he was twelve; but on his recovery he was sent at this early age to Glasgow University, and displayed so much precocious learning, especially in Greek, that he was offered a Snell exhibition at Oxford. He was not fourteen when he entered Balliol College, where he acquired a great store of knowledge outside the regular curriculum. He read French, Italian, German and Spanish, was interested in classical and British antiquities, and became versed in heraldic and genealogical lore. In 1813 he took a first class in classics in the final schools. For two years after leaving Oxford he lived chiefly in Glasgow before settling to the study of Scottish law in Edinburgh, where he was called to the bar in 1816. A tour on the continent in 1817, when he visited Goethe at Weimar, was made possible by the kindness of the publisher Blackwood, who advanced money for a promised translation of Schlegel's *Lectures on the History of Literature*, which was not published until 1838. Edinburgh was then the stronghold of the Whig party, whose organ was the *Edinburgh Review*, and it was not till 1817 that the Scottish Tories found a means of expression in *Blackwood's Magazine*. After a somewhat hum-drum opening, *Blackwood* suddenly electrified the Edinburgh world by an outburst of brilliant criticism. John Wilson (Christopher North) and Lockhart had joined its staff in 1817. Lockhart no doubt took his share in the caustic and aggressive articles which marked the early years of *Blackwood*; but his biographer, Mr Andrew Lang, brings evidence to show that he was not responsible for the virulent articles on Coleridge and on "The Cockney School of Poetry," that is on Leigh Hunt, Keats and their friends. He has been persistently accused of the later *Blackwood* article (August 1818) on Keats, but he showed at any rate a real appreciation of Coleridge and Wordsworth. He contributed to *Blackwood* many spirited translations of Spanish ballads, which in 1823 were published separately. In 1818 the brilliant and handsome young man attracted the notice of Sir Walter Scott, and the acquaintance soon ripened into an intimacy which resulted in a marriage between Lockhart and Scott's eldest daughter Sophia, in April 1820. Five years of domestic happiness followed, with winters spent in Edinburgh and summers at a cottage at Chiefswood, near Abbotsford, where Lockhart's two eldest children, John Hugh and Charlotte, were born; a second son, Walter, was born later at Brighton. In 1820 John Scott, the editor of the *London Magazine*, wrote a series of articles attacking the conduct of *Blackwood's Magazine*, and making Lockhart chiefly responsible for its extravagances. A correspondence followed, in which a meeting between Lockhart and John Scott was proposed, with Jonathan Henry Christie and Horace Smith as seconds. A series of delays and complicated negotiations resulted early in 1821 in a duel between Christie and John Scott, in which Scott was killed. This unhappy affair, which has been the subject of much misrepresentation, is fully discussed in Mr Lang's book on Lockhart.

Between 1818 and 1825 Lockhart worked indefatigably. In 1819 *Peter's Letters to his Kinsfolk* appeared, and in 1822 he edited Peter Motteux's edition of *Don Quixote*, to which he prefixed a life of Cervantes. Four novels followed: *Valerius* in 1821, *Some Passages in the Life of Adam Blair, Minister of Gospel at Cross Meikle* in 1822, *Reginald Dalton* in 1823 and *Matthew Wald* in 1824. But his strength did not lie in novel writing, although the vigorous quality of *Adam Blair* has been recognized by modern critics. In 1825 Lockhart accepted the editorship of the *Quarterly Review*, which had been in the hands of Sir John Taylor Coleridge since Gifford's resignation in 1824. He had now established his literary position, and, as the next heir to his unmarried half-brother's property in Scotland, Milton Lockhart, he was sufficiently independent, though he had abandoned the legal profession. In London he had great social success, and was recognized as a brilliant editor. He contributed largely to the *Quarterly Review* himself, his biographical articles being especially admirable. He showed the old railing spirit in an amusing but violent article in the *Quarterly* on Tennyson's *Poems* of 1833, in which he failed to discover the mark of genius. He continued to write for *Blackwood*; he produced for *Constable's Miscellany* in 1828 what remains the most charming of the biographies of Burns; and he undertook the superintendence of the series called "Murray's Family Library," which he opened in 1829 with a *History of Napoleon*. But his chief work was the *Life of Sir Walter Scott* (7 vols., 1837–1838; 2nd ed., 10 vols., 1839). There were not wanting those in Scotland who taxed Lockhart with ungenerous exposure of his subject, but to most healthy minds the impression conveyed by the biography was, and is, quite the opposite. Carlyle did justice to many of its excellencies in a criticism contributed to the *London and Westminster Review* (1837). Lockhart's account of the transactions between Scott and the Ballantynes and Constable caused great outcry; and in the discussion that followed he showed unfortunate bitterness by his pamphlet, "The Ballantyne Humbug handled." The *Life of Scott* has been called, after Boswell's *Johnson*, the most admirable biography in the English language. The proceeds, which were considerable, Lockhart resigned for the benefit of Scott's creditors.

The close of Lockhart's life was saddened by family bereavement, resulting in his own breakdown in health and spirits. His eldest boy (the suffering "Hugh Littlejohn" of Scott's *Tales of a Grandfather*) died in 1831; Scott himself in 1832; Mrs Lockhart in 1837; and the surviving son, Walter Lockhart, in 1852. Resigning the editorship of the *Quarterly Review* in 1853, he spent the next winter in Rome, but returned to England without recovering his health; and being taken to Abbotsford by his daughter Charlotte, who had become Mrs James Robert Hope-Scott, he died there on the 25th of November 1854. He was buried in Dryburgh Abbey, near Sir Walter Scott.

Lockhart's *Life* (2 vols., London and New York, 1897) was written by Andrew Lang. A. W. Pollard's edition of the *Life of Scott* (1900) is the best.

LOCKHART, SIR WILLIAM STEPHEN ALEXANDER (1841–1900), British general, was born in Scotland on the 2nd of September 1841, his father being a Lanarkshire clergyman. He entered the Indian army in 1858, in the Bengal native infantry. He served in the Indian Mutiny, the Bhutan campaign (1864–66), the Abyssinian expedition (1867–68; mentioned in despatches), the Hazara Black Mountain expedition (1868–69; mentioned in despatches). From 1869 to 1879 he acted as deputy-assistant and assistant quartermaster-general in Bengal. In 1877 he was military attaché with the Dutch army in Acheen. He served in the Afghan War of 1878–80, was mentioned in despatches and made a C.B., and from 1880 to 1885 was D.Q.G. in the intelligence branch at headquarters. He commanded a brigade in the Third Burmese War (1886–87), and was made K.C.B., C.S.I., and received the thanks of the government. An attack of fever brought him to England, where he was employed as assistant military secretary for Indian affairs; but in 1890 he returned to India to take command of the Punjab frontier force, and for five years was engaged in various expeditions against the hill tribes. After the Waziristan campaign in 1894–95 he was made K.C.S.I. He became full general in 1896, and in 1897 he was given the command against the Afridis and Mohmands, and conducted the difficult Tirah campaign with great skill. He was made G.C.B., and in 1898 became commander-in-chief in India. He died on the 18th of March 1900. Sir William Lockhart was not only a first-rate soldier, but also had a great gift for dealing with the native tribesmen. Among the latter he had the *sobriquet* of Amir Sahib, on account of their respect and affection for him.

LOCK HAVEN, a city and the county-seat of Clinton county, Pennsylvania, U.S.A., on the west branch of the Susquehanna river, near the mouth of Bald Eagle Creek, about 70 m. N.N.W. of Harrisburg. Pop. (1900) 7210 (618 foreign-born and 122 negroes); (1910) 7772. It is served by branches of the Pennsylvania and the New York Central & Hudson River railways and by electric interurban railways. The city is pleasantly situated in an agricultural region, and there are large deposits of cement and of fire-brick clay in the vicinity. Lock Haven is the seat of the Central State Normal School (opened 1877), and has a public library and a hospital. There are various manufactures. The municipality owns and operates the water-works. The locality was settled in 1769. A town was founded in 1833, the Pennsylvania Canal (no longer in use here) was completed to this point in 1834, and the name of the place was suggested by two canal locks and the harbour, or haven, for rafts in the river. Lock Haven was made the county-seat immediately after the erection of Clinton county in 1839, was incorporated as a borough in 1840, and first chartered as a city in 1870.

LOCKPORT, a city of Will county, Illinois, U.S.A., on the Des Plaines river and the Illinois & Michigan Canal, and the terminus of the Chicago Sanitary District Drainage Canal, about 33 m. S.W. of Chicago and 4 m. N.N.E. of Joliet. Pop. (1900) 2659 (552 being foreign-born and 130 negroes); (1910) 2555. Lockport is served by the Chicago & Alton, and the Atchison, Topeka & Santa Fé railways, and by the Chicago & Joliet Electric railway. It is in a picturesque farming country, and there are good limestone quarries in the valley of the Des Plaines river. It has manufactures and a considerable trade, especially in grain. A settlement was made here about 1827; in 1837 the site was chosen as headquarters for the Illinois & Michigan Canal and a village was laid out; it was incorporated in 1853, and was chartered as a city in 1904. In 1892 work was begun on the Chicago Drainage Canal, whose controlling works are here and whose plant, developing 40,000 h.p. from the 40 ft. fall between Joliet and Lockport, supplies Lockport with cheap power and has made it a manufacturing rather than a commercial city.

LOCKPORT, a city and the county-seat of Niagara county, New York, U.S.A., on the Erie Canal, 26 m. by rail N. by E. of Buffalo and 56 m. W. of Rochester. Pop. (1900) 16,581, of whom 2036 were foreign-born and 160 were negroes; (1910 census) 17,970. It is served by the New York Central & Hudson River and the Erie railways, by the International railway (electric interurban), and by the Erie Canal. The city owes its name to the five double locks of the canal, which here falls 66 ft. (over a continuation of the Niagara escarpment locally known as "Mountain Ridge") from the level of Lake Erie to that of the Genesee river. In 1909 a scheme was on foot to replace these five locks by a huge lift lock and to construct a large harbour immediately W. of the city. The surplus water from Tonawanda Creek, long claimed both by the Canal and by the Lockport manufacturers, after supplying the canal furnishes water-power, and electric power is derived from Niagara. The factory products, mostly paper and wood-pulp, flour and cereal foods, and foundry and machine-shop products, were valued in 1905 at $5,807,980. Lockport lies in a rich farming and fruit (especially apple and pear) country, containing extensive sandstone and Niagara limestone quarries, and is a shipping point for the fruits and grains and the limestone and sandstone of the surrounding country. Many buildings in the business part of the city are heated by the Holly distributing system, which pipes steam from a central station or plant, and originated in Lockport. The city owns and operates the water-works, long operated under the Holly system, which, as well as the Holly distributing system, was devised by Birdsill Holly, a civil engineer of Lockport. In 1909 a new system was virtually completed, water being taken from the Niagara river at Tonawanda and pumped thence to a stand-pipe in Lockport.

The site, that of the most easterly village in New York state held by the Neutral Nation of Indians, was part of the tract bought by the Holland Company in 1792–1793. Subsequently most of the land on which the city stands was bought from the Holland Company by Esek Brown, the proprietor of a local tavern, and fourteen others, but there were few settlers until after 1820. In 1822 the place was made the county-seat, and in 1823 it was much enlarged by the settlement here of workmen on the Erie Canal, and was the headquarters for a time of the canal contractors. It was incorporated as a village in 1829, was reached by the Erie railway in 1852, and in 1865 was chartered as a city.

LOCKROY, ÉDOUARD (1838–), French politician, son of Joseph Philippe Simon (1803–1891), an actor and dramatist who took the name of Lockroy, was born in Paris on the 18th of July 1838. He had begun by studying art, but in 1860 enlisted as a volunteer under Garibaldi. The next three years were spent in Syria as secretary to Ernest Renan, and on his return to Paris he embarked in militant journalism against the second empire in the *Figaro*, the *Diable à quatre*, and eventually in the *Rappel*, with which his name was thenceforward intimately connected. He commanded a battalion during the siege of Paris, and in February 1871 was elected deputy to the National Assembly where he sat on the extreme left and protested against the preliminaries of peace. In March he signed the proclamation for the election of the Commune, and resigned his seat as deputy. Arrested at Vanves he remained a prisoner at Versailles and Chartres until June when he was released without being tried. He was more than once imprisoned for violent articles in the press, and in 1872 for a duel with Paul de Cassagnac. He was returned to the Chamber in 1873 as Radical deputy for Bouches-du-Rhône in 1876, 1877 and 1881 for Aix, and in 1881 he was also elected in the 11th arrondissement of Paris. He elected to sit for Paris, and was repeatedly re-elected. During the elections of 1893 he was shot at by a cab-driver poet named Moore, but was not seriously injured. For the first ten years of his parliamentary life he voted consistently with the extreme left, but then adopted a more opportunist policy, and gave his unreserved support to the Brisson ministry of 1885. In the new Freycinet cabinet formed in January he held the portfolio of commerce and industry, which he retained in the Goblet ministry of 1886–1887. In 1885 he had been returned at the head of the poll for Paris, and his inclusion in the Freycinet ministry was taken to indicate a prospect of reconciliation between Parisian Radicalism and official Republicanism. During his tenure of the portfolio of commerce and industry he made the preliminary arrangements for the Exposition of 1889, and in a witty letter he defended the erection of the Tour Eiffel against artistic Paris. After the Panama and Boulangist scandals he became one of the leading politicians of the Radical party. He was vice-president of the Chamber in 1894 and in 1895, when he became minister of marine under Léon Bourgeois. His drastic measures of reform alarmed moderate politicians, but he had the confidence of the country, and held the same portfolio under Henri Brisson (1898) and Charles Dupuy (1898–1899). He gave his support to the Waldeck-Rousseau Administration, but actively criticized the marine policy of Camille Pelletan in the Combes ministry of 1902–1905, during which period he was again vice-president of the Chamber. M. Lockroy was a persistent and successful advocate of a strong naval policy, in defence of which he published *La Marine de Guerre* (1890), *Six mois rue Royale* (1897), *La Défense navale* (1900), *Du Weser à la Vistula* (1901), *Les Marines française et allemande* (1904), *Le Programme naval* (1906). His other works include *M. de Moltke et la guerre future* (1891) and *Journal d'une bourgeoise pendant la Révolution* (1881) derived from the letters of his great-grandmother. M. Lockroy married in 1877 Madame Charles Hugo, the daughter-in-law of the poet.

LOCKWOOD, SIR FRANK (1846–1897), English lawyer, was born at Doncaster. His grandfather and great-grandfather were mayors of Doncaster, and the former for some years filled the office of judge on the racecourse. He was educated at a private school, at Manchester grammar school, and Caius College, Cambridge. Called to the bar at Lincoln's Inn in 1872, he joined the old midland circuit, afterwards going to the north-eastern, making in his first year 120 guineas and in the next 265 guineas. From that time he had a career of uninterrupted success. In 1882 he was made a queen's counsel, in 1884 he was made recorder of Sheffield, and in 1894 he became solicitor-general in Lord Rosebery's ministry, and was knighted, having first entered parliament as Liberal member for York in 1885, after two unsuccessful attempts, the one at King's Lynn in 1880, the other at York in 1883. He was solicitor-general for less than a year. In 1896 Lord Chief Justice Coleridge, Mr Montague Crackanthorpe and Sir Frank Lockwood went to the United States to attend, as specially invited representatives of the English bar, the nineteenth meeting of the American Bar Association. On this trip Sir Frank Lockwood sustained the reputation which he enjoyed in England as a humorous after-dinner speaker, and helped to strengthen the bond of friendship which unites the bench and bar of the United States with the bench and bar of England. He died in London on the 18th of December 1897. Lockwood had considerable talent for drawing, inherited from his father, which he employed, chiefly for the amusement of himself and his friends, in the making of admirable caricatures in pen and ink, and of sketches of humorous incidents, real or imaginary, relating to the topic nearest at hand. An exhibition of them was held soon after his death.

See Augustine Birrell's biography of Lockwood and *The Frank Lockwood Sketch-Book* (1898).

LOCKWOOD, WILTON (1861–), American artist, was born at Wilton, Connecticut, on the 12th of September 1861. He was a pupil and an assistant of John La Farge, and also studied in Paris, becoming a well-known portrait and flower painter. He became a member of the Society of American Artists (1898), and of the Copley Society, Boston, and an associate of the National Academy of Design, New York.

LOCKYER, SIR JOSEPH NORMAN (1836–), English astronomer, was born at Rugby on the 17th of May 1836. After completing his education on the Continent of Europe, he obtained a clerkship in the War Office in 1857. His leisure was devoted to the study of astronomy, and he was appointed in 1870 secretary to the duke of Devonshire's royal commission on science. In 1875 he was transferred to the Science and Art Department at South Kensington, and on the foundation of the Royal College of Science he became director of the solar physics observatory and professor of astronomical physics. Eight British government expeditions for observing total solar eclipses were conducted by him between 1870 and 1905. On the 26th of October 1868 he communicated to the Paris Academy of Sciences, almost simultaneously with Dr P. J. C. Janssen, a spectroscopic method for observing the solar prominences in daylight, and the names of both astronomers appear on a medal which was struck by the French government in 1872 to commemorate the discovery. Lockyer was elected a fellow of the Royal Society in 1869, and received the Rumford medal in 1874. He initiated in 1866 the spectroscopic observation of sunspots; applied Doppler's principle in 1869 to determine the radial velocities of the chromospheric gases; and successfully investigated the chemistry of the sun from 1872 onward. Besides numerous contributions to the *Proceedings* of the Royal and the Royal Astronomical Societies, he published several books, both explanatory and speculative. The *Chemistry of the Sun* (1887) is an elaborate treatise on solar spectroscopy based on the hypothesis of elemental dissociation through the intensity of solar heat. The *Meteoritic Hypothesis* (1890) propounds a comprehensive scheme of cosmical evolution, which has evoked more dissent than approval, while the *Sun's Place in Nature* (1897) lays down the lines of a classification of the stars, depending upon their supposed temperature-relations. Among Lockyer's other works are—*The Dawn of Astronomy* (1894), to which *Stonehenge and other British Stone Monuments astronomically considered* (1906) may be considered a sequel; *Recent and coming Eclipses* (1897); and *Inorganic Evolution* (1900). He was created K.C.B. in 1897, and acted as president of the British Association in 1903–1904. His fifth son, WILLIAM JAMES STEWART LOCKYER (b. 1868), devoted himself to solar research, and became chief assistant in the Solar Physics Observatory, South Kensington.

LOCLE, LE, a town in the Swiss canton of Neuchâtel, 24 m. by rail N. of Neuchâtel, and 5 m. S.W. of La Chaux de Fonds. It is built (3035 ft. above the sea-level) on the Bied stream in a valley of the Jura, and is about 1 m. from the French frontier. In 1681 Daniel Jean Richard introduced watch-making here, which soon drove out all other industries. In 1900 the population was 12,559, mainly Protestants and French-speaking. The church tower dates from 1521, but the old town was destroyed by fire in 1833. The valley in which the town is situated used to be subject to inundations, but in 1805 a tunnel was constructed by means of which the surplus waters of the Bied are carried into the Doubs. About 1 m. W. of the town the Bied plunged into a deep chasm, on the steep rock face of which were formerly the subterranean mills of the Col des Roches, situated one above another; but the stream is now diverted by the above-mentioned tunnel, while another serves the railway line from Le Locle to Morteau in France (8 m.). (W. A. B. C.)

LOCMARIAQUER, a village of western France, on the W. shore of the Gulf of Morbihan, in the department of Morbihan, 8½ m. S. of Auray by road. Pop. (1906) 756. Locmariaquer has a small port, and oyster culture is carried on close to it. Roman remains are to be seen, but the place owes its celebrity to the megalithic monuments in the vicinity, some of which are among the largest extant. The menhir of Men-er-H'roeck (Fairy stone), which was broken into four pieces by lightning in the 18th century, previously measured about 67 ft. in height, and from 9 to 13 ft. in thickness.

LOCOMOTOR ATAXIA (Gr. ἀ, priv., and τάξις, order; synonyms, *Tabes dorsalis, posterior spinal sclerosis*), a progressive degeneration of the nervous system, involving the posterior columns of the spinal cord with other structures, and causing muscular incoordination and disorder of gait and station. The essential symptoms of the disease—stamping gait, and swaying with the eyes shut, the occurrence of blindness and of small fixed pupils—were recognized by Romberg (1851), but it was the clinical genius of Duchenne and his masterly description of the symptoms which led to its acceptance as a definite disease (1858), and he named it locomotor ataxia after its most striking symptom. In 1869 Argyll Robertson discovered that the eye-pupil is inactive to light but acts upon accommodation in the great majority of cases. This most important sign is named the "Argyll Robertson pupil." With an ever-increasing knowledge of the widespread character of this disease and its manifold variations in the complex of symptoms, the tendency among neurologists is to revert to the term employed by Romberg—*tabes dorsalis.* "Locomotor ataxia," although it expresses a very characteristic feature of the disease, has this objection: it is a symptom which does not occur in the first (preataxic) stage of the disease; indeed a great number of years may elapse before ataxy comes on, and sometimes the patient, after suffering a very long time from the disease, may die from some intercurrent complication, having never been ataxic.

It is generally recognized by neurologists that persons who are not the subjects of acquired or hereditary syphilis do not suffer from this disease; and the average time of onset after infection is ten years (see Neuropathology). There are three stages: (1) The preataxic, (2) the ataxic, (3) the bed-ridden paralytic. The duration of the first stage may be from one or two years, up to twenty years or even longer. In this stage various symptoms may arise. The patient usually complains of shooting, lightning-like pains in the legs, which he may attribute to rheumatism. If a physician examines him he will almost certainly find the knee-jerks absent and Argyll Robertson pupils present; probably on inquiry he will ascertain that the patient has had some difficulty in starting urination, or that he is unable to retain his water or to empty his bladder completely. In other cases, temporary or permanent paralysis of one or more muscles of the eyeball (which causes squint and double vision), a failure of sight ending in blindness, attacks of vomiting (or gastric crises), painless spontaneous fractures of bones and dislocations of joints, failing sexual power and impotence, may lead the patient to consult a physician, when this disease will be diagnosed, although the patient may not as yet have had locomotor ataxy. All cases, however, if they live long enough, pass into the second ataxic stage. The sufferer complains now of difficulty of walking in the dark; he sways with his eyes shut and feels as if he would fall (Romberg's symptom); he has the sensation of walking on wool, numbness and formication of the skin, and many sensory disturbances in the form of partial or complete loss of sensibility to pain, touch and temperature. These disturbances affect especially the feet and legs, and around the trunk at the level of the fourth to the seventh ribs, giving rise to a "girdle sensation." There may be a numbed feeling on the inner side of the arm, and muscular incoordination may affect the upper limb as well as the lower, although there is no wasting or any electrical change. The ataxic gait is very characteristic, owing to the loss of reflex tonus in the muscles, and the absence of guiding sensations from all the deep structures of the limbs, muscles, joints, bones, tendons and ligaments, as well as from the skin of the soles of the feet; therefore the sufferer has to be guided by vision as to where and how to place his feet. This necessitates the bending forward of the body, extension of the knees and broadening of the basis of support; he generally uses a walking stick or even two, and he jerks the leg forward as if he were on wires, bringing the sole of the foot down on the ground with a wide stamping action. If the arm be affected, he is unable to touch the tip of his nose with the eyes shut. Sooner or later he passes into the *third* bed-ridden stage, with muscles wasted and their tonus so much lost that he is in a perfectly helpless condition.

The complications which may arise in this disease are intercurrent affections due to septic conditions of the bladder, bedsores, pneumonia, vascular and heart affections. About 10% of the cases, at least, develop general paralysis of the insane. This is not surprising seeing that it is due to the same cause, and the etiology of the two diseases is such as to lead many neurologists to consider them one and the same disease affecting different parts of the nervous system. *Tabes dorsalis* occurs with much greater frequency in men than in women (see Neuropathology).

The avoidance of all stress of the nervous system, whether physical, emotional or intellectual, is indicated, and a simple regular life, without stimulants or indulgence of the sexual passion, is the best means of delaying the progress of the disease. Great attention should be paid to micturition, so as to avoid retention and infection of the bladder. Drugs, even antisyphilitic remedies, appear to have but little influence upon the course of the disease.

LOCO-WEEDS, or Crazy-Weeds, leguminous plants, chiefly species of *Astragalus* and *Lupinus,* which produce a disease in cattle known as "loco-disease." The name is apparently taken from the Spanish *loco,* mad. The disease affects the nervous system of the animals eating the plants, and is accompanied by exhaustion and wasting.

LOCRI, a people of ancient Greece, inhabiting two distinct districts, one extending from the north-east of Parnassus to the northern half of the Euboean channel, between Boeotia and Malis, the other south-west of Parnassus, on the north shore of the Corinthian Gulf, between Phocis and Aetolia. The former were divided into the northern Locri Epicnemidii, situated on the spurs of Mount Cnemis, and the southern Locri Opuntii, so named from their chief town Opus (*q.v.*): and the name Opuntia is often applied to the whole of this easterly district. Homer mentions only these eastern Locrians: their national hero in the Trojan War is Ajax Oileus, who often appears afterwards on Locrian coins. From Hesiod's time onwards, the Opuntians were thought by some to be of "Lelegian" origin (see Leleges), but they were Hellenized early (though matriarchal customs survived among them)—, and Deucalion, the father of Hellen himself, is described as the first king of Opus. The westerly Locri "in Ozolae" on the Corinthian Gulf, a rude and barbarous people, make no appearance in Greek history till the Peloponnesian War. It was believed that they had separated from the eastern Locrians four generations before the Trojan War; yet Homer has no hint of their existence. Probably the Locrians were once a single people, extending from sea to sea, till subsequent immigrations forced them apart into two separate districts. The Locrian dialect of Greek is little known, but resembles that of Elis: it has *στ* for *σθ*; uses *α*; and has *οις* in dat. plur. 3rd decl. A colony of Locrians (whether from Opus or Ozolae was disputed in antiquity) settled, about the end of the 8th century B.C., at the south-west extremity of Italy. They are often called Locri Epizephyrii from Cape Zephyrion 15 m. S. of the city. Their founder's name was Euanthes. Their social organization resembled that of the Opuntian Locri, and like them they venerated Ajax Oileus and Persephone. Aristotle (ap. Polyb. xii. 5 sqq.) records a tradition that these Western Locrians were base-born, like the Parthenians of Tarentum; but this was disputed by his contemporary Timaeus. See Locri (town) below. (J. L. M.)

LOCRI, an ancient city of Magna Graecia, Italy. The original settlers took possession of the Zephyrian promontory (Capo Bruzzano some 12 m. N. of Capo Spartivento), and though after three or four years they transplanted themselves to a site 12 m. farther north, still near the coast, 2 m. S. of Gerace Marina below the modern Gerace, they still retained the name of Locri Epizephyrii (*Λοκροὶ οἱ ἐπιζεφύριοι*), which served to distinguish them from the Ozolian and Opuntian Locri of Greece itself (see preceding article). The foundation of Locri goes back to about 683 B.C. It was the first of all Greek communities to have a written code of laws given by Zaleucus in 664 B.C. From Locri were founded the colonies of Meisma and Heiponium (Hipponium). It succeeded in repelling the attacks of Croton (battle on the river Sagras, perhaps sometime in the 6th century), and found in Syracuse a support against Rhegium: it was thus an active adversary or Athenian aggrandisement in the west. Pindar extolls its uprightness and love of the heroic muse of beauty, of wisdom, and of war, in the 10th and 11th Olympian Odes. Stesichorus (*q.v.*) was indeed of Locrian origin. But it owed its greatest external prosperity to the fact that Dionysius I. of Syracuse selected his wife from Locri: its territory was then increased, and the circuit of its walls was doubled, but it lost its freedom. In 356 B.C. it was ruled by Dionysius II. From the battle of Heraclea to the year 205 (when it was captured by P. Cornelius Scipio Africanus Maior, and placed under the control of his legate Q. Pleminius), Locri was continually changing its allegiance between Rome and her enemies; but it remained an ally, and was only obliged like other Greek coast towns to furnish ships. In later Roman times it is often mentioned, but was apparently of no great importance. It is mentioned incidentally until the 6th century A.D., but was destroyed by the Saracens in 915.

Excavations in 1889–1890 led to the discovery of an Ionic temple (the Doric style being usual in Magna Graecia) at the north-west angle of the town—originally a cella with two naves, a closed pronaos on the E. and an adytum at the back (W.), later converted into a hexastyle peripheral temple with 34 painted terra-cotta columns. This was then destroyed about 400 B.C. and a new temple built on the ruins, heptastyle peripteral, with no intermediate columns in the cella and opisthodomos, and with 44 columns in all. The figures from the pediment of the twin Dioscuri, who according to the legend assisted Locri against Crotona, are in the Naples museum (see R. Koldewey and O. Puchstein, *Griechische Tempel in Unteritalien und Sicilien*, Berlin, 1899, pp. 1 sqq.). Subsequent excavations in 1890–1891 were of the greatest importance, but the results remained unpublished up to 1908. From a short account by P. Orsi in *Atti del Congresso Storico*, vol. v. (Archeologia) Rome, 1904, p. 201, we learn that the exploration of the environs of the temple led to the discovery of a large number of archaic terra-cottas, and of some large trenches, covered with tiles, containing some 14,000 scyphoi arranged in rows. The plan of the city was also traced; the walls, the length of which was nearly 5 m., consisted of three parts—the fortified castles (φρούρια) with large towers, on three different hills, the city proper, and the lower town—the latter enclosed by long walls running down to the sea. In the Roman period the city was restricted to the plain near the sea. Since these excavations, a certain amount of unauthorized work has gone on, and some of the remains have been destroyed. In the course of these excavations some prehistoric objects have been discovered, which confirm the accounts of Thucydides and Polybius that the Greek settlers found the Siculi here before them. (T. As.)

LÖCSE (Ger. *Leutschau*), the capital of the county of Szepes, in Hungary, 230 m. N.E. of Budapest by rail. Pop. (1900) 6845, mostly Germans and Slovaks. The county of Szepes is the highest part of Hungary, and its north-western portion is occupied by the Tátra Mountains. Löcse lies in an elevated position surrounded by mountains, and is one of the oldest towns of Hungary. The church of St James is a Gothic structure of the 13th century, with richly carved altar, several monuments, and a celebrated organ erected in 1623, and long reputed the largest in Hungary. The old town-hall, restored in 1894, contains a Protestant upper gymnasium, founded in 1544, and one of the oldest printing establishments in Hungary, founded in 1585. Bee-keeping and the raising of garden produce are the chief industries.

Founded by Saxon colonists in 1245, Löcse had by the early part of the 16th century attained a position of great relative importance. In 1599 a fire destroyed the greater part of the town, and during the 17th century it suffered repeatedly at the hands of the Transylvanian princes and leaders.

LOCUS (Lat. for "place"; in Gr. τόπος), a geometrical term, the invention of the notion of which is attributed to Plato. It occurs in such statements as these: the locus of the points which are at the same distance from a fixed point, or of a point which moves so as to be always at the same distance from a fixed point, is a circle; conversely a circle is the locus of the points at the same distance from a fixed point, or of a point moving so as to be always at the same distance from a fixed point; and so in general a curve of any given kind is the locus of the points which satisfy, or of a point moving so as always to satisfy, a given condition. The theory of loci is thus identical with that of curves (see CURVE and GEOMETRY: § *Analytical*). The notion of a locus applies also to solid geometry. Here the locus of the points satisfying a single (or onefold) condition is a surface; the locus of the points satisfying two conditions (or a twofold condition) is a curve in space, which is in general a twisted curve or curve of double curvature.

LOCUST.[1] In its general acceptation this term is applied only to certain insects of the order *Orthoptera*, family *Acridiidae*. The family *Locustidae* is now viewed zoologically in a sense that does not admit of the species best known as "locusts" being included therein. The idea of a very destructive insect is universally associated with the term; therefore many orthopterous species that cannot be considered true locusts have been so-called; in North America it has even embraced certain *Hemiptera-Homoptera*, belonging to the *Cicadidae*, and in some parts of England cockchafers are so designated. In a more narrow definition the attribute of migration is associated with the destructive propensities, and it therefore becomes necessary that a true locust should be a migratory species of the family *Acridiidae*. Moreover, the term has yet a slightly different signification as viewed from the Old or New World. In Europe by a locust is meant an insect of large size, the smaller allied species being ordinarily known as "grasshoppers," hence the "Rocky Mountain locust" of North America is to Eastern ideas rather a grasshopper than a locust.

In Europe, and a greater part of the Old World, the best known migratory locust is that which is scientifically termed *Pachytylus cinerascens* with which an allied species *P. migratorius* has been often confounded. Another locust found in Europe and neighbouring districts is *Caloptenus italicus*, and still another, *Acridium peregrinum*, has once or twice occurred in Europe, though its home (even in a migratory sense) is more properly Africa and Asia. These practically include all the locusts of the Old World, though a migratory species of South Africa known as *Pachytylus pardalinus* (presumed to be distinct from *P. migratorius*) should be mentioned. The Rocky Mountain locust of North America is *Caloptenus spretus*, and in that continent there occurs an *Acridium* (*A. americanum*) so closely allied to *A. peregrinum* as to be scarcely distinct therefrom, though there it does not manifest migratory tendencies. In the West Indies and Central America *A. peregrinum* is also reported to occur.

The females excavate holes in the earth in which the eggs are deposited in a long cylindrical mass enveloped in a glutinous secretion. The young larvae hatch and immediately commence their destructive career. As these insects are "hemimetabolic" there is no quiescent stage; they go on increasing rapidly in size, and as they approach the perfect state the rudiments of the wings begin to appear. Even in this stage their locomotive powers are extensive and their voracity great. Once winged and perfect these powers become infinitely more disastrous, redoubled by the development of the migratory instinct. The laws regulating this instinct are not perfectly understood. Food and temperature have a great deal to do with it, and there is a tendency for the flights to take a particular direction, varied by the physical circumstances of the breeding districts. So likewise each species has its area of constant location, and its area of extraordinary migration. Perhaps the most feasible of the suggestions as to the causes of the migratory impulse is that locusts naturally breed in dry sandy districts in which food is scarce, and are impelled to wander to procure the necessaries of life; but against this it has been argued that swarms bred in a highly productive district in which they have temporarily settled will seek the barren home of their ancestors. Another ingenious suggestion is that migration is intimately connected with a dry condition of the atmosphere, urging them to move on until compelled to stop for food or procreative purposes. Swarms travel considerable distances, though probably generally fewer than 1000 m., though sometimes very much more. As a rule the progress is only gradual, and this adds vastly to the devastating effects. When an extensive swarm temporarily settles in a district, all vegetation rapidly disappears, and then hunger urges it on another stage. The large Old World species, although undoubtedly phytophagous, when compelled by hunger sometimes attack at least dry animal substances, and even cannibalism has been asserted as an outcome of the failure of all other kinds of food. The length of a single flight must depend upon circumstances. From peculiarities in the examples of *Acridium peregrinum* taken in England in 1869, it has been asserted that they must have come direct by sea from the west coast of Africa; and what is probably the same species has been seen in the Atlantic at least 1200 m. from land, in swarms completely covering the ship; thus, in certain cases flight must be sustained for several days and nights together. The height at which swarms fly, when their horizontal course is not liable to be altered by mountains, has been very variously estimated at from 40 to 200 ft., or even in a particular case to 500 ft. The extent of swarms and the number of individuals in a swarm cannot be accurately ascertained. They come sometimes in such numbers as to completely obscure the sun, when the noise made by the rustling of the wings is deafening. Nevertheless some idea on this point may be formed from the ascertained fact that in Cyprus in 1881, at the close of the season, 1,600,000,000 egg-cases, each containing a considerable number of eggs, had been destroyed; the estimated weight exceeding 1300 tons. Yet two years later, it is believed that not fewer than 5,076,000,000 egg-cases were again deposited in the island.

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[1] The Lat. *locusta* was first applied to a lobster or other marine shell-fish and then, from its resemblance, to the insect.

In Europe the best known and ordinarily most destructive species is *Pachytylus cinerascens*, and it is to it that most of the numerous records of devastations in Europe mainly refer, but it is probably not less destructive in many parts of Africa and Asia. That the arid steppes of central Asia are the home of this insect appears probable; still much on this point is enveloped in uncertainty. In any case the area of permanent distribution is enormous, and that of occasional distribution is still greater. The former area extends from the parallel of 40° N. in Portugal, rising to 48° in France and Switzerland, and passing into Russia at 55°, thence continuing across the middle of Siberia, north of China to Japan; thence south to the Fiji Islands, to New Zealand and North Australia; thence again to Mauritius and over all Africa to Madeira. The southern distribution is uncertain and obscure. Taking exceptional distribution, it is well known that it occasionally appears in the British Isles, and has in them apparently been noticed as far north as Edinburgh; so also does it occasionally appear in Scandinavia, and it has probably been seen up to 63° N. in Finland. Looking at this vast area, it is easy to conceive that an element of uncertainty must always exist with regard to the exact determination of the species, and in Europe especially is this the case, because there exists a distinct species, known as *P. migratorius*, the migratory area of which appears to be confined to Turkestan and eastern Europe.

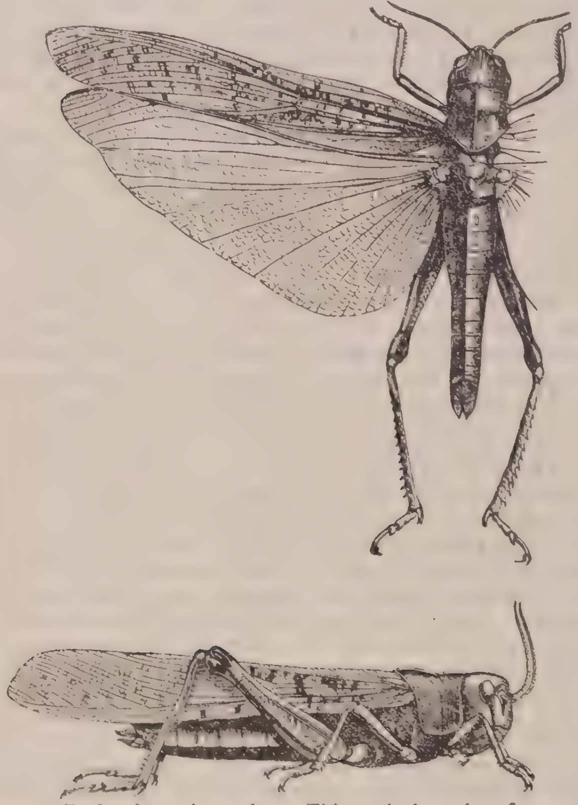

FIG. 1.—*Pachytylus migratorius*. This and the other figures are all natural size.

P. cinerascens is certainly the most common of the "locusts" occasionally found in the British Isles, and E. de Selys-Longchamps is of opinion that it breeds regularly in Belgium, whereas the true *P. migratorius* is only accidental in that country.

A South African species allied to the preceding and provisionally identified as *Pachytylus salcicollis* is noteworthy from the manifestation of the migratory instinct in immature wingless individuals. The families of young, after destroying the vegetation of a district, unite in a vast army and move away in search of fresh pastures, devastating the country as they go and proceeding of necessity on foot, hence they are known to the Dutch as "voetgangers." Travelling northwards towards the centre of the continent, the home of their parents before migration, they are diverted from their course by no obstacles. Upon reaching a river or stream they search the bank for a likely spot to cross, then fearlessly cast themselves upon the water where they form floating islands of insects, most of which usually succeed in gaining the opposite bank, though many perish in the attempt.

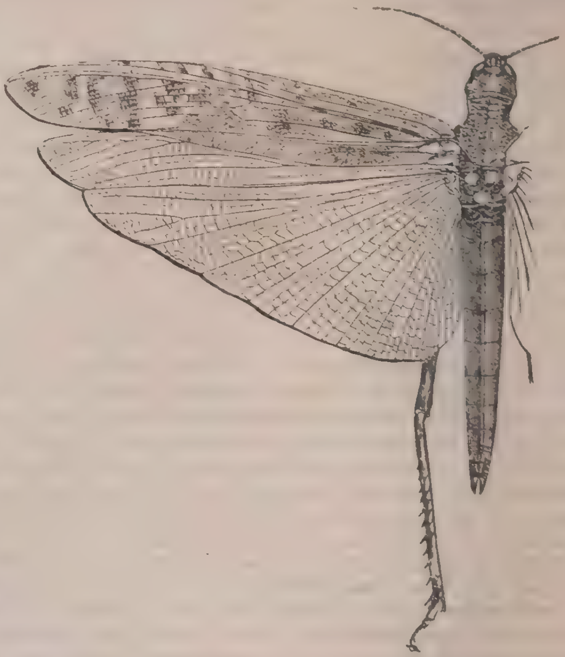

FIG. 2.—*Acridium peregrinum.*

Acridium peregrinum (fig. 2) can scarcely be considered even an accidental visitor to Europe; yet it has been seen in the south of Spain, and in many examples spread over a large part of England in the year 1869. It is a larger insect than *P. migratorius*. There is every reason to believe that it is the most destructive locust throughout Africa and in India and other parts of tropical Asia, and its ravages are as great as those of *P. migratorius*. Presumably it is the species occasionally noticed in a vast swarm in the Atlantic, very far from land, and presumably also it occurs in the West Indies and some parts of Central America. In the Argentine Republic a (possibly) distinct species (*A. paranense*) is the migratory locust.

Caloptenus italicus (fig. 3) is a smaller insect, with a less extended area of migration; the destruction occasioned in the districts to which it is limited is often scarce less than that of its more terrible allies. It is essentially a species of the Mediterranean district, and especially of the European side of that sea, yet it is also found in North Africa, and appears to extend far into southern Russia.

Caloptenus spretus (fig. 4) is the "Rocky Mountain locust" or "hateful grasshopper" of the North American continent. Though a comparatively small insect, not so large as some of the grasshoppers of English fields, its destructiveness has procured for it great notoriety. By early travellers and settlers the species was not recognized as distinct from some of its non-migratory congeners. But in 1877, Congress appointed a United States Entomological Commission to investigate the subject. The report of the commissioners (C.V Riley, A. S. Packard and C. Thomas) deals with the whole subject of locusts both in America and the Old World. *C. spretus* has its home or permanent area in the arid plains of the central region east of the Rocky Mountains, extending slightly into the southern portion of Canada; outside this is a wide fringe to which the term sub-permanent is applied, and this is again bounded by the limits of only occasional distribution, the whole occupying a large portion of the North American continent; but it is not known to have crossed the

Rocky Mountains westward, or to have extended into the eastern states.

As to remedial or preventive measures tending to check the ravages of locusts, little unfortunately can be said; but anything that will apply to one species may be used with practically all. Something can be done (as is now done in Cyprus) by offering a price for all the egg-tubes collected, which is the most direct manner of attacking them. Some little can be done by destroying the larvae while in an unwinged condition, and by digging trenches in the line of march into which they can fall and be drowned or otherwise put an end to. Little can be done with the winged hordes; starvation, the outcome of their own work, probably here does much. In South Africa some success has attended the spraying of the swarms with arsenic. It has been shown that with all migratory locusts the breeding-places, or true homes, are comparatively barren districts (mostly elevated plateaus); hence the progress of colonization, and the conversion of those heretofore barren plains into areas of fertility, may (and probably will) gradually lessen the evil.

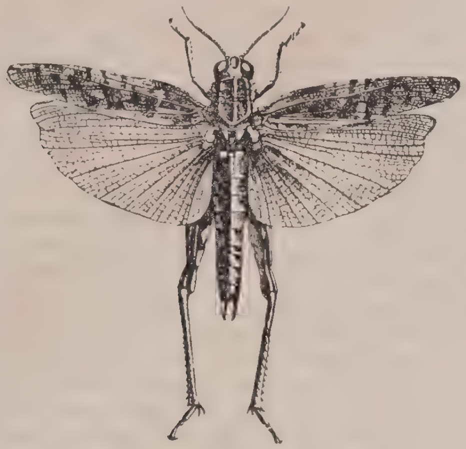

FIG. 3.—*Caloptenus italicus.*

Locusts have many enemies besides man. Many birds greedily devour them, and it has many times been remarked that migratory swarms of the insects were closely followed by myriads of birds. Predatory insects of other orders also attack them, especially when they are in the unwinged condition. Moreover, they have still more deadly insect foes as parasites. Some attack the fully developed winged insect. But the greater part attack the eggs. To such belong certain beetles, chiefly of the family *Cantharidae*, and especially certain two-winged flies of the family *Bombyliidae*. These latter, both in the Old and New World, must prevent vast quantities of eggs from producing larvae.

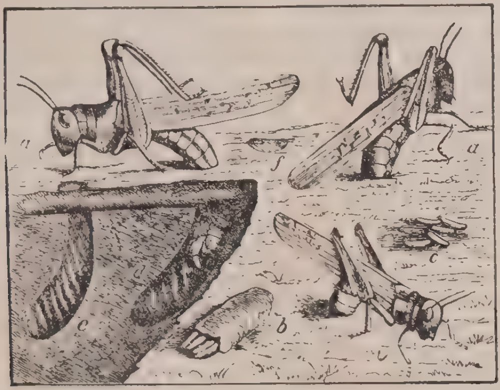

FIG. 4.—Rocky Mountain Locust (*Caloptenus spretus*). (After Riley.)

a, *a*, *a*, Female in different positions, ovipositing.
b, Egg-pod extracted from ground, with the end broken open.
c, A few eggs lying loose on the ground.
d, *e* show the earth partially removed, to illustrate an egg-mass already in place, and one being placed.
f, shows where such a mass has been covered up.

The larger Old World species form articles of food with certain semi-civilized and savage races, by whom they are considered as delicacies, or as part of ordinary diet, according to the race and the method of preparation. (R. M'L.; R. I. P.)

LOCUST-TREE, or CAROB-TREE (*Ceratonia siliqua*), a member of the tribe *Cassieae* of the order Leguminosae, the sole species of its genus, and widely diffused spontaneously and by cultivation from Spain to the eastern Mediterranean regions. The name of the genus is derived from the often curved pod (Gr. κεράτιον, a little horn). The flowers have no petals and are polygamous or dioecious (male, female and hermaphrodite flowers occur). The seed-pod is compressed, often curved, indehiscent and coriaceous, but with sweet pulpy divisions between the seeds, which, as in other genera of the *Cassieae*, are albuminous. The pods are eaten by men and animals, and in Sicily a spirit and a syrup are made from them. These husks being often used for swine are called swine's bread, and are probably referred to in the parable of the Prodigal Son. It is also called St John's bread, from a misunderstanding of Matt. iii. 4. The carob-tree was regarded by Sprengel as the tree with which Moses sweetened the bitter waters of Marah (Exod. xv. 25), as the *kharrûb*, according to Avicenna (p. 205), has the property of sweetening salt and bitter waters. Gerard (*Herball*, p. 1241) cultivated it in 1597, it having been introduced in 1570.

LODÈVE, a town of southern France, capital of an arrondissement of the department of Hérault, 36 m. W.N.W. of Montpellier by rail. Pop. (1906), 6142. It is situated in the southern Cévennes at the foot of steep hills in a small valley where the Soulondres joins the Lergue, a tributary of the Hérault. Two bridges over the Lergue connect the town with the faubourg of Carmes on the left bank of the river, and two others over the Soulondres lead to the extensive ruins of the château de Montbrun (13th century). The old fortified cathedral of St Fulcran, founded by him in 950, dates in its present condition from the 13th, 14th and 16th centuries; the cloister, dating from the 15th and 17th centuries, is in ruins. In the picturesque environs of the town stands the well-preserved monastery of St Michel de Grammont, dating from the 12th century and now used as farm buildings. In the neighbourhood are three fine dolmens. The manufacture of woollens for army clothing is the chief industry. Wool is imported in large quantities from the neighbouring departments, and from Morocco; the exports are cloth to Italy and the Levant, wine, brandy and wood. The town has tribunals of first instance and of commerce, a board of trade-arbitrators, a chamber of arts and manufactures, and a communal college.

Lodève (Luteva) existed before the invasion of the Romans, who for some time called it *Forum Neronis.* The inhabitants were converted to Christianity by St Flour, first bishop of the city, about 323. After passing successively into the hands of the Visigoths, the Franks, the Ostrogoths, the Arabs and the Carolingians, it became in the 9th century a separate countship, and afterwards the domain of its bishops. During the religious wars it suffered much, especially in 1573, when it was sacked. It ceased to be an episcopal see at the Revolution.

LODGE, EDMUND (1756–1839), English writer on heraldry, was born in London on the 13th of June 1756, son of Edmund Lodge, rector of Carshalton, Surrey. He held a cornet's commission in the army, which he resigned in 1773. In 1782 he became Bluemantle pursuivant-at-arms in the College of Arms. He subsequently became Lancaster herald, Norroy king-at-arms, Clarencieux king-at-arms, and, in 1832, knight of the order of the Guelphs of Hanover. He died in London on the 16th of January 1839. He wrote *Illustrations of British History, Biography and Manners in the reigns of Henry VIII., Edward VI., Mary, Elizabeth and James I . . . .* (3 vols., 1791), consisting of selections from the MSS. of the Howard, Talbot and Cecil families preserved at the College of Arms; *Life of Sir Julius Caesar . . .* (2nd ed., 1827). He contributed the literary matter to *Portraits of Illustrious Personages of Great Britain* (1814, &c.), an elaborate work of which a popular edition is included in Bohn's "Illustrated Library." His most important work on heraldry was *The Genealogy of the existing British Peerage . . .* (1832; enlarged edition, 1859). In *The Annual Peerage and Baronetage* (1827–1829), reissued after 1832 as *Peerage of the British Empire*, and generally known as Lodge's Peerage, his share did not go beyond the title-page.

LODGE, HENRY CABOT (1850–), American political leader and author, was born in Boston, Massachusetts, on the 12th of May 1850. He graduated at Harvard College in 1871 and at the Harvard Law School in 1875; was admitted to the Suffolk (Massachusetts) bar in 1876; and in 1876–1879 was instructor in American history at Harvard. He was a member of the Massachusetts House of Representatives in 1880–1881, and of the National House of Representatives in 1887–1893; succeeded Henry L. Dawes as United States Senator from Massachusetts in 1893; and in 1899 and in 1905 was re-elected to the Senate, where he became one of the most prominent of the Republican leaders, and an influential supporter of President Roosevelt. He was a member of the Alaskan Boundary Commission of 1903, and of the United States Immigration Commission of 1907. In the National Republican Convention of 1896 his influence did much to secure the adoption of the gold standard "plank" of the party's platform. He was the permanent chairman of the National Republican Convention of 1900, and of that of 1908. In 1874–1876 he edited the *North American Review* with Henry Adams; and in 1879–1882, with John T. Morse, Jr., he edited the *International Review*. In 1884–1890 he was an overseer of Harvard College. His doctoral thesis at Harvard was published with essays by Henry Adams, J. L. Laughlin and Ernest Young, under the title *Essays on Anglo-Saxon Land Law* (1876). He wrote: *Life and Letters of George Cabot* (1877); *Alexander Hamilton* (1882), *Daniel Webster* (1883) and *George Washington* (2 vols., 1889), in the "American Statesmen" series; *A Short History of the English Colonies in America* (1881); *Studies in History* (1884); *Boston* (1891), in the "Historic Towns" series; *Historical and Political Essays* (1892); with Theodore Roosevelt, *Hero Tales from American History* (1895); *Certain Accepted Heroes* (1897); *The Story of the American Revolution* (2 vols., 1898); *The War with Spain* (1899); *A Fighting Frigate* (1902); *A Frontier Town* (1906); and, with J. W. Garner, *A History of the United States* (4 vols., 1906). He edited *The Works of Alexander Hamilton* (9 vols., 1885–1886) and *The Federalist* (1891).

His son, GEORGE CABOT LODGE (1873–1909), also became known as an author, with *The Song of the Wave* (1898), *Poems, 1899–1902* (1902), *The Great Adventure* (1905), *Cain: a Drama* (1904), *Herakles* (1908) and other verse.

LODGE, SIR OLIVER JOSEPH (1851–), English physicist, was born at Penkhull, Staffordshire, on the 12th of June 1851, and was educated at Newport (Salop) grammar school. He was intended for a business career, but being attracted to science he entered University College, London, in 1872, graduating D.Sc. at London University in 1877. In 1875 he was appointed reader in natural philosophy at Bedford College for Women, and in 1879 he became assistant professor of applied mathematics at University College, London. Two years later he was called to the chair of physics in University College, Liverpool, where he remained till in 1900 he was chosen first principal of the new Birmingham University. He was knighted in 1902. His original work includes investigations on lightning, the seat of the electromotive force in the voltaic cell, the phenomena of electrolysis and the speed of the ion, electromagnetic waves and wireless telegraphy, the motion of the aether near the earth, and the application of electricity to the dispersal of fog and smoke. He presided over the mathematical and physical section of the British Association in 1891, and served as president of the Physical Society in 1899–1900 and of the Society for Psychical Research in 1901–1904. In addition to numerous scientific memoirs he wrote, among other works, *Lightning Conductors and Lightning Guards*, *Signalling without Wires*, *Modern Views of Electricity*, *Electrons* and *The Ether of Space*, together with various books and papers of a metaphysical and theological character.

LODGE, THOMAS (*c.* 1558–1625), English dramatist and miscellaneous writer, was born about 1558 at West Ham. He was the second son of Sir Thomas Lodge, who was lord mayor of London in 1562–1563. He was educated at Merchant Taylors' School and Trinity College, Oxford; taking his B.A. degree in 1577 and that of M.A. in 1581. In 1578 he entered Lincoln's Inn, where, as in the other Inns of Court, a love of letters and a crop of debts and difficulties were alike wont to spring up in a kindly soil. Lodge, apparently in disregard of the wishes of his family, speedily showed his inclination towards the looser ways of life and the lighter aspects of literature. When the penitent Stephen Gosson had (in 1579) published his *Schoole of Abuse*, Lodge took up the glove in his *Defence of Poetry, Music and Stage Plays* (1579 or 1580; reprinted for the Shakespeare Society, 1853), which shows a certain restraint, though neither deficient in force of invective nor backward in display of erudition. The pamphlet was prohibited, but appears to have been circulated privately. It was answered by Gosson in his *Playes Confuted in Five Actions*; and Lodge retorted with his *Alarum Against Usurers* (1584, reprinted *ib.*)—a "tract for the times" which no doubt was in some measure indebted to the author's personal experience. In the same year he produced the first tale written by him on his own account in prose and verse, *The Delectable History of Forbonius and Prisceria*, both published and reprinted with the *Alarum.* From 1587 onwards he seems to have made a series of attempts as a playwright, though most of those attributed to him are mainly conjectural. That he ever became an actor is improbable in itself, and Collier's conclusion to that effect rested on the two assumptions that the "Lodge" of Henslowe's M.S. was a player and that his name was Thomas, neither of which is supported by the text (see C. M. Ingleby, *Was Thomas Lodge an Actor?* 1868). Having, in the spirit of his age, "tried the waves" with Captain Clarke in his expedition to Terceira and the Canaries, Lodge in 1591 made a voyage with Thomas Cavendish to Brazil and the Straits of Magellan, returning home by 1593. During the Canaries expedition, to beguile the tedium of his voyage, he composed his prose tale of *Rosalynde, Euphues Golden Legacie*, which, printed in 1590, afterwards furnished the story of Shakespeare's *As You Like It.* The novel, which in its turn owes some, though no very considerable, debt to the medieval *Tale of Gamelyn* (unwarrantably appended to the fragmentary *Cookes Tale* in certain MSS. of Chaucer's works), is written in the euphuistic manner, but decidedly attractive both by its plot and by the situations arising from it. It has been frequently reprinted. Before starting on his second expedition he had published an historical romance, *The History of Robert, Second Duke of Normandy, surnamed Robert the Divell*; and he left behind him for publication *Catharos, Diogenes in his Singularity*, a discourse on the immorality of Athens (London). Both appeared in 1591. Another romance in the manner of Lyly, *Euphues Shadow, the Battaile of the Sences* (1592), appeared while Lodge was still on his travels. His second historical romance, the *Life and Death of William Longbeard* (1593), was more successful than the first. Lodge also brought back with him from the new world *A Margarite of America* (published 1596), a romance of the same description interspersed with many lyrics. Already in 1589 Lodge had given to the world a volume of poems bearing the title of the chief among them, *Scillaes Metamorphosis, Enterlaced with the Unfortunate Love of Glaucus*, more briefly known as *Glaucus and Scilla* (reprinted with preface by S. W. Singer in 1819). To this tale Shakespeare was possibly indebted for the idea of *Venus and Adonis.* Some readers would perhaps be prepared to give up this and much else of Lodge's sugared verse, fine though much of it is in quality, largely borrowed from other writers, French and Italian in particular, in exchange for the lost *Sailor's Kalendar*, in which he must in one way or another have recounted his sea adventures. If Lodge, as has been supposed, was the Alcon in *Colin Clout's come Home Again*, it may have been the influence of Spenser which led to the composition of *Phillis*, a volume of sonnets, in which the voice of nature seems only now and then to become audible, published with the narrative poem, *The Complaynte of Elstred*, in 1593. *A Fig for Momus*, on the strength of which he has been called the earliest English satirist, and which contains eclogues addressed to Daniel and others, an epistle addressed to Drayton, and other pieces, appeared in 1595. Lodge's ascertained dramatic work is small in quantity. In conjunction with Greene he, probably in 1590, produced in a popular vein the odd but far from feeble play of *A Looking Glasse for London and England* (printed in 1594). He had already written *The Wounds of Civile War. Lively set forth in the Tragedies of Marius and Scilla* (produced perhaps as early as 1587, and published in 1594), a good second-rate piece in the half-chronicle fashion of its age. Mr F. G. Fleay thinks there were grounds for assigning to Lodge *Mucedorus and Amadine*, played by the Queen's Men about 1588, a share with Robert Greene in *George a Greene, the Pinner of Wakefield*, and in Shakespeare's 2nd part of *Henry VI.*; he also regards him as at least part-author of *The True Chronicle of King Leir and his three Daughters* (1594); and *The Troublesome Raigne of John, King of England* (*c.* 1588); in the case of two other plays he allowed the assignation to Lodge to be purely conjectural. That Lodge is the "Young Juvenal" of Greene's *Groatsworth of Wit* is no longer a generally accepted hypothesis. In the latter part of his life—possibly about 1596, when he published his *Wits Miserie* and the *World's Madnesse*, which is dated from Low Leyton in Essex, and the religious tract *Prosopopeia* (if, as seems probable, it was his), in which he repents him of his "lewd lines" of other days—he became a Catholic and engaged in the practice of medicine, for which Wood says he qualified himself by a degree at Avignon in 1600. Two years afterwards he received the degree of M.D. from Oxford University. His works henceforth have a sober cast, comprising translations of Josephus (1602), of Seneca (1614), a *Learned Summary* of Du Bartas's *Divine Sepmaine* (1625 and 1637), besides a *Treatise of the Plague* (1603), and a popular manual, which remained unpublished, on *Domestic Medicine*. Early in 1606 he seems to have left England, to escape the persecution then directed against the Catholics; and a letter from him dated 1610 thanks the English ambassador in Paris for enabling him to return in safety. He was abroad on urgent private affairs of one kind and another in 1616. From this time to his death in 1625 nothing further concerning him remains to be noted.

Lodge's works, with the exception of his translations, have been reprinted for the Hunterian Club with an introductory essay by Mr Edmund Gosse. This preface was reprinted in Mr Gosse's *Seventeenth Century Studies* (1883). Of *Rosalynde* there are numerous modern editions. See also J. J. Jusserand, *English Novel in the Time of Shakespeare* (Eng. trans., 1890); F. G. Fleay, *Biographical Chronicle of the English Drama* (vol. ii., 1891). (A. W. W.)

LODGE, a dwelling-place, small and usually temporary, a hut, booth or tent. The word was in M. Eng. *logge*, from Fr. *loge*, arbour, in modern French a hut; also box in a theatre; the French word, like the Italian *loggia*, came from the Med. Lat. *laubia* or *lobia*, the sheltered promenade in a cloister, from which English "lobby" is derived. The Latin is of Teutonic origin from the word which survives in the Mod. Ger. *Laube*, an arbour, but which earlier was used for any hut, booth, &c. The word is probably ultimately from the root which appears in "leaf," meaning a rough shelter of foliage or boughs. The word is especially used of a house built either in a forest or away from habitation, where people stay for the purpose of sport, as a "hunting lodge," "shooting lodge," &c. The most frequent use of the word is of a small building, usually placed at the entrance to an estate or park and inhabited by a dependant of the owner. In the same sense the word means the room or box inhabited by the porter of a college, factory or public institution. Among Freemasons and other societies the "lodge" is the name given to the meeting-place of the members of the branch or district, and is applied to the members collectively as "a meeting of the lodge." The governing body of the Freemasons presided over by the grand master is called the "Grand Lodge." At the university of Cambridge the house where the head of a college lives is called the "lodge." Formerly the word was used of the den or lair of an animal, but is now only applied to that of the beaver and the otter. It is also applied to the tent of a North American Indian, a wigwam or tepee, and to the number of inhabitants of such a tent. In mining the term is used of a subterraneous reservoir made at the bottom of the pit, or at different levels in the shaft for the purpose of draining the mine. It is used also of a room or landing-place next to the shaft, for discharging ore, &c.

LODGER AND LODGINGS. The term "lodger" (Fr. *loger*, to lodge) is used in English law in several slightly different senses. It is applied (i.) most frequently and properly to a person who takes furnished rooms in a house, the landlord also residing on the premises, and supplying him with attendance; (ii.) sometimes to a person, who takes unfurnished rooms in a house finding his own attendance; (iii.) to a boarder in a boarding-house (*q.v.*). It is with (i.) and (ii.) alone that this article is concerned.

Where furnished apartments are let for immediate use, the law implies an undertaking on the part of the landlord that they are fit for habitation, and, if this condition is broken, the tenant may refuse to occupy the premises or to pay any rent. But there is no implied contract that the apartments shall *continue* fit for habitation; and the rule has no application in the case of unfurnished lodgings. In the absence of express agreement to the contrary, a lodger has a right to the use of everything necessary to the enjoyment of the premises, such as the door bell and knocker and the skylight of a staircase. Whether the rent of apartments can be distrained for by the immediate landlord where he resides on the premises and supplies attendance is a question the answer to which is involved in some uncertainty. The weight of authority seems to support the negative view (see Foa, *Landlord and Tenant*, 3rd ed. p. 434). To make good a right to distrain it is necessary to show that the terms of the letting create a tenancy or exclusive occupation and not a mere licence. Where the owner, although residing on the premises, does not supply attendance, the question depends on whether there is a real tenancy, giving the lodger an exclusive right of occupation as against the owner. The ordinary test is whether the lodger has the control of the outer door. But the whole circumstances of each case have to be taken account of. A lodger is rateable to the poor-rate where he is in exclusive occupation of the apartments let to him, and the landlord does not retain the control and dominion of the whole structure. As to distress on a lodger's goods for rent due by an immediate to a superior landlord, see Rent. As to the termination of short tenancies, as of apartments, see Landlord and Tenant. The landlord has no lien on the goods of the lodger for rent or charges. Overcrowding lodging-houses may be dealt with as a nuisance under the Public Health Acts 1875 and 1891 and the Housing of the Working Classes Acts. As to the lodger franchise, see Registration of Voters. It has been held in England that keepers of lodging-houses do not come within the category of those persons (see Carrier; Innkeeper) who hold themselves out to the public generally as trustworthy in certain employments; but that they are under an obligation to take reasonable care for the safety of their lodgers' goods; see *Scarborough* v. *Cosgrove*, 1905, 2 K.B. 805. As to Scots Law see Bell's *Prin.* s. 236 (4).

In the United States, the English doctrine of an implied warranty of fitness for habitation on a letting of furnished apartments has only met with partial acceptance; it was repudiated, *e.g.* in the District of Columbia, but has been accepted in Massachusetts. In the French *Code Civil*, there are some special rules with regard to furnished apartments. The letting is reputed to be made for a year, a month or a day, according as the rent is so much per year, per month or per day; if that test is inapplicable, the letting is deemed to be made according to the custom of the place (art. 1758). There are similar provisions in the Civil Codes of Belgium (art. 1758), Holland (art. 1622) and Spain (Civil Code, art. 1581).

See also the articles, Boarding House, and Flat; and the bibliographies to Flat and Landlord and Tenant. (A. W. R.)

LODI, a town and episcopal see of Piedmont, Italy, in the province of Milan, 20½ m. by rail S.E. of that city, on a hill above the right bank of the Adda, 230 ft. above sea-level. Pop. (1901) 19,970 (town), 26,827 (commune). The site of the city is an eminence rising very gradually from the Lombard plain, and the surrounding country is one of the richest dairy districts in Italy. The cathedral (1158), with a Gothic façade and a 16th-century lateral tower, has a restored interior. The church of the Incoronata was erected by Battaggio (1488) in the Bramantesque style. It is an elegant octagonal domed structure, and is decorated with frescoes by the Piazza family, natives of the town, and four large altar-pieces by Calisto Piazza (died after 1561). There is a fine organ of 1507. The 13th-century Gothic church of San Francesco, restored in 1889, with 14th-century paintings, is also noticeable. The Palazzo Modegnani has a fine gateway in the style of Bramante, and the hospital a cloistered quadrangle. In the Via Pompeia is an early Renaissance house with fine decorations in marble and terra-cotta. Besides an extensive trade in cheese (Lodi producing more Parmesan than Parma itself) and other dairy produce, there are manufactures of linen, silk, majolica and chemicals.

The ancient Laus Pompeia lay 3½ m. W. of the present city, and the site is still occupied by a considerable village, Lodi Vecchio, with the old cathedral of S. Bassiano, now a brick building, which contains 15th-century frescoes. It was the point where the roads from Mediolanum to Placentia and Cremona diverged, and there was also a road to Ticinum turning off from the former, but it is hardly mentioned by classical writers. It appears to have been a *municipium.* No ruins exist above ground, but various antiquities have been found here. From which Pompeius, whether Cn. Pompeius Strabo, who gave citizenship to the Transpadani, or his son, the more famous Pompey, it took its name is not certain. In the middle ages Lodi was second to Milan among the cities of northern Italy. A dispute with the archbishop of Milan about the investiture of the bishop of Lodi (1024) proved the beginning of a protracted feud between the two cities. In 1111 the Milanese laid the whole place in ruins and forbade their rivals to restore what they had destroyed, and in 1158, when in spite of this prohibition a fairly flourishing settlement had again been formed, they repeated their work in a more thorough manner. A number of the Lodigians had settled on Colle Eghezzone; and their village, the Borgo d'Isella, on the site of a temple of Hercules, soon grew up under the patronage of Frederick Barbarossa into a new city of Lodi (1162). At first subservient to the emperor, Lodi was before long compelled to enter the Lombard League, and in 1198 it formed alliance offensive and defensive with Milan. The strife between the Sommariva or aristocratic party and the Overgnaghi or democratic party was so severe that the city divided into two distinct communes. The Overgnaghi, expelled in 1236, were restored by Frederick II. who took the city after three months' siege. Lodi was actively concerned in the rest of the Guelph and Ghibelline struggle. In 1416 its ruler, Giovanni Vignati, was treacherously taken prisoner by Filippo Maria Visconti, and after that time it became dependent on Milan. The duke of Brunswick captured it in 1625 in the interests of Spain; and it was occupied by the French (1701), by the Austrians (1706), by the king of Sardinia (1733), by the Austrians (1736), by the Spaniards (1745), and again by the Austrians (1746). On the 10th of May 1796 was fought the battle of Lodi between the Austrians and Napoleon, which made the latter master of Lombardy.

LODZ (*Łódź*; more correctly *Lodzia*), a town of Russian Poland, in the government of Piotrków, 82 m. by rail S.W. of Warsaw. It is situated on the Lodz plateau, which at the beginning of the 19th century was covered with impenetrable forests. Now it is the centre of a group of industrial towns—Zgerź, Lęczyca, Pabianice, Konstantinov and Aleksandrov. Chiefly owing to a considerable immigration of German capitalists and workers, Lodz has grown with American-like rapidity. It consists principally of one main street, 7 m. long, and is a sort of Polish Manchester, manufacturing cottons, woollens and mixed stuffs, with chemicals, beer, machinery and silk. One of the very few educational institutions is a professional industrial school. The population, which was only 50,000 in 1872, reached 351,570 in 1900; the Poles numbering about 37%, Germans 40% and Jews 22½%.

LOESS (Ger. *Löss*), in geology, a variety of loam. Typical loess is a soft, porous rock, pale yellowish or buff in colour; one characteristic property is its capacity to retain vertical, or even over-hanging, walls in the banks of streams. These vertical walls have been well described by von Richthofen (*Führer für Forschungsreisende*, Berlin, 1886) in China, where they stand in some places 500 ft. high and contain innumerable cave dwellings; ancient roads too have worn their way vertically downwards deep into the deposit, forming trench-like ways. This character in the loess of the Mississippi region gave rise to the name "Bluff formation." A coarse columnar structure is often exhibited on the vertical weathered faces of the rock. Another characteristic is the presence throughout the rock of small capillary tubules, which appear to have been occupied by rootlets; these are often lined with calcite. Typical loess is usually calcareous; some geologists regard this as an essential property, and when the rock has become decalcified, as it frequently is on the surface by weathering, they call it "loess-loam" (*lösslehm*). In the lower portions of a loess deposit the calcium carbonate tends to form concretions, which on account of their mimetic forms have received such names as *lösskindchen*, *lösspuppen*, *poupées du loess*, "loess dolls." In deposits of this nature in South America these concretionary masses form distinct beds. Bedding is absent from typical loess. The mineral composition of loess varies somewhat in different regions, but the particles are always small; they consist of angular grains of quartz, fine particles of hydrated silicates of alumina, mica scales and undecomposed fragments of felspar, hornblende and other rock-forming silicates.

In Europe and America loess deposits are associated with the margins of the great ice sheets of the glacial period; thus in Europe they stretch irregularly through the centre eastwards from the north-west of France, and are not found north of the 57th parallel. In both regions loess deposits are found within and upon glacial deposits. For this reason the loess is very commonly assigned to the Pleistocene period; but some of the loess deposits of northern Europe have been in process of formation intermittently from the Miocene period onward, and in South America the great loess formations known as the Pampean or Patagonian belong to the Eocene, Oligocene and Pleistocene periods. Most geologists are agreed that the loess is an aeolian or wind-borne rock, formed most probably during periods of tundra or steppe conditions. The capillary tubules are supposed to have been caused by the roots of grass and herbage which kept growing upon the surface even while the deposit was slowly increasing. Others contend that loess is of the nature of alluvial loam; this may be true of certain deposits classed as loess, but it cannot be true of most of the typical loess formations, for they lie upon older rocks quite independently of altitude, from near sea level up to 5000 ft. in Europe and to 11,500 ft. in China; they are often developed on one side of a mountain range and not upon the other, and in a series of approximately parallel valleys the loess is frequently found lying upon one side and that the same in each case, facts pointing to the agency of prevalent winds.

The thickness of loess deposits is usually not more than 33 ft., but in China it reaches 1000 ft. or more; it also attains a great thickness in South America. Numerous proboscidian and other mammalian fossils have been found in the loess of Europe; the tapir, mastodon and giant sloths occur in South America, but the most common fossils are small land shells and such amphibious pond forms as *Succinea.* Certain loess deposits in Turkestan have been attributed to rain-wash, this is the so-called "lake-loess" (*see-löss*); according to Tukowski the difference between sub-aerial and lake loess is that the former is porous, dry and pervious, while the latter is laminated, plastic and impervious. Two types of loess have been recognized in Russia, the Hill- or Terrace-loess and the Low-level-loess, a product of the weathering of underlying rocks. In South Germany the following order has been recognized: (1) an upper unbedded, non-calcareous loess, (2) the *gehanglöss*, mixed with subsoil rocks, and (3) the sand or *thal-löss*, with some gravel. The effect of vegetation on the upper layers of loess is to produce soils of great fertility, such as the black earth (*Tschernozom*) of southern Russia, the dark *Bordelöss* of the Magdeburg district, and the black "cotton soil" (*regur*) of the Deccan.

LOFFT, CAPEL (1751–1824), English miscellaneous writer, was born in London on the 14th of November 1751. He was educated at Eton, and Peterhouse, Cambridge, which he left to become a member of Lincoln's Inn. He was called to the bar in 1775, and left by his father's and uncle's deaths with a handsome property and the family estates. He was a prolific writer on a variety of topics, and a vigorous contentious advocate of parliamentary and other reforms, and carried on a voluminous correspondence with all the literary men of his time. He became the patron of Robert Bloomfield, the author of *The Farmer's Boy*, and secured for him the very successful publication of that work. Byron, in a note to his *English Bards and*

Scotch Reviewers, ridiculed Lofft as "the Maecenas of shoemakers and preface-writer general to distressed versemen; a kind of gratis *accoucheur* to those who wish to be delivered of rhyme, but do not know how to bring forth." He died at Montcalieri, near Turin, on the 26th of May 1824.

His fourth son Capel Lofft, the younger (1806–1873), also a writer on various topics, inherited his father's liberal ideas and principles, and carried them in youth to greater extremes. In his old age he abandoned these theories, which had brought him into the company of some of the leading political agitators of the day. He died in America, where he had a Virginia estate.

LOFOTEN AND VESTERAALEN, a large and picturesque group of islands lying N.E. and S.W. off the N.W. coast of Norway, between 67° 30′ and 69° 20′ N., and between 12° and 16° 35′ E. forming part of the *amt* (county) of Nordland. The extreme length of the group from Andenaes, at the north of Andö, to Röst, is about 150 m.; the aggregate area about 1560 sq. m. It is separated from the mainland by the Vestfjord, Tjaeldsund and Vaagsfjord, and is divided into two sections by the Raftsund between Hindö and Öst-Vaagö. To the W. and S. of the Raftsund lie the Lofoten Islands proper, of which the most important are Öst-Vaagö, Gimsö, Vest-Vaagö, Flakstadö, Moskenaesö, Mosken, Värö and Röst; E. and N. of the Raftsund are the islands of Vesteraalen, the chief being Hindö, Ulvö, Langö, Skogsö and Andö. The islands, which are all of granite or metamorphic gneiss, are precipitous and lofty. The highest points and finest scenery are found on Öst-Vaagö, in the neighbourhood of the narrow, cliff-bound Raftsund and Troldfjord. The principal peaks are Higrafstind (3811 ft.), Gjeitgaljartind (3555), Rulten (3483), the Noldtinder (3467), Svartsundtind (3506). The long line of jagged and fantastic peaks seen from the Vestfjord forms one of the most striking prospects on the Norwegian coast, but still finer is the panorama from the Digermuler (1150 ft.), embracing the islands, the Vestfjord, and the mountains of the mainland. The channels which separate the islands are narrow and tortuous, and generally of great depth; they are remarkable for the strength of their tidal currents, particularly the Raftsund and the famous Maelström or Moskenström between Moskenaes and Mosken. The violent tempests which sweep over the Vestfjord, which is exposed to the S.W., are graphically described in Jonas Lie's *Den Fremsynte* (1870) and in H. Schultze's *Udvalgte Skrifter* (1883), as the Maelström is imaginatively by Edgar Allan Poe. Though situated wholly within the Arctic circle, the climate of the Lofoten and Vesteraalen group is not rigorous when compared with that of the rest of Norway. The isothermal line which marks a mean January temperature of 32° F. runs south from the Lofotens, passing a little to the east of Bergen onward to Gothenburg and Copenhagen. The prevailing winds are from the S. and W., the mean temperature for the year is 38·5° F., and the annual rainfall is 43·34 in. In summer the hills have only patches of snow, the snow limit being about 3000 ft. The natural pasture produced in favourable localities permits the rearing of cattle to some extent; but the growth of cereals (chiefly barley, which here matures in ninety days) is insignificant. The islands yield no wood. The characteristic industry, and an important source of the national wealth, is the cod fishery carried on along the east coast of the Lofotens in the Vestfjord in spring. This employs about 40,000 men during the season from all parts of Norway, the population being then about doubled, and the surplus accommodated in temporary huts. The average yield is valued at about £35,000. The fish are taken in nets let down during the night, or on lines upwards of a mile in length, or on ordinary hand-lines. The fishermen are paid in cash, and large sums of money are sent to the islands by the Norwegian banks each February. Great loss of life is frequent during the sudden local storms. The fish, which is dried during early summer, is exported to Spain (where it is known as *bacalao*), Holland, Great Britain, Belgium, &c. Industries arising out of the fishery are the manufacture of cod-liver oil and of artificial manure. The summer cod fisheries and the lobster fishery are also valuable. The herring is taken in large quantities off the west coasts of Vesteraalen, but is a somewhat capricious visitant. The islands contain no towns properly so called, but Kabelvaag on Öst-Vaagö and Svolvaer on a few rocky islets off that island are considerable centres of trade and (in the fishing season) of population; Lödingen also, at the head of the Vestfjord on Hindö, is much frequented as a port of call. A church existed at Vaagen (Kabelvaag) in the 12th century, and here Hans Egede, the missionary of Greenland, was pastor. There are factories for fish guano at Henningvaer (Öst-Vaagö), Kabelvaag, Svolvaer, Lödingen, and at Bretesnäs on Store Molla. Regular means of communication are afforded by the steamers which trade between Hamburg or Christiania and Hammerfest, and also by local vessels; less accessible spots can be visited by small boats, in the management of which the natives are adepts. There are some roads on Hindö, Langö, and Andö. The largest island in the group, and indeed in Norway, is Hindö, with an area of 860 sq. m. The south-eastern portion of it belongs to the *amt* of Tromsö. In the island of Andö there is a bed of coal at the mouth of Ramsaa.

LOFT (connected with "lift," *i.e.* raised in the air; O. Eng. *lyft*; cf. Ger. *Luft*; the French term is *grenier* and Ger. *Boden*), the term given in architecture to an upper room in the roof, sometimes called "cockloft"; when applied over stabling it is known as a hay-loft; the gallery over a chancel screen, carrying a cross, is called a rood-loft (see ROOD). The term is also given to a gallery provided in the choir-aisle of a cathedral or church, and used as a watching-loft at night.

LOFTUS, ADAM (*c.* 1533–1605), archbishop of Armagh and Dublin, and lord chancellor of Ireland, the son of a Yorkshire gentleman, was educated at Cambridge. He accompanied the earl of Sussex to Ireland as his chaplain in 1560, and three years later was consecrated archbishop of Armagh by Hugh Curwen, archbishop of Dublin. In 1565 Queen Elizabeth, to supplement the meagre income derivable from the archiepiscopal see owing to the disturbed state of the country, appointed Loftus temporarily to the deanery of St Patrick's; and in the same year he became president of the new commission for ecclesiastical causes. In 1567 he was translated to the archbishopric of Dublin, where the queen looked to him to carry out reforms in the Church. On several occasions he temporarily executed the functions of lord keeper, and in August 1581 he was appointed lord chancellor of Ireland. Loftus was constantly occupied in attempts to improve his financial position by obtaining additional preferment. He had been obliged to resign the deanery of St Patrick's in 1567, and twenty years later he quarrelled violently with Sir John Perrot, the lord deputy, over the proposal to appropriate the revenues of the cathedral to the foundation of a university. Loftus, however, favoured the project of founding a university in Dublin, though on lines different from Perrot's proposal, and it was largely through his influence that the corporation of Dublin granted the lands of the priory of All Hallows as a beginning of the endowment of Trinity College, of which he was named first provost in the charter creating the foundation in 1591. Loftus, who had an important share in the administration of Ireland under successive lords deputy, and whose zeal and efficiency were commended by James I. on his accession, died in Dublin on the 5th of April 1605. By his wife, Jane Purdon, he had twenty children.

His brother Robert was father of ADAM LOFTUS (*c.* 1568–1643), who became lord chancellor of Ireland in 1619, and in 1622 was created Viscount Loftus of Ely, King's county, in the peerage of Ireland. Lord Loftus came into violent conflict with the lord deputy, Viscount Falkland, in 1624; and at a later date his quarrel with Strafford was still more fierce. One of the articles in Strafford's impeachment was based on his dealings with Loftus. The title, which became extinct on the death of his grandson, the 3rd viscount, in 1725 (when the family estate of Monasterevan, re-named Moore Abbey, passed to his daughter's son Henry, 4th earl of Drogheda), was re-granted in 1756 to his cousin Nicholas Loftus, a lineal descendant of the archbishop. It again became extinct more than once afterwards, but was on each occasion revived in favour of a descendant through the female line; and it is now held by the marquis of Ely in conjunction with other family titles.

See Richard Mant, *History of the Church of Ireland* (2 vols., London, 1840); J. R. O'Flanagan, *Lives of the Lord Chancellors of Ireland* (2 vols., London, 1870); John D'Alton, *Memoirs of the Archbishops of Dublin* (Dublin, 1838); Henry Cotton, *Fasti Ecclesiae Hibernicae* (5 vols., Dublin, 1848–1878); William Monck Mason, *History and Antiquities of the College and Cathedral Church of St Patrick, near Dublin* (Dublin, 1819); G. E. C., *Complete Peerage* vol. iii., sub. "Ely" (London, 1890).

LOG (a word of uncertain etymological origin, possibly onomatopoeic; the *New English Dictionary* rejects the derivation from Norwegian *lág*, a fallen tree), a large piece of, generally unhewn, wood. The word is also used in various figurative senses, and more particularly for the "nautical log," an apparatus for ascertaining the speed of ships. Its employment in this sense depends on the fact that a piece of wood attached to a line was thrown overboard to lie like a log in a fixed position, motionless, the vessel's speed being calculated by observing what length of line ran out in a given time ("common log"); and the word has been retained for the modern "patent" or "continuous" log, though it works in an entirely different manner.

The origin of the "common log" is obscure, but the beginnings of the "continuous log" may be traced back to the 16th century. By an invention probably due to Humfray Cole and published in 1578 by William Bourne in his *Inventions and Devices*, it was proposed to register a ship's speed by means of a "little small close boat," with a wheel, or wheels, and an axle-tree to turn clockwork in the little boat, with dials and pointers indicating fathoms, leagues, scores of leagues and hundreds of leagues. About 1668 Dr R. Hooke showed some members of the Royal Society an instrument for the same purpose, depending on a vane or fly which rotated as the vessel progressed (Birch, *History of the Royal Society*, iv. 231), and Sir Isaac Newton in 1715 reported unfavourably on the "marine surveyor" of Henry de Saumarez, which also depended on a rotator. Conradus Mel in his *Antiquarius Sacer* (1719) described a "pantometron nauticum" which he claimed would show without calculation the distance sailed by the ship; and J. Smeaton in 1754 published improvements on the apparatus of Saumarez. William Foxon of Deptford in 1772, James Guerimand of Middlesex in 1776 (by his "marine perambulator"), and R. H. Gower in 1772, practically demonstrated the registration of a vessel's speed by mechanical means. Viscount de Vaux in 1807 made use of water-pressure, as did the Rev. E. L. Berthon in 1849, and C. E. Kelway invented an electrical log in 1876.

Common Log.—To ascertain the ship's speed by the common log four articles are necessary—a log-ship or log-chip, log-reel, log-line and log-glass. The log-ship (fig. 1) is a wooden quadrant $\frac{1}{2}$ in. thick, with a radius of 5 or 6 in., the circumference of which is weighted with lead to keep it upright and retard its passage through the water. Two holes are made near its lower angles. One end of a short piece of thin line is passed through one of these holes, and knotted; the other end has spliced to it a hard bone peg which is inserted in the other hole. The holes are so placed that the log-ship will hang square from the span thus formed. The log-line is secured to this span and consists of two parts. The portion nearest the log-ship is known as the "stray line"; its length varies from 10 to 20 fathoms, but should be sufficient to ensure that the log-ship shall be outside the disturbing element of the ship's wake. The point where it joins the other part is marked by a piece of bunting, and the line from this point towards its other end is marked at known intervals with "knots," which consist of pieces of cord worked in between its strands. A mean degree of the meridian being assumed to be 69·09 statute miles of 5280 ft., the nautical mile ($\frac{1}{60}$ degree) is taken as 6080 ft., which is a sufficiently close approximation for practical purposes, and the distances between the knots are made to bear the same relation to 6080 ft. as 28 seconds to an hour (3600 seconds); that is, they are placed at intervals of 47 ft. 3 in. The end of the first interval of this length (counting from the piece of bunting) is marked by a bit of leather, the second by a cord with two knots, the third by one with three knots, and so on; the middle of each of these lengths (half-knot) is also marked by a cord with one knot. It follows that, if, say, five knots of the line run out in 28 seconds, the ship has gone $5 \times 47\frac{1}{4}$ ft. in that time, or is moving at the rate of 5×6080 ft. (=five nautical miles) an hour; hence the common use of knot as equivalent to a nautical mile. In the log-glass the time is measured by running sand, which, however, is apt to be affected by the humidity of the atmosphere. Sometimes a 30-second glass is used instead of a 28-second one, and the intervals between the knots on the log-line are then made 50 ft. 7 in. instead of 47 ft. 3 in. For speeds over six knots a 14-second glass is employed, and the speed indicated by the log-line is doubled.

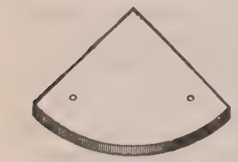
FIG. 1.

The log-line, after being well soaked, stretched and marked with knots, is wound uniformly on the log-reel, to which its inner end is securely fastened. To "heave the log," a man holds the log-reel over his head (at high speeds the man and portable reel are superseded by a fixed reel and a winch fitted with a brake), and the officer places the peg in the log-ship, which he then throws clear and to windward of the ship, allowing the line to run freely out. When the bunting at the end of the stray line passes his hand, he calls to his assistant to turn the glass, and allows the line to pay out freely. When all the sand has run through, the assistant calls "Stop!" when the log-line is quickly nipped, the knots counted, and the intermediate portion estimated. The strain on the log-ship when the log-line is nipped, causes the peg to be withdrawn from it, and the log-ship is readily hauled in. In normal circumstances the log is hove every hour. In a steam vessel running at high speed on an ocean route, with engines working smoothly and uniformly, a careful officer with correct line and glass can obtain very accurate results with the common log.

Ground Log.—In the deltas of shoal rivers, with a strong tide or current and no land visible, a 5 lb lead is substituted for the log-ship; the lead rests on the bottom, and the speed is obtained in a manner similar to that previously described. Such a "ground-log" indicates the actual speed over the ground, and in addition, when the log-line is being hauled in, it will show the real course the ship is making over the ground.

Patent Log.—The screw or rotatory log of Edward Massey, invented in 1802, came into general use in 1836 and continued until 1861. The registering wheel-work was contained in a shallow rectangular box (fig. 2), with a float plate on its upper side, carrying three indicating dials, recording respectively fractions, units and tens of miles (up to a hundred). The rotator was connected to the log by a rope 6 ft. in length, actuating a universal joint on the first spindle of the register; it consisted of an air-tight thin metal tube with a coned fore-end, carrying flat metal vanes set at an angle. Alexander Bain in 1846 suggested enclosing the wheelwork in the rotator. In Thomas Walker's harpoon or frictionless log, introduced in 1861, the wheelwork was enclosed in a cylindrical case of the same diameter as the body of the rotator or fan, and the latter was brought close up to the register, forming a compact machine and avoiding the use of the 6-ft. line. Two years later a heart-shaped float plate was attached to the case, and the log called the A1 Harpoon ship log (fig. 3). The log should be washed in fresh water when practicable, to prevent oxidization of the wheels, and be lubricated with suitable oil through a hole in the case.

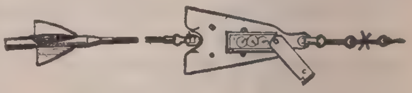
FIG. 2.

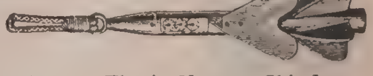
FIG. 3.—The A1 Harpoon Ship Log.

These logs were towed from the ship, but with quick passages and well surveyed coasts, the need arose for a patent log which could be readily consulted from the deck, and from which the distance run under varying speeds could be quickly ascertained. To meet this requirement, Walker in 1878 introduced the Cherub log (fig. 4), a taffrail one, which, however, is not as a rule used for speeds over 18 knots. Owing to the increased friction produced by a rotator making approximately 900 revolutions per mile, towed at the end of a line varying from 40 fathoms for a 12-knot speed to 60 fathoms for 20 knots, the pull of the line and rotator is borne by coned rollers, having their outlines tapering to a common point in their rotation, thus giving a broad rolling surface. Strong worms and wheels are substituted for the light clockwork. In fig. 4 the shoe H is secured to the taffrail, and the rotator in the water is hooked to the eye of the spindle M by the hook D. The case A contains the registering wheelwork and a sounding bell. The half gimbal B pivoting in the socket of the base C allows the register to receive the strain in the direct line. The bearings and rollers are lubricated with castor oil every twelve hours through holes in the sliding case E, and can be examined by unscrewing the case E and the eye M. When not in use, the register is removed from the shoe by lifting a small screw button near C. The tow line is usually plaited, and to avoid a knot close to the rotator, the latter is secured to the former by a knot inside an egg-shaped shell (fig. 5, Neptune pattern).

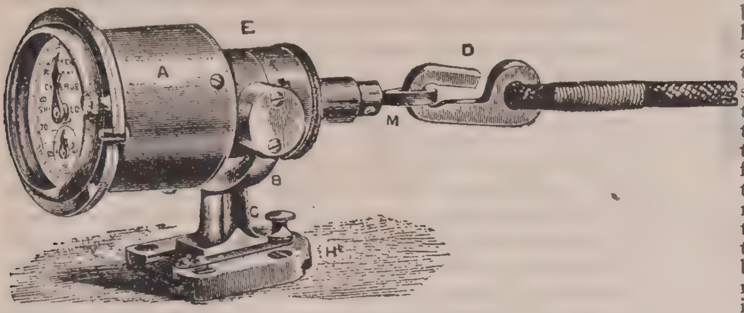

Fig. 4.—The Cherub Log.

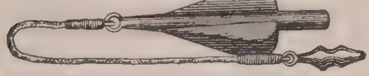

Fig. 5.—Neptune Pattern for securing Rotator.

Walker's Neptune log (fig. 6) is used for vessels of high speed. Case A contains the wheelwork, and case E the spindle and steel ball bearings; in each case are openings, closed by sliding tubes, for examination and lubrication. In fig. 6 the cases A and E are shown open. Fig. 7 shows the dial plate. In fig. 8 the ball bearings are shown unscrewed from the body of the log, with eye, cap and spindle. They consist of two rows of balls rolling in two pairs of V races or grooves. The outer pair receive the strain of the rotator, and the inner are for adjustment and to prevent lateral movement. The balls and races are enclosed in a skeleton cage (fig. 9) unscrewing from the cap F (fig. 6) for cleaning or renewal; the adjustment of the bearings is made by screwing up the cage cap *b*, locked by a special washer and the two screws *a*, *a* (figs. 8, 9). If the outer races become worn, the complete cage and bearings are reversed; the strain of the line is then transferred to what had previously been the inner with practically unworn balls and races. It is for this purpose that the skeleton cage is screwed internally at both ends, fitting a screwed ring inside the cap F (fig. 6). To enable the indications of the log register on the taffrail to be recorded in the chart room or any other part of the vessel as desired, a chart room electric register has been introduced. By means of an electric installation between the log register aft and the electric register in the chart room, every tenth of a mile indicated by the former is recorded by the latter.

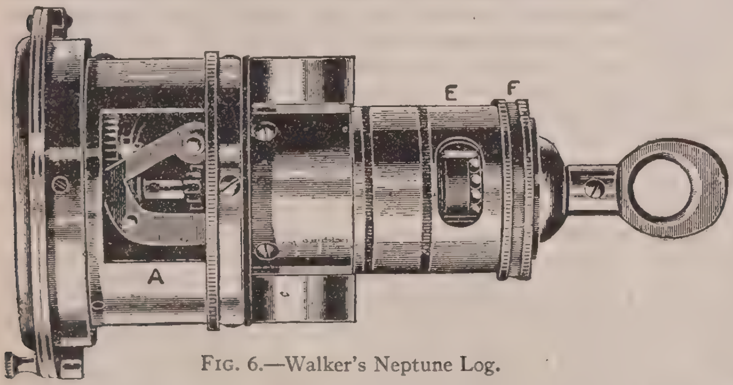

Fig. 6.—Walker's Neptune Log.

Walker's Rocket log (fig. 10) is a taffrail one, with bearings of hardened steel, and is intended to be slung or secured to the taffrail by a line; the gimbal pattern has a fitting for the deck. In taffrail logs, the movement of the line owing to its length becomes spasmodic and jerky, increasing the vibration and friction; to obviate this a governor or fly-wheel is introduced, the hook of the tow line K (fig. 11) and the eye of the register M being attached to the governor. Fig. 11 represents the arrangement fitted to the Neptune log; with the Cherub log, a small piece of line is introduced between the governor and the eye of the register. The two principal American taffrail logs are the Negus and Bliss (Messrs Norie and Wilson). The former bears a general resemblance to the Cherub log, but the dial plate is horizontal and the faces turn upwards. The main shaft bearings are in two sets and composed of steel balls running in steel cones and cups; the governor is an iron rod about 16 in. long, with 1 in. balls at the extremities. The Bliss resembles the Rocket log in shape, and is secured to the taffrail by a rope or slung. A governor is not employed. The blades of the rotator are adjustable, being fitted into its tube or body by slits and holes and then soldered. The outer ends of the blades are slit (fig. 12) to form two tongues, and with the wrench (fig. 12) the angle of the pitch can be altered.

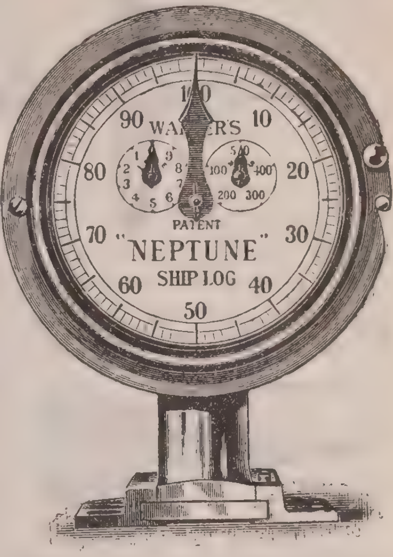

Fig. 7.—Dial-plate of Neptune Log.

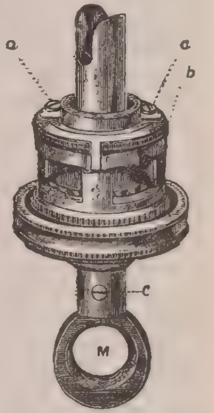

Fig. 8.—Ball Bearings of Neptune Log.

All patent logs have errors, the amounts of which should be ascertained by shore observations when passing a well surveyed coast in tideless waters on a calm day. Constant use, increased friction (more especially at high speeds), and damage to the rotator will alter an ascertained log error; head or following seas, strong winds, currents and tidal streams also affect the correctness.

A *Log Book* is a marine or sea journal, containing, in the British navy, the speed, course, leeway, direction and force of the wind, state of the weather, and barometric and thermometric observations. Under the heading "Remarks" are noted (for vessels with sail power) making, shortening and trimming sails; and (for all ships) employment of crew, times of passing prominent landmarks, altering of course, and any subject of interest and importance. The deck log book, kept by the officers of the watch, is copied into the ship's log book by the navigating

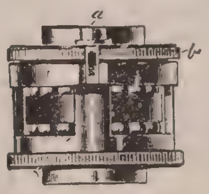

Fig. 9.—Ball Bearings of Neptune Log in Skeleton Case.

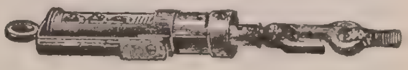

Fig. 10.—Rocket Log.

officer, and the latter is an official journal. In steam vessels a rough and fair engine room register are kept, giving information with regard to the engines and boilers. In the British mercantile marine all ships (except those employed exclusively in trading between ports on the coasts of Scotland) are compelled to keep an official log book in a form approved by the Board of Trade. A mate's log book and engine room register are not compulsory, but are usually kept. (J. W. D.)

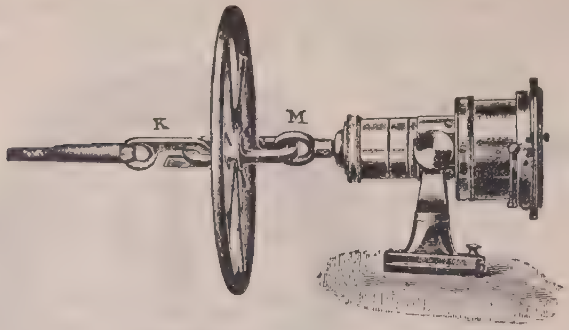

FIG. 11.—Neptune Log fitted with Governor.

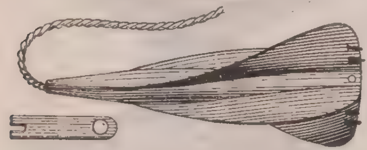

FIG. 12.—Bliss Log.

LOGAN, JOHN (*c.* 1725–1780), also known as TAHGAHJUTÉ, American Indian chief, a Cayuga by birth, was the son of Shikellamy, a white man who had been captured when a child by the Indians, had been reared among them, and had become chief of the Indians living on the Shamokin Creek in what is now Northumberland county, Pennsylvania. The name Logan was given to the son in honour of James Logan (1674–1751), secretary of William Penn and a steadfast friend of the Indians. John Logan lived for some time near Reedsville, Penn., and removed to the banks of the Ohio river about 1770. He was not technically a chief, but acquired great influence among the Shawnees, into which tribe he married. He was on good terms with the whites until April 1774, when, friction having arisen between the Indians and the whites, a band of marauders, led by one Greathouse, attacked and murdered several Indians, including, it appears, Logan's sister and possibly one or more other relatives. Believing that Captain Michael Cresap was responsible for this murder, Logan sent him a declaration of hostilities, the result of which was the bloody conflict known as Lord Dunmore's War. Logan refused to join the Shawnee chief, Cornstalk, in meeting Governor Dunmore in a peace council after the battle of Point Pleasant, but sent him a message which has become famous as an example of Indian eloquence. The message seems to have been given by Logan to Colonel John Gibson, by whom it was delivered to Lord Dunmore. Thomas Jefferson first called general attention to it in his *Notes on Virginia* (1787), where he quoted it and added: "I may challenge the whole orations of Demosthenes and Cicero, and of any more eminent orator, if Europe has furnished more eminent, to produce a single passage superior to it." Logan became a victim of drink, and in 1780 was killed near Lake Erie by his nephew whom he had attacked. There is a monument to him in Fair Hill Cemetery, near Auburn, New York.

Brantz Mayer's *Tahgahjuté, or Logan the Indian and Captain Michael Cresap* (Baltimore, 1851, 2nd ed., Albany, 1867) defends Captain Cresap against Jefferson's charges, and also questions the authenticity of Logan's message, about which there has been considerable controversy, though its actual wording seems to be that of Gibson rather than of Logan.

LOGAN, JOHN (1748–1788), Scottish poet, was born at Soutra, Midlothian, in 1748. His father, George Logan, was a farmer and a member of the Burgher sect of the Secession church. John Logan was sent to Musselburgh grammar school, and in 1762 to the university of Edinburgh. In 1768–1769 he was tutor to John, afterwards Sir John, Sinclair, at Ulbster, Caithness, and in 1770, having left the Secession church, he was licensed as a preacher by the presbytery of Haddington. In 1771 he was presented to the charge of South Leith, but was not ordained till two years later. On the death of Michael Bruce (*q.v.*) he obtained that poet's MSS. with a view to publication. In 1770 he published *Poems on Several Occasions, by Michael Bruce* with a preface, in which, after eulogizing Bruce, who had been a fellow student of his, he remarked that "to make up a miscellany some poems wrote by different authors are inserted, all of them originals, and none of them destitute of merit. The reader of taste will easily distinguish them from those of Mr Bruce, without their being particularized by any mark." Logan was an active member of the committee of the General Assembly of the Church of Scotland which worked from 1775 to 1781 at revising the "Translations and Paraphrases" for public worship, in which many of his hymns are printed. In 1779–1781 he delivered a course of lectures on the philosophy of history at St Mary's Chapel, Edinburgh. An analysis of these lectures, *Elements of the Philosophy of History* (1781), bears striking resemblance to *A View of Ancient History* (1787), printed as the work of Dr W. Rutherford, but thought by Logan's friends to be his. In 1781 he published his own *Poems*, including the "Ode to the Cuckoo" and some other poems which had appeared in his volume of Michael Bruce's poems, and also his own contributions to the Paraphrases. His other publications were *An Essay on the Manners and Governments of Asia* (1782), *Runnamede, a tragedy* (1783), and *A Review of the Principal Charges against Warren Hastings* (1788). His connexion with the theatre gave offence to his congregation at South Leith; he was intemperate in his habits, and there was some local scandal attached to his name. He resigned his charge in 1786, retaining part of his stipend, and proceeded to London, where he became a writer for the *English Review*. He died on the 28th of December 1788. Two posthumous volumes of sermons appeared in 1790 and 1791. They were very popular, and were reprinted in 1810. His *Poetical Works* were printed in Dr Robert Anderson's *British Poets* (vol. xi., 1795), with a life of the author. They were reprinted in similar collections, and separately in 1805.

Logan was accused of having appropriated in his *Poems* (1781) verses written by Michael Bruce. The statements of John Birrell and David Pearson on behalf of Bruce were included in Dr Anderson's *Life of Logan*. The charge of plagiarism has been revived from time to time, notably by Dr W. Mackelvie (1837) and Mr James Mackenzie (1905). The whole controversy has been marked by strong partisanship. The chief points against Logan are the suppression of the major portion of Bruce's MSS. and some proved cases of plagiarism in his sermons and hymns. Even in the beautiful "Braes of Yarrow" one of the verses is borrowed direct from an old border ballad. The traditional evidence in favour of Bruce's authorship of the "Ode to the Cuckoo" can hardly be set aside, but Dr Robertson of Dalmeny, who was Logan's literary executor, stated that he had gone over the MSS. procured at Kinnesswood with Logan.

Logan's authorship of the poems in dispute is defended by David Laing, *Ode to the Cuckoo with remarks on its authorship, in a letter to J. C. Shairp, LL.D.* (1873); by John Small in the *British and Foreign Evangelical Review* (July, 1877, April and October, 1879); and by R. Small in two papers (*ibid.*, 1878). See also BRUCE, MICHAEL.

LOGAN, JOHN ALEXANDER (1826–1886), American soldier and political leader, was born in what is now Murphysborough, Jackson county, Illinois, on the 9th of February 1826. He had no schooling until he was fourteen; he then studied for three years in Shiloh College, served in the Mexican War as a lieutenant of volunteers, studied law in the office of an uncle, graduated from the Law Department of Louisville University in 1851, and practised law with success. He entered politics as a Douglas Democrat, was elected county clerk in 1849, served in the State House of Representatives in 1853–1854 and in 1857, and for a time, during the interval, was prosecuting attorney of the Third Judicial District of Illinois. In 1858 and 1860 he was elected as a Democrat to the National House of Representatives. Though unattached and unenlisted, he fought at Bull Run, and then returned to Washington, resigned his seat, and entered the Union army as colonel of the 31st Illinois Volunteers, which he organized. He was regarded as one of the ablest officers who entered the army from civil life. In Grant's campaigns terminating in the capture of Vicksburg, which city Logan's division was the first to enter and of which he was military governor, he rose to the rank of major-general of volunteers; in November 1863 he succeeded Sherman in command of the XV. Army Corps; and after the death of McPherson he was in command of the Army of the Tennessee at the battle of Atlanta. When the war closed, Logan resumed his political career as a Republican, and was a member of the National House of Representatives from 1867 to 1871, and of the United States Senate from 1871 until 1877 and again from 1879 until his death, which took place at Washington, D.C., on the 26th of December 1886. He was always a violent partisan, and was identified with the radical wing of the Republican party. In 1868 he was one of the managers in the impeachment of President Johnson. His war record and his great personal following, especially in the Grand Army of the Republic, contributed to his nomination for Vice-President in 1884 on the ticket with James G. Blaine, but he was not elected. His impetuous oratory, popular on the platform, was less adapted to the halls of legislation. He was commander-in-chief of the Grand Army of the Republic from 1868 to 1871, and in this position successfully urged the observance of Memorial or Decoration Day, an idea which probably originated with him. He was the author of *The Great Conspiracy: Its Origin and History* (1886), a partisan account of the Civil War, and of *The Volunteer Soldier of America* (1887). There is a fine statue of him by St Gaudens in Chicago.

The best biography is that by George F. Dawson, *The Life and Services of Gen. John A. Logan, as Soldier and Statesman* (Chicago and New York, 1887).

LOGAN, SIR WILLIAM EDMOND (1798–1875), British geologist, was born in Montreal on the 20th of April 1798, of Scottish parents. He was educated partly in Montreal, and subsequently at the High School and university of Edinburgh, where Robert Jameson did much to excite his interest in geology. He was in a business house in London from 1817 to 1830. In 1831 he settled in Swansea to take charge of a colliery and some copper-smelting works, and here his interest in geology found abundant scope. He collected a great amount of information respecting the South Wales coal-field; and his data, which he had depicted on the 1-in. ordnance survey map, were generously placed at the disposal of the geological survey under Sir H. T. de la Beche and fully utilized. In 1840 Logan brought before the Geological Society of London his celebrated paper "On the character of the beds of clay lying immediately below the coal-seams of South Wales, and on the occurrence of coal-boulders in the Pennant Grit of that district." He then pointed out that each coal-seam rests on an under-clay with rootlets of *Stigmaria*, and he expressed his opinion that the under-clay was the old soil in which grew the plants from which the coal was formed. To confirm this observation he visited America in 1841 and examined the coal-fields of Pennsylvania and Nova Scotia, where he found the under-clay almost invariably present beneath the seams of coal. In 1842 he was appointed to take charge of the newly established geological survey in Canada, and he continued as director until 1869. During the earlier years of the survey he had many difficulties to surmount and privations to undergo, but the work was carried on with great tact and energy, and he spared no pains to make his reports trustworthy. He described the Laurentian rocks of the Laurentian mountains in Canada and of the Adirondacks in the state of New York, pointing out that they comprised an immense series of crystalline rocks, gneiss, mica-schist, quartzite and limestone, more than 30,000 ft. in thickness. The series was rightly recognized as representing the oldest type of rocks on the globe, but it is now known to be a complex of highly altered sedimentary and intrusive rocks; and the supposed oldest known fossil, the *Eozoon* described by Sir J. W. Dawson, is now regarded as a mineral structure. Logan was elected F.R.S. in 1851, and in 1856 was knighted. In the same year he was awarded the Wollaston medal by the Geological Society of London for his researches on the coal-strata, and for his excellent geological map of Canada. After his retirement in 1869, he returned to England, and eventually settled in South Wales. He died at Castle Malgwyn in Pembrokeshire, on the 22nd of June 1875.

See the *Life*, by B. J. Harrington (1883). (H. B. Wo.)

LOGAN, a city and the county-seat of Cache county, Utah, U.S.A., on the Logan river, about 70 m. N. of Salt Lake City. Pop. (1900) 5451 (1440 foreign-born); (1910) 7522. It is served by the Oregon Short Line railroad. It lies at the mouth of Logan Cañon, about 4500 ft. above the sea, and commands magnificent views of the Wasatch Mountains and the fertile Cache Valley. At Logan is a temple of the Latter-Day Saints (or Mormons), built in 1883, and the city is the seat of the Agricultural College of Utah, of Brigham Young College, and of New Jersey Academy (1878), erected by the women of the Synod of New Jersey and managed by the Woman's Board of Home Missions of the Presbyterian Church. The Agricultural College was founded in 1888 and opened in 1890; an agricultural experiment station is connected with it and the institution comprises schools of agriculture, domestic science and arts, commerce, mechanic arts and general science. Six experiment stations in different parts of the state and a central experimental farm near St George, Washington county, were in 1908 under the direction of the experiment station in Logan. Brigham Young College was endowed by Brigham Young in 1877 and was opened in 1878; it offers courses in the arts, theology, civil engineering, music, physical culture, domestic science, nurse training and manual training. Logan has various manufactures, and is the trade centre for a fertile farming region. The municipality owns and operates its water works and its electric lighting plant. Logan was settled in 1859 and first incorporated in 1866.

LOGANSPORT, a city and the county-seat of Cass county, Indiana, U.S.A., on the Wabash river, at the mouth of the Eel river, about 67 m. N. by W. of Indianapolis and 117 m. S. by E. of Chicago. Pop. (1900) 16,204, of whom 1432 were foreign-born, (1910 census) 19,050. It is served by six divisions of the Pittsburg, Cincinnati, Chicago & St Louis, two divisions of the Vandalia (Pennsylvania Lines), and the Wabash railways, and by electric interurban lines. The city is the seat of the Northern Indiana Hospital for the Insane (1888), and has a public library, and a hospital (conducted by the Sisters of St Joseph). Among the principal buildings are the court house, a Masonic temple, an Odd Fellows' temple, and buildings of the Order of Elks, of the Knights of Pythias, and of the fraternal order of Eagles. Situated in the centre of a rich agricultural region, Logansport is one of the most important grain and produce markets in the state. The Wabash and the Eel rivers provide good water power, and the city has various manufactures, besides the railway repair shops of the Vandalia and of the Pittsburg, Cincinnati, Chicago & St Louis railways. The value of the city's factory product increased from $2,100,394 in 1900 to $2,955,921 in 1905, or 40·7%. Limestone, for use in the manufacture of iron, is quarried in the vicinity. The city owns and operates the water works and the electric-lighting plant. Logansport was platted in 1828, was probably named in honour of a Shawnee chief, Captain Logan (d. 1812), became the county-seat of Cass county in 1829, and was chartered as a city in 1838.

LOGAR, a river and valley of Afghanistan. The Logar river drains a wide tract of country, rising in the southern slopes of the Sanglakh range and receiving affluents from the Kharwar hills, N.E. of Ghazni. It joins the Kabul river a few miles below the city of Kabul. The Logar valley, which is watered by its southern affluents, is rich and beautiful, about 40 m. long by 12 wide, and highly irrigated throughout. Lying in the vicinity of the capital, the district contributes largely to its food-supply. The valley was traversed in 1879 by a brigade under Sir F. (afterwards Lord) Roberts.

LOGARITHM (from Gr. λόγος, word, ratio, and ἀριθμός, number), in mathematics, a word invented by John Napier to denote a particular class of function discovered by him, and which may be defined as follows: if a, x, m are any three quantities satisfying the equation $a^x = m$, then a is called the base, and x is said to be the logarithm of m to the base a. This relation between x, a, m, may be expressed also by the equation $x = \log_a m$.

Properties.—The principal properties of logarithms are given by the equations

$$\log_a (mn) = \log_a m + \log_a n, \quad \log_a (m/n) = \log_a m - \log_a n,$$
$$\log_a m^r = r \log_a m, \quad \log_a \sqrt[r]{m} = (1/r) \log_a m,$$

which may be readily deduced from the definition of a logarithm. It follows from these equations that the logarithm of the product of any number of quantities is equal to the sum of the logarithms of the quantities, that the logarithm of the quotient of two quantities is equal to the logarithm of the numerator diminished by the logarithm of the denominator, that the logarithm of the rth power of a quantity is equal to r times the logarithm of the quantity, and that the logarithm of the rth root of a quantity is equal to $(1/r)$th of the logarithm of the quantity.

Logarithms were originally invented for the sake of abbreviating arithmetical calculations, as by their means the operations of multiplication and division may be replaced by those of addition and subtraction, and the operations of raising to powers and extraction of roots by those of multiplication and division. For the purpose of thus simplifying the operations of arithmetic, the base is taken to be 10, and use is made of tables of logarithms in which the values of x, the logarithm, corresponding to values of m, the number, are tabulated. The logarithm is also a function of frequent occurrence in analysis, being regarded as a known and recognized function like sin x or tan x; but in mathematical investigations the base generally employed is not 10, but a certain quantity usually denoted by the letter e, of value 2·71828 18284 . . . .

Thus in arithmetical calculations if the base is not expressed it is understood to be 10, so that $\log m$ denotes $\log_{10} m$; but in analytical formulae it is understood to be e.

The logarithms to base 10 of the first twelve numbers to 7 places of decimals are

log 1 = 0·0000000 log 5 = 0·6989700 log 9 = 0·9542425
log 2 = 0·3010300 log 6 = 0·7781513 log 10 = 1·0000000
log 3 = 0·4771213 log 7 = 0·8450980 log 11 = 1·0413927
log 4 = 0·6020600 log 8 = 0·9030900 log 12 = 1·0791812

The meaning of these results is that

$$1 = 10^0, \quad 2 = 10^{0.3010300}, \quad 3 = 10^{0.4771213}, \ \ldots$$
$$10 = 10^1, \quad 11 = 10^{1.0413927}, \quad 12 = 10^{1.0791812}.$$

The integral part of a logarithm is called the index or characteristic, and the fractional part the mantissa. When the base is 10, the logarithms of all numbers in which the digits are the same, no matter where the decimal point may be, have the same mantissa; thus, for example,

log 2·5613 = 0·4084604, log 25·613 = 1·4084604, log 2561300 = 6·4084604, &c.

In the case of fractional numbers (*i.e.* numbers in which the integral part is 0) the mantissa is still kept positive, so that, for example,

$$\log \cdot 25613 = \bar{1}\cdot 4084604, \quad \log \cdot 0025613 = \bar{3}\cdot 4084604, \text{ \&c.}$$

the minus sign being usually written over the characteristic, and not before it, to indicate that the characteristic only, and not the whole expression, is negative; thus

$$\bar{1}\cdot 4084604 \text{ stands for } -1 + \cdot 4084604.$$

The fact that when the base is 10 the mantissa of the logarithm is independent of the position of the decimal point in the number affords the chief reason for the choice of 10 as base. The explanation of this property of the base 10 is evident, for a change in the position of the decimal points amounts to multiplication or division by some power of 10, and this corresponds to the addition or subtraction of some integer in the case of the logarithm, the mantissa therefore remaining intact. It should be mentioned that in most tables of trigonometrical functions, the number 10 is added to all the logarithms in the table in order to avoid the use of negative characteristics, so that the characteristic 9 denotes in reality $\bar{1}$, 8 denotes $\bar{2}$, 10 denotes 0, &c. Logarithms thus increased are frequently referred to for the sake of distinction as *tabular logarithms*, so that the tabular logarithm = the true logarithm + 10.

In tables of logarithms of numbers to base 10 the mantissa only is in general tabulated, as the characteristic of the logarithm of a number can always be written down at sight, the rule being that, if the number is greater than unity, the characteristic is less by unity than the number of digits in the integral portion of it, and that if the number is less than unity the characteristic is negative, and is greater by unity than the number of ciphers between the decimal point and the first significant figure.

It follows very simply from the definition of a logarithm that

$$\log_a b \times \log_b a = 1, \quad \log_b m = \log_a m \times (1/\log_a b).$$

The second of these relations is an important one, as it shows that from a table of logarithms to base a, the corresponding table of logarithms to base b may be deduced by multiplying all the logarithms in the former by the constant multiplier $1/\log_a b$, which is called the *modulus* of the system whose base is b with respect to the system whose base is a.

The two systems of logarithms for which extensive tables have been calculated are the Napierian, or hyperbolic, or natural system, of which the base is e, and the Briggian, or decimal, or common system, of which the base is 10; and we see that the logarithms in the latter system may be deduced from those in the former by multiplication by the constant multiplier $1/\log_e 10$, which is called the modulus of the common system of logarithms. The numerical value of this modulus is 0·43429 44819 03251 82765 11289 . . ., and the value of its reciprocal, $\log^e 10$ (by multiplication by which Briggian logarithms may be converted into Napierian logarithms) is 2·30258 50929 94045 68401 79914 . . . .

The quantity denoted by e is the series,

$$1 + \frac{1}{1} + \frac{1}{1.2} + \frac{1}{1.2.3} + \frac{1}{1.2.3.4} + \cdots$$

the numerical value of which is,

2·71828 18284 59045 23536 02874 . . .

The logarithmic Function.—The mathematical function log x or $\log_e x$ is one of the small group of transcendental functions, consisting only of the circular functions (direct and inverse) sin x, cos x, &c., arc sin x or $\sin^{-1} x$,&c., log x and e^x which are universally treated in analysis as known functions. The notation log x is generally employed in English and American works, but on the continent of Europe writers usually denote the function by lx or lg x. The logarithmic function is most naturally introduced into analysis by the equation

$$\log x = \int_1^x \frac{dt}{t}, \quad (x > 0).$$

This equation defines log x for positive values of x; if $x \leqq 0$ the formula ceases to have any meaning. Thus log x is the integral function of $1/x$, and it can be shown that log x is a genuinely new transcendent, not expressible in finite terms by means of functions such as algebraical or circular functions. A connexion with the circular functions, however, appears later when the definition of log x is extended to complex values of x.

A relation which is of historical interest connects the logarithmic function with the quadrature of the hyperbola, for, by considering the equation of the hyperbola in the form $xy = \text{const.}$, it is evident that the area included between the arc of a hyperbola, its nearest asymptote, and two ordinates drawn parallel to the other asymptote from points on the first asymptote distant a and b from their point of intersection, is proportional to $\log b/a$.

The following fundamental properties of log x are readily deducible from the definition

(i.) $\log xy = \log x + \log y$.
(ii.) Limit of $(x^h - 1)/h = \log x$, when h is indefinitely diminished.

Either of these properties might be taken as itself the definition of log x.

There is no series for log x proceeding either by ascending or descending powers of x, but there is an expansion for $\log (1+x)$, viz.

$$\log (1+x) = x - \tfrac{1}{2}x^2 + \tfrac{1}{3}x^3 - \tfrac{1}{4}x^4 + \ldots;$$

the series, however, is convergent for real values of x only when x lies between +1 and −1. Other formulae which are deducible from this equation are given in the portion of this article relating to the calculation of logarithms.

The function $\log x$ as x increases from 0 towards ∞ steadily increases from $-\infty$ towards $+\infty$. It has the important property that it tends to infinity with x, but more slowly than any power of x, *i.e.* that $x^{-m} \log x$ tends to zero as x tends to ∞ for every positive value of m however small.

The exponential function, $\exp x$, may be defined as the inverse of the logarithm: thus $x = \exp y$ if $y = \log x$. It is positive for all values of y and increases steadily from 0 toward ∞ as y increases from $-\infty$ towards $+\infty$. As y tends towards ∞, $\exp y$ tends towards ∞ more rapidly than any power of y.

The exponential function possesses the properties

$$\text{(i.)}\ \exp(x+y) = \exp x \times \exp y.$$

$$\text{(ii.)}\ \frac{d}{dx} \exp x = \exp x.$$

$$\text{(iii.)}\ \exp x = 1 + x + x^2/2\,! + x^3/3\,! + \ldots$$

From (i.) and (ii.) it may be deduced that

$$\exp x = (1 + 1 + 1/2\,! + 1/3\,! + \ldots)^x,$$

where the right-hand side denotes the positive xth power of the number $1 + 1 + 1/2\,! + 1/3\,! + \ldots$ usually denoted by e. It is customary, therefore, to denote the exponential function by e^x, and the result

$$e^x = 1 + x + x^2/2\,! + x^3/3\,! \ldots$$

is known as the *exponential theorem.*

The definitions of the logarithmic and exponential functions may be extended to complex values of x. Thus if $x = \xi + i\eta$,

$$\log x = \int_1^x \frac{dt}{t}$$

where the path of integration in the plane of the complex variable t is any curve which does not pass through the origin; but now $\log x$ is not a uniform function, that is to say, if x describes a closed curve it does not follow that $\log x$ also describes a closed curve: in fact we have

$$\log(\xi + i\eta) = \log\sqrt{(\xi^2 + \eta^2)} + i(\alpha + 2n\pi),$$

where α is the numerically least angle whose cosine and sine are $\xi/\sqrt{(\xi^2+\eta^2)}$ and $\eta/\sqrt{(\xi^2+\eta^2)}$, and n denotes any integer. Thus even when the argument is real $\log x$ has an infinite number of values; for putting $\eta = 0$ and taking ξ positive, in which case $\alpha = 0$, we obtain for $\log \xi$ the infinite system of values $\log \xi + 2n\pi i$. It follows from this property of the function that we cannot have for $\log x$ a series which shall be convergent for all values of x, as is the case with $\sin x$ and $\cos x$, for such a series could only represent a uniform function, and in fact the equation

$$\log(1+x) = x - \tfrac{1}{2}x^2 + \tfrac{1}{3}x^3 - \tfrac{1}{4}x^4 + \ldots$$

is true only when the analytical modulus of x is less than unity. The exponential function, which may still be defined as the inverse of the logarithmic function, is, on the other hand, a uniform function of x, and its fundamental properties may be stated in the same form as for real values of x. Also

$$\exp(\xi + i\eta) = e^{\xi}(\cos\eta + i \sin\eta).$$

An alternative method of developing the theory of the exponential function is to start from the definition

$$\exp x = 1 + x + x^2/2\,! + x^3/3\,! + \ldots,$$

the series on the right-hand being convergent for all values of x and therefore defining an analytical function of x which is uniform and regular all over the plane.

Invention and Early History of Logarithms.—The invention of logarithms has been accorded to John Napier, baron of Merchiston in Scotland, with a unanimity which is rare with regard to important scientific discoveries: in fact, with the exception of the tables of Justus Byrgius, which will be referred to further on, there seems to have been no other mathematician of the time whose mind had conceived the principle on which logarithms depend, and no partial anticipations of the discovery are met with in previous writers.

The first announcement of the invention was made in Napier's *Mirifici Logarithmorum Canonis Descriptio* . . . (Edinburgh, 1614). The work is a small quarto containing fifty-seven pages of explanatory matter and a table of ninety pages (see NAPIER, JOHN). The nature of logarithms is explained by reference to the motion of points in a straight line, and the principle upon which they are based is that of the correspondence of a geometrical and an arithmetical series of numbers. The table gives the logarithms of sines for every minute of seven figures; it is arranged semi-quadrantally, so that the *differentiae*, which are the differences of the two logarithms in the same line, are the logarithms of the tangents. Napier's logarithms are not the logarithms now termed Napierian or hyperbolic, that is to say, logarithms to the base e where $e = 2{\cdot}7182818\ldots$; the relation between N (a sine) and L its logarithm, as defined in the *Canonis Descriptio*, being $\mathrm{N} = 10^7 e^{-\mathrm{L}/10^7}$, so that (ignoring the factors 10^7, the effect of which is to render sines and logarithms integral to 7 figures), the base is e^{-1}. Napier's logarithms decrease as the sines increase. If l denotes the logarithm to base e (that is, the so-called "Napierian" or hyperbolic logarithm) and L denotes, as above, "Napier's" logarithm, the connexion between l and L is expressed by

$$\mathrm{L} = 10^7 \log_e 10^7 - 10^7 l \text{ or } e^l = 10^7 e^{-\mathrm{L}/10^7}$$

Napier's work (which will henceforth in this article be referred to as the *Descriptio*) immediately on its appearance in 1614 attracted the attention of perhaps the two most eminent English mathematicians then living—Edward Wright and Henry Briggs. The former translated the work into English; the latter was concerned with Napier in the change of the logarithms from those originally invented to decimal or common logarithms, and it is to him that the original calculation of the logarithmic tables now in use is mainly due. Both Napier and Wright died soon after the publication of the *Descriptio*, the date of Wright's death being 1615 and that of Napier 1617, but Briggs lived until 1631. Edward Wright, who was a fellow of Caius College, Cambridge, occupies a conspicuous place in the history of navigation. In 1599 he published *Certaine errors in Navigation detected and corrected*, and he was the author of other works; to him also is chiefly due the invention of the method known as Mercator's sailing. He at once saw the value of logarithms as an aid to navigation, and lost no time in preparing a translation, which he submitted to Napier himself. The preface to Wright's edition consists of a translation of the preface to the *Descriptio*, together with the addition of the following sentences written by Napier himself: "But now some of our countreymen in this Island well affected to these studies, and the more publique good, procured a most learned Mathematician to translate the same into our vulgar English tongue, who after he had finished it, sent the Coppy of it to me, to bee seene and considered on by myselfe. I having most willingly and gladly done the same, finde it to bee most exact and precisely conformable to my minde and the originall. Therefore it may please you who are inclined to these studies, to receive it from me and the Translator, with as much good will as we recommend it unto you." There is a short "preface to the reader" by Briggs, and a description of a triangular diagram invented by Wright for finding the proportional parts. The table is printed to one figure less than in the *Descriptio*. Edward Wright died, as has been mentioned, in 1615, and his son, Samuel Wright, in the preface states that his father "gave much commendation of this work (and often in my hearing) as of very great use to mariners"; and with respect to the translation he says that "shortly after he had it returned out of Scotland, it pleased God to call him away afore he could publish it." The translation was published in 1616. It was also reissued with a new title-page in 1618.

Henry Briggs, then professor of geometry at Gresham College, London, and afterwards Savilian professor of geometry at Oxford, welcomed the *Descriptio* with enthusiasm. In a letter to Archbishop Usher, dated Gresham House, March 10, 1615, he wrote, "Napper, lord of Markinston, hath set my head and hands a work with his new and admirable logarithms. I hope to see him this summer, if it please God, for I never saw book which pleased me better, or made me more wonder.[1] I purpose to discourse with him concerning eclipses, for what is there which we may not hope for at his hands," and he also states "that he was wholly taken up and employed about the noble invention of logarithms lately discovered." Briggs accordingly visited Napier in 1615, and stayed with him a whole month.[2] He brought with him some calculations he had made, and suggested to Napier the advantages that would result from the choice of 10 as a base, an improvement which he had explained in his lectures at Gresham College, and on which he had written to Napier. Napier said that he had already thought of the change, and pointed out a further improvement, viz., that the characteristics of numbers greater than unity should be positive and not negative, as suggested by Briggs. In 1616 Briggs again visited Napier and showed him the work he had accomplished, and, he says, he would gladly have paid him a third visit in 1617 had Napier's life been spared.

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[1] Dr Thomas Smith thus describes the ardour with which Briggs studied the *Descriptio*: "Hunc in deliciis habuit, in sinu, in manibus, in pectore gestavit, oculisque avidissimis, et mente attentissima, iterum iterumque perlegit, . . ." *Vitae quorundam eruditissimorum et illustrium virorum* (London, 1707).

[2] William Lilly's account of the meeting of Napier and Briggs at Merchiston is quoted in the article NAPIER.

Briggs's *Logarithmorum chilias prima*, which contains the first published table of decimal or common logarithms, is only a small octavo tract of sixteen pages, and gives the logarithms of numbers from unity to 1000 to 14 places of decimals. It was published, probably privately, in 1617, after Napier's death,[1] and there is no author's name, place or date. The date of publication is, however, fixed as 1617 by a letter from Sir Henry Bourchier to Usher, dated December 6, 1617, containing the passage—" Our kind friend, Mr Briggs, hath lately published a supplement to the most excellent tables of logarithms, which I presume he has sent to you." Briggs's tract of 1617 is extremely rare, and has generally been ignored or incorrectly described. Hutton erroneously states that it contains the logarithms to 8 places, and his account has been followed by most writers. There is a copy in the British Museum.

Briggs continued to labour assiduously at the calculation of logarithms, and in 1624 published his *Arithmetica logarithmica*, a folio work containing the logarithms of the numbers from 1 to 20,000, and from 90,000 to 100,000 (and in some copies to 101,000) to 14 places of decimals. The table occupies 300 pages, and there is an introduction of 88 pages relating to the mode of calculation, and the applications of logarithms.

There was thus left a gap between 20,000 and 90,000, which was filled up by Adrian Vlacq (or Ulaccus), who published at Gouda, in Holland, in 1628, a table containing the logarithms of the numbers from unity to 100,000 to 10 places of decimals. Having calculated 70,000 logarithms and copied only 30,000, Vlacq would have been quite entitled to have called his a new work. He designates it, however, only a second edition of Briggs's *Arithmetica logarithmica*, the title running *Arithmetica logarithmica sive Logarithmorum Chiliades centum, . . . editio secunda aucta per Adrianum Vlacq, Goudanum.* This table of Vlacq's was published, with an English explanation prefixed, at London in 1631 under the title *Logarithmicall Arithmetike . . . London, printed by George Miller*, 1631. There are also copies with the title-page and introduction in French and in Dutch (Gouda, 1628).

Briggs had himself been engaged in filling up the gap, and in a letter to John Pell, written after the publication of Vlacq's work, and dated October 25, 1628, he says:—

> " My desire was to have those chiliades that are wantinge betwixt 20 and 90 calculated and printed, and I had done them all almost by my selfe, and by some frendes whom my rules had sufficiently informed, and by agreement the busines was conveniently parted amongst us; but I am eased of that charge and care by one Adrian Vlacque, an Hollander, who hathe done all the whole hundred chiliades and printed them in Latin, Dutche and Frenche, 1000 bookes in these 3 languages, and hathe sould them almost all. But he hathe cutt off 4 of my figures throughout; and hathe left out my dedication, and to the reader, and two chapters the 12 and 13, in the rest he hath not varied from me at all."

The original calculation of the logarithms of numbers from unity to 101,000 was thus performed by Briggs and Vlacq between 1615 and 1628. Vlacq's table is that from which all the hundreds of tables of logarithms that have subsequently appeared have been derived. It contains of course many errors, which were gradually discovered and corrected in the course of the next two hundred and fifty years.

The first calculation or publication of Briggian or common logarithms of trigonometrical functions was made in 1620 by Edmund Gunter, who was Briggs's colleague as professor of astronomy in Gresham College. The title of Gunter's book, which is very scarce, is *Canon triangulorum*, and it contains logarithmic sines and tangents for every minute of the quadrant to 7 places of decimals.

The next publication was due to Vlacq, who appended to his logarithms of numbers in the *Arithmetica logarithmica* of 1628 a table giving log sines, tangents and secants for every minute of the quadrant to 10 places; there were obtained by calculating the logarithms of the natural sines, &c. given in the *Thesaurus mathematicus* of Pitiscus (1613).

During the last years of his life Briggs devoted himself to the calculation of logarithmic sines, &c. and at the time of his death in 1631 he had all but completed a logarithmic canon to every hundredth of a degree. This work was published by Vlacq at his own expense at Gouda in 1633, under the title *Trigonometria Britannica*. It contains log sines (to 14 places) and tangents (to 10 places), besides natural sines, tangents and secants, at intervals of a hundredth of a degree. In the same year Vlacq published at Gouda his *Trigonometria artificialis*, giving log sines and tangents to every 10 seconds of the quadrant to 10 places. This work also contains the logarithms of numbers from unity to 20,000 taken from the *Arithmetica logarithmica* of 1628. Briggs appreciated clearly the advantages of a centesimal division of the quadrant, and by dividing the degree into hundredth parts instead of into minutes, made a step towards a reformation in this respect, and but for the appearance of Vlacq's work the decimal division of the degree might have become recognized, as is now the case with the corresponding division of the second. The calculation of the logarithms not only of numbers but also of the trigonometrical functions is therefore due to Briggs and Vlacq; and the results contained in their four fundamental works—*Arithmetica logarithmica* (Briggs), 1624; *Arithmetica logarithmica* (Vlacq), 1628; *Trigonometria Britannica* (Briggs), 1633; *Trigonometria artificialis* (Vlacq), 1633—have not been superseded by any subsequent calculations.

In the preceding paragraphs an account has been given of the actual announcement of the invention of logarithms and of the calculation of the tables. It now remains to refer in more detail to the invention itself and to examine the claims of Napier and Briggs to the capital improvement involved in the change from Napier's original logarithms to logarithms to the base 10.

The *Descriptio* contained only an explanation of the use of the logarithms without any account of the manner in which the canon was constructed. In an " Admonitio " on the seventh page Napier states that, although in that place the mode of construction should be explained, he proceeds at once to the use of the logarithms, " ut praelibatis prius usu, et rei utilitate, caetera aut magis placeant posthac edenda, aut minus saltem displiceant silentio sepulta." He awaits therefore the judgment and censure of the learned " priusquam caetera in lucem temerè prolata lividorum detrectationi exponantur "; and in an " Admonitio " on the last page of the book he states that he will publish the mode of construction of the canon " si huius inventi usum eruditis gratum fore intellexero." Napier, however, did not live to keep this promise. In 1617 he published a small work entitled *Rabdologia* relating to mechanical methods of performing multiplications and divisions, and in the same year he died.

The proposed work was published in 1619 by Robert Napier, his second son by his second marriage, under the title *Mirifici logarithmorum canonis constructio. . . .* It consists of two pages of preface followed by sixty-seven pages of text. In the preface Robert Napier says that he has been assured from undoubted authority that the new invention is much thought of by the ablest mathematicians, and that nothing would delight them more than the publication of the mode of construction of the canon. He therefore issues the work to satisfy their desires, although, he states, it is manifest that it would have seen the light in a far more perfect state if his father could have put the finishing touches to it; and he mentions that, in the opinion of the best judges, his father possessed, among other most excellent gifts, in the highest degree the power of explaining the most difficult matters by a certain and easy method in the fewest possible words.

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[1] It was certainly published after Napier's death, as Briggs mentions his " librum posthumum." This *liber posthumus* was the *Constructio* referred to later in this article.

It is important to notice that in the *Constructio* logarithms are called artificial numbers; and Robert Napier states that the work was composed several years (*aliquot annos*) before Napier had invented the name logarithm. The *Constructio* therefore may have been written a good many years previous to the publication of the *Descriptio* in 1614.

Passing now to the invention of common or decimal logarithms, that is, to the transition from the logarithms originally invented by Napier to logarithms to the base 10, the first allusion to a change of system occurs in the "Admonitio" on the last page of the *Descriptio* (1614), the concluding paragraph of which is "Verùm si huius inventi usum eruditis gratum fore intellexero, dabo fortasse brevi (Deo aspirante) rationem ac methodum aut hunc canonem emendandi, aut emendatiorem de novo condendi, ut ita plurium Logistarum diligentia, limatior tandem et accuratior, quàm unius opera fieri potuit, in lucem prodeat. Nihil in ortu perfectum." In some copies, however, this "Admonitio" is absent. In Wright's translation of 1616 Napier has added the sentence—"But because the addition and subtraction of these former numbers may seeme somewhat painfull, I intend (if it shall please God) in a second Edition, to set out such Logarithmes as shall make those numbers above written to fall upon decimal numbers, such as 100,000,000, 200,000,000, 300,000,000, &c., which are easie to be added or abated to or from any other number" (p. 19); and in the dedication of the *Rabdologia* (1617) he wrote "Quorum quidem Logarithmorum speciem aliam multò praestantiorem nunc etiam invenimus, & creandi methodum, unà cum eorum usu (si Deus longiorem vitae & valetudinis usuram concesserit) evulgare statuimus; ipsam autem novi canonis supputationem, ob infirmam corporis nostri valetudinem, viris in hoc studii genere versatis relinquimus: imprimis verò doctissimo viro D. Henrico Briggio Londini publico Geometriae Professori, et amico mihi longè charissimo."

Briggs in the short preface to his *Logarithmorum chilias* (1617) states that the reason why his logarithms are different from those introduced by Napier "sperandum, ejus librum posthumum, abunde nobis propediem satisfacturum." The "liber posthumus" was the *Constructio* (1619), in the preface to which Robert Napier states that he has added an appendix relating to another and more excellent species of logarithms, referred to by the inventor himself in the *Rabdologia*, and in which the logarithm of unity is 0. He also mentions that he has published some remarks upon the propositions in spherical trigonometry and upon the new species of logarithms by Henry Briggs, "qui novi hujus Canonis supputandi laborem gravissimum, pro singulari amicitiâ quae illi cum Patre meo L. M. intercessit, ànimo libentissimo in se suscepit; creandi methodo, et usuum explanatione Inventori relictis. Nunc autem ipso ex hâc vitâ evocato, totius negotii onus doctissimi Briggii humeris incumbere, et Sparta haec ornanda illi sorte quadam obtigisse videtur."

In the address prefixed to the *Arithmetica logarithmica* (1625) Briggs bids the reader not to be surprised that these logarithms are different from those published in the *Descriptio*:—

> "Ego enim, cum meis auditoribus Londini, publice in Collegio Greshamensi horum doctrinam explicarem; animadverti multo futurum commodius, si Logarithmus sinus totius servaretur 0 (ut in Canone mirifico), Logarithmus autem partis decimae ejusdem sinus totius, nempe sinus 5 graduum, 44, m. 21, s., esset 1000000000. atque ea de re scripsi statim ad ipsum authorem, et quamprimum per anni tempus, et vacationem a publico docendi munere licuit, profectus sum Edinburgum; ubi humanissime ab eo acceptus haesi per integrum mensem. Cum autem inter nos de horum mutatione sermo haberetur; ille se idem dudum sensisse, et cupivisse dicebat: veruntamen istos, quos jam paraverat edendos curasse, donec alios, si per negotia et valetudinem liceret, magis commodos confecisset. Istam autem mutationem ita faciendam censebat, ut 0 esset Logarithmus unitatis, et 1000000000 sinus totius: quod ego longe commodissimum esse non potui non agnoscere. Coepi igitur, ejus hortatu, rejectis illis quos anteà paraveram, de horum calculo serio cogitare; et sequenti aestate iterum profectus Edinburgum, horum quos hic exhibeo praecipuos, illi ostendi, idem etiam tertia aestate libentissime facturus, si Deus illum nobis tamdiu superstitem esse voluisset."

There is also a reference to the change of the logarithms on the title-page of the work.

These extracts contain all the original statements made by Napier, Robert Napier and Briggs which have reference to the origin of decimal logarithms. It will be seen that they are all in perfect agreement. Briggs pointed out in his lectures at Gresham College that it would be more convenient that 0 should stand for the logarithm of the whole sine as in the *Descriptio*, but that the logarithm of the tenth part of the whole sine should be 10,000,000,000. He wrote also to Napier at once; and as soon as he could he went to Edinburgh to visit him, where, as he was most hospitably received by him, he remained for a whole month. When they conversed about the change of system, Napier said that he had perceived and desired the same thing, but that he had published the tables which he had already prepared, so that they might be used until he could construct others more convenient. But he considered that the change ought to be so made that 0 should be the logarithm of unity and 10,000,000,000 that of the whole sine, which Briggs could not but admit was by far the most convenient of all. Rejecting therefore, those which he had prepared already, Briggs began, at Napier's advice, to consider seriously the question of the calculation of new tables. In the following summer he went to Edinburgh and showed Napier the principal portion of the logarithms which he published in 1624. These probably included the logarithms of the first chiliad which he published in 1617.

It has been thought necessary to give in detail the facts relating to the conversion of the logarithms, as unfortunately Charles Hutton in his history of logarithms, which was prefixed to the early editions of his *Mathematical Tables*, and was also published as one of his *Mathematical Tracts*, has charged Napier with want of candour in not telling the world of Briggs's share in the change of system, and he expresses the suspicion that "Napier was desirous that the world should ascribe to him alone the merit of this very useful improvement of the logarithms." According to Hutton's view, the words, "*it is to be hoped* that his posthumous work" . . . which occur in the preface to the *Chilias*, were a modest hint that the share Briggs had had in changing the logarithms should be mentioned, and that, as no attention was paid to it, he himself gave the account which appears in the *Arithmetica* of 1624. There seems, however, no ground whatever for supposing that Briggs meant to express anything beyond his hope that the reason for the alteration would be explained in the posthumous work; and in his own account, written seven years after Napier's death and five years after the appearance of the work itself, he shows no injured feeling whatever, but even goes out of his way to explain that he abandoned his own proposed alteration in favour of Napier's, and, rejecting the tables he had already constructed, began to consider the calculation of new ones. The facts, as stated by Napier and Briggs, are in complete accordance, and the friendship existing between them was perfect and unbroken to the last. Briggs assisted Robert Napier in the editing of the "posthumous work," the *Constructio*, and in the account he gives of the alteration of the logarithms in the *Arithmetica* of 1624 he seems to have been more anxious that justice should be done to Napier than to himself; while on the other hand Napier received Briggs most hospitably and refers to him as "amico mihi longè charissimo."

Hutton's suggestions are all the more to be regretted as they occur as a history which is the result of a good deal of investigation and which for years was referred to as an authority by many writers. His prejudice against Napier naturally produced retaliation, and Mark Napier in defending his ancestor has fallen into the opposite extreme of attempting to reduce Briggs to the level of a mere computer. In connexion with this controversy it should be noticed that the "Admonitio" on the last page of the *Descriptio*, containing the reference to the new logarithms, does not occur in all the copies. It is printed on the back of the last page of the table itself, and so cannot have been torn out from the copies that are without it. As there could have been no reason for omitting it after it had once appeared, we may assume that the copies which do not have it are those which were first issued. It is probable, therefore, that Briggs's copy contained no reference to the change, and it is even possible that the "Admonitio" may have been added after Briggs had communicated with Napier. As special attention has not been drawn to the fact that some copies have the "Admonitio" and some have not, different writers have assumed that Briggs did or did not know of the promise contained in the "Admonitio" according as it was present or absent in the copies they had themselves referred to, and this has given rise to some confusion. It may also be remarked that the date frequently assigned to Briggs's first visit to Napier is 1616, and not 1615 as stated above, the reason being that Napier was generally supposed to have died in 1618 until Mark Napier showed that the true date was 1617. When the *Descriptio* was published Briggs was fifty-seven years of age, and the remaining seventeen years of his life were devoted with steady enthusiasm to extend the utility of Napier's great invention.

The only other mathematician besides Napier who grasped the idea on which the use of logarithm depends and applied it to the construction of a table is Justus Byrgius (Jobst Bürgi), whose work *Arithmetische und geometrische Progress-Tabulen* . . . was published at Prague in 1620, six years after the publication of the *Descriptio* of Napier. This table distinctly involves the principle of logarithms and may be described as a modified table of antilogarithms. It consists of two series of numbers, the one being an arithmetical and the other a geometrical progression: thus

0, 1,0000 0000
10, 1,0001 0000
20, 1,0002 0001
. . . .
990, 1,0099 4967
. . . .

In the arithmetical column the numbers increase by 10, in the geometrical column each number is derived from its predecessor by multiplication by 1·0001. Thus the number $10x$ in the arithmetical column corresponds to $10^8\ (1{\cdot}0001)^x$ in the geometrical column; the intermediate numbers being obtained by interpolation. If we divide the numbers in the geometrical column by 10^8 the correspondence is between $10x$ and $(1{\cdot}0001)^x$, and the table then becomes one of antilogarithms, the base being $(1{\cdot}0001)^{1/10}$, viz. for example $(1{\cdot}0001)^{\frac{1}{10}\cdot 990}=1{\cdot}00994967$. The table extends to 230270 in the arithmetical column, and it is shown that 230270·022 corresponds to 9·9999 9999 or 109 in the geometrical column; this last result showing that $(1{\cdot}0001)^{23027\cdot 022}=10$. The first contemporary mention of Byrgius's table occurs on page 11 of the "Praecepta" prefixed to Kepler's *Tabulae Radolphinae* (1627); his words are: "apices logistici J. Byrgio multis annis ante editionem Neperianam viam praeiverent ad hos ipsissimos logarithmos. Etsi homo cunctator et secretorum suorum custos foetum in partu destituit, non ad usus publicos educavit." Another reference to Byrgius occurs in a work by Benjamin Bramer, the brother-in-law and pupil of Byrgius, who, writing in 1630, says that the latter constructed his table twenty years ago or more.[1]

As regards priority of publication, Napier has the advantage by six years, and even fully accepting Bramer's statement, there are grounds for believing that Napier's work dates from a still earlier period.

The power of 10, which occurs as a factor in the tables of both Napier and Byrgius, was rendered necessary by the fact that the decimal point was not yet in use. Omitting this factor in the case of both tables, the connexion between N a number and L its "logarithm" is

$$\mathrm{N}=(e^{-1})^{\mathrm{L}}\ \text{(Napier)},\qquad \mathrm{L}=(1{\cdot}0001)^{\frac{1}{10}\mathrm{N}}\ \text{(Byrgius)},$$

viz. Napier gives logarithms to base e^{-1}, Byrgius gives antilogarithms to base $(1{\cdot}0001)^{\frac{1}{10}}$.

There is indirect evidence that Napier was occupied with logarithms as early as 1594, for in a letter to P. Crügerus from Kepler, dated September 9, 1624 (Frisch's *Kepler*, vi. 47), there occurs the sentence: "Nihil autem supra Neperianam rationem esse puto: etsi quidem Scotus quidam literis ad Tychonem 1594 scriptis jam spem fecit Canonis illius Mirifici." It is here distinctly stated that some Scotsman in the year 1594, in a letter to Tycho Brahe, gave him some hope of the logarithms; and as Kepler joined Tycho after his expulsion from the island of Huen, and had been so closely associated with him in his work, he would be likely to be correct in any assertion of this kind. In connexion with Kepler's statement the following story, told by Anthony Wood in the *Athenae Oxonienses*, is of some importance:—

> "It must be now known, that one Dr Craig, a Scotchman . . . coming out of Denmark into his own country, called upon Joh. Neper, Baron of Mercheston, near Edinburgh, and told him, among other discourses, of a new invention in Denmark (by Longomontanus, as 'tis said), to save the tedious multiplication and division in astronomical calculations. Neper being solicitous to know farther of him concerning this matter, he could give no other account of it than that it was by proportional numbers. Which hint Neper taking, he desired him at his return to call upon him again. Craig, after some weeks had passed, did so, and Neper then showed him a rude draught of what he called *Canon mirabilis logarithmorum*. Which draught, with some alterations, he printing in 1614, it came forthwith into the hands of our author Briggs, and into those of Will. Oughtred, from whom the relation of this matter came."

This story, though obviously untrue in some respects, gives valuable information by connecting Dr Craig with Napier and Longomontanus, who was Tycho Brahe's assistant. Dr Craig was John Craig, the third son of Thomas Craig, who was one of the colleagues of Sir Archibald Napier, John Napier's father, in the office of justice-depute. Between John Craig and John Napier a friendship sprang up which may have been due to their common taste for mathematics. There are extant three letters from Dr John Craig to Tycho Brahe, which show that he was on the most friendly terms with him. In the first letter, of which the date is not given, Craig says that Sir William Stuart has safely delivered to him, "about the beginning of last winter," the book which he sent him. Now Mark Napier found in the library of the university of Edinburgh a mathematical work bearing a sentence in Latin which he translates, "To Doctor John Craig of Edinburgh, in Scotland, a most illustrious man, highly gifted with various and excellent learning, professor of medicine, and exceedingly skilled in the mathematics, Tycho Brahe hath sent this gift, and with his own hand written this at Uraniburg, 2d November 1588." As Sir William Stuart was sent to Denmark to arrange the preliminaries of King James's marriage, and returned to Edinburgh on the 15th of November 1588, it would seem probable that this was the volume referred to by Craig. It appears from Craig's letter, to which we may therefore assign the date 1589, that, five years before, he had made an attempt to reach Uranienburg, but had been baffled by the storms and rocks of Norway, and that ever since then he had been longing to visit Tycho. Now John Craig was physician to the king, and in 1590 James VI. spent some days at Uranienburg, before returning to Scotland from his matrimonial expedition. It seems not unlikely therefore that Craig may have accompanied the king in his visit to Uranienburg.[2] In any case it is certain that Craig was a friend and correspondent of Tycho's, and it is probable that he was the "Scotus quidam."

We may infer therefore that as early as 1594 Napier had communicated to some one, probably John Craig, his hope of being able to effect a simplification in the processes of arithmetic. Everything tends to show that the invention of logarithms was the result of many years of labour and thought,[1] undertaken with this special object, and it would seem that Napier had seen some prospect of success nearly twenty years before the publication of the *Descriptio*. It is very evident that no mere hint with regard to the use of proportional numbers could have been of any service to him, but it is possible that the news brought by Craig of the difficulties placed in the progress of astronomy by the labour of the calculations may have stimulated him to persevere in his efforts.

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[1] Frisch's *Kepleri opera omnia*, ii. 834. Frisch thinks Bramer possibly relied on Kepler's statement quoted in the text ("Quibus forte confisus Kepleri verbis Benj. Bramer . . ."). See also vol. vii. p. 298.

The claims of Byrgius are discussed in Kästner's *Geschichte der Mathematik*, ii. 375, and iii. 14; Montucla's *Histoire des mathématiques*, ii. 10; Delambre's *Histoire de l'astronomie moderne*, i. 560; de Morgan's article on "Tables" in the *English Cyclopaedia*; Mark Napier's *Memoirs of John Napier of Merchiston* (1834), p. 392, and Cantor's *Geschichte der Mathematik*, ii. (1892), 662. See also Gieswald, *Justus Byrg als Mathematiker und dessen Einleitung in seine Logarithmen* (Danzig, 1856).

[2] See Mark Napier's *Memoirs of John Napier of Merchiston* (1834), p. 362.

The "new invention in Denmark" to which Anthony Wood refers as having given the hint to Napier was probably the method of calculation called prosthaphaeresis (often written in Greek letters προσθαφαίρεσις), which had its origin in the solution of spherical triangles.[2] The method consists in the use of the formula

$$\sin a \sin b = \tfrac{1}{2}\{\cos(a-b) - \cos(a+b)\},$$

by means of which the multiplication of two sines is reduced to the addition or subtraction of two tabular results taken from a table of sines; and, as such products occur in the solution of spherical triangles, the method affords the solution of spherical triangles in certain cases by addition and subtraction only. It seems to be due to Wittich of Breslau, who was assistant for a short time to Tycho Brahe; and it was used by them in their calculations in 1582. Wittich in 1584 made known at Cassel the calculation of one case by this prosthaphaeresis; and Justus Byrgius proved it in such a manner that from his proof the extension to the solution of all triangles could be deduced.[3] Clavius generalized the method in his treatise *De astrolabio* (1593), lib. i. lemma liii. The lemma is enunciated as follows:—

> "Quaestiones omnes, quae per sinus, tangentes, atque secantes absolvi solent, per solam prosthaphaeresim, id est, per solam additionem, subtractionem, sine laboriosa numerorum multiplicatione divisioneque expedire."

Clavius then refers to a work of Raymarus Ursus Dithmarsus as containing an account of a particular case. The work is probably the *Fundamentum astronomicum* (1588). Longomontanus, in his *Astronomia Danica* (1622), gives an account of the method, stating that it is not to be found in the writings of the Arabs or Regiomontanus. As Longomontanus is mentioned in Anthony Wood's anecdote, and as Wittich as well as Longomontanus were assistants of Tycho, we may infer that Wittich's prosthaphaeresis is the method referred to by Wood.

It is evident that Wittich's prosthaphaeresis could not be a good method of practically effecting multiplications unless the quantities to be multiplied were sines, on account of the labour of the interpolations. It satisfies the condition, however, equally with logarithms, of enabling multiplication to be performed by the aid of a table of single entry; and, analytically considered, it is not so different in principle from the logarithmic method. In fact, if we put $xy=\phi(X+Y)$, X being a function of x only and Y a function of y only, we can show that we must have $X=Ae^{qx}$, $y=Be^{qy}$; and if we put $xy=\phi(X+Y)-\phi(X-Y)$, the solutions are $\phi(X+Y)=\frac{1}{4}(x+y)^2$, and $x=\sin X$, $y=\sin Y$, $\phi(X+Y)=-\frac{1}{2}\cos(X+Y)$. The former solution gives a method known as that of quarter-squares; the latter gives the method of prosthaphaeresis.

An account has now been given of Napier's invention and its publication, the transition to decimal logarithms, the calculation of the tables by Briggs, Vlacq and Gunter, as well as of the claims of Byrgius and the method of prosthaphaeresis. To complete the early history of logarithms it is necessary to return to Napier's *Descriptio* in order to describe its reception on the continent, and to mention the other logarithmic tables which were published while Briggs was occupied with his calculations.

John Kepler, who has been already quoted in connexion with Craig's visit to Tycho Brahe, received the invention of logarithms almost as enthusiastically as Briggs. His first mention of the subject occurs in a letter to Schikhart dated the 11th of March 1618, in which he writes—"Extitit Scotus Baro, cujus nomen mihi excidit, qui praeclari quid praestitit, necessitate omni multiplicationum et divisionum in meras additiones et subtractiones commutata, nec sinibus utitur: at tamen opus est ipsi tangentium canone: et varietas, crebritas, difficultasque additionum subtractionumque alicubi laborem multiplicandi et dividendi superat." This erroneous estimate was formed when he had seen the *Descriptio* but had not read it; and his opinion was very different when he became acquainted with the nature of logarithms. The dedication of his *Ephemeris* for 1620 consists of a letter to Napier dated the 28th of July 1619, and he there congratulates him warmly on his invention and on the benefit he has conferred upon astronomy generally and upon Kepler's own Rudolphine tables. He says that, although Napier's book had been published five years, he first saw it at Prague two years before; he was then unable to read it, but last year he had met with a little work by Benjamin Ursinus[4] containing the substance of the method, and he at once recognized the importance of what had been effected. He then explains how he verified the canon, and so found that there were no essential errors in it, although there were a few inaccuracies near the beginning of the quadrant, and he proceeds, "Haec te obiter scire volui, ut quibus tu methodis incesseris, quas non dubito et plurimas et ingeniosissimas tibi in promptu esse, eas publici juris fieri, mihi saltem (puto et caeteris) scires fore gratissimum; eoque percepto, tua promissa folio 57, in debitum cecidisse intelligeres." This letter was written two years after Napier's death (of which Kepler was unaware), and in the same year as that in which the *Constructio* was published. In the same year (1620) Napier's *Descriptio* (1614) and *Constructio* (1619) were reprinted by Bartholomew Vincent at Lyons and issued together.[5]

Napier calculated no logarithms of numbers, and, as already stated, the logarithms invented by him were not to base *e*. The first logarithms to the base *e* were published by John Speidell in his *New Logarithmes* (London, 1619), which contains hyperbolic log sines, tangents and secants for every minute of the quadrant to 5 places of decimals.

In 1624 Benjamin Ursinus published at Cologne a canon of logarithms exactly similar to Napier's in the *Descriptio* of 1614, only much enlarged. The interval of the arguments is 10″, and the results are given to 8 places; in Napier's canon the interval is 1′, and the number of places is 7. The logarithms are strictly Napierian, and the arrangement is identical with that in the canon of 1614. This is the largest Napierian canon that has ever been published.

In the same year (1624) Kepler published at Marburg a table of Napierian logarithms of sines with certain additional columns to facilitate special calculations.

The first publication of Briggian logarithms on the continent is due to Wingate, who published at Paris in 1625 his *Arithmétique logarithmétique*, containing seven-figure logarithms of numbers up to 1000, and log sines and tangents from Gunter's *Canon* (1620). In the following year, 1626, Denis Henrion published at Paris a *Traicté des Logarithmes*, containing Briggs's logarithms of numbers up to 20,001 to 10 places, and Gunter's log sines and tangents to 7 places for every minute. In the same year de Decker also published at Gouda a work entitled *Nieuwe Telkonst, inhoudende de Logarithmi voor de Ghetallen beginnende van 1 tot 10,000*, which contained logarithms of numbers up to 10,000 to 10 places, taken from Briggs's *Arithmetica* of 1624, and Gunter's log sines and tangents to 7 places for every minute.[1] Vlacq rendered assistance in the publication of this work, and the privilege is made out to him.

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[1] In the *Rabdologia* (1617) he speaks of the canon of logarithms as "a me longo tempore elaboratum."

[2] A careful examination of the history of the method is given by Scheibel in his *Einleitung zur mathematischen Bücherkenntniss*, Stück vii. (Breslau, 1775), pp. 13-20; and there is also an account in Kästner's *Geschichte der Mathematik*, i. 566-569 (1796); in Montucla's *Histoire des mathématiques*, i. 583-585 and 617-619; and in Klügel's *Wörterbuch* (1808), article "Prosthaphaeresis."

[3] Besides his connexion with logarithms and improvements in the method of prosthaphaeresis, Byrgius has a share in the invention of decimal fractions. See Cantor, *Geschichte*, ii. 567. Cantor attributes to him (in the use of his prosthaphaeresis) the first introduction of a subsidiary angle into trigonometry (vol. ii. 590).

[4] The title of this work is—*Benjaminis Ursini . . . cursus mathematici practici volumen primum continens illustr. & generosi Dn. Dn. Johannis Neperi Baronis Merchistonij &c. Scoti trigonometriam logarithmicam usibus discentium accommodatam . . . Coloniae . . . CIϽ IϽC XIX*. At the end, Napier's table is reprinted, but to two figures less. This work forms the earliest publication of logarithms on the continent.

[5] The title is *Logarithmorum canonis descriptio, seu arithmeticarum supputationum mirabilis abbreviatio. Ejusque usus in utraque trigonometria ut etiam in omni logistica mathematica, amplissimi, facillimi & expeditissimi explicatio. Authore ac inventore Ioanne Nepero, Barone Merchistonii, &c. Scoto. Lugduni . . .* It will be seen that this title is different from that of Napier's work of 1614; many writers have, however, erroneously given it as the title of the latter.

The invention of logarithms and the calculation of the earlier tables form a very striking episode in the history of exact science, and, with the exception of the *Principia* of Newton, there is no mathematical work published in the country which has produced such important consequences, or to which so much interest attaches as to Napier's *Descriptio*. The calculation of tables of the natural trigonometrical functions may be said to have formed the work of the last half of the 16th century, and the great canon of natural sines for every 10 seconds to 15 places which had been calculated by Rheticus was published by Pitiscus only in 1613, the year before that in which the *Descriptio* appeared. In the construction of the natural trigonometrical tables Great Britain had taken no part, and it is remarkable that the discovery of the principles and the formation of the tables that were to revolutionize or supersede all the methods of calculation then in use should have been so rapidly effected and developed in a country in which so little attention had been previously devoted to such questions.

For more detailed information relating to Napier, Briggs and Vlacq, and the invention of logarithms, the reader is referred to the life of Briggs in Ward's *Lives of the Professors of Gresham College* (London, 1740); Thomas Smith's *Vitae quorundam eruditissimorum et illustrium virorum* (Vita Henrici Briggii) (London, 1707); Mark Napier's *Memoirs of John Napier* already referred to, and the same author's *Naperi libri qui supersunt* (1839); Hutton's *History*; de Morgan's article already referred to; Delambre's *Histoire de l'Astronomie moderne*; the report on mathematical tables in the *Report of the British Association* for 1873; and the *Philosophical Magazine* for October and December 1872 and May 1873. It may be remarked that the date usually assigned to Briggs's first visit to Napier is 1616 and not 1615 as stated above, the reason being that Napier was generally supposed to have died in 1618; but it was shown by Mark Napier that the true date is 1617.

In the years 1791–1807 Francis Maseres published at London, in six volumes quarto " Scriptores Logarithmici, or a collection of several curious tracts on the nature and construction of logarithms, mentioned in Dr Hutton's historical introduction to his new edition of Sherwin's mathematical tables . . .," which contains reprints of Napier's *Descriptio* of 1614, Kepler's writings on logarithms (1624–1625); &c. In 1889 a translation of Napier's *Constructio* of 1619 was published by Walter Rae Macdonald. Some valuable notes are added by the translator, in one of which he shows the accuracy of the method employed by Napier in his calculations, and explains the origin of a small error which occurs in Napier's table. Appended to the Catalogue is a full and careful bibliography of all Napier's writings, with mention of the public libraries, British and foreign, which possess copies of each. A facsimile reproduction of Bartholomew Vincent's Lyons edition (1620) of the *Constructio* was issued in 1895 by A. Hermann at Paris (this imprint occurs on page 62 after the word " Finis ").

It now remains to notice briefly a few of the more important events in the history of logarithmic tables subsequent to the original calculations.

Common or Briggian Logarithms of Numbers.—Nathaniel Roe's *Tabulae logarithmicae* (1633) was the first complete seven-figure table that was published. It contains seven-figure logarithms of numbers from 1 to 100,000, with characteristics unseparated from the mantissae, and was formed from Vlacq's table (1628) by leaving out the last three figures. All the figures of the number are given at the head of the columns, except the last two, which run down the extreme columns—1 to 50 on the left-hand side, and 50 to 100 on the right-hand side. The first four figures of the logarithms are printed at the top of the columns. There is thus an advance half way towards the arrangement now universal in seven-figure tables. The final step was made by John Newton in his *Trigononometria Britannica* (1658), a work which is also noticeable as being the only extensive eight-figure table that until recently had been published; it contains logarithms of sines, &c., as well as logarithms of numbers.

In 1705 appeared the original edition of Sherwin's tables, the first of the series of ordinary seven-figure tables of logarithms of numbers and trigonometrical functions such as are in general use now. The work went through several editions during the 18th century, and was at length superseded in 1785 by Hutton's tables, which continued in successive editions to maintain their position for a century.

In 1717 Abraham Sharp published in his *Geometry Improv'd* the Briggian logarithms of numbers from 1 to 100, and of primes from 100 to 1100, to 61 places; these were copied into the later editions of Sherwin and other works.

In 1742 a seven-figure table was published in quarto form by Gardiner, which is celebrated on account of its accuracy and of the elegance of the printing. A French edition, which closely resembles the original, was published at Avignon in 1770.

In 1783 appeared at Paris the first edition of François Callet's tables, which correspond to those of Hutton in England. These tables, which form perhaps the most complete and practically useful collection of logarithms for the general computer that has been published, passed through many editions.

In 1794 Vega published his *Thesaurus logarithmorum completus*, a folio volume containing a reprint of the logarithms of numbers from Vlacq's *Arithmetica logarithmica* of 1628, and *Trigonometria artificialis* of 1633. The logarithms of numbers are arranged as in an ordinary seven-figure table. In addition to the logarithms reprinted from the *Trigonometria*, there are given logarithms for every second of the first two degrees, which were the result of an original calculation. Vega devoted great attention to the detection and correction of the errors in Vlacq's work of 1628. Vega's *Thesaurus* has been reproduced photographically by the Italian government. Vega also published in 1797, in 2 vols. 8vo, a collection of logarithmic and trigonometrical tables which has passed through many editions, a very useful one volume stereotype edition having been published in 1840 by Hülsse. The tables in this work may be regarded as to some extent supplementary to those in Callet.

If we consider only the logarithms of numbers, the main line of descent from the original calculation of Briggs and Vlacq is Roe, John Newton, Sherwin, Gardiner; there are then two branches, viz. Hutton founded on Sherwin and Callet on Gardiner, and the editions of Vega form a separate offshoot from the original tables. Among the most useful and accessible of modern ordinary seven-figure tables of logarithms of numbers and trigonometrical functions may be mentioned those of Bremiker, Schrön and Bruhns. For logarithms of numbers only perhaps Babbage's table is the most convenient.[2]

In 1871 Edward Sang published a seven-figure table of logarithms of numbers from 20,000 to 200,000, the logarithms between 100,000 and 200,000 being the result of a new calculation. By beginning the table at 20,000 instead of at 10,000 the differences are halved in magnitude, while the number of them in a page is quartered. In this table multiples of the differences, instead of proportional parts, are given.[3] John Thomson of Greenock (1782–1855) made an independent calculation of logarithms of numbers up to 120,000 to 12 places of decimals, and his table has been used to verify the errata already found in Vlacq and Briggs by Lefort (see *Monthly Not. R.A.S.* vol. 34, p. 447). A table of ten-figure logarithms of numbers up to 100,009 was calculated by W. W. Duffield and published in the *Report of the U.S. Coast and Geodetic Survey for 1895–1896* as Appendix 12, pp. 395-722. The results were compared with Vega's *Thesaurus* (1794) before publication.

Common or Briggian Logarithms of Trigonometrical Functions.—The next great advance on the *Trigonometria artificialis* took place more than a century and a half afterwards, when Michael Taylor published in 1792 his seven-decimal table of log sines and tangents to every second of the quadrant; it was calculated by interpolation from the *Trigonometria* to 10 places and then contracted to 7. On account of the great size of this table, and for other reasons, it never came into very general use, Bagay's *Nouvelles tables astronomiques* (1829), which also contains log sines and tangents to every second, being preferred; this latter work, which for many years was difficult to procure, has been reprinted with the original title-page and date unchanged. The only other logarithmic canon to every second that has been published forms the second volume of Shortrede's *Logarithmic Tables* (1849). In 1784 the French government decided that new tables of sines, tangents, &c., and their logarithms, should be calculated in relation to the centesimal division of the quadrant. Prony was charged with the direction of the work, and was expressly required " non seulement à composer des tables qui ne laissassent rien à désirer quant à l'exactitude, mais à en faire le monument de calcul le plus vaste et le plus imposant qui eût jamais été exécuté ou même conçu." Those engaged upon the work were divided into three sections: the first consisted of five or six mathematicians, including Legendre, who were engaged in the purely analytical work, or the calculation of the fundamental numbers; the second section consisted of seven or eight calculators possessing some mathematical knowledge; and the third comprised seventy or eighty ordinary computers. The work, which was performed wholly in duplicate, and independently by two divisions of computers, occupied two years. As a consequence of the double calculation, there are two manuscripts, one deposited at the Observatory, and the other in the library of the Institute, at Paris. Each of the two manuscripts consists essentially of seventeen large folio volumes, the contents being as follows:—

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[1] In describing the contents of the works referred to, the language and notation of the present day have been adopted, so that for example a table to radius 10,000,000 is described as a table to 7 places, and so on. Also, although logarithms have been spoken of as to the base *e*, &c., it is to be noticed that neither Napier nor Briggs, nor any of their successors till long afterwards, had any idea of connecting logarithms with exponents.

[2] The smallest number of entries which are necessary in a table of logarithms in order that the intermediate logarithms may be calculable by proportional parts has been investigated by J. E. A. Steggall in the *Proc. Edin. Math. Soc.*, 1892, 10, p. 35. This number is 1700 in the case of a seven-figure table extending to 100,000.

[3] Accounts of Sang's calculations are given in the *Trans. Roy. Soc. Edin.*, 1872, 26, p. 521, and in subsequent papers in the *Proceedings* of the same society.

Logarithms of numbers up to 200,000	8 vols.
Natural sines	1 „
Logarithms of the ratios of arcs to sines from $0^{g}\cdot00000$ to $0^{g}\cdot05000$, and log sines throughout the quadrant	4 „
Logarithms of the ratios of arcs to tangents from $0^{g}\cdot00000$ to $0^{g}\cdot05000$, and log tangents throughout the quadrant	4 „

The trigonometrical results are given for every hundred-thousandth of the quadrant ($10''$ centesimal or $3''\cdot24$ sexagesimal). The tables were all calculated to 14 places, with the intention that only 12 should be published, but the twelfth figure is not to be relied upon. The tables have never been published, and are generally known as the *Tables du Cadastre*, or, in England, as the great French manuscript tables.

A very full account of these tables, with an explanation of the methods of calculation, formulae employed, &c., was published by Lefort in vol. iv. of the *Annales de l'observatoire de Paris*. The printing of the table of natural sines was once begun, and Lefort states that he has seen six copies, all incomplete, although including the last page. Babbage compared his table with the *Tables du Cadastre*, and Lefort has given in his paper just referred to most important lists of errors in Vlacq's and Briggs's logarithms of numbers which were obtained by comparing the manuscript tables with those contained in the *Arithmetica logarithmica* of 1624 and of 1628.

As the *Tables du Cadastre* remained unpublished, other tables appeared in which the quadrant was divided centesimally, the most important of these being Hobert and Ideler's *Nouvelles tables trigonométriques* (1799), and Borda and Delambre's *Tables trigonométriques décimales* (1800–1801), both of which are seven-figure tables. The latter work, which was much used, being difficult to procure, and greater accuracy being required, the French government in 1891 published an eight-figure centesimal table, for every ten seconds, derived from the *Tables du Cadastre*.

Decimal or Briggian Antilogarithms.—In the ordinary tables of logarithms the natural numbers are all integers, while the logarithms tabulated are incommensurable. In an antilogarithmic table, the logarithms are exact quantities such as ·00001, ·00002, &c., and the numbers are incommensurable. The earliest and largest table of this kind that has been constructed is Dodson's *Antilogarithmic canon* (1742), which gives the numbers to 11 places, corresponding to the logarithms from ·00001 to ·99999 at intervals of ·00001. Antilogarithmic tables are few in number, the only other extensive tables of the same kind that have been published occurring in Shortrede's *Logarithmic tables* already referred to, and in Filipowski's *Table of antilogarithms* (1849). Both are similar to Dodson's tables, from which they were derived, but they only give numbers to 7 places.

Hyperbolic or Napierian logarithms (*i.e.* to base *e*).—The most elaborate table of hyperbolic logarithms that exists is due to Wolfram, a Dutch lieutenant of artillery. His table gives the logarithms of all numbers up to 2200, and of primes (and also of a great many composite numbers) from 2200 to 10,009, to 48 decimal places. The table appeared in Schulze's *Neue und erweiterte Sammlung logarithmischer Tafeln* (1778), and was reprinted in Vega's *Thesaurus* (1794), already referred to. Six logarithms omitted in Schulze's work, and which Wolfram had been prevented from computing by a serious illness, were published subsequently, and the table as given by Vega is complete. The largest hyperbolic table as regards range was published by Zacharias Dase at Vienna in 1850 under the title *Tafel der natürlichen Logarithmen der Zahlen*.

Hyperbolic antilogarithms are simple exponentials, *i.e.* the hyperbolic antilogarithm of x is e^x. Such tables can scarcely be said to come under the head of logarithmic tables. See TABLES, MATHEMATICAL: *Exponential Functions*.

Logistic or Proportional Logarithms.—The old name for what are now called ratios or fractions are *logistic numbers*, so that a table of $\log(a/x)$ where x is the argument and a a constant is called a table of logistic or proportional logarithms; and since $\log(a/x) = \log a - \log x$ it is clear that the tabular results differ from those given in an ordinary table of logarithms only by the subtraction of a constant and a change of sign. The first table of this kind appeared in Kepler's work of 1624 which has been already referred to. The object of a table of $\log(a/x)$ is to facilitate the working out of proportions in which the third term is a constant quantity a. In most collections of tables of logarithms, and especially those intended for use in connexion with navigation, there occurs a small table of logistic logarithms in which $a = 3600''(=1^\circ \text{ or } 1^h)$, the table giving $\log 3600 - \log x$, and x being expressed in minutes and seconds. It is also common to find tables in which $a = 10800''(=3^\circ \text{ or } 3^h)$, and x is expressed in degrees (or hours), minutes and seconds. Such tables are generally given to 4 or 5 places. The usual practice in books seems to be to call logarithms logistic when a is $3600''$, and proportional when a has any other value.

Addition and Subtraction, or Gaussian Logarithms.—*Gaussian logarithms* are intended to facilitate the finding of the logarithms of the sum and difference of two numbers whose logarithms are known, the numbers themselves being unknown; and on this account they are frequently called addition and subtraction logarithms. The object of the table is in fact to give $\log(a \pm b)$ by only one entry when $\log a$ and $\log b$ are given. The utility of such logarithms was first pointed out by Leonelli in a book entitled *Supplément logarithmique*, printed at Bordeaux in the year XI. (1802/3); he calculated a table to 14 places, but only a specimen of it which appeared in the *Supplément* was printed. The first table that was actually published is due to Gauss, and was printed in Zach's *Monatliche Correspondenz*, xxvi. 498 (1812). Corresponding to the argument $\log x$ it gives the values of $\log(1+x^{-1})$ and $\log(1+x)$.

Dual Logarithms.—This term was used by Oliver Byrne in a series of works published between 1860 and 1870. Dual numbers and logarithms depend upon the expression of a number as a product of 1·1, 1·01, 1·001 . . . or of ·9, ·99, ·999 . . . .

In the preceding *résumé* only those publications have been mentioned which are of historic importance or interest.[1] For fuller details with respect to some of these works, for an account of tables published in the latter part of the 19th century, and for those which would now be used in actual calculation, reference should be made to the article TABLES, MATHEMATICAL.

Calculation of Logarithms.—The name logarithm is derived from the words λόγων ἀριθμός, the number of the ratios, and the way of regarding a logarithm which justifies the name may be explained as follows. Suppose that the ratio of 10, or any other particular number, to 1 is compounded of a very great number of equal ratios, as, for example, 1,000,000, then it can be shown that the ratio of 2 to 1 is very nearly equal to a ratio compounded of 301,030 of these small ratios, or *ratiunculae*, that the ratio of 3 to 1 is very nearly equal to a ratio compounded of 477,121 of them, and so on. The small ratio, or *ratiuncula*, is in fact that of the millionth root of 10 to unity, and if we denote it by the ratio of a to 1, then the ratio of 2 to 1 will be nearly the same as that of $a^{301,030}$ to 1, and so on; or, in other words, if a denotes the millionth root of 10, then 2 will be nearly equal to $a^{301,030}$, 3 will be nearly equal to $a^{477,121}$, and so on.

Napier's original work, the *Descriptio Canonis* of 1614, contained, not logarithms of numbers, but logarithms of sines, and the relations between the sines and the logarithms were explained by the motions of points in lines, in a manner not unlike that afterwards employed by Newton in the method of fluxions. An account of the processes by which Napier constructed his table was given in the *Constructio Canonis* of 1619. These methods apply, however, specially to Napier's own kind of logarithms, and are different from those actually used by Briggs in the construction of the tables in the *Arithmetica Logarithmica*, although some of the latter are the same in principle as the processes described in an appendix to the *Constructio*.

The processes used by Briggs are explained by him in the preface to the *Arithmetica Logarithmica* (1624). His method of finding the logarithms of the small primes, which consists in taking a great number of continued geometric means between unity and the given primes, may be described as follows. He first formed the table of numbers and their logarithms:—

Numbers.	Logarithms.
10	1
3·162277	0·5
1·778279	0·25
1·333521	0·125
1·154781	0·0625

each quantity in the left-hand column being the square root of the one above it, and each quantity in the right-hand column being the half of the one above it. To construct this table Briggs, using about thirty places of decimals, extracted the square root of 10 fifty-four times, and thus found that the logarithm of 1·00000 00000 00000 12781 91493 20032 35 was 0·00000 00000 00000 05551 11512 31257 82702, and that for numbers of this form (*i.e.* for numbers beginning with 1 followed by fifteen ciphers, and then by seventeen or a less number of significant figures) the logarithms were proportional to these significant figures. He then by means of a simple proportion deduced that log (1·00000 00000 00000 1) = 0·00000 00000 00000 04342 94481 90325 1804, so that, a quantity 1·00000 00000 00000 x (where x consists of not more than seventeen figures) having been obtained by repeated extraction of the square root of a given number, the logarithm of 1·00000 00000 00000 x could then be found by multiplying x by ·00000 00000 00000 04342.....

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[1] In vol. xv. (1875) of the *Verhandelingen* of the Amsterdam Academy of Sciences, Bierens de Haan has given a list of 553 tables of logarithms. A previous paper of the same kind, containing notices of some of the tables, was published by him in the *Verslagen en Mededeelingen* of the same academy (Afd. Natuurkunde) deel. iv (1862), p. 15.

To find the logarithm of 2, Briggs raised it to the tenth power, viz. 1024, and extracted the square root of 1·024 forty-seven times, the result being 1·00000 00000 00000 16851 60570 53949 77. Multiplying the significant figures by 4342...he obtained the logarithm of this quantity, viz. 0·00000 00000 00000 07318 55936 90623 9336, which multiplied by 2^{47} gave 0·01029 99566 39811 95265 277444, the logarithm of 1·024, true to 17 or 18 places. Adding the characteristic 3, and dividing by 10, he found (since 2 is the tenth root of 1024) log 2 = ·30102 99956 63981 195. Briggs calculated in a similar manner log 6, and thence deduced log 3.

It will be observed that in the first process the value of the modulus is in fact calculated from the formula.

$$\frac{h}{10^h-1}=\frac{1}{\log_e 10},$$

the value of h being $1/2^{54}$, and in the second process $\log_{10} 2$ is in effect calculated from the formula.

$$\log_{10} 2=\left(2^{\frac{10}{2^{47}}}-1\right)\times\frac{1}{\log_e 10}\times\frac{2^{47}}{10}.$$

Briggs also gave methods of forming the mean proportionals or square roots by differences; and the general method of constructing logarithmic tables by means of differences is due to him.

The following calculation of log 5 is given as an example of the application of a method of mean proportionals. The process consists in taking the geometric mean of numbers above and below 5, the object being to at length arrive at 5·000000. To every geometric mean in the column of numbers there corresponds the arithmetical mean in the column of logarithms. The numbers are denoted by A, B, C, &c., in order to indicate their mode of formation.

	Numbers.	Logarithms.
$A=$	1·000000	0·0000000
$B=$	10·000000	1·0000000
$C=\sqrt{(AB)}$ =	3·162277	0·5000000
$D=\sqrt{(BC)}$ =	5·623413	0·7500000
$E=\sqrt{(CD)}$ =	4·216964	0·6250000
$F=\sqrt{(DE)}$ =	4·869674	0·6875000
$G=\sqrt{(DF)}$ =	5·232991	0·7187500
$H=\sqrt{(FG)}$ =	5·048065	0·7031250
$I=\sqrt{(FH)}$ =	4·958069	0·6953125
$K=\sqrt{(HI)}$ =	5·002865	0·6992187
$L=\sqrt{(IK)}$ =	4·980416	0·6972656
$M=\sqrt{(KL)}$ =	4·991627	0·6982421
$N=\sqrt{(KM)}$ =	4·997242	0·6987304
$O=\sqrt{(KN)}$ =	5·000052	0·6989745
$P=\sqrt{(NO)}$ =	4·998647	0·6988525
$Q=\sqrt{(OP)}$ =	4·999350	0·6989135
$R=\sqrt{(OQ)}$ =	4·999701	0·6989440
$S=\sqrt{(OR)}$ =	4·999876	0·6989592
$T=\sqrt{(OS)}$ =	4·999963	0·6989668
$V=\sqrt{(OT)}$ =	5·000008	0·6989707
$W=\sqrt{(TV)}$ =	4·999984	0·6989687
$X=\sqrt{(WV)}$ =	4·999997	0·6989697
$Y=\sqrt{(VX)}$ =	5·000003	0·6989702
$Z=\sqrt{(XY)}$ =	5·000000	0·6989700

Great attention was devoted to the methods of calculating logarithms during the 17th and 18th centuries. The earlier methods proposed were, like those of Briggs, purely arithmetical, and for a long time logarithms were regarded from the point of view indicated by their name, that is to say, as depending on the theory of compounded ratios. The introduction of infinite series into mathematics effected a great change in the modes of calculation and the treatment of the subject. Besides Napier and Briggs, special reference should be made to Kepler (*Chilias*, 1624) and Mercator (*Logarithmotechnia*, 1668), whose methods were arithmetical, and to Newton, Gregory, Halley and Cotes, who employed series. A full and valuable account of these methods is given in Hutton's " Construction of Logarithms," which occurs in the introduction to the early editions of his *Mathematical Tables*, and also forms tract 21 of his *Mathematical Tracts* (vol. i., 1812). Many of the early works on logarithms were reprinted in the *Scriptores logarithmici* of Baron Maseres already referred to.

In the following account only those formulae and methods will be referred to which would now be used in the calculation of logarithms.

Since

$$\log_e(1+x)=x-\tfrac{1}{2}x^2+\tfrac{1}{3}x^3-\tfrac{1}{4}x^4+\&c.,$$

we have, by changing the sign of x,

$$\log_e(1-x)=-x-\tfrac{1}{2}x^2-\tfrac{1}{3}x^3-\tfrac{1}{4}x^4-\&c.;$$

whence

$$\log_e\frac{1+x}{1-x}=2(x+\tfrac{1}{3}x^3+\tfrac{1}{5}x^5+\&c.),$$

and, therefore, replacing x by $\frac{p-q}{p+q}$,

$$\log_e\frac{p}{q}=2\left\{\frac{p-q}{p+q}+\tfrac{1}{3}\left(\frac{p-q}{p+q}\right)^3+\tfrac{1}{5}\left(\frac{p-q}{p+q}\right)^5+\&c.\right\},$$

in which the series is always convergent, so that the formula affords a method of deducing the logarithm of one number from that of another.

As particular cases we have, by putting $q=1$,

$$\log_e p=2\left\{\frac{p-1}{p+1}+\tfrac{1}{3}\left(\frac{p-1}{p+1}\right)^3+\tfrac{1}{5}\left(\frac{p-1}{p+1}\right)^5+\&c.\right\},$$

and by putting $q=p+1$,

$$\log_e(p+1)-\log_e p=2\left\{\frac{1}{2p+1}+\tfrac{1}{3}\frac{1}{(2p+1)^3}+\tfrac{1}{5}\frac{1}{(2p+1)^5}+\&c.\right\};$$

the former of these equations gives a convergent series for $\log_e p$, and the latter a very convergent series by means of which the logarithm of any number may be deduced from the logarithm of the preceding number.

From the formula for $\log_e(p/q)$ we may deduce the following very convergent series for $\log_e 2$, $\log_e 3$ and $\log_e 5$, viz. :—

$$\log_e 2=2(7P+5Q+3R),$$
$$\log_e 3=2(11P+8Q+5R),$$
$$\log_e 5=2(16P+12Q+7R),$$

where

$$P=\frac{1}{31}+\tfrac{1}{3}\cdot\frac{1}{(31)^3}+\tfrac{1}{5}\cdot\frac{1}{(31)^5}+\&c.$$
$$Q=\frac{1}{49}+\tfrac{1}{3}\cdot\frac{1}{(49)^3}+\tfrac{1}{5}\cdot\frac{1}{(49)^5}+\&c.$$
$$R=\frac{1}{161}+\tfrac{1}{3}\cdot\frac{1}{(161)^3}+\tfrac{1}{5}\cdot\frac{1}{(161)^5}+\&c.$$

The following still more convenient formulae for the calculation of $\log_e 2$, $\log_e 3$, &c. were given by J. Couch Adams in the *Proc. Roy. Soc.*, 1878, 27, p. 91. If

$$a=\log\frac{10}{9}=-\log\left(1-\frac{1}{10}\right),\quad b=\log\frac{25}{24}=-\log\left(1-\frac{4}{100}\right),$$
$$c=\log\frac{81}{80}=\log\left(1+\frac{1}{80}\right),\quad d=\log\frac{50}{49}=-\log\left(1-\frac{2}{100}\right),$$
$$e=\log\frac{126}{125}=\log\left(1+\frac{8}{1000}\right),$$

then

$$\log 2=7a-2b+3c,\ \log 3=11a-3b+5c,\ \log 5=16a-4b+7c,$$

and

$$\log 7=\tfrac{1}{2}(39a-10b+17c-d)\text{ or }=19a-4b+8c+e,$$

and we have the equation of condition,

$$a-2b+c=d+2e.$$

By means of these formulae Adams calculated the values of $\log_e 2$, $\log_e 3$, $\log_e 5$, and $\log_e 7$ to 276 places of decimals, and deduced the value of $\log_e 10$ and its reciprocal M, the modulus of the Briggian system of logarithms. The value of the modulus found by Adams is

Mo = 0·43429 44819 03251 82765 11289
18916 60508 22943 97005 80366
65661 14453 78316 58646 49208
87077 47292 24949 33843 17483
18706 10674 47663 03733 64167
92871 58963 90656 92210 64662

81226 58521 27086 56867 03295
93370 86965 88266 88331 16360
77384 90514 28443 48666 76864
65860 85135 56148 21234 87653
43543 43573 17253 83562 21868
25

which is true certainly to 272, and probably to 273, places (*Proc. Roy. Soc.*, 1886, 42, p. 22, where also the values of the other logarithms are given).

If the logarithms are to be Briggian all the series in the preceding formulae must be multiplied by M, the modulus; thus,

$$\log_{10}(1+x)=M(x-\tfrac{1}{2}x^2+\tfrac{1}{3}x^3-\tfrac{1}{4}x^4+\&c.),$$

and so on.

As has been stated, Abraham Sharp's table contains 61-decimal

Briggian logarithms of primes up to 1100, so that the logarithms of all composite numbers whose greatest prime factor does not exceed this number may be found by simple addition; and Wolfram's table gives 48-decimal hyperbolic logarithms of primes up to 10,009. By means of these tables and of a factor table we may very readily obtain the Briggian logarithm of a number to 61 or a less number of places or of its hyperbolic logarithm to 48 or a less number of places in the following manner. Suppose the hyperbolic logarithm of the prime number 43,867 required. Multiplying by 50, we have $50\times 43{,}867 = 2{,}193{,}350$, and on looking in Burckhardt's *Table des diviseurs* for a number near to this which shall have no prime factor greater than 10,009, it appears that

$$2{,}193{,}349 = 23\times 47\times 2029;$$

thus

$$43{,}867 = \tfrac{1}{50}(23\times 47\times 2029+1),$$

and therefore

$$\log_e 43{,}867 = \log_e 23+\log_e 47+\log_e 2029-\log_e 50$$
$$+\frac{1}{2{,}193{,}349}-\tfrac{1}{2}\frac{1}{(2{,}193{,}349)^2}+\tfrac{1}{3}\frac{1}{(2{,}193{,}349)^3}-\&c.$$

The first term of the series in the second line is

0·00000 04559 23795 07319 6286;

dividing this by $2\times 2{,}193{,}349$ we obtain

0·00000 00000 00103 93325 3457,

and the third term is

0·00000 00000 00000 00003 1590,

so that the series =

0·00000 04559 23691 13997 4419;

whence, taking out the logarithms from Wolfram's table,

$\log_e 43{,}867 =$ 10·68891 76079 60568 10191 3661.

The principle of the method is to multiply the given prime (supposed to consist of 4, 5 or 6 figures) by such a factor that the product may be a number within the range of the factor tables, and such that, when it is increased by 1 or 2, the prime factors may all be within the range of the logarithmic tables. The logarithm is then obtained by use of the formula

$$\log_e(x+d) = \log_e x+\frac{d}{x}-\tfrac{1}{2}\frac{d^2}{x^2}+\tfrac{1}{3}\frac{d^3}{x^3}-\&c.,$$

in which of course the object is to render d/x as small as possible. If the logarithm required is Briggian, the value of the series is to be multiplied by M.

If the number is incommensurable or consists of more than seven figures, we can take the first seven figures of it (or multiply and divide the result by any factor, and take the first seven figures of the result) and proceed as before. An application to the hyperbolic logarithm of π is given by Burckhardt in the introduction to his *Table des diviseurs* for the second million.

The best general method of calculating logarithms consists, in its simplest form, in resolving the number whose logarithm is required into factors of the form $1-\cdot 1^r n$, where n is one of the nine digits, and making use of subsidiary tables of logarithms of factors of this form. For example, suppose the logarithm of 543839 required to twelve places. Dividing by 10^5 and by 5 the number becomes 1·087678, and resolving this number into factors of the form $1-\cdot 1^r n$ we find that

$$543839 = 10^5\times 5(1-\cdot 1^2 8)(1-\cdot 1^4 6)(1-\cdot 1^5 6)(1-\cdot 1^6 3)(1-\cdot 1^7 3)$$
$$\times(1-\cdot 1^8 5)(1-\cdot 1^9 7)(1-\cdot 1^{10} 9)(1-\cdot 1^{11} 3)(1-\cdot 1^{12} 2),$$

where $1-\cdot 1^2 8$ denotes 1−·08, $1-\cdot 1^4 6$ denotes 1−·0006, &c., and so on. All that is required therefore in order to obtain the logarithm of any number is a table of logarithms, to the required number of places, of ·*n*, ·9*n*, ·99*n*, ·999*n*, &c., for $n = 1, 2, 3, \ldots 9$.

The resolution of a number into factors of the above form is easily performed. Taking, for example, the number 1·087678, the object is to destroy the significant figure 8 in the second place of decimals; this is effected by multiplying the number by 1−·08, that is, by subtracting from the number eight times itself advanced two places, and we thus obtain 1·00066376. To destroy the first 6 multiply by 1−·0006 giving 1·000063361744, and multiplying successively by 1−·00006 and 1−·000003, we obtain 1·000000357932, and it is clear that these last six significant figures represent without any further work the remaining factors required. In the corresponding antilogarithmic process the number is expressed as a product of factors of the form $1+\cdot 1^n x$.

This method of calculating logarithms by the resolution of numbers into factors of the form $1-\cdot 1^r n$ is generally known as Weddle's method, having been published by him in *The Mathematician* for November 1845, and the corresponding method for antilogarithms by means of factors of the form $1+(\cdot 1)^r n$ is known by the name of Hearn, who published it in the same journal for 1847. In 1846 Peter Gray constructed a new table to 12 places, in which the factors were of the form $1-(\cdot 01)^r n$, so that n had the values 1, 2, . . . 99; and subsequently he constructed a similar table for factors of the form $1+(\cdot 01)^r n$. He also devised a method of applying a table of Hearn's form (*i.e.* of factors of the form $1+\cdot 1^r n$) to the construction of logarithms, and calculated a table of logarithms of factors of the form $1+(\cdot 001)^r n$ to 24 places. This was published in 1876 under the title *Tables for the formation of logarithms and antilogarithms to twenty-four or any less number of places*, and contains the most complete and useful application of the method, with many improvements in points of detail. Taking as an example the calculation of the Briggian logarithm of the number 43,867, whose hyperbolic logarithm has been calculated above, we multiply it by 3, giving 131,601, and find by Gray's process that the factors of 1·31601 are

(1) 1·316
(2) 1·000007
(3) $1\cdot(001)^2 598$
(4) $1\cdot(001)^3 780$
(5) $1\cdot(001)^4 002$
(6) $1\cdot(001)^5 602$
(7) $1\cdot(001)^6 412$
(8) $1\cdot(001)^7 340$

Taking the logarithms from Gray's tables we obtain the required logarithm by addition as follows:—

$$\begin{array}{rrrrrrrrl}
522 & 878 & 745 & 280 & 337 & 562 & 704 & 972 & =\text{colog } 3\\
119 & 255 & 889 & 277 & 936 & 685 & 553 & 913 & =\log(1)\\
 & 3 & 040 & 050 & 733 & 157 & 610 & 239 & =\log(2)\\
 & & 259 & 708 & 022 & 525 & 453 & 597 & =\log(3)\\
 & & & 338 & 749 & 695 & 752 & 424 & =\log(4)\\
 & & & & & 868 & 588 & 964 & =\log(5)\\
 & & & & & 261 & 445 & 278 & =\log(6)\\
 & & & & & & 178 & 929 & =\log(7)\\
 & & & & & & & 148 & =\log(8)\\
\hline
4\cdot 642 & 137 & 934 & 655 & 780 & 757 & 288 & 464 & =\log_{10} 43{,}867
\end{array}$$

In Shortrede's *Tables* there are tables of logarithms and factors of the form $1\pm(\cdot 01)^r n$ to 16 places and of the form $1\pm(\cdot 1)^r n$ to 25 places; and in his *Tables de Logarithmes à 27 Décimales* (Paris, 1867) Fédor Thoman gives tables of logarithms of factors of the form $1\pm\cdot 1^r n$. In the *Messenger of Mathematics*, vol. iii. pp. 66-92, 1873, Henry Wace gave a simple and clear account of both the logarithmic and antilogarithmic processes, with tables of both Briggian and hyperbolic logarithms of factors of the form $1\pm\cdot 1^r n$ to 20 places.

Although the method is usually known by the names of Weddle and Hearn, it is really, in its essential features, due to Briggs, who gave in the *Arithmetica logarithmica* of 1624 a table of the logarithms of $1+\cdot 1^r n$ up to $r=9$ to 15 places of decimals. It was first formally proposed as an independent method, with great improvements, by Robert Flower in *The Radix, a new way of making Logarithms*, which was published in 1771; and Leonelli, in his *Supplement logarithmique* (1802-1803), already noticed, referred to Flower and reproduced some of his tables. A complete bibliography of this method has been given by A. J. Ellis in a paper "on the potential radix as a means of calculating logarithms," printed in the *Proceedings of the Royal Society*, vol. xxxi., 1881, pp. 401-407, and vol. xxxii., 1881, pp. 377-379. Reference should also be made to Hoppe's *Tafeln zur dreissigstelligen logarithmischen Rechnung* (Leipzig, 1876), which give in a somewhat modified form a table of the hyperbolic logarithm of $1+\cdot 1^r n$.

The preceding methods are only appropriate for the calculation of isolated logarithms. If a complete table had to be reconstructed, or calculated to more places, it would undoubtedly be most convenient to employ the method of differences. A full account of this method as applied to the calculation of the *Tables du Cadastre* is given by Lefort in vol. iv. of the *Annales de l'Observatoire de Paris*.

(J. W. L. G.)

LOGAU, FRIEDRICH, Freiherr von (1604–1655), German epigrammatist, was born at Brockut, near Nimptsch, in Silesia, in June 1604. He was educated at the gymnasium of Brieg and subsequently studied law. He then entered the service of the duke of Brieg. In 1644 he was made "ducal councillor." He died at Liegnitz on the 24th of July 1655. Logau's epigrams, which appeared in two collections under the pseudonym "Salomon von Golaw" (an anagram of his real name) in 1638 (*Erstes Hundert Teutscher Reimensprüche*) and 1654 (*Deutscher Sinngedichte drei Tausend*), show a marvellous range and variety of expression. He had suffered bitterly under the adverse conditions of the time; but his satire is not merely the outcome of personal feeling. In the turbulent age of the Thirty Years' War he was one of the few men who preserved intact his intellectual integrity and judged his contemporaries fairly. He satirized with unsparing hand the court life, the useless bloodshed of the war, the lack of national pride in the German people, and their slavish imitation of the French in customs, dress and speech. He belonged to the *Fruchtbringende Gesellschaft* under the name *Der Verkleinernde*, and regarded himself as a follower of Martin Opitz; but he did not allow such ties to influence his independence or originality.

Logau's *Sinngedichte* were edited in 1759 by G. E. Lessing and K. W. Ramler, who first drew attention to their merits; a second edition appeared in 1791. A critical edition was published by G. Eitner in 1872, who also edited a selection of Logau's epigrams for the *Deutsche Dichter des XVII. Jahrhunderts* (vol. iii., 1870); there is also a selection by H. Oesterley in Kürschner's *Deutsche Nationalliteratur*, vol. xxviii. (1885). See H. Denker, *Beiträge zur literarischen Würdigung Logaus* (1889); W. Heuschkel, *Untersuchungen über Ramlers und Lessings Bearbeitung Logauscher Sinngedichte* (1901).

LOGIA, a title used to describe a collection of the sayings of Jesus Christ (λόγια Ἰησοῦ) and therefore generally applied to the "Sayings of Jesus" discovered in Egypt by B. P. Grenfell and A. S. Hunt. There is some question as to whether the term is rightly used for this purpose. It does not occur in the Papyri in this sense. Each "saying" is introduced by the phrase "Jesus says" (λέγει) and the collection is described in the introductory words of the 1903 series as λόγοι not as λόγια. Some justification for the employment of the term is found in early Christian literature. Several writers speak of the λόγια τοῦ κυρίου or τὰ κυριακὰ λόγια, *i.e.* oracles of (or concerning) the Lord. Polycarp, for instance, speaks of "those who pervert the oracles of the Lord" (Philipp. 7), and Papias, as Eusebius tells us, wrote a work with the title "Expositions of the Oracles of the Lord." The expression has been variously interpreted. It need mean no more (Lightfoot, *Essays on Supernatural Religion*, 172 seq.) than narratives of (or concerning) the Lord; on the other hand, the phrase is capable of a much more definite meaning, and there are many scholars who hold that it refers to a document which contained a collection of the sayings of Jesus. Some such document, we know, must lie at the base of our Synoptic Gospels, and it is quite possible that it may have been known to and used by Papias. It is only on this assumption that the use of the term Logia in the sense described above can be justified.

"The Sayings," to which the term Logia is generally applied, consist of (*a*) a papyrus leaf containing seven or eight sayings of Jesus discovered in 1897, (*b*) a second leaf containing five more sayings discovered in 1903, (*c*) two fragments of unknown Gospels, the former published in 1903, the latter in 1907. All these were found amongst the great mass of papyri acquired by the Egyptian Exploration Fund from the ruins of Oxyrhynchus, one of the chief early Christian centres in Egypt, situated some 120 m. S. of Cairo.

The eight "sayings" discovered in 1897 are as follows:—

1. . . . καὶ τότε διαβλέψεις ἐκβαλεῖν τὸ κάρφος τὸ ἐν τῷ ὀφθαλμῷ τοῦ ἀδελφοῦ σου.

2. Λέγει Ἰησοῦς ἐὰν μὴ νηστεύσητε τὸν κόσμον οὐ μὴ εὕρητε τὴν βασίλειαν τοῦ θεοῦ· καὶ ἐὰν μὴ σαββατίσητε τὸ σάββατον οὐκ ὄψεσθε τὸν πατέρα.

3. Λέγει Ἰησοῦς ἔ[σ]την ἐν μεσῷ τοῦ κόσμου καὶ ἐν σαρκὶ ὤφθην αὐτοῖς, καὶ εὗρον πάντας μεθύοντας καὶ οὐδένα εὗρον διψῶντα ἐν αὐτοῖς, καὶ πονεῖ ἡ ψυχή μου ἐπὶ τοῖς υἱοῖς τῶν ἀνθρώπων, ὅτι τυφλοί εἰσιν τῇ καρδίᾳ αὐτῶ[ν] κ[αὶ] ο̣ὐ̣ βλ̣έ[πουσιν]. . . .

4. [Illegible: possibly joins on to 3] . . . . [τ]ὴν πτωχείαν.

5. [Λέγ]ει [Ἰησοῦς ὅπ]ου ἐὰν ὦσιν [β, οὐκ] ε[ἰσὶ]ν ἄθεοι· καὶ [ὅ]που ε[ἷς] ἐστιν μόνος, [λέ]γω, ἐγώ εἰμι μετ' αὐτ[οῦ]· ἔγει[ρ]ον τὸν λίθον κἀκεῖ εὑρήσεις με, σχίσον τὸ ξύλον κἀγὼ ἐκεῖ εἰμι.

6. Λέγει Ἰησοῦς οὐκ ἔστιν δεκτὸς προφήτης ἐν τῇ πατρίδι αὐτ[ο]ῦ, οὐδὲ ἰατρὸς ποιεῖ θεραπείας εἰς τοὺς γινώσκοντας αὐτόν.

7. Λέγει Ἰησοῦς πόλις οἰκοδομημένη ἐπ' ἄκρον [ὄ]ρους ὑψηλοῦ καὶ ἐστηριγμένη οὔτε πε[σ]εῖν δύναται οὔτε κρυ[β]ῆναι.

8. Λέγει Ἰησοῦς ἀκούεις [ε]ἰ̣ς τ̣ὸ ἒ̣ν̣ ὠ̣τ̣ίον σοῦ τ̣ὸ [δὲ ἕτερον συνέκλεισας].

Letters in brackets are missing in the original: letters which are dotted beneath are doubtful.

1. ". . . and then shalt thou see clearly to cast out the mote that is in thy brother's eye."

2. "Jesus saith, Except ye fast to the world, ye shall in no wise find the kingdom of God; and except ye make the sabbath a real sabbath, ye shall not see the Father."

3. "Jesus saith, I stood in the midst of the world and in the flesh was I seen of them, and I found all men drunken, and none found I athirst among them, and my soul grieveth over the sons of men, because they are blind in their heart, and see not. . . ."

4. ". . . poverty . . ."

5. "Jesus saith, Wherever there are two, they are not without God, and wherever there is one alone, I say, I am with him. Raise the stone and there thou shalt find me, cleave the wood and there am I."

6. "Jesus saith, A prophet is not acceptable in his own country, neither doth a physician work cures upon them that know him."

7. "Jesus saith, A city built upon the top of a high hill and stablished can neither fall nor be hid."

8. "Jesus saith, Thou hearest with one ear [but the other ear hast thou closed]."

The "sayings" of 1903 were prefaced by the following introductory statement:—

οἱ τοῖοι οἱ λόγοι οἱ [. . . οὓς ἐλάλησεν Ἰη(σοῦ)ς ὁ ζῶν κ[ύριος ? . . . καὶ Θωμᾷ καὶ εἶπεν [αὐτοῖς · πᾶς ὅστις ἂν τῶν λόγων τούτ[ων ἀκούσῃ θανάτου οὐ μὴ γεύσηται.

"These are the (wonderful?) words which Jesus the living (Lord) spake to . . . and Thomas and he said unto (them) every one that hearkens to these words shall never taste of death."

The "sayings" themselves are as follows:—

(1) [λέγει Ἰη(σοῦ)ς · μὴ παυσάσθω ὁ ζη[τῶν . . .
ἕως ἂν εὕρῃ καὶ ὅταν εὕρῃ [θαμβηθήσεται
καὶ θαμβηθεὶς βασιλεύσει κα[ὶ βασιλεύσας
ἀναπαήσεται.

(2) λέγει Ἰ[η(σοῦς . . . τίνες . . .
οἱ ἕλκοντες ἡμᾶς [εἰς τὴν βασιλείαν εἰ
ἡ βασιλεία ἐν οὐρα[νῷ ἐστιν;
τὰ πετεινὰ τοῦ οὐρ[ανοῦ καὶ τῶν θηρίων ὅ
τι ὑπὸ τὴν γῆν ἐστ[ιν ἢ ἐπὶ τῆς γῆς καὶ
οἱ ἰχθύες τῆς θαλά[σσης οὗτοι οἱ ἕλκον-
τες ὑμᾶς καὶ ἡ βασ[ιλεία τῶν οὐρανῶν
ἐντὸς ὑμῶν [ἐ]στι [καὶ ὅστις ἂν ἑαυτὸν
γνῷ ταύτην εὑρή[σει . . .
ἑαυτοὺς γνώσεσθε [καὶ εἰδήσετε ὅτι υἱοί
ἐστε ὑμεῖς τοῦ πατρὸς τοῦ τ[. . .
γνώσ(εσ)θε ἑαυτοὺς ἐν[. . .
καὶ ὑ εἶς ἐστὲ ηπτο̣[

(3) [λέγει Ἰη(σοῦ)ς
οὐκ ἀποκνήσει ἄνθ[ρωπος . . .
ρων ἐπερωτῆσαί πα[. . .
ρων περὶ τοῦ τόπου τῆ[ς . . .
σετε ὅτι πολλοὶ ἔσονται π[ρῶτοι ἔσχατοι καὶ
οἱ ἔσχατοι πρῶτοι καὶ [. . .
σιν.

(4) λέγει Ἰη(σοῦ)ς· [πᾶν τὸ μὴ ἔμπροσ-
θεν τῆς ὄψεώς σου καὶ [τὸ κεκρυμμένον
ἀπὸ σοῦ ἀποκαλυφ(θ)ήσετ[αί σοι. οὐ γάρ ἐσ-
τιν κρυπτὸν ὃ οὐ φανε[ρὸν γενήσεται
καὶ τεθαμμένον ὃ ο[ὐκ ἐγερθήσεται.

(5) [ἐξ] ετάζουσιν αὐτὸν ο[ἱ μαθηταὶ αὐτο̣ῦ καὶ
[λέ]γουσιν · πῶς νηστεύ[σομεν καὶ πῶς . . .
[. . .] μεθα καὶ πῶς [. . .
[. . . κ]αὶ τί παρατηρήσ[ομεν . . .
[. . .]ν ; λέγει Ἰη(σοῦ)ς · [. . .
[. . .]ειται μὴ ποεῖτ[ε . . .
[. . .]ης ἀληθείας ἀν[. . .
[. . .]ν ἀ[π]οκεκρ[υ . . .
[. . . μα]κάρι[ός] ἐστιν [. . .
[. . .]ω ἐστ[ι . . .
[. . .]ιν [. . .

1. "Jesus saith, Let not him who seeks . . . cease until he finds and when he finds he shall be astonished; astonished he shall reach the kingdom and having reached the kingdom he shall rest."

2. "Jesus saith (ye ask? who are those) that draw us (to the kingdom if) the kingdom is in Heaven? . . . the fowls of the air and all beasts that are under the earth or upon the earth and the fishes of the sea (these are they which draw) you and the kingdom of Heaven is within you and whosoever shall know himself shall find it. (Strive therefore?) to know yourselves and ye shall be aware that ye are the sons of the (Almighty?) Father; (and?) ye shall know that ye are in (the city of God?) and ye are (the city?)."

3. "Jesus saith, A man shall not hesitate . . . to ask concerning his place (in the kingdom. Ye shall know) that many that are first shall be last and the last first and (they shall have eternal life?)."

4. "Jesus saith, Everything that is not before thy face and that which is hidden from thee shall be revealed to thee. For there is nothing hidden which shall not be made manifest nor buried which shall not be raised."

5. "His disciples question him and say, How shall we fast and how shall we (pray?) . . . and what (commandment) shall we keep . . . Jesus saith . . . do not . . . of truth . . . blessed is he . . . ."

The fragment of a lost Gospel which was discovered in 1903 contained originally about fifty lines, but many of them have perished and others are undecipherable. The translation, as far as it can be made out, is as follows:—

1-7. "(Take no thought) from morning until even nor from evening until morning either for your food what ye shall eat or for your raiment what ye shall put on. 7-13. Ye are far better than the lilies which grow but spin not. Having one garment what do ye (lack)? . . . 13-15. Who could add to your stature? 15-16. He himself will give you your garment. 17-23. His disciples say unto him, When wilt thou be manifest unto us and when shall we see thee? He saith, When ye shall be stripped and not be ashamed . . . 41-46. He said, The key of knowledge ye hid: ye entered not in yourselves, and to them that were entering in, ye opened not."

The second Gospel fragment discovered in 1907 "consists of a single vellum leaf, practically complete except at one of the lower corners and here most of the lacunae admit of a satisfactory solution." The translation is as follows:—

> . . . before he does wrong makes all manner of subtle excuse. But give heed lest ye also suffer the same things as they: for the evil doers among men receive their reward not among the living only, but also await punishment and much torment. And he took them and brought them into the very place of purification and was walking in the temple. And a certain Pharisee, a chief priest, whose name was Levi, met them and said to the Saviour, Who gave thee leave to walk in this place of purification, and to see these holy vessels when thou hast not washed nor yet have thy disciples bathed their feet? But defiled thou hast walked in this temple, which is a pure place, wherein no other man walks except he has washed himself and changed his garments neither does he venture to see these holy vessels. And the Saviour straightway stood still with his disciples and answered him, Art thou then, being here in the temple, clean? He saith unto him, I am clean; for I washed in the pool of David and having descended by one staircase, I ascended by another and I put on white and clean garments, and then I came and looked upon these holy vessels. The Saviour answered and said unto him, Woe ye blind, who see not. Thou hast washed in these running waters wherein dogs and swine have been cast night and day and hast cleansed and wiped the outside skin which also the harlots and flute-girls anoint and wash and wipe and beautify for the lust of men; but within they are full of scorpions and all wickedness. But I and my disciples who thou sayest have not bathed have been dipped in the waters of eternal life which come from. . . . But woe unto thee. . . .

These documents have naturally excited considerable interest and raised many questions. The papyri of the "sayings" date from the 3rd century and most scholars agree that the "sayings" themselves go back to the 2nd. The year A.D.140 is generally assigned as the *terminus ad quem*. The problem as to their origin has been keenly discussed. There are two main types of theory. (1) Some suppose that they are excerpts from an uncanonical Gospel. (2) Others think that they represent an independent and original collection of sayings. The first theory has assumed three main forms. (*a*) Harnack maintains that they were taken from the Gospel according to the Egyptians. This theory, however, is based upon a hypothetical reconstruction of the Gospel in question which has found very few supporters. (*b*) Others have advocated the Gospel of the Hebrews as the source of the "sayings," on the ground of the resemblance between the first "saying" of the 1903 series and a well-authenticated fragment of that Gospel. The resemblance, however, is not sufficiently clear to support the conclusion. (*c*) A third view supposes that they are extracts from the Gospel of Thomas—an apocryphal Gospel dealing with the boyhood of Jesus. Beyond the allusion to Thomas in the introductory paragraph to the 1903 series, there seems to be no tangible evidence in support of this view. The second theory, which maintains that the papyri represent an independent collection of "sayings," seems to be the opinion which has found greatest favour. It has won the support of W. Sanday, H. B. Swete, Rendel Harris, W. Lock, Heinrici, &c. There is a considerable diversity of judgment, however, with regard to the value of the collection. (*a*) Some scholars maintain that the collection goes back to the 1st century and represents one of the earliest attempts to construct an account of the teaching of Jesus. They are therefore disposed to admit to a greater or less extent and with widely varying degrees of confidence the presence of genuine elements in the new matter. (*b*) Sanday and many others regard the sayings as originating early in the 2nd century and think that, though not "directly dependent on the Canonical Gospels," they have "their origin under conditions of thought which these Gospels had created." The "sayings" must be regarded as expansions of the true tradition, and little value is therefore to be attached to the new material.

With the knowledge at our disposal, it is impossible to reach an assured conclusion between these two views. The real problem, to which at present no solution has been found, is to account for the new material in the "sayings." There seems to be no motive sufficient to explain the additions that have been made to the text of the Gospels. It cannot be proved that the expansions have been made in the interests of any sect or heresy. Unless new discoveries provide the clue, or some reasonable explanation can otherwise be found, there seems to be no reason why we should not regard the "sayings" as containing material which ought to be taken into account in the critical study of the teaching of Jesus.

The 1903 Gospel fragment is so mutilated in many of its parts that it is difficult to decide upon its character and value. It appears to be earlier than 150, and to be taken from a Gospel which followed more or less closely the version of the teaching of Jesus given by Matthew and Luke. The phrase "when ye shall be stripped and not be ashamed" contains an idea which has some affinity with two passages found respectively in the Gospel according to the Egyptians and the so-called Second Epistle of Clement. The resemblance, however, is not sufficiently close to warrant the deduction that either the Gospel of the Egyptians or the Gospel from which the citation in 2 Clement is taken (if these two are distinct) is the source from which our fragment is derived.

The second Gospel fragment (1907) seems to be of later origin than the documents already mentioned. Grenfell and Hunt date the Gospel, from which it is an excerpt, about 200. There is considerable difficulty with regard to some of the details. The statement that an ordinary Jew was required to wash and change his clothes before visiting the inner court of the temple is quite unsupported by any other evidence. Nothing is known about "the place of purification" (*ἁγνευτήριον*) nor "the pool of David" (*λίμνη τοῦ Δαυείδ*). Nor does the statement that "the sacred vessels" were visible from the place where Jesus was standing seem at all probable. Grenfell and Hunt conclude therefore—"So great indeed are the divergences between this account and the extant and no doubt well-informed authorities with regard to the topography and ritual of the Temple that it is hardly possible to avoid the conclusion that much of the local colour is due to the imagination of the author who was aiming chiefly at dramatic effect and was not really well acquainted with the Temple. But if the inaccuracy of the fragment in this important respect is admitted the historical character of the whole episode breaks down and it is probably to be regarded as an apocryphal elaboration of Matt. xv. 1-20 and Mark vii. 1-23."

See the *Oxyrhynchus Papyri*, part i. (1897), part iv. (1904), part v. (1908). (H. T. A.)

LOGIC (*λογική*, sc. *τέχνη*, the art of reasoning), the name given to one of the four main departments of philosophy, though its sphere is very variously delimited. The present article is divided into I. *The Problems of Logic*, II. *History*.

I. *The Problems of Logic.*

Introduction.—Logic is the science of the processes of inference. What, then, is inference? It is that mental operation which proceeds by combining two premises so as to cause a consequent conclusion. Some suppose that we may infer from one premise by a so-called "immediate inference." But one premise can only reproduce itself in another form, *e.g.* all men are some animals; therefore some animals are men. It requires the combination of at least two premises to infer a conclusion different from both. There are as many kinds of inference as there are different ways of combining premises, and in the main three types:—

1. *Analogical Inference*, from particular to particular: *e.g.* border-war between Thebes and Phocis is evil; border-war between Thebes and Athens is similar to that between Thebes and Phocis; therefore, border-war between Thebes and Athens is evil.

2. *Inductive Inference*, from particular to universal: *e.g.* border-war between Thebes and Phocis is evil; all border-war is like that between Thebes and Phocis; therefore, all border-war is evil.

3. *Deductive or Syllogistic Inference*, from universal to particular, *e.g.* all border-war is evil; border-war between Thebes and Athens is border-war; therefore border-war between Thebes and Athens is evil.

In each of these kinds of inference there are three mental judgments capable of being expressed as above in three linguistic propositions; and the two first are the premises which are combined, while the third is the conclusion which is consequent on their combination. Each proposition consists of two terms, the subject and its predicate, united by the copula. Each inference contains three terms. In syllogistic inference the subject of the conclusion is the minor term, and its predicate the major term, while between these two extremes the term common to the two premises is the middle term, and the premise containing the middle and major terms is the major premise, the premise containing the middle and minor terms the minor premise. Thus in the example of syllogism given above, "border-war between Thebes and Athens" is the minor term, "evil" the major term, and "border-war" the middle term. Using S for minor, P for major and M for middle, and preserving these signs for corresponding terms in analogical and inductive inferences, we obtain the following formula of the three inferences:—

Analogical.	*Inductive.*	*Deductive or Syllogistic.*
S^1 is P	S is P	Every M is P
S^2 is similar to S^1	Every M is similar to S	S is M
∴ S^2 is P.	∴ Every M is P.	∴ S is P.

The love of unity has often made logicians attempt to resolve these three processes into one. But each process has a peculiarity of its own; they are similar, not the same. Analogical and inductive inference alike begin with a particular premise containing one or more instances; but the former adds a particular premise to draw a particular conclusion, the latter requires a universal premise to draw a universal conclusion. A citizen of Athens, who had known the evils of the border-war between Thebes and Phocis, would readily perceive the analogy of a similar war between Thebes and Athens, and conclude analogously that it would be evil; but he would have to generalize the similarity of all border-wars in order to draw the inductive conclusion that all alike are evil. Induction and deduction differ still more, and are in fact opposed, as one makes a particular premise the evidence of a universal conclusion, the other makes a universal premise evidence of a particular conclusion. Yet they are alike in requiring the generalization of the universal and the belief that there are classes which are whole numbers of similars. On this point both differ from inference by analogy, which proceeds entirely from particular premises to a particular conclusion. Hence we may redivide inference into particular inference by analogy and universal inference by induction and deduction. Universal inference is what we call reasoning; and its two species are very closely connected, because universal conclusions of induction become universal premises of deduction. Indeed, we often induce in order to deduce, ascending from particular to universal and descending from universal to particular in one act as it were; so that we may proceed either directly from particular to particular by analogical inference, or indirectly from particular through universal to particular by an inductive-deductive inference which might be called "perduction." On the whole, then, analogical, inductive and deductive inferences are not the same but three similar and closely connected processes.

The three processes of inference, though different from one another, rest on a common principle of similarity of which each is a different application. Analogical inference requires that one particular is similar to another, induction that a whole number or class is similar to its particular instances, deduction that each particular is similar to the whole number or class. Not that these inferences require us to believe, or assume, or premise or formulate this principle either in general, or in its applied forms: the premises are all that any inference needs the mind to assume. The principle of similarity is used, not assumed by the inferring mind, which in accordance with the similarity of things and the parity of inference spontaneously concludes in the form that similars are similarly determined ("similia similibus convenire"). In applying this principle of similarity, each of the three processes in its own way has to premise both that something is somehow determined and that something is similar, and by combining these premises to conclude that this is similarly determined to that. Thus the very principle of inference by similarity requires it to be a combination of premises in order to draw a conclusion.

The three processes, as different applications of the principle of similarity, consisting of different combinations of premises, cause different degrees of cogency in their several conclusions. Analogy hardly requires as much evidence as induction. Men speculate about the analogy between Mars and the earth, and infer that it is inhabited, without troubling about all the planets. Induction has to consider more instances, and the similarity of a whole number or class. Even so, however, it starts from a particular premise which only contains many instances, and leaves room to doubt the universality of its conclusions. But deduction, starting from a premise about all the members of a class, compels a conclusion about every and each of necessity. One border-war may be similar to another, and the whole number may be similar, without being similarly evil; but if all alike are evil, each is evil of necessity. Deduction or syllogism is superior to analogy and induction in combining premises so as to involve or contain the conclusion. For this reason it has been elevated by some logicians above all other inferences, and for this very same reason attacked by others as no inference at all. The truth is that, though the premises contain the conclusion, neither premise alone contains it, and a man who knows both but does not combine them does not draw the conclusion; it is the synthesis of the two premises which at once contains the conclusion and advances our knowledge; and as syllogism consists, not indeed in the discovery, but essentially in the synthesis of two premises, it is an inference and an advance on each premise and on both taken separately. As again the synthesis contains or involves the conclusion, syllogism has the advantage of compelling assent to the consequences of the premises. Inference in general is a combination of premises to cause a conclusion; deduction is such a combination as to compel a conclusion involved in the combination, and following from the premises of necessity.

Nevertheless, deduction or syllogism is not independent of the other processes of inference. It is not the primary inference of its own premises, but constantly converts analogical and inductive conclusions into its particular and universal premises. Of itself it causes a necessity of consequence, but only a hypothetical necessity; if these premises are true, then this conclusion necessarily follows. To eliminate this "if" ultimately requires other inferences before deduction. Especially, induction to universals is the warrant and measure of deduction from universals. So far as it is inductively true that all border-war is evil, it is deductively true that a given border-war is therefore evil. Now, as an inductive combination of premises does not necessarily involve the inductive conclusion, induction normally leads, not to a necessary, but to a probable conclusion; and whenever its probable conclusions become deductive premises, the deduction only involves a probable conclusion. Can we then infer any certainty at all? In order to answer this question we must remember that there are many degrees of probability, and that induction, and therefore deduction, draw conclusions more or less probable, and rise to the point at which probability becomes moral certainty, or that high degree of probability which is sufficient to guide our lives, and even condemn murderers to death. But can we rise still higher and infer real necessity? This is a difficult question, which has received many answers. Some noölogists suppose a mental power of forming necessary principles of deduction a priori; but fail to show how we can apply principles of mind to things beyond mind. Some empiricists, on the other hand, suppose that induction only infers probable conclusions which are premises of probable deductions; but they give up all exact science. Between these extremes there is room for a third theory, empirical yet providing a knowledge of the really necessary. In some cases of induction concerned with objects capable of abstraction and simplification, we have a power of identification, by which, not a priori but in the act of inducing a conclusion, we apprehend that the things signified by its subject and predicate are one and the same thing which cannot exist apart from itself. Thus by combined induction and identification we apprehend that one and one are the same as two, that there is no difference between a triangle and a three-sided rectilineal figure, that a whole must be greater than its part by being the whole, that inter-resisting bodies necessarily force one another apart, otherwise they would not be inter-resisting but occupy the same place at the same moment. Necessary principles, discovered by this process of induction and identification, become premises of deductive demonstration to conclusions which are not only necessary consequents on the premises, but also equally necessary in reality. Induction thus is the source of deduction, of its truth, of its probability, of its moral certainty; and induction, combined with identification, is the origin of the necessary principles of demonstration or deduction to necessary conclusions.

Analogical inference in its turn is as closely allied with induction. Like induction, it starts from a particular premise, containing one or more examples or instances; but, as it is easier to infer a particular than a universal conclusion, it supplies particular conclusions which in their turn become further particular premises of induction. Its second premise is indeed merely a particular apprehension that one particular is similar to another, whereas the second premise of induction is a universal apprehension that a whole number of particulars is similar to those from which the inference starts; but at bottom these two apprehensions of similarity are so alike as to suggest that the universal premise of induction has arisen as a generalized analogy. It seems likely that man has arrived at the apprehension of a whole individual, *e.g.* a whole animal including all its parts, and thence has inferred by analogy a whole number, or class, *e.g.* of animals including all individual animals; and accordingly that the particular analogy of one individual to another has given rise to the general analogy of every to each individual in a class, or whole number of individuals, contained in the second premise of induction. In this case, analogical inference has led to induction, as induction to deduction. Further, analogical inference from particular to particular suggests inductive-deductive inference from particular through universal to particular.

Newton, according to Dr Pemberton, thought in 1666 that the moon moves so like a falling body that it has a similar centripetal force to the earth, 20 years before he demonstrated this conclusion from the laws of motion in the *Principia*. In fact, analogical, inductive and deductive inferences, though different processes of combining premises to cause different conclusions, are so similar and related, so united in principle and interdependent, so consolidated into a system of inference, that they cannot be completely investigated apart, but together constitute a single subject of science. This science of inference in general is logic.

Logic, however, did not begin as a science of all inference. Rather it began as a science of reasoning (λόγος), of syllogism (συλλογισμός), of deductive inference. Aristotle was its founder. He was anticipated of course by many generations of spontaneous thinking (*logica naturalis*). Many of the higher animals infer by analogy: otherwise we cannot explain their thinking. Man so infers at first: otherwise we cannot explain the actions of young children, who before they begin to speak give no evidence of universal thinking. It is likely that man began with particular inference and with particular language; and that, gradually generalizing thought and language, he learnt at last to think and say "all," to infer universally, to induce and deduce, to reason, in short, and raise himself above other animals. In ancient times, and especially in Egypt, Babylon and Greece, he went on to develop reason into science or the systematic investigation of definite subjects, *e.g.* arithmetic of number, geometry of magnitude, astronomy of stars, politics of government, ethics of goods. In Greece he became more and more reflective and conscious of himself, of his body and soul, his manners and morals, his mental operations and especially his reason. One of the characteristics of Greek philosophers is their growing tendency, in investigating any subject, to turn round and ask themselves what should be the method of investigation. In this way the Presocratics and Sophists, and still more Socrates and Plato, threw out hints on sense and reason, on inferential processes and scientific methods which may be called anticipations of logic. But Aristotle was the first to conceive of reasoning itself as a definite subject of a special science, which he called analytics or analytic science, specially designed to analyse syllogism and especially demonstrative syllogism, or science, and to be in fact a science of sciences. He was therefore the founder of the science of logic.

Among the Aristotelian treatises we have the following, which together constitute this new science of reasoning:—

1. The *Categories*, or names signifying things which can become predicates;
2. The *De Interpretatione*, or the enumeration of conceptions and their combinations by (1) nouns and verbs (names), (2) enunciations (propositions);
3. The *Prior Analytics*, on syllogism;
4. The *Posterior Analytics*, on demonstrative syllogism, or science;
5. The *Topics*, on dialectical syllogism; or argument;
6. The *Sophistical Elenchi*, on sophistical or contentious syllogism, or sophistical fallacies.

So far as we know, Aristotle had no one name for all these investigations. "Analytics" is only applied to the *Prior* and *Posterior Analytics*, and "logical," which he opposed to "analytical," only suits the *Topics* and at most the *Sophistical Elenchi*; secondly, while he analyzed syllogism into premises, major and minor, and premises into terms, subject and predicate, he attempted no division of the whole science; thirdly, he attempted no order and arrangement of the treatises into a system of logic, but only of the *Analytics*, *Topics* and *Sophistical Elenchi* into a system of syllogisms. Nevertheless, when his followers had arranged the treatises into the *Organon*, as they called it to express that it is an instrument of science, then there gradually emerged a system of syllogistic logic, arranged in the triple division—terms, propositions and syllogisms—which has survived to this day as technical logic, and has been the foundation of all other logics, even of those which aim at its destruction.

The main problem which Aristotle set before him was the analysis of syllogism, which he defined as "reasoning in which certain things having been posited something different from them of necessity follows by their being those things" (*Prior Analytics*, i. 1). What then did he mean by reasoning, or rather by the Greek word λόγος of which "reasoning" is an approximate rendering? It was meant (cf. *Post. An.* i. 10) to be both internal, in the soul (ὁ ἔσω λόγος, ἐν τῇ ψυχῇ), and external, in language (ὁ ἔξω λόγος): hence after Aristotle the Stoics distinguished λόγος ἐνδιάθετος and προφορικός. It meant, then, both reason and discourse of reason (cf. Shakespeare, *Hamlet*, i. 2). On its mental side, as reason it meant combination of thoughts. On its linguistic side, as discourse it was used for any combination of names to form a phrase, such as the definition "rational animal," or a book, such as the *Iliad*. It had also the mathematical meaning of *ratio*; and in its use for definition it is sometimes transferred to essence as the object of definition, and has a mixed meaning, which may be expressed by "account." In all its uses, however, the common meaning is combination. When Aristotle called syllogism λόγος, he meant that it is a combination of premises involving a conclusion of necessity. Moreover, he tended to confine the term λόγος to syllogistic inference. Not that he omitted other inferences (πίστεις). On the contrary, to him (cf. *Prior Analytics*, ii. 24) we owe the triple distinction into inference from particular to particular (παράδειγμα, example, or what we call "analogy"), inference from particular to universal (ἐπαγωγή, induction), and inference from universal to particular (συλλογισμός, syllogism, or deduction). But he thought that inferences other than syllogism are imperfect; that analogical inference is rhetorical induction; and that induction, through the necessary preliminary of syllogism and the sole process of ascent from sense, memory and experience to the principles of science, is itself neither reasoning nor science. To be perfect he thought that all inference must be reduced to syllogism of the first figure, which he regarded as the specially scientific inference. Accordingly, the syllogism appeared to him to be the rational process (μετὰ λόγου), and the demonstrative syllogism from inductively discovered principles to be science (ἐπιστήμη). Hence, without his saying it in so many words, Aristotle's logic perforce became a logic of deductive reasoning, or syllogism. As it happened this deductive tendency helped the development of logic. The obscurer premises of analogy and induction, together with the paucity of experience and the backward state of physical science in Aristotle's time would have baffled even his analytical genius. On the other hand, the demonstrations of mathematical sciences of his time, and the logical forms of deduction evinced in Plato's dialogues, provided him with admirable examples of deduction, which is also the inference most capable of analysis. Aristotle's analysis of the syllogism showed man how to advance by combining his thoughts in trains of deductive reasoning. Nevertheless, the wider question remained for logic: what is the nature of all inference, and the special form of each of its three main processes?

As then the reasoning of the syllogism was the main problem of Aristotle's logic, what was his analysis of it? In distinguishing inner and outer reason, or reasoning and discourse, he added that it is not to outer reason but to inner reason in the soul that demonstration and syllogism are directed (*Post. An.* i. 10). One would expect, then, an analysis of mental reasoning into mental judgments (κρίσεις) as premises and conclusion. In point of fact, he analysed it into premises, but then analysed a premise into terms, which he divided into subject and predicate, with the addition of the copula "is" or "is not." This analysis, regarded as a whole and as it is applied in the *Analytics* and in the other logical treatises, was evidently intended as a linguistic analysis. So in the *Categories*, he first divided things said (τὰ λεγόμενα) into uncombined and combined, or names and propositions, and then divided the former into categories; and in the *De interpretatione* he expressly excluded mental conceptions and their combinations, and confined himself to nouns and verbs and enunciations, or, as we should say, to names and propositions. Aristotle apparently intended, or at all events has given logicians in general the impression, that he intended to analyse syllogism into propositions as premises, and premise into names as terms. His logic therefore exhibits the curious paradox of being an analysis of mental reasoning into linguistic elements. The explanation is that outer speech is more obvious than inner thought, and that grammar and poetic criticism, rhetoric and dialectic preceded logic, and that out of those arts of language arose the science of reasoning. The sophist Protagoras had distinguished various kinds of sentences, and Plato had divided the sentence into noun and verb, signifying a thing and the action of a thing. Rhetoricians had enumerated various means of persuasion, some of which are logical forms, *e.g.* probability and sign, example and enthymeme. Among the dialecticians, Socrates had used inductive arguments to obtain definitions as data of deductive arguments against his opponents, and Plato had insisted on the processes of ascending to and descending from an unconditional principle by the power of giving and receiving argument. All these points about speech, eloquence and argument between man and man were absorbed into Aristotle's theory of reasoning, and in particular the grammar of the sentence consisting of noun and verb caused the logic of the proposition consisting of subject and predicate. At the same time, Aristotle was well aware that the science of reasoning is no art of language and must take up a different position towards speech as the expression of thought. In the *Categories* he classified names, not, however, as a grammarian by their structure, but as a logician by their signification. In the *De interpretatione*, having distinguished the enunciation, or proposition, from other sentences as that in which there is truth or falsity, he relegated the rest to rhetoric or poetry, and founded the logic of the proposition, in which, however, he retained the grammatical analysis into noun and verb. In the *Analytics* he took the final step of originating the logical analysis of the proposition as premise into subject and predicate as terms mediated by the copula, and analysed the syllogism into these elements. Thus did he become the founder of the logical but linguistic analysis of reasoning as discourse (ὁ ἔξω λόγος) into propositions and terms. Nevertheless, the deeper question remained, what is the logical but mental analysis of reasoning itself (ὁ ἔσω λόγος) into its mental premises and conclusion?

Aristotle thus was the founder of logic as a science. But he laid too much stress on reasoning as syllogism or deduction, and on deductive science; and he laid too much stress on the linguistic analysis of rational discourse into proposition and terms. These two defects remain ingrained in technical logic to this day. But in the course of the development of the science, logicians have endeavoured to correct those defects, and have diverged into two schools. Some have devoted themselves to induction from sense and experience and widened logic till it has become a general science of inference and scientific method. Others have devoted themselves to the mental analysis of reasoning, and have narrowed logic into a science of conception, judgment and reasoning. The former belong to the school of empirical logic, the latter to the school of conceptual and formal logic. Both have started from points which Aristotle indicated without developing them. But we shall find that his true descendants are the empirical logicians.

Aristotle was the first of the empiricists. He consistently maintained that sense is knowledge of particulars and the origin of scientific knowledge of universals. In his view, sense is a congenital form of judgment (δύναμις σύμφυτος κριτική, *Post. An.* ii. 19); a sensation of each of the five senses is always true of its proper object; without sense there is no science; sense is the origin of induction, which is the origin of deduction and science. The *Analytics* end (*Post. An.* ii. 19) with a detailed system of empiricism, according to which sense is the primary knowledge of particulars, memory is the retention of a sensation, experience is the sum of many memories, induction infers universals, and intelligence is the true apprehension of the universal principles of science, which is rational, deductive, demonstrative, from empirical principles.

This empirical groundwork of Aristotle's logic was accepted by the Epicureans, who enunciated most distinctly the fundamental doctrine that all sensations are true of their immediate objects, and falsity begins with subsequent opinions, or what the moderns call "interpretation." Beneath deductive logic, in the logic of Aristotle and the canonic of the Epicureans, there already lay the basis of empirical logic: sensory experience is the origin of all inference and science. It remained for Francis Bacon to develop these beginnings into a new logic of induction. He did not indeed accept the infallibility of sense or of any other operation unaided. He thought, rather, that every operation becomes infallible by method. Following Aristotle in this order—sense, memory, intellect—he resolved the whole process of induction into three ministrations:—

1. The ministration to sense, aided by observation and experiment.
2. The ministration to memory, aided by registering and arranging the data, of observation and experiment in tables of instances of agreement, difference and concomitant variations.
3. The ministration to intellect or reason, aided by the negative elimination by means of contradictory instances of whatever in the instances is not always present, absent and varying with the given subject investigated, and finally by the positive inference that whatever in the instances is always present, absent and varying with the subject is its essential cause.

Bacon, like Aristotle, was anticipated in this or that point; but, as Aristotle was the first to construct a system of deduction in the syllogism and its three figures, so Bacon was the first to construct a system of induction in three ministrations, in which the requisites of induction, hitherto recognized only in sporadic hints, were combined for the first time in one logic of induction. Bacon taught men to labour in inferring from particular to universal, to lay as much stress on induction as on deduction, and to think and speak of inductive reasoning, inductive science, inductive logic. Moreover, while Aristotle had the merit of discerning the triplicity of inference, to Bacon we owe the merit of distinguishing the three processes without reduction:—

1. Inference from particular to particular by Experientia Literata, in plano;
2. Inference from particular to universal by Inductio, ascendendo;
3. Inference from universal to particular by Syllogism, descendendo.

In short, the comprehensive genius of Bacon widened logic into a general science of inference.

On the other hand, as Aristotle over-emphasized deduction so Bacon over-emphasized induction by contending that it is the only process of discovering universals (*axiomata*), which deduction only applies to particulars. J. S. Mill in his *Logic* pointed out this defect, and without departing from Baconian principles remedied it by quoting scientific examples, in which deduction, starting from inductive principles, applies more general to less general universals, *e.g.* when the more general law of gravitation is shown to include the less general laws of planetary gravitation. Mill's logic has the great merit of copiously exemplifying the principles of the variety of method according to subject-matter. It teaches us that scientific method is sometimes induction, sometimes deduction, and sometimes the consilience of both, either by the inductive verification of previous deductions, or by the deductive explanation of previous inductions.

It is also most interesting to notice that Aristotle saw further than Bacon in this direction. The founder of logic anticipated the latest logic of science, when he recognized, not only the deduction of mathematics, but also the experience of facts followed by deductive explanations of their causes in physics.

The consilience of empirical and deductive processes was an Aristotelian discovery, elaborated by Mill against Bacon. On the whole, however, Aristotle, Bacon and Mill, purged from their errors, form one empirical school, gradually growing by adapting itself to the advance of science; a school in which Aristotle was most influenced by Greek deductive Mathematics, Bacon by the rise of empirical physics at the Renaissance, and Mill by the Newtonian combination of empirical facts and mathematical principles in the *Principia.* From studying this succession of empirical logicians, we cannot doubt that sense, memory and experience are the real origin of inference, analogical, inductive and deductive. The deepest problem of logic is the relation of sense and inference. But we must first consider the mental analysis of inference, and this brings us to conceptual and formal logic.

Aristotle's logic has often been called formal logic; it was really a technical logic of syllogism analysed into linguistic elements, and of science rested on an empirical basis. At the same time his psychology, though maintaining his empiricism, contained some seeds of conceptual logic, and indirectly of formal logic. Intellectual development, which according to the logic of the *Analytics* consists of sense, memory, experience, induction and intellect, according to the psychology of the *De Anima* consists of sense, imagination and intellect, and one division of intellect is into conception of the undivided and combination of conceptions as one (*De An.* iii. 6). The *De Interpretatione* opens with a reference to this psychological distinction, implying that names represent conceptions, propositions represent combinations of conceptions. But the same passage relegates conceptions and their combinations to the *De Anima*, and confines the *De Interpretatione* to names and propositions in conformity with the linguistic analysis which pervades the logical treatises of Aristotle, who neither brought his psychological distinction between conceptions and their combinations into his logic, nor advanced the combinations of conceptions as a definition of judgment (κρίσις), nor employed the mental distinction between conceptions and judgments as an analysis of inference, or reasoning, or syllogism: he was no conceptual logician. The history of logic shows that the linguistic distinction between terms and propositions was the sole analysis of reasoning in the logical treatises of Aristotle; that the mental distinction between conceptions (ἔννοιαι) and judgments (ἀξιώματα in a wide sense) was imported into logic by the Stoics; and that this mental distinction became the logical analysis of reasoning under the authority of St Thomas Aquinas. In his commentary on the *De Interpretatione*, St Thomas, after citing from the *De Anima* Aristotle's "duplex operatio intellectus," said, "Additur autem et tertia operatio, scilicet ratiocinandi," and concluded that, since logic is a rational science (*rationalis scientia*), its consideration must be directed to all these operations of reason. Hence arose conceptual logic; according to which conception is a simple apprehension of an idea without belief in being or not being, *e.g.* the idea of man or of running; judgment is a combination of conceptions, adding being or not being, *e.g.* man is running or not running; and reasoning is a combination of judgments: conversely, there is a mental analysis of reasoning into judgments, and judgment into conceptions, beneath the linguistic analysis of rational discourse into propositions, and propositions into terms. Logic, according to this new school, which has by our time become an old school, has to co-ordinate these three operations, direct them, and, beginning with conceptions, combine conceptions into judgments, and judgments into inference, which thus becomes a complex combination of conceptions, or, in modern parlance, an extension of our ideas. Conceptual logicians were, indeed, from the first aware that sense supplies the data, and that judgment and therefore inference contains belief that things are or are not. But they held, and still hold that sensation and conception are alike mere apprehensions, and that the belief that things are or are not arises somehow after sensation and conception in judgment, from which it passes into inference. At first, they were more sanguine of extracting from these unpromising beginnings some knowledge of things beyond ideas. But at length many of them became formal logicians, who held that logic is the investigation of formal thinking, or consistent conception, judgment and reasoning; that it shows how we infer formal truths of consistency without material truth of signifying things; that, as the science of the form or process, it must entirely abstract from the matter, or objects, of thought; and that it does not tell us how we infer from experience. Thus has logic drifted further and further from the real and empirical logic of Aristotle the founder and Bacon the reformer of the science.

The great merit of conceptual logic was the demand for a mental analysis of mental reasoning, and the direct analysis of reasoning into judgments which are the sole premises and conclusions of reasoning and of all mental inferences. Aristotle had fallen into the paradox of resolving a mental act into verbal elements. The Schoolmen, however, gradually came to realize that the result to their logic was to make it a *sermocionalis scientia*, and to their metaphysics the danger of nominalism. St Thomas made a great advance by making logic throughout a *rationalis scientia*; and logicians are now agreed that reasoning consists of judgments, discourse of propositions. This distinction is, moreover, vital to the whole logic of inference, because we always think all the judgments of which our inference consists, but seldom state all the propositions by which it is expressed. We omit propositions, curtail them, and even express a judgment by a single term, *e.g.* "Good!" "Fire!". Hence the linguistic expression is not a true measure of inference; and to say that an inference consists of two propositions causing a third is not strictly true. But to say that it is two judgments causing a third is always true, and the very essence of inference, because we must think the two to conclude the third in "the sessions of sweet silent thought." Inference, in short, consists of actual judgments capable of being expressed in propositions.

Inference always consists of judgments. But judgment does not always consist of conceptions. It is not a combination of conceptions; it does not arise from conceptions, nor even at first require conception. Sense is the origin of judgment. One who feels pained or pleased, who feels hot or cold or resisting in touch, who tastes the flavoured, who smells the odorous, who hears the sounding, who sees the coloured, or is conscious, already believes that something sensible exists before conception, before inference, and before language; and his belief is true of the immediate object of sense, the sensible thing, *e.g.* the hot felt in touch. But a belief in the existence of something is a judgment and a categorical judgment of existence. Sense, then, outer and inner, or sensation and consciousness, is the origin of sensory judgments which are true categorical beliefs in the existence of sensible things; and primary judgments are such true categorical sensory beliefs that things exist, and neither require conception nor are combinations of conceptions. Again, since sense is the origin of memory and experience, memorial and experiential judgments are categorical and existential judgments, which so far as they report sensory judgments are always true. Finally, since sense, memory and experience are the origin of inference, primary inference is categorical and existential, starting from sensory, memorial and experiential judgments as premises, and proceeding to inferential judgments as conclusions, which are categorical and existential, and are true, so far as they depend on sense, memory and experience.

Sense, then, is the origin of judgment; and the consequence is that primary judgments are true, categorical and existential judgments of sense, and primary inferences are inferences from categorical and existential premises to categorical and existential conclusions, which are true so far as they arise from outer and inner sense, and proceed to things similar to sensible things. All other judgments and inferences about existing things, or ideas, or names, whether categorical or hypothetical, are afterthoughts, partly true and partly false.

Sense, then, because it involves a true belief in existence is fitted to be the origin of judgment. Conception on the other hand is the simple apprehension of an idea, particular or universal, but without belief that anything is or is not, and therefore is unfitted to beget judgment. Nor could a combination of conceptions make a difference so fundamental as that between conceiving and believing. The most that it could do would be to cause an ideal judgment, *e.g.* that the idea of a centaur is the idea of a man-horse; and even here some further origin is needed for the addition of the copula "is."

So far from being a cause, conception is not even a condition of all judgments; a sensation of hot is sufficient evidence that hot exists, before the idea of hot is either present or wanted. Conception is, however, a condition of a memorial judgment: in order to remember being hot, we require an idea of hot. Memory, however, is not that idea, but involves a judgment that there previously existed the hot now represented by the idea, which is about the sensible thing beyond the conceived idea; and the cause of this memorial judgment is past sense and present memory. So sense, memory and experience, the sum of sense and memory, though requiring conception, are the causes of the experiential judgment that there exist and have existed many similar, sensible things, and these sensory, memorial and experiential judgments about the existence of past and present sensible things beyond conceived ideas become the particular premises of primary inference. Starting from them, inference is enabled to draw conclusions which are inferential judgments about the existence of things similar to sensible things beyond conceived ideas. In rising, however, from particular to universal inference, induction, as we have seen, adds to its particular premise, S is P, a universal premise, every M is similar to S, in order to infer the universal conclusion, every M is P. This universal premise requires a universal conception of a class or whole number of similar particulars, as a condition. But the premise is not that conception; it is a belief that there is a whole number of particulars similar to those already experienced. The generalization of a class is not, as the conceptual logic assumes, the abstraction of a general idea, but an inference from the analogy of a whole individual thing, *e.g.* a whole man, to a whole number of similar individuals, *e.g.* the whole of men. The general idea of all men or the combination that the idea of all men is similar to the idea of particular men would not be enough; the universal premise that all men in fact are similar to those who have died is required to induce the universal conclusion that all men in fact die. Universal inference thus requires particular and universal conceptions as its condition; but, so far as it arises from sense, memory, experience, and involves generalization, it consists of judgments which do not consist of conceptions, but are beliefs in things existing beyond conception. Inference then, so far as it starts from categorical and existential premises, causes conclusions, or inferential judgments, which require conceptions, but are categorical and existential judgments beyond conception. Moreover, as it becomes more deductive, and causes conclusions further from sensory experience, these inferential judgments become causes of inferential conceptions. For example, from the evidence of molar changes due to the obvious parts of bodies, science first comes to believe in molecular changes due to imperceptible particles, and then tries to conceive the ideas of particles, molecules, atoms, electrons. The conceptual logic supposes that conception always precedes judgment; but the truth is that sensory judgment begins and inferential judgment ends by preceding conception. The supposed triple order—conception, judgment, reasoning—is defective and false. The real order is sensation and sensory judgment, conception, memory and memorial judgment, experience and experiential judgment, inference, inferential judgment, inferential conception. This is not all: inferential conceptions are inadequate, and finally fail. They are often symbolical; that is, we conceive one thing only by another like it, *e.g.* atoms by minute bodies not nearly small enough. Often the symbol is not like. What idea can the physicist form of intra-spatial ether? What believer in God pretends to conceive Him as He really is? We believe many things that we cannot conceive; as Mill said, the inconceivable is not the incredible; and the point of science is not what we can conceive but what we should believe on evidence. Conception is the weakest, judgment the strongest power of man's mind. Sense before conception is the original cause of judgment; and inference from sense enables judgment to continue after conception ceases. Finally, as there is judgment without conception, so there is conception without judgment. We often say "I understand, but do not decide." But this suspension of judgment is a highly refined act, unfitted to the beginning of thought. Conception begins as a condition of memory, and after a long continuous process of inference ends in mere ideation. The conceptual logic has made the mistake of making ideation a stage in thought prior to judgment.

It was natural enough that the originators of conceptual logic, seeing that judgments can be expressed by propositions, and conceptions by terms, should fall into the error of supposing that, as propositions consist of terms, so judgments consist of conceptions, and that there is a triple mental order—conception, judgment, reasoning—parallel to the triple linguistic order—term, proposition, discourse. They overlooked the fact that man thinks long before he speaks, makes judgments which he does not express at all, or expresses them by interjections, names and phrases, before he uses regular propositions, and that he does not begin by conceiving and naming, and then proceed to believing and proposing. Feeling and sensation, involving believing or judging, come before conception and language. As conceptions are not always present in judgment, as they are only occasional conditions, and as they are unfitted to cause beliefs or judgments, and especially judgments of existence, and as judgments both precede conceptions in sense and continue after them in inference, it follows that conceptions are not the constituents of judgment, and judgment is not a combination of conceptions. Is there then any analysis of judgment? Paradoxical as it may sound, the truth seems to be that primary judgment, beginning as it does with the simplest feeling and sensation, is not a combination of two mental elements into one, but is a division of one sensible thing into the thing itself and its existence and the belief that it is determined as existing, *e.g.* that hot exists, cold exists, the pained exists, the pleased exists. Such a judgment has a cause, namely sense, but no mental elements. Afterwards come judgments of complex sense, *e.g.* that the existing hot is burning or becoming more or less hot, &c. Thus there is a combination of sensations causing the judgment; but the judgment is still a division of the sensible thing into itself and its being, and a belief that it is so determined. Afterwards follow judgments arising from more complex causes, *e.g.* memory, experience, inference. But however complicated these mental causes, there still remain these points common to all judgment:—(1) The mental causes of judgment are sense, memory, experience and inference; while conception is a condition of some judgments. (2) A judgment is not a combination either of its causes or of its conditions, *e.g.* it is not a combination of sensations any more than of ideas. (3) A judgment is a unitary mental act, dividing not itself but its object into the object itself and itself as determined, and signifying that it is so determined. (4) A primary judgment is a judgment that a sensible thing is determined as existing; but later judgments are concerned with either existing things, or with ideas, or with words, and signify that they are determined in all sorts of ways. (5) When a judgment is expressed by a proposition, the proposition expresses the results of the division by two terms, subject and predicate, and by the copula that what is signified by the subject is what is signified by the predicate; and the proposition is a combination of the two terms; *e.g.* border war is evil. (6) A complex judgment is a combination of two judgments, and may be copulative, *e.g.* you and I are men, or hypothetical, or disjunctive, &c.

Empirical logic, the logic of Aristotle and Bacon, is on the right way. It is the business of the logician to find the causes of the judgments which form the premises and the conclusions of inference, reasoning and science. What knowledge do we get by sense, memory and experience, the first mental causes of judgment? What is judgment, and what its various kinds? What is inference, how does it proceed by combining judgments as premises to cause judgments as conclusions, and what are its various kinds? How does inference draw conclusions more or less probable up to moral certainty? How does it by the aid of identification convert probable into necessary conclusions, which become necessary principles of demonstration? How is categorical succeeded by conditional inference? What is scientific method as a system of inferences about definite subjects? How does inference become the source of error and fallacy? How does the whole process from sense to inference discover the real truth of judgments, which are true so far as they signify things known by sense, memory, experience and inference? These are the fundamental questions of the science of inference. Conceptual logic, on the other hand, is false from the start. It is not the first business of logic to direct us how to form conceptions signified by terms, because sense is a prior cause of judgment and inference. It is not the second business of logic to direct us how out of conceptions to form judgments signified by propositions, because the real causes of judgments are sense, memory, experience and inference. It is, however, the main business of logic to direct us how out of judgments to form inferences signified by discourse; and this is the one point which conceptual logic has contributed to the science of inference. But why spoil the further mental analysis of inference by supposing that conceptions are constituents of judgment and therefore of inference, which thus becomes merely a complex combination of conceptions, an extension of ideas? The mistake has been to convert three operations of mind into three processes in a fixed order—conception, judgment, inference. Conception and judgment are decisions: inference alone is a process, from decisions to decision, from judgments to judgment. Sense, not conception, is the origin of judgment. Inference is the process which from judgments about sensible things proceeds to judgments about things similar to sensible things. Though some conceptions are its conditions and some judgments its causes, inference itself in its conclusions causes many more judgments and conceptions. Finally, inference is an extension, not of ideas, but of beliefs, at first about existing things, afterwards about ideas, and even about words; about anything in short about which we think, in what is too fancifully called "the universe of discourse."

Formal logic has arisen out of the narrowness of conceptual logic. The science of inference no doubt has to deal primarily with formal truth or the consistency of premises and conclusion. But as all truth, real as well as formal, is consistent, formal rules of consistency become real rules of truth, when the premises are true and the consistent conclusion is therefore true. The science of inference again rightly emphasizes the formal thinking of the syllogism in which the combination of premises involves the conclusion. But the combinations of premises in analogical and inductive inference, although the combination does not involve the conclusion, yet causes us to infer it, and in so similar a way that the science of inference is not complete without investigating all the combinations which characterize different kinds of inference. The question of logic is how we infer in fact, as well as perfectly; and we cannot understand inference unless we consider inferences of probability of all kinds. Moreover, the study of analogical and inductive inference is necessary to that of the syllogism itself, because they discover the premises of syllogism. The formal thinking of syllogism alone is merely necessary consequence; but when its premises are necessary principles, its conclusions are not only necessary consequents but also necessary truths. Hence the manner in which induction aided by identification discovers necessary principles must be studied by the logician in order to decide when the syllogism can really arrive at necessary conclusions. Again, the science of inference has for its subject the form, or processes, of thought, but not its matter or objects. But it does not follow that it can investigate the former without the latter. Formal logicians say that, if they had to consider the matter, they must either consider all things, which would be impossible, or select some, which would be arbitrary. But there is an intermediate alternative, which is neither impossible nor arbitrary; namely, to consider the general distinctions and principles of all things; and without this general consideration of the matter the logician cannot know the form of thought, which consists in drawing inferences about things on these general principles. Lastly, the science of inference is not indeed the science of sensation, memory and experience, but at the same time it is the science of using those mental operations as data of inference; and, if logic does not show how analogical and inductive inferences directly, and deductive inferences indirectly, arise from experience, it becomes a science of mere thinking without knowledge.

Logic is related to all the sciences, because it considers the common inferences and varying methods used in investigating different subjects. But it is most closely related to the sciences of metaphysics and psychology, which form with it a triad of sciences. Metaphysics is the science of being in general, and therefore of the things which become objects apprehended by our minds. Psychology is the science of mind in general, and therefore of the mental operations, of which inference is one. Logic is the science of the processes of inference. These three sciences, of the objects of mind, of the operations of mind, of the processes used in the inferences of mind, are differently, but closely related, so that they are constantly confused. The real point is their interdependence, which is so intimate that one sign of great philosophy is a consistent metaphysics, psychology and logic. If the world of things is *known* to be partly material and partly mental, then the mind must have powers of sense and inference enabling it to know these things, and there must be processes of inference carrying us from and beyond the sensible to the insensible world of matter and mind. If the whole world of things is matter, operations and processes of mind are themselves material. If the whole world of things is mind, operations and processes of mind have only to recognize their like all the world over. It is clear then that a man's metaphysics and psychology must colour his logic. It is accordingly necessary to the logician to know beforehand the general distinctions and principles of things in metaphysics, and the mental operations of sense, conception, memory and experience in psychology, so as to discover the processes of inference from experience about things in logic.

The interdependence of this triad of sciences has sometimes led to their confusion. Hegel, having identified being with thought, merged metaphysics in logic. But he divided logic into objective and subjective, and thus practically confessed that there is one science of the objects and another of the processes of thought. Psychologists, seeing that inference is a mental operation, often extemporize a theory of inference to the neglect of logic. But we have a double consciousness of inference. We are conscious of it as one operation among many, and of its omnipresence, so to speak, to all the rest. But we are also conscious of the processes of the operation of inference. To a certain extent this second consciousness applies to other operations: for example, we are conscious of the process of association by which various mental causes recall ideas in the imagination. But how little does the psychologist know about the association of ideas, compared with what the logician has discovered about the processes of inference! The fact is that our primary consciousness of all mental operations is hardly equal to our secondary consciousness of the processes of the one operation of inference from premises to conclusions permeating long trains and pervading whole sciences. This elaborate consciousness of inferential process is the justification of logic as a distinct science, and is the first step in its method. But it is not the whole method of logic, which also and rightly considers the mental process necessary to language, without substituting linguistic for mental distinctions.

Nor are consciousness and linguistic analysis all the instruments of the logician. Logic has to consider the things we know, the minds by which we know them from sense, memory and experience to inference, and the sciences which systematize and extend our knowledge of things; and having considered these facts, the logician must make such a science of inference as will explain the power and the poverty of human knowledge.

General Tendencies of Modern Logic

There are several grounds for hope in the logic of our day. In the first place, it tends to take up an intermediate position between the extremes of Kant and Hegel. It does not, with the former, regard logic as purely formal in the sense of abstracting thought from being, nor does it follow the latter in amalgamating metaphysics with logic by identifying being with thought. Secondly, it does not content itself with the mere formulae of thinking, but pushes forward to theories of method, knowledge and science; and it is a hopeful sign to find this epistemological spirit, to which England was accustomed by Mill, animating German logicians such as Lotze, Dühring, Schuppe, Sigwart and Wundt. Thirdly, there is a determination to reveal the psychological basis of logical processes, and not merely to describe them as they are in adult reasoning, but to explain also how they arise from simpler mental operations and primarily from sense. This attempt is connected with the psychological turn given to recent philosophy by Wundt and others, and is dangerous only so far as psychology itself is hypothetical. Unfortunately, however, these merits are usually connected with a less admirable characteristic—contempt for tradition. Writing his preface to his second edition in 1888, Sigwart says: "Important works have appeared by Lotze, Schuppe, Wundt and Bradley, to name only the most eminent; and all start from the conception which has guided this attempt. That is, logic is grounded by them, not upon an effete tradition but upon a new investigation of thought as it actually is in its psychological foundations, in its significance for knowledge, and its actual operation in scientific methods." How strange! The spirit of every one of the three reforms above enumerated is an unconscious return to Aristotle's *Organon*. Aristotle's was a logic which steered, as Trendelenburg has shown, between Kantian formalism and Hegelian metaphysics; it was a logic which in the Analytics investigated the syllogism as a means to understanding knowledge and science: it was a logic which, starting from the psychological foundations of sense, memory and experience, built up the logical structure of induction and deduction on the profoundly Aristotelian principle that "there is no process from universals without induction, and none by induction without sense." Wundt's comprehensive view that logic looks backwards to psychology and forward to epistemology was hundreds of years ago one of the many discoveries of Aristotle.

Judgment

1. *Judgment and Conception.*—The emphasis now laid on judgment, the recovery from Hume's confusion of beliefs with ideas and the association of ideas, and the distinction of the mental act of judging from its verbal expression in a proposition, are all healthy signs in recent logic. The most fundamental question, before proceeding to the investigation of inference, is not what we say but what we think in making the judgments which, whether we express them in propositions or not, are both the premises and the conclusion of inference; and, as this question has been diligently studied of late, but has been variously answered, it will be well to give a list of the more important theories of judgment as follows:—

a. It expresses a relation between the content of two ideas, not a relation of these ideas (Lotze).

b. It is consciousness concerning the objective validity of a subjective combination of ideas, *i.e.* whether between the corresponding objective elements an analogous combination exists (Ueberweg).

c. It is the synthesis of ideas into unity and consciousness of their objective validity, not in the sense of agreement with external reality but in the sense of the logical necessity of their synthesis (Sigwart).

d. It is the analysis of an aggregate idea (*Gesammtvorstellung*) into subject and predicate; based on a previous association of ideas, on relating and comparing, and on the apperceptive synthesis of an aggregate idea in consequence; but itself consisting in an apperceptive analysis of that aggregate idea; and requiring will in the form of apperception or attention (Wundt).

e. It requires an idea, because every object is conceived as well as recognized or denied; but it is itself an assertion of actual fact, every perception counts for a judgment, and every categorical is changeable into an existential judgment without change of sense (Brentano, who derives his theory from Mill except that he denies the necessity of a combination of ideas, and reduces a categorical to an existential judgment).

f. It is a decision of the validity of an idea requiring will (Bergmann, following Brentano).

g. Judgment (*Urtheil*) expresses that two ideas belong together: "by-judgment" (*Beurtheilung*) is the reaction of will expressing the validity or invalidity of the combination of ideas (Windelband, following Bergmann, but distinguishing the decision of validity from the judgment).

h. Judgment is consciousness of the identity or difference and of the causal relations of the given; naming the actual combinations of the data, but also requiring a priori categories of the understanding, the notions of identity, difference and causality, as principles of thought or laws, to combine the plurality of the given into a unity (Schuppe).

i. Judgment is the act which refers an ideal content recognized as such to a reality beyond the act, predicating an idea of a reality, a what of a that; so that the subject is reality and the predicate the meaning of an idea, while the judgment refers the idea to reality by an identity of content (Bradley and Bosanquet).

k. Judgment is an assertion of reality, requiring comparison and ideas which render it directly expressible in words (Hobhouse, mainly following Bradley).

These theories are of varying value in proportion to their proximity to Aristotle's point that predication is about things, and to Mill's point that judgments and propositions are about things, not about ideas. The essence of judgment is belief that something is (or is not) determined, either as existing (*e.g.* "I am," "A centaur is not") or as something in particular (*e.g.* "I am a man," "I am not a monkey"). Neither Mill, however, nor any of the later logicians whose theories we have quoted, has been able quite to detach judgment from conception; they all suppose that an idea, or ideas, is a condition of all judgment. But judgment starts from sensation (*Empfindung*) and feeling (*Gefühl*), and not from idea (*Vorstellung*). When I feel pleased or pained, or when I use my senses to perceive a pressure, a temperature, a flavour, an odour, a colour, a sound, or when I am conscious of feeling and perceiving, I cannot resist the belief that something sensible is present; and this belief that something exists is already a judgment, a judgment of existence, and, so far as it is limited to sense without inference, a true judgment. It is a matter of words whether or not we should call this sensory belief a judgment; but it is no matter of choice to the logician, who regards all the constituents of inference as judgments; for the fundamental constituents are sensory beliefs, which are therefore judgments in the logical sense. Sense is the evidence of inference; directly of analogical and inductive, directly or indirectly of deductive, inference; and therefore, if logic refuses to include sensory beliefs among judgments, it will omit the fundamental constituents of inference, inference will no longer consist of judgments but of sensory beliefs plus judgments, and the second part of logic, the logic of judgment, the purpose of which is to investigate the constituents of inference, will be like *Hamlet* without the prince of Denmark. If, on the other hand, all the constituents of inference are judgments, there are judgments of sense; and the evidence of the senses means that a judgment of sense is true, while a judgment of inference is true so far as it is directly or indirectly concluded from judgments of sense. Now a sensory judgment, *e.g.* that a sensible pressure is existing, is explained by none of the foregoing theories, because it requires nothing but sensation and belief. It requires no will, but is usually involuntary, for the stimulus forces one's attention, which is not always voluntary; not all judgment then requires will, as Wundt supposes. It requires no reference to reality beyond the sensible pressure, because it is merely a belief that this exists without inference of the external stimulus or any inference at all: not all judgment then requires the reference of subjective to objective supposed by Ueberweg, or the consciousness of logical necessity supposed by Sigwart. It requires in addition to the belief that something exists, no consideration as to whether the belief itself be true, because a man who feels pressure believes in the thing without further question about the belief: not all judgment then requires a decision of validity, as Bergmann supposes. It requires nothing beyond the sensation and belief in the given existence of the given pressure: not all judgment then requires categories of understanding, or notions of identity, difference and causality, or even of existence, such as Schuppe supposes. It requires no comparison in order to express it in words, for a judgment need not be expressed, and a sensory judgment of pressure is an irresistible belief that a real pressure exists, without waiting for words, or for a comparison which is wanted not to make a sensation a judgment, but to turn a judgment into language: not all judgment then requires comparison with a view to its expression, as supposed by Hobhouse. Lastly, all the authors of the above-quoted theories err in supposing that all judgment requires conception; for even Mill thinks a combination of ideas necessary, and Brentano, who comes still nearer to the nature of sensory judgment when he says, "Every perception counts for a judgment," yet thinks that an idea is necessary at the same time in order to understand the thing judged. In reality, the sensation and the belief are sufficient; when I feel a sensible pressure, I cannot help believing in its reality, and therefore judging that it is real, without any *tertium quid*—an idea of pressure, or of existence or of pressure existing—intervening between the sensation and the belief. Only after sensation has ceased does an idea, or representation of what is not presented, become necessary as a substitute for a sensation and as a condition not of the first judgment that there is, but of a second judgment that there was, something sensible. Otherwise there would be no judgment of sensible fact, for the first sensation would not give it, and the idea following the sensation would be still farther off. The sensory judgment then, which is nothing but a belief that at the moment of sense something sensible exists, is a proof that not all judgment requires conception, or synthesis or analysis of ideas, or decision about the content, or about the validity, of ideas, or reference of an ideal content to reality, as commonly, though variously, supposed in the logic of our day.

Not, however, that all judgment is sensory: after the first judgments of sense follow judgments of memory, and memory requires ideas. Yet memory is not mere conception, as Aristotle, and Mill after him, have perceived. To remember, we must have a present idea; but we must also have a belief that the thing, of which the idea is a representation, was (or was not) determined; and this belief is the memorial judgment. Originally such judgments arise from sensory judgments followed by ideas, and are judgments of memory after sense that something sensible existed, *e.g.* pressure existed: afterwards come judgments of memory after inference, *e.g.* Caesar was murdered. Finally, most judgments are inferential. These are conclusions which primarily are inferred from sensory and memorial judgments; and so far as inference starts from sense of something sensible in the present, and from memory after sense of something sensible in the past, and concludes similar things, inferential judgments are indirect beliefs in being and in existence beyond ideas. When from the sensible pressures between the parts of my mouth, which I feel and remember and judge that they exist and have existed, I infer another similar pressure (*e.g.* of the food which presses and is pressed by my mouth in eating), the inferential judgment with which I conclude is a belief that the latter exists as well as the former (*e.g.* the pressure of food without as well as the sensible pressures within). Inference, no doubt, is closely involved with conception. So far as it depends on memory, an inferential judgment presupposes memorial ideas in its data; and so far as it infers universal classes and laws, it produces general ideas. But even so the part played by conception is quite subordinate to that of belief. In the first place, the remembered datum, from which an inference of pressure starts, is not the conceived idea, but the belief that the sensible pressure existed. Secondly, the conclusion in which it ends is not the general idea of a class, but the belief that a class, represented by a general idea, exists, and is (or is not) otherwise determined (*e.g.* that things pressing and pressed exist and move). Two things are certain about inferential judgment: one, that when inference is based on sense and memory, inferential judgment starts from a combination of sensory and memorial judgment, both of which are beliefs that things exist; the other, that in consequence inferential judgment is a belief that similar things exist. There are thus three primary judgments: judgments of sense, of memory after sense, and of inference from sense. All these are beliefs in being and existence, and this existential belief is first in sense, and afterwards transferred to memory and inference. Moreover, it is transferred in the same irresistible way: frequently we cannot help either feeling pressure, or remembering it, or inferring it; and as there are involuntary sensation and attention, so there are involuntary memory and inference. Again, in a primary judgment existence need not be expressed; but if expressed, it may be expressed either by the predicate, *e.g.* "I exist," or by the subject, *e.g.* "I who exist think." There are indeed differences between primary judgments, in that the sensory is a belief in present, the memorial in past, and the inferential in present, past and future existence. But these differences in detail do not alter the main point that all these are beliefs in the existing, in the real as opposed to the ideal, in actual things which are not ideas. In short, a primary judgment is a belief in something existing apart from our idea of it; and not because we have an idea of it, or by comparing an idea with, or referring an idea to, reality; but because we have a sensation of it, or a memory of it or an inference of it. Sensation, not conception, is the origin of judgment.

2. *Different Significations of Being in different Kinds of Judgment.*—As Aristotle remarked both in the *De Interpretatione* and in the *Sophistici Elenchi*, "not-being is thinkable" does not mean "not-being exists." In the latter treatise he added that it is a *fallacia a dicto secundum quid ad dictum simpliciter* to argue from the former to the latter; "for," as he says, "it is not the same thing to be something and to exist absolutely." Without realizing their debt to tradition, Herbart, Mill and recently Sigwart, have repeated Aristotle's separation of the copula from the verb of existence, as if it were a modern discovery that "is" is not the same as "exists." It may be added that they do not quite realize what the copula exactly signifies: it does not signify existence, but it does signify a fact, namely, that something is (or is not) determined, either absolutely in a categorical judgment, or conditionally in a conditional judgment. Now we have seen that all primary judgments signify more than this fact; they are also beliefs in the existence of the thing signified by the subject. But, in the first place, primary judgments signify this existence never by the copula, but sometimes by the predicate, and sometimes by the subject; and, secondly, it does not follow that all judgments whatever signify existence. Besides inference of existence there is inference of non-existence, of things inconsistent with the objects of primary judgments. Hence secondary judgments, which no longer contain a belief that the thing exists, *e.g.* the judgment, "not-being is thinkable," cited by Aristotle; the judgment, "A square circle is impossible," cited by Herbart; the judgment, "A centaur is a fiction of the poets," cited by Mill. These secondary judgments of non-existence are partly like and partly unlike primary judgments of existence. They resemble them in that they are beliefs in being signified by the copula. They are beliefs in things of a sort; for, after all, ideas and names are things; their objects, even though non-existent, are at all events things conceivable or nameable; and therefore we are able to make judgments that things, non-existent but conceivable or nameable, are (or are not) determined in a particular manner. Thus the judgment about a centaur is the belief, "A conceivable centaur is a fiction of the poets," and the judgment about a square circle is the belief, "A so-called square circle is an impossibility." But, though beliefs that things of some sort are (or are not) determined, these secondary judgments fall short of primary judgments of existence. Whereas in a primary judgment there is a further belief, signified by subject or predicate, that the thing is an existing thing in the sense of being a real thing (*e.g.* a man), different from the idea of it as well as from the name for it; in a secondary judgment there is no further belief that the thing has any existence beyond the idea (*e.g.* a centaur), or even beyond the name (*e.g.* a square circle): though the idea or name exists, there is no belief that anything represented by idea or name exists. Starting, then, from this fundamental distinction between judgments of existence and judgments of non-existence, we may hope to steer our way between two extreme views which emanate from two important thinkers, each of whom has produced a flourishing school of psychological logic.

On the one hand, early in the 19th century Herbart started the view that a categorical judgment is never a judgment of existence, but always hypothetical; on the other hand, in the latter part of the century Brentano started the view that all categorical judgments are existential. The truth lies between these contraries. The view of Herbart and his school is contradicted by our primary judgments of and from sense, in which we cannot help believing existence; and it gives an inadequate account even of our secondary judgments in which we no longer indeed believe existence, but do frequently believe that a non-existent thing is (or is not) somehow determined unconditionally. It is true, as Herbart says, that the judgment, "A square circle is an impossibility," does not contain the belief, "A square circle is existent"; but when he goes on to argue that it means, "If a square circle is thought, the conception of impossibility must be added in thought," he falls into a *non-sequitur*. To be categorical, a judgment does not require a belief in existence, but only that something, existent or not, is (or is not) determined; and there are two quite different attitudes of mind even to a non-existent thing, such as a square circle, namely, unconditional and conditional belief. The judgment, "A non-existent but so-called square circle is an impossibility," is an unconditional, or categorical judgment of non-existence, quite different from any hypothetical judgment, which depends on the conditions "if it is thought," or "if it exists," or any other "if." On the other hand, the view of Brentano and his school is contradicted by these very categorical judgments of non-existence; and while it applies only to categorical judgments of existence, it does so inadequately. To begin with the latter objection, Brentano proposed to change the four Aristotelian forms of judgment, A, E, I, O, into the following existential forms:—

A. "There is not an immortal man."
E. "There is not a live stone."
I. "There is a sick man."
O. "There is an unlearned man."

This reconstruction, which merges subject and predicate in one expression, in order to combine it with the verb of existence, is repeated in similar proposals of recent English logicians. Venn, in his *Symbolic Logic*, proposes the four forms, $x\bar{y}=0$, $xy=0$, $xy>0$, $x\bar{y}>0$ (where $\bar{y}$ means "not-*y*"), but only as alternative to the ordinary forms. Bradley says that "'S–P is real' attributes S–P, directly or indirectly, to the ultimate reality," and agrees with Brentano that "'is' never stands for anything but 'exists'"; while Bosanquet, who follows Bradley, goes so far as to define a categorical judgment as "that which affirms the existence of its subject, or, in other words, asserts a fact." Now it is true that our primary judgments do contain a belief in existence; but they do not all contain it in the same way, but are beliefs sometimes that something is determined as existing, and sometimes that something existing is particularly determined. Brentano's forms do not express such a judgment of existence, as "All existing men are mortal": nor does Bradley's form, "Reality includes S–P." Metaphysically, all realities are parts of one ultimate reality; but logically, even philosophers think more often only of finite realities, existing men, dogs, horses, &c.; and children know that their parents exist long before they apprehend ultimate reality. The normal form, then, of a judgment of existence is either "S is a real P," or "A real S is P." Hence the reconstruction of all categorical judgments by merging subject and predicate, either on Brentano's or on Bradley's plan, is a misrepresentation even of normal categorical judgments of existence. Secondly, it is much more a misrepresentation of categorical judgments of non-existence. No existential form suits a judgment such as "A centaur is a fiction," when we do not believe that there is a centaur, or that reality includes a centaur. As Mill pointed out, it cannot be implied that a centaur exists, since the very thing asserted is that the thing has no real existence. In a correspondence with Mill, Brentano rejoined that the centaur exists in imagination; Bradley says, "inside our heads." According to one, then, the judgment becomes "There is an imaginary centaur"; according to the other "Reality includes an imaginary centaur." The rejoinder, however, though partly true, is not to the point. The idea of the centaur does exist in our imagination, and inside our heads, and the name of it in our mouths. But the point is that the centaur conceived and named does not exist beyond the idea of it and the name for it; it is not, like a man, a real thing which is neither the idea of it nor the name for it. No amount of subtlety will remove the difference between a categorical judgment of existence, *e.g.* "An existing man is mortal," and a categorical judgment of non-existence, *e.g.* "A conceivable centaur is a fiction," because in the former we believe and mean that the thing exists beyond the idea, and in the latter we do not. If, contrary to usage, we choose to call the latter a judgment of existence, there is no use in quarrelling about words; but we must insist that new terms must in that case be invented to express so fundamental a difference as that between judgments about real men and judgments about ideal centaurs. So long, however, as we use words in the natural sense, and call the former judgments of existence, and the latter judgments of non-existence, then "is" will not be, as Bradley supposes, the same as "exists," for we use "is" in both judgments, but "exists" only in the first kind. Bosanquet's definition of a categorical judgment contains a similar confusion. To assert a fact and to affirm the existence of a subject are not, as he makes out, the same thing: a judgment often asserts a fact and denies existence in the same breath, *e.g.* "Jupiter is non-existent." Here, as usual in logic, tradition is better than innovation. All categorical judgment is an unconditional belief in the fact, signified by the copula, that a thing of some sort is (or is not) determined; but some categorical judgments are also beliefs that the thing is an existing thing, signified either by the subject or by the predicate, while others are not beliefs that the thing exists at all, but are only beliefs in something conceivable, or nameable, or in something or other, without particularizing what. Judgment then always signifies being, but not always existence.

3. *Particular and Universal Judgments.*—Aristotle, by distinguishing affirmative and negative, particular and universal, made the fourfold classification of judgments, A, E, I and O, the foundation both of opposition and of inference. With regard to inference, he remarked that a universal judgment means by "all," not every individual we know, but every individual absolutely, so that, when it becomes a major premise, we know therein every individual universally, not individually, and often do not know a given individual individually until we add a minor premise in a syllogism. Whereas, then, a particular judgment is a belief that some, a universal judgment is a belief that all, the individuals of a kind or total of similar individuals, are similarly determined, whether they are known or unknown individuals. Now, as we have already seen, what is signified by the subject may be existing or not, and in either case a judgment remains categorical so long as it is a belief without conditions. Thus, "Some existing men are poets," "All existing men are mortal," "Some conceivable centaurs are human in their forequarters," "All conceivable centaurs are equine in their hindquarters," are all categorical judgments, while the two first are also categorical judgments of existence. Nevertheless these obvious applications of Aristotelian traditions have been recently challenged, especially by Sigwart, who holds in his *Logic* (secs. 27, 36) that, while a particular is a categorical judgment of existence, a universal is hypothetical, on the ground that it does not refer to a definite number of individuals, or to individuals at all, but rather to general ideas, and that the appropriate form of "all M is P" is "if anything is M it is P." This view, which has influenced not only German but also English logicians, such as Venn, Bradley and Bosanquet, destroys the fabric of inference, and reduces scientific laws to mere hypotheses. In reality, however, particular and universal judgments are too closely connected to have such different imports. In opposition, a categorical particular is the contradictory of a universal, which is also categorical, not hypothetical, *e.g.*, "not all M is P" is the contradictory of "all M is P," not of "if anything is M it is P." In inference, a particular is an example of a universal which in its turn may become a particular example of a higher universal. For instance, in the history of mechanics it was first inferred from some that all terrestrial bodies gravitate, and then from these as some that all ponderable bodies, terrestrial and celestial, gravitate. How absurd to suppose that here we pass from a particular categorical to a universal hypothetical, and then treat this very conclusion as a particular categorical to pass to a higher universal hypothetical! Sigwart, indeed, is deceived both about particulars and universals. On the one hand, some particulars are not judgments of existence, *e.g.* "some imaginary deities are goddesses"; on the other hand, some universals are not judgments of non-existence, *e.g.* "every existing man is mortal." Neither kind is always a judgment of existence, but each is sometimes the one and sometimes the other. In no case is a universal hypothetical, unless we think it under a condition; for in a universal judgment about the non-existing, *e.g.* about all conceivable centaurs, we do not think, "If anything is a centaur," because we do not believe that there are any; and in a universal judgment about the existent, *e.g.* about all existing men, we do not think, "If anything is a man," because we believe that there is a whole class of men existing at different times and places. The cause of Sigwart's error is his misconception of "all." So far as he follows Aristotle in saying that "all" does not mean a definite number of individuals he is right; but when he says that we mean no individuals at all he deserts Aristotle and goes wrong. By "all" we mean every individual whatever of a kind; and when from the experience of sense and memory we start with particular judgments of existence, and infer universal judgments of existence and scientific laws, we further mean those existing individuals which we have experienced, and every individual whatever of the kind which exists. We mean neither a definite number of individuals, nor yet an infinite number, but an incalculable number, whether experienced or inferred to exist. We do not mean existing here and now, nor yet out of time and place, but at any time and place (*semper et ubique*)—

past, present and future being treated as simply existing, by what logicians used to call *suppositio naturalis*. We mean then by "all existing" every similar individual whatever, whenever, and wherever existing. Hence Sigwart is right in saying that "All bodies are extended" means "Whatever is a body is extended," but wrong in identifying this form with "If anything is a body it is extended." "Whatever" is not "if anything." For the same reason it is erroneous to confuse "all existing" with a general idea. Nor does the use of abstract ideas and terms make any difference. When Bosanquet says that in "Heat is a mode of motion" there is no reference to individual objects, but "a pure hypothetical form which absolutely neglects the existence of objects," he falls far short of expressing the nature of this scientific judgment, for in his *Theory of Heat* Clerk Maxwell describes it as "believing heat as it exists in a hot body to be in the form of kinetic energy." As Bacon would say, it is a belief that all individual bodies *qua* hot are individually but similarly moving in their particles. When, again, Bradley and Bosanquet speak of the universal as if it always meant one ideal content referred to reality, they forget that in universal judgments of existence, such as "All men existing are mortal," we believe that every individually existing man dies his own death individually, though similarly to other men; and that we are thinking neither of ideas nor of reality; but of all existent individual men being individually but similarly determined. A universal is indeed one whole; but it is one whole of many similars, which are not the same with one another. This is indeed the very essence of distribution, that a universal is predicable, not singly or collectively, but severally and similarly of each and every individual of a kind, or total of similar individuals. So also the essence of a universal judgment is that every individual of the kind is severally but similarly determined. Finally, a universal judgment is often existential; but whether it is so or not it remains categorical, so long as it introduces no hypothetical antecedent about the existence of the thing signified by the subject. It is true that even in universal judgments of existence there is often a hypothetical element; for example, "All men are mortal" contains a doubt whether every man whatever, whenever and wherever existing, must die. But this is only a doubt whether all the things signified by the subject are similarly determined as signified by the predicate, and not a doubt whether there are such things at all. Hence the hypothetical element is not a hypothetical antecedent "If anything is a man," but an uncertain conclusion that "All existing men are mortal." In other words, a categorical universal is often problematic, but a problematic is not the same as a hypothetical judgment.

4. *The Judgment and the Proposition.*—Judgment in general is the mental act of believing that something is (or is not) determined. A proposition is the consequent verbal expression of such a belief, and consists in asserting that the thing as signified by the subject is (or is not) determined as signified by the predicate. But the expression is not necessary. Sensation irresistibly produces a judgment of existence without needing language. Children think long before they speak; and indeed, as mere vocal sounds are not speech, and as the apprehension that a word signifies a thing is a judgment, judgment is originally not an effect, but a cause of significant language. At any rate, even when we have learnt to speak, we do not express all we think, as we may see not only from the fewness of words known to a child, but also from our own adult consciousness. The principle of thought is to judge enough to conclude. The principle of language is to speak only so far as to understand and be understood. Hence speech is only a curtailed expression of thought. Sometimes we express a whole judgment by one word, *e.g.* "Fire!" or by a phrase, *e.g.* "What a fire!" and only usually by a proposition. But even the normal proposition in the syllogistic form *tertii adjacentis*, with subject, predicate and copula, is seldom a complete expression of the judgment. The consequence is that the proposition, being different from a judgment arising after a judgment, and remaining an imperfect copy of judgment, is only a superficial evidence of its real nature. Fortunately, we have more profound evidences, and at least three evidences in all: the linguistic expression of belief in the proposition; the consciousness of what we mentally believe; and the analysis of reasoning, which shows what we must believe, and have believed, as data for inference. In these ways we find that a judgment is both different from, and more than, a proposition. But recent logicians, although they perceive the difference, nevertheless tend to make the proposition the measure of the judgment. This makes them omit sensory judgments, and count only those which require ideas, and even general ideas expressed in general terms. Sigwart, for example, gives as instances of our most elementary judgments, "This is Socrates," "This is snow"—beliefs in things existing beyond ourselves which require considerable inferences from many previous judgments of sense and memory. Worse still, logicians seem unable to keep the judgment apart from the proposition. Herbart says that the judgment "A is B" does not contain the usually added thought that A is, because there is no statement of A's existence; as if the statement mattered to the thought. So Sigwart, in order to reduce universals to hypotheticals, while admitting that existence is usually thought, argues that it is not stated in the universal judgment; so also Bosanquet. But in the judgment the point is not what we state, but what we think; and so long as the existence of A is added in thought, the judgment in question must contain the thought that A exists as well as that A is B, and therefore is a judgment that something is determined both as existing and in a particular manner. The statement only affects the proposition; and whenever we believe the existence of the thing, the belief in existence is part of the judgment thought, whether it is part of the proposition stated or not.

Here Sir William Hamilton did a real service to logic in pointing out that "Logic postulates to be allowed to state explicitly in language all that is implicitly contained in the thought." Not that men should or can carry this logical postulate out in ordinary life; but it is necessary in the logical analysis of judgments, and yet logicians neglect it. This is why they confuse the categorical and the universal with the hypothetical. Taking the carelessly expressed propositions of ordinary life, they do not perceive that similar judgments are often differently expressed, *e.g.* "I, being a man, am mortal," and "If I am a man, I am mortal"; and conversely, that different judgments are often similarly expressed. In ordinary life we may say, "All men are mortal," "All centaurs are figments," "All square circles are impossibilities," "All candidates arriving five minutes late are fined" (the last proposition being an example of the identification of categorical with hypothetical in Keynes's *Formal Logic*). But of these universal propositions the first imperfectly expresses a categorical belief in existing things, the second in thinkable things, and the third in nameable things, while the fourth is a slipshod categorical expression of the hypothetical belief, "If any candidates arrive late they are fined." The four judgments are different, and therefore logically the propositions fully expressing them are also different. The judgment, then, is the measure of the proposition, not the proposition the measure of the judgment. On the other hand, we may go too far in the opposite direction, as Hamilton did in proposing the universal quantification of the predicate. If the quantity of the predicate were always thought, it ought logically to be always stated. But we only sometimes think it. Usually we leave the predicate indefinite, because, as long as the thing in question is (or is not) determined, it does not matter about other things, and it is vain for us to try to think all things at once. It is remarkable that in *Barbara*, and therefore in many scientific deductions, to think the quantity of the predicate is not to the point either in the premises or in the conclusion; so that to quantify the propositions, as Hamilton proposes, would be to express more than a rational man thinks and judges. In judgments, and therefore in propositions, indefinite predicates are the rule, quantified predicates the exception. Consequently, A E I O are the normal propositions with indefinite predicates; whereas propositions with quantified predicates are only occasional forms, which we should use whenever we require to think the quantity of the predicate, *e.g.* (1) in conversion, when we must think that all men are some animals, in order to judge that some animals are men; (2) in syllogisms of the 3rd figure, when the predicate of the minor premise must be particularly quantified in thought in order to become the particularly quantified subject of the conclusion; (3) in identical propositions including definitions, where we must think both that 1 + 1 are 2 and 2 are 1 + 1. But the normal judgment, and therefore the normal proposition, do not require the quantity of the predicate. It follows also that the normal judgment is not an equation. The symbol of equality (=) is not the same as the copula (is); it means "is equal to," where "equal to" is part of the predicate, leaving ‘is" as the copula.

Now, in all judgment we think "is," but in few judgments predicate "equal to." In quantitative judgments we may think $x = y$, or, as Boole proposes, $x = vy = \frac{0}{0}y$, or, as Jevons proposes, $x = xy$, or, as Venn proposes, x which is not $y = 0$; and equational symbolic logic is useful whenever we think in this quantitative way. But it is a byway of thought. In most judgments all we believe is that x is (or is not) y, that a thing is (or is not) determined, and that the thing signified by the subject is a thing signified by the predicate, but not that it is the only thing, or equal to everything signified by the predicate. The symbolic logic, which confuses "is" with "is equal to," having introduced a particular kind of predicate into the copula, falls into the mistake of reducing all predication to the one category of the quantitative; whereas it is more often in the substantial, *e.g.* "I am a man," not "I am equal to a man," or in the qualitative, *e.g.* "I am white," not "I am equal to white," or in the relative, *e.g.* "I am born in sin," not "I am equal to born in sin." Predication, as Aristotle saw, is as various as the categories of being. Finally, the great difficulty of the logic of judgment is to find the mental act behind the linguistic expression, to ascribe to it exactly what is thought, neither more nor less, and to apply the judgment thought to the logical proposition, without expecting to find it in ordinary propositions. Beneath Hamilton's postulate there is a deeper principle of logic—*A rational being thinks only to the point, and speaks only to understand and be understood.*

Inference

The nature and analysis of inference have been so fully treated in the Introduction that here we may content ourselves with some points of detail.

1. *False Views of Syllogism arising from False Views of Judgment.*—The false views of judgment, which we have been examining, have led to false views of inference. On the one hand, having reduced categorical judgments to an existential form, Brentano proposes to reform the syllogism, with the results that it must contain four terms, of which two are opposed and two appear twice; that, when it is negative, both premises are negative; and that, when it is affirmative, one premise, at least, is negative. In order to infer the universal affirmative that every professor is mortal because he is a man, Brentano's existential syllogism would run as follows:—

There is not a not-mortal man.
There is not a not-human professor.
∴ There is not a not-mortal professor.

On the other hand, if on the plan of Sigwart categorical universals were reducible to hypotheticals, the same inference would be a pure hypothetical syllogism, thus:—

If anything is a man it is mortal.
If anything is a professor it is a man.
∴ If anything is a professor it is mortal.

But both these unnatural forms, which are certainly not analyses of any conscious process of categorical reasoning, break down at once, because they cannot explain those moods in the third figure, *e.g. Darapti*, which reason from universal premises to a particular conclusion. Thus, in order to infer that some wise men are good from the example of professors, Brentano's syllogism would be the following *non-sequitur*:—

There is not a not-good professor.
There is not a not-wise professor.
There is a wise good (*non-sequitur*).

So Sigwart's syllogism would be the following *non-sequitur*:—

If anything is a professor, it is good.
If anything is a professor, it is wise.
Something wise is good (*non-sequitur*).

But as by the admission of both logicians these reconstructions of *Darapti* are illogical, it follows that their respective reductions of categorical universals to existentials and hypotheticals are false, because they do not explain an actual inference. Sigwart does not indeed shrink from this and greater absurdities; he reduces the first figure to the *modus ponens* and the second to the *modus tollens* of the hypothetical syllogism, and then, finding no place for the third figure, denies that it can infer necessity; whereas it really infers the necessary consequence of particular conclusions. But the crowning absurdity is that, if all universals were hypothetical, *Barbara* in the first figure would become a purely hypothetical syllogism—a consequence which seems innocent enough until we remember that all universal affirmative conclusions in all sciences would with their premises dissolve into mere hypothesis. No logic can be sound which leads to the following analysis:—

If anything is a body it is extended.
If anything is a planet it is a body.
∴ If anything is a planet it is extended.

Sigwart, indeed, has missed the essential difference between the categorical and the hypothetical construction of syllogisms. In a categorical syllogism of the first figure, the major premise, "Every M whatever is P," is a universal, which we believe on account of previous evidence without any condition about the thing signified by the subject M, which we simply believe sometimes to be existent (*e.g.* "Every man existent"), and sometimes not (*e.g.*, "Every centaur conceivable"); and the minor premise, "S is M," establishes no part of the major, but adds the evidence of a particular not thought of in the major at all. But in a hypothetical syllogism of the ordinary mixed type, the first or hypothetical premise is a conditional belief, *e.g.* "If anything is M it is P," containing a hypothetical antecedent, "If anything is M," which is sometimes a hypothesis of existence (*e.g.* "If anything is an angel"), and sometimes a hypothesis of fact (*e.g.* "If an existing man is wise"); and the second premise or assumption, "Something is M," establishes part of the first, namely, the hypothetical antecedent, whether as regards existence (*e.g.* "Something is an angel"), or as regards fact (*e.g.* "This existing man is wise"). These very different relations of premises are obliterated by Sigwart's false reduction of categorical universals to hypotheticals. But even Sigwart's errors are outdone by Lotze, who not only reduces "Every M is P" to "If S is M, S is P," but proceeds to reduce this hypothetical to the disjunctive, "If S is M, S is P^1 or P^2 or P^3," and finds fault with the Aristotelian syllogism because it contents itself with inferring "S is P" without showing what P. Now there are occasions when we want to reason in this disjunctive manner, to consider whether S is P^1 or P^2 or P^3, and to conclude that "S is a particular P"; but ordinarily all we want to know is that "S is P"; *e.g.* in arithmetic, that 2+2 are 4, not any particular 4, and in life that all our contemporaries must die, without enumerating all their particular sorts of deaths. Lotze's mistake is the same as that of Hamilton about the quantification of the predicate, and that of those symbolists who held that reasoning ought always to exhaust all alternatives by equations. It is the mistake of exaggerating exceptional into normal forms of thought, and ignoring the principle that a rational being thinks only to the point.

2. *Quasi-syllogisms.*—Besides reconstructions of the syllogistic fabric, we find in recent logic attempts to extend the figures of the syllogism beyond the syllogistic rules. An old error that we may have a valid syllogism from merely negative premises (*ex omnibus negativis*), long ago answered by Alexander and Boethius, is now revived by Lotze, Jevons and Bradley, who do not perceive that the supposed second negative is really an affirmative containing a "not" which can only be carried through the syllogism by separating it from the copula and attaching it to one of the extremes, thus:—

The just are not unhappy (*negative*).
The just are not-recognized (*affirmative*).
∴ Some not-recognized are not unhappy (*negative*).

Here the minor being the infinite term "not-recognized" in the conclusion, must be the same term also in the minor premise. Schuppe, however, who is a fertile creator of quasi-syllogisms, has managed to invent some examples from two negative premises of a different kind:—

(1)	(2)	(3)
No M is P.	No M is P.	No P is M.
S is not M.	S is not M.	S is not M.
∴ Neither S nor M is P.	∴ S may be P.	∴ S may be P.

But (1) concludes with a mere repetition, (2) and (3) with a contingent "may be," which, as Aristotle says, also "may not be," and therefore *nihil certo colligitur.* The same answer applies to Schuppe's supposed syllogisms from two particular premises:—

(1)	(2)
Some M is P.	Some M is P.
Some S is M.	Some M is S.
∴Some S may be P.	∴Some S may be P.

The only difference between these and the previous examples (2) and (3) is that, while those break the rule against two negative premises, these break that against undistributed middle. Equally fallacious are two other attempts of Schuppe to produce syllogisms from invalid moods:—

(1) 1st Fig.	(2) 2nd Fig.
All M is P.	P is M.
No S is M.	S is M.
∴S may be P.	∴S is partially identical with P.

In the first the fallacy is the indifferent contingency of the conclusion caused by the *non-sequitur* from a negative premise to an affirmative conclusion; while the second is either a mere repetition of the premises if the conclusion means "S is like P in being M," or, if it means "S is P," a *non-sequitur* on account of the undistributed middle. It must not be thought that this trifling with logical rules has no effect. The last supposed syllogism, namely, that having two affirmative premises and entailing an undistributed middle in the second figure, is accepted by Wundt under the title "Inference by Comparison" (*Vergleichungsschluss*), and is supposed by him to be useful for abstraction and subsidiary to induction, and by Bosanquet to be useful for analogy. Wundt, for example, proposes the following premises:—

Gold is a shining, fusible, ductile, simple body.
Metals are shining, fusible, ductile, simple bodies.

But to say from these premises, "Gold and metal are similar in what is signified by the middle term," is a mere repetition of the premises; to say, further, that "Gold may be a metal" is a *non-sequitur*, because, the middle being undistributed, the logical conclusion is the contingent "Gold may or may not be a metal," which leaves the question quite open, and therefore there is no syllogism. Wundt, who is again followed by Bosanquet, also supposes another syllogism in the third figure, under the title of "Inference by Connexion" (*Verbindungsschluss*), to be useful for induction. He proposes, for example, the following premises:—

Gold, silver, copper, lead, are fusible.
Gold, silver, copper, lead, are metals.

Here there is no syllogistic fallacy in the premises; but the question is what syllogistic conclusion can be drawn, and there is only one which follows without an illicit process of the minor, namely, "Some metals are fusible." The moment we stir a step further with Wundt in the direction of a more general conclusion (*ein allgemeinerer Satz*), we cannot infer from the premises the conclusion desired by Wundt, "Metals and fusible are connected"; nor can we infer "All metals are fusible," nor "Metals are fusible," nor "Metals may be fusible," nor "All metals may be fusible," nor any assertory conclusion, determinate or indeterminate, but the indifferent contingent, "All metals may or may not be fusible," which leaves the question undecided, so that there is no syllogism. We do not mean that in Wundt's supposed "inferences of relation by comparison and connexion" the premises are of no further use; but those of the first kind are of no syllogistic use in the second figure, and those of the second kind of no syllogistic use beyond particular conclusions in the third figure. What they really are in the inferences proposed by Wundt is not premises for syllogism, but data for induction parading as syllogism. We must pass the same sentence on Lotze's attempt to extend the second figure of the syllogism for inductive purposes, thus:—

S is M.
Q is M.
R is M.
∴Every Σ, which is common to S, Q, R, is M.

We could not have a more flagrant abuse of the rule *Ne esto plus minusque in conclusione quam in praemissis*. As we see from Lotze's own defence, the conclusion cannot be drawn without another premise or premises to the effect that "S, Q, R, are Σ, and Σ is the one real subject of M." But how is all this to be got into the second figure? Again, Wundt and B. Erdmann propose new moods of syllogism with convertible premises, containing definitions and equations. Wundt's *Logic* has the following forms:—

(1) 1st Fig.	(2) 2nd Fig.	(3) 3rd Fig.
Only M is P.	$x=y$.	$y=x$.
No S is M.	$z=y$.	$y=z$.
∴No S is P.	∴$x=z$.	∴$x=z$.

Now, there is no doubt that, especially in mathematical equations, universal conclusions are obtainable from convertible premises expressed in these ways. But the question is how the premises must be thought, and they must be thought in the converse way to produce a logical conclusion. Thus, we must think in (1) "All P is M" to avoid illicit process of the major, in (2) "All y is z" to avoid undistributed middle, in (3) "All x is y" to avoid illicit process of the minor. Indeed, it is the very essence of a convertible judgment to think it in both orders, and especially to think it in the order necessary to an inference from it. Accordingly, however expressed, the syllogisms quoted above are, as thought, ordinary syllogisms, (1) being *Camestres* in the second figure, (2) and (3) *Barbara* in the first figure. Aristotle, indeed, was as well aware as German logicians of the force of convertible premises; but he was also aware that they require no special syllogisms, and made it a point that, in a syllogism from a definition, the definition is the middle, and the *definitum* the major in a convertible major premise of *Barbara* in the first figure, *e.g.*:—

The interposition of an opaque body is (essentially) deprivation of light.
The moon suffers the interposition of the opaque earth.
∴The moon suffers deprivation of light.

It is the same with all the recent attempts to extend the syllogism beyond its rules, which are not liable to exceptions, because they follow from the nature of syllogistic inference from universal to particular. To give the name of syllogism to inferences which infringe the general rules against undistributed middle, illicit process, two negative premises, *non-sequitur* from negative to affirmative, and the introduction of what is not in the premises into the conclusion, and which consequently infringe the special rules against affirmative conclusions in the second figure, and against universal conclusions in the third figure, is to open the door to fallacy, and at best to confuse the syllogism with other kinds of inference, without enabling us to understand any one kind.

3. *Analytic and Synthetic Deduction.*—Alexander the Commentator defined synthesis as a progress from principles to consequences, analysis as a regress from consequences to principles; and Latin logicians preserved the same distinction between the *progressus a principiis ad principiata*, and the *regressus a principiatis ad principia*. No distinction is more vital in the logic of inference in general and of scientific inference in particular; and yet none has been so little understood, because, though analysis is the more usual order of discovery, synthesis is that of instruction, and therefore, by becoming more familiar, tends to replace and obscure the previous analysis. The distinction, however, did not escape Aristotle, who saw that a progressive syllogism can be reversed thus:—

1. *Progression.*	2. *Regression.*	
	(1)	(2)
All M is P.	All P is M.	All S is P.
All S is M.	All S is P.	All M is S.
∴All S is P.	∴All S is M.	∴All M is P.

Proceeding from one order to the other, by converting one of the premises, and substituting the conclusion as premise for the other premise, so as to deduce the latter as conclusion, is what he calls circular inference; and he remarked that the process is fallacious unless it contains propositions which are convertible, as in mathematical equations. Further, he perceived that the difference between the progressive and regressive orders extends from mathematics to physics, and that there are two kinds of syllogism: one progressing a priori from real ground to consequent fact (ὁ τοῦ διότι συλλογισμός), and the other regressing a posteriori from consequent fact to real ground (ὁ τοῦ ὅτι συλλογισμός). For example, as he says, the sphericity of the moon is the real ground of the fact of its light waxing; but we can deduce either from the other, as follows:—

1. *Progression.*	2. *Regression.*
What is spherical waxes.	What waxes is spherical.
The moon is spherical.	The moon waxes.
∴ The moon waxes.	∴ The moon is spherical.

These two kinds of syllogism are synthesis and analysis in the ancient sense. Deduction is analysis when it is regressive from consequence to real ground, as when we start from the proposition that the angles of a triangle are equal to two right angles and deduce analytically that therefore (1) they are equal to equal angles made by a straight line standing on another straight line, and (2) such equal angles are two right angles. Deduction is synthesis when it is progressive from real ground to consequence, as when we start from these two results of analysis as principles and deduce synthetically the proposition that therefore the angles of a triangle are equal to two right angles, in the order familiar to the student of Euclid. But the full value of the ancient theory of these processes cannot be appreciated until we recognize that as Aristotle planned them Newton used them. Much of the *Principia* consists of synthetical deductions from definitions and axioms. But the discovery of the centripetal force of the planets to the sun is an analytic deduction from the facts of their motion discovered by Kepler to their real ground, and is so stated by Newton in the first regressive order of Aristotle—P-M, S-P, S-M. Newton did indeed first show synthetically what kind of motions by mechanical laws have their ground in a centripetal force varying inversely as the square of the distance (all P is M); but his next step was, not to deduce synthetically the planetary motions, but to make a new start from the planetary motions as facts established by Kepler's laws and as examples of the kind of motions in question (all S is P); and then, by combining these two premises, one mechanical and the other astronomical, he analytically deduced that these facts of planetary motion have their ground in a centripetal force varying inversely as the squares of the distances of the planets from the sun (all S is M). (See *Principia* I. prop. 2; 4 coroll. 6; III. Phaenomena, 4-5; prop. 2.) What Newton did, in short, was to prove by analysis that the planets, revolving by Kepler's astronomical laws round the sun, have motions such as by mechanical laws are consequences of a centripetal force to the sun. This done, as the major is convertible, the analytic order—P-M, S-P, S-M—was easily inverted into the synthetic order—M-P, S-M, S-P; and in this progressive order the deduction as now taught begins with the centripetal force of the sun as real ground, and deduces the facts of planetary motion as consequences. Thereupon the Newtonian analysis which preceded this synthesis, became forgotten; until at last Mill in his *Logic*, neglecting the *Principia*, had the temerity to distort Newton's discovery, which was really a pure example of analytic deduction, into a mere hypothetical deduction; as if the author of the saying "*Hypotheses non fingo*" started from the hypothesis of a centripetal force to the sun, and thence deductively explained the facts of planetary motion, which reciprocally verified the hypothesis. This gross misrepresentation has made hypothesis a kind of logical fashion. Worse still, Jevons proceeded to confuse analytic deduction from consequence to ground with hypothetical deduction from ground to consequence under the common term "inverse deduction." Wundt attempts, but in vain, to make a compromise between the old and the new. He re-defines analysis in the very opposite way to the ancients; whereas they defined it as a regressive process from consequence to ground, according to Wundt it is a progressive process of taking for granted a proposition and deducing a consequence, which being true verifies the proposition. He then divides it into two species: one categorical, the other hypothetical. By the categorical he means the ancient analysis from a given proposition to more general propositions. By the hypothetical he means the new-fangled analysis from a given proposition to more particular propositions, *i.e.* from a hypothesis to consequent facts. But his account of the first is imperfect, because in ancient analysis the more general propositions, with which it concludes, are not mere consequences, but the real grounds of the given proposition; while his addition of the second reduces the nature of analysis to the utmost confusion, because hypothetical deduction is progressive from hypothesis to consequent facts whereas analysis is regressive from consequent facts to real ground. There is indeed a sense in which all inference is from ground to consequence, because it is from logical ground (*principium cognoscendi*) to logical consequence. But in the sense in which deductive analysis is opposed to deductive synthesis, analysis is deduction from real consequence as logical ground *principiatum* as *principium*) *cognoscendi*) to real ground (*principium essendi*), *e.g.* from the consequential facts of planetary motion to their real ground, *i.e.* centripetal force to the sun. Hence Sigwart is undoubtedly right in distinguishing analysis from hypothetical deduction, for which he proposes the name "reduction." We have only further to add that many scientific discoveries about sound, heat, light, colour and so forth, which it is the fashion to represent as hypotheses to explain facts, are really analytical deductions from the facts to their real grounds in accordance with mechanical laws. Recent logic does scant justice to scientific analysis.

4. *Induction.*—As induction is the process from particulars to universals, it might have been thought that it would always have been opposed to syllogism, in which one of the rules is against using particular premises to draw universal conclusions. Yet such is the passion for one type that from Aristotle's time till now constant attempts have been made to reduce induction to syllogism. Aristotle himself invented an inductive syllogism in which the major (P) is to be referred to the middle (M) by means of the minor (S), thus:—

A, B, C magnets (S) attract iron (P).
A, B, C magnets (S) are all magnets whatever (M).
∴ All magnets whatever (M) attract iron (P).

As the second premise is supposed to be convertible, he reduced the inductive to a deductive syllogism as follows:—

Every S is P.	Every S is P.
Every S is M (convertibly).	Every M is S.
∴ Every M is P.	∴ Every M is P.

In the reduced form the inductive syllogism was described by Aldrich as "*Syllogismus in Barbara cujus minor* (*i.e.* every M is S) *reticetur*." Whately, on the other hand, proposed an inductive syllogism with the major suppressed, that is, instead of the minor premise above, he supposed a major premise, "Whatever belongs to A, B, C magnets belongs to all." Mill thereupon supposed a still more general premise, an assumption of the uniformity of nature. Since Mill's time, however, the logic of induction tends to revert towards syllogisms more like that of Aristotle. Jevons supposed induction to be inverse deduction, distinguished from direct deduction as analysis from synthesis, *e.g.* as division from multiplication; but he really meant that it is a deduction from a hypothesis of the law of a cause to particular effects which, being true, verify the hypothesis. Sigwart declares himself in agreement with Jevons; except that, being aware of the difference between hypothetical deduction and mathematical analysis, and seeing that, whereas analysis (*e.g.* in division) leads to certain conclusions, hypothetical deduction is not certain of the hypothesis, he arrives at the more definite view that induction is not analysis proper but hypothetical deduction, or "reduction," as he proposes to call it. Reduction he defines as "the framing of possible premises for given propositions, or the construction of a syllogism when the conclusion and one premise is given." On this view induction becomes a reduction in the form: all M is P (hypothesis), S is M (given), ∴ S is P (given). The views of Jevons and Sigwart are in agreement in two main points. According to both, induction, instead of inferring from A, B, C magnets the conclusion "Therefore all magnets attract iron," infers from the hypothesis, "Let every magnet attract iron," to A, B, C magnets, whose given attraction verifies the hypothesis. According to both, again, the hypothesis of a law with which the process starts contains more than is present in the particular data: according to Jevons, it is the hypothesis of a law of a cause from which induction deduces particular effects; and according to Sigwart, it is a hypothesis of the ground from which the particular data necessarily follow according to universal laws. Lastly, Wundt's view is an interesting piece of eclecticism, for he supposes that induction begins in the form of Aristotle's inductive syllogism, S–P, S–M, M–P, and becomes an inductive method in the form of Jevons's inverse deduction, or hypothetical deduction, or analysis, M–P, S–M, S–P. In detail, he supposes that, while an "inference by comparison," which he erroneously calls an affirmative syllogism in the second figure, is preliminary to induction, a second "inference by connexion," which he erroneously calls a syllogism in the third figure with an indeterminate conclusion, is the inductive syllogism itself. This is like Aristotle's inductive syllogism in the arrangement of terms; but, while on the one hand Aristotle did not, like Wundt, confuse it with the third figure, on the other hand Wundt does not, like Aristotle, suppose it to be practicable to get inductive data so wide as the convertible premise, "All S is M, and all M is S," which would at once establish the conclusion, "All M is P." Wundt's point is that the conclusion of the inductive syllogism is neither so much as all, nor so little as some, but rather the indeterminate "M and P are connected." The question therefore arises, how we are to discover "All M is P," and this question Wundt answers by adding an inductive method, which involves inverting the inductive syllogism in the style of Aristotle into a deductive syllogism from a hypothesis in the style of Jevons, thus:—

(1)	(2)
S is P.	Every M is P.
S is M.	S is M.
∴ M and P are connected.	∴ S is P.

He agrees with Jevons in calling this second syllogism analytical deduction, and with Jevons and Sigwart in calling it hypothetical deduction. It is, in fact, a common point of Jevons, Sigwart and Wundt that the universal is not really a conclusion inferred from given particulars, but a hypothetical major premise from which given particulars are inferred, and that this major contains presuppositions of causation not contained in the particulars.

It is noticeable that Wundt quotes Newton's discovery of the centripetal force of the planets to the sun as an instance of this supposed hypothetical, analytic, inductive method; as if Newton's analysis were a hypothesis of the centripetal force to the sun, a deduction of the given facts of planetary motion, and a verification of the hypothesis by the given facts, and as if such a process of hypothetical deduction could be identical with either analysis or induction. The abuse of this instance of Newtonian analysis betrays the whole origin of the current confusion of induction with deduction. One confusion has led to another. Mill confused Newton's analytical deduction with hypothetical deduction; and thereupon Jevons confused induction with both. The result is that both Sigwart and Wundt transform the inductive process of adducing particular examples to induce a universal law into a deductive process of presupposing a universal law as a ground to deduce particular consequences. But we can easily extricate ourselves from these confusions by comparing induction with different kinds of deduction. The point about induction is that it starts from experience, and that, though in most classes we can experience only some particulars individually, yet we infer all. Hence induction cannot be reduced to Aristotle's inductive syllogism, because experience cannot give the convertible premise, "Every S is M, and every M is S"; that "All A, B, C are magnets" is, but that "All magnets are A, B, C" is not, a fact of experience. For the same reason induction cannot be reduced to analytical deduction of the second kind in the form, S–P, M–S, ∴ M–P; because, though both end in a universal conclusion, the limits of experience prevent induction from such inference as:—

Every experienced magnet attracts iron.
Every magnet whatever is every experienced magnet.
∴ Every magnet whatever attracts iron.

Still less can induction be reduced to analytical deduction of the first kind in the form—P–M, S–P, ∴ S–M, of which Newton has left so conspicuous an example in his *Principia*. As the example shows, that analytic process starts from the scientific knowledge of a universal and convertible law (every M is P, and every P is M), *e.g.* a mechanical law of all centripetal force, and ends in a particular application, *e.g.* this centripetal force of planets to the sun. But induction cannot start from a known law. Hence it is that Jevons, followed by Sigwart and Wundt, reduces it to deduction from a hypothesis in the form "Let every M be P, S is M, ∴ S is P." There is a superficial resemblance between induction and this hypothetical deduction. Both in a way use given particulars as evidence. But in induction the given particulars are the evidence by which we discover the universal, *e.g.* particular magnets attracing iron are the origin of an inference that all do; in hypothetical deduction, the universal is the evidence by which we explain the given particulars, as when we suppose undulating aether to explain the facts of heat and light. In the former process, the given particulars are the data from which we infer the universal; in the latter, they are only the consequent facts by which we verify it. Or rather, there are two uses of induction: inductive discovery before deduction, and inductive verification after deduction. But neither use of induction is the same as the deduction itself: the former precedes, the latter follows it. Lastly, the theory of Mill, though frequently adopted, *e.g.* by B. Erdmann, need not detain us long. Most inductions are made without any assumption of the uniformity of nature; for, whether it is itself induced, or a priori or postulated, this like every assumption is a judgment, and most men are incapable of judgment on so universal a scale, when they are quite capable of induction. The fact is that the uniformity of nature stands to induction as the axioms of syllogism do to syllogism; they are not premises, but conditions of inference, which ordinary men use spontaneously, as was pointed out in *Physical Realism*, and afterwards in Venn's *Empirical Logic*. The axiom of contradiction is not a major premise of a judgment: the *dictum de omni et nullo* is not a major premise of a syllogism: the principle of uniformity is not a major premise of an induction. Induction, in fact, is no species of deduction; they are opposite processes, as Aristotle regarded them except in the one passage where he was reducing the former to the latter, and as Bacon always regarded them. But it is easy to confuse them by mistaking examples of deduction for inductions. Thus Whewell mistook Kepler's inference that Mars moves in an ellipse for an induction, though it required the combination of Tycho's and Kepler's observations, as a minor, with the laws of conic sections discovered by the Greeks, as a major, premise. Jevons, in his *Principles of Science*, constantly makes the same sort of mistake. For example, the inference from the similarity between solar spectra and the spectra of various gases on the earth to the existence of similar gases in the sun, is called by him an induction; but it really is an analytical deduction from effect to cause, thus:—

Such and such spectra are effects of various gases.
Solar spectra are such spectra.
∴ Solar spectra are effects of those gases.

In the same way, to infer a machine from hearing the regular tick of a clock, to infer a player from finding a pack of cards arranged in suits, to infer a human origin of stone implements, and all such inferences from patent effects to latent causes, though they appear to Jevons to be typical inductions, are really deductions which, besides the minor premise stating the particular effects, require a major premise discovered by a previous induction and stating the general kind of effects of a general kind of cause. B. Erdmann, again, has invented an induction from particular predicates to a totality of predicates which he calls "ergänzende Induction," giving as an example, "This body has the colour, extensibility and specific gravity of magnesium; therefore it is magnesium." But this inference contains the tacit major, "What has a given colour, &c., is magnesium," and is a syllogism of recognition. A deduction is often like an induction, in inferring from particulars; the difference is that deduction combines a law in the major with the particulars in the minor premise, and infers syllogistically that the particulars of the minor have the predicate of the major premise, whereas induction uses the particulars simply as instances to generalize a law. An infallible sign of an induction is that the subject and predicate of the universal conclusion are merely those of the particular instances generalized; *e.g.* "These magnets attract iron, ∴ all do."

This brings us to another source of error. As we have seen, Jevons, Sigwart and Wundt all think that induction contains a belief in causation, in a cause, or ground, which is not present in the particular facts of experience, but is contributed by a hypothesis added as a major premise to the particulars in order to explain them by the cause or ground. Not so; when an induction is causal, the particular instances are already beliefs in particular causes, *e.g.* "My right hand is exerting pressure reciprocally with my left," "A, B, C magnets attract iron"; and the problem is to generalize these causes, not to introduce them. Induction is not introduction. It would make no difference to the form of induction, if, as Kant thought, the notion of causality is a priori; for even Kant thought that it is already contained in experience. But whether Kant be right or wrong, Wundt and his school are decidedly wrong in supposing "supplementary notions which are not contained in experience itself, but are gained by a process of logical treatment of this experience"; as if our behalf in causality could be neither a posteriori nor a priori, but beyond experience wake up in a hypothetical major premise of induction. Really, we first experience that particular causes have particular effects; then induce that causes similar to those have effects similar to these; finally, deduce that when a particular cause of the kind occurs it has a particular effect of the kind by synthetic deduction, and that when a particular effect of the kind occurs it has a particular cause of the kind by analytic deduction with a convertible premise, as when Newton from planetary motions, like terrestrial motions, analytically deduced a centripetal force to the sun like centripetal forces to the earth. Moreover, causal induction is itself both synthetic and analytic: according as experiment combines elements into a compound, or resolves a compound into elements, it is the origin of a synthetic or an analytic generalization. Not, however, that all induction is causal; but where it is not, there is still less reason for making it a deduction from hypothesis. When from the fact that the many crows in our experience are black, we induce the probability that all crows whatever are black, the belief in the particulars is quite independent of this universal. How then can this universal be called, as Sigwart, for example, calls it, the ground from which these particulars follow? I do not believe that the crows I have seen are black because all crows are black, but vice versa. Sigwart simply inverts the order of our knowledge. In all induction, as Aristotle said, the particulars are the evidence, or ground of our knowledge (*principium cognoscendi*), of the universal. In causal induction, the particulars further contain the cause, or ground of the being (*principium essendi*), of the effect, as well as the ground of our inducing the law. In all induction the universal is the conclusion, in none a major premise, and in none the ground of either the being or the knowing of the particulars. Induction is generalization. It is not syllogism in the form of Aristotle's or Wundt's inductive syllogism, because, though starting only from some particulars, it concludes with a universal; it is not syllogism in the form called inverse deduction by Jevons, reduction by Sigwart, inductive method by Wundt, because it often uses particular facts of causation to infer universal laws of causation; it is not syllogism in the form of Mill's syllogism from a belief in uniformity of nature, because few men have believed in uniformity, but all have induced from particulars to universals. Bacon alone was right in altogether opposing induction to syllogism, and in finding inductive rules for the inductive process from particular instances of presence, absence in similar circumstances, and comparison.

5. *Inference in General.*—There are, as we have seen (*ad init.*), three types—syllogism, induction and analogy. Different as they are, the three kinds have something in common: first, they are all processes from similar to similar; secondly, they all consist in combining two judgments so as to cause a third, whether expressed in so many propositions or not; thirdly, as a judgment is a belief in being, they all proceed from premises which are beliefs in being to a conclusion which is a belief in being. Nevertheless, simple as this account appears, it is opposed in every point to recent logic. In the first place, the point of Bradley's logic is that "similarity is not a principle which works. What operates is identity, and that identity is a universal." This view makes inference easy: induction is all over before it begins; for, according to Bradley, "every one of the instances is already a universal proposition; and it is not a particular fact or phenomenon at all," so that the moment you observe that this magnet attracts iron, you *ipso facto* know that every magnet does so, and all that remains for deduction is to identify a second magnet as the same with the first, and conclude that it attracts iron. In dealing with Bradley's works we feel inclined to repeat what Aristotle says of the discourses of Socrates: they all exhibit excellence, cleverness, novelty and inquiry, but their truth is a difficult matter; and the Socratic paradox that virtue is knowledge is not more difficult than the Bradleian paradox that as two different things are the same, inference is identification. The basis of Bradley's logic is the fallacious dialectic of Hegel's metaphysics, founded on the supposition that two things, which are different, but have something in common, are the same. For example, according to Hegel, being and not-being are both indeterminate and therefore the same. "If," says Bradley, "A and B, for instance, both have lungs or gills, they are so far the same." The answer to Hegel is that being and not-being are at most similarly indeterminate, and to Bradley that each animal has its own different lungs, whereby they are only similar. If they were the same, then in descending, two things, one of which has healthy and the other diseased lungs, would be the same; and in ascending, two things, one of which has lungs and the other has not, but both of which have life, *e.g.* plants and animals, would be so far the same. There would be no limit to identity either downwards or upwards; so that a man would be the same as a man-of-war, and all things would be the same thing, and not different parts of one universe. But a thing which has healthy lungs and a thing which has diseased lungs are only similar individuals numerically different. Each individual thing is the same only with itself, although related to other things; and each individual of a class has its own individual, though similar, attributes. The consequence of this true metaphysics to logic is twofold: on the one hand, one singular or particular judgment, *e.g.* "this magnet attracts iron," is not another, *e.g.* "that magnet attracts iron," and neither is universal; on the other hand, a universal judgment, *e.g.* "every magnet attracts iron," means, distributively, that each individual magnet exerts its individual attraction, though it is similar to other magnets exerting similar attractions. A universal is not "one identical point," but one distributive whole. Hence in a syllogism, a middle term, *e.g.* magnets, is "absolutely the same," not in the sense of "one identical point" making each individual the same as any other, as Bradley supposes, but only in the sense of one whole class, or total of many similar individuals, *e.g.* magnets, each of which is separately though similarly a magnet, not magnet in general. Hence also induction is a real process, because, when we know that this individual magnet attracts iron, we are very far from knowing that all alike do so similarly; and the question of inductive logic, how we get from some similars to all similars, remains, as before, a difficulty, but not to be solved by the fallacy that inference is identification.

Secondly, a subordinate point in Bradley's logic is that there are inferences which are not syllogisms; and this is true. But when he goes on to propose, as a complete independent inference, "A is to the right of B, B is to the right of C, therefore A is to the right of C," he confuses two different operations. When A, B and C are objects of sense, their relative positions are matters, not of inference, but of observation; when they are not, there is an inference, but a syllogistic inference with a major premise.

induced from previous observations, "whenever of three things the first is to the right of the second, and the second to the right of the third, the first is to the right of the third." To reply that this universal judgment is not expressed, or that its expression is cumbrous, is no answer, because, whether expressed or not, it is required for the thought. As Aristotle puts it, the syllogism is directed "not to the outer, but to the inner discourse," or as we should say, not to the expression but to the thought, not to the proposition but to the judgment, and to the inference not verbally but mentally. Bradley seems to suppose that the major premise of a syllogism must be explicit, or else is nothing at all. But it is often thought without being expressed, and to judge the syllogism by its mere explicit expression is to commit an *ignoratio elenchi*; for it has been known all along that we express less than we think, and the very purpose of syllogistic logic is to analyse the whole thought necessary to the conclusion. In this syllogistic analysis two points must always be considered: one, that we usually use premises in thought which we do not express; and the other, that we sometimes use them unconsciously, and therefore infer and reason unconsciously, in the manner excellently described by Zeller in his *Vorträge*, iii. pp. 249-255. Inference is a deeper thinking process from judgments to judgment, which only occasionally and partially emerges in the linguistic process from propositions to proposition. We may now then reassert two points about inference against Bradley's logic: the first, that it is a process from similar to similar, and not a process of identification, because two different things are not at all the same thing; the second, that it is the mental process from judgments to judgment rather than the linguistic process from propositions to proposition, because, besides the judgments expressed in propositions, it requires judgments which are not always expressed, and are sometimes even unconscious.

Our third point is that, as a process of judgments, inference is a process of concluding from two beliefs in being to another belief in being, and not an ideal construction, because a judgment does not always require ideas, but is always a belief about things, existing or not. This point is challenged by all the many ideal theories of judgment already quoted. If, for example, judgment were an analysis of an aggregate idea as Wundt supposes, it would certainly be true with him to conclude that "as judgment is an *immediate*, inference is a *mediate*, reference of the members of an aggregate of ideas to one another." But really a judgment is a belief that something, existing, or thinkable, or nameable or what not, is (or is not) determined; and inference is a process from and to such beliefs in being. Hence the fallacy of those who, like Bosanquet, or like Paulsen in his *Einleitung in die Philosophie*, represent the realistic theory of inference as if it meant that knowledge starts from ideas and then infers that ideas are copies of things, and who then object, rightly enough, that we could not in that case compare the copy with the original, but only be able to infer from idea to idea. But there is another realism which holds that inference is a process neither from ideas to ideas, nor from ideas to things, but from beliefs to beliefs, from judgments about things in the premises to judgments about similar things in the conclusion. Logical inference never goes through the impossible process of premising nothing but ideas, and concluding that ideas are copies of things. Moreover, as we have shown, our primary judgments of sense are beliefs founded on sensations without requiring ideas, and are beliefs, not merely that something is determined, but that it is determined as existing; and, accordingly, our primary inferences from these sensory judgments of existence are inferences that other things beyond sense are similarly determined as existing. First press your lips together and then press a pen between them: you will not be conscious of perceiving any ideas: you will be conscious first of perceiving one existing lip exerting pressure reciprocally with the other existing lip; then, on putting the pen between your lips, of perceiving each lip similarly exerting pressure, but not with the other; and consequently of inferring that each existing lip is exerting pressure reciprocally with another existing body, the pen. Inference then, though it is accompanied by ideas, is not an ideal construction, nor a process from idea to idea, nor a process from idea to thing, but a process from direct to indirect beliefs in things, and originally in existing things. Logic cannot, it is true, decide what these things are, nor what the senses know about them, without appealing to metaphysics and psychology. But, as the science of inference, it can make sure that inference, on the one hand, starts from sensory judgments about sensible things and logically proceeds to inferential judgments about similar things beyond sense, and, on the other hand, cannot logically go beyond the similar. These are the limits within which logical inference works, because its nature essentially consists in proceeding from two judgments to another about similar things, existing or not.

6. *Truth.*—Finally, though sensory judgment is always true of its sensible object, inferential judgments are not always true, but are true so far as they are logically inferred, however indirectly, from sense; and knowledge consists of sense, memory after sense and logical inference from sense, which, we must remember, is not merely the outer sense of our five senses, but also the inner sense of ourselves as conscious thinking persons. We come then at last to the old question—What is truth? Truth proper, as Aristotle said in the *Metaphysics*, is in the mind: it is not being, but one's signification of being. Its requisites are that there are things to be known and powers of knowing things. It is an attribute of judgments and derivatively of propositions. That judgment is true which apprehends a thing as it is capable of being known to be; and that proposition is true which so asserts the thing to be. Or, to combine truth in thought and in speech, the true is what signifies a thing as it is capable of being known. Secondarily, the thing itself is ambiguously said to be true in the sense of being signified as it is. For example, as I am weary and am conscious of being weary, my judgment and proposition that I am weary are true because they signify what I am and know myself to be by direct consciousness; and my being weary is ambiguously said to be true because it is so signified. But it will be said that Kant has proved that real truth, in the sense of the "agreement of knowledge with the object," is unattainable, because we could compare knowledge with the object only by knowing both. Sigwart, indeed, adopting Kant's argument, concludes that we must be satisfied with consistency among the thoughts which presuppose an existent; this, too, is the reason why he thinks that induction is reduction, on the theory that we can show the necessary consequence of the given particular, but that truth of fact is unattainable. But Kant's criticism and Sigwart's corollary only derive plausibility from a false definition of truth. Truth is not the agreement of knowledge with an object beyond itself, and therefore *ex hypothesi* unknowable, but the agreement of our judgments with the objects of our knowledge. A judgment is true whenever it is a belief that a thing is determined as it is known to be by sense, or by memory after sense, or by inference from sense, however indirect the inference may be, and even when in the form of inference of non-existence it extends consequently from primary to secondary judgments. Thus the judgments "this sensible pressure exists," "that sensible pressure existed," "other similar pressures exist," "a conceivable centaur does not exist but is a figment," are all equally true, because they are in accordance with one or other of these kinds of knowledge. Consequently, as knowledge is attainable by sense, memory and inference, truth is also attainable, because, though we cannot test what we know by something else, we can test what we judge and assert by what we know. Not that all inference is knowledge, but it is sometimes. The aim of logic in general is to find the laws of all inference, which, so far as it obeys those laws, is always consistent, but is true or false according to its data as well as its consistency; and the aim of the special logic of knowledge is to find the laws of direct and indirect inferences from sense, because as sense produces sensory judgments which are always true of the sensible things actually perceived, inference from sense produces inferential judgments which, so far as they are consequent on sensory judgments, are always true of things similar to sensible things, by the very consistency of inference, or, as we say, by

parity of reasoning. We return then to the old view of Aristotle, that truth is believing in being; that sense is true of its immediate objects, and reasoning from sense true of its mediate objects; and that logic is the science of reasoning with a view to truth, or *Logica est ars ratiocinandi, ut discernatur verum a falso.* All we aspire to add is that, in order to attain to real truth, we must proceed gradually from sense, memory and experience through analogical particular inference, to inductive and deductive universal inference or reasoning. Logic is the science of all inference, beginning from sense and ending in reason.

In conclusion, the logic of the last quarter of the 19th century may be said to be animated by a spirit of inquiry, marred by a love of paradox and a corresponding hatred of tradition. But we have found, on the whole, that logical tradition rises superior to logical innovation. There are two old logics which still remain indispensable, Aristotle's *Organon* and Bacon's *Novum Organum.* If, and only if, the study of deductive logic begins with Aristotle, and the study of inductive logic with Aristotle and Bacon, it will be profitable to add the works of the following recent German and English authors:—

AUTHORITIES.—J. Bergmann, *Reine Logik* (Berlin, 1879); *Die Grundprobleme der Logik* (2nd ed., Berlin, 1895); B. Bosanquet, *Logic* (Oxford, 1888); *The Essentials of Logic* (London, 1895); F. H. Bradley, *The Principles of Logic* (London, 1883); F. Brentano, *Psychologie vom empirischen Standpunkte* (Vienna, 1874); R. F. Clarke, *Logic* (London, 1889); W. L. Davidson, *The Logic of Definition* (London, 1885); E. Dühring, *Logik und Wissenschaftstheorie* (Leipzig, 1878); B. Erdmann, *Logik* (Halle, 1892); T. Fowler, *Bacon's Novum Organum*, edited, with introduction, notes, &c. (2nd ed., Oxford, 1889); T. H. Green, *Lectures on Logic*, in *Works*, vol. iii. (London, 1886); J. G. Hibben, *Inductive Logic* (Edinburgh and London, 1896); F. Hillebrand, *Die neuen Theorien der kategorischen Schlüsse* (Vienna, 1891); L. T. Hobhouse, *The Theory of Knowledge* (London, 1896); H. Hughes, *The Theory of Inference* (London, 1894); E. Husserl, *Logische Untersuchungen* (Halle, 1891, 1901); W. Jerusalem, *Die Urtheilsfunction* (Vienna and Leipzig, 1895); W. Stanley Jevons, *The Principles of Science* (3rd ed., London, 1879); *Studies in Deductive Logic* (London, 1880); H. W. B. Joseph, *Introduction to Logic* (1906); E. E. Constance Jones, *Elements of Logic* (Edinburgh, 1890); G. H. Joyce, *Principles of Logic* (1908); J. N. Keynes, *Studies and Exercises in Formal Logic* (2nd ed., London, 1887); F. A. Lange, *Logische Studien* (2nd ed., Leipzig, 1894); T. Lipps, *Grundzüge der Logik* (Hamburg and Leipzig, 1893); R. H. Lotze, *Logik* (2nd ed., Leipzig, 1881, English translation edited by B. Bosanquet, Oxford, 1884); *Grundzüge der Logik* (*Diktate*) (3rd ed., Leipzig, 1891, English translation by G. T. Ladd, Boston, 1887); Werner Luthe, *Beiträge zur Logik* (Berlin, 1872, 1877); Members of Johns Hopkins University, *Studies in Logic* (edited by C. S. Peirce, Boston, 1883); J. B. Meyer, *Ueberweg's System der Logik*, fünfte vermehrte Auflage (Bonn, 1882); Max Müller, *Science of Thought* (London, 1887); Carveth Read, *On the Theory of Logic* (London, 1878); *Logic, Deductive and Inductive* (2nd ed., London, 1901); E. Schröder, *Vorlesungen über die Algebra der Logik* (Leipzig, 1890, 1891, 1895); W. Schuppe, *Erkenntnistheoretische Logik* (Bonn, 1878); *Grundriss der Erkenntnistheorie und Logik* (Berlin, 1894); R. Shute, *A Discourse on Truth* (London, 1877); Alfred Sidgwick, *Fallacies* (London, 1883); *The Use of Words in Reasoning* (London, 1901); C. Sigwart, *Logik* (2nd ed., Freiburg-i.-Br. and Leipzig, 1889–1893, English translation by Helen Dendy, London, 1895); K. Uphues, *Grundlehren der Logik* (Breslau, 1883); J. Veitch, *Institutes of Logic* (Edinburgh and London, 1885); J. Venn, *Symbolic Logic* (2nd ed., London, 1894); *The Principles of Empirical or Inductive Logic* (London, 1889); J. Volkelt, *Erfahren und Denken* (Hamburg and Leipzig, 1886); T. Welton, *A Manual of Logic* (London, 1891, 1896); W. Windelband, *Präludien* (Freiburg-i.-Br., 1884); W. Wundt, *Logik* (2nd ed., Stuttgart, 1893–1895). Text-books are not comprised in this list. (T. CA.)

II. HISTORY

Logic cannot dispense with the light afforded by its history so long as counter-solutions of the same fundamental problems continue to hold the field. A critical review of some of the chief types of logical theory, with a view to determine development, needs no further justification.

Logic arose, at least for the Western world, in the golden age of Greek speculation which culminated in Plato and Aristotle. There is an Indian logic, it is true, but its priority is more than disputable. In any case no influence upon Greek thought can be shown. The movement which ends in the logic of Aristotle is demonstrably self-contained. When we have shaken ourselves free of the prejudice that all stars are first seen in the East, Oriental attempts at analysis of the structure of thought may be treated as negligible.

It is with Aristotle that the bookish tradition begins to dominate the evolution of logic. The technical perfection of the analysis which he offers is, granted the circle of presuppositions within which it works, so decisive, that what precedes, even Plato's logic, is not unnaturally regarded as merely preliminary and subsidiary to it. What follows is inevitably, whether directly or indirectly, by sympathy or by antagonism, affected by the Aristotelian tradition.

A. GREEK LOGIC

i. *Before Aristotle*

The physical philosophers.

Logic needs as its presuppositions that thought should distinguish itself from things and from sense, that the problem of validity should be seen to be raised in the field of thought itself, and that analysis of the structure of thought should be recognized as the one way of solution. Thought is somewhat late in coming to self-consciousness. Implied in every contrast of principle and fact, of rule and application, involved as we see after the event, most decisively when we react correctly upon a world incorrectly perceived, thought is yet not reflected on in the common experience. Its so-called natural logic is only the potentiality of logic. The same thing is true of the first stage of Greek philosophy. In seeking for a single material principle underlying the multiplicity of phenomena, the first nature-philosophers, Thales and the rest, did indeed raise the problem of the one and the many, the endeavour to answer which must at last lead to logic. But it is only from a point of view won by later speculation that it can be said that they sought to determine the predicates of the single subject-reality, or to establish the permanent subject of varied and varying predicates.[1] The direction of their inquiry is persistently outward. They hope to explain the opposed appearance and reality wholly within the world of things, and irrespective of the thought that thinks things. Their universal is still a material one. The level of thought on which they move is still clearly pre-logical. It is an advance on this when Heraclitus[2] opposes to the eyes and ears which are bad witnesses "for such as understand not their language" a common something which we would do well to follow; or again when in the incommensurability of the diagonal and side of a square the Pythagoreans stumbled upon what was clearly neither thing nor image of sense, but yet was endowed with meaning, and henceforth were increasingly at home with symbol and formula. So far, however, it might well be that thought, contradistinguished from sense with its illusions, was itself infallible. A further step, then, was necessary, and it was taken at any rate by the Eleatics, when they opposed their thought to the thought of others, as the way of truth in contrast to the way of opinion. If Eleatic thought stands over against Pythagorean thought as what is valid or grounded against what is ungrounded or invalid, we are embarked upon dialectic, or the debate in which thought is countered by thought. Claims to a favourable verdict must now be substantiated in this field and in this field alone. It was Zeno, the controversialist of the Eleatic school, who was regarded in after times as the "discoverer" of dialectic.[3]

Zeno's amazing skill in argumentation and his paradoxical conclusions, particular and general, inaugurate a new era. "The philosophical mind," says Walter Pater,[4] "will perhaps never be quite in health, quite sane or natural again." The give and take of thought had by a swift transformation of values come by something more than its own. Zeno's paradoxes, notably, for example, the puzzle of Achilles and the Tortoise, are still capable of amusing the modern world. In his own age they found him imitators. And there follows the sophistic movement.

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[1] Cf. Heidel, "The Logic of the Pre-Socratic Philosophy," in Dewey's *Studies in Logical Theory* (Chicago, 1903).

[2] Heraclitus, *Fragmm.* 107 (Diels, *Fragmente der Vorsokratiker*) and 2, on which see Burnet, *Early Greek Philosophy*, p. 153 note (ed. 2).

[3] *e.g.* Diog. Laërt. ix. 25, from the lost *Sophistes* of Aristotle.

[4] *Plato and Platonism*, p. 24.

The Sophists.

The sophists have other claims to consideration than their service to the development of logic. In the history of the origins of logic the sophistic age is simply the age of the free play of thought in which men were aware that in a sense anything can be debated and not yet aware of the sense in which all things cannot be so. It is the age of discussion used as a universal solvent, before it has been brought to book by a deliberate unfolding of the principles of the structure of thought determining and limiting the movement of thought itself. The sophists furthered the transition from dialectic to logic in two ways. In the first place they made it possible. Incessant questioning leads to answers. Hair-splitting, even when mischievous in intent, leads to distinctions of value. Paradoxical insistence on the accidents of speech-forms and thought-forms leads in the end to perception of the essentials. Secondly they made it necessary. The spirit of debate run riot evokes a counter-spirit to order and control it. The result is a self-limiting dialectic. This higher dialectic is a logic. It is no accident that the first of the philosophical sophists, Gorgias, on the one hand, is Eleatic in his affinities, and on the other raises in the characteristic formula of his intellectual nihilism[1] issues which are as much logical and epistemological as ontological. The meaning of the copula and the relation of thoughts to the objects of which they are the thoughts are as much involved as the nature of being. It is equally no accident that the name of Protagoras is to be connected, in Plato's view at least, with the rival school of Heraclitean. The problems raised by the relativism of Protagoras are no less fundamentally problems of the nature of knowledge and of the structure of thought. The *Theaetetus* indeed, in which Plato essays to deal with them, is in the broad sense of the word logical, the first distinctively logical treatise that has come down to us. Other sophists, of course, with more practical interests, or of humbler attainments, were content to move on a lower plane of philosophical speculation. As presented to us, for example, in Plato's surely not altogether hostile caricature in the *Euthydemus*, they mark the intellectual preparation for, and the moral need for, the advance of the next generation.

Socrates.

Among the pioneers of the sophistic age Socrates stands apart. He has no other instrument than the dialectic of his compeers, and he is as far off as the rest from a criticism of the instrument, but he uses it differently and with a difference of aim. He construes the give and take of the debate-game with extreme rigour. The rhetorical element must be exorcised. The set harangue of teacher to pupil, in which steps in argument are slurred and the semblance of co-inquiry is rendered nugatory, must be eliminated. The interlocutors must in truth render an account under the stimulus of organized heckling from their equals or superiors in debating ability. And the aim is heuristic, though often enough the search ends in no overt positive conclusion. Something can be found and something is found. Common names are fitted for use by the would-be users being first delivered from abortive conceptions, and thereupon enabled to bring to the birth living and organic notions.

Aristotle would assign to Socrates the elaboration of two logical functions:—general definition and inductive method.[2] Rightly, if we add that he gives no theory of either, and that his practical use of the latter depends for its value on selection.[3] It is rather in virtue of his general faith in the possibility of construction, which he still does not undertake, and because of his consequent insistence on the elucidation of general concepts, which in common with some of his contemporaries, he may have thought of as endued with a certain objectivity, that he induces the controversies of what are called the Socratic schools as to the nature of predication. These result in the formulation of a new dialectic or logic by Plato. Manifestly Socrates' use of certain forms of argumentation, like their abuse by the sophists, tended to evoke their logical analysis. The use and abuse, confronted one with the other, could not but evoke it.

Antisthenes.

The one in the many, the formula which lies at the base of the possibility of predication, is involved in the Socratic doctrine of general concepts or ideas. The nihilism of Gorgias from the Eleatic point of view of bare identity, and the speechlessness of Cratylus from the Heraclitean ground of absolute difference, are alike disowned. But the one in the many, the identity in difference, is so far only postulated, not established. When the personality of Socrates is removed, the difficulty as to the nature of the Socratic universal, developed in the medium of the individual processes of individual minds, carries disciples of diverse general sympathies, united only through the practical inspiration of the master's life, towards the identity-formula or the difference-formula of other teachers. The paradox of predication, that it seems to deny identity, or to deny difference, becomes a *pons asinorum*. Knowledge involves synthesis or nexus. Yet from the points of view alike of an absolute pluralism, of a flux, and of a formula of bare identity—and *a fortiori* with any blending of these principles sufficiently within the bounds of plausibility to find an exponent—all knowledge, because all predication of unity, in difference, must be held to be impossible. Plato's problem was to find a way of escape from this impasse, and among his Socratic contemporaries he seems to have singled out Antisthenes[4] as most in need of refutation. Antisthenes, starting with the doctrine of identity without difference, recognizes as the only expression proper to anything its own peculiar sign, its name. This extreme of nominalism for which predication is impossible is, however, compromised by two concessions. A thing can be described as like something else. And a compound can have a λόγος or account given of it by the (literally) adequate enumeration of the names of its simple elements or πρῶτα.[5] This analytical λόγος he offers as his substitute for knowledge.[6] The simple elements still remain, sensed and named but not known. The expressions of them are simply the speech-signs for them. The account of the compound simply sets itself taken piecemeal as equivalent to itself taken as aggregate. The subject-predicate relation fails really to arise. Euclides[7] found no difficulty in fixing Antisthenes' mode of illustrating his simple elements by comparison, and therewith perhaps the "induction" of Socrates, with the dilemma; so far as the example is dissimilar, the comparison is invalid; so far as it is similar, it is useless. It is better to say what the thing is. Between Euclides and Antisthenes the Socratic induction and universal definition were alike discredited from the point of view of the Eleatic logic. It is with the other point of doctrine that Plato comes to grips, that which allows of a certainty or knowledge consisting in an analysis of a compound into simple elements themselves not known. The syllable or combination is, he shows, not known by resolution of it into letters or elements themselves not known. An aggregate analysed into its mechanical parts is as much and as little known as they. A whole which is more than its parts is from Antisthenes' point of view inconceivable. Propositions analytical of a combination in the sense alleged do not give knowledge. Yet knowledge is possible. The development of a positive theory of predication has become quite crucial.

Plato.

Plato's logic supplies a theory of universals in the doctrine of ideas. Upon this it bases a theory of predication, which, however, is compatible with more than one reading of the metaphysical import of the ideas. And it sets forth a dialectic with a twofold movement, towards differentiation and integration severally, which amounts to a formulation of inference. The more fully analysed movement, that which proceeds downward from less determinate to more determinate universals, is named Division. Its associations, accordingly, are to the modern ear almost inevitably those of a doctrine of classification only. Aristotle, however, treats it as a dialectical rival to syllogism, and it influenced Galilei and Bacon in their views of inference after the Renaissance. If we add to this logic of "idea," judgment and inference, a doctrine of categories in the modern sense of the word which makes the *Theaetetus*, in which it first occurs, a forerunner of Kant's *Critique of Pure Reason*, we have clearly a very significant contribution to logic even in technical regard. Its general philosophical setting may be said to enhance its value even as logic.

The "Idea."

(*a*) Of the idea we may say that whatever else it is, and apart from all puzzles as to ideas of relations such as smallness, of negative qualities such as injustice, or of human inventions such as beds, it is opposed to that of which it is the idea as its intelligible formula or law, the truth or validity—Herbart's word—of the phenomenon from the point of view of nexus or system. The thing of sense in its relative isolation is unstable. It is and is not. What gives stability is the insensible principle or principles which it holds, as it were, in solution. These are the ideas, and their mode of being is naturally quite other than that of the sensible phenomena which they order. The formula for an indefinite number of particular things in particular places at particular times, and all of them presentable in sensuous imagery of a given time and place, is not itself presentable in sensuous imagery side by side with the individual members of the group it orders. The law, *e.g.*, of the equality of the radii of a circle cannot be exhibited to sense, even if equal radii may be so exhibited. It is the wealth of illustration with which Plato expresses his meaning, and the range of application which he gives the idea—to the class-concepts of natural groups objectively regarded, to categories, to aesthetic and ethical ideals, to the concrete aims of the craftsman as well as to scientific laws—that have obscured his doctrine, viz. that wherever there is law, there is an idea.

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[1] Nothing is. If anything is, it cannot be known. If anything is known it cannot be communicated.

[2] *Metaphys.* μ. 1078*b* 28 sqq.

[3] Cf. Arist. *Top.* θ. i. 1 *ad fin.*

[4] For whom see Dümmler, *Antisthenica* (1882, reprinted in his *Kleine Schriften*, 1901).

[5] Aristotle, *Metaphys.* 1024*b* 32 sqq.

[6] Plato, *Theaetetus*, 201 E. sqq., where, however, Antisthenes is not named, and the reference to him is sometimes doubted. But cf. Aristotle, *Met.* H 3. 1043*b* 24-28.

[7] Diog. Laërt. ii. 107.

The one in the many.

(*b*) The paradox of the one in the many is none, if the idea may be regarded as supplying a principle of nexus or organization to an indefinite multiplicity of particulars. But if Antisthenes is to be answered, a further step must be taken. The principle of difference must be carried into the field of the ideas. Not only sense is a principle of difference. The ideas are many. The multiplicity in unity must be established within thought itself. Otherwise the objection stands: man is man and good is good, but to say that man is good is clearly to say the thing that is not. Plato replies with the doctrine of the interpenetration of ideas, obviously not of all with all, but of some with some, the formula of identity in difference within thought itself. Nor can the opponent fairly refuse to admit it, if he affirms the participation of the identical with being, and denies the participation of difference with being, or affirms it with not-being. The *Sophistes* shows among other things that an identity-philosophy breaks down into a dualism of thought and expression, when it applies the predicate of unity to the real, just as the absolute pluralism on the other hand collapses into unity if it affirms or admits any form of relation whatsoever. Identity and difference are all-pervasive categories, and the speech-form and the corresponding thought-form involve both. For proposition and judgment involve subject and predicate and exhibit what a modern writer calls "identity of reference with diversity of characterization." Plato proceeds to explain by his principle of difference both privative and negative predicates, and also the possibility of false predication. It is obvious that without the principle of difference error is inexplicable. Even Plato, however, perhaps scarcely shows that with it, and nothing else but it, error is explained.

Division.

(*c*) Plato's Division, or the articulation of a relatively indeterminate and generic concept into species and sub-species with resultant determinate judgments, presumes of course the doctrine of the interpenetration of ideas laid down in the *Sophistes* as the basis of predication, but its use precedes the positive development of that formula, though not, save very vaguely, the exhibition of it, negatively, in the antinomies of the one and the many in the *Parmenides*. It is its use, however, not the theory of it, that precedes. The latter is expounded in the *Politicus* (260 sqq.) and *Philebus* (16*c* sqq.). The ideal is progressively to determine a universe of discourse till true *infimae species* are reached, when no further distinction in the determinate many is possible, though there is still the numerical difference of the indefinite plurality of particulars. The process is to take as far as possible the form of a continuous disjunction of contraries. We must bisect as far as may be, but the division is after all to be into limbs, not parts. The later examples of the *Politicus* show that the permission of three or more coordinate species is not nugatory, and that the precept of dichotomy is merely in order to secure as little of a *saltus* as possible; to avoid *e.g.* the division of the animal world into men and brutes. It is the middle range of the *μέσα* of *Philebus* 17*a* that appeals to Bacon, not only this but their mediating quality that appeals to Aristotle. The *media axiomata* of the one and the *middle term* of the other lie in the phrase. Plato's division is nevertheless neither syllogism nor *exclusiva*. It is not syllogism because it is based on the disjunctive, not on the hypothetical relation, and so extends horizontally where syllogism strikes vertically downward. Again it is not syllogism because it is necessarily and finally dialectical. It brings in the choice of an interlocutor at each stage, and so depends on a concession for what it should prove.[1] Nor is it Bacon's method of exclusions, which escapes the imputation of being dialectical, if not that of being unduly cumbrous, in virtue of the cogency of the negative instance. The Platonic division was, however, offered as the scientific method of the school. A fragment of the comic poet Epicrates gives a picture of it at work.[2] And the movement of disjunction as truly has a place in the scientific specification of a concept in all its differences as the linking of lower to higher in syllogism. The two are complementary, and the reinstatement of the disjunctive judgment to the more honourable rôle in inference has been made by so notable a modern logician as Lotze.

Combination.

(*d*) The correlative process of Combination is less elaborately sketched, but in a luminous passage in the *Politicus* (§ 278), in explaining by means of an example the nature and use of examples, Plato represents it as the bringing of one and the same element seen in diverse settings to conscious realization, with the result that it is viewed as a single truth of which the terms compared are now accepted as the differences. The learner is to be led forward to the unknown by being made to hark back to more familiar groupings of the alphabet of nature which he is coming to recognize with some certainty. To lead on, *ἐπάγειν*, is to refer back, *ἀνάγειν*,[3] to what has been correctly divined of the same elements in clearer cases. Introduction to unfamiliar collocations follows upon this, and, only so, is it possible finally to gather scattered examples into a conspectus as instances of one idea or law. This is not only of importance in the history of the terminology of logic, but supplies a philosophy of induction.

Mental synthesis.

(*e*) Back of Plato's illustration and explanation of predication and dialectical inference there lies not only the question of their metaphysical grounding in the interconnexion of ideas, but that of their epistemological presuppositions. This is dealt with in the Theaetetus (184*b* sqq.). The manifold affections of sense are not simply aggregated in the individual, like the heroes in the Trojan horse. There must be convergence in a unitary principle, soul or consciousness, which is that which really functions in perception, the senses and their organs being merely its instruments. It is this unity of apperception which enables us to combine the data of more than one sense, to affirm reality, unreality, identity, difference, unity, plurality and so forth, as also the good, the beautiful and their contraries. Plato calls these pervasive factors in knowledge *κοινά*, and describes them as developed by the soul in virtue of its own activity. They are objects of its reflection and made explicit in the few with pains and gradually.[4] That they are not, however, psychological or acquired categories, due to "the workmanship of the mind" as conceived by Locke, is obvious from their attribution to the structure of mind[5] and from their correlation with immanent principles of the objective order. Considered from the epistemological point of view, they are the implicit presuppositions of the construction or *συλλογισμός*[6] in which knowledge consists. But as ideas,[7] though of a type quite apart,[8] they have also a constitutive application to reality. Accordingly, of the selected "kinds" by means of which the interpenetration of ideas is expounded in the *Sophistes*, only motion and rest, the ultimate "kinds" in the physical world, have no counterparts in the "categories" of the *Theaetetus*. In his doctrine as to *ἕν τὸ ποιοῦν* or *κρῖνον*, as generally in that of the activity of the *νοῦς ἀπαθής*, Aristotle in the *de Anima*[9] is in the main but echoing the teaching of Plato.[10]

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[1] Aristotle, *An. Pr.* i. 31, 46*a* 32 sqq.; cf. 91*b* 12 sqq.

[2] Athenaeus ii. 59*c*. See Usener, *Organisation der wissenschaftl. Arbeit* (1884; reprinted in his *Vorträge und Aufsätze*, 1907).

[3] Socrates' reference of a discussion to its presuppositions (Xenophon, *Mem.* iv. 6, 13) is not relevant for the history of the terminology of induction.

[4] *Theaetetus*, 186*c*.

[5] Timaeus, 37*a*, *b* (quoted in H. F. Carlill's translation of the *Theaetetus*, p. 60).

[6] *Theaetetus*, 186*d*.

[7] *Sophistes*, 253*d*.

[8] *Ib. id.*; cf. *Theaetetus*, 197*d*.

[9] Aristotle, *de An.* 430*b* 5, and generally iii. 2, iii. 5.

[10] For Plato's Logic, the controversies as to the genuineness of the dialogues may be treated summarily. The *Theaetetus* labours under no suspicion. The *Sophistes* is apparently matter for animadversion by Aristotle in the *Metaphysics* and elsewhere, but derives stronger support from the testimonies to the *Politicus* which presumes it. The *Politicus* and *Philebus* are guaranteed by the use made of them in Aristotle's Ethics. The rejection of the *Parmenides* would involve the paradox of a nameless contemporary of Plato

ii. *Aristotle.*

Plato's episodic use of logical distinctions[1] is frequent. His recourse to such logical analysis as would meet the requirements of the problem in hand[2] is not rare. In the "dialectical" dialogues the question of method and of the justification of its postulates attains at least a like prominence with the ostensible subject matter. There is even formal recognition of the fact that to advance in dialectic is a greater thing than to bring any special inquiry to a successful issue.[3] But to the end there is a lack of interest in, and therefore a relative immaturity of, technique as such. In the forcing atmosphere, however, of that age of controversy, seed such as that sown in the master's treatment of the uttered λόγος[4] quickly germinated. Plato's successors in the Academy must have developed a system of grammatico-logical categories which Aristotle could make his own. Else much of his criticism of Platonic doctrine[5] does, indeed, miss fire. The gulf too, which the *Philebus*[6] apparently left unbridged between the sensuous apprehension of particulars and the knowledge of universals of even minimum generality led with Speusippus to a formula of knowledge in perception (ἐπιστημονικὴ αἴσθησις). These and like developments, which are to be divined from references in the Aristotelian writings, jejune, and, for the most part, of probable interpretation only, complete the material which Aristotle could utilize when he seceded from the Platonic school and embarked upon his own course of logical inquiry.

Syllogism.

This is embodied in the group of treatises later known as the *Organon*[7] and culminates in the theory of syllogism and of demonstrative knowledge in the *Analytics*. All else is finally subsidiary. In the well-known sentences with which the *Organon* closes[8] Aristotle has been supposed to lay claim to the discovery of the principle of syllogism. He at least claims to have been the first to dissect the procedure of the debate-game, and the larger claim may be thought to follow. In the course of inquiry into the formal consequences from probable premises, the principle of mediation or linking was so laid bare that the advance to the analytic determination of the species and varieties of syllogism was natural. Once embarked upon such an analysis, where valid process from assured principles gave truth, Aristotle could find little difficulty in determining the formula of demonstrative knowledge or science. It must be grounded in principles of assured certainty and must demonstrate its conclusions with the use of such middle or linking terms only as it is possible to equate with the real ground or cause in the object of knowledge. Hence the account of axioms and of definitions, both of substances and of derivative attributes. Hence the importance of determining how first principles are established. It is, then, a fair working hypothesis as to the structure of the *Organon* to place the *Topics*, which deal with dialectical reasoning, before the *Analytics*.[9] Of the remaining treatises nothing of fundamental import depends on their order. One, however, the *Categories*, may be regarded with an ancient commentator,[10] as preliminary to the dialectical inquiry in the *Topics*. The other, on thought as expressed in language (Περὶ ἑρμηνείας) is possibly spurious, though in any case a compilation of the Aristotelian school. If genuine, its naïve theory that thought copies things and other features of its contents would tend to place it among the earliest works of the philosopher.

The logical treatises.

Production in the form of a series of relatively self-contained treatises accounts for the absence of a name and general definition of their common field of inquiry. A more important lack which results is that of any clear intimation as to the relation in which Aristotle supposed it to stand to other disciplines. In his definite classification of the sciences,[11] into First Philosophy, Mathematics and Physics, it has no place. Its axioms, such as the law of contradiction, belong to first philosophy, but the doctrine as a whole falls neither under this head nor yet, though the thought has been entertained, under that of mathematics, since logic orders mathematical reasoning as well as all other. The speculative sciences, indeed, are classified according to their relation to form, pure, abstract or concrete, *i.e.* according to their objects. The logical inquiry seems to be conceived as dealing with the thought of which the objects are objects. It is to be regarded as a propaedeutic,[12] which, although it is in contact with reality in and through the metaphysical import of the axioms, or again in the fact that the categories, though primarily taken as forms of predication, must also be regarded as kinds of being, is not directly concerned with object-reality, but with the determination for the thinking subject of what constitutes the knowledge correlative to being. Logic, therefore, is not classed as one, still less as a branch of one, among the 'ologies, ontology not excepted.

The way in which logical doctrine is developed in the Aristotelian treatises fits in with this view. Doubtless what we have is in the main a reflex of the heuristic character of Aristotle's own work as pioneer. But it at least satisfies the requirement that the inquiry shall carry the plain man along with it. Actual modes of expression are shown to embody distinctions which average intelligence can easily recognize and will readily acknowledge, though they may tend by progressive rectification fundamentally to modify the assumption natural to the level of thought from which he begins. Thus we start[13] from the point of view of a world of separate persons and things, in which thought mirrors these concrete realities, taken as ultimate subjects of predicates. It is a world of communication of thought, where persons as thinkers need to utter in language truths objectively valid for the *mundus communis*. In these truths predicates are accepted or rejected by subjects, and therefore depend on the reflection of fact in λόγοι (propositions). These are combinatory of parts, attaching or detaching predicates, and so involving

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and Aristotle who was inferior as a metaphysician to neither. No other dialogue adds anything to the *logical* content of these.

Granted their genuineness, the relative dating of three of them is given, viz. *Theaetetus*, *Sophistes* and *Politicus* in the order named. The *Philebus* seems to presuppose *Politicus*, 283-284, but if this be an error, it will affect the logical theory not at all. There remains the *Parmenides*. It can scarcely be later than the *Sophistes*. The antinomies with which it concludes are more naturally taken as a prelude to the discussion of the *Sophistes* than as an unnecessary retreatment of the doctrine of the one and the many in a more negative form. It may well be earlier than the *Theaetetus* in its present form. The stylistic argument shows the *Theaetetus* relatively early. The maturity of its philosophic outlook tends to give it a place relatively advanced in the Platonic canon. To meet the problem here raised, the theory has been devised of an earlier and a later version. The first may have linked on to the series of Plato's dialogues of search, and to put the *Parmenides* before it is impossible. The second, though it might still have preceded the *Parmenides* might equally well have followed the negative criticism of that dialogue, as the beginning of reconstruction. For Plato's logic this question only has interest on account of the introduction of an Ἀριστοτέλης in a non-speaking part in the *Parmenides*. If this be pressed as suggesting that the philosopher Aristotle was already in full activity at the date of writing, it is of importance to know what Platonic dialogues were later than the début of his critical pupil.

On the stylistic argument as applied to Platonic controversies Janell's *Quaestiones Platonicae* (1901) is important. On the whole question of genuineness and dates of the dialogues, H. Raeder, *Platons philosophische Entwickelung* (1905), gives an excellent conspectus of the views held and the grounds alleged. See also PLATO.

[1] *E.g.* that of essence and accident, *Republic*, 454.

[2] *E.g.* the discussion of correlation, *ib.* 437 sqq.

[3] *Politicus*, 285*d*.

[4] *Sophistes*, 261*c* sqq.

[5] *E.g.* in *Nic. Eth.* i. 6.

[6] *Philebus*, 16*d*.

[7] Principal edition still that of Waitz, with Latin commentary, (2 vols., 1844–1846). Among the innumerable writers who have thrown light upon Aristotle's logical doctrine, St Hilaire, Trendelenburg, Ueberweg, Hamilton, Mansel, G. Grote may be named. There are, however, others of equal distinction. Reference to Prantl, *op. cit.*, is indispensable. Zeller, *Die Philosophie der Griechen*, ii. 2, "Aristoteles" (3rd ed., 1879), pp. 185-257 (there is an Eng. trans.), and Maier, *Die Syllogistik des Aristoteles* (2 vols., 1896, 1900) (some 900 pp.), are also of first-rate importance.

[8] *Sophist. Elench.* 184, espec. *b* 1-3, but see Maier, *loc. cit.* i. 1.

[9] References such as 18*b* 12 are the result of subsequent editing and prove nothing. See, however, ARISTOTLE.

[10] Adrastus is said to have called them πρὸ τῶν τοπικῶν.

[11] *Metaphys.* E. 1.

[12] *De Part. Animal.* A. 1, 639*a* 1 sqq.; cf. *Metaphys.* 1005*b* 2 sqq.

[13] *De Interpretatione* 16*a* sqq.

subject, predicate and copula.[1] At this stage we are as much concerned with speech-forms as the thought-forms of which they are conventional symbols, with Plato's analysis, for instance, into a noun and a verb, whose connotation of time is as yet a difficulty. The universal of this stage is the universal of fact, what is recognized as predicable of a plurality of subjects. The dialectical doctrine of judgment as the declaration of one member of a disjunction by contradiction, which is later so important, is struggling with one of its initial difficulties,[2] viz. the contingency of particular events future, the solution of which remains imperfect.[3]

The Categories.

The doctrine of the *Categories* is still on the same level of thought,[4] though its grammatico-logical analysis is the more advanced one which had probably been developed by the Academy before Aristotle came to think of his friends there as "them" rather than "us." It is what in one direction gave the now familiar classification of parts of speech, in the other that of thought-categories underlying them. If we abstract from any actual combination of subject and predicate and proceed to determine the types of predicate asserted in simple propositions of fact, we have on the one hand a subject which is never object, a "first substance" or concrete thing, of which may be predicated in the first place "second substance" expressing that it is a member of a concrete class, and in the second place quantity, quality, correlation, action and the like. The list follows the forms of the Greek language so closely that a category emerges appropriated to the use of the perfect tense of the middle voice to express the relation of the subject to a garb that it dons. In all this the individual is the sole self-subsistent reality. Truth and error are about the individual and attach or detach predicates correctly and incorrectly. There is no committal to the metaphysics in the light of which the logical inquiry is at last to find its complete justification. The point of view is to be modified profoundly by what follows—by the doctrine of the class-concept behind the class, of the form or idea as the constitutive formula of a substance, or, again, by the requirement that an essential attribute must be grounded in the nature or essence of the substance of which it is predicated, and that such attributes alone are admissible predicates from the point of view of the strict ideal of science. But we are still on the ground of common opinion, and these doctrines are not yet laid down as fundamental to the development.

The Topics.

Dialectic then, though it may prove to be the ultimate method of establishing principles in philosophy,[5] starts from probable and conceded premises,[6] and deals with them only in the light of common principles such as may be reasonably appealed to or easily established against challenge. To the expert, in any study which involves contingent matter, *i.e.* an irreducible element of indetermination, *e.g.* to the physician, there is a specific form of this, but the reflection that this is so is something of an afterthought. We start with what is prima facie given, to return upon it from the ground of principles clarified by the sifting process of dialectic[7] and certified by νοῦς. The *Topics* deal with dialectic and constitute an anatomy of argumentation, or, according to what seems to be Aristotle's own metaphor, a survey of the tactical vantage-points (τόποι) for the conflict of wits in which the prize is primarily victory, though it is a barren victory unless it is also knowledge. It is in this treatise that what have been called "the conceptual categories"[8] emerge, viz. the *predicables*, or heads of predication as it is analysed in relation to the provisional theory of definition that dialectic allows and requires. A predicate either is expressive of the essence or part of the essence of the subject, viz. that original group of mutually underivable attributes of which the absence of any one destroys its right to the class-name, or it is not. Either it is convertible with the subject or it is not. Here then judgment, though still viewed as combinatory, has the types which belong to coherent systems of implication discriminated from those that predicate coincidence or accident, *i.e.* any happening not even derivatively essential from the point of view of the grouping in which the subject has found a place. In the theory of dialectic any predicate may be suggested for a subject, and if not affirmed of it, must be denied of it, if not denied must be affirmed. The development of a theory of the ground on which subjects claim their predicates and disown alien predicates could not be long postponed. In practical dialectic the unlimited possibility was reduced to manageable proportions in virtue of the groundwork of received opinion upon which the operation proceeded. It is in the *Topics*, further, that we clearly have a first treatment of syllogism as formal implication, with the suggestion that advance must be made to a view of its use for material implication from true and necessary principles. It is in the *Topics*,[9] again, that we have hints at the devices of an inductive process, which, as dialectical, throw the burden of producing contradictory instances upon the other party to the discussion. In virtue of the common-stock of opinion among the interlocutors and their potentially controlling audience, this process was more valuable than appears on the face of things. Obviously tentative, and with limits and ultimate interpretation to be determined elsewhere, it failed to bear fruit till the Renaissance, and then by the irony of fate to the discrediting of Aristotle. In any case, however, definition, syllogism, induction all invited further determination, especially if they were to take their place in a doctrine of truth or knowledge. The problem of analytic, *i.e.* of the resolution of the various forms of inference into their equivalents in that grouping of terms or premises which was most obviously cogent, was a legacy of the *Topics*. The debate-game had sought for diversion and found truth, and truth raised the logical problem on a different plane.

Class concept.

The Prior Analytics.

At first the problem of formal analysis only. We proceed with the talk of instances and concern ourselves first with relations of inclusion and exclusion. The question is as to membership of a class, and the dominant formula is the *dictum de omni et nullo*. Until the view of the individual units with which we are so far familiar has undergone radical revision, the primary inquiry must be into the forms of a class-calculus. Individuals fall into groups in virtue of the possession of certain predicates. Does one group include, or exclude, or intersect another with which it is compared? We are clearly in the field of the diagrams of the text-books, and much of the phraseology is based upon an original graphic representation in extension. The middle term, though conceived as an intermediary or linking term, gets its name as intermediate in a homogeneous scheme of quantity, where it cannot be of narrower extension than the subject nor wider than the predicate of the conclusion.[10] It is also, as Aristotle adds,[11] middle in position in the syllogism that concludes to a universal affirmative.[11] Again, so long as we keep to the syllogism as complete in itself and without reference to its place in the great structure of knowledge, the nerve of proof cannot be conceived in other than a formal manner. In analytic we work with an ethos different from that of dialectic. We presume truth and not probability or concession, but a true conclusion can follow from false premises, and it is only in the attempt to derive the premises in turn from their grounds that we unmask the deception. The passage to the conception of system is still required. The *Prior Analytics* then are concerned with a formal logic to be knit into a system of knowledge of the real only in virtue of a formula which is at this stage still to seek. The forms of syllogism, however, are tracked successfully through their figures, *i.e.* through the positions of the middle term that Aristotle recognizes as of actual employment, and all their moods, *i.e.* all differences of affirmative and negative, universal and particular within the figures, the cogent or legitimate forms are alone left standing, and the formal doctrine of syllogism is complete. Syllogism already defined[1] becomes through exhibition in its valid forms clear in its principle. It is a speech-and-thought-form (λόγος) in which certain matters being posited something other than the matters posited necessarily results because of them, and, though it still needs to receive a deeper meaning when presumed truth gives way to necessary truth of premises, the notion of the class to that of the class-concept, collective fact to universal law, its formal claim is manifest. "Certain matters being posited." Subject and predicate not already seen to be conjoined must be severally known to be in relation with that which joins them, so that more than one direct conjunction must be given. "Of necessity." If what are to be conjoined are severally in relation to a common third it does perforce relate or conjoin them. "Something other." The conjunction was by hypothesis not given, and is a new result by no means to be reached, apart from direct perception save by use of at least two given conjunctions. "Because of them," therefore. Yet so long as the class-view is prominent, there is a suggestion of a begging of the question. The class is either constituted by enumeration of its members, and, passing by the difficulty involved in the thought of "its" members, is an empirical universal of fact merely, or it is grounded in the class-concept. In the first case it is a formal scheme which helps knowledge and the theory of knowledge not at all. We need then to develop the alternative, and to pass from the external aspect of all-ness to the intrinsic ground of it in the universal *καθ’ αὐτὸ καὶ ᾗ αὐτό*, which, whatsoever the assistance it receives from induction in some sense of the word, in the course of its development for the individual mind, is secured against dependence on instances by the decisive fiat or guarantee of *νοῦς*, insight into the systematic nexus of things. The conception of linkage needs to be deepened by the realization of the middle term as the ground of nexus in a real order which is also rational.

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[1] *De Interpretatione* 16*a* 24-25.

[2] *Ib.* 18*a* 28 sqq.

[3] *Ib.* 19*a* 28-29.

[4] As shown *e.g.* by the way in which the relativity of sense and the object of sense is conceived, 7*b* 35-37.

[5] *Topics* 101*a* 27 and 36-*b* 4.

[6] *Topics* 100.

[7] *Politics* 1282*a* 1 sqq.

[8] 103*b* 21.

[9] *Topics* 160*a* 37-*b* 5.

[10] This is the explanation of the formal definition of induction, *Prior Analytics*, ii. 23, 68*b* 15 sqq.

[11] 25*b* 36.

Problem of inference.

Nous.

Aristotle's solution of the paradox of inference, viz. of the fact that in one sense to go beyond what is in the premises is fallacy, while in another sense not to go beyond them is futility, lies in his formula of implicit and explicit, potential and actual.[2] The real nexus underlying the thought-process is to be articulated in the light of the voucher by intelligence as to the truth of the principles of the various departments of knowledge which we call sciences, and at the ideal limit it is possible to transform syllogism into systematic presentation, so that, differently written down, it is definition. But for human thought sense, with its accidental setting in matter itself incognizable is always with us. The activity of *νοῦς* is never so perfectly realized as to merge implication in intuition. Syllogism must indeed be objective, *i.e.* valid for any thinker, but it is also a process in the medium of individual thinking, whereby new truth is reached. A man may know that mules are sterile and that the beast before him is a mule, and yet believe her to be in foal "not viewing the several truths in connexion."[3] The doctrine, then, that the universal premise contains the conclusion not otherwise than potentially is with Aristotle cardinal. The datum of sense is only retained through the universal.[4] It is possible to take a universal view with some at least of the particular instances left uninvestigated.[5] Recognition that the class-concept is applicable may be independent of knowledge of much that it involves. Knowledge of the implications of it does not depend on observation of all members of the class. Syllogism as formula for the exhibition of truth attained, and construction or what not as the instrumental process by which we reach the truth, have with writers since Hegel and Herbart tended to fall apart. Aristotle's view is other. Both are syllogisms, though in different points of view. For this reason, if for no other, the conception of movement from the potential possession of knowledge to its actualization remains indispensable. Whether this is explanation or description, a problem or its solution, is of course another matter.

Posterior Analytics.

In the *Posterior Analytics* the syllogism is brought into decisive connexion with the real by being set within a system in which its function is that of material implication from principles which are primary, immediate and necessary truths. Hitherto the assumption of the probable as true rather than as what will be conceded in debate[6] has been the main distinction of the standpoint of analytic from that of dialectic. But the true is true only in reference to a coherent system in which it is an immediate ascertainment of *νοῦς*, or to be deduced from a ground which is such. The ideal of science or demonstrative knowledge is to exhibit as flowing from the definitions and postulates of a science, from its special principles, by the help only of axioms or principles common to all knowledge, and these not as premises but as guiding rules, all the properties of the subject-matter, *i.e.* all the predicates that belong to it in its own nature. In the case of any subject-kind, its definition and its existence being avouched by *νοῦς*, "heavenly body" for example, the problem is, given the fact of a non-self-subsistent characteristic of it, such as the eclipse of the said body, to find a ground, a *μέσον* which expressed the *αἴτιον*, in virtue of which the adjectival concept can be exhibited as belonging to the subject-concept *καθ’ αὐτὸ* in the strictly adequate sense of the phrase in which it means also *ᾗ αὐτὸ*.[7] We are under the necessity then of revising the point of view of the syllogism of all-ness. We discard the conception of the universal as a predicate applicable to a plurality, or even to all, of the members of a group. To know merely *κατὰ παντὸς* is not to know, save accidentally. The exhaustive judgment, if attainable, could not be known to be exhaustive. The universal is the ground of the empirical "all" and not conversely. A formula such as the equality of the interior angles of a triangle to two right angles is only scientifically known when it is not of isosceles or scalene triangle that it is known, nor even of all the several types of triangle collectively, but as a predicate of triangle recognized as the widest class-concept of which it is true, the first stage in the progressive differentiation of figure at which it can be asserted.[8]

Three points obviously need development, the nature of definition, its connexion with the syllogism in which the middle term is cause or ground, and the way in which we have assurance of our principles.

Definition.

Definition is either of the subject-kind or of the property that is grounded in it. Of the self-subsistent definition is *οὐσίας τις γνωρισμός*[9] by exposition of genus and differentia.[10] It is indemonstrable. It presumes the reality of its subject in a postulate of existence. It belongs to the principles of demonstration. *Summa genera* and groups below *infimae species* are indefinable. The former are susceptible of elucidation by indication of what falls under them. The latter are only describable by their accidents. There can here be no true differentia. The artificiality of the limit to the articulation of species was one of the points to which the downfall of Aristotle's influence was largely due. Of a non-self-subsistent or attributive conception definition in its highest attainable form is a recasting of the syllogism, in which it was shown that the attribute was grounded in the substance or self-subsistent subject of which it is. Eclipse of the moon, *e.g.* is privation of light from the moon by the interposition of the earth between it and the sun. In the scientific syllogism the interposition of the earth is the middle term, the cause or "because" (*διότι*), the residue of the definition is conclusion. The difference then is in verbal expression, way of putting, inflexion.[11] If we pluck the fruit of the conclusion, severing its nexus with the stock from which it springs, we have an imperfect form of definition, while, if further we abandon all idea of making it adequate by exhibition of its ground, we have, with still the same form of words, a definition merely nominal or lexicographical. In the aporematic treatment of the relation of definition and syllogism identical as to one form and in one view, distinct as to another form and in another view, much of Aristotle's discussion consists.

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[1] *Prior Analytics*, i. 1. 24*a* 18-20, *Συλλογισμὸς δὲ ἐστὶ λόγος ἐν ᾧ τεθέντων τινῶν ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει τῷ ταῦτα εἶναι.* The equivalent previously in *Topics* 100*a* 25 sqq.

[2] *Prior Analytics*, ii. 21; *Posterior Analytics*, i. 1.

[3] 67*a* 33-37, *μὴ συνθεωρῶν τὸ καθ’ ἑκάτερον.*

[4] 67*a* 39-*b* 3.

[5] 79*a* 4-5.

[6] 24*b* 10-11.

[7] *Posterior Analytics*, i. 4 *καθ’ αὐτὸ* means (1) contained in the definition of the subject; (2) having the subject contained in its definition, as being an alternative determination of the subject, crooked, *e.g.* is *per se* of line; (3) self-subsistent; (4) connected with the subject as consequent to ground. Its needs stricter determination therefore.

[8] 73*b* 26 sqq., 74*a* 37 sqq.

[9] 90*b* 16.

[10] *Metaphys.* Z. 12, H. 6 ground this formula metaphysically.

[11] 94*a* 12, 75*b* 32.

The middle term.

The rest is a consideration of scientific inquiry as converging in *μέσου ζήτησις*, the investigation of the link or "because" as ground in the nature of things. Τὸ *μὲν γὰρ αἴτιον τὸ μέσον*[1] real ground and thought link fall together. The advance from syllogism as formal implication is a notable one. It is not enough to have for middle term a *causa cognoscendi* merely. We must have a *causa essendi*. The planets are near, and we know it by their not twinkling,[2] but science must conceive their nearness as the cause of their not twinkling and make the *prius* in the real order the middle term of its syllogism. In this irreversible catena proceeding from ground to consequent, we have left far behind such things as the formal parity of genus and differentia considered as falling under the same predicable,[3] and hence justified in part Porphyry's divergence from the scheme of predicables. We need devices, indeed, to determine priority or superior claim to be "better known absolutely or in the order of nature," but on the whole the problem is fairly faced.[4]

Of science Aristotle takes for his examples sometimes celestial physics, more often geometry or arithmetic, sometimes a concrete science, *e.g.* botany.[5] In the field of pure form, free from the disconcerting surprises of sensible matter and so of absolute necessity, no difficulty arises as to the deducibility of the whole body of a science from its first principles. In the sphere of abstract form, mathematics, the like may be allowed, abstraction being treated as an elimination of matter from the *σύνολον* by one act. When we take into account relative matter, however, and traces of a conception of abstraction as admitting of degree,[6] the question is not free from difficulty. In the sphere of the concrete sciences where law obtains only *ὡς ἐπὶ τὸ πολὺ* this ideal of science can clearly find only a relative satisfaction with large reserves. In any case, however, the problem as to first principles remains fundamental.

Formal and scientific principles.

If we reject the infinite regress and the circle in proof (*circulus in probando*) which resolves itself ultimately into proving A by B and B by A,[7] we are confronted by the need for principles of two kinds, those which condition all search for truth, and those which are the peculiar or proper principles of special sciences, their "positions," viz. the definitions of their subjects and the postulates of the existence of these. All are indemonstrable and cannot be less sure than the body of doctrine that flows from them. They must indeed be recognized as true, primary, causative and the like. But[8] they are not congenitally present in the individual in a determinate shape. The doctrine of latency is mystical and savours of Plato's reminiscence (*anamnesis*). Yet they must have something to develop from, and thereupon Aristotle gives an account of a process in the psychological mechanism which he illustrates by comparative psychology, wherein a *λόγος* or meaning emerges, a "first" universal recognized by induction.

Induction and dialectic.

Yet *νοῦς*, intelligence, is the principle of first principles. It is infallible, while, whatever the case with perception of the special sensibles,[9] the process which combines particulars is not. On the side of induction we find that experience is said to give the specific principles,[10] "the phenomena being apprehended in sufficiency." On the side of intuition, self-evidence of scientific principles is spoken of.[11] Yet dialectic is auxiliary and of methodological importance in their establishment.[12] Mutually limiting statements occur almost or quite side by side. We cannot take first principles "as the bare precipitate of a progressively refined analysis"[13] nor on the other as constitutive a priori forms. The solution seems to lie in the conception of a process that has a double aspect. On the one hand we have confrontation with fact, in which, in virtue of the rational principle which is the final cause of the phenomenal order, intelligence will find satisfaction. On the other we have a stage at which the rational but as yet not reasoned concepts developed in the medium of the psychological mechanism are subjected to processes of reflective comparison and analysis, and, with some modification, maintained against challenge, till at length the ultimate universals emerge, which rational insight can posit as certain, and the whole hierarchy of concepts from the "first" universals to *τὰ ἀμερῆ* are intuited in a coherent system. Aristotle's terminology is highly technical, but, as has often been observed, not therefore clear. Here two words at least are ambiguous, "principle" and "induction." By the first he means any starting-point, "that from which the matter in question is primarily to be known,"[14] particular facts therefore, premises, and what not. What then is meant by principles when we ask in the closing chapter of his logic how they become known? The data of sense are clearly not the principles in question here. The premises of scientific syllogisms may equally be dismissed. Where they are not derivative they clearly are definitions or immediate transcripts from definitions. There remain, then, primary definitions and the postulates of their realization, and the axioms or common principles, "which he must needs have who is to reach any knowledge."[15] In the case of the former, special each to its own science, Aristotle may be thought to hold that they are the product of the psychological mechanism, but are ascertained only when they have faced the fire of a critical dialectic and have been accepted from the point of view of the integral rationality of the system of concepts. Axioms, on the other hand, in which the sciences interconnect[16] through the employment of them in a parity of relation, seem to be implicit indeed in the psychological mechanism, but to come to a kind of explicitness in the first reflective reaction upon it, and without reference to any particular content of it. They are not to be used as premises but as immanent laws of thought, save only when an inference from true or admitted premises and correct in form is challenged. The challenge must be countered in a *reductio ad impossibile* in which the dilemma is put. Either this conclusion or the denial of rationality. Even these principles, however, may get a greater explicitness by dialectical treatment.[17] The relation, then, of the two orders of principle to the psychological mechanism is different. The kind of warrant that intelligence can give to specific principles falls short of infallibility. Celestial physics, with its pure forms and void of all matter save extension, is not such an exemplary science after all. Rationality is continuous throughout. A *λόγος* emerges with some beings in direct sequence upon the persistence of impressions.[18] Sense is of the "first" universal, the form, though not of the ultimate universal. The rally from the rout in Aristotle's famous metaphor is of units that already belong together, that are of the same regiment or order. On the other hand, rationality has two stages. In the one it is relatively immersed in sense, in the other relatively free. The same break is to be found in the conception of the relation of receptive to active mind in the treatise *Of the Soul*.[19] The one is impressed by things and receives their form without their matter. The other is free from impression. It thinks its system of concepts freely on the occasion of the affections of the receptivity. Aristotle is fond of declaring that knowledge is of the universal, while existence or reality is individual. It seems to follow that the cleavage between knowledge and reality

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[1] 90*a* 6. Cf. Ueberweg, *System der Logik*, § 101.

[2] 78*a* 30 sqq.

[3] *Topics*, 101*b* 18, 19.

[4] *Posterior Analytics*, ii. 13.

[5] *Posterior Analytics*, ii. 16.

[6] *Posterior Analytics*, i. 13 *ad. fin.*, and i. 27. The form which a mathematical science treats as relatively self-subsistent is certainly not the constitutive idea.

[7] *Posterior Analytics*, i. 3.

[8] *Posterior Analytics*, ii. 19.

[9] *De Anima*, 428*b* 18, 19.

[10] *Prior Analytics*, i. 30, 46*a* 18.

[11] *Topics*, 100*b* 20, 21.

[12] *Topics*, 101*a* 25, 36-37, *b*1-4, &c.

[13] Zeller (*loc. cit.* p. 194), who puts this formula in order to reject it.

[14] *Metaphys.* Δ 1, 1013*a* 14.

[15] *Posterior Analytics*, 72*a* 16 seq.

[16] *Posterior Analytics*, 77*a* 26, 76*a* 37 sqq.

[17] *Metaphys.* Γ.

[18] *Posterior Analytics*, ii. 19.

[19] *de Anima*, iii. 4-6.

Knowledge and reality.

Conclusions as to induction.

is not bridged by the function of νοῦς in relation to "induction." What is known is not real, and what is real is not known. The *nodus*[1] has its cause in the double sense of the word "universal" and a possible solution in the doctrine of εἶδος. The "form" of a thing constitutes it what it is, and at the same time, therefore, is constitutive of the group to which it belongs. It has both individual and universal reference. The individual is known in the εἶδος, which is also the first universal in which by analysis higher universals are discoverable. These are predicates of the object known, ways of knowing it, rather than the object itself. The suggested solution removes certain difficulties, but scarcely all. On seeing Callias my perception is of man, not Callias, or even man-Callias. The recognition of the individual is a matter of his accidents, to which even sex belongs, and the gap from lowest universal to individual may still be conceived as unbridged. It is in induction, which claims to start from particulars and end in universals,[2] that we must, if anywhere within the confines of logical inquiry, expect to find the required bridge. The Aristotelian conception of induction, however, is somewhat ambiguous. He had abandoned for the most part the Platonic sense of the corresponding verb, viz. to lead forward to the as yet unknown, and his substitute is not quite clear. It is scarcely the military metaphor. The adducing of a witness for which he uses the verb[3] is not an idea that covers all the uses.[4] Perhaps confrontation with facts is the general meaning. But how does he conceive of its operation? There is in the first place the action of the psychological mechanism in the process from discriminative sense upwards wherein we realize "first" universals.[5] This is clearly an unreflective, prelogical process, not altogether lighted up by our retrojection upon it of our view of dialectical induction based thereon. The immanent rationality of this first form, in virtue of which at the stage when intelligence acts freely on the occasion of the datum supplied it recognizes continuity with its own self-conscious process, is what gives the dialectical type its meaning. Secondly we have this dialectical "induction as to particulars by grouping of similars"[6] whose liability to rebuttal by an exception has been already noted in connexion with the limits of dialectic. This is the incomplete induction by simple enumeration which has so often been laughed to scorn. It is a heuristic process liable to failure, and its application by a nation of talkers even to physics where non-expert opinion is worthless somewhat discredited it. Yet it was the fundamental form of induction as it was conceived throughout the scholastic period. Thirdly we have the limiting cases of this in the inductive syllogism διὰ πάντων,[7] a syllogism in the third figure concluding universally, and yet valid because the copula expresses equivalence, and in analogy[8] in which, it has been well said, instances are weighed and not counted. In the former it has been noted[9] that Aristotle's illustration does not combine particular facts into a lowest concept, but specific concepts into a generic concept, and[10] that in the construction of definite inductions the ruling thought with Aristotle is already, though vaguely, that of causal relation. It appears safer, notwithstanding, to take the less subtle interpretation[11] that dialectical induction struggling with instances is formally justified only at the limit, and that this, where we have exhausted and know that we have exhausted the cases, is in regard to individual subjects rarely and accidentally reached, so that we perforce illustrate rather from the definite class-concepts falling under a higher notion. After all, Aristotle must have had means by which he reached the conclusions that horses are long-lived and lack gall. It is only then in the rather mystical relation of νοῦς to the first type of induction as the process of the psychological mechanism that an indication of the direction in which the bridge from individual being to universal knowledge is to be found can be held to lie.

Summary.

Enough has been said to justify the great place assigned to Aristotle in the history of logic. Without pressing metaphysical formulae in logic proper, he analysed formal implication, grounded implication as a mode of knowledge in the rationality of the real, and developed a justificatory metaphysic. He laid down the programme which the after history of logic was to carry out. We have of course abandoned particular logical positions. This is especially to be noted in the theory of the proposition. The individualism with which he starts, howsoever afterwards mitigated by his doctrine of τὸ τί ἦν εἶναι or εἶδος constituting the individual in a system of intelligible relations, confined him in an inadmissible way to the subject-attribute formula. He could not recognize such vocables as the impersonals for what they were, and had perforce to ignore the logical significance of purely reciprocal judgments, such as those of equality. There was necessarily a "sense" or direction in every proposition, with more than the purely psychological import that the advance was from the already mastered and familiar taken as relatively stable, to the new and strange. Many attributes, too, were predicable, even to the end, in an external and accidental way, not being derivable from the essence of the subject. The thought of contingency was too easily applied to these attributes, and an unsatisfactory treatment of modality followed. It is indeed the doctrine of the intractability of matter to form that lies at the base of the paradox as to the disparateness of knowledge and the real already noted. On the one hand Aristotle by his doctrine of matter admitted a surd into his system. On the other, he assigned to νοῦς with its insight into rationality too high a function with regard to the concrete in which the surd was present, a power to certify the truth of scientific principles. The example of Aristotle's view of celestial physics as a science of pure forms exhibits both points. On the Copernican change the heavenly bodies were recognized as concrete and yet subject to calculable law. Intelligence had warranted false principles. The moral is that of the story of the heel of Achilles.

To return to logic proper. The Aristotelian theory of the universal of science as secure from dependence on its instances and the theory of linking in syllogism remain a heritage for all later logic, whether accepted in precisely Aristotle's formula or no. It is because the intervening centuries had the Aristotelian basis to work on, sometimes in reduced quantity and corrupt form, but always in some quantity and some form, that the rest of our logical tradition is what it is. We stand upon his shoulders.

iii. *Later Greek Logic.*

After Aristotle we have, as regards logic, what the verdict of after times has rightly characterized as an age of *Epigoni*. So far as the Aristotelian framework is accepted we meet only minor corrections and extensions of a formal kind. If there is conscious and purposed divergence from Aristotle, inquiry moves, on the whole, within the circle of ideas where Aristotelianism had fought its fight and won its victory. Where new conceptions emerge, the imperfection of the instruments, mechanical and methodological, of the sciences renders them unfruitful, until their rediscovery in a later age. We have activity without advance, diversity without development. Attempts at comprehensiveness end in the compromises of eclecticism.

The Peripatetics.

Illustrations are not far to seek. Theophrastus and in general the elder Peripatetics, before the rise of new schools with new lines of cleavage and new interests had led to new antagonisms and new alliances, do not break away from the Aristotelian metaphysic. Their interests, however, lie in the sublunary sciences in which the substantive achievement of the school was to be found. With Theophrastus, accordingly, in his botanical inquiries, for example, the alternatives of classification, the normal sequence of such and such a character upon such another, the conclusion of rational probability, are what counts. It is perhaps not wholly fanciful to connect with this attitude the fact that Aristotle's pupils dealt with a surer hand than the master with the conclusions from premises of unlike modality, and that a formal advance of some significance attributable to Theophrastus and Eudemus is the doctrine of the hypothetical and disjunctive syllogisms.

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[1] *Metaphys.* M. 1087*a* 10-12; Zeller *loc. cit.* 304 sqq.; McLeod Innes, *The Universal and Particular in Aristotle's Theory of Knowledge* (1886).

[2] *Topics*, 105*a* 13.

[3] *Metaphys.* 995*a* 8.

[4] *E.g.*, *Topics*, 108*b* 10, "to induce" the universal.

[5] *Posterior Analytics*, ii. 19, 100*b* 3, 4.

[6] *Topics*, i. 18, 108*b* 10.

[7] *Prior Analytics*, ii. 23.

[8] Παράδειγμα, *Prior Analytics*, ii. 24.

[9] Sigwart, *Logik*, Eng. trans. vol. ii. p. 292 and elsewhere.

[10] Ueberweg, *System*, § 127, with a ref. to *de Partibus Animalium*, 667*a*.

[11] See 67*a* 17 ἐξ ἁπάντων τῶν ἀτόμων.

The Stoics.

The Stoics are of more importance. Despite the fact that their philosophic interests lay rather in ethics and physics, their activity in what they classified as the third department of speculation was enormous and has at least left ineffaceable traces on the terminology of philosophy. Logic is their word, and consciousness, impression and other technical words come to us, at least as technical words, from Roman Stoicism. Even inference, though apparently not a classical word, throws back to the Stoic name for a conclusion.[1] In the second place, it is in the form in which it was raised in connexion with the individualistic theory of perception with which the Stoics started, that one question of fundamental importance, viz. that of the criterion of truth, exercised its influence on the individualists of the Renaissance. Perception, in the view of the Stoics, at its highest both revealed and guaranteed the being of its object. Its hold upon the object involved the discernment that it could but be that which it purported to be. Such "psychological certainty" was denied by their agnostic opponents, and in the history of Stoicism we have apparently a modification of the doctrine of φαντασία καταληπτική with a view to meet the critics, an approximation to a recognition that the primary conviction might meet with a counter-conviction, and must then persist undissipated in face of the challenge and in the last resort find verification in the haphazard instance, under varying conditions, in actual working. The controversy as to the self-evidence of perception in which the New Academy effected some sort of conversion of the younger Stoics, and in which the Sceptics opposed both, is one of the really vital issues of the decadence.

Another doctrine of the Stoics which has interest in the light of certain modern developments is their insistence on the place of the λεκτόν in knowledge. Distinct alike from thing and mental happening, it seems to correspond to "meaning" as it is used as a technical phrase now-a-days. This anticipation was apparently sterile. Along the same lines is their use of the hypothetical form for the universal judgment, and their treatment of the hypothetical form as the typical form of inference.

The Stoical categories, too, have an historical significance. They are apparently offered in place of those of Aristotle, an acquaintance with whose distinctions they clearly presume. Recognizing a linguistic side to "logical" theory with a natural development in rhetoric, the Stoics endeavour to exorcise considerations of language from the contrasted side. They offer pure categories arising in series, each successive one presupposing those that have gone before. Yet the substance, quality, condition absolute (πῶς ἔχον) and condition relative of Stoicism have no enduring influence outside the school, though they recur with eclectics like Galen. The Stoics were too "scholastic" in their speculations.

Epicureans.

In Epicureanism logic is still less in honour. The practical end, freedom from the bondage of things with the peace it brings, is all in all, and even scientific inquiry is only in place as a means to this end. Of the apparatus of method the less the better. We are in the presence of a necessary evil. Yet, in falling back, with a difference, upon the atomism of Democritus, Epicurus had to face some questions of logic. In the inference from phenomena to further phenomena positive verification must be insisted on. In the inference from phenomena to their non-phenomenal causes, the atoms with their inaccessibility to sense, a different canon of validity obtains, that of non-contradiction.[2] He distinguishes too between the inference to combination of atoms as universal cause, and inference to special causes beyond the range of sense. In the latter case alternatives may be acquiesced in.[3] The practical aim of science is as well achieved if we set forth possible causes as in showing the actual cause. This pococurantism might easily be interpreted as an insight into the limitations of inverse method as such or as a belief in the plurality of causes in Mill's sense of the phrase. More probably it reflects the fact that Epicurus was, according to tradition through Nausiphanes, on the whole dominated by the influences that produced Pyrrhonism. Democritean physics without a calculus had necessarily proved sterile of determinate concrete results, and this was more than enough to ripen the naturalism of the utilitarian school into scepticism. Some reading between the lines of Lucretius has led the "logic" of Epicurus to have an effect on the modern world, but scarcely because of its deserts.

The Sceptics.

The school of Pyrrho has exercised a more legitimate influence. Many of the arguments by which the Sceptics enforced their advocacy of a suspense of judgment are antiquated in type, but many also are, within the limits of the individualistic theory of knowledge, quite unanswerable. Hume had constant recourse to this armoury. The major premise of syllogism, says the Pyrrhonist, is established inductively from the particular instances. If there be but one of these uncovered by the generalization, this cannot be sound. If the crocodile moves its upper, not its lower, jaw, we may not say that all animals move the lower jaw. The conclusion then is really used to establish the major premise, and if we still will infer it therefrom we fall into the circular proof.[4] Could Mill say more? But again. The inductive enumeration is either of all cases or of some only. The former is in an indeterminate or infinite subject-matter impossible. The latter is invalid.[5] Less familiar to modern ears is the contention that proof needs a standard or criterion, while this standard or criterion in turn needs proof. Or still more the dialectical device by which the sceptic claims to escape the riposte that his very argument presumes the validity of this or that principle, viz. the doctrine of the equipollence of counter-arguments. Of course the counter-contention is no less valid! So too when the reflection is made that scepticism is after all a medicine that purges out itself with the disease, the disciple of Pyrrho and Aenesidemus bows and says, Precisely! The sceptical suspension of judgment has its limits, however. The Pyrrhonist will act upon a basis of probabilities. Nay, he even treats the idea of cause[6] as probable enough so long as nothing more than action upon expectation is in question. He adds, however, that any attempt to establish it is involved in some sort of dilemma. That, for instance, cause as the correlate of effect only exists with it, and accordingly, cause which is come while effect is still to come is inconceivable.[7] From the subjectivist point of view, which is manifestly fundamental through most of this, such arguments suasory of the Pyrrhonist suspense of judgment (ἐποχή) are indeed hard to answer. It is natural, then, that the central contribution of the Sceptics to the knowledge controversy lies in the modes (τρόποι) in which the relativity of phenomena is made good, that these are elaborated with extreme care, and that they have a modern ring and are full of instruction even to-day. Scepticism, it must be confessed, was at the least well equipped to expose the bankruptcy of the post-Aristotelian dogmatism.

It was only gradually that the Sceptic's art of fence was developed. From the time of Pyrrho overlapping Aristotle himself, who seems to have been well content to use the feints of more than one school among his predecessors, while showing that none of them could claim to get past his guard, down through a period in which the decadent academy under Carneades, otherwise dogmatic in its negations, supplied new thrusts and parries, to Aenesidemus in the late Ciceronian age, and again to Sextus Empiricus, there seems to have been something of plasticity and continuous progress. In this matter the dogmatic schools offer a marked contrast. In especial it is an outstanding characteristic of the younger rivals to Aristotelianism that as they sprang up suddenly into being to contest the claims of the Aristotelian system in the moment of its triumph, so they reached maturity very suddenly, and thereafter persisted for the most part in a stereotyped tradition, modified only when convicted of indefensible weakness. The 3rd century B.C. saw in its first half the close of Epicurus' activity, and the life-work of Chrysippus, the refounder of Stoicism, is complete before its close. And subsequent variations seem to have been of a negligible where not of an eclectic character. In the case of Epicureanism we can happily judge of the tyranny of the literal tradition by a comparison of Lucretius with the recorded doctrine of the master. But the rule apparently obtains throughout that stereotype and compromise offer themselves as the exhaustive alternative. This is perhaps fortunate for the history of doctrine, for it produces the commentator, your Aspasius or Alexander of Aphrodisias, and the substitute for the critic, your Cicero, or your Galen with his attempt at comprehension of the Stoic categories and the like while starting from Aristotelianism. Cicero in particular is important as showing the effect or philosophical eclecticism upon Roman cultivation, and as the often author and always popularizer of the Latin terminology of philosophy.

The cause of the stereotyping of the systems, apart from political conditions, seems to have been the barrenness of science. Logic and theory of knowledge go together, and without living science, theory of knowledge loses touch with life, and logic becomes a perfunctory thing. Under such circumstances speculative interest fritters itself and sooner or later the sceptic has his way. Plato is full of the faith of mathematical physics. Aristotle is optimistic of achievement over the whole range of the sciences. But the divorce of science of nature from mathematics, the failure of biological inquiry to reach so elementary a conception as that of the nerves, the absence of chemistry from the circle of the sciences, disappointed the promise of the dawn and the relative achievement of the noon-day. There is no development. Physical science remains dialectical, and a physical experiment is as rare in the age of Lucretius as in that of Empedocles. The cause of eclecticism is the unsatisfying character of the creeds of such science, in conjunction with the familiar law that, in triangular or plusquam-triangular controversies a common hatred will produce an alliance based on compromise. A bastard Platonism through hostility to Stoicism may become agnostic. Stoicism through hostility to its sceptical critics may prefer to accept some of the positions of the dogmatic nihilist.

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[1] 'Επιφορά. 'Επί = "in" as in ἐπαγωγή, *in*ductio, and -φορά = -*ferentia*, as in διαφορά, dif*ferentia*.

[2] Diog. Laërt. x. 33 seq.; Sext. Emp. Adv. Math. vii. 211.

[3] Diog. Laërt. x. 87; cf. Lucretius, vi. 703 sq., v. 526 sqq. (ed. Munro).

[4] Sextus Empiricus, *Pyrrhon. Hypotyp.* ii. 195, 196.

[5] Sextus, *op. cit.* ii. 204.

[6] *Op. cit.* iii. 17 sqq., and especially 28.

[7] The point is raised by Aristotle, 95A.

Neoplatonism.

Of the later schools the last to arise was Neoplatonism. The mathematical sciences, at least, had not proved disappointing. For those of the school of Plato who refused the apostasy of the new academy, there was hope either in the mathematical side of the Pythagoreo-Platonic tradition, or in its ritual and theological side. Neoplatonism is philosophy become theosophy, or it is the sermon on the text that God geometrizes. It is of significance in the general history of thought as the one great school that developed after the decadence had set in. In its metaphysic it showed no failure in dialectical constructiveness. In the history of logic it is of importance because of its production of a whole series of commentators on the Aristotelian logic. Not only the *Introduction* of Porphyry, which had lasting effects on the Scholastic tradition, but the commentaries of Themistius, and Simplicius. It was the acceptance of the Aristotelian logic by Neoplatonism that determined the Aristotelian complexion of the logic of the next age. If Alexander is responsible for such doctrines as that of the *intellectus acquisitus*, it is to Porphyry, with his characteristically Platonist preference for the doctrine of universals, and for classification, that we owe the scholastic preoccupation with the realist controversy, and with the *quinque voces*. *i.e.* the Aristotelian predicables as restated by Porphyry.

B. SCHOLASTICISM

The living force in the spiritual life of the Roman empire was, after all, not philosophy, but religion, and specifically Christianity. With the extension of Christianity to the Gentile world it at length became necessary for it to orientate itself towards what was best in Greek culture. There is a Stoic element in the ethic of the Pauline epistles, but the theological affinity that the Johannine gospel, with its background of philosophic ideas, exhibits to Platonic and Neoplatonist teaching caused the effort at absorption to be directed rather in that direction. Neoplatonism had accepted the Aristotelian logic with its sharper definition than anything handed down from Plato, and, except the logic of the Sceptics, there was no longer any rival discipline of the like prestige. The logic of the Stoics had been discredited by the sceptical onset, but in any case there was no organon of a fitness even comparable to Aristotle's for the task of drawing out the implications of dogmatic premises. Aristotelian logic secured the imprimatur of the revived Platonism, and it was primarily because of this that it passed into the service of Christian theology. The contact of the Church with Platonism was on the mystical side. Orthodoxy needed to counter heretical logic not with mysticism, itself the fruitful mother of heresies, but with argument. Aristotelianism approved itself as the controversial instrument, and in due course held the field alone. The upshot is what is called Scholasticism. Scholasticism is the Aristotelianism of medieval orthodoxy as taught in the "schools" or universities of Western Europe. It takes form as a body of doctrine drawing its premises from authority, sometimes in secular matters from that of Aristotle, but normally from that of the documents and traditions of systematic theology, while its method it draws from Aristotle, as known in the Latin versions,[1] mainly by Boethius, of some few treatises of the *Organon* together with the *Isagoge* of Porphyry. It dominates the centres of intellectual life in the West because, despite its claim to finality in its principles or premises, and to universality for its method, it represents the only culture of a philosophic kind available to the adolescent peoples of the Western nations just becoming conscious of their ignorance. Christianity was the one organizing principle that pulsed with spiritual life. The vocation of the student could find fulfilment only in the religious orders. Scholasticism embodied what the Christian community had saved from the wreckage of Greek dialectic. Yet with all its effective manipulation of the formal technique of its translated and mutilated Aristotle, Scholasticism would have gone under long before it did through the weakness intrinsic to its divorce of the form and the matter of knowledge, but for two reasons. The first is the filtering through of some science and some new Aristotelian learning from the Arabs. The second is the spread of Greek scholarship and Greek manuscripts westward, which was consequent on the Latin occupation of Constantinople in 1204. It was respited by the opportunity which was afforded it of fresh draughts from the Aristotle of a less partial and purer tradition, and we have, accordingly, a golden age of revived Scholasticism beginning in the 13th century, admitting now within itself more differences than before. It is to the schoolmen of the two centuries preceding the Turkish capture of Constantinople that the controversial refinements usually associated with the name of Scholasticism are attributable. The *Analytics* of Aristotle now entered quite definitely into the logical thought of Scholasticism and we have the contrast of a *logica vetus* and *logica nova*. That other matters, the *parva logicalia* and Mnemonics adapted from Psellus and possibly of Stoic origin, entered too did not outweigh this advantage. Confrontation with the historical Aristotle may have brought but little comfort to the orthodox system, but it was a stimulus to dialectical activity within the schools. It provoked the distinction of what was true *secundum fidem* and what was true *secundum rationem* among even sincere champions of orthodoxy, and their opponents accepted with a smile so admirable a mask for that thinking for themselves to which the revival of hope of progress had spurred them. The pioneers of the Renaissance owe something of their strength to their training in the developments which the system that they overthrew underwent during this period. The respite, however, was short. The flight of Byzantine scholarship westward in the 15th century revealed, and finally, that the philosophic content of the Scholastic teaching was as alien from Aristotle as from the spirit of the contemporary revolt of science, with its cry for a new medicine, a new nautical astronomy and the like. The doom of the Scholastic Aristotle was nevertheless not the rehabilitation of the Greek Aristotle. Between him and the tide of feeling at the Renaissance lay the whole achievement of Arab science. That impatience of authority to which we owe the Renaissance, the Reformation and the birth of Nationalism, is not stilled by the downfall of Aristotle as the *nomen appellativum* of the schools. The appeal is to experience, somewhat vaguely defined, as against all authority, to the book of nature and no other. At last the world undertakes to enlarge the circle of its ideas.

C. THE RENAISSANCE

Accordingly what is in one sense the revival of classical learning is in another a recourse to what inspired that learning, and so is a new beginning. There is no place for a reformed Aristotelian logic, though the genius of Zabarella was there to attempt it. Nor for revivals of the competing systems, though all have their advocates. Scientific discovery was in the air. The tradition of the old world was too heavily weighted with the Ptolemaic astronomy and the like to be regarded as other than a bar to progress. But from the new point of view its method was inadequate too, its contentment with an induction that merely leaves an opponent silent, when experiment and the application of a calculus were within the possibilities. The transformation of logic lay with the man of science, hindered though he might be by the enthusiasm of some of the philosophers of nature. Henceforth the Aristotelian logic, the genuine no less than the traditional, was to lie on the other side of the Copernican change.

The demand is for a new organon, a scientific method which shall face the facts of experience and justify itself by its achievement in the reduction of them to control. It is a notable feature of the new movement, that except verbally, in a certain licence of nominalist expression, due to the swing of the pendulum away from the realist doctrine of universals, there is little that we can characterize as Empiricism. Facts are opposed to abstract universals. Yes. Particulars to controlling formulae. No. Experience is appealed to as fruitful where the formal employment of syllogism is barren. But it is not mere induction, with its "unanalysed concretes taken as ultimate" that is set up as the substitute for deduction. Rather a scientific process, which as experiential may be called inductive, but which is in other regards deductive as syllogism, is set up in constrast to syllogism and enumeration alike. This is to be seen in Zabarella,[1] in Galilei,[2] and in Bacon. The reformed Aristotelian logic of the first-named with its *inductio demonstrativa*, the mathematico-physical analysis followed by synthesis of the second, the *exclusiva*, or method of exclusions of the last, agree at least in this, that the method of science is one and indivisible, while containing both an inductive and a deductive moment. That what, *e.g.*, Bacon says of his method may run counter to this is an accident of the tradition of the quarrel with realism. So, too, with the scholastic universals. Aristotle's forms had been correlated, though inadequately, with the idea of function. Divorced from this they are fairly stigmatized as mental figments or branded as ghostly entities that can but block the path. But consider Bacon's own doctrine of forms. Or watch the mathematical physicist with his formulae. The faith of science looks outward as in the dawn of Greek philosophy, and subjectivism such as Hume's has as yet no hold. Bacon summing up the movement so far as he understood it, in a rather belated way, has no theory of knowledge beyond the metaphor of the mirror held up to nature. Yet he offers an ambitious logic of science, and the case is typical.

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[1] See Jourdain, *Recherches critiques sur l'âge et l'origine des traductions latines d'Aristote* (1843).

Galilei.

The science of the Renaissance differs from that of the false dawn in Greek times in the fact of fruitfulness. It had the achievement of the old world in the field of mathematics upon which to build. It was in reaction against a dialectic and not immediately to be again entrapped. In scientific method, then, it could but advance, provided physics and mathematics did not again fail of accord. Kepler and Galilei secured it against that disaster. The *ubi materia ibi geometria* of the one is the battle-cry of the mathematico-physical advance. The scientific instrument of the other, with its moments of analysis and construction, *metodo risolutivo* and *metodo compositivo*, engineers the road for the advance. The new method of physics is verifiable by its fruitfulness, and so free of any immediate danger from dialectic. Its germinal thought may not have been new, but, if not new, it had at least needed rediscovery from the beginning. For it was to be at once certain and experiential. A mathematico-physical calculus that would work was in question. The epistemological problem as such was out of the purview. The relation of physical laws to the mind that thought them was for the time a negligible constant. When Descartes, having faithfully and successfully followed the mathematico-physical inquiry of his more strictly scientific predecessors, found himself compelled to raise the question how it was possible for him to know what in truth he seemed to know so certainly, the problem entered on a new phase. The scientific movement had happily been content for the time with a half which, then and there at least, was more than the whole.

Bacon.

Bacon was no mathematician, and so was out of touch with the main army of progress. By temperament he was rather with the Humanists. He was content to voice the cry for the overthrow of the dominant system as such, and to call for a new beginning, with no realist presuppositions. He is with the nominalists of the later Scholasticism and the naturalists of the early Renaissance. He echoes the cry for recourse to nature, for induction, for experiment. He calls for a logic of discovery. But at first sight there is little sign of any greater contribution to the reconstruction than is to be found in Ramus or many another dead thinker. The syllogism is ineffective, belonging to argumentation, and constraining assent where what we want is control of things. It is a mechanical combination of propositions as these of terms which are counters to express concepts often ill-defined. The flight from a cursory survey of facts to wide so-called principles must give way to a gradual progress upward from propositions of minimum to those of medium generality, and in these consists the fruitfulness of science. Yet the induction of the Aristotelians, the dialectical induction of the *Topics*, content with imperfect enumeration and with showing the burden of disproof upon the critic, is puerile, and at the mercy of a single instance to the contrary. In all this there is but little promise for a new organon. It is neither novel nor instrumental. On a sudden Bacon's conception of a new method begins to unfold itself. It is inductive only in the sense that it is identical in purpose with the ascent from particulars. It were better called exclusiva or elimination of the alternative, which Bacon proposes to achieve, and thereby guarantee his conclusion against the possibility of instance to the contrary.

His three Methods.

Bacon's method begins with a digest into three tables of the facts relevant to any inquiry. The first contains cases of the occurrence of the quality under investigation, colour, *e.g.*, or heat, in varying combinations. The second notes its absence in combinations so allied to certain of these that its presence might fairly have been looked for. The third registers its quantitative variation according to quantitative changes in its concomitants. The method now proceeds on the basis of the first table to set forth the possible suggestions as to a general explanatory formula for the quality in question. In virtue of the remaining tables it rejects any suggestion qualitatively or quantitatively inadequate. If one suggestion, and one alone, survives the process of attempted rejection it is the explanatory formula required. If none, we must begin afresh. If more than one, recourse is to be had to certain devices of method, in the enumeration of which the methods of agreement, difference and concomitant variations[3] find a place, beside the crucial experiment, the glaring instance and the like. An appeal, however, to such devices, though a permissible "first vintage" is relatively an imperfection of method, and a proof that the tables need revision. The positive procedure by hypothesis and verification is rejected by Bacon, who thinks of hypothesis as the will o' the wisp of science, and prefers the cumbrous machinery of negative reasoning.

Historically he appears to have been under the dominance of the Platonic metaphor of an alphabet of nature, with a consequent belief in the relatively small number of ultimate principles to be determined, and of Plato's conception of Division, cleared of its dialectical associations and used experientially in application to his own molecular physics. True it is that the rejection of all the co-species is a long process, but what if therein their simultaneous or subsequent determination is helped forward? They, too, must fall to be determined sometime, and the ideal of science is fully to determine all the species of the genus. This will need co-operative effort as described in the account of Solomon's House in the *New Atlantis*.[4] But once introduce the conception of division of labour as between the collector of data on the one hand and the expert of method, the interpreter of nature at headquarters, on the other, and Bacon's attitude to hypothesis and to negative reasoning is at least in part explained. The hypothesis of the collector, the man who keeps a rain-gauge, or the missionary among savages, is to be discounted from as a source of error. The expert on the other hand may be supposed, in the case of facts over which he has not himself brooded in the course of their acquisition, to approach them without any presumption this way or that. He will, too, have no interest in the isolation of any one of several co-ordinate inquiries. That Bacon underestimates the importance of selective and of provisional explanatory hypotheses even in such fields as that of chemistry, and that technically he is open to some criticism from the point of view that negative judgment is derivate as necessarily resting on positive presuppositions, may be true enough. It seems, however, no less true that the greatness of his conception of organized common effort in science has but rarely met with due appreciation.

Forms.

In his doctrine of *forms*, too, the "universals" of his logic, Bacon must at least be held to have been on a path which led forward and not back. His forms are principles whose function falls entirely within knowledge. They are formulae for the control of the activities and the production of the qualities of bodies. Forms are qualities and activities expressed in terms of the ultimates of nature, *i.e.* normally in terms of collocations of matter or modes of motion. (The human soul is still an exception.) Form is bound up with the molecular structure and change of structure of a body, one of whose qualities or activities it expresses in wider relations. A mode of motion, for instance, of a certain definite kind, is the form of heat. It is the recipe for, and at the same time is, heat, much as H_2O is the formula for and is water. Had Bacon analysed bodies into their elements, instead of their qualities and ways of behaviour, he would have been the logician of the chemical formula. Here, too, he has scarcely received his meed of appreciation.

His influence on his successors has rather lain in the general stimulus of his enthusiasm for experience, or in the success with which he represents the cause of nominalism and in certain special devices of method handed down till, through Hume or Herschel, they affected the thought of Mill. For the rest he was too Aristotelian, if we take the word broadly enough, or, as the result of his Cambridge studies, too Ramist,[1] when the interest in scholastic issues was fading, to bring his original ideas to a successful market.

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[1] See E. Cassirer, *Das Erkenntnisproblem*, i. 134 seq., and the justificatory excerpts, pp. 539 sqq.

[2] See Riehl in *Vierteljahrschr. f. wiss. Philos.* (1893).

[3] Bacon, *Novum Organum*, ii. 22, 23; cf. also Aristotle, *Topics* i. 12. 13, ii. 10. 11 (Stewart, ad *Nic. Eth.* 1139*b* 27) and Sextus Empiricus, *Pyrr. Hypot.* iii. 15.

[4] Bacon's *Works*, ed. Ellis and Spedding iii. 164-165.

Bacon's Logic, then, like Galilei's, intended as a contribution to scientific method, a systematization of discovery by which, given the fact of knowledge, new items of knowledge may be acquired, failed to convince contemporaries and successors alike of its efficiency as an instrument. It was an ideal that failed to embody itself and justify itself by its fruits. It was otherwise with the mathematical instrument of Galilei.

Descartes.

Descartes stands in the following of Galilei. It is concurrently with signal success in the work of a pioneer in the mathematical advance that he comes to reflect on method, generalizes the method of mathematics to embrace knowledge as a whole, and raises the ultimate issues of its presuppositions. In the mathematics we determine complex problems by a construction link by link from axioms and simple data clearly and distinctly conceived. Three moments are involved. The first is an *induction*, *i.e.* an exhaustive enumeration of the simple elements in the complex phenomenon under investigation. This resolution or analysis into simple, because clear and distinct, elements may be brought to a standstill again and again by obscurity and indistinctness, but patient and repeated revision of all that is included in the problem should bring the analytic process to fruition. It is impatience, a perversity of will, that is the cause of error. Upon the analysis there results *intuition* of the simple data. With Descartes intuition does not connote givenness, but its objects are evident at a glance when induction has brought them to light. Lastly we have *deduction* the determination of the most complex phenomena by a continuous synthesis or combination of the simple elements. Synthesis is demonstrative and complete. It is in virtue of this view of derived or mediate knowledge that Descartes speaks of the (subsumptive) syllogism as "of avail rather in the communication of what we already know." Syllogism is not the synthesis which together with analysis goes to constitute the new instrument of science. The celebrated *Regulae* of Descartes are precepts directed to the achievement of the new methodological ideal in any and every subject matter, however reluctant.

It is the paradox involved in the function of intuition, the acceptance of the psychological characters of clearness and distinctness as warranty of a truth presumed to be trans-subjective, that leads to Descartes's distinctive contribution to the theory of knowledge. In order to lay bare the ground of certainty he raises the universal doubt, and, although, following Augustine,[2] he finds its limit in the thought of the doubter, this of itself is not enough. *Cogito, ergo sum. That* I think may be admitted. *What* I think may still need validation. Descartes's guarantee of the validity of my clear and distinct perceptions is the veracity of God.[3] Does the existence of God in turn call for proof? An effect cannot contain more than its cause, nor the idea of a perfect Being find adequate source save in the actuality of such a Being. Thus the intuition of the casual axiom is used to prove the existence of that which alone gives validity to intuitions. Though the logical method of Descartes has a great and enduring influence, it is the dualism and the need of God to bridge it, the doctrine of "innate" ideas, *i.e.* of ideas not due to external causes nor to volition but only to our capacity to think, our disposition to develop them, and finally the ontological proof, that affect the thought of the next age most deeply. That essence in the supreme case involves existence is a thought which comes to Spinoza more easily, together with the tradition of the *ordo geometricus*.

D. Modern Logic

i. *The Logic of Empiricism*

The path followed by English thought was a different one. Hobbes developed the nominalism which had been the hallmark of revolt against scholastic orthodoxy, and, when he brings this into relation with the analysis and synthesis of scientific method, it is at the expense of the latter.[4] Locke, when Cartesianism had raised the problem of the contents of consciousness, and the spirit of Baconian positivism could not accept of anything that bore the ill-omened name of innate ideas, elaborated a theory of knowledge which is psychological in the sense that its problem is how the simple data with which the individual is in contact in sensation are worked up into a system. Though he makes his bow to mathematical method, he, even more than Hobbes, misses its constructive character. The clue of mathematical certainty is discarded in substance in the English form of "the new way of ideas."

Hobbes.

With Hobbes logic is a calculus of marks and signs in the form of names. Naming is what distinguishes man from the brutes. It enables him to fix fleeting memories and to communicate with his fellows. He alone is capable of truth in the due conjunction or disjunction of names in propositions. Syllogism is simply summation of propositions, its function being communication merely. Analysis is the sole way of invention or discovery. There is more, however, in Hobbes, than the paradox of nominalism. Spinoza could draw upon him for the notion of genetic definition.[5] Leibnitz probably owes to him the thought of a calculus of symbols, and the conception of demonstration as essentially a chain of definitions.[6] His psychological account of syllogism[7] is taken over by Locke. Hume derived from him the explanatory formula of the association of ideas,[8] which is, however, still with Hobbes a fact to be accounted for, not a theory to account for facts, being grounded physically in "coherence of the matter moved." Finally Mill took from him his definition of cause as sum of conditions,[9] which played no small part in the applied logic of the 19th century.

Locke.

Locke is of more importance, if not for his logical doctrine, at least for the theory of knowledge from which it flows. With Locke the mind is comparable to white paper on which the world of things records itself in ideas of sensation. Simple ideas of sensation are the only points of contact we have with things. They are the atomic elements which "the workmanship of the understanding" can thereafter do no more than systematically compound and the like. It is Locke's initial attribution of the primary rôle in mental process to the simple ideas of sensation that precludes him from the development of the conception of another sort of ideas, or mental contents that he notes, which are produced by reflection on "the operations of our own mind within us." It is in the latter group that we have the explanation of all that marks Locke as a forerunner of the critical philosophy. It contains in germ a doctrine of categories discovered but not generated in the psychological processes of the individual. Locke, however, fails to "deduce" his categories. He has read Plato's *Theaetetus* in the light of Baconian and individualist preconceptions. Reflection remains a sort of "internal sense," whose ideas are of later origin than those of the external sense. His successors emphasize the sensationist elements, not the workmanship of the mind. When Berkeley has eliminated the literal materialism of Locke's metaphors of sense-perception, Hume finds no difficulty in accepting the sensations as present virtually in their own right, any nonsensible ground being altogether unknown. From a point of view purely subjectivist he is prepared to explain all that is to be left standing of what Locke ascribes to the workmanship of the mind by the principle of association or customary conjunction of ideas, which Locke had added a chapter to a later edition of his *Essay* explicitly to reject as an explanatory formula. Condillac goes a step farther, and sees no necessity for the superstructure at all, with its need of explanation valid or invalid. Drawing upon Gassendi for his psychological atomism and upon Hobbes for a thoroughgoing nominalism, he reproduces, as the logical conclusion from Locke's premises, the position of Antisthenes.

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[1] A notable formula of Bacon's *Novum Organum* ii. 4 § 3 turns out, *Valerius Terminus*, cap. 11, to come from Aristotle, *Post. An.* i. 4 *via* Ramus. See Ellis in Bacon's *Works*, iii. 203 sqq.

[2] *De Civitate Dei*, xi. 26, "Certum est me esse, si fallor."

[3] Cf. Plato, *Republic*, 381E seq.

[4] *Elementa Philosophiæ*, i. 3. 20, i. 6. 17 seq.

[5] Hobbes, *Elementa Philosophiæ*, i. 1. 5.

[6] *Id. ib.* i. 6. 16.

[7] *Id. ib.* i. 4. 8; cf. Locke's *Essay of Human Understanding*, iv. 17.

[8] *Id. Leviathan*, i. 3.

[9] *Id. Elem. Philos.* i. 6. 10.

The last word is that " une science bien traitée n'est qu'une langue bien faite." [1]

Locke's logic comprises, amid much else, a theory of general terms [2] and of definition, a view of syllogism [3] and a declaration as to the possibility of inference from particular to particular,[4] a distinction between propositions which are certain but trifling, and those which add to our knowledge though uncertain, and a doctrine of mathematical certainty.[5] As to the first, " words become general by being made the signs of general ideas, and ideas become general by separating from them " all " that may determine them to this or that particular existence. By this way of abstraction they are made capable of representing more individuals than one." This doctrine has found no acceptance. Not from the point of view for which idea means image. Berkeley, though at length the *notions* of spirits, acts and relations [6] give him pause, prefers the formula which Hume expresses in the phrase that " some ideas are particular in their nature but general in their representation," [7] and the after-history of " abstraction " is a discussion of the conditions under which one idea " stands for " a group. Not from those for whom general ideas mean schematic concepts, not imageable. The critic from this side has little difficulty in showing that abstraction of the kind alleged still leave the residuum particular *this* redness, *e.g.* not *redness*. It is, however, of the sorts constituted by the representation which his abstraction makes possible that definition is given, either by enumeration of the simple ideas combined in the significance of the sortal name, or " to save the labour of enumerating," and " for quickness and despatch sake," by giving the next wider general name and the proximate difference. We define essences of course in a sense, but the essences of which men talk are abstractions, " creatures of the understanding." Man determines the sorts or nominal essences, nature the similitudes. The fundamentally enumerative character of the process is clearly not cancelled by the recognition that it is possible to abbreviate it by means of technique. So long as the relation of the nominal to the real essence has no other background than Locke's doctrine of perception, the conclusion that what Kant afterwards calls analytical judgments a priori and synthetic judgments a posteriori exhaust the field follows inevitably, with its corollary, which Locke himself has the courage to draw, that the natural sciences are in strictness impossible. Mathematical knowledge is not involved in the same condemnation, solely because of the " archetypal " character, which, not without indebtedness to Cumberland, Locke attributes to its ideas. The reality of mathematics, equally with that of the ideals of morals drawn from within, does not extend to the " ectypes " of the outer world. The view of reasoning which Locke enunciates coheres with these views. Reasoning from particular to particular, *i.e.* without the necessity of a general premise, must be possible, and the possibility finds warranty in a consideration of the psychological order of the terms in syllogism. As to syllogism specifically, Locke in a passage,[8] which has an obviously Cartesian ring, lays down four stages or degrees of reasoning, and points out that syllogism serves us in but one of these, and that not the all-important one of finding the intermediate ideas. He is prepared readily to " own that all right reasoning may be reduced to Aristotle's forms of syllogism," yet holds that " a man knows first, and then he is able to prove syllogistically." The distance from Locke to Stuart Mill along this line of thought is obviously but small.

Hume.

Apart from the adoption by Hume of the association of ideas as the explanatory formula of the school—it had been allowed by Malebranche within the framework of his mysticism and employed by Berkeley in his theory of vision—there are few fresh notes struck in the logic of sensationalism. The most notable of these are Berkeley's treatment of " abstract " ideas and Hume's change of front as to mathematical certainty. What, however, Hume describes as " all the *logic* I think proper to employ in my reasoning," viz. his " rules by which to judge cause and effects," [9] had, perhaps, farther-reaching historical effects than either. In these the single method of Bacon is already split up into separate modes. We have Mill's inductive methods in the germ, though with an emphasis quite older than Mill's. Bacon's *form* has already in transmission through Hobbes been transmuted into *cause* as antecedent in the time series. It may, perhaps, be accounted to Hume for righteousness that he declares—whether consistently or not is another matter—that " the same effect never arises but from the same cause," and that he still follows Bacon in the conception of *absentia in proximo.* It is " when in any instance we find our expectation disappointed " that the effect of one of " two resembling objects " will be like that of the other that Hume proposes to apply his method of difference.

No scientific discipline, however, with the doubtful exception of descriptive psychology, stands to gain anything from a temper like that of Hume. The whittling away of its formal or organizing rubrics, as *e.g.*, sameness into likeness, is disconcerting to science wherever the significance of the process is realized. It was because the aftermath of Newtonian science was so rich that the scientific faith of naturalism was able to retain a place besides its epistemological creed that a logician of the school could arise whose spirit was in some sort Baconian, but who, unlike Bacon, had entered the modern world, and faced the problems stated for it by Hume and by Newton.

J. S. Mill.

Stuart Mill's *System of Logic* marked a fresh stage in the history of empiricism, for the reason that it made the effort to hold an even balance between the two moments in the thought of the school. Agreement in the use of a common watchword had masked as it seems a real divergence of meaning and purpose. The apostles of inductive method had preached recourse to experience, but had meant thereby nature as a constituted order. They had devised canons for the investigation of the concrete problems of this, but had either ignored altogether the need to give an account of the mirroring mind, or, in the alternative had been, with some naïveté, content to assume that their nominalist friends, consistently their allies in the long struggle with traditionalism, had adequately supplied or could adequately supply the need. The exponents of psychological atomism, on the other hand, with the association of ideas for their one principle of agglutination had come to mean by experience the mental phantasmagoria of the individual. They had undermined the foundations of scientific certainty, and so far as the fecundity of contemporary science did not give them pause, were ready, notwithstanding the difference of their starting-point, to acquiesce in the formula as well as the temper of Pyrrhonism. They could concede the triumphant achievement of science only with the proviso that it must be assumed to fall within the framework of their nominalism. Mill aspired after a doctrine of method such as should satisfy the needs of the natural sciences, notably experimental physics and chemistry as understood in the first half of the 19th century and, *mutatis mutandis*, of the moral sciences naturalistically construed. In uniting with this the Associationism which he inherited, through his father, from Hume, he revealed at once the strength and weakness of the dual conception of naturalism. His rare thoroughness and rarer candour made it at once unnecessary and impossible that the work should be done again.

If judged by what he denies, viz. the formal logic of Hamilton and Mansel, whose Aristotelian and scholastic learning did but accentuate their traditionalism, and whose acquiescence in consistency constituted in Mill's view a discouragement of research, such as men now incline to attribute at the least equally to Hume's idealism, Mill is only negatively justified. If judged by his positive contribution to the theory of method he may claim to find a more than negative justification for his teaching in its success. In the field covered by scholastic logic Mill is frankly associationist. He aims at describing what he finds given, without reference to insensible implications of doubtful validity and value. The upshot is a psychological account of what from one aspect is evidence, from the other, belief. So he explains "concepts or general notions"[1] by an abstraction which he represents as a sort of alt-relief operated by attention and fixed by naming, association with the name giving to a set of attributes a unity they otherwise lack. This is manifestly, when all is said, a particular psychological event, a collective fact of the associative consciousness. It can exercise no organizing or controlling function in knowledge. So again in determining the "import" of propositions, it is no accident that in all save existential propositions it is to the familiar rubrics of associationism—co-existence, sequence, causation and resemblance—that he refers for classification, while his general formula as to the conjunctions of connotations is associationist through and through. It follows consistently enough that inference is from particular to particular. Mill holds even the ideas of mathematics to be hypothetical, and in theory knows nothing of a non-enumerative or non-associative universal. A premise that has the utmost universality consistent with this view can clearly be of no service for the establishment of a proposition that has gone to the making of it. Nor again of one that has not. Its use, then, can only be as a memorandum. It is a shorthand formula of registration. Mill's view of ratiocinative process clearly stands and falls with the presumed impossibility of establishing the necessity for universals of another type than his, for what may be called principles of construction. His critics incline to press the point that association itself is only intelligible so far as it is seen to depend on universals of the kind that he denies.

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[1] Condillac, *Langue des Calculs*, p. 7.
[2] Locke, *Essay*, iii. 3.
[3] *Id. ib.* iv. 17.
[4] *Loc. cit.* § 8.
[5] *Id. ib.* iv. 4, §§ 6 sqq.
[6] Berkeley, *Of the Principles of Human Knowledge*, § 142.
[7] Hume, *Treatise of Human Nature*, i. 1. 7 (from Berkeley, *op. cit.*, introd., §§ 15-16).
[8] *Essay*, iv. 17, § 3.
[9] Hume, *Treatise of Human Nature*, i. 3. 15.

In Mill's inductive logic, the nominalistic convention has, through his tendency to think in relatively watertight compartments,[2] faded somewhat into the background. Normally he thinks of what he calls phenomena no longer as psychological groupings of sensations, as "states of mind," but as things and events in a physical world howsoever constituted and apprehended. His free use of relating concepts, that of sameness, for instance, bears no impress of his theory of the general notion, and it is possible to put out of sight the fact that, taken in conjunction with his nominalism, it raises the whole issue of the possibility of the equivocal generation of formative principles from the given contents of the individual consciousness, in any manipulation of which they are already implied. Equally, too, the deductive character, apparently in intention as well as in actual fact, of Mill's experimental methods fails to recall the point of theory that the process is essentially one from particular to particular. The nerve of proof in the processes by which he establishes causal conjunctions of unlimited application is naturally thought to lie in the special canons of the several processes and the axioms of universal and uniform causation which form their background. The conclusions seem not merely to fall within, but to depend on these organic and controlling formulae. They follow not merely according to them but from them. The reference to the rule is not one which may be made and normally is made as a safeguard, but one which must be made, if thought is engaged in a forward and constructive movement at all. Yet Mill's view of the function of "universal" propositions had been historically suggested by a theory—Dugald Stewart's—of the use of axioms![3] Once more, it would be possible to forget that Mill's ultimate laws or axioms are not in his view intuitions, nor forms constitutive of the rational order, nor postulates of all rational construction, were it not that he has made the endeavour to establish them on associationist lines. It is because of the failure of this endeavour to bring the technique of induction within the setting of his Humian psychology of belief that the separation of his contribution to the applied logic of science from his sensationism became necessary, as it happily was easy. Mill's device rested special inductions of causation upon the laws that every event has a cause, and every cause has always the same effect. It rested these in turn upon a general induction enumerative in character of enormous and practically infinite range and always uncontradicted. Though obviously not exhaustive, the unique extent of this induction was held to render it competent to give practical certainty or psychological necessity. A vicious circle is obviously involved. It is true, of course, that ultimate laws need discovery, that they are discovered in some sense in the medium of the psychological mechanism, and that they are nevertheless the grounds of all specific inferences. But that truth is not what Mill expounds, nor is it capable of development within the limits imposed by the associationist formula.

It is deservedly, nevertheless, that Mill's applied logic has retained its pride of place amid what has been handed on, if in modified shape, by writers, *e.g.*, Sigwart and Professor Bosanquet, whose theory of knowledge is quite alien from his. He prescribed regulative or limiting formulae for research as it was actually conducted in his world. His grasp of the procedure by which the man of science manipulated his particular concrete problems was admirable. In especial he showed clear understanding of the functions of hypothesis and verification in the investigations of the solitary worker, with his facts still in course of accumulation and needing to be lighted up by the scientific imagination. He was therefore enabled to formulate the method of what Bacon had tended to despise as merely the "first vintage." Bacon spent his strength upon a dream of organization for all future discovery. Mill was content to codify. The difference between Bacon and Mill lies chiefly in this, and it is because of this difference that Mill's contribution, spite of its debt to the Baconian tradition, remains both characteristic and valuable. It is of course possible to criticise even the experimental canons with some severity. The caveats, however, which are relevant within the circle of ideas within which Mill's lesson can be learned and improved on,[4] seem to admit of being satisfied by relatively slight modifications in detail, or by explanations often supplied or easily to be supplied from points brought out amid the wealth of illustration with which Mill accompanied his formal or systematic exposition of method. The critic has the right of it when he points out, for example, that the practical difficulty in the Method of Agreement is not due to plurality of causes, as Mill states, but rather to intermixture of effects, while, if the canon could be satisfied exactly, the result would not be rendered uncertain in the manner or to the extent which he supposes. Again the formula of the Joint-Method, which contemplates the enumeration of cases "which have nothing in common but the absence of one circumstance," is ridiculously unsound as it stands. Or, on rather a different line of criticism, the use of corresponding letters in the two series of antecedents and consequents raises, it is said, a false presumption of correlation. Nay, even the use of letters at all suggests that the sort of analysis that actually breaks up its subject-matter is universally or all but universally applicable in nature, and this is not the case. Finally, the conditions of the methods are either realized or not. If they are realized, the work of the scientist falls entirely within the field of the processes preliminary to the satisfaction of the canon. The latter becomes a mere memorandum or formula of registration. So is it possible "to have the engineer hoist with his own petar." But the conditions are not realized, and in an experiential subject-matter are not realizable. Not one circumstance only in common but "apparently one relevant circumstance only in common" is what we are able to assert. If we add the qualification of relevance we destroy the cogency of the method. If we fail to add it, we destroy the applicability.

The objections turn on two main issues. One is the exaggeration of the possibilities of resolution into separate elements that is due to the acceptance of the postulate of an alphabet of nature. This so soon as noted can be allowed for. It is to the combination of this doctrine with a tendency to think chiefly of experiment, of the controlled addition or subtraction of these elements one at a time, that we owe the theoretically premature linking of *a* as effect to *A* as cause. This too can be met by a modification of form. The other issue is perhaps of more significance. It is the oscillation which Mill manifests between the conception of his formula as it is actually applicable to concrete problems in practice, and the conception of it as an expression of a theoretical limit to practical procedure. Mill seems most often to think of the former, while tending to formulate in terms of the latter. At any rate, if relevance *in proximo* is interpolated in the peccant clause of the canon of the Joint-Method, the practical utility of the method is rehabilitated. So too, if the canon of the Method of Agreement is never more than approximately satisfied, intermixture of effects will in practice mean that we at least often do not know the cause or antecedent equivalent of a given effect, without the possibility of an alternative. Finally, it is on the whole in keeping with Mill's presuppositions to admit even in the case of the method of difference that in practice it is approximative and instructive, while the theoretical formula, to which it aims at approaching asymptotically as limit, if exact, is in some sense sterile. Mill may well have himself conceived his methods as practically fruitful and normally convincing with the limiting formula in each case more cogent in form but therewith merely the skeleton of the process that but now pulsed with life.

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[1] Mill, *Examination of Sir William Hamilton's Philosophy*, cap. 17.

[2] Cf. Mill, *Autobiography*, p. 159. "I grappled at once with the problem of Induction, postponing that of Reasoning." *Ib.* p. 182 (when he is preoccupied with syllogism), "I could make nothing satisfactory of Induction at this time."

[3] *Autobiography*, p. 181.

[4] The insight, for instance, of F. H. Bradley's criticism, *Principles of Logic*, II. ii. 3, is somewhat dimmed by a lack of sympathy due to extreme difference in the point of view adopted.

Enough has been said to show why the advance beyond the letter of Mill was inevitable while much in the spirit of Mill must necessarily affect deeply all later experientialism. After Mill experientialism takes essentially new forms. In part because of what Mill had done. In part also because of what he had left undone. After Mill means after Kant and Hegel and Herbart, and it means after the emergence of evolutionary naturalism. Mill, then, marks the final stage in the achievement of a great school of thought.

ii. *The Logic of Rationalism.*

Spinoza.

A fundamental contrast to the school of Bacon and of Locke is afforded by the great systems of reason, owning Cartesian inspiration, which are identified with the names of Spinoza and Leibnitz. In the history of logic the latter thinker is of the more importance. Spinoza's philosophy is expounded *ordine geometrico* and with Euclidean cogency from a relatively small number of definitions, axioms and postulates. But how we reach our assurance of the necessity of these principles is not made specifically clear. The invaluable tractate *De Intellectus emendatione*, in which the agreement with and divergence from Descartes on the question of method could have been fully elucidated, is unhappily not finished. We know that we need to pass from what Spinoza terms *experientia vaga*,[1] where imagination with its fragmentary apprehension is liable to error and neither necessity nor impossibility can be predicated, right up to that which *fictionem terminat*—namely, *intellectio*. And what Spinoza has to say of the requisites of definition and the marks of intellection makes it clear that insight comes with coherence, and that the work of method on the "inductive" side is by means of the unravelling of all that makes for artificial limitation to lay bare what can then be seen to exhibit nexus in the one great system. When all is said, however, the geometric method as universalized in philosophy is rather used by Spinoza than expounded.

Leibnitz.

With Leibnitz, on the other hand, the logical problem holds the foremost place in philosophical inquiry.[2] From the purely logical thesis, developed at quite an early stage of his thinking,[3] that in any true proposition the predicate is contained in the subject, the main principles of his doctrine of Monads are derivable with the minimum of help from his philosophy of dynamics. *Praedicatum inest subjecto.* All valid propositions express in the last resort the relation of predicate or predicates to a subject, and this Leibnitz holds after considering the case of relational propositions where either term may hold the position of grammatical subject, A = B and the like. There is a subject then, or there are subjects which must be recognized as not possible to be predicated, but as absolute. For reasons not purely logical Leibnitz declares for the plurality of such subjects. Each contains all its predicates: and this is true not only in the case of truths of reason, which are necessary, and ultimately to be exhibited as coming under the law of contradiction, "or, what comes to the same thing, that of identity," but also in the case of truths of fact which are contingent, though a sufficient reason can be given for them which "inclines" without importing necessity. The extreme case of course is the human subject. "The individual notion of each person includes once for all what is to befall it, world without end," and "it would not have been our Adam but another, if he had had other events." Existent subjects, containing eternally all their successive predicates in the time-series, are substances, which when the problems connected with their activity, or dynamically speaking their force, have been resolved, demand—and supply—the metaphysic of the Monadology.

Complex truths of reason or essence raise the problem of definition, which consists in their analysis into simpler truths and ultimately into simple—*i.e.* indefinable ideas, with primary principles of another kind—axioms, and postulates that neither need nor admit of proof. These are identical in the sense that the opposite contains an express contradiction.[4] In the case of non-identical truths, too, there is a priori proof drawn from the notion of the terms, "though it is not always in our power to arrive at this analysis,"[5] so that the question arises, specially in connexion with the possibility of a calculus, whether the contingent is reducible to the necessary or identical at the ideal limit. With much that suggests an affirmative answer, Leibnitz gives the negative. Even in the case of the Divine will, though it be always for the best possible, the sufficient reason will "incline without necessitating." The propositions which deal with actual existence are still of a unique type, with whatever limitation to the calculus.

Leibnitz's treatment of the primary principles among truths of reason as identities, and his examples drawn *inter alia* from the "first principles" of mathematics, influenced Kant by antagonism. Identities some of them manifestly were not. The formula of identity passed in another form to Herbart and therefore to Lotze. In recognizing, further, that the relation of an actual individual fact to its sufficient ground was not reducible to identity, he set a problem diversely treated by Kant and Herbart. He brought existential propositions, indeed, within a rational system through the principle that it must be feasible to assign a sufficient reason for them, but he refused to bring them under the conception of identity or necessity, *i.e.* to treat their opposites as formally self-contradictory. This bore interest in the Kantian age in the treatment alike of cause and effect, and of the ontological proof of existence from essence. Not that the Law of Sufficient Reason is quite free from equivoque. Propositions concerning the *possible* existence of individuals put Leibnitz to some shifts, and the difficulty accounts for the close connexion established in regard to our actual world between the law of sufficient reason and the doctrine of the final cause. This connexion is something of an afterthought to distinguish from the potential contingency of the objectively possible the real contingency of the actual, for which the "cause or reason" of Spinoza[6] could not account. The law, however, is not invalidated by these considerations, and with the degree of emphasis and the special setting that Leibnitz gives the law, it is definitely his own.

If we may pass by the doctrine of the Identity of Indiscernibles, which played a part of some importance in subsequent philosophy, and the Law of Continuity, which as Leibnitz represents it is, if not sheer dogma, reached by something very like a fallacy, we have as Leibnitz's remaining legacy to later logicians the conception of *Characteristica Universalis* and *Ars Combinatoria*, a universal denoting by symbols and a calculus working by substitutions and the like. The two positions that a subject contains all its predicates and that all non-contingent propositions—*i.e.* all propositions not concerned with the existence of individual facts ultimately analyse out into identities—obviously lend themselves to the design of this algebra of thought, though the mathematician in Leibnitz should have been aware that a significant equation is never an identity. Leibnitz, fresh from the battle of the calculus in the mathematical field, and with his conception of logic, at least in some of its aspects, as a generalized mathematic,[1] found a fruitful inspiration, harmonizing well with his own metaphysic, in Bacon's alphabet of nature. He, too, was prepared to offer a new instrument. That the most important section, the list of forms of combination, was never achieved—this too was after the Baconian example while the mode of symbolization was crude with $a=ab$ and the like—matters little. A new technique of manipulation—it is, of course, no more—had been evolved.

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[1] Bacon, *Novum organum*, i. 100.

[2] Russell's *Philosophy of Leibnitz*, capp. 1–5.

[3] See especially remarks on the letter of M. Arnauld (Gerhardt's edition of the philosophical works, ii. 37 sqq.).

[4] Gerhardt, vi. 612, quoted by Russell, *loc. cit.*, p. 19.

[5] Ibid., ii. 62, Russell, p. 33.

[6] Spinoza, ed. van Vloten and Land, i. 46 (*Ethica*, i. 11).

It may be said that among Leibnitz's successors there is no Leibnitzian. The system as a whole is something too artificial to secure whole-hearted allegiance. Wolff's formalism is the bastard outcome of the speculation of Leibnitz, and is related to it as remotely as Scholasticism is to Aristotle. Wolff found a sufficient reason for everything and embodied the results of his inquiries in systematic treatises, sometimes in the vernacular. He also, by a transparent *petitio principii*, brought the law of the sufficient reason under that of non-contradiction. Wolff and his numerous followers account for the charge of dogmatism against "the Leibnitzio-Wolffian school." They are of importance in the history of logic for two reasons only: they affected strongly the German vocabulary of philosophy and they constituted the intellectual environment in which Kant grew to manhood.

A truer continuator of Leibnitz in the spirit was Herbart.

iii. *Kant's Logic.*

Herbart's admitted allegiance, however, was Kantian with the qualification, at a relatively advanced stage of his thinking, that it was "of the year 1828"—that is, after controversy had brought out implications of Kant's teaching not wholly contemplated by Kant himself. The critical philosophy had indeed made it impossible to hark back to Leibnitz or any other master otherwise than with a difference.

Yet it is not a single and unambiguous logical movement that derives from Kant. Kant's lesson was variously understood. Different moments in it were emphasized, with a large diversity of result. As interpreted it was acquiesced in or revolted from and revolt ranged from a desire for some modifications of detail or expression to the call for a radical transformation. Grounds for a variety of developments are to be found in the imperfect harmonization of the rationalistic heritage from the Wolffian tradition which still dominates Kant's pure general logic with the manifest epistemological intention of his transcendental theory. Or again, within the latter in his admission of a duality of thought and "the given" in knowledge, which within knowledge was apparently irreducible, concurrently with hints as to the possibility, upon a wider view, of the sublation of their disparateness at least hypothetically and speculatively. The sense in which there must be a ground of the unity of the supersensible[2] while yet the transcendent use of Reason—*i.e.* its use beyond the limits of experience was denied theoretical validity—was not unnaturally regarded as obscure.

Kant's treatment of technical logic was wholly traditional, and in itself is almost negligible. It is comprised[3] in an early essay on the mistaken subtlety of the syllogistic figures, and a late compilation by a pupil from the introductory matter and running annotations with which the master had enriched his interleaved lecture-room copy of Meyer's *Compendium* of 1752. Wolff's general logic, "the best," said Kant, "that we possess," had been abridged by Baumgarten and the abridgment then subjected to commentation by Meyer. With this traditional body of doctrine Kant was, save for matters of minor detail, quite content. Logic was of necessity formal, dealing as it must with those rules without which no exercise of the understanding would be possible at all. Upon abstraction from all particular methods of thought these rules were to be discerned a priori or without dependence on experience by reflection solely upon the use of the understanding in general. The science of the form of thought abstracted in this way from its matter or content was regarded as of value both as propaedeutic and as canon. It was manifestly one of the disciplines in which a position of finality was attainable. Aristotle might be allowed, indeed, to have omitted no essential point of the understanding. What the moderns had achieved consisted in an advance in accuracy and methodical completeness. "Indeed, we do not require any new discoverers in logic,"[4] said the discoverer of a priori synthesis, "since it contains merely the form of thought." Applied logic is merely psychology, and not properly to be called logic at all. The technical logic of Kant, then, justifies literally a movement among his successors in favour of a formal conception of logic with the law of contradiction and the doctrine of formal implication for its equipment. Unless the doctrine of Kant's "transcendental logic" must be held to supply a point of view from which a logical development of quite another kind is inevitable, Kant's mantle, so far as logic is concerned, must be regarded as having fallen upon the formal logicians.

Formal Logic.

Kant's transcendental teaching is summarily as follows: "Transcendental" is his epithet for what is neither empirical—*i.e.* to be derived from experience—nor yet transcendent—*i.e.* applicable beyond the limits of experience, the mark of experience being the implication of sense or of something which thought contradistinguishes from its own spontaneous activity as in some sense "the given." Those features in our organized experience are to be regarded as transcendentally established which are the presuppositions of our having that experience at all. Since they are not empirical they must be structural and belong to "the mind"—*i.e.* the normal human intelligence, and to like intelligence so far as like. If we set aside such transcendental conditions as belong to sensibility or to the receptive phase of mind and are the presuppositions of juxtaposition of parts, the remainder are ascribable to spontaneity or understanding, to thought with its unifying, organizing or focussing function, and their elucidation is the problem of transcendental analytic. It is still logic, indeed, when we are occupied with the transcendent objects of the discursive faculty as it is employed beyond the limits of experience where it cannot validate its ideas. Such a logic, however, is a dialectic of illusion, perplexed by paralogisms and helpless in the face of antinomies. In transcendental analytic on the other hand we concern ourselves only with the transcendental "deduction" or vindication of the conditions of experience, and we have a logic of cognition in which we may establish our epistemological categories with complete validity. Categories are the forms according to which the combining unity of self-consciousness (synthetic unity of apperception) pluralizes itself through the various functions involved in the constitution of objectivity in different types of the one act of thought, viz. judgment. The clue to the discovery of transcendental conditions Kant finds in the existence of judgments, most manifest in mathematics and in the pure science of nature, which are certain, yet not trifling, necessary and yet not reducible to identities, synthetic therefore and a priori, and so accounted for neither by Locke nor by Leibnitz. "There lies a transcendental condition at the basis of every necessity."

Definition of "Transcendental."

Kant's mode of conceiving the activity of thought in the constitution of objects and of their connexion in experience

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[1] *Nouveaux essais*, iv. 2 § 9, 17 § 4 (Gerhardt v. 351, 460).

[2] *Critique of Judgment*, Introd. § 2, *ad. fin.* (*Werke*, Berlin Academy edition, vol. v. p. 176, l. 10).

[3] *Kant's Introduction to Logic and his Essay on the Mistaken Subtlety of the Four Figures*, trans. T. K. Abbott (1885).

[4] *Loc. cit.*, p. 11.

Form of Matter of Thought.

was thought to lie open to an interpretation in conformity with the spirit of his logic, in the sense that the form and the content in knowledge are not merely distinguishable functions within an organic whole, but either separable, or at least indifferent one to the other in such a way as to be clearly independent. Thought as form would thus be a factor or an element in a composite unit. It would clearly have its own laws. It would be the whole concern of logic, which, since in it thought has itself for object, would have no reference to the other term of the antithesis, nor properly and immediately to the knowledge which is compact of thought in conjunction with something which, whatever it may be, is prima facie other than thought. There is too much textual warrant for this interpretation of Kant's meaning. Doubtless there are passages which make against an extreme dualistic interpretation. Even in his "logic" Kant speaks of abstraction from all particular objects of thought rather than of a resolution of concrete thinking into thought and its "other" as separable co-operating factors in a joint product. He spoke throughout, however, as if form and content were mutually indifferent, so that the abstraction of form from content implied nothing of falsification or mutilation. The reserve, therefore, that it was abstraction and not a decomposing that was in question remained to the admirers of his logic quite nugatory. They failed to realize that permissible abstraction from specific contents or methods of knowledge does not obliterate reference to matter or content. They passed easily from the acceptance of a priori forms of thinking to that of forms of a priori thinking, and could plead the example of Kant's logic.

Kant's theory of knowledge, then, needed to be pressed to other consequences for logic which were more consonant with the spirit of the *Critique*. The forms of thought and what gives thought its particular content in concrete acts of thinking could not be regarded as subsisting in a purely external and indifferent relation one to the other. "Laws according to which the subject thinks" and "laws according to which the object is known" cannot be the concern of separate departments of inquiry. As soon divorce the investigation of the shape and material of a mirror from the laws of the incidence of the rays that form images in it, and call it a science of reflection! An important group of writers developed the conception of an adaptation between the two sides of Kant's antithesis, and made the endeavour to establish some kind of correlation between logical forms and the process of "the given." There was a tendency to fall back upon the conception of some kind of parallelism, whether it was taken to be interpretative or rather corrective of Kant's meaning. This device was never remote from the constructions of writers for whom the teaching of Spinoza and Leibnitz was an integral part of their intellectual equipment Other modes of correlation, however, find favour also, and in some variety. Kant is seldom the sole source of inspiration. His unresolved antithesis[1] is interpreted either diversely or with a difference of emphasis. And the light that later writers bring to bear on Kant's logic and epistemology from other sides of his speculation varies in kind and in degree.

Another logical movement springs from those whom a correlation of fact within the unity of a system altogether failed to satisfy. There must also be development of the correlated terms from a single principle. Form and content must not only correspond one to the other. They must be exhibited as distinguishable moments within a unity which can at one and the same time be seen to be the ground from which the distinction springs and the ground in virtue of which it is over-ruled. Along this line of speculation we have a logic which claims that whatsoever is in one plane or at one stage in the development of thought a residuum that apparently defies analysis must at another stage and on a higher plane be shown so to be absorbed as to fall altogether within thought. This is the view of Hegel upon which logic comes to coincide with the progressive self-unfolding of thought in that type of metaphysic which is known as absolute, *i.e.* all-inclusive idealism. The exponent of logic as metaphysic, for whom the rational is the real is necessarily in revolt against all that is characteristically Kantian in the theory of knowledge, against the transcendental method itself and against the doctrine of limits which constitutes the nerve of "criticism." Stress was to be laid upon the constructive character of the act of thought which Kant had recognized, and without Kant's qualifications of it. In all else the claim is made to have left the Kantian teaching behind as a cancelled level of speculation.

Limitation of Transcendental Method.

Transcendental method is indeed not invulnerable. A principle is transcendentally "deduced" when it and only it can explain the validity of some phase of experience, some order of truths. The order of truths, the phase of experience and its certainty had to be taken for granted. The sense, for example, in which the irreversibility of sequence which is the more known *in ordine ad hominem* in the case of the causal principle differs from merely psychological conviction is not made fully clear. Even so the inference to the a priori ground of its necessity is, it has been often pointed out, subject to the limitation inherent in any process of reduction, in any regress, that is, from conditionate to condition, viz. that in theory an alternative is still possible. The inferred principle may hold the field as explanation without obvious competitor potential or actual. Nevertheless its claim to be the sole possible explanation can in nowise be validated. It has been established after all by dialectic in the Aristotelian sense of the word. But if transcendental method has no special pride of place, Kant's conclusion as to the limits of the competence of intellectual faculty falls with it. Cognition manifestly needs the help of Reason even in its theoretical use. Its speculation can no longer be stigmatized as vaticination *in vacuo*, nor its results as illusory.

Logic and Psychology.

Finally, to logic as metaphysic the polar antithesis is psychology as logic. The turn of this also was to come again. If logic were treated as merely formal, the stress of the problem of knowledge fell upon the determination of the processes of the psychological mechanism. If alleged a priori constituents of knowledge—such rubrics as substance, property, relation—come to be explained psychologically, the formal logic that has perforce to ignore all that belongs to psychology is confined within too narrow a range to be able to maintain its place as an independent discipline, and tends to be merged in psychology. This tendency is to be seen in the activity of Fries and Herbart and Beneke, and was actualized as the aftermath of their speculation. It is no accident that it was the psychology of apperception and the voluntaryist theory or practice of Herbart, whose logical theory was so closely allied to that of the formal logicians proper, that contributed most to the development of the post-Kantian psychological logic. Another movement helped also; the exponents of naturalistic evolution were prepared with Spencer to explain the so-called *a priori* in knowledge as in truth *a posteriori*, if not to the individual at any rate to the race. It is of course a newer type of psychological logic that is in question, one that is aware of Kant's "answer to Hume." Stuart Mill, despite of his relation of antagonism to Hamilton and Mansel, who held themselves to be Kantian in spirit, is still wholly pre-Kantian in his outlook.

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[1] Or antitheses. Kant follows, for example, a different line of cleavage between form and content from that developed between thought and the "given." And these are not his only unresolved dualities, even in the *Critique of Pure Reason*. For the logical inquiry, however, it is permissible to ignore or reduce these differences.

The determination too of the sense in which Kant's theory of knowledge involves an unresolved antithesis is for the logical purpose necessary so far only as it throws light upon his logic and his influence upon logical developments. Historically the question of the extent to which writers adopted the dualistic interpretation or one that had the like consequences is of greater importance.

It may be said summarily that Kant holds the antithesis between thought and "the given" to be unresolved and within the limits of theory of knowledge irreducible. The dove of thought falls lifeless if the resistant atmosphere of "the given" be withdrawn (*Critique of Pure Reason*, ed. 2 Introd. Kant's *Werke*, ed. of the Prussian Academy, vol. iii. p. 32, ll. 10 sqq.). Nevertheless the thing-in-itself is a problematic conception and of a limiting or negative use merely. He "had woven," according to an often quoted phrase of Goethe, "a certain sly element of irony into his method; . . . he pointed as it were with a side gesture beyond the limits which he himself had drawn." Thus (*loc. cit.* p. 46, ll. 8, 9) he declares that "there are two lineages united in human knowledge, which perhaps spring from a common stock, though to us unknown—namely sense and understanding." Some indication of the way in which he would hypothetically and speculatively mitigate the antithesis is perhaps afforded by the reflection that the distinction of the mental and what appears as material is an external distinction in which the one appears outside to the other. "Yet what as thing-in-itself lies back of the phenomenon may perhaps not be so wholly disparate after all" (ib. p. 278, ll. 26 sqq.).

Summary.

Kant's influence, then, upon subsequent logic is least of all to be measured by his achievement in his professed contribution to technical logic. It may be attributed in some slight degree, perhaps, to incidental flashes of logical insight where his thought is least of what he himself calls logic, *e.g.* his exposition of the significance of synthetic judgments *a priori*, or his explanation of the function of imagery in relation to thought, whereby he offers a solution of the problem of the conditions under which one member of a group unified through a concept can be taken to stand for the rest, or again the way in which he puts his finger on the vital issue in regard to the alleged proof from essence to existence, and illustrations could be multiplied. But much more it belongs to his transformation of the epistemological problem, and to the suggestiveness of his philosophy as a whole for an advance in the direction of a speculative construction which should be able to cancel all Kant's surds, and in particular vindicate a "ground of the unity of the supersensible which lies back of nature with that which the concept of freedom implies in the sphere of practice,"[1] which is what Kant finally asserts.

iv. *After Kant.*

Starting from the obvious antithesis of thought and that of which it is the thought, it is possible to view the ultimate relation of its term as that of mutual indifference or, secondly, as that of a correspondence such that while they retain their distinct character modification of the one implies modification of the other, or thirdly and lastly, as that of a mergence of one in the other of such a nature that the merged term, whichever it be, is fully accounted for in a complete theory of that in which it is merged.

The Formal Logicians.

The first way is that of the purely formal logicians, of whom Twesten[2] and in England H. L. Mansel may be regarded as typical. They take thought and "the given" as self-contained units which, if not in fact separable, are at any rate susceptible of an abstraction the one from the other so decisive as to constitute an ideal separation. The laws of the pure activity of thought must be independently determined, and since the contribution of thought to knowledge is form they must be formal only. They cannot go beyond the limits of formal consistency or analytic correctness. They are confined to the determination of what the truth of any matter of thought, taken for granted upon grounds psychological or other, which are extraneous to logic, includes or excludes. The unit for logic is the concept taken for granted. The function of logic is to exhibit its formal implications and repulsions. It is questionable whether even this modest task could be really achieved without other reference to the content abstracted from than Mansel, for example, allows. The analogy of the resolution of a chemical compound with its elements which is often on the lips of those who would justify the independence of thought and the real world, with an agnostic conclusion as to non-phenomenal or trans-subjective reality, is not really applicable. The oxygen and hydrogen, for example, into which water may be resolved are not in strictness indifferent one to the other, since both are members of an order regulated according to laws of combination in definite ratios. Or, if applicable, it is double-edged. Suppose oxygen to be found only in water. Were it to become conscious, would it therefore follow that it could infer the laws of a separate or independent activity of its own? Similarly forms of thinking, the law of contradiction not excepted, have their meaning only in reference to determinate content, even though distributively all determinate contents are dispensable. The extreme formalist is guilty of a fallacy of composition in regard to abstraction.

It does not follow, however, that the laws asserted by the formal logicians are invalid or unimportant. There is a permissible abstraction, and in general they practise this, and although they narrow its range unduly, it is legitimately to be applied to certain characters of thinking. As the living organism includes something of mechanism—the skeleton, for example—so an organic logic doubtless includes determinations of formal consistency. The skeleton is meaningless apart from reference to its function in the life of an organism, yet there are laws of skeleton structure which can be studied with most advantage if other characters of the organism are relegated to the background. To allow, however, that abstraction admits of degrees, and that it never obliterates all reference to that from which it is abstracted, is to take a step forward in the direction of the correlation of logical forms with the concrete processes of actual thinking. What was true in formal logic tended to be absorbed in the correlationist theories.

Those formal logicians of the Kantian school, then, may be summarily dismissed, though their undertaking was a necessary one, who failed to raise the epistemological issue at all, or who, raising it, acquiesced in a naïve dualism agnostic of the real world as Kant's essential lesson. They failed to develop any view which could serve either in fact or in theory as a corrective to the effect of their formalism. What they said with justice was said as well or better elsewhere.

Among them it is on the whole impossible not to include the names of Hamilton and Mansel. The former, while his erudition in respect to the history of philosophical opinion has rarely been equalled, was not a clear thinker. His general theory of knowledge deriving from Kant and Reid, and including among other things a *contaminatio* of their theories of perception,[3] in no way sustains or mitigates his narrow view of logic. He makes no effective use of his general formula that to think is to condition. He appeals to the direct testimony of consciousness in the sense in which the appeal involves a fallacy. He accepts an ultimate antinomy as to the finiteness or infinity of "the unconditioned," yet applies the law of the excluded middle to insist that one of the two alternatives must be true, wherefore we must make the choice. And what is to be said of the judgment of a writer who considers the relativity of thought demonstrated by the fact that every judgment unites two members? Hamilton's significance for the history of logic lies in the stimulus that he gave to the development of symbolic logic in England by his new analytic based upon his discovery or adoption of the principle of the quantification of the predicate. Mansel, too, was learned, specially in matters of Aristotelian exegesis, and much that is of value lies buried in his commentation of the dry bones of the *Artis Logicae Rudimenta* of Locke's contemporary Aldrich. And he was a clearer thinker than Hamilton. Formal logic of the extremest rigour is nowhere to be found more adequately expressed in all its strength, and it must be added in all its weakness, than in the writings of Mansel. But if the view maintained above that formal logic must compromise or mitigate its rigour and so fail to maintain its independence, be correct, the logical consistency of Mansel's logic of consistency does but emphasize its barrenness. It contains no germ for further development. It is the end of a movement.

The brief logic of Herbart[4] is altogether formal too. Logical forms have for him neither psychological nor metaphysical reference. We are concerned in logic solely with the systematic

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[1] *Critique of Judgment*, Introd. § 2 (*Werke*, v., 276 ll. 9 sqq.); cf. Bernard's "Prolegomena" to his translation of this, pp. xxxviii. sqq.).

[2] *Die Logik, insbesondere die Analytik* (Schleswig, 1825). August Detlev Christian Twesten (1789–1876), a Protestant theologian, succeeded Schleiermacher as professor in Berlin in 1835.

[3] See *Sir William Hamilton: The Philosophy of Perception*, by J. Hutchison Stirling.

[4] *Hauptpunkte der Logik*, 1808 (*Werke*, ed. Hartenstein, i. 465 sqq.), and specially *Lehrbuch der Einleitung in die Philosophie* (1813), and subsequently §§ 34 sqq. (*Werke*, i. 77 sqq.).

Herbart.

clarification of concepts which are wholly abstract, so that they are not merely not ultimate realities, but also in no sense actual moments of our concrete thinking. The first task of logic is to distinguish and group such concepts according to their marks, and from their classification there naturally follows their connexion in judgment. It is in the logic of judgment that Herbart inaugurates a new era. He is not, of course, the first to note that even categorical judgments do not assert the realization of their subject. That is a thought which lies very near the surface for formal logic. He had been preceded too by Maimon in the attempt at a reduction of the traditional types of judgment. He was, however, the first whose analysis was sufficiently convincing to exorcise the tyranny of grammatical forms. The categorical and disjunctive judgment reduce to the hypothetical. By means of the doctrine of the quantification of the predicate, in which with his Leibnitzian conception of identity he anticipated Beneke and Hamilton alike, universal and particular judgments are made to pull together. Modal, impersonal, existential judgments are all accounted for. Only the distinction of affirmative and negative judgments remains unresolved, and the exception is a natural one from the point of view of a philosophy of pluralism. There was little left to be done here save in the way of an inevitable *mutatis mutandis*, even by Lotze and F. H. Bradley. From the judgment viewed as hypothetical we pass by affirmation of the antecedent or denial of the consequent to inference. This point of departure is noteworthy, as also is the treatment of the inductive syllogism as one in which the middle term is resoluble into a group or series (*Reihe*). In indicating specifically, too, the case of conclusion from a copulative major premise with a disjunctive minor, Herbart seems to have suggested the cue for Sigwart's exposition of Bacon's method of exclusions.

That it was the formal character of Herbart's logic which was ultimately fatal to its acceptance outside the school as an independent discipline is not to be doubted. It stands, however, on a different footing from that of the formal logic hitherto discussed, and is not to be condemned upon quite the same grounds. In the first place, Herbart is quite aware of the nature of abstraction. In the second, there is no claim that thought at one and the same time imposes form on "the given" and is susceptible of treatment in isolation by logic. With Herbart the forms of common experience, and indeed all that we can regard as his categories, are products of the psychological mechanism and destitute of logical import. And lastly, Herbart's logic conforms to the exigencies of his system as a whole and the principle of the bare or absolute self-identity of the ultimate "reals" in particular It is for this reason that it finally lacks real affinity to the "pure logic" of Fries. For at the basis of Herbart's speculation there lies a conception of identity foreign to the thought of Kant with his stress on synthesis, in his thoroughgoing metaphysical use of which Herbart goes back not merely to Wolff but to Leibnitz. It is no mere coincidence that his treatment of all forms of continuance and even his positive metaphysic of "reals" show affinity to Leibnitz. It was in the pressing to its extreme consequences of the conception of uncompromising identity which is to be found in Leibnitz, that the contradictions took their rise which Herbart aimed at solving, by the method of relations and his doctrine of the ultimate plurality of "reals," The logic of relations between conceptual units, themselves unaltered by the relation, seems a kind of reflection of his metaphysical method. To those, of course, for whom the only real identity is identity in difference, while identity without difference, like difference without identity, is simply a limit or a vanishing point, Herbart's logic and metaphysic will alike lack plausibility.

The setting of Herbart's logic in his thought as a whole might of itself perhaps justify separate treatment. His far-reaching influence in the development of later logic must certainly do so. Directly he affected a school of thought which contained one logician of first-rate importance in Moritz Wilhelm Drobisch (1802–1896), professor at Leipzig. In less direct relation stands Lotze, who, although under other influences he developed a different view even in logic, certainly let no point in the doctrine of his great predecessor at Göttingen escape him. A Herbartian strain is to be met with also in the thought of writers much further afield, for example F. H. Bradley, far though his metaphysic is removed from Herbart's. Herbart's influence is surely to be found too in the evolution of what is called *Gegenstandstheorie.* Nor did he affect the logic of his successors through his logic alone. Reference has been made above to the effect upon the rise of the later psychological logic produced by Herbart's psychology of apperception, when disengaged from the background of his metaphysic taken in conjunction with his treatment in his practical philosophy of the judgment of value or what he calls the aesthetic judgment. Emerson's verdict upon a greater thinker—that his was "not a mind to nestle in"—may be true of Herbart, but there can be no doubt as to the stimulating force of this master.

Logic as the rationale of knowledge.

The second way of interpreting the antithesis of thought to what is thought of, was taken by a group of thinkers among whom a central and inspiring figure was Schleiermacher. They in no sense constitute a school and manifest radical differences among themselves. They are agreed, however, in the rejection, on the one hand, of the subjectivist logic with its intrinsic implication that knowledge veils rather than reveals the real world, and, on the other hand, of the logic of the speculative construction with its pretension to "deduce," to determine, and finally at once to cancel and conserve any antithesis in its all-embracing dialectic. They agree, then, in a maintenance of the critical point of view, while all alike recognize the necessity of bringing the thought-function in knowledge into more intimate relation with its "other" than Kant had done, by means of some formula of correlation or parallelism. Such an advance might have taken its cue directly from Kant himself. As an historical fact it tended rather to formulate itself as a reaction towards Kant in view of the course taken by the speculative movement. Thus Schleiermacher's posthumously published *Dialektik* (1839) may be characterized as an appeal from the absolutist element in Schelling's philosophy to the conception of that correlation or parallelism which Schelling had exhibited as flowing from and subsisting within his absolute, and therein as a return upon Kant's doctrine of limits. Schleiermacher's conception of dialectic is to the effect that it is concerned with the principles of the art of philosophizing, as these are susceptible of a relatively independent treatment by a permissible abstraction. Pure thinking or philosophizing is with a view to philosophy or knowledge as an interconnected system of all sciences or departmental forms of knowledge, the mark of knowledge being its identity for all thinking minds. Dialectic then investigates the nexus which must be held to obtain between all thoughts, but also that agreement with the nexus in being which is the condition of the validity of the thought-nexus. In knowing there are two functions involved, the "organic" or animal function of sensuous experience in virtue of which we are in touch with being, directly in inner perception, mediately in outer experience, and the "intellectual" function of construction. Either is indispensable, though in different departments of knowledge the predominant rôle falls to one or other, *e.g.* we are more dependent in physics, less so in ethics. The idea of a perfect harmony of thinking and being is a presupposition that underlies all knowing but cannot itself be realized in knowledge. In terms of the agreement of thought and being, the logical forms of the part of dialectic correspondent to knowledge statically considered have parallels and analogies in being, the concept being correlated to substance, the judgment to causal nexus. Inference, curiously enough, falls under the technical side of dialectic concerned with knowledge in process or becoming, a line of cleavage which Ueberweg has rightly characterized as constituting a rift within Schleiermacher's parallelism.

Schleiermacher.

Schleiermacher's formula obviously ascribes a function in knowledge to thought as such, and describes in a suggestive manner a duality of the intellectual and organic functions, resting on a parallelism of thought and being whose collapse into identity it is beyond human capacity to grasp. It is rather, however, a statement of a way in which the relations of the terms of the problem may be conceived than a system of necessity. It may indeed be permitted to doubt whether its influence upon subsequent theory would have been a great one apart from the spiritual force of Schleiermacher's personality. Some sort of correlationist conception, however, was an inevitable development, and the list[1] of those who accepted it in something of the spirit of Schleiermacher is a long one and contains many distinguished names, notably those of Trendelenburg and Ueberweg. The group is loosely constituted however. There was scope for diversity of view and there was diversity of view, according as the vital issue of the formula was held to lie in the relation of intellectual function to organic function or in the not quite equivalent relation of thinking to being. Moreover, few of the writers who, whatsoever it was that they baptized with the name of logic, were at least earnestly engaged in an endeavour to solve the problem of knowledge within a circle of ideas which was on the whole Kantian, were under the dominance of a single inspiration. Beneke's philosophy is a striking instance of this, with application to Fries and affinity to Herbart conjoined with obligations to Schelling both directly and through Schleiermacher. Lotze again wove together many threads of earlier thought, though the web was assuredly his own. Finally it must not be forgotten that the host of writers who were in reaction against Hegelianism tended to take refuge in some formula of correlation, as a half-way house between that and formalism or psychologism or both, without reference to, and often perhaps without consciousness of, the way in which historically it had taken shape to meet the problem held to have been left unresolved by Kant.

Lotze.

Lotze on the one hand held the Hegelian "deduction" to be untenable, and classed himself with those who in his own phrase "passed to the order of the day," while on the other hand he definitely raised the question, how an "object" could be brought into forms to which it was not in some sense adapted. Accordingly, though he regards logic as formal, its forms come into relation to objectivity in some sort even within the logical field itself, while when taken in the setting of his system as a whole, its formal character is not of a kind that ultimately excludes psychological and metaphysical reference, at least speculatively. As a logician Lotze stands among the masters. His *flair* for the essentials in his problem, his subtlety of analysis, his patient willingness to return upon a difficulty from a fresh and still a fresh point of view, and finally his fineness of judgment, make his logic[2] so essentially logic of the present, and of its kind not soon to be superseded, that nothing more than an indication of the historical significance of some of its characteristic features need be attempted here.

In Lotze's pure logic it is the Herbartian element that tends to be disconcerting. Logic is formal. Its unit, the logical concept, is a manipulated product and the process of manipulation may be called abstraction. Processes of the psychological mechanism lie below it. The paradox of the theory of judgment is due to the ideal of identity, and the way in which this is evaded by supplementation to produce a non-judgmental identity, followed by translation of the introduced accessories with conditions in the hypothetical judgment, is thoroughly in Herbart's manner. The reduction of judgments is on lines already familiar. Syllogism is no instrumental method by which we compose our knowledge, but an ideal to the form of which it should be brought. It is, as it were, a schedule to be filled in, and is connected with the disjunctive judgment as a schematic setting forth of alternatives, not with the hypothetical, and ultimately the apodictic judgment with their suggestion that it is the real movement of thought that is subjected to analysis. Yet the resultant impression left by the whole treatment is not Herbartian. The concept is accounted for in Kantian terms. There is no discontinuity between the pre-logical or sub-logical conversion of impressions into "first universals" and the formation of the logical concept. Abstraction proves to be synthesis with compensatory universal marks in the place of the particular marks abstracted from. Synthesis as the work of thought always supplies, beside the mere conjunction or disjunction of ideas, a ground of their coherence or non-coherence. It is evident that thought, even as dealt with in pure logic, has an objectifying function. Its universals have objective validity, though this does not involve direct real reference. The formal conception of pure logic, then, is modified by Lotze in such a way as not only to be compatible with a view of the structural and functional adequacy of thought to that which at every point at which we take thinking is still distinguishable from thought, but even inevitably to suggest it. That the unit for logic is the concept and not the judgment has proved a stumbling-block to those of Lotze's critics who are accustomed to think in terms of the act of thought as unit. Lotze's procedure is, indeed, analogous to the way in which, in his philosophy of nature, he starts from a plurality of real beings, but by means of a reductive movement, an application of Kant's transcendental method, arrives at the postulate or fact of a law of their reciprocal action which calls for a monistic and idealist interpretation. He starts, that is in logic, with conceptual units apparently self-contained and admitting of nothing but external relation, but proceeds to justify the intrinsic relation between the matter of his units by an appeal to the fact of the coherence of all contents of thought. Indeed, if thought admits irreducible units, what can unite? Yet he is left committed to his puzzle as to a reduction of judgment to identity, which partially vitiates his treatment of the theory of judgment. The outstanding feature of this is, nevertheless, not affected, viz. the attempt that he makes, inspired clearly by Hegel, "to develop the various forms of judgment systematically as members of a series of operations, each of which leaves a part of its problem unmastered and thereby gives rise to the next."[3] As to inference, finally, the ideal of the articulation of the universe of discourse, as it is for complete knowledge, when its disjunctions have been thoroughly followed out and it is exhaustively determined, carried the day with him against the view that the organon for gaining knowledge is syllogism. The Aristotelian formula is "merely the expression, formally expanded and complete, of the truth already embodied in disjunctive judgment, namely, that every S which is a specific form of M possesses as its predicate a particular modification of each of the universal predicates of M to the exclusion of the rest." Schleiermacher's separation of inference from judgment and his attribution of the power to knowledge in process cannot find acceptance with Lotze. The psychologist and the formal logician do indeed join hands in the denial of a real movement of thought in syllogism. Lotze's logic then, is formal in a sense in which a logic which does not find the conception of synthetic truth embarrassing is not so. It is canon and not organon. In the one case, however, where it recognizes what is truly synthesis, *i.e.* in its account of the concept, it brings the statics of knowledge, so to speak, into integral relation with the dynamics. And throughout, wherever the survival from 1843, the identity bug-bear, is for the moment got rid of in what is really a more liberal conception, the statical doctrine is developed in a brilliant and informing manner. Yet it is in the detail of his logical investigations, something too volatile to fix in summary, that Lotze's greatness as a logician more especially lies.

With Lotze the ideal that at last the forms of thought shall be realized to be adequate to that which at any stage of actual knowledge always proves relatively intractable is an illuminating projection of faith. He takes courage from the reflection that to accept scepticism is to presume the competence of the thought that accepts. He will, however, take no easy way of parallelism. Our human thought pursues devious and circuitous methods. Its forms are not unseldom scaffolding for the house of knowledge rather than the framework of the house itself. Our task is not to realise correspondence with something other than thought, but to make explicit those justificatory notions which condition the form of our apprehension. "However much we may presuppose an original reference of the forms of thought to that nature of things which is the goal of knowledge, we must be prepared to find in them many elements which do not directly reproduce the actual reality to the knowledge of which they are to lead us." [1] The impulse of thought to reduce coincidence to coherence reaches immediately only to objectivity or validity. The sense in which the presupposition of a further reference is to be interpreted and in which justificatory notions for it can be adduced is only determinable in a philosophic system as a whole, where feeling has a place as well as thought, value equally with validity.

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[1] See Ueberweg, *System of Logic and History of Logical Doctrines*, § 34.

[2] *Drei Bücher der Logik*, 1874 (E.T., 1884). The Book on Pure Logic follows in essentials the line of thought of an earlier work (1843).

[3] *Logic*, Eng. trans. 35 *ad. fin.*

Lotze's logic then represents the statical aspect of the function of thought in knowledge, while, so far as we go in knowledge thought is always engaged in the unification of a manifold, which remains contradistinguished from it, though not, of course, completely alien to and unadapted to it. The further step to the determination of the ground of harmony is not to be taken in logic, where limits are present and untranscended.

Logic as Metaphysic.

The position of the search for truth, for which knowledge is a growing organism in which thought needs, so to speak, to feed on something other than itself, is conditioned in the post-Kantian period by antagonism to the speculative movement which culminated in the dialectic of Hegel. The radical thought of this movement was voiced in the demand of Reinhold [2] that philosophy should "deduce" it all from a single principle and by a single method. Kant's limits that must needs be thought and yet cannot be thought must be thought away. An earnest attempt to satisfy this demand was made by Fichte whose single principle was the activity of the pure Ego, while his single method was the assertion of a truth revealed by reflection on the content of conscious experience, the characterization of this as a half truth and the supplementation of it by its other, and finally the harmonization of both. The pure ego is inferred from the fact that the non-ego is realized only in the act of the ego in positing it. The ego posits itself, but reflection on the given shows that we must add that it posits also the non-ego. The two positions are to be conciliated in the thought of reciprocal limitation of the posited ego and non-ego. And so forth. Fichte cannot be said to have developed a logic, but this rhythm of thesis, antithesis and synthesis, foreshadowed in part for Fichte in Spinoza's formula, "omnis determinatio est negatio," and significantly in Kant's triadic grouping of his categories, gave a cue to the thought of Hegel. Schelling, too, called for a single principle and claimed to have found it in his Absolute, "the night" said Hegel, "in which all cows are black," but his historical influence lay, as we have seen, in the direction of a parallelism within the unity, and he also developed no logic. It is altogether otherwise with Hegel.

Hegel.

Hegel's logic,[3] though it involves inquiries which custom regards as metaphysical, is not to be characterized as a metaphysic with a method. It is logic or a rationale of thought by thought, with a full development among other matters of all that the most separatist of logicians regards as thought forms. It offers a solution of what has throughout appeared as the logical problem. That solution lies doubtless in the evolution of the Idea, *i.e.* an all-inclusive in which mere or pure thought is cancelled in its separateness by a transfiguration, while logic is nothing but the science of the Idea viewed in the medium of pure thought. But, whatever else it be, this *Panlogismus*, to use the word of J. E. Erdmann, is at least a logic. Thought in its progressive unfolding, of which the history of philosophy taken in its broad outline offers a pageant, necessarily cannot find anything external to or alien from itself, though that there is something external for it is another matter. As Fichte's Ego finds that its *non-ego* springs from and has its home within its very self, so with Hegel thought finds itself in its "other," both subsisting in the Idea which is both and neither. Either of the two is the all, as, for example, the law of the convexity of the curve is the law of the curve and the law of its concavity. The process of the development of the Idea or Absolute is in one regard the immanent process of the all. Logically regarded, *i.e.* "in the medium of mere thought," it is dialectical method. Any abstract and limited point of view carries necessarily to its contradictory. This can only be atoned with the original determination by fresh negation in which a new thought-determination is born, which is yet in a sense the old, though enriched, and valid on a higher plane. The limitations of this in turn cause a contradiction to emerge, and the process needs repetition. At last, however, no swing into the opposite, with its primarily conflicting, if ultimately complementary function, is any longer possible. That in which no further contradiction is possible is the absolute Idea. Bare or indeterminate being, for instance, the first of the determinations of Hegel's logic, as the being of that which is not anything determinate, of Kant's thing-in-itself, for example, positively understood, implicated at once the notion of not-being, which negates it, and is one with it, yet with a difference, so that we have the transition to determinate being, the transition being baptized as becoming. And so forth. It is easy to raise difficulties not only in regard to the detail in Hegel's development of his categories, especially the higher ones, but also in regard to the essential rhythm of his method. The consideration that mere double negation leaves us precisely where we were and not upon a higher plane where the dominant concept is richer, is, of course, fatal only to certain verbal expressions of Hegel's intent. There is a differentiation in type between the two negations. But if we grant this it is no longer obviously the simple logical operation indicated. It is inferred then that Hegel complements from the stuff of experience, and fails to make good the pretension of his method to be by itself and of itself the means of advance to higher and still higher concepts till it can rest in the Absolute. He discards, as it were, and takes in from the stock while professing to play from what he has originally in his hand. He postulates his unity in senses and at stages in which it is inadmissible, and so supplies only a schema of relations otherwise won, a view supported by the way in which he injects certain determinations in the process, *e.g.* the category of chemism. Has he not cooked the process in the light of the result? In truth the Hegelian logic suffers from the fact that the good to be reached is presupposed in the beginning. Nature, *e.g.*, is not deduced as real because rational, but being real its rationality is presumed and, very imperfectly, exhibited in a way to make it possible to conceive it as in its essence the reflex of Reason. It is a vision rather than a construction. It is a "theosophical logic." Consider the rational-real in the unity that must be, and this is the way of it, or an approximation to the way of it! It was inevitable that the epistemologists of the search for truth would have none of it. The ideal in whatsoever sense real still needs to be realized. It is from the human standpoint regulative and only hypothetically or formally constitutive. We must not confuse *οὐσία* with *εἶναι*, nor *εἶναι* with *γίγνεσθαι*.

Yet in a less ambitious form the fundamental contentions of Hegel's method tend to find a qualified acceptance. In any piece of presumed knowledge its partial or abstract character involves the presence of loose edges which force the conviction of inadequacy and the development of contradictions. Contradictions must be annulled by complementation, with resultant increasing coherence in ascending stages. At each successive stage in our progress fresh contradictions break out, but the ideal of a station at which the thought-process and its other, if not one, are at one, is permissible as a limiting conception. Yet if Hegel meant only this he has indeed succeeded in concealing his meaning.

Hegel's treatment of the categories or thought determinations which arise in the development of the immanent dialectic is rich in flashes of insight, but most of them are in the ordinary view of logic wholly metaphysical. In the stage, however, of his process in which he is concerned with the notion are to be found concept, judgment, syllogism. Of the last he declares that it "is the reasonable and everything reasonable" (*Encyk.* § 181), and has the phantasy to speak of the definition of the Absolute as being "at this stage" simply the syllogism. It is, of course, the rhythm of the syllogism that attracts him. The concept goes out from or utters itself in judgment to return to an enhanced unity in syllogism. Ueberweg (*System* § 101) is, on the whole, justified in exclaiming that Hegel's rehabilitation of syllogism "did but slight service to the Aristotelian theory of syllogism," yet his treatment of syllogism must be regarded as an acute contribution to logical criticism in the technical sense. He insists on its objectivity. The transition from judgment is not brought about by our subjective action. The syllogism of "all-ness" is convicted of a *petitio principii* (*Encyk.* § 190), with consequent lapse into the inductive syllogism, and, finally, since inductive syllogism is involved in the infinite process, into analogy. "The syllogism of necessity," on the contrary, does not presuppose its conclusion in its premises. The detail, too, of the whole discussion is rich in suggestion, and subsequent logicians—Ueberweg himself perhaps, Lotze certainly in his genetic scale of types of judgment and inference, Professor Bosanquet notably in his systematic development of "the morphology of knowledge," and others—have with reason exploited it.

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[1] *Logic*, Introd. § ix.

[2] For whom see Höffding, *History of Modern Philosophy*, Eng. trans., vol. ii. pp. 122 sqq.; invaluable for the logical methods of modern philosophers.

[3] *Wissenschaft der Logik* (1812–1816), in course of revision at Hegel's death in 1831 (*Werke*, vols. iii.-v.), and *Encyklopadie der philosophischen Wissenschaften*, i.; *Die Logik* (1817; 3rd ed., 1830); *Werke*, vol. vi.. Eng. trans., Wallace (2nd ed., 1892).

Hegel's logic as a whole, however, stands and falls not with his thoughts on syllogism, but with the claim made for the dialectical method that it exhibits logic in its integral unity with metaphysic, the thought-process as the self-revelation of the Idea. The claim was disallowed. To the formalist proper it was self-condemned in its pretension to develop the content of thought and its rejection of the formula of bare-identity. To the epistemologist it seemed to confuse foundation and keystone, and to suppose itself to build upon the latter in a construction illegitimately appropriative of materials otherwise accumulated. At most it was thought to establish a schema of formal unity which might serve as a regulative ideal. To the methodologist of science in genesis it appeared altogether to fail to satisfy any practical interest. Finally, to the psychologist it spelt the failure of intellectualism, and encouraged, therefore, some form of rehabilitated experientialism.

In the Hegelian school in the narrower sense the logic of the master receives some exegesis and defence upon single points of doctrine rather than as a whole. Its effect upon logic is rather to be seen in the rethinking of the traditional body of logical doctrine in the light of an absolute presupposed as ideal, with the postulate that a regulative ideal must ultimately exhibit itself as constitutive, the justification of the postulate being held to lie in the coherence and all-inclusiveness of the result. In such a logic, if and so far as coherence should be attained, would be found something akin to the spirit of what Hegel achieves, though doubtless alien to the letter of what it is his pretension to have achieved. There is perhaps no serious misrepresentation involved in regarding a key-thought of this type, though not necessarily expressed in those verbal forms, as pervading such logic of the present as coheres with a philosophy of the absolute conceived from a point of view that is intellectualist throughout. All other contemporary movements may be said to be in revolt from Hegel.

v. *Logic from* 1880–1910

Logic in the present exhibits, though in characteristically modified shapes, all the main types that have been found in its past history. There is an intellectualist logic coalescent with an absolutist metaphysic as aforesaid. There is an epistemological logic with sometimes formalist, sometimes methodological leanings. There is a formal-symbolic logic engaged with the elaboration of a relational calculus. Finally, there is what may be termed psychological-voluntaryist logic. It is in the rapidity of development of logical investigations of the third and fourth types and the growing number of their exponents that the present shows most clearly the history of logic in the making. All these movements are logic of the present, and a very brief indication may be added of points of historical significance.

Of intellectualist logic Francis Herbert Bradley[1] (b. 1846) and Bernard Bosanquet[2] (1848) may be taken as typical exponents. The philosophy of the former concludes to an Absolute by the annulment of contradictions, though the ladder of Hegel is conspicuous by its absence. His metaphysical method, however, is like Herbart's, not identifiable with his logic, and the latter has for its central characteristic its thorough restatement of the logical forms traditional in language and the text-books, in such a way as to harmonize with the doctrine of a reality whose organic unity is all-inclusive. The thorough recasting that this involves, even of the thought of the masters when it occasionally echoes them, has resulted in a phrasing uncouth to the ear of the plain man with his world of persons and things in which the former simply think about the latter, but it is fundamentally necessary for Bradley's purpose. The negative judgment, for example, cannot be held in one and the same undivided act to presuppose the unity of the real, project an adjective as conceivably applicable to it and assert its rejection. We need, therefore, a restatement of it. With Bradley reality is the one subject of all judgment immediate or mediate. The act of judgment "which refers an ideal content (recognized as such) to a reality beyond the act" is the unit for logic. Grammatical subject and predicate necessarily both fall under the rubric of the adjectival, that is, within the logical idea or ideal content asserted. This is a meaning or universal, which can have no detached or abstract self-subsistence. As found in judgment it may exhibit differences within itself, but it is not two, but one, an articulation of unity, not a fusion, which could only be a confusion, of differences. With a brilliant subtlety Bradley analyses the various types of judgment in his own way, with results that must be taken into account by all subsequent logicians of this type. The view of inference with which he complements it is only less satisfactory because of a failure to distinguish the principle of nexus in syllogism from its traditional formulation and rules, and because he is hampered by the intractability which he finds in certain forms of relational construction.

Bosanquet had the advantage that his logic was a work of a slightly later date. He is, perhaps, more able than Bradley has shown himself, to use material from alien sources and to penetrate to what is of value in the thought of writers from whom, whether on the whole or on particular issues, he disagrees. He treats the book-tradition, however, a debt to which, nowadays inevitable, he is generous in acknowledging,[3] with a judicious exercise of freedom in adaptation, *i.e.* constructively as datum, never eclectically. In his fundamental theory of judgment his obligation is to Bradley. It is to Lotze, however, that he owes most in the characteristic feature of his logic, viz., the systematic development of the types of judgment, and inference from less adequate to more adequate forms. His fundamental continuity with Bradley may be illustrated by his definition of inference. "Inference is the indirect reference to reality of differences within a universal, by means of the exhibition of this universal in differences directly referred to reality."[4] Bosanquet's *Logic* will long retain its place as an authoritative exposition of logic of this type.

Of epistemological logic in one sense of the phrase Lotze is still to be regarded as a typical exponent. Of another type Chr. Sigwart (*q.v.*) may be named as representative Sigwart's aim was "to reconstruct logic from the point of view of methodology." His problem was the claim to arrive at propositions universally valid, and so true of the object, whosoever the individual thinker. His solution, within the Kantian circle of ideas, was that such principles as the Kantian principle of causality were justified as "postulates of the endeavour after complete knowledge." "What Kant has shown is not that irregular fleeting changes can never be the object of consciousness, but only that the ideal consciousness of complete science would be impossible without the knowledge of the necessity of all events.[1] "The universal presuppositions which form the outline of our ideal of knowledge are not so much laws which the understanding prescribes to nature . . . as laws which the understanding lays down for its own regulation in its investigation and consideration of nature. They are a priori because no experience is sufficient to reveal or confirm them in unconditional universality; but they are a priori . . . only in the sense of presuppositions without which we should work with no hope of success and merely at random and which therefore we must believe." Finally they are akin to our ethical principles. With this coheres his dictum, with its far-reaching consequences for the philosophy of induction, that "the logical justification of the inductive process rests upon the fact that it is an inevitable postulate of our effort after knowledge, that the given is necessary, and can be known as proceeding from its grounds according to universal laws."[2] It is characteristic of Sigwart's point of view that he acknowledges obligation to Mill as well as to Ueberweg. The transmutation of Mill's induction of inductions into a postulate is an advance of which the psychological school of logicians have not been slow to make use. The comparison of Sigwart with Lotze is instructive, in regard both to their agreement and their divergence as showing the range of the epistemological formula.

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[1] *The Principles of Logic* (1883).

[2] *Logic, or The Morphology of Thought* (2 vols., 1888).

[3] *Logic*, Pref. pp. 6 seq.

[4] *Id.* vol. ii. p. 4.

Of the formal-symbolic logic all that falls to be said here is, that from the point of view of logic as a whole, it is to be regarded as a legitimate praxis as long as it shows itself aware of the sense in which alone form is susceptible of abstraction, and is aware that in itself it offers no solution of the logical problem. "It is not an algebra," said Kant[3] of his technical logic, and the kind of support lent recently to symbolic logic by the *Gegenstandstheorie* identified with the name of Alexius Meinong (b. 1853)[4] is qualified by the warning that the real activity of thought tends to fall outside the calculus of relations and to attach rather to the subsidiary function of denoting. The future of symbolic logic as coherent with the rest of logic, in the sense which the word has borne throughout its history seems to be bound up with the question of the nature of the analysis that lies behind the symbolism, and of the way in which this is justified in the setting of a doctrine of validity. The "theory of the object," itself, while affecting logic alike in the formal and in the psychological conception of it very deeply, does not claim to be regarded as logic or a logic, apart from a setting supplied from elsewhere.

Finally we have a logic of a type fundamentally psychological, if it be not more properly characterized as a psychology which claims to cover the whole field of philosophy, including the logical field. The central and organizing principle of this is that knowledge is in genesis, that the genesis takes place in the medium of individual minds, and that this fact implies that there is a necessary reference throughout to interests or purposes of the subject which thinks because it wills and acts. Historically this doctrine was formulated as the declaration of independence of the insurgents in revolt against the pretensions of absolutist logic. It drew for support upon the psychological movement that begins with Fries and Herbart. It has been chiefly indebted to writers, who were not, or were not primarily, logicians, to Avenarius, for example, for the law of the economy of thought, to Wundt, whose system, and therewith his logic,[5] is a pendant to his psychology, for the volitional character of judgment, to Herbert Spencer and others. A judgment is practical, and not to be divorced without improper abstraction from the purpose and will that informs it. A concept is instrumental to an end beyond itself, without any validity other than its value for action. A situation involving a need of adaptation to environment arises and the problem it sets must be solved that the will may control environment and be justified by success. Truth is the improvised machinery that is interjected, so far as this works. It is clear that we are in the presence of what is at least an important half-truth, which intellectualism with its statics of the rational order viewed as a completely articulate system has tended to ignore. It throws light on many phases of the search for truth, upon the plain man's claim to start with a subject which he knows whose predicate which he does not know is still to be developed, or again upon his use of the negative form of judgment, when the further determination of his purposive system is served by a positive judgment from without, the positive content of which is yet to be dropped as irrelevant to the matter in hand. The movement has, however, scarcely developed its logic[6] except as polemic. What seems clear is that it cannot be the whole solution. While man must confront nature from the human and largely the practical standpoint, yet his control is achieved only by the increasing recognition of objective controls. He conquers by obedience. So truth works and is economical because it is truth. Working is proportioned to inner coherence. It is well that the view should be developed into all its consequences. The result will be to limit it, though perhaps also to justify it, save in its claim to reign alone.

There is, perhaps, an increasing tendency to recognize that the organism of knowledge is a thing which from any single viewpoint must be seen in perspective. It is of course a postulate that all truths harmonize, but to give the harmonious whole in a projection in one plane is an undertaking whose adequacy in one sense involves an inadequacy in another. No human architect can hope to take up in succession all essential points of view in regard to the form of knowledge or to logic. "The great campanile is still to finish."

BIBLIOGRAPHY.—Historical: No complete history of logic in the sense in which it is to be distinguished from theoretical philosophy in general has as yet been written. The history of logic is indeed so little intelligible apart from constant reference to tendencies in philosophical development as a whole, that the historian, when he has made the requisite preparatory studies, inclines to essay the more ambitious task. Yet there are, of course, works devoted to the history of logic proper.

Of these Prantl's *Geschichte der Logik im Abendlande* (4 vols., 1855–1870), which traces the rise, development and fortunes of the Aristotelian logic to the close of the middle ages, is monumental. Next in importance are the works of L. Rabus, *Logik und Metaphysik*, i. (1868) (pp. 123-242 historical, pp. 453-518 bibliographical, pp. 514 sqq. a section on apparatus for the study of the history of logic), *Die neuesten Bestrebungen auf dem Gebiete der Logik bei den Deutschen* (1880), *Logik* (1895), especially for later writers § 17. Ueberweg's *System der Logik und Geschichte der logischen Lehren* (4th ed. and last revised by the author, 1874, though it has been reissued later, Eng. trans., 1871) is alone to be named with these. Harms' posthumously published *Geschichte der Logik* (1881) (*Die Philosophie in ihrer Geschichte*, ii.) was completed by the author only so far as Leibnitz. Blakey's *Historical Sketch of Logic* (1851), though, like all this writer's works, closing with a bibliography of some pretensions, is now negligible. Franck, *Esquisse d'une histoire de la logique* (1838) is the chief French contribution to the subject as a whole.

Of contributions towards the history of special periods or schools of logical thought the list, from the opening chapters of Ramus's *Scholae Dialecticae* (1569) downwards (v. Rabus *loc. cit.*) would be endless. What is of value in the earlier works has now been absorbed. The *System der Logik* (1828) of Bachmann (a Kantian logician of distinction) contains a historical survey (pp. 569-644), as does the *Denklehre* (1822) of van Calker (allied in thought to Fries). pp. 12 sqq.; Eberstein's *Geschichte der Logik und Metaphysik bei den Deutschen von Leibniz bis auf gegenwärtige Zeit* (latest edition, 1799) is still of importance in regard to logicians of the school of Wolff and the *origines* of Kant's logical thought. Hoffmann, the editor and disciple of von Baader, published *Grundzüge einer Geschichte der Begriffe der Logik in Deutschland von Kant bis Baader* (1851). Wallace's prolegomena and notes to his *Logic of Hegel* (1874, revised and augmented 1892–1894) are of use for the history and terminology, as well as the theory. Riehl's article entitled *Logik in Die Kultur der Gegenwart*, vi. 1. *Systematische Philosophie* (1907), is excellent, and touches on quite modern developments. Liard, *Les Logiciens Anglais Contemporains* (5th ed., 1907), deals only with the 19th-century inductive and formal-symbolic logicians down to Jevons, to whom the book was originally dedicated. Venn's *Symbolic Logic* (1881) gave a careful history and bibliography of that development. The history of the more recent changes is as yet to be found only in the form of unshaped material in the pages of review and *Jahresbericht*. (H. W. B.*)

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[1] *Logik* (1873, 1889), Eng. trans. ii. 17.

[2] *Op. cit.* ii. 289.

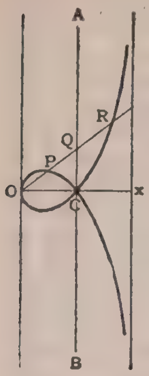
[3] *Introd. to Logic.*, trans. Abbott, p. 10.

[4] *Ueber Annahmen* (1902, &c.).

[5] *Logik* (1880, and in later editions).

[6] Yet see *Studies in Logic*, by John Dewey and others (1903).

LOGOCYCLIC CURVE, STROPHOID or **FOLIATE,** a cubic curve generated by increasing or diminishing the radius vector of a variable point Q on a straight line AB by the distance QC of the point from the foot of the perpendicular drawn from the origin to the fixed line. The polar equation is $r\cos\theta = a(1 \pm \sin\theta)$, the upper sign referring to the case when the vector is increased, the lower when it is diminished. Both branches are included in the Cartesian equation $(x^2+y^2)(2a-x) = a^2x$, where a is the distance of the line from the origin. If we take for axes the fixed line and the perpendicular through the initial point, the equation takes the form $y\sqrt{(a-x)} = x\sqrt{(a+x)}$. The curve resembles the folium of Descartes, and has a node between $x=0$, $x=a$, and two branches asymptotic to the line $x=2a$.



LOGOGRAPHI (λόγος, γράφω, writers of prose histories or tales), the name given by modern scholars to the Greek historiographers before Herodotus.[1] Thucydides, however, applies the term to all his own predecessors, and it is therefore usual to make a distinction between the older and the younger logographers. Their representatives, with one exception, came from Ionia and its islands, which from their position were most favourably situated for the acquisition of knowledge concerning the distant countries of East and West. They wrote in the Ionic dialect, in what was called the unperiodic style, and preserved the poetic character of their epic model. Their criticism amounts to nothing more than a crude attempt to rationalize the current legends and traditions connected with the founding of cities, the genealogies of ruling families, and the manners and customs of individual peoples. Of scientific criticism there is no trace whatever. The first of these historians was probably Cadmus of Miletus (who lived, if at all, in the early part of the 6th century), the earliest writer of prose, author of a work on the founding of his native city and the colonization of Ionia (so Suïdas); Pherecydes of Leros, who died about 400, is generally considered the last. Mention may also be made of the following: Hecataeus of Miletus (550–476); Acusilaus of Argos,[2] who paraphrased in prose (correcting the tradition where it seemed necessary) the genealogical works of Hesiod in the Ionic dialect; he confined his attention to the prehistoric period, and made no attempt at a real history; Charon of Lampsacus (*c.* 450), author of histories of Persia, Libya, and Ethiopia, of annals (ὧροι) of his native town with lists of the prytaneis and archons, and of the chronicles of Lacedaemonian kings; Xanthus of Sardis in Lydia (*c.* 450), author of a history of Lydia, one of the chief authorities used by Nicolaus of Damascus (*fl.* during the time of Augustus); Hellanicus of Mytilene; Stesimbrotus of Thasos, opponent of Pericles and reputed author of a political pamphlet on Themistocles, Thucydides and Pericles; Hippys and Glaucus, both of Rhegium, the first the author of histories of Italy and Sicily, the second of a treatise on ancient poets and musicians, used by Harpocration and Plutarch; Damastes of Sigeum, pupil of Hellanicus, author of genealogies of the combatants before Troy (an ethnographic and statistical list), of short treatises on poets, sophists, and geographical subjects.

On the early Greek historians, see G. Busolt, *Griechische Geschichte* (1893), i. 147-153; C. Wachsmuth, *Einleitung in das Studium der alten Geschichte* (1895); A. Schäfer, *Abriss der Quellenkunde der griechischen und römischen Geschichte* (ed. H. Nissen, 1889); J. B. Bury, *Ancient Greek Historians* (1909), lecture i.; histories of Greek literature by Müller-Donaldson (ch. 18) and W. Mure (bk. iv. ch. 3), where the little that is known concerning the life and writings of the logographers is exhaustively discussed. The fragments will be found, with Latin notes, translation, prolegomena, and copious indexes, in C. W. Müller's *Fragmenta historicorum Graecorum* (1841–1870).

See also GREECE: *History, Ancient* (section, " Authorities ").

LOGOS (λόγος), a common term in ancient philosophy and theology. It expresses the idea of an immanent reason in the world, and, under various modifications, is met with in Indian, Egyptian and Persian systems of thought. But the idea was developed mainly in Hellenic and Hebrew philosophy, and we may distinguish the following stages:

1. *The Hellenic Logos.*—To the Greek mind, which saw in the world a κόσμος (ordered whole), it was natural to regard the world as the product of reason, and reason as the ruling principle in the world. So we find a Logos doctrine more or less prominent from the dawn of Hellenic thought to its eclipse. It rises in the realm of physical speculation, passes over into the territory of ethics and theology, and makes its way through at least three well-defined stages. These are marked off by the names of Heraclitus of Ephesus, the Stoics and Philo.

It acquires its first importance in the theories of Heraclitus (6th century B.C.), who, trying to account for the aesthetic order of the visible universe, broke away to some extent from the purely physical conceptions of his predecessors and discerned at work in the cosmic process a λόγος analogous to the reasoning power in man. On the one hand the Logos is identified with γνώμη and connected with δίκη, which latter seems to have the function of correcting deviations from the eternal law that rules in things. On the other hand it is not positively distinguished either from the ethereal fire, or from the εἱμαρμένη and the ἀνάγκη according to which all things occur. Heraclitus holds that nothing material can be thought of without this Logos, but he does not conceive the Logos itself to be immaterial. Whether it is regarded as in any sense possessed of intelligence and consciousness is a question variously answered. But there is most to say for the negative. This Logos is not one above the world or prior to it, but in the world and inseparable from it. Man's soul is a part of it. It is *relation*, therefore, as Schleiermacher expresses it, or reason, not speech or word. And it is objective, not subjective, reason. Like a law of nature, objective in the world, it gives order and regularity to the movement of things, and makes the system rational.[3]

The failure of Heraclitus to free himself entirely from the physical hypotheses of earlier times prevented his speculation from influencing his successors. With Anaxagoras a conception entered which gradually triumphed over that of Heraclitus, namely, the conception of a supreme, intellectual principle, not identified with the world but independent of it. This, however, was νοῦς, not Logos. In the Platonic and Aristotelian systems, too, the theory of ideas involved an absolute separation between the material world and the world of higher reality, and though the term Logos is found the conception is vague and undeveloped. With Plato the term selected for the expression of the principle to which the order visible in the universe is due is νοῦς or σοφία, not λόγος. It is in the pseudo-Platonic *Epinomis* that λόγος appears as a synonym for νοῦς. In Aristotle, again, the principle which sets all nature under the rule of thought, and directs it towards a rational end, is νοῦς, or the divine spirit itself; while λόγος is a term with many senses, used as more or less identical with a number of phrases, οὗ ἕνεκα, ἐνέργεια, ἐντελέχεια, οὐσία, εἶδος, μορφή, &c.

In the reaction from Platonic dualism, however, the Logos doctrine reappears in great breadth. It is a capital element in the system of the Stoics. With their teleological views of the world they naturally predicated an active principle pervading it and determining it. This operative principle is called both Logos and God. It is conceived of as material, and is described in terms used equally of nature and of God. There is at the same time the special doctrine of the λόγος σπερματικός, the seminal Logos, or the law of generation in the world, the principle of the active reason working in dead matter. This parts into λόγοι σπερματικοί, which are akin, not to the Platonic ideas, but rather to the λόγοι ἔνυλοι of Aristotle. In man, too, there is a Logos which is his characteristic possession, and which is ἐνδιάθετος, as long as it is a thought resident within his breast, but *προφορικός* when it is expressed as a word. This distinction between Logos as *ratio* and Logos as *oratio*, so much used subsequently by Philo and the Christian fathers, had been so far anticipated by Aristotle's distinction between the ἔξω λόγος and the λόγος ἐν τῇ ψυχῇ. It forms the point of attachment by which the Logos doctrine connected itself with Christianity. The Logos of the Stoics (*q.v.*) is a reason in the world gifted with intelligence, and analogous to the reason in man.

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[1] The word is also used of the writers of speeches for the use of the contending parties in the law courts, who were forbidden to employ advocates.

[2] There is some doubt as to whether this Acusilaus was of Peloponnesian or Boeotian Argos. Possibly there were two of the name. For an example of the method of Acusilaus see Bury, *op. cit.* p. 19.

[3] Cf. Schleiermacher's *Herakleitos der Dunkle*; art. HERACLITUS and authorities there quoted.

2. *The Hebrew Logos.*—In the later Judaism the earlier anthropomorphic conception of God and with it the sense of the divine nearness had been succeeded by a belief which placed God at a remote distance, severed from man and the world by a deep chasm. The old familiar name Yahweh became a secret; its place was taken by such general expressions as the Holy, the Almighty, the Majesty on High, the King of Kings, and also by the simple word "Heaven." Instead of the once powerful confidence in the immediate presence of God there grew up a mass of speculation regarding on the one hand the distant future, on the other the distant past. Various attempts were made to bridge the gulf between God and man, including the angels, and a number of other hybrid forms of which it is hard to say whether they are personal beings or abstractions. The Wisdom, the Shekinah or Glory, and the Spirit of God are intermediate beings of this kind, and even the Law came to be regarded as an independent spiritual entity. Among these conceptions that of the Word of God had an important place, especially the creative Word of Genesis i. Here as in the other cases we cannot always say whether the Word is regarded as a mere attribute or activity of God, or an independent being, though there is a clear tendency towards the latter. The ambiguity lies in the twofold purpose of these activities: (1) to establish communication with God; (2) to prevent direct connexion between God and the world. The word of the God of revelation is represented as the creative principle (*e.g.* Gen. i. 3; Psalm xxxiii. 6), as the executor of the divine judgments (Hosea vi. 5), as healing (Psalm cvii. 20), as possessed of almost personal qualities (Isaiah lv. 11; Psalm cxlvii. 15). Along with this comes the doctrine of the angel of Yahweh, the angel of the covenant, the angel of the presence, in whom God manifests Himself, and who is sometimes identified with Yahweh or Elohim (Gen. xvi. 11, 13; xxxii. 29-31; Exod. iii. 2; xiii. 21), sometimes distinguished from Him (Gen. xxii. 15, &c.; xxiv. 7; xxviii. 12, &c.), and sometimes presented in both aspects (Judges ii., vi.; Zech. i.). To this must be added the doctrine of Wisdom, given in the books of Job and Proverbs. At one time it is exhibited as an attribute of God (Prov. iii. 19). At another it is strongly personified, so as to become rather the creative thought of God than a quality (Prov. viii. 22). Again it is described as proceeding from God as the principle of creation and objective to Him. In these and kindred passages (Job xv. 7, &c.) it is on the way to become hypostatized.

The Hebrew conception is partially associated with the Greek in the case of Aristobulus, the predecessor of Philo, and, according to the fathers, the founder of the Alexandrian school. He speaks of Wisdom in a way reminding us of the book of Proverbs. The pseudo-Solomonic *Book of Wisdom* (generally supposed to be the work of an Alexandrian flourishing somewhere between Aristobulus and Philo) deals both with the Wisdom and with the Logos. It fails to hypostatize either. But it represents the former as the framer of the world, as the power or spirit of God, active alike in the physical, the intellectual, and the ethical domain, and apparently objective to God. In the Targums, on the other hand, the three doctrines of the word, the angel, and the wisdom of God converge in a very definite conception. In the Jewish theology God is represented as purely transcendent, having no likeness of nature with man, and making no personal entrance into history Instead of the immediate relation of God to the world the Targums introduce the ideas of the *Mēmrā* (word) and the *Shechīnā* (real presence). This Memra (=Ma'amar) or, as it is also designated, *Dibbūrā*, is a hypostasis that takes the place of God when direct intercourse with man is in view. In all those passages of the Old Testament where anthropomorphic terms are used of God, the Memra is substituted for God. The Memra proceeds from God, and retains the creaturely relation to God. It does not seem to have been identified with the Messiah.[1]

3. *Philo.*—In the Alexandrian philosophy, as represented by the Hellenized Jew Philo, the Logos doctrine assumes a leading place and shapes a new career for itself. Philo's doctrine is moulded by three forces—Platonism, Stoicism and Hebraism. He detaches the Logos idea from its connexion with Stoic materialism and attaches it to a thorough-going Platonism. It is Plato's idea of the Good regarded as creatively active. Hence, instead of being merely immanent in the Cosmos, it has an independent existence. Platonic too is the doctrine of the divine architect who seeks to realize in the visible universe the archetypes already formed in his mind. Philo was thus able to make the Logos theory a bridge between Judaism and Greek philosophy. It preserved the monotheistic idea yet afforded a description of the Divine activity in terms of Hellenic thought; the Word of the Old Testament is one with the λόγος of the Stoics. And thus in Philo's conception the Logos is much more than "the principle of reason, informing the infinite variety of things, and so creating the World-Order"; it is also the divine dynamic, the energy and self-revelation of God. The Stoics indeed sought, more or less consciously, by their doctrine of the Logos as the Infinite Reason to escape from the belief in a divine Creator, but Philo, Jew to the core, starts from the Jewish belief in a supreme, self-existing God, to whom the reason of the world must be subordinated though related. The conflict of the two conceptions (the Greek and the Hebrew) led him into some difficulty; sometimes he represents the Logos as an independent and even personal being, a "second God," sometimes as merely an aspect of the divine activity. And though passages of the first class must no doubt be explained figuratively—for Philo would not assert the existence of two Divine agents—it remains true that the two conceptions cannot be fused. The Alexandrian philosopher wavers between the two theories and has to accord to the Logos of Hellas a semi-independent position beside the supreme God of Judaea. He speaks of the Logos (1) as the agency by which God reveals Himself, in some measure to all men, in greater degree to chosen souls. The appearances recorded in the Old Testament are manifestations of the Logos, and the knowledge of God possessed by the great leaders and teachers of Israel is due to the same source; (2) as the agency whereby man, enmeshed by illusion, lays hold of the higher spiritual life and rising above his partial point of view participates in the universal reason. The Logos is thus the means of redemption; those who realize its activity being emancipated from the tyranny of circumstance into the freedom of the eternal.

4. *The Fourth Gospel.*—Among the influences that shaped the Fourth Gospel that of the Alexandrian philosophy must be assigned a distinct, though not an exaggerated importance. There are other books in the New Testament that bear the same impress, the epistles to the Ephesians and the Colossians, and to a much greater degree the epistle to the Hebrews. The development that had thus begun in the time of Paul reaches maturity in the Fourth Gospel, whose dependence on Philo appears (1) in the use of the allegorical method, (2) in many coincident passages, (3) in the dominant conception of the Logos. The writer narrates the life of Christ from the point of view furnished him by Philo's theory. True, the Logos doctrine is only mentioned in the prologue to the Gospel, but it is presupposed throughout the whole book. The author's task indeed was somewhat akin to that of Philo, "to transplant into the world of Hellenic culture a revelation originally given through Judaism." This is not to say that he holds the Logos doctrine in exactly the same form as Philo. On the contrary, the fact that he starts from an actual knowledge of the earthly life of Jesus,

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[1] Cf. the Targum of Onkelos on the Pentateuch under Gen. vii. 16, xvii. 2, xxi 20; Exod. xix. 16, &c.; the Jerusalem Targum on Numb. vii. 89, &c. For further information regarding the Hebrew *Logos* see, beside Dr Kaufmann Kohler, *s.v.* "Memra," *Jewish Encyc.* viii. 464-465, Bousset, *Die Religion des Judenthums* (1903), p. 341, and Weber, *Jüdische Theologie* (1897), pp. 180-184. The hypostatizing of the Divine Word in the doctrine of the Memra was probably later than the time of Philo, but it was the outcome of a mode of thinking already common in Jewish theology. The same tendency is of course expressed in the "Logos" of the Fourth Gospel.

while Philo, even when ascribing a real personality to the Logos, keeps within the bounds of abstract speculation, leads him seriously to modify the Philonic doctrine. Though the Alexandrian idea largely determines the evangelist's treatment of the history, the history similarly reacts on the idea. The prologue is an organic portion of the Gospel and not a preface written to conciliate a philosophic public. It assumes that the Logos idea is familiar in Christian theology, and vividly summarizes the main features of the Philonic conception—the eternal existence of the Logos, its relation to God (*πρὸς τὸν θεόν*, yet distinct), its creative, illuminative and redemptive activity. But the adaptation of the idea to John's account of a historical person involved at least three profound modifications:—(1) the Logos, instead of the abstraction or semi-personification of Philo, becomes fully personified. The Word that became flesh subsisted from all eternity as a distinct personality within the divine nature. (2) Much greater stress is laid upon the redemptive than upon the creative function. The latter indeed is glanced at ("All things were made by him"), merely to provide a link with earlier speculation, but what the writer is concerned about is not the mode in which the world came into being but the spiritual life which resides in the Logos and is communicated by him to men. (3) The idea of λόγος as Reason becomes subordinated to the idea of λόγος as Word, the expression of God's will and power, the outgoing of the divine energy, life, love and light. Thus in its fundamental thought the prologue of the Fourth Gospel comes nearer to the Old Testament (and especially to Gen. i.) than to Philo. As speech goes out from a man and reveals his character and thought, so Christ is "sent out from the Father," and as the divine Word is also, in accordance with the Hebrew idea, the medium of God's quickening power.

What John thus does is to take the Logos idea of Philo and use it for a practical purpose—to make more intelligible to himself and his readers the divine nature of Jesus Christ. That this endeavour to work into the historical tradition of the life and teaching of Jesus—a hypothesis which had a distinctly foreign origin—led him into serious difficulties is a consideration that must be discussed elsewhere.

5. *The Early Church.*—In many of the early Christian writers, as well as in the heterodox schools, the Logos doctrine is influenced by the Greek idea. The Syrian Gnostic Basilides held (according to Irenaeus i. 24) that the Logos or Word emanated from the *νοῦς*, or personified reason, as this latter emanated from the unbegotten Father. The completest type of Gnosticism, the Valentinian, regarded Wisdom as the last of the series of aeons that emanated from the original Being or Father, and the Logos as an emanation from the first two principles that issued from God, Reason (*νοῦς*) and Truth. Justin Martyr, the first of the sub-apostolic fathers, taught that God produced of His own nature a rational power (*δύναμίν τινα λογικήν*), His agent in creation, who now became man in Jesus (*Dial. c. Tryph.* chap. 48, 60). He affirmed also the action of the λόγος σπερματικός, (*Apol.* i. 46; ii. 13, &c.). With Tatian (*Cohort. ad. Gr.* chap. 5, &c.) the Logos is the beginning of the world, the reason that comes into being as the sharer of God's rational power. With Athenagoras (*Suppl.* chap. 9, 10) He is the prototype of the world and the energizing principle (*ἰδέα καὶ ἐνέργεια*) of things. Theophilus (*Ad Autolyc.* ii. 10, 24) taught that the Logos was in eternity with God as the λόγος ἐνδιάθετος, the counsellor of God, and that when the world was to be created God sent forth this counsellor (*σύμβουλος*) from Himself as the λόγος προφορικός, yet so that the begotten Logos did not cease to be a part of Himself. With Hippolytus (*Refut.* x. 32, &c.) the Logos, produced of God's own substance, is both the divine intelligence that appears in the world as the Son of God, and the idea of the universe immanent in God. The early Sabellians (comp. Eusebius, *Hist. Eccl.* vi. 33; Athanasius, *Contra Arian.* iv.) held that the Logos was a faculty of God, the divine reason, immanent in God eternally, but not in distinct personality prior to the historical manifestation in Christ. Origen, referring the act of creation to eternity instead of to time, affirmed the eternal personal existence of the Logos. In relation to God this Logos or Son was a copy of the original, and as such inferior to that. In relation to the world he was its prototype, the *ἰδέα ἰδεῶν* and its redeeming power (*Contra Cels.* v. 608; *Frag. de princip.* i. 4; *De princip.* i. 109, 324).

In the later developments of Hellenic speculation nothing essential was added to the doctrine of the Logos. Philo's distinction between God and His rational power or Logos in contact with the world was generally maintained by the eclectic Platonists and Neo-Platonists. By some of these this distinction was carried out to the extent of predicating (as was done by Numenius of Apamea) three Gods:—the supreme God; the second God, or Demiurge or Logos; and the third God, or the world. Plotinus explained the λόγοι as constructive forces, proceeding from the ideas and giving form to the dead matter of sensible things (*Enneads*, v. 1. 8 and Richter's *Neu-Plat. Studien*).

See the histories of philosophy and theology, and works quoted under Heraclitus, Stoics, Philo, John, The Gospel of, &c., and for a general summary of the growth of the Logos doctrine, E. Caird, *Evolution of Theology in the Greek Philosophers* (1904), vol. ii.; A. Harnack, *History of Dogma*; E. F. Scott, *The Fourth Gospel*, ch. v. (1906); J. M. Heinze, *Die Lehre vom Logos in der griech. Philosophie* (1872); J. Réville, *La Doctrine du Logos* (1881); Aal, *Gesch. d. Logos-Idee* (1899); and the *Histories of Dogma*, by A. Harnack, F. Loofs, R. Seeberg. (S. D. F. S.; A. J. G.)

LOGOTHETE (Med. Lat. *logotheta*, Gr. λογοθέτης, from λόγος, word, account, calculation, and τιθέναι, to set, *i.e.* "one who accounts, calculates or ratiocinates"), originally the title of a variety of administrative officials in the Byzantine Empire, *e.g.* the λογοθέτης τοῦ δρόμου, who was practically the equivalent of the modern postmaster-general; and the λογοθέτης τοῦ στρατιωτικοῦ, the logothete of the military chest. Gibbon defines the great Logothete as "the supreme guardian of the laws and revenues," who "is compared with the chancellor of the Latin monarchies." From the Eastern Empire the title was borrowed by the West, though it only became firmly established in Sicily, where the *logotheta* occupied the position of chancellor elsewhere, his office being equal if not superior to that of the *magnus cancellarius.* Thus the title was borne by Pietro della Vigna, the all-powerful minister of the emperor Frederick II., king of Sicily.

See Du Cange, *Glossarium*, s.v. *Logotheta.*

LOGROÑO, an inland province of northern Spain, the smallest of the eight provinces formed in 1833 out of Old Castile; bounded N. by Burgos, Álava and Navarre, W. by Burgos, S. by Soria and E. by Navarre and Saragossa. Pop. (1900) 189,376; area, 1946 sq. m. Logroño belongs entirely to the basin of the river Ebro, which forms its northern boundary except for a short distance near San Vicente; it is drained chiefly by the rivers Tiron, Oja, Najerilla, Iregua, Leza, Cidacos and Alhama, all flowing in a north-easterly direction. The portion skirting the Ebro forms a spacious and for the most part fertile undulating plain, called La Rioja, but in the south Logroño is considerably broken up by offshoots from the sierras which separate that river from the Douro. In the west the Cerro de San Lorenzo, the culminating point of the Sierra de la Demanda, rises 7562 ft., and in the south the Pico de Urbion reaches 7388 ft. The products of the province are chiefly cereals, good oil and wine (especially in the Rioja), fruit, silk, flax and honey. Wine is the principal export, although after 1892 this industry suffered greatly from the protective duties imposed by France. Great efforts have been made to keep a hold upon French and English markets with light red and white Rioja wines. No less than 128,000 acres are covered with vines, and 21,000 with olive groves. Iron and argentiferous lead are mined in small quantities and other ores have been discovered. The manufacturing industries are insignificant. A railway along the right bank of the Ebro connects the province with Saragossa, and from Miranda there is railway communication with Madrid, Bilbao and France; but there is no railway in the southern districts, where trade is much retarded by the lack even of good roads. The town of Logroño (pop. 1900, 19,237) and the city of Calahorra (9475) are separately described. The only other towns with upwards of 5000 inhabitants are Haro (7914), Alfaro (5938) and Cervera del Río Alhama (5930).

LOGROÑO, the capital of the Spanish province of Logroño, on the right bank of the river Ebro and on the Saragossa-Miranda de Ebro railway. Pop. (1900) 19,237. Logroño is an ancient walled town, finely situated on a hill 1204 ft. high. Its bridge of twelve arches across the Ebro was built in 1138, but has frequently been restored after partial destruction by floods. The main street, arcaded on both sides, and the crooked but highly picturesque alleys of the older quarters are in striking contrast with the broad, tree-shaded avenues and squares laid out in modern times. The chief buildings are a bull-ring which accommodates 11,000 spectators, and a church, Santa Maria de Palacio, called "the imperial," from the tradition that its founder was Constantine the Great (274–337). As the commercial centre of the fertile and well-cultivated plain of the Rioja, Logroño has an important trade in wine.

The district of Logroño was in ancient times inhabited by the *Berones* or *Verones* of Strabo and Pliny, and their *Varia* is to be identified with the modern suburb of the city of Logroño now known as Varea of Barea. Logroño was named by the Romans *Juliobriga* and afterwards *Lucronius*. It fell into the hands of the Moors in the 8th century, but was speedily retaken by the Christians, and under the name of Lucronius appears with frequency in medieval history. It was unsuccessfully besieged by the French in 1521, and occupied by them from 1808 to 1813. It was the birthplace of the dumb painter Juan Fernandez Navarrete (1526–1579).

LOGROSCINO (or Lo Groscino), **NICOLA** (1700?–1763?), Italian musical composer, was born at Naples and was a pupil of Durante. In 1738 he collaborated with Leo and others in the hasty production of *Demetrio*; in the autumn of the same year he produced a comic opera *L'inganno per inganno*, the first of a long series of comic operas, the success of which won him the name of "il Dio dell' opera buffa." He went to Palermo, probably in 1747, as a teacher of counterpoint; as an opera composer he is last heard of in 1760, and is supposed to have died about 1763. Logroscino has been credited with the invention of the concerted operatic finale, but as far as can be seen from the score of *Il Governatore* and the few remaining fragments of other operas, his finales show no advance upon those of Leo. As a musical humorist, however, he deserves remembrance, and may justly be classed alongside of Rossini.

LOGWOOD (so called from the form in which it is imported), the heart-wood of a leguminous tree, *Haematoxylon campechianum*, native of Central America, and grown also in the West Indian Islands. The tree attains a height not exceeding 40 ft., and is said to be ready for felling when about ten years old. The wood, deprived of its bark and the sap-wood, is sent into the market in the form of large blocks and billets. It is very hard and dense, and externally has a dark brownish-red colour; but it is less deeply coloured within. The best qualities come from Campeachy, but it is obtained there only in small quantity.

Logwood is used in dyeing (*q.v.*), in microscopy, in the preparation of ink, and to a small extent in medicine on account of the tannic acid it contains, though it has no special medicinal value, being much inferior to kino and catechu. The wood was introduced into Europe as a dyeing substance soon after the discovery of America, but from 1581 to 1662 its use in England was prohibited by legislative enactment on account of the inferior dyes which at first were produced by its employment.

The colouring principle of logwood exists in the timber in the form of a glucoside, from which it is liberated as haematoxylin by fermentation. Haematoxylin, $C_{16}H_{14}O_6$, was isolated by M. E. Chevreul in 1810. It forms a crystalline hydrate, $C_{16}H_{14}O_6+3H_2O$, which is a colourless body very sparingly soluble in cold water, but dissolving freely in hot water and in alcohol. By exposure to the air, especially in alkaline solutions, haematoxylin is rapidly oxidized into haematein, $C_{16}H_{12}O_6$, with the development of a fine purple colour. This reaction of haematoxylin is exceedingly rapid and delicate, rendering that body a laboratory test for alkalis. By the action of hydrogen and sulphurous acid, haematein is easily reduced to haematoxylin. It is chemically related to brazilin, found in brazil-wood. Haematoxylin and brazilin, and also their oxidation products, haematin and brazilin, have been elucidated by W. H. Perkin and his pupils (see *Jour. Chem. Soc.*, 1908, 1909).

LOHARU, a native state of India, in the south-east corner of the Punjab, between Hissar district and Rajputana. Area, 222 sq. m.; pop. (1901) 15,229; estimated gross revenue, £4800. The chief, whose title is nawab, is a Mahommedan, of Afghan descent. The nawab Sir Amir-ud-din-Ahmad Khan, K.C.I.E., who is a member of the viceroy's legislative council, was until 1905 administrator and adviser of the state of Maler Kotla. The town of Loharu had a population in 1901 of 2175.

LÖHE, JOHANN KONRAD WILHELM (1808–1872), German divine and philanthropist, was born on the 21st of February 1808 in Fürth near Nuremberg, and was educated at the universities of Erlangen and Berlin. In 1831 he was appointed vicar at Kirchenlamitz, where his fervent evangelical preaching attracted large congregations and puzzled the ecclesiastical authorities. A similar experience ensued at Nuremberg, where he was assistant pastor of St Egidia. In 1837 he became pastor in Neuendettelsau, a small and unattractive place, where his life's work was done, and which he transformed into a busy and influential community. He was interested in the spiritual condition of Germans who had emigrated to the United States, and built two training homes for missionaries to them. In 1849 he founded the Lutheran Society of Home Missions and in 1853 an institution of deaconesses. Other institutions were added to these, including a lunatic asylum, a Magdalen refuge, and hospitals for men and women. In theology Löhe was a strict Lutheran, but his piety was of a most attractive kind. Originality of conception, vividness of presentation, fertility of imagination, wide knowledge of Scripture and a happy faculty of applying it, intense spiritual fervour, a striking physique and a powerful voice made him a great pulpit force. He wrote a good deal, amongst his books being *Drei Bücher von der Kirche* (1845), *Samenkörner des Gebetes* (over 30 editions) and several volumes of sermons. He died on the 2nd of January 1872.

See his *Life*, by J. Deinzer (3 vols., Gütersloh, 1873, 3rd ed., 1901).

LOHENGRIN, the hero of the German version of the legend of the knight of the swan. The story of Lohengrin as we know it is based on two principal motives common enough in folklore: the metamorphosis of human beings into swans, and the curious wife whose question brings disaster. Lohengrin's guide (the swan) was originally the little brother who, in one version of "the Seven Swans," was compelled through the destruction of his golden chain to remain in swan form and attached himself to the fortunes of one of his brothers. The swan played a part in classical mythology as the bird of Apollo, and in Scandinavian lore the swan maidens, who have the gift of prophecy and are sometimes confused with the Valkyries, reappear again and again. The wife's desire to know her husband's origin is a parallel of the myth of Cupid and Psyche, and bore in medieval times a similar mystical interpretation. The Lohengrin legend is localized on the Lower Rhine, and its incidents take place at Antwerp, Nijmwegen, Cologne and Mainz. In its application it falls into sharp division in the hands of German and French poets. By the Germans it was turned to mystical use by being attached loosely to the Grail legend (see Grail and Perceval); in France it was adapted to glorify the family of Godfrey de Bouillon.

The German story makes its appearance in the last stanzas of Wolfram von Eschenbach's *Parzival*, where it is related how Parzival's son, Loherangrin,[1] was sent from the castle of the Grail to the help of the young duchess of Brabant. Guided by the swan he reached Antwerp, and married the lady on condition that she should not ask his origin. On the breach of this condition years afterwards Loherangrin departed, leaving sword, horn and ring behind him. Between 1283 and 1290, a Bavarian disciple of Wolfram's[2] adopted the story and developed it into an epic poem of nearly 8000 lines, incorporating episodes of Lohengrin's prowess in tournament, his wars with Henry I. against the heathen Hungarians and the Saracens,[3] and incidentally providing a detailed picture of the everyday life of people of high condition. The epic of Lohengrin is put by the anonymous writer into the mouth of Wolfram, who is made to relate it during the Contest of the Singers at the Wartburg in proof of his superiority in knowledge of sacred things over Klingsor the magician, and the poem is thus linked on to German tradition. Its connexion with Parzival implies a mystic application. The consecrated wafer shared by Lohengrin and the swan on their voyage is one of the more obvious means taken by the poet to give the tale the character of an allegory of the relations between Christ, the Church and the human soul. The story was followed closely in its main outlines by Richard Wagner in his opera *Lohengrin*.

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[1] *i.e.* Garin le Loherin (*q.v.*), or Garin of Lorraine.

[2] Elster (*Beiträge*) says that the poem is the work of two poets: the first part by a Thuringian wandering minstrel, the second—which differs in style and dialect—by a Bavarian official.

[3] Based on material borrowed from the *Sächsische Weltchronik* (formerly called *Repgowische Chronik* from its dubious assignment to Eime von Repgow), the oldest prose chronicle of the world in German (*c.* 1248 or 1260).

The French legend of the knight of the swan is attached to the house of Bouillon, and although William of Tyre refers to it about 1170 as fable, it was incorporated without question by later annalists. It forms part of the cycle of the *chansons de geste* dealing with the Crusade, and relates how Helyas, knight of the swan, is guided by the swan to the help of the duchess of Bouillon and marries her daughter Ida or Beatrix in circumstances exactly parallel to the adventures of Lohengrin and Elsa of Brabant, and with the like result. Their daughter marries Eustache, count of Boulogne, and had three sons, the eldest of whom, Godefroid (Godfrey), is the future king of Jerusalem. But in French story Helyas is not the son of Parzival, but of the king and queen of Lillefort, and the story of his birth, of himself, his five brothers and one sister is, with variations, that of "the seven swans" persecuted by the wicked grandmother, which figures in the pages of Grimm and Hans Andersen. The house of Bouillon was not alone in claiming the knight of the swan as an ancestor, and the tradition probably originally belonged to the house of Cleves.

German Versions.—See *Lohengrin*, ed. Rückert (Quedlinburg and Leipzig, 1858); another version of the tale, *Lorengel*, is edited in the *Zeitschr. für deutsches Altertum* (vol. 15); modern German translation of *Lohengrin*, by H. A. Junghaus (Leipzig, 1878); Conrad von Würzburg's fragmentary *Schwanritter*, ed. F. Roth (Frankfurt, 1861). Cf. Elster, *Beiträge zur Kritik des Lohengrin* (Halle, 1884), and R. Heinrichs, *Die Lohengrindichtung und ihre Deutung* (Hamm i. West., 1905).

French Versions.—Baron de Reiffenberg, *Le Chevalier au cygne et Godfrey de Bouillon* (Brussels, 2 vols., 1846–1848), in *Mon. pour servir à l'hist. de la province de Namur*; C. Hippeau, *La Chanson du chevalier au cygne* (1874); H. A. Todd, *La Naissance du chevalier au cygne, an inedited French poem of the 12th cent.* (Mod. Lang. Assoc., Baltimore, 1889); cf. the Latin tale by Jean de Haute Seille (Johannes de Alta Silva) in his *Dolopathos* (ed. Oesterley, Strassburg, 1873).

English Versions.—In England the story first appears in a short poem preserved among the Cotton MSS. of the British Museum and entitled *Chevelere assigne*. This was edited by G. E. V. Utterson in 1820 for the Roxburghe Club, and again by H. H. Gibbs in 1868 for the Early English Text Society. The E.E.T.S. edition is accompanied by a set of photographs of a 14th-century ivory casket, on which the story is depicted in 36 compartments. An English prose romance, *Helyas Knight of the Swan*, translated by Robert Copland, and printed by W. Copland about 1550, is founded on a French romance *La Génealogie . . . de Godeffroy de Boulin* (printed 1504) and is reprinted by W. J. Thoms in *Early Prose Romances*, vol. iii. It was also printed by Wynkyn de Worde in 1512. A modern edition was issued in 1901 from the Grolier Club, New York.

LOIN (through O. Fr. *loigne* or *logne*, mod. *longe*, from Lat. *lumbus*), that part of the body in an animal which lies between the upper part of the hip-bone and the last of the false ribs on either side of the back-bone, hence in the plural the general term for the lower part of the human body at the junction with the legs, covered by the loin-cloth, the almost universal garment among primitive peoples. There are also figurative uses of the word, chiefly biblical, due to the loins being the supposed seat of male vigour and power of generation. Apart from these uses the word is a butcher's term for a joint of meat cut from this part of the body. The upper part of a loin of beef is known as the "surloin" (Fr. *surlonge*, *i.e.* upper loin). This has been commonly corrupted into "sirloin," and a legend invented, to account for the name, of a king, James I. or Charles II., knighting a prime joint of beef "Sir Loin" in pleasure at its excellence. A double surloin, undivided at the back-bone, is known as a "baron of beef," probably from an expansion of the legend of the "Sir Loin."

LOIRE, the longest river of France, rising in the Gerbier de Jonc in the department of Ardèche, at a height of 4500 ft. and flowing north and west to the Atlantic. After a course of 18 m. in Ardèche it enters Haute-Loire, in which it follows a picturesque channel along the foot of basaltic rocks, through narrow gorges and small plains. At Vorey, where it is joined by the Arzon, it becomes navigable for rafts. Four miles below its entrance into the department of Loire, at La Noirie, river navigation is officially reckoned to begin, and breaking through the gorges of Saint Victor, the Loire enters the wide and swampy plain of Forez, after which it again penetrates the hills and flows out into the plain of Roanne. As in Haute-Loire, it is joined by a large number of streams, the most important being the Coise on the right and the Lignon du Nord or du Forez and the Aix on the left. Below Roanne the Loire is accompanied on its left bank by a canal to Digoin (35 m.) in Saône-et-Loire, thence by the so-called "lateral canal of the Loire" to Briare in Loiret (122 m.). Owing to the exteme irregularity of the river in different seasons these canals form the only certain navigable way. At Digoin the Loire receives the Arroux, and gives off the canal du Centre (which utilizes the valley of the Bourbince) to Chalon-sur-Saône. At this point its northerly course begins to be interrupted by the mountains of Morvan, and flowing north-west it enters the department of Nièvre. Just beyond Nevers it is joined by the Allier; this river rises 30 m. S.W. of the Loire in the department of Lozère, and following an almost parallel course has at the confluence a volume equal to two-thirds of that of the main stream. Above Nevers the Loire is joined by the Aron, along which the canal du Nivernais proceeds northward, and the Nièvre, and below the confluence of the Allier gives off the canal du Berry to Bourges and the navigable part of the Cher. About this point the valley becomes more ample and at Briare (in Loiret) the river leaves the highlands and flows between the plateaus of Gatinais and the Beauce on the right and the Sologne on the left. In Loiret it gives off the canal de Briare northward to the Seine and itself bends north-west to Orléans, whence the canal d'Orléans, following the little river Cens, communicates with the Briare canal. At Orléans the river changes its north-westerly for a south-westerly course. A striking peculiarity of the affluents of the Loire in Loiret and the three subsequent departments is that they frequently flow in a parallel channel to the main stream and in the same valley. Passing Blois in Loir-et-Cher, the Loire enters Indre-et-Loire and receives on the right the Cisse, and, after passing Tours, the three important left-hand tributaries of the Cher, Indre and the Vienne. At the confluence of the Vienne the Loire enters Maine-et-Loire, in its course through which department it is frequently divided by long sandy islands fringed with osiers and willows; while upon arriving at Les Ponts-de-Cé it is split into several distinct branches. The principal tributaries are: left, the Thouet at Saumur, the Layon and the Evre; right: the Authion, and, most important tributary of all, the Maine, formed by the junction of the rivers Mayenne, Sarthe and Loir. Through Loire-Inférieure the river is studded with islands until below Nantes, where the largest of them, called Belle-Ile, is found. It receives the Erdre on the right at Nantes and on the opposite shore the Sèvre-Nantaise, and farther on the canalized Achenau on the left and the navigable Etier de Méan on the right near Saint Nazaire. Below Nantes, between which point and La Martinière (below Pellerin) the channel is embanked, the river is known as the Loire Maritime and widens out between marshy shores, passing Paimbœuf on the left and finally Saint-Nazaire, where it is 1½ m. broad. The length of the channel of the Loire is about 625 m.; its drainage area is 46,700 sq.m. A lateral canal (built in 1881–1892 at a cost of about £1,000,000) known as the Maritime Canal of the Loire between Le Carnet and La Martinière enables large ships to ascend to Nantes. It is 9½ m. long, and 19½ (capable of being increased to 24) ft. deep. At each end is a lock 405 ft. long by 59 ft. wide. The canal de Nantes à Brest connects this city with Brest.

The Loire is navigable only in a very limited sense. During the drought of summer thin and feeble streams thread their way between the sandbanks of the channel; while at other times a stupendous flood submerges wide reaches of land. In the middle part of its course the Loire traverses the western portion of the undulating Paris basin, with its Tertiary marls, sands and clays, and the alluvium carried off from these renders its lower channel inconstant; the rest of the drainage area is occupied by crystalline rocks, over the hard surface of which the water, undiminished by absorption, flows rapidly into the streams. When the flood waters of two or more tributaries arrive at the same time serious inundations result. Attempts to control the river must have begun at a very early date, and by the close of the middle ages the bed between Orléans and Angers was enclosed by dykes 10 to 13 ft. high. In 1783 a double line of dykes or *turcies* 23 ft. high was completed from Bec d'Allier downwards. The channel was, however, so much narrowed that the embankments are almost certain to give way as soon as the water rises 16 ft. (the average rise is about 14, and in 1846 and 1856 it was more than 22). In modern times embankments, aided by dredging operations extending over a large number of years, have ensured a depth of 18 ft. in the channel between La Martinière and Nantes. Several towns have constructed special works to defend themselves against the floods; Tours, the most exposed of all, is surrounded by a circular dyke.

Various schemes for the systematic regulation of the Loire have been discussed. It has been proposed to construct in the upper valleys of the several affluents a number of gigantic dams or reservoirs from which the water, stored during flood, could be let off into the river as required. A dam of this kind (built in 1711) at the village of Pinay, about 18 m. above Roanne, and capable of retaining from 350 to 450 million cub. ft. of water, has greatly diminished the force of the floods at Roanne, and maintained the comparative equilibrium of the current during the dry season. Three other dams of modern construction are also in existence, one near Firminy, the other two near St Étienne.

LOIRE, a department of central France, made up in 1793 of the old district of Forez and portions of Beaujolais and Lyonnais, all formerly included in the province of Lyonnais. Pop. (1906) 643,943. Area 1853 sq. m. It is bounded N. by the department of Saône-et-Loire, E. by those of Rhône and Isère, S. by Ardèche and Haute-Loire, and W. by Puy-de-Dôme and Allier. From 1790 to 1793 it constituted, along with that of Rhône, a single department (Rhône-et-Loire). It takes its name from the river which bisects it from south to north. The Rhone skirts the S.E. of the department, about one-eighth of which belongs to its basin. After crossing the southern border the Loire runs through wild gorges, passing the picturesque crag crowned by the old fortress of St Paul-en-Cornillon. At St Rambert it issues into the broad plain of Fotez, flows north as far as its confluence with the Aix where the plain ends, and then again traverses gorges till it enters the less extensive plain of Roanne in the extreme north of the department. These two plains, the beds of ancient lakes, are enclosed east and west by chains of mountains running parallel with the river. In the west are the Forez mountains, which separate the Loire basin from that of the Allier; their highest point (Pierre sur Haute, 5381 ft.) is 12 m. W. of Montbrison. They sink gradually towards the north, and are successively called Bois Noirs (4239 ft.), from their woods, and Monts de la Madeleine (3822 to 1640 ft.). In the east the Rhone and Loire basins are separated, by Mont Pilat (4705 ft.) at the north extremity of the Cévennes, and by the hills of Lyonnais, Tarare, Beaujolais and Charolais, none of which rise higher than 3294 ft. Of the affluents of the Loire the most important are the Lignon du Nord, the beautiful valley of which has been called "La Suisse Forezienne," and the Aix on the left, and on the right the Ondaine (on which stand the industrial towns of Chambon-Feugerolles and Firminy), the Furens and the Rhin. The Gier forms a navigable channel to the Rhone at Givors, and has on its banks the industrial towns of St Chamond and Rive-de-Gier. From Mont Pilat descends the Déôme, in the valley of which are the workshops of Annonay (*q.v.*). The climate on the heights is cold and healthy, it is unwholesome in the marshy plain of Forez, mild in the valley of the Rhone. The annual rainfall varies from 39 to 48 in. on the Forez mountains, but only reaches 20 to 24 in. in the vicinity of Montbrison.

The plains of Forez and Roanne are the two most important agricultural districts, but the total production of grain within the department is insufficient for the requirements of the population. The pasture lands of the plain of Forez, the western portion of which is irrigated by the canal of Forez, support a large number of live stock. Good pasturage is also found on the higher levels of the Forez mountains, on the north-eastern plateaus, where oxen of the famous Charolais breed are raised, and on the uplands generally. Wheat and rye are the leading cereal crops; oats come next in importance, barley and colza occupying a relatively small area. The vine is cultivated in the valley of the Rhone, on the lower slopes of the Forez mountains and on the hills west of the plain of Roanne. The forests of Mont Pilat and the Forez chain yield good-sized pines and wood for mining purposes. The so-called Lyons chestnuts are to a large extent obtained from Forez; the woods and pasture lands of Mont Pilat yield medicinal plants, such as mint. Poultry-rearing and bee-keeping are considerable industries. The department is rich in mineral springs, the waters of St Galmier, Sail-sous-Couzan, St Romain-le-Puy and St Alban being largely exported. The chief wealth of the department lies in the coal deposits of the basin of St Étienne (*q.v.*), the second in importance in France, quarrying is also active. Metal-working industries are centred in the S.E. of the department, where are the great manufacturing towns of St Étienne, Rive-de-Gier, St Chamond and Firminy. At St Étienne there is a national factory of arms, in which as many as 10,000 have been employed; apart from other factories of the same kind carried on by private individuals, the production of hardware, locks, edge-tools, common cutlery, chain cables for the mines, files, rails, &c., occupies thousands of hands. Cast steel is largely manufactured, and the workshops of the department supply the heaviest constructions required in naval architecture, as well as war material and machinery of every description. The glass industry is carried on at Rive-de-Gier and St Galmier. St Étienne and St Chamond are centres for the fabrication of silk ribbons, elastic ribbons and laces, and the dressing of raw silks. Between 50,000 and 60,000 people are employed in the last-named industries. The arrondissement of Roanne manufactures cotton stuffs, muslins and the like. That of Montbrison produces table linen. The department has numerous dye-works, flour-mills, paper works, tanyards, brick-works, silk-spinning works and hat factories. It is served by the Paris-Lyon railway, Roanne being the junction of important lines from Paris to Lyons and St Étienne. Within the department the Loire is hardly used for commercial navigation; the chief waterways are the canal from Roanne to Digoin (13 m. in the department), that from Givors to Rive-de-Gier (7 m.) and the Rhone (7 m.).

Loire comprises three arrondissements—St Étienne, Montbrison and Roanne—with 31 cantons and 335 communes. It falls within the region of the XIII. army corps and the *diocèse* and *académie* (educational circumscription) of Lyons, where also is its court of appeal. St Étienne is the capital, other leading towns being Roanne, Montbrison, Rive-de-Gier, St Chamond, Firminy and Le Chambon, all separately noticed. St Bonnet-le-Château, besides old houses, has a church of the 15th and 16th centuries, containing paintings of the 15th century; St Rambert and St Romain-le-Puy have priory churches of the 11th and 12th centuries; and at Charlieu there are remains of a Benedictine abbey founded in the 9th century, including a porch decorated with fine Romanesque carving.

LOIRE-INFÉRIEURE, a maritime department of western France, made up in 1790 of a portion of Brittany on the right and of the district of Retz on the left of the Loire, and bounded W. by the ocean, N. by Morbihan and Ille-et-Vilaine, E. by Maine-et-Loire and S. by Vendée. Pop. (1906) 666,748. Area 2694 sq. m. The surface is very flat, and the highest point, in the north on the borders of Ille-et-Vilaine, reaches only 377 ft. The line of hillocks skirting the right bank of the Loire, and known as the *sillon de Bretagne*, scarcely exceeds 250 ft.; below Savenay they recede from the river, and meadows give place to peat bogs. North of St Nazaire and Grande Brière, measuring 9 m. by 6, and rising hardly 10 ft. above the sea-level, still supplies old trees which can be used for joiners' work. A few scattered villages occur on the more elevated spots, but communication is effected chiefly by the canals which intersect it. The district south of the Loire lies equally low; its most salient feature is the lake of Grandlieu, covering 27 sq. m., and surrounded by low and marshy ground, but so shallow (6½ ft. at most) that drainage would be comparatively easy. The Loire (*q.v.*) has a course of 70 m. within the department. On the left bank a canal stretches for 9 m. between Pellerin, where the dikes which protect the Loire valley from inundation terminate, and Paimbœuf, and vessels drawing 17 or 18 ft. can reach Nantes. The principal towns on the river within the department are Ancenis, Nantes and St Nazaire (one of the most important commercial ports of France) on the right, and Paimbœuf on the left. The chief affluents are, on the right the Erdre and on the left the Sèvre, both debouching at Nantes. The Erdre in its lower course broadens in places into lakes which give it the appearance of a large river. Four miles below Nort it coalesces with the canal from Nantes to Brest. The Sèvre is hemmed in by picturesque hills; at the point where it enters the department it flows past the beautiful town of Clisson with its imposing castle of the 13th century. Apart from the Loire, the only navigable channel of importance within the department is the Nantes and Brest canal, fed by the Isac, a tributary of the Vilaine, which separates Loire-Inférieure from Ille-et-Vilaine and Morbihan. The climate is humid, mild and equable. At Nantes the mean annual temperature is 54·7° Fahr., and there are one hundred and twenty-two rainy days, the annual rainfall being 25·6 in.

Horse and cattle raising prospers, being carried on chiefly in the west of the department and in the Loire valley. Good butter and cheese are produced. Poultry also is reared, and there is a good deal of bee-keeping. Wheat, oats, buckwheat and potatoes are produced in great abundance; leguminous plants are also largely cultivated, especially near Nantes. Wine, cider and forage crops are the chief remaining agricultural products. The woods are of oak in the interior and pine on the coast. The department has deposits of tin, lead and iron. N.W. of Ancenis coal is obtained from a bed which is a prolongation of that of Anjou. The salt marshes, about 6000 acres in all, occur for the most part between the mouth of the Vilaine and the Loire, and on the Bay of Bourgneuf, and salt-refining, of which Guérande is the centre, is an important industry. The granite of the sea-coast and of the Loire up to Nantes is quarried for large blocks. Steam-engines are built for the government at Indret, a few miles below Nantes; the forges of Basse-Indre are in good repute for the quality of their iron; and the production of the lead-smelting works at Couëron amounts to several millions of francs annually. There are also considerable foundries at Nantes, Chantenay, close to Nantes, and St Nazaire, and shipbuilding yards at Nantes and St Nazaire. Among other industries may be mentioned the preparation of pickles and preserved meats at Nantes, the curing of sardines at Le Croisic and in the neighbouring communes, the manufacture of sugar, brushes, tobacco, macaroni and similar foods, soap and chemicals at Nantes, and of paper, sugar and soap at Chantenay. Fishing is prosecuted along the entire coast, particularly at Le Croisic. Among the seaside resorts Le Croisic, Pornichet and Pornic, where there are megalithic monuments, may be mentioned. The department is traversed by the railways of the state, the Orléans company and the Western company. The department is divided into five arrondissements—Nantes, Ancenis, Châteaubriant, Paimbœuf and St Nazaire—45 cantons and 219 communes. It has its appeal court at Rennes, which is also the centre of the *académie* (educational division) to which it belongs.

The principal places are Nantes, the capital, St Nazaire and Châteaubriant, which receive separate treatment. On the west coast the town of Batz, and the neighbouring villages, situated on the peninsula of Batz, are inhabited by a small community possessed of a distinct costume and dialect, and claiming descent from a Saxon or Scandinavian stock. Its members are employed for the most part in the salt marshes N.E. of the town. Guérande has well-preserved ramparts and gates of the 15th century, a church dating from the 12th to the 16th centuries, and other old buildings. At St Philbert-de-Grandlieu there is a church, rebuilt in the 16th and 17th centuries, but preserving remains of a previous edifice belonging at least to the beginning of the 11th century.

LOIRET, a department of central France, made up of the three districts of the ancient province of Orléanais—Orléanais proper, Gâtinais and Dunois—together with portions of those of Île-de-France and Berry. It is bounded N. by Seine-et-Oise, N.E. by Seine-et-Marne, E. by Yonne, S. by Nièvre and Cher, S.W. and W. by Loir-et-Cher and N.W. by Eure-et-Loir. Area, 2629 sq. m. Pop. (1906) 364,999. The name is borrowed from the Loiret, a stream which issues from the ground some miles to the south of Orléans, and after a course of about 7 m. falls into the Loire; its large volume gives rise to the belief that it is a subterranean branch of that river. The Loire traverses the south of the department by a broad valley which, though frequently devastated by disastrous floods, is famed for its rich tilled lands, its castles, its towns and its vine-clad slopes. To the north of the Loire are the Gâtinais (capital Montargis) and the Beauce; the former district is so named from its *gâtines* or wildernesses, of which saffron is, along with honey, the most noteworthy product; the Beauce (*q.v.*), a monotonous tract of corn-fields without either tree or river, has been called the granary of France. Between the Beauce and the Loire is the extensive forest of Orléans, which is slowly disappearing before the advances of agriculture. South of the Loire is the Sologne, long barren and unhealthy from the impermeability of its subsoil, but now much improved in both respects by means of pine plantation and draining and manuring operations. The highest point (on the borders of Cher) is 900 ft. above sea-level, and the lowest (on the borders of Seine-et-Marne) is 220 ft. The watershed on the plateau of Orléans between the basins of the Seine and Loire, which divide Loiret almost equally between them, is almost imperceptible. The lateral canal of the Loire from Roanne stops at Briare; from the latter town a canal (canal de Briare) connects with the Seine by the Loing valley, which is joined by the Orléans canal below Montargis. The only important tributary of the Loire within the department is the Loiret; the Loing, a tributary of the Seine, has a course of 40 m. from south to north, and is accompanied first by the Briare canal and afterwards by that of the Loing. The Essonne, another important affluent of the Seine, leaving Loiret below Malesherbes, takes its rise on the plateau of Orléans, as also does its tributary the Juine. The department has the climate of the Sequanian region, the mean temperature being a little above that of Paris; the rainfall varies from 18·5 to 27·5 in., according to the district, that of the exposed Beauce being lower than that of the well-wooded Sologne. Hailstorms cause much destruction in the Loire valley and the neighbouring regions.

The department is essentially agricultural in character. A large number of sheep, cattle, horses and pigs are reared; poultry, especially geese, and bees are plentiful. The yield of wheat and oats is in excess of the consumption; rye, barley, meslin, potatoes, beetroot, colza and forage plants are also cultivated. Wine in abundance, but of inferior quality, is grown on the hills of the Loire valley. Buckwheat supports bees by its flowers, and poultry by its seeds. Saffron is another source of profit. The woods consist of oak, elm, birch and pine; fruit trees thrive in the department, and Orléans is a great centre of nursery gardens. The industries are brick and tile making, and the manufacture of faience, for which Gien is one of the most important centres in France. The Briare manufacture of porcelain buttons and pearls employs many workmen. Flour-mills are very numerous. There are iron and copper foundries, which, with agricultural implement making, bell-founding and the manufacture of pins, nails and files, represent the chief metal-working industries. The production of hosiery, wool-spinning and various forms of wool manufacture are also engaged in. A large quantity of the wine grown is made into vinegar (vinaigre d'Orléans). The tanneries produce excellent leather; and paper-making, sugar-refining, wax-bleaching and the manufacture of caoutchouc complete the list of industries. The four arrondissements are those of Orléans, Gien, Montargis and Pithiviers, with 31 cantons and 349 communes. The department forms part of the *académie* (educational division) of Paris.

Besides Orléans, the capital, the more noteworthy places, Gien, Montargis, Beaugency, Pithiviers, Briare and St Benoît-sur-Loire, are separately noticed. Outside these towns notable examples of architecture are found in the churches of Cléry (15th century), of Ferrières (13th and 14th centuries) of Puiseaux (12th and 13th centuries) and Meung (12th century). At Germigny-des-Prés there is a church built originally at the beginning of the 9th century and rebuilt in the 19th century, on the old plan and to some extent with the old materials. Yèvre-le-Châtel has an interesting château of the 13th century, and Sully-sur-Loire the fine medieval château rebuilt at the beginning of the 17th century by Maximilien de Béthune, duke of Sully, the famous minister of Henry IV. There are remains of a Gallo-Roman town (perhaps the ancient *Vellaunodunum*) at Triguères and of a Roman amphitheatre near Montbouy.

LOIR-ET-CHER, a department of central France, formed in 1790 from a small portion of Touraine, the Perche, but chiefly from the Dunois, Vendômois and Blésois, portions of Orléanais. It is bounded N. by Eure-et-Loir, N.E. by Loiret, S.E. by Cher, S. by Indre, S.W. by Indre-et-Loire and N.W. by Sarthe. Pop. (1906) 276,019. Area, 2479 sq. m. The department takes its name from the Loir and the Cher by which it is traversed in the north and south respectively. The Loir rises on the eastern border of the Perche and joins the Maine after a course of 195 m.; the Cher rises on the Central Plateau near Aubusson, and reaches the Loire after a course of 219 m. The Loire flows through the department from north-east to south-west, and divides it into two nearly equal portions. To the south-east is the district of the Sologne, to the north-west the rich wheat-growing country of the Beauce (*q.v.*) which stretches to the Loir. Beyond that river lies the Perche. The surface of this region, which contains the highest altitude in the department (840 ft.), is varied by hills, valleys, hedged fields and orchards. The Sologne was formerly a region of forests, of which those in the neighbourhood of Chambord are the last remains. Its soil, once barren and marshy, has been considerably improved by draining and afforestation, though pools are still very numerous. The district is much frequented by sportsmen. The Cher and Loir traverse pleasant valleys, occasionally bounded by walls of tufa in which dwellings have been excavated, as at Les Roches in the Loir valley; the stone, hardened by exposure to the air, is also used for building purposes. The Loire and, with the help of the Berry canal, the Cher are navigable. The chief remaining rivers of the department are the Beuvron, which flows into the Loire on the left, and the Sauldre, a right-hand affluent of the Cher. The climate is temperate and mild, though that of the Beauce tends to dryness and that of the Sologne to dampness. The mean annual temperature is between 52° and 53° F.

The department is primarily agricultural, yielding abundance of wheat and oats. Besides these the chief products are rye, wheat and potatoes. Vines thrive on the valley slopes, the vineyards falling into four groups—those of the Cher, which yield fine red wines, the Sologne, the Blésois and the Vendômois. In the valleys fruit-trees and nursery gardens are numerous; the asparagus of Romorantin and Vendôme is well-known. The Sologne supplies pine and birch for fuel, and there are extensive forests around Blois and on both sides of the Loir. Pasture is of good quality in the valleys. Sheep are the chief stock; the Perche breed of horses is much sought after for its combination of lightness and strength. Bee-farming is of some importance in the Sologne. Formerly the speciality of Loir-et-Cher was the production of gun-flints. Stone-quarries are numerous. The chief industries are the cloth-manufacture of Romorantin, and leather-dressing and glove-making at Vendôme; and lime-burning, flour-milling, distilling, saw-milling, paper-making and the manufacture of "sabots" and boots and shoes, hosiery and linen goods, are carried on. The department is served chiefly by the Orléans railway.

The arrondissements are those of Blois, Romorantin and Vendôme, with 24 cantons and 297 communes. Loir-et-Cher forms part of the educational division (*académie*) of Paris. Its court of appeal and the headquarters of the V. army corps, to the regions of which it belongs, are at Orléans. Blois, the capital, Vendôme, Romorantin and Chambord are noticed separately. In addition to those of Blois and Chambord there are numerous fine châteaux in the department, of which that of Montrichard with its donjon of the 11th century, that of Chaumont dating from the 15th and 16th centuries, and that of Cheverny (17th century) in the late Renaissance style are the most important. Those at St Aignan, Lassay, Lavardin and Cellettes may also be mentioned. Churches wholly or in part of Romanesque architecture are found at Faverolles, Selles-sur-Cher, St Aignan and Suèvres. The village of Trôo is built close to ancient tumuli and has an interesting church of the 12th century, and among other remains those of a lazar-house of the Romanesque period. At Pontlevoy are the church, consisting of a fine choir in the Gothic style, and the buildings of a Benedictine abbey. At La Poissonnière (near Montoire) is a small Renaissance manor-house, in which Ronsard was born in 1524.

LOISY, ALFRED FIRMIN (1857–), French Catholic theologian, was born at Ambrières in French Lorraine of parents who, descended from a long line of resident peasantry, tilled there the soil themselves. The physically delicate boy was put into the ecclesiastical school of St Dizier, without any intention of a clerical career; but he decided for the priesthood, and in 1874 entered the Grand Seminaire of Chalons-sur-Marne. Mgr Meignan, then bishop of Chalons, afterwards cardinal and archbishop of Tours, ordained him priest in 1879. After being *curé* successively of two villages in that diocese, Loisy went in May 1881, to study and take a theological degree, to the Institut Catholique in Paris. Here he was influenced, as to biblical languages and textual criticism, by the learned and loyal-minded Abbé Paulin Martin, and as to a vivid consciousness of the true nature, gravity and urgency of the biblical problems and an Attic sense of form by the historical intuition and the mordant irony of Abbé Louis Duchesne. At the governmental institutions, Professors Oppert and Halévy helped further to train him. He took his theological degree in March 1890, by the oral defence of forty Latin scholastic theses and by a French dissertation, *Histoire du canon de l'ancien testament*, published as his first book in that year.

Professor now at the Institut Catholique, he published successively his lectures: *Histoire du canon du N.T.* (1891); *Histoire critique du texte et des versions de la Bible* (1892); and *Les Evangiles synoptiques* (1893, 1894). The two latter works appeared successively in the bi-monthly *L'Enseignement biblique*, a periodical written throughout and published by himself. But already, on the occasion of the death of Ernest Renan, October 1892, the attempts made to clear up the main principles and results of biblical science, first by Mgr d'Hulst, rector of the Institut Catholique, in his article "La Question biblique" (*Le Correspondant*, Jan. 25th, 1893), and then by Loisy himself, in his paper "La Question biblique et l'inspiration des Écritures" (*L'Enseignement biblique*, Nov.–Dec. 1893), promptly led to serious trouble. The latter article was immediately followed by Loisy's dismissal, without further explanation, from the Institut Catholique. And a few days later Pope Leo XIII. published his encyclical *Providentissimus Deus*, which indeed directly condemned not Abbé Loisy's but Mgr d'Hulst's position, yet rendered the continued publication of consistently critical work so difficult that Loisy himself suppressed his *Enseignement* at the end of 1893. Five further instalments of his *Synoptiques* were published after this, bringing the work down to the Confession of Peter inclusively.

Loisy next became chaplain to a Dominican convent and girls' school at Neuilly-sur-Seine (Oct. 1894–Oct. 1899), and here matured his apologetic method, resuming in 1898 the publication of longer articles, under the pseudonyms of Desprès and Firmin in the *Revue du clergé français*, and of Jacques Simon in the lay *Revue d'histoire et de littérature religieuses*. In the former review, a striking paper upon development of doctrine (Dec. 1st, 1898) headed a series of studies apparently taken from an already extant large apologetic work. In October 1899 he resigned his chaplaincy for reasons of health, and settled at Bellevue, somewhat farther away from Paris. His notable paper, "La Religion d'Israel" (*Revue du clergé français*, Oct. 15th, 1900), the first of a series intended to correct and replace Renan's presentation of that great subject, was promptly censured by Cardinal Richard, archbishop of Paris; and though scholarly and zealous ecclesiastics, such as the Jesuit Père Durand and Monseigneur Mignot, archbishop of Albi, defended the general method and several conclusions of the article, the aged cardinal never rested henceforward till he had secured a papal condemnation also. At the end of 1900 Loisy secured a government lectureship at the École des Hautes Études Pratiques, and delivered there in succession courses on the Babylonian myths and the first chapters of Genesis; the Gospel parables; the narrative of the ministry in the synoptic Gospels; and the Passion narratives in the same. The first course was published in the *Revue d'histoire et de littérature religieuses*; and here also appeared instalments of his commentary on St John's Gospel, his critically important *Notes sur la Genèse*, and a *Chronique biblique* unmatched in its mastery of its numberless subjects and its fearless yet delicate penetration.

It was, however, two less erudite little books that brought him a European literary reputation and the culmination of his ecclesiastical troubles. *L'Evangile et l'église* appeared in November 1902 (Eng. trans., 1903). Its introduction and six chapters present with rare lucidity the earliest conceptions of the Kingdom of Heaven, the Son of God, the Church, Christian dogma and Catholic worship; and together form a severely critico-historical yet strongly Catholic answer to Harnack's still largely pietistic *Wesen des Christentums*. It develops throughout the principles that "what is essential in Jesus' Gospel is what occupies the first and largest place in His authentic teaching, the ideas for which He fought and died, and not only that idea which we may consider to be still a living force to-day"; that "it is supremely arbitrary to decree that Christianity must be essentially what the Gospel did not borrow from Judaism, as though what the Gospel owes to Judaism were necessarily of secondary worth"; that "whether we trust or distrust tradition, we know Christ only by means of, athwart and within the Christian tradition"; that "the *essence of Christianity* resides in the fulness and totality of its life"; and that "the adaptation of the Gospel to the changing conditions of humanity is to-day a more pressing need than ever." The second edition was enlarged by a preliminary chapter on the sources of the Gospels, and by a third section for the Son of God chapter. The little book promptly aroused widespread interest, some cordial sympathy and much vehement opposition; whilst its large companion the *Études évangéliques*, containing the course on the parables and four sections of his coming commentary on the Fourth Gospel, passed almost unnoticed. On the 21st of January 1903 Cardinal Richard publicly condemned the book, as not furnished with an *imprimatur*, and as calculated gravely to trouble the faith of the faithful in the fundamental Catholic dogmas. On the 2nd of February Loisy wrote to the archbishop: "I condemn, as a matter of course, all the errors which men have been able to deduce from my book, by placing themselves in interpreting it at a point of view entirely different from that which I had to occupy in composing it." The pope refused to interfere directly, and the nuncio, Mgr Lorenzelli, failed in securing more than ten public adhesions to the cardinal's condemnation from among the eighty bishops of France.

Pope Leo had indeed, in a letter to the Franciscan minister-general (November 1898), and in an encyclical to the French clergy (September 1899), vigorously emphasized the traditionalist principles of his encyclical *Providentissimus* of 1893; he had even, much to his prompt regret, signed the unfortunate decree of the Roman Inquisition, January 1897, prohibiting all doubt as to the authenticity of the "Three Heavenly Witnesses" passage, 1 John v. 7, a text which, in the wake of a line of scholars from Erasmus downwards, Abbé Paulin Martin had, in 1887, exhaustively shown to be no older than the end of the 4th century A.D. Yet in October 1902 he established a "Commission for the Progress of Biblical Studies," preponderantly composed of seriously critical scholars; and even one month before his death he still refused to sign a condemnation of Loisy's *Études évangéliques*.

Cardinal Sarto became Pope Pius X. on the 4th of August 1903. On the 1st of October Loisy published three new books, *Autour d'un petit livre*, *Le Quatrième Évangile* and *Le Discours sur la Montagne*. *Autour* consists of seven letters, on the origin and aim of *L'Évangile et l'Église*; on the biblical question; the criticism of the Gospels; the Divinity of Christ; the Church's foundation and authority; the origin and authority of dogma, and on the institution of the sacraments. The second and third, addressed respectively to a cardinal (Perraud) and a bishop (Le Camus), are polemical or ironical in tone; the others are all written to friends in a warm, expansive mood; the fourth letter especially, appropriated to Mgr Mignot, attains a grand elevation of thought and depth of mystical conviction. *Le Quatrième Évangile*, one thousand large pages long, is possibly over-confident in its detailed application of the allegorical method; yet it constitutes a rarely perfect sympathetic reproduction of a great mystical believer's imperishable intuitions. *Le Discours sur la Montagne* is a fragment of a coming enlarged commentary on the synoptic Gospels. On the 23rd of December the pope ordered the publication of a decree of the Congregation of the Index, incorporating a decree of the Inquisition, condemning Loisy's *Religion d'Israël*, *L'Évangile et l'Église*, *Études évangéliques*, *Autour d'un petit livre* and *Le Quatrième Évangile*. The pope's secretary of state had on the 19th December, in a letter to Cardinal Richard, recounted the causes of the condemnation in the identical terms used by the latter himself when condemning the *Religion d'Israël* three years before. On the 12th of January 1904 Loisy wrote to Cardinal Merry del Val that he received the condemnation with respect, and condemned whatever might be reprehensible in his books, whilst reserving the rights of his conscience and his opinions as an historian, opinions doubtless imperfect, as no one was more ready to admit than himself, but which were the only form under which he was able to represent to himself the history of the Bible and of religion. Since the Holy See was not satisfied, Loisy sent three further declarations to Rome; the last, despatched on the 17th of March, was addressed to the pope himself, and remained unanswered. And at the end of March Loisy gave up his lectureship, as he declared, "on his own initiative, in view of the pacification of minds in the Catholic Church." In the July following he moved into a little house, built for him by his pupil and friend, the Assyriologist François Thureau Dangin, within the latter's park at Garnay, by Dreux. Here he continued his important reviews, notably in the *Revue d'histoire et de littérature religieuses*, and published *Morceaux d'exégèse* (1906), six further sections of his synoptic commentary. In April 1907 he returned to his native Lorraine, to Ceffonds by Montier-en-Der, and to his relatives there.

Five recent Roman decisions are doubtless aimed primarily at Loisy's teaching. The Biblical Commission, soon enlarged so as to swamp the original critical members, and which had become the simple mouthpiece of its presiding cardinals, issued two decrees. The first, on the 27th of June 1906, affirmed, with some significant but unworkable reservations, the Mosaic authorship of the Pentateuch; and the second (29th of May 1907) strenuously maintained the Apostolic Zebedean authorship of the fourth Gospel, and the strictly historical character of the events and speeches recorded therein. The Inquisition, by its decree *Lamentabili sane* (2nd of July 1907), condemned sixty-five propositions concerning the Church's *magisterium*; biblical inspiration and interpretation; the synoptic and fourth Gospels; revelation and dogma; Christ's divinity, human knowledge and resurrection; and the historical origin and growth of the Sacraments, the Church and the Creed. And some forty of these propositions represent, more or less accurately, certain sentences or ideas of Loisy, when torn from their context and their reasons. The encyclical *Pascendi Dominici Gregis* (Sept. 6th, 1907), probably the longest and most argumentative papal utterance extant, also aims primarily at Loisy, although here the vehemently scholastic redactor's determination to piece together a strictly coherent, complete a priori system of "Modernism" and his self-imposed restriction to medieval categories of thought as the vehicles for describing essentially modern discoveries and requirements of mind, make the identification of precise authors and passages very difficult. And on the 21st of November 1907 a papal *motu proprio* declared all the decisions of the Biblical Commission, past and future, to be as binding upon the conscience as decrees of the Roman Congregations.

Yet even all this did not deter Loisy from publishing three further books. *Les Évangiles synoptiques*, two large 8vo volumes of 1009 and 798 pages, appeared "chez l'auteur, à Ceffonds, Montier-en-Der, Haute-Marne," in January 1908. An incisive introduction discusses the ecclesiastical tradition, modern criticism; the second, the first and the third Gospels; the evangelical tradition; the career and the teaching of Jesus; and the literary form, the tradition of the text and the previous commentaries. The commentary gives also a careful translation of the texts. Loisy recognizes two eye-witness documents, as utilized by all three synoptists, while Matthew and Luke have also incorporated Mark. His chief peculiarity consists in clearly tracing a strong Pauline influence, especially in Mark, which there remodels certain sayings and actions as these were first registered by the eye-witness documents. These doctrinal interpretations introduce the economy of blinding the Jews into the parabolic teaching; the declaration as to the redemptive character of the Passion into the sayings; the sacramental, institutional words into the account of the Last Supper, originally a solemnly simple Messianic meal; and the formal night-trial before Caiaphas into the original Passion-story with its informal, morning decision by Caiaphas, and its one solemn condemnation of Jesus, by Pilate. Mark's narratives of the sepulture by Joseph of Arimathea and of the empty tomb are taken as posterior to St Paul; the narratives of the infancy in Matthew and Luke as later still. Yet the great bulk of the sayings remain substantially authentic; if the historicity of certain words and acts is here refused with unusual assurance, that of other sayings and deeds is established with stronger proofs; and the redemptive conception of the Passion and the sacramental interpretation of the Last Supper are found to spring up promptly and legitimately from our Lord's work and words, to saturate the Pauline and Johannine writings, and even to constitute an element of all three synoptic Gospels.

Simples Réflexions sur le décret Lamentabili et sur l'encyclique Pascendi, 12mo, 277 pages, was published from Ceffonds a few days after the commentary. Each proposition of the decree is carefully tracked to its probable source, and is often found to modify the latter's meaning. And the study of the encyclical concludes: "Time is the great teacher . . . we would do wrong to despair either of our civilization or of the Church."

The Church authorities were this time not slow to act. On the 14th of February Mgr Amette, the new archbishop of Paris, prohibited his diocesans to read or defend the two books, which "attack and deny several fundamental dogmas of Christianity," under pain of excommunication. The abbé again declared "it is impossible for me honestly and sincerely to make the act of absolute retractation and submission exacted by the sovereign pontiff." And the Holy Office, on the 7th of March, pronounced the major excommunication against him. At the end of March Loisy published *Quelques Lettres* (December 1903–February 1908), which conclude: "At bottom I have remained in my last writings on the same line as in the earlier ones. I have aimed at establishing principally the historical position of the various questions, and secondarily the necessity for reforming more or less the traditional concepts."

Three chief causes appear jointly to have produced M. Loisy's very absolute condemnation. Any frank recognition of the abbé's even general principles involves the abandonment of the identification of theology with scholasticism or even with specifically ancient thought in general. The abbé's central position, that our Lord himself held the proximateness of His second coming, involves the loss by churchmen of the prestige of directly divine power, since Church and Sacraments, though still the true fruits and vehicles of his life, death and spirit, cannot thus be immediately founded by the earthly Jesus himself. And the Church policy, as old as the times of Constantine, to crush utterly the man who brings more problems and pressure than the bulk of traditional Christians can, at the time, either digest or resist with a fair discrimination, seemed to the authorities the one means to save the very difficult situation.

BIBLIOGRAPHY.—Autobiographical passages in M. Loisy's *Autour d'un petit livre* (Paris, 1903), pp. xv. xvi. 1, 2, 157, 218. A full account of his literary activity and ecclesiastical troubles will be found in Abbé Albert Houtin's *La Question biblique au XIX^{e} siècle* (Paris, 2nd ed., 1902) and *La Question biblique au XX^{e} siècle* (Paris, 1906), but the latter especially is largely unfair to the conservatives and sadly lacking in religious feeling. The following articles and booklets concerning M. Loisy and the questions raised by him are specially remarkable. **France**: Père Durand, S. J., *Études religieuses* (Paris, Nov. 1901) frankly describes the condition of ecclesiastical biblical studies; Monseigneur Mignot, archbishop of Albi, *Lettres sur les études ecclésiastiques 1900–1901* (collected ed., Paris, 1908) and "Critique et tradition" in *Le Correspondant* (Paris, 10th January 1904), the utterances of a finely trained judgment; Mgr Le Camus, bishop of La Rochelle, *Fausse Exégèse, mauvaise théologie* (Paris, 1902), a timid, mostly rhetorical, scholar's protest; Père Lagrange, a Dominican who has done much for the spread of Old Testament criticism, *La Méthode historique, surtout à propos de l'Ancien Testament* (Paris, 1903) and *Éclaircissement* to same (*ibid.* 1903); P. Lagrange, Mgr P. Batiffol, P. Portalié, S. J., "Autour des fondements de la Foi" in the *Bulletin de litt. eccl. Toulouse* (Paris, December 1903, January 1904), very suggéstive papers; Professor Maurice Blondel's "Histoire et dogma," in *La Quinzaine* (Paris, January 16, February 16, 1904), F. de Hugel's "Du Christ éternel et des christologies successives" (*ibid.* June 1, 1904), the Abbé J. Wehrle's "Le Christ et la conscience catholique" (*ibid.* August 16, 1904) and F. de Hügel's "Correspondance" (*ibid.* Sept. 16, 1904) discuss the relations between faith and the affirmation of phenomenal happenings; Paul Sabatier, "Les Derniers Ouvrages de l'Abbé Loisy," in the *Revue chrétienne* (Dôle, 1904) and Paul Desjardins' *Catholicisme et critique* (Paris, 1905), a Broad Church Protestant's and a moralist agnostic's delicate appreciations; a revue of *Les Évangiles synoptiques* by the Abbé Mangenot, in *Revue du Clergé français* (Feb. 15, 1908) containing some interesting discriminations; a revue by L. in the *Revue biblique* (1908), pp. 608-620, a mixture of unfair insinuation, powerful criticism and discriminating admissions; and a paper by G. P. B. and Jacques Chevalier in the *Annales de philosophie chrétienne* (Paris, Jan. 1909) seeks to trace and to refute certain philosophical presuppositions at work in the book's treatment, especially of the Miracles, the Resurrection and the Institution of the Church. **Italy**: "Lettres Romaines" in *Annales de philosophie chrétienne* (Paris, January–March 1904), an Italian theologian's fearless defence of Loisy's main New Testament positions; Rev. P. Louis Billot S.J., *De sacra traditione* (Freiburg i. Br. 1905), the ablest of the scholastic criticisms of the historical method by a highly influential French professor of theology, now many years in Rome; *Quello che vogliamo* (Rome, 1907, Eng. trans., *What we want*, by A. L. Lilley, London, 1907), and *Il Programma dei Modernisti* (*ibid.* 1908), Eng. trans., *The Programme of Modernism* ed. by Lilley (London, eloquent 1098), pleadings by Italian priest, substantially on M. Loisy's lines; "L' Abate Loisy e il Problema dei Vangeli Sinottici," four long papers signed "H," in *Il Rinnovamento* (Milan, 1908, 1909) are candid and circumspect. **Germany**: Professor E. Troeltsch, "Was heisst Wesen des Christentums?" 6 arts. in *Die christliche Welt* (Leipzig, autumn 1903), a profound criticism of M. Loisy's developmental defence of Catholicism; Professor Harnack's review of *L'Évangile et l'Église* in the *Theol. Literatur-Zeitung* (Leipzig, 23rd January 1904) is generous and interesting; Professor H. J. Holtzmann's "Urchristentum u. Reform-Katholizismus," in the *Prot. Monatshefte*, vii. 5 (Berlin, 1903), "Der Fall Loisy," *ibid.* ix. 1, and his review of "Les Évangiles synoptiques" in *Das zwanzigste Jahrhundert* (Munich, May 3, 1908) are full of facts and of deep thought; Fr. F. von Hummelauer, *Exegetisches zur Inspirationsfrage* (Freiburg i. Br. 1904) is a favourable specimen of present-day German Roman Catholic scholarship. **America**: Professor C. A. Briggs, "The Case of the Abbé Loisy," *Expositor* (London, April 1905), and C. A. Briggs and F. von Hügel, *The Papal Commission and the Pentateuch* (London, 1907) discuss Rome's attitude towards biblical science. **England**: The Rev. T. A. Lacey's *Harnack and Loisy*, with introduction by Viscount Halifax (London, 1904); "The Encyclical and M. Loisy" (*Church Times*, Feb. 20, 1908); "Recent Roman Catholic Biblical Criticism" (*The Times Literary Supplement* for January 15th, 22nd, 29th, 1904), and "The Synoptic Gospels" (review in *The Times Literary Supplement*, March 26, 1908) are interesting pronouncements respectively of two Tractarian High Churchmen and of a disciple of Canon Sanday. Professor Percy Gardner's paper in the *Hibbert Journal*, vol. i. (1903) p. 603, is the work of a Puritan-minded, cultured Broad Church layman. (F. v. H.)

LOJA (formerly written *Loxa*), a town of southern Spain, in the province of Granada, on the Granada-Algeciras railway. Pop. (1900) 19,143. The narrow and irregular streets of Loja wind up the sides of a steep hill surmounted by a Moorish citadel; many of the older buildings, including a fine Moorish bridge, were destroyed by an earthquake in December 1884, although two churches of the early 16th century remained intact. An iron bridge spans the river Genil, which flows past the town on the north, forcing a passage through the mountains which encircle the fertile and beautiful Vega of Granada. This passage would have afforded easy access to the territory still held by the Moors in the last half of the 15th century, had not Loja been strongly fortified; and the place was thus of great military importance, ranking with the neighbouring town of Alhama as one of the keys of Granada. Its manufactures consist chiefly of coarse woollens silk, paper and leather. Salt is obtained in the neighbourhood.

Loja, which has sometimes been identified with the ancient *Ilipula*, or with the *Lacibi* (*Lacibis*) of Pliny and Ptolemy, first clearly emerges in the Arab chronicles of the year 890. It was taken by Ferdinand III. in 1226, but was soon afterwards abandoned, and was not finally recaptured until the 28th of May, 1486, when it surrendered to Ferdinand and Isabella after a siege.

LOKEREN, an important industrial town of Belgium between Ghent and Antwerp (in East Flanders on the Durme). Pop. (1904) 21,869. It lies at the southern point of the district called Pays de Waes, which in the early part of the 19th century was only sandy moorland, but is now the most highly cultivated and thickly populated tract in Belgium. The church of St Laurence is of some interest.

LOKOJA, a town of Nigeria, at the junction of the Niger and Benue rivers, founded in 1860 by the British consul, W. B. Baikie, and subsequently the military centre of the Royal Niger Company. It is in the province of Kabba, 250 m. from the mouth of the Niger, and is of considerable commercial importance (see NIGERIA and KABBA).

LOLLARDS, the name given to the English followers of John Wycliffe; they were the adherents of a religious movement which was widespread in the end of the 14th and beginning of the 15th centuries, and to some extent maintained itself on to the Reformation. The name is of uncertain origin; some derive it from *lolium*, tares, quoting Chaucer (*C. T.*, Shipman's Prologue):—

> "This Loller heer wil prechen us somwhat . . .
> He wolde sowen som difficultee
> Or springen cokkel in our clene corn";

but the most generally received explanation derives the words from *lollen* or *lullen*, to sing softly. The word is much older than its English use; there were Lollards in the Netherlands at the beginning of the 14th century, who were akin to the Fratricelli, Beghards and other sectaries of the recusant Franciscan type. The earliest official use of the name in England occurs in 1387 in a mandate of the bishop of Worcester against five "poor preachers," *nomine seu ritu Lollardorum confoederatos*. It is probable that the name was given to the followers of Wycliffe because they resembled those offshoots from the great Franciscan movement which had disowned the pope's authority and set before themselves the ideal of *Evangelical poverty*.

The 14th century, so full of varied religious life, made it manifest that the two different ideas of a life of separation from the world which in earlier times had lived on side by side within the medieval church were irreconcilable. The church chose to abide by the idea of Hildebrand and to reject that of Francis of Assisi; and the revolt of Ockham and the Franciscans, of the Beghards and other spiritual fraternities, of Wycliffe and the Lollards, were all protests against that decision. Gradually there came to be facing each other a great political Christendom, whose rulers were statesmen, with aims and policy of a worldly type, and a religious Christendom, full of the ideas of separation from the world by self-sacrifice and of participation in the benefits of Christ's work by an ascetic imitation. The war between the two ideals was fought out in almost every country in Europe in the 14th century. In England Wycliffe's whole life was spent in the struggle, and he bequeathed his work to the Lollards. The main practical thought with Wycliffe was that the church, if true to her divine mission, must aid men to live that life of evangelical poverty by which they could be separate from the world and imitate Christ, and if the church ceased to be true to her mission she ceased to be a church. Wycliffe was a metaphysician and a theologian, and had to invent a metaphysical theory—the theory of *Dominium*—to enable him to transfer, in a way satisfactory to himself, the powers and privileges of the church to his company of poor Christians; but his followers were content to allege that a church which held large landed possessions, collected tithes greedily and took money from starving peasants for baptizing, burying and praying, could not be the church of Christ and his apostles.

Lollardy was most flourishing and most dangerous to the ecclesiastical organization of England during the ten years after Wycliffe's death. It had spread so rapidly and grown so popular that a hostile chronicler could say that almost every second man was a Lollard. Wycliffe left three intimate disciples:—Nicolas Hereford, a doctor of theology of Oxford, who had helped his master to translate the Bible into English; John Ashton, also a fellow of an Oxford college; and John Purvey, Wycliffe's colleague at Lutterworth, and a co-translator of the Bible. With these were associated more or less intimately, in the first age of Lollardy, John Parker, the strange ascetic William Smith, the restless fanatic Swynderly, Richard Waytstract and Crompe. Wycliffe had organized in Lutterworth an association for sending the gospel through all England, a company of poor preachers somewhat after the Wesleyan method of modern times. "To be poor without mendicancy, to unite the flexible unity, the swift obedience of an order, with free and constant mingling among the poor, such was the ideal of Wycliffe's 'poor priests'" (cf. Shirley, *Fasc. Ziz.* p. xl.), and, although proscribed, these "poor preachers" with portions of their master's translation of the Bible in their hand to guide them, preached all over England. In 1382, two years before the death of Wycliffe, the archbishop of Canterbury got the Lollard opinions condemned by convocation, and, having been promised royal support, he began the long conflict of the church with the followers of Wycliffe. He was able to coerce the authorities of the university of Oxford, and to drive out of it the leading Wycliffite teachers, but he was unable to stifle Oxford sympathies or to prevent the banished teachers preaching throughout the country. Many of the nobles, like Lords Montacute and Salisbury, supported the poor preachers, took them as private chaplains, and protected them against clerical interference. Country gentlemen like Sir Thomas Latimer of Braybrooke and Sir Richard Stury protected them, while merchants and burgesses supported them with money. When Richard II. issued an ordinance (July 1382) ordering every bishop to arrest all Lollards, the Commons compelled him to withdraw it. Thus protected, the "poor preachers" won masses of the people to their opinions, and Leicester, London and the west of England became their headquarters.

The organization must have been strong in numbers, but only those who were seized for heresy are known by name, and it is only from the indictments of their accusers that their opinions can be gathered. The preachers were picturesque figures in long russet dress down to the heels, who, staff in hand, preached in the mother tongue to the people in churches and graveyards, in squares, streets and houses, in gardens and pleasure grounds, and then talked privately with those who had been impressed. The Lollard literature was very widely circulated—books by Wycliffe and Hereford and tracts and broadsides—in spite of many edicts proscribing it. In 1395 the Lollards grew so strong that they petitioned parliament through Sir Thomas Latimer and Sir R. Stury to reform the church on Lollardist methods. It is said that the Lollard Conclusions printed by Canon Shirley (p. 360) contain the substance of this petition. If so, parliament was told that temporal possessions ruin the church and drive out the Christian graces of faith, hope and charity; that the priesthood of the church in communion with Rome was not the priesthood Christ gave to his apostles; that the monk's vow of celibacy had for its consequence unnatural lust, and should not be imposed; that transubstantiation was a feigned miracle, and led people to idolatry; that prayers made over wine, bread, water, oil, salt, wax, incense, altars of stone, church walls, vestments, mitres, crosses, staves, were magical and should not be allowed; that kings should possess the *jus episcopale*, and bring good government into the church; that no special prayers should be made for the dead; that auricular confession made to the clergy, and declared to be necessary for salvation, was the root of clerical arrogance and the cause of indulgences and other abuses in pardoning sin; that all wars were against the principles of the New Testament, and were but murdering and plundering the poor to win glory for kings; that the vows of chastity laid upon nuns led to child murder; that many of the trades practised in the commonwealth, such as those of goldsmiths and armourers, were unnecessary and led to luxury and waste. These Conclusions really contain the sum of Wycliffite teaching; and, if we add that the principal duty of priests is to preach, and that the worship of images, the going on pilgrimages and the use of gold and silver chalices in divine service are sinful (*The Peasants' Rising and the Lollards*, p. 47), they include almost all the heresies charged in the indictments against individual Lollards down to the middle of the 15th century. The king, who had hitherto seemed anxious to repress the action of the clergy against the Lollards, spoke strongly against the petition and its promoters, and Lollardy never again had the power in England which it wielded up to this year.

If the formal statements of Lollard creed are to be got from these Conclusions, the popular view of their controversy with the church may be gathered from the ballads preserved in the *Political Poems and Songs relating to English History*, published in 1859 by Thomas Wright for the Master of the Rolls series, and in the Piers Ploughman poems. *Piers Ploughman's Creed* (see LANGLAND) was probably written about 1394, when Lollardy was at its greatest strength; the ploughman of the *Creed* is a man gifted with sense enough to see through the tricks of the friars, and with such religious knowledge as can be got from the creed, and from Wycliffe's version of the Gospels. The poet gives us a "portrait of the fat friar with his double chin shaking about as big as a goose's egg, and the ploughman with his hood full of holes, his mittens made of patches, and his poor wife going barefoot on the ice so that her blood followed" (*Early English Text Society*, vol. xxx., pref., p. 16); and one can easily see why farmers and peasants turned from the friars to the poor preachers. The *Ploughman's Complaint* tells the same tale. It paints popes, cardinals, prelates, rectors, monks and friars, who call themselves followers of Peter and keepers of the gates of heaven and hell, and pale poverty-stricken people, cotless and landless, who have to pay the fat clergy for spiritual assistance, and asks if these are Peter's priests. "I trowe Peter took no money, for no sinners that he sold. . . . Peter was never so great a fole, to leave his key with such a losell."

In 1399 the Lancastrian Henry IV. overthrew the Plantagenet Richard II., and one of the most active partisans of the new monarch was Arundel, archbishop of Canterbury and the most determined opponent of Lollardy. Richard II. had aided the clergy to suppress Lollardy without much success. The new dynasty supported the church in a similar way and not more successfully. The strength of the anti-clerical party lay in the House of Commons, in which the representatives of the shires took the leading part. Twice the Commons petitioned the crown to seize the temporalities of the church and apply them to such national purposes as relief of taxation, maintenance of the poor and the support of new lords and knights. Their anti-clerical policy was not continuous, however. The court party and the clergy proposed statutes for the suppression of heresy, and twice at least secured the concurrence of the Commons. One of these was the well-known statute *De heretico comburendo* passed in 1401.

In the earlier stages of Lollardy, when the court and the clergy managed to bring Lollards before ecclesiastical tribunals backed by the civil power, the accused generally recanted and showed no disposition to endure martyrdom for their opinions. They became bolder in the beginning of the 15th century. William Sawtrey (Chartris), caught and condemned, refused to recant and was burnt at St Paul's Cross (March 1401), and other martyrdoms followed. The victims usually belonged to the lower classes. In 1410 John Badby, an artisan, was sent to the stake. His execution was memorable from the part taken in it by the prince of Wales, who himself tried to reason the Lollard out of his convictions. But nothing said would make Badby confess that "Christ sitting at supper did give to His disciples His living body to eat." The Lollards, far from daunted, abated no effort to make good their ground, and united a struggle for social and political liberty to the hatred felt by the peasants towards the Romish clergy. Jak Upland (John Countryman) took the place of Piers Ploughman, and upbraided the clergy, and especially the friars, for their wealth and luxury. Wycliffe had published the rule of St Francis, and had pointed out in a commentary upon the rule how far friars had departed from the maxims of their founder, and had persecuted the *Spirituales* (the Fratricelli, Beghards, Lollards of the Netherlands) for keeping them to the letter (cf. Matthews, *English Works of Wyclif hitherto unprinted*, Early Eng. Text Soc., vol. lxxiv., 1880). Jak Upland put all this into rude nervous English verse:

> "Freer, what charitie is this
> To fain that whoso liveth after your order
> Liveth most perfectlie,
> And next followeth the state of the Apostles
> In povertie and pennance:
> And yet the wisest and greatest clerkes of you
> Wend or send or procure to the court of Rome,
> . . . and to be assoiled of the vow of povertie."

The archbishop, having the power of the throne behind him, attacked that stronghold of Lollardy the university of Oxford. In 1406 a document appeared purporting to be the testimony of the university in favour of Wycliffe; its genuineness was disputed at the time, and when quoted by Huss at the council of Constance it was repudiated by the English delegates. The archbishop treated Oxford as if it had issued the document, and procured the issue of severe regulations in order to purge the university of heresy. In 1408 Arundel in convocation proposed and carried the famous *Constitutiones Thomae Arundel* intended to put down Wycliffite preachers and teaching. They provided amongst other things that no one was to be allowed to preach without a bishop's licence, that preachers preaching to the laity were not to rebuke the sins of the clergy, and that Lollard books and the translation of the Bible were to be searched for and destroyed.

When Henry V. became king a more determined effort was made to crush Lollardy. Hitherto its strength had lain among the country gentlemen who were the representatives of the shires. The court and clergy had been afraid to attack this powerful class. The new king determined to overawe them, and to this end selected one who had been a personal friend and whose life had been blameless. This was Sir John Oldcastle, in right of his wife, Lord Cobham, "the good Lord Cobham" as the common people called him. Henry first tried personal persuasion, and when that failed directed trial for heresy. Oldcastle was convicted, but was imprisoned for forty days in the Tower in hope that he might recant. He escaped, and summoned his co-religionists to his aid. A Lollard plot was formed to seize the king's person. In the end Oldcastle was burnt for an obstinate heretic (Dec. 1417). These persecutions were not greatly protested against; the wars of Henry V. with France had awakened the martial spirit of the nation, and little sympathy was felt for men who had declared that all war was but the murder and plundering of poor people for the sake of kings. Mocking ballads were composed upon the martyr Oldcastle, and this dislike to warfare was one of the chief accusations made against him (comp. Wright's *Political Poems*, ii. 244). But Arundel could not prevent the writing and distribution of Lollard books and pamphlets. Two appeared about the time of the martyrdom of Oldcastle—*The Ploughman's Prayer* and the *Lanthorne of Light*. The *Ploughman's Prayer* declared that true worship consists in three things—in loving God, and dreading God and trusting in God above all other things; and it showed how Lollards, pressed by persecution, became further separated from the religious life of the church. "Men maketh now great stonen houses full of glasen windows, and clepeth thilke thine houses and churches. And they setten in these houses mawmets of stocks and stones, to fore them they knelen privilich and apert and maken their prayers, and all this they say is they worship. . . . For Lorde our belief is that thine house is man's soul." Notwithstanding the repression, Lollardy fastened in new parts of England, and Lollards abounded in Somerset, Norfolk, Suffolk, Essex, Lincoln and Buckinghamshire.

The council of Constance (1414–1418) put an end to the papal schism, and also showed its determination to put down heresy by burning John Huss. When news of this reached England the clergy were incited to still more vigorous proceedings against Lollard preachers and books. From this time Lollardy appears banished from the fields and streets, and takes refuge in houses and places of concealment. There was no more wayside preaching, but instead there were *conventicula occulta* in houses, in peasants' huts, in sawpits and in field ditches, where the Bible was read and exhortations were given, and so Lollardy continued. In 1428 Archbishop Chichele confessed that the Lollards seemed as numerous as ever, and that their literary and preaching work went on as vigorously as before. It was found also that many of the poorer rectors and parish priests, and a great many chaplains and curates, were in secret association with the Lollards, so much so that in many places processions were never made and worship on saints' days was abandoned. For the Lollards were hardened by persecution, and became fanatical in the statement of their doctrines. Thomas Bagley was accused of declaring that if in the sacrament a priest made bread into God, he made a God that can be eaten by rats and mice; that the pharisees of the day, the monks, and the nuns, and the friars and all other privileged persons recognized by the church were limbs of Satan; and that auricular confession to the priest was the will not of God but of the devil. And others held that any priest who took salary was excommunicate; and that boys could bless the bread as well as priests.

From England Lollardy passed into Scotland. Oxford infected St Andrews, and we find traces of more than one vigorous search made for Lollards among the teaching staff of the Scottish university, while the Lollards of Kyle in Ayrshire were claimed by Knox as the forerunners of the Scotch Reformation.

The opinions of the later Lollards can best be gathered from the learned and unfortunate Pecock, who wrote his elaborate *Repressor* against the "Bible-men," as he calls them. He summed up their doctrines under eleven heads: they condemn the having and using images in the churches, the going on pilgrimages to the memorial or "mynde places" of the saints, the holding of landed possessions by the clergy, the various ranks of the hierarchy, the framing of ecclesiastical laws and ordinances by papal and episcopal authority, the institution of religious orders, the costliness of ecclesiastical decorations, the ceremonies of the mass and the sacraments, the taking of oaths and the maintaining that war and capital punishment are lawful. When these points are compared with the Lollard Conclusions of 1395, it is plain that Lollardy had not greatly altered its opinions after fifty-five years of persecution. All the articles of Pecock's list, save that on capital punishment, are to be found in the Conclusions; and, although many writers have held that Wycliffe's own views differed greatly from what have been called the "exaggerations of the later and more violent Lollards," all these views may be traced to Wycliffe himself. Pecock's idea was that all the statements which he was prepared to impugn came from three false opinions or "trowings," viz. that no governance or ordinance is to be esteemed a law of God which is not founded on Scripture, that every humble-minded Christian man or woman is able without "fail and defaut" to find out the true sense of Scripture, and that having done so he ought to listen to no arguments to the contrary; he elsewhere adds a fourth (i. 102), that if a man be not only meek but also keep God's law he shall have a true understanding of Scripture, even though "no man ellis teche him saue God." These statements, especially the last, show us the connexion between the Lollards and those mystics of the 14th century, such as Tauler and Ruysbroeck, who accepted the teachings of Nicholas of Basel, and formed themselves into the association of the Friends of God.

The persecutions were continued down to the reign of Henry VIII., and when the writings of Luther began to appear in England the clergy were not so much afraid of Lutheranism as of the increased life they gave to men who for generations had been reading Wycliffe's *Wickette*. "It is," wrote Bishop Tunstall to Erasmus in 1523, "no question of pernicious novelty, it is only that new arms are being added to the great band of Wycliffite heretics." Lollardy, which continued down to the Reformation, did much to shape the movement in England. The subordination of clerical to laic jurisdiction, the reduction in ecclesiastical possessions, the insisting on a translation of the Bible which could be read by the "common" man were all inheritances bequeathed by the Lollards.

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LOLLIUS, MARCUS, Roman general, the first governor of Galatia (25 B.C.), consul in 21. In 16, when governor of Gaul, he was defeated by the Sigambri (Sygambri), Usipetes and Tencteri, German tribes who had crossed the Rhine. This defeat is coupled by Tacitus with the disaster of Varus, but it was disgraceful rather than dangerous. Lollius was subsequently (2 B.C.) attached in the capacity of tutor and adviser to Gaius Caesar (Augustus's grandson) on his mission to the East. He was accused of extortion and treachery to the state, and denounced by Gaius to the emperor. To avoid punishment he is said to have taken poison. According to Velleius Paterculus and Pliny, he was a hypocrite and cared for nothing but amassing wealth. It was formerly thought that this was the Lollius whom Horace described as a model of integrity and superior to avarice in *Od.* iv. 9, but it seems hardly likely that this Ode, as well as the two Lollian epistles of Horace (i. 2 and 18), was addressed to him. All three must have been addressed to the same individual, a young man, probably the son of this Lollius.

See Suetonius, *Augustus*, 23, *Tiberius*, 12; Vell. Pat. ii. 97. 102; Tacitus, *Annals*, i. 10, iii. 48; Pliny, *Nat. Hist.* ix. 35 (58); Dio Cassius, liv. 6; see also J. C. Tarver, *Tiberius the Tyrant* (1902), pp. 200 foll.

LOLOS, the name given by the Chinese to a large tribe of aborigines who inhabit the greater part of southern Szechuen. Their home is in the mountainous country called Taliang shan, which lies between the Yangtsze river on the east and the Kien ch'ang valley on the west, in south Szechuen, but they are found in scattered communities as far south as the Burmese frontier, and west to the Mekong. There seems no reason to doubt that they were, like the Miaotze, one of the aboriginal tribes of China, driven southwards by the advancing flood of Chinese. The name is said to be a Chinese corruption of Lulu, the name of a former chieftain of a tribe who called themselves Nersu. Their language, like the Chinese, is monosyllabic and probably ideographic, and the characters bear a certain resemblance to Chinese. No literature, however, worthy of the name is known to exist, and few can read and write. Politically they are divided into tribes, each under the government of a hereditary chieftain. The community consists of three classes, the "blackbones" or nobles, the "whitebones" or plebeians, and the *watze* or slaves. The last are mostly Chinese captured in forays, or the descendants of such captives. Within Lolo-land proper, which covers some 11,000 sq.m., the Chinese government exercises no jurisdiction. The Lolos make frequent raids on their unarmed Chinese neighbours. They cultivate wheat, barley and millet, but little rice. They have some knowledge of metals, making their own tools and weapons. Women are said to be held in respect, and may become chiefs of the tribes. They do not intermarry with Chinese.

See A. F. Legendre, "Les Lolos. Étude ethnologique et anthropologique," in *T'oung Pao II.*, vol. x. (1909); E. C. Baber, *Royal Geog. Society Sup. Papers*, vol. i. (London, 1882); F. S. A. Bourne, *Blue Book, China, No. 1* (1888); A. Hosie, *Three Years in Western China* (London, 1897).

LOMBARD LEAGUE, the name given in general to any league of the cities of Lombardy, but applied especially to the league founded in 1167, which brought about the defeat of the emperor Frederick I. at Legnano, and the consequent destruction of his plans for obtaining complete authority over Italy.

Lacking often the protection of a strong ruler, the Lombard cities had been accustomed to act together for mutual defence, and in 1093 Milan, Lodi, Piacenza and Cremona formed an alliance against the emperor Henry IV., in favour of his rebellious son Conrad. The early years of the reign of Frederick I. were largely spent in attacks on the privileges of the cities of Lombardy. This led to a coalition, formed in March 1167, between the cities of Cremona, Mantua, Bergamo and Brescia to confine Frederick to the rights which the emperors had enjoyed for the past hundred years. This league or *concordia* was soon joined by other cities, among which were Milan, Parma, Padua, Verona, Piacenza and Bologna, and the allies began to build a fortress near the confluence of the Tanaro and the

Bormida, which, in honour of Pope Alexander III., was called Alessandria. During the absence of Frederick from Italy from 1168 to 1174, the relations between the pope and the league became closer, and Alexander became the leader of the alliance. Meetings of the league were held in 1172 and 1173 to strengthen the bond, and to concert measures against the emperor, the penalties of the church being invoked to prevent defection. The decisive struggle began when Frederick attacked Alessandria in 1174. The fortress was bravely defended, and the siege was raised on the approach of succour from the allied cities. Negotiations for peace failed, and the emperor, having marched against Milan, suffered a severe defeat at Legnano on the 29th of May 1176. Subsequently Pope Alexander was detached from his allies, and made peace with Frederick, after which a truce for six years was arranged between the emperor and the league. Further negotiations ripened into the peace of Constance signed on the 25th of June 1183, which granted almost all the demands of the cities, and left only a shadowy authority to the emperor (see Italy).

In 1226, when the emperor Frederick II. avowed his intention of restoring the imperial authority in Italy, the league was renewed, and at once fifteen cities, including Milan and Verona, were placed under the ban. Frederick, however, was not in a position to fight, and the mediation of Pope Honorius III. was successful in restoring peace. In 1231 the hostile intentions of the emperor once more stirred the cities into activity. They held a meeting at Bologna and raised an army, but as in 1226, the matter ended in mutual fulminations and defiances. A more serious conflict arose in 1234. The great question at issue, the nature and extent of the imperial authority over the Lombard cities, was still unsettled when Frederick's rebellious son, the German king Henry VII., allied himself with them. Having crushed his son and rejected the proffered mediation of Pope Gregory IX., the emperor declared war on the Lombards in 1236; he inflicted a serious defeat upon their forces at Cortenuova in November 1237 and met with other successes, but in 1238 he was beaten back from before Brescia. In 1239 Pope Gregory joined the cities and the struggle widened out into the larger one of the Empire and the Papacy. This was still proceeding when Frederick died in December 1250 and it was only ended by the overthrow of the Hohenstaufen and the complete destruction of the imperial authority in Italy.

For a full account of the Lombard League see C. Vignati, *Storia diplomata della Lega Lombarda* (Milan, 1866); H. Prutz, *Kaiser Friedrich I.*, Band ii. (Danzig, 1871–1874); W. von Giesebrecht, *Geschichte der deutschen Kaiserzeit*, Band v. (Leipzig, 1888); and J. Ficker, *Zur Geschichte des Lombardenbundes* (Vienna, 1868).

LOMBARDO, the name of a family of Venetian sculptors and architects; their surname was apparently Solaro, and the name of Lombardo was given to the earliest known, Martino, who emigrated from Lombardy to Venice in the middle of the 15th century and became celebrated as an architect. He had two sons, Moro and Pietro, of whom the latter (*c.* 1435–1515) was one of the greatest sculptors and architects of his time, while his sons Antonio (d. 1516) and Tullio (d. 1559) were hardly less celebrated. Pietro's work as an architect is seen in numerous churches, the Vendramini-Calargi palace (1481), the doge's palace (1498), the façade (1485) of the *scuola* of St Mark and the cathedral of Cividale del Friuli (1502); but he is now more famous as a sculptor, often in collaboration with his sons; he executed the tomb of the doge Mocenigo (1478) in the church of San Giovanni e Paolo at Venice, and a bas-relief for the tomb of Dante at Ravenna, and in 1483 began the beautiful decorations in the church of Sta Maria de' Miracoli at Venice, which is associated with his workshop (see also Venice for numerous references to the work of the Lombardi). Antonio's masterpiece is the marble relief of St Anthony making a new-born child speak in defence of its mother's honour, in the Santo at Padua (1505). Tullio's best-known works are the four kneeling angels (1484) in the church of San Martino, Venice, a coronation of the Virgin in San Giovanni Crisostomo and two bas-reliefs in the Santo, Padua, besides two others formerly in the Spitzer collection, representing Vulcan's Forge and Minerva disputing with Neptune.

LOMBARDS, or Langobardi, a Suevic people who appear to have inhabited the lower basin of the Elbe and whose name is believed to survive in the modern Bardengau to the south of Hamburg. They are first mentioned in connexion with the year A.D. 5, at which time they were defeated by the Romans under Tiberius, afterwards emperor. In A.D. 9, however, after the destruction of Varus's army, the Romans gave up their attempt to extend their frontier to the Elbe. At first, with most of the Suevic tribes, they were subject to the hegemony of Maroboduus, king of the Marcomanni, but they revolted from him in his war with Arminius, chief of the Cherusci, in the year 17. We again hear of their interference in the dynastic strife of the Cherusci some time after the year 47. From this time they are not mentioned until the year 165, when a force of Langobardi, in alliance with the Marcomanni, was defeated by the Romans, apparently on the Danubian frontier. It has been inferred from this incident that the Langobardi had already moved southwards, but the force mentioned may very well have been sent from the old home of the tribe, as the various Suevic peoples seem generally to have preserved some form of political union. From this time onwards we hear no more of them until the end of the 5th century.

In their own traditions we are told that the Langobardi were originally called Winnili and dwelt in an island named Scadinavia (with this story compare that of the Gothic migration, see Goths). Thence they set out under the leadership of Ibor and Aio, the sons of a prophetess called Gambara, and came into conflict with the Vandals. The leaders of the latter prayed to Wodan for victory, while Gambara and her sons invoked Frea. Wodan promised to give victory to those whom he should see in front of him at sunrise. Frea directed the Winnili to bring their women with their hair let down round their faces like beards and turned Wodan's couch round so that he faced them. When Wodan awoke at sunrise he saw the host of the Winnili and said, "*Qui sunt isti Longibarbi?*"—"Who are these long-beards?"—and Frea replied, "As thou hast given them the name, give them also the victory." They conquered in the battle and were thenceforth known as Langobardi. After this they are said to have wandered through regions which cannot now be identified, apparently between the Elbe and the Oder, under legendary kings, the first of whom was Agilmund, the son of Aio.

Shortly before the end of the 5th century the Langobardi appear to have taken possession of the territories formerly occupied by the Rugii whom Odoacer had overthrown in 487, a region which probably included the present province of Lower Austria. At this time they were subject to Rodulf, king of the Heruli, who, however, took up arms against them; according to one story, owing to the treacherous murder of Rodulf's brother, according to another through an irresistible desire for fighting on the part of his men. The result was the total defeat of the Heruli by the Langobardi under their king Tato and the death of Rodulf at some date between 493 and 508. By this time the Langobardi are said to have adopted Christianity in its Arian form. Tato was subsequently killed by his nephew Waccho. The latter reigned for thirty years, though frequent attempts were made by Ildichis, a son or grandson of Tato, to recover the throne. Waccho is said to have conquered the Suabi, possibly the Bavarians, and he was also involved in strife with the Gepidae, with whom Ildichis had taken refuge. He was succeeded by his youthful son Walthari, who reigned only seven years under the guardianship of a certain Audoin. On Walthari's death (about 546?) Audoin succeeded. He also was involved in hostilities with the Gepidae, whose support of Ildichis he repaid by protecting Ustrogotthus, a rival of their king Thorisind. In these quarrels both nations aimed at obtaining the support of the emperor Justinian, who, in pursuance of his policy of playing off one against the other, invited the Langobardi into Noricum and Pannonia, where they now settled.

A large force of Lombards under Audoin fought on the imperial side at the battle of the Apennines against the Ostrogothic king

Totila in 553, but the assistance of Justinian, though often promised, had no effect on the relations of the two nations, which were settled for the moment after a series of truces by the victory of the Langobardi, probably in 554. The resulting peace was sealed by the murder of Ildichis and Ustrogotthus, and the Langobardi seem to have continued inactive until the death of Audoin, perhaps in 565, and the accession of his son Alboin, who had won a great reputation in the wars with the Gepidae. It was about this time that the Avars, under their first Chagun Baian, entered Europe, and with them Alboin is said to have made an alliance against the Gepidae under their new king Cunimund. The Avars, however, did not take part in the final battle, in which the Langobardi were completely victorious. Alboin, who had slain Cunimund in the battle, now took Rosamund, daughter of the dead king, to be his wife.

In 568 Alboin and the Langobardi, in accordance with a compact made with Baian, which is recorded by Menander, abandoned their old homes to the Avars and passed southwards into Italy, were they were destined to found a new and mighty kingdom. (F. G. M. B.)

The Lombard Kingdom in Italy.—In 568 Alboin, king of the Langobards, with the women and children of the tribe and all their possessions, with Saxon allies, with the subject tribe of the Gepidae and a mixed host of other barbarians, descended into Italy by the great plain at the head of the Adriatic. The war which had ended in the downfall of the Goths had exhausted Italy; it was followed by famine and pestilence; and the government at Constantinople made but faint efforts to retain the province which Belisarius and Narses had recovered for it. Except in a few fortified places, such as Ticinum or Pavia, the Italians did not venture to encounter the new invaders; and, though Alboin was not without generosity, the Lombards, wherever resisted, justified the opinion of their ferocity by the savage cruelty of the invasion. In 572, according to the Lombard chronicler, Alboin fell a victim to the revenge of his wife Rosamund, the daughter of the king of the Gepidae, whose skull Alboin had turned into a drinking cup, out of which he forced Rosamund to drink. By this time the Langobards had established themselves in the north of Italy. Chiefs were placed, or placed themselves, first in the border cities, like Friuli and Trent, which commanded the north-eastern passes, and then in other principal places; and this arrangement became characteristic of the Lombard settlement. The principal seat of the settlement was the rich plain watered by the Po and its affluents, which was in future to receive its name from them; but their power extended across the Apennines into Liguria and Tuscany, and then southwards to the outlying dukedoms of Spoleto and Benevento. The invaders failed to secure any maritime ports or any territory that was conveniently commanded from the sea. Ticinum (Pavia), the one place which had obstinately resisted Alboin, became the seat of their kings.

After the short and cruel reign of Cleph, the successor of Alboin, the Lombards (as we may begin for convenience sake to call them) tried for ten years the experiment of a national confederacy of their dukes (as, after the Latin writers, their chiefs are styled), without any king. It was the rule of some thirty-five or thirty-six petty tyrants, under whose oppression and private wars even the invaders suffered. With anarchy among themselves and so precarious a hold on the country, hated by the Italian population and by the Catholic clergy, threatened also by an alliance of the Greek empire with their persistent rivals the Franks beyond the Alps, they resolved to sacrifice their independence and elect a king. In 584 they chose Authari, the grandson of Alboin, and endowed the royal domain with a half of their possessions. From this time till the fall of the Lombard power before the arms of their rivals the Franks under Charles the Great, the kingly rule continued. Authari, "the Longhaired," with his Roman title of Flavius, marks the change from the war king of an invading host to the permanent representative of the unity and law of the nation, and the increased power of the crown, by the possession of a great domain, to enforce its will. The independence of the dukes was surrendered to the king. The dukedoms in the neighbourhood of the seat of power were gradually absorbed, and their holders transformed into royal officers. Those of the northern marches, Trent and Friuli, with the important dukedom of Turin, retained longer the kind of independence which marchlands usually give where invasion is to be feared. The great dukedom of Benevento in the south, with its neighbour Spoleto, threatened at one time to be a separate principality, and even to the last resisted, with varying success, the full claims of the royal authority at Pavia.

The kingdom of the Lombards lasted more than two hundred years, from Alboin (568) to the fall of Desiderius (774)—much longer than the preceding Teutonic kingdom of Theodoric and the Goths. But it differed from the other Teutonic conquests in Gaul, in Britain, in Spain. It was never complete in point of territory: there were always two, and almost to the last three, capitals—the Lombard one, Pavia; the Latin one, Rome; the Greek one, Ravenna; and the Lombards never could get access to the sea. And it never was complete over the subject race: it profoundly affected the Italians of the north; in its turn it was entirely transformed by contact with them; but the Lombards never amalgamated with the Italians till their power as a ruling race was crushed by the victory given to the Roman element by the restored empire of the Franks. The Langobards, German in their faults and in their strength, but coarser, at least at first, than the Germans whom the Italians had known, the Goths of Theodoric and Totila, found themselves continually in the presence of a subject population very different from anything which the other Teutonic conquerors met with among the provincials—like them, exhausted, dispirited, unwarlike, but with the remains and memory of a great civilization round them, intelligent, subtle, sensitive, feeling themselves infinitely superior in experience and knowledge to the rough barbarians whom they could not fight, and capable of hatred such as only cultivated races can nourish. The Lombards who, after they had occupied the lands and cities of Upper Italy, still went on sending forth furious bands to plunder and destroy where they did not care to stay, never were able to overcome the mingled fear and scorn and loathing of the Italians. They adapted themselves very quickly indeed to many Italian fashions. Within thirty years of the invasions, Authari took the imperial title of Flavius, even while his bands were leading Italian captives in leash like dogs under the walls of Rome, and under the eyes of Pope Gregory; and it was retained by his successors. They soon became Catholics; and then in all the usages of religion, in church building, in founding monasteries, in their veneration for relics, they vied with Italians. Authari's queen, Theodelinda, solemnly placed the Lombard nation under the patronage of St John the Baptist, and at Monza she built in his honour the first Lombard church, and the royal palace near it. King Liutprand (712–744) bought the relics of St Augustine for a large sum to be placed in his church at Pavia. Their Teutonic speech disappeared; except in names and a few technical words all traces of it are lost. But to the last they had the unpardonable crime of being a ruling barbarian race or caste in Italy. To the end they are "nefandissimi," execrable, loathsome, filthy. So wrote Gregory the Great when they first appeared. So wrote Pope Stephen IV., at the end of their rule, when stirring up the kings of the Franks to destroy them.

Authari's short reign (584–591) was one of renewed effort for conquest. It brought the Langobards face to face, not merely with the emperors at Constantinople, but with the first of the great statesmen popes, Gregory the Great (590–604). But Lombard conquest was bungling and wasteful; when they had spoiled a city they proceeded to tear down its walls and raze it to the ground. Authari's chief connexion with the fortunes of his people was an important, though an accidental one. The Lombard chronicler tells a romantic tale of the way in which Authari sought his bride from Garibald, duke of the Bavarians, how he went incognito in the embassy to judge of her attractions, and how she recognized her disguised suitor. The bride was the Christian Theodelinda, and she became to the Langobards what Bertha was to the Anglo-Saxons and Clotilda to the Franks.

She became the mediator between the Lombards and the Catholic Church. Authari, who had brought her to Italy, died shortly after his marriage. But Theodelinda had so won on the Lombard chiefs that they bid her as queen choose the one among them whom she would have for her husband and for king. She chose Agilulf, duke of Turin (592–615). He was not a true Langobard, but a Thuringian. It was the beginning of peace between the Lombards and the Catholic clergy. Agilulf could not abandon his traditional Arianism, and he was a very uneasy neighbour, not only to the Greek exarch, but to Rome itself. But he was favourably disposed both to peace and to the Catholic Church. Gregory interfered to prevent a national conspiracy against the Langobards, like that of St Brice's day in England against the Danes, or that later uprising against the French, the Sicilian Vespers. He was right both in point of humanity and of policy. The Arian and Catholic bishops went on for a time side by side; but the Lombard kings and clergy rapidly yielded to the religious influences around them, even while the national antipathies continued unabated and vehement. Gregory, who despaired of any serious effort on the part of the Greek emperors to expel the Lombards, endeavoured to promote peace between the Italians and Agilulf; and, in spite of the feeble hostility of the exarchs of Ravenna, the pope and the king of the Lombards became the two real powers in the north and centre of Italy. Agilulf was followed, after two unimportant reigns, by his son-in-law, the husband of Theodelinda's daughter, King Rothari (636–652), the Lombard legislator, still an Arian though he favoured the Catholics. He was the first of their kings who collected their customs under the name of laws—and he did this, not in their own Teutonic dialect, but in Latin. The use of Latin implies that the laws were to be not merely the personal law of the Lombards, but the law of the land, binding on Lombards and Romans alike. But such rude legislation could not provide for all questions arising even in the decayed state of Roman civilization. It is probable that among themselves the Italians kept to their old usages and legal precedents where they were not overridden by the conquerors' law, and by degrees a good many of the Roman civil arrangements made their way into the Lombard code, while all ecclesiastical ones, and they were a large class, were untouched by it.

There must have been much change of property; but appearances are conflicting as to the terms on which land generally was held by the old possessors or the new comers, and as to the relative legal position of the two. Savigny held that, making allowance for the anomalies and usurpations of conquest, the Roman population held the bulk of the land as they had held it before, and were governed by an uninterrupted and acknowledged exercise of Roman law in their old municipal organization. Later inquirers, including Leo, Troya and Hegel, have found that the supposition does not tally with a whole series of facts, which point to a Lombard territorial law ignoring completely any parallel Roman and personal law, to a great restriction of full civil rights among the Romans, analogous to the condition of the rayah under the Turks, and to a reduction of the Roman occupiers to a class of half-free "aldii," holding immovable tenancies under lords of superior race and privilege, and subject to the sacrifice either of the third part of their holdings or the third part of the produce. The Roman losses, both of property and rights, were likely to be great at first; how far they continued permanent during the two centuries of the Lombard kingdom, or how far the legal distinctions between Rome and Lombard gradually passed into desuetude, is a further question. The legislation of the Lombard kings, in form a territorial and not a personal law, shows no signs of a disposition either to depress or to favour the Romans, but only the purpose to maintain, in a rough fashion, strict order and discipline impartially among all their subjects.

From Rothari (d. 652) to Liutprand (712–744) the Lombard kings, succeeding one another in the irregular fashion of the time, sometimes by descent, sometimes by election, sometimes by conspiracy and violence, strove fitfully to enlarge their boundaries, and contended with the aristocracy of dukes inherent in the original organization of the nation, an element which, though much weakened, always embarrassed the power of the crown, and checked the unity of the nation. Their old enemies the Franks on the west, and the Slavs or Huns, ever ready to break in on the north-east, and sometimes called in by mutinous and traitorous dukes of Friuli and Trent, were constant and serious dangers. By the popes, who represented Italian interests, they were always looked upon with dislike and jealousy, even when they had become zealous Catholics, the founders of churches and monasteries; with the Greek empire there was chronic war. From time to time they made raids into the unsubdued parts of Italy, and added a city or two to their dominions. But there was no sustained effort for the complete subjugation of Italy till Liutprand, the most powerful of the line. He tried it, and failed. He broke up the independence of the great southern duchies, Benevento and Spoleto. For a time, in the heat of the dispute about images, he won the pope to his side against the Greeks. For a time, but only for a time, he deprived the Greeks of Ravenna. Aistulf, his successor, carried on the same policy. He even threatened Rome itself, and claimed a capitation tax. But the popes, thoroughly irritated and alarmed, and hopeless of aid from the East, turned to the family which was rising into power among the Franks of the West, the mayors of the palace of Austrasia. Pope Gregory III. applied in vain to Charles Martel. But with his successors Pippin and Charles the popes were more successful. In return for the transfer by the pope of the Frank crown from the decayed line of Clovis to his own, Pippin crossed the Alps, defeated Aistulf and gave to the pope the lands which Aistulf had torn from the empire, Ravenna and the Pentapolis (754–756). But the angry quarrels still went on between the popes and the Lombards. The Lombards were still to the Italians a "foul and horrid" race. At length, invited by Pope Adrian I., Pippin's son Charlemagne once more descended into Italy. As the Lombard kingdom began, so it ended, with a siege of Pavia. Desiderius, the last king, became a prisoner (774), and the Lombard power perished. Charlemagne, with the title of king of the Franks and Lombards, became master of Italy, and in 800 the pope, who had crowned Pippin king of the Franks, claimed to bestow the Roman empire, and crowned his greater son emperor of the Romans (800).

Effects of the Carolingian Conquest.—To Italy the overthrow of the Lombard kings was the loss of its last chance of independence and unity. To the Lombards the conquest was the destruction of their legal and social supremacy. Henceforth they were equally with the Italians the subjects of the Frank kings. The Carolingian kings expressly recognized the Roman law, and allowed all who would be counted Romans to "profess" it. But Latin influences were not strong enough to extinguish the Lombard name and destroy altogether the recollections and habits of the Lombard rule; Lombard law was still recognized, and survived in the schools of Pavia. Lombardy remained the name of the finest province of Italy, and for a time was the name for Italy itself. But what was specially Lombard could not stand in the long run against the Italian atmosphere which surrounded it. Generation after generation passed more and more into real Italians. Antipathies, indeed, survived, and men even in the 10th century called each other Roman or Langobard as terms of reproach. But the altered name of Lombard also denoted henceforth some of the proudest of Italians; and, though the Lombard speech had utterly perished their most common names still kept up the remembrance that their fathers had come from beyond the Alps.

But the establishment of the Frank kingdom, and still more the re-establishment of the Christian empire as the source of law and jurisdiction in Christendom, had momentous influence on the history of the Italianized Lombards. The Empire was the counterweight to the local tyrannies into which the local authorities established by the Empire itself, the feudal powers, judicial and military, necessary for the purposes of government, invariably tended to degenerate. When they became intolerable, from the Empire were sought the exemptions, privileges, immunities from that local authority, which, anomalous and anarchical as they were in theory, yet in fact were the foundations of all the liberties of the middle ages in the Swiss cantons, in the free towns of Germany and the Low Countries, in the Lombard cities of Italy. Italy was and ever has been a land of cities; and, ever since the downfall of Rome and the decay of the municipal system, the bishops of the cities had really been at the head of the peaceful and industrial part of their population, and were a natural refuge for the oppressed, and sometimes for the mutinous and the evil doers, from the military and civil powers of the duke or count or judge, too often a rule of cruelty or fraud. Under the Carolingian empire, a vast system grew up in the North Italian cities of episcopal "immunities," by which a city with its surrounding district was removed, more or less completely, from the jurisdiction of the ordinary authority, military or civil, and placed under that of the bishop. These "immunities" led to the temporal sovereignty of the bishops; under it the spirit of liberty grew more readily than under the military chief. Municipal organization, never quite forgotten, naturally revived under new forms, and with its "consuls" at the head of the citizens, with its "arts" and "crafts" and "gilds," grew up secure under the shadow of the church. In due time the city populations, free from the feudal yoke, and safe within the walls which in many instances the bishops had built for them, became impatient also of the bishop's government. The cities which the bishops had made thus independent of the dukes and counts next sought to be free from the bishops; in due time they too gained their charters of privilege and liberty. Left to take care of themselves, islands in a sea of turbulence, they grew in the sense of self-reliance and independence; they grew also to be aggressive, quarrelsome and ambitious. Thus, by the 11th century, the Lombard cities had become "communes," commonalties, republics, managing their own affairs, and ready for attack or defence. Milan had recovered its greatness, ecclesiastically as well as politically; it scarcely bowed to Rome, and it aspired to the position of a sovereign city, mistress over its neighbours. At length, in the 12th century, the inevitable conflict came between the republicanism of the Lombard cities and the German feudalism which still claimed their allegiance in the name of the Empire. Leagues and counter-leagues were formed; and a confederacy of cities, with Milan at its head, challenged the strength of Germany under one of its sternest emperors, Frederick Barbarossa. At first Frederick was victorious; Milan, except its churches, was utterly destroyed; everything that marked municipal independence was abolished in the "rebel" cities; and they had to receive an imperial magistrate instead of their own (1158–1162). But the Lombard league was again formed. Milan was rebuilt, with the help even of its jealous rivals, and at Legnano (1176) Frederick was utterly defeated. The Lombard cities had regained their independence; and at the peace of Constance (1183) Frederick found himself compelled to confirm it.

From the peace of Constance the history of the Lombards is merely part of the history of Italy. Their cities went through the ordinary fortunes of most Italian cities. They quarrelled and fought with one another. They took opposite sides in the great strife of the time between pope and emperor, and were Guelf and Ghibelline by old tradition, or as one or other faction prevailed in them. They swayed backwards and forwards between the power of the people and the power of the few; but democracy and oligarchy passed sooner or later into the hands of a master who veiled his lordship under various titles, and generally at last into the hands of a family. Then, in the larger political struggles and changes of Europe, they were incorporated into a kingdom, or principality or duchy, carved out to suit the interest of a foreigner, or to make a heritage for the nephew of a pope. But in two ways especially the energetic race which grew out of the fusion of Langobards and Italians between the 9th and the 12th centuries has left the memory of itself. In England, at least, the enterprising traders and bankers who found their way to the West, from the 13th to the 16th centuries, though they certainly did not all come from Lombardy, bore the name of Lombards. In the next place, the Lombards or the Italian builders whom they employed or followed, the "masters of Como," of whom so much is said in the early Lombard laws, introduced a manner of building, stately, solemn and elastic, to which their name has been attached, and which gives a character of its own to some of the most interesting churches in Italy. (R. W. C.)

LOMBARDY, a territorial division of Italy, bounded N. by the Alps, S. by Emilia, E. by Venetia and W. by Piedmont. It is divided into eight provinces, Bergamo, Brescia, Como, Cremona, Mantua, Milan, Pavia and Sondrio, and has an area of 9386 sq. m. Milan, the chief city, is the greatest railway centre of Italy; it is in direct communication not only with the other principal towns of Lombardy and the rest of Italy but also with the larger towns of France, Germany and Switzerland, being the nearest great town to the tunnels of the St Gothard and the Simplon. The other railway centres of the territory are Mortara, Pavia and Mantua, while every considerable town is situated on or within easy reach of the railway, this being rendered comparatively easy owing to the relative flatness of the greater part of the country. The line from Milan to Porto Ceresio is worked in the main by electric motor driven trains, while on that from Lecco to Colico and Chiavenna over-head wires are adopted. The more remote districts and the immediate environs of the larger town are served by steam tramways and electric railways. The most important rivers are the Po, which follows, for the most part, the southern boundary of Lombardy, and the Ticino, one of the largest tributaries of the Po, which forms for a considerable distance the western boundary. The majority of the Italian lakes, those of Garda, Idro, Iseo, Como, Lugano, Varese and Maggiore, lie wholly or in part within it. The climate of Lombardy is thoroughly continental; in summer the heat is greater than in the south of Italy, while the winter is very cold, and bitter winds, snow and mist are frequent. In the summer rain is rare beyond the lower Alps, but a system of irrigation, unsurpassed in Europe, and dating from the middle ages, prevails, so that a failure of the crops is hardly possible. There are three zones of cultivation: in the mountains, pasturage; the lower slopes are devoted to the culture of the vine, fruit-trees (including chestnuts) and the silkworm; while in the regions of the plain, large crops of maize, rice, wheat, flax, hemp and wine are produced, and thousands of mulberry-trees are grown for the benefit of the silkworms, the culture of which in the province of Milan has entirely superseded the sheep-breeding for which it was famous during the middle ages. Milan is indeed the principal silk market in the world. In 1905 there were 490 mills reeling silk in Lombardy, with 35,407 workers, and 276 throwing-mills with 586,000 spindles. The chief centre of silk weaving is Como, but the silk is commercially dealt with at Milan, and there is much exportation. A considerable amount of cotton is manufactured, but most of the raw cotton (600,000 bales) is imported, the cultivation being insignificant in Italy. There are 400 mills in Lombardy, 277 of which are in the province of Milan. The largest linen and woollen mills in Italy are situated at Fara d'Adda. Milan also manufactures motor-cars, though Turin is the principal centre in Italy for this industry. There are copper, zinc and iron mines, and numerous quarries of marble, alabaster and granite. In addition to the above industries the chief manufactures are hats, rope and paper-making, iron-casting, gun-making, printing and lithography. Lombardy is indeed the most industrial district of Italy. In parts the peasants suffer much from *pellagra*.

The most important towns with their communal population in the respective provinces, according to the census of 1901, are Bergamo (46,861), Treviglio (14,897), total of province 467,549, number of communes 306; Brescia (69,210), Chiari (10,749), total of province 541,765, number of communes 280; Como (38,174), Varese (17,666), Cantù (10,725), Lecco (10,352), total of province 594,304, number of communes 510; Cremona (36,848), Casalmaggiore (16,407), Soresina (10,358), total of province 329,471, number of communes 133; Mantua (30,127), Viadana (16,082), Quistello (11,228), Suzzara (11,502), St Benedetto Po (10,908), total of province 315,448, number of communes 68; Milan (490,084), Monza (42,124), Lodi (26,827), Busto Arsizio (20,005), Legnano (18,285), Seregno (12,050), Gallarate (11,952), Codogno (11,925), total of province 1,450,214, number of communes 297; Pavia (33,922), Vigevano (23,560), Voghera (20,442), total of province 504,382, number of communes 221; Sondrio (7077), total of province 130,966, number of communes 78. The total population of Lombardy was 4,334,099. In most of the provinces of Lombardy there are far more villages than in other parts of Italy except Piedmont; this is attributable partly to their mountainous character, partly perhaps to security from attack by sea (contrast the state of things in Apulia).

Previous to the fall of the Roman republic Lombardy formed a part of Gallia Transpadana, and it was Lombardy, Venetia and Piedmont, the portion of the Italian peninsula N. of the Po, that did not receive citizenship in 89 B.C. but only Latin rights. The gift of full citizenship in 49 B.C. made it a part of Italy proper, and Lombardy and Piedmont formed the 11th region of Augustus (Transpadana) while Venetia and Istria formed the 10th. It was the second of the regions of Italy in size, but the last in number of towns; it appears, however, to have been prosperous and peaceful, and cultivation flourished in its fertile portions. By the end of the 4th century A.D. the name Liguria had been extended over it, and Milan was regarded as the capital of both. Stranger still, in the 6th century the old Liguria was separated from it, and under the name of *Alpes Cottiae* formed the 5th Lombard province of Italy.

For details of subsequent history see LOMBARDS and ITALY; and for architecture see ARCHITECTURE. G. T. Rivoira in *Origini dell' Architetturo Lombarda* (2 vols. Rome, 1901–1907), successfully demonstrates the classical origin of much that had hitherto been treated by some authorities as "Byzantine.". In the development of Renaissance architecture and art Lombardy played a great part, inasmuch as both Bramante and Leonardo da Vinci resided in Milan at the end of the 15th century.

LOMBOK (called by the natives *Sasak*), one of the Lesser Sunda Islands, in the Dutch East Indies, E. of Java, between 8° 12′ and 9° 1′ S. and 115° 46′ and 116° 40′ E., with an area of 3136 sq. m. It is separated from Bali by the Strait of Lombok and from Sumbawa by the Strait of Alas. Rising out of the sea with bold and often precipitous coasts, Lombok is traversed by two mountain chains. The northern chain is of volcanic formation, and contains the peak of Lombok (11,810 ft.), one of the highest volcanoes in the Malay Archipelago. It is surrounded by a plateau (with lower summits, and a magnificent lake, Segara Anak) 8200 ft. high. The southern chain rises a little over 3000 ft. Between the two chains is a broad valley or terrace with a range of low volcanic hills. Forest-clad mountains and stretches of thorny jungle alternating with rich alluvial plains, cultivated like gardens under an ancient and elaborate system of irrigation, make the scenery of Lombok exceedingly attractive. The small rivers serve only for irrigation and the growing of rice, which is of superior quality. In the plains are also grown coffee, indigo, maize and sugar, katyang (native beans), cotton and tobacco. All these products are exported. To the naturalist Lombok is of particular interest as the frontier island of the Australian region, with its cockatoos and megapods or mound-builders, its peculiar bee-eaters and ground thrushes. The Sasaks must be considered the aborigines, as no trace of an earlier race is found. They are Mahommedans and distinct in many other respects from the Hindu Balinese, who vanquished but could not convert them. The island was formerly divided into the four states of Karang-Asam Lombok on the W. side, Mataram in the N.W., Pagarawan in the S.W. and Pagutan in the E. Balinese supremacy dated from the conquest by Agong Dahuran in the beginning of the 19th century; the union under a single raja tributary to Bali dated from 1839. In July 1894 a Dutch expedition landed at Ampanam, and advanced towards Mataram, the capital of the Balinese sultan, who had defied Dutch authority and refused to send the usual delegation to Batavia. The objects of that expedition were to punish Mataram and to redress the grievances of the Sasaks whom the Balinese held in cruel subjection. The first Dutch expedition met with reverses, and ultimately the invaders were forced back upon Ampanam. The Dutch at once despatched a much stronger expedition, which landed at Ampanam in September. Mataram was bombarded by the fleet, and the troops stormed the sultan's stronghold, and Tjakra Negara, another chieftain's citadel, both after a desperate resistance. The old sultan of Mataram was captured, and he and other Balinese chiefs were exiled to different parts of the Malay Archipelago, whilst the sultan's heir fell at the hands of his warriors. Thus ended the Balinese domination of Lombok, and the island was placed under direct Dutch-Indian control, an assistant resident being appointed at Ampanam. Lombok is now administered from Bali by the Dutch resident on that island. The people, however, are in undisturbed exercise of their own laws, religions, customs and institutions. Disturbances between the Sasaks and the Lombok Balinese frequently occur. Lombok has been divided since 1898 into the West, Middle and East Lombok. Its chief towns are Mataram, Praya and Sisi. On the west coast the harbour of Ampanam is the most frequented, though, on account of heavy breakers, it is often difficult of approach. The Sasaks are estimated at 320,000, the Balinese at 50,000, Europeans number about 40, Chinese 300, and Arabs 170.

See A. R. Wallace, *Malay Archipelago* (London, 1869, and later editions). The famous "Wallace's Line" runs immediately west of Lombok, which therefore has an important part in the work. Captain W. Cool, *With the Dutch in the East* (Amsterdam and London, 1897), in Dutch and English, is a narrative of the events sketched above, and contains many particulars about the folklore and dual religions of Lombok, which, with Bali, forms the last stronghold of Hinduism east of Java.

LOMBROSO, CESARE (1836–1909), Italian criminologist, was born on the 18th of November 1836 at Verona, of a Jewish family. He studied at Padua, Vienna and Paris, and was in 1862 appointed professor of psychiatry at Pavia, then director of the lunatic asylum at Pesaro, and later professor of forensic medicine and of psychiatry at Turin, where he eventually filled the chair of criminal anthropology. His works, several of which have been translated into English, include *L'Uomo delinquente* (1889); *L'Uomo di genio* (1888) *Genio e follia* (1877) and *La Donna delinquente* (1893). In 1872 he had made the notable discovery that the disorder known as *pellagra* was due (but see PELLAGRA) to a poison contained in diseased maize, eaten by the peasants, and he returned to this subject in *La Pellagra in Italia* (1885) and other works. Lombroso, like Giovanni Bovio (b. 1841), Enrico Ferri (b. 1856) and Colajanni, well-known Italian criminologists, and his sons-in-law G. Ferrero and Carrara, was strongly influenced by Auguste Comte, and owed to him an exaggerated tendency to refer all mental facts to biological causes. In spite of this, however, and a serious want of accuracy and discrimination in handling evidence, his work made an epoch in criminology; for he surpassed all his predecessors by the wide scope and systematic character of his researches, and by the practical conclusions he drew from them. Their net theoretical results is that the criminal population exhibits a higher percentage of physical, nervous and mental anomalies than non-criminals; and that these anomalies are due partly to degeneration, partly to atavism. The criminal is a special type of the human race, standing midway between the lunatic and the savage. This doctrine of a "criminal type" has been gravely criticized, but is admitted by all to contain a substratum of truth. The practical reform to which it points is a classification of offenders, so that the born criminal may receive a different kind of punishment from the offender who is tempted into crime by circumstances (see also CRIMINOLOGY). Lombroso's biological principles are much less successful in his work on Genius, which he explains as a morbid, degenerative condition, presenting analogies to insanity, and not altogether alien to crime. In 1899 he published in French a book which gives a résumé of much of his earlier work, entitled *Le Crime, causes et remèdes*. Later works are: *Delitti vecchi e delitti nuovi* (Turin, 1902); *Nuovi studi sul genio* (2 vols., Palermo, 1902); and in 1908 a work on spiritualism (Eng. trans., *After Death—What?* 1909), to which subject he had turned his attention during the later years of his life. He died suddenly from a heart complaint at Turin on the 19th of October 1909.

See Kurella, *Cesare Lombroso und die Naturgeschichte des Verbrechers* (Hamburg, 1892); and a biography, with an analysis of his works, and a short account of their general conclusions by his daughters, Paola Carrara and Gina Ferrero, written in 1906 on the occasion of the sixth congress of criminal anthropology at Turin.

LOMÉNIE DE BRIENNE, ÉTIENNE CHARLES DE (1727–1794), French politician and ecclesiastic, was born at Paris on the 9th of October 1727. He belonged to a Limousin family, dating from the 15th century, and after a brilliant career as a student entered the Church, as being the best way to attain to a distinguished position. In 1751 he became a doctor of theology, though there were doubts as to the orthodoxy of his thesis. In 1752 he was appointed grand vicar to the archbishop of Rouen. After visiting Rome, he was made bishop of Condom

(1760), and in 1763 was translated to the archbishopric of Toulouse. He had many famous friends, among them A. R. J. Turgot, the Abbé A. Morellet and Voltaire, and in 1770 became an academician. He was on three occasions the head of the *bureau de jurisdiction* at the general assembly of the clergy; he also took an interest in political and social questions of the day, and addressed to Turgot a number of *mémoires* on these subjects, one of them, treating of pauperism, being especially remarkable. In 1787 he was nominated as president of the Assembly of Notables, in which capacity he attacked the fiscal policy of Calonne, whom he succeeded as head of the *conseil des finances* on the 1st of May 1787. Once in power, he succeeded in making the parlement register edicts dealing with internal free trade, the establishment of provincial assemblies and the redemption of the *corvée*; on their refusal to register edicts on the stamp duty and the proposed new general land-tax, he persuaded the king to hold a *lit de justice*, to enforce their registration. To crush the opposition to these measures, he persuaded the king to exile the parlement to Troyes (August 15th, 1787). On the agreement of the parlement to sanction a prolongation for two years to the tax of the two *vingtièmes* (a direct tax on all kinds of income), in lieu of the above two taxes, he recalled the councillors to Paris. But a further attempt to force the parlement to register an edict for raising a loan of 120 million *livres* met with determined opposition. The struggle of the parlement against the incapacity of Brienne ended on the 8th of May in its consenting to an edict for its own abolition; but with the proviso that the states-general should be summoned to remedy the disorders of the state. Brienne, who had in the meantime been made archbishop of Sens, now found himself face to face with almost universal opposition; he was forced to suspend the *Cour plénière* which had been set up to take the place of the parlement, and himself to promise that the states-general should be summoned. But even these concessions were not able to keep him in power, and on the 29th of August he had to retire, leaving the treasury empty. On the 15th of December following, he was made a cardinal, and went to Italy, where he spent two years. After the outbreak of the Revolution he returned to France, and took the oath of the Civil Constitution of the Clergy in 1790 (see FRENCH REVOLUTION). He was repudiated by the pope, and in 1791 had to give up the biretta at the command of Pius VI. Both his past and present conduct made him an object of suspicion to the revolutionaries; he was arrested at Sens on the 9th of November 1793, and died in prison, either of an apoplectic stroke or by poison, on the 16th of February 1794.

The chief works published by Brienne are: *Oraison funèbre du Dauphin* (Paris, 1766); *Compte-rendu au roi* (Paris, 1788); *Le Conciliateur*, in collaboration with Turgot (Rome, Paris, 1754). See also J. Perrin, *Le Cardinal Loménie de Brienne . . . épisodes de la Révolution* (Sens, 1896).

LOMOND, LOCH, the largest and most beautiful of Scottish lakes, situated in the counties of Stirling and Dumbarton. It is about 23 m. long; its width varies from 5 m. towards the south end to ⅕ m. at the narrows to the north of the Isle of the Vow; its area is 27 sq. m., and the greatest depth 630 ft. It is only 23 ft. above the sea, of which doubtless it was at one time an arm. It contains 30 islands, the largest of which is Inchmurrin, a deer park belonging to the duke of Montrose. Among other islands are Inch Cailliach (the "Island of Women," from the fact that a nunnery once stood there), Inchfad ("Long Island"), Inchcruin ("Round Island"), Inchtavannach ("Monks' Isle"), Inchconnachan ("Colquhoun's Isle"), Inchlonaig ("Isle of the Yews," where Robert Bruce caused yews to be planted to provide arms for his bowmen), Creinch, Torrinch and Clairinch (which gave the Buchanans their war-cry). From the west the loch receives the Inveruglas, the Douglas, the Luss, the Finlas and the Fruin. From Balloch in the south it sends off the Leven to the Clyde; from the east it receives the Endrick, the Blair, the Cashell and the Arklet; and from the north the Falloch. Ben Lomond (3192 ft.), the ascent of which is made with comparative ease from Rowardennan, dominates the landscape; but there are other majestic hills, particularly on the west and north-west banks. The fish are sea-trout, lake-trout, pike and perch. Part of the shore is skirted by the West Highland railway, opened in 1894, which has stations on the loch at Tarbet and Ardlui, and Balloch is the terminus of the lines from Dumbarton and from Stirling via Buchlyvie. Steamers make the tour of the loch, starting from Balloch and calling at Balmaha, Luss, Rowardennan, Tarbet, Inversnaid and Ardlui. Luss has a considerable population, and there is some stone quarried near it. INVERSNAID is the point of arrival and departure for the Trossachs coaches, and here, too, there is a graceful waterfall, fed by the Arklet from the loch of that name, 2½ m. to the east, commemorated in Wordsworth's poem of the "Highland Girl." Inversnaid was in the heart of the Macgregor country, and the name of Rob Roy is still given to his cave on the loch side a mile to the north and to his prison 3 m. to the south. Inversnaid was the site of a fort built in 1713 to reduce the clan to subjection. Craig Royston, a tract lying between Inversnaid and Ben Lomond, was also associated with Rob Roy.

LOMONÓSOV, MIKHAIL VASILIEVICH (1711–1765), Russian poet and man of science, was born in the year 1711, in the village of Denisovka (the name of which was afterwards changed in honour of the poet), situated on an island not far from Kholmogori, in the government of Archangel. His father, a fisherman, took the boy when he was ten years of age to assist him in his calling; but the lad's eagerness for knowledge was unbounded. The few books accessible to him he almost learned by heart; and, seeing that there was no chance of increasing his stock of knowledge in his native place, he resolved to betake himself to Moscow. An opportunity occurred when he was seventeen, and by the intervention of friends he obtained admission into the Zaikonospasski school. There his progress was very rapid, especially in Latin, and in 1734 he was sent from Moscow to St Petersburg. There again his proficiency, especially in physical science, was marked, and he was one of the young Russians chosen to complete their education in foreign countries. He accordingly commenced the study of metallurgy at Marburg; he also began to write poetry, imitating German authors, among whom he is said to have especially admired Günther. His *Ode on the Taking of Khotin from the Turks* was composed in 1739, and attracted a great deal of attention at St Petersburg. During his residence in Germany Lomonósov married a native of the country, and found it difficult to maintain his increasing family on the scanty allowance granted to him by the St Petersburg Academy, which, moreover, was irregularly sent. His circumstances became embarrassed, and he resolved to leave the country secretly and to return home. On his arrival in Russia he rapidly rose to distinction, and was made professor of chemistry in the university of St Petersburg; he ultimately became rector, and in 1764 secretary of state. He died in 1765.

The most valuable of the works of Lomonósov are those relating to physical science, and he wrote upon many branches of it. He everywhere shows himself a man of the most varied learning. He compiled a Russian grammar, which long enjoyed popularity, and did much to improve the rhythm of Russian verse.

LOMZA, or LOMZHA, a government of Russian Poland, bounded N. by Prussia and the Polish government of Suwalki, E. by the Russian government of Grodno, S. by the Polish governments of Siedlce and Warsaw and W. by that of Plock. It covers 4666 sq. m. It is mostly flat or undulating, with a few tracts in the north and south-west where the deeply cut valleys give a hilly aspect to the country. Extensive marshes overspread it, especially on the banks of the Narev, which flows from east to south-west, joining the Bug in the south-western corner of the government. The Bug flows along the southern border, joining the Vistula 20 m. below its confluence with the Narev. There are forests in the east of the government. The inhabitants numbered 501,385 in 1872 and 585,033 in 1897, of whom 279,279 were women, and 69,834 lived in towns. The estimated population in 1906 was 653,100. By religion 77½% are Roman Catholics, 15½% Jews and 5½% members of the Orthodox Church. Agriculture is the predominant industry, the chief crops being rye, oats, wheat, barley, buckwheat, peas, potatoes, flax and hemp. Bees are extensively kept, and large numbers of poultry, especially geese, are reared. Stock raising is carried on to some extent. The wood trade is important; other industries are the production of pottery, beer, flour, leather, bricks, wooden wares, spirits, tobacco and sugar. There is only one railway (between Grodno and Warsaw); the Bug is navigable, but wood only is floated down the Narev. The government is divided into seven districts, of which the chief towns, with their populations in 1897, are Lomza (*q.v.*), Ostrolenka (8679), Mazowiec (3900), Ostrów (11,264), Maków (7232), Kolno (4941) and Szczuczyn (5725).

LOMZA, a town of Russia, capital of the government of the same name, on the Narew, 103 m. by rail N.E. from Warsaw. Pop. (1872), 13,860, (1900) 22,428. Lomza is an old town, one of its churches having been erected before 1000. In the 16th century it carried on a brisk trade with Lithuania and Prussia. It was well fortified and had two citadels, but nevertheless often suffered from the invasions of the Germans and Tatars, and in the 17th century it was twice plundered by the Cossacks of the Ukraine. In 1795 it fell under the dominion of Prussia, and after the peace of Tilsit (1807) it came under Russian rule.

LONAULI, a town of India, in the Poona district of Bombay, at the top of the Bhor Ghat pass in the Western Ghats, by which the Great Indian Peninsula railway climbs from Bombay to Poona. Pop. (1901), 6686. It contains the locomotive works of the railway. Lonauli is a place of resort from Bombay during the hot season.

LONDON, a city and port of entry of Middlesex county, Ontario, Canada, situated 121 m. N.W. of Toronto, on the river Thames and the Grand Trunk, Canadian Pacific and Michigan Central railways. Pop. (1901), 37,981; but several suburbs, not included in these figures, are in reality part of the city. The local nomenclature is largely a reproduction of that of the great city whose name it has borrowed. Situated in a fertile agricultural district, it is a large distributing centre. Among the industries are breweries, petroleum refineries, and factories for the manufacture of agricultural implements and of railway carriages. The educational institutions include the Hellmuth Ladies' College and the Western University (founded in 1878 under the patronage of the Church of England). London was founded in 1825–1826.

LONDON, the capital of England and of the British Empire, and the greatest city in the world, lying on each side of the river Thames 50 m. above its mouth.[1] The "City," so called both formally and popularly, is a small area (673 acres) on the north bank of the river, forming the heart of the metropolis, and constituting within its boundaries one only, and one of the smallest, of twenty-nine municipal divisions which make up the administrative County of London. The twenty-eight remaining divisions are the Metropolitan Boroughs. The county thus defined has an extreme length (E. to W.) of 16 m., an extreme breadth (N. to S.) of 11½ m., and an area of 74,839 acres or about 117 sq. m. The boroughs are as follows:—

1. *North of the Thames.*—Touching the northern boundary of the county, from W. to E.—Hammersmith, Kensington, Paddington, Hampstead, St Pancras, Islington, Stoke Newington, Poplar.

Bounded by the Thames—Fulham, Chelsea, the City of Westminster (here the City of London intervenes), Stepney, Poplar.

Between Westminster, the City and Stepney, and the northern boroughs—St Marylebone (commonly Marylebone), Holborn, Finsbury, Shoreditch, Bethnal Green.

2. *South of the Thames.*—Wandsworth, Battersea, Lambeth, Southwark, Camberwell, Bermondsey, Deptford, Lewisham, Greenwich, Woolwich (with a small part of the north bank).

These names are all in common use, though their formal application is in some cases extended over several districts of which the ancient names remain familiar. Each borough is noticed in a separate article.

I. Extent and Site

The County of London is bounded N. and W. by Middlesex, E. by Essex and Kent, S. by Kent and Surrey. The Metropolitan police area, or "Greater London," however, embraces the whole of Middlesex, with parts of the other three counties and of Hertfordshire. Its extent is 443,419 acres or nearly 693 sq. m., and its population is about seven millions. Only here and there upon its fringe the identity of this great area with the metropolis is lost to the eye, where open country remains unbroken by streets or close-set buildings.

Site.—North of the Thames, and west of its tributary the Lea, which partly bounds the administrative county on the east, London is built upon a series of slight undulations, only rarely sufficient to make the streets noticeably steep. On the northern boundary of the county a height of 443 ft. is found on the open Hampstead Heath. The lesser streams which flow from this high ground to the Thames are no longer open. Some, however, as well as other natural features effaced by the growth of the city, retain an historical interest through the survival of their names in streets and districts, or through their relation to the original site of London (in the present City). South of the Thames a broken amphitheatre of low hills, approaching the river near Greenwich and Woolwich on the east and Putney and Richmond on the west, encloses a tract flatter than that to the north, and rises more abruptly in the southern districts of Streatham, Norwood and Forest Hill.

In attempting to picture the site of London in its original condition, that is, before any building took place, it is necessary to consider (1) the condition of the Thames unconfined between made banks, (2) the slopes overlooking it, (3) the tributary streams which watered these slopes. The low ground between the slight hills flanking the Thames valley, and therefore mainly south of the present river, was originally occupied by a shallow lagoon of estuarine character, tidal, and interspersed with marshy tracts and certain islets of relatively firm land. Through this the main stream of the Thames pursued an ill-defined course. The tributary streams entered through marshy channels. The natural process of sedimentation assisted the gradual artificial drainage of the marshes by means of embankments confining the river. The breadth of this low tract, from Chelsea downward, was from 2 to 3 m. The line of the foot of the southern hills, from Putney, where it nearly approaches the present river, lies through Stockwell and Camberwell to Greenwich, where it again approaches the river. On the north there is a flat tract between Chelsea and Westminster, covering Pimlico, but from Westminster down to the Tower there is a marked slope directly up from the river bank. Lower still, marshes formerly extended far up the valley of the Lea. The higher slopes of the hills were densely forested (cf. the modern district-name St John's Wood), while the lower slopes, north of the river, were more open (cf. Moor-gate). The original city grew up on the site of the City of London of the present day, on a slight eminence intersected by the Wal- or Wall-brook, and flanked on the west by the river Fleet.

These and other tributary streams have been covered in and built over (in some cases serving as sewers), but it is possible to trace their valleys at various points by the fall and rise of streets crossing them, and their names survive, as will be seen, in various modern applications. The Wallbrook rose in a marsh in the modern district of Finsbury, and joined the Thames close to the Cannon Street railway bridge. A street named after it runs south from the Mansion House parallel with its course. The Fleet was larger, rising in, and collecting various small streams from, the high ground of Hampstead. It passed Kentish Town, Camden Town and King's Cross, and followed a line approximating to King's Cross Road. The slope of Farringdon Road, where crossed by Holborn Viaduct, and of New Bridge Street, Blackfriars, marks its course exactly, and that of Fleet Street and Ludgate Hill its steep banks. The name also appears in Fleet Road, Hampstead. From King's Cross downward the banks were so steep and high that the stream was called

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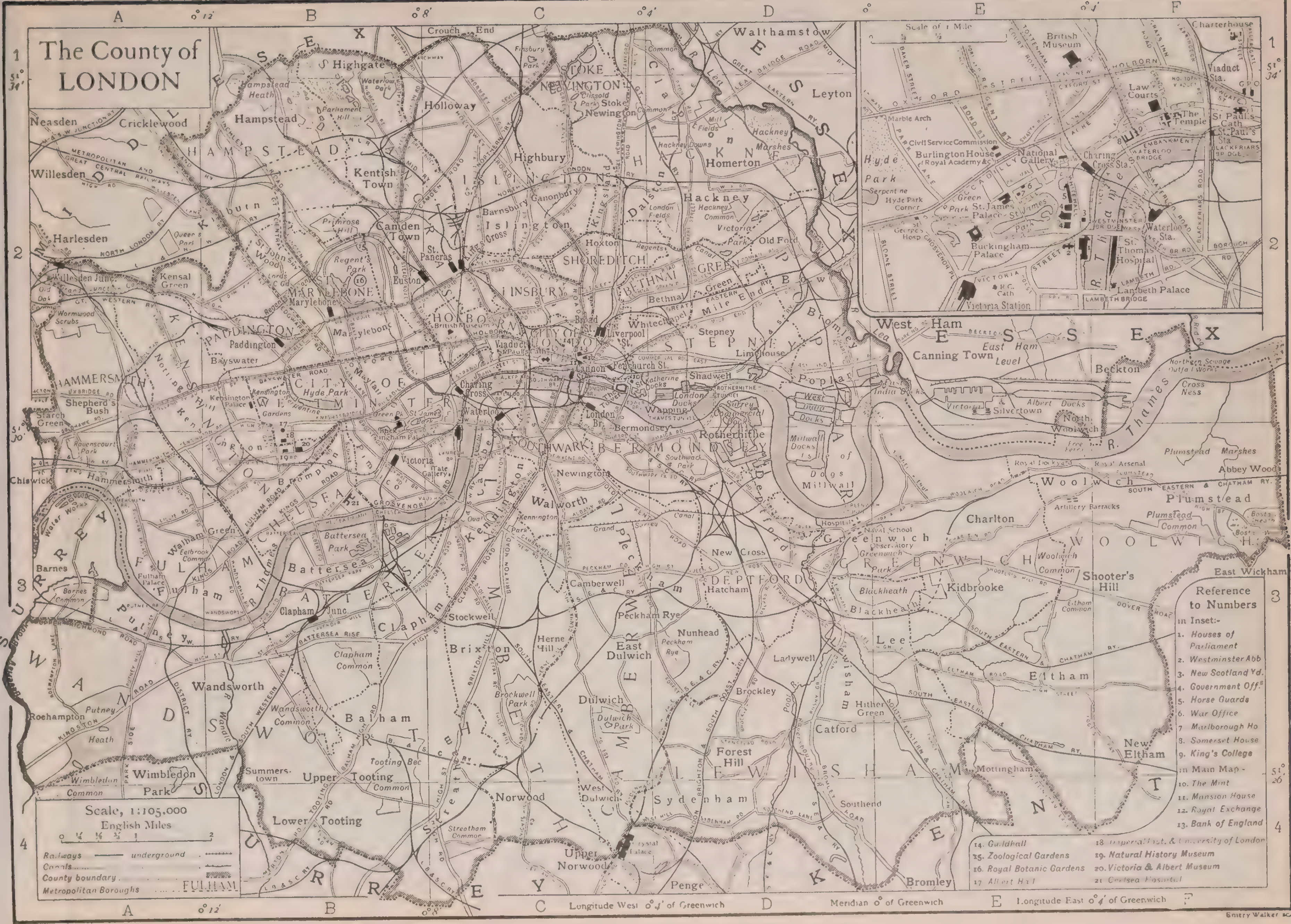
[1] See map in *London Statistics* (vol. xix., 1909), an annual publication of the London County Council, which besides these divisions shows "Water London," the London main drainage area, and the Central Criminal Court district.



The County of LONDON

Scale, 1:105,000
English Miles
0 ¼ ½ ¾ 1 2
Railways
underground
Canals
County boundary
Metropolitan Boroughs
FULHAM
Scale of 1 Mile
Reference to Numbers
in Inset:-
1. Houses of Parliament
2. Westminster Abb
3. New Scotland Yd.
4. Government Offs
5. Horse Guards
6. War Office
7 Marlborough Ho
8. Somerset House
9. King's College
in Main Map -
10. The Mint
11. Mansion House
12. Royal Exchange
13. Bank of England
14. Guildhall
15. Zoological Gardens
16. Royal Botanic Gardens
17 Albert Hall
18 Imperial Inst. & University of London
19. Natural History Museum
20. Victoria & Albert Museum
21 Chelsea Hospital
Longitude West 0°4' of Greenwich
Meridian 0° of Greenwich
Longitude East 0°4' of Greenwich
0°12'
0°8'
0°4'
0°
51° 34'
51° 30'
51° 26'
A
B
C
D
E
F
1
2
3
4
MIDDLESEX
ESSEX
SURREY
KENT
HAMPSTEAD
ISLINGTON
HACKNEY
STOKE NEWINGTON
SHOREDITCH
BETHNAL GREEN
FINSBURY
HOLBORN
CITY OF LONDON
CITY OF WESTMINSTER
ST. MARYLEBONE
PADDINGTON
KENSINGTON
HAMMERSMITH
FULHAM
CHELSEA
BATTERSEA
WANDSWORTH
LAMBETH
SOUTHWARK
BERMONDSEY
CAMBERWELL
DEPTFORD
GREENWICH
WOOLWICH
LEWISHAM
STEPNEY
POPLAR
ST. PANCRAS
Neasden
Cricklewood
Willesden
Harlesden
Willesden Junc.
Kensal Green
Wormwood Scrubs
Hampstead
Hampstead Heath
Highgate
Parliament Hill
Waterlow Park
Holloway
Crouch End
Finsbury Park
Kentish Town
Highbury
Primrose Hill
Camden Town
Kilburn
St John's Wood
Regent's Park
Euston
St. Pancras
King's Cross
Barnsbury
Canonbury
Islington
Marylebone
Paddington
Bayswater
Hyde Park
Mayfair
Kensington Palace
Kensington Gardens
Notting Hill
Shepherd's Bush
Starch Green
Ravenscourt Park
Chiswick
Hammersmith
Brompton
Walham Green
Eelbrook Common
Fulham Palace
Barnes
Barnes Common
Putney
Roehampton
Kingston Heath
Wimbledon Common
Wimbledon Park
Wandsworth
Wandsworth Common
Summerstown
Upper Tooting
Lower Tooting
Tooting Bec Common
Balham
Clapham Common
Clapham Junc.
Clapham
Battersea Park
Battersea
Pimlico
Victoria
Tate Gallery
Charing Cross
Waterloo
Kennington
Kennington Oval
Stockwell
Brixton
Brockwell Park
Herne Hill
Streatham
Streatham Common
Norwood
Upper Norwood
Crystal Palace
West Dulwich
Dulwich
Dulwich Park
East Dulwich
Peckham Rye
Peckham
Nunhead
Camberwell
Walworth
Newington
Southwark Park
London Br.
Bermondsey
Rotherhithe
Surrey Commercial Docks
Wapping
London Docks
Shadwell
Limehouse
Tower
Fenchurch St.
Cannon St.
Liverpool St.
Broad St.
Whitechapel
Stepney
Mile End
Bethnal Green
Bow
Bromley
Old Ford
Victoria Park
Hackney
Hackney Common
Hackney Downs
Hackney Marshes
Homerton
Dalston
London Fields
Hoxton
Kingsland
Stoke Newington
Clissold Park
Clapton
Walthamstow
Leyton
West Ham
Canning Town
East Ham Level
Victoria Docks
Albert Docks
Silvertown
North Woolwich
Beckton
Cross Ness
Northern Sewage Outfall Works
R. Thames
Poplar
West India Docks
East India Docks
Millwall Docks
Isle of Dogs
Millwall
Deptford
New Cross
Hatcham
Brockley
Ladywell
Forest Hill
Sydenham
Penge
Catford
Hither Green
Southend
Lewisham
Lee
Blackheath
Greenwich Park
Greenwich Observatory
Naval School
Hospital
Charlton
Kidbrooke
Woolwich
Royal Arsenal
Royal Dockyard
Artillery Barracks
Woolwich Common
Shooter's Hill
Eltham Common
Eltham
New Eltham
Mottingham
Plumstead
Plumstead Common
Plumstead Marshes
Abbey Wood
East Wickham
Dover Road
British Museum
Law Courts
Holborn
Viaduct Sta.
G.P.O.
Charterhouse
St. Paul's Cath.
St. Paul's Sta.
Blackfriars Bridge
The Temple
Embankment
Waterloo Bridge
Charing Cross Sta.
National Gallery
Burlington House (Royal Academy &c.)
Civil Service Commission
Marble Arch
Hyde Park Corner
Serpentine
Green Park
St. James Palace
St. James Park
Buckingham Palace
St. George's Hosp.
Victoria Station
R.C. Cath.
Westminster Bridge
Waterloo Sta.
St. Thomas Hospital
Lambeth Palace
Lambeth Bridge
Oxford Street
Regent Street
Bond St.
Baker Street
Sloane Street
Park Lane
Piccadilly
Whitehall
Victoria Street
Grosvenor Pl.
Tottenham Court Road
Blackfriars Road
Waterloo Road
Borough Road
Emery Walker sc.

Hollow or Hole-bourne, this name surviving in Holborn; and it was fed by numerous springs (Bagnigge Well, Clerkenwell and others) in this vicinity. It entered a creek which was navigable for a considerable distance, and formed a subsidiary harbour for the City, but by the 14th century this was becoming choked with refuse, and though an attempt was made to clear it, and wharves were built in 1670, it was wholly arched over in 1737–1765 below Holborn Bridge. Continuing westward, the most important stream was Tyburn (*q.v.*), which rose at Hampstead, and joined the Thames through branches on either side of Thorney Island, on which grew up the great ecclesiastical foundation of St Peter, Westminster, better known as Westminster Abbey. There is no modern survival of the name of Tyburn, which finds, indeed, its chief historical interest as attaching to the famous place of execution which lay near the modern Marble Arch. The residential district in this vicinity was known at a later date as Tyburnia. The next stream westward was the Westbourne, the name of which is perpetuated in Westbourne Grove and elsewhere in Paddington. It rose on the heights of Hampstead, traversed Paddington, may be traced in the course of the Serpentine lake in Hyde Park, ran parallel to and east of Sloane Street, and joined the Thames close to Chelsea Bridge. The main tributaries of the Thames from the north, to east and west of those described, are not covered, nor is any tributary of importance from the south entirely concealed.

Geology.—London lies within the geological area known as the London basin. Within the confines of Greater London the chalk which forms the basement of this area appears at the surface in isolated patches about Greenwich, while its main line approaches within 10 m. of the City to the south and within 15 to the north-west. In the south and north-west the typical London clay is the principal formation. In the south-east, however, the Blackheath and Woolwich pebble-beds appear, with their belts of Thanet sands bordering the chalk. Valley gravel borders the Thames, with some interruptions, from Kingston to Greenwich; and extends to a wide belt, with ramifications, from Wandsworth south to Croydon, and in a narrower line from Greenwich towards Bromley. Brick earth overlies it from Kensington to Brentford and west thereof, and appears in Chelsea and Fulham, Hornsey and Stoke Newington, and in patches south of the Thames between Battersea and Richmond. The main deposits of alluvium occur below Lambeth and Westminster, and in the valley of the Wandle, which joins the Thames from the south near Putney. In the north and west the clay is interspersed with patches of plateau gravel in the direction of Finchley (where boulder clay also appears), Enfield and Barnet; and of Bagshot sands on Hampstead Heath and Harrow Hill. Gravel is found on the high ground about Richmond Park and Wimbledon. (See further MIDDLESEX.)

Climate.—The climate is equable (though excessive heat is sometimes felt for short periods during the summer) and moist, but healthy. Snow is most common in the early months of the year. The fogs of London have a peculiar and perhaps an exaggerated notoriety. They are apt to occur at all seasons, are common from September to February, and most common in November. The atmosphere of London is almost invariably misty in a greater or less degree, but the denser fogs are generally local and of no long duration. They sometimes cause a serious dislocation of railway and other traffic. Their principal cause is the smoke from the general domestic use of coal. The evil is of very long standing, for in 1306 the citizens petitioned Edward I. to prohibit the use of sea-coal, and he made it a capital offence. The average temperature of the hottest month, July, is 64°·4 F.; of the coldest, January, 37°·9; and the mean annual 50°·4. The mean annual rainfall ranges in different parts of the metropolis from about 20½ to 27½ in.

II. Topography

London as a whole owes nothing in appearance to the natural configuration of its site. Moreover, the splendid building is nearly always a unit; seldom, unless accidentally, a component part of a broad effect. London has not grown up along formal lines; nor is any large part of it laid out according to the conceptions of a single generation. Yet not a few of the great thoroughfares and buildings are individually worthy of London's pre-eminence as a city. The most notable of these fall within a circumscribed area, and it is therefore necessary to preface their consideration with a statement of the broader characteristic divisions of the metropolis.

Characteristic Divisions.—In London north of the Thames, the salient distinction lies between West and East. From the western boundary of the City proper, an area covering the greater part of the city of Westminster, and extending into Chelsea, Kensington, Paddington and Marylebone, is exclusively associated with the higher-class life of London. Within the bounds of Westminster are the royal palaces, the government offices and many other of the finest public buildings, and the wider area specified includes the majority of the residences of the wealthier classes, the most beautiful parks and the most fashionable places of recreation. "Mayfair," north of Piccadilly, and "Belgravia," south of Knightsbridge, are common though unofficial names for the richest residential districts. The "City" bears in the great commercial buildings fringing its narrow streets all the marks of a centre of the world's exchanges. East of it there is an abrupt transition to the district commonly known as the "East End," as distinguished from the wealthy "West End," a district of mean streets, roughly coincident with the boroughs of Stepney and Poplar, Shoreditch and Bethnal Green, and primarily (though by no means exclusively) associated with the problems attaching to the life of the poor. On the Thames below London Bridge, London appears in the aspect of one of the world's great ports, with extensive docks and crowded shipping. North London is as a whole residential: Hackney, Islington and St Pancras consist mainly of dwellings of artisans and the middle classes; while in Hampstead, St Marylebone and Paddington are many terraces and squares of handsome houses. Throughout the better residential quarters of London the number of large blocks of flats has greatly increased in modern times. But even in the midst of the richest quarters, in Westminster and elsewhere, small but well-defined areas of the poorest dwellings occur.

London south of the Thames has none of the grander characteristics of the wealthy districts to the north. Poor quarters lie adjacent to the river over the whole distance from Battersea to Greenwich, merging southward into residential districts of better class. London has no single well-defined manufacturing quarter.

Suburbs.—Although the boundary of the county of London does not, to outward appearance, enclose a city distinct from its suburbs, London outside that boundary may be conveniently considered as suburban. Large numbers of business men and others who must of necessity live in proximity to the metropolis have their homes aloof from its centre. It is estimated that upwards of a million daily enter and leave the City alone as the commercial heart of London, and a great proportion of these travel in and out by the suburban railways. In this aspect the principal extension of London has been into the counties of Kent and Surrey, to the pleasant hilly districts about Sydenham, Norwood and Croydon, Chislehurst and Orpington, Caterham, Redhill and Reigate, Epsom, Dorking and Leatherhead; and up the valley of the Thames through Richmond to Kingston and Surbiton, Esher and Weybridge, and the many townships on both the Surrey and the Middlesex shores of the river. On the west and north the residential suburbs immediately outside the county include Acton and Ealing, Willesden, Highgate, Finchley and Hornsey; from the last two a densely populated district extends north through Wood Green and Southgate to Barnet and Enfield; while the "residential influence" of the metropolis far exceeds these limits, and may be observed at Harrow and Pinner, Bushey and Boxmoor, St Albans, Harpenden, Stevenage and many other places. To the north-east the beauty of Epping Forest attracts numerous residents to Woodford, Chingford and Loughton. The valley of the Lea is also thickly populated, but chiefly by an industrial population working in the numerous factories along this river. The Lea separates the county of London from Essex, but the townships of West Ham and Stratford, Barking and Ilford, Leyton and Walthamstow continue the metropolis in this direction almost without a break. Their population is also largely occupied in local manufacturing establishments; while numerous towns on either bank of the lower Thames share in the industries of the port of London.

Streets.—The principal continuous thoroughfares within the metropolis, though each bears a succession of names, are coincident with the main roads converging upon the capital from all parts of England. On the north of the Thames two great thoroughfares from the west meet in the heart of the City. The northern enters the county in Hammersmith as Uxbridge Road, crosses Kensington and borders the north side of Kensington Gardens and Hyde Park as Bayswater Road. It then bears successively the names of Oxford Street, New Oxford Street and High Holborn; enters the City, becomes known as Holborn Viaduct from the fact that it is there carried over other streets which lie at a lower level, and then as Newgate Street and Cheapside. The southern highway enters Hammersmith, crosses the centre of Kensington as Kensington Road and High Street, borders Kensington Gardens and Hyde Park as Kensington Gore and Knightsbridge, with terraces of fine residences, and merges into Piccadilly. This beautiful street, with its northward branches, Park Lane, from which splendid houses overlook Hyde Park, and Bond Street, lined with handsome shops, may be said to focus the fashionable life of London. The direct line of the thoroughfare is interrupted after Piccadilly Circus (the term "circus" is frequently applied to the open space—not necessarily round—at the junction of several roads), but is practically resumed in the Strand, with its hotels, shops and numerous theatres, and continued through the City in Fleet Street, the centre of the newspaper world, and Ludgate Hill, at the head of which is St Paul's Cathedral. Thence it runs by commercial Cannon Street to the junction with Cheapside and several other busy streets. At this junction stand the Royal Exchange, the Mansion House (the official residence of the Lord Mayor of London) and the Bank of England, from which this important point in the communications of London is commonly known as "Bank." From the east two main roads similarly converge upon the City, which they enter by Aldgate (the suffix in this and other names indicating the former existence of one of the City gates). The southern of these highways, approaching through the eastern suburbs as Barking Road, becomes East India Docks Road in Poplar and Commercial Road East in Stepney. The continuous thoroughfare of 12 m. between Hammersmith and the East India Docks illustrates successively every phase of London life. The northern road enters from Stratford and is called Bow Road, Mile End Road, Whitechapel Road and High Street, Whitechapel. From the north of England two roads preserve communication-lines from the earliest times. The Old North Road, entering London from the Lea valley through Hackney and Shoreditch as Stamford Hill, Stoke Newington Road and Kingsland Road, reaches the City by Bishopsgate. The straight highway from the north-west which as Edgware Road joins Oxford Street at the Marble Arch (the north-eastern entrance to Hyde Park) is coincident with the Roman Watling Street. The Holyhead and Great North Roads, uniting at Barnet, enter London by branches through Hampstead and through Highgate, between the Old North and Edgware roads. South of the Thames the thoroughfares crossing the river between Lambeth and Bermondsey converge upon two circuses, St George's and the Elephant and Castle. At the second of these points the majority of the chief roads from the southern suburbs and the south of England are collected. Among them, the Old Kent Road continues the southern section of Watling Street, from Dover and the south-east, through Woolwich and across Blackheath. The road through Streatham, Brixton and Kennington, taking name from these districts successively, is the principal southern highway. The Portsmouth Road from the south-west is well marked as far as Lambeth, under the names of Wandsworth, High Street, St John's Hill, Lavender Hill and Wandsworth Road.

Thames Embankments.—The Thames follows a devious course through London, and the fine embankments on its north side, nowhere continuing uninterruptedly for more than 2 m., do not form important thoroughfares, with the exception of the Victoria Embankment. Mostly they serve rather as beautiful promenades. One of them begins over against Battersea Bridge. Its finest portion is the Chelsea Embankment, fronting Battersea Park across the river, shaded by a pleasant avenue and lined with handsome houses. It continues, with some interruptions, nearly as far as the Houses of Parliament. Below these the grandest of the embankments extends to the City at Blackfriars. It was formed in 1864–1870, and is named the Victoria Embankment, though its popular title is "The Embankment" simply. Open gardens fringe it in part on the landward side, and it is lined with fine public and private buildings. The bold sweep of the Thames, here some 300 yds. wide, the towers of Westminster on the one hand and the dome of St Paul's on the other, make up a fine prospect. Below London Bridge the river is embanked for a short distance in front of the Tower of London, and above Westminster Bridge the Albert Embankment extends for nearly 1 m. along the south bank.

Bridges.—Fourteen road-bridges cross the Thames within the county of London. Of these London Bridge, connecting the City with Southwark and Bermondsey, stands first in historical interest and in importance as a modern highway. The old bridge, famous for many generations, bearing its rows of houses and its chapel in the centre, was completed early in the 13th century. It was 308 yds. long and had twenty narrow arches, through which the tides formed dangerous rapids. It stood just below the existing bridge, which was built of granite by John Rennie and his son Sir John Rennie, and completed in 1831. A widening to accommodate the growth of traffic, after being frequently discussed for many years, was completed in 1904, by means of corbels projecting on either side, without arresting traffic during the work. There was no bridge over the Thames below London Bridge until 1894, when the Tower Bridge was opened. This is a suspension bridge with a central portion, between two lofty and massive stone towers, consisting of bascules which can be raised by hydraulic machinery to admit the passage of vessels. The bridge is both a remarkable engineering work, and architecturally one of the finest modern structures in London. The bridges in order above London Bridge are as follows, railway-bridges being bracketed—Southwark, (Cannon Street), (Blackfriars), Blackfriars, Waterloo, (Hungerford—with a footway), Westminster, Lambeth, Vauxhall, (Grosvenor), Victoria, Albert, Battersea, (Battersea), Wandsworth, (Putney), Putney and Hammersmith. Waterloo Bridge, the oldest now standing within London, is the work of John Rennie, and was opened in 1817. It is a massive stone structure of nine arches, carrying a level roadway, and is considered one of the finest bridges of its kind in the world. The present Westminster Bridge, of iron on granite piers, was opened in 1862, but another preceded it, dating from 1750; the view from which was appreciated by Wordsworth in his sonnet beginning "Earth has not anything to show more fair." The complete reconstruction of Vauxhall Bridge was undertaken in 1902, and the new bridge was opened in 1906. Some of the bridges were built by companies, and tolls were levied at their crossing until modern times; thus Southwark Bridge was made toll-free in 1866, and Waterloo Bridge only in 1878, on being acquired by the City Corporation and the Metropolitan Board of Works respectively. The road-bridges mentioned (except the City bridges) are maintained by the London County Council, who expended for this purpose a sum of £9149 in 1907–1908. The following table shows the capital expenditure on the more important bridges and their cost of maintenance in 1907–1908:—

	Net Capital Expenditure.	Cost of Maintenance 1907–1908.
Albert Bridge	£120,774	£1296
Battersea Bridge	312,193	512
Hammersmith Bridge . .	204,250	421
Lambeth Bridge	47,555	496
Putney Bridge	430,052	653
Vauxhall Bridge (temporary)	270,749	73
Vauxhall Bridge (new) .	457,108	1109
Wandsworth Bridge . .	65,661	410
Waterloo Bridge . . .	552,867	1102
Westminster Bridge . .	393,189	1491

The properties entrusted to the Corporation for the upkeep of London Bridge are managed by the Bridge House Estates Committee, the revenues from which are also used in the maintenance of the other three City bridges, £26,989 being thus expended in 1907, the Tower bridge absorbing £17,735 of this amount.

Thames Tunnels.—Some of the metropolitan railway lines cross the river in tunnels beneath its bed. There are also several tunnels under the river below London Bridge, namely: Tower Subway, constructed in 1870 for foot-passengers, but no longer used, Greenwich Tunnel (1902) for foot-passengers, Blackwall Tunnel (1897), constructed by the County Council between Greenwich and Poplar, and Woolwich Tunnel, begun in 1910. A tunnel between Rotherhithe and Ratcliff was authorized in 1897 and opened in 1908. The Thames Tunnel (1825–1843), 2 m. below London Bridge, became a railway tunnel in 1865. The County Council maintains a free ferry at Woolwich for passengers and vehicular traffic. The capital expenditure on this undertaking was £185,337 and the expense of maintenance in 1907–1908 £20,881. The Greenwich Tunnel (capital expenditure £179,293) in the same year had expended on it for maintenance £3725, and the Blackwall Tunnel (capital expenditure £1,268,951) £11,420. The capital expenditure on the Rotherhithe Tunnel was £1,414,561.

Parks.—The administration and acreage of parks and open spaces, and their provisions for the public recreation, fall for consideration later, but some of them are notable features in the topography of London. The royal parks, namely St James's, Green and Hyde Park, and Kensington Gardens, stretch in an irregular belt for nearly 3 m. between Whitehall (Westminster) and Kensington. St James's Park was transformed from marshy land into a deer park, bowling green and tennis court by Henry VIII., extended and laid out as a pleasure garden by Charles II., and rearranged according to the designs of John Nash in 1827–1829. Its lake, the broad Mall leading up to Buckingham Palace, and the proximity of the government buildings in Whitehall, combine to beautify it. Here was established, by licence from James I., the so-called Milk Fair, which remained, its ownership always in the same family, until 1905, when, on alterations being made to the Mall, a new stall was erected for the owners during their lifetime, though the cow or cows kept here were no longer allowed. St James's Park is continued between the Mall and Piccadilly by the Green Park. Hyde Park, to the west, belonged originally to the manor of Hyde, which was attached to Westminster Abbey, but was taken by Henry VIII. on the dissolution of the monasteries. Two of its gateways are noteworthy, namely that at Hyde Park Corner at the south-east and the Marble Arch at the north-east. The first was built in 1828 from designs of Decimus Burton, and comprises three arches with a frieze above the central arch copied from the Elgin marbles in the British Museum. The Marble Arch was intended as a monument to Nelson, and first stood in front of Buckingham Palace, being moved to its present site in 1851. It no longer forms an entrance to the park, as in 1908 a corner of the park was cut off and a roadway was formed to give additional accommodation for the heavy traffic between Oxford Street, Edgware Road and Park Lane. The Marble Arch was thus left isolated. Hyde Park contains the Serpentine, a lake 1500 yds. in length, from the bridge over which one of the finest prospects in London is seen, extending to the distant towers of Westminster. Since the 17th century this park has been one of the most favoured resorts of fashionable society, and at the height of the "season," from May to the end of July, its drives present a brilliant scene. In the 17th and 18th centuries it was a favourite duelling-ground, and in the present day it is not infrequently the scene of political and other popular demonstrations (as is also Trafalgar Square), while the neighbourhood of Marble Arch is the constant resort of orators on social and religious topics. Kensington Gardens, originally attached to Kensington Palace, were subsequently much extended; they are magnificently timbered, and contain plantations of rare shrubs and flowering trees. Regent's Park, mainly in the borough of Marylebone, owes its preservation to the intention of George III. to build a palace here. The other most notable open spaces wholly or partly within the county are Hampstead Heath in the north-west, a wild, high-lying tract preserved to a great extent in its natural state, and in the south-west Wimbledon Common, Putney Heath and the royal demesne of Richmond Park, which from its higher parts commands a wonderful view up the rich valley of the Thames. The outlying parts of the county to east, south and north are not lacking in open spaces, but there is an extensive inner area where at most only small gardens and squares break the continuity of buildings, and where in some cases old churchyards serve as public grounds.

Architecture.—While stone is the material used in the construction of the majority of great buildings of London, some modern examples (notably the Westminster Roman Catholic cathedral) are of red brick with stone dressings; and brick is in commonest use for general domestic building. The smoke-laden atmosphere has been found not infrequently to exercise a deleterious effect upon the stonework of important buildings; and through the same cause the appearance of London as a whole is by some condemned as sombre. Bright colour, in truth, is wanting, though attempts are made in a few important modern erections to supply it, a notable instance being the Savoy Hotel buildings (1904) in the Strand. Portland stone is frequently employed in the larger buildings, as in St Paul's Cathedral, and under the various influences of weather and atmosphere acquires strongly contrasting tones of light grey and black. Owing to the by-laws of the County Council, the method of raising commercial or residential buildings to an extreme height is not practised in London; the block known as Queen Anne's Mansions, Westminster, is an exception, though it cannot be called high in comparison with American high buildings.

Ecclesiastical architecture.

Architectural remains of earlier date than the Norman period are very few, and of historical rather than topographical importance. In architecture of the Norman and Gothic periods London must be considered rich, though its richness is poverty when its losses, particularly during the great fire of 1666, are recalled. These losses were confined within the City, but, to go no farther, included the Norman and Gothic cathedral of St Paul, perhaps a nobler monument of its period than any which has survived it, much as it had suffered from injudicious restoration. Ancient architecture in London is principally ecclesiastical. Westminster Abbey is pre-eminent; in part, it may be, owing to the reverence felt towards it in preference to the classical St Paul's by those whose ideal of a cathedral church is essentially Gothic, but mainly from the fact that it is the burial-place of many of the English monarchs and their greatest subjects, as well as the scene of their coronations (see WESTMINSTER). In the survey of London (1598) by John Stow, 125 churches, including St Paul's and Westminster Abbey, are named; of these 89 were destroyed by the great fire. Thirteen large conventual churches were mentioned by Fitzstephen in the time of Henry II., and of these there are some remains.

The church of St Bartholomew the Great, Smithfield, is the finest remnant of its period in London. It was founded in 1123 by Rahere, who, probably a Breton by birth, was a courtier in the reign of William II. He is said to have been the king's minstrel, and to have spent the earlier part of his life in frivolity. Subsequently he entered holy orders, and in *c.* 1120, being stricken with fever while on a pilgrimage to Rome, vowed that he would found a hospital in London. St Bartholomew, appearing to him in a vision, bade him add a church to his foundation. He became an Augustinian canon, and founded his hospital, which is now, as St Bartholomew's Hospital, one of the principal medical institutions in the metropolis. He became its first master. Later he erected the priory, for canons of his order, of which the nave and transepts of the church remain. The work is in the main very fine Norman, with triforium, ambulatory and apsidal eastern end. An eastern lady chapel dates from *c.* 1410, but the upper part is modern, for the chapel was long desecrated. There are remains of the cloisters north of the church,—and praiseworthy efforts have been made since 1903 towards their restoration. The western limit of the former nave of the church is marked by a fine Early English doorway, now forming an entrance to the churchyard. Rahere's tomb remains in the church; the canopy is Perpendicular work, but the effigy is believed to be original. He died in 1144.

The Temple Church (see INNS OF COURT), serving for the Inner and Middle Temples, belonged to the Knights Templars. It is the finest of the four ancient round churches in England, dating from 1185, but an Early English choir opens from the round church. St Saviour's in Southwark (*q.v.*), the cathedral church of the modern bishopric of Southwark, was the church of the priory of St Mary Overy, and is a large cruciform building mainly Early English in style. There may be mentioned also an early pier in the church of St Katherine Cree or Christ Church, Leadenhall Street, belonging to the priory church of the Holy Trinity; old monuments in the vaults beneath St James's Church, Clerkenwell, formerly attached to a Benedictine nunnery; and the Perpendicular gateway and the crypt of the church of the priory of St John of Jerusalem (see FINSBURY). Among other ancient churches within the City, that of All Hallows Barking, near the Tower of London, is principally Perpendicular and contains some fine brasses. It belonged to the convent at Barking, Essex, and was the burial-place of many who were executed at the scaffold on Tower Hill. St Andrew Undershaft, so named because a Maypole used to be set up before the former church on May-day, is late Perpendicular (*c.* 1530); and contains a monument to John Stow the chronicler (d. 1605). The church of Austin Friars, originally belonging to a friary founded in 1253, became a Dutch church under a grant of Edward VI., and still remains so; its style is principally Decorated, but through various vicissitudes little of the original work is left. St Giles, Cripplegate, was founded *c.* 1090, but the existing church is late Perpendicular. It is the burial-place of Fox the martyrologist and Milton the poet, and contains some fine wood-carving by Grinling Gibbons. St Helen's, Bishopsgate, belonged to a priory of nuns founded *c.* 1212, but the greater part of the building is later. It has two naves parallel, originally for the use of the nuns and the parishioners respectively. The church of St Mary-le-Bow, in Cheapside, is built upon a Norman crypt, and that of St Olave's, Hart Street, which was Pepys's church and contains a modern memorial to him, is of the 15th century. Other ancient churches outside the City are few; but there may be noted St Margaret's, under the shadow of Westminster Abbey; and the beautiful Ely Chapel in Holborn (q.v.), the only remnant of a palace of the bishops of Ely, now used by the Roman Catholics. The Chapel Royal, Savoy, near the Strand, was rebuilt by Henry VII. on the site of Savoy Palace, which was erected by Peter, earl of Savoy and Richmond, in 1245, and destroyed in the insurrection of Wat Tyler in 1381. In 1505 Henry VII. endowed here a hospital of St John the Baptist for the poor. The chapel was used as the parish church of St Mary-le-Strand (1564–1717) and constituted a Chapel Royal in 1773; but there are no remains of the rest of the foundation.

Sir Christopher Wren.

Later churches.

The architect to whom, after the great fire of 1666, the opportunity fell of leaving the marks of his influence upon London was Sir Christopher Wren. Had all his schemes been followed out, that influence would have extended beyond architecture alone. He, among others, prepared designs for laying out the City anew. But no such model city was destined to be built; the necessity for haste and the jealous guardianship of rights to old foundations resulted in the old lines being generally followed. It is characteristic of London that St Paul's Cathedral (*q.v.*) should be closely hemmed in by houses, and its majestic west front approached obliquely by a winding thoroughfare. The cathedral is Wren's crowning work. It is the scene from time to time of splendid ceremonies, and contains the tombs of many great men; but in this respect it cannot compete with the peculiar associations of Westminster Abbey. Of Wren's other churches it is to be noted that the necessity of economy usually led him to pay special attention to a single feature. He generally chose the steeple, and there are many fine examples of his work in this department. The steeple of St Mary-le-Bow, commonly called Bow Church, is one of the most noteworthy. This church has various points of interest besides its Norman crypt, from which it took the name of Bow, being the first church in London built on arches. The ecclesiastical Court of Arches sat here formerly. "Bow bells" are famous, and any person born within hearing of them is said to be a "Cockney," a term now applied particularly to the dialect of the lower classes in London. Wren occasionally followed the Gothic model, as in St Antholin. The classic style, however, was generally adopted in the period succeeding his own. Some fine churches belong to this period, such as St Martin's-in-the-Fields (1726), the Corinthian portico of which rises on the upper part of Trafalgar Square; but other examples are regrettable. While the architecture of the City churches, with the exceptions mentioned, is not as a rule remarkable, many are notable for the rich and beautiful wood-carving they contain. A Gothic style has been most commonly adopted in building modern churches; but of these the most notable, the Roman Catholic Westminster Cathedral (see WESTMINSTER), is Byzantine, and built principally of brick, with a lofty campanile. The only other ecclesiastical building to be specially mentioned is Lambeth Palace, opposite to the Houses of Parliament across the Thames. It has been a seat of the archbishops of Canterbury since 1197, and though the present residential portion dates only from the early 19th century, the chapel, hall and other parts are of the 13th century and later (see LAMBETH).

Tower of London.

Among secular buildings, there is none more venerable than the Tower of London (*q.v.*), the moated fortress which overlooks the Thames at the eastern boundary of the City. It presents fine examples of Norman architecture; its historical associations are of the highest interest, and its armoury and the regalia of England, which are kept here, attract great numbers of visitors.

Government buildings.

The Houses of Parliament, with Westminster Abbey and St Margaret's Church, complete the finest group of buildings which London possesses; a group essentially Gothic, for the Houses of Parliament, completed in 1867 from the designs of Barry, are in a late Perpendicular style. They cover a great area, the east front giving immediately upon the Thames. The principal external features are the huge Victoria Tower at the south, and the clock tower, with its well-known chimes and the hour-bell "Big Ben," on the north. Some of the apartments are magnificently adorned within, and the building incorporates the ancient Westminster Hall, belonging to the former royal palace on the site (see WESTMINSTER). The government offices are principally in Whitehall, the fine thoroughfare which connects Parliament Square, in the angle between the Houses and the Abbey, with Trafalgar Square. Somerset House (1776–1786), a massive range of buildings by Sir William Chambers, surrounding a quadrangle, and having its front upon the Strand and back upon the Victoria Embankment, occupies the site of a palace founded by the protector Somerset, *c.* 1548. It contains the Exchequer and Audit, Inland Revenue, Probate, Registrar-General's and other offices, and one wing houses King's College. Other offices are the New Record Office, the repository of State papers and other records, and the Patent Office in Chancery Lane. The Heralds' College or College of Arms, the official authority in matters of armorial bearings and pedigrees, occupies a building in Queen Victoria Street, City, erected subsequently to the great fire (1683). The Royal Courts of Justice or Law Courts stand adjacent to the Inns of Court, facing the Strand at the point where a memorial marks the site of Old Temple Bar (1672), at the entrance to the City, removed in 1878 and later re-erected at Theobald's Park, near Cheshunt, Hertfordshire. The Law Courts (1882) were erected from the designs of G. E. Street, in a Gothic style.

The buildings connected with local government in London are with one exception modern, and handsome town-halls have been erected for some of the boroughs. The exception is the Guildhall (*q.v.*) of the City Corporation, with its splendid hall, the scene of meetings and entertainments of the corporation, its council chamber, library and crypt (partly opened to the public in 1910). In 1906 the London County Council obtained parliamentary sanction for the erection of a county hall on the south bank of the Thames, immediately east of Westminster Bridge, and in 1908 a design submitted by Mr Ralph Knott was accepted in competition. The style prescribed was English Renaissance. Several of the great livery companies or gilds of the City possess fine halls, containing portraits and other collections of high interest and value. Among the more notable of these halls are those of the Mercers, Drapers, Fishmongers, Clothworkers, Armourers and Stationers.

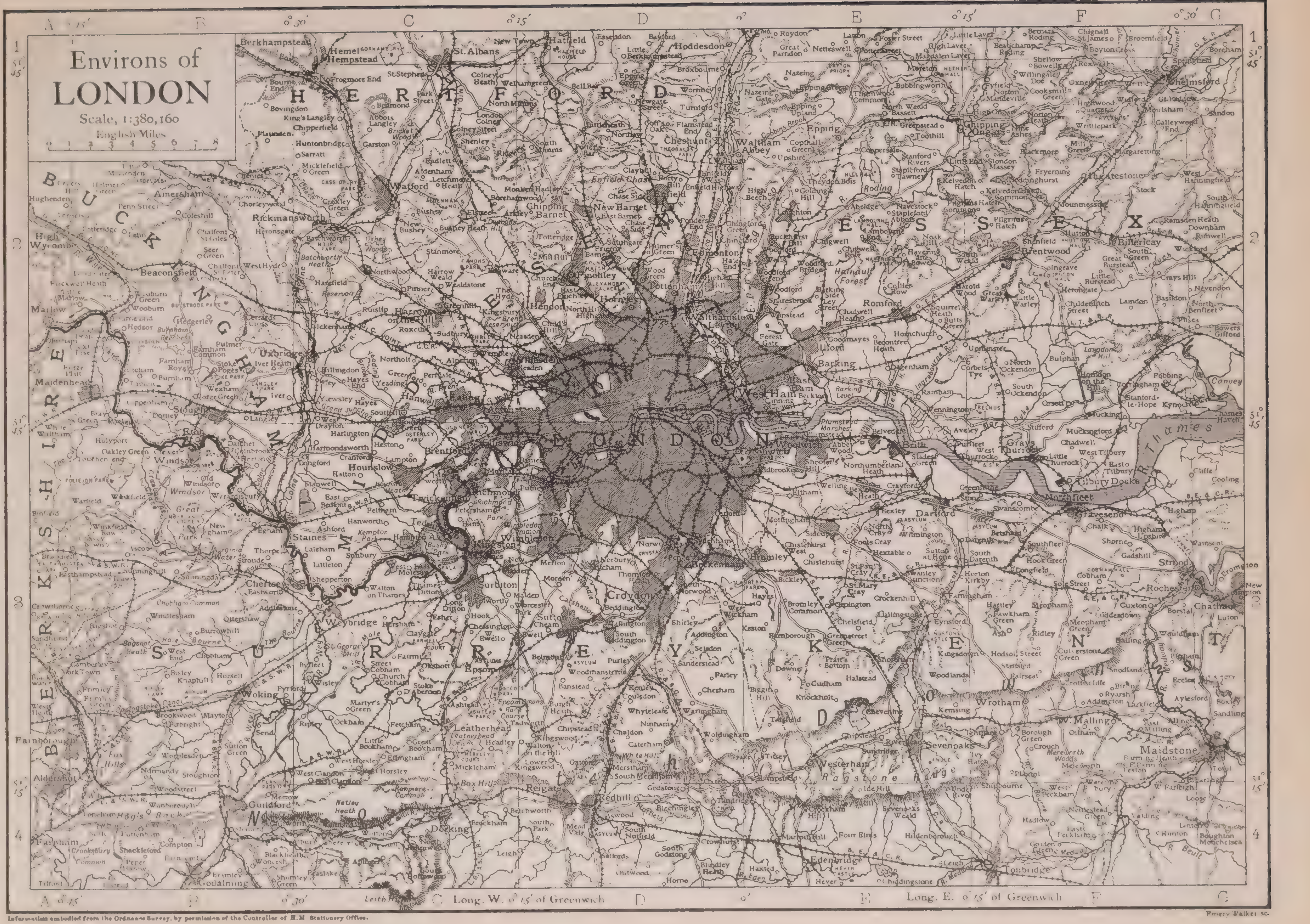
Royal palaces.

The former royal palaces of Westminster and of Whitehall, of which the fine Jacobean banqueting hall remains, are described under WESTMINSTER. The present London residence of the sovereign is Buckingham Palace, on the west side of St James's Park, with beautiful gardens behind it. Buckingham House was built in 1705 for the duke of Buckinghamshire, and purchased by George III. in 1762. The existing palace was finished by John Nash in 1835, but did not meet with approval, and was considerably altered before Queen Victoria occupied it in 1837. As regards its exterior appearance it is one of the least satisfactory of London's great buildings, though the throne room and other state apartments are magnificent within. The picture gallery contains valuable works of Dutch masters and others. The front of the palace forms the background to the public memorial to Queen Victoria, at the head of the Mall. Provision was made in the design, by Sir Aston Webb, for the extension of the Mall to open upon Trafalgar Square, through gateways in a semicircular range of buildings to be occupied by government offices, and for a wide circular space in front of the Palace, with a statue of the Queen by Thomas Brock in its centre. St James's Palace, at the north side of St James's Park, was acquired and rebuilt by Henry VIII., having been formerly a hospital founded in the 12th century for leprous maidens. It was the royal residence after the destruction of Whitehall by fire in the time of William III. until a fire in 1809 destroyed the greater part. Only the gateway and certain apartments remain of the Tudor building. Marlborough House, adjacent to the palace, was built by the first duke of Marlborough in 1710 from the designs of Wren, came into possession of the Crown in 1817, and has been occupied since 1863 by the prince of Wales. In Kensington (*q.v.*), on the west side of Kensington Gardens, is the palace acquired by William III. as a country seat, and though no longer used by the sovereign, is in part occupied by members of the royal family, and possesses a deeper historical interest than the other royal palaces, as the birth-place of Queen Victoria and her residence in youth.

There are few survivals of ancient domestic architecture in London, but the gabled and timbered front of Staple Inn, Holborn (*q.v.*) is a picturesque fragment. In Bishopsgate Street, City, stood Crosby Hall, which belonged to Crosby Place, the mansion of Sir John Crosby (d. 1475). Richard III. occupied the mansion as duke of Gloucester and Lord Protector (cf. Shakespeare's *Richard III.*, Act i. Sc. 3, &c.) The hall was removed in 1908, in spite of strong efforts to preserve it, which resulted in its re-erection on a site in Chelsea. The hall of the Middle Temple is an admirable example of a refectory of later date (1572).

A fine though circumscribed group of buildings is that in the heart of the City which includes the Bank of England, the Royal Exchange and the Mansion House. The Bank is a characteristic building, quadrilateral, massive and low, but covering a large area, without external windows, and almost wholly unadorned; though the north-west corner is copied from the Temple of the Sibyl at Tivoli. The building is mainly the work of Sir John Soane (*c.* 1788). The first building for the Royal Exchange was erected and presented to the City by Sir Thomas Gresham (1565–1570) whose crest, a grasshopper, appears in the wind-vane above the present building. Gresham's Exchange was destroyed in the great fire of 1666; and the subsequent building was similarly destroyed in 1838. The present building has an imposing Corinthian portico, and encloses a court surrounded by an ambulatory adorned with historical paintings by Leighton, Seymour Lucas, Stanhope Forbes and others. The Mansion House was erected *c.* 1740.

The only other public buildings, beyond those at Westminster, which fall into a great group are the modern museums, the Imperial Institute, London University and other institutions, and Albert Hall, which lie between Kensington Gore and Brompton and Cromwell Roads, and these, together with the National Gallery (in Trafalgar Square) and other art galleries, and the principal scientific, educational and recreative institutions, are considered in Section V.



Environs of LONDON

Scale, 1:380,160

English Miles

0 1 2 3 4 5 6 7 8
HERTFORD
ESSEX
BUCKINGHAM
MIDDLESEX
LONDON
SURREY
KENT
BERKSHIRE
Thames
St. Albans
Hemel Hempstead
Watford
Chelmsford
Brentwood
Romford
Barking
West Ham
Croydon
Richmond
Kingston
Windsor
Staines
Guildford
Dorking
Reigate
Sevenoaks
Maidstone
Gravesend
Rochester
Chatham
Tonbridge
Long. W. 0°15' of Greenwich
Long. E. 0°15' of Greenwich
A B C D E F G
1 2 3 4

Information embodied from the Ordnance Survey, by permission of the Controller of H.M. Stationery Office.

Emery Walker sc.

Monuments and Memorials.—The Monument (1677), Fish Street Hill, City, erected from the designs of Wren in commemoration of the great fire of 1666, is a Doric column surmounted by a gilt representation of a flaming urn. The Nelson Column, the central feature of Trafalgar Square, is from the designs of William Railton (1843), crowned with a statue of Nelson by Baily, and has at its base four colossal lions in bronze, modelled by Sir Edwin Landseer. A statue of the duke of Cambridge, by Captain Adrian Jones, was unveiled in 1907 in front of the War Office, Whitehall. The duke of York's Column, Carlton House Terrace (1833), an Ionic pillar, is surmounted by a bronze statue by Sir Richard Westmacott. The Westminster Column, outside the entrance to Dean's Yard, was erected to the memory of the old pupils of Westminster School who died in the Russian and Indian wars of 1854–1859. The Guards Memorial, Waterloo Place, commemorates the foot guards who died in the Crimea. The Albert Memorial, Kensington Gardens, was erected (1872) by "Queen Victoria and her People to the memory of Albert, Prince Consort," from the designs of Sir Gilbert Scott, with a statue of the Prince (1876) by John Henry Foley beneath a huge ornate Gothic canopy. At the eastern end of the Strand a memorial with statue by Hamo Thorneycroft of William Ewart Gladstone was unveiled in 1905. In Parliament Square and elsewhere are numerous statues, some of high merit, but it cannot be said that statuary occupies an important place in the adornment of streets and open places in London. Cleopatra's Needle, an ancient Egyptian monument, was presented to the government by Mehemet Ali in 1819, brought from Alexandria in 1878, and erected on the Victoria embankment on a pedestal of grey granite.

Nomenclature.—Having regard to the destruction of visible evidences of antiquity in London, both through accidental agencies such as the great fire, and through inevitable modernizing influences, it is well that historical associations in nomenclature are preserved in a great measure unimpaired. The City naturally offers the richest field for study in this direction. The derivations of names may here be grouped into two classes, those having a commercial connexion, and those associated with ancient buildings, particularly the City wall and ecclesiastical foundations. Among examples of the first group, Cheapside is prominent. This modern thoroughfare of shops was in early times the Chepe (O. Eng. *ceap*, bargain), an open place occupied by a market, having, until the 14th century, a space set apart for popular entertainments. There was a Queen Eleanor cross here, and conduits supplied the city with water. Modern Cheapside merges eastward into the street called the Poultry, from the poulterers' stalls "but lately departed from thence," according to Stow, at the close of the 16th century. Cornhill, again, recalls the cornmarket "time out of mind there holden" (Stow), and Gracechurch Street was corrupted from the name of the church of St Benet Grasschurch (destroyed by the great fire, rebuilt, and removed in 1868), which was said to be derived from a herb-market held under its walls. The Jews had their quarter near the commercial centre, their presence being indicated by the street named Old Jewry, though it is probable that they did not reoccupy this locality after their expulsion in 1290. Lombard Street similarly points to the residence of Lombard merchants, the name existing when Edward II. confirmed a grant to Florentine merchants in 1318, while the Lombards maintained their position until Tudor times. Paternoster Row, still occupied by booksellers, takes name from the sellers of prayer-books and writers of texts who collected under the shadow of St Paul's Cathedral. As regards names derived from ancient buildings, instances are the streets called London Wall and Barbican, and those named after the numerous gates. Of those associated with ecclesiastical foundations several occur in the course of this article (Section II., *Ecclesiastical Architecture*, &c.). Such are Austin Friars, Crutched Friars, Blackfriars and Whitefriars. To this last district a curious alternative name, Alsatia, was given, probably in the 17th century, with reference to its notoriety as a hiding-place of debtors. A derivation is suggested from the disputed territory of Alsace, pointing the contrast between this lawless district and the adjacent Temple, the home of the law itself. The name Bridewell came from a well near the Fleet (New Bridge Street), dedicated to St Bride, and was attached to a house built by Henry VIII. (1522), but is most familiar in its application to the house of correction instituted by Edward VI., which remained a prison till 1863. The Minories, a street leading south from Aldgate, takes name from an abbey of nuns of St Clare (*Sorores Minores*) founded in 1293. Apart from the City an interesting ecclesiastical survival is the name Broad Sanctuary, Westminster, recalling the place of sanctuary which long survived the monastery under the protection of which it originally existed. Covent Garden, again, took its name from a convent garden belonging to Westminster. Among the survivals of names of non-ecclesiastical buildings Castle Baynard may be noted; it stood in the City on the banks of the Thames, and was held by Ralph Baynard, a Norman, in the time of William the Conqueror; a later building being erected in 1428 by Humphrey duke of Gloucester. Here Richard III. was acclaimed king, and the mansion was used by Henry VII. and Henry VIII. Its name is kept in a wharf and a ward of the City.

The survival of names of obliterated physical features or characteristics is illustrated in Section I.; but additional instances are found in the Strand, which originally ran close to the sloping bank of the Thames, and in Smithfield, now the central meat market, but for long the "smooth field" where a cattle and hay market was held, and the scene of tournaments and games, and also of executions. Here in 1381 Wat Tyler the rebel was killed by Sir William Walworth during the parley with Richard II. In the West End of London the majority of important street-names are naturally of a later derivation than those in the ancient City, though Charing Cross (*q.v.*) is an instance of an exception. The derivation commonly accepted for Piccadilly is from *pickadil*, a stiff collar or hem in fashion in the early part of the 17th century (Span. *picca*, a spear-head). In Pall Mall and the neighbouring Mall in St James' Park is found the title of a game resembling croquet (Fr. *paille maille*) in favour at or before the time of Charles I., though the Mall was laid out for the game by Charles II. Other names pointing to the existence of pastimes now extinct are found elsewhere in London, as in Balls Pond Road, Islington, where in the 17th century was a proprietary pond for the sport of duck-hunting. An entertainment of another form is recalled in the name of Spring Gardens, St James' Park, where at the time of James I. there was a fountain or spring so arranged as to besprinkle those who trod unwarily on the valve which opened it. Many of the names of the rich residential streets and squares in the west have associations with the various owners of the properties; but Mayfair is so called from a fair held on this ground in May as early as the reign of Charles II. Finally there are several survivals, in street-names, of former private mansions and other buildings. Thus the district of the Adelphi, south of Charing Cross, takes name from the block of dwellings and offices erected in 1768 by the brothers (Gr. *adelphi*) Robert and William Adam, Scottish architects. In Piccadilly Clarendon House, erected in 1664 by Edward Hyde, earl of Clarendon, became Albemarle House when acquired by the duke of Albemarle in 1675. Northumberland House, from which is named Northumberland Avenue, opening upon Trafalgar Square, was built *c.* 1605 by Henry Howard, earl of Northampton, and was acquired by marriage by Algernon Percy, earl of Northumberland, in 1642. It took name from this family, and stood until 1874. Arundel House, originally a seat of the bishops of Bath, was the residence of Thomas Howard, earl of Arundel, whose famous collection of sculpture, the Arundel Marbles, was housed here until presented to Oxford University in 1667. The site of the house is marked by Arundel Street, Strand.

III. COMMUNICATIONS

Railways.—The trunk railways leaving London, with their termini, are as follows: (1) *Northern.* The Great Northern, Midland and London & North-Western systems have adjacent termini, namely King's Cross, St Pancras and Euston, in Euston Road, St Pancras. The terminus of the Great Central railway is Marylebone, in the road of that name. (2) *Western.* The terminus of the Great Western railway is Paddington (Praed Street); and that of the London & South-Western, Waterloo, south of the Thames in Lambeth. (3) *Southern.* The London, Brighton & South Coast railway has its western terminus at Victoria, and its central terminus at London Bridge, on the south side of the Thames. The South-Eastern & Chatham railway has four terminal stations, all on or close to the north bank of the river—Victoria, Charing Cross,[1] Holborn Viaduct and Cannon Street (City). St Paul's Station on the Holborn branch is also terminal in part. (4) *Eastern*. The principal terminus of the Great Eastern Railway is in Liverpool Street (City), but the company also uses Fenchurch Street (City), the terminus of the London, Tilbury & Southend railway, and St Pancras. These lines, especially the southern lines, the Great Eastern, Great Northern and South-Western carry a very heavy suburban traffic. Systems of joint lines and running powers are maintained to afford communication between the main lines. Thus the West London Extension line carries local traffic between the North Western and Great Western and the Brighton and South-Western systems, while the Metropolitan Extension through the City connects the Midland and Great Northern with the South-Eastern & Chatham lines.

The railways whose systems are mainly or wholly confined within the metropolitan area are as follows. The North London railway has a terminal station at Broad Street, City, and serves the parts of London implied by its name. The company possesses running powers over the lines of various other companies: thus its trains run as far north as Potter's Bar on the Great Northern line, while it serves Richmond on the west and Poplar on the east. The East London line connects Shoreditch with New Cross (Deptford) by way of the Thames Tunnel, a subway under the river originally built for foot-passengers. The London & India Docks line connects the city with the docks on the north bank of the river as far as North Woolwich. The Metropolitan railway has a line from Baker Street through north-west London to Harrow, continuing to Uxbridge, while the original main line runs on to Rickmansworth, Aylesbury and Verney Junction, but has been worked by the Metropolitan and Great Central companies jointly since 1906. Another line serves the western outskirts (Hammersmith, Richmond, &c.) from the city. Metropolitan trains also connect at New Cross with the south-eastern railway system. This company combines with the Metropolitan District to form the Inner Circle line, which has stations close to all the great railway termini north of the Thames. The Metropolitan District (commonly called the District) system serves Wimbledon, Richmond, Ealing and Harrow on the west, and passes eastward by Earl's Court, South Kensington, Victoria and Mansion House (City) to Whitechapel and Bow. The Metropolitan and the District lines within London are for the most part underground (this feature supplying the title of "the Underground" familiarly applied to both systems); the tunnels being constructed of brick. The earliest part of the system was opened in 1863. Although these railways, as far as concerns the districts they serve, form the fastest method of communication from point to point, their discomfort, arising mainly from the impossibility of proper ventilation, and various other disadvantages attendant upon the use of steam traction, led to a determination to adapt the lines to electrical working. Experiments on a short section of the line were made in 1900, and later schemes were set on foot to electrify the District system and bring under one general control this railway, other lines in deep level "tubes" between Baker Street and Waterloo, between Charing Cross, Euston and Hampstead, and between Hammersmith, Brompton, Piccadilly, King's Cross and Finsbury Park, and the London United Tramways Company. The Underground Electric Railways Company, which acquired a controlling influence over these concerns, undertook the construction of a great power station at Chelsea; while the Metropolitan Company, which had fallen into line with the District (not without dispute over the system of electrification to be adopted) erected a station at Neasden on the Aylesbury branch. Electric traction was gradually introduced on the Metropolitan and the District lines in 1906. The former company combined with the Great Western Company as regards the electrification of, and provision of stock for, the lines which they had previously worked jointly, from Edgware Road by Bishop's Road to Hammersmith, &c. The Baker Street & Waterloo railway (known as the "Bakerloo") was opened in 1906 and subsequently extended in one direction to Paddington and in the other to the Elephant and Castle. The Great Northern, Piccadilly & Brompton line, from Finsbury Park to Hammersmith, was opened early in 1907, and the Charing Cross, Euston & Hampstead line later in the same year. Deep-level electric railways ("tubes"), communicating with the surface by lifts, were already familiar in London. The first opened was the City & South London (1890), subsequently extended to run between Euston, the Angel, Islington, the Bank (City) and Clapham. Others are the Waterloo & City (1898) running from the terminus of the South-Western railway without intermediate stations to the Bank; the Central London (1900), from the Bank to Shepherd's Bush, Hammersmith; and the Great Northern & City (1904) from Finsbury Park (which is an important suburban junction on the Great Northern railway) to Moorgate Street.

Tramways.—The surface tramway system of London cannot be complete, as, within an area roughly represented by the boroughs of Chelsea, Kensington and Fulham, the city of Westminster and a considerable district north thereof, and the city of London, the existing streets could not accommodate tram lines along with other traffic over any great distance consecutively, and in point of fact there are few, beyond the embankment line from Blackfriars Bridge to Westminster Bridge, which connects with the southern system. Another line, running south from Islington, uses the shallow-level subway under Kingsway and connects with the embankment line. The northern, western and eastern outskirts and London south of the Thames are extensively served by trams. On the formation of the London County Council there were thirteen tramway companies in existence. Powers under the Tramways Act of 1870 were given to the council, enabling it to acquire possession of these undertakings, and within the county of London they have been for the most part so acquired, and are worked by the council. Outside the county both companies and local authorities own and work tramways. Both electric and horse traction are used; the latter, however, has been in great part displaced by the former. The total mileage for greater London is about 240.

Omnibuses.—The omnibus system is very extensive, embracing all the principal streets throughout the county and extending over a large part of Greater London. The two principal omnibus companies are the London General Omnibus and the London Road Car. The first omnibus ran between the Bank and Paddington in 1829. In 1905 and following years motor omnibuses (worked mostly by internal combustion engines) began to a large extent to supplant horse traction. The principal existing companies adopted them, and new companies were formed to work them exclusively. With their advantages of greater speed and carrying capacity over the horsed vehicles, their introduction was a most important development, though their working at first imposed a severe financial strain on many companies.

Cabs.—The horse-drawn cabs which ply for hire in the streets, or wait at authorized "cab-stands," are of two kinds, the "hansom," a two-wheeled vehicle so named after its inventor (1834) and the "four-wheeler." "Hackney coaches" for hire are first mentioned in 1625, when they were kept at inns, and numbered 20. Until 1832 their numbers were restricted, in 1662 to 400, in 1694 to 700, in 1771 to 1000. In some cases a driver owns his cab, but the majority of vehicles are let to drivers by owners, and the adjustment of terms between them has led to disputes from time to time. In 1894 a dispute necessitated the formulation of the "Asquith award" by the Rt. Hon. H. H. Asquith as home secretary, and subsequent modifications of this were only arrived at, as in 1904, after a strike of the drivers affected. A long-standing cause of complaint on the part of the public has been the common refusal of cab-drivers to accept their legal fares, but, on the other hand, several attempts to introduce cabs with an automatic taximeter failed, until the introduction of motor cabs, of which a few had already been plying for some time when in 1907 a large number, provided with taximeters, were put into service. Subsequently, as the number of "taxicabs" (see MOTOR VEHICLES) increased, that of horse-cabs decreased.

Traffic Problem.—One of the most serious administrative problems met with in London is that of locomotion, especially as regards the regulation of traffic in the principal thoroughfares and at the busiest crossings. The police have powers of control over vehicles and exercise them admirably; their work in this respect is a constant source of wonder to foreign visitors. But this control does not meet the problem of actually lessening the number of vehicles in the main arteries of traffic. At such crossings as that of the Strand and Wellington Street, Ludgate Circus and south of the Thames, the Elephant and Castle, as also in the narrow streets of the City, congestion is often exceedingly severe, and is aggravated when any main street is under repair, and diversion of traffic through narrow side streets becomes necessary. Many street improvements were carried out, it is true, in the last half of the 19th century, the dates of the principal being as follows: 1854, Cannon Street; 1864, Southwark Street; 1870, Holborn Viaduct; 1871, Hamilton Place, Queen Victoria Street; 1876, Northumberland Avenue; 1882, Tooley Street; 1883, Hyde Park Corner; 1884, Eastcheap; 1886, Shaftesbury Avenue; 1887, Charing Cross Road; 1890–1892, Rosebery Avenue. At the beginning of the 20th century several important local widenings of streets were put in hand, as for example between Sloane Street and Hyde Park Corner, in the Strand and at the Marble Arch (1908). At the same period a great work was undertaken to meet the want of a proper central communication between north and south, namely, the construction of a broad thoroughfare, called Kingsway in honour of King Edward VII., from High Holborn opposite Southampton Row southward to the Strand, connexion with which is established at two points through a crescent named Aldwych. The idea of such a thoroughfare is traceable back to the time of William IV. The magnitude of the traffic problem as a whole may be best appreciated by examples of the vast schemes of improvement which from time to time have been put forward by responsible individuals. Thus Sir John Wolfe Barry, as chairman of the Council of the Society of Arts in 1899, proposed to alleviate congestion of traffic by bridges over and tunnels under the streets at six points, namely—Hyde Park Corner, Piccadilly Circus, Ludgate Circus, Oxford Street and Tottenham Court Road, Strand and Wellington Street, and Southwark Bridge and Upper Thames Street. Another scheme seriously suggested in 1904, to meet existing disabilities of communication between north and south by linking the northern and southern tramway services, involved the removal of the Charing Cross terminus of the South Eastern and Chatham railway to the south side of the river, and the construction of a new bridge in place of the railway bridge. The mere control of existing traffic, local street improvements and provision of new means of communication between casual points, were felt to miss the root of the problem, and in 1903 a Royal Commission was appointed to consider the whole question of locomotion and transport in London, expert evidence being taken from engineers, representatives of the various railway and other companies, of the County Council, borough councils and police, and others. The commission reported in 1905.[1]

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[1] Charing Cross station was the scene of a remarkable catastrophe on the 5th of December 1905, when a large part of the roof collapsed, and the falling débris did very serious damage to the Avenue theatre, which stands close to the station at a lower level.

Traffic commission 1903. With regard to street improvements the most important recommendation was that of the construction of two main avenues 140 ft. wide, one running west and east, from Bayswater Road to Whitechapel, and passing through the city in the neighbourhood of London Wall, and another from Holloway to the Elephant and Castle, to cross the Thames by a new bridge above Blackfriars. Four lines of surface tramways and four railway lines in shallow tunnels were proposed along these avenues. Many widenings and other improvements of existing thoroughfares, and extensions of tramways were proposed, and detailed recommendations were made as regards urban and suburban railways, and the rehousing of the working population on the outskirts of London. Finally, the commission made the important recommendation that a traffic board should be established for London, to exercise a general supervision of traffic, and to act as a tribunal to which all schemes of railway and tramway construction should be referred.

Thames Steamers.—A local passenger steamboat service on the Thames suffers from the disadvantage that the river does not provide the shortest route between points at any great distance apart, and that the main thoroughfares between east and west do not touch its banks, so that passengers along those thoroughfares are not tempted to use it as a channel of communication. High pier dues, moreover, contributed to the decline of the traffic, and attempts to overcome the disinclination of passengers to use the river (at any rate in winter) show a record of failure. The London, Westminster and Vauxhall Steamboat Company established in 1840 a service of seven steamboats between London Bridge and Vauxhall. This company was bought up by the Citizen and Iron Steamboat Companies in 1865. The City Steamboat Company, established in 1848, began with eight boats, and by 1865 had increased their fleet to seventeen, running from London Bridge to Chelsea. This company was taken over by the London Steamboat Company in 1875. The sinking of the "Princess Alice" in 1878 was a serious blow to the London Steamboat Company, which collapsed, and was succeeded by the River Thames Steamboat Navigation Company, which went into liquidation in 1887. The fleet was bought by a syndicate and sold to the Victoria Steamboat Association. The Thames Steamboat Company then took up the service, but early in 1902 announced that it would be discontinued, although in 1904 it was temporarily resumed. Meanwhile, however, in 1902 the London County Council had promoted a bill in Parliament to enable them to run a service of boats on the Thames. The bill was thrown out on this occasion, but was revived and passed in 1904, and on the 17th of June 1905 the service was put into operation. The boats, however, were worked at a loss, and the service was discontinued in 1909.

Foreign Communications.—A large pleasure traffic is maintained by the steamers of the New Palace Company and others in summer between London Bridge and Southend, Clacton and Harwich, Ramsgate, Margate and other resorts of the Kent coast, and Calais and Boulogne. Passenger steamers sail from the port of London to the principal ports of the British Isles and northern Europe, and to all parts of the world, but the most favoured passenger services to and from Europe and North America pass through other ports, to which the railways provide special services of trains from London. The principal travelling agency in London is that of Messrs Cook, whose head office is at Ludgate Circus. A number of sub-offices of large steamship lines are congregated in Cockspur Street, Trafalgar Square, and several of the principal railway companies have local offices throughout the centre of the metropolis for the issue of tickets and the collection and forwarding of luggage and parcels.

Post Office.—The General Post Office lies in the centre of the City on either side of the street called St Martin's le Grand. The oldest portion of the buildings, Ionic in style, was designed by Sir Robert Smirke and erected in 1829. Here are the central offices of the letter, newspaper and telegraph departments, with the office of the Postmaster General; but the headquarters of the parcels department are at Mount Pleasant, Clerkenwell; those of the Post Office Savings Bank at Blythe Road, West Kensington, and those of the Money Order department in Queen Victoria Street. The postal area is divided into eight districts, commonly designated by initials (which it is customary to employ in writing addresses)—East Central (E.C., the City, north to Pentonville and City Roads, west to Gray's Inn Road and the Law Courts); West Central (W.C., from Euston Road to the Thames, and west to Tottenham Court Road); West (W., from Piccadilly and Hyde Park north to Marylebone and Edgware Roads; the greater part of Paddington and Kensington, north part of Fulham and Hammersmith); South-west (S.W., City of Westminster south of Piccadilly, Chelsea, South Kensington, the greater part of Fulham, and London south of the Thames and west of Vauxhall Bridge); South-east (S.E., remainder of London south of the Thames); East (E., east of the City and Kingsland Road); North (N., west of Kingsland Road; Islington); North-west (N.W., greater part of St Pancras and St Marylebone, and Hampstead). The postal area excludes part of Woolwich within the county; but includes considerable areas outside the county in other directions, as West Ham, Leyton, &c., on the east; Woodford, Chingford, &c., on the north-east; Wood Green, Southgate and Finchley on the north; Hendon and Willesden on the north-west; Acton and Ealing, Barnes and Wimbledon on the west; and Penge and Beckenham on the south, wholly or in part. There are ten district head offices and about a thousand local offices in the metropolitan district.

Telephones.—The National Telephone Company, working under licence expiring on the 31st of December 1911, had until 1901 practically a monopoly of telephonic communication within London, though the Post Office owned all the trunk lines connecting the various telephone areas of the company. The company's management did not give satisfaction, and the use of the telephone was consequently restricted in the metropolis, when in 1898 a Select Committee on Telephones reported that "general immediate and effective" competition by either the government or local authority was necessary to ensure efficient working. The Post Office thereupon instituted a separate system of exchanges and lines, intercommunication between the two systems being arranged. Charges were reduced and efficiency benefited by this movement. The area covered by the local as distinct from the trunk service is about 630 sq. m. extending to Romford, Enfield, Harrow, &c., north of the Thames, and to Dartford Reigate, Epsom, &c., south of it. Public call offices are provided in numerous shops, railway stations and other public places, and at many post offices. The District Messengers Company affords facilities through local offices for the use of special messengers.

IV. POPULATION, PUBLIC HEALTH, &C.

The population of Greater London by the census of 1901 was 6,581,402.

The following table gives comparisons between the figures of certain census returns for Greater London and its chief component parts, namely, the City, the county and the outer ring (*i.e.* Greater London outside the county). All the figures before those of 1901 are adjusted to these areas.

Year.	City.	County.	Outer Ring.	Greater London.
1801	128,129	831,181	155,334	1,114,644
1841	123,563	1,825,714	286,067	2,235,344
1881	50,569	3,779,728	936,364	4,766,661
1901	26,923	4,509,618	2,044,864	6,581,402

The reason for the decrease in the resident City population is to be found in the rapid extension of business premises, while the widening ramifications of the outer residential areas are illustrated by the increase in the later years of the population of the Outer Ring. The growth and population of London previous to the 19th century is considered under *History, ad fin.*

Aliens. The foreign-born population of London was 60,252 in 1881, and 135,377 in 1901. During 1901, 27,070 aliens (excluding sailors) arrived at the port, and in 1902, 33,060. Of these last Russians and Poles numbered 21,013; Germans, 3386; Austrians and Hungarians, 2197; Dutch, 1902; Norwegians Swedes and Danes, 1341; and Rumanians, 1016. Other nationalities numbered below one thousand each. The foreign-born population shows a large increase in percentage to the whole, being 1·5 in 1881 and 2·98 in 1901. Residents of Irish birth have decreased since 1851; those of Scottish birth have increased steadily, and roughly as the population. German residents are found mainly in the western and west central districts; French mainly in the City of Westminster (especially the district of Soho), St Pancras and St Marylebone; Italians in Holborn (Saffron Hill), Soho and Finsbury; and Russians and Poles in Stepney and Bethnal Green.

Vital Statistics.—The following table shows the average birth rate and death-rate per thousand at stated periods.

Years.	Births.	Deaths.
1861–1880[2]	35·4	23·4
1891–1900[2]	30·3	19·2
1901–1904[2]	28·5	16·5
1905	27·1	15·6

[2] Average.

A comparison of the death-rate of London and those of other great towns in England and abroad is given here:—

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[1] The report appeared in eight volumes, the first of which, containing the general conclusions to which allusion is here made, bore the number, as a blue-book, Cd. 2597.

	Average 1895–1904.	1905.
Leicester	16·7	13·3
Brussels	16·7	14·5
Bristol	16·9	14·6
Bradford	17·7	15·2
Leeds	19·1	15·2
London	18·2	15·6
Birmingham	20·2	16·2
Nottingham	18·4	16·5
Newcastle	20·9	16·8
Sheffield	19·6	17·0
Berlin	17·8	17·2
Paris	19·2	17·4
Manchester	22·6	18·0
New York	20·2	18·3
Vienna	20·0	19·0
Liverpool	23·2	19·6
Rome	19·1	20·6
St Petersburg	25·9	25·3

In 1905 the lowest death-rates among the metropolitan boroughs were returned by Hampstead (9·3), Lewisham (11·7), Wandsworth (12·6), Woolwich (12·8), Stoke Newington (12·9), and the highest by Shoreditch (19·7), Finsbury (19·0), Bermondsey (18·7), Bethnal Green (18·6) and Southwark (18·5). A return of the percentage of inhabitants dwelling in over-crowded tenements shows 2·7 for Lewisham, 4·5 for Wandsworth, 5·5 for Stoke Newington, and 6·4 for Hampstead, against 35·2 for Finsbury and 29·9 for Shoreditch.

Sanitation.—As regards sanitation London is under special regulations. When the statutes relating to public health were consolidated and amended in 1875 London was excluded; and the law applicable to it was specially consolidated and amended in 1891. The London County Council is a central sanitary authority; the City and metropolitan boroughs are sanitary districts, and the Corporation and borough councils are local sanitary authorities. The County Council deals directly with matters where uniformity of administration is essential, *e.g.* main drainage, housing of working classes, infant life protection, common lodging-houses and shelters, and contagious diseases of animals. With a further view to uniformity it has certain powers of supervision and control over local authorities, and can make by-laws respecting construction of local sewers, sanitary conveniences, offensive trades, slaughter-houses and dairies, and prevention of nuisances outside the jurisdiction of local authorities. A medical officer of health for the whole county is appointed by the Council, which also pays half the salaries of local medical officers and sanitary inspectors. The Council may also act in cases of default by the local authorities, or may make representations to the Local Government Board respecting such default, whereupon the Board may direct the Council to withhold payment due to the local authority under the Equalization of Rates Act 1894.

Drainage.

The first act providing for a commission of sewers in London dates from 1531. Various works of a more or less imperfect character were carried out, such as the bridging over in 1637 of the river Fleet, which as early as 1307 had become inaccessible to shipping through the accumulation of filth. Scavengers were employed in early times, and sewage was received into wells and pumped into the kennels of the streets. A system of main drainage was inaugurated by the Commissioners of Sewers in 1849, but their work proceeded very slowly. It was carried on more effectively by the Metropolitan Board of Works (1856–1888) which expended over six-and-a-half millions sterling on the work. The London County Council maintained, completed and improved the system. The length of sewers in the main system is about 288 m., and their construction has cost about eight millions. The system covers the county of London, West Ham, Penge, Tottenham, Wood Green, and parts of Beckenham, Hornsey, Croydon, Willesden, East Ham and Acton. There are actually two distinct systems, north and south of the Thames, having separate outfall works on the north and south banks of the river, at Barking and Crossness. The clear effluent flows into the Thames, and the sludge is taken 50 m. out to sea. The annual cost of maintenance of the system exceeds £250,000. The sanitary authorities are concerned only with the supervision of house drainage, and the construction and maintenance of local sewers discharging into the main system. The Thames and the Lea Conservancies have powers to guard against the pollution of the rivers.

Metropolitan Asylums Board.

Hospitals.—The Metropolitan Asylums Board, though established in 1867 purely as a poor-law authority for the relief of the sick, insane and infirm paupers, has become a central hospital authority for infectious diseases, with power to receive into its hospitals persons, who are not paupers, suffering from fever, smallpox or diphtheria. Both the Board and the County Council have certain powers and duties of sanitary authority for the purpose of epidemic regulations. The local sanitary authorities carry out the provisions of the Infectious Diseases (Notification and Prevention) Acts, which for London are embodied in the Public Health (London) Act 1891. The Board has asylums for the insane at Tooting Bec (Wandsworth), Ealing (for children); King's Langley, Hertfordshire; Caterham, Surrey; and Darenth, Kent. There are twelve fever hospitals, including northern and southern convalescent hospitals. For smallpox the Board maintains hospital ships moored in the Thames at Dartford, and a land establishment at the same place. There are land and river ambulance services.

There are three regular funds in London for the support of hospitals. (1) King Edward's Hospital Fund (1897) founded by King Edward VII. as Prince of Wales in commemoration of the Diamond Jubilee of Queen Victoria. The League of Mercy, under royal charter, operates in conjunction with the Fund in the collection of small subscriptions. The Order of Mercy was instituted by the King as a reward for distinguished personal service. (2) The Metropolitan Hospital Sunday Fund, founded in 1873, draws the greater part of its revenue from collections in churches on stated occasions. (3) The Metropolitan Hospital Saturday Fund was founded in 1873, and is made up chiefly of small sums collected in places of business, &c. The following is a list of the principal London hospitals, with dates of foundation:—

1. *General Hospitals with Medical Schools* (all of which, with the exception of that of the Seamen's Hospital, are schools of London University):—
    - Charing Cross; Agar Street, Strand (1820).
    - Guy's; St Thomas Street, Southwark (1724).
    - King's College; Lincoln's Inn Fields (1839).
    - London; Whitechapel (1740).
    - Middlesex; Mortimer Street, Marylebone (1745).
    - North London, or University College; Gower Street (1833).
    - Royal Free; Gray's Inn Road (1828; on present site, 1842). London School of Medicine for Women.
    - St Bartholomew's; Smithfield (1123; refounded 1547).
    - St George's; Hyde Park Corner (1733).
    - St Mary's; Paddington (1845).
    - St Thomas'; Lambeth (1213; on present site, 1871).
    - Seamen's Hospital Society; Greenwich (1821).
    - Westminster, facing the Abbey. (1720; on present site, 1834).
2. *General Hospitals without Schools*:—
    - Great Northern Central; Islington (1856; on present site, 1887).
    - Metropolitan; Hackney (1836).
    - Poplar Hospital for Accidents (1854).
    - West London; Hammersmith Road (1856).
3. *Hospitals for Special Purposes*:—
    - Brompton Consumption Hospital (1841).
    - Cancer Hospital; Brompton (1851).
    - City of London Hospital for diseases of the chest; Bethnal Green (1848).
    - East London Hospital for Children and Dispensary for Women; Shadwell (1868).
    - Hospital for Sick Children; Bloomsbury (1852).
    - London Fever Hospital; Islington (1802).
    - National Hospital for Paralysed and Epileptics; Bloomsbury (1859).
    - Royal Hospital for Incurables; Putney (1854).
    - Royal London Ophthalmic Hospital; City Road (1804; on present site, 1899).

(See also separate articles on boroughs.)

Water Supply.—In the 12th century London was supplied with water from local streams and wells, of which Holy Well, Clerk's Well (Clerkenwell) and St Clement's Well, near St Clement's Inn, were examples. In 1236 the magistrates purchased the liberty to convey the waters of the Tyburn from Paddington to the City by leaden pipes, and a great conduit was erected in West Cheap in 1285. Other conduits were subsequently built (cf. Conduit Street off Bond Street, Lamb's Conduit Street, Bloomsbury); and water was also supplied by the company of water-bearers in leathern panniers borne by horses. In 1582 Peter Moris, a Dutchman, erected a "forcier" on an arch of London Bridge, which he rented for 10s. per annum for 500 years. His works succeeded and increased, and continued in his family till 1701, when a company took over the lease. Other forciers had been set up, and in 1609, on an act of 1605, Sir Hugh Myddelton undertook the task of supplying reservoirs at Clerkenwell through the New river from springs near Ware, Hertfordshire; and these were opened in 1613. In 1630 a scheme to bring water from Hoddesdon on the Lea was promoted by aid of a lottery licensed by Charles I. The Chelsea Water Company opened its supply from the Thames in 1721; the Lambeth waterworks were erected in 1783; the Vauxhall Company was established in 1805, the West Middlesex, near Hammersmith, and the East London on the river Lea in 1806, the Kent on the Ravensbourne (Deptford) in 1810, the Grand Junction in 1811, and the Southwark (which amalgamated with the Vauxhall) in 1822.

For many years proposals to amalgamate the working of the companies and displace them by a central public authority were put forward from time to time. The difficulty of administration lay in the fact that of the area of 620 sq. m. constituting what is known as "Water London" (see map in *London Statistics*, vol. xix., issued by the L.C.C., 1909) the London County Council has authority over little more than one-third, and therefore when the Council proposed

Metropolitan Water Board.

to acquire the eight undertakings concerned its scheme was opposed not only by the companies but by the county councils and local authorities outside the County of London. The Council had a scheme of bringing water to London from Wales, in view of increasing demands on a stationary supply. This involved impounding the headwaters of the Wye, the Towey and the Usk, and the total cost was estimated to exceed fifteen millions sterling. The capacity of existing sources, however, was deemed sufficient by a Royal Commission under Lord Balfour of Burleigh in 1893, and this opinion was endorsed by a further Commission under Lord Llandaff. The construction of large storage reservoirs was recommended, and this work was put in hand jointly by the New River, West Middlesex and Grand Junction companies at Staines on the Thames. As regards administration, Lord Llandaff's Commission recommended the creation of a Water Trust, and in 1902 the Metropolis Water Act constituted the Metropolitan Water Board to purchase and carry on the undertakings of the eight companies, and of certain local authorities. It consists of 66 members appointed by the London County Council (14), the City of London and the City of Westminster (2 each), the other Metropolitan boroughs (1 each), the county councils of Middlesex, Hertfordshire, Essex, Kent and Surrey (1 each), borough of West Ham (2), various groups of other boroughs and urban districts, and the Thames and the Lea Conservancies. The first election of the Board took place in 1903. The 24th of June, 1904, was the date fixed on which control passed to the Board, and in the meantime a Court of Arbitration adjudicated the claims of the companies for compensation for the acquisition of their properties.

"Water London" is an irregular area extending from Ware in Hertfordshire to Sevenoaks in Kent, and westward as far as Ealing and Sunbury.

A constant supply is maintained generally throughout "Water London," although a suspension between certain hours has been occasionally necessitated, as in 1895 and 1898, when, during summer droughts, the East London supply was so affected. During these periods other companies had a surplus of water, and in 1899 an act was passed providing for the interconnexion of systems. The Thames and Lea are the principal sources of supply, but the Kent and (partially) the New River Company draw supplies from springs. The systems of filtration employed by the different companies varied in efficacy, but both the Royal Commissions decided that water as supplied to the consumer was generally of a very high standard of purity. The expenditure of the Water Board for 1907–1908 amounted to £2,846,265. Debt charges absorbed £1,512,718 of this amount.

Public baths and washhouses are provided by local authorities under various acts between 1846 and 1896, which have been adopted by all the borough councils.

Lighting.—From 1416 citizens were obliged to hang out candles between certain hours on dark nights to illuminate the streets. An act of parliament enforced this in 1661; in 1684 Edward Heming, the inventor of oil lamps, obtained licence to supply public lights; and in 1736 the corporation took the matter in hand, levying a rate. Gas-lighting was introduced on one side of Pall Mall in 1807, and in 1810 the Gas Light & Coke Company received a charter, and developed gas-lighting in Westminster. The City of London Gas Company followed in 1817, and seven other companies soon after. Wasteful competition ensued until in 1857 an agreement was made between the companies to restrict their services to separate localities, and the Gas Light & Coke Company, by amalgamating other companies, then gradually acquired all the gas-lighting north of the Thames, while a considerable area in the south was provided for by another great gas company, the South Metropolitan. Various acts from 1860 onwards have laid down laws as to the quality and cost of gas. Gas must be supplied at 16-candle illuminating power, and is officially tested by the chemists' department of the London County Council. The amalgamations mentioned were effected subsequently to 1860, and there are now three principal companies within the county, the Gas Light & Coke, South Metropolitan and Commercial, though certain other companies supply some of the outlying districts. As regards street lighting, the extended use of burners with incandescent mantles has been of good effect. The Metropolitan Board of Works, and the commissioners of sewers in the City, began experiments with electric light. At the close of the 19th and the beginning of the 20th century a large number of electric light companies came into existence, and some of the metropolitan borough councils, and local authorities within Greater London, also undertook the supply. An extensive use of the light resulted in the principal streets and in shops, offices and private houses.

Fire.—In 1832 the fire insurance companies united to maintain a small fire brigade, and continued to do so until 1866. The brigade was confined to the central part of the metropolis; for the rest, the parochial authorities had charge of protection from fire. The central brigade came under the control of the Metropolitan Board of Works; and the County Council now manages the Metropolitan Fire Brigade, under a chief officer and a staff numbering about 1300. The cost of maintenance exceeds £200,000 annually; contributions towards this are made by the Treasury and the fire insurance companies. The Council controls the provision of fire escapes in factories employing over 40 persons, under an act of 1901; it also compels the maintenance of proper precautions against fire in theatres and places of entertainments. A Salvage Corps is independently maintained by the Insurance Companies.

Cemeteries.—The administrative authorities of cemeteries for the county are the borough councils and the City Corporation and private companies. The large cemetery at Brompton is the property of the government. Kensal Green cemetery, the burial-place of many famous persons, is of great extent, but several large cemeteries outside the metropolis have come into use. Such are that of the London Necropolis Company at Brookwood near Woking, Surrey, and that of the parishes of St Mary Abbots, Kensington, and St George, Hanover Square, at Hanwell, Middlesex. Crematoria are provided at certain of the companies' cemeteries, and the Cremation Act 1902 enabled borough councils to provide crematoria.

V. Education and Recreation

Elementary education.

Education.—The British and Foreign School Society (1808) and the National Society (1811), together with the Ragged Schools Union (1844), were the only special organizations providing for the education of the poorer classes until 1870. To meet the demand for elementary education, increasing as it did with population, was beyond the powers of these societies, the churches and the various charitable institutions. Thus a return of 1871 showed that the schools were capable of accommodating only 39% of the children of school-going age. In 1870, however, a School Board had been created in addition, and this body carried out much good work during its thirty-four years of existence. In 1903 the Education (London) Act was passed in pursuance of the general system, put into operation by the Education Act (1902) of bringing education within the scope of municipal government. The County Council was created a local education authority, and given control of secular education in both board and voluntary schools. It appoints an education committee in accordance with a scheme approved by the Board of Education. This scheme must allow of the Council selecting at least a majority of the committee, and must provide for the inclusion of experts and women. Each school or group of schools is under a body of managers, in the appointment of whom the borough council and the County Council share in the following proportions:—(*a*) *Board or provided schools*; borough council, two-thirds; county council, one-third: (*b*) *Voluntary or non-provided schools*; the foundation, two-thirds; borough council and county council, each one-sixth. The total number of public elementary schools was 963 in 1905, with 752,487 scholars on the register. Other institutions include higher elementary schools for pupils certified to be able to profit by higher instruction; and schools for blind, deaf and defective children. Instruction for teachers is provided in pupil teachers' centres (preparatory), and in residential and day training colleges. There are about 15 such colleges.

Technical education.

Previous to the act of 1903 the County Council had educational powers under the Technical Instructions Acts which enabled it to provide technical education through a special board, merged by the act of 1903 in the education committee. The City and Guilds of London Institute, Gresham College, also maintains various technical institutions. The establishment of polytechnics was provided for by the City of London Parochial Charities Act 1883; the charities being administered by trustees. The model institution was that of Mr Quintin Hogg (1880) in Regent Street, where a striking statue by George Frampton (1906) commemorates him. The general scope of the polytechnics is to give instruction both in general knowledge and special crafts or trades by means of classes, lectures and laboratories, instructive entertainments and exhibitions, and facilities for bodily and mental exercise (gymnasia, libraries, &c.). Other similar institutions exist primarily for special purposes, as the St Bride Foundation Institute, near Fleet Street, in immediate proximity to the great newspaper offices, for the printing trade, and the Herolds' Institute, a branch of the Borough Polytechnic situated in Bermondsey, for the purposes of the leather trade. The County Council also aids numerous separate schools of art, both general and special, such as the Royal School of Art Needlework and the School of Art Woodcarving; the City and Guilds Institute maintains similar establishments at some of its colleges, and art schools are also generally attached to the polytechnics.

Philanthropical institutions.

The London County Council maintains a number of industrial schools and reformatories, both in London and in the country, for children who have shown or are likely to be misled into a tendency towards lawlessness. The City Corporation has separate responsibilities in the same direction, but has no schools of its own. The expenditure of the London County Council on education for 1907–1908 was £4,281,291 for elementary education, and £742,962 for higher education.

The work of private philanthropists and philanthropical bodies among the poor of East London, Southwark and Bermondsey, and elsewhere, falls to be noticed at this point. The labours of the regular clergy here lie largely in the direction of social reform, and churches and missions have been established and are maintained by colleges, such as Christ Church, Oxford, schools and other bodies. There are, further, "settlements" where members of the various bodies may reside in order to devote themselves to philanthropical work; and these include clubs, recreation rooms and other institutions for the use of the poor. Such are the Oxford House, Bethnal

Green; the Cambridge House, Camberwell Road; Toynbee Hall, Whitechapel; Mansfield House, Canning Town; the Robert Browning Settlement, Southwark; and the Passmore Edwards Settlement, St Pancras. There are also several women's settlements of a similar character. The People's Palace, Mile End Road, opened in 1887, is both a recreative and an educational institution (called East London College) erected and subsequently extended mainly through the liberality of the Drapers' Company and of private donors.

Public schools.

In early times the priories and other religious houses had generally grammar schools attached to them. Those at St Peter's, Westminster, and St Paul's, attained a fame which has survived, while other similar foundations lapsed, such as St Anthony's (Threadneedle Street, City), at which Sir Thomas More, Archbishop Whitgift and many other men of eminence received education. Certain of the schools were re-endowed after the dissolution of the monasteries. St Peter's College or Westminster School (see WESTMINSTER) is unique among English public schools of the highest rank in maintaining its original situation in London. Other early metropolitan foundations have been moved in accordance with modern tendencies either into the country or to sites aloof from the heart of London. Thus Charterhouse school, part of the foundation of Sir Thomas Sutton (1611), was moved from Finsbury to Godalming, Surrey; St Paul's School occupies modern buildings at Hammersmith, and Christ's Hospital is at Horsham, Sussex. Of other schools, Merchant Taylors' was founded by the Company of that name in 1561, and has occupied, since 1875, the premises vacated by Charterhouse School. The Mercers' School, Dowgate, was originally attached to the hospital of St Thomas of Acon, which was sold to the Mercers' Company in 1522, on condition that the company should maintain the school. The City of London School, founded in Milk Street, Cheapside, by the City Corporation in 1835, occupies modern buildings on the Victoria Embankment. Dulwich College originated in the foundation of the College of God's Gift by Edward Alleyn in 1626, and is now constituted as one of the principal English public schools. St Olave's and St Saviour's grammar school, Southwark, received its charter in 1571. Both classical and modern education is provided; a large number of scholarships are maintained out of the foundation, and exhibitions from the school to the universities and other higher educational institutions.

London University.—The University of London was incorporated by royal charter in 1836, as an examining body for conferring degrees. Its scope and powers were extended by subsequent charters, and in 1900, under the University of London Act 1898, it was reorganized as both a teaching and an examining body. The function of the academic department is to control the teaching branch, internal examinations, &c., and that of the external department to control external examinations, while the university extension system occupies a third department. The university is governed by a senate consisting of a chancellor, chairman of convocation and 54 members, whose appointment is shared by the Crown, convocation, the Royal Colleges of Physicians and of Surgeons, the Inns of Court, the Law Society, the London County Council, City Corporation, City and Guilds Institute, University and King's Colleges and the faculties. The faculties are theology, arts, law, music, medicine, science, engineering and economics. The schools of the University include University College, Gower Street, and King's College, Somerset House (with both of which preparatory schools are connected), East London College and numerous institutions devoted to special faculties both within and without London. The university in part occupies buildings which formerly belonged to the Imperial Institute.

Other Educational Institutions.—The Board of Education directly administers the following educational institutions—the Victoria and Albert Museum, South Kensington, with its branch at Bethnal Green, from both of which objects are lent to various institutions for educational purposes; the Royal College of Science, South Kensington, with which is incorporated the Royal School of Mines; the Geological Survey of the United Kingdom and the Museum of Practical Geology, Jermyn Street; the Solar Physics Observatory, South Kensington; and the Royal College of Art, South Kensington. At Gresham College, Basinghall Street, City, founded in 1597 by Sir Thomas Gresham, and moved to its present site in 1843, lectures are given in the principal branches of science, law, divinity, medicine, &c.

Some further important establishments and institutions may be tabulated here:—

Architecture.—The Royal Institute of British Architects, Conduit Street, conducts examinations and awards diplomas.

Education.—The College of Preceptors, Bloomsbury, conducts examinations of persons engaged in education and awards diplomas.

Engineering.—A School of Practical Engineering is maintained at the Crystal Palace, Sydenham.

Law.—The Inns of Court are four—Middle Temple, Inner Temple, Lincoln's Inn, Gray's Inn. A joint board of examiners examines students previous to admission. The Council of Legal Education superintends the education and subsequent examination of students. (See INNS OF COURT.) The Law Society is the superintending body for examination and admission in the case of solicitors.

Medical.—The Royal College of Physicians is in Pall Mall East, and the Royal College of Surgeons is in Lincoln's Inn Fields. The Society of Apothecaries is in Water Lane, City. The Royal College of Veterinary Surgeons is in Red Lion Square, and the Royal Veterinary College at Camden Town. (The principal hospitals having schools are noted in the list of hospitals, Section VII.)

Military and Naval.—The Royal Military College and the Ordnance College are at Woolwich; the Royal Naval College at Greenwich.

Music.—The principal educational institutions are—the Royal Academy of Music, Tenterden Street, Hanover Square; the Royal College of Music, South Kensington; Guildhall School, City, near the Victoria Embankment; London College, Great Marlborough Street; Trinity College, Manchester Square; Victoria College, Berners Street; and the Royal College of Organists, Bloomsbury.

Scientific Societies.—Numerous learned societies have their headquarters in London, and the following may especially be noticed here. Burlington House, in Piccadilly, built in 1872 on the site of a mansion of the earls of Burlington, houses the Royal Society, the Chemical, Geological, Linnaean and Royal Astronomical Societies, the Society of Antiquaries and the British Association for the Advancement of Science, of which the annual meetings take place at different British or colonial towns in succession. The Royal Society, the most dignified and influential of all, was incorporated by Charles II. in 1663. It originally occupied rooms in Crane Court, City, and was moved in 1780 to Somerset House, where others of the societies named were also located. The Society of Arts, John Street, Adelphi, was established in 1754 for the encouragement of arts, manufactures and commerce. The Royal Institution, Albemarle Street, was founded in 1799, maintains a library and laboratories and promotes research in connexion with the experimental sciences. The Royal Geographical Society, occupying a building close to Burlington House in Savile Row, maintains a map-room open to the public, holds lectures by prominent explorers and geographers, and takes a leading part in the promotion of geographical discovery. The Royal Botanic Society has private gardens in the midst of Regent's Park, where flower shows and general entertainments are held. The Royal Horticultural Society maintains gardens at Wisley, Surrey, and has an exhibition hall in Vincent Square, Westminster. The exhibitions of the Royal Agricultural Society are held at Park Royal, near Willesden. The Zoological Society maintains a magnificent collection of living specimens in the Zoological Gardens, Regent's Park, a popular resort.

Museums, Art Galleries, Libraries.—In the British Museum London possesses one of the most celebrated collections in the world, originated in 1753 by the purchase of Sir Hans Sloane's collection and library by the government. The great building in Bloomsbury (1828–1852) with its massive Ionic portico, houses the collections of antiquities, coins, books, manuscripts and drawings, and contains the reading-rooms for the use of readers. The natural history branch was removed to a building at South Kensington (the Natural History Museum) in 1881, where the zoological, botanical and mineralogical exhibits are kept. Close to this museum is the Victoria and Albert Museum (formerly South Kensington Museum, 1857) for which an extension of buildings, from a fine design by Sir Aston Webb, was begun in 1899 and completed in ten years. Here are collections of pictures and drawings, including the Raphael cartoons, objects of art of every description, mechanical and scientific collections, and Japanese, Chinese and Persian collections, and an Indian section. In the vicinity, also, is the fine building of the Imperial Institute, founded in 1887 as an exhibition to illustrate the resources of all parts of the Empire, as well as an institution for the furtherance of imperial intercourse; though not developed on the scale originally intended. Other museums are Sir John Soane's collection in Lincoln's Inn Fields and the Museum of Practical Geology in Jermyn Street, while the scientific societies have libraries and in some cases collections of a specialized character, such as the museums of the Royal College of Surgeons, the Royal Architectural Society, and the Society of Art and the Parkes Museum of the Sanitary Institute. Among permanent art collections the first place is taken by the National Gallery in Trafalgar Square. This magnificent collection was originated in 1824, and the building dates from 1838, but has been more than once enlarged. The building of the National Portrait Gallery, adjoining it, dates from 1896, but the nucleus of the collection was formed in 1858. The munificence of Sir Henry Tate provided the gallery, commonly named after him, by the Thames near Vauxhall Bridge, which contains the national collection of British art. The Wallace collection of paintings and objects of art, in Hertford House, Manchester Square, was bequeathed to the nation by the widow of Sir Richard Wallace in 1897. Dulwich College possesses a fine series of paintings, of the Dutch and other schools, bequeathed by Sir P. F. Bourgeois in 1811. There are also notable collections of pictures in several of the mansions of the nobility, government buildings, halls of the City Companies and elsewhere. No gallery in London is exclusively or especially devoted to sculpture. Of the periodical art exhibitions that of the Royal Academy is most noteworthy. It is held annually at Burlington House from the first Monday in May to the first Monday in August. It consists mainly of paintings, but includes a few drawings and examples of sculpture. Earlier in each year exhibitions of works by deceased British artists and by old masters are held, and the Gibson and Diploma Galleries are permanent exhibitions. At the Guildhall special exhibitions are held from time to time. There are a number of art galleries in and about Bond Street and Piccadilly, Regent Street and Pall Mall, such as the New Gallery, where periodical exhibitions are given by the New English Art Club, the Royal Society of Painters in Water-Colours, the Royal Institute of Painters in Water-Colours, other societies and art dealers.

Municipal provision of public libraries under acts of 1892 and 1893 is general throughout London, and these institutions are exceedingly popular for purposes both of reference and of loan. The acts are extended to include the provisions of museums and art galleries, but the borough councils have not as a rule availed themselves of this extension. The London County Council administers the Horniman Museum at Forest Hill, Lewisham. The City Corporation maintains the fine Guildhall library and museum. A few free libraries are supported by donations and subscriptions or charities. Besides the Government reference libraries at the British Museum and South Kensington there are other such libraries, of a specialized character, as at the Patent Office and the Record Office. Among lending libraries should be noticed the London Library in St James's Square, Pall Mall.

Theatres and Places of Entertainment.—The principal London theatres lie between Piccadilly and Temple Bar, and High Holborn and Victoria Street, the majority being in Shaftesbury Avenue, the Haymarket, the neighbourhood of Charing Cross and the Strand. At these central theatres successful plays are allowed to "run" for protracted periods, but there are numerous fine houses in other parts of London which are generally occupied by a succession of touring companies presenting either revivals of popular plays or plays successful at the moment in the central theatres. The principal music halls (variety theatres) are in Shaftesbury Avenue, Piccadilly Circus, Leicester Square and the Strand. The Covent Garden theatre is the principal home of grand opera; the building, though spacious, suffers by comparison with the magnificence of opera houses in some other capitals, but during the opera season the scene within the theatre is brilliant. The chief halls devoted mainly to concerts are the Royal Albert Hall, close to the South Kensington museums, and Queen's Hall in Langham Place, Regent Street. For a long time St James's Hall (demolished in 1905) between Regent Street and Piccadilly was the chief concert hall. Oratorio is given usually in the Albert Hall, the vast area of which is especially suited for a large chorus and orchestra, and at the Crystal Palace (*q.v.*). This latter building, standing on high ground at Sydenham, and visible from far over the metropolis, is devoted not only to concerts, but to general entertainment, and the extensive grounds give accommodation for a variety of sports and amusements. Among other popular places of entertainment may be mentioned the exhibition grounds and buildings at Earl's Court; similar grounds at Shepherd's Bush, where a Franco-British Exhibition was held in 1908, an Imperial Exhibition in 1909, and an Anglo-Japanese in 1910; the great Olympia hall, West Kensington; the celebrated wax-work exhibition of Madame Tussaud in Marylebone Road, the Alexandra Palace, Muswell Hill, an institution resembling the Crystal Palace; and the Agricultural Hall, Islington, where agricultural and other exhibitions are held. The well-known Egyptian Hall in Piccadilly was taken down in 1906, and the permanent conjuring entertainment for which (besides picture exhibitions) it was noted was removed elsewhere. Theatres, music halls, concert halls and other places of entertainment are licensed by the County Council, except that the licence for stage-plays is granted by the lord chamberlain under the Theatres Act 1843. The council provides for inspection of places of entertainment in respect of precautions against fire, structural safety, &c. The principal clubs are in and about Piccadilly and Pall Mall (see CLUB). A club for soldiers, sailors and marines in London, called the Union Jack Club, was opened in Waterloo Road by King Edward VII. in 1907.

Parks and Open Spaces: Administration.—The administration of parks and open spaces in and round London, topographical details of the principal of which are given in Section I., is divided between the Office of Works, the London County Council, the City Corporation and the borough councils. The Office of Works controls the Royal parks, the County Council controls the larger parks and open spaces not under Government or City control, and the borough councils the smaller; while the City Corporation controls certain public grounds outside the County of London. There are a few other bodies controlling particular open spaces, as the following list of public grounds exceeding 50 acres (in 1910) will show:—

1. *Under the Office of Works:—*		
Green Park	52¾	acres
Greenwich Park	185	,,
Hyde Park	363¾	,,
Kensington Gardens	274½	,,
Regent's Park	472¼	,,
St James's Park	93	,,
2. *Under the War Office:—*		
Woolwich Common	159	,,
3. *Under the London County Council:—*		
Avery Hill, Eltham	80	,,
Battersea Park	199½	,,
Blackheath	267	,,
Bostall Heath and Woods, Woolwich	133¾	,,
Brockwell Park, Herne Hill	127¼	acres
Clapham Common	205	,,
Clissold Park	54½	,,
Dulwich Park	72	,,
Finsbury Park	115	,,
Hackney Marsh	339	,,
Hainault Forest, Essex	805	,,
Hampstead Heath	320½	,,
Ladywell Ground, Lewisham	51½	,,
Marble Hill, Twickenham	66	,,
Millfields, Hackney	62½	,,
Parliament Hill	267¼	,,
Peckham Rye and Park	112¾	,,
Plumstead Common	103	,,
Southwark Park	63	,,
Streatham Common	66¼	,,
Tooting Bec Common	151¾	,,
Tooting Graveney Common	66	,,
Victoria Park, East London	217	,,
Wandsworth Common	155	,,
Wormwood Scrubbs	193	,,
4. *Under the City Corporation:—*		
Burnham Beeches, Buckinghamshire	375	,,
Coulsdon Commons, Surrey	347	,,
Epping Forest, Essex	5559½	,,
Highgate Woods	69	,,
West Ham Park	77	,,

Wimbledon and Putney Commons are under a board of conservators. The London County Council's parks and open spaces increased in number from 40 in 1890 to 114 in 1907, and in acreage from 2656 to 5006 in the same years. The expenditure in 1907–1908 was £131,582, which sum included £11,987 for bands. (See also separate articles on boroughs.)

Bathing (at certain hours) and boating are permitted in the ornamental waters in several of the parks, music is provided and much attention is paid to the protection of waterfowl and other birds, while herds of deer are maintained in some places, and also botanical gardens. Surplus plants and cuttings are generally distributed without charge to educational or charitable institutions, and to the poor. Provision is made for cricket, football and other games in a number of the parks. Large gatherings of spectators are attracted to the first-class cricket matches played at Lord's ground, St John's Wood, by the Marylebone Club and the Middlesex County teams, Eton College against Harrow School, and Oxford against Cambridge University; to the Kennington Oval for the matches of the Surrey club, and the Leyton ground for those of the Essex club. In the Crystal Palace grounds the final match for the English Association Football cup is generally played, and huge crowds from both the metropolis and the provinces witness the game. At Queen's Club, West Kensington, the annual Oxford and Cambridge athletic meeting and others take place, besides football matches, and there is covered accommodation for tennis and other games. Professional association football teams are maintained locally in several parts of London, and much popular interest is taken in their matches. Rugby football is upheld by such notable teams as Blackheath and Richmond. Fashionable society takes its pastimes at such centres as the grounds of the Hurlingham and Ranelagh clubs, at Fulham and Barnes respectively, where polo and other games are played; and Rotten Row, the horse-track in Hyde Park, is the favourite resort of riders. In summer, boating on the lovely reaches of the Thames above the metropolis forms the recreation of thousands. The growth of popularity of the cycle, and later of the motor-car, has been a principal factor in the wide development of a tendency to leave London during the "week-end," that is to say, as a rule, for Saturday afternoon and Sunday. With many this is a practice at all seasons, and the railway companies foster the habit by means of tickets at reduced fares to all parts. The watering-places of the Sussex, Kent and Essex coasts, and pre-eminently Brighton, are specially favoured for these brief holidays.

VI. COMMERCE

Port of London.—The extent of the Port of London has been variously defined for different purposes, but for those of the Port Authority it is taken to extend from Teddington Lock to a line between Yantlet Creek in Kent and the City Stone opposite Canvey Isle and in Essex. London Bridge is to outward appearance the up-river limit of the port. There are wharves and a large carrying trade in barges above this point, but below it the river is crowded with shipping, and extensive docks open on either hand.

Towards the close of the 19th century evidence was accumulating that the development of the Port of London was not keeping pace with that of shipping generally. In 1900 a Royal Commission was appointed to investigate the existing administration of the port, the alleged inadequacy of accommodation for vessels and kindred questions, and to advance a scheme of reform. The report, issued in 1902, showed apprehension to be well founded. The river, it was ascertained, was not kept sufficiently dredged; the re-export trade was noted as showing an especially serious decline, and the administration was found to suffer from decentralization. The recommendations of the Commission included the creation of a single controlling authority to take over the powers of the Thames Conservancy Watermen's Company, and Trinity House and the docks of the companies already detailed. This authority, it was advised, should consist of 40 members, of whom 11 should be nominated by the London County Council and 3 by the Corporation of the City (supposing these bodies to accept certain financial responsibilities proposed in the direction of river improvements), 5 by the governors of the Bank of England from the mercantile community, 2 by the London Chamber of Commerce, and 1 each by the Admiralty, Board of Trade and Trinity House. The remaining members should be elected by various groups, *e.g.* shipowners, barge owners, the railway companies interested, &c. Rival schemes, however, were proposed by the London County Council, which proposed to take over the entire control through a committee, by the City Corporation, which suggested that it should appoint 10 instead of 3 members to the new board; and by the London Chamber of Commerce, which proposed a Harbour Trust of *ex-officio* and elected members. The Thames Conservancy also offered itself as the public authority. In 1902 a Mansion House Conference was convened by the lord mayor and a deputation was appointed which in 1903 pressed the solution of the matter upon the government.

Thames barrage scheme.

A noteworthy scheme to improve the condition of the Thames, first put forward in 1902–1903, was that of constructing a dam with four locks across the river between Gravesend and Tilbury. The estimated cost was between three and four millions sterling, to be met by a toll, and it was urged that a uniform depth, independent of tides, would be ensured above the dam, that delay of large vessels wishing to proceed up river would thus be obviated, that the river would be relieved of pollution by the tides, and the necessity for constant dredging would be abolished. This "barrage scheme" was discussed at considerable length, and its theoretical advantages were not universally admitted. The scheme included a railway tunnel beneath the dam, for which, incidentally, a high military importance was claimed.

Port authorities before 1909.

In 1904 the Port of London Bill, embodying the recommendations of the Royal Commission with certain exceptions, was brought forward, but it was found impossible to carry it through. In 1908, however, the Port of London Act was passed, and came into force in 1909. This act provided for the establishment of a Port Authority, the constitution of which is detailed below, which took over the entire control of the port, together with the docks and other property of the several existing companies.

The principal dock companies, with the docks owned by them, were as follows:—

1. *London and India Company.*—This company had amalgamated all the docks on the north side of the river except the Millwall Docks. Following the river down from the Tower these docks, with dates of original opening and existing extent, are—St Katherine's (1828; 10½ acres), London (1805; 57½ acres), West India, covering the northern part of the peninsula called the Isle of Dogs (1802; 121½ acres), East India, Blackwall (1806; 38 acres), Royal Victoria and Albert Docks (1876 and 1880 respectively), parallel with the river along Bugsby's and Woolwich Reaches, nearly 3 m. in distance (181 acres) and Tilbury Docks, 25 m. below London Bridge, constructed in 1886 by the East and West India Docks Company (65 acres). Tilbury Docks are used by the largest steamers trading with the port.

2. *Millwall Docks* (1868), in the south part of the Isle of Dogs, are 36 acres in extent.

3. *Surrey Commercial Docks*, Rotherhithe (Bermondsey), occupy a peninsula between the Lower Pool and Limehouse Reach. There have been docks at Rotherhithe since the middle of the 17th century. The total area is 176 acres, a large new dock, the Greenland, being opened in 1904.

The principal railways have wharves and through connexions for goods traffic, and huge warehouses are attached to the docks. The custom house stands on the north bank, a short distance from London Bridge, in Lower Thames Street. It dates from 1817, the body of the building being by Laing, but the Corinthian façade was added by Smirke. It includes a museum containing ancient documents and specimens of articles seized by the customs authorities.

The chief authorities concerned in the government of the Port of London till 1909 were:—

1. *Thames Conservancy.*—For conservancy purposes, regulation of navigation, removal of obstruction, dredging, &c.

2. *City Corporation.*—Port sanitary purposes from Teddington Lock seawards.

3. *Trinity House.*—Pilotage, lighting and buoying from London Bridge seawards.

4. *The Watermen's and Lightermen's Company.*—The licensing authority for watermen and lightermen.

Besides these authorities, the London County Council, the Board of Trade, the Admiralty, the Metropolitan and City Police, police of riparian boroughs, Kent and Essex Fisheries Commissioners, all the dock companies and others played some part in the government and public services of the port.

Port Authority.—The Port of London Authority, as constituted by the act of 1908, is a body corporate consisting of a chairman, vice-chairman, 17 members elected by payers of dues, wharfingers and owners of river craft, 1 member elected by wharfingers exclusively, and 10 members appointed by the following existing bodies—Admiralty (one); Board of Trade (two); London County Council (two from among its own members and two others); City Corporation (one from among its own members and one other); Trinity House (one). The Board of Trade and the County Council must each, under the act, consult with representatives of labour as to the appointment of one of the members, in order that labour may be represented on the Port Authority. The first "elected" members were actually, under the act, appointed by the Board of Trade. The undertakings of the three dock companies mentioned above were transferred to and vested in the Port Authority, an equivalent amount of port stock created under the act being issued to each. The Port Authority has full powers to authorize construction works. All the rights, powers and duties of the Thames Conservancy, so far as concerns the Thames below Teddington Lock, were transferred to the Port Authority under the act, as also were the powers of the Watermen's Company in respect of the registration and licensing of vessels, and the regulation of lightermen and watermen. The Port Authority fixes the port rates, which, however, must not in any two consecutive years exceed one-thousandth part of the value of all imports and exports, or a three-thousandth of the value of goods discharged from or taken on board vessels not within the premises of a dock. Preferential dock charges are prohibited and a port fund established under the act. The authority has powers to borrow money, but for certain purposes in this connexion, as in other matters, it can only act subject to the approval of the Board of Trade.

Commerce.—The following figures may be quoted for purposes of comparison at different periods:—

Value of Exports of Home Produce (1840), £11,586,037; (1874), £60,232,118; (1880), £52,600,929; (1902–1905 average), £60,095,294. *Imports* (1880), £141,442,907; (1902–1905), £174,059,316. These figures point to the fact that London is essentially a mart, and neither is itself, nor is the especial outlet for, a large manufacturing centre; hence imports greatly exceed exports.

Vessels entered and cleared (foreign and colonial trade):—

Year.	Entered.	Cleared.
	Tonnage.	Tonnage.
1694	135,972	81,148
1750	511,680	179,860
1800	796,632	729,554
1841–1850 (average)	1,596,453	1,124,793
1881	5,810,043	4,478,960
1895	8,435,676	6,110,325
1905	10,814,115	7,913,115

In the coastwise trade, in 1881, 38,953 vessels of 4,545,904 tons entered; in 1895, 43,704 vessels of 6,555,618 tons; but these figures include vessels trading within the Thames estuary (ports of London, Rochester, Colchester and Faversham), which later returns do not. Omitting such vessels, therefore, the number which entered in the coastwise trade in 1905 was 16,358 of 6,374,832 tons.

Business.—The City has been indicated as the business centre of the metropolis. Besides the Royal Exchange, in the building of which are numerous offices, including "Lloyd's," the centre of the shipping business and marine insurance, there are many exchanges for special articles. Among these are the Corn Exchange in Mark Lane, where the privilege of a fair was originally granted by Edward I.; the Wool Exchange, Coleman Street; the Coal Exchange, Lower Thames Street; the Shipping Exchange, Billiter Street; and the auction mart for landed property in Tokenhouse Yard. The Hop Exchange is across the river in Southwark. In Mincing Lane are the commercial salerooms. Besides the Bank of England there are many banking houses; and the name of Lombard Street, commemorating the former money dealers of Lombardy, is especially associated with them. The majority of the banks are members of the Clearing House, Post Office Court, where a daily exchange of drafts representing millions of pounds sterling is effected. The Royal Mint is on Tower Hill. The Stock Exchange is in Capel Court, and numbers of brokers have their offices in the vicinity of the Royal Exchange and the Bank of England.

Manufactures and Retail Trade.—No part of London can be pointed out as essentially a manufacturing quarter, and there is a strong tendency for manufacturing firms to establish their factories outside the metropolis. There are, however, several large breweries, among which that of Messrs Barclay & Perkins, on the riverside in Southwark, may be mentioned; engineering works are numerous in East London by the river, where there are also shipbuilding yards; the leather industry centres in Bermondsey, the extensive pottery works of Messrs Doulton are in Lambeth, there are chemical works on the Lea, and paper-mills on the Wandle. Certain industries (not confined to factories) have long been associated with particular localities. Thus, clock-makers and metal-workers are congregated in Finsbury, especially Clerkenwell and in Islington; Hatton Garden, near Holborn Viaduct, is a centre for diamond merchants; cabinet-making is carried on in Bethnal Green, Shoreditch and the vicinity; and large numbers in the East End are employed in the match industry. Silk-weaving is still carried on in the district of Spitalfields (see STEPNEY). West of the City certain streets are essentially connected with certain trades. The old-established collection of second-hand book-shops in Holywell Street was only abolished by the widening of the Strand, and a large proportion then removed to Charing Cross Road. In the Strand, and more especially in Fleet Street and its offshoots, are found the offices of the majority of the most important daily newspapers and other journals. Carriage and motor-car warehouses congregate in Long Acre. In Tottenham Court Road are the showrooms of several large upholstering and furnishing firms. Of the streets most frequented on account of their fashionable shops Bond Street, Regent Street, Oxford Street, Sloane Street and High Street, Kensington, may be selected. In the East End and other poor quarters a large trade in second-hand clothing, flowers and vegetables, and many other commodities is carried on in the streets on movable stalls by costermongers and hawkers.

Markets.—The City Corporation exercises a control over the majority of the London markets, which dates from the close of the 14th century, when dealers were placed under the governance of the mayor and aldermen. The markets thus controlled are:

Central Markets, Smithfield, for meat, poultry, provisions, fruit, vegetables, flowers and fish. These extend over a great area north of Newgate Street and east of Farringdon Road. Beneath them are extensive underground railway sidings. A market for horses and cattle existed here at least as early as the time of Henry II.

Leadenhall Market, Leadenhall Street, City, for poultry and meat. This market was in existence before 1411 when it came into the possession of the City.

Billingsgate Market, by the Thames immediately above the custom house, for fish. Formerly a point of anchorage for small vessels, it was made a free market in 1699.

Smithfield Hay Market.
Metropolitan Cattle Market, Copenhagen Fields, Islington.
Deptford Cattle Market (foreign cattle).
Spitalfields Market (fruit, vegetables and flowers).
Shadwell Market (fish).

Of other markets, the Whitechapel Hay Market and Borough Market, Southwark, are under the control of trustees; and Woolwich Market is under the council of that borough. Covent Garden, the great mart in the west of London for flowers, fruit and vegetables, is in the hands of private owners. It appears to have been used as a market early in the 17th century. Scenes of remarkable activity may be witnessed here and at Billingsgate in the early hours of the morning when the stock is brought in and the wholesale distributions are carried on.

VII. GOVERNMENT

Vestries.

Metropolitan Board of Works.

Administration before 1888.—The middle of the 19th century found the whole local administration of London still of a medieval character. Moreover, as complete reform had always been steadily resisted, homogeneity was entirely wanting. Outside the City itself a system of local government can hardly be said to have existed. Greater London (in the sense in which that name might then have been applied) was governed by the inhabitants of each parish in vestry assembled, save that in some instances parishes had elected select vestries under the provisions of the Vestries Act 1831. In neither case had the vestry powers of town management. To meet the needs of particular localities, commissioners or trustees having such powers had been from time to time created by local acts. The resulting chaos was remarkable. In 1855 these local acts numbered 250, administered by not less than 300 bodies, and by a number of persons serving on them computed at 10,448. These persons were either self-elected, or elected for life, or both, and therefore in no degree responsible to the ratepayers. There were two bodies having jurisdiction over the whole metropolis except the City, namely, the officers appointed under the Metropolitan Building Act of 1844, and the Metropolitan Commissioners of Sewers, appointed under the Commissioners of Sewers Act 1848. Neither body was responsible to the ratepayers. To remedy this chaotic state of affairs, the Metropolis Management Act 1855 was passed. Under that act a vestry elected by the ratepayers of the parish was established for each parish in the metropolis outside the City. The vestries so elected for the twenty-two larger parishes were constituted the local authorities. The fifty-six smaller parishes were grouped together in fifteen districts, each under a district board, the members of which were elected by the vestries of the constituent parishes. A central body, styled the Metropolitan Board of Works, having jurisdiction over the whole metropolis (including the City) was also established, the members of which were elected by the Common Council of the City, the vestries and district boards, and the previously established local board of Woolwich (*q.v.*). Further the area of the metropolis for local government purposes was for the first time defined, being the same as that adopted in the Commissioners of Sewers Act, which had been taken from the area of the weekly bills of mortality. The Metropolitan Board of Works was also given certain powers of supervision over the vestries and district boards, and superseded the commissioners of sewers as authority for main drainage. By an act of the same session it became the central authority for the administration of the Building Acts, and subsequently had many additional powers and duties conferred upon it. The vestries and district boards became the authorities for local drainage, paving, lighting, repairing and maintaining streets, and for the removal of nuisances, &c.

London County Council.

Acts of 1888 and 1899.—An objection to the Metropolitan Board of Works soon became manifest, inasmuch as the system of election was indirect. Moreover, some of its actions were open to such suspicion that a royal commission was appointed to inquire into certain matters connected with the working of the board. This commission issued an interim report in 1888 (the final report did not appear until 1891), which disclosed the inefficiency of the board in certain respects, and also indicated the existence of corruption. Reform followed immediately. Already in 1884 Sir William Harcourt had attempted to constitute the metropolis a municipal borough under the government of a single council. But in 1888 the Local Government Act, dealing with the area of the metropolis as a separate county, created the London County Council as the central administrative body, possessing not only the powers of an ordinary county council, but also extensive powers of town management, transferred to it from the abolished Board of Works. Here, then, was the central body, under their direct control, which inhabitants of London had hitherto lacked. The question of subsidiary councils remained to be settled. The wealthier metropolitan parishes became discontented with the form of local government to which they remained subject, and in 1897 Kensington and Westminster petitioned to be created boroughs by the grant of charters under the Municipal Corporation Acts. These, however, were inapplicable to London, and it was realized

Metropolitan boroughs.

that the bringing of special legislation to bear on special cases (as the petition of these two boroughs would have demanded) would be inexpedient as making against homogeneity. Instead, the London Government Act of 1899 was evolved. It brought into existence the twenty-eight Metropolitan boroughs enumerated at the outset of this article. The county of London may thus be regarded from the administrative standpoint as consisting of twenty-nine contiguous towns, counting the City of London. As regards the distribution of powers and duties between the County Council and the Borough Councils, and the constitution and working of each, the underlying principle may be briefly indicated as giving all powers and duties which require uniformity of action throughout the whole of London to the County Council, and powers and duties that can be locally administered to the Borough Councils.

Summary of Administrative Bodies.—The administrative bodies of the County of London may now be summarized:

1. *London County Council.*—Consists of 118 councillors, 2 elected by each parliamentary division (but the City of London elects 4); and 19 aldermen, with chairman, vice-chairman and deputy-chairman, elected in council. Triennial elections of councillors by householders (male and female) on the rate-books. Aldermen hold office for 6 years.

2. *Metropolitan Boroughs.*—Councils consist of a mayor and aldermen and councillors in proportion as 1 to 6. The commonest numbers, which cannot be exceeded, are 10 and 60 (see separate article on each borough). Triennial elections.

3. *Corporation of the City of London.*—The legislation of 1855, 1885 and 1894 left the government of the small area of the City in the hands of an unreformed Corporation. Here at least the medieval system, in spite of any anomalies with respect to modern conditions, has resisted reform, and no other municipal body shares the traditions and peculiar dignity of the City Corporation. This consists of a Lord Mayor, 26 aldermen and 206 common councilmen, forming the Court of Common Council, which is the principal administrative body. Its scope may be briefly indicated as including (a) duties exercised elsewhere by the Borough Councils, and by the London County Council (although that body is by no means powerless within the City boundaries); and (*b*) peculiar duties such as control of markets and police. The election of common councilmen, whose institution dates from the reign of Edward I., takes place annually, the electors being the ratepayers, divided among the twenty-five wards of the City. An alderman (*q.v.*) of each ward (save that the wards of Cripplegate within and without, share one) is elected for life. The Lord Mayor (*q.v.*) is elected by the Court of Aldermen from two aldermen nominated in the Court of Common Hall by the Livery, an electorate drawn from the members of the ancient trade gilds or Livery Companies (*q.v.*), which, through their control over the several trades or manufactures, had formerly an influence over the government of the city which from the time of Edward III. was paramount.

Non-administrative Arrangements.—The Local Government Act of 1888 dealt with the metropolis for non-administrative purposes as it did for administrative, that is to say, as a separate county. The arrangements of quarter-sessions, justices, coroners, sheriffs, &c., were thus brought into line with other counties, except in so far as the ordinary organization is modified by the existence of the central criminal court, the metropolitan police, police courts and magistrates, and a paid chairman of quarter-sessions. The powers of the governing body of the City, moreover, are as peculiar in this direction as in that of municipal administration, and the act left the City as a county of a city practically unchanged. Thus the Lord Mayor and aldermen possess judicial authority, and the police of London are divided into two separate bodies, the Metropolitan and the City Police (see POLICE).

Courts.

The chief courts for the trial of criminal cases are the Central Criminal Court and the Court of Quarter-sessions. The Central Criminal Court, taking the place of the provincial Assizes, was established by an act of 1834. There are twelve sessions annually, under the Lord Mayor, aldermen and judges. They were formerly held in the "Old Bailey" sessions-house, but a fine new building from designs of E. W. Mountford took the place of this in 1906. Quarter-sessions for the county of London are held thirty-six times annually, for the north side of the Thames at the Sessions-house in Clerkenwell (Finsbury) and for the south side at that in Newington Causeway, Southwark. For judicial purposes Westminster was merged with the county of London in 1889, and the Liberty of the Tower was abolished in 1894. The separate court of the Lord Mayor and Aldermen is held at the Guildhall. The Metropolitan police courts are fourteen in number, namely—Bow Street, Covent Garden; Clerkenwell; Great Marlborough Street (Westminster); Greenwich and Woolwich; Lambeth; Marylebone; North London, Stoke Newington Road; Southwark; South Western, Lavender Hill (Battersea); Thames, Arbour Street East (Stepney); West Ham; West London, Vernon Street (Fulham); Westminster, Vincent Square; Worship Street (Shoreditch). The police courts of the City are held at the Mansion House, the Lord Mayor or an alderman sitting as magistrate, and at the Guildhall, where the aldermen preside in rotation. The prisons within the metropolis are Brixton, Holloway, Pentonville, Wandsworth and Wormwood Scrubbs. In the county of London there are 12 coroners' districts, 19 petty sessional divisions (the City forming a separate one) and 13 county court districts (the City forming a separate one). The boundaries of these divisions do not in any way correspond with each other, or with the police divisions, or with the borough or parish boundaries. The registration county of London coincides with the administrative county.

Parliamentary Representation.—The London Government Act contains a saving clause by which "nothing in or done under this act shall be construed as altering the limits of any parliamentary borough or parliamentary county." The parliamentary boroughs are thus in many cases named and bounded differently from the metropolitan boroughs. The parliamentary arrangements of each metropolitan borough are indicated in the separate articles on the boroughs. In the following list the boroughs which extend outside the administrative county of London are noted. Each division of each borough, or each borough where not divided, returns one member, save that the City of London returns two members.

(*a*) *North of the Thames.* (1) Bethnal Green—*Divs.*: North-eastern, South-western. (2) Chelsea (detached portion in administrative county of Middlesex, Kensal Town). (3) Finsbury (detached portion in Middlesex, Muswell Hill)—*Divs.*: Holborn, Central, Eastern. (5) Fulham. (6) Hackney—*Divs.*: North, Central, South. (7) Hammersmith. (8) Hampstead. (9) Islington—*Divs.*: Northern, Southern, Eastern, Western. (10) Kensington—*Divs.*: Northern, Southern; (11) City of London. (12) Marylebone—*Divs.*: Eastern, Western. (13) Paddington (extending into Middlesex)—*Divs.*: Northern, Southern. (14) St George's Hanover Square. (15) St Pancras—*Divs.*: Northern, Southern, Eastern, Western. (16) Shoreditch—*Divs.*: Hoxton, Haggerston. (17) Strand. (18) Tower Hamlets—*Divs.*: Bow and Bromley, Limehouse, Mile End, Poplar, St George, Stepney, Whitechapel. (19) Westminster.

A detached portion of the parliamentary division of Hornsey, Middlesex, is in the metropolitan borough of Hackney. London University returns a member.

(*b*) *South of the Thames.* (1) Battersea and Clapham—*Divs.*: Battersea, Clapham. (2) Camberwell (extending into Kent)—*Divs.*: Northern, Peckham, Dulwich. (3) Deptford. (4) Greenwich. (5) Lambeth—*Divs.*: Northern, Kennington, Brixton, Norwood. (6) Lewisham. (7) Newington—*Divs.*: Western, Walworth. (8) Southwark—*Divs.*: Western, Rotherhithe, Bermondsey. (9) Wandsworth. (10) Woolwich.

Part of the Wimbledon parliamentary division of Surrey is in the metropolitan borough of Wandsworth.

Ecclesiastical Divisions and Denominations.—London north of the Thames is within the Church of England bishopric of London, the bishop's palace being at Fulham. In this diocese, which covers nearly the whole of Middlesex and a very small portion of Hertfordshire, are the suffragan bishoprics of Islington, Kensington and Stepney. The bishopric of Southwark was created in 1904, having been previously a suffragan bishopric in the diocese of Rochester. The county contains 612 ecclesiastical parishes. Westminster is the seat of the Roman Catholic archbishopric in England, and Southwark is a bishopric. Among the numerous chapels of dissenting bodies there may be mentioned the City Temple, Congregational, on Holborn Viaduct; the Metropolitan Tabernacle, Baptist, in Southwark, the creation of which was the outcome of the labours of the famous preacher Charles Spurgeon (d. 1892); and Wesley's Chapel, City Road, in the graveyard of which is the tomb of John Wesley; his house, which adjoins the chapel, being open as a memorial museum. In 1903 the Wesleyans acquired the site of the Royal Aquarium, near Westminster Abbey, for the erection of a central hall. The Great Synagogue of the Jews is in St James' Place, Aldgate.

The headquarters of the Salvation Army are in Queen Victoria Street, City. There are numerous foreign churches, among which may be mentioned the French Protestant churches in Monmouth Road, Bayswater and Soho Square; the Greek church of St Sophia, Moscow Road, Bayswater; and the German Evangelical church in Montpelier Place, Brompton Road, opened in 1904. (O. J. R. H.)

VIII. Finance

In addition to the provisions that have been mentioned above (Section VII.), the London Government Act 1899 simplified administration in two respects. The duties of overseers in London had been performed by most diverse bodies. In some parishes overseers were appointed in the ordinary manner; in others the vestry, by local acts and by orders under the Local Government Act 1894, was appointed to act as, or empowered to appoint, overseers, whilst in Chelsea the guardians acted as overseers. The act of 1899 swept away all these distinctions, and constituted the new borough councils in every case the overseers for every parish within their respective boroughs, except that the town clerk of each borough performs the duties of overseers with respect to the registration of electors.[1] Again, with regard to rates, there were in all cases three different rates leviable in each parish—the poor rate, the general rate and the sewers rate—whilst in many parishes in addition there was a separate lighting rate. From the sewers rate and lighting rate, land, as opposed to buildings, was entitled to certain exemptions. Under the act of 1899 all these rates are consolidated into a single rate, called the general rate, which is assessed, made, collected and levied as the poor rate, but the interests of persons previously entitled to exemptions are safeguarded. Further, every precept sent by an authority in London for the purpose of obtaining money (these authorities include the London County Council, the receiver of the Metropolitan Police, the Central Unemployed Body and the Boards of Guardians) which has ultimately to be raised out of a rate within a borough is sent direct to the council of the borough instead of filtering through other authorities before reaching the overseers. The only exceptions to this rule are: (1) precepts issued by the local government board for raising the sums to be contributed to the metropolitan common poor fund; and (2) precepts issued by poor law authorities representing two or more poor-law unions; in both these cases the precept has of necessity to be first sent to the guardians. The metropolitan borough councils make one general rate, which includes the amount necessary to meet their own expenditure, as well as to meet the demands of the various precepting authorities. There was thus raised in the year 1906–1907 a sum of £15,393,956 (in 1898–1899 the amount was £10,401,441); of this £11,012,424 was for central rates, which was subdivided into £7,930,275 for county services and £3,082,149 for local services, leaving a balance of £4,381,532, strictly local rates. The total local expenditure of London for the year 1906–1907 was £24,703,087 (in 1898–1899 it was only £14,768,757), the balance of £9,761,734 being made up by receipts-in-aid and imperial subventions. This expenditure was divided among the following bodies:

London County Council	£9,491,271
Metropolitan Borough Councils	5,009,982
Boards of Guardians	3,587,429
Metropolitan Water Board	2,318,618
Metropolitan Police	1,903,441
City Corporation	1,270,406
Metropolitan Asylums Board	934,463
Central (Unemployed) Body	141,284
Overseers—City of London	34,757
Market Trustees (Southwark)	10,680
Local Government Board—Common Poor Fund	756
	£24,703,087

The total expenditure was equal to a rate in the pound of 11s. 4·4d.; the actual amount raised in rates was equivalent to a rate of 7s. 1·0d., receipts-in-aid were equivalent to a rate of 3s. 2·5d., and imperial subventions to a rate of 1s. 3·4d. Practically the whole amount contributed towards the support of public local expenditure, and a considerable amount of that contributed to public national expenditure is based on the estimated annual value of the immovable property situated within the county of London, which in 1876 was £23,240,070; in 1886 £30,716,719; in 1896 £35,793,672; and in 1909 £44,666,651. The produce of a penny rate was, in the

(1) *Rate and Debt Accounts.*

Estimated Income.

Balances	£967,740
Receipts in aid of expenditure (local taxation licences and estate duty, beer and spirit duties, &c.)	513,541
Government grants in aid of education	1,515,663
Interest on loans advanced to local authorities, &c.	586,065
Rents, &c.	427,767
Contributions from revenue-producing undertakings for interest and repayment of debt	685,948
Miscellaneous	3,633
Rate contributions—	
General, for other than education	2,698,610
For education	3,675,694
Special	407,946
	£11,482,607

Estimated Expenditure.

Debt (including management)		£3,905,135
Grants (mostly guardians)		645,913
Pensions		75,665
Establishment charges		232,045
Judicial expenses		52,515
Services—		
Main drainage	£295,650	
Fire brigade	263,575	
Parks and open spaces	140,715	
Bridges, tunnels, ferry	49,925	
Embankments	14,940	
Pauper lunatics	78,870	
Inebriates Acts	14,045	
Coroners	30,925	
Weights and measures	14,830	
Gas testing	13,785	
Building Acts	25,595	
Diseases of Animals Acts	19,260	
Miscellaneous	63,060	
	£1,025,175	
Education	4,837,442	
Steamboats	14,805	
Works Dept.	12,100	5,889,522
Parliamentary expenses		22,675
Miscellaneous		6,214
Total expenditure		10,829,684
Balances		652,923
		£11,482,607

(2) *Revenue Producing Undertakings.*

Estimated Income.

Balances		£4,055
Receipts—		
Working class dwellings	£173,443	
Tramways	2,089,955	
Small Holdings and Allotments	410	
Parks boating	5,100	2,268,908
Transfers		6,214
		£2,279,177

Estimated Expenditure.

Working expenses—		
Working class dwellings	£56,060	
Tramways	1,318,620	
Small Holdings and Allotments	621	
Parks boating	2,965	£1,378,266
Renewals		163,828
Reserve		44,557
Interest on and repayment of debts		685,946
Transfer in relief of rates (parks boating)		2,000
Balances		4,580
		£2,279,177

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[1] Over 200 local acts were repealed by schemes made under the act of 1899.

metropolitan police district in 1908–1909, £226,739, and in the county of London (excluding the City) £161,806. A complete re-valuation of properties in the county of London is made every five years, valuation lists being prepared in duplicate by the borough councils acting as overseers of the parishes in their respective boroughs. They are revised by statutory assessment committees, who hear any objections by ratepayers against their valuation. These lists when revised are sent to the clerk of the County Council, who publishes the totals. By the Metropolitan Poor Act 1867, the metropolitan common poor fund, to which each union in London contributes in proportion to its rateable value, was established. Out of this fund certain expenses of guardians in connexion with the maintenance of indoor paupers and lunatics, the salaries of officers, the maintenance of children in poor-law schools, valuation, vaccination, registration, &c., are paid. The payments amounted in 1906–1907 to £1,662,942. Under the Local Government Act 1888, the London County Council makes grants to boards of guardians, sanitary authorities and overseers in London in respect of certain services. This grant is in lieu of the grants formerly made out of the exchequer grant in aid of local rates, and amounted in 1906–1907 to £619,489. Finally, in 1894, the fund called the Equalization Fund was established. This fund is raised by the rate of 6d. in the pound on the assessable value of the county of London, and redistributed among the boroughs in proportion to their population. It amounted in 1906–1907 to £1,094,946. But, in spite of attempts at equalization, rates remain very unequal in London, and varied in 1908 from 6s. 2d. in St Anne's, Westminster, to 11s. 6d. in Poplar. The London County Council levied in 1909–1910 to meet its estimated expenditure for the year a total rate of 36·75d.; 14·50d. of this was for general county purposes, 19·75d. for education purposes and 2·50d. for special county purposes. The preceding tables show the estimated income and expenditure of the London County Council for 1909–1910.

Besides the annual expenditure of the various authorities large sums have been borrowed to defray the cost of works of a permanent nature. The debt of London, like that of other municipalities, has considerably increased and shows a tendency to go on increasing, although certain safeguards against too ready borrowing have been imposed. Every local authority has to obtain the sanction of some higher authority before raising a loan, and there are in addition certain statutory limits of borrowing. Metropolitan borough councils have to obtain the sanction of the Local Government Board to loans for baths, washhouses, public libraries, sanitary conveniences and certain other purposes under the Public Health Acts; for cemeteries the sanction of the Treasury is required, and for all other purposes that of the London County Council; poor law authorities, the metropolitan asylums board, the metropolitan water board and the central (unemployed) body require the sanction of the Local Government Board; the receiver for the metropolitan police district that of the Home Office, and the London County Council that of parliament and the Treasury. The following table gives the net loans outstanding of the several classes of local authorities in London at the 31st of March 1908:

Local Authorities.	Loans outstanding 31st March 1908.
London County Council (*excluding loans advanced to other authorities*)	£49,938,131
Metropolitan Asylums Board	3,113,612
Metropolitan Police (London's proportion).	226,131
Metropolitan Water Board (proportion)	38,726,514
Central (Unemployed) Body	31,845
City of London Corporation	5,553,173
Metropolitan Borough Councils	12,551,204
Guardians and sick asylum managers	4,029,013
	£114,169,623

Authorities.—Full details and figures relating to the finance of London will be found in the parliamentary papers *Local Taxation Returns* (*England and Wales*), part iv. published annually; *Returns relating to the London County Council*, published annually; the annual report and accounts of the Metropolitan Water Board, and the metropolitan police accounts. The publications of the London County Council, especially the tramways accounts, the annual estimates, *London Statistics*, and the *Financial Abstract* (10 years ended 31st March 1908) have much valuable information. (T. A. I.)

IX. History

1. *British and Roman to A.D. 449.*—There is practically no record of British London, and considerable difference of opinion exists among antiquaries as to its very existence. Bishop Stillingfleet held that London was of Roman foundation and not older than the time of Claudius (*Origines Brit.*, 1685, p. 43); and Dr Guest affirmed that the notion of a British town having "preceded the Roman camp has no foundation to rest upon" (*Archaeological Journal*, xxiii. 180). J. R. Green expressed the same opinion in *The Making of England* (p. 101). On the other side Kemble held that it was difficult to believe that Cair Lunden was an unimportant place even in Caesar's day (*Saxons in England*, ii. 266); and Thomas Lewin believed that London had attained prosperity before the Romans came, and held that it was probably the capital of Cassivellaunus, which was taken and sacked by Julius Caesar (*Archaeologia*, xl. 59). The origin of London will probably always remain a subject of dispute for want of decisive facts.

The strongest reason for believing in a British London is to be found in the name, which is undoubtedly Celtic, adopted with little alteration by the Romans. It is also difficult to believe that Londinium had come to be the important commercial centre described by Tacitus (A.D. 61) if it had only been founded a few years before the conquest of Claudius.

The discovery by General Pitt Rivers in 1867 of the remains of pile dwellings both on the north and on the south of the Thames gives ground for an argument of some force in favour of the date of the foundation of London having been before the Roman occupation of Britain. Of Roman London we possess so many remains that its appearance can be conjectured with little difficulty.

During the centuries when Britain was occupied by the Romans (A.D. 43–409) there was ample time for cities to grow up from small beginnings, to overflow their borders and to be more than once rebuilt. The earliest Roman London must have been a comparatively small place, but it probably contained a military fort of some kind intended to cover the passage of the river.

Extent of Roman London.

The Roman general Paulinus Suetonius, after marching rapidly from Wales to put down a serious insurrection, found Londinium unfitted for a base of military operations, and therefore left the place to the mercy of Boadicea, who entirely destroyed it, and killed the inhabitants. After this the need of fortifying Londinium must have been apparent, and a walled city of small dimensions arose soon after the defeat of the British queen. The earliest Roman city probably extended as far as Tower Hill on the east, and there is reason to believe that it did not include any ground to the west of Leadenhall. The excavations at the latter place in 1881 threw great light upon the early history of London. The foundation walls of a basilica were discovered, and from the time when that was built until the present day the ground has always been devoted to public uses. How far north the first wall was placed it is difficult to guess. One help towards a settlement of the question may be found in the discovery of burial places. As it was illegal in Roman times to bury within the walls, we are forced to the conclusion that the places where these sepulchral remains have been found were at one time extramural. Now no such remains have been found between Gracechurch Street and the Tower. The northern wall was placed by Roach Smith somewhere along the course of Cornhill and Leadenhall Street. The second extension of the city westwards was probably to Wallbrook.

In the latest or third Roman enclosure the line of the wall ran straight from the Tower to Aldgate, where it bent round somewhat to Bishopsgate. On the east it was bordered by the district subsequently called the Minories and Houndsditch. The line from Bishopsgate ran eastward to St Giles's churchyard (Cripplegate), where it turned to the south as far as Falcon square; again westerly by Aldersgate round the site of the Greyfriars (afterwards Christ's Hospital) towards Giltspur Street, then south by the Old Bailey to Ludgate, and then down to the Thames, where Dr Edwin Freshfield suggests that a Roman fortress stood on the site of Baynard's Castle. This is most probable, because the Romans naturally required a special protection on the river at the west as well as at the east. So in later times when William the Conqueror planned the Tower he gave the site at the western extremity to his follower Ralph Baynard, where was erected the stronghold known as Baynard's Castle. Roach Smith pointed out that the enclosure indicated above gives dimensions far greater than those of any other town in Britain. There can be no doubt that within the walls there was originally much unoccupied space, for with the single exception of the larger circuit south of Ludgate, up to where the river Fleet ran, made in 1276 for the benefit of the Black Friars, the line of the walls, planned by the later Romans, remained complete until the Great Fire (1666). The Thames formed the natural barrier on the south, but the Romans do not appear to have been content with this protection, for they built a wall here in addition, which remained for several centuries. Portions of this wall have been discovered at various times.

It is difficult even to guess when the third wall was erected. The emperor Theodosius came to London from Boulogne to mature his plan for the restoration of the tranquillity of the province. As Theodosius is said to have left Britain in a sound and secure condition it has been suggested that to him was due the wall of the later Londinium, but there is little or no evidence for this opinion, and according to an old tradition Constantine the Great walled the city at the request of his mother Helena, presumed to be a native of Britain. There is, however, some evidence in favour of the supposition that the wall was built at a much earlier date. It is not improbable that early in the 2nd century the wall was finished at the west portion and enclosed a cemetery near Newgate. Sir William Tite, in describing a tessellated pavement found in 1854 on the site of the Excise Office (Bishopsgate Street), expresses the opinion that the finished character of the pavement points to a period of security and wealth, and fixes on the reign of Hadrian (A.D. 117–138), to which the silver coin found on the floor belongs, as the date of its foundation.

The historians of the Roman Empire have left us some particulars of the visits of emperors and generals to Britain, but little or nothing about what happened in London, and we should be more ignorant than we are of the condition of Londinium if it had not been that a large number of excavations have been made in various parts of the city which have disclosed a considerable amount of its early history. From these remains we may guess that London was a handsome city in the reign of Hadrian, and probably then in as great a position of importance as it ever attained. This being so, there seems to be reason in attributing the completed walls to this period.

Remains of Roman Wall.

The persistence of the relics of the walls of London is one of the most remarkable facts of history. Pieces of the wall are to be seen in various parts of the city, and are frequently found when extensive excavations are made for new buildings. In some places where the Roman wall is not to be seen there still exist pieces of the old wall that stand upon Roman foundations. In Amen Court, where the residences of canons of St Paul's and the later houses of the minor canons are situated, there stretches such a piece of wall, dividing the gardens of the Court from the Old Bailey. Of the few accessible fragments of the Roman wall still existing special mention may be made of the bastion in the churchyard of St Giles's, Cripplegate; a little farther west is a small fragment in St Martin's Court, Ludgate Hill (opposite the Old Bailey), but the best specimen can be seen near Tower Hill just out of George Street, Trinity Square. Early in the 20th century a fragment nearly 40 ft. long, together with the base of a bastion, was brought to light in digging for the foundation of some large warehouses in Camomile Street, at a depth of 10 ft. below the level of the present street. A considerable portion of the old wall was laid bare by the excavations for the new Post Office in St Martin's-le-Grand. From a comparison of these fragments with the descriptions of Woodward, Maitland and others, who in the early part of the 18th century examined portions of the wall still standing, we learn that the wall was from 9 to 12 ft. thick, and formed of a core of rough rubble cemented together with mortar (containing much coarse gravel) of extraordinary hardness and tenacity, and a facing for the most part of stone—Kentish rag, freestone or ironstone—but occasionally of flints; about 2 ft. apart are double layers of tiles or bricks which serve as bonding courses. The wall appears to have been about 20 ft. high, the towers from 40 to 50 ft., but when described only the base was Roman. Upon that was raised a wall of rough rubble rudely faced with stone and flint, evidently a medieval work and about 2½ ft. thick; then succeeded a portion wholly of brick, terminating in battlements topped with copings of stone.

Gates and buildings.

Although the course of the later Roman walls is clear, we do not know with any certainty the position of the Roman gates. They were not the same as the medieval gates which have left the record of their names in modern London nomenclature. It follows, therefore, that the main streets also are not in line with the Roman ways, except perhaps in a few instances. Many ineffectual attempts have been made to connect the Watling street in the city with the great Roman road so named in medieval times. The name of the small street is evidently a corruption, and in the valuable Report of the MSS. of the Dean and Chapter of St Paul's (*Ninth Report of the Historical MSS. Commission*, Appendix, p. 4) the original name is given as "Atheling Street," and instances of this spelling are common in the 13th century. The form Watling Street seems to occur first in 1307. Stow spells it Watheling Street (Kingsford's edition of Stow's *Survey*, 1908, vol. ii. p. 352). Sir William Tite gave reasons for believing that Bishopsgate Street was not a Roman thoroughfare, and in the excavations at Leadenhall the basilica to which allusion has already been made was found apparently crossing the present thoroughfare of Gracechurch Street. Tite also agreed with Dr Stukeley's suggestion that on the site of the Mansion House (formerly Stocks Market) stood the Roman forum, and he states that a line drawn from that spot as a centre would pass by the pavements found on the site of the Excise Office. Besides the forum Stukeley suggested the sites of seven other buildings—the *Arx Palatina* guarding the south-eastern angle of the city where the Tower now stands, the grove and temple of Diana on the site of St Paul's, &c. No traces of any of these buildings have been found, and they are therefore purely conjectural. Stukeley's industrious researches into the history of Roman London cannot be said to have any particular value, although at one time they enjoyed considerable vogue. As to the Temple of Diana, Sir Christopher Wren formed an opinion strongly adverse to the old tradition of its existence (*Parentalia*, p. 266). Although we know that the Christian church was established in Britain during the later period of the Roman domination, there is little to be learnt respecting it, and the bishop Restitutus, who is said to have attended an Ecclesiastical Council, is a somewhat mythical character. In respect to the discovery of the position of the Roman gates, the true date of the *Antonini Itinerarium* (*q.v.*) is of great importance, as it will be seen from it that Londinium was either a starting-point or a terminus in nearly half the routes described in the portion relating to Britain. This would be remarkable if the work dated back to the 2nd century. Probably in the later, as in the earlier time, Londinium had the usual four gates of a Roman city, with the main roads to them. The one on the east was doubtless situated near where Aldgate afterwards stood. On the south the entrance to Londinium must always have been near where London Bridge was subsequently built. On the west the gate could not have been far from the place afterwards occupied by Newgate. As to Ludgate there is reason to believe that if there was an opening there in Roman times it was merely a postern. On the north the gate may have been near Bishopsgate or at Aldersgate. If we take from the *Itinerary* the last station before Londinium in all the routes we shall be able to obtain some idea of the position of the gate entered from each route by drawing a line on the map of London to the nearest point. Ammianus Marcellinus (about A.D. 390) speaks twice of Londinium as an ancient town to which the honourable title of Augusta had been accorded. Some writers have been under the misapprehension that this name for a time superseded that of Londinium. The anonymous Chorographer of Ravenna calls the place Londinium Augusta, and doubtless this was the form adopted.

The most interesting Roman relic is "London Stone." It has generally been supposed to be a "milliarium" or central point for measuring distances, but Sir Christopher Wren believed it

London Stone.

was part of some more considerable monuments in the forum (*Parentalia*, pp. 265, 266). Holinshed (who was followed by Shakespeare in *2 Henry VI.*, act 4 sc. 6) tells us that when Cade, in 1450, forced his way into London, he first of all proceeded to London Stone, and having struck his sword upon it, said in reference to himself and in explanation of his own action, "Now is Mortimer lord of this city." Mr H. C. Coote, in a paper published in the *Trans. London and Middlesex Arch. Soc.* for 1878, points out that this act meant something to the mob who followed the rebel chief, and was not a piece of foolish acting. Mr Laurence Gomme (*Primitive Folk-Moots*, pp. 155, 156) takes up the matter at this point, and places the tradition implied by Cade's significant action as belonging to times when the London Stone was, as other great stones were, the place where the suitors of an open-air assembly were accustomed to gather together and to legislate for the government of the city. Corroborative facts have been gathered from other parts of the country, and, although more evidence is required, such as we have is strongly in favour of the supposition that the London Stone is a prehistoric monument.

The first London Bridge.

One of the most important questions in the history of London that requires settlement is the date of the building of the first bridge, that is whether it was constructed by Britons or by Romans. If the Britons had not already made the bridge before the Romans arrived it must have been one of the first Roman works. As long as there was no bridge to join the north and south banks of the Thames the great object of Roman rule remained unfulfilled. This object was the completion of a system of roads connecting all parts of the Empire with Rome.

Dio Cassius, who lived in the early part of the 3rd century (*Hist. Rom.* lib. lx. c. 20), states that there was a bridge over the Thames at the time of the invasion of Claudius (A.D. 43), but he places it a little above the mouth of the river ("higher up"). The position is vague, but the mouth of the Thames in these early times may be considered as not far from the present position of London Bridge. Sir George Airy held that this bridge was not far from the site of London Bridge (*Proceedings of Institut. Civil Engineers*, xlix. 120), but Dr Guest was not prepared to allow that the Britons were able to construct a bridge over a tidal river such as the Thames, some 300 yds. wide, with a difference of level at high and low water of nearly 20 ft. He therefore suggested that the bridge was constructed over the marshy valley of the Lea, probably near Stratford. It needs some temerity to differ from so great an authority as Dr Guest, but it strikes one as surprising that, having accepted the fact of a bridge made by the Britons, he should deny that these Britons possessed a town or village in the place to which he supposes that Aulus Plautius retired.

As the Welsh word for "bridge" is "pont," and this was taken directly from the Latin, the inference is almost conclusive that the Britons acquired their knowledge of bridges from the Romans. Looking at the stage of culture which the Britons had probably reached, it would further be a natural inference that there was no such thing as a bridge anywhere in Britain before the Roman occupation; but, if Dion's statement is correct, it may be suggested as a possible explanation that the increased intercourse with Gaul during the hundred years that elapsed between Julius Caesar's raids and Claudius Caesar's invasion may have led to the construction of a bridge of some kind across the Thames at this point, through the influence and under the guidance of Roman traders and engineers. If so, the word "pont" may have been borrowed by the Britons before the commencement of the Roman occupation. Much stronger are the reasons for believing that there was a bridge in Roman times. Remains of Roman villas are found in Southwark, which was evidently a portion of Londinium, and it therefore hardly seems likely that a bridge-building people such as the Romans would remain contented with a ferry. Roach Smith is a strong advocate for the bridge, and remarks, "It would naturally be erected somewhere in the direct line of road into Kent, which I cannot but think pointed towards the site of Old London Bridge, both from its central situation, from the general absence of the foundations of buildings in the approaches on the northern side, and from discoveries recently made in the Thames on the line of the old bridge" (*Archaeologia*, xxix. 160). Smith has, however, still stronger arguments, which he states as follows: "Throughout the entire line of the old bridge, the bed of the river was found to contain ancient wooden piles; and when these piles, subsequently to the erection of the new bridge, were pulled up to deepen the channel of the river, many thousands of Roman coins, with abundance of broken Roman tiles and pottery, were discovered, and immediately beneath some of the central piles brass medallions of Aurelius, Faustina and Commodus. All these remains are indicative of a bridge. The enormous quantities of Roman coins may be accounted for by consideration of the well-known practice of the Romans to make these imperishable monuments subservient towards perpetuating the memory, not only of their conquests, but also of those public works which were the natural result of their successes in remote parts of the world. They may have been deposited either upon the building or repairs of the bridge, as well as upon the accession of a new emperor" (*Archaeological Journal*, i. 113).

At the beginning of the 5th century the Roman legions left Britain, and the *Saxon Chronicle* gives the exact date, stating that never since A.D. 409 "have the Romans ruled in Britain"—the chronicler setting down the Roman sway at 470 winters and dating from Julius Caesar's invasion. We learn that in the year 418 "the Romans collected all the treasures that were in Britain, and hid some of them in the earth, that no man might afterwards find them, and conveyed some with them into Gaul."

2. *Saxon* (449-1066).—We are informed in the *Saxon Chronicle* that about A.D. 449 or 450 the invaders settled in Britain, and in 457 Hengist and Aesc fought against the Britons at Crayford, driving them out of Kent. The vanquished fled to London in terror and apparently found a shelter there. After this entry there is no further mention of London in the *Chronicle* for a century and a half. This silence has been taken by some historians of weight to imply that London practically ceased to exist. Dr Guest asserted "that good reason may be given for the belief that even London itself for a while lay desolate and uninhabited" (*Archaeological Journal*, xix. 219). J. R. Green and Mr Loftie strongly supported this view, and in Sir Walter Besant's *Early London* (1908) the idea of the desolation of the city is taken for granted.

In answer to this contention it may be said that, although the silence of the *Chronicle* is difficult to understand, it is almost impossible to believe that the very existence of the most important city in the country could suddenly cease and the inhabitants disappear without some special notice. Battles and scenes of destruction are so fully described in other instances that one must believe that when nothing is related nothing special occurred. No doubt the coming of the Saxons, which entirely changed the condition of the country, must have greatly injured trade, but although there was not the same freedom of access to the roads, the Londoners had the highway of the river at their doors. Although the Saxons hated towns and refused to settle in London, they may have allowed the original inhabitants to continue their trade on condition that they received some share of the profits or a tribute. The only question really is whether London being an exceptional city received exceptional treatment.

Saxon Settlement.

Along the banks of the Thames are several small havens whose names have remained to us, such as Rotherhithe, Lambhith (Lambeth), Chelchith (Chelsea), &c., and it is not unlikely that the Saxons, who would not settle in the city itself, associated themselves with these small open spots. Places were thus founded over a large space which otherwise might have remained unsettled.

If what is here suggested really occurred it may be that this separation of London from the surrounding country originated the remarkable position of London with its unparalleled privileges, which were continued for many centuries and kept it not only the leader among cities but distinct from all others. Laurence Gomme, in *The Governance of London* (1907), opposes the view that the city was for a time left deserted (a view which, it may be remarked, is a comparatively modern one, probably originating with Dr Guest). H. C. Coote in his *Romans of Britain* elaborated a description of the survival of Roman influence in English institutions, but his views did not obtain much support from London historians. Mr Gomme's contention is to some extent a modification of Mr Coote's view, but it is original in the illustrations that give it force. Londinium was a Roman city, and (as in the case of all such cities) was formed on the model of ancient Rome. It may therefore be expected to retain evidence of the existence of a Pomoerium and Territorium as at Rome. The Pomoerium marked the unbuilt space around the walls. Gomme refers to an open space outside the western wall of Dorchester still called the Pummery as an indication of the Pomoerium in that place; and he considers that the name of Mile End, situated 1 m. from Aldgate and the city walls, marks the extent of the open space around the walls of London known as the Pomoerium. This fact throws a curious light upon the growth of the "Liberties." It has always been a puzzle that no note exists of the first institution of these liberties. If this open space was from the earliest times attached to the city there would be no need when it was built upon for any special act to be passed for its inclusion in London. "The *Territorium* of the city was its special property, and it extended as far as the limits of the territorium of the nearest Roman city or as near thereto as the natural boundaries." This explains the position of Middlesex in relation to London. In connexion with these two features of a Roman city supposed to be found in Ancient London the author argues for the continuity of the city through the changes of Roman and Saxon dominion.

Origin of the Liberties.

One of the most striking illustrations of the probable continuity of London history is to be found in the contrast between York and London. This is only alluded to in Gomme's book, but it is elaborated in an article in the *Cornhill Magazine* (November 1906). These two were the chief Roman cities in Britain, one in the north and the other in the south. They are both equally good examples of important cities under Roman domination. York was conquered and occupied by the Saxons, and there not only are the results of English settlement clear but all records of Roman government were destroyed. In London the Saxon stood outside the government for centuries, and the acceptance of the Roman survival explains much that is otherwise unintelligible.

Independence of London.

Gomme finds important evidence of the independence of London in the existence of a merchant law which was opposed to Anglo-Saxon law. He reprints and discusses the celebrated *Judicia Civitatis Lundoniae* of King Æthelstan's reign—"the ordinance" (as it declares itself) "which the bishop and the reeves belonging to London have ordained." He holds that the Londoners passed "their own laws by their own citizens without reference to the king at all," and in the present case of a king who according to Kemble "had carried the influence of the crown to an extent unexampled in any of his predecessors." He adds: "What happened afterwards was evidently this: that the code passed by the Londoners was sent to the king for him to extend its application throughout the kingdom, and this is done by the eleventh section." The view originated by Gomme certainly explains many difficulties in the history of the transition from Roman to English London, which have hitherto been overlooked by historians.

Arrival of Christianity.

When the city is next referred to in the *Saxon Chronicle* it appears to have been inhabited by a population of heathens. Under the date 604 we read: "This year Augustine consecrated two bishops: Mellitus and Justus. He sent Mellitus to preach baptism to the East Saxons, whose king was called Sebert, son of Ricole the sister of Æthelbert, and whom Æthelbert had then appointed king. And Æthelbert gave Mellitus a bishop's see in Lundenevic and to Justus he gave Rochester, which is twenty-four miles from Canterbury." The Christianity of the Londoners was of an unsatisfactory character, for, after the death of Sebert, his sons who were heathens stirred up the multitude to drive out their bishop. Mellitus became archbishop of Canterbury, and London relapsed into heathenism. In this, the earliest period of Saxon history recorded, there appears to be no relic of the Christianity of the Britons, which at one time was well in evidence. What became of the cathedral which we may suppose to have existed in London during the later Roman period we cannot tell, but we may guess that it was destroyed by the heathen Saxons. Bede records that the church of St Paul was built by Æthelbert, and from that time to this a cathedral dedicated to St Paul has stood upon the hill looking down on Ludgate.

After the driving out of Mellitus London remained without a bishop until the year 656, when Cedda, brother of St Chad of Lichfield, was invited to London by Sigebert, who had been converted to Christianity by Finan, bishop of the Northumbrians. Cedda was consecrated bishop of the East Saxons by Finan and held the see till his death on the 26th of October 664. He was succeeded by Wini, bishop of Winchester, and then came Earconuald (or St Erkenwald), whose shrine was one of the chief glories of old St Paul's. He died on the 30th of April 693, a day which was kept in memory in his cathedral for centuries by special offices. The list of bishops from Cedda to William (who is addressed in the Conqueror's Charter) is long, and each bishop apparently held a position of great importance in the government of the city.

Danish Invasions.

In the 7th century the city seems to have settled down into a prosperous place and to have been peopled by merchants of many nationalities. We learn that at this time it was the great mart of slaves. It was in the fullest sense a free-trading town; neutral to a certain extent between the kingdoms around, although the most powerful of the kings conquered their feebler neighbours. During the 8th century, when a more settled condition of life became possible, the trade and commerce of London increased in volume and prosperity. A change, however, came about towards the end of the century, when the Scandinavian freebooters known as Danes began to harry the coasts. The Saxons had become law-abiding, and the fierce Danes treated them in the same way as in former days they had treated the Britons. In 871 the chronicler affirms that Alfred fought nine great battles against the Danes in the kingdom south of the Thames, and that the West Saxons made peace with them. In the next year the Danes went from Reading to London, and there took up their winter quarters. Then the Mercians made peace with them. In 886 Alfred overcame the Danes, restored London to its inhabitants, rebuilt its walls, reannexed the city to Mercia, and committed it to Ethelred, alderman of Mercia. Then, as the chronicler writes, "all the Angle race turned to him (Alfred) that were not in bondage of the Danish men." In 896 the Londoners came off victorious in their encounters with the Danes. The king obstructed the river so that the enemy could not bring up their ships, and they therefore abandoned them. The Londoners broke up some, and brought the strongest and best to London. In 912 Æthelred, the alderman of the Mercians, who had been placed in authority by Alfred, died, and Edward the Elder took possession of London and Oxford, "and all the lands which thereto belonged."

Under Æthelstan we find the city increasing in importance and general prosperity. There were then eight mints at work, a fact which exhibits evidence of great activity and the need of coin for the purposes of trade. The folk-moot met in the precincts of St Paul's at the sound of the bell of the famous bell-tower, which also rang out when the armed levy was required to march under St Paul's banner. For some years after the decisive battle of Brunanburh (A.D. 937) the Danes ceased to trouble the country. Fire, however, was almost as great an enemy to London as the Dane. Fabyan when recording the entire destruction of London by fire in the reign of Æthelred (981) makes this remarkable statement—"Ye shall understand that this daye the cytie of London had more housynge and buyldinge from Ludgate toward Westmynstre and lytel or none wher the chief or hart of the citie is now, except (that) in dyvers places were housyng, but they stod without order."

In the reign of Æthelred II., called the Unready (but more correctly the Redeless), the Danes were more successful in their operations against London, but the inhabitants resisted stoutly. Snorre the Icelander tells us that the Danes fortified Southwark with ditch and rampart, which the English assailed in vain. In 982 London was burnt, and in 994 Olaf and Sweyn (the father of Canute) came with ninety-four ships to besiege it. They tried to set the city on fire, but the townsmen did them more harm than they "ever weened." The chronicler piously adds that "the holy Mother of God on that day manifested her mercy to the townsmen, and delivered them from their foes." The Danes went from the town and ravaged the neighbourhood, so that in the end the king and his witan agreed to give sixteen thousand pounds to be relieved of the presence of the enemy. This was the origin of the Danegelt. In the year 1009 the Danes frequently attacked London, but they had no success, and fared ill in their attempts. The Londoners withstood Sweyn in 1013, but in the end they submitted and gave him hostages. Three years after this, Æthelred died in London, and such of the witan as were there and the townsmen chose Edmund Ironside for king, although the witan outside London had elected Canute. Canute's ships were then at Greenwich on their way to London, where they soon afterwards arrived. The Danes at once set to work to dig a great ditch by Southwark, and then dragged their ships through to the west side of the bridge. They were able after this to keep the inhabitants from going either in or out of the town. In spite of all this, after fighting obstinately both by land and by water, the Danes had to raise the siege of London and take the ships to the river Orwell. After a glorious reign of seven months Edmund died in London, and Canute became master of England. The tribute which the townsmen of London had to pay was £10,500, about one-seventh of the amount which was paid by all the rest of the English nation. This shows the growing importance of the city. From this time there appears to have been a permanent Danish settlement in London, probably Aldwich, referred to below.

There is little more to be said of the history of Saxon London than that Edward the Confessor held his Witanagemot there. On his death the Witan which had attended his funeral elected to succeed him Harold, the foremost man in England, and the leader who had attempted to check the spread of the Norman influence fostered by the Confessor. After his defeat and death on the hill on the Sussex Downs then called Senlac, the duke of Normandy had the country at his mercy, but he recognized the importance of London's position, and moved forward with the greatest caution and tact.

Before proceeding with the history of London during the Norman period it is necessary to say something of the counties more especially connected with London.

The "Home Counties."

The walled city of London was a distinct political unit, although it owed a certain allegiance to that one of the kingdoms around it which was the most powerful for the time being. This allegiance therefore frequently changed, but London retained its identity and individuality all through. Essex seems seldom to have held an independent position, for when London first appears as connected with the East Saxons the real power was in the hands of the king of Kent. According to Bede, Wini, being expelled from his bishopric of Wessex in 635, took refuge with Wulfhere, king of the Mercians, of whom he purchased the see of London. Hence the Mercian king must then have been the overlord of London. Not many years afterwards the king of Kent again seems to have held some jurisdiction here. From the laws of the Kentish kings Lhothhere and Eadric (673–685) we learn that the Wic-reeve was an officer of the king of Kent, who exercised a jurisdiction over the Kentish men trading with or at London, or was appointed to watch over their interests.

The origin of the two counties in which London is chiefly situated opens up an interesting question. It is necessary to remember that London is older than these counties, whose names, Middlesex and Surrey, indicate their relative positions to the city and the surrounding county. We have neither record of their settlement nor of the origin of their names. Both must have been peopled from the river. The name Middle Saxons plainly shows that Middlesex must have been settled after the East and West Saxons had given their names to their respective districts. The name Surrey clearly refers to the southern position of the county.

Aldwich.

Reference has already been made to a Danish settlement, and there seems some reason for placing it on the ground now occupied by the parishes of St Clement Danes and St Giles's. For many centuries this district between London and Westminster was a kind of "no man's land" having certain archaic customs. Gomme in his *Governance of London* (1907) gives an account of the connexion of this with the old village of Aldwich, a name that survived in Wych Street, and has been revived by the London County Council in Aldwych, the crescent which leads to Kingsway.

The Conquest.

3. *Norman* (1066–1154).—To return to the condition of things after the great battle. The citizens of London were a divided body, and Duke William knowing that he had many friends in the city saw that a waiting game was the best for his cause in the end. The defeated chiefs retired on the city, led by Ansgar the Staller, under whom as sheriff the citizens of London had marched to fight for Harold at Senlac. They elected Edgar Atheling, the grandson of Edmund Ironside, as king, which the *Saxon Chronicle* says "was indeed his natural right." On hearing of this action William marched towards London, when the citizens sallied forth to meet him. They were repulsed by the Norman horse, but with such loss to the latter that the duke thought it imprudent to lay siege to the city at that time, and he retired to Berkhampstead.[1] It is reported that William sent a private message to Ansgar asking for his support. The result was that Edgar and Earls Edwin and Morkere and "the best men of London" repaired to Berkhampstead, where they submitted themselves and swore fealty to the Conqueror.

Changes in the City.

Thus ends the Saxon period, and the Norman period in London begins with the submission of the citizens as distinct from the action of the rest of the kingdom, which submission resulted soon afterwards in the Conqueror's remarkable charter to William the bishop and Gosfrith the portreeve, supposed to be the elder Geoffrey de Mandeville. A great change was at once made both in the appearance and in the government of the city under Norman rule. One of the earliest acts of the Conqueror was to undertake the erection of a citadel which should overawe the citizens and give him the command of the city. The Tower was situated at the eastern limit of the city, and not far from the western extremity Castle Baynard was built.

The position of the city grew in importance, but the citizens suffered from severe laws and from serious restrictions upon their liberties. In August 1077 occurred a most extensive fire, such a one, says the *Chronicle*, as "never was before since London was founded." This constant burning of large portions of the city is a marked feature of its early history, and we must remember that, although stone buildings were rising on all sides, these were churches, monasteries, and other public edifices; the ordinary houses remained as before, small wooden structures. The White Tower, the famous keep of the Tower of London, was begun by Gundulph, bishop of Rochester, *c.* 1078. In 1083 the old cathedral of St Paul's was begun on the site of the church which Æthelbert is said to have founded in 610. But four years afterwards the chronicler tells us "the holy monastery of St Paul, the episcopal see of London, was burnt, and many other monasteries, and the greatest and fairest part of the whole city." In this same year (1087) William the Conqueror died. In 1090 a tremendous hurricane passed over London, and blew down six hundred houses and many churches. The Tower was injured, and a portion of the roof of the church of St Mary-le-Bow, Cheapside, was carried off and fell some distance away, being forced into the ground as much as 20 ft., a proof of the badness of the thoroughfares as well as of the force of the wind. William Rufus inherited from his father a love for building, and in the year 1097 he exacted large sums of money from his subjects with the object of carrying on some of the undertakings he had in hand. These were the walling round of the Tower and the rebuilding of London Bridge, which had been almost destroyed by a flood. In 1100 Rufus was slain, and Henry I. was crowned in London. This king granted the citizens their first real charter, but this was constantly violated. When Stephen seized the crown on the death of Henry I., he tried successfully to obtain the support of the people of London. He published a charter confirming in general terms the one granted by Henry, and commanding that the good laws of Edward the Confessor should be observed. The citizens, however, did not obtain their rights without paying for them, and in 1139 they paid Stephen one hundred marks of silver to enable them to choose their own sheriffs. In this reign the all-powerfulness of the Londoners is brought prominently forward. Stephen became by the shifting fortune of war a prisoner, and the empress Matilda might, if she had had the wisdom to favour the citizens, have held the throne, which was hers by right of birth. She, however, made them her enemies by delivering up the office of justiciary of London and the sheriffwick to her partisan Geoffrey, earl of Essex, and attempting to reduce the citizens to the enslaved condition of the rest of the country. This made her influential enemies, who soon afterwards replaced Stephen upon the throne. The Norman era closes with the death of Stephen in 1154.

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[1] A valuable article on "The Conqueror's Footprints in Domesday" was published in the *English Historical Review* in 1898 (vol. xiii. p. 17). This article contains an account of Duke William's movements after the battle of Senlac between Enfield, Edmonton, Tottenham and Berkhampstead.

Early parishes.

One of the most striking changes in the appearance of Norman London was caused by the rebuilding of old churches and the building of new ones, and also by the foundation of the great monastic establishments. The early history of the parishes of London is one of great difficulty and complexity. Although some of the parishes must be of great antiquity, we have little authentic information respecting them before the Conquest. The dedications of many of the churches indicate their great age, but the constant fires in London destroyed these buildings. The original churches appear to have been very small, as may be judged from their number. It is not easy, however, to understand how it was that when the first parishes were formed so small an area was attached to each. The parish church of which we have the most authentic notice before the Conquest is St Helen's, Bishopsgate. It was in existence many years before the priory of the nuns of St Helen's was founded. Bishop Stubbs in his Introduction to the Historical Works of Ralph de Diceto writes: "St Paul's stood at the head of the religious life of London, and by its side, at some considerable interval, however, St Martin's le Grand (1056), St Bartholomew's, Smithfield (1123) and the great and ancient foundation of Trinity, Aldgate" (1108). The great Benedictine monastery of Black Monks was situated away from the city at Westminster, and it was the only monastic house subject to the rule of St Benedict in the neighbourhood of London, although the houses of nuns, of which there were many dotted over the suburbs of London, were governed by this rule. In course of time there was a widespread desire in Europe for a stricter rule among the monks, and reforms of the Benedictine rule were instituted at Cluni (910), Chartreuse (about 1080) and Citeaux (1098). All these reforms were represented in London.

Religious foundations.

Cluniac Order.—This order was first brought to England by William, earl of Warren (son-in-law of William the Conqueror), who built the first house at Lewes in Sussex about 1077. The priory of Bermondsey in Surrey was founded by Aylwin Child, citizen of London about 1082.

Carthusians.—When this order was brought to England in 1178 the first house was founded at Witham in Somersetshire. In all there were nine houses of the order in England. One of these was the Charterhouse of London which was not founded until 1371 by Sir Walter Manny, K.G.

Cistercians.—It was usual to plant these monasteries in solitary and uncultivated places, and no other house, even of their own order, was allowed to build within a certain distance of the original establishment. This makes it surprising to learn that there were two separate houses of this order in the near neighbourhood of London. A branch of the order came to England about 1128 and the first house was founded at Waverley in Surrey. Very shortly after (about 1134) the abbey of Stratford Langthorne in Essex was founded by William de Montfichet, who endowed it with all his lordship in West Ham. It was not until two centuries afterwards that the second Cistercian house in the immediate neighbourhood of London was founded. This was the Abbey of St Mary Graces, East-Minster or New Abbey without the walls of London, beyond Tower Hill, which Edward III. instituted in 1350 after a severe scourge of plague (the so-called Black Death).

The two great Military Orders—the Knights Hospitallers of St John of Jerusalem and the Templars—followed the Augustinian rule and were both settled in London. The Hospital or Priory of St John was founded in 1100 by Jordan Briset and his wife Muriel, outside the northern wall of London, and the original village of Clerkenwell grew up around the buildings of the knights. A few years after this the Brethren of the Temple of Solomon at Jerusalem or Knights of the Temple came into being at the Holy City, and they settled first on the south side of Holborn near Southampton Row. They removed to Fleet Street or the New Temple in 1184. On the suppression of the order by command of the pope the house in Fleet Street was given in 1313 by Edward II. to Aymer de Valence, earl of Pembroke, at whose death in 1324 the property passed to the knights of St John, who leased the new Temple to the lawyers, still the occupants of the district.

The queen of Henry I. (Matilda or Maud) was one of the chief founders of religious houses, and so great was the number of monasteries built in this king's reign that it was said almost all the labourers became bricklayers and carpenters and there was much discontent in consequence.

Fitzstephen's description of London.

4. *Plantagenet (1154–1485).*—Henry II. appears to have been to a certain extent, prejudiced against the citizens of London on account of their attitude towards his mother, and he treated them with some severity. In 1176 the rebuilding of London Bridge with stone was begun by Peter of Colechurch. This was the bridge which was pulled down early in the 19th century. It consisted of twenty stone arches and a drawbridge. There was a gatehouse at each end and a chapel or crypt in the centre, dedicated to St Thomas of Canterbury, in which Peter of Colechurch was buried in 1205. The large amount of building at this time proves that the citizens were wealthy. Fitzstephen, the monk of Canterbury, has left us the first picture of London. He speaks of its wealth, commerce, grandeur and magnificence—of the mildness of the climate, the beauty of the gardens, the sweet, clear and salubrious springs, the flowing streams, and the pleasant clack of the watermills. Even the vast forest of Middlesex, with its densely wooded thickets, its coverts of game, stags, fallow deer, boars and wild bulls is pressed into the description to give a contrast which shall enhance the beauty of the city itself. Fitzstephen tells how, when the great marsh that washed the walls of the city on the north (Moorfields) was frozen over, the young men went out to slide and skate and sport on the ice. Skates made of bones have been dug up in this district. This sport was allowed to fall into disuse, and was not again prevalent until it was introduced from Holland after the Restoration.

In spite of Fitzstephen's glowing description we must remember that the houses of London were wholly built of wood and thatched with straw or reeds. These houses were specially liable to be destroyed by fire, and in order to save the city from this imminent danger the famous Assize of Building known as "Fitz-Ailwyne's Assize" was drawn up in 1189. In this document the following statement was made: "Many citizens, to avoid such danger, built according to their means, on their ground, a stone house covered and protected by thick tiles against the fury of fire, whereby it often happened that when a fire arose in the city and burnt many edifices and had reached such a house, not being able to injure it, it then became extinguished, so that many neighbours' houses were wholly saved from fire by that house."

Various privileges were conceded to those who built in stone, but no provision was made as to the material to be used in roofing tenements. This Assize, which has been described as the earliest English Building Act, is of great value from an historical point of view, but unfortunately it had little practical effect, and in 1212 what was called "Fitz-Ailwyne's Second Assize," with certain compulsory regulations, was enacted. Thenceforth everyone who built a house was strictly charged not to cover it with reeds, rushes, stubble or straw, but only with tiles, shingle boards or lead. In future, in order to stop a fire, houses could be pulled down in case of need with an alderman's hook and cord. For the speedy removal of burning houses each ward was to provide a strong iron hook, with a wooden handle, two chains and two strong cords, which were to be left in the charge of the bedel of the ward, who was also provided with a good horn, "loudly sounding."

Richard I. was a popular king, but his fighting in the Holy Land cost his subjects much. London had to pay heavily towards his ransom; and, when the king made his triumphal entry into London after his release from imprisonment, a German nobleman is said to have remarked that had the emperor known of the wealth of England he would have insisted on a larger sum. The Londoners were the more glad to welcome Richard back in that the head of the regency, Longchamp, bishop of Ely, was very unpopular from the encroachments he made upon the city with his works at the Tower.

The first charter by which the city claims the jurisdiction and conservancy of the river Thames was granted by Richard I. John granted several charters to the city, and it was expressly stipulated in Magna Charta that the city of London should have all its ancient privileges and free customs. The citizens opposed the king during the wars of the barons. In the year 1215 the barons having received intelligence secretly that they might enter London with ease through Aldgate, which was then in a very ruinous state, removed their camp from Bedford to Ware, and shortly after marched into the city in the night-time. Having succeeded in their object, they determined that so important a gate should no longer remain in a defenceless condition. They therefore spoiled the religious houses and robbed the monastery coffers in order to have means wherewith to rebuild it. Much of the material was obtained from the destroyed houses of the unfortunate Jews, but the stone for the bulwarks was obtained from Caen, and the small bricks or tiles from Flanders.

Allusion has already been made to the great change in the aspect of London and its surroundings made during the Norman period by the establishment of a large number of monasteries. A still more important change in the configuration of the interior of London was made in the 13th century, when the various orders of the friars established themselves there. The Benedictine monks preferred secluded sites; the Augustinians did not cultivate seclusion so strictly; but the friars chose the interior of towns by preference. At the beginning of the 13th century the remarkable evangelical revival, instituted almost simultaneously by St Dominic and St Francis, swept over Europe.

The four chief orders of Mendicant friars were magnificently housed in London:—

Mendicant friars.

Blackfriars.—The Black, Preaching or Dominican Friars came to England in 1221 and their first house was at Oxford. Shortly after this they came to London and settled in Holborn near Lincoln's Inn, where they remained for more than fifty years. In 1276 they removed to the neighbourhood of Baynard Castle, and their house gave a name to a London district which it still retains.

Greyfriars.—The Greyfriars, Minorites or Franciscans, first settled in Cornhill, and in 1224 John Ewin made over to them an estate situated in the ward of Farringdon Within and in the parish of St Nicholas in the Shambles, where their friary was built. Christ Church, Newgate Street, occupies the site of the choir of the great church of the Greyfriars.

Austin Friars.—The house of the Austin Friars or Friars Eremites was founded in Broad Street Ward in 1253.

White Friars.—The Friars of the Blessed Virgin of Mount Carmel or Carmelites or Whitefriars came to London in 1241, and made their home on land between Fleet Street and the Thames given by Edward I.

Besides the four chief orders of friars there were the Crutched Friars in the parish of St Olave, Hart Street (about 1298), and the Friars of the Sac first outside Aldersgate (about 1257) and afterwards in the Old Jewry.

The names of places in London form valuable records of the habitations of different classes of the population. The monasteries and friaries are kept in memory by their names in various parts of London. In the same way the residences of the Jews have been marked. When Edward I. expelled the Jews from England in 1290 the district in which they had lived since William the Conqueror's day came to be called the Old Jewry. On their return after many centuries of exile most of them settled in the neighbourhood of Aldgate and Aldersgate. There is a reminder of them in the names of Jewry Street near the former and of Jewin Street near the latter place. Jewin Street was built on the site of the burying-place of the Jews before the expulsion.

Pageants.

In the middle ages there was a constant succession of pageants, processions and tournaments. The royal processions arranged in connexion with coronations were of great antiquity, but one of the earliest to be described is that of Henry III. in 1236, which was chronicled by Matthew Paris. After the marriage at Canterbury of the king with Eleanor of Provence the royal personages came to London, and were met by the mayor, aldermen and principal citizens to the number of 360, sumptuously apparelled in silken robes embroidered, riding upon stately horses. After the death of Henry III. (1272) the country had to wait for their new king, who was then in the Holy Land. Edward I. came to London on the 2nd of August 1274, when he was received with the wildest expressions of joy. The streets were hung with rich cloths of silk arras and tapestry; the aldermen and principal men of the city threw out of their windows handsful of gold and silver, to signify their gladness at the king's return; and the conduits ran with wine, both white and red.

Dr Jessopp gives a vivid picture of what occurred when King Edward III. entered London in triumph on the 14th of October 1347. He was the foremost man in Europe, and England had reached a height of power and glory such as she had never attained before. Ten years after this, one of the most famous scenes in the streets of London occurred, when Edward the Black Prince brought the French King John and other prisoners after the battle of Poitiers to England. This was a scene unequalled until Henry V. returned from the glorious field of Agincourt in 1415. The mayor and aldermen apparelled in orient-grained scarlet, and four hundred commoners in murrey, well mounted, with rich collars and chains, met the king at Blackheath. At the entrance to London Bridge the towers were adorned with banners of the royal arms, and in the front of them was inscribed *Civitas Regis Justicie.*

During the troubles of the 15th century the authorities had seen the necessity of paying more attention to the security of the gates and walls of the city, and when Thomas Nevill, son of William, Lord Fauconberg, made his attack upon London in 1471 he experienced a spirited resistance. He first attempted to land from his ships in the city, but the Thames side from Baynard's Castle to the Tower was so well fortified that he had to seek a quieter and less prepared position. He then set upon the several gates in succession, and was repulsed at all. On the 11th of May he made a desperate attack upon Aldgate, followed by 500 men. He won the bulwarks and some of his followers entered into the city, but the portcullis being let down these were cut off from their own party and were slain by the enemy. The portcullis was drawn up, and the besieged issued forth against the rebels, who were soon forced to flee.

When Richard, duke of Gloucester, laid his plans for seizing the crown, he obtained the countenance of the lord mayor, Sir Edmund Shaw, whose brother Dr Shaw praised Richard at Paul's Cross. Crosby Hall, in Bishopsgate Street, then lately built, was made the lodging of the Protector. There he acted the accessible prince in the eyes of the people, for the last of the Plantagenets was another of the usurpers who found favour in the eyes of the men of London. His day, however, was short, and with the battle of Bosworth ends Plantagenet London.

First maps of London.

5. *Tudor* (*1485–1603*).—It was during this period that the first maps of London were drawn. No representation of the city earlier than the middle of the 16th century has been discovered, although it seems more than probable that some plans must have been produced at an earlier period.[1] The earliest known view is the drawing of Van den Wyngaerde in the Bodleian Library (dated 1550). Braun and Hogenberg's map was published in 1572–1573, and the so-called Agas's map was probably produced soon afterwards, and was doubtless influenced by the publication of Braun and Hogenberg's excellent engraving; Norden's maps of London and Westminster are dated 1593. Some of these maps were pasted upon walls, and must have been largely destroyed by ordinary wear and tear. It is curious that the only two existing copies of Agas's map[2] were published in the reign of James I., although apparently they had not been altered from the earlier editions of Elizabeth's reign which have been lost. By the help of these maps we are able to obtain a clear notion of the extent and chief characteristics of Tudor London. Henry VII. did little to connect his name with the history of London, although the erection of the exquisite specimen of florid Gothic at Westminster Abbey has carried his memory down in its popular name of Henry VII.'s chapel. Soon after this king obtained the throne he borrowed the sum of 3000 marks from the city, and moreover founded the excellent precedent of repaying it at the appointed time. The citizens were so pleased at this unexpected occurrence that they willingly lent the king £6000 in 1488, which he required for military preparations against France In 1497 London was threatened by the rebels favourable to Perkin Warbeck, who encamped on Blackheath on the 17th of June. At first there was a panic among the citizens, but subsequently the city was placed in a proper state of defence, and the king himself encamped in St George's Fields. On June 22 he entirely routed the rebels; and some time afterwards Perkin Warbeck gave himself up, and was conducted in triumph through London to the Tower.

Suppression of religious houses.

As the chief feature of Norman London was the foundation of monasteries, and that of Plantagenet London was the establishment of friaries, so Tudor London was specially characterized by the suppression of the whole of these religious houses, and also of the almost numberless religious gilds and brotherhoods. When we remember that more than half of the area of London was occupied by these establishments, and that about a third of the inhabitants were monks, nuns and friars, it is easy to imagine how great must have been the disorganization caused by this root and branch reform. One of the earliest of the religious houses to be suppressed was the hospital of St Thomas of Acon (or Acre) on the north side of Cheapside, the site of which is now occupied by Mercers' Hall. The larger houses soon followed, and the Black, the White and the Grey Friars, with the Carthusians and many others, were all condemned in November 1538.

Love of show was so marked a characteristic of Henry VIII. that we are not surprised to find him encouraging the citizens in the same expensive taste. On the occasion of his marriage with Catherine of Aragon the city was gorgeously ornamented with rich silks and tapestry, and Goldsmiths' Row (Cheapside) and part of Cornhill were hung with golden brocades. When on the eve of St John's Day, 1510, the king in the habit of a yeoman of his own guard saw the famous march of the city watch, he was so delighted that on the following St Peter's Eve he again attended in Cheapside to see the march, but this time he was accompanied by the queen and the principal nobility. The cost of these two marches in the year was very considerable, and, having been suspended in 1528 on account of the prevalence of the sweating sickness, they were soon afterwards forbidden by the king, and discontinued during the remainder of his reign. Sir John Gresham, mayor in 1548, revived the march of the city watch, which was made more splendid by the addition of three hundred light horsemen raised by the citizens for the king's service.

The best mode of utilizing the buildings of the suppressed religious houses was a difficult question left unsolved by Henry VIII. That king, shortly before his death, refounded Rahere's St Bartholomew's Hospital, "for the continual relief and help of an hundred sore and diseased," but most of the large buildings were left unoccupied to be filled by his successor. The first parliament of Edward's reign gave all the lands and possessions of colleges, chantries, &c., to the king, when the different companies of London redeemed those which they had held for the payment of priests' wages, obits and lights at the price of £20,000, and applied the rents arising from them to charitable purposes. In 1550 the citizens purchased the manor of Southwark, and with it they became possessed of the monastery of St Thomas, which was enlarged and prepared for the reception of "poor, sick and helpless objects." Thus was refounded St Thomas's Hospital, which was moved to Lambeth in 1870–1871. Shortly before his death Edward founded Christ's Hospital in the Grey Friars, and gave the old palace of Bridewell to the city "for the lodging of poor wayfaring people, the correction of vagabonds and disorderly persons, and for finding them work." On the death of Edward VI. Lady Jane Grey was received at the Tower as queen, she having gone there by water from Durham House in the Strand. The citizens, however, soon found out their mistake, and the lord mayor, aldermen and recorder proclaimed Queen Mary at Cheapside. London was then gay with pageants, but when the queen made known her intention of marrying Philip of Spain the discontent of the country found vent in the rising of Sir Thomas Wyat, and the city had to prepare itself against attack. Wyat took possession of Southwark, and expected to have been admitted into London; but finding the gates shut against him and the drawbridge cut down he marched to Kingston, the bridge at which place had been destroyed. This he restored, and then proceeded towards London. In consequence of the breakdown of some of his guns he imprudently halted at Turnham Green. Had he not done so it is probable that he might have obtained possession of the city. He planted his ordnance on Hay Hill, and then marched by St James's Palace to Charing Cross. Here he was attacked by Sir John Gage with a thousand men, but he repulsed them and reached Ludgate without further opposition. He was disappointed at the resistance which was made, and after musing a while "upon a stall over against the Bell Savadge Gate" he turned back. His retreat was cut off, and he surrendered to Sir Maurice Berkeley. We have somewhat fully described this historical incident here because it has an important bearing on the history of London, and shows also the small importance of the districts outside the walls at that period.

Tudor London.

We now come to consider the appearance of London during the reign of the last of the Tudors. At no other period were so many great men associated with its history; the latter years of Elizabeth's reign are specially interesting to us because it was then that Shakespeare lived in London, and introduced its streets and people into his plays. In those days the frequent visitation of plagues made men fear the gathering together of multitudes. This dread of pestilence, united with a puritanic hatred of plays, made the citizens do all they could to discountenance theatrical entertainments. The queen acknowledged the validity of the first reason, but she repudiated the religious objection provided ordinary care was taken to allow "such plays only as were fitted to yield honest recreation and no example of evil." On April 11, 1582, the lords of the council wrote to the lord mayor to the effect that, as "her Majesty sometimes took delight in those pastimes, it had been thought not unfit, having regard to the season of the year and the clearance of the city from infection, to allow of certain companies of players in London, partly that they might thereby attain more dexterity and perfection the better to content her Majesty" (Analytical Index to the *Remembrancia*). When theatres were established the lord mayor took care that they should not be built within the city. The "Theatre" and the "Curtain" were situated at Shoreditch; the "Globe," the "Swan," the "Rose" and the "Hope" on the Bankside; and the Blackfriars theatre, although within the walls, was without the city jurisdiction.

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[1] "A map of London engraved on copper-plate, dated 1497," which was bought by Ferdinand Columbus during his travels in Europe about 1518–1525, is entered in the catalogue of Ferdinand's books, maps, &c., made by himself and preserved in the Cathedral Library at Seville, but there is no clue to its existence.

[2] One is in the Guildhall Library, and the other among the Pepysian maps in Magdalene College, Cambridge.

In 1561 St Paul's steeple and roof were destroyed by lightning, and the spire was never replaced. This circumstance allows us to test the date of certain views; thus Wyngaerde's map has the spire, but Agas's map is without it. In 1566 the first stone was laid of the "Burse," which owed its origin to Sir Thomas Gresham. In 1571 Queen Elizabeth changed its name to the Royal Exchange. The Strand was filled with noble mansions washed by the waters of the Thames, but the street, if street it could be called, was little used by pedestrians. Londoners frequented the river, which was their great highway. The banks were crowded with stairs for boats, and the watermen of that day answered to the chairmen of a later date and the cabmen of to-day. The Bankside was of old a favourite place for entertainments, but two only—the bull-baiting and the bear-baiting—were in existence when Agas's map was first planned. On Norden's map,[1] however, we find the gardens of Paris Garden, the bearhouse and the playhouse.

The settled character of the later years of Elizabeth's reign appears to have caused a considerable change in the habits of the people. Many of the chief citizens followed the example of the courtiers, and built for themselves country residences in Middlesex, Essex and Surrey; thus we learn from Norden that Alderman Roe lived at Muswell Hill, and we know that Sir Thomas Gresham built a fine house and planned a beautiful park at Osterley. The maps show us much that remains somewhat the same as it was, but also much that has greatly altered. St Giles's was literally a village in the fields; Piccadilly was "the waye to Redinge," Oxford Street "the way to Uxbridge," Covent Garden an open field or garden, and Leicester Fields lammas land. Moorfields was drained and laid out in walks in Elizabeth's reign. At Spitalfields crowds used to congregate on Easter Monday and Tuesday to hear the Spital sermons preached from the pulpit cross. The ground was originally a Roman Cemetery, and about the year 1576 bricks were largely made from the clayey earth, the recollection of which is kept alive in the name of Brick Lane. Citizens went to Holborn and Bloomsbury for change of air, and houses were there prepared for the reception of children, invalids and convalescents. In the north were sprinkled the outlying villages of Islington, Hoxton and Clerkenwell.

6. *Stuart (1603–1714)*.—The Stuart period, from the accession of James I. to the death of Queen Anne, extends over little more than a century, and yet greater changes occurred during those years than at any previous period. The early years of Stuart London may be said to be closely linked with the last years of Elizabethan London, for the greatest men, such as Raleigh, Shakespeare and Ben Jonson, lived on into James's reign. Much of the life of the time was then in the City, but the last years of Stuart London take us to the 18th century, when social life had permanently shifted to the west end. In the middle of the period occurred the civil wars, and then the fire which changed the whole aspect of London. When James came to the throne the term suburbs had a bad name, as all those disreputable persons who could find no shelter in the city itself settled in these outlying districts. Stubbs denounced suburban gardens and garden houses in his *Anatomy of Abuses*, and another writer observed "how happy were cities if they had no suburbs."

The preparations for the coronation of King James were interrupted by a severe visitation of the plague, which killed off as many as 30,578 persons, and it was not till March 15, 1604, that the king, the queen and Prince Henry passed triumphantly from the Tower to Westminster. The lord mayor's shows, which had been discontinued for some years, were revived by order of the king in 1609. The dissolved monastery of the Charterhouse, which had been bought and sold by the courtiers several times, was obtained from Thomas, earl of Suffolk, by Thomas Sutton for £13,000. The new hospital chapel and schoolhouse were begun in 1611, and in the same year Sutton died.

Social life.

With the death of James I. in 1625 the older history of London may be said to have closed. During the reign of his successor the great change in the relative positions of London within and without the walls had set in. Before going on to consider the chief incidents of this change it will be well to refer to some features of the social life of James's reign. Ben Jonson places one of the scenes of *Every Man in his Humour* in Moorfields, which at the time he wrote the play had, as stated above, lately been drained and laid out in walks. Beggars frequented the place, and travellers from the village of Hoxton, who crossed it in order to get into London, did so with as much expedition as possible. Adjoining Moorfields were Finsbury Fields, a favourite practising ground for the archers. Mile End, a common on the Great Eastern Road, was long famous as a rendezvous for the troops. These places are frequently referred to by the old dramatists; Justice Shallow boasts of his doings at Mile End Green when he was Dagonet in Arthur's Show. Fleet Street was the show-place of London, in which were exhibited a constant succession of puppets, naked Indians and strange fishes. The great meeting-place of Londoners in the day-time was the nave of old St Paul's. Crowds of merchants with their hats on transacted business in the aisles, and used the font as a counter upon which to make their payments; lawyers received clients at their several pillars; and masterless serving-men waited to be engaged upon their own particular bench. Besides those who came on business there were gallants dressed in fashionable finery, so that it was worth the tailor's while to stand behind a pillar and fill his table-books with notes. The middle or Mediterranean aisle was the Paul's Walk, also called the Duke's Gallery from the erroneous supposition that the tomb of Sir Guy Beauchamp, earl of Warwick, was that of the "good" Humphrey, duke of Gloucester. After the Restoration a fence was erected on the inside of the great north door to hinder a concourse of rude people, and when the cathedral was being rebuilt Sir Christopher Wren made a strict order against any profanation of the sacred building. St Paul's churchyard was from the earliest days of printing until the end of the 18th century the headquarters of the book trade, when it shifted to Paternoster Row. Another of the favourite haunts of the people was the garden of Gray's Inn, where the choicest society was to be met. There, under the shadow of the elm trees which Bacon had planted, Pepys and his wife constantly walked. Mrs Pepys went on one occasion specially to observe the fashions of the ladies because she was then "making some clothes."

Taverns.

In those days of public conviviality, and for many years afterwards, the taverns of London held a very important place. The Boar's Head in Great Eastcheap was an inn of Shakespeare's own day, and the characters he introduces into his plays are really his own contemporaries. The "Mermaid" is sometimes described as in Bread Street, and at other times in Friday Street and also in Cheapside. We are thus able to fix its exact position; for a little to the west of Bow church is Bread Street, then came a block of houses, and the next thoroughfare was Friday Street. It was in this block that the "Mermaid" was situated, and there appear to have been entrances from each street. What makes this fact still more certain is the circumstance that a haberdasher in Cheapside living "'twixt Wood Street and Milk Street," two streets on the north side opposite Bread and Friday Streets, described himself as "over against the Mermaid tavern in Cheapside." The Windmill tavern occupies a prominent position in the action of *Every Man in his Humour*.[2] The Windmill stood at the corner of the Old Jewry towards Lothbury, and the Mitre close by the Mermaid in Bread Street. The Mitre in Fleet Street, so intimately associated with Dr Johnson, also existed at this time. It is mentioned in a comedy entitled *Ram Alley* (1611) and Lilly the astrologer frequented it in 1640. At the Mermaid Ben Jonson had such companions as Shakespeare, Raleigh, Beaumont, Fletcher, Carew, Donne, Cotton and Selden, but at the Devil in Fleet Street, where he started the Apollo Club, he was omnipotent. Herrick, in his well-known *Ode to Ben*, mentions several of the inns of the day.

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[1] This map of London by Norden is dated 1593, as stated above. The same topographer published in his *Middlesex* a map of Westminster as well as this one of the City of London.

[2] Various changes in the names of the taverns are made in the folio edition of this play (1616) from the quarto (1601); thus the Mermaid of the quarto becomes the Windmill in the folio, and the Mitre of the quarto is the Star of the folio.

Theatres.

Under James I. the theatre, which established itself so firmly in the latter years of Elizabeth, had still further increased its influence, and to the entertainments given at the many playhouses may be added the masques so expensively produced at court and by the lawyers at the inns of court. In 1613 *The Masque of Flowers* was presented by the members of Gray's Inn in the Old Banqueting House in honour of the marriage of the infamous Carr, earl of Somerset, and the equally infamous Lady Frances, daughter of the earl of Suffolk. The entertainment was prepared by Sir Francis Bacon at a cost of about £2000.

The "West End."

It was during the reign of Charles I. that the first great exodus of the wealthy and fashionable was made to the West End. The great square or piazza of Covent Garden was formed from the designs of Inigo Jones about 1632. The neighbouring streets were built shortly afterwards, and the names of Henrietta, Charles, James, King and York Streets were given after members of the royal family. Great Queen Street, Lincoln's Inn Fields, was built about 1629, and named in honour of Henrietta Maria. Lincoln's Inn Fields had been planned some years before. With the Restoration the separation of fashionable from city life became complete.

When the Civil War broke out London took the side of the parliament, and an extensive system of fortification was at once projected to protect the town against the threatened attack of the royal army. A strong earthen rampart, flanked with bastions and redoubts, surrounded the City, its liberties, Westminster and Southwark, making an immense enclosure.

The Plague.

The Great Fire.

London had been ravaged by plague on many former occasions, but the pestilence that began in December 1664 lives in history as "the Plague of London." On the 7th of June 1665 Samuel Pepys for the first time saw two or three houses marked with the red cross and the words "Lord, have mercy upon us," on the doors. The deaths daily increased, and business was stopped. Grass grew in the area of the Royal Exchange, at Whitehall, and in the principal streets of the city. On the 4th of September 1665 Pepys writes an interesting letter to Lady Carteret from Woolwich: "I have stayed in the city till above 7400 died in one week, and of them about 6000 of the plague, and little noise heard day or night but tolling of bells." The plague was scarcely stayed before the whole city was in flames, a calamity of the first magnitude, but one which in the end caused much good, as the seeds of disease were destroyed, and London has never since been visited by such an epidemic. On the 2nd of September 1666 the fire broke out at one o'clock in the morning at a house in Pudding Lane. A violent east wind fomented the flames, which raged during the whole of Monday and great part of Tuesday. On Tuesday night the wind fell somewhat, and on Wednesday the fire slackened. On Thursday it was extinguished, but on the evening of that day the flames again burst forth at the Temple. Some houses were at once blown up by gunpowder, and thus the fire was finally mastered. Many interesting details of the fire are given in Pepys's *Diary*. The river swarmed with vessels filled with persons carrying away such of their goods as they were able to save. Some fled to the hills of Hampstead and Highgate, but Moorfields was the chief resort of the houseless Londoner. Soon paved streets and two-storey houses were seen in that swampy place. The people bore their troubles heroically, and Henry Oldenburg, writing to the Hon. Robert Boyle on September 10, says: "The citizens, instead of complaining, discoursed almost of nothing but of a survey for rebuilding the city with bricks and large streets." Within a few days of the fire three several plans were presented to the king for the rebuilding of the city, by Christopher Wren, John Evelyn and Robert Hooke. Wren proposed to build main thoroughfares north and south, and east and west, to insulate all the churches in conspicuous positions, to form the most public places into large piazzas, to unite the halls of the twelve chief companies into one regular square annexed to Guildhall and to make a fine quay on the bank of the river from Blackfriars to the Tower. His streets were to be of three magnitudes—90 ft., 60 ft. and 30 ft. wide respectively. Evelyn's plan differed from Wren's chiefly in proposing a street from the church of St Dunstan's in the East to the cathedral, and in having no quay or terrace along the river. In spite of the best advice, however, the jealousies of the citizens prevented any systematic design from being carried out, and in consequence the old lines were in almost every case retained. But though the plans of Wren and Hooke were not adopted, it was to these two fellows of the Royal Society that the labour of rebuilding London was committed. Wren's great work was the erection of the cathedral of St Paul's, and the many churches ranged round it as satellites. Hooke's task was the humbler one of arranging as city surveyor for the building of the houses. He laid out the ground of the several proprietors in the rebuilding of the city, and had no rest early or late from persons soliciting him to set out their ground for them at once. The first great impetus of change in the configuration of London was given by the great fire, and Evelyn records and regrets that the town in his time had grown almost as large again as it was within his own memory. Although for several centuries attempts had been made in favour of building houses with brick or stone, yet the carpenters continued to be the chief house-builders. As late as the year 1650 the Carpenters' Company drew up a memorial in which they "gave their reasons that tymber buildings were more commodious for this citie than brick buildings were." The Act of Parliament "for rebuilding the city of London" passed after the great fire, gave the *coup de grâce* to the carpenters as house-builders. After setting forth that "building with brick was not only more comely and durable, but also more safe against future perils of fire," it was enacted "that all the outsides of all buildings in and about the city should be made of brick or stone, except doorcases and window-frames, and other parts of the first story to the front between the piers," for which substantial oaken timber might be used "for conveniency of shops." In the winter of 1683–1684 a fair was held for some time upon the Thames. The frost, which began about seven weeks before Christmas and continued for six weeks after, was the greatest on record; the ice was 11 in. thick.

Rebuilding: Wren's scheme.

The revocation of the edict of Nantes in October 1685, and the consequent migration of a large number of industrious French Protestants, caused a considerable growth in the east end of London. The silk manufactories at Spitalfields were then established.

During the short reign of James II. the fortunes of the city were at their lowest, and nowhere was the arrival of the prince of Orange more welcomed.

William III. cared little for London, the smoke of which gave him asthma, and when a great part of Whitehall was burnt in 1691 he purchased Nottingham House and made it into Kensington Palace. Kensington was then an insignificant village, but the arrival of the court soon caused it to grow in importance.

Although the spiritual wants of the city were amply provided for by the churches built by Wren, the large districts outside the city and its liberties had been greatly neglected. The act passed in the reign of Queen Anne for building fifty new churches (1710) for a time supplied the wants of large districts.

7. *Eighteenth Century.*—London had hitherto grown up by the side of the Thames. In the 18th century other parts of the town were more largely built upon. The inhabitants used coaches and chairs more than boats, and the banks of the river were neglected. London could no longer be seen as a whole, and became a mere collection of houses. In spite of this the 18th century produced some of the most devoted of Londoners—men who considered a day lived out of London as one lost out of their lives. Of this class Dr Johnson and Hogarth are striking examples. The exhibitions of vice and cruelty that were

constantly to be seen in the capital have been reproduced by Hogarth, and had they not been set down by so truthful an observer it would have been almost impossible to believe that such enormities could have been committed in the streets of a great city. A few days after his accession George I. addressed the representatives of the city in these words: "I have lately been made sensible of what consequence the city of London is, and therefore shall be sure to take all their privileges and interests into my particular protection." On the following lord mayor's day the king witnessed the show in Cheapside and attended the banquet at Guildhall. Queen Anne and the first three Georges were all accommodated, on the occasions of their visits to the city to see the show, at the same house opposite Bow church. In the time of Queen Anne and George I. David Barclay (the son of the famous apologist for the Quakers) was an apprentice in the house, but he subsequently became master, and had the honour of receiving George II. and George III. as his guests. There was a large balcony extending along the front of the house which was fitted with a canopy and hangings of crimson damask silk. The building, then numbered 108 Cheapside, was pulled down in 1861.

Extension in the 18th century.

Early in the 18th century there was a considerable extension of building operations in the West End. Still, however, the north of London remained unbuilt upon. In 1756 and for some years subsequently the land behind Montague House (now the British Museum) was occupied as a farm, and when in that year a proposal was made to plan out a new road the tenant and the duke of Bedford strongly opposed it. In 1772 all beyond Portland Chapel in Great Portland Street was country. Bedford House in Bloomsbury Square had its full view of Hampstead and Highgate from the back, and Queen's Square was built open to the north in order that the inhabitants might obtain the same prospect.

In 1737 the Fleet ditch between Holborn Bridge and Fleet Bridge was covered over, and Stocks Market was removed from the site of the Mansion House to the present Farringdon Street, and called Fleet market. On October 25, 1739, the first stone of the Mansion House was laid. Previously the first magistrates lived in several different houses. A frost almost as severe as the memorable one of 1683–1684 occurred in the winter of 1739–1740, and the Thames was again the scene of a busy fair. In 1758 the houses on London Bridge were cleared away, and in 1760–1762 several of the city gates were taken down and sold. Moorgate is said to have fetched £166, Aldersgate £91, Aldgate £177, Cripplegate £90, and Ludgate £148. The statue of Queen Elizabeth which stood on the west side of Ludgate was purchased by Alderman Gosling and set up against the east end of St Dunstan's church in Fleet Street, where it still remains.

8. *Nineteenth Century.*—In 1806 London saw the public funerals of three of England's greatest men. On the 8th February the body of Nelson was borne with great pomp from the Admiralty to St Paul's Cathedral, where it was interred in the presence of the prince of Wales and the royal dukes. Pitt was buried on the 22nd of February, and Fox on the 10th of October, both in Westminster Abbey.

The first exhibition of Winsor's system of lighting the streets with gas took place on the king's birthday (June 4) 1807, and was made in a row of lamps in front of the colonnade before Carlton House. Finsbury Square was the first public place in which gas lighting was actually adopted, and Grosvenor Square the last. In the winter of 1813–1814 the Thames was again frozen over. The frost began on the evening of December 27, 1813, with a thick fog. After it had lasted for a month, a thaw of four days, from the 26th to the 29th of January, took place, but this thaw was succeeded by a renewal of the frost, so severe that the river soon became one immovable sheet of ice. There was a street of tents called the City Road, which was daily thronged with visitors. In 1838 the second Royal Exchange was destroyed by fire; and on October 28, 1844, the Queen opened the new Royal Exchange, built by Mr (afterwards Sir William) Tite. The Great Exhibition of 1851 brought a larger number of visitors to London than had ever been in it before at one time. The great and continuous increase in the buildings and the enlargement of London on all sides dates from this period.

London within the walls has been almost entirely rebuilt, although in the neighbourhood of the Tower there are still many old houses which have only been refronted. From the upper rooms of the houses may be seen a large number of old tiled roofs.

Unlike many capitals of Europe which have shifted their centres the city of London in spite of all changes and the continued enlargement of the capital remains the centre and head-quarters of the business of the country. The Bank of England, the Royal Exchange and the Mansion House are on the site of Ancient London.

In 1863 on the occasion of the marriage of King Edward VII. (when prince of Wales) the streets of London were illuminated as they had never been before. Among other events which made the streets gay and centred in processions to St Paul's may be specially mentioned the Thanksgiving Day on the 27th of February 1872 for the recovery of the prince of Wales after his dangerous illness; and the rejoicings at the Jubilee of Queen Victoria in 1887, and the Diamond Jubilee in 1897.

The first great emigration of the London merchants westward was about the middle of the 18th century, but only those who had already secured large fortunes ventured so far as Hatton Garden. At the beginning of the 19th century it had become common for the tradesmen of the city to live away from their businesses, but it was only about the middle of the 19th century that it became at all usual for those in the West End to do the same.

During the first half of the 19th century the position of the City Corporation had somewhat fallen in public esteem, and some of the most influential men in the city were unconnected with it, but a considerable change took place in the latter half of the century. Violent attacks were made upon the Livery Companies, but of late years, largely owing to the public spirit of the companies in devoting large sums of money towards the improvement of the several industries in connexion with which they were founded, and the establishment of the City and Guilds of London Technical Institute, a complete change has taken place as to the public estimation in which they are held.

Growth and Population

Medieval Population.

Much has been written upon the population of medieval London, but little certainty has resulted therefrom. We know the size of London at different periods and are able to guess to some extent as to the number of its inhabitants, but most of the figures which have come down to us are mere guesses. The results of the poll-tax have often been considered as trustworthy substitutes for population returns, but Professor Oman has shown that little trust can be placed in these results. As an instance he states that the commissioners of the poll-tax reported that there were only two-thirds as many contributaries in 1381 as in 1377. The adult population of the realm had ostensibly fallen from 1,355,201 to 896,481. These figures were monstrous and incredible.[1]

The Bills of Mortality of the 16th and 17th centuries are of more value, and they have been considered and revised by such able statisticians as John Graunt and Sir William Petty. It was not, however, before the 19th century that accurate figures were obtainable. The circuit of the walls of London which were left by the Romans was never afterwards enlarged, and the population did not overflow into the suburbs to any extent until the Tudor period. Population was practically stationary for centuries owing to pestilences and the large proportion of deaths among infants. We have no materials to judge of the number of inhabitants before the Norman Conquest, but we can guess that there were many open spaces within the walls that were afterwards filled up. It is scarcely worth while to guess as to the numbers in Saxon London, but it is possible that in the early period there were about 10,000 inhabitants, growing later to about 20,000. During the latter part of the Saxon period the numbers of the population of the country began to decay; this decay, however, was arrested by the Norman Conquest. The population increased during ten peaceful years of Henry III., and increased slowly until the death of Edward II., and then it began to fall off, and continued to decrease during the period of the Wars of the Roses and of the Barons until the accession of the first Tudor monarch.

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[1] *The Great Revolt of 1381* (Oxford, 1906), p. 27.

The same causes that operated to bring about these changes in the whole kingdom were of course also at work in the case of the City of London.

One of the earliest statements as to the population of London occurs in a letter of about the year 1199 written to Pope Innocent III. by Peter of Blois, then archdeacon of London, and therefore a man of some authority on the subject. He states that the City contained 120 parish churches and 40,000 inhabitants. These numbers have been very generally accepted as fairly correct, and Dr Creighton[1] comes to the conclusion after careful consideration that the population of London from the reign of Richard I. to that of Henry VII. varied within a limit of about forty to fifty thousand inhabitants.

Plagues and Mortality.

Dr Creighton points out that the number given by certain chroniclers of the deaths from the early pestilences in London are incredible; such for instance as the statement that forty or fifty thousand bodies were buried in Charterhouse churchyard at the time of the Black Death in 1348–1349. These numbers have been taken as a basis for calculation of population, and one statistician reasoned that if 50,000 were buried in one churchyard 100,000 should represent the whole mortality of London. If this were allowed the population at this time must have been at least 200,000, an impossible amount.

Although the mortality caused by the different plagues had a great effect upon the population of the country at large the city soon recovered the losses by reason of the numbers who came to London from outside in hopes of obtaining work. Although there were fluctuations in the numbers at different periods there is evidence to show that on the average the amount of forty to fifty thousand fixed by Dr Creighton for the years between 1189 and 1509 is fairly correct. The medieval period closed with the accession of the Tudor dynasty, and from that time the population of London continued to increase, in spite of attempts by the government to prevent it. One of the first periods of increase was after the dissolution of the religious houses; another period of increase was after the Restoration.

A proclamation was issued in 1580 prohibiting the erection within 3 m. of the city gates of any new houses or tenements "where no former house hath been known to have been." In a subsequent proclamation Queen Elizabeth commanded that only one family should live in one house, that empty houses erected within seven years were not to be let and that unfinished buildings on new foundations were to be pulled down. In spite of these restrictions London continued to grow. James I. and Charles I. were filled with the same fear of the increasing growth of London. In 1630 a similar proclamation to that of 1580 was published. During the greater part of the 18th century there was a serious check to the increase of population, but at the end of the century a considerable increase occurred, and in the middle of the 19th century the enormous annual increase became particularly marked. To return to the 16th century when the Bills of Mortality came into existence.[2] Mention is made of these bills as early as 1517, but the earliest series now

Bills of Mortality.

known dates from 1532. Dr Creighton had access to the manuscript returns of burials and christenings for five years from 1578 to 1582 preserved in the library at Hatfield House. The history of the Bills of Mortality which in the early years were intermittent in their publication is of much interest, and Dr Creighton has stated it with great clearness. The Company of Parish Clerks is named in an ordinance of 1581 (of which there is a copy in the Record Office) as the body responsible for the bills, and their duties were then said to be "according to the Order in that behalf heretofore provided." John Bell, clerk to the company, who wrote an essay during the great plague of 1665, had no records in his office of an earlier date than 1593, and he was not aware that his company had been engaged in registering births and deaths before that year. The fire of 1666 destroyed all the documents of the Parish Clerks Company, and in its hall in Silver Street only printed tables from about the year 1700 are to be found. There is a set of Annual Bills from 1658 (with the exception of the years 1756 to 1764) in the library of the British Museum.[3]

These bills were not analysed and general results obtained from them until 1662, when Captain John Graunt first published his valuable *Natural and Political Observations upon the Bills of Mortality.* Sir William Petty followed with his important inquiries upon the population (*Essay on Political Arithmetic*, 1683).

It is not worth while to refer to all the wild guesses that were made by various writers, but Dr Creighton shows the absurdity of one of these calculations made in 1554 by Soranzo, the Venetian ambassador for the information of the doge and senators of Venice. He estimates the population to have been 180,000 persons, which Dr Creighton affirms to be nearly three times the number that we obtain by a moderate calculation from the bills of mortality in 1532 and 1535.

Population in 16th and 17th centuries.

Following on his calculations from 1509, when the population may be supposed to have been about 50,000, Dr Creighton carries on his numbers to the Restoration in the following table:—

1532–1535	62,400	1605	224,275
1563	93,276	1622	272,207
1580	123,034	1634	339,824
1593–1595	152,478	1661	460,000

The numbers for 1661 are those arrived at by Graunt, and they are just about half the population given authoritatively in the first census 1801 (864,845). It therefore took 140 years to double the numbers, while in 1841 the numbers of 1801 were more than doubled.

These numbers were arrived at with much care and may be considered as fairly accurate although some other calculations conflict with a few of the figures. The first attempt at a census was in August 1631 when the lord mayor returned the number of mouths in the city of London and Liberties at 130,268, which is only about half the number given above. This is accounted for by the larger area contained in the bills of mortality compared with that containing only the city and its liberties.[4] Howell's suggestion that the population of London in 1631 was a million and a half need only be mentioned as a specimen of the wildest of guesses.

18th century.

Petty's numbers for 1682 are 670,000 and those of Gregory King for 1696, 530,000. The latter are corroborated by those of 1700, which are given as 550,000. Maitland gives the numbers in 1737 as 725,903. With regard to the relative size of great cities Petty affirms that before the Restoration the people of Paris were more in number than those of London and Dublin, whereas in 1687 the people of London were more than those of Paris and Rome or of Paris and Rouen.

It is not necessary to give any further numbers for the population of the 18th century, as that has been already stated to have been almost stationary. This is proved by Gregory King's figures for 1696 (530,000) when compared with those of the first census for 1801 (864,035). A corroboration is also to be found in the report of the first census for 1801, where a calculation is made of the probable population of the years 1700 and 1750. These are given respectively as 674,350 and 676,250. These figures include (1) the City of London within and (2) without the walls, (3) the City and Liberties of Westminster, (4) the outparishes within the bills of mortality and (5) the parishes not within the bills of mortality. No. 5 is given as 9150 in 1700, and 22,350 in 1750. It is curious to find that already in the 18th century a considerable reduction in the numbers of the city of London is supposed to have taken place, as is seen in the following figures:—

	1700.	1750.
City of London within the walls	139,300	87,000
,, ,, without the walls	69,000	57,300

As the increase in Westminster is not great (130,000 in 1700 and 152,000 in 1750) and there is little difference in the totals it will be seen that the amount is chiefly made up by the increase in the parishes without the bills of mortality. The extraordinary growth of London did not come into existence until about the middle of the 19th century (see § IV. above).

GOVERNMENT

Saxon Period.

We know little of the government of London during the Saxon period, and it is only incidentally that we learn how the Londoner had become possessed of special privileges which he continued to claim with success through many centuries. One of the chief of these was the claim to a separate voice in the election of the king. The citizens did not dispute the right of election by the kingdom but they held that that election did not necessarily include the choice of London.

An instance of this is seen in the election of Edmund Ironside, although the Witan outside London had elected Canute. The remarkable instance of this after the Conquest was the election of Stephen, but William the Conqueror did not feel secure until he had the sanction of the Londoners to his kingship, and his attitude towards London when he hovered about the neighbourhood of the city for a time shows that he was anxious to obtain this sanction freely rather than by compulsion. His hopes and expectations were fulfilled when the gates of London were opened to receive him, as already related. Athelstan's acceptance of the London-made law for the whole kingdom, as pointed out by Mr Gomme, is another instance of the independence of the Londoner. When William the Conqueror granted the first charter to London he addressed the bishop and the portreeve—the bishop as the ecclesiastical governor and the portreeve as the representative of the civil power.

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[1] In a valuable paper on "The Population of Old London" in *Blackwood's Magazine* for April 1891.

[2] The old Bills of Mortality, although of value from being the only authority on the subject, were never complete owing to various causes: one being that large numbers of Roman Catholics and Dissenters were not registered in the returns of the parish clerk who was a church officer. The bills were killed by the action of the Registration Act for England and Wales, which came into operation July 1, 1837. The Weekly Returns of the Registrar-General began in 1840.

[3] "The invention of 'bills of mortality' is not so modern as has been generally supposed, for their proper designation may be found in the language of ancient Rome. Libitina was the goddess of funerals; her officers were the Libitinarii *our* undertakers; her temple in which all business connected with the last rites was transacted, in which the account of deaths—*ratio Libitinae*—was kept, served the purpose of a register office."—*Journal Statistical Society*, xvii. 117 (1854).

[4] The return was made "by special command from the Right Honourable the Lords of His Majesty's Privy Council." The Privy Council were at this time apprehensive of an approaching scarcity of food. The numbers (130,268) were made up as follows: London Within the Walls 71,029, London Without the Walls 40,579, Old Borough of Southwark (Bridge Without) 18,660.

The word "port" in the title "portreeve" does not indicate the Port of London as might naturally be supposed, for Stubbs has pointed out that it is *porta* not *portus*, and "although used for the city generally, seems to refer to it specially in its character of a Mart or City of Merchants." The Saxon title of reeve was continued during the Norman period and the shire-reeve or sheriff has continued to our own time. There were originally several distinct reeves, all apparently officers appointed by the king. Some writers have supposed that a succession of portreeves continued in London, but J. H. Round holds that this title disappeared after the Conqueror's charter. Henry I. granted to the city by charter the right of appointing its own sheriffs; this was a great privilege, which, however, was recalled in the reigns of Henry II. and Richard I., to be restored by John in 1199.

J. H. Round holds that the office of Justiciar was created by Henry I.'s charter, and as he was the chief authority in the city this somewhat takes off from the value of the privilege of appointing sheriffs.

In the 12th century there was a great municipal movement over Europe. Londoners were well informed as to what was going on abroad, and although the rulers were always willing to wait for an opportunity of enlarging their liberties, they remained ready to take advantage of such circumstances as might occur. Their great opportunity occurred while Richard I. was engaged abroad as a crusader.

In 1889 a medal was struck to commemorate the 700th anniversary of the mayoralty which according to popular tradition was founded in 1189. With respect to this tradition Round writes (*Commune of London*, p. 223): "The assumption that the mayoralty of London dates from the accession of Richard I. is an absolute perversion of history," and he adds that "there is record evidence which completely confirms the remarkable words of Richard of Devizes, who declares that on no terms whatever would King Richard or his father have ever assented to the establishment of the *Communa* in London."

The Commune.

In October 1191 the conflict between John the king's brother and Longchamp the king's representative became acute. The latter bitterly offended the Londoners, who, finding that they could turn the scales to either side, named the Commune as the price of their support of John. A small party of the citizens under Henry of Cornhill remained faithful to the chancellor Longchamp, but at a meeting held at St Paul's on the 8th of October, the barons welcomed the archbishop of Rouen as chief justiciar (he having produced the king's sign manual appointing a new commission), and they saluted John as regent. Stubbs, in his introduction to the Chronicle of Roger de Hoveden, writes: "This done, oaths were largely taken: John, the Justiciar and the Barons swore to maintain the *Communa* of London; the oath of fealty to Richard was then sworn, John taking it first, then the two archbishops, the bishops, the barons, and last the burghers with the express understanding that should the king die without issue they would receive John as his successor." Referring to this important event Mr Round writes: "The excited citizens, who had poured out overnight, with lanterns and torches, to welcome John to the capital, streamed together on the morning of the eventful 8th of October at the well-known sound of the great bell swinging out from its campanile in St Paul's Churchyard. There they heard John take the oath to the 'Commune' like a French king or lord; and then London for the first time had a municipality of her own."

The Mayor and Échevins.

Little is known as to what the Commune then established really was. Round's remarkable discovery among the manuscripts of the British Museum of the Oath of the Commune proves for the first time that London in 1193 possessed a fully developed "Commune" of the continental pattern. A striking point in this municipal revolution is that the new privileges extended to the city of London were entirely copied from those of continental cities, and Mr Round shows that there is conclusive proof of the assertion that the Commune of London derived its origin from that of Rouen. This MS. gives us information which was unknown before, but upsets the received opinions as to the early governing position of the aldermen. From this we learn that the government of the city was in the hands of a mayor and twelve échevins (*skivini*); both these names being French, seem for a time to have excluded the Saxon aldermen.

Twelve years later (1205–1206) we learn from another document, preserved in the same volume as the oath, that *alii probi homines* were associated with the mayor and échevins to form a body of twenty-four (that is, twelve *skivini* and an equal number of councillors). Round holds that the Court of Skivini and *alii probi homines*, of which at present we know nothing further than what is contained in the terms of the oaths, was the germ of the Common Council. We must not suppose that when the city of London obtained the privilege of appointing a mayor, and a citizen could boast in 1194 that "come what may the Londoners shall have no king but their mayor," that the king did not occasionally exert his power in suspending the liberties of the city. There were really constant disagreements, and sometimes the king degraded the mayor and appointed a custos or warden in his place. Several instances of this are recorded in the 13th and 14th centuries. It is very important to bear in mind that the mayors of London besides holding a very onerous position were mostly men of great distinction. They often held rank outside the city, and naturally took their place among the rulers of the country. They were mostly representatives of the landed interests as well as merchant princes.

There is no definite information as to when the mayor first received the title of lord. A claim has been set up for Thomas Legge, mayor for the second time in 1354, that he was the first lord mayor, but there is positively no authority whatever for this claim, although it is boldly stated that he was created lord mayor by Edward III. in this year. Apparently the title was occasionally used, and the use gradually grew into a prescriptive right. There is no evidence of any grant, but after 1540 the title had become general.

Aldermen.

No record has been found of the date when the aldermen became the official advisers of the mayor. The various wards were each presided over by an alderman from an early period, but we cannot fix the time when they were united as a court of aldermen. Stubbs writes: "The governing body of London in the 13th century was composed of the mayor, twenty-five aldermen of the wards and two sheriffs."

As we do not find any further evidence than the oath of the Commune alluded to of the existence of "échevins" in London, it is possible that aldermen were elected on the mayor's council under this title. This, however, is not the opinion of Mr Round, who, as before stated, is inclined to believe that the body of échevins became in course of time the Court of Common Council. The aldermen are not mentioned as the colleagues of the mayor until the very end of the 13th century, except in the case of Fitz-Ailwin's Assize of 1189, and this, of course, related specially to the duties of aldermen as heads of the wards of the city.

In March 1298–1299 letters were sent from "the Mayor and Commune of the City of London" to the municipalities of Bruges, Caen and Cambray. Although the official form of "The Mayor and Commune" was continued until the end of the 13th century, and it was not until early in the 14th century that the form "Mayor, Aldermen and Common Council" came into existence, there is sufficient evidence to show that the aldermen and common council before that time were acting with the mayor as governors of the city. In 1377 it was ordered that aldermen could be elected annually, but in 1384 the rule was modified so as to allow an alderman to be re-elected for his ward at the expiration of his year of office without any interval.

In 1394 the Ordinance respecting annual elections was repealed by the king (Richard II.). Distinct rank was accorded to aldermen, and in the *Liber Albus* we are told that "it is a matter of experience that ever since the year of our Lord 1350, at the sepulture of aldermen, the ancient custom of interment with baronial honours was observed." When the poll-tax of 1379 was imposed the mayor was assessed as an earl and the aldermen as barons.

Sheriffs.

The government of the city by reeves dates back to a very early period, and these reeves were appointed by the king. The prefix of the various kinds of reeves made but little difference in the duties of the office, although the area of these duties might be different. There was slight difference between the office of sheriff and that of portreeve, which latter does not appear to have survived the Conquest.

After the establishment of the Commune and the appointment of a mayor the sheriffs naturally lost much of their importance, and they became what they are styled in *Liber Albus* "the Eyes of the Mayor." When Middlesex was in farm to London the two sheriffs were equally sheriffs of London and Middlesex. There is only one instance in the city records of a sheriff of Middlesex being mentioned as distinct from the sheriffs, and this was in 1283 when Anketin de Betteville and Walter le Blond are described as sheriffs of London, and Gerin as sheriff of Middlesex. By the Local Government Act of 1888 the citizens of London were deprived of all right of jurisdiction over the county of Middlesex, which had been expressly granted by various charters.

In 1383 it was ordained and agreed "that no person shall from henceforth be mayor in the said city if he have not first been sheriff of the said city, to the end that he may be tried in governance and bounty before he attains such estate of the mayoralty."

Common Council.

The two courts—that of aldermen and that of the common council—were probably formed about the same time, but it is remarkable that we have no definite information on the subject. The number of members of the common council varied greatly at different times, but the right to determine the number was indirectly granted by the charter of Edward III. (1341) which enables the city to amend customs and usages which have become hard.

There have also been many changes in the mode of election. The common council were chosen by the wards until 1351, when the appointments were made by certain companies. In 1376 an ordinance was made by the mayor and aldermen, with the assent of the whole commons, to the effect that the companies should select men with whom they were content, and none other should come to the elections of mayors and sheriffs; that the greater companies should not elect more than six, the lesser four and the least two. Forty-seven companies nominated 156 members. In 1383 the right of election reverted to the wards, but was obtained again by the livery companies in 1467.

Common Hall.

The Common Hall was the successor of the folkmote, the meetings of which were originally held in the open air at the east end of St Paul's and afterwards in the Guildhall. These general assemblies of the citizens are described in the old city records as *immensa communitas* or *immensa multitudo civium*. The elections in Common Hall were by the whole body of citizens until Edward I.'s reign, citizens were then specially summoned to Common Hall by the mayor. In Edward IV.'s reign the elections of mayor, sheriffs and other officers and members of parliament were transferred to liverymen. Various alterations were subsequently made and now the qualification of electors at the election of the corporate offices of lord mayor, sheriffs, chamberlain and minor offices in Common Hall is that of being a liveryman of a livery company and an enrolled freeman of London. The election of aldermen and common councilmen takes place in the wardmotes.

Officials of the city.

The recorder, the chief official, is appointed for life. He was formerly appointed by the city, but since the Local Government Act of 1888 he is nominated by the city and approved by the lord chancellor. The common sergeant was formerly appointed by the city, but since 1888 by the lord chancellor. The town clerk is appointed by the city and re-elected annually.

The chamberlain or comptroller of the king's chamber is appointed by the livery. He was originally a king's officer and the office was probably instituted soon after the Conquest. The remembrancer is appointed by the common council.

The common hunt, an office abolished in 1807, was filled by John Courtenay in 1417. The sword-bearer is noticed in the *Liber Albus* (1419) and the first record of an appointment is dated 1426.

Later history of the corporation.

Few fundamental alterations have been made in the constitution of the city, but in the reign of Charles II. the most arbitrary proceedings were taken against its liberties. The king and his brother had long entertained designs against the city, and for the purpose of crushing them two pretexts were set up—(1) that a new rate of market tolls had been levied by virtue of an act of common council, and (2) that a petition to the king, in which it was alleged that by the prorogation of parliament public justice had been interrupted, had been printed by order of the Court of Common Council. Charles directed a writ *quo warranto* against the corporation of London in 1683, and the Court of King's Bench declared its charter forfeited. Soon afterwards all the obnoxious aldermen were displaced and others appointed in their room by royal commission. When James II. found himself in danger from the landing of the Prince of Orange he sent for the lord mayor and aldermen and informed them of his determination to restore the city charter and privileges, but he had no time to do anything before his flight. The Convention which was summoned to meet on the 22nd of January 1689 was converted by a formal act into a true parliament (February 23). One of the first motions put to the House was that a special Committee should be appointed to consider the violations of the liberties and franchises of all the corporations of the kingdom "and particularly of the City of London." The motion was lost but the House resolved to bring in a bill for repealing the Corporation Act, and ten years later (March 5) the Grand Committee of Grievances reported to the House its opinion (1) that the rights of the City of London in the election of sheriffs in the year 1682 were invaded and that such invasion was illegal and a grievance, and (2) that the judgment given upon the *Quo Warranto* against the city was illegal and a grievance. The committee's opinion on these two points (among others) was endorsed by the House and on the 16th of March it ordered a Bill to be brought in to restore all corporations to the state and condition they were in on the 29th of May 1660, and to confirm the liberties and franchises which at that time they respectively held and enjoyed.[1]

When the Act for the reform of Municipal Corporations was passed in 1835 London was specially excepted from its provisions. When the Metropolitan Board of Works was formed by the Metropolis Management Act of 1855 the city was affected to a certain extent, but by the Local Government Act of 1888 which founded the London County Council the right of appointing a sheriff for Middlesex was taken away from the city of London.

When the county of Middlesex was dissociated from the city of London one portion was joined to the administrative county of London, and the other to the county of Middlesex.

Privileges of the lord mayor.

The lord mayor of London has certain very remarkable privileges which have been religiously guarded and must be of great antiquity. It is only necessary to mention these here, but each of the privileges requires an exhaustive examination as to its origin. They all prove the remarkable position of Old London, and mark it off from all other cities of modern Europe. Shortly stated the privileges are four:

1. The closing of Temple Bar to the sovereign.
2. The mayor's position in the city, where he is second only to the king.
3. His summons to the Privy Council on the accession of a new sovereign.
4. His position of butler at the coronation banquets.

The last may be considered in abeyance as there has not been any coronation banquet since that of George IV. In the case of the coronation of King Edward VII. the claim was excluded from the consideration of the Court of Claims under the royal proclamation. The terms of the judgment on a further claim are as follows: "The Court considers and adjudges that the lord mayor has by usage a right, subject to His Majesty's pleasure, to attend the Abbey during the coronation and bear the crystal mace."

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[1] R. R. Sharpe, *London and the Kingdom* (1894), i. 541.

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In connexion with the government of London may be noted works on the following: Inns of Court. William Herbert, *Antiquities of the Inns of Court and Chancery* (1804); Robert P. Pearce, *History* (1848). Artillery Company, Anthony Highmore, *History of the Hon. Artillery Co. of London to 1802* (1804); G. A. Raikes, *History of the Hon. Artillery Co.* (1878). William Herbert published in 1837 *History of the Twelve great Livery Companies of London*, and in 1869 Thomas Arundell published *Historical Reminiscences of the City and its Livery Companies.* Since then have appeared *The Livery Companies of the City of London*, by W. Carew Hazlitt (1892); *The City Companies of London*, by P. H. Ditchfield (1904); *The Gilds and Companies of London*, by George Unwin (1908). Separate histories have been published of the chief London companies.

The following are some of the chief works connected with the topography of London: Thomas Pennant, *Of London* (1790, 1793, 1805, 1813, translated into German 1791); John T. Smith, *Antient Topography of London* (1815); David Hughson [E. Pugh], *Walks through London* (1817); *London* (edited by Charles Knight 1841–1844, reprinted 1851, revised by E. Walford 1875–1877); J. H. Jesse, *Literary and Historical Memorials of London* (1847); Leigh Hunt, *The Town, its Memorable Character and Events* (1848, new ed. 1859); Peter Cunningham, *A Handbook of London past and present* (1849, 2nd ed. 1850, enlarged into a new work in 1891); Henry B. Wheatley, *London past and present*; *Vestiges of Old London*, etchings by J. W. Archer (1851); *A New Survey of London* (1853); G. W. Thornbury, *Haunted London* (1865, new ed. by E. Walford 1880); *Old and New London*, vols. i.-ii. by G. W. Thornbury, vols. iii.-vi. by Edward Walford (1873–1878); Walter Besant, *London, Westminster, South London, East London* (1891–1902); *East London Antiquities*, edited by Walter A. Locks (*East London Advertiser*, 1902); Philip Norman, *London vanished and vanishing* (1905); *Records of the London Topographical Society*; *Monographs of the Committee for the Survey of the Memorials of Greater London.*

The following books on the population of London have been published: John Graunt, *Natural and Political Observations on the Bills of Mortality* (1661, other editions 1662, 1665, 1676); *Essay in Political Arithmetick* (1683); *Five Essays on Political Arithmetick* (1687); *Several Essays in Political Arithmetick* (1699, 1711, 1751, 1755); *Essay concerning the Multiplication of Mankind* (1682, 1683, 1686), all by Sir William Petty; Corbyn Morris, *Observations on the past Growth and present State of the City of London* (1751); *Collection of the Yearly Bills of Mortality from 1657 to 1758* (ed. by T. Birch, D.D. 1759); Graunt's *Observations*, Petty's *Another Essay* and C. Morris's *Observations* are reprinted in this collection. Graunt and Petty's *Essays* are reprinted in *Economic Writings* of Sir W. Petty (1899). (H. B. W.*)

LONDON CLAY, in geology, the most important member of the Lower Eocene strata in the south of England. It is well developed in the London basin, though not frequently exposed, partly because it is to a great extent covered by more recent gravels and partly because it is not often worked on a large scale. It is a stiff, tenacious, bluish clay that becomes brown on weathering, occasionally it becomes distinctly sandy, sometimes glauconitic, especially towards the top; large calcareous septarian concretions are common, and have been used in the manufacture of cement, being dug for this purpose at Sheppey, near Southend, and at Harwich, and dredged off the Hampshire coast. Nodular lumps of pyrites and crystals of selenite are of frequent occurrence. The clay has been employed for making bricks, tiles and coarse pottery, but it is usually too tenacious for this purpose except in well-weathered or sandy portions. The base of the clay is very regularly indicated by a few inches of rounded flint pebbles with green and yellowish sand, parts of this layer being frequently cemented by carbonate of lime. The average thickness of the London Clay in the London basin is about 450 ft.; at Windsor it is 400 ft. thick; beneath London it is rather thicker, while in the south of Essex it is over 480 ft. In Wiltshire it only reaches a few feet in thickness, while in Berkshire it is some 50 or 60 ft. It is found in the Isle of Wight, where it is 300 ft. thick at Whitecliff Bay—here the beds are vertical and even slightly reversed—and in Alum Bay it is 220 ft. thick. In Hampshire it is sometimes known as the Bognor Beds, and certain layers of calcareous sandstone within the clays are called Barnes or Bognor Rock. In the eastern part of the London basin in east Kent the pebbly basement bed becomes a thick deposit (60 ft.), forming part of the Oldhaven and Blackheath Beds.

The London Clay is a marine deposit, and its fossils indicate a moderately warm climate, the flora having a tropical aspect. Among the fossils may be mentioned *Panopoea intermedia*, *Ditrupa plana*, *Teredina personata*, *Conus concinnus*, *Rostellaria ampla*, *Nautilus centralis*, *Belosepia*, foraminifera and diatoms. Fish remains include *Otodus obliquus*, *Sphyroenodus crassidens*; birds are represented by *Halcyornis Toliapicus*, *Lithornis* and *Odontopteryx*, and reptiles by *Chelone gigas*, and other turtles, *Palaeophis*, a serpent and crocodiles. *Hyracotherium leporinum*, *Palaeotherium* and a few other mammals are recorded. Plant remains in a pyritized condition are found in great abundance and perfection on the shore of Sheppey; numerous species of palms, screw pines, water lilies, cypresses, yews, leguminous plants and many others occur; logs of coniferous wood bored through by annelids and *Teredo* are common, and fossil resin has been found at Highgate.

See EOCENE; also W. Whitaker, "The Geology of London and part of the Thames Valley," *Mem. Geol. Survey* (1889), and *Sheet Memoirs of the Geol. Survey, London*, Nos. 314, 315, 268, 329, 332, and *Memoirs on the Geology of the Isle of Wight* (1889).

LONDONDERRY, EARLS AND MARQUESSES OF. The 1st earl of Londonderry was Thomas Ridgeway (*c.* 1565–1631), a Devon man, who was treasurer in Ireland from 1606 to 1616 and was engaged in the plantation of Ulster. Ridgeway was made a baronet in 1611, Baron Ridgeway in 1616 and earl of Londonderry in 1623. The Ridgeways held the earldom until March 1714, when Robert, the 4th earl, died without sons. In 1726 Robert's son-in-law, Thomas Pitt (*c.* 1688–1729), son of Thomas Pitt, "Diamond Pitt," governor at Madras and uncle of the great earl of Chatham, was created earl of Londonderry, the earldom again becoming extinct when his younger son Ridgeway, the 3rd earl of this line, died unmarried in January 1765. In 1796 Robert Stewart (1739–1821), of Mount Stewart, Co. Down, was made earl of Londonderry in the Irish peerage. He had been created Baron Londonderry in 1789 and Viscount Castlereagh in 1795; in 1816 he was advanced to the rank of marquess of Londonderry. The 3rd marquess married the heiress of the Vane-Tempests and took the name of Vane instead of Stewart; the 5th marquess called himself Vane-Tempest and the 6th marquess Vane-Tempest-Stewart.

LONDONDERRY, CHARLES WILLIAM STEWART (VANE), 3RD MARQUESS OF (1778–1854), British soldier and diplomatist, was the son of the 1st marquess by a second marriage with the daughter of the 1st Earl Camden. He entered the army and served in the Netherlands (1794) on the Rhine and Danube (1795), in the Irish rebellion (1798), and Holland (1799), rising to be colonel; and having been elected to parliament for Kerry he became under secretary for war under his half-brother Castlereagh in 1807. In 1808 he was given a cavalry command in the Peninsula, where he brilliantly distinguished himself. In 1809, and again in the campaigns of 1810, 1811, having become a major-general, he served under Wellington in the Peninsula as his adjutant-general, and was at the capture of Ciudad Rodrigo, but at the beginning of 1812 he was invalided home. Castlereagh (see LONDONDERRY, 2nd Marquess of) then sent him to Berlin as minister, to represent Great Britain in the allied British, Russian and Prussian armies; and as a cavalry leader he played an important part in the subsequent fighting, while ably seconding Castlereagh's diplomacy. In 1814 he was made a peer as Baron Stewart, and later in the year was appointed ambassador at Vienna, and was a member of the important congresses which followed. In 1822 his half-brother's death made him 3rd marquess of Londonderry, and shortly afterwards, disagreeing with Canning, he resigned, being created Earl Vane (1823), and for some years lived quietly in England, improving his Seaham estates. In 1835 he was for a short time ambassador at St Petersburg. In 1852, after the death of Wellington, when he was one of the pall-bearers, he received the order of the Garter. He died on the 6th of March 1854. He was twice married, first in 1808 to the daughter of the earl of Darnley, and secondly in 1819 to the heiress of Sir Harry Vane-Tempest (a descendant of Sir Piers Tempest, who served at Agincourt, and heir to Sir Henry Vane, Bart.), when he assumed the name of Vane. Frederick William Robert (1805–

1872), his son by the first marriage, became 4th marquess; and on the latter's death in 1872, George Henry (1821–1884), the eldest son by the second marriage, after succeeding as Earl Vane (according to the patent of 1823), became 5th marquess. In 1884 he was succeeded as 6th marquess by his son Charles Stewart Vane-Tempest-Stewart (b. 1852), a prominent Conservative politician, who was viceroy of Ireland (1886–1889), chairman of the London School Board (1895–1897), postmaster-general (1900–1902), president of the Board of Education (1902–1905) and lord president of the Council (1903–1905).

LONDONDERRY, ROBERT STEWART, 2ND MARQUESS OF (1769–1822), British statesman, was the eldest son of Robert Stewart of Ballylawn Castle, in Donegal, and Mount Stewart in Down, an Ulster landowner, of kin to the Galloway Stewarts, who became baron, viscount, earl and marquess in the peerage of Ireland. The son, known in history as Lord Castlereagh, was born on the 18th of June in the same year as Napoleon and Wellington. His mother was Lady Sarah Seymour, daughter of the earl of Hertford. He went from Armagh school to St John's College, Cambridge, but left at the end of his first year. With Lord Downshire, then holding sway over the County Down, Lord Stewart had a standing feud, and he put forward his son, in July 1790, for one of the seats. Young Stewart was returned, but at a vast cost to his family, when he was barely twenty-one. He took his seat in the Irish House of Commons at the same time as his friend, Arthur Wellesley, M.P. for Trim, but sat later for two close boroughs in England, still remaining member for Down at College Green.

From 1796, when his father became an earl, he took the courtesy title of Viscount Castlereagh, and becoming keeper of the privy seal in Ireland, he acted as chief secretary, during the prolonged absence of Mr Pelham, from February 1797. Castlereagh's conviction was that, in presence of threatened invasion and rebellion, Ireland could only be made safe by union with Great Britain. In Lord Camden, as afterwards in Lord Cornwallis, Castlereagh found a congenial chief; though his favour with these statesmen was jealously viewed both by the Irish oligarchy and by the English politicians who wished to keep the machine of Irish administration in their own hands. Pitt himself was doubtful of the expediency of making an Irishman chief secretary, but his view was changed by the influence of Cornwallis. In suppressing Lord Edward Fitzgerald's conspiracy, and the rebellion which followed in 1798, Castlereagh's vigilance and firmness were invaluable. His administration was denounced by a faction as harsh and cruel—a charge afterwards repudiated by Grattan and Plunket—but he was always on the side of lenity. The disloyal in Ireland, both Jacobins and priest-led, the Protestant zealots and others who feared the consequence of the Union, coalesced against him in Dublin. Even there Castlereagh, though defeated in a first campaign (1799), impressed Pitt with his ability and tact. With Cornwallis he joined in holding out, during the second Union campaign (1800), the prospect of emancipation to the Roman Catholics. They were aided by free expenditure of money and promises of honours, methods too familiar in Irish politics. When the Act of Union was carried through the Irish parliament, in the summer of 1800, Castlereagh's official connexion with his native land practically ended. Before the Imperial Parliament met he urged upon Pitt the measures which he and Cornwallis thought requisite to make the Union effective. In spite of his services and of Pitt's support, disillusion awaited him. The king's reluctance to yield to the Roman Catholic claims was underestimated by Pitt, while Cornwallis imprudently permitted himself to use language which, though not amounting to a pledge, was construed as one. George III. resented the arguments brought forward by Castlereagh—" this young man " who had come over to talk him out of his coronation oath. He peremptorily refused to sanction emancipation, and Pitt and his cabinet made way for the Addington administration. Thereupon Castlereagh resigned, with Cornwallis. He took his seat at Westminster for Down, the constituency he had represented for ten years in Dublin. The leadership of an Irish party was offered to him, but he declined so to limit his political activity. His father accepted, at Portland's request, an Irish marquessate, on the understanding that in the future he or his heirs might claim the same rank in the Imperial Legislature; so that Castlereagh was able to sit in the House of Commons as Marquess in 1821–1822. Wilberforce discussed with Pitt the possibility of sending out Castlereagh to India as governor-general, when the friction between Lord Wellesley and the directors became grave; but Pitt objected, as the plan would remove Castlereagh from the House of Commons, which should be " the theatre of his future fame."

In 1802, Castlereagh, at Pitt's suggestion, became president of the Board of Control in the Addington cabinet. He had, though not in office, taken charge of Irish measures under Addington, including the repression of the Rebellion Bill, and the temporary suspension of the Habeas Corpus in 1801, and continued to advocate Catholic relief, tithe reform, state payment of Catholic and dissenting clergy and " the steady application of authority in support of the laws." To Lord Wellesley's Indian policy he gave a staunch support, warmly recognized by the governor-general. On Pitt's return to office (May 1804), Castlereagh retained his post, and, next year, took over also the duties of secretary for war and the colonies. Socially and politically, the gifts of his wife, Lady Emily Hobart, daughter of a former Irish viceroy, whom he had married in 1794, assisted him to make his house a meeting-place of the party; and his influence in parliament grew notwithstanding his defects of style, spoken and written. As a manager of men he had no equal. After Pitt's death his surviving colleagues failed to form a cabinet strong enough to face the formidable combination known as " All the Talents," and Castlereagh acquiesced in the resignation. But to the foreign policy of the Fox-Greville ministry and its conduct of the war he was always opposed. His objections to the Whig doctrine of withdrawal from " Continental entanglements " and to the reduction of military expenditure were justified when Fox himself was compelled " to nail his country's colours to the mast."

The cabinet of " All the Talents," weakened by the death of Fox and the renewed quarrel with the king, went out in April 1807. Castlereagh returned to the War Office under Portland, but grave difficulties arose, though Canning at the Foreign Office was then thoroughly at one with him. A priceless opportunity had been missed after Eylau. The Whigs had crippled the transport service, and the operations to avert the ruin of the coalition at Friedland came too late. The Tsar Alexander believed that England would no longer concern herself with the Continental struggle, and Friedland was followed by Tilsit. The secret articles of that compact, denied at the time by the Opposition and by French apologists, have now been revealed from official records in M. Vandal's work, *Napoléon et Alexandre*. Castlereagh and Canning saw the vital importance of nullifying the aim of this project. The seizure of the Danish squadron at Copenhagen, and the measures taken to rescue the fleets of Portugal and Sweden from Napoleon, crushed a combination as menacing as that defeated at Trafalgar. The expedition to Portugal, though Castlereagh's influence was able only to secure Arthur Wellesley a secondary part at first, soon dwarfed other issues. In the debates on the Convention of Cintra, Castlereagh defended Wellesley against parliamentary attacks: " A brother," the latter wrote, " could not have done more." The depression produced by Moore's campaign in northern Spain, and the king's repugnance to the Peninsular operations, seemed to cut short Wellesley's career; but early in 1809, Castlereagh, with no little difficulty, secured his friend's appointment as commander-in-chief of the second Portuguese expedition. The merit has been claimed for Canning by Stapleton, but the evidence is all the other way.

Meanwhile, Castlereagh's policy led to a crisis that clouded his own fortunes. The breach between him and Canning was not due to his incompetence in the conduct of the Walcheren expedition. In fact, Castlereagh's ejection was decided by Canning's intrigues, though concealed from the victim, months before the armament was sent out to the Scheldt. In the selection of the earl of Chatham as commander the king's personal preference was known, but there is evidence also that it was one of Canning's schemes, as he reckoned, if Chatham succeeded, on turning him into a convenient ministerial figurehead. Canning was not openly opposed to the Walcheren expedition, and on the Peninsular question he mainly differed from Castlereagh and Wellington in fixing his hopes on national enthusiasm and popular uprisings. Military opinion is generally agreed that the plan of striking from Walcheren at Antwerp, the French naval base, was sound. Napoleon heard the news with dismay; in principle Wellington approved the plan. Castlereagh's proposal was for a *coup de main*, under strict conditions of celerity and secrecy, as Antwerp was unable to make any adequate defence. But Chatham, the naval authorities and the cabinet proceeded with a deliberation explained by the fact that the war secretary had been condemned in secret. The expedition, planned at the end of March, did not reach Walcheren till the end of July 1809; and more time was lost in movements against Batz and Flushing, protracted until an unhealthy autumn prostrated the army, which was withdrawn, discredited and disabled, in September. Public opinion threw the whole blame upon Castlereagh, who then found that, in deference to Canning, his colleagues had decreed his removal half a year earlier, though they kept silence till the troops were brought back from Walcheren. When Castlereagh learned from Percival that the slur cast on him had its origin in a secret attack on him many months before, he was cruelly hurt. The main charge against him was, he says, that he would not throw over officers on whom unpopularity fell, at the first shadow of ill-fortune. His refusal to rush into censure of Moore, following Canning's sudden change from eulogy to denunciation, requires no defence. According to the ideas then prevailing Castlereagh held himself justified in sending a challenge to the original author, as he held, of a disloyal intrigue against a colleague. In the subsequent duel Canning was wounded and the rivals simultaneously resigned. In private letters to his father and brother, Castlereagh urged that he was bound to show that he "was not privy to his own disgrace." When Canning published a lengthy explanation of his conduct, many who had sided with him were convinced that Castlereagh had been much wronged. The excuse that the protest upon which the cabinet decided against Castlereagh did not mention the minister's name was regarded as a quibble. Men widely differing in character and opinions—Walter Scott, Sidney Smith, Brougham and Cobbett—took this view. Castlereagh loyally supported the government in parliament, after Lord Wellesley's appointment to the Foreign Office. Though Wellington's retreat after Talavera had been included, with the disasters of the Corunna and Walcheren campaigns, in the censures on Castlereagh, and though ministers were often depressed and doubtful, Castlereagh never lost faith in Wellington's genius. Lord Wellesley's resignation in 1812, when the Whigs failed to come to terms with the regent, led to Castlereagh's return to office as foreign secretary (March 1812). The assassination of Percival soon threw upon him the leadership of the House of Commons, and this double burden he continued to bear during the rest of his life.

From March 1812 to July 1822 Castlereagh's biography is, in truth, the history of England. Though never technically prime minister, during these years he wielded a power such as few ministers have exercised. Political opponents and personal ill-wishers admitted that he was the ablest leader who ever controlled the House of Commons for so long a period. As a diplomatist, nobody save Marlborough had the same influence over men or was given equal freedom by his colleagues at home. Foreigners saw in him the living presence of England in the camp of the Allies. At the War Office he had been hampered by the lack of technical knowledge, while nature had not granted him, as an organizer, the powers of a Carnot or Roon. But in diplomacy his peculiar combination of strength and charm, of patience and conciliatory adroitness, was acknowledged by all. At the Foreign Office he set himself at once to meet Napoleon's designs in northern Europe, where Russia was preparing for her life-and-death struggle. Lord Wellesley paid a high tribute to Castlereagh's conduct in this situation, and Wellington declared that he had then "rendered to the world the most important service that ever fell to the lot of any individual to perform." Castlereagh wisely rejected Napoleon's insincere overtures for peace. After the Moscow *débâcle* Napoleon's fate was affected not only by Wellington's progress in Spain, but by the attitude of the northern powers and by the action of Turkey, due to Castlereagh's opportune disclosure to the Porte of the scheme of partition at Tilsit. At home, the repeal of the Orders in Council was carried, the damage to British trade plainly outweighing the injury inflicted on France by the restrictive system. The British subsidies to the Allies were largely increased as the operations of 1813 developed, but all Castlereagh's skill was needed to keep the Coalition together. The Allied powers were willing, even after Leipzig, to treat with France on the basis of restoring her "natural frontiers"—the Rhine, the Alps and the Pyrenees; but Castlereagh protested. He would not allow the enemy to take ground for another tiger-spring. Before the Conference of Châtillon, where Napoleon sent Caulaincourt to negotiate for peace—with the message scribbled on the margin of his instructions, "Ne signez rien"—Aberdeen wrote to hasten Castlereagh's coming: "Everything which has been so long smothered is now bursting forth"; and again, "Your presence has done much and would, I have no doubt, continue to sustain them (the Allies) in misfortune." The Liverpool cabinet then and later were as urgent in pressing him to return to lead the House of Commons. He had lost his seat for Down in 1805, and afterwards sat for British boroughs; but in 1812 he was re-elected by his old constituents; and again in 1818 and 1820, sitting, after he became marquess of Londonderry in 1821, for Orford. Early in 1814 his colleagues reluctantly consented to his visit to the allied head-quarters. The Great Alliance showed signs of weakness and division. Austria was holding back; Prussia had almost broken away; above all, the ambiguous conduct of Alexander bred alarm and doubt. This situation became increasingly serious while Napoleon was giving daily proofs that his military genius, confronting a hesitant and divided enemy, was at its best. Castlereagh strove to keep the Allies together, to give no excuse for those separate arrangements upon which Napoleon was reckoning, to assert no selfish policy for England, to be tied by no theoretical consistency. At the Châtillon conferences England was represented by others, but Castlereagh was present with supreme authority over all, and it was he who determined the result. He declined to commit his country either to a blank refusal to negotiate with Napoleon or to the advocacy of a Bourbon restoration. He was ready to give up almost the whole of England's conquests, but he insisted on the return of France within her ancient limits as the basis of a settlement. Caulaincourt's advice was to take advantage of these overtures; but his master was not to be advised. The counter-projects that he urged Caulaincourt to submit to were advanced after his victory at Montereau, when he boasted that he was nearer to Munich than the Allies were to Paris. Even before the Châtillon conference was dissolved (March 18th), Castlereagh saw that Caulaincourt's efforts would never bend Napoleon's will. The Allies adopted his view and signed the treaty of Chaumont (March 1st), "my treaty," as Castlereagh called it, with an unusual touch of personal pride; adding "Upon the face of the treaty this year our engagement is equivalent to theirs united." The power of England when she threw her purse into the scale had been just exhibited at Bar-sur-Aube, when at a council of all the representatives of the powers the retreat of the allied armies was discussed. Bernadotte, playing a waiting game in Holland, was unwilling to reinforce Blücher, then in a dangerous position, by the Russian and Prussian divisions of Winzingerode and Bülow, temporarily placed under his orders. Having asked for and received the assurance that the military leaders were agreed in holding the transfer necessary, Castlereagh declared that he took upon himself the responsibility of bringing the Swedish prince to reason. The withholding of the British subsidies was a vital matter, not only with Bernadotte but with all the powers. Castlereagh's avowed intention to take this step without waiting for sanction from his cabinet put an end to evasion and delay. Blücher was reinforced by the two divisions; the battle of Laon was fought and won, and the allies occupied the French capital. In April 1814 Castlereagh arrived in Paris. He did not disguise his discontent with Napoleon's position at Elba, close to the French coast, though he advised England not to separate herself at this crisis from her allies. His uneasiness led him to summon Wellington from the south to the Embassy in Paris. He hastened himself to London during the visit of the allied sovereigns, and met with a splendid reception. He was honoured with the Garter, being one of the few commoners ever admitted to that order. When the House of Commons offered to the Crown its congratulations upon the treaty of peace, Castlereagh's triumph was signalized by a brilliantly eloquent panegyric from Canning, and by a recantation of his former doubts and denunciations from Whitbread. His own dignified language vindicated his country from the charge of selfish ambition.

His appointment as British representative at Vienna, where the congress was to meet in September, was foreseen; but meanwhile he was not idle. The war with the United States, originating in the non-intercourse dispute and the Orders in Council, did not cease with the repeal of the latter. It lasted through 1814 till the signing of the treaty of Ghent, soon before the flight from Elba. In parliament the ministry, during Castlereagh's absence, had been poorly championed. Canning had thrown away his chance by his unwise refusal of the Foreign Office. None of the ministers had any pretension to lead when Castlereagh was busy abroad and Canning was sulking at home, and Castlereagh's letters to Vansittart, the chancellor of the exchequer, show how these difficulties weighed upon him in facing the position at Vienna, where it was imperative for him to appear. At Vienna he realized at once that the ambition of Russia might be as formidable to Europe and to Great Britain as that of the fallen tyrant. His aim throughout had been to rescue Europe from military domination; and when he found that Russia and Prussia were pursuing ends incompatible with the general interest, he did not hesitate to take a new line. He brought about the secret treaty (Jan. 3, 1815) between Great Britain, Austria and France, directed against the plans of Russia in Poland and of Prussia in Saxony. Through Castlereagh's efforts, the Polish and Saxon questions were settled on the basis of compromise. The threat of Russian interference in the Low Countries was dropped.

While the Congress was still unfinished, Napoleon's escape from Elba came like a thunderclap. Castlereagh had come home for a short visit (Feb. 1815), at the urgent request of the cabinet, just before the flight was known. The shock revived the Great Alliance under the compact of Chaumont. All energies were directed to preparing for the campaign of Waterloo. Castlereagh's words in parliament were, " Whatever measures you adopt or decision you arrive at must rest on your own power and not on reliance on this man." Napoleon promptly published the secret treaty which Castlereagh had concluded with Metternich and Talleyrand, and the last left in the French archives. But Russia and Prussia, though much displeased, saw that, in the face of Bonaparte's return, they dared not weaken the Alliance. British subsidies were again poured out like water. After Napoleon's overthrow, Castlereagh successfully urged his removal to St Helena, where his custodians were charged to treat him " with all the respect due to his rank, but under such precautions as should render his escape a matter of impossibility." Some of the continental powers demanded, after Waterloo, fines and cessions that would have crushed France; but in November a peace was finally concluded, mainly by Castlereagh's endeavours, minimising the penalties exacted, and abandoning on England's part the whole of her share of the indemnity. The war created an economic situation at home which strengthened the Whigs and Radicals, previously discredited by their hostility to a patriotic struggle. In 1816 the Income Tax was remitted, despite Castlereagh's contention that something should first be done to reduce the Debt Charge. His policy, impressed upon British representatives abroad, was " to turn the confidence Great Britain inspired to the account of peace, by exercising a conciliatory influence in Europe." Brougham's action, at the end of 1815, denouncing the Holy Alliance, even in its early form, was calculated to embarrass England, though she was no party to what Castlereagh described as a " piece of sublime mysticism and nonsense."

While he saw no reason in this for breaking up the Grand Alliance, which he looked upon as a convenient organ of diplomatic intercourse and as essential for the maintenance of peace, he regarded with alarm " the little spirit of German intrigue," and agreed with Wellington that to attempt to crush France, as the Prussians desired, or to keep her in a perpetual condition of tutelage under a European concert from which she herself should be excluded, would be to invite the very disaster which it was the object of the Alliance to avoid. It was not till Metternich's idea of extending the scope of the Alliance, by using it to crush " the revolution " wherever it should raise its head, began to take shape, from the conference of Aix-la-Chapelle (1818) onward, that Great Britain's separation from her continental allies became inevitable. Against this policy of the reactionary powers Castlereagh from the first vigorously protested. As little was he prepared to accept the visionary schemes of the emperor Alexander for founding an effective " confederation of Europe " upon the inclusive basis of the Holy Alliance (see ALEXANDER I. of Russia).

Meanwhile financial troubles at home, complicated by the resumption of cash payments in 1819, led to acute social tension. " Peterloo " and the " Six Acts " were furiously denounced, though the bills introduced by Sidmouth and Castlereagh were carried in both Houses by overwhelming majorities. The danger that justified them was proved beyond contest by the Cato Street Conspiracy in 1820. It is now admitted by Liberal writers that the " Six Acts," in the circumstances, were reasonable and necessary. Throughout, Castlereagh maintained his tranquil ascendancy in the House of Commons, though he had few colleagues who were capable of standing up against Brougham. Canning, indeed, had returned to office and had defended the " Six Acts," but Castlereagh bore the whole burden of parliamentary leadership, as well as the enormous responsibilities of the Foreign Office. His appetite for work caused him to engage in debates and enquiries on financial and legal questions when he might have delegated the task to others. Althorp was struck with his unsleeping energy on the Agricultural Distress Committee; " His exertions, coupled with his other duties—and unfortunately he was always obstinate in refusing assistance—strained his constitution fearfully, as was shown by his careworn brow and increasing paleness." In 1821, on Sidmouth's retirement, he took upon himself the laborious functions of the Home Office. The diplomatic situation had become serious. The policy of " intervention," with which Great Britain had consistently refused to identify herself, had been proclaimed to the world by the famous Troppau Protocol, signed by Russia, Austria and Prussia (see TROPPAU, CONGRESS OF). The immediate occasion was the revolution at Naples, where the egregious Spanish constitution of 1812 had been forced on the king by a military rising. With military revolts, as with paper constitutions of an unworkable type, Castlereagh had no sympathy; and in this particular case the revolution, in his opinion, was wholly without excuse or palliation. He was prepared to allow the intervention of Austria, if she considered her rights under the treaty of 1813 violated, or her position as an Italian Power imperilled. But he protested against the general claim, embodied in the Protocol, of the European powers to interfere, uninvited, in the internal concerns of sovereign states; he refused to make Great Britain, even tacitly, a party to such interference, and again insisted that her part in the Alliance was defined by the letter of the treaties, beyond which she was not prepared to go. In no case, he affirmed, would Great Britain " undertake the moral responsibility for administering a general European police," which she would never tolerate as applied to herself.

To Troppau, accordingly, no British plenipotentiary was sent, since the outcome of the conferences was a foregone conclusion; though Lord Stewart came from Vienna to watch the course of events. At Laibach an attempt to revive the Troppau proposals was defeated by the firm opposition of Stewart; but a renewal of the struggle at Verona in the autumn of 1822 was certain. Castlereagh, now marquess of Londonderry, was again to be the British representative, and he drew up for himself instructions that were handed over unaltered by Canning, his successor at the Foreign Office, to the new plenipotentiary, Wellington. In the threatened intervention of the continental powers in Spain, as in their earlier action towards Naples and Sardinia, England refused to take part. The Spanish revolutionary movement, Castlereagh wrote, "was a matter with which, in the opinion of the English cabinet, no foreign power had the smallest right to interfere." Before, however, the question of intervention in Spain had reached its most critical stage the development of the Greek insurrection against the Ottoman government brought up the Eastern Question in an acute form, which profoundly modified the relations of the powers within the Alliance, and again drew Metternich and Castlereagh together in common dread of an isolated attack by Russia upon Turkey. A visit of King George IV. to Hanover, in October 1821, was made the occasion of a meeting between Lord Londonderry and the Austrian chancellor. A meeting so liable to misinterpretation was in Castlereagh's opinion justified by the urgency of the crisis in the East, "a practical consideration of the greatest moment," which had nothing in common with the objectionable "theoretical" question with which the British government had refused to concern itself. Yet Castlereagh, on this occasion, showed that he could use the theories of others for his own practical ends; and he joined cordially with Metternich in taking advantage of the emperor Alexander's devotion to the principles of the Alliance to prevent his taking an independent line in the Eastern Question. It was, indeed, the belief that this question would be made the matter of common discussion at the congress that led Castlereagh to agree to be present at Verona; and in his *Instructions* he foreshadowed the policy afterwards carried out by Canning, pointing out that the development of the war had made the recognition of the belligerent rights of the Greeks inevitable, and quoting the precedent of the Spanish American colonies as exactly applicable. With regard to the Spanish colonies, moreover, though he was not as yet prepared to recognize their independence *de jure*, he was strongly of opinion that the Spanish government should do so since "other states would acknowledge them sooner or later, and it is to the interest of Spain herself to find the means of restoring an intercourse when she cannot succeed in restoring a dominion."

But the tragic ending of Castlereagh's strenuous life was near; and the credit of carrying out the policy foreshadowed in the *Instructions* was to fall to his rival Canning. Lord Londonderry's exhaustion became evident during the toilsome session of 1822. Both the king and Wellington were struck by his overwrought condition, which his family attributed to an attack of the gout and the lowering remedies employed. Wellington warned Dr Bankhead that Castlereagh was unwell, and, perhaps, mentally disordered. Bankhead went down to North Cray and took due precautions. Castlereagh's razors were taken away, but a penknife was forgotten in a drawer, and with this he cut his throat (August 12, 1822). He had just before said, "My mind, my mind, is, as it were, gone"; and, when he saw his wife and Bankhead talking together, he moaned "there is a conspiracy laid against me." It was as clear a case of brain disease as any on record. But this did not prevent his enemies of the baser sort from asserting, without a shadow of proof, that the suicide was caused by terror at some hideous and undefined charge. The testimony of statesmen of the highest character and of all parties to Castlereagh's gifts and charm is in strong contrast with the flood of vituperation and calumny poured out upon his memory by those who knew him not.

Bibliography.—Castlereagh's correspondence and papers were published by his brother and successor (1850–1853) in twelve volumes. Sir Archibald Alison's *Biography* in three volumes came out in 1861, with copious extracts from the manuscripts preserved at Wynyard. It was made the subject of an interesting essay in the *Quarterly Review* for January 1862, reprinted in *Essays by the late Marquis of Salisbury* (London, 1905). A graceful sketch by Theresa, Marchioness of Londonderry (London, 1904), originally brought out in the *Anglo-Saxon Review*, contains some extracts from Castlereagh's unpublished correspondence with his wife, the record of an enduring and passionate attachment which throws a new light on the man. (E. D. J. W.)

LONDONDERRY, a northern county of Ireland in the province of Ulster, bounded N. by the Atlantic, W. by Lough Foyle and Donegal, E. by Antrim and Lough Neagh, and S. by Tyrone. The area is 522,315 acres, or about 816 sq. m. The county consists chiefly of river valleys surrounded by elevated tablelands rising occasionally into mountains, while on the borders of the sea-coast the surface is generally level. The principal river is the Roe, which flows northward from the borders of Tyrone into Lough Foyle below Newton-Limavady, and divides the county into two unequal parts. Farther west the Faughan also falls into Lough Foyle, and the river Foyle passes through a small portion of the county near its north-western boundary. In the south-east the Moyola falls into Lough Neagh, and the Lower Bann from Lough Neagh forms for some distance its eastern boundary with Antrim. The only lake in the county is Lough Finn on the borders of Tyrone, but Lough Neagh forms about 6 m. of its south-eastern boundary. The scenery of the shores of Lough Foyle and the neighbouring coast is attractive, and Castlerock, Downhill, Magilligan and Portstewart are favourite seaside resorts. On the flat Magilligan peninsula, which forms the eastern horn of Lough Foyle, the base-line of the trigonometrical survey of Ireland was measured in 1826. The scenery of the Roe valley, with the picturesque towns of Limavady and Dungiven, is also atrractive, and the roads from the latter place to Draperstown and to Maghera, traversing the passes of Evishgore and Glenshane respectively, afford fine views of the Sperrin and Slieve Gallion mountains.

The west of this county consists of Dalradian mica-schist, with some quartzite, and is a continuation of the northern region of Tyrone. An inlier of these rocks appears in the rising ground east of Dungiven, including dark grey crystalline limestone. Old Red Sandstone and Lower Carboniferous Sandstone overlie these old rocks in the south and east, meeting the igneous "green rocks" of Tyrone, and the granite intrusive in them, at the north end of Slieve Gallion. Triassic sandstone covers the lower slope of Slieve Gallion on the south-east towards Moneymore, and rises above the Carboniferous Sandstone from Dungiven northward. At Moneymore we reach the western scarp of the White Limestone (Chalk) and the overlying basalt of the great plateaus, which dip down eastward under Lough Neagh. The basalt scarp, protecting chalk and patches of Liassic and Rhaetic strata, rises to 1260 ft. in Benevenagh north of Limavady, and repeats the finest features of the Antrim coast. A raised shelf with post-glacial marine clays forms the flat land west of Limavady. Haematite has been mined on the south flank of Slieve Gallion.

The excessive rainfall and the cold and uncertain climate are unfavourable for agriculture. Along the sea-coast there is a district of red clay formed by the decomposition of sandstone, and near the mouth of the Roe there is a tract of marl. Along the valleys the soil is often fertile, and the elevated districts of the clay-slate region afford pasture for sheep. The acreage of pasture-land does not greatly exceed that of tillage. Oats, potatoes and turnips are chiefly grown, with some flax; and cattle, sheep, pigs and poultry are kept in considerable numbers. The staple manufacture of the county is linen. The manufacture of coarse earthenware is also carried on, and there are large distilleries and breweries and some salt-works. There are fisheries for salmon and eels on the Bann, for which Coleraine is the headquarters. The deep-sea and coast fisheries are valuable, and are centred at Moville in Co. Donegal. The city of Londonderry is an important railway centre. The Northern Counties (Midland) main line reaches it by way of Coleraine and the north coast of the county, and the same railway serves the eastern part of the county, with branches from Antrim to Magherafelt, and Magherafelt to Cookstown (Co. Tyrone), to Draperstown and to Coleraine, and from Limavady to Dungiven. The Great Northern railway reaches Londonderry from the south, and the city is also the starting-point of the County Donegal, and the Londonderry and Lough Swilly railways.

The population decreases (152,009 in 1891; 144,404 in 1901) and emigration is extensive, though both decrease and emigration are well below the average of the Irish counties. Of the total, about 43% are Roman Catholics, and nearly 50% Presbyterians or

Protestant Episcopalians. Londonderry (pop. 38,892), Coleraine (6958) and Limavady (2692) are the principal towns, while Magherafelt and Moneymore are lesser market towns. The county comprises six baronies. Assizes are held at Londonderry, and quarter sessions at Coleraine, Londonderry and Magherafelt. The county is represented in parliament by two members, for the north and south divisions respectively. The Protestant and Roman Catholic dioceses of Armagh, Derry and Down each include parts of the county.

At an early period the county was inhabited by the O'Cathans or O'Catrans, who were tributary to the O'Neills. Towards the close of the reign of Elizabeth the county was seized, with the purpose of checking the power of the O'Neills, when it received the name of Coleraine, having that town for its capital. In 1609, after the confiscation of the estates of the O'Neills, the citizens of London obtained possession of the towns of Londonderry and Coleraine and adjoining lands, 60 acres out of every 1000 being assigned for church lands. The common council of London undertook to expend £20,000 on the reclamation of the property, and elected a body of twenty-six for its management, who in 1613 were incorporated as the Irish Society, and retained possession of the towns of Londonderry and Coleraine, the remainder of the property being divided among twelve of the great livery companies. Their estates were sequestrated by James I., and in 1637 the charter of the Irish Society was cancelled. Cromwell restored the society to its former position, and Charles II. at the Restoration granted it a new charter, and confirmed the companies in their estates. In the insurrection of 1641 Moneymore was seized by the Irish, and Magherafelt and Bellaghy, then called Vintner's Town, burned, as well as other towns and villages. There are several stone circles, and a large number of artificial caves. The most ancient castle of Irish origin is that of Carrickreagh; and of the castles erected by the English those of Dungiven and Muff are in good preservation. The abbey of Dungiven, founded in 1109, and standing on a rock about 200 ft. above the river Roe, is a picturesque ruin.

LONDONDERRY, or DERRY, a city, county of a city, parliamentary borough (returning one member) and the chief town of Co. Londonderry, Ireland, 4 m. from the junction of the river Foyle with Lough Foyle, and 95 m. N.N.W. of Belfast. Pop. (1901) 38,892. The city is situated on an eminence rising abruptly from the west side of the river to a height of about 120 ft. The eminence is surrounded by hills which reach, a few miles to the north, an elevation of upwards of 1500 ft., and the river and lough complete an admirable picture. The city is surrounded by an ancient rampart about a mile in circumference, having seven gates and several bastions, but buildings now extend beyond this boundary. The summit of the hill, at the centre of the town, is occupied by a quadrangular area from which the main streets diverge. Some old houses with high pyramidal gables remain but are much modernized. The Protestant cathedral of St Columba, in Perpendicular style, was completed from the design of Sir John Vanbrugh in 1633, at a cost of £4000 contributed by the city of London, and was enlarged and restored in 1887. The spire was added in 1778 and rebuilt in 1802. The bishop's palace, erected in 1716, occupies the site of the abbey founded by Columba. The abbot of this monastery, on being made bishop, erected in 1164 Temple More or the "Great Church," one of the finest buildings in Ireland previous to the Anglo-Norman invasion. The original abbey church was called the "Black Church," but both it and the "Great Church" were demolished in 1600 and their materials used in fortifying the city. There is a large Roman Catholic cathedral, erected *c.* 1870 and dedicated to St Eugenius. For Foyle College, founded in 1617, a new building was erected in 1814. This and the Academical Institution, a foundation of 1868, were amalgamated in 1896. Magee College, taking its name from its foundress, Mrs Magee of Dublin, was instituted in 1857 as a training-school for the Presbyterian ministry.

The staple manufacture of the town is linen (especially shirt-making), and there are also shipbuilding yards, iron-foundries, saw-mills, manure-works, distilleries, breweries and flour-mills. The salmon fishery on the Foyle is valuable. The river affords a commodious harbour, its greatest depth being 33 ft. at high tide, and 12 ft. at low tide. It is under the jurisdiction of the Irish Society. The port has a considerable shipping trade with Great Britain, exporting agricultural produce and provisions. Regular services of passenger steamers serve Londonderry from Glasgow, Liverpool, Morecambe, Belfast and local coast stations. In 1898 Londonderry was constituted one of the six county boroughs which have separate county councils.

About 5 m. W. of the city, on a hill 803 ft. high, is a remarkable fort, consisting of three concentric ramparts, and an interior fortification of stone. It is named the Grianan of Aileach, and was a residence of the O'Neills, kings of Ulster. It was restored in 1878.

Derry, the original name of Londonderry, is derived from *Doire*, the "place of oaks." It owes its origin to the monastery founded by Columba about 546. With the bishopric which arose in connexion with this foundation, that of Raphoe was amalgamated in 1834. From the 9th to the 11th century the town was frequently in the possession of the Danes, and was often devastated, but they were finally driven from it by Murtagh O'Brien about the beginning of the 12th century. In 1311 it was granted by Edward II. to Richard de Burgh. After the Irish Society of London obtained possession of it, it was incorporated in 1613 under the name of Londonderry. From this year until the Union in 1800 two members were returned to the Irish parliament. The fortifications, which were begun in 1600, were completed in 1618. In 1688 Derry had become the chief stronghold of the Protestants of the north. On the 7th of December certain of the apprentices in the city practically put themselves and it in a stage of siege by closing the gates, and on the 19th of April 1689 the forces of James II. began in earnest the famous siege of Derry. The rector of Donaghmore, George Walker, who, with Major Baker, was chosen to govern Derry, established fame for himself for his bravery and hopefulness during this period of privation, and the historic answer of "No surrender," which became the watchword of the men of Derry, was given to the proposals of the besiegers. The garrison was at the last extremity when, on the 30th of July, ships broke through the obstruction across the harbour and brought relief. Walker and the siege are commemorated by a lofty column (1828), bearing a statue of the governor, on the Royal Bastion, from which the town standards defied the enemy; and the anniversary of the relief is still observed.

LONG, GEORGE (1800–1879), English classical scholar, was born at Poulton, Lancashire, on the 4th of November 1800, and educated at Macclesfield grammar-school and Trinity College, Cambridge. He was Craven university scholar in 1821 (bracketed with Lord Macaulay and Henry Malden), wrangler and senior chancellor's medallist in 1822 and became a fellow of Trinity in 1823. In 1824 he was elected professor of ancient languages in the new university of Virginia at Charlottesville, U.S.A., but after four years returned to England as the first Greek professor at the newly founded university of London. In 1842 he succeeded T. H. Key as professor of Latin at University College; in 1846–1849 he was reader in jurisprudence and civil law in the Middle Temple, and finally (1849–1871) classical lecturer at Brighton College. Subsequently he lived in retirement at Portfield, Chichester, in receipt (from 1873) of a Civil List pension of £100 a year obtained for him by Gladstone. He was one of the founders (1830), and for twenty years an officer, of the Royal Geographical Society; an active member of the Society for the Diffusion of Useful Knowledge, for which he edited the quarterly *Journal of Education* (1831–1835) as well as many of its text-books; the editor (at first with Charles Knight, afterwards alone) of the *Penny Cyclopaedia* and of Knight's *Political Dictionary*; and a member of the Society for Central Education instituted in London in 1837. He contributed the Roman law articles to Smith's *Dictionary of Greek and Roman Antiquities*, and wrote also for the companion dictionaries of *Biography* and *Geography*. He is remembered, however, mainly as the editor of the *Bibliotheca Classica* series—the first serious attempt to produce scholarly editions of classical texts with English commentaries—to which he contributed the edition of Cicero's *Orations* (1851–1862). He died on the 10th of August 1879.

Among his other works are: *Summary of Herodotus* (1829); editions of Herodotus (1830–1833) and Xenophon's *Anabasis* (1831); revised editions of J. A. Macleane's Juvenal and Persius (1867) and Horace (1869); the *Civil Wars of Rome*; a translation with notes of thirteen of Plutarch's *Lives* (1844–1848); translations of the *Thoughts of Marcus Aurelius* (1862) and the *Discourses of Epictetus* (1877); *Decline of the Roman Republic* (1864–1874), 5 vols. See H. J. Matthews, "In Memoriam," reprinted from the *Brighton College Magazine*, 1879.

LONG, JOHN DAVIS (1838–), American lawyer and political leader, was born in Buckfield, Oxford county, Maine, on the 27th of October 1838. He graduated at Harvard in 1857, studied law at the Harvard Law School and in 1861 was admitted to the bar. He practised in Boston, became active in politics as a Republican, was a member of the Massachusetts House of Representatives in 1875–1878 and its speaker in 1876–1878, lieutenant-governor of the state in 1879, and governor in 1880–1882. In 1883–1889 he was a member of the National House of Representatives, and from March 1897 to May 1902 was secretary of the navy, in the cabinet, first of President McKinley and then of President Roosevelt. In 1902 he became president of the Board of Overseers of Harvard College. His publications include a version of the *Aeneid* (1879), *After-Dinner and Other Speeches* (1895) and *The New American Navy* (1903).

LONG BRANCH, a city of Monmouth county, New Jersey, U.S.A., on the easternmost or "long" branch of the Shrewsbury river and on the Atlantic coast, about 30 m. S. of New York City. Pop. (1890) 7231; (1900) 8872, of whom 1431 were foreign-born and 987 were negroes; (1910 census) 13,298. It is served by the Pennsylvania, the Central of New Jersey, the New York & Long Branch, and electric railways, and by steamboats to New York. The carriage roads in the vicinity are unusually good. Long Branch is one of the oldest American watering-places. It is situated on a bluff which rises abruptly 20-35 ft. above the beach, and along the front of which bulkheads and jetties have been erected as a protection from the waves; along or near the edge of the bluff, Ocean Avenue, 60 ft. wide and about 5 m. long (from Seabright to Deal), commands delightful views of the ocean. A "bluff walk" runs above the water for 2 m. The city has one public park, Ocean Park (about 10 acres), and two privately owned parks, one of which is Pleasure Bay Park (25 acres), on the Shrewsbury river, where operas are given in the open air. The principal public institutions are the Monmouth Memorial Hospital and the Long Branch Circulating Library. In Long Branch the Monmouth County Horse Show is held annually in July. The southern part of Long Branch, known as Elberon, contains some beautiful summer residences—in one of its cottages General U. S. Grant spent his summers for many years, and in another, the Francklyn, President J. A. Garfield died in 1881. In 1909 a monument to Garfield was erected in Ocean Park. Adjoining Long Branch on the N. is the borough of Monmouth Beach (incorporated in 1906; population, 1910, 485). Before the War of Independence the site of Long Branch was owned by Colonel White, a British officer. It was confiscated as a result of the war, and late in the century its development as a watering-place began. Long Branch was chartered as a city in 1904.

LONGCHAMP, WILLIAM (d. 1197), chancellor of England and bishop of Ely, entered public life at the close of Henry II.'s reign as official to the king's son Geoffrey, for the archdeaconry of Rouen. Henry II., who disliked him, called him the "son of two traitors." He soon deserted Geoffrey for Richard, who made him chancellor of the duchy of Aquitaine. He always showed himself an able diplomatist. He first distinguished himself at Paris, as Richard's envoy, when he defeated Henry II.'s attempt to make peace with Philip Augustus (1189). On Richard's accession William became chancellor of the kingdom and bishop of Ely. When Richard left England (Dec. 1189), he put the tower of London in his hands and chose him to share with Hugh de Puiset, the great bishop of Durham, the office of chief justiciar. William immediately quarrelled with Hugh, and by April 1190 had managed to oust him completely from office. In June 1190 he received a commission as legate from Pope Celestine. He was then master in church as well as state. But his disagreeable appearance and manners, his pride, his contempt for everything English made him detested. His progresses through the country with a train of a thousand knights were ruinous to those on whom devolved the burden of entertaining him. Even John seemed preferable to him. John returned to England in 1191; he and his adherents were immediately involved in disputes with William, who was always worsted. At last (June 1191) Geoffrey, archbishop of York and William's earliest benefactor, was violently arrested by William's subordinates on landing at Dover. They exceeded their orders, which were to prevent the archbishop from entering England until he had sworn fealty to Richard. But this outrage was made a pretext for a general rising against William, whose legatine commission had now expired, and whose power was balanced by the presence of the archbishop of Rouen, Walter Coutances, with a commission from the king. William shut himself up in the Tower, but he was forced to surrender his castles and expelled from the kingdom. In 1193 he joined Richard in Germany, and Richard seems to have attributed the settlement soon after concluded between himself and the emperor, to his "dearest chancellor." For the rest of the reign Longchamp was employed in confidential and diplomatic missions by Richard all over the continent, in Germany, in France and at Rome. He died in January 1197. His loyalty to Richard was unswerving, and it was no doubt through his unscrupulous devotion to the royal interest that he incurred the hatred of Richard's English subjects.

Authorities.—Benedictus, *Gesta Henrici*, vol. ii.; Giraldus Cambrensis, *De Vita Galfridi*; Stubbs' Preface to Roger of Hoveden, vol. iii.; L. Bovine-Champeaux, *Notice sur Guillaume de Longchamp* (Évreux, 1885).

LONGCLOTH, a plain cotton cloth originally made in comparatively long pieces. The name was applied particularly to cloth made in India. Longcloth, which is now commonly bleached, comprehends a number of various qualities. It is heavier than cambric, and finer than medium or Mexican. As it is used principally for underclothing and shirts, most of the longcloth sold in Great Britain passes through the hands of the shirt and underclothing manufacturers, who sell to the shopkeepers, though there is still a considerable if decreasing retail trade in piece-goods. The lower kinds of longcloth, which are made from American cotton, correspond in quality to the better kinds of "shirting" made for the East, but the best longcloths are made from Egyptian cotton, and are fine and fairly costly goods.

LONG EATON, an urban district in the Ilkeston parliamentary division of Derbyshire, England, 10 m. E.S.E. of Derby, on the Midland railway. Pop. (1891) 9636; (1901) 13,045. It lies in the open valley of the Trent, at a short distance from the river, and near the important Trent Junction on the Midland railway system. The church of St Lawrence has Norman portions, and an arch and window apparently of pre-Conquest date. The large industrial population of the town is occupied in the manufacture of lace, which extended hither from Nottingham; there are also railway carriage works. To the north is the township of Sandiacre (pop. 2954), where the church has a fine Decorated chancel.

LONGEVITY, a term applied to express either the length or the duration of life in any organism, but, as cases of long duration excite most interest, frequently used to denote a relatively unusual prolongation of life. There is no reason to suppose that protoplasm, the living material of organisms, has a necessarily limited duration of life, provided that the conditions proper to it are maintained, and it has been argued that since every living organism comes into existence as a piece of the protoplasm of a pre-existing living organism, protoplasm is potentially immortal. Living organisms exist, however, as particles or communities of particles of protoplasm (see Life), and as such have a limited duration of life. Longevity, as E. Ray Lankester pointed out in 1869, for practical purposes must be understood to mean the "length of time during which life is exhibited in an individual." The word "individual" must be taken in its ordinary sense as a wholly or partially independent, organized mass produced from a pre-existing organized mass, as otherwise the problem will be confused by arguments as to the meaning of biological individuality.

Empirical Data.—A multitude of observations show that only a very brief life, ranging from a few hours to a few days, is the normal fate of the vast majority of single-celled organisms, whether these be animal or vegetable or on the border-line between the two kingdoms. Death comes to them rapidly from internal or external causes, or the individual life ends in conjugation or division or spore-formation. Under special conditions, natural or artificial, the individual life may be prolonged by desiccation, or freezing, or by some similar arrest of functional activity.

The duration of life among plants is varied. The popular division into annuals, biennials and perennials is not absolute, for natural and artificial conditions readily prolong the lives of annuals and biennials for several seasons, whereas the case of perennials is much complicated by the mode of growth, and the problem of individuality, however we desire to exclude it, obtrudes itself. In the vast majority of cases where a plant is obviously a simple individual, its life is short, ranging from a few days in the case of fungi, to two seasons in the case of biennial herbs. Most of the simple algae are annual, their life enduring only for part of the year; the branching algae are more often perennial, but in their cases not only are observations as to duration lacking, but however simply we may use the term individual, its application is difficult. The larger terrestrial plants with woody tissues which we denote roughly as shrubs and trees have an individuality which, although different from that of a hyacinth or carrot, is usually obvious. Shrubs live from four to ten or more years, and it apparently is the case that odoriferous shrubs such as sage and lavender display the longer duration. Trees with soft wood, such as poplars and willows, last for about fifty years, fruit-trees rather longer. Estimates of the age which large trees can attain, based partly on attempts to count the annual rings, have been given by many writers, and range from about three hundred years in the case of the elm to three to five thousand years in the case of *Sequoia gigantea* of California, and over five thousand years in that of the baobab (*Adansonia digitata*) of Cape Verde. It is impossible to place exact reliance on these estimates, but it is at least certain that very many trees have a duration of life exceedingly great in comparison with the longest-lived animals.

The duration of life amongst multicellular invertebrate animals is little known, except in the frequent instances where it is normally brief. Many sponges and polyps die at the end of the season, leaving winter eggs or buds. The much-branched masses of the larger sponges and compound hydrozoa certainly may be perennial. A sea-anemone (*Actinia mesembryanthemum*), captured in 1828 by Sir John Dalyell, a Scottish naturalist, and then guessed to be about seven years old, lived in captivity in Edinburgh until 1887, the cause of death being unknown. As other instances of great ages attained by sea-anemones are on record, it is plain that these animals, although simple polyps, are long-lived. Echinoderms are inferred to live to considerable ages, as they grow slowly and as there is great difference in size amongst fully adult specimens. On similar reasoning, considerable age is attributed to the larger annulates and crustacea, but the smaller forms in many cases are known to have very short lives. The variation in the length of life of molluscs appears to be great. Many species of gastropods live only a few years; others, such as *Natica heros*, have reached thirty years, whilst the large *Tridacna gigas* is stated to live from sixty to a hundred years. Among insects, the adult stage has usually only a very short duration of life, extending from a few hours to a few months, but the larval stages may last much longer. Including these latter, the range of duration among insects, taking the whole life from hatching to death, appears to lie between the limits of a few weeks in the case of plant-lice to seventeen years in the case of the American *Cicada septemdecim*, the larva of which lives seventeen years, the adult only a month. Most butterflies are annuals, but those which fail to copulate may hibernate and live through a second season, whilst the lives of some have been preserved artificially for seven years. Worker bees and drones do not survive the season, but queens may live from two to five years. In the case of vertebrates, the duration of life appears to be greater among fish and reptiles than among birds and mammals. The ancient Romans have noted that eels, kept in aquaria, could reach the age of sixty years. Estimates based on size and rate of growth have led to the inference that salmon may live to the age of a hundred years, whilst G. L. L. Buffon set down the period of life of carp in ponds as one hundred and fifty years, and there is evidence for a pike having reached the age of over two centuries. More recently it has been claimed that the age of fish can be ascertained exactly by counting the annual rings of the otoliths. No great ages have as yet been recorded by this method, whilst, on the other hand, by revealing great variations of weight and size in fishes with the same number of annual rings, it has thrown doubt on the validity of estimates of age based on size and rate of growth. The evidence as a whole is unsatisfactory, but it is highly probable that in the absence of accidents most fish can attain very great ages. The duration of life among batrachia is little known, but small frogs have been recorded as living over twelve years, and toads up to thirty-six years.

Almost nothing is known as to the longevity of snakes and lizards, but it is probable that no great ages are reached. Crocodiles, alligators and caymans grow slowly and are believed to live very long. There is exact evidence as to alligators in captivity in Europe reaching forty years without signs of senescence, and some of the sacred crocodiles of India are believed to be more than a hundred years old. Chelonians live still longer. A tortoise has lived for eighty years in the garden of the governor of Cape Town, and is believed to be at least two hundred years old. There are records of small land-tortoises that have been kept in captivity for over a century, whilst the very large tortoises of the Galapagos Islands certainly attain ages of at least two centuries and possibly much more. A considerable body of information exists regarding the longevity of birds, and much of this has been brought together by J. H. Gurney. From his lists, which include more than fifty species, it appears that the duration is least in the case of small passerine and picarian birds, where it ranges from eight or nine years (goat-suckers and swifts) to a maximum of twenty-five years, the latter age having been approached by larks, canaries and goldfinch. Gulls have been recorded as living over forty years, ducks and geese over fifty years (the duchess of Bedford has recorded the case of a Chinese goose having been in possession of the same family for fifty-seven years). Parrots frequently live over eighty years, swans nearly as long, ravens and owls rather less, whilst there is excellent evidence of eagles and falcons considerably exceeding a hundred years. Notwithstanding their relatively large size, struthious birds do not reach great ages. The records for cassowaries and rheas do not exceed thirty years, and the maximum for ostriches is fifty years, and that on doubtful evidence.

Exact records regarding the longevity of mammals are surprisingly few. There is no evidence as to Monotremes. The life of Marsupials in captivity is seldom long; a phalanger has lived in the London Zoological Gardens and showed no signs of age at more than ten years old; it may be inferred that the larger forms are capable of living longer. Reliable records as to Edentates do not exist; those in captivity have short lives, but the size and structure of some of the extinct forms suggests that they may have reached a great age. Nothing is known regarding the longevity of Sirenians, except that they do not live long in captivity. In the case of Cetaceans, estimates based on the growth of whale-bone assign an age of several centuries to whale-bone whales; exact records do not exist. More is known regarding Ungulates, as many of these are domesticated, semi-domesticated or are frequently kept in captivity. Great length of life has been assigned to the rhinoceros, but the longest actual record is that of an Indian rhinoceros which lived for thirty-seven years in the London Zoological Gardens. The usual duration of life in the case of horses, asses and zebras is from fifteen to thirty years, but instances of individuals reaching fifty years are fairly well authenticated. Domestic cattle may live from twenty-five to thirty years, sheep and goats from twelve to fourteen years, antelopes rather longer, especially in the case of the larger forms. A giraffe has lived for nineteen years in the London Zoological Gardens. Deer are reputed to live longer than sheep, and records of individuals at the London Gardens confirm this, but it is doubtful if they live as long as cattle. Camels are long-lived, according to repute, but actual records show no great age; a llama which died in the London Gardens at the age of seventeen years showed unmistakable signs of senility. The hippopotamus is another large ungulate to which great longevity has been assigned, but the longest actual record is the case of a female born in the London Gardens which died in its thirty-fifth year. The duration of life assigned to domestic swine is about twenty years; an Indian wild boar, alive in the London Zoological Gardens in 1910, and apparently in full vigour, was fifteen years old. Elephants are usually supposed capable of reaching great ages, but the actual records of menagerie and military animals show that thirty to forty years is a normal limit. Facts as to rodents are not numerous; the larger forms such as hares and rabbits may live for ten years, smaller forms such as rats and mice, for five or six years. Bats have a reputation for long duration of life, and tropical fruit-bats are known to have lived for seventeen years. No great ages have been recorded for Carnivora, but the average is fairly high. Twenty-five years appears to be a limit very rarely exceeded by lions, tigers or bears; domestic cats may live for from twelve to twenty-three years, and dogs from sixteen to eighteen years, though cases of as many as thirty-four years have been noted. Less is known of the smaller forms, but menagerie records show that ages between twelve and twenty are frequently reached. There were in 1910 in the London Zoological Gardens, apparently in good health, a meerkat at least twelve years old, a sand-badger fourteen years and a ratel nineteen years of age. Records regarding monkeys are unsatisfactory, for these creatures are notoriously delicate in captivity, and it is practically certain that under such circumstances they rarely die of old age. A grey lemur eleven years old and a chimpanzee eleven and a half, both in good health in the London Zoological Gardens, appear to be the oldest primates definitely recorded. Estimates based on size, condition of the skull and so forth obtained by examination of wild specimens that have been killed would seem to establish a rough correspondence between the size of monkeys and their duration of life, and to set the limits as between seven or eight and thirty years.

With regard to the human race, there seems to be almost no doubt but that the average duration of life has increased with civilization; the generally improved conditions of life, the greater care of the young and of the aged and the advance in medical and surgical science far more than outweigh any depressing effect caused by the more strenuous and nervous activity required by modern social organization. The expectation of life of those who attain the age of sixty varies with race, sex and occupation, but is certainly increasing, and an increasing number of persons have a chance of reaching and do reach ages between ninety and one hundred. Careful investigation has thrown doubt almost amounting to disproof on the much-quoted cases of great longevity, such as that of Thomas Parr, the Shropshire peasant, who was supposed to have reached his hundred and fifty-third year, and, although the existence of centenarians is thoroughly established, any ages exceeding a hundred by more than two or three years are, at the most, dubious.

A survey of the facts of longevity, so far as these are established on reasonable evidence, discloses that the recorded ages both of men and animals are much shorter than those assigned in popular belief. The duration of life is usually brief in the animal kingdom, and except for some fish and reptiles, and possibly whales, it is certain that a man enjoys the longest average duration of life and that centenarians occur more frequently amongst men than amongst most of the lower animals.

Theories of Longevity.—Ray Lankester has pointed out that several meanings are attached to the word longevity. It may be used of an individual, and in this sense has little importance, partly because of the inevitable variability of the individual, and partly because there may be individuals that are abnormal in duration of life, just as there are abnormalities in weight or height. It may be used for the average duration of life of all the individuals of a species and so be another way of expressing the average mortality that affects the species, and that varies not only with structure and constitution but with the kind of enemies, accidents and conditions to which the members of the species are subject. If we reflect on the large incidence of mortality from external causes affecting a species and particularly the young of a species, we shall see that we must conclude that intrinsic, physiological causes can have relatively little weight in determining the average mortality rate. Finally, longevity may be used, and is most conveniently used, to denote the specific potential longevity, that is to say the duration of life that would be attained by normal individuals of a species if the conditions were most favourable. It is necessary to keep in mind these various applications of the term when considering the theoretical explanations that have been associated with the empirical facts.

There is a certain relation between size and longevity. As a general rule small animals do not live so long as larger creatures. Whales survive elephants, elephants live longer than camels, horses and deer, and these again than rabbits and mice. But the relation is not absolute; parrots, ravens and geese live longer than most mammals and than many larger birds. G. L. L. Buffon tried to find a more definite measure of longevity, and believed that it was given by the ratio between the whole period of life and the period of growth. He believed that the possible duration of life was six or seven times that of the period of growth. Man, he said, takes fourteen years to grow, and his duration of life is ninety to one hundred years; the horse has reached its full size at four years of age and may live for a total period of twenty-five to thirty years. M. J. P. Flourens attempted to make Buffon's suggestion more exact; he took the end of the period of growth as the time at which the epiphyses of the long bones united with the bones themselves, and on this basis held that the duration of life was five times the length of the period of growth. The theories of Buffon and Flourens, however, do not apply to all vertebrates and have no meaning in the case of invertebrates. Y. Bunge has suggested that in the case of mammals the period taken by the new-born young to double in weight is an index of the rapidity of growth and is in a definite relation to the possible duration of life. M. Oustalet has discussed the existence of definite relations between duration of life and size, rate of growth, period of gestation and so forth, and found so many exceptions that no general conclusion could be drawn. He finally suggested that diet was the chief factor in determining the span of life. E. Metchnikoff has provided the most recent and fullest criticism and theory of the physiological causes of longevity. He admits that many factors must be involved, as the results vary so much in different kinds of animals. He thinks that too little is known of the physiological processes of invertebrates to draw any valid conclusions in their case. With regard to vertebrates, he calls attention to the gradual reduction of longevity as the scale of life is ascended. On the whole, reptiles live much longer than birds, and birds than mammals, the contrast being specially notable when birds and mammals are compared. He dismisses the effect of the reproductive tax from possible causes of short duration of life, for the obvious reason that longevity is nearly equal in the two sexes, although females have a much greater reproductive drain. He points out that the hind-gut or large intestine is least developed in fishes, relatively small in reptiles, still small but relatively larger in birds and largest in mammals, relatively and absolutely, the caecum or caeca being reckoned as part of the hind-gut. The area of the intestinal tract in question is of relatively little importance in digestion, although a considerable amount of absorption may take place from it. It serves chiefly as a reservoir of waste matter and is usually the seat of extensive putrefactive change. The products of putrefaction are absorbed by the blood and there results a constant auto-intoxication of the body which Metchnikoff believes to be the principal agent in senile degeneration. Mammals, if they escape from enemies, diseases and accidents, fall victims to premature senility as the result of the putrefactive changes in their intestines, and the average mortality of the species is much too high, the normal specific longevity being rarely if ever attained. Metchnikoff urges, and so far probably is followed by all competent authorities, that improvements in the conditions of life, greater knowledge of disease and of hygiene and simplification of habits are tending to reduce the average mortality of man and the domestic animals, and to bring the average longevity nearer the specific longevity. He adds to this, however, a more special theory, which, although it appears rapidly to be gaining ground, is yet far from being accepted. The theory is that duration of life may be prolonged by measures directed against intestinal putrefaction.

The process of putrefaction takes place in masses of badly-digested food, and may be combated by careful dieting, avoidance of rich foods of all kinds and particularly of flesh and alcohol. Putrefaction, however, cannot take place except in the presence of a particular group of bacteria, the entrance of which to the body can be prevented to a certain extent. But it would be impossible or impracticable to secure a sterilized diet, and Metchnikoff urges that the bacteria of putrefaction can be replaced or suppressed by another set of microbes. He found that there was a widely spread popular belief in the advantage of diet consisting largely of products of soured milk and that there was a fair parallel between unusual longevity and such a diet. Experimentally he showed that the presence of the bacilli which produce lactic acid inhibited the process of putrefaction. Accordingly he recommends that the diet of human beings should include preparations of milk soured by cultures of selected lactic acid bacilli, or that the spores of such bacilli should be taken along with food favourable to their development. In a short time the bacilli establish themselves in the large intestine and rapidly stop putrefactive change. The treatment has not yet been persisted in sufficiently long by a sufficient number of different persons to be accepted as universally satisfactory, and there is even more difference of opinion as to Metchnikoff's theory that the chief agent in senile degeneration is the stimulation of phagocytes by the products of putrefaction with the resulting destruction of the specific cells of the tissues. Metchnikoff, however, gave it to the world, not as a proved and completed doctrine, but as the line of inquiry that he himself had found most promising. He has suggested further that if the normal specific longevity were attained by human beings, old and not degenerate individuals would lose the instinct for life and acquire an instinct for death, and that as they had fulfilled the normal cycle of life, they would accept death with the same relieved acquiescence that they now accept sleep.

The various writers whose opinions have been briefly discussed agree in supposing that there is a normal specific longevity, although Metchnikoff alone has urged that this differs markedly from the average longevity, and has propounded a theory of the causes of the divergence. It is common ground that they believe the organism to be wound up, so to say, for a definite period, but have no very definite theory as to how this period is determined. A. Weismann, on the other hand, in a well-known essay on the duration of life, has developed a theory to explain the various fashions in which the gift of life is measured out to different kinds of creatures. He accepts the position that purely physiological conditions set a limit to the number of years that can be attained by each kind of multi-cellular organism, but holds that these conditions leave room for a considerable amount of variation. Duration of life, in fact, according to Weismann, is a character that can be influenced by the environment and that by a process of natural selection can be adapted to the conditions of existence of different species.

If a species is to maintain its existence or to increase, it is obvious that its members must be able to replace the losses caused by death. It is necessary, moreover, for the success of the species, that an average population of full vigour should be maintained. Weismann argues that death itself is an adaptation to secure the removal of useless and worn-out individuals and that it comes as soon as may be after the period of reproductive activity. It is understood that the term reproductive activity covers not merely the production of new individuals but the care of these by the parents until they are self-sufficient. The average longevity, according to Weismann, is adapted to the needs of the species; it is sufficiently long to secure that the requisite number of new individuals is produced and protected. He has brought together a large number of instances which show that there is a relation between duration of life and fertility. Birds of prey, which breed slowly, usually producing an annual brood of no more than one or two, live to great ages, whilst rabbits which produce large litters at frequent invervals have relatively short lives. Allowance has to be made in cases where the young are largely preyed upon by enemies, for this counteracts the effect of high fecundity. In short, the duration of life is so adapted that a pair of individuals on the average succeed in rearing a pair of offspring. Metchnikoff, however, has pointed out that the longevity of such fecund creatures must have arisen independently, as otherwise species subject to high risks of this nature would have ceased to exist and would have disappeared, as many species have vanished in the past of the world's history.

The normal specific longevity, the age to which all normal individuals of a species would survive under the most favourable conditions, must depend on constitution and structure. No doubt selection is involved, as it is obvious that creatures would perish if their constitution and structure were not such that they could live long enough to reproduce their kind. The direct explanation, however, must be sought for in size, complexity of structure, length of period of growth, capacity to withstand the wear and tear of life and such other intrinsic qualities. The average specific longevity, on the other hand, depends on a multitude of extrinsic conditions operating on the intrinsic constitution; these extrinsic conditions are given by the environment of the species as it affects the young and the adults; enemies, diseases, abundance of food, climatic conditions and so forth. It would seem most natural to suppose that in all cases, except perhaps those of intelligent man and the domestic animals or plants he harbours, the average longevity must vary enormously with changing conditions, and must be a factor of greater importance in the survival of the species than the ideal normal specific longevity. It also seems more probable that the reproductive capacity, which is extremely variable, has been adapted to the average longevity of the species, than that, as Weismann supposed, it should itself be the determining cause of the duration of life.

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LONGFELLOW, HENRY WADSWORTH (1807–1882), American poet, was born on the 27th of February 1807, at Portland, Maine. His ancestor, William Longfellow, had immigrated to Newbury, Massachusetts, in 1676, from Yorkshire, England. His father was Stephen Longfellow, a lawyer and United States congressman, and his mother, Zilpha Wadsworth, a descendant of John Alden and of "Priscilla, the Puritan maiden."

Longfellow's external life presents little that is of stirring interest. It is the life of a modest, deep-hearted gentleman, whose highest ambition was to be a perfect man, and, through sympathy and love, to help others to be the same. His boyhood was spent mostly in his native town, which he never ceased to love, and whose beautiful surroundings and quiet, pure life he has described in his poem "My Lost Youth." Here he grew up in the midst of majestic peace, which was but once broken, and that by an event which made a deep impression on him—the War of 1812. He never forgot

> "the sea-fight far away,
> How it thundered o'er the tide,
> And the dead captains as they lay
> In their graves o'erlooking the tranquil bay,
> Where they in battle died."

The "tranquil bay" is Casco Bay, one of the most beautiful in the world, studded with bold, green islands, well fitted to be the Hesperides of a poet's boyish dreams. At the age of fifteen Longfellow entered Bowdoin College at Brunswick, a town situated near the romantic falls of the Androscoggin river, about 25 m. from Portland, and in a region full of Indian scenery and legend. Here he had among his classfellows Nathaniel Hawthorne, George B. Cheever and J. S. C. Abbott. During the latter years of his college life he contributed to the *United States Literary Gazette* some half-dozen poems, which are interesting for two reasons—(1) as showing the poet's early, book-mediated sympathy with nature and legendary heroisms, and (2) as being almost entirely free from that supernatural view of nature which his subsequent residence in Europe imparted to him. He graduated in 1825, at the age of eighteen, with honours, among others that of writing the "class poem"—taking the fourth place in a class of thirty-eight. He then entered his father's law office, without intending, however, it would appear, to devote himself to the study of the law. For this profession he was, both by capacity and tastes, utterly unfitted, and it was fortunate that, shortly after his graduation, he received an offer of a professorship of modern languages at Bowdoin College. In order the better to qualify himself for this appointment, he went to Europe (May 15th, 1826) and spent three years and a half travelling in France, Italy, Spain, Germany, Holland and England, learning languages, for which he had unusual talent, and drinking in the spirit of the history and life of these countries. The effect of Longfellow's visit was twofold. On the one hand, it widened his sympathies, gave him confidence in himself and supplied him with many poetical themes; on the other, it traditionalized his mind, coloured for him the pure light of nature and rendered him in some measure unfit to feel or express the spirit of American nature and life. His sojourn in Europe fell exactly in the time when, in England, the reaction against the sentimental atheism of Shelley, the pagan sensitivity of Keats, and the sublime, Satanic outcastness of Byron was at its height; when, in the Catholic countries, the negative exaggerations of the French Revolution were inducing a counter current of positive faith, which threw men into the arms of a half-sentimental, half-aesthetic medievalism; and when, in Germany, the aristocratic paganism of Goethe was being swept aside by that tide of dutiful, romantic patriotism which flooded the country, as soon as it began to feel that it still existed after being run over by Napoleon's war-chariot. He returned to America in 1829, and remained six years at Bowdoin College (1829–1835), during which he published various text-books for the study of modern languages. In his twenty-fourth year (1831) he married Miss Mary Story Potter, one of his "early loves." In 1833 he made a series of translations from the Spanish, with an essay on the moral and devotional poetry of Spain, and these were incorporated in 1835 in *Outre-mer: a Pilgrimage beyond the Sea.*

In 1835 Longfellow was chosen to succeed George Ticknor as professor of modern languages and belles-lettres in Harvard. On receiving this appointment, he paid a second visit of some fifteen months to Europe, this time devoting special attention to the Scandinavian countries and Switzerland. During this visit he lost his wife, who died at Rotterdam, on the 29th of November 1835.

On his return to America in December 1836, Longfellow took up his residence in Cambridge, and began to lecture at Harvard and to write. In his new home he found himself amid surroundings entirely congenial to him. Its spaciousness and free rural aspect, its old graveyards and towering elms, its great university, its cultivated society and its vicinity to humane, substantial, busy Boston, were all attractions for such a man. In 1837–1838 several essays of Longfellow's appeared in the *North American Review*, and in 1839 he published *Hyperion: a Romance*, and his first volume of original poetry, entitled *Voices of the Night*. *Hyperion*, a poetical account of his travels, had, at the time of its publication, an immense popularity, due mainly to its sentimental romanticism. At present few persons beyond their teens would care to read it through, so unnatural and stilted is its language, so thin its material and so consciously mediated its sentiment. Nevertheless it has a certain historical importance, for two reasons—(1) because it marks that period in Longfellow's career when, though he had left nature, he had not yet found art, and (2) because it opened the sluices through which the flood of German sentimental poetry flowed into the United States. The *Voices of the Night* contains some of his best minor poems, *e.g.* "The Psalm of Life" and "Footsteps of Angels." In 1842 Longfellow published a small volume of *Ballads and other Poems*, containing some of his most popular pieces, *e.g.* "The Skeleton in Armour," "The Wreck of the Hesperus," "The Village Blacksmith," "To a Child," "The Bridge," "Excelsior." In the same year he paid a third brief visit to Europe, spending the summer on the Rhine. During his return-passage across the Atlantic he wrote his *Poems on Slavery* (1842), with a dedication to Channing. These poems went far to wake in the youth of New England a sense of the great national wrong, and to prepare them for that bitter struggle in which it was wiped out at the expense of the lives of so many of them. In 1843 he married again, his wife being Miss Frances Elizabeth Appleton of Boston, a daughter of Hon. Nathan Appleton, one of the founders of Lowell, and a sister of Thomas G. Appleton, himself no mean poet.

About the same time he bought, and fixed his residence in, the Craigie House, where he had formerly only been a lodger, an old "revolutionary house," built about the beginning of the 18th century, and occupied by General Washington in 1776. This quaint old wooden house, in the midst of a large garden full of splendid elms, continued to be his chief residence till the day of his death. Of the lectures on Dante which he delivered about this time, James Russell Lowell says: "These lectures, illustrated by admirable translations, are remembered with grateful pleasure by many who were thus led to learn the full significance of the great Christian poet." Indeed, as a professor, Longfellow was eminently successful. Shortly after the *Poems on Slavery*, there appeared in 1843 a more ambitious work, *The Spanish Student, a Play in Three Acts*, a kind of sentimental "Morality," without any special merit but good intention. If published nowadays it would hardly attract notice; but in those gushing, emotion-craving times it had considerable popularity, and helped to increase the poet's now rapidly widening fame. A huge collection of translations of foreign poetry edited by him, and entitled *The Poets and Poetry of Europe*, appeared in 1845, and, in 1846, a few minor poems—songs and sonnets—under the title *The Belfry of Bruges*. In 1847 he published at Boston the greatest of all his works, *Evangeline, a Tale of Acadie*. It was, in some degree, an imitation of Goethe's *Hermann and Dorothea*, and its plot, which was derived from Hawthorne's *American Note-Books*, is even simpler than that of the German poem, not to say much more touching. At the violent removal by the British government of a colony of French settlers from Acadie (Nova Scotia) in 1755, a young couple, on the very day of their wedding, were separated and carried in different directions, so that they lost all trace of each other. The poem describes the wanderings of the bride in search of her lover, and her final discovery of him as an old man on his death-bed, in a public hospital which she had entered as a nurse. Slight as the story is, it is worked out into one of the most affecting poems in the language, and gives to literature one of its most perfect types of womanhood and of "affection that hopes and endures and is patient." Though written in a metre deemed foreign to English ears, the poem immediately attained a wide popularity, which it has never lost, and secured to the dactylic hexameter a recognized place among English metres.

In 1849 Longfellow published a novel of no great merit, *Kavanagh*, and also a volume of poems entitled *The Seaside and the Fireside*, a title which has reference to his two homes, the seaside one on the charming peninsula of Nahant, the fireside one in Cambridge. One of the poems in this collection, "Resignation," has taken a permanent place in literature; another, "Hymn for my Brother's Ordination," shows plainly the nature of the poet's Christianity. His brother, the Rev. Samuel Longfellow, was a minister of the Unitarian Church.

Longfellow's genius, in its choice of subjects, always oscillated between America and Europe, between the colonial period of American history and the Middle and Romantic Ages of European feeling. When tired of the broad daylight of American activity, he sought refuge and rest in the dim twilight of medieval legend and German sentiment. In 1851 appeared *The Golden Legend*, a long lyric drama based upon Hartmann von Aue's beautiful story of self-sacrifice, *Der arme Heinrich*. Next to *Evangeline*, this is at once the best and the most popular of the poet's longer works, and contains many passages of great beauty. Bringing his imagination back to America, he next applied himself to the elaboration of an Indian legend. In 1854 he resigned his professorship. In the following year he gave to the world the Indian Edda, *The Song of Hiawatha*, a conscious imitation, both in subject and metre, of the Finnish epic, the *Kalevala*, with which he had become acquainted during his second visit to Europe. The metre is monotonous and easily ridiculed, but it suits the subject, and the poem is very popular. In 1858 appeared *The Courtship of Miles Standish*, based on a charming incident in the early history of the Plymouth colony, and, along with it, a number of minor poems, included under the modest title, *Birds of Passage*. One of these is "My Lost Youth."

Two events now occurred which served to cast a gloom over the poet's life and to interrupt his activity,—the outbreak of the Civil War, and the tragic fate of his wife, who, having accidentally allowed her dress to catch fire, was burnt to death in her own house in 1861. It was long before he recovered from the shock caused by this terrible event, and in his subsequent published poems he never ventured even to allude to it. When he did in some measure find himself again, he gave to the world his charming *Tales of a Wayside Inn* (1863), and in 1865 his *Household Poems*. Among the latter is a poem entitled "The Children's Hour," which affords a glance into the home life of the widowed poet, who had been left with five children—two sons, Ernest and Charles, and three daughters,

> "Grave Alice, and laughing Allegra,
> And Edith with golden hair."

A small volume entitled *Flower de Luce* (1867) contains, among other fine things, the beautiful "threnos" on the burial of Hawthorne, and "The Bells of Lynn." Once more the poet sought refuge in medieval life by completing his translation of the *Divina Commedia*, parts of which he had rendered into English as much as thirty years before. This work appeared in 1867, and gave a great impulse to the study of Dante in America. It is a masterpiece of literal translation. Next came the *New England Tragedies* (1868) and *The Divine Tragedy* (1871), which found no large public. In 1868–1869 the poet visited Europe, and was everywhere received with the greatest honour. In 1872 appeared *Three Books of Song*, containing translated as well as original pieces, in 1873 *Aftermath* and in 1875 *The Mask of Pandora, and other Poems*. Among these "other poems" were "The Hanging of the Crane," "Morituri Salutamus" and "A Book of Sonnets." *The Mask of Pandora* is a proof of that growing appreciation of pagan naturalism which marked the poet's later years. Though not a great poem, it is full of beautiful passages, many of which point to the riddle of life as yet unsolved, a conviction which grew ever more and more upon the poet, as the ebulliency of romanticism gave way to the calm of classic feeling. In the "Book of Sonnets" are some of the finest things he ever wrote, especially the five sonnets entitled "Three Friends of Mine." These "three friends" were Cornelius Felton, Louis Agassiz and Charles Sumner, whom he calls

> "The noble three,
> Who half my life were more than friends to me."

The loss of Agassiz was a blow from which he never entirely recovered; and, when Sumner also left him, he wrote:—

> "Thou hast but taken thy lamp and gone to bed;
> I stay a little longer, as one stays
> To cover up the embers that still burn."

He did stay a little longer; but the embers that still burnt in him refused to be covered up. He would fain have ceased writing, and used to say, "It's a great thing to know when to stop"; but he could not stop, and did not stop, till the last. He continued to publish from time to time, in the magazines, poems which showed a clearness of vision and a perfection of workmanship such as he never had equalled at any period of his life. Indeed it may be said that his finest poems were his last. Of these a small collection appeared under the title of *Keramos, and other Poems* (1878). Besides these, in the years 1875–1878 he edited a collection of *Poems of Places* in thirty-one small volumes. In 1880 appeared *Ultima Thule*, meant to be his last work, and it was nearly so. In October 1881 he wrote a touching sonnet on the death of President Garfield, and in January 1882, when the hand of death was already upon him, his poem, *Hermes Trismegistus*, in which he gives utterance, in language as rich as that of the early gods, to that strange feeling of awe without fear, and hope without form, with which every man of spotless life and upright intellect withdraws from the phenomena of time to the realities of eternity.

In the last years of his life he suffered a great deal from rheumatism, and was, as he sometimes cheerfully said, "never free from pain." Still he remained as sunny and genial as ever, looking from his Cambridge study windows across the Brighton meadows to the Brookline hills, or enjoying the "free wild winds of the Atlantic," and listening to "The Bells of Lynn" in his Nahant home. He still continued to receive all visitors, and to take occasional runs up to Castine and Portland, the homes of his family. About the beginning of 1882, however, a serious change took place in his condition. Dizziness and want of strength confined him to his room for some time, and, although after some weeks he partially recovered, his elasticity and powers were gone. On the 19th of March he was seized with what proved to be peritonitis, and he died on the 24th. The poet was buried two days afterwards near his "three friends" in Mount Auburn cemetery. The regret for his loss was universal; for no modern man was ever better loved or better deserved to be loved.

Longfellow was made an LL.D. of Bowdoin College in 1828, at the age of twenty-one, of Harvard in 1859 and of Cambridge (England) in 1868, and D.C.L. of Oxford in 1869. In 1873 he was elected a member of the Russian Academy of Science, and in 1877 of the Spanish Academy.

In person, Longfellow was rather below middle height, broad shouldered and well built. His head and face were extremely handsome, his forehead broad and high, his eyes full of clear, warming fire, his nose straight and graceful, his chin and lips rich and full of feeling as those of the Praxitelean Hermes, and his voice low, melodious and full of tender cadences. His hair, originally dark, became, in his later years, silvery white, and its wavy locks combined with those of his flowing beard to give him that leonine appearance so familiar through his later portraits. Charles Kingsley said of Longfellow's face that it was the most beautiful human face he had ever seen. A bust to his memory was erected in the Poet's Corner in Westminster Abbey in 1884.

In Longfellow, the poet was the flower and fruit of the man. His nature was essentially poetic, and his life the greatest of his poems. Those who knew only the poems he wrote could form but a faint notion of the harmony, the sweetness, the manliness and the tenderness of that which he lived. What he would have been as a poet, if, instead of visiting Europe in early life and drinking in the spirit of the middle ages under the shadows of cathedral towers, he had, like

Whittier, grown old amid American scenery and life, we can only guess from his earlier poems, which are as naturalistic, fresh and unmystical as could be desired; but certain it is that, from his long familiarity with the medieval view of nature, and its semi-pagan offspring, the romantic view, he was brought, for the greater part of his life, to look upon the world of men and things either as the middle scene of a miracle play, with a heaven of rewarding happiness above and a purgatory of purifying pain below, or else as a garment concealing, while it revealed, spiritual forms of unfathomed mystery. During this time he could hear "the trailing garments of the night sweep through her marble halls," and see "the stars come out to listen to the music of the seas." Later on, as he approached his second youth (he was spared a second childhood), he tended to a more pagan view. About the time when he was writing *The Mask of Pandora*, he could see "in the sunset Jason's fleece of gold," and hear "the waves of the distracted sea piteously calling and lamenting" his lost friend. But through all the periods of his life his view of the world was essentially religious and subjective, and, consequently, his manner of dealing with it hymnal or lyric. This fact, even more than his merits as an artist, serves to account for his immense popularity. Too well-informed, too appreciative and too modest to deem himself the peer of the "grand old masters," or one of "those far stars that come in sight once in a century," he made it his aim to write something that should "make a purer faith and manhood shine in the untutored heart," and to do this in the way that should best reach that heart. This aim determined at once his choice of subjects and his mode of treating them.

The subjects of Longfellow's poetry are, for the most part, aspects of nature as influencing human feeling, either directly or through historical association, the tender or pathetic sides and incidents of life, or heroic deeds preserved in legend or history. He had a special fondness for records of human devotion and self-sacrifice, whether they were monkish legends, Indian tales, Norse *drápas* or bits of American history. His mode of treatment is subjective and lyric. No matter what form his works assume, whether the epic, as in *Evangeline*, *The Courtship of Miles Standish* and *Hiawatha*, the dramatic, as in *The Spanish Student*, *The Golden Legend* and *The Mask of Pandora*, or the didactic, as in *The Psalm of Life* and many of the minor poems; they are all subjective. This is not the highest praise that can be given to works of art; but it implies less dispraise in Longfellow's case than in almost any other, by reason of his noble subjectivity.

If we look in Longfellow's poetry for originality of thought, profound psychological analysis or new insights into nature, we shall be disappointed. Though very far from being hampered by any dogmatic philosophical or religious system of the past, his mind, until near the end, found sufficient satisfaction in the Christian view of life to make it indifferent to the restless, inquiring spirit of the present, and disinclined to play with any more recent solution of life's problems. He had no sympathy with either scepticism or formal dogmatism, and no need to hazard rash guesses respecting man's destiny. He disliked the psychological school of art, believing it to be essentially morbid and unhealthy. He had no sympathy with the tendency represented by George Eliot, or with any attempt to be analytic in art. He held art to be essentially synthetic, creative and manifesting, not analytic, destructive or questioning. Hence he never strove to draw from nature some new secret, or to show in her relations never discovered before. His aim was to impress upon her familiar facts and aspects the seal of his own gracious nature. A man in intellect and courage, yet without conceit or bravado; a woman in sensibility and tenderness, yet without shrinking or weakness; a saint in purity of life and devotion of heart, yet without asceticism or religiosity; a knight-errant in hatred of wrong and contempt of baseness, yet without self-righteousness or cynicism; a prince in dignity and courtesy, yet without formality or condescension; a poet in thought and feeling, yet without jealousy or affectation; a scholar in tastes and habits, yet without aloofness or bookishness; a dutiful son, a loving husband, a judicious father, a trusty friend, a useful citizen and an enthusiastic patriot,—he united in his strong, transparent humanity almost every virtue under heaven. A thoroughly healthy, well-balanced, harmonious nature, accepting life as it came, with all its joys and sorrows, and living it beautifully and hopefully, without canker and without uncharity. No man ever lived more completely in the light than Henry Wadsworth Longfellow.

Perhaps the most remarkable traits in Longfellow's character were his accessibility and his charity. Though a great worker, he seemed always to have time for anything he was asked to do. He was never too busy to see a caller, to answer a letter, or to assist, by word or deed, any one that needed assistance. His courtesy to all visitors, even to strangers and children who called to look at him, or who, not venturing to call, hung about his garden-gate in order to catch a glimpse of him, was almost a marvel. He always took it for granted that they had come to see Washington's study, and, accordingly, took the greatest interest in showing them that. He never, as long as he could write, was known to refuse his autograph, and so far was he from trying to protect himself from intruders that he rarely drew the blinds of his study windows at night, though that study was on the ground floor and faced the street. His acts of charity, though performed in secret, were neither few nor small. Of him it may be said with perfect truth, "He went about doing good"; and not with his money merely, but also with his presence and his encouragement. To how many sad hearts did he come like an angel, with the rich tones of his voice waking harmonics of hope, where before there had been despair and silence? How many young literary people, disappointed at the unsuccess of their first attempts, did he comfort and spur on to renewed and higher efforts! How careful he was to quench no smoking flax! How utterly free he was from jealousy or revengefulness! While poor, morbid Edgar Allan Poe was writing violent and scurrilous articles upon him, accusing him of plagiarism and other literary misdemeanours, he was delivering enthusiastic lectures to his classes on Poe's poetry. His charity was unbounded. Once, when the present writer proposed to the president of the Harvard University Visiting Committee that Longfellow should be placed on that committee, the president replied: "What would be the use? Longfellow could never be brought to find fault with anybody or anything." And it was true. His whole life was bathed in that sympathy, that love which suffers long and envies not, which forgives unto seventy times seven times, and as many more if need be. Even in his last years, when loss of friends and continual physical pain made life somewhat "cold, and dark and dreary" for him, he never complained, lamented or blamed the arrangements of nature, and the only way in which it was possible to know that he suffered was through his ever-increasing delight in the health and strength of younger men. His whole nature was summed up in the lines of his favourite poet:—

> "Luce intellettual, piena d'amore,
> Amor di vero ben, pien di letizia,
> Letizia che trascende ogni dolzore."

See his *Life . . . with Extracts from his Journals and Correspondence*, by Samuel Longfellow, and the "Riverside" edition of the prose and poems (Boston, 11 vols., 1886–1890). An enlarged edition of the *Life* (3 vols., 1891) included the journals and correspondence, 1866–1882, published in 1887 as *Final Memorials* (Boston and New York). Also the volume by T. W. Higginson in the "American Men of Letters" series (1902); E. C. Stedman's criticism in *Poets of America*; and an article in W. D. Howells' *My Literary Friends and Acquaintance* (New York, 1900) which contains a valuable account of Longfellow's later life. (T. Da.)

LONG FIVES. This game, though played in a tennis-court, bears but a slight resemblance to tennis, but is nevertheless a valuable form of preparatory practice. The game is 8 or 11 points, each stroke won counting one point to the winner. The server gives 3 points in 8, or 4 points in 11 to the striker-out. There are no chases. The winning openings count as at tennis. If a ball be struck into any other gallery or opening, it may be counted, by arrangement, either as a "let" (the rest being annulled) or against the striker; a similar arrangement is made for balls that make any chase on the hazard-side, or a chase of the last gallery on the service-side.

LONGFORD, a county of Ireland in the province of Leinster, bounded N.W. by Leitrim, N.E. by Cavan, E. and S. by Westmeath and W. by Lough Ree and Roscommon. With the exception of Carlow, Louth and Dublin, it is the smallest county in Ireland, the area being 269,408 acres, or about 421 sq. m. The general level surface is broken occasionally by low hills, which cover a considerable area at its northern angle. The principal rivers are the Camlin, which rises near Granard and flows past Longford to the Shannon, and the Inny, which entering the county from Westmeath crosses its southern corner and falls into Lough Ree. Lough Ree is partly included in Longford, and the other principal lakes are Lough Gowna, Derrylough, Lough Drum and Lough Bannow.

The Silurian axis of Newry reaches the north of this county, where Lough Gowna lies upon it. The rest of the county, but for anticlinals which bring up Old Red Sandstone at Longford town and Ardagh, belongs to the Carboniferous Limestone plain, in which Lough Ree forms a very characteristic lake, with signs of extension by solution along its shores. Marble of fine quality has been raised. In the north indications of iron are abundant, and there are also some traces of lead.

The climate is somewhat moist and cold, and there is a large extent of marsh and bog. The soil in the southern districts resting on the limestone is a deep loam well adapted for pasture, but in the north it is often poor. The proportion of tillage to pasture is roughly as 1 to 2. Oats and potatoes, in decreasing quantities, are the principal crops. The numbers of cattle, sheep, pigs and poultry are well maintained. The population is almost wholly rural, but the principal industry of agriculture is supplemented by a slight manufacture of coarse woollens and linen. The Midland Great Western line from Mullingar to Sligo crosses the centre of the county by way of the county town of Longford; and the Cavan branch touches the extreme east. The Royal Canal enters the county in the south at Abbeyshrule, and joins the Shannon near Cloondara.

The population (52,647 in 1891; 46,672 in 1901) decreases seriously, owing to emigration. About 90% of the total are Roman Catholics. The only towns of any importance are Longford (the county town, pop. 3747) and Granard (1622). The county includes six baronies. Assizes are held at Longford, and quarter sessions at Ballymahon, Granard and Longford. The county is in the Protestant diocese of Ardagh, and the Roman Catholic dioceses of Ardagh and Meath. It is divided into two parliamentary divisions, north and south, each returning one member.

The early name of Longford was Annaly or Analé, and it was a principality of the O'Farrels. Along with the province of Meath, in which it was then included, it was granted by Henry II. to Hugh de Lacy, who planted an English colony. On the division of Meath into two counties in 1543, Annaly was included in Westmeath, but under a statute of 1569, for the shiring of countries not already shired, it was made shire ground under the name of Longford.

Among antiquarian remains the chief ruin is the rath called the Moat of Granard, at the end of the main street of that town. There are monastic remains at Ardagh, a former bishopric, Longford, Moydow and on several of the islands of Lough Ree. The principal old castles are those of Rathcline near Lanesborough, and Ballymahon on the Inny. The principal modern seats are those of Carrickglass on the Camlin, and Castle Forbes, the seat of the earls of Granard. Oliver Goldsmith was born at Pallas, a village near Ballymahon, in this county; and at Edgeworthstown the family of Edgeworth, of which the famous novelist Maria Edgeworth was a member, established themselves in the 16th century.

LONGFORD, the county town of Co. Longford, Ireland, on the river Camlin, and on a branch of the Midland Great Western railway, 75 m. W.N.W. of Dublin. Pop. (1901) 3747. The principal building is St Mel's Roman Catholic cathedral for the diocese of Ardagh, one of the finest Roman Catholic churches in Ireland. The town has a considerable trade in grain, butter and bacon. There are corn-mills, a spool factory and tanneries. Longford is governed by an urban district council. The ancient name of the town was Athfada, and here a monastery is said to have been founded by St Idus, a disciple of St Patrick. The town obtained a fair and market from James I. and a charter of incorporation from Charles II., as well as the right to return two members to parliament. It was disfranchised at the Union in 1800.

LONGHI, PIETRO (1702–1762), Venetian painter, was born in Venice. He was a pupil of Antonio Palestra and Giuseppe Maria Crespi at Bologna, and devoted himself to the painting of the elegance of the social life in 18th-century Venice. The republic was dying fast, but her sons, even in this period of political decline, retained their love of pageants and ceremonies and of extravagant splendour in attire. The art of Venice was vanishing like her political power; and the only painters who attempted to stem the tide of artistic decadence were the Canaletti, Guardi, Tiepolo and Longhi. But whilst the Canaletti and Guardi dwelt upon the architectural glories of Venice, and Tiepolo applied himself to decorative schemes in which he continued the tradition of Paolo Veronese and Tintoretto, Longhi became the chronicler of the life of his compatriots. In a way his art may be set beside Hogarth's, though the Venetian did not play the part of a satirical moralist. He has aptly been called the Goldoni of painting. His sphere is that of light social comedy—the life at the café, the hairdresser's, at the dancing-school, at the dressmaker's. The tragic, or even the serious, note is hardly sounded in his work, which, in its colour, is generally distinguished by a rich mellow quality of tone. Most of his paintings are in the public and private collections of Venice. They are generally on a small scale, but the staircase of the Palazzo Grassi in Venice is decorated by him with seven frescoes, representing scenes of fashionable life. At the Venice academy are a number of his genre pictures and a portrait of the architect Temanza; at the Palazzo Quirini-Stampalia the portrait of Daniele Dolfino, "The Seven Sacraments" (etched by Pitteri), a "Temptation of St Anthony," a "Circus," a "Gambling Scene," and several other genre pictures and portraits; at the Museo Correr a dozen scenes of Venetian life and a portrait of Goldoni. In England the National Gallery owns "The Exhibition of a Rhinoceros in an Arena," a "Domestic Group," "The Fortune-Teller," and the portrait of the Chevalier Andrea Tron; two genre pictures are at Hampton Court Palace, and others in the Richter and Mond collections. Many of his works have been engraved by Alessandro Longhi, Bartolozzi, Cattini, Faldoni and others. Longhi died in Venice in 1762.

LONGINUS, CASSIUS (*c.* A.D. 213–273), Greek rhetorician and philosophical critic, surnamed PHILOLOGUS. The origin of his gentile name Cassius is unknown; it can only be conjectured that he adopted it from a Roman patron. He was perhaps a native of Emesa (Homs) in Syria, the birthplace of his uncle Fronto the rhetorician. He studied at Alexandria under Origen the heathen, and taught for thirty years at Athens, one of his pupils being the Neoplatonist Porphyry. Longinus did not embrace the new speculations then being developed by Plotinus, but continued a Platonist of the old type. He upheld, in opposition to Plotinus, the doctrine that the Platonic ideas existed outside the divine Νοῦς (*ὅτι ἔξω τοῦ νοῦ ὑφέστηκε τὰ νοητά*: see F. Überweg, *Grundriss der Geschichte der Philosophie*, 9th ed., 1903, i. § 72). Plotinus, after reading his treatise Περὶ ἀρχῶν (*On First Principles*), remarked that Longinus might be a scholar (*φιλόλογος*), but that he was no philosopher (*φιλόσοφος*). The reputation which Longinus acquired by his learning was immense; he is described by Porphyry as "the first of critics," and by Eunapius as "a living library and a walking museum" or encyclopaedia. During a visit to the East he became teacher in Greek, and subsequently chief counsellor in state affairs, to Zenobia, queen of Palmyra. It was by his advice that she endeavoured to regain her independence; Aurelian, however, crushed the attempt, and while Zenobia was led captive to Rome to grace Aurelian's triumph, Longinus paid the forfeit of his life.

Longinus was the author of a large number of works, nearly all of which have perished. Among those mentioned by Suīdas are *Quaestiones Homericae*, *An Homerus fuerit philosophus*, *Problemata Homeri et solutiones*, *Atticorum vocabulorum editiones duae*; the most important of his philological works, Φιλόλογοι ὁμιλίαι (*Philological Discourses*) consisting of at least 21 books, is omitted. A considerable fragment of the Περὶ τέλους (*De finibus*, *On the Chief End*) is preserved in the *Life of Plotinus* by Porphyry (§ 20). Under his name there are also extant Prolegomena to the *Encheiridion* of Hephaestion on metre (printed in R. Westphal, *Scriptores Metrici Graeci*, i. 1866) and the fragment of a treatise on rhetoric (L. Spengel, *Rhetores Graeci*, i. pp. 299-320), inserted in the middle of a similar treatise by Apsines. It gives brief practical hints on invention, arrangement, style, memory and other things useful to the student. Some important excerpts ἐκ τῶν Λογγίνου (Spengel, i. 325-328) may possibly be from the φιλόλογοι ὁμιλίαι.

It is as the reputed author of the well-known and remarkable work Περὶ ὕψους (generally, but inadequately, rendered *On the Sublime*) that Longinus is best known. Modern scholars, however, with few exceptions, are agreed that it cannot with any certainty be ascribed to him, and that the question of authorship cannot be determined (see Introduction to Roberts's edition). The following are the chief arguments against Longinus. (1) The treatise is not mentioned by any classical author, nor in any lists of the works attributed to him. (2) The evidence of the MSS. shows that doubts existed even in early times. In the most important (No. 2036 in the Paris Library, 10th century) the heading is Διονυσίου ἢ Λογγίνου, thus giving an alternative author Dionysius; in the Laurentian MS. at Florence the title has ἀνωνύμου, implying that the author was unknown. The ascription in the Paris MS. led to the addition of Dionysius to the name of the reputed author—Dionysius Cassius Longinus, accounted for by the supposition that his early name was Dionysius, Cassius Longinus being subsequently adopted from a Roman patron whose client he had beeen. (3) The absence of any reference to the famous writers on rhetoric of the age of the Antonines, such as Hermogenes and Alexander son of Numenius. (4) The opening sentences show that the Περὶ ὕψους was written with a view of correcting the faults of style and method in a treatise by Caecilius (*q.v.*) of Calactē on the same subject. As Caecilius flourished during the reign of Augustus, it is hardly likely that his work would have been selected for purposes of criticism in the 3rd century. (5) General considerations of style and language and of the point of view from which the work is written. In favour of Longinus: (1) The traditional ascription, which held its ground unchallenged till the beginning of the 18th century. (2) The philosophical colouring of the first chapter and the numerous quotations from Plato are in accordance with what is known of his philosophical opinions. (3) The treatise is the kind of work to be expected from one who was styled "the first of critics." (4) The Ammonius referred to (xiii. 3) is supposed to be Ammonius Saccas (*c.* 175–242), but it appears from the Venetian scholia to the *Iliad* that there was an earlier Ammonius (fl. *c.* 140 B.C.), a pupil and successor of Aristarchus at Alexandria, who, judging from the context, is no doubt the writer in question. The reference is therefore an argument against Longinus.

The work is dedicated to a certain Terentianus, of whom nothing is known (see Roberts's edition, p. 18).

The alternative author Dionysius of the MSS. has been variously identified with the rhetorician and historian Dionysius of Halicarnassus, the Atticist Aelius Dionysius of Halicarnassus, Dionysius Atticus of Pergamum, Dionysius of Miletus. Other suggested claimants to the authorship are Plutarch (L. Vaucher in *Études critiques sur le traité du sublime* (Geneva, 1854) and Aelius Theon of Alexandria (W. Christ), the author of a work on the *Arrangement of Speech*. But it seems most probable that the author was an unknown writer who flourished in the 1st century soon after Caecilius and before Hermogenes. Wilamowitz-Möllendorff gives his date as about A.D. 40.

The rendering *On the Sublime* implies more than is intended by the Greek Περὶ ὕψους ("impressiveness in style," Jebb). Nothing abnormal, such as is associated with the word "sublime," is the subject of discussion; it is rather a treatise on style. According to the author's own definitions, "Sublimity is a certain distinction and excellence in expression," "sublimity consists in elevation," "sublimity is the echo (or expression) of a great soul" (see note in Roberts).

The treatise is especially valuable for the numerous quotations from classical authors, above all, for the preservation of the famous fragment of Sappho, the ode to Anactoria, beginning

φαίνεταί μοι κῆνος ἴσος θεοῖσιν,

imitated by Catullus (li.) *Ad Lesbiam*,

"Ille mi par esse deo videtur."

"Its main object is to point out the essential elements of an impressive style which, avoiding all tumidity, puerility, affectation and bad taste, finds its inspiration in grandeur of thought and intensity of feeling, and its expression in nobility of diction and in skilfully ordered composition" (Sandys).

A full bibliography of the subject will be found in the edition by W. R. Roberts (Cambridge, 2nd ed., 1907), containing an Introduction, Analysis, Translation and Appendices (textual, linguistic, literary and bibliographical), to which may be added F. Marx, *Wiener Studien*, xx. (1898), and F. Kaibel, *Hermes*, xxxiv. (1899), who respectively advocate and reject the claims of Longinus to the authorship; J. E. Sandys, *History of Classical Scholarship* (2nd ed., 1906), pp. 288, 338, should also be consulted. The number of translations in all the languages of Europe is large, including the famous one by Boileau, which made the work a favourite text-book of the bellelettristic critics of the 18th century. A text and translation was published by A. O. Prickard (1907–1908).

LONG ISLAND, an island, 118 m. long and 12 to 23 m. wide, with its axis E.N.E. and W.S.W., roughly parallel with the S. shore of Connecticut, U.S.A., from which it is separated by Long Island Sound (115 m. long and 20-25 m. wide) and lying S.E. of the mainland of New York state, of which it is a part, and immediately E. of Manhattan Island. Area, 1682 sq. m. The east end is divided into two narrow peninsulas (the northern culminating in Orient Point about 25 m. long, the southern ending in Montauk Point, the eastern extremity of the island, about 40 m. long) by the three bays, Great Peconic, Little Peconic (in which lies Shelter Island) and Gardiners (in which lies Gardiners Island). The N. shore is broken in its western half by the fjords of Flushing Bay, Little Neck Bay, Manhasset Bay, Cold Spring Harbor, Huntington Bay (nearly landlocked), Smithtown Bay and Port Jefferson Harbor, which also is nearly landlocked. East of Port Jefferson the N. shore is comparatively unbroken. The S. shore has two bays, Jamaica Bay with many low islands and nearly cut off from the ocean by the narrow spur of Rockaway Beach; and the ill-defined Great South Bay, which is separated from the Atlantic by the narrow Long Beach, Jones Beach and Oak Island Beach, and by the long peninsula (35 or 40 m.), called Fire Island or Great South Beach. Still farther E. and immediately S. of Great Peconic Bay is Shinnecock Bay, about 10 m. long and cut off from the ocean by a narrow beach.

The N. side of the island was largely built by deposits along the front of the continental glacier, and its peculiar surface is due to such deposits. At Astoria the dark gneiss bed rock is visible. The S. half of the island is mostly built of a light sandy or loamy soil and is low, except for the hills (140-195 ft.) of Montauk peninsula, which are a part of the "back-bone" of the island elsewhere running through the centre from E. to W. and reaching its highest point in its western extremity, Oakley's High Hill (384 ft.) and Hempstead Harbor Hill, W. of which are the flat and fertile Hempstead Plains. North of the back-bone or central ridge the country is hilly with glacial drift and many boulders along the coast and with soil stonier and more fertile than that of the "South Side." There is good clay at Whitestone and at Lloyd's Point on the north side. This north shore is comparatively well wooded; the middle of the island is covered with stunted oaks and scrubby pines; the south side is a floral mean between the other divisions. It is cut in its middle part by a few creeks and tidal rivers[1] flowing into the Great South Bay. Another "river," the Peconic, about 15 m. long, runs E. into Peconic Bay. On the north side there are few waterways save Nissequoge river, partly tidal, which runs N. into Smithtown Bay. Near the centre of the island is Lake Ronkonkoma, which is well below the level of the surrounding country, and whose deep cold waters with their unexplained ebb and flow are said to have been so feared by the Indians that they would not fish there. There are salt marshes (probably 100 sq. m. in all) on the shore of the Sound and of the Great South Bay.

As regards its fauna Long Island is a meeting-place for equatorial and arctic species of birds and fish; in winter it is visited occasionally by the auk and in summer sometimes by the turkey buzzard. James E. DeKay in his botanical and zoological survey (1842–1849) of New York state estimated that on Long Island there were representatives of two-thirds of the species of land birds of the United States and seven-eighths of the water birds—probably an exaggerated estimate for the time and certainly not true now. There is snipe and duck shooting, especially on the shores of the Great South Bay; there is good deer hunting, especially in Islip town; and there are several private preserves, some stocked with English game birds, within 50 m. of New York City. There are many excellent trout streams and the island was known in aboriginal times for its fresh and salt water fish. Indian names referring to fishing places are discussed in Wm. W. Tooker's *Some Indian Fishing Stations upon Long Island*. Long Island wampum was singularly good—the Indian name, Seawanhacky (Seawanhaka, &c.), of the island has been interpreted to mean "shell treasury"—and black wampum was made from the purple part of the shell of the quahaug. Soft clams are dug on the north shore at low tide and hard clams are found along the southern shore, where (at Islip) they were first successfully canned; scallops and other small shell fish are taken, especially at the E. end of the island. But the most important shell fishery is that of oysters. The famous Blue Points grow in the Great South Bay, particularly at Sayville and Bellport, where seed oysters planted from Long Island Sound develop into the Blue Points with characteristics of no other variety of oyster. Farther west, on the S. shore are grown the well-known Rockaway oysters. The New York State Fish Commission has a hatchery at Cold Spring Harbor on the N. shore. The largest commercial fisheries are on the south side, in the ocean off Fire Island Beach, where there are great "pounds" in which captured fish are kept alive before shipment to market. Sag Harbor and East Hampton on the E. end of the island were important whaling ports in the 18th century and the first part of the 19th, and they and other fishing villages afterward did a large business in the capture of menhaden (*Brevoortia tyrannus*), a small shad-like fish, which, following the custom of the Indians, they manufactured into fertilizer. At Glen Cove there are now great starch factories.

The west end of the island has been called New York's market garden. On the Hempstead Plains and immediately E. of them along the north shore great quantities of cabbage and cucumbers are grown and manufactured into sauerkraut and pickles. There are large cranberry fields near the village of Calverton, immediately W. of Riverhead.

There are a few large farms on Long Island, mostly on the north side, but it is becoming more and more a place of suburban residence. This change is due in part to cool summer and warm winter winds from the ocean, which makes the July mean temperature 68° to 70° F. at the east end and the south side, and 72° on the north shore, as contrasted with 74° for the west end and New York City. The range of temperature is said to be less than in any other place in the United States with the exception of Corpus Christi (Tex.), Eureka (California), Galveston (Texas), and Key West (Florida). Even on the south shore the humidity for August and September is less than that of any location on the Atlantic coast, or Los Angeles and San Diego on the Pacific, according to Dr Le Grand N. Denslow in a paper, "The Climate of Long Island" (1901). Surf-bathing on the south shore, yachting and boating on the Sound, the Great South Bay and the Ocean, and hunting and fishing are attractions. At Garden City, Nassau (Glen Cove), Great River and Shinnecock Hills are well-known golf links; there are several hunt clubs; and at Southampton are some of the best turf tennis-courts in the United States. Few parts of the island are summer resorts in the ordinary use of the word; there are large hotels hardly anywhere save on Coney Island, at Far Rockaway, on Long Beach and on Shelter Island; and a large part of the summer population lives in private mansions. Some Long Island "country places" are huge estates with game and fish preserves and luxurious "châteaux." The roads are good. The course of the Vanderbilt automobile races is along the roads of the Hempstead Plains. Also on the Hempstead Plains are the Creedmoor Rifle Range, where, in an Interstate Park, E. of Jamaica, annual international rifle shooting tournaments for the championship of America were held until 1909; Garden City, which was founded by A. T. Stewart for the purpose of providing comfortable homes at low cost to his employés and others, and where are the Protestant Episcopal Cathedral of the Incarnation, St Paul's School for Boys and St Mary's School for Girls; and, near Hempstead, the grounds of the Meadowbrook (hunt and polo) Club and those of the Farm Kennel Club. The only railway is the Long Island Railroad (owned by the Pennsylvania Railroad) with western termini on Manhattan and in Long Island City and Brooklyn, whence lines meet at Jamaica, and thence three principal lines branch, the north shore to Wading River, the main line to Greenport, and the south side to Montauk.

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[1] G. K. Gilbert, in an article, "The Deflection of Streams" in the *American Journal of Science* (xxvii. 427-432), points out that each of these streams is "bounded on the west or right side by a bluff 10 to 20 ft. high."

Long Island is a part of New York State, its western third forming Brooklyn and Queens boroughs of New York City—these boroughs were formed respectively from Kings county and from the W. half of Queens county upon the erection of Greater New York. What was formerly the E. half of Queens county then became Nassau county (area 252 sq. m.; pop., in 1900, 55,448, in 1905, 69,477), whose county-seat is Mineola. The eastern and the larger part of the island is the less thickly settled Suffolk county with an area of 918 sq. m. and a population in 1900 of 77,582 and in 1905 of 81,653. The county-seat of Suffolk county is Riverhead, so named from its position at the head of the Peconic river on the W. end of Great Peconic Bay. The ten townships of Suffolk county are large governmental units, showing, by their similarity to the towns of New England, the relation of the early settlers to New England. The largest in area is Brookhaven, which reaches all the way across the island near its central part. The townships of Suffolk county with their population in 1905 were: Huntington (10,236). Babylon (7919), Smithtown (3325), Islip (13,721), Brookhaven (16,050), Riverhead (4950), Shelter Island (1105), Easthampton (4303), Southold (8989) and Southampton (11,024). The total population of Long Island was 1,452,611 in 1900, and 1,718, 056 in 1905 (state census), the population of the borough of Brooklyn alone for these years being 1,166,582 and 1,358,686.

History.—The principal Indian tribes on Long Island at the time of the first settlement by the whites were the Montauk, on the eastern end of the island, where they gave their name to the "point" and where their last "king," David Pharoah, died in 1785; the Shinnecock, who, much admixed with negro blood, now live on the reservation between Canoe Place and Shinnecock Hills; the Manhasset, on what is now Shelter Island; the Patchogue, near the present village of that name; the Massapequa, between the Hempstead Plains and what is now Islip, who were defeated and practically exterminated in 1653 by John Underhill; the Canarsie, who lived near the present Jamaica; and on the north side the Nessaquague or Nissequoge (in the present town of Smithtown), and the Sealtocot who gave their name to Setauket in Brookhaven town. The first pastor of the church (Presbyterian-Congregational) at Easthampton, Thomas James (*c.* 1620–1696), is supposed to have translated a catechism and parts of the Bible into the dialect of the Montauk, among whom Samson Occum had a school between 1755 and 1765.

The territory of Long Island was included in the grant of 1620 by James I. to the Plymouth Company and in 1635 was conveyed to William Alexander, earl of Stirling. The conflicting claims of English and Dutch were the subject of the treaty concluded at Hartford, Connecticut, in 1650, by which the Dutch were to hold everything west of Oyster Bay, the English everything east—a provision which accomplished no agreement, since Oyster Bay itself was the matter of contention, and English settlers on what the Dutch called the west side of Oyster Bay refused to remove. Long Island was included in the territory assigned to the duke of York in 1663–1664, when the New England towns on the island objected to separation from Connecticut. On the recovery of New York by the Dutch in 1673 the eastern towns refused to submit to the Dutch governor. In 1674 by the treaty of Westminster Long Island became a part of the British colony of New York. The Dutch settlements were more important ethnically than historically; on the west end of the Island the Dutch Reformed Church is still strong and there are many Dutch names; at West Sayville, on the "south side," about 50 m. from New York, in a settlement made about 1786 by Gustav Tukker, who did much to develop the oyster fisheries, Holland Dutch was the common speech until the last quarter of the 19th century. The "Five Dutch Towns" were: Nieuw Amersfoord (after 1801 officially called Flatlands), on Jamaica Bay, where the first settlement was made about 1623 and the first grant in 1636; Midwout (later Vlackte-Bosch and Flatbush), settled between 1645 and 1650 and having in 1654 the first Dutch church; Nieuw Utrecht, settled soon after 1650 and incorporated in 1660; Breuckelen (now Brooklyn), which was settled a little before its organization as a town in 1646; and Boswijck (Bushwick), first settled by Swedes and Norwegians and incorporated in 1660. These five towns became one administrative district in 1661.

Apparently the earliest English settlement was at Hempstead in 1640 by colonists from Lynn, Massachusetts, who based their claim on the patent (1621) of Nova Scotia to Lord Stirling, but were almost immediately driven out by the Dutch. In 1643 another English settlement was made at Hempstead by men from Stamford, Connecticut, who in 1644 secured a patent from Governor Kieft of New Netherland. In 1645 Kieft granted land at Gravesend to Lady Deborah Moody, who had settled there about 1643, when she had left Lynn and the Salem church because of her anti-pedobaptist views. At Gravesend in 1664 Colonel Richard Nicolls first landed the English troops which occupied the island; and in 1693 it became one of its three ports of entry. The Connecticut towns on Long Island were as follows: Southampton was settled in 1640 by the Lynn men driven out of Hempstead by the Dutch, and in 1644–1664 was in the Connecticut jurisdiction. Southold (the "South Hold of New Haven"), called from 1640 until 1644 by the Indian name Yennicock, had a church in 1640, and a court based on the Levitical law, which was abolished in 1643 upon the remonstrance of the authorities of New Haven. The Southold settlers were from Hingham, Norfolk and New Haven, and the colony joined New Haven in 1648, in which year the colony of Forrett's (now Shelter) Island also submitted to New Haven. Easthampton was settled in 1648 from Lynn. Oyster Bay was also settled by Lynn men in 1640 and contested by the Dutch and English. Newtown, officially called Middleburgh, was settled in 1652, purchased from the Indians in 1656, "annexed to the other side of the Sound" in 1662, in the same year took the name of Hastings, in 1706 was the scene of the arrest of the Presbyterian itinerants Francis Mackemie and John Hampton, and in 1766 was the site of the Methodist Episcopal Society at Middle Village, the second oldest of that denomination in America. Huntington was settled in 1653 from New Haven, Hempstead, Southold and Southampton. Other early settlements were: Jamaica, about 1657; Brookhaven, first settled at Ashford (now Setauket) from Boston in 1655, and Smithtown, patented in 1677 to Richard Smith of Setauket, who was said to be a soldier of Cromwell, and of whom there is a story that having bargained with the Indians for as much land as a bull could cover in a day he rode his trained bull in a great circuit about the land he coveted and was thereafter known as "Bull" Smith. Almost all these English settlements were made by Presbyterians and from Jamaica east this was the prevailing denomination. During the War of Independence the battle of Long Island (see below) was fought within what is now the borough of Brooklyn.

Authorities.—Benj. F. Thompson, *The History of Long Island* (New York, 2nd ed. 1843); Nathaniel S. Prime, *History of Long Island* (New York, 1845), especially valuable for ecclesiastical history, particularly of the Presbyterian church; Martha B. Flint, *Early Long Island* (New York, 1896); Gabriel Furman, *Antiquities of Long Island* (New York, 1875), edited by Frank Moore; and the publications of the Long Island Historical Society (of Brooklyn) and of the Suffolk County Historical Society (of Riverhead). (R. We.)

Battle of Long Island, 1776.—The interest of this battle lies in the fact that it was the first engagement in the campaign of 1776 (see American War of Independence) and was expected in England to be decisive of the contest in the colonies. After the evacuation of Boston (March 1776), Lord Howe moved against New York City, which he thought would afford a better base of operations for the future. The Americans undertook its defence although recognizing the difficulties in the case, as the bay and rivers adjoining would enable the British fleet to co-operate effectively with the army. To protect his left flank Washington was forced to throw a portion of his troops over to the Long Island side of the East river; they fortified themselves there on the site of the present Borough of Brooklyn. Lord Howe, who had encamped on Staten Island at the entrance to the harbour, determined to attack this isolated left wing, and on the 22nd of August landed at Gravesend Bay, Long Island, with about 20,000 men. The Americans maintained strong outposts in the wooded hills in advance of their fortified lines. On the morning of the 27th Howe, after four days' reconnaissance, attacked these posts with three columns, the left and centre delivering the holding attack, and the right and strongest column turning the enemy's left by a détour. Howe himself, accompanied by Generals (Sir H.) Clinton and Lord Cornwallis, led the turning movement, which came upon the rear of the enemy at the moment when they were engaged with the two other columns. By noon the Americans had been driven back into the Brooklyn lines in considerable confusion, and with the loss of about half their number. This constituted the battle. The completeness of the English victory was due to the neglect of the Americans in guarding the left of their outposts. Howe has been criticized for not immediately assaulting the American works which he might have carried on the evening of the battle. In view of the fact that he had only defeated a small portion of the American forces, and that the works were of considerable strength, he decided to make a formal siege, and Washington took advantage of the delay in operations to retreat across the river to New York on the night of the 29th. This successful movement repaired to some extent the bad moral effect of the defeat of the 27th in the American camp. In the engagement of Long Island Washington lost about 1200 prisoners and 30 guns, and 400 killed and wounded; of the latter the British lost nearly the same number. (C. F. A.)

LONG ISLAND CITY, formerly a city of Queens county, New York, U.S.A., and since the 1st of January 1898 the first ward of the Borough of Queens, New York City. Pop. (1880) 17,129, (1890) 30,506, (1900) 48,272, of whom 15,899 were foreign-born. It has a river front, on East river and Long Island Sound, of 10 m., and is the eastern terminal and the headquarters of the Long Island railway, having a large Y.M.C.A. building (the gift of Mrs Russell Sage) for employees of this railway. Among manufactures are chemicals, pottery, varnish, silk, &c., and there are oil-storage warehouses. Most of the borough offices of Queens borough are in Long Island City, which was formerly the county-seat of Queens county. The first settlement within the limits of what subsequently became Long Island City was made in 1640 by a Dutch blacksmith, Hendrick Harmensen, who soon afterward was murdered by an Indian. Other settlers, both Dutch and English, soon followed, and established detached villages, which became known as Hunter's Point, Blissville, Astoria, Ravenswood, Dutch Kills, Middleton and Steinway. In 1853 this group of villages, by that time virtually one community, was called Long Island City, and it was formally incorporated under that name in 1870. In 1871–1872 the city was laid out by a commission of which General W. B. Franklin was president. Political convictions, economic considerations and fear combined to make the residents in this region largely loyalist in their attitude during the War of Independence. From 1776 to 1783 British troops occupied Newtown, a village to the S.E. In January 1776 the committee on the state of New York in Congress reported a resolution that "Whereas a majority of the inhabitants of Queens county, in the colony of New York, being incapable of resolving to live and die free men, . . . all such persons as voted against sending deputies to the present convention in New York . . . be put out of the protection of the United Colonies," &c., an action which led to the arrest and imprisonment of many of the accused persons.

See J. S. Kelsey, *History of Long Island City* (Long Island City, 1896).

LONGITUDE (from Lat. *longitudo*, "length"), the angle which the terrestrial meridian from the pole through a point on the earth's surface makes with some standard meridian, commonly that of Greenwich. It is equal to the difference between local time on the standard meridian, and at the place defined, one hour of time corresponding to 15° difference of longitude. Formerly each nation took its own capital or principal observatory as the standard meridian from which longitudes were measured. Another system had a meridian passing through or near the island of Ferro, defined as 20° W. of Paris, as the standard. While the system of counting from the capital of the country is still used for local purposes, the tendency in recent years is to use the meridian of Greenwich for nautical and international purposes. France, however, uses the meridian of the Paris observatory as its standard for all nautical and astronomical purposes (see Time). In astronomy, the longitude of a celestial body is the distance of its projection upon the ecliptic from the vernal equinox, counted in the direction west to east from 0° to 360°.

LONGLEY, CHARLES THOMAS (1794–1868), archbishop of Canterbury, was born at Rochester, and educated at Westminster and Oxford. He was ordained in 1818, and was appointed vicar of Cowley, Oxford, in 1823. In 1827 he received the rectory of West Tytherley, Hampshire, and two years later he was elected headmaster of Harrow. This office he held until 1836, when he was consecrated bishop of the new see of Ripon. In 1856 he was translated to the see of Durham, and in 1860 he became archbishop of York. In 1862 he succeeded John Bird Sumner as archbishop of Canterbury. Soon afterwards the questions connected with the deposition of Bishop Colenso were referred to him, but, while regarding Colenso's opinions as heretical and his deposition as justifiable, he refused to pronounce upon the legal difficulties of the case. The chief event of his primacy was the meeting at Lambeth, in 1867, of the first Pan-Anglican conference of British, colonial and foreign bishops (see Lambeth Conferences). His published works include numerous sermons and addresses. He died on the 27th of October 1868 at Addington Park, near Croydon.

LONGMANS, a firm of English publishers. The founder of the firm, Thomas Longman (1) (1699–1755), born in 1699, was the son of Ezekiel Longman (d. 1708), a gentleman of Bristol. Thomas was apprenticed in 1716 to John Osborn, a London bookseller. At the expiration of his apprenticeship he married Osborn's daughter, and in August 1724 purchased the stock and household goods of William Taylor, the first publisher of *Robinson Crusoe*, for £2282 9s. 6d. Taylor's two shops were known respectively as the Black Swan and the Ship, and occupied the ground in Paternoster Row upon which the present publishing house stands. Osborn, who afterwards entered into partnership with his son-in-law, held one-sixth of the shares in Ephraim Chambers's *Cyclopaedia of the Arts and Sciences*, and Thomas Longman was one of the six booksellers who undertook the responsibility of Samuel Johnson's *Dictionary*. In 1754 Thomas

Longman took his nephew into partnership, the title of the firm becoming T. and T. Longman.

Upon the death of his uncle in 1755, Thomas Longman (2) (1730–1797) became sole proprietor. He greatly extended the colonial trade of the firm. He had three sons. Of these, Thomas Norton Longman (3) (1771–1842) succeeded to the business. In 1794 Owen Rees became a partner, and Thomas Brown, who was for many years after 1811 a partner, entered the house as an apprentice. Brown died in 1869 at the age of 92. In 1799 Longman purchased the copyright of Lindley Murray's *English Grammar*, which had an annual sale of about 50,000 copies; he also purchased, about 1800, the copyright, from Joseph Cottle, of Bristol, of Southey's *Joan of Arc* and Wordsworth's *Lyrical Ballads*. He published the works of Wordsworth, Coleridge, Southey and Scott, and acted as London agent for the *Edinburgh Review*, which was started in 1802. In 1804 two more partners were admitted; and in 1824 the title of the firm was changed to Longman, Hurst, Rees, Orme, Brown & Green. In 1814 arrangements were made with Thomas Moore for the publication of *Lalla Rookh*, for which he received £3000; and when Archibald Constable failed in 1826, Longmans became the proprietors of the *Edinburgh Review*. They issued in 1829 Lardner's *Cabinet Encyclopaedia*, and in 1832 M‘Culloch's *Commercial Dictionary*.

Thomas Norton Longman (3) died on the 29th of August 1842, leaving his two sons, Thomas (4) (1804–1879) and William Longman (1813–1877), in control of the business in Paternoster Row. Their first success was the publication of Macaulay's *Lays of Ancient Rome*, which was followed in 1849 by the issue of the first two volumes of his *History of England*, which in a few years had a sale of 40,000 copies. The two brothers were well known for their literary talent; Thomas Longman edited a beautifully illustrated edition of the New Testament, and William Longman was the author of several important books, among them a *History of the Three Cathedrals dedicated to St Paul* (1869) and a work on the *History of the Life and Times of Edward III.* (1873). In 1863 the firm took over the business of Mr J. W. Parker, and with it *Fraser's Magazine*, and the publication of the works of John Stuart Mill and J. A. Froude; while in 1890 they incorporated with their own all the publications of the old firm of Rivington, established in 1711. The family control of the firm (now Longmans, Green & Co.) was continued by Thomas Norton Longman (5), son of Thomas Longman (4).

LONGOMONTANUS (or LONGBERG), **CHRISTIAN SEVERIN** (1562–1647), Danish astronomer, was born at the village of Longberg in Jutland, Denmark, on the 4th of October 1562. The appellation Longomontanus was a Latinized form of the name of his birthplace. His father, a poor labourer called Sören, or Severin, died when he was eight years old. An uncle thereupon took charge of him, and procured him instruction at Lemvig; but after three years sent him back to his mother, who needed his help in field-work. She agreed, however, to permit him to study during the winter months with the clergyman of the parish; and this arrangement subsisted until 1577, when the illwill of some of his relatives and his own desire for knowledge impelled him to run away to Viborg. There he attended the grammar-school, defraying his expenses by manual labour, and carried with him to Copenhagen in 1588 a high reputation for learning and ability. Engaged by Tycho Brahe in 1589 as his assistant in his great astronomical observatory of Uraniborg, he rendered him invaluable services there during eight years. He quitted the island of Hveen with his master, but obtained his discharge at Copenhagen on the 1st of June 1597, for the purpose of studying at some German universities. He rejoined Tycho at Prague in January 1600, and having completed the Tychonic lunar theory, turned homeward again in August. He visited Frauenburg, where Copernicus had made his observations, took a master's degree at Rostock, and at Copenhagen found a patron in Christian Friis, chancellor of Denmark, who gave him employment in his household. Appointed in 1603 rector of the school of Viborg, he was elected two years later to a professorship in the university of Copenhagen, and his promotion to the chair of mathematics ensued in 1607. This post he held till his death, on the 8th of October 1647.

Longomontanus, although an excellent astronomer, was not an advanced thinker. He adhered to Tycho's erroneous views about refraction, held comets to be messengers of evil and imagined that he had squared the circle. He found that the circle whose diameter is 43 has for its circumference the square root of 18252—which gives 3·14185 . . . for the value of π. John Pell and others vainly endeavoured to convince him of his error. He inaugurated, at Copenhagen in 1632, the erection of a stately astronomical tower, but did not live to witness its completion. Christian IV. of Denmark, to whom he dedicated his *Astronomia Danica*, an exposition of the Tychonic system of the world, conferred upon him the canonry of Lunden in Schleswig.

The following is a list of his more important works in mathematics and astronomy: *Systematis Mathematici*, &c. (1611); *Cyclometria e Lunulis reciproce demonstrata*, &c. (1612); *Disputatio de Eclipsibus* (1616); *Astronomia Danica*, &c. (1622); *Disputationes quatuor Astrologicae* (1622); *Pentas Problematum Philosophiae* (1623); *De Chronolabio Historico, seu de Tempore Disputationes tres* (1627); *Geometriae quaesita XIII. de Cyclometria rationali et vera* (1631); *Inventio Quadraturae Circuli* (1634); *Disputatio de Matheseos Indole* (1636); *Coronis Problematica ex Mysteriis trium Numerorum* (1637); *Problemata duo Goemetrica* (1638); *Problema contra Paulum Guldinum de Circuli Mensura* (1638); *Introductio in Theatrum Astronomicum* (1639); *Rotundi in Plano*, &c. (1644); *Admiranda Operatio trium Numerorum* 6, 7, 8, &c. (1645); *Caput tertium Libri primi de absoluta Mensura Rotundi plani*, &c. (1646).

See E. P. F. Vindingius, *Regia Academia Havinensis*, p. 212 (1665); R. Nyerup and Kraft, *Almindeligt Litteraturlexikon*, p. 350 (1820); Ch. G. Jöcher, *Allgemeines Gelehrten-lexikon*, ii. 2518, iii. 2111; Jens Worm, *Forsög til et Lexikon over danske, norske og islandske laerde Maend*, p. 617, 1771, &c.; P. Bayle, *Hist. and Crit. Dictionary*, iii. 861 (2nd ed. 1736); J. B. J. Delambre, *Hist. de l'astr. moderne*, i. 262; J. S. Bailly, *Hist. de l'astr. moderne*, ii. 141; J. L. E. Dreyer, *Tycho Brahe*, pp. 126, 259, 288, 299; F. Hoeffer, *Hist. de l'astronomie*, p. 391; J. Mädler, *Geschichte der Himmelskunde*, i. 195; J. F. Weidler, *Hist. Astronomiae*, p. 451.

LONGSTREET, JAMES (1821–1904), American soldier, lieutenant-general in the Confederate army, was born on the 8th of February 1821 in Edgefield district, South Carolina, and graduated at West Point in 1842. He served in the Mexican War, was severely wounded, and received two brevets for gallantry. In 1861, having attained the rank of major, he resigned when his state seceded, and became a brigadier-general in the Confederate army. In this rank he fought at the first battle of Bull Run, and subsequently at the head of a division in the Peninsular campaign and the Seven Days. This division subsequently became the nucleus of the I. corps, Army of Northern Virginia, which was commanded throughout the war by Longstreet. This corps took part in the battles of second Bull Run and Antietam, and held the left of Lee's front at Fredericksburg. Most of the corps was absent in North Carolina when the battle of Chancellorsville took place, but Longstreet, now a lieutenant-general, returned to Lee in time to take part in the campaign of Gettysburg. At that battle he disapproved of the attack because of the exceptionally strong position of the Federals. He has been charged with tardiness in getting into the action, but his delay was in part authorized by Lee to await an absent brigade, and in part was the result of instructions to conceal his movements, which caused circuitous marching. The most conspicuous fighting in the battle was conducted by Longstreet. In September 1863 he took his corps to the west and bore a conspicuous part in the great battle of Chickamauga. In November he commanded the unsuccessful expedition against Knoxville. In 1864 he rejoined Lee's army in Virginia, and on the 6th of May arrived upon the field of the Wilderness as the Confederate right had been turned and routed. His attack was a model of impetuosity and skill, and drove the enemy back until their entire force upon that flank was in confusion. At this critical moment, as Longstreet in person, at the head of fresh troops, was pushing the attack in the forest, he was fired upon by mistake by his own men and desperately wounded. This mischance stayed the Confederate assault for two hours, and enabled the enemy to provide effective means to meet it. In October 1864 he resumed command of his corps, which he retained until the surrender, although paralysed in his right arm. During the period of Reconstruction Longstreet's attitude towards the political problem, and the discussion of certain military incidents, notably the responsibility for the Gettysburg failure, brought the general into extreme unpopularity, and in the course of a controversy, which lasted for many years, much was said and written by both sides which could be condoned only by irritation. His acceptance of a Federal office at New Orleans brought him, in a riot, into armed conflict with his old Confederate soldiers. His admiration for General Grant and his loyalty to the Republican party accentuated the ill-feeling of the Southern people. But in time his services in former days were recalled, and he became once more "General Lee's war-horse" to his old soldiers and the people of the South. He held several civil offices, among them being that of minister to Turkey under Grant and that of commissioner of Pacific railways under Presidents McKinley and Roosevelt. In 1896 he published *From Manassas to Appomattox*, and in his later years he prepared an account of Gettysburg, which was published soon after his death, with notes and reminiscences of his whole military career. General Longstreet died at Gainesville, Georgia, on the 2nd of January 1904.

See *Lee and Longstreet at High Tide*, by Helen D. Longstreet (Gainesville, Ga., 1904).

LONGTON, a market-town of Staffordshire, England, on the North Staffordshire railway, 2½ m. S.E. of Stoke-on-Trent, within which parliamentary and municipal borough it is included. Pop. (1901) 35,815. The town is in the Potteries district, and in the neighbourhood of coal and iron mines. It was governed by a mayor, 10 aldermen and 30 councillors until under the "Potteries Federation" scheme (1908) it became part of the borough of Stoke-on-Trent in 1910.

LONGUEVILLE, the name of a French family which originated with Jean, count of Dunois, the "Bastard of Orleans," to whom Charles VII. gave the countship of Longueville in Normandy in 1443. François of Orleans, count of Longueville, was created duke in 1505. The marriage of his brother Louis with Jeanne, daughter and heiress of Philip, count of Baden-Hochberg-Sausenberg (d. 1503), added considerable estates to the house of Longueville. Henry, duc de Longueville (d. 1663), took an important part in the Fronde, and for a long time held the royal troops in check in Normandy. His wife, Anne Geneviève (see below), was a leading figure in the political dissensions of the time. The last of the family was Jean Louis, the Abbé d'Orléans, who died in 1694. The numismatist, Charles d'Orléans-Rothelin (1691–1744), belonged to a bastard branch of the family.

LONGUEVILLE, ANNE GENEVIÈVE, Duchesse de (1619–1679), was the only daughter of Henri de Bourbon, Prince de Condé, and his wife Charlotte Marguerite de Montmorency, and the sister of Louis, the great Condé. She was born on the 28th of August 1619, in the prison of Vincennes, into which her father and mother had been thrown for opposition to Marshal D'Ancre, the favourite of Marie de' Medici, who was then regent in the minority of Louis XIII. She was educated with great strictness in the convent of the Carmelites in the Rue St Jacques at Paris. Her early years were clouded by the execution of the duc de Montmorency, her mother's only brother, for intriguing against Richelieu in 1631, and that of her mother's cousin the comte de Montmorency-Boutteville for duelling in 1635; but her parents made their peace with Richelieu, and being introduced into society in 1635 she soon became one of the stars of the Hôtel Rambouillet, at that time the centre of all that was learned, witty and gay in France. In 1642 she was married to the duc de Longueville, governor of Normandy, a widower twice her age. The marriage was not happy. After Richelieu's death her father became chief of the council of regency during the minority of Louis XIV., her brother Louis won the great victory of Rocroy in 1643 (see Condé), and the duchess became of political importance. In 1646 she accompanied her husband to Münster, where he was sent by Mazarin as chief envoy, and where she charmed the German diplomatists who were making the treaty of Westphalia, and was addressed as the "goddess of peace and concord." On her return she fell in love with the duc de la Rochefoucauld, the author of the *Maxims*, who made use of her love to obtain influence over her brother, and thus win honours for himself. She was the guiding spirit of the first Fronde, when she brought over Armand, Prince de Conti, her second brother, and her husband to the malcontents, but she failed to attract Condé himself, whose loyalty to the court overthrew the first Fronde. It was during the first Fronde that she lived at the Hôtel de Ville and took the city of Paris as god-mother for the child born to her there. The peace did not satisfy her, although La Rochefoucauld won the titles he desired. The second Fronde was largely her work, and in it she played the most prominent part in attracting to the rebels first Condé and later Turenne. In the last year of the war she was accompanied into Guienne by the duc de Nemours, her intimacy with whom gave La Rochefoucauld an excuse for abandoning her, and who himself immediately returned to his old mistress the duchesse de Chevreuse. Thus abandoned, and in disgrace at court, the duchess betook herself to religion. She accompanied her husband to his government at Rouen, and devoted herself to good works. She took for her director M. Singlin, famous in the history of Port Royal. She chiefly lived in Normandy till 1663, when her husband died, and she came to Paris. There she became more and more Jansenist in opinion, and her piety and the remembrance of her influence during the disastrous days of the Fronde, and above all the love her brother, the great Condé, bore her, made her conspicuous. The king pardoned her and in every way showed respect for her. She became the great protectress of the Jansenists; it was in her house that Arnauld, Nicole and De Lane were protected; and to her influence must be in great part attributed the release of Lemaistre De Sacy from the Bastille, the introduction of Pomponne into the ministry and of Arnauld to the king. Her famous letters to the pope are part of the history of Port Royal (*q.v.*), and as long as she lived the nuns of Port Royal des Champs were left in safety. Her elder son resigned his title and estates, and became a Jesuit under the name of the Abbé d'Orléans, while the younger, after leading a debauched life, was killed leading the attack in the passage of the Rhine in 1673. As her health failed she hardly ever left the convent of the Carmelites in which she had been educated. On her death in 1679 she was buried with great splendour by her brother Condé, and her heart, as she had directed, was sent to the nuns of the Port Royal des Champs.

The chief authority for Madame de Longueville's life is a little book in two volumes by Villefore the Jansenist, published in 1738. Victor Cousin has devoted four volumes to her, which, though immensely diffuse, give a vivid picture of her time. See also Sainte-Beuve, *Portraits des femmes* (1840). Her connexion with Port Royal should be studied in Arnauld's *Memoirs*, and in the different histories of that institution.

LONGUS, Greek sophist and romancer, author of *Daphnis and Chloë*. Nothing is known of his life, and all that can be said is that he probably lived at the end of the 2nd or the beginning of the 3rd century A.D. It has been suggested that the name Longus is merely a misreading of the last word of the title Λεσβιακῶν ἐρωτικῶν λόγοι δ′ in the Florentine MS.; Seiler also observes that the best MS. begins and ends with λόγου (not λόγγου) ποιμενικῶν. If his name was really Longus, he was probably a freedman of some Roman family which bore it. Longus's style is rhetorical, his shepherds and shepherdesses are wholly conventional, but he has imparted human interest to a purely fanciful picture. As an analysis of feeling, *Daphnis and Chloë* makes a nearer approach to the modern novel than its chief rival among Greek erotic romances, the *Aethiopica* of Heliodorus, which is remarkable mainly for the ingenious succession of incidents. Daphnis and Chloë, two children found by shepherds, grow up together, nourishing a mutual love which neither suspects. The development of this simple passion forms the chief interest, and there are few incidents. Chloë is carried off by a pirate, and ultimately regains her family. Rivals alarm the peace of mind of Daphnis; but the two lovers are recognized by their parents, and return to a happy married life in the country. *Daphnis and Chloë* was the model of *La Sireine* of Honoré d'Urfé, the *Diana enamorada* of

Montemayor, the *Aminta* of Tasso, and *The Gentle Shepherd* of Allan Ramsay. The celebrated *Paul et Virginie* is an echo of the same story.

See J. Dunlop's *History of Prose Fiction* (1888), and especially E. Rohde, *Der griechische Roman* (1900). Longus found an incomparable translator in Jacques Amyot, bishop of Auxerre, whose French version, as revised by Paul Louis Courier, is better known than the original. It appeared in 1559, thirty-nine years before the publication of the Greek text at Florence by Columbanus. The chief subsequent editions are those by G. Jungermann (1605), J. B. de Villoison (1778, the first standard text with commentary), A. Coraës (Coray) (1802), P. L. Courier (1810, with a newly discovered passage), E. Seiler (1843), R. Hercher (1858), N. Piccolos (Paris 1866) and Kiefer (Leipzig, 1904), W. D. Lowe (Cambridge, 1908). A. J. Pons's edition (1878) of Courier's version contains an exhaustive bibliography. There are English translations by G. Thornley (1657, reprinted 1895), C. V. Le Grice (1803), R. Smith (in Bohn's Classical Library), and the rare Elizabethan version by Angel Day (from Amyot's translation) ed. J. Jacobs (Tudor Library, 1890). The illustrated editions generally of Amyot's version are numerous and some are beautiful, Prudhon's designs being especially celebrated.

LONGWY, a fortified town of north-eastern France in the department of Meurthe-et-Moselle, 80 m. N.N.W. of Nancy by rail. Pop. (1906) 8901. Longwy is situated on a plateau overlooking the Chiers, a right-bank affluent of the Meuse, near the frontiers of Belgium and Luxemburg. It comprises an upper and a lower town, the former, on a hill 390 ft. above the Chiers valley, commands the Luxemburg road, and is strengthened by an enceinte and a few out-lying fortifications. There is garrison accommodation for 3000 men and 800 horses, but the permanent garrison is small. The lower town is the industrial centre. The 17th-century church has a lofty square tower, the hôtel de ville dates from 1730, and there is a fine hospital. Iron is extensively mined in the district, and supplies numerous blast furnaces. Several iron and steel works are in operation, and metal utensils, fire-proof ware and porcelain are manufactured. Longwy (*Longus vicus*) came into the possession of the French in 1678 and was at once fortified by Vauban. It was captured by the Prussians in 1792, 1815 and 1871.

LÖNNROT, ELIAS (1802–1884), Finnish philologist and discoverer of the *Kalevala*, was born at Nyland in Finland on the 9th of April 1802. He was an apothecary's assistant, but entered the university of Åbo in 1822, and after taking his successive degrees became a physician in 1832. But before this, as early as 1827, he had begun to publish contributions to the study of the ancient Finnish language, and to collect the national ballads and folk-lore, a field which was at that time uncultivated. In 1833 he settled as a doctor in the country district of Kajana, and began to travel throughout Finland and the adjoining Russian provinces in his leisure time, collecting songs and legends. In this way he was able to put together the great epic of Finland, the *Kalevala*, the first edition of which he published in 1835; he continued to add to it, and in 1849 issued a larger and completer text. In 1840 Lönnrot issued his important collection of the *Kanteletar*, or folk-songs of ancient Finland, which he had taken down from oral tradition. The *Proverbs of Finland* followed in 1842. In 1853, on the death of Castrén, Lönnrot became professor of the Finnish language and literature at the high school of Helsingfors. He retired from this chair in 1862. He died on the 19th of March 1884.

LONSDALE, EARLS OF. This English earldom is held by the ancient family of Lowther, which traces its descent to Sir Hugh Lowther, who flourished in the reign of Edward I. Sir Hugh's descendant Sir Richard Lowther (1529–1607) received Mary queen of Scots on her flight into England in 1568, and in the two following years was concerned with his brother Gerard in attempts to release her from captivity. He was sheriff of Cumberland and lord warden of the west marches. A house built by Gerard Lowther at Penrith is now the "Two Lions Inn." Sir Richard's eldest son, Sir Christopher Lowther (d. 1617), was the ancestor of the later Lowthers, and another son, Sir Gerard Lowther (d. 1624), was judge of the common pleas in Ireland.

One of Sir Christopher's descendants was Sir John Lowther, Bart. (d. 1706), the founder of the trade of Whitehaven, and another was John Lowther (1655–1700), who was created Viscount Lonsdale in 1696. Before this creation John had succeeded his grandfather, another Sir John Lowther (d. 1675), as a baronet, and had been member of parliament for Westmorland from 1675 to 1696. In 1688 he was serviceable in securing Cumberland and Westmorland for William of Orange; in 1690 he was first lord of the treasury, and he was lord privy seal from March 1699 until his death in July 1700. Lonsdale wrote *Memoirs of the Reign of James II.*, which were printed in 1808 and again in 1857. His family became extinct when his son Henry, the 3rd viscount (1694–1751), died unmarried in March 1751.

James Lowther, 1st earl of Lonsdale (1736–1802), was a son of Robert Lowther (d. 1745) of Maulds Meaburn, Westmorland, who was for some time governor of Barbados and was descended from Sir Christopher Lowther; through his mother Catherine Pennington, James was a great-grandson of the 1st viscount Lonsdale. He inherited one of the family baronetcies in 1751, and from three sources he obtained immense wealth, being the heir of the 3rd viscount Lonsdale, of Sir James Lowther, Bart. (d. 1755) of Whitehaven, and of Sir William Lowther, Bart. (d. 1756). From 1757 to 1784 he was a member of parliament, exercising enormous influence on elections in the north of England and usually controlling nine seats in the House of Commons, where his nominees were known as "Sir James's ninepins." He secured the election of William Pitt as member for his borough of Appleby in 1781, and his dispute with the 3rd duke of Portland over the possession of the socage manor of Carlisle and the forest of Inglewood gave rise to lengthy proceedings, both in parliament and in the law courts. In 1784 Lowther was created earl of Lonsdale and in 1797 Viscount Lowther with an extended remainder. The earl's enormous wealth enabled him to gratify his political ambitions. Sir N. W. Wraxall (*Historical and Posthumous Memoirs*, ed. H. B. Wheatley, 1884), who gives interesting glimpses of his life, speaks of his "prodigious property," and quotes Junius, who called him "the little contemptible tyrant of the north." He was known as the "bad earl," and Horace Walpole and others speak slightingly of him; he was, however, a benefactor to Whitehaven, where he boasted he owned the "land, fire and water."

He married Mary (1738–1824), daughter of George III.'s favourite, John Stuart, 3rd earl of Bute, but died childless on the 24th of May 1802, when the earldom became extinct, but a kinsman, Sir William Lowther, Bart. (1757–1844), of Swillington, became 2nd viscount Lowther. This viscount, who was created earl of Lonsdale in 1807, is chiefly famous as the friend of Wordsworth and the builder of Lowther Castle, Penrith. His son, William Lowther, 3rd earl of Lonsdale (1787–1872), held several subordinate positions in various Tory ministries, and was lord president of the council in 1852. He died unmarried, and was succeeded by his nephew Henry (1818–1876), whose son Hugh Cecil (b. 1857) succeeded his brother as 6th earl of Lonsdale in 1882.

Other prominent members of the Lowther family are the Right Hon. James William Lowther (b. 1855), who became speaker of the House of Commons in 1905; Sir Gerard Augustus Lowther (b. 1858), who became British ambassador at Constantinople in 1908; and the Right Hon. James Lowther (1840–1904), who was a well-known Conservative member of parliament from 1865 onwards, and chief secretary for Ireland from 1878 to 1880.

LONSDALE, WILLIAM (1794–1871), English geologist and palaeontologist, was born at Bath on the 9th of September 1794. He was educated for the army and in 1810 obtained a commission as ensign in the 4th (King's Own) regiment. He served in the Peninsular War at the battles of Salamanca and Waterloo, for both of which he received medals, and he retired as lieutenant. Residing afterwards for some years at Batheaston he collected a series of rocks and fossils which he presented to the Literary and Scientific Institution of Bath. He became the first honorary curator of the natural history department of the museum, and worked there until 1829 when he was appointed assistant secretary and curator of the Geological Society of London at Somerset House. There he held office until 1842, when ill-health led him to resign. The ability with which he edited the publications of the society and advised the council "on every obscure and difficult point" was commented on by Murchison in his presidential address (1843). In 1829 Lonsdale read before the society an important paper "On the Oolitic District of Bath" (*Trans. Geol. Soc.* ser. 2, vol. iii.), the results of a survey begun in 1827; later he was engaged in a survey of the Oolitic strata of Gloucestershire (1832), at the instigation of the Geological Society, and he laid down on the one-inch ordnance maps the boundaries of the various geological formations. He gave particular attention to the study of corals, becoming the highest authority in England on the subject, and he described fossil forms from the Tertiary and Cretaceous strata of North America and from the older strata of Britain and Russia. In 1837 he suggested from a study of the fossils of the South Devon limestones that they would prove to be of an age intermediate between the Carboniferous and Silurian systems. This suggestion was adopted by Sedgwick and Murchison in 1839, and may be regarded as the basis on which they founded the Devonian system. Lonsdale's paper, "Notes on the Age of the Limestones of South Devonshire" (read 1840), was published in the same volume of the *Transactions of the Geological Society* (ser. 2, vol. v.) with Sedgwick and Murchison's famous paper "On the Physical Structure of Devonshire," and these authors observe that "the conclusion arrived at by Mr Lonsdale, we now apply without reserve both to the five groups of our North Devon section, and to the fossiliferous slates of Cornwall." The later years of Lonsdale's life were spent in retirement, and he died at Bristol on the 11th of November 1871. (H. B. Wo.)

LONS-LE-SAUNIER, a town of eastern France, capital of the department of Jura, 76 m. N.N.E. of Lyons on the Paris-Lyons railway, on which it is a junction for Chalon-sur-Saône, Dôle, Besançon and Champagnole. Pop. (1906) 10,648. The town is built on both sides of the river Vallière and is surrounded by the vine-clad hills of the western Jura. It owes its name to the salt mines of Montmorot, its western suburb, which have been used from a very remote period. The church of St Désiré, a building of the 12th and 15th centuries, preserves a huge Romanesque crypt. The town is the seat of a prefect and of a court of assizes, and there are tribunals of first instance and of commerce, a chamber of commerce, lycées and training-colleges for both sexes, and a branch of the Bank of France. There is an establishment for the use of the mineral waters, which are sodio-chlorinated and have strengthening properties. The principal industry of the place is the manufacture of sparkling wines, the Étoile growth being the best for this purpose. Trade is in cheese, cereals, horses, cattle, wood, &c.

Lons-le-Saunier, known as *Ledo* in the time of the Gauls, was fortified by the Romans, who added the surname *Salinarius* to the Gallic name. An object of contention owing to the value of its salt, it belonged for a long time during the medieval period to the powerful house of Chalon, a younger branch of that of Burgundy. It was burned in 1364 by the English, and again in 1637, when it was seized by the duke of Longueville for Louis XIII. It became definitively French in 1674. It was here that the meeting between Ney and Napoleon took place, on the return of the latter from Elba in 1815. Rouget de l'Isle, the author of the *Marseillaise*, was born at Montaigu near this town, where there is a statue erected to him.

LOO (formerly called "Lanterloo," Fr. *lanturlu*, the refrain of a popular 17th-century song), a round game of cards, played by any number of persons; from five to seven makes the best game. "Three-card loo" is the game usually played. An ordinary pack of fifty-two cards is used and the deal passes after each round. Each player must have the same number of deals; but if there is a "loo" (the sum forfeited by a player who plays, but does not win a trick) in the last deal of a round, the game continues till there is a hand without a loo. The dealer deals three cards face downwards, one by one, to each player and an extra hand called "miss," and turns up the top of the undealt cards for trumps. Each player contributes to the pool a sum previously agreed upon. The unit for a single stake should be divisible by three without a remainder, *e.g.* three counters or three pence. The players are bound to put in the stake before the deal is completed. Each player in rotation, beginning from the dealer's left, looks at his cards, and declares whether he will play, or pass, or take "miss." If the former, he says "I play." If he takes miss he places his cards face downwards in the middle of the table, and takes up the extra hand. If he passes, he similarly places his cards face downwards in the middle of the table. If miss is taken, the subsequent players only have the option of playing or passing. A player who takes miss must play. Those who are now left in play one card each in rotation, beginning from the dealer's left, the cards thus played constituting a trick. The trick is won by the highest card of the suit led, or, if trumped, by the highest trump, the cards ranking as at whist. The winner of the trick leads to the next, and so on, until the hand is played out. The cards remain face upwards in front of the persons placing them.

If the leader holds ace of trumps he must lead it (or king, if ace is turned up). If the leader has two trumps he must lead one of them, and if one is ace (or king, ace being turned up) he must lead it. With this exception the leader is not bound to lead his highest trump if more than two declare to play; *but if there are only two declared players* the leader with more than one trump must lead the highest. Except with trumps as above stated he may lead any card he chooses. The subsequent players must head the trick if able, and must follow suit if able. Holding none of the suit led, they must head the trick with a trump, if able. Otherwise they may play any card they please. The winner of the first trick is subject to the rules already stated respecting the lead, and in addition he must lead a trump if able (called *trump after trick*).

When the hand has been played out, the winners of the tricks divide the pool, each receiving one-third of the amount for each trick. If only one has declared to play, the dealer plays miss either for himself or for the pool. If he plays for the pool he must declare before seeing miss that he does not play for himself. Any tricks he may win, when playing for the pool, remain there as an addition to the next pool. Other rules provide that the dealer must play, if only one player stands, with his own cards or with "miss." If miss is gone and against him, he may defend with the three top cards of the pack, excluding the trump card; these cards are called "master."

If each declared player wins at least one trick it is a *single*, *i.e.* a fresh pool is made as already described; but if one of the declared players fails to make a trick he is looed. Then only the player who is looed contributes to the next pool. If more than one player is looed, each has to contribute.

At *unlimited loo* each player looed has to put in the amount there was in the pool. But it is often agreed to limit the loo, so that it shall not exceed a certain fixed sum. Thus, at eighteen-penny loo, the loo is generally limited to half a guinea. If there is less than the limit in the pool the payment is regulated as before; but if there is more than the limit, the loo is the fixed sum agreed on.

The game is sometimes varied by "forces," *i.e.* by compelling every one to play in the first deal, or when there is no loo the previous deal, or whenever clubs are trumps ("club law"). When there is a force no miss is dealt. "Irish loo" is played by allowing declared players to exchange some or all of their cards for cards dealt from the top of the pack. There is no miss, and it is not compulsory to lead a trump with two trumps, unless there are only two declared players. At "five-card loo" each player has five cards instead of three, and a single stake should be divisible by five. "Pam" (knave of clubs) ranks as the highest trump, whatever suit is turned up. There is no miss, and cards may be exchanged as at Irish loo. If ace of trumps is led, the leader says "Pam be civil," when the holder of that card must pass the trick if he can do so without revoking. A flush (five cards of the same suit, or four with Pam) "loos the board," *i.e.* the holder receives the amount of a loo from every one, and the hand is not played. A trump flush takes precedence of flushes in other suits. If more than one flush is held, or if Pam is held, the holder is exempted from payment. As between two flushes which do not take precedence, the elder hand wins. A single stake should be divisible by five.

LOOE, a seaport and market town in the Bodmin parliamentary division of Cornwall, England, 17 m. by sea W. of Plymouth, a terminus of the Liskeard & Looe light railway.

Pop. (1901) 2548. It is divided by the river into East Looe and West Looe; and is sheltered so completely by the surrounding hills that myrtles, geraniums, fuchsias and other delicate plants flourish at all seasons in the open air. Its lanes are narrow, steep and winding; many of the houses are entered by wooden staircases; and though considerably modernized the town has a medieval air. Inland, the shores of the river are richly wooded; and towards the sea they rise on the south into rugged cliffs. The parish church of St Martin, which stands 1 m. outside the town, has a Norman doorway and font. Among other buildings may be mentioned the ancient chapel of St Nicholas in West Looe, restored in 1862; and the old town-hall, where the ancient pillory is preserved. A considerable export trade in copper, tin and granite was formerly carried on, and the last is still exported, but the chief trade is in grain; while timber, coal and limestone are imported. There are also thriving fisheries, the Looe fishermen being particularly expert with the seine on a rocky bottom. The inlet of Trelawne is one of the most exquisite wooded coombes in Cornwall. At its head are the remains of a camp, connected with the Giant's Hedge, a raised earthwork which extends for 7 m. in a straight line, as far as a larger camp, on Bury Down, and is of Danish or Saxon construction. Trelawne, a fine old mansion belonging to the family of Trelawny, dates in part from the 15th century, but has been very largely restored.

The harbourage was probably the original cause of settlement at Looe. At the time of the Domesday Survey East Looe was assessed under Pendrym, which was of the king's demesne and West Looe under Hamelin's manor of Trelowia. In the 14th century the former manor was held by the family of Bodrugan; the latter by that of Dauney, who had inherited it from the Treverbyns. In 1237 Henry Bodrugan received the grant of a market on Fridays and a fair at Michaelmas in his manor of Pendrym. In 1301 his grandson and namesake granted to East Looe a market and fair, view of frank pledge, ducking stool and pillory and assize of bread and ale. Otto Bodrugan in 1320 granted the burgesses the privilege of electing their own portreeve and controlling the trade of the town. A charter of incorporation was granted in 1558 under which the common council was to consist of a mayor and 8 chief burgesses. There was to be a court of record, a market on Saturdays and fairs at Michaelmas and Candlemas. In 1685 James II. provided that there should be a mayor and 11 aldermen, 36 free burgesses, 4 fairs and a court of pie powder. East Looe was governed under this charter until 1885. West Looe (known also as Porpighan or Porbuan) benefited by a charter granted by Richard king of the Romans to Odo Treverbyn and ratified in 1325 constituting it a free borough whose burgesses were to be free of all custom throughout Cornwall. Residence for a year and a day within the borough conferred freedom from servitude. There were to be a market on Wednesdays and a fair at Michaelmas. Hugh son of Odo Treverbyn gave West Looe the privileges enjoyed by Helston and Launceston. Upon the attainder of the earl of Devon in 1539 the borough fell to the crown and was annexed to the duchy. In 1574 a charter of incorporation was granted, providing for a mayor and 11 burgesses, also for a market on Wednesdays and two fairs. West Looe continued to be administered under this charter until 1869, when the death of the mayor deprived the council of its only surviving member and elector. Parliamentary representation was conferred upon East Looe in 1571 and upon West Looe in 1553. In the debate on the reform bill O'Connell stated that there was but one borough more rotten than East Looe and that was West Looe. Looe was second only to Fowey as a port in the 15th century. It furnished 20 ships for the siege of Calais. Of the markets and fairs only the markets on Wednesdays and Saturdays and a fair on the 6th of May remain.

LOOM, or Loon (Icelandic, *Lómr*), a name applied to water-birds of three distinct families, remarkable for their clumsy gait on land.[1] The first is the *Colymbidae*, to which the term diver (*q.v.*) is usually restricted in books; the second the *Podicipedidae*, or grebes (*q.v.*); and the third the *Alcidae*. The form loo*n* is most commonly used both in the British Islands and in North America for all species of the genus *Colymbus*, or *Eudytes* according to some ornithologists, frequently with the prefix sprat, indicating the fish on which they are supposed to prey; though it is the local name of the great crested grebe (*Podiceps cristatus*) wherever that bird is sufficiently well known to have one; and, as appears from Grew (*Mus. Reg. Soc.* p. 69), it was formerly given to the little grebe or dabchick (*P. fluviatilis* or *minor*). The other form loo*m* seems more confined in its application to the north, and is said by T. Edmonston (*Etym. Gloss. Shetl. and Orkn. Dialect*, p. 67) to be the proper name in Shetland of *Colymbus septentrionalis*;[2] but it has come into use among Arctic seamen as the name of the guillemot (*Alca arra* or *bruennichi*) which throngs the cliffs of northern lands, from whose "loomeries" they obtain a wholesome food; while the writer believes he has heard the word locally applied to the razorbill (*q.v.*). (A. N.)

LOOM, a machine for weaving fabrics by intersecting the longitudinal threads, the "warp," *i.e.* "that which is thrown across" (O.E. *wearp*, from *weorpan*, to throw, cf. Ger. *werfen*) with the transverse threads, the "weft," *i.e.* "that which is woven" (O.E. *wefta*, from *wefan*, to weave, cf. Ger. *weben*). The O.E. *geloma* and M.E. *lome* meant an implement or tool of any kind. In the sense of property, furniture, &c., it appears in heirloom (*q.v.*). The earliest example with its specific meaning quoted by the *New English Dictionary* is from the *Nottingham Records* of 1404 (see Weaving).

"Loom" in the sense of "to appear indistinctly," to come into view in an exaggerated indistinct shape, must be distinguished from the above word. This appears to have been a sailor's term for the indistinct or exaggerated appearance of land, a vessel or other object through haze or darkness at sea. It is of obscure origin, but has been connected through the O. Fr. *lumer*, modern *allumer*, with Lat. *lumen*, light, and with the root seen in "lame," in the sense of "moving slowly towards one."

LOÓN, the largest town of the province of Bohol, island of Bohol, Philippine Islands, on the extreme W. coast. Pop. (1903) 18,114. Loón is picturesquely situated on the W. slope of a hill, and is reached from the sea by steps cut in the rocks. The harbour is in a sheltered bay on the N. side of the town. The cultivation of coco-nuts, coffee, cocoa, maguey, tobacco, cotton and Indian corn, and the raising of livestock are the principal industries; there is also considerable commerce and some manufacturing. The language is chiefly Bohol-Visayan.

LOOP. (1) A curve or bend, particularly a bend in a string, rope, &c., formed by doubling back one part so as to leave an opening; similarly a ring of metal or other material leaving an aperture. (2) In architecture or fortification, "loop," more usually in the form "loophole," is an opening in the wall of a building, very narrow on the outside and splayed within, from which arrows or darts might be discharged on an enemy, or through which light might be admitted. They are often in the form of a cross, and generally have round holes at the ends (see Oillets). (3) The word is also a term in iron and steel manufacturing for a mass of metal ready for hammering or rolling, a "bloom."

This last word is represented in French by *loupe*, from which it is probably adapted. The earlier English form was also *loupe*, and it was also applied to precious stones which were of inferior brilliancy; the same also appears in French. Of the word in its two first meanings, a bend or circle in a line of string, metal, rails, &c., and "loophole," the derivation is uncertain. Skeat takes the word in both meanings to be the same and to be of Scandinavian origin, the old Norwegian *hlaup*, a leap, being the direct source. The base is the Teutonic *hlaufan*, to run, to leap, German *laufen*. The *New English Dictionary* considers the Swedish example, *löp-knut*, "running knot," and others given by Skeat in support of his derivation to be Germanisms, and also that the pronunciation of the word would have been *lowp* rather than *lūp*. "Loop" in meaning (2) "loophole" is also taken to be a different word, and is derived from Dutch *luipen*, to peer, watch. In modern Dutch the word for a narrow opening is *gluip*.

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[1] The word also takes the form "lumme" (*fide* Montagu), and, as Professor Skeat observes, is probably connected with *lame*. The signification of *loon*, a clumsy fellow, and metaphorically a simpleton, is obvious to any one who has seen the attempt of the birds to which the name is given to walk.

[2] Dunn and Saxby, however, agree in giving "rain-goose" as the name of the species in Scotland.

LOOSESTRIFE, in botany, the common name of *Lysimachia vulgaris*, an erect plant, 2 to 4 ft. high, common on river banks in England; the branched stem bears tapering leaves in pairs or whorls, and terminal panicles of rather large deep yellow flowers. It is a member of the primrose family. *L. nemorum*, yellow pimpernel, or wood loosestrife, a low-growing plant with slender spreading stem, and somewhat similar yellow flowers standing singly in the leaf-axils, is frequent in copses. *L. Nummularia* is the well-known creeping jenny or money-wort, a larger plant with widely creeping stem, pairs of shining leaves and large solitary yellow flowers; it is found on banks of rivers and damp woods, and is a common rockery plant. Purple loosestrife, *Lythrum Salicaria*, belongs to a different family, *Lythraceae*. It is a handsome plant growing 2 to 6 ft. high on river banks and ditches, with a branched angled stem bearing whorls of narrow pointed stalkless leaves and ending in tall tapering spikes of beautiful rose-purple flowers. The flowers are trimorphic, that is to say, exist in three forms which differ in the relative length of the styles and stamens and are known as long-styled, mid-styled and short-styled forms respectively; the size and colour of the pollen also differ. These differences play an important part in the pollination of the flower.

LOOT, plunder or spoil taken from an enemy in war, especially the indiscriminate plunder taken by the victor after the capture of a city. The word came into English from India. It is adapted from the Hindi *lūt*, which is either from Sanskrit *luṇṭ*, to rob, plunder, or *lōtra*, *lōptra*, booty.

LOPES, FERNÃO (1380?–1459?), the patriarch of Portuguese historians, was appointed keeper of the royal archives, then housed in the castle of St George in Lisbon, by King John I. in November 1418. He acted as private secretary to the Infants D. Duarte and D. Fernando, and when the former ascended the throne he charged Lopes, by letter of the 19th of March 1434, with the work of "putting into chronicles the stories of the kings of old time as well as the great and lofty actions of the most virtuous king my lord and father" (John I.). The form of the appointment marked its limits, and is a sufficient reply to those modern critics who have censured Lopes for partiality. Notwithstanding his official title of chief chronicler of the realm, he was the king's man (*Vassallo del Rei*), and received his salary from the royal treasury. King Alphonso V. confirmed him in his post by letter of the 3rd of June 1449, and in 1454, after thirty-six years' service in the archives and twenty as chronicler, he resigned in favour of Gomez Eannes de Azurara. The latter pays a tribute to his predecessor as "a notable person, a man of rare knowledge and great authority," and the modern historian Herculano says, "there is not only history in the chronicles of Fernão Lopes, there is poetry and drama as well; there is the middle age with its faith, its enthusiasm, its love of glory." Lopes has been called the Portuguese Froissart, and that rare gift, the power of making their subjects live, is common to the two writers; indeed, had the former written in a better-known language, there can be little doubt that the general opinion of critics would have confirmed that of Robert Southey, who called Lopes "beyond all comparison the best chronicler of any age or nation." Lopes was the first to put in order the stories of the earlier Portuguese monarchs, and he composed a general chronicle of the kingdom, which, though it never appeared under his name, almost certainly served as a foundation for the chronicles of Ruy de Pina (*q.v.*). Lopes prepared himself for his work with care and diligence, as he tells us, not only by wide reading of books in different languages, but also by a study of the archives belonging to municipalities, monasteries and churches, both in Portugal and Spain. He is usually a trustworthy guide in facts, and charms the reader by the naïve simplicity of his style.

His works that have come down are: (1) *Chronica del Rei D. João I. de boa memoria*, parts 1 and 2 (Lisbon, 1644). The third part relating the capture of Ceuta was added by Azurara. A corrected text of the chronicle has been issued by instalments in the *Archivo Historico Portuguez*. (2) "Chronica do senhor rei D Pedro I.," in vol. iv. of the *Collecção de Livros Ineditos da Historia Portugueza*, published by the Academy of Sciences (Lisbon, 1816); a much better text than that published by Father Bayão in his edition of the same chronicle (Lisbon, 1760). (3) *Chronica do senhor rei D. Fernando* published in the same volume and collection. The British Museum has some important 16th-century MSS. of the chronicles.

See Damião de Goes, *Chronica del Rei Dom Manoel*, part iv. ch. 38; Araãgo Morato, introduction to vol. iv. of the above collection; Herculano, *Opusculos*, vol. v. (E. Pr.)

LOPEZ, CARLOS ANTONIO (1790–1862), Paraguayan autocrat, was born at Asuncion on the 4th of November 1790, and was educated in the ecclesiastical seminary of that city. He attracted the hostility of the dictator, Francia, and he was forced to keep in hiding for several years. He acquired, however, so unusual a knowledge of law and governmental affairs that, on Francia's death in 1840, he obtained an almost undisputed control of the Paraguayan state, which he maintained uninterruptedly until his death on the 10th of September 1862. He was successively secretary of the ruling military *junta* (1840–1841), one of the two consuls (1841–1844), and president with dictatorial powers (1844–1862) by successive elections for ten and three years, and in 1857 again for ten years, with power to nominate his own successor. Though nominally a president acting under a republican constitution, he ruled despotically. His government was in general directed with wise energy towards developing the material resources and strengthening the military power of the country. His jealousy of foreign approach several times involved him in diplomatic disputes with Brazil, England, and the United States, which nearly resulted in war, but each time he extricated himself by skilful evasions.

His eldest son, Francisco Solano Lopez (1826–1870), was born near Asuncion on the 24th of July 1826. When in his nineteenth year he was made commander-in-chief of the Paraguayan army, during the spasmodic hostilities then prevailing with the Argentine Republic. He was sent in 1853 as minister to England, France and Italy, and spent a year and a half in Europe. He purchased large quantities of arms and military supplies, together with several steamers, and organized a project for building a railroad and establishing a French colony in Paraguay. He also formed the acquaintance of Madame Lynch, an Irish adventuress of many talents and popular qualities, who became his mistress, and strongly influenced his later ambitious schemes. Returning to Paraguay, he became in 1855 minister of war, and on his father's death in 1862 at once assumed the reins of government as vice-president, in accordance with a provision of his father's will, and called a congress by which he was chosen president for ten years. In 1864, in his self-styled capacity of "protector of the equilibrium of the La Plata," he demanded that Brazil should abandon her armed interference in a revolutionary struggle then in progress in Uruguay. No attention being paid to his demand, he seized a Brazilian merchant steamer in the harbour of Asuncion, and threw into prison the Brazilian governor of the province of Matto Grosso who was on board. In the following month (December 1864) he despatched a force to invade Matto Grosso, which seized and sacked its capital Cuyabá, and took possession of the province and its diamond mines. Lopez next sought to send an army to the relief of the Uruguayan president Aguirro against the revolutionary aspirant Flores, who was supported by Brazilian troops. The refusal of the Argentine president, Mitre, to allow this force to cross the intervening province of Corrientes, was seized upon by Lopez as an occasion for war with the Argentine Republic. A congress, hastily summoned, and composed of his own nominees, bestowed upon Lopez the title of marshal, with extraordinary war powers, and on April 13, 1865, he declared war, at the same time seizing two Argentine war-vessels in the bay of Corrientes, and on the next day occupied the town of Corrientes, instituted a provisional government of his Argentine partisans, and summarily announced the annexation to Paraguay of the provinces of Corrientes and Entre Rios. Meantime the party of Flores had been successful in Uruguay, and that state on April the 18th united with the Argentine Republic in a declaration of war on Paraguay. On the 1st of May Brazil joined these two states in a secret alliance, which stipulated that they should unitedly prosecute the war "until the existing government of Paraguay should be overthrown," and "until no arms or elements of war should be left to it." This agreement was literally carried out. The war which ensued, lasting until the 1st of April 1870, was carried on with great stubbornness and with alternating fortunes, though with a steadily increasing tide of disasters to Lopez (see PARAGUAY). In 1868, when the allies were pressing him hard, his mind, naturally suspicious and revengeful, led him to conceive that a conspiracy had been formed against his life in his own capital and by his chief adherents. Thereupon several hundred of the chief Paraguayan citizens were seized and executed by his order, including his brothers and brothers-in-law, cabinet ministers, judges, prefects, military officers, bishops and priests, and nine-tenths of the civil officers, together with more than two hundred foreigners, among them several members of the diplomatic legations. Lopez was at last driven with a mere handful of troops to the northern frontier of Paraguay, where, on the 1st of April 1870, he was surprised by a Brazilian force and killed as he was endeavouring to escape by swimming the river Aquidaban.

LOPEZ DE GÓMARA, FRANCISCO (1510?–1555?), Spanish historian, was educated at the university of Alcalá, where he took orders. Soon after 1540 he entered the household of the famous Cortés, who supplied him with most of the material for his *Historia de las Indias* (1552), and *Crónica de la conquista de Nueva España* (1552). The pleasing style and novel matter enchanted the Spanish public, but the unmeasured laudation of Cortés at the expense of his lieutenants and companions brought about a violent reaction. Though the *Historia* was dedicated to Charles V., both works were forbidden on the 17th of November 1553, and no editions of them were issued between 1554 and 1727. Italian and French versions of his books were published in 1556 and 1578 respectively.

LOP-NOR or LOB-NOR, a lake of Central Asia, in the Gobi Desert, between the Astin-tagh (Altyn-tagh) on the south and the Kuruk-tagh on the north. Previous to 1876 it was placed in nearly all maps at 42° 30′ N., a position which agreed with the accounts and the maps of ancient Chinese geographers. In the year mentioned the Russian explorer Przhevalsky discovered two closely connected lake-basins, Kara-buran and Kara-koshun, fully one degree farther south, and considerably east of the site of the old Lop-nor, which lake-basins he nevertheless regarded as being identical with the old Lop-nor of the Chinese. But the water they contained he pronounced to be fresh water. This identification was disputed by Baron von Richthofen, on the ground that the Lop-nor, the "Salt Lake" of the Chinese geographers, could not be filled with fresh water; moreover, being the final gathering basin of the desert stream, the Tarim, it was bound to be salt, more especially as the lake had no outflow. Przhevalsky visited the Lop-nor region again in 1885, and adhered to his opinion. But ten years later it was explored anew by Dr Sven Hedin, who ascertained that the Tarim empties part of its waters into another lake, or rather string of lakes (Avullu-köl, Kara-köl, Tayek-köl and Arka-köl), which *are* situated in 42° 30′ N., and thus so far justified the views of von Richthofen, and confirmed the Chinese accounts. At the same time he advanced reasons for believing that Przhevalsky's lake-basins, the southern Lop-nor, are of quite recent origin—indeed, he fixed upon 1720 as the probably approximate date of their formation, a date which von Richthofen would alter to 1750. Besides this, Sven Hedin argued that there exists a close inter-relation between the northern Lop-nor lakes and the southern Lop-nor lakes, so that as the water in the one group increases, it decreases to the same proportion and volume in the other. He also argued that the four lakes of northern Lop-nor are slowly moving westwards under the incessant impetus of wind and sandstorm (*buran*). These conclusions were afterwards controverted by the Russian traveller, P. K. Kozlov, who visited the Lop-nor region in 1893–1894—that is, before Dr Sven Hedin's examination. He practically only reiterated Przhevalsky's contention, that the ancient Chinese maps were erroneously drawn, and that the Kara-koshun, in spite of the freshness of its water, was the old Lop-nor, *the* Salt Lake *par excellence* of the Chinese. Finally, in 1900, Dr Sven Hedin, following up the course of the Kum-darya, discovered—at the foot of the Kuruk-tagh, and at the E. (lowest) extremity of the now desiccated Kuruk-darya, with traces of dead forest and other vegetation beside it and beside the river-bed—the basin of a desiccated salt lake, which he holds to be the true ancient Lop-nor of the Chinese geographers, and at the same time he found that the Kara-koshun or Lop-nor of Przhevalsky had extended towards the north, but shrunk on the south. Thus the old Lop-nor no longer exists, but in place of it there are a number of much smaller lakes of newer formation. It may fairly be inferred that, owing to the uniform level of the region, the sluggish flow of the Tarim, its unceasing tendency to divide and reunite, conjoined with the violence and persistency of the winds (mostly from the east and north-east), and the rapid and dense growth of the reed-beds in the shallow marshes, the drainage waters of the Tarim basin gather now in greater volume in one depression, and now in greater volume in another; and this view derives support from the extreme shallowness of the lakes in both Sven Hedin's northern Lop-nor and Przhevalsky's southern Lop-nor, together with the uniformly horizontal level of the entire region.

See Delmar Morgan's translation of Przhevalsky's *From Kuja across the Tian-shan to Lop-nor* (London, 1879); Von Richthofen's "Bemerkungen zu den Ergebnissen von Oberst-Leutenant Prjewalskis Reise nach dem Lop-nor" in *Verhandl. der Gesch. f. Erdkunde zu Berlin* (1878), pp. 121 seq.; Sven Hedin's *Scientific Results of a Journey in Central Asia, 1899–1902* (vols. i. and ii., Stockholm, 1905–1906), where Kozlov's share of the controversy is summarized (cf. ii., 270-280). (J. T. BE.)

LOQUAT, JAPANESE PLUM or JAPANESE MEDLAR, known botanically as *Eriobotrya japonica*, small evergreen tree belonging to the natural order Rosaceae, with large thick oval-oblong leaves borne near the ends of the branches, and dark green above with a rusty tomentum on the lower face. The fruit is pear-shaped, yellow, about 1½ in. long and contains large stony seeds; it has an agreeable acid flavour. The plant is a native of China and Japan, but is widely grown for its fruit and as a decorative plant. It is a familiar object in the Mediterranean region and in the southern United States.

LORAIN, a city of Lorain county, Ohio, U.S.A., on Lake Erie, at the mouth of the Black river, and about 25 m. W. by S. of Cleveland. Pop. (1890) 4863; (1900) 16,028, of whom 4730 were foreign-born and 359 negroes; (1910 census) 28,883. Lorain is served by the New York, Chicago & St. Louis, and the Baltimore & Ohio railways, by the Lake Shore Electric railway, and by several of the more important steamboat lines on the Great Lakes. It has a Carnegie library, the Lake View Hospital and the Saint Joseph's Hospital. There is a good harbour, and the city's chief interests are in the shipping of great quantities of coal, iron-ore, grain and lumber, in the building of large steel vessels, in railway shops, and in the manufacture of iron pipes, gas engines, stoves and automatic steam shovels. The value of the factory products increased from $9,481,388 in 1900 to $14,491,091 in 1905, or 52·8%. The municipality owns and operates the waterworks. A Moravian mission was established here in 1787–1788, and a trading post in 1807, but no permanent settlement was made until several years later. In 1836 the place was incorporated as a village under the name "Charleston"; in 1874 the present name was adopted, and in 1896 Lorain became a city of the second class.

LORALAI, a town and district of India, in Baluchistan. The town, which is situated 4700 ft. above the sea, 35 m. by road from the railway station of Harnai, was occupied as a military station in 1886, and has quarters for a native cavalry and a native infantry regiment. Pop. (1901) 3561.

The DISTRICT OF LORALAI was formed in 1903. It consists of a series of long, narrow valleys, hemmed in by rugged mountains, and bordered E. by Dera Ghazi Khan district of the Punjab. Area 7999 sq. m.; pop. (1901) 67,864, of whom the majority are Afghans. The principal crops are wheat and millet; but the chief wealth of the inhabitants is derived from their herds of cattle, sheep and goats.

LORCA, a town of eastern Spain, in the province of Murcia, on the right bank of the river Sangonera (here called the Guadalantin or Guadalentin) and on the Murcia-Baza railway. Pop. (1900) 69,836. It occupies a height crowned by a medieval fortress, among the foothills of the Sierra del Caño. Its older parts, Moorish in many features and with narrow irregular streets, contrast with the modern parts, which have broad streets and squares, and many fine public buildings—theatre, town hall, hospitals, courts of justice and a bridge over the Sangonera. There is an important trade in agricultural products and live stock, as well as manufactures of woollen stuffs, leather, gunpowder, chemicals and porcelain. Silver, sulphur and lead are found in the neighbourhood.

Lorca is the Roman *Eliocroca* (perhaps also the *Ilorci* of Pliny, *N.H.* iii. 3) and the Moorish *Lurka.* It was the key of Murcia during the Moorish wars, and was frequently taken and retaken. On the 30th of April 1802 it suffered severely by the bursting of the reservoir known as the Pantano de Puentes, in which the waters of the Sangonera were stored for purposes of irrigation (1775–1785); the district adjoining the river, known as the Barrio de San Cristobal, was completely ruined, and more than six hundred persons perished. In 1810 Lorca suffered greatly from the French invasion. In 1886 the Pantano, which was one of the largest of European reservoirs, being formed by a dam 800 ft. long and 160 ft. high, was successfully rebuilt.

LORCH, a town in the Prussian province of Hesse-Nassau, romantically situated on the right bank of the Rhine, 8 m. below Rüdesheim by the railway Frankfort-on-Main-Wiesbaden-Cologne. Pop. (1905) 2269. It has a fine Gothic Roman Catholic church—St Martin's—dating from the 14th century. The slopes of the hills descending to the Rhine are covered with vineyards, which produce excellent wine. In the neighbourhood of Lorch, which was mentioned as early as 832, is the ruined castle of Nollich.

LORCH, a town in the kingdom of Württemberg, on the Rems, 26 m. E. from Stuttgart by the railway to Nördlingen. Pop. (1905) 3033. It possesses a fine Protestant church dating from the 12th century. Its industries include carriage-building and the manufacture of cement and paper. On the Marienberg lying above the town stands the former Benedictine monastery of Lorch, founded about 1108 by Frederick of Hohenstaufen, and in 1563 converted into an Evangelical college. Here Schiller passed a portion of his school days. The church contains several tombs of the Hohenstaufen family. The Roman *limes* began at Lorch and Roman remains have been found in the neighbourhood of the town.

See Kirn, *Führer durch das Kloster Lorch* (Lorch, 1888); and Steimle, *Kastell Lorch* (Heidelberg, 1897).

LORD, JOHN (1810–1894), American historical writer and lecturer, was born in Portsmouth, New Hampshire, on the 27th of December 1810. He was the nephew of Nathan Lord (1792–1870), president of Dartmouth College from 1828 to 1863. He graduated at Dartmouth in 1833, and at Andover Theological Seminary in 1837. His course at the Seminary was interrupted by a period of teaching—at Windham, Connecticut (1834), and at Norwich (1834–1835)—and by a tour in 1836 through New York and Ohio, in which he lectured on the dark ages. He was agent and lecturer for the American Peace Society (1837–1839), and for a brief time was a Congregational pastor in turn at New Marlboro and West Stockbridge, Massachusetts, and at Utica, New York. About 1840 he became a professional lecturer on history. He lectured extensively for fifty years, especially in the United States and Great Britain, and introduced, with success, the mid-day lecture. He was lecturer on history in Dartmouth from 1869 to 1876. He received, in 1864, the degree of LL.D. from the University of the City of New York. From 1854 he made his home in Stamford, Connecticut, where he died on the 15th of December 1894. His works include, besides several school and college histories, *The Old Roman World: the Grandeur and Failure of Civilization* (1867); *Ancient States and Empires* (1869); *Two German Giants: Frederick the Great and Bismarck* (1885); and *Beacon Lights of History* (8 vols., 1884–1896), his chief contribution to historical literature.

See *The Life of John Lord* (1896) by Rev. Alexander S. Twombley, D. D. (in "Beacon Lights of History"), which is based chiefly upon Lord's *Reminiscences of Fifty Years in the Lecture Field.*

LORD (O. Eng. *hlā́ford, i.e. hlā́fweard,* the warder or keeper of bread, *hlā́f,* loaf; the word is not represented in any other Teutonic language), in its primary sense, the head of a household, the master of those dependent on him for their daily bread, correlative to O. Eng. *hlā́f-aḗta,* loaf-eater, servant; the word frequently occurs in this sense in the Bible, cf. Matt. xxiv. 45. As a term implying the ownership of property, "lord" survives in "lord of the manor" and "landlord." The chief applications are due to its use as the equivalent of Lat. *dominus,* Gr. *κύριος* and Fr. *seigneur*; thus in the Old Testament it represents *Yahweh,* Jehovah, and in the New Testament *κύριος,* as a title of Jesus Christ. Selden's words may be quoted for the more general meanings of "lord"; "the name Dominus is . . . to be thought of only as a distinguishing attribute of Greatness and as our English word Lord is; and that without any relation of it to an Interest of property or to servitude, and only as it denotes such Superiours as King or Subjects of the greater Nobility with us and men of special Eminency in other States, known by the names of Heeren, Dons, Sieurs, signiors, seigneurs . . . and the like." It is thus not only a general word for a prince or sovereign, but also the common word for a feudal superior, and particularly of a feudal tenant holding directly of the king, a baron (*q.v.*), hence a peer of the realm, a member of the House of Lords, constituted of the lords temporal and the lords spiritual; this is the chief modern usage. The prefix "lord" is ordinarily used as a less formal alternative to the full title, whether held by right or by courtesy, of marquess, earl or viscount, and is always so used in the case of a baron (which in English usage is generally confined to the holder of a foreign title). Where the name is territorial, the "of" is dropped, thus, the marquess of A., but Lord A. The younger sons of dukes and marquesses have, by courtesy, the title of Lord prefixed to the Christian and surname, *e.g.* Lord John Russell. In the case of bishops, the full and formal title of address is the Lord Bishop of A., whether he be a spiritual peer or not. Many high officials of the British government have the word "lord" prefixed to their titles; some of them are treated in separate articles; for lord privy seal see PRIVY SEAL. In certain cases the members of a board which has taken the place of an office of state are known as lords commissioners or, shortly, lords of the office in question, *e.g.* lords of the treasury, civil or naval lords of the admiralty. For lord lieutenant and lord mayor see LIEUTENANT and MAYOR. As the proper form of address "my lord" is used not only to those members of the nobility to whom the title "Lord" is applicable, and to bishops, but also to all judges of the High Court in England, and of the Scottish and Irish Superior Courts, and to lord mayors and lord provosts (see also LADY).

LORD ADVOCATE, or king's advocate, the principal law-officer of the crown in Scotland. His business is to act as a public prosecutor, and to plead in all causes that concern the crown. He is at the head of the system of public prosecutions by which criminal justice is administered in Scotland, and thus his functions are of a far more extensive character than those of the English law-officers of the crown. He is aided by a solicitor-general and by subordinate assistants called advocates-depute. The office of king's advocate seems to have been established about the beginning of the 16th century. Originally he had no power to prosecute crimes without the concurrence of a private party; but in the year 1597 he was empowered to prosecute crimes at his own instance. He has the privilege of pleading in court with his hat on.

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